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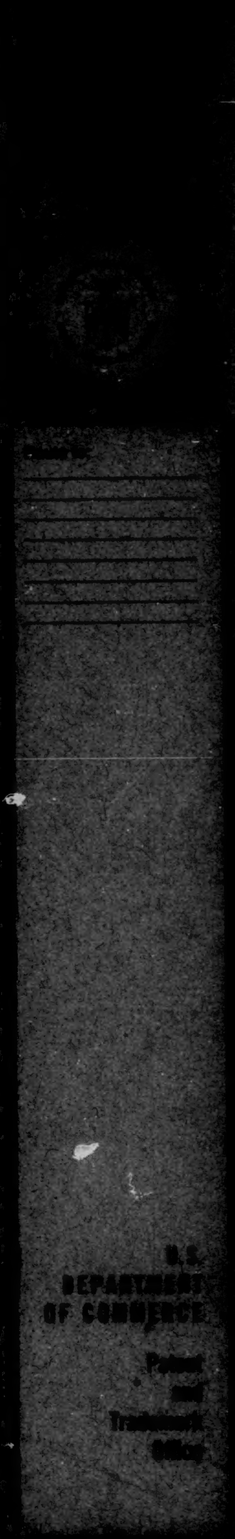
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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
January 6, 1987 Volume 1074 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
All cases:	1015.00
International fees	
Basic fee (first 30 pages):	430.00
Basic Supplemental fee (for each page over 30):	8.00
Designation fee for the first 10 national or regional offices:	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Sept. 30, 1986.

Board of Appeals Decisions Rendered in the Month of Nov. 1986

Affirmed	171
Affirmed in Part	23
Reversed	69
Total	263

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Jan. 3, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,423,523 through 4,424,594
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED OCTOBER 19, 1986 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,354,282	06/242,847	10/19/82
4,354,296	06/236,587	10/19/82
4,354,303	06/216,679	10/19/82
4,354,325	06/292,152	10/19/82
4,354,326	06/281,670	10/19/82
4,354,356	06/260,288	10/19/82
4,354,357	06/252,174	10/19/82
4,354,365	06/236,020	10/19/82
4,354,387	06/298,152	10/19/82
4,354,391	06/219,919	10/19/82
4,354,392	06/241,259	10/19/82
4,354,395	06/216,321	10/19/82
4,354,415	06/218,815	10/19/82
4,354,441	06/230,507	10/19/82
4,354,444	06/237,519	10/19/82
4,354,466	06/271,749	10/19/82
4,354,476	06/308,059	10/19/82
4,354,477	06/260,348	10/19/82
4,354,484	06/222,316	10/19/82
4,354,494	06/242,036	10/19/82
4,354,510	06/259,841	10/19/82
4,354,511	06/244,690	10/19/82
4,354,513	06/216,230	10/19/82
4,354,560	06/315,184	10/19/82
4,354,571	06/231,582	10/19/82
4,354,583	06/293,364	10/19/82
4,354,593	06/244,973	10/19/86
4,354,596	06/236,936	10/19/82
4,354,598	06/295,771	10/19/82
4,354,604	06/219,395	10/19/82
4,354,637	06/227,741	10/19/82
4,354,650	06/245,026	10/19/82
4,354,657	06/220,839	10/19/82
4,354,660	06/230,194	10/19/82
4,354,669	06/236,155	10/19/82
4,354,746	06/305,081	10/19/82
4,354,752	06/253,244	10/19/82
4,354,755	06/253,958	10/19/82
4,354,768	06/259,734	10/19/82
4,354,769	06/222,156	10/19/82
4,354,827	06/255,244	10/19/82
4,354,842	06/267,682	10/19/82
4,354,869	06/265,172	10/19/82
4,354,874	06/316,854	10/19/82
4,354,875	06/316,857	10/19/82
4,354,879	06/226,838	10/19/82
4,354,887	06/327,881	10/19/82
4,354,890	06/246,905	10/19/82
4,354,910	06/223,285	10/19/82
4,354,914	06/251,380	10/19/82
4,354,916	06/259,814	10/19/82
4,354,918	06/225,066	10/19/82
4,354,933	06/236,801	10/19/82
4,354,939	06/234,186	10/19/82
4,354,941	06/225,720	10/19/82
4,354,945	06/271,894	10/19/82
4,354,946	06/285,849	10/19/82
4,354,972	06/291,435	10/19/82
4,354,980	06/270,363	10/19/82
4,354,985	06/246,093	10/19/82
4,355,007	06/255,552	10/19/82
4,355,008	06/255,553	10/19/82
4,355,022	06/279,536	10/19/82
4,355,031	06/262,717	10/19/82
4,355,044	06/218,285	10/19/82
4,355,052	06/255,503	10/19/82
4,355,099	06/278,792	10/19/82
4,355,120	06/327,930	10/19/82
4,355,173	06/269,686	10/19/82
4,355,186	06/277,288	10/19/86
4,355,189	06/232,210	10/19/82
4,355,192	06/328,984	10/19/82
4,355,195	06/249,185	10/19/82
4,355,216	06/221,962	10/19/82
4,355,238	06/236,277	10/19/82
4,355,315	06/222,244	10/19/82
4,355,328	06/236,948	10/19/82
4,355,382	06/220,091	10/19/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,060,311, Re. S.N. 907,133, Filed Sept. 12, 1986, Cl. 350/357, ELECTROCHROMIC DEVICE, Mino Green, Owner of Record: *Inventor,* Attorney or Agent: Watson T. Scott, et al., Ex. Gp.: 250

4,419,348, Re. S.N. 929,395, Filed Nov. 10, 1986, Cl. 424/180, ANTHRACYCLINE GLYCOSIDE COMPOSITIONS, THEIR USE AND PREPARATION, Aquilur Rahman, et al., Owner of Record: *Georgetown University, Washington, D.C.,* Attorney or Agent: Norman F. Oblon, et al., Ex. Gp.: 120

4,499,797, Re. S.N. 930,683, Filed Nov. 12, 1986, Cl. 81/367, SELF-ADJUSTING LOCKING WRENCH, Neill R. Wilson, Owner of Record: *Inventor,* Attorney or Agent: Christopher B. Fagan, Ex. Gp.: 320

4,501,842, Re. S.N. 926,428, Filed Nov. 3, 1986, Cl. 524/432, ADHESIVE FOR BONDING CURED EPDM RUBBER, Chester T. Chmiel, et al., Owner of Record: *Uniroyal Plastic Co., Inc., Middlebury, Conn.,* Attorney or Agent: Stephen P. Gilbert, et al., Ex. Gp.: 150

4,533,461, Re. S.N. 926,153, Filed Nov. 3, 1986, Cl. 208/44, PROCESS FOR PRODUCING MESOPHASE PITCH, Takayuki Izumi, et al., Owner of Record: *Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Arthur H. Seidel, et al., Ex. Gp.: 110

4,557,052, Re. S.N. 929,618, Filed Nov. 12, 1986, Cl. 30/276, MOWING MACHINE WITH ANNULAR INERTIA SHIFTER, Toru Baba, et al., Owner of Record: *Kioritz Corp., Tokyo, Japan,* Attorney or Agent: Ernest A. Wegner, et al., Ex. Gp.: 320

4,570,038, Re. S.N. 896,694, Filed Nov. 12, 1986, Cl. 379/452, SANITARY COVER FOR TELEPHONES AND THE LIKE, Frank Tinelli, Owner of Record: *Inventor,* Attorney or Agent: Paul D. Flehr, et al., Ex. Gp.: 260

4,570,805, Re. S.N. 927,549, Filed Nov. 6, 1986, Cl. 211/149, FOLDABLE DISPLAY STAND, Irving Smith, Owner of Record: *Inventor,* Attorney or Agent: David B. Kirschstein, et al., Ex. Gp.: 350

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the gen-

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eral public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,815,317, Reexam. No. 90/001,133, Requested: Nov. 25, 1986, Cl. 53/29, METHOD AND MECHANISM FOR MAKING FILLED BAGS, Franco Toss, Owner of Record: *Minigrip, Inc., Orangeburg, N.Y.,* Attorney or Agent: Hill, Vansaten, et al., Ex. Gp.: 320, Requester: Owner

3,980,151, Reexam. No. 90/001,134, Requested: Dec. 3, 1986, Cl. 180/43, FRONT WHEEL DRIVE ASSEMBLY FOR FOUR-WHEEL DRIVE TRACTOR, Yoshinobu Murayama, et al., Owner of Record: *Kibota Tekko Kabushiki Kaisha, Osaka, Japan,* Attorney or Agent: Armstrong, Nikaido, et al., Ex. Gp.: 310, Requester: Kioti Tractor, Inc., Portland, Ore.

3,998,233, Reexam. No. 90/001,128, Requested: Nov. 14, 1986, Cl. 132/48A, BARRETTE WITH SWIVELED HINGE, Irene M. Dorr, Owner of Record: *Irene M. Zeman, Baltimore, Md.,* Attorney or Agent: Thomas L. Creel, Ex. Gp.: 330, Requester: Lotus Heart, Inc.

4,034,534, Reexam. No. 90/001,130, Requested: Nov. 21, 1986, Cl. 52/668, LOUVERED CEILING, John Ludlum Taylor, Owner of Record: *Intalite International N.V., Northbrook, Ill.,* Attorney or Agent: Berman, Aisenberg, et al., Ex. Gp.: 350, Requester: American Luminous Ceilings, Inc., Cleveland, Ohio

4,048,654, Reexam. No. 90/001,129, Requested: Nov. 6, 1986, Cl. 358/144, STEREOPHONIC TELEVISION SOUND TRANSMISSION SYSTEM, Carl R. Wegner, Owner of Record: *Telesonics, Inc., Chicago, Ill.,* Attorney or Agent: Lockwood, Alex, et al., Ex. Gp.: 230, Requester: Zenith Electronics Corp., Glenview, Ill.

4,194,650, Reexam. No. 90/001,136, Requested: Dec. 9, 1986, Cl. 222/57, LIQUID MIXING AND AERATING SYSTEM, James E. Nottke, et al., Owner of Record: *Lykes Pasco Packing Co., Dispenser Div., Clearwater, Fla.,* Attorney or Agent: Frijouf, Rust, et al., Ex. Gp.: 310, Requester: Lancer Corp., San Antonio, Tex.

4,261,339, Reexam. No. 90/001,131, Requested: Dec. 1, 1986, Cl. 128/1.004, BALLOON CATHETER WITH ROTATABLE SUPPORT, Bruce L. Hanson, et al., Owner of Record: *Datascope Corp., Paramus, N.J.,* Attorney or Agent: Kenyon & Kenyon, Ex. Gp.: 330, Requester: Kontron, Inc., Everett, Mass.

4,462,242, Reexam. No. 90/001,135, Requested: Dec. 5, 1986, Cl. 72/467, METHOD FOR WIRE DRAWING, Allen C. Morgenthaler, Owner of Record: *GK Technologies, Inc., Greenwich, Conn.,* Attorney or Agent: Hopgood, Calimafde, et al., Ex. Gp.: 320, Requester: Dale M. Heist, Philadelphia, Pa.

4,543,288, Reexam. No. 90/001,132, Requested: Nov. 24, 1986, Cl. 428/297, FIBRE REINFORCED PLASTICS SHEETS, Bronislaw Radrian, et al., Owner of Record: *The Wiggins Teape Group, Ltd., Beaconsfield, England,* Attorney or Agent: Burns, Doane, et al., Ex. Gp.: 150, Requester: Owner

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Interference Practice: Response to Order to Show Cause Under 37 CFR 1.640

37 CFR 1.640(e) provides that when an order to show cause under 37 CFR 1.640(d) is issued against an interference party, the Board of Patent Appeals and Interferences will enter judgment against that party "unless, within 20 days after the date of the order, the party against whom the order issued files a paper which shows good cause why judgment should not be entered in accordance with the order." In the application of this rule, some confusion has arisen as to the nature of the "paper" which the party must file when the basis of the order is 37 CFR 1.640(d)(1), i.e., where "[a] decision on a motion is entered which is dispositive of the interference against the party on any count."

Normally, the "paper" filed in response to such an order to show cause should be a simple request that final hearing (see 37 CFR 1.654) be set to review the decision on the motion which was dispositive of the interference against the party, as well as any other decision on motion which the party may wish to have reviewed by the Board.* When such a response is filed, the Examiner-in-Chief will normally set the times for filing briefs under 37 CFR 1.656. The response should be accompanied by a motion requesting a testimony period, if the party desires to take testimony. See 37 CFR 1.640(e), last sentence. Also, an opposing party may request a testimony period, even if the party responding to the order to show cause does not. Such a request should be filed promptly after the Examiner-in-Chief enters an order setting the brief times, but in no event more than twenty (20) days after entry of such order. Cf. the Commissioner's Notice of June 15, 1981, 1008 O.G. 9 (July 14, 1981).

Instead of filing a request that final hearing be set, the party under order to show cause may file a paper containing a full discussion of the reasons why judgment should not be entered. However, before deciding to file such a paper, the following should be taken into consideration:

(1) Such paper will be construed as a request for final hearing if a testimony period is requested;

(2) Such paper will be deemed a waiver of any opportunity to present oral argument concerning the matters discussed therein, and the matter will be decided by the Board based upon the content of the paper and any response thereto;

(3) An opposing party may still request final hearing and/or a testimony period within twenty (20) days of the date of service of the paper, and if either request is granted it will be necessary for the parties to file briefs under 37 CFR 1.656.

It is the policy of the Board of Patent Appeals and Interferences that when final hearing is set pursuant to a request therefor following an order to show cause issued as a result of a decision on preliminary motions under 37 CFR 1.633 or 1.634, the parties must raise at that hearing for consideration by the Board *all* matters specified in 37 CFR 1.655(b) which were decided on the merits by the Examiner-in-Chief and which they wish to have considered. In other words, once the brief times are set for such a final hearing, every matter which was decided by an Examiner-in-Chief in connection with a motion under 37 CFR 1.633 or 1.634 must be raised in the parties' main briefs if the parties wish to have those matters considered by the Board. A party cannot wait to see what the Board's decision on one such matter will be and then, if the decision is unfavorable to the party and the case continues, raise that matter or any other such matter at a subsequent final hearing.

DONALD W. PETERSON,
Deputy Commissioner
of Patents
and Trademarks.

Dec. 8, 1986.

*It should be recognized that the decision of the Board following the final hearing may not terminate the interference. For example, if the order to show cause resulted from an Examiner-in-Chief's grant of a motion for judgment, and the Board after final hearing reversed the Examiner-in-Chief's decision, the case might then proceed to the taking of priority testimony. The Board's decision would however be final with regard to the basis of the motion for judgment.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

R. J. Investments, Inc., assignee, by mesne assignment, of Vulcan Containers, Inc., Addison, Ill., Reg. No. 919,623, for the mark "VULCALON", Canc. No. 15,517.

Baccarat Clothing, Inc., Los Angeles, Calif., Reg. No. 1,183,066, for the mark "JEANJER JEANS", Canc. No. 15,601.

Discos America, Los Angeles, Calif., Reg. No. 1,157,146, for the mark "TELEDISCOS AND DESIGN", Canc. No. 15,706.

Carrington Industries, Ltd., New York, N.Y., Reg. No. 1,311,149, for the mark "TRIANGLE DESIGN", Canc. No. 15,790.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

The Consolidated Listing of Official Gazette

The Consolidated Listing of Official Gazette Notices—Re Patent and Trademark Office Practices and Procedures does not appear in the Official Gazette or Trademark Official Gazette notices for the issue of January 6, 1987. It will appear in the issue of January 13, 1987.

Department of the Treasury
United States Custom Service

Application for Recordation of Trade Name: "ALASKAN SEAFOOD CO."

Action: Notice of Application for Recordation of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12) for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "ALASKAN SEAFOOD CO." used by the Alaskan Seafood Co., a corporation organized under the laws of the State of Ariz., located at 1827 W. Mission Dr., Chandler, Ariz. 85224.

The application states that the trade name is used in connection with fresh frozen seafood, manufactured in Mex. and the U.S.

Before final action is taken of the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before Jan. 26, 1987.

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229.

For Further Information Contact: Beatrice E. Moore, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202–566–5765).

DONALD W. LEWIS,
Director, Entry Procedures
and Penalties Division.

Nov. 21, 1986.

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PATENT NOTICES

Certificates of Correction for the Week of Jan. 6, 1987

D. 284,161	4,567,474	4,597,856	4,611,334
D. 286,377	4,568,149	4,598,069	4,612,132
4,397,767	4,568,844	4,599,070	4,613,095
4,399,813	4,569,574	4,599,550	4,613,305
4,445,164	4,569,704	4,599,974	4,613,589
4,454,924	4,571,021	4,601,303	4,613,691
4,491,567	4,571,848	4,601,468	4,614,516
4,492,724	4,577,980	4,602,289	4,614,533
4,498,404	4,578,575	4,603,307	4,614,661
4,505,564	4,579,453	4,603,456	4,615,518
4,507,116	4,582,187	4,603,552	4,615,721
4,512,200	4,582,762	4,603,682	4,615,808
4,515,730	4,584,041	4,604,718	4,615,866
4,527,017	4,584,229	4,605,211	4,616,075
4,529,034	4,586,252	4,605,333	4,616,344
4,529,165	4,587,363	4,605,642	4,616,616
4,536,282	4,587,532	4,607,327	4,616,699
4,539,659	4,588,288	4,607,368	4,616,816
4,543,892	4,588,701	4,607,723	4,616,942
4,548,923	4,589,769	4,609,350	4,617,379
4,550,186	4,590,130	4,609,482	4,617,458
4,552,447	4,591,440	4,609,637	4,618,531
4,552,483	4,592,030	4,610,197	4,618,737
4,555,598	4,592,811	4,610,398	4,618,771
4,559,131	4,595,692	4,610,484	4,618,800
4,559,449	4,595,759	4,610,527	4,618,849
4,562,044	4,595,874	4,610,662	4,618,929
4,564,664	4,596,457	4,610,668	4,619,255
4,565,764	4,596,994	4,610,898	4,619,567
4,565,766	4,597,417	4,610,960	
4,565,855	4,597,835	4,611,029	

Disclaimers

Re. No. 31,353.—*Nelson Cheung,* Arlington Heights, Ill. EXPANDING STRAP LOOP FORMING AND FRICTION FUSION MACHINE. Patent dated Aug. 23, 1983. Disclaimer filed Oct. 14, 1986, by the assignee, *Signode Corp.*

Hereby enters this disclaimer to claims 1 and 5 of said patent.

3,670,142.—*John T. Attridge,* Monroe, Conn. RECESS MOUNTED ELECTRIC AIR HEATER. Patent dated June 13, 1972. Disclaimer filed Sept. 15, 1980, by the assignee, *Westinghouse Electric Corp.*

Hereby enters this disclaimer to claims 1, 2, 3 and 5 of said patent.

3,903,485.—*Ray Milton Dolby,* London, England. COMPRESSORS, EXPANDERS AND NOISE REDUCTION SYSTEMS. Patent dated Sept. 2, 1975. Disclaimer filed Oct. 21, 1986, by the *inventor.*

Hereby enters this disclaimer to all claims of said patent.

3,972,010.—*Ray Milton Dolby,* London, England. COMPRESSORS, EXPANDERS AND NOISE REDUCTION SYSTEMS. Patent dated July 27, 1976. Disclaimer filed Oct. 21, 1986, by the *inventor.*

Hereby enters this disclaimer to all claims of said patent.

4,077,313.—*Peter Lems,* Wilmette and *Nelson Cheung,* Arlington Heights, Ill. METHOD OF TENSIONING AND JOINING A FORMED STRAP LOOP ABOUT A PACKAGE. Patent dated Mar. 7, 1978. Disclaimer filed Oct. 14, 1986, by the assignee, *Signode Corp.*

Hereby enters this disclaimer to the remaining term of said patent.

4,159,326.—*Derek H. R. Barton,* London, England and *Robert H. Hesse,* Cambridge, Mass. HYDROGENATION PROCESS FOR THE PREPARATION OF 5,6 CIS- AND 5,6-TRANS-10,19-DIHYDRO-VITAMIN D COMPOUNDS USING TRANSITION METAL CATALYSTS. Patent dated June 26, 1979. Disclaimer filed Sept. 11, 1986, by the assignee, *Research Institute for Medicine & Chemistry, Inc.*

Hereby enters this disclaimer to claims 14 and 15 of said patent.

4,190,707.—*Yoshinao Doi,* Kawasaki, *Mitsuo Kohno,* Yokohama and *Katsumi Yoshitake,* Yokosuka, Japan. ALKALINE BATTERY SEPARATOR. Patent dated Feb. 26, 1980. Disclaimer filed Aug. 7, 1986, by the assignee, *Asahi Kasei Kogyo Kabushiki Kaisha.*

Hereby enters this disclaimer to claims 17–36 of said patent.

4,232,366.—*John V. Levy,* Palo Alto, Calif., *David Rodgers,* Acton, *Robert E. Stewart* and *Richard J. Casabona,* Stow, Mass. BUS FOR A DATA PROCESSING SYSTEM WITH OVERLAPPING SEQUENCES. Patent dated Nov. 4, 1980. Disclaimer filed July 24, 1986, by the assignee, *Digital Equipment Corp.*

Hereby enters this disclaimer to claims 1–6, 11–15, 17,18, 21, 25–30, 33–35 and 37 of said patent.

4,401,020.—*Robert A. Brux,* Salinas, Calif. VEGETABLE BANDING APPARATUS. Patent dated Aug. 30, 1983. Disclaimer filed Oct. 6, 1986, by the assignee, *Seaco Industries, Inc.*

Hereby enters this disclaimer to claims 1, 8, 9, 10, 11, 12, 14 and 15 of said patent.

Dedication

4,447,667.—*Dane K. Parker,* Massillon and *Timothy Sabo,* Southington, Ohio. PROCESS FOR THE DEHALOGENATION OF ORGANIC COMPOUNDS. Patent dated May 8, 1984. Dedication filed Sept. 8, 1986, by the assignee, *The Goodyear Tire & Rubber Co.*

Hereby dedicates to the Public claims 1 through 4 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

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	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 22, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL; INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	8-01-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-29-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-15-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-25-85
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-19-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-12-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	6-22-84
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-07-84
DESIGN, GROUP 290—K. L. CAGE, Director	6-13-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-19-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-21-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during November 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,475,765 to 3,480,965, inclusive
Plant Patents ..... Numbers 2,937 to 2,944 inclusive

REEXAMINATIONS

JANUARY 6, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,440,973 (614th)

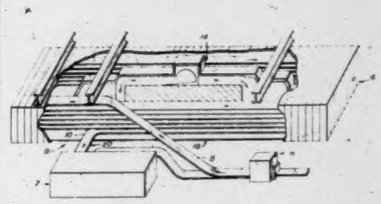
PROOFERS FOR BREAD PRODUCTS AND CONVEYOR SYSTEMS WHICH ARE ADAPTED TO USE THEREIN

William E. Lanham, 3456 Woods Dr.; Gene C. Miller, 3540 Woods Dr., and William E. Lanham, Jr., 3044 Katherine Valley Rd., all of Decatur, Ga. 30032

Reexamination Request No. 90/000,883, Oct. 11, 1985.
Reexamination Certificate for Patent No. 3,440,973, issued Apr. 29, 1969, Ser. No. 593,504, Nov. 10, 1966.
Continuation-in-part of Ser. No. 448,732, Apr. 16, 1965, Pat. No. 3,285,394.

Int. Cl.[4] A21C *9/00;* **A23G** *7/00*

U.S. Cl. 99—483



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–6** is confirmed.

1. In dough processing apparatus, the combination of, means forming an enclosure having a peripheral wall, an endless conveyor including a spiral conveyor within said enclosure, said conveyor being adapted to receive dough products and to convey them at a predetermined continuous rate along the path of said spiral conveyor, and means to supply conditioned air in contact with said products, said conveyor comprising an endless conveyor chain and a continuous array of vertical brackets having grid portions supported in spaced relationship upon said chain and each providing a relatively fixed support for the products at a support surface with the products remaining relatively fixed with respect to the respective grid portions throughout the movement along said path, each said grid portion comprising a product support surface mounted at the top of a bracket above said chain, and each said product support surface including generally longitudinal bar portions extending more than one half the distance between adjacent brackets thereby to overlap with the next adjacent support surface.

B1 3,548,373 (615th)

THEFT PREVENTING SYSTEM FOR VEHICLES

Aureo Rivera, and Aureo E. Rivera, both of P.O. Box 1306, Bayamon, P.R. 00619

Reexamination Request No. 90/000,755, Apr. 10, 1985.
Reexamination Certificate for Patent No. 3,548,373, issued Dec. 15, 1970, Ser. No. 656,802, Jul. 28, 1967.

Int. Cl.[4] B60R *25/04;* **G08B** *13/00;* **B60R** *25/00*

U.S. Cl. 340—64

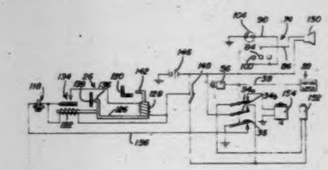
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **13** is confirmed.

Claim **1** is cancelled.

Claims **2–12, 14** and **15** are determined to be patentable as amended.

2. [The combination of claim **1**] *A theft preventing system for a vehicle having a source of current connected by an ignition switch to an ignition circuit for an engine enclosed by a hood within an engine compartment and another compartment adapted*



to be closed by a closure member, said system including lock means movably mounted within said vehicle for displacement between a release position and a lock position operatively engaging the hood to prevent opening of the engine compartment, and disabling switch means connected in series with the ignition switch for opening said ignition circuit in response to displacement of the lock means to the lock position, including by-pass switch means operatively connected to the lock means in by-pass relation to the ignition switch for preventing shut-down of the engine until the lock means is in the lock position.

B1 3,680,493 (616th)

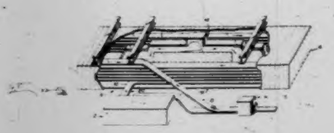
CONVEYOR SYSTEM

William E. Lanham, 3456 Woods Dr.; Gene C. Miller, 3540 Woods Dr., and William E. Lanham, Jr., 3044 Katherine Valley Rd, all of Decatur, Ga. 30032

Reexamination Request No. 90/000,884, Oct. 11, 1985.
Reexamination Certificate for Patent No. 3,680,493, issued Aug. 1, 1972, Ser. No. 90,652, Nov. 18, 1970.
Division of Ser. No. 809,153, Mar. 21, 1969, Pat. No. 3,570,651, which is a continuation of Ser. No. 593,504, Nov. 10, 1966, Pat. No. 3,440,973, which is a continuation-in-part of Ser. No. 448,732, Apr. 16, 1965, Pat. No. 3,285,394.

Int. Cl.[4] F26B *15/26*

U.S. Cl. 34—207



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–5** is confirmed.

New claim **6** is added and determined to be patentable.

1. In food processing apparatus, the combination of means forming a food conditioning enclosure, an endless conveyor including a spiral conveyor within said enclosure, said con-

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veyor being adapted to receive food products and to convey them at a predetermined continuous rate along the path of said spiral conveyor means to supply conditioned air in contact with said products within said enclosure, said conveyor comprising, an endless conveyor drive chain and a continuous array of vertical brackets having product supporting grid portions supported in spaced relationship upon said chain and each providing a relatively fixed support for the products at a support surface with the products remaining relatively fixed with respect to the respective grid portions throughout the movement along said path, each said grid portion comprising a product support surface mounted at the top of a bracket above said chain, and each said product support surface including generally longitudinal bar portions extending between adjacent brackets thereby to overlap with the next adjacent support surface to permit said product support surfaces to move separately around the spiral portion without restriction while maintaining a continuous product support surface and wherein each said support surface comprises a transverse support member upon which is mounted a bar bent in a zig-zag form to provide said longitudinal bar portions which are joined at each end to the next adjacent bar portion by a U-shaped bend.

B1 4,457,490 (617th)

HIGH TEMPERATURE VALVE AND SEAT THEREFOR

William B. Scobie, Houston, Tex., assignor to Keystone International, Inc., Houston, Tex.

Reexamination Request No. 90/000,948, Feb. 4, 1986.
Reexamination Certificate for Patent No. 4,457,490, issued Jul. 3, 1984, Ser. No. 344,501, Feb. 1, 1982.
Int. Cl.⁴ F16K *25/00*
U.S. Cl. 251—174

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

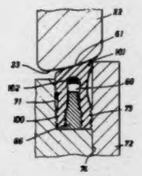
Claims 2, 3, 11 and 12 are cancelled.

Claims 1 and 10 are determined to be patentable as amended.

Claims 4–9 and 13–19, dependent on an amended claim, are determined to be patentable.

1. A valve seat for use in a fluid control valve having a pivotable valve closure element to open and close said valve comprising:

an annular, polymeric member having a seating surface for sealingly engaging said valve element when said valve is in the closed position; and



a [multiplicity of circumferential] *single, elongate strand of material forming an annular bundle of about ten or more* windings of *said* material in surrounding relationship to said annular member, [each of said windings comprising an elongate strand of said material,] *the radially inner surface of said bundle of said windings being in direct contact with said annular member,* each of said [strands] *windings in said bundle* having its centerline oriented substantially circumferentially with respect to said [sealing section] *seating surface* for generally the full length of said [windings] *winding*, the ends of said [windings] *strand* being fixed with respect to one another, said windings being placed in tensile stress due to circumferential stretching when said valve is in the closed position.

STATUTORY INVENTION REGISTRATIONS

PUBLISHED JANUARY 6, 1987

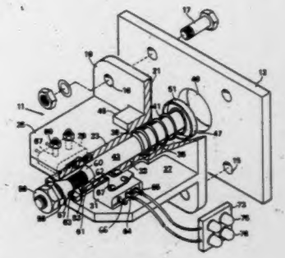
A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H182

ADJUSTABLE INDICATING DEVICE FOR LOAD POSITION

Clarence Heller, 2205 Manassas Dr. SW., Huntsville, Ala. 35803

Filed Dec. 20, 1984, Ser. No. 684,194
Int. Cl.⁴ G08B *13/14*; H01H *3/00*
U.S. Cl. 340—568 **5 Claims**



1. An indicating device, comprising:

an elongated central housing having a front mounting plate;

said central housing having a hole extending through its length including its front mounting plate;

a movable shaft member with its front end extending forward of said front mounting plate and its rear end extending rearwardly of said central housing;

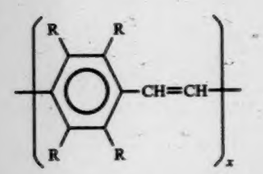
a spring means for urging said movable shaft forward of said front mounting plate;

a conical cam member adjustably mounted on the rear portion of said movable shaft member to vary the distance said movable shaft extends from said front mounting plate;

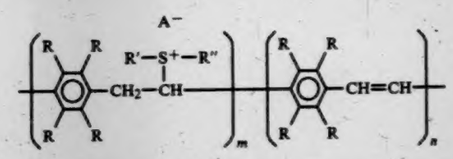
said conical cam member having its largest configuration portion larger than the rear opening of said hole within the central housing so as to act as a stop against the housing and thereby prevent said spring means from pulling the rear portion of said movable shaft into said hole;

a first wing structure extending from said housing, said first wing structure having a mounting surface adjacent said central housing; and

a first switch means having an activation arm, said first switch means mounted to said mounting surface and having the distal end of its arm adapted to ride against said cam member so as to activate said first switch means when said shaft member is moved from its forward extended position.



wherein R is selected from the group consisting of hydrogen, alkyl having from 1 to 4 carbon atoms and halogen of atomic number not greater than 35, with the proviso that not more than two of said R groups is halogen or alkyl having 1 to 4 carbon atoms, and X is an integer having a value between about 150 and about 20,000, wherein said poly)p-xylylidene) polymer is prepared by drying at a temperature between about 0° and 300° C. an aqueous solution of polyelectrolyte derived from monomeric sulfonium salts and having recurring units of the structure



wherein R is as described above, R′ and R″ each represent an alkyl or hydroxyalkyl group containing from 1 to 4 carbon atoms, A is an anion, and m and n are integers which show the ratio of the receptive recurring units in the strucuture,

said article being in the form of a film, fiber or foam having a length and other dimensions in which the length is large compared with at least one of said other dimensions,

which comprises the steps of annealing said article at a temperature between about 25° and 350° C. for about 1 to 36 hours to provide an m:n ratio in the range of 2:1 to 1:11;

doping the resulting annealed article in the absence of oxygen with a dopant selected from the group consisting of AsF_5, SbF_5, H_2SO_4, $HClO_4$ and sodium napthhalide to a conductivity level at least 10^{+8} times greater than that of the undoped polymer;

and covering said article with an impermeable material.

H183

CONDUCTING POLY (P-XYLYLIDENES)

Frank E. Karasz; Robert W. Lenz, both of Amherst; David R. Gagnon, Sunderland, and James D. Capistran, Leverett, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 19, 1985, Ser. No. 766,723
Int. Cl.⁴ H01B *1/06*
U.S. Cl. 252—518 **13 Claims**

1. A method for making an at least semiconducting article made of a high molecular weight poly (p-xylylidene) of the general formula

H184

2,2,2-TRIFLUOROETHOXY BIS(2-FLUORO-2,2-DINITROETHOXY)METHANE AND A METHOD PREPARATION

William M. Koppes, Adelphi, and Horst G. Adolph, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 23, 1986, Ser. No. 878,150
Int. Cl.⁴ C07C *43/00, 79/34*
U.S. Cl. 568—590 **3 Claims**

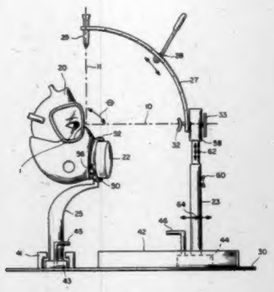
1. 2,2,2-trifluoroethoxy bis(2-fluoro-2,2-dinitroethoxy)methane, $CF_3CH_2OCH[OCH_2CF(NO_2)_2]_2$.

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H185
RESPIRATOR PERIMETRY DEVICE

Richard W. McMahon, Elkton, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 25, 1985, Ser. No. 801,278
Int. Cl.[4] A61B *3/02*
U.S. Cl. 351—226 **7 Claims**



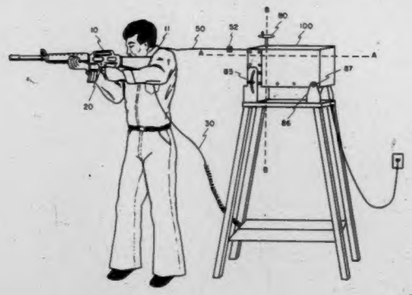
1. A perimetry device for measuring the field of vision for a subject wearing a mask, comprising:
a base;
a mask support for supporting a mask and which is horizontally movable in a first direction on the base;
a scale support for supporting a scale member, said scale support being mounted for movement to the base in a second horizontal direction;
mask clamping means connected to said mask support for clamping a mask to said mask support;
an angle measuring scale member rotatably mounted to said scale support about a horizontal axis which is parallel to said second horizontal direction, said scale member having an end remote from said scale support;
a pointer connected to said end of said scale member for pointing along an axis which is perpendicular to said horizontal axis and adapted for pointing downwardly at an eye of a subject wearing a mask clamped in said mask clamping means;
a vision indicator slidable along said scale member and viewable by a subject for determining a maximum angular field of vision away from said horizontal axis;
an eye alignment mirror connected to said scale support and lying on said horizontal axis for aiding an alignment of the subject's eye with the horizontal axis; and
a vision angle indicator connected to said scale member mounted for rotation with said scale member on said scale support for indicating a rotational position of said scale member around said horizontal axis.

H186
RECOIL SIMULATOR FOR WEAPONS

Albert H. Marshall, Orlando; Paul D. Grimmer, Winter Park; Edward J. Purvis, Winter Park; Randy R. Fields, Winter Park, and Edmund Swiatosz, Maitland, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 16, 1986, Ser. No. 865,993
Int. Cl.[4] F41F *27/00*
U.S. Cl. 434—18 **7 Claims**

1. Recoil simulating apparatus for a weapon comprising
flexible tether means having at least two ends;
means for attaching a first end of said tether means to a weapon;
detection means for detecting when the trigger of the said weapon is pulled; and
means for applying an impulse of force to a second end of said tether means in response to each detection of a trigger

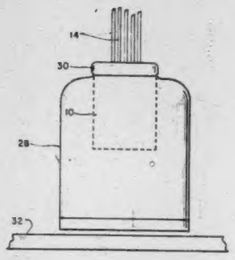


pull by said detection means such that weapon recoil is simulated.

H187
SOLDERING METHOD FOR CABLE CONNECTORS

Linden O. Blanchard, North Andover, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 21, 1984, Ser. No. 592,034
Int. Cl.[4] B23K *31/02, 35/38*
U.S. Cl. 228—222 **3 Claims**



1. In a method for vapor phase soldering a first solderable component to a second solderable component wherein at least one of said solderable components comprises at least one heat-degradable subcomponent, which comprises assembling said components, applying solder paste at a desired position, contacting the assembled components with a high temperature vapor to effect melting of said solder and removing the resulting soldered assembled components from said vapor, the improvement which comprises covering the said heat-degradable subcomponent with a loose fitting bag made of a metallic foil, said bag being closed at one end and secured to one of said components at the other end in such manner as to prevent entry of said high temperature vapor to the inside of said bag.

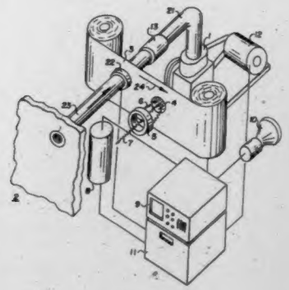
H188
MONITOR FOR AIRBORNE DUSTS

George M. Thomson, and Sandra M. Thomson, both of Churchville, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 3, 1986, Ser. No. 825,424
Int. Cl.[4] G01N *23/223*
U.S. Cl. 378—45 **19 Claims**

1. A method of detecting the presence of medium to heavy elements in an aerosol comprising:
irradiating a selected geometry which contains an amount of particles of at least one element to be detected using x-rays

for fluorescing the quantity of particles so that they produce secondary x-rays;
detecting the secondary x-rays to produce detection signals; and



analyzing the detection signals using criteria for establishing the identity and concentration of the irradiated particles.

H189
PROCESS FOR PRODUCTION OF ALPHA ALUMINA BODIES BY SINTERING SEEDED BOEHMITE MADE FROM ALUMINA HYDRATES

Ralph Bauer, Niagara Falls, Canada, assignor to Norton Company, Worcester, Mass.

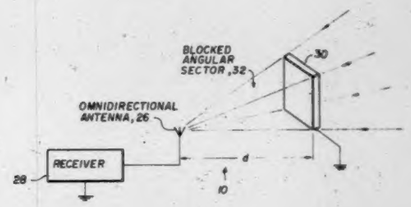
Filed Jul. 16, 1985, Ser. No. 755,510
Int. Cl.[4] C01F *1/00, 7/24*
U.S. Cl. 423—111 **5 Claims**

1. A method of making articles containing submicron alpha alumina in at least one phase, comprising (1) dissolving alumina hydrate in nitric acid, (2) converting the thus formed aluminum salt to boehmite having a crystal size below 100×10^{-10} meters by nuetralization with ammonia, converting said boehmite to a gel by acidification, and firing said gel in the presence of at least 0.5% by weight of alpha alumina submicron seed particles to a temperature less than 1450° C. for a time such that the thus formed alpha alumina phase has an average crystal size of less than 0.5×10^{-6} meters.

H190
NOTCH ANTENNA FOR A RADIO COMMUNICATIONS SYSTEM

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 26, 1984, Ser. No. 573,908
Int. Cl.[4] G01S *3/24*
U.S. Cl. 342—384 **9 Claims**



1. An antenna system having a notch type antenna pattern coupled to radio communications apparatus, comprising:
antenna means having an omnidirectional antenna beam pattern; and
a shield of a predetermined size and shape located a predetermined distance away from said antenna means and capable of being selectively positioned for a predetermined azimuth and elevation so that energy of a selected type is blocked within a relatively small angular sector.

H191
SMALL PARTICLE ZEOLITE CONTAINING CATALYTIC CRACKING CATALYST

Grant C. Edwards, Silver Spring, and Kuppuswamy Rajagopalan, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jun. 5, 1985, Ser. No. 741,500
Int. Cl.[4] C01G *47/02, 47/12, 47/16*; B01J *29/06*
U.S. Cl. 208—111 **7 Claims**

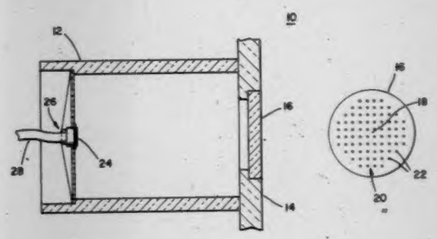
1. In a petroleum catalytic cracking process, a method of increasing the conversion of a heavy hydrocarbon fraction of a feedstock and of producing higher yields of liquid products, said method consisting in the use of a Y zeolite containing catalytic cracking catalyst wherein said Y zeolite is dispersed in an inorganic oxide matrix the improvement comprising the use of a Y zeolite characterized by a t plot external surface area of up to 100 m^2/g and an effective particle size in the range of 0.03 to 0.3 micrometer.

4. A catalytic cracking catalyst composition for contacting heavy hydrocarbon feedstocks that contain at least 20% by weight hydrocarbons that boil above about 482° C., comprising an inorganic oxide matrix, and a Y zeolite having a t plot external surface area of up to 100 m^2/g and an effective particle size 0.03 to 0.3 micrometer.

H192
SATELLITE ALIGNMENT SENSOR

Max Daehler, Belmont, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 3, 1984, Ser. No. 567,587
Int. Cl.[4] G01B *11/26*; G01C *1/00*; G01J *1/20*
U.S. Cl. 356—152 **20 Claims**



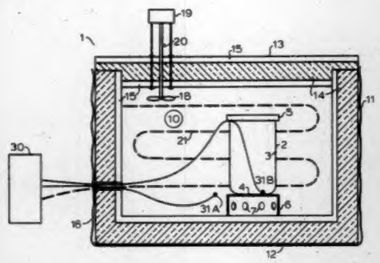
1. A sensor for measuring the attitude of said sensor with respect to an incident beam of collimated radiation comprising:
(a) a housing;
(b) an aperture plate disposed in one end of said housing for receiving said incident beam, said aperture plate being opaque to said incident beam and having an array of circular apertures arranged in a predetermined pattern, said apertures being transparent to said incident beam, incident radiation passing through said apertures producing a radiation spot pattern related to the angle of incidence of said radiation relative to the sensor; and
(c) means for detecting said spot pattern.

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H193
ELECTRONIC TEMPERATURE EQUALIZER

Everett D. Bitner, Trivoli, and Earl B. Lancaster, Peoria, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation of Ser. No. 696,274, Jan. 29, 1985, abandoned. This application Jun. 9, 1986, Ser. No. 873,299
Int. Cl.[4] G05D *15/00*
U.S. Cl. 236—15 BB 6 Claims

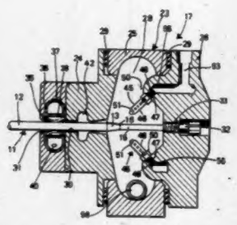


1. An apparatus for controlling the temperature within a first zone so as to coincide with the temperature within a second zone comprising:
(a) a first temperature sensor within said first zone and a second temperature sensor within said second zone, wherein said sensors are interconnected so as to generate an input signal when an imbalance in temperature occurs between said zones;
(b) a signal conditioner for enhancing said input signal and for generating an output signal;
(c) temperature control means responsive to said output signal for adjusting the temperature of said first zone to correspond to the temperature of said second zone.

H194
DECONTAMINATION APPARATUS AND METHOD

David J. Oakley, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 16, 1983, Ser. No. 562,148
Int. Cl.[4] G21C *19/42*
U.S. Cl. 376—310 11 Claims

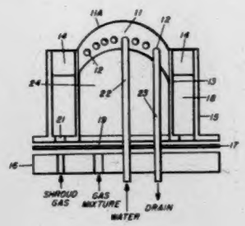


1. A method for removing debris from the peripheral surface of a workpiece comprising: positioning a workpiece in an enclosed chamber, directing a plurality of pressurized gas and abrasive grit steams toward a peripheral portion of said workpiece, each of said streams oriented approximately 45° toward the longitudinal axis of the workpiece and slightly askew therefrom to tangentially engage said peripheral portion of said workpiece, creating a vortex flow of gas and grit about said workpiece providing 360° grit contact thereabout, and exhausting said gas and spent grit from said chamber.

H195
RESEARCH BURNER

Mark A. DeWilde, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 18, 1984, Ser. No. 662,932
Int. Cl.[4] F23D *11/36*
U.S. Cl. 431—160 1 Claim



1. A research burner providing stable flames of flammable gas mixtures with optical access to the primary reaction zone of said flame consisting of:
a metallic base;
an inner annular hollow stainless steel septum having two ends of open construction one of which is secured to said base;
a porous water-cooled bronze hemispherical head having a curved upper surface for optical access secured to the other of said end of said septum;
said head containing a coil of copper tubing having an inlet and outlet for the passage of water, said base having a first port communicating with said head,
said first port for passage of a gaseous flammable mixture;
an outer stainless steel annular shell of open construction secured to said base in spaced relation to said septum; and
a porous bronze annulus mounted between said septum and said shell, said base having a second port communicating with said annulus for passage of a shroud gas selected from the group consisting of argon, nitrogen, and helium.

H196
LARGE PARTICLE ZEOLITE CONTAINING CRACKING CATALYST EXHIBITING IMPROVED HYDROTHERMAL STABILITY

Grant C. Edwards, Silver Spring, and Kuppuswamy Rajagopalan, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jul. 12, 1985, Ser. No. 754,302
Int. Cl.[4] C10G *47/02, 47/12, 47/16*; B01J *29/06*
U.S. Cl. 208—111 11 Claims

1. A hydrocarbon conversion catalyst composition comprising a Y zeolite having a t plot effective particle size range of 0.6 to 1.0 micrometer dispersed in an inorganic oxide matrix.

9. A process for converting hydrocarbons which comprises reacting a hydrocarbon feedstock with the catalyst of claim 1 under hydrocarbon conversion reaction conditions.

H197
TERNARY RARE EARTH-LANTHANIDE SULFIDES

Takuo Takeshita, Omiya, Japan; Karl A. Gschneidner, Jr., and Bernard J. Beaudry, both of Ames, Iowa, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 6, 1986, Ser. No. 836,881
Int. Cl.[4] C01F *17/00*
U.S. Cl. 423—263 5 Claims

1. A ternary rare earth sulfur compound having the formula:

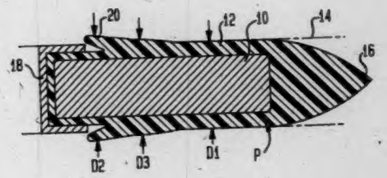
$La_{3-x}M_xS_4$

where M is a rare earth element selected from the group consisting of europium, samarium and ytterbium, and x=0.15 to 0.8.

H198
EXPANDING PROJECTILE ROTATING BAND

William J. Stone, Bangor, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 728,971, Apr. 30, 1985, abandoned. This application Apr. 30, 1986, Ser. No. 857,276
Int. Cl.[4] F42B *31/00*
U.S. Cl. 102—524 15 Claims

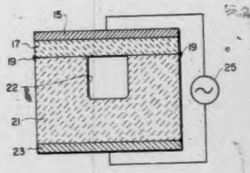


1. A projectile for firing through a gun tube with high pressure gas comprising:
a central load;
a jacket encircling said load and having a rearwardly directed appendage flaring outwardly from said jacket, said appendage being formed of a flexible material for outwardly and radially deflecting in response to application of said high pressure gas.

H199
GROUND SLOT WAVEGUIDE LASER

Peter P. Chenausky, Avon; Erroll H. Drinkwater, Portland, and Lanny M. Laughman, Bolton, all of Conn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 18, 1985, Ser. No. 712,943
Int. Cl.[4] E04B *1/16*
U.S. Cl. 51—326 3 Claims



1. A method of fabrication of slot type RF excited waveguide lasers which are composed of hard ceramic material, comprising the steps of; placing a block of said hard ceramic material, which has flat and parallel upper and lower broad surfaces, in a surface grinding machine and grinding a slot in one of said broad surfaces using a two step grinding operation in which the first of said grinding steps comprises the use of a coarse grinding wheel which is used to remove approximately 90% of the material of said slot and the second step comprises the use of a finer grinding wheel to remove the remainder of the material of said slot.

H200
HIGH TEMPERATURE STRUCTURAL INSULATING MATERIAL

Wayne Y. Chen, Munster, Ind., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

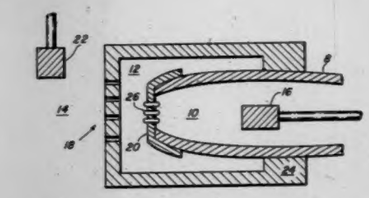
Filed Jun. 27, 1984, Ser. No. 625,324
Int. Cl.[4] C30B *29/16*; B29C *71/02*
U.S. Cl. 428—404 6 Claims

1. A method of producing a structural insulating composite having a useful temperature above about 800° C. a thermal conductivity of below about 0.2 Watts/meter/°C. as measured at temperatures in the range of 25°–200° C. and a compressive strength above about 400 psi, the method comprising the steps of
selecting hollow ceramic beads having a metal content predominantly of Si and Al, an outer diameter in the range of about 20–200 microns, a wall thickness of above about 2 microns, a softening temperature above about 800° C., and a bulk density above about 0.3 gm/cc,
forming a mixture of the ceramic beads with a compatible binder composition in amounts sufficient to coat the beads and in a beads-to-binder ratio of about 1:1–2 by weight,
removing entrained gas bubbles in said mixture, and
compacting the mixture under sintering conditions and pressure to provide the structural insulating composition, the sintering conditions including a temperature below the softening temperature but above 700° C., and a sintering time sufficient to produce said composite with said temperature, thermal conductivity and compressive strength, the pressure being applied to increase the surface area of contact between the bead surface areas being joined by the binder composition.

H201
BIOSENSORS FROM MEMBRANE PROTEINS RECONSTITUTED IN POLYMERIZED LIPID BILAYERS

Paul Yager, Washington, D.C., assignor to United States of America, Washington, D.C.

Filed Aug. 23, 1985, Ser. No. 768,650
Int. Cl.[4] G01N *27/50*
U.S. Cl. 436—151 15 Claims



1. A method for detecting a stimulus such as vapors or dissolved compounds, comprising the steps of:
extracting membrane proteins which react to said stimulus from biological cells;
reincorporating said membrane proteins into a lipid bilayer, said bilayer being mounted so as to create an external compartment and an internal compartment, said external compartment being accessible to the environment containing said stimulus;
contacting said bilayer containing said membrane proteins with the environment containing said stimulus; and
measuring the change in voltage or conductivity across said bilayer, said voltage or conductivity change indicating the presence of said stimulus, the magnitude of said voltage or conductivity change indicating the amount of said stimulus present.

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,323

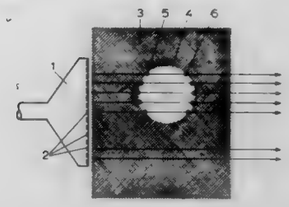
HEART EXAMINATION BY MEANS OF ULTRASOUND WAVES

Nicolaas Bom, Berkenwoude, Netherlands, assignor to Organon Teknika B.V., Oss, Netherlands

Original No. 3,789,833, dated Feb. 5, 1974, Ser. No. 237,286, Mar. 23, 1972. Continuation of Ser. No. 207,805, Nov. 17, 1980, abandoned, which is a continuation of Ser. No. 573,338, Apr. 20, 1975, abandoned. Application for reissue Nov. 30, 1984, Ser. No. 676,794

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—660 **11 Claims**



6. Apparatus for heart examination by means of ultrasound waves, comprising:

a. a crystal holder adapted to be externally placed on the body of a patient;

*b. a first group of piezo-*electric crystals supported in said holder, said crystals being arranged in a row and having parallel axes of radiation lying in a plane adapted to intersect the heart being examined along a predetermined cross-section *and forming both a transmitter and receiver of ultrasound waves;*

c. a cathode ray tube;

d. means for displaying echo signals reflected by the heart walls at the predetermined cross-section and received by said crystals on the screen of said cathode ray tube in a coordinate system wherein one coordinate represents the position of each of the crystals in said holder, and another coordinate represents the time of reception of said echo signals,

e. means for repeatedly and rapidly cyclically exciting certain ones of said crystals in a predetermined order and at such a frequency that an instantaneous image of said cross-section is displayed on the screen of said cathode ray tube, and

f. means for producing additional ultrasound radiation along axes inclined with respect to the parallel axes of radiation produced by said first group of crystals and for producing echo signals superimposed on the echo signals of said first group of crystals for providing an image on said screen of the entire outline of the heart including not only the front and back walls thereof but also the top and bottom walls as well.

Re. 32,324

MIXING DEVICE

Abraham Kedem, 42 Weizmann St., 76283 Rehovot, Israel

Original No. 4,536,092, dated Aug. 20, 1985, Ser. No. 610,835, May 16, 1984. Application for reissue Nov. 12, 1985, Ser. No. 796,694

Claims priority, application Israel, Jun. 1, 1983, 68842

Int. Cl. B01F *5/12*

U.S. Cl. 366—265 **31 Claims**

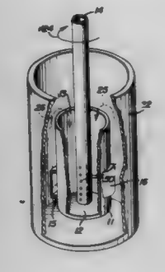
6. A mixing device to be submerged in a liquid contained in a vessel for low velocity and low shear mixing of delicate materials, such as cell suspensions, microspheres and the like, said device comprising:

(a) cylinder means open at one end and closed at the other end to be submerged in a liquid contained in a vessel and to be rotated about its longitudinal axis;

(b) a tubular member coaxially mounted on said cylinder means and projecting into and terminating within said cylinder means for introducing gas into said cylinder means;

(c) at least two inner vent openings defined by the wall of the cylinder means, said inner vent openings being equally spaced about the periphery of the cylinder means and located in a common plane normal to the axis of the cylinder means; and

(d) a vent cover and flow director for each of said inner vent openings extending tangentially from the inner vent opening radially outwardly and peripherally of said cylinder means terminating in an outer vent opening located in an axial plane,



(e) said outer vent openings being equally spaced about the periphery of the cylinder means and lying in said common plane normal to the axis of the cylinder means, said outer vent openings facing in the same direction so that when the cylinder means is rotated at a speed in the range of 10 to 50 RPM with said outer vent openings facing rearwardly, liquid contained in a vessel in which the mixing device is submerged will flow from the interior of the cylinder means through said at least two inner vent openings, their vent covers and flow directors and exit through said outer vent openings tangentially with respect to said cylinder means due to a pressure drop occurring at the outer vent openings caused by the inertia of the liquid, thus creating a suction effect.

Re. 32,325

TACK-FREE POLYMER PELLETS

Malcolm S. Smith, Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 4,510,281, dated Apr. 9, 1985, Ser. No. 563,231, Dec. 19, 1983. Continuation-in-part of Ser. No. 472,644, Mar. 7, 1983, abandoned, which is a continuation-in-part of Ser. No. 348,012, Feb. 16, 1982, abandoned, which is a continuation-in-part of Ser. No. 267,082, May 26, 1981, abandoned. Application for reissue Apr. 17, 1986, Ser. No. 853,342

Int. Cl.[4] C08K *5/20*

U.S. Cl. 524—229 **14 Claims**

1. A pellet of a polymer selected from the group consisting of:

(a) copolymers of ethylene with vinyl acetate in which the amount of vinyl acetate is about 18–55 weight percent,

(b) terpolymers of ethylene with vinyl acetate and carbon monoxide in which the amount of vinyl acetate is about 20–40 weight percent and the amount of carbon monoxide is about 3–12 weight percent,

(c) copolymers of ethylene with methacrylic acid in which the amount of methacrylic acid is about 6–30 weight percent, the carboxyl groups of the copolymers being neutralized with zinc ions to an extent of 0 to about 50%,

(d) copolymers of ethylene with methyl methacrylate in which the amount of methyl methacrylate is about 18–40 weight percent, and

(e) terpolymers of ethylene with n-butyl acrylate and carbon monoxide in which the amount of n-butyl acrylate is about 20–40 weight percent, and the amount of carbon monoxide is about 3–15 weight percent;

the stick temperature of the copolymers of paragraph (a) being at most about 40° C., and the stick temperature of the polymers of paragraphs (b) through (e) being below about 60° C.;

said pellet having incorporated into the copolymer an effective amount from about 500 to about 10000 parts by weight per million parts by weight of the polymer (ppm) of an additive selected from the group consisting of N,N'-ethylenebisoleamide, N,N'-ethylenebiserucamide, N,N'-dioleyladipamide, and N,N'-dierucyladipamide to reduce the tackiness of the pellet;

with the proviso that when the polymer in the pellet is a dipolymer with vinyl acetate, it may also contain blended therewith wax in an amount of up to about 13% of the copolymer weight.

Re. 32,326

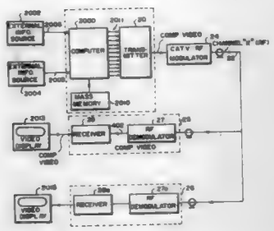
ROW GRABBING SYSTEM

Robert H. Nagel, New York, and Richard Saylor, Monsey, both of N.Y., assignors to IRD, Inc., Farmingdale, N.Y.

Original No. 3,889,054, dated Jun. 10, 1975, Ser. No. 434,226, Jan. 17, 1974. Application for reissue May 19, 1983, Ser. No. 496,273

Int. Cl.⁴ H04N *5/00*

U.S. Cl. 358—83 **26 Claims**



1. A real time frame grabbing system for substantially instantaneously providing a continuous video display of a selectable predetermined video frame of information on a video display means from continuously transmittable video information comprising means for transmitting said video information as a plurality of pseudo video scan lines, each of said pseudo video scan lines having a television video scan line format and capable of comprising a complete self-contained packet of digital information sufficient to provide an entire displayable row of video data characters, said pseudo video scan line having an associated transmission time equivalent to said television video scan line, said packet of digital information comprising at least address information for said displayable row and data information for said displayable characters in said displayable row, each of said pseudo video scan lines further comprising a horizontal sync signal at the beginning thereof, said horizontal sync signal providing a record separator between adjacent pseudo video scan lines, said transmitting means further comprising means for providing a vertical sync signal after a predetermined plurality of pseudo video scan lines have been transmitted, said pseudo video scan line being a composite video signal, said system further comprising television signal distribution means for distributing said transmitted composite pseudo video scan line signals to said video display means for providing said continuous video display[.], *and receiver means operatively connected between said television signal distribution means and said video display means for processing said distributed composite pseudo video scan line signals and capable of providing a displayable video row signal to said video display means from a pseudo video scan line signal pertaining to said selected frame for providing said continuous video display, said receiver means comprising means for updating said continuously video displayable selectable frame on a displayable video row-by-row basis as said data portion of any of said displayable received distributed pseudo video scan line signals pertaining to said selected frame is updated.*

Re. 32,327

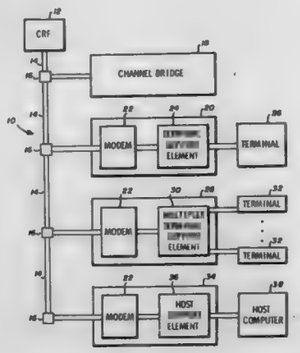
MULTIPLE CHANNEL DATA COMMUNICATION SYSTEM

Kenneth J. Biba, San Francisco, and Jose J. Picazo, Jr., San Jose, both of Calif., assignors to Sytek, Inc., Mountain View, Calif.

Original No. 4,365,331, dated Dec. 21, 1982, Ser. No. 166,384, Jul. 7, 1980. Application for reissue Aug. 30, 1984, Ser. No. 645,566

Int. Cl.⁴ H04J *1/10*

U.S. Cl. 370—124 **13 Claims**



1. A data communication system comprising:

a coaxial cable;

a plurality of [MODEM's] *MODEMs* connected to the cable including means for selecting the transmit and receive [frequency bandwidths] *frequencies* of each of the [MODEM's] *MODEMs*;

means connected to the [MODEM's] *MODEMS* for supplying data to and receiving data from each of the [MODEM's] *MODEMs*;

a central retransmission facility connected at the head end of the cable [whereby] *such that* a signal transmitted by at least one of the [MODEM's] *MODEMs* is received by the central retransmission facility and translated to the receive frequency [bandwidth] of the MODEM which transmitted said signal; and

a channel bridge connected to the cable including two or more [MODEM's] *MODEMs* each of said [MODEM's] *MODEMs* having different [transmit frequency bandwidths] *transmitting frequencies* and different [receive frequency bandwidths] *receiving frequencies than the other of said MODEMs in said channel bridge* and including means for transferring [a signal] *signals* received by one of said MODEM's to another of said [MODEM's whereby the MODEM's] *MODEMs in the channel bridge such that the MODEMs* connected to the cable which are transmitting and receiving [in] *at* different [frequency bandwidths] *frequencies* may receive signals from and transmit signals to each other *via the channel bridge.*

PLANT PATENTS

GRANTED JANUARY 6, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,846

ROSE PLANT KORLINGO

Reimer Kordes; Werner Kordes, and Hermann Kordes, all of Klein Offenseth-Sparrieshoop, Fed. Rep. of Germany, assignors to Jackson & Perkins Company, Medford, Oreg.

Filed May 3, 1985, Ser. No. 730,073

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its long stems bearing scarlet blooms of heavy substance (thick petals), long pointed buds, low fragrance, and good resistance to rose powdery mildrew.

5,847

VARIEGATED LEMON-LIME TREE NAMED LEMONINE

Nicolas A. Turmes, Jr., 144 NW. 20 St., Homestead, Fla. 33030

Filed Jul. 30, 1984, Ser. No. 635,499

Int. Cl.⁴ A01H *5/03*

U.S. Cl. Plt.—45 **1 Claim**

1. A new and distinct variety of lemon-lime hybrid citrus tree, substantially as herein shown and described characterized particularly as to novelty by foliage and fruits both being variegated, said variegation arising from the type of bud variation known as white-over-green periclinal chimera.

5,848

CHRYSANTHEMUM PLANT NAMED HYPY

Bal K. Bhat, Hobart, and Robert C. Menary, Taroona, both of Australia, assignors to The University of Tasmania, Tasmania, Australia

Filed Jul. 19, 1984, Ser. No. 632,330

Claims priority, application Australia, Jul. 20, 1983, PG385

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum cinerariaefolium* plant known by the cultivar name Hypy and particularly characterised as to uniqueness as herein described and illustrated by the combined characteristics of high pyrethrins content, substantially erect growing habit and producing flowers at a substantially uniform height.

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GRANTED JAN. 6, 1987

ERRATA

For CLASS	See PATENT NO.
270-056	4,634,107
371-011	4,634,110
272-134	4,634,127
425-453	4,634,368
420-073	4,634,476
540-001	4,634,553
548-950	4,634,554
540-126	4,634,555
540-310	4,634,556
540-145	4,634,557
427-097	4,634,619
430-325	4,634,628
546-269	4,634,779
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379-430	4,634,816
365-200	4,635,190
382-041	4,635,292
382-044	4,635,293

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UMI

PATENTS

GRANTED JANUARY 6, 1987

GENERAL AND MECHANICAL

4,633,526

IMMERSION SUITS

Graham Richardson, Fleet, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 9, 1985, Ser. No. 785,671

Claims priority, application United Kingdom, Oct. 18, 1984, 8426368

Int. Cl.⁴ A62B *17/00*

U.S. Cl. 2—2.1 R **2 Claims**



1. An immersion suit for aircrew, said suit comprising a waterproof overall, a chamber mounted in the upper region of said overall and comprising first and second compartments, said first compartment carrying a valve body and providing a free passage of air through the valve body between the interior of the suit and the surroundings, a flexible diaphragm separating said first and second compartments and a valve head mounted on the diaphragm and matable with, but normally spaced from, the valve body whereby excess pressure in said second compartment distorts the diaphragm and causes said valve head to mate with said valve body thereby preventing fluid flow into the suit interior through the valve body, and means for creating excess pressure in said second compartment when the wearer of said suit is immersed in water.

4,633,527

MULTILAYERED PROTECTIVE TROUSER ASSEMBLY

Carolyn C. Ehring, West Caldwell, N.J., assignor to Cairns & Brother, Inc., Clifton, N.J.

Filed Dec. 9, 1985, Ser. No. 806,765

Int. Cl.⁴ A41D *1/06*

U.S. Cl. 2—2 **15 Claims**

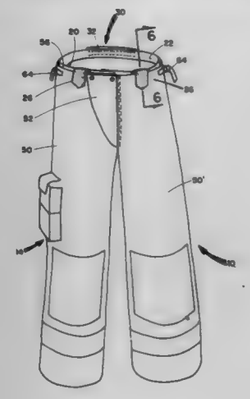
1. A multilayered protective trouser assembly for a user, which comprises:

a station trouser specially designed for said user including a waist portion and formed of a thermally protective fabric;

tab members overlying said waist portion of said station trouser, said tab means provided with a first fastening element;

overpants positioned about said station trouser formed of a material to provide direct flame protection and including a waist portion; and

second fastening elements positioned about said waist portion of said overpants, said second fastening elements cooperating with said first fastening elements to mount and maintain said overpants with respect to said station trouser whereby in cooperative mounted relationship between said fastening elements said tab members provide



a visual indication of the presence of said station trouser in said assembly.

4,633,528

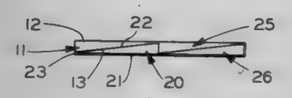
BULLET AFFECTING/DEFLECTING MATERIAL

Raymond W. Brandt, 5828 Wheelock, Fort Wayne, Ind. 46815

Filed Jul. 30, 1984, Ser. No. 635,638

Int. Cl.⁴ F41H *1/02, 1/04;* **B32B** *3/00*

U.S. Cl. 2—2.5 **10 Claims**



1. A protective device having inner and outer surfaces relative to a body to be protected comprising:

a first plate having a first planar surface which defines first and second orthogonal axes and an outer surface relative to a body to be protected and a second planar surface which defines a longitudinal axis generally tangential to said first and second axes and formed in a plane at a predetermined angle to said first planar surface, said second planar surface intersecting said first planar surface at an edge thereof, said first, second and tangential axes extending generally longitudinally and tangentially with respect to the body;

a second plate having a first planar surface which defines first and second orthogonal axes and an inner surface relative to the body to be protected and a second planar surface which defines a longitudinal axis generally tangential to said second axis of said first planar surface of said second plate and formed at said predetermined angle to a plane of said inner surface, said second planar surface intersecting said first planar surface at an edge thereof, said first, second and tangential axes of said second plate extending generally longitudinally and tangentially with respect to the body and generally parallel to the corresponding ones of said first, second and tangential axes of said first plate along substantially the whole length of the tangential axis, and wherein said second surfaces of said first and second plates are positioned in abutting relationship whereby when a projectile strikes said first planar surface of said first plate, said first and second plates move

relative to one another along said longitudinal axes and along said second planar surfaces; and

a flexible sheet of material forming a pocket enclosing said first and second plates and adapted to be worn on a body to be protected.

7. A garment for a body including a sheet of protective material comprising: flexible sheet means having at least two adjacent pockets, a pair of cooperating plates enclosed by each of said pockets, each of said plates having a first planar surface which defines first and second orthogonal axes and a second planar surface which defines a longitudinal axis generally tangential to an associated one of said second axes, said first, second and tangential axes of each of said pairs of plates extending generally longitudinally and tangentially with respect to the body, each of said second planar surfaces being formed in a plane at a predetermined angle with respect to a plane of an associated one of said first surfaces, said second planar surface intersecting said first planar surface to form a first edge of said plate, and said first, second and tangential axes of one of said pair of plates being generally parallel to the corresponding ones of said first, second and tangential axes of the other cooperating one of said pair of plates, said second surfaces of said plates in each pair being maintained in abutting relation to one another by said pockets whereby when a projectile strikes one of said first planar surfaces of one of said pairs of plates, said plates of said one pair move relative to one another along said associated longitudinal axes and said associated second planar surfaces.

4,633,529

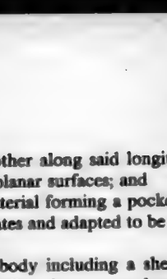
BASEBALL SHIN GUARDS

Steven D. Litz, P.O. Box C, Buffalo, Okla. 73834

Continuation-in-part of Ser. No. 656,704, Oct. 1, 1984, abandoned. This application Jan. 31, 1985, Ser. No. 697,213

Int. Cl.⁴ A41D *13/00*

U.S. Cl. 2—22 **3 Claims**



1. An improved baseball shin guard capable of more rapid donning and removal, the combination comprising:

a shin guard consisting of an elongated shin-plate having first and second sides and upper and lower ends with an upper plate and an instep plate hingedly affixed on respective upper and lower shin plate ends, and including at least one pair of securing means defining openings disposed on said first and second sides, said securing means defining openings consisting of first ring means hingedly affixed to said first side, and second ring means hingedly affixed to said second side and including parallel D-rings to enable relatively permanent fastening;

at least one unitary securing strap means consisting of an elongated strap having first and second strap ends with consolidated tip ends for operative insertion through respective first and second securing means openings, said first and second strap ends each having VELCRO® joinder pads secured thereon thereby to be releasably joinable to a coactive VELCRO® joinder pad secured on the mid-portion of said strap.

4,633,530

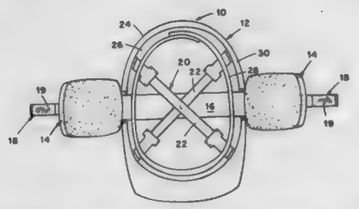
PROTECTIVE DEVICE

Roy E. Satterfield, 309 Oak Park Dr., Knoxville, Tenn. 37918

Filed Sep. 4, 1985, Ser. No. 772,321

Int. Cl.⁴ A42B *1/06*

U.S. Cl. 2—423 **4 Claims**



1. A protective device for providing ear warmth and head protection to construction workers and the like, comprising:

a hard hat for being worn on the head of a wearer, said hard hat having an impact resistant protective shell and support webbing disposed within said shell for supporting said shell on the head of the wearer and to define a space between said shell and the head of the wearer, and having an adjustable support band connected to said shell to supportingly engage and surround the head of the wearer;

a pair of ear warmer pads dimensioned to substantially cover each ear of the wearer, each of said pads being elongate and having a width sufficient to cover an ear from front to back and comprising a soft material having insulating properties and an outer surface, and having a thickness approximately the distance between said support band and said shell whereby said pads, when not disposed to cover the ears of the wearer, can be stored in said space between said shell and the head of the wearer and be held within said space by the engagement of said outer surfaces of said pads against said shell and said webbing;

means for connecting said ear warmer pads so that each of said ear warmer pads depends from a point adjacent the support band of said hard hat when said pads are disposed to cover the ears of the wearer; and

means for detachably attaching said ear warmer pads together beneath the chin of the wearer to hold said ear warmer pads against the ears of the wearer;

said means for connecting said ear warmer pads together so that each of said ear warmer pads depends from a point adjacent the support band of said hard hat when said pads are disposed to cover the ears of the wearer comprising a strap extending from one of said ear warmer pads to the other ear warmer pad, said strap being located about the head of the wearer relative to said support webbing and said band so that when said ear warmers are attached together beneath the chin of the wearer, said strap engages said support webbing and said band to hold said hard hat on the head of the wearer.

4,633,531

TENSION MOUNTING FOR FACE GUARD

Kenneth W. Nimmons, Litchfield, Ill., assignor to Schutt Manufacturing Co., Inc., Litchfield, Ill.

Filed May 3, 1985, Ser. No. 730,357

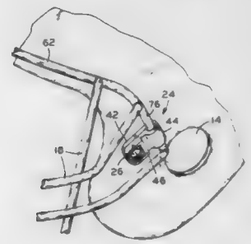
Int. Cl.⁴ A41D *13/00*; **A42B** *3/00*

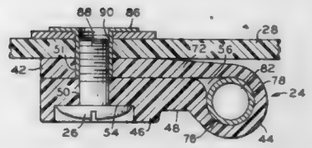
U.S. Cl. 2—424 **6 Claims**

1. In a helmet including a pair of ear holes and a grid-like face guard,

first mounting means for attaching the guard to the front of a helmet and for permitting said guard to pivot about a horizontal axis away from said helmet, the improvement comprising:

a plurality of second mounting means for attaching the sides of said guard to the sides of said helmet, said second mounting means being in tension when said guard encounters a frontal force, the sides of said guard being attached to said second mounting means at points spaced a distance in the range of 1.5 inches to 2.0 inches from the centers of said ear holes, said second mounting means including a head portion, said head portion being dimensioned in a





direction perpendicular to the surface of said helmet a distance sufficiently small to permit said guard to clear said head portion without distortion of said guard when said guard is disengaged from said plurality of second mounting means and is pivoted about said horizontal axis.

4,633,532

HELMET DEVICE

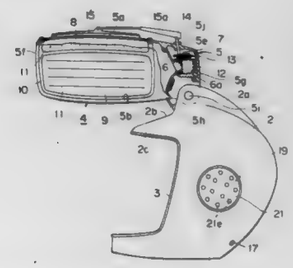
Akio Yagasaki, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 372,708, Apr. 28, 1982, abandoned. This application Sep. 6, 1984, Ser. No. 648,343

Claims priority, application Japan, May 1, 1981, 56-64597[U]; May 27, 1981, 56-80379

Int. Cl.⁴ A42B *3/02*

U.S. Cl. 2—424 **7 Claims**



1. A helmet device comprising:

a helmet body having an open front portion;

a shielding mechanism attached to said helmet body so as to substantially shield said front portion of said helmet body;

said shielding mechanism having an upper portion thereof pivotably connected to an upper portion of said said helmet body and including a see-through member which permits an outside view therethrough;

wiper means for wiping the outer surface of said see-through member;

said see-through member comprising:

a front face shield member having a substantially flat gentle curvature; and

side shield members connected to respective sides of said front face shield member;

said wiper means comprising a wiping member disposed so as to come into sliding contact with the outer surface of said see-through member, and means for driving said wiping member, said driving means comprising an electric motor disposed above said front face shield member and extending rearwardly within said upper portion of said shielding mechanism;

said wiper means being adapted to wipe an area within the substantially flat outer surface of said front face shield member;

each said side shield member being adapted to cover an area extending between the side of said front face shield member and said helmet body, and being connected to said front face shield member so as to form a corner therebetween, and extending rearwardly; and

said shielding mechanism including a pair of pivot members through which it is pivotably connected with said helmet body, said pivot members being positioned above said side shield members and exteriorly of the respective sides of said driving means.

4,633,533

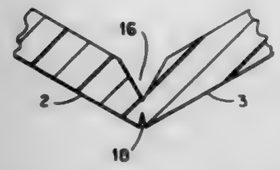
METHOD AND ARTICLE FOR NEUTRALIZING OFFENSIVE ODORS

Frank Meehan, 203 Cathedral Ave., Hempstead, N.Y. 11550

Continuation-in-part of Ser. No. 608,185, May 8, 1984, Pat. No. 4,567,613. This application Feb. 3, 1986, Ser. No. 825,318

Int. Cl.⁴ E03D *9/02*

U.S. Cl. 4—222 **19 Claims**



1. Apparatus for dispensing a deodorant liquid dropwise comprising an article including an inner container for a deodorant liquid which is floatable on water in dispersed droplet form, said inner container having an outlet means for dispensing of said liquid therefrom, and an outer container supporting and enclosing said inner container therein with said outlet means outside said outer container, said outer container including means through which the inner container and the liquid therein are visible and actuator means associated with said outer container for the application of actuating force via said outer container to said inner container to cause discharge of liquid dropwise through the outlet means thereof with the article inverted and said outlet means facing downwardly.

13. A method of neutralizing odor of human evacuation into a toilet facility comprising

storing an odor-neutralizing liquid in an inner container, supporting said inner container in an outer container, providing an outlet for said inner container, supporting and enclosing the inner container within the outer container so that the outlet of the inner container opens externally of the outer container,

forming said outlet so that application of external force to the inner container will produce dropwise discharge of the odor-neutralizing liquid when the outer container is held in an inverted position in which the outlet of the inner container faces downwardly, providing a window in the outer container through which the liquid contents in the inner container are visible, and

depositing drops of said odor-neutralizing liquid into said

toilet facility by application of external force to the inverted inner container via said container.

4,633,534

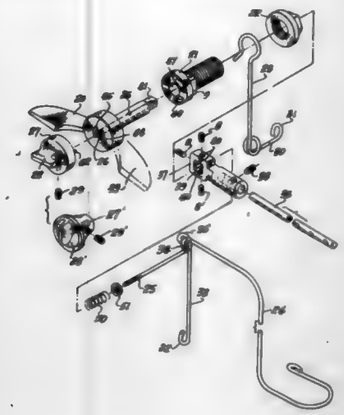
UNIVERSAL TOILET TANK SHUT-OFF ASSEMBLY

Ronald P. Hardman, 1046 W. Tropicana Ct., Ontario, Calif. 91762

Continuation-in-part of Ser. No. 529,940, Sep. 7, 1983, abandoned, which is a continuation-in-part of Ser. No. 499,304, May 31, 1983, abandoned. This application Apr. 20, 1984, Ser. No. 602,321

Int. Cl.⁴ E03D *5/092*

U.S. Cl. 4—412 **5 Claims**



1. A universal shut off device for stopping the flow of water from a tank to a toilet bowl during the flushing of the toilet and being mountable on toilet tanks having a handle on either the right-hand or left-hand side of the tank, said device comprising:

a toilet having trip handle means, a flush arm, a toilet tank, a tank bowl, a tank ball and a valve seat on which the tank ball rests;

stop handle means affixed to the wall of the toilet tank and positioned for operating from the exterior of the tank;

bendable and ductile operator arm means pivotally attached to the wall of the toilet tank at its first end and being pivotable by moving said stop handle means and said operator arm means being positionable over the tank ball at its other end; and

biasing means positioned directly below said trip handle means on the inner surface means on the inner surface of the toilet tank, said biasing means being affixed to said bendable and ductile operator arm means, whereby when said stop handle means is turned, said operator arm is brought into contact with the tank ball to close the tank ball against the valve seat to stop the flow of water into the bowl and whereby said bendable and ductile operator arm means may be installed to extend either to the right or left of the trip handle means; wherein said biasing means comprises a rod formed from an elastically bendable material, said rod having at least one loop formed therein and being affixed to the wall of the toilet tank, said rod being linked to said bendable and ductile operator arm means by said at least one loop and said elastically bendable rod is linked to said bendable and ductile operator arms means by a link having a loop in its lower end which is affixed to said loop of said link, said link having a further loop in its upper end which is affixed to yet a further loop in the bendable and ductile arm means.

4,633,535

APPARATUS FOR TREATING BIOLOGICAL WASTE BY MEANS OF COMPOSTING

Jarmo Louvo, Kumputie 5 A, SF-45200 Kouvola, Finland

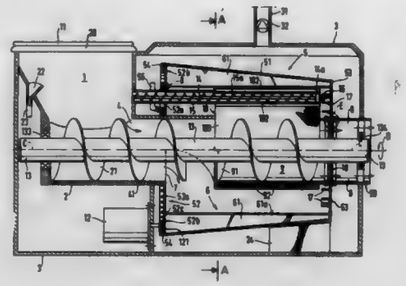
PCT No. PCT/FI84/00083, § 371 Date Jul. 2, 1985, § 102(e) Date Jul. 2, 1985, PCT Pub. No. WO85/02172, PCT Pub. Date May 23, 1985

PCT Filed Nov. 16, 1984, Ser. No. 758,219

Claims priority, application Finland, Nov. 16, 1983, 834191

Int. Cl.⁴ A47K *11/02, 11/00*

U.S. Cl. 4—449 **12 Claims**



1. A dry latrine for treating biological household waste by means of composting, which latrine comprises a space (1) for collecting the waste, the bottom of which space is formed as a trough (2), into which trough is fitted a conveyor (21), and at the end of said trough there is located an opening (4), through which the waste is moved out of the trough into a separate space where the composting takes place, characterized in that the separate space is formed of a mixing drum (5), which is placed in horizontal position and at the first end (52) whereof there is located an inlet opening (7), and that on an inner wall (51) of the mixing drum (5) there are attached mixer means (6), and that the mixing drum (5) is connected to an actuator (12) whereby the mixing drum (5) is rotated around its axis, and that there is an outlet opening (8) at the other end (53) of the mixing drum (5).

4,633,536

COLLAPSIBLE POTTY CHAIR WITH DISPOSABLE BAG

Bobby J. Tribble-DuBose, 7876 Hillmont Dr., Oakland, Calif. 94605

Filed Jan. 4, 1984, Ser. No. 567,997

Int. Cl.⁴ A47K *11/02*; E04H *1/12*

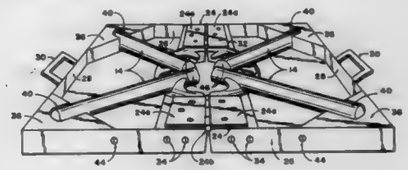
U.S. Cl. 4—460 **6 Claims**

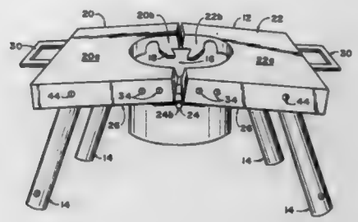
1. A collapsible potty chair comprising:

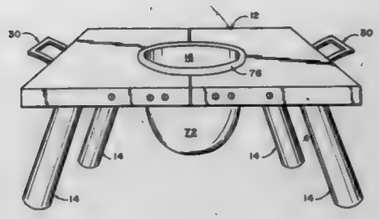
a seat member including a pair of panels having respective side edges contiguous with each other, each panel having an underside and; block structure secured to the underside of each panel, respectively, the block structures having respective lower surfaces; hinge means on the lower surfaces of the block structures near said contiguous edges of the panels for hingedly mounting the panels for movement from first positions in which the panels are substantially coplanar with each other to second positions in which the panels are generally parallel with and spaced from each other, the lower surfaces of the block structures being adjacent to each other when the panels are in said second positions, said panels defining a central hole when the panels are in said first positions;

a number of legs; means pivotally mounting the legs to respective block structures for movement of the legs from extended positions for supporting the seat member above a support surface to collapsed positions near and contiguous to the undersides of respective panels, the block structures defining recesses for receiving the legs when the legs are in their collapsed positions and when the panels are in either of their first and second positions;

a bag having an open top; and







tab means coupled with the seat member and extending at least partially into the central hole for removably mounting the upper margin of the bag to the seat member with the open top of the bag being in alignment with and below said hole.

4,633,537

COMBINATION CRIB/CABINET UNIT

Ralph Smith, 3513 Emmett Pl., Santa Clara, Calif. 95051

Filed May 6, 1985, Ser. No. 730,631

Int. Cl.⁴ A47B *85/00*; A47D *7/00*

U.S. Cl. 5—2 R **6 Claims**



1. A combination crib/cabinet unit, comprising:

(a) an overall housing which has the exterior appearance of a self-standing cabinet, said housing including

(i) a lowermost base end,

(ii) opposite sidewalls and a back wall extending vertically upward from said base end,

(iii) a closed topside connecting the top ends of said sidewalls and said backwall, and

(iv) a pair of vertically extending doors respectively hinge connected to said sidewalls for movement between first closed positions in a common plane normal to said sidewalls for closing the frontside of the housing and second, open positions extending out from said front side parallel with said sidewalls;

(b) a base member pivotally connected with the inside surface of said backwall for movement between a vertically extending first position adjacent said backwall between and within the confines of said sidewalls whereby said housing doors can be closed and a second, horizontal position when said doors are in said open positions such that the base member extends out from said backwall between and within the confines of said open doors for supporting a mattress thereon; and

(c) a front wall pivotally connected with said base member for movement between a first position parallel with and adjacent to said base member and a second position perpendicular to said base member such that, when the base member is in said horizontally extending second position, said front wall is movable between a first horizontal position directly over and adjacent said base member and a second vertical position to one side of the base member opposite said backwall and between said open doors, whereby said back and front walls, said open doors and said base member together define a crib;

(d) said base member including a mattress supporting underside and a frame around said underside and the combination crib/cabinet unit further including a mattress positioned over said underside and within the confines of said frame for movement with the base member between its vertically extending first position and its second, horizontal position; and

(e) each of said vertically extending doors and said front wall including cooperating means for disengagably latching said front wall to said doors when the doors are in their second, opened positions and said front wall is in its second position with said base member in its second horizontal position, whereby to disengagably latch the combination crib/cabinet unit in its crib functioning condition.

4,633,538

INVALID HOIST

David R. James, Glenyard, England, assignor to James Industries Limited, Gloucester, England

Filed Feb. 11, 1985, Ser. No. 700,513

Claims priority, application United Kingdom, Feb. 14, 1984, 8403788

Int. Cl.⁴ A61G *7/10*

U.S. Cl. 5—86 **19 Claims**



1. An invalid hoist comprising:

a base having a column support socket;

an upstanding column detachably mounted in said support socket, a screw-and-nut lifting mechanism extending longitudinally within said column, a lifting arm extending from the column and movable therealong by said lifting mechanism, the nut of said lifting mechanism being coupled to said lifting arm;

a reversible electric motor unit having an output shaft, a battery for energization of said motor unit, said motor unit and said battery being mounted on said base with said output shaft disposed in alignment with the screw of said mechanism; and

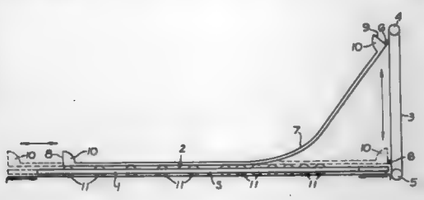
a drive coupling positioned within said support socket for coupling the output shaft of said motor unit with said screw and comprising freely and axially separable lower and upper coupling elements, with said lower coupling element secured to said output shaft of the motor unit and said upper coupling element secured to a lower end of said screw of the lifting mechanism, the arrangement being such that said column is removable from said base by lifting out of said support socket without disturbing said motor unit.

4,633,539

APPARATUS FOR ALTERING THE CONTOUR OF A MATTRESS ON A BED

Ronald F. Morrison, Helensburgh, United Kingdom, assignor to Orthomatic Limited, Yoker, United Kingdom

Filed Feb. 28, 1985, Ser. No. 706,508
Int. Cl.⁴ A61G 7/06; A47C 20/04
U.S. Cl. 5—508 **6 Claims**



1. Apparatus for altering the contour of a mattress on a bed having generally horizontal supporting surface means for said mattress extending longitudinally between opposite ends of said bed, said apparatus comprising:

elevating and lowering means adapted to be mounted at an end of said bed,

attachment means carried by said elevating and lowering means for movement thereby in a generally vertical plane between a lower position adjacent said mattress supporting surface means and an upper position,

flexible elongate carrier means for said mattress adapted to be supported by said supporting surface means, with opposite ends of said carrier means adjacent said opposite ends of said bed, and to be longitudinally movable relative to said supporting surface means,

hinge means connecting the end of said carrier means adjacent said elevating and lowering means to said attachment means,

said elevating and lowering means being operable to adjust said carrier means between a first contour in which the said attachment means is in its lower position and said carrier means is supported by said supporting surface means wholly in a generally horizontal plane and a second contour in which said attachment means is in its upper position and said adjacent end of said carrier means is spaced above said supporting surface means while the opposite end of said carrier means, together with a substantial portion of said carrier means adjacent said opposite end, remains supported by said supporting surface means in said generally horizontal plane, and

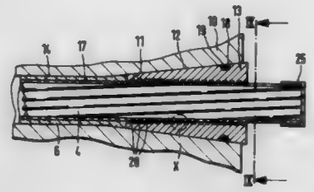
friction reducing means for facilitating longitudinal movement of said carrier means relative to said supporting surface means.

4,633,540

TENSION TIE MEMBER

Dieter Jungwirth; Gerd Thielen, and Otmar Langwadt, all of Munich, Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft

Filed Apr. 30, 1985, Ser. No. 728,753
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1984, 3437107
Int. Cl.⁴ E01D 11/00
U.S. Cl. 14—22 **18 Claims**



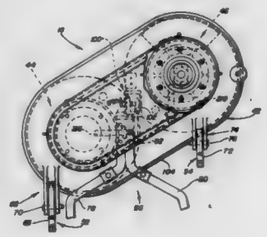
1. A tie member comprising at least one axially elongated tension element, such as a steel wire, steel strand and the like, a tubular sheathing laterally enclosing said at least one tension element, an anchoring unit at each end of said tension element for transferring the tension force to a structure, said anchoring unit comprising an anchor member having at least one conically shaped borehole therethrough, a multi-part annular wedge engageable within said borehole for securing said tension element therein, wherein the improvement comprises a coating of a synthetic resin completely laterally enclosing said at least one tension element between the ends thereof including the portion of said tension element located within said wedges, each said annular wedge has a pair of end surfaces spaced apart in the axial direction of said tension element extending transversely of the axial direction of said tension element, a conically shaped outside surface, and an inside surface arranged to contact the surface of said tension element extending between said spaced end surfaces of said annular wedge, said inside surface of said wedge being shaped in the direction between said spaced ends for forming a series of teeth with the tips of said teeth being rounded off and arranged to penetrate through said coating into contact with said tension element.

4,633,541

FLOOR TREATING MACHINE

Thomas S. Block, Muskegon, Mich., assignor to Cooper Industries, Houston, Tex.

Continuation-in-part of Ser. No. 537,730, Sep. 29, 1983, Pat. No. 4,506,405. This application Sep. 6, 1984, Ser. No. 647,914
Int. Cl.⁴ A47L 11/283
U.S. Cl. 15—49 R **17 Claims**



1. A floor treating machine, comprising:

a frame;

a brush housing operatively connected to said frame;

a rotatable brush for treating the floor; and

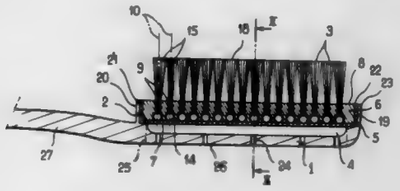
means for positioning said brush with respect to the floor, said means for positioning said brush with respect to the floor further including means for regulating the contact pressure of the brush with respect to the floor.

4,633,542

BRUSH HAVING RESILIENTLY RETRACTABLE BRISTLES, IN PARTICULAR FOR BRUSHING SURFACES OF COMPLEX SHAPE, SUCH AS TEETH

Bernard Taravel, Angers, France, assignor to Laboratoires Pharmascience, Courbevoie, France

Filed Apr. 12, 1985, Ser. No. 722,445
Claims priority, application France, Apr. 13, 1984, 84 05896
Int. Cl.⁴ A46B 9/04
U.S. Cl. 15—167 R **15 Claims**



1. A brush comprising a rigid brush head and a predetermined number of tufts of bristles, with each tuft having a first end held captive in the brush head and a free second end intended to come into contact with a surface to be brushed, the brush head comprising:

a rigid brush head wall having a first face, a second face, and a plurality of openings passing through said wall from the first face to the second face thereof along respective predetermined axes, there being as many of said openings as there are tufts of bristles, and each opening receiving a respective one of said tufts, said tufts being slidable in said openings along respective ones of said axes, each tuft thus being oriented along a corresponding axis and having its second end projecting from the second face of the wall, and an intermediate zone in between said first and second ends which is engaged in a corresponding one of said openings, said intermediate zones and said openings having respective complementary cross-sections in a direction perpendicular to the corresponding axes;

a resiliently deformable membrane capable of spot deformation superposed on the first face of the wall over said openings and said first ends of said tufts, said membrane being independent therefrom, and having a peripheral zone which is fixed over its entire length to said brush head, said membrane being held taut by said brush head;

means for enabling resilient spot deformation of the membrane opposite said openings and said first ends of said tufts, and in a direction away from said first face of the wall;

stop means imposing a limit on the sliding of each tuft in the direction away from said first face towards said second face of the wall to ensure contact between said first end of each tuft and said membrane;

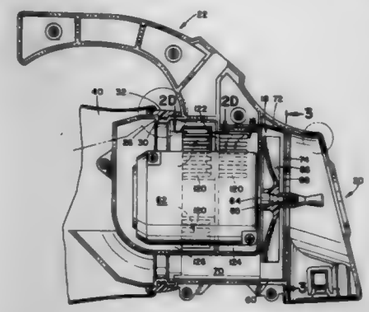
the brush including the improvement whereby said resilient spot deformation of the membrane is defined by said brush head including a cavity facing the set of openings through the wall, said cavity being common to all of said openings and being on the opposite side of said membrane from said first face of the wall, and said membrane being made of an isotropic material and behaving anisotropically in such a manner that the tufts of bristles are capable of retracting resiliently into said cavity independently from one another.

4,633,543

HAND VACUUM CLEANER

John F. Sovis, Coldwater, Mich.; Robert M. Smith, Copley, Ohio, and George H. Bramhall, Boulder, Colo., assignors to Royal Appliance Mfg. Co., Cleveland, Ohio

Filed Nov. 9, 1984, Ser. No. 670,553
Int. Cl.⁴ A47L 5/26
U.S. Cl. 15—344 **2 Claims**



1. A hand-held vacuum cleaner including a housing comprising mating first and second half housing elements, said housing having a handle and a nozzle, a motor having means for drawing cooling air through the motor, a selectively-separable bag assembly, a working air channel for communicating working air from said nozzle to said bag assembly, and a motor mount portion receiving said motor and spaced from said working air channel by a motor mount portion peripheral wall;

said motor mount portion including a peripheral motor cooling air intake chamber, a peripheral motor cooling air exhaust chamber and a peripheral baffle wall extending from a housing outer wall to contiguous engagement to said motor, said housing outer wall including a plurality of air inlet vents at said cooling air intake chamber, oppositely disposed in said first and second half housing elements, for cooling air inflow to said motor from said first and second half housing elements, and air outlet vents at said cooling air exhaust chamber, oppositely disposed in said first and second half housing elements for cooling air exhaust from said motor through said first and second housing elements, said inlet and outlet vents being oppositely spaced about said baffle wall, said means for drawing cooling air through the motor causing the cooling air to enter said inlet vents and chamber and exit the outlet chamber and vents;

said sealing peripheral wall adjacent said working air channel sealing said intake and exhaust chambers from said channel to preclude cooling air in said cooling air intake and exhaust chambers from mixing with working air in said working air channel.

4,633,544

SHOPPING CART FRICTION WHEEL ASSEMBLY

Jimmy L. Hicks, La Mirada, Calif., assignor to P & H Sales Co., Montebello, Calif.

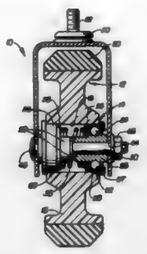
Filed Mar. 13, 1985, Ser. No. 711,229
Int. Cl.⁴ B60B 33/00
U.S. Cl. 16—35 R **6 Claims**

1. In a shopping cart wheel of the type having a caster frame including a generally U-shaped bracket having aligned bores formed therein and an upstanding caster pivot shaft projecting from the closed end of the U-shaped bracket for attaching the caster frame to a shopping cart, a wheel having a transversely extending central bore formed therethrough, a cylindrical axle projecting through the central bore of the wheel and the aligned bores of the bracket for mounting the wheel to the

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bracket, and a pair of axially spaced bearing assemblies seated within the central bore of the wheel at opposite ends thereof and axially inwardly of the bracket, the bearing assemblies supporting the wheel on the axle for relative rotation about the axle, the improvement comprising:

said bearing assemblies having a respective pair of first members seated within said central bore of said wheel generally at opposite ends thereof for rotation with said wheel and having radially enlarged thrust shoulders for engaging the outer periphery of said wheel, and a respective pair of second members mounted on said axle and supporting said respective pair of first members for relative rotation, said second members including a respective



pair of axially inboard projecting extensions each having a non-circular cross-section;

a pair of friction washers carried respectively about said extensions, each having a non-circular inner periphery cooperating with said non-circular cross-section of said extensions to prevent relative rotation therebetween; and

a compression spring surrounding said axle and having opposite ends disposed between said washers, said opposite ends of said spring applying an axial force against said washers to urge said washers axially against said first members thereby to frictionally resist rotation of said first members relative to said second members and said shopping cart wheel relative to said axle.

4,633,545

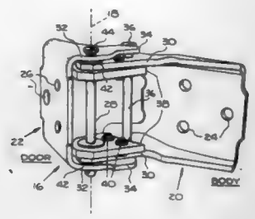
AUTOMOBILE DOOR HINGE CONSTRUCTION

Darrell Schiller, 407½W. Avenue G, Temple, Tex. 76501

Filed Jan. 31, 1984, Ser. No. 575,508

Int. Cl.⁴ E05D *11/04*

U.S. Cl. 16—275 **3 Claims**



1. Automobile door hinge construction, for use in an automobile having a body and a door, in which the door is supported entirely by hinges on upright edges of the body and door and in which the door swings on an upright axis, comprising,

a pair of leaves including a body leaf, and a door leaf,

each leaf having a pair of parallel spaced apart side flanges and the two leaves are interfitted with their flanges overlapping, and the flanges of the two leaves at each side being closely adjacent,

a hinge plate fitted flat against each of the flanges of one of the leaves and secured rigidly thereto,

the overlapping flanges of the two leaves and the hinge plates having holes aligned on an axis coinciding with said upright axis when the hinge is mounted on the automobile, and the hinge including a hinge pin in said holes pivotally mounting the leaves together for mutual swinging movement, and

sealed ball bearing means mounted in each of the hinge plates and on the hinge pin, and the ball bearing means being thereby in correspondingly spaced apart position,

the hinge construction providing interconnecting support solely through the respective leaves which are spaced axially of the hinge pin, and the hinge plates in which the ball bearing means are mounted, the leaves and hinge plates providing their said support through the ball bearing means.

4,633,546

RESILIENT HINGE

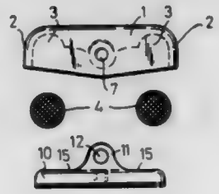
Franciscus H. Bergs, Maastricht, Netherlands, assignor to Wagemans Mastricht B.V., Netherlands

Filed Mar. 15, 1985, Ser. No. 712,559

Claims priority, application Netherlands, Mar. 16, 1984, 8400855

Int. Cl.⁴ A47B *95/00*

U.S. Cl. 16—277 **7 Claims**



1. A resilient hinge comprising

a first support that can be mounted on a member to be supported, such as a back of a chair having a remainder,

a second support that can be mounted on a main body, such as said remainder of said chair,

a hinge shaft rotatably connecting said first and second supports about a hinge axis, said first and second supports each having first and second supporting portions on both sides of said shaft,

a hood rotatably mounted about said hinge axis, said hood having hood portions facing and spaced from said supporting portions, wherein the hood has depending edges having bearing holes for said hinge shaft, and wherein the hood comprises an elevated central portion with a tunnel therethrough for receiving said hinge shaft, said shaft extending through the passage in at least one of the two supports and

bodies of elastic, resilient material between said hood portions and said first and second supporting portions to resiliently resist rotation of said first and second supports with respect to each other in both directions.

4,633,547

CRAB PICKING MACHINE

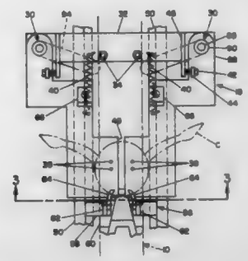
Linald R. Caroon, Lowland, N.C., assignor to Caroon Brothers Seafood, Lowland, N.C.

Filed Apr. 17, 1985, Ser. No. 724,184

Int. Cl.⁴ A22C *29/00*

U.S. Cl. 17—71 **11 Claims**

1. A crab picking machine comprising a two part tray adapted to support a crab with its carapace up and its head forward and with approximately one lengthwise half supported on one tray part and the other lengthwise half supported on the other tray part, transport means for moving the tray through successive first, second and third work stations in the recited order, means for holding the tray parts side by side as the tray moves through the first and second work stations, means at the first work station for removing claws from a crab, means at the first work station for removing the carapace from a crab, means at the second work station for cutting a crab in approximately half lengthwise and from top to bottom, leaving



each crab half supported by a respective tray part, means adjacent the third station for rotating both tray parts to positions such that cuts of crab halves formed at said second station face generally rearwardly, with respect to the direction of movement of each tray part through the third station, and a pair of rolls at the third station, each of which is adapted to engage a crab half and squeeze out the meat through a cut formed at said second station as the respective tray parts move through the third station.

4,633,548

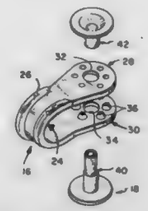
SPEED LACE STRUCTURE

Leland B. M. Siskind, 20 Mill Pond, North Andover, Mass. 01845; William A. Samaha, 14 South Park St., Bradford, Mass. 01830, and Thayer S. Warshaw, 11 Tillotson Rd., Needham Heights, Mass. 02194

Filed Oct. 9, 1984, Ser. No. 658,506

Int. Cl.⁴ A43C *1/00*

U.S. Cl. 24—145 **4 Claims**



1. A speed lace structure for footwear comprising:

(a) a lacer assembly integrally formed with a lacer loop portion having peripheral lips and with opposed fastening portions provided with central openings peripherally surrounded by a plurality of gripping teeth;

(b) a rivet assembly formed of a capped eyelet and of a deformable eyelet, said deformable eyelet deformably to be received over said capped eyelet;

(c) said lacer assembly coated with a plastic material so as to render said lacer loop portion, including said peripheral lips thereof, smooth and slippery;

(d) said peripheral lips extending tangentially with said opposed fastening portions;

(e) said capped eyelet serving as an anchoring stem fitting within and through said central openings of said opposed fastening portions;

(f) with said speed lace structure secured in operative position to a part of said footwear, said deformable eyelet deforming about one of said opposed fastening portions of said lacer assembly and also about said capped eyelet serving as said anchoring stem, and the free end of said capped eyelet extends through and deforms about said one of said opposed fastening portions;

(g) said capped eyelet being formed with a stem portion characterized by having two segments of different external diameters; a first segment with an external diameter to fit snugly within said deformable eyelet, and a second segment with an external diameter larger than the internal diameter of said deformable eyelet, and a smooth shoulder connecting said segments.

4,633,549

RELEASABLE BUCKLE PARTICULARLY FOR BAGS, SATCHELS AND SIMILAR ARTICLES

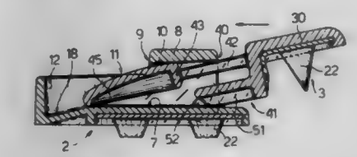
Attilio Lovato, Pino Torinese, Italy, assignor to ITW Fastex Italia S.p.A., Torino, Italy

Filed May 29, 1985, Ser. No. 738,636

Claims priority, application Italy, Jun. 1, 1984, 67564 A/84

Int. Cl.⁴ A44B *11/25*

U.S. Cl. 24—615 **9 Claims**



1. A buckle comprising: an essentially plate-like female part having a U-shaped bracket on its upper surface and a male part separable from the female part; said female part including a receiving cavity having towards one end an opening for receiving said male part, an adjacent locking edge on the opposite side of the said opening, both said opening and said locking edge being defined by said U-shaped bracket, and a slanting ramp portion comprising a portion of the inside surface of said cavity sloping downwards away from said U-shaped bracket in the male part insertion direction; said male part having a locking portion engaging behind said locking edge when said male part is inserted inside said receiving opening and an activating portion located in front of said locking portion in the male part insertion direction; said male part further having said locking and said activating portions formed on an intermediate portion and the free end respectively of a first flexible tongue projecting from said male part in the direction of its insertion; said male part also having a second essentially rigid contrasting tongue projecting beneath said first flexible tongue and essentially beneath said locking portion, the lower surface of said second rigid tongue being located, in relation to said locking portion, at a distance measured perpendicularly to the planes of said second rigid and first flexible tongues, greater than the height of said receiving opening; wherein said activating portion of said male part cooperates with said receiving opening and said ramp portion of said female part for insertion and retention therein.

4,633,550

YARN ENTANGLING APPARATUS

John E. McAlliley, and James R. Crozier, Jr., both of Rock Hill, S.C., assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,405

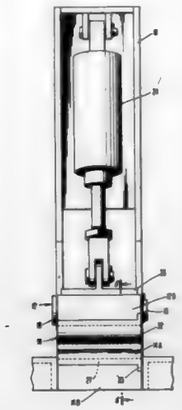
Int. Cl.⁴ D02G *1/16*; D02J *1/08*

U.S. Cl. 28—272 **22 Claims**

1. In an apparatus for entangling a plurality of bundles of filamentary material of the type comprising first and second blocks positionable against one another, each said block comprising a plurality of channels arranged so that when said

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blocks are positioned against one another, the channels of one block mate with the channels of the other block to form passages through which respective bundles of filamentary material may pass, each block including fluid ports communicating with respective ones of said passages to conduct pressurized fluid thereto in order to create turbulence within respective ones of said passages for entangling said bundles, the improvement wherein said blocks are rapidly separable and are adapted to be converted to blocks having a different bundle capacity, said improvement comprising the formation of each of said



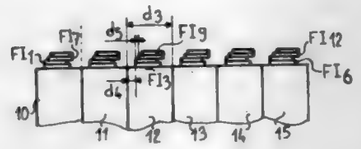
blocks of a base section and a head section removably mounted to said base section, said head section containing said channels, there being provided a plurality of said sections which are configured to be interchangeably mountable on said base section and which are of different bundle capacity, releasable fastening means for securing any one of said head sections to said base section to enable said head sections to be interchanged, and mechanical means for mutually separating said blocks to provide simultaneous and immediate access to the interior of said yarn passages.

4,633,551

METHOD OF CONTINUOUS FABRICATION OF MOTHER-CAPACITORS

Daniel Bernard, Seurre, France, assignor to LCC.CICE-Compagnie Europeenne de Composants Electroniques, Bagnolet, France

Filed Jul. 5, 1984, Ser. No. 627,836
Claims priority, application France, Jul. 6, 1983, 83 11259
Int. Cl.⁴ H01G *4/32*
U.S. Cl. 29—25.42 **4 Claims**



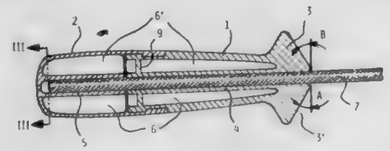
1. A method of fabrication of mother-capacitors, wherein:
(a) a mother-film of metallized plastic material is formed on at least one face of the film without any border;
(b) the metallized mother-film is cut approximately so as to form a plurality of intermediate metallized films;
(c) partial demetallization of each intermediate film is carried out by displacing said film in front of a YAG-laser beam divided into a plurality of secondary beams, this movement being performed in such a manner as to obtain a plurality of borders having the same width and substantially parallel to the edges of the intermediate film, the distance between said borders being substantially equal and of predetermined value;
(d) simultaneously each intermediate film is cut so as to form indiviual films having a border and a metallized portion of predetermined width, with cutting means placed near said YAG-laser;
(e) the individual films are moved away from each other to a predetermined distance;
(f) n mother-capacitors are formed in juxtaposed relation by winding two intermediate films on a wheel of large diameter each intermediate film being prepared in accordance with steps a to e but with a non-metallized border located on the opposite lateral edges;
(g) a common intercalary element is deposited on the n mother-capacitors thus formed;
(h) there is deposited on each intercalary element fresh mother-capacitor whose edges are substantially aligned with those of the preceding tier;
(i) m tiers of mother-capacitors are thus formed in succession;
(j) the side faces of each assembly of m tiers of mother-capacitors are spray-coated by the Shcoop process;
(k) and the mother-capacitors are separated from each other.

4,633,552

TOOL HANDLE WITH ECCENTRIC TOOL GRIPPING ASSEMBLY

Karl E. S. Eriksson, 212 Lake View Dr., Summerville, S.C. 29483

Filed Mar. 26, 1985, Ser. No. 716,245
Int. Cl.⁴ B25G *3/20*
U.S. Cl. 29—80 **9 Claims**



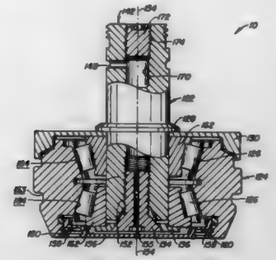
1. A tool handle comprising first and second handle parts having a common longitudinal axis, a joint connecting said parts for at least limited relative rotation of the parts about said axis, means defining a longitudinally extending through bore in one of the handle parts with an opening at one end of said one handle part remote from the joint for insertion of an elongate tool into the handle, the through bore having an axis which is offset from said common longitudinal axis, means defining a further longitudinal bore in the other of said parts for receiving an end portion of the tool inserted into said through bore, the further bore also having an axis which is offset from said common longitudinal axis, the handle parts having a relative rotational position wherein the respective axes of said through bore and further bore are substantially coaxially aligned for receipt of the tool and wherein relative rotation of the parts from said position about the common longitudinal axis provides relative eccentric displacement of the respective axes of the through bore and further bore effective for clamping the tool in the handle.

4,633,553

ADJUSTABLE, LOCKING SEAMING ROLLER PIN

Constantine P. Caronis, and Patrick F. Caronis, both of P.O. Box 4840, Santa Clara, Calif. 95054

Filed Jul. 18, 1985, Ser. No. 756,874
Int. Cl.⁴ B21B *13/02*; B23P *17/00*
U.S. Cl. 29—116 R **11 Claims**



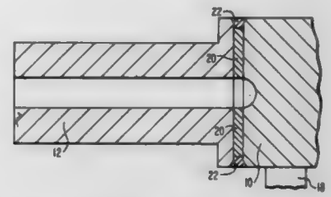
1. A seaming roller for use in a canning machine to join a lid to a can body comprising:
a spindle having a spindle axis, a throughgoing bore defined along the spindle axis, first and second ends, and an annular flange between the first and second ends, the first end including means for mounting the spindle to the canning machine;
a roller body for engaging the lid;
first and second bearings for mounting the roller body to rotate around the spindle;
positioner means, adjustably fixable in the throughgoing bore in the region of the second end, for positioning the bearings and the roller body against the annular flange; and
locking means, removably mountable in the throughgoing bore and adjustably fixable to the roller spindle adjacent the first end, for tightly engaging the positioner means within the throughgoing bore, thereby fixing the adjustment of the positioner means.

4,633,554

METHOD FOR REPAIRING A STEAM TURBINE OR GENERATOR ROTOR

Robert E. Clark, Orlando, Fla., and Deanis R. Amos, Rock Hill, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 8, 1985, Ser. No. 763,744
Int. Cl.⁴ B23P *15/00*; B21K *3/00*; B23K *9/00*
U.S. Cl. 29—156.4 R **6 Claims**



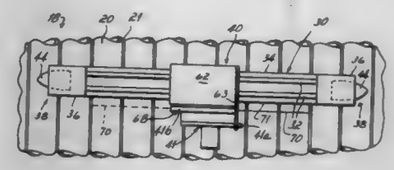
1. A method for repairing iow alloy steel steam turbine or generator rotors, said method comprising:
a. machining mating attachments on a replacement end and a remaining portion of the original rotor;
b. mating said replacement end and said original rotor;
c. welding said replacement end to said original rotor by narrow-gap gas metal arc or submerged arc welding up to a depth of ½–2 inches from the rotor surface;
d. gas tungsten arc welding the remaining ½–2 inches;
e. boring out the mating attachment and at least the inside ½ inch of the weld; and
f. inspecting said bore.

4,633,555

METHOD FOR CUTTING TUBE-WALLS

Gerald A. Legge, R.R. #3, Box 342, Aurora, Ind. 47001

Filed Apr. 10, 1985, Ser. No. 721,581
Int. Cl.⁴ B21D *53/02*; B23P *6/00, 15/26*; B26D *5/08*
U.S. Cl. 29—157.4 **32 Claims**



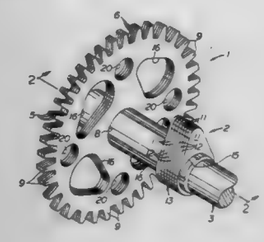
1. A method of cutting a boiler tube-wall of a power generating station comprised of a plurality of generally parallel, vertical tubes welded together lengthwise, said method employing a guide having at least one guide rod interposed between a pair of securement means for selectively, removably securing said guide to said tube-wall and actuatable cutting means slidably mounted for movement along said guide rod between said securement means for selectively cutting through said tube-wall, said method comprising the steps of:
(a) removably securing said guide to a location on one vertical surface of said tube-wall by cooperation of only said securement means and said one vertical surface, said location being defined by a line of cut to be made in said tube-wall;
(b) actuating said cutting means;
(c) moving said cutting means along said guide rod between said securement means and along said line of cut to cut through said tube-wall and any of said tubes therealong.

4,633,556

METHOD OF FORMING A LAMINATED WHEEL ASSEMBLY

John D. Santi, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Division of Ser. No. 403,465, Jul. 30, 1982, Pat. No. 4,522,080.
This application Mar. 4, 1985, Ser. No. 707,692
Int. Cl.⁴ B23P *15/14*
U.S. Cl. 29—159.2 **4 Claims**



1. A method of forming a wheel assembly comprising the steps of stamping a plurality of plates of desired configuration each provided with teeth along the periphery thereof and an opening formed therethrough, stamping a plurality of apertures in each of said plates in the shape of a cam at locations equi-angularly spaced apart from one another to provide a plurality of cam members, stamping an opening in each cam

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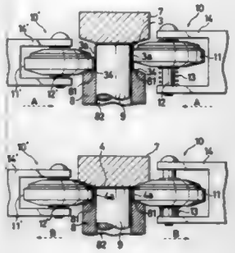
member, assembling the cam members into a laminated stack so that adjacent cam members are in abutting relation to one another with their openings in registry to form an integral cam surface, assembling the plates into a laminated stack so that adjacent plates are in abutting relation to one another with their openings and teeth in registry to provide a laminated gear, positioning said laminated stack of cam members in spaced relation to said laminated gear and forcing a support member through said openings in said plates and said cam members to provide a press fit so that said stack of cam members is press fit onto said support member at substantially the same time as said gear and the frictional force between said plates and cam members and said support member provides the substantially sole means for maintaining the plates and cam members in substantially abutting relationship at their radially outer ends.

4,633,557

METHOD OF MAKING POLY-V PULLEYS

Yukio Kanemitsu, Hyogo, Japan, assignor to Kabushiki Kaisha Kanemitsu, Japan

Division of Ser. No. 400,415, Jul. 21, 1982, Pat. No. 4,518,374. This application Apr. 15, 1985, Ser. No. 710,166
Claims priority, application Japan, Dec. 24, 1981, 56-212370
Int. Cl.⁴ B21K *1/42*
U.S. Cl. 29—159 R **3 Claims**



1. A method of manufacturing a sheet metal poly-V pulley comprising the steps of:

forming a cup-shaped blank by drawing a sheet metal plate, said cup-shaped blank having a circular bottom and a cylindrical peripheral wall having inner and outer peripheral surfaces, extending from the periphery of said circular bottom;

thickening the cylindrical peripheral wall of said cup-shaped blank by supporting the blank between rotary support members while holding the cylindrical peripheral wall of said cup-shaped blank by radially-urged rotary roller devices, and, synchronously rotating and axially bringing together the rotary support members to thereby axially compress said cup-shaped blank while slowly separating said rotary rollers, allowing thickening of the peripheral wall of said cup-shaped blank; and,

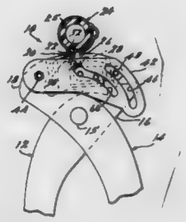
simultaneously forming a plurality of parallel v-shaped annular outer grooves and smaller v-shaped annular inner grooves respectively in the outer and inner peripheral surfaces of said cup-shaped blank, by applying a v-shaped groove forming outer roller and an inner groove forming rotary mold simultaneously to said out and inner peripheral surfaces, respectively, of said thickened cylindrical peripheral wall, said plurality of parallel v-shaped annular grooves being divided by tapering partition walls in the peripheral direction of said wall, said v-shaped annular inner grooves being smaller than said plurality of parallel v-shaped annular grooves and located at positions corresponding to the tops of said partition walls dividing said V-shaped grooves in said outer peripheral surface of said cylindrical peripheral wall.

4,633,558

CAM ACTION TOOL FOR APPLYING A SPRING CLAMP

George E. Spaulding, Woodridge, Ill., assignor to Wittek Industries, Inc., Broadview, Ill.

Filed Feb. 27, 1986, Ser. No. 833,549
Int. Cl.⁴ B25B *25/00*
U.S. Cl. 29—229 **4 Claims**



1. In combination with an openable spring clamp of circular configuration and having a radially outwardly extending latch at one end and a latch hook at the other end, said latch hook having a radially outwardly extending portion, a circumferentially extending portion and a radially inwardly reentrantly folded portion,

a tool for closing said spring clamp comprising:

a pair of handles,

a pin joining said handles for relative rotation,

a pair of jaws on said handles, respectively, one of said jaws being engageable with the latch on said clamp and the other of said jaws being engageable with the radially outwardly extending portion of the latch hook on said clamp,

a cam pivotally supported by the other of said jaws, and

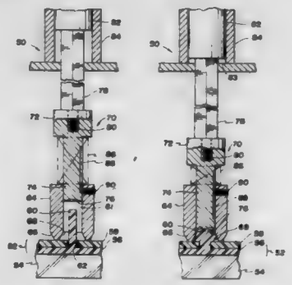
means on said one jaw for controlling rotation of said cam, said cam being engageable with the hook portion of said clamp to effect closure of said clamp.

4,633,559

APPARATUS FOR STAKING

Norman S. Loren, Warren, Mich., assignor to Michael Ladney, Grosse Pointe Shores, Mich.

Filed Mar. 18, 1985, Ser. No. 712,671
Int. Cl.⁴ B23P *11/00*; B21P *39/00*; B29C *65/00*
U.S. Cl. 29—243.5 **19 Claims**



1. A device for staking a formable plastic projection onto a work surface comprising:

clamp means, adapted to contact the work surface, for retaining the work in fixed position;

tool means, having travel between a retracted position and an extended position to define a staking stroke, for engaging said projection to form a staked head; and

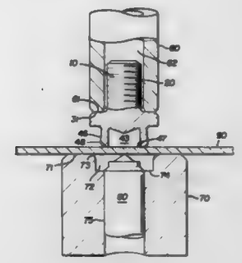
bias means, interposed between the tool means and the clamp means and responsive to movement of the tool means through the staking stroke, to thereby apply a progressive clamping force on the work surface of sufficient magnitude to retain the work in fixed position during formation of the staked head.

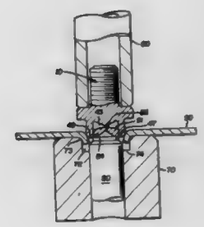
4,633,560

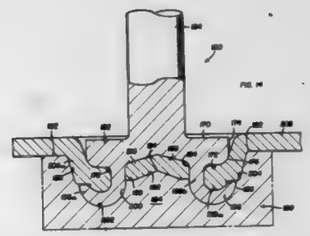
SELF-ATTACHING FASTENER, DIE SET

Rudolph R. M. Muller, Frankfurt, Fed. Rep. of Germany, assignor to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 563,833, Dec. 21, 1983, Pat. No. 4,555,838, which is a continuation-in-part of Ser. No. 485,009, Mar. 28, 1983, Pat. No. 4,459,073, and Ser. No. 504,074, Jun. 14, 1983, Pat. No. 4,543,701, each is a continuation of Ser. No. 229,274, abandoned, each is a division of Ser. No. 229,274, abandoned. This application Sep. 6, 1985, Ser. No. 773,387
Int. Cl.⁴ B23P *11/00*
U.S. Cl. 29—243.52 **13 Claims**







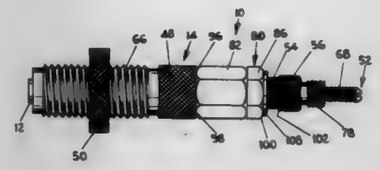
10. A die set assembly including a die member for securing a self-attaching fastener to a plastically deformable panel, said fastener having a body portion and a self-piercing and riveting annular wall projecting from said body portion including a piercing surface adjacent an inner surface of said annular wall, said die member comprising a body portion having an annular concave die cavity surrounding a central die portion projecting from said die cavity and a panel supporting shoulder located on at least two sides of said die set assembly including a die cavity, the free end of said central die portion including a central conical die surface and a relatively sharp piercing edge surrounding said conical die surface at the outer edge of said central die portion free end, said piercing die edge adapted to generally mate with said fastener piercing surface to pierce a slug from a panel supported on said die shoulder, and said shoulder blending into said annular concave die cavity in an inclined surface for receiving the panel as the panel is deformed into said die cavity during installation and a second member for moving said self attaching fastener relative to said die member to pierce a slug from a panel supported on said die shoulder, and to deform said fastener annular wall free end radially outwardly by contact with said annular die cavity to form a mechanical interlock with a pierced edge of said panel.

4,633,561

STUCK CASE REMOVER

Ramon Grabel, 6337 Egypt Valley Rd., Rockford, Mich. 49341

Filed Oct. 23, 1985, Ser. No. 790,421
Int. Cl.⁴ B23P *11/02*
U.S. Cl. 29—263 **7 Claims**



1. The combination of a sizing die and a device for dislodging a bullet case lodged within a sizing die;

said case having a shoulder and a neck, said shoulder and said neck defining an interior;

said sizing die having a body including a first axial end, a second axial end and a bore extending longitudinally through said body from said first axial end to said second axial end, a threaded sizing rod having an upper end and lower end and engaging said bore, a first nut threadably engaging said upper end, a lock nut threadably engaging said upper end, securely engaging said first nut and for preventing rotation of said sizing rod relative to said die body, and a sizer secured to said lower end of said sizing rod; and

said device adapted for dislodging said case when said sizer is lodged within said interior of said case and is prevented from passing through said neck due to interference with said shoulder and comprising a base adapted to engage said body and a force-transferring means removably engaging said base, engaging said first nut and responsive to applied rotational forces for exerting linear forces on said sizing rod along the longitudinal axis of said sizing rod so as to force said sizer through said shoulder and said neck.

4,633,562

ARROWHEAD EXTRACTOR

John R. Ulsh, Box 143, Summit Station, Pa. 17979

Filed Dec. 31, 1984, Ser. No. 688,064
Int. Cl.⁴ B23P *19/04*
U.S. Cl. 29—264 **3 Claims**

1. An arrowhead extractor for detachable arrowheads of the type having a threaded shank, comprising:

an externally threaded rod,

a threaded axial bore in one end of said rod adapted for threaded connection to the threaded shank of an embedded arrowhead,

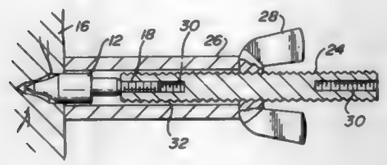
a hollow cylindrical sleeve having a diameter greater than the diameter of the arrowhead and adapted to slide over said rod and the arrowhead following threaded attachment of said rod to the shank of an embedded arrowhead, said sleeve being shorter in length than said rod,

a centering guide on said rod adjacent the end thereof con-

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taining the axial bore, said guide effecting a centering of said sleeve with respect to said rod, said guide comprising a washer disposed on said rod, and a pair of nuts on said rod flanking said washer to secure the washer in position on said rod,

a wing nut threadedly attachable to said rod,



and an apertured stop plate slideable on said rod, said stop plate being adapted to engage said sleeve and provide a stop for said wing nut,

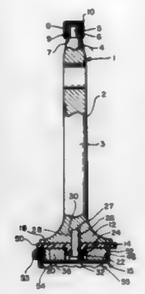
the rotation of said wing nut on said rod upon engagement with said sleeve effecting relative movement between said rod and said sleeve to extract the embedded arrowhead.

4,633,563

SLIVER RETRIEVER

Stanley Rykaczewski, 5936 W. Eastwood Ave., Chicago, Ill. 60630

Filed Oct. 31, 1985, Ser. No. 793,216
Int. Cl.[4] B25B *27/00*
U.S. Cl. 29—270 **14 Claims**



1. A tool for removing ferrous particles from a food product within an opened ferrous can having a body and a peripheral upper bead with a top edge and an inner side circumscribing a top end of a can and wherein the can is opened by shearing its top end adjacent to said inner side of the bead,

said tool comprising an elongated handle,

a magnetic assembly mounted on one end of the handle,

said assembly comprising an annular disk having an outer edge portion adapted to seat upon the top of the bead to control the depth of insertion of the tool into the can,

said assembly also comprising an annular element having a peripheral side portion offset radially inwardly of said outer edge portion of the disk and adapted to be engaged with said inner side of the bead and rolled thereagainst while the tool is bodily moved along the bead for rotating said magnetic assembly within and over the product in the vicinity of any particles for attracting them thereto,

and said assembly being fastened to said handle and including a magnet and a protective cover enclosing the magnet,

and said assembly being rotatable with respect to the handle,

and the cover being plastic and being secured to the disk,

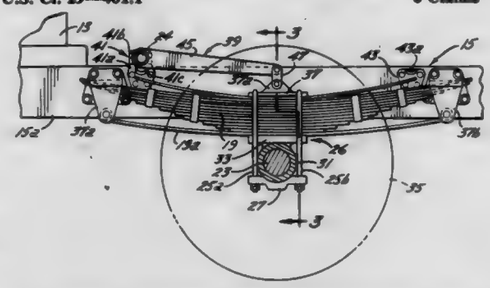
and means providing a muddler associated with said cover.

4,633,564

TORSION BAR STABILIZER FOR A VEHICLE AND METHOD FOR MOUNTING THE STABILIZER ON THE VEHICLE FRAME

Charles J. Sauber, 10 N. Sauber Rd., Virgil, Ill. 60182

Filed Mar. 29, 1984, Ser. No. 594,696
Int. Cl.[4] B21K *21/16*; B23P *17/04, 23/00*
U.S. Cl. 29—401.1 **6 Claims**



1. A method of mounting a stabilizing mechanism on a vehicle frame which is supported and biased on a suspension assembly at opposite sides of said frame, wherein said frame includes overload stops riveted to opposite sides of said frame and said suspension assembly includes bracket assemblies which secure the vehicle's suspension springs to a wheel axle, said method comprising the following steps:

removing an overload stop from each side of said vehicle frame;

mounting a modified overload stop on each side of said frame which serves as both an overload stop and a support for said stabilizing mechanism wherein said modified overload stop is mounted into the holes in the frame left from the removal of said overload stop;

removing from each side of said vehicle the top bracket from said bracket assembly;

inserting a modified top bracket into each bracket assembly wherein said top bracket assembly is modified to couple with said stabilizing mechanism; and

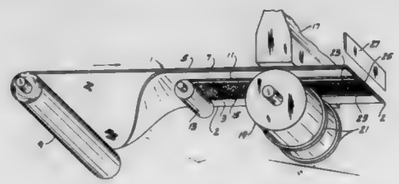
mounting on said modified overload stops a torsion bar whose opposite ends are coupled to the modified top bracket by way of linkages.

4,633,565

FASTENERS FOR APPAREL AND METHODS OF MANUFACTURING THEM

Irvin S. DeWoskin, St. Louis County, Mo., assignor to Barnhart Industries, Inc., Barnhart, Mo.

Division of Ser. No. 553,105, Nov. 18, 1983, Pat. No. 4,592,118.
This application Oct. 16, 1985, Ser. No. 787,994
Int. Cl.[4] B23P *17/00*; A44B *18/00*; A41H *37/00*
U.S. Cl. 29—417 **9 Claims**



1. The method of making fastener elements for use with apparel comprising

feeding forward a continuous base strip of material which is heat-sealable at least on one surface thereof,

feeding forward a continuous fastener tape constituting one of a hook tape or a plush tape adapted to be releasably fastened together by pressing them together, said fastener tape being heat sealable to the base strip,

combining the fastener tape with the base strip as they are fed forward with the fastener tape extending longitudinally of the base strip on said surface of the latter,

heat-sealing the fastener tape to the base strip on relatively narrow seals extending longitudinally of the fastener tape spaced transversely of the fastener strip, and

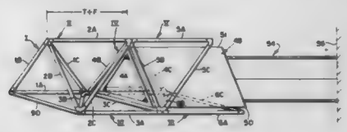
segmenting the combined base strip and fastener tape on transverse lines at intervals spaced longitudinally thereof to form individual fastener elements each comprising a band of the base material having a segment of fastener tape material heat-sealed on one surface of the band by relatively narrow seals extending across the element from one side edge thereof to the other.

4,633,566

APPARATUS AND METHOD FOR CONSTRUCTING AND DISASSEMBLING A TRUSS STRUCTURE

Anthony P. Coppa, Merion, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Apr. 4, 1985, Ser. No. 719,866
Int. Cl.[4] B23P *11/00, 19/04*; B64G *1/00, 1/10*
U.S. Cl. 29—429 **24 Claims**



1. Apparatus for assembling an elongate prism-form truss structure from a plurality of planar, congruent, triangular frame elements, and for disassembling said structure, said apparatus comprising:

an elongate prism-form construction fixture defined by first, second and third longitudinal edges parallel to a central longitudinal axis and having a right cross section in the form of an equilateral triangle, said longitudinal fixture edges defining planes therebetween;

means on said fixture for holding a plurality of frame elements deposited thereon;

said structure to be assembled or disassembled conforming substantially to the external configuration of said fixture and including three longitudinal edges parallel to said longitudinal axis, said structure and said fixture being coaxially disposed and being capable of relative axial movement;

each of said frame elements having A-, B- and C-sides located opposite A-, B- and C-vertices, respectively, wherein each of said sides comprises a substantially linear strut, said A- and B-sides of each of said elements being substantially equal in length and said C-side being substantially $2/\sqrt{3}$ times the length of one of the shorter sides;

said apparatus further comprising:

first, second and third frame feed units equidistantly spaced radially from said axis at locations 120° apart around said axis, said frame feed units being axially spaced from one another by a distance substantially equal to one third of said A-side; and

said frame feed units including means for feeding said frame elements to predetermined locations in said fixture planes.

8. A method for constructing an elongate prism-form truss structure from a plurality of planar, congruent, triangular frame elements, said structure being defined by first, second and third longitudinal edges parallel to a central longitudinal axis and having a right cross section in the form of an equilateral triangle, each of said frame elements having A-, B- and C-sides located opposite A-, B- and C-vertices, respectively, said A- and B-sides of each of said elements being substantially equal in length and said C-side being substantially $2/\sqrt{3}$ times the length of one of the shorter sides, at least some of said elements being fed from first, second and third feed points radially spaced from said axis substantially 120° apart and axially spaced from one another by substantially one third the length of said A-side;

said method comprising the steps of:

(1) assembling first, second and third frame elements around said axis by attaching the C-vertex of said second element to the A-vertex of said first element and the C-vertex of said third element to the A-vertex of said second element;

(2) feeding a fourth frame element from said first feed point toward said axis;

(3) fastening the C-vertex of said fourth element to the A-vertex of said third element and to the B-vertex of said first element;

(4) feeding subsequent frame elements toward said axis in sequence from successive feed points; and

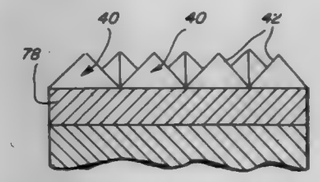
(5) repeating step (3) for each of said subsequent elements by fastening the C-vertex of the Nth element being fed to the A-vertex of the N-1 element and to the B-vertex of the N-3 element until the desired number of said frame elements have been joined.

4,633,567

METHOD AND APPARATUS FOR MAKING A TOOL

Anthony J. Montalbano, Lake Barrington Shores, Ill., assignor to Amerace Corporation, Hackettstown, N.J.

Division of Ser. No. 455,387, Jan. 3, 1983, Pat. No. 4,460,449.
This application May 2, 1984, Ser. No. 606,361
Int. Cl.[4] B23P *9/00*; C25D *1/00*
U.S. Cl. 29—445 **10 Claims**



1. The method of making a bi-metallic pin for use in making electroforms or molds for producing optical quality part, comprising the steps of: forming a metallic pin blank of high strength characteristics having a first end and a second end; coupling a slug of a second metal capable of being more easily machined than said blank to one of said ends; and forming a repeating optical pattern on the exposed end of said metal slug, said optical pattern comprising an array of between about 600 and, 400 cube-corner elements scribed thereon.

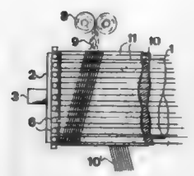
2. A method of making a tool for the production of an electroform for producing optical quality parts, comprising the steps of: forming a plurality of circular metallic pin blanks of high strength characteristics having first and second ends; coupling a slug of a second metal capable of being more easily machined than said blank to one of said ends of each of said blanks; forming the composite pin blanks and slugs to form elongated bi-metallic pins each having a regular polygonal cross-section whereby such bi-metallic pins can be juxtaposed in a variety of patterns without gaps therebetween; placing said plurality of bi-metallic pins in a fixture without gaps between adjacent pins or between said pins and said fixture; and forming at least one optical quality surface on said second slug end of each of said bi-metallic pins.

4,633,568

METHOD OF MANUFACTURING REINFORCED CONCRETE PIPE HAVING AN EVENLY DISTRIBUTED STEEL WIRE REINFORCEMENT

Sergio Marchesi, and Gino Fachin, both of Rome, Italy, assignors to Vianini Industria S.p.A., Rome, Italy

Filed Jul. 15, 1985, Ser. No. 755,376
Claims priority, application Italy, Nov. 27, 1984, 49211 A/84
Int. Cl.[4] B21D *39/00*
U.S. Cl. 29—452 3 Claims



1. A method of manufacturing a reinforced concrete pipe having an evenly distributed steel wire reinforcement of continuous, thin circumferential wires and thin longitudinal wires, comprising

projecting a high speed jet of concentrated concrete while simultaneously winding a first plurality of continuous and thin circumferential wires onto a mandrel rotating around its axis, the mandrel having two heads provided with anchoring means at its ends,

winding the circumferential wires in a helix having an inclination from about 2 to about 10 degrees with respect to the axis of the mandrel until the pipe is completely wound,

stopping rotation of the mandrel,

anchoring a second plurality of wires to a first head of the mandrel on the anchoring means,

stretching the second plurality of wires in a first direction longitudinal to the mandrel, towards the second head of the mandrel, beyond the anchoring means of the mandrel, whereby the wires are applied as a longitudinal band on the pipe being formed,

rotating the mandrel through an angle corresponding to the arc of circle of the mandrel covered by the band of longitudinal wires,

maintaining a hold on the wires to bend the wires around the second anchoring means,

stretching the second plurality of wires in the direction opposed to the first longitudinal direction of the mandrel until the second wires reach beyond the anchoring means of the first head whereby the second wires are laid down as a second longitudinal band upon the pipe being formed,

rotating the mandrel through an angle corresponding to the arc of the circle of the mandrel covered by the band of longitudinal wires,

repeating the stretching of longitudinal wires and rotating the mandrel to lay down at least one layer of longitudinal wires on the pipe,

anchoring and severing the longitudinal wires in register with the last anchoring means,

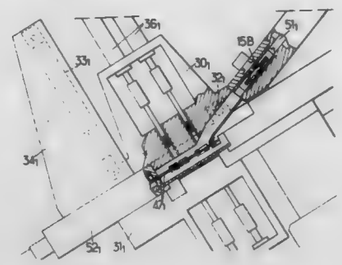
resuming simultaneous rotation of the mandrel, winding of circumferential wires, and projecting of concrete, whereby the layer of longitudinal wires is formed between two layers of wound circumferential wires.

4,633,569

PROCESS AND DEVICE FOR POSITIONING HAIR-PIN SPRINGS ON PLATE, PARTICULARLY FOR FUEL ASSEMBLY GRIDS

Bernard Véré, Eybens; Paul Mathevon, Bollene, and Michel Decarsin, Villeurbanne, all of France, assignors to Cogema et Framatome, Velizy Villacoublay, France

Filed Oct. 24, 1983, Ser. No. 545,012
Claims priority, application France, Oct. 22, 1982, 82 17717
Int. Cl.[4] B23Q *7/10*
U.S. Cl. 29—514 9 Claims



1. A device for inserting hair-pin springs each having two legs over the edge of a plate positioned in a plane and formed with windows distributed along a direction parallel to said edge, each into the position where said legs straddle said plate and confront each other through a respective one of said windows, said device comprising

(a) transport means for receiving one plate at a time and moving it step by step along said direction parallel to said edge thereof;

(b) corridor means for guiding each of said springs in turn toward an insertion position of said spring into said plate, directed substantially perpendicularly to said edge;

(c) means for moving one spring at a time along said corridor means towards said insertion position, cooperating with said corridor means for holding said spring in an angular position close to said plane of said plate during movement thereof transversely to said edge;

(d) masking means movable parallel to the location of said plate in said transport means from the edge thereof opposite to the edge over which insertion takes place between a position where said masking means covers on at least one side of said plate, at least one of said windows, in order to avoid accidental engagement of one leg of said spring in that window.

4,633,570

APPARATUS FOR ASSEMBLING AN ELECTRICAL CONNECTOR TO A CABLE

Richard A. Burgit, Middletown; Newton G. Davis, Harrisburg; Josita M. Goyert, Elizabethtown; Keith Johnson, Jr., Manheim; Robert A. Long, and Joseph F. Stachura, both of Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 24, 1985, Ser. No. 748,097
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—564.4 10 Claims

1. Apparatus for assembling an electrical connector to an end portion of multi-conductor electrical cable having a cable sheath, the apparatus comprising:

a base;

a table on the base;

a cable clamp assembly on the base beside the table;

a cable sheath stripper assembly on the table;

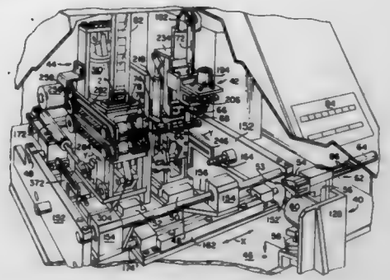
a connector applicator assembly on the table beside the stripper assembly, for applying a connector to the end portion of the cable;

means for feeding connectors to said applicator assembly;

means for translating the table along the base in two opposite directions along a first path extending past the cable clamp assembly;

means for translating said stripper and applicator assemblies in two opposite directions and independently of one another, along respective second paths on said table, perpendicular to said first path;

drive means for said assemblies, said feed means and said translating means; and



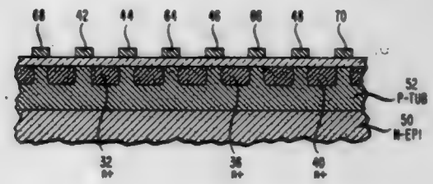
control means for so cycling said drive means that the end portion of a cable held by said clamp is stripped of the sheath by the stripper assembly, a connector fed to said applicator assembly by said feed means is moved onto the stripped end portion of the cable and said applicator assembly is actuated to apply that connector to said stripped end portion.

4,633,571

METHOD OF MANUFACTURING A CMOS CELL ARRAY WITH TRANSISTOR ISOLATION

Kevin D. Kolwicz, Allentown, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 600,969, Apr. 16, 1984, Pat. No. 4,570,176. This application Oct. 2, 1985, Ser. No. 782,911
Int. Cl.[4] H01L *29/78*
U.S. Cl. 29—571 5 Claims



1. A method for producing a CMOS custom logic circuit including a plurality of cells separated from one another by a cell boundary, each cell including at least one complementary logic transistor pair, the method including the steps of

(a) depositing a first, continuous thin oxide strip onto a substrate material;

(b) depositing a second, continuous thin oxide strip onto said substrate material parallel to said first strip and separated therefrom by a predetermined distance;

(c) implanting ions of a first conductivity type in said first, continuous thin oxide strip;

(d) implanting ions of a second conductivity type in said second, continuous thin oxide strip;

(e) growing a field oxide region on said substrate between said first and second continuous strips;

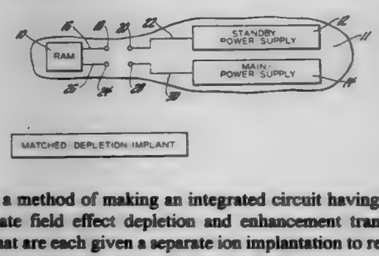
(f) depositing a polysilicon patterned mask layer on said first and second continuous strips to form, in association with said first and second continuous strips, a plurality of transistors wherein selected sets from said plurality of transistors form logic transistors and are included in said plurality of cells, and selected others of said plurality of transistors form a plurality of isolation transistors and are permanently connected to either one of a positive voltage supply and a negative voltage supply for isolating said plurality of cells from one another and forming the cell boundaries.

4,633,572

PROGRAMMING POWER PATHS IN AN IC BY COMBINED DEPLETION AND ENHANCEMENT IMPLANTS

Randy A. Rusch, Kokomo; Douglas A. Kittle, Sharpsville; Bernhard G. Ulfers, Logansport, and Stephen L. Inman, Kokomo, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 468,352, Feb. 22, 1983. This application Oct. 23, 1985, Ser. No. 790,382
Int. Cl.[4] H01L *21/263, 21/80*
U.S. Cl. 29—576 B 4 Claims



1. In a method of making an integrated circuit having insulated gate field effect depletion and enhancement transistor types that are each given a separate ion implantation to respectively lower and raise their threshold voltages, the improvement of combining and matching the separate depletion transistor and enhancement transistor ion implantations to first parallel at least two alternative supply power paths in the circuit by means of the depletion implantation, and then block at least one of the paths by means of the enhancement implantation, whereby path selection for supply power can be reserved until late in the process of making the integrated circuit.

4,633,573

MICROCIRCUIT PACKAGE AND SEALING METHOD

Jeremy D. Scherer, South Dartmouth, Mass., assignor to Aegis, Inc., New Bedford, Mass.

Division of Ser. No. 433,792, Oct. 12, 1982. This application May 23, 1984, Ser. No. 613,367
Int. Cl.[4] H05K *5/06*; H01L *23/30*
U.S. Cl. 29—589 20 Claims

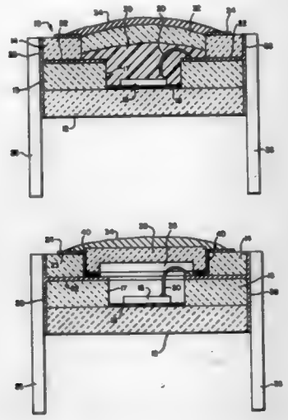
1. The method of hermetically sealing a microcircuit mounted on a package having a continuous perimeter sealing surface of random shape independent of the hermetic seal to be applied comprising the steps of:

isolating the microcircuit and insulating the microcircuit to protect it from contamination and heat by forming a thermal barrier over the microcircuit sufficient to prevent the microcircuit from being damaged by the heat of applying a non-organic coating over the thermal barrier; and

hermetically sealing the microcircuit by applying a non-organic coating over the thermal barrier whereby the

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non-organic coating overlaps the continuous perimeter sealing surface so that the non-organic coating fuses to the



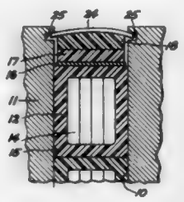
sealing surface in order to hermetically seal the microcircuit package.

4,633,574

METHOD FOR SECURING CONDUCTOR BAR IN MACHINE SLOT WHILE CLOSING SLOT

Duncan T. Bath, and James H. Ferguson, both of Peterborough, Canada, assignors to Canadian General Electric Co., Ltd., Toronto, Canada

Division of Ser. No. 580,315, Feb. 15, 1984, Pat. No. 4,547,690. This application Mar. 29, 1985, Ser. No. 717,347
Claims priority, application Canada, Dec. 21, 1983, 443885
Int. Cl.⁴ H02K *15/10*
U.S. Cl. 29—596 **2 Claims**



1. A method for securing a conductor bar in a slot of a dynamoelectric machine and closing the opening of said slot, said slot having opposing notches adjacent said opening, comprising:

inserting a wedge in said slot, said wedge having on one surface thereof an axially extending central portion of greater thickness than the side edges of said wedge;

inserting a flat spring member into the slot opening, the side edges of said spring member terminating in said notches, said flat spring member engaging said central portion of greater thickness; and

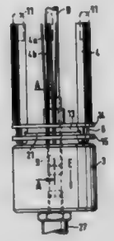
advancing said wedge in said slot to deform the central portion of said spring member outwardly, thereby providing an inwardly directed spring force to retain said conductor bar and closing said slot opening while maintaining the outwardly facing surface of said spring member exposed, thereby not impeding heat dissipation from said spring member.

4,633,575

PROCESS FOR THE WINDING OF STATORS OF ELECTRIC MOTORS

Franz Veser, Kanalstrasse 16, D-7980 Ravensburg, Fed. Rep. of Germany

Filed Mar. 18, 1985, Ser. No. 712,775
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409584
Int. Cl.⁴ H02K *15/06*
U.S. Cl. 29—596 **3 Claims**



1. Working process for winding stator coils on a stator of an electric motor, the stator having a top edge and a center axis and being formed with grooves that extend parallel to the center axis and that are provided with groove insulations, and the process being carried out with the aid of draw-in needles each having two spreadable elastic tongues and each tongue having a free end, a draw-in tool for supporting the needles, a vertically adjustable work table, a draw-in mechanism, a central vertical draw in spindle coupled to the draw-in mechanism and a fixing star and a guide plate connectable to the spindle, the coils being laid out in coil groups according to the number of stator poles and being interconnected according to polarity before being drawn into the stator grooves, said process comprising the following successive steps:

(a) centering the stator in a vertical axial position in relation to the central vertical draw-in spindle and fixing the stator at a selected working height on the vertically adjustable work table;

(b) inserting all the draw-in needles into the draw-in tool in a ring in the correct pole order, with the free ends of the tongues directed upwardly and with each needle having a tongue disposed adjacent a tongue of one other needle, then introducing the draw-in tool centrally into the stator from above with the tongues of each needle being laid against one another and spread apart at the top and being pushed axially into the stator grooves up to a predetermined groove length, and positively connecting the draw-in tool to the draw-in spindle;

(c) placing an elastic cap as an aid for correct coil insertion over every two adjacent needle tongues and threading coils in between the tongues of each needle;

(d) placing the fixing star and the guide plate over the coils and positively connecting the fixing star and the guide plate to the draw-in spindle; and

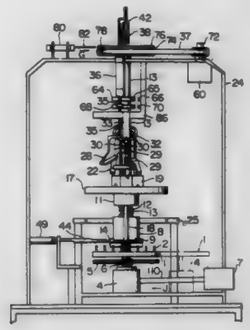
(e) carrying out a first draw-in procedure including drawing the draw-in tool with the coils downwardly mechanically by the draw-in mechanism until the free ends of the draw-in needle tongues are flush with the top edge of the stator.

4,633,576

METHOD OF PRODUCING ARMATURE WINDING AND APPARATUS THEREFOR

Tadashi Kuwana, Sukagawa, Japan, assignor to Yamamoto Electric Industrial Co., Ltd., Fukushima, Japan

Filed Jun. 22, 1984, Ser. No. 623,750
Claims priority, application Japan, Jun. 22, 1983, 58-112501
Int. Cl.⁴ H01R *43/06*
U.S. Cl. 29—597 **5 Claims**



1. An apparatus for producing an armature winding of flat type motor comprising:

a first motor;

a flyer rotated by said first motor for feeding a wire for the armature winding out of a nozzle thereof;

a bobbin member for winding the wire fed out from said flyer around the outer periphery of said bobbin member when said flyer is rotated around it to thereby form an unit coil;

first moving means for moving said nozzle of said flyer to opposite first and second directions in parallel with a plane defined by the circle inscribed by the rotation of said nozzle;

second moving means for moving said nozzle to opposite third and fourth directions perpendicular to said plane;

a heater plate for heating the unit coil wound around said bobbin member;

a turn table means for supporting a commutator on the center thereof and plural unit coils around said commutator;

a second motor for rotating said turn table;

pushing means for pushing the unit coil wound around said bobbin member to place on said turn table;

guide means for catching a portion of the wire connected between said nozzle and the unit coil placed on said turn table and guiding the caught portion of the wire near a corresponding one of a plurality of hooks of said commutator mounted on said turn table;

revolution number detecting means for detecting the revolution number of said flyer; and

a control circuit for controlling said first and second motor, first and second moving means, heater plate, pushing means and guide means in response to an output of said revolution number detecting means;

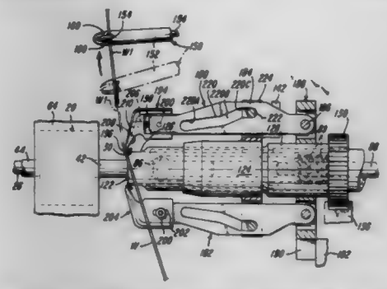
said control circuit said first motor so as to rotate said flyer for a predetermined number of turns around said bobbin member so as to form a unit coil having the predetermined number of turns, said control circuit also provides an energizing signal to actuate said heater plate to engage said bobbin so as to heat said unit coil, actuates said pushing means so as to place said unit coil on said turn table, and actuates said first and second moving means and said guide means thereby hooking the wire of said unit coil to the corresponding hook.

4,633,577

ARMATURE WINDING METHOD AND APPARATUS

Alvin C. Banner, Kettering, Ohio, assignor to The Globe Tool & Engineering Company, Dayton, Ohio

Filed Oct. 19, 1984, Ser. No. 662,710
Int. Cl.⁴ H01R *43/06*
U.S. Cl. 29—597 **12 Claims**



1. In an armature winding machine for winding an armature of the type having an armature shaft, a core having coil-receiving slots mounted on said shaft, and a commutator mounted on said shaft, said commutator having coil lead-receiving tangs,

said armature winding machine having a winding station,

means for holding an armature in said winding station,

at least one wire guiding flier for winding coils of wire in said coil-receiving slots,

wire clamp means actuated to grip a stretch of wire extending from said flier at the end of the winding of one armature in said winding station until the commencement of the winding of the next armature in said winding station, and

drive means for moving said wire clamp means,

the improvement comprising:

wire trimmer means having a sharp edge,

means supporting said wire trimmer means for movement between a first position wherein said sharp edge is closely adjacent a commutator tang located at a predetermined rotary position in said winding station and a stretch of wire extending from said tang to said wire clamp means extends over said sharp edge and a second position wherein said sharp edge is substantially spaced from said tang, and

said drive means moves said wire clamp means in a direction generally perpendicular to said sharp edge to create a high concentration of stresses in the wire extending over said sharp edge thereby to sever said stretch of wire at said edge.

4,633,578

MINIATURE THERMAL FLUID FLOW SENSORS AND BATCH METHODS OF MAKING SAME

Harry E. Aine, 30600 Page Mill Rd., and Barry Block, 30610 Page Mill Rd., both of Los Altos, Calif. 94022

Filed Dec. 1, 1983, Ser. No. 556,800
Int. Cl.⁴ H01C *17/06;* **G01F** *1/68*
U.S. Cl. 29—612 **8 Claims**

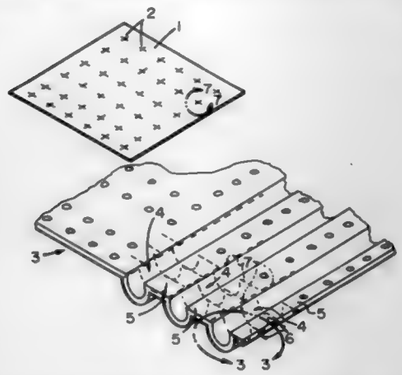
4. In a method for batch manufacture of thermal sensors of the type having thermal sensing devices carried from a thin carrier for immersion in a fluid stream so that the carrier for each sensor has an upstream and downstream side, the steps of:

bonding a sheet of carrier material to a major face of a substrate wafer;

removing portions of the substrate material underlying portions of said carrier sheet to produce a batch of devices, each of which includes a thin sheet of carrier material supported from the lip of a frame portion of the substrate wafer surrounding respective ones of said supported carrier portions;

forming thermal sensing devices having a temperature de-

pendent electrical parameter on each of said thin framed carrier sheet portions;
dicing said substrate wafer to separate said batch of thermal sensors into individual thermal sensing chips; and
notching said frame portions of said substrate wafer and breaking off and removing portions of said frame on the



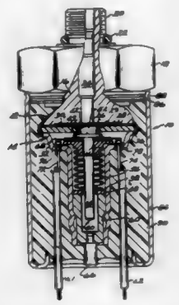
upstream and downstream side of said thin carrier portion to expose said thin carrier portions of said devices to substantially undisturbed flow of fluid over said carrier portions in a direction parallel to the plane of said carrier sheet and undisturbed by said removed frame portions.

4,633,579

METHOD FOR MAKING A PRESSURE RESPONSIVE SWITCH

Werner Strasser, Lexington, Ky., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 672,644, Nov. 19, 1984. This application Mar. 3, 1986, Ser. No. 835,402
Int. Cl.⁴ H01H *65/00*
U.S. Cl. 29—622 **1 Claim**



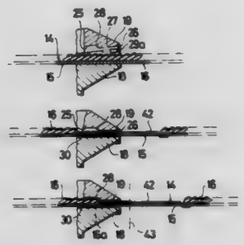
1. A method for making a pressure responsive sensor comprising the steps of taking a metallic fitting having a centrally located bore extending therethrough and having an end defined by a periphery and with a recessed wall portion in communication with the bore, placing a metallic membrane having a periphery generally matching that of the end of the fitting on said end to cover the recessed wall portion, placing a metallic support having a periphery generally matching that of the end of the fitting and of the membrane over the membrane, the support having a bore in alignment with the bore in the fitting, subjecting the membrane to a sufficient force exerted through the bore in the support to cause the membrane to contact the recessed wall portion, and welding the fitting, membrane and support together along their respective peripheries.

4,633,580

DEVICE FOR POSITIONING SLIDE FASTENER STRINGERS IN FASTENER FINISHING APPARATUS

Keiichi Yoshieda, Kurobe; Toshiaki Sodeno, Toyama, and Syuichi Honmoto, Uozu, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 8, 1985, Ser. No. 763,625
Claims priority, application Japan, Aug. 14, 1984, 59-124144[U]
Int. Cl.⁴ A41H *37/06*
U.S. Cl. 29—767 **8 Claims**



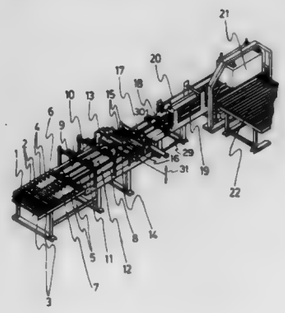
1. A device for positioning a pair of longitudinally advancing elongate slide fastener stringers each including a stringer tape and a row of coupling elements supported on and along one longitudinal edge of the stringer tape at longitudinal intervals, said device comprising:
(a) a pair of stoppers for stopping the slide fastener stringers, respectively, each of said stoppers including a pair of positioning jaws movable relatively to one another in a direction substantially perpendicular to the plane of each slide fastener stringer to define therebetween a guide channel for the passage of the slide fastener stringer, at least one of said positioning jaws including a step for engaging the leading coupling element of each coupling element row to stop advancing movment of the slide fastener stringer; and
(b) means operatively connected with said positioning jaws for driving them to move relatively to one another.

4,633,581

INSTALLATION FOR PALLETISING FLAT PIECES

Eliseo H. Villanueva, C/Cid, s/n.-Polígono Industrial Torrubero, Museros (Valencia), Spain

Filed Oct. 26, 1984, Ser. No. 665,013
Claims priority, application Spain, Apr. 27, 1984, 279.083
Int. Cl.⁴ B23P *19/00*; B65G *57/081, 47/24*
U.S. Cl. 29—822 **2 Claims**



1. An installation for palletizing flat pieces, comprising:
a first roller table for conveying flat pieces in a horizontal position and in a feed direction;

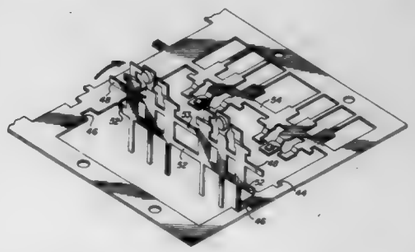
passage forming means over said first roller table for defining two parallel passages extending in the feed direction for guiding flat pieces in a horizontal position on the first roller table and in two parallel rows;
said first roller table having a central opening in each of said two passages whereat pieces in a horizontal position are supported only at their edges parallel to said feed direction so that defectives pieces fall through said central opening;
turning means positioned over each parallel passage downstream of said central opening in said feed direction for turning alternate flat pieces in each row of flat pieces into an upside down horizontal position;
grip means over each of said parallel passages downstream of said turning means for gripping and raising alternate ones of the flat pieces in each row and for placing each alternate piece on a following piece moving in said feed direction to form facing pairs of pieces lying in a horizontal position on said passages;
lateral conveyor means positioned over one of said passages downstream of said grip means for engaging each facing pair of pieces on said one passage, for lifting each pair of facing pieces and for transferring each pair of facing pieces over the other of said passages and further for depositing each pair of pieces from said one passage onto a pair of pieces on said other passage;
further conveyor means extending in said feed direction from said other passage and positioned downstream of said lateral conveyor means for conveying superimposed facing pairs of pieces from said other pasage further along said feed direction;
vertical positioning means downstream of said further conveyor means for moving each of said superiposed facing pairs of pieces from a horizontal position to a vertical position;
upper and lower conveyor belts positioned downstream of said vertical positioning means for engaging upper and lower edges of said vertically positioned superimposed facing pairs of pieces and for conveying them further along said feed direction; and
strapping means downstream of said upper and lower conveyor belts for placing the strap around each superimposed facing pairs of pieces.

4,633,582

METHOD FOR ASSEMBLING AN OPTOISOLATOR AND LEADFRAME THEREFOR

Steve Ching, San Jose; Frank Babbitt, Jr., Palo Alto; Adnan Merchant, San Jose, all of Calif., and Putt C. Yong, Kajang, Malaysia, assignors to General Instrument Corporation, New York, N.Y.

Filed Aug. 14, 1985, Ser. No. 765,582
Int. Cl.⁴ H01R *43/00*; H01L *23/50*
U.S. Cl. 29—827 **17 Claims**



1. A leadframe for use in manufacturing an optoisolator comprising:
first and second spaced parallel rails;
first and second tie bars extending perpendicularly from and connecting said rails to form a planar open frame;
a first lead assembly having a pad extending therefrom;
first means for mounting said first lead assembly to said open frame to be coplanar therewith;
a second lead assembly having a pad extending therefrom;
second means for rotatably mounting said second lead assembly to said open frame to enable said second lead assembly to be rotated 180° from an initial position coplanar with said open frame to a second position coplanar with said open frame, the pad of said second lead assembly in said second position being in overlying alignment with the pad of said first lead assembly; and
means operatively associated with said second lead assembly for limiting the travel of said second lead assembly as it is rotated to said second position to ensure that a coplanar relationship between the first and second lead assemblies is achieved.

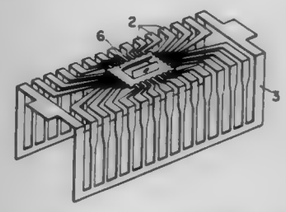
7. A method for assembling an optoisolator comprising the steps of:
providing a leadframe having first and second lead assemblies mounted via mounting bars to a planar frame;
attaching a first die to a die pad extending from the first lead assembly;
attaching a second die to a die pad extending from the second lead assembly;
rotating said second lead assembly about the axis of its associated mounting bar to place said first and second dies into overlying alignment with each other, thereby twisting a spiral shape along the axis of said bar; and
stopping said rotation when said first lead assembly, second lead assembly, and frame are coplanar.

4,633,583

METHOD OF MAKING A LEAD FRAME FOR INTEGRATED CIRCUITS

Yoshihisa Kato, Kokubunji, Japan, assignor to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Division of Ser. No. 425,102, Sep. 27, 1982, Pat. No. 4,523,218. This application Oct. 26, 1984, Ser. No. 664,968
Claims priority, application Japan, Sep. 29, 1981, 56-154653
Int. Cl.⁴ H01R *43/00*
U.S. Cl. 29—827 **1 Claim**



1. A method of fabricating a lead frame for use in an integrated circuit package, comprising the steps of:
preparing an integral metal plate structure which includes a support frame, a central section, a multiplicity of spaced lead elements extending between said central section and said frame, the outer ends of said lead elements being integrally connected with said frame and the inner ends of said lead elements being integrally connected with said central section along its periphery, said central section having slots spaced inwardly of said periphery and cutouts defined between said slots;
severing a portion of said central section from said lead elements to provide a metal piece whose periphery includes alternate recesses and projections, said recesses being formed at locations where the inner ends of said lead elements were previously connected to said central section, said slots and said cutouts jointly dividing said metal

piece into a plurality of comb-shaped members interconnected by a plurality of bendable portions defined therebetween by said slots and said cutouts, said comb-shaped members being independently bendable;

moving said metal piece in a first direction with respect to said lead frame so as to separate the recesses in the periphery of said metal piece from the extended tips of said lead elements; and

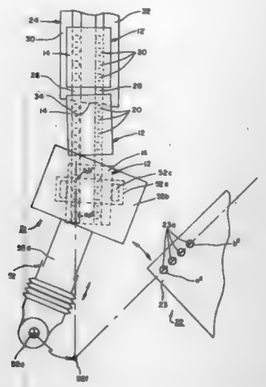
moving said metal piece in a second direction opposite said first direction so as to reposition the recesses in the periphery of said metal piece around the respective extended tips of the lead elements.

4,633,584

ACCURATE POSITIONING OF SOLID COMPONENTS FOR A ROBOTIC PICKUP

Steven F. Wright, Glen Ellyn; Eric J. Stenstrom, Park Ridge, and Joseph Wolyn, Gurnee, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Feb. 20, 1985, Ser. No. 703,356
Int. Cl.⁴ H05K *3/30*
U.S. Cl. 29—834 **8 Claims**



1. A method of accurately positioning a solid body from a loading station to a remote mounting station on a mounting surface by means of a robotic arm,

said body having an external surface defined between a pair of opposed external edges, and at least one linear array of projections having a predetermined configuration depending from said external surface located between said external edges,

said mounting surface including a linear array of projection-receiving apertures having a configuration corresponding to that of said linear array of said projections,

said robotic arm having a head which engages said external edges of said solid body, a pick up and thereby withdraw said solid body from said loading station, moving said solid body to said remote mounting station so as to overlie said array of projection-receiving apertures, and lowering said solid body so as to insert said solid projections in said apertures,

wherein the improvement comprises:

positioning said linear array of projections along a reference line a-b having a configuration corresponding to that of said linear array of projections, where a is a position of a lead projection;

positioning the head to overlie said connector at a given orientation with respect to said reference line;

gripping said edges of said solid body independent of the orientation of said head;

raising said arm and withdrawing said solid body from said loading station, and moving said solid body to said mounting station;

orienting said head such that said projections overlie and are aligned with said linear array of mounting holes; and

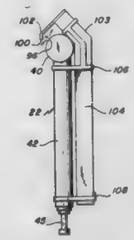
lowering said head and inserting said solid projections in said apertures.

4,633,585

CONTINUOUS WATER-SUPPLIED SHAVING APPARATUS

James Whitaker, Rte. 1, Box 234, and James Fultz, Rte. 4, Box 252A 9F7, both of Elkhorn, Wis. 53121

Filed Feb. 15, 1985, Ser. No. 702,081
Int. Cl.⁴ B26B *21/44*
U.S. Cl. 30—41 **16 Claims**



1. A shaving apparatus, including:

a shaver which comprises:

a head comprising means for attaching a shaving edge thereto, and at least one orifice for dispersing water from said head in the proximity of said shaving edge, and

a handle comprising a water conduit which extends along the longitudinal axis of said handle, said handle being connected at one end thereof to said head;

valve means, adapted for connection to a conventional water-supply, for regulating the flow of water through the shaving apparatus, wherein said valve means provides a continuous flow of water;

a flexible tubing connecting said shaver handle to said valve means; and

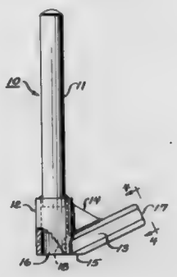
means for providing a swivel connection of said flexible tubing to said shaver handle.

4,633,586

SAFETY CHISEL

James M. Yawn, Bonaire; Huby M. Whitaker, Dry Branch, and Frank Bridgers, Macon, all of Ga., assignors to J. M. Huber Corporation, Rumson, N.J.

Filed Mar. 25, 1985, Ser. No. 715,857
Int. Cl.⁴ B25D *3/00*
U.S. Cl. 30—168 **4 Claims**



1. A safety chisel for use in shearing a bolt upon which a nut has become permanently affixed, comprising

a handle for positioning the safety chisel upon a nut and bolt assembly to be severed and for holding the safety chisel in position during severing operation,

said handle including a retaining container extending coaxially from an end of said handle and having a closed end fixed to said end of said handle,

said retaining container having an open free end adapted to receive therethrough and surround therein the portion of the nut and bolt assembly which is inserted therethrough to be severed free during the severing operation,

said retaining container in cooperation with a surface upon which the nut and bolt assembly is mounted forming a closed housing,

a force transmitting portion secured to said retaining container and having a first end thereof forming a striking face for receiving an impact force to be transmitted to the nut and bolt assembly for effecting the severing operation, and

said force transmitting portion having a second impacting end which extends within the inner peripheral surface of said retaining container and is adpated to be positioned in contact with the nut and bolt assembly when the nut and bolt assembly has been received within said retaining container for transmitting an impact force thereagainst upon said striking face receiving an impact force to sever the nut and bolt assembly,

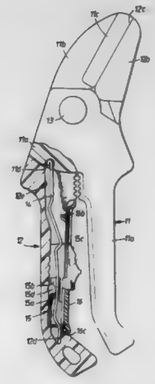
said second impacting end comprising a flat planar impacting face extending vertically upward relative to the surface upon which the nut and bolt assembly is mounted and positioned in contact with said nut and bolt assembly when the nut and bolt assembly is received within said retaining container.

4,633,587

SPRING-BIASED GARDEN PRUNERS

Christopher R. B. Harrison, Mid-Glamorgan, Wales, assignor to Wilkinson Sword Limited of Sword House, High Wycombe, England

Filed Jun. 4, 1985, Ser. No. 741,326
Claims priority, application United Kingdom, Jun. 16, 1984, 8415418
Int. Cl.⁴ B26B *13/00*
U.S. Cl. 30—261 **5 Claims**



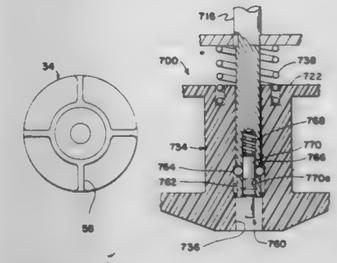
1. A garden prune of the type comprising a pair of members, each comprising a handle and a work-engaging portion, pivot means pivotally interconnecting the members, a spring biasing the members apart, and means mounted on one of the handles and moveable to vary the force applied by the spring, wherein the spring is a leaf spring secured to said one of the handles and the means for varying the force of the spring is moveable to vary the effective length of the spring, and wherein the means for varying the effective length of the spring is a slider moveable along the spring.

4,633,588

BUMP-FEED FILAMENT VEGETATION TRIMMER MEANS AND METHOD

Charles B. Pittinger, Jr., 320 Cockeys Mill Rd., Reisterstown, Md. 21136

Division of Ser. No. 713,147, Aug. 10, 1976, abandoned. This application Jul. 10, 1985, Ser. No. 753,408
Int. Cl.⁴ A01D *50/00*; A01G *3/00*
U.S. Cl. 30—347 **3 Claims**



1. In a filament trimmer mechanism for cutting materials including ground-growing vegetation by swinging a filament free-end as a cutting length, means for storing filament for resupplying said cutting length, and means for deploying in succession lengths from the storing means for said resupplying, the improvement comprising: the means for deploying including means responsive to impulse actuation for feeding filament, means for securing filament following said feeding, the means responsive including first means, second means, one of said first and second means including said means for storing, the other of said first and second means including means for guiding, means for positioning the first means and the second means movably relative to each other for responding to said impulse actuation, the means for positioning including a driveshaft, the means for storing including a spool having a bore, the spool mounted on the lower end of the driveshaft, quick-attachment-detachment means for the spool including the driveshaft having a counterbore with a transverse passage, a plunger slidable within the counterbore between first and second locations, the plunger having a reduced portion opposite a spool bore recess in the second location, means movable within the transverse passage, the movable means dimensioned for protruding outward and engaging the spool recess when the plunger is at the first location and for retracting inwardly and freeing the spool when the plunger is at the second location.

4,633,589

CAN OPENER

James W. Gray, Tucson, Ariz., assignor to R. Rick Rodig, Denair, Calif., a part interest

Filed Oct. 26, 1984, Ser. No. 665,351
Int. Cl.⁴ B67B *7/30*
U.S. Cl. 30—427 **10 Claims**

1. An improved can opener adapted to open recessed top type cylindrical can containers of the type having a bead at the top comprising:

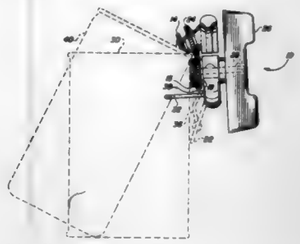
an upper body portion, said upper body portion including an outstanding handle, a circular cutting wheel, and a first rotary gear, said circular cutting wheel and first rotary gear attached by a first common axle to said upper body portion;

a lower body portion pivotally attached to said upper body portion, said lower body portion including an outstanding handle, a flat circular traction wheel, a second rotary gear, and a turning handle; said turning handle, traction wheel,

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and second rotary gear attached by a second common axle to said lower body portion, said second rotary gear adapted to be engaged by said first rotary gear, said traction wheel adapted to engage the underside of an associated recessed top can bead;

said lower body portion also including an outstanding extended rest having an arcuate shaped portion, said arcuate shaped portion adapted to engage the side of an associated recessed top can container, said rest extending beyond said traction wheel sufficient to hold the container at an angle of approximately 30° to the flat circular traction wheel such that said traction wheel will engage the recessed can bead;



said lower body portion further including a groove formed therein; and

an elongated structural member operably attached at a first end to said extended rest and operably attached at a second end to said lower body portion groove, said structural member securing said extended rest in an outward position whereby said upper body portion may be pivoted to a closed position with said lower body portion and thus bring the circular cutting wheel into the top of the can to force the traction wheel teeth into the underside of the bead of the can, and by turning the turning handle, the traction wheel is rotated which rotates the associated container can top into the cutter wheel and thus severs the top from the container can to open the can.

4,633,590

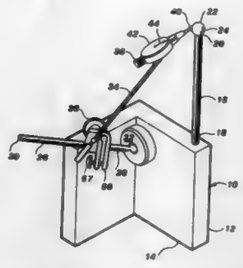
TUBE WALL THICKNESS MEASUREMENT APPARATUS

Paul R. Lagasse, Santa Fe, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 21, 1985, Ser. No. 747,204

Int. Cl.⁴ G01B *5/06*

U.S. Cl. 33—148 R **13 Claims**



1. An apparatus for measuring the thickness of a tube's wall for the tube's entire length and circumference by determining the deviation of the tube wall thickness from the known thickness of a selected standard item, said apparatus comprising:

a. a base;

b. a first support member having first and second ends, said first end being connected to said base, said first support member having a sufficiently small circumference that the tube can be slid over said first support member;

c. a spherical element, said spherical element being connected to said second end of said first support member, said spherical element having a sufficiently small circumference at its equator that the tube can be slid over said spherical element, said spherical element having at its equator a larger circumference than said first support member;

d. a second support member having first and second ends, said first end being connected to said base, said second support member being spaced apart from said first support member;

e. a positioning element connected to and movable relative to said second support member; and

f. an indicator connected to said positioning element and being movable thereby to a location proximate said spherical element, said indicator including a contact ball for contacting the selected standard item and holding it against said spherical element, said contact ball contacting the tube when the tube is disposed about said spherical element, said indicator including a dial having a rotatable needle for indicating the deviation of the tube wall thickness from the thickness of the selected standard item, said rotatable needle being operatively connected to and responsive to the position of said contact ball.

4,633,591

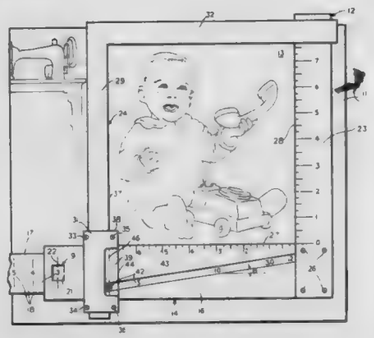
DIGITAL IMAGE PROPORTION ANALYZER

Alfred J. Pikora, 6420 Colechester Ct., Centerville, Ohio 45459

Filed Oct. 28, 1985, Ser. No. 792,282

Int. Cl.⁴ B43L *7/00*

U.S. Cl. 33—452 **20 Claims**



1. A device for calculating the magnification value required to enlarge or reduce a selected portion of graphic artwork from the initial size thereof to a selected size for reproduction of the selected portion, said device comprising:

(a) an elongated main member;

(b) a first edge indicator on the main member to be aligned with a first edge of the selected portion of the graphic artwork to be reproduced;

(c) a movable second edge indicator mounted on the main member to be aligned with the opposite edge of the selected portion, whereby the distance between the first edge indicator and the second edge indicator is a measure of the size of one dimension of the selected portion between the first edge and the opposite edge;

(d) an elongated second member movable longitudinally relative to the main member;

(e) a first reference indicator on one of the members;

(f) a first set of indicia elements extending along the other of the members and representing dimensional values to which the one dimension of the selected portion of the artwork is to be changed by magnification, each of the elements of the first set of indicia being selectively settable relative to the reference indicator;

(g) a second set of indicia elements extending along the second member and representing magnification values by which the one dimension of the selected portion of the artwork is to be magnified to correspond to the selected one of the dimension values of the first set of indicia aligned with thereference indicator; and

(h) a second reference indicator attached to the second edge indicator to move therewith and to point to a specific magnification value in the second set of indicia.

4,633,592

PRECISION RULE

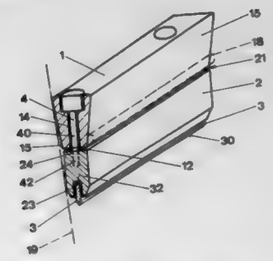
Marcel Wahli, Allmendstrasse 3, CH-8154 Oberglatt, Switzerland

Filed May 3, 1985, Ser. No. 730,720

Claims priority, application Switzerland, May 15, 1984, 2382/84

Int. Cl.⁴ B43L *7/00*

U.S. Cl. 33—493 **7 Claims**



1. A precision rule, comprising a handle part, a holding part having a measuring edge, and connecting means for connecting said holding part to said handle part, said connecting means providing a free space between said handle part and said holding part as well as providing a temperature barrier, and including an elastically yieldable, heat insulating spacer means in said space for facilitating only a minimal amount of relative movement between said handle part and said holding part while simultaneously blocking heat flow therethrough, only said connecting means extending through said space to provide said connection of said handle part and said holding part to thereby substantially restrict the heat transfer from said handle part to said holding part.

4,633,593

METHOD FOR THE CONTROLLED DRYING OF MATERIALS

Bruce Wallis, Thorp Arch Trading Estate, Wetherby, West Yorkshire, LS23 7BJ, England

Continuation-in-part of Ser. No. 495,374, May 17, 1983, abandoned. This application May 31, 1985, Ser. No. 739,740

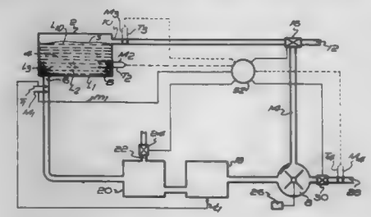
Int. Cl.⁴ F26B *3/00*

U.S. Cl. 34—26 **10 Claims**

1. A method of drying a material by passing a gas at least one of through and over said material, comprising the steps of:

(a) warming said material by maintaining the enthalpy substantially constant and by maintaining a minimal drying potential; and

(b) removing a first quantity of moisture from said material by increasing the drying potential from the level of the



same utilized in Step (a) and by at least maintaining the former enthalpy level.

4,633,594

OPTICAL-PROBE CONTROL DEVICE FOR DRYING OVENS FOR MIRROR PROTECTIVE PAINT

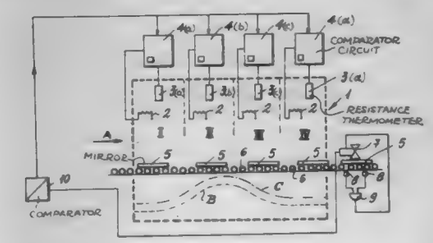
Enrico Bovone, Corso Italia 53, 15076 Ovada (Alessandria), Italy

Filed Oct. 30, 1985, Ser. No. 792,982

Claims priority, application Italy, Nov. 9, 1984, 23510 A/84

Int. Cl.⁴ F26B *21/10*

U.S. Cl. 34—48 **3 Claims**



1. A temperature control device for continuous drying ovens for testing the dryness of protective paint on mirrors (glass sheets), comprising;

moving means for moving said mirrors through an oven and beneath a plurality of drying means, each of said drying means having a different dryness temperature regulated by a regulated heating element, wherein said mirrors are mounted on said moving means;

presettable temperature control means which controls each of the heating elements disposed in the environment of the oven above the mirrors, through which the mirrors move;

at least one optical probe located at the outlet of said oven wherein mirrors pass under said probe, and the output of said probe, which is a function of the measured temperature, is fed to a comparator outside the oven and having a presettable input the output of said comparator regulates the setting of said temperature control means.

4,633,595

ROTARY DRYING DRUM

Adriaan van den Broek, Zeist, Netherlands, assignor to Vanden-Broek International B.V., Netherlands

Filed Oct. 29, 1985, Ser. No. 793,325

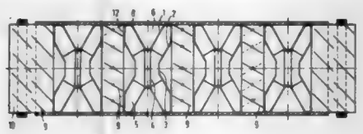
Claims priority, application Netherlands, Nov. 8, 1984, 8403407

Int. Cl.⁴ F26B *17/32*

U.S. Cl. 34—108 **11 Claims**

1. A rotary, cylindrical drying drum comprising in axial direction a series of vaned sections, with air and material passages and in which material to be dried can enter each section via an annular material passage adjacent the drum wall and be

transported by the vanes in radial direction and material transporting vanes disposed against the drum wall, on either side of each section for axially transporting the material to be dried, wherein each section includes two double-walled, frusto-conical portions whose apices are directed towards one another, the apices of the outer cones being interconnected to form an air and material passage with edges of the base circles of said outer cones being connected to the drum wall and the inner cones being connected to the outer cones by means of spacers.



4,633,596

PAPER MACHINE CLOTHING

Michael J. Josef, Clifton Park, N.Y., assignor to Albany International Corp., Menands, N.Y.

Filed Sep. 1, 1981, Ser. No. 298,320
Int. Cl.⁴ F26B *13/00*
U.S. Cl. 34—116 **3 Claims**



1. A papermachine dryer fabric, which comprises;
a plurality of interwoven machine direction and cross-machine direction yarns, said cross-machine direction yarns being selected from the group consisting of mono- and multi-filament yarns, said machine direction yarns being monofilaments of a synthetic, polymeric resin having a cross-sectional configuration such that the monofilaments are thinner at their center than at their lateral edges;
said lateral edges being deformable under pressure;
crossover points between the interwoven machine direction and cross-machine direction yarns being sited on the thicker lateral edges of the machine direction yarns;
the cross-machine direction yarns being interlocked with the machine direction yarns at the crossover points by deformation of the lateral edge at the crossover points to conform to the shape of cross-machine direction yarns crossing over;
said fabric having the characteristics associated with a heat-set fabric.

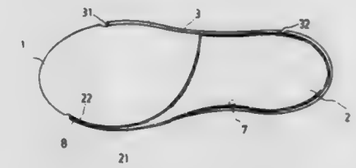
4,633,597

ELASTIC PRESSURE AND AUTOMATIC-AIR-VENTILATION TYPE OF INSOLE

Joung-Lin Shiang, No. 72, Hu Chu St., Pao-Chiao City, Taipei Shien, Taiwan

Filed Mar. 6, 1984, Ser. No. 586,701
Int. Cl.⁴ A43B *13/38*
U.S. Cl. 36—43 **3 Claims**

1. An air-ventilation type of insole having a front portion and a rear portion, and comprising:
an elastic air sack formed in said rear portion and having a pair of opposed side edges;
a first ventilation means disposed adjacent one of said side edges and connected to said air sack for exhausting of air; and
second ventilating means adjacent the other of said side edges and connected to said air sack for intake of air, whereby periodic application and release of pressure to said air sack will cause air movement across said insole between both of said ventilation means.

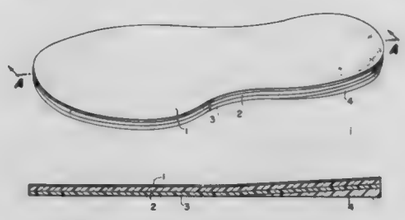


4,633,598

INSOLE FOR SHOE

Yoshiharu Moronaga, Kurume, and Junji Izumi, Ohmuta, both of Japan, assignors to Nippon Rubber Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1984, Ser. No. 650,529
Claims priority, application Japan, Sep. 30, 1983, 58-153107[U]
Int. Cl.⁴ A43B *13/40*
U.S. Cl. 36—44 **3 Claims**



1. An insole for shoes, said insole comprising:
an upper layer formed of an elastic foamed material having a 12.5°–28° shore A hardness;
a lower layer formed of an elastic foamed material having a 28°–47° shore A hardness, said lower layer being laminated on a lower surface of said upper layer; and
a shock-absorptive foamed material layer having a 28°–63° shore A hardness, said shock-absorptive foamed material layer being laminated on a lower surface of said lower layer at the heel portion;
the heel portion increases in hardness from said upper layer to said lower layer and increases in hardness from said lower layer to said shock-absorptive foamed material layer.

4,633,599

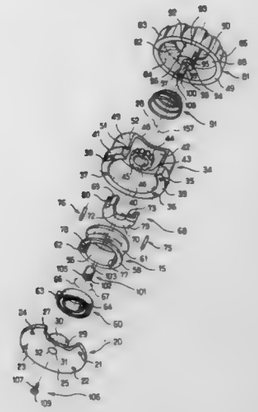
SKI BOOT

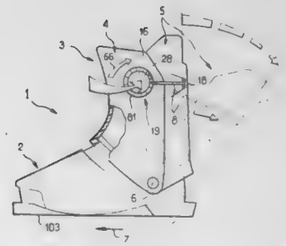
Joseph Morell, Annecy; Louis Benoit, Frangy, and Maurice Bonnet, Rumilly, all of France, assignors to Salomon S. A., Annecy, France

Filed Aug. 19, 1985, Ser. No. 767,391
Claims priority, application France, Aug. 17, 1984, 84 12911
Int. Cl.⁴ A43B *11/00, 5/04*
U.S. Cl. 36—50 **12 Claims**

1. In a downhill ski boot, of the type which includes two rigid elements (4, 5) forming a front collar element (4) and a rear cap element (5), mutually arranged in a lower zone of an upper (3) to permit the changing between a relative open (3) position and a relative closed (3) position, a notably, to allow a position of variable pressure of these two elements (4, 5)

against the skier's leg to be occupied, this position being intermediate between said open and closed positions;
releasable locking means (8, 19), to retain said elements (4, 5) in position pressing against the leg and to allow, when desired, their passage into open (3) position, said locking means (8, 19) having, for this purpose, at least one flexible cable (8) which is substantially inextensible, in functional connection with at least a first of said elements (4, 5) of said upper in an upper zone thereof and means of traction (19) on said flexible cable (8), carried by the second of said elements (4, 5) of said upper (3), the improvement in which said traction means (19) on said flexible cable (8) comprises
(a) a reel (15) for winding said flexible cable (8), a zone (14) of which is connected to a zone of said reel (15);





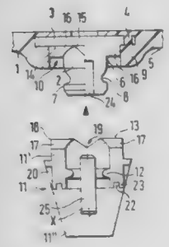
(b) devices (20, 34, 89) carried by said second element (3) for defining at least one rotational axis (28, 157) of said reel (15) with respect to said second element (3);
(c) means (60) of elastic solicitation for said reel (15) in a predetermined direction (67) of rotation around said rotational axis (28, 157), corresponding to a windup of said flexible cable (8), to elastically solicit said elements (4, 5) towards the closed upper (3) position;
(d) means (81) for manual pulling of said reel in said direction (67), to allow an additional windup of said flexible cable on said reel (15) when said upper (3) elements (4, 5) occupy a position exerting pressure against the skier's leg; and
(e) means (44, 73, 113, 114) for temporary immobilization of said reel (15) in rotation in a direction opposite to said predetermined direction (67).

4,633,600

OUTER SOLE FOR AN ATHLETIC SHOE HAVING CLEATS WITH EXCHANGEABLE SNAP-ON GRIPPING ELEMENTS

Armin A. Dassler, and Willi Bauer, both of Herzogenaurach, Fed. Rep. of Germany, assignors to Puma AG Rudolf Dassler Sport, Fed. Rep. of Germany

Filed Feb. 19, 1986, Ser. No. 830,861
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1985, 3505665
Int. Cl.⁴ A43C *15/02, 15/16*
U.S. Cl. 36—134 **20 Claims**



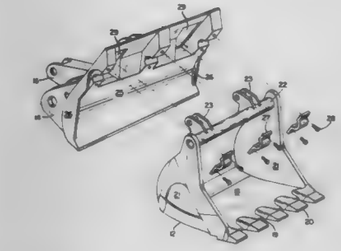
1. Athletic shoe sole having cleats with exchangeable grip elements of the type including mounting studs attached to the sole and a grip element, at least a part of which is made of elastic material that is securable over a respective mounting stud by way of a snap-lock arrangement comprised of at least one exterior surface formation of each stud that is interengageable with a complementary grip element inner wall surface formation, wherein the sole is provided with disengagement means, that is operative by rotation of at least part of the grip element about its longitudinal axis, for producing a longitudinal displacement of the grip element relative to its respective mounting stud sufficient to shift the surface formations past a catch point thereof so as to release said snap lock arrangement securing the grip element of the cleat from the mounting stud thereof.

4,633,601

EXCAVATING SHOVEL

Robert S. Fleck, Beaverton, and John S. Kreitzberg, Portland, both of Oreg., assignors to Esco Corporation, Portland, Oreg.

Filed Sep. 25, 1984, Ser. No. 654,371
Int. Cl.⁴ E02F *3/00*
U.S. Cl. 37—118 R **8 Claims**



1. An excavating shovel comprising a back section and a front section pivotally related thereto,
said front section including an outwardly-curved bottom wall terminating at a forward earth-engaging edge and side walls upstanding from said bottom wall, a torque tube extending between and rigidly connected to upper por-

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tions of said side walls, said torque tube being equipped with radially-extending moment arm means,

said back section including a back wall having a slight outward curvature to cooperate with said front section bottom wall in developing roll-over of excavated earth and narrow forwardly-projecting side walls to cooperate with said forward section side walls in presenting a closed shovel during excavation,

said back wall being equipped interiorly with bushing means, said torque tube being rotatably supported in said bushing means, and

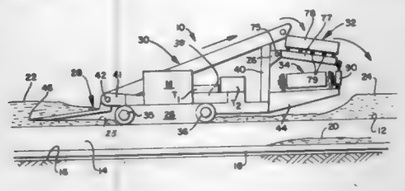
actuator means for pivoting said front section mounted on said back wall and coupled to said arm means, said back wall being equipped with window means aligned with said arm means projecting through said back wall to the exterior thereof, said actuator means being mounted on said back wall exteriorly thereof.

4,633,602

METHOD AND APPARATUS FOR PADDING PIPE

Ricky L. Layh, P.O. Box 2272, and Christy B. Landrum, Jr., 1227 Short St., both of Hobbs, N. Mex. 88240

Filed Sep. 3, 1985, Ser. No. 771,840
Int. Cl.⁴ E02F *1/00*
U.S. Cl. 37—195 **5 Claims**



1. Apparatus for continuously moving along the ground parallel to a ditch while continuously gathering and processing excavated material which lies on the ground adjacent to a pipeline ditch so as to enable padding material to be separated from the gathered material and conveyed back into the ditch, with the residue from the processed material being returned to the ground adjacent to the ditch;

said apparatus having a longitudinal conveyor arranged parallel to the path of travel of the apparatus, and means forming a gathering head at the forward marginal end of the conveyor for gathering excavated material from the ground and forcing the excavated material onto the leading end of the conveyor; said conveyor having a forward end opposed to a discharge end and translocates the gathered material rearwardly to an elevated position;

means by which said gathering head is pivotally mounted to said apparatus and forms the forward marginal end thereof; said gathering head has a ground engaging lip at the forward end thereof, said gathering head can be pivotally moved vertically respective to the excavated material in order to gather a controlled amount of excavated material for subsequently processing into padding material;

a separator means supported at the rear end of the apparatus for separating padding material and residual processed material from the translocated gathered material; said separator means being located in underlying relationship respective to the discharge end of the longitudinal conveyor;

a lateral conveyor means positioned in underlying relationship respective to the separator means for translocating the padding material received from the separator into the ditch and thereby covering a pipe which may be located in the ditch;

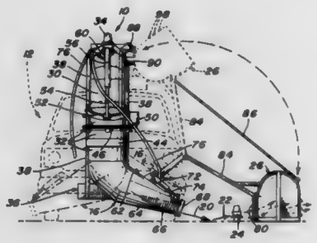
and means for redepositing the residual processed material from the separator onto the remaining said material which lies on the ground along a path which is parallel to the ditch.

4,633,603

SNOW REMOVAL APPARATUS

Pierre David, 1000, rue Riel, Laval, Quebec, Canada (H7C 2L6)

Continuation of Ser. No. 594,413, Mar. 28, 1984, abandoned, which is a continuation of Ser. No. 328,650, Dec. 8, 1981, abandoned. This application Feb. 7, 1985, Ser. No. 698,754
Int. Cl.⁴ E01H *5/00*
U.S. Cl. 37—197 **30 Claims**



19. A method of removing snow from a light fixture or the like protruding from the ground comprising:

(a) providing a flowing stream of air;

(b) directing said air stream through a nozzle means at a flow velocity of at least 180 mph onto the ground at an angle of about 10° to the horizontal and at a predetermined distance between the light fixture and the nozzle; and

(c) causing the deflected air stream to impinge on the light fixture at a reduced velocity sufficient to remove snow therefrom without damaging same and to spread the snow over a surrounding area with sufficient pressure to clear the area around the light fixture of snow.

4,633,604

AUTOMATIC GARMENT PORTION LOADER

Fletcher D. Adamson, and James M. Caldwell, both of Alexander City, Ala., assignors to Russell Corporation, Alexander City, Ala.

Filed Dec. 2, 1985, Ser. No. 803,416
Int. Cl.⁴ D06F *69/00*; D05B *35/00*
U.S. Cl. 38—2 **15 Claims**



1. Apparatus for loading precut garment portions in an automated hemming production line comprising:

(a) horizontal conveying means for moving said garment portions along said production line;

(b) pick-up means for transferring a single garment portion from the top of a stack of such garment portions to said conveying means;

(c) smoothing means for removing wrinkles from said garment portion when positioned on said conveying means;

(d) automated means for aligning an edge of said garment portion along a predetermined line relative to said conveying means; and

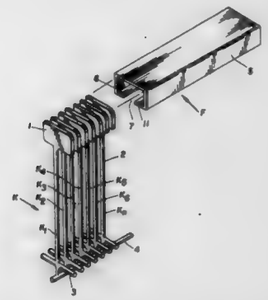
(e) rejection means responsive to said automated means for removing misaligned garment portions from said production line.

4,633,605

ASSEMBLY OF TAG PINS WITH A CAP AVOIDING AN ENTWINEMENT BETWEEN HEADS

Young W. Kang, c/o K & K Associated Co., C.P.O. Box 2378, Seoul, Rep. of Korea

Filed May 20, 1985, Ser. No. 735,506
Claims priority, application Rep. of Korea, Jun. 2, 1984, 84-5244[U]
Int. Cl.⁴ G09F *3/12*
U.S. Cl. 40—24 **8 Claims**



1. An assembly of tag pins comprising:

a plurality of tag pins made of a soft synthetic resin, each tag pin including a generally flat head, a thin and long filament operatively connected at an upper end thereof to said head, and a transversely extended-cross bar operatively connected to a lower end of said filament,

a connecting bar integral with and connecting said tag pins together in a line in uniformly spaced parallel relation to each other to form the assembly of tag pins, and

a cap of deformable material for surrounding at least a portion of each of the heads of the assembly, said cap consisting of

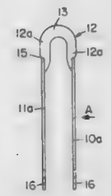
a body made of a longitudinally extended box and having a generally C-shaped cross section and including a base and side walls extending outwardly therefrom defining a space for receiving the heads of the assembly at the interior thereof, said space being fully opened at both longitudinal ends thereof in order to slideably receive and extract a group of heads of the assembly.

4,633,606

TAG

Lindsay W. J. Cohr, Palmerston North, New Zealand, assignor to Allflex International Limited, Ton North, New Zealand

Filed Apr. 11, 1985, Ser. No. 722,727
Int. Cl.⁴ A01K *11/00*; G09F *3/00*
U.S. Cl. 40—301 **12 Claims**



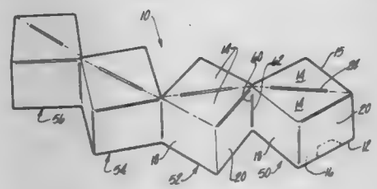
1. A one piece tag formed from a resilient plastics material said tag comprising a mounting member and a pair of panels attached thereto, said panels being in a spaced apart, substantially parallel disposition, said mounting member having a pair of limb portions coupled together by an intermediate portion, the cross sectional configuration of said mounting member being such that it is less flexible than said panels, said panels extending from the end of each said limb portion.

4,633,607

MULTIPLE AXIS HINGED DISPLAY ASSEMBLY

Miles E. Brasch, and Allan G. Campbell, III, both of Bloomfield Hills, Mich., assignors to A.R. Brasch Advertising, Inc., Southfield, Mich.

Filed Sep. 13, 1984, Ser. No. 650,255
Int. Cl.⁴ G09F *19/00*
U.S. Cl. 40—530 **5 Claims**



1. A display assembly comprising:

at least two substantially identical subassemblies,

means for pivotally securing said subassemblies together about a first pivotal axis,

wherein each subassembly comprises two substantially identical geometric units, each unit having a plurality of indicia bearing surfaces, each of said surfaces being planar,

means for pivotally securing said geometric units together in each subassembly about a second pivotal axis, said first and second pivotal axes being perpendicular to each other,

wherein said means for pivotally securing said subassemblies together comprises means for pivotally securing only one unit of one subassembly to only one unit of the other subassembly about said first pivotal axis, and

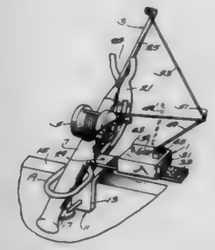
wherein the faces of said units are selectively covered and exposed by pivoting said units about said second axis into different positions with respect to each other and by pivotting said subassemblies about said first axis into different positions with respect to each other.

4,633,608

FISH STRIKE DETECTOR

Richard Savarino, 2607 E. Carpenter Ave., Cudahy, Wis. 53110

Filed Apr. 12, 1985, Ser. No. 722,511
Int. Cl.⁴ A01K *97/12*
U.S. Cl. 43—17 **2 Claims**



1. In combination with an ice fishing tip-up having a mast biased to a vertical position and a fishing line supported by a reel, the reel being adapted to release the mast from a restrained generally horizontal attitude to a vertical attitude upon a strike on the fishing line, a fish strike detector comprising:

a. a case;

b. means for releaseably connecting the case to the tip-up at selected locations thereon;
c. electrical circuit means enclosed within the case for selective operation between a closed energized condition and an open deenergized condition;
d. an actuator arm having a free end and being displaceable between an unactuated position and an actuated position to close the electric circuit means upon displace to the actuated position;
e. a first tube placed over the free end of the actuator arm;
f. a second tube placed over the free end of the tip-up mast; and
g. a string connected to the first and second tubes, the string having a length slightly shorter than the distance between the free end of the mast when in the vertical attitude and the free end of the actuator arm when in the unactuated position,

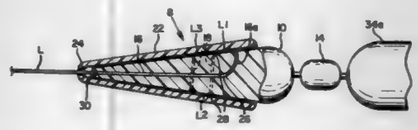
so that a strike on the tip-up releases the restrained mast to raise it and take up the slack in the string and thereby displace the actuator arm to the actuated position and close the electric circuit means.

4,633,609

KNOTLESS FISHLINE CONNECTOR

Ian A. Brown, 44 Tanglewood Dr., Lake Oswego, Oreg. 97034

Filed Jan. 4, 1985, Ser. No. 688,713
Int. Cl.[4] A01K *91/04*
U.S. Cl. 43—43.1 **2 Claims**



1. In combination,

a connector device having a body member with opposite ends,

one end of said body member having a connector portion for connection to other means to which attachment is to be made,

the said body member having a smooth exterior surface tapered to a smaller dimension from said one end to the other end,

a longitudinal bore interiorly of said body member having a portion thereof leading inwardly from said other end and having a radial extension exiting through the surface of said body member at a point between said ends,

a full width transverse bore in said body member spaced from the exit point of said radial extension;

a fish line extending endwise into said bore at said other end of the body member and out said radial extension with an end thereof projecting exteriorly of said body member and lying along said smooth surface and extending into said transverse bore;

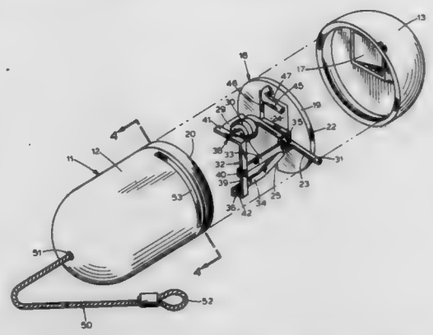
and a sleeve member having a central tapered opening therethrough dimensioned and arranged to have wedging engagement on said body member whereby to pinch said line which extends between the exit point of said radial extension of said longitudinal bore and said transverse bore and which lies against the surface of said body member, whereby to form a knotless connection between the body member and the line.

4,633,610

SMALL ANIMAL TRAP

Robert R. Thompson, 613 State St., Ackley, Iowa 50601

Filed May 3, 1985, Ser. No. 729,918
Int. Cl.[4] A01M *23/00*
U.S. Cl. 43—95 **9 Claims**



2. A trap assembly for capturing a small animal comprising:

a. an oblong-shaped housing having an inlet opening in one end sized to permit said animal to stick one of its paws and associated leg into said housing;

b. jaw means secured inside of said housing, said jaw means having;

1. a trap plate having an aperture and being interposed between the ends of the housing with one side of said plate facing said housing opening and the opposite side of said plate facing away from said opening;
2. resilient means attached to said opposite side of said plate;
3. a trap arm associated with said resilient means and movable thereby from an open position unrestricting said aperture to a closed position whereby said arm and at least a portion of the side edge of said aperture to serve as coacting jaws to grasp the paw or leg of said animal;
4. trigger means operable by said animal and mounted on said opposite side of said trap plate for releasably securing said arm in said open position; and

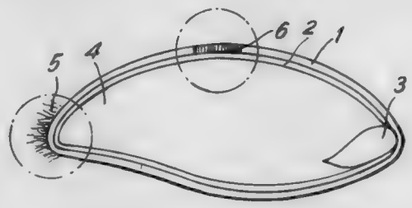
c. means for gaining access to the interior of said housing to set said trigger means in its releasably securing condition.

4,633,611

PROCESS AND APPARATUS FOR DISINFECTING SEEDS

Siegfried Schiller; Siegfried Panzer, and Klaus Gaber, all of Dresden, German Democratic Rep., assignors to Bakish Materials Corporation, Englewood, N.J.

Filed Dec. 31, 1984, Ser. No. 687,804
Int. Cl.[4] A01C *1/08*
U.S. Cl. 47—1.3 **16 Claims**



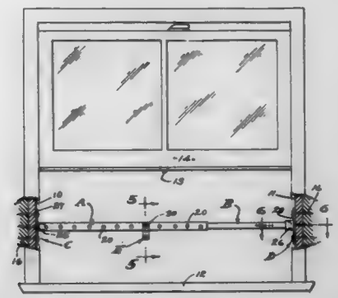
1. A process for the disinfection of seeds, comprising: exposing said seeds on all sides thereof to irradiation by low-energy electrons generated by an electron gun; and controllably limiting the electron energy and radiation dose to ranges predetermined to destroy surface and subsurface pathogens selectively and to avoid substantial electron penetration into said seeds that would adversely affect seed germination and growth characteristics.

4,633,612

ANTI-BURGLAR WINDOW BARS

Robert L. Forkish, 2555 S. Sepulveda Blvd., Los Angeles, Calif. 90064

Filed Oct. 4, 1985, Ser. No. 784,354
Int. Cl.[4] E06B *3/68*
U.S. Cl. 49—55 **5 Claims**



1. An anti-burglar window bar for installation in a double hung window having inner and outer side jamb channels in opposite side jambs and having a sash slideable in each of said inner and outer channels and one sash moveable to overlie the other sash and leaving a window opening between the side jambs, and including;

a trunnion plate secured into each of the opposite side jamb channels of the other sash and each with a trunnion in horizontal alignment with the other across the window opening,

a pair of telescoping bars and each with an end received and supported by a trunnion plate trunnion, one bar having a coextensive series of longitudinally spaced adjustment openings extending therealong in equally spaced increments, and the other bar having a series of adjustment openings confined to the end portion thereof, the series of adjustment openings confined to the end portion of the other bar being more closely spaced than the equal spacing of the adjustment openings in the first mentioned one bar, one adjustment opening of one bar being alignable with one adjustment opening of the other bar when said pars are extended between the trunnion plates and supported by the trunnions thereof,

and a securement bolt passed through the aligned adjustment openings of the supported bars.

4,633,613

WINDOW REGULATOR FOR DOOR

Fumio Kobayashi, Ayase, and Jun Yamagishi, Yokohama, both of Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Dec. 7, 1984, Ser. No. 679,274
Claims priority, application Japan, Dec. 9, 1983, 58-231489; Mar. 28, 1984, 59-43227[U]
Int. Cl.[4] E05F *11/52*
U.S. Cl. 49—227 **18 Claims**

1. In a door having a retractable window pane which moves between its full-open position and its full-closed position,

a window regulator for regulating the movement of said window pane, comprising:

an elongate plate secured to said door, said plate being formed with a first guide rail which extends therealong;

a first slider slidably engaged with said first guide rail so that it runs along the rail;

a carrier secured to said window and mounting thereon said first slider, so that the movement of said first slider along the first guide rail induces the movement of said window pane between said full-open and full-closed positions;

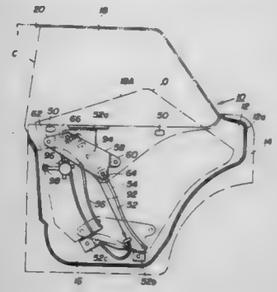
guide means permitting said window pane to pivot during the movement of the same, said guide means comprising:

a second guide rail integrally formed on said elongate plate and extending therealong, said first and second guide rails extending in similar, but nonparallel, directions; and

a second slider slidably engaged with said second guide rail and connected to said carrier to move therewith, said first and second sliders being connected to said carrier through respective pivot pins;

a flexible wire connected at a portion thereof to said carrier, so that the movement of said wire therealong induces the movement of said carrier and

a drive unit mounted to said door and engaging the ends of said flexible wire for moving said wire therealong.

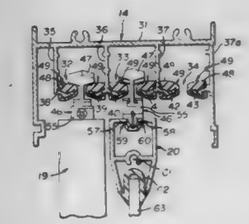


4,633,614

ADJUSTABLE TUB ENCLOSURE AND SHOWER STALL DOORS

Roger M. Van Weelden, Chicago, Ill., assignor to USG Corporation, Chicago, Ill.

Filed Apr. 5, 1985, Ser. No. 720,514
Int. Cl.[4] E05D *13/02*
U.S. Cl. 49—409 **10 Claims**



1. An adjustment apparatus for movably supporting a door on a track and providing means for adjusting the ends of the door vertically to compensate for out-of-plumb wall conditions, said apparatus comprising:

A. A lower adjustment apparatus member comprising;

(1) means for being affixed to a door frame,

(2) means defining an inclined bearing surface,

(3) a tab provided at one end of said member having an aperture and having a screw disposed in said aperture,

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said screw being oriented substantially parallel to said inclined bearing surface,

B. An upper adjustment apparatus member comprising:

(1) a body portion,

(2) means for movably engaging said track,

(3) means provided in said body portion for threadedly engaging the threads of said screw,

(4) chamber means for receiving the portion of said screw extending beyond said means for threadly engaging the threads of said screw, and

(5) means defining a surface adapted to engage a surface of said lower adjustable apparatus member,

one member of said lower and said upper adjustment apparatus members being provided with a longitudinal engaging member comprising a key having a T-shaped cross-section and the other of said members being provided with a complementary slot retaining said engaging member in slidably relationship, whereby rotation of said screw causes said upper member to slide upwardly or downwardly in relation to said lower adjustment apparatus member, thereby raising or lowering the ends of said door.

4,633,615

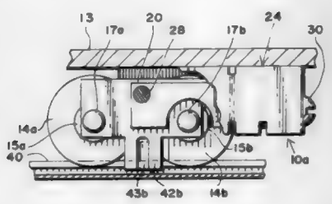
TRACK-INTER-LOCKING ROLLER WHEEL ASSEMBLY FOR SLIDING PATIO DOORS

James R. Moose, Miami, Fla., assignor to Watsco Inc., Hialeah, Fla.

Filed Jul. 8, 1985, Ser. No. 752,668

Int. Cl.⁴ E05D *13/02*

U.S. Cl. 49—425 **1 Claim**



1. In a track inter-locking roller wheel assembly for sliding patio doors of the type having one or more sliding doors and a building framework within which the doors slide, including a threshold track having an upstanding longitudinal projection upon which the sliding patio doors are rollingly supported by roller wheel assemblies mounted near each end of the bottom rails of each of the patio doors, and further including mechanism for vertical adjustment of the roller wheel assemblies relative to their respective doors, and wherein the upper rail of the building framework has a longitudinal groove within which upper end rail portions of the sliding patio doors are received for sliding movement therealong, the improvement comprising; a pair of opposed, downwardly-extending leg portions provided one at each side of each of said roller wheel assemblies, said leg portions extending below lower-most peripheral portions of the wheels of their respective roller wheel assemblies, said leg portions extending downwardly of each side of the threshold track projection upon the sliding patio doors being installed in the building framework and being adapted to prevent broadside displacement of the doors for removal from the threshold track upon lifting of the doors in attempts at unauthorized entry, said downwardly-extending leg portions being of sheet metal formed with vertically-extending, inwardly-stamped, rounded depressions facing opposed side portions of the upstanding threshold projection.

4,633,616

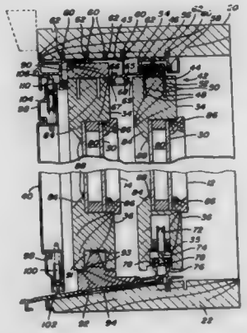
PATIO-DOOR UNIT

Jean-Paul Gignere, Lotbiniere, Canada, assignor to Donat Flamand Inc., Lotbiniere, Canada

Filed Jul. 5, 1984, Ser. No. 627,687

Int. Cl.⁴ E05D *13/00*

U.S. Cl. 49—425 **11 Claims**



1. A patio door unit, comprising:

a wooden, substantially rectangular frame defined by a jamb on each side, a lintel joining the two jambs on their upper extremities, and a sill joining the two jambs on their lower extremities;

at least two glazed panels with wooden sashes, one of said panels is sliding in said frame, the sliding panel laying in a plane, each panel comprising a sash constituted by two stiles, a top rail joining two stiles on their upper extremities and a bottom rail joining said two stiles on their lower extremities; and

a guiding and supporting device allowing said sliding panel to move by lateral translation inside said frame, and substantially parallely to the lintel and to the sill of said frame, said device comprising at the base of the sliding panel a roller system mounted between the bottom rail of the sliding panel and the sill of said frame and comprising rollers installed on a track in such a way as to reduce the displacement resistance of the sliding panel; said guiding and supporting device further comprising a slideway system at the top of the sliding panel, said slideway system allowing the sliding of the upper portion of said sliding panel relatively to the lintel and also allowing said sliding panel to be removed from said frame, the slideway system being constituted by a retractable elongated runner mounted on the top rail on the sliding panel and extending upwardly, and by a corresponding slideway on the lintel receiving the retractable runner which is held in extended position by resilient drawback means, said elongated runner being tiltable against said resilient drawback means in the plane of said sliding panel in order to remain parallel with said lintel during the sliding of said sliding panel when said lintel is not strictly parallel with said sill.

4,633,617

APPARATUS FOR GRINDING A TRANSVERSE ELEMENT FOR A DRIVING BELT

Johannes A. van Dijk, Eindhoven, Netherlands, assignor to Van Doorne's Transmissie B.V., Tilburg, Netherlands

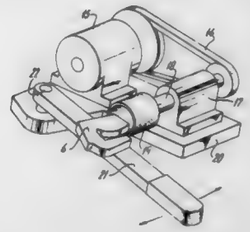
Filed Nov. 13, 1984, Ser. No. 670,846

Claims priority, application Netherlands, Nov. 11, 1983, 8303870

Int. Cl.⁴ B24B *7/10*

U.S. Cl. 51—73 R **1 Claim**

1. Apparatus for grinding a plate-like element for a driving belt, the plate-like element having opposite faces, an edge and at least one recess for receiving a flexible endless carrier, the recess extending inwardly from the edge of the element and exhibiting at least one contact surface which contacts a flexible endless carrier when the carrier is fitted into the recess, said apparatus comprising: a rotatable open-ended hollow cylindrical grinding member having an annular wall with an inner abrading surface, the radial thickness of said wall being such that said wall can be received in the recess in said plate-like element in a position in which said abrading surface is engageable with the contact surface of the recess in the plate-like element, with a portion of the element residing outside said grinding member; support means for supporting a plate-like



element to be machined; and means for effecting relative swinging movement between said support means and said cylindrical grinding member in an arcuate path about an axis which extends transversely to the axis of said cylindrical grinding member and which is located outside said grinding member, such swinging movement effecting movement of said wall of said grinding member into the recess in a plate-like element supported by said support means and effecting engagement of the contact surface of such element with said abrading surface to thereby grind the contact surface of such element so as to be convex in two mutually perpendicular directions.

4,633,618

LENS GRINDING APPARATUS

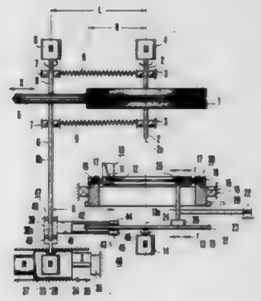
Takahide Kobayashi, Kawasaki, Japan, assignor to Koken Co., Kanagawa, Japan

Filed Jan. 7, 1985, Ser. No. 689,240

Claims priority, application Japan, Jan. 14, 1984, 59-005342

Int. Cl.⁴ B24B *9/14*

U.S. Cl. 51—101 LG **11 Claims**



1. In an apparatus for grinding a lens blank to the predetermined configuration of a lens frame to which the lens is to be fitted, said apparatus includes a grinding wheel adapted to be rotated at a high rotational speed to grind said lens blank, a wheel shaft for mounting said grinding wheel thereon and first and second lens shafts adapted to clamp said lens blank therebetween, the axis of said lens shafts extending in parallel with the axis of said wheel shaft and rotating at a low rotational speed, wherein at least one of the wheel shaft and the lens shafts is adapted to move toward and away from the other, the improvement comprising;

a writing means for scribing a band of magnetized zone on a magnetic sheet including a first arm having a follower roller which is adapted to roll on a V-shaped groove of a lens frame, said magnetized zone having a contour line corresponding to the configuration of said V-shaped groove of said lens frame,

a reading means for reading said contour line of said magnetized zone on said magnetic sheet said reading means including a second arm having a plurality of hole elements for reading said contour line,

a center distance changing means for changing the distance between both said wheel shaft and said lens shafts in response to changing of the configuration of said contour line read by said reading means, and

a control means for controlling operations of each of said writing means, reading means and distance dhanging means.

4,633,619

APPARATUS FOR THE MANUFACTURE OR MACHINING OF GEARS BY ROLLING ON A TOOL HAVING ABRASIVE WORKING SURFACES

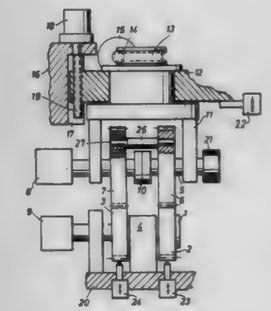
Manfred Erhardt, Puchheim; Herbert Loos, Dorfen-Stadt, and Gerhard Reichert, Puchheim, all of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen-und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Jul. 12, 1985, Ser. No. 754,791

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425880

Int. Cl.⁴ B24B *5/36*

U.S. Cl. 51—105 GG **3 Claims**



1. In an apparatus for the manufacture of straight or helically toothed workpieces using at least one toothed tool having abrasive working surfaces and which roll alternately with single-flank contact on a workpiece, the relative position between said workpiece and tool, during this rolling movement, being controlled by a tooth system of a guide gear means which also rolls with a single-flank contact, the contacting tooth flanks of said guide gear means being the counter-flanks of a workpiece-tool pair, said apparatus including first adjusting means for changing the contacting tooth flanks by rotation of a member of said workpiece-tool pair relative to at least one member of said guide gear means, and a pair of stops for limiting the amount of relative rotation between said workpiece-tool pair and said guide gear means, the improvement comprising wherein a first of said pair of stops limits the extent to which contact of finish worked tooth flanks on said workpiece occurs on the corresponding tooth flanks of said tool and said counter-flanks of said guide gear means, and a second of said pair of stops limits the extent to which relative rotation occurs between said workpiece-tool pair and said guide gear means to control finish working of the counter-flanks of said workpiece and the contact of the flanks of said guide gear means, and

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second adjusting means for selectively adjusting the magnitude of and the relative position between said relatively rotatable workpiece-tool pair and said guide gear means.

4,633,620

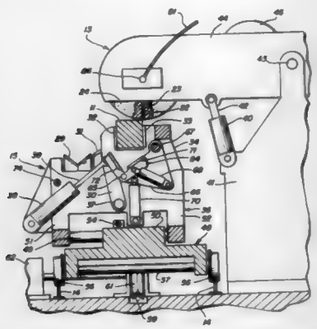
SYSTEM FOR PROCESSING OF STEEL BILLETS OR THE LIKE TO REMOVE SURFACE DEFECTS

Donald E. Lorenzi, and Helmut F. Wagerer, both of Des Plaines, Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Continuation of Ser. No. 531,165, Sep. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 407,656, Aug. 12, 1982, Pat. No. 4,502,253. This application Oct. 16, 1985, Ser. No. 788,080

Int. Cl.⁴ B24B *19/00*

U.S. Cl. 51—165 R **13 Claims**



1. Apparatus for processing rough-surfaced steel billets or like workpieces to remove cracked or otherwise defective portions thereof, comprising: workpiece support means, material removal means for coacting with a portion of a workpiece supported by said support means to remove material therefrom, positioning means for effecting relative movement of said workpiece support means and said material removal means, control means for controlling said positioning means, signal means including probe means associated with said material removal means and operative during coaction of said material removal means with a portion of the workpiece to detect defects in said portion and to apply corresponding defect signals to said control means, said positioning means being controlled through said control means to move in a predetermined scan pattern over a surface portion of the workpiece and to remove a thin layer of rough surface material therefrom and facilitate coaction of said probe means with said workpiece to develop a defect signal from any defective portion thereof, said positioning means being controlled through said control means for operation in the absence of a defect signal from said signal means to limit the depth of material removed and remove only said thin layer of rough surface material, and said positioning means being controlled through said control means and from a defect signal developed at any point during movement in said predetermined scan pattern to interrupt movement in said pattern, to then initiate removal of a defective portion at said point and to then continue removal of said defective portion at said point until removed and to thereafter continue movement in said scan pattern, whereby to effect removal of a thin surface layer and detection and removal of all defective portions in a single complete movement in said predetermined scan pattern.

4,633,621

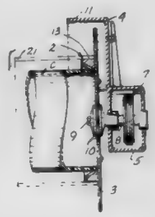
PORTABLE CUTOFF AND END-BEVELING DEVICE

Raymond R. Weber, 17710 Larch Way, Alderwood Manor, Wash. 98037

Filed Nov. 7, 1985, Ser. No. 796,043

Int. Cl.⁴ B24B *25/00*; **B25F** *3/00*

U.S. Cl. 51—181 R **12 Claims**



1. A combination cutoff and beveling device for a conduit comprising a saw blade adapted for rotation about an axis, and a beveling ring of a diameter substantially less than the diameter of said blade, mounted on a side surface of said blade concentric with said axis and having an inner conduit-beveling periphery flared outward in diameter from said side surface of said blade.

4,633,622

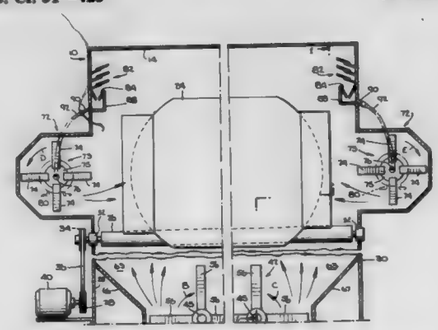
SHOT CLEANING APPARATUS WITH GRAVITY FED AUXILIARY IMPELLER

Raymond Lightsey, Valdosta, Ga., assignor to Walker Peenimpac Machine, Inc., Valdosta, Ga.

Filed May 28, 1985, Ser. No. 738,669

Int. Cl.⁴ B24C *3/30*

U.S. Cl. 51—423 **10 Claims**



1. A shot cleaning apparatus comprising an outer housing, at least one main shot blast impeller mounted in the lower part of said housing to throw shot in an upward direction relative to said main shot blast impeller in the housing, workpiece holding means in said housing above the main impeller for holding a workpiece in the path of shot thrown by said main impeller, a main hopper arranged in the housing below the workpiece holding means to collect shot falling in the housing and to direct the collected shot to the main impeller, an auxiliary impeller located above said main impeller and arranged to throw shot in a direction other than said upward direction at a workpiece held in said housing and a shot collection assembly mounted in said housing above said auxiliary impeller to collect shot thrown incident thereon by said main shot blast impeller and to direct the collected shot by gravity to the auxiliary impeller, said shot collection assembly comprising an elongated collection trough slanted relative to a horizontal direction and a feed tube, a lower portion of said trough opening to one end of said feed tube, said feed tube extending downwardly from said one end to said auxiliary impeller.

4,633,623

SAND BLASTING NOZZLE

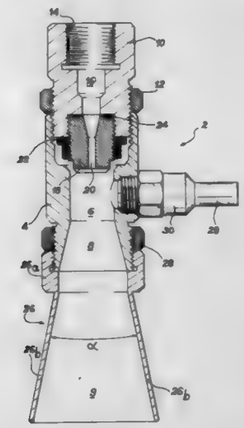
Jean Spitz, Chatenois, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 15, 1983, Ser. No. 475,514

Claims priority, application France, Mar. 15, 1982, 82 04336

Int. Cl.⁴ B24C *5/04*

U.S. Cl. 51—439 **13 Claims**



1. A nozzle for the mixture of an incompressible propellant fluid and a mixture of a compressible fluid and abrasive particles, said nozzle comprising:

(a) a body having a distal end and a proximal end, said body containing a first bore leading from the distal end to the proximal end of said body, the distal end of said first bore constituting a suction chamber;

(b) an intake unit for an incompressible propellant fluid attached to the proximal end of said body, said intake unit having a second bore which has a distal end and a proximal end, the distal end of said second bore terminating in an outlet port sized, shaped, and positioned so as to produce a flat, divergent jet of incompressible propellant fluid centrally located in said suction chamber, the discharge angle of the flat, divergent jet of incompressible propellant fluid produced by said outlet port being such that and said outlet portion and said suction chamber being sized, shaped, and positioned so that the flat, divergent jet of incompressible propellant fluid produced by said outlet port does not contact said body;

(c) a supply connection for a mixture of a compressible fluid and abrasive particles attached to said body, said supply connection being in fluid communication with said suction chamber; and

(d) a discharge member attached to the distal end of said body, said discharge member containing an interior volume defined by two divergent walls and two convergent walls, said interior volume having a proximal end which is in fluid communication with the distal end of said first bore and a distal end which is open to the exterior of the nozzle, said two divergent walls being at least approximately perpendicular to the flat, divergent jet of incompressible fluid produced by said outlet port and diverging toward the distal end of said interior volume by an angle α which is at least approximately equal to the angle by which the flat, divergent jet of incompressible fluid produced by said outlet port diverges, each of said two convergent walls connecting said two divergent walls at opposite ends thereof and converging toward the distal end of said interior volume by an angle β, the angles α and β being selected and said interior volume being sized and shaped so as to produce a vacuum in said suction chamber which draws the mixture of compressible fluid and abrasive particles into said suction chamber, where they are entrained in the incompressible propellant fluid, and so that the flat, divergent jet of incompressible fluid produced by said outlet port does not contact said discharge member.

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ASSEMBLY OF COMPONENTS TRESTLE TYPE FOR OUTSIDE FITTINGS

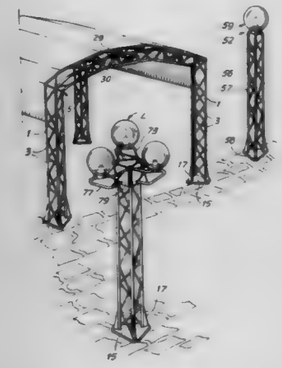
Giampaolo Targetti, Florence, Italy, assignor to Targetti Sankey S.p.A., Florence, Italy

Filed Mar. 15, 1985, Ser. No. 712,551

Claims priority, application Italy, Sep. 18, 1984, 11825/84[U]; Sep. 18, 1984, 11826/84[U]; Sep. 18, 1984, 11827/84[U]; Sep. 18, 1984, 11828/84[U]; Sep. 18, 1984, 11829/84[U]

Int. Cl.⁴ E04H *12/00*

U.S. Cl. 52—28 **6 Claims**



5. Support apparatus for exterior use comprising in combination:

at least a support assembly including a plurality of linear support members each of which is formed of at least three longitudinal beams juxtaposed in a predetermined substantially parallel spatial relationship and being networked together with brace members so that said beams terminate in a common plane at one end of said support members, said support members being of substantially identical cross section and having at the ends of their beams in said common plane coupling means, a set of coupling members for joining two of said support members in end-to-end curvilinear relationship to one another comprising at least two joining members of a first radius of curvature and a first length having at both ends means for connecting them to said couping means of said beams and at least a third coupling member of a second radius of curvature and a second length, both ends of which are provided with means for connecting them with said coupling means of said beams, whereby said support assembly has at least two support members slantedly connected with respect to each other when said support members and coupling members are suitably joined, and

a light-supporting stanchion adjacent said support assembly capable of supporting a light fixture for casting light on said support assembly including a plurality of linear supports joined end-to-end, each of which includes three poles juxtaposed in triangular relationship with respect to each other and networked together with a plurality of bracing parts, and a light support for mounting atop said

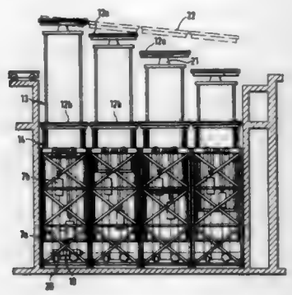
assembly comprising three bars provided with right angles at their outer portions centrally connected at a support point, said bars being constructed and arranged so that their lower extremes abut the upper portions of said poles of said linear supports upon mounting thereon.

4,633,625

PEDESTAL UNIT HAVING RAISABLE AND LOWERABLE PLATFORMS

Peter H. Dieban, Gustavsburg, and Helmut Ziller, Wesel, both of Fed. Rep. of Germany, assignors to Man Gutehoffnungshuette GmbH, Nuremberg, Fed. Rep. of Germany

Filed Sep. 23, 1983, Ser. No. 535,378
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1982, 3235990
Int. Cl.⁴ E04H 3/26
U.S. Cl. 52—30 9 Claims



1. A pedestal unit for a theater stage, comprising:
first and second structures each having a platform on a corresponding end, the first structure being telescopically nestable in the second structure with the platform thereof on top of the platform of the second structure, whereby to be an upper platform; and
a framework about the structures having means therein comprising a motor-driven chain and counterweight unit for each structure for raising and lowering the first structure relative to the second and, independently, raising and lowering the first structure with the second relative to the framework, whereby the platforms of the structures can be variably spaced from each other as well as raised and lowered relative to a fixed reference.

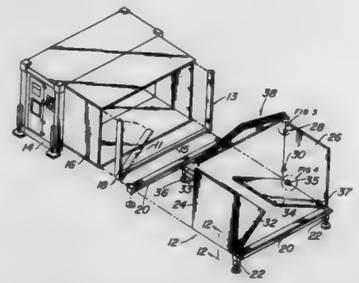
4,633,626

KNOCK-DOWN EXTENDIBLE SHELTER

Richard B. Freeman, Wilmington, Del., and Walter S. Eggert, Jr., Huntington Valley, Pa., assignors to The Budd Company, Troy, Mich.

Filed Dec. 3, 1984, Ser. No. 677,627
Int. Cl.⁴ E04H 1/12
U.S. Cl. 52—71 6 Claims

1. An extendible shelter comprising:
(a) a plurality of similar units each including floor, side wall and roof panels;
(b) hinge members for connecting said side wall panels to previously assembled wall panels as units are added;
(c) second hinge members for connecting a pair of wall panels to a pair of floor panels in the same unit;
(d) a support beam for supporting said floor panels;
(e) truss members connected to adjacent assembled wall panels; and
(f) means for connecting said roof panels to said truss members;
(g) flexible gaskets including open areas disposed within said gaskets to permit water drainage disposed around said panels and between adjacent panels when said shelter is assembled;
(h) lateral support beams connected to adjustable jacks to permit leveling of said floor panels;
(i) each said lateral support beams supporting floor panels of two adjacent units;



(j) each of said units including a pair of floor panels extending outwardly from a pair of said side wall panels towards a center of said extendible shelter;
(k) center support beams connected to adjustable jacks centrally disposed along said shelter to support a pair of floor panels in said units, and
(l) locking mechanism including latches to lock said floor panels to said lateral and center support beams.

4,633,627

EARTH ANCHORS

Michael C. Tucker, Brisbane, Australia, assignor to Gearhart Australia Limited, Queensland, Australia

Filed Sep. 11, 1984, Ser. No. 649,551
Claims priority, application Australia, Sep. 14, 1983, PG1404; Feb. 6, 1984, PG3478
Int. Cl.⁴ F16B 13/04; E04B 1/41
U.S. Cl. 52—162 7 Claims



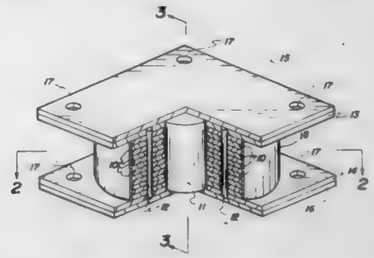
1. An earth anchor comprising an insertable shank portion for insertion into a borehole in an earth formation, said insertable shank portion having a looped end with spaced opposing sides; and at least one apertured disk-like locking member freely slidable and captively located on each opposing side with each said opposing side passing through an aperture in a respective said locking member, said at least one locking member on each opposing side being mutually engageable with the other at their respective inner ends to obtain a mechanical advantage when tension is applied to said shank portion to wedgingly engage their respective outer ends with the wall of said borehole.

4,633,628

DEVICE FOR BASE ISOLATING STRUCTURES FROM LATERAL AND ROTATIONAL SUPPORT MOTION

Naser Mostaghel, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed Oct. 31, 1985, Ser. No. 794,249
Int. Cl.⁴ E02D 27/34
U.S. Cl. 52—167 11 Claims



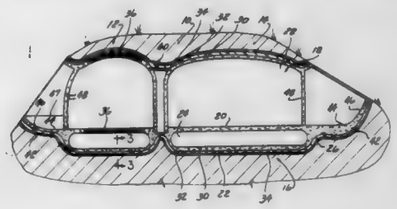
1. Base isolator apparatus for isolating structures from lateral ground motion, comprising in combination:
a plurality of abutting flat plates arranged in a vertical stack and being slideably disposed with respect to each other, each plate having a centrally oriented aperture therein:
an elongate, vertically oriented central rubber core unattachedly disposed within the apertures of said stack of plates and extending the full height of said stack; and
means for securing said stack of plates to a base and a structure.

4,633,629

MODULAR BUILDING STRUCTURE

Richard D. Britz, Eugene, Oreg., assignor to Earthship Enterprise, Inc., Mt. Pleasant, Mich.

Division of Ser. No. 392,643, Jun. 28, 1982, Pat. No. 4,519,176.
This application May 8, 1985, Ser. No. 731,930
Int. Cl.⁴ E02D 27/00; E04H 9/00
U.S. Cl. 52—169.11 10 Claims



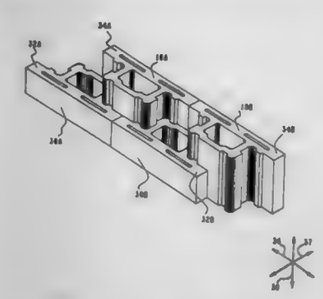
1. A modular building structure comprising:
an integral base completely nestable in ground surrounding the structure, the integral base having a lower planar portion in contact with the ground, sidewalls having an outwardly facing convex form extending outwardly from the lower planar portion and an upper planar portion extending between the sidewalls to define a hollow space between the lower planar portion and the upper portion; and
a hollow upper shell having a continuous outer wall perpendicular to the upper planar portion and an outwardly facing convex upper surface contiguous thereto opposite the base, the hollow upper shell integrally joined to the sidewalls and upper planar portion of the base, wherein the hollow shell and the base are formed of an inner layer of poured concrete which is applied in its non-solid form.

4,633,630

STRUCTURAL BLOCKS AND STRUCTURAL SYSTEM UTILIZING SAME

Stavros Kindylides, Victoria, Canada, assignor to G. R. Block Research and Development Corporation, Victoria, Canada

Filed Feb. 25, 1986, Ser. No. 833,094
Int. Cl.⁴ E06B 1/00; E04B 1/04; E04C 1/10
U.S. Cl. 52—204 26 Claims



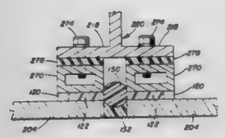
1. A structural block, comprising:
(a) a longitudinally extending member having vertical inner and outer faces;
(b) a web centred on and projecting away from said inner face and extending from top to bottom of said member along one half of the longitudinal extent of said inner face;
(c) tongue and groove projections and recesses on said inner face and on said web for mating with corresponding projections and recesses on identical blocks, whereby a plurality of said blocks may be longitudinally, transversely and vertically interlocked together.

4,633,631

CURTAINWALL SYSTEM

Stephen L. Crandell, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 572,328, Jan. 20, 1984, Pat. No. 4,543,755.
This application Jun. 27, 1985, Ser. No. 749,234
Int. Cl.⁴ E04B 5/30
U.S. Cl. 52—235 28 Claims



1. Curtainwall for a structure, comprising:
a grid having panel supporting surfaces;
means for mounting said grid to the structure;
a panel having a surface facing the structure interior defined as an inner surface, a surface opposite said inner surface defined as an outer surface, a peripheral edge between and continuous with said inner and outer surfaces, and a peripheral corner portion at the juncture of the peripheral edge and the outer surface of said panel;
hanger means;
means for securing said hanger means on the inner surface of said panel with said hanger means terminating short of the peripheral corner portion;
weatherstripping interposed between said hanger means and

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selected portions of said panel supporting surfaces of said grid; and,

means for attaching said hanger means to said grid and urging said weatherstripping against said hanger means.

4,633,632

STRUCTURAL COMPONENT HAVING A CURVED WALL AND APPARATUS FOR MAKING SUCH STRUCTURAL COMPONENT

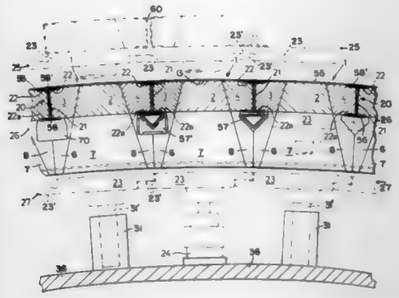
Branko Sarh, Watertown, Mass., assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 670,472

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341564

Int. Cl.⁴ E04C *2/36*

U.S. Cl. 52—245 **9 Claims**



1. A structural component having a curved wall with a longitudinal axis, comprising longitudinal stringers (**20**) extending substantially in parallel to said longitudinal axis and having a given width in a direction toward said longitudinal axis and ribs (**28**) extending substantially perpendicularly to said stringers (**20**) and circumferentially relative to said longitudinal axis for forming a grid structure, planking means covering said grid structure, said ribs, stringers and planking means being made of fiber reinforced synthetic material and bonded to one another, said ribs further comprising reinforcing belt segments (**28**) also made of fiber reinforced synthetic material and having a width dimension in the direction toward said longitudinal axis corresponding to a multiple of said given width dimension of said stringers for forming radially extending flanges for reinforcing the respective rib, wherein said ribs and stringers comprise preimpregnated bands of fiber reinforced synthetic material forming rectangular box frames having longitudinal sides and short ends assembled in an end to end and side by side fashion for forming said grid structure, first means bonding said longitudinal sides to each other to form said stringers, and second means bonding said short ends to each other to form said ribs.

4,633,633

WATERPROOF FLOOR FORMATION

Martin Bard, Amberg, Fed. Rep. of Germany, assignor to Buchtal Gesellschaft mit beschrankter Haftung, Amberg, Fed. Rep. of Germany

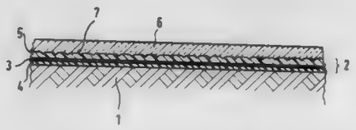
Filed Sep. 18, 1985, Ser. No. 777,220

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1984, 3434559

Int. Cl.⁴ E04F *13/08*

U.S. Cl. 52—384 **6 Claims**

1. A waterproof floor formation for application over a rigid support surface, a laminated sheet having upper and lower layers and an intermediate layer of fibrous material; a surface of ceramic tile, said tile having a relief formed on their lower faces; said upper and lower layers of said sheet each being formed of asphalt; said lower layer providing a bonding means for securing said sheet to the support surface; the upper layer being thicker than said lower layer and providing a bonding



means for securing and supporting the tile; the depth of the relief on the tile being less than the thickness of said upper layer whereby said relief does not contact said intermediate layer when said tile have been laid to form a smooth, flat surface.

4,633,634

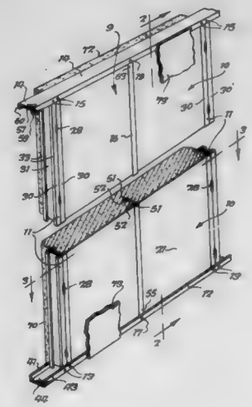
BUILDING SIDE WALL CONSTRUCTION AND PANEL THEREFOR

Albert E. Nemmer, 5371 Shimerville Rd.; Albert W. Nemmer, 5361 Shimerville Rd., both of Clarence, N.Y. 14031, and Joseph E. Nemmer, 305 A. Audino La., Rochester, N.Y. 14624

Filed Aug. 30, 1985, Ser. No. 774,746

Int. Cl.⁴ E04C *1/10*

U.S. Cl. 52—474 **27 Claims**



1. A building side wall construction comprising a bottom channel having a first horizontal web and first legs extending upwardly therefrom, a plurality of rigid expanded plastic panels having inner and outer faces and opposite end portions and opposite vertical side edge portions, connecting studs for connecting said opposite side edge portions to each other, each of said connecting studs comprising a pair of C-shaped channels having second webs and second legs extending outwardly therefrom with said second webs being secured to each other in fixed back-to-back relationship, and elongated slots in said side edge portions for slidably receiving said second legs in substantially complementary mating relationship, said second legs of said C-shaped channels having outer end portions remote from said second webs which extend transversely to said second legs, and bottom ends portions on said connecting studs received in said bottom channel.

4,633,635

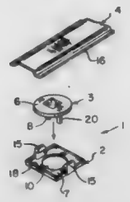
PANEL INSTALLATION CLIP

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas, Inc., Totowa, N.J.

Continuation-in-part of Ser. No. 516,093, Jul. 22, 1983, abandoned. This application Jun. 25, 1984, Ser. No. 624,182

Int. Cl.⁴ E04B *5/52*

U.S. Cl. 52—489 **11 Claims**



1. Panel installation clip for fastening panels having longitudinal rims thereon to a carrier, characterized in that said clip comprises a base part adapted to be engaged with and supported from a carrier and a panel engaging part having thereon a bearing portion rotatably engaging a surface of said base and supporting said panel engaging part on said base part, hook means for connecting said base part to said carrier and for retaining said bearing portion of the panel engaging part on said base part against removal therefrom independently of the engagement of the base part with the carrier, said panel engaging part having means adapted to retain at least one longitudinal rim of adjacent panels.

4,633,636

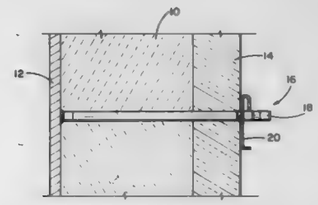
RETAINER ASSEMBLY

William E. Alexander, P.O. Box 791, Ponca City, Okla. 74602

Filed Jan. 22, 1985, Ser. No. 693,841

Int. Cl.⁴ E04B *1/40, 1/62;* **F16B** *21/16*

U.S. Cl. 52—512 **9 Claims**



1. A retainer assembly for retaining insulation material or the like adjacent a surface, the retainer assembly comprises a longitudinally-extending member having at least one throat portion thereon, and a retainer member for mounting thereon; the retainer member further comprises a body having at least two prongs exteriorly-extending therefrom and which lie in the same plane to define a channel there between, an outer portion of the prongs being folded back, the channel having a first zone adjacent to the folded-back portions of the prongs and a second zone not adjacent to the folded-back portions of the prongs;

the first zone having a width less than a cross-length of the throat portion of the longitudinally-extending member, and the folded-back portions of the prongs having a height greater than a height of the throat portion of the longitudinally-extending member; and

upon passage of the throat portion through the first zone of the channel, the folded-back portions of the prongs are compressed and released from compression to thereby retain the longitudinally-extending member within the second zone of the channel.

4,633,637

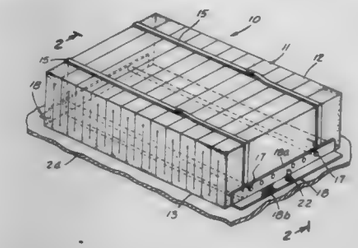
HEAT INSULATING MODULE AND METHOD OF ASSEMBLY FOR USE IN A HIGH TEMPERATURE CHAMBER

Carl E. Frahme, Canyon Country, Calif., assignor to Industrial Insulations, Inc., Industry, Calif.

Filed Jan. 30, 1986, Ser. No. 824,111

Int. Cl.⁴ F23M *5/00;* **E04B** *1/80*

U.S. Cl. 52—512 **9 Claims**



1. A unitary heat insulating module adapted to be handled and/or secured to the interior side of a high temperature chamber as a unitary assembly comprising:

a multiplicity of rectangular layers of refractory fibers held pressed against one another and impaled on at least one tie member extending through each of said layers adjacent but spaced inwardly from one longer edge of said layers; and

a single pair of elongated L-shaped mounting members having one leg of each lying parallel to one another adjacent a respective end of said at least one tie member and secured thereto thereby to hold all of said layers compressed and snugly secured against one another on said at least one tie member and the other leg of said mounting members lying in a common plane close to and parallel to said one longer edge of said layers and extending away from one another along and outwardly of the opposite sides of said module and accessible for use in securing said unitary module assembly to the interior side of a high temperature chamber.

4,633,638

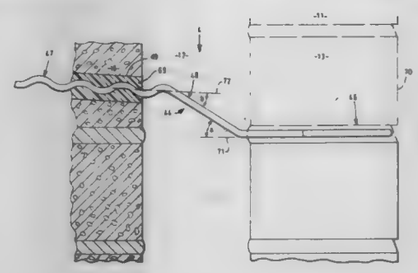
REPLACEMENT OF WALL TIES AND APPARATUS AND TIES FOR USE THEREIN

Dennis E. Ash, Sutton Coldfield, England, assignor to Tarmac Construction Limited, Wolverhampton, England

Filed Dec. 19, 1983, Ser. No. 562,695

Int. Cl.⁴ E04B *1/02*

U.S. Cl. 52—562 **3 Claims**

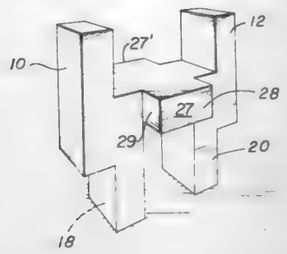


2. An old rehabilitated cavity wall comprising inner and outer leaves reinforced by wall ties installed after the wall has been completed;

each of the inner and outer leaves comprising a plurality of

masonry elements bonded together with a jointing medium;
the inner and outer leaves being tied together by a plurality of single piece wall ties;
each wall tie comprising first and second end portions and an elongated mid-portion extending between the end portions;
the tie first end portion being substantially flat and parallel to a reference plane which is defined by a surface of the first end portion;
the second end portion being spaced substantially from said plane and the mid-portion being arranged with its length inclined at an acute angle to said reference plane;
the tie second end portion being embedded in a hole bored in a masonry element of the inner leaf of the cavity wall;
the tie first end portion being embedded in a joint between, and not in, two adjacent masonry elements of the outer leaf of the cavity wall;
the tie second end portion being at a different level than the joint in which the tie first end portion is embedded; and
one of the two adjacent masonry elements fills an opening in the outer leaf made when the tie in installed.

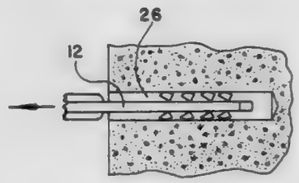
4,633,639
CONSTRUCTION BLOCK
Michael L. Deimen, 11695 Oak Hill, Pinckney, Mich. 48169
Filed Dec. 5, 1983, Ser. No. 557,888
Int. Cl.⁴ E04C *1/10, 1/30*
U.S. Cl. 52—590 **16 Claims**



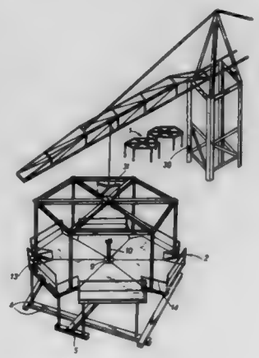
1. A generally H-shaped construction block comprising two opposed vertical portions each having a top and a bottom and joined by a horizontal central portion between the tops and bottoms, said horizontal portion having two longer parallel vertical sides and two shorter parallel vertical sides, said junctures centered on the longer vertical sides of the horizontal portion, said horizontal portion located substantially intermediate the tops and bottoms of the vertical portions and extending beyond both sides of the vertical portions and said longer vertical sides of the horizontal portion substantially equal to the distance between the tops of the vertical portions, and said shorter vertical sides of the horizontal portion substantially equal to the distance between the bottoms of the vertical portions.

4,633,640
WALL ANCHOR OR SUPPORT
Gerhard P. Hutter, 993 Lake Ave., Greenwich, Conn. 06830
Filed Mar. 25, 1986, Ser. No. 843,560
Int. Cl.⁴ E05D *5/00*
U.S. Cl. 52—704 **6 Claims**

1. A wall anchor or support for insertion in an opening in a wall structure comprising a support end portion and a shank portion, a plurality of members each having a curved surface and two straight side surfaces, said side surfaces being connected together at adjacent ends to form a joint which is affixed to said shank at spaced locations thereon whereby said members are capable of limited pivotal movement when said shank is inserted in said opening and when force is applied to said wall anchor in a direction away from said wall structure whereby said curved surfaces of said members pivot to frictionally grip an interior surface of said opening to thereby prevent the wall anchor from being dislodged from said wall structure.

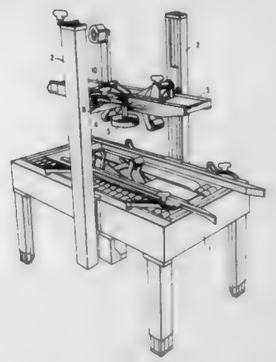


4,633,641
METHOD FOR MOUNTING SKELETONS OF SUPERSTRUCTURES AND JIG FOR IMPLEMENTING SUCH METHOD
Johann Heinbuchner, Attnang-Puchheim, Austria, assignor to Doubrava KG, Austria
PCT No. PCT/EP83/00014, § 371 Date Nov. 2, 1983, § 102(e) Date Nov. 2, 1983, PCT Pub. No. WO83/02634, PCT Pub. Date Aug. 4, 1983
PCT Filed Jan. 19, 1983, Ser. No. 545,377
Claims priority, application Switzerland, Jan. 22, 1982, 398/82
Int. Cl.⁴ E04B *1/348;* **E04G** *21/18*
U.S. Cl. 52—747 **17 Claims**



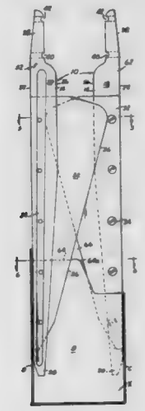
1. A process for assembling a modular cell of a high building having a skeleton and consisting of a plurality of such cells which comprise self-supporting vertical skeleton support means having pin receiving holes and horizontal beam means having pin receiving holes matching the holes in the vertical skeleton support means which are pinned together by inserting pin means into respective matching holes, the process comprising the steps of:
arranging jig means;
orienting and securing at least said horizontal beam means on said jig means;
assembling said support means and said oriented beam means by inserting said pin means into said holes; and
placing the cell, after being prefabricated in this way, onto the respective location of said building to be assembled by a plurality of such cells.

4,633,642
PRESSURE ROLLER DEVICE FOR LATERALLY RETAINING BOXES IN PACKAGING MACHINES WITH AUTOMATIC BOX FEED
Adelio Lissoni, Vedano Olona, Italy, assignor to S.I.A.T. Societa Internazionale Applicazioni Techniche S.p.A., Turate, Italy
Filed Oct. 3, 1985, Ser. No. 783,441
Claims priority, application Italy, Oct. 5, 1984, 23459/84[U]
Int. Cl.⁴ B65B *7/16, 51/06*
U.S. Cl. 53—137 **3 Claims**



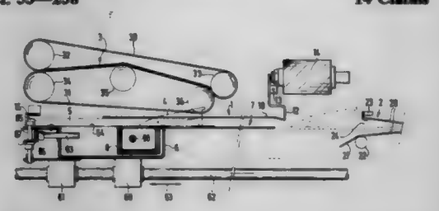
1. In a packaging machine for cardboard boxes, comprising means supporting the boxes and two lateral uprights (2) along which vertically slide the ends of a horizontal cross-member (4) supporting a taping head (3), a lateral retention and guiding device for the boxes comprising a plate (8) from which a support arm (7) projects, said plate being mounted oscillating on a vertical pivot (11) fixed to the cross-member (4) supporting the head (3), a pressure roller (5) mounted freely rotating on a vertical pin (6) carried at the free end of said support arm (7), said plate having an arcuate slot (9) with its center on the axis of rotation of said plate, and a bolt (12) and nut (10) one of which is fixed to said cross-member supporting the head, the bolt extending through said slot.

4,633,643
GUIDE MECHANISM FOR LOADING CARTONS
Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corp., Atlanta, Ga.
Filed Sep. 21, 1981, Ser. No. 304,187
Int. Cl.⁴ B65B *39/02*
U.S. Cl. 53—248 **10 Claims**



1. A guide member for a drop loading mechanism adapted to be used in sets to guide articles into a cellular carton during a drop loading procedure in which the sets of guide members have a first portion extending into the cells past the tops of the carton partitions and a second portion located above the carton partitions, said guide member comprising an elongate loading finger having upper and lower ends and a central axis, said finger including shank means at the upper end for connecting said finger to the drop loading mechanism and a pair of flanges defining a back face and a front face thereon, said flanges extending outwardly from the axis of the finger substantially at right angles to one another whereby said flanges meet to form a corner spine extending centrally along said back face, each flange terminating in a free edge remote from said corner spine and tapering axially from the upper end towards the lower end of said finger, one of said flanges defining an outwardly projecting axially tapered guide plate portion projecting from the upper end of said flange a distance greater than the distance between adjacent sets of said guide members so that the upper end of said plate portion overlaps the back face of a loading finger in the adjacent set, said guide plate portion tapering inwardly toward the lower end of said finger so that said plate portion has a width less than one-half the distance between adjacent sets of fingers at the top of the carton partitions.

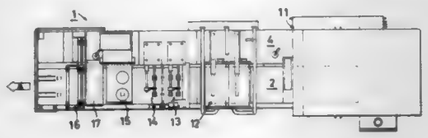
4,633,644
DEVICE FOR INSERTING BUNDLES INTO ENVELOPES
Jean-Claude Haroutel, Orsay, and Christian Galceran, Ballancourt sur Essonne, both of France, assignors to Societe Anonyme dite: SMH ALCATEL, Paris, France
Filed Sep. 13, 1985, Ser. No. 775,557
Claims priority, application France, Sep. 14, 1984, 84 14141
Int. Cl.⁴ B65B *5/00*
U.S. Cl. 53—258 **14 Claims**



1. Device for inserting bundles into envelopes, comprising:
a fixed bundle entry station defined by a fixed horizontal plate for supporting said bundle,
a fixed open envelope holding station for supporting an envelope open, facing and spaced from said entry station,
guides extending horizontally beneath said entry station, and a carriage mounted on said guides and movable horizontally in translation on said guides,
a bundle receiving table carried by said carriage and movable under said entry station,
drive means having a forward stroke and a return stroke for reciprocating said carriage between a working position in which said table is inserted in the envelope and an idle position below said entry station,
retractable pusher fingers, parallel support arms extending between the entry station and said table and means on said support arms for pivotably mounting said pusher fingers from first end portions of said support arms and for moving said pusher fingers longitudinally relative to said support arms for raising said pusher fingers to form an abutment for said bundle on the forward stroke and for lowering said pusher fingers on the return stroke,
coupling means between said support arms and said carriage comprising at least elastic first linking means for relative translation to the extent of said longitudinal movement of said pusher fingers on said support arms, between the forward stroke and the return stroke and vice-versa, and means responsive to translational movement of said carriage for raising said pusher fingers respectively on said

support arms to form an abutment for pushing the bundle off said plate onto said table and into said envelope and lowering thereof upon return under said plate.

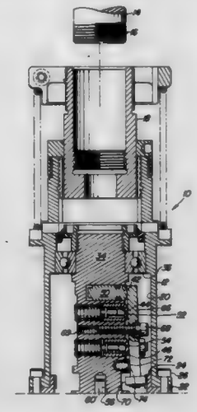
4,633,645
PACKAGING MACHINE
Katsuhiro Joo, Tokushima, Japan, assignor to Shikoku Kakooki Co., Ltd., Tokushima, Japan
Filed Jul. 15, 1983, Ser. No. 514,234
Claims priority, application Japan, Jul. 15, 1982, 57-123940
Int. Cl.⁴ B65B *55/10*
U.S. Cl. 53—282 **5 Claims**



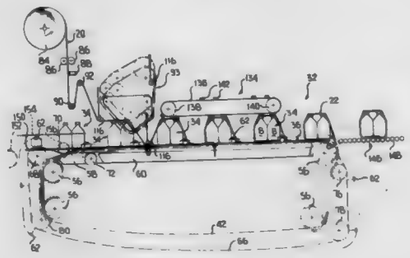
1. A packaging machine comprising:
a container transport conveyor having a plurality of container holders for retaining containers, each container holder being adapted to restrain containers retained therein from moving horizontally while permitting vertical movement of the containers retained therein;
a closed main chamber having opposite side walls and enclosing the container transport conveyor in its entirety;
a closed rear chamber disposed in communication with the main chamber to the rear of the main chamber with respect to the running direction of the conveyor and enclosing the container forming-feeding unit in its entirety;
a group of units, including at least a filling unit, a capping unit and a container discharge unit arranged in series on a top wall of the main chamber from a rear portion toward a front portion with respect to a running direction of the conveyor, the group of units having portions operative on containers and extending into the main chamber;
at least one rail disposed below and parallel with an upper path of travel of the container holders for supporting the bottoms of the containers retained by the container holders and for guiding the containers, said at least one rails being movable upwardly and downwardly; and
a rail lifting assembly for moving at least one rail,
the rail lifting assembly comprising a hydraulic cylinder positioned laterally of the main chamber and provided with a piston rod, a rotary shaft extending transversely through the main chamber, supported by the opposite side walls of the main chamber and having one end projecting outward from the main chamber, a first arm having an upper end secured to the piston rod and a lower end pivoted to the projecting end of the rotary shaft and a plurality of second arms each having a lower end pivoted to the rotary shaft within the main chamber and an upper end secured to said rail.

4,633,646
CAPPING HEAD
Darwin L. Ellis, and Frank M. Kelly, both of Richmond, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Oct. 29, 1985, Ser. No. 792,579
Int. Cl.⁴ B67B *1/06;* **B65B** *7/28*
U.S. Cl. 53—331.5 **22 Claims**

1. A capping head comprising a housing adapted to be secured to a drive spindle, a quill mounted in said housing for free rotation therewith and containing a pair of poppet valves, a torque-dependent clutch having a drive plate connected to said housing and a driven plate connected to said quill, a chuck capable of gripping a prethreaded closure attached to said driven plate and fluidly activated between an open and a closed position by said poppet valves, activating means attached to said quill and cooperating with said housing to selectively operate said poppet valves when the torque value between said drive plate and said driven plate exceeds a predetermined value, and conduit means for routing pressurized fluid to and from said poppet valves.

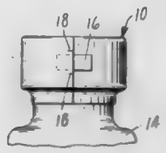


4,633,647
WRAP FOR ARTICLE CLUSTERS AND APPARATUS FOR AND METHOD OF APPLYING SAME
Robert H. Ganz, Saddle River, N.J., assignor to The Mead Packaging Corporation, Dayton, Ohio
Filed Mar. 8, 1985, Ser. No. 709,724
Int. Cl.⁴ B65B *21/24*
U.S. Cl. 53—398 **20 Claims**



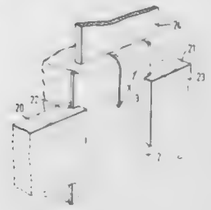
1. An apparatus for applying a wrap to a cluster of articles in the formation of a package, said apparatus comprising a conveyor for receiving article clusters from a delivery mechanism arranged in spaced relation and delivering wrapped article clusters to a discharge mechanism, said conveyor having at regularly spaced intervals wrap receiving openings extending transversely of a longitudinal direction of movement of said conveyor, said openings being spaced a distance greater than the dimension of an intended cluster in the direction of movement of said conveyor whereby a portion of a wrap may be directed downwardly through each opening, retarder means for engaging and holding back each article cluster conveyed by said conveyor, means for advancing said retarder means in unison with said conveyor but at a slower rate wherein each of said openings after receiving a portion of a wrap progressively passes under a next forward article cluster, and means for supplying an elongated wrap of a length greater than that required to wrap each article cluster, and means for advancing an intermediate portion of such wrap through each of said conveyor openings in sequence.

4,633,648
CONTAINER CLOSURE SEAL AND METHOD OF MAKING
Wing W. Yeung, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed May 6, 1985, Ser. No. 730,489
Int. Cl.⁴ B65B *61/18*
U.S. Cl. 53—412 **6 Claims**



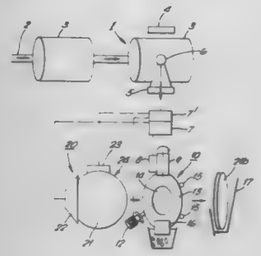
4. A method for forming a heat shrinkable polyolefin film useful for forming a seal of the type comprising a length of polymeric film heat shrunk about a closure and an outlet portion of a container closed by the closure, which seal must be at least partially peeled away to afford access to the closure and opening of the container, said method comprising the steps of:
uniaxially orienting polyolefin at a temperature in the range of about 120° to 170° C. by stretching the film without restraining its edges at a draw ratio in the range of about 3/1 to 10/1 to form a film having a thickness in the range of about 0.0025 to 0.009 centimeter;
quickly cooling the oriented film to prevent substantial heat annealing and provide a heat shrinkable film.

4,633,649
PROCESS AND DEVICE FOR POSITIONING HANDLES OR RIGIDIFYING ELEMENTS ON A TUBULAR SLEEVE
Paoul Louis A. Gautier, Belmont sur Vair, and Michel Cazes, Rue Jean Bouin, both of F-88800 Vittel, France
PCT No. PCT/FR84/00259, § 371 Date Sep. 16, 1985, § 102(e) Date Sep. 16, 1985, PCT Pub. No. WO85/02160, PCT Pub. Date May 23, 1985
PCT Filed Nov. 13, 1984, Ser. No. 758,648
Claims priority, application France, Nov. 15, 1983, 83 18257; Jun. 25, 1984, 84 10092
Int. Cl.⁴ B65B *61/14*
U.S. Cl. 53—413 **12 Claims**



1. In a process for the production of a sachet made from a flexible synthetic material for holding a liquid of a type wherein the sachet is formed from a pillow pack produced in continuous fashion from a sleeve of synthetic film wound on a mandrel with the sleeve being cut to form sleeve segments and the ends of the segments being sealed to form a pillow pack having flap-like corner portions, the improvement comprising:
attaching a handle to a portion of the sleeve while the sleeve portion is on the mandrel; and
subsequently folding the flap-like corner portion over onto the handle.

4,633,650
METHOD AND A DEVICE FOR CUTTING END DISKS FOR THE PACKING OF PAPER ROLLS
Jan-Henrik Sohlberg, and Seth I. S. Olsson, both of Forshaga, Sweden, assignors to Broderna Solbergs Forsaljnings Aktiebolag, Forshaga, Sweden
Filed Oct. 8, 1985, Ser. No. 785,528
Claims priority, application Sweden, Oct. 12, 1984, 8405106
Int. Cl.⁴ B65B *59/00, 61/06*
U.S. Cl. 53—415 **12 Claims**



1. A method of cutting end disks for the packing of paper rolls of variable diameter comprising:
providing a measuring means for measuring the diameter of each paper roll to be packed;
measuring the diameter of a paper roll with said measuring means;
providing at least one disk blank magazine for holding a plurality of disk blanks;
providing a cutting unit comprising a cutting table rotatable about a center axis and a knife which is radially movable relative to said center axis in response to the measured diameter of said paper roll;
feeding a predetermined number of disk blanks for the packing of said paper roll from said disk blank magazine to said cutting unit and fixing said predetermined number of disk blanks to said cutting table for rotation therewith;
moving said knife to a radial position relative to said center axis substantially corresponding to one-half of said measured diameter of said paper roll;
rotating said cutting table about said center axis and engaging said knife with said fixed disk blanks during such rotation to produce cut disks of a diameter substantially corresponding to said measured diameter of said paper roll and annular excess material;
removing said cut disks and said annular excess material separately from said cutting table.

4,633,651
APPARATUS AND METHOD FOR EXTRUDING AND PACKAGING PORTIONS OF EXTRUDABLE, FORM RETAINING PRODUCTS
Raymond S. Edmunds, 817 Eventide Dr., San Antonio, Tex. 78209
Filed Feb. 26, 1985, Ser. No. 705,905
Int. Cl.⁴ B65B *63/00*
U.S. Cl. 53—435 **18 Claims**

1. An apparatus for extruding and wrapping portions of a pliable product of individually wrapped portions being placed in trays, said apparatus comprising:
a housing;
means for receiving said pliable product within said housing;
drive means mounted on said housing;
means for dispensing said upper and lower substrates from pivotally mounted rolls on said housing;
means for pumping said pliable product from said receiving means through an extruder to product cutter means for cutting the extruder pliable product into portions, said

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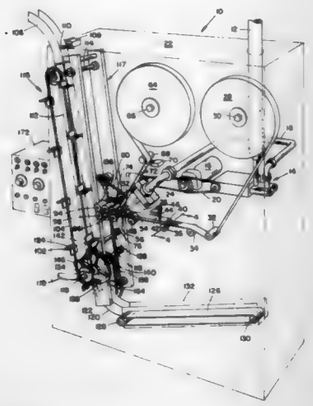
pumping means and said product cutter means being driven by said drive means;

channel forming means to form a channel in said lower substrate as received from said dispensing means;

draw means for drawing said upper and lower substrates together to adhere around said portions after said portions are dropped in said channel, depth of said channel being approximately same depth as said portions;

substrate cutting means for simultaneously cutting and pressing together said upper and lower substrates between said portions of said pliable product to form said individually wrapped portions;

tension means for separating said individually wrapped portions after said cutting and for depositing said individually wrapped portions in said trays;



tray advancement means for carrying said trays thereon to receive deposits of said individally wrapped portions, said tray advancement means being driven by drive means to advance as said deposits are made in a first of said trays;

means for rapidly moving said tray advancement means forward a specific amount as said deposits fill said first tray with said predetermined number of said individually wrapped portions and said deposits are started in a second of said trays, said rapid movement of said tray advancement means being repeated as said trays are filled; and

said drive means driving said draw means, substrate cutting means, tension means, tray advancement means, and said rapid movement means.

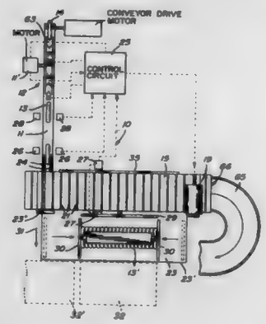
4,633,652

METHOD AND APPARATUS FOR AUTOMATICALLY PACKING SAUSAGE LINKS

Georges Dagenais, Montréal; Ghislain Michaud, Laval, and Michel Presseau, St.-Francois de Laval, all of Canada, assignors to Les Epiciers Unis Metro-Richelieu Inc., Montréal, Canada

Filed Feb. 4, 1986, Ser. No. 826,000
Int. Cl.[4] B65B *19/34, 19/10*
U.S. Cl. 53—444 **20 Claims**

1. An automatic sausage link packing machine comprising a feed conveyor means for feeding a plurality of spaced-apart sausage links in a lengthwise direction, compartment conveying means for receiving said sausage links in individual compartments and conveying them transversewise in side-by-side relationship to a grpup forming station, sensing means to determined a predetermined quantity of said sausage links at said group forming station to form a predetermined group of sausage links, unloading means for orienting said group of sausage links in substantially side-by-side contact relationship and unloading them into a container, and control means to permit said feed conveyor means and said compartment conveying means to position a second group of sausage links at said group



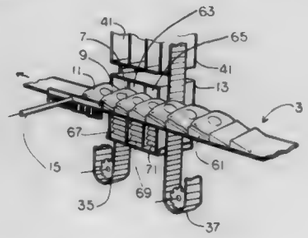
forming station during the operation cycle of said unloading means.

4,633,653

CASE PACKING APPARATUS

John T. Roberts, Rte. 5, Box 1981B, Clover, S.C. 29710, and Philip L. Reid, Rte. 2, Box 422, Duncan, S.C. 29334

Filed Oct. 29, 1984, Ser. No. 666,046
Int. Cl.[4] B65B *57/10*
U.S. Cl. 53—498 **1 Claim**



1. An apparatus for packing articles into a case, comprising:

first conveying means for moving a plurality of said articles seriatim in a first horizontal direction;

means for interrupting the movement of said articles along said conveying means when a predetermined plural number of said plurality of articles have arrived at a location along the length of said conveying means;

means for moving said predetermined plural number of said plurality of articles in a side-by-side relationship in a second horizontal direction which is substantially perpendicular to said first direction into a case to form a first layer in said case;

means on said conveying means for tilting said predetermined plural number of said plurality articles with respect to a horizontal plane for movement and for maintaining said article in said tilted position while said second direction moving means moves said articles into said case, but said case accommodating articles in an untilted state;

means for vertically moving said case downwardly after receipt of said first layer;

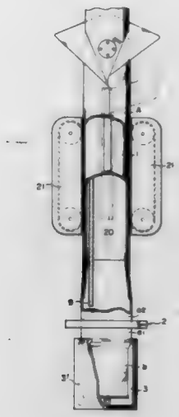
means for activating said conveying means after said means for moving has moved said predetermined plural number of articles from said location into said case for movement whereby said means for interrupting interrupts the movement of said articles when said predetermined number of articles have again arrived at said location for movement by said means for moving into said case to form subsequent layers therein.

4,633,654

AIR EXTRACTOR FOR BAG MAKING, FILLING AND PACKAGING MACHINE

Minoru Sato, Funabashi, and Takayuki Kanai, Matsudo, both of Japan, assignors to Tokyo Automatic Machinery Works, Ltd., Tokyo, Japan

Filed Jul. 9, 1984, Ser. No. 628,908
Int. Cl.[4] B65B *31/04, 9/20*
U.S. Cl. 53—511 **2 Claims**



1. In an apparatus for forming, filling and closing a series of bags, said apparatus including a bag-making cylinder around which a film can be wrapped to form a tube as the film passes along the length of said bag-making cylinder in a downstream direction and through the interior of which the articles intended to be contained in each bag can flow, a sealing means sealingly located adjacent the downstream end of said bag-making cylinder for closing the open top of a downstream bag and closing the bottom of an adjacent upstream bag, and an air extractor for removing air from within a bag which contains articles prior to the closing of its open top, the improvement wherein said air extractor means comprises

an exhaust pipe which extends along the interior of said bag-making cylinder to its downstream end, and

two frames which are positioned downstream of said sealing means and are movable toward and away from each other between an open position wherein a bag in which articles have been deposited can be positioned therebetween and a closed position wherein they provide an internal chamber in which a bag containing articles can be located, said two frames being sealingly connected to said sealing means when in their closed position, said two frames having mating surfaces; wherein one of said two frames includes a rubber seal on its mating surface which abuts the mating surface of the other of said two frames when in their closed position, said rubber seal being discontinuous on a side of said one frame facing said sealing means to provide a vent passage which, when vacuum is applied to said exhaust pipe, allows air from within a bag positioned in said internal chamber to flow therethrough and into said exhaust pipe; wherein one of said two frames contains a flexible elastomer therein which includes groove-shaped air passages arranged in a grid and an inlet opening which communicates with said air passages to enable pressurized air to flow into said groove-shaped air passages, and wherein the other of said two frames contains a flexible elastomer which provides a recess therein which helps constitute said internal chamber.

4,633,655

CASE PACKER

Biagio J. Nigrelli, Sr., Kiel, Wis., assignor to Nigrelli Systems, Inc., Kiel, Wis.

Filed Apr. 20, 1984, Ser. No. 602,527
Int. Cl.[4] B65B *5/06, 7/20, 43/28*
U.S. Cl. 53—543 **4 Claims**



1. Apparatus for loading open side cases having opposed pairs of leading and trailing vertical flaps and top and bottom horizontal flaps for closing the case sides, adjacent flaps being separated by notches, comprising:

(a) an open-bottom hopper for storing a plurality of folded case blanks in a generally vertical stack, the case blanks being folded into an upper layer and a lower layer, the blanks lying in a substantially horizontal plane in the hopper;

(b) stationary finger means mounted on the hopper to support the lowest blank in the stack;

(c) pulling means for pulling the lowest blank vertically downwardly from between the finger means and the next lowest blank in the stack and for partially opening the blank;

(d) case conveyor means for receiving and completely unfolding the partially unfolded case blanks into open side cases and for transporting the cases along a first path comprising:

(i) at least one pair of flight bars consisting of a leading and a trailing flight bar and defining a space therebetween for receiving a partially unfolded case blank from the pulling means and for holding the case while it is opened and transported;

(ii) chain and sprocket means for positioning the space between the flight bars vertically beneath the hopper to receive a partially opened blank;

(iii) drive means for driving the chain and sprocket means in synchronization with the pulling means; and

(iv) a pair of stationary plows lying in a substantially horizontal plane and having upstream ends adapted to enter the notches between the opposed pairs of leading vertical flaps and adjacent bottom horizontal flaps to control the location of the bottom horizontal flaps as the chain and sprocket means transports the cases along the first path between the hopper and case loading means, each plow having a downstream end;

(e) article conveyor means for conveying a multiplicity of generally upright articles along a pair of second paths;

(f) case loading means for receiving the open side cases and articles and for simultaneously side loading a case from both sides with complements of a predetermined number of the articles;

(g) flap control means located on each side of the case loading means and actuated by the articles being loaded for restraining the location of the opposed vertical case flaps while the articles are being loaded into a case from both sides thereof;

(h) folding and bonding means for folding and applying adhesive to the flaps to form a closed case; and

(i) compression means for setting the adhesive.

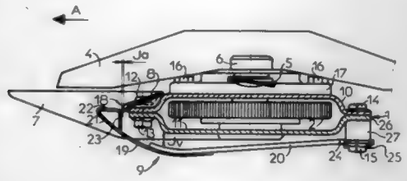
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4,633,656

DISK MOWER SUBSTANTIALLY PREVENTING SOIL ACCUMULATION ON ITS HOUSING

Joseph Willinger, Bouxwiller, France, assignor to Kuhn S.A., Saverne, France

Continuation of Ser. No. 681,082, Dec. 13, 1984, abandoned, which is a continuation of Ser. No. 510,269, Jul. 1, 1983, abandoned. This application Jan. 15, 1986, Ser. No. 820,574
Claims priority, application France, Jul. 9, 1982, 82 12234
Int. Cl.[4] A01D *55/18*
U.S. Cl. 56—13.6 **35 Claims**



30. A soil accumulation prevention device for use in connection with a disk mower, said disk mower including a housing and at least two disks rotatably mounted in said housing and operable thereabove, each disk including at least one cutter, comprising in combination,

soil removal means, and

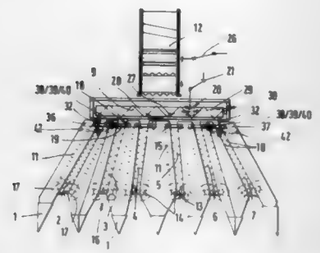
suspension means connected to said soil removal means and adapted to be suspended from said housing so as to allow said soil removal means to extend at the front portion of said housing and as seen from above, completely within the area delimited by the trajectories of the said cutter during rotation, and to have at least one degree of freedom of movement with respect to said housing to move along a substantially vertical direction and in an upwardly sense.

4,633,657

FRONT ATTACHMENT OF FIELD CHOPPING MACHINE FOR PICKING AND TRANSPORTING STALK FRUITS STANDING IN ROWS

Rudolf Arnold, Saulgau, Fed. Rep. of Germany, assignor to Claas Saulgau GmbH, Saulgau, Fed. Rep. of Germany

Filed Sep. 7, 1983, Ser. No. 530,074
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1982, 3233122
Int. Cl.[4] A01D *45/02*
U.S. Cl. 56—98 **2 Claims**



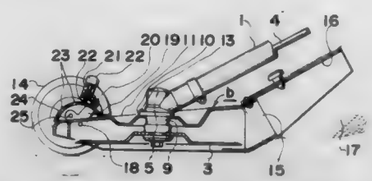
1. A front attachment of a field chopping machine for picking and transporting stalk fruits standing in rows, particularly corn, comprising a plurality of stalk dividers; at least four transporting passages laterally limited by said stalk dividers and extending inclined relative to one another toward a chopper of the field chopping machine, said transporting passages including two outer transporting passages each having a frame and a drive shaft with an inner end; and a transporting element provided in each of said transporting passages, said stalk dividers including two outer stalk dividers arranged so that said two outer stalk dividers with the respective transporting elements, are turnable upwardly about an axis extending in a travelling direction to an inoperative position and fixable in said position; a drive for said transporting elements of said transporting passages and including a main drive shaft located under said transporting passages and arranged so that said drive shafts of said outer transporting passages lie on the extension of said main drive shaft and are bringable into and out of driving connection with the latter during turning of said outer transporting passages, said main drive shaft having two ends; a coupling device provided at each end of said main drive shaft and operative for bringing said drive shafts of said outer transporting passages into and out of driving connection with said main drive shaft, each of said coupling devices being formed as a claw coupling and having one coupling half which is supported axially movable against a spring force on the inner end of the drive shaft of a respective one of said outer transporting passages, and another coupling half immovably connected with said main drive shaft; a supporting frame; and locking means for locking each of said outer stalk dividers in an operative position and including an opening provided in said supporting frame and an arresting pin axially movable on said frame of a respective one of said outer transporting passages parallel to the drive shaft against a spring force and engageable in said opening of said supporting frame, said axially movable coupling half having a collar provided with an annular groove, and each of said arresting pins having a drive lever with a fork-shaped free end engageable with said annular groove of said collar of said movable coupling half so as to move said movable coupling half relative to said immovable coupling half for unlocking said coupling halves and therefore uncoupling a respective one of said drive shafts from said main drive shaft.

4,633,658

LAWN MOWER

Masato Nogawa, Yokosuka, Japan, assignor to Oppama Kogyo Kabushiki Kaisha, Yokosuka, Japan

Filed May 2, 1985, Ser. No. 729,637
Claims priority, application Japan, Dec. 20, 1984, 59-268860
Int. Cl.[4] A01D *34/67, 34/74*
U.S. Cl. 56—255 **5 Claims**



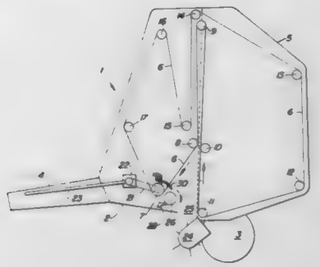
1. Lawn cutting apparatus comprising a portable power weeder having an elongated rod-like handle, a motor mounted at the rear end of said handle, a rotatable cutting blade operatively connected to the motor and journalled at the forward end of said handle in a bearing extending at an angle to said handle, and a separable carriage comprising a rigid cover removably mounted to the bearing and fitting over and peripherally enclosing said cutting blade, said cover having a discharge port along the rear edge thereof for removing cuttings and a single pair of wheels journaled at the forward end about a horizontal axis spaced forwardly of said bearing so that said apparatus can be pushed along the ground and said rotary cutting blade swung about said wheel axis through manipulation of said handle, said cutting blade and said wheel axis being arranged so that the peripheral tip of said cutting blade extends substantially to the vertical plane containing said wheel axis whereby fluctuation of the mowing height is reduced during operation of said apparatus.

4,633,659

CYLINDRICAL BALE-FORMING PRESS

Henry D. Anstey, Ottumwa, Iowa, and Jean Viaud, Sarregueminés, France, assignors to Deere & Company, Moline, Ill.

Filed Jan. 28, 1985, Ser. No. 695,319
Claims priority, application European Pat. Off., Jan. 27, 1984, 84400188
Int. Cl.[4] A01D *39/00*
U.S. Cl. 56—341 **6 Claims**



1. In a press for forming large cylindrical bales and including a plurality of belts supported on a plurality of rollers so as to define a chamber having an opening at its bottom, an upright forward portion defined by a first section of the plurality of belts which are driven in a direction toward the opening by a driven one of the rollers located at the front of the opening and an upright rearward portion defined by another section of the plurality of belts which is supported by another one of the rollers located at the rear of the opening and is driven in a direction away from the opening, a pickup located for gathering crop material from the ground and transferring it through the opening in a zone adjacent the rearward portion of the opening, and a starting roller located in the opening adjacent to the driven one of the rollers and driven in a direction which is the same as that in which the driven one of the rollers is driven, the improvement comprising: a scraper mounted forwardly of and adjacent to said starting roller and having an end located in the immediate vicinity of the periphery of the starting roller; and a plurality of fingers mounted at a location above the driven one of the support rollers and respectively projecting between the belts at the first section of the plurality of belts and having ends disposed in continuous adjacent relationship to an upper peripheral portion of the starting roller, whereby the fingers serve to deflect material carried by the first section of the plurality of belts rearwardly toward the upper periphery of the starting roller so as to augment the action of the starting roller in forming a bale and to consequently augment the action of the scraper in preventing crop material from wrapping around the starting roller.

4,633,660

PROCESS AND APPARATUS FOR REJOINING A THREAD ON AN OPEN-END FRICTION-SPINNING DEVICE

Peter Artzt; Gerhard Egbers, and Hans Rottmayr, all of Reutlingen, Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Aug. 28, 1985, Ser. No. 770,209
Int. Cl.[4] D01H *15/02*
U.S. Cl. 57—263 **30 Claims**

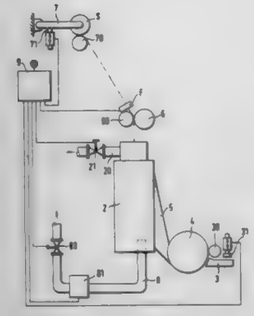
1. A process for rejoining a thread for restarting the spinning process on an open-end friction-spinning device, in which fibers are fed into a V-shaped nip formed by two driven friction rollers and subjected to suction, and the thread formed in the V-shaped nip is drawn off from the nip and wound onto a bobbin driven by drive roller, comprising the steps of:

providing a joinable length of a thread end for the V-shaped nip;

storing a predetermined length of said thread at the end of the V-shaped nip opposite the bobbin;

starting the thread draw off in coordination with the friction roller speed;

twisting said thread; and



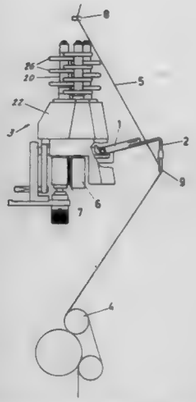
starting the fiber feed into the V-shaped nip formed by said driven friction rollers when a predetermined length of thread remains in said storage, whereby a smooth uniform length joint is formed between the thread being formed by the friction rollers and the thread end which had been stored.

4,633,661

RETHREADING ARRANGEMENT FOR FRICTION FALSE-TWISTING UNIT FOR TEXTILE THREADS

Gunther Paul, Hammelburg, and Kirit Patel, deceased, late of Elfershausen, both of Fed. Rep. of Germany (by Shakuntala Patel, heiress), assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed May 24, 1985, Ser. No. 738,045
Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419483
Int. Cl.[4] D01H *15/00, 1/241, 7/22*; D02G *1/08*
U.S. Cl. 57—280 **12 Claims**



1. A friction false-twisting unit for false-twisting textile threads, the unit comprising:

a mount for rotatable spindles; a support for the mount; three spindles projecting up from the mount and generally parallel to each other; a drive whorl on one of the spindles for engaging a drive belt for being driven to rotate, and the spindles being interconnected for rotation together; at

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least one respective friction disk on each of the spindles and rotatable therewith; the spindles being so placed and the friction disks being so sized that the disks on all three spindles are interleaved;

a support lever connected with at least one of the belt, the drive whorl and the mount for the spindles; the support lever having an operative position at which it causes the drive whorl and the belt to be in engagement for the belt to drive the whorl, and an inoperative position at which the support lever causes the belt and the drive whorl to be separated so that the belt does not drive the whorl to rotate; and

a thread guide arm connected to the support lever and movable therewith between the operative and inoperative positions of the support lever; the thread guide arm being so shaped that a thread passed over the thread guide arm when the support lever is in the inoperative position is held away from the disks and thereby is held away from contacting the disks; the thread guide arm also being shaped and positioned such that when the support lever is in the operative position, the thread guide arm is disposed where it will permit the thread to be moved into contact with the disks.

12. A method of threading a length of thread into a friction false-twisting unit, wherein the unit comprises three parallel spindles, each carrying at least one friction disk and the friction disks being interleaved; the method comprising

threading the thread past an upper thread guide above one end of the spindles, passing the thread past the spindles and passing the thread to a feeder system below the other end of the spindles;

separating the spindles from a means for driving the spindles and at the same time raising a thread guide arm outwardly of the spindles; the thread guide arm and the spindles being interconnected for causing said separating thereof to occur at the same time as said outward movement; the thread guide arm moving outwardly sufficiently that thread passed from the upper thread guide to the feeder system and past the thread guide arm is held out of contact with the disks; threading the thread from the upper thread guide, over and past the thread guide arm and to the feeder system and thereafter feeding the thread to the feeder system; and

moving the thread guide arm away from the position of holding the thread out from the disks, for enabling the thread to be moved in toward the disks, and separating the thread guide arm from the thread; and inserting the thread into the interleaved disks for causing the thread to be acted upon by all of the disks past which the thread is moved by the feeder system; wherein moving the thread guide arm away from said outward position causes the spindles to be drivingly engaged with the means for driving the spindles.

4,633,662

METHOD FOR PRODUCING FLAT YARN

Masahisa Toki; Seiji Satoh, both of Osaka; Yoshiaki Matsui; Kunio Morihata, both of Nagoya, and Toyoji Murata, Kiryu, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Sep. 23, 1985, Ser. No. 779,114

Claims priority, application Japan, Sep. 28, 1984, 59-203299

Int. Cl.⁴ D02G *1/00, 1/14, 7/00*

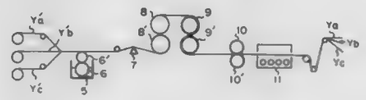
U.S. Cl. 57—286 **3 Claims**

1. A method for producing a flat yarn, comprising steps of:

continuously impregnating a plurality of material yarn fibers with a liquid capable of acting as a solvent for at least one of said fibers;

bringing said material yarn fibers into contact with a bar guide for aligning said fibers in parallel to form a flat body under a state of tension;

preheating said material yarn fibers; and



prior to complete drying of said solvent, gear-crimping said material yarn fibers.

4,633,663

TWIST GENERATOR FOR A RUNNING FIBER AGGREGATE

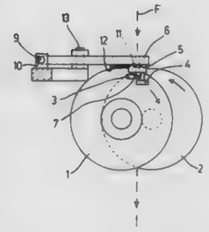
Louis Vignon, Geneva, Switzerland, assignor to Heberlein Hispano S.A., Vernier, Switzerland

Filed Jun. 21, 1985, Ser. No. 747,791

Claims priority, application Switzerland, Jun. 22, 1984, 3024/84

Int. Cl.⁴ D02G *1/08*

U.S. Cl. 57—340 **11 Claims**



1. In a twist generator for a running fiber aggregate, comprising two friction discs rotatable in opposite directions and having end faces turned towards one another for the twisting of the fiber aggregate running between the friction discs at a thread contact point, one of said friction discs being made flexible, pressure roll means in contact with said flexible friction disc for pressing the flexible friction disc towards the end face of the other friction disc; the improvement in which said pressure roll means comprises first and second pressure rollers in contact with said flexible friction disc respectively before and after the thread contact point of the friction discs in the direction of movement of said flexible friction disc, and means for adjusting the distribution of the total pressing force between the two pressure rollers.

4,633,664

OPEN-END ROTOR SPINNING APPARATUS

Hans-Friedrich Mueller-Storz, Dietweg 25, 8074 Gaimersheim, and Erich Bock, Rosenstrasse 11-1/2, 8071 Wettstetten, both of Fed. Rep. of Germany

Filed Jun. 12, 1984, Ser. No. 619,845

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1983, 3326405

Int. Cl.⁴ D01H *7/882*

U.S. Cl. 57—406 **10 Claims**

1. An open-end rotor spinning apparatus for use on an open-end spinning machine comprising:

(a) an open-end spinning rotor having a major diameter;

(b) a bearing casing;

(c) bearing members mounted in said bearing casing;

(d) a driven rotor shaft mounted by said bearing members for rotation in said bearing casing;

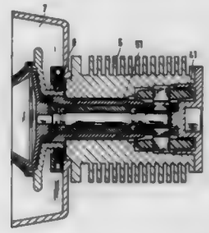
(e) a mounting on said open-end spinning machine in which said bearing casing is inserted;

(f) drive means for driving said rotor shaft;

(g) flange means for said bearing casing comprising:

(1) an annular flange carried by said bearing casing;

(2) said annular flange extending along the rear side of the spinning rotor to project over said major diameter of the spinning rotor, the portion of the flange extending



over the rear side of the rotor being axially spaced apart from the mounting and cooperating therewith to define a space therebetween adequate to permit said flange to be grasped; and

(3) said annular flange thereby providing a handle by which said spinning rotor together with said bearing casing may be removed from said mounting without removing said mounting.

4,633,665

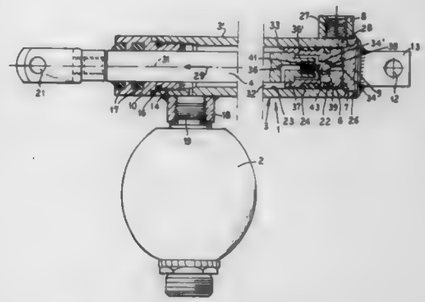
DOUBLE-ACTION PISTON/CYLINDER UNIT

Josef Büter, Neue Industriestr.1, and Heinrich Büter, Dorfstr 12, both of D-4472 Haren OT-Altenberge, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 684,846

Int. Cl.⁴ F16D *31/02*

U.S. Cl. 60—413 **1 Claim**



1. A double action piston/cylinder unit comprising:

a cylinder including first and second ends and first and second spaced apart pressure agent fittings in fluid communication with the interior of said cylinder;

a piston slidably mounted in said cylinder and including first and second ends for acting on and being acted on by a pressure agent;

first and second end pieces sealing said first and second ends of said cylinder;

a piston rod connected to said second end of said piston and slidably and sealingly received through said second end piece, said piston rod and said second end piece and said second end of said piston forming an annular chamber in said cylinder in communication with said second pressure agent fitting;

an accumulator connected to said cylinder and connected in communication with the annular chamber via said second pressure agent fitting for receiving and expelling the pressure agent; and

pressure compensation means, including a connecting line and a check valve means in communication with said connecting line, extending between the annular chamber and said first pressure agent fitting,

said check valve means operable in response to the application of an operating pressure by a pressure agent through said first pressure agent fitting acting on said first end of said piston to connect said first and second pressure agent fittings via said connecting line and operable in response to the lack of operating pressure on said first end of said piston and the application of operating pressure on said second end of said piston via said accumulator, said second pressure agent fitting and the annular chamber to disconnect said first and second pressure agent fittings,

said connecting line extending from said first end of said piston to said annular chamber via the end of said piston rod which is connected to said piston,

said connecting line comprising a first bore extending through said piston, a second bore aligned with said first bore and extending longitudinally of said piston rod, and a third bore extending radially of said piston rod and communicating with said second bore and the annular chamber,

said check valve means further comprising a spring mounted in said second bore, a valve seat in said first bore and a ball mounted in said first bore and urged against said valve seat by said spring,

said second bore of said connecting line comprising a further valve seat for receiving said ball in response to the application of the operating pressure acting on said first end of said piston and elastic deformation of said spring, and

said check valve means further comprising a first counterbore of said connecting line receiving said ball, a second counterbore of said connecting line in said piston rod receiving said spring, and a recess in said piston connecting said first and second counterbores.

4,633,666

INTEGRATED HYDRAULIC SYSTEM

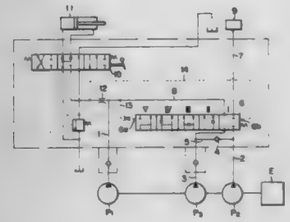
Tadao Karakama, Kawasaki, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 653,741

Claims priority, application Japan, Sep. 22, 1983, 58-145945[U]

Int. Cl.⁴ F16D *31/02*

U.S. Cl. 60—421 **1 Claim**



1. An integrated hydraulic system for a vehicle having a propulsion engine comprising a first fixed capacity or displacement hydraulic pump; a steering mechanism hydraulically operating circuit for supplying the hydraulic fluid delivered by said first hydraulic pump into a steering mechanism; a second fixed capacity or displacement hydraulic pump; a work implement hydraulically operating circuit for selectively supplying the hydraulic fluid delivered by said second hydraulic pump through a pilot operated directional control valve into said

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steering mechanism hydraulically operating circuit and/or said work implement hydraulically operating circuit; a third hydraulic pump serving as an auxiliary pump; an auxiliary hydraulic circuit for selectively supplying the hydraulic fluid delivered by said third hydraulic pump through the pilot operated directional control valve into said steering mechanism hydraulically operating circuit and/or said work implement hydraulically operating circuit; and a restrictor means installed in said steering mechanism hydraulically operating circuit, wherein said pilot operated directional control valve is actuated in such a manner that when the pressure differential across said restrictor means is less than a predetermined minimum value the whole quantity of the hydraulic fluid delivered by said second hydraulic pump and said auxiliary hydraulic pump is supplied into said steering mechanism hydraulically operating circuit so as to join the flow rate delivered by the first hydraulic pump, and wherein said pressure differential is between the predetermined minimum value and a predetermined maximum value the hydraulic fluid delivered by said second hydraulic pump and said auxiliary hydraulic pump is distributedly supplied into said steering mechanism hydraulically operating circuit and said work implement hydraulically operating circuit, respectively, and wherein when said pressure differential is more than the predetermined maximum value the whole flow rate of the hydraulic fluid delivered by said second hydraulic pump and said auxiliary hydraulic pump is supplied into said work implement hydraulically operating circuit.

4,633,667

BURNER FOR STIRLING ENGINES

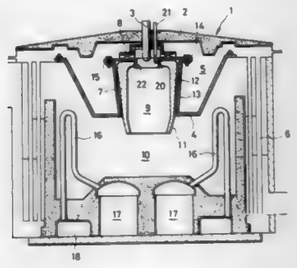
Tetsumi Watanabe, Okazaki, and Akira Yamaguro, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

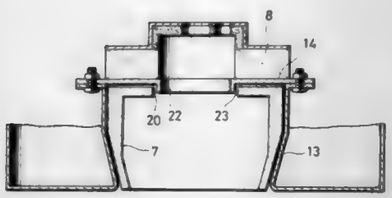
Filed Mar. 11, 1986, Ser. No. 838,351

Claims priority, application Japan, Mar. 20, 1985, 60-40304[U]

Int. Cl.⁴ F02G *1/04*

U.S. Cl. 60—517 **3 Claims**





1. A burner for a Stirling engine, comprising:

a housing;

a baffle for partitioning the interior of said housing into an air chamber and a combustion chamber, said baffle having an outer circumferential portion supported on said housing and a centrally located cylindrical portion of tapered configuration;

a generally cylindrical ceramic burner cone for primary combustion of a mixture of fuel and combustion air, said burner cone being inserted into and retained by the cylindrical portion of said baffle and having a tapered outer circumferential surface and an annular end face on an upstream side thereof;

a plurality of heater tubes supported on said housing and arranged on an inner circumferential side of the combustion chamber; and

a fuel injector nozzle supported on said housing for injecting fuel into said burner cone at an upstream portion thereof;

said baffle being equipped with an engagement portion having an annular outer circumferential surface for engaging the annular end face of said burner cone;

said burner cone being retained by the tapered cylindrical portion of said baffle and said engagement portion.

4,633,668

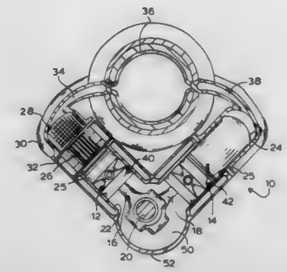
TWO PISTON V-TYPE STIRLING ENGINE

John A. Corey, North Troy, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,470

Int. Cl.⁴ F02G *1/04*

U.S. Cl. 60—526 **3 Claims**



1. A Stirling cycle engine comprising: a compression piston reciprocal in a cold compression space and an expansion piston operated from a common crank shaft reciprocal in an expansion space out of phase with respect to each other; said pistons reciprocating along axes which are angularly disposed to one another, such that a V-configuration engine is formed; cooling means; regenerator means; said regenerator means being positioned immediately adjacent the cooling means; said cooling means being axially aligned immediately adjacent the cold compression piston so as to minimize cold duct volume; and heating means coupled with said regenerator and said expansion space completing the Stirling cycle.

4,633,669

QUICK TAKE-UP MASTER CYLINDER VALVE ARRANGEMENT

David L. Brademeyer, Centerville, and Timothy M. Welch, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 591,179, Mar. 19, 1984, abandoned. This application Oct. 17, 1985, Ser. No. 788,733

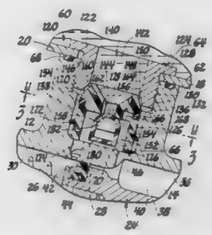
Int. Cl.⁴ B60T *11/08*

U.S. Cl. 60—578 **3 Claims**

1. In a quick take-up master cylinder having a boss with a vertically oriented valve-controlled passage, compensation ports at the bottom of said passage connecting with the master cylinder bore, and a hydraulic fluid reservoir mounted on the upper end of said boss and maintaining a supply of hydraulic fluid in said passage and the master cylinder bore, a compensation port control valve assembly comprising:

housing means including a valve housing received in said vertically oriented valve-controlled passage and including first and second valve housing sections with said second valve housing section having a vertically extending stepped bore therethrough having a shoulder and providing a valve chamber open to the compensation ports and an upper passage section formed in said first housing section open to said hydraulic fluid reservoir, said housing means providing a first valve seat in said valve chamber and a second valve seat on the outer side of said second valve housing section;

valve means in said valve chamber having a specific gravity less than the specific gravity of the hydraulic fluid in said passage so as to normally buoyantly rest against said shoulder and prevent any substantial flow of hydraulic fluid between the master cylinder bore and the reservoir through the compensation ports in one valve means condition of operation, said shoulder providing said first valve seat, said valve means being sensitive to a pressure differential biased toward the master cylinder bore to move downwardly away from said shoulder and permit fluid flow through said valve housing bore from said reservoir to said master cylinder, said second valve housing section engaging said first valve housing section with bypass fluid communication passages at said engagement;



a valve means bypass passage in said second valve housing section with said second valve seat formed at one end thereof;

and a resiliently biased check valve controlling said bypass passage to prevent fluid flow through said bypass passage toward the master cylinder bore from said reservoir via said bypass fluid communication passages and operable to open at a predetermined master cylinder quick take-up pressure to permit fluid flow from the master cylinder bore to said reservoir through said bypass passage and said bypass fluid communication passages to relieve any excess quick take-up pressure that may be generated in the master cylinder bore during master cylinder actuation.

4,633,670

SUPERCHARGING PRESSURE CONTROL DEVICE FOR AN EXHAUST GAS TURBOCHARGER

Yoshio Iwasa, Nagareyama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 25, 1985, Ser. No. 705,003

Claims priority, application Japan, Feb. 25, 1984, 59-25231[U]

Int. Cl.⁴ F02B *37/12*

U.S. Cl. 60—603 **13 Claims**

1. An internal combustion engine comprising:

an exhaust gas turbocharger means, comprising a compressor means and an exhaust gas turbine means for rotating said compressor means, for supercharging intake air to the internal combustion engine;

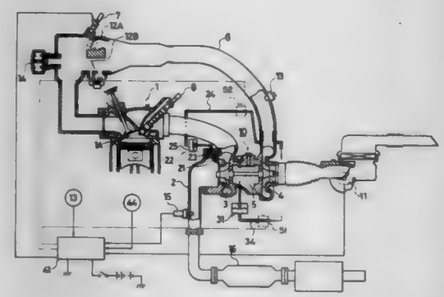
a fuel supply means having an injection valve means for injecting fuel;

a bypass channel means for permitting exhaust gas to bypass said exhaust gas turbine;

a supercharging pressure control device means for controlling a supercharging pressure downstream of said compressor means in conformance with an engine comprising:

a bypass control valve means for increasing the flow of exhaust gas to pass through said bypass channel means when the supercharging pressure downstream of said compressor means exceeds a first set value;

a velocity control device means for controlling the exhaust gas flow comprising a throttle valve means for decreasing a velocity of the exhaust gas flowing through said exhaust gas turbine when the supercharging pressure downstream of said compressor means exceeds a second set value less than said first set value;



a pressure sensor means for detecting the supercharging pressure downstream from said compressor means; and

a controller comprising a fuel cutoff control means for de-activating said fuel supply means when said pressure sensor means detects a rise in supercharging pressure above a third set value greater than said first set value, and for re-activating said fuel supply means when said pressure sensor means detects a reduction in the supercharging pressure below a fourth set value less than said first set value.

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EXHAUST GAS DRIVEN SUPERCHARGER FOR SUPERCHARGING INTERNAL COMBUSTION ENGINES

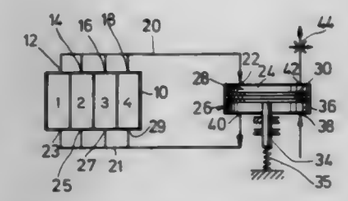
Oskar Schatz, Tellhohe 14, D-8031 Stockdorf, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 609,929

Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318136

Int. Cl.⁴ F02B *37/00*

U.S. Cl. 60—605 **2 Claims**



1. An exhaust gas driven supercharger for an internal combustion engine having cylinders which produce cyclical exhaust gas pulses comprising;

a housing defining a supercharging chamber,

a movable partition separating said chamber into two chambers, an exhaust gas chamber having an exhaust inlet and an exhaust outlet, and a supercharging air chamber having an air inlet and air outlet,

a first exhaust duct for conducting exhaust gas from said

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cylinder to said exhaust gas chamber through said exhaust inlet, such that said exhaust gas acts upon said partition to urge said partition to move in said housing,

a second exhaust duct for conducting exhaust gas from said exhaust gas chamber through said exhaust outlet,

a first air duct for conducting air into said supercharging air chamber through said air inlet,

a second air duct for conducting air to said cylinder from said supercharging air chamber through said air outlet such that movement of said partition causes air to be pumped through said second air duct into said cylinders, and

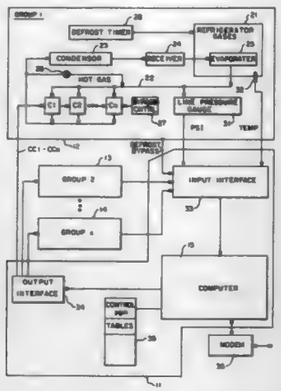
means incorporated into either of said first or second exhaust ducts for modifying the duration of pulses of exhaust gas within said exhaust gas chamber.

4,633,672

UNEQUAL COMPRESSOR REFRIGERATION CONTROL SYSTEM

Jake Persson, Tracy; Mike Quinn, Santa Clara, both of Calif.; Walter C. Emery, Newport, Oreg., and Philip E. Bracht, San Mateo, Calif., assignors to Margaux Controls, Inc., San Jose, Calif.

Filed Feb. 19, 1985, Ser. No. 702,965
Int. Cl.⁴ F25B *49/00*
U.S. Cl. 62—126 **25 Claims**



1. In a method of controlling a refrigeration system having at least one refrigerator case wherein goods are stored, a refrigeration system for said cases including a plurality of compressors having a common compressor suction line directing refrigerant into the compressors, means for detecting the pressure in the compressor suction line, the initial steps of:

selecting a target pressure for said compressor suction line; and

establishing a record of the load handling capabilities of a multiplicity of configurations of said compressors; and

the steps of periodically:

detecting the current line pressure;

selecting a preferred configuration of compressors in accordance with a predetermined algorithmic function of the target pressure, the current line pressure, and said record of the load handling capabilities; and

activating said preferred configuration of compressors if different from the currently active configuration; and

at at least one preselected time during the operation of an active compressor configuration:

determining the expected rate of change of the line pressure while said active compressor configuration is in use, said determination being in accordance with said record of the load handling capabilities;

determining the actual rate of change of the line pressure while said active compressor configuration has been in use; and

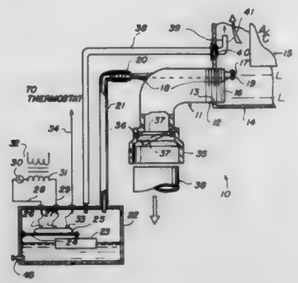
updating said record of the load handling capabilities, in accordance with a predetermined algorithm, when said actual rate of change of the line pressure is not equal to said expected rate.

4,633,673

EMERGENCY SHUTOFF FOR AIR CONDITIONERS

Daniel R. Morrison, 412 Warren La., Key Biscayne, Fla. 33149; Ross J. Petrie, 2518 Bimini La., Ft. Lauderdale, Fla. 33312, and Kenneth D. Savage, 640 Ridgewood Rd., Key Biscayne, Fla. 33149

Continuation-in-part of Ser. No. 650,536, Sep. 14, 1984, abandoned. This application Aug. 28, 1985, Ser. No. 770,411
Int. Cl.⁴ F25D *21/00*
U.S. Cl. 62—129 **10 Claims**



1. In an air conditioning system having an air conditioner and a drain pan for catching fluid resulting from operation of the air conditioner, the improvement comprising:

an emergency drain and shut off for the air conditioner, including a drain fitting for attachment to a drain opening in the air conditioner drain pan;

said drain fitting having a primary drain opening for draining fluid away from the pan, and an emergency drain outlet opening for draining fluid away from the pan when the primary drain outlet opening is obstructed;

a reservoir connected to receive fluid drained through the emergency drain outlet opening;

fluid level responsive switch means in the reservoir for shutting off the air conditioner when fluid is collected in the reservoir upon obstruction of the primary drain; and

means connected with the reservoir for producing a low pressure in the reservoir whereby fluid is evacuated through the emergency drain outlet opening.

4,633,674

REFRIGERATION CIRCUIT

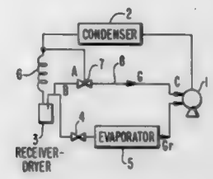
Motoharu Sato, Honjo, Japan, assignor to Sanden Corporation, Japan

Filed May 7, 1985, Ser. No. 731,353
Claims priority, application Japan, May 7, 1984, 59-65490[U]
Int. Cl.⁴ F25B *41/06*
U.S. Cl. 62—197 **3 Claims**

1. In a refrigerant circuit including a compressor, a condenser, a first expansion means and an evaporator so that discharging refrigerant from a compressor passes through said condenser, said first expansion means and said evaporator, respectively, and returns to a first suction port of said compressor, the improvement comprising:

a second expansion means connecting said condenser and said first expansion means so that the outlet port of said second expansion means is connected to the inlet port of said first expansion means; and

a pressure sensitive regulating valve fixed between an inlet port of said second expansion means and an outlet port of said second expansion means so that said valve is responsive to a pressure differential between said inlet and outlet ports whereby said valve opens progressively wider as the pressure differential increases, the outlet port of said valve connected to a second suction port of said compressor so that said valve controls the quantity of refrigerant passing from said second expansion means to said second suction



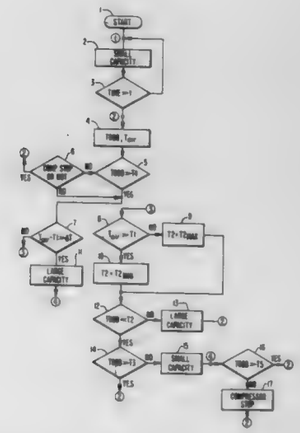
port of said compressor according to the pressure differential between said inlet and outlet ports of said second expansion means, said pressure differential and thus said quantity of refrigerant being larger when said compressor is engaged and thereafter diminishing so that the torque produced when said compressor is engaged is reduced while steady-state flow through the circuit is quickly attached.

4,633,675

DEVICE FOR CONTROLLING THE CAPACITY OF A VARIABLE CAPACITY COMPRESSOR

Motoharu Sato, Honjo, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Jan. 28, 1986, Ser. No. 823,363
Claims priority, application Japan, Feb. 1, 1985, 60-16397
Int. Cl.⁴ F25B *41/00*
U.S. Cl. 62—208 **25 Claims**



1. A device for controlling the capacity of a variable capacity compressor having an evaporator and compressor capacity changing means, said device comprising:

first temperature detecting means disposed behind said evaporator for detecting a first air temperature at an outlet side of said evaporator;

second temperature detecting means disposed forward of said evaporator for detecting a second air temperature at an inlet side of said evaporator; and

control means for controlling said capacity changing means, said control means including

first comparison means for comparing a first predetermined temperature with said first air temperature and providing a first control signal when said first air temperature is higher than said first predetermined temperature,

second comparison means for comparing the difference between said second air temperature and a second predetermined temperature with a predetermined change in temperature in response to the comparison by said first comparison means and the presence of said first control signal, said second comparison means providing a second control signal when said difference in temperature is greater than said predetermined change in temperature, wherein said capacity changing means changes the capacity of said compressor to a large capacity in response to said second control signal,

third comparison means for comparing said second air temperature to said second predetermined temperature in response to the comparison by said second comparison means and the absence of said second control signal, said third comparison means providing a third control signal when said second air temperature is higher than said second predetermined temperature, wherein in response to said third control signal a third predetermined temperature is set to a first temperature and in the absence of said third control signal said third predetermined temperature is set to a second temperature,

fourth comparison means for comparing said first air temperature to said third predetermined temperature and providing a fourth control signal when said third predetermined temperature is higher than said first air temperature, wherein said capacity changing means changes the capacity of said compressor to a large capacity in the absence of said fourth control signal,

fifth comparison means for comparing said first air temperature to said fourth predetermined temperature in response to the comparison by said fourth comparison means and the presence of said fourth control signal, said fifth comparison means providing a fifth control signal when said first air temperature is higher than said fourth predetermined temperature, wherein said capacity changing means changes the capacity of said compressor to a small capacity in response to the absence of said fifth control signal, and

sixth comparison means for comparing said first air temperature with a fifth predetermined temperature in response to the comparison by said fifth comparison means and the absence of said fifth control signal, said sixth comparison means providing a sixth control signal when said first air temperature is higher than said fifth predetermined temperature, wherein said capacity changing means stops the operation of said compressor in response to said sixth control signal.

4,633,676

COOLING AND HEATING APPARATUS

Edward W. Dittell, 6280 NE. 6th St., Minneapolis, Minn. 55432

Filed Nov. 19, 1984, Ser. No. 673,233
Int. Cl.⁴ F25B *27/00*
U.S. Cl. 62—238.6 **18 Claims**

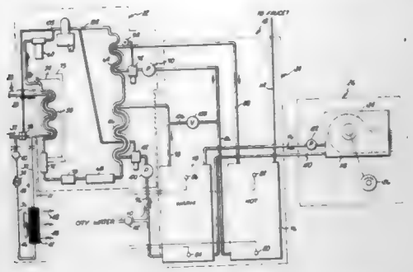
1. An energy transfer apparatus for transferring energy from and to a source liquid to heat and cool a facility, the apparatus comprising:

means for providing a refrigeration cycle including means for evaporating refrigerant, means for condensing refrigerant and means for producing a phase change in the refrigerant;

means for cooling air;

means for providing a single continuous flow of the source liquid first to the means for evaporating refrigerant and next to the means for cooling air, said means for providing a continuous flow of the source liquid being in heat transfer relationship with the means for evaporating refrigerant such that heat is absorbed from the source liquid by the

refrigerant prividing a cooled source liquid, said means for cooling air being in fluid communication with the cooled source liquid downstream of the means for evaporating refrigerant and using the cooled source liquid to cool the air;



means for storing a heat-absorbing liquid and connected in heat transfer relationship with the means for condensing refrigerant such that heat is transferred from the refrigerant to the heat-absorbing liquid.

4,633,677

REFRIGERATED DISPLAY CASE

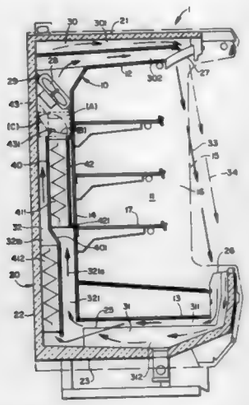
Kazuo Maehara, Isezaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Aug. 13, 1985, Ser. No. 765,216

Claims priority, application Japan, Aug. 13, 1984, 59-122835[U]; Aug. 13, 1984, 59-122836[U]; Nov. 12, 1984, 59-186706[U]; Nov. 12, 1984, 59-186707[U]

Int. Cl.⁴ A47F *3/04*

U.S. Cl. 62—256 **11 Claims**



1. In a refrigerated display case having an interior cabinet and an exterior member, including a refrigerating means, a circulating means for forcing air into contact with said refrigerating means, and a passage means for directing the refrigerated air, said case defining a front opening for access to the interior thereof, at least two air inlets and corresponding outlets extending across opposed edges of said front opening, said passage means including at least inner and outer conduits communicating with the respective outlets and inlets and defining between said interior cabinet and said exterior member, said circulating means operating to drive separate air streams through said passage means and across said front opening in an innermost stream and an outermost stream, and said refrigerating means being located in said inner conduit for refrigerating the innermost stream crossing said access opening, the improvement comprising:

a portion of said inner conduit being divided into two chambers;

an evaporator of said refrigerating means being located within each chamber; and a damper device extending across the discharge openings of said two chambers for selectively controlling the opening and closing of the discharge openings, said damper device being operated by a driving device, and said damper device comprising a rectangular cross-sectional shaped case having upper and bottom openings and a shutter plate rotatably supported in said case through a support shaft, said shutter plate being selectively located to block a discharge opening from one of the chambers to prevent air circulation therethrough while allowing air circulation through the other chamber.

4,633,678

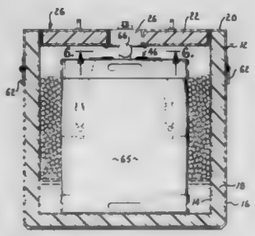
KEG COOLER

Randy J. Lea and Richard P. Lea, both of 3230 W. Kearney, Springfield, Mo. 65803

Filed Sep. 23, 1985, Ser. No. 778,913

Int. Cl.⁴ F25D *3/08*

U.S. Cl. 62—457 **9 Claims**



1. An assembly for cooling a beverage keg, said assembly comprising:

a container having insulated, rigid bottom and sidewall portions defining an open topped compartment of a size larger than the keg to provide space for ice around the keg within the compartment;

a removable cover for closing the top of said container to enclose the keg in said compartment; and

a flexible harness including elongated flexible strap means having opposite ends secured to the container sidewall portion on the interior of the container and adapted to extend over the keg in the compartment in a taut condition to hold the keg down on the container bottom portion and against floating in the water from the melted ice, said harness being adjustable to vary the effective length of the strap means to accommodate kegs which differ in size and shape.

4,633,679

ACCUMULATOR-DEHYDRATOR ASSEMBLY FOR AN AIR CONDITIONING SYSTEM

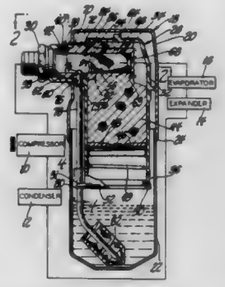
Douglas C. Wintersteen, Burt, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 17, 1986, Ser. No. 840,200

Int. Cl.⁴ F25B *43/00*

U.S. Cl. 62—474 **3 Claims**

1. In an accumulator-dehydrator assembly for an air conditioning system comprising a housing having an inlet connector and an outlet connector by which the assembly is connected in the system, a desiccant canister located within the housing, an outlet fitting having an entrance open to the interior of the canister and an exit open to the outlet connector, a particulate filter located within the canister and connected between the outlet fitting and the interior of the canister, and a liquid refrigerant and oil pickup tube having an entrance end open to the interior of the housing adjacent the bottom thereof and an exit end open to the outlet connector through the outlet fitting, the improvement comprising a neck integral with and extending about the exit of the outlet fitting, a cage for the filter integral with and extending about the entrance of the outlet fitting, a flange formed integral with and projecting outward from and extending about an outlet opening in the canister, the cage being insertable through and the neck being received in the



flanged outlet opening, the neck also being received from the interior of the housing in and sealingly engaging with the outlet connector, both the neck and the flange having radial holes which align and receive the exit end of the pickup tube with the latter arranged external of the canister, the neck and flange having cooperating angular alignment means for positively aligning their holes angularly, and the filter cage and the interior of the canister having cooperating longitudinal alignment means for positively aligning the neck and flange holes longitudinally.

4,633,680

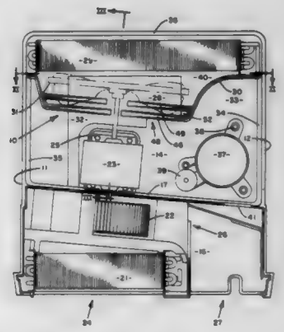
DOUBLE WALL CONDENSER ORIFICE

Richard D. Lang, Chittenango, and James E. Napolitano, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 20, 1985, Ser. No. 778,116

Int. Cl.⁴ F25B *39/04*

U.S. Cl. 62—507 **6 Claims**



1. In an air conditioning system of the type having a heat exchanger and a fan positioned to direct the flow of air thereover, with both the heat exchanger and the fan being contained in a housing with a wall surrounding the fan periphery to form an orifice gap therebetween, an improved orifice wall assembly comprising:

a first wall attached to the inner side of the housing in surrounding relationship with said fan, said first wall extending radially inwardly toward said fan to thereby reduce said orifice gap and diminish the recirculation of air around the fan periphery: and

a second wall attached to the inner side of the housing, said second wall being axially disposed downstream from and in parallel relationship with said first wall, in surrounding relationship with the fan, and extending radially inwardly to create a gap between said first and second walls to further diminish the recirculation of air around the periphery of the fan.

4,633,681

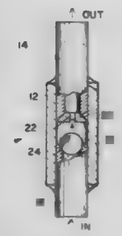
REFRIGERANT EXPANSION DEVICE

Robert C. Webber, 908 Holoma Dr., Vero Beach, Fla. 32963

Filed Aug. 19, 1985, Ser. No. 767,042

Int. Cl.⁴ F25B *41/06*

U.S. Cl. 62—511 **12 Claims**



1. In a refrigeration system having a compressor, a condenser, an evaporator, and a liquid line for receiving liquid refrigerant from said condenser, an expansion device for connecting said liquid line to said evaporator comprising:

a housing having an inlet connected to said liquid line and an outlet connected to said evaporator, said outlet having a valve type seat formed therein and at least one orifice groove formed across said seat; and

an orifice forming element movably disposed within said housing for seating in said seat under pressure of liquid refrigerant when said compressor is operating thereby forming an expansion orifice in concert with said orifice groove, and for unseating from said seat when said compressor is not operating thereby equalizing pressure in said refrigeration system.

4,633,682

HORIZONTAL CRYOSTAT INSERT WITH A VERTICAL SERVICE STACK

Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 4, 1986, Ser. No. 826,058

Int. Cl.⁴ F25B *19/00*

U.S. Cl. 62—514 R **6 Claims**

1. An insert for a cryostat having a horizontal penetration, the cryostat having an inner supercoolable vessel, an outer wall, at least one radiation shield situated between the supercoolable vessel and the outer wall and electrical leads extending through the cryostat penetration to the exterior of the cryostat, said insert comprising:

an outer tubular low thermal conductivity housing including a generally horizontal portion having a first and second section, said first section having an open end and adapted to be inserted inside said horizontal penetration extending through said cryostat outer wall, said radiation shield and inside said inner supercoolable vessel, said first and second section adapted to surround said electrical leads extending from the cryostat, said outer tubular housing further including a first tubular portion extending vertically from the second section of said horizontal portion so that access to said electrical leads outside the cryostat can be provided and a second tubular portion extending perpendicu-

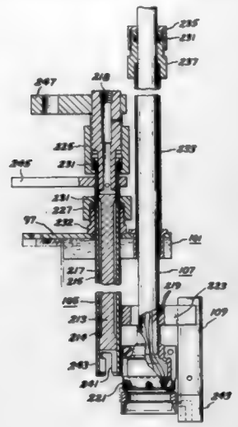
VOL 1074 ISS 1 JA 6 1987 UMI

larly from the second section of the horizontal portion of the outer housing;

a cover securing the top of the vertical tubular portion;

an inner housing situated inside said outer tubular housing, said inner housing defining an opening at the end of the first section of said horizontal portion, the open ends of said first section and said inner housing being joined together, said inner housing adapted to surround said cryostat electrical leads, said inner housing extending part way up said vertical tubular portion and opening into said vertical tubular portion;

two concentric tubes situated in said first and second section of the inner housing and extending beyond the end of said first section of the outer tubular housing, said concentric tubes adapted to fit through said cryostat electrical leads and extend into said supercoolable cryostat vessel, said



outer concentric tube defining holes in the portion situated in the second section;

a vent tube situated in said second tubular portion of said housing, said vent tube penetrating said inner housing and in flow communication with the outer of said two concentric tubes;

means for coupling liquid gas to said inner concentric tube through said vent tube;

a radiation shield situated between said horizontal portion of said outer housing and said inner housing, said shield extending partway up said vertical stack and heat stationed to said inner housing partway up said stack; and

electrical connection means extending through said cover down said vertical tubular portion, said electrical connection means adapted to be coupled to said cryostat electrical leads.

4,633,683

METHOD FOR THE MANUFACTURE OF PATTERNED PILE FABRICS AND CIRCULAR KNITTING MACHINE THEREFOR

Walter R. Schmidt, Dr Gachmeidler-Str. 19/2, A-3500 Krems/-Donau, Austria

Continuation of Ser. No. 279,003, Jun. 30, 1981, abandoned. This application Feb. 8, 1984, Ser. No. 577,321

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1980, 3024705

Int. Cl.⁴ D04B *9/12*

U.S. Cl. 66—9 R **7 Claims**

1. A method for knitting patterned pile fabrics on circular knitting machines having latch needles and pile elements having pile forming edges movable between the shafts of the needles to form pile loops, comprising the steps of

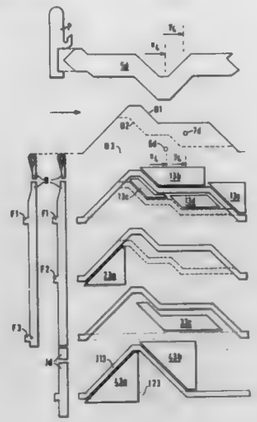
(a) selecting a first set of needles for receiving only ground thread and a second set of needles for receiving ground thread and, also, pile thread for forming pile loops, said selection comprising selecting groups of adjacent needles for forming pile loops

(b) raising all thus-selected needles

(c) feeding ground thread to all selected needles

(d) moving the pile elements between the needles without any selection of the pile elements and

(e) holding only said first set of needles at an intermediate level at which the hook opening is below the level of the pile forming edges of the pile elements, but not yet so far as to form stitches, so that said hook openings are rendered inaccessible to pile thread by the presence of the pile forming edges



(f) said ground thread feeding, pile element moving and needle first set retracting steps being carried out in relation to each other so that the ground thread lies, after such steps, completely below the level of the pile forming edges in the hooks of the needles of the first set and on the latches of the needles of the second set

(g) feeding pile thread to said second set of needles while they stand with their hooks open above the pile forming edges and while said first set of needles is at said intermediate level as aforesaid and inaccessible to pile thread, and

(h) retracting all selected needles to the knock-over position as a result of which said second set of needles takes up said pile and ground thread into the hooks of said second set needles and knits pile loops and the base fabrics.

4,633,684

KNITTING MACHINE HAVING AT LEAST ONE NEEDLE BED

Falk Kühn, Rottenburg, Fed. Rep. of Germany, assignor to Memminger GmbH, Freudenstadt, Fed. Rep. of Germany

Filed Mar. 17, 1986, Ser. No. 840,505

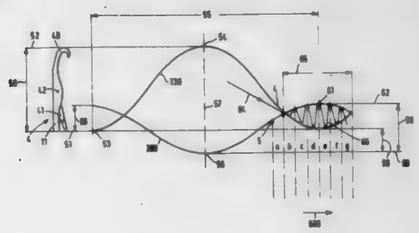
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1985, 3510054

Int. Cl.⁴ D04B *15/06*

U.S. Cl. 66—104 **14 Claims**

1. Knitting machine having at least one needle bed equipped with longitudinally displaceable needles controlled by a needle cam curve, sinkers, and a sinker cam curve controlling the sinkers, and protruding between the needles, the sinkers being movably supported in at least the longitudinal direction of the needles and being controlled such that at a given feed, after the locking in of the yarn, they are moved counter the lowering movement of the associated needles and after casting off of the loop are moved counter to the needle raising movement, the needles and sinker cam surves having adjoining steadily

curved are portions wherein sid portions in the needle can curve are sinusoidal and merge steplessly with one another, and



wherein, the sinker cam curve (220) at least in the loop forming zone (65) is shaped in substantially sinusoidal form.

4,633,685

APPARATUS FOR DEWATERING WET LAUNDRY

Alexander Mollerus, Friedhofstrasse 13,, D-7128 Lauffen, Fed. Rep. of Germany

Filed Apr. 9, 1985, Ser. No. 721,432

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1984, 3413309

Int. Cl.⁴ D06F *47/06*

U.S. Cl. 68—242 **11 Claims**

1. Apparatus for dewatering wet laundry comprising:

a base having drain outlets therein;

a loose cylinder having at least one annular flanges thereabout, said cylinder being disposable on said base about said drain outlets;

a bell having an open end and a peripheral margin thereabout, said bell being disposable with its open end on said cylinder;

a membrane arranged in said bell across said open end;

means for introducing a pressure fluid into said bell to force said membrane out said open end of said bell; and

means for selectively lifting said cylinder and said bell or just said bell and for latching said bell, cylinder and base together in releasably fashion, said lifting and latching means comprising:

a plurality of sets of aligned openings distributed around said bell, cylinder and base, each set of aligned openings comprising an opening through the peripheral margin of said bell, an opening through a flange of said cylinder, and an opening through said base; and

a plurality of rotatable rods each of which can be extended through a set of aligned openings when said cylinder is disposed on said base and said bell is disposed on said cylinder, each rod having a locking element thereon;

whereby when the cylinder is disposed on the base, the bell is disposed on the cylinder and the rods are extended through the aligned openings, the rods and locking elements can be rotated to latch the bell, cylinder and base together, and pressure fluid can be introduced into the bell to force the membrane against laundry disposed on the base inside the cylinder and press water out of the laundry.

4,633,686

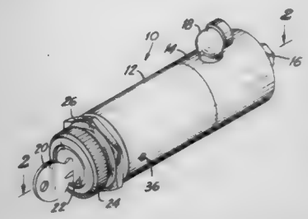
ANTI-THEFT BRAKE LOCK

Wesley G. Carr, 244 Ohio Ave., West Springfield, Mass. 01089

Filed Oct. 22, 1984, Ser. No. 663,321

Int. Cl.⁴ G05G *5/00*; **E05B** *65/12*

U.S. Cl. 70—179 **5 Claims**



1. A device for locking the brakes of a vehicle having a fluid brake system adapted to be connected in the brake fluid line between the master cylinder and at least one wheel brake cylinder, comprising:

a hydraulic cylinder having a brake fluid inlet and outlet and a fluid chaxber connecting said inlet and outlet;

a valve seat within said fluid chamber in fluid communication with said inlet;

a valve element within said fluid chamber including a ball having a diameter greater than the diameter of the inlet to said fluid chamber adapted to press against said valve seat to restrict the fluid flow through said fluid chamber; and

means for pressing said ball against said valve seat including a compressible coil spring for holding said ball therein, wherein compression of said spring causes said ball to Press against said valve seat thereby restricting the fluid flow through the inlet of said hydraulic cylinder, and wherein said coil spring includes ends having a diameter greater than the diameter of said ball and a central portion for holding said ball having a diameter less than the diameter of said ball, so that upon insertion of said ball, said central portion will expand to tightly coil around and firmly hold said ball therewithin.

4,633,687

DRIVE MECHANISM FOR KEY OPERATED ELECTRONIC LOCK

William J. Fane, North Vancouver, Canada, assignor to NI Industries, Inc., Long Beach, Calif.

Filed Jan. 22, 1985, Ser. No. 693,185

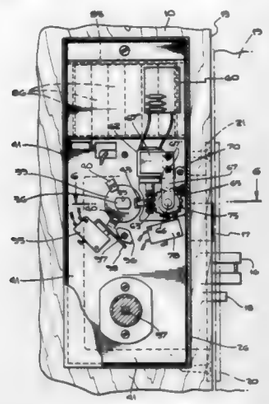
Int. Cl.⁴ E05B *47/00*

U.S. Cl. 70—276 **16 Claims**

1. A locking mechanism including an electronically programmed actuating mechanism for enabling manipulation of said locking mechanism, said locking mechanism comprising a frame having therein a locking bolt movable between an extended locked position and a retracted unlocked position, a cylinder plug assembly for said locking bolt rotatably mounted on said frame, said cylinder plug assembly being responsive to manual rotation, said cylinder plug assembly having a rotation inhibiting shoulder, a blocker having a first position in engagement with said shoulder inhibiting movement of said locking bolt and a second position removed from said first position, an electric motor powered means having an operable linkage with said blocker for moving said blocker between said first and second positions, said linkage comprising a power transfer means mounted for rotation on said frame, a drive member eccentrically located on said power transfer means, a drive track on said blocker having a driven engagement with said

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drive member, said drive track disposed in a direction transverse with respect to the direction of movement of said blocker



whereby said blocker is shifted between said first and second positions in response to motor operation.

4,633,688

LOCK DEVICE

Emile Beudat, and Stig G. Terraeus, both of Stockholm, Sweden, assignors to Emile Beudat, Stockholm, Sweden

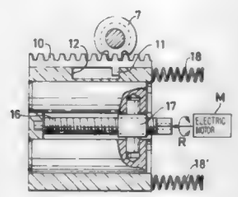
PCT No. PCT/SE84/00109, § 371 Date Oct. 24, 1984, § 102(e) Date Oct. 24, 1984, PCT Pub. No. WO84/03909, PCT Pub. Date Oct. 11, 1984

PCT Filed Mar. 27, 1984, Ser. No. 676,194

Claims priority, application Sweden, Mar. 28, 1983, 8301728

Int. Cl.⁴ E05B *47/00*

U.S. Cl. 70—279 **7 Claims**



1. A lock device comprising: a manually and electrically operable lock unit; an electrically powered means; said lock unit including at least one lock bolt which can be moved between two different positions of extension in relation to said lock unit by said electrically powered means;

a housing adapted to receive said lock unit;

a manually operable adjacent lock mechanism adapted to operate said lock unit;

said lock unit being movable between two different positions in relation to said housing when said manually operable adjacent lock mechanism is manually operated;

said at least one lock bolt being movable from a first position relative to said lock unit by said electrically powered means only when said electrically powered means is operating; said lock bolt being fixed against displacement relative to said lock unit when said electrically powered means is not operating;

said electrically operable lock unit including an electric motor having a rotary movement;

a first means for transforming said rotary movement into linear motion of said at least one lock bolt relative to said lock unit; said first means for transforming including a mechanical transmission gear adapted to move said at least one lock bolt from an initial position to another position.

4,633,689

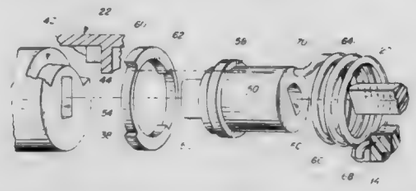
ANTI-STATIC SWITCH LOCK WITH MOMENTARY POSITION

Stanley C. Wolniak, Vernon Hills; Timothy P. Lasbe, Maywood, and Richard H. Schulz, Jr., Elk Grove Village, all of Ill., assignors to The Eastern Company, Naugatuck, Conn.

Filed Sep. 4, 1984, Ser. No. 646,790

Int. Cl.⁴ H01H *27/06;* **E05B** *17/04*

U.S. Cl. 70—379 R **12 Claims**



9. In a key operated switch including a lock having a barrel and rotatable lug whith key actuated tumblers and a switch secured for rotation with the plug, an improved switch actuator comprising:

a rotatable stop plate;

a stop plate return spring connected with the stop plate;

a stop plate surface adapted to engage a surface secured relative to the plug, said engagement occurring upon rotation of the plug in one direction to turn the switch momentarily from a first position to a second position against the action of said spring;

means for securing the stop plate against the action of the return spring in an orientation corresponding to the switch first position; and

means associated with the stop plate for allowing rotation of the switch and plug in the opposite direction independently of the stop plate to turn the switch from the first to a third position.

4,633,690

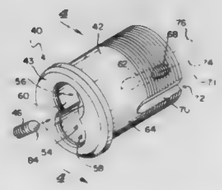
CYLINDER ANCHOR

William R. Foshée, Noblesville, Ind., assignor to Best Lock Corporation, Indianapolis, Ind.

Filed May 13, 1985, Ser. No. 733,120

Int. Cl.⁴ E05B *9/08*

U.S. Cl. 70—451 **14 Claims**



1. A lock cylinder assembly of the type mountable in a lock case, the assembly comprising

a lock body including an exterior side wall, the lock body being formed to include a cavity for the reception of an interchangeable lock core, at least one channel having a, side setscrew-receiving opening in the exterior side wall, and a bore extending between the lock body cavity and the exterior side wall to define a hidden setscrew-receiving opening in the exterior side wall,

a side setscrew in the at least one channel and movable therein to block rotation of the lock cylinder assembly in relation to the lock case, and

a hidden setscrew in the bore and movable therein to anchor the lock cylinder assembly in its mounted position in the lock case, the opening of each channel being situated in spaced-apart relation to the bore opening on the exterior side wall so that the side setscrew is movable in the at least one channel to its rotation-blocking position without entering the spaced-apart bore.

6. A lock cylinder assembly mountable in a lock case or the like, the lock cylinder assembly comprising

a lock body including a front face, a rear face, and a cylindrically-shaped exterior side wall extending therebetween, the lock body being formed to include a cavity having an opening in the forward face for the reception of an interchangeable lock core, at least one elongate channel having a side setscrew-receiving opening in the exterior side wall, and a bore having one of its opening in communication with the lock body cavity and the other of its openings in the cylindrically-shaped exterior side wall in circumferentially spaced relation to the opening of each channel, and

a side setscrew in the at least one elongate channel and movable therein to block rotation of the lock cylinder assembly in relation to the lock case.

11. A lock cylinder assembly mountable in a lock case, the lock cylinder assembly comprising

a lock body including an exterior side wall, the lock body being formed to include a cavity for the reception of an interchangeable lock core, an elongated channel having a longitudinal axis and a side setscrew-receiving opening in the exterior side wall, and a bore extending between the lock body cavity and the exterior side wall to define a hidden setscrew-receiving opening in the exterior side wall,

a side setscrew in the at least one channel and movable therein to block rotation of the lock cylinder assembly in relation to the lock case, and

a hidden setscrew in the bore and movable therein to anchor the lock cylinder assembly in its mounted position in the lock case, the hidden setscrew-receiving opening and each side setscrew-receiving opening being situated in spaced-apart relation on the exterior side wall, the bore having a longitudinal axis in skewed non-intersecting relation to the longitudinal axis of the channel.

4,633,691

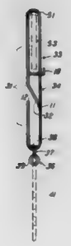
SPRING LOOP KEY HOLDER

Gilbert F. Hardy, 8191 Sterling Ave., Huntington Beach, Calif. 92646

Filed Oct. 7, 1985, Ser. No. 784,733

Int. Cl.⁴ A45F *5/02*

U.S. Cl. 70—456 B **8 Claims**



1. In a key holder for attachment to a suspension device the combination comprising a support loop, obverse and reverse limbs on the support loop, said reverse limb terminating in a lock tongue merging with said obverse limb, a container loop defined by an extension of said obverse limb both away from and toward said support loop and terminating in a free end spaced from the obverse limb, a key shank, a key head and a key circle defining a key hook, an elongate pair of walls in the obverse limb defining a slot adapted to accept said key hook, said slot having a first portion adapted to receive a key hook head and a second portion adapted to receive a key hook shank, a thruster extending transversely between obverse and reverse limbs and penetrating one of said limbs to provide means for thrusting said limbs apart to pass said key hook into said slotted second portion and retain said key hook in the second portion until the thruster separates the obverse and reverse limbs to displace the lock tongue from the limb.

4,633,692

DEVICE FOR DETERMINING A SETTING VALUE OF A SHAPE OPERATING AMOUNT IN A ROLLING MILL

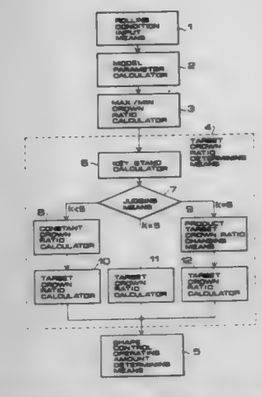
Fumio Watanabe, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1985, Ser. No. 758,063

Claims priority, application Japan, Aug. 17, 1984, 59-172023

Int. Cl.⁴ B21B *37/12*

U.S. Cl. 72—8 **5 Claims**



1. A device for determining setting values of shape operating amounts in a rolling mill having shape controlling meansin crown and flatness control, comprising:

(a) rolling condition input means for inputting rolling conditions such as a thickness, a plate width and a rolling load;

(b) model parameter calculating means connected to said rolling condition input means for receiving an output of said rolling condition input means to calculate parameters of crown and flatness models;

(c) maximum and minimum crown ratio calculating means connected to said model parameter calculating means for receiving an output of said model parameter calculating means to calculate a maximum crown ratio and a minimum crown ratio;

(d) target crown ratio determining means connected to said maximum and minimum crown ratio calculating means for receiving an output of said maximum and minimum crown ratio calculating means to determine a target crown ratio; and

(e) shape operating amount determining means connected to said target crown ratio determining means for receiving an output of said target crown ratio determining means to determine a setting value of a shape operating amount.

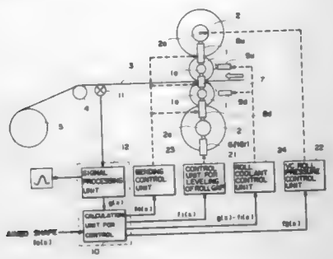
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4,633,693

METHOD OF CONTROLLING THE STRIP SHAPE AND APPARATUS THEREFOR

Akihiro Tahara, Osaka, and Katsuya Kondo, Amagasaki, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Mar. 27, 1985, Ser. No. 716,766
Claims priority, application Japan, Mar. 29, 1984, 59-63071
Int. Cl.⁴ B21B *37/02*
U.S. Cl. 72—8 **5 Claims**



1. A method of controlling width-wise shape of a strip according to a predetermined shape, said strip rolled by a rolling mill of the type provided with back-up rolls, whose amount of the crown is variable by expanding or shrinking its shell radially using pressure of a liquid fed into the inside thereof, right and left pressing-down balancers and roll benders, said method comprising the steps of:

operating said rolling mill to form a strip;

generating a first power function indicating the predetermined strip shape, said first power function being of a variable which is a distance in a width-wise direction from a selected location on such strip and including a term of the first power, a term of the second power and a term of at least one of the fourth, sixth and eighth powers of said variable,

repetitively generating a signal indicating a strip shape rolled by said rolling mill, said generated signal including readings of strip shape at preselected distances in a width-wise direction from the selected location on the strip;

obtaining a second power function approximating the generated signal, said second power function being of a variable which is a distance in a width-wise direction from the selected location on the strip and including a term of the first power, a term of the second power and a term of at least one of the fourth, sixth and eighth powers of said variable;

adjusting the amount of right and left pressing-down of said right and left pressing-down balancers so that said term of the first power of said second power function accords with said term of the first power of said first power function;

adjusting the amount of the crown of said back-up roll so that said term of the second power of said second power function accords with said term of the second power of said first power function; and

adjusting the roll bending force of said roll bender so that said term of at least one of the fourth, sixth and eighth powers of said second power function accords with said term of at least one of the fourth, sixth and eighth powers of said first power function.

3. An apparatus for controlling width-wise shape of a strip according to a predetermined shape, said strip rolled by a rolling mill of the type provided with work rolls, said apparatus comprising:

roll benders operatively connected to rolls of said rolling mill;

variable crown back-up rolls backing-up said work rolls, the roll crown of said back-up rolls being adjusted by pressure of a liquid fed into the inside thereof;

shape meter means disposed at a location along a feed path of said rolling mill for generating a signal indicating the strip shape;

calculation means operatively connected to said shape meter means for obtaining a power function approximating the generated signal from said shape meter means, said power function being of a variable which is a distance in a width-wise direction from a selected location on such strip and including a term of the second power and a term of at least one of the fourth, sixth and eighth powers of said variable; and

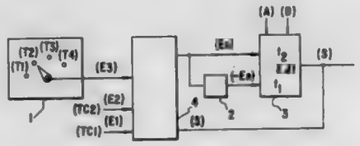
means operatively connected to said roll benders and said back-up rolls for controlling operation of said roll benders and said back-up rolls according to signals received from said calculation means, and said control means adjusting the roll crown of said back-up roll responsive to said term of the second power of said power function and said controlling means adjusting said roll-bender responsive to said term of at least one of the fourth, sixth and eighth powers of said power function.

4,633,694

AUTOMATIC CONTROL ON STRIP CONTINUOUS PROCESSING LINES

Kazuo Miyazaki, R. Argelia, 39, Cariru, Ipatinga, MG, Brazil

Filed Feb. 13, 1985, Ser. No. 701,156
Int. Cl.⁴ B21B *37/00*
U.S. Cl. 72—9 **6 Claims**



1. Apparatus for controlling the acceleration and deceleration of a continuous strip processing line, said apparatus comprising:

variable speed drive means responsive to an applied control signal for moving said continuous strip processing line at a velocity determined by the amplitude of said control signal;

actuable selector means for providing a drive command signal at a plurality of alternatively selectable amplitude levels;

integrator means for receiving and integrating an applied command signal and generating said control signal at an amplitude which is the integral of the applied command signal;

means for providing at least one reference command signal of a first predetermined threshold level, said first predetermined threshold level being lower than each of said plurality of alternatively selectable amplitude levels of said drive command signal; and

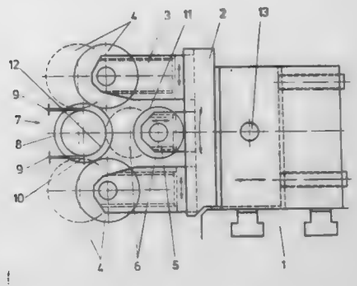
automatic command signal selector means comparing the signal levels of said control signal and said reference command signal and applying said at least one reference command signal to said integrator means to the exclusion of said drive command signal when said control signal amplitude is below said first predetermined threshold level but applying said drive command signal to said integrator means to the exclusion of said reference command signal when the amplitude of said control signal exceeds said first predetermined threshold level, thereby providing a smooth transition from constant speed operation at the onset of acceleration or deceleration.

4,633,695

TOOL FOR THE SEPARATION OF TUBES

Werner Klein, Riegelsberg, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 15, 1984, Ser. No. 671,561
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1983, 3341005
Int. Cl.⁴ B21B *19/00*; B23B *27/06*; B23P *17/00*
U.S. Cl. 72—70 **5 Claims**



1. A tool for the separation of tubes, having a tool holder movable substantially radially to a tube, the tool holder having mounting means for respectively supporting first and second deforming rollers adapted to separate the material of the tube by deformation without cutting, said first and second deforming roller having parallel axes in a plane extending normal to the direction of movement of the tool and being spaced from one another at a distance greater than the inner diameter but less than the outer diameter of the tube to be severed the deforming rollers having rounded circumferential profiles, said tool further comprising a cutting roller affixed to the tool holder, said cutting roller being mounted on said tool holder by way of a third mounting means arranged between said first and second mounting means and having a circumferential profile with a sharper edge than that of the deforming rollers, the deforming rollers and cutting roller being arranged during the forming and cutting operations with their respective outer circumferences being mutually tangential to a circle having a diameter slightly greater than the inner diameter of the tube to be severed.

4,633,696

THREAD ROLLING METHOD

Kimimasa Murayama; Shoji Ikawa, and Shinobu Kaneko, all of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 5, 1985, Ser. No. 762,396
Claims priority, application Japan, Aug. 22, 1984, 59-174681
Int. Cl.⁴ B21H *3/06*
U.S. Cl. 72—88 **4 Claims**

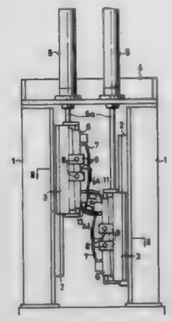
1. A method of producing threads on a plurality of different workpieces of different diameters, comprising the steps of:

providing a plurality of workpieces having different diameters;

adjusting the distance between at least two dies to match the diameter of a desired workpiece;

moving said dies for each selected workpiece in a direction tangential to said selected workpiece;

rotating each of the plurality of workpieces in synchronism with said moving of said dies, peripheral speeds of said workpieces are different from said die moving speed causing slip between said dies and said workpieces, and thereby cutting threads on said workpieces at a constant pitch for all workpiece diameters, lead angles of the threads depending on rolling diameters of said workpieces



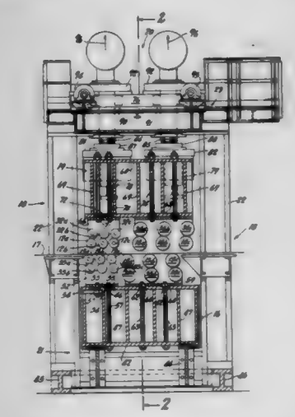
to maintain pitch constant independent of workpiece diameter.

4,633,697

PLATE LEVELLING MACHINE

Leonard P. Blough, Irwin, Pa., assignor to Mesta Engineering Company, Pittsburgh, Pa.

Filed Aug. 16, 1985, Ser. No. 766,890
Int. Cl.⁴ B21D *1/02*
U.S. Cl. 72—164 **17 Claims**



1. A levelling machine for levelling a metallic product and having a first frame means, a first group of relatively small lower rolls and a second group of relatively larger lower rolls all mounted on said first frame means and oriented along a pass line which defines the path of the product through said machine,

a unitary second frame means disposed above said first frame means and mounted for movement relative to said first frame means, and said pass line,

a first group of relatively small upper rolls and a second group of relatively larger upper rolls all mounted on said second frame means for movement therewith relative to said pass line, said small and large upper rolls being disposed in a staggered opposed relation respectively to the relatively small and larger lower rolls,

the rolls of said groups of relatively larger lower and upper rolls being more widely spaced respectively than the rolls of said groups of relatively small lower and upper rolls,

said second frame means being movable between first and

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second positions whereby when said second frame means is in said first position said relatively small upper rolls are located in an operative position opposed to said relatively small lower rolls and adjacent the pass line and said relatively larger upper rolls are located in an inoperative position displaced from the pass line and when said second frame means is in its second position said relatively small upper rolls are located in an inoperative position displaced from the pass line and the relatively larger upper rolls are located in an opposed relation to said relatively larger lower rolls and adjacent the pass line,

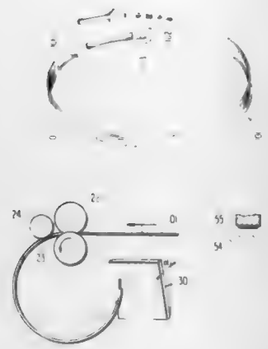
and positioning means for selectively moving said second frame means between its first and second positions for moving said relatively small and larger rolls relative to the pass line so that product of different thickness can be levelled without removing and replacing said rolls.

4,633,698

METHOD FOR PREFORMING A SUBSTANTIALLY FLAT BLANK OF AN OPEN CLAMP

Hans Oetiker, Oberdorfstrasse 21, CH-8810 Horgen, Switzerland

Filed Dec. 21, 1983, Ser. No. 563,823
Int. Cl.[4] B21D *53/36*
U.S. Cl. 72—168 **3 Claims**



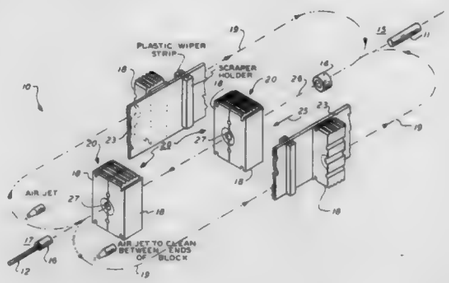
1. A method for preforming a substantially flat pre-cut blank of a band material each adapted to form an individual open clamp provided with means for a mechanical interconnection near the free ends thereof and operable to be mechanically interconnected by said means near the free overlapping ends thereof into a clamp having a generally circular configuration corresponding at least approximately to the configuration of the clamp when being installed about an object to be fastened onto a relatively fixed, generally circular part, comprising the steps of providing a pre-cut generally flat elongated blank having means for mechanical interconnection near its leading and trailing ends, feeding said elongated blank along its length into a number of rollers thereby preforming the thus-fed substantially flat blank into permanent generally circular shape corresponding to said generally circular configuration with the free ends thereof overlapping while also axially spacing the leading end from the trailing end relative to the circular configuration so that said mechanical interconnection means are overlapping and axially spaced from one another so as to facilitate subsequent radial assembly of the thus preformed clamp over the object to be fastened when the previously open clamp is mechanically interconnected by said mechanical interconnecting means.

4,633,699

CONTINUOUS EXTRUSION APPARATUS

Francis J. Fuchs, Jr., P.O. Box 10016, Naples, Fla. 33941

Filed Mar. 22, 1985, Ser. No. 714,905
Int. Cl.[4] B21C *23/32, 35/00*
U.S. Cl. 72—262 **9 Claims**





4. In continuous extrusion apparatus for continuously deforming an elongated workpiece of indefinite length to produce an elongated product of indefinite length, the apparatus including:

(a) a deforming agency;

(b) a plurality of trains of gripping element members;

(c) a plurality of first means, each of said first means being operatively associated with one train of gripping element members for providing an endless path for said associated train of gripping element members;

(d) a plurality of second means, each of said second means for engaging an adjacent pair of trains, for moving in unison each of said adjacent pair of trains of gripping element members around its respective endless path past a first station upstream of said deforming agency toward a second station downstream of said deforming agency, the first and second stations and the span therebetween being common to all of said plurality of endless paths;

(e) the gripping element members of each of said plurality of moving trains of gripping element members being configured to cooperate with each other to form a centrally apertured chamber extending between and moving from said first station to said second station;

(f) the moving chamber for receiving the elongated workpiece in the central aperture thereof and being configured to continuously operatively engage the surface of the elongated workpiece for continuously applying motive force along the surface of the elongated workpiece in the direction of the deforming agency to continuously advance said elongated workpiece against said deforming agency and produce elongated product;

(g) said apparatus having a center-line extending therethrough;

WHEREIN THE APPARATUS FURTHER COMPRISES:

(h) a plurality of endless belts, each being operatively associated with a different one of said trains of gripping element members and each disposed to advance with the associated train of gripping element members from said first station to said second station while contacting the gripping element members of said associated train along the surfaces thereof remote from said endless central apertured chamber; and

(i) pressure means for applying sufficient pressure to said endless belts and through said endless belts to said gripping element members to provide compressive stress support thereto having a stress gradient increasing from said first station toward said deforming agency and substantially equal and opposite to said gradient within said elongated workpiece increasing from said first station toward said deforming agency, and

wherein said plurality of endless belts consist of only two endless belts and wherein said pressure means comprise two hydrostatic bearings, each hydrostatic bearing consisting of two pressure zones, a relatively high pressure zone and a relatively low pressure zone, said pressure zones for cooperatively providing said compressive support stress, and wherein said apparatus further comprises:

(j) third means comprising a first relatively high pressure fluid pressure intensifier and a second relatively low pressure fluid pressure intensifier, said fluid pressure intensifiers connected to said hydrostatic bearings and for respectively providing relatively high pressurized fluid to said relatively high pressure zone and for providing relatively low pressurized fluid to said relatively low pressure zone, and wherein each of said fluid pressure intensifier comprises:

first and second relatively high pressure pump means each including a drive piston mounted for reciprocating sliding axial movement into axial positions, said first and second relatively high pressure pump means for independently receiving a relatively low pressure fluid and pressurizing said fluid into a relatively high pressure;

an intensifier output;

control means for controlling the reciprocation sequence of said first and second high pressure pump means to cause said pump means to deliver said fluid pressurized to said relatively high pressure to said intensifier output at a substantially continuous flow and at a substantially constant pressure; and

said control means operable in accordance with respective predetermined axial positions of said drive pistons, and wherein said first and second pump means each further include a high pressure pump cylinder and a drive cylinder aligned axially with respect to each other and with respect to said drive piston and wherein the forward portion of said drive piston is mounted reciprocably in said high pressure pump cylinder and wherein the rearward portion of said reciprocably mounted drive piston is mounted reciprocably in said drive cylinder, said drive piston provided intermediately with a pair of axially displaced and oppositely disposed predetermined spring biased cams and wherein said first and second pump means are positioned in predetermined parallel and laterally displaced positions with respect to each other, each said high pressure pump cylinder for receiving relatively low pressure fluid at its ends which is pressurized to a relatively high pressure upon said drive piston being advanced by said drive cylinder whereupon said relatively high pressure fluid is delivered to said intensifier output, the forward portion of each of said drive cylinders for being constantly communicated with a source of first pressurized drive fluid to cause said drive cylinder to retract said drive piston;

wherein said control means comprise a four-way control valve including a valve cylinder having a spool mounted therein for reciprocating sliding axial movement, and a pair of push rods mounted at opposite ends of said spool and extending axially outwardly through said valve cylinder, each push rod provided with a pair of axially displaced cam followers, said control valve positioned at a predetermined position between said first and second pumps and oriented perpendicularly with respect thereto, said spool normally occupying a central position within said valve cylinder with a predetermined cam follower of each push rod engageable by a predetermined cam of one of said drive pistons upon the advancement thereof;

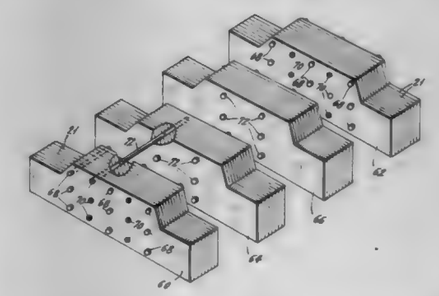
said four-way control valve for being connected to a source of second pressurized drive fluid and upon said spool occupying said central position said second pressurized drive fluid for being communicated through said control valve to the rear of said drive cylinders to cause said drive cylinders to advance said drive pistons within said high pressure pump cylinders, upon each of said drive pistons being advanced into a predetermined axial position said predetermined cam engaging said predetermined cam follower of a predetermined one of said push rods to impart first predetermined axial movement to said spool to disconnect and vent said second pressurized drive fluid from the drive cylinder of the other of said drive pistons to halt the advance thereof while said second pressurized drive fluid is maintained communicated to the drive cylinder of each drive piston, and upon said each drive piston being advanced to a second predetermined axial position, the other of its cams engaging the other cam follower of said predetermined push rod to impart axial movement to said spool in a direction opposite to said first axial movement to return said spool to its central position and upon the advance of said drive piston being halted said first pressurized drive fluid retracting said each drive piston, upon said axial movements of said spool a predetermined reciprocation advancement sequence imparted to said drive pistons to cause at least one of said drive pistons to be advanced at all times to cause said pumps to deliver at said intensifier output a substantially continuous flow of said relatively high pressure fluid at a substantially constant pressure.

4,633,700

CROSSHEAD TIES AND CLEARANCE HOLES ARRANGEMENT FOR EASY REMOVAL OF SAID TIES WITHOUT DISMANTLING OF ENTIRE CROSSHEAD

Adam Zandel, Forest Hills, N.Y., assignor to Preas Technology Corporation, White Plains, N.Y.

Filed Jan. 21, 1986, Ser. No. 820,112
Int. Cl.[4] B21D *37/12;* **B21J** *13/04*
U.S. Cl. 72—455 **15 Claims**



1. An assembly for a frame of a forging press, said assembly comprising:

a plurality of sections mounted on said frame and in a parallel relationship, each of said sections including a plurality of generally flat plates arranged in overlapping relationship to one another;

a plurality of aligned tie holes through said plates; and

a plurality of elongated ties disposed in and protruding from said tie holes for reinforcing and securing said plates of each section to one another, said plurality of sections including first and second outer sections and at least one intermediate section located between and spaced from said first and second outer sections, said tie holes in said at least one intermediate section being offset from said tie

holes which are provided in at least one of said outer sections; and

clearance holes located in at least one of said outer sections to permit ties used with said at least one intermediate section to be withdrawn by passage thereof through said clearance holes whereby removal of ties from said at least one intermediate section is enabled without dismantling or removal of any one of said outer sections.

4,633,701

ABRASION TESTING APPARATUS

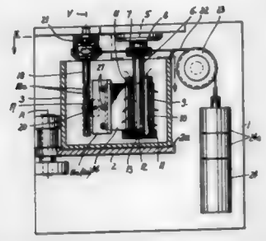
Haas Einleitner, Industriestrasse 3a, 8901 Kissing, Fed. Rep. of Germany

Filed Mar. 15, 1985, Ser. No. 713,073

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1984, 8410643[U]

Int. Cl.⁴ G01N *3/56*

U.S. Cl. 73—7 **14 Claims**



1. In an abrasion testing apparatus for determining abrasion in a screen caused by suction box coatings and the like in the cellulose and paper industry, using a drum arranged in an open tank containing a filler suspension, said drum being mounted on a driving shaft, said drum having a circumference on which suction device coatings are provided, and with a substantially stationary retaining and tensioning means for holding a test piece, in the form of a portion of said screen, pressed against a part of the circumference of said drum, the improvement comprising wherein drive means are provided for rotatably driving said driving shaft, said driving shaft being arranged vertically and said drum being connected to the lower end of said driving shaft, which shaft extends into an upper end of said tank, said drum being of a hollow construction and has a plurality of openings in the circumferential wall thereof and is open at least at its upper end, and said retaining and tensioning means has two pairs of clamping bars arranged in said tank, each of which pairs is connected to a supporting rod extending into said open top of said tank, one of which supporting rods is arranged to be stationary, while the other supporting rod is arranged on a tensioning lever swingable about a vertical axis and loaded by a predetermined force.

4,633,702

TORQUE AND FRICTION TESTER

Willard D. Kaiser, Grove City; Mark J. Koenig, Worthington, and William K. LeBlanc, Mansfield, all of Ohio, assignors to The Shafer Valve Company, Mansfield, Ohio

Filed Aug. 21, 1984, Ser. No. 642,896

Int. Cl.⁴ G01M *19/00*; G01L *5/00, 5/22*; G01N *19/02*

U.S. Cl. 73—9 **19 Claims**

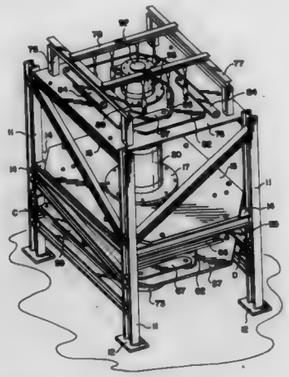
1. An apparatus for measuring torque generated by devices comprising:

a first shaft having a first torque applied thereto by a first device;

a second shaft having a second torque applied thereto by a second device, the second torque opposing the first torque;

sensor means for detecting forces generated by the torques of said first and second shafts respectively and providing electrical signals proportional thereto;

means for transferring the force generated by the first torque from said first shaft and the force generated by the second torque from said second shaft to said sensor means, said means for transferring including a first plate attached to



said first shaft and a second plate attached to said second shaft, said first plate and said second plate applying the forces generated by the torque from said first and said second shafts respectively to said sensor means; and

suspension means to permit the second device to move laterally independently of the first device.

4,633,703

SHOCK ABSORBER TESTING APPARATUS

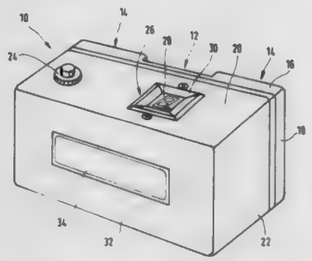
Nathan Needleman, Augusta-Anlage 14, 6800 Mannheim, Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 674,824

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 8429976[U]

Int. Cl.⁴ G01M *17/04*

U.S. Cl. 73—11 **10 Claims**



1. A shock absorber test unit, comprising: a housing attachable to the body of an automobile and containing a mass which swings with damped oscillations due to inertia and whose number of oscillations is counted and indicated after an exciting jolt of the automobile,

wherein said mass is part of an inductive oscillation sensor fixed in the interior of said housing, and

wherein said mass is a current carrying coil suspended by a spring within an induction loop to measure only vertical movements of the automobile.

4,633,704

GAS SENSOR

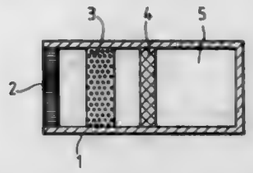
Anthony D. S. Tantram, Great Bookham, and Yat S. Chan, London, both of England, assignors to City Technology Limited, England

Continuation of Ser. No. 723,722, Apr. 17, 1985, abandoned, which is a continuation of Ser. No. 495,328, May 17, 1983, abandoned. This application Apr. 21, 1986, Ser. No. 857,501

Claims priority, application United Kingdom, May 26, 1982, 8215426

Int. Cl.⁴ G01N *27/28*

U.S. Cl. 73—23 **3 Claims**



1. An electrochemical gas sensor for the continuous measurement of a gas comprising housing means, sensing means within said housing means including electrolytic means for generating output current, diffusion barrier means for severely restricting the flux of gas into said housing means to an extent sufficient to insure the output current of the sensor is controlled by the diffusion flux of gas through said diffusion barrier means so that the output current is a direct function of the concentration of gas being sensed and separate filter means of particulate material mounted between said diffusion barrier and said sensing means, said filter means being subjected to a substantially reduced flux of gas since said diffusion barrier means provides diffusion control to such a degree that the life of said filter means is substantially extended and said filter means being substantially inert to the gas being sensed but capable of removing at least one interfering gas from said gas being sensed wherein the degree of flux restriction by said diffusion barrier in relation to the amount of filter material is such that the sensor is capable of exposure to the interfering gas, without significant interference to the signal of the sensor for the gas being sensed, in an amount on an equivalency basis of at least 21,000 SO_2 ppm days when SO_2 is the interfering gas and CO is the gas to be sensed.

4,633,705

QUICK RESPONSE PARAMAGNETIC ANALYZER FOR MEASUREMENT OF OXYGEN CONTENTS OF GASES

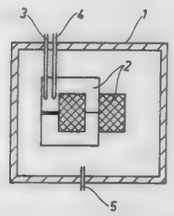
Pekka Meriläinen, and Osmo Toikka, both of Helsinki, Finland, assignors to Instrumentarium Corp., Finland

Filed Apr. 1, 1985, Ser. No. 718,547

Claims priority, application Finland, May 16, 1984, 841961

Int. Cl.⁴ G01N *27/76*

U.S. Cl. 73—27 A **9 Claims**



1. A measuring cell for measuring the oxygen content of a gas mixture comprising:

a member (1) having a closed cavity therein;

a sample gas conduit (3) extending into said cavity for supplying sample gas to said measuring cell;

a reference gas conduit (4) extending into said cavity for supplying reference gas to said measuring cell;

an exit conduit (5) for removing gases from said cavity;

an electromagnet (2) positioned in said cavity, said electromagnet having a core (8, 9) with spaced opposing magnetic poles forming an air gap therebetween, said electromagnet being energizable by chopped direct current for establishing a magnetic field in said air gap, at least one of said magnetic poles having passages (13, 14) extending therethrough and opening into said air gap, said passages being connected to said gas conduits for supplying sample and reference gases to said gap; and

pedestals (15, 16) mounted in said air gap adjacent the openings of said passages for guiding the gases for mixing in said air gap, said mixed gases being discharged into said cavity for removal via said exit conduit.

4,633,706

SYSTEM FOR MEASURING AMOUNT OF PARTICULATES EXHAUSTED FROM VEHICLE ENGINE

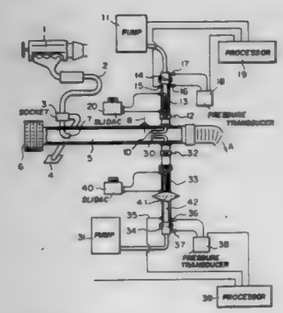
Seitoku Ito; Shigeo Iwashita, both of Okazaki; Sigeru Kamiya, Chiryu; Hiroshi Noguchi, Gotenba, all of Japan, and Nobuhisa Mori, Ann Arbor, Mich., assignors to Nippon Soken, Inc. and Toyota Jidosha Kabushiki Kaisha, both of Toyota, Japan

Filed Oct. 31, 1984, Ser. No. 666,856

Claims priority, application Japan, Nov. 1, 1983, 58-203641

Int. Cl.⁴ G01N *15/06*

U.S. Cl. 73—28 **3 Claims**



1. In a system for measuring the amount of particulates of dry soot and soluble organic fractions contained in exhaust gas from an internal combustion engine, comprising a dilution tunnel in which the exhaust gas is mixed with and diluted by a large amount of clean air, a blower means for sucking the exhausted gas and the clean air into said tunnel section and discharging the diluted gas therefrom and means for detecting the amount of particulates in the diluted gas, the improvement in which said means for detecting the amount of particulates in the diluted gas comprises first and second arrangements for detecting the amounts of dry soot and soluble organic fraction, respectively, said first arrangement comprising a first sampling pipe for extracting one part of the diluted gas from said dilution tunnel, a first sampling pump for flowing the diluted gas through said first sampling pipe, a first filter for depositing the dry soot on said first filter, a first heating means disposed in the upstream region in said first sampling pipe for heating the diluted gas taken in said first sampling pipe, a first pressure transducer for converting a value of a pressure drop across said first filter to an electrical signal, and a first processor for calculating the amount of dry soot in the exhaust gas in accordance with a differential value of the pressure drop output from said first pressure transducer as a function of time, while said second arrangement comprising a second sampling pipe for extracting another part of the diluted gas from said dilution

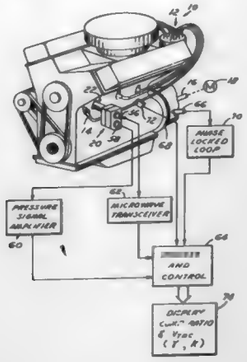
tunnel, a second sampling pump for flowing the diluted gas through said second sampling pipe, an additional filter of a relatively large size for depositing dry soot on said additional filter, a second heating means disposed in the upstream region in said second sampling pipe for heating the diluted gas taken in said second sampling pipe, a second filter disposed downstream of said additional filter for depositing the soluble organic fraction on said second filter, a second pressure transducer for converting a value of a pressure drop across said second filter to an electrical signal, and a second processor for calculating the amount of soluble organic fraction in the exhaust gas in accordance with a differential value of the pressure drop output from said second pressure transducer as a function of time.

4,633,707

METHOD AND APPARATUS FOR MEASURING ENGINE COMPRESSION RATIO, CLEARANCE VOLUME AND RELATED CYLINDER PARAMETERS

Mark L. Haddox, Ann Arbor, Mich., assignor to Jodon Engineering Associates, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 416,852, Sep. 13, 1982, Pat. No. 4,505,152. This application Aug. 31, 1984, Ser. No. 645,857
Int. Cl.⁴ G01M *15/00*
U.S. Cl. 73—47 **26 Claims**



15. A method of quantifying leakage from a cylinder of an internal combustion engine having a piston disposed to reciprocate within said cylinder and a crankshaft rotatably coupled to said piston, said method comprising the steps of:

(a) monitoring rotation of said crankshaft,

(b) monitoring pressure within said cylinder while said crankshaft is rotating and said piston is reciprocating within said cylinder,

(c) identifying displacement volumes of said piston within said cylinder as a function of rotation of said crankshaft, and

(d) quantifying leakage from said cylinder as a function of monitored pressure and identified displacement volumes.

4,633,708

CONSISTOMETER CONTAINER FOR TESTING RHEOLOGICALLY EVOLUTIVE MATERIAL

Paul A. G. Blommaert, Tournai, Belgium, assignor to Total Compagnie Francaise des Petroles, Paris, France

Filed Aug. 16, 1985, Ser. No. 766,374
Claims priority, application France, Aug. 31, 1984, 84 13538
Int. Cl.⁴ G01N *11/14*
U.S. Cl. 73—59 **3 Claims**

1. A consistometer for testing rheologically evolutive materials, comprising:

(a) a housing vessel (1) defining an internal chamber (2),

(b) a container (3) for rheologically evolutive materials removably disposed with the chamber,

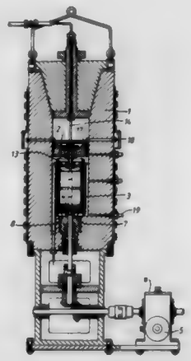
(c) agitator means (15) disposed within the container and rotatable relative thereto,

(d) resilient means for restraining the rotation of one of the container and the agitator means,

(e) means (18) operatively associated with the resilient means for indicating the degree of rotational restraint,

(f) means (19) for establishing desired temperature and pressure conditions in the chamber, and

(g) means (4–6) coupled to another one of the container and the agitator means for implementing relative rotation therebetween,



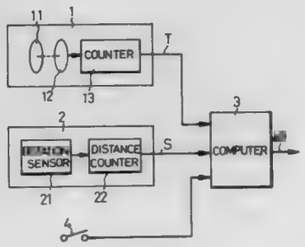
(h) wherein the container comprises a side wall of generally cylindrical or frustoconical shape formed by two longitudinal half-shells (20, 21) separably connected to one another along two diametrically opposite connection generatrices (40, 41) and having externally threaded longitudinal end portions (26, 27), and two unitary clamp rings (22, 23) respectively screwed one on each of said threaded longitudinal end portions to clamp said two half-shells one against the other, said container thus being readily disassemblable to facilitate the removal of evolutively hardened material.

4,633,709

VEHICLE TURN ANGLE DETECTING DEVICE

Koji Numata, Toyokawa; Hiroaki Tanaka, Nukata, and Akira Kuno, Obu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed Aug. 7, 1985, Ser. No. 763,413
Claims priority, application Japan, Aug. 7, 1984, 59-165477; Jun. 13, 1985, 60-129003
Int. Cl.⁴ G01C *21/00*
U.S. Cl. 73—178 R **13 Claims**



1. A vehicle turn angle detecting device comprising:

a steering wheel rotation angle detecting means for detecting a rotation angle ϕ of a steering wheel of a vehicle;

a travelled distance detecting means for detecting a travelled distance L of the vehicle at the steering wheel rotation angle ϕ; and

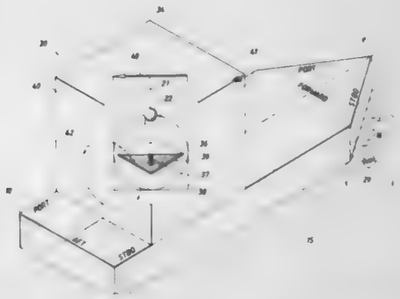
a turn angle computing means for calculating a turn angle θ of the vehicle by using the following equation: $\theta = K \cdot \tan \phi \cdot L$ where K is a proportional constant.

4,633,710

SHIP WAVE HEADING INDICATION METHOD AND APPARATUS

Howard L. Shatto, Jr., Houston, Tex., assignor to Shell Offshore, Inc., Houston, Tex.

Filed Jan. 17, 1985, Ser. No. 692,094
Int. Cl.⁴ G01C *21/00*
U.S. Cl. 73—178 R **10 Claims**



9. Ship wave heading indication apparatus for use on a floating vessel subjected to wave impact, said vessel having a longitudinal axis and two ends, said ship wave heading indication apparatus used to indicate the proper direction to turn the vessel in order to align one of said ends into the direction of wave impact, said apparatus comprising:

an indicator plate positioned within a plane formed perpendicular to the longitudinal axis of the vessel, said indicator plate located within an inhabitable interior compartment of said vessel,

an attachment post having a first end and a second end, said first end operatively connected to said indicator plate,

an elastic member having a first end and a second end, said second end of said elastic member operatively connected to said second end of said attachment post, and

an observable mass suspended from said first end of said elastic member, said mass capable of orbital motion due to flexure of said elastic member as a result of accelerative forces imparted to said mass from wave impact upon said vessel.

4,633,711

LOCAL DISPLAY TECHNIQUE FOR FIBER OPTIC ILLUMINATOR/HOOD SYSTEM

James H. Hipple; Don W. Smith, and Neil E. Reed, all of Lancaster, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

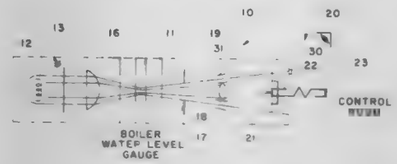
Filed Sep. 4, 1984, Ser. No. 646,715
Int. Cl.⁴ G01F *23/00*
U.S. Cl. 73—293 **8 Claims**

1. The method of optically indicating a fluid level at locations proximate and remote of a level gauge having a plurality of substantially vertically aligned viewing ports composed of a transparent material, said gauge containing the fluid, which comprises the steps of:

passing a bi-color light through each viewing port of the gauge and the fluid whereby the bi-color light refracts responsive to the type of the fluid and the gauge viewing port material and diverges through the gauge viewing port;

providing a masking plate for each viewing port having an aperture between the gauge viewing ports and focusing lenses, and aligning each aperture and each focusing lens in the path of the diverging light so as to pass a first color of the diverging light through the apertures to and above and below the focusing lenses when one fluid is present within said port and pass a second color of the diverging light through the apertures when a different fluid is present within said ports;

focusing the one color of the diverging light passed to the



focusing lens for each port onto a locally receiving face of a fiber optic cable of a port of a remote readout assembly;

illuminating a glass diffuser proximate to each port of the gauge with the one color of the diverging light which passes above or below the focusing lens; and

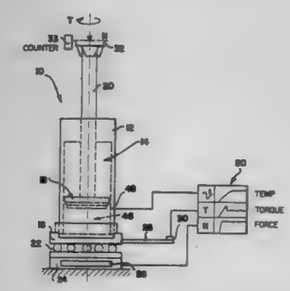
viewing either the remote readout assembly or the glass diffuser proximate to a port of the gauge and determining the fluid level as lying between the port illuminated by said first color and the port illuminated by said second color.

4,633,712

APPARATUS FOR, AND METHOD OF, TESTING AND PULVERIZING PARTICULATE MATERIAL

Stanislaw F. Scieszka, Cape Town, South Africa, assignor to University of Cape Town, Cape Province, South Africa

Filed Nov. 9, 1984, Ser. No. 669,860
Claims priority, application South Africa, Nov. 10, 1983, 83/8372
Int. Cl.⁴ G01N *3/58, 3/24*
U.S. Cl. 73—866 **10 Claims**



1. Apparatus for use in determining mechanical properties of a first, to be pulverized, particulate material with reference to a second material in contact with the first material during pulverization, the apparatus comprising:

an outer member which has a cylindrical cavity therein;

an inner member in said cavity, the inner member being rotatable with respect to the outer member about the longitudinal axis of symmetry of the cavity, the inner and outer members together defining, on one side axially of the inner member, a pulverizing chamber for containing a sample of said first material, there being a gap between the inner and outer members through which particles of said first material which have been reduced to below a predetermined size can leave the pulverizing chamber, the inner member defining a pressure-bearing face facing the pul-

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verizing chamber, whereby the contents of the pulverizing chamber can be placed under axial compression, and the inner member further being adapted to carry removably a sample element of said second material so as to protrude from the pressure-bearing face into the pulverizing chamber;

torque measuring means for measuring the torque transmitted from one said chamber to the other via the contents of the pulverizing chamber during rotation of the members relative to one another; and

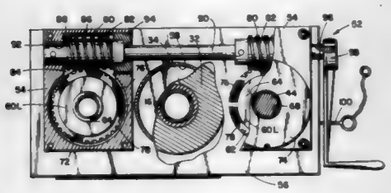
force measuring means for measuring the axial force transmitted from one said member to the other via the contents of the pulverizing chamber during rotation of the members relative to one another.

4,633,713

INSERT/RETRACT MECHANISM FOR FLOW MEASUREMENT PROBES

David R. Mesnard, Boulder, and Horst W. Kalin, Longmont, both of Colo., assignors to Dieterich Standard Corp., Boulder, Colo.

Filed Aug. 23, 1985, Ser. No. 768,829
Int. Cl.⁴ G01F *15/00*
U.S. Cl. 73—866.5 **7 Claims**



1. An insert/retract mechanism for inserting and removing flow-measurement probes and the like axially into and out of a pipeline normal to the direction of fluid flow therein which comprises: a hanger subassembly including yoke-forming means attachable to the probe for movement therewith externally of the pipe and a pair of threaded rods suspended nonrotatably from said yoke in transversely-spaced parallel relation to one another and to the probe axis on opposite sides thereof; a drive subassembly supported in fixed position beneath the yoke and including a common drive shaft along with a pair of gear trains, each of said gear trains having a first gear threaded onto one of said threaded rods and a second gear mounted on said drive shaft for rotation therewith, each of said second gears being operatively interconnected to a first gear for rotating same upon rotation of the drive shaft, said drive subassembly operatively interconnecting said shaft and two threaded rods together for simultaneously and synchronously raising and lowering the latter together with a probe attached to the yoke-forming means and positioned therebetween; and means connected to the drive shaft for rotating same.

4,633,714

AEROSOL PARTICLE CHARGE AND SIZE ANALYZER

Malay K. Mazumder, Little Rock, and Ron E. Ware, Sheridan, both of Ark., assignors to University of Arkansas, Little Rock, Ark.

Filed Aug. 13, 1985, Ser. No. 765,144
Int. Cl.⁴ G01N *29/00*
U.S. Cl. 73—596 **18 Claims**

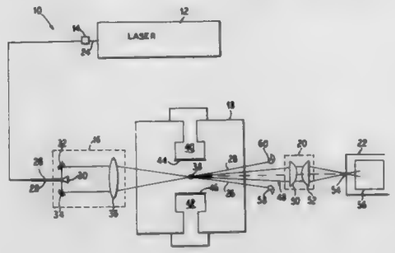
1. A method of determining the charge and aerodynamic size of a particle, comprising the steps of:

(a) propagating an acoustic field on a directionalized first axis at a given location,

(b) driving a gaseous carrier stream carrying particles of indeterminate size and charge,

(c) directing said laden carrier stream into said acoustic field at a directionalized second axis transverse to said first axis to produce a difference between the motion of the particle and the motion of the gaseous carrier stream,

(d) propagating a directionalized electrical field at the same location as said acoustic field to produce a unidirectional



drift velocity on the particle which is a function of the charge and polarity of said particle,

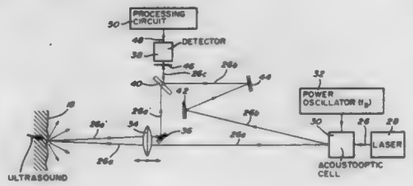
(e) and monitoring said particle to determine the quantum of said difference and of said unidirectional drift velocity as a measure of its charge and aerodynamic size.

4,633,715

LASER HETERODYNE INTERFEROMETRIC METHOD AND SYSTEM FOR MEASURING ULTRASONIC DISPLACEMENTS

Jean-Pierre Monchalin, Montreal, Canada, assignor to Canadian Patents and Development Limited - Societe Canadienne des Brevets et d'Exploitation Limitee, Ottawa, Canada

Filed May 8, 1985, Ser. No. 731,733
Int. Cl.⁴ G01N *29/00*
U.S. Cl. 73—657 **26 Claims**



1. A laser heterodyne interferometric method for measuring the displacement of a free surface of a material subjected to ultrasound, which comprises the steps of:

(a) generating a laser beam having a predetermined intensity;

(b) dividing said laser beam into first and second beam portions having respective intensities representing minor and major fractions of said predetermined intensity, said first beam portion being angularly displaced relative to said second beam portion and being frequency shifted by a predetermined frequency;

(c) passing said second beam portion through an optical lens off-center thereof to focalize said second beam portion onto the free surface of said material subjected to ultrasound, thereby scattering same;

(d) combining the scattered second beam portion with said first beam portion to obtain an optical fringe signal;

(e) converting said optical fringe signal into an electrical fringe signal comprising a central peak at said predetermined frequency and a sideband on either side of said central peak; and

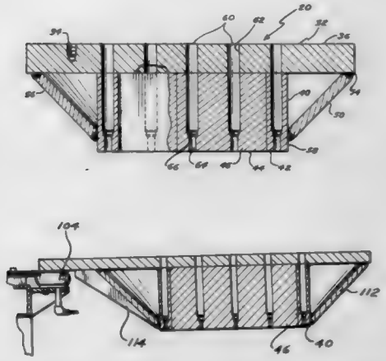
(f) processing said electrical fringe signal through circuitry means without demodulating a phase modulation produced by ambient vibrations, to extract a signal proportional to the displacement of said free surface.

4,633,716

SHAKER HEAD EXPANDER

Robert W. Martin, 136 S. 8th Ave., #1, Industry, Calif. 91746

Filed Apr. 26, 1985, Ser. No. 727,907
Int. Cl.⁴ G01N *29/04*
U.S. Cl. 73—663 **20 Claims**



1. An expander structure for increasing the available test surface area of a vibrational tester including:

a test plate having:

a first surface with a predetermined effective diameter for supporting items to be vibrationally tested; and

a second opposite surface;

a cylinder having:

a first end securely attached to said second opposite surface of said test plate;

an inner cylindrical surface;

an outer cylindrical surface; and

a second end opposite from said first end, said second end having:

a second end surface;

a plurality of walls attached to said inner cylindrical surface of said cylinder, each having:

a first surface securely attached to said second opposite surface of said test plate; and

a second surface planar to said second end of said cylinder; and

a frustoconical member connected between said outer cylindrical surface of said cylinder and said second opposite surface of said test plate.

4,633,717

THERMOCOUPLE VACUUM GAUGE

Richard A. Scholl, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 31, 1985, Ser. No. 760,789
Int. Cl.⁴ G01L *21/14*
U.S. Cl. 73—755 **3 Claims**

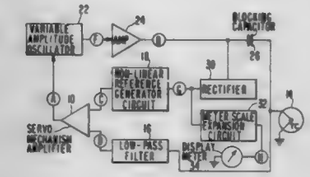
1. A system for deriving an electrical signal which is responsive to pressure at partial vacuum comprising:

a thermocouple in a partial vacuum;

servomechanism means for generating an AC heating current to said thermocouple in response to DC voltage signal from said thermocouple;

low pass filter means for forming a signal responsive to that pressure from the AC heating current to said thermocouple, and

means for generating a reference signal from said signal responsive to pressure, said reference signal being used



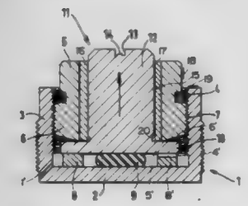
with said DC voltage signal from said thermocouple to control said servomechanism means.

4,633,718

METHOD AND APPARATUS FOR DETERMINING A STRESS RELAXATION CHARACTERISTIC OF ELASTOMERIC MATERIALS UNDER PRESSURE

Ber van Engelshoven, Maastricht, Netherlands, assignor to Rubber- en Kunststoffabriek ENBI B.V., Nuth, Netherlands

Continuation of Ser. No. 711,317, Mar. 13, 1985, abandoned. This application Apr. 29, 1986, Ser. No. 858,537
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1984, 3409252
Int. Cl.⁴ G01N *11/00*
U.S. Cl. 73—822 **12 Claims**



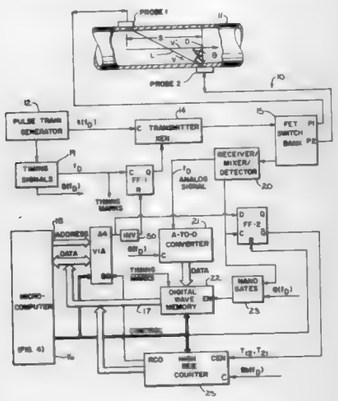
1. An apparatus for determining a stress relaxation characteristic of an elastomeric material under pressure, comprising a housing having a base platen and a collar extending from said base plate for forming a pot shaped configuration, having a longitudinal central axis extending perpendicularly to said base plate, a clamping sleeve axially displaceable inside said collar for adjusting the position of said clamping sleeve in said collar in the direction of said central axis, said clamping sleeve having a central bore of given inner diameter, a compression piston having a piston shaft extending through said central bore, said piston shaft having an outer diameter smaller than said inner diameter of said central bore in said clamping sleeve for providing radial play between said piston shaft and said clamping sleeve, said compression piston further having a compression plate extending radially away from said piston shaft, said compression plate having a ring surface in contact with said clamping sleeve and a compression surface for contacting a sample of said elastomeric material resting on said base plate, and a spacer ring resting on said base plate around said sample for contact with said compression surface of said compression piston to limit a stroke of said compression piston when said compression piston deforms said sample.

4,633,719

DIGITAL FLOW METER CIRCUIT AND METHOD FOR MEASURING FLOW

William H. Vander Heyden, Mequon, Wis., assignor to Badger Meter, Inc., Milwaukee, Wis.

Filed Mar. 27, 1985, Ser. No. 716,471
Int. Cl.[4] G01F *1/66*
U.S. Cl. 73—861.28 9 Claims
MICROFICHE APPENDIX INCLUDED
(55 Microfiche, 1 Pages)



1. A method of generating a signal proportional to the rate of fluid flow in an axial direction through a pipe, the method comprising:

transmitting a first ultrasonic pulse train across the flow from a first probe to a second probe;

transmitting a second ultrasonic pulse train from the second probe to the first probe;

receiving the first and second ultrasonic pulse trains, generating a first sequence of multibit groups of sampling data for the first pulse train and generating a second sequence of multibit groups of sampling data for the second pulse train;

generating timing data, and associating the timing data in memory with the first and second sequences of sampling data to form first and second sequences of time-related sampling data;

reading time-related sampling data from memory and using the timing data therein as a reference for synchronizing the time-related sampling data;

using the synchronized data to determine phase difference between the respective ultrasonic pulse trains;

measuring the elapsed travel times between transmission and reception of the ultrasonic pulse trains; and

in response to phase difference and the elapsed travel times, determining the flow rate and generating an output signal proportional thereto.

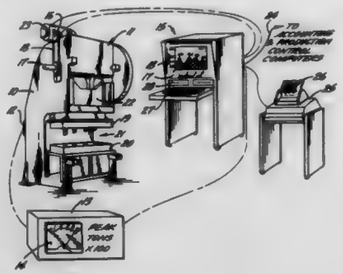
4,633,720

LOAD MONITORING SYSTEM FOR PROGRESSIVE DIES

Frank R. Dybel, and William P. Dybel, both of 981 Wingate Rd., Olympia Fields, Ill. 60461

Filed Dec. 17, 1984, Ser. No. 682,428
Int. Cl.[4] G01L *5/00*; G01D *1/12*
U.S. Cl. 73—862.53 40 Claims

1. A system for monitoring loads that are cyclically applied to a force carrying member comprising a load transducer means for generating an electrical signal indicating the stress applied to said member, analog-to-digital converter means for generating a time series of numerical load values representative of said electrical signal over a substantial portion of at least one operating cycle, and peak finding means responsive to the time series of numerical load values for automatically indicating which of the numerical load values within an individual operating cycle represent at least two different peak loads applied



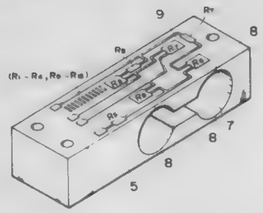
to said member within said individual operating cycle in comparison to adjacent numerical load values within said individual operating cycle.

4,633,721

LOAD CELL HAVING A THIN FILM STRAIN-INDUCIBLE ELEMENT

Yoshihisa Nishiyama, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 1, 1985, Ser. No. 729,362
Claims priority, application Japan, May 17, 1984, 59-99288; May 17, 1984, 59-99289; May 18, 1984, 59-99782; May 18, 1984, 59-99783
Int. Cl.[4] G01L *1/22*
U.S. Cl. 73—862.67 6 Claims



1. A load cell comprising:

a strain-inducible element having four thin portions deformable in the shape of a parallogram and having a pattern forming surface;

A plurality of thin film deposited strain gauges formed on said pattern forming surface wherein each of said gauges is positioned in correspondence with said thin portions and wherein said strain gauges are interconnected to constitute a bridge network;

differential amplifier means including a thin film differential amplifier resistance means;

power supply means;

potential divider means whose input is connected to the output of said power supply means and wherein said potential divider means includes a potential divider resistor means wherein the output of said divider means is connected to the input of said differential amplifier means;

signal amplifier means including a thin film gain determining resistor means wherein one output of said bridge network is connected to one input of said signal amplifier means;

zero-point setting means including a thin film setting resistor means wherein said setting means is connected to the output of said differential amplifier means and to one output of said bridge network;

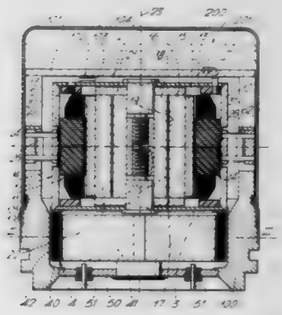
wherein each of said differential amplifier means, said potential divider means, said signal amplifier means and said zero-point setting means is deposited on said pattern forming surface together with said strain gauges in such a manner so that at least one of said differential amplifier resistor means, said divider resistor means, said gain determining resistor means and said setting resistor means is adjustable by trimming simultaneously with trimming adjustment of said strain gauges.

4,633,722

GYROSCOPE APPARATUS

Geoffrey Beardmore, 20 Oak Manor Drive, and Nicholas R. Capaldi, 50 Albemarle Gate, both of Cheltenham, Gloucestershire, England

Filed Feb. 21, 1984, Ser. No. 581,746
Claims priority, application United Kingdom, Feb. 25, 1983, 8305250
Int. Cl.[4] G01C *19/30*
U.S. Cl. 74—5.46 10 Claims



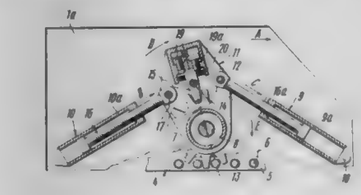
1. In a single-axis servoed rate gyroscope of the kind including a gimbal assembly comprising an inertia member and a motor, said motor being arranged to rotate the inertia member about a first axis, said motor and inertia member being arranged concentrically of one another; bearing means mounting the gimbal assembly for angular displacement about a second axis at right angles to the first axis; sensor means for sensing displacement of the gimbal assembly about the second axis; and torquer means mounted with the gimbal assembly and comprising a coil having a plurality of windings and a permanent magnet so that a restoring torque about the second axis can be applied by energizing the windings of the coil; the improvement comprising said coil being of a cylindrical shape and mounted at one end of said gimbal assembly coaxially of the first axis and spaced from the second axis, said permanent magnet being fixedly mounted with the gyroscope so that the major part at least of the magnet extends within said coil coaxially of the first axis and said magnet being polarized radially of said axis such that a part at least of the magnetic field of said magnet passes through the windings of the coil.

4,633,723

CHAINLESS FEED SYSTEM OF MINING CUTTERLOADER

Felix Z. Masovich; Vladimir N. Khorin; Svetlana M. Golubeva, and Vyacheslav I. Shishlov, all of Moscow, U.S.S.R., assignors to Gosudarstvenny Proektno-Konstruktorsky I Experimentalny Institut Agolnogo Mashinostroenia, Moscow, U.S.S.R.

PCT No. PCT/SU83/00014, § 371 Date Aug. 16, 1984, § 102(e) Date Aug. 16, 1984, PCT Pub. No. WO84/02738, PCT Pub. Date Jul. 19, 1984
PCT Filed May 27, 1983, Ser. No. 642,674
Claims priority, application U.S.S.R., Jan. 11, 1983, 3528703
Int. Cl.[4] F16H *27/02*; E21C *29/02*
U.S. Cl. 74—141.5 4 Claims



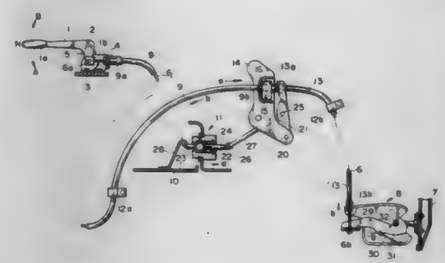
1. A chainless feed system of a mining cutter-loader having a guiding rack mounted on a conveyor and meshing with at least one pair of gears rotatably mounted on the cutter-loader, the guiding rack connected through a rotating mechanism of the gears with hydraulic cylinders operably rolling the gears along the guiding rack, wherein the improvement comprises: a carrier rotatably mounted on a shaft of each of said gears and connected to a first end of each of the hydraulic cylinders forming an acute angle relative to the guiding rack; and a pawl pivotally mounted on a longitudinal axis of said carrier which intersects an axis of said shaft of said gears, said pawl adjacent said first ends of said hydraulic cylinders and having one end of said pawl engaging each of said gears during a working stroke of the rotating mechanism and disengaging from said gears during a return stroke of the rotating mechanism.

4,633,724

PUSH-PULL CABLE ARRANGEMENT FOR TRANSMITTING LONGITUDINAL MOTION

Haruo Mochida, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 23, 1983, Ser. No. 507,085
Claims priority, application Japan, Jul. 12, 1982, 57-121520
Int. Cl.[4] G05G *9/00*; F16C *1/12*
U.S. Cl. 74—471 R 5 Claims



1. A push-pull cable arrangement for transmitting longitudinal motion, comprising

a wire having a front end, a rear end and an intermediate node between the front and rear ends,

a first casing enclosing the wire between the front end and

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the intermediate node, and having a front end and a rear end,

a second casing enclosing the wire between the intermediate node and the rear end, and having a front end and a rear end,

an input unit having a stationary member to which the front end of the first casing is fixed, and a movable member connected with the front end of the wire and capable of pulling the wire from the first casing and pushing the wire into the first casing,

an intermediate unit having a stationary member to which the rear end of the first casing is fixed, and which holds the intermediate node and allows the intermediate node to move longitudinally, the front end of the second casing abutting against, the stationary member of the intermediate unit so as to prevent the distance between the rear end of the first casing and the front end of the second casing from decreasing when the wire is pulled, the intermediate node pushing the front end of the second casing and moving the front end of the second casing away from the stationary member of the intermediate unit when the wire is pushed,

link means connected with the front end of the second casing and caused to move in accordance with the movement of the front end of the second casing,

a first receiving unit having a first member connected with the rear end of the wire, and a second member connected with the rear end of the second casing,

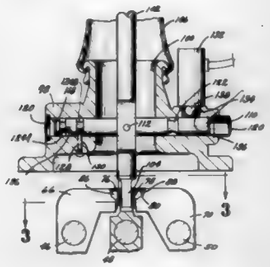
a second receiving unit connected with the link means.

4,633,725

TRANSMISSION AND RANGE BOX CONTROL

Charles R. Jones, Ottawa Lake, Mich., assignor to Dana Corporation, Toledo, Ohio

Filed Oct. 28, 1983, Ser. No. 546,728
Int. Cl.⁴ B60K *20/00*; F16H *3/02*
U.S. Cl. 74—473 R **20 Claims**



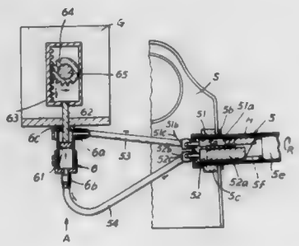
1. A gear ratio selection mechanism for use with a transmission assembly comprising, in combination, a main gear box having an input shaft, an output shaft, a plurality of gear sets providing a plurality of independently selectable gear ratios between said input shaft and said output shaft, a shift rail disposed for substantially free movement through a limited distance, a shift lever pivotally secured to said shift rail, three shift yokes each including means for receiving a portion of said shift lever, biasing means secured to two of said shift yokes for providing a force urging said portion of said shift lever out of a respective two of said shift lever receiving means, auxiliary gear box means in tandem with said main gear box for providing at least two selectable gear ratios, control means activated by said shift rail for commanding selection of one of said auxiliary gear ratios when said shift rail is disposed in a first position and selecting the other of said two gear ratios when said shift rail is disposed in a second position.

4,633,726

EXTERNAL HYDRAULIC DRIVING SYSTEM FOR MOTORCYCLE BRAKE, CLUTCH AND GEAR SHIFT

Kuo-Chou Chang, P.O. Box 10160, Taipei, Taiwan

Filed Sep. 25, 1984, Ser. No. 654,842
Int. Cl.⁴ G05G *9/00*
U.S. Cl. 74—473 R **2 Claims**



1. An external driving system for a motorcycle gear shift comprising:

a primary cylinder combination having two primary cylinders mounted on a handle of a motorcycle; and

a secondary cylinder fluidically communicated with said primary cylinder combination by two delivery conduits, and including a piston in said secondary cylinder, a piston rod connected with a gear rack which engages with a driving gear of the motorcycle gear shift; the improvement which comprises:

said primary cylinder combination including a first primary cylinder having a small diameter and fluidically communicated with an upper connector positioned above said piston of said secondary cylinder by a first delivery conduit of hydraulic fluid, a piston disposed in said primary cylinder, a second primary cylinder having a larger diameter than said first primary cylinder and fluidically communicated with a lower connector positioned under said piston of said secondary cylinder, a piston disposed in said second primary cylinder, the motorcycle handle having a hollow portion, both said primary cylinders inserted into the hollow portion of the motorcycle handle and both pistons of said primary cylinders alternatively pushed or retracted by an inclined-plane tongue of a twist bar formed in said handle, whereby upon the twisting of said twist bar, said piston in said first primary cylinder will be pushed to force the hydraulic fluid through said first delivery conduit to lower said piston in said secondary cylinder to actuate said gear shift and force the fluid under said piston of said secondary cylinder through said secondary delivery conduit for retracting said piston in said second primary cylinder.

4,633,727

MOTORCYCLE AUXILIARY GEARSHIFT

Carl D. Pike, 45515 S.E. Tanner Rd., North Bend, Wash. 98045

Filed Mar. 7, 1985, Ser. No. 709,128
Int. Cl.⁴ B60K *23/00*
U.S. Cl. 74—474 **4 Claims**

1. A foot actuated auxiliary gearshift mechanism for a motorcycle comprising:

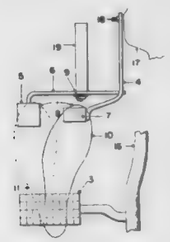
a mounting bracket for attaching the auxiliary gearshift to a motorcycle;

an auxiliary gearshift lever including a pedal at one end and means for contacting the underside of an existing gearshift lever at its opposite end;

a pivot shaft for attaching said gearshift lever between its ends to said mounting bracket;

said lever being attached to said mounting bracket by said pivot shaft generally perpendicular to the existing gearshift lever;

said lever pivoting on said pivot shaft in such a manner as to cause upward movement of the existing gearshift by said



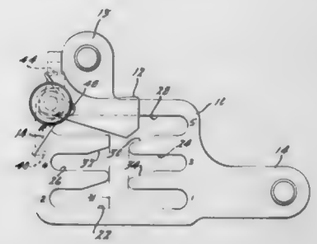
contacting means when downward movement on said pedal is effected by an operator.

4,633,728

GEAR SELECTOR CONTROL FOR MANUAL TRANSMISSION

Kenneth W. May, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 5, 1985, Ser. No. 772,820
Int. Cl.⁴ G05G *5/02, 9/12*
U.S. Cl. 74—476 **4 Claims**



1. A transmission gear selector for controlling the movement of a gear shift mechanism comprising:

a selector pin secured to the gear shift mechanism for movement therewith;

a guide plate having a system of interconnected slots, into which system the selector pin is fitted and by which its movement is restricted, including a first slot extending between a first position of the selector pin that corresonds to a forward drive ratio position of the gear shift mechanism and a second position of the selector pin that corresponds to a reverse drive ratio position of the gear shift mechanism, a third slot parallel to and adjacent the first slot and extending between third and fourth positions of the selector pin, which corresond to forward drive positions of the gear shift mechanism, and a second slot that intersects the first slot between the first position and the second position and intersects the third slot between the third position and the fourth position;

a pivot pin fixed to the guide plate;

a torsion spring supported on the pin and the guide plate; and

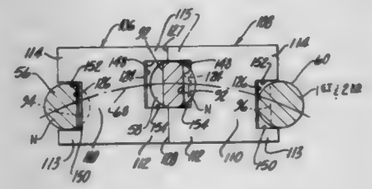
a pawl pivotably mounted on the pin, connected to the torsion spring for resilient movement with respect to the guide plate, adapted for contact with the selector pin, including a slotted hole through which the pivot pin pivotably mounts the pawl to the guide plate and stop means for limiting pivotal movement of the pawl, for preventing movement of the selector pin from the first position to the second position and for guiding movement of the selector pin from the first position toward the third slot.

4,633,729

SHIFT RAIL I-SHAPED INTERLOCKING LUGS

Joseph M. Scalisi, and Peter Bzowycky, both of Liverpool, N.Y., assignors to Chrysler Motors, Highland Park, Mich.

Filed Sep. 24, 1985, Ser. No. 779,545
Int. Cl.⁴ G05G *5/10*
U.S. Cl. 74—477 **3 Claims**



1. An interlocking mechanism for a pair of first and second outboard shift rails and a center shift rail wherein the rails extending longitudinally of a change speed gear transmission, said transmission including case means having a transverse vertically extending support flange formed with three equal diameter bores arranged in an equally spaced symmetrical manner with respect to a longitudinally extending vertically disposed plane, said three bores defining a central bore and a pair of outboard bores, each said rail sized to extend through an associated one of said bores for reciprocal axial travel therein, said interlocking mechanism comprising:

a pair of first and second plate-like, I-shaped identical interlocking lugs;

each lug of said pair of lugs arranged in a mirror-image manner on either side of said center shift rail for horizontal movement in a transverse vertical plane;

each said I-shaped lug comprising a vertically disposed rectangularly shaped body portion having inwardly and outwardly facing vertical edges, each said I-shaped lug formed with an inwardly and an outwardly extending toe portion on its upper end and with an inwardly and an outwardly extending toe portion on its lower end, each said inwardly extending toe portion terminating in a vertical disposed inwardly facing edge;

said first lug body portion disposed intermediate said center rail and said first outboard rail such that its upper inwardly extending toe portion is positioned above said center rail and its upper outwardly extending toe portion is positioned above said first outboard rail, said upper inwardly and outwardly extending toe portions each having a horizontally disposed downwardly facing edge located juxtaposed the upper periphery of said center rail and said first outboard rail, respectively;

said first lug lower inwardly extending toe portion positioned below said center rail, said first lug lower outwardly extending toe portion positioned below said first outboard rail, said first lug lower inwardly and outwardly extending toe portions each having a horizontally disposed upwardly facing edge located juxtaposed the lower periphery of said center rail and said first outboard rail, respectively;

said second lug upper inwardly and outwardly extending toe portions and lower inwardly and outwardly extending toe portions being disposed in an identical mirror-image manner as said first lug toe portions relative to said center rail and said second outboard rail;

each said outboard rail having an inwardly facing recess and said center rail having a pair of opposed outwardly facing recesses;

whereby with said rails positioned in one mode wherein

their associated recesses are disposed in a common transverse plane, each said first and second lug having its body portion outwardly facing vertical edge in locking engagement with its associated outboard rail recess, and each said first and second lug having its body portion inwardly facing vertical edge located closely adjacent said center rail;

whereby upon said first outboard rail being shifted axially its recess being operative to cam said first lug a predetermined distance inwardly toward said center rail causing its body portion inwardly facing vertical edge to be moved into locking engagement with its associated center rail recess, and whereby said first lug upper and lower inwardly extending toe portions vertical edges contacting said second lug upper and lower inwardly extending toe portions vertical edges causing said second lug body portion outwardly facing vertical edge to be moved into locking engagement with said second outboard rail recess;

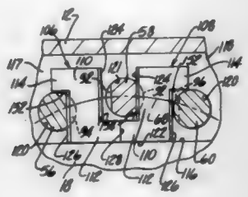
and whereby upon said second outboard rail being shifted axially its recess being operative to cam said second lug toward said center rail causing said second lug body portion inwardly facing vertical edge to be moved into locking engagement with its associated center rail recess, and whereby said second lug upper and lower inwardly extending toe portions vertical edges causing said first lug body portion outwardly facing vertical edge to be moved into locking engagement with said first outboard rail recess.

4,633,730

SHIFT RAIL Z-SHAPED INTERLOCKING LUG ARRANGEMENT

Joseph M. Scalisi, and Peter Bzowycky, both of Liverpool, N.Y., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Sep. 24, 1985, Ser. No. 779,741
Int. Cl.[4] G05G *5/10*
U.S. Cl. 74—477 **3 Claims**



1. An interlocking mechanism for a pair of first and second outboard shift rails and a center shift rail wherein the rails extending longitudinally of a change speed gear transmission, said transmission including case means having transverse support means formed with three equal diameter bores arranged in a equally spaced symmetrical manner with respect to a longitudinally extending vertically disposed plane, said three bores defining a central bore and a pair of outboard bores, each said rail sized to extend through an associated one of said bores for reciprocal axial travel therein, said interlocking mechanism comprising:

a pair of first and second plate-like, Z-shaped identical interlocking lugs having upper and lower horizontally disposed edges;

means for supporting each lug of said pair of lugs being arranged in a mirror-image manner on either side of said center shift rail for sliding movement of their respective lower edges in a transverse vertical plane;

each said Z-shaped lug comprising a vertically disposed rectangularly shaped body portion having inwardly and outwardly facing vertical edges, each said Z-shaped lug formed with an outwardly extending toe portion on its upper end and an inwardly extending toe portion on its lower end, each said lug lower inwardly extending toe terminating in a vertical disposed inwardly facing edge;

said first lug body portion disposed intermediate said center rail and said first outboard rail such that its upper outwardly extending toe portion is positioned above said first outboard rail, said first lug upper toe portion having a horizontally disposed downwardly facing edge located closely adjacent the upper periphery of said first outboard rail;

said first lug lower inwardly extending toe portion positioned below said center rail, said first lug lower inwardly extending toe portion having a horizontally disposed upwardly facing edge located closely adjacent the lower periphery of said center rail;

said second lug upper outwardly extending toe portion and lower inwardly extending toe portion being disposed in an identical mirror-image manner as said first lug toe portions relative to said center rail and said second outboard rail;

each said outboard rail having an inboard facing recess and said center rail having a pair of opposed outboard facing recesses;

whereby with said rails positioned in one mode their associated recesses being disposed in a common transverse plane with each said first and second lug having its body portion outwardly facing vertical edge in locking engagement with its associated outboard rail recess, and each said first and second lug having its body portion inwardly vertical edge located closely adjacent said center rail;

whereby upon said first outboard rail being shifted axially its recess being operative to cam said first lug a predetermined distance toward said center rail causing its body portion outboard vertical edge to be moved into locking engagement with its associated center rail recess, and whereby said first lug lower toe portion vertical edge contacting said second lug lower toe vertical edge causing said second lug body outboard vertical edge portion to be moved into locking engagement with said second outboard rail recess;

and whereby upon said second outboard rail being shifted axially its recess being operative to cam said second lug toward said center rail causing the said second lug body portion inwardly facing vertical edge to be moved into locking engagement with its associated center rail recess, and whereby said second lug inwardly extending lower toe portion vertical edge contacting said first lug inwardly extending lower toe portion vertical edge causing said first lug body portion outwardly facing vertical edge to be moved into locking engagement with said first outboard rail recess.

4,633,731

STEERING SYSTEM EQUIPPED WITH STEERING WHEEL CENTER PAD ANTI-ROTATION MECHANISM

Hidenori Kurata, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 8, 1985, Ser. No. 752,953
Claims priority, application Japan, Jul. 10, 1984, 59-143055
Int. Cl.[4] B62D *1/10, 1/16*
U.S. Cl. 74—492 **4 Claims**

1. A steering system comprising:

a stationary column having an upper end portion;

a steering shaft concentrically surrounded by said column and having an upper end portion;

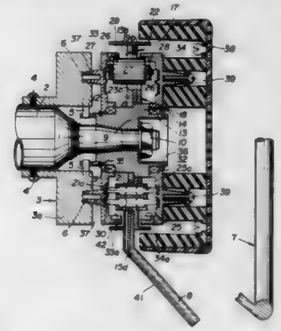
a steering wheel having a hub portion at which it is mounted on the upper end portion of said steering shaft for rotation therewith;

said hub portion having an annular flange section and a pair of upper and lower sleeve sections projecting upwardly and downwardly from the inner periphery of said flange section;

a pair of upper and lower internal gears mounted on said upper and lower sleeve sections, respectively, said lower internal gear being arranged axially and upwardly of said upper end portion of said column;

a pair of bearings interposed between said upper and lower internal gears and said upper and lower sleeve sections, respectively;

means extending axially between said upper end portion of said column and said lower internal gear for preventing



rotation of said lower internal gear relative to said column;

a bracket fixedly mounted on said hub portion; and

a pinion rotatably carried on said bracket and meshing with said upper and lower internal gears;

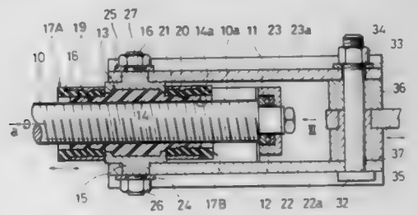
said upper and lower internal gears being made of the same material as that of which said bracket is made.

4,633,732

SHAFT AND BUSH DEVICE AND TILTING STEERING EQUIPMENT WITH THE SHAFT AND BUSH DEVICE

Masumi Nishikawa, Toyoake; Masanobu Ishikawa, Nagoya; Hiroki Sato, Aichi; Shuhei Toyoda, Toyota, and Hakumi Ishii, Okazaki, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 11, 1984, Ser. No. 619,269
Claims priority, application Japan, Jun. 11, 1983, 58-104829; Jun. 11, 1983, 58-104830; Jun. 13, 1983, 58-90070[U]
Int. Cl.[4] B62D *1/18;* F16H *25/22*
U.S. Cl. 74—493 **5 Claims**



1. A shaft and bush device, comprising:

a bush with an engaging hole supported on a base and a shaft being at least rotatably inserted into said engaging hole of the bush, wherein said bush has at least one slit axially formed therein to dimensionally change radially; and

pressing means for forcing said bush to dimensionally change radially and to be pressed toward the shaft for diminishing backlash between the shaft and bush wherein said bush is divided axially into at least two parts and the at least one slit is formed between divided surfaces of said parts, wherein the pressing means is provided at an outer periphery of said bush for pressing said bush inwardly, and wherein the pressing means includes an elastic member covering the outer periphery of the bush and a rigid member covering the outer periphery of the elastic member.

4,633,733

RATCHET MECHANISM

John W. Tavener, Stokesley, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Sep. 23, 1985, Ser. No. 780,020
Claims priority, application United Kingdom, Oct. 10, 1984, 8425549
Int. Cl.[4] G05G *5/06*
U.S. Cl. 74—533 **8 Claims**



1. A ratchet mechanism comprising a disc rotatable on a pivot pin, said disc being provided with radially disposed ratchet teeth on a face of the disc, an engagement plate provided with channels corresponding to and engageable with the teeth of the disc, the ratchet face of the rotatable disc being biassed into engagement with the ratchet face of the plate, and means for disengaging the ratchet disc from the plate comprising a release disc situated between the rotatable ratchet disc and the engagement plate having at least one inclined surface on a face of the disc corresponding with an inclined surface provided on the rotatable ratchet disc or the engagement plate, means for rotating the release disc independently of the rotatable ratchet disc whereby the corresponding inclined surfaces are co-operable to separate the rotatable disc from engagement with the plate.

4,633,734

STEERING WHEEL

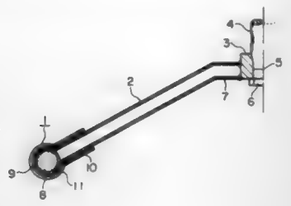
Isamu Yano; Ryoji Fujita, and Hidetoshi Kitakoga, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

PCT No. PCT/JP84/00102, § 371 Date Oct. 25, 1984, § 102(e) Date Oct. 25, 1984, PCT Pub. No. WO84/03673, PCT Pub. Date Sep. 27, 1984
PCT Filed Mar. 14, 1984, Ser. No. 667,907
Claims priority, application Japan, Mar. 15, 1983, 58-42623; Oct. 7, 1983, 58-187822
Int. Cl.[4] B62D *1/04*
U.S. Cl. 74—552 **7 Claims**

1. In a steering wheel comprising an annular rim forming a grip, a boss for connection to a steering shaft and a spoke connecting the rim and the boss, the improvement wherein said rim comprises a core of lightweight material and a plastic layer reinforced with unidirectional reinforcing fiber and surrounding said core, and said spoke is formed from a metal and

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has one end secured to said boss, said boss being formed from a metal, while the other end of said spoke is secured to said rim



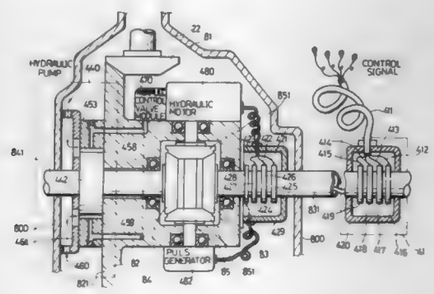
by a plastic layer reinforced with unidirectional reinforcing fiber.

4,633,735

AUTOMOBILE DIFFERENTIAL GEAR SYSTEM

Masao Sakurai, Obbu; Yousuke Hamada, Kariya; Morimasa Ninomiya, Nagoya; Toshihide Takechi; Kunihiro Nakagawa, both of Kariya, and Takashi Fujii, Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 23, 1985, Ser. No. 790,529
Claims priority, application Japan, Oct. 24, 1984, 59-223639
Int. Cl.⁴ F16H *37/06*
U.S. Cl. 74—675 **4 Claims**



1. An automobile differential gear system comprising:

a differential gear including a differential gear case to which a torque of the propeller shaft is transmitted through a gear wheel, pinions mounted on said differential gear case for revolution together with the differential gear case and for rotation on their axes, and gear wheels capable of being rotated by the composite rotative action of the rotation of the pinions and the revolution of the differential gear case;

a steering angle detecting unit for detecting a steering angle;

a driving speed detecting unit for detecting the revolving speed of the differential gear case;

a pinion speed control unit which receives signals from the steering angle detecting unit and the driving speed detecting unit and provides a control signal corresponding to the input signals for controlling the differential rotation of the right and left gear wheels; and

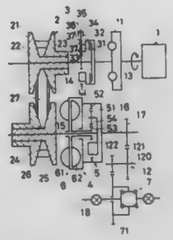
a pinion driving unit for rotating the pinions to control the respective revolving speed of the right and the left gear wheels according to the control signal given thereto by the pinion speed control unit.

4,633,736

VEHICULAR CONTINUOUSLY VARIABLE TRANSMISSION

Shiro Sakakibara, Toyokawa; Mutsumi Kawamoto, Nagoya, and Masahiko Ando, Anjo, all of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Continuation of Ser. No. 446,953, Dec. 6, 1982, abandoned. This application Nov. 18, 1985, Ser. No. 798,724
Int. Cl.⁴ F16H *37/00, 47/04*
U.S. Cl. 74—689 **4 Claims**



1. A vehicular continuously variable transmission comprising a V-belt drive continuously variable transmission and a power transmission splitting driving mechanism formed of a combination of a fluid coupling and a planetary gearing and disposed between the V-belt drive continuously variable transmission and an output shaft of a power transmission splitting driving mechanism of the vehicular continuously variable transmission, wherein said V-belt drive continuously variable transmission including a fixed flange fixed to the input shaft and a movable flange adapted to be operated hydraulically, an output sheave mounted on the output shaft of the V-belt drive continuously variable transmission in parallel to the input shaft and including a fixed flange fixed to the output shaft and a movable flange adapted to be operated hydraulically and a V-belt for transmitting power between the input sheave and the output sheave, and said fluid coupling having a pump and a turbine, and said planetary gearing including a sun gear, a ring gear, and a carrier, and said planetary gearing connecting the carrier to the output shaft of said V-belt drive continuously variable transmission, while connecting the sun gear to the pump, while still connecting the ring gear to the turbine.

4,633,737

METHOD AND APPARATUS FOR MINIMIZING PRESSURIZED FLUID FLOW IN AN AUTOMATIC TRANSMISSION

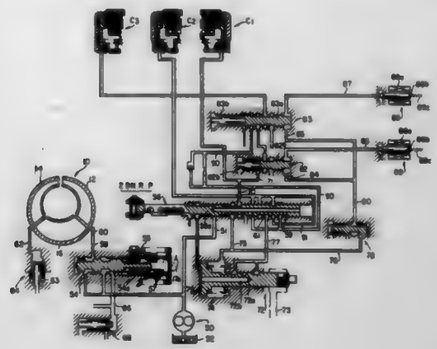
Masao Nishikawa, Tokyo; Shinzo Sakai, and Junichi Miyake, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 556,665, Dec. 6, 1983. This application Jul. 1, 1985, Ser. No. 750,239
Claims priority, application Japan, Dec. 6, 1982, 57-213572; Dec. 6, 1982, 57-213573
Int. Cl.⁴ B60K *41/18, 41/16*
U.S. Cl. 74—866 **8 Claims**

1. A method for controlling a plurality of magnet valves in an automatic transmission having a fluid torque converter, and auxiliary transmission equipped with a plurality of gear trains for transmitting the output torque of said torque converter to drive wheels through a selected one of the gear trains, a plurality of shift valves to select said gear trains, and a plurality of magnet valves to drive said shift valves, comprising the steps of:

(a) closing a first magnet valve, at about the time of stalling of said torque converter, which valve is subsequently to take an open-state at the time the gear train shifts up from the gear train of the lowest speed to that of the second lowest speed,

(b) opening said first magnet valve near the time that the vehicle velocity reaches said second lowest speed; and



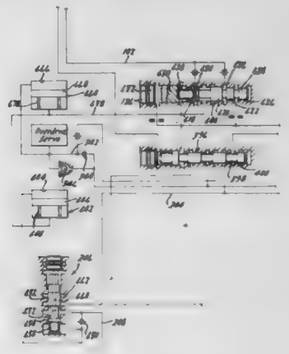
(c) closing the remaining magnet valves when the vehicle velocity reaches a slightly higher speed, so that only a short time delay occurs after opening of said magnet valve before said remaining valves are closed.

4,633,738

CONTROL VALVE SYSTEM FOR A FOUR SPEED RATIO AUTOMATIC TRANSMISSION INCLUDING A DUAL RANGE REGULATOR VALVE FOR CONTROLLING INDEPENDENTLY TWO UPSHIFT RATIO CHANGES

Frank W. Timte, Canton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 19, 1985, Ser. No. 756,627
Int. Cl.⁴ B60K *41/16*
U.S. Cl. 74—869 **7 Claims**



1. In a control system for a four speed automatic transmission for use in a vehicle driveline to deliver torque from an engine to vehicle traction wheels, said transmission having a driving shaft powered by said engine, a driven shaft, multiple ratio gearing establishing multiple torque delivery paths between said driving and driven shafts and fluid pressure operated clutches and brakes adapted to control the relative motion of the elements of said gearing;

clutch and brake servo means for activating and deactivating said clutches and brakes to effect speed ratio changes;

a fluid pressure source, conduit structure connecting said pressure source with said servo means, multiple ratio shift valve structure including a 1-2 shift valve means and a 3-4 shift valve means in said conduit structure for controlling distribution of pump pressure to said servo means to effect ratio changes, respectively, between a first ratio and a second ratio and between a third ratio and a fourth ratio;

a 1-2 accumulator comprising an accumulator cylinder and an accumulator piston cooperating with said cylinder to define a 1-2 accumulator chamber, said 1-2 accumulator chamber communicating with the servo means for effecting second speed ratio;

a 3-4 accumulator comprising an accumulator cylinder and an accumulator piston cooperating with said cylinder to define a 3-4 accumulator chamber, said 3-4 accumulator chamber communicating with the servo means for effecting fourth speed ratio;

an accumulator regulator valve means for regulating pressure from said pressure source to produce a modulated accumulator control pressure, a common accumulator control pressure passage connecting the output side of said accumulator regulator valve means with each accumulator whereby an accumulator control pressure source is applied to each accumulator piston; and

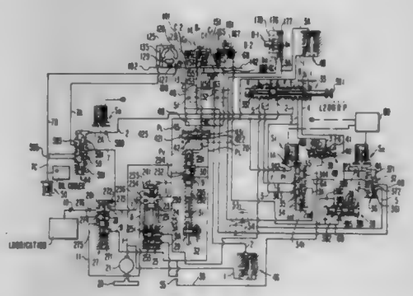
means for applying an added pressure force to said accumulator pressure regulator valve means to modify the regulating characteristics thereof for one of said ratio changes relative to the regulating characteristics thereof for the other of said ratio changes.

4,633,739

SYSTEM FOR CONTROLLING AUTOMATIC TRANSMISSION HAVING COMMUNICATION CONTROL VALVE MEANS

Tsunehiko Ogasawara, Kariya; Yoshichika Arakawa, Nagoya; Koji Sumiya, Nishio, and Yoshikazu Sakaguchi, Anjo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Aisin Warner Kabushiki Kaisha, both of Aichi, Japan

Filed Mar. 28, 1984, Ser. No. 594,291
Claims priority, application Japan, Mar. 31, 1983, 58-57495
Int. Cl.⁴ B60K *41/06*
U.S. Cl. 74—869 **7 Claims**



1. A system for hydraulically controlling an automatic transmission equipped with a gear mechanism having elements and a plurality of friction engaging means therefor for attaining a plurality of shift ranges by locking and releasing at least one of the elements of the gear mechanism, which is disposed between an input shaft and an output shaft, to and from a case, by bringing the elements into and out of engagement with one of the input shaft, the output shaft, and each other, comprising:

a first and a second friction engaging means which take part in achieving at least two speed ranges comprising a higher speed range and a lower speed range;

the first friction engaging means taking part in achieving a gear train of the higher speed range between said input and output shafts, and the second friction engaging means taking part in achieving a gear train of the lower speed range;

a first and a second hydraulic servo means for actuating the first and the second friction engaging means, respectively;

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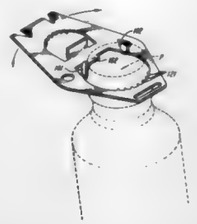
a third hydraulic servo means which is disposed to act opposing to said second hydraulic servo means and is communicated with the first hydraulic servo means;
a hydraulic pressure source for generating a hydraulic pressure;
a regulator valve for regulating the hydraulic pressure from the hydraulic pressure source into a given pressure;
a first signal hydraulic pressure valve for generating a first signal pressure related with the operation conditions of an engine for driving said input shaft, said conditions including at least output of the engine;
shifting valves for selectively supplying the hydraulic pressure from the regulator valve to respective servo means of said friction engaging means;
a hydraulic line communicating the first hydraulic servo means with the third hydraulic servo means;
a communication control valve means, disposed in said hydraulic line, for controlling the communication therebetween in response to at least the first signal pressure;
said communication control valve means includes an orifice control valve and in parallel therewith a flow rate control valve means;
said orifice control valve comprising a valve cylinder, two ports each being communicated with the first and second servo means, respectively, a spool slidably disposed in the cylinder to control the communication between said two ports, a first chamber receiving the first signal pressure related with the throttle opening adapted to urge the spool to interrupt communication between said two ports as the first signal increases, and a second chamber receiving a second signal pressure related with vehicle speed applicable upon said spool against the first signal pressure; and
said flow rate control valve means comprising in parallel an orifice and a check valve which allows the fluid only to flow from the first servo to the third servo,
wherein the lower the first signal pressure and the higher the second signal pressure the more quickly is the second friction engaging means engaged upon downshifting from the higher speed range to the lower speed range.

4,633,740

COMBINATION RECEPTACLE OPENER

Ralph S. Jacobs, Norton, Mass., assignor to Color Dynamics, Inc., Norton, Mass.

Filed Oct. 23, 1984, Ser. No. 663,767
Int. Cl.[4] B67B *7/44*
U.S. Cl. 81—3.09 **18 Claims**



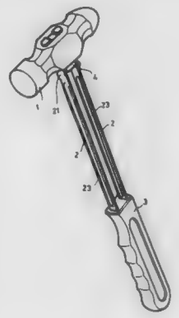
1. A combination receptacle opener, comprising:
a plate member having two faces and an aperture, wherein a portion of the inner surface of the plate member surrounding the aperture includes serrations for gripping for twisting off a twist-cap inserted flatly into the aperture (i.e., in such a way that the plane of the top of the cap is parallel to the plane of the plate member), and a further portion of such inner surface includes means for engaging a crown cap such that the serrated portion of such inner surface serves as a fulcrum for prying such a cap off its bottle, wherein in each case, the twist-cap or the crown cap is first inserted into the same face of the plate member (hereinafter the "insertion face") for removal.

4,633,741

HAMMERING TOOL WITH FLEXIBLE HANDLE

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Continuation-in-part of Ser. No. 544,260, Oct. 21, 1983, abandoned. This application Jun. 26, 1985, Ser. No. 749,097
Int. Cl.[4] B25C *1/00*
U.S. Cl. 81—20 **10 Claims**



1. In a hammering tool having a gripping handle and further having a head portion for delivering impact blows, the improvement which comprises a pair of substantially parallel members having respective first and second end portions, means for securing the first respective end portion to the gripping handle, and means for anchoring the second respective end portion to the head portion of the tool, wherein the members may flex substantially in unison as the tool is used to deliver the impact blows, wherein the members comprise substantially parallel plate-like springs, each of which is provided with a longitudinal rib extending substantially from the head to the handle, and wherein the means to anchor the second respective end portions of the springs comprises the head having a tapered cross bore formed therein, the tapered bore diverging downwardly of the head and in a direction towards the handle, and a wedge block received in the bore and having a complementary taper to anchor the plate-like springs in the head.

4,633,742

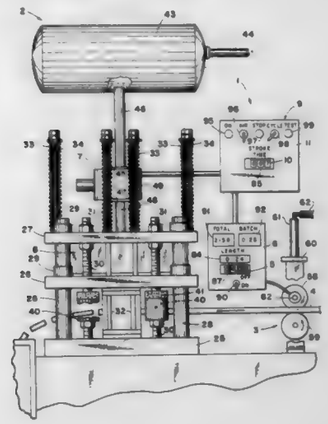
PNEUMATIC PRESS CONTROLLER AND METHOD

Timothy A. Gutowski, Spring Lake, and Merl T. Tucker, Grand Haven, both of Mich., assignors to Contour Roll Company, Grand Haven, Mich.

Filed Jul. 22, 1985, Ser. No. 757,154
Int. Cl.[4] B23D *36/00*; B26D *5/12, 5/26*
U.S. Cl. 83—13 **22 Claims**

1. In a pneumatic press of the type having mating platens which reciprocate through a stroke defined between open and closed platen positions, an air actuated ram positioned between said platens, a valve positioned between a source of pressurized air and said ram, with an open position in which pressurized air communicates with a power side of said ram to converge said platens to the closed position, and a closed position in which the pressurized air does not communicate with the power side of said ram, and means for automatically diverging said platens to the open position when said valve is closed, the improvement of a controller comprising:
a gauge having means for measuring increments of length of stock material translating through said press, and providing a continuous readout;
means for recording a preselected length of stock material;
means for comparing the readout of said measuring means with the preselected length of said length recording means, and when equal, generating a stroke initiate signal;
means for detecting said stroke initiate signal and opening said valve in response thereto;
a timer having means for measuring increments of time from a zero point, and providing a continuous readout;
means for recording a preselected amount of time;
means for comparing the readout of said timer with the preselected time of said time recording means, and when equal, generating a stroke halt signal;
means for detecting said stroke halt signal and closing said valve in response thereto, whereby the stroke of said press is varied in accordance with each selected press operation and application to minimize press cycle time, and increase production speed.

20. A method for controlling pneumatic presses of the type having mating platens which reciprocate through a stroke defined between open and closed platen positions, an air actuated ram positioned between said platens, a valve positioned between a source of pressurized air and said ram, with an open position in which pressurized air communicates with a power side of said ram to converge said platens to the closed position, and a closed position in which the pressurized air does not communicate with the power side of said ram, and means for automatically diverging said platens to the open position when said valve is closed, comprising:



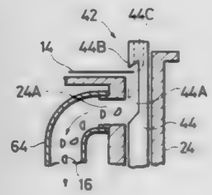
measuring increments of length of stock material translating through said press, and providing a continuous readout;
recording a preselected length of stock material;
comparing the readout of said measuring means with the preselected length, and when equal, generating a stroke initiate signal;
zeroing said gauge in response to said stroke initiate signal;
detecting said stroke initiate signal an opening said valve in response thereto;
measuring increments of time from a zero point, and providing a continuous readout;
recording a preselected amount of time;
comparing the readout of said timer with the preselected time, and when equal, generating a stroke halt signal;
zeroing said timer in response to said stroke initiate signal;
detecting said stroke halt signal and closing said valve in response thereto, whereby the stroke of said press is varied in accordance with each selected press operation and application to minimize press cycle time, and increase production speed detecting said stroke halt signal and closing said valve in response thereto, whereby the stroke of said press is varied in accordance with each selected press operation and application to minimize press cycle time, and increase production speed.

4,633,743

NOTCHER WITH IMPROVED WASTE CHIP REMOVAL MEANS

Koji Ichikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 7, 1985, Ser. No. 742,481
Claims priority, application Japan, Jun. 7, 1984, 59-117590
Int. Cl.[4] B26D *3/14*
U.S. Cl. 83—100 **20 Claims**



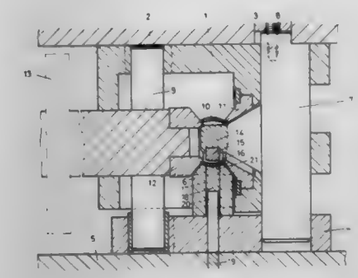
1. A notcher which comprises:
(a) a die having a die bore connected to a suction device; and
(b) a notching cutter movable between first and second positions, said nothching cutter performing a cutting operation between said first and second positions, and said nothcing cutter having an air hole for communicating ambient air with said die bore when said notching cutter is in said second position.

4,633,744

PUNCH PRESS FOR CUTTING WINDOWS IN A BALL CAGE

Martin Maurer, Uttwil, Switzerland, assignor to Hydrel AG, Romanshorn, Switzerland

Filed Jun. 7, 1984, Ser. No. 618,175
Claims priority, application Switzerland, Jun. 9, 1983, 3169/83
Int. Cl.[4] B26F *1/44*
U.S. Cl. 83—128 **6 Claims**



1. A punch press for cutting windows in cylindrical workpieces, comprising:
a fixed press member having an arm with a free end extending therefrom;
a cutting punch mounted on the arm at the free end and facing downward;
an upper press member adapted to be displaced vertically with respect to the fixed member, the upper member having holding means for securing the cylindrical workpiece about the cutting punch within the press;
a lower press member adapted to be dispaced vertically with respect to the upper member and the fixed member, the lower member having a die formed with a cutting opening for cooperating with the cutting punch;
the die formed with a portion directly engaging the holding

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means and the workpiece to displace the holding means and workpiece upwardly;

a counter-punch within the cutting opening and displaceable therein with respect to the die, the counter-punch being displaceably mounted on the lower press member; and

wherein the lower member is displaced towards the workpiece to contact the outer surface, the upper and lower members are displaced upward with respect to the cutting punch to cut the window in the workpiece, the cutting punch and cut piece from the workpiece being forced into the cutting opening and displacing the counter-punch downward with respect to the lower member.

4,633,745

APPARATUS FOR TRIMMING ARTICLES MOLDINGLY FORMED ON PLASTIC SHEET

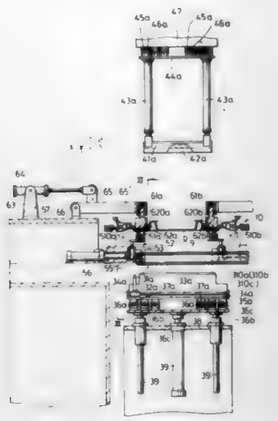
Kazuo Asano, Nagoya, Japan, assignor to Kabushiki Kaisha Asano Kenkyusho, Nagoya, Japan

Filed Aug. 15, 1985, Ser. No. 765,996

Claims priority, application Japan, Aug. 22, 1984, 59-174500

Int. Cl.⁴ B26D *11/00*

U.S. Cl. 83—455 **2 Claims**



1. An apparatus for trimming a plastic sheet on which articles are moldingly formed with longitudinally and transversely extended ridges around the articles, comprising a plurality of first sets of assemblies, each of said first sets of assemblies comprising a first knife, an upwardly protruded and longitudinally extended first rib member, first support means for supporting said first knife and said first rib member, first drive means for longitudinally driving said knife parallel to said first rib member, and first adjusting means for adjusting the position of said first support means in a transverse direction; a plurality of second sets of assemblies, each of said second sets of assemblies comprising a second knife, an upwardly protruded and transversely extended second rib member, second support means for supporting said second knife and said second rib member, second drive means for transversely driving said second knife prarallel to said second rib member and second adjusting means for adjusting the position of said second support means in a longitudinal direction; a pair of endless link chains each having a plurality of chains for gripping side edges of said plastic sheet; first movable means for vertically moving said first sets of assemblies between a raised position where the first knives engage the plastic sheet and the longitudinally extended first rib members fit in the longitudinally extended ridge of the plastic sheet and a lowered position such that when said first movable means is in said raised position, said first knives sever said plastic sheet in a longitudinal direction; and second movable means for vertically moving said second sets of assemblies between a raised position where the second knives engage the plastic sheet and the transversely extended second extended rib members fit in the transversely extended ridges of the plastic sheet and a lowered retracted position such that when said second movable means is in said raised position, said second knives sever said plastic sheet in a transverse direction.

4,633,746

DEVICE FOR PUNCHING FLAT SHAPED ARTICLES, PARTICULARLY PAPER, PAPERBOARD OR THE LIKE

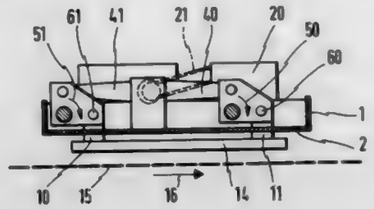
Hagen Gämmerler, Ichoring 44, D-8021 Icking, Fed. Rep. of Germany

Filed Apr. 18, 1985, Ser. No. 724,620

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1984, 3414783

Int. Cl.⁴ B26D *5/16*

U.S. Cl. 83—602 **9 Claims**



1. A device for punching flat articles or the like, comprising a rectangular frame having a drive motor attached thereto; a rotatable shaft attached to and extending toward the interior of said frame; means for rotatably coupling said drive motor to said rotatable shaft; a pair of crank arms eccentrically mounted to said rotatable shaft, each of said crank arms having a distal end; a pair of parallel rocker shafts attached to said frame and each rocker shaft passing through the interior of said frame; a toggle lever rocker arm pivotally mounted to each rocker shaft along a first axis through said toggle lever, and pivotally attached to a distal end of a crank arm along a second axis through said toggle lever; and a punching tool pivotally coupled to said toggle lever along a third axis through said toggle lever; whereby said drive motor causes pivotal movement of said toggle levers about said rocker shafts and corresponding reciprocating movement of said punching tool about said rocker shafts.

4,633,747

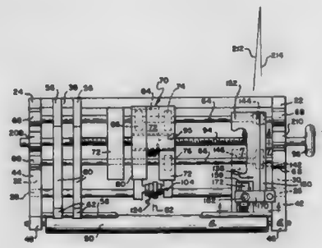
SHEET MATERIAL SLITTER

Theodore Primich, Merrillville, Ind., assignor to Gary Steel Products Corp., Gary, Ind.

Filed Sep. 30, 1985, Ser. No. 781,769

Int. Cl.⁴ B26D *1/24, 3/08*

U.S. Cl. 83—732 **16 Claims**



1. A device for slitting a narrow strip from a wider elongated strip of sheet material comprising, in combination:

a frame having means defining a surface for supporting the elongated strip adapted to be horizontally disposed,

a carriage,

means for mounting the carriage on the frame for translation along an axis parallel to the surface of the frame,

two shafts mounted on the carriage parallel to each other and in a plane normal to the surface of the frame, said shafts being disposed on opposite sides and parallel to the surface of the frame,

a first circular knife mounted on one of said shafts and a second circular knife mounted on the other of said shafts, each of said circular knives being rotatable with respect to the frame, the first and second circular knives being disposed adjacent to a common plane normal to the two shafts and in cutting relation to each other,

a linear guide disposed on the surface of the frame, said linear guide being adapted to abut the edge of the strip of sheet material when disposed on the surface of the frame,

means for mounting the linear guide on the carriage, said mounting means including means for adjusting the distance between the guide and the common plane,

and means mounted on the frame for maintaining the strip of sheet material against the linear guide.

4,633,748

ELECTRONIC MUSICAL INSTRUMENT

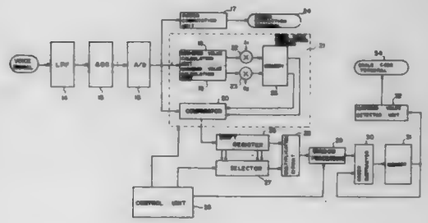
Susumu Takashima, Kodaira; Toyotarou Tokimoto, Saitama, and Kazuyuki Kurosawa, Hamura, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1984, Ser. No. 583,091

Claims priority, application Japan, Feb. 27, 1983, 58-31284; Feb. 27, 1983, 58-31285; Feb. 27, 1983, 58-31286; Jan. 27, 1984, 59-13075; Jan. 27, 1984, 59-13076; Jan. 27, 1984, 59-13077

Int. Cl.⁴ G10H *7/00*

U.S. Cl. 84—1.01 **24 Claims**



1. An electronic musical instrument comprising:

a microphone for converting a human voice to an electrical signal;

analog-to-digital conversion means for converting said electrical signal to digital data corresponding to an amplitude value of the human voice;

quantization means for quantizing said digital data outputted from said analog-to-digital conversion means, based on an amplitude value of the human voice, and for producing a digital quantization data signal; and

pitch extraction means coupled to said quantization means for extracting pitch data of said digital quantization data obtained by said quantization means, and for producing an output corresponding to the extracted pitch data, thereby obtaining said pitch data as a function of an amplitude value of the human voice;

processing means for processing the output of said pitch extraction means; and

musical tone production means for receiving the output of said processing means and for producing a musical tone in accordance with said output of said processing means.

4,633,749

TONE SIGNAL GENERATION DEVICE FOR AN ELECTRONIC MUSICAL INSTRUMENT

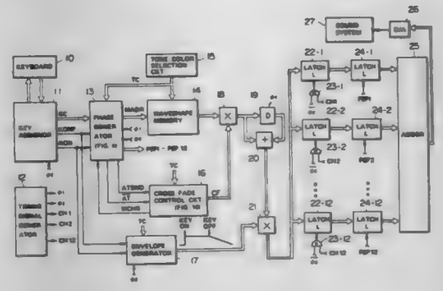
Junichi Fujimori, and Jun Sugiyama, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 9, 1985, Ser. No. 690,771

Claims priority, application Japan, Jan. 12, 1984, 59-2667; Jan. 19, 1984, 59-6249; Apr. 10, 1984, 59-71658

Int. Cl.⁴ G10H *1/00*

U.S. Cl. 84—1.01 **48 Claims**



1. A tone signal generation device comprising:

waveshape memory means for storing waveshape data corresponding to respective sample points of a plurality of different tone waveshapes, each of the respective tone waveshapes being divided into a plurality of said sample points;

waveshape designation means for designating both a set of tone waveshapes to be read out from said waveshape memory means and the timewise switching between the designated tone waveshapes;

readout means for repeatedly reading out waveshape data of a designated tone waveshape from said waveshape memory means in response to the frequency of a tone to be generated, said readout means reading out both a preceding tone waveshape and a following tone waveshape at a time when switching therebetween is designated by said designation means;

interpolation means for weighting both said preceding tone waveshape and said following tone waveshape according to a predetermined interpolation function at said time when the tone waveshape to be read out is switched, so as to achieve smooth transition from the preceding tone waveshape to the following waveshape, thereby to obtain crossfading there between;

counting means for generating a time function for establishing said interpolation function; and

switching control means, responsive to the output of said counting means, for controlling switching between waveshapes in said waveshape designation means.

4,633,750

KEY-TOUCH VALUE CONTROL DEVICE OF ELECTRONIC KEY-TYPE MUSICAL INSTRUMENT

Tadao Sakai, Hamamatsu, Japan, assignor to Roland Kabushiki Kaisha, Osaka, Japan

Filed May 17, 1985, Ser. No. 735,205

Claims priority, application Japan, May 19, 1984, 59-101184

Int. Cl.⁴ G10H *1/02, 1/46;* **G06F** *1/02;* **G04F** *10/00*

U.S. Cl. 84—1.1 **2 Claims**

1. A key-touch value control device for an electronically operated musical instrument for producing sound with a variable volume and including a series of keys each having a key-off state wherein no finger pressure is applied, a key-on state wherein a key is fully depressed under a pressure manually applied to the key and a key-fly state wherein a key is moving

from said key-off state toward said key-on state at a variable velocity, comprising:

a key-state signal generating means for detecting the state of each of said keys and for producing a succession of key-state signals each indicative of one of the key-on state, key-off state and key-fly state of the key, and

a key-touch value calculating means for calculating a key-touch value on a real-time basis during a period of time when a key is being depressed toward said key-on state and for producing, in response to each of said key-state signals, a key-touch value signal which is representative of said key-touch value, said key-touch value signal being variable with the velocity at which the key is being depressed toward the key-on state and which is representative of the volume of the sound to be produced after the key has reached the key-on state;

wherein said key-touch value calculating means comprises:

(1) a key-fly state detecting means for detecting from generating means the key-fly state of a selected one of said keys and for producing key-fly data indicating that said selected one of said keys is in the key-fly state;

(2) an operation command data memory means having addresses for storing operation command data indicative of various time durations consisting of different number of successive cycles of operation each of said time durations ending upon termination of the last one of the successive cycles of operation providing a particular time duration;

(3) a key-touch value memory means having addresses for storing key-touch value data indicative of key-touch values for individual cycles of operation, the addresses of the key-touch value memory means being respectively assigned to the individual keys of the instrument;

(4) an operation command data read-out control means responsive to the key-fly data produced by said key-fly state detecting means for reading the operation command data stored in the memory means at the address specified by the key-touch value data read from said key-touch value memory means;

(5) a key-touch value maintaining means responsive to the operation command data read out from said operation command data memory means for monitoring an end of any of said time durations specified by the operation command data and for supplying end-of-duration data to said operation command data read-out control means upon an end of a particular time duration, said operation command data read-out control means being responsive to the end-of-duration data and for interrupting the reading of the data from the operation command data memory means until the end-of-duration data is produced by the key-touch value maintaining means after the operation command data has been read from the operation command data memory means at each of the addresses thereof, and

(6) a key-touch value subtracting means responsive to the data read out from the operation command data memory means for subtracting a predetermined quantity from the key-touch value represented by the data stored in the key-touch value represented by the data stored in the key-touch value memory means at the address corresponding to said selected one of said keys.

4,633,751

AUTOMATIC PERFORMANCE APPARATUS

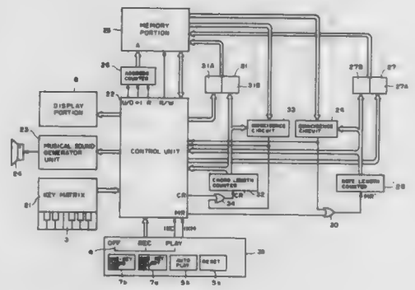
Hideshi Fukaya, Oume; Toshifumi Hoshii, Fussa, and Keiji Yuzawa, Akishima, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

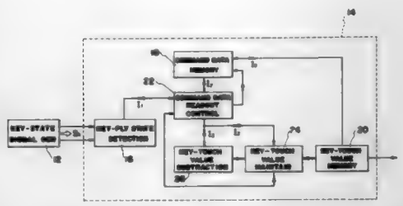
Continuation of Ser. No. 513,107, Jul. 12, 1983, abandoned. This application Apr. 15, 1985, Ser. No. 722,764

Claims priority, application Japan, Jul. 15, 1982, 57-122160

Int. Cl.⁴ G10F *1/00*

U.S. Cl. 84—1.03 **16 Claims**





1. An automatic performance apparatus comprising:

input means for inputting musical sound information of a musical piece which includes melodic musical sound information corresponding to a melody of said musical piece and chordal musical sound information corresponding to a chord to be added to the melody, in accordance with a progression of said musical piece;

storage means coupled to said input means and having, in a single memory area, a plurality of memory locations, each of said memory locations selectively storing said melodic sound information and said chordal musical sound information corresponding to a chord to be added to the melody, said melodic and chordal musical sound information being inputted by said input means, the storing order of the melodic musical sound information and of the chordal musical sound information in said plurality of memory locations being determined by the musical piece to be stored, said melodic musical sound information stored in a given memory location including at least note pitch code data and note length code data, and said chordal musical sound information stored in a given memory location including at least chord name code data and chord length code data;

reading means coupled to said storage means for successively and sequentially reading out the musical sound information stored in said memory locations of said storage means, said reading means including a single address designation means for sequentially designating addresses of memory locations in said single storage means from which said musical sound information is to be read out; and

musical sound producing means coupled to said reading means for producing musical sounds corresponding to the melody and chord based on the musical sound information successively read out by said reading means.

4,633,752

OPERATING PANEL DEVICE IN ELECTRONIC MUSICAL INSTRUMENT

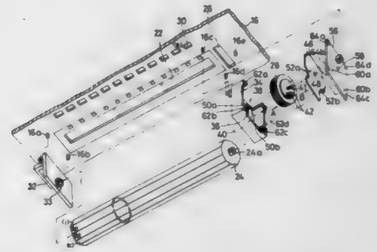
Tatsuhiro Koike, Hamakita, and Takamichi Masubuchi, Hamamatsu, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 5, 1984, Ser. No. 658,152

Claims priority, application Japan, Oct. 8, 1983, 58-156273

Int. Cl.⁴ G10H *1/06*

U.S. Cl. 84—1.03 **11 Claims**



1. An operating panel device in an electronic musical instrument, comprising:

a panel having a plurality of operating members arranged at least in one row and a display window formed in the vicinity of said row of operating members and extending the length of said row of operating members;

an indicating member rotatably provided in the vicinity of said display window of said panel and having on its circumference a plurality of indicating sections corresponding to a plurality of modes, each of said sections being comprised of a plurality of segments which correspond to said row of operating members and which contain the names of functions of said musical instrument and/or names of tonal characteristics which may be set by said operating members, whereby said indicating member causes an indicating section associated with a selected setting mode to appear in said display window;

mode designating means coupled to said indicating member to cause one of said plurality of indicating sections to appear in said display window which is associated with a selected one of said plurality of modes;

mode detecting means associated with said mode designating means to detect a mode designated by said mode designating means and to deliver out a mode selection signal; and

means electrically connected to said mode detecting means to enable the setting of the function of the musical instrument and/or the tonal characteristic in accordance with the operation of selected operating members corresponding to the desired function name and/or tonal characteristic.

4,633,753

MUFFLER MECHANISM FOR A PIANO

Horoyoshi Takahashi, Shizuoka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed May 14, 1985, Ser. No. 733,974

Claims priority, application Japan, May 15, 1984, 59-69793[U]; Apr. 17, 1985, 60-80346[U]

Int. Cl.⁴ G10C *3/26*

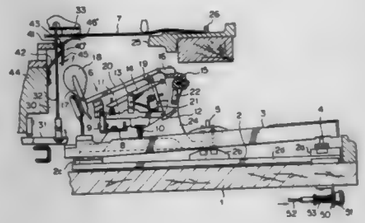
U.S. Cl. 84—220 **11 Claims**

1. A muffler mechanism for a piano, comprising;

at least one muffler pipe axially rotatably arranged below an array of strings and extending horizontally in the width direction of the piano;

a muffler coupled to the muffler pipe and movable, upon axial rotation of the muffler pipe, between an inoperative position for normal performance and an operative position for damper performance, the operative position being located between the array of strings and an associated array of hammers;

a means for driving the muffler pipe for the axial rotation in response to the manual operation of the driving means;



a sound generator unit which clicks upon the axial rotation of the muffler pipe, the sound generator unit includes a magnet mounted to the driving means for generating the clicking sound.

4,633,754

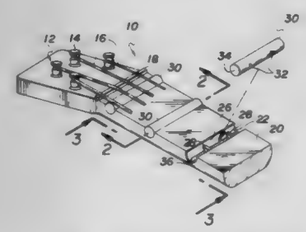
FRET ROD FOR STRINGED MUSICAL INSTRUMENTS

Emmett H. Chapman, 8320 Yucca Trail, Los Angeles, Calif. 90046

Filed Feb. 19, 1986, Ser. No. 831,226

Int. Cl.⁴ G10D *3/06*

U.S. Cl. 84—314 R **7 Claims**



1. A fingerboard for a fretted stringed instrument, comprising:

an elongate, unitary body member with a playing surface having a series of grooves which are disposed transversely with respect to a longitudinal dimension of the body member;

the grooves each being essentially U-shaped in cross-section and including a circularly arcuate portion having the arcuate center below the playing surface, with the distance between the transverse edges of each groove at the playing surface being no less than twice the radius of the arcuate portion, and

a cylindrical fret member adhesively secured in each of the grooves, each of the fret members being circular in cross-section and matingly engaging the circularly arcuate groove portion with the cylindrical axis of the fret member lying below the playing surface.

4,633,755

GASTIGHT SEAL OF A GUN BARREL

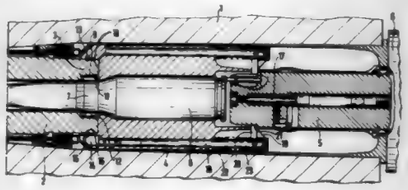
Roland Bertiller; Gerd Kellner, both of Schramberg, and Helmut Reudelsterz, Oberndorf, all of Fed. Rep. of Germany, assignors to Maaser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Filed Jun. 6, 1984, Ser. No. 617,727

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321233

Int. Cl.⁴ F41C *21/10;* **F41D** *11/30*

U.S. Cl. 89—29 **2 Claims**



1. A gastight seal apparatus for a gun barrel having a barrel bore with a breech, comprising a gun barrel insert disposed in the barrel bore and having an insert bore with an end facing the breech having a cylindrical inner surface, an adapter cartridge having a cartridge chamber and engaged in the barrel bore against the barrel insert, a subcaliber cartridge having a cartridge case disposed in said cartridge chamber, said cartridge case having a cylindrical neck portion extending out of said adapter cartridge into said insert bore and in close association with said inner cylindrical surface of said insert bore whereby when said subcaliber cartridge is fired gases expand said neck to form a seal between an outer surface of the neck and said inner surface of said insert bore, a periphery of said barrel insert being provided with an annular groove, a locking ring disposed in said groove, a striking mechanism engaged in said cartridge chamber between said adapter cartridge and the breech of said gun barrel, a plurality of locking members extending from said striking mechanism toward and around said adapter cartridge and said barrel insert, said locking members being circumferentially spaced and axially displaceable, a thrust pin associated with each of said locking members for displacing said members, said locking members having oblique surfaces engaged with said locking ring, and means axially biasing said locking members into engagement with said ring, said locking members carrying at their inner ends a shoulder which is engageable by said striking mechanism.

4,633,756

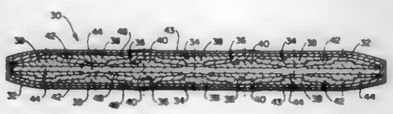
BULLET PROOF ARMOR SHIELD

Boris L. Rudoi, 1170 Chambers, Columbus, Ohio 43212

Filed May 21, 1984, Ser. No. 612,310

Int. Cl.⁴ F41H *1/02, 5/04*

U.S. Cl. 89—36.02 **3 Claims**



1. In an armor shield having a front and rear face, the combination of: a plurality of elongated rows, each of said rows formed by a plurality of ceramic plates arranged in adjacent relationship to one another to form a projectile barrier; each of said plates forming one of said rows having a first surface and a second generally planar surface, each extending in a generally parallel direction to the front and rear faces of said armor shield; said first surface including a generally rectangular central portion and a pair of intergrally formed wing portions having a generally quadrilateral configuration, said central portion being upraised from said wing portions; each of said plates forming one said elongated rows being disposed in said row with its first surface oppositely disposed relative to the disposition of said first surface of adjacent plates in said row and with its wing portions essentially fully overlapping a wing portion of each adjacent and oppositely disposed plate in the row; and each plate further having a cross-sectional configuration along a plane perpendicular to the length of said rows which defines a quadrilateral configuration taken from a group consisting essentially of a parallelogram or a trapezoid; each of said elongated rows of plates being disposed closely adjacent to one another with the sides of said plates defining the major and minor angle of said quadrilateral configuration being in overlapping relationship with the sides of the plates in an adjacently disposed row of plates.

4,633,757

BRAKE BOOSTER

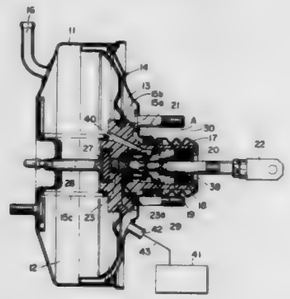
Hitoshi Kubota, Minami-ashigara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 28, 1984, Ser. No. 655,683

Claims priority, application Japan, Oct. 5, 1983, 58-186500

Int. Cl.⁴ F15B *13/04*

U.S. Cl. 91—32 **10 Claims**



1. A brake booster for augmenting the force applied to a brake of a vehicle, comprising:

an air-tight housing;

a pressure-differential responsive movable wall dividing the interior of said housing into first and second fluid pressure chambers, said first chamber being held at an essentially constant vacuum air pressure;

an output rod fixed to said movable wall for applying force to the brake of the vehicle in accordance with its movement;

first valve means for controlling communication between said second fluid pressure chamber and atmosphere;

second valve means for controlling communication between said fluid pressure chambers;

valve actuating means capable of actuating both said valve means in accordance with manual operation of a brake pedal;

means connected to the interior of the second fluid pressure chamber for supplying fluid at an adjustable pressure; and

a booster converter continuously holding both of said valve means closed regardless of the valve actuating means in a first mode of operation of the brake booster, whereby the fluid at an adjustable pressure is supplied to the second pressure chamber through said fluid supply means, said booster converter allowing said valve actuating means to open and close said first valve means and close and open said second valve means respectively as the brake pedal is depressed and released in a second mode of operation of the brake booster, whereby atmospheric air is supplied to the second fluid pressure chamber through said first valve means.

4,633,758

DOUBLE-ACTING WORKING CYLINDER HAVING A PISTON-DAMPENING ARRANGEMENT

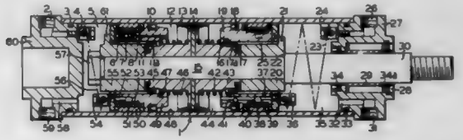
Heinrich Kedzierski, Wennigsen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Steuerungstechnik GmbH & Co., Hanover, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,259

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1983, 3338781

Int. Cl.⁴ F15B *15/26, 15/22;* **F16F** *11/00;* **B65H** *59/10*

U.S. Cl. 91—44 **16 Claims**



1. A fluid-pressure-operated, double-acting working cylinder having a dampening arrangement for dampening final piston braking, said working cylinder comprising:

(a) a cylinder housing having a chamber formed therein;

(b) a work piston, reciprocally movable within said chamber, divides said chamber into first and second work chambers;

(c) a piston rod connected to said work piston for coincident movement therewith;

(d) at least one auxiliary braking member coaxially, slidably disposed on said piston rod to one side of said work piston;

(e) auxiliary braking means disposed on said at least one auxiliary braking member for selectively braking said at least one auxiliary braking member to a desired position within said chamber relative to said work piston;

(f) dampening means disposed between said at least one auxiliary braking member and said work piston for dampening movement of said work piston toward said at least one auxiliary braking member following a braking of said at least one auxiliary braking member effected by said auxiliary braking means; and

(g) throttling means disposed within said chamber for restricting communication of such fluid pressure between said dampening means and at least one of said first and second work chambers following braking of said at least one auxiliary braking member.

4,633,759

HYDRAULIC PIVOT DRIVE

Eckehart Schulze, Weissach, Fed. Rep. of Germany, assignor to Hartmann & Lammle GmbH & Co., Rutesheim, Fed. Rep. of Germany

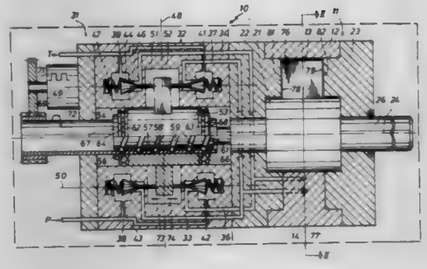
Continuation of Ser. No. 463,661, Feb. 5, 1983. This application Sep. 3, 1985, Ser. No. 771,721

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1982, 3204067

Int. Cl.⁴ F15B *9/10*

U.S. Cl. 91—368 **1 Claim**

1. A hydraulic pivot drive having a rotary-piston hydraulic cylinder comprising at least two pressure chambers defined by a vane and a radial wall of a cylinder housing and which can be alternatively connected to high-pressure and low-pressure sides of a hydraulic pressure supply system characterized in that control means are provided for leveling out a leak oil loss encountered in a defined rotary position of the vane, a width of gaps remaining between the vane and one of a wall of the cylinder housing or a shaft of the pivot drive and radial partition wall of the cylinder housing are determined in accordance with the following relationship:



$$h = 3\sqrt{\frac{\delta\Phi 12\eta f_r}{\Delta\rho\, Ga}}$$

wherein:

$\delta\Phi$ is an admissible deviation of the rotary vane from a predetermined desired position, measured in angular degrees,

η is a viscosity of the hydraulic fluid,

f_r is a control frequency of the control means,

ρ is a difference of the pressures existing in the pressure chambers of the rotary-piston hydraulic cylinder required for maintaining a defined rotary position of the rotary vane,

G is a geometry factor which considers the gap lengths and widths, and

a is a sensitivity of the control means determined by a relationship between the maximum pivot angle and a total volume of the pressure chambers, said control means includes a mechano-hydraulic analog controller comprising a follow-up control valve having a spindle drive means for presetting a nominal value and a feedback of the actual value, and in that the nominal value of the pivot angle of the vane can be adjusted by rotating a spindle nut of the spindle drive means by a stepping motor means,

and in that the control frequency of the control means is at least 500 s^{-1}, the vane and the partition wall of the housing have a sector-shaped cross-section with a sector angle of 30° and 60°, respectively, a diameter of the vane shaft is equal to half a clear diameter of the cylinder housing, a radial and axial extension of the vane are in a range of substantially 18 to 20 mm, and a width of the axially and radially extending gaps between the housing and the vane are identical and substantially equal to 0.05 mm.

4,633,760

VACUUM-OPERATED POWER BRAKE BOOSTER HAVING TWO-PART COAXIAL CONTROL VALVE HOUSING

Wilfried Wagner, Hattersheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 23, 1984, Ser. No. 613,596

Claims priority, application Fed. Rep. of Germany, May 24, 1983, 3318744; Jul. 28, 1983, 3327223

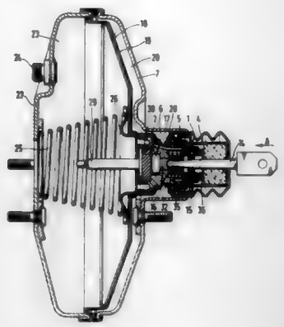
Int. Cl.⁴ F15B *9/10;* **F16K** *31/00*

U.S. Cl. 91—369 A **10 Claims**

1. A vacuum-operated power brake booster comprising, a booster housing, a rolling diaphragm dividing said housing into a working compartment and a low-pressure compartment, a piston rod coupled to a brake pedal for actuation of a double valve between a brake released position and a fully braked position, the working compartment of the power brake booster being alternatively connectible to vacuum or to a higher differential pressure by said double valve, said double valve including a first valve defined by a first valve seat on a first control

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housing part and a sealing surface on one side of an annular portion of one end of a poppet valve, a second valve is defined by said sealing surface on said poppet valve and a second valve seat on a valve piston connected to said piston rod, said poppet valve preloaded in a direction toward said fully braked position, the rolling diaphragm abuts a diaphragm plate coupled to the first control housing part, wherein said first control housing part is received in and guided by a second control housing part for relative slidable movement therein, and wherein a spring washer on the second control housing part is received in an indentation in the first control housing part at a predetermined spaced distance from a stop surface on said first housing part when in the released position, the stop surface on said first

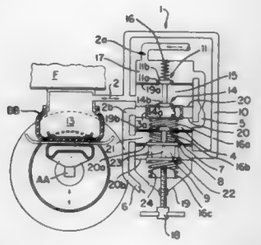


housing part adapted to engage said spring washer to limit the relative movement of the first control housing part relative to said second control housing part from said released position toward said fully braked position to said predetermined distance, in the release position the first valve seat on said first control valve housing part and the second valve seat on said valve piston being in abutment on the sealing surface of the poppet valve, a second stop surface on said poppet valve on said annular portion opposite said sealing surface, said second stop surface in the release position being in abutment against a stop member on the second control housing part, and a ring seal affixed to said housing and sealingly engaging an external sliding surface of said second control housing part.

4,633,761
AIR SPRING

Willi Schweikert, Heidelberg, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Sep. 17, 1985, Ser. No. 776,813
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434658
Int. Cl.⁴ F15B *11/10*
U.S. Cl. 91—433 **18 Claims**



1. A pressure controller for an air spring having an interior space which is variable in response to relatively-vibratable bodies between which the air spring is used for spring action therebetween when filled with a gas, the pressure controller comprising:

a housing;

a first actuating piston movably sealed in the housing and having a face for bounding one side of an antechamber in the housing, the face of the first actuating piston having an outlet valve seat and vent means for venting gas to the atmosphere from the outlet valve seat through the first actuating piston;

first gas line means for gas connecting the antechamber and the outlet valve seat to the gas in the variable interior space of the air spring and, through an intake valve seat in the housing, for gas connecting the variable interior space of the air spring to a compressed-gas reservoir;

a first control chamber in the housing on the opposite side of the first actuating piston from the antechamber;

a first compression spring across the first control chamber for spring force on the face of the first actuating piston opposite that bounding the antechamber and having the outlet valve seat, whereby to move the first actuating piston in response to the relative spring force and gas pressure in the antechamber;

an outlet valve stem and an intake valve stem, the outlet valve stem being seatable in the outlet valve seat on the first actuating piston for outlet valve action on the vent means therethrough in response to the movement of the first actuating piston, and the intake valve stem being seatable in the intake valve seat for intake valve action on the gas line means for connecting the variable interior space of the air spring to the compressed-gas reservoir, the intake and outlet valve stems being movable in the housing by the first actuating piston and interconnected for opposite valve actions thereupon;

a second compression spring in the housing operative on the interconnected intake and outlet valve stems oppositely to the first compression spring on the first actuating piston;

second gas line means for gas connecting the first control chamber to the first gas line means for connecting the antechamber to the variable interior space;

a vent chamber in the housing having a second actuating piston movably sealed in the housing and bounding one side thereof;

an auxiliary valve connecting the control and vent chambers and having a stem for valve actuation thereof connected to the second actuating piston;

a second control chamber in the housing bounded on one side by the side of the second actuating piston opposite that bounding the vent chamber and having a third actuating piston bounding the side of the second control chamber opposite that bounded by the second actuating piston;

equalizing gas line means gas connecting the second control chamber to the first gas line means for connecting the antechamber to the variable interior space;

at least one projection across the second control chamber between the second and third actuating pistons.

4,633,762
SPEED LIMITING DEVICE DESIGNED TO EQUIP THE SLIDE VALVE OF A HYDRAULIC SYSTEM

Maurice Tardy, Lorette - Loire, France, assignor to Bennes Marrel, France

Filed Jun. 22, 1984, Ser. No. 623,825
Int. Cl.⁴ F15B *11/08*
U.S. Cl. 91—461 **5 Claims**

1. A speed limiting hydraulic valve comprising:

a valve housing;

a slide which is slidable within said valve housing;

first and second control pressure chambers disposed at opposite ends of said valve housing, each end of said slide being in communication with the control pressure chamber which is disposed at the end of the housing which is adjacent to said end of said slide;

a plurality of grooves in said valve housing, said plurality of grooves in said valve housing comprising:

a first sensing groove adjacent one end of said valve housing;

a second sensing groove adjacent the other end of said valve housing;

the pressures in said first and second sensing grooves being adapted to be used to control the operation of said hydraulic valve by an external device, such as a governor;

a plurality of grooves in said slide, said grooves in said slide comprising first and second longitudinally spaced apart and longitudinally extending peripheral grooves in said slide;

certain of said grooves in said valve housing being in fluid communication with certain of said grooves in said slide when said slide is in a first position within said valve housing to cause hydraulic fluid to flow in a first direction through said valve, and certain of said grooves in said valve housing being in fluid communication with certain of said grooves in said slide when said slide is in a second position within said valve housing to cause hydraulic fluid to flow in a second direction through said valve;

first and second longitudinally extending passages within said slide, said first longitudinally extending passage opening into the first of said control pressure chambers and said second longitudinally extending passage opening into the second of said control pressure chambers;

a third radial passage connecting said first sensing groove to said first longitudinally extending passage; and

a fourth radial passage connecting said second sensing groove to said second longitudinally extending passage;

a first radial passage connecting said first peripheral groove to said first longitudinally extending passage;

a second radial passage connecting said second peripheral groove to said second longitudinally extending passage;

first check valve means within said first longitudinally extending passage;

second check valve means within said second longitudinally extending passage;

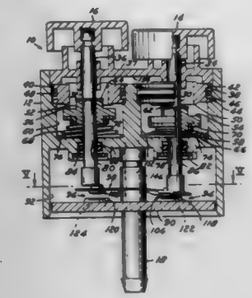
said first check valve means being adapted to open to permit the control pressure in said first control pressure chamber to move said slide toward said second control pressure chamber to control the rate of hydraulic fluid flow in said first direction; and

said second check valve means being adapted to open to permit the control pressure in said second control pressure chamber to move said slide toward said first control pressure chamber to control the rate of hydraulic fluid flow in said second direction.

4,633,763
SWITCH AND VALVE ASSEMBLY

Stevens F. Manning, Londonderry, N.H., Jimmie G. Perkins, Moore, Tenn., and Dennis H. Heling, Milford, Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Continuation of Ser. No. 525,847, Aug. 24, 1983, abandoned.
This application Apr. 15, 1985, Ser. No. 699,603
Int. Cl.⁴ F15B *11/00*
U.S. Cl. 91—530 **4 Claims**

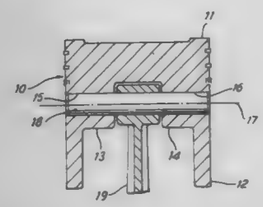


1. A switch and valve assembly comprising a housing, a pair of side-by-side chambers formed in said housing, a third chamber formed adjacent said side-by-side chambers in said housing, a pair of stems extending into said housing and being slidably mounted through said side-by-side chambers and into said third chamber, a pushbutton mounted on the outer end of each stem, a spring-loaded valve connected for movement with each of said stems in said respective side-by-side chambers and normally closed against a valve seat formed in the chambers but adapted to permit communication therethrough in one direction upon being partially opened by partial depression of said respective stems by said pushbuttons, a pair of normally open switches mounted in said third chamber and being closed only upon said valve being fully opened by full depression of said respective stems by said pushbuttons and adapted to thereby permit communication therethrough in the opposite direction overcoming any communication in said one direction.

4,633,764
ALUMINUM BASE ALLOY PISTON FOR INTERNAL COMBUSTION ENGINES WITH MECHANICALLY SURFACE-CONDENSED BOSS BORES

Hans-Jürgen Köhnert, Winnenden, Fed. Rep. of Germany, assignor to Mahle GmbH, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 699,100
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1984, 3404903
Int. Cl.⁴ F02F *3/00*
U.S. Cl. 92—208 **6 Claims**



1. An aluminum silicon alloy piston for internal combustion engines having

(a) a piston head;

(b) a cylindrical skirt connected at one end to said head; and

(c) two gudgeon pin bosses having bores located on a common axis and extending radially inwards from said skirt;
(d) the improvement being that the grain structure of the aluminum material defining the boss bores is
orientated with the silicon grain lengths extending in the circumferential direction of the boss bores over a radial depth of at least 0.1 mm and is free of residual pressure stresses by having roll-burnished the bore surfaces with the piston heated to a temperature of at least 350 degrees C.

4,633,765

PISTON FOR PRECISION DOSING INSTRUMENT

Erich Knödel, Wertheim, Fed. Rep. of Germany, assignor to Walter Graf u. Co GmbH & Co., Wertheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 418,132, Sep. 15, 1982, Pat. No. 4,501,192. This application Dec. 10, 1984, Ser. No. 679,959
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1981, 3138536
The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.
Int. Cl.[4] B23P *15/10*; F16J *1/02*
U.S. Cl. 92—248 **13 Claims**



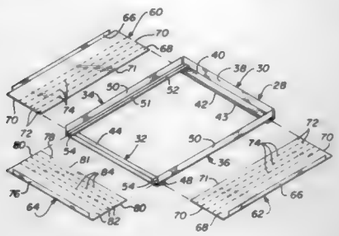
1. A piston for a precision dosing instrument comprising:
a cylindrical core and a sleeve of polytetrafluoroethylene disposed on said core, said core being of glass, ceramic or metal and being formed as a rigid tube open at both longitudinal ends, said sleeve having a cylindrical first portion extending about the cylindrical walls of said core and a closed end second portion extending over one of the longitudinal ends of said core forming the working end of the piston and having a rigid planar front working face extending perpendicularly of the longitudinal axis of said core, said sleeve being thermally shrunk onto said core thus tensioning said closed end portion and is precision-ground finished.

4,633,766

ADAPTER FOR JOINING HEATER AND AIR CONDITIONING ELEMENTS

James H. Nation, and Donald C. Tomlinson, both of Dallas, Tex., assignors to First Co., Dallas, Tex.

Filed Jun. 7, 1985, Ser. No. 742,471
Int. Cl.[4] F24F *13/02*
U.S. Cl. 98—1 **15 Claims**



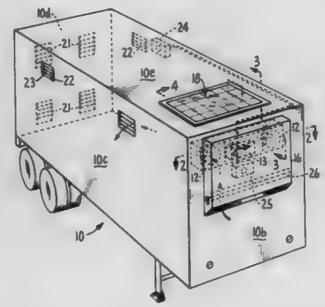
1. An adapter for joining facing ends of first and second elements in an air conditioning system for air flow therebetween, the end of the second element having a smaller cross section than the end of the first element, the second element defining a support surface at its end and a lip extending from the support surface about the inner edge of the support surface, comprising:
a frame for attachment about the end of the first element;
at least one panel having a plurality of side by side segments, each segment separated from the adjacent segment by a frangible connection to permit selected segments to be broken off the panel; and
means for attaching the panel within said frame to reduce the size of the opening through the frame and block off a portion of the cross section of the first element at its end, selected segments being broken off the panel to increase the size of the opening so that the adapter rests on the support surface of the second element with the lip extending through the opening in the frame thereof.

4,633,767

MODULAR VENTILATION SYSTEM FOR VEHICLES

Bernard S. Sain, Old Bridge, N.J., assignor to Trailer Marine Transport Corporation, San Francisco, Calif.

Filed Aug. 2, 1985, Ser. No. 761,825
Int. Cl.[4] B60L *1/00*
U.S. Cl. 98—6 **14 Claims**



1. A modular ventilation system for installation and use in conjunction with transporting goods susceptible to heat or moisture damage during transit, and comprising:
(a) a horizontally sectionalized cabinet containing and supporting at least one fan motor, at least one solar battery and a voltage regulator;
(b) an air plenum having a lower air intake and an upper opening adapted for fluid connection with sections of said cabinet which house each fan motor; and
(c) a solar panel array adapted for mounting in the horizontal top panel of a storage compartment.

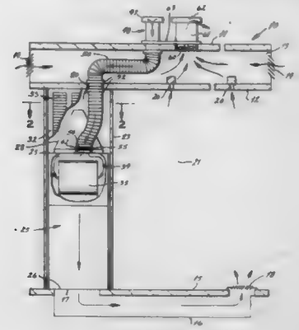
4,633,768

SUPPLEMENTAL VENTILATION APPARATUS FOR MANUFACTURED HOUSING

Robert J. Benson, DesPeres, Mo., assignor to Intertherm Inc., St. Louis, Mo.

Filed Apr. 1, 1985, Ser. No. 718,844
Int. Cl.[4] F24D *5/00*; F24F *7/00*
U.S. Cl. 98—34.6 **2 Claims**

1. For use in a manufactured housing unit of the type having a roof and a ceiling spacedly therebeneath, whereby to provide room space below and attic space above such ceiling, there being an opening in such ceiling sufficient for passage of air therethrough, such housing unit having in such room space a downflow cabinet furnace of the type having in its upper portion a return air chamber, a return air inlet into such chamber, and an air circulating blower directing air from such chamber to a downflow outlet to such room space,
the combination comprising
A. exterior air intake apparatus including
a supplemental, upward flanged opening into such return air inlet chamber extending through such furnace cabinet top wall,
an adjustable damper in said supplemental opening,
an outside air inlet through such roof, and
a flexible duct leading downward from said outside air inlet and removably secured to said damper flange,



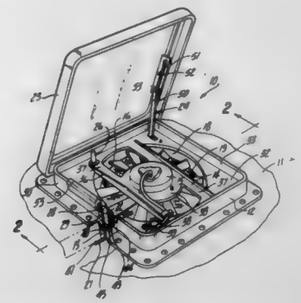
whereby the room air circulating blower of such draws outside air through said damper to supplement the return air and thereby create a positive pressure in the room space, and whereby temporary removal of the flexible duct permits adjustment of the damper, and
B. an outside attic air inlet and, spaced remotely therefrom, an attic exhaust vent having an exhaust fan,
whereby operation of the attic exhaust fan creates a negative pressure in the attic space which, together with the positive pressure so created in the room space, withdraws air from the room space into the attic space for exhausting by the attic exhaust fan.

4,633,769

ROOF VENT FAN ASSEMBLY

Stephen A. Milks, 4431 Bridgeman Trail, Swartz Creek, Mich. 48473

Filed Oct. 15, 1985, Ser. No. 787,200
Int. Cl.[4] F24F *7/02*
U.S. Cl. 98—42.08 **8 Claims**



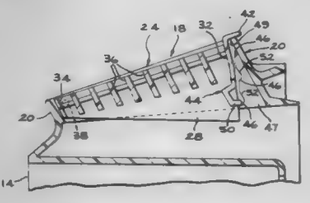
1. A vent fan assembly for a roof comprising:
a body having a plurality of sidewalls extending in one direction and defining a closed polygonal shape, a roof support flange extending perpendicularly to the sidewalls and outwardly from the exterior of the sidewalls between a top end and a bottom end of the sidewalls, a motor mount flange extending perpendicular to the sidewalls and inwardly from the interior of the sidewalls to define a first circular opening;
a shroud having a cylindrical sidewall extending in the same direction as the sidewalls of the body, a base plate secured to a lower end of the cylindrical sidewall having a screen support flange extending in a plane inwardly from the cylindrical sidewall to define a second circular opening, and a trim flange extending outwardly toward the sidewalls of the body to an outer edge adjacent to and spaced from said body sidewalls, said cylindrical sidewall having an upper end adapted to engage the motor mount flange adjacent the first circular opening, said body and shroud defining a pocket between the sidewalls of the body and the cylindrical sidewall of the shroud, the pocket having a downwardly facing opening defined by the outer edge of the trim flange and said sidewalls of the body;
a bezel having a plurality of sidewalls extending in the same direction as said body sidewalls and shaped substantially congruently thereto, said bezel further having a ceiling flange extending outwardly in a direction parallel to said roof support flange from the lower edge of said bezel sidewalls, said bezel walls being telescopically received in the pocket whereby roofs of different thicknesses may be received between the ceiling flange and the roof support flange;
a motor and fan blade secured to the motor mount flange; and
an openable cover connected to the body above said motor to selectively close said vent fan assembly.

4,633,770

VARIABLE DISCHARGE GRILL FOR ROOM AIR CONDITIONER

Larry D. Taylor; David A. Reel, and Gene R. Reafro, all of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 9, 1985, Ser. No. 806,397
Int. Cl.[4] F24F *13/08*; E06B *7/08*
U.S. Cl. 98—94.2 **5 Claims**



1. An air conditioning unit having a flow path through which conditioned air is discharged to a space which comprises:
a casing including an air intake opening in the front of said casing and a discharge frame defining a discharge opening having side walls, rear wall and a front wall at the top of said casing through which the conditioned air may flow;
a grille member including a frame dimensioned to be received in said discharge from having side walls, rear wall and a front wall, louvers extending between said side walls for directing air passing through said discharge opening;
pivot means operable between said side wall of said grille member frame and said discharge frame for allowing pivoting of said grille member relative to said discharge frame;
said pivot means include pintles projecting outwardly from said side walls of said grille member and a pivot opening on said side walls of said discharge opening for receiving said pintles;
said discharge opening and said grille member being gener-

ally trapezoidal with said front walls being shorter than said rear walls;

said pivot opening being arranged adjacent said shorter front wall of said discharge opening;

said pintles being arranged adjacent the shorter front wall of said grille member for allowing said shorter wall of said grille member to be initially inserted in said discharge opening with its shorter wall including said projecting pintles adjacent the longer rear wall of said discharge opening and for subsequently allowing movement of said grille member forwardly until said pintles and said pivot openings align and move into operative engagement;

tab means positioned on one of said frames cooperatively arranged to engage vertically spaced detents on the other of said frame for positioning said grille member relative to said top discharge opening for selectively directing air passing through said discharge opening;

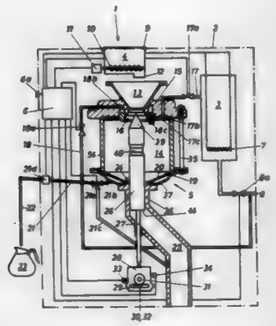
stop means cooperatively arranged between said discharge frame and said grille member operable for maintaining said grille member within the dimensions of said discharge frame.

4,633,771

COFFEE PERCOLATOR

Siegfried Anderl, Amstetten, Fed. Rep. of Germany, assignor to Wuerttembergische Metallwarenfabrik AG, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,856
Int. Cl.⁴ A47J *31/057*
U.S. Cl. 99—280 **6 Claims**



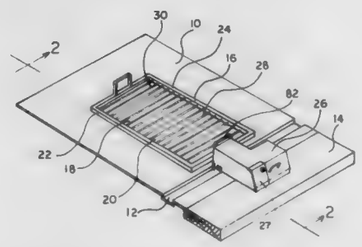
1. A coffee percolator comprising a brewing section including a coffee meal supply means, a brewing water supply conduit, a brewing chamber for brewing coffee under elevated pressure, and a coffee-grounds flushing conduit, wherein said coffee meal supply means communicates with said brewing chamber through a first opening and said brewing chamber communicates with said flushing conduit through a second opening located below said first opening in coaxial alignment therewith, said first and second openings being operatively associated to a control piston adapted to be displaced to different operating positions by means of a motor under the control of control means, said control piston being positionable in a filling position for opening said first opening and closing said second opening, in a brewing position for closing both said openings, in a flushing position for opening both said openings, and in a pressure relief position between said brewing position and said flushing position for closing said first opening and opening said second opening for relieving the elevated pressure in said brewing chamber.

4,633,772

GRIDDLE MOUNTED HOT DOG TURNER WITH LIFT OFF DETACHABLE DRIVE UNIT

John E. Bowden, Ostrander; Roy E. Hook, Orient, and E. Craig Miller, Powell, all of Ohio, assignors to Wendy's International, Inc., Dublin, Ohio

Filed Oct. 24, 1985, Ser. No. 790,886
Int. Cl.⁴ A47J *37/04*
U.S. Cl. 99—332 **9 Claims**



1. An apparatus for automatically turning elongated foodstuffs while cooking them upon a griddle which has a generally horizontal, flat heating surface and an adjacent surface beside the heating surface, the apparatus comprising:

(a) a grid slidably resting upon the griddle, the grid having a longitudinal axis and a plurality of laterally elongated openings for receipt of the foodstuffs;

(b) a portable, detachable drive unit setting upon said adjacent surface for driving the grid in longitudinal reciprocation, said adjacent surface having laterally extending surface contour irregularities and the bottom surface of the drive unit having a surface contour which is inversely conforming with a portion of the surface contour of said adjacent surface for matingly engaging in registration with the adjacent surface to removably retain the drive unit against longitudinal and pivotal movement upon the surface; and

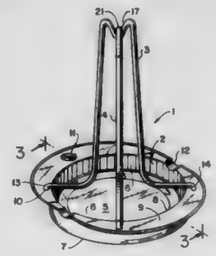
(c) a releasable coupling means drivingly but detachably connecting the drive unit to the grid for permitting the drive unit to be lifted and removed from said adjacent surface and said grid without touching, but leaving, said grid on the griddle.

4,633,773

HOLDER FOR ROASTING POULTRY

Murray Jay, Woodsburgh, N.Y., assignor to Gemco Ware, Inc., Freeport, N.Y.

Filed Dec. 20, 1985, Ser. No. 811,297
Int. Cl.⁴ A47J *43/18*
U.S. Cl. 99—426 **6 Claims**



1. A holder for roasting poultry comprising:

(a) a detachable drip pan;

(b) a first bent wire element having means at opposite ends for releasable attachment to a circumference of said drip pan, said first bent wire element first curving inwardly in a substantially horizontal plane relative to a vertical axis of said drip pan, then curving in a substantially vertical plane relative to said vertical axis, and then curving toward said vertical axis of said drip pan and forming a sine-like top curve with a low point of said curve located at a vertical axis of said first bent wire element; and

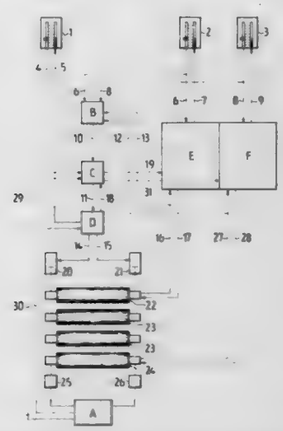
(c) a second bent wire element of a shorter length than the length of said first bent wire element, said second bent wire element having means at opposite ends for releasable attachment to said circumference of said drip pan and first curving inwardly in a second substantially horizontal plane relative to said vertical axis of said drip pan, then curving in a substantially vertical plane relative to said vertical axis and then curving toward said vertical axis of said drip pan and forming an apex point, and interlocking said second bent wire element with said first bent wire element at said apex point of said second bent wire element and said low point of said sine-like top curve.

4,633,774

CONTROL DEVICE FOR A ROLL PRESS

Harri Kuosa, and Tapani Kultaranta, both of Järvenpää , Finland, assignors to Oy Wärtsilä AB, Helsinki, Finland

Filed May 8, 1985, Ser. No. 731,793
Claims priority, application Finland, May 18, 1984, 842013
Int. Cl.⁴ B30B *15/26, 15/16*
U.S. Cl. 100—43 **1 Claim**



1. A device for bending-compensation control of a multi-roll press of a calender for glazing of a continuous thin web, such as a paper web, which press comprises an upper roll (22) with a first compensation circuit (E), a lower roll (24) with a second compensation circuit (F), and at least one press roll (23) arranged between the upper and the lower roll, said device comprising:

a press-load control circuit (A, B, C, D) comprising a first part (A) acting upon the lower roll (24) and a second part (D) acting upon the upper roll (22),

a first feedback (13) for transfering from the first compensating circuit (E) to the control circuit (A, B, C, D) a first signal indicating the rate of compensation of the first compensation circuit (E),

a second feedback (12) for transfering from the second compensating circuit (F) to the control circuit (A, B, C, D) a second signal indicating the rate of compensation of the second compensation circuit (F),

means (B) in the control circuit (A, B, C, D) for selecting, among the first and second signals, the signal that indicates the slower rate of compensation and to brake down the roll (22 or 24) that has the higher rate of compensation,

a third feedback (29, 31) connecting the first part (A) of the control circuit (A, B, C, D) to the first compensation circuit (E),

a fourth feedback (30) connecting the first part (A) of the control circuit (A, B, C, D) to the second part (D) of the control circuit (A, B, C, D), and

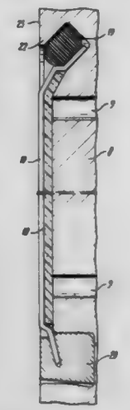
a fifth feedback (18, 19) connecting the second part (D) of the control circuit (A, B, C, D) to the first compensating circuit (E).

4,633,775

ATTACHMENT CONSTRUCTION FOR THE ATTACHMENT OF A WOVEN FILTER MAT TO A PRESS PLATE OF A COCOA PRESS

Gerardus Kraiver, Westwood/Drechterland, Netherlands, assignor to B.V. Machinefabriek P.M. Duyvis, AA Koog aan de Zaan, Netherlands

Filed Oct. 1, 1985, Ser. No. 782,539
Claims priority, application Netherlands, Oct. 1, 1984, 8402993
Int. Cl.⁴ B30B *15/00*; B01D *25/12*
U.S. Cl. 100—297 **6 Claims**



1. In apparatus for the attachment of a woven filter mat to a press plate of a cocoa press comprising a filter mat (10) forming a peripheral edge, a press plate (8) defining a reference surface (23) and a groove (15) arranged extending into the plate from the reference surface (23) for receiving the peripheral edge of the mat (10), the peripheral edge of the mat being bent-over for insertion into the groove (15) and a cord (19) pressed into the groove for retaining in place the peripheral edge of the mat, the improvement wherein the groove (15) is partially defined by a pair of opposed, substantially parallel walls (16, 17) against which walls the peripheral edge of the mat (10) and the cord (19) are pressed and which walls (16, 17) form an angle (β, γ) in a range of 25° and 55° with respect to the reference surface (23) of the press plate (8).

4,633,776

BRANCH COMPACTOR

William Blackmore, 24135 Mariposa Rd., Escalon, Calif. 95420 and Vito Bavaro, 1641 Walnut St., Escalon, Calif. 95320

Filed Jul. 10, 1984, Ser. No. 616,846
Int. Cl.⁴ B30B *3/04*
U.S. Cl. 100—158 R **13 Claims**

1. A branch compactor comprising:

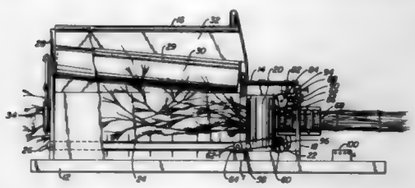
(a) a feed bin having a conveyor means for advancing branch-like material placed in said bin, and,

(b) a compacting mechanism coupled to an end of said feed bin said compacting mechanism having a frame structure wherein is mounted:

(i) a pair of vertical rolls displaced a distance apart, said rolls having drive means for contrarotation; and

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(ii) a pair of horizontal rolls displaced a distance apart, said rolls having drive means for contrarotation; said vertical rolls and horizontal rolls juxtaposed to define a constricted substantially square opening wherein said rolls having surface vanes to draw material advanced from said conveyer means through said constricted opening for discharge in a compact continuous bundle,



wherein said pair of vertical rolls comprise tall entry rolls to said compacting mechanism arranged at one end of said feed bin proximate said conveyer means and said pair of horizontal rolls comprise short secondary rolls arranged behind said entry rolls, said arrangement of rolls being fixed to maintain said defined opening, wherein material is transported from said conveyer means first to said entry rolls and then to said secondary rolls.

4,633,777

MULTICOLOR ROTARY PRINTING MACHINE

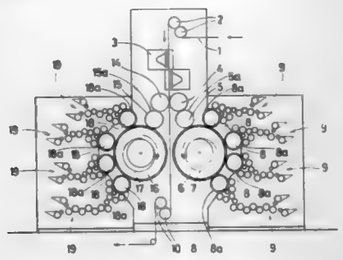
Albrecht J. Germann, Würzburg, Fed. Rep. of Germany, assignor to De La Rue Giori S.A., Lusanne, Switzerland

Continuation of Ser. No. 620,315, Jun. 13, 1984, abandoned. This application Feb. 12, 1986, Ser. No. 829,463

Claims priority, application Switzerland, Jul. 26, 1983, 4083/83

Int. Cl.⁴ B41F *5/16, 5/22*

U.S. Cl. 101—177 **3 Claims**



1. Rotary machine for the simultaneous multicolor printing of both sides of a web or sheet, more particularly for printing the safety background of fiduciary papers and notably bank notes, which comprises a first pair of blanket cylinders each blanket cylinder having arranged along the periphery a group of several cylinders each inked by an inking unit in a different color and cooperating with the corresponding blanket cylinder of said first pair for applying thereto a multicolor image, and comprising a second pair of blanket cylinders each adapted to cooperate with a roller arranged for engagement with one or the other of said blanket cylinders of said first pair wherein the path of the paper to be printed passes between the two blanket cylinders of said first pair, and comprising means for mounting the first pair of blanket cylinders for movement away from each other, means for mounting the blanket cylinders of said second pair of blanket cylinders for movement away from one another, and means for mounting the second pair of blanket cylinders and said rollers for movement away from the first pair of blanket cylinders; and comprising means for converting said several cylinders from selective color inking cylinders to plate cylinders and from plate cylinders to selective color inking cylinders, and means for converting said rollers from printing plate cylinders to image transfer cylinders and from image transfer cylinders to printing plate cylinders; means for selectively adapting said machine, to make different types of printings through the following arrangement of addition and replaceable component elements:

(a) means for selectively adapting said cylinders of each group into selective color inking cylinders of which the relief areas correspond to the image portions to be colored in the different colors and of which the number corresponds to the number of colors to be printed;

means for spacing the two blanket cylinders of said first pair from each other to operate as color collecting cylinders;

means for adapting said rollers into printing plate cylinders each provided with a typographic plate representing the complete design to be printed and set in contact with the corresponding collecting cylinder so as to be inked thereby;

means for pressing blanket cylinders of said second pair against each other so that a juxtaposed color image is printed on each side of the paper by means of the corresponding typographic plate inked by the relevant collecting cylinder;

(b) means for selectively adapting said cylinders of each group into plate cylinders each provided with a printing plate, the number of said printing plates in each group corresponding to the number of colors and designs to be printed;

means for spacing the blanket cylinders of said second pair from each other, means for spacing said blanket cylinders of said second pair and said rollers from the corresponding blanket cylinder of the first pair so as to have no printing function;

means for pressing both blanket cylinders of said first pair against each other so as to print an image with superposed colors and designs on both sides of the paper by means of the plurality of said printing plates;

(c) means for selectively adapting said cylinders of one of said groups into selective color inking cylinders of which the relief areas correspond to the portions of the image to be colored in various colors, and of which the number corresponds to the number of colors to be printed, whereas the cylinders of the other group are plate cylinders each provided with a printing plate, the number of said printing plates corresponding to the number of colors and designs to be printed;

means for spacing said blanket cylinders of said first pair from each other wherein the one blanket cylinder contacting the selective color inking cylinders operates as a collecting cylinder;

means for adapting the one of said rollers which is associated with said collecting cylinder with a typographic plate representing the complete design to be printed and set for engagement with said collecting cylinder so as to be inked thereby, means for adapting the other one of said rollers into an image transfer cylinder engaging the other blanket cylinder of the first pair;

means for pressing the blanket cylinders of said second pair against each other so that a juxtaposed color image is printed on one side of the paper by means of said typographic plate inked by the corresponding collecting cylinder and that an image with superposed colors and designs is printed on the other side of the paper by means of the plurality of said printing plates and said image transfer cylinder.

4,633,778

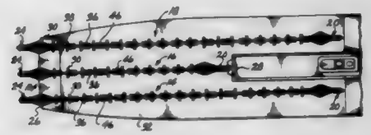
SURFACE MINELAYING SYSTEM FOR CRAFT OF OPPORTUNITY

Bruno A. Joner, and John W. Williams, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 3, 1985, Ser. No. 688,686

Int. Cl.⁴ F42B *22/10*

U.S. Cl. 102—411 **18 Claims**



1. A device for laying mines from a ship comprising:

a frame member with first and second ends, said frame member having a rail track framed by vertical and transverse connecting members;

means for mounting said frame member to the ship;

an endless drive member with a drive roller and an idler roller disposed in opposite ends of said frame member, said endless drive member looped about said rollers;

a plurality of carriers engaged at spaced locations to said endless drive member, said carriers having wheels that are retained within the rail track and having grasping means for selectively grasping a mine; and

means for releasing each mine from the minelaying device at a predetermined point along its transit beneath the frame member.

4,633,779

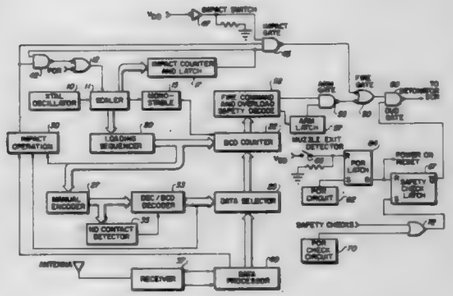
TIMING APPARATUS FOR A FUSE

Bradley M. Bigga, Tempe; Jimmy L. Brown, Mesa, and Thomas M. Kerns, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 29, 1984, Ser. No. 626,562

Int. Cl.⁴ F42C *11/06, 15/40, 21/00*

U.S. Cl. 102—215 **6 Claims**



1. Timing apparatus incorporated in a fuze comprising:

oscillator means for providing clock pulses including a multivibrator having an upper limit frequency of operation beyond which said multivibrator does not provide an output;

data selecting means for providing an output indicative of a preselected time;

a counter coupled to receive the clock pulses from said oscillator means and further coupled to said data selecting means for counting clock pulses until the preselected time is achieved;

firing means coupled to said counter for detonating the fuze after the preselected time is achieved; and

checking means coupled to said counter and said firing means for performing safety checks on said counter and deactivating said firing means in the event of a failure.

4,633,780

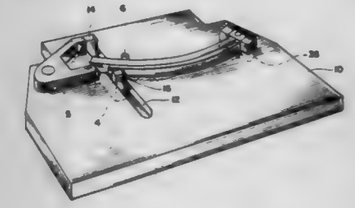
ENHANCED POINT DETONATION BACKUP MECHANISM FOR FUZE

Richard S. Andrejkovics, R.R. #2, Box 457, Blairstown, N.J. 07825

Filed Nov. 21, 1985, Ser. No. 800,243

Int. Cl.⁴ F24C *7/00, 19/00*

U.S. Cl. 102—274 **9 Claims**



1. A detonation backup mechanism for a fuze, comprising:

a housing plate;

a weight link mounted for movement on a path to the plate, said weight link having a first leg;

a trip link pivotally mounted to said plate, said trip link having a first leg for engagement with said first leg of said weight link for holding said weight link in a first position on the path; and

biasing means engaged with said trip link for urging said trip link first leg into said engagement against said weight link first leg by urging said trip link to rotate, and said biasing means also for urging said weight link to move away from its first position on the path, to thereby disengage its first leg from said trip link first leg.

4,633,781

SHOTGUN GAUGE ADAPTER

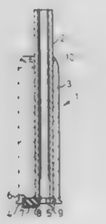
Gustav A. Bergman, Le Mas de Tanit, Karalys No. 2198, F-06160 Juan-les-Pins, France

Filed Sep. 25, 1984, Ser. No. 654,261

Claims priority, application Sweden, Oct. 3, 1983, 8305418

Int. Cl.⁴ F42B *8/00*

U.S. Cl. 102—446 **10 Claims**



1. In a shotgun gauge adapter for firing a bullet cartridge, said adapter being for use in a breech-action fire-arm having a gauge, bore and cartridge chambers adapted to receive a shot cartridge, and a breech face, said adapter comprising a plug having the dimensions of the shot cartridge and a bullet barrel fixed in the plug; the improvement in which the bullet barrel is mounted eccentrically in the plug, parallel to the axis of the plug, a portion of the bullet barrel extending out of the plug a lesser distance than the length of the plug, said barrel having an outer diameter smaller than said gauge of the fire-arm into which it is to be inserted, the plug being provided at its rear end with a resilient pressure means that is so disposed as to act

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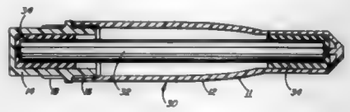
against the breech face of a closed fire-arm for pressing the forward portion of the plug against the wall in a transition cone of the cartridge chamber for fixing the position of the plug in the cartridge chamber from shot to shot, said forward portion of the plug having a spherically shaped breast region for seating against said transition cone.

4,633,782

CENTERING ADAPTOR FOR AN ANTI-ARMOUR KINETIC ENERGY PENETRATOR

Gilles Bérubé, and Raymond Langlois, both of Loretteville, Canada, assignors to Minister of National Defence of Her Majesty's Canadian Government, Canada

Filed Dec. 18, 1984, Ser. No. 682,911
Claims priority, application Canada, Apr. 19, 1984, 452546
Int. Cl.[4] F42B *11/06*
U.S. Cl. 102—518 15 Claims



1. A conversion assembly for converting a practice warhead to an armour penetrating warhead, the practice warhead having a hollow plastic shell with sockets at opposing ends thereof for receiving a metal ballast, the shell being separable into two parts to allow the metal ballast to be placed within said shell, the conversion assembly comprising:

a penetrator rod replacement for the metal ballast, said rod having an outside diameter substantially less than the inside diameter of the sockets in the shell; and

two adapters each being in the form of a cup made from elastomeric material, each adapter cup having, in a relaxed state, a substantially uniform side wall thickness, an inner diameter slightly less than the outside diameter of the penetrator rod and an outside diameter slightly less than the inside diameter of the sockets in the shell, the adapter cups, in use, being in a stretched condition and extending over respective ends of the penetrator rod and such cups also fitting snugly into respective said sockets when in use to positively center the penetrator rod in the hollow shell.

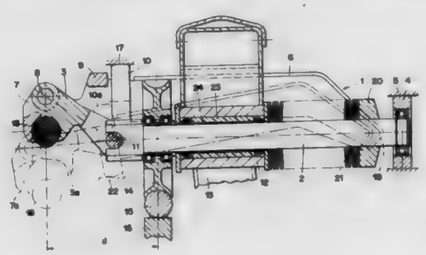
4,633,783

DEVICE FOR CLAMPING AND SUPPORTING A TRANSPORT APPARATUS ON A CONVEYING CABLE

Fritz Feuz, Thun, Switzerland, assignor to Von Roll Habegger AG., Berne, Switzerland

PCT No. PCT/CH84/00172, § 371 Date Jun. 24, 1985, § 102(e) Date Jun. 24, 1985, PCT Pub. No. WO85/01922, PCT Pub. Date May 9, 1985
PCT Filed Oct. 26, 1984, Ser. No. 752,338
Claims priority, application Switzerland, Oct. 28, 1983, 5858/83
Int. Cl.[4] B61B *12/12*
U.S. Cl. 104—211 10 Claims

1. A device for clamping and supporting a transport apparatus on a conveying cable, having a frame, a main shaft guided in a bearing part and intended for the hanging-on of the transport apparatus, at least one guide-pulley and a clamping jaw including an inner clamping member and an outer clamping member, characterized in that the outer clamping member is connected via a frame part to the bearing part wherein said bearing part is pivotably connected to said frame part and is displaceable against the pressure of a spring, and the inner clamping member is connected jointedly to the outer clamping member and the main shaft, and a stop component is provided



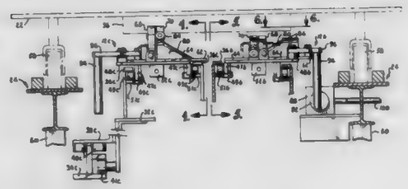
for limiting the clamping-jaw movement in the opening direction.

4,633,784

CLAMPING DEVICE FOR HIGH SPEED INDEXING

Robert A. Hoehn, Monticello Township, Johnson County, and Thomas B. Doyle, Overland Park, both of Kans., assignors to Lico, Inc., Kansas City, Mich.

Filed Sep. 19, 1984, Ser. No. 652,337
Int. Cl.[4] B61B *13/00*
U.S. Cl. 104—162 7 Claims



1. In an indexing conveyor:

a shuttle carriage;

drive means connected with said shuttle carriage for advancing the same along a predetermined path of travel from a first position to a second position, and for returning said carriage to said first position;

a product carrier movable along said path and having a projecting coupling member presenting a pair of opposed contact surfaces facing generally forwardly and rearwardly with respect to said path of travel;

clamping means mounted on said carriage and having a pair of front and rear clamp arms engageable with corresponding contact surfaces of said coupling member;

an operating mechanism on said carriage associated with said clamping means, said mechanism having operating means shiftable in one direction into engagement with said clamp arms to close the same against said contact surfaces of the coupling member and hold the clamp arms closed thereagainst to couple said carriage and carrier together for movement of the carrier by the carriage in unison along said path, and shiftable in another direction to open said clamp arms and release the carrier; and

power operated means independent of said carriage and disposed adjacent said first and second positions thereof for actuating said operating mechanism to close and open said clamp arms when the carriage is at said first and second positions respectively,

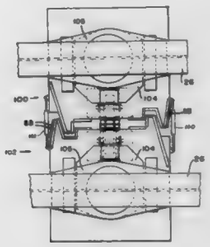
said power operated means including a first actuator operable to engage said operating mechanism when the carriage is in said first position thereof to shift said operating means in said one direction to close the clamp arms, and a second actuator operable to engage said mechanism when the carriage is in said second position thereof for shifting the operating means in said another direction to disengage the operating means from the clamp arms to open the latter, whereby to couple the carrier with the carriage at said first position and release the carrier at said second position.

4,633,785

HOPPERS AND BOGIES

Gysbert J. du Plessis, Potchefstroom, South Africa, assignor to Rotaque (Proprietary) Limited, Potchefstroom, South Africa

Filed Dec. 10, 1984, Ser. No. 679,751
Claims priority, application South Africa, Dec. 22, 1983, 83/9569
Int. Cl.[4] B61F *3/00*
U.S. Cl. 105—176 9 Claims



1. A split bogie assembly having bogie parts each pivotally mounted at an end region of a respective rail car and each including a pair of flanged wheels rotatable about a common axis, the bogie parts being mounted adjacent to one another and each having means for co-operating with complementary means on the other bogie part for co-ordinating movement of the bogie parts of the assembly with respect to one another at least when the assembly moves along a suitable curved track, in use;

the co-operating means and the complementary co-operating means each comprising formations at adjacent edge regions of the bogie parts;

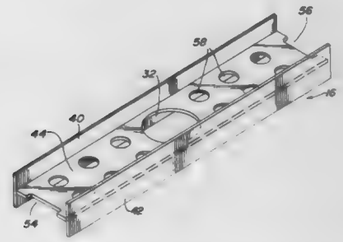
the assembly including locking means for preventing undue pivoting movement of the bogie parts when when said rail cars and their respective bogie parts are uncoupled from one another.

4,633,786

FLEXIBLE TRANSOM CONNECTED BETWEEN SIDE FRAMES OF A RAILWAY TRUCK TO PROVIDE EQUALIZATION

Michael J. Pavlick, Norristown, Pa., assignor to The Budd Company, Troy, Mich.

Filed Feb. 4, 1985, Ser. No. 697,801
Int. Cl.[4] B61F *5/52*
U.S. Cl. 105—203 1 Claim



1. In combination with a railway car truck having a pair of side frames including four joined welded plates for receiving wheel axle units,

an integral transom connecting said side frames comprising:

(a) a pair of side plates and a web plate welded together to form an open "I" beam structure having a constant cross section throughout its length;

(b) said web plate including end sections having cut-away portions therein;

(c) means for welding said "I" beam structure to said side frames whereby relatively small twisting movements of said web plate permits small weaving movements between said side frames in vertical directions to provide equalization in said truck;

(d) said transom including plurality of openings included therein to provide water drainage;

(e) said transom further including a relatively large central opening to receive therein a connecting member of said rail car; and

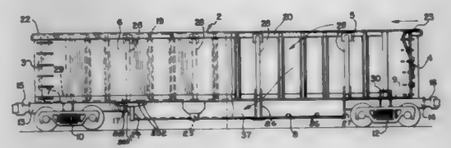
(f) said side plates being vertically disposed and said web plate being horizontally disposed.

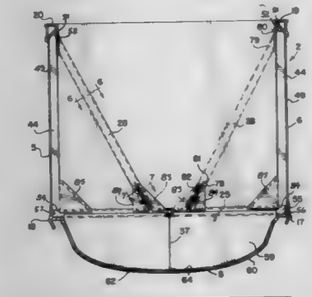
4,633,787

LIGHT WEIGHT GONDOLA TYPE RAILWAY CAR

Phillip G. Przybylinski, Schererville, and Donald C. Bodinger, Crown Point, both of Ind., assignors to Pullman Standard Inc., Chicago, Ill.

Filed Apr. 5, 1984, Ser. No. 596,968
Int. Cl.[4] B61D *9/08*
U.S. Cl. 105—406.1 35 Claims





19. A railway car having two opposite longitudinal ends and comprising:

first and second stub center sills adjacent respective ends of the car;

first and second shear plate members each connected with a respective stub center sill for transferring loads thereto, each of said shear plate members having laterally opposing side portions;

a depressed floor section supported between the shear plate members;

a pair of longitudinally extending side sill members, each of the side sill members being connected with a respective side portion of each of the shear plate members;

a pair of side walls, each side wall extending generally upwardly from a respective side sill member, said side walls

defining a space therebetween for carrying cargo in the railway car;

each of said side sill members being a single integral member comprising:

a generally laterally inward extending first portion being welded to the shear plate members and being generally in the same plane therewith;

a second portion, extending generally upwardly from the first portion and being welded to the respective side wall; and

an outward positioned reinforcement flange portion formed integral with the first portion and extending downwardly therefrom, said flange portion being substantially unwelded and out of the heat effect zone of the welds to the side wall and the shear plate members whereby each of the side sill members is strengthened by the flange portion to bear draft and buff loads in the railway car; and

the first portion having a first laterally inward positioned downward depending depressed bottom connective portion and being connected with the depressed floor section.

4,633,788

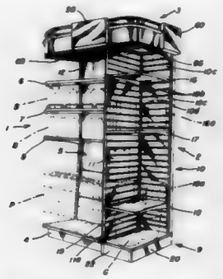
DISPLAY UNIT

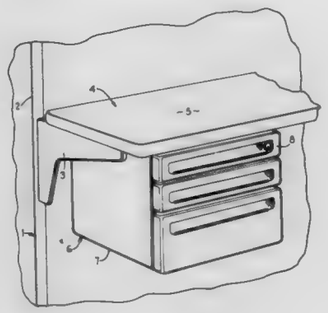
James D. Robertson, Atlanta, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 29, 1985, Ser. No. 770,695

Int. Cl.⁴ A47B *9/00*

U.S. Cl. 108—108 **16 Claims**





1. A display unit comprising a display stand having a base and a back extending upwardly from said base, a wing unit secured to one side of said display stand and having a wing base and a wing back extending upwardly from said wing base, and a header unit overlying said display stand and said wing unit and including an outer generally U-shaped peripheral structure having prongs which are secured to upper parts of said back and of said wing back which are remote from each other and which includes a pair of rounded corner portions each interconnecting adjacent ends of a front and a side plate which are disposed in normal relation to each other and wherein end portions of a diagonal corner bracket are interconnected with adjacent ends of said front and side plates and wherein adjacent ends of said front and side plates include longitudinal medial slots and wherein a rounded strip of translucent plastic material is arranged with its ends disposed in said slots respectively.

4,633,789

TOOLLESS MOUNTING ARRANGEMENT

Randall L. Kortering, Zeeland, and Gordon C. Berry, Grand Rapids, both of Mich., assignors to Haworth, Inc., Holland, Mich.

Continuation of Ser. No. 641,916, Aug. 17, 1984. This application Mar. 14, 1986, Ser. No. 841,010

Int. Cl.⁴ A47B *5/00*

U.S. Cl. 108—152 **9 Claims**

1. In a mounting arrangement including a work surface and a removable accessory mounted on the underside of said work surface, the improvement which comprises:

said work surface has a substantially horizontal, downwardly opening, elongated front slot formed on the underside thereof, said front slot tapering in depth forwardly from the rear end thereof in the lengthwise direction of said front slot;

said accessory has a front upright projection on top wall means thereof, said projection having flange means formed at the tip thereof, which front projection is inserted through a forward end portion of said front slot on the underside of said work surface and is then moved rearwardly and upwardly along said front slot to said rear end thereof, so that said front projection is snugly held at said rear end of said slot;

said accessory further has a self-locking releasable spring means for resiliently locking said front projection at the rear end of said front slot;

said spring means comprises a spring plate which extends forwardly from said front projection, resiliently snaps into said front slot as said front projection moves rearwardly along said front slot, and is adapted to engage a front wall of said front slot so as to prevent movement of said front projection forwardly within said front slot;

said work surface has a substantially vertical, frontwardly opening rear slot formed on the underside thereof, and said accessory has a rear, substantially horizontally extending projection which is inserted into said rear slot as said front projection is inserted into said front slot, which rear projection is locked into said rear slot by said spring means; and

said work surface has a pair of parallel front and rear, upwardly opening channel members secured to the underside thereof, said rear channel member having a front wall which defines said rear slot therein, and said front channel member having a bottom wall which defines said front slot therein, said bottom wall of said front channel member defining a cover which extends over said front slot so that said spring plate contacts the underside of said cover when said spring plate is in locked position, said cover being integral with said bottom wall of said front channel member.

4,633,790

COMBUSTION CHAMBER APPARATUS AND METHOD

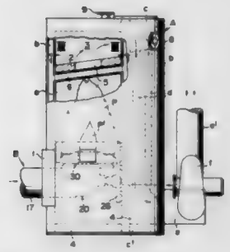
Jiro Kosaka, Kanagawa, Japan, assignor to Meiko Industry Corporation, Ltd., Tokyo, Japan

Continuation of Ser. No. 589,688, Mar. 15, 1984, abandoned. This application May 23, 1985, Ser. No. 737,564

Claims priority, application Japan, Sep. 30, 1981, 56-145296; Sep. 30, 1981, 56-145297; Dec. 29, 1981, 56-197162; May 29, 1982, 57-80240

Int. Cl.⁴ F23D *1/00*

U.S. Cl. 110—347 **58 Claims**



1. An apparatus for burning fuel comprising:

a combustion chamber having a side wall and only one exhaust port; and

a combustion device including a burner head for burning fuel to produce a volatilization zone having a temperature of approximately 800° C., said burner head being positioned substantially vertically under said exhaust port and spaced from said wall, wherein the diameter of said exhaust port is substantially equal to but smaller than the diameter of said burner head, wherein said combustion chamber, said exhaust port, said position between said exhaust port and burner head, and said side wall and said size of said exhaust port relative to said burner head together comprise means for maintaining said volatilization zone in a substantially stationary position.

4,633,791

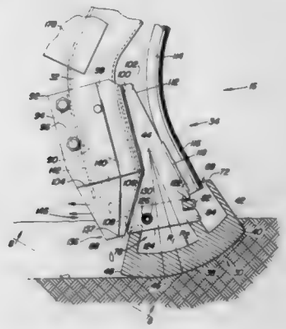
OPENER ASSEMBLY INCLUDING A COMPACT, ARC-SHAPED OPENER

Harold R. Lindstrom, Des Moines, and Virgil D. Haverdink, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Aug. 31, 1984, Ser. No. 646,620

Int. Cl.⁴ A01C *5/06*

U.S. Cl. 111—86 **39 Claims**



1. For a seeding implement, a furrow opener assembly adapted for towing forwardly through a field where trash is present on the surface of the ground, said opener assembly comprising:

an upright boot standard adapted to be rockably connected to the implement and having a lower end and a seed channel opening downwardly from the lower end;

supporting structure connected to the lower end of the standard;

fore-and-aft extending furrow-forming means for wedging a narrow material-receiving furrow a preselected distance below the surface of the ground as the assembly is towed forwardly, said furrow-forming means comprising a compact body having a forwardly located nose section and a point defining the forwardmost extremity of the body, a lower curved edge extending downwardly and rearwardly from the point to a lowermost portion of the body, said lowermost portion closely adjacent the aft end of the body, the aft end of said curved edge lying on the arc of a circle of radius R struck on a center offset above the aft end of the body, said body further including sides extending upwardly and diverging outwardly at an acute angle from the edge, said edge and sides presenting a V-shaped cross section substantially the length of the body, wherein said nose section includes a narrow soil-deflecting surface sloping gently rearwardly and upwardly from the point for providing a small amount of trash-moving said flow upwardly from the point;

means mounting the furrow-forming means on the supporting structure with the point located below the surface of the ground to prevent hairpinning of the trash around the curved edge and with the lowermost portion of the body located forwardly of the aft end of the body; and

wherein the point and the aft end of the body define the fore-and-aft extremities of the furrow-forming means and the point is spaced from the aft end of the body a distance less than twice the preselected distance and wherein the radius R is less than approximately twice the preselected distance to thereby minimize changes in furrow-forming and material placement characteristics as the boot standard rocks.

4,633,792

APPARATUS FOR SEWING SLIDE FASTENERS TO PAIRS OF FABRIC PIECES

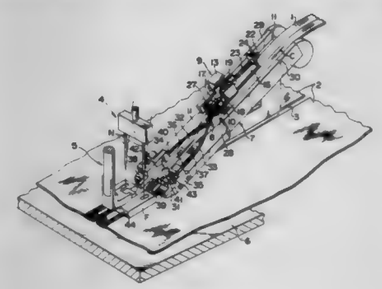
Hiroshi Yoshioka, Namerikawa, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 7, 1986, Ser. No. 837,591

Claims priority, application Japan, Mar. 8, 1985, 60-45884

Int. Cl.⁴ D05B *3/12*

U.S. Cl. 112—104 **14 Claims**



1. An apparatus for sewing a slide fastener to a pair of fabric pieces, the slide fastener including a pair of fastener stringers and a slider movable on and along the fastener stringers for opening and closing a slide fastener, the slider including a pivotally movable pull tab, said apparatus comprising:

(a) a table;

(b) a sewing station defined by a double-needle sewing machine mounted on said table for receiving the slide fas-

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tener and the pair of fabric pieces in respective superimposed relationship;

(c) a first guide disposed upstream of said sewing station for guiding the pair of fabric peices in lateral spaced relation to said sewing station;

(d) a second guide supported on said table and disposed above said first guide for supporting the slide fastener with the pair of fastener stringers partially uncoupled from a top end portion of the slide fastener, and for guiding the uncoupled portions of the pair of fastener stringers to said sewing station so as to turn the uncoupled stringer portions upside down so that the uncoupled stringer portions assume twisted positions in mirror symmetry with respect to the longitudinal centerline of the slide fastner; and

(e) a slider holder disposed on said second guide adjacent to said sewing station for temporarily holding the slider, said slider holder yieldably releasing the slider in response to the engagement of a bottom portion of the slide fastener with the slider, thereby automatically progressively uncoupling the pair of fastener stringers while said sewing machine is operating.

4,633,793

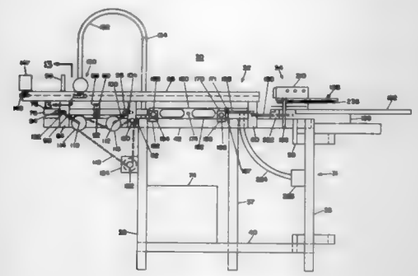
APPARATUS FOR SEWING A CURVED SEAM

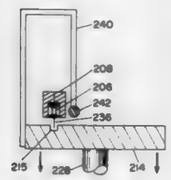
Elbert Eagle, Ashville, Ala., assignor to Chesebrough-Pond's Inc., Westport, Conn.

Filed Jan. 17, 1984, Ser. No. 571,120

Int. Cl.⁴ D05B *19/00, 27/00;* **B65G** *25/00;* **B65H** *39/00*

U.S. Cl. 112—121.11 **65 Claims**





1. Apparatus for transporting fabric or similar material in a selected curved path along a surface, comprising:

an endless flexible conveying member comprising a chain having a plurality of transversely extending pins;

a curved groove on said surface along at least a curved portion of said path receiving the ends of said pins;

means for supporting said conveying member adjacent said surface along said path with said pins extending into said groove;

and means for transporting said conveying member along said path.

4,633,794

DEVICE FOR DETECTING FABRIC THICKNESS OF A SEWING MACHINE

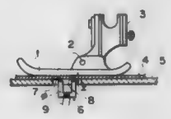
Kenji Kato, Hachioji, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

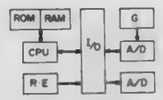
Filed Mar. 3, 1986, Ser. No. 835,560

Claims priority, application Japan, Mar. 13, 1985, 60-34719[U]

Int. Cl.⁴ D05B *19/00*

U.S. Cl. 112—121.11 **5 Claims**





1. A device for detecting thickness of a fabric stitched in a sewing machine which feeds a fabric into a space between a needle plate and presser foot, at least one of the said needle plate and said presser foot containing a magnetizable substance, said device comprising an electric iron core having a pair of magnetic pole ends which are positioned in opposition to said component containing the magnetizable substance, said ends being spaced from said component containing magnetizable substance by a distance including a fabric thickness to be detected; an electric coil wound about said core; electric detecting means including said coil and detecting a changing amount of a relation between electric current in said coil due to a change in said distance depending on the thickness being detected and a magnetic flux in a magnetic path including said distance; and electronic calculating means which calculates the fabric thickness from a calculated changing amount of the detecting means.

4,633,795

LOOPER THREAD CONTROL WITH ANTI-SPIN CUTTING KNIVES

Wolf R. von Hagen, Hemmingen, Fed. Rep. of Germany, assignor to Union Special G.m.b.H., Stuttgart, Fed. Rep. of Germany

Filed Mar. 18, 1986, Ser. No. 840,804

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510332

Int. Cl.⁴ D05B *49/04*

U.S. Cl. 112—248 **16 Claims**

1. A thread control device comprising:

rotatable disc means for controlling a thread and having a rotational axis; and

a pair of knives located on opposed sides of the disc means and having cutting edges disposed generally parallel to the rotational axis of the disc means.

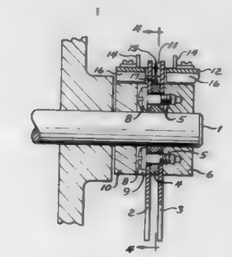
10. A thread control device, comprising:

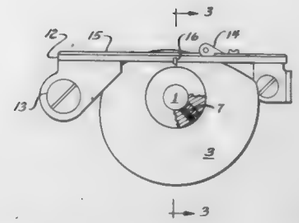
a pair of spaced rotatable discs and having a rotational axis;

a cover plate having a slot through which the discs project;

a pair of thread eyes extending from the cover plate on opposed sides of the discs; and

a pair of knives on opposed sides of the discs and extending from the cover plate toward the rotational axis, said knives extending to a location near the discs and having cutting edges which are generally parallel to the rotational axis of the discs.





4,633,796

SEWING MACHINE MATERIAL FEEDER

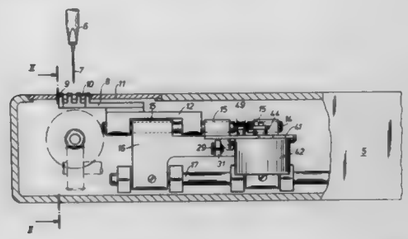
Manfred Hoffmann-Glewe, Neuburg, and Dieter Prause, Karlsruhe, both of Fed. Rep. of Germany, assignors to Pfaff Haushaltmaschinen, Fed. Rep. of Germany

Filed Aug. 23, 1985, Ser. No. 769,006

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 3431375

Int. Cl.⁴ D05B *27/02*

U.S. Cl. 112—314 **4 Claims**



1. A feed device for a sewing machine having a housing and a sewing machine main drive for reciprocating a needle which operates on material to be sewn, comprising a feeder rocker mounted in said housing, feed means connected between said rocker and the sewing machine main drive for moving said rocker in a first feed direction, a horizontal swing shaft mounted for axial movement on said rocker, said axial movement of said horizontal swing shaft being transverse to said first direction, a support with a feed dog connected to said swing shaft for axial movement with axial movement of said swing shaft, and further drive means which are separate from the sewing machine main drive, said further drive means being mounted on said feed rocker and being operatively connected to said swing shaft for moving said swing shaft axially.

4,633,797

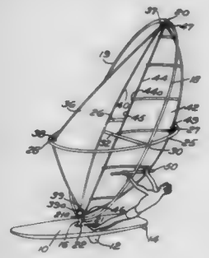
DOUBLE WISHBONE RIG

John G. Hoyt, #9 Defender's Row, Goat Island, Newport, R.I. 02840

Filed Apr. 25, 1985, Ser. No. 727,236

Int. Cl.⁴ B63B *15/00*

U.S. Cl. 114—91 **4 Claims**



1. In a sailing craft having a hull, a mast mounted on the hull comprising a pair of spaced curved members joined at each end, two spaced curved booms joined at each end pivotally secured to the mast at a pivot point whereby the booms extend forward and aft of the mast, a rigid spacer between the booms at the pivot point, a three cornered jib sail and a mainsail, means to attach the head of the sails to the upper portion of the mast, means to attach the lower corner of the sails to the lower portion of the mast, means to attach the lower corner of the jib to the forward end of the booms and means to attach the clew of the mainsail to the aft end of the booms whereby the luff of the mainsail may be tensioned and the clew adjusted to provide the proper camber.

4,633,798

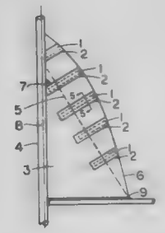
SAILBOAT BATTENS

A. Homer Skinner, 9 Harding La., Marblehead, Mass. 01945, and Graham T. Skinner, 10145 Camino Vista Dr., Monta Vista, Calif. 95014

Continuation of Ser. No. 214,457, Dec. 8, 1980, abandoned. This application Feb. 27, 1984, Ser. No. 508,859

Int. Cl.⁴ B63H *9/04*

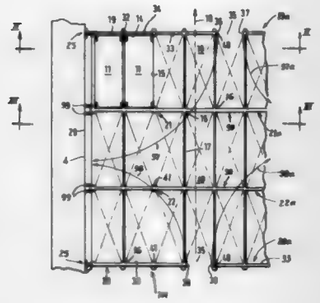
U.S. Cl. 114—107 **11 Claims**



1. A sail batten comprised of at least one long thin resilient element of curved cross-section so that when a plurality of said battens is installed in the leech of a sail at an angle to the mast, said battens are not only stiff enough to keep the leech of the sail from curling when the sail is set, but also flexible enough to be wrapped into a helical coil with the sail around an axis which runs parallel to the mast.

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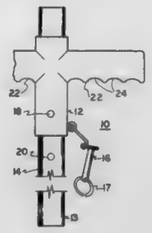
4,633,799
CARGO CARRIER
Heinz-Herbert Hey, Henstedt-Ulzburg, Fed. Rep. of Germany, assignor to C.E.M.A.N. Special-Container GmbH, Hamburg, Fed. Rep. of Germany
Continuation of Ser. No. 351,545, Feb. 23, 1982, abandoned. This application Sep. 13, 1985, Ser. No. 778,152
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1981, 3106751
Int. Cl.⁴ B63B *25/24*
U.S. Cl. 114—72 4 Claims



1. A cargo carrier, particularly an oceangoing vessel, comprising means defining a cargo compartment and including at least one wall; a mounting plate pivotally mounted on said one wall and being movable between a pair of terminal positions; at least one member for confining containers which are accommodated in said compartment, said member being pivotally mounted on said plate for movement between an operative position in which said member is arranged to confine containers and an inoperative position in the region of said one wall; and a bearing element mounted on said one wall and having a pair of arresting recesses, said plate having a pair of arresting openings which are respectively aligned with said arresting recesses in said terminal positions to permit said plate to be arrested in said terminal positions, said bearing element having a pivot for said plate at approximately the midpoint thereof and said arresting recesses being located at the opposite sides of and being approximately equidistant from said pivot.

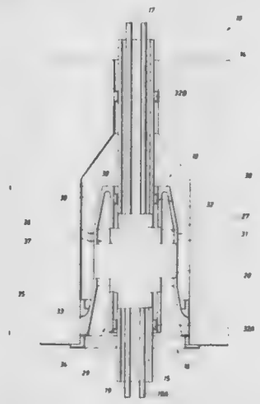
3. A cargo carrier, particularly an oceangoing cargo vessel, comprising means defining a cargo compartment and including a first and a second wall, said walls being spaced apart from one another; two members for confining containers which are accommodated in said compartment, said members being mounted on said first wall for movement between operative positions in which said members are arranged to confine containers and inoperative positions in the region of said first wall, said members being spaced by at least twice the length of a container when such members are in said operative positions; a first divider; means for releasably securing said divider to said first wall at a location intermediate said members when said members are in said operative positions; a second divider, each of said dividers including substantially horizontal bars; means for releasably securing said second divider to said second wall so that said dividers are substantially in alignment; and means for connecting said dividers with one another, including a spine and a plurality of ribs pivotally mounted on said spine, said ribs being movable between non-aligned positions and aligned positions in which each of said ribs is in alignment with and joins a bar of one divider with a bar of the other divider.

4,633,800
SAILBOAT TILLER
F. Andrew Wolf, Jr., 230 N. Washington Dr., Sarasota, Fla. 33577
Filed Feb. 19, 1985, Ser. No. 702,937
Int. Cl.⁴ B63H *25/02*
U.S. Cl. 114—144 R 6 Claims



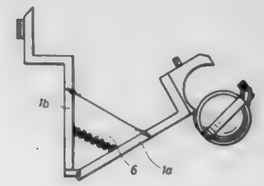
1. A sailboat tiller comprising:
an axially extending tiller rod having a plurality of pin receiving apertures;
a sleeve for positioning around said tiller rod having a pin receiving aperture which may be aligned with any one of said apertures in said tiller rod;
a grip secured to said sleeve;
a spring;
a pin retracting handle having a socket to receive one end of said spring;
said grip being mounted on a pedestal secured to said sleeve;
said grip and said pedestal being formed to receive the other end of said spring; and
said pin retracting handle having a pin to be retractably positioned in said pin receiving aperture in said sleeve and any pin receiving aperture in said tiller rod.

4,633,801
STRESS REDUCTION CONNECTION APPARATUS FOR CYLINDRICAL TETHERS
Peter W. Marshall, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Filed May 9, 1985, Ser. No. 732,109
Int. Cl.⁴ E21B *7/12*
U.S. Cl. 114—266 11 Claims



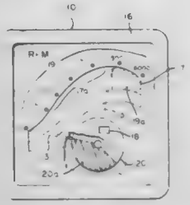
1. An elongated cylindrical tether stress reduction connection apparatus for use with a floating platform anchored to a marine bottom of a body of water, said floating platform having a buoyant hull and at least one elongated cylindrical tether depending vertically downward from said buoyant hull and secured to said marine bottom, the upper end of each elongated cylindrical tether passing through a central opening defined upwardly through at least a lower portion of said buoyant hull, the upper end of said tether operatively secured to said floating platform, said elongated cylindrical tether stress reduction connection apparatus comprising;
at least a first tubular support member having an inner diameter greater than the outer diameter of said elongated cylindrical tether placed exterior to and in close-spaced axial relationship about said elongated cylindrical tether, said first tubular support member having an inner and an outer end, said first tubular support member normally operatively contacting the outer surface of said elongated cylindrical tether, and
at least a second tubular support member of substantially equal length as said first tubular support member located exterior to and in close-spaced axial relationship to at least a portion of said first tubular support member, said second tubular support member having an inner diameter greater than the outer diameter of said first tubular support member, said second tubular support member having an inner and an outer end, said inner end rigidly connected to said inner end of said first tubular support member, said outer end operatively secured to said buoyant hull of said floating platform, said inner end of said second tubular support member capable of movement relative to said outer end of said second tubular support member.

4,633,802
APPARATUS FOR STORING AND LAUNCHING A FLOAT OR THE LIKE VESSEL FROM A SHIP
Karl H. Olsen, Njardvik, Iceland, assignor to Velsmidjan OL. Olsen, Njardvik, Iceland
Filed Sep. 12, 1984, Ser. No. 649,659
Int. Cl.⁴ B63B *23/00*
U.S. Cl. 114—367 6 Claims



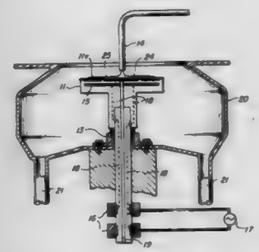
1. Apparatus for storing and launching a float or the like from a ship comprising: first and second arm means; means pivoting said first arm means for swinging movement relative to said second arm means, said second arm means being adapted to be fixed to a ship; bias means connected between said first and second arm means for biasing said first arm means in a direction away from said second arm means; storing means for releasably holding a float to said second arm means; a retaining shaft axially movable between a retaining position and a releasing position; a blocking assembly connected to said storing means and connected to said retaining shaft in such a manner that in the retaining position of said retaining shaft said storing means holds the float to said second arm means and such that movement of said retaining shaft to its releasing position releases said blocking assembly so that said holding means releases the float from said first arm means, said blocking assembly including a manually releasable part which upon manual release permits said storing means to release the float from said second arm means, said retaining shaft in its retaining position also cooperating with said second arm means in a manner to restrain swinging of said second arm means by said bias means and in a manner to release said second arm means when said retaining shaft moves to its releasing position; and means for moving said retaining shaft from its retaining position to its releasing position.

4,633,803
TACHOMETER
John P. Flowers, Skagit County, Wash., assignor to Bayliner Marine Corporation, Seattle, Wash.
Filed Oct. 15, 1985, Ser. No. 787,532
Int. Cl.⁴ G01D *13/02*
U.S. Cl. 116—334 10 Claims



1. A gauge for measuring a first parameter of interest and indicating a value for said first parameter and also a value for a second parameter of interest that is related to the first parameter, comprising:
a gauge including a pointer indicator, said gauge receiving a signal related to said first parameter whereby said pointer is relatively positioned in response to said signal to indicate said first parameter value; and
a display cover that includes a scale for indicating values of said first parameter for each pointer position and also substantially obstructs observation of said pointer position, said cover further including
a display window, said scale adjacent thereto, said window permitting limited observation of each pointer position, said window including an edge that is contoured to a shape of a curve that represents a proportional relationship between said first and said second parameters of interest such that each pointer position indicates a value of the first parameter by reference to said scale and a value for said second parameter by reference to the pointer position relative to the shape of the contoured window edge.

4,633,804
SPINNER AND METHOD FOR PROCESSING A SUBSTRATE
Katsuyuki Arii, Tama, Japan, assignor to Fujitsu Limited, Kanagawa, Japan
Filed Mar. 4, 1985, Ser. No. 707,766
Claims priority, application Japan, Mar. 6, 1984, 59-042612
Int. Cl.⁴ B05C *13/02, 11/02*
U.S. Cl. 118—52 2 Claims



1. A spinner for use in processing of semiconductor substrates and the like, comprising:
spinning disk means for holding a workpiece thereon, said spinning disk means being rotatable at a specified rotating speed;

VOL 1074 ISS 1 JA 6 1987 UMI

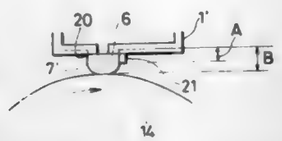
dispensing means for dispensing process liquid material onto a workpiece held on said spinning disk means;
supersonic power generating means;
supersonic vibration transducer means embedded in said spinning disk means; and
conducting means operably connecting said supersonic power generating means and said supersonic vibration transducer means for supplying supersonic power generated by said supersonic power generating means to said supersonic vibration transducer means for causing said supersonic vibration transducer means to vibrate supersonically, whereby supersonic vibrations are applied to said liquid process material dispensed onto said workpiece held on said spinning disk means.

4,633,805

RELEASE AGENT APPLICATOR FOR COPYING MACHINE

Hiroo Katsuya; Chiaki Kato, and Yoshiharu Fujii, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 12, 1984, Ser. No. 630,045
Claims priority, application Japan, Jul. 15, 1983, 58-129990
Int. Cl.⁴ B05C *11/105*
U.S. Cl. 118—60 **3 Claims**



1. In a release agent applicator for use with a copying machine having a fixing device for pressure fusing a toner image to copy paper as said paper is being passed between a fixing roll and a pressure roll, said fixing roll having in contact therewith a porous receptacle of poly(ethylene tetrafluoride) resin for applying a release agent to said fixing roll, the improvement wherein said porous receptacle of poly(ethylene tetrafluoride) resin is installed on a support in such a manner that part of said receptacle projects from an opening of the support, said receptacle being provided with a backup means for preventing deformation of said receptacle, said backup means being provided behind said receptacle in the direction of rotation of said fixing roll and along substantially the entire length of said receptacle, and having a height A which is more than half of a projection height B of said receptacle so as to satisfy the relation $A > \frac{1}{2}B$, wherein a reference level for each height is a base of said opening.

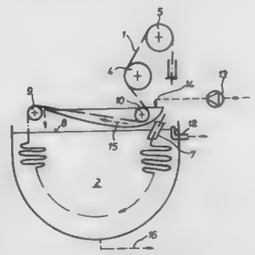
4,633,806

APPARATUS FOR THE WET TREATMENT OF A CONTINUOUS LENGTH OF TEXTILE MATERIAL

Manfred Schuierer, Michelstadt, Fed. Rep. of Germany, assignor to Bruckner Apparatebau GmbH, Erbach Odw., Fed. Rep. of Germany

Filed Jun. 5, 1985, Ser. No. 741,462
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1984, 3422397
Int. Cl.⁴ B05C *3/172, 11/10*
U.S. Cl. 118—419 **3 Claims**

1. Apparatus for the wet treatment of a continuous length of textile material, comprising a plurality of chambers for holding treatment solution through which the length of material passes in succession, and driven transport rollers which convey the length of material from chamber to chamber, characterised in that an open trough-like channel through which the length of material passes from chamber to chamber extends above and across every two adjacent chambers, an end chamber through which the length of material passes last is provided with means for supplying fresh treatment solution to such end chamber, means are provided for conveying solution from each chamber to the end of a channel at which the length of material leaves the channel, and each channel being arranged for overflow of



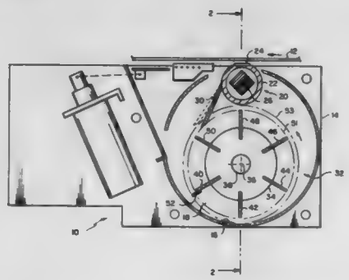
solution at the other end of the channel, at which the length of material enters the channel, into the chamber from which the length of material enters the channel, whereby the liquid flows through the chambers and channels in counterflow to the movement of the length of material.

4,633,807

ELECTROGRAPHIC DEVELOPMENT STATION WITH IMPROVED DEVELOPER MIXER AND SKIVE

Michael E. Jacobs, Henrietta, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 11, 1985, Ser. No. 807,721
Int. Cl.⁴ G03G *15/09*
U.S. Cl. 118—657 **5 Claims**



1. In a development station for applying developer material to a latent image on a photoconductor of an electrographic apparatus, the station having a sump for holding a supply of developer material, an applicator for supplying such material to the latent image on the photoconductor, and a flexible skive in engagement with the applicator for removing excess developer material from the applicator so that it can be returned to the sump, the improvement comprising:
mixing means in the sump, the mixing means comprising a plurality of blades and drive means for rotating the blades about an axis, the blades being effective when rotated to mix developer material in the sump and supply developer material from the sump to the applicator, and at least one of the blades being of sufficient length to strike the skive during rotation of the mixing means, thereby to flex the skive and cause developer material on the skive to be returned to the sump.

4,633,808

DEVELOPING PROCESS FOR ELECTROPHOTOGRAPHY USING A TWO-COMPONENT DEVELOPER

Kouji Maekawa, Kyoto, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Apr. 23, 1985, Ser. No. 726,354
Claims priority, application Japan, Apr. 27, 1984, 59-86849
Int. Cl.⁴ G03G *13/08*
U.S. Cl. 118—658 **6 Claims**

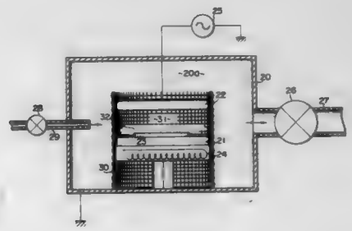
1. A developing process for electrophotography using a two-component developer comprising:
feeding a two-component developer to a non-magnetic sleeve, said developer consisting of an insulative and non-magnetic toner charged with an electrical polarity and a magnetic carrier,
maintaining said developer on the sleeve by means of a first fixed magnet disposed behind said sleeve,
removing said carrier from said developer on the sleeve to leave said non-magnetic toner on the sleeve by means of at least a second fixed magnet disposed behind said sleeve adjacent said first magnet and between said first magnet and a photoreceptor with said second magnet being of the same polarity as the adjacent portion of said first magnet, and
transferring said non-magnetic toner from the sleeve to and electrostatic latent image on the surface of the said photoreceptor.

4,633,809

AMORPHOUS SILICON FILM FORMING APPARATUS

Masataka Hirose, Hiroshima; Tsuyoshi Ueno, Fujisawa, and Katsumi Suzuki, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 4, 1984, Ser. No. 607,310
Claims priority, application Japan, May 10, 1983, 58-81462
Int. Cl.⁴ C23C *13/08*
U.S. Cl. 118—719 **6 Claims**



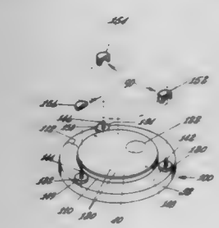
1. An amorphous silicon film-forming apparatus for forming an amorphous silicon film on a drum member, comprising:
a sealed vessel having an interior wall which establishes a reaction chamber;
gas inlet means for introducing a silicon-containing gas into the reaction chamber;
bearer means, including an electrically grounded based, for supporting said drum member;
plasma generating means, including an electrode spaced from and surrounding said bearer means so that said electrode establishes a plasma generating region with said base, and power source means for causing an electrical discharge to thereby produce a plasma of said gas in said plasma generating region; and
a conductive mesh structure which is disposed in the reaction chamber and surrounds the plasma generating region and the drum member, the portion of the mesh structure facing the outer periphery of the drum member being in the form of a drum and spaced at a constant distance therefrom, and the mesh structure also being separated from said interior wall such that an annular space is defined in said reaction chamber between said mesh structure and said interior wall, wherein said inlet means introduces said silicon-containing gas into said annular space such that said silicon-containing gas surrounds said mesh structure, and wherein a portion of said silicon-containing gas in said annular space enters said plasma generating region through said mesh structure to produce a plasma of said gas and form a film on said substrate, owing to the difference in density between the gas in the annular space and the gas in the plasma generating region, the density of which is reduced by forming the film on the substrate.

4,633,810

APPARATUS FOR ACCURATELY REGISTERING A FIRST MEMBER AND A SECOND MEMBER IN AN INTERDEPENDENT RELATIONSHIP

Richard T. Martin, Goleta, Calif., assignor to Applied Magnetics Corp., Goleta, Calif.

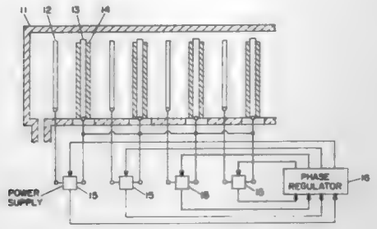
Division of Ser. No. 304,066, Sep. 21, 1981, Pat. No. 4,372,248.
This application Sep. 13, 1982, Ser. No. 417,676
The portion of the term of this patent subsequent to Jan. 8, 2002, has been disclaimed.
Int. Cl.⁴ C23C *13/08*
U.S. Cl. 118—721 **5 Claims**



1. Apparatus for accurately registering a reference member in interdependent loading relationship at a predetermined spacing and position relative to one of a plurality of moveable members comprising
means for supporting a plurality of moveable members each of which has a selected number of prealigned registration members which are located therein in a predetermined pattern, and with axes thereof substantially perpendicular to a selected plane, said supporting means being adapted to transport each of said moveable members including its associated prealigned registration members along a predetermined path to a working station;
means for supporting a reference member at a said working station in spaced opposed relationship to a said moveable member located at a said working station with said prealigned registration members thereof positioned towards said reference member supporting means; and
reference registration members, equal in number to the selected number of prealigned registration members, located on at least one of said reference member supporting means and a reference member and positioned thereon in substantially said predetermined pattern and which are adapted to co-act with said prealigned registration members when loaded thereagainst and being adapted to accurately register the reference member supporting means including a said reference member at a predetermined spacing and position relative to said moveable member located at said working station.

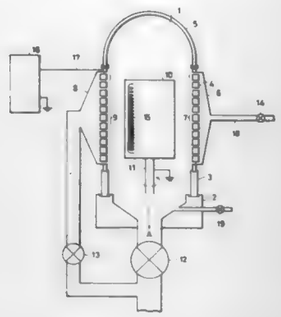
VOL 1074 ISS 1 JAN 6 1987 UMI

4,633,811
PLASMA CVD APPARATUS
Kazumi Maruyama, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Japan
Filed Jan. 16, 1985, Ser. No. 691,861
Claims priority, application Japan, Mar. 28, 1984, 59-60344
Int. Cl.[4] C23C 13/08
U.S. Cl. 118—723 5 Claims



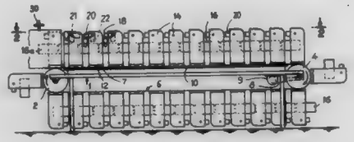
1. A plasma CVD apparatus comprising:
a power supply means comprising a high frequency power source, a plurality of amplifiers each supplied by said source, and a plurality of matching circuit means each supplied from a different one of said amplifiers, and a plurality of output units each supplied by a respective one of the matching circuit means, and a common terminal;
a reaction chamber;
a plurality of electrodes disposed in spaced face-to-face relation within the chamber, at least each alternate electrode of the plurality being arranged to support on opposite faces thereof a substrate for receiving a thin film produced by a glow discharge, each of said alternate electrodes being connected to said common terminal and the remaining electrodes of the plurality being connected into at least two separate sets, each separate set being connected to a different one of the plurality of output units whereby the amount of power supplied to each adjacent pair of electrodes may be separately regulated to be substantially the same.

4,633,812
VACUUM PLASMA TREATMENT APPARATUS
Yasutomo Fujiyama, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 8, 1985, Ser. No. 699,870
Claims priority, application Japan, Feb. 13, 1984, 59-24633
Int. Cl.[4] C23C 13/08
U.S. Cl. 118—723 2 Claims



1. In a vacuum plasma treating apparatus having a reaction chamber formed at least in part of electric insulating material subject to corrosion by a fluorine or chlorine containing gas plasma, the improvement wherein the electric insulating material subject to corrosion comprises a sintered ceramic material containing alumina as a primary ingredient.

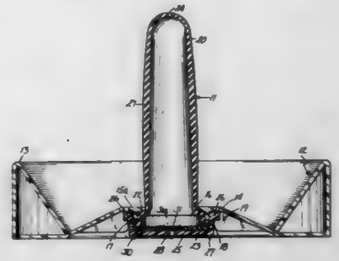
4,633,813
MILKING AND FEEDING STALL
Philippe Tisserand, Paris, and Jean-Pierre Daffini, Onet le Chateau 4 Saisons, both of France, assignors to R. J. Fullwood & Bland Ltd., Ellesmere, Great Britain
Filed Jun. 4, 1985, Ser. No. 741,063
Claims priority, application France, Jun. 4, 1984, 84 08733
Int. Cl.[4] A01K 1/12
U.S. Cl. 119—14.04 9 Claims



1. A milking and feeding stall comprising a frame, an endless floor having a longitudinally extending substantially horizontal first part and a longitudinally extending second part and two transition end parts interconnecting said first and second parts, the floor comprising floor elements articulated together, support means carried by the frame and supporting the first floor part, two guide means carried by the frame and guiding said transition floor parts, means combined with the floor for moving said first floor part in a longitudinal path between an entrance for the animals to be milked and an exit for the milked animals, which floor is provided on a lateral side thereof with retainer plates, each retainer plate being mounted on a respective floor element and extending upwardly of the respective floor element in said first floor part, the floor element extending from a side of the retaining plate transversely of the longitudinally extending first floor part, an individual trough carried by each retaining plate and offset longitudinally of said first floor part relative to the respective retainer plate and disposed on a side of the retainer plate opposed to the side of the retainer plate from which the respective floor element extends, and said retainer plates defining a passage between neighbouring retainer plates, which passage allows a head of an animal placed on said first floor part access to the respective individual trough, each retainer plate further carrying retractable closing means for closing said passage and movable between a passageclosing position and a retracted position in which latter position the closing means is substantially withdrawn from the passage, said closing means being freely movable to said retracted position by the animal to be fed, means interposed between the retainer plate and the closing means to prevent the animal from moving the closing means away from the closing position when the animal has its neck placed under the respective closing means, and means for constantly yieldably biasing said closing means to the closing position thereof.

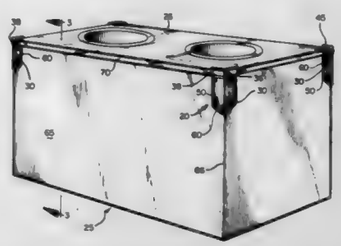
4,633,814
FLOATING CALF FEEDER FOR FEEDING CALVES
Winthrop A. Eastman, Wayzata, and John A. Gale, Minneapolis, both of Minn., assignors to Mobion, Inc., Wayzata, Minn.
Filed Jan. 22, 1986, Ser. No. 821,256
Int. Cl.[4] A01K 9/00
U.S. Cl. 119—71 16 Claims

1. A floating calf feeder for feeding calves comprising:
(a) an annular float ring having a cross-plate extending across the central opening of the float ring and affixed near the first end of the float ring, the cross-plate further having a central nipple hole;
(b) an elongate cylindrical nipple having outside dimensions at the first end to snuggly fit within the nipple hole, and further having a means for limiting travel into the nipple hole affixed at the first end; the nipple further having a second end of reducing cross-section terminating in a small orifice; and
(c) a retainer valve cap having a means removably attaching



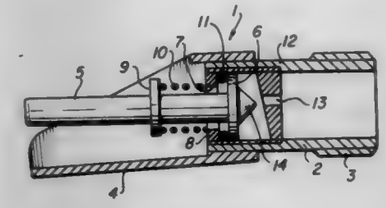
the valve cap to the first end surface of the cross plate and extending over the first end of the nipple and the nipple hole; the retainer valve further having a valving means disposed therein allowing the one way passage of fluids into the nipple.

4,633,815
WATERER CORNER WEAR GUARD
Jerry D. Peterson, Conrad, Iowa, and Gerald L. Kaief, Bay St. Louis, Mo., assignors to Ritchie Industries, Inc., Conrad, Iowa
Filed Aug. 28, 1985, Ser. No. 770,667
Int. Cl.[4] A01K 7/00
U.S. Cl. 119—72 5 Claims



1. A wear guard to protect the vertical corners of an animal waterer housing having an overlaying cover, the cover having a cover flange of predetermined thickness, the wear guard comprising, in combination: an elongated V-shaped body member defining substantially a right angle for attachment to the waterer housing, an outwardly and upwardly extending shoulder member, a guard flange integral with the shoulder member extending upwardly to define a top end, a rod of circular cross section forming substantially a right angle and fixed to the top end to present a rounded surface to animals using the waterer; the shoulder member spacing the guard flange from the vertical corner of the animal waterer housing to allow a cover flange corner to fit between the guard flange and the housing corner so that the guard flange overlies and surrounds the corner of the cover flange in a nesting relationship.

4,633,816
DEVICE FOR CONTROLLED DISCHARGE OF LIQUID TO ANIMALS
Olsson Ove, and Olsson Ingegärd, both of Sätofta, Sweden, assignors to Ove Olsson and Ingegärd Olsson, Sweden
Filed Jan. 24, 1985, Ser. No. 706,859
Claims priority, application Sweden, May 24, 1983, 8302924
Int. Cl.[4] A01K 7/00
U.S. Cl. 119—72.5 8 Claims



1. A drinking device for supplying water to animals, said device being adapted to prevent or restrict spillage of water when an animal drinks therefrom comprising a housing member including a water inlet and a water outlet, means associated with said housing member for engagement by the mouth of said animal to cause water to selectively flow from said inlet to said outlet, said engagement means including a first engagement member (4, 23, 43) and a second engagement member (5, 24, 46) movable from a neutral position towards said first engagement member when said members are simultaneously engaged by said mouth of said animal, a first valve means positioned relative to said housing member between said inlet and said outlet, said first valve means being (a) closed to prevent flow of water from said inlet to said outlet when said engagement means is in said neutral position; and (b) opened to allow continuous flow of water from said inlet to said outlet when said second member is moved a first distance towards said first member as a result of the forces generated by the contraction of the muscles of said animal's tongue and mouth when said engagement members are engaged by the mouth of said animal; and a second valve means positioned relative to said housing member between said first valve means and said inlet, said second valve means being closed when said second member is moved a further distance towards said first member as a result of the forces generated by the swallowing reflex of said animal, which reflex is released when water has flown into the mouth cavity of said animal, causing a further contraction of said muscles to so move said second member said further distance.

4,633,817
PROTECTIVE FOOTWEAR FOR ANIMALS
Jackson H. Taylor, 467 Hill Street, Green Lake, Wis. 54941
Filed Jul. 2, 1984, Ser. No. 626,933
Int. Cl.[4] A01K 13/00
U.S. Cl. 119—96 16 Claims

1. Protective footwear for animals comprising:
a. a plurality of bootees, each being an independent garment, adapted to fit over the feet and legs of an animal, each extending up the leg and terminating at a point above the knee, but below the legpit;
b. a suspender system adapted to drape over the animal's back and having a strap end corresponding to each bootee; and

c. fastening means attached to each bootee for receiving the corresponding strap end of the suspender system,



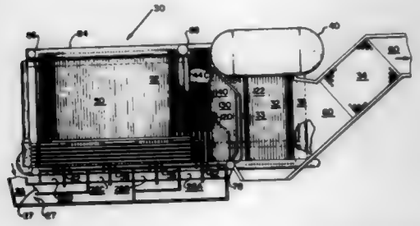
so that the suspender system holds the bootees in place on the animal's feet and legs and also allows the animal full function.

4,633,818

MOBILE COAL-FIRED FLUIDIZED BED POWER UNIT

Carl F. Horlitz, Jr., Windsor, and Franciscek J. Swietek, Hartford, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 20, 1985, Ser. No. 811,213
Int. Cl.[4] F22B *1/00*
U.S. Cl. 122—4 D **3 Claims**



1. A fluidized bed furnace system wherein fuel is combusted to produce a flue gas which is passed in heat exchange relationship with a liquid to generate and superheat a vapor, comprising:

a. a longitudinally elongated furnace enclosure formed of a plurality of fluid-cooled tubes enclosing a furnace chamber having an open floor at the bottom thereof and a gas outlet at one end thereof, an evaporator section having a gas inlet opening to said furnace chamber and a gas outlet, and an economizer section having a gas inlet opening to said evaporator section and a gas outlet, said furnace chamber, said evaporator section and said economizer arranged longitudinally in that sequence with respect to flue gas flow;

b. a support base comprising plate means having a plurality of passages therethrough for admitting fluidizing air to the furnace chamber and adapted to extend across the open floor of said furnace chamber for supporting a bed of fuel material and an inert material, an air plenum disposed immediately subadjacent said plate means for supporting said plate means and directing air through the plurality of openings in said plate means into said bed to fluidize the fuel and inert material within the furnace chamber superadjacent said plate means, fuel feed means extending upwardly through said plate means into the furnace chamber for supplying fuel to said bed of fluidized material, and a support cradle disposed beneath said air plenum, the support cradle of said support base having a base member upon which said air plenum is supported and having longitudinally extending side members from which said furnace enclosure is supported independently of said air plenum; and

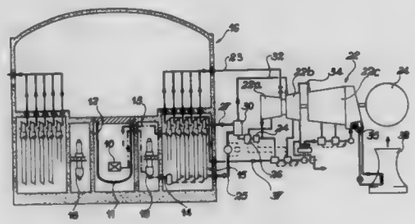
c. a superheater tube bundle disposed within the furnace chamber and positioned therein so as to be immersed within said bed of fluidized material, said superheater tube bundle supported from a portion of the fluid-cooled tubes enclosing the furnace chamber.

4,633,819

WATER-SODIUM STEAM GENERATOR WITH STRAIGHT CONCENTRIC TUBES AND GAS CIRCULATING IN THE ANNULAR SPACE

Zéphyr Tilliette, Clamart, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 680,467, Dec. 11, 1984, abandoned. This application Feb. 27, 1986, Ser. No. 833,588
Claims priority, application France, Dec. 21, 1983, 83 20469
Int. Cl.[4] F22B *1/16*
U.S. Cl. 122—32 **10 Claims**



1. A steam generator installation comprising:

a steam generator envelope, of generally elongated shape;

a liquid metal inlet and a liquid metal outlet being provided in the envelope for a liquid metal, said inlet and outlet being spaced apart to define a heat exchange area between them;

a bundle of tubular elements enclosed within said envelope and located substantially within said heat exchange area, each tubular element being comprised of at least an external tube and an internal tube positioned substantially coaxially within said external tube, with a clearance for defining a passage for a chemically neutral pressurized gas;

at least a water admission chamber for water to be vaporized and a discharge chamber for water steam produced by vaporization of said water;

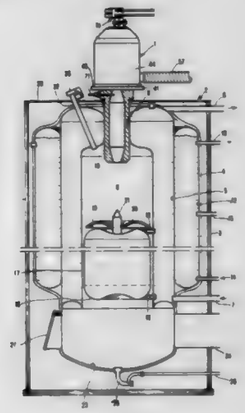
at least one pressurized gas admission chamber and a pressurized gas discharge chamber for said pressurized gas, and located on one side and on the other side of said heat exchange area respectively, each of said external tubes having an inlet end connected to said pressurized gas admission chamber, and an outlet end connected to said pressurized gas discharge chamber; each of said internal tubes having an inlet end connected to said water admission chamber, and an outlet end connected to said steam discharge chamber; said installation further comprising a means for including forced convection in the thermal exchange between said liquid metal and said pressurized gas and between said pressurized gas and said water, said means including a heat exchanger means for controlling the temperature of said pressurized gas which includes a a heat exchanger envelope, a pressurized gas admission chamber, and a pressurized gas discharge chamber in said heat exchanger envelope, a heat exchange fluid inlet, and a heat exchange fluid outlet being provided in said heat exchange envelope, said gas being cooled by heat exchange fluid, a first pipe for connecting said pressurized gas discharge chamber of said steam generator to said pressurized gas admission chamber of said heat exchanger, and a second pipe for connecting said pressurized gas discharge chamber of said heat exchanger to said pressurized gas admission chamber of said steam generator, and a circulating pump means for circulating and recirculating said pressurized gas within said passage between said internal and external tubes, thus making possible the effecient thermal exchange between said liquid metal and said water.

4,633,820

HIGH-EFFICIENCY THERMAL GROUP

Renato Montini, Costermano, Italy, assignor to C.E.M. S.p.A., Rivoli Veronese, Italy

Filed Dec. 9, 1985, Ser. No. 806,582
Claims priority, application Italy, Dec. 21, 1984, 84978 A/84
Int. Cl.[4] F22B *33/02*
U.S. Cl. 122—37 **7 Claims**



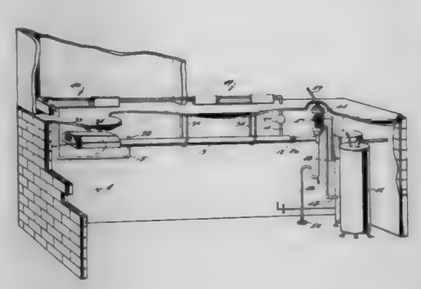
1. A high-efficiency thermal group having a boiler and a clear blue flame burner, wherein the said boiler comprises at least one metal head tank arranged to contain a fluid to be heated and delimiting a furnace in which the said burner extends, and at least one metal end tank at least partly located in the said furnace downstream of the burner, and in fluid communication with the said head tank, the or each end tank delimiting a gap or interstice with the furnace side wall to controllably confine and convey hot flue gases through it, thereby providing a throttled passage for the hot flue gases in the furnace and obtaining high-rate transfer of heat from the hot flue gases to the fluid in the tanks, and the burner comprises a nosepiece secured to the boiler and extending into the boiler furnace, and a unit removably fixed to the said nosepiece and including a flanged hollow element having its flanged end fixed to the nosepiece end projecting from the boiler, a gauged bush carried inside the said hollow element at its flanged end, whereby the inner light of said hollow element is in direct communication with the said nosepiece, a covering cap which encloses the said hollow element and defines therewith a peripheral cavity communicating with the inner light of the said hollow element and having an inlet for the combustion air at its end adjacent to the flanged end of the hollow element, whereby incoming combustion air passing through the said inlet is conveyed to follow a winding path through the said peripheral cavity before entering the said hollow element, and a holder carried on the said cap and extending into said hollow element and the said gauged bush, an atomizer carried by the said holder, and a thermally insulating or insulated conduit extending along the said holder for supplying the said atomizer with fuel.

4,633,821

LIQUID HEATING APPARATUS

Clarence W. Cleer, Jr., RD #2, Box 90, Kane, Pa. 16735

Filed Aug. 1, 1980, Ser. No. 174,456
Int. Cl.[4] F23B *7/00*
U.S. Cl. 122—155 A **13 Claims**



1. Apparatus for heating liquid, utilizing a combustible fuel, and comprising:

a power burner for burning a combustible fuel;

an elongated flue extending outwardly from said power burner, and having sufficient length to provide for the condensation of at least some of the exhaust products flowing therein if sufficiently cooled; and

at least one elongated tubular member generally concentric with said flue and comprising a component part of means for circulating liquid adjacent said flue from an inlet to an outlet, the outlet adjacent the end of the flue adjacent said burner, so that the temperature of at least some of the exhaust products of combustion exiting through said flue are cooled below the dew point of water so that the latent heat of vaporization from said exhaust products is transferred to the circulating liquid; said liquid circulating means consisting essentially of:

a single said elongated tubular member, said member having a cross-sectional area larger than the cross-sectional area of said flue, and surrounding said flue; an inlet to said tubular member adjacent the end thereof remote from said burner; an outlet from said tubular member; and means insuring circulation of liquid from said inlet, in the volume between said tubular member and said flue, and out said outlet; and

wherein said flue is formed of heat conductive material;

said flue including means formed on the interior thereof for preventing corrosion thereof from the action of condensate formed therein, said corrosion preventing means being formed along at least the length of said flue wherein condensation is likely to take place; said flue comprising a metal pipe and wherein said corrosion preventing means comprises a glass lining coating a portion of said flue;

said apparatus further comprising sealing means sealing the volume between said flue and elongated tubular member at the end termination of said elongated tubular member remote from said power burner without destruction of the glass lining of said flue thereat; said sealing means comprising a substantially annular member extending around said tubular member adjacent said end termination thereof and rigidly affixed thereto; a sealing ring of resilient material; a compression plate; and means for drawing said compression plate against said sealing ring and toward said annular member to effect sealing between said flue and said tubular member.

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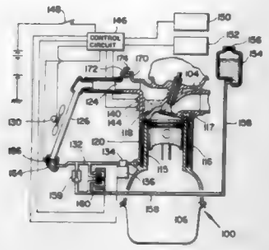
VOL 1074 ISS 1 JA 6 1987 UMI

4,633,822

COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 15, 1984, Ser. No. 640,862
Claims priority, application Japan, Aug. 25, 1983, 58-155277
Int. Cl.⁴ F01P *3/22*
U.S. Cl. 123—41.21 **11 Claims**



1. In a method of a coolant an arrangement, the steps of:
boiling a liquid coolant in a coolant jacket;
condensing the vapor produced in said boiling step, in a radiator;
maintaining said radiator essentially empty of liquid coolant when the engine is warmed-up and running so as to maximize the surface area available for coolant vapor to release its latent heat of evaporation;
storing coolant in a reservoir in fluid communication with said radiator; and
reducing the surface area of said radiator via which the vapor produced in said coolant jacket can release its latent heat of evaporation by using a pressure differential between said reservoir and said radiator which develops when the pressure in said radiator falls a predetermined amount below that prevailing in said reservoir to induct additional coolant from said reservoir into said radiator.

5. In an internal combustion engine having a combustion chamber:
a radiator;
a coolant jacket in which liquid coolant is boiled and the vapor produced conveyed to said radiator for condensation therein;
a reservoir containing liquid coolant; and
a first valve fluidly interposed between said radiator and said reservoir which opens in response to a pressure developing in said radiator which is a predetermined amount lower than that prevailing in said reservoir, said first valve being a check valve which permits flow of coolant from said reservoir to said radiator, but which prevents flow of coolant from said radiator to said reservoir.

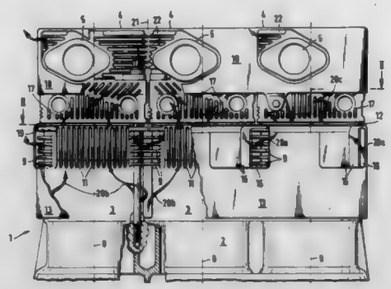
4,633,823

AIR-COOLED INTERNAL COMBUSTION ENGINE HAVING COOLING RIBS AND COOLING AIR DEFLECTORS

Werner Haas; Dieter Hilker, both of Cologne, Fed. Rep. of Germany, and Slezak, Pavel J., Pierrefonds, Canada, assignors to KHD Canada, Inc., Quebec, Canada

Filed Mar. 11, 1985, Ser. No. 710,172
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 3408624
Int. Cl.⁴ F01P *1/02*
U.S. Cl. 123—41.61 **13 Claims**

1. An air-cooled, reciprocating piston, internal combustion engine having a crankcase and at least two adjacent cylinder barrels on said crankcase, comprising a plurality of cooling ribs lying substantially perpendicular to the longitudinal axes of said cylinder barrels on at least a part of the periphery thereof, cylinder heads on said cylinder barrels, said heads and said barrels having a cooling air inlet side and a cooling air outlet side, said heads each having an intake port at said inlet side thereof and each having an exhaust port at said outlet side thereof, at least one air deflecting means mounted on said outlet side of said cylinder barrels, and said cylinder barrels



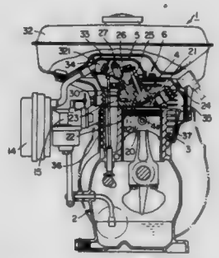
having cooling ribs on said outlet side thereof lying substantially parallel to said longitudinal axes, said air deflecting means overlying said parallel lying cooling ribs whereby at least some cooling air which flows laterally around and between said adjacent cylinder barrels is capable of being deflected toward said parallel lying cooling ribs.

4,633,824

COOLING MEANS FOR THE SQUISH PART OF AN AIR COOLING OVERHEAD VALVE ENGINE

Tatsutoshi Umeda; Yoshio Tani; Takeshi Kaai; Keiichi Nakano, and Yoshio Izui, all of Sakaishi, Japan, assignors to Kubota Limited, Osaka, Japan

Filed Feb. 25, 1985, Ser. No. 704,955
Claims priority, application Japan, Mar. 30, 1984, 59-47406[U]; May 9, 1984, 59-92567; May 16, 1984, 59-72119[U]
Int. Cl.⁴ F01P *1/02*
U.S. Cl. 123—41.65 **8 Claims**



1. An air cooled engine comprising:
(a) a cylinder having a cylinder head affixed thereon and having a right side and a left side;
(b) a combustion chamber disposed in an upper area of said cylinder and under the right side of said cylinder head;
(c) a squish area disposed in said cylinder adjacent to said combustion chamber under and across the left side of said cylinder head;
(d) an air wind tunnel disposed above said squish area and extending through said cylinder head and over substantially the entire squish area;
(e) a squish part including a portion of said cylinder head disposed between said air wind tunnel and said squish area;
(f) a fan means for providing a cooling wind;

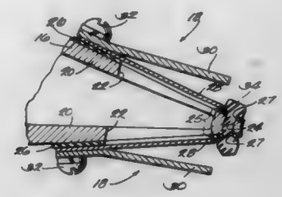
(g) a fan case for guiding the cooling wind to said air wind tunnel;
(h) a pipe means disposed across an upper part of an entrance of said wind tunnel for guiding the cooling wind into said wind tunnel.

4,633,825

REED VALVE ASSEMBLY

John D. Flaig, Libertyville, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 2, 1985, Ser. No. 751,292
Int. Cl.⁴ F02B *33/04*
U.S. Cl. 123—73 V **7 Claims**



1. A reed valve assembly comprising a valve member having a valve opening therein, a resilient valve seat member having a first end, an opposite second end, and an opening registering with said valve opening and defining a valve seat surrounding said valve opening, a reed valve having an end, first means for securing said end of said reed valve and said first end of said valve seat member to said valve member with said first end of said valve seat member secured between said reed valve and said valve member and with said reed valve movable into and out of engagement with said valve seat member to respectively close and open said valve opening, and second means for securing said second end of said valve seat member to said valve member, wherein said valve member has therein an aperture, wherein said second end of said valve seat member has therein an aperture aligned with said aperture in said valve member, and wherein said means for securing said second end of said valve seat member includes a fastening means received in said aligned apertures.

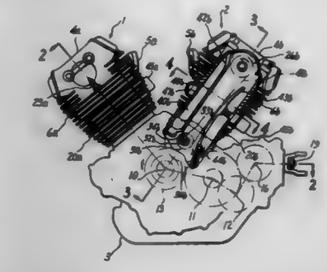
4,633,826

OVERHEAD CAM SHAFT TYPE V-ENGINE CYLINDER BLOCK

Nobuyoshi Tominaga, Hamamatsu; Nobuyoshi Kurai, Iwata; Hajime Ueno, Shizuoka, and Sadahide Suzuki, Iwata, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 236,612, Feb. 20, 1981, abandoned. This application Jan. 13, 1984, Ser. No. 570,623
Claims priority, application Japan, Feb. 21, 1980, 55-21017
Int. Cl.⁴ F01L *1/04*
U.S. Cl. 123—90.31 **3 Claims**

1. In an overhead camshaft type V-engine having V-shaped cylinders equipped with an overhead camshaft drive by a timing chain disposed and arranged on either side of said cylinders at a right angle to a crankshaft, the improvement comprising:
a cylinder block;
a timing chain passage in said cylinder block, said passage housing said timing chain for chain movement in a plane of said chain, said passage including a spacing on each side of a pair of runs of said chain, and in said plane, said spacing on each side of a pair of runs of said chain being substantially the same;
said block further including a wall at least partially bounding said spacings and intersecting said plane, said wall having symmetrical wall openings therethrough symmetrically disposed on opposite sides of said chain and its plane, and opening into a respective substantially same spacing;
a plurality of chain guide means, each mounted in a respective substantially same spacing; and
tensioning means resiliently biasing one of said chain guide means toward and against a run of said chain to place the



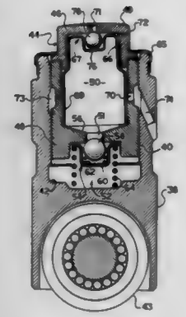
chain in tension, at least a portion of said tensioning means being mounted in one of said symmetrical wall openings adjacent to the respective run, the symmetry of said symmetrical wall openings enabling said tensioning means to be positioned adjacent to either run, whereby said cylinder block may be used for diametrically opposite cylinders.

4,633,827

HYDRAULIC LASH ADJUSTER WITH COMBINED RESERVOIR EXTENSION AND METERING SYSTEM

Stephen M. Bueste, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 7, 1985, Ser. No. 785,301
Int. Cl.⁴ F01L *1/24*
U.S. Cl. 123—90.55 **6 Claims**



1. A hydraulic lash adjuster for valve gear of an internal combustion engine comprising:
(a) a body having a blind bore formed therein;
(b) plunger means slidably received in said body bore and defining, in cooperation with the blind end of said bore, a cavity, and a fluid reservoir;
(c) a one way valve means positioned at one end of said plunger means permitting fluid flow from said reservoir to said cavity;
(d) said body and plunger means including port means adapted for receiving fluid under pressure, said port means communicating with said reservoir intermediate the ends of said plunger means;
(e) a cup shaped insert member disposed within said reservoir having an open end secured in fluid tight sealing engagement with the wall of the plunger means between

said valve means and port means, the closed end of said insert member positioned in closely spaced relationship to the closed end of said plunger means and having at least one bore extending through the closed end of said insert member;

(f) the closed end of said plunger means having a contact surface adapted to contact associated valve gear components and transmit periodically applied forces and a bleed orifice extending through the closed end of said plunger means and said contact surface, whereby fluid from said port means is communicated to both said insert bore and said plunger bore;

(g) and, a fluid metering means associated with the closed end of said insert and with said bleed orifice to precisely meter the flow of fluid through said bleed orifice.

4,633,828

ADJUSTABLE POLAR POINT MOUNT

Luther R. Steele, 4404 Briarhaven Rd., Fort Worth, Tex. 76109

Filed Jun. 3, 1985, Ser. No. 740,758
Int. Cl.⁴ F02B *77/00*
U.S. Cl. 123—195 A **1 Claim**



1. An assembly for mounting automotive accessories, such as a compressor, generator or alternator on an engine block, comprising, in combination, a "U"-shaped polar bracket, a polar extension and a pair of threaded rods adjustably mounting said extension on said bracket; said bracket comprising a central portion for resting against said engine block and parallel legs at opposite ends thereof for receiving said extension therebetween, a pair of arcuate slots in each said leg, one said slot being longer than the other, said longer slots of both said legs being aligned together and said other slots of both said legs being likewise aligned together, a pair of threaded rods supporting said extension having opposite ends received through said slots and a nut on each rod end for affixing the position of each said rod, and said extension comprising two straight wide arms at acute angle respective to each other and joined together at their one ends, one said arm being longer than the other, a longitudinal opening through each terminal end of said arms receiving said rods therethrough, and a third longitudinal opening parallel to the said first opening being through said joined ends of said arms for a third threaded rod extending through mounting lugs of said accessories.

4,633,829

ROTARY INTERNAL COMBUSTION ENGINE

Richard H. Kollen, Kerkstraat 48, 2242 HH Wassenaar, Netherlands

Filed Sep. 27, 1985, Ser. No. 780,987
Int. Cl.⁴ F02B *53/00*
U.S. Cl. 123—246 **20 Claims**

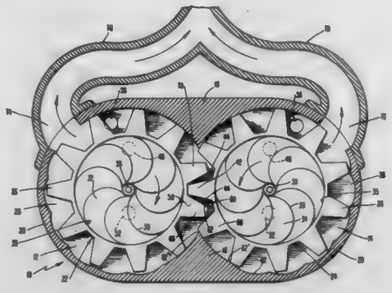
1. A rotary internal combustion engine operating on fuel and air, comprising:

a housing having a pair of communicating parallel axis rotor chambers;

a pair of parallel axis rotors, one in each rotor chamber of said housing, said rotors each having on its outer periphery a plurality of circumferentially spaced axial teeth with a plurality of intervening circumferentially spaced axial passages, said rotors being positioned with said teeth and passages of one rotor engaging, respectively, said passages and teeth of the other rotor, and each of said rotors further having an internal mixer chamber surrounding a plurality of axial generally cylindrical oblique helicoid walls forming a mixer means;

mean for introducing a mixture of the fuel and air into said mixer chambers of said rotors whereby rotation of said rotors correspondingly rotates said mixer means to homogenize said mixture to produce a fuel/air mist;

means for transferring said mist from said mixer chambers to a predetermined injection point in said rotor chambers of said housing such that said mist is disposed in selected passages of said rotors as said selected passages rotate past said predetermined injection point;



means for igniting said mist at a predetermined ignition point in said rotor chambers of said housing, said predetermined ignition point being proximate a combustion chamber formed by interengagement of the teeth of said rotors immediately adjacent said selected passages, whereby exhaust resulting from ignition of said mist urges expansion of said combustion chamber and causes rotation of said rotors; and

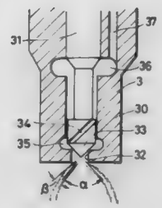
means for extracting said exhaust as said selected passages rotate past a predetermined exhaust point in said rotor chambers of said housing, said predetermined exhaust point being located in said rotor chambers such that said selected passages of said rotors rotate past said predetermined exhaust point before rotating past said predetermined injection point.

4,633,830

DIRECT INJECTION INTERNAL COMBUSTION ENGINE OF COMPRESSION IGNITION TYPE

Yujiro Oshima; Masatoshi Yamada; Nobuyuki Mori; Katsuhiko Sugiyama; Taro Aoyama; Akinori Saito, and Kazuhiro Kozuka, all of Aichi, Japan, assignors to K.K. Toyota Chuo Kenkyusho, Aichi, Japan

Filed Sep. 5, 1984, Ser. No. 647,496
Claims priority, application Japan, Sep. 5, 1983, 58-163006
Int. Cl.⁴ F02F *3/26*; F02B *19/08*; F02M *51/00*
U.S. Cl. 123—276 **19 Claims**



1. A direct injection internal combustion engine of a compression ignition type in which air is sucked into a combustion chamber and compressed by a piston, and fuel is injected directly thereinto so as to be ignited and combusted, comprising:

air intake means having swirling means for swirling intake air supplied to said combustion chamber;

a piston having a combustion chamber substantially in the form of a spherical cavity formed in a top portion of said piston, said cavity having walls which gradually converge towards an opening of said cavity at a top surface of said piston;

a swirl injector for injecting a fuel spray having substantially the form of a hollow cone, said sprayed fuel having a velocity component in a tangential direction of a central axis of an injection port of said injector, said injection port being offset from a central axis of said cavity and being inclined with respect to said central axis of said cavity such that said fuel spray is injected in a forward direction of a swirl stream of intake air formed in said cavity, and

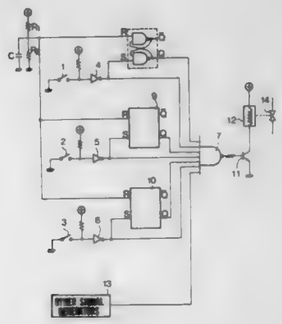
wherein said air intake means comprises a port located offset from a central axis of a cylinder of said engine, said offset port having an intake passage, an inner side wall of said intake passage having an inclination sloping gradually toward a periphery of said cylinder as said passage approaches said cylinder, said inclined side wall being arranged such that an extension line of said inclined side wall extends within a region from an outer wall of a rod of an intake valve to a position apart from said outer wall; an outer side wall of said intake passage near a periphery of said piston being linear and smoothly connecting with an arcuate side wall of said intake passage, said arcuate side wall defining a center offset toward said periphery of said cylinder with respect to a central axis of said intake valve.

4,633,831

FUEL CUTOFF SYSTEM FOR A MOTOR VEHICLE

Hiroya Ohkumo, Koganei, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1985, Ser. No. 801,986
Claims priority, application Japan, Nov. 30, 1984, 59-253959
Int. Cl.⁴ F01D *41/22*
U.S. Cl. 123—325 **3 Claims**



1. A fuel cutoff system for a motor vehicle having an accelerator pedal comprising:

sensing means responsive to the operation of the accelerator pedal for producing an accelerator signal having logic levels, one of which is a first level at the depression of the accelerator pedal and the other is a second level at the release of the pedal and the failure of the means;

means for detecting the driving state of the motor vehicle and for producing a driving signal;

failure detecting means having first and second states, the first state responsive to the accelerator signal of the first signal and to second signals after the first signal for producing an output signal having a first level, and the second state responsive to the accelerator signal of the second level for producing the output signal having a second level;

gate means responsive to the accelerator signal, driving signal and output signal for producing a control signal;

fuel supply control means responsive to the control signal for controlling the supply of fuel;

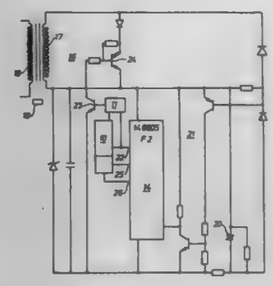
the gate means being responsive to the accelerator signal of the second level, driving signal and output signal of the first level for producing the control signal for cutting off the fuel, and responsive to the accelerator signal of the second level and the output signal of the second level for producing the control signal for supplying the fuel.

4,633,832

TORQUE LIMITING ARRANGEMENT IN AN I.C. ENGINE

Bo C. Andreasson, Gothenburg; Jan O. Donnerdal, Partille, and Tore A. Aronsson, Mölndal, all of Sweden, assignors to AB Electrolux, Stockholm, Sweden

Filed Feb. 18, 1986, Ser. No. 830,645
Claims priority, application Sweden, Feb. 27, 1985, 8500955
Int. Cl.⁴ F02D *11/10*
U.S. Cl. 123—335 **3 Claims**



1. In a torque limiting arrangement in an internal combustion engine with a magnetic ignition system generating ignition energy and an ignition coil with a spark plug connected to its secondary winding and the primary winding connected to an ignition switch switchable by triggering, a detector giving a reference time to every ignition spark, a microprocessor having a static memory, a timer and a comparator emitting a trigger pulse via output circuits to said ignition switch, the improvement wherein the timer of the microprocessor through converting circuits emits a signal to a start circuit during an interval of r.p.m. in the middle of the total r.p.m. range of the engine and that the start circuit is connected to a logic circuit (10,11) in which the said trigger pulses in a selected succession are separated from triggering of the ignition switch with missing or delayed ignition as a consequence in said interval of the r.p.m. range of the engine.

4,633,833

THROTTLES WITH HIGH VELOCITY AIRSTREAM COLLISION

George Q. Morris, 655 Paseo Esmeralda, Newbury Park, Calif. 91320

Continuation of Ser. No. 617,144, Jun. 4, 1984, Pat. No. 4,491,106. This application Dec. 31, 1984, Ser. No. 687,802
Int. Cl.⁴ F02D *9/08*
U.S. Cl. 123—336 **2 Claims**

1. An apparatus for fuel and air mixing and flow modulation comprising:

throttle body means having an air inlet passageway means therein for flowing air to an internal combustion engine;

said air inlet means having an upstream end and a downstream end;

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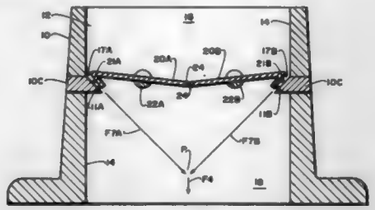
said throttle body means having extension means extending across said air inlet means;

a plurality of butterfly-type throttle blades rotatably disposed in said air inlet passageway for regulating air flowing through said inlet passageway;

a plurality of channel means;

each of said channel means formed by a region of cooperation of one of said throttle blades with said extension of said throttle body in response to a pressure difference between said upstream and downstream ends of said air inlet means;

each of said channel means acting to form a channel flow stream for flowing said air from upstream of said throttles to downstream from said throttles in response to a pressure difference between said upstream and downstream ends of said air inlet means;



each of said channel means flowing said channel flow stream so as to form a channel exit at a region of separation;

each of said channel means acting to form a channel exit stream by flowing said channel flow stream past said channel exit;

a plurality of channel exit streams;

each of said channel exit streams having a flow axis;

two of said channels being adapted to direct two channel exit streams on converging paths;

said two channel exit streams on converging paths converging such that the included angle between the flow axis of one converging exit stream with respect to the flow axis of the other converging exit stream is in the range of 45 to 180 degrees, and

said two channel exit streams on converging paths colliding in said air inlet downstream from said throttle.

4,633,834

SPARK TIMING CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

Toshio Takeuchi, Hamamatsu; Hiroshi Tomita, and Takio Ogasawara, both of Shizuoka, all of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Mar. 13, 1985, Ser. No. 711,185

Claims priority, application Japan, Mar. 16, 1984, 59-50544

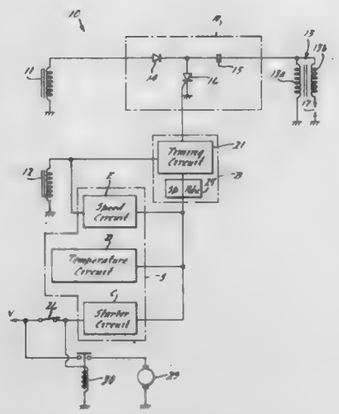
Int. Cl.⁴ F02D *5/04*

U.S. Cl. 123—424 **9 Claims**

1. In an ignition system for an internal combustion engine, a spark timing controller, comprising:

means for advancing the time at which said ignition system will produce a sparking potential during the starting of said engine;

means for maintaining said advanced spark time for a predetermined time period after said engine has started only if the temperature of said engine is below a predetermined temperature level during the starting of said engine; and



means for advancing the time at which said ignition system will produce a sparking potential when the speed of said engine is below a predetermined speed level.

4,633,835

IGNITION TIMING CONTROL APPARATUS FOR ENGINE

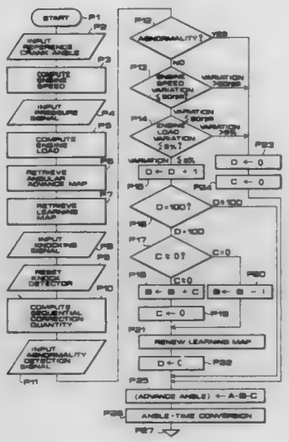
Masahira Akasu, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 616,418, Jun. 1, 1984, abandoned. This application Feb. 26, 1986, Ser. No. 834,125

Claims priority, application Japan, Jun. 3, 1983, 58-99683; Jun. 3, 1983, 58-99682

Int. Cl.⁴ F02P *5/15*

U.S. Cl. 123—425 **6 Claims**



1. An apparatus for controlling the timing of ignition in an engine, comprising:

means for detecting knocking in the engine;

means for computing a cumulative correction value from the detected knocking;

a running mode sensor for detecting the running mode of the engine;

means for producing a reference control value of the basis of a reference ignition timing characteristic corresponding to the running mode of the engine;

memory means for storing corrective control values corresponding to the individual running modes of the engine and, in response to the information from said running mode sensor representative of one running mode, outputting the corrective control value corresponding to said information;

renewal control means operated after periods of steady running conditions extending over a plurality of ignition cycles for renewing the corrective control value in the memory means corresponding to the present running mode in accordance with the cumulative correction value so that said control value is changed in the direction of angular advance for ignition upon detection of no knocking and is changed in the direction of angular delay for ignition upon detection of knocking with a corresponding adjustment in the cumlative correction value;

means for computing an ignition-timing corrective control quantity according to the corrective control value read out from said memory means and the cumulative correction value;

timing converter means for determining the ignition timing on the basis of said ignition-timing corrective control quantity and said reference control valve; and

abnormality detecting means capable of detecting occurrence of an abnormality in said knock detecting means and, upon detection of any abnormality, prohibiting said renewal control means for renewing the stored value.

4,633,836

METHOD AND APPARATUS FOR INJECTING FUEL TO ATTAIN A SMOOTH COMBUSTION IN A COMBUSTION ENGINE

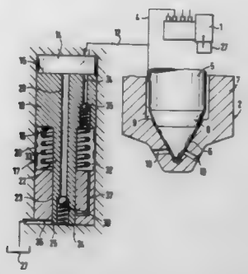
Werner Faupel, Gerlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 548,043

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1982, 3245142

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—467 **12 Claims**



1. A fuel injection apparatus for internal combustion engines comprising a fuel injection pump which supplies a fuel for injection and a fuel injection valve, said injection valve including a valve closing member which opens counter to a restoring force under pressure of the fuel supplied for injection by the fuel injection pump, a cylinder including a piston influencing the course of injection, one end face of the piston enclosing in said cylinder a pressure chamber, which exposes said piston to the pressure of the fuel pumped by the fuel injection pump, said piston is displaceable as far as a stop which forms a valve seat, said piston including an end face which seats on said valve seat to form a valve, by means of which a relief bore leading away from said valve seat is controllable, and said relief bore communicates upon the raising of the piston from the end face, with said pressure chamber via a longitudinal bore in the piston.

4,633,837

METHOD FOR CONTROLLING FUEL INJECTION IN INTERNAL COMBUSTION ENGINES AND FUEL INJECTION SYSTEM FOR PERFORMING THE METHOD

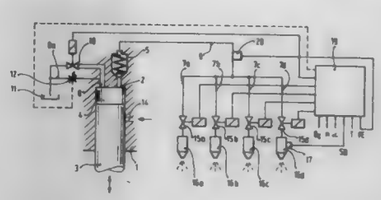
Rudolf Babitzka, Kirchberg; Ernst Linder, Mühlacker, and Wilhelm Polach, Moglingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 24, 1985, Ser. No. 779,408

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1984, 3436768

Int. Cl.⁴ F02D *41/40*

U.S. Cl. 123—478 **21 Claims**



1. A method for controlling fuel injection in internal combustion engines with the generation of a fuel injection pressure by a fuel pump, comprising the steps of:

metering a portion of the fuel pumped by the fuel pump by means of an electrically control relief-metering valve;

controlling the injection of the pumped fuel and the metered fuel at staggered times, with respect to control time of the relief-metering valve, by means of at least one electrically controlled control valve which extends to a nozzle means;

establishing an injection pressure at an injection valve at the onset of injection (SB) as the result of an intermittent pumping of fuel in synchronism with the engine rpm; and

influencing said injection pressure so that a variable portion, the variation being in accordance with operating parameters, of the pumped fuel determined by the relief-metering valve is pre-pumped into the injection line that is closed by the control valve.

4,633,838

METHOD AND SYSTEM FOR CONTROLLING INTERNAL-COMBUSTION ENGINE

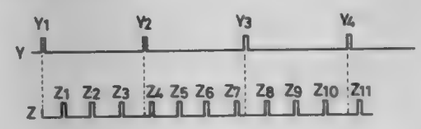
Toyoaki Fukui, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo K.K., Tokyo, Japan

Filed Apr. 15, 1985, Ser. No. 723,125

Claims priority, application Japan, Apr. 13, 1984, 59-74603; Mar. 19, 1985, 60-54823

Int. Cl.⁴ F02B *3/00*

U.S. Cl. 123—488 **30 Claims**



1. In a system for controlling an internal-combustion engine having a sensor for detecting data of an operating parameter of the engine and producing an output signal of pulses having a frequency corresponding to the data of said operating parameter, means receiving a result detected by the sensor for computing controlling data based at least on an input value corresponding to the data of an operating parameter for each trigger signal pulse of a period different from that of the output signal, and means receiving said controlling data for controlling an operating condition of said engine according to said control-

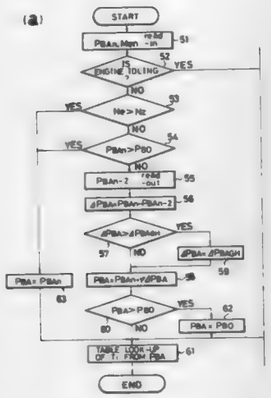
ling data, the improvement wherein said system comprises: means for counting number of pulses of said output signal; means for measuring an interval between a trigger signal pulse and a last pulse of said output signal, prior to said trigger signal pulse; means for converting a result measured by said interval measuring means to number of pulses of said output signal; means for computing said input value based on outputs of said pulse number counting means and said converting means; said input value computing means transmitting said input value to said controlling data computing means synchronously with said trigger signal.

4,633,839

METHOD FOR CONTROLLING THE SUPPLY OF FUEL FOR AN INTERNAL COMBUSTION ENGINE

Akimasa Yasuoka, Tokyo; Takahiro Iwata, and Takeo Kiuchi, both of Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1985, Ser. No. 715,294
Claims priority, application Japan, Mar. 28, 1984, 59-060087
Int. Cl.⁴ F02B *33/00*
U.S. Cl. 123—488 **2 Claims**



1. A method for controlling fuel supply of an internal combustion engine having a throttle valve, according to a pressure within an intake pipe, downstream of the throttle valve, comprising the sequential steps of:

sampling said pressure within the intake pipe and a value corresponding to engine rotational speed at predetermined time intervals;

correcting a latest sample value P_{BAn} of said pressure within the intake pipe by a ratio between a latest sampled value M_{en} corresponding to engine rotational speed and a value corresponding to a predetermined idle speed of the engine, to produce a corrected value P_{BA}; and

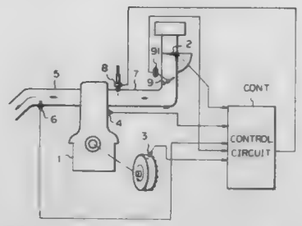
determining fuel supply amount according to said corrected value P_{BA}.

4,633,840

METHOD FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

Tsutomu Saito, Okazaki; Tsuneyuki Egami, Aichi; Tokio Kohama, Nishio; Kimitaka Saito, Okazaki; Hiroshi Takahashi, Toyota, and Kunihiko Sato, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jan. 10, 1985, Ser. No. 690,502
Claims priority, application Japan, Jan. 14, 1984, 59-004254; Jan. 26, 1984, 59-010937; Jan. 28, 1984, 59-012859
Int. Cl.⁴ F02D *41/14*
U.S. Cl. 123—489 **18 Claims**



1. A method for controlling the air-fuel ratio in an internal combustion engine using operating condition sensing means for sensing a parameter corresponding to a load of the engine and the air-fuel ratio of the engine, injection valve means driven by electrical signal to carry out injection of fuel, and control means for receiving signals from said operating condition sensing means and producing the electrical signals for driving said injection valve means, said method comprising the steps of:

obtaining an air-fuel ratio variation (D (A/F)) with respect to an optimum air-fuel ratio,

obtaining a blunting coefficient Cb on the basis of said obtained air-fuel ratio variation (D (A/F)),

obtaining a blunted value of said parameter corresponding to a load of the engine on the basis of said obtained blunting coefficient Cb, and

regulating a transient fuel amount correction ratio (f (AEW)) on the basis of the difference between the current value and said blunted value of said parameter.

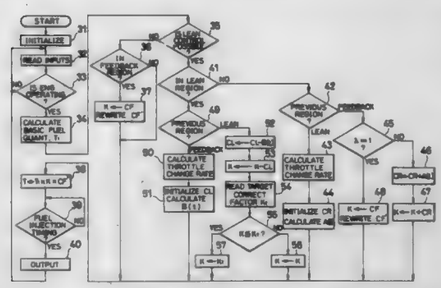
4,633,841

AIR-FUEL RATIO CONTROL FOR AN INTERNATIONAL COMBUSTION ENGINE

Masahiko Matsuura; Tadashi Kaneko; Tadayoshi Kaide, and Makoto Hotate, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 26, 1985, Ser. No. 769,390
Claims priority, application Japan, Aug. 29, 1984, 59-178424
Int. Cl.⁴ F02D *41/04, 41/26*
U.S. Cl. 123—492 **10 Claims**

1. An engine air-fuel ratio control system for controlling air-fuel ratio of a mixture to be supplied to the engine, said system including air-fuel ratio control means for providing a first air-fuel ratio in a first region of engine operating condition and a second air-fuel ratio in a second region of engine operating condition, engine operating condition detecting means for producing an engine operating condition signal which is applied to said air-fuel ratio control means to make the air-fuel ratio control means output a signal corresponding to one of the first and second air-fuel ratios depending on the engine operating condition, engine load change rate detecting means for detecting a rate of change in load on the engine and producing a load change rate signal, air-fuel ratio changing means responsive to said load change rate signal to determine a rate of change in the air-fuel ratio, when the engine operating condition changes between said first and second regions, in accordance with the rate of change in the engine load so that the rate



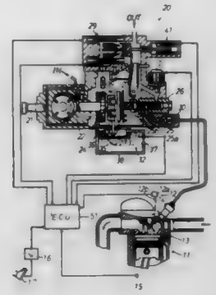
of change in the air-fuel ratio is inreased as the rate of change in the engine load increases.

4,633,842

METHOD AND APPARATUS FOR CONTROLLING THE FUEL INJECTION AMOUNT AND TIMING FOR A DIESEL ENGINE

Shinji Ikeda, and Shinichi Matsumoto, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 11, 1984, Ser. No. 609,183
Claims priority, application Japan, May 24, 1983, 58-91334
Int. Cl.⁴ F02M *39/00*
U.S. Cl. 123—501 **7 Claims**



1. A method of controlling the fuel injection for a Diesel engine which comprises the steps of:

detecting the speed of the engine;

retrieving a basic maximum fuel injection amount in accordance with the detected engine speed;

determining whether a value of a counter is greater than a predetermined number;

detecting a peak value of light intensity of a burning flame light transmitted from a combustion chamber of the engine;

calculating a total peak value by summing the detected peak values a number of times equal to the predetermined number;

calculating a means peak value of light intensity by dividing the total peak value by the predetermined number;

determining a revised correction factor in accordance with the mean peak value of the light intensity when the value of the counter is greater than the predetermined number; and

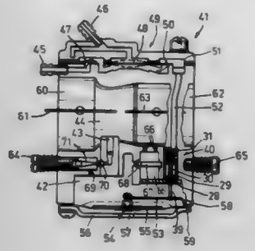
calculating a corrected maximum fuel injection amount equal to the basic maximum fuel injection amount minus the correction factor.

4,633,843

CARBURETOR ARRANGEMENT FOR AN INTERNAL COMBUSTION ENGINE

Michael Wissmann, Markgröningen, and Harald Schliemann, Waiblingen, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Aug. 21, 1984, Ser. No. 642,757
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1983, 3330994
Int. Cl.⁴ F02M *39/00*
U.S. Cl. 123—518 **7 Claims**



1. A portable hand-held motor-driven chain saw, comprising:

a two-stroke internal combustion engine generating a suction underpressure during operation;

a housing for accommodating said engine therein;

a tank mounted in close proximity to said engine in said housing for holding fuel and wherein overpressure develops in response to a warming of the fuel caused by the heat developed by the engine during said operation thereof and subsequent to said operation until said engine cools down;

a carburetor having an inlet valve and nozzle means for metering fuel to the engine;

fuel conduit means for conducting fuel in a flow direction from said tank through said inlet valve to said nozzle means;

blocking valve means mounted in the wall of said tank and at an elevation above the level of the fuel in said tank and arranged in said conduit means between the fuel in said tank and said inlet valve, said blocking valve means including:

a structure for accommodating a portion of said conduit means;

a valve seat defined by said structure and disposed in surrounding relationship to said portion; and,

a valve body movably mounted in said structure for movement between a first position whereat the valve body is in contact engagement with said valve seat to block the flow of fuel through said conduit means and a second position whereat said valve body is lifted from said valve seat to allow passage of fuel through said conduit means to said nozzle means, said valve body being arranged with respect to said conduit means so as to be biased in said flow direction by fuel from said tank pressed upwardly and against said valve body under the force developed by said overpressure in said tank so as to cause said valve body and said valve seat to conjointly define a seal-tight blockage of said conduit means when said engine is at standstill and said overpressure is present in said tank thereby preventing fuel from said tank from flooding the engine in response to said overpressure;

actuating means responsive to said suction underpressure of the engine during the operation thereof for lifting said valve body from said valve seat to said second position in a direction opposite to said flow direction and said overpressure in said tank thereby permitting fuel to flow through said fuel conduit means to said nozzle means;

ventilating valve means arranged in said wall of said tank for

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responding to an underpressure in said tank to open the same to the ambient and for responding to an overpressure in said tank for closing off the same with respect to the ambient;

said ventilating valve means being configured as a check valve and including:

a check valve housing mounted in said wall of said tank and defining a check valve seat;

a valve body movably mounted in said check valve housing for moving from a first position whereat said valve body is pressed tightly against said check valve seat for sealing off said tank from the ambient in the presence of an overpressure condition therein to a second position spaced from said check valve seat for opening said tank to the ambient in the presence of an underpressure condition therein; and,

a spring mounted in said check valve housing for resiliently biasing said valve body against said check valve seat.

4,633,844

IGNITION TIMING CONTROL FOR A SUPERCHARGED ENGINE

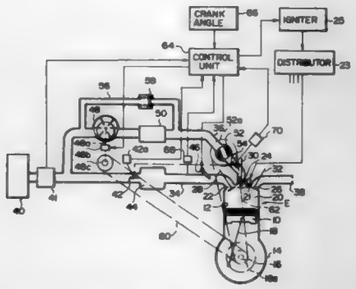
Haruo Okimoto, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed May 28, 1985, Ser. No. 738,463

Claims priority, application Japan, May 30, 1984, 59-109897

Int. Cl.⁴ F02B *33/00*; F02P *5/04*

U.S. Cl. 123—559 **14 Claims**



1. A supercharged engine including combustion chamber means, supercharging means for producing a supercharging pressure, means for introducing the supercharging pressure into said combustion chamber means under an engine load greater than a predetermined value, supercharging start signal generating means for generating a supercharging start signal when the engine load increases beyond the predetermined value, and ignition timing control means responsive to said supercharging start signal to retard ignition timing, wherein said ignition timing control means includes means for retarding the ignition timing for a predetermined time period from an instant when the supercharging start signal is produced.

4,633,845

VACUUM CONTROL DEVICE

Frank M. Seleno, Haslett, Mich., assignor to Schmelzer Corporation, Flint, Mich.

Filed Aug. 31, 1984, Ser. No. 646,201

Int. Cl.⁴ F02M *25/06*

U.S. Cl. 123—568 **18 Claims**

1. An exhaust gas recirculation valve assembly for an internal combustion engine, comprising:

a housing;

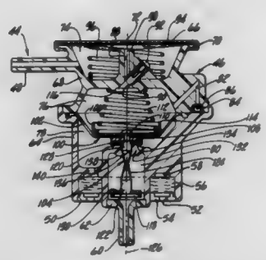
first inlet means for providing communication between said housing and the intake manifold of said engine;

second inlet means for providing communication between said housing and the atmosphere;

third inlet means for providing communication between said housing and the exhaust manifold of said engine;

outlet means for providing communication between said housing and said intake manifold of said engine;

first valve means contained in said housing for controlling the communication between said first inlet means and a mixing chamber formed in said housing and between said second inlet means and said mixing chamber, such that the vacuum level in said mixing chamber includes a first range in which the vacuum level in said mixing chamber is a linear function of an increasing vacuum level in said first



inlet means and a second range in which the vacuum level in said mixing chamber is a non-linear function of an increasing vacuum level in said first inlet means by permitting a controlled communication with both said first and second inlet means and said mixing chamber, and the vacuum level in said mixing chamber is maintained during a decrease in the vacuum level in said first inlet means above said predeterminable vacuum level; and

second valve means contained in said housing for controlling the communication between said third inlet means and said outlet means in response to the vacuum level in said mixing chamber.

4,633,846

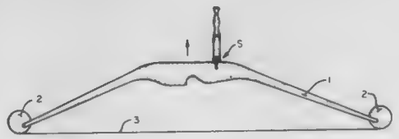
COMBINATION STABILIZER/HUNTING KNIFE FOR COMPOUND BOW

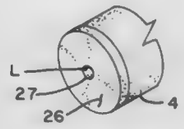
William Ipock, R.R. #1, P.O. Box 146A, Summerville, Mo. 65571

Filed Mar. 11, 1985, Ser. No. 710,500

Int. Cl.⁴ F41B *5/00, 11/00*; B26B *11/00*

U.S. Cl. 124—23 R **3 Claims**





1. The combination of a stabilizer contained hunting knife and an archery compound bow of the type incorporating a flexible strip of material of wood, connected proximate its ends with a cord, for use for projecting an arrow, said bow normally being unbalanced in its stability, comprising, a length of tubular means fastened to the front of said bow at a position generally downwardly of its central portion, said tubular means

being threadedly engaged with said bow, said tubular means having a cavity provided therethrough and extending approximately the length of the said tubular means, an end plate formed at one end of the tubular means said end plate having a threaded means attached thereto, said threaded means also fastening the tubular means to the said bow, said tubular means incorporating means therein to enhance its weight to a quantity that balances the bow to the state of equilibrium at its central portion, said weight enhancing means comprising a knife, a closure means for said tubular means to close the said formed cavity, said closure means comprising a connection of said knife with the said tubular means, said knife having a blade, a handle securing to said blade, said handle forming the closure means through its securement with tubular means, said handle means proximate its attachment to the blade having a series of threads provided thereat, said tubular means having a threaded end, and said knife handle threads engaging with the threaded end of the tubular means to provide the closure for the formed cavity, with the knife blade being enclosed within the tubular means, and the knife handle extending axially and exteriorly from the tubular means and from the bow to which the tubular means fastens.

4,633,847

MULTIPLE-BLADE INTERNAL-HOLE SAW FOR SAWING CRYSTALLINE RODS

Gunter Lossl, Kirchweidach; Helmut Zauhar, and Horst Stock, both of Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie Gesellschaft fur Elektronik-Grundstoffe mbH, Munich, Fed. Rep. of Germany

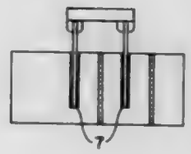
Continuation of Ser. No. 487,200, Apr. 21, 1983, Pat. No. 4,513,544. This application Apr. 8, 1985, Ser. No. 721,176

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1982, 3216200

The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.

Int. Cl.⁴ B28D *1/04*

U.S. Cl. 125—13 R **3 Claims**



1. A multiple blade internal hole saw for sawing a crystalline workpiece into wafers having a wafer thickness in the range of approximately 0.1 mm to 1.0 mm, comprising:

means for sawing an elongated workpiece of material, by a sequence of cuts, into a plurality of thin wafers that are connected to one another, said means for sawing including at least two blades for simultaneously making at least two cuts in the workpiece such that the thin wafers formed thereby remain connected together, each blade spaced from an adjacent blade by a distance of at least approximately 10 mm;

first means for rotatably controlling said at least two blades to simultaneously make at least two cuts in the workpiece; and

second means for controlling one of said workpiece and said at least two blades so that said at least two blades repeatedly and simultaneously make at least two additional cuts at different locations along said workpiece such that the thin wafers formed thereby remain connected together, one of said two additional cuts being between said previous at least two cuts.

4,633,848

ENDLESS SAW AND METHOD FOR CUTTING ANNULAR ROCK BODIES

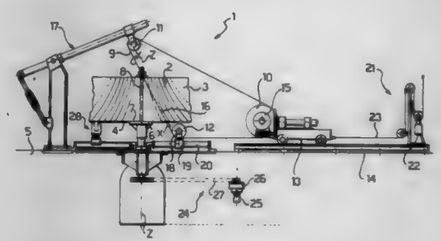
Paolo Bresciani, Massa, Italy, assignor to Tongiani Domenico S.p.A., Massa, Italy

Filed Mar. 12, 1985, Ser. No. 710,665

Claims priority, application Italy, Mar. 14, 1984, 18305 A/84

Int. Cl.⁴ B28D *1/08*

U.S. Cl. 125—21 **3 Claims**



2. A method of making annular bodies from rock material blocks, said method comprising the steps of drilling a first hole through said block, drilling a second hole through said block, said second hole spaced from said first hole, securing the block on a rotary block-holding table by passing a tie rod through said first hole, said table rotatable about a vertical axis, threading a saw wire through said second hole, imparting a cutting motion to said saw wire, and moving said block rotatively about said vertical axis of rotation.

4,633,849

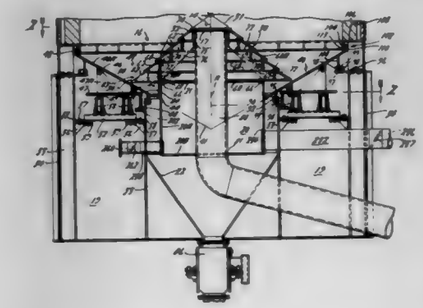
CENTRAL FEED ROTARY AUTOMATIC ASH DISCHARGE STOKER

Harold L. Knox, Grosse Ile, Mich., assignor to Detroit Stoker Company, Monroe, Mich.

Filed Nov. 21, 1983, Ser. No. 554,057

Int. Cl.⁴ F23H *9/00*; F23K *3/18*

U.S. Cl. 126—182 **46 Claims**



1. A rotary stoker for use in a combustion chamber comprising:

(a) a grate for supporting burning fuel, said grate comprising a central stationary section and an outer rotating ring, said outer rotating ring having a rotating fuel supporting surface generally disposed in a downwardly and inwardly converging conical configuration;

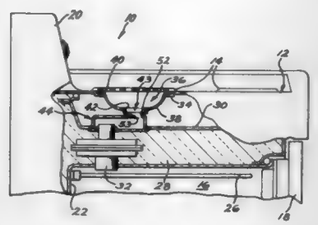
said central stationary section and said fuel supporting surface downwardly converging and overlapping to form a circular vertex lying within the radial confines of said combustion chamber;

(b) a compartment located directly under said grate for supplying pressurized air through said grate to the fuel supported thereon;

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(c) air supply means for supplying pressurized air to said compartment;
(d) means for continuously removing ash from said grate; and
(e) means for rotating said outer ring with substantial circumferential movement about said central stationary section.

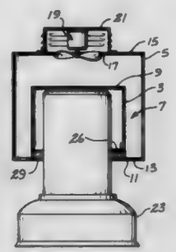
4,633,850
RANGE OVEN VENT SYSTEM
Ralph G. Hawkins, and George Fields, Jr., both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.
Filed Dec. 2, 1985, Ser. No. 803,620
Int. Cl.[4] F24C *15/32*
U.S. Cl. 126—21 R **8 Claims**



1. A domestic cooking appliance including an oven surrounded by an insulated outer cabinet, and a venting system for said oven, comprising;
a horizontal support plate adjacent to the upper portion of said oven;
a first vertical oven vent conduit having its lower end communicating with the upper portion of said oven and an upper portion extending through said support plate;
a second vertical conduit located above said upper portion of said first conduit but horizontally offset therefrom to serve as an extension of said first conduit;
a horizontal elongated adapter duct removably supported on said support plate extending between said first vertical conduit and said second vertical conduit, said elongated adapter duct including a body portion having a top wall, side wall and end walls defining an open bottom communicating with said first vertical conduit extending through said support plate; the end portion of said adapter duct adjacent one of said end walls including an enlargement relative to the end portion of said duct adjacent the other end wall;
a vent opening in said top wall of said adapter duct being aligned with said second vertical conduit; and
an elongated locating means on said support plate, including side walls and end walls formed to provide an enlarged area adjacent one of said end walls relative to the end portion adjacent the other end wall dimensioned to receive said enlargement of said adapter duct so that when said adapter duct is in said locating means said vent opening in said adapter duct is aligned with said second vertical conduit and said first vertical conduit is communicating with the open bottom of said adapter duct.

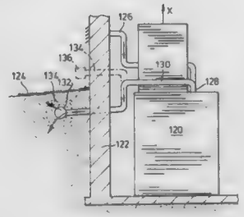
4,633,851
PORTABLE HOT AIR CIRCULATOR
Ray V. Hamilton, 8224 Wolf Run Shoals Rd., Clifton, Va. 22024
Filed Nov. 26, 1985, Ser. No. 801,913
Int. Cl.[4] F24H *3/06*
U.S. Cl. 126—110 AA **4 Claims**

1. A portable hot air circulator for use in combination with a conventional liquid fuel gravity heater comprising
a first cylindrical member having one end thereof closed by a circular plate to form an inverted cup-like structure;
a second cylindrical member positioned concentrically around the first cylindrical member;
a first flat annulus joining the bottom portions of the first and second cylindrical members to form an annular passageway therebetween,
said first flat annulus having a plurality of holes spaced therearound to provide air flow therethrough;
a second flat annulus connected to the top portion of the second cylindrical member to define a space between the said second flat annulus and the circular plate;



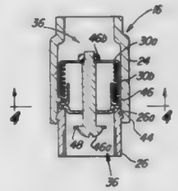
a fan member mounted on the top side of the second flat annulus and positioned over the central aperture of the annulus;
whereby the circulator, when mounted in position on a conventional liquid fuel gravity heater, will operate by drawing in ambient air and force the air through the annular passageway to be heated by the heater and then discharged through the holes in the first annulus to the surrounding atmosphere at floor-level.

4,633,852
METHOD OF DISPERSING EXHAUST GASES
John A. Kitchen, R.R. #3, Hastings, Ontario, Canada (K0L 1Y0)
Continuation-in-part of Ser. No. 654,439, Sep. 26, 1984. This application Sep. 19, 1985, Ser. No. 777,649
Int. Cl.[4] F23J *11/00*
U.S. Cl. 126—307 R **7 Claims**



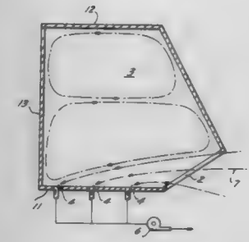
1. A method of dispersing exhaust gases from an aspirated fuel burning unit having an exhaust outlet, the method comprising the steps of:
providing a perforated dispersion pipe at a location below the ground and outside a building in which the unit is installed;
connecting a vent pipe between said exhaust outlet and said dispersion pipe; and
providing around said dispersion pipe a bed of particulate material selected so that the back pressure imposed on the exhaust of the unit is less than the maximum tolerable back pressure, said bed permitting dispersion into the ground of exhaust gases leaving said pipe.

4,633,853
HOT WATER TANK CHECK VALVE
Leonard Prill, 28522 Hillview, and Michael F. Mathews, 20421 Lakeworth, both of Roseville, Mich. 48066
Filed May 6, 1985, Ser. No. 730,815
Int. Cl.[4] F24H *1/00*; **F16K** *15/06*
U.S. Cl. 126—362 **10 Claims**



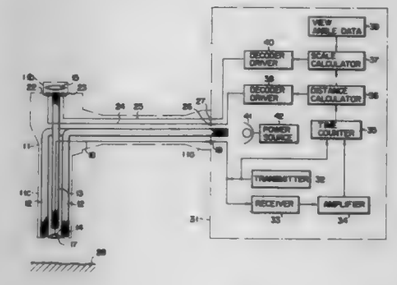
6. A hot water heater assembly comprising:
(A) a hot water tank including heating means;
(B) a cold water conduit for delivering cold water to said tank;
(C) a hot water conduit for delivering heated water from said tank to a hot water demand location;
(D) a first spring loaded poppet valve positioned in said cold water conduit adjacent said tank and normally closed to preclude migration of hot water into said cold water conduit from said tank but operative in response to withdrawal of hot water from said tank to open and allow replenishing cold water to flow into said tank; and
(E) a second spring loaded poppet valve substantially identical to said first poppet valve and positioned in said hot water conduit adjacent said tank normally closed to preclude migration of hot water into said hot water conduit but operative in response to demand for hot water at said demand location to open and allow hot water to flow from said tank to said demand location;
(F) each of said poppet valves comprising:
(1) a valve body defining an elongated valving cavity having an upstream inlet and downstream outlet,
(2) a first cylindrical cup shaped member positioned within said cavity and including a downstream end wall having a central aperture and a cylindrical side wall upstream of said end wall having an outer cylindrical surface spaced from the confronting inner surface of said cavity,
(3) a valve stem positioned centrally and longitudinally within said cavity and passing loosely through said aperture.
(4) head means at the downstream end of said valve stem for closing said aperture,
(5) a second cylindrical cup shaped member positioned within said cavity upstream of said first member with the outer cylindrical surface of its cylindrical side wall slideably engaging the confronting inner surface of said cavity, the inner cylindrical surface of its side wall spaced radially outwardly from the outer cylindrical surface of said side wall of said first cup shaped member to define an annular space therebetween, and its end wall position upstream of its side wall;
(6) means fixedly securing the upstream end of said valve stem to the central portion of the end wall of said second cup shaped member,
(7) a coil spring positioned in said annular space in surrounding relation to said valve stem with the upstream end of the spring bearing against said end wall of said second cylindrical member and received telescopically within said side wall of said second cylindrical member, and the downstream end of said spring bearing against a fixed portion of said poppet valve and received telescopically over said side wall of said first cylindrical member, and
(8) aperture means in said end wall of said second cylindrical member radially outwardly of said central portion thereof.

4,633,854
CAVITY RECEIVER FOR CONCENTRATED SOLAR RADIATION
Otto Mayrhofer, Karlsfeld, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Munich, Fed. Rep. of Germany
Filed Nov. 26, 1985, Ser. No. 802,044
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1984, 3444530
Int. Cl.[4] F24J *2/02*
U.S. Cl. 126—451 **6 Claims**



1. A cavity receiver comprising a plurality of interconnected walls defining an enclosed cavity, an aperture in the lower part of the receiver through which concentrated solar radiation can enter the cavity to heat air occupying the upper region of the cavity, at least one hole in a cavity wall at the lower part of the receiver, and means for withdrawing air from the cavity through the hole so as to create a flow of air through the lower part of the cavity from the aperture to the hole, said air flow remaining substantially entirely within the lower part of the cavity so that it remains relatively cold and separates the heated air in the upper region of the cavity from the aperture.

4,633,855
ENDOSCOPE APPARATUS
Kazuo Baba, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 683,949, Dec. 19, 1984, abandoned, which is a continuation of Ser. No. 512,314, Jul. 8, 1983, abandoned, which is a continuation of Ser. No. 295,704, Aug. 24, 1981, abandoned. This application Sep. 30, 1985, Ser. No. 782,145
Claims priority, application Japan, Sep. 2, 1980, 55-121371
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **10 Claims**



1. An endoscope apparatus comprising:
an endoscope including an observation optical system having an eyepiece section and an image guide means and

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objective lens system for guiding an image of a subject to said eyepiece section so that the image is observed at the eyepiece section; a light guiding optical system having light guide means for guiding illumination light for illuminating the subject; an insertion section having a distal end portion; at least one ultrasonic transducer disposed at said distal end portion of said insertion section for transmitting and receiving ultrasonic waves to and from the subject; and display means disposed inside a field of view of said observation optical system and displaying at least one scale the graduation of which is variable;

distance information output means including means for measuring the time between the transmission of the ultrasonic waves and the reception of the ultrasonic waves reflected from said subject; means for calculating a distance between said distal end portion of said insertion section and the subject as a function of at least said measured time and a velocity of propagation of the ultrasonic waves; and means coupled to the calculating means for generating distance information representing the distance calculated;

view angle information supplying means for supplying at least view angle information representing an angle-of-view of said observation optical system; and

circuit means coupled to said distance information output means and to said view angle information supplying means and including:

means for calculating a ratio of the size of an image observed in said field of view of said optical system to the size of the subject, said ratio being calculated on the basis of at least said distance information generated by said distance information output means and said view angle information supplied from said view angle information delivering means; and

means for calculating an actual distance scale as a function of said calculated ratio and unit scale information; and

means for setting the graduations of said display means to display set graduations in accordance with said actual distance scale.

4,633,856

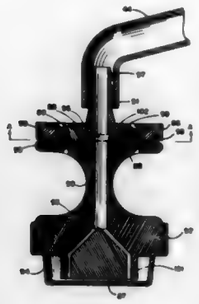
PERCUSSOR SUBASSEMBLY FOR GENERATING GAS BURSTS

Harold R. Havstad, Eagle Point, Oreg., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Division of Ser. No. 602,146, Apr. 19, 1984, Pat. No. 4,566,441, which is a continuation-in-part of Ser. No. 223,355, Jan. 8, 1981, Pat. No. 4,445,503, which is a continuation-in-part of Ser. No. 50,685, Jun. 21, 1979, abandoned. This application Oct. 31, 1985, Ser. No. 793,201

Int. Cl.⁴ A61H *23/04*; **F16K** *3/316, 3/00*

U.S. Cl. 128—40 **2 Claims**



1. A percussor assembly comprising, in combination, an apparatus for generating successive bursts of gas, and a remote applicator pneumatically connected to said apparatus with a flexible gas supply tubing and for receiving said bursts of gas therefrom, said applicator comprising:

a body attached to said tubing, adapted for being hand-held and having a gas passageway therein for directing said bursts of gas received from said apparatus,

a flexible diaphragm secured to said body and a percussion chamber therebetween for receiving said bursts of gas, and

a movable restrictor cooperating with said gas passageway for selectively varying the opening thereof said restrictor comprising a slidable plate having an orifice therethrough for being oriented relative to said gas passageway and movable relative to said gas passageway between a first position wherein said passageway is substantially open and a second position wherein said passageway is substantially closed, and a movable guide having a cam surface in contact with said slidable plate whereby movement of said guide urges movement of said slidable plate along said cam surface, and whereby the force of said bursts of gas may be selected by moving said restrictor.

4,633,857

MASSAGER

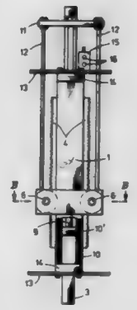
Nordfried Czeczerski, Freinsheimer Strasse 88, 6710 Frankenthal 4, Fed. Rep. of Germany

Filed Apr. 27, 1984, Ser. No. 604,639

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 3315041; Mar. 9, 1984, 8407237[U]

Int. Cl.⁴ A61H *7/00*

U.S. Cl. 128—50 **7 Claims**



1. A massager with a brush head which can be raised and lowered as the brusher rotates in opposite directions comprising:

a. a vertical guide column with stationary toothed racks at the sides thereof,

b. a brush head surrounding the guide column,

c. two laterally spaced brushes which rotate in opposite directions mounted on the head,

d. each brush attached to a drive shaft having a pinion,

e. each pinion engaging one of the racks of the guide column,

f. a hydraulically operated cylinder piston system having the piston connected to the brush head whereby the piston can alternately receive pressure on either side through a control valve to reciprocate the brush head and rotate the brushes.

4,633,858

MASSAGE DEVICE WITH PINCHING ACTION

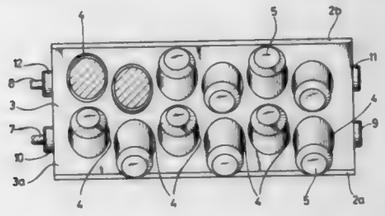
Hubert Rutsch, 10 bis, route de Saint-Julien, Geneva; Gilbert Golay, 5, Tour de Boël, both of Geneva, and Daniele Muhlemann, 81, route de Troinex, 1256 Troinex, all of Switzerland

Filed Jun. 26, 1984, Ser. No. 624,993

Claims priority, application Switzerland, Jul. 26, 1983, 4081/83

Int. Cl.⁴ A61H *7/00, 23/00*

U.S. Cl. 128—59 **3 Claims**



1. Massager for massaging a selected portion of the human body comprising:

at least one rotatably driven crankshaft having its end journals engaged in bearings supported by two opposite lateral walls of a casing;

crankshaft crakpins supporting a plurality of connecting rods having their small ends free, rounded and projecting from a top surface of said casing, the bodies of said connecting rods passing through corresponding elliptical shaped holes along the top surface of said casing wherein said elliptical holes are disposed in a staggered relationship in two parallel rows along the upper surface of said casing thereby permitting the movement of the connecting rods transversely of the longitudinal dimension of said rods to create a pinching action with respect to the portion being massaged;

the center lines of said rows being disposed on either side of a plane perpendicular to said top surface of the casing,

said plane defining a geometrical axis of rotation of the corresponding crankshaft, the guide holes of one row alternating with the guide holes of the other row, whereby two adjacent connecting rods engaging two adjacent holes, one per row, are inclined on one and the other side, respectively, of said plane perpendicular to said upper surface of the casing and containing the geometrical axis of rotation of said crankshaft.

4,633,859

INERT GAS ENVIRONMENTAL CONTROL SYSTEM FOR A HYPERBARIC CHAMBER AND A METHOD FOR DOING SAME

Raymond P. Reneau, Houston, Tex., assignor to Keyes Offshore, Inc., Sugar Land, Tex.

Filed Nov. 4, 1983, Ser. No. 549,482

Int. Cl.⁴ A61M *16/02*

U.S. Cl. 128—205.26 **4 Claims**

1. A method for controlling the environment inside a hyperbaric chamber to reduce combustibility therein, the chamber having a patient therein, the method comprising the steps of:

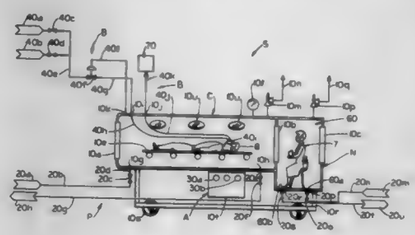
connecting the patient to a breathing system which delivers breathing gases to the patient at pressures substantially equal to the pressure in the chamber;

displacing a portion of the oxygen in the air initially in the chamber using a pressurized inert gas by initially opening a first valve at an outlet connection to the chamber and thereafter opening a second valve at the pressurizing inlet to the chamber;

controlling the movement of the first and second valves for sequentially opening the first valve, and then opening the second valve;

analyzing the oxygen concentration in the chamber to detect a drop in oxygen concentration;

pressurizing the chamber with pressurized inert gas; and,



closing the first valve when the oxygen concentration has been reduced below the oxygen concentration in air at one atmosphere absolute.

4,633,860

CANAL FORMING DEVICE FOR PERCUTANEOUS NEPHROSCOPY

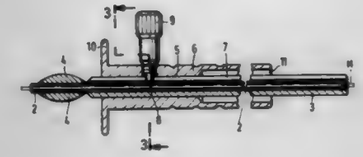
Knut Korth, Merzhausen, and Heinz Hluchy, Hamburg, both of Fed. Rep. of Germany, assignors to Olympus Winter & Ibe, GmbH, Hamburg, Fed. Rep. of Germany

Filed Jan. 30, 1985, Ser. No. 696,482

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1984, 3403962

Int. Cl.⁴ A61F *17/32*

U.S. Cl. 128—305 **26 Claims**



1. An apparatus for preparing a canal for insertion of an endoscope into a patient for percutaneous nephroscopy along a path defined by a small diameter guide wire inserted percutaneously into the renal calyx comprising the combination of

an elongated hollow tube having an inner diameter slightly larger than the diameter of the guide wire; and

an axially extending scalpel blade fixedly attached to the distal end of said tube and protruding radially from the outer surface thereof,

whereby said tube can be slidably moved along said guide wire into the patient so that said scalpel blade creates an incision adjacent to the path of said wire.

4,633,861

SURGICAL STAPLING INSTRUMENT WITH JAW CLAMPING MECHANISM

Hector Chow, Cincinnati; Hugh Melling, West Chester, and Denise S. Schieltz, Cincinnati, all of Ohio, assignors to Senmed, Inc., Cincinnati, Ohio

Filed Oct. 19, 1984, Ser. No. 662,622

Int. Cl.⁴ A61B *17/10, 17/32*

U.S. Cl. 128—305 **22 Claims**

1. A surgical stapling instrument, comprising:

first and second cooperating elongate jaw members, one of said jaw members including staple carrying means adapted to receive a plurality of staples arranged in at least one row, and said other jaw member including anvil means adapted to form said staples,

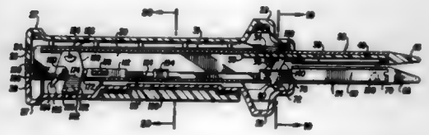
pusher means for driving the staples from said staple carry-

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ing means into tissue gripped between said jaw members and forming the staples against said anvil means to produce at least one row of staples in the tissue,

knife means for cutting the tissue gripped between said jaw members along a line adjacent to said row of staples,

means for latching said jaw members together at an intermediate position therealong adjacent to said staple carrying means and said anvil means, and



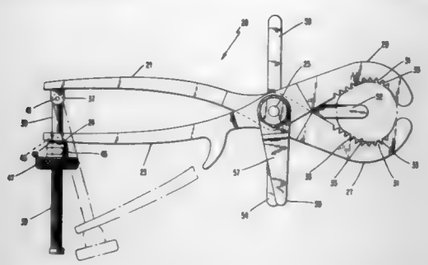
cam means mounted on one of said jaw members and engageable with said other jaw member at a position remoted from said latching means for moving said jaw members apart at said remote position to urge said staple carrying means and said anvil means together to resist the forces exerted thereon when the staples are formed.

4,633,862

PATELLAR RESECTION SAWGUIDE

Thomas D. Petersen, 5555 Reservoir Dr., San Diego, Calif. 92120

Filed May 30, 1985, Ser. No. 739,153
Int. Cl.[4] A61E *5/04*
U.S. Cl. 128—92 VY **13 Claims**



1. A saw guide for guiding the resection of a patella comprising:

(a) first and second arms pivotally mounted together at a pivot axis;

(b) each said arm having a handle portion at one end and a jaw member at the other end whereby pivoting of said handle portions toward one another causes said jaw members to pivot toward one another about said pivot axis and into engagement with the periphery of said patella;

(c) wing guide means for engaging posterior surfaces of said patella to thereby define the location of engagement of said jaw members with said periphery in anterior and posterior directions thereof; and

(d) guide surface means for guiding said resection.

4,633,863

ARTERIAL ANCHOR BANDAGE

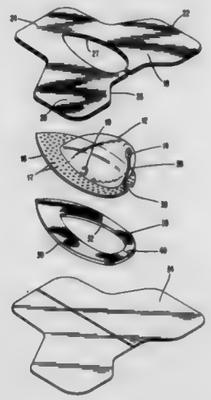
Chester P. Filips, 16401 SW. 142nd Ave., Lot 49, Miami, Fla. 33177, and Antonio G. Blanco, 927 SW. 118th Ct., Miami, Fla. 33184

Filed Sep. 27, 1985, Ser. No. 780,815
Int. Cl.[4] A61L *15/00*
U.S. Cl. 128—165 **7 Claims**

1. An arterial anchor bandage comprising:

a bulbous element having a generally planar flange defining an oblong footprint, with a central opening and a peripheral edge fashioned from a transparent material, including a general circular opening at a predetermined elevation above the footprint sized to receive a cannula tube, a slit extending from the opening through the flange, and the flange defining an acute angle with the bulbous element at the slit;

a layer of absorbent material under the flange having an opening generally coextensive with the central opening, and extending laterally beyond the flange;



an outer covering having an adhesive surface and a cutout larger than the central opening but smaller than the peripheral edge of the flange, the bulbous element being received in the cutout and so that the flange is adhesively bonded to the outer covering, and the absorbent layer being adhesively bonded to the outer covering outside the peripheral edge of the flange; and

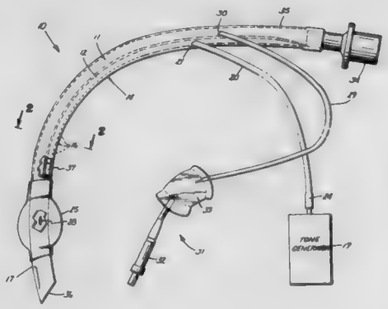
a protective layer coextensive with the outer covering, releasable from the adhesive surface to expose the adhesive surface.

4,633,864

SPEAKING ENDOTRACHEAL TUBE

John J. Walsh, LaCrescent, Minn., assignor to Dacomed Corporation, Minneapolis, Minn.

Filed Oct. 22, 1984, Ser. No. 663,578
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—207.15 **19 Claims**



1. A speaking endotracheal tube for use in ventilating a patient, the endotracheal tube being insertable through a breathing cavity of a patient into a patient's trachea, the endotracheal tube comprising:

(a) said endotracheal tube having a distal end adapted to be located within the trachea of a patient and a proximal end adapted to extend from said breathing cavity;

(b) cuff means located proximate the distal end of said endotracheal tube for substantially preventing respiratory gases delivered to the lungs by the endotracheal tube from escaping around the tube upward in the trachea of the intubated patient

(c) a primary ventilating channel contained within the endotracheal tube for the delivery of said respiratory gas to the lungs of an intubated patient; and

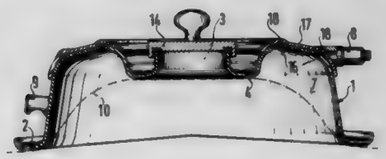
(d) a secondary speaking channel contained within the endotracheal tube, separate from the ventilating channel, said secondary speaking channel having proximate one end thereof at least one tone exit port located between the proximal end of said endotracheal tube and said cuff means and adapter means at the opposite end thereof for interconnection to a tone generating means for the delivery of a tone to the posterior oral pharynx of an intubated patient enabling the patient to speak through articulation of the tone into speech.

4,633,865

DEVICE FOR PERFORMING EXAMINATIONS AND INTERVENTIONS IN THE ABDOMINAL CAVITY OF A PATIENT

Maria Hengstberger; Herbert Hengstberger, both of Vienna, Austria, and Harry Mönch, Knittlingen, Fed. Rep. of Germany, assignors to Rewoplan medizin-technische Einrichtungsgesellschaft mbH, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,299
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 R **6 Claims**



6. A device for use in performing examinations and surgical operations within an abdominal cavity of a patient after an abdominal integument has been pierced to allow insertion of a known instrument into the cavity, said device comprising a cowling having an interior and a marginal section for sealingly engaging the abdominal integument, said cowling having means on an outer surface for attaching the cowling to a vertical adjustable carrier, said cowling having means for connecting a source of vacuum to the interior of the cowling including a connector, said cowling having means for forming a temporarily closable opening in the upper portion of said cowling with an annular projection directed into the interior of the cowling, said annular projection having a free end for creating a sealing contact with the abdominal integument so that the abdominal integument may be raised by temporarily closing said opening and generating a negative pressure within the interior of the cowling and when raised the abdominal integument can be pierced by an instrument extending through said opening.

4,633,866

OPHTHALMIC LASER SURGICAL METHOD

Gholam Peyman, 535 N. Michigan Ave., Chicago, Ill. 60611, and Esa Viherkoski, Kuusmiehentie 56 G, 00670 Helsinki 67, Finland

Filed Apr. 22, 1982, Ser. No. 370,696
Claims priority, application Finland, Nov. 23, 1981, 813736
Int. Cl.[4] A61N *5/06*
U.S. Cl. 128—303.1 **16 Claims**

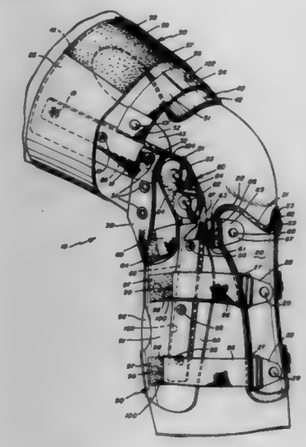
1. A method of laser surgical treatment of the eye comprising the steps of aiming a source capable of producing laser radiation, a major portion of which has a wavelength of from about 1100 nanometers to about 1350 nanometers or from about 1850 nanometers to about 2050 nanometers, at the intraocular tissue to be treated and thereafter exposing said tissue to said laser radiation for a time sufficient and at an intensity sufficient to induct photocoagulation or membrane disruption of said tissue whereby the surgical method is effected.

4,633,867

KNEE BRACE FOR CONTROL OF LIGAMENT INSTABILITY

James H. Kausek, 85 Salem St., Lynnfield, Mass. 01940; Alfred Klugman, Waban, and William J. Donovan, Somerville, both of Mass., assignors to James H. Kausek, Lynnfield, Mass.

Filed Jun. 27, 1984, Ser. No. 624,990
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—80 C **9 Claims**



1. An improved knee brace of the type having an elongated shin plate shaped to fit over the front of the leg and extend from the knee downwardly over the shin, a thigh plate shaped to fit over the front of the leg and extend from the knee upwardly over the thigh, means for positioning said shin plate and said thigh plate on the leg, and means for maintaining said shin plate and thigh plate in vertical alignment and connecting said shin plate and said thigh plate in hinged relationship to allow the knee to bend when said knee brace is positioned on the leg, wherein the improvement comprises:

said shin plate having a top arcuate edge positionable below the front tibia tubrical and having a pair of flanges extending from opposing corners of said top edge positionable over the side tibia tubricals on opposing sides of the tibia head;

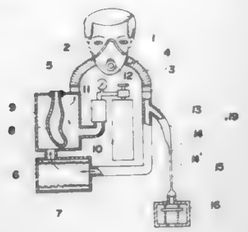
a tensioned popliteal strap attached at opposing ends to said opposing flanges and positionable in a substantially horizontal plane around the back of the upper calf adjacent the knee to compress each of said flanges against the side tibia tubricals on opposing sides of the tibia head for increasing the rotational stability of the knee.

4,633,868

CLOSED CIRCUIT TYPE RESPIRATOR

Kazu Itoh, deceased, late of Tokyo, and Akira Itoh, legal representative, Komae, both of Japan, assignors to Itoh Seiki Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1985, Ser. No. 736,718
Claims priority, application Japan, Jun. 4, 1984, 59-83167[U]
Int. Cl.[4] A62B *7/04*
U.S. Cl. 128—204.26 **5 Claims**



1. In a closed-circuit type respirator including a face mask, an inhalation conduit communicating with said face mask, and exhalation conduit communicating with said face mask, a first check valve provided in said inhalation conduit, a second check valve provided in said exhalation conduit; said face mask, exhalation conduit and second check valve constituting at least a part of an exhalation system which is a section of the respirator where exhaled air passes, and an oxygen demand system connected to said inhalation conduit and supplying oxygen automatically when the pressure in the respirator is reduced to a predetermined level characterized in that said respirator comprises an oxygen enriching valve provided in said exhalation system, said oxygen enriching valve including a housing opening to said exhalation system on one side and to atmosphere on the other side, first valve means provided within said housing on the side opening to said exhalation system and being capable of opening only when pressurized by exhaled air to let the air from said exhalation system into said housing, second valve means provided within said housing on the side opening to the atmosphere and being capable of opening for a predetermined period of time by applying an external force for communicating the inside of said housing to atmosphere, the air in said exhalation system being let out through said first and second valve means when said second valve means is opened and the pressure in the respirator thereby being reduced to the predetermined level at which oxygen is automatically supplied.

4,633,869

TENSION RETAINING DEVICE FOR SURGICAL PROCEDURES

Reinhold Schmieding, Munich, Fed. Rep. of Germany, assignor to Arthrex Arthroscopy Instruments, Inc., Norwalk, Conn.

Filed Dec. 23, 1985, Ser. No. 813,989
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 R **9 Claims**

1. A tension retaining device for use in surgical procedures in which the working end of an instrument which has a shaft portion is inserted through a surface of a person's body to engage material within the body for drawing and holding the material outward toward said surface under tension, comprising in combination:

an open ended tubular section concentrically received within the bore of an open ended sleeve element and slideable therein, said tubular section having a bore of sufficient diameter for the shaft of an instrument to be slideably received therethrough,

one end of said sleeve element being adapted to bear against a surface of a person's body,

said tubular section having a notch diametrically through one wall and opening into its bore,

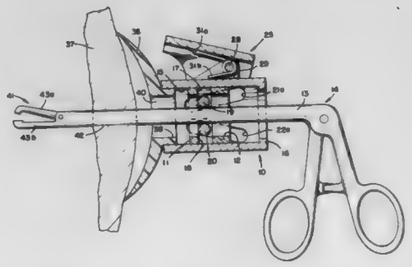
a surface in the bore of said tubular section at the opposite side of said bore from said notch,

a cylindrical roller extending axially through said notch,

the relative dimensions of said notch and said roller being such that with the roller resting in the bottom of the notch the space between the roller and said opposite surface in the bore of said tubular section is less than the diameter of the shaft of an instrument that is to be received through said tubular section.

said sleeve element having a pair of slots respectively in alignment through opposite side walls thereof and opening into its bore with the respective end portions of said roller rotatably received in said slots,

said slots extending generally longitudinally of the bore of said sleeve element at an angle to the axis of said bore such that by relative movement of said tubular element longitudinally within the sleeve element the walls of the slots acting on said roller end portions cause the roller to move



relatively down and up in said notch, depending upon the direction of relative movement, said roller being moved down in said notch, toward said opposite surface, by movement of said tubular element in a first direction, toward the end of said sleeve element that is adapted to bear against a surface of a person's body and being moved up in said notch, away from said opposite surface, by relative movement in the opposite direction,

means resiliently urging said tubular element in said first direction and thereby resiliently urging said roller toward said opposite surface so that a said instrument whose shaft is through the bore of said tubular section is permitted by the angular disposition of said slots to be moved longitudinally in the direction away from the end of said sleeve element that is adapted to bear against a surface of a person's body, but is prevented from movement in the opposite direction, and

means actuatable to counteract said resiliently urging means and thereby permit a said instrument to be moved in said opposite direction.

4,633,870

APPARATUS FOR EFFECTING ANASTOMOSIS OF TUBULAR TISSUE BY LASER WELDING

Jude S. Sauer, 6½ Lattimore Rd., Rochester, N.Y. 14620

Filed Jun. 26, 1985, Ser. No. 748,972
Int. Cl.[4] A61B *17/36, 17/04;* **B23K** *9/00*
U.S. Cl. 128—303.1 **17 Claims**

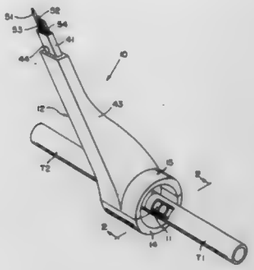
1. A surgical instrument for the external laser welding of tissues, comprising

a hand manipulable housing having first and second sections movable relative to each other selectively to form a central opening through said housing,

means for releasably supporting a pair of generally cylindrically shaped tissue sections in said central opening upon formation thereof, and with confronting ends of said tissues abutting each other along a seam located within said central opening,

a first, flexible, light transmissive element extending at one end into said housing and disposed to be connected at its opposite end to a source of laser energy operable to direct a beam of laser energy through said first element into said housing, and

means in said housing for directing said laser beam from said one end of said first element to said central opening and onto said seam,



said beam directing means including means for moving said beam around the abutting ends of said tissue sections thereby to weld together said abutting ends along said seam, and

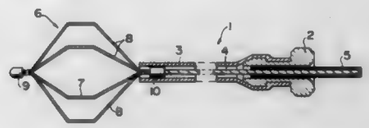
said housing sections being movable away from each other at the conclusion of a welding operation, thereby to permit withdrawal of the housing laterally from the welded tissues to disengage the latter.

4,633,871

BASKET FORCEPS ASSEMBLY

Minoru Shinozuka, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Japan

Filed Apr. 30, 1985, Ser. No. 728,783
Claims priority, application Japan, Jun. 18, 1984, 59-124630
Int. Cl.[4] A61B *17/28*
U.S. Cl. 128—321 **10 Claims**



6. A basket to grasp foreign matter for use with a basket forceps assembly comprising:

a plurality of resilient wires being bundled together at each of their ends and being biased so as to define a basket to grasp foreign matter therein when said plurality of resilient wires is in an expanded position; said plurality of resilient wires capable of being passed through a flexible tube of a basket forceps assembly when said plurality of resilient wires is in an unexpanded position; and

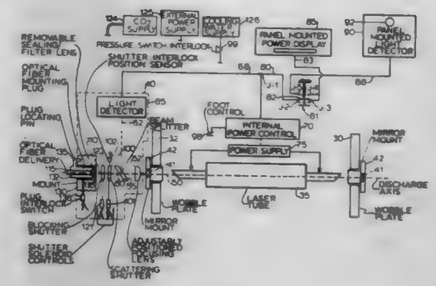
said resilient wires further characterized in that at least one of the resilient wires have tensile strengths which are lower than different, higher tensile strengths, associated with remaining ones of said plurality of resilient wires so that if any one of said at least one wires break all of said plurality of wires remain connected to said basket and are retrievable from the location of said foreign matter.

4,633,872

LASER OPTICAL DELIVERY APPARATUS

Edwin G. Chaffee; Steve Holtman, both of Salt Lake City; George A. Nelson, Sandy, and Howard M. C. Tanner, Salt Lake City, all of Utah, assignors to HGM, Incorporated, Salt Lake City, Utah

Filed Nov. 8, 1983, Ser. No. 549,819
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **10 Claims**



1. A laser system comprising:

(a) a laser having a tube and mirror laser beam generating system mounted on base structure and at each of anode and cathode ends of said tube and mirror system a wobble plate surrounding the beam path and supporting a transmission mirror forming a part of said system, said wobble plate being mounted so as to track thermal drift of the system's optical alignment;

(b) an optical delivery assembly, comprising:

(i) a first mounting block providing a cavity adjacent and removably secured to a selected said wobble plate for corresponding thermal tracking thereof and having an opening extending therethrough for passing said laser beam;

(ii) focusing means mounted on said first mounting block including a focusing lens mounted within said cavity for focusing said laser beam with means separately supporting said focusing lens and accessible externally of said cavity for precisely adjusting said focusing lens with respect to said beam;

(iii) beam splitting means mounted on said first mounting block and located in the path of said laser beam for providing a split off beam directed away from the path of said laser beam;

(iv) first circuitry means mounted on said first mounting block for detecting said split off beam and developing an electrical signal responsive to the level thereof;

(v) a scattering shutter slidably mounted on said first mounting block and having a first normal position with filtering means positioned for scattering said laser beam and a second withdrawn position with an aperture positioned for passing said laser beam;

(vi) first sensing and display means including means dependent on the correct position of said scattering shutter for sensing such position and associated means for remotely displayed such correct shutter position:

(vii) first controllable electric solenoid actuator means mounted on said first mounting block and linked to said scattering shutter and effective when energized to withdraw said scattering shutter from said first to said second position;

(viii) a blocking shutter slidably mounted on said first mounting block and having a first normal position with a portion thereof positioned for blocking said laser beam and a second withdrawn position with an aperture positioned for passing said laser beam;

(ix) second controllable electric solenoid actuator means mounted on said first mounting block and linked to said

blocking shutter and effective when energized to withdraw said blocking shutter from its said first position to its second position;

(x) a removable filter lens mounted on said first mounting block at a position effective to pass said laser beam dependent on said laser beam first having passed through both said shutters;

(xi) auxiliary structure comprising an auxiliary mounting block secured to said first mounting block and providing a first bore with precision-formed depth and diameter adapted for receiving a mating plug and aligning connected optical fiber having the proximal end enclosed by said plug and locating said proximal end immediately adjacent said filter lens, said filter lens being removably mounted in a second bore formed in said auxiliary mounting block;

(xii) an optical plug and optical fiber assembly including a said mating plug adapted to be inserted and snuggly fitted in said first bore to a predetermined depth and an assembly of optical fiber operatively associated with said plug and with the proximal end thereof adapted to be aligned with said beam after passage through said filter lens when said plug is inserted in said first bore for transmitting said laser beam to the distal end of said fiber for utilizing said beam at a selected operative site; and

(xiii) second sensing and display means dependent on the correct longitudinal position of said plug for sensing said plug position in said first bore and associated means for remotely displaying such correct plug position; and

(c) a cabinet housing said laser and optical delivery assembly in a manner exposing said first bore, said scattering shutter and plug position displays to the operator of said laser.

4,633,873

SURGICAL REPAIR MESH

Barry L. Dumican, Newtown; Alan L. Kaganov, Stamford, and Thomas A. Ritter, Bristol, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 26, 1984, Ser. No. 604,104

Int. Cl.[4] A61F *13/00*; A61L *15/04*; A61B *17/00*

U.S. Cl. 128—334 R **10 Claims**

1. A stretchable, non-heat set knitted surgical mesh comprising a plurality of filaments, each filament manufactured from a polymer having a glycolic acid ester linkage, said filaments bundled to twisted into a yarn, and said yarn knitted into a mesh.

4,633,874

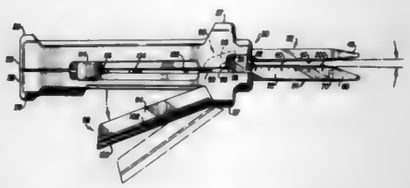
SURGICAL STAPLING INSTRUMENT WITH JAW LATCHING MECHANISM AND DISPOSABLE STAPLE CARTRIDGE

Hector Chow, Cincinnati; Hugh Melling, West Chester, and Denise S. Schieltz, Cincinnati, all of Ohio, assignors to Seamed, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 662,622, Oct. 19, 1984. This application Mar. 15, 1985, Ser. No. 712,201

Int. Cl.[4] A61B *17/04*; B31B *1/00*

U.S. Cl. 128—334 R **49 Claims**



1. A surgical stapling instrument, comprising:

first and second cooperating elongate jaw members, one of said jaw members including staple carrying means adapted to receive a plurality of staples arranged in at least one row, and said other jaw member including anvil means adapted to form said staples,

pusher means for driving the staples from said staple carrying means into tissue gripped between said jaw members and forming the staples against said anvil means to produce at least one row of staples in the tissue,

means for latching said jaw members together with the tissue located between said staple carrying means and said anvil means,

jaw clamping means for applying clamping forces to said jaw members to urge said staple carrying means and said anvil means together during the formation of said staples, and

means for retaining said latching means in a partially latched position with said jaw members loosely connected together to permit said jaw members to be moved apart and said staple carrying means and said anvil means to be adjusted in position on the tissue without disconnecting said jaw members from each other.

4,633,875

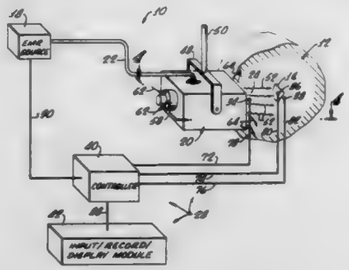
SYSTEM FOR IRRADIATING LIVING TISSUE, OR SIMULATIONS THEREOF

Paul F. Turner, North Salt Lake, Utah, assignor to BSD Corporation, Salt Lake City, Utah

Continuation of Ser. No. 315,749, Oct. 28, 1981, abandoned, which is a division of Ser. No. 48,515, Jun. 14, 1979, Pat. No. 4,341,227, which is a continuation-in-part of Ser. No. 2,583, Jan. 11, 1979, abandoned. This application Jun. 7, 1984, Ser. No. 618,315

Int. Cl.[4] A61N *1/40*

U.S. Cl. 128—422 **10 Claims**



1. A system for irradiating living tissue, or simulations thereof, comprising in combination:

(a) an electromagnetic radiation source having an output impedance equivalent to a first impedance of approximately 50 ohms over a selected frequency range, said frequency range having a bandwidth ratio in excess of 50% for providing varied depth penetration of electromagnetic radiation in said living tissues, or simulations thereof;

(b) an applicator means adapted for irradiating electromagnetic energy into said tissue, said applicator means including a waveguide transmission line having electrically conductive top, bottom and sidewalls and a radiation emitting face and an opposite rearward face, dielectric means disposed in the transmission line for enabling the transmission line to have a characteristic impedance when radiating electromagnetic energy into the tissue, or simulations thereof, over the selected frequency range, equivalent to the first impedance, said dielectric means further including a dielectric portion having a dielectric constant of approximately 12 and having a forward surface spaced rearwardly of said transmission line emitting face and having a rearward surface spaced forwardly from said transmission line rearward face, and coupling means connected to a transmission means external to the applicator means for receiving electromagnetic energy from the transmission means and launching the electromagnetic energy into the waveguide transmission line for irradiating thereby into tissue or simulations thereof, and means for cooling surface portions of the tissue, or simulations thereof, during irradiation, said cooling means being disposed forwardly adjacent to said surface of said dielectric portions;

(c) said transmission means interconnected between the electromagnetic radiation source and the applicator means for transmitting electromagnetic energy therebetween, said transmission means having a characteristic impedance equivalent to said first impedance at the selected frequency; and

(d) feedback control means connected to said electromagnetic radiation source and including electromagnetically non-interfering temperature sensing means for disposal at different locations in said living tissue, or simulations thereof, for measuring temperature, said control means for controlling the output of the electromagnetic radiation source in response to outputs from the temperature sensing means.

4,633,876

NURSING BRA

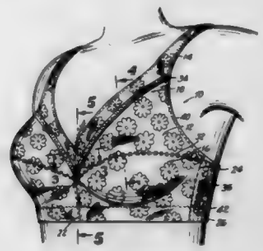
Mary E. Scullin, Forest Hills North, N.Y., assignor to Exquisite Form Industries, Inc., New York, N.Y.

Filed Nov. 9, 1984, Ser. No. 669,891

The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

Int. Cl.[4] A61C *3/04*

U.S. Cl. 128—460 **21 Claims**



1. A nursing brassiere comprising a pair of breast cups connected to side panels and shoulder strap means; each of said breast cups having an underbust panel, an upperbust panel and a fold over panel; said fold over panel at least partially overlying said upperbust panel; at least one edge of said fold over panel being unattached to any other panels so as to enable said fold over panel to be stretched or deformed by pulling generally downwardly, on said fold over panel, thereby opening said breast cup and exposing a breast.

4,633,877

DYNAMIC FOOT SUPPORT AND KIT THEREFOR

Hugh L. Pendergast, Lafayette, Ind., assignor to Duramet Systems, Inc., Fort Wayne, Ind.

Filed Aug. 7, 1984, Ser. No. 638,878

Int. Cl.[4] A43B *13/38*; A61F *5/14*

U.S. Cl. 128—581 **22 Claims**

1. An orthotic device comprising a resilient member having a perimetral outline conforming to a predetermined portion of the human foot, said member including a plurality of adjoining segments, each said segment having a perimetral outline conforming to a predetermined different portion of the human foot and, at least a portion of said outline being complementary to at least a portion of the perimetral outline of an adjoining segment, each said segment being constructed from a material having a predetermined range of firmness and having a constant vertical thickness, all of said segments being of the same thickness to form a said member of uniform thickness, the



firmness of said segments being selected from one of a group of ranges of durometer 120 BHN or less, about 140 BHN, and 180 BHN and greater, and each said segment being compressible independently of adjoining segments.

4,633,878

DEVICE FOR THE AUTOMATIC INSULIN OR GLUCOSE INFUSION IN DIABETIC SUBJECTS, BASED ON THE CONTINUOUS MONITORING OF THE PATIENT'S GLUCOSE, OBTAINED WITHOUT BLOOD WITHDRAWAL

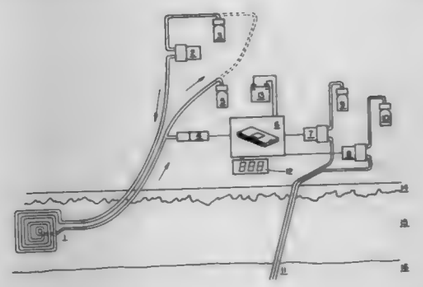
Guiseppe Bombardieri, Via della Mendola, 47, Roma, Italy

Filed Apr. 10, 1984, Ser. No. 598,787

Claims priority, application Italy, Apr. 18, 1983, 48129 A/83

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—635 **5 Claims**



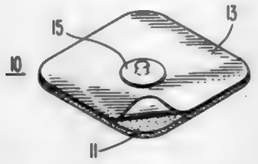
1. A device for the determination of the glucose content in the blood of a living body, which comprises a filter implantable in the subcutaneous tissue of said living body and composed of a circuit of biocompatible hollow fibers of polyacrylonitrile or polyethylene having a cut-off of 40,000 which are permeable to glucose but impermeable to the larger molecular weight components of the blood, means for circulating a saline solution through said filter located outside of the body whereby when said filter is implanted in said living body, glucose diffuses from the blood of said living body to said saline solution by dialysis and said saline solution after equilibrium is reached acquires the same concentration of glucose as in the blood of said living body; a sensor located outside of the body and in communication with said filter for determining the concentration of glucose connected to said filter.

4,633,879

ELECTRODE WITH DISPOSABLE INTERFACE MEMBER

Lincoln Ong, Minnetonka, Minn., assignor to Lec Tec Corporation, Minnetonka, Minn.

Filed Nov. 16, 1979, Ser. No. 94,821
Int. Cl.[4] A61B 5/04; A61N 1/04
U.S. Cl. 128—641 **8 Claims**



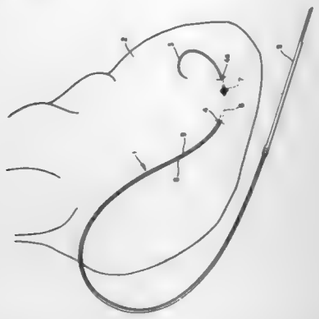
1. A partially reuseable medical electrode comprising:
adhesive electrical interfacing means for making an electrical connection to the skin surface during electrode use;
electrical connector means for making an electrical connection; and
non-conductive durable backer means for releasable adherence to the interfacing, said electrical connector means secured to and extending through said backer means for making an electrical connection between said secured electrical connector means and said electrical interfacing means when said electrical interfacing means is adhered to said backer means, said backer means fabricated of a tough, flexible, but resilient material being capable of repeated clean strippings of said electrical interfacing means from said backer means, and said backer means returning to original shape after each such stripping allowing reuse of said backer means, and allowing reuse of said electrical connector means secured to said backer means.

4,633,880

SURGICAL ELECTRODE

Peter Osypka, Hornrain 31, D-7889 Grenzach-Wyhlen, and Rüdiger Höge, Giessen, both of Fed. Rep. of Germany, assignors to Peter Osypka, Grenzach-Wyhlen, Fed. Rep. of Germany

Filed Apr. 4, 1985, Ser. No. 719,901
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 3412950
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—642 **22 Claims**



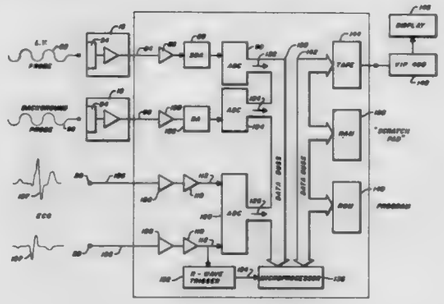
1. A temporary lead for insertion in the body, particularly for cardiac pacing or monitoring purposes, comprising first conductor means including a first elongated conductor having a first proximal end and a first distal end, said first conductor means further including a first electrode in the region of said first distal end and electrically connected with said first conductor, and said first electrode having a width which exceeds the average width of said first conductor and being radially expandable and contractible; second conductor means including a second elongated conductor insulated from and extending along said first conductor, said second conductor having a second proximal end and a second distal end, and said second conductor means further including a second electrode in the region of said second distal end and electrically connected with said second conductor, said second electrode being spaced from said first electrode and being disposed between the latter and said proximal ends; and a needle connected with said electrodes and arranged to effect simultaneous introduction thereof into the body.

4,633,881

AMBULATORY VENTRICULAR FUNCTION MONITOR

Richard H. Moore, Concord; H. William Strauss, Newton Centre, and Nathaniel M. Alpert, Swampscott, all of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Filed Jul. 1, 1982, Ser. No. 394,465
Int. Cl.[4] A61B 6/00
U.S. Cl. 128—659 **26 Claims**



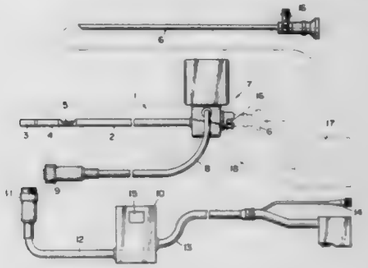
1. An ambulatory ventricular function recorder, comprising:
a vest garment including means for removably supporting it about the human body;
nuclear radiation detection first means, connected to and wholly supported in a body ambulatory manner by said garment, and adapted to respond to nuclear radiation from the region of the ventricle for repetitively providing an analog signal the amplitude of which cyclically represents the nuclear ventricular time-activity of the heart;
second means, wholly suported in a body ambulatory manner by said garment and responsive to said analog signal, for repetitively providing a digital representation of said analog signal;
third means, wholly supported in a body ambulatory manner by said garment and responsive to said digital representation, for accumulating said digital representation in storage so as to repetitively provide composite data that represents an average of said repetitively provided digital representation over successive time intervals that each correspond to a predetermined plurality of heart beats; and
said third means including means for accumulating said digital representation in categories corresponding to premature, normal and post-premature ventricular contraction.

4,633,882

DEVICE FOR DIAGNOSING BODY CAVITY INTERIORS WITH ULTRASONIC WAVES

Kazumasa Matsuo, Tama, and Akio Nakada, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 475,601, Mar. 15, 1983, abandoned.
This application Sep. 23, 1985, Ser. No. 778,763
Claims priority, application Japan, Mar. 15, 1982, 57-40480
Int. Cl.[4] A61B 10/00
U.S. Cl. 128—660 **8 Claims**



1. A device for diagnosing body cavity interiors said device comprising:
(a) an elongated insertion portion for introduction into a body cavity having forward and rear ends, said insertion portion including a guide tube extending along the length thereof, and a window formed in the side of said insertion portion between the forward and rear ends and positioned at one end of said guide tube;
(b) an ultrasonic wave probe head means positioned at the forward end of said insertion portion, said ultrasonic head means transmitting ultrasonic waves to body tissue and receiving ultrasonic waves reflected from the body tissue;
(c) a curved portion formed in said insertion portion at a position adjacent said ultrasonic head means;
(d) optical tube means having forward and rear ends inserted into said guide tube, wherein the forward end of said optical tube means is positioned in the window of said insertion portion such that body tissues may be observed through said optical tube means; and
(e) optical tube fitting means coupled to the rear end of said insertion portion, said optical tube means being inserted into said insertion portion through said fitting means;
(f) wherein the longitudinal axis of said guide tube is positioned to the right and above the longitudinal axis of said insertion portion with reference to an observer looking through said optical tube means such that said guide tube is positioned to one side of the middle of said window and wherein the forward end of said optical tube means and said ultrasonic wave probe head means are located on opposite sides of said insertion portion such that when said ultrasonic head means contacts body tissue and said curved portiòn is curved, the location of the ultrasonic wave probe head means and the contacted body tissue are in the field of view of the forward end of said optical tube means.

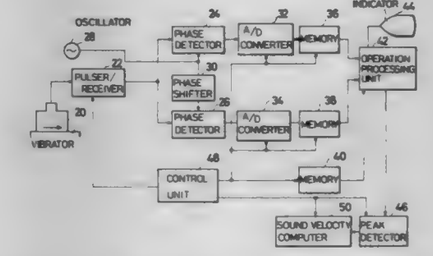
4,633,883

ULTRASONIC DIAGNOSTIC EQUIPMENT

Yutaka Matsui, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 8, 1985, Ser. No. 699,674
Claims priority, application Japan, Feb. 16, 1984, 59-025983
Int. Cl.[4] A61B 10/00
U.S. Cl. 128—660 **7 Claims**

7. An ultrasonic diagnostic device for examining an object with an ultrasonic wave in order to determine the reconstructed data and a velocity of the ultrasonic wave from a reflected wave, comprising:
means for transmitting an ultrasonic wave to the object and for receiving a reflected ultrasonic wave from the object;
a phase detector means for detecting a phase difference of a received signal of the reflected wave and for generating a hologram signal for the object;
a signal generator means for varying a kernel signal as a function of a depth of the object and for providing varied kernel signals;



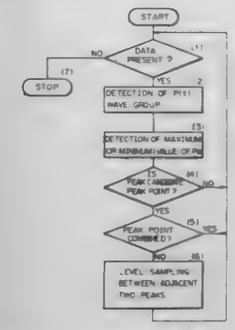
operation controlling unit means for carrying out a synthetic aperture operation using said varied kernel signals and the hologram signal, in order to obtain a plurality of reconstructed data signals with varied peak amplitude values corresponding to said varied kernel signals;
peak detecting means for detecting the reconstructed data signal having maximum peak amplitude and for identifying its corresponding kernel signal depth parameter; and
a sound velocity computer means for computing said velocity of the ultrasonic wave as a function of said corresponding kernel signal depth parameter.

4,633,884

PHYSIOLOGICAL SIGNALS PROCESSING SYSTEM

Hideki Imai, and Minoru Sasaki, both of Yokohama, Japan, assignors to Kabushiki Kaisya Advance Kaihatsu Kenkyujo, Tokyo, Japan

Filed May 23, 1984, Ser. No. 613,293
Claims priority, application Japan, May 24, 1983, 58-89953
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—696 **2 Claims**



1. In a physiological signals processing system including (a) a A/D conversion means for converting physiological signals into digital signals and (b) a data compression means for reducing the number of data points sampled from said digital signals, the improvement which comprises: said data compression means being provided with a first sampling means for sampling a pair of combined peak points from said digital signals by applying a second order differential conversion to said digital

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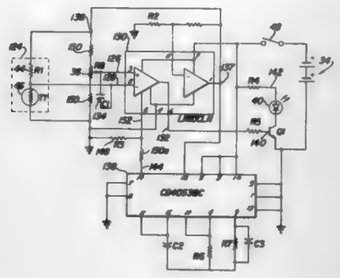
signals, and a second sampling means for sampling level points by the level detection of said digital signals in the portion where adjacent peak points are not combined.

4,633,885

ELECTRONIC TEMPERATURE PROBE

Denyse C. DuBracq, 1520 17th St. North #4, Arlington, Va. 22209, and Henry C. Kondracki, 707 Tamarack Way, Herndon, Va. 22070

Division of Ser. No. 490,045, Apr. 29, 1983, Pat. No. 4,502,487. This application Oct. 31, 1984, Ser. No. 666,720
Int. Cl.⁴ A61B *5/00*
U.S. Cl. 128—736 **13 Claims**



1. An electronic temperature probe for indicating small changes in temperature, comprising:
an enclosure having an extension;
means for manually setting a fixed reference temperature;
means disposed within said extension for detecting a predetermined change in temperature from said reference temperature;
means disposed within said enclosure for indicating the detection of said predetermined change in temperature; and
electronic circuit means disposed within said enclosure and operatively connecting said indicating means in response to said predetermined change in temperature, said indicating means includes a light which is illuminated upon the energization of said indicating means, and said indicating means also includes means for flashing said light on and off when the temperature measured is greater than the reference temperature and less than said predetermined change in temperature above the reference temperature, such that the light is illuminated in a steady state when the measured temperature is greater than said predetermined change in temperature above the reference temperature.

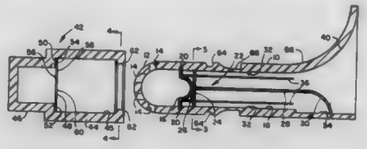
4,633,886

DEVICE FOR HOME DETECTION OF CERVICAL AND VAGINAL CANCER

Russell J. Bucaro, Jr., 4007 S. Tamarack Trail, Crystal Lake, Ill. 60014

Continuation of Ser. No. 454,378, Dec. 30, 1982, abandoned. This application May 2, 1985, Ser. No. 731,321
Int. Cl.⁴ A61B *10/00*
U.S. Cl. 128—749 **11 Claims**

1. A device for the detection of cervical and vaginal carcinomas comprising:
an elongated tube;
said elongated tube including an internal and an external wall;
a rounded end disposed at one end of said elongated tube;
said rounded end of said elongated tube defining a plurality of orifices;
said elongated tube includes an integral shield disposed adjacent the end of the elongated tube remote from said rounded end for limiting penetration of said elongated tube into the vagina;
a flexible diaphragm, having a peripheral edge disposed within said elongated tube;
said peripheral edge being circumferentially sealed to the inner wall of said elongated tube thereby fixing the location of said flexible diaphragm within said elongated tube and dividing said elongated tube into a first portion which in part defines said rounded end of said elongated tube and a second portion which houses a plunger;
said plunger comprising a piston connected to a piston rod having a trigger;
said plunger is disposed within said elongated tube and cooperates with said flexible diaphragm for drawing a vaginal specimen into said elongated tube upon the axial



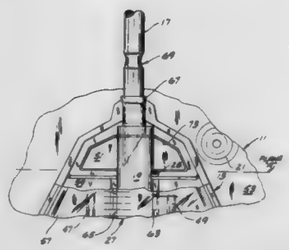
movement of said plunger by reciprocation of said trigger thereby enabling said plunger to be reciprocated within and relative to said elongated tube which results in reciprocation of said flexible diaphragm providing aspiration of the vaginal specimen through said orifices and into said elongated tube;
a fixing container cooperating with said elongated tube;
said fixing container including a cylindrical portion;
said fixing container further including an ampule for containing a fixing solution;
a rupturable membrane disposed between said ampule and said cylindrical portion; and
said cylindrical portion slidably receiving said rounded end of said elongated tube to enable the rupture of said rupturable membrane enabling the fixing solution and the vaginal specimen to mix.

4,633,887

ANTI-REFLUX DRAIN TUBE AND DRAINAGE METER COMBINATION

Christopher J. Edwards, Bonita, Calif.; Robert D. George, St. Louis, Mo., and Paul Sherlock, San Francisco, Calif., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Aug. 3, 1984, Ser. No. 637,464
Int. Cl.⁴ A61B *5/00*; B65D *81/00*; A61M *1/00*
U.S. Cl. 128—762 **14 Claims**



1. A body drainage fluid metering and collection assembly comprising a drainage collection container having an inlet port in an upper portion thereof, a relatively rigid meter chamber for collecting and measuring body drainage fluid having inlet and outlet ports, said meter chamber outlet port being connected in fluid communication with said container inlet port, and flexible drain tube means for connection at one end with a patient source of drainage fluid and connected at the opposite end with said meter chamber inlet port for transfering drainage fluid from the source to said meter chamber, said meter chamber being connected to and manually movable from a substantially vertical position in which drainage fluid is collected and retained therein toward a horizontal position in which drainage fluid can pass from said meter chamber outlet port through said container inlet port and into said container for collection therein, said drain tube means having a first tube section spaced from said meter chamber inlet port, and a second tube section external to said meter chamber and said container and connected between said first tube section and said meter chamber, said second tube section being less resistant to bending substantially transversely to the longitudinal axis of said tube means than said first tube section so that upon movement of said meter chamber from the substantially vertical position toward a horizontal position said second tube section bends substantially transversely of the longitudinal axis thereof and closes said second tube section.

4,633,888

ELECTROTHERAPEUTICAL DEVICE

Takeshi Yoneyama, Yokohama, Japan, assignor to Nippon Athletic Industry Company, Tokyo, Japan

Continuation of Ser. No. 471,676, Mar. 3, 1983, abandoned. This application Apr. 26, 1985, Ser. No. 727,605
Claims priority, application Japan, Nov. 27, 1982, 57-208054
Int. Cl.⁴ A61N *1/28*
U.S. Cl. 128—784 **1 Claim**



1. An electrotherapeutical device having high therapeutical effect, comprising a substrate in the form of a small sheet of electrically insulating material having a first surface adapted to be placed upon the human body and an opposed second surface; a semiconductor element having both photoelectromotive force and thermoelectromotive force which is in the form of a sheet which is smaller than said sheet of electrically insulating material and which is adhered to said second surface of the substrate; and a pair of lead wires, one end of each lead wire being connected to the semiconductor element and the other end thereof being formed into a terminal so as to be in contact with a human body, the lead wires being connected to the semiconductor element at opposite ends of the semiconductor element, the two terminals of the lead wires being spaced apart so as to contact a human body at two spaced points, and needles connected to the terminals of the respective lead wires, whereby heat from said human body, conducted through said electrically insulating material to said semiconductor element, generates an electrical current that is applied through said wires and needles to said human body.

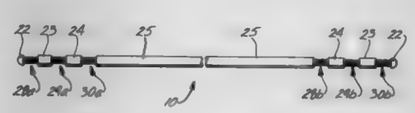
4,633,889

STIMULATION OF CAUDA-EQUINA SPINAL NERVES

Andrew Talalla, Oriole Lodge, 195 Lake Street, Grimsby, Ontario L3M 4M1, Canada, and Leo A. Bullara, 704 E. Kirkwall Rd., Glendora, Calif. 91740

Filed Dec. 12, 1984, Ser. No. 681,121
Int. Cl.⁴ A61N *1/04*
U.S. Cl. 128—784 **10 Claims**

1. A nerve-stimulating electrode assembly for delivering stimulating signals through body fluid to spinal nerves within the lower end of the vertebral column, comprising:
an elongated core;
a first spiral-wound coil of insulated wire on the core between the core ends, the ends of the wire being uninsulated and wound over the respective ends of the coil to form a pair of first electrodes at opposite ends of the core; and
means for enabling charge injection through a body fluid to a group of nerves, while deterring direct electrode contact



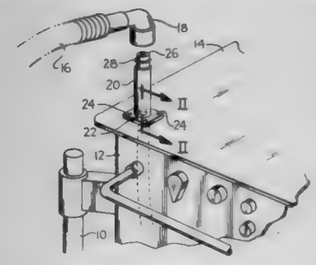
with a nerve surface; said enabling means comprising a plurality of insulating spacers on the core on opposite sides of each electrode, said spacers being larger in outside dimension than said electrodes, whereby said electrodes are recessed between said spacers.

4,633,890

ANAESTHETIST'S GAS POLLUTION INHIBITOR

Edward Carden, 53 Priestnall Rd., Stockport, United Kingdom

Filed Dec. 4, 1984, Ser. No. 677,995
Int. Cl.⁴ A61M *17/00*
U.S. Cl. 128—910 **17 Claims**



1. Apparatus for preventing the undesirable egress of anaesthetic gas into ambient atmosphere comprising:
a tube having one end connected to an anaesthesia machine and its second end being a free end;
said anaesthesia machine supplying anaesthetic gas to said tube;
said free end being removably connectable to a breathing passage of a patient;
an obturator post connected to said anaesthesia machine and constructed to sealingly engage said free end, for preventing the undesirable egress of said anaesthetic gas into the atmosphere of an operating theater when said free end is disconnected from said breathing passage; and
a bore passing through said obturator post and communicating with exhaust means.

4,633,891

PIERCING DEVICE FOR PIERCING VENTILATING HOLES IN CIGARETTES OR SIMILAR SMOKING COMMODITIES

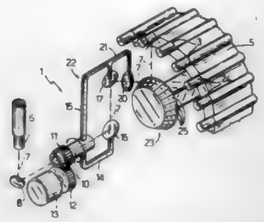
Riccardo Mattei; Armando Neri, both of Bologna; Santo R. Gobbi, Pavia, and Maichi Cantello, Torino, all of Italy, assignors to G.D. Societa per Azioni, Bologna, Italy

Filed Sep. 10, 1984, Ser. No. 649,225
Claims priority, application Italy, Sep. 12, 1983, 3556 A/83
Int. Cl.⁴ A24C *5/60*
U.S. Cl. 131—281 **4 Claims**

1. A piercing device for piercing ventilating holes in the surface of cigarettes, the device comprising a feeding drum mounting for rotation about a first axis coinciding with the longitudinal axis of said feeding drum, said feeding drum being configured to support a row of equally spaced cigarettes with

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their longitudinal axes extending parallel to said first axis; rotary means carried by said feeding drum to rotate each cigarette relative to said drum about a second axis parallel to said first axis and coinciding with the longitudinal axis of each cigarette; a laser source for emitting a laser beam in a continuous manner along said first axis; and an optical reflecting and focusing system to divert and focus said beam in succession on predetermined points on the surface of each cigarette; said



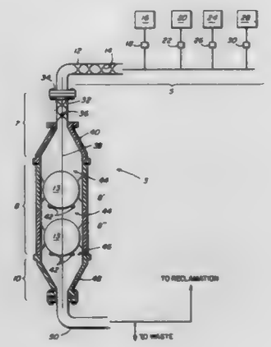
optical system comprising a mobile focusing unit mounted for rotation about said first axis to divert said beam away from and then toward said first axis, and a fixed reflecting member comprising a plurality of reflective surfaces arranged about said first axis and positioned to intercept said beam as it is diverted toward said firs axis by said mobile focusing unit, said reflecting surfaces diverting said beam outwardly onto said rotating cigarettes.

4,633,892
ORAL HYGIENE DEVICE
Norman Charatan, 22 Varady Dr., Fords, N.J. 08863
Filed Dec. 23, 1985, Ser. No. 812,765
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—89 **9 Claims**



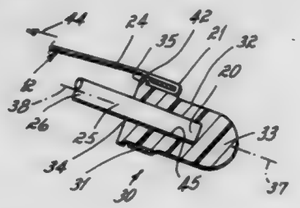
1. An oral hygiene device comprising a unitary housing, said housing defining a cavity therewithin, means to separate said housing into at least two portions, a flexible elongatable material, said material being capable of being permanently elongated once said material is stretched, said material being disposed within said cavity when un-elongated, said material having a pair of ends, one of said pair of ends being secured within said cavity to one of said at least two portions of said housing, the other said pair of ends being secured within said cavity to another of said at least two portions of said housing said material being elongatable so as to have an exposed length equal to the distance separating each said pair of ends when said housing is separated into two said portions, said housing having two openings therein, said two openings having cross-section dimensions substantially smaller than the cross-sectional dimensions of the interior portions of each of said housing portions, said two openings being disposed substantially at the location formed in each of said pair of ends adjacent and opposite each other when said housing is separated into said two portions, said flexible elongatable-like material passing through both said two openings when said housing is in unitary form and when said housing is separated into said two said portions.

4,633,893
APPARATUS FOR TREATING SEMICONDUCTOR WAFERS
Christopher F. McConnell, Gulph Mills, and Alan E. Walter, Exton, both of Pa., assignors to CFM Technologies Limited Partnership, Penllyn, Pa.
Continuation-in-part of Ser. No. 612,355, May 21, 1984, Pat. No. 4,577,650. This application Jun. 24, 1985, Ser. No. 747,894
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—95 **17 Claims**



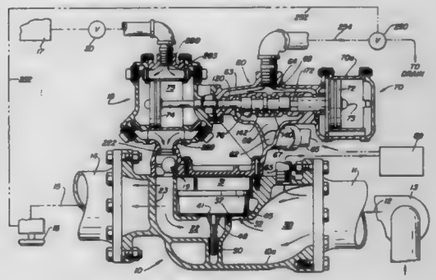
1. An apparatus for treating semiconductor wafers with a sequential flow of liquids, said apparatus comprising:
A. a vessel comprising an enclosure defining a treatment liquid inlet opposed to a treatment liquid outlet, the direction of liquid flow through said enclosure between said inlet and outlet defining an axis;
B. means for supporting the semiconductor wafers within said enclosure for exposure to the liquid flow through said enclosure; and
C. a liquid-input element in fluid communication with said treatment liquid inlet comprising means for imparting plug flow to a first liquid being introduced into said enclosure to displace by the plug flow a second liquid already disposed within said enclosure such that the semiconductor wafers are uniformly exposed to the plug flow of liquid through said enclosure.

4,633,894
UMBRELLA RIB TIPPING SYSTEM
Toshio Okuda, Hirakata, Japan, assignor to 'totes', Incorporated, Ohio
Filed Oct. 24, 1984, Ser. No. 664,260
Claims priority, application Japan, Mar. 13, 1984, 59-36275[U]
Int. Cl.[4] A45B *15/00, 25/18*
U.S. Cl. 135—34 **2 Claims**



1. An umbrella comprising
a cover,
a series of cover ribs, each rib having an inner and an outer end, and each outer end having a rib tip,
a plurality of connectors with one being fixed to each rib tip, each connector comprising a ring seat having a generally tapered cross sectional configuration with a nose portion having a first diameter, seat portion having a second diameter which is greater than said first diameter, a tapered portion interim said nose portion and said seat portion and a shoulder adjacent said seat portion, and
a portion of said cover being fixed to each connector by a closed cylindrical ring being received in generally co-axially sliding fashion over each ring seat portion for clamping the associated cover portion to the connector, said ring seat portion being of a cross sectional configuration and cross sectional area to receive the ring and the associated cover portion in a friction fit therewith with the cover portion being intermediate the ring and the ring seat portion, wherein the sole means of securing the cover portion to a rib is a clamping pressure exerted upon the cover portion between the ring seat and the ring and said cover being structured so that said clamping pressure is increased when said umbrella is open relative to when said umbrella is collapsed,.

4,633,895
FLUID PROPORTIONING APPARATUS
H. Alfred Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.
Filed Dec. 30, 1985, Ser. No. 814,742
Int. Cl.[4] F16K *19/00*
U.S. Cl. 137—98 **18 Claims**



1. Apparatus for admixing a secondary fluid, such as a foam-liquid solution, with a primary fluid, such as water, in a predetermined proportion comprising:
a proportioner including
a body having an inlet and an inlet chamber in fluid communication with said inlet, said body having an outlet and an outlet chamber in fluid communication with said outlet;
valve seat means defining a primary port providing fluid flow communication between said inlet chamber and said outlet chamber;
valving means extending across said primary port and mounted for movement between a closed position blocking fluid communication through said primary port between said inlet and outlet chambers and a variably open position spaced from said primary port providing fluid flow communication through said primary port so that the primary fluid may flow through said body from said inlet to said outlet;
means biasing said valving means in the direction of said primary port into said flow blocking position;
first conduit means providing a fluid flow conduit in said body for containing the secondary fluid to be proportioned with said primary fluid in said outlet chamber;
means associated with said first conduit means and providing a secondary port opening into said outlet chamber interiorly of said primary port;
means carried by said valving means and disposed within said secondary port for cooperating therewith to meter the flow of said secondary fluid from said first conduit means and into said outlet chamber in relation to the spacing of said valving means from said primary port as determined by the flow of primary fluid;
means supplying said primary fluid at a main pressure to said inlet to said proportioner;
a supply of secondary fluid; and
means delivering said secondary fluid from said supply thereof to said first conduit means at a pressure approximating said main pressure including
a directional valve means including a valve housing having an inlet and an inlet chamber in fluid communication with said inlet, and an outlet and an outlet chamber in fluid communication with said outlet, and second conduit means delivering said primary fluid to said inlet of said valve housing from said supply thereof,
a piston water motor means mounted at one end of said valve housing and having a first piston dividing a first piston chamber into a pair of first chambers,
a piston pump means mounted at an opposite end of said valve housing and having a second piston dividing a second piston chamber into a pair of second chambers, and
a piston rod assembly mounted for axial sliding movement in said valve housing and having said first piston mounted at one end thereof and said second piston mounted at the other end thereof, said piston assembly and said first and second pistons being supported for reciprocating movement,
said directional valve including a shuttle spool in the valve housing adapted for axial sliding movement relative to said piston rod assembly between a first control position and a second control position,
said shuttle spool being constructed and arranged so that in said first control position thereof it establishes fluid communication between said directional valve inlet chamber and one of said first piston chambers on one side of said first piston and fluid communication between the other of said first piston chambers on the other side of said first piston and said directional valve outlet chamber whereby flow of primary fluid from said directional valve inlet chamber effects axial movement of said first piston in one direction, said piston rod assembly and said second piston also moving in said one direction with said first piston,
said shuttle spool being constructed and arranged so that in said second control position thereof it establishes fluid communication between said directional valve inlet chamber and said other first piston chamber on the other side of said first piston and fluid communication between said one first piston chamber on the one side of said first piston and said directional valve outlet chamber whereby flow of primary fluid from said inlet chamber effects axial movement of said first piston in a direction opposite said one direction, said piston rod assembly and said second piston also moving in said opposite direction along with said first piston,
said pistion pump means including first flow control valves for controlling the flow of said secondary fluid from said supply thereof into said second piston chambers on opposite sides of said second piston and second flow control valves for controlling the flow of said secondary fluid from said second piston chambers to the upstream end of said first conduit means whereby back and forth axial movement of said piston rod assembly and said second piston being operable to draw predetermined quantities of secondary fluid into said second piston chamber and discharge the same therefrom to said first conduit means for delivering the secondary fluid to be proportioned with said primary fluid in said proportioner outlet chamber,
said second piston being constructed and arranged to develop a secondary fluid delivery pressure slightly exceeding that of the primary fluid main pressure.

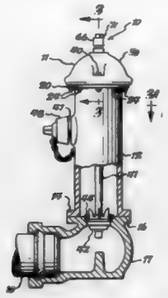
VOL 1074 ISS 1 JA 6 1987 UMI

4,633,896

OPERATING NUT FOR FIRE HYDRANT

Gary R. Bainbridge, Tonawanda; Lewis D. McCauley, Snyder, and Jeffrey R. Sullivan, Boston, all of N.Y., assignors to McGard, Inc., Buffalo, N.Y.

Filed Feb. 28, 1986, Ser. No. 834,548
Int. Cl.⁴ F16K *35/06*; E03B *9/06*
U.S. Cl. 137—296 **21 Claims**



1. In a fire hydrant having a valve housing, a valve in said valve housing, a hydrant barrel having a lower barrel portion secured to said valve housing and an upper barrel portion remote from said valve housing, a valve rod having a lower rod portion secured to said valve and an upper rod portion proximate said upper barrel portion, a thread on said upper rod portion, a first shoulder at said upper barrel portion, a sleeve having a sleeve end threadably received within said upper barrel portion, and a second shoulder on said sleeve end spaced from and in opposition to said first shoulder: an operating nut construction for preventing unauthorized use of said fire hydrant comprising a body member having a lower end portion and an upper end portion and a central portion therebetween, a tapped bore in said lower end portion for threadably receiving said thread of said upper rod portion in mating relationship, a flange on said body member for placement between said first and second shoulders to thereby retain said body member against axial movement while permitting rotation thereof, a second sleeve, first mounting means mounting said second sleeve for rotation on said central portion of said body member without turning said body member whereby said rotation prevents unauthorized use of said fire hydrant, an upper end on said second sleeve, a cap, second mounting means rotatably mounting said cap above said second sleeve on said upper end portion of said body member while securing said cap against removal from said body member, said rotatable mounting of said cap on said body member preventing said cap from turning said body member and thus preventing unauthorized use of said fire hydrant, a lower end on said cap axially spaced from said upper end of said second sleeve to thereby expose a narrow section of a central portion of said body member therebetween, and wrench-gripping configurations on said narrow section of said central portion of said body member for receiving a wrench for turning said body member to operate said fire hydrant.

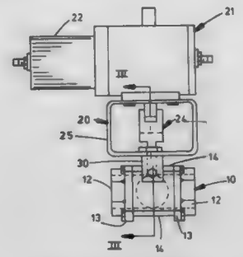
4,633,897

ACTUATOR MOUNT FOR VALVES

Leo T. Effenberger, 7161 Angora Loop S., El Paso, Tex. 79934

Filed Apr. 4, 1986, Ser. No. 848,391
Int. Cl.⁴ F16K *43/00*
U.S. Cl. 137—315 **10 Claims**

1. Means for securing an actuator to a valve, the valve having a body including a plurality of bolts arranged exteriorly of and in spaced relationship around the valve body and extending lengthwise thereof for holding the valve body together, said means comprising: a frame element for supporting the actuator, said frame element having a flange adapted to extend generally parallel to one side face of the valve body and having a pair of ears mounted thereon and spaced apart to seat on at least two of said bolts and against the outer faces thereof for supporting said frame element; said ears each having a step forming a stop surface facing away from said flange, said stops facing each other and seating on said bolts for limiting move-



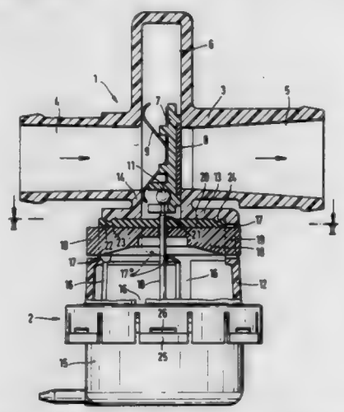
ment of said ears toward said valve body and stabilizing said ears and frame against rocking motion lengthwise of said bolts; anchor means on each of said ears movable for engaging the surface of said bolts opposite from said stops for locking said ears and frame element to said valve body.

4,633,898

SLIDE VALVE WITH PARTIAL-VACUUM ACTUATOR

Walter Denk, Ditzingen, Fed. Rep. of Germany, assignor to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Sep. 26, 1985, Ser. No. 780,441
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, #429994
Int. Cl.⁴ F16K *41/00*
U.S. Cl. 137—315 **8 Claims**



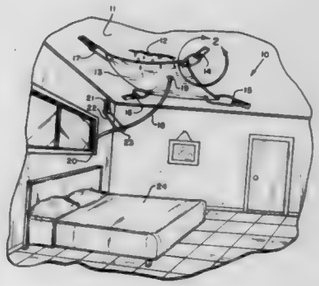
1. A slide valve with a partial vacuum actuator, especially for motor vehicle heating and/or air conditioning units, comprising:
a valve housing having a bottom;
a slide for opening and closing said valve;
a slide chamber for slidably containing the slide;
an actuating rod connected with the slide, and for actuating the slide;
a partial-vacuum actuator for actuating the actuating rod, and having a first housing section integral with the valve housing;
a flat seal for sealing the sliding chamber, and for surrounding and sealing the actuating rod;
a support for holding the flat seal against the bottom of the valve housing; and
means for fastening and securing the support inside said first housing section, said means comprising a bayonet mount including a plurality of radial tabs on said support, a plurality of axial slots positioned along an inner cylindrical wall of the first housing section for slidably containing the tabs, and a plurality of circumferential slots merging into the axial slots, also for slidably containing the tabs.

4,633,899

DEVICE FOR PROVIDING A TEMPORARY REMEDY FOR CEILING LEAKS

Phillip E. Lord, 15 Rose Ave., Venice, Calif. 90291

Filed Oct. 15, 1984, Ser. No. 661,168
Int. Cl.⁴ F16L *5/00*
U.S. Cl. 137—357 **2 Claims**



1. A device for providing a temporary remedy for ceiling leaks including, in combination:
a flexible waterproof plastic sheet member;
at least three individual fastening means connected to said sheet member at three locations defining the vertices of a triangle so that said member can be secured by said fastening means to a ceiling with at least part of the sheet member within said triangle underlying the leak in said ceiling so as to capture water from said leak; and
a flexible tube passing from said part of said sheet member to a selected location for continuously passing water collected to said sheet member to said selected location;
said sheet member including at each of said three locations an eyelet defining a hole;
said fastening means each corresponding with a respective one of said eyelets and each including water resistant adhesive tape, and,
said fastening means each further including a string for each tape secured to the tape and extending towards the corresponding one of said eyelets a given distance and thence passing through the eyelet and back to the tape where it is again secured to the tape so that said given distance for each of the tapes permits securement at spaced points on the ceiling that are removed from the leak in the ceiling so as to contact a dry area of the ceiling and whereby the tape can easily be pulled from the ceiling by grasping the string when it is desired to store the device.

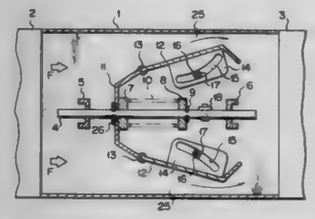
4,633,900

CONSTANT AIRFLOW CONTROL APPARATUS FOR AIR CONDITIONING

Hikoshiro Suzuki, Sagamihara, Japan, assignor to Topre Corporation, Tokyo, Japan

Filed Mar. 8, 1985, Ser. No. 709,663
Claims priority, application Japan, Jun. 30, 1984, 59-98959
Int. Cl.⁴ F16D *17/34*
U.S. Cl. 137—504 **5 Claims**

1. A constant airflow control apparatus which is connected to an air duct of an air conditioning system to keep the flow rate of air fed from the air duct constant, comprising:
a housing extending in one direction and having a passage with a rectangular cross section and openings at both ends, one of said openings communicating with the air duct;
a guide shaft extending along a central axis of said housing inside the passage;
a rectangular pressure receiving plate slidably mounted on the guide shaft and substantially extending at right angles to said central axis of the housing so as to block part of the cross section of the passage;
urging means for urging the pressure receiving plate against the flow of air with a force such that the pressure receiving plate moves along the guide shaft in proportion to an air pressure thereon, and
gate means attached to the pressure receiving plate and adapted to change the cross-sectional area of an air passage defined between the gate means and the inner surface of the housing in a mode represented by a quadratic curve in accordance with a rectilinear change of the pressure of the air, wherein said gate means includes swinging plates swingably attached to two opposite side edges of the pressure receiving plate, individually, and shifting means for shifting the swinging plates so that the cross-sectional area of the air passage changes in a quadratic curve in accordance with the rectilinear change of the air pressure, wherein said shifting means includes guide plates protruding individually from the swinging plates toward the guide shaft, each said guide plate having a guide slot with a non-linear curve, and slide shafts penetrating their corresponding guide slots and fixed at both ends to the housing.

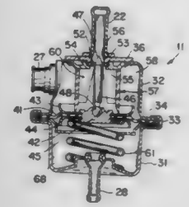


4,633,901

PRESSURE REGULATOR

Timothy B. Brandt, and Erwin W. Parr, both of Des Moines, Iowa, assignors to Parr Manufacturing, Inc., Des Moines, Iowa

Filed Apr. 3, 1986, Ser. No. 847,958
Int. Cl.⁴ F16K *15/00*
U.S. Cl. 137—510 **2 Claims**

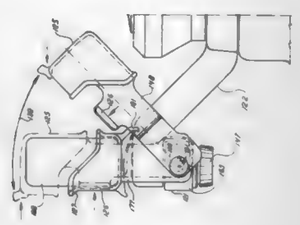


1. A pressure regulator comprising:
a housing;
means for forming a chamber in said housing;
diaphragm means sealingly connected around the outer periphery thereof to said housing for dividing said chamber into a first and a second subchamber;
a first port fluidly connected to said first subchamber and adapted to be attached to a fuel return line, said first port begin disposed along a longitudinal axis;
a second port fluidly connected to said first subchamber and

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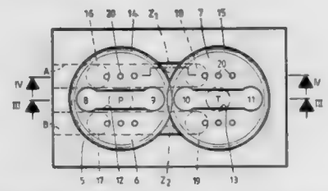
adapted to be fluidly attached to a fuel rail having fuel injectors attached thereto;
a third port fluidly connected to said second subchamber and adapted to be fluidly connected to an intake manifold;
a resilient flat washer being attached around the outer periphery thereto to said housing, said washer having a circular opening disposed centrally thereof, the axis of said opening being generally coincident with the longitudinal axis of said first port;
an elongated valve member disposed in said first subchamber and having one end thereof adapted to be selectively and sealingly received within said opening in the washer;
universal mounting means for attaching the other end of said elongated valve member to a central portion of said diaphragm means;
guide means disposed in said first subchamber around said elongated valve member for guiding said elongated valve member into the opening of said washer;
stop means integral with said guide means for limiting the movement of said diaphragm means and said elongated valve member in one direction to a first position wherein the first port is closed by having the elongated valve member disposed into the opening in said washer; and
spring means in said second subchamber for biasing said diaphragm means and said elongated valve member to said first position thereof but allowing said diaphragm and elongated valve member to move to a second position whereby the one end of the elongated valve member is not in the opening of the washer to thereby permit flow between the first subchamber and the fuel return line when relative differential pressures conditions between the first and second subchambers, in conjunction with the biasing force of said spring means, force the diaphragm means to said second position thereof.

4,633,902
WATER VALVE
Mikhail E. Tsipov, 120 Ruth Ellen Dr., Cleveland, Ohio 44143
Continuation-in-part of Ser. No. 474,204, Mar. 10, 1983, Pat. No. 4,508,141. This application Mar. 25, 1985, Ser. No. 715,489
The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.
Int. Cl.[4] F16K *19/00, 31/60*
U.S. Cl. 137—560 **9 Claims**



1. A valve for interrupting the flow of water between a source and an outlet comprising: a valve body; means within the valve body for interrupting water flow through the valve body; and actuating means for imposing the interrupting means into the water flow thereby terminating water flow through the valve body, the actuating means including a receptacle configured to receive a soap product and being moveable between a closed position and a position whereby soap can be retrieved from the receptacle, the actuator means being configured whereby with the receptacle in the closed position water flow through the valve body is unimpaired by the interrupting means and with the receptacle in the retrieval position water flow through the valve is interrupted by the interrupting means.

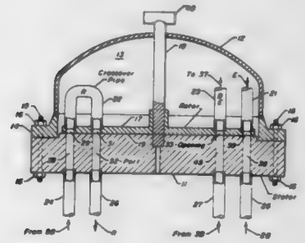
4,633,903
DISTRIBUTING CONTROL VALVE WITH HYDRAULIC CONTROL
Dionizy Simson, Winterthur, Switzerland, assignor to ENFO Grundlagenforschungs AG, Döttingen, Switzerland
Filed May 10, 1985, Ser. No. 732,724
Claims priority, application Switzerland, May 11, 1984, 2356/84
Int. Cl.[4] F15B *13/02*
U.S. Cl. 137—624.13 **10 Claims**

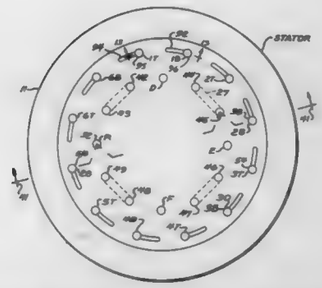


1. A distributing control valve with hydraulic control, comprising a valve housing having bores for intake and return of a hydraulic medium, the housing containing two circular index plates, each plate having teeth about its periphery and being rotatably mounted on a rotational axis within a cylindrical chamber such that the teeth of one plate mesh with the teeth of the other plate, each index plate also having at least one switching bore extending through the plate on an axis parallel to the rotational axis of the plate and a groove extending radially from the switching bore to the axis of the plate thereby connecting the switching bore with a bore for the hydraulic medium, the housing further including two control channels, each control channel extending to the exterior of the housing and including a control channel bore having an axis parallel to the rotational axes of the index plates and spaced radially from one of said plate axes the same distance as is the axis of the switching bore of that index plate.

4,633,904
PREVENTION OF WATER HAMMER IN ROTARY VALVE FOR INTERCONNECTING CONDUITS
Gary M. Schumann, Arlington Heights, and David L. Schick, Mt. Prospect, both of Ill., assignors to UOP Inc., Des Plaines, Ill.
Filed Dec. 10, 1984, Ser. No. 679,778
Int. Cl.[4] F16K *11/074*
U.S. Cl. 137—625.15 **6 Claims**

1. A multiport rotary valve for accomplishing the simultaneous interconnection of a plurality of conduits in accordance with a previously determined cycle, where any conduit communicates, by means of the valve, with no more than one other conduit at any one valve index position, comprising:
(a) a stator having a seating surface and a plurality of ports, which ports are disposed around an axis of rotation, each port extending through the stator from the seating surface to another surface of the stator, the number of ports being at least equal to the number of said conduits and each of said conduits communicating with a port;
(b) a rotor having a seating surface which is in fluid-tight contact with said stator seating surface, thereby forming an interface region which includes said stator and rotor seating surfaces, which rotor is capable of rotating about said axis of rotation to various valve index positions in accordance with said previously determined cycle, where said axis of rotation passes through the center of both the stator and rotor and is normal to said seating surfaces, and which rotor has a plurality of openings, each opening extending from said rotor seating surface through the rotor to another surface of the rotor, the number of openings being at least equal to the number of said ports, with the openings disposed about the axis of rotation such that in each index position, each port of the stator is in register with a different one of the openings, where said interface region contains a plurality of channels for reduction of water hammer, each channel being associated with a particular stator port at each valve index position, each channel having a first end portion communicating with said associated stator port at said valve index position, each channel having a second end portion which is not in direct communication with any stator port at any valve index position, and each channel having a length and orientation such that said associated stator port is in communication with a rotor opening, by means of the channel, when said rotor opening has passed totally out of register with said associated stator port, and where the intersections of the stator ports and rotor openings with the interface region are arranged in two concentric circles about said axis of rotation and are equally spaced around the circumferences of the circles, and said channels extend along the circumferences of the circles; and,
(c) a plurality of crossover pipes connected to the rotor, each crossover pipe communicating between two openings of the rotor in order to complete fluid transfer paths between conduits in accordance with said previously determined cycle, and where that part of a fluid transfer path between a conduit and a crossover pipe comprises a port and an opening.





4,633,905
WATER-MICRO-CONTROLLER
Po-Hsiung Wang, No. 91, kuo Tai Road, Chu Nan Chen, Miao Li Hsien, Taiwan
Filed Jan. 6, 1986, Ser. No. 816,439
Int. Cl.[4] F16K *31/48*
U.S. Cl. 137—624.11 **4 Claims**

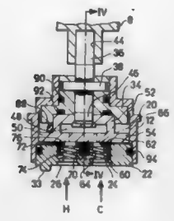
1. A water-micro-controller comprising:
a front cover portion provided with a front panel, a control circuit associated with a liquid crystal display and a plurality of control keys being disposed in the front cover portion with the liquid crystal display and the control keys mounted on the front panel thereof, a dust-protect cover being-disposed on the front panel of the front cover portion to protect the liquid crystal display and the control keys disposed on the front panel;
a rear cover portion capable of being sealingly secured to the front cover portion being provided at its interior with a recess;
a front plate provided at the one side with a limited switch being arranged to be disposed in the front cover portion;
a rear plate having a reed relay disposed thereon being arranged to be located in the front cover portion and adjacent to the front plate thereof;
a shaft passing through the rear plate being supported at both ends respectively to the front plate and the rear cover portion;
a gear set associated with a small cam being secured to the shaft and located between the front and rear plates, the small cam being arranged to correspond to the limited switch of the front plate;
a motor provided with a gear shaft being disposed in such a manner that the gear shaft is arranged to drive the gear set together with the shaft to rotate;

a water wheel provided around the central axis with a plurality of magnetic sensor cores being rotatably mounted on the shaft such that the magnetic sensor cores will respectively cross the reed relay of the rear plate to be capable of actuating the reed relay as the water wheel is driven to rotate, the water wheel capable of being received in the recess of the rear cover portion;
a special designed cam adjacent to the water wheel being secured to the shaft and received within the recess of the rear cover portion;
a control valve mechanism being integrally formed with the rear cover portion, the control valve mechanism comprising a cylindrical chamber which is formed at the top with a round recess and at the bottom with an inlet, a post furnished with an enlarged end being disposed in the cylindrical chamber with its enlarged end corresponding to the cam, a supporting frame having valve disposed thereon being located in the round recess of the cylindrical chamber and corresponding to the post thereof, a positioning cover with a spring-loaded positioning plug received therein being secured to the bottom side of the round recess of the cylindrical chamber, a connector having a filter disposed therein being mounted on the top of the positioning cover and secured thereto by a top cover which is threadedly engaged with the top of the cylindrical chamber.

4,633,906
MIXING CARTRIDGE FOR HOT AND COLD WATER FAUCETS

Michael Tuchman, Holon, Israel, assignor to Hamat Koor Metals Ltd., Holon, Israel

Filed Dec. 16, 1985, Ser. No. 809,304
Claims priority, application Israel, Dec. 25, 1984, 73930
Int. Cl.[4] F16K *11/078*
U.S. Cl. 137—625.17 15 Claims



1. A self-contained, unitary mixing cartridge for use in hot and cold water faucets for manually selecting the mixture-proportions and flow ates of water supplied from separate hot water and cold water inlets, comprising:

an outer housing closed at one end by a top wall formed with a central opening;

a base plate closing the opposite end of said outer housing and having a cold water inlet, a hot water inlet adjacent to said cold water inlet, and a common outlet;

an inner housing rotatably mounted within said housing;

a lever pivotably mounted at an intermediate point to said inner housing and having an outer end projecting through said opening in said top wall of the outer housing for coupling to a handle of the faucet;

a slide-valve within said inner housing and coupled to the inner end of said lever;

a first annular sealing ring between said inner housing and said outer housing;

a second annular ring between said inner housing and said slide-valve;

said cold and hot water inlets including annular recesses;

and a bushing seal received in each of said annular recesses and spring-urged into contact with said slide-valve;

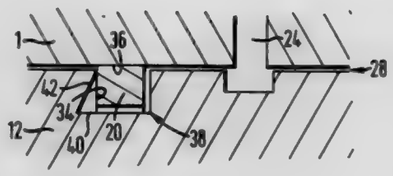
said slide-valve being formed with a first passageway cooperable with said two bushing seals of the two inlets, and a second passageway cooperable with said outlet, such that rotating said handle in the circumferential direction rotates said inner housing and said slide-valve to move said first passageway so as to vary the portion thereof in alignment with each of said two bushing seals, to control the mixture-proportions and temperature of the water entering said first passageway from said two inlets and passing therefrom via said second passageway to the common outlet;

whereas pivoting said handle in the vertical direction moves said slide-valve diammetrically of said housing to vary the portion of said first passageway in alignment with either of said two bushing seals and thereby to control the flow-rate of the water passing via said first passageway and second passageway to the common outlet.

4,633,907
VALVE ASSEMBLIES

Frederick J. Adams, Clevedon, England, assignor to TRW Cam Gears Limited, Clevedon, England

Filed Oct. 29, 1984, Ser. No. 665,643
Claims priority, application United Kingdom, Nov. 18, 1983, 8330877
Int. Cl.[4] F16K *11/12;* F16J *15/46*
U.S. Cl. 137—625.22 7 Claims



1. A rotary control valve assembly comprising:

an outer valve sleeve member defining an inner cylindrical bore;

an inner valve member received within said inner cylindrical bore of said valve sleeve member for relative rotation therein about a common longitudinal axis of said inner and outer valve members, said outer and inner valve members having valve ports and defining fluid passaeways, said outer and inner valve member effecting fluid flow control by relative rotational movement thereof;

sealing means for effecting fluid sealing between said inner and outer valve members, said sealing means comprising an annular ring groove formed coaxially with said inner and outer valve members in the surface of one of said inner and outer valve members and a sealing ring received in said annular ring groove for sealingly engaging both said inner and outer valve members;

said sealing ring having one pair of opposite sides which face radially inwardly and outwardly with respect to said common longitudinal axis, and another pair of opposite sides which face axially with respect to said common longitudinal axis;

said sealing ring and said annular ring groove therefor being formed with cooperating profiles to define a passageway providing fluid pressure communication between said opposite axially facing sides of the sealing ring, whereby axially directed resultant forces exerted by the fluid pressure on said pair of opposite axially facing sides of said sealing ring substantially offset each other;

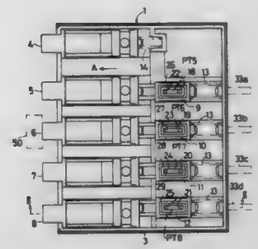
one of said radially facing sides of said sealing ring sealingly engaging a radially facing surface on the other of said inner and outer valve members under the influence of radially directed forces exerted by the fluid pressure on the other of said radially facing sides of said sealing ring so as to be rotationally fixed to said other of said inner and outer valve members;

said cooperating profiles of said sealing ring and said annular ring groove defining means for effecting sliding rotational sealing engagement between one of said axially facing sides of said sealing ring and an axially facing surface of said annular ring groove, the width of said one axial facing side and said axial facing surface measured in the radial direction being less than the radial thickness of said sealing ring.

4,633,908
MANUALLY OPERATED MODE-SELECTING VALVE DEVICE

Masaichi Hattori; Akira Hanaki, and Kouichi Kihira, all of Aichi, Japan, assignors to Kabushiki-Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Sep. 2, 1983, Ser. No. 528,806
Claims priority, application Japan, Sep. 16, 1982, 57-140348[U]
Int. Cl.[4] F16K *11/065, 31/44*
U.S. Cl. 137—637.1 3 Claims



1. A manually operated mode-selecting valve device of the type wherein a single or plurality of working agents are actuated upon operation of a single actuator means in accordance with a predetermined mode selection, comprising:

(a) a port forming medium having a plurality of paired ports (PT5–PT8) each arranged with an inlet port (**18**) and a work port (**22**) as one pair;

(b) valve media (**26–29**) mounted on said port forming medium with their respective locations corresponding to those of the paired ports (PT5–PT8), the valve media being adapted to individually move between an original position where said inlet and work ports are communicated at a suitable degree of combination and an operative position where selected numbers of said work ports are in communication with the atmosphere and other selected numbers of said inlet ports are air-tightly sealed;

(c) spring means (**13**) which individually bias said valve media (**26–29**) toward their said original positions;

(d) actuator means (**5–8**) adapted to be manually operated to individually push said valve media to move them from their said original positions to said operative positions and to hold them at the operative positions;

(e) a cross-operation preventive means (**17**) which prohibits more than a single one of said actuator means (**5–8**) from being simultaneously operated;

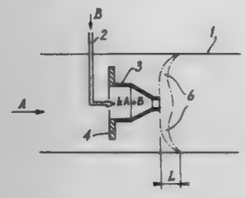
(f) a tube connector system (**33***b*) always communicating between a pressurized source and the inlet port (**19**) of one of the paired ports (**PT6**) suitably selected so that the number of working agents to be operated may be minimized; and

(g) an air-passage forming medium (**31**) having air-passage ways (**31***a*) thereon, said air-passage ways communicating between the work port (**23**) of one of said selected paired ports (PT6) and the inlet port (**20**) of another of the paired ports (PT7), the valve medium (**28**) of which is operated with one of said actuator means (**7**) so that the number of working agents to be selected may be minimized next to that selected with another of the actuator means (**6**).

4,633,909
APPARATUS FOR THE RAPID IN-LINE MIXING OF TWO FLUIDS

Robert Louboutin, Crespieres; Vincent Savall, Velizy, and Patrick Vion, Houilles, all of France, assignors to Degremont, Rueil Malmaison, France

Filed Mar. 28, 1985, Ser. No. 717,296
Claims priority, application France, Apr. 6, 1984, 84 05496
Int. Cl.[4] B01F *3/04*
U.S. Cl. 137—888 7 Claims



1. An apparatus for the rapid in-line mixing of an additive fluid with a primary fluid, said apparatus comprising:

a conduit for passing therethrough in a direction of flow a primary fluid;

a nozzle positioned within said conduit and having an outlet;

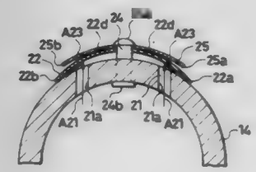
conduit means for supplying an additive fluid to said nozzle, such that the additive fluid is injected through said outlet into the primary fluid; and

said nozzle having means for causing the additive fluid to diffuse rapidly outwardly from said outlet in a generally radially oriented fluid current and thereby for mixing with the primary fluid within a zone occupying a limited length of said conduit, measured in said direction from said outlet, said means comprising a ring extending outwardly from a relatively large diameter upstream portion of said nozzle, said nozzle discharging said additive fluid from a relatively small diameter downstream portion of said nozzle, said nozzle portions being connected by an intermediate nozzle portion of decreasing diameter.

4,633,910
PULSATION ABSORBING MEANS HAVING ONE OR MORE VALVE SHOES DIVIDED INTO TWO PARTS EACH DISPLAYS SUITABLE FUNCTION

Nobuyuki Sugimura, 308, Mabase, Shimizu-shi, Shizuoka-ken, Japan

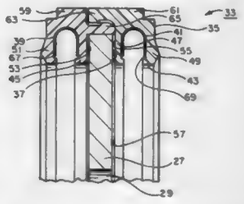
Filed Jul. 9, 1985, Ser. No. 753,103
Claims priority, application Japan, Jul. 11, 1984, 59-104586[U]; Aug. 31, 1984, 59-182382
Int. Cl.[4] F16L *55/02*
U.S. Cl. 138—30 7 Claims



1. A pulsation absorbing device comprising: a cylindrical pressure vessel; a cylindrical resilient diaphragm and an inner cylinder; and one or more communicating holes formed around a periphery of said inner cylinder, said cylindrical resilient diaphragm and said inner cylinder being disposed within said pressure vessel, said inner cylinder being concentric with said vessel and with said diaphragm; valve means for

said device comprising, one or more arched resilient valve members and one or more separate arched leaf springs laminated with each other and disposed along the outer surface of said inner cylinder with said leaf springs in position to cover said communicating holes, said leaf springs being capable of being raised or lowered dependent upon the extent of applied fluid pressure to open and close said communicating holes; said valve members each having an at rest radius substantially equal to the radius of the inner cylinder plus the thickness of the leaf spring and the at rest radius of the leaf spring being less than the radius of said inner cylinder so that such communicating holes are opened when the laminated valve members and leaf springs are not acted upon by fluid flow and/or diaphragm urging.

4,633,911
ORIFICE PLATE SEAL
Paul Lohn, Houston, Tex., assignor to Control Specialties Co., Inc., Houston, Tex.
Filed Jan. 18, 1985, Ser. No. 692,428
Int. Cl.⁴ F15D *1/02*
U.S. Cl. 138—44 **2 Claims**



1. An orifice plate assembly containing a generally planar orifice plate of the type designed to be inserted into a plate carrier within an orifice meter tube for determining fluid velocity within the tube, comprising:

a resilient seal ring formed from an elastomeric material which resists swell in the fluid within the meter tube, said seal ring having an interior region adapted to be received about a circumferential region of said orifice plate, said seal ring having a pair of circumferential grooves formed in said ring interior region, each of said circumferential grooves defining an inner and outer resilient lip on said seal ring interior region, said inner resilient lips of said circumferential grooves being arranged to overlie the circumferential region of said orifice plate and form a central, orifice plate channel to retain said orifice plate within said seal ring; and

a spring within each of said circumferential grooves for resisting the deformation of said groove inner lips in a direction perpendicular to the plane of said orifice plate as fluid passes through said meter tube and acts upon said orifice plate.

4,633,912
HOSE CONSTRUCTION
Mervin V. Pilkington, Akron, Ohio; Robert W. Cole, Sun Prairie, Wis., and Robert C. Schisler, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed May 31, 1985, Ser. No. 739,659
Int. Cl.⁴ F16L *11/08*
U.S. Cl. 138—132 **17 Claims**

1. A hose comprising: (1) a polyamide core; (2) an elastomeric friction layer comprising (a) a base polymer selected from EPDM's, copolymers of butadiene, polychloroprene, polybutadiene, polyisoprene or mixtures thereof, (b) a calcium ion source selected from the group comprising calcium stearate, calcium alkoxides of 1 to 10 carbon atoms, calcium hydroxide, calcium oxide and calcium carbonate, (c) a resorcinol or phenolic based adhesive system, and (d) a peroxide or sulfur curative; applied to the outer surface of the core and adhered directly thereto after curing; (3) a first layer of reinforcement strands tensioned about the elastomeric friction layer; (4) an adhesive/ barrier/friction layer comprising a compound selected from natural and synthetic elastomers and copolymers of ethylene and acrylic acid; (5) a second layer of reinforcement strands tensioned about the adhesive/ barrier/friction layer; and (6) a halobutyl rubber cover wherein the halobutyl rubber contains a bis-dienophile as a crosslinker.

12. A process for the preparation of a reinforced hose construction which comprises;

(a) forming a core tube of polyamide:

(b) applying a coating of polymer to the core tube, the coating being in a range of 0.1 mm to 2 mm, the coating comprising a base polymer, an adhesive system, a calcium ion source, and a curative for the base polymer;

(c) applying a fibrous reinforcement over the coated tube;

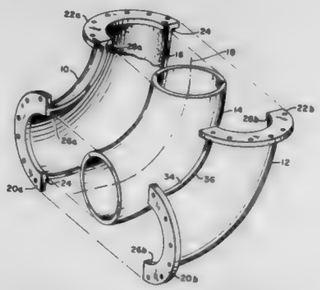
(d) applying a layer of an ethylene acrylic acid copolymer;

(e) applying a second layer of fibrous reinforcement over the ethylene acrylic acid copolymer;

(f) applying a halobutyl rubber cover over the second layer of reinforcement which contains a bis-dienophile crosslinker; and

(g) open steam curing the hose to result in a reinforced hose having excellent Freon and water impermeability.

4,633,913
WEAR-RESISTANT PIPE
Michael W. Carty, Narragansett, R.I., and Guenther M. Kraus, Windsor, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.
Continuation of Ser. No. 740,684, Jun. 3, 1985, abandoned, which is a division of Ser. No. 535,516, Sep. 26, 1983, Pat. No. 4,554,721. This application May 29, 1986, Ser. No. 868,377
Int. Cl.⁴ F16L *9/02*
U.S. Cl. 138—147 **3 Claims**



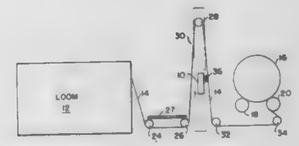
1. A wear-resistant, non-linear pipe segment comprising:

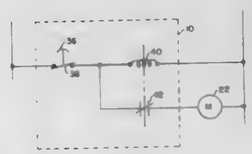
a. a one-piece replaceable liner configured in the shape of a non-linear conduit, the liner being formed of a ceramic material having good wear-resistant properties;

b. an outer shell formed of metal and configured to fit around the outer surface of the liner such that a gap exists therebetween, the outer shell being divided longitudinally into a first half and a second half so as to permit the outer shell to be fitted around the liner, the first half having a flange portion fastened thereto at each end thereof such that the flange portion projects outwardly of the first half at right angles to the major axis of the first half, each of the flange portions fastened to the first half having an annular lip formed as part thereof so as to lie in the same plane as the flange portion and so as to project inwardly of the first half, the second half having a flange portion fastened thereto at each end thereof such that the flange portion projects outwardly of the second half at right angles to the major axis of the second half, each of the flange portions fastened to the second half having an annular lip formed as a part thereof so as to lie in the same plane as the flange portion and so as to project inwardly of the second half, the first and second halves of the outer shell being clamped about the liner such that the annular lips formed as part of the flange portions of the first and second halves engage the liner for purposes of retaining the liner in place within the first and second halves so as to prevent the liner from slipping relative to the first and second halves; and

c. bedding material deposited on the inner surface of each of the first and second halves such that with the outer shell positioned in surrounding relation to the liner the gap between the liner and the first and second halves of the outer shell is substantially filled by the bedding material.

4,633,914
TAKE-UP TENSION CONTROL
William B. Carry, Union, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Continuation of Ser. No. 252,777, Apr. 10, 1981, abandoned. This application Mar. 10, 1986, Ser. No. 838,874
Int. Cl.⁴ D03D *49/20;* **D06C** *3/00*
U.S. Cl. 139—1 R **1 Claim**



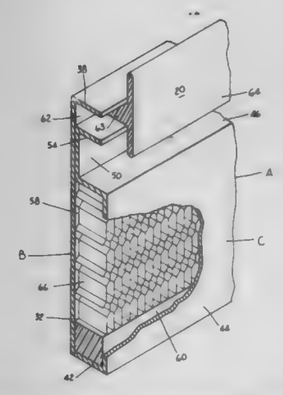


1. A machine to produce and take-up a running length of fabric comprising: a fabric producing machine, a take-up mechanism operably associated with said fabric producing machine to take-up fabric produced on said machine, drive means operably associated with said mechanism and detector means located between said machine and said mechanism to automatically detect a pre-determined tension above that desired in the length of fabric and de-activate said drive means upon such detection, said detector means including a disc shaped feeler adjacent the path of the running length of fabric and a control circuit with a switch thereon connected to said feeler wherein said control circuit including a time delay means therein to delay deactivation of said drive means upon the detection of the pre-determined tension.

4,633,915
DEVICE FOR PREVENTING DUST DEPOSITS ON WEFT FEEDERS FOR WEAVING LOOMS
Luigi Pezzoli, Leffe, Italy, assignor to O.M.V. Officine Meccaniche Vilminore S.p.A., Vilminore Di Scalve, Italy
Filed Jun. 18, 1985, Ser. No. 746,057
Claims priority, application Italy, Jun. 27, 1984, 21628 A/84
Int. Cl.⁴ D03D *49/00*
U.S. Cl. 139—1 C **2 Claims**

2. In a weft feeder for a weaving loom, comprising a drum about which a reserve of weft yarn is wound and a detecting unit for detecting the amount of weft yarn in the reserve; the improvement comprising a tubular ring surrounding the drum and having holes facing the drum, and means to supply air to the interior of said ring for blowing blasts of air toward said drum between said detecting unit and said drum to prevent dust from causing a false reading by said detecting unit, said ring being disposed closely adjacent said detecting unit.

4,633,916
ROLL-FORMED SHEAR-RESISTANT FRAME SLAT
John L. Rast, 29 Continental Apartments, Greenville, S.C. 29615
Filed Jun. 24, 1985, Ser. No. 747,779
Int. Cl.⁴ D03D *9/00*
U.S. Cl. 139—92 **19 Claims**



1. In a heddle frame assembly for a loom of the type which includes upper and lower frame slats vertically spaced side by side frame members, heddle rods carried by the frame slats between which heddles are supported in the frame, wherein said heddle frame slat comprises:

an elongated, thin, rolled-formed steel back plate extending generally the entire length of said heddle frame assembly having an upper edge and a lower edge;

an elongated, thin, roll-formed steel front plate extending generally the length of said heddle frame assembly parallel to said back plate having an upper edge and a lower edge;

a first ledge formed adjacent to said upper edge of said back plate extending perpendicular to said back plate;

a second ledge formed adjacent said upper edge of said front plate extending perpendicular to said front plate;

a longitudinal sheer-resistant mounting socket formed between said first and second ledges generally across the entire length of said frame slat;

a generally box shaped core space formed between said back plate and front plate;

a lightweight reinforcing material carried within said core

space providing stiffness to said frame slat and resistance against bending;

a reduced neck portion, connecting said box shaped core space and said mounting socket, wherein said back plate and said front plate extend in parallel planes and in abutting contact with each other;

a T-shaped heddle rod having a rod stem and a heddle retaining rod flange extending transverse to said rod stem; and

said rod stem being received and fixed within said longitudinal mounting slot whereby shearing forces in opposing vertical directions occurring during shedding motion are effectively resisted.

4,633,917

WEFT THREAD STORAGE DEVICE FOR A WEAVING MACHINE

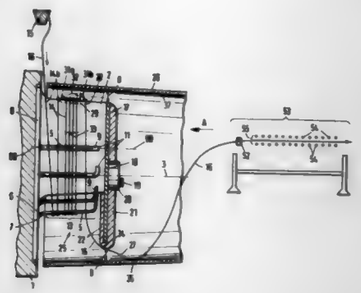
Giaani Riboli, Laupen, Switzerland, assignor to Maschinenfabrik Sulzer-Rüti AG, Rüti, Switzerland

Filed Nov. 16, 1984, Ser. No. 672,142

Claims priority, application European Pat. Off., Nov. 22, 1983, 83810545.0

Int. Cl.⁴ D03D *47/36*; B65H *51/20*

U.S. Cl. 139—452 **7 Claims**



1. A weft thread storage device with a predetermined axis for a weaving machine, comprising:

means defining said predetermined axis at a stationary location laterally of a weaving shed of the weaving machine;

a winding reel having a weft thread withdrawal face and being arranged eccentrically with respect to said predetermined axis of the weft thread storage device;

said winding reel containing a plurality of radially adjustable peripheral thread support rods;

a balloon-breaker housing for substantially preventing excessive ballooning of weft thread to be withdrawn from said winding reel and which is to be inserted into a weaving shed of the weaving machine;

said balloon-breaker housing having an axis extending eccentrically with respect to said winding reel; and

a thread guide disk arranged upon said weft thread withdrawal face of said winding reel substantially concentrically in relation to said balloon-breaker housing and having a circumference which extends at a substantially constant radial distance from said balloon-breaker housing such that said balloon-breaker housing and said circumference of said thread guide disk conjointly define a space devoid of further guide means for withdrawing weft thread.

4,633,918

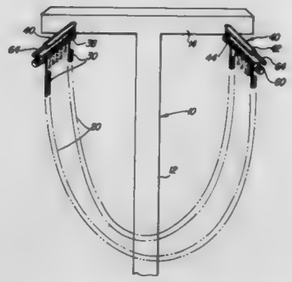
COIL HANGER AND HANDLING METHOD

John C. Lachmaa, Charlevoix; Lewis B. Moorman, Lathrup Village, and Alan A. Bosak, Howell, all of Mich., assignors to Hoskins Manufacturing Company, Hamburg, Mich.

Filed Dec. 20, 1984, Ser. No. 684,011

Int. Cl.⁴ B21F *45/00*

U.S. Cl. 140—71 R **16 Claims**



1. The method of handling a plurality of helical coils of resistance heating wire or the like wherein said plurality of coils are to be stored as a group for use in a manufacturing operation comprising manufacturing, a plurality of helical coils with a terminal at each end thereof, assembling at a first location all of said terminals at one of said ends of said coils on a first hanger, transporting the coils assembled as a group on said first hanger to a second location remote from said first location, storing said plurality of coils as a group by mounting said first hanger on a rack, and then removing said coils from said first hanger on said rack as required for a manufacturing operation at said second location.

4,633,919

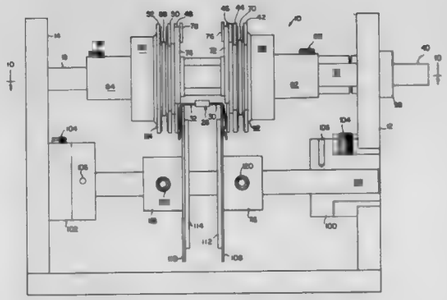
MACHINE FOR CUTTING, BENDING AND FORMING AXIAL LEAD COMPONENTS

Adam Shiloh, 3517 Glen Way, Huntingdon Valley, Pa. 19006; Peretz J. Shiloh, 534 A Knights Bridge, and Avraham Shiloh, 127 Thunder Cir., both of Bensalem, Pa. 19020

Filed Oct. 16, 1984, Ser. No. 661,695

Int. Cl.⁴ B21F *1/00*

U.S. Cl. 140—105 **17 Claims**



1. A machine for processing the leads of electrical components comprising

a frame comprising at least a support;

a drive shaft rotatably carried on the support, the drive shaft rotating a first rotary die member;

a plurality of electrical component advancing means secured to the drive shaft to rotatively move the electrical components within the machine, the component advancing means defining an outer periphery;

a tooling shaft carried on the support in spaced relation to the drive shaft, the tooling shaft carrying a second die member in tangential engagement with the first rotary die member to form a kink on the leads as the components are rotatively moved,

cutter means defining an outer periphery and being affixed to the tooling shaft in spaced relation to the advancing means to trim the leads as they are rotatively moved by the component advancing means, the drive shaft and the tooling shaft being spaced apart by a distance suitable to permit the outer periphery defined by the component advancing means to intersect the outer periphery defined by the cutter means;

prebend means supported on the tooling shaft in spaced relation to the advancing means to slightly bend the leads as they are rotatively moved by the component advancing means, the prebend means being positioned to be contacted by the leads of the electrical components as the electrical components are rotatively moved by the advancing means;

a bender shaft carried upon the support in spaced relation to the tooling shaft, and

a bender means having an outer periphery and being secured to the bender shaft in position whereby its said outer periphery peripherally intersects the outer periphery of the component advancing means to bend the component to an angle of approximately ninety degrees as the drive shaft is rotated;

whereby the component leads can be trimmed, prebent, kinked and/or bent as they are rotatively advanced through the machine.

4,633,920

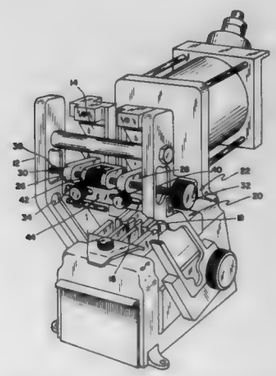
POSITIONING DEVICE

James G. Donovan, Wilmington, Mass., and Charles O. Wittemen, Pelham, N.H., assignors to Avco Corporation, Wilmington, Mass.

Filed Jul. 17, 1984, Ser. No. 631,703

Int. Cl.⁴ B21F *1/00*

U.S. Cl. 140—105 **2 Claims**



1. In an electronic component lead-forming device and similar apparatus, feed mechanism positioning apparatus comprising in combination:

a threaded shaft supported in a main frame operatively connected to a pair of positioning means for positioning said components with respect to a forming tool, said shaft having a first threading in a given direction of spiral along a predetermined portion of its driving length and having a second threading with an oppositely-directed spiral along the remainder of its driving length, one of said pair of positioning means being located so as to be driven by the right-hand-threaded portion of said shaft and the other of said pair being located so as to be driven by the left-hand-threaded portion of said draft,

driving means for manually rotating said shaft about its axis, and

second driving means having a threaded passage conforming to and an engagement with one of said threading of said shaft, said second driving means being constrained against axial movement whereby when rotated while said shaft is held against rotation, said second driving means will move said shaft axially.

4,633,921

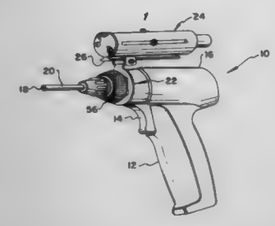
ADJUSTABLE SUPPORT BRACKET FOR CONDUCTOR WRAPPING TOOL ATTACHMENT

Paul R. Kilmer, Leroy, Mich., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jun. 12, 1985, Ser. No. 743,855

Int. Cl.⁴ B21F *15/00*

U.S. Cl. 140—124 **8 Claims**



1. In a portable hand held conductor wrapping tool having a tool body for supporting a rotatable conductor wrapping bit, a polygonal shaped boss formed on said body and projecting from a generally transverse surface on said body, a mounting bracket for supporting an attachment device on said body including a polygonal recess having a shape complementary to said polygonal shaped boss and adapted to be supported on said boss in a selected one of plural working positions of said mounting bracket; and

means on said body for releasably securing said mounting bracket in said selected one of said working positions.

4,633,922

CAP-, DROPPER- AND RING ASSEMBLY FOR BOTTLES

Oreste Fabbro, Lancshire, England, assignor to Rory Ltd., Sorengo, Switzerland

Filed Jul. 16, 1985, Ser. No. 755,437

Claims priority, application Switzerland, Jul. 16, 1984, 3462/84; May 15, 1985, 2083/85

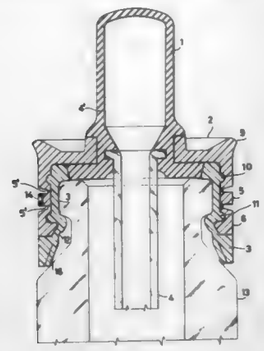
Int. Cl.⁴ B65D *83/00*

U.S. Cl. 141—24 **3 Claims**

1. Cap- (2), dropper- (1) and ring (3) assembly for penicillin-type bottles comprising a dropper (1), a cap (2) with a guarantee seal (5) and a ring (3) characterized in that the cap (2) and dropper (1) with guarantee seal (5) are mounted together on the ring by pressure (3) from which they cannot be removed

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except after breakage of the guarantee seal (5) and in that the ring (3) in turn can be pressed onto the mouth of a bottle and



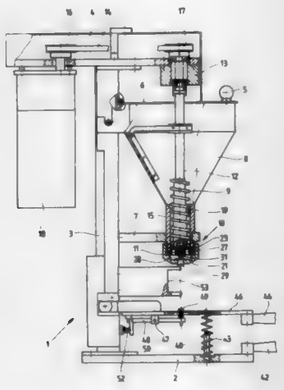
has a tapered portion (12) which enables it to be mounted on a bottle by automatic filling machines.

4,633,923

APPARATUS FOR FILLING INK CARTRIDGES

Alfred Hinzmann, Weams, Va., assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed May 2, 1985, Ser. No. 729,548
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—116 15 Claims



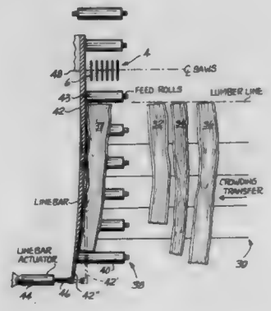
1. Apparatus for admitting a flowable medium into containers for use in the printing unit of a machine for the making of rod-shaped articles of the tobacco processing industry, comprising a source of supply of flowable medium; a housing defining a variable-volume chamber for temporary reception of flowable medium; means for feeding flowable medium from said source into said chamber; and a valving element installed in said housing and defining at least one passage for evacuation of flowable medium from said chamber and for entry of evacuated medium into a container which is placed next to said housing, said valving element being movable between a first position in which said passage is free to convey flowable medium from said chamber and the valving element reduces the volume of said chamber, and a second position in which the volume of said chamber is increased as a result of movement of the valving element from the first to the second position and said passage is sealed from the container, said passage being in communication with said chamber during movement of said valving element to said second position so that the flowable medium in said passage is sucked back into said chamber in response to movement of said valving element from said first to said second position due to increasing volume of said chamber.

4,633,924

VARIABLE CURVE LINEBAR

Earl D. Hasenwinkle, Puyallup; Frank Wislocker, Sumner, and Charles Blickenderfer, Puyallup, all of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Nov. 1, 1985, Ser. No. 793,925
Int. Cl.[4] B27C *1/12*
U.S. Cl. 144—242 E 18 Claims



1. A linebar assembly for guiding a cant or log into a saw which comprises

an elongated flexible linebar means positionable to that one end is adjacent to the saw, said linebar having a longitudinal axis comformable between a straight line and a line approximating an arc of a circle, the end of the linebar adjacent said saw being positionable so that a tangent to the end is essentially parallel to the plane containing said saw; and

bending means for controlling the curvature of said linebar means;

whereby said linebar can be configured into an arc which approximates the curvature of a cant and said cant can be guided into the saw along a path approximating its radius of curvature.

4,633,925

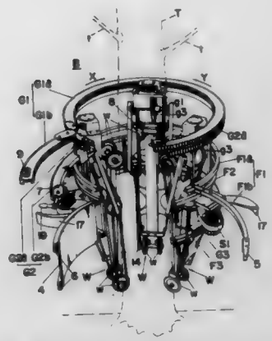
METHOD OF PRUNING TREE AND TREE PRUNING MACHINE

Suezaki Yasunaga, Yame, Japan, assignor to Kaisei Kogyo Corporation, Kumamoto, Japan

Filed Jul. 25, 1985, Ser. No. 759,031
Claims priority, application Japan, Oct. 8, 1984, 59-211816
Int. Cl.[4] B27L *1/00*; A01G *23/02*
U.S. Cl. 144—343 2 Claims

1. A method for pruning a tree with a device having a body, wheels for elevating the body, a cutting unit mounted on the body, means for driving the wheels and the cutting unit, and a sensor mounted on the top of the cutting unit for detecting branches comprising the steps of:

detecting a branch with the sensor; and



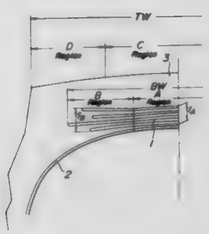
temporarily stopping the wheel driving means in a tree climbing direction when the branch is detected.

4,633,926

HEAVY DUTY PNEUMATIC RADIAL TIRE

Akira Tamura, Iruma, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,310
Claims priority, application Japan, Dec. 29, 1983, 58-251170
Int. Cl.[4] B60C *11/00, 9/28*
U.S. Cl. 152—209 R 5 Claims



1. A heavy duty radial tire comprising; a tread portion, a radial structure carcass composed of one or more rubberized cord layers containing cords each arranged in a radial plane of the tire or in a plane deviating at a small angle therefrom, a belt composed of plural rubberized cord layers upon the outer periphery of the radial carcass and having a substantially lower flexural rigidity at central region than at side regions; wherein the ratio t_B/t_A in which t_A is the maximum thickness of the belt in the central region thereof and t_B is the maximum thickness in the side region thereof is 1.25–1.55 and the tread portion has such a tread pattern that a ratio N_C/N_D in the negative ratio between the central region and the side regions is 1.15–1.50.

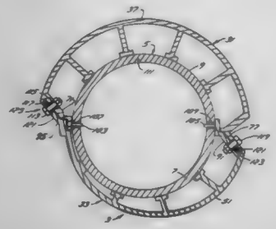
4,633,927

BARREL RINGS

H. M. Robert Labelle, Cornwall, Canada, assignor to Martinray Industries Ltd., Cornwall, Canada

Filed Jan. 25, 1984, Ser. No. 573,674
Claims priority, application Canada, Mar. 31, 1983, 425057
Int. Cl.[4] E06B *9/171*
U.S. Cl. 160—133 6 Claims

1. A barrel ring for use in rolling closures comprising: at least two extruded ring sections; each of the ring sections having an outer curved strip defining an outer curved surface for use in receiving a closure thereon, an inner curved strip defining an inner curved surface for use in mounting the section on a central support, at least one of the strips divided into segments separated by gaps, and only one cross-member joining each segment of the one strip to the other strip; one of the ring sections having its outer curved strip joined to its inner curved strip by cross-members that progressively increase in length; and fastening means fastening the ring sections together end-to-end to form the ring.

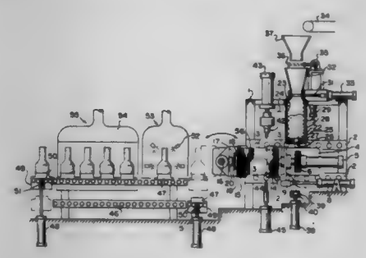


4,633,928

APPARATUS FOR MAKING CORE FROM GREEN SAND

Nagato Uzaki, Toyohashi; Shigeru Itoh, Aichi; Ryoji Kanayama; Hisashi Harada, both of Toyokawa, and Yasutaro Kawamura, Okazaki, all of Japan, assignors to Sintokogio Ltd., Nagoya, Japan

Filed Nov. 9, 1983, Ser. No. 550,336
Claims priority, application Japan, Dec. 3, 1982, 57-213092
Int. Cl.[4] B22D *15/00*
U.S. Cl. 164—19 8 Claims



1. A core making apparatus for making cores from green sand, said apparatus comprising:

a vertically split type die means having a first die and a second die movable horizontally relatively to said first die, said first die and said second die being adapted to form, when they are jointed to each other, a die cavity which is communicated with the exterior through an upper end opening and a lower end opening formed in said die means;

a frame movable horizontally, a first cylinder having a rod, either one of said cylinder and said rod being connected to said frame while the other is connected to said first die, and a second cylinder connected to said first die and adapted to move said frame horizontally, said second die being pivotally secured to said frame for 180° rotation;

a blow head movable relatively to said vertically split type die means and adapted to blow the green sand into said die cavity through said upper opening;

a sieve for sieving the green sand and supplying the sieved green sand into said blow head;

a vent plate movable relatively to said vertically split type die means to selectively close said lower end opening in such a manner as to permit air to be passed therethrough;

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a stabbing rod movable relatively to said vertically split type die means and adapted to be inserted into said die cavity through said upper opening to stab the green sand filled in said die cavity when said blow head is spaced from said upper opening of said vertically split type die means;
a conveyor line adapted to recirculate stools for receiving and supporting the cores shifted from said second die;
a spraying station disposed along said conveyor line and adapted to apply a surface stabilizing agent to said cores received and held by said stools; and
a drying station disposed at the downstream side of said spraying station as viewed in the direction of running of said conveyor line.

4,633,929

METHOD FOR PRODUCING METAL CASTINGS

Joseph G. Santangelo; James J. Weber, both of Allentown, Pa.; Richard G. Sinclair, and Richard D. Tenaglia, both of Columbus, Ohio, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 16, 1985, Ser. No. 787,859
Int. Cl.[4] B22C *9/04, 7/02*
U.S. Cl. 164—34 **18 Claims**

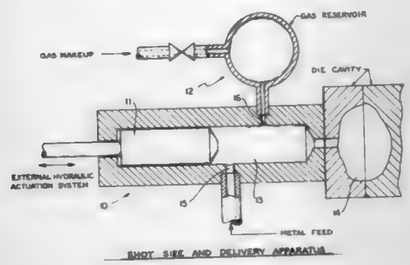
1. A method for reducing residual carbon ash and surface flaws on metal castings produced by an evaporative pattern casting process in which an organic foam is shaped into a particular pattern to be reproduced by molten metal, said foam pattern being embedded in a support medium, whereby when said foam is subsequently contacted with molten metal whereby the organic foam vaporizes leaving a metal replica of the foam pattern in the support medium, said method comprising: using an organic foam comprising a polymer formed by polymerizing CO_2 with one or more oxirane compounds.

4,633,930

MOLTEN METAL SHOT SIZE AND DELIVERY MECHANISM FOR CONTINUOUS CASTING OPERATIONS

Hugh C. Behrens, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 11, 1985, Ser. No. 743,343
Int. Cl.[4] B22D *17/10, 23/00*
U.S. Cl. 164—66.1 **2 Claims**



SHOT SIZE AND DELIVERY APPARATUS

1. A shot size and delivery device comprised of
a body having a chamber,
a retractable ram within said chamber,
a metal inlet in the lower side of said chamber at a position in the length of said chamber near the retracted position of said ram,
a gas inlet in the upper side of said chamber positioned forward of said metal inlet relative to said retracted ram position,
a source of molten metal under a positive pressure associated with said metal inlet,
a source of inert non-reactive gas associated with said gas inlet, and
a source of power to move said ram.

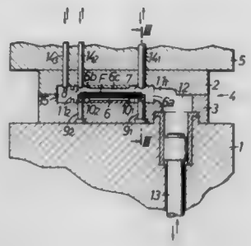
2. A method for delivering a measured quantity of molten metal to a casting machine which comprises providing a source of molten metal under a positive head pressure to the inlet of a shot size and delivery device as set forth in claim 1, providing a source of inert gas or mixture of gases of reduced oxidizing potential containing a metal protective gas to the gas inlet of said device, said device associated with a casting machine having mold or die(s) to receive the molten metal, programming the movement of the ram of said device to move into the closed position when the amount of molten metal delivered to the device is sufficient to fill the mold or die cavity, and supplying the inert gas to the device under sufficient pressure to sweep the chamber and the mold or die of oxidizing ambient atmosphere, closing by movement of the ram past the metal inlet and subsequently past the gas inlet, both the metal inlet and the gas inlet being positioned along said chamber such that the ram will seal off said inlets prior to its full length of travel and continuing the movement of the ram until the mold cavity is under sufficient pressure to insure the die has been completely filled, said gas being admitted to the chamber and the mold or die during the retraction of the ram and throughout the metal filling step.

4,633,931

METHOD OF PRODUCING FIBER-REINFORCED COMPOSITE BODY

Fumio Yamaguchi, Sakado; Yoshiaki Nakaniwa, Sayama; Yoshiaki Masuda, Kawagoe; Hisayuki Sakurai, Kasukabe, and Waichiro Nakashima, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1984, Ser. No. 589,515
Claims priority, application Japan, Nov. 1, 1983, 58-205559
Int. Cl.[4] B22D *19/14*
U.S. Cl. 164—110 **19 Claims**



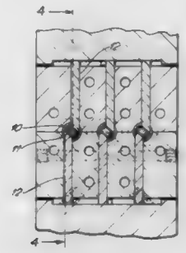
1. A method of producing a fiber-reinforced composite body comprising the steps of:
arranging a fiber shaped article in a cavity of a casting mold;
filling a molten metal acting as a matrix into said cavity and subjecting it to primary pressure;
holding said molten metal under said primary pressure for a predetermined period of time to bring said molten metal into a semi-solidified state; and
subjecting said molten metal now in said semi-solidified state, to a hydrostatic pressure of a magnitude greater than said primary pressure while a secondary pressure of higher magnitude than said primary pressure is additionally and simultaneously applied locally in proximity to at least one end of said fiber shaped article to completely fill said molten metal into said fiber shaped article to integrate said metal and said article.

4,633,932

METHOD AND APPARATUS FOR FORMING AN INTERNALLY SCREW-THREADED ARTICLE

James M. Ferguson, Glasgow, Scotland, assignor to Dynacast International Limited, England

Filed Aug. 10, 1984, Ser. No. 639,394
Claims priority, application United Kingdom, Aug. 20, 1983, 8322469
Int. Cl.[4] B22D *29/00, 17/24*
U.S. Cl. 164—131 **8 Claims**



1. The method of casting or moulding an article having an accurately formed internally screw-threaded hole in a mould body formed with a cavity shaped to define the exterior contour of the article by introducing casting or moulding material into the mould cavity around a core pin formed with two diametrically opposite segments of a male image of the female internal screw thread to be formed in the article, said segments of the core pin being separated by diametrically opposite flutes which are deeper than the depth of the screw-threads on the segments, the angle subtended at the axis of the pin by the segments being less than the angle subtended by the flutes at said axis, in which ther are included the steps of moving two withdrawable flat core members through slots formed in the sides of the mould body into the mould cavity in a direction transversely of the core pin such that the core members are guided accurately toward the core pin with their leading ends entering and fitting snugly into respective flutes in the core pin and engaging the core pin such that the core pin is located between them accurately in the mould cavity before the casting or moulding material is introduced into the mould cavity and, after the casting and moulding material has been introduced into the cavity and has set therein, withdrawing the core members through the slots in the mould body from engagement with the core pin, the method being thereupon completed by rotating the core pin through an angle sufficient to cause the screw-threaded segments to occupy a position within the angular position formerly occupied by the flutes of the core pin, withdrawing axially the core pin from the mould and removing the article from the mould cavity.

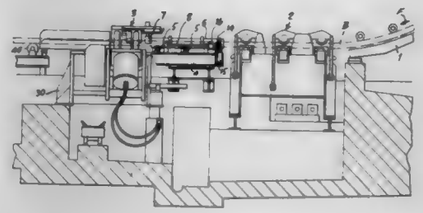
2. Apparatus for forming by casting or moulding an article having an internally screw-threaded hole, including a mould body formed with a cavity shaped to define the exterior contour of the article to be formed and provided with at least one passage for introduction into the cavity of casting or moulding material, in which the mould body is formed with a bore coaxial with the screw-threaded hole to be formed in the article and open to the cavity, and with two slots extending outwardly from the cavity to the outside of the mould body in opposite directions transversely of the axis of the bore, a core pin slidable through the bore into the cavity, said core pin being formed with the diametrically opposite segments formed as male images of segments of the female screw thread to be formed in the cavity, said segments on the core pin being separated by flutes deeper than the depth of the screw threads on the segments, the angle subtended by the segments on the core pin at the axis of the pin being less than the angle subtended by the flutes at said axis, two flat core members slidable transversely of the axis of said bore through said slots, said core members having their leading ends formed to fit snugly into respective flutes in the core member, means for moving the flat core members through the slots into and out of the mould cavity so that in their movement into the mould cavity their leading ends enter the respective flutes in the core member and engage the core member accurately between them and in their movement out of the mould cavity they move out of engagement with the core pin, and means for inserting, withdrawing and rotating the core pin through a predetermined angle.

4,633,933

CONTINUOUS CASTING PLANT

Piero Colombo, Udine, Italy, assignor to Continua International Continuous Casting, Italy

Filed Feb. 15, 1985, Ser. No. 702,022
Claims priority, application Italy, Feb. 17, 1984, 12436 A/84
Int. Cl.[4] B22D *11/126, 11/16*
U.S. Cl. 164—154 **6 Claims**



1. A continuous casting plant including a casting path comprising:
a casting mold;
a casting line providing a curved guide path for bending a casting emerging from said casting mold from a substantially vertical direction to a substantially rectilinear direction different from the vertical;
a straightening machine;
a cutting device for shearing the casting into consecutive sections of predetermined length; and
means for stepwise feeding a tail end section of the casting across the cutting device including a least one longitudinal pushing-expelling device having a fluid-operated pushing-expelling cylinder and means for alternately moving said cylinder between a rest position in which said cylinder is disposed clear of the casting path and an operative position in which said cylinder is disposed in the casting path between the straightening machine and the cutting device rearwardly of the tail end section of the casting.

2. A continuous casting plant according to claim 1, comprising two or more casting lines, characterized by the fact that the said means for stepwise feeding the tail end section of the casting across the cutting device and for operating said cutting device after each of the said feed steps are provided only in correspondence of one casting line, programming means being provided for automatically controlling the operation of the plant in such a manner that the said tail end section is formed only in correspondence of the one casting line provided with the said stepwise feeding means, whilst the casting operation on any remaining casting lines is interrupted automatically whenever a last section of the casting being cast has reached a prefixed length.

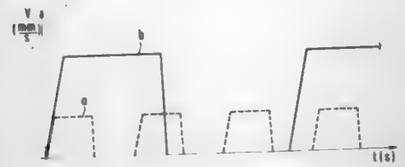
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4,633,934

HORIZONTAL CONTINUOUS CASTING METHOD

Klaus-Peter Ehlert, Moers; Achim Kubon, Neukirchen, and Peter Voss-Spilker, Kempen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 749,555
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1984, 3426169
Int. Cl.[4] B22D *11/128*
U.S. Cl. 164—484 2 Claims



1. Method of continuous casting of metal, particularly steel, to obtain thin and wide ingots under utilization of a casting vessel and a mold for continuous casting the mold being fed intermittently comprising the steps of:

providing a continuous casting mold capable of casting thin and wide ingots, wherein said thin and wide ingots have a width at least twice the thickness of the ingot, and the length of the mold is at least twice the length of an extraction length,

extracting an ingot from said mold in repeating cyclic steps, wherein each of said cyclic steps includes:

(i) an extraction step which includes extracting the extraction length of said ingot at an extraction speed, wherein said extraction length exceeds 50 mm and said extraction speed is greater than 3 meters per minute but less than or equal to 20 meters per minute; and

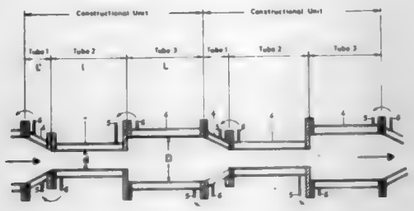
(ii) following said extraction step is a holding period, said holding period being equal to or greater than one second, but less than 5 seconds.

4,633,935

METHOD FOR THE COOLING OF HOT GASEOUS SOLIDS SUSPENSIONS OF TITANIUM DIOXIDE

Achim Hartmann, Pulheim, and Dietrich W. Schönherr, Odenthal, both of Fed. Rep. of Germany, assignors to Kronos Titan-GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 463,409, Feb. 3, 1983, Pat. No. 4,569,387. This application Apr. 1, 1985, Ser. No. 718,523
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1982, 3205213
Int. Cl.[4] F24H *3/00*
U.S. Cl. 165—1 8 Claims



1. A method for cooling a hot gaseous TiO_2 suspension resulting from the production of titanium dioxide by oxidation of titanium tetrachloride in the vapor phase comprising:

passing said gaseous suspension through a first cooling zone having a generally conically tapering flow path having a length L', said flow path tapering downwardly in the direction of flow;

passing the gaseous suspension from said first cooling zone through a second, contiguous cooling zone having a generally cylindrical flow path and said cylindrical flow path having a diameter d;

passing the gaseous suspension from said second cooling zone through a third, contiguous cooling zone, said third cooling zone having a pathway of diameter D and the ratio $L'/(D/2-d/2)$ is from 20:1 to 5:1, the flow path of said gaseous suspension being abruptly expanded upon passing from said second cooling zone to said third cooling zone;

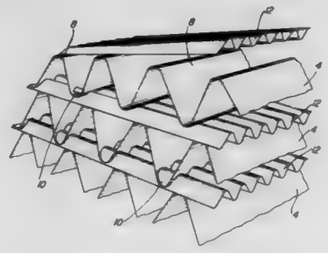
said first, second and third cooling zones being externally cooled.

4,633,936

HEAT EXCHANGER

Sven M. Nilsson, Småkullevägen 18, S-430 50 Kållered, Sweden

PCT No. PCT/SE83/00415, § 371 Date Jul. 27, 1984, § 102(e) Date Jul. 27, 1984, PCT Pub. No. WO84/02179, PCT Pub. Date Jun. 7, 1984
PCT Filed Nov. 29, 1983, Ser. No. 638,466
Claims priority, application Sweden, Nov. 30, 1982, 8206809
Int. Cl.[4] F28D *19/00*
U.S. Cl. 165—8 5 Claims



1. A heat exchanger comprising two metal webs arranged in superposed relationship and wound about a core, the first one of said webs being formed with corrugations extending in the crosswise web direction, said corrugations forming channels throughout the heat exchanger, the second of said webs having a wavy configuration with the waves extending in the lengthwise direction, said heat exchanger forming, in its operational condition, a rotating wheel wherein the exchange of heat is obtained by rotating the wheel between flows of fluid of different temperatures so that said fluid flows are heated or cooled by the walls of said channels, characterised in that the two webs are joined together through mutual frictional abutment, the second web being highly tensioned in its lengthwise direction, whereby the two webs will be pressed hard together, said waves of said second web being arranged, when the two webs are joined together, to press into the ridges and depressions of the corrugations formed in said first web and said second web being attached by its outer end relative to the rest of the wheel.

4,633,937

METHOD AND APPARATUS FOR MULTI-ZONE AIR DISTRIBUTION SYSTEM

Andre H. Zilbermann, Dallas, Tex., assignor to Brandt Engineering Company, Dallas, Tex.

Filed Nov. 26, 1984, Ser. No. 674,878
Int. Cl.[4] F24F *3/00*
U.S. Cl. 165—22 20 Claims

1. An air conditioning and distribution system, comprising:

(a) an interior distribution zone, including

a plurality of first controllable dampers for distributing and regulating cooled air, and

a first thermostatic controller for each said first controllable damper;

(b) a skin distribution zone, including

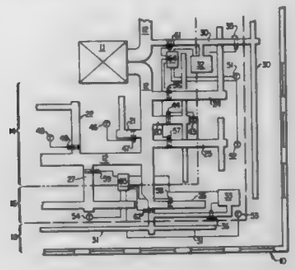
a second controllable damper for regulating the overall flow of cooled air through said skin zone,

a controllable air mixing box having a return air fan, and

a heater downstream of said second controllable damper and said mixing box;

(c) a perimeter distribution zone, including

a plurality of third controllable dampers, and



a second thermostatic controller for each said third controllable damper; and

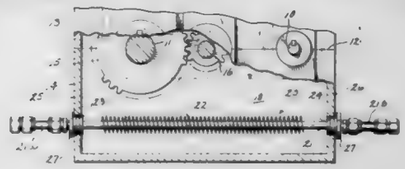
(d) thermostatic control means independent of said interior distribution zone for said skin distribution zone including means for deriving a single skin control output from said second thermostatic controllers indicative of a selected thermal load in said perimeter zone for regulating said second controllable damper, said air mixing box, and said heater.

4,633,938

GEAR DRIVE COOLING SYSTEM

Richard A. Schunck, New Berlin, and Richard W. Holzman, Waukesha, both of Wis., assignors to The Falk Corporation, Milwaukee, Wis.

Filed Aug. 8, 1985, Ser. No. 763,647
Int. Cl.[4] F16H *57/04*; F01M *5/00*; F01P *11/08*; F16N *39/02*
U.S. Cl. 165—47 3 Claims



1. In a gear drive that has meshing gearing mounted in an enclosure that provides a reservoir for a lubricant, a cooling system comprising:

pairs of bushings received in corresponding pairs of aligned openings in opposite walls of said enclosure;

a plurality of heat exchanger tubes each including a straight pipe and fins disposed about the pipe, the pipe of each tube extending at each end through a respective one of a pair of bushings;

fittings mounted in said bushings exterior of the enclosure and each including first sealing means sealing the perimeter of the pipes to thereby seal the lubricant in the enclosure from the surrounding environment; and

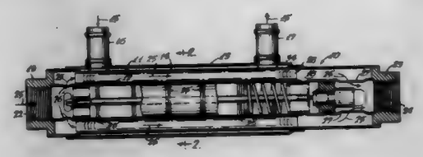
connections joining adjacent extending pipe ends exterior of the enclosure to form a continuous path of tubes, said connections each including second sealing means sealing the perimeters of the pipes to thereby seal a cooling fluid in the pipes from the surrounding environment.

4,633,939

HEAT TRANSFER DEVICE FOR OIL TEMPERATURE REGULATOR

Dennis C. Granetzke, Racine, Wis., assignor to Modine Manufacturing, Racine, Wis.

Filed Feb. 11, 1982, Ser. No. 348,096
Int. Cl.[4] B28D *7/10*
U.S. Cl. 165—154 11 Claims



1. A heat transfer device comprising:

first and second boundary members having surfaces spaced apart to define a fluid flow space;

a heat transfer member substantially spanning said space to be contacted by said fluid, said member comprising a deformable heat transfer material; and

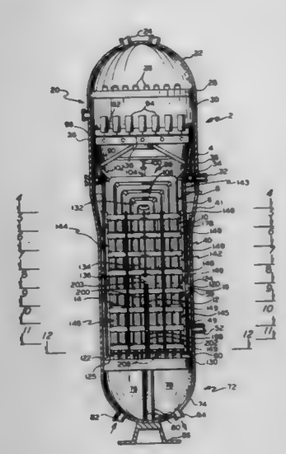
spaced contact members on one of said boundary members engaging, at correspondingly spaced locations, said heat transfer member compressively to provide snug heat transfer contact between said boundary members and said heat transfer member.

4,633,940

HEAT EXCHANGER

Cecil C. Gentry, and William M. Small, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 477,475, Mar. 21, 1983, abandoned, which is a division of Ser. No. 182,741, Aug. 29, 1980, Pat. No. 4,429,739. This application Jan. 16, 1985, Ser. No. 692,449
Int. Cl.[4] F28F *9/00*
U.S. Cl. 165—159 5 Claims



1. An apparatus comprising:

(a) a tube sheet having apertures therethrough;

(b) a tube bundle comprising a plurality of parallel tubes affixed to the apertures through the tube sheet, each tube affixed by at least one end to an aperture of the tube sheet,

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the tubes being arranged in at least a first plurality of parallel tube rows with lanes between the rows and a second plurality of parallel tube rows with lanes between the rows; and

(c) a baffle cage supporting the tubes, the cage comprising a series of rod baffles, each baffle having a plurality of parallel rods passing through at least a portion of the lanes between the parallel tube rows and supporting a portion of the plurality of parallel tubes, wherein the cage also comprises at least one longitudinal support member affixed to each baffle of the series of rod baffles and extending between the baffles in a direction generally parallel to the plurality of tubes; and

(d) at least one apertured baffle affixed to the at least one longitudinal support member of the baffle cage and positioned intermediate the tube sheet and the series of rod baffles so as to form a partition substantially across the tube bundle with substantially each of the tubes of the plurality of tubes passing through an aperture in the at last one apertured baffle.

4,633,941

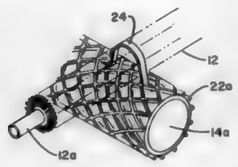
SLIT FIN COIL AND THE METHOD OF MAKING COILS

John R. McManus, Marcellus, and Lawrence W. Ubowski, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 682,114, Dec. 17, 1984. This application Feb. 3, 1986, Ser. No. 825,428

Int. Cl.[4] F28F *1/36*

U.S. Cl. 165—172 **3 Claims**



1. A slit fin heat exchanger formed from wrapped fin tubing including a tubular fluid conducting portion and a fin portion defining a plurality of radially extending tines spirally wrapped about said tubular portion comprising:

at least one circuit defining first and second rows of tubing with said tines of said tubing of said first row being in nesting contact with said tines of said second row for essentially their entire lengths to, thereby, lock said first and second rows together;

a piece of expanded metal located between said first and second rows and locked in place by said nested tines whereby said heat exchanger is rigidly supported; and

said first and second rows having at least one bend with the bend angle being between 30° and 120°.

4,633,942

SLIT FIN COIL AND THE METHOD OF MAKING COILS

John R. McManus, Marcellus, and William E. Wright, East Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 682,449, Dec. 17, 1984. This application Feb. 3, 1986, Ser. No. 825,503

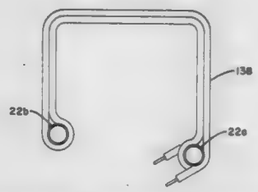
Int. Cl.[4] F28F *1/36*

U.S. Cl. 165—172 **3 Claims**

1. A slit fin heat exchanger formed from wrapped fin tubing including a tubular fluid conducting portion and a fin portion defining a plurality of radially extending tines spirally wrapped about said tubular portion comprising:

at least one circuit defining first and second rows of tubing with said tines of said tubing of said first row being in nesting contact with said tines of said second row for essentially their entire lengths to, thereby, lock said first and second rows together;

said first and second rows having a pair of expanded metal cylinders therebetween located, respectively, at each end



thereof with said tines of said first and second rows being in nesting contact with said expanded metal cylinders; and

said first and second rows having at least one bend with the bend angle being between 30° and 120°.

4,633,943

GRAVEL PACKER

Gary D. Zunkel, Chickasha, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jul. 19, 1985, Ser. No. 757,036

Int. Cl.[4] E21B *43/04*

U.S. Cl. 166—51 **20 Claims**

1. A retrievable gravel packer for placing a gravel pack in a wellbore about a gravel screen disposed therebelow across a producing formation comprising:

a gravel packer assembly;

a packer element disposed on the exterior of said assembly;

means in said assembly for selectively maintaining said packer element in an unset mode;

means in said assembly for releasably locking said packer element in a set mode;

an intake passage in said assembly for receiving fluid from a tubing string in said well bore above and secured to said gravel packer;

a return passage in said assembly for receiving fluid from the interior of said gravel screen;

a circulation passage extending from the exterior of said gravel packer assembly below said packer element to said intake passage;

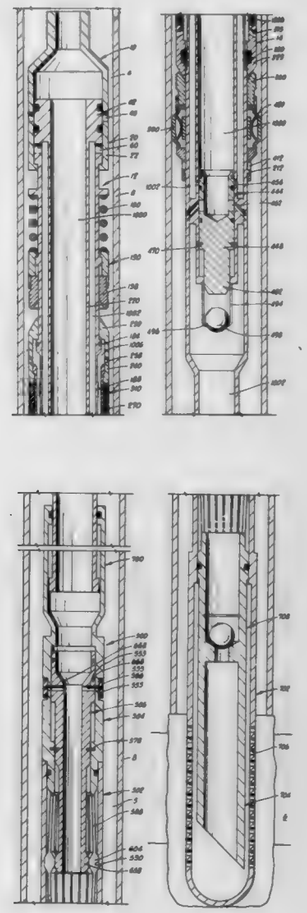
closeable crossover means to receive fluid from said return passage and guide said received fluid from said return passage to the exterior of said assembly above said packer element;

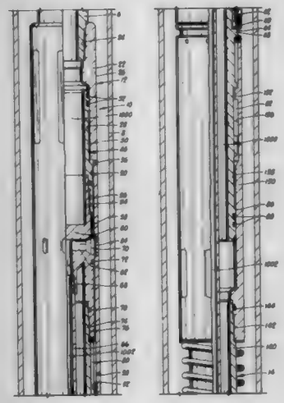
relief ports between said intake passage and said return passage;

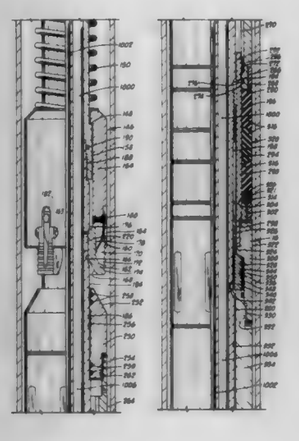
first valve means for closing said intake passage from said circulation passage;

second valve means for opening communication through said relief ports;

a check ball at the lower end of said gravel packer; and







check ball release means for selectively releasing said check ball from said gravel packer.

4,633,944

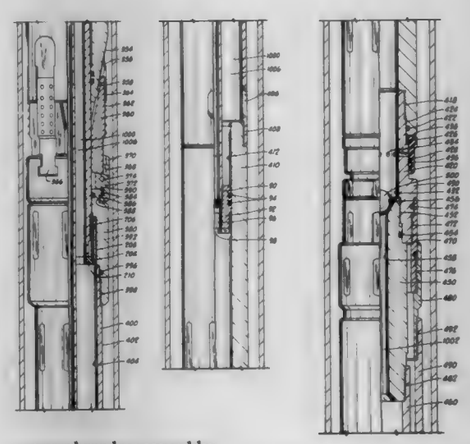
GRAVEL PACKER

Gary D. Zunkel, Chickasha, Okla., and Michael L. Bolin, Knoxville, Tenn., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 19, 1985, Ser. No. 756,885

Int. Cl.[4] E21B *43/04*

U.S. Cl. 166—51 **18 Claims**



1. A gravel packer for placing a gravel pack in a wellbore about a gravel screen disposed therebelow across a producing formation comprising:

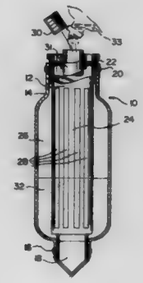
a gravel packer assembly;

a packer element disposed on the exterior of said assembly;

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ratchet means in said assembly for releasably locking said packer element in a set mode;
an intake passage in said assembly for receiving fluid from a tubing string in said well bore above and secured to said gravel packer and guiding said fluid to a location below said packer element in said assembly;
a return passage disposed in said assembly for receiving fluid from the interior of said gravel screen;
a circulation passage extending from the exterior of said gravel packer below said packer element to said intake passage;
closeable crossover means at the upper end of said return passage adapted to receive fluid therefrom and guide said received fluid from said return passage to the exterior of said assembly above said packer element;
first check valve means in said return passage for preventing flow to said gravel screen through said return passage;
second check valve means above said first check valve means adapted to selectively communicate said return passage and the exterior of said gravel packer below said packer element in response to a positive pressure differential between said return passage and the exterior of said gravel packer; and
J-slot means above said packer element and ratchet means for selectively disconnecting said crossover means, the upper portion of said return passage and said tubing string from said assembly in response to longitudinal and rotational movement of said tubing string.

4,633,946
BORE HOLE PLUG
Jim Jackson, Carvel, Canada, assignor to J.J. Seismic Flowing Hole Control (C.I.), Inc., Carvel, Canada
Filed Oct. 15, 1984, Ser. No. 661,227
Int. Cl.[4] E21B *33/13*
U.S. Cl. 166—187 **9 Claims**



1. A bore hole plug comprising:
a central support member;
an expandable sleeve secured about said central support;
a first reactant chemical within said sleeve which is capable of reacting with a second reactant chemical or catalyst to form a closed cell foam;
a second reactant chemical or catalyst; and
means for enabling said second reactant chemical or catalyst to contact said first reactant chemical within said sleeve.

4,633,945
PERMANENT COMPLETION TUBING CONVEYED PERFORATING SYSTEM
James M. Upchurch, Sugar Land, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.
Filed Dec. 3, 1984, Ser. No. 677,127
Int. Cl.[4] E21B *43/112*
U.S. Cl. 166—55.1 **1 Claim**

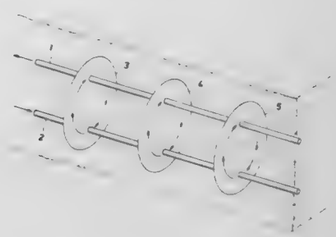
1. A permanent completion tubing conveyed perforating system for a wellbore, comprising:
a production tubing string;
a packer cooperating with said string to isolate an interval of the wellbore;
a perforating gun incorporated into said string for perforating said wellbore in said isolated interval;
a firing head incorporated into said string, said firing head being responsive to development thereacross of a predetermined difference between the pressure of fluids in the well annulus above said packer and the pressure of fluids in said isolated interval;
a gun removal mechanism included in the string to remove said gun and said firing head from the string after the gun has fired, leaving a passage for the flow of formation fluids from said isolated interval to the surface through said string;
means to route pressure to the firing head from said well annulus and from said isolated interval for development of said predetermined pressure; and
piston means for sealing communication through the pressure routing means between the annulus and the isolated interval upon removal of the gun and the firing head from the string.



4,633,947
PRODUCTION OF A POLYACRYLAMIDE SOLUTION USED IN AN OIL RECOVERY PROCESS
Wayne E. Luetzelschwab, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio
Filed May 23, 1985, Ser. No. 737,317
Int. Cl.[4] E21B *33/138, 43/22*
U.S. Cl. 166—252 **18 Claims**

1. A process for recoverying oil from a subterranean oil-bearing formation having performance demands comprising the steps of:
determining said performance demands of said formation;
determining correlations between an initial polymerization reaction parameter of initiator level and partially hydrolyzed polyacrylamide solution properties of screen factor and viscosity, each said correlation having a discontinuity;
selecting a value of said initiator level below each said discontinuity such that said selected value of said initiator level is capable of producing a partially hydrolyzed polyacrylamide solution having values of said properties of viscosity and screen factor relatively sensitive to varying said initiator level and capable of meeting said performance demands of said formation;
producing said partially hydrolyzed polyacrylamide solution having said values of said properties relatively sensitive to varying said initiator level and capable of meeting said performance demands by polymerizing an acrylamide monomer using a polymerization initiator at said selected value; and
injecting said partially hydrolyzed polyacrylamide solution into said formation to improve oil recovery therefrom.

4,633,948
STEAM DRIVE FROM FRACTURED HORIZONTAL WELLS
Philip J. Closmann, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Filed Oct. 25, 1984, Ser. No. 664,715
Int. Cl.[4] E21B *43/17, 43/24*
U.S. Cl. 166—271 **1 Claim**



1. In a process for producing oil from a relatively deep viscous oil reservoir, an improvement for increasing the rate at which oil production is initiated and maintained, comprising:
opening at least two horizontal wells within a portion of the reservoir in which hydraulic fractures tend to be vertical with said wells being substantially parallel to each other, perpendicular to the least principal compressive stress, and positioned so that at least one well is located near the top and at least one well is located near the bottom of the reservoir;
extending at least three substantially parallel vertical fractures between the wells;
heating at least one portion of the reservoir which lies between at least the outermost pair of said fractures by circulating hot fluid through all of those fractures at substantially the same time;
selectively injecting steam into at least said outermost pair of fractures adjoining a preheated portion of the reservoir while selectively producing fluid from at least one intermediately located fracture extending into a preheated portion of the reservoir between the pair of fractures into which steam is being injected; and
recovering oil from fluid being displaced horizontally from the pair of fractures into which steam is injected and being produced from said intermediately located fracture.

4,633,949
METHOD OF PREVENTING PRECIPITATION OF FERROUS SULFIDE AND SULFUR DURING ACIDIZING
Curtis W. Crowe, Tulsa, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.
Filed Feb. 12, 1985, Ser. No. 700,832
Int. Cl.[4] E21B *41/02, 43/27*
U.S. Cl. 166—279 **13 Claims**

13. A method of treating a subterranean earth formation penetrated by a wellbore comprising the steps of:
(a) injecting down the wellbore and into contact with the formation an aqueous acidizing solution comprising:
(i) water,
(ii) an acid,
(iii) an effective amount of an organic carboxylic acid iron complexing agent capable of stabilizing the ferrous, Fe(II), ion in solution in the presence of H_2S, thus inhibiting the precipitation of FeS, and
(iv) an effective amount of an iron reducing agent capable of reducing the ferric, Fe(III), ion at a pH of about 0.6 or less, thus inhibiting the formation of elemental sulfur; and
(b) shutting in the wellbore.

4,633,950
METHOD FOR CONTROLLING LOST CIRCULATION OF DRILLING FLUIDS WITH HYDROCARBON ABSORBENT POLYMERS
Harold J. Delhommer, Houston, and Clarence O. Walker, Richmond, both of Tex., assignors to Texaco Inc., White Plains, N.Y.
Filed May 28, 1985, Ser. No. 737,991
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—295 **11 Claims**

1. A method of reducing lost circulation of drilling fluids in a borehole penetrating an underground formation, comprising:
injecting a discrete slug of an aqueous fluid into a borehole, said aqueous fluid having dispersed therein a hydrocarbon absorbent polymer which expands upon absorbing a hydrocarbon; said polymer dispersed in the aqueous fluid in proportions sufficient to seal off a lost circulation zone upon contact with a hydrocarbon;
said hydrocarbon absorbent polymer selected from the group consisting of polymers and copolymers of styrenes and substituted styrenes, copolymers of vinyl chloride and vinyl acetate, polymers and copolymers of vinylidene chloride and acrylonitrile, polymers of methylmethacrylate and ethylacrylate, copolymers of styrene and divinylbenzene containing up to about 10 wt% of divinylbenzene, polymers and copolymers of alkylstyrenes, natural rubbers, and synthetic rubbers;
forcing the aqueous polymer slug into a lost circulation zone;
contacting the aqueous polymer slug with a hydrocarbon to allow the hydrocarbon absorbent polymer to absorb hydrocarbon and expand in the formation and borehole; and
circulating undesired compounds out of the borehole.

4,633,951
WELL TREATING METHOD FOR STIMULATING RECOVERY OF FLUIDS
Gilman A. Hill, Englewood; Richard S. Passamaneck, Littleton, and Kenell J. Touryan, Indian Hills, all of Colo., assignors to Mt. Moriah Trust, Englewood, Colo.
Filed Dec. 27, 1984, Ser. No. 686,990
Int. Cl.[4] E21B *43/26, 43/267*
U.S. Cl. 166—308 **32 Claims**

1. A method for fracturing a subterranean earth formation to stimulate the production of fluid from said formation wherein a wellbore extends at least to said formation from a surface point, said wellbore being provided with casing means forming a substantially fluid tight interior space, said method comprising the steps of:

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providing perforating means for perforating said casing means at a predetermined zone of said formation to provide for flow of fluids between said formation and said wellbore and placing said perforating means at said zone,
filling at least a portion of said wellbore with a compressible fracturing fluid comprised of a liquid containing dispensed quantities of gas and having a solid propant dispersed therein;



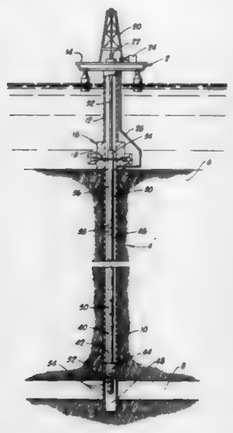
raising the pressure of said fracturing fluid in said wellbore to a predetermined pressure greater than the pressure required to hydraulically extend a fracture in said formation at said zone; and
actuating said perforating means to form apertures in said casing means and concomitantly generating a high gas pressure within said fluid whereby said pressurized fracturing fluid at said predetermined pressure is allowed to flow into said formation under decompression forces to fracture said formation with a quantity of said fracturing fluid and to prop fractures in said formation open with said propant.

4,633,952

MULTI-MODE TESTING TOOL AND METHOD OF USE

Paul D. Ringgenberg, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Apr. 3, 1984, Ser. No. 596,321
Int. Cl.[4] E21B *34/10, 49/08*
U.S. Cl. 166—336 **62 Claims**



1. A tool for use in a testing string disposed in a well bore, comprising:
tubular housing means defining a longitudinal tool bore;
valve means disposed in said housing means, including a sleeve valve for controlling communication between said tool bore and the exterior of said housing means, and a tool bore closure valve; and
operating means adapted to selectively open and close either said sleeve valve or said tool bore closure valve while the other of said valves remains inoperative, in response to sequential changes in pressure proximate said tool insaid well bore.

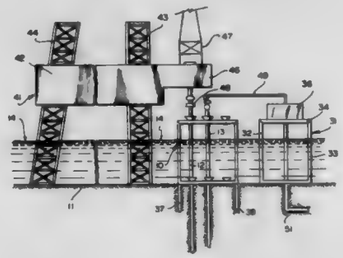
51. A method of operating a multi-mode downhole tool, having a longitudinal bore extending therethrough comprising:
running said tool into a well bore on a pipe string;
changing said tool between operating modes comprising a formation tester mode and a circulation mode through sequential changes of pressure in said well bore;
opening and closing a bore closure valve disposed in the bore of said tool a plurality of times while said tool is in said formation tester mode responsive to sequential changes in well bore pressure without changing said tool to a different operating mode.

4,633,953

METHOD FOR OFFSHORE PRODUCTION OF HYDROCARBONS CONCURRENTLY WITH THE INSTALLATION OF A STRUCTURE THEREFOR

Harry P. LeBoeuf, Morgan City; Allen J. Verret, and Paul D. Broussard, both of Berwick, all of La., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 23, 1984, Ser. No. 633,747
Int. Cl.[4] E21B *7/136, 43/017*
U.S. Cl. 166—358 **7 Claims**



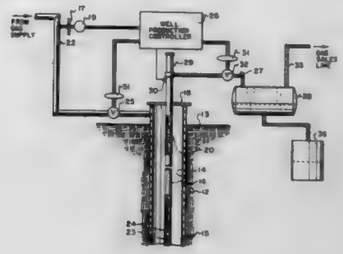
1. Method for producing hydrocarbon fluids from at least one hydrocarbon producing well formed in a subterranean hydrocarbon containing formation beneath an offshore body of water, which method includes the steps of;
installing a drilling template at the floor of said offshore body of water, said drilling template including at least one upstanding drill conductor which extends from said ocean floor to an elevation beyond the ocean's surface,
installing a second structure at the floor of said offshore body of water adjacent to said installed drilling template, said second structure including hydrocarbon fluid processing equipment,
and communicating said at least one hydrocarbon producing well with said processing equipment,
removably positioning a drilling vessel having an outboard drilling platform adjacent to said drilling template, such that said outboard drilling platform overlies the drilling template and is in vertical alignment with said at least one upstanding drill conductor,
completing at least one well into said formation from said overlying drilling platform through said at least one drill conductor,
producing hydrocarbon fluid flow from said at least one completed well,
displacing said drilling vessel from its position adjacent to the drilling template,
guidably positioning a protective jacket having an operating deck about said drilling template, while maintaining production of the hydrocarbon fluid flow from said at least one completed well, and
drilling further wells into said formation from drilling equipment on said operating deck, through other drill conductors in said drilling template.

4,633,954

WELL PRODUCTION CONTROLLER SYSTEM

Glen A. Dixon, The Colony, Tex.; Clark E. McCloskey, Yukon, Okla.; David L. Chambers; Woodrow D. Hawk, both of Garland, Tex., and Oliver W. McCracken, Pauls Valley, Okla., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 5, 1983, Ser. No. 557,950
Int. Cl.[4] E21B *34/16*
U.S. Cl. 166—372 **40 Claims**



1. A system for controlling the cyclic operation of a plurality of different petroleum production wells, each having a motor valve connected between the tubing and a flow sales line, comprising:
selectively programmable memory means;
means for storing in said memory a pair of signals associated with each one of said plurality of wells and which are indicative of a first time period during which the motor valve of that well should be open to permit production flow from the well and a second time period during which the motor valve of that well should be closed to shut in the well;
means responsive to the beginning of a cycle for opening the motor valve of the first well in the plurality of wells from which production flow is to be permitted and beginning the first time period of the first well and the second time period of all other wells;
means responsive to the sequential expiration of the second time periods of each of the other wells for storing in said memory means an indication of the sequence within which said second time periods expired; and
means responsive to the expiration of the first time period of each well having the motor valve open for simultaneously closing the motor valve of that well, beginning the second time period of that well, and opening the motor valve of the next well in sequence having had its second time period expire and beginning its first time period.

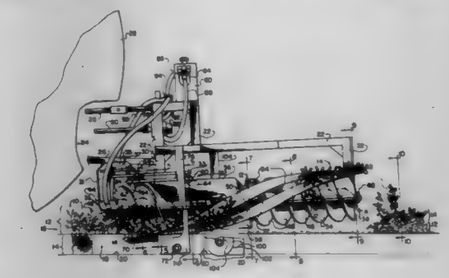
21. A method for controlling the cyclic operation of a plurality of different petroleum production wells, each having a motor valve connected between the tubing and a flow sales line, comprising:
storing in a selectively programmable memory a pair of signals associated with each one of said plurality of wells and which signals are indicative of a first time period during which the motor valve of that well should be open to permit production flow from the well and a second time period during which the motor valve of that well should be closed to shut in the well;
opening the motor valve of the first well in the plurality of wells from which production flow is to be permitted and beginning the first time period of the first well and the second time period of all other wells in response to the beginning of a cycle;
storing in said memory means an indication of the sequence within which said second time periods expire in response to the sequential expiration of the second time periods of each of the other wells; and
simultaneously closing the motor valve of a well, beginning the second time period of that well and opening the motor valve of the next well in sequence having had its second time period expire and beginning its first time period all in response to the expiration of the first time period of each well having the motor valve open.

4,633,955

DIGGER FOR ROOT CROPS

Tony R. Gresham, Portales, N. Mex., assignor to Lenard L. Bigler and Marshall W. Baker, both of Portales, N. Mex., part interest to each

Filed Apr. 11, 1985, Ser. No. 722,715
Int. Cl.[4] A01D *29/00, 25/04;* B65G *47/24, 47/44*
U.S. Cl. 171—1 **15 Claims**



1. An agricultural implement for digging root crops, including
a. a frame adapted for connection to
b. draft means for conveying the frame in a direction of shaft along spaced apart, parallel rows of said root crops;
wherein the improved implement comprises:
c. a screw conveyor journaled to the frame for rotation about a conveyor axis,
d. the screw conveyor having a forward end and a rear end,
e. the screw conveyor having at least one flight helically wrapped around a length thereof,
f. drive means connected to the frame for rotating the screw conveyor about the conveyor axis,
g. a guide pair connected to the frame and helically disposed around and adjacent to the screw conveor flights, such that
h. guides of the guide pair are spaced apart across a guide slot therebetween, with the guide slot having a mouth end associated with the forward end and a discharge end associated with the rear end,
i. the guide slot wraps helically around at least a portion of the conveyor length,
j. the mouth end of the guide slot is disposed below the conveyor, and
k. the discharge end of the guide slot is disposed above the conveyor.

4,633,956

ARRANGEMENT IN ROOT-CROP HARVESTING MACHINES

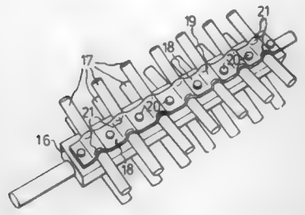
Nils B. Glifberg, Staffanstorp, and Wilhelm Bengtsson, Glumslöv, both of Sweden, assignors to Svenska Sockerfabriks AB, Malmo, Sweden

Filed Sep. 19, 1984, Ser. No. 652,309
Claims priority, application Sweden, Sep. 20, 1983, 8305033
Int. Cl.[4] A01D *17/06, 25/04, 27/04;* B65G *13/02*
U.S. Cl. 171—25 **2 Claims**

1. An arrangement in a machine for harvesting root-crops grown in rows, said machine comprising means for loosening and lifting the root-crops, a cleaning unit for cleaning the crops of soil and stones, said cleaning unit comprising:

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a plurality of mutually parallel cleaning rolls mounted on cores transversely of the direction of travel of the machine and driven about their respective central axes, each of said rolls including a plurality of resilient rods affixed generally orthogonally to said core, said rods being grouped in spaced apart pairs on opposite sides of said cores and including a plurality of said pairs along the length of said cores, wherein said core includes a quadrangular shaped member having at least two planar surfaces and wherein said rods are affixed in pairs on opposing surfaces of said quadrangular member, said cleaning rolls including clasp



means affixed to said core and formed with spaced apart arcuate bends to receive said rods with said bends being flanged at their peripheral edge to allow omnidirectional movement of said rods,

a continuous hold-down mat situated above said rolls, and having a lower portion located adjacent but spaced apart from said rolls,

first means for driving said rolls and second means for driving said mat at a speed independent of said first means and wherein said hold-down mat can be adjustably spaced from said rolls.

4,633,957

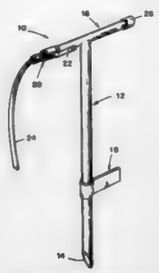
SOIL PLUGGER WITH PLUG EJECTOR

Claude D. Prost, 4009 Port Cleburne La., Hermitage, Tenn. 37076

Filed Apr. 15, 1985, Ser. No. 723,057

Int. Cl.[4] A01B *45/04, 45/02;* **F16K** *31/00;* **A01C** *11/00*

U.S. Cl. 172—22 **13 Claims**



1. A soil plugging and ejecting apparatus for being inserted into soil to form and remove a soil plug and for ejecting the plug, comprising:

an elongate tubular body having an upper and a lower end;

a circular cutting edge formed on said lower end of said tubular body, said edge operable to pierce and enter the soil to and remove a cylindrical soil plug in the lower end of said body when the apparatus is inserted into the soil;

a grip extending across and attached to said upper end of said tubular body forming a T-shaped configuration therewith for being held by an operator to guide and stabilize the apparatus as it is inserted into and removed from the soil;

elongated step means disposed on said body extending generally parallel to the grip for receiving downward pressure from the foot of the operator to force the apparatus into the soil;

a valve mounted on the apparatus proximate to the grip in fluid flow communication with said body and with means for connection with a source of pressurized water, said valve operable to be moved between a first and second position, and operable in its first position to be closed so that flow of pressurized water into said body is prevented and operable in its second position to be open allowing flow of pressurized water into said body to eject a plug; and

actuating means operable to actuate said valve to selectively admit pressurized water into said body to eject a plug formed in the lower end of said body after the apparatus has been removed from the soil.

4,633,958

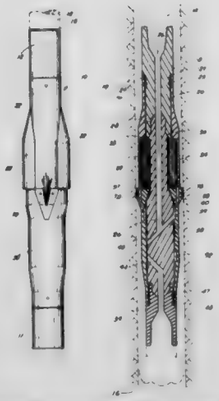
DOWNHOLE FLUID SUPERCHARGER

David E. Mouton, 104 Asphodel Pl., Mandeville, La. 70448

Filed Feb. 4, 1985, Ser. No. 698,135

Int. Cl.[4] E21B *21/12*

U.S. Cl. 175—65 **20 Claims**



1. A tool positioned intermediate a section of drill string and a drill bit, for assisting in downhole drilling, said tool comprising:

a. a tool body having a longitudinal fluid flow bore substantially therethrough for providing fluid to said drill bit;

b. means contained within said tool body for rotating a portion of said tool body to a first position interrupting fluid flow to said drill bit;

c. means positioned substantially exterior to said tool body in fluid communication with said fluid flow bore for allowing fluid flow to be jetted and diffused through the wall of said tool body when said portion of said tool body is in said first position; and

d. means contained within said tool body for further rotating said portion of said tool body to a second position resuming said fluid flow to said drill bit and interrupting said fluid flow to said wall of said tool body.

4,633,959

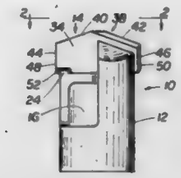
DRILL HAVING MEANS FOR LOCATING CUTTING BIT IN A BIT HOLDER

John D. Knox, Louisville, Ky., assignor to Vermont American Corporation, Louisville, Ky.

Filed Jun. 26, 1985, Ser. No. 748,857

Int. Cl.[4] E21B *10/58, 10/62*

U.S. Cl. 175—410 **7 Claims**



1. A drill comprising:

(a) a generally cylindrical drill head;

(b) a web located proximate one end of the drill head extending diametrically across the drill head;

(c) means defining a first wall surface generally perpendicular to the web and extending part way along one longitudinal side of the web to the periphery of the drill head;

(d) means defining a second wall surface generally perpendicular to the web and extending part way along the other longitudinal side of the web to the periphery of the drill head in the diametrically opposite direction to that in which the first wall surface extends such that the first and second wall surfaces are in off-set parallel planes;

(e) first drill bit blade locating means defining a first inclined surface projecting from the web, spaced transversely across the web from the first wall surface and slanting toward the first wall surface, the first inclined surface being closer to the first wall surface than to the second wall surface;

(f) second drill bit blade locating means defining a second inclined surface projecting from the web, spaced transversely across the web from the second wall surface and slanting toward the second wall surface, the second inclined surface being closer to the second wall surface than to the first wall surface;

(g) a generally planar drill bit blade having a width smaller than the transverse distance between the first and second wall surfaces and a generally flat bottom surface adapted to rest on the web; and

(h) a first beveled surface formed in the flat bottom surface of the drill bit blade for receiving the first inclined surface with the first beveled surface in at least partial facing contact with the first inclined surface; and

(i) a second beveled surface formed in the flat bottom surface of the drill bit blade for receiving the second inclined surface with the second beveled surface in at least partial facing contact with the second inclined surface.

4,633,960

CRAWLER TRACK HYDRAULIC TRANSMISSION CONTROL SYSTEM

Rudolf Horsch, Davenport, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Dec. 6, 1985, Ser. No. 805,868

Int. Cl.[4] B62D *11/08*

U.S. Cl. 180—6.7 **1 Claim**

1. A transmission control system for a crawler drive having right-hand and left-hand crawler tracks respectively driven by a transmission assembly having right-hand and left-hand clutch means for selective delivery of power to a respective one of the tracks, and right-hand and left-hand brake means for selective braking of a respective one of the tracks, comprising:

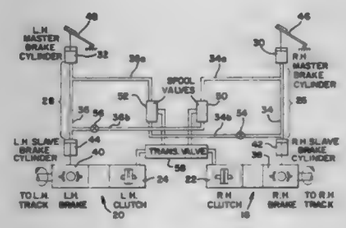
right-hand brake cylinder means selectively operable for generating a first brake fluid pressure and for selectively applying said right-hand brake means in response thereto;

left-hand brake cylinder means selectively operable for generating a second brake fluid pressure and for selectively applying said left-hand brake means in response thereto;

right-hand conduit means associated in fluid communication with said right-hand brake cylinder means;

left-hand conduit means associated in fluid communication with said left-hand brake cylinder means;

right and left, independent, hydraulic spool valve means for sensing a difference in the respectively applied first and second brake fluid pressures, with said right spool valve means operatively coupled in fluid communication between said right-hand and said left-hand conduit means, and with said left spool valve means operatively coupled in fluid communication between said left-hand and said right-hand conduit means, each said spool valve means including movable valve spool means in fluid flow communication with a control input of a respective one of said right-hand and left-hand clutch means, each said clutch means maintaining driving engagement for the respective track in response to said right and left spool valve means both sensing a balance of said brake fluid pressures, with each said valve spool means being movable in response to pressurization of the respective brake cylinder means and a sensed difference in the first and second brake fluid

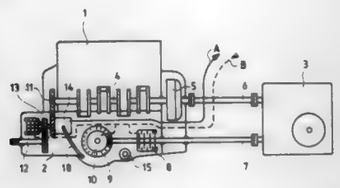


pressures, to thereby cause said respective clutch means to disengage the respective track;

right-hand, manually operable shut-off valve means operably positioned between said left spool valve sensing means and said right-hand conduit means, said right-hand shut-off valve means being positionable to block fluid communication between said left spool valve sensing means and said right-hand conduit means so that operation of said left-hand brake cylinder means results in said second brake fluid pressure being applied to said left-hand spool valve means for supplying fluid pressure therefrom to the control input of the respective left-hand clutch means to effect disengagement thereof; and

left-hand, manually operable shut-off valve means operably positioned between said right spool valve sensing means and said left-hand conduit means, said left-hand shut-off valve means being positionable to block fluid communication between said right spool valve sensing means and said left-hand conduit means so that operation of said right-hand brake cylinder means results in said first brake fluid pressure being applied to said right-hand spool valve means for supplying fluid pressure therefrom to the control input of the respective right-hand clutch means to effect disengagement thereof, whereby said system is operable to permit selective engine-braking of said crawler tracks attendant to simultaneous operation of said right-hand and left-hand brake cylinder means.

4,633,961
POWER TRANSMISSION ARRANGEMENT IN A TRACTOR
Hannu Niskanen, Jyväskylä , Finland, assignor to Valmet Oy, Finland
Filed Jan. 6, 1986, Ser. No. 816,621
Claims priority, application Finland, Jan. 9, 1985, 850108
Int. Cl.[4] B60K *25/02, 17/35;* **F16H** *37/00*
U.S. Cl. 180—53.7 **7 Claims**



1. In a four-wheel drive tractor including an engine having a crankshaft and an oil sump containing a reservoir of lubricant for said engine, a power transmission arrangement including power take-off shaft means for transmitting power from said engine crank shaft to external equipment, first transmission means and take-off shaft clutch means for transmitting power from said engine crank shaft to said take-off shaft means, a driving front axle, a differential gear of said front axle, said front axle differential gear having a differential lock, second transmission means for transmitting power from one of a tractor gearbox and a separate take-off gearbox to said front axle differential gear, four-wheel drive clutch means for coupling said second transmission means to said front axle differential gear, and means for steering said tractor, said steering means including a hydraulic steering pump,

the improvement in said power transmission arrangement comprising:

each of said front axle differential gear and differential lock, said four-wheel drive clutch means, at least part of said take-off shaft clutch means and first transmission means, and at least said hydraulic steering pump of said steering means, being situated within said oil sump;

each of said front axle differential gear and differential lock, said four-wheel drive clutch means and said take-off shaft clutch means is hydraulically operated; and

a hydraulic control system including means for fluidly coupling each of said differential lock, said four-wheel drive clutch means and said take-off shaft clutch means to said engine lubricant contained in said oil sump so that said engine lubricant operates the same.

4,633,962
ARTICULATED WHEEL CHAIR
Francis C. Cox, Colonial House-Apt. #3, Rural Rt. 1, Humboldt, Iowa 50548, and Darryl R. Cox, 611 Oakwood Dr.-#3, Sparks, Nev. 89431
Filed Dec. 2, 1985, Ser. No. 803,220
Int. Cl.[4] B60K *1/02*
U.S. Cl. 180—65.1 **8 Claims**

1. An articulated wheel chair comprising:

a front section having a pair of support wheels journaled thereon for support thereof,

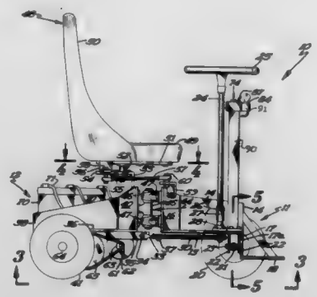
a rear section having a pair of propulsion wheels connected thereto for support thereof,

means pivotally connecting said front and rear sections together for pivotal movement therebetween about an articulating vertical axis,

power means on said rear section drivably connected to said propulsion wheels for driving the latter,

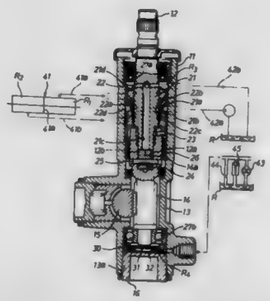
a seat pivotally mounted on said rear section for pivotal movement relative thereto,

a generally vertically disposed elongate steering rod on said front section and being rotatable about its longitudinal axis, means interconnecting said steering rod with said rear section to produce articulated pivotal movement between the sections in response to rotation of said steering rod,



and motion transmitting means interconnecting said front section with said seat for causing pivoting of the seat in response to articulated pivoting movement between the sections.

4,633,963
POWER STEERING APPARATUS
Akira Hasegawa, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Nov. 21, 1984, Ser. No. 673,985
Claims priority, application Japan, Nov. 21, 1983, 58-219310
Int. Cl.[4] B62D *5/08*
U.S. Cl. 180—143 **8 Claims**



1. A power steering apparatus for an automotive vehicle including rack means for actuating a steering mechanism, a primary source of fluid under pressure, a secondary source of fluid under pressure and responsive to the vehicle speed for supply of fluid under pressure proportional to the vehicle speed, and a hydraulic power cylinder for providing a hydraulic power assist to the driver's steering effort applied to the steering mechanism of the vehicle, the power steering apparatus comprising:

a housing;

an input member rotatably mounted in said housing;

an output pinion member directly connected to said rack means for actuating said steering mechanism, said output pinion member being rotatably and axially slidably mounted in said housing and arranged coaxially with said input member for relative rotation;

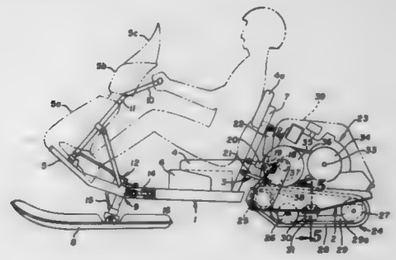
a valve rotor integral with said input member;

a valve sleeve rotatably mounted in said housing and arranged in surrounding relationship with said valve rotor, said valve sleeve being connected integrally with said output member to cooperate with said valve rotor for selectively directing fluid under pressure from said primary source to opposite ends of said power cylinder in response to relative rotation between said input member and said output pinion member;

cam means positioned between inner ends of said input member and said output pinion member and directly connected to said output pinion member in such a manner as to permit relative rotation of said input member and said output pinion member and to effect axial movement of said output pinion member upon the application of a predetermined manual torque to said input member; and

pressure means arranged to apply a hydraulic pressure to said output pinion member in an axial direction thereof from said secondary source for increasing the resistance to relative rotation between said input member and said output pinion member in accordance with an increase in vehicle speed.

4,633,964
SNOWMOBILE
Kirk A. Boyer, Lino Lakes, Minn., and Tesuo Imai, Shizuoka, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed Dec. 23, 1985, Ser. No. 812,912
Int. Cl.[4] B62M *27/02*
U.S. Cl. 180—190 **12 Claims**



1. A snowmobile comprising:

(a) a front frame member supporting a pair of steerable skis and a driver's seat;

(b) a rear frame member supporting an engine and a drive track device drivable by said engine; and

(c) a link mechanism having an upper arm assembly and a lower arm assembly, each pivotally coupled between the rear end of said front frame member and the front end of said rear frame member.

4,633,965
MOTORCYCLE
Yasuyuki Tsurumi, Fujimi, and Akio Matsuzaki, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 6, 1984, Ser. No. 647,775
Claims priority, application Japan, Sep. 6, 1983, 58-163813
Int. Cl.[4] B60K *11/00;* **B62D** *61/02*
U.S. Cl. 180—229 **8 Claims**

1. A motorcycle, comprising:

an engine;

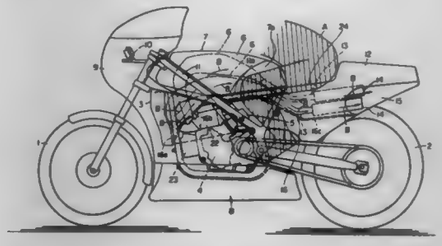
an intake system including a carburetor positioned on the rear side of said engine;

an exhaust system exiting from the front side of said engine;

a radiator mounted in front of said engine for cooling said engine by water;

a seat cowl mounted on the rear portion of the motorcycle including a seat for the rider, an upper plate behind said seat, and said plates extending downwardly from the sides of said upper plate and said seat; and

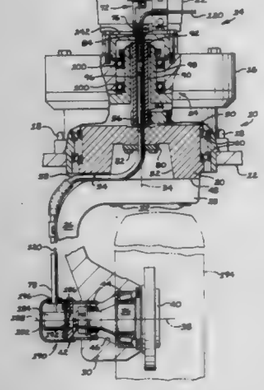
an air guide means extending from said radiator into said seat cowl and passing above said engine for guiding air having passed through said radiator, from the rear of said radiator into said seat cowl, such that the air passes above said engine and does not interact with said engine, said air guide means including,



(a) an inlet port receiving air having passed through said radiator, and being positioned between said radiator and said engine, and

(b) exhaust ports communicating with said inlet port and being positioned in said side plates behind a rider for exhausting air from said air guide means through said side plates.

4,633,966
SENSOR MOUNTING ARRANGEMENT
James R. Fotheringham, Willowick, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio
Filed Sep. 12, 1985, Ser. No. 775,193
Int. Cl.[4] B60T *8/02*
U.S. Cl. 180—253 **18 Claims**



1. A mounting arrangement, comprising:

a housing;

an output member having an axis and being connected to said housing and rotatable in said housing about said axis;

a first sensor having a body and an input shaft rotatably connected to said body, said input shaft having an axis and being rotatable about said axis;

means for connecting the input shaft to said output member at a location at which the input shaft is axially spaced from said output member, and substantially axially aligning the axis of said input shaft with the axis of said output member, said input shaft being rotatable in response to rotation of said output member; and

means for connecting the body of said first sensor to said

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housing and maintaining said first sensor body from rotation about the axis of the input shaft and for movement in at least one of an axial and radial direction relative to the input shaft axis, said means for connecting the first sensor body to said housing being movable, in response to said input shaft applying a force to said first sensor body in at least one of said anxial and radial directions relative to said input shaft axis, to permit said movement of the first sensor body and reduce the force applied to said first sensor body.

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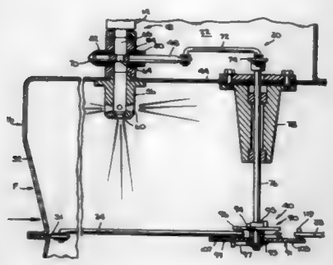
CIRCUMBENDIBUS SAFETY SYSTEM FOR A VEHICLE

William J. Kranz, Yonkers, N.Y., assignor to Consolidated Solar Industries Corp., Yonkers, N.Y.

Filed Jun. 4, 1984, Ser. No. 617,190

Int. Cl.⁴ B60K *28/10*; A62C *25/00*

U.S. Cl. 180—274 **16 Claims**



1. A circumbendibus safety system for dispensing fire extinguishant material into the fuel tank of a vehicle comprising,

(a) valve means comprising a first valve through which said fire extinguishant material is dispensed into said fuel tank, said first valve having a normally closed position to prevent dispensation of said fire extinguishant material into said fuel tank and an open position for permitting dispensation of said fire extinguishant material into said fuel tank,

(b) sensing means on said fuel tank for sensing a predetermined distortion of said fuel tank and moving a predetermined amount in response to said predetermined distortion,

(c) transmission means actuatable by said sensing means for moving said first valve from said normally closed position to said open position when said sensing means has moved said predetermined amount upon sensing said predetermined distortion.

4,633,968

BRAKE ACTUATING SYSTEM

Brian Fisher, and Raymond R. Westmoreland, both of Cropwell Bishop, United Kingdom, assignors to Fisher Westmoreland (UK) Limited, Nottingham, United Kingdom

Filed Nov. 29, 1984, Ser. No. 676,172

Claims priority, application United Kingdom, Dec. 2, 1983, 8332259; Jan. 9, 1984, 8400433; Mar. 15, 1984, 8406762; Mar. 15, 1984, 8406763

Int. Cl.⁴ B60T *7/12*

U.S. Cl. 180—275 **9 Claims**

1. An auxilary braking device for a vehicle operable when the vehicle is in a reversing condition said device comprising:

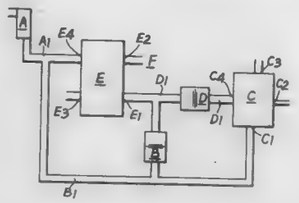
detecting means adapted to be mounted at the rear of a vehicle and comprising a deformable means arranged to generate a signal on contact with an obstruction;

first response means operable by a signal generated by placing the vehicle in a reversing condition;

second response means operable by said detecting means signal;

fluid control valve means adapted to be incorporated in the vehicle braking system and to actuate the vehicle brakes;

said first and second responsive means being arranged to control said valve means to cause actuation of the vehicle brakes; and



selective means for ensuring that said second response means is operable by said detecting means signal only when the first response means has been operated,

wherein said selective means is a valve which normally connects a fluid chamber to atmosphere and is operable to close the connection to atmosphere in response to operation of the second responsive means.

4,633,969

SIGNALLING DEVICE

Malcolm G. Palmer, 12 Forge Lane, Blakedown, Kidderminster, Worcestershire, United Kingdom

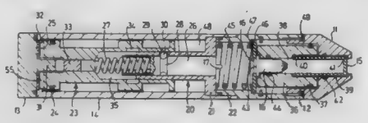
PCT No. PCT/GB83/00341, § 371 Date Aug. 30, 1984, § 102(e) Date Aug. 30, 1984, PCT Pub. No. WO84/02788, PCT Pub. Date Jul. 19, 1984

PCT Filed Dec. 22, 1983, Ser. No. 648,169

Claims priority, application United Kingdom, Jan. 12, 1983, 8300709

Int. Cl.⁴ G01V *1/06, 1/38*

U.S. Cl. 181—118 **8 Claims**



1. A signalling device comprising:

a hollow body within which there is a chamber,

a closure element which normally closes the chamber off from space outside the hollow body,

a source of gas adapted to charge the chamber with gas, whereby the pressure within the chamber is increased to rupture the closure element, and

triggering means for initiating release of gas from said source into the chamber,

wherein the hollow body includes first and second parts provided with respective threads which are mutually engaged to hold the parts releasably together, said first and second body parts having respective annular shoulders facing in respective directions along the threads towards each other, both shoulders being engaged with the closure element to trap the closure element between the shoulders, said closure element being adapted to be ruptured by a gas pressure within the chamber which gas pressure the hollow body can withstand without rupture.

4,633,970

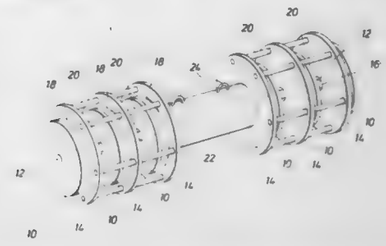
DISTRIBUTED MARINE SEISMIC SOURCE

Joseph F. Mifsud, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Jan. 3, 1984, Ser. No. 567,701

Int. Cl.⁴ G01V *1/135, 1/38*

U.S. Cl. 181—120 **10 Claims**



1. A marine seismic source suitable for producing a seismic signal in waterbody, said seismic source comprising:

a central housing having first and second ends and a longitudinal axis passing through said first and second ends:

first and second sets of back plates corresponding, respectively, to said fitst and second ends of said central housing, each of said sets of back plates comprising an initial back plate fixedly attached to the corresponding end of said central housing and one or more additional back plates positioned axially outwardly from said initial back plate in a spaced relationship along said longitudinal axis, each of said back plates having a central hole therethrough, said central holes being substantially coaxial with said longitudinal axis;

a plurality of frame rods interconnecting said back plates, whereby said back plates are fixedly positioned with respect to said central housing;

first and second actuators located within said central housing and corresponding, respectively, to said first and second ends of said central housing, said first and second actuators having variable output frequencies;

first and second drive rods corresponding, respectively, to said first and second actuators and said first and second ends of said central housing, each of said drive rods being fixedly attached to the corresponding actuator and extending axially outwardly through the corresponding end of said central housing and said central holes in said back plates;

first and second gangs of seismic radiator plates corresponding, respectively, to said first and second sets of back plates, said first and second drive rods, and said first and second actuators, each of said seismic radiator plates corresponding to hnd being located axially outwardly of one of said back plates and being attached to the corresponding drive rod, each seismic radiator plate further having an outer edge;

a plurality of first bellows means, each of said first bellows means corresponding to one of said seismic radiator plates and the corresponding back plate, each first bellows means being sealingly connected to said outer edge of said corresponding seismic radiator plate and to said corresponding back plate, thereby defining a cavity between said seismic radiator plate and said back plate;

a plurality of sealing means, each of said sealing means corresponding to one of said back plates and being adapted to prevent water from entering said cavity through said central hole in said back plate and to permit the corresponding drive rod to move longitudinally through said central hole;

each of said first and second actuators being adapted to oscillate the corresponding gang of seismic radiator plates through the corresponding drive rod so as to produce a repeating seismic signal having a frequency which varies with time in said waterbody, said first and second actuators being further adapted to oscillate said first and second gangs of seismic radiator plates substantially simultaneoulsly in opposite directions with respect to said central housing.

4,633,971

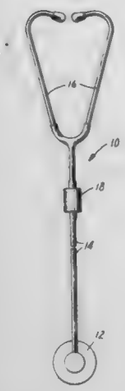
STETHOSCOPE WITH HIGH FREQUENCY FILTER

David L. Robbins, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 6, 1985, Ser. No. 796,016

Int. Cl.⁴ A61B *7/02*

U.S. Cl. 181—131 **10 Claims**



1. A low-pass filter for use in the binaural tubing of a stethoscope to attentuate high frequency noise and prevent the transmission of such noise to the user, comprising:

an inertance defined by a tube having an outer diameter sized to frictionally engage the inner diameter of said binaural tubing and an inner diameter substantially less than the inner diameter of said binaural tubing; and

a compliance defined by a chamber into which said inertance tube opens, said compliance chamber having a volume substantially greater than that of the inertance and being disposed between said inertance tube and said binaural tubing and in direct communication with said binaural tubing.

4,633,972

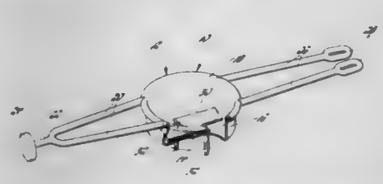
SPEAKER RETAINER

Benjamin K. DeRocher, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 3, 1985, Ser. No. 771,632

Int. Cl.⁴ H04R *7/20*

U.S. Cl. 381—188 **3 Claims**



1. In a vehicle panel having a speaker opening therethrough, the combination comprising, a speaker having a magnet portion and a cone portion, and a retainer for securing the speaker to the vehicle panel, said retainer including a generally cup-shaped portion for supporting the speaker magnet, and elastic

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attaching means extending oppositely of each other from the cup-shaped portion for securement to the vehicle panel adjacent the opening therethrough to resiliently hold the cone portion of the speaker against the panel around the panel opening.

4,633,973

ACOUSTIC APPARATUS

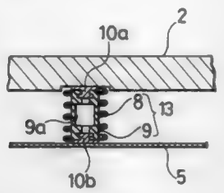
Toyoaki Kitano, Muko, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1985, Ser. No. 790,364

Claims priority, application Japan, Oct. 25, 1984, 59-225509; Apr. 3, 1985, 60-70358

Int. Cl.⁴ F16F *9/10*; G11B *17/00*

U.S. Cl. 181—207 **5 Claims**



1. An acoustic apparatus which, including a reproduction mechanism portion and a container for containing the same, comprises:

a suspension mechanism provided between the reproduction mechanism portion and the container, said mechanism including a first elastic element and a second elastic element;

said second elastic element comprising a pillar shaped viscous-elastic body produced to include a hollow section inside thereof;

the upper and the lower end of said second elastic element being fixed to the reproduction mechanism portion and the contanier, respectively; and

said first elastic element comprising a coil spring provided surrounding said second elastic element.

4,633,974

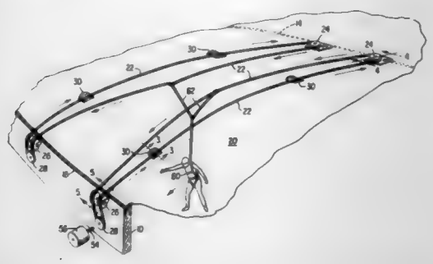
INFLATABLE ROOF SAFETY RIGGING SYSTEM

Robert I. Weiner, 305 W. Chesapeake Ave., Towson, Md. 21502, and Robert Magladry, 1125B Charles View Way, Towson, Md. 21204

Filed Nov. 12, 1985, Ser. No. 796,726

Int. Cl.⁴ A62B *37/00*

U.S. Cl. 182—3 **9 Claims**



1. A safety rigging system for use by workers moving on the exterior of an air-supported fabric roof structure which spans across peripheral walls comprising:

at least one endless cable;

for each said cable, a first pulley mounted on the roof structure at a point spaced from the peripheral wall, a pair of second pulleys mounted on the peripheral wall at the juncture thereof with said roof structure, and a third pulley mounted on the peripheral wall below said pair of second pulleys, said cable being entrained over said pulleys so as to define parallel cable runs extending across the roof surface between said first pulley and said pair of second pulleys and runs extending between said pair of second pulleys and said third pulley;

means for rotating said third pulley;

at least one safety line;

means for connecting said safety line to one of said cable runs on said roof surface; and

means for connecting the safety line to the worker.

4,633,975

UNDER-BRIDGE ACCESS ASSEMBLY

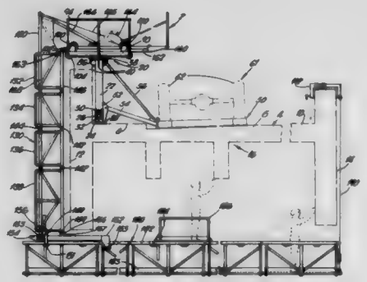
Richard C. Connor, New Milton, and Dennis A. Rule, Bournemouth, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 14, 1985, Ser. No. 711,493

Claims priority, application United Kingdom, Mar. 19, 1984, 8407141

Int. Cl.⁴ B66F *11/04*

U.S. Cl. 182—63 **5 Claims**



1. Apparatus for providing access to the underside of a bridge deck comprising:

(i) a support means positionable on said bridge deck:

(ii) a first cantilever support means mountable on said support means;

(iii) a plurality of tower modules separate from each other but selectively interengageable end to end such that they can be assembled to form a tower, and including a first tower module on which is rotatably mounted a second cantilever support means, each of said tower modules being separately engageable with said first cantilever support means so as to be advanceable therethrough whilst being supported thereby substantially horizontally such that a further tower module is engageable with a previous tower module supported by said first cantilever means and is advanceable into engagement with said first cantilever means to advance the previous tower module therethrough so that the further tower module is then supported by the first cantilever means and supports the previous tower modules which have been assembled and advanced through said first cantilever means; and

(iv) a plurality of platform modules separate from each other but selectively interengageable end to end such that they can be assembled to form a platform, each of said platform modules being separately engageable with said second cantilever support means when said first tower module is supported by said first cantilever support means such that each of said platform modules is advanceable through said second cantilever support means whilst being supported thereby substantially horizontally such that a further platform module is engageable with a previous platform module supported by said second cantilever means and the further platform module is advanceable into engagement with said second cantilever means to advance the previous platform module therethrough so that the further platform module is then supported by the second cantilever means and supports previous platform modules which have been assembled and advanced through said second cantilever means; and in which

(v) said tower is supportable by said first cantilever support means both substantially horizontally and substantially vertically; and

(vi) said platform is supportable by said second cantilever support means both substantially parallel to and substantially perpendicular to said tower.

4,633,976

METHOD OF CONTROLLING LUBRICATING-OIL QUANTITY FOR INTERNAL MIXER

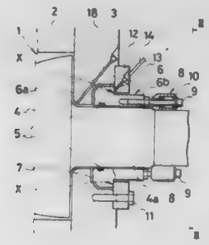
Yusaku Waki, Hiratsuka, and Hideki Aoyama, Yokohama, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1985, Ser. No. 799,751

Claims priority, application Japan, Aug. 12, 1983, 58-146716

Int. Cl.⁴ F01M *1/18, 11/10*

U.S. Cl. 184—6.4 **1 Claim**



1. A method of controlling the quantity of a lubricating oil for an internal mixer characterized in that oil supply ports connected to a lubricating oil supply source and a temperature sensor are disposed on a dust seal portion of seal ring for rotatably supporting rotors, the seal ring has a seal surface, the temperature of heat generated in said seal ring is detected by said temperature sensor, and the quantity of the lubricating oil to be supplied to the seal surface of said seal ring from said lubricating oil supply source is controlled in accordance with the temperature of heat generated in said seal ring.

4,633,977

MANUAL OVERRIDE CONTROL HANDLE SELECTIVELY ENGAGEABLE WITH THE VALVE SPOOL OF A SERVO VALVE

William K. Holmes, Delafield, Wis., assignor to Hi-Ranger, Inc., Waukesha, Wis.

Filed Aug. 5, 1985, Ser. No. 762,628

Int. Cl.⁴ B66B *9/20*

U.S. Cl. 187—9 R **6 Claims**

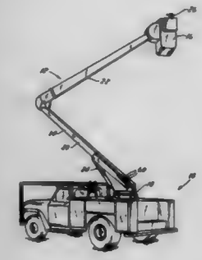
1. A hydraulic control valve comprising

a valve body having a valve bore and a plurality of hydraulic fluid ports communicating with said valve bore, and said valve bore having opposite ends,

a main valve control spool housed in said valve bore and supported therein for linear reciprocal movement to control hydraulic fluid flow through said fluid ports,

first means for controlling the position of said main valve control spool in said valve bore, said first means for controlling including a first spool position control means operably connected to one end of said valve bore, a second spool position control means operably connected to an opposite one of said ends of said valve bore, and means for controlling said first and second spool position control means, and

manual valve control means for selectively engaging said main valve control spool for controlling the position of said main valve control spool in said valve bore, said manual valve control means including a control lever, said control lever being supported for movement with respect to said valve body, and means for selectively providing a connection between said control lever and a portion said main valve control spool such that manual movement of said control lever with respect to said valve body causes controlled linear movement of said main valve control spool, said means for selectively providing a connection between said control lever and a portion of said main valve control spool including means for causing engagement of said control lever with said valve spool in response to initial manual movement of said control lever from a neutral position to a second position and whereby subsequent movement of said control handle causes controlled movement of said valve spool, and said valve spool being freely movable with respect to said control lever unless there is manual movement of said control lever from said neutral position to said second position, said control lever including one end adapted to be engaged by the operator and a movable portion movable between a first position wherein said movable portion engages said main valve spool to provide a connection between said control lever and said main valve spool to cause movement of said valve spool in response to movement of said one end of said control handle, and a second position wherein said movable portion is disengaged from said main valve spool and said main valve spool is freely movable with respect to said control lever.



4,633,978

BRAKE CALIPER INCLUDES MECHANICAL ACTUATOR WITH CAMMING DEVICE AND MANUAL WEAR COMPENSATOR

Stephen J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.

Filed Jul. 22, 1985, Ser. No. 757,698

Int. Cl.⁴ F16F *55/08*

U.S. Cl. 188—71.7 **26 Claims**

1. A brake caliper for applying a braking force to a rotating wheel, disc, or the like, the brake caliper comprising

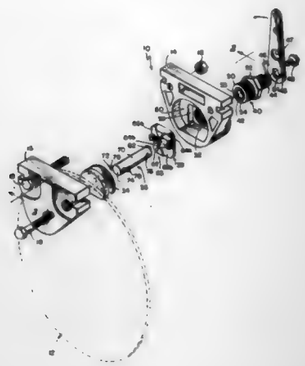
a brake actuator,

an actuator housing,

bearing means for rotatably and slideably receiving the brake actuator in the actuator housing, and

ramp means for displacing the brake actuator in an axial direction in relation to the actuator housing between an inactive position and a brake-actuating position in response to rotation of the brake actuator, the ramp means including a ramp block mounted in the actuator housing, the ramp block including at least one contoured camming surface, the brake actuator including means for riding on

the at least one contoured camming surface to displace axially the brake actuator during rotation thereof, and a shaft having a distal end, the ramp block being formed to include a shaft-receiving aperture to permit the distal end of the shaft to be positioned in proximity to the at least one contoured camming surface, and the riding means including a dowel pin mounted on the distal end of the received shaft to engage the at least one contoured camming surface so that the brake actuator is displaced in the axial direction selectively toward the inactive position or the brake-actuating position as the dowel pin rides on the at least one contoured camming surface during rotation of the brake actuator.

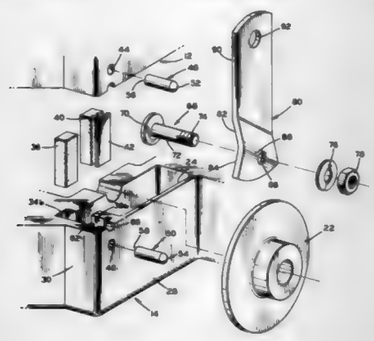


4,633,979

SIMPLIFIED DISC BRAKE

Douglas F. Edwards, Mt. Vernon, Ohio, assignor to The J. B. Foote Foundry Co., Fredericktown, Ohio

Filed Apr. 8, 1985, Ser. No. 721,043
Int. Cl.⁴ F16F *55/224*
U.S. Cl. 188—72.7 **4 Claims**



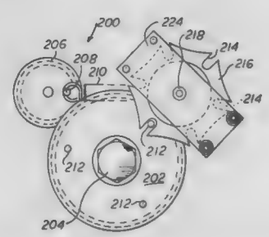
1. In combination, a housing having an upper part and a lower part non-integrally meeting along a mating line, an output shaft extending from the housing at the mating line, a brake disc rotatable with said output shaft, a first brake puck, said upper housing part having a first upper recess with an open lower end, said lower housing part having a first lower recess with an open upper end communicating with the lower open end of said upper recess to form a first puck pocket, a second brake puck, said upper housing part having a second upper recess with a lower open end, said lower housing part having a second lower recess with an upper open end communicating with the lower open end of said second upper recess to form a second puck pocket, said first puck pocket positioning said first brake puck in a position facing toward an inside surface of said brake disc which faces toward said housing, said second puck pocket positioning said second brake puck in a position facing toward an outside surface of said brake disc which faces away from said housing, with said first and second brake pucks being in alignment on opposite sides of said brake disc, said upper housing part having a pin passage communicating with said second upper recess, said lower housing part having a pin passage communicating with said second lower recess, pins in said passages, longitudinally movable therein, and positioned to move said second brake puck against the outer surface of said brake disc when said pins are moved toward said second brake puck, a mounting bolt having a shank and an enlarged head, said upper and lower housing parts having enlarged recesses communicating with one another at the mating line of said parts to receive and hold said head of said bolt, and said upper and lower housing parts having notches communicating with one another at the mating line to receive and hold said shank of said bolt, and a brake lever mounted on said mounting bolt and engagable with outer ends of said pins to move said pins when said lever is moved on said mounting bolt.

4,633,980

ROTARY MOTION DAMPING MEANS

William A. Lambertson, Pine Ridge Family Campground, Otts Shoals Rd. (Rte. 1), Roebuck, S.C. 29376

Division of Ser. No. 517,068, Jul. 25, 1983, Pat. No. 4,516,667. This application May 13, 1985, Ser. No. 733,627
Int. Cl.⁴ F16D *63/00*
U.S. Cl. 188—84 **2 Claims**



1. In a device including a member rotatable incrementally between succeeding spaced normally stopped positions thereof, damping means operable to hold said member at a normally stopped position but yieldable to a certain magnitude of force acting to rotate said member from said normally stopped position to a succeeding stopped position, said damping means further being operable upon release of said certain force to apply damping force to said member to bring it to a stopped position at the said succeeding stopped position, said damping means including

a fixed plate member,

a rotatable plate member in face-to-face juxtaposition with said fixed plate member,

bias means urging said two plate members into frictional face-to-face contact,

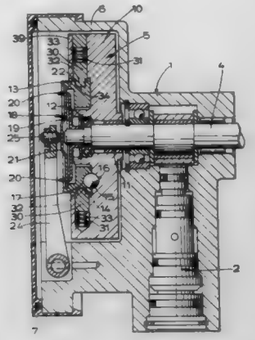
selective coupled cooperating drive means coupled to said incrementally rotatable member and said rotatable plate member, said cooperating drive means being coupled only during initial and terminal portions of the movement of said incrementally rotatable member between said normally stopped position and said succeeding stopped position, the frictional contact between said two plate members being sufficient to absorb the movement momentum of said incrementally rotatable member as it arrives at said succeeding stopped position and maintain it held thereat.

4,633,981

ROTARY FLYWHEEL SKID SENSING MEANS FOR VEHICLE HYDRAULIC BRAKING SYSTEMS

Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries Public Limited Company, Great Britain

Filed Feb. 22, 1985, Ser. No. 704,771
Claims priority, application United Kingdom, Mar. 7, 1984, 8405905; Jul. 23, 1984, 8418698
Int. Cl.⁴ B60T *8/40*
U.S. Cl. 188—181 A **8 Claims**



1. Rotary flywheel skid sensing means for a vehicle hydraulic braking system comprising a shaft adapted to be driven from a wheel to be braked for rotation about an axis, and a flywheel mechanism rotatable with said shaft, said flywheel mechanism comprising a flywheel member, a thrust member, and camming means responsive to relative angular movement between the said two members to cause one of the said members to move axially relative to the other of said two members between a first angular position in which the said members are in a predetermined angular alignment and a second angular position in which the said one axially movable member cooperates with means to actuate brake pressure modulating means, wherein centrifugally-operable locking means are provided for locking the said members together in the said first angular position against relative movement, and said locking means are automatically releasable in response to a centrifugal force of a magnitude which corresponds to a predetermined minimum road speed for the vehicle, said locking means comprising at least one weight which is movable in a plane normal to said axis of said shaft, and resilient means for urging said weight inwardly into a locking position to lock the said members together, and said weight being movable in an outward direction and into a disengaged position when said centrifugal force to which said weight is subjected attains a value greater than that corresponding to the said minimum road speed, whereafter said two members are free to move relative to each other, wherein one of said members has a radial bore, and the other of said members has a notch, said weight comprising a plunger which is guided in said radial bore and has an inner end, and said resilient means is adapted to bias said weight into engagement at said inner end in said notch in the said other member.

4,633,982

SYSTEM FOR WIDE BANDWIDTH DAMPING

Charles J. Swigert, 14827 Bestor Blvd., Pacific Palisades, Calif. 90272

Filed Feb. 11, 1985, Ser. No. 700,597
Int. Cl.⁴ F16F *15/03*
U.S. Cl. 188—267 **9 Claims**

1. A system for wide bandwidth damping, said system comprising:

a vibratable mechanical structure to be damped;

an input transducer responsive to an input signal to affect vibration of said mechanical structure;

an output transducer responsive to displacement vibration of said mechanical structure for producing an output signal in accordance therewith;

an active electronic feedback circuit connected from said output transducer for producing a positive feedback signal to each resonant mode to be damped;

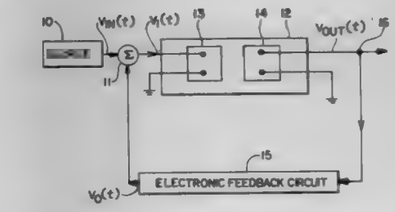
a signal souce; and

an input circuit for impressing an input signal on said input transducer directly proportional to the sum of the output signals of said source and said feedback circuit,

said feedback circuit supplying said feedback signal to said input circuit with a phase lagging the output signal of said output transducer by more than 0° and less than 180°, wherein:

said feedback signal has a phase which lags said output transducer output signal by approximately 90°, and wherein:

said input and output transducers are vibration sensitive transducers fixed to said structure in spaced relative positions;



said electronic feedback circuit is connected from said output transducer to said input transducer,

said circuit having a Laplace transfer function $H(\omega)$ where ω is radian frequency,

said circuit having circuit components with values such that $H(\omega)$ meets conditions (1), (2) and (3) as follows:

$$G(\omega)H(\omega)<1 \text{ for all } \omega \text{ when } Im[G(\omega)H(\omega)]=0 \quad (1)$$

$G(\omega)$ being the Laplace transfer function through said input transducer, through said structure and through said output transducer, $Im[G(\omega)H(\omega)]$ being the imaginary part of the complex product $G(\omega)H(\omega)$,

(2) $c_0 Re[H(\omega)]<1$, for all $\omega>0$ that $Im[H(\omega)]=0$, c_0 being a constant, $Re[H(\omega)]$ being the real part of the complex variable $H(\omega)$, and $Im[H(\omega)]$ being the imaginary part of $H(\omega)$, and

(3) $c_n Im[H(\omega)]>0$ for all $\omega>0$ and one or more of the modes to be damped, where for each said mode $n=1, 2, \ldots,$ each c_n being a constant, $Im[H(\omega)]$ being the imaginary part of the complex variable $H(\omega)$.

4,633,983

STRUT DAMPER WITH BASE VALVE AND CUP RETENTION

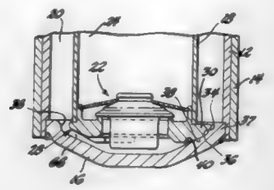
Richard A. Horvath; William E. Rank, and James E. Whelan, all of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 110,212, Jan. 7, 1980, abandoned. This application Dec. 21, 1981, Ser. No. 333,009
Int. Cl.⁴ F16F *9/34*
U.S. Cl. 188—322.14 **4 Claims**

1. A steerable suspension strut and damper assembly for a vehicle comprising a cylinder tube having upper and lower ends and having a damping fluid therein, a piston mounted for axial reciprocal movement in said cylinder tube, a piston rod attached to said piston and extending outwardly from the upper end of said cylinder tybe, closure means closing the

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upper end of said cylinder tube and having an opening therein for slidably receiving said piston rod, a reservoir tube disposed around said cylinder tube and cooperating therewith to form a fluid reservoir, a steering arm connected to said reservoir tube for turning said reservoir tube and steering said strut, base valve means operatively supported on the lower end of said cylinder tube, base cup means having an annular rim secured to the end of said reservoir tube for supporting said cylinder tube and said base valve means, said base valve means having a valve body with a plurality of arcuately spaced foot pad means



on the lower surface thereof, each of said foot pad means having a bottom surface for directly contacting the interior surface of said base cup means to define a plurality of fluid flow passages therebetween leading between said cylinder tube and said reservoir, each of said foot pads having end wall means at the outermost radial extremity thereof extending at a predetermined angle from the associated bottom surface directly engaging the inner side wall surface of said annular rim of said base cup means to limit side movement of the lower end of said cylinder tube with respect to said reservoir tube under high side loads when said strut is steered.

4,633,984

BRAKING ARRANGEMENT FOR A ROTARY DRIVE SYSTEM

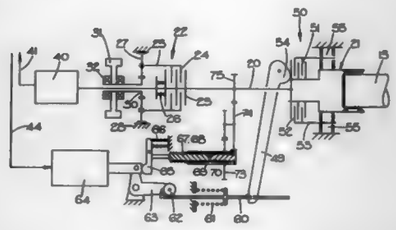
Philip Hudson, Wolverhampton, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed Dec. 3, 1984, Ser. No. 677,222

Claims priority, application United Kingdom, Dec. 20, 1983, 8333848

Int. Cl.⁴ B60K *41/24*

U.S. Cl. 192—9 **5 Claims**



1. A braking arrangement for a rotary drive system which includes a drive shaft and one or more geared actuators connecting said drive shaft to respective driven elements, said braking arrangement comprising an input shaft, means for connecting said input shaft to said drive shaft, an actuator operable by an input signal, braking means operable by said actuator and connected to said input shaft, and means for limiting angular rotation of said input shaft during operation of said braking means, said means for limiting angular rotation comprising a flywheel and gear means for coupling said input shaft to said flywheel so as to drive the latter at a speed greater than that of said input shaft.

4,633,985

CONTROL OF THE SUPPLY PRESSURE OF A HYDRAULIC ACTUATOR

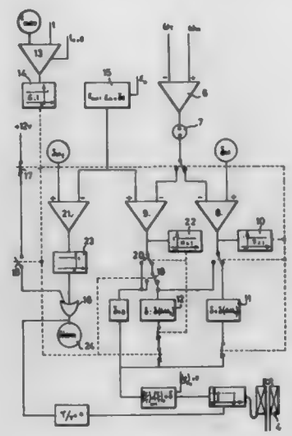
Francois Leorat, Versailles, France, assignor to Regie Nationale des Usines Renault, Boulogne Billancourt, France

Filed Mar. 22, 1984, Ser. No. 592,294

Claims priority, application France, Mar. 22, 1983, 83 04636

Int. Cl.⁴ F16D *47/06*

U.S. Cl. 192—0.055 **3 Claims**



1. A control device for controlling the hydraulic pressure of a hydraulic actuator of a transmission, said actuator including a cylinder and mating linings, comprising:

a controller for producing a control signal having a first input for receiving an engine speed signal ω_m, a second input for receiving a turbine speed signal ω_t, a third input for receiving an engine load signal α_C, a fourth input for receiving a vehicle speed signal V_v, a fifth input for receiving an enabling input E, and an output for transmitting said control signal;

a pressure modulator connected to said output of said controller, said modulator being controlled by said control signal and closed by a lack of current on said output of said controller;

said control signal being a function of the measurement of the slippage $\Delta\omega=\omega_m-\omega_t$ when α_C and V_v are less than preset threshold values, said control signal causing said pressure modulator to position said cylinder so that said linings mate;

said controller including a first comparator and a second comparator, said first comparator comparing $\Delta\omega$ to a first threshold $\delta\omega$ and said second comparator comparing $\Delta\omega$ to a second threshold ϵ,

whereby a large gain correction signal $\delta=\delta(\Delta\omega_1)$ is generated to modify said control signal if $\Delta\omega_1=\delta\omega-\Delta\omega$ is negative, a small gain correction signal $\delta=\delta(\Delta\omega_2)$ is generated if $\Delta\omega_1$ is positive and $\Delta\omega_2=\epsilon-\Delta\omega$ is negative, and a zero gain correction signal is generated if $\Delta\omega_1$ and $\Delta\omega_2$ are positive.

4,633,986

CLUTCH/BRAKE APPARATUS

Robert C. Matson, Waukesha, Wis., assignor to Industrial Clutch Corporation, Waukesha, Wis.

Filed Sep. 7, 1984, Ser. No. 648,321

Int. Cl.⁴ F16D *67/04*

U.S. Cl. 192—18 A **8 Claims**

1. A clutch/brake apparatus for alternatively clutching and braking a driven shaft and to be mounted on a machine frame stationary member, comprising:

a quill shaft support mounted to said machine frame stationary member and having said driven shaft extending therethrough;

a fly wheel driving member journaled on said quill shaft support;

a rotatable housing connected for rotation with said fly wheel driving member and having a radial cavity into which said quill shaft support and said driven shaft extend;

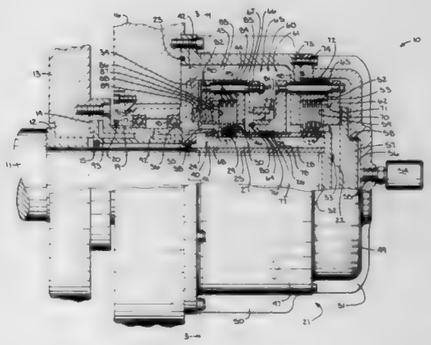
a first set of brake plates in said radial cavity operatively connected to said driven shaft to rotate therewith;

a second set of brake plates in said radial cavity interleaved with said first set of brake plates and operatively connected to said quill shaft support to be rotationally stationary with respect thereto;

a first set of clutch plates in said radial cavity operatively connected to said driven shaft for rotation therewith;

a second set of clutch plates in said radial cavity interleaved with said first set of clutch plates and operatively connected to said rotatable housing for rotation therewith;

an operator assembly for engaging said clutch plates and disengaging said brake plates when said operator assembly is moved in a first axial direction and for disengaging said



clutch plates and engaging said brake plates when said operator assembly is moved in a second axial direction opposite to said first axial direction, comprising:

a brake operator connected to be rotationally stationary with respect to said quill shaft support for urging said brake plates together when said operator assembly is moved in said second axial direction;

a clutch operator connected for rotation with said rotatable housing for urging said clutch plates together when said operator assembly is moved in said first axial direction;

a bearing for connecting said clutch operator to said brake operator so that said clutch and brake operators are rotationally independent but are constrained to move together axially;

a compression spring for biasing said operator assembly to cause said brake plates to be normally engaged and said clutch plates to be normally disengaged; and

an actuator connected for rotation with said rotatable housing to urge said operator assembly against the force exerted by said compression spring to cause said clutch plates to move into engagement and said brake plates to move out of engagement.

4,633,987

PRESSURE-MEDIUM ACTUATED SHIFTING ARRANGEMENT

Horst Rögner, Immenstaad; Roland Schacherer, Geisingen, and Gerold Bieber, Langenargen, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedshafen, Fed. Rep. of Germany

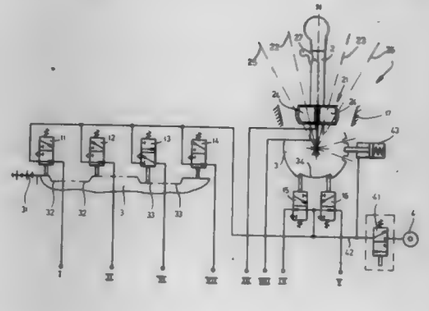
PCT No. PCT/EP84/00195, § 371 Date Apr. 4, 1985, § 102(e) Date Apr. 4, 1985, PCT Pub. No. WO85/00860, PCT Pub. Date Feb. 28, 1985

PCT Filed Jun. 27, 1984, Ser. No. 722,221

Claims priority, application Luxembourg, Aug. 12, 1983, PCT/EP83/00216

Int. Cl.⁴ B60K *41/22, 41/04*

U.S. Cl. 192—0.092 **12 Claims**



1. In a multispeed transmission of a vehicle having in a shifting console a speed-selection lever having a speed-selection lever shaft and displaceable in a double-H pattern by a driver of the vehicle, a transmission shaft shiftable in response to said lever for path selection and gear shifting, respective control valves responsive to displacement of said shaft, transmission-operating cylinders connected with said valves and receiving a pressure medium upon operation of said valves by said transmission shaft, a clutch connected with said transmission, and feedback means for transmitting to said driver through said speed-selection lever a perceptible indication of instantaneous shift position of the transmission and for locking out gear-shifting operation while said clutch remains closed, the improvement wherein;

said transmission shaft is provided with a plurality of cams rotatable upon rotation of said shaft by said speed-selection lever;

said control valves include respective pairs of three-port/-two-position valves actuated by each of said cams;

said control three-port/two-position valves are grouped in alignment parallel to an axis of said shaft for selective actuation for path selection and in circumferential alignment for gear shifting;

said cylinders include a three-position path selection cylinder and a two-position gear-shifting cylinder connected to said control three-port/two position valves;

a respective safety valve is provided between the three-position path selection cylinder and each said control three-port/two-position valve connected therewith to cooperate with said speed-selection lever shaft, said safety valve being open only in neutral position of said lever; and

a respective further three-port/two position valve is provided between said two-position gear-shifting cylinder and each said control three-port/two position valve being connected therewith, said further three-port/two-position valves being operated by further cams on said speed-selection lever shaft for arresting said two-position shifting cylinder in a median position.

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4,633,988

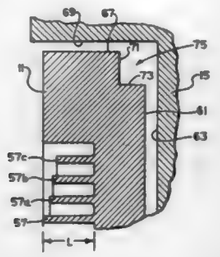
FLUID COUPLING DEVICE WITH IMPROVED MODULATION CAPABILITY

Gerard M. Light, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 433,937, Oct. 12, 1982, abandoned. This application Jun. 17, 1985, Ser. No. 745,732

Int. Cl.⁴ F16D *35/00, 43/25*

U.S. Cl. 192—58 B **6 Claims**



1. A fluid coupling device of the type including a first rotatable coupling assembly defining a fluid chamber therein, valve means associated with said first rotatable coupling assembly and disposed to separate said fluid chamber into a fluid operating chamber and a fluid reservoir chamber, a second rotatable coupling member disposed in said fluid operating chamber and being rotatable realtive to said first coupling assembly, said valve means being operable to control the flow of fluid between said reservoir chamber and said operating chamber, and including control means associated with said valve means to effect operation thereof in response to variations in a predetermined temperature condition, said valve means being of the type which is configured to provide modulating operation of the fluid coupling device, said second coupling member defining a generally cylindrical outer surface and including forward and rearward transverse surfaces, said forward surface and the adjacent wall surface of said first coupling assembly cooperating to define a viscous shear area, and a first recess in which is disposed a pumping element operable to pump fluid from said fluid operating chamber to said fluid reservoir chamber, said rearward surface and the adjacent wall surface of said first coupling assembly comprising a pair of generally parallel surfaces defining a clearance, characterized by: said outer surface and said rearward surface cooperating to define a second annular recess, said second annular recess being defined by an annular transverse surface portion, generally parallel to said rearward surface, and by a cylindrical surface portion, generally concentric with said cylindrical outer surface, said second annular recess having an axial extent less than about one-third of the axial extent of said cylindrical outer surface of said second coupling member, said second annular recess providing a localized region having a substantially lower viscous shear rate than the shear rate in said clearance, to thereby reduce the rate of increase of viscous shear torque transmitted from said second coupling member to said first coupling assembly as fluid as communicated to said fluid operating chamber.

4,633,989

STRUCTURE FOR SUPPORTING A DIAPHRAGM SPRING IN A CLUTCH

Kazuhiko Yoneda, Katano, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

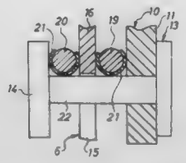
Filed Mar. 1, 1985, Ser. No. 707,142

Claims priority, application Japan, Mar. 1, 1984, 59-30201[U]

Int. Cl.⁴ F16D *13/44*

U.S. Cl. 192—70.27 **3 Claims**

1. A structure for supporting a diaphragm spring in a clutch comprising a pressure plate; a clutch cover covering the rear of the pressure plate; a diaphragm spring disposed between the pressure plate and the clutch cover for forcing the pressure plate and provided with recesses radiately extending from the inner periphery of the spring; support means extending from the inner periphery of the clutch cover through radially outer portions of the recesses; and a pair of wire rings employed as fulcrums for said spring and supported by said support means; at least a part of the surface of each wire ring being formed by



a solid lubricant material having a small coefficient of friction compared to steel and contacting at least one of the clutch cover, the diaphragm spring and the support means, wherein the solid lubricant material includes a tape-like member made from organic or inorganic material, and the tape-like member is affixed to one of the wire rings.

4,633,990

STRUCTURE FOR SUPPORTING A DIAPHRAGM SPRING

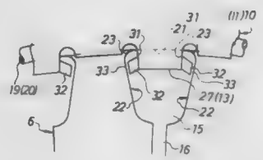
Heiji Fukutake, Toyonaka, and Shozo Iwata, Minamisumiyoshi, both of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Feb. 20, 1985, Ser. No. 703,473

Claims priority, application Japan, Feb. 27, 1984, 59-27667

Int. Cl.⁴ F16D *13/44*

U.S. Cl. 192—70.27 **4 Claims**



1. A structure for supporting a diaphgragm spring in a clutch comprising a pressure plate; a clutch cover covering the rear of the pressure plate; a diaphragm spring disposed between the pressure plate and the clutch cover for forcing the pressure plate and provided with slits radially extending from the inner periphery of the spring; tabs extending from the inner periphery of the clutch cover through radially outer portions of the slits; and a pair of wire rings employed as fulcrums for said spring and supported by said tabs from the radially inner side and the respective sides opposite to the spring; said radially outer portions of the slits through which the tabs extend being formed into recesses which are wider than other portions of the slits so that a tool for bending the tabs can be inserted therethrough;

said recesses defining an outer periphery and inner side edges with arc-shaped corners;

said tabs are provided with straight portions extending substantially perpendicular to the spring and engaging the outer peripheries of the recesses, respectively, and each straight portion is provided at each side with a protrusion protruding toward a corresponding inner side edge of the recess distant from a corner between the inner side edge and the outer periphery of the recess, said protrusions extending in a radially inward direction from the straight portion so that planar contact occurs between the protrusion and the corresponding inner side edge.

4,633,991

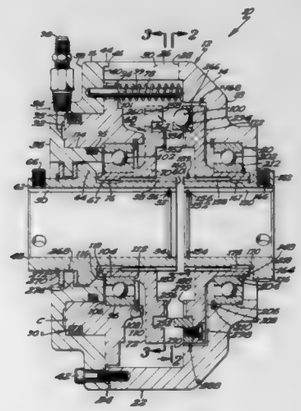
COUPLING CLUTCH HAVING AXIALLY CAPTURED, ROTATABLE HOUSING

James V. Hanks, Robbinsdale; Charles D. Raines, Blaine, and Leonid Dayen, Plymouth, all of Minn., assignors to Horton Manufacturing Co., Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 715,736, Mar. 25, 1985, Pat. No. 4,624,356, which is a continuation-in-part of Ser. No. 630,370, Jul. 12, 1984, Pat. No. 4,606,447. This application Jul. 31, 1985, Ser. No. 761,196

Int. Cl.⁴ F16D *25/08*

U.S. Cl. 192—85 CA **21 Claims**



1. Coupling clutch comprising, in combination: a first hub for receipt of a first shaft in a non-rotatable condition; a second hub for receipt of a second shaft in a non-rotatable condition; a first interface disc; means for slideably mounting the first interface disc on the first hub; means for biasing the first interface disc in a first axial direction towards a first axial position on the first hub; means for moving the first interface disc in the opposite axial direction towards a second axial position; a second interface disc, with the second interface disc being selectively engageable with the first interface disc to rotatably relate the first interface disc and the second interface disc; means for slideably mounting the second interface disc on the second hub; and means for substantially preventing slideable movement of the second interface disc with respect to the second hub and for allowing the canting of the second interface disc with respect to the second hub to take up angular misalignment of the first and second shafts; a housing; means for mounting the housing on the first interface disc for axial movement therewith and for rotation of the housing relative to the first interface disc; means for mounting the housing on the second interface disc for axial movement therewith and for rotation of the housing relative to the second interface disc; and means for axially capturing the housing on one of the first and second hubs for preventing relative axial movement of the housing with respect to the hub, with the axially capturing means allowing rotation of the housing relative to the hub.

4,633,992

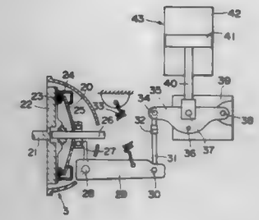
CLUTCH MECHANISM FOR AUTOMOBILE

Hisao Ishida, Tokyo, Japan, assignor to Isuzu Motors, Ltd., Japan

Filed Nov. 23, 1984, Ser. No. 674,092

Int. Cl.⁴ F16D *25/08, 13/75*

U.S. Cl. 192—85 C **6 Claims**



1. A clutch assembly for automobiles comprising:

a clutch mechanism;

a pivotally mounted operator means coupled to said clutch mechanism and pivotable between positions that alternatively produce either engagement or disengagement thereof;

a pivotally mounted actuator means;

a coupling means manually adjustable between a first state that couples said operator means to said actuator means and a second state that decouples said operator means from said actuator means;

a hydraulic driver comprising a piston coupled to said actuator means and operable to produce pivotal movement thereof;

operator positioning means for establishing a predetermined position of said operator means with said coupling means in said second state and adapted to permit pivotal movement of said operator means from said predetermined position with said coupling in said first state; said operator positioning means comprising bias means biasing said operator means in a clutch disengaging direction with said coupling means in said second state, the bias provided by said bias means being insufficient to move said operator means to a clutch disengaging position; and

actuator positioning means for establishing a given position of said actuator means relative to said operator means and adapted to permit pivotal movement of said actuator positioning means from said given position, said actuator positioning means being manually adjustable between a first state that establishes said given position and prevents pivotal movement of said actuator means and a second state that allows said hydraulic driver to produce pivotal movement of said actuator means from said given position.

4,633,993

HYDRAULICALLY OPERATED CLUTCH RELEASE BEARING

Bernhard Limbacher, Niederwerrn; Karl Müller, Kronungen, and Gottfried Mader, Ebelsbach, all of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 17, 1984, Ser. No. 631,612

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1983, 3326107

Int. Cl.⁴ F16D *23/14, 25/08*

U.S. Cl. 192—98 **6 Claims**

1. In a hydraulically operable clutch release device for a motor vehicle friction clutch, comprising

(a) a substantially annular housing part defining a ring axis;

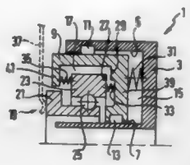
(b) an annular piston displaceably guided in sealed manner in the direction of the ring axis on the housing part, which

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piston together with the housing part defines an annular hydraulic pressure chamber and possesses a stop face facing axially away from the pressure chamber,

(c) a release bearing guided both axially and radially movably on the annular piston, with a non-rotating race ring supportable radially movably on the stop face of the annular piston and with a rotating race ring intended for radially movable supporting on release members of the friction clutch,

(d) an axially acting compression spring compressed in between the housing part and the annular piston for the permanent self-centering supporting of the rotating race ring on the release members,



(e) said release bearing including spring means supported between the non-rotating race ring and the annular piston, said spring means holding the stop face of the annular piston at a distance from the non-rotating race ring, against the action of the compression spring, when the pressure chamber is relieved of pressure for the engagement of the friction clutch, and permitting the supporting of the stop face on the non-rotating race ring when the pressure chamber is charged with pressure for the disengagement of the friction clutch, and the spring means comprises two spring elements which, acting axially contrarily of one another, clamp the non-rotating bearing race ring in between them.

4,633,994

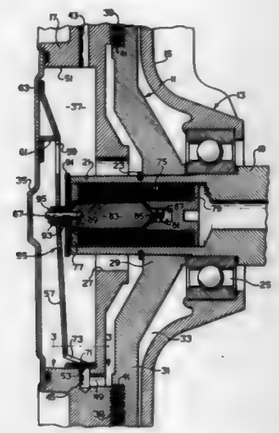
VISCOUS FAN DRIVE AND AXIALLY MOVABLE VALVE ELEMENT

Gerard M. Light, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 506,163, Jun. 20, 1983, abandoned. This application Nov. 22, 1985, Ser. No. 800,904

Int. Cl.⁴ F16D *11/00*

U.S. Cl. 192—58 B **6 Claims**



1. In a remote temperature-sensing fluid coupling device of the type including a first rotatable coupling member defining an axis of rotation, cover means associated with said first member to define a fluid chamber therebetween, means disposed to separate said fluid chamber into a fluid operating chamber and a fluid reservoir chamber, a second rotatable coupling member disposed in said fluid operating chamber and being rotatable relative to said first coupling member, valve means being operable to control the flow of fluid between said reservoir chamber and said operating chamber, and including a fill port and an elongated valve member oriented generally transverse to said axis and disposed to have at least a portion thereof move axially between first and second positions in response to variations in an axial input, characterized by:

(a) said first coupling member defining an annular surface portion oriented generally parallel to said axis of rotation, said annular surface portion comprising a peripheral boundary of said fluid reservoir chamber, said annular surface portion defining said fill port, said first coupling member further defining fluid passage means communication between said fill port and said fluid operating chamber; and

(b) said valve member including a flow control portion disposed to prevent substantial fluid flow through said fill port when said valve member is in said first position, and to permit substantial fluid flow through said fill port when said portion of said valve member moves axially from said first position to said second position.

4,633,995

PARTS FEEDER WITH CHUTE

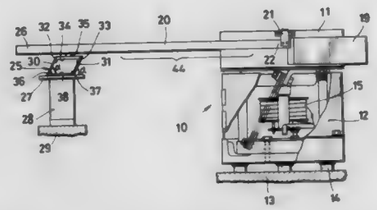
Genichi Hamada, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Continuation of Ser. No. 555,159, Nov. 25, 1983, abandoned. This application Jul. 26, 1985, Ser. No. 759,516

Claims priority, application Japan, Nov. 25, 1982, 57-178343

Int. Cl.⁴ B65G *11/18*

U.S. Cl. 193—2 R **1 Claim**



—1. The combination of a parts feeder with a chute, comprising:

(a) a parts feeder having a bowl with a parts outlet and carried on a support by means of a set of resilient leaf spring assemblies each extending at an angle of about 45° to the vertical, and including a vibrator acting vertically between said support and said bowl whereby a point on the periphery of said bowl will have vertical components and small horizontal arcuate components of motion;

(b) a curved parts-guiding track having one end attached to said parts outlet and disposed outside of said bowl, and having a discharge end;

(c) a parts collecting receptacle secured to said bowl and disposed beneath said parts-guiding track for collecting any parts which fail to ride on said parts-guiding track, said receptacle being adapted to return any collected parts to the bottom of said bowl;

(d) an elongated chute body having a horizontal inlet end carrying a support arm directly connected to said point on said vibratable bowl, said inlet end being connected to said track at said discharge end and extending in parallel to a tangent to said bowl and spaced therefrom by said support arm, said inlet end being directly reciprocated near said point in said vertical and small arcuate components of motion by said bowl, and said chute body having an outlet end remote from said inlet end; and

(e) a leaf spring assembly adapted to be fixed to a stationary base and having an upper end movable in back and forth movements corresponding to the horizontal component of the movement of said inlet end and coupled to said elongated chute body adjacent to said outlet end, said leaf spring assembly being disposed across said elongate chute body and inclined at an angle with respect to said elongate chute body for being reciprocated by said chute body.

4,633,996

BELT-CONVEYOR FRAME

John C. Waterhouse, Sydney, Australia, assignor to Timalara Pty. Limited, Allambie Heights, Australia

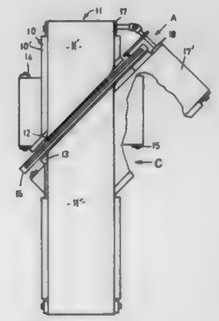
PCT No. PCT/AU84/00091, § 371 Date Jan. 30, 1985, § 102(e) Date Jan. 30, 1985, PCT Pub. No. WO84/04740, PCT Pub. Date Dec. 6, 1984

PCT Filed May 18, 1984, Ser. No. 702,238

Claims priority, application Australia, Jun. 1, 1983, PF9636

Int. Cl.⁴ B65G *47/34*

U.S. Cl. 198—372 **2 Claims**



1. A conveyor assembly comprising an endless conveyor belt having an upper surface and adapted to provide a plurality of runs, a belt supporting structure including a belt supporting surface having a diverter slot extending therethrough at an angle to the direction of belt movement over said supporting surface, a semi-circular edging on each side of said slot over which two said conveyor belt runs move in opposite directions, said edgings having the same radius of curvature which is equal to the spacing apart of the closest portions of said edgings, two parallel belt pulleys located one to each side of and below said belt supporting surface at a distance such that said conveyor belt runs disposed between said edgings and said belt pulleys are in the same plane and parallel to the plane of said belt supporting surface, a diverter mechanism aligned within said slot and including a plurality of continuously linearly moving diverter members, selectively operable means to determine whether said members while moving will adopt retracted positions below the upper surface of the said conveyor belt passing over said belt supporting surface or raised positions whereby said members project through said diverter slot above the upper surface of said conveyor belt passing over said belt supporting surface.

4,633,997

REDESIGNED BODY CENTERING MECHANISM

Daniel W. Woodman, Jr., Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

Filed May 28, 1985, Ser. No. 738,250

Int. Cl.⁴ B65G *47/26*

U.S. Cl. 198—456 **4 Claims**

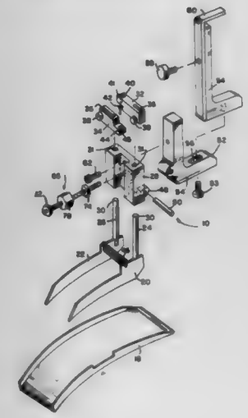
1. A mechanism for centering the body of an electrical component having leads in a carrier during a phase of processing the component, comprising:

a. a chute positioned adjacent the carrier and adapted to guidingly support the component by its leads only free from contact with its body portion;

b. a pair of centering fingers pivotally mounted in a block for movement toward and away from one another equal distant from a center line;

c. a support pivotally carrying said block above said chute for movement of said centering fingers toward and away from said chute;

d. means positioned between said block and said support for adjustably limiting the downward pivotal movement of said centering fingers toward said chute;



e. a stud threaded through said block and abutting said support to limit the upward pivotal movement of said centering fingers from said chute;

f. adjustable means associated with said block for downwardly biasing said centering fingers toward said chute to assure contact of said centering fingers with the juncture of the component body and leads;

g. said adjustable means being spaced from said chute and exposed from the surface of said block to be easily accessible for adjustment to vary the downward bias of said centering fingers; and

h. said adjustable means is a counterweight threaded on said stud to bias said centering fingers toward said chute

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4,633,998

CONVEYOR SYSTEM

Michael P. Norfolk, Ottley, England, assignor to Sastrade Limited, Lucerne, Switzerland

Filed May 30, 1984, Ser. No. 615,147

Claims priority, application United Kingdom, Jun. 3, 1983, 8315237

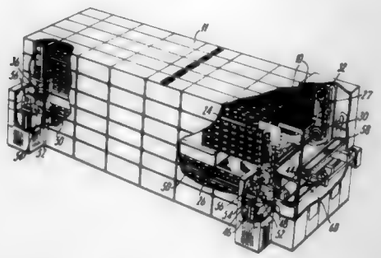
Int. Cl.⁴ B65G *37/00*

U.S. Cl. 198—465.3 **9 Claims**

1. A transportation system comprising upper and lower rails forming upper and lower passes for the system, racks carried in line on the rails and lying in juxtaposed relationship, an upper sproket located at a downstream end of said upper pass, a lower sprocket, first vertically operating endless conveying means mounted on said upper and lower sprockets so that said endless conveying means is movable along a path, first abutment members on said first conveying means, each first abutment member being U-shaped with arms of the U-shape being of different length, the shorter arms forming a ledge to support elements on successive racks and to carry the racks from the upper pass to the lower pass and the longer arms forming a projection which, as the first abutment member goes around

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said lower sprocket, impels the rack carried by the abutment members against the line of the racks on the lower rails and toward the downstream end of the lower pass, said endless conveying means moving said first abutment members along an upwardly inclined portion of said path into engagement with elements on successive racks positioned at said downstream end of said upper pass, said upwardly inclined path portion being spaced from said downstream end of said upper pass so that as each first abutment member moves along said



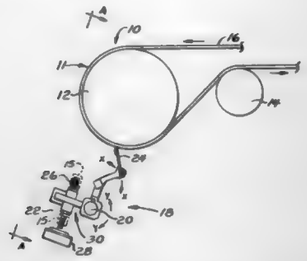
path portion, said shorter arm passes by said element on the successive rack without engaging said element and said longer arm engages said element, second vertically operating endless conveying means located at the downstream end of the lower pass, and second abutment members on said second conveying means, said second abutment members forming a projecting ledge to support elements on successive racks to carry the racks from the lower pass to the upper pass and impel each such rack against the line of racks on the upper rails and toward the downstream end of the upper pass.

4,633,999

SELF-ADJUSTING CONVEYOR BELT CLEANING APPARATUS

George C. Perneczky, 8918 Biloba, Orland Park, Ill. 60462

Filed Aug. 30, 1985, Ser. No. 771,836
Int. Cl.[4] B65G *45/00*
U.S. Cl. 198—499 11 Claims



11. A self-adjusting cleaning apparatus for use in cleaning the surface of endless conveyor belts and the like, comprising:

a blade including a blade tip support having a blade tip made from an abrasive-resistant hard material attached at one end thereof and the other end thereof being removably attached to one end of a blade arm, said blade arm comprising a rigid curvilinear arm with the other end thereof having a first void therein with a bar member passing therethough and further having a first threaded hole partially therethrough and communicating with said first void, such that with a first set screw positioned in said first threaded hole tightening of said first set screw will hold said blade arm on said bar member;

a first torsion unit connected to said bar member, said first torsion unit comprising a top portion having a substantially square-shaped cross-sectional void therein with said bar member passing therethrough and aligned such that the diagonal axes of said bar member are parallel to the horizontal and vertical axes of said square-shaped void, a resilient member positioned at each corner of said square-shaped void, a bottom portion having a second void therein and a second threaded hole partially therethrough communicating with said second void, and a second set screw positioned in said second threaded hole;

a shaft including a reinforcing bar on one surface thereof and a bar on the opposite surface thereof, said bar having at least one hole therein, with the longitudinal axis of said hole lying along a radius of said shaft, said hole being fitted with a removable plug such that the uppermost portion of said plug extends beyond the top surface of said bar, said plug being adapted for mating engagement in said second void of the bottom portion of said first torsion unit such that with such mating engagement tightening of said second set screw will hold said first torsion unit in contact with said bar;

an arm support attached to each end of said shaft, said arm support comprising a U-shaped bracket having a closed end portion and an open end portion defined by arms, with a stop means attached to the inner surface of said bracket opposite the ends of said arms; a shaft support, with a third void therein adapted to receive the ends of said shaft, attached to the outer surface of said bracket opposite the ends of said arms, said shaft support being provided with at least one third threaded hole communicating with said third void for receipt of a third set screw, the ends of said arms being provided with a plurality of holes; a tubular member attached on one surface thereof to a plate and one the opposite surface thereof to a set screw holder, said plate being further attached to spaced-apart brackets, a second torsion unit disposed between said spaced-apart brackets, a fourth set screw adapted for receipt in said set screw holder;

said second torsion unit comprising a holder having a substantially square-shaped cross-sectional void therein with a central member having a substantially square-shape cross-section positioned in said square-shaped void and aligned such that the diagonal axes of said central member are parallel to the horizontal and vertical axes of said square-shaped void, a resilient member positioned at each corner of said square-shaped void, with said central member being provided with a plurality of holes passing therethrough such that said second torsion unit is releasably engagable with said arms when the holes of said central member are aligned with the holes of said arms and attachment means are passed therethrough;

a threaded spindle passing through said tubular member and having a plurality of threaded adjustment lugs to hold said tubular member in a stationary position;

a spindle support attached to one end of said threaded spindle and adapted to hold said threaded spindle in a stationary position, whereby said blade tip contacts the surface of said endless belt at a location where said belt is supported by a cylindrical means associated with said endless conveyor belt and sale blade tip is movable in response to force imparted by the endless belt as the belt translates across the surface of the blade tip.

4,634,000

VAPOR PHASE PROCESSING SYSTEM

Nile E. Papp, Bloomington, and Ray W. Willett, Minneapolis, both of Minn., assignors to Centech Corporation, Minneapolis, Minn.

Filed Jun. 17, 1985, Ser. No. 745,707
Int. Cl.[4] B65G *17/18*
U.S. Cl. 198—800 2 Claims

1. A conveyor assembly for maintaining workpieces in a horizontal orientation while conveying them along a non-horizontal linear path; said assembly including:

A. a first pair of spaced-apart, mutually parallel rails defining a first non-horizontal linear path;

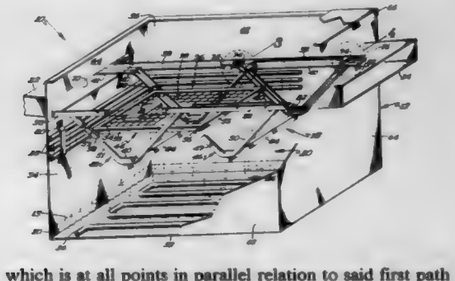
B. a second path of spaced-apart, mutually parallel rails, each rail located between the first pair of rails and in relatively closely adjacent relation to one of the rails of the first pair;

C. a horizontal platform receiving and supporting workpieces, said horizontal platform being configured to extend between the rails of the second pair;

D. a pair of leading platform support pins, each extending from one of two transversely aligned first forward points on said platform into operational travelling relationship with respect to one of said rails of said first pair;

E. a pair of elongated trailing platform support shoes each partially defined by a lowermost plane skid support surface, each shoe being pivotably mounted at an intermediate portion thereof on its own skid shaft to one of two transversely aligned second rearward points on said platform and each shoe being in operative sliding relation to one of said rails of said second pair;

F. said second pair of rails defining a second non-linear path



which is at all points in parallel relation to said first path defined by said first pair of rails and at a distance behind the first path equal to the distance between the first forward support pin mounting points and the second rearward shoe mounting pivot points on the platform;

G. each rail of said second pair of rails being provided with a break therein at each point the first path crosses the second path, each break being only long enough to effectively accommodate passage of a leading platform support pin;

H. the length of the skid support surface forwardly of and rearwardly of its skid shaft in relation to the length of each break in its rail being such that a forward portion of the skid support surface will be in firm supported contact with a front portion of its rail adjacent the break before the skid shaft loses its support from the back portion of said rail adjacent the break, and such that the skid shaft is firmly supported on the forward portion of the rail before a rearward portion of the skid support shaft leaves supported relation with the back portion of the rail; and

I. means to move the platform along the first and second pairs of rails.

4,634,001

BOX FOR HOLDING THIN OBJECTS

Thomas C. V. Wakelin, Bramcote 1, Norris Close, Firgrove Road, Whitehill, Hampshire GU32 9EG, United Kingdom

Filed May 23, 1984, Ser. No. 613,155
Claims priority, application United Kingdom, Jun. 1, 1983, 8315041; Mar. 27, 1984, 8407936
Int. Cl.[4] B65D *5/50*
U.S. Cl. 206—45.18 39 Claims

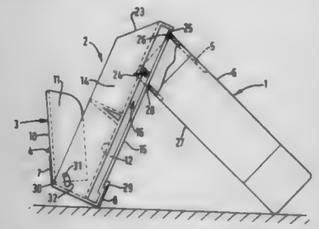
1. A box for holding thin objects, comprising:

(A) a sleeve, including two opposite side members, a top member and a bottom member, each member having a terminating end defining an open end of the sleeve;

(B) a drawer, including two opposite side members and a bottom member, the side members of the sleeve and the side members of the drawer being arranged in two adjacent pairs of one sleeve side member and one drawer side member per pair; and

(C) engagement means for interconnecting the drawer and the sleeve so as to allow the drawer to be moved from a first closed position wherein the drawer is substantially enclosed by the sleeve, to a second position wherein the drawer is partially withdrawn from the sleeve, to a third position wherein the drawer is swung through an angle of less than 180 degrees with respect to the sleeve, to a fourth self-supporting open posititon; wherein the engagement means comprises:

(1) a respective pin fixedly attached to a side member of each pair of side members so as to be positioned between the corresponding pair of side members, and (2) a respective groove extending in a corresponding side member of the pair of side members for co-operating with a respective one of said pins to interconnect the drawer and the sleeve, each groove having a first elongated portion for guiding at least part of the drawer's travel between the first and second positions, and each groove having a second portion connected to the first groove portion, the second portion having at least first and second terminating ends, the first end defining a first stop to prevent further withdrawal of the drawer from the sleeve by abutment of a corresponding pin against the first stop, and the second end defining a second stop to prevent the drawer from further movement beyond the fourth position when the drawer is in the third, swung, position, the second portion of the

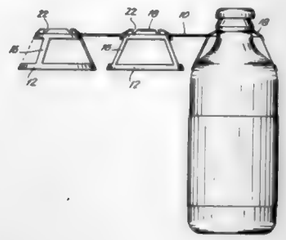


groove having a width transverse to its longitudinal length that is greater than the maximum cross-sectional dimension of the respective pin so as to allow the drawer, when in at least the second position, to be swung with respect to the sleeve into the third position, and to further allow the drawer, when in the third position, to be moved in the second portion of the groove in a direction away from the first terminating end until the respective pin contacts the second stop defined by the second terminating end of the second groove portion, said movement of the drawer such that the bottom member of the drawer abuts at least one terminating end of the members forming the sleeve and defining a relative inclination of the drawer with the sleeve in which the box is self-supporting, thereby positioning the drawer in the fourth self-supporting position;

whereby the drawer is partially withdrawable from the sleeve, and from there the drawer and sleeve can be swung with respect to each other through an angle of less than 180 degrees while still interengaged, and the drawer can then be moved into the fourth position wherein the pins abut the respective second ends of each second groove portion to stop further movement of the drawer away from the first end and, together with an engagement of the bottom member of the drawer with at least one terminating end of the members forming the sleeve, defining a relative inclination of the drawer with the sleeve in which the box is self-supporting in its fourth open position.

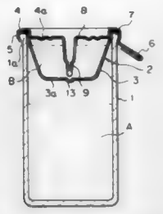
VOL 1074 ISS 1 JAN 6 1987 UMI

4,634,002
BOTTLE CARRIER
Adriano G. A. Delonghi, Nuevo Leon, Mexico, assignor to Fabricacion de Maquinas, S.A., Col. Del Prado, Mexico
Filed Apr. 12, 1985, Ser. No. 722,781
Claims priority, application Mexico, Apr. 23, 1984, 201,107
Int. Cl.[4] B65D *71/00, 70/04*
U.S. Cl. 206—158 2 Claims



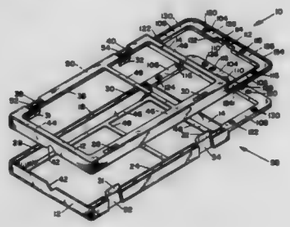
1. A plastic carrier adapted to receive and hold a plurality of containers comprising:
a flat plate having a plurality of circular apertures adapted to surround shoulders of the containers in order to maintain the containers spaced from each other, said flat plate including a pair of finger receiving openings, and further including:
a circular wall extending upwardly and surrounding each circular aperture;
ribs provided on said flat plate in order to increase its resistance to bending and lessen the weight of said carrier;
at least three bands extending upwards from each circular wall;
an upper ring connected with each circular wall through said bands, and, forming an opening to receive the neck of a container; and,
a plurality of container supporting tabs protecting upwards from the upper contour of each ring in order to retain each container by its neck.

4,634,003
CONTAINER FOR ACCOMMODATING TWO KINDS OF LIQUIDS
Toshihiro Ueda, Ibaraki; Masamichi Imanishi, Ikoma; Kazuo Iyama, Chiba; Akio Fukuhara, Tsukui, and Ken Iwase, Hachioji, all of Japan, assignors to Suntory Limited, Osaka, Japan
Filed Aug. 20, 1985, Ser. No. 767,431
Claims priority, application Japan, Aug. 22, 1984, 59-127349[U]; Aug. 23, 1984, 59-127790[U]; Sep. 26, 1984, 59-145155[U]; Sep. 28, 1984, 59-146896[U]; Jun. 18, 1985, 60-130812
Int. Cl.[4] B65D *25/08*
U.S. Cl. 206—221 11 Claims



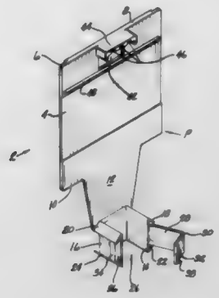
1. A container for accommodating two kinds of liquids therein separately from each other, comprising
a main body for accommodating a first liquid therein, said main body having an opening at an upper end thereof;
a cup for accommodating a second liquid therein, provided with a flange extending outwardly from substantially the entire periphery of an upper end of said cup and a skirt extending downwardly from substantially the entire periphery of an outer end of said flange, said cup fitted into the opening of said main body with said flange and said skirt engaging the entire periphery of an upper end of said main body; and
a flexible lid liquid-tightly sealing an upper opening of said cup;
said cup having, in a bottom wall thereof, an area at least partially bordered by a score line and
said lid having a projection extending toward said area;
whereby said specified area of said small cup may be broken by pushing said lid downwardly until a tip end of said projection presses onto said specified area;
said skirt of said cup being bent inwardly along the entire periphery of a lower end thereof to engage the entire periphery of the upper end of said main body and provided with a tab integrally extending from a part of the lower end thereof;
said skirt of said cup having at least two pairs of linear weakenings extending upwardly from the lower end of said skirt, each pair of linear weakenings being positioned symmetrically in relation to said tab.

4,634,004
MAGNETIC TAPE SECURITY HOUSING
Roger L. Mortensen, Chanhassen, Minn., assignor to Empak Inc., Chanhassen, Minn.
Filed Dec. 11, 1984, Ser. No. 680,518
Int. Cl.[4] B65D *17/00, 85/672*
U.S. Cl. 206—387 1 Claim



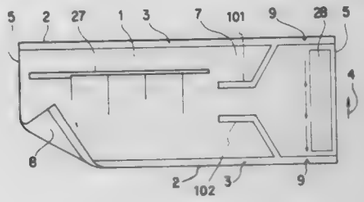
1. Magnetic tape security package including substantially identical housing members, each separate housing member comprising:
a. spaced opposing horizontal channels;
b. spaced opposing upper and lower U-shaped members connected to ends of said channels;
c. hook for hooking connected to each end of one of said upper and lower U-shaped members and including open area indentations about an internal side of each of said hook means providing for latching movement of said hook means and a U-shaped mid-portion member connected between said hook means;
d. latch means for latching connected to each end of an other of said upper and lower U-shaped members, opposing said hook means, and a U-shaped mid-portion member connected between said latch means;
e. planar security bar connecting between said U-shaped mid-portion members; and,
f. U-shaped carrying handle attached to end of one of said channels, a hanging-carrying bar surface in said handle, and a plurality of male and female snap fastener means for snap fastening extending outwardly from an inner surface of said handle whereby said channels, said U-shaped members, said planar security bar and said handle form a flat planar surface and two of said housing members mate together in interlocking engagement thereby forming said magnetic tape security package.

4,634,005
PACKAGE AND METHOD FOR USE IN DISPLAYING MERCHANDISE FOR SALE
Darrell A. Kulzer, Denver, and Martin L. Rohm, Aurora, both of Colo., assignors to B & R Plastics, Inc., Denver, Colo.
Filed Jul. 25, 1985, Ser. No. 758,676
Int. Cl.[4] B65D *75/56*
U.S. Cl. 206—477 11 Claims



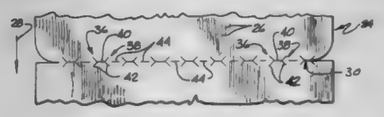
1. A package for use in displaying merchandise in a condition for sale comprising:
a plate having a relatively large surface area and having a front surface and a rear surface;
a pair of spaced apart projections extending outwardly from said front surface;
an opening between said spaced apart projections so that a portion of the merchandise may be moved through said opening to a position between said projections and adjacent to said front surface;
means for locking said means for closing said opening in a position wherein said opening is closed;
means for closing said opening so that said merchandise cannot be readily separated from said plate comprising:
an integral tab extending from one of said projections and having a length greater than the width of said opening between said projections;
means for locking the end of said integral tab to the other of said projections;
a pair of opposed flanges on each of said projections for strengthening each of said projections and said flanges being integral therewith; and
said flanges extending from each of said projections so as to form an included acute angle.

4,634,006
BAG FOR MOTHERS MILK
Shozaburo Yanase, 2-20, Tsurigane-cho, Higashi-ku, Osaka, Japan
Continuation-in-part of Ser. No. 561,975, Dec. 16, 1983, Pat. No. 4,600,104. This application Dec. 3, 1984, Ser. No. 677,557
Claims priority, application Japan, Jun. 8, 1983, 58-87257[U]
Int. Cl.[4] B65D *17/28, 33/16*
U.S. Cl. 206—604 24 Claims



1. A bag for the preservation of mother's milk made of a laminated film or a laminated tube prepared by extrusion molding, said bag comprising:
(a) a first surface and a second surface which are joined together around a periphery comprising first to fourth edges to define a closed interior volume between said first and second surfaces which is at least substantially empty prior to use of the bag, said first and second surfaces having a first welded portion which is formed by welding said first surface to said second surface along said first edge perpendicular to the direction in which said first and second surfaces have been extruded;
(b) second and third welded portions formed by welding inner layers of said first and second surfaces so that said second welded portion extends inwardly from said first edge and the third welded portion extends inwardly from the second edge opposite to said first edge to form a funnel-shaped portion, whereby said second and third welded portions form a narrow passage for the milk and effect prevention of any reflux flow of milk to an outside of the bag; and
(c) a notch which is provided on said first edge between the second welded portion and said third edge which extends parallel to said direction, the first welded portion having a width and the notch extending only part way through the first welded portion, the notch being directed in said direction.

4,634,007
CARTON BLANK WITH PERFORATED TEAR LINE
Kevin R. Rusnock, Boulder, Colo., assignor to Adolph Coors Company, Golden, Colo.
Filed Dec. 2, 1985, Ser. No. 803,632
Int. Cl.[4] B65D *5/54*
U.S. Cl. 206—620 3 Claims



1. A carton blank comprising:
a paperboard sheet having a length, a width and a thickness and a grain extending in a direction along said length;
a plurality of fold lines in said paperboard sheet to define a plurality of panels which are adapted to be folded to form a carton;
at least one of said fold lines comprising a tear line;
said tear line comprising a first plurality of perforations and a second plurality of perforations formed in said paperboard sheet;
each of said first plurality of perforations comprising a double Y shape wherein each Y shape has a straight leg and two arms extending angularly from one end of said straight leg and said double Y shape is formed by superposing the leg of each Y shape with two angularly extending arms at each end of the susperposed legs;
each of said second plurality of perforations comprising a linear shape; and
said tear line is formed by alternating a double Y shaped perforation and a linear shaped perforation with said superposed legs and said linear shaped perforations being in alignment and forming said fold line.

4,634,008
CONTAINER MADE OUT OF A FLAT MATERIAL LIKE PAPER, CARDBOARD, ETC. WITH A RIDGED-SEAM CLOSURE, ESPECIALLY A PARALLELEPIPEDAL CONTAINER FOR LIQUID AND MADE OUT OF PAPER, PLASTIC OR COMPOSITE

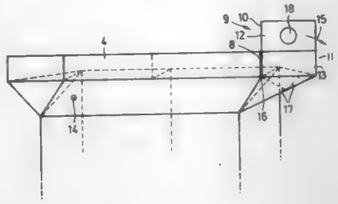
Ulrich Ströle, Land Str. 63, 5177 Titz; Jürgen Färber, Am Hagelkreuz 8, 4044 Kaarst, and Arnold Tholen, Alte Schmiede 97, 5138 Heinsberg, all of Fed. Rep. of Germany

Continuation of Ser. No. 570,137, Jan. 12, 1984, abandoned. This application Nov. 8, 1985, Ser. No. 796,498

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1983, 3301086

Int. Cl.[4] B65D 5/70

U.S. Cl. 206—628 10 Claims



1. A container comprising: a parallelipedal body made in the form of a folded box from a scored blank or flattened surface with a flat top and composed of a flexible composite sheet material; a ridged-seam closure at the top and extending above a base line on the top of the body to a free terminal edge facing away from the base line; triangular folds at the ends of the ridged seam closure and folded down against side walls of the body with the base of each triangular fold disposed along an upper side wall edge; a tear-off opening flap having a connecting portion attached to the outside of the ridged-seam closure and a gripping portion projecting beyond the terminal edge of the closure and away from the base line of the ridged-seam closure at the side wall of the body and extending over an area covered by one of the triangular folds, wherein the seam closure has a scored line disposed parallel to and over the base of said one of the triangular folds and extending from the base line to the terminal edge of the seam closure and the tear-off flap has an inner longitudina[1] edge parallel to and coincident with the scored line.

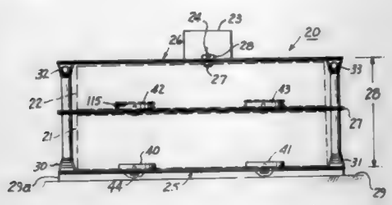
4,634,009
SECURITY RACK

J. Scott Gassaway, 2356 Glendon, Los Angeles, Calif. 90064

Filed Dec. 19, 1983, Ser. No. 562,849

Int. Cl.[4] A47F 5/00

U.S. Cl. 211—4 18 Claims



1. In a rack for securely holding articles, which articles have a top surface, a bottom surface, dimensions of length, width and height, and engagement means on one of said surfaces, said rack including a base plate and a top plate, a pair of anchor blocks attached to each of said plates, said base plate and top plate facing each other, and parallel to and spaced apart from one another, with the anchor blocks of each opposing the anchor blocks of the other, a pair of posts extending between each pair of opposed anchor blocks, said anchor blocks having post-receiving openings defined by respective walls, the improvements comprising:

a plurality of rivets, each rivet having a shank and a head, said plates each having a plurality of holes to pass the rivet shanks and restrain the rivet heads, and each anchor block having a plurality of holes aligned with respective holes in the plates to pass the rivet shanks, and a peripheral surface around the holes in the anchor blocks against which bears an upset head that is formed from the shank material, whereby to join the anchor blocks to the plates;

a recess in each anchor block bounded by a non-circular inner wall aligned with and continuing each respective post-receiving opening in the anchor blocks mounted to a first one of said plates, each said recess having a dimension of axial length in alignment with its post receiving opening and extending radially outward beyond it, and a shoulder between the post-receiving opening and the recess;

an internally threaded nut in each said recess, each said nut having a non-circular outer wall, the walls of the nuts and recesses making a rotation-resisting engagement with one another, and permitting limited axial movement of the nut in the recess, a thread on one end of each post threaded into a respective nut, whereby to attach the post to the anchor block, the post fitting snugly into the respective post-receiving opening;

the anchor blocks attached to the other of said plates having a plurality of post-receiving openings, and a plurality of aligned lock pin receiving ports extending laterally relative to said post-receiving openings, said posts at this anchor block fitting snugly into the respective post-receiving openings, and having a cross-hole aligned with said lock pin receiving ports; a lock pin passed through said cross-holes and lock pin receiving ports to hold the posts to the respective anchor block; and lock means releasably restraining the lock pin in the respective anchor block.

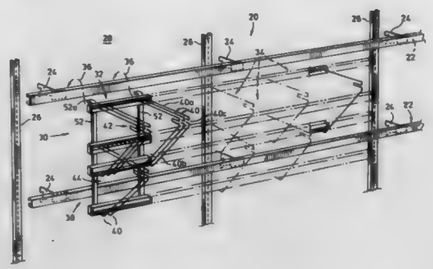
4,634,010
STORE FIXTURES

Martin Otema, 51 Pine Ridge Drive, Scarborough, Ontario, Canada M1M 2X6

Filed Nov. 29, 1984, Ser. No. 676,166

Int. Cl.[4] A47E 5/08

U.S. Cl. 211—96 6 Claims



1. A display rack comprising:

at least one rail secured in a generally horizontal position on and spaced outwardly from a fixed structure; and

an array of article supports provided by a series of similar article display units disposed side by side on said rail and each comprising a base, a plurality of individual article supports carried by the base and hook means on the base engaging said rail and suspending the unit with said article supports projecting from the base and forming part of said array;

wherein each said article display unit comprises a frame defining said base and including said hook means, and

wherein said article supports comprise wire garment supports pivotally coupled to said frame and arranged in upper and lower rows with the supports in the respective rows interleaved to provide for display of garments at two different levels.

4,634,011
DOUBLE OPENING LID

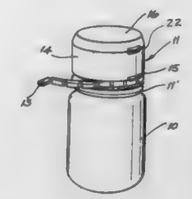
Alan H. Polyblank, 156B Hopetoun Ave., Vaucluse, N.S.W., Australia (2030)

Filed May 31, 1985, Ser. No. 739,913

Claims priority, application Australia, Jun. 5, 1984, PG5363

Int. Cl.[4] B65D 51/28

U.S. Cl. 215—6 3 Claims



1. A container for solid medication products having a neck defining a container opening, a bottom lid, a first hinge connecting the bottom lid to the container neck on one side of the container for selectively opening and closing the container for withdrawing products therefrom, the bottom lid having a peripheral cylindrical wall defining a compartment with an open top for receipt of quantities of the medication products, a top lid, and a second hinge connecting the top lid to the bottom lid on a side of the container opposite said one side for selectively covering and uncovering the open top of the compartment, the relative positioning of the hinges on respectively opposite sides of the container inhibiting opening of the bottom lid when the top lid is raised to uncover the compartment.

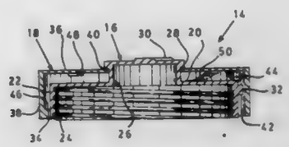
4,634,012
SAFETY BOTTLE CLOSURE HAVING A TIME INDICATOR

John Kelley, Rte. 4, Box 146-B, Lexington, Tenn. 38351

Filed Oct. 4, 1985, Ser. No. 784,542

Int. Cl.[4] B65D 55/02, 85/56; A61J 1/00

U.S. Cl. 215—203 15 Claims



1. A closure for bottles of the type having twist-type closure provision, such closure having child-proof opening characteristics, which comprises:

an inner member for sealing such bottle, said inner member having

a. a disk portion,

b. a peripheral lip extending at substantially right angles from said disk portion, said lip being provided on the interior thereof with a surface to cooperate with such closure provision of such bottle, and

c. a central neck portion extending from said disk portion in a direction opposite said lip, said neck portion terminating in a closed flange substantially parallel to said disk portion, said flange having a diameter greater than said neck portion;

an outer member for effecting rotation of said inner member having

a. a disk portion substantially parallel with said disk portion of said inner member, said disk portion of said outer member being provided with a central opening having a diameter intermediate the diameter of said neck portion and said flange whereby said flange can be snapped through said opening to assemble such closure, and

b. a peripheral lip extending at substantially right angles from said disk portion and substantially equally spaced from said lip of said inner member;

biasing means interposed between said disk portions of said outer member and said inner member for normally maintaining said disk portions separated a selected distance but permitting said disk portions to be moved toward each other upon application of pressure to said disk portion of said outer member in a direction toward said inner member disk portion;

cooperating opening tab means each carried by said inner member and said outer member whereby said opening tab means are engaged when said outer member and said inner member are properly rotationally oriented and said pressure is applied to said outer member thereby effecting counter-clockwise rotation of said inner member when said outer member is rotated in a counter-clockwise direction to effect removal of such closure from such bottle;

cooperating closing tab means each carried by said inner member and said outer member whereby said inner member is rotated in a clockwise direction when said outer member is rotated in a clockwise direction to effect tightening of such closure upon such bottle; and

visable alignment indicia carried by said disk portion of said outer member, adjacent said opening, and by said flange of said inner member whereby when said indicia are aligned, said opening tab means are aligned for said engagement upon application of said pressure to said outer member.

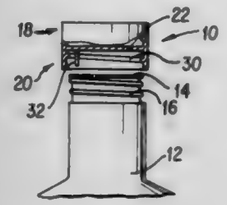
4,634,013
CLOSING AND OPENING DEVICE FOR MEMBRANE-SEALED BOTTLES

Abraham Bar-Kokhba, 67 Prospect Ave., Hewlett, N.Y. 11557

Filed Jun. 6, 1985, Ser. No. 741,764

Int. Cl.[4] B65D 41/50

U.S. Cl. 215—228 11 Claims



1. A closing and opening device for a bottle with an opening sealed by a membrane, comprising:

a cap adapted to engage the opening of the bottle for closing the same,

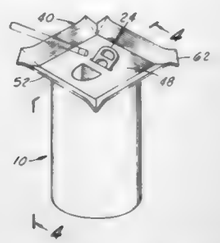
means for cutting the membrane of the bottle without pushing the membrane downwardly while cutting, said cutting means being connected to the cap, and

means for allowing rotation of the cap less than 360 degrees relative to the opening of the bottle, said means for allowing rotation being connected to the cap so that while the cap is rotating, the membrane of the bottle is cut less than 360 degrees without pushing the membrane downwardly

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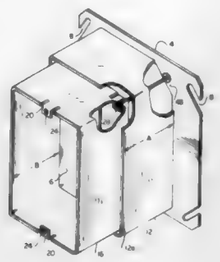
to prevent the membrane being cut from detaching from and entering into the bottle.

4,634,014
DISPOSABLE ASHTRAY ATTACHMENT FOR BEVERAGE CANS
Morris L. Carr, 2836 Sierra Canyon Way, Hacienda Heights, Calif. 91745
Filed Jan. 21, 1986, Ser. No. 820,017
Int. Cl.[4] A24F *19/00*
U.S. Cl. 220—1 H **18 Claims**



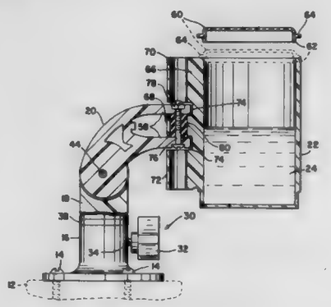
1. A blank for use on the top of a can in which an opening can be made through the top wall of the can by means of an actuator handle connected to the top wall of the can, said blank comprising:
- a flat piece of a thin sheet material having a score to define a floor that is bordered by an area of the blank which can be erected into an upstanding wall;
- said floor being formed with a passage means through which the actuator handle of the can top can be passed after the handle has been actuated to form an opening through the top wall of the can;
- said floor also being formed with a key tab portion that is displaceable out of the plane of said floor for penetration into the opening made in the top wall of the can by the actuator handle;
- said passage means through said floor and said key tab portion of said floor being so oriented relative to one another that said key tab portion is positioned for registration with the opening of the can top wall when the actuator handle has been inserted through said passage means of said floor.

4,634,015
ADJUSTABLE ELECTRIC OUTLET BOX
Jerald M. Taylor, 4062 Evelyn Dr., Salt Lake City, Utah 84124
Filed Jul. 15, 1985, Ser. No. 754,746
Int. Cl.[4] H02G *3/08*
U.S. Cl. 220—3.7 **6 Claims**



1. An adjustable electrical outlet box for mounting on conventional electrical junction boxes comprising
- a mounting plate having a large central opening, and a plurality of smaller openings spaced about the central opening and adapted to receive fastening elements, said smaller openings being positioned to coincide with the threaded openings disposed about the perimeter of a conventional electrical junction box so that the mounting plate may be mounted on such conventional junction box,
- collar means open at the front and rear ends and disposed on the mounting plate about the central opening, said collar means including sidewalls which project outwardly of the plate a predetermined distance to define a front lip,
- frame means having sidewalls formed generally parallel and in slidable contact with the sidewalls of the collar means to move between a withdrawn position, where the front edge of the frame means is generally coincident with the front lip of the collar means, and an extended position where the front edge of the frame means is disposed a certain distance outwardly from the mounting plate beyond the front lip of the collar means, the height of the sidewalls of the frame means being generally same as or less than the height of the sidewalls of the collar means, and
- at least one screw means mounted on the frame means, and on the collar means or mounting plate, and disposed within and at the rear of the frame means so that when rotated in one direction, the frame means is caused to move toward the withdrawn position, and when rotated in the other direction, the frame means is caused to move toward the extended position.

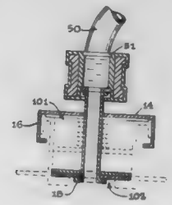
4,634,016
FISH FORMULA CONTAINER ASSEMBLY
Martin L. Voss, Fort Lauderdale, Fla., assignor to Voss Bros., Inc., Fort Lauderdale, Fla.
Filed Sep. 12, 1985, Ser. No. 775,237
Int. Cl.[4] F16M *13/00*; A47D *15/00*
U.S. Cl. 220—69 **9 Claims**



1. A fish formula container assembly capable of being mounted on a side of a boat, which comprises:
- a container capable of holding a fish formula and of being movable above the side of the boat between inboard and outboard positions;
- a base member capable of being rigidly mounted on the side of the boat;
- a vertical support post extending above the base member and having upper and lower ends, the post being mounted at its lower end on the base member for rotation about a vertical axis, with the base member or the post including a projecting hub portion having a cylindrical recess and the other of the base member or the post having a stub shaft rotatably received in the recess;
- first clamping means mounted on the hub portion for clamping the vertical support post in preselected positions about the vertical axis;
- a cantilevered container support arm having opposite inner and outer ends, the inner end of the arm and the upper end of the vertical support post having opposed mating portions;

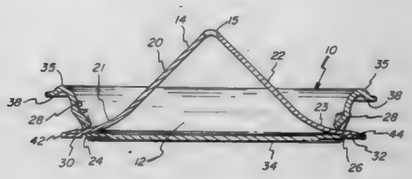
- pivot means extending through the opposed mating portions of the upper end of the vertical support post and the inner end of the cantilevered support arm for mounting the arm on the post for pivotable movement about a horizontal axis;
- second clamping means for clamping the cantilevered support arm in preselected positions about the horizontal axis;
- a pair of vertically spaced apertured mounting lugs projecting horizontally from the outer end of the cantilevered support arm or the container;
- an apertured mounting portion on the other of the cantilevered support arm or the container and disposed between the apertured mounting lugs; and
- a locking device having an elongated clamping member extending through aligned apertures in the projecting mounting lugs and the mounting portion.

4,634,017
RADIATOR FLUSHING DEVICE
Greg S. Kilayko, 45 Croman Ct., Hazlet, N.J. 07730
Filed Dec. 13, 1985, Ser. No. 808,753
Int. Cl.[4] B65D *51/16*
U.S. Cl. 220—203 **5 Claims**



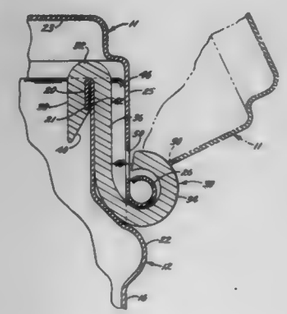
1. A radiator flushing apparatus in combinatin with a hose connected to a source of pressurized water and an automobile radiator, wherein the apparatus comprises:
- a modified radiator cap unit having an elongated hollow tubular member forming an elongated open fluid passageway through the modified radiator cap unit;
- a hose coupling unit secured on one end of the elongated tubular member, and adapted to engage said hose in a fluid tight relationship; and,
- a pressure relief unit secured to the other end of the elongated tubular member and having a resilient sealing gasket adapted to sealingly engage the periphery of the inlet of said automobile radiator, whereby the pressurized water from said hose may be in open fluid communication with the interior of the said automobile radiator.

4,634,018
IMPACT PLUG ASSEMBLY
Philip D. Becker, Southbury, Conn., assignor to Buell Industries, Inc., Waterbury, Conn.
Filed Dec. 20, 1985, Ser. No. 811,678
Int. Cl.[4] B65D *53/00*
U.S. Cl. 220—233 **6 Claims**



1. An improved impact plug assembly for engaging a workpiece to close an aperture extending through said workpiece, said assembly of the type having a plug for insertion into said aperture and a cooperating crossbar retained in diametrically opposed slots formed in the walls of said plug, said bar for being extended outwardly through said slots to lockingly engage said workpiece and sealingly retain said plug in said aperture, said crossbar being restricted from removal inwardly through said slots to separate said bar from said plug before use of said assembly, the improvement comprising at least one shear lip means formed in said crossbar outwardly of said plug adjacent said slots, said shear lip means being adapted to engage said plug walls adjacent said slots whereby said crossbar is captured in said plug.

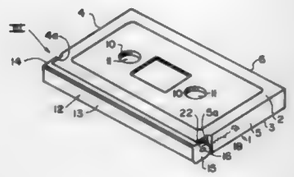
4,634,019
CONTAINER WITH PLASTIC HINGE
Douglas E. Pherigo, Loves Park, Ill., assignor to J. L. Clark Manufacturing Co., Rockford, Ill.
Filed Mar. 14, 1986, Ser. No. 840,409
Int. Cl.[4] B65D *43/14*, *51/04*
U.S. Cl. 220—334 **8 Claims**



1. A container having a box-like body and having a cover for closing said body, said body having an upper lip portion defining an opening of predetermined size and shape, said cover being shaped as an inverted dish and having a top wall of the same general size and shape as said opening, a peripheral skirt formed integrally with and depending from said top wall and adapted to telescope over the lip portion of said body when said cover is in a closed position on said body, the lower end of said skirt being defined by an outwardly protruding peripheral bead, and a hinge for mounting said cover for swinging between open and closed positions on said body, said container being characterized in that said hinge consists of a singlepiece extrusion of resiliently yieldable plastic, said hinge being substantially S-shaped in transverse cross-section and having an upright intermediate section which lies substantially face-to-face with the outer side of said body adjacent the lip portion thereof, said hinge having an upper hook section formed integrally with the upper end of said intermediate section and curved inwardly and then downwardly therefrom, said upper hook section having a lower end portion which lies substantially face-to-face with the inner side of said lip portion and which coacts with said intermediate section to resiliently grip said lip portion and to hold said hinge on said body with a snap fit, said hinge having a lower hook section formed integrally with the lower end of said intermediate section and curved outwardly and then upwardly therefrom, said lower hook section being snapped resiliently around said bead and pivotally receiving said bead to support said cover for swinging between said positions, and a slot formed through said skirt above said bead and accommodating said lower hook section as said cover is swung to said open position thereby to prevent interference between said skirt and said lower hook section during such swinging.

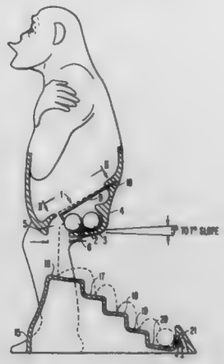
VOL 1074 ISS 1 JA 6 1987 UMI

4,634,020
CASSETTE WITH A LATCHING PIVOTED COVER
Cornelis M. Beyersbergen van Henegouwen; Hubertus F. W. van de Kerkhof; Karel G. M. Koken, and John C. J. Olierook, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 609,243, May 11, 1984, abandoned.
This application Dec. 28, 1984, Ser. No. 687,487
Claims priority, application Netherlands, Jan. 25, 1984, 8400226
Int. Cl.[4] G03B *1/04*
U.S. Cl. 220—335 12 Claims



2. A magnetic-tape cassette provided with a housing which comprises:
- two substantially parallel major walls which each have two openings for the passage of drive spindles of a magnetic-tape-cassette apparatus,
- two substantially parallel side walls, each having a pivot pin projecting therefrom, the axes of the pivot pins on the side walls coinciding with each other and forming a pivot axis which is situated in a plane of symmetry situated at equal distances from the two major walls of the housing, each of the side walls being formed with a semicircular slot which is concentric with the pivot axis and is disposed symmetrically relative to said plane of symmetry,
- a rear wall,
- a front wall along which a part of magnetic tape extends, and
- a cassette cover which comprises a major portion which, when the cover is in the closed position, covers the part of the magnetic tape which extends along the front wall, and cover flanges which are situated one on each side of the major portion adjacent the side walls and which are pivotally connected to the respective pivot pins on the adjacent side walls, each flange comprising a respective journal which engages a respective semicircular slot, the cassette cover being pivotable about said pivot axis from the closed position to a selected one of two different open positions, either a first open position in which the major portion is situated near a first major wall or a second open position in which said major portion is situated near a second major wall, and
- a respective spring acting on each journal to keep the cassette cover in the closed position or to pivot it towards the closed position,
- characterized in that each cover flange is formed with a straight slot in which the pivot pin of the adjacent side wall is situated, the axis of the slot being disposed in said plane of symmetry in the closed position of the cassette cover, the slot in each side wall being situated at that side of the pivot pin which is remote from the front wall, and
- near said plane of symmetry having a recessed portion at that side which is remote from the pivot pin, the journal on the adjacent cover flange is urged into said recessed portion by the spring force exerted by the spring in the closed position of the cassette cover.

4,634,021
RELEASE MECHANISM
John W. Davis, 114 Laurel Haven Rd., Fairview, N.C. 28730
Filed Jun. 27, 1985, Ser. No. 749,277
Int. Cl.[4] G07F *11/00*
U.S. Cl. 221—3 20 Claims

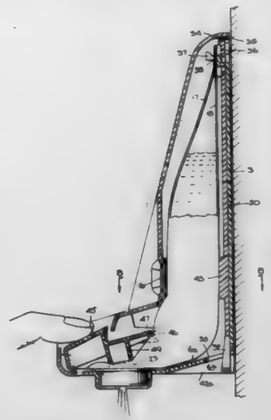


1. A release mechanism comprising means defining a passageway for movement of an object to be released and temperature responsive means at least partially obstructing said passageway to prevent movement of said object along said passageway past said temperature responsive means before the temperature of said temperature responsive means reaches a predetermined release temperature and said temperature responsive means moving to open said passageway to allow movement of said object along said passageway past said temperature responsive means when the temperature of said temperature responsive means reaches said predetermined release temperature, wherein said temperature responsive means is a bimetallic element, means being provided for fixedly supporting said bimetallic element at one portion thereof with a second portion of said bimetallic element being positioned for movement toward and away from said passageway for at least partially obstructing said passageway to prevent movement of said object along said passageway before the temperature of said bimetallic-element reaches the predetermined release temperature and for moving away from said passageway to open said passageway to allow movement of said object along said passageway when the temperature of said bimetallic element reaches said predetermined release temperature.

4,634,022
FIXTURE FOR BAG-TYPE LIQUID DISPENSER
P. Joseph O'Halloran, 541 Clinton Ave., Wyckoff, N.J. 07481; Robert H. Laauwe, 237 Green Ridge Rd., Franklin Lakes, N.J. 07417; Stanley L. Roggenburg, Jr., 70 St. James Pl., Staten Island, N.Y. 10304, and Michael E. Tully, 69 Bentley St., Staten Island, N.Y. 10307
Filed May 28, 1985, Ser. No. 738,660
Int. Cl.[4] B65D *35/28*
U.S. Cl. 222—95 8 Claims

1. A wall fixture containing a liquid dispenser, the fixture comprising a bracket having an upstanding plate from the bottom of which a shelf having a nozzle hole extends forwardly and a cover adapted to open and close in front of the plate and shelf, the dispenser comprising an extremely flexible bag having front and back walls, having edges side-seamed together and containing the liquid and having a main portion with its back wall suspended in front of the plate and a dispensing portion folded forwardly on the shelf so as to form a lower wall, the lower wall having a dispensing valve having a dispensing nozzle extending downwardly through said nozzle hole, and a depressible upper wall above the valve, the valve having an operator between the upper and lower walls and

actuated by pressing the upper wall downwardly on the operator; said cover having pressing means for pressing a bulge in the bag's front wall at a position spaced from at least one of its side edges, and extending towards the bag's back wall at a position above said dispensing portion and so as to form a



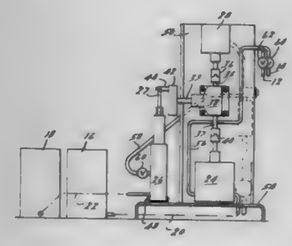
passageway on at least one side of the bulge extending between the main and dispensing portions of the bag when the cover is closed, the bulge preventing forward sagging of the bag's front wall from closing communication between the bag's main and dispensing portions.

4,634,023
CONTAINER
Yoshinobu Tanaka, Minoo, Japan, and Hiromitsu Yokoi, Torrance, Calif., assignors to Kabushiki Kaisha Alpha Gikeu, Osaka, Japan
Filed Jan. 22, 1985, Ser. No. 693,430
Claims priority, application Japan, Jan. 25, 1984, 59-11664
Int. Cl.[4] B65D *35/56*
U.S. Cl. 222—105 3 Claims



1. A container comprising an outer casing having a base-side opening and a front-side opening and not deformable by rail pressure, an inner container fitted in said outer casing for containing liquid therein and having a nozzle at the front end thereof, said inner container having a resilient structure portion that it is depressed inwardly by an external pressure applied to the base-side portion thereof but is restored to its original shape when the pressure is removed, a support member which is in engagement with or fitted in said outer casing at the rear of said inner container to hold the inner container in the outer casing, said support member having a pressure portion for compressing the inner container at the base side thereof when a finger push is applied from behind and said support member further having a resilient structure portion for allowing the inner container to restore its original position, and an inner ring between said outer casing and said inner container, one end of said inner ring abutting a ledge formed on the inner container at a location nearer to the nozzle than from the resilient structure portion and the other end thereof abutting the support member, whereby a single finger-push applied from behind the support member allows the inner container to discharge one drop of liquid out of its content through the front end of the nozzle.

4,634,024
AUTOMATIC RESIN DISPENSING APPARATUS
Edward E. Vollenweider, Pontiac, Mich., assignor to Technical Innovations, Inc., Drayton Plains, Mich.
Filed Jan. 16, 1984, Ser. No. 571,341
Int. Cl.[4] B67D *5/52*
U.S. Cl. 222—135 4 Claims



1. A device for automatically dispensing catalyst and resin material at a preselected quantity ratio, comprising:
- a positive displacement gear pump for dispensing resin from a first remote container,
- a positive displacement piston pump for dispensing catalyst from a second remote container,
- motive means for driving said gear pump and said piston pump comprising a motor and reduction means coupled to the output of said motor, said reduction means having first and second outputs thereof with the motive drive at said second output being substantially reduced relative to the motive drive at said first output,
- first coupling means for connecting said gear pump to said first output of said reduction means, and
- second coupling means for connecting said piston pump to said second output of said reduction means and including control means for controlling the volumetric displacement of said piston pump relative to said gear pump so as to achieve said preselected ratio of catalyst to resin material dispensed.

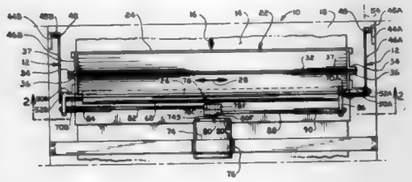
4,634,025
HOPPER MOUNTING ARRANGEMENT FOR AN AUTOMATIC TONING APPARATUS
Lennart G. Swartling, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 559,796, Dec. 9, 1983, abandoned. This application Sep. 18, 1985, Ser. No. 777,454
Int. Cl.[4] B67D *5/64*
U.S. Cl. 222—161 45 Claims

25. Apparatus for applying particulate material to an element as the element is transported along a planar path of transport comprising:
- a frame;
- a hopper having a first and a second portion, one portion

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being reciprocable with respect to the frame in a direction transverse to the path of transport of the element;

a first pair of flexible mounting members for mounting the reciprocable portion of the hopper to the frame, one of the first pair of flexible members being disposed at each end of the reciprocable portion of the hopper, each flexible member being stiff in a plane normal to the path of transport of the element to thereby rigidly support the reciprocable



portion of the hopper a predetermined clearance distance above the path of transport;

a counterweight reciprocably mounted with respect to the frame in a direction transverse to the path of transport of the element; and

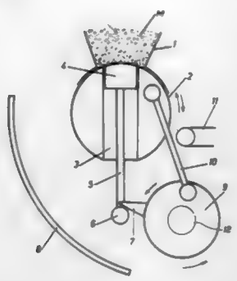
an actuator connected to both the reciprocable portion of the hopper and to the counterweight to reciprocate each of them in opposed phase relationship in a direction transverse to the path of transport of the element.

4,634,026

BREAD DOUGH DISPENSING MACHINE

Enrique Suay Puig, and Javier Suay Puig, both of Calle 550, No. 28, La Canada (Valencia), Spain

Filed Dec. 3, 1984, Ser. No. 677,224
Claims priority, application Spain, Dec. 2, 1983, 276114
Int. Cl.[4] A21C 5/04; G01F 11/10
U.S. Cl. 222—218 **1 Claim**



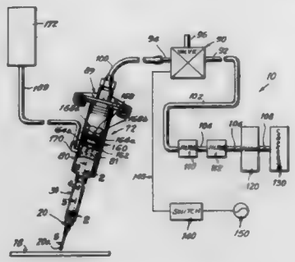
1. A bread dough dispensing machine of the type consisting of a hopper whose bottom is formed by the lateral surface of a drum driven in an alternating rotating movement, said drum having a cylindrical hole running through it diametrically from end to end and within which a piston is located, which piston carries a stem which extends through the cylindrical hole and out one end thereof the piston receding to draw in the dough to be dispensed, when the drum is rotated to a first position in which the cylindrical hole is in an approximately vertical position aligned with the hopper, and which piston advances expelling the dough, when the drum is rotated to a second position in which the cylindrical hole is in an approximately horizontal position, the improvement comprising a continuously rotating shaft, an arm attached to the shaft for rotation therewith and located so as to contact a follower on the end of the piston stem opposite the piston on each turn of the shaft when the drum is in its first position to thereby cause the receding movement of the piston, a disk connected to the shaft for rotation therewith, a rod pivotably connected at one end to the disk and pivotably connected at its other end to the drum so as to enable the rotation of the disk to impart the alternating rotating movement to the drum.

4,634,027

LIQUID DISPENSING APPARATUS AND AN ANTI-DRIP VALVE CARTRIDGE THEREFOR

Leon Kanarvogel, Hicksville, N.Y., assignor to MVM Valve Co., Inc., Hicksville, N.Y.

Filed Jan. 4, 1985, Ser. No. 688,862
Int. Cl.[4] B67D 5/00
U.S. Cl. 222—380 **15 Claims**



1. A liquid dispensing apparatus comprising:

a container for containing said liquid having an aperture in the bottom thereof;

a needle element for dispensing said liquid comprising a standard industrial blunt including:

a hollow needle having,

a connected end;

an unconnected end opposite to said connected end;

an axial bore therethrough communicating between the said connected end and the said unconnected end; and

a female coupling connected to said hollow needle having,

a pair of opposed ends,

a tapered bore communicating between the said opposed ends of said female coupling, with the narrowmost section of said tapered bore being in registry with said axial bore of said hollow needle at one of said opposed ends of said female coupling and at said connected end of said hollow needle and with the widestmost section of said tapered bore being located at the other of the said opposed ends of said female coupling,

a mouth defined by the widesmost section of said tapered bore, and

a radially extending flange connected to the outside of said female coupling level with the said mouth thereof; and

means for pressurizing said container for the duration of a time interval, to thereby force said liquid from said aperture of said container, and for depressurizing said container to atmospheric pressure, simultaneously, with the end of said time interval; and an anti-drip valve cartridge, said valve cartridge comprising:

a casing operable to be located between said container and said needle element, including,

a central portion,

an inlet portion connected to said central portion having,

an inlet opening, and

means for sealably connecting said casing to said container with said inlet opening in communication with said aperture of said container,

an outlet portion, spaced apart from said inlet portion and connected to said central portion, said outlet portion having,

an outlet opening, and

sealable connection means for sealably connecting said casing to said needle element with said outlet opening in registry with said tapered bore of said needle element, said sealable connection means for connecting said casing to said needle element including,

a depending nozzle member configured to project into said mouth of said female coupling of said needle element and seal within said tapered bore thereof, said nozzle member having,

a proximal end, and

a distal end operable to be extended within said tapered bore of said needle element, said nozzle member connected to said central portion by its said proximal end, said nozzle member having said outlet opening located on its said distal end, and

a cylindrical flange of a male luerlock fitting, said cylindrical flange connected to said central portion in a coaxial relationship with said nozzle member, with said nozzle member situated within said cylindrical flange and with said central axis of said cylindrical flange being coincident with the central axis of said nozzle member, said cylindrical flange having a plurality of threads therein configured to threadably engage said radially extending flange of said needle element, and

a passageway, communicating between said inlet opening and said outlet opening; and

means, associated with said outlet opening, for unsealing said outlet opening for the duration of said time interval, so that said liquid under said application of pressure is forced from said aperture of said container, into said inlet opening, through said passageway, out of said outlet opening, through said needle element and out of the said unconnected end thereof and for sealing said outlet opening simultaneously with the end of said time interval, whereby after said time interval, a volume of liquid remains in said needle element which is operable to be acted upon by said incoming atmospheric pressure at the unconnected end of said hollow needle so that when the product of the specific gravity of said liquid remaining in said needle element and the difference between the length of said needle element and the length of said nozzle member sealed within said tapered bore of said needle element is less than that of the said atmospheric pressure, said liquid will not drip from said needle element said sealing and unsealing means include an outwardly opening pressure activated poppet valve sized for reciprocating movement beyond said outlet opening of said nozzle member and within said tapered bore of said needle element between a closed and seated position when sealing said outlet opening and an open unseated position of maximum valve stroke, towards but spaced from said narrow most section of said tapered bore of said needle element, when unsealing said outlet opening, said oppet valve having means for biasing said poppet valve in its said closed and seated position;

said depending nozzle member comprises a truncated tip member of a male luerlock fitting configured to seal within said tapered bore of said needle element when extended through the said mouth thereof:

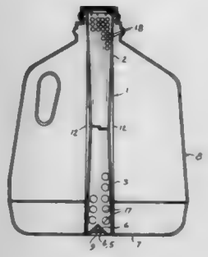
said nozzle member further has, a valve seat configured to seal against said poppet valve when in its said closed and seated position, said valve seat being located on the said distal end of said nozzle member, said valve seat having an annular configuration, the inner periphery of which defines said outlet opening and the outer perphery of which is located on the said distal end of said nozzle member.

4,634,028

CONTAINER REINFORCEMENT

Pierre J. de Larosiere, 30 Duque de Palmela, 4C, 1200 Lisboa, Portugal

Filed Nov. 16, 1984, Ser. No. 672,454
Int. Cl.[4] B67D 5/60; B65D 25/02
U.S. Cl. 222—464 **10 Claims**



1. A container having improved axial strength and controlled pouring, comprising:

a lightweight, thin-walled container having a bottom and a neck with an opening therethrough; and

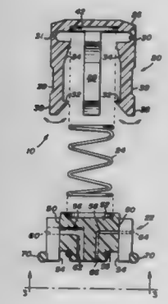
an elongate, rigid, hollow tubular member extending axially in the container from a top end at the neck to a bottom end at the container bottom, said member top and bottom ends engaging the neck and bottom of the container and having means thereon to prevent relative axial and lateral displacement between the member and container, said member being of sufficient rigidity to reinforce the container in an axial direction whereby a number of said containers may be stacked one on top of the other without collapsing the containers, and said member having openings in the side thereof through which material flows when filling the container and when pouring from the container.

4,634,029

EXTERNAL BOTTLE CAP

Hugo Hauser, Palo Alto, Calif., assignor to Tritec Industries, Inc., Mountain View, Calif.

Filed Jan. 29, 1986, Ser. No. 823,992
Int. Cl.[4] B65D 47/06
U.S. Cl. 222—567 **6 Claims**



1. A quick release, sealing container closure comprising:

a generally U-shaped spider member having a plurality of flexible legs, said legs including flexing means for flexing said legs outwardly and engaging means for engaging said legs with a flange formed onto a container neck;

a disk-shaped plug member for slidably fitting within the spider member and including a plurality of slot means formed about the periphery thereof and adapted to receive said flexible legs of the spider member, the plug

member further including a securing means for urging said legs into contact with said flange and fluid channel means for conducting fluids from an interior of said container to an exterior of said container, said plug member also including a sealing cavity means for receiving a mouth of said container in a sealing manner; and

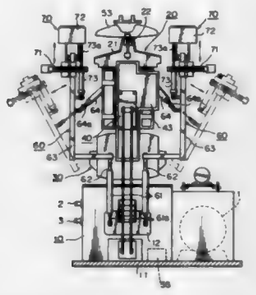
a biasing means to bias apart the spider and plug members, the plug member being retained within the spider by said engaging means.

4,634,030

LAUNDRY PRESSER FOR SIMULTANEOUSLY PRESSING MULTIPLE CLOTHING SECTIONS

Mituyuki Uchikoshi, Hachiouji, Japan, assignor to Sankousha Co., Ltd., Hachiouji, Japan

Filed Jul. 5, 1985, Ser. No. 752,363
Claims priority, application Japan, Jul. 17, 1984, 59-147969
Int. Cl.⁴ D06F *71/18*
U.S. Cl. 223—57 **7 Claims**



1. An improved laundry presser comprising

a pedestal,

a clothing bearer arranged vertically on said pedestal and substantially patterned after a human upper body,

a skirt holder unit arranged on said pedestal and including two pairs of inner and outer holders which face the lower end of said clothing bearer,

a body presser unit mounted to said pedestal and including a first heater plate which faces the body front of said clothing bearer,

a shoulder presser unit arranged on said pedestal and including a second heater plate which faces the shoulder of said clothing bearer,

a supporter unit mounted to said pedestal and including a pair of base plates located on both lateral sides of the shoulder of said clothing bearer,

a pair of tack presser units held atop by said supporter unit and each including one of a pair of third heater plates which face said base plates of said supporter unit, respectively,

means for supplying steam to said first to third heater plates, and

a control unit for controlling operations of said units and said supplying means so that said body, shoulder and tack presser units can be driven for substantially concurrent pressing of an article of clothing applied to said clothing bearer.

4,634,031

ARTICLE CARRIER

Florence D. Frankhouse, 2211-B E. Winston Rd., Anaheim, Calif. 92806

Filed Jun. 5, 1985, Ser. No. 741,450
Int. Cl.⁴ A45C *13/30*
U.S. Cl. 224—205 **13 Claims**



1. An article carrier to be worn over the shoulder and around the torso of the wearer, comprising:

(a) a plurality of interconnected pocket members, each of said pocket members comprised of an inner and an outer generally rectangular panel and said panels disposed in contiguous overlying relation and being secured together along the peripheral edges thereof for providing a pocket therebetween;

(b) zipper means extend along two opposite lateral side edges of each of said pocket members;

(c) a zipper closure element secures together the zipper means of adjacent side edges of adjacent pocket members for interconnecting said pocket members and said interconnected pocket members arranged in a continuous endless looped chain;

(d) a zipper assembly extends generally transverse to and between the zipper means of each pocket member and is closely adjacent a longitudinal edge thereof for providing access to the associated pockets;

(e) a passageway extends along each of said pocket members adjacent the associated zipper assembly and the passageways of adjacent pocket members are aligned;

(f) cord means extend through each of said passageways for preventing said pocket members from being separated from said chain; and,

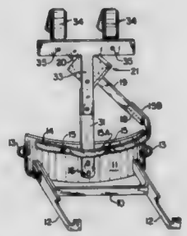
(g) means associated with each of said outer panels for preventing viewing therethrough into the associated pocket.

4,634,032

CARRIER FOR A PERCUSSION INSTRUMENT OR OTHER OBJECT

Thomas R. LaFlame, 107 Noble Ave., Pittsburgh, Pa. 15205

Continuation-in-part of Ser. No. 385,292, Jun. 4, 1982, Pat. No. 4,453,442. This application Apr. 26, 1984, Ser. No. 604,165
The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.
Int. Cl.⁴ A45F *3/10*
U.S. Cl. 224—265 **11 Claims**



1. Apparatus for use by a person to carry an object, said apparatus including the combination of:

plate means for partial support at the waistline area of a person, said plate means including a carrier to receive an object,

means forming a rigid band with a generally bent contour supported by said plate means for extending from said plate means along at least a portion of the waistline of the person,

a riser arm supported by said band at the waistline of a person, said riser arm extending in a generally upward direction at a side of a person which opposite said plate means such that an upper end portion of the arm projects to an elevation generally at the thoracic region of the person, and

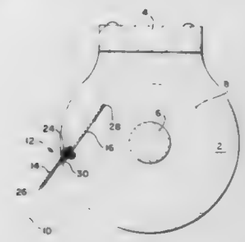
pad means carried by the upper end portion of said arm for imparting to the person a reactive force to the weight of said object about fulcrum area defined by a contact area of the plate means at the waistline area of the person.

4,634,033

PAPER TOWEL DISPENSER

Benjamin L. Lloyd, Rte. 2, Box 122, Kennedy, Ala. 35574

Filed Jul. 20, 1984, Ser. No. 632,655
Int. Cl.⁴ B26F *3/02*; A47K *10/36*
U.S. Cl. 225—73 **2 Claims**



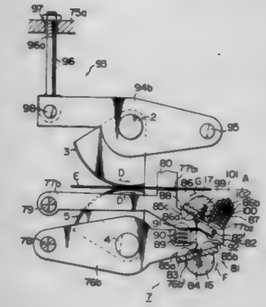
1. Paper towel dispenser comprising a roll of paper towels mounted on a housing for rotation about a first axis, and a combined braking and severing device mounted on said housing for rotation about a fixed second axis, said device comprising a pair of flat elongated plates extending longitudinally along the outer surface of said roll, said plates being superimposed and spaced from each other to receive a loose end of said roll of towels therebetween, means for connecting the superimposed portions of said plates and for mounting said plates on said housing for rotation about said second axis, one of said plates extending outwardly from said roll, the other of said plates having a major portion extending inwardly toward said roll and a minor portion extending outwardly from said roll, whereby when a force is applied to the loose end in order to remove a portion thereof said one of said plates acts as a lever to rotate said device to bring said other of said plates into braking contact with the outer surface of said roll and permit the loose end to be severed with the aid of said one plate.

4,634,034

ROLL FEED APPARATUS

Heizaburo Kato, Ichikawa, Japan, assignor to Sankyo Manufacturing Co., Ltd., Tokyo, Japan

Division of Ser. No. 519,174, Aug. 1, 1983. This application Apr. 15, 1985, Ser. No. 723,227
Claims priority, application Japan, Feb. 22, 1983, 58-24892; Feb. 22, 1983, 58-24893
The portion of the term of this patent subsequent to Oct. 9, 2001, has been disclaimed.
Int. Cl.⁴ B65H *20/04, 20/18, 23/10*
U.S. Cl. 226—142 **3 Claims**



1. A roll feed apparatus comprising:

a housing;

an oscillation driving device;

a main sector roll integrally carried by a main roll shaft and adapted to be oscillatorily driven by said oscillation driving device;

a sub-sector roll integrally carried by a sub-roll shaft extending parallel to said main roll shaft, said sub-sector roll being adapted to cooperate with said main sector roll so as to clamp a sheet material therebetween and feed the same along a planar path of feed;

a driving connection mechanism for drivingly connecting said main sector roll and said sub-sector roll to each other in such a manner that, when said main sector roll is rotated in one direction by a predetermined angle, said sub-sector roll is rotated in the opposite direction substantially by the same angle as said main sector roll; and

a roll release device adapted to cause a relative movement between said main sector roll and said sub-sector roll away from each other when said sector rolls are rotated in the directions opposite to those for feeding said sheet material thereby to release said sheet material from the clamping force exerted by said sector rolls;

wherein said roll release device includes a release pivot shaft extending from said housing of said apparatus in parallel with said sub-roll shaft; a brake pivot shaft extending from said housing substantially in parallel with said sub-roll shaft; a pair of release arms carried substantially at the lengthwise mid-portion thereof by portions of said sub-roll shaft, said sub-roll shaft portions extending beyond both axial end surfaces of said sub-sector roll and each of said release arms being fitted at one end on said release pivot shaft; a pair of brake arms disposed between respective release arms and the path of feed of said sheet material and each having one end adjacent to one of said pivot shaft ends of said release arms fitted on said brake pivot shaft, said brake arms being provided with movable brake pads extending therefrom towards said path of feed of said sheet material; stationary brake pads opposed to said movable brake pads across said sheet material; and an arm actuating device operatively connected to the other ends of said pair of release arms and the other ends of said pair of brake arms and adapted to be driven by said oscillation driving device;

wherein said arm actuating device is adapted to cause pivotal motions of said pair of release arms and said pair of brake arms in such a manner that, when said sector rolls are rotated in the direction for feeding said sheet material, said sub-sector roll is moved towards said main sector roll while said movable brake pads are kept away from said stationary brake pads; and,

wherein, when said sector rolls are rotated in a direction opposite to the direction for feeding said sheet material, said sub-sector roll is moved away from said main sector roll and, while the sub-sector roll is in a position away from the main sector roll, said movable brake pads are temporarily moved toward said stationary brake pads and then moved away from the latter.

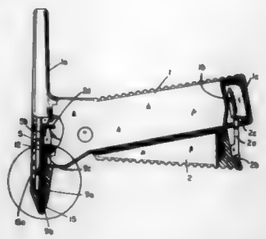
VOL 1074 ISS 1 JA 6 1987 UMI

4,634,035

SKIN STAPLER

Lehmann K. Li, and Michael Marra, both of Fairfield, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 12, 1984, Ser. No. 588,275
Int. Cl.[4] A61B *17/00*
U.S. Cl. 227—19 12 Claims



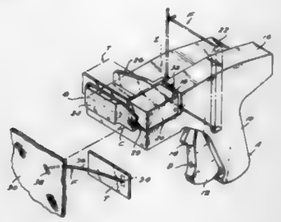
1. A surgical stapler comprising a housing, means for forming a staple, said forming means having an anvil surface terminating in a movable flange and a staple forming track movable containing a forming blade, said anvil surface having a boss and said forming blade having an opening, said anvil surface boss having an arcuate motion dependent on the linear motion of said forming blade opening such that said boss moves into said opening as said forming blade approaches said flange, and said boss moves out of said opening as said forming blade retracts from said flange, a staple feed track movably containing a plurality of staples in a point-to-crown configuration, the holding portion of said feed track being substantially parallel to said forming track and the distal, escaping, portion of said feed track being in substantial alignment with the distal portion of said forming track, and means for activating said forming means said activating means being cooperatively attached to said forming means.

4,634,036

TAG DISPENSING AND ATTACHING APPARATUS

Daniel Duchin, Wantagh, N.Y., assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 553,080, Nov. 18, 1983. This application Dec. 20, 1985, Ser. No. 811,223
Int. Cl.[4] A43D *69/00*; B31F *7/00*
U.S. Cl. 227—67 17 Claims



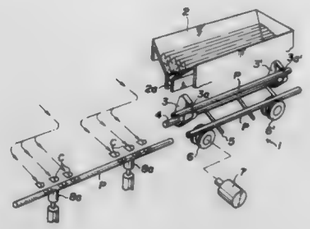
1. Tag attaching apparatus comprising a housing, actuating means, a hollow needle through which a fastener is dispensed, means for mounting said needle to said housing for movement between an original position and an extended position, means for moving a fastener through said needle, means for moving said needle mounting means from said original position to said extended position in response to acutation of said actuating means and means for causing said fastener moving means to move said fastener through said needle, in response to further actuation of said actuating means.

4,634,037

SPRING CLAMP DELIVERY DEVICE FOR PIPE MATERIAL WELDING APPARATUS

Yutaka Yajima, and Kazuyoshi Matsushita, both of Akishima, Japan, assignors to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Jun. 12, 1984, Ser. No. 620,324
Int. Cl.[4] B23K *37/04*
U.S. Cl. 228—6.1 3 Claims



1. A spring clamp delivery device for a pipe material welding apparatus adapted for welding spring clamps to a linearly-shaped pipe material, said spring clamp delivery device including a pipe material supply mechanism for supplying pipe materials and means for setting a position for welding spring clamps to said pipe material, said device comprising:

a transfer rail adapted to receive and supply said spring clamps in a lined-up manner, said transfer rail being disposed in a facing relationship with said pipe material and having an opening formed in both lateral surfaces of its forward end portion, said opening being aligned in a direction substantially crossing the longitudinal direction of said transfer rail;

a delivery mechanism interposed between said transfer rail and said pipe material, said delivery mechanism being slidable longitudinally of said pipe material and having a plurality of chutes disposed at intervals corresponding to each welding position of said spring clamps on said pipe material, each of said chutes being so arranged that the rearward mouth thereof is so positioned as to correspond to said opening formed in said transfer rail each time said delivery mechanism is moved and further each of said chutes being so arranged that on the upper surface of its forward end portion, an insertion opening is formed for allowing a welding gun to move therethrough for welding said spring clamps to said pipe material and on the lower surface of said chute's forward end portion is formed a drop opening for permitting said spring clamps to drop therethrough onto said pipe material; and

an extrusion body provided at one of said lateral surfaces of said transfer rail in such a manner as to correspond to said opening, said extrusion body being adapted to move in a direction substantially crossing the alignment direction of said opening formed in both lateral surfaces of said forward end portion of said transfer rail so as to push out said spring clamp from within said transfer rail and into one of said plurality of chutes,

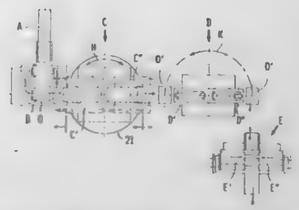
whereby said delivery mechanism is moved along the longitudinal direction of said transfer rail so that said rearward mouth of each of said chutes is positioned at a point corresponding to one of said openings of said transfer rail and then one of said spring clamps in said transfer rail is pushed by said extrusion body to enter into said rearward mouth of each of said chutes and is transferred through said chutes to reach the forward end portion of said chute.

4,634,038

APPARATUS FOR THE MANUFACTURE OF RING MEMBERS

Caprioglio Luigi, Corso Francia 224, I-10146 Torino, Italy

Filed Jun. 6, 1985, Ser. No. 741,821
Claims priority, application Italy, Jun. 15, 1984, 67612 A/84; Jun. 15, 1984, 67613 A/84
Int. Cl.[4] B23K *37/04*; B21H *1/06*; B21K *1/38*
U.S. Cl. 228—17.5 16 Claims



1. Apparatus for manufacturing ring members, starting from metal plate strip cut lengths, comprising: a cylinder bending machine, a welding machine of the type with flushing rollers, a hot rolling station and a removal station for removing the excess material pushed out at the beginning and the end of the welding zone; said bending station including a calender; said welding station including at least one welding machine of discontinuous type with flushing rollers, a corresponding grasping means for grasping the workpiece, said grasping means being movable between an extended position and a retracted position, and a movable support, said movable support being displaceable between a first and a second position; said rolling station including at least a pair of rollers, means for driving at least one of said rollers and means for supporting and guiding the workpiece; and said removal station including mechanical means for material removing, said material removing means being arranged to work only on end portions of the workpiece; the mutual arrangement of said stations being such that when said movable support of the welding station is in its first position said welding machine faces the bending station, and said grasping means, in its extended position, extends into the bending station in such a position as to grasp the workpiece lying therein, whilst, when said movable support of the welding station is in its second position, said welding machine faces the rolling station, and said grasping means, in its extended position, is positioned in such a position as to transfer a workpiece to said support and guide means of the rolling station; said welding machine being arranged to carry out the welding operation during the travel of said grasping means from the retracted position towards the extended position, and said movable support of the welding station being arranged so as to pass from the first to the second position during the welding step.

4,634,039

SOLDER RESIST PASTE AND METHOD OF SOLDERING

Hari N. Banerjee, Rexdale, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 19, 1984, Ser. No. 662,916
Int. Cl.[4] B23K *1/20*, *31/02*
U.S. Cl. 228—118 2 Claims

1. A method of soldering components to a PCB (printed circuit board), said method characterized by:

selectively applying a temporary solder resist consisting of a polyglycol and either kaolin or talc powder to at least one hole in said PCB;

selectively situating first components on said PCB either on the surface of said PCB or into holes other than the holes containing said solder resist;

soldering said first components to said PCB;

washing said PCB with a solvent in which said solder resist is soluble and which is not harmful to either said PCB or said first components;

selectively situating second components on said PCB employing holes that had previously held said solder resist; and

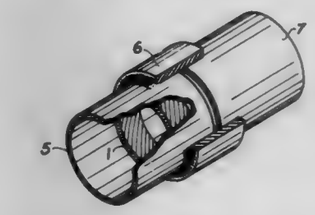
soldering said second components to said PCB.

4,634,040

PROCESS FOR WELDING PIPE ENDS AND AN INSULATING RING THEREFOR

Donald D. Savard, 15139 Ramsay Crescent, Edmonton, Alberta, Canada (T6H 5R1)

Filed Mar. 10, 1986, Ser. No. 837,779
Int. Cl.[4] B23K *9/02*
U.S. Cl. 228—119 1 Claim



1. In a process for joining together a pair of aligned end sections of steel pipe, internally filled with liquid, utilizing a cylindrical steel sleeve positioned over the junction between adjacent pipe ends and welded thereto by means of circumferential fillet welds, the improvement comprising:

positioning a composite ring, comprising a body of heat-insulating, liquid-disintegratable material coated with a liquid-impermeable material which dissolves slowly in the pipe liquid, within each pipe end section and contiguous thereto, beneath the anticipated area of the circumferential fillet weld, whereby the rate of heat transfer from the weld and pipe end to the liquid in the pipe will be reduced during the welding process;

fillet welding the sleeve ends to the pipe end sections with the insulating rings positioned therein; and

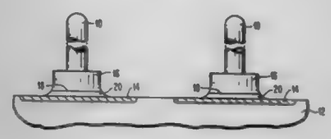
subsequently disintegrating the rings in the liquid.

4,634,041

PROCESS FOR BONDING CURRENT CARRYING ELEMENTS TO A SUBSTRATE IN AN ELECTRONIC SYSTEM, AND STRUCTURES THEREOF

Chandrika Prasad, Poughkeepsie, and Andrew F. Szewczyk, Troy, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,185
Int. Cl.[4] B23K *1/20*
U.S. Cl. 228—124 12 Claims



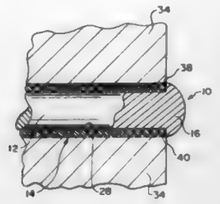
1. A process for bonding an I/O pin to a substrate of dielectric material comprising,

providing a solder wettable pin pad of a predetermined diameter of said substrate,

providing an I/O pin with a bonding surface having a diameter that is smaller than the diameter of said pin pad by at least 0.01 inch

providing a brazing material of an alloy that at least includes Ag and a metal selected from the group consisting of In and Sn and mixtures thereof that exhibits a mushy zone over a predetermined temperature range,
placing said bonding surface of said pin in centered relation to said pin pad with a mass of said brazing material disposed between said bonding surface and said pin pad,
heating the resultant assembly to a brazing temperature within said predetermined temperature range while applying pressure to said pin to force the pin head into contact with said brazing material, and cooling the assembly,
the edge of the resultant fillet of brazing material being displaced inwardly from the edge of said pin pad.

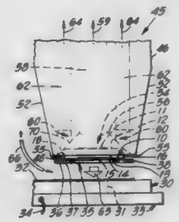
4,634,042
METHOD OF JOINING REFRACTORY METALS TO LOWER MELTING DISSIMILAR METALS
Kevin Smith, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.
Filed Apr. 10, 1984, Ser. No. 598,879
Int. Cl.⁴ B23K *31/00*
U.S. Cl. 228—173.4 **14 Claims**



1. A method for manufacturing an angiographic coil spring guide wire for use with a catheter for guiding the catheter into a vessel of a body, including the steps of: coating a predetermined length of wire having a high melting point with a metallic glaze having a melting point less than said wire; wrapping said coated wire around a mandrel to form a wire coil thereabout; removing said mandrel from said wire coil; inserting a core wire within said wire coil so that a portion of said core wire protrudes from one end of said wire coil, said core wire having a melting point which is less than said wire coil and which is close to the melting point of said metallic glaze; surrounding said wire coil with a thermally conductive chill; heating said protruding portion of said core wire until said core wire melts such that said metallic glaze also melts in order to provide an oxide-free resilient bond between said wire coil and said core wire.

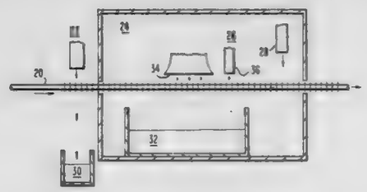
4,634,043
ENGAGING SECOND ARTICLES TO ENGAGED FIRST ARTICLES
Michael K. Avedissian, Mohnton, Pa., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.
Filed Sep. 20, 1984, Ser. No. 652,388
Int. Cl.⁴ B23K *31/02*
U.S. Cl. 228—180.2 **6 Claims**

1. A method of removably engaging to a head, a first article having peripheral sides and then engaging a second article to the engaged first article, comprising:
supporting a body by connection to an upper portion of the body such that a lower portion terminates in a downwardly presented working face;
receiving the first article at said working face, against surfaces for engaging such that at least a portion of the peripheral sides of said first article protrude from said working face;
removably engaging a first article utilizing a vacuum bore adapted for first connection between said working face and a vacuum source for engaging and holding the first article against said engaging surfaces; and
moving air streams toward said working face at the peripheral sides of an engaged first article, such streams being



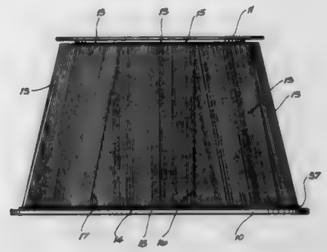
sufficient in force, direction and distribution around said peripheral sides that when the engaged first article is moved adjacent to a free second article, the air streams capture sufficient peripheral portions of said second article against the first article.

4,634,044
PROCESS FOR RESTRICTED LEAD CONTENT SOLDERING OF COPPER FINS TO COPPER ALLOY TUBING WITH CONTROLLED COPPER CONTAMINATION OF THE MOLTEN SOLDER RESERVOIR
Homer G. Hargrove, Maitland, Fla.; Jay L. Kratz, Cherry Hill, N.J.; Raymond A. Sabatino, Havertown, Pa., and Perry A. Weyant, Winter Springs, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Oct. 4, 1985, Ser. No. 784,431
Int. Cl.⁴ B23K *31/02*
U.S. Cl. 228—183 **8 Claims**



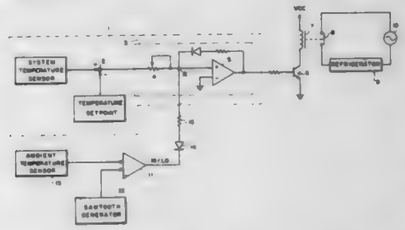
1. An improved method for continuous metal fusion bonding of copper-based fin to copper-based heat exchanger tubing, said improved method comprising:
a. assembling said fin to said tubing;
b. applying flux to said fin-tubing assembly;
c. controlling the temperature of an essentially lead-free, high tin solder reservoir;
d. flowing solder from said reservoir on said fin tubing assembly;
e. returning excess solder to the reservoir; and
f. wiping each portion of said soldered finned tubing with an air quench in less than 15 seconds from the time that solder was flowed on that portion and return the excess solder wiped from said finned tubing to said reservoir whereby the solder is rapidly solidified and essentially all of the high temperature melting copper-tin alloy which is formed is retained adjacent to the fin and tube surfaces thus avoiding copper-tin alloy sludge formation in the reservoir

4,634,045
DEWATERING SCREEN MANUFACTURE AND METHOD THEREOF
Alan D. Baldwin, 53 Melrose Avenue, Sylvania. N.S.W. 2224, Australia
PCT No. PCT/AU83/00003, § 371 Date Sep. 19, 1983, § 102(e) Date Sep. 19, 1983, PCT Pat. No. WO83/02409, PCT Pub. Date Jul. 21, 1983.
PCT Filed Jan. 14, 1983, Ser. No. 537,420
Claims priority, application Australia, Jan. 19, 1982, 2343
Int. Cl.⁴ B01D *29/22*; B23P *15/16*
U.S. Cl. 228—212 **7 Claims**



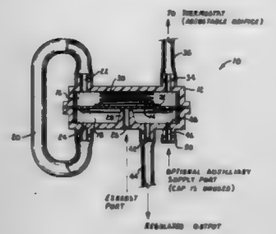
1. Apparatus for the manufacture of a dewatering screen composed of a plurality of screen wires disposed on a frusto-conical surface and oriented in the axial direction of said surface, said apparatus comprising a plurality of screen wire support members shaped to form upon assembly a frusto-conical surface, each one of said plurality of screen wire support members having:
(a) a plurality of parallel grooves dimensioned for the reception of the screen wires, said plurality of parallel grooves being oriented in the axial direction of the frusto-conical surface;
(b) a pair of end edges at least substantially normal to the axial direction of the frusto-conical surface; and
(c) a pair of side edges, a first one of said pair of side edges being parallel to said plurality of parallel grooves and a second one of said pair of side edges tapering towards said first edge in the direction of the apex of the frusto-conical surface.

4,634,046
CONTROL SYSTEM USING COMBINED CLOSED LOOP AND DUTY CYCLE CONTROL FUNCTIONS
Minoru Tanaka, Yamato, Japan, assignor to Yamatake-Honeywell Co. Limited, Tokyo, Japan
Filed Apr. 22, 1985, Ser. No. 726,191
Claims priority, application Japan, May 10, 1984, 59-91839
Int. Cl.⁴ F23N *5/20*
U.S. Cl. 236—46 F **4 Claims**



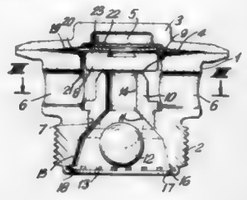
1. A control system comprising
a differential amplifier for amplifying the difference between a preset reference temperature for a controlled system and a detected temperature in the controlled system,
thermostat means having a differential circuit for providing a predetermined hysteresis lag for an output of said amplifier, and
a duty cycle generating circuit for changing the operating potential of said differential circuit in accordance with a predetermined duty cycle thereby to shift the operating point thereof wherein said duty cycle generating circuit includes a comparator for comparing output of a sawtooth generating circuit and the output of an ambient temperature sensor for providing an output corresponding to the difference therebetween.

4,634,047
THERMOSTATICALLY ADJUSTABLE PRESSURE REGULATOR
Raymond H. Dean, Shawnee Mission, Kans., assignor to Tempmaster Corporation, North Kansas City, Mo.
Filed Sep. 13, 1985, Ser. No. 775,533
Int. Cl.⁴ F24F *7/00*
U.S. Cl. 236—49 **39 Claims**



VOL 1074 ISS 1 JAN 6 1987 UMI

unhardened turnings, a diaphragm clamped in a hermetic and leak-proof manner between said margins, said upper capsule part being of a hat-shaped configuration and together with the diaphragm forming a chamber for receiving a voltile liquid; said lower capsule part comprising: a threaded stem to be threaded into a bore in a casing of a drain, lateral inlet ports for steam water, said lower capsule part above the threaded stem in the area of the inlet ports including a cylindrical body, a valve body, and a controlled outlet opening; said lower capsule part including a first portion extending from said outer margins to closely adjacent said valve body and said upper capsule part including a second portion extending from said outer margins to at least closely adjacent to said valve body, said first and second portions defining means for supporting said diaphragm, said first extending portion being spaced from said valve body to define a free annular gap between said valve body and said



lower capsule part to permit working movement of said valve body, a valve seat body being held in a press fit in a bore of said lower capsule part and having first and second valve seats respectively at inlet and outlet ends thereof, the outlet end of said valve seat body cooperating with a check valve body, a sieve plate limiting the opening movement of said check valve body, and through-bore in the valve seat body flaring towards the outlet end, continuing conically in the outlet opening of said lower capsule part beyond the valve seat body and being simultaneously a chamber for the movement of the check valve body, said inlet ports being bores which extend transversely of said cylindrical body, said bores having a top edge lying closely adjacent to a plane containing said first valve seat and a bottom edge lying closely adjacent to a plane containing said second valve seat whereby said inlet ports form a tool engaging means.

4,634,049

CONCRETE CROSSTIE WITH RECESSES AND METHOD FOR THE PRODUCTION THEREOF

Horst E. Steinfeld, Schwerte, and Gerd Westerdorff, Dusseldorf, both of Fed. Rep. of Germany, assignors to Hoesch Aktiengesellschaft, Fed. Rep. of Germany

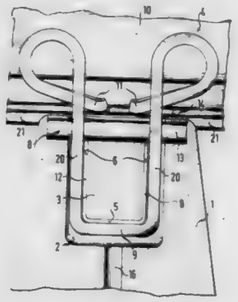
Filed Mar. 11, 1985, Ser. No. 710,025

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 3408597

Int. Cl.⁴ E01B *9/30*

U.S. Cl. 238—84 **5 Claims**

1. A concrete crosstie and rail securing member combination; the concrete crosstie having a recess with a generally rectangular nose formed therein having a generally horizontal downwardly facing bearing surface at the bottom and two side surfaces which are generally vertical and which are spaced apart horizontally, and the rail securing member being generally U-shaped with a loop at the free end portion of each arm of the U and with the free end of the arm extending generally horizontally and flexible generally vertically through the spring action inherent in its associated loop, the body of the U-shaped rail securing member being disposed beneath and retained against upward movement by the downwardly facing bearing surface of the nose in the recess of the crosspiece, the arms of the U-shaped member engaging the said side surfaces of the nose and retaining the member against horizontal dislodgement, and the free ends of the arms being flexed upwardly and engaging a rail disposed adjacent the recess and supported on the crosspiece whereby to retain the rail in position, and a metallic reinforcing member disposed between said



securing member and said nose bearing and side surfaces and also having a portion engaging an edge portion of the rail.

4,634,050

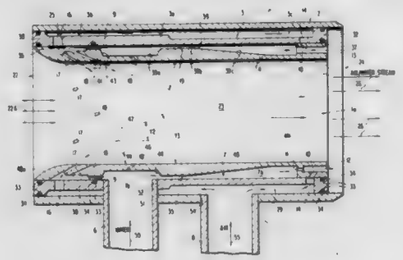
FANLESS AIR ASPIRATION SNOWMAKING APPARATUS

James H. Shippee, P.O. Box 47, Vernon, Vt. 05354

Filed Jan. 3, 1986, Ser. No. 815,839

Int. Cl.⁴ A01G *15/00;* **E01H** *13/00;* **A62C** *1/12;* **B05B** *7/10*

U.S. Cl. 239—14.2 **16 Claims**



1. A fanless air aspiration snow making apparatus comprising:

a hollow tubular member having a cylindrical inner sidewall forming a substantially uninterrupted axial ambient air eductor flow passage and including inlet and outlet ends open to the atmosphere,

means carried by said hollow tubular member for ejecting compressed air in jet form into said passage for fluid attachment to said tubular member inner sidewall and for educing ambient air flow through said passage, and

means for ejecting water into said compressed air eductor air stream to propagate growth of ice crystals and for increasing the freezing rate of the water by vaporization of water attaching to the inner sidewall of the tubular member, significantly increasing the flow rate of air leaving the outlet end of said hollow tubing member over that of the compressed air eductor the ambient air into the flow stream while minimizing the energy requirements in ejecting both compressed air and water into said eductor flow passage.

4,634,051

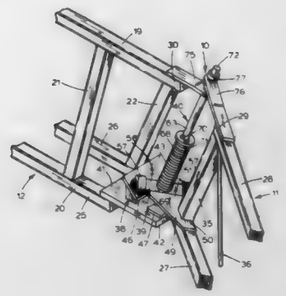
BREAK AWAY JOINT BOOM ASSEMBLY

Wayne C. Dudley, Parkersburg, Iowa, assignor to Top-Air Manufacturing, Inc., Parkersburg, Iowa

Filed Mar. 20, 1986, Ser. No. 841,870

Int. Cl.⁴ B05B *1/20*

U.S. Cl. 239—168 **5 Claims**



1. An improved break away joint assembly for connecting an outer boom section to a center boom section of an elongated spray boom to permit pivotal movement of said outer section with respect to said center section from a normal condition in which said sections are colinear to a folded condition, said joint comprising:

(a) said outer boom section having a frame type construction formed of upper and lower vertically spaced apart beam members connected together by at least two brace members;

(b) said center boom section having a frame type construction formed of upper and lower vertically spaced apart beam members connected together by at least two brace members;

(c) means for pivotally connecting an outer end of the upper beam member of said center section with an inner end of the upper beam member of said outer section;

(d) a first extension member extending outwardly from an outer end of the lower beam member of said center section and having a generally vertically directed aperture;

(e) an inclined ramp member secured to an upper surface of said first extension member;

(f) a second extension member extending outwardly from an inner end of the lower beam member of said outer section;

(g) a stabilizing means on the outer end of said second extension member that overlies said first extension member and is transverse to said second extension member and the inclined surface of said ramp when said boom is in the normal condition, said means having a through bore generally in alignment with the aperture in said first member;

(h) yieldable biasing means extended through said through bore and said aperture for pivotally connecting said first extension member and said stabilizing means together in such fashion that said stabilizing means is adjacent the lower end of the inclined surface of said ramp to thereby maintain said boom in the normal condition, and permitting said stabilizing means to rotate about the longitudinal axis of said yieldable means as said outer boom section is moved from the normal condition to the folded condition.

4,634,052

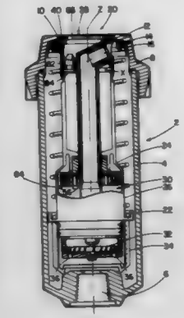
ADJUSTABLE ARC SPRINKLER HEAD

Glen Grizzle, Corona; Stephen L. Tyler, Diamond Bar, both of Calif., and Joseph J. Walto, Chaska, Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Nov. 5, 1984, Ser. No. 668,347

Int. Cl.⁴ B05B *15/10*

U.S. Cl. 239—205 **9 Claims**



1. An improved adjustable arc sprinkler head of the type having a nozzle assembly which rotates about an axis of rotation; first and second circumferentially spaced stops carried on the nozzle assembly; drive means for rotating the nozzle assembly in opposed first and second directions, wherein the drive means includes means responsive to the stops for reversing the direction of nozzle assembly rotation such that the nozzle assembly waters an arc segment which is subtended by the circumferential distance between the stops; wherein the improvement comprises:

(a) means for normally fixing each of the stops to the nozzle assembly for rotation therewith; and

(b) means responsive to a longitudinal movement of the nozzle assembly along the axis of rotation for uncoupling one of the stops from the nozzle assembly such that continued rotation of the nozzle assembly will vary the circumferential distance between the stops.

4,634,053

HANDLE FOR A FLUIDIC CLEANING AND/OR MASSAGING DEVICE

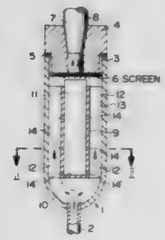
Ronald Herzfeld, Germering; Karl Wydra, Oberhaindlfing, and Alexander Uebel, Stanggass, all of Fed. Rep. of Germany, assignors to Knorr-Bremse Fluidics GmbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 443,881, Nov. 23, 1982, abandoned. This application Feb. 26, 1985, Ser. No. 705,879

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 3147264

Int. Cl.⁴ B05B *7/00*

U.S. Cl. 239—315 **14 Claims**



1. In a hollow handle for a fluidic personal care device,

VOL 1074 ISS 1 JA 6 1987 UMI

which handle carries the personal care device at an upper handle end and which is connected with its opposite handle end to a flexible water hose through which water under pressure is supplied to the fluidic personal care device for delivering through the hollow handle at least one water jet, the improvements comprising: a hollow, enlongated dosing container for holding a supply of an effective substance, said dosing container being insertable into said hollow handle and having a closed bottom end and an open top end forming a leaking opening, at least one first flow passage defined between an outer wall of said dosing container and an inner wall of the hollow handle, a closure cap having an inner end and an outer end and a central flow channel through said closure cap which is secured to said upper handle end, connecting means for said closure cap to connect the closure cap to said personal care device, a flow interaction region forming an annular space on the inner end of said closure cap around said flow channel between said closure cap and said open end of said handle with said dosing container inserted in said handle, at least one second flow passage connecting said first flow passage to said flow interaction region, said flow interaction region being formed such that water flow from said second flow passage into said interaction region causes the effective substance to dissolve generally in the range of said leaking opening by vortex flow, wherein a flow velocity in at least one of said flow passages is slower than in said interaction region, a screen secured to said closure cap for covering said flow channel, said screen being located opposite to said leaking opening of said dosing container in said handle, said screen having a central part spaced from an inlet opening of said flow channel, said screen having edges held in said annular space for retaining said effective substance, thereby preventing it from closing said flow channel, when said effective substance is moved by water flow toward said central part of said screen, first spacer means located between said inner end of said closure cap and said open top end of said dosing container, second spacer means located between an inner wall of said handle and an outer wall of said dosing container, said second spacer means forming at least one of said first flow passages for the flow of water between the inner wall of the handle and the outer wall of the dosing container, and wherein the cross-sectional area of said first flow passage is smaller than the free cross-sectional area of said water hose at said opposite handle end and the pressure of the water flow in said first flow passage is greater than the pressure of the water flow in said interaction region.

4,634,054

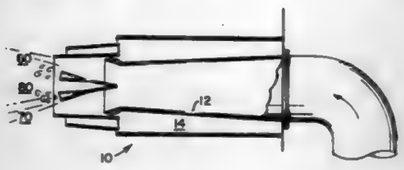
SPLIT NOZZLE TIP FOR PULVERIZED COAL BURNER

John Grusha, Windsor Locks, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 487,552, Apr. 22, 1983, abandoned. This application Mar. 14, 1985, Ser. No. 712,454

Int. Cl.⁴ F23K *3/02*

U.S. Cl. 239—423 **4 Claims**



1. A nozzle tip for a burner on a pulverized fuel fired furnace comprising:

a. an open-ended inner shell having an inlet end and an outlet end and defining therebetween a flow passageway through which a mixture of pulverized fuel and transport air passes from the burner into the furnace;

b. an open-ended outer shell spaced from and surrounding said inner shell thereby defining an annular flow passageway therebetween through which additional air passes from the burner into the furnace; and

c. first and second splitter plates disposed within said inner shell, each having a leading edge portion disposed transversely across the flow passageway of said inner shell at the inlet end thereof and a trailing edge portion extending transversely across the flow passageway of said inner shell at the outlet end thereof, said first and second splitter plates converging at the inlet end of said inner shell and extending outwardly therefrom in a diverging manner toward the outlet end of said inner shell, said first and second splitter plates thereby dividing the flow passageway through said inner shell into a first flow passage bounded by the first splitter plate and said inner shell and a second flow passage bounded by the second splitter plate and said inner shell, said first and second flow passages diverging in the direction of flow through the nozzle tip and being spaced apart at the outlet end of the nozzle tip so as to establish a void region therebetween through which flow directly from the nozzle tip is precluded, the trailing edge portion of each of said first and second splitter plates being formed of a plurality of longitudinally elongated strips extending longitudinally outward from the leading edge portion of each of said first and second splitter plates in a side-by-side relationship transversely across the flow passageway of said inner shell, a first portion of said trailing edge strips disposed alternately between a second portion of said trailing edge strips and bent radially away from the leading edge portion of each of said first and second splitter plates thereby forming a scalloped tailing edge portion of each of said first and second splitter plates.

4,634,055

INJECTION VALVE WITH UPSTREAM INTERNAL METERING

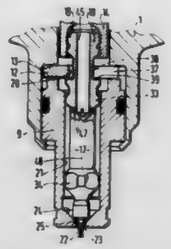
Waldemar Hans, Bamberg; Mathias Linssen, Litzendorf, and Rudolf Sauer, Benningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 25, 1985, Ser. No. 715,321

Claims priority, application Fed. Rep. of Germany, May 19, 1984, 3418762

Int. Cl.⁴ F02M *61/04*

U.S. Cl. 239—533.3 **6 Claims**



1. An injection valve for fuel injection systems of internal combustion engines comprising a nozzle body arranged to receive a nozzle needle therein, said nozzle needle having a constricted area disposed between first and second guide sections for said nozzle needle, said first guide section being disposed above a conical valve seat face, said second guide section being disposed upstream of said first guide section, said first guide section including means defining fuel flow passages, said constricted area being arranged to terminate below said second guide section and in close proximity to means defining fuel metering openings, said means defining fuel metering openings having a substantially smaller cross-section than that of said fuel flow passages.

4,634,056

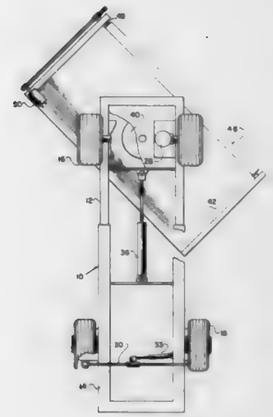
COMPOST DISTRIBUTOR

Carroll R. Precure, Rte. 1, Box 1005, Muleshoe, Tex. 79347

Filed Jan. 11, 1985, Ser. No. 690,753

Int. Cl.⁴ A01C *15/18*

U.S. Cl. 239—661 **6 Claims**



1. In a spreadable material distributor having:

a. a frame, having

(i) a frame axis,

(ii) A hopper end, and

(iii) a driver end,

b. ground engaging wheels journaled to the frame, said wheels spaced on either side of the frame axis, and having a wheel width,

c. at least two of the wheels at the hopper end and at least one of the wheels at the driver end,

d. an engine on the frame,

e. a hopper on the frame at the hopper end having

(i) a bottom,

(ii) a hopper length greater than the wheel width, and

(iii) a hopper width less than the wheel width, and

f. spreader means on the hopper for distributing material from the hopper;

wherein the improved structure comprises:

g. a turntable on the frame,

h. the hopper on the turntable so that

(i) the hopper may be turned with the length along the frame axis to go through gates and the like, and

(ii) the hopper may be turned with the length normal to the frame axis to spread the material in the hopper,

j. a hydraulic reservoir on the frame

k. a hydraulic motor rotatably connected to said wheels at the hopper end,

l. a hydraulic pump mechanically connected to the engine and hydraulically connected to the reservoir and motor,

m. the frame telescoped between the hopper end and driver end, so that

(i) the frame may be stretched out when the hopper is aligned with the frame axis, and

(ii) the frame may be retracted when the hopper is normal to the frame axis.

4,634,057

PUMPS AND PUMP COMPONENTS

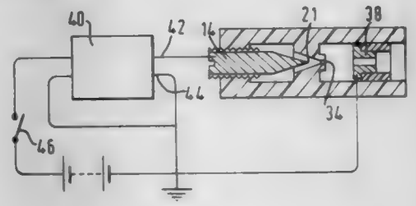
Ronald A. Coffee, Haslemere; Timothy J. Noakes, Midhurst, and Robert A. Anstey, Walton-on-Thames, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 515,267, Jul. 19, 1983, abandoned. This application Sep. 3, 1985, Ser. No. 771,167

Claims priority, application United Kingdom, Aug. 25, 1982, 8224408

Int. Cl.⁴ B05B *5/02*

U.S. Cl. 239—690 **21 Claims**



21. An electrostatic pump for pumping liquids, comprising a housing; said housing containing:

a passageway for liquid to be pumped through said housing between an inlet and an outlet;

an injection electrode disposed in an upstream position of said passageway, said electrode having a sharp electrically-conducting tip of conical configuration, and said injection electrode comprising an electrically conductive core containing a passageway for liquid to be pumped, and terminating in said tip, said conductive core being surrounded by an non-conductive coating;

a collector electrode disposed in a downstream position of said passageways and separated from said injection electrode by a chamber downstream from said injection electrode;

means defining an orifice of significantly less cross-sectional area than the cross-sectional area of said chamber, and positioned between said tip and said collector electrode;

electrical connection means for providing electrical connection from a high voltage generator to said injection and collector electrodes to maintain an electric potential on the order of kilovolts therebetween; and

said passageway in the region of the tip of said injection electrode being shaped to conform to the surface configuration of said tip so that liquid being pumped flows past the said tip in laminar non-turbulent flow through said orifice into said chamber.

4,634,058

POWDER SPRAY GUN

Thomas E. Hollstein, Amherst; David E. O'Ryan, Avon Lake, and Joseph C. Waryu, Amherst, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Dec. 13, 1984, Ser. No. 681,501

Int. Cl.⁴ B05B *5/00*

U.S. Cl. 239—697 **4 Claims**

1. A powder spray gun for spraying solid particulate powder material comprising

a barrel having a longitudinally extending opening at its forward end, said opening extending from the forward end of said barrel to a point located approximately medially of the length of said barrel,

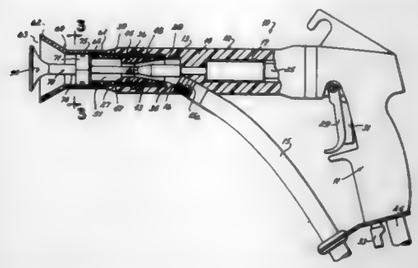
a passage through the wall of said barrel communicating with the rear of the opening near the midpoint in the length of the barrel, said passage being adapted to be connected to a source of air entrained powder material,

an extension tube mounted in said barrel opening, said exten-

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sion tube having a forward end extending out of and forward of the forward end of said barrel,

a venturi sleeve mounted within the rear of said extension tube, said venturi sleeve including a rear end and a forward end, the rear end of said venturi sleeve being located immediately adjacent said passage in the wall of said barrel, said venturi sleeve having a bore extending therethrough, said bore having a rearwardly opening tapered section and a forward open section of reduced diameter operatively connected to said tapered section for increasing the velocity of powder conveyed therethrough, and the forward section of said bore opening abruptly rearwardly of said forward end of said barrel into a relatively large chamber within said extension tube for generating turbulence in said powder within said extension tube.



4,634,059

METHOD AND DEVICE FOR EMPTYING SUSPENSION FROM A PULPER

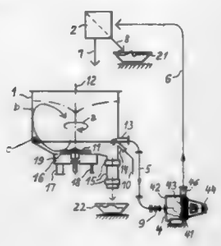
Theodor Bühr; Helmut Thumm, and Walter Musselmann, all of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Mar. 21, 1984, Ser. No. 591,870

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311082

Int. Cl.⁴ B02C *23/38*

U.S. Cl. 241—46 B **12 Claims**



1. Apparatus for emptying pulp suspension from a pulper, comprising:

a pulper including a pulping chamber in which pulping is to be performed, and pulping means in the pulping chamber for pulping material into a pulp suspension; the pulping chamber having a bottom;

a suspension withdrawal outlet from the pulper near the bottom of the pulping chamber;

a withdrawal apparatus including a withdrawal apparatus chamber therein, a rotor within said withdrawal apparatus chamber, a suspension conveying inlet and a suspension conveying outlet; said suspension conveying inlet communicating with the suspension withdrawal outlet from the pulper for feeding suspension into the withdrawal apparatus chamber for agitating suspension in that chamber; said suspension conveying outlet being located sufficiently near said rotor such that said rotor provides a pumping-off action for suspension flowing through said suspension conveying outlet;

a sorting apparatus for removing dirt from said suspension; an inlet to the sorting apparatus connected to the conveying outlet to convey the suspension from the withdrawal apparatus chamber to the sorting apparatus; the sorting apparatus also having a first outlet to deliver suspension that has been freed of dirt; and

means for periodically cyclically permitting simultaneous suspension flow from the pulper to the withdrawal apparatus and from the withdrawal apparatus to the sorting apparatus and for simultaneously halting both such flows.

4,634,060

PROCESSING AND SORTING OF REFUSE

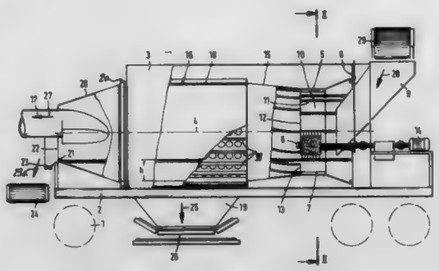
Hanns-Helmut Riemann, Bochum; Heinz-Josef Skaletz, Recklinghausen, and Hans Sonnenschein, Essen, all of Fed. Rep. of Germany, assignors to CMU-Gesellschaft fuer Materialrueckgewinnung, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 94,533, Nov. 15, 1979, abandoned. This application Apr. 10, 1980, Ser. No. 139,020

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1978, 2849509

Int. Cl.⁴ B02L *13/06*

U.S. Cl. 241—74 **7 Claims**



1. Apparatus for processing refuse, comprising:

a frame and support structure;

drum means, rotating in the frame and support structure and including a first drum which contains a drum-shaped chopping means being a hammer drum and additional means for chopping, there being means for charging the first drum with refuse, and including a second drum, rotating with the first drum for aerating and loosening, the second drum being oriented axially downstream from the first drum;

suction means on the structure to suck air through the first and second drum, for causing light-weight components of the refuse to be carried floatingly from the first drum through the second drum and out, through the suction means;

means, including sieveing means, for discharging other refuse components from the second drum; and

a horizontal funnel member, continuing the second drum and being also a component for the means for discharging, the funnel member establishing a minimum height for refuse being sieved.

4,634,061

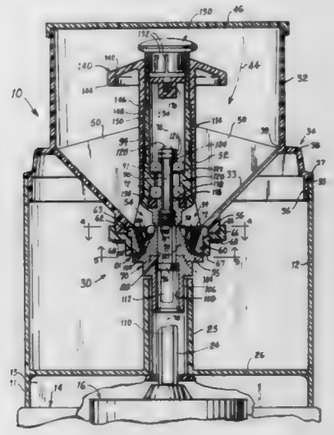
METHOD AND APPARATUS FOR GRINDING KERNELS OF GRAIN, COFFEE BEANS, AND THE LIKE IN A FOOD PROCESSOR

James E. Williams, Stamford, Conn., assignor to Cuisinarts, Inc., Greenwich, Conn.

Filed Jun. 12, 1985, Ser. No. 743,788

Int. Cl.⁴ B02C *18/00*

U.S. Cl. 241—101 R **27 Claims**



1. Grinding apparatus for particulate food adapted to be mounted as an attachment on a food processor having a base containing a motor drive and tool drive means extending up vertically from the base into a bowl and being rotated by the motor drive, said food processor including actuatable control means for enabling the motor drive to be operated when said actuatable control means are actuated and for disabling the motor drive when said actuatable control means are not actuated, said grinding apparatus comprising:

mounting means for mounting said grinding apparatus on the bowl of the food processor in a predetermined position,

said mounting means including an actuator for actuating said actuatable control means when said mounting means are mounted on the bowl in said predetermined position for enabling the motor drive to be operated when said mounting means are mounted on the bowl in said predetermined position,

a grinding apparatus carried by said mounting means and having stator grinding means and rotor grinding means positioned coaxially with respect to each other,

said rotor grinding means being rotatable about a vertical axis,

said stator and rotor grinding means defining a downwardly extending convergent grinding zone therebetween,

said grinding assembly carried by said mounting means being positioned about the bottom of said bowl when said mounting means are mounted on the bowl in said predetermined position,

means for removably coupling said rotor grinding means to said tool drive means of the food processor for rotation thereby, and

a hopper carried by said mounting means positioned above said grinding assembly for directing the particulate food to be ground down into said grinding zone between said stator and rotor grinding means of said grinding assembly, whereby said particulate food is ground by said grinding assembly and the ground food product is deposited into said bowl of the food processor.

4,634,062

FORGED STEEL GRINDING ELEMENT FOR BALL MILLING

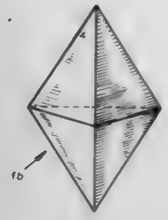
Rütger Berchem, Gelsenkirchen, Fed. Rep. of Germany, assignor to Berchem & Schaberg GmbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Nov. 1, 1984, Ser. No. 667,284

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1983, 3339550

Int. Cl.⁴ B02C *17/20*

U.S. Cl. 241—184 **2 Claims**



1. A forged steel grinding element for tumble milling comprising:

0.75 wt % manganese,

0.75 wt % chromium,

0.35 wt % molybdenum,

0.55 wt % nickel,

up to 0.20 wt % carbon, and

the balance iron with conventional steel impurities, said grinding element having a basic tensile strength of 1300 to 1700 N/mm².

4,634,063

STATOR WINDING APPARATUS

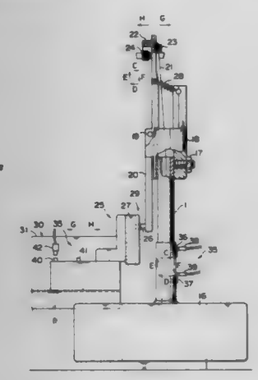
Hideji Watanabe; Hiroshi Ohki, and Keizou Watanabe, all of Ueda, Japan, assignors to Sanyo Denki Co., Ltd., Kitaotsuka, Japan

Filed Jun. 4, 1985, Ser. No. 741,278

Claims priority, application Japan, Jun. 4, 1984, 59-114014

Int. Cl.⁴ H02K *15/085*

U.S. Cl. 242—1.1 R **4 Claims**



1. A coil winding apparatus comprising:

a main shaft;

a shaft drive mechanism for actuating said main shaft so that it may repeatedly carry out motion of which one cycle comprises a first axial movement, forward rotation, opposite axial movement and backward rotation with four turning points of motion in said cycle;

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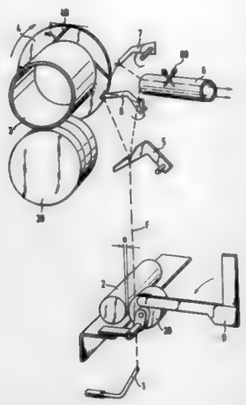
an oscillating arm pivotally mounted on said main shaft;
wire delivery means mounted on one end of said oscillating arm to be revolved around a coil form on which a wire is to be wound in the form of a coil while feeding said wire therefrom from a winding start position to a winding finish position with said motion of said main shaft to accomplish the coil winding operation; and
a traverse mechanism for traversing said oscillating arm and wire delivery means substantially radially with respect to said main shaft in a predetermined motion;
said traverse mechanism comprising a traverse drive mechanism with a cam actuated in synchronism with said motion of said main shaft and determining the amount of traverse of said oscillating arm and a traverse transmission mechanism interposed between said oscillating arm and said traverse drive mechanism;
said traverse transmission mechanism including a cam follower provided on another portion of said oscillating arm, said cam and cam follower being engaged together to transmit the movement and amount of traverse of said traverse drive mechanism therethrough to said oscillating arm;
a detector for electrically detecting said motion of said main shaft to actuate said traverse mechanism according to the detected motion of said main shaft; and
said detector comprising a first detection means for detecting the turning points of said motion of said main shaft and a second detection means for detecting the winding start position and the winding finish position along a direction substantially radially of said main shaft.

4,634,064

PROCESS FOR FORMING A THREAD-RESERVE WINDING

Ludwig Burkhard; Edmund Schuller, both of Ingolstadt; Kurt Lovas, Böhmfeld, and Rupert Karl, Ingolstadt, all of Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Fed. Rep. of Germany

Filed Dec. 7, 1984, Ser. No. 679,565
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1983, 3344646
Int. Cl.[4] B65H *54/02, 54/34*
U.S. Cl. 242—18 PW **4 Claims**



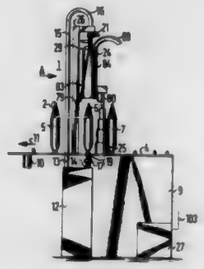
1. A process for forming a thread-reserve winding on a bobbin tube of a spinning device in which the thread is drawn off continuously from the spinning device by means of a pair of draw-off rollers containing a pressure roller and, to form a thread-reserve winding, is grasped and wound onto the bobbin tube, comprising the steps:
(a) releasing the thread from the draw-off rollers immediately after the thread has been grasped,
(b) pulling the thread from the spinning device solely by rotation of the bobbin tube;
(c) forming the thread-reserve winding on the bobbin tube;
(d) bringing the thread again in clamping contact with the draw-off rollers after the thread-reserve winding has been applied; and
(e) delivering the thread by the draw-off rollers to the bobbin tube for winding thereon.

4,634,065

DEVICE FOR INSERTING THE THREAD END OF A TEXTILE BOBBIN INTO A BOBBIN SLEEVE

Wilhelm Küpper, Am Betelsberg 10, 5144 Wegberg, and Helmuth Heusen, Stadtwaldstrasse 79, 4050 Moenchengladbach, both of Fed. Rep. of Germany

Filed Dec. 4, 1985, Ser. No. 805,329
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444821
Int. Cl.[4] B65H *54/00*
U.S. Cl. 242—18 R **9 Claims**



1. Device for inserting the thread end of a textile bobbin into a bobbin sleeve, comprising a bobbin conveyer, slip-on arbors disposed on said bobbin conveyer, each of said slip-on arbors being a tube with upper and lower open ends for receiving a bobbin sleeve thereon, a first controllable suction nozzle, means for positioning said first suction nozzle against said lower end of one of said slip-on arbors on which a bobbin sleeve is disposed, a controllable mechanical thread stripper for stripping thread from the bobbin sleeve, a thread clamp, a second controllable suction nozzle connected to said thread stripper and to said thread clamp, means for moving said second suction nozzle upward and downward into a stop position against the upper end of the bobbin sleeve, a controllable holding device for laterally pressing the base of the bobbin sleeve against said one slip-on arbor, a thread severing device disposed downstream of said second suction nozzle as seen in travel direction of a thread end separated from the bobbin above the bobbin sleeve, and means for reversing the direction of suction air flow acting on the thread end separated from the bobbin for inserting the thread end into the bobbin sleeve.

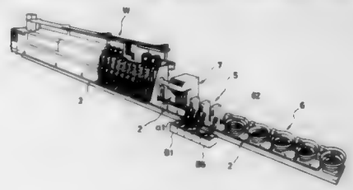
4,634,066

ARTICLE CONVEYING AND HANDLING SYSTEM

Isamu Matsui, Kyoto, and Hiroshi Uchida, Oumihachiman, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Aug. 28, 1984, Ser. No. 645,019
Claims priority, application Japan, Aug. 29, 1983, 58-158276
Int. Cl.[4] B65H *67/06*
U.S. Cl. 242—35.5 A **2 Claims**

1. A bobbin conveying and handling system for conveying various kinds of spinning bobbins between a winder and a plurality of bobbin supply stations, each of said spinning bobbins being erected on a respective carrier member, said system comprising: a first conveyor for transporting said carrier members bearing spinning bobbin from said supply stations to said winder; a second conveyor for transporting said carrier members bearing spinning bobbins from said winder to said supply stations;
a plurality of branch conveyors for transporting said carrier members from said second conveyor to said first conveyor, each one of said branch conveyors being positioned adjacent a respective one of said supply stations; and
means adjacent said second conveyor and intermediate said winder and said supply stations for extracting from said carrier members those spinning bobbins having less than a predetermined amount of yarn thereon.

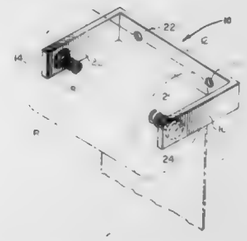


4,634,067

HOLDER FOR TOILET PAPER AND PAPER TOWEL ROLLS

Roy L. White, Rte. 4, Box 166 K, P.O. #1205, Douglas, Ga. 31533

Filed Feb. 4, 1985, Ser. No. 697,724
Int. Cl.[4] A47K *10/32, 10/04*
U.S. Cl. 242—55.2 **1 Claim**



1. A roll tissue dispenser for paying sheets of tissue from a roll of tissue of the type having a center tube, comprising at least one wall mounting means, a pair of projecting arms extending from said wall mounting means, circular recesses in said arms facing each other inwardly, said recesses each having a bottom portion and upstanding side walls, resilient double ended coil spring means of smaller outer diameter than the innder diameter of said recess side walls in said arms affixed to the bottom of the circular recesses at one of their ends and having their free ends facing each other, the outer diameter of said coil spring means being slightly smaller than the inner diameter of the center tube and adapted to bind directly thereagainst when said tube and said roll are slightly deformed whereby free rotation of said roll on said coil springs is prevented.

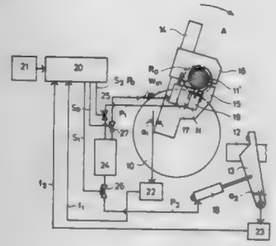
4,634,068

METHOD FOR CONTROLLING PAPER WEB REEL-UP

Raimo Malkki, Lappeenranta; Antti Kuisma, Jyväskylä, and Matti Verkasalo, Oulu, all of Finland, assignors to Valmet Oy and Oy Kaukas AB, both of, Finland

Filed Nov. 27, 1985, Ser. No. 803,106
Claims priority, application Finland, Nov. 27, 1984, 844652
Int. Cl.[4] B65H *18/16*
U.S. Cl. 242—65 **9 Claims**

1. A method for controlling a paper web reeling operation in reeling apparatus including a reeling drum around which a paper web reel is wound and a reeling cylinder for transmitting power required for reeling to the paper web reel mainly through a nip formed between the periphery of said reeling cylinder and the periphery of the paper web reel being formed, and wherein the reeling operation is begun with said reeling drum supported in primary forks from which said reeling drum and an inner section of the paper web reel wound therearound are transferred to secondary forks in which the reeling operation is completed, and wherein power equipment is coupled to said primary and secondary forks for loading the nip between said reeling cylinder and the paper web reel, comprising the steps of:
generating a first control signal determined by the position of the primary forks;



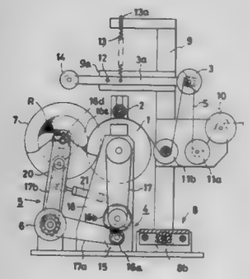
generating a second control signal determined by the position of the secondary forks;
transmitting said control signals to control means for said power equipment; and
controlling said power equipment by said control means based on said first and second control signals transmitted thereto so that the load distribution of the nip with respect to time is substantially linear during the reeling operation including an exchange step wherein said reeling drum and inner section of the paper web reel wound therearound are transferred from the support of said primary forks to be supported and loaded by said secondary forks.

4,634,069

WINDING APPARATUS FOR SHEET STRIP

Hiroshi Katsuka, 3686, Sangawacho, Iyomishima-shi, Ehime 799-04, Japan

PCT No. PCT/JP84/00414, § 371 Date Apr. 29, 1985, § 102(e) Date Apr. 29, 1985, PCT Pub. No. WO85/01038, PCT Pub. Date Mar. 14, 1985
PCT Filed Aug. 29, 1984, Ser. No. 732,826
Claims priority, application Japan, Aug. 29, 1983, 58-132267[U]
Int. Cl.[4] B65H *18/10, 18/16, 23/16*
U.S. Cl. 242—65 **3 Claims**



1. Apparatus for winding into a roll a strip of scrap sheet fed

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to the apparatus at a speed which represents the output of another device, said apparatus comprising:

(a) a winding frame comprising a winding barrel on which, during use of the apparatus, a strip of scrap sheet is wound, and opposite flanges;

(b) a first means for detecting variations in the tension of the strip of scrap sheet at it is fed to said winding frame, said first means comprising a dancer roller which, during use of the apparatus, operatively engages the strip of scrap sheet as it is fed to said winding frame;

(c) a touch roller which, during use of the apparatus:

(i) operatively engages the strip of scrap sheet downstream of said dancer roller and advances it toward said winding frame and

(ii) bears against the roll being wound on said winding barrel;

(d) a second means for adjusting the pressure of contact between said touch roller and a roll being wound on said winding barrel;

(e) a drive means for rotating said touch roller at a peripheral speed controlled by the tension variations detected by said first means to be equal to the speed at which the strip of scrap sheet is being fed to the apparatus; and

(f) a winding barrel rotating means provided with a third means for adjusting the winding torque during the winding of the strip of scrap sheet onto said winding barrel.

4,634,070

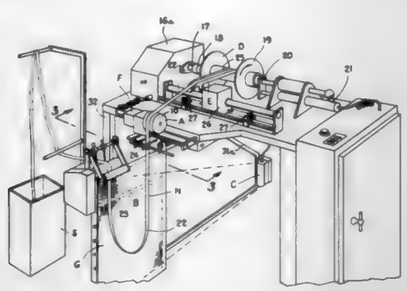
APPARATUS AND METHOD FOR MEASURING AND PACKAGING ELASTIC PRODUCTS

Ernest F. Looper, Rte. 9, Box 254, Easley, S.C. 29640

Filed Mar. 13, 1984, Ser. No. 588,990

Int. Cl.⁴ B65H *18/14, 23/198*

U.S. Cl. 242—67.2 **3 Claims**



1. Apparatus for measuring and packaging elongated elastic material comprising:

a free turning, low inertia measuring wheel;

means feeding said elongated elastic material forming a suspended loop of said elongated elastic material between said means feeding and said measuring wheel;

a winder receiving elongated elastic material from said loop in a substantially tensionless state from said measuring wheel;

said loop being suspended between said feed means and said measuring wheel; and

means operable responsive to sensing the size of said loop controlling the winder and hence the sizes of said loop of elongated elastic material;

a surface generally aligned with a delivery path of said elastic material between said feeding means and measuring wheel stabilizing the position of the loop during its passage to said measuring wheel, and a frame pivoted about a horizontal transverse axis carrying said aligned surface and carrying sensing means operable responsive to the size of the loop for controlling said winder for limiting the size of the loop.

4,634,071

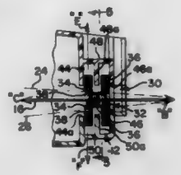
LIGHT TIGHT FILM CARTRIDGE WITH FLOATING LIGHT SEAL

Heinz E. Hertel, Mt. Prospect, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Oct. 16, 1985, Ser. No. 787,836

Int. Cl.⁴ G03B *1/04, 17/26*

U.S. Cl. 242—71.1 **20 Claims**



1. A light tight, container for a light-sensitive film strip wound on a spool, comprising:

a container body having a pair of opposite sidewalls and a transverse wall extending between the peripheries of said sidewalls for enclosing said spool and film strip around an axis of rotation of said spool extending between central portions of said sidewalls and normal thereto;

exit port means formed in said transverse wall parallel of said axis between said sidewalls for passing said film strip outwardly of said container as said film is unwound from said spool on a tangential film path upon relative rotation of said spool in said body; and

floating light seal means mounted in said exit port means for shiftable movement relative to said axis for continuously sealingly engaging opposite surfaces of said film strip extending from said container for preventing outside light from entering said body adjacent said film surfaces,

said exit port means and said floating light seal means including limit means for permitting relative movement of said floating light seal means in a direction generally normal to said film path to accommodate different angular paths of travel of said film strip between said spool and a position exteriorly of said container in fixed locational relationship with said spool axis.

4,634,072

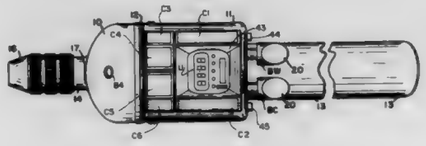
ELECTRIC FISHING REEL

Arthur J. Stealy, 2100 W. 100th Ave., Denver, Colo. 80221

Filed Mar. 11, 1985, Ser. No. 710,215

Int. Cl.⁴ A01K *89/012*

U.S. Cl. 242—84.1 A **10 Claims**



1. A fishing reel comprising:

a housing enclosing a motor;

a spool on which a fishing line may be wound or unwound for movement through an aperture in said housing;

a winding cup carrying means for engaging said line for winding onto said spool;

means driven by said motor for rotating said winding cup;

battery means including at least one battery for supplying current to said motor;

a plurality of solar cells of different production capacities for producing electrical current upon exposure to sunlight;

means for mounting said cells in an exterior position on the top and sides of said reel; and

means connecting said cells with said batteries for charging said batteries.

4,634,073

BRAKE FOR FISH CASTING REEL

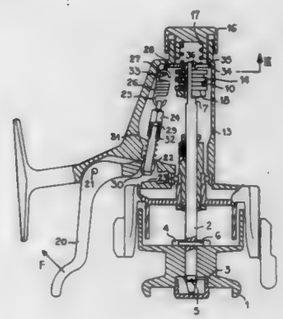
André Coquelet, Cluses, France, assignor to Mitchell Sports, France

Filed Mar. 22, 1985, Ser. No. 715,636

Claims priority, application France, Mar. 26, 1984, 84 05419

Int. Cl.⁴ A01K *89/01, 89/02*

U.S. Cl. 242—84.5 A **8 Claims**



1. A reel of the fixed spool type with rear brake, comprising a reel housing, a drive shaft having a first end, a spool mounted on the first end of the shaft, means mounting the shaft and the spool for reciprocation within the housing so as to distribute the line on the spool, a sleeve integral with a braking surface and locked for rotation with the spool and rotatable freely in a cavity of the reel housing in which it is secured against axial translation, a main spool brake comprising a braking member and an operating member actuatable in a first direction from the rear of the reel by the user and pushing the braking member against the braking surface of said sleeve for braking rotation thereof with respect to said housing, an auxiliary braking lever comprising a grippable part forming a control member for also pushing the braking member in the first direction for braking rotation of the sleeve with respect to the housing, resilient transmission means directly between the grippable part of the auxiliary braking lever and the braking member for transmitting an auxiliary braking force, and resilient return means for urging said auxiliary braking lever to its rest position, so that the rest position of the auxiliary braking lever is constant, the influence of the weight of the lever is inhibited, the range of travel of the lever is non zero, the maximum value of the additional braking torque is limited and the stiffness of the auxiliary braking lever is practically independent of the setting of the main brake.

4,634,074

SPINNING TYPE FISHING REEL WITH LINE UNTWISTING CAPABILITY

Hatsutaro Ohmori, Tokyo, Japan, assignor to Kabushiki Kaisha Ohmori Seisakusho, Japan

Filed Mar. 15, 1985, Ser. No. 712,234

Claims priority, application Japan, Nov. 22, 1984, 59-246332; Nov. 22, 1984, 59-246333

Int. Cl.⁴ A01K *89/01*

U.S. Cl. 242—84.21 R **8 Claims**

1. A spinning type fishing reel, comprising:

(a) a body;

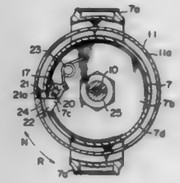
(b) a spool rotatably and reciprocally supported in said body, said spool including a cylindrical section;

(c) a rotor rotatably supported in said body, said rotor including a cylindrical section;

(d) driving means mounted with said body for rotating said rotor and for reciprocating said spool;

(e) a bail arm mounted on said rotor for causing a fishing line to be wound around said spool when said rotor is rotated in a first direction;

(f) control means shiftable between first and second positions for selectively causing said spool to be rotated in a second direction, opposite from said first direction, along with rotation of said rotor in said second direction, said first



position being wherein said control means causes said spool to be rotated in said second direction along with rotation of said rotor in said second direction, and said second position being wherein said rotor may rotate in either said first direction or said second direction relative to said spool;

(g) drag means coupled with said spool for preventing rotational movement of said spool, when a turning force of less than a determinant value is applied to said spool; and

(h) coupling means for selectively substantially rotationally coupling said spool to said drag means only when said spool tends to rotate in said first direction.

4,634,075

CONTROL DEVICE FOR AN INERTIA REEL SEAT BELT

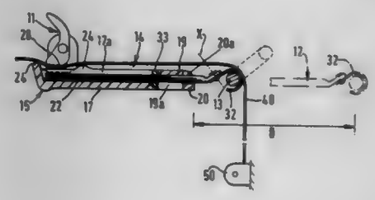
Andrew N. Oxley, and Douglas A. J. Oxley, both of Banbury, United Kingdom, assignors to PZ Products Limited, Banbury, United Kingdom

Filed Jan. 3, 1985, Ser. No. 688,636

Claims priority, application United Kingdom, Jan. 9, 1984, 8400444

Int. Cl.⁴ B60R *22/00*

U.S. Cl. 242—107.2 **8 Claims**



1. A control device for an inertia reel seat belt comprising a member across which a portion of the seat belt passes when in use, a movable element mounted on said member for movement between first and second positions in which the seat belt is respectively gripped to inhibit rewinding and released to permit rewinding, and attachment means pivotally connected to the member for engagement with a mounting on a vehicle and which allows the member to swivel about an axis extending in the longitudinal direction of said portion of the seat belt to enable the member to follow twisting movement of the seat belt, said attachment means comprising first and second portions interconnected by a pivot element defining a further axis of swivelling transverse to the first said axis and about which the member can swivel, said first portion being pivotally connected to the member to enable the member to swivel about

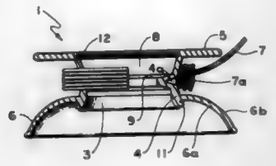
the first said axis and the second portion being engageable with the mounting on the vehicle.

4,634,076

BOBBIN AND METHOD OF WINDING SAID BOBBIN

Robert L. Eckert, 11231 Foster Rd., Los Alamitos, Calif. 90720, and Walter T. Gorrell, 625 E. 10th St., Azusa, Calif. 91702

Filed Jul. 15, 1985, Ser. No. 754,547
Int. Cl.[4] B65H *75/02, 75/24;* B65D *85/00*
U.S. Cl. 242—118.7 12 Claims



1. In a bobbin for desoldering braid comprising:
a body including a hub portion for holding and supporting a winding of braid;
a first head having a substantially flat portion extending outwardly from one end of said hub portion; and
a second head having a curling portion of a flexible material extending outwardly from the other end of the hub portion and establishing a surface portion overlying and in close tolerance with the peripheral edge of said flat head portion;
so as to enclose a winding of braid on the hub portion when curled inwardly to a first position, and extending outwardly from the hub portion in substantially spaced relation to said first head portion when curled outwardly to a second position, to prevent winding of the braid on the hub portion;
the improvement which comprises:
said hub portion containing a slot wider than said braid for receiving an end of said braid;
said slot and the distance between said heads being capable of being narrowed by applying pressure to the ends of said hub portion to hold securely an end of said braid during winding of said braid upon the compressed hub portion;
said slot and the distance between said heads being capable of being widened to their normal widths by ceasing the application of pressure to the ends of said hub portion, whereby the end of said braid is released from said slot and the braid is supported loosely upon said hub portion between said heads.

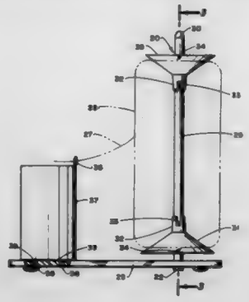
4,634,077

YARN CADDY

Christine A. Wilson, 31 N. Laurel St., Ventura, Calif. 93001

Continuation-in-part of Ser. No. 422,393, Sep. 24, 1982, abandoned. This application Mar. 15, 1985, Ser. No. 711,925
Int. Cl.[4] B65H *49/32*
U.S. Cl. 242—139 8 Claims

1. A yarn caddy comprising:
a base;
an upright spindle supporting dowel;
means on said base for vertically securing said dowel to said base and for preventing said dowel from rotating;
an upright spindle including a length of tubing rotatably supported by said dowel and having an end resting loosely on said base;
at least one removeable and vertically adjustable bottom support member means positioned on said tubing for vertically supporting a yarn or thread package on said spindle;
said bottom support member means comprising a generally frusto-conical surface having an axial cylindrical projection extending from the smaller end of said support member;
means for slideably and vertically adjusting the position of said support member means on said tubing;



said means for slideably and vertically adjusting the position of said support member means on said tubing comprising at least one expandable slot means on said axial cylindrical projection for allowing radial expansion of said cylindrical projection.

4,634,078

ROPE GUIDE

Karl-Ernst Kaufmann, Wetter; Josef-Paul Saeftel, Castrop; Harald Bitsch, Witten, and Otto Oldewurtel, Hagen, all of Fed. Rep. of Germany, assignors to Mannesmann Ag, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 13, 1985, Ser. No. 744,515
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1984, 3421843
Int. Cl.[4] B65H *54/28*
U.S. Cl. 242—158 R 14 Claims



1. In a rope drum arrangement a rope guide having a cam or claw to prevent the guide from following the rotation of the drum, comprising:
a guide segment looping around parts of the periphery of the drum and being provided with an inner threading;
a holding segment bolted to the guide segment and looping around a different portion of the drum and also being provided with an inner threading ;
a rope hold down device on the holding segment covering at least part of a single loop of rope on the drum and extending over several places for loops or rope on the drum, the threadings of the segments engaging the threadlike grooves of the drum so as to be moved in axial direction upon rotation of the drum;
a slot-forming guide loop element fastened to said guide segment through which a rope runs towards the periphery of the drum;
said segments and said slot forming element being made of synthetic material;

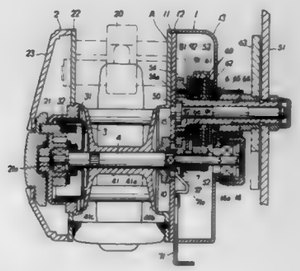
a mounting pin on the guide segment and in a position above said slot;
roller mounting means on said pin;
at least one roller with an axle journaled on the mounting means; and
a spring for biasing said at least one roller, the bias being such that upon engagement of the rope by the roller the rope is forced towards the drum and into the groove thereof.

4,634,079

FISHING REEL

Yoshiyuki Furomoto, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 8, 1985, Ser. No. 752,654
Claims priority, application Japan, Jul. 11, 1984, 59-105510[U]
Int. Cl.[4] A01K *89/015*
U.S. Cl. 242—219 8 Claims



5. A fishing reel, comprising:
a reel body with a pair of side frames,
a spool mounted on a spool shaft disposed between said side frames,
a driving shaft rotatably mounted relative to said side frames,
a transmission mechanism, including a main gear rotatably mounted relative to said driving shaft, for transmitting a driving force from said driving shaft to said spool shaft to drive said spool shaft,
a drag mechanism, responsive to said driving force from said drive shaft, for transmitting an adjustable transmission force to said main gear,
an anti-reverse rotation mechanism including a stopper gear rotatably supported relative to said driving shaft and a stopper pawl engageable with said stopper gear to prevent reverse rotation of said stopper gear and said spool shaft,
a rotary member mounted on said driving shaft to rotate integrally therewith, said rotary member being disposed in opposed relationship to said stopper gear on said driving shaft, and
a shock absorber means interconnecting said stopper gear and said rotary member, said shock absorber means comprising a biasing means which deflects responsive to reverse rotation of said rotary member to limit reverse rotation of said stopper gear and said spool shaft to an amount corresponding to deflection of said biasing means.

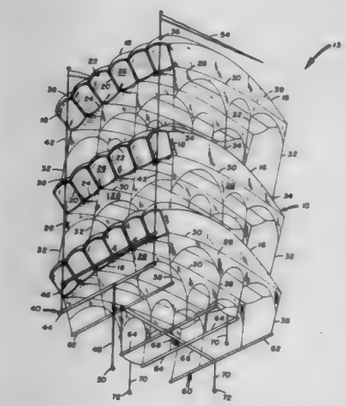
4,634,080

PARAFOIL VERTICAL LIFT MECHANISM

Thomas C. McNally, 3307 Frisby St., Baltimore, Md. 21218

Filed Feb. 29, 1984, Ser. No. 584,746
Int. Cl.[4] B64D *17/04;* B64C *3/00*
U.S. Cl. 244—13 14 Claims

1. A vertical lift mechanism, comprising:
a plurality of parafoil means, said plurality of parafoil means being suitably affixed into a multi-tiered configuration, each parafoil means of said plurality of parafoil means consists of a plurality of cell means, each cell means of said plurality of cell means having a top panel member, a bottom panel member, and two side panel members, said top, bottom, and two side panel members being suitably affixed to each other to form each of said cell means, said cell means being open at the front end thereof, the side elevation cross-sectional configuration of each said cell means being similar to the cross sectional configuration of a fixed wing aircraft airfoil, each said cell means having an adjustable vent means in and near the rear of said top panel member, said top panel member being longer and extending forward of said bottom panel member at said open front end of each said cell means;
a parafoil stabilization means, said parafoil stabilization means being suitably affixed to said plurality of parafoil means, said parafoil stabilization means maintaining each of said parafoil means of said plurality of parafoil means in a spaced apart relation to each other, said parafoil stabilization means consists of a plurality of parafoil stabilization rods, a plurality of transverse members, a parafoil stabilization means tether, a tether connector means, and a plurality of combined flange and clamp means, and additionally a plurality of grommet-like eyelet means for said plurality of parafoil means, said plurality of parafoil stabilization means being suitably affixed to each of said plurality of transverse members, said plurality of transverse



members being spaced apart for said affixation to said plurality of parafoil stabilization means, said parafoil stabilization means tether being suitably affixed to one of said plurality of transverse members, said tether connector means being suitably affixed to the distal end of said parafoil stabilization means tether, said plurality of grommet-like eyelet means being each individually affixed into specific said top panel members of said cell means so as to thereby form an aperture through each said specific top panel member, said specific top panel members being equally distributed and located spaced apart in each of said plurality of parafoil means so that said apertures of said grommet-like eyelet means are in horizontally spaced apart locations in each said parafoil means and are also in vertical alignment with said apertures of said grommet-like eyelet means in each of the other said parafoil means, each of said plurality of parafoil stabilization rods being slidably inserted into and through one of said vertical alignments of said apertures of said grommet-like eyelet means in said specific top panels of said cell means in each said parafoil means, said plurality of combined flange and clamp means being distributed, located, and slidably arranged on said plurality of parafoil stabilization rods so as to provide one said combined flange and clamp means under each said aperture of said grommet-like eyelet

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means, said combined flange and clamp means being thereafter affixed in place by clamping at selected spaced apart locations on each said parafoil stabilization rod so as to maintain a vertical spaced apart relationship between each of said parafoil means of said plurality of parafoil means; and

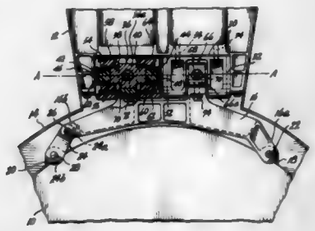
a load frame means, said load frame means being suitably affixed to said plurality of parafoil means.

4,634,081

AFT ENGINE MOUNT WITH VIBRATION ISOLATORS

Wen T. Chee, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 30, 1983, Ser. No. 567,226
Int. Cl.⁴ B64D *27/00*
U.S. Cl. 244—54 **9 Claims**



1. In an aircraft having a jet engine mounted to and beneath a wing thereof, wherein said engine is a predetermined distance from said wing and wherein further said engine is mounted to a strut affixed to said wing, a low-profile, aft engine mount assembly mounted to said strut and said engine to hold said engine on said strut, said aft engine mount assembly constructed and arranged to occupy a minimum portion of the distance between said engine and said wing so as to provide the maximum strut vertical dimension and so as to keep said aft engine mount within the contours of a cowl surrounding said engine, said aft engine mount assembly being further constructed and arranged to accommodate longitudinal growth of said engine due to thermal expansion, while maintaining sufficient stiffness to react against vertical, side, and torsional loads on said engine, said aft engine mount assembly being further constructed and arranged to provide vibration isolation between said engine and said strut, said engine mount assembly including a yoke having a first arm and a second arm, said first and second arms being pivotally attached at respective first ends thereof to said engine, said yoke being affixed to said strut at first and second attachment locations, spaced from one another and both located on an axis substantially orthogonal to the longitudinal axis of said engine, said aft engine mount assembly further including a first vibration isolation means associated with said strut at said first location and a second vibration isolation means associated with said strut at said second location.

4,634,082

EXTENDABLE SHOCK STRUT

Giles A. Kendall, Grass Valley, Calif., assignor to Menasco Inc., Burbank, Calif.

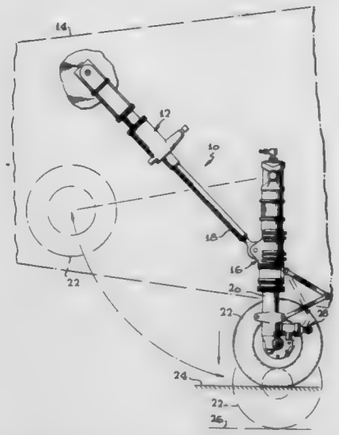
Filed May 10, 1983, Ser. No. 493,284
Int. Cl.⁴ B64C *25/02, 25/60*
U.S. Cl. 244—100 R **15 Claims**

1. An extendable shock strut comprising:

a strut housing having an open end and a closed end;

a piston including a piston housing and a piston head slidable in said strut housing, said piston housing and said strut housing adapted to move a selected distance relative to one another under normal usage and to provide a shock absorbing action;

a secondary piston slidable in said strut housing and positioned between said closed end of said strut housing and said piston head, said secondary piston including a secondary piston head, said secondary piston head and said closed end of said strut housing forming an expandable chamber; and



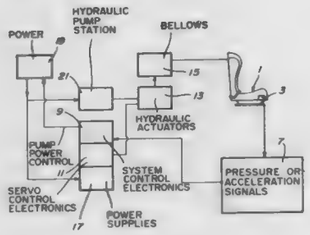
expansion means coupled to said shock strut for rapidly driving said strut housing and said piston housing relative to one another to an extended position.

4,634,083

HELICOPTER SEAT ISOLATION SYSTEM

Gordon M. McKinnon, Montreal, Canada, assignor to CAE Electronics Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 649,508, Sep. 11, 1984, abandoned. This application Nov. 29, 1985, Ser. No. 802,739
Int. Cl.⁴ B64D *25/04*
U.S. Cl. 244—122 R **4 Claims**



1. A system for counteracting the effect of helicopter vibrations on a pilot sitting on a seat in the helicopter, said seat comprising a plurality of controllable air cells positioned for direct contact by said pilot for isolating said pilot from vibrations of said seat and helicopter;

said system comprising:

means for fixedly connecting said seat to said helicopter during operation thereof;

means for varying the pressure of said cells;

vibration transducer means for sensing pressure in at least one of said cells, and for providing electrical signals representative thereof;

control means for providing signals for controlling said means for varying; and

processing means for processing said electrical signals and for providing driving signals for driving said control means;

wherein;

an output of said transducer means is connected to a first input of said processing means;

an output of said processing means is connected to an input of said control means;

an output of said control means is connected to said means for varying; and

said means for varying is physically connected to said controllable air cells;

whereby;

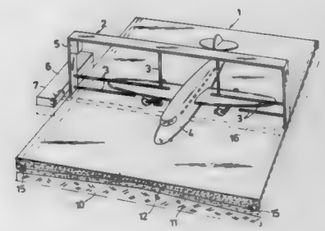
the effects of helicopter vibrations are counteracted by counteracting the changes of pressure in the air cells due to the vibrations and thereby reducing or eliminating said changes in pressure of said air cells.

4,634,084

AIRCRAFT DE-ICING SYSTEM

Kjell-Eric Magnusson, Bromma, Sweden, assignor to De-Icing System K.B., Stockholm, Sweden

Filed Aug. 29, 1985, Ser. No. 770,483
Int. Cl.⁴ B64D *15/10*
U.S. Cl. 244—134 C **3 Claims**



1. An aircraft de-icing system comprising an aircraft-washing hardstanding (1) for supporting an aircraft and further incorporating a carriageway for an aircraft (4), pipe and nozzle means (3) for washing the aircraft with de-icing fluid, and drainage and discharge means (15, 16) for collecting and carrying away the de-icing fluid, characterized in that the hardstanding (1) comprises a substantially planar surface layer (12) for contact with the aircraft and constructed from a liquid-permeable road-surfacing material, such as so-called drainage asphalt, and an impervious layer (11) under said surface layer which slopes away towards drainage pipes (15), for collecting and carrying away the de-icing fluid.

4,634,085

WHISTLE KITE

Eugenio M. Cuesta, and George Spector, both of 233 Broadway, RM 3615, New York, N.Y. 10007

Filed Jul. 2, 1985, Ser. No. 751,273
Int. Cl.⁴ B64C *31/06*
U.S. Cl. 244—153 R **3 Claims**

1. A whistle kite which comprises:

(a) a flat frame structure formed in a shape of an airplane having a fuselage portion, a pair of wing portions, a nose portion and a tail portion;

(b) a cover sheet secured to said flat frame structure;

(c) an air activated sound making device mounted on said fuselage portion of said flat frame structure to be activated by air passing by as said kite flies; and

(d) a flying line attached to said fuselage portion of said flat frame structure, wherein said flat frame structure includes

(e) a plurality of sticks some of which are curved;

(f) a plurality of line lashings so attach said sticks together;

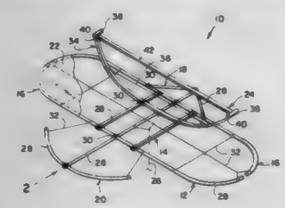
(g) a plurality of string braces to hold said sticks together in stabilized relationships, wherein said air activated sound making device includes:

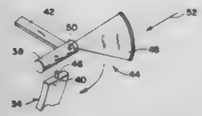
(h) a bow-shaped member transversely mounted on top of said fuselage portion by said line lashings;

(i) a stabilizing brace wire extending across middle of said bow-shaped member;

(j) a pair of clamps, each said clamp positioned on each end of said bow-shaped member;

(k) a flexible strap extended between said clamps which emits a sound like an airplane propeller when it vibrates





through said air, further comprising an adjustable tension holder which includes:

(l) one of said clamps being pivotable on said end of said bow-shaped member;

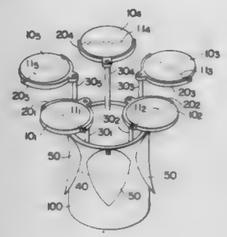
(m) a deflector blade affixed to said pivotable clamp which is activated by wind speed to turn said pivotable clamp, thus stretching said flexible strap to vary pitch of said sound emitted from said flexible strap.

4,634,086

SOLAR RAY COLLECTING DEVICE FOR USE IN A SPACECRAFT

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 670,692, Nov. 13, 1984, abandoned. This application Nov. 22, 1985, Ser. No. 800,906
Claims priority, application Japan, Nov. 18, 1983, 58-217146
Int. Cl.⁴ B64G *1/10*
U.S. Cl. 244—173 **11 Claims**



1. A solar ray collecting device loaded and employed in a spacecraft comprising a cylindrical container, a plurality of round solar ray collecting portions each having a light-receiving surface, each of said light-receiving surfaces having a surface area substantially equal to the circular cross-sectional area of the cylindrical container, supporting arms for rotatably supporting each of said solar ray collecting portions, and supporting poles supporting each of said supporting arms, said supporting poles being rotatable to thereby rotate said support-

ing arms and the solar ray collecting portion supported on the respective supporting arm about the axis of the respective supporting pole, said supporting poles being longitudinally moveable to longitudinally extend and withdraw said supporting arms and the solar ray collecting portions supported on the respective supporting arm, whereby said solar ray collecting portions are movable into a non-deployed position in which the solar ray collecting portions are accommodated within said cylindrical container and a deployed position in which said solar ray collecting portions are disposed outside of said cylindrical container for collecting solar rays.

4,634,087

GROOVED RAIL SWITCH WITH A TONGUE RAIL DEVICE

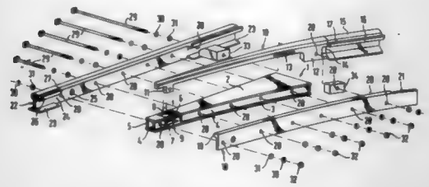
Bernd-Joachim Kempa, Berlin, Fed. Rep. of Germany, assignor to Elektro-Thermit GmbH, Berlin, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 676,544

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343239

Int. Cl.⁴ E01B *7/06, 7/02*

U.S. Cl. 246—430 **5 Claims**



1. Grooved rail switch with a tongue rail device comprising an elongated stock rail having a first end and a second end, an elongated switch rail separate from said stock rail and having a first end and a second end and extending alongside said stock rail, said tongue rail device comprises an elongated tongue rail having a first end and a second end extending alongside and located between said stock rail and said switch rail, and means for supporting said tongue rail separate from said stock rail and said switch rail for displacement laterally of said tongue rail between said stock rail an said switch rail, said means comprises a generally horizontally arranged slide plate for slidably supporting said tongue rail for lateral displacement between said stock rail and said switch rail along the length of said tongue rail in the first end-second end direction, said slide plate having a first end and a second end, a generally horizontally arranged bottom plate spaced below said slide plate having a corresponding first end and a second end, a pair of generally vertically arranged laterally spaced flat bars each extending upwardly from said bottom plate to said slide plate and extending in the direction from the first ends to the second ends of said slide plate and bottom plate, said flat bars being welded to said slide plate and bottom plate, said slide plate, bottom plate and flat bars forming a torsion-stiff tongue rail support box having a first end and a second end, and high-strength bolts extending transversely of and spaced apart in the first end-second end direction of said stock rail and switch rail and extending through said stock rail said support box and said switch for removably securing said stock rail and switch rail to said support box, an inserting rail has a first end abutting against the second end of said tongue rail and said inserting rail extends in general alignment with and away from said tongue rail, the second end of said support box extends to the first end of said inserting rail and said support box on the side adjacent said switch rail is cut out to correspond to the shape of said tongue rail adjacent said second end thereof, a spacer plate positioned between the second end of said tongue rail and the second end of said switch rail, and a bolt extends through said stock rail and said support box in the region of said cutaway portion extending through said tongue rail and said spacer plate and through said switch rail.

4,634,088

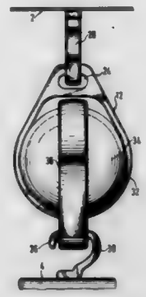
SUSPENSION ELEMENT FOR THE EXHAUST SYSTEM OF A MOTOR VEHICLE ENGINE

Kurt Schad, Bischofsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 1, 1985, Ser. No. 707,392

Int. Cl.⁴ F16L *3/00*

U.S. Cl. 248—60 **1 Claim**



1. In a motor vehicle having a floor with an exhaust system extending therebeneath, elastic air-filled suspension means for suspending said exhaust system from said floor while attenuating vibrations generated by said exhaust system prior to their transmission to said floor, said means comprising a pair of elastic rings that are linked together and adapted to be connected to said floor and exhaust system respectively, and an air-filled elastic sphere arranged between said rings at their linkage so as to provide an air cushion therebetween.

4,634,089

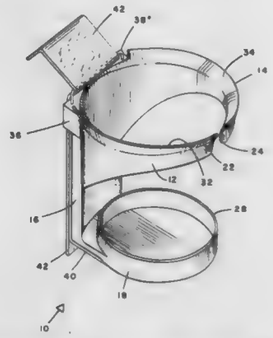
UNIVERSAL CUP HOLDER

William T. Wright, 2760 Ranch House Rd., Orlando, Fla. 32822, and Edward J. Guard, 2480 McIntosh Way, Maitland, Fla. 32751

Filed Apr. 16, 1985, Ser. No. 723,916

Int. Cl.⁴ A47K *1/08*

U.S. Cl. 248—311.2 **26 Claims**



23. A universal drink container holder of the top loading type for accommodating and safely supporting a drink container of any of a wide variety of sizes and configurations, comprising a vertical backbone member having a flat back portion, and a front portion having integrated thereon, a pair of curved arms functioning to securely clasp a drink container, said back portion of said backbone member having a strip of

Velcro of a first type mounted thereon, a strip of Velcro of the second type being secured upon a generally vertical mounting surface, from which said holder is to be supported, said holder being firmly supported from the generally vertical mounting surface upon the two strips of Velcro being joined, and means at the top of the holder for preventing separation by peeling of the joined strips of Velcro, thus preventing removal of the holder from the vertical surface except as a result of a deliberate removal effort by the user.

4,634,090

COLLAPSIBLE SUPPORT STAND FOR AN ELECTRONIC MUSICAL KEYBOARD AND THE LIKE

Edmund Currie, 3905 N. Panama Ave., Chicago, Ill. 60634, and Hillel Frankel, P.O. Box 3017, Santa Monica Blvd. #109, Santa Monica, Calif. 90406

Filed May 7, 1985, Ser. No. 731,675

Int. Cl.⁴ F16M *13/00*

U.S. Cl. 248—544 **7 Claims**



1. A collapsible support stand for an electronic musical keyboard and the like, said stand in a disassembled carrying mode comprising:

(a) a base member, a post and a table top to be removably positioned on one end of said post and having a pair of parallel opposed sides for supporting an electronic keyboard on the upper surface thereof;

(b) a vertical sleeve with a downwardly open recess centrally located on and extending from the undersurface of the table top for receiving said one end of said post;

(c) said base member including a plurality of radially extending horizontal legs with transverse spaces between adjacent legs terminating in a centrally located hub extending upwardly therefrom, said hub having an open recess extending upwardly from said base member for receiving the other end of said post;

(d) the ends of said post being adapted to be removably seated within said recesses in said sleeve and base member respectively;

(e) strap securing means secured to the undersurface of said table top comprising three strap securing members positioned at the apices of a triangle, one apex of said triangle being adjacent said one of said opposed sides and positioned substantially along a first line through said sleeve which is normal to a second line through said sleeve, which second line is parallel to said pair of opposed sides of said table the other apices being on opposite sides of said sleeve along said second line;

(f) a first strap secured to said strap securing members at said other apices and passing through said strap securing member at said one apex;

(g) a second strap secured to said strap securing members at said other apices; and

(h) said post is placed against the undersurface of the table top underneith said first strap, and said base is placed over said post against the undersurface of the table top with the sleeve extending into one of said spaces between the legs of the base, with said second strap securing said base to said table top.

4,634,091

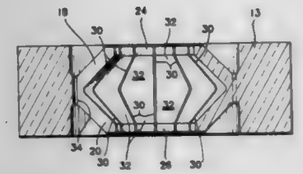
SUPPORT FOR RING LASER GYRO

Alfred L. Butler, Thousand Oaks, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Sep. 16, 1985, Ser. No. 776,433

Int. Cl.⁴ F16M *1/00*

U.S. Cl. 248—637 **12 Claims**



1. A support structure for a ring laser comprising:

two structural members in the shape of substantially identical frustums of circular cones rigidly attached to each other, with their axes coaxial, at their largest diameter portions;

said members being divided by axially and radially-directed slots into a plurality of struts.

4,634,092

CLAMP VALVES

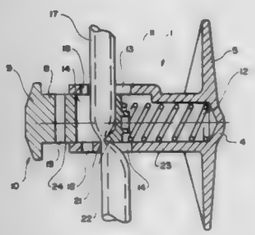
Michael G. Daniell, and Gerald S. Martin, both of Auckland, New Zealand, assignors to Fisher & Paykel, Private Bag, Auckland, New Zealand

Filed Oct. 1, 1984, Ser. No. 656,724

Claims priority, application New Zealand, Sep. 30, 1984, 205826

Int. Cl.⁴ F16L *55/14*

U.S. Cl. 251—7 **6 Claims**



1. A clamp valve comprising a hollow member open at one end and having a side wall with a pair of apertures therethrough, a slide movable in said hollow member and having a transverse aperture therethrough so that a conduit having a pliable resilient wall can in use be passed through both said apertures in said wall of said hollow member and through said aperture through said slide, said aperture through said slide having an outer edge juxtaposed to an inner edge of one of the apertures in said wall for clamping said conduit between said edges, and biasing means to bias said slide relative to said hollow member to a position for clamping said conduit between said edges so that said conduit is normally closed to fluid flow.

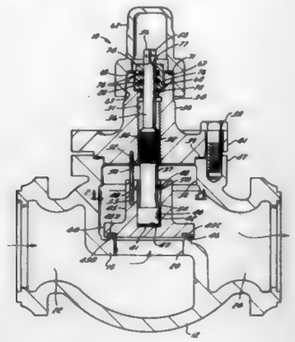
VOL 1074 ISS 1 JA 6 1987 UMI

4,634,093

MOUNTING MEANS FOR VALVE DISC

Robert J. Schintgen, New Berlin, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed Oct. 7, 1985, Ser. No. 784,776
Int. Cl.⁴ F16K *31/50*
U.S. Cl. 251—82 **13 Claims**



5. A combined shut-off and stop-check valve comprising:
- a hollow valve body having fluid ports and a valve stem hole therein;
- a valve plate within said valve body and having a fluid passage therethrough;
- valve seat on said valve plate and surrounding said fluid passage;
- a hollow valve stem sleeve attached to said valve body and overlying said valve hole:
- a valve stem rotatably mounted in said valve sleeve and axially shiftable therein within said housing, said valve stem being axially shiftable between closed and open positions and intermediate positions therebetween;

said valve stem having an inner end;
- a valve disc on said inner end of said valve stem and relatively rotatable for at least some predetermined angular distance relative thereto, said valve disc being movable toward and away from said valve seat as said valve stem is rotated and is axially shifted, said valve disc being movable relative to said valve seat between closed and open positions and intermediate positions therebetween in response to axial shifting movement of said valve stem, said valve disc also being movable relative to said valve seat and relative to said valve stem from an intermediate position to closed position in response to reverse fluid flow in said fluid passage when said valve stem is in an intermediate position;
- and an anti-rotation means engaging said valve sleeve and said valve disc to prevent rotation of said valve disc relative to said valve seat as said valve stem is rotated to ensure that said valve disc always seats in the same position on said valve seat but allowing axial shifting movement of said valve disc on said valve stem in any of said intermediate positions.

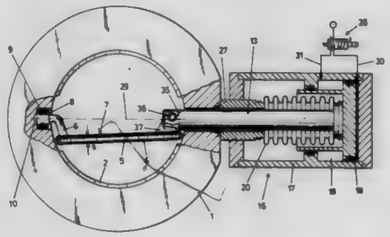
4,634,094

SHUTOFF VALVE

Friedrich Geiser, Nüxiders, Austria, assignor to Siegfried Schertler, Haag, Switzerland

Filed Mar. 3, 1986, Ser. No. 835,546
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1985, 3508318
Int. Cl.⁴ F16K *31/124, 31/163*
U.S. Cl. 251—58 **6 Claims**

1. Shutoff valve for a pipeline or a container comprising a housing forming an axially extending flow passageway with a valve seat formed by said housing and encircling the axis of the flow passageway, a flap shaped cutoff part pivotally mounted in the flow passageway, an actuator located exteriorly of said housing and extending therethrough and connected to said cutoff part so that said cutoff part can be pivoted from a first position in sealed contact with said valve seat blocking flow through the flow passageway and at least one other position permitting flow through the flow passageway, said cut off part having a pair of oppositely directed face surfaces extending transversely of the axis of the flow passageway in the first position of said cutoff part, a circumferential edge bordering said cutoff part and extending between said face surfaces, and a pivot axis spaced from the face surfaces on said cutoff part, said pair of face surfaces comprising a first face surface facing said valve seat in the first position of said cutoff part and an oppositely directed second face surface, a pivot shaft having a first end and a second end, said pivot shaft secured at the first end to the second face surface of said cutoff part and extending outwardly from the circumferential edge thereof, a ball member located at the second end of said pivot shaft, means in said housing for mounting said ball member in a universally pivotal and tiltable manner to initially disengage the cutoff part from the first position, means on said cutoff part diametrically opposite said pivot shaft for connecting said actuator to said cutoff



part, said actuator comprises an axially extending shifter rod displaceable in the axial direction thereof and having a first end secured to said means for connecting said actuator and a second end spaced outwardly from said flow passageway in said housing, said means for connecting said actuator to said cutoff part comprises a sliding guide located in one of said cutoff part and said shifter rod and a guide pin secured in the other one of said shifter rod and cutoff part and extending into said sliding guide, said sliding guide extending generally in the axial direction of said shifter rod and said guide pin extending transversely of the axial direction of said shifter rod, said sliding guide disposed obliquely with respect to the axial direction of said shifter rod so that the axial displacement of said shifter rod and the engagement of said guide pin in said sliding guide effects the pivotal and tiltable movement of said cutoff part between the first position and said at least one other position thereof, said shifter rod is displaceable only in the axial direction, and said sliding guide has a generally axially extending section extending helically relative to the axis of said shifter rod for effecting a rotational movement of said guide pin for pivotally and tiltable displacing said cutoff part between the first position and the at least one other position.

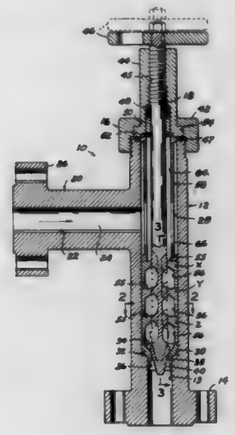
4,634,095

MULTIPLE STAGE CHOKE VALVE

Julian S. Taylor, 8300 SW. 8, Oklahoma City, Okla. 73128

Filed Jul. 26, 1985, Ser. No. 759,380
Int. Cl.⁴ F16K *47/04*
U.S. Cl. 251—121 **3 Claims**

1. A choke valve, comprising:
- a valve body having an inlet port and an outlet port defining a flow passageway;
- an annular valve seat in the flow passageway adjacent the outlet port;
- an axially moveable valve stem intersecting and extending into the downstream end portion of the flow passageway and defining an annulus around the valve stem in the downstream end portion of the flow passageway;
- a valve on the downstream end of said valve stem for sealing with the valve seat; and,
- flow restriction means in the flow passageway annulus cooperating with said valve stem for dividing the flow passageway annulus into a longitudinally extending series of axially spaced annular recesses,
- said flow restriction means comprising,
- a plurality of centrally bored cylindrical members having an upstream end portion closely surrounding intermediate portions said valve stem,
- said cylindrical members each having the major portion of its downstream end portion counterbored, and,



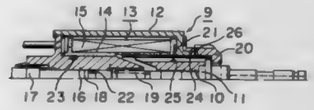
- said valve stem having a plurality of circumferentially spaced longitudinally extending relatively narrow, when compared with the diameter of the valve stem, radially penetrating throttling slots longitudinally bridged by the respective cylindrical member counterbore when the valve is seated,
- whereby axial movement of said valve stem in a valve opening direction progressively moves the throttling slots upstream for spanning the centrally bored upstream end portion of each cylindrical member and defining a like series of fluid restricting pressure differential reducing stages.

4,634,096

ELECTROMAGNETIC SOLENOID DEVICE FOR OIL PRESSURE CONTROL

Tadayuki Hara, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 662,153
Claims priority, application Japan, Oct. 24, 1983, 58-164396[U]
Int. Cl.⁴ F16K *31/06*
U.S. Cl. 251—129.15 **6 Claims**



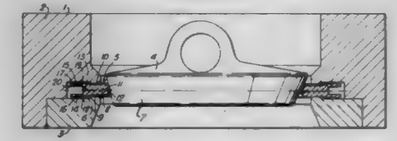
1. An electromagnetic solenoid device for oil pressure control, comprising:
- a valve body having oil flow paths;
- a spool movable in an oil filled bore of said valve body for selectively communicating said oil flow paths;
- a solenoid device fixed to said valve body, said solenoid device having a solenoid case within which are positioned a solenoid coil mounted on a coil bobbin, a movable iron core, a stationary iron core, a sealed end and another end communicating with said bore of said valve body, whereby oil from said bore communicates with oil surrounding said movable iron core, said movable iron core including rod means for pushing said spool;
- a screw rod threaded into said stationary iron core;
- at least one oil pressure releasing means extending through said iron core in the direction of movement of said iron core;
- a return spring interposed between said stationary iron core and said movable iron core; and
- O-rings respectively provided at positions between said coil bobbin and said stationary iron core, between said coil bobbin and said solenoid case and between said screw rod and said stationary iron core to prevent leakage of working oil from said space for receiving said movable iron core.

4,634,097

SEALING DEVICE FOR THROTTLE VALVES

Folke H. Hubertson, Säffle, Sweden, assignor to Aktiebolaget Somas Ventiler, Saffle, Sweden

Filed Jul. 29, 1985, Ser. No. 759,852
Claims priority, application Sweden, Sep. 27, 1984, 8404833
Int. Cl.⁴ F16K *1/226*
U.S. Cl. 251—173 **1 Claim**



1. In a throttle valve comprising a valve housing with a substantially annular valve seat, having a first sealing surface, and a throttle member having a second sealing surface, pivotally mounted in said valve housing so as to have said second sealing surface pressed into engagement with said first sealing surface when said valve is closed; said valve seat consisting essentially of a substantially annular slot, having an axis, an axial width, an inner diameter and an outer diameter, formed in said valve housing and an annular sealing ring, having an axial width, disposed within said slot, said slot having a pair of axially spaced apart side walls and a bottom wall forming the outer diameter of said annular slot, said sealing ring slidably engaging said pair of side walls; the improvement comprising: said sealing ring comprising an annular member having a substantially Y-shaped cross-section formed by a pair of radially outwardly extending, spaced apart, parallel legs conjoined by a radially inward extending head portion; each of sid legs at their free end having a flange portion extending axially away from the other of said pair of legs; said head portion having a rounded portion at its free end, said rounded portion forming said first sealing surface; said radial inward extension of said head protion being at least equal to said radial outward extension of said pair of legs; said sealing ring being formed of a resilient material to afford a head portion of considerable rigidity and resistance to radial deformation and to cause said pair of legs to spring axially outwardly against side walls; said outer diameter of said slot being greater than the outer diameter of said sealing ring as defined by the free ends of said legs and said inner diamter of said slot being greater than said inner diameter of said sealing ring as defined by the rounded portion of the head portion such that when said sealing ring is centered on the axis of said slot said free ends of said legs are radially

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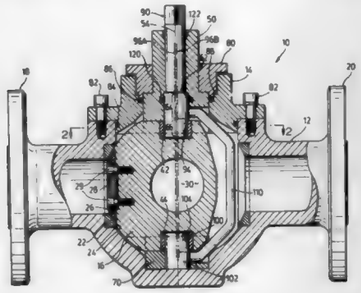
spaced apart from said bottom wall and said rounded portion of said head portion protrudes from said slot; said axial width of said sealing ring is greater across said pair of legs than across said head portion; and said axial width of said slot is greater proximate said pair of legs of said sealing ring than proximate said head portion of said sealing ring.

4,634,098

BALL VALVE

Arnold Varden, Barrie, Canada, assignor to 596801 Ontario Limited, Toronto, Canada

Continuation of Ser. No. 589,920, Mar. 15, 1984, abandoned.
This application Apr. 7, 1986, Ser. No. 848,517
Int. Cl.⁴ F16K *25/00*
U.S. Cl. 251—188 **13 Claims**



1. A valve for use in a pipeline comprising; a housing; said housing having an inlet, an outlet and an internal chamber to accommodate a closure member and an inspection port;

a closure member contained within said housing, said closure member and said housing having co-operating sealing means for sealing said inlet;

said closure means movable from a closed position blocking fluid flow through said valve to an open position permitting fluid flow through said valve;

operating means to move said closure member, including main means to move said closure member angularly about an axis and auxiliary means to move said closure member radially with respect to said axis;

said means to move said closure member angularly including an upper main stem and a lower main stem,

said upper main stem and said lower main stem located on opposite sides of said closure member;

said means to move said closure member radially including an upper auxiliary stem, and a lower auxiliary stem,

said upper auxiliary stem and said lower auxiliary stem located on opposite sides of said closure member, and

a connecting bar contained within said housing and connecting said upper auxiliary stem and said lower auxiliary stem so that said upper auxiliary stem and said lower auxiliary stem may be moved simultaneously.

4,634,099

HIGH PRESSURE INVERTED BELLOWS VALVE

Oliver L. Danko, Chesterland; Carl R. Bork, Jr., Euclid; William C. Steiss, Parma, and Donald A. Levengood, Silver Lake, all of Ohio, assignors to Nupro Company, Willoughby, Ohio

Filed May 17, 1985, Ser. No. 735,807
Int. Cl.⁴ F16K *31/00*
U.S. Cl. 251—335.3 **15 Claims**

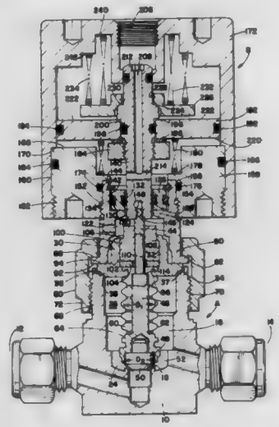
1. A bellows valve comprising:

a valve body having an inlet passage, an outlet passage, a valve chamber in fluid communication with said passages, and a valve seat interposed between said passages;

a stem including first and second coaxial portions, one end of said first stem portion being selectively cooperable with said valve seat for controlling fluid flow between said passages;

a bellows surrounding a portion of said first stem portion and sealingly isolating said stem from system fluid passing through said valve chamber, whereby the system fluid is adapted to exert an external compressive force on said bellows;

said valve chamber having an open end adapted to receive said first stem portion;



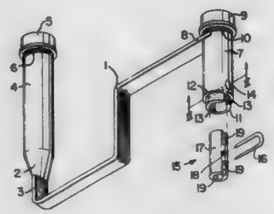
an actuator housing removably connected to said valve body, said actuator housing receiving means cooperating with said stem second portion for reciprocating said second stem portion in a first direction in response to first force means for shifting said first stem portion one end into sealing relation with said valve seat and in a second direction in response to second force means for shifting said first stem portion one end to a non-sealing relation with said valve seat, one of said force means including means compensating for uneven force generated thereby for preventing eccentric loading of said stem.

4,634,100

FENCE WIRE TIGHTENER

Bill Glen, Tennessee Valley Ranch, Pincher Creek, Alberta, Canada (T0K 1W0)

Filed Feb. 15, 1985, Ser. No. 702,290
Claims priority, application Canada, Sep. 13, 1984, 463117
Int. Cl.⁴ A44B *21/00*; B25B *25/00*
U.S. Cl. 254—213 **1 Claim**



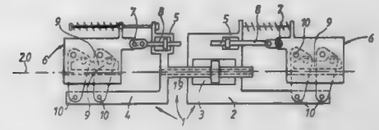
1. A fence wire tightener comprising an elongated handle body having a handle at one end and a hollow tubular post member at the other end thereof, said post member extending generally perpendicularly from said body and having a diametrically arranged pin extending through said post member near the distal end thereof, a wire engaging element removably insertable in the distal end of said post member and comprising a generally cylindrial tightening member having a slot formed in each end thereof and a central transverse passageway formed therein, the slot in one end of said tightening member being adapted to engage said pin in said post member when said wire tighening member is inserted in said post member and the slot in the other end of said body being adapted to receive a fence wire therein, whereby rotation of said handle body about said post member causes a fence wire to be wound about said tightening member and whereupon a staple member may be inserted into said passageway for retaining the fence wire around said tightening member after said tightening member is removed from said post member.

4,634,101

CONVERTIBLE ROPE PULLING AND WALKING MACHINE

Ernst Lauber, Thun, Switzerland, assignor to Willy Habegger AG, Switzerland

Filed Feb. 13, 1985, Ser. No. 701,108
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3404758
Int. Cl.⁴ B62D *57/02*
U.S. Cl. 254—228 **8 Claims**



1. A convertible rope pulling and walking machine comprising:

a machine frame having a pulling frame portion defining a pulling station and a gripping frame portion defining a gripping station, said pulling and gripping frame portions being movable in a longitudinal direction back and forth along a rope, said machine frame having guide means for guiding said pulling and gripping frame portions along a rope;

a main piston/cylinder combination connected between said gripping and pulling frame portions for moving said gripping and pulling frame portions toward and away from each other in the longitudinal direction;

a first auxiliary piston/cylinder combination connected to said pulling frame portion;

a second auxiliary piston/cylinder combination connected to said gripping frame portion;

first and second driving bearing shafts detachably connected to said first and second auxiliary piston/cylinder combinations respectively;

first and second grippers each having a movably mounted clamping jaw extending in the longitudinal direction and movably mounted between a clamping and a releasing position for clamping and releasing a rope;

said first and second grippers being detachably connected to said first and second driving bearing shafts respectively for movement of first and second auxiliary piston/ cylinder combinations;

first and second mounting bearing shafts detachably connected to said pulling and gripping frame portions respectively, said first and second detachable mounting bearing shafts being detachably connected to said clamping jaws of said first and second grippers respectively so that movement of said grippers with movement of said auxiliary piston/cylinder combinations causes movement of said clamping jaws between their clamping and releasing positions; and

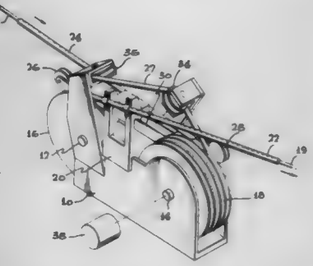
first and second walkers each having a movably mounted pawl for movement to engage and disengage a rack, said first and second walkers being detachably connected to said pulling and gripping frame portions respectively by said first and second mounting bearing shafts respectively, each pawl being detachably connected to one of said first and second auxiliary piston/cylinder combinations at said first and second drive bearing shafts respectively, said first and second walkers each having guide means for guiding said walkers in a longitudinal direction along a rack.

4,634,102

SELF-THREADING CAPSTAN DRIVE

James Appling, 6917 Bobbyboyer Ave., Canoga Park, Calif. 91307, and John M. Franchuk, 3806 191st Pl. SW., Lynnwood, Wash. 98036

Filed Dec. 23, 1985, Ser. No. 812,588
Int. Cl.⁴ B66D *1/26, 1/34*
U.S. Cl. 254—278 **12 Claims**



7. A self-threading capstan drive including a frame, first and second sheaves supported in said frame, means for driving at least one of said sheaves, guide means for directing an elongated tubular sonar array into and out of said capstan drive,

characterized in that the grooves in said sheaves include a deep channel to accommodate said sonar array and a larger diameter outside channel, and

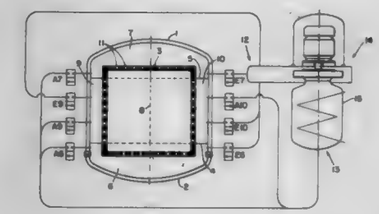
an endless tubular belt of significantly greater diameter than said sonar array, said belt being carried in said outside channel of the grooves in said sheaves such that when said sonar array is carried on said sheaves said belt makes contact throughout much of its length with said array and carries said array around the grooves of said sheaves and from sheave to sheave.

4,634,103

OVEN EQUIPMENT FOR COOLING A CHARGE AFTER THERMAL TREATMENT

Peter Schmetz, Menden, and Dieter Gierse, Werdohl, both of Fed. Rep. of Germany, assignors to Schmetz GmbH, Menden, Fed. Rep. of Germany

Filed Jun. 18, 1984, Ser. No. 621,524
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1983, 3322386
Int. Cl.⁴ C21D *9/00, 11/00*
U.S. Cl. 266—80 **4 Claims**



1. Oven equipment for cooling thermally treated metal charges or workpieces hardened by heat after thermal treat-

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ment within a closed chamber and quenched by blowing in a cooling gas to allow cooling of the charges to take place as a function of actual conditions at a predetermined velocity while at the same time making possible maintenance of a uniform temperature distribution within the charge to avoid distortion and greatly differing hardness values resulting therefrom due to different mass distributions and due to temperature differences between different spots of workpieces being treated comprising:

a closable cylindrical housing having a cylinder wall and two end walls;

a cylindrical treatment chamber having a cylinder wall, two end walls, and an upright cylinder axis; said treatment chamber being concentrically disposed in said housing in such a way that space is provided on all sides of said treatment chamber between the latter and said walls of said housing, namely an annular space around said cylinder wall of said treatment chamber, and spaces at each of said end walls thereof; said cylinder wall and said end walls of said treatment chamber being provided with a plurality of gas passages which are either adapted to be closed off, or are permeable for gases and impermeable for heat rays;

a first partition, which extends in said annular space around said treatment chamber at right angles from said cylinder wall of said treatment chamber to said cylinder wall of said housing, and is disposed in the vicinity of the bottom end of said treatment chamber, to form a first closed-off chamber below said treatment chamber;

a second partition, which extends in said annular space around said treatment chamber at right angles from said cylinder wall of said treatment chamber to said cylinder wall of said housing, and is disposed in the vicinity of the top end of said treatment chamber, to form a second closed-off chamber above said treatment chamber;

two third partitions, each of which extends in said annular space around said treatment chamber at right angles from said cylinder wall of said treatment chamber to said cylinder wall of said housing, between said first and second partitions, and in a single axial plane, which coincides with said cylinder axis of said treatment chamber, to form two third closed-off chambers around said cylinder wall of said treatment chamber;

for each of said four closed-off chambers, a respective first pipe connection in said walls of said housing for introducing cooling gas into said chambers;

for each of said four closed-off chambers, a respective second pipe connection in said walls of said housing for withdrawing cooling gas from said chambers;

a blower unit, for cooling gas, having a pressure side and a suction side;

a respective connecting line and control valve for connecting each first pipe connection of a given closed-off chamber to said pressure side of said blower unit;

a respective connecting line and control valve for connecting each second pipe connection of a given closed-off chamber to said suction side of said blower unit; and

a temperature control system which operates on the basis of desired-actual-comparisons between the theoretical values of preset temperatures and measured actual temperature values of temperature distribution in respective charges; said system serving to operate said control valves and, as the case may be, closure elements for said gas passages of said walls of said treatment chamber for changing at least one of the intensity and direction of flow of said cooling gas as a function of deviations of the measured temperature values from predetermined theoretical values for said temperatures in order to achieve a desired cooling speed and to achieve substantially uniform temperature distribution in said charges respectively for uniform hardening thereof.

4,634,104

HOODED METALLURGICAL VESSEL

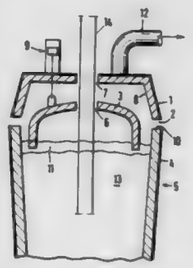
Karl Wamser, Moers, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 19, 1985, Ser. No. 756,601

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1984, 3427087

Int. Cl.⁴ C21C *5/38*

U.S. Cl. 266—158 **9 Claims**



1. A metallurgical vessel comprising:

(a) an upwardly open vessel which, in use, contains a metallurgical melt, said upwardly vessel having an upper rim;

(b) a suction hood having a lower rim sized and shaped so that, in use, the lower rim of said suction hood opposes the upper rim of said upwardly open vessel but is spaced therefrom to permit ambient air to enter through an annular gap therebetween;

(c) a downwardly open covering bell having a lower rim, said downwardly open covering bell being mounted on the underside of said suction hood in position so that, in use, the lower rim of said covering bell isolates a portion of a slag cover on a metallurgical melt in said upwardly open vessel;

(d) at least one opening in said suction hood; and

(e) at least one opening in said covering bell sized, shaped, and positioned relative to said opening in said suction hood so that, in use, a probe can be introduced through said at least one opening in said suction hood, through said at least one opening in said covering bell, and into the portion of the slag cover on the metallurgical melt in said upwardly open vessel isolated by said covering bell.

4,634,105

ROTARY DEVICE FOR TREATING MOLTEN METAL

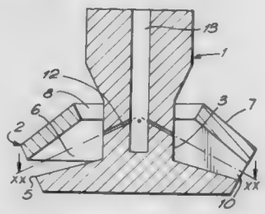
Christopher J. Withers, Stourbridge, and David W. Pattle, Lichfield, both of United Kingdom, assignors to Foseco International Limited, Birmingham, England

Filed Nov. 12, 1985, Ser. No. 797,022

Claims priority, application United Kingdom, Nov. 29, 1984, 8430194; Nov. 29, 1984, 8430195

Int. Cl.⁴ C21C *7/00*

U.S. Cl. 266—217 **19 Claims**



1. A rotary device for dispersing a gas in molten metal comprising a rotatable hollow shaft and a hollow rotor fixedly attached to the shaft, said rotor comprising top, bottom and peripheral surfaces and a hollow interior, and said rotor having

(1) a plurality of vanes each extending from adjacent the shaft, towards the peripheral surface of the rotor whereby the hollow interior of the rotor is divided into a plurality of compartments,

(2) means for defining at least one aperture in at least one of the top and bottom surfaces of the rotor, adjacent the shaft, and at least one aperture in the peripheral surface of the rotor, so that when the rotor rotates the molten metal can enter each of the compartments through the at least one aperture in at least one of the top and bottom surfaces, and flow outwardly through the at least one aperture in the peripheral surface, and

(3) at least one duct for the passage of the gas, the duct extending from the hollow interior of the shaft to each of said compartments.

4,634,106

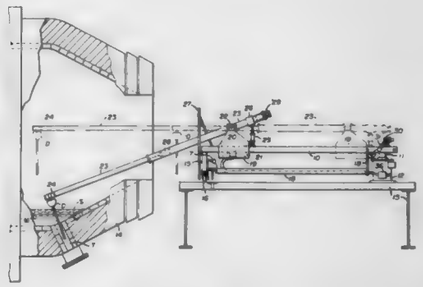
DEVICE FOR PLACING SLAG RETENTION MEANS IN TAPPING CONVERTER

Michael D. LaBate, II, 115 Hazen Ave., Ellwood City, Pa. 16117

Continuation-in-part of Ser. No. 631,968, Jun. 18, 1984, abandoned. This application Sep. 23, 1985, Ser. No. 779,136

Int. Cl.⁴ C21C *5/48*

U.S. Cl. 266—236 **3 Claims**



1. Apparatus for forcefully moving a slag retaining device through molten metal and a slag layer thereon into a tap hole in a converter comprising a horizontally disposed elongated frame movably positioned on a platform adjacent said converter, a fixed pivotal support on said platform, a first end of said elongated frame pivoted to said pivotal support, wheels on a second end of said elongated frame engaging said platform whereby said second end can move horizontally in an arcuate path on said platform, a carriage movable along said elongated frame and means for moving said carriage, a pivot on said carriage, a two-part telescopic supporting boom, a first part of said two-part supporting boom being pivotally attached inwardly of one end thereof to said pivot on said carriage, a second part of said two-part supporting boom being movable longitudinally of said first part so that said supporting boom is extensible into and out of said converter and collapsible upon itself, and means for moving said second part of said supporting boom with respect to said first part of said supporting boom, said pivot on said carriage forming a fulcrum for said supporting boom and means on said carriage for tilting said supporting boom relative to said pivot and carriage whereby the ends of said supporting boom are movable in vertical and horizontal arcuate paths and means on one end of said second part of said supporting boom detachably supporting said slag retaining device whereby said slag retaining device may be moved toward and away from said converter and said tap hole therein on said horizontal and vertical paths.

4,634,107

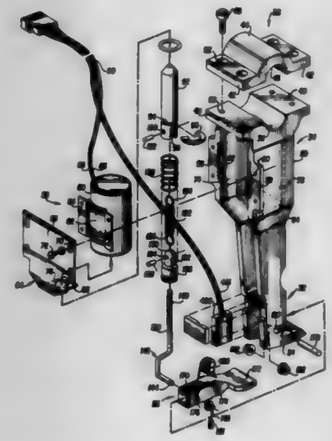
GRIPPER ARM AND METHOD OF OPERATION

Gary L. Vandersyde, Naperville, and K. George Rabindran, Morton Grove, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 648,391, Sep. 7, 1984, abandoned. This application Jan. 17, 1986, Ser. No. 820,890

Int. Cl.⁴ B65H *43/02*

U.S. Cl. 270—56 **29 Claims**



1. A gripper arm for selectively engaging and retrieving articles from a station proximate the gripper arms, said gripper arm comprising:

a gripper arm housing having a first end and a second end;

means at the second end of said housing for securing said gripper arm to oscillating drive means;

a first jaw member proximate said first end of said gripper arm housing;

a second jaw member proximate said first end of said gripper arm housing, said second jaw member being selectively movable with respect to said first jaw member for the engagement of articles therebetween;

a solenoid mounted to said gripper arm housing, said solenoid having a plunger associated therewith, said plunger being actuatable to a first position when an electrical signal is supplied to said solenoid and to a second position in the absence of said electrical signal;

linkage means for connecting said plunger of said solenoid to said movable second jaw member whereby said movable second jaw is selectively moved toward and away from said first jaw member in response to the position of said plunger means of said solenoid;

biasing means connected intermediate said plunger of said solenoid and said second jaw member for biasing said second jaw member with respect to said first jaw member; and,

means for applying a preloading force on said biasing means.

4,634,108

RESILIENT BEARING WITH A POSITIVE GUIDANCE

Gunter Munch, Damme, Fed. Rep. of Germany, assignor to Lemförder Metallwaren AG, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 683,933

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346665

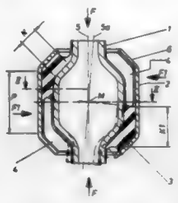
Int. Cl.⁴ B60G *11/18*

U.S. Cl. 267—57.1 R **6 Claims**

1. A resilient bearing having a central axis and comprising an outer sleeve, an inner sleeve forming a supporting tube having a central portion disposed within said outer sleeve, and an

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annular resilient body of elastic material clamped between said outer sleeve and said inner sleeve, said inner and outer sleeves have central axes aligned with said bearing central axis, said resilient body having an initial shape with substantially cylindrical outer and inner surfaces and having a pair of cavities therein which are offset from each other on opposite sides of said resilient body and at opposite ends of said resilient body, each cavity extending from one of said opposite ends to a longitudinal central plane of the bearing, and wherein said resilient body has zones of solid resilient material extending across said inner sleeve at respective opposite ends thereof from each of said cavities, said resilient body being prestressed,



one cavity being provided at each end of said resilient body and said cavities being diametrically offset from each other and, in respect to the axial cross section of the bearing, said outer sleeve having an inwardly tapering wall portion at each end thereof, each wall portion prestressing said resilient body from the outside of the resilient body and wherein said inner sleeve includes an inwardly tapering wall portion at each end thereof extending parallel to one of the tapering wall portions of said outer sleeve, said inner sleeve, before said resilient body is prestressed, having its central axis extending obliquely to said bearing central axis in a direction away from each zone of solid resilient material and toward each cavity.

4,634,109

APPARATUS FOR ADJUSTING THE SPRING CHARACTERISTIC OF A HELICAL SPRING

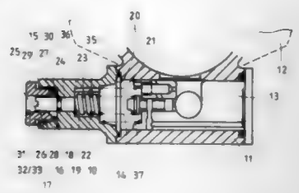
Jean-Pierre Cigolotti, Chassieu, and Jean Leblanc, Lyons, both of France, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 20, 1985, Ser. No. 735,929

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1984, 3421560

Int. Cl.⁴ F16F *1/06, 1/16;* F02D *1/04*

U.S. Cl. 267—170 **12 Claims**



1. An apparatus for adjusting the spring characteristic of a rotationally fixed helical compression spring for adjusting movement of a control device which is in operative engagement with one end of said helical compression spring which comprises: a housing, said housing including a chamber for receiving said helical spring and said control device in axial alignment, said housing including a stepped bore in one end in axial alignment with said chamber, said stepped bore including a larger diameter portion and a smaller diameter portion, said smaller diameter portion being located between said chamber and said larger diameter portion and extending from said chamber to said larger diameter portion, an adjusting tang, said adjusting tang including a large diameter end which extends into said chamber and includes a helical groove along its circumference for receiving one end of said helical spring thereon in engagement with said helical groove and a smaller diameter end which forms a bearing neck portion that extends through said smaller diameter portion of said stepped bore into said larger diameter portion of said stepped bore, an arresting member positioned within said larger diameter bore relative to said bearing neck portion of said tang for fixing said tang in a desired position relative to said chamber, said arresting member including a locking ring that surrounds said bearing neck portion of said adjusting tang and a fastening member for forcing said locking ring against said bearing neck portion to prevent movement of said adjusting tang, and means on an end of said bearing neck portion of said adjusting tang for rotating said adjusting tang relative to said helical compression spring and for axial movment of said adjusting tang relative to said chamber.

4,634,110

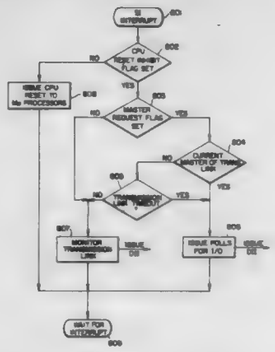
FAULT DETECTION AND REDUNDANCY MANAGEMENT SYSTEM

Paul M. Julich, Indialantic, and Jeffrey B. Pearce, Melbourne, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jul. 28, 1983, Ser. No. 518,291

Int. Cl.⁴ G06F *15/16, 11/00*

U.S. Cl. 371—11 **21 Claims**



1. For use in a redundancy-configured control apparatus having a plutality of available multi-processor control units through which control of the operation of said apparatus is carried out, a plurality of input/output units through which signals are interfaced between actuator/sensor units and said control units, and a signal transmission link through which said control units communicate with said input/output units for responding to input signals from and supplying output signals to said actuator/sensor units, an arrangement of controlling the functional coupling of said units to said signal transmission link and thereby the operation of said apparatus by one of said control units comprising, within each respective control unit:

first means, coupled with each of the multiple processors within that respective control unit, for providing an indication of the operational capability of each of said multiple processors;

second means, coupled to said first means, for enabling the functional coupled of said control unit to said link so that said control unit may assume control of said apparatus in response to said first means providing an indication that each of said multiple processors is capable of successfully carrying out its intended processing operations; and wherein

said control unit includes a bus interface unit, coupled to said signal transmission link, for assembling and disassembling messages between said signal transmission link and said control unit, and wherein said second means includes means for providing said indication to said bus interface unit that each of said processors is capable of successfully carrying out its intended processing operation.

4,634,111

FRICTION SEPARATION DEVICE

Werner Frank, Reichenau, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

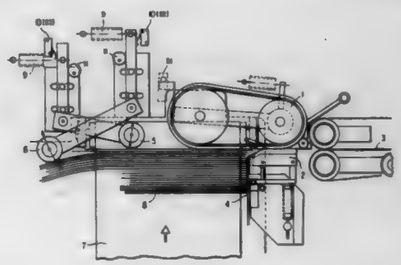
PCT No. PCT/EP84/00144, § 371 Date Jan. 15, 1985, § 102(e) Date Jan. 15, 1985, PCT Pub. No. WO84/04517, PCT Pub. Date Nov. 22, 1984

PCT Filed May 15, 1984, Ser. No. 692,882

Claims priority, application Fed. Rep. of Germany, May 17, 1983, 3317863

Int. Cl.⁴ B65H *3/04*

U.S. Cl. 271—34 **17 Claims**



1. A friction separator for separating letters and similar flat items from a stack of such items, the length of each of said items being between a predetermined minimum length and a predetermined maximum length, comprising

a base belt for supporting said stack of items and conveying them in a first direction, the leading edge of said stack of items defining a plane perpendicular to said first direction;

a guide wall extending along one side of said belt;

a removal member mounted for frictional engagement with the foremost item in said stack, said removal member withdrawing said foremost item through a gap between said guide wall and said removal member in a second direction parallel to the plane defined by the leading edge of said stack;

a first support member positioned in the plane defined by the leading edge of said stack at the trailing portion of the shortest item withdrawn by said removal member, said first support member supporting said stack at a point spaced from said guide wall by a distance which is less than said predetermined minimum length;

a second support member positioned at a location between said plane and the trailing edge of the stack of items supported by said base belt, said second support member being further positioned at a distance from said guide wall which is less than said maximum length and greater than said minimum length for supporting the longest items withdrawn by said removal member; and

means for resiliently pressing at least one of said first and second support members against said stack.

4,634,112

PLURAL BELT DOCUMENT FEEDER

Morton Silverberg, 23 Old Pond Rd., Rochester, N.Y. 14625

Filed Oct. 17, 1985, Ser. No. 788,591

Int. Cl.⁴ B65H *9/06*

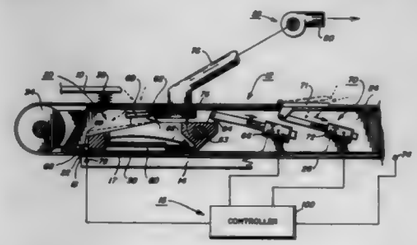
U.S. Cl. 271—245 **4 Claims**

1. In a document feeder with a belt platen transport system for transporting document sheets over the platen of a copier under an imaging backing surface closely overlying said platen and into a registration position for imaging the document sheets, with registration means for temporarily stopping the document sheets at said registration position without stopping the belt platen transport system, and then releasing the document for transporting through said registration position and off of said platen, said belt platen transport system including plural spaced belts engaging the document sheet being transported with a transporting force sufficient to provide relatively high frictional transport of the document sheet with movement of said belts into said registration means, said belt platen transport system being adapted to allow slippage of said belts relative to the document sheet at said registration means, and wherein said registration means comprises rigid cantilevered document registration fingers insertable into the transport path of the document sheet at said registration position from between said belts of said belt platen transport system, against which inserted registration fingers the document sheet is driven by said belts for and during registration, and means for rapidly removing said registration fingers from the document transport path; the improvement wherein:

said registration means includes energy absorbing means mechanically connecting with said rigid cantilevered registration fingers to automatically absorb a substantial portion of the impact of a document sheet with said inserted registration fingers, to protect the document sheet from damage by said registration means,

said energy absorbing means comprising means for preset resilient energy absorbing limited movement of said inserted registration fingers by the impact of the document sheet thereagainst, said registration fingers being so moved in the direction of movement of the document sheet and said belts to slightly beyond said registration position, while maintaining said registration fingers in the path of the document sheet,

said means for energy absorbing movement further providing for the automatic pushing back of the document sheet into said registration position against the document transporting force of said belt platen transport system by automatic reverse movement of said registration fingers after said impact energy absorbing movement while maintaining said registration fingers in the path of the document sheet during registration, wherein said registration fingers themselves are not sprung or deformed by the documents but briefly slide downstream for a preset maximum limited distance under the initial document impact and then are slid back upstream automatically by said energy absorbing means.



4,634,113

SHEET WINDING AND DISCHARGING DEVICE

Hideo Matsuda, Nara, and Shinitiro Hiraoka, Yamatotakada, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 21, 1985, Ser. No. 800,306

Claims priority, application Japan, Nov. 22, 1984, 59-248317; Nov. 22, 1984, 59-248318; Dec. 7, 1984, 59-259619

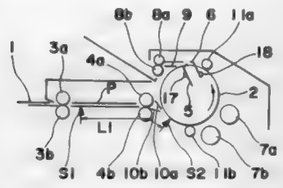
Int. Cl.⁴ B65H *7/14*

U.S. Cl. 271—259 **5 Claims**

1. A sheet winding and discharging device which comprises:

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a drum rotatably mounted in the device for winding a sheet therearound;
a sheet feeding means for feeding the sheet to the drum;
a sheet detecting means for detecting the length of the sheet to be fed;
a sheet holding means mounted on the drum for holding the sheet which is fed to the drum; and



a control means for controlling the movement of the sheet holding means, said control means having a function for discharging the sheet without winding it around the drum in case that the sheet has a length more than the predetermined length.

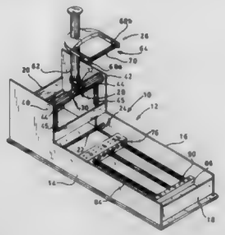
4,634,114
HAND EXERCISER
Luis M. Garcia, 333 Somers Rd., Hampden, Mass. 01036
Filed Oct. 9, 1984, Ser. No. 658,993
Int. Cl.[4] A63B *21/02, 21/30*
U.S. Cl. 272—67 **10 Claims**



1. A hand exerciser comprising a main shaft, a plurality of helical spring segments circumscribing said shaft, the end of one spring segment being contiguous with the end of the adjoining spring segment, separator means located between each helical spring segment circumscribing said shaft and adapted to receive and abut the ends of each spring segment, a securing means located at one end of said shaft, a means for engaging said securing means to said shaft, an inside handle, an outside handle surrounding the inside handle, said inside handle being in the shape of a triangle and having an opening at the apex thereof, adapted to circumscribe the shaft with threads on its inside surface adapted to mesh with threads on the outside surface of said shaft located at the opposite end of said shaft from the securing means, whereby said inside handle is secured to said shaft, said outside handle being a closed six sided member with the side opposite it's grip portion having a circular opening therein, whereby the said shaft passes therethrough and being freely movable a predetermined distance on said shaft. a means for adjusting the space between the handles on said shaft.

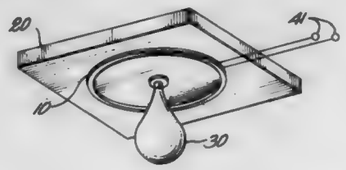
4,634,115
ARM WRESTLING AND CURLING MACHINE APPARATUS
David E. Hawkins, 411 Glen Oaks Dr., Knoxville, Tenn. 37912
Filed May 29, 1984, Ser. No. 615,064
Int. Cl.[4] A63B *5/00*
U.S. Cl. 272—67 **18 Claims**

1. An apparatus useful for selectable arm wrestling and arm curling exercise by a user, which comprises:
a frame membbr
a lever arm having a first end pivotally mounted on said frame member, and a second end;
a grip means, slidably reciprocatable along said lever arm proximate said second end during said exercise whereby an effective length of said lever arm and said grip means varies during said exercise to compensate for a change in an effective length of an arm of said user;



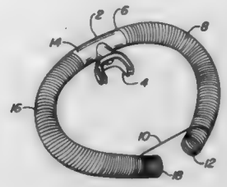
a first biasing means connected between said grip means and said lever arm for biasing said grip means toward said first end of said lever arm; and
a second biasing means connected between said lever arm, proximate said pivotal mounting, and said frame for biasing said lever arm to preselected pivotal positions whereby said second biasing means provides selective resistance against which said selectable arm wrestling and arm curling exercise is performed.

4,634,116
SPEED AND STRIKING BAG FREQUENCY DEVICE
Raymond A. Amador, 5523 Somerset Dr., Santa Barbara, Calif. 93111, and Robert S. Amador, 28025 San Nicolas Dr., Rancho Palos Verdes, Calif. 90274
Filed Apr. 26, 1984, Ser. No. 604,232
Int. Cl.[4] A63B *69/00*
U.S. Cl. 272—77 **5 Claims**



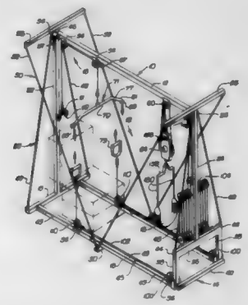
1. A device for sensing the frequency at which a bag rotatably suspended from a platform is struck comprising:
means for sensing the impact of the bag propelled by a strike against the platform, said bag rebounding from the platform to be struck again, the sensing means including conductive rings disposed at the platform and adapted to generate a signal when said rings make mutual contact and means for maintaining the rings out of contact, at least one of said rings arranged to be struck by the bag when it impacts the platform, said rings upon impact contacting and generating said signal;
means for determining the frequency of sensed impacts per unit time, the determining means adapted to receive said signal to determine frequency; and
means for displaying the determined frequency.

4,634,117
LUNG TRAINER
Peter G. Kramer, R.D. #3 Box 4720, Morrisville, Vt. 05661
Filed Sep. 13, 1984, Ser. No. 649,925
Int. Cl.[4] A63B *23/00*
U.S. Cl. 272—99 **2 Claims**



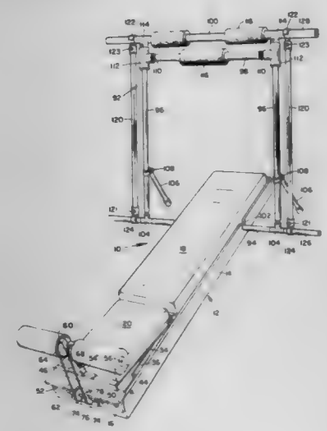
1. An apparatus for increasing respiratory tidal volume of athletes comprising:
T-shaped mouthpiece means for respiring, having three unobstructed passages, a first passage communicating with the mouth of said athlete and comprising the vertical member of said T-shape, and second and third passages, positioned to oppose each other as the respective members of the horizontal section of said T-shape, said second and third passages easily communicating with each other and with said first passage;
two unobstructed flexible tubes, each joined at one end to said mouthpiece means at said second and third passages, and each tube open to the atmosphere at the other end to permit unobstructed inflow and outflow; and
means appending the open ends of said tubes in proximity with each other,
said apparatus configured such that the entire apparatus lies in substantially the same horizontal plane when in use by the athlete.

4,634,118
COOPERATIVE EXERCISING APPARATUS
Peter A. Jensen, 3314 Sawtelle Blvd., #24, Los Angeles, Calif. 90066
Filed Feb. 16, 1984, Ser. No. 580,798
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—117 **22 Claims**



1. A two person cooperative exercising device for use by an exercising individual and a partner comprising:
exercising means for transmitting a resistive force for exercising to an exercising individual;
means for supporting a partner and providing a force related to the gravitational weight of the partner, the partner supporting means spaced apart from the exercising means;
a pulley arrangement including line means for transmitting the partner related force of the exercising partner from the partner support means to the excercising means, the pulley arrangement coupled to the exercise means;
upper support means for supporting the pulley arrangement to movably support the partner supporting means;
lower support means for supporting the pulley arrangement to receive the partner related force for the exercising means;
means for retaining the upper support means in fixed relationship to the lower support means; and
means for adjusting the partner related gravity force, the adjusting means coupled to the pulley arrangement, said pulley arrangement being adjustable by the partner at one station and the partner's related gravity force being transmittable to the exercising means at another station whereby the partner may supply and adjust the significant portion of the force transmitted to the exercising individual, thus providing a two person cooperative participation apparatus for an exercising program.

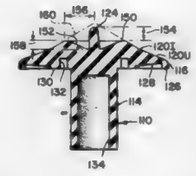
4,634,119
RESILIENT EXERCISE MACHINE WITH BODY SUPPORT PLATFORM
Paul K. Pesthy, 203 Greenlawn St., San Antonio, Tex. 78201
Filed Jul. 11, 1985, Ser. No. 753,884
Int. Cl.[4] A63B *21/00, 21/04*
U.S. Cl. 272—144 **13 Claims**



1. An exercise machine comprising:
an elongate frame having a first platform mounted thereon;
a second platform pivotally mounted to said frame for pivoting between a first horizontal position and a second upright position;
a T-bar unit pivotally mounted to one end of said frame comprising
support means for supporing said second platform in said second position,
a support frame pivotally mounted to the support means,
engagement means mounted to the support frame for engaging the foot of the user of said exercise machine for selectively pivoting the support frame with respect to the support means when said second platform is in said second position;
means having an end mounted to said frame and an end engaging the support frame of said T-bar unit for providing resistance to the pivoting of the support frame with respect to the support means;
an upright pivotally mounted to said frame comprising upper and lower portions in telescoping relationship and a horizontal bar integral with the upper portions thereof; and

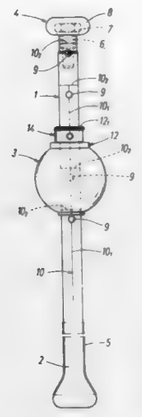
means for resisting the extension of the upper portions of said upright out of the lower portions of said upright.

4,634,120
LOCATOR PLUG FOR GROUND ANCHOR
Roger E. Hall, 2 Rainbow Clr., Elizabethtown, Pa. 17022
Continuation of Ser. No. 647,534, Sep. 5, 1984. This application Oct. 1, 1984, Ser. No. 656,706
Int. Cl.[4] A63B *71/00*
U.S. Cl. 273—25 **20 Claims**



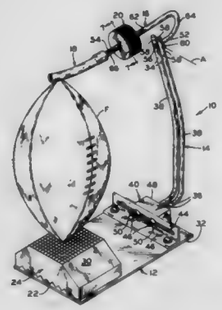
12. A locator plug for a ground anchor comprising a head means and a depending shaft means, said head means having a bottom surface extending outwardly from the shaft to provide horizontal support surface and a top surface with an outer surface sloping upwardly and inwardly to a central area, said top surface further having an upwardly extending locating pin means within said central area, and said upwardly sloping surface having a first slope and a second slope different from said first slope, the change in slope from said first slope to said second slope providing a rise which minimizes ground dragging tools from catching on said pin when said locator plug is placed with its shaft in a buried ground anchor with said pin means extending out of the ground to permit location of the ground anchor.

4,634,121
BAT SWING PRACTICE MEANS
Yuuki Sasaki, 6-11-10, Tsukamoto,, Yodogawa-ku, Osaka-shi, Japan
Filed Aug. 8, 1985, Ser. No. 763,699
Claims priority, application Japan, Aug. 23, 1984, 59-128195[U]; Jan. 21, 1985, 60-007063[U]
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—26 B **2 Claims**



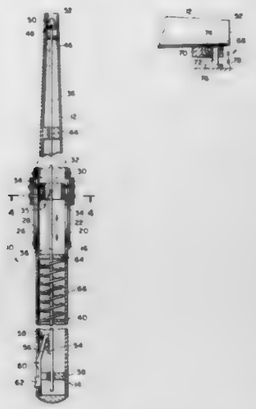
1. A bat swing practice means comprising a shaft body having a predetermined length to be swung, a weight axially slidably put on said shaft body, and means for engaging and disengaging said weight with and from said shaft body, said means including a plurality of engagement holes formed in said shaft body at spaced intervals therealong and an engagement projection on said weight, said projection being adapted to be resiliently engaged with and disengaged from any one of said engagement holes in said shaft body, said weight including a peripheral groove, and said engagement projection being secured to a loop-shape leaf spring resiliently fitted in said peripheral groove.

4,634,122
HOLDER FOR FOOTBALL PLACE-KICKING PRACTICE
Roy A. Kline, 8311 Park State Dr., Fort Wayne, Ind. 46815
Filed Jul. 18, 1985, Ser. No. 756,762
Int. Cl.[4] A63B *67/00*
U.S. Cl. 273—55 B **27 Claims**



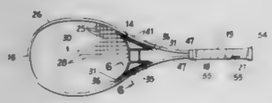
4. A football place-kicking practice holder, comprising:
(a) a base adapted to rest on a playing surface and generally define a location for placing a football in a teed up position;
(b) a support member mounted in an upright position on said base such that said member is spaced from a side of a football when the football is disposed in the teed up position;
(c) an elongated arm being pivotally mounted to said support member for movement downwardly toward, and upwardly away from, a football in the teed up position and about an axis extending in the general direction of the flight of the football when kicked from the teed up position;
(d) a flexible finger connected to said arm and disposable into contact with an upper end of a football for maintaining it in the teed up position when said arm is moved relative to said support member downwardly toward the football after the football has been placed in the teed up position; and
(e) means disposed on said arm for movement therealong between a football and said support member to adjust the tension imposed on the teed up football by said finger;
(f) said elongated arm having a thread section for adjusting said tension adjusting means which is located between said support member and a football when said arm has been moved downardly toward the football and said finger has been brought into contact with the football so as to maintain it in the teed up position.

4,634,123
SPRING ACTUATED CUE STICK
James H. Cowan, and George Spector, both of 233 Broadway RM 3615, New York, N.Y. 10007
Filed Nov. 2, 1984, Ser. No. 667,556
Int. Cl.[4] A63D *15/08*
U.S. Cl. 273—69 **1 Claim**



1. An inner spring drive cut stick which comprises:
(a) a hollow tapered housing, having a front and rear;
(b) a moveable elongated rod within said housing, having front and rear ends;
(c) means for propelling said rod forward within said housing;
(d) means for adjusting said rod rearward for propulsion;
(e) a trigger means for holding and releasing said rod responsive to manual actuation;
(f) a tapered cue tip secured to said front of said rod moveable from within said housing through said housing front to a position outward of said housing;
(g) a plurality of spaced apart stationary discs mounted within said housing for guiding said rod therethrough, one said stationary disc is secured near said front of said housing to positively and accurately guide said cue tip outwardly from said housing, wherein said means for propelling comprises:
(h) a disc secured to said rod and slideable within said housing; and
(i) a coil compression spring which is received around said rod within said housing, one end of said coil spring being in abuttment with said slideable disc while the other end of said coil spring is in abutment with one of said stationary discs, wherein said trigger means comprises:
(j) said rod having a plurality of teeth at said rear end;
(k) a trigger latch springly urged to engage with one of said teeth of said rod, said trigger latch having a concave trigger end which will allow said rod to be released when said trigger end is depressed, wherein said means for adjusting said rod for propulsion comprises:
(l) an internal sleeve slideably mounted in said housing and secured to said rod;
(m) said housing having a pair of opposing longitudinal slots;
(n) a pair of spacer plates, each said plate having an elongated slot which coincides with one of said slots in said housing when said plate is attached thereto, one of said plates having a plurality of spaced apart graduations which indicates varying degrees of pressure of said spring;
(o) an outer sleeve secured to said inner sleeve through said slots in said plates and said housing for manually actuating said inner sleeve and rod to said rearward position thereby compressing said spring and causing said trigger latch to engage one of said teeth to hold said rod in a rearward position, said plates spacing said outer sleeve from said housing thereby reducing sliding friction and providing improved means for grasping said outer sleeve said cue stick includes a housing front elevational adjustment device which comprises:
(p) a case attached adjacent said housing front;
(q) a rack slideably mounted within said case;
(r) a pinion gear within said case meshing with said rack;
(s) a foot attached to bottom of said rack and
(t) an adjustment knob attached to the center of said pinion gear so that when said knob is turned said rack with said foot will move up and down thus adjusting said front of said housing with respect to a playing surface of a pool table.

4,634,124
VIBRATION DAMPED SPORTS RACQUET
Drew J. Yuhas, Plainsboro, and Joseph Boggia, North Brunswick, both of N.J., assignors to AMF Incorporated, White Plains, N.Y.
Filed Jan. 4, 1985, Ser. No. 688,855
Int. Cl.[4] A63B *49/00*
U.S. Cl. 273—73 G **5 Claims**





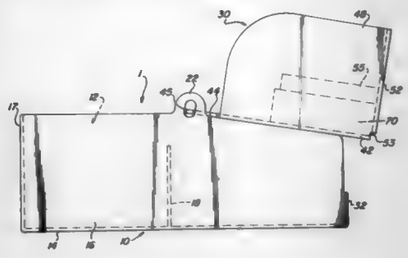
1. An improvement in a racquet having a substantially oval shaped frame perforated for the reception of strings with the frame tapering into a handle and a throatpiece having a curved top surface forming the remainder of the oval and also being perforated for the reception of strings, said throat piece having sides that taper together from the ends of the curved surface, the taper of the sides being substantially the same as the taper of the frame ends, and the throat piece sides being aligned with and situated completely within the inside of the frame ends, the improvement comprising means for dampening frame vibrations and string vibrations through the throat piece to the frame when the racquet is strung through the frame and the throat piece perforations, said means comprising a retainer of dampening material placed between the inside of each tapering end and throat piece side, said retainer having a first longitudinal recess for receiving a portion of said throat piece and a second, opposed longitudinal recess for receiving a portion of said frame.

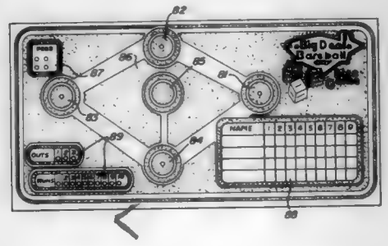
4,634,125
DEVICE AND METHOD FOR EXCHANGE OF TRADING CARDS AND DICE
Sigmund F. Seklecki, 2977 Edgemont St., Philadelphia, Pa. 19134
Filed Nov. 21, 1984, Ser. No. 673,982
Int. Cl.[4] A63F *1/00, 1/10*
U.S. Cl. 273—93 R **9 Claims**

1. An article for storing and dispensing trading cards comprising: a base member which includes a trading card storage compartment and support means; a card dispensing tray which includes a base wall and which is associated with said base member and is movable relative thereto to a closed position in

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which said compartment is covered by said base wall and to a play position, the base wall of said tray in said play position being supported on said support means; said support means and said base wall thereon being inclined downwardly with respect





to said base member; said tray in said play position having an upstanding wall adapted to support a card stack position on said inclined base wall; and slot means positioned between said base wall and said upstanding wall from which a card can be dispensed.

4,634,126

DEVICE FOR CONVERTING THE AMOUNT OF A MECHANICAL DISPLACEMENT INTO ELECTRICAL SIGNAL

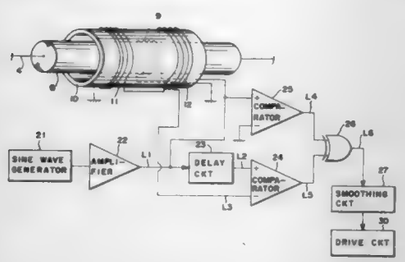
Yutaka Kimura, Osaka, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed Mar. 26, 1985, Ser. No. 716,192

Claims priority, application Japan, Mar. 26, 1984, 59-41832[U]

Int. Cl.⁴ H01F *21/06*

U.S. Cl. 273—129 S **6 Claims**



1. A transducer for converting the amount of mechanical displacement of a member (1) into an electrical signal, comprising:

first coil means (9) driven by an a.c. signal (L1);

second means (11, 12) disposed adjacent to said first coil means (9) for generating an induction current (L3) that varies as the change of a magnetic field produced by said first coil means (9), said second means comprising two coils (11, 12) opposite in winding direction to each other, said two coils (11, 12) being connected in series and spaced apart from each other by a predetermined distance;

a movable member (8) moved by said member (1) for changing the spatial relations between said first coil means (9) and said second coil means (11, 12) by making said first and second coil means move relative to each other;

means (23, 24, 25, 26) for converting the amplitude of said induction current (L3) into the duty ratio of a pulse (L6), said means comprising: a first comparator (25) for comparing said a.c. signal (L1) with a reference potential; a delay circuit (23) for delaying said a.c. signal (L1) by a predetermined angle in phase; a second comparator (24) for comparing an output signal (L2) from said delay circuit (23) with said induction current (L3); and an exclusive OR gate (26) for inputting the output signals from both comparators (25, 24); and

means (27) for smoothing and converting said pulse (L6) into a d.c. current.

4,634,127

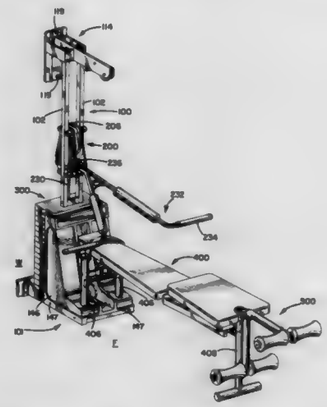
WALL MOUNTED EXERCISE UNIT

Gary L. Rockwell, LaGrange, Ga., assignor to Diversified Products Corporation, Opelika, Ala.

Filed Jun. 29, 1984, Ser. No. 626,394

Int. Cl.⁴ A63B *21/00*

U.S. Cl. 272—134 **30 Claims**



1. In an adjustable, floor-supported exercise bench having an elongated bench frame, a seat supported on said bench frame, and front and rear support means for supporting said frame above the floor, the improvement comprising:

said bench frame having front and rear longitudinally arranged subframes, said subframes each having front and rear ends, the rear end of said front subframe positioned adjacent the front end of said rear subframe with the rear end of said rear subframe supported by said rear support means, said rear subframe comprising a single, tubular, longitudinal undercarriage member;

pivot means for pivotably interconnecting the adjacent ends of said subframes;

said front support means comprising a front leg assembly selectively coupled with said undercarriage member for selectively supporting said front subframe between (1) a first position wherein said front leg assembly is removed from said undercarriage assembly so that said front subframe and said front end of rear subframe are adjacent the floor and wherein said rear subframe is supported by said undercarriage member so that said rear subframe is inclined upwardly at an obtuse angle with respect to said front subframe when said front and rear subframes are in said first position and (2) a second position wherein said front leg is coupled with said undercarriage member and wherein said front and rear subframes are substantially coplanar and elevated above the floor; and

lock means for selectively allowing relative pivotal movement about said pivot means between said subframes in said first position and selectively preventing relative pivotal movement about said pivot means between said subframes in said second position.

22. An exercise unit comprising a frame including upright guide means; a liftable weight assembly including a guided carriage and at least one selectively engageable weight attached thereto guided by said guide means; pulley means including a carriage pulley movable with said carriage and an upper pulley at a fixed location above said carriage for facilitating and directing movement of a cable; a user-engageable cable operatively coupled to said weight assembly and said pulley means for lifting the weight assembly; the improvement and effort level selection means for selectively varying the mechanical advantage of said cable and pulley means, said effort level selection means comprising cable coupling means for coupling one end of said cable directly to said carriage with said cable trained over said upper pulley for requiring a lifting force equal to the selected weight on said guided carriage, and wherein said effort selection means further comprises elevated anchoring means for anchoring said one end of said cable at an elevated location with said cable trained around said carriage pulley and said upper pulley for reducing the required lifting force.

24. In an arm curl exercise attachment for the front end of an exercise bench, having a support member removably attachable to a front leg support assembly of the bench and a forwardly facing and inclined arm curl cushion fixed to the support member for supporting the upper arms and elbows of a forwardly facing user seated on the bench, the improvement comprising cable guide means including a forwardly projecting guide arm fixed to said support member, said guide arm projecting forwardly beyond the forward vertical plane of said inclined arm curl cushion fixed to said support member, a roller rotatably supported by said guide arm and a cable guide adjacent the front end of said guide arm for guiding a user-engageable tensioned cable.

27. In an exercise unit having a frame including upright guide means, a liftable weight assembly guided by said guide means, and a handlebar assembly removably connected to said liftable weight assembly, said handlebar assembly having spaced, longitudinally aligned hand grip portions the improvement comprising:

a cross-piece removably fastened to and extending between said spaced, longitudinally aligned hand grip portions on said handlebar assembly, said cross-piece rotatable about said hand grip portions.

4,634,128

TRIATHLON TIME CHALLENGE GAME

Stephen M. Fulton, 8775 W. Ridgeville Rd., Morenci, Mich. 49256

Filed Mar. 4, 1985, Ser. No. 708,165

Int. Cl.⁴ A63F *3/00*

U.S. Cl. 273—246 **20 Claims**

1. A board game based upon the triathlon athletic event consisting of the three events swimming, cycling, and running, said game comprising:

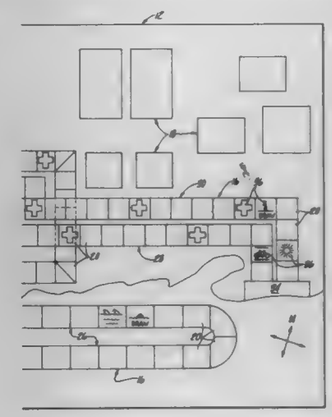
a game board;

an elongated game course affixed to said game board wherein said game course is divided into a plurality of contiguous segments and wherein said game course is further divided into three portions, said three portions comprising a first portion representing a first one of the events, a second portion representing a second one of the events and a third portion representing a third one of the events;

indicating means for indicating a player's position along said game course;

random selection means for advancing said indicating means along said plurality of segments of said game course; and

means for recording said advancement through said game course and determining a player's score therefrom;



wherein said course additionally comprises a first transition segment between and connecting said first and second portions of said game course, and a second transition segment between and connecting said second and third portions of said game course.

4,634,129

COLOR CORRELATED GAME BOARD AND PLAYING PIECES

Jorge Martinez, New York, N.Y., assignor to Hugo Roman, New York, N.Y.

Filed Aug. 27, 1984, Ser. No. 644,851

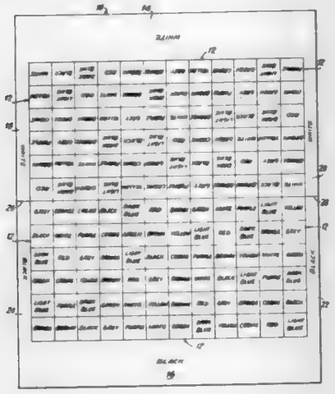
Int. Cl.⁴ A63F *3/00*

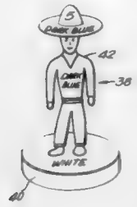
U.S. Cl. 273—255 **14 Claims**

1. In a board game which includes a game board comprising a generally rectangular playing field which is divided into a plurality of generally parallel rows of equal nuabers of generally rectangular playing spaces, the improvements comprising, each of said playing space rows comprising a plurality of differently colored playing spaces, a plurality or differently colored playing pieces which are positionable on said playing spaces and moveable therebetween attendant game play, each of said playing pieces bearing the color of at least one of said

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playing spaces, and some, only, of said playing pieces bearing the different colors of at least two of said playing spaces, and





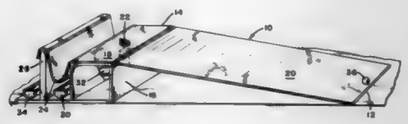
wherein no two playing spaces of any one of said playing space rows are of the same color.

4,634,130

GOLF PRACTICE PUTTING DEVICE

Luther G. Simjian, Fort Lauderdale, Fla., assignor to Command Automation, Inc., Fort Lauderdale, Fla.

Filed Sep. 11, 1985, Ser. No. 774,963
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—176 FA **8 Claims**



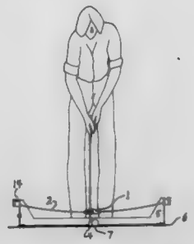
1. A golf practice putting device comprising:
an elongated mat upon which a golf ball or golf ball simulating device can be propelled from one end to an opposite elevated end;
means for causing said mat to have a first inclined portion sloping upward from said one end toward said opposite elevated end, and a second elevated substantially level portion;
a cup simulating aperture disposed in said mat at said second portion for receiving a ball propelled from said first end, and
a pair of ball receiving and retaining receptacles disposed to the rear of said aperture as viewed from said one end, one of said receptacles communicating with said aperture for receiving and retaining balls received in said aperture, and the other one of said receptacles for receiving and retaining balls rolling over said second portion but failing to be received in said aperture.

4,634,131

GOLF PUTTING TRAINER

Claude J. Vella, 24 Westward Street, Kareela, New South Wales 2232, and Raymond T. Mansell, 3 Narooma Place, Gymea, New South Wales 2227, both of Australia

PCT No. PCT/AU84/00065, § 371 Date Dec. 18, 1984, § 102(e) Date Dec. 18, 1984, PCT Pub. No. WO84/04047, PCT Pub. Date Oct. 25, 1984
PCT Filed Apr. 18, 1984, Ser. No. 689,550
Claims priority, application Australia, Apr. 18, 1983, PF8923
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—192 **12 Claims**



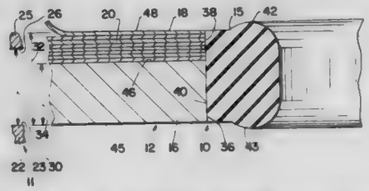
8. A golf putting trainer device comprising a support structure affixed to a base plate, said support structure having oppositely disposed upright members, each of said upright members being provided with aligned apertures, a rod element positioned in each of said apertures in said upright members, adjustable means positioned proximate to each of said upright members arranged to apply a transverse torque to said rod element, golf club shaft engaging means arranged to slide along said rod element and said golf club shaft engaging means further includes means to lock said golf club shaft against slippage in a longitudinal direction.

4,634,132

ELASTOMERIC SEAL ASSEMBLY WITH VARIABLE THICKNESS SHIM

Jerry G. Jelinek, La Habra, Calif., assignor to Parker Hannifin Corporation, Cleveland, Ohio

Filed May 20, 1985, Ser. No. 736,050
Int. Cl.[4] F16J *15/00*
U.S. Cl. 277—11 **11 Claims**



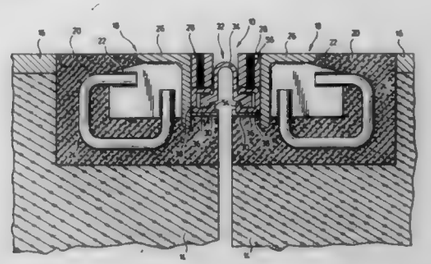
1. An elastomeric seal assembly for sealing a joint between adjacent surfaces, said assembly comprising a retainer and elastomeric seal combination,
said retainer comprising a substrate section surmounted by a plurality of outer shim layers, said substrate section being of rigid material, said shim layers being flexible and substantially in the same shape as said substrate section, said shim layers and said substrate section defining a predetermined thickness of said retainer, one or more of said shim layers being completely removable for adjustment of the thickness of said retainer,
said elastomeric seal being in engagement with said substrate section and said shim layers and having at least one sealing surface thereon projecting outwardly of the outermost said shim layer of said retainer, and
means for joining said seal and said retainer in a unitary structure for placement in a joint to be sealed whereby the final thickness of said retainer may be adjusted by removal of one or more of said shim layers without affecting the integrity of said seal assembly.

4,634,133

ROADWAY EXPANSION JOINT WITH IMPROVED SEAL SECURING ASSEMBLY

Robert J. Wercholoz, Burlington, Canada, assignor to Wercholoz-Hosel Systems Inc., Burlington, Canada

Continuation of Ser. No. 506,328, Jun. 21, 1983, abandoned. This application Apr. 12, 1985, Ser. No. 722,824
Int. Cl.[4] F16J *15/12*; E01C *11/10*
U.S. Cl. 277—12 **3 Claims**



1. An expansion joint for providing a flexible seal between two spaced-apart confronting sections of similar structures such as roadway slabs or the like, said joint comprising:
at least one seal support assembly secured to each section to define a gap between opposed seal support assemblies, each said assembly including spaced apart upper and lower elongate members defining opposed channels and clamping means seated within the channels;
sealing means for spanning the gap between opposed assemblies, said sealing means including an intermediate portion and laterally extending flanks one on each side of said intermediate portion;
said clamping means including an upper jaw and a lower jaw, said upper jaw being movable into locking engagement with an adjacent flank to compressibly retain said flank in said channel; and
means positioned substantially directly above each flank and in contact with the upper jaw of the respective clamping means for urging said upper jaw into engagement with said flank.

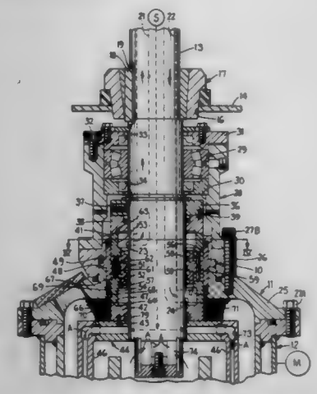
4,634,134

MECHANICAL SEAL

Raymond A. Entrikin, East Liverpool, Ohio, assignor to Epworth Manufacturing Co., Inc., South Haven, Mich.

Filed May 8, 1985, Ser. No. 732,201
Int. Cl.[4] B02C *17/00*; F16J *15/16, 15/54*
U.S. Cl. 277—12 **14 Claims**

1. A mechanical seal apparatus for use between a wall and a shaft extending through an opening in said wall with relative rotation occurring therebetween, said shaft extending from a first region at a first pressure into said opening in said wall to a second region at a second pressure, comprising:
a seal element positioned within said opening and having mutually contacting sealing faces, a first annular seal member being fixed with respect to said wall and a second annular seal member being fixed with respect to said shaft, said second annular seal member being oriented at an axial end portion of said wall and having an outer diameter less than the diameter of said opening in said wall to define a gap therebetween; and



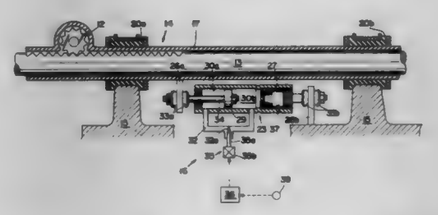
bushing means snugly received in said gap for preventing entry and collection of material into said gap, said bushing means comprising an annular, axially extending leg portion having an axially facing end surface facing away from said opening and extending radially outwardly of said shaft for repelling said material from entry into said gap.

4,634,135

STEERING SYSTEM CONTROLLING TRANSVERSE DISPLACEMENT OF A GEAR HOUSING

Moritsune Nakata, Yokohama; Tokiyoshi Yanai, Yokosuka; Hirotsugu Yamaguchi, Chigasaki; Megumu Higuchi, Tokyo; Yutaka Aoyama, Yokosuka, and Yasuji Shibahata, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Oct. 29, 1984, Ser. No. 665,744
Claims priority, application Japan, Jan. 31, 1984, 59-15709
Int. Cl.[4] B62D *15/00*
U.S. Cl. 280—90 **6 Claims**



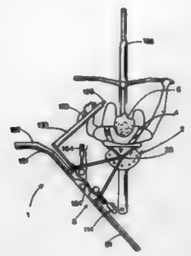
1. In a vehicle having a vehicle body and a change-direction road wheel,
a steering system including:
a steering gear and a gear housing having received therein said steering gear;
gear housing mount insulator means for elastically supporting said gear housing on the vehicle body in such a manner as to allow transverse displacement of said gear housing; and
restraining means independent of the support of said gear housing by said gear housing mount insulator means for restraining said tranverse displacement of said gear housing allowed by said gear housing mount insulator means.

4,634,136

WIND POWERED PROPULSION DEVICE

Line W. Alexander, P.O. Box, 34244 Station "D" , Vancouver, British Columbia, Canada (V6J 4N8)

Filed Oct. 30, 1984, Ser. No. 666,296
Int. Cl.⁴ B62B *15/00*
U.S. Cl. 280—213 **17 Claims**



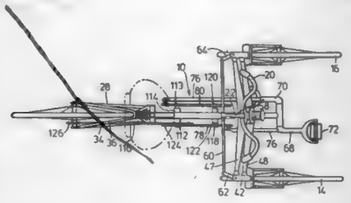
1. A wind powered propulsion device comprising:
(a) a sail mount;
(b) harness means for retaining the sail mount on the back of a person;
(c) a sail mounted on the sail mount, so the sail is substantially upright when the person's back is erect;
(d) a mast means for the sail;
(e) means for deploying and for retracting the sail that includes a spring biased roller near the mast means said means for deploying and retracting the sail further including support rod means connected to an end of the sail opposite the roller;
(f) means for moving the support rod means away from the mast means;
(g) the sail including a sail fabric connected to the roller.

4,634,137

TRICYCLE AND DRIVE THEREFOR

George T. Cockaedge, 7530 Mountain Rd., Niagara Falls, Ontario L2E 6S4, Canada

Filed Aug. 13, 1985, Ser. No. 765,296
Claims priority, application Canada, Aug. 17, 1984, 461301
Int. Cl.⁴ B62M *1/04;* **B60K** *5/08*
U.S. Cl. 280—256 **16 Claims**



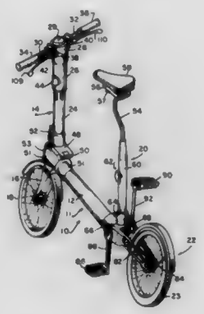
5. A tricycle comprising
a frame including means for mounting front and rear wheels and a steering mechanism;
a seat mounted on said frame;
a single driven rear wheel mounted to said frame;
a pair of steerable, spaced-apart front wheels mounted to said frame;
means for turning said front wheels substantially in unison;
a pair of matched, laterally spaced rear sprockets rotatably mounted on said frame;
a pair of matched, laterally spaced front sprockets rotatably mounted on said frame and disposed forwardly of said rear sprockets, each of said front sprockets being aligned in a common plane with a corresponding rear sprocket;
an endless chain extending about each pair of corresponding sprockets;
pedal means pivotally mounted on said frame at a forward point thereof, said pedal means comprising two elongate arm members each with a foot pedal mounted on its bottom end and each pivotally connected to the frame at top end of the arm member;
a pair of connecting links each of which is connected to one of said elongate arm members at one end and to one of the endless chains at the other end of the link;
a connecting device securing said one end of each link to its respective arm member, said connecting device permitting pivotal movement of the link in a vertical plane defined by the movement of the respective arm member and in a plane substantially perpendicular to said vertical plane; and
transmission means connected to the rear wheel to drive the latter in response to rotation of said rear sprockets.
9. A tricycle comprising
a frame including means for mounting front and rear wheels and a steering mechanism, said steering mechanism including a central steering column and handlebar means pivotally mounted in said column;
a seat mounted on said frame;
a single rear wheel connected to said frame;
means for driving said rear wheel;
a pair of spaced-apart front wheels each connected to said frame by its own steering column and steerable by said steering mechanism;
said mounting means including two, transversely extending, tiltable elongate members comprising leaf springs, each of which has the steering column of one of said front wheels pivotally connected to one end thereof and the steering column of the other of the front wheels pivotally connected to the other end thereof;
means for tiltably connecting the centre of each transversely extending elongate member to said central steering column; and
means for biasing said tiltable elongate members to a tilting or non-tilting position, said biasing means engaging at least one of said two tiltable elongate members.

4,634,138

FOLDING BICYCLE

George E. Fryer, 15 Maplewood Ave., Newton, Mass. 02159; William Pilson, 31 High Plain St., Sharon, Mass. 02067; William J. Stephens, 27 Stanhope St., Boston, Mass. 02116, and Charles H. Chandler, 80 Boundary St., Malden, Mass. 02148

Filed Nov. 7, 1983, Ser. No. 549,433
Int. Cl.⁴ B62K *15/00*
U.S. Cl. 280—278 **13 Claims**



1. A folding bicycle having a frame, front and rear wheels mounted thereto, a pedal sprocket and pedal assembly

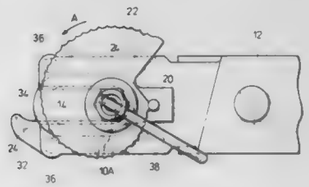
mounted to said frame proximate said rear wheel, a steering column and handle bars mounted to said frame proximate said front wheel and a seat and seat column mounted to said frame proximate said rear wheel, the improvement comprising means for folding said steering column and said seat column into proximity with a portion of said frame and substantially in the plane of said frame, and means for positioning sid rear wheel such that said front and rear wheels are disposed entirely below said frame and substantially in the plane of said frame when the bicycle is folded, such that said front and rear wheels remain free to roll.

4,634,139

REAR FORK OF MOTORCYCLE

Kazuo Watanabe, Niiza; Hajime Shougase, and Akio Umeoka, both of Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1985, Ser. No. 770,473
Claims priority, application Japan, Sep. 4, 1984, 59-183835; Sep. 4, 1984, 59-183836
Int. Cl.⁴ B62K *19/30*
U.S. Cl. 280—288 **3 Claims**



1. A rear fork of a motorcycle comprising:
a pair of right and left rear fork arms made of light alloy and having rear end portions formed in a bifurcate shape respectively;
a pair of U-shaped rear axle guide plates detachably bolted along internal surfaces of said rear end portions respectively, each rear axle guide plate being made of steel and provided with an upper branch portion and a lower branch portion longer than said upper branch portion, a free end portion of said lower branch portion including a projection projecting upward therefrom,
a pair of retaining pins made of steel and threadedly fixed at front locations of said rear end portions of said rear fork arms respectively, each retaining pin having a head portion butted against said internal surface of said rear fork arm and a tip portion projecting from an external surface opposite to said internal surface, wherein said retaining pins are pressed against said rear fork arms by engagement of said head portions with said rear axle guide plates; and
a pair of drive chain tension adjusting plates pivotably supported by a rear axle and caused to engage with peripheral surfaces of said tip portions of said retaining pins by cam faces formed on outer peripheries of said adjusting plates.

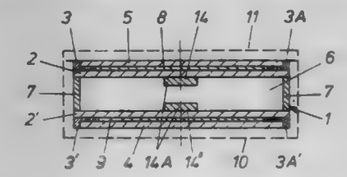
4,634,140

PROCESS OF MANUFACTURING A SKI AND A SKI WHICH IS MANUFACTURED BY THAT PROCESS

Johann Stroi, Ried im Innkreis, Austria, assignor to Fischer Gesellschaft m.b.H., Ried im Innkreis, Austria

Filed Oct. 26, 1984, Ser. No. 665,379
Claims priority, application Austria, Oct. 27, 1983, 3820/83; Sep. 2, 1984, 416/84
Int. Cl.⁴ B29C *45/00, 47/00;* **B29D** *9/00;* **A63C** *5/00*
U.S. Cl. 280—610 **10 Claims**

1. A process of making a ski comprising the steps of:
a. placing the components of the ski comprising edge members, top and bottom members, intermediate layers and a core member which defines a longitudinal passage into a mold which is adapted to be evacuated and which includes a suction line at one longitudinal end to provide communication between the interior of the mold and a source of vacuum, and which includes a binder line at an opposite longitudinal end to provide communication between the interior of the mold and a source of liquid binder material,
b. closing and airtightly sealing the mold,
c. evacuating the air from the mold by applying a vacuum to the vacuum line, and
d. supplying liquid binder material to
said mold through the binder line, whereby the air is evacuated from the mold at one end of the longitudinal extent of the mold and whereby the liquid binder supplied to the mold at the other end of its longitudinal extent flows through the longitudinal passage of the core and fills the joints between the components of the ski to join said components so that they are firmly held together in a final ski structure.
4. A ski made by a process comprising the steps of:
a. placing the components of the ski comprising edge members, top and bottom members, intermediate layers and a core member which defines a longitudinal passage into a mold which is adapted to be evacuated and which includes a suction line at one longitudinal end to provide communication between the interior of the mold and a source of vacuum, and which includes a binder line at an opposite longitudinal end to provide communication between the interior of the mold and a source of liquid binder material,
b. closing and airtightly sealing the mold,
c. evacuating the air from the mold by applying a vacuum to the vacuum line, and
d. supplying liquid binder material to
said mold through the binder line, whereby the air is evacuated from the mold at one end of the longitudinal extent of the mold and whereby the liquid binder supplied to the mold at the other end of its longitudinal extent flows through the longitudinal passage of the core and fills the joints between the components of the ski to join said components so that they are firmly held together in a final ski structure.



4,634,141

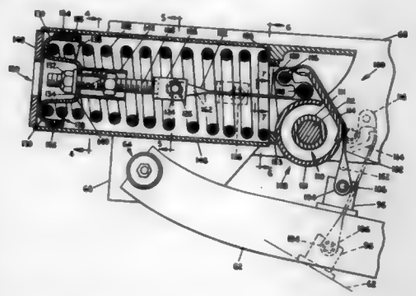
AXLE LIFT MECHANISM

Lyle M. Hagan, North Muskegon, and William C. Pierce, Muskegon, both of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Jul. 3, 1984, Ser. No. 627,414
Int. Cl.⁴ B60G *11/56*
U.S. Cl. 280—704 **20 Claims**

1. In an axle lift mechanism for use in a vehicle having a support frame, and suspension means including an axle coupled to the frame for selective movement between load bearing and non-load bearing relationships with the vehicle, wherein the lift mechanism comprises:
cam linkage means pivotably coupled to the frame and to the suspension means for rotation between first and second positions corresponding to the load bearing and non-load bearing positions, respectively; and
spring biasing means coupled to said frame and to said cam linkage means to bias said cam linkage means to the second position, said spring biasing means comprising a com-

pression spring having one end maintained stationary relative to the frame for exerting the biasing forces and a translation means bearing against another end of the compression spring and operatively coupled to the cam linkage means for compressing the compression spring during movement of the axle from the non-load bearing position toward the load bearing position;



the improvement wherein the cam linkage means comprises a flexible strap operatively connecting the spring biasing means and the suspension means, and a cam so shaped that the force exerted along the strap between the cam and compression spring remains coaxial during rotation of the cam so that forces exerted by the biasing means are translated coaxially with the biasing means through the flexible strap to lifting forces exerted on the suspension means.

4,634,142

COMPUTER OPTIMIZED ADAPTIVE SUSPENSION SYSTEM

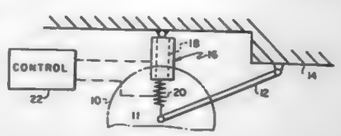
Lonnie K. Woods, Alpine, and James M. Hamilton, El Cajon, both of Calif., assignors to C & K Venture Income I-Coast, Los Angeles, Calif.

Continuation-in-part of Ser. No. 523,279, Aug. 15, 1983, Pat. No. 4,468,050, and a continuation-in-part of Ser. No. 352,239, Feb. 25, 1982, Pat. No. 4,468,739, which is a continuation-in-part of Ser. No. 322,200, Nov. 17, 1981, abandoned. This application Aug. 27, 1984, Ser. No. 644,806

The portion of the term of this patent subsequent to Aug. 28, 2001, has been disclaimed.

Int. Cl.⁴ B06G *9/00*

U.S. Cl. 280—707 **46 Claims**



1. A control system for one or more damping devices comprising extensible shock absorber means for damping between two masses in compression and rebound directions, sensor means for generating signals representative of the degree of the extension of the shock absorber means, and regulator means responsive to independent compression control signal and rebound control signal for adjusting, respectively, the compression direction force and the rebound direction force presented by the shock absorber means to the extension, the control system comprising:

means for receiving signals, representative of the degree of the extension, generated by the sensor means, processing means for processing the received signals to determine one or more independent parameters each representative of a distinct state of motion of the two masses, for using each of the parameters to determine, for each of the shock absorber means, a desired independent response for each of the distinct states of motion, and for processing the desired independent responses for each of the individual shock absorber means to form compression control signal and rebound control signal for each of the regulator means.

4,634,143

REAR WHEEL SUSPENSION CONTROLLER

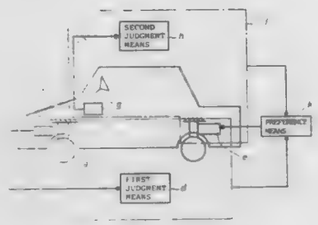
Ken Asami, Nagoya; Kaoru Ohashi, Okazaki; Toshio Onuma, Susono, and Shuuichi Buma, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 26, 1985, Ser. No. 813,506

Claims priority, application Japan, Dec. 25, 1984, 59-276514

Int. Cl.⁴ B60G *11/26*

U.S. Cl. 280—707 **7 Claims**



1. A rear wheel suspension controller for a vehicle having a suspension between a body and a wheel of the vehicle comprising:

a front wheel vehicle height detection means for detecting an interval between a front wheel and a vehicle body and for generating a vehicle height signal indicative of the interval;

a first judgment means for comparing said vehicle height signal with a predetermined reference signal and for generating a first judgment signal when the vehicle height signal is greater than the reference signal;

a rear wheel suspension characteristic alteration means for altering suspension characteristic of a rear wheel in accordance with said first judgment signal;

a driving state detection means for detecting a driving state of the vehicle and for generating one or plural state signals indicative of the driving state;

a second judgment means for comparing said state signals with respectively corresponding predetermined condition and for generating second judgment signal when said state signals satisfy the predetermined conditions;

a suspension characteristic alteration means for controlling the suspension characteristic in accordance with said second judgment signal; and

a preference means for preferring the control of a vehicle posture control portion which is consisted of the front wheel vehicle height detection means, the first judgment means and the rear wheel suspension characteristic alteration means to that of a rear wheel suspension control portion which is consisted of the driving state detection means, the second judgment means and the suspension characteristic alteration means.

4,634,144

SAND SHOE

Stephen J. Ringe, Farmington, Mich., assignor to Fruehauf Corporation, Detroit, Mich.

Filed Nov. 1, 1985, Ser. No. 794,196

Int. Cl.⁴ B60S *9/00*

U.S. Cl. 280—763.1 **4 Claims**

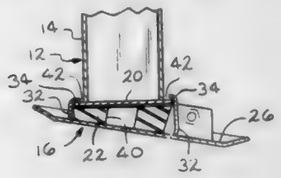
1. A landing gear for vertically supporting one end of a trailer comprising:

a leg mounted at one end of said trailer;

a plate fastened at the other end of said leg having peripheral edges extending laterally away from said leg;

a restriction collar girding said leg and said plate defining an opening smaller than said plate whereby said plate retains said restriction collar upon said leg;

a ground engagement member comprising a skid tray fixed to said collar and opposing said leg plate;



a resilient body having a skid tray engaging face oriented at an acute angle relative to a plate engaging face, said resilient body circumscribed by said restriction collar and being under compression between said leg plate and said skid tray, whereby said skid tray is resiliently held at an acute angle with respect to said leg plate.

4,634,145

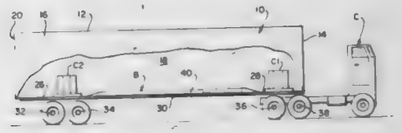
TRUCK TRAILER LOADING BRIDGE ASSEMBLY

Gilbert Humpe, 155 E. Main St., Hopedale, Ohio 43976

Filed Nov. 1, 1985, Ser. No. 793,843

Int. Cl.⁴ B60P *1/00;* **B60R** *9/04*

U.S. Cl. 280—769 **10 Claims**



1. A truck trailer bridge assembly for use with a truck trailer having a first area directly supported by at least one axle and a second area directly supported by at least one axle, the bridge assembly comprising:

(a) a base portion having a first end and a second end, and a first side and a second side, the distance between said first end and said second end being substantially equal to the distance between the first area of the truck trailer directly supported by at least one axle and the second area of the truck trailer directly supported by at least one axle;

(b) a plurality of support beams generally extending from proximate said base portion first end to proximate said base portion second end and including a first and second central support beam;

(c) a central supported plate having a length smaller than said base portion;

(d) a first end angled support plate extending from proximate said base portion first end to a line at which said first end angled supported plate joins said central supported plate, said first end angled supported plate defining a plurality of lift openings;

(e) a second end angled supported plate extending from proximate said base portion second end to a line at which said second end angled supported plate joins the central supported plate;,

(f) lift engagement support plate positioned between said central support plate and said base portion and extending intermediate said first and said second central support beam and secured thereto; and

(g) said lift opening having a portion extending below said lift engagement support plate.

4,634,146

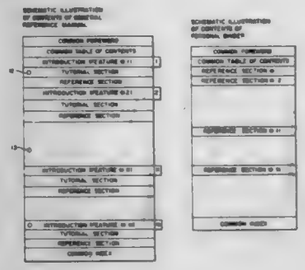
INSTRUCTION MANUAL AND METHOD OF USING INSTRUCTION MANUAL

Meir Yaniv, Yonkers, N.Y., assignor to Crystal Technologies Corporation, Elmsford, N.Y.

Filed Nov. 28, 1984, Ser. No. 675,826

Int. Cl.⁴ B42D *1/00, 15/00*

U.S. Cl. 281—15 R **2 Claims**



1. An instruction manual comprising:

a plurality of chapters, each chapter having a plurality of sections, all the pages of said chapters being arranged in a first loose-leaf binder means of given size;

at least one of said sections of each of said chapters comprises a personal reference section made up of pages smaller than the pages of the other sections of each of said chapters to provide for easier identification of said personal reference section in said first binder means;

the pages of said smaller size personal reference section being selectively removably received in said first loose-leaf binder means so that they can be selectively removed from and re-inserted in said first loose-leaf binder means;

a personal reference binder including a second loose-leaf binder means of a size smaller than said first loose-leaf binder means to accept selectively removed personal reference section pages therein;

said first loose-leaf binder means having rings in a first configuration and said second loose-leaf binder means having rings in a second configuration to avoid confusion therebetween, the pages of said personal reference section of each of said chapters having one edge having ring-receiving openings of said first configuration, and another edge having ring-receiving openings of said second configuration, whereby personal reference section pages which are removed from said first binder means are insertable into said second binder means in a different orientation than in said first binder means;

said personal reference section containing practical operational information concerning a feature of equipment to which said instruction manual is directed; and

a common Table of Contents and a common Index for the pages in said first and second binder means referring to the pages in both said first and second binder means;

whereby personal reference section pages are selectively removed from said first binder means by a user, as desired by said user, and inserted into said personal reference binder means, to build up a reference manual personal to the user.

4,634,147

REDEEMABLE COUPON

Murray C. McClure, Markham, Canada, assignor to Common Market Investment Ltd., Bermuda, Bermuda

Filed Mar. 12, 1984, Ser. No. 588,205

Claims priority, application Canada, Mar. 6, 1984, 448990

Int. Cl.⁴ G09F *19/00;* **G06G** *1/02*

U.S. Cl. 283—56 **3 Claims**

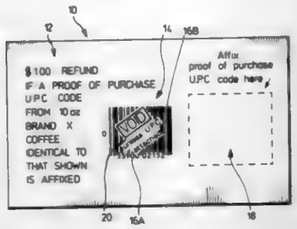
1. A refund coupon redeemable at a cash value at retail

stores when a proof-of-purchase portion of a given product packaging is affixed thereto, said coupon comprising in combination:

(a) comparison indicia thereon corresponding substantially identically to product identification indicia provided on the proof-of-purchase portion of the product packaging,

(b) location indicia thereon indicating a location on the coupon for affixation of the proof-of-purchase portion of the product packaging,

said comparison indicia and said location being positioned on said coupon closely adjacent to each other to facilitate a visual comparison of the comparison indicia and the product identification indicia on the proof-of-purchase portion when the proof-of-purchase portion is affixed to the coupon on the location, and



(c) means to affix said portion to said coupon on said location,

said means to affix comprising:

a strip having two portions, a first portion and a second portion;

said first portion being fixedly secured to said coupon;

said second portion coupled to said first portion and being removably secured to the coupon by a pressure sensitive adhesive on an underside of said second portion;

whereby said second portion may be removed from adhesion with said coupon and upon insertion of said proof-of-purchase portion of a product packaging thereunder, said pressure-sensitive adhesive being adapted to form a substantially unremovable adhesion with said proof-of-purchase portion.

4,634,148

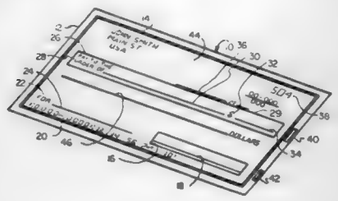
NEGOTIABLE INSTRUMENT

Edwin B. Greene, 60K Crescent Rd., Greenbelt, Md. 20770

Continuation-in-part of Ser. No. 277,015, Jun. 24, 1981, abandoned. This application Nov. 17, 1983, Ser. No. 552,859

Int. Cl.⁴ B42D *15/00*

U.S. Cl. 283—70 **19 Claims**



1. A method for processing a negotiable instrument having at least one generally rectangular field area on one side thereof to receive visible indicia by a payor of the negotiable instrument on top of a generally rectangular background field of fluorescent ink said method comprising steps of:

applying an ultraviolet source of light to said negotiable instrument;

scanning said negotiable instrument to locate said generally rectangular background field of fluorescent ink;

reading only the visible indicia highlighted by the fluorescence of said fluorescent ink;

developing digital information signals representative of only the visible indicia highlighted by the fluorescence of said fluorescent ink within said at least one generally rectangular field area; and

storing the digital information signals representative of the visible indicia within said at least one generally rectangular area.

4,634,149

LABEL

John A. Donovan, Hatfield Peverel, England, assignor to Don Marketing Management Limited, United Kingdom

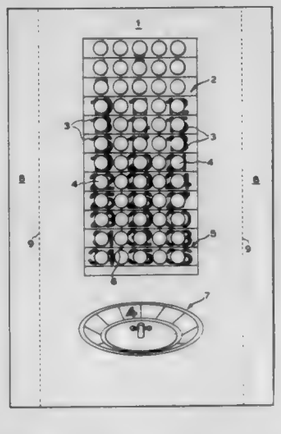
PCT No. PCT/GB84/00256, § 371 Date Mar. 18, 1985, § 102(e) Date Mar. 18, 1985, PCT Pub. No. WO85/00685, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 19, 1984, Ser. No. 713,909

Claims priority, application United Kingdom, Jul. 20, 1983, 8319632; Aug. 18, 1983, 8321912

Int. Cl.⁴ B42D *15/00*

U.S. Cl. 283—102 **5 Claims**



1. In a label for a container, the improvement comprising means for releasably securing the label to the container, said label bearing on one side thereof a plurality of printed separate first game indicia each normally camouflaged by a removable material which can be removed selectively in order to expose the indicia in a desired sequence, said releasable securing means being arranged with respect to said one side such that when the label is releasably secured to said container said one side and first indicia thereon face the container and are thereby hidden from view prior to separation of said label from the container further including on said one side at least one printed second indicia which is a different view of at least one of the first indicia, whereby a player of said game may selectively remove the camouflaging material to match the first indicia with the second indicia.

4,634,150

CONDUIT ARRANGEMENT FOR INTERCONNECTING STATIONARY CONDUIT EXTENSIONS

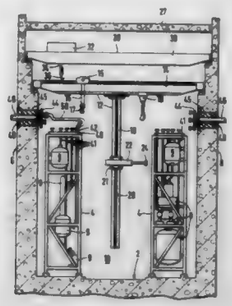
Jürgen Forster, Minden, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Oct. 22, 1984, Ser. No. 663,445

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 3340465

Int. Cl.⁴ F16L *35/00*

U.S. Cl. 285—24 **9 Claims**



1. A conduit arrangement for interconnecting two stationary end flanges of two pipe conduits leading to a process component arranged in a large-area cell for reprocessing irradiated nuclear fuel, the large-area cell being equipped with a rack for accommodating the process component therein, the two end flanges being separated from each other by a predetermined distance and the conduit arrangement comprising:

a conduit section for interconnecting said stationary end flanges;

said stationary end flanges having respective flange engaging surfaces facing in a first direction and being in respective planes parallel to each other;

said conduit section having two connecting end flanges at respective ends thereof connectable to corresponding ones of said stationary end flanges, by connecting means said connecting end flanges having respective flange engaging surfaces facing in a second direction directly opposite to said first direction, said flange engaging surfaces of said connecting end flanges being in corresponding ones of said planes when said conduit section is connected by said connecting means to said stationary end flanges;

a first conduit connecting plate mounted on a wall of the large-area cell, a first conduit extension arranged on said first plate and a first one of said stationary end flanges being mounted on said first conduit extension; and,

a second conduit connecting plate mounted on the rack, a second conduit extension arranged on said second plate and the second one of said stationary end flanges being mounted on said second conduit extension, the two pipe conduits terminating in corresponding ones of said conduit extensions.

4,634,151

GLAD HAND EXTENSION

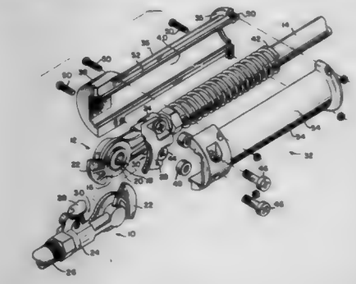
Joseph C. Holt, 1003 Gray St., Veedersburg, Ind. 14233

Filed Nov. 12, 1985, Ser. No. 796,873

Int. Cl.⁴ F16L *35/00*

U.S. Cl. 285—38 **13 Claims**

1. A rotatably interlocking coupling for use on an end of a hose of an air brake system, the coupling having a laterally facing surface including a central opening for communication with a similar coupling, a forwardly projecting tongue on a distal end thereof, a shoulder situated on a proximal and thereof including a rearwardly facing opening for communication with the hose, and a flange at least partially overlying the laterally facing surface defining a tongue-receiving slot for engaging the tongue of the similar coupling, the improvement comprising a longitudinal member enveloping the shoulder for



enclosing the adjacent portion of the hose, the longitudinal member having an outer surface sized to be easily grasped by a human hand for facilitating the engagement and disengagement of the laterally facing surface and tongue.

4,634,152

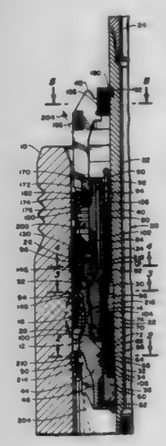
CASING HANGER RUNNING TOOL

John Pettit, Camarillo, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Apr. 26, 1985, Ser. No. 727,491

Int. Cl.⁴ F16L *55/00*

U.S. Cl. 285—39 **17 Claims**



1. An apparatus for supporting a tubular string extending into a well bore from a surrounding wellhead, comprising;

hanger body means adapted to be located in the wellhead and having at least external threads and at least one sealing surface thereon;

wear bushing means adapted to be located in the wellhead;

packoff means adapted to be located in the wellhead;

running tool means connectible to a running string;

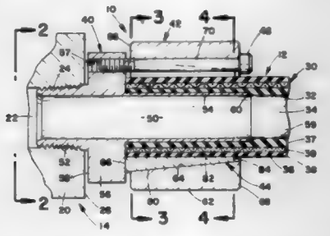
means releasably connecting said hanger body means, wear bushing means, and packoff means to said running tool means to enable said hanger body means, wear bushing means, and packoff means to be lowered into said wellhead; and

means for moving said packoff means downwardly of said hanger body means toward said sealing surface and effecting sealing engagement of said packoff means with said

VOL 1074 ISS 1 JA 6 1987 UMI

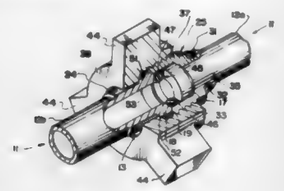
sealing surface and said surrounding wellhead without downward movement of either said hanger body means or said wear bushing means.

4,634,153
REUSABLE HOSE FITTING
Donald L. Kishton, Mentor, Ohio, assignor to Hydrafit, Inc., Cleveland, Ohio
Filed Sep. 3, 1985, Ser. No. 772,260
Int. Cl.⁴ F16L *33/22*
U.S. Cl. 285—255 **5 Claims**



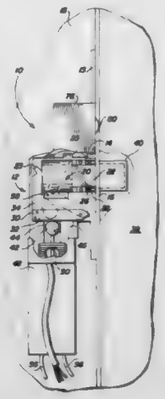
1. A hydraulic fitting for fluidly connecting a fluid accessory with a compressible hose member comprising: a nipple member fluidly connectable with the fluid accessory, said nipple member having an elongated sleeve portion, an enlarged neck portion and a flow passage extending therethrough, said hose member being receivable over said sleeve portion; segment means comprising a plurality of circumferentially spaced wedge members having an inner surface engagable with the outer surface of the hose member and a conical outer surface and diverging toward said neck portion; a socket member having a conical inner surface diverging away from said neck portion, said conical inner surface being engagable with said conical outer surface of said segment means and complementary thereto; fastener means operatively connected between said socket member and said neck portion for axially moving said socket member toward said neck portion and for radially inwardly moving said segment means toward said sleeve portion to thereby fixedly compress the hose member therebetween in assembly; means including said fastener means operative between said socket member, said neck portion and said segment means for circumferentially spacing said wedge members and for limiting radially inward movement of said wedge members relative to said socket member.

4,634,154
LIGHTWEIGHT INTEGRAL PUP JOINT WITH SPLIT FEMALE SUB
Vas D. Arora, Irvine; William A. Gill, El Toro, both of Calif., and Charles L. Patrick, Stephenville, Tex., assignors to FMC Corporation, Chicago, Ill.
Filed Feb. 6, 1985, Ser. No. 698,663
Int. Cl.⁴ F16L *19/02*
U.S. Cl. 285—353 **3 Claims**



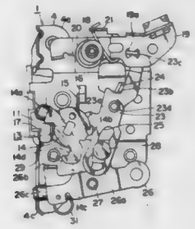
1. A pup joint for interconnecting lengths of oilwell service pipe in an end-to-end relationship, said joint comprising:
first and second lengths of pipe each having a first annular flange extending radially outward from a first end of each of said pipes and a second annular flange extending radially outward from a second end of each of said pipes, said first annular flange having a smaller radial size than said second annular flange;
a one-piece union nut having a large internally threaded bore extending axially along a portion of said union nut, said union nut having a smaller bore extending axially along a remaining portion of said union nut, said smaller bore having a larger radial size than said first annular flange on said pipes and having a smaller radial size than said second annular flange, so said union nut can be moved over said first annular flange and positioned with said internally threaded bore about said second annular flange;
an annular female sub having an externally threaded portion extending axially along a portion of said female sub, said female sub having a first bore extending axially along a portion of said sub and a smaller bore extending axially along a remaining portion of said female sub, said female sub including at least two axially extending sections;
a snap ring extending about said sections of said female sub to retain said female sub about said pipe with said first bore of said female sub about said first annular flange on said pipe and with said smaller bore of said female bore about said pipe adjacent said first annular flange; and
an annular sealing ring mounted inside said first bore of said female sub to seal a junction between a first end of a first pipe and said second annular flange of a second pipe when said union nut about said second pipe is threaded onto said female sub on said first pipe.

4,634,155
POWER ACTUATED DOOR LOCKING AND MONITORING ASSEMBLY
Arthur V. Geringer, 5424 Geyser, Tarzana, Calif. 91356; Richard G. Geringer, 28834 Barragan St., and David A. Geringer, 5382 Cheseboro Rd., both of Agoura, Calif. 90301
Filed Sep. 1, 1983, Ser. No. 528,874
Int. Cl.⁴ E05C *1/06*
U.S. Cl. 292—144 **6 Claims**



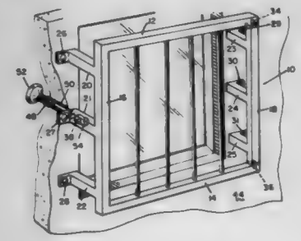
1. An improved power activated door locking and monitoring assembly, said assembly comprising:
(a) a housing adapted to be disposed in a door frame and defining a passageway extending to the front thereof;
(b) a bolt slideably disposed in said passageway;
(c) a lever disposed below and to the rear of said bolt, wherein said lever comprises a first arm and a second arm pivotably connected to the rear end of said first arm and extending at substantially a right angle with respect thereof when in an at-rest position, and spring means interconnecting said first and second arms for releasably maintaining said arms perpendicular to each other when in an at-rest position,
(d) biasing means normally retaining said bolt in the fully retracted unlocked position in said passageway,
(e) power activator means connected to said housing which, when energized, pivot said lever into the rear of said bolt causing said second arm to rotate in a clockwise direction from said perpendicular position while advancing said bolt against the action of said biasing means to the positively locked position extending out of the front of said passageway;
(f) dead-lock means for maintaining said bolt in the extended position;
(g) said dead-lock means including an extension on said second arm and a recess in said housing adapted to receive said extension, wherein movement of the bolt to the positively locked position causes concurrent counter-clockwise rotation of said second arm from said perpendicular position past the perpendicular position and concurrent movement of the extension into the recess to provide a lockset function;
(h) bolt position and signaling means secured to said housing activated by said bolt; and
(i) door position detecting and signaling means associated with said assembly.

4,634,156
DOOR LOCK DEVICE
Ryoji Shimura, Yokohama, and Osamu Seko, Fujisawa, both of Japan, assignors to Nissan Motor Co., Ltd. and OHI Seisakusho Co., Ltd., both of Yokohama, Japan
Filed Apr. 18, 1984, Ser. No. 601,599
Claims priority, application Japan, Apr. 21, 1983, 58-69134
Int. Cl.⁴ E05C *3/26*
U.S. Cl. 292—216 **17 Claims**



1. A door lock device for locking a door to a fixed member, comprising:
a latching member mounted for movement into a releasing position, a half-latching position and a full-latching position, said latching member being biased toward said releasing position;
a pawl member mounted on said device and engageable with a leg of said latching member to restrain the same at said half-latching and full-latching positions;
an open lever associated with said pawl member, said open lever having means for assuming a first stop position when said latching member is in one of said half-latching and full-latching positions, and a second stop position when said latching member is in the releasing position;
a first actuating member pivotally engaged with a movement means and being adjustable between a first movable condition and a second movable condition, said first condition providing releasable engagement of said first actuating member with said open lever so that when said first actuating member is moved, said open lever is movable from said first stop position to said second stop position, said second condition being a condition in which said first actuating member is non-engageable with said open lever;
a second actuating member mounted on said device and having means for rotating said open lever from said first stop position to said second stop position when actuated;
a third actuating member pivotally connected to said device and having means for pivoting from a first position to cause said first actuating member to assume said first condition to a second position to cause said first actuating member to assume said second condition;
a fourth actuating member having means for pivotal movement together with said third actuating member;
means formed on said second actuating member for moving said third actuating member from said second position to said first position when said second actuating member is actuated, said moving means including engagement of said third actuating member with said fourth actuating member; and
means for suppressing the pivotal movement of said third actuating member from said first position to said second position when said open lever is in the second stop position.

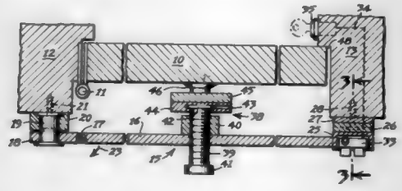
4,634,157
WINDOW GUARD AND LATCHING MECHANISM THEREFOR
Jesus S. Fernandez, 128 Glenn Heaven, Chula Vista, Calif. 92011
Filed Aug. 3, 1984, Ser. No. 637,317
Int. Cl.⁴ E05C *3/04*
U.S. Cl. 292—218 **3 Claims**



1. In a security window apparatus, the combination comprising:
a generally rectangular frame means having generally parallel upper and lower frame members and first and second side members, said first side member being secured to said upper and lower frame members intermediate the ends thereof, and said second side member being hingedly secured to said upper and lower frame members, the hinged securement of said second side member including a pair of axially aligned hinge pins extending into complementary apertures in said upper and lower frame members for providing a concealed hinge;
standoff means secured to said second side member for attachment to a wall;
standoff means secured to said first side member, at least one of said standoff means having an opening therein, each of said standoff means lying in a plane generally perpendicular to the plane of said frame means, and the majority of said standoff means further includes a plate member attached generally perpendicular thereto, the standoff means of said first side member having apertures for passage therethrough of bolt means for securing to a wall, and at least some of the standoff means of said second side member having means secured thereto simulating the heads of the bolt means to provide the appearance of a connection to a wall;
latch means within said opening;
a latch mechanism having passage means configured for extending through and securing to a wall, said mechanism including a pivotable shaft member extending through

said passage means, said shaft member having on one end thereof cam means for passage into said opening for engagement with said latch means and on the other end thereof handle means for pivoting said shaft member.

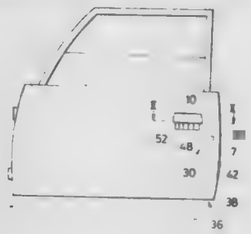
4,634,158
DOOR BRACE ASSEMBLY
Aroll A. Jones, 4 Pandanus South Fln, F.P.O., San Francisco, Calif. 96630
Filed Dec. 18, 1984, Ser. No. 682,997
Int. Cl.⁴ E05C *17/50*
U.S. Cl. 292—260 **3 Claims**



1. A door brace assembly comprising:
(a) an exterior door frame in a building, having first and second opposed vertical door jambs,
(b) an exterior door hung in said door frame,
(c) an elongated brace bar longer than the width of said door, and having first and second end portions,
(d) hinge means connecting said first end portion to said first door jamb to permit said brace bar to extend transversely of said door frame and be spaced from said door in an operative position, and to permit said brace bar to swing to an inoperative position,
(e) magnetic securing means on said second end portion,
(f) a latch frame bar fixed to said second door jamb,
(g) a magnetic keeper fixed to said latch frame bar, said magnetic keeper and said magnetic securing means being magnetically attracted to each other to secure said door brace to said latch frame bar in said operative position,
a pressure control device comprising a pressure member having an operative end,
(i) means operatively mounting said pressure member on said brace bar for positive movement toward and away from the door when said brace bar is in said operative position,
(j) said operative end comprising a bearing pad member adapted to engage said door, and
(k) said pressure control device further comprising means for moving said pressure member toward said door, in said operative position, for forcing said bearing pad member against said door.

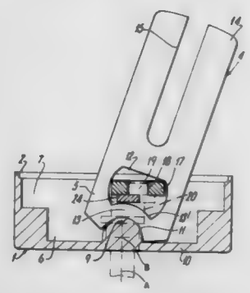
4,634,159
HARNESS SUPPORTING STRUCTURE AT INNER PART OF DOOR
Katsuyoshi Uchida, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Feb. 26, 1986, Ser. No. 833,025
Claims priority, application Japan, Feb. 27, 1985, 60-36443
Int. Cl.⁴ E05B *3/00*
U.S. Cl. 292—336.3 **5 Claims**

1. A wire harness supporting structure for supporting a wire harness which is extended from an electrical parts in an internal space of a door, comprising:
(a) a door lock for maintaining the door in locked position; and
(b) a reinforced bracket fastened to the door together with said door lock for supporting the wire harness,
(c) said reinforced bracket having,



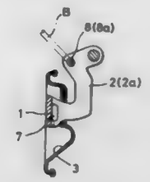
a guide for guiding the wire harness, and
a harness holder being foldable for fixing and supporting the wire harness on the guide.

4,634,160
HANDLE FITTING FOR A DRIVE ROD LOCKING ARRANGEMENT FOR WINDOWS, DOORS AND THE LIKE
Ernst Lahmann, Meerbeck; Werner Walder, and Friedhelm Bürger, both of Heiligenhaus, all of Fed. Rep. of Germany, assignors to Mila Hardware & Machinery (UK) Limited, Daventry, England
Filed Oct. 26, 1984, Ser. No. 665,045
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 8333991[U]
Int. Cl.⁴ E05C *21/00*
U.S. Cl. 292—336.3 **8 Claims**



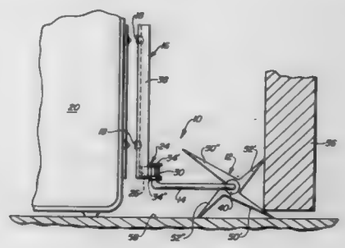
1. A handle fitting for a drive rod locking arrangement for windows, doors and the like, said fitting comprising a housing, a first bearing in said housing having a first bearing axis, an operating handle mounted on said first bearing for pivotal movement about said first axis, a second bearing in said housing having a second bearing axis which intersects said first bearing axis, a drive rod actuating lever connectable to the drive rod locking arrangement, said lever having an inner end in the housing and a free end outside the housing, the inner end being mounted on said second bearing for pivotal movement about said second axis and coupling means for coupling said operating handle and said drive rod actuating lever, said coupling means being positioned between said second axis and the free end of the drive rod actuating lever, said coupling means including an opening in that portion of the length of the drive rod actuating lever within the housing, said opening having one edge concentric with said second axis, and further comprising a coupling portion of the operating handle and a shoulder on said coupling portion engaging said one edge of the opening effective to retain the drive rod actuating lever in place.

4,634,161
AUTOMOTIVE OUTSIDE DOOR HANDLE UNIT
Takeshi Fukasawa, Yokohama, and Isamu Uemura, Yokosuka, both of Japan, assignors to Kokusan Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 29, 1984, Ser. No. 676,319
Int. Cl.⁴ E05C *21/00*
U.S. Cl. 292—336.3 **2 Claims**



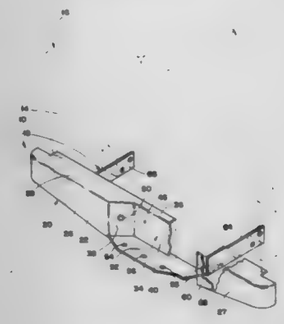
1. An automotive outside door handle comprising:
a one piece door handle assembly including a door handle and an operating arm,
said door handle being elongated and having an inner side and an outlet side defining opposite sides of said door handle,
one end of said operating arm includng two leg portions spaced apart from one another and a crosspiece interconnecting said two leg portions, said two leg portions each having one end terminating at said inner side of said door handle and each having another end terminating at said crosspiece, and
said two leg portions, said inner side of said door handle, and said crosspiece spaced away from said inner side of said door handle defining an open, material thefting bridging portion shaped for preventing contraction marks from forming on said outer side of said door handle during manufacture of said door handle assembly.

4,634,162
PORTABLE PORTAL LOCK
Dale O. Kimmel, P.O. Box 139, Eureka, Mont. 59917
Filed Mar. 18, 1985, Ser. No. 713,296
Int. Cl.⁴ E05C *17/54*
U.S. Cl. 292—343 **7 Claims**



1. A portable portal lock, comprising:
a support arm adapted for securing to a portable case; and
a wedge member rotatably secured to the arm, said wedge member having four legs radiating outwardly from said support arm at substantially equal spacing from one another;
wherein one pair of said legs projecting substantially opposite one another are longer than the other pair of oppositely projecting legs.

4,634,163
APPARATUS FOR MOUNTING A TRAILER HITCH ON A VEHICLE
Donald E. Bundy, Sapulpa, and Ronald W. Bundy, Sand Springs, both of Okla., assignors to Judd & Judd, Inc., Tulsa, Okla.
Filed Aug. 19, 1985, Ser. No. 766,589
Int. Cl.⁴ B60R *19/48*
U.S. Cl. 293—117 **13 Claims**



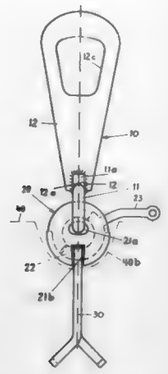
1. Apparatus for mounting a trailer hitch on a vehicle to enable the vehicle to tow a load on a surface supporting the vehicle, said apparatus being of the type which is securedly mountable on the vehicle and which is adapted to have a trailer hitch secured thereto, said apparatus comprising:
a substantially planar base having a hole therethrough for receiving a trailer hitch therein, said base being substantially parallel to the surface supporting the vehicle when said apparatus is mounted thereon, said base further having a pair of opposing substantially parallel sides;
a substantially planar plate mounted on each side of said base, each of said plates being at an angle of substantially less than ninety degrees to said base and extending upwardly and outwardly therefrom; and
an elongate support bracket mounted on the outer end of each of said plates, the longitudinal axes of said brackets being substantially parallel to said base.

4,634,164
HOISTING ASSEMBLY WITH QUICK-RELEASE HOISTING SHACKLE
Siegfried Fricker, Wurmberger Str. 30-34, 7135 Wiernsheim, Fed. Rep. of Germany
Filed Apr. 29, 1985, Ser. No. 728,096
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1984, 3415884
Int. Cl.⁴ B66C *1/34, 1/66*
U.S. Cl. 294—89 **9 Claims**

1. A hoisting assembly adapted for the releasable connection of a hoisting harness to a load, particularly to a precast concrete element which has at least one anchoring member embedded therein, the hoisting harness comprising in combination:
an exposed eye portion on one end of said anchoring member, the eye portion having an eye hole extending transversely therethrough;
a hoisting shackle having an annular shackle body with a central opening and a locking bolt with is movable in relation to the shackle body, the locking bolt being engageable through the eye hole of the anchoring member to establish a connection between the hoisting shackle and the precast element, and the locking bolt being retractable to release the hoisting shackle from the precast element;
a ring part which is permanently connected to the hoisting shackle in the manner of a chain link, the ring part having a radial slit for the insertion of the ring part through the

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central opening of the shackle body in connection with bending operations on the ring part before and after insertion, the ring part being rejoined at its radial slit by a weld; and



a link member which is attached to the ring part in the area of its radial slit, in a configuration in which the ring part and the link plate maintain a common longitudinal axis, the link member having an eye through which an extremity of the hoisting harness is insertable to attach the hoisting harness to the hoisting assembly.

4,634,165

FORCEPS HAVING REPLACEABLE TIPS

Robert C. Russell, P.O. Box 3926, Springfield, Ill. 62702, and David J. Keeler, 152 Valley Rd., Ardmore, Pa. 19003

Filed Jan. 17, 1985, Ser. No. 692,377
Int. Cl.[4] B25B *9/02*
U.S. Cl. 294—99.2 **2 Claims**



1. Forceps having replaceable tips comprising:

a. forceps tips, said forceps tips including a pair of side-by-side elongate configured members, each of said elongate members having including first end and a second end, said first ends of said elongate members being affixed together and including a retaining aperture, said seconds ends of said elongate members being configured as opposable tips and means biasing said second ends away with respect to each other; and,

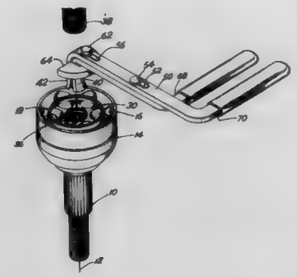
b. handle means including opposing symmetrical configured handle portions pivotally mounted about a retainer body means and including a spring biased tongue internal to said retainer body for releasably engaging said retainer aperture, a cap including means securing said handle portions about said retainer body means and means for disengaging said spring biased tongue from said retaining aperture, said handle portions and cap including knurled locations to be grasped by a person, means for receiving said forceps tips in said retainer body and for pivotally mounting about said retainer body and means on said handle means for causing a mid portion of each of said elongate members of said forceps tips to engage each of said elongate members about mid portion and to be forced towards each other in response to digital manipulation of said graspable location of said handle means, and said handle means including releasable retaining means for releasably retaining said first ends of said forceps tips.

4,634,166

TOOL FOR REPAIR OF RZEPPA TYPE CONSTANT VELOCITY UNIVERSAL JOINT

James L. Pool, Clarinda, Iowa, assignor to Lisle Corporation, Clarinda, Iowa

Filed Nov. 1, 1985, Ser. No. 793,968
Int. Cl.[4] B25B *13/12*
U.S. Cl. 294—103.1 **6 Claims**



1. A tool useful for removing and replacing bearings of a Rzeppa or constant velocity type universal joint of the kind having a cup with an assembly of a hub, ring and bearings in the cup, said cup having a shaft therefrom defining an axis of the joint, said hub having a passage for receipt of a shaft, said tool comprising in combination:

first and second separable jaw members, each member comprising a generally longitudinal bar, said jaw members arranged in opposed longitudinal relationship, said jaws sized to be positionable in the shaft passage in the hub of the joint;

first and second links attached respectively to the first and second jaw members, said links overlying each other, said links extending generally transversely from the jaw members and slidable in said transverse direction relative to each other to control separation of the jaws in the same transverse direction; and

first and second handles attached to the first and second links respectively, said handles separated in the transverse direction from each other and manually manipulatable to slide the first link relative to the second link and thereby to adjust the transverse spacing of the jaw members in the shaft passage to engage the passage walls so as to permit pivotal movement of the hub relative to the ring and cup upon simultaneous movement of the handles toward and away from the axis of the joint.

4,634,167

STRUCTURE FOR REINFORCING AUTOMOTIVE COVER MEMBER OF SYNTHETIC RESIN

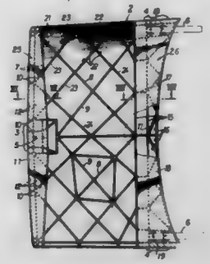
Shinichi Moriki, Tokyo, and Kazuyuki Okui, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 5, 1985, Ser. No. 751,910
Int. Cl.[4] B62D *25/00*
U.S. Cl. 296—31 P **3 Claims**

1. A reinforced cover member for an automobile comprising:

a lid body having a generally rectangular shape, a top face, and a bottom face;

a plurality of ribs extending generally perpendicularly from said bottom face, said ribs and said lid body being integrally molded of a synthetic resin, said ribs including a first set of at least two peripheral ribs extending along one longer side of said lid body, a second set of at least two peripheral ribs extending along the other longer side of said lid body, a third pair and a fourth pair of peripheral ribs extending along the shorter sides of said lid body, a first set of angular ribs continuously extending to connect a generally central point of said one longer side of said lid body and the two end portions of said other longer side, a second set of angular ribs continuously extending to connect a generally central point of said other long side of said lid body and the two end portions of said one longer



side, first short ribs connecting together said first set of at least two peripheral ribs, and second short ribs connecting together said second set of at least two peripheral ribs;

a first closure plate fixed to said first set of at least two peripheral ribs and said first short ribs defining plural closed compartments;

and a second closure plate fixed to said second set of at least two peripheral ribs and said second short ribs defining further plural closed compartments.

4,634,168

BRACKET FOR MOUNTING A TRUCK BODY ON A CHASSIS

Daniel G. Fuchs, Charlotte, N.C., and Larry R. Rudd, Quincy, Ill., assignors to Knappheide Mfg. Co., Quincy, Ill.

Continuation-in-part of Ser. No. 593,839, Mar. 27, 1984, abandoned. This application Feb. 13, 1986, Ser. No. 829,023
Int. Cl.[4] B62D *21/02, 23/00*
U.S. Cl. 296—35.1 **9 Claims**



1. An integral rear end bracket means for facilitating the mounting and proper positioning of a prefabricated truck body, having a generally C-shaped rearward cross-member comprised of an upper flange and a lower flange with a joining rear wall having an inner surface, onto a prefabricated truck chassis which is provided with at least one longitudinal frame member, said bracket means comprising:

a plate member having a hook-like profile comprised of a stem portion and a hook portion wherein, when mounted, the stem portion extends in a rearward, substantially longitudinal direction behind said chassis, and wherein said hook portion extends in an upward and rearward direction,

said hook-like profile being of such a dimension and contour that when mounted in combination with said truck body and chassis said hook portion of said profile accommodates said cross-member and resides proximate to the inner surface of the joining wall of said C-shaped cross-member thereby preventing said body from any significant further forward movement with respect to said chassis, said hook portion being located proximal a side wall of said longitudinal frame of said chassis for connection thereto when said hook portion is proximal said inner surface of said cross-member, and

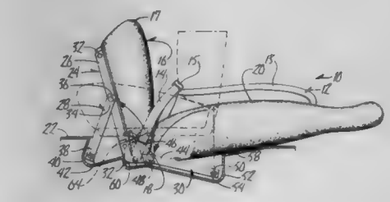
wherein said bracket is of such a configuration and size that when said hook portion is proximate to the inner surface of said cross-member, said body is properly positioned with respect to said chassis.

4,634,169

VEHICLE SEAT

Kenneth L. Hasstedt, 1812 Forest Ave., Des Moines, Iowa 50315

Filed May 28, 1985, Ser. No. 737,789
Int. Cl.[4] B60R *21/10*
U.S. Cl. 296—65 A **15 Claims**



1. An improved crashworthy motor vehicle having a floor and a passenger seat mounted therein with the seat portion and a back portion, said improvement comprising:

a pair of front braces each having a first end pivotally connected to said seat portion and a second end pivotally connected to said vehicle;

a pair of rear braces each having a first end pivotally connected to the rear of said seat and a second end pivotally connected to said vehicle;

said floor having a recessed area including an upright front wall and a bottom wall;

said seat being pivotal by momentum upon sudden stopping of said vehicle from an upright driving position above said recessed area wherein said seat portion is substantially horizontal and said back portion is substantially vertical to a reclined impact position within said recessed area wherein said seat portion is substantially vertical and said back portion is substantially horizontal and wherein said back portion of said seat engages said bottom wall of said recessed area.

4,634,170

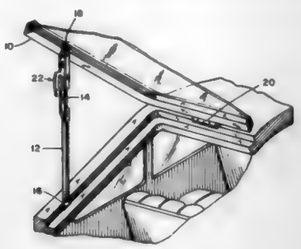
DEVICE FOR HOLDING HINGED STRUCTURE IN OPEN POSITION

John S. Lach, 24 Talbot St., Torrington, Conn. 06790

Filed Jan. 27, 1986, Ser. No. 822,879
Int. Cl.[4] B60R *27/00*
U.S. Cl. 296—76 **10 Claims**

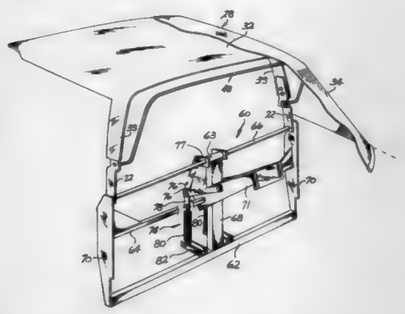
1. A hold-up device for holding a hinged structure in an open position relative to a frame against the force of gravity, wherein a hydraulic cylinder is pivotally connected to one of said structure and said frame and a cylinder rod is pivotally connected to the other of said structure and said frame, said hold-up device for use when said cylinder fails and comprising

a body having first and second opposite ends and a straight elongate contoured alcove extending between said ends for



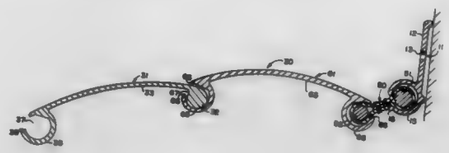
removable reception therein of said rod with said structure in its open position.

4,634,171
AUTOMOBILE HARD TOP CONVERTIBLE
William E. McKeag, Cassoplois, Mich., assignor to D-M Design Corp., Elkhart, Ind.
Continuation-in-part of Ser. No. 389,680, Jun. 18, 1982, abandoned. This application Apr. 30, 1984, Ser. No. 605,630
Int. Cl.[4] B60J *7/08*
U.S. Cl. 296—108 6 Claims



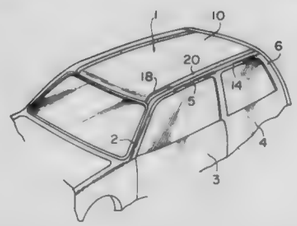
1. A motor vehicle in combination with a removable top, said vehicle comprising a body having a rearwardly hinged trunk lid, said trunk lid being raisable towards the rear of said vehicle to reveal a storage compartment located therein, an upstanding windshield at a front portion of the body of said vehicle, a passenger compartment located generally between said storage compartment and said windshield, said top including a rigid overhead component for overlying said passenger compartment, a frame cage located behind said passenger compartment, said frame cage having spaced vertical end members, said top overhead component being pivotally connected at its rear end portion to said frame cage end members, wherein said top is rotatable with said trunk lid opened between an open position in which the top rests within said storage compartment and a closed position in which said overhead component of the top overlies said passenger compartment of the vehicle and is supported thereover by said windshield and cage, said trunk lid adapted to overlie said top in a closed orientation when the top is in its open position, said top including a flexible rear window component extending from said rear end portion of the top overhead component, means for releasably securing said top rear window component to said vehicle body when the top is in its said closed position.

4,634,172
FLEXIBLE HINGE RAIN SEALING MECHANISM
Heary J. Duda, 1884 West Palm, Mount Prospect, Ill. 60056
Filed Nov. 29, 1985, Ser. No. 802,816
Int. Cl.[4] B60P *3/34*
U.S. Cl. 296—163 16 Claims



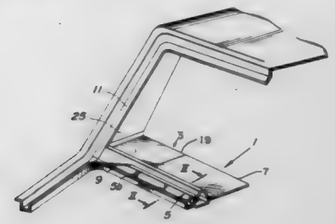
1. A flexible connector for connecting a metal awning cover to a vehicle, comprising a flexible water-impervious strip, means for connecting one end of said strip to the vehicle, and means for connecting the other end of said strip to the metal awning cover, whereby when the awning is in use or in an extended position said flexible strip is under tension providing a water-tight seal between the awning cover and the recreational vehicle.

4,634,173
AUTOMOBILE REAR UPPER STRUCTURE
Takahiro Aonuma, and Minoru Konishi, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Jul. 15, 1985, Ser. No. 754,724
Claims priority, application Japan, Jul. 16, 1984, 59-107479
Int. Cl.[4] B62D *25/00*
U.S. Cl. 296—188 16 Claims



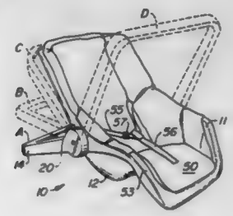
1. An automobile rear upper body structure, said body structure comprising:
a roof structure having a roof panel and a roof side rail formed along each side of said roof panel, said roof side rail including a side rail inner panel and a side rail outer panel which are connected together to form a structure of a closed cross-section, said roof structure being formed with a longitudinally extending recessed groove along each side thereof, a rear pillar structure including a pillar inner panel and a pillar outer panel which are welded together to form a structure of a closed cross-section, a rear header extending transversely to said rear pillar and having a rear edge connected with a rear edge of the roof panel, said pillar inner panel having an upper portion connected with said rear header and said side rail inner panel, said pillar outer panel having an upper portion connected with said roof panel and said side rail outer panel, a corner reinforcement having a laterally outer edge connected with said pillar inner panel, an intermediate portion connected with a bottom portion of said recessed groove and a laterally inner edge connected with said rear header.

4,634,174
VEHICLE BODY HAVING REAR PARCEL SHELF
Yoshinori Kamiya, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Japan
Filed Jul. 3, 1985, Ser. No. 751,684
Claims priority, application Japan, Jul. 4, 1984, 59-137266
Int. Cl.[4] B62D *25/08*
U.S. Cl. 296—195 14 Claims



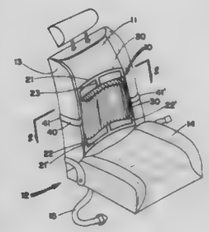
1. A rear portion of a vehicle body comprising:
left and right pillar inner panels,
left and right side parcel shelf members, respectvely, joined to said left and right pillar inner panels, and
a center parcel shelf member extending in a lateral direction of the vehicle body, joining said left and right side shelf members to form a rear end of a passenger compartment of the vehicle body, and comprising a center parcel shelf panel having a generally horizontal front portion serving as a rear panel shelf and a rear portion; and a waist panel lying on said center shelf panel and having front and rear flanges extending in the lateral direction and a channel portion extending in the lateral direction between said front and rear flanges and projecting upwardly so that the cross section of said channel portion has an inverted U-shape, said front and rear flanges of said waist panel being joined to an upper surface of said rear portion of said center shelf panel to form a box beam extending between said front and rear flanges in the lateral direction.

4,634,175
BABY CARRIER
Robert D. Wise, Akron, Ohio, assignor to Gerber Baby Products, Fremont, Mich.
Filed Nov. 8, 1983, Ser. No. 550,261
Int. Cl.[4] A47C *1/02*; A47D *13/02*
U.S. Cl. 297—183 3 Claims



1. In a baby carrier having a shell seat with sides and a rotatable handle, all bilaterally symmetrical about a lengthwise plane, an improved handle support pivot comprising:
an outwardly extending cup portion formed integrally with the shell side and including a series of tabs;
a generally cylindrical hub gear having a hub axis perpendicular to the plane, the hub gear including:
a disc-like member arranged generally perpendicular to the hub axis and having an outwardly facing first planar area and an inwardly facing second planar area, the inwardly facing planar area facing the shell side;
a first rim extending axially outwardly from the disc-like member a first distance from the first planar area, the first rim having an inner circumferential surface in which a plurality of spaced apart notches are formed;
a cylindrical shaft, concentric with hub axis, extending a second distance outwardly from the first planar area, the second distance being greater than the first distance; and
a second rim extending axially inwardly from the disc-like member toward the shell side, the second rim sized for mating engagement with the cup portion, the second rim including a series of parallel slots for receipt of the tabs to prevent relative rotary motion of the hub gear and cup portion;
a hub cap at the end of the handle including a drum portion for rotatable engagement about the first rim and an end face, the drum portion including a plunger opening;
a compression spring; and
a radially extending plunger including:
an outer portion extending through the plunger opening;
an inner portion, the inner portion including a radially extending slot having a first slot portion through which the cylindrical shaft extends and a second slot portion housing the compression spring between an outer boundary surface of the second slot portion and the cylindrical shaft; and
a plunger peg positioned for mating engagement with the notches in the first rim.

4,634,176
BACK SUPPORT ASSEMBLY FOR VEHICLE SEAT
Gregory M. Scott, 74 Walman St., Clifton, N.J. 07011
Filed Oct. 1, 1984, Ser. No. 656,665
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—230 4 Claims



1. A back support assembly for a vehicular seat, which comprises:
a back support frame including a plurality of vertically-disposed, elongated track members, two of which are disposed along the sides of said frame, and two track members generally C-shaped in cross-section and facing inwardly toward each other and elongated cross member means fixedly attached to each other in a generally flat rectangular configuration having a major face that may be fitted closely against a front surface of a back rest of a vehicle seat;
a back support attachment for securing said back support frame, in a generally vertical position, to said front surface of said back rest; and
a back support carriage including a rigid carriage frame having a generally rectangular major face the width of which approximates the width of said back support frame, a first plurality of roller attachments affixed along an upper portion of said rigid carriage frame, a second plurality of roller attachments affixed along a lower portion of said rigid carriage frame, each of said first and second

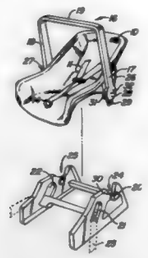
plurality of roller attachments including a roller partially positioned within one of said plurality of vertically-disposed, elongated track members of said back support frame for interconnecting said back support carriage to said back support frame for avoiding lateral displacement of said back support carriage with respect to said back support frame, while permitting free vertical movement of said back support carriage with respect to said back support frame, said back support carriage further including a pliant back support member having a concave cross-section in a horizontal plane for maintaining large are vertical and horizontal support to the lower back of a motorist.

4,634,177

INTERLOCKING INFANT CARRIER AND BASE FOR CAR SEAT MOUNTING

Paul K. Meeker, Kent, Ohio, assignor to Gerber Products Company, Fremont, Mich.

Filed Oct. 10, 1985, Ser. No. 786,036
Int. Cl.[4] A47C *1/11*
U.S. Cl. 297—250 **13 Claims**



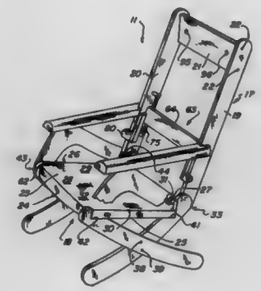
1. Apparatus for locking an infant carrier into a base which is mountable to a car seat, said apparatus comprising:
- a bolt slidably mounted to said base and spring-biased to project laterally therefrom said bolt having a sloping surface oriented to yield under a transverse contact force and thereby cause retraction of said bolt;
- a hollow in said carrier to receive said bolt, said hollow having a rim capable of exerting said transverse contact force to said sloping surface of said bolt during insertion of said carrier into said base;
- a projection extending transversely from said bolt; and
- a lever arm mounted to said carrier, said lever arm having a cam protruding radially from the fulcrum thereof to engage said projection when said carrier is inserted into said base, said cam being spiraled to urge said projection backward and thereby retract said bolt upon turning of said lever arm.

4,634,178

ADAPTABLE SEATING DEVICE

Steven H. Carney, Rte. 2, Box 542K, Golden, Colo. 80401

Filed Dec. 10, 1984, Ser. No. 680,131
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—284 **4 Claims**



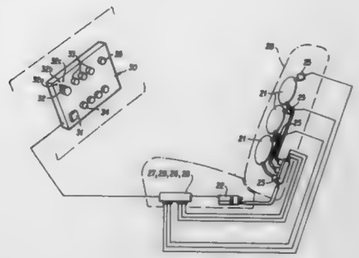
1. A body adaptable seating device, comprising:
- a frame having a seat section, an open back framework formed by a pair of side members that are substantially parallel to one another and spaced from one another substantially the width of said seat section, and an upper supporting member extending between and at an angle with respect to said side members at the top portions thereof, said seat section having a rear portion and each of said side members having a lower portion connected with said rear portion of said seat section with said open back framework extending upwardly and at an obtuse angle from said seat section and with said upper supporting member being at an angle with respect to said seat section that is less than that formed by said seat section and said open back framework;
- first and second pairs of mounting means each pair of which is located on a different one of said side members;
- first and second substantially rigid guide members the opposite end portions of which are mounted at different ones of said pairs of mounting means on said side members so that the central portions of said guide members extend along and adjacent to an associated one of said side members with said central portions of said guide members being substantially parallel to one another and extending at an obtuse angle with respect to said seat section that is greater than said obtuse angle formed by said open back framework and said seat section;
- lower back support means mounted on said central portions of said guide members so that said support means is movable along and with respect to said central portions of said guide members, said lower back support means being positioned between said side members within the otherwise open back area provided by said open back framework formed between said side members and below and spaced from said upper supporting member to provide a lower back support surface thereat, with said support means having a support surface that is substantially parallel to said central portions of said guide members for providing lower back support to a substantial number of the vertebrae in the lumbar region of the spine of a user when properly seated in said seating device;
- handle means on said support means to facilitate movement of said support means along said central portions of said guide members; and
- cushion means positioned at said frame to at least substantially span said open back framework with said cushion means extending between said seat section to and beyond said upper supporting member so that said cushion means is positioned between said support means and a user when said user is properly seated in said seating device whereby lower back support is provided to such a user by said support means and such a user can displace said cushion means in a direction away from said user at the area of said cushion means between said upper supporting member and said support means to thereby facilitate contouring of said cushion means to better support the body of said user seated in said seating device.

4,634,179

AIR LUMBAR SUPPORT DEVICE

Nobuyuki Hashimoto, Toyota, and Shigeru Nishio, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation-in-part of Ser. No. 517,689, Jul. 27, 1983. This application Dec. 24, 1985, Ser. No. 814,174
Claims priority, application Japan, Jul. 31, 1982, 57-133871
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—284 **1 Claim**



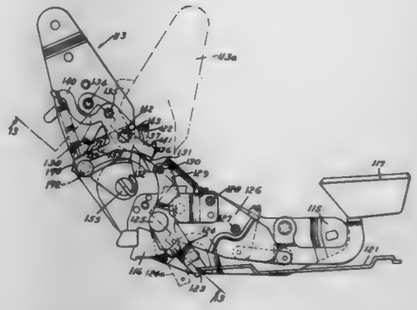
1. An air lumbar support device in an automobile seat for adjusting the curvature of a seat back comprising:
- a plurality of air bags accommodated in said seat back;
- an electric-powered air pump supplying pressurized air to said air bags;
- a solenoid activated air control valve connected to said air bags and controlling the air pressures of said air bags;
- a pressure sensor detecting the air pressures of said air bags and supplying an electric signal indicative of said pressure;
- an input circuit receiving said electric signals from said pressure sensor and supplying an output electric signal;
- an output circuit for receiving an input electric signal and producing an output which causes said air control valve and said air pump to actuate;
- a control circuit for receiving said output electric signal from said input circuit and supplying said input electric signal to said output circuit;
- a memory circuit connected to said control signal for storing said output electric signals supplied from said input circuit to said control circuit;
- a manually controlled operation panel provided with a mode changeover switch, a pressure valve memory select switch, and a manual air pump switch in connection to said control circuit;
- wherein said control circuit is directed by said operation panel to store in said memory said electric signal from said input circuit when said mode changeover switch is in a first position; to read from said memory a stored signal and compare said stored signal to said electric signal from said input circuit to supply said input electric signal to said output circuit when said mode changeover switch is in a second position; and to permit manual control of said input electric signal to said output circuit when said mode change over switch is in a third position;
- wherein the pressure in said air bags may be manually adjusted for the occupant's comfort, said pressures stored in memory, and used to control said air bags to retain said pressures when called out of memory by the occupant.

4,634,180

VEHICLE EASY ENTRY SEAT LATCHING MECHANISM

Vikram Zaveri, Springfield; Dennis H. Heling, Canton, and Keith S. Radyko, Roseville, all of Mich., assignors to Keiper Recaro Incorporated, Battle Creek and Chrysler Motors Corporation, Highland Park, both of, Mich.

Continuation-in-part of Ser. No. 638,311, Aug. 6, 1984. This application Nov. 4, 1985, Ser. No. 794,452
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—341 **13 Claims**



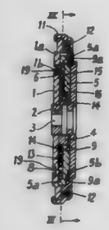
1. Passenger car individual front passenger seat back actuated seat latch release means comprising pivotally connected seat and seat back bracket means, longitudinal track seat adjustment means including manual latch release means, pivoted lever means on said seat bracket means, striker means fixed on said seat back bracket means responsive to forward tilting for actuating said lever means, linkage means from said lever means for actuating said manual latch release means, said striker means including a surface for retaining said lever means in latch release mode during manual return of the seat to rearward position and seat back to upright position.

4,634,181

ROUND HINGED-PART FOR LAND, SEA AND AIR VEHICLE SEATS

Yves Pipon, Flers, France, assignor to A & M Cousin & Cie, Flers, France

Filed Apr. 1, 1985, Ser. No. 718,430
Claims priority, application France, Apr. 18, 1984, 84 06131; Feb. 18, 1985, 85 02308
Int. Cl.[4] A47C *1/024*; B60N *1/06*
U.S. Cl. 297—362 **16 Claims**



1. Hinge apparatus for seats used in land, sea and air-vehicles, comprising:
- a housing constituting first and second circular flanges, and means for coupling said first and second flanges together for relative rotation,
- said first flange (1) adapted to be fixed to a first portion of a seat and having in its center an opening receiving a main

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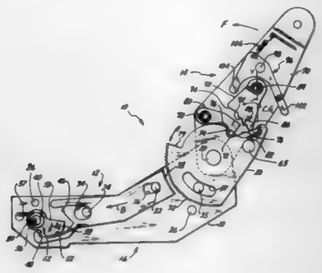
piece (2) supporting a cam on which a double satellite gear is mounted,
said second flange being adapted to be secured to a second portion of the seat,
the double satellite gear including an inner tooth set (5*a*) and an outer tooth set (5*b*), one of said two tooth sets cooperating with an outer tooth set (8*a*) of the first flange (1) and the other of said two tooth sets cooperating with an inner tooth set (9*a*) of the second flange (9),
said first flange further having annular means facing said second flange for centering said double satellite gear (5) and a central ovoid ring (13) between said first and second flanges,
first bearing means (12) interposed between the second flange (9) and a rim for securing the second flange (9) to the first flange (1),
second bearing means (15,16) interposed between the annular centering means (1*b*), the central ovoid ring (13) and a needle ball race (14) serving as a resting piece for the double satellite gear (5) relative to the cam (4),
opposing faces of the first flange (1) and the second flange (9) including means, communicating with the interior of said housing, for securing said hinge apparatus to the first and second portions of the seat,
the central main piece (2) having a central portion with a circular recess and a plain bearing for receiving means for driving the mechanism of the hinge apparatus.

4,634,182

SEATBACK RECLINER MECHANISM AND INERTIA OPERATED LOCK

Aki Tanaka, Northridge, Calif., assignor to P.L. Porter Co., Woodland Hills, Calif.

Filed Aug. 9, 1985, Ser. No. 764,013
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—379 **6 Claims**



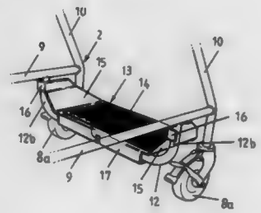
1. An inertia operated lock for a forward tilting backrest in a vehicle seat comprising:
a lower plate attachable to the seat;
an upper plate pivoted to said lower plate and attachable to the backrest;
a pawl pivoted to the upper plate and normally engaging a recess in said lower plate;
first cam means on said lower plate urging said pawl out of engagement with said recess in response to forward pivoting motion of said upper plate;
a pendulum pivotably suspended to said upper plate, said pendulum being swingable by its forward inertia, upon simultaneous deceleration of both said upper and lower plates, into engagement with said pawl to positively stop the pawl against disengagement from said lower plate thereby interlocking said upper and lower plates against pivotal movement; and in second cam means;
on said lower plate normally biasing the pendulum towards engagement with said pawl, said second cam means releasing the pendulum away from engagement with the pawl upon forward pivotal movement of the upper plate thereby normally allowing free forward pivoting of the upper plate in relation to the lower plate.

4,634,183

TOILET CHAIRS

Robert Ruiz, Hempsted, England, assignor to James Industries Limited, Gloucester, England

Filed Mar. 7, 1986, Ser. No. 837,219
Claims priority, application United Kingdom, Apr. 19, 1985, 8510044
Int. Cl.[4] A47C *9/12*
U.S. Cl. 297—433 **9 Claims**



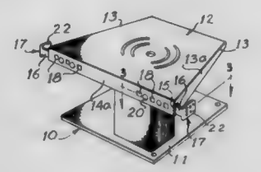
1. A toilet chair comprising a support frame open at the rear to fit over and around a WC pan and a footrest pivotable between an operative forwardly projecting lowered position and a retracted position within said frame, said frame including a front cross member disposed at a lower level adjacent the front of the frame and forming a structural member of the frame, said footrest being pivotably mounted on said cross member for pivotal movement between said operative and retracted positions, and said footrest having stop means engageable with said cross member to limit said pivotal movement and thus to define said operative position of the footrest.

4,634,184

ADJUSTABLE SEAT BELT ATTACHMENT FOR VANS

Herbert A. Hitson, Roanoke, Ala., assignor to Monitor Manufacturing Company, Smyrna, Ga.

Filed Sep. 19, 1985, Ser. No. 777,958
Int. Cl.[4] A62B *35/00*; B60R *22/26*
U.S. Cl. 297—468 **1 Claim**



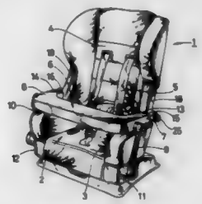
1. A seat pedestal for vans and the like, said seat pedestal including a base for fixing said pedestal to the floor of a van, a platform for receiving a seat thereon, and a pair of seat belt brackets for receiving seat belts, said platform including a vertical skirt comprising two side skirts and a rear skirt, each of said two side skirts defining a slot with said rear skirt for providing a pair of slots for receiving said seat belt brackets, each seat belt bracket of said pair of brackets including a connector plate for attachment of a seat belt, a tongue extending from said connector plate generally at a right angle thereto, said tongue being slidably receivable through said slot, and fastening means for selectively fixing said tongue to said rear skirt, the arrangement being such that said tongue is disposable parallel and adjacent to said rear skirt and fixable thereto, and said tongue extends through said slot and bears against said side skirt, said tongue defining a first plurality of holes therein, said rear skirt defining a second plurality of holes therein, said second plurality being substantially twice said first plurality, said fastening means being receivable through at least two of said first plurality of holes and two of said first plurality of holes.

4,634,185

CHILDREN'S AUTOMOBILE-MOUNTED SAFETY SEAT

Kenzou Kasai, Osaka, Japan, assignor to Aprica Kasai Kabushikikaisha, Osaka, Japan

Filed May 31, 1985, Ser. No. 739,871
Claims priority, application Japan, Jun. 11, 1984, 59-87138[U]; Nov. 9, 1984, 59-170740[U]
Int. Cl.[4] A47C *1/08*; B60N *1/12*
U.S. Cl. 297—487 **15 Claims**



1. A children's automobile-mounted safety seat comprising a seat portion for seating a baby or child therein, said seat portion having first lateral surfaces, a safety guard disposed forwardly of said seat portion, said safety guard having second lateral surfaces, left-hand and right-hand support rods having respective upper and lower support rod ends, first journal means for rotatably connecting said lower support rod ends to the respective one of said first lateral surfaces of said seat portion, and second journal means for rotatably connecting said upper support rod ends to the respective one of said second lateral surfaces of said safety guard, left-hand and right-hand connecting members for removably securing said safety guard to said safety seat, mounting means for movably attaching said connecting members to said safety guard for permitting a relative longitudinal sliding movement within a predetermined range between said connecting members and said safety guard, left-hand and right-hand springs interposed between said mounting means and said safety guard for urging said mounting means and thus said left-hand and right-hand connecting members and said safety guard to move toward each other, said second journal means comprising a journal axis and journalling movement limiting members operatively interposed between said upper support rod ends and said second journal means for limiting a journalling movement of said support rods about said journal axis to said predetermined range of said sliding movement.

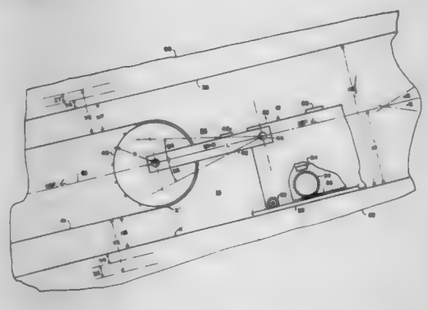
4,634,186

CONTROL SYSTEM FOR LONGWALL SHEARER

Robert E. Pease, 8010 Valley Bend Rd., Huntsville, Ala. 35802

Filed Oct. 24, 1985, Ser. No. 791,203
Int. Cl.[4] E21C *27/20, 35/08*
U.S. Cl. 299—1 **2 Claims**

1. A control system for a longwall coal shearer assembly, said shear assembly comprising a track positionable in a tunnel along a seam of coal having a generally sine wave contour and a shearing machine adapted to move along said track, said shearing machine including a body having a longitudinal reference, a shearing drum, and an arm pivotally supported at one end on an end region of said body, with an opposite end of said arm extending beyond said body, a driven shearing drum rotably attached to said opposite end of said arm, and means responsive to control signals for rotating said arm whereby said drum is varied in elevation, said system comprising:
first inclination means supported by said body for providing first electrical signals representative of the inclination of said longitudinal reference of said shearer with respect to a horizontal line perpendicular to gravity;
second inclination means for providing second electrical signals representative of the inclination of said arm with respect to said longitudinal reference;
sensing means responsive to the movement of said body along said track for providing third electrical signals representative of the movement of said shearer along said track;
first computational means responsive to first and third signals for providing, as fourth signals, signals representative of changes of said first signals in relation to changes of said third signals;



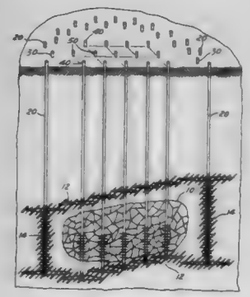
second computational means responsive to the sum of a first constant times said first signals and a second constant times said fourth signals for providing fifth signals representative of the difference in the elevation of said shearing drum from a sine wave elevational contour formed by said track and when maintained at a fixed elevation as said shearer traverses said track; and
control means responsive to said fifth signals and said second signals for providing said control signals to said means for rotating said arm and controlling the elevation of said drum.

4,634,187

METHOD OF IN-SITU LEACHING OF ORES

Ray V. Huff; Steven G. Axen, and Baughman, David R., all of Golden, Colo., assignors to ISL Ventures, Inc., San Francisco, Calif.

Filed Nov. 21, 1984, Ser. No. 674,026
Int. Cl.[4] E21B *43/28, 43/30*
U.S. Cl. 299—4 **5 Claims**



1. A method of in-situ leaching of ore bodies comprising:
(a) Drilling a ring of boundary wells about the periphery of the desired ore body; fracturing the strata surrounding a number of the boundary well; and inject into each bound-

ary well and the surrounding strata a material to form an impermeable barrier;

(b) Drilling a number of wells within the area enclosed by the boundary wells to a depth above the top surface of the desired ore body;

(c) Creating an overlapping pattern of horizontally-oriented fractures in the strata around the bottom of said wells, and injecting into said fractures and the surrounding strata a material to form an impermeable barrier;

(d) Continued drilling of said wells through the desired ore body;

(e) Creating an overlapping pattern of horizontally-oriented fractures in the strata around the bottom of said wells, and injecting an into said fracture and the surrounding strata a material to form an impermeable barrier;

(f) Injecting a lixiviant through a number of said wells into the ore body to solubilize the desired mineral values, and recovering the pregnant lixiviant from the ore body through a number of said wells.

4,634,188

ROTARY TOOL

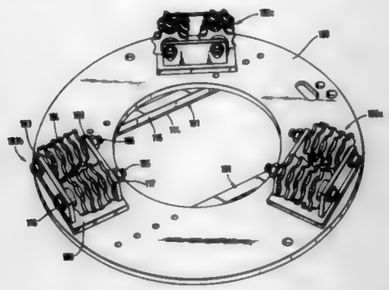
Gert Persson, Lyckeby, Sweden, assignor to Dynapac AB, Solna, Sweden

Filed Apr. 17, 1985, Ser. No. 724,007

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1984, 8412179[U]

Int. Cl.⁴ E01C *23/08*

U.S. Cl. 299—39 **10 Claims**



1. A rotary tool for attachment to a machine for working and smoothing an even surface of a base made of cement, concrete or similar hard material, the machine including a multi-wheeled vehicle for moving the rotary tool across the base from a standstill position and at least one tool drive shaft arranged on the vehicle, the tool drive shaft defining a longitudinal axis extending perpendicularly to the base to be worked and having a tool holder for holding the rotary tool for rotation about said axis, the rotary tool comprising:

a tool plate having a circular periphery;

attachment means for mounting said plate to the tool holder in a position perpendicular to said axis for rotation about said axis;

a plurality of cutter-wheel units attached to and distributed on said plate at predetermined locations thereon radially spaced from said longitudinal axis;

each of said cutter-wheel units including a frame attached to said plate, said frame including two mutually parallel bracket-like legs extending downwardly from said tool plate so as to be perpendicular thereto and approximately tangential to said periphery; and, two mutually parallel axles mounted in said legs so as to define respective rotational axes parallel to said plate; and,

each of said cutter wheel units further including a plurality of cutter wheels each of which has a plurality of abrading tips for abrading and smoothing the base, said cutter wheels being grouped into two groups mounted on respective ones of said axles so as to rotate freely about said rotational axes as said plate rotates about said longitudinal axis and said cutter wheels abrade and smooth said base; and,

said axles being spaced laterally from and being substantially parallel to a radius passing through said longitudinal axis thereby causing said abrading tips to also abrade and smooth the base when said machine is in said standstill position.

4,634,189

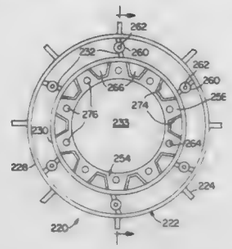
WHEEL HUB INCLUDING STRUCTURE FOR ATTACHMENT OF ACCESSORIES

Charles E. LeBlond, and Henri LeBlond, both of St. Bruno, Canada, assignors to Hamelin Industries, Inc., Warsaw, Ind.

Continuation-in-part of Ser. No. 393,069, Jun. 28, 1982, Pat. No. 4,508,392. This application Jan. 24, 1985, Ser. No. 694,953

Int. Cl.⁴ B60B *5/02*

U.S. Cl. 301—63 PW **17 Claims**



10. A wheel hub having an improved structure for mounting at least one accessory thereto, said wheel hub comprising: a hollow cylindrical body; radially acting coupling means including a plurality of alternating recesses and ridges formed interiorly of said hollow body for complementary engagement with a portion of said accessory for rotation in unison with said wheel hub; and axially acting coupling means for holding said accessory substantially against axial movement relative to said wheel hub; wherein said hollow cylindrical body has an internal diameter at least as great as the maximum radial extent of said accessory for receiving said accessory therewithin and further includes an opening in at least one end thereof for receiving said accessory therethrough, and wherein said bosses extend axially over a major fractional portion of said hollow hub interior.

4,634,190

HYDRAULIC BRAKE SYSTEM WITH SLIP CONTROL

Hans Wupper, Friedrichsdorf, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

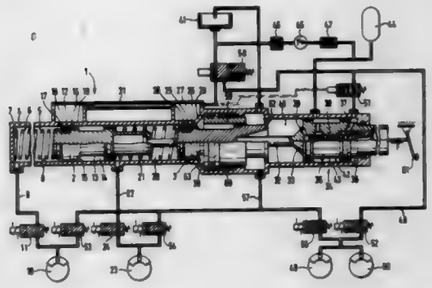
Continuation of Ser. No. 544,635, Oct. 24, 1983, abandoned. This application Feb. 10, 1986, Ser. No. 828,571

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1982, 3240404

Int. Cl.⁴ B60T *8/32, 13/12*

U.S. Cl. 303—114 **2 Claims**

1. In a hydraulic brake system with slip control for motor vehicles, including a master cylinder with a hydraulic brake booster arranged in front of the master cylinder, with at least one static brake circuit connected to the master cylinder and with a dynamic brake circuit connected to a pressure chamber of the hydraulic brake booster, with valves connected in the brake circuits for the control of wheel cylinder pressures during slip control, and with a gasket at the master cylinder piston, said gasket acting as check valve for supplying pressure medium from the dynamic brake circuit into the static brake circuit by means of pressurization of the face of the master cylinder piston adjacent the brake pedal, said master cylinder piston face alternatively connected to the dynamic brake circuit or to an unpressurized return reservoir by means of a electromagnetic switch-over valve, the invention wherein upon pressurization of the face of the master cylinder piston, a throttle is connected from the booster pressure chamber to the dynamic brake circuit and to said switch-over valve so as to divide and throttle the pressure medium supply from the



booster pressure chamber to the dynamic circuit and to the static brake circuit wherein the throttle is a component of a pressure-dependent 2/2-way valve which will switch from free passage into a throttling position upon pressurization of the face of the master cylinder piston, and

the 2/2-way valve is electromagnetically operable and recieves the same switch signals as the electromagnetic switch-over valve.

4,634,191

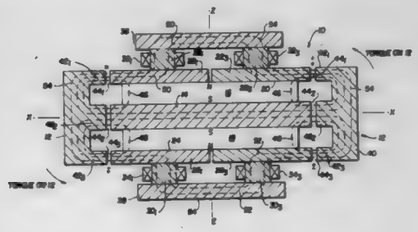
RADIAL AND TORSIONALLY CONTROLLED MAGNETIC BEARING

Philip A. Studer, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

Filed Nov. 21, 1985, Ser. No. 800,193

Int. Cl.⁴ F16C *39/06*

U.S. Cl. 310—90.5 **20 Claims**



1. An active magnetic bearing system for producing both radial and torsional forces on a suspended body, comprising:

an inner generally circular stator member having a plurality of peripheral outer surfaces defining a set of curvilinear exterior pole faces;

an outer annular magnetically permeable ring member coaxial with said stator member about a longitudinal axis and having a like plurality of inwardly projecting rims including surfaces defining a like set of curvilinear interior pole faces disposed opposite said set of exterior pole faces of said stator member and being separated therefrom by respective circumferential air gaps;

said stator member further being comprised of at least one permanent magnet member lying in a plane perpendicular to said longitudinal axis and providing a substantially uniform DC magnetic flux across said circumferential air gaps, a first and second set of segmented magnetically permeable members respectively located on opposite sides of said at least one permanent magnet member and including means for magnetically coupling pairs of segments of the same set diametrically to direct flux across said air gaps along first and second mutually orthogonal axes perpendicular to said longitudinal axis, flux coil means selectively energized to produce a first variable magnetic control flux alono predetermined radial paths which interacts with said DC magnetic flux to modulate radial forces across said circumferential air gaps for providing active radial stabilization of ring member about said longitudinal axis and flux coil means selectively energized to produce a second variable magnetic control flux which differentially interacts with said DC magnetic flux across said circumferential air gaps to generate torsional forces of said ring member about said first and second orthogonal axis.

4,634,192

ROLLER TOWEL APPARATUS

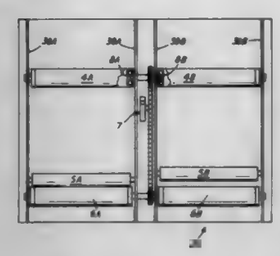
Robert M. G. Fielding, Annes, England, assignor to Dudley Industries Limited, Lytham, England

Filed Jul. 24, 1985, Ser. No. 758,509

Claims priority, application United Kingdom, Jul. 24, 1984, 8418832

Int. Cl.⁴ B65H *19/00*

U.S. Cl. 312—37 **10 Claims**



1. A roller towel dispenser arrangement comprising first and second means for mounting respective roller towels, first detecting means for detecting when a roller towel mounted in said first mounting means is exhausted, first control means responsive to said first detecting means for allowing dispensing of a roller towel mounted in said second mounting means, second detecting means for detecting when said second roller towel is exhausted, and second control means responsive to said second detecting means for allowing dispensing of a roller towel mounted in said first mounting means.

4,634,193

CABINET FOR STORING SMALL PARTS SUCH AS BOLTS SCREWS OR THE LIKE

Mike Liu, 2nd Fl., No. 442, Chang Chuen Road, Taipei, Taiwan

Continuation-in-part of Ser. No. 684,854, Dec. 21, 1984, abandoned. This application Jul. 25, 1985, Ser. No. 758,775

Int. Cl.⁴ A47B *87/02*

U.S. Cl. 312—107 **1 Claim**

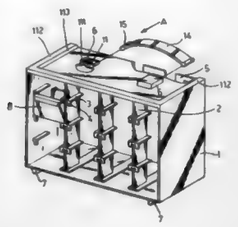
1. A cabinet for storing small parts such as bolts, screws or the like, comprising:

(a) a framework including a top wall, a bottom wall and two sidewalls, each sidewall being provided with a plurality of horizontal flanges on an inner surface thereof, with the top of the framework being provided with raised edges having inclined surfaces;

(b) a plurality of vertical panels disposed between the top and bottom walls of the framework, each side of each vertical panel being provided with a plurality of horizon-

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tal supporting strips, with each strip including a stop extending from a front end thereof;
(c) a plurality of drawers slidably receivable within the framework along the horizontal flanges and supporting strips;
(d) supporting means provided on the bottom wall of the framework and including two parallel legs and a transverse rod connecting the legs, the legs and transverse rod being each provided with an inclined surface;
(e) retaining means provided on the top wall of the framework and including two spaced blocks integrally formed with the top wall, each block being hollow and provided with an inclined surface and a notch in the rear of each block;



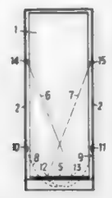
(f) a stretchable handle including two enlarged ends, each enlarged end being disposable through the notch of a coresponding block, the handle being longer than the distance between the two blocks so as to permit the handle to be disposed in a first position wherein a gripping space is provided between the handle and the top wall, and a second position wherein the handle is disposed substantially flat with the enlarged ends being inserted within the blocks; and
(g) the inclined surfaces of the raised edges being configured for corresponding engagement by the inclined surfaces of the legs, and the inclined surface of the transverse rod being configured for corresponding engagement with the inclined surfaces of the blocks so as to permit the stable stacking of one cabinet on another.

4,634,194

CABINET WITH ROLL FRONT TO BE OPENED IN THE UPWARD DIRECTION

Johann Svoboda, Purkersdorfer Strasse 58, A-3100 St. Polten, Austria

Filed Aug. 2, 1985, Ser. No. 761,710
Int. Cl.[4] A47B *96/20*
U.S. Cl. 312—297 **4 Claims**



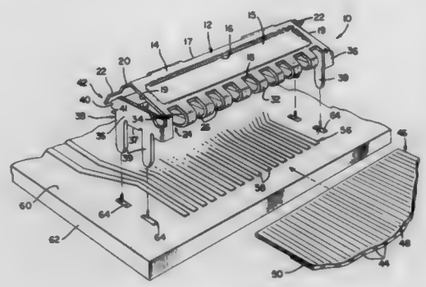
1. A cabinet with a roll front to be opened in the upward direction, the roll front having a completely closed position in which most of the roll front is disposed from top to bottom of the cabinet along the front of the cabinet and a completely open position in which most of the roll front is disposed from top to bottom of the cabinet along the rear of the cabinet, first tension spring means interconnecting the roll front and the cabinet and so disposed along the path of movement of the roll front as to resist movement of the roll front to a said completely open position, and second spring means interconnecting the roll front and the cabinet and so disposed as to resist movement of the roll front to said fully closed position, said first spring means being connected to the cabinet at a location spaced a substantial distance from the location at which said second spring means is connected to the cabinet, in the direction of closing movement of the cabinet.

4,634,195

ELECTRICAL INTERCONNECTION DEVICE

John R. Shoemaker, Reidsville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 20, 1985, Ser. No. 747,092
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—17 F **16 Claims**



1. An electrical interconnection device for interconnecting conductors in an array to circuitry on the surface of a substrate, the device comprising a unitary spring metal member, the spring metal member further comprising:
first means for securing the spring metal member to the substrate;
a formed metal body having a first section and a second section joined by an intermediate bight, the first and second sections being relatively inclined about an acute included angle in a first position, the first and second sections being mutually relatively deflectable about the bight to a second position in which the relative inclination therebetween is less than in the first position, and
a lock depending from the first section for retaining the first and second sections in the second position, energy being stored in the body in the second position, whereby upon positioning the array of conductors between the second body section and the circuitry on the substrate and deflecting the first section to the second position to engage the lock, the stored energy is transmitted through the second section to the conductor array to maintain a normal force electrical contact between the conductors in the array and the circuitry on the substrate.

4,634,196

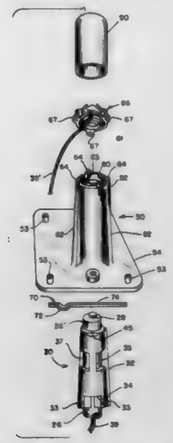
VISOR MOUNTING BRACKET

David E. Nestell, Wyoming, Mich., assignor to Prince Corporation, Holland, Mich. and David E. Nestell, Wyoming, Mich.

Filed Feb. 10, 1984, Ser. No. 579,084
Int. Cl.[4] H01R *39/00*
U.S. Cl. 339—5 R **5 Claims**

1. A snap-in visor mounting system comprising:
a socket defined by a generally cylindrical collar with an internal longitudinally extending keyway for receiving a visor rod therein, said socket further including integral flange means extending radially outwardly from an open end of said collar for mounting said socket to a vehicle with one side of said flange adjacent said collar facing upwardly, said flange including a spring receiving recess formed therein in a side opposite said one side;

a spring removably mounted within a recess of said flange and including a leg extending across a chordal segment of the opening of said socket, said spring deflectable to urge against a visor rod when inserted in said socket for holding the rod within said socket;
holding means secured to said flange and engaging a side of said spring opposite said flange for holding said spring within the said recess wherein said holding means comprises a cover member extending at least over said spring



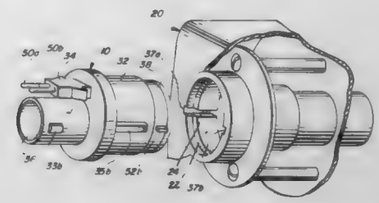
receiving recess for holding said spring within said recess; and
a visor mounting rod with an end shaped to extend into said opening of said socket and having an axially extending surface positioned such that said spring engages said surface for holding said rod within said housing and wherein said mounting rod includes a molded-on torque fitting with a longitudinally extending flange which extends into said longitudinally extending keyway for preventing rotation of said torque fitting within said socket.

4,634,197

VACUUM CLEANER HOSE ADAPTER

Albert F. Horlacher, Jr., 420 N. Fleming Rd., Woodstock, Ill. 60098

Filed Dec. 27, 1985, Ser. No. 813,713
Int. Cl.[4] H01R *31/06*
U.S. Cl. 339—16 R **24 Claims**



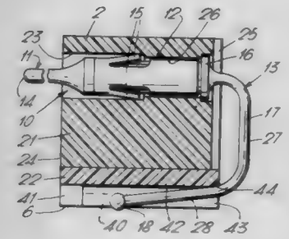
1. A vacuum cleaner hose adapter for use with a vacuum cleaner having a hose receptacle with electrical contacts therein, comprising:
(a) a generally cylindrical housing, said housing having means at one end for being received in and lockingly engaging the electrified vacuum cleaner hose receptacle, and means at the other end thereof for engaging a vacuum cleaner hose, said housing communicating suction developed in the vacuum cleaner to the hose engaged with said other end of said housing;
(b) connector means at said other end of said housing for receiving a mating electrical connector on a vacuum cleaner hose;
(c) said housing comprising a single-walled generally cylindrical member made of a non-conductive material and having a pair of longitudinally extending bores formed therein;
(d) a pair of electrical conductors running within said pair of bores, said pair of electrical conductors terminating in a pair of electrical contact members projecting outwardly at diametrically opposed side wall locations on said housing, and said electrical contact members being located so as to electrically contact mating electrical contacts within said vacuum cleaner hose receptacle when said one end of said housing is received in said hose receptacle;
whereby electrical energy is supplied from a vacuum cleaner to said mating electrical connector on said vacuum cleaner hose via said electrical conductors when said housing is received in said hose receptacle of the vacuum cleaner.

4,634,198

ELECTRICAL CONTACT ASSEMBLIES AND COMPONENTS

Derek A. Rush, London, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Sep. 12, 1985, Ser. No. 775,184
Claims priority, application United Kingdom, Sep. 22, 1984, 8424041
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—17 LC **7 Claims**



1. An electrical contact assembly comprising an insulative housing having a lower surface that is arranged for mounting on the surface of an electrical circuit board and at least one contact element having one end supported by the housing, the other end of the or each said contact element being of circular section along the major part of its length, the said other end being bent back beneath itself along the lower surface of the housing, said other end of the or each said contact element contacting and being joined to a respective conductive region on the surface of the electrical circuit board by means of a settable, electrically-conductive joint material, the said other end of the or each said contact element having an enlarged portion of substantially spherical shape, the housing including a plurlity of walls that extend along the lower surface of the housing and define respective channels therebetween along the said lower surface of the housing, and each said channel having a roof that is rounded to receive the said enlarged spherical portion of a respective contact element so that the said joint material flows over and around the said enlarged spherical portion to substantially fill any space between the said enlarged portion and the respective channel in which said enlarged portion is located.

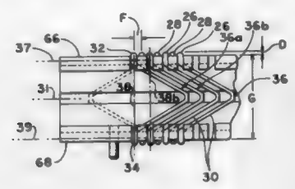
VOL 1074 ISS 1 JA 6 1987 UMI

4,634,199

CONNECTOR ASSEMBLY FOR MAKING MULTIPLE CONNECTIONS IN A THIN SPACE

John W. Anhalt, Orange; David S. Goodman, Mission Viejo, and Gerald J. Selvin, Huntington Beach, all of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Jan. 22, 1985, Ser. No. 693,408
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—17 M **3 Claims**



1. A connector apparatus for fitting in the small space between a panel and a circuit board to electrically connect a multiplicity of closely-spaced conductors of the panel to a multiplicity of corresponding contacts of a circuit board, comprising:

a row of contact elements, each having first and second opposite ends and a middle, each element being bent so the middle is out of line with the ends to enable compression to allow the ends to resiliently move together and apart;

means for holding said elements spaced apart along said row with said first ends being spaced apart along a first row line, said second ends being spaced apart along a second row line, said middles being spaced apart along a third row line, and said first, second and third row lines lying in substantially the same plane; and

the bent middles of said elements which lie in said row are nested in one another; and

said means for holding includes a largely beam shaped housing having a center rib and opposite flanges, each of said flanges having an elongated recess beside the rib, and said means for holding also include a retaining plate that has opposite sides that lie in said recesses, each of said flanges having a row of spaced openings for receiving the ends of said contact elements, said openings being connected to said recess, and said row of elements lie between said retaining plate and said center rib, with the ends of said elements projecting through said openings in said flanges.

4,634,200

LOW PROFILE STACKING CONNECTOR FOR PRINTED CIRCUIT BOARDS

Helen Dechelette, Paris, France, assignor to Molex Incorporated, Lisle, Ill.

Filed Jul. 29, 1985, Ser. No. 759,778
Claims priority, application United Kingdom, Aug. 11, 1984, 8420472
Int. Cl.[4] H05K *1/00*
U.S. Cl. 339—17 M **15 Claims**

1. A low profile stacking connector adapted for mounting to a first printed circuit board to provide electrical connection between said first printed circuit board and a pin connector extending in a predetermined direction and electrically associated with a second printed circuit board which is parallel to and spaced apart from said first printed circuit board, said stacking connector including:

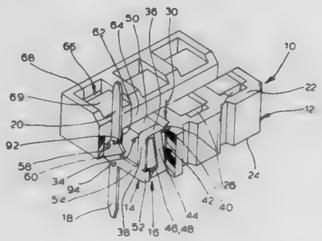
a housing having a top surface and a bottom surface, at least one of said surfaces defining a board mounting surface for mounting on a first side of the first printed circuit board, and a pin receiving passageway; and

a stamped integral terminal mounted in said housing, having a resilient female portion mounted in said pin receiving passageway and being adapted to electrically mate with the pin connector as the pin connector is advanced in the predetermined direction, a board engaging portion extending out of the board mounting surface for electrical connection to said first printed circuit board, and means for retaining said terminal within said housing;

the improvement in said stacking connector comprising:

said resilient female portion including a spring-like cantilevered finger member struck out to extend obliquely relative to said predetermined direction;

said terminal being formed from flat, metal stock and including an interconnecting member interconnecting the female portion to the board engaging portion, said female portion of said terminal including a support member from which said finger member depends, and said support member cooperating with said housing to define said retaining means;



said support member including a generally U-shaped portion and said housing further including shoulder means for engaging said U-shaped portion;

said board engaging portion disposed in a first plane perpendicular to said first printed circuit board and said U-shaped portion disposed in a second plane generally perpendicular to said first plane and said printed circuit board; and

said retaining means including a second generally U-shaped terminal support portion interconnected with said board engaging portion by said interconnecting member; and

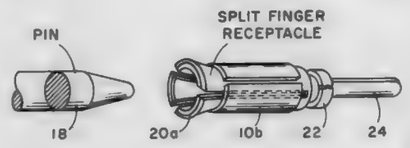
a second housing shoulder means which engages the second U-shaped portion.

4,634,201

CONNECTOR/NITINOL Δ CONTACT FORCE DEVICE

Rudy F. Kemka, Hillsdale, N.J., assignor to The United States of America as represented by the Department of the Navy, Washington, D.C.

Filed May 7, 1984, Ser. No. 607,477
Int. Cl.[4] H01R *13/20*
U.S. Cl. 339—30 **3 Claims**



1. An electrical connector arrangement comprising:

a pin;

a socket receiving said pin; and

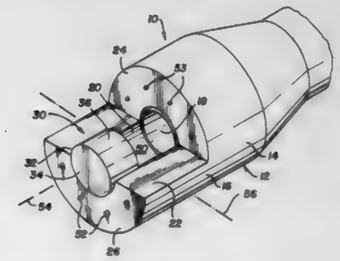
enclosing means comprising a wire helix, said enclosing means for being placed over said socket and having a common axis with said socket, said enclosing means for having a uniqueness of material so that after insertion of the pin in the socket at a predetermined temperature lower than ambient and cold enough so that said material is in its martensite phase the material is permitted to return to ambient temperature which places the material in its austenite phase and said enclosing means in said austenite phase for gripping said socket and pin so that the separation force of the pin from the socket is much greater than the insertion force, said enclosing means further having a uniqueness of material for being returned to said martensite phase upon said enclosing means being returned to said predetermined temperature.

4,634,202

COUPLING SYSTEM, ESPECIALLY FOR A CONNECTOR

Derek Taylor, Canterbury, England, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 17, 1984, Ser. No. 581,474
Claims priority, application United Kingdom, Feb. 22, 1983, 8304942
Int. Cl.[4] H01R *25/00*; G02B *6/36, 7/26*
U.S. Cl. 339—49 R **21 Claims**



1. A hermaphroditic coupling member comprising:

a body having an exterior surface and a longitudinal axis;

a mating surface defining a portion of said exterior surface, said mating surface adapted to mate with a complementary mating surface on an identical coupling member;

first and second locking conformations provided in said body and engageable with identical first and second locking conformations in said identical coupling member such that said first locking conformation of said coupling member engages the second locking conformation on said identical coupling member and said second locking conformaiton of said coupling member engages the first locking conformation on said identical coupling member; and

resilient means mounted in said body and urging one of said first and second locking conformations into a first position at which it is operable to engage the respective locking conformation on said identical coupling member, said one of said first and second locking coformations being movable against said urging of said resilient means along said longitudinal axis into a second position at which it is operable to release the respective locking conformation of said identical coupling member, said one of said first and second locking conformations being moved into its second position upon limited movement of said coupling member along said longitudinal axis away from said identical coupling member after said coupling members are mated, whereby said coupling member is disengaged from said identical coupling member.

4,634,203

UNIVERSAL INTERNAL LATCH AND LOCK D SHELL CONNECTOR

Robert W. Noyes, Framingham, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

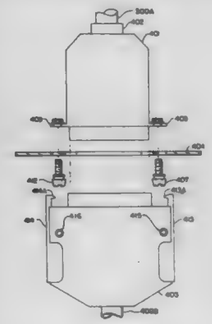
Filed Jun. 27, 1985, Ser. No. 749,243
Int. Cl.[4] H01R *13/639*
U.S. Cl. 339—91 R **7 Claims**

1. An apparatus for connecting an electrical cable having a first D-type electrical connector assembly with an electrical cable having a second D-type electrical connector assembly comprising in combination:

(a) a bulkhead for mounting and latching said first D-type electrical connector assembly, said bulkhead having at least one first aperture for permitting a portion of one of said first or second D-type electrical connector assemblies to protrude through said bulkhead and further including second apertures;

(b) a first flange on said first D-type electrical connector assembly having threaded inserts pressed into said first flange;

(c) at least one cylindrical bud-stud having a head and tail section with a smooth cylindrical undercut section between said head and tail section, said tail section having external threads for mating through said second apertures on said bulkhead with said threaded inserts on said first flange, and latching said first D-type electrical connector assembly to said bulkhead, said head section having a portion of its head section countersunk and internal threads therein; and,



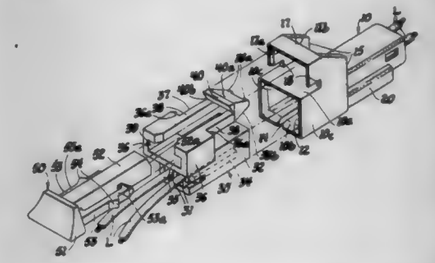
(d) a second flange on said second D-type electrical connector assembly having at least one captive-threaded insert for mating with said internal threads of the head-section of said bud stud, whereby said first and second D-type electrical connector assemblies are latched and locked onto said bulkhead and to each other.

4,634,204

ELECTRICAL CONNECTOR WITH CONNECTOR POSITION ASSURANCE/ASSIST DEVICE

Gary C. Detter, Berlin Center; Samuel A. Norling, New Middletown; Janet S. Penney, Warren, and Emil J. Toinar, Jr., Cortland, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 24, 1985, Ser. No. 813,054
Int. Cl.[4] H01R *13/639, 13/64*
U.S. Cl. 339—91 R **3 Claims**



1. A connector device for electric circuit terminals including

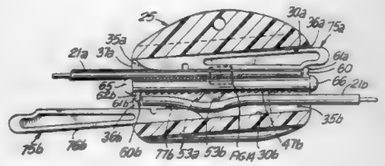
a matable female connector and male connector and a connector position assurance and assist device, said female connector having spaced apart a top wall, a bottom wall and side wall means defining a socket at its inboard mating end, and stepped support extensions extending upward from said side wall means relative to said top wall and a lock bar extending therebetween so as to define with said top wall open window means of a predetermined height, a portion of said stepped support extensions defining a first set of shoulders; said male connector having a plug means at its inboard mating end for engagement into said socket, said male connector further including a wall means upstanding from the outboard end of said plug means with resilient lock arm means extending therefrom so as to overlie said plug means in spaced relationship thereto and defining with said wall means an inverted T-shaped slot that includes a guide track next adjacent to said wall means, said resilient lock arm means including a lock arm at its free end adapted for locking engagement with said lock bar when said male and female connectors are fully mated, said wall means defining a second set of shoulders facing said inboard mating end of said male connector which are in spaced apart relationship to said first set of shoulders when said connectors are mated; said connector assurance and assist device including an enlarged push head with a shank extending therefrom of a predetermined height and axial extent slidably received by said slot whereby the free end of said shank is operative to effect and retain locking engagement of said lock arm with said lock bar and, said connector assurance and assist device further including side guide and resilient lock tab means, including outward extending tapered lock tabs, positioned on opposite sides of said plug means so as to be slidably received in said guide track whereby when said connector assurance and assist device is operatively connected to said male and female connectors, said tapered lock tabs are operatively positioned between said first and second sets of shoulders to effect axial retention of said connector assurance and assist device while being positioned so as to permit manual release of these tapered lock tabs to allow disassembly of said connector device.

4,634,205

CONDUCTOR SPLICING DEVICES

Richard J. Gemra, Millington, N.J., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Dec. 6, 1984, Ser. No. 678,919
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—97 P **4 Claims**



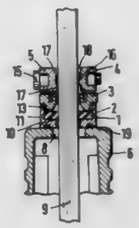
1. The improvement in a device for making an electrical connection to an electrical conductor comprising at least one wire jacketed by insulation, in which said device comprises:
(a) an insulative housing having formed therein a longitudinal through channel bounded on laterally opposite sides thereof by a backing wall and by a ramp wall at an acute angle to said backing wall so that said channel at its longitudinal opposite ends of said ramp wall is relatively wider and narrower,
(b) an electrical insulation-piercing terminal projecting from said backing wall into said channel,
(c) conductive means for connecting said terminal to other electrical means, and
(d) a wedge drivable into said channel through its opening for the wider part thereof so as to produce piercing by said terminal of the insulation of said conductor when inserted into said channel through the opening for the narrower part thereof and, thereby, the making of electrical contact between said terminal and said wire, and in which said improvement comprises:
(e) a transverse rib which is longitudinally spaced away from said terminal towards said opening, and which laterally projects from said backing wall into said channel, said rib being supported in cantilevered relation from said backing wall so that the outer end of said rib is resiliently deflectable longitudinally and inwardly relative to such wall, and
(f) a rearwardly facing shoulder formed on the inner side of said wedge adjacent the back end thereof,
(g) said wedge being drivable into said channel to position said shoulder forward of said rib, and said shoulder being thereafter adapted by contact with such rib to impede withdrawal of said wedge from said channel.

4,634,206

APPARATUS FOR INSERTING A FLAT CABLE

Dietmar Harting, Espelkamp; Hans Nagel, Porta Westfalica, and Günter Piewitt, Lübbecke, all of Fed. Rep. of Germany, assignors to Harting Elektronik GmbH, Espelkamp, Fed. Rep. of Germany

Filed Sep. 4, 1985, Ser. No. 772,595
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1984, 8427559[U]; Apr. 20, 1985, 8511822[U]
Int. Cl.[4] H01R *13/58*
U.S. Cl. 339—103 M **24 Claims**



1. Apparatus for securing a flat cable means into an opening in a connector housing, comprising a mounting-part means having an opening through which said flat cable means passes, said mounting-part means and said connector housing being integrally formed as one part, said mounting part means having posts on opposite sides of said opening, said mounting-part means having a rim-shoulder-groove disposed about said opening, a resilient seal means disposed in said rim shoulder-groove, said resilient seal means having an opening with a configuration corresponding generally to the cross sectional configuration of said flat cable means, and stress-relief clamp means secured to said posts and disposed above said flat cable means to engage and secure said flat cable means as said resilient seal means effects a seal about said flat cable means.

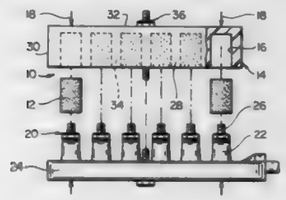
4,634,207

APPARATUS AND METHOD FOR PROTECTION OF A SUBSTRATE

Christian A. Debbaut, Cary, N.C., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 434,011, Oct. 12, 1982. This application Jun. 13, 1983, Ser. No. 504,000
Int. Cl.[4] H01R *13/52*
U.S. Cl. 339—116 C **40 Claims**

1. Apparatus for protecting a substrate, comprising:
a gel, the gel being cured prior to coming into contact with any part of a substrate to be protected, the gel having a cone penetration value of 100 to 350 (10^{-1} mm) and an ultimate elongation of at least 200%; and



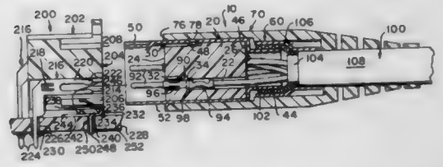
means for deforming the gel into close and conforming contact with the substrate.

4,634,208

ELECTRICAL PLUG CONNECTOR AND METHOD OF TERMINATING A CABLE THEREWITH

Lawrence A. Hall, and Daniel E. Stahl, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 691,620, Jan. 15, 1985, which is a continuation of Ser. No. 462,278, Jan. 31, 1983, Pat. No. 4,493,525. This application Mar. 25, 1985, Ser. No. 715,856
Int. Cl.[4] H01R *13/648*
U.S. Cl. 339—143 R **20 Claims**



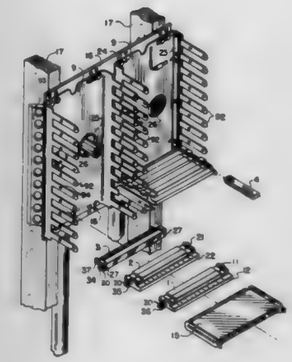
1. A shielded plug connector for electrical connection to a plurality of electrical conductors and a shield of a shielded cable, the electrical conductors having electrical terminals terminated thereon which have contact sections for mating with corresponding contact terminals of a receptacle, the plug connector having a dielectric housing means having terminal-receiving passageways therethrough whereinto the electrical terminals are insertable and securable therein, metal shell means around the housing, crimping ferrule means for crimping around a rear section means of the metal shell means to crimpingly secure the shield of the cable therebetween and for crimping around an outer jacket of the cable to secure the plug connector to the cable, and an insulating means around the metal shell means and crimping ferrule means, characterized in that:
said metal shell means is a one-piece shell member having a body section of selected diameter at least as great as the diameter of said dielectric housing means and of an axial length greater than the axial length of said dielectric housing means, and said rear section means of said metal shell means having a reduced diameter less than said diameter of said dielectric housing means, said shell member having a forwardly facing stop surface therewith proximate said rear section means; and
said dielectric housing means and said shell member are adapted such that said dielectric housing means is insertable into said shell member from the front thereof and securable therewithin against said stop surface thereof prior to insertion into passageways thereof of the electrical terminals terminated to said plurality of electrical conductors of the shielded cable.

4,634,209

MODULAR PLUG CONNECTOR

Horst Forberg; Gunter Hegner; Peter Achtnig, and Bernd Delakowitz, all of Berlin, Fed. Rep. of Germany, assignors to Krone GmbH, Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 442,561, Nov. 18, 1982, abandoned. This application Jun. 14, 1985, Ser. No. 745,319
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1982, 3201894
Int. Cl.[4] H01R *3/00, 13/74*
U.S. Cl. 339—147 R **29 Claims**

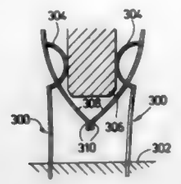


1. A modular plug connector for a multiplicity of cable conductor wires for communication apparatus, particularly for use in trunk distribution systems, said plug connector being adapted to be mounted to a back mount frame having at least one oppositely disposed pair of upstanding tabs, said connector comprising:
an elongated ground module formed with slot means and first slideable connector means at either end, each said slot means being adapted to slidingly engage one of said frame tabs, said ground module further being formed with wire guide means for receiving and guiding said conductor wires;
an elongated jumper wire connection module formed with slot means and second slideable connector means at either end, each said slot means being adapted to slidingly engage one of said frame tabs, said jumper wire connection module being positioned adjacent said ground module on said frame;
a multiplicity of first termination elements in said jumper wire connection module, each said termination element comprising a stripless, solderless, non-screwed terminal for each said cable wire; and
a wire guide insert having a plurality of guide means, each guide means being adapted to receive a pair of jumper wires, said wire guide insert being formed with third slideable connector means on opposite ends, said third slideable connector means being shaped and configured to slidingly engage said first and second slideable connector means, whereby said wire guide insert interconnects said ground and jumper wire connection modules;
said first termination elements also comprising a stripless, solderless, non-screwed terminal for connection to each jumper wire independently of said cable wires.

4,634,210
ELECTRICAL CONNECTORS

Gregan F. Crawford, Edinburgh, Scotland, assignor to Hewlett Packard Company, Palo Alto, Calif.

PCT No. PCT/GB85/00123, § 371 Date Nov. 25, 1985, § 102(e) Date Nov. 25, 1985, PCT Pub. No. WO85/04528, PCT Pub. Date Oct. 10, 1985
PCT Filed Mar. 28, 1985, Ser. No. 807,099
Claims priority, application United Kingdom, Mar. 28, 1984, 8407948
Int. Cl.⁴ H01R 13/11
U.S. Cl. 339—176 MP 8 Claims



7. A connector for electrical attachment to a printed circuit board and comprising a pair of electrically-conductive resiliently-flexible elements arranged to be mounted in face-to-face relationship, each element comprising a bridge portion (620) and first and second elongate portions (610, 600) in side-by-side relationship and integrally-formed with said bridge portion, the first elongate portion being formed as a leaf-spring (610) arranged to electrically contact the opposed element, and each element further comprising a laterally-extending portion (630) facing the other element so that a printed circuit board can be inserted between the two elements firstly to conductively engage the laterally-extending portions with conductive traces on opposite sides of the circuit board and urge them apart while electrical contact is maintained between the two elements, and so that the circuit board can be further inserted to separate the leaf-springs (610) from electrical contact with the opposed element and to establish electrical contact between the leaf-springs and said conductive traces, the connector being characterized in that

each second elongate portion (600) comprises a mounting portion (660),

and each leaf-spring (610) is of a length and shape such that as the laterally-extending portions (630) are urged apart or flex together, the end portion (670) of each leaf-spring wipes against surface portions of the opposed element to provide self-cleaning of the contacting surfaces.

4,634,211
WIRING DEVICE SYSTEM WITH SINGLE SCREW SUBASSEMBLY

John M. Poliak, East Meadow; Juan M. Lopez, Jamaica, and Robert W. Gritz, Little Neck, all of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,631
Int. Cl.⁴ H01R 33/72
U.S. Cl. 339—196 M 12 Claims

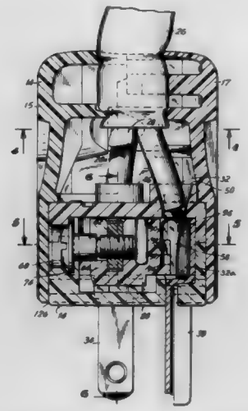
1. An electrical wiring device comprising in combination:

a housing shell,

an assembly carried by said shell, said assembly including electrical contacts capable of mating engagement with other electrical contacts, receiving means formed in said assembly for receiving electrical conductors having terminals, and single fastener means for holding said electrical conductors which terminate in said assembly,

said single fastener means including movable means mounted within said assembly and positioned in proximity with a portion of each of said electrical contacts, chamber means associated with said receiving means, said chamber means being formed between said movable means and said portion of each of said contacts, said chamber means being for positioning said portion of said contacts and for receiving the terminals of said conductors, and a single fastener associated with said movable means capable of moving said movable means,

said movable means being for biasing said terminals of said conductors into electrical connection with said contacts at said chamber means upon manipulation of said single fastener, said movable means including a carriage slidably mounted within said assembly, said single fastener means



including a nut engaged with said carriage having threads disposed approximately at right angles to the direction of movement of said carriage, a screw engaged within said nut having a screw head, said assembly forming an access hole in an outer wall of said assembly dimensioned to receive a screw head, and stop means connected to said screw and engaged with said assembly, said stop means being for preventing movement of said screw relative to said assembly when said screw is rotated at said screw head.

4,634,212
TERMINAL BLOCK MOUNT

Bruce K. Boundy, Holland, and Craig M. Miller, Jenison, both of Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

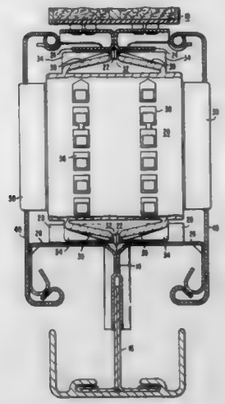
Filed Jun. 8, 1984, Ser. No. 618,629
Int. Cl.⁴ H01R 9/22
U.S. Cl. 339—198 R 7 Claims

1. A terminal block mount comprising:

frame means having a terminal block receiving aperture therein;

terminal block positioning and locking means located within said aperture at the top and bottom surfaces thereof, said positioning and locking means including detent means extending into said aperture and horizontal flange means on each side of said detent means for supporting and locating a terminal block therein; and

a terminal block, said terminal block including a pair of opposed flexible tab members on the top and bottom sides thereof, said opposed flexible tab members defining a detent receiving slot therebetween and positioning guide fins on each side of said flexible tabs, said positioning guide fins coacting with said flanges to orient and support said terminal block within said terminal block receiving

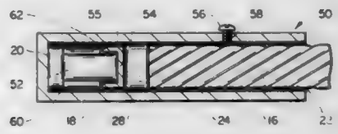


aperture when said detent means are locked in said slots between said opposed flexible tab members.

4,634,213
CONNECTORS FOR POWER DISTRIBUTION CABLES

Peter L. Larsson, Mountain View; Robert Parker, Alamo, and Thomas D. Ratzlaff, Menlo Park, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 483,997, Apr. 11, 1983, abandoned. This application Apr. 9, 1984, Ser. No. 598,557
Int. Cl.⁴ H01R 11/06
U.S. Cl. 339—275 T 29 Claims



24. A kit of parts for forming an electrically conductive connection with an electrical conductor comprising:

(a) an electrically conductive connector comprising at least one metallic tubular sleeve having an open end for receiving an electrical conductor and a closed end, the peripheral inner wall of the sleeve being pretinned; and

(b) at least one metallic tubular insert sized to be rotatably positioned in the sleeve, the inside wall of the insert being pretinned and non-circular in transverse cross-section.

4,634,214
OPTICAL FIBER CONNECTOR AND ARTICLE COMPRISING SAME

Thomas C. Cannon, Jr.; Arthur W. Carlisle, both of Dunwoody; Bruce V. Darden, Lawrenceville, and Clyde J. Myers, Stone Mountain, all of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 22, 1984, Ser. No. 623,727
Int. Cl.⁴ G02B 6/36
U.S. Cl. 350—96.20 17 Claims

16. In combination, an optical fiber cable comprising at least one coated optical fiber, and optical fiber termination means fitted to an uncoated end portion of the optical fiber, the fiber termination means comprising

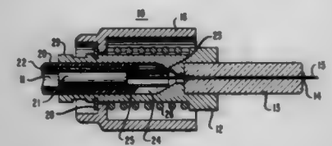
(a) at least one substantially cylindrical fiber terminus piece having a longitudinal bore, an outer cylinder surface, a diameter, and a first end face, the uncoated end portion of the optical fiber inserted into the bore and held therein; and

(b) means, acting on the outer cylinder surface, for maintaining the fiber terminus piece in substantially coaxial relationship with an opposing member;

characterized in that

(c) the fiber terminus piece comprises a pedestal projecting from the first end face, with the longitudinal bore extending through the pedestal, the pedestal consisting substantially of material having a modulus of compression between about 10^4 and about 10^6 psi at 25° C., the pedestal having a pedestal end face that is substantially parallel with the first end face and having a diameter that is smaller than the terminus piece diameter, and also having a height that is less than the pedestal end face diameter;

(d) the uncoated end portion of the optical fiber extending



through the bore in the pedestal, with the end of the optical fiber substantially flush with the pedestal end face; and

(e) the uncoated end portion of the optical fiber being held in the bore of the terminus piece by adhesive means.

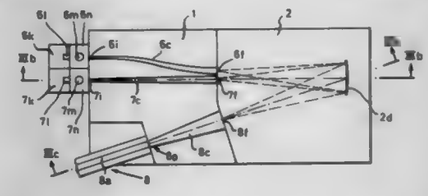
17. Combination of claim 16, wherein the optical fiber cable comprises at least one strength member disposed outwardly of the coated optical fiber, the fiber termination means comprising a connector body and means for transmitting an axial load between the strength member and the connector body, further characterized in that

the load-transmitting means comprise a tubular body inserted at least in part into the end of the optical fiber cable such that the tubular body encloses the coated optical fiber and contacts the strength member, and is attached to the strength member and to the connector body by adhesive means.

4,634,215
WAVELENGTH MULTI/DEMULTIPLEXER

Alfred Reule, Aalen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Mar. 12, 1984, Ser. No. 588,683
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309349
Int. Cl.⁴ G02B 6/36
U.S. Cl. 350—96.16 15 Claims



1. A wavelength multi/demultiplexer optically connectable to a radiation conductor having a core for conducting radiation of a predetermined first aperture, the wavelength multi/demultiplexer comprising:

a planar multimode slab waveguide having a grating formed therein; and,

transition means disposed between said radiation conductor and said grating for conducting radiation from the radiation conductor in a direction toward said grating, said

transition means having an input cross-section through which the radiation from the radiation conductor passes when entering the same;

said transition means being configured to alter the aperture of the radiation conducted therein so as to cause said radiation to impinge upon said grating at a second aperture in a plane perpendicular to the plane of said slab waveguide, said second aperture being less than said first aperture; and,

said slab waveguide having a thickness in the vicinity of said grating that is greater than the thickness of said input cross-section.

4,634,216
DEVICE FOR QUICKLY CONNECTING OPTICAL FIBERS

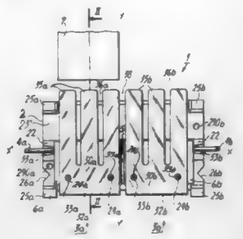
Robert Calevo, L'Hay les Roses; Vincent Dewez, Paris, and Marcel Garcia, Domont, all of France, assignors to Societe Anonyme de Telecommunications (SAT) and Societe Industrielle de Liaisons Electroiques, both of, France

Filed Jan. 5, 1984, Ser. No. 568,504

Claims priority, application France, Jan. 5, 1983, 83 00076

Int. Cl.⁴ G02B *6/36*

U.S. Cl. 350—96.21 **19 Claims**



1. A device for connecting two optical fibers, said device comprising a base member including a first major side having a fiber end-receiving groove for aligning and abutting ends of said two fibers on either side of a fiber endface connection plane, and a bent spring fastener having a flexible first portion on either side of a fastener bend above said base member first major side and a second portion contacting said base member, said flexible portion of said spring fastener having one free edge opposite said fastener bend, said flexible portion edge being accessible from one of two edges of said base member on either side of said groove to deflect only said flexible portion in front of said base member first major side when said ends of said two fibers are inserted in said groove, said second portion of said spring fastener being anchored to said base member, and said flexible portion pressing said fiber ends into said groove at least in the immediate vicinity of said fiber endface connection plane.

4,634,217
HIGH TENSILE WIRE PROVIDED WITH LIGHT GUIDE SENSOR

Friedrich K. Levacher, P.Brauweiler, and Helmut Federmann, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Felten & Guilleaume Energietechnik GmbH, Köln, Fed. Rep. of Germany

Filed Feb. 15, 1984, Ser. No. 580,546

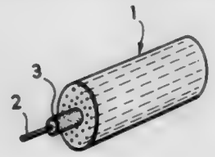
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1983, 3305234

Int. Cl.⁴ G02B *6/44;* **H01J** *5/16*

U.S. Cl. 350—96.23 **5 Claims**

1. A high-tensile wire structure comprising an outer sleeve of a fiber-reinforced resinous material; said outer sleeve enclosing a single optical fiber forming a light wave conductor; an intermediate sleeve of a heterogenous material provided between and being firmly connected with said outer sleeve and said single optical fiber; said heterogenous material including plastic or synthetic resin into which finely divided powder of glass or quartz or corundum or emery is admixed; and means for coupling the ends of said optical fiber to a light testing instrument to sense attenuation of light due to microscopic bends in said optical fiber caused by transverse pressure exerted by said heterogenous material during constriction of said wire structure.

5. A high-tensile wire structure comprising an outer sleeve of a fiber-reinforced resinous material said outer sleeve enclos-



ing a single optical fiber forming a light wave conductor; an intermediate sleeve of a heterogeneous material provided between and being firmly connected with said outer sleeve and said single optical fiber; said heterogeneous material including plastic or synthetic resin in which glass fibers coiled on said optical fiber are embedded; and means for coupling the ends of said optical fiber to a light testing instrument to sense attenuation of light due to microscopic bends in said optical fiber caused by transverse pressure exerted by said heterogeneous material during constriction of said wire structure.

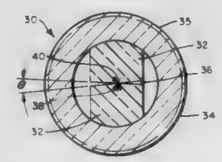
4,634,218
SINGLE MATERIAL OPTICAL FIBER AND METHOD

John W. Hicks, Jr., Northboro, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 3, 1984, Ser. No. 677,736

Int. Cl.⁴ G02B *6/16*

U.S. Cl. 350—96.30 **8 Claims**



1. An optical waveguide comprising:

means defining one cross-sectional region of light transmissive material having a preestablished nominal index of refraction and another cross-sectional region of light transmissive material having a preestablished index of refraction the same as the nominal index of refraction of said region; and

means for applying a compressive stress to said one region to raise the index of refraction of said one region, said means defining said one and another regions includes a pair of loading rails in compression against one another, a first portion of said rails being included in said one region, and a second portion of said rails being included in said another region, each said rail having a surface defining a ridge, and said ridges being in compression against one another.

4,634,219
OPTICAL LOW-PASS FILTER

Takashi Suzuki, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 634,411, Jul. 25, 1984, abandoned, which is a continuation of Ser. No. 360,692, Mar. 22, 1982, abandoned. This application Apr. 4, 1986, Ser. No. 848,895

Claims priority, application Japan, Mar. 25, 1981, 56-43440

Int. Cl.⁴ G02B *5/18;* **H04N** *5/72*

U.S. Cl. 350—162.22 **4 Claims**



1. An optical low-pass filter having a blazed diffraction grating structure arranged in an image-forming light beam, said diffraction grating structure being assymetrical and being formed of plural diffraction elements, each element comprising a first face almost perpendicular to the optical axis of the light beam, a second face inclined thereto, and a third face arranged almost parallel to said optical axis, said plural elements being arranged so that said first and second faces of said elements have a predetermined pitch.

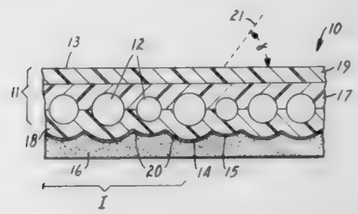
4,634,220
DIRECTIONALLY IMAGED SHEETING

Eric N. Hockert, Cottage Grove; Bruce D. Orensteen, St. Paul; Thomas I. Bradshaw, Afton, and Frank A. Borgeson, St. Paul Park, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 7, 1983, Ser. No. 464,627

Int. Cl.⁴ G20B *27/00*

U.S. Cl. 350—167 **45 Claims**



1. Directionally imaged sheeting comprising a monolayer of transparent microlenses; a layer of transparent material covering at least the back surfaces of the microlenses and extending continuously between microlenses; and at least one set of regularly repeated axial markings on the back surface of the layer of transparent material; each individual marking in a set of markings being associated with a microlens, with the center point of each individual marking being located on an axis that extends through the optical center of its associated microlens and is coordinated with the axes of the other markings in the set so that the markings are together viewable as an image from the front of the sheeting across a limited range of angles centered on said coordinated axes.

4,634,221
FOCUSING MECHANISM

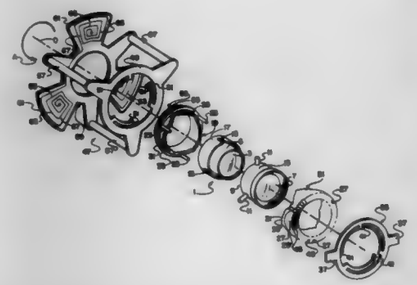
Clemens Höpfner, Stuttgart, Fed. Rep. of Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 1, 1984, Ser. No. 605,747

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1983, 3340066

Int. Cl.⁴ G02B *7/04*

U.S. Cl. 350—255 **12 Claims**



11. In a focusing mechanism of the type for a lens mounted for movement bi-directionally along an optical axis between an infinity focus position and a close-up focus position and to at least one intermediate focus position, the improvement comprising:

motion imparting means having respective positions corresponding to the focus positions of said lens and being mounted for rotation uni-directionally about the optical axis from one of its positions to the other positions and back to the first position for moving said lens between its infinity and close-up positions;

ratchet means connected to said motion imparting means for rotation with said motion imparting means about the optical axis;

first pawl means engageable with said ratchet means for rotating said ratchet means in one direction to rotate said motion imparting means uni-directionally from the first position to the other positions and back to the first position; and

second pawl means engageable with said ratchet means for preventing backward rotation of said ratchet means to prevent such rotation of said motion imparting means.

4,634,222
NATURAL-LIGHT ILLUMINATION ENHANCEMENT ASSEMBLY

Donald L. Critten, Luton, England, assignor to National Research Development Corporation, London, England

Filed Jun. 15, 1984, Ser. No. 620,925

Claims priority, application United Kingdom, Jun. 17, 1983, 8316511

Int. Cl.⁴ G02B *27/00*

U.S. Cl. 350—263 **9 Claims**

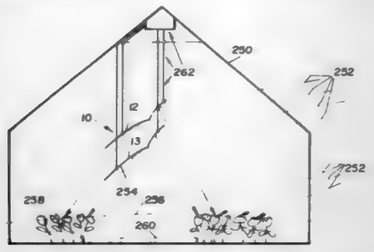
1. A natural-light illumination enhancement assembly, comprising:

a louver array including at least on louver;

each louver of said array having means defining an at least partially-reflective lower surface;

means mounting all of said louvers so as to have direct sunlight incident upon at least some of said at least partially reflective lower surface of each and for mounting each of said louvers in such relation to one another that at least some of said incident direct sunlight is reflected by each of said louvers from said at least partially reflective lower surface thereof to a notional plane disposed at a lower level than said louver array;

each of said at least partially reflecting louvers, when viewed short-edge on, comprising an inclined downwardly-facing concave first section and a lower downwardly-facing concave second section which is less-steeply inclined than the first section and having about double the length of the first section when so viewed, both the first



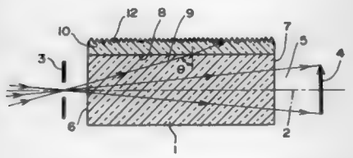
and the second sections lying on or close to respective 15° circular arcs and meeting one another at about 145° to define a downwardly-facing ridge-like portion, the vertical separtion of like parts of adjacent said louvers being about half the edge-to-edge dimensions of each said louver when so viewed.

4,634,223

PRISM WITH NO DETRIMENTAL INTERNAL REFLECTION

Toshio Ishii, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 6, 1985, Ser. No. 741,823
Claims priority, application Japan, Jun. 6, 1984, 59-114434
Int. Cl.⁴ G02B *5/04*
U.S. Cl. 350—276 SL **4 Claims**



1. A transparent prism enclosed by operative planes and inoperative planes, said prism comprising:

a solid block forming said prism and having a refractive index of n_0; and

transparent members having a refractive index of n_1 which are cemented to said inoperative planes;

each of said transparent members having a light attenuation part on its outer side and satisfying the following condition:

$$n_1 \geqq n_0 - 0.03,$$

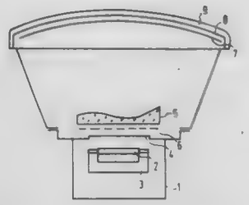
said light attenuation part having a great number of either superfine prismatic protuberances or fine acute indentations formed over the whole outer surface thereof, said outer surface being made flat by being coated with a light opaque material.

4,634,224

LOW-LOSS CORRECTION FILTER FOR MANUFACTURING THE PHOSPHOR SCREENS OF COLOR PICTURE TUBES

Bruno Fischer, Esslingen, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 24, 1983, Ser. No. 544,827
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1982, 3239559
Int. Cl.⁴ G02B *5/26*
U.S. Cl. 350—311 **10 Claims**



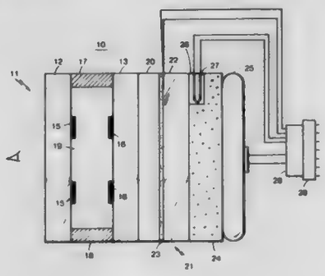
1. In a correction filter for a lighthouse for use in connection with the manufacture of color picture tubes, with one surface thereof having portions provided with a barrier layer having a defined pattern and with remaining surface portions thereof which are not provided with the barrier layer permitting the passage of light, the improvement comprising said surface portions which are not provided with the barrier layer are coated with a layer reducing the reflection of radiation and said surface portions which are provided as a barrier layer are coated with a layer increasing the radiation reflection.

4,634,225

TRANSFLECTIVE LIQUID CRYSTAL DISPLAY WITH INTEGRAL HEATING UNIT AND TEMPERATURE SENSOR

Elias S. Haim, Windham, N.H., and John E. Sunnsby, Wenham, Mass., assignors to General Electric Co., Schenectady, N.Y.

Filed Dec. 24, 1984, Ser. No. 686,065
Int. Cl.⁴ G02F *1/13*
U.S. Cl. 350—331 T **10 Claims**



1. In a heated liquid crystal display, the combination comprising:

(a) a liquid crystal cell containing a liquid crystal solution,

(b) reflector means positioned behind said cell to reflect light entering the front of the cell back through the cell,

(c) heating means located outside of the reflective light path including a heating element and a support element in heat exchanging relationship with said cell for maintaining the temperature of the solution above the minimal operating temperature of the solution,

(d) temperature responsive sensing means positioned adjacent to said heating element and in heat exchange relationship therewith to to generate an electrical signal as a function of temperature, said temperature responsive sensing means is a separate element from said liquid crystal solution and is a separate element from said heating means,

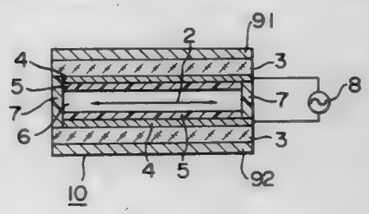
(e) said heating and support elements being constructed so that the temperature gradients between the heater element and the cell solution and the heater element and said sensing means respectively are substantially equal whereby the temperature at the sensing means essentially tracks the cell temperature.

4,634,226

OPTICAL APPARATUS USING FERROELECTRIC LIQUID CRYSTAL AND SWITCHING UNIT FOR EMITTED LIGHT

Masato Isogai; Shintaroo Hattori, both of Hitachi; Kishiro Iwasaki, Hitachiota; Akio Mukoh, Mito; Takao Umeda, and Yoshiharu Nagae, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 6, 1984, Ser. No. 597,746
Claims priority, application Japan, Apr. 8, 1983, 58-60826
Int. Cl.⁴ G02F *1/13*
U.S. Cl. 350—332 **25 Claims**



1. An optical apparatus comprising an optical device having an optically functional material sandwiched between a pair of substrates with electrodes formed on opposing surfaces, said optically functional material having such a characteristic that intensity of light emitted from said optical device changes asymmetrically in response to inversion of the polarity of an applied external field, wherein

first means for applying to said optically functional material pulse voltages of one polarity for determining the intensity of the emitted light and pulse voltages of an opposite polarity at a predetermined period so that an average voltage is zeroed within the predetermined period, and

second means for selecting or changing said emitted light intensity under the application of the pulse voltages of one polarity and said emitted light intensity under the application of the other pulse voltages.

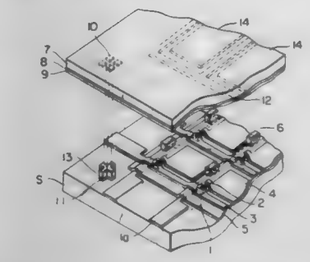
4,634,227

OPTICAL MODULATING DEVICE HAVING PROJECTION ON SUBSTRATE FOR REGISTRATION

Norihisa Nishimura; Yuko Suga, both of Tokyo; Takeshi Miyachi, Yokohama, and Yuichi Masaki, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1984, Ser. No. 632,230
Claims priority, application Japan, Jul. 22, 1983, 58-134847
Int. Cl.⁴ G02F *1/13*
U.S. Cl. 350—334 **27 Claims**

1. An optical modulating device having a layer of optical modulating substance between a pair of electrode-supporting plates, characterized in that at least one of the electrode-supporting plates is provided with a mark for registration and the other electrode-supporting plate is provided with a projection



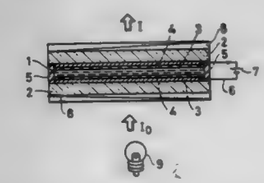
for registration at the position corresponding to that of the mark for registration.

4,634,228

FERROELECTRIC LIQUID CRYSTAL CELL WITH RUBBED POLYIMIDE ALIGNMENT LAYER

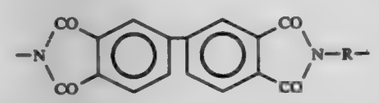
Kishiro Iwasaki, Hitachiohta; Susumu Era; Hisao Yokokura, both of Hitachi; Tadao Nakata, Katsuta, and Akio Mukoh, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 1, 1984, Ser. No. 729,420
Claims priority, application Japan, May 1, 1984, 59-86235; Jun. 8, 1984, 59-116455
Int. Cl.⁴ G02F *1/13*
U.S. Cl. 350—341 **3 Claims**

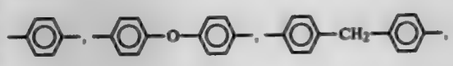


1. A ferroelectric liquid crystal cell including a pair of substrates, at least one of which is transparent; a ferroelectric liquid crystal layer sandwiched between said substrates; a pair of electrodes fitted respectively to said substrates for applying an electric field to said ferroelectric liquid crystal layer; and a pair of rubbed orientation control films formed on said respective substrates on the side contiguous to said ferroelectric liquid crystal layer, for uniformly aligning the molecules thereof, wherein said orientation control films are made of a polyimide polymer material selected from the group consisting of a polyimide polymer material having repeating units of the general formula

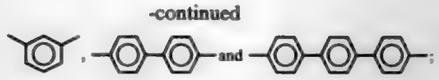
[I]



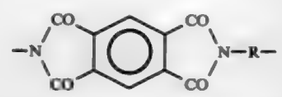
wherein R is a divalent group selected from the group consitting of



-continued

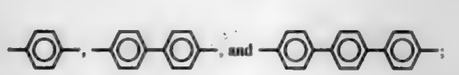


a polyimide polymer material having repeating units of the general formula

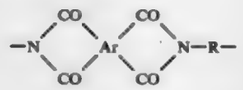


[II]

wherein R is a divalent group selected from the group consisting of

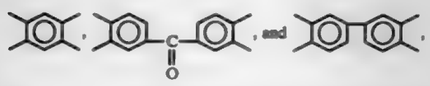


and a polyimide polymer material having repeating units of the general formula

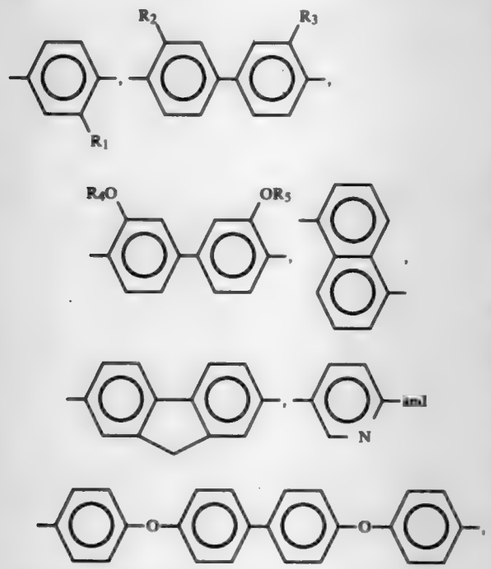


[III]

where Ar is a tetravalent group selected from the group consisting of



wherein R is a divalent group selected from the group consisting of



wherein R_1–R_5 represent lower alkyl groups.

4,634,229

LIQUID CRYSTAL DISPLAY

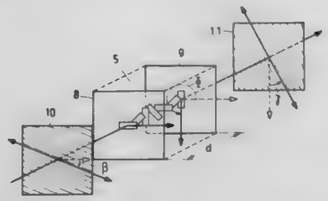
Hermann Amstutz, Mellingen; Dieter Heimgartner, Baden; Meinolph Kaufmann, Baden-Rütihof, and Terry J. Scheffer, Forch, all of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jun. 29, 1984, Ser. No. 626,380

Claims priority, application Switzerland, Jul. 12, 1983, 3819/83; Oct. 28, 1983, 5835/83

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—346 **16 Claims**



1. A multiplexable liquid crystal display comprising:
- two plane-parallel support plates which form a cell with inner surfaces and a border;
- a nematic liquid crystal filled into the cell, said nematic liquid crystal having positive dielectric anisotropy and a chiral additive;
- electrode layers formed on the inner surfaces of the support plates;
- orientation layers formed on said electrode layers, at least one said orientation layers aligning adjoining liquid crystal molecules in such a way that a local optical axis of the liquid crystal on said at least one orientation layer has a tilt angle of more than 5° with respect to the respective support plate;
- polarizing means for polarizing light that passes through said cell at least twice between entering and leaving the display;
- said support plates separated by a distance less than 10 um;
- said liquid crystal exhibiting a total twist angle ϕ in the cell the absolute value of which is greater than or equal to 180° and smaller than 360°; and
- said liquid crystal having a layer thickness (d) and a pitch (p) wherein the ratio between layer thickness (d) and pitch (p) of the liquid crystal has an absolute value greater than or equal to 0.50 and less than or equal to 0.95.

4,634,230

MULTI DIMENSIONAL INSTANTANEOUS OPTICAL SIGNAL PROCESSOR

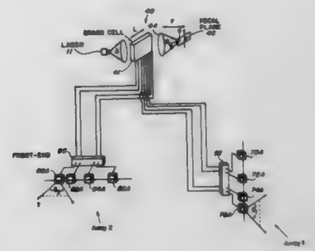
Anthony E. Spezio, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 3, 1984, Ser. No. 576,834

Int. Cl.⁴ G02F *1/33*; G01S *13/72*

U.S. Cl. 350—358 **16 Claims**

1. A three or more dimensional instantaneous optical signal processor, comprising:
- means for providing at least a first parameter set of input signals and a second parameter set of input signals from a signal emitter at intermediate frequencies;
- a focal plane with a first axis and a second axis perpendicular thereto;
- means for generating a first light pattern representing said first parameter set on said focal plane, said first light pattern having a mainlobe with a centroid, with the distance between the location of the mainlobe for the pattern and the first axis of the focal plane being proportional to the frequency of said signal emitter, and with the distance between the location of the mainlobe and a second axis in said focal plane perpendicular to said first axis being proportional to said first parameter of said signal emitter; and
- means for generating a second light pattern redundantly within said first light pattern representing said second parameter in said focal plane to thereby form a plurality of grating lobes thereon, with the distance between the location of the grating lobe in this second light pattern closest to the centroid of said first light pattern and a second pattern null boresight reference position being proportional to said second parameter.



4,634,231

GLASS FOR PANORAMIC ROOF

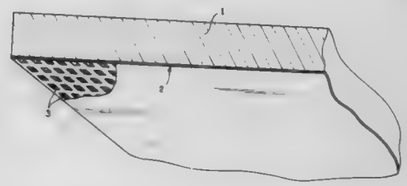
Denis Poncelet, Thourotte; Jean-Claude Coulon, Mercurey; Jacques Chaumette, Thourotte, and Pierre Letourneur, Paris, all of France, assignors to Saint-Gobain Vitrage, Aubervilliers, France

Filed Mar. 21, 1984, Ser. No. 591,848

Claims priority, application France, Mar. 23, 1983, 83 04736

Int. Cl.⁴ G02B *26/00, 5/26*

U.S. Cl. 350—311 **13 Claims**



1. A glass suitable for use as a panoramic roof for motor vehicles, comprising a tinted glass sheet coated with a network of enamel patterns, having a light transmission factor less than 30% and having an energy transmission factor less than 30%, both factors being approximately equal.

4,634,232

LIGHT SOURCE DEVICE FOR CLOSE SPACING OF TWO LIGHT BEAMS

Masamichi Tateoka, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

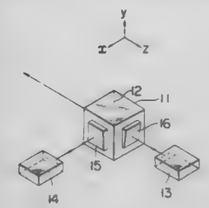
Filed Jan. 26, 1984, Ser. No. 574,123

Claims priority, application Japan, Feb. 1, 1983, 58-15678

Int. Cl.⁴ G02B *27/10*

U.S. Cl. 350—394 **3 Claims**

1. A scanning apparatus comprising:
- a polarizing beam splitter having a plurality of sides, said beams splitter adapted to include a interference film;
- first and second semiconductor lasers for supplying light beams, each having major and minor cross-sectional axes and a central ray, to said interference film from first and second sides thereof, respectively, said first and second semiconductor lasers being disposed relative to said polarizing beam splitter so that the respective major and minor cross-sectional axes of the beams are coordinated with each other after passage through said polarizing beam splitter;
- means disposed in an optical path between said first semiconductor laser and said polarizing beams splitter for rotating the plane of polarization of the incident light beam from said first semiconductor laser by approximately 90 degrees;
- means positioned between one of said semiconductor lasers and said polarizing beams splitter for varying the direction of the central ray of the light beam supplied from said one of said semiconductor lasers;
- optical means for imaging the light beams supplied, through said polarizing beams splitter, by said semiconductor lasers, on a light receiving surface; and
- means for causing relative movement between the light receiving surface and the light beams.



4,634,233

METHOD OF FORMING A LIGHT SOURCE BY THE USE OF A REFRACTIVE INDEX DISTRIBUTION TYPE LENS AND LIGHT SOURCE DEVICE

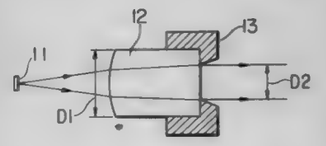
Akihiro Usami, Tokyo, and Mitsuhiro Tokuhara, Chigasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1984, Ser. No. 645,403

Claims priority, application Japan, Sep. 2, 1983, 58-162308

Int. Cl.⁴ G02B *3/00, 6/00*

U.S. Cl. 350—413 **5 Claims**



1. A method of providing a collimated a light source comprising the steps of:
- manufacturing a refractive index distribution type lens the refractive index of which on the optic axis is n_0 and the refractive index n(r) of which at a position spaced by a distance r from the optic axis is represented by

$$n^2(r) = n_0^2\{1-(gr)^2+h_4(gr)^4+h_6(gr)^6+h_8(gr)^8+\ldots\}$$

where g, h_4, h_6, h_8, ... are constants, while controlling the terms up to $h_6(gr)^6$;
- providing light beam emitting means;
- providing a member for intercepting a light beam emitted from the light beam emitting means and passing through a marginal portion, spaced from the optic axis, of said manufactured refractive index distribution type lens; and
- setting the positional relationship among the light beam emitting means, the lens, and the intercepting member such that the light beam passing through the marginal portion of the lens is prevented from mixing with a collimated light beam emerging from the lens.

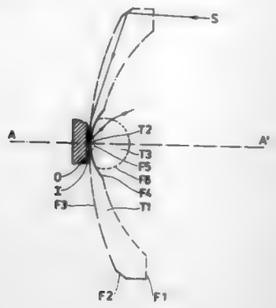
VOL 1074 ISS 1 JA 6 1987 UMI

4,634,234

FRONT LENS GROUP FOR IMMERSION MICROSCOPE OBJECTIVE IN BD VERSIONS OF HIGH APERTURE

Hans-Georg Baumann, Jena, German Democratic Rep., assignor to Jenoptik Jena G.m.b.H., Jena, German Democratic Rep.

Filed Aug. 29, 1984, Ser. No. 645,873
Int. Cl.⁴ G02B *21/10*
U.S. Cl. 350—414 **5 Claims**



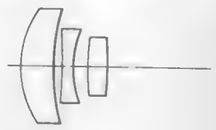
1. In a front lens group for an immersion microscope objective in BD arrangement with high aperture for dark field incident illumination, comprising a front lens (T1) having a spherical surface adapted to be immersed in the immersion, and an imaging system of first and second lenses (T2, T3), the lenses (T2, T3) of the imaging system having their surfaces of greatest curvature towards the image plane, the improvement wherein the surface of said front lens toward said immersion is continuous, the front lens having an annular rear surface in a plane normal to the axis for receiving light, and an aspherical front surface positioned for reflecting light in the direction of an object in said immersion from said annular surface.

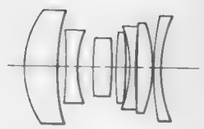
4,634,235

LENS SYSTEM CAPABLE OF CONVERTING FOCAL LENGTH BY ADDITION OF A LENS

Yoshisato Fujioka, Higashikurume, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 11, 1983, Ser. No. 522,218
Claims priority, application Japan, Aug. 11, 1982, 57-138454
Int. Cl.⁴ G02B *15/02*
U.S. Cl. 350—422 **11 Claims**





1. A lens system capable of converting a focal length, which comprises a main lens and an auxiliary lens system detachably added rearwardly of the main lens, in which the auxiliary lens system is added whereby the focal length of the resultant system is converted so as to be shorter than the focal length of the main lens, characterized in that the relation of the full length L_M of the main lens with respect to the full length L_A of the auxiliary lens system is represented by

$$L_M > L_A,$$

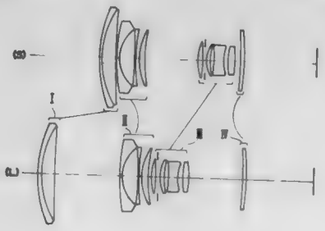
wherein said auxiliary lens system includes at least two positive lenses and at least one negative lens, and
wherein a first surface of a first lens of said auxiliary lens system on the side of said main lens is convex toward said main lens, whereby an increase in negative distortion aberration can be prevented and the length of said auxiliary lens system can be reduced.

4,634,236

COMPACT ZOOM LENS SYSTEM OF A RELATIVELY HIGH ZOOM RATIO CAPABLE OF PROVIDING A WIDE FIELD ANGLE

Hisayuki Masumoto, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 2, 1981, Ser. No. 270,150
Claims priority, application Japan, Jun. 12, 1980, 55-79932; Jul. 28, 1980, 55-104186
Int. Cl.⁴ G02B *15/163, 15/22*; G03B *17/14*
U.S. Cl. 350—427 **41 Claims**



1. A compact zoom lens system of a relatively high zoom ratio ranging to a wide field angle comprising, from object to image side:
a first lens unit of a positive refractive power;
a second lens unit of a negative refractive power, the total refractive power of the first and second lens units being negative;
a third lens unit of a positive refractive power; and
a fourth lens unit including at least a focusing lens unit of a relatively simple and lightweight construction, wherein air spaces between the first and second lens units, between the second and third lens units, and between the third and fourth lens units are changeable during a zooming mode of operation, and the focusing lens group is movable for focusing along the optical axis while the remaining part of the lens system other than the focusing lens unit is left stationary, wherein all of the first to fourth lens units are movable along the optical axis for zooming.

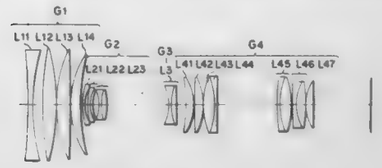
4,634,237

ZOOM LENS

Yasuhiro Aono, and Yasuo Yonezawa, both of Kawasaki, Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Jun. 26, 1984, Ser. No. 624,694
Claims priority, application Japan, Jun. 30, 1983, 58-119419
Int. Cl.⁴ G02B *15/14*
U.S. Cl. 350—427 **8 Claims**

1. A zoom lens having a high zooming ratio, a high aperture ratio and a wide angle of view comprising, in the order from the object side:
a first lens group which has a positive power and is fixed in position during zooming, second and third lens groups which have negative powers and movable during zooming, and a fourth lens group which is fixed in position during zooming;
wherein when said zoom lens is zoomed from a wide angle end to a telephoto end, said second lens group is monotonously moved along an optical axis from the side of the object to a side of an image, and said third lens group reciprocates along the optical axis; and
said zoom lens satisfies the following conditions:



$$0.68 < \sqrt{FT} \cdot fl/fT < 0.74$$

$$1.1 < |\beta 2w \cdot \sqrt{v}| < 1.3$$

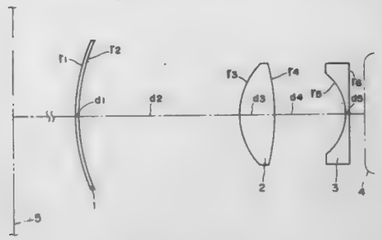
where fT is a focal length of an entire optical system at the telephoto end, FT is a minimum F number at the telephoto end, fl is a focal length of said first lens group, β2w is a magnification factor of said second lens group at the wide angle end, and v is a zooming ratio.

4,634,238

PROJECTION LENS

Takeshi Matumura, and Yoshiaki Himeno, both of Saitama, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed Feb. 14, 1985, Ser. No. 701,737
Claims priority, application Japan, Apr. 2, 1984, 59-66270
Int. Cl.⁴ G02B *9/12, 27/18*
U.S. Cl. 350—432 **13 Claims**



1. A projection lens for projecting an image on a screen, comprising from the screen side a first lens means comprising a meniscus lens with both surfaces convex relative to the screen, a second lens means of positive power and a third lens means of negative power, wherein said projection lens satisfies the following conditions:

$$0.0 < f/f_1 < 0.1 \quad (1)$$

$$1.0 < r_1/f < 9.7 \quad (2)$$

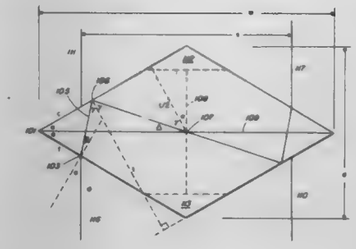
where
f: the focal length of the overall lens
f_1: the focal length of said first lens means
r_1: the paraxial radius of curvature of the screen side surface of said meniscus lens.

4,634,239

MULTIPLE PORT OPTICAL FIBER SWITCH

Carl F. Buhrer, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 3, 1984, Ser. No. 637,631
Int. Cl.⁴ G02B *26/08*
U.S. Cl. 350—486 **7 Claims**



1. A prism for exchanging the optical paths of two initially parallel beams by means of four refractions at their entry and exit points and two internal reflections per beam within said prism comprising
a homogenous transparent solid having a central axis, a first pair of opposed planar faces equally displaced from and parallel to said axis, and a second pair of opposed planar faces equally displaced from and parallel to said axis, there being one face of each pair that contains an entry point and there being the other face of each pair that contains an exit point,
there being a plane of symmetry through said prism such that said one face of said first pair that contains said entry point and said other face of said second pair that contains said exit point each forms an angle α with said plane of symmetry, and such that said other face of said first pair that contains said exit point and said one face of said second pair that contains said entrance point each forms said angle α with said plane of symmetry,
said entry points and said exit points being so oriented that a first line joining said entry point on said one face of said first pair with said exit point on said other face of said second pair, and a second line joining said exit point on said other face of said first pair with said entrance point on said one face of said second pair are parallel to each other and are each perpendicular to said plane of symmetry,
said prism being so constructed that a central ray of one of said two initially parallel beams when impinged upon said entrance point on said one face of said first pair of faces and coaligned with said first line so as to form an angle of incidence with said one face, of said first pair, of said angle α,
is refracted at an angle of refraction β toward a reflecting point on said other face of said second pair of faces, at an angle of reflection γ therewith, then
is reflected at said angle of reflection γ toward a reflecting point on said one face of said second pair of faces, at an angle of reflection of said angle γ therewith, then
is reflected at said angle of reflection γ toward said exit point on said other face of said first pair of faces and then
is refracted at said angle of refraction β to coalign with said second line, and
said prism being so constructed that a central ray of the other of said two initially parallel beams when impinged upon said entrance point on said one face of said second pair of faces and coaligned with said second line so as to form an angle of incidence, at said one face of said second pair of faces, of said angle α,
is refracted at an angle of refraction of said angle β toward a reflecting point on said other face of said first pair of

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faces at an angle of reflection of said angle γ therewith, then

is reflected at said angle of reflection γ toward a reflecting point on said one face of said first pair of faces, at said angle of reflection γ therewith, then

is reflected at said angle of reflection γ toward said exit point on said other face of said second pair of faces, and then

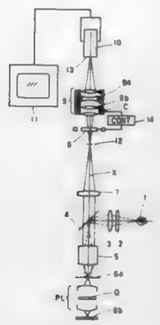
is refracted at said angle of refraction β to coalign with said first line.

4,634,240

OPTICAL APPARATUS USING POLARIZED LIGHT

Akiyoshi Suzuki, Tokyo, and Hideki Ina, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1984, Ser. No. 574,351
Claims priority, application Japan, Feb. 2, 1983, 58-15575
Int. Cl.⁴ G02B *7/11, 27/28*
U.S. Cl. 350—508 **15 Claims**



1. An optical apparatus comprising:

an illuminating system for illuminating an object with a polarized beam in a desired state of polarization;

an imaging system including means for selecting the beam polarized in the desired state of polarization and variable magnification means for changing the magnification of an image, wherein said imaging system forms an image of the object on an image pick-up surface of image taking means; and

means for changing the state of polarization of the beam in said illuminating or imaging system in accordance with the change of image magnification by said variable magnification means so as to control the quantity of light that forms the image on the image pick-up surface as the magnification of the image is changed.

4,634,241

STEREOSCOPIC MICROSCOPE

Yoshimi Kobayakawa, Yokohama, and Takashi Mazuda, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

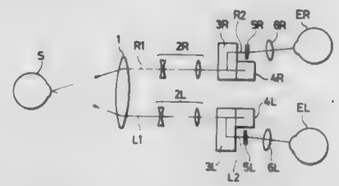
Filed Apr. 19, 1985, Ser. No. 724,883
Claims priority, application Japan, Apr. 27, 1984, 59-62402; Aug. 22, 1984, 59-127151
Int. Cl.⁴ G02B *21/22*
U.S. Cl. 350—516 **7 Claims**

1. A stereoscopic microscope comprising:

a single objective lens;

a pair of eyepieces disposed rearwardly of said objective lens;

a pair of interpupillary distance adjusting means disposed between said objective lens and said eyepieces; and



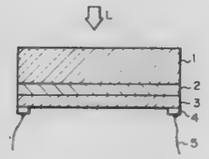
a pair of refraction type vergence adjusting means disposed between said objective lens and said eyepieces.

4,634,242

DEFROSTABLE OUTSIDE REAR VIEW MIRROR FOR AN AUTOMOBILE

Takasi Taguchi, Anjo; Yoshiki Ueno, and Tadashi Hattori, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 11, 1984, Ser. No. 619,196
Claims priority, application Japan, Jul. 11, 1983, 58-125739; Jul. 14, 1983, 58-128105; Jul. 14, 1983, 58-128106
Int. Cl.⁴ G02B *5/08, 5/28*
U.S. Cl. 350—588 **3 Claims**



1. A reflecting mirror for an automobile comprising a transparent substratum plate, a thin non-transparent vacuum deposited metal layer and a thin transparent dielectric layer on said plate, which layers are arranged adjacent to each other, said metal layer having a predetermined electric resistance, and a pair of electrodes connected to said metal layer, said metal layer being made of a metal material doped with a dielectric material and having a locally increased dope ratio at the portion of said mirror which is the most important to the driver, so as to provide said portion with a locally high electric resistance value, so that a voltage applied across said electrodes generates a large heat to remove cloudiness or frost on said portion of the reflecting surface of the mirror.

4,634,243

GLAUCOMA DETECTION UTILIZING PATTERN DISCRIMINATION TEST

Robert W. Massof, Baltimore, and John N. Maagat-Rai, Gaithersburg, both of Md., assignors to LKC Systems, Inc., Gaithersburg and Vision Research Associates, Inc., Baltimore, both of, Md.

Filed Dec. 26, 1984, Ser. No. 686,879
Int. Cl.⁴ A61B *3/02*
U.S. Cl. 351—243 **14 Claims**

12. A system for detecting eye disease and disorder comprising:

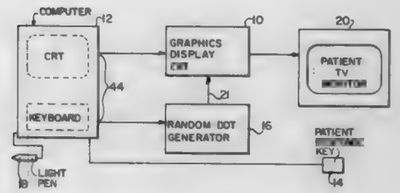
means for generating random dot data;

memory means for storing data therein;

video display means connected to the memory for displaying the stored data and having sufficient display area to cover a normal patient's field of view when the patient is placed in front of the display means;

a data register for storing data therein representing a fixed pattern;

switching means having a first input connected to the output of the data register, and a second input connected to the output of the generating means, the output of the switching means being connected to the memory means;



and a computer connected to the switching means for controlling its continuing switching operation between the data register and the generating means whereby the fixed pattern is superposed against a time varying display of random dots;

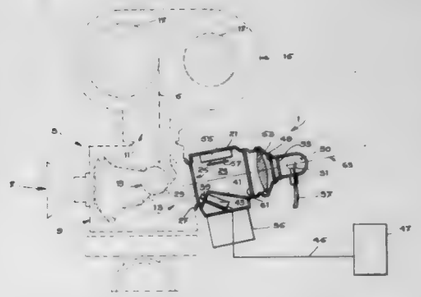
wherein a patient's inability to differentiate the fixed pattern from the random dot display being indicative of eye disease or disorder.

4,634,244

FLASHING DEVICE FOR MOTION PICTURE CAMERA

Daniel Jobin, 4136 St-Christophe, Montreal, Quebec, Canada H2L 3Y2

Filed Dec. 16, 1985, Ser. No. 809,043
Int. Cl.⁴ G03B *23/02*
U.S. Cl. 352—72 **6 Claims**



1. A flashing device attachable to a motion picture camera having a body provided with an objective lens aperture and with at least two magazine apertures over one of which may be detachably mounted a film magazine, said camera comprising a driving mechanism inside its body to move the film stored in the magazine and passing it through the one magazine aperture over which the magazine is mounted, in front of the lens aperture in order to expose the successive frames of this film to the light of a scene to be recorded, said flashing device comprising:

a casing provided with an opening closed by a ground glass;

means for detachably mounting the casing onto the body of the camera over the other magazine aperture with the opening of said casing facing said other magazine aperture;

lighting means mounted inside the casing for directing light onto the ground glass closing the opening of the casing and therefrom through said opening and its facing aperture, onto the film moving through the body of the camera in order to subject said film to a supplemental uniform exposure;

means mounted inside the casing and facing the ground glass for measuring directly onto the surface of said glass the intensity of the light directed thereto by said lighting means; and

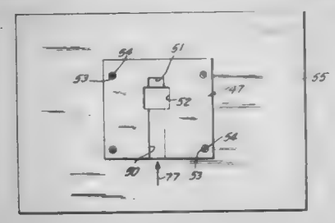
means for adjusting the intensity of said light directed onto the ground glass by said lighting means.

4,634,245

CARTRIDGE PLACEMENT HOLDER

Dwight R. Foster, and Diane Foster, both of Budd Lake, N.J., assignors to Life Key Corporation, Budd Lake, N.J.

Division of Ser. No. 561,952, Dec. 16, 1983, Pat. No. 4,577,425.
This application Dec. 17, 1985, Ser. No. 809,487
Int. Cl.⁴ G03B *1/50*
U.S. Cl. 353—95 **2 Claims**



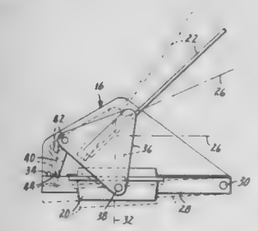
1. A cartridge placement holder comprising, a generally rectangular shaped block having two generally parallel flat surfaces, said block having a cam shaped bore formed between said flat surfaces and penetrating past the mid-point of said block to form a cartridge alignment stop, and a transverse aperture spaced from said stop intersecting said bore and penetrating both of flat surfaces, a plate attached to said block, said plate having the dimensions of a microfiche card and said block being disposed centrally thereon with one of said flat faces bearing against said plate.

4,634,246

AUTOMATIC FOCUS FOR OVERHEAD PROJECTOR

John F. Dreyer, Jr., North Oaks, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 1, 1985, Ser. No. 718,214
Int. Cl.⁴ G03B *21/30*
U.S. Cl. 353—98 **2 Claims**



1. In an overhead projector including an object plane, a projection lens disposed above the object plane and a planar mirror disposed above the projection lens and along a common optic axis, the improvement comprising:

a projection head pivotally mounting said mirror for rotation with respect to said object plane;

a frame mounting said projection lens and connected at a pivot to said projection head, said pivot being removed from said optic axis so that rotation of said frame about said pivot results in rotation and translation of said projection lens; and

linkage means for connecting said mirror and said projection lens frame so that pivoting of said mirror produces rota-

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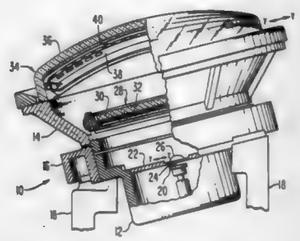
tion of said frame about said pivot and said rotation and translation of said projection lens with respect to said optic axis.

4,634,247

METHOD FOR SCREENING LINE SCREEN SLIT MASK COLOR PICTURE TUBES

Albert M. Morrell, East Hempfield Township, Lancaster County; Walter D. Masterton, Manheim Township, Lancaster County, and Richard C. Bauder, Manor Township, Lancaster County, all of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 19, 1985, Ser. No. 811,153
Int. Cl.[4] G03B *41/00*; G03C *5/00*
U.S. Cl. 354—1 **1 Claim**



1. In a method of screening a line screen slit mask color picture tube including coating a faceplate panel of said tube with a photosensitive material, inserting a slit shadow mask into said panel and exposing said photosensitive material by passing light from a line light source through the slits of said mask, positioning at least one generally cylindrical shaped lens between said line light source and said faceplate panel, during exposure of said photosensitive material, with the longitudinal axis of said lens perpendicular to the longitudinal axis of said line light source, the improvement comprising

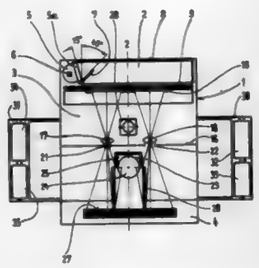
moving both said faceplate panel and said cylindrical, shaped lens in synchronization in a direction substantially parallel to the line light source during exposure of said photosensitive material.

4,634,248

PHOTOGRAPHIC CAMERA FOR PRODUCING A COMPOSITE PICTURE

Heinrich Ostermeier, Cologne, Fed. Rep. of Germany, assignor to Happycard International Limited, Shannon, Ireland

Filed Sep. 19, 1985, Ser. No. 777,745
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434634
Int. Cl.[4] G03B *15/08, 27/72*
U.S. Cl. 354—75 **25 Claims**



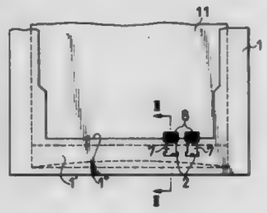
1. In a photographic camera for producing a composite picture, the camera comprising a casing including means for focusing an image of an external object or scene on a first portion of an unexposed photographic medium disposed in an image plane within the casing and a plurality of projection systems for focusing respective static thematic images, illuminated by a flash tube within the casing, on other respective portions of the medium, the improvement wherein the flash tube is located within a portion of the casing which is separated from the thematic images by a light-diffusing plate, the light-diffusing plate being located close to the thematic images for illumination thereof, and wherein the projection systems have different aperture sizes each related to the distance of the flash tube from the portion of the plate adjacent to the thematic image which is focused on the medium by the respective projection system, whereby uneven illumination of the different thematic images by the flash tube is at least partially compensated at the image plane.

4,634,249

FILM HOLDER FOR PUTTING MARKS ON FILM

Kanji Tomidokoro, Tokyo, Japan, assignor to Kansamura Photographic Co., Ltd., Osaka, Japan

Filed Apr. 9, 1985, Ser. No. 721,447
Int. Cl.[4] G03B *17/24*
U.S. Cl. 354—108 **1 Claim**



1. A photographic film holder for putting marks on film, which comprises a bottom flap forming a part of said film holder and having an inner edge, a slot formed in said bottom flap and extending downwardly of said inner edge of said bottom flap, and a marking member having marks or characters on a part thereof and positioned in said slot, said slot being shaped such that said marking member is positioned in said slot with said part of said member opposed to a photo-sensitive material within said holder and projected above said slot so that said marks or characters are photographically put on the photo-sensitive material through the exposure to a photographing light.

4,634,250

ZOOM LENS BARREL

Tamotsu Koiwai, Akigawa, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

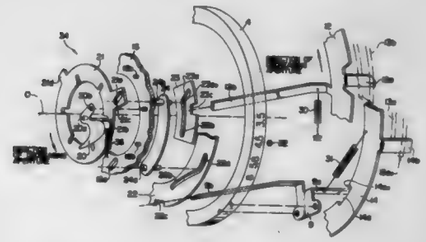
Filed Apr. 12, 1985, Ser. No. 722,527
Claims priority, application Japan, Jun. 5, 1984, 59-115172; Jan. 16, 1985, 60-5234
Int. Cl.[4] G02B *15/00*
U.S. Cl. 354—195.11 **13 Claims**

7. A zoom lens barrel of the type in which an open F-value varies with a zooming operation when a diaphragm aperture defined by a diaphragm mechanism does not vary with a zooming operation; comprising

diaphragm aperture correcting means for varying a diaphragm aperture defined by the diaphragm mechanism for the purpose of correction so as to maintain an open F-value constant over an entire zooming range;

a diaphragm ring for determining a diaphragm value to be used during a photographing operation; and

means for terminating the correcting operation by the diaphragm aperture correcting means to allow the diaphragm aperture to be open and to maintain the maximum aperture whenever the diaphragm ring is set to a given position beyond a position of the diaphragm ring which represents one, corresponding to the minimum aperture, position while discharging fluid of such charge to drain from said third compartment means.



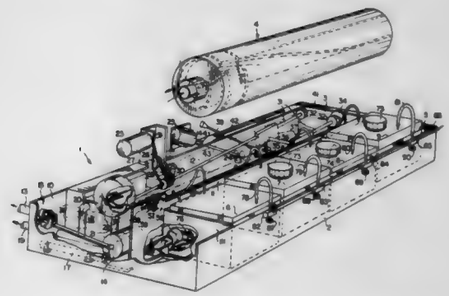
of the diaphragm values over which the open F-value can be maintained constant by the action of the diaphragm aperture correcting means.

4,634,251

APPARATUS FOR DEVELOPING PHOTOGRAPHS AND PHOTOGRAPHIC STRIPS

Johan Jonker, Enschede, Netherlands, assignor to 501 Elektrotechnisch Bureau Moekotte B V, Enschede, Netherlands

PCT No. PCT/NL82/00033, § 371 Date May 29, 1984, § 102(e) Date May 29, 1984, PCT Pub. No. WO84/01629, PCT Pub. Date Apr. 26, 1984
PCT Filed Oct. 8, 1982, Ser. No. 619,597
Int. Cl.[4] G03D *13/04*
U.S. Cl. 354—312 **24 Claims**



1. Apparatus for developing photographic film, which comprises a drum adapted to contain film to be developed, a plurality of fluid containers for the developing process, said drum having first compartment means for containing the film to be developed, second compartment means for transferring fluid therein by gravity flow to said first compartment means only in response to rotational movement of said drum from a first rotational position to a second rotational position of said drum, and third compartment means for receiving fluid by gravity flow from said first compartment means only in response to rotational movement of said drum from said first rotational position to a third rotational position of said drum and for discharging fluid from the third compartment means in response to rotational movement of said drum between said third position and said first position, control means for transferring fluid from a fluid container to said second compartment means while said drum is in said first position thereof and rotating said drum to said second position to charge said first compartment means with such fluid and then back to said first position, for thereafter rotating said drum from said first position to said third position to empty such charge of fluid from said first compartment means to said third compartment means, and for rotating said drum from said third position back to said first

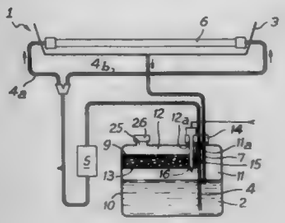
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4,634,252

DEVELOPMENT INSTALLATION AND STORAGE DEVICE FOR ELECTROSTATIC PRINTER USING A LIQUID DEVELOPER

Vojin Jeremijevic, Montreuil, France, assignor to Benson, S.A., Creteil, France

Filed Dec. 14, 1984, Ser. No. 681,519
Claims priority, application France, Dec. 16, 1983, 83 20223
Int. Cl.[4] G03D *3/02*; G03G *15/10*
U.S. Cl. 354—324 **12 Claims**



1. A development installation for an electrostatic printer using a liquid developer and a concentrate comprising:

a reservoir having first and second separate compartments for the liquid developer and for the concentrate, said reservoir having first and second openings adapted to be closed by first closing means for tightly insulating each of said compartments during the transportation of the liquid developer and concentrate in said reservoir;

first means for circulating the liquid developer between said first compartment and a developing station; and

second means for selectively circulating concentrate from said second compartment to said first compartment; and

second closing means substitutable for said first closing means and attachable to said first and second circulating means and removably connectable to said reservoir for communicating said first circulating means with said first compartment, and said second circulating means with said second compartment, through said openings.

4,634,253

UNDERWATER PHOTOGRAPHABLE CAMERA

Hideo Tamamura, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1984, Ser. No. 571,449
Claims priority, application Japan, Jan. 19, 1983, 58-7106; Jan. 19, 1983, 58-7107; Jan. 19, 1983, 58-7108
Int. Cl.[4] G03B *3/10, 17/08*
U.S. Cl. 354—403 **8 Claims**

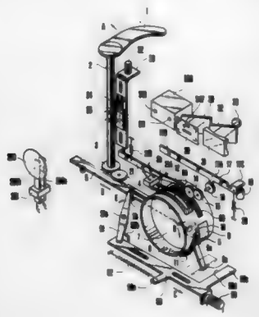
1. In a camera capable of underwater photography, the improvement comprising:

(a) automatic focusing adjustment means for automatically performing the focusing adjustment of a photographic lens; and

(b) restricting means for restricting focusing positions to which said photographic lens is to be set so that focusing is not effected to farther distances than a prescribed value

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when in underwater photography, whereby said restricting means allows for said automatic focusing adjustment

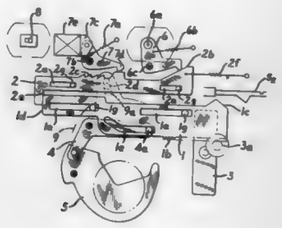


means to operate when the measured value of the object distance is shorter than said prescribed one.

4,634,254
ELECTROMAGNETICALLY ACTUATED SHUTTER FOR A CAMERA

Masuo Ogihara; Hiroaki Ishida; Shinji Nagaoka, and Koji Sato, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 747,015
Claims priority, application Japan, Jun. 25, 1984, 59-130674
Int. Cl.⁴ G03B *3/00, 9/08, 7/08*
U.S. Cl. 354—403 **18 Claims**

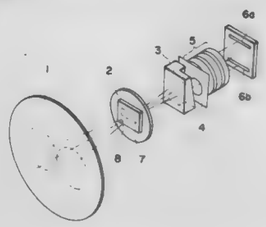


1. An electromagnetically actuated shutter, comprising:
a movable member mounted for movement in forward and reverse directions between a focusing region and an exposing operation region;
a single electromagnetic actuating means for forwardly and reversely actuating said movable member;
an interlocking member mounted to undergo movement with said movable member in said focusing region;
a focus operating member actuated by forward movement of said interlocking member to effect an automatic focusing operation;
a focusing control member engageable with said interlocking member to stop the forward movement thereof when said movable member moves through said focusing region and reaches a focusing point;
shutter blades driven by a sector lever when said movable member undergoes movement in said exposing operation region; and
controlling means operable in response to movement of said movable member into said exposing operation region for producing a reversing signal and applying the same to said electromagnetic actuating means after the lapse of a time corresponding to object brightness information to thereby cause said electromagnetic actuating means to move said movable member in the reverse direction.

4,634,255
FOCUS DETECTION APPARATUS

Yasuo Suda; Akira Ishizaki, both of Yokohama; Keiji Ohtaka, Tokyo; Akira Akashi, and Akira Hiramatsu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1985, Ser. No. 741,880
Claims priority, application Japan, Jun. 13, 1984, 59-121137
Int. Cl.⁴ G03B *3/00;* **G02B** *5/22*
U.S. Cl. 354—406 **14 Claims**

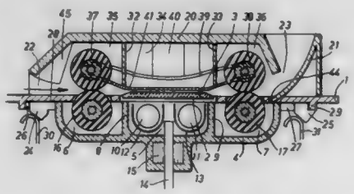


1. A focus detection apparatus for detecting focus by a light beam transmitted through an object lens, comprising;
a field lens arranged on or in a vicinity of a predetermined imaging plane of the object lens;
refocusing optical means for forming a secondary image from a light beam transmitted through said field lens;
photo-electric conversion means for producing a signal in response to the secondary image; and
filtering means for cutting an undesired light and having a transmission characteristic which changes with an incident angle of light, wherein the distance between said filtering means and said field lens is less than the distance between said filtering means and said refocusing optical means thereby minimizing the reduction of the intensity of the light transmitted therethrough.

4,634,256
PICTURE TAKING ASSEMBLY FOR COPIER APPARATUS

Jean-Claude Berger, Issoudun, France, assignor to Tetras, St. Denis, France

Filed May 16, 1985, Ser. No. 734,812
Claims priority, application France, May 16, 1984, 84 07563
Int. Cl.⁴ G03B *27/00*
U.S. Cl. 355—1 **3 Claims**

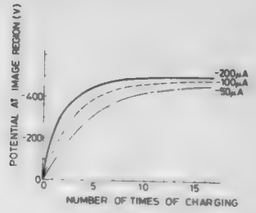


1. A photocopier for the line-by-line copying of a document, comprising:
a body having an upper plate;
a substantially linear array of optical fibers disposed along the length of the picture-taking line;
a light-proof housing disposed in said body, said housing comprising first and second lateral chambers, first and second light-proof walls separating said first and second lateral chambers, respectively, from said central chamber, a central chamber intermediate said lateral chambers, and a light-proof lateral joint disposed beneath said central chamber, said array of optical fibers being maintained in position with the upper end thereof extending laterally into the bottom of said central chamber by said lateral joint;
a substantially planar plate transparent disposed in said upper plate and covering said central chamber;
first and second tubular illuminating assemblies disposed in said central chamber on either side of said array of optical fibers; and
first and second driving rollers disposed in said first and second lateral chambers, respectively, said rollers being insulated from said array of optical fibers and tubular illuminating assemblies by said light-proof walls.

4,634,257
ELECTROSTATIC PRINTING METHOD

Masaki Yoshino; Kozo Oka, and Fuminori Koide, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 413,098, Aug. 30, 1982, abandoned. This application Oct. 12, 1984, Ser. No. 660,543
Claims priority, application Japan, Sep. 4, 1981, 56-138374
Int. Cl.⁴ G03G *15/02*
U.S. Cl. 355—3 CH **5 Claims**



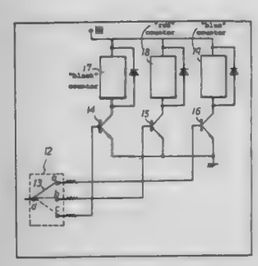
1. A method of electrostatic printing, comprising the steps of:
forming a printing master by forming a fixed toner image on a photoconductive member, and then charging said photoconductive member by effecting a plurality of like charging operations on said photoconductive member to thereby increase a potential in an image region thereof; and
printing a least one copy from said printing master by charging said printing master with a single charging operation, uniformly illuminating said charged printing master, developing said illuminated printing master, and transferring a toner image from said developed printing master onto a transferring sheet for obtaining a print.

4,634,258
COLOR COPYING MACHINE WITH COPY NUMBER COUNTING DEVICE FOR INDIVIDUAL COLOR PRINTING

Toyoki Tanaka, Yamatokoriyama, and Ikuo Itoh, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 26, 1984, Ser. No. 686,849
Claims priority, application Japan, Dec. 26, 1983, 58-202092[U]
Int. Cl.⁴ G03G *15/01*
U.S. Cl. 355—4 **6 Claims**

1. A copying machine comprising:
a plurality of internally installed color toner developer containers;
a plurality of counters in a one-to-one correspondence with each of said plurality of color toner developer containers, said plurality of counters individually counting a cumulative number of photocopies made from each one of said color toner developer containers;
means for connecting said plurality of counters to said corresponding plurality of color toner developer containers;
selection means for selecting one of said plurality of color toner developer containers for use in providing photocopies of the selected color;
means, responsive to said selection means, for feeding counter pulses generated in each copying cycle of the selected color to said respective one of said plurality of counters;

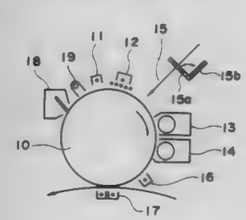


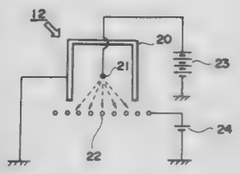
display means for individually displaying a cumulative number of copies made by the copying machine from each of said color toner developer containers as counted by each of said plurality of counters; and
display means for displaying a cumulative number of copies made by the copying machine as determined by a sum of each of said plurality of counters.

4,634,259
APPARATUS FOR MAINTAINING DISTINCT EDGES BETWEEN TWO COLORS IN A TWO-COLOR IMAGE FORMING DEVICE

Mitsugu Oishi, and Hidefumi Kanai, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd. and Casio Electronics Manufacturing Co., Ltd., both of Tokyo, Japan

Filed Dec. 11, 1984, Ser. No. 680,772
Claims priority, application Japan, Dec. 13, 1983, 58-233677; Feb. 29, 1984, 59-37728; Mar. 22, 1984, 59-54947; Apr. 29, 1984, 59-87307; Apr. 30, 1984, 59-87365; May 22, 1984, 59-103394
Int. Cl.⁴ G03G *15/01*
U.S. Cl. 355—4 **38 Claims**





1. Two-color image forming apparatus comprising a movable bipolar photosensitive body, first charging means for applying a predetermined polarity charge to a surface of said photosensitive body, first electrostatic latent image forming means for forming a first electrostatic latent image by exposing

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the surface of said photosensitive body which is charged by said first charging means, said first electrostatic latent image forming means arranged downstream of the first charging means along the moving direction of said photosensitive body, first developing means for developing said first electrostatic latent image, said first developing means provided downstream of an exposing portion in said first electrostatic latent image forming means along the moving direction of said photosensitive body, second charging means comprising a corona discharger having a corona ion stream control screen formed by laminating a conducting member with an insulating member, said corona ion stream control screen being disposed at or near an open portion for radiating a corona ion and applying a charge opposite in polarity to the charge applied by said first charging means to a surface of said photosensitive body, second electrostatic latent image forming means for forming a second electrostatic latent image by exposing the surface of the photosensitive body charged by said second charging means, said second electrostatic latent image forming means being disposed at a downstream side of said second charging means in the moving direction of the photosensitive body, and second developing means provided downstream of an exposing portion in said second electrostatic latent image forming means along the moving direction of the photosensitive body.

4,634,260

IMAGE FORMING APPARATUS

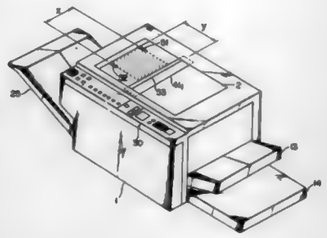
Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 29, 1985, Ser. No. 770,789

Claims priority, application Japan, Sep. 3, 1984, 59-184113

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—7 **9 Claims**



1. An image forming apparatus comprising:

a photosensitive body holding electric charge on a surface thereof;

charging means for uniformly applying electric charge to the surface of the photosensitive body;

an original table adapted to carry an original thereon;

image exposure means for exposing the surface of the photosensitive body uniformly charged by the charging means to an image of the original on the original table, thereby forming an electric charge pattern responsive to the original image on the surface of the photosensitive body;

developing means for developing the electric charge pattern on the surface of the photosensitive body formed by the image exposure means;

indicating means for indicating a specific range of the original on the original table, said indicating means including: (a) light emitting means for applying a spot light to the original on the original table from under the same, said light emitting means including a light emitting element, disposed under the original table so as to be movable along the same, emitting light of sufficient brightness to be transmitted through the original on the original table, and (b) moving means for moving the light emitting element along the original table and detecting means for detecting the position of the light emitting element moved by the moving means, and

erasing means for erasing the electric charge on the surface of the photosensitive body in response to the specific range of the original indicated by the indicating means.

4,634,261

OPTICAL SYSTEM FOR REPRODUCING APPARATUS

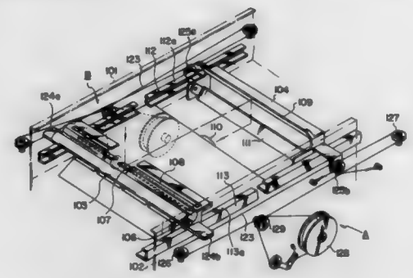
Mitsuru Nagoshi, Tokyo, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 394,171, Jul. 1, 1982. This application Apr. 4, 1985, Ser. No. 719,631

Claims priority, application Japan, Jul. 7, 1981, 56-106410; Jul. 7, 1981, 56-106411; Aug. 31, 1981, 56-129092; Aug. 31, 1981, 56-136737; Aug. 31, 1981, 56-136738

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—8 **8 Claims**



1. An electrophotographic reproducing apparatus comprising a stationary document glass plate on which a document to be reproduced is placed, a first scanning means which comprises a reflector having a reflecting surface formed by an elliptic curve and arranged below the document glass plate so that an opening portion of the reflector for exposing the document faces a direction substantially parallel with the surface of said document glass plate, an illuminating lamp for exposure arranged in said reflector, and a first mirror, and a second scanning means which comprises a second mirror, said first and second scanning means movable so that said second scanning means moves at half the speed of the speed of said first scanning means wherein said document glass plate, reflector, and illuminating lamp for exposure are so arranged mutually that a light from said lamp is reflected from the reflecting surface which is positioned on a remote side part of said reflector with respect to said document glass plate and then focused on a predetermined position on said document glass plate.

4,634,262

TONER IMAGE FIXING CONTROL PROCESS AND APPARATUS IN ELECTROSTATIC COPYING MACHINE

Masaru Imaizumi, Shinshiro; Masazumi Ito, Toyokawa, and Kenji Shibazaki, Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 494,211, May 13, 1983, abandoned, which is a continuation-in-part of Ser. No. 189,246, Sep. 22, 1980, abandoned. This application Jul. 26, 1985, Ser. No. 759,497

Claims priority, application Japan, Sep. 26, 1979, 54-124308

Int. Cl.⁴ G03G *15/20, 21/00*

U.S. Cl. 355—14 R **8 Claims**

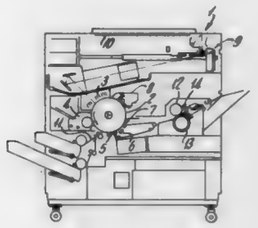
6. In an electrostatic copying machine handling both thin sheets and thick sheets, and including,

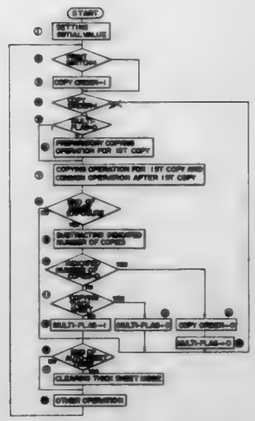
means for producing a toner image on said sheet,

a fixing unit for fixing the toner image onto said sheet,

means for advancing said sheet through said toner image producing means and said fixing unit at a constant speed, and

a toner image fixing control device comprising: a switch for selecting a thick sheet, a multiswitch for making a multiplicity of copies, and a control circuit for setting the copying operation of said copying machine to a thick sheet copy processing mode by activation of said thick sheet switch and to a standard sheet copy processing mode by disactivation of said thick sheet switch, and to a multicopy processing mode by activation of said multiswitch, said standard sheet copy processing mode having a specified cycle interval time for the first copy and a shorter cycle interval time than said specified cycle interval time for each of the second and following copies upon activation of said multiswitch, and said thick sheet copy processing mode having the same cycle interval time as said specified cycle interval time for the first copy, wherein each of said cycle interval times includes a standby period and a sheet feeding period, said standby period of said thick sheet during a continuous copying operation being longer than that of said thin sheet and said sheet feeding periods are equal and constant.





4,634,263

ORIGINAL DOCUMENT FEEDING ARRANGEMENT

Yoshihisa Miwa, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

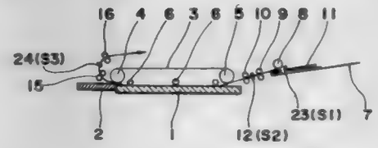
Filed Jul. 2, 1985, Ser. No. 751,144

Claims priority, application Japan, Jul. 4, 1984, 59-139647

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 SH **7 Claims**

1. An original document feeding arrangement for use in a copying machine and the like, which comprises means for feeding original documents placed on a tray, means for transporting the original document thus fed, up to a predetermined position on an original document platform so as to be stopped thereat, means for driving said transporting means, a selecting means for selecting speeds of said transporting means according to kinds of the original documents, and a control means for effecting speed control of said driving means at the speed selected by said selecting means.



4,634,264

PHOTOSENSITIVE MEMBER OF RECORDING APPARATUS

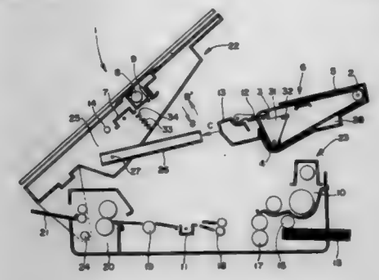
Sadao Takahashi, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Nov. 23, 1984, Ser. No. 674,177

Claims priority, application Japan, Nov. 25, 1983, 58-221752

Int. Cl.⁴ G03G *21/00*

U.S. Cl. 355—16 **4 Claims**



1. A recording apparatus comprising:

(a) a main body having an upper structure pivotally mounted to a lower structure, said upper structure being pivotally movable toward or away from the lower structure to close or open the recording apparatus;

(b) a photosensitive unit removably mountable in said main body comprising a photosensitive endless belt member trained over supporting rollers, a support plate movably mounted in the photosensitive unit, and a tension roller mounted on the support plate so as to be movable to or from a tensioning position against said belt with respect to said supporting rollers; and

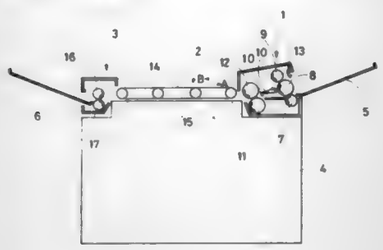
(c) tensioning means having one end engaged with one of said structures of the main body and its other end adapted to engage said support plate to move said tension roller to the tensioning position against said endless belt when said photosensitive unit is mounted in a predetermined position in said main body;

wherein said upper structure includes rails pivotally movable apart from said upper structure, and said photosensitive unit further comprises side plates adapted to be slid onto said rails to mount said photosensitive member, said one end of said tensioning means being mounted in said upper structure, and said rails and mounted photosensitive unit being pivotally movable toward said upper structure to move said photosensitive unit to the predetermined position for tensioning said tension roller.

4,634,265
AUTOMATIC DOCUMENT FEED TYPE ELECTROPHOTOGRAPHIC COPYING MACHINE

Mitsuro Tada, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 7, 1984, Ser. No. 679,382
Claims priority, application Japan, Dec. 9, 1983, 58-233261
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—3 SH **9 Claims**



1. An automatic document feed system for an electrophotographic copying machine comprising:

a document intake/return means for sequentially introducing document papers to the copying machine to be copied and returning the document papers which have been copied;

document transport means operable to rotate in a forward and reverse direction, said document transport means being responsive to said document intake/return means for transporting a single document paper between both said document intake/return means and a light scanning portion of the copying machine to produce an electrostatic latent image;

document exhaust means responsive to said document transport means for removing a single document paper which has been copied from the document transport means, and

mode selecting means operatively associated with said document transport means for selecting said document transport means to either forward the single document paper from said light scanning portion to said document exhaust means or return said document paper from said light scanning portion to said document intake/return means.

4,634,266
ELECTROPHOTOGRAPHIC COPYING MACHINE WITH PICTURE POSITION SELECTION FUNCTION

Haruyoshi Migita, Nara, and Shoichiro Yoshiura, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 5, 1985, Ser. No. 762,389
Claims priority, application Japan, Aug. 6, 1984, 59-166852
Int. Cl.⁴ G03B *27/52*
U.S. Cl. 355—55 **3 Claims**

1. An electrophotographic copying machine having a variable magnification copying function, said copying machine comprising:

means for detecting and temporarily storing the length of a longitudinal side and the width of a lateral side of a copy document;

means for setting a copy paper size to be utilized in a copying operation;

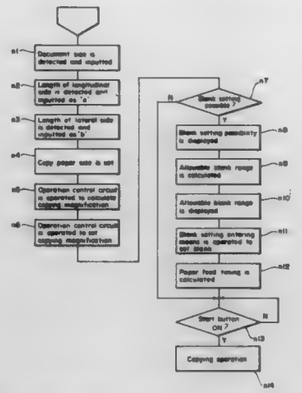
means for calculating and automatically selecting either a longitudinal or lateral magnification ratio based upon the length and width of said copy document and the length and width of said copy paper, respectively;

indicator means for indicating that selection of said longitudinal magnification ratio will produce a blank portion on the right-hand side of said copy paper;

blank copy range display means for displaying the total blank portion width to be produced on said copy paper;

means for selectively distributing the width of a blank portion on either side of a copy image to be produced on said copy paper;

selected blank display means responsive to said means for



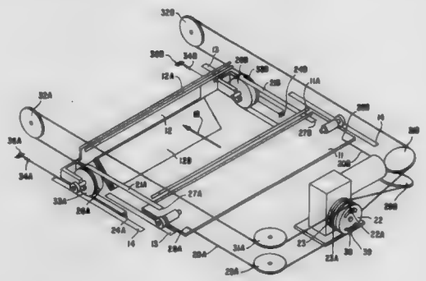
selectively distributing, for displaying a numerical value of said blank portion distributed on either side of the copy image; and

means for controlling the timing of a copy paper feed operation in response to the respective widths of the blank portions on the sides of the copy image determined by said means for selectively distributing.

4,634,267
PHOTOCOPIER SCANNING APPARATUS AND METHOD FOR ADJUSTMENT

Rick O. Jones; Walter F. Price, Jr., both of Longmont; Glean E. Siemer, and Michael H. Ulrich, both of Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 14, 1985, Ser. No. 701,490
Int. Cl.⁴ G03B *27/70*
U.S. Cl. 355—66 **2 Claims**



1. Photocopier scanning apparatus comprising:

a pair of carriages, a first one of said carriages having running block pulleys at each end thereof;

a pair of capstans;

a pair of springs;

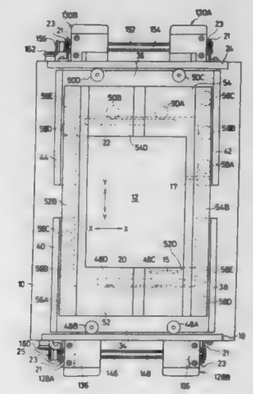
a pair of cables, each of said cables attached to a different end of said second carriage, coiled around one of said capstans, engaging one of said running block pulleys at the corresponding end of said first carriage, and fastened by one of said springs to a stationary part of said photocopier;

a pair of precision tapes, each of said tapes attached to a different end of said second carriage, engaging one of said running block pulleys at the corresponding end of said first carriage and fastened to a stationary part of said photocopier, said precision tapes requiring no adjustment to their length after installation and one of said capstans being adjustable to bring the two carriages into parallel alignment.

4,634,268
PRINT MASK APPARATUS

Mikio Kogane, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 2, 1985, Ser. No. 751,171
Claims priority, application Japan, Jul. 2, 1984, 59-136879
Int. Cl.⁴ G03B *27/58*
U.S. Cl. 355—74 **26 Claims**



1. A print mask apparatus for defining a print mask opening having plural sides, for use in a printer which effects printing on a photographic paper, said print mask apparatus comprising:

(a) a pair of slide members provided such as to oppose each other and supported such as to be independently movable in the direction orthogonal to the direction in which they oppose each other;

(b) a pair of mask members respectively provided on said slide members and supported such as to be independently movable in a direction substantially parallel to an imaginary line which bisects said slide members, each of said mask members having first and second edges which are respectively parallel to the lateral and longitudinal directions of said photographic paper for defining adjacent sides of said opening;

(c) slide member driving transmission means for respectively moving said pair of slide members in the opposite directions relative to each other;

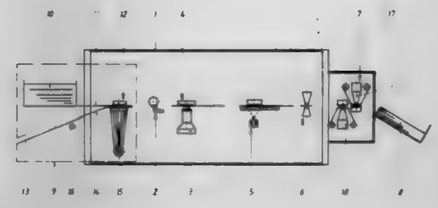
(d) mask member driving transmission means for respectively moving said pair of mask members in the opposite directions relative to each other,

whereby it is possible for the change-over of print sizes to be easily effected by an operation conducted externally without any need to replace said mask members with others.

4,634,269
FILM CARD CAMERA AND PROCESS FOR MANUFACTURING DUPLICATE FILM CARDS

Ulrich Welp, Bad Nauheim; Willi Kramer, Bad Vilbel; Michael Girke, Bad Nauheim, and Bernd Lack, Friedberg, all of Fed. Rep. of Germany, assignors to Dr. Welp Entwicklungs-KG, Fed. Rep. of Germany

Filed Aug. 6, 1985, Ser. No. 762,851
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1984, 3429296; Sep. 5, 1984, 3432617; May 7, 1985, 3516265
Int. Cl.⁴ G03B *27/30*
U.S. Cl. 355—100 **22 Claims**

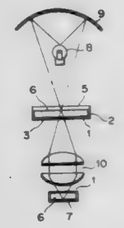


1. A film card camera for making either an original film card or a duplicate film card, which comprises a lead-in for unexposed film cards, an optical exposing unit with a lens for exposing the original film card, a processing unit, a film card lead-out, means for exposing a duplicate film card through an original film card separate from the optical exposing unit, and means to transport the exposed duplicate film card to the processing unit.

4,634,270
PROTECTIVE COVER

Sadao Yokoo, Kanagawa; Tadashi Shimomura, Tokyo; Soichi Torisawa, Tokyo; Masahiro Dan, Tokyo, and Tsuyoshi Kaneda, Tokyo, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Tokyo; Hitachi Ltd., Osaka and Hitachi Microcomputer Engineering Ltd., Tokyo, all of, Japan

Filed Oct. 18, 1985, Ser. No. 789,071
Claims priority, application Japan, Oct. 19, 1984, 59-219669
Int. Cl.⁴ G03B *27/28, 27/52*
U.S. Cl. 355—125 **7 Claims**



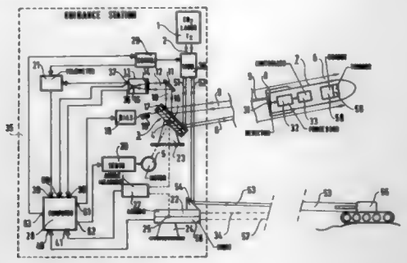
1. A protective cover for photoprinting system comprising a cover portion made of a transparent thin plate of inorganic material, an antireflection multiple coating provided on at least one of the inner and outer surfaces of said cover plate, and a spacer arranged on the peripheral portion of said cover plate for keeping said inner surface of said cover plate away from the surface to be protected and sealing the space between them.

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4,634,271
LASER DEVICE FOR GUIDING A MISSILE TO A TARGET

Patrice Jano, Chilly Mazarin, and Michèle Tron, Ville d'Avray, both of France, assignors to Compagnie Industrielle des Lasers Cilas Alcatel, Marcoussis, France

Filed Feb. 7, 1985, Ser. No. 699,380
Claims priority, application France, Feb. 7, 1984, 84 01842
Int. Cl.[4] G01C *3/08*; F41G *7/26*
U.S. Cl. 356—5 4 Claims



1. A laser device for guiding a missile to a target, the missile being launched towards the target and including flight controller means for modifying the direction of its movement, the laser device comprising:

a guidance station including:

an automatic missile pointing system comprising:

a laser beam generator, including a transmitter for transmitting laser radiation at a frequency F_1, said generator being provided with beam pointing menas for pointing the beam towards a target which returns a portion of the beam energy in the opposite direction;

an error measuring system fitted with an electro-optical receiver disposed to receive said returned portion of energy, the receiver being suitable for delivering an error measuring signal in response thereto representative of the angle of error between the position of the missile and the axis of the beam; and

a servo-control circuit suitable for controlling the beam pointing means to reduce the angle of error;

means for measuring the distance of the missile, said means comprising:

a modulator constituting a part of the said generator, said modulator being suitable for receiving the laser radiation delivered by the transmitter and for delivering laser pulses at the frequencey F_1 in response thereto; and

a missile telemeter circuit, connected to the modulator and to the output of the electro-optical receiver to measure the time interval between the transmission of a laser pulse at the frequency F_1 and its return to the receiver after being returned from the missile, said time interval being representative of the missile distance;

means for measuring the distance of the target;

an aiming sight which is pointable towards the target;

angle measuring means for delivering information on the angular position of the missile, said position being determined by the said pointing means, the angular position information being relative to the direction in which the sight is pointed;

a computer connected to the missile telemeter circuit, to the said means for measuring the distance to the target, and to the said angle measuring means, said computer being capable firstly of determining a trajectory for the missile towards the target on the basis of the information on the distance to the missile, on the distance to the target, and on the angular position of the missile, and also capable of generating piloting signals suitable for controlling the said flight controller means to guide the missile on said trajectory; and

a modulator control circuit connected to the computer to modulate the said laser pulses at the frequency F_1 with the said piloting signals;

and a laser beam receiver circuit disposed on board the missile and connected to the said flight controller means, said circuit being capable of receiving the said modulated laser pulses at frequency F_1 and of delivering the said piloting signals in response thereto;

the laser device including the improvement wherein the said beam is a first beam,

the said modulator is also capable of delivering a second beam at a second frequency F_2 different from the frequency F_1; and

the means for measuring the distance to the target comprise:

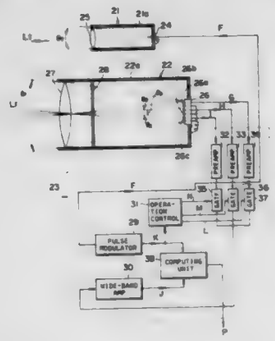
a reflector fixed to the aiming sight to direct the second beam towards the target; and

a pulse receiver system for receiving pulses from the second beam as reflected by the target, said system being fixed to the aiming sight and being connected to the computer, siad system being capable of measuring the time interval between transmitting a laser pulse of frequency F_2 and its return to the guidance station after reflection by the target, said time interval being representative of the distance to the target.

4,634,272
OPTICAL RADAR SYSTEM WITH AN ARRAY OF PHOTOELECTRIC SENSORS

Hiroshi Endo, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Mar. 25, 1983, Ser. No. 478,871
Claims priority, application Japan, Jun. 2, 1982, 57-94477
Int. Cl.[4] G01C *3/08*, *1/00*
U.S. Cl. 356—5 19 Claims



1. A system for measuring a distance to an object, comprising:

a. first means responsive to a predetermined drive signal for transmitting a coherent pulsating light to a detection region of predetermined dimensions and orientation with respect to the system;

b. second means including means for collecting a portion of the coherent pulsating light reflected by the object in the detection region and a plurality of arrayed photo-sensitive elements each monitoring a distinct light receiving area of said detection region and receiving the collected coherent light reflected from objects therein; and

c. third means for generating and outputting the drive signal to said first means and determining the distance to the object in the detection region on the basis of the difference in time between an output timing of the drive signal and timing of reception of a received electric signal derived from each said light receiving area of said plurality of arrayed photo-sensitive elements,

said third means comprising means for sequentially processing the received electric signals from each of said plurality of photo-sensitive elements within a sequence of predetermined time periods and

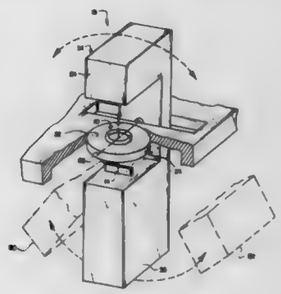
means for measuring a time within each of said predetermined time periods for reception of reflected light by the photo-sensitive elements,

thereby determining a time for transit of said light pulse to an object in said light receiving area monitored by the photo-sensitive elements.

4,634,273
O-RING INSPECTION METHOD

Ronald K. Farleman, Reminderville; Charles W. Fetheroff, Willowick, and Istvan M. Matay, North Royalton, all of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Jun. 8, 1984, Ser. No. 618,595
Int. Cl.[4] G01N *21/88*; G01B *11/08*
U.S. Cl. 356—73 28 Claims



13. A method for inspecting a resiliently deflectable O-ring which tends to distort under the influence of its own weight when supported at one segment with its central axis extending horizontally, said method comprising the steps of:

providing a transparent support member;

placing the O-ring on the transparent support member with its central axis in a vertical orientation;

scanning the O-ring with a narrow beam of light along a path which extends through the center of the ring, including the step of imparting relative movement between the transparent support and the light source;

detecting the distance between portions of the O-ring by measuring the shadows cast by the scanning light;

scanning at least two different portions of the O-ring by moving said O-ring relative to the light source thereby casting at least two different shadows and comparing the dimensions of the different cast shadows.

4,634,274
METHOD AND APPARATUS FOR DETERMINING ATTENUATION ACROSS OPTICAL FIBER SPLICE

Nelson M. Shen, San Jose, and Robert Zimmerman, Cupertino, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 545,413, Oct. 25, 1983. This application Jul. 16, 1984, Ser. No. 630,921
Int. Cl.[4] G01N *21/59*, *21/84*
U.S. Cl. 356—73.1 18 Claims

1. An apparatus for determining attenuation across an optical fiber splice between a first fiber and a second fiber, comprising:

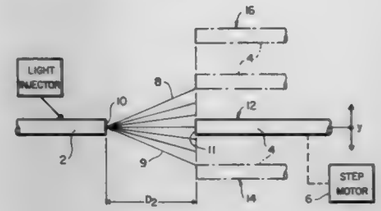
means for launching optical signals into the first fiber;

means for positioning ends of the fibers at a distance D_2 and measuring a second optical signal P_2 in the second fiber generated by a second optical signal launched into the first fiber;

means for positioning the fiber ends at a distance D_1 and measuring a first optical signal P_1 in the second fiber generated by a first optical signal launched into the first fiber, D_2 being greater than D_1;

means for calculating the attenuation dB across the optical fiber splice using the algorithm;

$$dB = 10 \log (1 - L_{tel}) \quad (2)$$

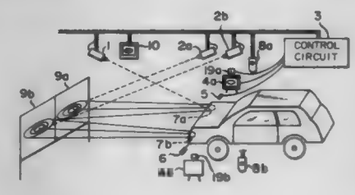


where L_{tel} is empirically determined from P_1, P_2, P_1' and P_2', P_1' being a third optical signal measured in a sample optical fiber created by launching the third optical signal into the sample optical fiber, P_2' being a fourth optical signal measured in the sample optical fiber created by launching a fourth optical signal into the sample optical fiber, the launched fourth optical signal passing between confronting ends of the sample optical fiber.

4,634,275
METHOD OF AND APPARATUS FOR EXAMINING AUTOMOTIVE HEADLAMP

Mamoru Yoshida, and Mituo Kamemoto, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 17, 1984, Ser. No. 631,783
Claims priority, application Japan, Jul. 18, 1983, 58-130627
Int. Cl.[4] G01J *1/20*
U.S. Cl. 356—121 20 Claims



1. A method of examining an alignment of headlamp beam of an automobile in which a first mark representing a position of a headlamp beam axis and a second mark representing an allowable range for the headlamp beam axis are displayed on a monitor TV and when said first mark falls within said allowable range, a judgement is made that the alignment of the beam axis is acceptable, comprising the steps of:

taking up by a TV camera an image of a light distribution pattern of a headlamp beam of a screen;

specifying a closed curved area surrounded by a line indicative of illumination intensity higher than a predetermined level in the taken-up image of the light distribution pattern;

determining a position of a geometrical center of the specified closed curved area to display the position of the geometrical center on the monitor TV;

measuring an area of the specified closed curved area;

comparing the measured actual area of said specified closed curved area with a command area; and

adjusting a quantity of light received by said TV camera in accordance with the result of the comparison until the measured actual area of said closed curved area becomes equal to said command area.

4,634,276

SLIT IMAGING SYSTEM USING TWO CONCAVE MIRRORS

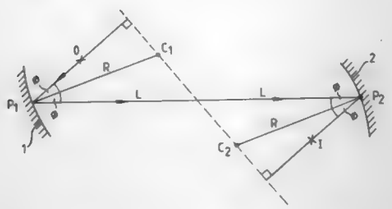
Michael R. Sharpe, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 14, 1984, Ser. No. 620,784

Claims priority, application United Kingdom, Jun. 15, 1983, 8316269

Int. Cl.⁴ G01J *3/18*; G02B *5/10*

U.S. Cl. 356—305 **10 Claims**



1. An optical system comprising two concave mirrors for imaging a line object placed off-axis with respect to a first one of said two mirrors as a line image being off-axis with respect to a second one of said two mirrors, characterized in that the off-axis angle ϕ and the radius of curvature R of each of said two mirrors are chosen so that the separation S between the poles of said two concave mirrors is given by the expression:

$$S = 2R\frac{\cos\phi}{\cos 2\phi},$$

and in that the principal ray from the center of said line object to said first one of said two mirrors and the principal ray from said second one of said two mirrors to the center of said line image are both substantially perpendicular to an axis of symmetry passing through centers of curvature of said two concave mirrors.

4,634,277

ATOMIC ABSORPTION SPECTROPHOTOMETER AND METHOD OF ANALYSIS BY ATOMIC ABSORPTION SPECTROPHOTOMETRY

Trevor J. Stockdale, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 456,238, Jan. 7, 1983, abandoned. This application Jun. 1, 1985, Ser. No. 750,664

Claims priority, application United Kingdom, Jan. 19, 1982, 8201373

Int. Cl.⁴ G01N *21/72*

U.S. Cl. 356—315 **23 Claims**

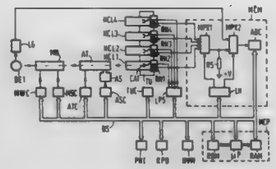
1. An atomic absorption spectrophotometer comprising a flame atomizer,

first means for setting parameters of the spectrophotometer to a first set of preset values dependent on a substance to be detected,

second means for setting a fuel gas flow rate to a burner to a preset value dependent on said substance to be detected,

third means for aspirating an optimization standard into a flame of said flame atomizer,

fourth means for incrementally changing said gas flow rate and for measuring absorbance of said optimization standard at each incremental change of said gas flow rate, and



fifth means for selecting one of a plurality of stored sets of parameters of said spectrophotometer depending on said absorbance of said optimization standard.

4,634,278

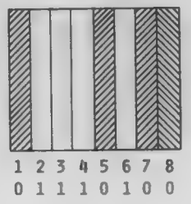
METHOD OF THREE-DIMENSIONAL MEASUREMENT WITH FEW PROJECTED PATTERNS

Joseph Ross, Ft. Salonga, and Richard Schmidt, Huntington, both of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Feb. 6, 1984, Ser. No. 577,331

Int. Cl.⁴ G01B *11/24*

U.S. Cl. 356—376 **3 Claims**



1. A method for unambiguously identifying the location of a point within the view of a two- or three-dimensional measurement sensor with a single projected pattern comprising the steps of: projecting a binary pattern having unique codes over any span of N segments out of a total of as many as 2^N segments onto a surface to be measured, so that said segments form uniquely identifiable local patterns; recording reflected radiation with a detector and generating a recorded signal; analyzing the recorded signal and providing, a digital representation thereof; and identifying the location of the point in the pattern by comparing the digital representation with a known reference pattern digital representation.

4,634,279

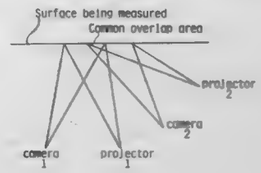
METHOD OF THREE-DIMENSIONAL MEASUREMENT WITH FEW PROJECTED PATTERNS

Joseph Ross, Ft. Salonga, and Richard Schmidt, Huntington, both of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Division of Ser. No. 577,331, Feb. 6, 1984. This application Nov. 4, 1985, Ser. No. 794,612

Int. Cl.⁴ G01B *11/24*

U.S. Cl. 356—376 **2 Claims**



1. A method for relating at least two measurement data bases to a common coordinate system comprising the steps of: performing two- or three-dimensional surface measurements with at least two measurement sensor systems, said measurements containing at least one overlapping area on a surface; producing a surface measurement data base from each said measurement sensor system; projecting a radiation pattern on said overlapping area by one of said sensor systems; recording said pattern with another one of said sensor systems, said pattern having structure in two dimensional directions and comprising a binary pattern having unique codes over any span of N segments out of a total of as many as 2^N segments; selecting two smooth areas for a 2-D or three non-collinear smooth areas for 3-D, said areas each encompassing at least a length of N segments in each of said two dimensional directions within said overlapping area; correlating said pattern structure with said measured surface data; and transforming said measurement data bases to a common coordinate system.

4,634,280

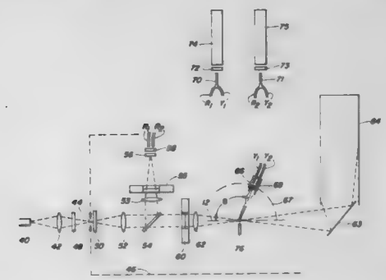
METHOD FOR MEASURING SHAPE PARAMETERS OF YARN

Charles M. Paulson, Jr., Wilmington, Del., assignor to E. I. DuPont De Nemours and Company, Wilmington, Del.

Filed Nov. 21, 1984, Ser. No. 673,874

Int. Cl.⁴ G01B *11/04*

U.S. Cl. 356—385 **7 Claims**



1. A method for measuring average cross sectional shape parameters such as modification ratio for a yarn bundle of multilobal filaments comprising:

moving the yarn in a path under tension;

directing an incident beam of light onto the yarn in a plane perpendicular to said path;

detecting the light scattered from the yarn in said plane at a position at an angle from the incident beam of light;

measuring the intensity of the scattered light detected at said position; and

determining the average modification ratio of said yarn from a calibration curve based on said intensity.

4,634,281

APPARATUS FOR THE INSPECTION OF CONTINUOUS SHEETS OF MATERIAL

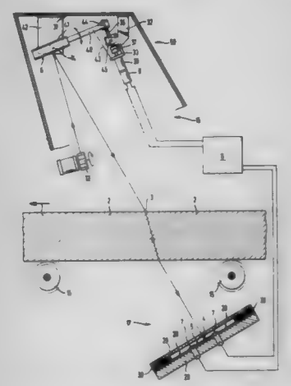
Peter Elkmeyer, Bielefeld, Fed. Rep. of Germany, assignor to Feldmuehle Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 24, 1984, Ser. No. 664,154

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1983, 3338802

Int. Cl.⁴ G01N *21/89, 21/86*

U.S. Cl. 356—431 **9 Claims**



1. Apparatus for the inspection of a continuous sheet of a light-transmissive material which may have defects comprising:

a light source for supplying a light beam;

first and second movable mirror means, said first movable mirror means being associated with said light source for directing a beam of light to said second movable mirror means for reflecting the light beam onto the sheet of material to be inspected;

receiver means for receiving the reflected light comprising a plurality of light-responsive transducer means and a housing including light-diffusing means;

the reflected light beam falling on an opaque area of said light-diffusing means, when the continuous sheet of material is free of defects;

at least one of said light-responsive transducer means being disposed with respect to said reflected light beam after said light-diffusing means and forming a defect-detecting transducer;

a plurality of said light-responsive transducer means being spaced relative to each other in the direction of travel of the continuous sheet of material within said opaque area of said light-diffusing means; and

control means responsive to said transducer means located within said opaque area for re-positioning said second mirror means in response to gradual thickness changes of the light-transmissive material.

4,634,282

MULTIMODE FIBER OPTIC ROTATION SENSOR

Herbert J. Shaw, Stanford, and George A. Pavlath, Thousand Oaks, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

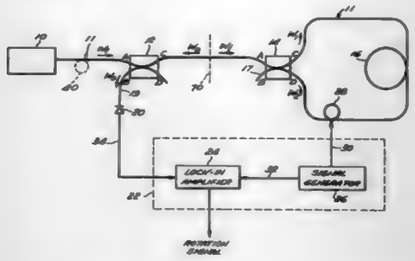
PCT No. PCT/US82/01555, § 371 Date Jul. 5, 1983, § 102(e) Date Jul. 5, 1983, PCT Pub. No. WO83/01683, PCT Pub. Date May 11, 1983

Continuation-in-part of Ser. No. 318,813, Nov. 6, 1981, Pat. No. 4,456,377. This PCT application Nov. 5, 1982, Ser. No. 514,776

The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.

Int. Cl.[4] G01B *9/02;* **G01C** *19/64*

U.S. Cl. 356—350 **31 Claims**



1. A multimode fiber optic rotation sensor, comprising:

light source means for producing a light wave;

a multimode optical fiber which supports plural spatial modes for said lightwave, said fiber forming a loop for sensing rotation in accordance with the Sagnac effect;

a device for splitting said light wave into a pair of light waves which propagate about said loop in opposite directions, the intensity of each of said lightwaves distributed substantially equally among substantially all of the modes of said fiber, said loop configured to return said pair of light waves to said splitting device after propagation through said loop, said splitting device combining said pair of light waves to form an optical output signal comprised of light from substantially all of the modes of said fiber;

means for detecting said optical output signal to determine the rotation rate of said loop, said detecting means detecting light from substantially all of the modes of said fiber.

4,634,283

METHOD AND APPARATUS FOR REDUCING QUANTIZATION ERROR IN LASER GYRO TEST DATA THROUGH HIGH SPEED FILTERING

John G. Mark, Pasadena, Calif.; Alison K. Brown, Monument, Colo.; and Anthony Matthews, Calabasas, Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Mar. 19, 1984, Ser. No. 590,111

Int. Cl.[4] G01C *19/64*

U.S. Cl. 356—350 **12 Claims**

1. A method for processing ring laser gyroscope test data comprising the steps of:

(a) accumulating said data over a preselected sample period; and



(b) filtering said data at a predetermined frequency so that non-time dependent errors are reduced by a substantially greater amount than are time dependent errors; then

(c) analyzing the random walk error of said filtered data.

4,634,284

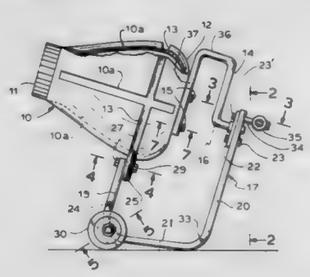
HAND-OPERATED MIXING DEVICE

Robert J. Bishop, 1083 Bloomfield Ave., West Caldwell, N.J. 07006

Filed Oct. 3, 1985, Ser. No. 783,680

Int. Cl.[4] B28C *5/18, 5/20, 7/16*

U.S. Cl. 366—47 **9 Claims**



1. A hand-operated mixing device comprising a mixing drum, having an open end, a closed end, and an outer periphery radially spaced from an axis of rotation passing through said ends, said outer periphery being formed by divergently tapered circumferential walls extending from said ends to an enlarged diameter portion intermediate said ends, means providing an annular groove at the outer periphery of said enlarged diameter portion, and the closed end having a detachably mounted crank member terminating in a bearing shaft coaxial with the drum axis, said drum being detachably mounted on a light-weight frame having spaced forward and rear portions disposed perpendicularly to said drum axis, said frame having at the forward portion thereof transversely spaced rollers for engagement with said annular groove, and at the rear portion thereof a bearing orifice detachably receiving the bearing shaft of said crank handle, the positioning of said rollers and bearing orifice being such as to orient the drum axis at an angle of about 10°–20° to the horizontal to thereby elevate the open end of the drum, said light-weight frame being of knockdown construction having parts of such dimension as to permit packing when disassembled in a container adapted to closely receive said mixing drum, and said light-weight frame, when assembled, having wheels at the base of said frame and a handle at the rear portion thereof facilitating transport of the mixing drum and contents.

4,634,285

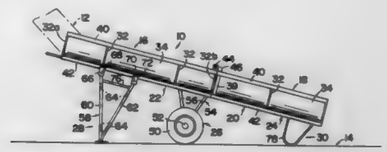
PORTABLE AUXILIARY DISCHARGE CHUTE ASSEMBLY

Robert L. Newberry, P.O. Box 389, Brandon, Fla. 33511

Filed Apr. 26, 1985, Ser. No. 727,553

Int. Cl.[4] B28C *7/16*

U.S. Cl. 366—68 **8 Claims**



1. A portable auxiliary discharge chute assembly for use with a mobile concrete mixer to deliver premixed concrete to an area normally beyond the delivery range of the mobile concrete mixer comprising an inner and outer chute section operatively affixed to a frame, said frame comprising an inner and outer frame section, said inner and outer chute sections each comprising a plurality of flat substantially parallel chute elements held in spaced relationship relative to each other by said inner and outer frame sections respectively and a flexible replacable liner, said inner and outer frame sections each comprising a pair of L-shaped substantially parallel upper frame elements affixed to the upper portion of said flat substantially parallel chute plates and detachably attached to said flexible repaceable liner and a pair of substantially L-shaped parallel lower frame elements affixed to the lower portion of said flat substantially parallel chute plates.

4,634,286

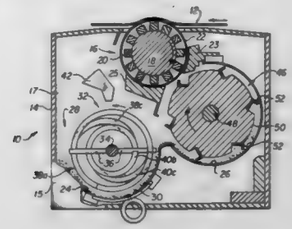
ELECTROGRAPHIC DEVELOPMENT APPARATUS HAVING A CONTINUOUS COIL RIBBON BLENDER

Susan C. Pike, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 6, 1985, Ser. No. 773,282

Int. Cl.[4] B01F *7/08;* **G03B** *15/00*

U.S. Cl. 366—320 **5 Claims**



1. In development apparatus having a sump for developer material comprising hard magnetic carrier particles and toner particles, a ribbon blender for mixing developer material in the sump, and means for transporting developer material from the sump to a latent image on a photoconductor, an improved ribbon blender comprising:

a rotatable shaft, first and second continuous elongate ribbons coiled around the shaft, each of the ribbons having first and second generally cylindrical helical portions with the first helical portion being larger in diameter than the second helical portion, the first ribbon having its second portion located within the first portion of the second ribbon, the second ribbon having its second portion located within the first portion of the first ribbon, and means for supporting the ribbons from the shaft so that rotation of the shaft effects rotation of the ribbons.

4,634,287

UNIVERSAL TIME PIECE

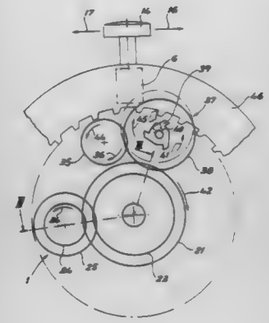
Cyril Vuilleumier, and Bruno Erni, both of Bienne, Switzerland, assignors to Tissot S.A., Le Locle, Switzerland

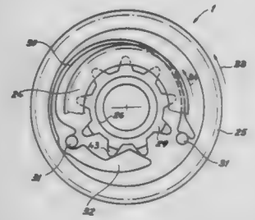
Filed Aug. 22, 1985, Ser. No. 768,375

Claims priority, application Switzerland, Aug. 23, 1984, 4026/84

Int. Cl.[4] G04B *19/22*

U.S. Cl. 368—27 **2 Claims**





1. A universal timepiece having an analog display comprising the usual time of day indicators including at least an hours hand making one revolution in twelve hours, a date indicator, a universal time indicator in the form of a disc or hand making one revolution in twenty-four hours and a crown arranged and adapted to asume at least two pulled-out positions relative to a neutral pushed-in position wherein in the first pulled-out position the crown operates a displaceable setting wheel which drives either the date indicator or the universal time indicator as determined by the sense of rotation of the crown in order to permit setting of said indicators independently of one another and in the second pulled-out position the crown drives the usual time of day indicators and the universal time indicator simultaneously, a speed reducing setting mechanism being arranged between first teeth fixed to the universal time indicator and second teeth fixed to the hours hand, said setting mechanism including a boss pivotally mounted on the timepiece base plate, a star wheel and a pinion both fixed to said boss, said pinion meshing with said first teeth and a hollowed-out gear mounted on said boss and rotatable relative thereto, said hollowed-out gear meshing with said second teeth and bearing a jumper spring in its hollowed-out portion arranged to engage with said star wheel.

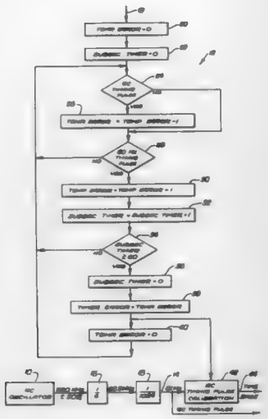
VOL 1074 ISS 1 JAN 6 1987 UMI

4,634,288

AUXILIARY TIMING SOURCE FOR AC-POWERED ELECTRONIC CLOCKS

Toribio Lobato, San Dimas, Calif., assignor to Clemar Manufacturing Corporation, Glendora, Calif.

Filed Apr. 17, 1985, Ser. No. 724,095
Int. Cl.[4] G04B *17/12*
U.S. Cl. 368—200 **14 Claims**



1. An auxiliary timing source for electronic clocks powered by an alternating current (ac), comprising:

a resistor-capacitor (RC) oscillator; and

means for calibrating the RC oscillator continuously with a frequency of the alternating current until loss of the ac power.

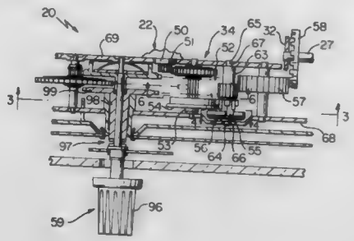
4,634,289

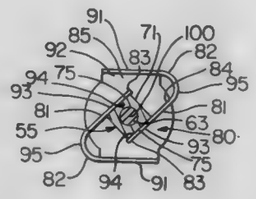
CLOCK CONSTRUCTION, GENEVA CLUTCH THEREFOR AND METHODS OF MAKING THE SAME

Larry V. Price, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 12, 1985, Ser. No. 796,902
Int. Cl.[4] G04B *19/02*
U.S. Cl. 368—220 **24 Claims**

1. In a clock construction comprising a frame means, drive means carried by said frame means, time indicating means carried by said frame means, and a Geneva clutch means carried by said frame means and operatively interconnecting said drive means to said time indicating means so that said drive means can drive said time indicating means in a timed sequence thereof, said clutch means comprising a shaft rotatably carried by said frame means, a pair of leaf spring means each having opposed end means with a longitudinal axis therebetween, one of said opposed end means of each said leaf spring means being fixed to said shaft so that said leaf spring means rotate in unison therewith, and a Geneva pinion rotatably disposed on said shaft and having a multi-sided section engaged by said leaf spring means to tend to cause said shaft to rotate in unison with said pinion about an axis of rotation as said pinion is being rotated by said drive means, each said leaf spring means having said longitudinal axis thereof disposed substantially transverse to said axis of rotation of said shaft and said pinion, the improvement wherein the other opposed end means of said leaf





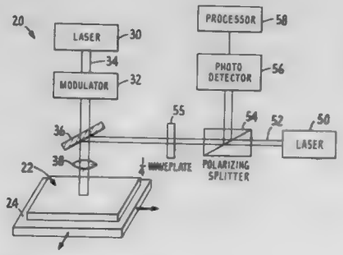
spring means extend in opposite directions relative to each other.

4,634,290

METHOD AND APPARATUS FOR DETECTING THERMAL WAVES

Allan Rosencwaig, Danville, and Jon Opsal, Livermore, both of Calif., assignors to Therma-Wave, Inc., Fremont, Calif.

Division of Ser. No. 612,075, May 21, 1984, Pat. No. 4,579,463.
This application Nov. 14, 1985, Ser. No. 797,949
The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.
Int. Cl.[4] G01N *21/41, 25/00*
U.S. Cl. 374—5 **8 Claims**



1. An apparatus for detecting thermal waves in a sample, by measuring intensity variations of a reflected probe beam resulting from periodic changes in optical reflectivity of the sample induced by the thermal waves, said thermal waves being generated by a periodic localized heating at a spot on the surface of the sample, said apparatus comprising:

a probe beam for emitting a beam of radiation;

means for directing the radiation probe beam within a portion of the periodically heated area on the sample surface in a manner such that the radiation probe beam reflects off the surface of the sample;

means for measuring the intensity variations of the reflected radiation probe beam resulting from the periodic changes in optical reflectivity of the sample induced by the periodic heating with the measured intensity changes being independent of changes in diameter or position of the probe beam; and

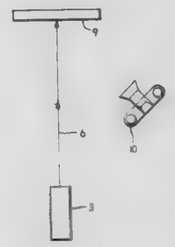
means for processing the measured intensity variations of the reflected radiation probe to detect the presence of the thermal waves.

4,634,291

COATING THICKNESS MEASUREMENT

Thomas E. Bantel, Cincinnati, Ohio; David F. Lahrman, Champaign, Ill., and John F. Halase, III, Fairfield, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 26, 1984, Ser. No. 674,998
Int. Cl.[4] G01N *25/00, 21/71*
U.S. Cl. 374—7 **2 Claims**



1. A method of ascertaining the equivalent thermal barrier thickness of a coating comprising the following steps:

(a) transferring heat to a part of the coating from an external source;

(b) measuring the relative temperature intensity distribution of a part of the coating other than the part of (a); and

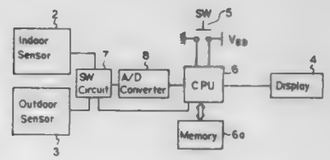
(c) comparing the relative temperature intensity distribution measured in (b) with a preestablished collection of reference intensities relating to actual coating specimens having known thermal barrier equivalent values and selecting from the reference collection a second distribution having a predetermined relationship to the relative temperature intensity distribution.

4,634,292

ELECTRONIC THERMOMETER

Toshio Ikeda, Kameoka; Tamaki Sakamoto, Otokuni, and Yoshihisa Masuo, Shiga, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Sep. 10, 1985, Ser. No. 774,495
Claims priority, application Japan, Sep. 11, 1984, 59-136722[U]
Int. Cl.[4] G01K *3/14, 13/00*
U.S. Cl. 374—109 **3 Claims**



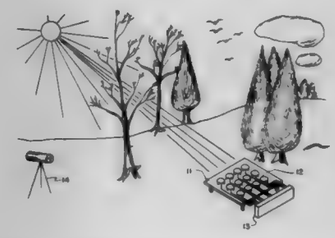
1. An electronic thermometer apparatus, comprising: a first temperature sensor for monitoring and detecting a first temperature in a first environment; a second temperature sensor for monitoring and detecting a second temperature in a second environment differing from said first environment; a display device for displaying said first and second temperatures on the basis of outputs from said sensors; means for displaying automatically said first and second temperatures in an alternate manner in a normal operating mode; a change-over switch for changing over the alternating display of said first and second temperatures to a continuous display of only one of said first and second temperatures; computer-controlled means responding to activation of said change-over switch to thereby cause the one of said first or second temperatures that is not displayed immediately before the activation of said change-over switch to be displayed continuously until said change-over switch is deactivated; and computer-controlled means responding to the deactivation of said change-over switch to allow said alternate display of said first and second temperatures to be continuously effected.

4,634,293

BATTLEFIELD ENVIRONMENT THERMAL ANALYZER

John A. D'Agostino, Alexandria, and Thomas J. Lillie, Stafford, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 8, 1981, Ser. No. 261,839
Int. Cl.[4] G01K *13/00, 1/02, 7/04;* **G01J** *5/00*
U.S. Cl. 374—124 **2 Claims**



1. The method of synthesizing the thermal signature of a target and background as seen through a thermal viewer comprising the steps of:

mounting a series of test elements having equal exposed surfaces, but different temperatures vs. time characteristics, when exposed to the same thermal radiation source, on a low heat capacity support member;

exposing said test elements simultaneously to at least a 24 hour variation of insolation at a plurality of widely separated geographical locations at different times of the year;

independently measuring the temperature vs. time characterstic of each test element; and

correlating said test elements by composition and thickness to exposed surface areas of the target and background to construct a temperature as time signature of the two in combination.

4,634,294

HAND-HELD DIGITAL TEMPERATURE MEASURING INSTRUMENT

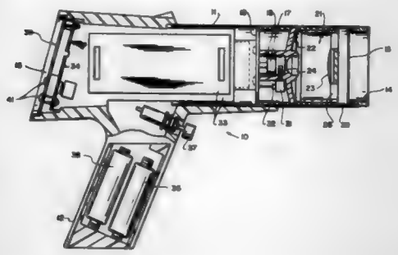
James T. Christol, Cupertino; Michael R. Jacobs, Mt. View, and Herbert L. Berman, Los Altos Hills, all of Calif., assignors to Raytek, Inc., Santa Cruz, Calif.

Filed May 12, 1981, Ser. No. 262,936
Claims priority, application PCT Int'l. Appl, Sep. 12, 1979, 79/00718
Int. Cl.[4] G01J *5/26, 5/60*
U.S. Cl. 374—170 **18 Claims**

1. In an instrument for measuring the temperature of a target without contact with the target: an infrared detector for providing a reading in the form of an electrical signal corresponding to infrared energy impinging thereon, optical means for directing infrared energy along a predetermined optical path from a target to the detector, a first temperature sensor for providing a reading in the form of an electrical signal corre-

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sponding to ambient temperature, a reference body which moves into and out of the optical path so that the detector reading corresponds alternately to the infrared energy from the target and the infrared energy from the reference body, a second temperature sensor for providing a reading in the form of an electrical signal corresponding to the temperature of the reference body, signal processing means responsive to the



signals from the infrared detector and the temperature sensors for calculating the temperature of the target and providing an output signal corresponding thereto, and display means responsive to the output signal for displaying the temperature of the target, said signal processing means employing a look up table and the following relationship in calculating temperature of the target:

$$N_S(T_S) = \frac{K_G(S_1 - S_2) - N_A(T_A)(1 - E_S) + N_F(T_F)}{E_S},$$

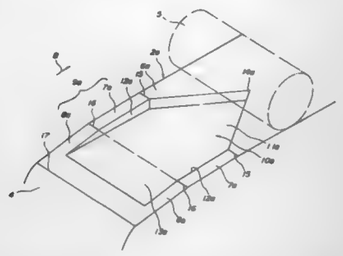
where $N_S(T_S)$ is the radiance of a black body radiator at the temperature of the target, K_G is a constant, S_1 is the detector reading corresponding to the target, S_2 is the detector reading corresponding to the reference body, $N_A(T_A)$ is the radiance of a black body radiator at the ambient temperature measured by the first temperature sensor, $N_F(T_F)$ is the radiance of a black body radiator at the reference body temperature measured by the second temerature sensor, and E_S is the emissivity of the target.

4,634,295

TRACK SURFACE OF A ROLLER BEARING FOR AN INFINITE RECTILINEAR MOTION

Norimasa Agari, Seki, Japan, assignor to Nippon Thompson Co. Ltd., Tokyo, Japan

Filed Sep. 5, 1985, Ser. No. 772,944
Claims priority, application Japan, Feb. 14, 1985, 60-19487[U]
Int. Cl.⁴ F16C *29/06*
U.S. Cl. 384—44 **4 Claims**



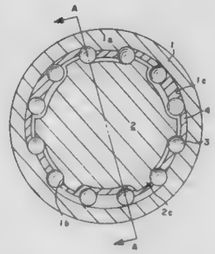
1. A track surface of a roller bearing for an infinite rectilinear motion in which a number of rollers respectively having rolling axes roll in succession in an infinite circulating passage which is constituted such that both ends of a rectilinear load track having a central longitudinal portion and a return passage are coupled by direction turning passages, wherein slope ranges each consisting of a gentle slope range which is formed subsequently to a rectilinear load track surface and a steep slope range which is steeper than said gentle slope range and is formed subsequently thereto are formed in both end portions of said load track surface and are continued to said direction turning passages on both ends of said load track, and concave portions which become narrow toward the longitudinal central portion of said load track are formed in the load track from both end portions thereof to said slope ranges.

4,634,296

BALL SPLINE BEARING

Hitoshi Watanabe, Mino, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1985, Ser. No. 773,013
Claims priority, application Japan, May 20, 1985, 60-106123
Int. Cl.⁴ F16C *31/06;* **F16D** *3/06*
U.S. Cl. 384—45 **2 Claims**



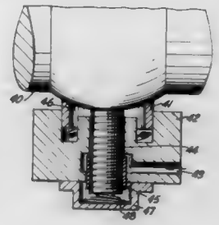
1. A ball spline bearing comprising:
a number of substantially identical balls;
an outer cylinder shaped as a hollow cylinder in which axially extending projections are formed in the inner peripheral surface of said outer cylinder at regular intervals the circumferential width of each of said projections being relatively narrow, while an axial length of each of said projections is shorter than the axial length of said outer cylinder, track grooves adapted to load said balls being formed in both side surfaces of each of said projections, U-shaped grooves being formed between said respective projections and having a predetermined substantially constant depth, the circumferential width of each of said U-shaped grooves being much greater than the circumferential width of each of said projections, and circularly curved direction turning passages formed at both axial ends of said projections so as to move the balls from each of said track grooves to a corresponding return passage formed in each of said U-shaped grooves;
cylindrical holding means fixed to the inner peripheral surface of said outer cylinder, in which, two of said return passages extending parallel to said track grooves are formed between said projections of said outer cylinder, each of said return passages connecting to the end of the corresponding circularly curved direction turning passage so as to form endless circulating passages for the balls, and windows extending in the axial direction, each width of said windows being slightly narrower than the diameter of each ball, being formed at least at the locations corresponding to said track grooves; and
a spline shaft having protuberances therein in axial direction so as to sandwich two rows of the load balls toward each other, in which the circumferential width of each of said protuberances is relatively narrow, and a track groove is formed in one side surface of each of said protuberances so that two of said track grooves formed respectively in adjacent protuberances face each other.

4,634,297

MEANS FOR SEALING OF A BEARING SPACE FORMED IN HYDROSTATIC AND AEROSTATIC BEARINGS ADAPTED TO RECEIVE A FLUID

Sven Schriwer, Trädgårdsvägen 36, 461 42 Trollhättan, Sweden

PCT No. PCT/SE82/00116, § 371 Date Dec. 14, 1982, § 102(e) Date Dec. 14, 1982, PCT Pub. No. WO82/03666, PCT Pub. Date Oct. 28, 1982
Continuation of Ser. No. 453,884, Dec. 14, 1982, abandoned.
This PCT application Apr. 8, 1982, Ser. No. 743,276
Claims priority, application Sweden, Apr. 15, 1981, 8102435
Int. Cl.⁴ F16C *32/06, 33/72*
U.S. Cl. 384—100 **5 Claims**



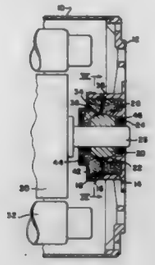
1. A hydrostatic or aerostatic bearing comprising: a first stationary bearing body, a second bearing body having a bearing surface slidable relative to said first bearing body, a space between said two bearing bodies containing a fluid, an annular seal in said stationary bearing body for sealing said space, said annular seal being movable towards and away from said bearing surface, said annular seal having a first end face remote from said bearing surface, and a second end face facing said second bearing body, said second end face having a linear annular edge, and a spring in said first bearing body and engaging said first end face, said spring pressing said end face into sealing line contact with said bearing surface along said annular edge only, to thereby seal said space.

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SELF-ALIGNING BEARING RETENTION SYSTEM

Bradly A. Crawford, American Township, Allen County, Ohio, assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Aug. 14, 1985, Ser. No. 765,471
Int. Cl.⁴ F16C *23/04*
U.S. Cl. 384—209 **6 Claims**



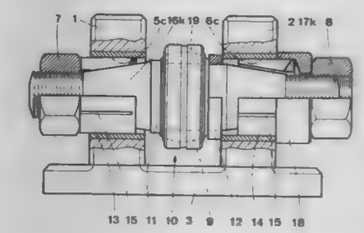
1. A self-aligning bearing assembly, comprising:
a bearing having a partially spherical outer surface and having a central hole for rotatably journaling a shaft therein;
a housing defining a generally cylindrical opening having an internal surface that is generally radially spaced from said bearing, said housing including a bearing seat adjacent to and generally conforming in shape with a first portion of the outer surface of said bearing;
said housing having a lip formed by the internal surface of the generally cylindrical opening;
a bearing retainer for urging said bearing into contact with said bearing seat, said retainer being of resilient, flexible, sheet-like material and initially having a generally planar body, having a plurality of radially deformable projections extending outwardly from said body, and having an aperture being engagable with said bearing outer surface;
said housing being so constructed as to permit said retainer to be moved axially into the opening toward said seat so that said retainer portion forming said aperture may be brought into engagement with said outer bearing surface and so that said projections deform radially inward as said retainer is inserted into said housing and said projections spring radially outward as said retainer clears said lip;
said lip being positioned with respect to said bearing such that when said retainer portion forming said aperture is in contact with said bearing surface and said projections are in contact with said lip, said retainer body is deformed axially at an acute angle with respect to its initial plane, whereby said retainer exerts a force against said lip and resiliently retains said bearing against said seat; and
wherein said projections continue to be inwardly radially deformed when in contact with said lip, thereby providing radial support for said bearing.

4,634,299

ARRANGEMENT FOR AN AXLE AND A METHOD OF MOUNTING A BEARING ON THE AXLE

Everth Svensson, Åtvidaberg, Sweden, assignor to Schaktfirma Broderna Svensson AB., Tvidaberg, Sweden

PCT No. PCT/SE84/00385, § 371 Date Jun. 20, 1985, § 102(e) Date Jun. 20, 1985, PCT Pub. No. WO85/02236, PCT Pub. Date May 23, 1985
PCT Filed Nov. 14, 1984, Ser. No. 752,199
Claims priority, application Sweden, Nov. 15, 1983, 8306273-7
Int. Cl.⁴ F16C *25/00, 23/04;* **F16B** *2/14*
U.S. Cl. 384—271 **5 Claims**



1. An arrangement for an axle (4) which is anchored at two points situated at the ends of the axle (4), preferably in mounting cheeks (1, 2) or the like provided with through-bores (5, 6) for the axle (4), by means of nuts (7, 8) which can be screwed on outside the fixing points, and which is designed to have a bearing (10) mounted on a central cylindrical part (9), this bearing being fixed by means of spacer elements (11, 12) disposed on the axle (4) and bridging the distance between the respective fixing points and the bearing (10), characterized in that one (11) of the space elements (11, 12) is integral with the cylindrical part (9) of the axle (4), that the arrangement comprises two expanding sleeves (13, 14) which can be inserted in the said through-bores (5, 6) and have inwardly-facing conical shaping, and that the axle (4) has a corresponding conical shaping over a zone (16, 17) at the respective fixing points so that the respective expanding sleeves (13, 14) act as annular wedges with their apex pointing towards the cylindrical part (9), so that by means of the associated nut (7, 8) the respective expanding sleeves (13, 14) can be caused to expand against the wall of the through-bores (5, 6), thereby accomplishing the anchoring of the axle (4).

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3. A method of mounting a bearing (10) on an axle (4) which is anchored at two points situated at the ends of the axle (4), preferably in mounting cheeks (1, 2) or the like provided with through-bores (5, 6) for the axle (4), by means of nuts (7, 8) which can be screwed on outside the fixing points, and which is designed to have the bearing (10) mounted on a central cylindrical part (9), this bearing being fixed by means of spacer elements (11, 12) disposed on the axle (4) and bridging the distance between the respective fixing points and the bearing (10), one (11) of the space elements (11, 12) is integral with the cylindrical part (9) of the axle (4), and the arrangement comprises two expanding sleeves (13, 14) which can be inserted in the said through-bores (5, 6), comprising the steps of: placing between the nut (8) and the mounting cheek (2), a sleeve (18), on the end of the axle which is furthest away from the spacer element (11), the dimensions of this sleeve being such that, without influencing the associated expanding sleeve (14) when the nut (8) is tightened, it can be braced against the mounting cheek (2) so that the inner race (19) of the bearing (10) is thereby clamped between the fixed spacer element (11) on one side and the spacer element (12) resting loosely against the mounting cheek (2) on the other side, and designed to bridge the gap and eliminate looseness between the inner race (19) of the bearing (10) and the mounting cheek (2), the second end of the axle is then anchored by means of an associated expanding sleeve (13), by tightening the associated nut (7), the sleeve (18) is then removed, and finally the first-named end of the axle is anchored in the same way as the second end of the axle.

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ROTATING MEMBER SUPPORTING APPARATUS

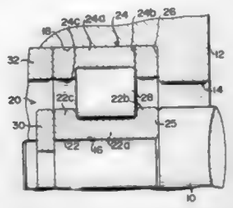
Hiroaki Takebayashi, Oosaka; Fujio Harumi, Hirakata; Kiyoshi Nakamura, Yokohama, and Koichi Inoue, Tokyo, all of Japan, assignors to Koyo Seiko Company Limited, Oosaka and Kabushiki Kaisha Toshiba, Kawasaki, both of, Japan

Filed Mar. 29, 1985, Ser. No. 717,883

Claims priority, application Japan, Mar. 30, 1984, 59-64844

Int. Cl.[4] F16C *19/26*

U.S. Cl. 384—548 **17 Claims**



1. A rotating member supporting apparatus comprising:
an outer member having a bore therein;
an inner member inserted in the bore and capable of rotation relative to the outer member, one of said outer and inner members constituting a rotating member, and the other constituting a supporting member for supporting the rotating member; and
a rolling bearing interposed between the outer and inner members and rotatably supporting the rotating member, said rolling bearing including an inner ring having resistance to heat and corrosion and fitted on the outer peripheral surface of the inner member, an outer ring having resistance to heat and corrosion and fitted in the bore so as to face the inner ring, wherein said inner and outer rings are each formed of a metal ring coated with a corrosion resisting film of carbide of vanadium or compound of chromium, and a plurality of ceramic rolling elements rollably arranged between the outer peripheral surface of the inner ring and the inner peripheral surface of the outer ring.

4,634,301

PRINT HEAD WITH TORSION SPRING

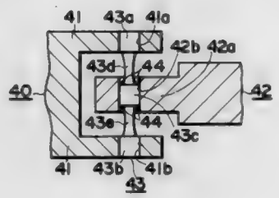
Atsuo Sakaida, Gifu; Masafumi Kawaura, Nagoya; Yasuji Chikaoka, Shippocho; Hiroshi Iwata, Nagoya, and Kiyomitsu Asano, Musashino, all of Japan, assignors to Nippon Telecommunication Engineering Company, Tokyo and Brother Industries, Ltd., Nagoya, both of, Japan

Filed Oct. 18, 1984, Ser. No. 662,247

Claims priority, application Japan, Oct. 20, 1983, 58-163199[U]; Oct. 20, 1983, 58-163202[U]

Int. Cl.[4] B41J *3/12*

U.S. Cl. 400—124 **4 Claims**



1. A print head for dot printers comprising a plurality of actuators each including an armature supported on a holder through a torsion spring and having at an actuator end a printing wire with a wire end which is swingably driven to print letters with the wire end, wherein one of said holder and armature has a bifurcated end portion and the other of said holder and armature has an opposite end portion located between said bifurcated ends, said bifurcated end portion and said opposite end portion having through-holes with innerwalls which are provided in axial alignment relation with one another, and said torsion spring is inserted into and bonded to the inner wall of said through-holes by soldering, said torsion spring having a central axis, bonding portions disposed in said through-holes, and intermediate portions separating said bonding portions, said intermediate portions having a smaller diameter than a diameter of said bonding portions, said intermediate portions being defined by upper and lower arched curves concave in the middle and symmetrically disposed with respect to said central axis.

4,634,302

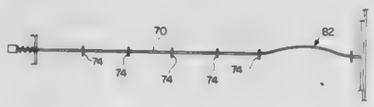
ACTUATOR FOR DOT MATRIX PRINTHEAD

Daniel A. West, Santa Clara; Lawrence S. Nyi, San Jose, and Ramon J. Ravelo, Santa Cruz, all of Calif., assignors to Dataproducts, Inc., Woodland Hills, Calif.

Division of Ser. No. 769,668, Aug. 26, 1985, Pat. No. 4,585,361, which is a continuation of Ser. No. 580,656, Feb. 16, 1984, abandoned. This application Dec. 9, 1985, Ser. No. 806,408

Int. Cl.[4] B41J *3/12*

U.S. Cl. 400—124 **1 Claim**



1. A wire matrix printhead comprising:
an actuator housing containing a plurality of actuator assemblies, each actuator including a yoke assembly, an armature assembly which is pivotably supported with respect to the yoke assembly, and a drive coil coupled to the yoke assembly to generate a magnetic field within the yoke assembly to attract the armature assembly;
a wire guide housing extending from the actuator housing and including a plurality of print wires passing therethrough, each print wire having an armature end thereof adjacent an armature assembly to be moved thereby and an impact end opposed to the armature end, wherein when a print wire impacts a printing medium it will buckle and subsequently return to an unstressed condition;
a plurality of wire bearings located along the length of the wire guide housing and supporting the print wires within the housing, wherein a first subset of said plurality of wire bearings are located relatively close together along the length of the wire guide housing near a position at which the armature ends of said print wires rest when in their unstressed condition and a second subset of said plurality of wire bearings are located adjacent to the inpact ends of said print wires and spaced relatively far apart such that said print wires are forced to buckle in a region supported by said second subset and are prevented from buckling in a region supported by said first subset so that potential energy created by the buckling will quickly return the armature ends of the print wires to their position at the unstressed condition.

4,634,303

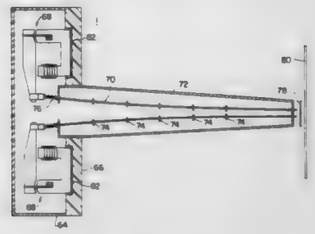
ACTUATOR FOR DOT MATRIX PRINTHEAD

Daniel A. West, Santa Clara; Lawrence S. Nyi, San Jose, and Ramon J. Ravelo, Santa Cruz, all of Calif., assignors to Dataproducts, Inc., Woodland Hills, Calif.

Division of Ser. No. 769,668, Aug. 26, 1985, Pat. No. 4,585,361, which is a continuation of Ser. No. 580,656, Feb. 16, 1984, abandoned. This application Dec. 9, 1985, Ser. No. 806,382

Int. Cl.[4] B41J *3/12, 9/42*

U.S. Cl. 400—124 **8 Claims**



1. An actuator for a matrix printhead, comprising:
a yoke assembly having a base portion and first and second leg portions extending from one side of the base portion;
an armature assembly extending across the leg portions and pivotally supported with respect to the first leg portion, said yoke assembly and armature assembly together forming a magnetic circuit with a closing gap defined between the armature and a pole face at an end of the second leg portion;
a drive coil coupled to the yoke assembly to generate a magnetic field in the yoke assembly to cause the armature assembly to pivot toward the pole face of the second leg portion; and
cushion means located at a peripheral surface surrounding the end of the second leg portion and positioned to contact the armature before the armature closes through a last portion of the closing gap to prevent the armature assembly from impacting directly against the pole face of the second leg portion thereby to minimize the amount of noise generated by the actuator.

7. A matrix printhead comprising:
a plurality of actuator assemblies including a yoke assembly having a base portion and first and second leg portions extending from one side thereof, an armature assembly pivotably coupled to the first leg portion and extending beyond the second leg portion, and a drive coil coupled to the yoke assembly to generate a magnetic field in the yoke assembly to attract the armature toward a face of the second leg portion;
a base plate having molded recesses in which the base portions of the actuator assemblies are encapsulated; and
a layer of damping material provided in the molded recesses and located between the base plate and actuator assemblies for reducing the transmission of vibration from the actuators to the base plate.

4,634,304

PRINTER

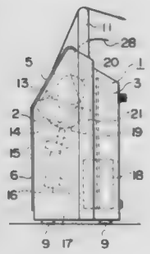
Tsugio Narushima; Tsutomu Arai, and Yasuo Doumoto, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1984, Ser. No. 648,087

Claims priority, application Japan, Sep. 12, 1983, 58-168070; Sep. 14, 1983, 58-170135; Sep. 14, 1983, 58-142698[U]

Int. Cl.[4] B41J *29/16, 29/02, 15/04*

U.S. Cl. 400—691 **2 Claims**



1. A printer comprising:
a vertical body having a height thereof greater than a depth thereof and having a bottom surface area and a side surface area thereof smaller than a front surface area thereof;
means for feeding paper which is arranged at an upper portion in a space on the front side of said case and which further comprises a paper feed motor;
a platen arranged at an intermediate portion in a space on the front side of said case;
carrier means including a carrier arranged at a lower portion in a space on the front side of said case and which includes a carrier motor for driving said carrier, wherein said carrier means comprises means for printing said paper;
a power source block arranged at a lower portion in a space on a rear side of said case;
a cover detachably mounted on said case so as to cover said paper feed motor, said means for feeding paper and said carrier; and
a handle mounted on the upper portion of said case and which includes means for guiding said paper out of said body after being printed.

4,634,305

INK SUPPLY SYSTEM FOR WRITING INSTRUMENTS WHICH OPERATE WITH LIQUID INK

Günther Herrnring, Alvesloe, Fed. Rep. of Germany, assignor to Montblanc-Simplo GmbH, Hamburg, Fed. Rep. of Germany

Filed Jun. 13, 1984, Ser. No. 620,162

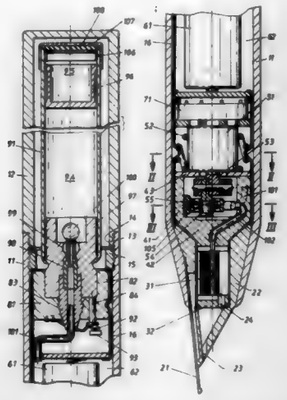
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1983, 3321301

Int. Cl.[4] B43K *5/06*

U.S. Cl. 401—151 **8 Claims**

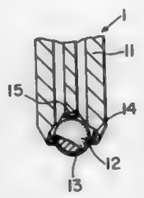
1. An ink supply system for a writing instrument which operates with liquid ink; said system comprising:
a housing for said writing instrument, said housing including a primary large-volume reservoir for ink at a pressure in excess of atmospheric pressure, and also including a sec-

ondary, small-volume capillary active reservoir operatively connected therewith;
a writing element connected to said housing; said secondary reservoir having means for communication with outside air and also with said writing element; and
a tube pump which is installed within said housing for said writing instrument and which acts as an electrically actu-



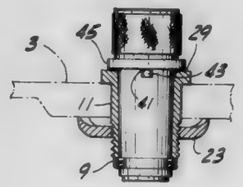
atable recharge valve, is controllable as a function of sensed filling need, and means to connect said primary large-volume reservoir via line connection to said secondary small-volume reservoir for supplying it every time if the ink supply in said secondary small-volume reservoir is running short and refills the small-volume reservoir with ink, supplied from the large-volume reservoir until it is sufficiently filled.

4,634,306
WRITING POINT FOR WRITING OR RECORDING INSTRUMENTS AND PROCESS FOR ITS MANUFACTURE
Peter Dzuik, Nuremburg, Fed. Rep. of Germany, assignor to Firma J.S. Staedtler, Nuremburg, Fed. Rep. of Germany
Filed Nov. 28, 1983, Ser. No. 555,516
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3243964
Int. Cl.⁴ B43K *1/00, 1/06, 1/08*
U.S. Cl. 401—215 **3 Claims**



1. In a writing or recording instrument, a writing point having a portion thereof adapted to contact a writing surface and at least said portion comprising a coating of one of metallic glass or amorphous metal, said coating having a thickness of 1–500 μm, said metallic glass or amorphous metal is formed of alloys selected from the group comprising an alloy of at least one of iron, nickel and cobalt with at least one of phosphorous, boron, carbon, aluminum, silicon and chromium.

4,634,307
QUICK-DISCONNECT CONNECTOR
Donald J. Gnaedinger, 90 Sundew Ln., Highland, Ill. 62249, and Dennis J. Potthast, 149 E. Dunn, Edwardsville, Ill. 62025
Filed Feb. 14, 1986, Ser. No. 829,166
Int. Cl.⁴ F16B *9/00*
U.S. Cl. 403—194 **14 Claims**

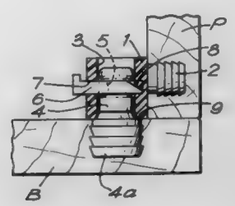


1. A connector for connecting a base and a column of a microphone stand or the like, said connector comprising:
a generally cylindric male member having a first end portion adapted for connection to the column of the microphone stand and a second end portion having an external annular groove spaced axially of the male member from the first end portion;
spring retaining means carried in said groove compressible from an expanded configuration wherein it projects partially out of the groove to a compressed configuration wherein it lies entirely within said groove;
a female member adapted for connection to the base of the microphone stand, said female member having a generally circular bore therethrough sized to receive the second end portion of said male member with relatively minimal clearance, the length of said bore being only slightly less than the distance said groove is spaced from said first end portion of the male member whereby when said second end portion of the male member is inserted into one end of the bore through the female member the spring retaining means is adapted to move to its compressed configuration to permit passage of said male member into said bore to a locking position wherein the second end portion of the male member projects endwise beyond the other end of the bore and wherein said spring retaining means is adapted to spring outwardly to its expanded configuration, said spring retaining means in its expanded configuration being adapted for engagement with the female member to retain the male member in said female member and thereby secure the column to the base, said column being detachable from the base by exerting an axial withdrawing force on the column sufficient to compress said spring retaining means to its compressed configuration to permit said male member to be withdrawn from said female member; and

means adapted for preventing relative rotation between the male and female members when the male member is in said locking position.

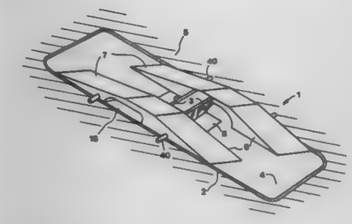
4,634,308
Patent Not Issued For This Number

4,634,309
KNOCK-DOWN FITTINGS
Dave Dewey, London, United Kingdom, assignor to Unerman Greenman Berger Limited, England
Filed Nov. 7, 1985, Ser. No. 795,927
Int. Cl.⁴ B25G *3/00*
U.S. Cl. 403—407.1 **2 Claims**



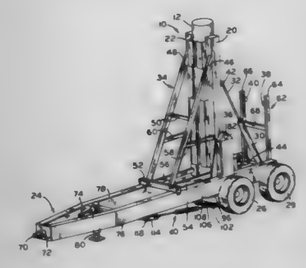
1. A knock-down fitting assembly for securing together two panels at right-angles to one another, each said panel having pre-drilled hole means therein near to an edge thereof, the assembly comprising a first component comprising a generally oblong body having two flat side surfaces at right-angles to one another, a pair of projections extending generally perpendicularly from one of said two flat sides in mutually spaced relation longitudinally of said side, a bore located generally centrally of said body parallel with said one side and opening to the other of said two sides, and an aperture in the body opening to a third side thereof parallel with said one side and transversely intersecting the bore intermediate the ends of the latter, a second component in the form of a peg having a shoulder intermediate its ends, one end portion of the peg being receivable in the bore in the body until said shoulder abuts said other of said two sides thereof, the other end portion of the peg resembling each said projection of the body, said one end portion of the peg having an hourglass shaped waist, and a third component in the form of a bifurcated clip which is insertable in the aperture so that arms thereof engage opposite sides of the waist in said one end portion of the peg when received in the bore, and by a camming action on the surface of the waist presented to said other end portion of the peg tend to draw the peg into the bore until the shoulder abuts said other of said two sides of the body.

4,634,310
TRAFFIC MARKER AND HOUSING
Ronald A. W. Clarke, 501 Wilkins Street, Apt. 717, London, Ontario, Canada N6C 5G2
Filed Feb. 12, 1985, Ser. No. 700,874
Claims priority, application Canada, Feb. 14, 1984, 447389
Int. Cl.⁴ E01F *9/00*
U.S. Cl. 404—15 **5 Claims**



1. Traffic marker, having a reflector which reflects light from the headlamps of an oncoming vehicle back towards the vehicle;
where a longitudinal axis of the marker lies parallel to the direction of the traffic;
where the marker comprises a ramp-surface;
where the ramp surface is so positioned on the marker that an oncoming snow-plow blade will strike the ramp-surface;
where the ramp-surface slopes gently upwards in such a manner that the said snow-plow blade, upon striking the ramp-surface, will be deflected gently up and over the marker;
and where the ramp surface also slopes laterally, at a substantial angle to the longitudinal axis of the marker.

4,634,311
PAVEMENT BREAKING APPARATUS
John W. Jinnings, and Orrin H. Jinnings, both of Columbia City, Ind., assignors to Hercules Machinery Corporation, Fort Wayne, Ind.
Filed Feb. 20, 1985, Ser. No. 703,303
Int. Cl.⁴ E01C *23/12*
U.S. Cl. 404—90 **12 Claims**



1. An apparatus for impacting on a hard surface such as concrete so as to break up the hard surface comprising:
a frame having a bed and an upstanding rail assembly projecting from said bed;
a drive shoe;
hammer means, attached to said rail assembly so as to be

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movably in only one direction and operatively connected to the drive shoe, for impacting upon said drive shoe;

said drive shoe positioned adjacent the surface so that upon being impacted by said hammer means said shoe forcefully impacts the surface so as to breakup the surface; and

an adjustment means for continuously exerting a biasing force on the drive shoe so as to selectively position the drive shoe relative to the hammer means including an adjustable arm assembly wherein said arm assembly includes a resilient belt mounted to said bed, and an adjustable rigid turnbuckle having one end attached to said belt and the other end attached to said drive shoe.

4,634,312

SELF CLEANING DRAIN GUTTER OR PIPE

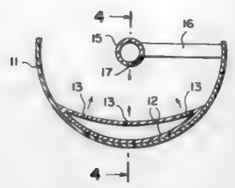
Erich Sierzel, Brink 36, 4270 Dorsten 12, Fed. Rep. of Germany

Filed May 4, 1984, Ser. No. 607,222

Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317228; May 28, 1983, 3319424

Int. Cl.⁴ E02B *9/04*; E04D *13/00*; B08B *3/00*

U.S. Cl. 405—119 **10 Claims**



1. A self cleaning drainage channel, comprising a drainage channel, at least one conduit disposed at the bottom of said drainage channel and matched to the cross-sectional shape thereof, and a nozzle system integrated into the drainage channel which includes injection nozzles provided in said at least one conduit approximately at regular intervals along the length of said drainage channel oriented in the drainage direction, a rinsing medium being supplied under relatively high pressure through said at least one conduit to said injection nozzles, which direct the rinsing medium directly at the bottom of said channel exclusively towards said drainage direction so that it imparts an impulse to solid particles at the bottom of the channel.

4,634,313

PIPE LAYING AND REPLACEMENT

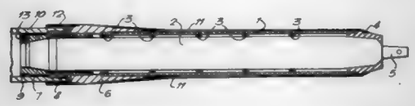
Brian A. Robbins, Maidstone, England, assignor to Water Research Centre, England

Filed Dec. 6, 1984, Ser. No. 679,060

Claims priority, application United Kingdom, Dec. 8, 1983, 8332738

Int. Cl.⁴ F16L *1/00*; E21B *1/00*

U.S. Cl. 405—184 **17 Claims**



1. Apparatus for use in the laying and/or replacement of pipes underground said apparatus comprising a sleeve having a front end and a rear end, a percussive drive means mounted in said sleeve and arranged to drive the front end of said sleeve through the ground, means for securing the leading end of a pipe to the rear end of the sleeve and means for pushing the rear end of the pipe through a bore formed in the ground as said sleeve is advanced through the ground by said drive means, said means for securing the end of the pipe to the sleeve being mounted on said sleeve and being axially movable relative to said sleeve to allow relative axial movement to take place between the pipe and the sleeve in order to prevent impact stresses on the sleeve from said drive means from being transmitted to the pipe.

4,634,314

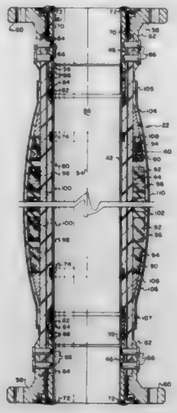
COMPOSITE MARINE RISER SYSTEM

Robert H. Pierce, Houston, Tex., assignor to Vetco Offshore Inc., Ventura, Calif.

Filed Jun. 26, 1984, Ser. No. 624,621

Int. Cl.⁴ E21B *17/01*

U.S. Cl. 405—195 **36 Claims**



1. A marine riser for use in drilling or production of hydrocarbons from a subsea formation comprising:

elongated tubular body means constructed of a composite of elongated filaments of a material in a resin matrix having a modulus of elasticitiy not less than about 27×10^6 psi, said filaments being bonded in a resin matrix to form a load bearing member of said tubular body means having an elastic elongation strain characteristic under stress in tension not substantially greater than steel; and

coupling means at opposite ends of said tubular body means for coupling said riser to a member for transmission of tensile loads through said tubular body means between said ends.

4,634,315

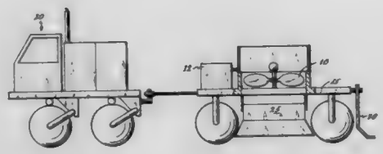
FORCED REFREEZING METHOD FOR THE FORMATION OF HIGH STRENGTH ICE STRUCTURES

Lawrence B. Owen, and Sidney J. Green, both of Salt Lake City, Utah, assignors to Terra Tek, Inc., Salt Lake City, Utah

Filed Aug. 22, 1985, Ser. No. 768,053

Int. Cl.⁴ E02D *17/00*

U.S. Cl. 405—217 **11 Claims**



1. An improved method for the construction of load-bearing ice structures including ice platforms and grounded ice islands and the like wherein the ambient air is sufficiently cold to effect freezing of sea water and wherein the structure is constructed from sea water, comprising the steps of:

initially forming an initial ice structure from sea water by spraying or impounding the sea water,

thereafter directing downwardly towards the upper surface of said initial ice structure a controlled column of ambient air having a temperature sufficiently low to freeze sea water and water having a salinity greater than sea water such that at least a portion of the entire surface is sequentially exposed to said column of air to effect freezing or refreezing thereof, and

continuing to apply sea water to said ice structure followed by the step of directing cold ambient air to the surface thereof until said ice structure is completed.

4,634,316

COMPACTED DEEP FOUNDATION STRUCTURE, METHOD OF AND APPARATUS FOR BUILDING THE SAME

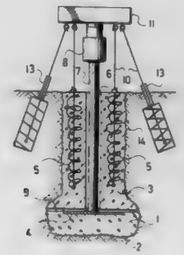
Boris Cernak, and Karol Klein, both of Bratislava, Czechoslovakia, assignors to Vyzkumny ustav inzenierskych stavieb, Bratislava, Czechoslovakia

Filed Dec. 27, 1984, Ser. No. 686,721

Claims priority, application Czechoslovakia, Dec. 27, 1983, 9989-83

Int. Cl.⁴ E02D *5/00*

U.S. Cl. 405—229 **10 Claims**



1. An apparatus for building a compacted deep foundation structure, comprising a separate foot block pushed into a foundation ground, a foundation body which is arranged above said foot block and separated therefrom by a space, at least one through hole for a strut being provided in said foundation body, a strut in said through hole, a load distributing beam anchored in said foundation body and a linear motor disposed between said strut and said load distributing beam.

4,634,317

METHOD OF ROCK BOLTING AND TUBE-FORMED EXPANSION BOLT

Bo T. Skogberg, Handen, and Gunnar V. R. Romell, Djursholm, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 127,776, Mar. 6, 1980, Pat. No. 4,459,067. This application Jan. 23, 1984, Ser. No. 572,858

Claims priority, application Sweden, Mar. 9, 1979, 7902129

The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.

Int. Cl.⁴ E21D *20/00*

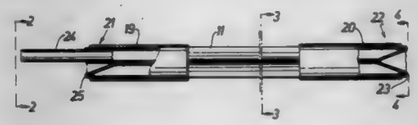
U.S. Cl. 405—259 **16 Claims**

1. In a method of rock bolting wherein an elongated tube-formed bolt is first inserted into a borehole and then expanded against the borehole,

the improvement comprising:

inserting a bolt freely into the borehole which, before being expanded, in its tubular cross-section has a peripheral length in a direction transverse to the axial direction of the bolt that exceeds the circumference of the borehole, the bolt having a closed cross-section and having at least a part of its closed cross-section initially inwardly collapsed toward the axis of the tube continuously along a substantial length of the tube so that in its initially collapsed state it is slimmer than the borehole and so that it can be freely inserted into the borehole; then

expanding at least the collapsed portion of said bolt by temporarily applying an expansion medium internally of the tube such that at least the non-collapsed portion of the



tube is moved into contact with the borehole to frictionally clamp against the walls of the borehole; and then

removing the application of said expansion medium after expansion and clamping of the expanded portion of the tube against the walls of the borehole, the expanded portion of the tube remaining frictionally clamped against the walls of the borehole even after removal of application of said expansion medium.

4,634,318

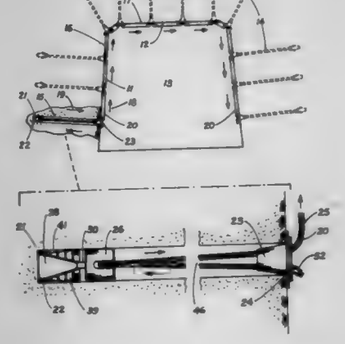
INTEGRATED ROCK REINFORCEMENT SYSTEM AND METHOD USING A CONTINUOUS CABLE

George Koumal, 2001 N. Evelyn Ave., Tucson, Ariz. 85715

Filed Nov. 23, 1984, Ser. No. 620,699

Int. Cl.⁴ E21D *20/00*

U.S. Cl. 405—259 **2 Claims**



1. A rock mass reinforcement method for use in excavations having a rib and back rock mass with fractures and joints oriented in multi-directional planes, the excavation being provided with a plurality of drill holes in a drill hole reinforcement pattern and a continuous cable having one end anchored to an initial anchor point, said method comprising the steps of:

(a) doubling a loose end portion of said anchored continuous cable to form a looped end;

(b) installing a drill hole collar plate assembly over said looped end of said continuous cable;

(c) positioning said looped end of said continuous cable over a pulley member of an anchor-pulley assembly;

(d) positioning into a drill hole, said anchor-pulley assembly having said looped end of said continuous cable;

(e) activating a spring-loaded expansion shell member of said anchor-pulley assembly positioned in said drill hole;

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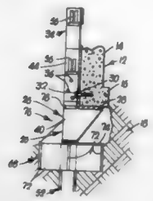
(f) positioning said drill hole collar plate assembly into said drill hole having said anchor-pulley assembly and said looped end of said continuous cable positioned therein;
(g) applying tension on a loose end portion of said continuous cable extending from said drill hole having positioned therein said anchor-pulley assembly, said looped end of said continuous cable and said drill hole collar plate assembly; and
(h) locking said applied tension on said continuous cable by inserting a plug insert member into a drill hole collar plug member of said positioned drill hole collar plate assembly, whereby said locking of applied tension, anchors said continuous cable in a manner equivalent to said initial anchor point; said recited steps being sequentially repeated at each drill hole of said reinforcement drill hole pattern until said plurality of drill holes of said reinforcement pattern have been tensioned with said continuous cable thereby reinforcing said fractures and joints oriented in multi-directional planes in said rock mass of said excavation.

4,634,319

METHOD AND APPARATUS FOR LIFTING AND SUPPORTING STRUCTURES

Donald R. May, 720 Belle Vista Dr., Independence, Mo. 64055, assignor to Donald R. May and Sandra L. May, both of Independence, Mo.

Filed Mar. 28, 1985, Ser. No. 717,142
Int. Cl.⁴ E02D *5/00*
U.S. Cl. 405—230 **7 Claims**



1. Apparatus for lifting and supporting a building structure having a base comprising:
a vertically positioned pier driven in the ground adjacent the building structure and having an upper end proximal to the base of the building structure;
a pier plate unit fitted over the upper end of the driven pier;
a shoe attached to the base of the structure, said shoe being in spaced, overlying relationship to the pier plate unit;
temporary lifting means between the pier plate unit and the shoe for initially lifting the shoe and therefore the structure; and
permanent supporting means finally positioned between the pier plate unit and the structure for supporting the structure in its final desired position.

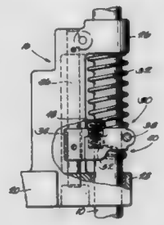
4,634,320

DRILL STAND LOCK

Andrew L. Itzov, Menomonee Falls, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

Filed Jul. 1, 1985, Ser. No. 750,170
Int. Cl.⁴ E21C *11/00*
U.S. Cl. 408—136 **7 Claims**

1. A stand for supporting a portable power drill for operation in the manner of a drill press, comprising
a base
a column supported by and projecting upwardly from said base,
a clamp slideably mounted on said column and including means fixing said clamp on said column at a desired height,
a carriage slideably mounted on said column and including a bushing on each side of said clamp,
a first spring biasing said carriage to a raised position relative to said clamp,
means operative to move said carriage downwardly against the bias of said spring,
a lock plate having a hole slightly larger than the diameter of said column and fitting over said column adjacent said clamp,



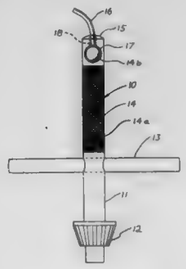
a fulcrum fixed relative to said clamp and engaging said plate so the plate can tilt about said fulcrum,
a second spring biasing said plate to tilt said plate to engage the edge of the hole in the plate with the column,
said plate being moveable against the bias of said second spring to disengage said plate from said column to enable said clamp to be moved up or down said column if said clamp is released from said column.

4,634,321

CHUCK KEY AND EXTENSION MEMBER FOR A CHUCK KEY

Thomas W. McClelland, 407 Broome St., 4th Floor, New York, N.Y. 10013

Filed Jul. 16, 1985, Ser. No. 755,608
Int. Cl.⁴ B23B *39/00*
U.S. Cl. 402—241 R **11 Claims**



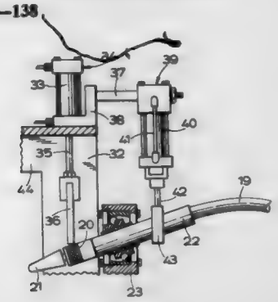
1. The combination of a chuck key and a suspension therefor comprising:
a rotatable rod having a gear thereon and transverse means extending therefrom for rotating said rod, said rod having an extended portion on a side of said transverse means opposite to said gear, said extended portion having an aperture therein near an end-portion thereof and extending transversely through said extended portion;
said extended portion having an aperture extending longitudinally through said end portion to said transversely extending aperture; and
elongated, flexible means having a ball fitting in said transversely extending aperture and said flexible means extending through said longitudinally extending aperture through said end portion.

4,634,322

ASSEMBLY FOR USE IN REMOVING MATERIAL FROM THE ENDS OF BARS OR THE LIKE WORKPIECES

Derek W. R. Walker, Four Gates, Hopstone, Claverley, Wolverhampton, England

Filed Nov. 19, 1984, Ser. No. 673,127
Claims priority, application United Kingdom, Nov. 17, 1983, 8330710
Int. Cl.⁴ B23C *3/12*
U.S. Cl. 409—138 **8 Claims**



1. An assembly for use in removing material from both ends of a workpiece of elongated shape, the assembly comprising two pieces of apparatus, each operative to remove material from an associated end of a workpiece and each comprising cutter holding means rotatable about a cutter axis, a motor operative to rotate said cutter holding means about said cutter axis, so that in use a cutter held by the cutter holding means can effect removal of material from the workpiece, a universal mounting for the cutter holding means enabling the cutter holding means to swing bodily about at least one point on a workpiece axis and thus in use to rotate bodily in a closed path of appropriate configuration around said workpiece axis to effect removal of said material, and guiding means operative in use to urge the cutter to follow said closed path, said two pieces of apparatus being capable of being disposed in a working state in which cutters held by said cutter holding means can remove material from both ends simultaneously of a workpiece of elongated shape mounted between them in a working position, and the assembly also including positioning means operable in use to cause those cutter heads to assume loading positions such that in use when the cutters are in their loading position a workpiece can be moved laterally into or out of its working position, the positioning means comprising deflecting means, associated with each of the cutter holding means and operative in use to move in a direction transverse to said working axis so as to cause the cutter to move to or to be retained in a predetermined loading position outside said closed path.

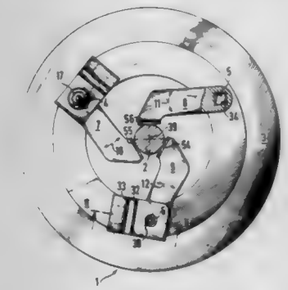
4,634,323

APPARATUS FOR GUIDING WORKPIECES

Ralf Wagner, Solingen; Horst Fischer, Hilden, and Fritz Heider, Solingen, all of Fed. Rep. of Germany, assignors to Th. Kieserling & Albrecht, G.m.b.H. & Co., Solingen, Fed. Rep. of Germany

Filed Oct. 27, 1983, Ser. No. 545,889
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1982, 3240146
Int. Cl.⁴ B23B *25/00*
U.S. Cl. 409—167 **18 Claims**

1. Apparatus for guiding elongated workpieces moving longitudinally along an axis comprising: a plurality of spaced workpiece guides movable toward and away from said axis, guide adjusting means for selectively moving said guides toward and away from said axis, a torsion spring interposed between each said guide and said adjusting means for providing yielding movement of said guides relative to said adjusting means, and wherein said guides and guide adjusting means are connected by shafts extending generally parallel to said axis



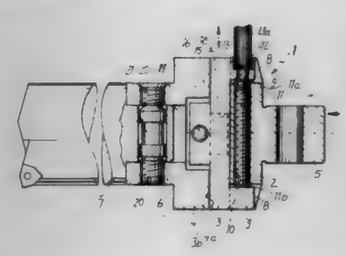
and at least a portion of each said shaft defines said torsion spring.

4,634,324

TOOL HOLDER WITH RADIAL ADJUSTMENT MEANS FOR A TOOL, IN PARTICULAR A ROTARY TOOL

Otto Eckle, Loechgau, and Walter Roser, Besigheim, both of Fed. Rep. of Germany, assignors to Komet Stahlhalter-und Werkzeugfabrik Robert Bruening GmbH, Besigheim, Fed. Rep. of Germany

Filed Jul. 16, 1985, Ser. No. 755,403
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1984, 8422976
Int. Cl.⁴ B23C *1/12*
U.S. Cl. 409—209 **6 Claims**



1. In a tool holder with radial adjustment means for a tool, in particular a rotary tool, comprising a connecting portion having an axially extending connecting shank and a first screwthreaded spindle which extends radially with respect to an axis thereof, a head portion which is adjustable radially relative to said axis of said connecting shank and with respect to said connecting portion, said head portion having at its free end a tool receiving means, and a plurality of clamping screws extending parallel to said axis of said connecting shank, the improvement comprising wherein an intermediate portion is disposed between said connecting portion and said head portion, wherein all three portions are of a substantially disc-like configuration and have their axially facing sides bearing against each other, which sides extend radially with respect to said axis of connecting shank, wherein two diametrally oppositely disposed first recesses are provided at the periphery of said connecting portion, said intermediate portion having two diametrically disposed first claws received in said first recesses on said connecting portion with radial play and without circumferential play, wherein two diametrally oppositely disposed second recesses are provided at the periphery of said intermediate portion, said second recesses being displaced through 90° relative to said first claws, said head portion having two diametrically disposed second claws received in said

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second recesses in said intermediate portion with radial play and without circumferential play, wherein said first screwthreaded spindle is threadedly received in a first screw-threaded bore in said connecting portion, the ends of said first spindle terminating at said first recesses on said connecting portion and bear without play against said first claws on said intermediate portion, wherein a second screwthreaded spindle is threadedly received in a second screwthreaded bore in said intermediate portion and extending normal to said first screwthreaded bore, the ends of said second spindle terminating at said second recesses and bear without play against said second claws on said head portion, and wherein said plurality of clamping screws connect respective pairs of said three portions together so that mutually opposed, axially facing surfaces are pressed together upon a tightening of said plurality of clamping screws, whereby, upon a loosening of said plurality of clamping screws, a rotation of one or both of said first and second screws will effect a movement of said head portion relative to said connecting portion radially along one radius or radially along two radii.

4,634,325

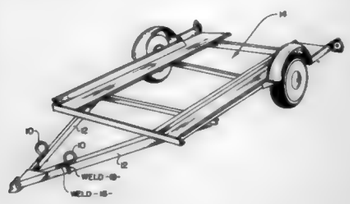
EYE LOOP TIE DOWN BRACKET

Margie M. Smith-Williams, 7929 Stewart & Gray #10, Downey, Calif. 90241

Continuation-in-part of Ser. No. 224,027, Jan. 12, 1981, abandoned. This application Jan. 25, 1982, Ser. No. 342,641

Int. Cl.⁴ B61D *45/00*

U.S. Cl. 410—101 **5 Claims**



1. An eye bracket formed of a rod-like member bent into a loop and having end portions each extending a predetermined distance beyond the loop and being disposed at a predetermined angle to one another, said eye bracket including an apertured plate secured thereto along one of said end portions and traversing the other of said end portions for permitting the bracket to be bolted to a supporting frame.

4,634,326

EXPANSION ANCHOR

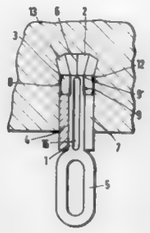
Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3, Fed. Rep. of Germany

Filed May 29, 1985, Ser. No. 738,732

Claims priority, application Fed. Rep. of Germany, May 29, 1984, 3419968; Nov. 29, 1984, 3443503

Int. Cl.⁴ F16B *13/06;* **E04B** *1/38*

U.S. Cl. 411—54 **5 Claims**



1. An expansion anchor for anchoring in drill holes having undercut portions widening towards bottoms of the drill holes, the anchor comprising an expansion member having an expander cone at a leading end thereof and supported at the bottom of the drill hole; an expansible sleeve being driven onto said expansion member, said expansible sleeve having elongated slots spaced from each other to form expansible portions driven onto said cone; means for securing objects, provided on said expansion member; and means for driving said expansible sleeve, said expansion member being punched-out from sheet steel and said expander cone being rolled from a respective flat blank, said expander cone having a roll gap at an outer surface thereof, said gap being calibrated for closure, said expansion member having a narrowed portion immediately adjoining said expander cone, said expansible portions of said expansible sleeve being bent into said narrowed portion in a non-anchored position.

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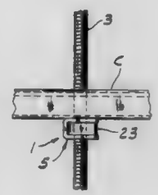
FASTENING DEVICE FOR ATTACHMENT TO A THREADED ROD

Joseph W. Kowalski, Highland, Ill., assignor to B-Line Systems, Inc., Highland, Ill.

Filed Dec. 23, 1985, Ser. No. 812,010

Int. Cl.⁴ F16B *37/08*

U.S. Cl. 411—432 **14 Claims**



1. A fastening device adapted for quick attachment to a threaded rod at any point along the length of the rod, comprising a fastening element having a web, first and second generally flat flanges extending outwardly from the web in spaced-apart substantially parallel relation, each flange having opposite side edges and an outer edge opposite the web, the first flange having a recess extending inwardly from one of its side edges at one side of the element, said recess having a rounded inner edge threaded to mate with the threads at one side of said threaded rod, the second flange having a recess extending inwardly from one of its side edges at the opposite side of the element, said recess in the second flange having a rounded inner edge generally concentrically disposed with respect to the rounded inner edge of the recess in the first flange and threaded to mate with the threads of said rod at the side of the rod opposite its said one side, and retainer means for retaining the threaded recess edges in engagement with the threaded rod, said fastening device being adapted to be attached to a vertical threaded rod by moving said fastening element to a position in which the first and second flanges lie in generally vertical planes with the threaded rod disposed between the flanges and in general alignment with said recesses, rotating the fastening element to bring the rod into the recesses and the threaded inner edges of the recesses into mating engagement with the threads of the rod, and assembling said retaining means with said fastener element.

4,634,328

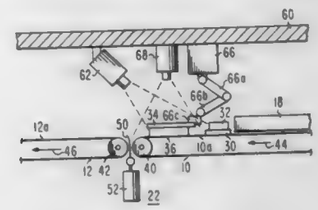
MAIL SINGULATION SYSTEM

Ross M. Carrell, Cinnaminson, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 31, 1985, Ser. No. 739,917

Int. Cl.⁴ B65H *7/20*

U.S. Cl. 414—117 **9 Claims**



1. A mail singulation system including a singulation station having an output edge, means for inputting unsingulated mail into said singulation station and means for carrying singulated mail from said output edge of said singulation station, comprising in combination:

first means for viewing said unsingulated mail in said singulation station at said output edge for producing a signal indicative of the profile of a single piece of said unsingulated mail as viewed from said output edge; and

an adjustable lip positioned at said output edge of said singulation station;

said lip including second means responsive to said signal from said first means for moving said lip to a shape corresponding to the shape of said single piece of mail.

4,634,329

LOADING DEVICE FOR A HORIZONTAL CONTINUOUS FURNACE FOR THE HEATING OF GLASS PLATES

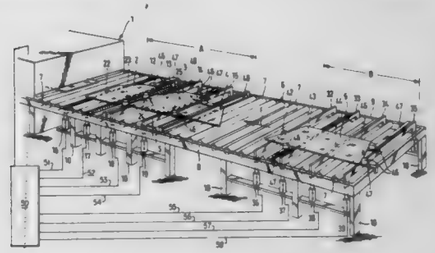
Werner Diederen, Herzogenrath, and Herbery Sonnleitner, Stolberg, both of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Nov. 14, 1984, Ser. No. 671,204

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1983, 3341207

Int. Cl.⁴ C03B *35/16*

U.S. Cl. 414—159 **7 Claims**



1. A loading device for a horizontal continuous furnace for the heating of glass plates to bending or tempering temperature, said loading device comprising a continuous conveying system having at least one feed station at which the glass plates are lowered onto said conveying system, said continuous conveying system comprising:

a roller conveyor for transporting the glass sheets from said at least one feed station toward the furnace, said roller conveyor defining a conveying level;

a plurality of support strips having upper surfaces and being respectively disposed between adjacent rollers of said roller conveyor at said at least one feed station, said upper surfaces of said support strips comprising means for restingly receiving a glass plate being lowered onto said conveying system;

means for transferring a glass plate resting on said upper surfaces of said support strips directly onto said roller conveyor, including support strip lifting means for raising and lowering said support strips being lowered positions in which said upper surfaces thereof are below said conveying level and raised positions in which said upper surfaces thereof are above said conveying level, wherein a glass plate is transferred to said roller conveyor by simultaneous lowering of said support strips, said support strip lifting means comprising independent moving means for raising at least one of said support strips independently of the remainder of said support strips;

detection means disposed adjacent said at least one support strip, on the furnace side thereof, and being responsive to the presence of a glass plate immediately downstream from said at least one support strip, said independent moving means being responsive to said detection means, wherein said at least one support strip is raised to said raised position thereof in response to the passage of a glass plate along said roller conveyor away from said detection means; and

control means for operating said support strip lifting means.

4,634,330

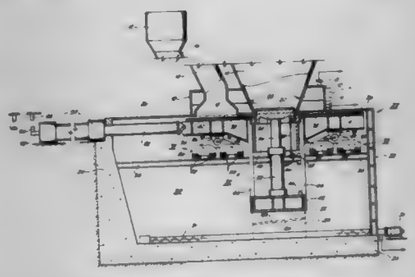
APPARATUS FOR INTRODUCING SOLIDS INTO A SOLIDS UPFLOW VESSEL

Daniel Svoboda; Steven Hordinski, both of Denver; Dale R. Severns, Broomfield, and Howard W. Hooker, Arvada, all of Colo., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Oct. 6, 1980, Ser. No. 194,133

Int. Cl.⁴ F23K *3/00*

U.S. Cl. 414—198 **12 Claims**



1. An apparatus for introducing particulate solids upwardly into a solids upflow vessel having a bottom solids inlet, which comprises:

a solids feed chute mounted adjacent to said solids upflow vessel and communicating with an elevated solids feed reservoir, said feed chute terminating in a solids outlet in substantially the same horizontal plane as said bottom solids inlet and spaced from said bottom solids inlet along a first axis;

a carriage positioned below said solids upflow vessel;

first and second substantially horizontal structural rails mounted parallel to said first axis and on opposite sides of said carriage;

tram-like suspension means for horizontally movably and substantially independently supporting said carriage from said first and second rails;

carriage actuator means for horizontally reciprocating said carriage between first and second stationary carriage positions along a substantially horizontal second axis parallel to said first axis;

a vertical solids feed cylinder mounted on said carriage such

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that said feed cylinder is axially aligned with and immediately below said solids outlet when said carriage is in said first carriage position and said feed cylinder is axially aligned with and immediately below said bottom solids inlet when said carriage is in said second carriage position;

a solids feed piston movably mounted in said solids feed cylinder;

feed piston actuating means supported from said carriage for vertically reciprocating said solids feed piston between at least two piston positions along the axis of said feed cylinder;

solids sealing means for sealing said solids outlet and said bottom solids inlet when said feed cylinder is not axially aligned therewith;

control means for synchronizing the movements of said carriage and said feed piston;

a foundation positioned below said carriage;

a wedge plate fixedly positioned upon said foundation;

wherein said carriage is adapted with a downwardly facing engaging surface positioned so as to be immediately above said wedge plate during the upward stroke of said feed piston and wherein at least a portion of the structure of said apparatus is adapted to controllably yield in the vertical direction under a preselected force during said upward stroke of said feed piston thereby engaging said engaging surface with said wedge plate and transmitting any force in excess of said preselected force directly to said foundation.

4,634,331

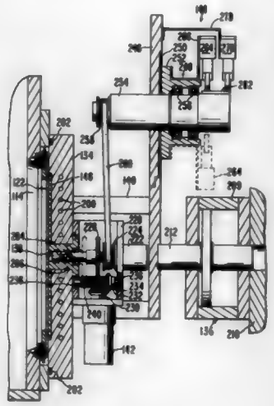
WAFER TRANSFER SYSTEM

Richard J. Hertel, Bradford, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 381,286, May 24, 1982, Pat. No. 4,498,833. This application Dec. 10, 1984, Ser. No. 680,202

Int. Cl.⁴ B65G *1/00*; C23C *14/00*

U.S. Cl. 414—217 **6 Claims**



1. Apparatus for positioning a semiconductor wafer in a vacuum provessing chamber for processing therein, said apparatus comprising:

wall means forming a vacuum processing chamber having an opening to receive a wafer for processing;

processing means in said chamber for processing a wafer at a position inside and aligned with said opening;

a door and chuck assembly comprising sealing door means for closing said opening and vacuum chuck means for holding a wafer on said assembly;

means for moving said door and chuck assembly between an open position spaced from the outside of said opening and a closed position in which said door means closes and seals said opening;

wafer clamping means supported by said chamber wall means adjacent said opening, and spring means resiliently urging said clamping means outwardly with respect to said opening;

the configuration of said clamping means and said door and chuck assembly being such that when said assembly is in said closed position a wafer held by vacuum on said assembly will be pressed against said clamping means to displace said clamping means against the force of said spring means;

valve means inside said chamber adjacent said opening, said valve means having a closed position which isolates said opening from the interior of said processing chamber when said door and chuck assembly is in its open position, and said valve means having an open position which permits processing of a wafer when said door and chuck assembly is in its closed position; and

the arrangement being such that when the airlock formed by the closed valve means and the closed door means is evacuated, the compressive cooperation between said clamping means and said door and chuck assembly prevents a wafer from being dislodged from said door and chuck assembly when the vacuum in the airlock reaches a level which disenables the vacuum of the vacuum chuck means from holding the wafer in position, and said compressive cooperation between said clamping means and said door and chuck assembly remains in effect to hold a wafer during processing thereof.

4,634,332

AUTOMATIC CONTROL SYSTEM FOR A LOADING AND UNLOADING VEHICLE

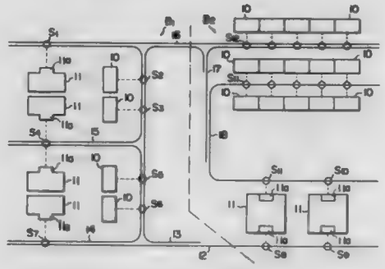
Takao Kamide, Hiratsuka; Norio Ueda, and Akira Nemoto, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho and Komatsu Fork Lift Co. Ltd., both of Tokyo, Japan

Continuation of Ser. No. 730,882, Oct. 8, 1976, abandoned. This application Jan. 15, 1979, Ser. No. 3,685

Claims priority, application Japan, Oct. 15, 1975, 50-123944

Int. Cl.⁴ B66G *1/00*; B61J *3/00*

U.S. Cl. 414—273 **7 Claims**



1. An automatic control system for controlling a vehicle for automatically conducting the transportation, loading and unloading of goods in a work area comprising:

vehicle guideways consisting of a plurality of leader cables disposed in a work area and being capable of receiving instruction signals;

a plurality of stop stations provided at desired places along said vehicle guideways;

vehicle travelling control means which, in use, is carried by a vehicle to be controlled by said system, said travelling control means being responsive to instruction signals received by said leader cables for controlling travelling of said vehicle along said vehicle guideways from stop station to stop station; and

pre-programmed loading and unloading control means which, in use, is carried by the vehicle carrying said travelling control means, the said loading and unloading control means taking over control of the vehicle from said travelling control means upon arrival of the vehicle at each stop station and controlling the entry of the vehicle to a set working position removed from the guideway, the loading and unloading of goods and the return of the vehicle from said working position to said guideway for further control of its travel therealong by said travelling control means.

4,634,333

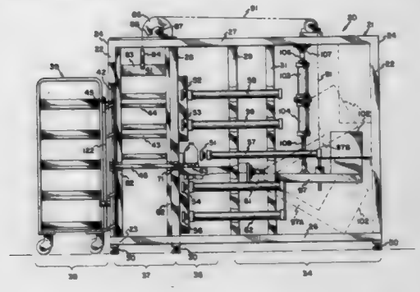
CONVEYOR LINE LOADER FOR MULTI-TIERED ROLLING CARTS

Edward R. Butterly, Jr., Brookfield, and Doyle E. Stoppel, Danbury, both of Conn., assignors to Doran Brothers Inc., Danbury, Conn.

Filed Oct. 19, 1984, Ser. No. 662,724

Int. Cl.⁴ B65G *67/00*

U.S. Cl. 414—331 **17 Claims**



1. A cart loader for assembling objects advancing along an infeed conveyor line into at least one column of objects, and transferring these objects to individual shelves of a multi-tiered rolling cart, comprising:

A. a frame enclosing

(1) a vertically elongated front elevator zone, and

(2) a central staging zone rearwardly behind the elevator zone aligned to receive objects delivered by the infeed conveyor, as at least one lateral column across the staging zone,

B. a multi-deck elevator movably mounted for reciprocating vertical movement within the elevator zone and having at least two decks spaced apart vertically by a distance corresponding to the vertical distance between shelves on the multi-tiered cart,

C. cart latching means mounted on the front of the frame and defining the rear portion of a cart loading zone in which the multi-tiered cart is disengageably latched to the frame with its individual shelves presented to the elevator zone for loading,

D. a plurality of horizontally forward deployable and rearward retractable pushers corresponding to the number of shelves of the multi-tiered cart, each pusher being aligned with one said shelf when the cart is latched to the frame, and positioned for delivery of objects from the elevator zone to the cart-loading zone, with one vertically central pusher being aligned with the infeed conveyor and having at least two forward stop positions, a proximal stop position in which objects propelled by the central pusher are delivered from the infeed conveyor to the aligned elevator deck and a remote stop position in which objects propelled by the central pusher have been swept from the elevator deck and delivered forward to the aligned cart shelf,

E. elevator hoisting-lowering means connected to move the elevator between a top position with its uppermost deck substantially aligned with the top shelf of the cart, and a bottom position with its lowermost deck substantially aligned with the bottom shelf of the cart,

F. and elevator stop means connected to stop the elevator at successive levels with each of its decks in turn aligned with the infeed conveyor and with one of said pushers.

4,634,334

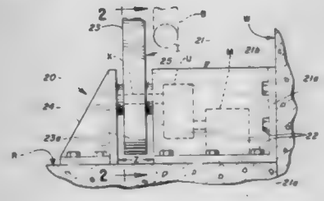
VEHICLE RESTRAINT

Norbert Hahn, South Milwaukee, Wis., and Arthur A. Olson, Jr., Gleaview, Ill., assignors to Rite-Hite Corporation, Milwaukee, Wis.

Filed Jul. 19, 1985, Ser. No. 757,030

Int. Cl.⁴ B65G *69/00*

U.S. Cl. 414—401 **10 Claims**



1. A releasable locking device for securing a parked vehicle in close proximity to an upright surface of an adjacent structure, said device comprising a first means mountable adjacent the structure upright surface and being adapted to project outwardly therefrom; second means mounted on an outwardly disposed distal end portion of said first means for selective movement between operative and inoperative modes about an axis adapted to project angularly outwardly from the upright surface, said axis remaining in an outwardly projecting position, when said second means is in either of said modes, when in said operative mode, said second means having at least a portion thereof assuming a vehicle interlocking upright position, and when in an inoperative mode, the said second means portion assuming a vehicle release position disposed at a substantial angle relative to said upright position and in a non-obstructing relation with the parked vehicle; and third means associated with said first means for selectively actuating said second means from said inoperative mode to said operative mode.

4,634,335

ELONGATE, TRANSPORTABLE UNIT STANDING UPRIGHT DURING USE

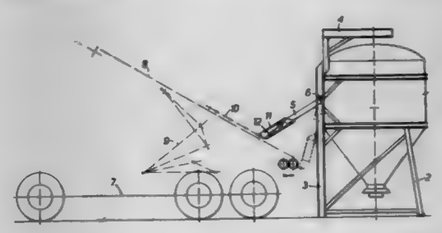
Aart A. van den Pol, AG Nijkerk, Netherlands, assignor to Multilift B.V., Droaten, Netherlands

Filed Jan. 24, 1985, Ser. No. 694,303

Claims priority, application Netherlands, Feb. 4, 1984, 8400354

Int. Cl.⁴ B60P *1/16, 3/00*

U.S. Cl. 414—494 **3 Claims**



1. Apparatus which stands upright during use and which is transported in a horizontal position on a vehicle provided with:

(a) a loading bridge that is pivotable back and forth between

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a horizontal transport position and a tilted loading position about a pivot axis that is located near the rear end of the vehicle and that extends horizontally and transversely of the longitudinal axis of the vehicle and

(b) a flexible, linear force transmission means for loading the apparatus onto the loading bridge and for unloading the apparatus from the loading bridge,

said apparatus comprising:

(c) an elongate unit having a longitudinal axis;

(d) a frame mounting said elongate unit, said frame holding said elongate unit in an upright position during use of said elongate unit;

(e) an arm:

(i) having a first end and a second end;

(ii) the first end of said arm being mounted on said frame for pivotal movement about an axis which is at least substantially horizontal when said elongate unit is in its upright position;

(iii) the second end of said arm being provided with coupling means for coupling said arm to the flexible, linear force transmission means on the vehicle;

(iv) said arm being pivotal back and forth through at least approximately 180° between a first position which said arm assumes when said elongate unit is in its upright position and a second position which said arm assumes when said elongate unit is in its horizontal position; and

(v) said arm being sized, shaped, and positioned so that:

(A) when said elongate unit is in its upright position and said arm is in its first position, the second end of said arm is within reach of someone standing on the ground;

(B) as said elongate unit is moved from its upright position to its horizontal position, said arm pivots through at least approximately 180° from its first position to its second position; and

(C) when said elongate unit is in its horizontal position and said arm is in its second position, the second end of said arm is located near the top of said elongate unit; and

(f) a stop which prevents motion of said arm beyond its second position.

4,634,336

BALE LOADER

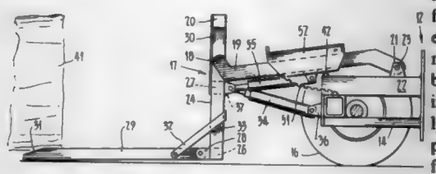
Arthur W. Pearce, Weering, Victoria, Australia

Filed Jan. 28, 1985, Ser. No. 695,823

Claims priority, application Australia, Feb. 9, 1984, PG3547; Feb. 29, 1984, PG3836

Int. Cl.⁴ A01D *90/00*

U.S. Cl. 414—546 **8 Claims**



1. A bale loader

comprising a pair of support arms each pivotally mounted at one end to a wheeled frame, said support arms being movable substantially vertically, means to restrict downward movement of said support arms, a loader platform pivotally mounted to and carried by the other ends of said support arms, said loader platform being movable between a first position and a second position, two or more tynes mounted to said loader platform to extend therefrom at a predetermined angle at least when said loader platform is in said first position, and actuating means operable to move the platform between the first and second positions and to move the arms and platform relative to the frame, wherein said arms carry a carriage movable therealong from a position adjacent the loader platform in its said second position towards said frame, and

wherein a flexible line or chain extends between said carriage and said frame, said line or chain being of a length such that upward movement of the arms causes the line or chain to become tensioned.

4,634,337

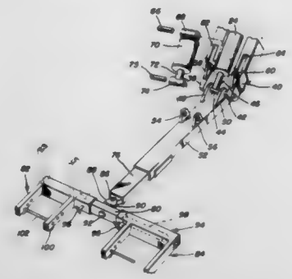
INTEGRATED WHEEL LIFT WRECKER

Reed K. Hamman, Newbern, Tenn., assignor to Dover Corporation, Chattanooga, Tenn.

Filed Jan. 10, 1985, Ser. No. 690,308

Int. Cl.⁴ B60P *3/12*

U.S. Cl. 414—563 **15 Claims**



1. Towing apparatus mounted in the bed at the rear of a towing vehicle for lifting and towing a disabled vehicle, said bed being fixedly secured on said towing vehicle at a fixed angular disposition, said apparatus comprising an elongated lifting boom housing, said lifting boom housing carrying extendible lifting means adapted to be placed beneath the disabled vehicle for operatively engaging the disabled vehicle, first power means having a casing and a moveable member extendible and retractable linearly relative to said casing, means for securing one of said casing and said moveable member to said towing vehicle, journal means for pivotably attaching the other of said casing and said moveable member to said lifting boom housing at a pivotal support, guide means supported beneath the bed for constraining said pivotal support for movement in a fixed linear path angularly inclined rearwardly and downwardly relative to said bed and said towing vehicle upon extension and retraction of said moveable member, second power means having a casing and a moveable member extendible and retractable relative to said casing, connecting means for pivotably attaching one of said second power means casing and said second power means moveable member to said guide means, and means for pivotably attaching the other of said second power means casing and said second power means moveable member to said lifting boom housing at a disposition spaced longitudinally from said pivotal support for pivoting the boom housing about said pivotal support upon extension and retraction of said power means moveable member.

4,634,338

WORKPIECE CONVEYING APPARATUS

Eiji Tsuge; Taminori Yanagisawa, both of Toyota; Takaharu Yamaguchi, Toyokawa, and Hiroshi Fukatsu, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Taiho Seiki Kabushiki Kaisha, both of Toyota, Japan

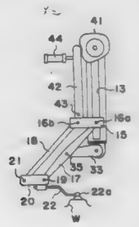
Division of Ser. No. 599,866, Apr. 13, 1984, Pat. No. 4,574,941.

This application Oct. 25, 1985, Ser. No. 791,440

Claims priority, application Japan, Apr. 14, 1983, 58-065972

Int. Cl.⁴ B65G *25/02*; B23Q *7/04*

U.S. Cl. 414—752 **7 Claims**



1. A workpiece conveying apparatus for a working machine comprising:

a slider rail arranged vertically and in a rocking manner around a pin on the body of the workpiece conveying apparatus having a rotating drive source;

a slider link slidably fitted in said slider rail and crossing at a right angle thereto;

a parallel link comprising the slider link, a slider arm, a lower slider link and a sub arm, connected rotatably with each other;

a cam means for causing the slider rail to rock around said pin;

a rocking lever adapted to reciprocatively rock in synchronism with said rotating drive source and having its leading end portion contacted rotatably to a middle portion of said slider arm;

a driving means for rocking the rocking lever; and

a workpiece holder attached to said lower slider link,

wherein the cam means comprises a plate cam, the apparatus further comprising a solenoid for abutting the slider rail to the plate cam.

4,634,339

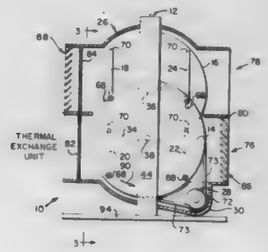
AIR MOVER

Roy C. Keddy, 705 Main St., Wakefield, Mass. 01880

Filed Mar. 7, 1984, Ser. No. 587,153

Int. Cl.⁴ F24F *7/007*

U.S. Cl. 415—70 **9 Claims**



1. A device for moving air quietly, said device comprising:

(a) housing means having input and output ports;

(b) first rotatable means journalled in said housing means for rotation, and second rotatable means journalled in said housing means for rotation, said first rotatable means and said second rotatable means being spaced from and generally parallel to each other; and

(c) a plurality of paddle means each having a pair of opposed portions, one of said pair of opposed portions being journalled on said first rotatable means, the other of said pair of opposed portions being journalled on said second rotatable means;

(d) said paddle means orbiting and being spaced from each other in mechanically balanced relation and maintaining predetermined orientation as said first rotatable means and said second rotatable means rotate;

(e) baffle means mounted in said housing means free of said orbiting of said paddle means;

(f) whereby said plurality of paddle means cause quiet movement of air through said housing means.

4,634,340

EQUIPMENT FOR CONTROLLING THE EXTRACTION PRESSURE OF AN EXTRACTION CONDENSING TURBINE

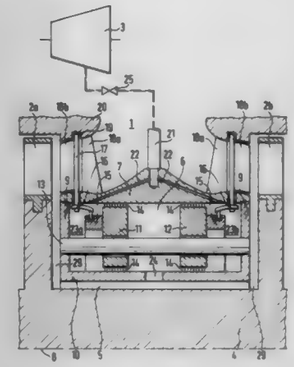
Heinz Stetter, Nuremberg, Fed. Rep. of Germany, assignor to Alsthom-Atlantique, Paris, France

Filed Jul. 18, 1985, Ser. No. 756,216

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1984, 3427528

Int. Cl.⁴ F01D *17/08*

U.S. Cl. 415—95 **2 Claims**



1. Apparatus for controlling the extraction pressure of an extraction condensing turbine having an intermediate-pressure section or high-pressure section and a double-flow low-pressure section, said double-flow low-pressure section having guide vane lattices, said apparatus including means for taking steam off a stage in the blade pasage of said intermediate-pressure section or the high-pressure section of said turbine for heating purposes or chemical process purposes, means for passing the steam remaining in the turbine into said double-flow low-pressure turbine section, pivotable vanes of said guide vane lattices arranged in said double-flow, low-pressure turbine section downstream of the steam extraction point and means for effecting vane pivoting motion by adjusting levers, adjusting rings forming the bearings of the adjusting levers for axial displacement of said adjusting levers, the improvement wherein said double-flow low-pressure turbine section further comprises an annular casing (7, 9, 10) arranged coaxially to and surrounding a rotor shaft (4), annular pistons (11, 12) axially slidably supported in an annular space (6) defined by at least said annular casing (7, 9, 10), adjusting rings (15) slidably connected to said annular pistons (11, 12), said annular pistons (11, 12) being mounted on at least one coaxial rod (13), said annular pistons (11, 12) having radially outer and radially inner peripheral surfaces, seal strips (14) provided on said radially outer and radially inner peripheral surfaces, means defining

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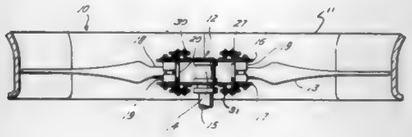
pressure spaces, respectively, (23a, 23b) for said two annular pistons (11, 12), means including pipes (21, 22) for supplying said pressure spaces (23a, 23b) with turbine steam from said intermediate-pressure section or said high-pressure section at a correspondingly high pressure, means forming low-pressure spaces downstream of the guide vanes (18), means defining at least one suction space, and means for communicating via connections (24, 5, 29), said at least one suction space with the low-pressure spaces downstream of the guide vanes (18), and a pressure setting valve (25) arranged in said control pressure pipe (21), and the actuating and control mechanism for said setting valve and said means for effecting vane pivoting motion constituting the guide vane adjusting apparatus being arranged in the annular space (1) between the two first moving blade lattices (2a, 2b) of the low-pressure turbine section.

4,634,341

AXIAL FLOW FANS

Robert C. Monroe, Houston, Tex., assignor to Hudson Products Corporation, Houston, Tex.

Filed Dec. 20, 1984, Ser. No. 683,868
Int. Cl.⁴ F04D *29/36*
U.S. Cl. 415—129 **14 Claims**



1. An axial flow fan, comprising a fan ring, a hub rotatable about the axis of the fan ring and having a pair of spaced apart plates on opposite sides of the hub, each plate having radially aligned holes, a pair of blades each having a cylindrical neck and an abutment shoulder on the inner end of the neck, and means for mounting each blade on the hub for rotation with the hub and for rotation about its axis, including clamps having inner surfaces for fitting about the neck of the blade outwardly of the shoulder, outer surfaces which fit closely between a pair of plates to hold them against rotation, and holes which are aligned with one another and the holes in the plates on opposite sides of the blade neck, bolts which extend through the aligned slots, and nuts on the bolts for selectively drawing the hub plates toward one another to hold the blade against rotation about its axis or loosening the engagement of the clamps about the neck of the blade to permit the blade to be rotated about its axis in order to adjust its pitch, slider plates having holes therein aligned with the holes in the hub plates and clamps to receive the bolts, the holes in the hub plates being radial slots, so that, when the nuts are loosened, the slider plates and clamps and thus the blade may be moved in a radial direction, means connecting the slider plates to the hub plates and operable to move the slider plates in such radial direction, said connecting means comprising a bracket on each hub plate, a radially extending bolt connecting each bracket with a slider plate, and nuts on the bolts for moving the slider plates toward and away from the brackets and then locking them against radial movement.

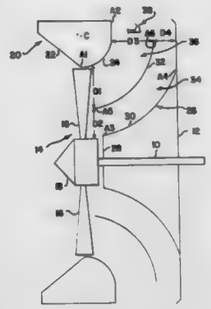
4,634,342

BLOWER FOR AGRICULTURAL SPRAYING

Wilhelm H. A. Rodewald, 31 George Starck Drive, Oostersee, Cape Province, South Africa

Filed Jul. 23, 1984, Ser. No. 633,329
Int. Cl.⁴ B05B *7/24*; F04D *29/54*
U.S. Cl. 415—209 **4 Claims**

4. An air blower comprising a fan housing; a fan co-axial with and within the fan housing, the fan having a hub and the fan housing including an outflow section on the pressure side of the fan, said outflow section increasing in area with distance from the fan and being bounded by a surface generated by rotating a first arc about the axis of rotation of said fan; a cone-like air deflector on the pressure side of the fan and co-axial with said fan, said air deflector increasing in diameter with increasing distance from the fan and being of the form generated by rotating a second arc about the axis of rotation of the fan; and an air flow divider of conical form on the pressure side of said fan, the flow divider being between the fan housing and the air deflector, increasing in diameter with increasing



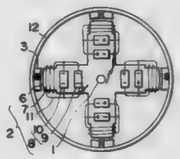
distance from the fan, and having the form generated by rotating a third arc about the axis of rotation of the fan; and wherein the spacing between the maximum diameter end of the flow divider and said back plate is approximately half the spacing between the flow divider and the maximum diameter end of the outflow section, such spacings being measured axially of the blower, the flow divider converging with the back plate radially outwardly of the circular outer edge of the air deflector.

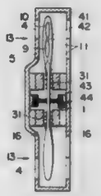
4,634,343

APPARATUS FOR CONVERTING RADIANT ENERGY SUCH AS LIGHT OR HEAT DIRECTLY INTO TURNING FORCE

Yoshiro Nakamats, 1-10-1105, Minami Aoyama 5-chome, Minato-ku, Tokyo, Japan

Filed Jan. 12, 1984, Ser. No. 570,130
Claims priority, application Japan, Jan. 14, 1983, 58-4687
Int. Cl.⁴ F03G *7/02*; H02N *6/00*; H02K *41/02*; B60K *1/00*
U.S. Cl. 416—3 **19 Claims**





1. An apparatus for converting radiant energy such as light

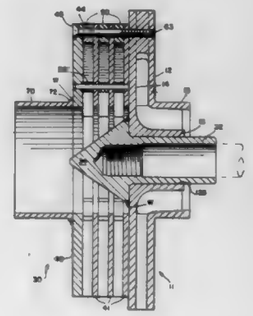
or heat directly into a turning force, comprising a rotor, a stator, photoelectric converting means comprising a pair of photoelectric converting elements on one of the rotor and stator for converting radiant energy such as light or heat into electric energy, each of said pair of elements having opposite polarities, said photoelectric converting means comprising windows for exposing said elements to said radiant energy, coil means on one of the rotor and stator, connecting means electrically connecting said coil means to said pair of elements, said coil means being operable to produce a magnetic field when the coil means receives the electric energy produced due to said radiant energy without need of any brush means, said two elements being alternately exposed to said windows so as to pass the electrical energy to said coil means alternately in opposite directions, and magnet means on the other of the rotor and stator for providing a turning force in response to the magnetic field in said coil means.

4,634,344

MULTI-ELEMENT CENTRIFUGAL PUMP IMPELLERS WITH PROTECTIVE COVERING AGAINST CORROSION AND/OR ABRASION

Irvin F. Zagar, Denver, and Henry T. Choquette, Wheatridge, both of Colo., assignors to A. R. Wilfley and Sons, Inc., Denver, Colo.

Filed Aug. 3, 1984, Ser. No. 637,572
Int. Cl.⁴ F04D *1/04*
U.S. Cl. 416—175 **8 Claims**



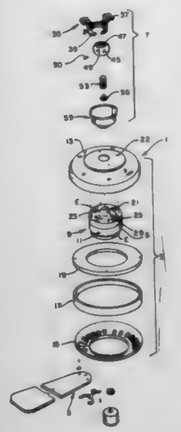
1. A pump device comprising:
an impeller unit having substantially parallel front and back walls including;
a first plate having a central aperture therethrough, a plurality of separator discs also each having a central aperture therethrough, and a plurality of solid vanes with assembly holes therethrough;
an expeller unit having substantially parallel front and back walls with a plurality of solid vanes between said walls, a central input aperture leading to openings between said vanes and walls, and peripheral openings around the circumference of said expeller unit;
aligning and fastening means for aligning and holding the solid vanes, the first plate, the separator discs and the expeller unit together;
means for diverting liquid flowing inwardly through said central apertures outwardly to said vanes;
non-frictional seal means at the central aperture of said first plate;
said aligning and fastening means for aligning and holding the component elements together comprising a plurality of separate dowels and separate assembly screws;
said separate dowels fitting through inner circumferential holes in the solid vanes, the first plate, and the separator discs; and
said separate assembly screws fitting through outer circumferential holes in the solid vanes, the first plate, and the separator discs, and being screwed into tapped holes of the expeller unit.

4,634,345

CEILING FAN MOUNTED CLOSE TO CEILING

Terrence L. Stanek, St. Louis County, Mo., and David R. Lathrop, Madison County, Ill., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 22, 1985, Ser. No. 715,000
Int. Cl.⁴ F01D *29/60*
U.S. Cl. 416—244 R **7 Claims**



1. In a ceiling fan having a motor assembly which, when in its operating position, has a fan axis disposed generally vertically with said fan suspended from said ceiling, said ceiling fan being intended to be mounted in a room having a ceiling and a floor, said ceiling fan having one or more fan blades rotatably driven by said motor assembly for rotation about said fan axis in a generally horizontal fan blade plane, said motor assembly having a body, the latter having an opening in the top thereof, said opening being generally coaxial with said fan axis, a plurality of motor lead wires passing through said opening, said lead wires being adapted to be connected to a source of power in said ceiling for engergization of said motor assembly, said power source comprising an electrical box rigidly mounted within said ceiling and having said electrical leads therein for connection to said motor lead wires, wherein the improvement comprises: means for mounting said ceiling fan relatively close to said ceiling such that said fan blade plane within about one foot (0.3m.) of said ceiling, said mounting means comprising a tubular hanger having a threaded outer surface, one end of said hanger being threaded into said opening of said motor body with said motor lead wires extending through said hanger, a ball having an internally threaded aperture extending therethrough, said ball aperture threadably receiving a portion of said hanger extending out beyond said body said such that said ball and motor body are substantially in abutting relation with one antoher, a bracket having a base securable to said electrical box and a socket spaced downwardly from said base, said socket being open on one side so as to permit said ball, while affixed to said motor assembly, to be inserted within said socket, said ball being supported by said socket such that said motor assembly is self-aligned with respect to said bracket with said motor axis being generally vertical, wherein said ball has a cavity in the portion thereof proximate said motor assembly, and wherein said motor assembly has a boss protruding upwardly, said boss having said opening therein, at least a portion of said boss being received within said ball cavity so as to minimize the distance between the ceiling and the fan blade plane.

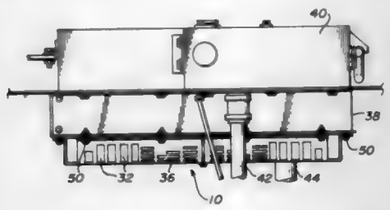
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4,634,346

FAN GUARD ASSEMBLY

Thomas M. Cameron, Waukegan, and Glenn M. Betlinski, Libertyville, both of Ill., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 18, 1985, Ser. No. 756,218
Int. Cl.⁴ F04B *39/10*
U.S. Cl. 416—247 R **4 Claims**



1. A guard assembly for a fan of a motor vehicle comprising:

a plate having a top, bottom and sides, said plate including a top wall, a bottom wall and side walls for enclosing the fan, said walls being integrally formed with said plate and being generally perpendicularly disposed to said plate at said top, bottom and sides, respectively;

said plate having a plurality of perforations extending therethrough to define a plurality of air flow passages, wherein said plurality of perforations generally increase in area at the top, bottom and sides of said plate as compared to the area of said perforations at the center of said plate, and wherein the area between said perforations generally increase in area at the top, bottom and sides of said plate as compared to the area between said perforations at the center of said plate; and

said walls having a plurality of perforations extending therethrough to define a plurality of air flow passages, wherein said plurality of perforations generally increase in area at the ends of said walls as compared to the area of said perforations at the center of said walls and the area between said perforations generally increase in area at the ends of said walls as compared to the area between said perforations at the center of said walls.

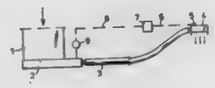
4,634,347

ARRANGEMENT IN PLANT EQUIPMENT FOR SUPPLYING A BINDING AGENT DIRECTLY TO A BUILDING ELEMENT

Ulf Gauffin, Upsala, and Björn Söderlund, Huddinge, both of Sweden, assignors to Allman Byggnadsservice AB ABS, Sweden

Filed Apr. 29, 1985, Ser. No. 728,402
Claims priority, application Sweden, May 3, 1984, 8402384
Int. Cl.⁴ F04B *15/02, 49/02*
U.S. Cl. 417—45 **5 Claims**

1. A mechanism for supplying mortar-like materials of a pumpable slurry consistency which contain liquid, including: a container (1) for the liquid containing mortar-like material, a pump (2) driven by a motor (9), a slightly expandable hose (3) connecting the pump (2) to a closable nozzle (4), characterized in that manually operable means (5, 6) are provided for stopping the motor (9) driven pump (2) and for closing the nozzle (4) and that means (7, 9, 18) are provided for preventing the overpressure in the expanded hose (3) from being transferred to the closed nozzle (4) due to contraction of the hose when the nozzle is closed and the pump stopped, thereby preventing the pressure of the liquid-containing material in the nozzle to rise





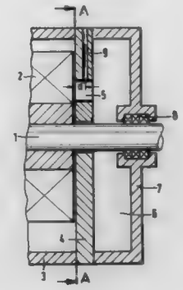
to a value substantially above atmospheric pressure causing separation in the nozzle of liquid from the mortar-like material.

4,634,348

LIQUID RING COMPRESSOR HAVING A PASSAGEWAY IN DISCHARGE PORT FOR INTRODUCING AIR

Siegfried Auschrat, Heiligenstedten, Fed. Rep. of Germany, assignor to Sihi GmbH & Co. KG, Itzehoe, Fed. Rep. of Germany

Filed Sep. 30, 1985, Ser. No. 782,202
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1984, 3436022
Int. Cl.⁴ F04C *19/00*
U.S. Cl. 417—68 **7 Claims**



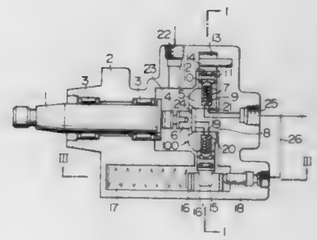
1. A liquid ring compressor, in particular for the operating range of suction pressures below one bar, said compressor including a drive shaft, a pressure chamber, a suction chamber, at least one control disk disposed between said suction chamber and said pressure chamber, a suction inlet passage and a vane impeller driven by said shaft, said impeller having an end face adjacent the control disk of the last compression stage, said control disk having a pressure passage for the operating fluid, and said pressure passage extending azimuthally for a limited distance on said control disk, characterized in that an opening is arranged in the first quarter of the pressure passage as viewed azimuthally in the direction of impeller rotation, which opening is spaced from the impeller end face and is directly connected to a gas/air chamber in which approximately the compression pressure of the compressor is present.

4,634,349

VARIABLE DISPLACEMENT FLUID PUMP

Taizou Abe, Chiryu, and Kenji Tsukahara, Obu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 12, 1985, Ser. No. 808,837
Claims priority, application Japan, Dec. 13, 1984, 59-264260
Int. Cl.⁴ F04B *1/06*
U.S. Cl. 417—219 **6 Claims**



1. A variable displacement fluid pump comprising:

a housing provided therein with a working chamber, said housing having a fluid inlet port and a fluid discharge port;

a rotor disposed within said working chamber of said housing for rotation about a fixed center of rotation;

a plurality of pumping chambers radially provided in said rotor;

an inlet chamber provided in said housing in communication with said fluid inlet port, said inlet chamber being successively communicated with said pumping chambers upon rotation of said rotor;

a discharge chamber provided in said housing in communication with said discharge port, said discharge chamber being successively communicated with said pumping chambers upon rotation of said rotor;

an eccentric ring disposed radially outwards from said rotor, said eccentric ring being movable within said housing in a first direction perpendicular to an axis of said eccentric ring so that a first eccentricity between a center of an inner periphery of said eccentric ring and said fixed center of rotation of said rotor is adjustable, whereby a displacement of said fluid pump is variable, and said eccentric ring being disposed in said housing so that said fixed center of rotation of said rotor is apart by a second eccentricity from said center of the inner periphery of said eccentric ring in a direction perpendicular to said first direction towards a communication portion between at least one of said pumping chambers a volume of which is reducing and said discharging chamber, whereby a volume of said one pumping chamber which just becomes in incommunication with said inlet chamber is further reduced to pre-compress the fluid in said pumping chamber upon rotation of said rotor; and

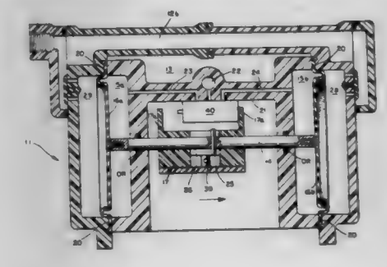
means for biasing said eccentric ring to adjust said first eccentricity.

4,634,350

DOUBLE ACTING DIAPHRAGM PUMP AND REVERSING MECHANISM THEREFOR

William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 320,584, Nov. 12, 1981, Pat. No. 4,436,493, which is a continuation-in-part of Ser. No. 77,544, Sep. 21, 1979, abandoned. This application Jan. 26, 1984, Ser. No. 574,310
The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.
Int. Cl.⁴ F04B *43/06*
U.S. Cl. 417—393 **30 Claims**



1. A reciprocating pump and reversing mechanism therefor comprising in combination:

(a) a pump housing including a pair of laterally spaced-apart chambers each of which has a diaphragm member therein dividing each chamber into a driving section and a discharge section, each of said discharge sections having an inlet port and an outlet port and each of said driving sections having inlet-outlet port means;

(b) said diaphragm members being interconnected by a shaft mounted in said housing for reciprocating movement, whereby said shaft moves with said diaphragm members such that as the driving section of one chamber expands, forcing its discharge section to contract, the driving section of the other chamber contracts while its discharge section expands;

(c) protrusion means fixedly connected to said shaft and extending transversely therefrom for use in coupling the movement of said shaft to the movement of the below-recited valve actuating member;

(d) said housing also including a fluid outlet manifold interconnecting said outlet ports of said discharge sections, a fluid inlet manifold interconnecting said inlet ports of said discharge sections, and driving fluid manifold means for feeding driving fluid to and from said inlet-outlet port means of said driving sections;

(e) inlet and outlet valves in said housing in fluid communication with said fluid inlet and outlet manifolds, respectively, for controlling the flow of fluid to be pumped to and from each of said discharge sections;

(f) control valve means including valve housing means for housing said control valve means, said valve housing means being connected to said pump housing and including reciprocable spool valve element means in said valve housing means and being in fluid communication with said driving fluid manifold means and being movable between two alternate positions for alternately directing driving fluid to one of said two driving sections, while also alternately allowing driving fluid to flow from the other one of said two driving sections, said spool valve element means having first contact surface means for being contacted by the below-recited valve actuating member;

(g) a valve actuating member mounted for reciprocating movement between two control valve-actuated end positions, said valve actuating member having second contact surface means positioned adjacent said first contact surface means of said spool valve element means for alter-

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nately snap contacting said first contact surface means to alternately snap said spool valve element means back and forth between its two positions, said valve actuating member also having third contact surface means for use in coupling the movement of said shaft to the movement of said valve actuating member, coupling means including said protrusion means and said third contact surface means for operatively coupling said protrusion means to said valve actuating means for alternately initiating each reciprocating stroke of said valve actuating member as said shaft reciprocates, the completion of each of said reciprocating strokes of said valve actuating member being carried out by the below-recited snap-acting means; and

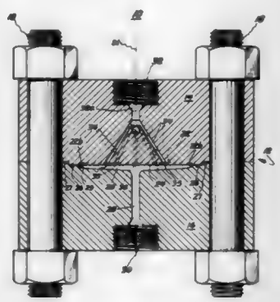
(h) snap-acting means, including at least one pin, a helicoidal compression spring at least partially surrounding said pin and a pin mounting element, for completing the movement of said valve actuating member from one of its two positions to the other initiated by said coupling means, said pin mounting element being pivotably secured for at least partial rotation about an axis stationary with respect to one of said valve actuating member and said housing, said pin being slidably mounted to said pin mounting element for sliding motion in a direction perpendicular to said axis.

4,634,351

DIAPHRAGM PUMP

Gary L. Leonard, Clifton Park, and Roger N. Johnson, Hagaman, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,366
Int. Cl.⁴ F04B *43/06*
U.S. Cl. 417—395 **13 Claims**



1. A diaphragm pump comprising:

a pump housing including internally disposed pumping and driving chambers, at least one fluid aperture communicating with said driving chamber for conducting a pressurized fluid into and out of said driving chamber, and an inlet and outlet aperture each communicating with said pumping chamber for conducting a pressurized material into and out of said pumping chamber, respectively;

a flexible diaphragm mounted in said pump housing and sealingly separating said pumping and driving chambers;

said pumping chamber generally conical in shape including an end portion adjoining said diaphragm and having a cross-sectional area of generally circular shape; and

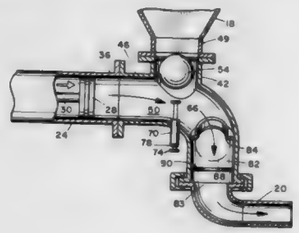
said inlet aperture substantially straight, disposed substantially tangential to the surface of said pumping chamber end portion and including a port disposed on the surface of said pumping chamber end portion.

4,634,352

CEMENT PUMP WITH VALVE MANIFOLD CONTROL

Richard D. Austin, 18414 Buckthorne Rd., Devore, Calif. 92407

Filed Jul. 8, 1985, Ser. No. 752,552
Int. Cl.⁴ F04B *21/02, 15/02*
U.S. Cl. 417—531 **4 Claims**



1. A cement pump comprising:

a hopper for containing flowable material to be pumped;

pump means for receiving the flowable material from said hopper and discharging the flowable material under pressure, said pump means comprising a pair of parallel spaced apart pump cylinders with pistons reciprocatively slidable therein, each of said cylinders having outlets at one end through which the flowable material is received and discharged, and power means operatively connected to said pistons for simultaneously reciprocating said pistons in opposite directions within said pump cylinders;

manifold means interconnecting said hopper and said pump means, and including a flowable material discharge outlet, a first internal pump response chamber in flow communication with one of said pump cylinder outlets and having an inlet opening communicating with said hopper, a second internal pump response chamber in flow communication with the other of said pump cylinder outlets and having a second inlet opening in communication with said hopper,

said hopper being positioned directly above said two pump response chambers and having a single outlet connected to both of said inlet openings;

first and second inlet valve means within said first and second pump response chambers, respectively, for controlling the opening of said first and second inlet openings to allow passage of flowable material from said hopper to said pump response chambers, an internal discharge chamber in flow communication with said first and second pump response chambers and said manifold discharge outlet, and outlet valve means within said discharge chamber for alternately isolating the flow of flowable material from said first and second pump response chambers to said discharge outlet in response to pumping action of said pump means;

each inlet valve means comprising a valve ball and a valve stop positioned beneath and spaced from the respective inlet opening, the valve ball being movable between the valve stop and the respective inlet opening in response to pumping action of the respective piston, the valve stop including adjusting means for varying the vertical position of the respective valve stop and the travel of the valve ball to adjust the flow of material from the hopper into said pump response chamber;

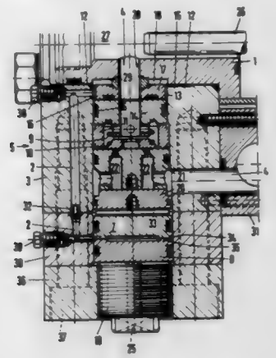
each valve stop having a valve stem which extends through the manifold wall, the wall having corresponding openings opposite the respective inlet openings for receiving the respective stems, the adjusting means comprising external operating means connected to the projecting end of each valve stem for operator control to vary the vertical position of the valve stop in the respective pump response chamber.

4,634,353

VALVE HEAD FOR HIGH-PRESSURE PUMPS

Adalbert Huperz, Hockenheim, Fed. Rep. of Germany, assignor to Woma-Apparatebau Wolfgand Massberg & Co. GmbH, Duisburg, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,399
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3406850
Int. Cl.⁴ F04B *21/02*
U.S. Cl. 417—564 **13 Claims**



1. In a valve head for a high pressure pump, the valve head including a housing connected to a cylinder defining block of the pump, the valve head housing defining intake and discharge connections which are in fluid communication with a pump cylinder, the valve head intake connection including means defining an intake passage having an inlet valve mounted therein, the inlet valve having a valve seat and a valve member which is relatively movable relating thereto, the discharge connection including a discharge passage and a discharge valve which cooperates therewith, the improvement comprising:

a chamber in the valve head housing which communicates with the intake connection, said chamber being at least in part in alignment with the intake valve head housing further including a closure member for the chamber disposed at an opposite side of the chamber with respect to the intake valve; chamber,

pressure compensator means disposed in said chamber, said compensator means being mechanically coupled to the intake valve seat and being axially movable relative to the intake valve seat; and

means establishing fluid communication between the discharge passage at a point downstream of the discharge valve and the interior of said chamber in the region between said compensator means and said closure means whereby a force commensurate with the pump discharge pressure will be developed by said compensator means and applied to the inlet valve seat.

4,634,354

HYDRAULIC PUMP

Jörg Dantlgraber, Lohr-Sackenbach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Jul. 8, 1985, Ser. No. 752,724
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1985, 3425013
Int. Cl.⁴ F04C *2/00*
U.S. Cl. 418—31 **5 Claims**

1. A hydraulic pump comprising:

a housing;

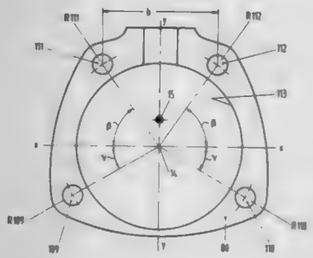
a cover fixedly mounted to said housing to define a rotor chamber;

a rotor mounted in said rotor chamber for rotation about an axis;

a cam ring mounted in said rotor chamber;

adjustment means for applying forces through said housing along an adjustment axis transverse to said rotation axis to adjust the level of said cam ring;

said rotor chamber defining a single pressure region and a single suction region, said regions being arranged in a mirror-like fashion with respect to an x-x-axis transverse to said adjustment axis;



means for mounting said cover to said housing including two and only two pairs of bolts extending parallel to said rotation axis,

one of said pairs of bolts being arranged in the area of said pressure region while the other pair of bolts being arranged in the area of the suction region,

wherein the angular distance of said one pair of bolts is less than 90°,

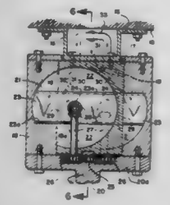
and the angular distance of said other pair of bolts is larger than 90°.

4,634,355

ROTARY FLUID-HANDLING MECHANISM

Alvaro Marin A., Juan Palau 1845, Santiago, Chile

Division of Ser. No. 680,935, Dec. 12, 1984, which is a continuation-in-part of Ser. No. 628,406, Jul. 6, 1984. This application Mar. 19, 1986, Ser. No. 841,159
Int. Cl.⁴ F01C *3/08*
U.S. Cl. 418—226 **7 Claims**



1. Rotary fluid-handling mechanism, comprising a rotor cylindrically recessed internally from one end therof and provided with power transfer means; a stationary cylinder closely and sealingly fitted within the rotor recess; means for fixedly mounting said cylinder relative to said rotor; means holding said rotor on said cylinder; at least one pair of oppositely disposed, helically oriented cavities in the rotor, opening at the interior cylindrical surface thereof in confronting relationship with the cylindrical surface of said stationary cylinder; at least one correponding pair of elongate blades; means mounting said blades within and at diametrically opposite sides of said stationary cylinder on respective axes at right angles to the axis of rotation of said rotor, so portions thereof will enter and pass through the respective cavities during synchronized rotation of said blades and said rotor; means for synchronizing rotation of said blades and said rotor; means for providing inflow of

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fluid internally of said mechanism into the paths of advancing movement of said blades within said cavities; and means for the discharge from the mechanism of fluid acted upon by said blades; said means for synchronizing comprising sets of teeth projecting from opposite longitudinal edges, respectively, of said blades intermediate their lengths, and corresponding sets of auxiliary cavities at opposite sides of said internal cylindrical surface of the rotor for receiving the respective teeth during operation of the mechanism.

4,634,356

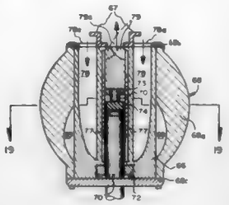
ROTARY FLUID-HANDLING MECHANISM

Alvaro Marin A., Juan Palau 1845, Santiago, Chile

Division of Ser. No. 680,935, Dec. 12, 1984, which is a continuation-in-part of Ser. No. 628,406, Jul. 6, 1984. This application Mar. 19, 1986, Ser. No. 841,162

Int. Cl.⁴ F01C *1/00*

U.S. Cl. 418—226 **12 Claims**



1. Rotary fluid-handling mechanism, comprising a rotor cylindrically recessed internally from one end therof and provided with power transfer means; a stationary cylinder closely and sealingly fitted within the rotor recess; means for fixedly mounting said cylinder relative to said rotor; means holding said rotor on said cylinder; at least one pair of oppositely disposed, helically oriented cavities in the rotor, opening at the interior cylindrical surface thereof in confronting relationship with the cylindrical surface of said stationary cylinder; at least one corresponding pair of blades; means independently rotatably mounting said blades within and at diametrically opposite sides of said stationary cylinder on respective axes at right angles to the axis of rotation of said rotor, so portions thereof will enter and pass through the respective cavities during synchronized rotation of said blades and said rotor; means for synchronizing rotation of said blades and said rotor; means for providing inflow of fluid internally of said mechanism into the paths of advancing movement of said blades within said cavities; and means for the discharge from the mechanism of fluid acted upon by said blades; said means for synchronizing comprising a single shaft extending axially in the stationary cylinder; means in said cylinder journaling said shaft, and gearing interconnecting said shaft and said means mounting said blades; and said means for providing inflow of fluid internally of the mechanism including diametrically opposite passages flanking said shaft and said synchronizing means and extending from inflow ports at one end of the stationary cylinder along said shaft toward the opposite end of said cylinder.

4,634,357

BEAD SEAL RING UNIT

Donaldee Brewer; Ronald R. Seiler, and Thomas J. Niedergeses, all of Muscatine, Iowa, assignors to Bandag Licensing Corporation, Muscatine, Iowa

Filed Nov. 8, 1985, Ser. No. 796,458

Int. Cl.⁴ B29C *33/00*

U.S. Cl. 425—36 **11 Claims**

1. A bead seal ring with unit assembly for use in retreading of radial tires in a precured tread system with a curing envelope, comprising:

(a) a generally cylindrical rubber ring having flanges extending radially inwardly and radially outwardly at each end,

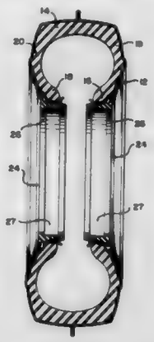
(b) a metal band,

(c) said ruber ring mounted on said metal band,

(d) a mechanical locking means secured to said metal band,

(e) said locking means having a retracted position and an expanded position,

(f) said radial tire having a bead member with an axial bead surface forming a circumference with a bead diameter,



(g) said ring unit having an intial diameter when said locking means is in its retracted position and an expanded diameter when in its expanded position, and

(h) said initial diameter is smaller than said bead diameter and said expanded diameter is larger than said bead diameter.

4,634,358

APPARATUS FOR FLATTENING AND WITHDRAWING BLOWN CONTINUOUS PLASTIC TUBULAR FILMS

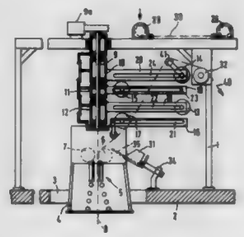
Herbert Dellbrugge, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Mar. 11, 1986, Ser. No. 838,345

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1985, 3508626

Int. Cl.⁴ B29C *53/20*

U.S. Cl. 425—72 R **8 Claims**



1. Apparatus for flattening and taking off blown continuous plastic tubular film that issues from a stationary film-blowing head, said apparatus comprising: a support frame; flattening plates and a pair of squeeze rolls supported from said frame and pivotally movable in mutually opposite senses through at least approximately 360 degrees about an axis of rotation along which a tubular blown film is supplied; at least two deflecting rollers for deflecting the tubular film through about 180° and at least two turning rods for deflecting the tubular film through about 180° and for effecting a simultaneous change in direction, said deflecting rollers and turning rods supported from said frame and disposed in alternation relative to each other between the squeeze rolls and a pair of rotatable feed rolls supported in the frame, said deflecting rollers and turning rods mounted on supports that are pivotally movable relative to each other about the axis of rotation of the flattening plates,

wherein the axes of the deflecting rollers and of the turning rods are tangent to circles described about the axis of rotation of the flattening plates, said deflecting rolls disposed in operating positions radially outwardly of the turning rods relative to the axis of rotation of the flattening plates, the angles through which the axes of the deflecting rolls and the turning rods are pivotally movable decreasing as the distance from the feed rolls increases, wherein a tubular film can extend between and pass around the deflecting rollers and the turning rods and to said pair of rotatable feed rolls, and between successive deflecting rollers and turning rods the film lies in mutually parallel planes positioned substantially at right angles to the axis of rotation of the flattening plates; said deflecting roller and turning rod supports including respective pairs of parallel, spaced, transversely extending side arms having substantially equal lengths, the deflecting rollers and turning rods carried in and extending between respective pairs of side arms, said side arms each having track grooves extending therealong in inward and outward directions relative to said axis of rotation, and said deflecting rollers and turning rods each including respective mounting means movable along said track grooves and adapted to be retained in respective inner and outer positions along said track grooves.

4,634,359

PROCESS FOR THE MANUFACTURE OF ELEMENTS IN THE FORM OF INSULATED PREPACKED BLOCKS OPERATING AS DISPOSAL CAISSON FOR RECEIVING THE LOAD BEARING MIXTURES AND PRODUCING INNER DUCTS, SUCH AS SEATS OF SERVICES, IN BUILDING ERECTION

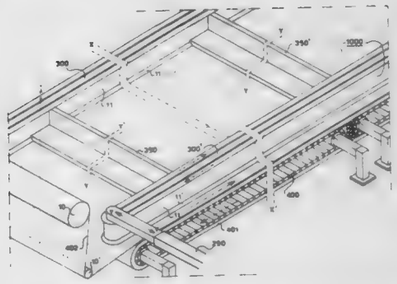
Sergio Sartorio, Via Medeghino, 7, 20141 Milano, Italy

Continuation of Ser. No. 250,220, Apr. 2, 1981, abandoned. This application Aug. 20, 1984, Ser. No. 641,932

Claims priority, application Italy, Apr. 2, 1980, 21133 A/80; Mar. 23, 1981, 20655 A/81

Int. Cl.⁴ B28B *1/16, 5/02, 7/04, 7/36*

U.S. Cl. 425—89 **13 Claims**



1. Apparatus for the manufacture of insulating building elements including at least one inner insulating panel and two outer concrete slabs and having well trimmed outer surfaces, and reinforcements to space apart the two slabs thus forming a continuous cavity, said apparatus comprising: a working plane, a pair of opposed side boards and a pair of transverse cross pieces positioned on said working plane for molding a pair of concrete slabs in spaced relationship, two vertically spaced rectangular frames defining mold sides and supported by said side boards in superposed parallel relationship, supporting means positioned between the concrete slabs for supporting an insulating panel to define a surface of at least one of said concrete slabs, said supporting means serving as spacer elements, and connecting means extending between the frames for positioning each one of the frames in adjustably spaced apart relationship and at the level of at least one concrete slab and defining therebetween an opening through which reinforcements extending into and between the concrete slabs can be introduced or removed.

4,634,360

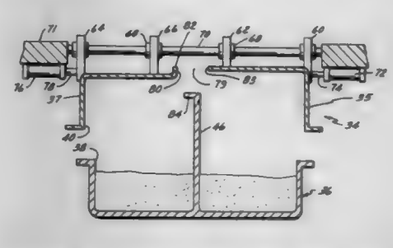
ROTATIONAL MOLD FOR MAKING MULTI-COLOR PLASTIC SHELLS

John D. Gray, New Durham, N.H., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Nov. 4, 1985, Ser. No. 794,805

Int. Cl.⁴ B29C *41/04, 43/30*

U.S. Cl. 425—130 **2 Claims**



1. Apparatus for molding a thin-walled plastic shell in a heated open-ended mold from a charge of dry thermoplastic plastisol material in open-ended charge box means comprising: means for joining a mold and charge box in open-ended relationship; co-acting means on the charge box and the mold to define at least two separate casting surfaces on the mold; means for rotating the mold and charge box so as to distribute two charges of different color against the separate casting surfaces of the mold;

said charge box including a single open-end box having a divider separating the box into first and second open end compartments each having a predetermined charge of plastic powder of different color;

said mold having first and second separable split portions movable to clamp and unclamp the divider to define the first and second power casting surfaces on the split portions for receiving powder from the first and second open end compartments when the box and mold are joined and rotated;

and joint formation means including a bend end on one of said split mold portions engageable with said divider when in clamped position to form a powder collection region.

4,634,361

HEAT TRANSFER MEANS TO BE INSTALLED AROUND THE BARREL OF AN EXTRUDER OR INJECTION MOLDING MACHINE

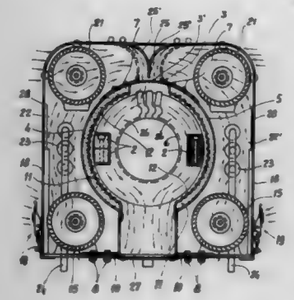
Gaetano Piazzola, Viale Borri, 148, Varese, Italy

Filed Feb. 11, 1985, Ser. No. 700,511

Claims priority, application Italy, Feb. 14, 1984, 19610 A/84

Int. Cl.⁴ B29C *45/72, 47/78*

U.S. Cl. 425—190 **1 Claim**



1. A heat transfer apparatus to be applied about a barrel of an

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extruder or injection molding machine, comprising: two adjustable semicylindrical structures having means for defining, when positional about one said barrel, a gap defining at opposite positions, two openings, for entrance of cooling air to the apparatus and one opening for exit of air form the apparatus, air induction fans for introducing outside air to the apparatus, air-circulation fans to circulate air within the apparatus, cooling coils to cool the circulated air, said fans and coils being enclosed in a removable casing also enveloping said semicylindrical structures, said semicylindrical structures being provided with a respective right angle bent end defining a collar for positioning said structure axial with respect to said barrel, said semicylindrical structures being adjustably mounted, on an arcuate plate member arranged between two half ring pairs, coupled through coupling blocks for support by said barrel, said right angle bent ends being coupled to side portions of a base plate on the side adjoining said structures, there being mounted, at an intermediate position of said base plate a motor the driving shaft of which extends on the two sides of the motor and connected to corresponding said fans, on the edges of said side portions of said base plate there being provided vertically extending walls supported by said half-rings and provided, at said fans, with air inlet ports, said vertically extending walls defining, with said base plate, a box like body open on the two sides parallel to said barrel and closed, on the sides and top, by said casing, said casing being coupled to said base plate by means of tension hook members and carrying on its top wall, symmetrically with respect to said motors, corresponding motors driving fan pairs, said casing defining, laterally of said semicylindrical structures, two substantially vertically extending ducts in the inside of which there is arranged said cooling coil, said top wall of said casing being provided, at an intermediate position with a two-portion splittable baffle member to convey the cooled air to the space encompassing said barrel and defined by said semicylindrical structures.

4,634,362

DEVICE FOR MAKING ANNULAR PRODUCTS FROM MOLDABLE FOODSTUFF

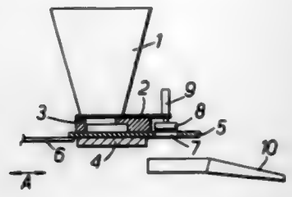
Wilhelmus F. A. Koppens, Bakel, Netherlands, assignor to Koppens Machinefabriek B.V., Bakel, Netherlands

Filed Feb. 15, 1985, Ser. No. 701,934

Claims priority, application Netherlands, Feb. 15, 1984, 8400478

Int. Cl.⁴ A22C *7/00*; B29C *43/04, 47/10*

U.S. Cl. 425—287 **2 Claims**



1. In a device for forming annular shaped products from moldable foodstuff, including a hopper for the foodstuff and a slide having part thereof defining at least one recess to form the products, said slide being adapted to reciprocate between a first position in which the material can move from the hopper into the recess and a second position in which the recess is located at the side of the hopper opposite an expelling member which is adapted to reciprocate transversely of the slide for expelling the product out of the recess the improvement wherein the recess extends around a plate-shaped part of the slide which is connected with the surrounding part of the slide with the aid of a plurality of connecting ribs, while the thickness of the plate-shaped part is at least substantially equal to the thickness of the slide part surrounding the recess and the thickness of the connecting ribs is less than said thickness of the slide and the undersides of the ribs are located at a level higher than the underside of part of the slide surrounding the recess and wherein the expelling member includes hanging limbs separated from one another by slots in a manner such that the hanging limbs fit in the holes located between the connecting ribs, while the connecting ribs can be received in the slots.

4,634,363

APPARATUS FOR SLITTING AND FOLDING DOUGH PIECES

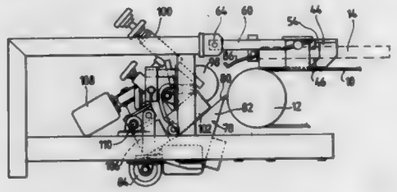
Josef K. Pivonka, Hingham, England, assignor to Tweedy of Burnley Limited, Burnley, England

Filed Aug. 13, 1985, Ser. No. 765,349

Claims priority, application United Kingdom, Aug. 16, 1984, 8420829

Int. Cl.⁴ A21C *11/12*

U.S. Cl. 425—306 **9 Claims**



1. A bakery dough molding machine having a conveyor for carrying dough pieces each having a longitudinal axis, toward a discharge end of the machine; at least one blade for making an incision in each of said dough pieces as it travels on said conveyor, to form at least one dough hinge in the dough piece; a moving element for conveying the dough piece after it have been engaged by said at least one blade, to a dough folding station; and a stationary control member, disposed over the path of movement of said moving element, said control member having a control surface for engaging the dough piece as said dough piece is moving on the moving element, the length of the control surface being such that the dough piece is caused to turn through an angle about said longitudinal axis such that each dough hinge is presented at the folding station in a desired orientation.

4,634,364

DEVICE FOR THE POSITIVE DRAWING OF LUMPS OF DOUGH FOR THE INDUSTRIAL MANUFACTURE OF LONG LOAVES

René Voegtlin, 2, rue de la Colline, 67200 Strasbourg (Bas-Rhin), France

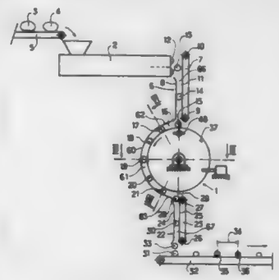
Filed May 24, 1985, Ser. No. 738,060

Claims priority, application France, May 29, 1984, 84 08632

Int. Cl.⁴ A21C *11/00*

U.S. Cl. 425—335 **15 Claims**

1. Apparatus for positively drawing to greater length lumps of prelengthened dough comprising, a plurality of rotationally driven discs disposed side-by-side so that the periphery thereof engages the lumps of prelengthened dough for drawing thereof during rotation of the driven discs, means for defining in conjunction with said discs a space radially of the discs through which the lumps of prelengthened dough pass disposed peripherally of the driven discs for drawing thereof by the perpheries of the driven discs while in said space, said space having a limited extent in a circumferential direction of the discs and having an elongated inlet into which the prelengthened dough is introduced extending in contact with the periphery of at least some of the driven discs and having an elongate outlet at which the prelengthened dough is discharged by peripheries of the driven discs in a drawn and lengthened state, means for feeding successively the prelenthened lumps of dough into said inlet of said space disposed across said some of the discs, and means for discharging the drawn and lenthened lumps of



dough from said apparatus after being discharged at said outlet of said spaced successively.

4,634,365

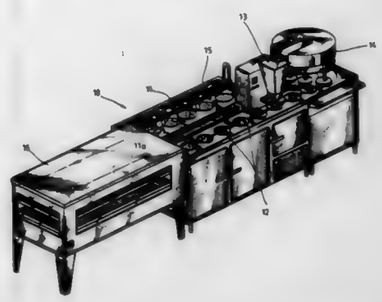
APPARATUS FOR MAKING PIZZA

Pedro R. Triporo, 1012 Sean Ct., Hurst, Tex. 76053, and Stanley Eckels, Ft. Worth, Tex., assignors to Pedro R. Triporo, Hurst, Tex.

Filed Jun. 14, 1984, Ser. No. 620,424

Int. Cl.⁴ A21C *7/04, 11/00*

U.S. Cl. 425—398 **9 Claims**



1. An apparatus for preparing a pie shell from a batch of dough, said apparatus comprising:

(a) a conveyor adapted to carry a pan of dough;

(b) a tamping device adapted to travel laterally along with and above the pan;

(c) reciprocating drive means to repeatedly lower said device into contact with the dough;

(d) means to vary the vertical travel of the drive; and

(e) means to rotate said tamping device during such lateral and vertical travel.

4,634,366

INJECTION MOLDING MACHINE

Philip L. Brun, Dayton, and Stephen A. Bright, Troy, both of Ohio, assignors to Electra Form, Inc., Vandalia, Ohio

Division of Ser. No. 439,760, Nov. 8, 1982, Pat. No. 4,497,624. This application Nov. 7, 1984, Ser. No. 668,953

Int. Cl.⁴ B29C *35/16, 45/73*

U.S. Cl. 425—526 **18 Claims**

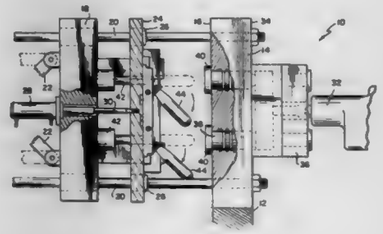
1. A mold element for use in an injection molding machine wherein the mold element is received substantially wholly within a platen, said platen adapted for retaining a plurality of similarly configured mold elements, the mold element comprising

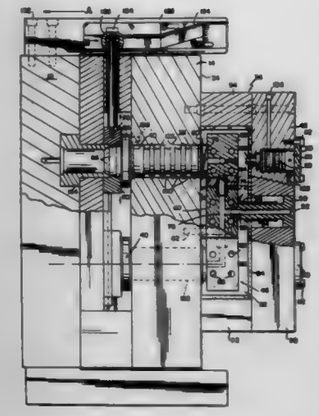
a tubular body portion having a substantially closed end and an open end, an inside of the tubular body portion defining a molding cavity for receiving plastics material,

cooling means comprising a plurality of separate, spaced parallel grooves on the outside of the tubular body portion, and

retaining means for retaining the tubular body portion in fixed relation to the platen, the retaining means including a ring situated at the open end of, and unitary with, the tubular body portion, the ring having an outside diameter greater than the outside diameter of the tubular body portion, and means for coupling the ring to a forward face of the platen.

9. A stationary platen for use in an injection molding machine between a plastics injector and a movable platen, the stationary platen comprising





a generally rectangular block having a pair of parallel faces and having a plurality of regularly spaced mold element-receiving chambers extending through the platen between the pair of parallel faces,

a plurality of separate cooling channels penetrating the block generally orthogonal to, and intersecting, each mold element-receiving chamber,

means for securing mold elements substantially wholly within the block,

manifold means fixed to a side of the platen in communiation with the plurality of separate cooling channels for distributing cooling liquid to certain cooling channels, and

blocking means for modifying the flow of cooling liquid in selected cooling channels.

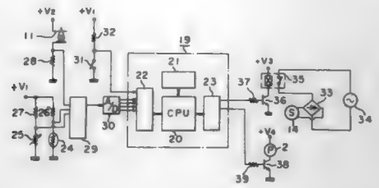
VOL 1074 ISS 1 JA 6 1987 UMI

4,634,367

CARBURETION TYPE BURNING APPARATUS

Toshio Kasada, Gunma, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1985, Ser. No. 783,179
Claims priority, application Japan, Oct. 15, 1984, 59-215822
Int. Cl.[4] F23N *5/00*
U.S. Cl. 431—29 **6 Claims**



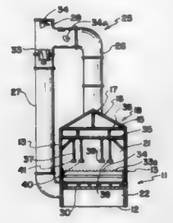
1. A carburetion type burning apparatus which comprises a needle for opening and closing a nozzle orifice, a carburetion chamber, a fuel tank for receiving fuel, a pump for feeding the fuel to said carburetion chamber from said fuel tank, a heater element for vaporizing the fuel, said nozzle orifice receiving said vaporized fuel from said carburetion chamber, a burner for burning fuel gas ejected from said nozzle orifice and a needle controlling device for closing said nozzle orifice with said needle following a delay time after the fire is extinguished and the pump is stopped, said delay time being varied depending on the rate of supply of liquid fuel immediately before the fire is extinguished.

4,634,368

APPARATUS FOR IMPROVING THE SURFACE CHARACTERISTICS OF WAXY MATERIALS

Manuel Diaz, Point Pleasant, N.J., assignor to Fluid Packaging Company, Inc., Lakewood, N.J.

Continuation-in-part of Ser. No. 393,642, Jun. 30, 1982, abandoned. This application May 14, 1984, Ser. No. 609,528
Int. Cl.[4] A01J *15/14*
U.S. Cl. 425—453 **17 Claims**



1. An apparatus for improving the characteristics of a stick or cake of solidified wax-based low melting material having a housing with an entrance and an exit; a horizontally-mounted endless conveyor means within the housing and heating means interposed into said housing and constructed to heat a first preselected position along said path of the conveyor, the improvement which comprises:

a. said conveyor means supporting on its upper surface a plurality of containers for sticks or cakes of said solidified wax-based material arranged in aligned relation along the length of the conveyor means;

b. driving means for progressively moving said conveyor means to propel said containers along a path from said entrance to said exit;

c. said heating means designed to heat the preselected position to a first temperature sufficient to at least partially melt said low-melting wax-based material;

d. means comprising separators mounted along said path for insulating said first preselected position from another area below the melting point of said wax-based material, whereby said wax-based material at least partially melts at said first preselected position and resolidifies in said other area;

e. means maintaining said chamber under reduced pressure;

f. an about vertical air feed conduit attached to a top of the housing; and

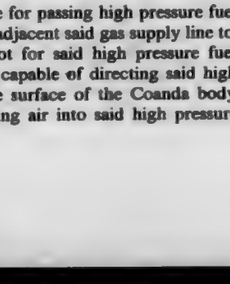
g. a discharge conduit attached near a bottom of the housing.

4,634,369

PURGING PROCESS

James C. McGill; John W. Schindeler, Jr., both of Tulsa; Eugene C. McGill, Skiatook, and Robert L. Rawlings, Tulsa, all of Okla., assignors to McGill Incorporated, Tulsa, Okla.

Continuation-in-part of Ser. No. 623,845, Jun. 23, 1984, Pat. No. 4,559,006. This application Dec. 16, 1985, Ser. No. 809,586
Int. Cl.[4] F23J *15/00;* **F23D** *13/20*
U.S. Cl. 431—3 **18 Claims**



1. An improved purging process for controlling back-flow migration of air into a flare system through which a flare gas is caused to be destroyed, the process comprising:

flowing purge gas through the flare system in a sufficient amount to substantially prevent air migration into the exit port through which the purge gas is exhausted to the atmosphere;

sensing the flow rate of the flare gas being passed through the flare system;

reducing the flow of purge gas to permit substantial air migration to occur, said reduction of purge gas being for a selected interval of time and the amount of reduction being a predetermined amount in response to the sensed flare gas flow rate; and

re-establishing the full flow of purge gas at the end of the interval such that only a predetermined amount of migration air has occurred to prevent harmful conditions from occurring as a result of the air migration.

4,634,370

FLARE

David A. Chesters, Walton-on-Thames, England, assignor to The British Petroleum Company p.l.c., London, England

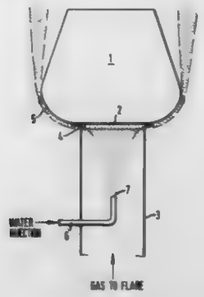
Filed Dec. 5, 1984, Ser. No. 678,391
Claims priority, application United Kingdom, Dec. 8, 1983, 8332747
Int. Cl.[4] F23D *21/00*
U.S. Cl. 431—202 **3 Claims**

1. Flare using water for noise and radiation suppression comprising:

(a) a gas supply line for passing high pressure fuel gas,

(b) a Coanda body adjacent said gas supply line to define an annular outlet slot for said high pressure fuel gas, the outlet slot being capable of directing said high pressure fuel gas over the surface of the Coanda body so as to entrain surrounding air into said high pressure fuel gas flow, and

(c) means supplying water in its liquid state under pressure to an injection nozzle located adjacent and upstream of the high pressure fuel gas outlet, said injection nozzle having



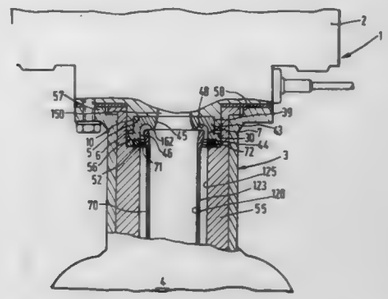
outlet means directed at said coanda body for creating water droplets whereby said water droplets are sprayed into the high pressure fuel gas immediately prior to its emergence from the high pressure fuel gas outlet.

4,634,371

INTERMEDIARY CHANNEL FOR A FEEDING DEVICE FOR A PULSATORY COMBUSTION CHAMBER

Jean-Marc Bader, Morsaant, France, assignor to Societe Nationale Elf Aquitaine, Courbevoie, France and Marek B.V., Amsterdam, Netherlands

Filed Mar. 29, 1985, Ser. No. 717,665
Claims priority, application France, Mar. 29, 1984, 84 04919
Int. Cl.[4] F23C *9/00*
U.S. Cl. 431—116 **11 Claims**



1. An intermediary channel located between a combustion chamber for pulsatory combustion of a mixture of fuel and a combustive agent and an injection chamber for the injection of said mixture, comprising:

a heat tube wherein an internal wall of said intermediary channel and an outer surface of said heat tube define a recirculation zone for the recirculation of burned gases issuing from said combustion chamber, said recirculation zone being at least partially open at an upper end thereof;

and wherein said intermediary channel further comprises a lower portion located in the vicinity of the combustion chamber and an upper portion located in the vicinity of the injection chamber, said heat tube being located in said lower portion; and

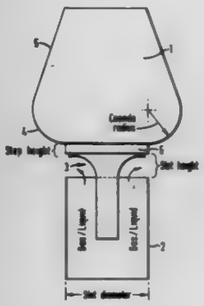
wherein said lower and upper portions are cylindrical, the lower portion having an inner diameter larger than an inner diameter of said upper portion, said upper and lower portions being connected to each other by a flange in front of which is located the upper end of said heat tube.

4,634,372

FLARE

Stephen M. Allum, Woking, and David A. Chesters, Walton-on-Thames, both of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Mar. 1, 1985, Ser. No. 707,228
Claims priority, application United Kingdom, Mar. 2, 1984, 8405575; Nov. 29, 1984, 8430145
Int. Cl.[4] F23Q *9/00*
U.S. Cl. 431—202 **5 Claims**



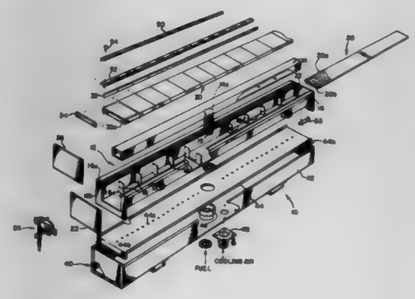
1. A Coanda flare for the simultaneous disposal of gas-liquid combustible materials containing up to 70% by weight of liquid comprising (a) a supply line for pressurized gas-liquid combustible materials (b) a Coanda body having an outer surface positioned across the supply line so as to define an annular outlet adapted to direct the gas-liquid combustible materials issuing from the annular outlet over the outer surface of the Coanda body, (c) director outer surface of the Coanda body having a step located close to the annular outlet, the step height being equal to or greater than the width of the annular outlet, (d) the ratio of the radius of curvature of the Coanda body to the width of the annular outlet being in the range from 4 to 100 and the ratio of the diameter of the supply line to the radius of curvature of the Coanda body being in the range from 0.2 to 25.

4,634,373

GAS-FIRED RADIANT HEATER

David Rattner, Box 104, Solebury, Pa. 18963

Filed Sep. 24, 1985, Ser. No. 779,626
Int. Cl.[4] F23D *13/12*
U.S. Cl. 431—328 **19 Claims**



1. A heater apparatus, comprising:

a plurality of porous tile members arranged in an elongated series;

fuel distribution means adapted to support said tile members and having a baffled compartmentalized chamber trans-

versely integrally formed therein for delivering a predetermined ignitable fuel mixture evenly to said tile members; and

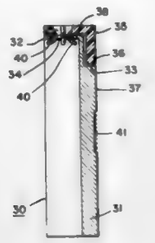
air circulation means adapted to substantially encase said fuel distribution means for circulating cooling air thereabout, said air circulation means being formed to provide an elongated and deflected air gap along opposite edges thereof to direct vented air away from said tile members.

4,634,374

WINDSCREEN FOR LIGHTER JACKET

Robert W. Herko, Harrison, N.Y., assignor to Surefire, Inc., New York, N.Y.

Filed May 15, 1985, Ser. No. 734,396
Int. Cl.⁴ F23Q *25/00*
U.S. Cl. 431—146 **9 Claims**



1. In a jacket for receiving a cigarette lighter, a slidable windscreen which can be slid up from the jacket when the lighter is lit, to shield the lighter flame from the wind, and thereafter pushed down into the jacket with the finger, said windscreen comprising:

an elongated generally trough-shaped member having a top surface at an upper end thereof, and a chimney hole in said top surface for venting the lighter flame; and

a cap comprising a heat-resistant material mounted on the top surface of said member and having a vent hole with a plurality of prongs extending into the vent hole and snap-fit into the chimney hole so that at least a part of the vent hole is in alignment with at least a part of the chimney hole,

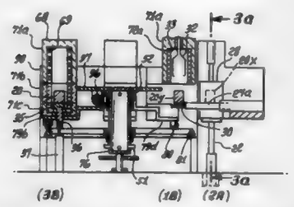
said heat-resistant material providing an insulating effect so that the finger is not burned when pushing the windscreen down into the jacket after the lighter has been used.

4,634,375

HEATING AND HANDLING SYSTEM FOR METAL CONSOLIDATION PROCESS

Robert W. Hailey, 2030-229 Beverly Plz., Long Beach, Calif. 90815

Filed Mar. 11, 1985, Ser. No. 710,541
Int. Cl.⁴ F27B *9/00, 9/06, 9/02*; F27D *3/00*
U.S. Cl. 432—121 **57 Claims**



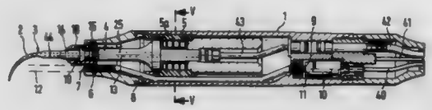
1. Apparatus for heating powder material charges to high temperatures at a fast rate, and for moving said charges through process operations, and for maintaining the temperatures of preheated charges and protecting the charges against contamination as they are moved through process operations, which includes: a charge enclosing heated enclosure body having two or more separate sections; an interanl wall in the enclosure body sections that has an interanl cavity having a configuration shaped to hold a desired charge configuration; heating means for the internal cavity wall to heat it to desired temperature; the body being openable to receive a charge or allow transfer to a next step; the body being closable to enclose the charge; the body sections being movable horizontally and vertically as required to move the charge and carry out process operations; an internal protective atmosphere around the charge; the body having associated interior insulation to reduce heat loss to the outside surfaces and allow close temperature control; and mechanisms to open and close and move the heated body sections to allow receiving, holding and transferring of the charge, and including a sealed outer chamber in which the heated enclosure body sections are enclosed, which outer chamber is gas tight and contains a protective atmosphere and the outer chamber is constructed to allow the body sections to be moved through process steps inside the outer chamber with minimum or no exposure to external air, and means by which the body sections are moved within said outer chamber in a predetermined path and through process steps.

4,634,376

TARTAR-REMOVING HANDPIECE

Walter Mössle, Bad Waldsee, and Eugen Elbofner, Biberach, both of Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

Filed Apr. 16, 1985, Ser. No. 723,821
Claims priority, application Fed. Rep. of Germany, May 9, 1984, 3417123
Int. Cl.⁴ A61C *3/00*
U.S. Cl. 433—29 **15 Claims**



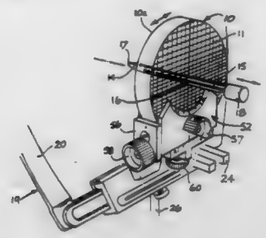
1. In a tartar-removing handpiece, including an elongated gripping sleeve, a tartar-removing implement having a bent operating end being arranged at one end of said gripping sleeve, said gripping sleeve having a light source at the end facing said implement, said light source being directed towards the region of the tartar-removing implement and being located at one side adjacent the tartar-removing implement; the improvement comprising: said tartar-removing implement is inserted into the gripping sleeve; and latching means for fixing the rotational position of the implement for aligning a light beam emanating from the light source with the bent operating end of the tartar-removing implement, said latching means comprising at least one engaging means on the implement and cooperative engaging means on the handpiece, wherein the engaging means and cooperative engaging means are engagable with each other in the rotational position of the implement effecting the alignment of the light beam and the bent operating end, one said engaging means being formed by an axially projecting protuberance and the cooperative engaging means comprising a recess for receiving the protuberance.

4,634,377

DEVICE FOR ALIGNING ARTIFICIAL TEETH AND CROWNS

Donald A. Behrend, 147 Collins Street, Melbourne, Victoria, Australia (3000)

Filed Jul. 27, 1983, Ser. No. 517,629
Claims priority, application Australia, Jul. 27, 1982, PF5068; Dec. 24, 1982, PF7460
Int. Cl.⁴ A61C *19/04*
U.S. Cl. 433—73 **10 Claims**



1. A device for recording or providing information concerning the anulation of the anterior teeth of a dental patient during restoration of teeth with crowns or the construction of dental prostheses, including a transparent screen mounted on a support means for positioning said screen in a substantially vertical frontal plane and in a predetermined position in front of the patient's mouth, said screen having horizontal and vertical lines marked thereon, said support means comprising a calibrated support block, said screen being rotatably adjustable on said calibrated support block to obtain a prescription of the angulation of said anterior teeth, said prescription being transferable to an identical screen mounted on an articulator upon which fabrication of said crowns and prostheses can be performed having reference to said prescription.

4,634,378

DENTAL DRILL

Henri Leonard, Besancon, France, assignor to Micro-Mega, Besancon, France

Filed Sep. 12, 1983, Ser. No. 531,445
Claims priority, application France, Dec. 10, 1982, 82 20903
Int. Cl.⁴ A01C *5/02*
U.S. Cl. 433—102 **2 Claims**



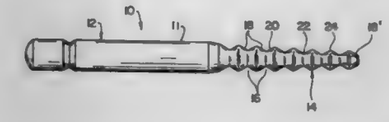
1. A dental drill comprising a tip at one end and a shank at another end thereof, a core of the drill defining a conical rod having conical triple flutes disposed helicoidally axially from the shank to the tip progressively decreasing in diameter and pitch from the shank to the tip, the flutes defining therebetween axial helicoidal grooves, the flutes having cutting lips along peripheral edges thereof for drilling dental canals, and triple flutes at each cross section of the drill the corresponding triple flutes at a corresponding cross section having a same cross sectional configuration.

4,634,379

ABRASIVE DENTAL TOOL

John E. Nash, Downington, Pa., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 76,102, Sep. 17, 1979, Pat. No. 4,270,903, which is a continuation-in-part of Ser. No. 873,748, Jan. 30, 1978, abandoned. This application Jan. 30, 1981, Ser. No. 230,222
The portion of the term of this patent subsequent to Jun. 2, 1998, has been disclaimed.
Int. Cl.⁴ A61C *3/06*
U.S. Cl. 433—166 **24 Claims**



1. A dental tool of unitary construction for use with a dental handpiece comprising:

an elongate shank having first operative end and a second end adapted to engage a chuck of a dental handpiece, any cross section of said operative end perpendicular to the longitudinal axis of said shank being substantially circular, said operative end having a plurality of adjacent, continuous annular grooves extending about said end, each of said grooves being formed by a pair of inclined side surfaces intersecting to form a circular, lower junction lying in a plane perpendicular to the longitudinal axis of said shank, said side surfaces intersecting side surfaces of adjacent grooves to form crests of said grooves, the included angle formed between said intersecting side surfaces being about 60° to 150° C., the distance between crests of adjacent grooves being about 0.02 to 0.06 inch, and the distance from the longitudinal axis of said shank to said lower junction being greater than about 0.010 inch, and

an abrasive material covering a least a portion of the surfaces defining said grooves and having a particle size of less than about 0.006 inch, said tool being adapted to generate a relatively smooth surface upon the manual tracking and scanning thereof across the surface of a tooth.

4,634,380

NON-FLOATING TECHNIQUE-MALE

Eric H. Zahn, P.O. Box 3434, Bellevue, Wash. 98009

Filed Jan. 7, 1985, Ser. No. 689,316
Int. Cl.⁴ A61C *13/12*
U.S. Cl. 433—181 **19 Claims**



14. In an improved male-technique molded of a rubber-like elastomer that is form-retaining when cured and flexible to be attached to an upright downwardly tapered female cavity for a removable partial denture restoration having a base block, a pair of concavities located vertically along the sides of said base block, a supporting attachment member matchingly tapered to be received by said female cavity integrally molded vertically into the forward face of said base block, a head surmounted upon the base block and the attachment member joining said base block and attachment member into an integral unit, wherein the improvement comprises:

a foreign body molded into the head of said male-technique, the foreign body having a density greater than the molded

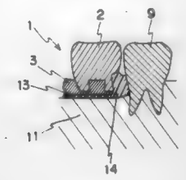
VOL 1074 ISS 1 JA 6 1987 UMI

material comprising the block, attachment member and head.

4,634,381
PARTIAL DENTAL PROSTHESIS

Takae Kusano, and Masato Ueno, both of Hiroshima, Japan, assignors to Molten Corp. and Kabushiki Kaisha Four Brain, both of Hiroshima, Japan

Filed Apr. 29, 1985, Ser. No. 728,129
Claims priority, application Japan, May 16, 1984, 59-99309
Int. Cl.[4] A61C *13/22*
U.S. Cl. 433—172 **7 Claims**

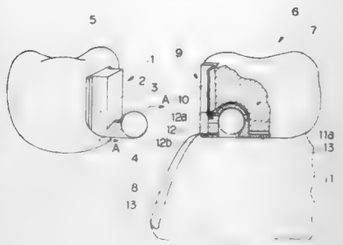


1. In a partial dental prosthesis comprising artificial teeth and a denture base holding said artificial teeth, wherein at least one end of the partial dental prosthesis is adjacent to a retentive tooth, the improvement which comprises a projecting member made of an elastomeric material provided at said denture base and at least one end of said partial dental prosthesis between said prosthesis and adjacent retentive tooth, said projecting member having an inclined end surface in contact with a tapered portion of said retentive tooth so as to be tapered toward said retentive tooth, whereby the partial dental prosthesis is urged toward said alveolus ridge and stably and steadily supported on an alveolus ridge of a patient.

4,634,382
ATTACHMENT FOR DENTAL PROSTHESIS

Takae Kusano, and Masato Ueno, both of Hiroshima, Japan, assignors to Molten Corp. and Kabushiki Kaisha Four Brain, both of Hiroshima, Japan

Filed Jun. 3, 1985, Ser. No. 740,595
Claims priority, application Japan, Jun. 7, 1984, 59-85375[U]; Jun. 11, 1984, 59-87126[U]; Jun. 26, 1984, 59-97021[U]; Jun. 26, 1984, 59-97022[U]
Int. Cl.[4] A61C *13/22*
U.S. Cl. 433—182 **4 Claims**

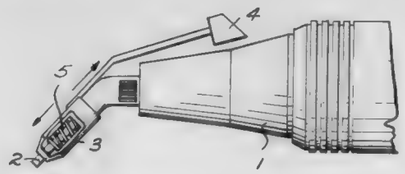


1. An attachment for a dental prosthesis comprising:
(a) a male member of rigid material fixedly attached in the patient's mouth adjacent the area to receive the prosthesis; and
(b) a female member at the area receiving said prosthesis, said female member facing said male member, said male and female members being in intimate interengaging contact with each other without any gap therebetween:
said female member having a rubber-like resilient part made of rubber-like material for gripping engaging a portion of said male member, said rubber-like resilient part forming an elastic lining layer on an inner surface of the prosthesis base in contact with the alveolous ridge,
said male member having a rail, an arm extending outward from a lower end of said rail and a spherical body forming said gripping engaging portion at a free end of said arm, and said female member having a groove formed at a side portion of the dental prosthesis for fittingly sliding on the rail, an intermediate portion in which the arm is received and a recess portion having an elastic part defining a spherical space for gripping the spherical body.

4,634,383
PROCESS AND APPARATUS FOR THE PRODUCTION OF FILLINGS IN TEETH

Hans-Hermann Beyer, Kahl; Walter Diehl, Hanau; Karlheinz Eckert, Gründau; Kurt Eiermann, Pfungstadt, and Hans-Martin Ringelstein, Frankfurt, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 28, 1985, Ser. No. 695,631
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1984, 3403779
Int. Cl.[4] A61C *5/04*
U.S. Cl. 433—226 **4 Claims**



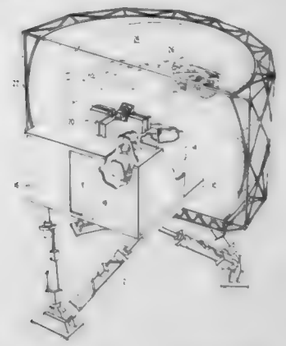
1. In a process for the production of a filling in a tooth cavity by inserting gold powder into the cavity and subsequently mechanically hardening said powder, the improvement comprising employing a platelet shaped gold powder, working said gold powder into a paste with a plastic organic binder that liquifies at 20° to 45° C., inserting said paste into said cavity and mechanical hardening said paste by ultrasonic action.

4,634,384
HEAD AND/OR EYE TRACKED OPTICALLY BLENDED DISPLAY SYSTEM

Fernando B. Neves, Daytona Beach, and Jimmy Page, Ormond Beach, both of Fla., assignors to General Electric Company, Syracuse, N.Y.

Filed Feb. 2, 1984, Ser. No. 576,432
Int. Cl.[4] G09B *9/08*
U.S. Cl. 434—44 **5 Claims**

1. An area of interest display system wherein area of interest imagery of relatively great detail and resolution is displayed in the spatial position of the foveal region of the eye of an observer and background imagery of relatively lesser detail and resolution is displayed about the area of interest imagery, comprising:
first display means for generating said area of interest imagery;
second display means for generating said background imagery; and
optical means coupled to said first and second display means for optically blending and projecting said area of interest imagery and said background imagery, said optical means including:
(i) first transmission filter means having a central high transmissivity portion surrounded by a transition region intermediate the central high transmissivity portion and a low transmissivity portion for passing said area of interest imagery;
(ii) second transmission filter means having a central low transmissivity portion surrounded by a transition region

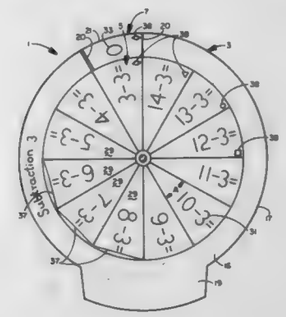


intermediate the central low transmissivity portion and a high transmissivity portion for passing said background imagery; and
(iii) beam splitter means for combining the images passed by said first and second transmission filter means.

4,634,385
TEACHING WHEELS

Virginia Stemper, Rte. 3, Plymouth, Wis. 53073

Filed Dec. 16, 1985, Ser. No. 809,305
Int. Cl.[4] G09B *1/22, 19/02, 19/12*
U.S. Cl. 434—198 **19 Claims**

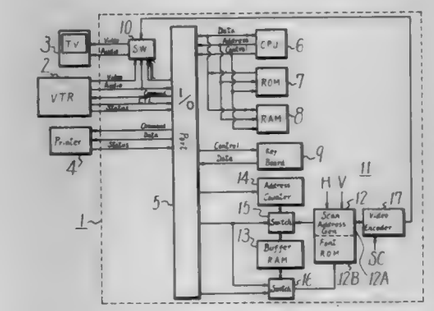


1. A teaching wheel comprising:
a. a frame fabricated from a thin material and having a center and periphery, the frame defining a notch extending from the periphery toward the center;
b. a problem disk superimposed on the frame and having a center coaxial with the frame center, the problem disk having a periphery terminating inwardly of the frame periphery and bearing a plurality of problem indicia thereon;
c. an answer disk underlying the frame and having a center coaxial with the problem disk center, the answer disk having a periphery approximately coextensive with the frame periphery, the answer disk bearing answer indicia corresponding to each of the problem indicia on the problem disk, the answer indicia being located on the answer disk at locations adjacent the periphery thereof and outwardly of the problem disk periphery; and
d. rivet means for mounting the problem disk and answer disk for rotation about the respective centers thereof to the frame center,
so that the problem disk may be rotated relative to the frame to align a selected problem indicia with the frame notch and the answer disk may be rotated relative to the frame to display a selected answer indicia in the frame notch adjacent the selected problem indicia.

4,634,386
AUDIO-VISUAL TEACHING APPARATUS

Isao Tamaki, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 2, 1981, Ser. No. 298,608
Claims priority, application Japan, Sep. 5, 1980, 55-123345
Int. Cl.[4] G09B *7/04, 7/08*
U.S. Cl. 434—323 **15 Claims**



1. Teaching apparatus of the type employing a video reproducing device for reproduction of a video teaching program on a video display device, and in which a student is presented with questions to be answered by selecting a response, the video reproducing device being capable of operation in at least a forward mode and a stop mode; the apparatus, comprising:
a video record medium for use with said video reproducing device and having recorded thereon a video signal, an audio signal, and a control signal in respective tracks, said audio signal including program information code groups and segment information code groups in burst form;
controller means coupled to said video reproducing device to receive said audio signal and said control signal therefrom and to supply a mode-establishing signal thereto to cause said video reproducing device to stop at predetermined positions of the record medium and following a student response to proceed, said controller means including permanent memory means containing a system control program and temporary memory means controlled by said system control program and arranged to store program address data, segment address data, and correct response data contained in bursts of program information code groups and segment information code groups;
student input means for supplying to said controller means the student response selected at said predetermined positions; and
video generator means coupled to said controller means for generating a video instruction display in cooperation with said student-selected responses and presenting such display on said video display device;
wherein said program information code groups and said segment information code groups in said audio signal recorded on said video record medium include at least one segment of control information recorded at the onset of said video teaching program and containing data for halting and commencing said reproducing device at said predetermined positions which occur later in said video teaching program, and wherein said temporary memory

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means is arranged for receiving and storing said control information, for use by said control means in generating said mode-establishing signal at the later-occurring predetermined positions in dependence upon said control signal as governed by the control information contained in the stored at least one segment thereof.

4,634,387

DEVICE FOR SIMULATING THE MOVEMENTS OF AND REPRESENTING ROTATION SYMMETRICAL BODIES

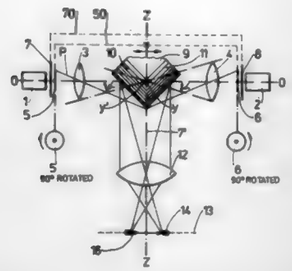
Gebhard Kühn, 9, Werner-Seelenbinder-Str., Jena-Lobeda, German Democratic Rep.

Filed Sep. 4, 1985, Ser. No. 772,503

Claims priority, application German Democratic Rep., Oct. 1, 1964, 2678028

Int. Cl.⁴ G09B *27/00*

U.S. Cl. 434—291 **8 Claims**



1. A device for simulating the movements of and representing rotation symmetrical bodies, such as planets, particularly for use in projection devices and planetaria, comprising about a first optical axis,

a first optical unit,

a second optical unit,

a reflecting member being arranged between said first optical unit and said second optical unit,

said first optical unit being constituted, subsequently and in direction of said reflecting member, of

a first illumination system,

a first occulting means,

a first photo slide,

and a first imaging lens,

said second optical unit being constituted, subsequently and in direction of said reflecting member, of

a second illumination system,

a second occulting means,

a second photo slide, and

a second imaging lens,

said reflecting member having a first reflecting face in opposition to said first imaging system and

a second reflecting face in opposition to said second imaging system,

said first and said second reflecting face including an angle of 90° to one another and being symmetrical to a common plane of symmetry being at right angles to said first optical axis, when said reflecting member being in an initial position,

said first and said second reflecting face being contiguous in said plane of symmetry and including an angle of 45° with said first optical axis,

said first and said second reflecting face being provided with a step arrangement, and being arranged in intermediate image planes of said first and said second imaging system, respectively,

an axis of rotation being provided perpendicular to said first optical axis and intercepting the latter in said plane of symmetry,

a second optical axis being at right angles to said axis of rotation and to said first optical axis, a third imaging lens being arranged about said second optical axis,

said third imaging lens having an image plane, a circular aperture being arranged in said image plane, projection means being for projecting said image plane onto a projection screen,

said first and said second illumination systems illuminating said first and said second photo slides, said first and said second imaging system imaging said first and said second photo slide, respectively, upon said first and said second reflecting face,

said third imaging lens imaging the intermediate images of said first and said second photo slides from said first and said second reflecting face, respectively, into said circular aperture.

4,634,388

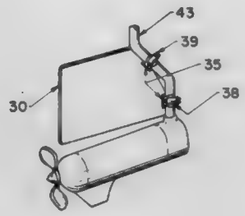
RUDDER FOR ELECTRIC TROLLING MOTOR

Walter R. Covell, Rte. #1, Milan, Pa. 18831

Continuation-in-part of Ser. No. 603,365, Apr. 24, 1984, abandoned. This application Jun. 24, 1985, Ser. No. 748,124

Int. Cl.⁴ B63H *21/17*

U.S. Cl. 440—6 **11 Claims**



1. A rudder assembly for an electric outboard trolling motor comprising:

a flat major portion having at least one side edge;

at least one minor portion integrally joined with said flat major portion along said one side edge of the flat major portion and curved for at least partial wrap around a section of a circular shaft of said electric outboard trolling motor;

a second minor portion rigidly and integrally joined to said major portion along a side edge of said major portion and curved for positioning in a partial wrap around a different section of the same shaft;

a pair of apertures each positioned proximate to a different one of said two minor portions;

separate securing means for positioning and holding said curved one minor portion of said rudder against said shaft, above a propeller of said electric trolling motor in proximity to said propeller, at least part of said securing means being detachable from the remainder of said rudder assembly sufficiently to position said shaft between said one minor portion and said securing means, said rudder assembly being adapted to be supported solely by said circular shaft;

second securing means cooperating with said second minor portion for positioning and holding said second curved portion of said rudder against said shaft, at least part of said second securing means being detachable from said rudder assembly sufficiently to position said shaft between said second minor portion and said second securing means, said rudder assembly being positionable and supportable on said electric trolling motor circular shaft solely by said two minor curved portions and said two securing means for positioning and holding; and

said two securing means for positioning and holding each comprising a flexible band clamp, the band of each clamp being passed through a different one of said apertures and

around said circular shaft and the minor portion of the rudder assembly proximate said aperture.

4,634,389

VESSEL HAVING DEMOUNTABLE SUBMERGED PROPELLER UNIT

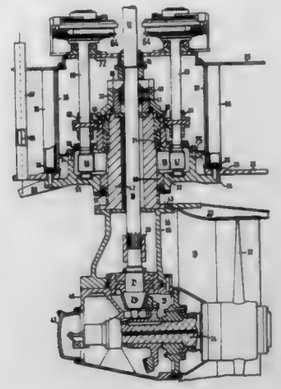
Yannis Eptaminitakis, London, England, assignor to Vickers Public Limited Company, London, England

Filed Jan. 23, 1985, Ser. No. 694,011

Claims priority, application United Kingdom, Jan. 25, 1984, 8401879

Int. Cl.⁴ B63H *25/42*

U.S. Cl. 440—53 **11 Claims**



1. A vessel having a hull and a submerged propeller unit demountably fitted to the hull and continuously rotatable through 360° of azimuth relative to the hull to give full thrust in any required direction, comprising means defining an aperture in the hull of the vessel surrounded by a fixing flange, a drive input shaft for the propeller unit and at least one steering drive shaft, at least one steering drive motor mounted in the vessel and connected to the steering drive shaft to effect rotation thereof, a casing that fits in the aperture from under the hull with a circumferential flange releasably bolted to the underside of the fixing flange, a stem depending from said casing and rotatably supported therein at its upper end to act as a steering tube for a propeller rotatably supported at its lower end, a steering gear wheel in said casing through which the stem passes and to which gear wheel the stem is connected so as to rotate therewith, steering drive gear means rotatably supported in said casing in mesh with the steering gear wheel and releasably connected to said steering drive shaft via an opening in said casing that can be closed by an intended protective cap so that operation of said steering motor rotates the propeller unit, and a drive transmission shaft for the propeller extending through the stem and releasably connected at its upper end to the drive input shaft via a further opening in said casing that can be closed by an intended protective cap so that the propeller unit can be dismounted from under the hull of the vessel with the protective caps in place, the steering gear wheel and the gear means being removed in the casing as part of the demountable propeller unit.

4,634,390

RAISING AND LOWERING AID FOR TROLLING MOTORS

John S. Baird, 9600 Baird Rd., Shreveport, La. 71118

Filed Oct. 10, 1985, Ser. No. 785,978

Int. Cl.⁴ B63H *21/26*

U.S. Cl. 440—63 **20 Claims**

1. In a retractable trolling motor apparatus having a mount bracket which includes a mount shoe, a shaft bracket carrying a trolling motor and a pair of primary arms extending between the mount shoe and the mount bracket, the improvement comprising a pair of torsion springs disposed in spaced relationship on each side of the mount shoe with one end of each of said torsion springs fixed with respect to the mount shoe; a pair of connector bars having one end thereof pivotally mounted with respect to the mount shoe in spaced relationship, with the opposite ends of said torsion springs attached to said one end of



said connector bars, respectively, and the opposite ends of said connector bars extending in close proximity to the primary arms, respectively; a keeper plate joining said opposite ends of said connector bars; and roller means carried by said opposite ends of said connector bars, said roller means contacting the primary arms and adapted for traversal of the primary arms responsive to retraction and extension of the trolling motor apparatus.

4,634,391

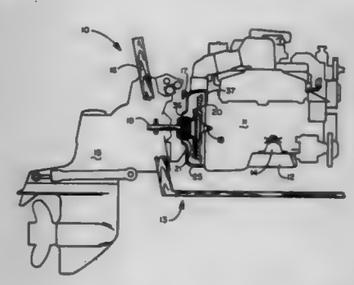
ENGINE COUPLER FOR STERN DRIVE

David C. Entringer, Fond du Lac, and Gerald F. Neisen, Oshkosh, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Jun. 27, 1985, Ser. No. 749,917

Int. Cl.⁴ B63H *23/00*

U.S. Cl. 440—75 **10 Claims**



1. In a marine drive having an inboard engine coupled to drive an outboard drive unit, a coupling assembly for coupling the drive shaft of said engine to a generally coaxial driven shaft of said drive unit, said coupling assembly comprising:

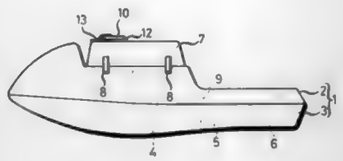
(A) a flywheel fixed to said drive shaft;

(B) a coupling member formed by stamping from a single steel sheet, said coupling member having

(1) a generally planar triangular base lying in a plane perpendicular to the axis of said drive shaft, said base including a central planar portion spaced from said flywheel to act as the flex plate to accommodate loads resulting from misalignments of said drive and driven shafts and three attachment regions respectively near the vertices of said triangular base, each of said attachment regions attached to said flywheel, and

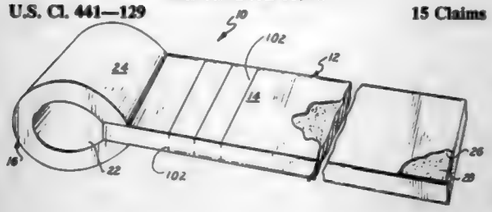
(2) a cylindrical outer hub having its axis generally coaxial with said drive shaft and said driven shaft, said hub extending from said base away from said flywheel;
(C) an inner hub attached to said driven shaft; and
(D) an elastomeric annulus compressed between said inner hub and said outer hub.

4,634,392
PRESSURE RELIEF DEVICE FOR ENGINE ROOM OF A SMALL WATERCRAFT
Hiroshi Nishida, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan
Filed Apr. 24, 1985, Ser. No. 726,727
Claims priority, application Japan, Apr. 25, 1984, 59-66950[U]
Int. Cl.⁴ B63H *21/36*
U.S. Cl. 440—88 **2 Claims**



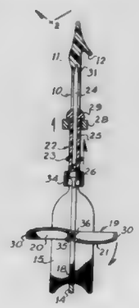
1. A sealing and pressure relief device for an engine room of a watercraft, the engine room having an encasement sealed except for an opening sufficiently wide to relieve excess pressure, said device comprising: a pressure relief member having a flange portion larger than said opening and located outside said encasement, another flange portion smaller than said opening and located inside said encasement, and a portion interconnecting said flange portions; and an annular resilient U-shaped grommet having two spaced leg portions respectively covering said encasement on opposite sides around said opening, and said U-shaped grommet also having a portion fit around said interconnecting portion and between said two flange portions, whereby said device seals said encasement against ingress of water, while excess pressure in said encasement can be vented by forcing said pressure relief member out of said opening.

4,634,393
AQUATIC MAT
Robert L. Wood, Wichita Falls, Tex., assignor to Advanced Sports Corporation, Wichita Falls, Tex.
Continuation of Ser. No. 270,042, Jun. 3, 1981, abandoned, which is a continuation of Ser. No. 10,102, Feb. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 743,340, Nov. 19, 1976, Pat. No. 4,138,753, which is a division of Ser. No. 609,049, Aug. 29, 1975, Pat. No. 4,006,503, which is a continuation-in-part of Ser. No. 594,018, Jul. 8, 1975, abandoned. This application Feb. 22, 1985, Ser. No. 704,592
The portion of the term of this patent subsequent to Feb. 13, 1996, has been disclaimed.
Int. Cl.⁴ B63B *35/72*
U.S. Cl. 441—129 **15 Claims**



1. An aquatic flotation mat capable of floating in water and supporting one or more persons, comprising an elongated planar member having top and bottom planar surfaces and a headrest secured to and extending from an end portion of said planar member; said planar member and said headrest formed from closed cell, plastic foam slab members, which are flexible, resilient and non-water absorbent; said headrest slab member having ends thereof secured to an end portion of said planar member, and includes one open transverse void above said top planar surface; said elongated planar member having transverse creases formed in upper and lower surfaces of the elongated planar member; said creases extending equidistantly into the elongated planar member, said creases being placed so that the creases on each respective planar surface oppose creases on the opposing respective planar surface, and said creases being spaced so as to enable the aquatic mat to be easily rolled up.

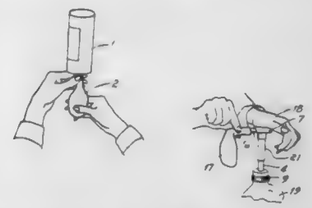
4,634,394
PROJECTED TOY WITH ROTATABLE PADDLES
Jerald L. Massey, 140 Briardale Ave., Warner Robins, Ga. 31093
Filed Nov. 25, 1985, Ser. No. 801,229
Int. Cl.⁴ A63H *27/12*
U.S. Cl. 446—36 **6 Claims**



1. An aerial toy, said toy being of the type to be projected into the air to the apex of flight and then descend by gravity, said toy including a body having a longitudinal axis, said toy being arranged to be projected so that said body moves through the air axially of said longitudinal axis, a rotor carried by said body, said rotor being mounted for rotation about an axis transverse to said longitudinal axis of said body, the arrangement being such that rotation of said rotor about said axis slows the motion of said toy axially of said longitudinal axis, said toy further including locking means for selectively locking said rotor for preventing rotation of said rotor, and means for releasing said locking means generally at the apex of flight, the arrangement being such that said rotor can be locked while said toy is projected into the air and said rotor is released for the descent, said rotor comprising two paddles rotatable about said axis, said locking means being arranged to engage one of said two paddles when said two paddles are substantially coplanar with said body.

4,634,395
INFLATABLE ELASTOMERIC BALLOONS HAVING INCREASED BUOYANT LIFETIMES
Donald Burchett, 616 Rymer Way, Louisville, Ky. 40223
Filed Mar. 22, 1984, Ser. No. 592,229
Int. Cl.⁴ A63H *3/06*
U.S. Cl. 446—222 **44 Claims**

14. A method of coating an inflatable elastomeric toy balloon having an inflated diameter of from about 15 cm to about 50 cm with a diffusion barrier film to increase the floating lifetime of the balloon when in an inflated condition, comprising the steps of:
applying a liquid comprising an aqueous solution of a dispersed gas diffusion barrier coating material to a surface of the balloon;
expanding the coated surface by inflating the balloon; and
drying the liquid while the balloon is in an inflated condition with said surface expanded.
24. An inflatable balloon comprising



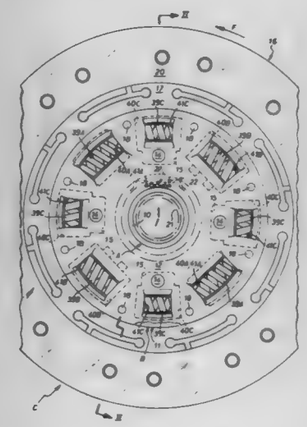
an elastomeric material, said elastomeric material having inside and outside surfaces adapted to be expanded by inflation of said balloon, and
a gas barrier coating on at least one of said surfaces comprising a polyvinyl alcohol.

4,634,396
JOINT FOR THE TRANSMISSION OF MOTION FROM A DRIVING SHAFT TO A DRIVEN SHAFT
Giorgio Tangorra, Monza, Italy, assignor to Industrie Pirelli, S.p.A., Milan, Italy
Filed Nov. 19, 1984, Ser. No. 672,949
Claims priority, application Italy, Nov. 28, 1983, 23905 A/83
Int. Cl.⁴ F16D *3/52*
U.S. Cl. 464—55 **8 Claims**



1. A joint for transmission of motion from a driving shaft rotating around a first axis to a driven shaft rotating around a second axis, said joint comprising a driving support and a driven support associated with said shafts, each support comprising at least two arms, said joint further comprising at least one single element of connection between the arms for transmission of motion between the shafts constituted in the form of a closed annular strap of flexible material and resistant to traction, said strap being disposed substantially within a plane separating the two supports at a central position with respect to the joint so as to form a polygon whose vertices are the ends of the arms belonging alternatively to the driven and driving supports and whose sides constitute the tension rods for the transmission of motion between the driven shaft and the driving shaft, said tension rods during the operation being equal to half of the polygon sides, said strap comprising alternatively a pair of opposite sides under traction and a pair of opposite inactive sides and the traction condition exchanging with the inactivity condition on varying the sign of the transmitted torque, said strap, at each end of the arm to which it is connected, being folded upon itself with superimposition of two sides thereof to form a first edge directed transversely with respect to the width of the strap, said two sides rotating with respect to the superimposition on the arm around a second edge, so as to form a triangle, said second edge forming an angle α of inclination predetermined with respect to the first edge, said two sides projecting from the superimposition to the ends of the arms forming the tension rods lying on a single plane, said two sides superimposed on said arms and forming in the support said first and second edges surrounding a chamfer of corresponding shape and being provided with two rigid elements associated and fixed with blocking means for blocking with respect to said chamfer of the support, said blocking means extending beyond an extent of the annular strip around the chamfer.

4,634,397
TORSIONAL DAMPER DEVICE FOR A CLUTCH DISK
Carlo Beccaris, Santena, and Ernesto Lanzarini, Moncalieri-Torino, both of Italy, assignors to Valeo, Paris, France
Filed Dec. 19, 1984, Ser. No. 683,388
Claims priority, application France, Dec. 30, 1983, 83 21134
Int. Cl.⁴ F16D *3/12*
U.S. Cl. 464—68 **13 Claims**



1. Torsional damper device comprising at least two coaxial parts adapted to rotate relative to one another within predetermined limits of relative angular movement, meshing means being provided with clearance between said coaxial parts and defining said predetermined limits of relative angular movement, circumferentially acting elastic means disposed between said coaxial parts in the circumferential direction for resisting relative angular movement between said coaxial parts, and centering means cooperating with said meshing means for urging said coaxial parts in the circumferential direction towards a rest position intermediate said predetermined limits of relative angular movement, said coaxial parts having shoulders, said centering means comprising at least one elastic member having circumferential ends and constituting part of said circumferentially acting elastic means colocated with said meshing means, and a respective bearing member disposed between each end of said elastic member and an associated one of said shoulders on said coaxial parts, said elastic member being adapted to bear on said shoulders through the intermediary of said bearing members, and said bearing members being formed with a concave dihedron, said shoulders on the respective coaxial parts in said rest position forming a dihedron complementary to that of said bearing members, and at least one of said bearing members being in one piece with a corresponding circumferential end of said elastic member, said elastic member comprising corrugations between its circumferential ends and said corrugations having varied circumferential widths so as to vary the stiffness of said elastic member in the course of relative angular movement of said coaxial parts.

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4,634,398

TORSIONAL DAMPER DEVICE COMPRISING TWO COAXIAL PARTS DISPOSED TO ROTATE RELATIVE TO ONE ANOTHER

Jacques Alas, Eaubonne, France, assignor to Valeo, Paris, France

Filed Feb. 19, 1985, Ser. No. 702,580

Claims priority, application France, Feb. 23, 1984, 84 02762; Feb. 23, 1984, 84 02763

Int. Cl.⁴ F16D *3/14*

U.S. Cl. 464—68 **21 Claims**



1. Torsional damper device comprising two coaxial parts disposed to rotate relative to one another within defined limits of relative angular movement, wherein one of said coaxial parts comprises a hub flange and the other comprises first and second guide rings disposed one on each side of said hub flange, elastic means disposed circumferentially between said coaxial parts for resisting relative angular movement of said coaxial parts, said elastic means comprising at least one spring which extends substantially tangentially to a circumference of said coaxial parts, openings adapted to accommodate said elastic means in said hub flange and in each of said guide rings, friction means disposed axially between said coaxial parts frictionally engageable between said coaxial parts and including a pressure ring interposed between said hub flange and said first guide ring, said pressure ring having on both sides respective annular friction surfaces, and lugs elastically clamping said pressure ring against one of said parts and each lug having a root fastened to one of said parts and an end partially in radial alignment with said pressure ring and bearing against said pressure ring in a contact area radially outwardly of the external periphery of said friction surfaces of said pressure ring.

4,634,399

STRUCTURAL COMPONENT FOR TRANSMITTING TORQUE

Klaus Brunsch, Wolfratshausen/Weidach; Peter Sappl, Hausham, and Bernd Bongers, Heimstetten, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

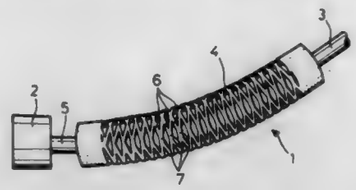
Filed May 23, 1985, Ser. No. 737,174

Claims priority, application Fed. Rep. of Germany, May 23, 1984, 3419176

Int. Cl.⁴ B62D *1/18*

U.S. Cl. 464—87 **6 Claims**

1. Structural component for interconnecting and transmitting torque, such as for use in a safety steering arrangement with a bent steering solumn, comprising an axially extending first member having a free end, an axially extending second member having a free end spaced from the free end of said first member, the axis of said first member disposed at an angle to the axis of said second member, an axially extending coil-shaped body formed of fiber-reinforced plastics material lattice rods wound around the axis of the body, said coil-shaped body having a first end and a second end spaced apart in the axial direction thereof with the first end connected to the free end of said first member and the second end connected to the free end of said second member with said coil-shaped body being arcuately shaped in the axial direction thereof between the first and second ends, said lattice rods formed of a plurality of layers of a plastics material impregnated fiber strand with the lattice



rods disposed in crossing relation, the dimension of said lattice rods in the radial direction being greater than the width thereof, the radial dimension of said lattice rods amounts to at least three times the width of said rods extending generally in the axial direction of said coil-shaped body, and the angle of said lattice rods relative to the axis of said body is in the range of 70° to 85°.

4,634,400

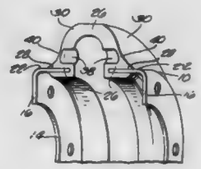
END STRESS RELIEF CONFIGURATION FOR FLEXIBLE ELEMENT OF ELASTOMERIC COUPLING

Neil W. Butzow, Greendale, and Gerald G. Lambert, Brookfield; Donald Tumidajewicz, Windlake, all of Wis, assignors to Rexnord Inc., Brookfield, Wis.

Continuation of Ser. No. 901,401, May 1, 1978, abandoned. This application May 13, 1980, Ser. No. 149,599

Int. Cl.⁴ F16D *3/52, 3/14*

U.S. Cl. 464—88 **16 Claims**



1. In a coupling, for joining adjacent ends of two shafts that are approximately aligned on a central axis, of the type having a plurality of annular, sectorial members, each member including a flexible center element that includes two radially extending side walls having radially inner and outer portions, and an axially extending outer wall connecting the outer portions of said side walls, said walls forming a hollow cross-sectional shape having circumferential ends; each member also including two axially spaced annulas, arcuate shoes having circumferential free terminal edges and providing surfaces onto which is bonded said inner portion of said side walls, wherein the improvement comprises: a portion of said side walls of each of said members circumferentially and radially adjacent the circumferential free terminal edges of said shoe having a cross-sectional area on a radial plane in which said axis lies that is substantially less than the cross-sectional area of said side walls at an angular position remote from and intermediate both of said circumferential ends, said wall cross-sectional area increasing gradually from said portion toward said intermediate position.

4,634,401

JOURNAL CROSS WITH HIGH FATIGUE STRENGTH

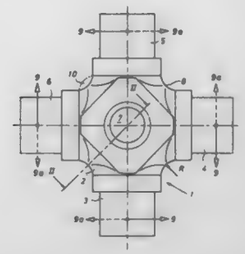
Helmut Mueller, Heidenheim, and Reinhard Bretzger, Gerstetten-Dettingen, both of Fed. Rep. of Germany, assignors to Voith Transmit GmbH, Fed. Rep. of Germany

Filed Apr. 3, 1981, Ser. No. 250,655

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1980, 3013443; Mar. 21, 1981, 3111145

Int. Cl.⁴ F16D *3/40*

U.S. Cl. 464—136 **3 Claims**



1. A spider for a Hooke's joint, comprising:

a center piece having a rotation axis; four pins radiating from the center piece; each pin having a respective axis, and the pin axes lying all essentially in a plane, and that plane intersecting the rotation axis;

the center piece having transition regions between adjacent pins, and at each of the transition regions, the center piece being thick enough along the rotation axis that each transition region has a concave, rounded fillet surface defined in it, the fillet surface is long enough to be generally cylindrically curved around and the fillet surface extends along a respective fillet surface axis, which fillet surface axis is generally parallel to the rotation axis of the center piece, the fillet surface being an arcuate portion of a cylinder, and the generally cylindrically curved fillet surface has a generally constant radius measured from the fillet surface axis along the axial length of the fillet surface.

4,634,402

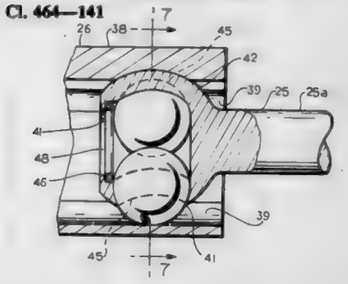
UNIVERSAL JOINT CAPABLE OF ACCOMMODATING THRUST LOADS

Daniel W. Hazebrook, Detroit, Mich., assignor to GKN Automotive Components Inc., Southfield, Mich.

Filed Feb. 22, 1985, Ser. No. 704,197

Int. Cl.⁴ F16D *3/16*

U.S. Cl. 464—141 **8 Claims**



1. A power transmitting mechanical joint comprising, in combination:

an inner joint member having a central axis and comprising recess means therein and an end which is generally spherical in configuration, said recess means being located in said generally spherical end;

an outer joint member comprising a plurality of generally spherical inner surface portions, said plurality of generally spherical inner surface portions of said outer joint member engaging said generally spherical end of said inner joint member to permit angular articulation between said inner joint member and said outer joint member and to prevent relative axial movement between said inner joint member and said outer joint member;

said outer joint member further comprising a plurality of rectilinear recesses extending thereinto; and

a plurality of spherical roller balls, each of said roller balls having a center and being rollingly engaged in said recess means in said inner joint member and in one of said rectilinear recesses in said outer joint member, the angular articulation between said inner joint member and said outer joint member causing each of said plurality of spherical roller balls to roll in said recess means in said inner joint member and in said one of said rectilinear recesses in said outer joint member, the centers of each of said spherical roller balls lying in a plane that extends generally transversely of said central axis of said inner joint member, said recess means in said inner joint member providing freedom for each of said plurality of spherical roller balls to contact another of said plurality of spherical roller balls, each of said plurality of spherical roller balls, upon the angular articulation between said inner joint member and said outer joint member, being free to rotate about any axis within said recess means.

4,634,403

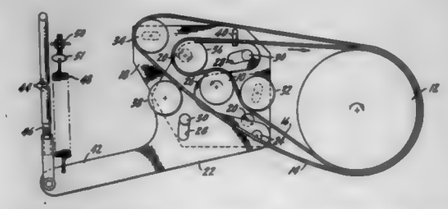
BELT DRIVE

Ralph C. Peabody, Brooklyn Center, and Charles E. Grimes, Bloomington, both of Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Nov. 18, 1985, Ser. No. 798,962

Int. Cl.⁴ F16H *9/00*

U.S. Cl. 474—1 **18 Claims**



1. In a belt drive, an input pulley, an output pulley spaced therefrom, a pair of belts one outside of the other, both belts operating within the width of one of the belts, the outer belt going around both pulleys with the input pulley being between the belts so that it is outside of the inner belt, and an idler pulley arrangement, including at least one movable idler pulley, constructed and arranged to tension either one belt or the other against the input pulley so that one belt drives the output pulley in one direction and the other belt drives it in the other direction.

4,634,404

METHOD OF CONTROLLING ROTATION OF A V-BELT DRIVE

Hiroshi Takano, Miki, Japan, assignor to Mitsuboshi Belting Ltd., Kobe, Japan

Filed May 6, 1985, Ser. No. 730,945

Int. Cl.⁴ F16H *11/06*

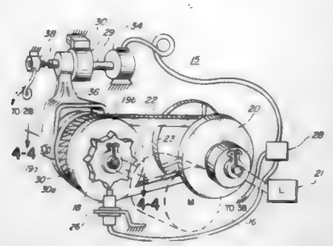
U.S. Cl. 474—11 **25 Claims**

1. The method of controlling the speed of the output of a V-Belt drive having an output driven pulley driven by a V-Belt from an input driver pulley, comprising the steps of:

determining the rotational speed of the driver pulley;

determining the instantaneous effective belt diameter of the driver pulley;

determining the ratio of the effective belt drive diameters of the driver and driven pulleys; and



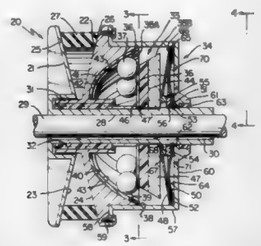
adjusting the effective belt drive diameter of at least one of the pulleys to provide a preselected speed of the drive output.

4,634,405

PULLEY CONSTRUCTION AND METHOD OF MAKING THE SAME

Terrence R. Quick, Springfield; Joseph P. Miranti, Jr., Porter Township, Christian County, and Randy C. Foster, Springfield, all of Mo., assignors to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 449,046, Dec. 13, 1982, Pat. No. 4,496,335. This application Oct. 1, 1984, Ser. No. 655,774
The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.
Int. Cl.[4] F16H *11/06*
U.S. Cl. 474—13 **11 Claims**



1. In a method of making a pulley construction comprising the steps of forming said pulley construction to have a pair of opposed flanges respectively provided with surface means for engagement with a V-belt construction when said V-belt construction is disposed therebetween, forming said pulley construction to have means for moving one of said flanges axially relative to the other of said flanges, and forming said pulley construction to have fluid dampening means operatively associated with said one flange to dampen said axial movement of said one flange relative to said other flange with a restrictive force, the improvement comprising the steps of forming said dampening means to comprise a flexible bladder, and operatively interconnecting a part of said bladder to said one flange.

4,634,406

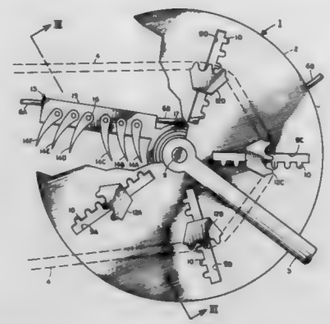
MULTIPLE SPEED TRANSMISSION FOR BICYCLES

Eric B. Hufschmid, 1268 Camino Rio Verde, Santa Barbara, Calif. 93111

Filed Aug. 7, 1985, Ser. No. 763,280
Int. Cl.[4] F16H *9/02*
U.S. Cl. 474—49 **5 Claims**

1. A variable speed transmission member for a bicycle comprising:

a. a variable radius sprocket, said sprocket having a plurality of moveable sprocket segments adapted for engagement with a positive drive belt, each of said segments being mounted in a different radial slot of a rotatable disc and held at one of a plurality of predetermined radial positions by a spring biased retaining means therein; and



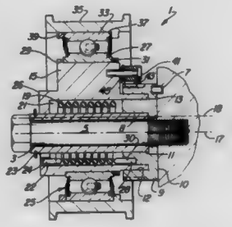
b. a speed control means, said control means having a plurality of prongs mounted on a supporting means so as to be pivotal under manual control, said supporting means being positioned so that said prongs can be pivoted into the path of said retaining means to push said segments to a different radial position.

4,634,407

SELF-TENSIONING BELT TIGHTENER

Glen D. Holtz, Redford, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Aug. 12, 1985, Ser. No. 765,011
Int. Cl.[4] F16H *7/10*
U.S. Cl. 474—112 **9 Claims**



1. A compact apparatus for tightening a belt or a chain comprising:

a stationary mandrel;

a cup member rigidly fixed to a portion of said mandrel;

an eccentric hub member rotatably associated with said cup member for eccentric rotation about said mandrel;

a torsion spring mounted over said mandrel and having one end portion fixed to said cup member and an opposite end portion fixed to said hub member for rotatably biasing said hub member about said mandrel;

a tensioning pulley rotatably connected to said hub member such that said torsion spring urges said pulley into engagement with said belt or said chain; and

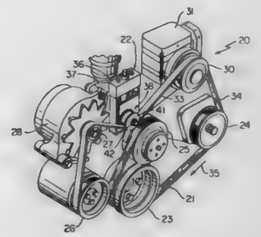
pawl means provided on said hub member and ratchet means provided on said cup member for selectively engaging said pawl means and for preventing rotation of said hub member in at least one direction around said mandrel.

4,634,408

BELT TENSIONER, PART THEREFOR AND METHODS OF MAKING THE SAME

Randy C. Foster, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 633,154, Jul. 20, 1984, which is a continuation of Ser. No. 391,643, Jun. 25, 1982, abandoned, which is a continuation-in-part of Ser. No. 301,351, Sep. 11, 1981, Pat. No. 4,413,982. This application Mar. 20, 1986, Ser. No. 842,099
Int. Cl.[4] F16H *7/12*
U.S. Cl. 474—135 **20 Claims**



1. In a tensioner for a power transmission belt that is adapted to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt, a belt engaging means carried by said support means and being movable relative thereto, mechanical spring means operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, and fluid dampening means operatively associated with said support means and said belt engaging means to dampen the movement of said belt engaging means relative to said support means in at least one direction of movement thereof, said fluid dampening means comprising a rotary dampening means having a rotatable means and a longitudinal axis about which said rotatable means rotates, said spring means having a longitudinal axis and being spiraled about said axis thereof, said support means comprising a shaft means having a longitudinal axis and being fixed from movement relative to said belt engaging means, the improvement wherein said shaft means carries said dampening means and said spring means in spaced apart side-by-side relation thereon with said axis of said shaft means being substantially coaxial with said axes of said dampening means and said spring means whereby said rotary dampening means and said spring means are coaxially spaced apart and are coaxially aligned by said shaft means, said belt engaging means having a portion thereof disposed between said rotary dampening means and said spring means and being rotatably carried by said shaft means so as to rotate relative to said shaft means whereby said rotary dampening means and said spring means are coaxially spaced apart from each other by said portion of said belt engaging means.

4,634,409

IDLER PULLEY

David W. Johnson, Bennet, Nebr., and Keith A. Tyler, Sun Prairie, Wis., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

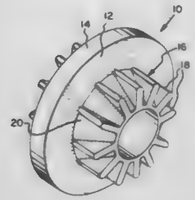
Filed Mar. 5, 1985, Ser. No. 708,314
Int. Cl.[4] F16H *55/30*
U.S. Cl. 474—152 **10 Claims**

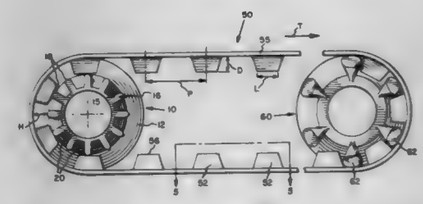
1. An idler pulley comprising:

an annular hub rotatable around a central axis;

a center flange extending radially outward from said hub;

a plurality of radial ribs circumferentially spaced around and axially extending away from said center flange on both sides of said hub said radial ribs extending generally perpendicularly outward from the intersection of said annular hub and said center flange, each of said plurality of radial ribs lying with an imaginary cylindrical surface extending axially outward from said intersection and extending radially inward toward said central axis, said ribs having a radial dimension substantially less than said center flange; and





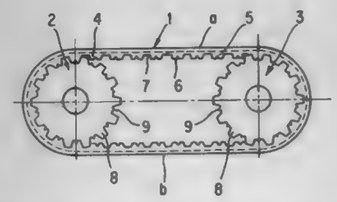
webs between said ribs extending radially inward toward the central axis and axially outward away from said center flange.

4,634,410

TOOTHED-PULLEY FOR TRANSMISSION WITH A TOOTHED-BELT

Giorgio Tangorra, Monza; Mario Cicognani, Milan, and Vincenzo Macchiarulo, Chieti, all of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Division of Ser. No. 467,793, Feb. 18, 1983, Pat. No. 4,553,952. This application Sep. 3, 1985, Ser. No. 771,663
Claims priority, application Italy, Feb. 26, 1982, 19873 A/82
Int. Cl.[4] F16G *1/28*; F16H *55/30*
U.S. Cl. 474—153 **6 Claims**



1. A toothed-pulley for transmission with an elastomeric belt, said belt comprising a plurality of belt teeth and a protuberance cantilevered from a top portion of each of said belt teeth, said toothed-pulley comprising:

a pulley toothing comprising a plurality of pulley teeth formed from a rigid material and a plurality of grooves which separate the individual teeth of said plurality of pulley teeth, said grooves having bottom and side portions; and

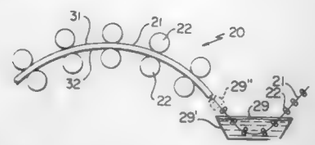
widening means for widening said teeth of said belt during engagement with said pulley toothing, said widening means comprising a housing-slot in each bottom portion of the respective grooves of said pulley toothing.

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4,634,411
ENDLESS POWER TRANSMISSION BELT CONSTRUCTION AND METHOD OF MAKING THE SAME

Larry R. Oliver, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 328,166, Dec. 7, 1981, abandoned. This application Aug. 2, 1984, Ser. No. 637,182
Int. Cl.⁴ F16G *1/08*
U.S. Cl. 474—244 **22 Claims**



1. In a method of making an endless power transmission belt construction having power transmitting contact faces and comprising the steps of forming an axial tensioning means, forming a plurality of lateral stiffening means that are carried by said tensioning means whereby said tensioning means and said stiffening means comprise a self-contained unit, forming friction material that is carried by said stiffening means and said tensioning means, forming said tensioning means and said stiffening means from material that provides an axial and lateral stiffness for said belt construction and thereby provides a backbone structure for said belt construction with said backbone structure comprising said self-contained unit, and forming said friction material to have a first portion thereof disposed on said backbone structure to define said contact faces and have a remaining portion thereof disposed on said backbone structure to at least assist in securing said first portion to said backbone structure, the improvement wherein said steps of forming said friction material comprise the step of dipping said backbone structure as said self-contained unit thereof in said friction material while said friction material is in a liquid condition so as to form the thickness of said first portion of said friction material to be relatively thin and the thickness of said remaining portion to be no thicker than the thickness of said first portion whereby a substantially large amount of said belt construction comprises said backbone structure and a substantially small amount of said belt construction comprises said friction material.

4,634,412
BELT CONNECTOR DEVICE

Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

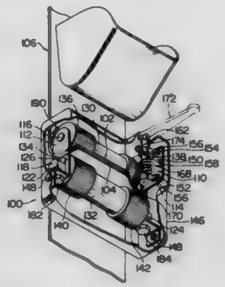
Filed Apr. 10, 1985, Ser. No. 721,592
Claims priority, application Japan, Apr. 20, 1984, 59-80757
Int. Cl.⁴ F16G *3/00*
U.S. Cl. 474—253 **10 Claims**

1. A belt connector device for connecting opposite end portions of a belt to each other to form an endless belt assembly for use in a belt type delivery apparatus, said belt connector device comprising:

mounting means including a pair of opposed, but spaced side wall members;

first and second rollers rotatably mounted on said side wall members so as to have respective rotary axes extending substantially in parallel to each other and laterally to said side wall members, said first and second rollers having their respective circumferential surfaces concentric with their respective axes, the respective circumferential surfaces of said first and second rollers cooperating with each other to define therebetween a gap;

drive means cooperating with said first roller for drivingly rotating said first roller to forcibly move, through said gap, the opposite end portions of the belt received in said gap with the opposite end portions of the belt being in direct contact with each other in face to face relation, while clamping the opposite end portions of the belt therebetween said first and second rollers, until a tension applied to the belt reaches a desired value when the opposite end portions of the belt are forcibly moved through said gap by said drive means, said gap being set to have its size slightly less than the sum of the respective thicknesses of the opposite end portions of the belt; and

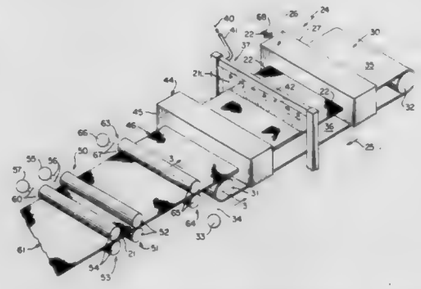


locking means cooperating with at least one of said first and second rollers for locking said at least one of said first and second rollers against rotation thereof to maintain the opposite end portions of the belt frictionally retained in said gap between said first and second rollers so as to be prevented from coming out of said gap, to thereby connect the opposite end portions of the belt to each other to form the belt into an endless loop.

4,634,413
METHOD OF MAKING A FIBER-LOADED POLYMERIC SHEET

Gerald C. Holloway, Jr., Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 281,153, Jul. 7, 1981, Pat. No. 4,445,949. This application Jan. 27, 1984, Ser. No. 574,439
Int. Cl.⁴ F16G *1/00*
U.S. Cl. 474—263 **20 Claims**

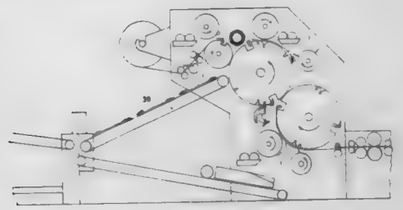


1. In an endless power transmission belt having at least one part thereof comprised of polymeric material which has a plurality of elongate reinforcing fibers embedded therein with said polymeric material serving as a matrix for said fibers, the improvement in which said fibers comprise between 40% and 70% by weight of said one part and at least 70% of said fibers are disposed in parallel relation.

4,634,414
METHOD AND APPARATUS FOR MANUFACTURING FOLDING PAPER SACKS

Bernd Hollmann, Bielefeld, Fed. Rep. of Germany, assignor to Kochsiek Maschinenbau GmbH Soltau, Soltau, Fed. Rep. of Germany

Filed Jul. 6, 1984, Ser. No. 628,184
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1983, 3324719
Int. Cl.⁴ B31B *23/26, 23/84, 1/90*
U.S. Cl. 493—213 **17 Claims**



1. A method of manufacturing folded paper sacks in an uninterrupted and continuous flow comprising the steps of

(a) uninterruptedly conveying a web of paper in a longitudinal direction, applying and positioning a valve onto the web such that the valve extends traversely to the direction of travel of the web,

(b) shaping the web, with the valve applied thereto, into a tubular web and closing the longitudinal edges of the tubular web by applying adhesive thereto,

(c) separating individual tube blanks from the tubular web,

(d) for each tubular blank, forming a sack closure at the longitudinal ends of the tubular blank, said forming step comprising in sequence initially longitudinally feeding a first side of the blank onto and facing the periphery of a first rotating gripper cylinder and transversely folding and glueing a first longitudinal end, then longitudinally feeding a second side of the blank onto and facing a second rotating gripper cylinder and transversely folding and gluing a second longitudinal end.

9. An apparatus for manufacturing folded paper sacks comprising:

(a) a means to move a web of paper along a longitudinal path,

(b) a valve-insertion station disposed along said path downstream of said means to move a web of paper, said valve-insertion station defined by means for forming individual folded valves from valve material stock and for applying and positioning the valves on the web,

(c) a tube-shaping station disposed along said path downstream of said valve-insertion station, said tube-shaping station defined by means for shaping the web into a tubular web and for sealing the longitudinal web thereof with adhesive,

(d) a separating station disposed along said path downstream of said tube shaping station, said separating station defined by means for separating individual tubular blanks from the tubular web,

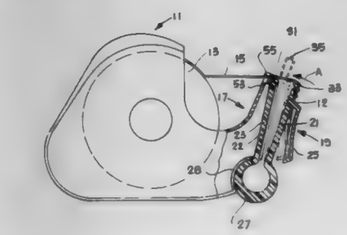
(e) an initial folder and sealer assembly disposed downstream of said separating station, said initial folder defined by means for forming a longitudinally trailing sack closure by transversely folding and sealing a longitudinally trailing tubular blank end, comprising a gripper cylinder having gripper fingers and slotted strips on its surface and which rotates about a transverse axis and a rotating knife, an adhesive applicator and an overlayer associated with the gripper cylinder and

(f) a second folder and sealer assembly disposed downstream of said initial folder and sealer assembly, said second folder and sealer assembly defined by means for forming a longitudinally leading sack closure by transversely folding and sealing a longitudinally leading tubular blank end, comprising a gripper cylinder having gripper fingers and slotted strips on its surface and which rotates about a transverse axis and a rotating knife, an adhesive applicator and a roller brush associated with the gripper cylinder.

4,634,415
TAB FORMING DEVICE IN PLASTIC TAPE ROLL HOLDER

Jack P. Knoop, 326 Avenida Arboles, San Jose, Calif. 95123

Continuation-in-part of Ser. No. 538,230, Oct. 3, 1983, Pat. No. 4,540,393, which is a continuation-in-part of Ser. No. 294,533, Aug. 20, 1981, Pat. No. 4,437,854. This application Aug. 19, 1985, Ser. No. 767,230
The portion of the term of this patent subsequent to May 20, 2001, has been disclaimed.
Int. Cl.⁴ B26F *3/02*
U.S. Cl. 493—353 **19 Claims**



1. A tape tab device in a tape dispenser comprising,

at least one upright flexible strut with upper and lower extremities, the upper extremity terminating in a wing having a forward tape tear-off section, and

a flexible, cylindrical spring having a lateral slot with front and back edges, the front edge supporting said upright flexible strut, said cylindrical spring increasing in thickness from said front and back edges to a thickest center section,

said cylindrical spring supported at said back edge by a tape roll holder, said tape roll holder having a tape support region at approximately the same elevation as said wing of the upright strut, said spring having a relaxed position biasing said wing in a spaced apart relation relative to said tape support region, said spring having a tensed position with combined rearward flexing of the strut and compression of said spring said wing being near said tape support region in said tensed position, said spring being movable between said relaxed position and said tensed position thereby defining means for forming a tape tab from tape suppliable by said tape roll holder.

10. A molded polymer tab-forming device for attachment to a tape dispenser comprising,

a pair of upwardly extending forward and rearward struts, having lower and upper extremities, the upper extremities of the struts each terminating in a wing, the wing of the forward strut having a forward extending tear-off section, anchor means being disposed on said rearward strut for rapid coupling to a tape dispenser, and

a flexible spring comprising a cylinder having a lateral slot with front and back edges, said lower extremities of the forward and rearward struts joined respectively to said front and back edges of said slot, said struts being biased by said spring to diverge upwardly at the upper extremities thereby defining a spaced open position, said strut and said spring being relaxed in said open position, the two wings of said struts abutting when said forward strut is pushed against rearward strut, thereby defining a closed position, said wing defining means for forming tape tabs by movement of the struts between said open and closed positions, said forward strut being flexible, said front and

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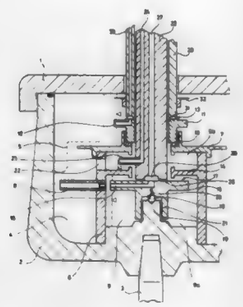
back edges of said slot being pushed into contact with each other by said movement of the struts between said open and closed positions, said front edge contacting said back edge when said forward and rearward struts are in a spaced partially open position, said forward strut being in a flexed condition between said partially open and closed positions.

4,634,416

OUTLET ARRANGEMENT FOR A CENTRIFUGAL SEPARATOR

Lars Elmström, Tullinge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

PCT No. PCT/SE84/00207, § 371 Date Dec. 12, 1984, § 102(e) Date Dec. 12, 1984, PCT Pub. No. WO85/00022, PCT Pub. Date Jan. 3, 1985
PCT Filed May 30, 1984, Ser. No. 695,452
Claims priority, application Sweden, Jun. 14, 1983, 8303379
Int. Cl.⁴ B04B *11/00*
U.S. Cl. 494—27 **17 Claims**



1. A centrifugal separator comprising a rotor forming a separating chamber and having an inlet for supplying a mixture of fluid components to said chamber, the rotor being rotatable about an axis to rotate said mixture and thereby divide the same into separated fluid components located at different respective regions in the rotor, an outlet member mounted for rotation relative to the rotor and positioned for entrainment in rotation about said axis by fluid supplied to the rotor, said outlet member having an outlet channel extending radially inward from a said region of one of said components and terminating at its inner end within the rotor, and means for counteracting said entrainment to cause the outlet member to rotate at a lower speed than said fluid in the rotor, thereby inducing a flow of said one component through said outlet channel, the rotor at least partly containing a member separate from said outlet member and located adjacent said inner end of the outlet channel, said separate member having a cavity for receiving said one component from the outlet channel.

4,634,417

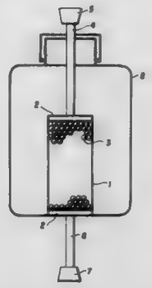
PROCESS FOR TREATMENT OF TUMORS AND APPARATUS THEREFOR

Stefan Korec, McLean, Va., assignor to Georgetown University, Washington, D.C.

Continuation of Ser. No. 447,222, Dec. 6, 1982, abandoned. This application Jun. 24, 1985, Ser. No. 748,034
Int. Cl.⁴ A61M *37/00*
U.S. Cl. 604—4 **23 Claims**

1. A process for removing cell mediated cytotoxicity-inhibiting substances from the blood of patients having cancer comprising:
(1) removing the blood from the patient;
(2) separating plasma and red blood cells from said blood;
(3) cooling said plasma to between 0° and 5° C. to prevent undesired side effects;
(4) contacting said plasma with Protein A immobilized on a solid support formed of polyacrylamide to remove said substances;
(5) recombining said plasma with said red blood cells; and
(6) returning the plasma to said patient.

5. A perfusion apparatus for removing cell-mediated cytotoxicity-inhibiting substances from the blood plasma of cancer patients comprising:



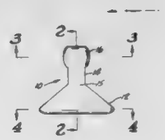
a chamber substantially filled with solid support particles formed of polyacrylamide, the surface of said particles having Protein A immobilized thereon;
means for introducing plasma into said chamber;
means for withdrawing plasma from said chamber; and
a cooling jacket means surrounding said chamber;
said cooling jacket means maintaining the temperature of the chamber at between about 0° to 5° C.

4,634,418

HYDROGEL SETON

Perry S. Binder, P.O. Box 1097, Rancho Santa Fe, Calif. 92067

Filed Apr. 6, 1984, Ser. No. 597,530
Int. Cl.⁴ A61M *27/00*
U.S. Cl. 604—8 **15 Claims**





1. A seton for reducing intraocular pressure comprising a body portion, said body portion being substantially triangular in shape and having a cross-section which varies from substantially elliptical to substantially oval, a neck portion extending from said body portion, a lip portion formed about said neck portion, said seton being constructed from a biocompatible porous hydrogel material and said seton further including a peripheral edge.

11. A seton for reducing excessive intraocular pressure caused by glaucoma, comprising, a body portion, said body portion being substantially triangular in shape and having a cross section which varies from substantially elliptical to substantially oval, a neck portion extending from said body portion and a lip portion formed about said neck portion at the end of said neck portion farthest from said body portion, said seton being constructed from a biocompatible porous hydrogel material having a water content ranging from 30% to 79%.

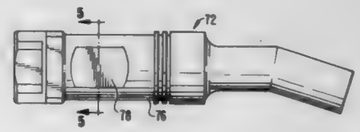
12. A method for reducing intraocular pressure, the steps comprising,
creating a limbus-based conjunctiva and scleral flap by making an incision near the junction of the cornea and the sclera,
excising a portion of the cornea, Schalbe's line and the trabecular meshwork by making incisions into the anterior chamber beneath said flap,
inserting a first end of a seton beneath said flap, said seton being constructed from a biocompatible porous hydrogel material and including a body portion and a lip portion, said lip portion being formed on said first end of said seton, said body portion having a peripheral edge,
suturing said flap about said seton such that said seton extends radially from the anterior chamber to the space beneath said flap and such that at least a portion of said seton extends from beneath said sutured flap, and
closing the conjunctiva about said flap and said seton.

4,634,419

ANGULATED ULTRASONIC SURGICAL HANDPIECES AND METHOD FOR THEIR PRODUCTION

Alexander Kreizman, Stamford, Conn., and Alan Broadwin, Brooklyn, N.Y., assignors to Cooper LaserSonics, Inc., Santa Clara, Calif.

Filed Dec. 13, 1985, Ser. No. 808,573
Int. Cl.⁴ A61B *17/20*
U.S. Cl. 604—22 **7 Claims**



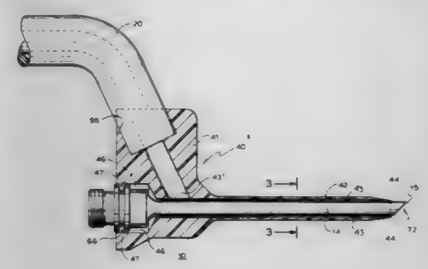
1. In an ultrasonic surgical handpiece for breaking apart and removing tissue from a recessed operative site, the handpiece including a vibration assembly having an elongated straight transducer operable to convert high frequency electrical energy to high frequency mechanical vibrations, an elongated connecting body having one end rigidly joined to one end of the elongated transducer, and an elongated straight operative tip removably mounted on the other end of the connecting body, the vibrating assembly having an overall length substantially equal to the length of the longitudinal vibration wave λ when vibrated at the resonant frequency F of the assembly, the vibration wave λ having an antinodal plane adjacent to the joined ends of the transducer and connecting body, and a nodal plane adjacent to the other end of the connecting body, the improvement wherein said connecting body comprises,
a first substantially straight portion having a longitudinal axis coincident with the longitudinal axis X of said transducer and a second substantially straight portion having a longitudinal axis X' extending at an angle α with respect to the axis X, said connecting body having a circular cross section throughout at least a major portion of its length and having a portion of its mass removed from its outer surface at a location adjacent to said nodal plane relative to the mass of a straight connecting body of the same cross-section whereby the resonant frequency of the angled vibrating assembly is substantially identical to the resonant frequency of said vibration assembly of equal length and dimension and having said straight connecting body but without the mass removed from the connecting body.

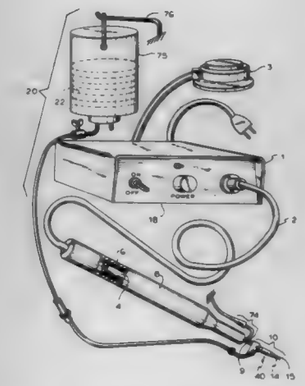
4,634,420

APPARATUS AND METHOD FOR REMOVING TISSUE MASS FROM AN ORGANISM

Joseph D. Spinosa, Woodbury, and Dominic J. Spinosa, Wantagh, both of N.Y., assignors to United Sonics Incorporated, Hauppauge, N.Y.

Filed Oct. 31, 1984, Ser. No. 662,843
Int. Cl.⁴ A61B *17/20*
U.S. Cl. 604—22 **53 Claims**





1. In an apparatus for breaking apart and removing tissue from an enclosed area which includes an elongated instrument capable of being ultrasonically vibrated and having an operative end for placement directly against said tissue, means for applying ultrasonic vibrations, means for supplying treatment fluid in the region adjacent said working tip, and fluid withdrawal means for removing fluid and particles from said enclosed area, said withdrawal means including a conduit extending through said elongated instrument, an improved removable sheath device for delivery of treatment fluid comprising:
sleeve means having a length sufficient to extend substantially the length of said elongated instrument and a transverse cross-section with an inside perimeter greater than the outside perimeter of the transverse cross-section of said instrument whereby fluid introduced to said sleeve means passes between said instrument and said sleeve means;
fluid reservoir means in fluid communication with said sleeve means, said reservoir means having a volume for providing a supply of fluid by gravity continuously through said sleeve means,

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fluid delivery means connected for fluid communication with one of said sleeve means and said fluid reservoir, said delivery means having an external port for connection with said means for supplying treatment fluid, and

sealing means which fits cooperatively with said elongated instrument to prevent passage of fluid from the non-operative end of said instrument,

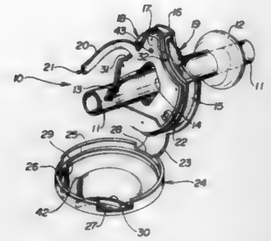
whereby said sheath means is sealingly fitted to said instrument so that treatment fluid continuously supplied to said sheath device by gravity is maintained at said operative end substantially in the absence of interruption in flow.

4,634,421

VALVE FOR INCONTINENT PATIENTS

Manfred Hegemann, Nyack, N.Y., assignor to Johnson & Johnson Products Inc., New Brunswick, N.J.

Filed Jul. 26, 1985, Ser. No. 759,545
Int. Cl.⁴ A61M *1/00*
U.S. Cl. 604—34 **24 Claims**



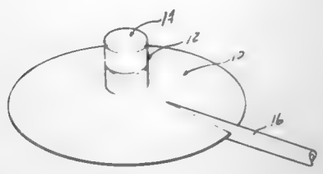
1. A ostomy valve for incontinent patients comprising a valve body and a drainage tube, said drainage tube having an inner end portion for insertion within the stoma of a patient and a collapsible outer end portion, said valve body associated with said collapsible outer end portion of said tube comprising plate means having an orifice through which said outer end portion of said draining tube passes, releasable clamping means comprising a pair of pivotable clamping arms mounted on said plate means and extending on opposing sides of said orifice for collapsing the lumen of said tube, and removable cover means cooperating with said plate means to define a space enclosing said clamping means and that portion of the outer end of said tube which extends from said clamping means.

4,634,422

PERCUTANEOUS ACCESS DEVICE AND METHOD FOR IMPLANTING SAME

Adrian Kantrowitz, 70 Gallogly Rd., Pontiac, Mich. 48055; Paul S. Freed, 1486 Sodon Ct., Bloomfield Hills, Mich. 48013; Frizell L. Vaughan, 1336 Culver Rd., Ann Arbor, Mich. 48103; Isadore A. Bernstein, 1200 Arlington, and Robert H. Gray, 2780 Carmel St., both of Ann Arbor, Mich. 48104

Filed May 31, 1984, Ser. No. 615,883
Int. Cl.⁴ A61M *31/00, 5/32*; C12N *5/02*
U.S. Cl. 604—49 **5 Claims**



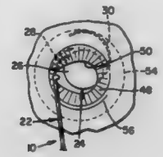
1. In a percutaneous device adapted to be implanted beneath the skin of a patient and to project outwardly through the skin; the improvement comprising a detachable member adapted to be assembled to said device at a location such that the external surface of said member constitutes the surface of said device which passes through and is exposed to the dermis of the patient when the device is implanted, means defining a multiplicity of pores or cavities in said external surface of diameters and distribution such that a dermal cell placed at random on said external surface will overlie at least two of said pores or cavities, said pores or cavities having diameters between about 0.5 and about 1.0 microns and depths of at least three times their respective diameters.

4,634,423

OPHTHALMOLOGICAL METHOD AND INSTRUMENT FOR IMPLANTATION OF POSTERIOR CHAMBER INTRAOCULAR LENS

Paul F. Bailey, Jr., 1955 NW. Northrup St., Portland, Oreg. 97209

Filed Apr. 30, 1984, Ser. No. 605,430
Int. Cl.⁴ A61M *31/00*
U.S. Cl. 604—51 **5 Claims**



1. An ophthalmological method for facilitating controlled insertion of an intraocular lens having resilient, openloops into the posterior chamber of an eye comprising:

elastically deforming a first one of the loops from its normally nonstressed arcuate shape until it is substantially straight and biased thereby into a stressed condition;

orienting the lens into a position whereby the other loop is at least partially inserted into the posterior chamber; and

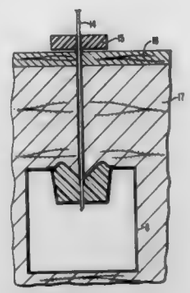
rotatably displacing the lens into the posterior chamber by releasing the first loop from its stressed condition.

4,634,424

MULTIPLE RE-ENTRY IMPLANTABLE SEPTUM AND METHOD OF USING SAME

Matthew O'Boyle, Somers, Conn., assignor to Windsor Medical, Inc., Enfield, Conn.

Filed Apr. 23, 1984, Ser. No. 603,149
Int. Cl.⁴ A61M *31/00*
U.S. Cl. 604—51 **4 Claims**



1. A method of making multiple re-entries in a septum implanted under the skin, the septum having a resilient member,

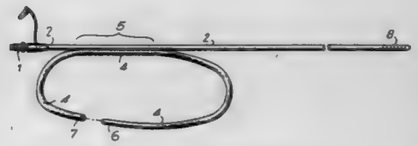
support means for supporting the resilient member, the resilient member having a perforation therein which is compressed closed, and a protective shroud over a side of the resilient member, the protective shroud having a relatively large surface configured to channel the end of a slender, elongate component such as a needle to a predetermined location at a relatively small bore in the protective shroud which is located adjacent the perforation in the resilient member, comprising the steps of providing an assembly of a first needle and a cannula positioned over the first needle, penetrating the skin with said first needle and cannula thereon and contacting the the protective shroud with the end of said needle so as to channel the same to the small bore in the protective shroud, the small bore being dimensioned to prevent passage of the first needle through said shroud, withdrawing said first needle from the protective shroud and skin while leaving said cannula in place adjacent the small bore in said protective shroud, and inserting a second, relatively smaller needle into said cannula and through said small bore and the perforation in said resilient member.

4,634,425

NASO-ENTERAL TUBE HARNESS APPARATUS AND METHOD

Jeffrey A. Meer, 7380 St. Auburn, Birmingham, Mich. 48010

Filed Sep. 10, 1985, Ser. No. 774,485
Int. Cl.⁴ A61M *25/00*
U.S. Cl. 604—54 **14 Claims**



1. Apparatus for use in a patient comprising:

a naso-enteral tube;

a harness having a first end and a second end, the first end for passing through the same nostril as the naso-enteral tube, the second end for passing through the other nostril, the first and second ends being adapted for fastening to each other about the nasal septum; and

means for attaching the harness to the naso-enteral tube for a distance along the length of the tube before the tube is inserted into the nostril so that there is substantially no relative movement between the harness and the naso-enteral tube along said distance.

4,634,426

MEDICAL INFUSION CONTROLLER AND USER INTERFACE

Dean L. Kamen, Bedford, N.H., assignor to Baxter Travenol Laboratories, Deerfield, Ill.

Filed Dec. 11, 1984, Ser. No. 680,500
Int. Cl.⁴ A61M *5/00*
U.S. Cl. 604—65 **14 Claims**

1. A medical infusion system for conrolling the flow of fluid from a reservoir through a drip chamber via a flow tube and valve arrangement to a patient, such system comprising:

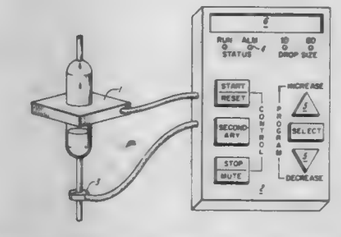
data entry means for permitting a user to enter desired dose data;

data cumulation means, for storing data entered by the user, for receiving drip detection signals derived from a drip detector, and for cumulating such signals to provide a measure of total delivered volume;

timing means for providing clock signal pulses;

drip rate analysis means, in communication with the timing means, for receiving drip detection signals derived from a drip detector and determinging the current drip rate therefrom;

target rate means, in communication with the timing means and the data cumulation means for repeatedly deriving a target rate to correct the delivered volume at a given time to a volume corresponding to the user-entered data, the target rate means further including means for determining a plurality of volume tolerance bands corresponding to successive ranges of the relative difference between the



total delivered volume and the desired volume at a given time, and also includes means for determining the target rate as a function of a program rate determined from the user-entered data, such function being distinct for each tolerance band; and

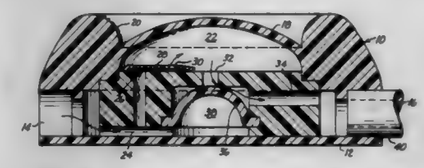
valve control means, in communication with the the drip rate analysis means and the target rate means, for adjusting the valve so that the current drip rate approaches the target rate.

4,634,427

IMPLANTABLE DEMAND MEDICATION DELIVERY ASSEMBLY

Donald L. Hannula, San Luis Obispo, and Frederick L. Coe, Santa Barbara, both of Calif., assignors to American Hospital Supply Company, Deerfield, Ill.

Filed Sep. 4, 1984, Ser. No. 646,998
Int. Cl.⁴ A61M *5/00*
U.S. Cl. 604—93 **21 Claims**



1. An implantable demand medication delivery assemably comprising:

a reservoir means for storing a liquid medication to be delivered;

a pump means in fluid communication with the reservoir means for pumping a selected volume of the liquid medication, the pump means comprising:

a base member having an inlet port in fluid communication with the reservoir means and an outlet port;

a resilient deformable wall extending over the base member and defining a chamber between the resilient deformable wall and base member;

a fluid passage having a first portion extending through the base member between the inlet port and the chamber and a second portion extending between the chamber and the outlet port;

a one-way valve means in the first portion of the fluid passage between the inlet port and chamber for permitting fluid flow toward the chamber; and

a pressure regulated valve means in the second portion of

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the fluid passage between the chamber and outlet port for selectively permitting fluid flow through such fluid passage at preselected fluid pressures; and

a delivery catheter means connected to the outlet port of the pump means for delivering the liquid medication to a location spaced from the pump means.

4,634,428

COVER FOR A DISPOSABLE SYRINGE

Cwo-Liang Cau, Fl. 6-1, No. 149-15, Ho Ping 1st Rd., Kao Hsiung, Taiwan

Filed Aug. 15, 1985, Ser. No. 765,841
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—110 **7 Claims**



1. A cover for destroying a needle on a disposable syringe after use, comprising:

(a) a pair of tubular cover members, each being elongated in an axial direction lengthwise of the needle and bounding interiors in which the needle is enclosed;

(b) one of the cover members being stationarily mounted on the syringe;

(c) the other of the cover members being movably mounted on the one cover member for telescoping movement along the axial direction between extended and retracted positions in which the cover members axially overlap each other over a lesser and a greater distance respectively;

(d) means for releasably holding the cover members in the extended position prior to use of the syringe to protect the needle; and

(e) destroying means on the other cover member for bending the needle during said telescoping movement, and for retaining the needle within the other cover member even after said telescoping movement.

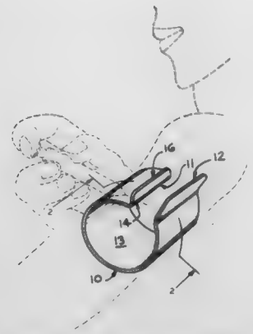
4,634,429

SELF INJECTION APPLIANCE

Gerald L. Schoettley, 2640 McCord Rd., Toledo, Ohio 43615

Continuation of Ser. No. 513,748, Jul. 15, 1983, abandoned. This application Sep. 24, 1985, Ser. No. 779,505
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—115 **5 Claims**

1. A self-injection appliance made of spring steel comprising, in combination, a guide portion, a platform portion and a bight portion integrally connected between said guide portion and said platform portion, said guide portion and said platform portion being spaced from one another and defining an opening for receiving an arm, said arm being received through the opening defined by and against the guide and platform portions until the arm is fully through the opening, said bight portion being non-circular and non-symmetrical and said platform portion extending outwardly from said bight portion, said guide portion being lower than the intersection of the bight portion and the platform portion, said bight portion receiving said arm with the non-symmetrical contour of the bight portion engaging and moving the flesh of the arm upward against the platform portion whereby self-injection is facilitated and



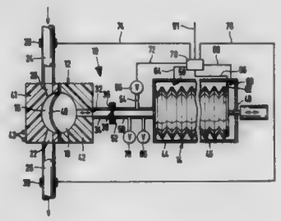
the fleshy portion of the arm is positioned on said platform portion to facilitate self-injection.

4,634,430

PUMP ARRANGEMENT FOR MEDICAL PURPOSES

Hans-Dietrich Polaschegg, Oberursel, Fed. Rep. of Germany, assignor to Fresenius Ag, Bad Homburg, Fed. Rep. of Germany

Filed Mar. 7, 1985, Ser. No. 709,167
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1985, 3408331
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—141 **19 Claims**



1. In an apparatus for pumping liquids for medical purposes, in particular blood fluid or infusion fluid, including at least one pump housing **12** having a cavity which is divided by an impermeable diaphragm into a working chamber **(16)** and a drive chamber **(18)**, said working chamber being provided with at least one opening **(2)** for the supply and discharge of the fluid to be conveyed, and said drive chamber being adapted to be subjected to a gas as a pumping fluid and coupled via a conduit **(50)** of a limited pumping volume, the improvement comprising:

a valve means **(56)** connected to said drive chamber **(18)** for pressure compensation upon stroke change of the pumping means **(46)**; and

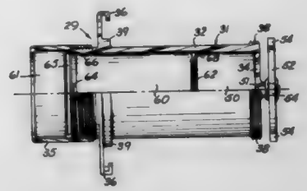
a control means **(70)** connected to said valve means **(56)** and means responsive to the pumping means for controlling opening said valve means before each said stroke change and closing said valve means **(56)** after pressure equalization with ambient pressure.

4,634,431

SYRINGE INJECTOR

Douglass G. Whitney, 3800 State Bridge Rd., Alpharetta, Ga. 30201, and J. Kell Martin, III, 2837 Ridge Wood Circle, Atlanta, Ga. 30327

Continuation-in-part of Ser. No. 248,512, Mar. 27, 1981, Pat. No. 4,405,318, which is a division of Ser. No. 1,091, Jan. 8, 1979, Pat. No. 4,273,122, which is a continuation-in-part of Ser. No. 741,528, Nov. 12, 1976, Pat. No. 4,150,762. This application May 16, 1983, Ser. No. 494,662
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—155 **2 Claims**



1. A syringe injector for injecting liquids into patients comprising:

a syringe barrel defining a cylindrical bore therein opening onto one end thereof and a discharge opening in the other end thereof communicating with said bore;

a piston slidably mounted in said bore and in sealing engagement with said barrel for movement toward said discharge opening to force liquid in said bore between said piston and said discharge opening out through said discharge opening; and

a driver slidably extending into said barrel bore from the open end thereof behind said piston, said driver including:

a housing having a projecting end and a trailing end, said housing defining external threads therearound at the projecting end thereof;

an internally threaded tubular plunger screwed onto the external threads on said housing and extending over said housing so that, when said driver extends into said barrel bore with the projecting end of said housing facing said piston, said plunger engages said piston and moves said piston toward said discharge opening as said plunger is unscrewed from over said housing;

locking means adjacent the trailing end of said housing to selectively engage said barrel and fix said housing axially of said barrel bore;

a power supply; and

drive means operated by said power supply, said drive means including a drive shaft projecting from the projecting end of said housing and oriented coaxially of said plunger and a drive wheel mounted on said drive shaft adjacent the projecting end of said housing for rotation with said drive shaft, said drive wheel including at least one drive lug thereon and said plunger defining at least one longitudinally extending slot therein into which said drive lug projects so that, when said drive means rotates said drive shaft and said drive wheel, said drive lug rotates said plunger to unscrew said plunger from over said housing to cause said plunger to move relative to said barrel to engage and propel said piston toward said discharge opening.

4,634,432

INTRODUCER SHEATH ASSEMBLY

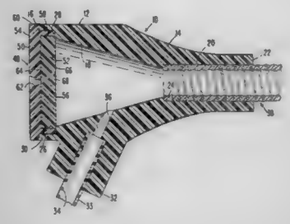
Nuri Kocak, 296 Lafayette Ave., Cliffside Park, N.J. 07010

Filed May 13, 1985, Ser. No. 733,556
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—167 **21 Claims**

1. A flexible tube for the introduction of catheters and like devices into a vascular system, comprising:

a helical coiled spring having a plurality of coils, each of a plurality of said coils being spaced from at least one adjacent coil; and

a thin cylindrical wall prepared from a protective coating composition completely surrounding said spring to define an inner wall surface and an outer wall surface, the portion of said cylindrical wall surrounding each of said coils having a first thickness and the portion of said cylindrical wall between said spaced coils having a second, smaller



thickness, with said inner and outer wall surfaces being indented thereat;

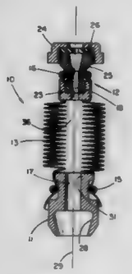
said coating composition comprising a thermoplastic polymeric material dissolved in a solvent solution, said composition having a solids content ranging from about 4% to about 18%, and said solution comprising a solvent selected from the group consisting of tetrahydrofuran, dioxane, methyl ethyl ketone, dimethylformamide, cyclohexane, and mixtures thereof.

4,634,433

FLEXIBLE SHEATH ASSEMBLY FOR AN INDWELLING CATHETER

Thomas A. Osborne, Bloomington, Ind., assignor to Cook, Incorporated, Bloomington, Ind.

Continuation of Ser. No. 433,256, Oct. 7, 1982, Pat. No. 4,551,137. This application May 6, 1985, Ser. No. 731,138
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—171 **2 Claims**



1. A flexible sheath for shielding a catheter disposed therethrough, comprising:

front and rear hubs each having a passageway therethrough sized to permit movement therethrough of said catheter;

tubular flexible sheathing having two ends with one end sealingly connected to said front hub and the other end sealingly connected to said rear hub;

said flexible sheathing including means for maintaining said flexible sheathing in an initial contracted orientation wherein said hubs are relatively close together and said sheathing defines a central passageway aligned with said hub passageways, said central passageway being sized to permit movement therethrough of said catheter;

said flexible sheathing being capable of being expanded from said contracted orientation to an expanded orientation

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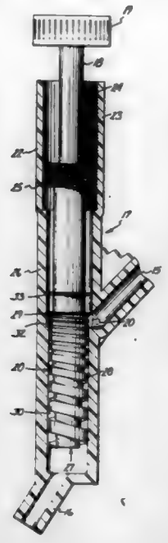
wherein said flexible sheathing shields a greater length of said catheter than is shielded when said flexible sheathing is in said contracted orientation.

4,634,434

APPARATUS FOR REGULATING THE FLOW OF FLUID IN MEDICAL APPARATUS

Joseph A. Marino, Jr., Apple Valley, and Matthew E. Bellin, Burnsville, both of Minn., assignors to Biomedical Dynamics Corporation, Burnsville, Minn.

Filed Feb. 19, 1985, Ser. No. 702,991
Int. Cl.⁴ A61M *5/005*
U.S. Cl. 604—246 **10 Claims**



8. In combination with a container for intravenous fluid for delivering the fluid at a controlled rate to a patient, a flexible conduit extending from said container for delivery of said fluid, a valve in said conduit for adjusting the rate at which fluid is delivered, said valve comprising:

a valve body having inlet and outlet openings and having a cylindrical passage therebetween defined by a cylindrical wall;

a flow regulating member extending into the cylindrical passage and having an outer cylindrical surface closely engaging the wall of the cylindrical passage, the flow regulating member having a helical grooved portion on the outer cylindrical surface thereof to form a helical fluid passage through the valve body between said inlet and outlet openings, the pitch of the helical groove progressively varying from one end of the helical groove to the other; and

actuating means for shifting the flow regulating member axially to vary the amount of the helically grooved portion that is disposed between the inlet and outlet openings to vary the length of the helical passage through which fluid must flow to adjust the flow of fluid from said container.

4,634,435

NASO-GASTRIC TUBE

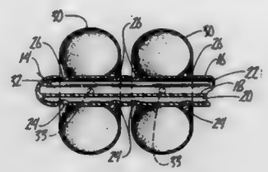
Steven A. Ingraham, 5208 Territorial N.W., Albuquerque, N. Mex. 87120

Filed Aug. 23, 1985, Ser. No. 768,637
Int. Cl.⁴ A61M *27/00*
U.S. Cl. 604—268 **9 Claims**

1. A naso-gastric tube for continuously suctioning fluids from a patient's stomach, comprising:

an elongated tube member having a first end and a second end, said second end being adapted for insertion into the patient's stomach;

said tube member including a vent passage for venting the stomach and a suction passage through which fluid can be removed from the stomach, said vent passage and said suction passage being distinct from one another with no direct communication therebetween, said vent passage being in communication with the atmosphere and said suction passage being in communication with a vacuum source;



said tube member having at least one vent opening adjacent said second end defining an outlet from said vent passage to the stomach and at least one suction opening adjacent said second end defining an inlet from said stomach to said suction passage;

cushion means on said tube member adjacent said second end of said tube member and adjacent said vent and suction openings and being adapted for inflation so as to protect said openings from occlusion by the lining of the stomach; and

means for inflating and deflating said cushion means.

4,634,436

METHOD FOR MAKING A BODY WRAP COMPOSITION

June T. La Tour, 2619 Palms Rd., Richmond, Mich. 48062

Filed Jul. 5, 1983, Ser. No. 510,658
Int. Cl.⁴ A61M *35/00*; A61F *13/00*
U.S. Cl. 604—290 **3 Claims**

1. A method for making a composition for a body wrap comprising the steps of:

mixing together in a suitable container the following ingredients,

6 parts by volume of lecithin;

3 parts by volume of kelp;

3 parts by volume of parsley;

3 parts by volume of alfalfa; and

64 parts by volume of water;

bringing the mixture to a temperature having a range between 200 degrees fahrenheit and 212 degrees fahrenheit;

lowering the temperature to 150 degrees fahrenheit for a time period of two hours;

removing the source of heat for a time period of one hour; and then

draining the liquid from the mixture leaving a solid substance.

4,634,437

ANTI-KINK DEVICE FOR A FLEXIBLE URINE COLLECTOR

Peter T. Lowthian, Watford, England, assignor to Simpla Plastics Limited, Cardiff, Wales

Filed Jan. 29, 1985, Ser. No. 696,136
Claims priority, application United Kingdom, Jan. 31, 1984, 8402455
Int. Cl.⁴ A61M *1/00*
U.S. Cl. 604—323 **14 Claims**

1. A flexible collector arrangement for urine, comprising:

(i) a flexible baglike collector for urine;

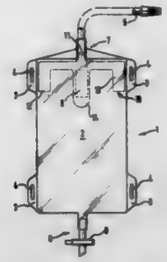
(ii) said collector having an inlet and outlet means for permitting urine to be respectively supplied to and removed from said collector;

(iii) a flexible non-return valve means in the collector adjacent said inlet means;

(iv) a device mounted wholly within the collector, adjacent said valve means for preventing obturation thereof, said device comprising:

(a) a trifurcate body member having two lateral limbs and an intermediate limb;

(b) said two lateral limbs each extending along respective opposite sides of the collector and longitudinally thereof from the inlet means towards the outlet means;



(c) said intermediate limb being at least as long as and overlying said non-return valve means, said intermediate limb also being substantially parallel to the two lateral limbs and extending from the inlet means toward the outlet means; and

(d) a tongue means projecting opposite and away from the intermediate limb and being secured to said inlet means, whereby the body member is secured wholly within the bag and the intermediate limb obviates rucking of the non-return valve means for preventing obturation thereof.

4,634,438

PH-REGULATING CELLULOSE PRODUCTS

Scarlet Sustmann, Viersen, Fed. Rep. of Germany, and Ingo G. Marini, Lenzing, Austria, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 12, 1984, Ser. No. 660,334
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1983, 3337444
Int. Cl.⁴ A61F *13/16, 13/20*; B01J *20/24, 20/28*
U.S. Cl. 604—376 **13 Claims**

1. A hygenic pH-regulating product for topical application operatively comprising a homogeneous mass of carboxy-C_{1-3}-alkyl modified celluose homogeneous fibers, wherein about 1 to 30 carboxyalkyl groups are present per 100 anhydroglucose units and wherein the carboxyalkyl groups consist essentially of carboxyalkyl groups in the free acid form, wherein said carboxyalkyl groups are distributed throughout the length and diameter of the fibers.

4,634,439

PH-REGULATING CELLULOSE FIBER

Scarlet Sustmann, Viersen, Fed. Rep. of Germany, and Ingo G. Marini, Lenzing, Austria, assignors to Lenzing Aktiengesellschaft, Lenzing, Austria

Filed Oct. 12, 1984, Ser. No. 660,338
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1983, 3337443
Int. Cl.⁴ B01J *20/28, 20/24, 20/30*; D01F *11/02*
U.S. Cl. 604—376 **18 Claims**

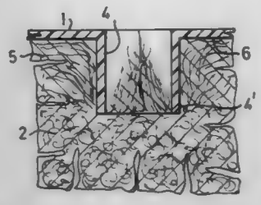
1. Carboxy-C_{1-3}-alkyl cellulose homogenuous fiber wherein about 1 to 30 carboxyalkyl groups are present per 100 anhydroglucose units and wherein the carboxyalkyl groups consist essentially of carboxyalkyl groups in the free acid form, said carboxyalkyl groups being distributed throughout the length and diameter of the fiber.

4,634,440

ABSORBENT ARTICLE

Leif U. R. Widlund, and Sven G. Bergdahl, both of Mölnlycke, Sweden, assignors to Molnlycke AB, Goteberg, Sweden

Filed May 14, 1985, Ser. No. 733,779
Claims priority, application Sweden, May 15, 1984, 8402613
Int. Cl.⁴ A61F *13/16*
U.S. Cl. 604—383 **6 Claims**



1. An absorbent article, such as a diaper, a sanitary towel or bandage, having an absorbent core, a liquid-permeable topsheet intended to be in contact with the wearer when the article is worn, and a liquid-impermeable layer arranged on the opposite side of the absorbent core, the liquid-permeable topsheet comprising a perforated but otherwise liquid-impermeable layer; the perforations comprising straight ducts which are of a uniform width along the whole of their lengths, the ends of said ducts freely projecting away from the topsheet and extending into the absorbent core, and fibers extending into the ducts in a manner such that the fiber density in said ducts decreases in a direction away from the free ends of said ducts, such that said fibers form capillaries which taper toward the interior of the absorbent article.

4,634,441

POSTERIOR CHAMBER INTRA-OCULAR LENS WITH THE LENS BODY WITHIN A CARRIER

Henry Clayman, 12555 Biscayne Blvd., Suite 709, Miami, Fla. 33181, and James R. Longacre, 3621 Littledale Rd., Kensington, Md. 20895

Filed Apr. 26, 1985, Ser. No. 733,250
Int. Cl.⁴ A61F *2/16*
U.S. Cl. 623—6 **7 Claims**



1. A posterior chamber intra-ocular implant comprising:

a lens having a central optic portion with extending front and rear surfaces bounded by a edge;

a transparent carrier having an internal pocket mounting and

surrounding said front and rear surfaces of said central optic portion and extending beyond said edge; and

centering means attached to said carrier for positioning said lens in the posterior chamber.

4,634,442

INTRAOCULAR LENS WITH A VAULTED OPTIC

William J. Link, Irvine, Calif., assignor to American Hospital Supply Corporation, Deerfield, Ill.

Filed Sep. 28, 1984, Ser. No. 656,074

Int. Cl.⁴ A61F *4/16*

U.S. Cl. 623—6 **11 Claims**



1. An intraocular lens with a vaulted optic for implantation in the posterior chamber of the eye with the optic being in the capsular bag, said intraocular lens comprising:

an optic having an optic body with a posterior surface and first and second circumferentially spaced spacing tabs at the periphery of the optic body;

each of said first and second spacing tabs extending radially outwardly from the periphery of the optic body and axially of the optic body in a first axial direction; and

a haptic mounted on the optic and projecting generally radially outwardly of the periphery of the optic whereby the intraocular lens can be implanted in the eye with the haptic at least assisting in retaining the optic in the posterior chamber with the spacing tabs in contact with the posterior capsule of the capsular bag to space the posterior surface of the optic from the posterior capsule.

4,634,443

SINGLE CIRCUIT ELASTOFLUIDIC SPHINCTER

Terry M. Haber, Lake Forest, Calif., assignor to Habley Medical Technology Corporation, Laguna Hills, Calif.

Filed Jul. 5, 1985, Ser. No. 752,137

Int. Cl.⁴ A61F *2/08*; A61B *19/00*

U.S. Cl. 623—14 **19 Claims**

19. A prosthetic sphincter for surgical implantation to apply occlusive pressures to a patient's lumen for achieving coaptive continence, said sphincter comprising:

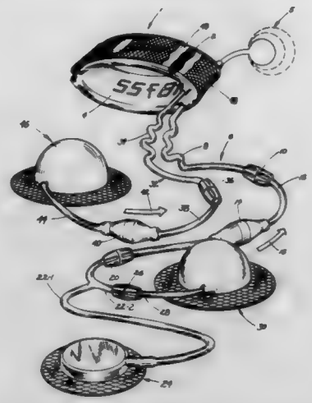
an occlusion cuff being relatively inextensible and resistant to elongation in response to tensile stretching forces and surrounding the lumen and having an expandable chamber thereof for engaging and articulating the lumen;

a first fluid filled path communicating with said expandable chamber;

a second fluid filled path communicating with said expandable chamber;

first and second fluid filled reservoirs respectively interconnected with said first and second fluid paths and having respective flexible surfaces to be manually depressed to force fluid outwardly therefrom and into a corresponding fluid path for delivery to said expandable chamber for filling said chamber and increasing the occlusive pressure being applied to the patient's lumen such that the successive compression of the first and then the second of said reservoirs variably increases the occlusive pressure being applied to said lumen from a first to a second pressure level;

a fluid filled physician actuated port, said fluid filled port being surgically implanted at a manually accessible area of the patient and interconnected with at least one of said first and second fluid paths, said fluid filled port having a region in which to receive a fluid filled syringe so that an additional supply of fluid can be introduced to said port to



force existing fluid therefrom and into said corresponding fluid path for delivery to said expandable chamber; and

relatively extensible membrane means subject to variable elongation in response to at least predetermined minimum tensile stretching forces, said membrane means interconnected with said occlusion cuff to increase the inside circumference thereof and thereby accommodate a distension of the lumen when said membrane means and occlusion cuff are positioned therearound.

4,634,444

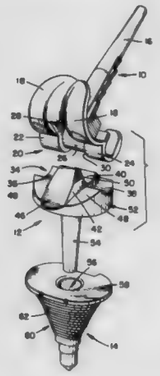
SEMI-CONSTRAINED ARTIFICIAL JOINT

Douglas G. Noiles, New Canaan, Conn., assignor to Joint Medical Products Corporation, Stamford, Conn.

Filed Feb. 9, 1984, Ser. No. 578,437

Int. Cl.⁴ A61F *2/38*

U.S. Cl. 623—20 **16 Claims**



1. An artificial joint which can be articulated between an extended and a flexed position about an axis of rotation, comprising:

a first component having a convex bearing surface which includes two outer parts and an inner part, the inner part having a radius of curvature different from the radius of curvature of each of the outer parts and being connected to each of those parts by a wall, said connecting walls being parallel to one another; and

a second component having a concave bearing surface engageable with the convex bearing surface of the first component, said concave bearing surface including two outer parts and an inner part which respectively congruently mate with the outer and inner parts of the convex bearing surface of the first component, the inner part of the concave bearing surface being connected to each of the outer parts by a wall, said connecting walls being parallel to one another, and said connecting walls between the parts of the convex bearing surface being engageable with said connecting walls between the parts of the concave bearing surface when those bearing surfaces are engaged with each other so as to constrain the first and second components from moving relative to one another along the axis of rotation of the joint,

the inner part of the convex bearing surface being able to remain in contact with the inner part of the concave bearing surface and the outer parts of the convex bearing surface being able to remain in contact with the outer parts of the concave bearing surface as the joint is articulated between its extended and flexed positions and the congruent mating of the parts of the conves bearing surface with the parts of the concave bearing surface constraining those surfaces from rotating relative to each other about an axis perpendicular to the axis of rotation of the joint.

4,634,445

JOINT PROSTHESIS

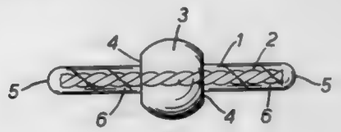
Basil H. Helal, Cheshunt, United Kingdom, assignor to OEC Europe Limited, United Kingdom

Filed Jan. 29, 1982, Ser. No. 344,169

Claims priority, application United Kingdom, Jan. 30, 1981, 8102977

Int. Cl.⁴ A61F *2/42*

U.S. Cl. 623—21 **11 Claims**



1. A joint prosthesis comprising:

a spacer for insertion between first and second bones, and,

first and second intermedullary stems extending from opposite ends of said spacer for insertion into said bones and remaining slidable within said bones,

the spacer having a greater width than the stems and thus is relatively more rigid than said stems,

said spacer including at least two shoulders,

said shoulders being designed and arranged to abut said bones when said stems are implanted therein

where the spacer is spherically shaped and said shoulders define flat end faces,

said spacer and said stems being designed and arranged such that when the prosthesis is implanted in said bones, bending of the joint prosthesis occurs in each of the stems and not in the spacer.

4,634,446

DEVICE FOR MOUNTING AN ARTIFICIAL LIMB TO THE STUMP OF AN AMPUTATED LIMB

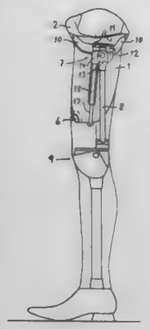
Ösur Kristinsson, Box 5288, 125 Reykjavik, Iceland

Filed Feb. 13, 1981, Ser. No. 234,149

Int. Cl.⁴ A61F *2/60, 2/78, 2/80*

U.S. Cl. 623—33 **1 Claim**

1. A device for mounting an artificial limb to the stump of an amputated limb, comprising a sleeve, intended to receive said stump, which sleeve is closed at one end and which is in force-transferring connection with said artificial limb, wherein the sleeve is made of a flexible material which is substantially nonstretchable under the loads or forces in question; the shape and volume of the sleeve are arranged to be adapted to the stump so as to obtain substantially total contact between the stump and the inner surface of the sleeve for distribution of the forces acting on the stump over the inner surface of the sleeve; the artificial limb is provided with a load-transferring structure



which is attached to the sleeve at its inner or proximal, open end; the position of the outer distal, closed end of the sleeve is arranged to be fixed relative to the artificial limb; the sleeve has the form of a slotted, sleeve-like part and a brim arranged to be inserted into said sleeve-like part; the sleeve has an extended part which covers said slot; said extended part is provided an elongated flange which projects through the slot in the sleeve; and both said flange and the edge parts of the slot are provided with holes by means of which the sleeve can be laced.

4,634,447

METHOD FOR MANUFACTURING ARTIFICIAL ORGAN

Keinosuke Isono, Kawaguchi, and Keiji Naoi, Tokyo, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

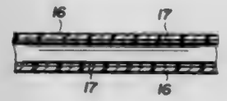
Division of Ser. No. 530,023, Sep. 7, 1983, Pat. No. 4,588,407.

This application Jan. 14, 1986, Ser. No. 818,878

Claims priority, application Japan, Sep. 9, 1982, 57-155842; Oct. 6, 1982, 57-174478; Oct. 6, 1982, 57-174479; Oct. 6, 1982, 57-174480

Int. Cl.⁴ A61F *2/02*; B01D *13/00*

U.S. Cl. 623—66 **18 Claims**



1. A method for the manufacture of an artificial organ having a film of a fat-soluble vitanin deposited on the surfaces of parts of said artificial organ susceptible to contact with body fluid in motion through a zone for flow of said body fluid within said artificial organ, which method is characterized by the steps of causing a solution of said fat-soluble vitamin in an organic solvent to flow into said zone for flow of body fluid within said artificial organ and allowing said parts to be amply wetted with said solution, then discharging an excess of said solution out of said artificial organ, and subsequently drying said solution deposited on said parts thereby expelling said organic solvent from the solution.

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4,634,448

METHOD FOR DYEING OF NATURAL LEATHERS USING REACTIVE DYES

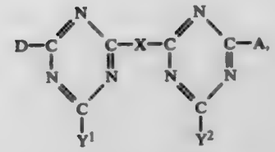
Syohei Ajioka, Ina, and Toshio Tanaka, Higashiyamato, both of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1985, Ser. No. 763,783
Claims priority, application Japan, Aug. 20, 1984, 59-171521
Int. Cl.[4] D06P *3/32, 1/38*
U.S. Cl. 8—436 **3 Claims**

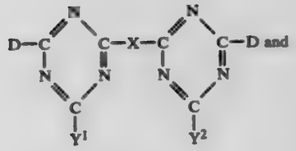
1. A method for dyeing natural leather by an exhaustion of a reactive dyestuff represented by the formulae (III) to (VI):



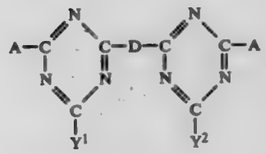
(III)



(IV)



(V)



(VI)

wherein Y represents a group



Y^1 and Y^2 are a group



or one of Y^1 and Y^2 is a group



and the other represents a chlorine atom, a fluorine atom or a bromine atom; D represents a chromophore having at least one water-soluble group, and D is bonded to the triazinyl group via a group

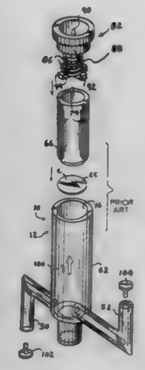
wherein R is a hydrogen atom or an alkyl ($C_1 \sim C_3$) group; A represents an unsubstituted or substituted amino group, an alkoxy ($C_1 \sim C_4$) group or a phenoxy group which does not react with the chromophore; and X represents a diamino residual group bonded to the triazinyl group via two amino groups.

4,634,449

OPAQUE TINTING PROCESS FOR CONTACT LENS

Evan J. Jenkins, Shepperton, United Kingdom, assignor to International Hydron Corporation, Woodbury, N.Y.

Filed Sep. 20, 1985, Ser. No. 778,576
Int. Cl.[4] D06P *5/00*
U.S. Cl. 8—507 **23 Claims**



1. A method of tinting a hydrogel contact lens such that the visual effect of the tint is not appreciably influenced or modified by the color of the wearer's eyes which comprises:

(a) opaquing selected portion(s) of said lens with an opaquing medium which is a metal salt which undergoes reaction with a precipitating agent to provide a metallic opaquing material selected from the group consisting of silver, gold and platinum; and,

(b) tinting only the opaqued portion(s) of the lens wherein said tinting is carried out by exposing the opaqued portion(s) of said lens to a solution of a water-soluble leuco ester of a vat dye whereby said dye penetrates said opaqued portion(s) of the lens and thereafter the dye is oxidized to regenerate the vat dye.

4,634,450

COAL-WATER DISPERSION

Helena Ljusberg-Wahren, Söderhamn, Sweden, assignor to Bergvik Kemi AB and Fluidcarbon International AB, both of, Sweden

Filed Jul. 3, 1984, Ser. No. 627,585
Claims priority, application Sweden, Jul. 6, 1983, 8303863; Rep. of Korea, Apr. 18, 1984, 84-2036
Int. Cl.[4] B01J *13/00;* **C10L** *1/32*
U.S. Cl. 44—51 **11 Claims**

1. A coal-water dispersion comprising coal particles dispersed in water and a dispersing agent in an amount of 0.01–5% by weight of the dispersion, wherein the dispersing agent is a partial ester of a dimeric, trimeric or oligomeric fatty acid-containing composition selected from the group consisting of:

(a) a crude tall oil having been polymerized so that its viscosity at 50° C. has been at least doubled;

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(b) a polymerized fatty acid compound; and
(c) a residue obtained in distilling fatty acids from fats or oil, which composition has been partially esterified with a polyalkylene glycol compound having an average molecular weight of at least 4000 and mainly being composed of ethylene oxide units, said dispersing agent having a residual acid value higher than 3.

4,634,451

AQUEOUS CARBONACEOUS MIXTURES

Stanley A. Lipowski, Livingston; José L. Villa, Bridgewater; John J. Miskel, Jr., Mendham, and Reuben H. Grinstein, Denville, all of N.J., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed May 10, 1985, Ser. No. 732,745
Int. Cl.⁴ C10L *1/32*
U.S. Cl. 44—51 **29 Claims**

1. A water slurry of solid particulate carbonaceous materials having present a water soluble dispersant which is a condensation product of
(a) an aldehyde liberating composition,
(b) ketone, and
(c) a sulfur dioxide liberating composition,
the dispersant being present in an amount sufficient to reduce viscosity of the water slurry, to stabilize carbonaceous materials in the water network and to improve pumpability of the water slurry, the slurry having from about 50% to about 80% by weight of the solid carbonaceous materials, the balance being water.

4,634,452

PREPARATION OF TALL OIL FUEL BLEND

Robert J. Secor, Pointe Claire, Canada, assignor to Canadian Patents and Development Ltd/Société Canadienne des Brevets et d'Exploitation Limitée, Ontario, Canada

Filed Apr. 11, 1986, Ser. No. 850,555
Claims priority, application Canada, Apr. 12, 1985, 479072
Int. Cl.⁴ C10L *1/18*
U.S. Cl. 44—66 **24 Claims**

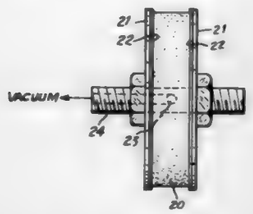
1. A process for preparing a fuel mixture which comprises:
(1) heating a mixture of (a) from 10 to 90 percent crude tall oil and (b) a balance of mineral oil or vegetable oil or a combination thereof, to a temperature ranging from about 35 degrees C. to about 100 degrees C. for a period of time sufficient to agglomerate the lignin-like dispersed substances in the mixture and,
(2) separating the agglomerated lignin-like substances from the mixture.

4,634,453

CERAMIC BONDED GRINDING WHEEL

John Hay, Shrewsbury; Leonard L. Smith, Princeton, and George E. Foster, Dudley, all of Mass., assignors to Norton Company, Worcester, Pa.

Filed May 20, 1985, Ser. No. 736,158
Int. Cl.⁴ B24D *3/00*
U.S. Cl. 51—293 **6 Claims**



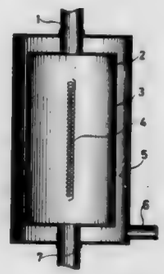
1. A method for making vitrified bonded grinding tools comprising coating a slip of abrasive and vitreous bond on a peripheral surface of a porous ceramic hub member while drawing a vacuum through said surface, conforming the surface of said coating to a desired shape, and firing said coating to produce a vitreous bonded grinding annulus on said hub.

4,634,454

METHOD AND DEVICE FOR SEPARATION OF AN ISOTOPE MIXTURE OF HYDROGEN, EXISTING PREDOMINANTLY IN MOLECULAR AND/OR BOUND FORM IN A GAS CONTAINING FREE MATERIALS AND/OR OTHER MATERIALS IN COMPOSITION, FROM THE REMAINING COMPONENTS OF THE GAS

Imran A. Khan, Jülich, Fed. Rep. of Germany; Karl-Jürgen Dietz, Oxon, United Kingdom; Francoise Waelbroeck, and Peter Wienhold, both of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 104,734, Dec. 18, 1979, abandoned. This application Oct. 23, 1981, Ser. No. 314,230
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1978, 2854638
Int. Cl.⁴ B01D *53/22*
U.S. Cl. 55—16 **3 Claims**



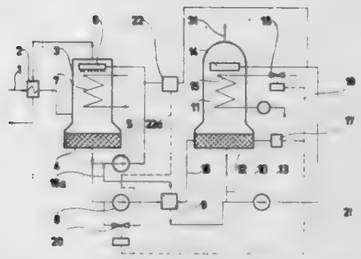
1. A method of separating hydrogen from the remaining components of a gaseous mixture, said hydrogen existing predominantly in a molecular bound form selected from the group consisting of molecular hydrogen and gaseous hydrogen compounds, which method includes in combination the steps of:
providing a first chamber which is capable of being closed on all sides and supplying said hydrogen containing gaseous mixture into said first chamber;
providing a second chamber which is capable of being closed on all sides;
separating said chamber by a wall consisting of material which is permeable for atomic hydrogen and less permeable for molecular hydrogen;
converting said molecular bound hydrogen into gaseous atomic hydrogen in the gas space of said first chamber, by a dissociating device operating separate from said wall;
allowing said atomic hydrogen to permeate said wall into said second chamber;
collecting said hydrogen recombining to molecular hydrogen while leaving the wall in said second chamber; and
carrying out said method until the pressure in the separated off hydrogen reaches a predetermined level greater than the partial pressure of said hydrogen in said gas from which it is separated.

4,634,455

PROCESS AND APPARATUS FOR DEHUMIDIFICATION OF GASEOUS MEDIA

Gyorgy Barta, and Jozsef Aszlanyi, both of Budapest, Hungary, assignors to Innofinance Altalanos Innovacios Penzintezet, Hungary

Filed Nov. 26, 1985, Ser. No. 801,774
Int. Cl.⁴ B01D *53/16*
U.S. Cl. 55—32 **10 Claims**



1. A process for dehumidifying a gaseous medium by means of absorption with a humidity absorbing solution, comprising the steps of:
leading the said solution into an absorber, causing it to pass along a cooler situate within the absorber, letting it stream out and to recirculate,
leading the gaseous medium into the absorber and intensively contacting it within the absorber with the absorbing solution, the temperature and water concentration of the latter being adjusted to practically constant values corresponding to the desired rate of dehumidification, the quantity of this absorbing solution being 10 to 100-fold the vapor absorbed,
discharging the dehumidified gaseous medium from the absorber,
circulating in an expeller a quantity of the solution 10 to 100-fold the vapor absorbed at a temperature higher than the temperature in the absorber,
heating this solution by means of a heater in the expeller to drive out its previously absorbed humidity content, which is drained in the form of vapor at an outlet of the expeller,
discharging a part of the solution circulating in the absorber at a branch outside this absorber and supplying this part of the solution into the circulation in the expeller, and
discharging the solution from the expeller after driving out its said humidity content and leading it back into the solution circuit of the absorber.

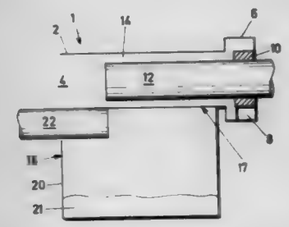
4,634,456

CLASSIFICATION AND/OR GRADING

Nicholas Syred, Cardiff, and Martin Biffin, Pontyclun, both of Wales, assignors to Coal Industry (Patents) Limited, England

Filed Dec. 20, 1984, Ser. No. 684,288
Claims priority, application United Kingdom, Jan. 24, 1984, 8401845
Int. Cl.⁴ B01D *53/24*
U.S. Cl. 55—52 **18 Claims**

1. Equipment for the classification and/or grading of gas/-solids, liquid/solids or liquid/liquid combinations, comprises a main vortex chamber having an annular passage means formed by a cylindrical body extending into said main vortex chamber and inlet means for the combination and a discharge outlet means, and a secondary vortex chamber intersecting and opening into said annular passage means of the main vortex chamber, the chambers overlapping thereby, said secondary vortex chamber provided with a cylindrical body adjacent the boundary between the main and secondary vortex chambers, means to variably control the degree of overlap, whereby in use a secondary vortex is generated in the secondary vortex chamber and driven by a main vortex in the main vortex chamber, a component of the combination being captured by the secondary vortex and being deposited in the secondary chamber, and the combination thereby being classified or graded.

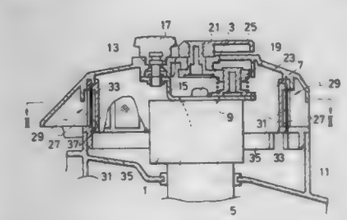


4,634,457

AIR CLEANER FOR ENGINE

Hiroshi Miyazaki, Musashimurayama; Toshiharu Sawada, Fuchu, and Kazuo Nakajima, Tokorozawa, all of Japan, assignors to Kamatsu Zenoah Co., Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 760,310
Claims priority, application Japan, Aug. 3, 1984, 59-119694[U]
Int. Cl.⁴ B01D *25/04*
U.S. Cl. 55—276 **4 Claims**



1. An air cleaner for air being admitted to the suction port of a carburetor of a gasoline engine, comprising:
a housing including a cover cooperating with a portion of said engine to define a suction chamber, said carburetor being enclosed within said chamber and having its suction port communicating therewith,
openings in said housing leading from said suction chamber to the surrounding atmosphere,
a fabric filter positioned at said openings to filter air passing therethrough,
wall means spaced inwardly from said filter, said wall means cooperating with said filter to define a first passageway which surrounds said carburetor and which is isolated from said suction chamber, and
a second passageway connecting said first passageway to said suction chamber, the arrangement of said passageways being such that air admitted to and suction sounds emitted from said suction port are caused to follow a circuitous path between said openings and said suction port.

4,634,458

DOUBLE-STAGE AIR FILTER

W. Dale Craig, Dahlgren, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 10, 1986, Ser. No. 827,589
Int. Cl.⁴ B01D *50/00*
U.S. Cl. 55—316 **26 Claims**

1. A double-stage air filter apparatus of modular construc-

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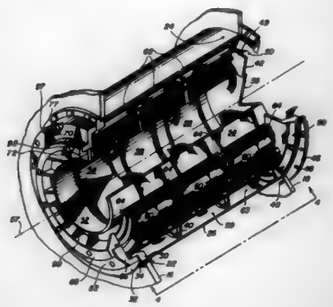
tion for purifying and cleaning air between an inlet area and a controlled area, said apparatus comprising:

a double wall structure separating the areas with one of the walls being an outer wall exposed to the inlet area and the other wall being the inner wall exposed to the controlled area as well as spaced from the outer wall, the walls of said structure including longitudinally aligned apertures therein, an air filter provided in said structure and generally comprising casing means and combined plate and sleeve means,

the casing means extending between the apertures of the inner and outer walls and having flange means affixed to the outer wall about the aperture thereof so that the hollow interior of the casing means defines an opening between the inner and outer walls that is separated from and not in communication with the space between the walls of said structure,

the sleeve means of the combined plate and sleeve means being of smaller diameter than the casing means and being provided with a patterned series of perforation means between its ends,

the plate means of the combined plate and sleeve means being provided with flange means having a series of relatively spaced slot means, the series of slot means being disposed about the flange means outer periphery, the plate means also being provided with retainer means connected to said flange means, the flange means being interposed between the outer periphery of said plate means and the retainer means.



the retainer means being affixed to the inner wall about its aperture such that the sleeve means and the plate flange means are inserted in the interior of the casing means, the sleeve means being of such a length that the outer end of the sleeve means extends to the outer wall aperture, the outer periphery of the plate flange means having a diameter substantially equal to the inside diameter of the casing means while the outside diameter of the sleeve means is substantially less than the inside diameter of the casing means,

inner and outer filter means of annular shape disposed about the sleeve means so as to cover the series of perforation means while at the same time being disposed against the plate means, the filter means being of a length substantially corresponding to the length of the sleeve means, the outside diameter of the outer filter means being less than the inside diameter of the casing means so as to define a chamber between the filter means and the casing means and between the plate flange means and the outer wall, the series of slot means of the flange means being in direct open communication with the chamber and the controlled area, opposed inner and outer end faces of the filter means having seal means, and

second retainer means of annular shape affixed to the casing means flange means so as to be in sealing and pressured engagement with the seal means at the outer end face of the filter means and at the same time forcibly urging the seal means at the inner end face of the filter means into sealing engagement with the plate means and the second retainer means also closing off the chamber at the outer wall so as to define an air flow purifying and cleaning path from the inlet area through the interior of the sleeve means, the series of perforation means, the filter means, and the chamber to the slot means so as to furnish an uninterrupted flow of filtered air to the controlled area.

4,634,459

PARTICLE FILTRATION AND REMOVAL SYSTEM

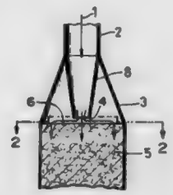
Franz Plachinger, Aachen, and Gerhard Lepperhoff, Eschweiler, both of Fed. Rep. of Germany, assignors to FEV Forschungsgesellschaft für Energie-Technik und Verbrennungsmotoren GmbH, Aachen, Fed. Rep. of Germany

Filed Feb. 10, 1986, Ser. No. 827,617

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1985, 3504692; Jan. 9, 1986, 3600373

Int. Cl.⁴ B01D *46/30*

U.S. Cl. 55—418 **12 Claims**



1. In a particle filter device containing porous filter material adapted for the exhaust flow of a diesel engine to filter particles from the exhaust gases discharged from the engine, a system for the removal of filtered particles collected on said filter material, the removal being effected by oxidation, the system comprising a housing having an inlet end and an opposite outlet end for the exhaust gas to be filtered, said housing having an enlarged wall section between said ends, said filter material being contained within said wall section and being secured without interruption about the entire periphery and between opposing inflow and outflow sides thereof to the inner surface of said wall section, said housing having at least one flow control nozzle in communication with said inlet end, said nozzle having a cross-section which decreases in a direction toward said filter material and having a terminal end spaced a predetermined short distance from one of said sides of said filter material, the cross-section at said terminal end being substantially less than the cross-section of said filter material, whereby a non-homogeneous particle layer thickness is distributed laterally across said filter material by said flow control nozzle thereby resulting in relatively thick and thin particle layers for effecting an homogenization of the temperature distribution for oxidation as relatively greater and lesser exhaust gas mass flow is required for carrying away the heat generated during incineration and oxidation of said thick and thin layers, respectively.

4,634,460

DRAIN BUSHING

Samuel R. Fowler, Tucson, Ariz., assignor to Manville Service Corporation, Denver, Colo.

Filed Jan. 17, 1986, Ser. No. 820,277

Int. Cl.⁴ C03B *37/09*

U.S. Cl. 65—1 **12 Claims**

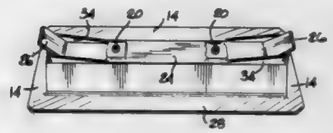
1. A non-precious metal drain bushing for draining molten glass from a glass melting apparatus, comprising:

electrically conductive side walls, end walls and bottom wall connected to each other to form a receptable for molten glass,

the bottom wall containing apertures through which molten glass can flow,

an electrically conductive relatively thin terminal ear extending from the receptacle adjacent each end thereof,

the width of the terminal ears extending in the direction of the width of the receptacle for a substantial distance, and



electrically conductive means for reinforcing the terminal ears against bending stresses, said means also being configured so as to electrically widen the conductive action of the terminal ears.

4,634,461

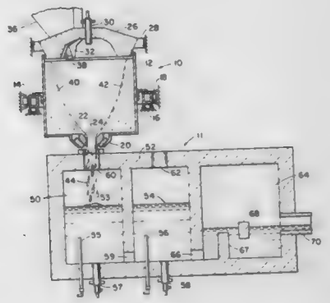
METHOD OF MELTING RAW MATERIALS FOR GLASS OR THE LIKE WITH STAGED COMBUSTION AND PREHEATING

Henry M. Demarest, Jr., Natrona Heights; Gerald E. Kunkle, New Kensington, and Clement C. Moxie, Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 25, 1985, Ser. No. 748,640

Int. Cl.⁴ C03B *5/04*

U.S. Cl. 65—27 **54 Claims**



1. A method of making glassy or ceramic material comprising providing batch material mixed with solid or liquid fuel having an ash content in a preheating stage, combusting the fuel in the preheating stage so as to heat the batch material to a temperature below its fusion temperature, passing the heated batch in admixture with the ash to a stage were the batch is liquefied, and completing melting of the material under oxidizing conditions so as to produce an essentially oxidized product.

4,634,462

METHODS OF AND APPARATUS FOR MONITORING PRECIPITATES IN METALLIC MATERIALS

Gordon E. Fish, Verona; Ryusuke Hasegawa, Morristown, and Ernest D. Buff, Far Hills, all of N.J., assignors to Allied Corporation, Morristown, N.J.

Filed Jan. 9, 1985, Ser. No. 690,061

Int. Cl.⁴ C03B *32/00*

U.S. Cl. 65—29 **18 Claims**

1. A method for annealing a starting material composed of a magnetic, metallic glass wherein a portion of said starting material is transformed into a transformed material having a magnetic permeability different from that of said starting material, comprising the steps of:

a. heating said starting material to a preselected temperature;

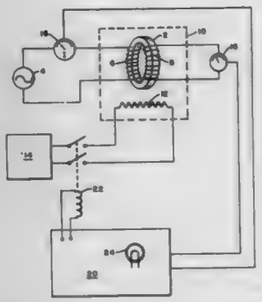
b. measuring the magnetic permeability of said material while at said temperature;

c. maintaining said starting material at said preselected temperature until a preselected change in magnetic permeability thereof is detected; and

d. cooling said material when said preselected change in magnetic permeability has been detected.

15. Apparatus for annealing a starting material composed of a magnetic, metallic glass comprising:

a. heating means for evenly heating said starting material to a preselected temperature;



b. measuring means for continously or intermittently measuring the magnetic permeability of said material during said heating;

c. cooling means for cooling said material;

d. signal means associated with said measuring means for sensing said magnetic permability and for transmitting an electrical signal in response to a preselected change in said magnetic permeability; and

e. actuating means operative upon receipt of said signal to actuate said cooling means.

4,634,463

VEGETABLE ACTIVATOR AND METHOD FOR MANUFACTURING SAME

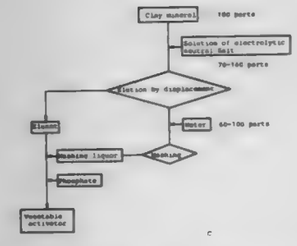
Kamemaru Ohsuga, Gobo, Japan, assignor to Yamabo Kogyo Co., Ltd., Wakayama, Japan

Filed Sep. 13, 1984, Ser. No. 650,674

Claims priority, application Japan, Jul. 30, 1984, 59-162458

Int. Cl.⁴ C05B *7/00*

U.S. Cl. 71—34 **2 Claims**



1. A method for manufacturing a vegetable activator comprising the steps of:

causing an aqueous solution of an electrolytic neutral salt to penetrate into a clay mineral having a cation displacement capacity of 50 me/100 g or higher and a particle diameter of 0.8 mm or larger to cause exchangeable cations adsorbed on said clay mineral to elute by displacement;

washing said clay mineral with water;

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mixing the eluant from said clay mineral with the waste liquid obtained by the washing to obtain a mixture; and adding a phosphate to said mixture.

4,634,464

DEFOLIANT METHOD

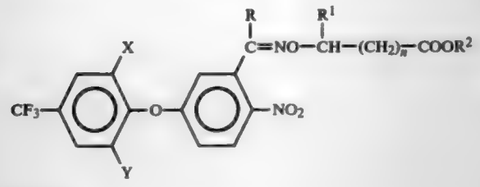
Dennis K. Kraus, Canal Fulton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 373,815, Apr. 30, 1982, abandoned, which is a division of Ser. No. 136,171, Apr. 15, 1980, Pat. No. 4,344,789, which is a continuation-in-part of Ser. No. 38,043, May 11, 1979, abandoned. This application Dec. 4, 1984, Ser. No. 678,121

Int. Cl.⁴ A01N *37/50, 37/34*

U.S. Cl. 71—70 **3 Claims**

1. A method of defoliating cotton crop prior to harvest thereof while not causing significant damage to the crop by applying to the crop an effective defoliating amount of compound of the formula:



wherein:

X and Y are hydrogen or halogen provided that one of X or Y is halogen;

R is hydrogen, halogen, C_1 to C_4 alkyl or haloalkyl, C_1 to C_4 alkoxy or alkylthio, mono or dialkylamino, or cyano:

R^1 is hydrogen or C_1 to C_4 alkyl;

R^2 is hydrogen or C_1 to C_{10} alkyl, haloalkyl or alkoxyalkyl; and

n is 0, 1, 2, or 3.

4,634,465

FUSED N-PHENYLSULFONYL-N'-PYRIMIDINYLUREAS AND N-PHENYLSULFONYL-N'TRIAZINYLUREAS

Josef Ehrenfreund, Allschwil; Werner Föry, Basel; Willy Meyer, Riehen, and Werner Töpfl, Dornach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

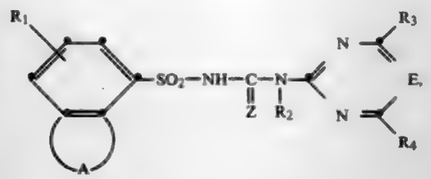
Filed Jul. 8, 1983, Ser. No. 512,091

Claims priority, application Switzerland, Jul. 16, 1982, 4357/82

Int. Cl.⁴ C07D *411/12;* **A01N** *47/36*

U.S. Cl. 71—91 **13 Claims**

1. A fused N-phenylsulfonyl-N'-pyrimidinylurea or N-phenylsulfonyl-N'-triazinylurea of the formula



wherein

Z is oxygen or sulfur,

E is nitrogen or =CH—,

R_1 is hydrogen, halogen, nitro, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, C_1–C_4 alkylsulfonyl or C_2–C_5 alkoxyalkoxy, R_2 is hydrogen, C_1–C_4 alkyl or C_1–C_3 alkoxy, R_3 and R_4, each independently of the other, are hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy or $—NR_5R_6$, wherein R_5 and R_6 are hydrogen or C_1–C_4 alkyl, and

the bridge A, together with the phenyl nucleus which carries it, forms a 3,4-dihydro-2,2-dioxo-1,2-benzoxathiine system which is substituted by C_1–C_4 alkyl.

4,634,466

TRIAZOLES AND USE AS FUNGICIDES AND PLANT GROWTH REGULATORS

Robert A. Noon, Maidenhead; Patrick J. Crowley, Crowthorne, and Diana M. Worthington, Maidenhead, all of England, assignors to Imperial Chemical Industries PLC, London, England

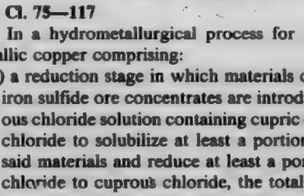
Filed May 31, 1983, Ser. No. 499,399

Claims priority, application United Kingdom, Jun. 14, 1982, 8217206; Jun. 18, 1982, 8217693; Jan. 21, 1983, 8301679

Int. Cl.⁴ A01N *43/653;* **C07D** *249/08*

U.S. Cl. 71—92 **8 Claims**

1. A compound selected from the group consisting of (1) compounds of Formula (A):



formula A

wherein R^3 is hydrogen; X is hydrogen, methyl, ethyl or propyl; Y is N and R^2 is 2,4-dichlorophenyl; and (2) compounds of Formula (B):

formula B

wherein R^3 is hydrogen; X is hydrogen, methyl, ethyl or propyl; R^2 is 2,4-dichlorophenyl, and Y is N.

7. A method of combating fungi, which comprises applying to a plant, to seed of a plant, or to the locus of the plant or seed an effective amount of a compound according to claim 1.

8. A method of regulating plant growth, which comprises applying to the plant, to seed of a plant or to the locus of a plant or seed, an effective amount of a compound according to claim 1.

4,634,467

HYDROMETALLURGICAL PROCESS FOR COPPER RECOVERY

Leonard R. Ochs, Tucson, Ariz., assignor to Duval Corporation, Tucson, Ariz.

Filed Jul. 30, 1985, Ser. No. 760,565

Int. Cl.⁴ C22B *15/00*

U.S. Cl. 75—117 **15 Claims**

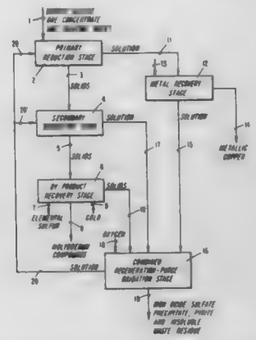
1. In a hydrometallurgical process for the production of metallic copper comprising:

(a) a reduction stage in which materials containing copper-iron sulfide ore concentrates are introduced into an aqueous chloride solution containing cupric chloride and ferric chloride to solubilize at least a portion of the copper in said materials and reduce at least a portion of the cupric chloride to cuprous chloride, the total chloride ion concentration relative to the water content of said chloride solution being maintained at a sufficient level to minimize precipitation of cuprous chloride in said solution by the addition of a saline metal chloride selected from the group consisting of sodium chloride, potassium chloride, magnesium chloride and mixtures thereof to said solution;

(b) an electrolytic copper recovery stage in which metallic copper is recovered at the cathode by reduction of the cuprous chloride in the solution from the reduction stage, and in which cupric chloride is regenerated at the anode; and

(c) an oxidation stage combined with a regeneration-pure-stage wherein a raffinate from the copper recovery stage is reacted with oxygen to form a solution containing ferric chloride which concurrently oxidizes the unreacted materials from the reduction stage to solubilize substantially all the remaining copper in the materials and form a solution containing cupric chloride, and recycling the chloride solution containing cupric chloride to the reduction stage,

the improvement comprising: a secondary reduction stage in which the partially reacted copper-iron sulfide ore concentrate which discharges from the reduction stage of said process is used as feed solids to the second reduction



reactor wherein the partially reacted feed solids are introduced into a portion of the aqueous chloride solution from the oxidation stage, thereby producing a reacted slurry, feeding the slurry to a liquid-solids separation device in which the substantially reacted copper-iron sulfide ore concentrate is separated from the bulk of the solution as a thick slurry, said solution containing cuprous chloride ferrous chloride and some unreacted cupric chloride, passing the thick slurry containing the solids to a by-product recovery stage which comprises a separator where the solids from the secondary reduction stage liquid-solids separation device are washed to free them of process solution and elemental sulfur from the washed secondary reduction stage discharge solids, thereby producing elemental sulfur free of residue solids at least a portion of the cuprous chloride containing solution from said secondary reduction stage comprising anode compartment feed solution in said electrolytic copper recovery stage to thereby insure the presence of excess cuprous chloride at the anode.

4,634,468

CATALYTIC METAL OF REDUCED PARTICLE SIZE

Michael Gulla, Sherborn; Oleh B. Dutkewych, Harvard, and John J. Bladon, Wayland, all of Mass., assignors to Shipley Company Inc., Newton, Mass.

Filed May 7, 1984, Ser. No. 607,649

Int. Cl.⁴ C23C *3/02*

U.S. Cl. 106—1.11 **28 Claims**

1. A functional catalytic adsorbate for electroless metal deposition consisting essentially of a reduced platinum family metal fixedly associated with an organic suspending agent, where the reduced platinum family metal is characterized by an average maximum dimension not exceeding 500 Angstroms, said catalytic adsorbate being suspended in an aqueous medium consisting essentially of water.

4,634,469

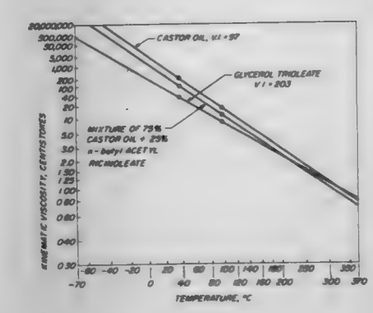
PARTING COMPOSITION COMPRISING GLYCEROL TRIOLEATE, CASTOR OIL AND COPPER CORROSION INHIBITOR

Joseph T. Laemmle, Murrysville; John Bohaychick, New Kensington, both of Pa., and Willie Lansdale, Newburgh, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 454,268, Dec. 29, 1982, Pat. No. 4,522,250. This application Mar. 21, 1985, Ser. No. 714,538

Int. Cl.⁴ B28B *7/36*

U.S. Cl. 106—38.24 **5 Claims**



1. A parting composition for the continuous casting of aluminum and its alloys, said parting composition comprising

(a) about 25 to 95 wt % glycerol trioleate,

(b) about 5 to 75 wt % castor oil, and

(c) an effective concentration of a corrosion inhibitor for copper.

4,634,470

CELLULOSE DOPE, PROCESS FOR PREPARATION AND METHOD FOR APPLICATION THEREOF

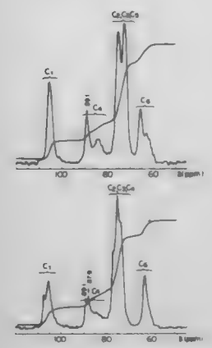
Kenji Kamide, Ikoma, and Kunihiko Okajima, Takatsuki, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Nov. 28, 1984, Ser. No. 675,762

Claims priority, application Japan, Dec. 26, 1983, 58-244337

Int. Cl.⁴ C08L *1/00*

U.S. Cl. 106—163.1 **6 Claims**



1. A cellulose dope suitable for shaping which comprises an aqueous alkali solution containing substantially at least 3% by weight of cellulose having a polymerization degree of at least 100, wherein in the ^{13}C-NMR spectrum of said cellulose, the

C_4 carbon peak is found at a magnetic field higher by at least 7 ppm than the magnetic field of the C_4 carbon peak of solid cellulose attributed to the strong intramolecular hydrogen bond.

4,634,471

PIGMENT PRODUCT

Thomas E. Foye, and Edward K. Sasamoto, both of Holland, Mich., assignors to BASF Corporation, Wyandotte, Mich.

Filed Apr. 29, 1985, Ser. No. 728,236
Int. Cl.⁴ C08L *91/00*; C04B *14/00*
U.S. Cl. 106—262 **13 Claims**

1. A method of producing a pigment-hydrophobic organic vehicle product which comprises:

A. providing an emulsion which comprises:
  1. an organic liquid selected from the group consisting of:
    (a) oleophilic resins
    (b) organic solvents and
    (c) mixtures thereof,
  2. an emulsification agent and
  3. water
B. forming a water slurry of a pigment,
C. admixing said emulsion with said pigment slurry,
D. forcing said emulsion and pigment slurry mixture through a concentration zone and
E. flushing said mixture with a hydrophobic organic vehicle.

4,634,472

ENRICHMENT OF FRUCTOSE SYRUPS

Carl W. Niekamp, Forsyth, and James D. Wideman, Decatur, both of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Aug. 23, 1985, Ser. No. 768,892
Int. Cl.⁴ F24C *1/00*
U.S. Cl. 127—60 **15 Claims**

1. A process for manufacturing an enriched fructose syrup comprising the steps of:

(a) providing a fructose containing feed syrup having a dry solids content between about 75 and 89 percent with the dry solids including at least about 92 percent monosaccharides, on a dry solids basis, said monosaccharides being primarily composed of dextrose and fructose;
(b) establishing a feed syrup temperature appropriate for crystallization of the desired form of dextrose crystals;
(c) seeding said feed syrup with a dextrose seed crystal;
(d) allowing said feed syrup to crystallize for at least about 8 hours to form a massecuite comprising dextrose crystals and mother liquor;
(e) mixing a fructose containing diluent syrup comprising from about 35 percent to about 50 percent dry solids, the dry solids of said diluent syrup containing, on a dry solids basis, from about 35 percent to about 50 percent fructose, with said massecuite in an amount sufficient to enhance separation of the dextrose crystals from the mother liquor in said massecuite; and
(f) separating said dextrose crystals from said mother liquor to yield a crystalline product and an enriched fructose syrup in which the fructose content, on a dry solids basis, is at least about 1.1 times the original fructose content of the initial fructose containing feed syrup.

4,634,473

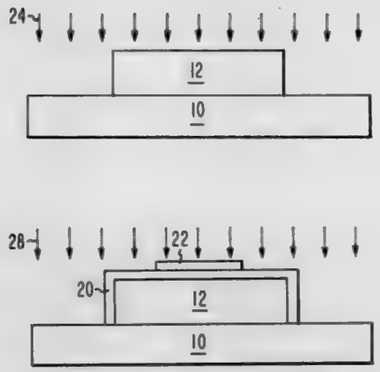
METHOD FOR FABRICATING A RADIATION HARDENED OXIDE HAVING STRUCTURAL DAMAGE

George A. Swartz, North Brunswick, and Carl W. Benyon, Jr., Trenton, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 9, 1985, Ser. No. 773,772
Int. Cl.⁴ H01L *21/265, 21/20*
U.S. Cl. 148—1.5 **17 Claims**

1. A method for making a radiation hardened oxide comprising:

forming a defined first layer having an edge on a substrate;
forming an oxide second layer on said first layer and on said edge to said substrate at a temperature of between about 975° C. and 1400° C.;



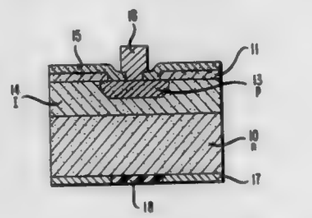
damaging the structure of said oxide layer; and
annealing said oxide layer between about 850° C. and 900° C.

4,634,474

COATING OF III-V AND II-VI COMPOUND SEMICONDUCTORS

Irfan Camlibel, Stirling; Aland K. Chin, Berkeley Heights; Shobha Singh, Summit; LeGrand G. Van Uitert, Morris Township, Morris County, and George J. Zydzik, Columbia, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 9, 1984, Ser. No. 658,569
Int. Cl.⁴ H01L *21/223, 21/383*
U.S. Cl. 148—1.5 **8 Claims**



1. A method for fabricating III-V and II-VI compound semiconductor devices comprising the steps of forming a layer comprising silicon on a major surface of a semiconductor substrate comprising a material selected from the group consisting of III-V and II-VI compounds in a manner which does not cause significant damage to the semiconductor surface and subsequently heating the structure without causing significant diffusion of the silicon layer into the surface of the semiconductor and without converting any significant amount of the silicon layer to silicon oxide.

4,634,475

DEEP-DRAWABLE ALUMINUM SHEET OR STRIP AND METHOD OF MAKING SAME

Fritz Fischer, Freising, Fed. Rep. of Germany, assignor to Austria Metall Aktiengesellschaft, Vienna, Austria

Continuation of Ser. No. 240,244, Mar. 3, 1981, abandoned. This application Dec. 27, 1982, Ser. No. 453,176
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1980, 3008679
Int. Cl.⁴ C22F *1/04*
U.S. Cl. 148—11.5 A **7 Claims**

1. A method of making a deep-drawable aluminum sheet or strip which comprises the steps of:

(a) blasting the surface of a roller with broken cast steel of a Rockwell hardness on the C scale of 62 to 65 and a grain size in the range of Nos. 2 to 4 with a centrifugal velocity of 50 to 150 m/s to profile said roller; and
(b) rolling an aluminum workpiece in a plurality of rolling steps and applying a micro roughness to one surface of said workpiece of 0.8 to 5 microns in the last rolling step with said roller, said micro roughness consisting predominantly of steep-flank slender peaks finely distributed over said surface of said workpiece and separated by troughs rounded off where the flanks of the peaks meet the troughs; and

soft-annealing said peaks to soften at least the tips thereof.

4,634,476

HIGH-STRENGTH, LOW-ALLOY CAST STEEL

Benjamin J. Bergson, Bellevue, Wash., assignor to Paccar Inc, Bellevue, Wash.

Filed May 3, 1985, Ser. No. 730,342
Int. Cl.⁴ C22C *38/12, 38/22, 38/44*
U.S. Cl. 420—73 **4 Claims**

1. A high-strength, cast, heat-treated steel alloy with a bainite microstructure having good weldability, ductility, and toughness at temperatures between 250° F. and −50° F., comprising the product which has been subjected to a process of casting and heat treating, wherein the alloy has an analysis, by weight, consisting of:

0.07 to 0.12% carbon,
0.20 to 0.60% silicon,
0.90 to 1.20% manganese,
0.30 to 0.50% molybdenum
0.50 to 0.10% vanadium,
0.009 to 0.015% nitrogen,
0.010 max. sulphur,
0.30% max. chromium,
0.30% max. nickel,
0.01% max. titanium,
0.35% max. copper,
0.07% max. aluminum, and
0.15% max. phosphorus,

the remainder being essentially iron with incidental impurities.

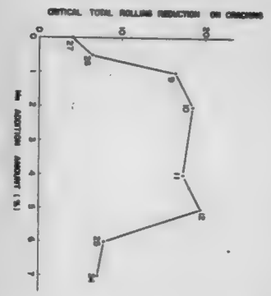
4,634,477

WORKABLE HIGH STRENGTH SHAPE MEMORY ALLOY

Koichi Sugimoto, Osaka; Kiyoshi Kamei, Hyogo; Yotaro Murakami, Kyoto; Takashi Sugimoto, Osaka; Takashi Nishimura, Kobe, and Takahiro Takashima, Hyogo, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 17, 1985, Ser. No. 776,807
Int. Cl.⁴ C22C *9/01*
U.S. Cl. 148—402 **1 Claim**

1. In a workable high strength shape memory alloy, consisting essentially of aluminum in amounts of 11.5–13.5%, nickel in amounts of 2–6%, titanium in amounts of 0.1–5%, and the balance copper, the improvement comprising the addition of



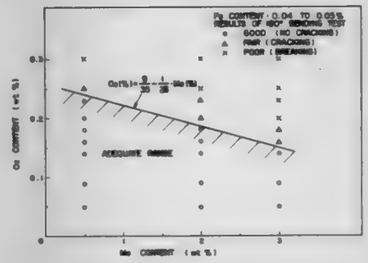
Mn in amounts of 1–5%, to improve workability, all on a weight basis.

4,634,478

TITANIUM MOLYBDENUM ALLOY SUPERIOR IN RESISTANCE TO PITTING CORROSION IN BROMIDE ION ENVIRONMENT

Kazutoshi Shimogori, Kobe; Hiroshi Satoh, Samiyoshimiya, and Fumio Kamikubo, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Aug. 12, 1985, Ser. No. 764,745
Claims priority, application Japan, Aug. 13, 1984, 59-169736
Int. Cl.⁴ C22C *14/00*
U.S. Cl. 148—421 **1 Claim**



1. A Ti-Mo alloy consisting essentially of 0.2 to 3.0 wt % of molybdenum, with the balance being substantially titanium, characterized in that the amount of Fe in the impurities is not greater than 0.1% and the amount of O_2 in the impurities is in the range that satisfies the following equation on the basis of the amount of Mo (%).

$$O_2\,(\%) \leqq 9/35 - 1/28 \cdot Mo\,(\%)$$

said titanium alloy having been heated at a temperature higher than 700° C. and lower than the β-transformation point and then cooled at a rate of 500° C./min or less whereby an alloy is obtained highly reistant to pitting corrosion in an environment where there are bromide ions and which is malleable and superior in formability.

4,634,479

POWER SOURCE UTILIZING ENCAPSULATED LITHIUM PELLETS AND METHOD OF MAKING SUCH PELLETS

John T. Buford, Winnebago, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 8, 1984, Ser. No. 618,893
Int. Cl.⁴ C06B *45/32*; B05D *7/00*
U.S. Cl. 149—6 **5 Claims**

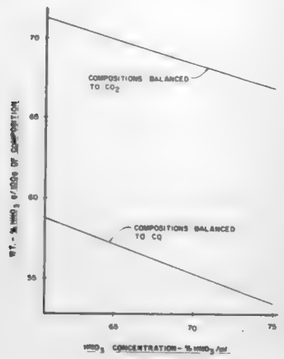
1. Encapsulated lithium based fuel consisting essentially of:
a shot shaped body of metallic lithium having a nominal diameter in the approximate range of 1–25 mm; and
a coating encapsulating said body and formed of a thin layer of predominantly fluorine substituted polymeric or telomeric material, said material exothermally reacting with the lithium of said body at temperatures approximately at or above the melting point of lithium.

4,634,480

METHOD OF COMBINING LIQUID EXPLOSIVE COMPOSITIONS FOR FIELD OPERATIONS

Joseph L. Trocino, 15233 Ventura Blvd., P-10, Sherman Oaks, Calif. 91403

Filed Sep. 23, 1985, Ser. No. 778,972
Int. Cl.⁴ C06B *47/04*
U.S. Cl. 149—74 **10 Claims**



1. In a completely liquid and flowable explosive composition for use and mixture at the field operational site, the improvement consisting of:
28.4% to 47.18% nitroethane blended at the operation site with 53.82% to 71.6% nitric acid wherein said nitric acid contains from 25.0% to 40.05% water.

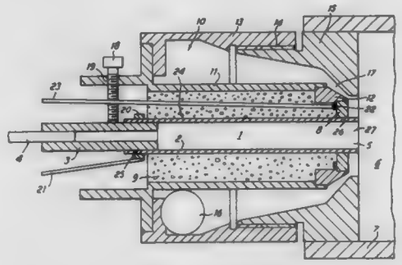
4,634,481

METHOD OF MAKING FUEL PREPARING ELEMENTS FOR VAPOR BURNERS FED WITH LIQUID FUEL

Jørgen H. Petersen; Peter J. M. Clausen, and Hilmar Ø. Rasmussen, all of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Division of Ser. No. 550,310, Nov. 10, 1983, Pat. No. 4,497,625. This application Oct. 11, 1984, Ser. No. 659,785
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243397
Int. Cl.⁴ B32B *31/04*; F23D *11/44*
U.S. Cl. 156—89 **8 Claims**

1. A method of making a fuel preparing unit for a vapour burner which unit comprises a plurality of ceramic parts including a smaller diameter first tube part having a first end portion and a second end portion, a larger diameter second tube part having a first end portion and a second end portion with the first tube part second end portion being pushed into the second tube part first end portion, and an annular closure element projecting radially outwardly of the second tube part second end portion, a first annular electric terminal on the second tube part first end portion and a second annular electric terminal on the closure element, said method comprising the steps of assemblying said tube parts and closure element in the above relationship, sintering said assemblied tube parts and



closure element to unify them and soldering the first and second electric terminals to the second tube first portion and the closure element respectively in electrically conductive relationship, the second tube part and closure element being of an electrically conductive material.

4,634,482

METHOD FOR SECURING ELASTIC STRANDS TO DISPOSABLE ABSORBENT ARTICLES

Donald W. Lammers, Oostburg, Wis., assignor to Curt G. Joa, Inc., Sheboygan Falls, Wis.

Filed Jun. 20, 1985, Ser. No. 746,838
Int. Cl.⁴ B32B *31/08*
U.S. Cl. 156—164 **7 Claims**



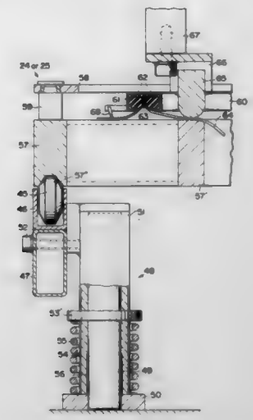
1. A method for attaching elastic strands continuously to a moving inelastic web of interconnected articles to impart an elasticized characteristic to predetermined regions on the individual articles and to leave other regions in said articles without elasticized characteristics, said method comprising the steps of:
feeding an elastic strand in a stretched condition and a continuous sheet of material concurrently toward an article assembly station,
applying a quick setting adhesive periodically to zones of predetermined length on a selected one of the strand or the sheet and applying a relatively slower setting adhesive periodically to zones of predetermined length on the other of the strand or the sheet while said strand and sheet are being fed,
causing said stretched strand and said sheet to contact in a relationship such that zones having quick setting adhesive alternate with zones having the slower setting adhesive so said strand becomes adhered continuously to said sheet and the zones having the slow setting adhesive are tentatively adhered and extend from one of said interconnected articles to the next,
maintaining said elastic strand in a stretched condition at least until said quick setting adhesive sets,
after the articles have passed said assembly station and before said slower setting adhesive sets cutting said elastic strand transversely to the line of movement of the sheet at a place between successive articles across which place said tentatively adhered zone extends,
cutting of said strand allowing the tentatively adhered ends of the strand to contract to an unstretched condition before said slow setting adhesive sets such that after it sets said ends are adhered but do not impart an elastic characteristic to the region of the article to which said ends adhere.

4,634,483

APPARATUS FOR PERFORMING SEVERAL DIFFERENT OPERATIONS ON AN INITIALLY FLAT WORK PIECE

Ernst M. Spengler, Heusenstamm, Fed. Rep. of Germany, assignor to Stanztechnik GmbH R & S, Frankfurt, Fed. Rep. of Germany

Filed Mar. 15, 1985, Ser. No. 712,708
Int. Cl.⁴ B29C *17/04*
U.S. Cl. 156—216 **12 Claims**



1. An apparatus for performing several different operations on an initially flat work piece, comprising a machine base, machine frame means supported by said machine base, turntable means, bearing means rotatably supporting said turntable means on said machine base inside said machine frame means, a first work station and a second work station inside said machine frame means, each work station having an upper section operatively supported by said machine frame means for up and down movement, each work station also having a lower section rigidly supported by said turntable means for rotation with said turntable and for cooperation with one or the other upper work station section depending on the respective position of said turntable means, said upper and lower section of said first work station providing access therebetween for automatically feeding flat, limp sheet material into the first work station with the aid of tentering means, rotation drive means operatively connected to said turntable means for rotating said lower work station sections into cooperation with one or the other of said upper work station sections, wherein said upper section of said first work station comprises first upper laminating tool means, wherein said lower section of said first work station comprises first lower tool means carried by said turntable means and constructed for cooperation with said first upper laminating tool means, first reciprocating drive means for moving said first upper and lower tool means into cooperation with each other for laminating sheet material to a substructure, wherein said upper section of said second work station comprises second upper trimming tool means, wherein said lower section of said second work station comprises second lower tool means also carried by said turntable means and constructed for cooperation with said second upper trimming tool means, second reciprocating drive means for moving said second upper and lower tool means into cooperation with each other for trimming said sheet material along edges of said substructure, and wherein said first lower tool means and said second lower tool means each comprise identical lower mold means constructed for cooperation with said first and second upper tool means and vice versa in accordance with the respective turntable position.

4,634,484

METHOD FOR THE PRODUCTION OF AN EMBOSSING ROLLER FOR THE CONTINUOUS EMBOSSING OF THE SURFACE OF A THERMOPLASTIC FILM

Werner Wagner, Bad Neandorf, Fed. Rep. of Germany, assignor to J.H. Benecke GmbH, Fed. Rep. of Germany

Filed Feb. 19, 1985, Ser. No. 702,490
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1984, 8405040[U]; Jan. 24, 1985, 3502244
Int. Cl.⁴ B29C *33/40, 67/00*; B28B *11/18*
U.S. Cl. 156—219 **4 Claims**

1. In a method for the production of a negative embossing roller for the continuous embossing of a thermoplastic film in which a synthetic resin is poured or spread as a uniformly thick coating onto a grain-patterned surface and then hardened into an embossing matrix which is then peeled off the grain pattern, the improvement comprising
wrapping a generally-rectangular sheet of leather with the grain pattern out, and opposed edges of the sheet abutting, around a roller whose diameter corresponds esentially to the diameter of the embossing roller to be produced, so that the entire surface of the roller is covered,
spreading liquid silicone rubber on the grain pattern,
hardening the rubber while in contact with said grain pattern to form a tubular embossing matrix, having discontinuities in the grain design where said opposed edges abut, and continuous portions adjacent said abutting edges,
embossing at elevated temperature between a pair of spaced rollers the surface of a tubular thermoplastic film mounted on one roller of said tubular embossing matrix mounted on the other roller of said pair,
embossing again the surface of the thermoplastic film by contact with said continuous portions of the embossing roller in the areas along the abutting edges of the natural grain pattern on the roller, while gradually increasing the pressure as the rolls approach the bight and then decreasing the embossing pressure as said abutting edges pass through the bight of said spaced rollers, thus producing an endless positive impression without discontinuities in the grain pattern,
spreading liquid silicone rubber onto the positive impression,
hardening the rubber to provide a negative embossing matrix,
peeling the matrix from the positive impression, and adhering the negative embossing matrix, embossed side out, onto the circumferential surface of the embossing roller.

4,634,485

EXTRUDED ARTICLE AND METHOD OF MAKING THE SAME

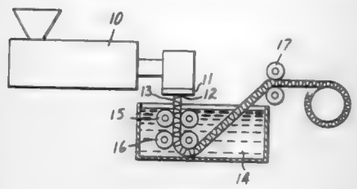
Dennis G. Welygan, and Ronald O. Zemke, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 550,641, Nov. 15, 1983, abandoned. This application Aug. 23, 1985, Ser. No. 768,803
Int. Cl.⁴ B32B *31/00*
U.S. Cl. 156—244.11 **18 Claims**

1. Method of making an extruded article comprising
(1) extruding at a first rate a first filament-forming, extrudable plastic mass to form a plurality of spaced, straight continuous parallel elements;
(2) extruding simultaneously, at a second rate faster than said first extrusion rate and between adjacent spaced, continuous parallel elements, a second filament-forming extrud-

able plastic mass to form an undulatable element which is thinner than it is wide to provide a cross-section with an aspect ratio of at least two, with the undulatable element being positioned with each opposite face of its wide dimension facing one of said continuous straight parallel elements, the surfaces of said plastic masses having a tacky first physical state which permits said surfaces to bond to one another at points of mutual contact and a second physical state in which subsequent bonding will no longer occur and in which latter state said elements have sufficient structural integrity to maintain their extruded bonded shape;

(3) while the surfaces of said elements are sufficiently tacky to simultaneously cause bonding therebetween at points of contact, causing said undulatable element to undulate in its



thin dimension by permitting contact between a parallel element to form an apex on one side of said undulatable element while maintaining the other adjacent parallel element in sufficiently close proximity to permit subsequent contact between it and the undulating undulatable element to form an opposed apex and to permit repetition of such undulation and subsequent contact to form a plurality of apexes, thereby providing an article having an undulated element with apexes aligned on opposed sides wherein the apexes on one side of the undulated element are bonded to one of said parallel elements and the apexes on the other side of said undulated element are bonded to the other adjacent parallel element; and

(4) changing or permitting the change of said plastic masses to said second physical state.

4,634,486

UPHOLSTERY MATERIAL FOR SEATS AND METHOD OF MAKING THE SAME

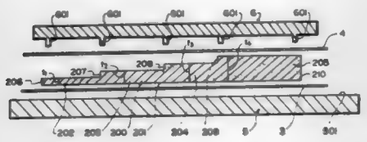
Yoshiaki Kashio, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Minato, Japan

Filed Sep. 20, 1985, Ser. No. 778,032

Claims priority, application Japan, Sep. 20, 1984, 59-142648[U]

Int. Cl.⁴ B32B *31/20, 3/26*

U.S. Cl. 156—253 **4 Claims**



1. The method of manufacturing an upholstery material composed of a plurality of sheet-like block-shaped resilient bodies having different thicknesses enclosed between a face sheet and a back sheet comprising the steps of:

forming an integral continuous staircase-shaped resilient base member having an elongaed flat base and step portions of different thicknesses forming stepped end faces;

positioning a flat back sheet on a base table;

positioning said base member on said back sheet with the stepped portions directed upwardly;

positioning a flat face sheet on top of said resilient base member; and

fusing said face sheet to said back sheet by pressing a welder having fusing blades aligned with stepped end faces of said resilient base member against said resilient face member through said face sheet to fuse said face sheet and said back sheet to each other, thereby forming said resilient bodies having different thicknesses between said face sheet and said back sheet.

4,634,487

METHOD OF PRODUCING SCAFFOLDS

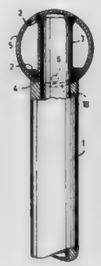
Jorma H. Karo, Helsinki, Finland, assignor to Karolon Oy, Helsinki, Finland

Filed Feb. 20, 1985, Ser. No. 703,308

Claims priority, application Finland, Mar. 13, 1984, 841003

Int. Cl.⁴ B32B *31/04*

U.S. Cl. 156—256 **7 Claims**



1. A method of manufacturing scaffolds having rails and rungs made of hollow tubes and profiles of reinforced plastic, said method comprising the following steps:

(a) drilling a plurality of holes within said rails for insertion of ends of the rungs;

(b) placing a batch of a polymerizable monomer mixture on the inner surface of the rail oppositely to the hole through each of the holes drilled in the rail;

(c) inserting ends of the rungs into the holes;

(d) turning the rail together with the rungs upside down so that the rail is positioned above the rungs, whereby the polymerizable monomer mixture flows downwardly, forming a collar on the inner surface of the rail around a junction of the rung and the rail;

(e) polymerizing the monomer mixture by means of heat, a catalyst and an accelerator, and

(f) repeating steps (a)–(e) for other rails of the scaffold so as to fasten said other rails on the rungs.

4,634,488

MATERIAL INTENDED TO FORM A JOINT BETWEEN TWO BODIES ON THE OUTSIDE OF THEIR INTERFACE; METHODS OF PRODUCING ASSEMBLIES WITH SUCH MATERIAL; ASSEMBLIES THUS OBTAINED

Jean-Louis Tournier, Riom, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Division of Ser. No. 503,757, Jun. 13, 1983, Pat. No. 4,578,421.

This application Nov. 18, 1985, Ser. No. 799,126

Claims priority, application France, Jul. 2, 1982, 82 11800

Int. Cl.⁴ B29C *17/00*

U.S. Cl. 156—285 **7 Claims**

1. A method of producing an assembly comprising at least two bodies, at least one of the bodies being deformable, which consists in arranging one face of one of the bodies against one face of the other body and then applying a material intended to form a joint between the bodies over at least a part of the outside of their interface which is thus obtained, the assembly

thus produced being intended thereupon to be cured after formation of the joint within a heated enclosure containing a fluid under pressure in such a manner that upon this curing the assembly is directly in contact with the fluid and the bodies adhere to each other, characterized by the following features:

(a) the faces are arranged against each other in such a manner that there are imperfect contacts between them which are capable of favoring the channeling of gases towards the outside of the assembly;

(b) the material is a mixture comprising at least one solvent and at least one elastomer, said mixture having a Brookfield viscosity, measured at 20° C., of from 0.3 Pa.s to 700 Pa.s; this mixture has a volatile part which can be evaporated at 20° C., 1 bar, to yield a dry extract which is from 20% by weight to 80% by weight, based on the weight of the mixture; the dry extract of the mixture comprises an elastomer fraction at least 20% by weight of which elastomer fraction is formed of at least one unsaturated elastomer capable of cross-linking either at ambient temperature or by heating for a period of time of less than one minute;

(c) the quantity of material applied is selected in such a manner that the joint obtained after cross-linking of the at least one unsaturated elastomer has a thickness of from 0.1 mm to 1 mm in the portion thereof covering the outside of the interface.

4,634,489

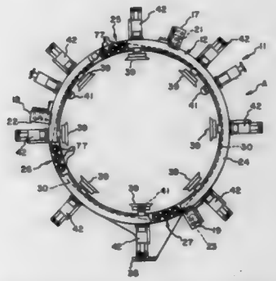
DEVICE FOR TRANSFERRING A TIRE CARCASS BAND

Jean M. Dupommier, Athus, Belgium, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 18, 1984, Ser. No. 632,144

Int. Cl.⁴ B29D *30/20, 30/08*

U.S. Cl. 156—403 **21 Claims**



1. A transfer device for transferring an uncured tire carcass of a substantially cylindrical shape from a carcass building station to a tire building station and comprising:

a hollow housing for receiving a tire carcass,

a first means attached to the housing to provide support for the outer cylindrical surface of the carcass, said first means supporting the carcass at least at each end portion and a mid portion thereof and around substantially the whole outer cylindrical surface at said portions, and

a second means attached to the housing and moveable solely in the radial direction with respect to the housing to hold at least one tire bead independently of and spaced radially outward from the carcass so that the carcass and tire bead so positioned can be simultaneously transferred from the carcass building station to the tire building station.

17. A transfer device for transferring an uncured tire carcass of a substantially cylindrical shape from a carcass building station to a tire building station and comprising:

a hollow cylindrical housing for receiving a carcass comprising a circular support frame, at least 3 struts equiangularly spaced around the support frame and each extending axially on each side of the support frame, and two circular end plates located on each side of the support frame to hold the ends of the struts in a circular way;

a first means for supporting the outer cylindrical surface of a carcass including frames attached to the housing;

a pair of second means, each of which holds a tire bead coaxially with and radially outward of a carcass supported within the housing; and

a support for each of said second means, said supports being adjustably mounted on the housing so that the axial location of each of the tire beads can be altered, said supports for the second means being slideably mounted on the struts and said first means frames also being slideably mounted on the struts.

4,634,490

METHOD OF MONITORING SINGLE CRYSTAL DUHING GROWTH

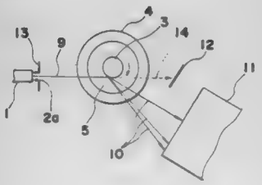
Masami Tatsumi; Shin-ichi Sawada, and Ryusuke Nakai, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 10, 1984, Ser. No. 679,895

Claims priority, application Japan, Dec. 16, 1983, 58-237669

Int. Cl.⁴ C30B *15/26*

U.S. Cl. 156—601 **4 Claims**



1. A method of monitoring growth of a single crystal which is pulled up from melted crystal material, being rotated at a predetermined speed which includes a step of passing an X-ray beam through a slit elongated in the horizontal direction with a small vertical width, a step of irradiating the slitted X-ray beam on the rising part of the pulled single crystal, a step of receiving white X-ray and characteristic X-ray diffracted by the crystal plane of the pulled up crystal by a monitoring means for displaying one or more patterns in a two dimensional area to show the crystal lattice structure of the growing crystal.

4,634,491

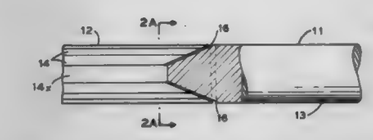
PROCESS FOR PRODUCING A SINGLE CRYSTAL ARTICLE

Raymond C. Benn, Huntington, W. Va., assignor to Inco Alloys International, Inc., Huntington, W. Va.

Filed Jun. 21, 1985, Ser. No. 747,225

Int. Cl.⁴ C30B *1/08*

U.S. Cl. 156—603 **5 Claims**



1. A process for producing a single crystal metallic object comprising establishing in a metallic object preform, having an object portion and discard portion, a coarsely columnar crystalline structure in said discard portion and a recrystallizable polycrystalline structure in said object portion, the longitudinal axes of the columnar crystals of said coarsely columnar crystal structure lying in a direction from said discard portion

toward said object portion, cutting said preform to establish a relatively centrally-located one of said columnar crystals of suitable orientation as the sole continuous metallic connection between said object portion and said discard portion, the angle of cut being at least about 135° measured with reference to the axis of said one columnar crystal from the discard portion, thereafter zone annealing said cut object preform the epitaxially grow said one columnar crystal into said object portion at the expense of the crystals of said recrystallizable polycrystalline structure, said zone annealing being characterized by relative motion between said object preform and a localized, steep gradient thermal energy source so controlled and modified as to at least for an initial portion of said zone annealing, provide a higher annealing temperature at or near the location of said growing single columnar crystal than at the exterior of said preform and discarding said discard portion of said preform to thereby provide a single crystal metallic object of controlled crystallographic orientation.

4,634,492

CHRYSOBERYL SINGLE CRYSTAL AND METHOD OF PRODUCING THE SAME

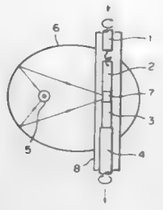
Hitoshi Oguri, Funabashi, and Motoya Hirota, Narashino, both of Japan, assignors to Sumitomo Cement Co., Ltd., Tokyo, Japan

PCT No. PCT/JP83/00227, § 371 Date Apr. 26, 1984, § 102(e) Date Apr. 26, 1984, PCT Pub. No. WO85/00392, PCT Pub. Date Jan. 31, 1985

PCT Filed Jul. 14, 1983, Ser. No. 608,692

Int. Cl.⁴ C30B *13/22, 29/20, 29/22*

U.S. Cl. 156—605 **6 Claims**



1. A method for producing a chrysoberyl single crystal displaying a luminous band effect, comprising the steps of:

(a) mixing a principal component consisting of nearly equimolar amounts of beryllium oxide and aluminum oxide with titanium (III) oxide and a coloring metallic oxide material consisting essentially of at least one member selected from the group consisting of iron oxide, chromium oxide and vanadium oxide, the amount of titanium oxide being 0.1 to 2.0 mole % of the amount of the principal component, and the amount of metallic oxide material being 0.2 to 3.0 mole % for iron oxide, 0.2 to 2.0 mole % for chromium oxide and 0.2 to 3.0 mole % for vanadium oxide based on the amount of the principal component;

(b) compression-shaping the resultant mixture in a mold to form a compressed bar-shaped body of the mixture;

(c) sintering the compressed bar-shaped body of the mixture in a non-oxidizing atmosphere to prepare a raw material bar;

(d) heating the raw material bar in a non-oxidizing atmosphere by means of a condense-heating type floating zone method at a temperature at which a chrysoberyl single crystal containing trivalent titanium solid-dissolved therein grows; and

(e) heat-treating the chrysoberyl single crystal containing solid-dissolved trivalent titanium at a temperature of from 1200° C. to 1850° C. in air whereby the trivalent titanium is oxidized to quadrivalent titanium and resultant needle crystals of titanium (IV) oxide are precipitated and grow in one orientation in the chrysoberyl single crystal.

4,634,493

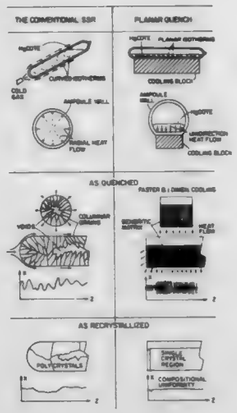
METHOD FOR MAKING SEMICONDUCTOR CRYSTALS

Christopher M. Devaney, Sutton; Robert J. Martineau, Marlboro; John L. Miles, Belmont, all of Mass., and Theodore T. S. Wong, Montgomeryville, Pa., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 24, 1983, Ser. No. 544,553

Int. Cl.⁴ C30B *21/02*

U.S. Cl. 156—616 R **14 Claims**



1. In a method of growing crystals of mercury cadmium telluride (MCT) in which MCT is melted within a sealed elongated ampoule having a wall, and thereafter solidified and subjected to a solid state recrystallization, the improvement comprising;

solidifying said MCT while

maintaining said ampoule in a substantially horizontal position

maintaining heat-transfer contact between at least a portion of the liquid-containing segments of the ampoule wall and a non-volatile heat sink external to said ampolue and

removing heat from portions of said ampoule in contact with said heat sink.

4,634,494

ETCHING OF A PHOSPHOSILICATE GLASS FILM SELECTIVELY IMPLANTED WITH BORON

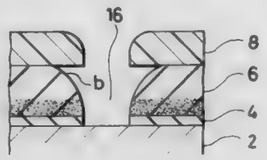
Satoru Taji, Toyonaka; Norio Yoshida, Nishinomiya, and Tetsuo Hikawa, Takarazuka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 760,135

Claims priority, application Japan, Jul. 31, 1984, 59-161912

Int. Cl.⁴ B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—628 **14 Claims**



1. A process for forming a hole in a phosphosilicate glass film formed on an underlying structure, comprising the steps of:

introducing ions of selected material into said phosphosilicate glass film so as to define a desired concentration profile of said ions in said film, said ions of selected material causing to lower an etch rate of said phosphosilicate glass film when introduced therein;

forming a mask having a desired pattern on said phosphosilicate glass film; and

etching said phosphosilicate glass film to define a hole therein using the pattern of said mask.

4,634,495

DRY ETCHING PROCESS

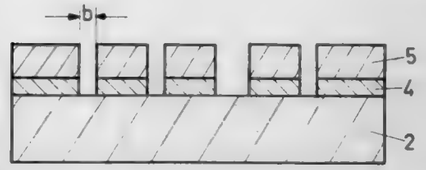
Jens Gobrecht, Gebenstorf, and Marco Rossinelli, Fislisbach, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Apr. 26, 1985, Ser. No. 727,429

Claims priority, application Switzerland, May 4, 1984, 2174/84

Int. Cl.⁴ H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—643 **12 Claims**



1. A dry etching process for patterning a substrate (2), which comprises

depositing an Al_2O_3 layer as an inorganic etching mask (4) on a substrate (2), wherein said layer is deposited on said substrate (2) as a solution dissolved in an organic compound by dipping the substrate (2) in the solution or by spinning the solution onto the substrate (2), and

patterning said substrate by exposing predetermined areas of said etching mask (4) and the surface of aaid substrate (2), and removing the material of said substrate in said predetermined areas by an ion etching process, wherein said ion etching process is carried out in a fluorine-containing plasma.

4,634,496

METHOD FOR PLANARIZING THE SURFACE OF AN INTERLAYER INSULATING FILM IN A SEMICONDUCTOR DEVICE

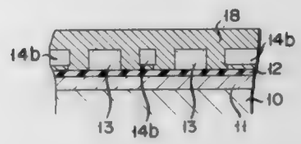
Yasukazu Mase, Tokyo; Masahiro Abe, Yokohama, and Masaharu Aoyama, Fujisawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 14, 1985, Ser. No. 797,986

Claims priority, application Japan, Nov. 15, 1984, 59-239560

Int. Cl.⁴ B44C *1/22*; C03C *15/00, 25/06*; B29C *17/08*

U.S. Cl. 156—643 **5 Claims**



1. A method for planarizing a layer-to-layer insulating film, comprising the steps of:

(a) forming a first interconnection layer on an underlying insulating film such that the film overlies a semiconductor substrate;

(b) depositing a first insulating film of a predetermined thickness on the resultant structure to cover at least the first interconnection layer;

(c) depositing a second insulating film on the first insulating film differing in etching properties from the second insulating film;

(d) depositing a resist layer on the second insulating film;

(e) removing the resist layer by an etching step to expose a top surface of the second insulating film and forming a resist mask covering a portion of the second insulating film which is located between said first interconnection layer and an adjacent first interconnection layer;

(f) effecting such an anisotropic etching as to permit the second insulating film to be selectively etched with the first insulating film as an etching stopper, while leaving only that portion of the second insulating film which is located beneath the resist mask;

(g) removing the first insulating film and resist mask to expose the underlying insulating film, first interconnection layer and second insulating film portion; and

(h) depositing a third insulating film on the resultant structure to a depth at which the surface of the third insulating film becomes flat.

4,634,497

METHOD AND APPARATUS FOR DECOMPOSING SEMICONDUCTOR THIN FILM

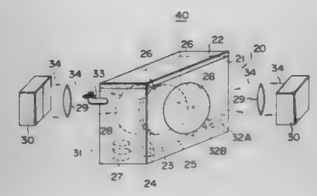
Ayako Shimazaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 10, 1985, Ser. No. 732,618

Claims priority, application Japan, Jun. 22, 1984, 59-128754

Int. Cl.⁴ B44C *1/22*; C03C *15/00, 25/06*; H01L *21/306*

U.S. Cl. 156—646 **21 Claims**



1. A method of decomposing a semiconductor thin film, comprising:

a first step of filling a treating vessel with a prescribed gaseous atmosphere;

a second step of forming a desired semiconductor thin film on a semiconductor substrate housed in said treating vessel; and

a third step of decomposing into liquid the semiconductor thin film formed on the substrate within said treating vessel and subsequently recovering the decomposed liquid material.

4,634,498

METHOD FOR THE PRODUCTION OF HIGH DENSITY FIBERBOARD

Dennis L. Hardesty, Wheeling; Timothy D. Hanna, Arlington Heights, both of Ill.; Frank J. Wendt, Kenosha, Wis., and Kendall D. White, Jr., Palatine, Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Dec. 31, 1984, Ser. No. 688,168

Int. Cl.⁴ D21B *1/16*

U.S. Cl. 162—13 **8 Claims**

1. A process for making wood fiberboard of the type in which:

(1) a wood fiber source material is fibrillated into fibers,

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(2) the fibers are interfelted into a loose mat,
(3) the mat is lightly roll compressed,
(4) and the mat is dried and finished to form a fiberboard product of at least about ¼th inch thickness, characterized by the improvement of the steps: consisting essentially of:
mechanically fibrillating raw wood chips with essentially simultaneous addition of a highly alkaline aqueous solution sufficient to form an aqueous slurry having a pH of at least about pH 12, fibrillating said wood chips at a temperature below the boiling point of said aqueous slurry and imparting an about at least three-fold increase in the zeta potential of fibers from the fiber source material, whereby densities greater than about 20 pounds per cubic foot and strengths greater than 500 psi modulus of rupture are obtained.

4,634,499

SULFITE PROCESS FOR MAKING PULP HAVING A TACTILE SOFTNESS FROM HARDWOOD CHIPS

Robert S. Ampulski, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 490,926, May 2, 1983, abandoned. This application Aug. 14, 1985, Ser. No. 766,063
Int. Cl.⁴ D21C *3/06*
U.S. Cl. 162—84 **10 Claims**

1. A process for making pulp from hardwood having a tactile sense of softness comprising the steps of:
a. Providing hardwood chips having dimensions of from about 0.6 to about 2.5 centimeter;
b. Introducing said chips into a digester;
c. Removing substantially all the free oxygen from said chips;
d. Providing a cooking liquor comprising from about 0.4% to about 3% by weight ammonia and from about 9% to about 14% by weight sulfur dioxide;
e. Reacting the lignin in said chips by maintaining the temperature within said digester at less than about 110° C. to form lignin products, wherein said chips are reacted under substantially oxygen-free conditions and substantially all of said chips are immersed in said cooking liquor;
f. Increasing the temperature within said digester to from about 140° C. to about 155° C. at a rate of from about 0.75° C. per minute to about 3° C. per minute under substantially oxygen-free conditions;
g. Hydrolyzing said lignin reaction products at a temperature of from about 140° C. to 155° C. at a pH of from about 2 to about 3;
h. Decreasing rapidly the temperature within said digester; and wherein subsequent to step h, said pulp has a xylan content of between 6% and about 8% by weight on a dry pulp basis, a xylan to mannan weight ratio of between 2.5 and about 3.7 and a glucan content of between about 80% to 92%.

4,634,500

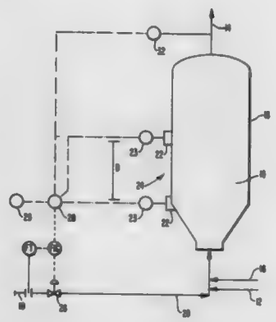
METHOD OF QUENCHING HEATED COKE TO LIMIT COKE DRUM STRESS

John D. Elliott, Randolph, and Steven P. King, Succasunna, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jul. 15, 1985, Ser. No. 754,783
Int. Cl.⁴ C10B *39/04, 39/06*
U.S. Cl. 201—39 **17 Claims**

1. A method of quenching heated coke in a coke drum, having a coke drum wall comprising the steps of:
(a) feeding quench water into the coke drum to cool the coke;
(b) measuring a longitudinal thermal temperature gradient along the coke drum wall during the feeding of the quench water into the coke drum;
(c) comparing the longitudinal thermal temperature gradient measurements with a predetermined gradient parameter for the coke drum; and
(d) regulating the rate of feeding quench water into the coke drum as a function of the comparison of the measured longitudinal thermal temperature gradient with the predetermined gradient parameter to minimize stress in the coke drum wall.

8. A method of quenching heated coke in a coke drum having a coke drum wall comprising the steps of:
(a) feeding quench water into the coke drum to cool the coke;



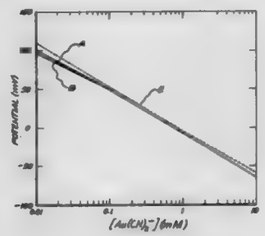
(b) measuring a rate of change in the coke drum wall temperature over time during the feeding of the quench water into the coke drum;
(c) comparing said rate of change in the coke drum wall temperature with a predetermined temperature rate parameter for the coke drum; and
(d) regulating the rate of feeding quench water into the coke drum as a function of the comparison of the rate of change in the measured coke drum wall temperature with the predetermined temperature rate parameter to minimize stress in the coke drum wall.

4,634,501

ARTICLE AND METHOD FOR DETERMINING THE CONCENTRATION OF METAL IONIC COMPLEXES IN A SOLUTION

Oliver H. LeBlanc, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 29, 1986, Ser. No. 857,217
Int. Cl.⁴ G01N *27/30, 27/58*
U.S. Cl. 204—1 T **8 Claims**



1. A semipermeable membrane for determining the concentration of dicyanoaurate anions in a solution, said membrane comprising an organopolysiloxane-polycarbonate block copolymer film permeable to dicyanoaurate anions and a complexed salt of the dicyanoaurate anion, said block copolymer having a dielectric constant of from about 4 to about 13.

7. A method for determining the concentration of dicyanoaurate anions in an aqueous solution, said method comprising measuring the potential between a first electrode in contact with a first solution having an unknown concentration of dicyanoaurate anions and a second electrode in contact with a reference solution having a known concentration of dicyanoaurate anions, said solutions each having a pH between about 4 and 11 and separated by a membrane comprising an organopolysiloxane-polycarbonate block copolymer film permeable to dicyanoaurate anions and a complexed salt of the dicyanoaurate anion, said block copolymer having a dielectric constant of from about 4 to about 13.

8. A device for determining the concentration of dicyanoaurate anions in a sample solution containing an unknown concentration of dicyanoaurate anions and having a pH between about 4 and 11, said device comprising a reference electrode immersed in a reference solution containing a known concentration of dicyanoaurate anions and a second electrode adapted to be immersed in said sample solution, said reference solution having a pH between about 4 and 11, and further comprising a semipermeable membrane adapted to separate said reference solution from said sample solution, said membrane formed from an organopolysiloxane-polycarbonate block copolymer film permeable to dicyanoaurate anions and a complexed salt of the dicyanoaurate anion, said block copolymer having a dielectric constant of from about 4 to about 13, and means present to connect said electrodes by an external circuit, including potential measuring means.

4,634,502

PROCESS FOR THE REDUCTIVE DEPOSITION OF POLYOXOMETALLATES

James L. Callahan, Norwich, N.Y.; Michael J. Desmond, Cleveland Heights, and Marc A. Pepera, Northfield Center, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 667,843, Nov. 2, 1984, abandoned. This application Aug. 26, 1985, Ser. No. 769,557
Int. Cl.⁴ C25D *3/00, 9/08, 13/02*
U.S. Cl. 204—23 **11 Claims**

1. A process for the reductive deposition of polyoxometallate complexes on supports comprising the steps of:
forming a solution of at least one polyoxometallate compound in a solvent, said compound having the formula

$$A_a(L_lM_mJ_zO_y)$$

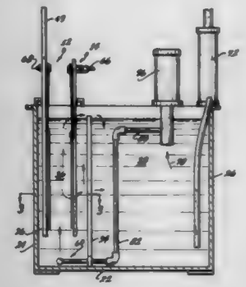
wherein
A is at least one ion selected from the group consisting of hydrogen, one or more of the Group IA to VIIIA or Group IB to VIIB metals, one or more of the rare earth metals or actinides, ammonium, alkyl ammonium, alkyl phosphonium and alkyl arsonium, or a mixture of two or more thereof;
L is selected from the group consisting of hydrogen and one or more of the Group IIIB to VIIB elements;
M is at least one metal selected from the group consisting of one or more of the Group IA to IVA and VIIA to IIB metals, the rare earths and actinides;
J is at least one metal selected from the group consisting of one or more of the Group VA and VIA metals;
a is a number which when multiplied by the valence of A will result in balancing the charge on the complex within the parentheses;
l is a number ranging from zero to about 20;
m is a number ranging from zero to about 20;
z is a number ranging from about 1 to about 50; and
y is a number ranging from about 7 to about 150;
adding a quantity of a support material to said solution;
charging said solution containing said support material to an electrolytic cell in contact with the cathode thereof said cell having a separate compartment for the anode;
passing a current of from about 0.1 to about 500 mA/cm² of electrode area through said cell whereby said support material receives a deposit of a polyoxometallate wherein the average oxidation state of the metals therein has been reduced to a valence greater than zero; and
thereafter separating and recovering said support material carrying said reduced metallate complex.

4,634,503

IMMERSION ELECTROPLATING SYSTEM

Daniel Nogavich, 153 Redfield St., Newbury Park, Calif. 91320

Filed Jun. 27, 1984, Ser. No. 625,040
Int. Cl.⁴ C25D *17/00*
U.S. Cl. 204—27 **6 Claims**



1. A method for immersion electroplating of an object in a plating vat filled with electrolyte comprising:
forming a plating section and a reservoir section in the vat by disposing a baffle therein,
pumping electrolyte under pressure into the plating section at the bottom thereof through a linear distribution means disposed along a line at the bottom of the section and parallel to the baffle to thereby generate an upward flowing vertical stream of electrolyte from the distribution means, said electrolyte stream moving along a vertical plane extending from the linear distribution head upwardly through the plating section, while maintaining the vertical plane free of obstructions,
positioning a cathode electrode between said upward flowing stream and the baffle, and connecting the object to be plated to the cathode,
positioning an anode electrode on the other side of said of upward flowing stream,
passing electrolyte from the region of the stream over the entire surface of the object and around all sides thereof by forming an opening in the baffle approximately horizontally even with the middle of the object, through which opening the electrolyte flows to the reservoir section,
continuously pumping electrolyte from the reservoir section to the distribution means during plating while simultaneously applying a plating current.

4,634,504

PROCESS FOR THE ELECTRODEPOSITION OF METALS

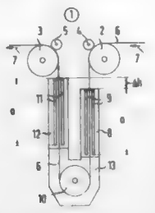
Werner Bechem, Hilchenbach; Hubertus Peters, Dortmund; Werner Solbach, Wallmenroth, and Dietrich Wolfhard, Dortmund, all of Fed. Rep. of Germany, assignors to Hoesch Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 670,408
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1983, 3340732
Int. Cl.⁴ C25D *5/08, 7/06*
U.S. Cl. 204—28 **8 Claims**

1. Process for the electrodeposition of a first metal onto a second metal strip from an aqueous electrolytic solution of a salt of said first metal contained in an electrolytic cell which cell also contains vertically disposed anodes in a feed section and in an exit section of said cell, wherein high relative flow velocities between the electrolytic solution and said strip and

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between the electrolytic solution and said anodes are maintained, the metal strip being introduced downwardly vertically into the electrolytic solution in said feed section, turned around in said cell and passed upwardly vertically in said exit section and out of said electrolytic cell, wherein the electrolytic solu-



tion is forced to flow counter current to the direction of the metal strip in said feed section and in said exit section, said electrolytic solution flow being obtained by a pressure increase due to a difference in height between the upper surface of the electrolytic solution in said exit section and the upper surface of the electrolytic solution in said feed section.

4,634,505

PROCESS AND BATH FOR THE ELECTROLYTIC DEPOSITION OF GOLD-TIN ALLOY COATINGS

Werner Kuhn, Rodenbach, and Wolfgang Zilske, Hanau, both of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany

Filed Feb. 26, 1986, Ser. No. 833,228

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1985, 3509367

Int. Cl.⁴ C25D *3/62*

U.S. Cl. 204—44.3 **19 Claims**

1. A bath suitable for the electrolytic deposition of gold/tin alloy coatings at a pH below 3 consisting essentially of (a) water, (b) 1 to 20 g/l gold in the form of at least one member of the group consisting of alkali and ammonium tetracyanoaurate (III), (c) 0.1 to 10 g/l tin in the form of tin (IV)-oxalato complex, (d) an acid, (e) a buffer or conducting salt or (a), (b), (c), (d), (e), and (f) 0.005 to 1 g/l of an additional alloying metal.

4,634,506

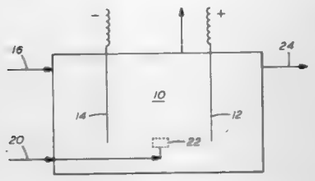
PROCESS FOR PREPARING OLEFIN OXIDES

Leo R. Novak, and Dennis J. Milligan, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 12, 1985, Ser. No. 764,683

Int. Cl.⁴ C25B *3/02*

U.S. Cl. 204—80 **23 Claims**



1. A process for preparing an olefin oxide in an electrolytic cell, comprising:

mixing aqueous electrolyte with an olefin at a pressure and temperature at which substantially all the olefin is in the liquid state;

reducing the pressure of the mixture to a pressure at which substantially all the olefin is vaporized;

flowing the mixture into the cell; and

effecting an electric current through the electrolyte.

4,634,507

PROCESS FOR THE PRODUCTION OF LEAD FROM SULPHIDE ORES

Eduardo D. Nogueira, Avda. del Mediterraneo 47, 28007 Madrid, and Enrique H. Tezanos, Aniceto Marinas 110, 28008 Madrid, both of Spain

Filed Oct. 3, 1985, Ser. No. 783,471

Int. Cl.⁴ C25C *1/14*

U.S. Cl. 204—118 **18 Claims**

1. A process for lead metal production from lead sulphide concentrates which comprises: leaching lead sulphide, together with their precious metal content, silver and gold, by oxidation with chlorine gas in a strong chloride solution containing sodium chloride and iron cations, or directly by a ferric chloride solution, at a temperature in the range of about 70° C. to 105° C., at a pH value in the range of from about 4.0 to 0.5, and in the presence of from about 0.5 grams per liter of ferric cation as a minimum; recovering lead, silver, and gold from the brine solution, after solid residue removal, by cementation with metallic zinc; recovering zinc chloride from the resulting brine solution by solvent extraction, stripping the extracted zinc chloride with hot water to produce a pure and concentrated aqueous solution of zinc chloride, feeding such zinc chloride solution, as loaded catholyte, to a membrane electrowinning cell, in which cathode and anode are separated by a cation exchange membrane, discharging metallic zinc on the cathode, which is recycled back for lead cementation, zinc being electrically replaced in the catholyte by sodium cations which are transferred from the anolyte through the membrane; sending the spent catholyte to a depletion unit, where the remainder zinc chloride content is removed by solvent extraction and recycled back to the cell catholyte feed, said spent catholyte comprising sodium chloride and zinc chloride in solution, said spent catholyte having the same chloride content as the incoming catholyte, with sodium cations having been substituted for the electrowon zinc, said sodium cations coming from the anolyte; feeding the resulting zinc free sodium chloride solution to the anodic compartment of the electrowinning cell, where chloride ions are discharged on the anode, producing chorine, and the equivalent sodium ions are transferred to the cathodic compartment through the cation exchange membrane, and reclaiming the chlorine produced at the anode for using it as the oxidizing agent in the previous leaching operation to oxidize lead sulphide into lead chloride and elemental sulphur.

4,634,508

PROCESS FOR COATING SHEARED EDGES OF METAL CAN LIDS

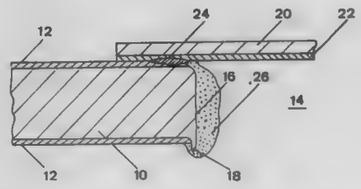
Zdenek Maly, and Erich Höfling, both of Kreuzlingen, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jun. 10, 1985, Ser. No. 742,902

Claims priority, application Switzerland, Jun. 18, 1984, 2946/84

Int. Cl.⁴ C25D *13/04, 13/06, 13/10, 13/12*

U.S. Cl. 204—181.6 **7 Claims**



1. A process for coating the sheared edges of openings for pouring or drinking stamped out in metal lids for beverage cans

wherein said sheared edges of openings are characterized by burrs, comprising applying a rectified voltage of 100–300 V for electrophoretically depositing modified lacquers containing a thixotropizing agent selected from the group consisting of large surface area silicon oxide, Bentonite and mixtures thereof and pigments selected from the group consisting of mica powder, titanium dioxide, calcium carbonate and mixtures thereof on the bare non-insulated regions of the sheared edges of the lids including the burrs wherein said modified lacquer has a solids content of 8–12 wt.%.

4,634,509

METHOD FOR PRODUCTION OF AQUEOUS QUATERNARY AMMONIUM HYDROXIDE SOLUTION

Shumpei Shimizu, Moses Lake, Wash.; Toshitsura Cho, and Osamu Yagi, both of Kawasaki, Japan, assignors to Tama Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1986, Ser. No. 822,073

Claims priority, application Japan, Jan. 25, 1985, 60-12109

Int. Cl.⁴ C25D *13/06*

U.S. Cl. 204—182.4 **5 Claims**

1. A method for the production of an aqueous quaternary ammonium hydroxide solution of high purity, comprising the steps of:

(1) preparing an aqueous solution of an inorganic acid salt of quaternary ammonium of high purity by reacting of trialkylamine with a dialkyl carbonate in an alcohol solvent; then removing the alcohol solvent, unreacted trialkylamine and unreacted dialkyl carbonate by distillation; and dissolving the resultant distillate in pure water to give an aqueous solution of an inorganic acid salt of quaternary ammonium of high purity, said inorganic acid salt consisting of at least one compound selected from the group consisting of ditetraalkyl ammonium carbonate and hydrogen tetraalkyl carbonate;

(2) electrolyzing said aqueous solution of the inorganic acid salt of quaternary ammonium of high purity in an electrolytic cell comprising an anode compartment, a cathode compartment and a cation-exchange membrane as a diaphragm under conditions wherein the aqueous solution of the inorganic acid salt of quaternary ammonium is circulated through the interior of the anode compartment at a retention time of not more than 60 seconds, thereby producing a solution of quaternay ammonium hydroxide of high purity.

4,634,510

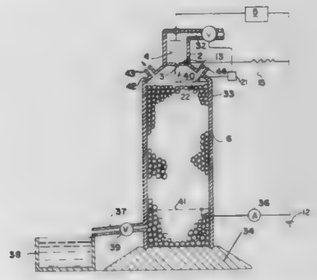
CLARIFYING A CONTAMINATED FLUID

Donald J. Mintz, Summit; Cornelius H. Brons, Washington, and Floyd E. Smith, East Windsor, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Apr. 17, 1984, Ser. No. 601,272

Int. Cl.⁴ B03C *5/02*

U.S. Cl. 204—188 **23 Claims**



1. A method for use in the separation of a contaminant from a fluid by producing migration of contaminant within the liquid, said method comprising the steps of:

(1) introducing into the contaminated liquid an additive which is selected so that it combines with the contaminant to form a dispersion suspended in the fluid;

(2) introducing free charge that is net unipolar into the liquid, at least predominantly by electron emission which causes the liquid to act as a medium through which volumetric distribution of the introduced charge takes place by charge motion relative to said liquid, there being a sufficient excess of free charge introduced such that the volumetric charge distribution causes an electric field to be induced in the liquid and the dispersion to become charged, and the induced electric field and the charge on the dispersed phase interact to produce an electrical driving force acting on the dispersion so that said migration of said contaminant, combined with said additive to form said dispersion, is due substantially to said driving force; and

(3) allowing the migrating dispersion to accumulate in a region within a body of said liquid.

4,634,511

DEVICE FOR ELECTROPOLISHING THE INNER SURFACE OF HOLLOW CYLINDRICAL BODIES

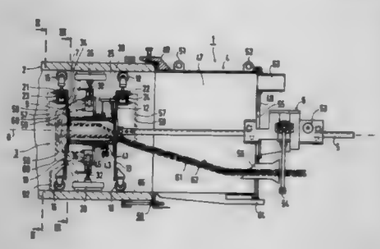
Hermann Operschall, Lauf; Klaus-Alfred Steiner, Erlangen, and Ludwig Voggenthaler, Regensburg, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Dec. 12, 1984, Ser. No. 681,107

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345278

Int. Cl.⁴ C25D *17/00*

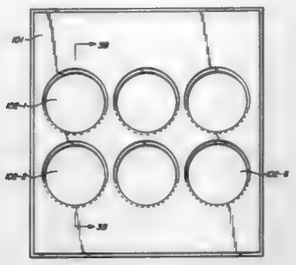
U.S. Cl. 204—212 **23 Claims**



1. Device for electropolishing the inner surface of a hollow cylindrical body with at least one sponge movable along the inner surface, as well as with devices for guiding the sponge and for supplying the sponge with electrolyte, comprising a chassis braced against the inner surface of the hollow cylindrical body and being movable along the axis of curvature of the hollow cylindrical body, a rigid housing for each of the sponges, respectively, and respective support elements supporting said rigid housing on the hollow cylindrical body, an annular seal surrounding the respective sponge, said annular seal having an inner and an outer peripheral edge and being in engagement at one of its edges with said rigid housing and at the other of its edges with the inner surface of the hollow cylindrical body, the sponge being carried by said chassis, being pressible against the inner surface of the hollow cylindrical body and being rotatable about the axis of curvature of the hollow cylindrical body, an upper seal connected to a pressure plate for pressing the respective sponge against the inner surface of the hollow cylindrical body, said upper seal together with the inner surface of the hollow cylindrical body and said annular seal located thereat forming a sealing system for a spatial region of said rigid housing wherein the respective sponge is located, a suction line for electrolyte connected to said spatial region of said rigid housing wherein said sponge is located.

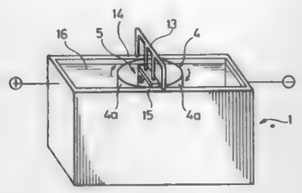
VOL 1074 ISS 1 JAN 6 1987 UMI

4,634,512
DISK AND PLUG
Ronald Allen, San Jose, and Tu Chen, Saratoga, both of Calif., assignors to Komag, Inc., Milpitas, Calif.
Continuation-in-part of Ser. No. 642,853, Aug. 21, 1984. This application Nov. 15, 1985, Ser. No. 798,554
Int. Cl.⁴ C23C *15/00*
U.S. Cl. 204—298 **16 Claims**



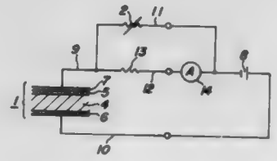
1. In combination, a circular flat computer disk having a central aperture and an aperture-closing plug, said plug comprising:
first and second imperforate plug portions;
each of said plug portions having a circular peripheral edge portion abutting said sealing-off entry to said disk central aperture at opposite sides of said disk;
means within at least one of said plug portions and extending within said disk central aperture for engaging the other of said plug portions for holding said plug portions together on opposite sides of said disk; and
means on a surface of each of said plug portions outward of said disk central aperture for grasping said plug portions to insert and pull said plug portions from said disk central aperture.

4,634,513
APPARATUS FOR RECOVERING FRACTIONATED SAMPLE FROM GEL
Jezro Asao, Tokyo, Japan, assignor to Funakoshi Pharmaceutical Co., Ltd., Tokyo, Japan
Filed Apr. 26, 1985, Ser. No. 727,504
Claims priority, application Japan, Jul. 28, 1984, 59-156515
Int. Cl.⁴ G01N *27/28*
U.S. Cl. 204—301 **4 Claims**



1. An apparatus for recovering an electrophoretically fractionated sample from a gel strip containing the same, which comprises:
a tank; a positive electrode and a negative electrode disposed inside said tank in spaced-apart relationship and adapted to be connected to the positive and negative terminals, respectively, of a direct current power source; a rotatable, cylindrical vessel disposed in said tank between and spaced from said electrodes, said vessel having a cylindrical sidewall made of a dialysis membrane; means for rotating said vessel with respect to said tank; and a stationary, reticulate support disposed within said vessel and spaced therefrom so that said reticulate support remains stationary when said vessel is rotated with respect to said tank, said reticulate support having a cavity for containing a gel strip containing a fractionated sample so that the gel strip remains stationary when said vessel is rotated with respect to said tank, whereby when the tank and the vessel are charged with a solvent solution, said vessel is rotated and direct current is flowed between said positive and negative electrodes, the fractionated sample is subjected to electrophoresis, is eluted into the solvent solution in the vessel and remains in the vessel.

4,634,514
ELECTROCHEMICAL APPARATUS AND METHOD OF MANUFACTURING THE SAME
Hitoshi Nishizawa, and Kazuyoshi Shibata, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan
Filed Feb. 7, 1986, Ser. No. 827,107
Claims priority, application Japan, Feb. 14, 1985, 60-26808; Feb. 23, 1985, 60-24181[U]; Feb. 23, 1985, 60-24182[U]
Int. Cl.⁴ G01N *27/58*
U.S. Cl. 204—406 **14 Claims**

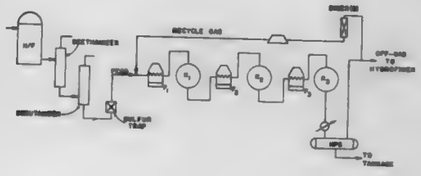


1. An electrochemical apparatus utilizing an electrochemical cell having a solid-electrolyte and at least one pair of porous electrodes arranged in contact with said solid-electrolyte, wherein one of said pair of electrodes is exposed through a diffusion means having a diffusion resistance to a gas to be measured to a space in which the gas to be measured is present, and an atmosphere near said one of the electrode is controlled by an electrode reaction due to a current flowing through said one pair of electrodes, comprising:
a first branch conductor and a second branch conductor formed by dividing one of conductors respectively connected to said electrodes and arranged connectably to an external power source;
at least one first resistive means formed in said first branch conductor, a resistive value of which can be arbitrarily adjusted; and
at least one second resistive means formed in said second branch conductor; whereby a predetermined current corresponding to a predetermined concentration of the gas to be measured flows through one of said first or second resistive means.

7. A method of manufacturing an electrochemical apparatus utilizing an electrochemical cell having a solid-electrolyte and at least one pair of porous electrodes arranged in contact with said solid-electrolyte, wherein one of said pair of electrodes is exposed through a diffusion means having a diffusion resistance to a gas to be measured in a space in which the gas to be measured is existent, and an atmosphere near said one of the electrodes is controlled by an electrode reaction due to a current flowing through said one pair of electrodes, comprising the steps of:
forming a first branch conductor and a second branch conductor by dividing one of conductors respectively connected to said electrodes;
forming at least one first resistive means in said first branch conductor, a resistive value of which can be arbitrarily adjusted;
forming at least one second resistive means in said second branch conductor; and

adjusting the resistive value of said first resistive means to a predetermined value so as to obtain a predetermined output in response to a component concentration of the gas to be measured from a current through one of said first branch conductor and second branch conductor.

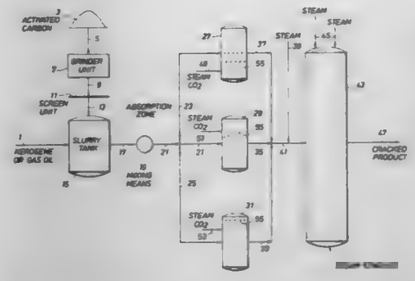
4,634,515
NICKEL ADSORBENT FOR SULFUR REMOVAL FROM HYDROCARBON FEEDS
George W. Bailey, and George A. Swan, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Oct. 25, 1985, Ser. No. 791,532
Int. Cl.⁴ C10G *25/00, 45/00, 67/06*
U.S. Cl. 208—91 **11 Claims**



1. In a process which includes in combination a hydrofiner, sulfur trap, and reforming unit,
said hydrofiner located upstream of the reforming unit, for hydrofining a sulfur-containing naphtha to remove a major portion of the sulfur,
said sulfur trap located downstream of said hydrofiner which contains a nickel catalyst constituted of from about 10 weight percent to about 70 weight percent nickel dispersed on a support, the low-sulfur naphtha from the hydrofiner being passed therethrough and contacted with the nickel catalyst to remove sulfur from the naphtha,
said reforming unit for reforming, with hydrogen, the low-sulfur naphtha from the hydrofiner and nickel-containing sulfur trap, the reforming unit containing a plurality of catalyst-containing on-stream reactors connected in series, the hydrogen and low-sulfur naphtha feed flowing from one reactor of the series to another to contact the catalyst contained therein at reforming conditions,
the improvement wherein the nickel catalyst contained in said sulfur trap is one wherein the average crystallite size of the nickel is greater than 92 Å and nickel surface area ranges between about 31 m^2/g and about 52 m^2/g, and at least 50 percent of the nickel is in reduced state, based on the total weight of the supported component.

4,634,516
SLURRY TREATMENT OF A GAS OIL OR KEROSENE FEED STOCK FOR A STEAM CRACKING PROCEDURE
Weston W. Haskell, and Danny Y. Ngan, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.
Filed Nov. 22, 1985, Ser. No. 800,850
Int. Cl.⁴ C10G *25/06, 55/04*
U.S. Cl. 208—91 **7 Claims**

1. A process for thermal steam cracking in the absence of a catalyst, in a steam cracking zone, of a gas oil having coke precursors contained therein to a hydrocarbon product having smaller molecules which comprises:
(a) passing said gas oil with said coke precursors therein and activated carbon particles to a slurry mix tank at a temperature of from about 10° C. to about 50° C. at slurry forming conditions, wherein said activated carbon particles are present in a particle size of from 4 mesh to about 50 mesh;
(b) slurrying said gas oil with said activated carbon for a period of time sufficient to transfer at least a portion of said coke precursors from said gas oil to said activated carbon;
(c) passing said slurry containing said gas oil of diminished coke precursor content and said activated carbon of enhanced coke precursor content to a separation zone for



the physcial separation of said gas oil from said activated carbon; and
(d) passing said separated gas oil to said steam cracking zone to crack said gas oil to said hydrocarbon product of smaller molecules in the absence of a catalyst at steam cracking conditions.

4,634,517
ZEOLITE CATALYST AND PROCESS FOR USING SAID CATALYST (C-1591)
Samuel J. Tauster, Englishtown; Angelo A. Montagna, Summit; John J. Steger, Pittstown; Shun C. Fung, Bridgewater, all of N.J., and Virginia R. Cross, Houston, Tex., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Division of Ser. No. 550,889, Nov. 10, 1983, Pat. No. 4,555,670. This application Mar. 10, 1986, Ser. No. 837,949
Int. Cl.⁴ C10G *35/06*
U.S. Cl. 208—138 **3 Claims**

1. A process for reforming naphtha which comprises (a) contacting the feedstock in the presence of hydrogen at elevated temperatures with a catalyst comprising a type L zeolite containing exchangeable cations of which at least 75 percent are selected from the group consisting of lithium, sodium, potassium, rubidium, cesium, calcium and barium cations and containing at least one Group VIII noble metal from the Periodic Table of Elements, characterized in that the particles of the noble metal prior to reduction thereof are well dispersed over the surface of the catalyst and at least about 90% of the noble metal prior to reduction thereof is dispersed in the form of particles having a diameter of less than about 7 Å, and (b) recovering the reformed product.

4,634,518
PLATINUM-BARIUM-TYPE L ZEOLITE
Waldeen C. Buss, Kensington, and Thomas R. Hughes, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.
Continuation-in-part of Ser. No. 344,570, Feb. 1, 1982, abandoned. This application Aug. 6, 1982, Ser. No. 405,837
Int. Cl.⁴ C10S *35/06*
U.S. Cl. 208—138 **42 Claims**

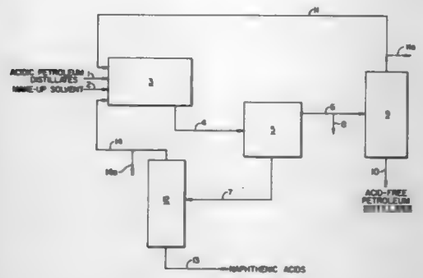
1. A method of reforming hydrocarbons comprising contacting said hydrocarbons with a catalyst comprising:
(a) a type L zeolite;
(b) at least one Group VIII metal; and
(c) an alkaline earth metal selected from the group consisting of barium, strontium and calcium.

12. A method of dehydrocyclizing acyclic hydrocarbons comprising contacting said hydrocarbons with a catalyst comprising:

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(a) a type L zeolite;
(b) at least one Group VIII metal; and
(c) an alkaline earth metal selected from the group consisting of barium, strontium and calcium.

4,634,519
PROCESS FOR REMOVING NAPHTHENIC ACIDS FROM PETROLEUM DISTILLATES
Mitchell Daazik, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed Jun. 11, 1985, Ser. No. 743,342
Int. Cl.⁴ B01J *19/02, 21/16*
U.S. Cl. 208—263 **14 Claims**



1. A liquid extraction process for removing naphthenic acids from naphthenic acid containing petroleum distillates boiling within the range of about 180°–600° C. and having an acid number of at least about 0.2 which process comprises the steps of:

(a) intimately contacting said petroleum distillates with a solvent consisting essentially of methanol, water, and about from 2–20 wt. % ammonia and having a methanol:-water ratio in the range of about from 0.2 to 3 parts by weight of methanol per part by weight of water and using an ammonia to petroleum distillate ratio of about 0.1–1 part by weight of ammonia per 100 parts by weight of said petroleum distillate, thereby selectively extracting said naphthenic acids into said solvent and yielding an immiscible two-phase liquid mixture, one of which is a naphthenic acid-rich solvent phase and the other of which is a substantially naphthenic acid-free petroleum distillate phase; and

(b) separating and respectively recovering said naphthenic acid-rich solvent phase and petroleum distillate phase.

12. A liquid extraction process for removing naphthenic acids from naphthenic acid containing petroleum distillates having an acid number of at least about 0.2 which process comprises the steps of:

(a) intimately contacting said petroleum distillates with a solvent consisting essentially of methanol, water, and about from 2–20 wt. % ammonia and having a ratio of methanol to water in the range of about from 0.3 to 2 parts by weight of methanol per part by weight of water using a solvent to petroleum distillates ratio in the range of about 0.025–0.1 volumes of solvent per volume of distillate and a solvent ammonia to petroleum distillate ratio of about 0.25–0.3 parts by weight of ammonia per part by weight of petroleum distillates, thereby selectively extracting said naphthenic acids into said solvent yielding a mixture comprising a naphthenic acid-rich solvent phase and a substantially naphthenic acid-free petroleum distillate phase;

(b) allowing said solvent phase and said petroleum distillate phase to settle into two distinct immiscible liquid-liquid phases and separating said phases; and

(c) evaporating the separated solvent phase to remove solvent leaving a substantially pure naphthenic acid concentrate.

13. The process of claim 12 wherein said step (a) is conducted at temperatures in the range of about from 0 to 100° C.

4,634,520
DE-ASPHALTING HEAVY CRUDE OIL AND HEAVY CRUDE OIL/WATER EMULSIONS
Georgi Angelov, Don Mills, and Paul W. M. Shibley, Oshawa, both of Canada, assignors to Bitumen Development Corporation Limited, Toronto, Canada
Filed Oct. 22, 1984, Ser. No. 663,298
Claims priority, application United Kingdom, Nov. 4, 1983, 8329570; Dec. 19, 1983, 8333712
Int. Cl.⁴ C10G *33/00, 33/04;* **B01D** *21/01*
U.S. Cl. 208—309 **10 Claims**

1. A process for the simultaneous de-emulsification and de-asphalting of heavy oil/water well head emulsions containing asphaltics which enables de-asphalted oil, asphaltics and emulsion water to be separately recovered, said process comprising:

mixing a heavy oil/water well head emulsion with a solvent to cause the emulsion to be broken with consequent dissolution of oil by the solvent and coalescence of emulsion water and asphaltics as fast settling particles, said solvent comprising a light C_4 to C_7 paraffinic composition and the weight of solvent being from about 2 to about 5 times the weight of heavy oil, said fast settling particles each comprising a water droplet stabilized by a sheath of asphaltics,

separating the water/asphaltic particles from the bulk of the oil/solvent phase,

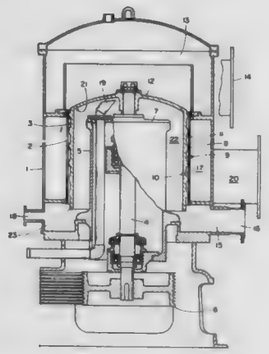
feeding the separated water/asphaltic particles and residual solvent into a hot water bath to produce relatively large stable asphaltic agglomerates with exclusion of emulsion water and with said residual solvent being flashed off,

recovering the flashed off solvent,

removing the asphaltic agglomerates from the hot water bath, and

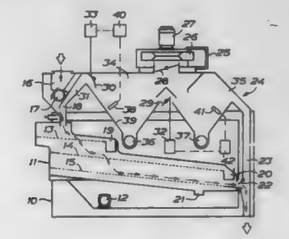
recovering de-asphalted oil from the oil/solvent phase.

4,634,521
SCREENING APPARATUS WITH LIGHT REJECT REMOVAL
Markku A. Simola, Karhula, and Vesa Haapoja, Pietarsaari, both of Finland, assignors to Ahlström Corp and Oy Wilh.-Schauman AB, both of Helsinki, Finland
PCT No. PCT/FI84/00074, § 371 Date Apr. 30, 1985, § 102(e) Date Apr. 30, 1985, PCT Pub. No. WO85/01967, PCT Pub. Date May 9, 1985
PCT Filed Oct. 11, 1984, Ser. No. 732,158
Claims priority, application Finland, Oct. 25, 1983, 833895
Int. Cl.⁴ B07B *1/20*
U.S. Cl. 209—17 **5 Claims**



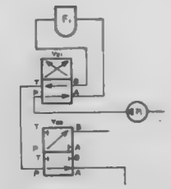
1. A screening apparatus for separating the accept from the reject and separating impurities of specific gravity lower than the average particles of the impurities in the reject, from the heavy reject, which comprises a vertical cylindrical screen (2); a rotor (3) concentrically disposed within the screen, said rotor having an outer surface (9) and a closed upper end (12), said upper end having an inner surface (21), said closed upper end and said outer surface defining a space (22) within the rotor, means to rotate the rotor, said screen having an inner surface (10), said outer surface (9) of the rotor and said inner surface of the screen defining a screening zone (11), an acceptor chamber (17) surrounding the outer surface of the screen; an inlet (14) for supplying the pulp to be screened into a feed chamber at the upper end of the screening zone; a reject chamber (15) connected to the lower end of the screening zone; and means for separating the heavy reject from the impurities of lower specific gravity from each other, which comprises a pipe (19) disposed within the rotor, the upper end of the pipe being located adjacent said inner surface (21) of said closed upper end (12) of the rotor, said reject collecting in the reject chamber.

4,634,522
ARRANGEMENT IN MACHINES FOR SEPARATING MATERIALS HAVING DIFFERENT AERODYNAMIC PROPERTIES
Thomas Edholm, Staffanstorp, and Ulf Stahl, Höllviksnäs, both of Sweden, assignors to Kamas Industri AB, Vellinge, Sweden
Continuation of Ser. No. 447,950, Dec. 8, 1982, abandoned. This application Aug. 28, 1985, Ser. No. 770,360
Claims priority, application Sweden, Dec. 10, 1981, 8107399
Int. Cl.⁴ B07B *11/04*
U.S. Cl. 209—154 **1 Claim**



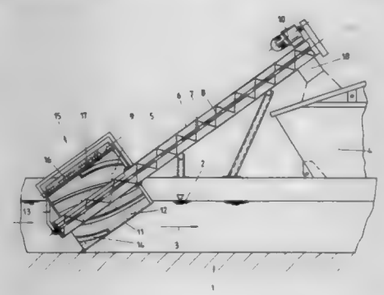
1. A machine for separating lighter and heavier materials based on their different aerodynamic properties comprising feed means for supplying materials for separation, a generally vertical passageway in communication with said feed means at one end, a hopper in communication with said passageway at its other end, said hopper having at least one generally vertically sloping wall located adjacent said other end of the passageway, means for generating an air current to draw a portion of said materials through said passageway into said hopper, throttle means located at said other end of the passageway adjacent to but separated from said sloping wall, sensor means located adjacent but separated from said wall and below said throttle means and in the path of said deflected airborne materials to generate electric signals in response to material impinging the sensor, said throttle means for controlling the flow rate of the air current, means for adjusting said throttle means, and a function circuit connected to the sensor to receive the signal generated by the sensor, said function circuit being operatively connected to said adjusting means for controlling the flow rate of the air current in response to said sensor signal corresponding to predetermined impingement intensity, said feed means operating independently of said sensor, a second hopper adjacent said first hopper, second means for controlling the flow rate of air current located between said hoppers, said second hopper having a pair of walls, one adjacent said second controlling means and the other distant therefrom, second sensor means for detecting impingements thereon and adjusting said second controlling means, said second sensor means being located adjacent said other wall of said second hopper, said other wall being generally vertically sloping.

4,634,523
FLUID SUPPLY DEVICE WITH PERIODICALLY POSITIVE AND REVERSE FLOW CLEANING CYCLE
Po-Chi Lin, No. 21, Lane 57, Fu-Der Road, Shyh-Lin, Taipei, Taiwan
Filed Mar. 19, 1985, Ser. No. 713,758
Int. Cl.⁴ B01D *23/24, 29/38*
U.S. Cl. 210—140 **11 Claims**



1. In a fluid supply system, wherein in its working mode a pump delivers fluid through a filter in one direction to a discharge outlet an improvement comprising a relief outlet and controlled valve means interposed between said pump and said discharge outlet and between the pump and the relief outlet, means for selectively controlling said controlled valve means (1) to effect delivery to fluid from said pump through said filter, in the one direction, and through said valve means to said discharge outlet in the working mode, (2) to effect passage of fluid from said pump through said filter, in a direction opposite to the one direction, and through the valve means to said relief outlet in reverse cleaning mode and (3) to effect passage of fluid from said pump through said filter, in the one direction, and through the valve means to said relief outlet in forward cleaning mode.

4,634,524
DEVICE FOR REMOVING SCREENED OR SIFTED MATERIAL FROM LIQUID FLOWING IN A GUTTER
Hans G. Huber, Berching, Fed. Rep. of Germany, assignor to Hans Huber GmbH, Berching, Fed. Rep. of Germany
Filed May 17, 1985, Ser. No. 735,342
Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420157
Int. Cl.⁴ B01D *33/00*
U.S. Cl. 210—158 **7 Claims**



1. A device for removing screened or sifted material from liquid flowing in a gutter, comprising: a sloping cylindrical grizzly mounted in the gutter and being partly immersed in the liquid, said grizzly having a face open upstream and closed downstream; a conveyor with a housing positioned coaxial to said grizzly, said conveyor leading to an ejection point outside

of the liquid; said conveyor having a powered shaft with a helix; said conveyor housing having an intake funnel for screened or sifted material in vicinity of said grizzly; a separator for the screened or sifted material positioned above said intake funnel; said grizzly being rotated; said separator being positioned stationary on the outside of sid grizzly to release screened or sifted material adhering to the inside of said grizzly.

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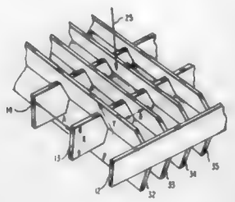
LOOSE PARTS FILTER

Howard W. Yant, Unity Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 4, 1984, Ser. No. 657,555

Int. Cl.[4] B01D *25/08, 35/02*

U.S. Cl. 210—171 **19 Claims**



1. Apparatus for removing debris of a predetermined size from a fluid flowing in an annular path, comprising a filter formed from an annular array of abutting arcuate-shaped filter sections, each section having a first face disposed transversely in the fluid path and a second face disposed substantially parallel to said first face and displaced therefrom in the direction of fluid flow, said first and second faces cooperating to define a plurality of apertures extending through said filter section of a size to preclude passage of the debris with a predetermined resistance to the fluid flow, the displacement of said second face from said first face defining a thickness of said filter section being sufficient for said filter section to resist deformation by the fluid flow without increasing said predetermined resistance to the fluid flow, and wherein said array of abutting, arcuate-shaped sections includes an inner portion and an outer portion in which the filter sections forming the outer portion are staggered with respect to the filter sections forming the inner portion in order to minimize the deformation of the annular filter array in response to thermal and mechanical loading.

4,634,526

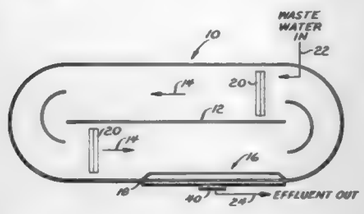
SIDEWALL MOUNTED CLARIFIER

Melvin R. Salkeld, Elgin; Wayne E. Langeland, Carol Stream, both of Ill., and Jerry L. Kennedy, Jeffersontown, Ky., assignors to Lakeside Equipment Corporation, Bartlett, Ill.

Filed Oct. 24, 1985, Ser. No. 780,676

Int. Cl.[4] B01D *21/00*

U.S. Cl. 210—194 **14 Claims**



1. A waste water treatment system comprising:

means defining a vessel having a closed loop flow path, a bottom, and at least one vessel wall;

means for introducing waste water to be treated into said vessel;

means for moving waste water within said vessel along said path;

means for introducing an oxygen containing medium into waste water within said vessel to promote oxidation of organic solids in the waste water;

a clarifier mounted on said vessel wall and within said vessel, said clarifier including a clarifier wall elongated in the direction of said flow path and relatively narrowly spaced from said vessel wall, and further extending from said bottom to a location above the intended level of waste water within said vessel, and additional walls on the upstream and downstream ends of said clarifier wall extending between the same and said clarifier wall so that said walls define an elongated, narrow clarifying chamber having an upper end and a substantially closed lower end, said substantially closed lower end providing isolation of the interior of said chamber from flow in said vessel to promote setting of organic solids;

baffle means within said chamber between said upper and lower ends;

an inlet for said chamber at or adjacent to said upstream end of said clarifier wall and at said lower end of said chamber; and

means at said upper end of said chamber for withdrawing clarified water therefrom at a rate such that organic solids in waste water within said chamber may settle therein.

4,634,527

FLUID FILTER ELEMENT WITH ANNULAR SEALING MEANS

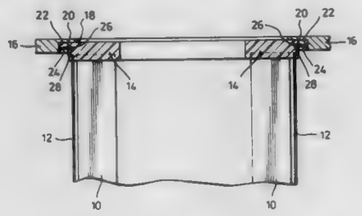
Dennis A. G. Marshall, Greets Cottage, Friday Street, Warnham, Near Horsham, Sussex, England

Continuation of Ser. No. 630,841, Jul. 13, 1984, abandoned. This application Mar. 25, 1986, Ser. No. 844,239

Claims priority, application United Kingdom, Jul. 15, 1983, 8319167

Int. Cl.[4] B01D *27/08, 35/30, 39/10*

U.S. Cl. 210—232 **12 Claims**



1. A fluid filter comprising, a holder and a fluid filter element received in said holder, said fluid filter element comprising an annular part and an annular sealing member separate from said annular part and of soft, flexible sealing material, said annular part having a diameter smaller than that of said holder and a groove in an external surface, an inner peripheral portion of said annular sealing member being received and rooted in said annular groove, said annular sealing member being substantially rectangular with a width greater than its thickness and having an outer peripheral portion with a diameter larger than that of said holder and projecting radially outward from said external surface and engaging an inner surface of said holder to form a seal between said inner surface and said annular sealing member.

4,634,528

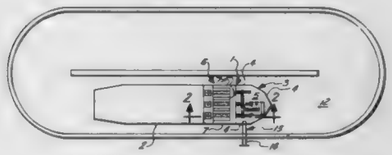
FILTER FOR INTRA-CHANNEL CLARIFICATION

Harold J. Beard, and Raleigh L. Cox, both of P.O. Box 3838, Baton Rouge, La. 70821

Filed Oct. 4, 1985, Ser. No. 784,154

Int. Cl.[4] B01D *23/24, 29/38, 33/16*

U.S. Cl. 210—277 **13 Claims**



1. A filter, comprising a means designed for reducing energy consumption and land use in conjunction with sewage treatment systems utilizing intra-channel clarification, including:

a. an enclosure, positionable within a channel and connectable to an intra-channel clarifier, and having a floor and sides;

b. a filter compartment fixed within said enclosure, having:

i. sides, either connected to or coincidental with said sides of said enclosure and segregating the interior of said filter compartment from the remainder of said enclosure;

ii. a porous medium support, fixedly connected to said sides of said enclosure and positioned within said filter compartment;

iii. a bottom, below said medium support and fixedly connected to said sides of said filter compartment;

iv. a filter medium, positioned within said filter compartment above said medium support;

v. a conduit, connecting between the interior of said filter compartment beneath said medium support and the interior of said enclosure;

c. a liquid dispersion means, positioned within said filter compartment above said filter medium, for receiving liquid from said intra-channel clarifier and dispensing said liquid over said filter medium; and

d. a liquid transfer means, connected to the interior of said enclosure, for transferring liquid out of said enclosure.

4,634,529

ROTATABLE DISC FILTER

Bjarne Nilsson, Nygatan 18C, 462 00 Vänersborg, Sweden

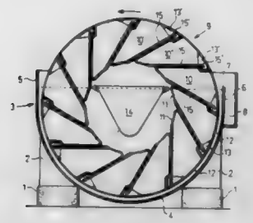
PCT No. PCT/SE84/00347, § 371 Date Aug. 12, 1985, § 102(e) Date Aug. 12, 1985, PCT Pub. No. WO85/01672, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 19, 1984, Ser. No. 752,177

Claims priority, application Sweden, Oct. 21, 1983, 8305817

Int. Cl.[4] B01D *33/26*

U.S. Cl. 210—331 **4 Claims**



1. Disc filter comprising a plurality of rotatable, axially spaced, annular filter discs (**9**), which are adapted to be partly submerged in a liquid or a suspension to be filtered, each disc consisting of a plurality of hollow filter elements (**10**), axial suction channels (**13**) arranged adjacent the circumference (**12**) of said discs (**9**) for withdrawal of filtrate and communicating with the interiors of said filter elements, a collecting funnel (**14**) extending through all of said discs to receive filtered out material falling therefrom, wherein said suction channels (**13**) are provided with backflow barriers (**15'**) for preventing the flow of liquid from said suction channels (**13**) radially inwards when the filter elements rise above the surface of said liquid.

4,634,530

CHEMICAL MODIFICATION OF PREFORMED POLYBENZIMIDAZOLE SEMIPERMEABLE MEMBRANE

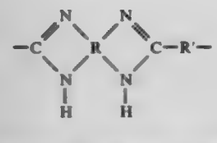
James E. Kuder, Fanwood, and John C. Chen, Westfield, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 192,150, Sep. 29, 1980, abandoned. This application Jul. 6, 1982, Ser. No. 395,648

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—500.23 **42 Claims**

1. A process for chemically modifying a preformed polybenzimidazole semipermeable membrane wherein said polybenzimidazole consists essentially of recurring units of the formula



wherein R is a tetravalent aromatic nucleus, with the nitrogen atoms forming the benzimidazole rings paired upon adjacent carbon atoms of said aromatic nucleus, and R' is selected from the group consisting of an aromatic ring; an alkylene group having from 4 to 8 carbon atoms; and a heterocyclic ring selected from the group consisting of pyridine, pyrazine, furan, quinoline, thiophene, and pyran; and wherein the chemically modified membrane exhibits improved separatory capabilities, said process comprising the steps of:

(a) sulfonating said membrane with the formation of ionic bonds by contacting said membrane at a temperature within the range of approximately 5° C. to 100° C. with a sulfonating agent selected from the group consisting of (i) sulfuric acid, (ii) a complex of SO_3 with a Lewis base or other organic compound, (iii) an acyl or alkyl sulfate, (iv) sulfamic acid, (v) a halosulfonic acid, (vi) an organic sulfonic acid, and (vii) mixtures of the foregoing; and

(b) heating said membrane in an inert atmosphere at a temperature and for a period of time sufficient to convert the ionic bonds formed in the sulfonating step (a) to permanent, covalent bonds, thereby providing a covalently bonded sulfonated polybenzimidazole semipermeable membrane.

16. The covalently bonded sulfonated polybenzimidazole semipermeable membrane produced by the process of claim **1**.

4,634,531

MEMBRANE TREATMENT METHOD FOR SEMIPERMEABLE MEMBRANES

Yukio Nakagawa, Kyoto; Katsufumi Oto, and Masaru Kurihara, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 563,796, Dec. 21, 1983, abandoned. This application Feb. 12, 1985, Ser. No. 700,331

Claims priority, application Japan, Dec. 24, 1982, 57-226382

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—639 **21 Claims**

1. A method for improving the selective permeability of a semipermeable membrane, comprising:

first contracting the membrane with a first water-soluble organic compound in feed water; and

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then contacting the membrane with a second water-soluble organic compound in feed water, said first and second compounds reacting to form a water-insoluble or very slightly water-soluble material.

4,634,532

ORTHOPHOSPHATE-CONTAINING DESALINATION SCALE INHIBITORS

Douglas P. Logan; Thomas E. Cornelius, III, and Susan P. Rey, all of Corsopolis, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 606,049, May 12, 1984, abandoned. This application Sep. 25, 1985, Ser. No. 780,044

Int. Cl.[4] C02F *5/10*

U.S. Cl. 210—697 **13 Claims**

1. A process for controlling the formation and deposition of seawater scale, including calcium carbonate, on heat transfer surfaces contacting seawater at a temperature of at least about 200° F. in thermal desalination plants, comprising adding to said seawater 0.1 to 100 ppm of (a) a water soluble source of orthophosphate selected from the group consisting of phosphoric acid, sodium orthophosphates, potassium orthophosphates, lithium orthophosphates and ammonium orthophosphates and (b) at least one water soluble component selected from the group consisting of:

(1) polymers of maleic acid or anhydride having a weight average molecular weight of less than 25,000;

(2) phosphonates selected from the group consisting of hydroxyethylidene diphosphonic acid and 2-phosphino-1,2,4-tricarboxybutane;

(3) polymers comprising:

(i) acrylic acid or methacrylic acid and

(ii) 2-acrylamido-2-methylpropyl sulfonic acid or 2-methacrylamido-2-methylpropyl sulfonic acid,

wherein said polymers comprising (i) and (ii) have a weight average molecular weight of less than about 66,000, and wherein the mole ratio of (i):(ii) ranges from about 98:2 to about 10:90; and

(4) polyacrylic acids having a weight average molecular weight of less than about 25,000;

wherein the weight ratio of component (a):component (b) ranges from about 0.1:1 to about 10:1 and wherein the pH of said water to be desalinated ranges from about 6.5 to about 9.5.

4,634,533

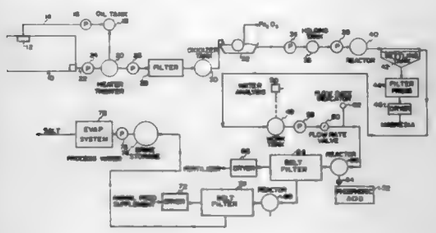
METHOD OF CONVERTING BRINES TO USEFUL PRODUCTS

Robert L. Somerville; Samuel F. Sweat, and John L. Sullivan, all of c/o Brine Extractions Systems Technology Co., 6100 Channingway Blvd., Ste. 701, Columbus, Ohio 43232

Filed Apr. 26, 1985, Ser. No. 727,804

Int. Cl.[4] C02F *1/52*

U.S. Cl. 210—722 **14 Claims**



1. A method for recovering useful products from a brine containing divalent ferrous, calcium, and magnesium ions comprising the steps of:

(a) adding a sufficient amount of oxidizing agent to said brine to convert said ferrous ions to ferric ions and form an iron oxide precipitate and removing said precipitate from said brine;

(b) adding a first alkaline agent comprising sodium hydroxide to said brine to adjust the pH of said brine to the range of 7.0 to 9.0 and removing a magnesium hydroxide precipitate from said brine;

(c) adding phosphoric acid in a substantially stoichiometric ratio to the divalent cations in said brine followed by the addition of a second alkaline agent comprising sodium hydroxide to form a calcium phosphate precipitate useful as an animal feed supplement or fertilizer; and

(d) separating said calcium phosphate precipitate from said brine.

4,634,534

MODULAR PLASTIC PACKING FOR THE BIOLOGICAL TREATMENT OF WASTE WATERS BY PEPCOLATION

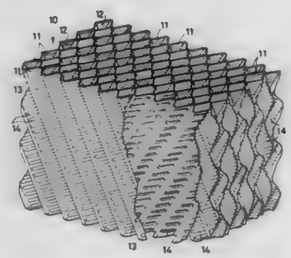
Gilberto Cominetta, Milan, and Claudio Oggionni, Cernusco Sul Naviglio, both of Italy, assignors to BS Smogless S.p.A., Milan, Italy

Filed Apr. 30, 1985, Ser. No. 728,945

Claims priority, application Italy, Sep. 21, 1984, 23267/84[U]

Int. Cl.[4] B01F *3/04*

U.S. Cl. 210—150 **4 Claims**



1. A modular packing for the biological treatment of waste waters by percolation comprising a plurality of adjacent undulating sheets each defining a plurality of adjacent generally parallel channels inclined relative to a support plane thereof, immediately opposing adjacent pairs of said undulating sheets being positioned with their opposing channels oppositely inclined and in generally crossing relationship to each other thereby effecting intersecting flow of fed liquors therebetween, each channel having a generatrix shaped as a generally flat elongated crest with the flat crests of each sheet being in parallel relationship to each other, each channel including a wall at each side of and generally parallel to each crest, a plurality of spaced generally flat bossages projecting from each of said walls, and said bossages being generally parallel to each other and to said support plane.

4,634,535

DRILLING MUD CLEANING METHOD AND APPARATUS

W. Gerald Lott, 1857 Post Oak Pk. Dr., Houston, Tex. 77027

Filed Mar. 25, 1985, Ser. No. 715,379

Int. Cl.[4] B01D *33/22, 36/00*

U.S. Cl. 210—780 **26 Claims**

10. In an integral and portable vibrating screen apparatus adapted to remove liquid and selected particulated solids from a mixture including pieces of larger size, the combination comprising:

(a) housing means adapted to be vibrated through cycles of a selected frequency and through a movement of selected pattern between an upper position and a lower position;

(b) a supporting screen frame mounted within said housing to be vibrated by said housing and supporting an elongate screen means at a selected angle from the horizontal, said screen means comprising:

(1) upright support means mounted on said frame in a spaced apart array across the area of said screen with each of said support means defining a curved support knob at its upper end;

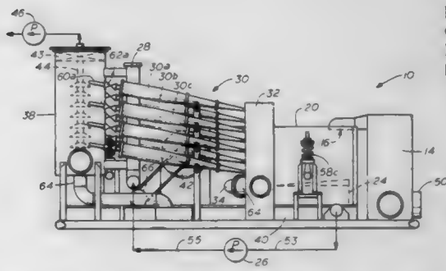
(2) an integrally formed elastomeric grid member mounted across the working area of said frame and vertically supported by said knobs.

(3) said grid member defining spaced apart first strands joined at substantially right angles to spaced apart second strands with a resilient, upwardly protruding stud formed at each intersection of said first strands and said second strands to form a spaced apart array of protruding studs;

(4) a woven metal screen of selected mesh per inch mounted across the working area of said grid member and vertically supported by said studs; and

(5) screen retainer means clamping coincident edges of said grid member and said screen together as an operating screen unit and retaining said operating unit in a condition of selected tension across the working area of said screen for said grid member to be vertically supported by said knobs and for said screen to be vertically supported by said studs;

(c) vibrator means for vibrating said screen means through said housing means and said screen frame to cause cyclic



vibration of said screen means through said cycles of said frequency and said movement;

(d) said vibrator means having means to modify the structure of said screen unit during a mud screening operation including:

(1) means draping said screen unit into a first curvature between said knobs beginning with the upward movement of each cycle of vibration as caused by the inertia of said screen unit and the mass of the mud slurry;

(2) means further draping said screen into a second curvature between said studs, beginning with said upward movement;

(3) said first curvature and said second curvature thereby changing the shape of each mesh opening of said screen during each cycle of said cycles;

(4) means flapping said screen unit beginning with the downward movement of each cycle of said vibration as caused by said inertia to thereby urge said mud slurry to part from said screen unit; said screen to part from said studs of said grid member; and said grid member to part from said knobs with said flapping resulting in the return of the initial shape of said openings; and

(5) means slapping said screen unit against said knobs and said screen against said studs and said mud slurry against said screen through the end of said downward movement, tending to impart a jarring action, and to thereafter repeat said draping action as upward movement begins.

4,634,536

SEPARATING SYSTEMS

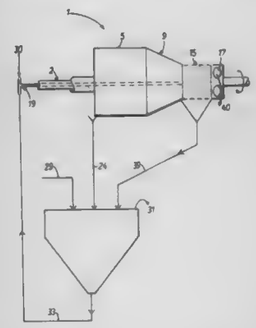
Geoffrey L. Grimwood, Holmfirth, and Geoffrey G. Brook, Huddersfield, both of England, assignors to Thomas Broadbent & Sons Limited, West Yorkshire, England

Filed Jun. 20, 1985, Ser. No. 747,153

Claims priority, application United Kingdom, Jun. 26, 1984, 8416220

Int. Cl.[4] B01D *45/12*

U.S. Cl. 210—781 **4 Claims**



1. A method comprising separating solid particles from the liquid constituent of a slurry, containing solids having a "wide" particle size distribution, that is, a size distribution wherein the equivalent diameter of particles in the slurry ranges between at least 15 mocrons and 150 mocrons in a screen bowl centrifuge by the steps of

(a) establishing a bed of solids on the screen section of the centrifuge whose maximum radial thickness is greater than 15 times the mean particle equivalent diameter of said solids in the slurry:

(b) operating the scroll of the centrifuge at a speed within the range of 0.5 to 10% of the bowl speed; and

(c) returning at least a portion of the solids contaminated centrate from the centrifuge, separately and remote from the slurry inlet to the centrifuge, to a point interior of the screen section of the bowl so as to deposit the centrate on the solids passing over the screen section at or adjacent a region of maximum solids thickness.

4,634,537

METHOD OF DEWATERING A SLUDGE SUSPENSION

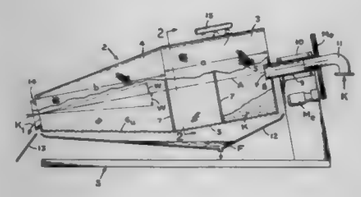
Helmut Schreiber, D 5905 Bottenberg, Fed. Rep. of Germany

Continuation of Ser. No. 173,278, Jul. 29, 1980, abandoned. This application Jan. 8, 1982, Ser. No. 338,154

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1979, 7921970[U]

Int. Cl.[4] B01D *33/10*

U.S. Cl. 210—784 **7 Claims**



1. A method of dewatering a sludge suspension to produce a sludge cake, said method comprising introducing a suspension of sludge solids in a liquid into the inlet end of a sieve drum having a perforated wall, separating liquid from the suspension

by passage of the liquid through said perforated wall while rotating the drum about an axis of rotation to provide substantially uniform peripheral velocity conditions at the perforated wall of the drum to form a dewatered cake within the drum in a first zone of relatively intense dewatering, axially advancing the now formed cake in said first zone on the rotating wall of the drum which is inclined downwardly at an acute angle with respect to the horizontal, the angle and rotation of the drum being conditioned on the sludge suspension to achieve formation of said cake and the intense dewatering in said first zone, continuing the axial advance of said now formed cake on the wall of the drum in a second zone of relatively gentle dewatering while gradually reducing the peripheral velocity of the wall in said second zone to reduce stresses in said cake and consequent damage to the flakes of the cake, and discharging said cake from an outlet end of the sieve drum, said cake being advanced along a substantially horizontal path in said second zone in which the peripheral velocity is being gradually reduced in relation to said cake to further minimize damage to said cake.

4,634,538

WATER SWELLABLE CLAY COMPOSITION AND METHOD TO MAINTAIN STABILITY IN SALT CONTAMINATED WATER

William Alexander, Naperville, Ill., assignor to American Colloid Company, Skokie, Ill.

Continuation of Ser. No. 640,680, Aug. 13, 1984, abandoned. This application Jun. 28, 1985, Ser. No. 749,663

Int. Cl.⁴ C09K *7/02;* **E02D** *3/12*

U.S. Cl. 252—8.514 **4 Claims**

1. A method of drilling comprising contacting an earthen formation with a rotary drilling bit to form a salt contaminated drill hole and circulating a drilling fluid in said drill hole to cool and lubricate said drill bit during rotation and to lift drill cuttings out of said drill hole, wherein the drilling fluid becomes contaminated with salt contaminated water, the improvement comprising adding a water swellable montmorillonite clay composition to said drilling fluid said composition comprising a water swellable montmorillonite clay, xanthan gum in an amount of 0.1% to 20% based on the weight of water swellable montmorillonite clay, and at least one other, water soluble gum selected from the group consisting of guar gum, dextran gum, locust bean gum, and mixtures thereof in an amount of 4.0% to 10% based on the weight of water swellable clay.

4,634,539

SCAVENGING OXYGEN FROM AQUEOUS SYSTEMS

Irwin Fox, 37 Meadowbrook Country Club Estates, Ballwin, Mo. 63011, and Alvin Samuels, 444 Fairway Dr., New Orleans, La. 70124

Filed Mar. 11, 1985, Ser. No. 710,132

Int. Cl.⁴ C09K *7/04*

U.S. Cl. 252—8.51 **9 Claims**

1. A composition comprising a mixture of (a) particulates of an oxygen-reactive, water-soluble sulfite and/or a bisulfite, and (b) iron oxide particles having a surface area of at least 3.5 m^2/g, a kinetic "K" value of at least 1000 and composed of an Fe_3O_4 crystalline phase, substantially free of crystalline Fe_2O_3, and an amorphous Fe_2O_3 moiety, said iron oxide being present in an amount sufficient to catalyze the reaction between said sulfite or bisulfite and oxygen in an aqueous system.

4,634,540

COMPOSITION AND METHOD FOR MODIFYING AND AUGMENTING RECOVERY OF HYDROCARBONS FROM HYDROCARBON-BEARING FORMATIONS

Richard C. Ropp, 138 Mountain Ave., Warren, N.J. 07060

Continuation-in-part of Ser. No. 220,062, Jan. 26, 1981, abandoned. This application Nov. 22, 1983, Ser. No. 553,885

Int. Cl.⁴ E21B *43/22*

U.S. Cl. 252—8.551 **35 Claims**

1. A composition having the capability of modifying hydrocarbons, said composition including a basic aqueous solution having a pH greater than about 9 said solution being formed of alkali metal silicate and finely divided silicon particles suspended in said solution.

4,634,541

COLOR STABILIZERS FOR ZINC DITHIOPHOSPHATES

Gunter Caspari, Wheaton, and Joseph J. Valcho, Naperville, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Jan. 28, 1985, Ser. No. 695,563

Int. Cl.⁴ C10M *137/14*

U.S. Cl. 252—32.7 E **11 Claims**

1. A process comprising incorporating in a metal salt of an ester of dithiophosphoric acid a small amount, sufficient to decrease the rate of color generation in the product, of a color stabilizer compound selected from the group consisting of hydrogen sulfide, an olefin of from 2 to 100 carbon atoms, a mercaptan of from 4 to 40 carbon atoms, and trialkylphosphines of the formula $R^1{}_3P$ where R^1 is an alkyl group of 1 to 20 carbon atoms, said small amount not being greater than about 1.0 (wt)% of the weight of said metal salt.

4,634,542

NOVEL INTERPOLYMER COMPLEXES OF SULFONATED OCTENE-1 COPOLYMER

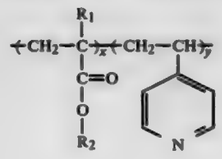
Ilan Duvdevani, Leonia; Joseph Wagensommer, Westfield, and Pawan K. Agarwal, Bridgewater, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Nov. 26, 1985, Ser. No. 801,948

Int. Cl.⁴ C10M *107/10, 107/12, 107/46*

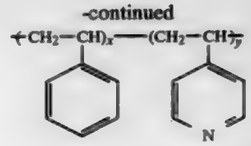
U.S. Cl. 252—47.5 **18 Claims**

1. A method for controlling the viscosity of organic liquids, said organic liquid having a solubility parameter of from about 6 to about 10.5, which comprises incorporating in said organic liquid a minor amount of a polymer complex, said complex being comprised of a sulfonated terpolymer of hexene-1/ethylene/ENB or a sulfonated terpolymer of octene-1/ethylene/ENB or a sulfonated copolymer of octene-1/ENB or a sulfonated copolymer of hexene-1/ENB, wherein said copolymer or said terpolymer contains about 1 to about 40 meq. of metal neutralized sulfonate groups per 100 grams of said copolymer or said terpolymer, said metal neutralized sulfonate groups contain a metal ion selected from the group consisting of Group IA, IIA, zinc, antimony, lead, copper, iron, nickel and cobalt of the Periodic Table of Elements and polymer B, containing basic nitrogen groups, said basic nitrogen groups being present at a level of from about 8 to 200 meq. per 100 g. of polymer B, wherein polymer B has the formula:



or

-continued



wherein R_1 is H or an alkyl group having about 1 to about 8 carbon atoms, R_2 is an alkyl group having about 1 to about 18 carbon atoms, x is about 50.0 to 99.8 mole percent and y is about 0.2 to about 50.0 mole percent wherein the weight ratio of said sulfonated co or terpolymer to polymer B is about 20/1 to about 1/20.

4,634,543

SHOCK ABSORBER FLUID COMPOSITION AND SHOCK ABSORBER CONTAINING SAID COMPOSITION

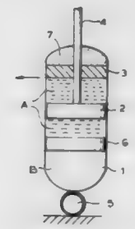
Tahei Okada, Ichihara, and Masahiko Takesue, Sodegaura, both of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 415,371, Sep. 7, 1982, abandoned. This application Apr. 8, 1985, Ser. No. 720,694

Claims priority, application Japan, Sep. 10, 1981, 56-142975

Int. Cl.⁴ C10M *129/00, 133/04, 137/04, 141/12*

U.S. Cl. 252—78.5 **20 Claims**



1. A fluid composition for use in a shock absorber, comprising:

(a) a lubricating base oil;

(b) 10 to 1,000 ppm, as calculated as boron, of at least one boron-containing compound selected from the group consisting of (i) a compound which is prepared by reacting an aliphatic acid and an amine compound to form an amide compound and then reacting the amide compound with a boron compound and (ii) a reaction product of a hydrocarbon-substituted succinic acid imide and a boron compound; and

(c) 100 to 3,000 ppm, as calculated as phosphorus, of a phosphoric acid ester, a phosphorus acid ester, a mixture thereof, a reaction product of the phosphoric acid ester and amine compound, a reaction product of the phosphorus acid ester and amine compound or a reaction product of the mixture and amine compound, said phosphoric acid ester being selected from the group consisting of butyl acid phosphate, 2-ethylhexyl acid phosphate, lauryl acid phosphate and oleic acid phosphate, and said phosphorus acid ester being selected from the group consisting of dibutyl hydrogenphosphite, dilauryl hydrogenphosphite, distearyl hydrogenphosphite, dioleyl hydrogenphosphite and diphenyl hydrogenphosphite.

4,634,544

DETERGENT COMPOSITION FOR COLORED FABRICS

Rudolf Weber, Duesseldorf; Winfried Pochandke, Baumberg; Hans Andree, Leichlingen, and Hermann Anzinger, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 1, 1985, Ser. No. 718,394

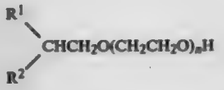
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1984, 3413292

Int. Cl.⁴ C11D *3/32, 7/18, 3/37*

U.S. Cl. 252—99 **18 Claims**

17. A liquid detergent composition for colored fabrics consisting essentially of:

(a) 7.5–12.5% of first alkyl polyglycol ethers of the formula



wherein:

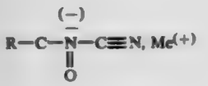
R^1 is a straight chain alkyl;

R^2 is a mixture of C_{1-4} alkyl derived from the alcohol of said first ether to a level of 20 to 75% by weight, and hydrogen at a level to balance to 100%; the total number of carbon atoms in R^1+R^2 being 11 to 13; and

n is 5 to 9 and selected so that the average ethylene oxide content of said first ether is 55 to 65% by weight based upon the total weight of said ether;

(b) 7.5–12.5% of a second alkyl polyglycol ether of the same formula as (a) in which R^1 is a C_{7-10}-straight chain alkyl, R^2 is hydrogen, and n is 3 to 8 and is selected so that the average ethylene oxide content of said second ether is 60–70% by weight based upon the total weight of said second ether;

(c) 3.0–5.0% of an acylcyanamide salt of the formula



wherein:

R is a C_{11-17} unsubstituted alkyl or alkenyl; and

Me is sodium;

(d) 1.0–6.0% of water-soluble synthetic polyethylene imines and/or polyamines, showing a strongly basic reaction in water;

(e) 1.0–6.0% of water-soluble polymeric reaction products of at least one of melamine, urea, dicyanodiamide or guanidine with formaldehyde;

(f) small amounts of at least one auxiliary ingredient comprising: redeposition inhibitors; bleaching compounds; bleach activators; foam regulators; enzymes; perfume oils; microbicides; or optical brighteners; and

(g) q.s. to 100% of water and/or organic solvents;

the percentages of (a) through (g) all being by weight based upon the total weight of said composition, and which composition contains from 0 to not more than 5% by weight strong electrolytes.

18. The composition of claim 17 wherein component:

(a) is (i):a C_{14-15} oxoalcohol ethoxylate containing on average 58% by weight of ethylene oxide;

(ii)a C_{10-12} fatty alcohol ethoxylate containing on average 60% by weight of ethylene oxide; or

(iii)a mixture of (i) and (ii);

(b) is:

(i) a tallow alcohol ethoxylate containing about 5 mols of ethylene oxide;

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(ii) a tallow alcohol ethoxylate containing about 14 mols of ethylene oxide; or
(iii) a mixture of (i) and (ii);
(c) is an acycyanamide sodium salt and R is derived from: tallow fatty acid; hydrogenated tallow fatty acid; stearic acid; or any mixture thereof;
(d) is a 25% aqueous solution of a polyamine showing a strongly basic reaction;
(e) is:
(i) a melamine:formaldehyde condensate with a mol ratio of 1:5;
(ii) a melamine:urea:formaldehyde condensate;
(iii) a dicyanodiamide:formaldehyde condensate;
(iv) condensates of adipic acid:polyethylene imine in a mol ratio of 1:1 and a molecular weight of 600 and/or 900; or
(v) a mixture of any of (i) to (iv);
(f) is:
(i) a redeposition inhibitor based upon carboxymethyl cellulose and methyl cellulose;
(ii) a sodium aluminosilicate of the zeolite NaA type;
(iii) ethylene diamine tetraacetic acid sodium salt;
(iv) 1-hydroxyethane-1,1-disphosphonic acid disodium salt;
(v) a soap which is a mixture of C_{16-22} long chain fatty acid salts;
(vi) technical sodium perborate tetrahydrate;
(vii) dimethyl distearylammonium chloride;
(viii) magnesium silicate;
(ix) sodium silicate of the formula $Na_20.3.35SiO_2$; or
(x) any mixture of (i) to (ix); and
(g) is: water and/or a solvent mixture of ethanol and 1,2-propylene glycol.

4,634,545
RAILROAD TRACK LUBRICANT
Peter L. Zaleski, and Stanley H. Gratt, both of Chicago, Ill., assignors to Superior Graphite Co., Chicago, Ill.
Filed Mar. 7, 1985, Ser. No. 709,170
Int. Cl.[4] C10M *125/02*
U.S. Cl. 252—29 **14 Claims**

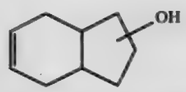
1. A method of lubricating a railroad track comprising the steps of:
dispersing together a mixture of at least approximately 30% by weight of powdered graphite having an average particle size of not larger than approximately 50 microns, and an oil-based carrier, to yield a viscosity of approximately 25,000 centipoise at standard temperature and pressure;
applying such dispersion to a railroad track; and
pressure fixing such dispersion upon the railroad track to form a film-like coating thereon.

4,634,546
PROCESS FOR THE INTERCALATION OF GRAPHITIC CARBON EMPLOYING FULLY HALOGENATED HYDROCARBONS
Ilmar L. Kalnin, Millington; Harris A. Goldberg, Colonia, and George J. Breckenridge, Jr., Clark, all of N.J., assignors to Celanese Corporation, New York, N.Y.
Filed Jul. 19, 1985, Ser. No. 756,528
Int. Cl.[4] H01B *1/04*
U.S. Cl. 252—506 **28 Claims**

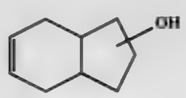
1. In a process for forming an intercalated electrically conducting composition comprising reacting graphite in a reaction zone under anhydrous conditions with:
(a) sulfur-containing reactant selected from the group consisting of fluorosulfonic acid, chlorosulfonic acid, and mixtures thereof, and
(b) a halide reactant selected from the group consisting of boron trihalide, a tetrahalide of a Group IV element, a pentahalide of a Group V element, and mixtures thereof;
the improvement of additionally providing in said reaction zone while at a temperature of a approximately 0° to 50° C. during at least a portion of said reaction a fully halogenated hydrocarbon having 1 to 4 carbon atoms which is capable of aiding the increase in the electrical conductivity of the graphite, wherein contact between said halide reactant (b) and said fully halogenated hydrocarbon for more than about 30 minutes prior to contact with said graphite is avoided, and wherein the molar ratios of reactant (a), reactant (b), and the fully halogenated hydrocarbon provided in the reaction zone are approximately 1:0.1:100 to 100:20:100.

4,634,547
ORGANOLEPTIC USES OF BICYCLONONENYL ALCOHOLS
Richard M. Boden, Ocean, and John R. Helm, East Keansburg, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.
Continuation-in-part of Ser. No. 763,569, Aug. 8, 1985, Pat. No. 4,608,194. This application Nov. 8, 1985, Ser. No. 796,430
Int. Cl.[4] A61K *7/46*
U.S. Cl. 252—522 R **4 Claims**

1. A process for augmenting or enhancing the aroma of a liquid perfume composition comprising the step of intimately admixing with said liquid perfume composition an aroma augmenting or enhancing quantity of a mixture of compounds, bicyclononenyl alcohols comprising alcohols defined according to the structure:

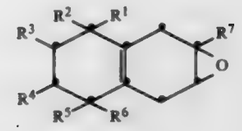


produced according to the process consisting essentially of the steps:
(i) forming a mixture of bicyclononene formates by reaction of bicyclononadiene with formic acid at reflux conditions for a period of time sufficient to produce a product containing greater than 80% bicyclononene formates, with the mole ratio of formic acid:bicyclononadiene varying between about 2:1 up to about 7:1 and then fractionally distilling the resulting product, the bicyclononene formates; and then
(ii) hydrolyzing the resulting bicyclononene formates using strong base wherein the mole ratio of hydroxyl ion:formates being between about 2:1 and about 1:1, the reaction temperature varying between about 40° C. and 60° C.; and
(iii) then neutralizing the resulting reaction mass and fractionally distilling the resulting product comprising the mixture of compounds defined according to the structure:



4,634,548
NOVEL BICYCLIC EPOXIDES AND COMPOSITIONS
Daniel Helmlinger, Gockhausen, and Mario Pesaro, Zurich, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.
Filed Jan. 9, 1984, Ser. No. 569,020
Claims priority, application Switzerland, Jan. 13, 1983, 158/83
Int. Cl.[4] A61K *7/46;* **C11B** *9/00*
U.S. Cl. 252—522 R **17 Claims**

8. A fragrance composition comprising an olfactorily effective amount of a compound of the formula



wherein:
R^1, R^2, R^5 and R^6 represent methyl, and
R^3, R^4 and R^7 represent hydrogen or methyl
and at least one other olfactory agent.

4,634,549
HAY FRAGRANCE
Marion D. Case, Rte. 3, Box 1462, Lake Geneva, Wis. 53147
Filed Sep. 30, 1985, Ser. No. 781,743
Int. Cl.[4] A61K *7/46;* **C11B** *9/00*
U.S. Cl. 252—522 R **19 Claims**

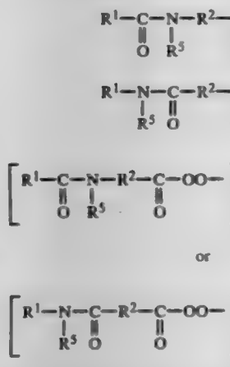
1. A method for isolating a hay fragrance from hay selected from the group consisting of alfalfa hay and clover hay comprising:
a. cutting said hay;
b. soaking said hay in at least one organic solvent selected from the group consisting of ethanol and isopropanol to form a liquid containing a hay fragrance, wherein up to about fifteen liters of said at least one organic solvent is used to soak each kilogram of said hay; and wherein said hay is soaked within 350 hours of said cutting of said hay;
c. recovering the said liquid containing a hay fragrance; and
d. using said liquid to add said hay fragrance to a product selected from the group consisting of toiletries, perfumes, aftershave lotions, cosmetics soaps, salves, powders, toothpaste, mouthwash, deodorants, shampoos, lotions, eau de toilette, eau de cologne, essences, washing agents, detergents, smoking articles, food stuffs, luxury consumables and drinks.

4,634,550
POUR DEPRESSANT
Nicholas Feldman, Woodbridge, and John W. Frankenfeld, Atlantic Highlands, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Oct. 7, 1985, Ser. No. 785,241
Int. Cl.[4] C10M *107/20*
U.S. Cl. 252—56 D **8 Claims**

1. A pour depressant for addition to a hydrocarbon oil comprising:
A. an asphaltene;
B. a copolymer of:
I. dibehenyl fumarate; and,
II. vinyl acetate; and,
C. a copolymer of:
I. ditallow fumarate; and
II. vinyl acetate wherein the weight ratio of asphaltene to the total weight of copolymers ranges between about 0.5:1 and about 25:1, and the molar ratio of the copolymer of dibehenyl fumarate and vinyl acetate to the copolymer of ditallow fumarate and vinyl acetate ranges between about 0.5:1 and about 1.5:1.

4,634,551
BLEACHING COMPOUNDS AND COMPOSITIONS COMPRISING FATTY PEROXYACIDS SALTS THEREOF AND PRECURSORS THEREFOR HAVING AMIDE MOIETIES IN THE FATTY CHAIN
Michael E. Burns, West Chester, Ohio, and Frederick E. Hardy, Newcastle upon Tyne, England, assignors to Procter & Gamble Company, Cincinnati, Ohio
Filed Jun. 3, 1985, Ser. No. 740,446
Int. Cl.[4] C11D *3/395, 7/38, 7/54*
U.S. Cl. 252—102 **25 Claims**

1. A compound which has the formula:



(A)

(B)

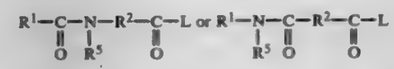
(C)

or

(D)

wherein R^1 is an alkyl, aryl or alkaryl group containing from about 1 to about 14 carbon atoms, R^2 is an alkylene, arylene or alkarylene group containing from about 1 to about 14 carbon atoms, R^5 is H or an alkyl, aryl or alkaryl group containing from about 1 to about 10 carbon atoms, X is a compatible anion, n is 1 or 2, and Y is from 0 to about 6.

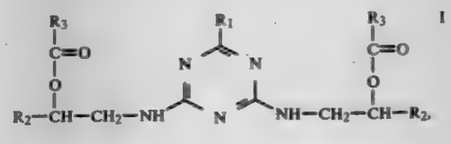
6. A bleach activator of the general formulas:



wherein R^1 is an alkyl, aryl or alkaryl group containing from about 1 to about 14 carbon atoms, R^2 is an alkylene, arlene or alkarylene group containing from about 1 to about 14 carbon atoms, and R^5 is H or an alkyl, aryl or alkaryl group containing from about 1 to about 10 carbon atoms, and L is a leaving group, the conjugate acid of which has a pKa in the range of from about 4 to about 13.

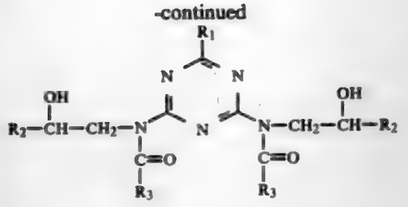
4,634,552
POLYMERIC DIAMINO TRIAZINE DISPERSING AGENT AND PREPARATION THEREOF
Giuseppe Canestri, Rastignano, Italy, assignor to Bergvik Kemi AB, Sweden
Filed May 2, 1985, Ser. No. 729,868
Int. Cl.[4] B01F *17/32, 17/34*
U.S. Cl. 252—356 **11 Claims**

1. A dispersing agent comprising compunds of the formulas

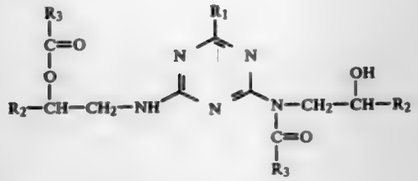


I

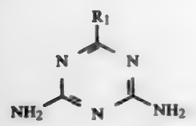
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II 

and

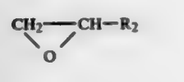
III 

wherein
R_1 is aryl or alkyl having 1–8 carbon atoms,
R_2 in a hydrocarbon radical optionally comprising one or more ether groups and having a molecular weight of less than 200, and
R_3 is a branched polyester chain residue, having a molecular weight of at least 1000, which polyester chain has been obtained by polymerization of a saturated or unsaturated monohydroxy monocarboxylic acid having 8–20 carbon atoms between the oxygen atoms,
which compounds are obtainable by reacting
a diamino triazone of the formula



VI

an oxiran containing compound of the formula



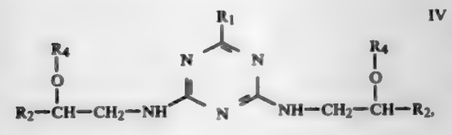
VII

and
a polymer chain of the formula

R_3—COOH VIII

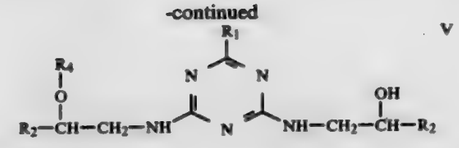
in which formulas R_1, R_2 and R_3 are as defined above, in stoichiometrically equivalent amounts.

8. A dispersing agent comprising compounds of the formulas

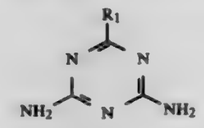
IV 

and

-continued

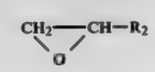
V 

wherein
R_1 is aryl or alkyl having 1–8 carbon atoms,
R_2 is a hydrocarbon radical optionally comprising one or more ether groups and having a molecular weight of less than 200, and
R_4 is a polymer chain residue, having a molecular weight of at least 1000, which polymer chain has been obtained by reacting a diol or a polyalkylene glycol with a polyester,
which compounds are obtainable by reacting
a diamino triazine of the formula



VI

an oxiran containing compound of the formula



VII

and
a polymer chain of the formula

R_4—CH IX

in which formulas R_1, R_2 and R_4 are as defined above, in stoichiometrically equivalent amounts.

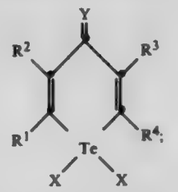
4,634,553

NOVEL 4H-TELLURIN TELLURANE ELECTRON-ACCEPTING SENSITIZERS FOR ELECTRON-DONATING PHOTOCONDUCTIVE COMPOSITIONS

Michael R. Detty, Rochester; Bruce J. Murray, Walworth, and Michael Scozzafava, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

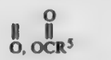
Filed Aug. 12, 1985, Ser. No. 764,469
Int. Cl.⁴ C07D *345/00*
U.S. Cl. 540—1 **8 Claims**

1. A compound having the structure



wherein
R^1 and R^4, each independently represent hydrogen, alkyl, trialkylsilyl, triarylsilyl, alkylarylsilyl, aryl and heteroaryl;
R^2 and R^3, each independently represent hydrogen; or
R^1 and R^2, or R^3 and R^4 taken together with the carbon atoms to which they are attached, form a 4 to 20 carbon atom mono- or polynuclear fused carbocyclic aromatic

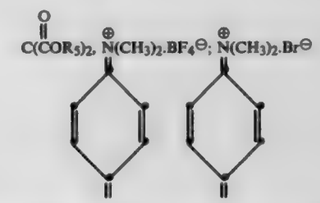
ring having at least one electron donating substituent meta to the carbon bearing the tellurium atom;



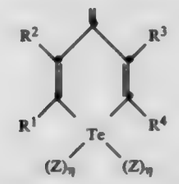
X represents F, Cl, Br, I, OH,



wherein R^5 represents alkyl or aryl;
Y represents O, S, C(CN)$_2$,



or a 4H-tellurin-4-ylidene group of the structure



wherein R^1, R^2, R^3 and R^4 are as above;
Z repreanets OH, or



and
η represents 0 or 1.

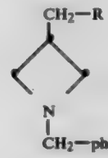
4,634,554

N-BENZYL,3-HYDROXYMETHYL AND 3-ALKANOYLOXYMETHYL AZETIDINE DERIVATIVES

Derek A. Wood, Sittingbourne, and Ronald F. Mason, Ashford, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 19, 1984, Ser. No. 662,752
Claims priority, application United Kingdom, Oct. 21, 1983, 8328253
Int. Cl.⁴ C07D *205/04*
U.S. Cl. 548—950 **2 Claims**

1. A compound of the formula



wherein R is hydroxy or alkanoyloxy of two to six carbon atoms.

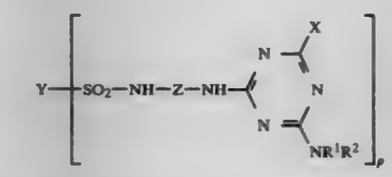
4,634,555

WATER-SOLUBLE COPPER PHTHALOCYANINE DYES FREE FROM CELLULOSE REACTIVE GROUPS

Anthony G. Baxter, Manchester; Stephen B. Bostock, Bury, and David Greenwood, Oldham, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Aug. 12, 1985, Ser. No. 764,998
Claims priority, application United Kingdom, Aug. 24, 1984, 8421358
Int. Cl.⁴ C09B *47/04*
U.S. Cl. 540—126 **4 Claims**

1. A water-soluble dye, free from cellulose reactive groups, of the formula:



wherein
R^1 is $—(C_aH_{2a}O)_m(C_bH_{2b}O)_nH$,
R^2 is H or $—(C_aH_{2a}O)_m(C_bH_{2b}O)_nH$, or
R^1 and R^2 together with the nitrogen atom form a morpholine ring
a and b are different and from 1 to 8
m is from 1 to 10;
n is from 0 to 9;
Y is the residue of a copper phthalocyanine sulphonic acid of the formula:
$CuPc(SO_3M)_q$
P is from 1 to 3
q is from 1 to 3
p+q is from 3 to 4
M is H, ammonium, or a monovalent metal;
X is NR^1R^2, OR^3, or NR^3R^4 in which R^3 is H or C_{1-4}-alkyl and R^4 is selected from H, C_{1-4}-alkyl, phenyl and naphthyl in which the phenyl and naphthyl are unsubstituted or substituted by a group selected from SO_3M, sulphonate, carboxylate, ureido, C_{1-4}-alkyl, C_{1-4}-alkoxy, mono- and di-alkylamino, aminosulphonyl, mono- and di-alkylaminosulphonyl, aminocarbonyl, mono- and di-alkylaminocarbonyl, phenylamino, C_{1-4}-alkylcarbonylamino, hydroxy, nitro, and halogen;
Z is selected from C_{2-6}-alkylene, cycloalkylene, phenylene, biphenylene, phenylene-C_{2-6}-alkylene and biphenylene-C_{2-6}-alkylene, $—SO_2CH_2—$, 4-sulphonylphen-1-yl, $—(CH_2)_5O(CH_2)_5—$, $—C_2H_4SO_2C_2H_4—$, diphen-4,4'-ylenemethane, 4,4-diiminostilbene and diphen-4,4'-ylene ether.

4,634,556

CRYSTALLINE SODIUM (5R, 6S, 8R)-6-(1-HYDROXYETHYL)-2-(2-CARBAMOYLOXYETHYLTHIO)-PENEM-3-CARBOXYLATE AND PROCESS FOR MAKING SAME

John K. Jenkins, Chatham; John S. Chiu, Parsippany; Charles G. Eckhart, Manville; Paul E. McNamara, Westfield; Stanley Rosenhouse, Plainfield, and Richard E. Youngstrom, Cedar Grove, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed May 10, 1985, Ser. No. 732,533
Int. Cl.⁴ C07D *499/00*; A61K *31/425*
U.S. Cl. 540—310 **20 Claims**

1. A stable, substantially anhydrous crystalline sodium

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(5R,6S,8R)-6-(1-hydroxyethyl)-2-(2-carbamoyloxyethylthio)-penem-3-carboxylate exhibiting an x-ray crystallographic powder diffraction pattern having the essentially following values:

Angle of 2 θ (degrees)	Spacing, d Å	Relative Intensities I/I'
7.530	11.7392	6
10.833	8.1669	5
12.617	7.0155	50
13.108	6.7538	4
14.625	6.0566	26
14.933	5.9326	4
16.137	5.4924	4
16.825	5.2692	29
17.780	4.9885	11
18.058	4.9122	6
19.544	4.5419	23
20.603	4.3109	36
21.255	4.1802	5
21.600	4.1141	9
21.990	4.0419	8
23.168	3.8390	10
23.926	3.7191	12
24.147	3.6856	100
24.665	3.6094	13
25.031	3.5574	7
26.430	3.3785	23
27.608	3.2309	21
28.181	3.1665	43
29.391	3.0389	13
30.321	2.9477	11
32.434	2.7603	11
32.899	2.7224	9
33.257	2.6939	6
33.909	2.6436	7
34.364	2.6096	6
34.968	2.5659	14
35.411	2.5348	9
35.818	2.5069	13
37.662	2.3883	16
39.695	2.2705	16

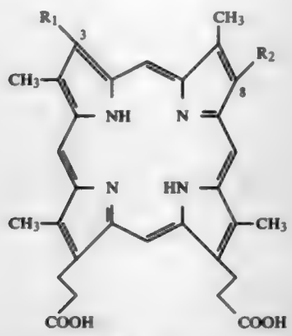
4,634,557

DEUTEROPORPHYRIN DERIVATIVE OR SALT THEREOF

Haruo Sato, Chiba, Japan, assignor to Sato Pharmaceutical Research Institute Ltd., Tokyo, Japan

Filed Jan. 11, 1985, Ser. No. 690,579
Claims priority, application Japan, Jan. 18, 1984, 59-6745
Int. Cl.⁴ C07D *487/22*
U.S. Cl. 540—145 **3 Claims**

1. A deuteroporphyrin derivative represented by the following formula:



wherein one of R_1 and R_2 is —CH(CH₃)—OR, wherein R is a lower alkyl group, and the other R_1 or R_2 substituent is —CH=CH₂, or a photosensitively active salt thereof.

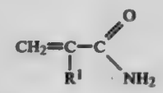
4,634,558

PREPARATION OF α-SUBSTITUTED ACRYLAMIDES

Franz Merger, Frankenthal, and Wolfgang Schwarz, Pfinztal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

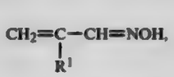
Filed Nov. 30, 1984, Ser. No. 677,035
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1983, 3343674
The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.
Int. Cl.⁴ C07C *102/10*
U.S. Cl. 260—404 **4 Claims**

1. A process for the preparation of an α-substituted acrylamide of the formula I



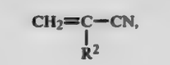
(I)

where R^1 is a straight-chain, branched or cyclic alkyl radical of not more than 15 carbon atoms which can be unsubstituted or further substituted, from an aldoxime of the formula II



(II)

where R^1 has the above meanings, wherein the aldoxime is heated at from 40° to 250° C. in the presence of a carrier-free copper(II) carboxylate obtained from a monocarboxylic acid of 2 to 18 carbon atoms and in the presence of a nitrile of the formula III



(III)

where R^2 is hydrogen or has the same meaning as R^1, as a cocatalyst.

4,634,559

FLUID FLOW CONTROL PROCESS

Charles E. Eckert, Plum Boro, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

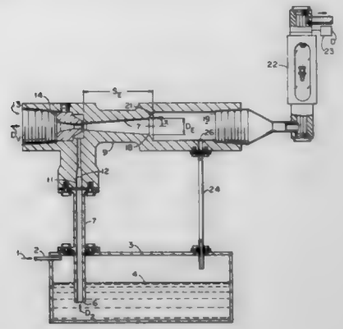
Continuation-in-part of Ser. No. 584,766, Feb. 29, 1984, abandoned. This application Jul. 8, 1985, Ser. No. 752,969
Int. Cl.⁴ B01F *3/04*
U.S. Cl. 261—76 **19 Claims**

1. A method for controlling low rates of flow such that the Reynolds number is less than 30,000 of a corrosive, volatile liquid comprising:

establishing a venturi insert within a flow casing, said insert selected to have specified proportions including discharge coefficient;

passing said liquid by venturi suction through a liquid orifice of specified discharge coefficient and into the venturi at a position at or near the vena contracta; and

selecting a configuration for said venturi such that C_{DV}/C_{D2} varies with linear proportionality over flow rates below the said Reynolds number of 30,000 above which the discharge coefficients become invariant; wherein,



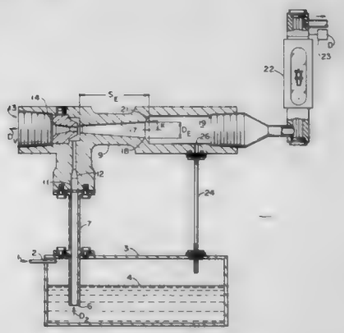
C_{DV}=the discharge coefficient for the venturi;
C_{D2}=the discharge coefficient for the liquid orifice.

4,634,560

ASPIRATOR PUMP AND METERING DEVICE

Charles E. Eckert, Plum Boro, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 584,766, Feb. 29, 1984, abandoned. This application Jul. 8, 1985, Ser. No. 752,966
Int. Cl.⁴ B01F *3/04*
U.S. Cl. 261—76 **18 Claims**



1. Fluid flow control apparatus comprising:

an aspirator including a liquid orifice and a venturi for pumping at a low flow rate such that the Reynolds number is less than 30,000 and mixing a liquid into a diluent gas to form a vapor mixture having a substantially constant volume fraction independent of flow rates; and

means for metering the flow rate of said vapor mixture;

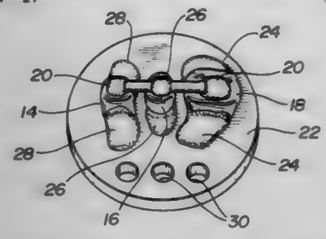
wherein said aspirator comprises said venturi and said liquid orifice having a configuration such that its venturi discharge coefficient C_{DV} and its liquid orifice discharge coefficient C_{D2} forms a ratio C_{DV}/C_{D2} substantially linear over flow rates below the said Reynolds number of 30,000 above which the discharge coefficients become invariant.

4,634,561

METHOD FOR JOINING CERAMIC COMPONENTS IN PRECISE SPATIAL RELATIONSHIP

Robert D. DeLuca, Pennington, N.J., assignor to Johnson & Johnson Dental Products Company, East Windsor, N.J.

Filed Mar. 22, 1985, Ser. No. 714,668
Int. Cl.⁴ A61C *13/20, 13/08*
U.S. Cl. 264—17 **4 Claims**



1. A process for joining ceramic components in precise spatial relationship, which comprises the steps of:

(a) forming a first composite comprising a plurality of individual ceramic components joined in precise spatial relationship with temporary joining means;

(b) immobilizing said first composite on a sagger with individual masses of a low temperature curing refractory cement;

(c) removing said temporary joining means while said ceramic components are maintained in said precise spatial relationship on said sagger with said refractory cement;

(d) forming a joint between each pair of adjacent ceramic components with ceramic frit to form a second composite comprising said ceramic components maintained in said precise spatial relationship on said sagger with said refractory cement, with each pair of adjacent ceramic components having a ceramic frit joint between them;

(e) firing said second composite to fuse said ceramic frit to thereby form permanent ceramic joints between said adjacent pairs of ceramic components; and

(f) removing the permanently joined ceramic components from said sagger,

wherein said sagger is constructed of a material that has a coefficient of thermal expansion that matches that of the material from which said ceramic components are made.

4,634,562

PHOTOCURABLE POLYVINYL CHLORIDE COMPOSITION

Raymond E. Downey, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 8, 1981, Ser. No. 299,770
Int. Cl.⁴ C08F *2/50*; B28B *1/46*; B29C *35/08*
U.S. Cl. 264—22 **8 Claims**

1. A polyvinyl chloride composition composed of 100 parts polyvinyl chloride, at least sufficient plasticizer to form a plastisol with said polyvinyl chloride, stabilizer amounts of a polyvinyl chloride stabilizer, about 13 to 50 parts of a photopolymerizable polymer and a photoinitiator.

4,634,563

METHOD OF MAKING A COMPOSITE FOAMED RESIN SKI

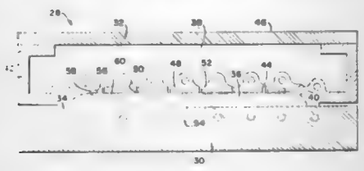
Kendal Hancock, Wichita Falls, Tex., assignor to Texas Recreation Corporation, Wichita Falls, Tex.

Continuation of Ser. No. 655,617, Sep. 28, 1984, which is a division of Ser. No. 431,485, Sep. 30, 1982, Pat. No. 4,486,368. This application Dec. 10, 1984, Ser. No. 679,854
Int. Cl.⁴ B29C *45/16, 67/22*; C08J *9/00*
U.S. Cl. 264—46.7 **14 Claims**

1. A method of making a ski comprising placing a plate against a first end of a mold cavity, aligning the plate with a

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peripheral gasket in a recess in the first end of the mold cavity, holding the plate against the first end of the mold cavity by creating a vacuum on a first surface of the plate, wherein the vacuum is maintained on the first surface of the plate with the



peripheral gasket, closing an open second end of the mold cavity and injection a foamable reaction material in the mold cavity, whereby after molding, the plate is embedded into a surface of the foamed resin ski.

4,634,564

MANUFACTURE OF MULTI-COLORED DETERGENT BARS

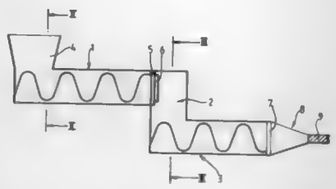
Andrew J. Keralake, Merseyside, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Oct. 9, 1984, Ser. No. 659,140

Claims priority, application United Kingdom, Oct. 14, 1983, 8327616

Int. Cl.⁴ C11D *13/18*; B29B *9/16*

U.S. Cl. 264—75 **3 Claims**



1. A method of manufacturing multi-coloured detergent bars wherein at least two stream of detergent noodles of different visual appearance are supplied to a detergent plodder and the extrudate is cut and stamped to form bars, characterised in that the streams of detergent noodles are generated from a single detergent feedstock by feeding a portion of said feedstock to each barrel of a parallel twin barrel refiner and by adding a visually distinct liquid, which is miscible with the feedstock, only to at least a part of the feedstock portion fed to one barrel of the twin barrel refiner at the point where said feedstock enters the refiner in which the streams are subjected to substantially equal working before passing to the plodder.

3. A method of manufacturing multi-coloured detergent bars wherein at least two streams of detergent noodles of different visual appearance are supplied to a detergent plodder and the extrudate is cut and stamped to form bars, characterised in that the streams of detergent noodles are generated from a single feedstock by adding a visually distinct liquid, which is miscible with the feedstock, to at least a part of the feedstock at the point where said feedstock enters a refiner in which the streams are subjected to substantially equal working before passing to the plodder, and wherein said refiner comprises a single barrel and liquid is added to the feedstock in pulses so that the parts of the feedstock mixed with liquid are separated in sequence by untreated parts.

4,634,565

METHOD AND APPARATUS FOR MANUFACTURING A PLASTIC INJECTION MOLDING, PARTICULARLY MOLDING STRIPS FOR AUTOMOTIVE VEHICLES

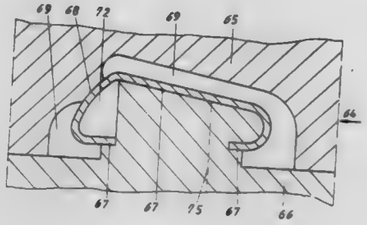
Manfred Irrgang, Wuppertal, Fed. Rep. of Germany, assignor to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed May 17, 1985, Ser. No. 735,444

Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418275

Int. Cl.⁴ B29C *45/14*

U.S. Cl. 264—510 **14 Claims**



1. A method of manufacturing a plastic injection molding comprising:

inserting a support, having a front side and a rear side, into a mold cavity of an injection mold;

injection a plastic injection molding composition with high pressure into the mold cavity for forming a layer of the plastic material on at least the front side of the support; but not on a region of the front side which is free of the plastic material; and

during the injecting of the composition, supplying pressure fluid against the rear side of the support, generally to the rear of the plastic material-free region of the front side, for urging the plastic material-free region against the mold part thereover for preventing the plastic material composition from flowing onto the plastic material-free region.

6. A plastic injection molding machine comprising:

an injection mold including a top mold part and a bottom mold part between which a support for plastic injection molding composition can be positioned and held;

the top mold part, which is for being over the front of the support, having a first support region which supports the front of the support; a first recess formed in the first support region and defining a mold cavity over the front of the support for receiving injected plastic injection molding composition under high pressure and the composition being for applying a layer of plastic material to the front side of the support in the mold;

the bottom mold part, which is for being over the rear of the support, having a second support region which supports the rear of the support; a second recess formed in the second support region for being filled with a pressurizing fluid that acts against the rear of the support and presses the support against the first support region of the upper mold part; the second recess laterally generally adjoins the first recess;

with the proviso that the top mold part support region has a sealing section that is shaped for contacting the front of the support and, as a result of such contact, for defining a region contacted by substantially all of said sealing section from which coating composition can be excluded.

4,634,566

METHOD OF MANUFACTURING A PROFILED STRIP, PARTICULARLY FOR AUTOMOTIVE VEHICLES

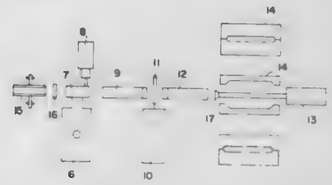
Rolf Schlenz, Velbert, Fed. Rep. of Germany, assignor to Gebr. Happich GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 599,247, Apr. 11, 1984. This application Jul. 10, 1985, Ser. No. 753,617

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314682

Int. Cl.⁴ B29C *49/20, 49/22*

U.S. Cl. 264—515 **8 Claims**



1. A method of manufacturing a profiled strip for application to an automotive vehicle, or the like, comprising:

extruding a hollow elongate profiled member having a front wall and a rear wall, wherein the extruded profiled member is closed at the side margins between the front and rear walls; extruding the profiled member with at least one transparent longitudinal strip in the front wall; the profiled member being coextruded around a decorative strip and moving the decorative strip along with the profiled member as the profiled member is extruded for disposing the decorative strip inside the hollow of the profiled member being extruded;

dividing the elongate extruded profiled member and decorative strip transversely into individual sections, and squeezing the ends of the sections together, thereby enclosing the respective sections with the decorative strip therein;

defining openings in the extruded profiled member;

placing the enclosed section in a blow mold and blow molding the enclosed section against supporting surfaces in the blow mold to provide the profiled strips having the decorative strip visible through the transparent longitudinal strip.

4,634,567

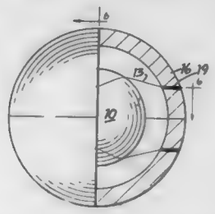
MULTISHELL INERTIAL CONFINEMENT FUSION TARGET

James R. Holland, Butler, and Robert M. Del Vecchio, Vandergrift, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 269,286, Jun. 1, 1981, Pat. No. 4,477,958. This application Aug. 10, 1983, Ser. No. 521,810

Int. Cl.⁴ G21B *1/00*

U.S. Cl. 376—152 **12 Claims**



1. A multishell inertial confinement fusion target, comprising:

a preformed fuel pellet;

a hollow shell surrounding the fuel pellet and having an inner surface spaced from an outer surface of the fuel pellet, said shell comprising an inner layer of self-supporting material and an outer coating; and

a pair of substantially parallel taut open nets stretched across the shell and secured to the inner layer of the shell at a number of spaced locations around the inner surface thereof and along a plane cutting the shell parallel to an equator of the shell and spaced therefrom, said pair of taut open nets being in spaced relationship with respect to one another and with respect to said equator of the shell and located on opposite sides of said equator, said pair of taut open nets forming an open center pocket therebetween for engaging opposing portions of the outer surface of the fuel pellet to maintain the fuel pellet in a substantially concentric position relative to the inner surface of said shell;

each of said taut open nets consisting of a network of intersecting fibers, each of said fibers being stretched across the shell with ends thereof being scured to said inner layer of said shell along said plane, said fibers each having a length less than a diameter across said equator of the shell so as to form the open central pocket for engaging the opposing portions of the outer surface of the fuel pellet.

4,634,568

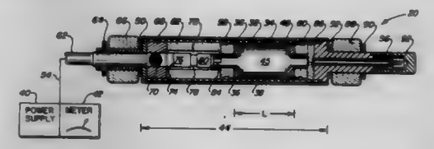
FIXED INCORE WIDE RANGE NEUTRON SENSOR

Leslon C. Wimpee; John P. Sturtz, and John P. Neissel, all of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Oct. 19, 1983, Ser. No. 543,464

Int. Cl.⁴ G21C *17/00*

U.S. Cl. 376—154 **36 Claims**



35. In combination with a nuclear reactor including a reactor core, a reactor vessel, a fixed site interior of said core for disposing a neutron sensor, cables running from said fixed site interior of said core to a location exterior of said pressure vessel, a power supply capable of delivering power exterior of said core, and a signal processor capable of analyzing electrical signals including current exterior of said core, the improvement of a wide range neutron detector connected across said cables comprising:

(a) a sealed chamber, having first and second spaced electrodes positioned therein, disposed in said core having a neutron flux, with the first electrode connected to receive power from the power supply and the second electrode connected to deliver current to the signal processor through said cables, which chamber is hermetically sealed with a seal which is disposed exterior of said core within said vessel having a neutron flux which is substantially at least two decades below the neutron flux in the core location of the detector;

(b) an ionizable gas, disposed within the space between the electrodes, pressurized to a pressure above one atmosphere; and

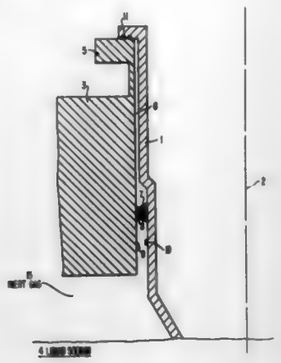
(c) a layer of a mixture of an active material and a breeding material, positioned within the chamber, the active material and the breeding material being respectively U-235 and U-234, the layer having a thickness of at least 0.2 milligrams per square centimeter, which active material when struck by the neutron flux is capable of ionizing the gas to cause conduction of electric current from the first electrode through the second electrode to the signal processor, which current is proportional to the intensity of the neutron flux.

4,634,569

DEVICE PERMITTING REDUCTION OF THERMOSIPHON EFFECTS IN FAST NEUTRON NUCLEAR REACTORS

Nicolas Delloye, and Philippe Denimal, both of Jeumont, France, assignors to Jeumont-Schneider Corporation, Puteaux Cedex, France

Filed Nov. 15, 1982, Ser. No. 441,654
Claims priority, application France, Nov. 16, 1981, 81 21365
Int. Cl.⁴ G21C *13/00*
U.S. Cl. 376—203 **3 Claims**



1. In a fast neutron nuclear reactor having a vessel containing liquid sodium, a slab covering said vessel, an opening in said slab having a pump therein, said opening having a vertical wall and said pump having a casing separated from said vertical wall by an annular space, said slab being spaced above said sodium, and an inert gas being provided between said slab and said sodium, a device for reducing thermosiphon effects in said annular space, said device comprising circumferential seal means extending continuously about said casing in said annular space for isolating a region above said seal means from a region below said seal means, said seal means including a ring body carried on and extending about said casing with substantial freedom of movement vertically along said casing and a disk that is stationary on said vertical wall, said ring body resting on said disk, and said ring body and said disk having mutually engaged surfaces of complementary shape.

4,634,570

PROCESS AND DEVICE FOR MEASURING THE LOCAL THERMAL POWER IN A NUCLEAR REACTOR

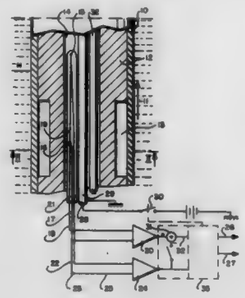
Jean-Paul Jacquot, Paris, and Patrick Guillery, Saint Germain en Laye, both of France, assignors to Scandpower, Inc., Rockville, Md.

Filed Jul. 5, 1983, Ser. No. 510,592
Int. Cl.⁴ G21C *17/00*
U.S. Cl. 376—247 **6 Claims**

1. A method of measuring the thermal power released locally at a measuring area of the core of a nuclear reactor comprising the steps of:

measuring of the voltage supplied by a measuring thermocouple brought to a reference temperature directly connected to the temperature of the coolant of the reactor at the measuring area during the stabilized operation of the reactor with a second junction placed so as to be brought to the temperature of a body which absorbs the gamma radiation at said area;

measuring simultaneously the voltage supplied by a supplementary thermocouple with a first junction coupled to the second junction of the measuring thermocouple, and provided with a second junction maintained at a reference temperature outside the reactor; and



correcting said voltage of said measuring thermocouple by means of the use said voltage from said supplementary thermocouple.

4,634,571

PROCESS FOR THE PRODUCTION OF PLATE-SHAPED FUEL ELEMENTS FOR RESEARCH REACTORS

Horst Langhans, Klingenberg, and Erwin Wehner, Neu Isenburg, both of Fed. Rep. of Germany, assignors to NUKEM GmbH, Hanau, Fed. Rep. of Germany

Filed Mar. 5, 1985, Ser. No. 708,474
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1984, 3408240
Int. Cl.⁴ G21C *3/00*
U.S. Cl. 376—416 **10 Claims**

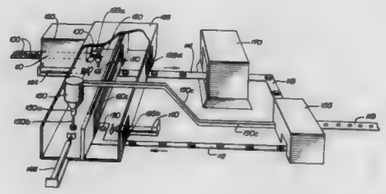
1. In a process for the production of plate-shaped fuel elements suitable for use in research and material testing reactors having loads of more than 26 volume % of uranium compound by mixing the powdered uranium compounds with aluminum powder, molding to a plate-shaped molded body, enclosing the molded body in an aluminum jacket and inserting it into an aluminum plate having a cutout corresponding to the molded body, covering the molded body and the aluminum plate on both sides with two aluminum sheets and rolling this packet, the improvement comprising applying a jacket of a 0.01 to 0.3 mm thick aluminum coating directly on the plate-shaped molded body before placing it in the aluminum jacket.

4,634,572

SYSTEM FOR AUTOMATICALLY CONSOLIDATING A PLURALITY OF BODIES FORMED OF POWDER

Robert D. Lichti, Signal Hill, Calif., assignor to Metal Alloys, Inc., Irvine, Calif.

Filed Oct. 25, 1984, Ser. No. 664,544
Int. Cl.⁴ B22F *3/12*
U.S. Cl. 419—44 **6 Claims**



1. A system for automating the consolidation of a plurality of bodies formed of metallic or ceramic powder or mixtures thereof to thereby produce a plurality of consolidated aticles of manufacture, the system employing a process wherein pressure is applied to a particulate medium which has embedded within an article preform formed of said powder, the preform being shaped in a desired configuration, the system comprising:

a consolidation container having a cavity;

an assembly container having a hot atmosphere which is maintained reducing or inert during operation of the system, the assembly container including means for delivering a predetermined amount of particulate medium to the consolidation container cavity and means or embedding a preform in the predetermined amount of particulate medium thereby to form a consolidation charge including the container, preform and particulate medium;

means for bringing a preform and a consolidation container to the inside fo the assembly container; and

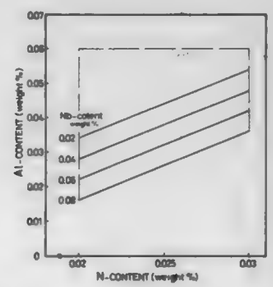
means for bringing the consolidation charge to a press where the preform is consolidated thereby to form a consolidated article of manufacture.

4,634,573

STEEL FOR COLD FORGING AND METHOD OF MAKING

Toshio Yanagiya; Kenji Isokawa; Hisashi Ohta, and Hideaki Inaba, all of Aichi, Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Continuation-in-part of Ser. No. 416,492, Sep. 10, 1982, abandoned. This application Oct. 19, 1984, Ser. No. 662,543
Claims priority, application Japan, Sep. 10, 1981, 56-141650
Int. Cl.⁴ C21D *7/14*
U.S. Cl. 420—127 **10 Claims**



1. A steel suitable for machine structural use consisting essentially of Al: 0.02 to 0.6%, N: 0.015 to 0.03% and Nb: 0.01 to 0.08%, wherein

$$Al(\%) \geq 2.0[N(\%) - 0.15Nb(\%)],$$

the balance being substantially Fe, said steel having an O-content of less than 15 ppm, a S-content of less than 0.015%, and a ferrite+pearlite structure, the ferrite crystal grain size number being 9 or higher, said steel being cold forged and case-hardened.

4,634,574

APPARATUS FOR USE IN SULFIDE CHEMILUMINESCENCE DETECTION

Stanford R. Spurlin, and Edward S. Yeung, both of Ames, Iowa, assignors to Iowa State Research Foundation, Inc., Ames, Iowa

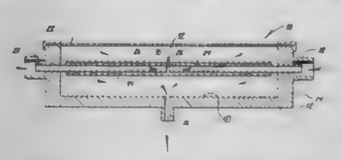
Division of Ser. No. 462,532, Jan. 31, 1983, Pat. No. 4,555,491. This application Jan. 3, 1985, Ser. No. 688,461
Int. Cl.⁴ G01N *21/76;* **F21K** *2/06*
U.S. Cl. 422—52 **5 Claims**

1. A chemiluminescence detection cell, especially for determining the presence of either hydrogen sulfide or methyl mercaptan via reaction with chlorione dioxide to produce emission of photons, comprising:

a cell container having a bottom wall, a side wall, and an open top, said bottom wall including means defining a gas withdrawal exit, said side wall including means defining two inlet openings, and said top being sealingly closed with a window plate to form an enclosed chamber within said cell container;

each of said inlet openings carrying an inlet tube having an exterior wall, an entrance end, and an exit end to provide access from said openings to said chamber, said inlet tubes being directionally oriented, each toward the other, in such a manner that the exit end of each tube extends into said chamber and terminates therein to define a turbulence gap between their exit ends; and

an elongated cylindrical sheath having two open ends and an interior cylindrical wall, one open end of said sheath surrounding one of said inlet tube and the other end of said sheath surrounding the other said inlet tube, said sheath spanning at least part of each inlet tube and enclosing said



turbulence gap so as to define a reaction residence zone comprising said turbulence gap and space between the exterior walls of said inlet tubes and the interior cylindrical wall of said sheath, whereby fluid introduced to said reaction residence zone from said exit ends of said inlet tubes can only escape therefrom by passing between the exterior walls of said inlet tubes and said interior cylindrical wall of said sheath and moving axially outwardly from both open ends of said sheath;

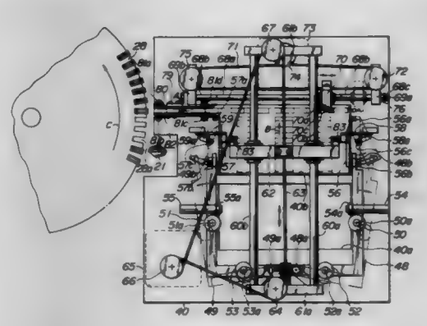
said window, said sheath, and said inlet tubes all being made of quartz so as to be transparent to any photon emission within said reaction residence zone, and said window being positioned relative to said reaction residence zone so as to permit any photon emission within the entire reaction residency zone to be visible from outside said cell container through said window.

4,634,575

AUTOMATIC CUVETTE LOADING APPARATUS

Kazuo Kawakami; Yawara Nagai, and Takayuki Aihara, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 434,109, Oct. 13, 1982, abandoned. This application Sep. 3, 1985, Ser. No. 771,484
Int. Cl.⁴ G01N *35/04;* **B65H** *1/26*
U.S. Cl. 422—63 **11 Claims**



1. An automatic cuvette loading apparatus for use in an automatic chemical analyzer comprising:

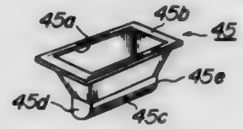
a plurality of magazines, each magazine containing a plural-

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ity of cuvette rows and each row having a plurality of cuvettes, each magazine comprising:
(i) a top and a bottom arranged in parallel with each other;
(ii) first and second side walls arranged in parallel with each other between opposing side edges of said top and bottom;
(iii) third and fourth side walls arranged in parallel with each other between other opposing side edges of said top and bottom and between said first and second side walls;
(iv) an outlet provided in the first side wall and sized to allow discharge of the cuvettes therethrough one by one;
(v) a movable push plate contained within the magazine and being substantially parallal with said rows of cuvettes; and
(vi) a window formed in ihe third side wall and extending from the first side wall to the second side wall;
means for containing said plurality of magazines;
means for successively feeding magazines from said magazine containing means into a cuvette loading position, said top and bottom of a magazine in said cuvette loading position being substantially horizontal;
reaction line means for conveying cuvettes to an analyzing station located along said reaction line, said reaction line having a cuvette receiving part disposed opposite a magazine in said cuvette loading position;
means, insertable into said magazine through said window, for successively loading the cuvettes in one cuvette row contained in the magazine situated at the ouvette loading position horizontally one by one through the outlet of the magazine into said cuvette receiving part of the reaction line;
means for moving cuvette rows in the relevant magazine, after loading of the one cuvette row has been completed, in a direction substantially horizontal, thereby to move a new row of cuvettes to become the one cuvette row being loaded, said means for moving cuvette rows engaging said push plate to move said cuvette rows; and
means for removing an empty magazine from the cuvette loading position.

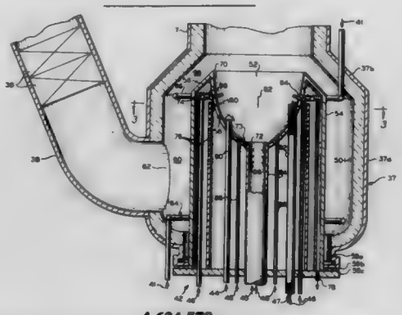
4,634,576
AUTOMATIC ANALYZING APPARATUS
Kevin Galle, New City, N.Y.; Ryoichi Orimo, Ohmo, Japan; Masahiko Sakurada, Machida, Japan; Taiichi Banno, Hachioji, Japan, and Sugio Manabe, Kodaira, Japan, assignors to Olympus Optical Co. Ltd., Japan
Division of Ser. No. 139,469, Apr. 11, 1980, abandoned. This application Jan. 25, 1983, Ser. No. 460,916
Claims priority, application Japan, Apr. 14, 1979, 54-44912
Int. Cl.⁴ B01L *3/00*; G01N *21/03*
U.S. Cl. 422—102 **4 Claims**

1. A reaction vessel for use in a chemical analyzing apparatus comprising:
a bottom portion including a curved wall defining a semi-cylinder, said curved wall having first and second side edges substantially parallel to a longitudinal axis of said semi-cylinder and first and second end edges substantially perpendicular to said longitudinal axis, said bottom portion further including transparent semi-circular end windows adjoining said curved wall at said first and second end edges, said end windows being substantially perpendicular to said longitudinal axis of said semi-cylinder;
an upper portion including side walls adjoining and tapering



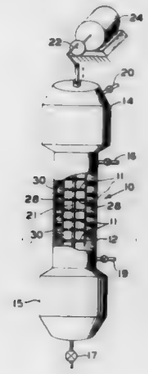
outwardly from said first and second side edges and said end windows of said bottom portion, said side walls forming boundaries of a rectangular opening at an end of said upper portion opposite from said bottom portion; and
a flange attached to each of said side walls at the end of the said upper portion opposite from said bottom portion and extending outwardly from said side walls, said flange being substantially coplanar with said rectangular opening.

4,634,577
Patent Not Issued For This Number



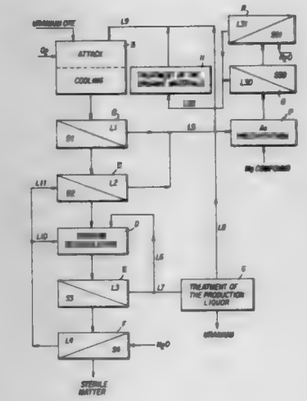
4,634,578
HIGH CAPACITY RECIPROCATING PLATE EXTRACTOR
Robert J. Flocco, Summit, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Dec. 13, 1985, Ser. No. 808,477
Int. Cl.⁴ B01D *11/04*
U.S. Cl. 422—257 **11 Claims**

1. In a liquid-liquid extractor of the reciprocating plate type having a column proper with a plurality of plates located therein and means operably connected thereto for imparting reciprocating motion to said plates, the improvement comprising locating coalescence media in said column proper at least in a zone therein, which under conditions of use is emulsion prone.

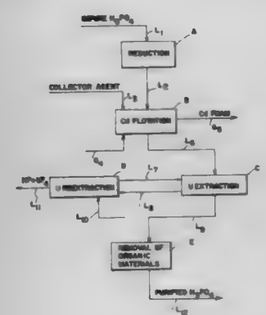


4,634,579
SELECTIVE REMOVAL OF ARSENICAL MATERIAL IN THE COURSE OF AN ALKALINE PROCESS FOR TREATING A URANIFEROUS AND/OR MOLYBDENIFEROUS ORE BY MEANS OF A MAGNESIUM COMPOUND
Pierre Maurel, Aix en Provence; Jean-Michel Lamerant, Bouc Bel Air, and Francois Pallez, Aix en Provence, all of France, assignors to Aluminium Pechiney, Paris, France
PCT No. PCT/FR82/00128, § 371 Date Mar. 7, 1983, § 102(e) Date Mar. 7, 1983, PCT Pub. No. WO83/00509, PCT Pub. Date Feb. 17, 1983
PCT Filed Jul. 27, 1982, Ser. No. 474,597
Claims priority, application France, Jul. 29, 1981, 81 15066
Int. Cl.⁴ C22B *60/02*, *30/04*
U.S. Cl. 423—17 **10 Claims**

1. A process for the selective removal of arsenical material, by means of a magnesium compound, in the course of a process for the hot oxidising attack on a uraniferous and/or molybdeniferous ore containing arsenical materials, comprising attacking said ore by means of an aqueous liquor of sodium or potassium carbonate and/or bicarbonate thereby forming a carbonated and/or bicarbonated medium containing arsenic, said attack operation being carried out under conditions with respect to levels of concentration, temperatures and pressures which cause solubilisation of the uranium and/or molybdenum and the arsenic present in the ore, then collecting a suspension of a solid phase in a liquid phase, and finally separating said phases, wherein the arsenic which is solubilised in the attack operation is extracted in the form of magnesium arsenate by treating the carbonated and/or bicarbonated medium containing arsenic with a magnesium compound which is carbonated or which is converted to a carbonated compound in said medium.



4,634,580
PROCESS FOR THE PURIFICATION OF WET-PROCESS PHOSPHORIC ACID BY REMOVAL OF CADMIUM
El A. Jdid, Vandoeuvre les Nancy; Pierre Bizzy, Nancy; Jacques Beaziere, Gondreville, and Antoine Floreancig, Pierre Benite, all of France, assignors to Uranium Pechiney, France
Filed Dec. 14, 1984, Ser. No. 681,846
Claims priority, application France, Dec. 23, 1983, 83 21039
Int. Cl.⁴ C01G *11/00*; C01B *25/18*; C22B *17/04*
U.S. Cl. 423—100 **19 Claims**



1. A process for the removal of cadmium in wet-process phosphoric acid containing iron impurities in the trivalent state, comprising the steps of reducing said trivalent iron to a divalent state, introducing a cadmium-collector anionic surface active agent into said phosphoric acid to precipitate the cadmium, and separating the cadmium from said phosphoric acid by flotation.

4,634,581

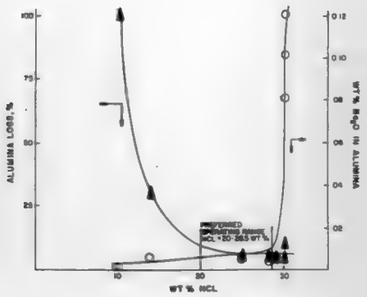
PRODUCTION OF HIGH PURITY ALUMINA

Edward L. Cambridge; Raouf O. Loutfy; James C. Withers, and Daniel M. Blake, all of Tucson, Ariz., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 519,799, Aug. 8, 1983, abandoned. This application Feb. 5, 1986, Ser. No. 826,468

Int. Cl.⁴ C01F *7/46*

U.S. Cl. 423—126 **20 Claims**



1. A process useful for removing impurities from solid hydrated alumina containing a significant impurity content which comprises:

(a) reacting solid hydrated alumina with aqueous hydrochloric acid to dissolve at least a portion of said impurities in the acid and to convert at least a portion of the solid hydrated alumina to solid aluminum chloride hexahydrate while maintaining the acid concentration of the reaction mixture above about 15% by weight and

(b) withdrawing reaction mixture having an acid concentration of about 15 to about 30% by weight and recovering solid aluminum chloride hexahydrate and any unreacted solid hydrated alumina from the acid and dissolved impurities.

4,634,582

SULFUR DIOXIDE REMOVAL PROCESS

A. Glenn Sliger; James J. O'Donnell; W. Ronald Cares, all of Houston, and Aldrich H. Northup, Jr., Katy, all of Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed Nov. 18, 1985, Ser. No. 799,052

Int. Cl.⁴ C01B *17/00, 17/02*

U.S. Cl. 423—243 **11 Claims**

1. A process for removing sulfur dioxide from a gas stream with a buffered, aqueous thiosulfate/polythionate solution which comprises:

(a) introducing sulfur dioxide-containing gas, recovered hydrogen sulfide, and a buffered, aqueous, lean thiosulfate/polythionate solution to an SO_2-gas/liquid contacting zone;

(b) recovering cleaned gas and a buffered, aqueous, enriched thiosulfate/polythionate solution from the SO_2-gas/liquid contacting zone;

(c) introducing the recovered, enriched solution to a regeneration zone;

(d) introducing externally supplied hydrogen sulfide to the regeneration zone to react a portion of the recovered, enriched solution therein to form a slurry of elemental sulfur in a buffered, aqueous, lean thiosulfate/polythionate solution;

(e) recovering unreacted excess hydrogen sulfide from the regeneration zone for use in step (a); and

(f) withdrawing the slurry from the regeneration zone, separating elemental sulfur from the slurry, and recovering the buffered, aqueous, lean thiosulfate/polythionate solution for use in step (a).

4,634,583

METHOD FOR THE DESULFURIZATION OF FLUE GAS OF A FIRING SYSTEM

Albrecht Wolter, Cologne, and Horst Herchenbach, Hennef, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Jan. 7, 1985, Ser. No. 689,393

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1984, 3400417; Apr. 21, 1984, 3415210

Int. Cl.⁴ B01J *8/00;* **C01B** *17/00;* **C04B** *7/02*

U.S. Cl. 423—244 **8 Claims**

1. A method for the desulfurization of a flue gas in a cement making plant employing a tubular kiln-heat exchanger system for the manufacture of cement, said tubular kiln having a calcination stage therein, the method comprising:

introducing raw cement meal into said calcination stage,

withdrawing cement meal from said calcination stage at a temperature of about 850° C. to 950° C. and with a deacification degree of at least 50%,

cooling the withdrawn hot meal to a temperature of about 220° to 250° C., and

thereafter contacting the meal with flue gas present in said kiln-heat exchanger system to bond the sulfur oxides in said flue gas to said partially deacidified meal.

4,634,584

STABILIZED SOLUTIONS OF HYDROXYLAMINE OR ITS SALTS IN WATER OR ALCOHOLS, AND THEIR PREPARATION

Otto-Alfred Grosskinsky; Elmar Frömmer; Josef Ritz, all of Ludwigshafen; Erwin Thomas, Freinsheim, and Franz-Josef Weiss, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

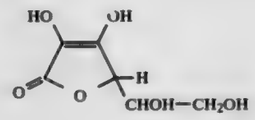
Filed Dec. 17, 1984, Ser. No. 682,068

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345733

Int. Cl.⁴ C01B *21/14*

U.S. Cl. 423—265 **4 Claims**

1. An oxygen-free stabilized solution of hydroxylamine or its salts in water or an alcohol which is stable over a prolonged period and in which the solution does not become discolored, which contains the lactone of the formula



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4,634,585

HETEROPOLY ACID CONTAINING CARBON AS HETERO ATOM

Tetsuichi Kudo, Setagaya; Go Kawamura, Musashino, and Akira Ishikawa, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 24, 1985, Ser. No. 737,474

Claims priority, application Japan, May 25, 1984, 59-104553

Int. Cl.⁴ C01B *31/24*

U.S. Cl. 423—419 R **4 Claims**

1. A heteropoly acid containing carbon as a hetero atom, wherein the heteropoly acid comprises dodecatungstocarbonate as represented by the general formula:

$$H_4[CW_{12}O_{40}].nH_2O$$

wherein n is 2 to 30.

4,634,586

REAGENT AND METHOD FOR RADIOIMAGING LEUKOCYTES

David A. Goodwin, Atherton, and Claude F. Meares, Davis, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed May 21, 1984, Ser. No. 612,759

Int. Cl.⁴ A61K *43/00, 49/00*

U.S. Cl. 424—1.1 **16 Claims**

1. A leukocyte radioimmunoimaging reagent comprising an immunoreactive nonleukocidal conjugate of an antibody to a leukocyte membrane determinant and a bifunctional phenyl or benzyl derivatine of EDTA or DTPA chelated with a radioactive metal.

16. A kit for use in radioimmunoimaging leukocytes in a patient comprising in:

(a) a first container containing conjugate of an antibody to a nontumor-specific membrane determinant of the leukocytes and a bifunctional benzyl or phenyl derivative of EDTA or DTPA; and

(b) a second container containing an antibody to the conjugate that does not cross react with endogenous components of the patient's blood.

4,634,587

SUSTAINED RELEASE QUINIDINE DOSAGE FORM

Charles H. Hsiao, Cooper City, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 396,669, Jul. 9, 1982, abandoned. This application Aug. 16, 1984, Ser. No. 641,559

Int. Cl.⁴ A61K *9/22, 9/36, 9/52*

U.S. Cl. 424—19 **6 Claims**

1. In a sustained release quinidine dosage form which comprises a compressed tablet or capsule, the improvement consisting essentially of plurality of pellets, the average pellet diameter greater than about 1 mm, each pellet consisting essentially of a coating of quinidine over a nonpareil seed, the thus quinidine-coated nonpareils are coated thereon with a coating consisting essentially of about 5% to about 15% by weight of a mixture of about 1.5 to about 9 parts by weight ethylcellulose to about 1 part by weight hydroxypropylcellulose, the sum of such pellets in forming a single dosage unit of quinidine.

4,634,588

DEODORANT

Michio Moroe, Mitaka, Japan, assignor to Takasago Perfumery Co. Ltd., Tokyo, Japan

Filed Jun. 5, 1985, Ser. No. 741,560

Int. Cl.⁴ A61K *9/68, 7/26*

U.S. Cl. 424—48 **10 Claims**

1. A chewing gum all but effective amount of having a wine like fragrance comprising as an effective component, extinguishing odor of foul breath components hydrogen sulfide, methylmercaptan and dimethy sulfide, smoking tobacco odor, garlic odor, sweaty odor, and toilet odor, a residual solid, oily or viscous substance which is obtained by removing water and alcohols from brewed wine or an ethanol-extracted liquid of a fermentation residue by-produced in the manufacture of the brewed wine.

4,634,589

DENTIFRICE FOR HYPERSENSITIVE TEETH

Hans-Ulrich Scheller, Eislingen, Fed. Rep. of Germany, assignor to Wurttembergische Parfumerie-Fabrik GmbH, Eislingen, Fed. Rep. of Germany

Filed May 7, 1985, Ser. No. 731,286

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418427

Int. Cl.⁴ A61K *7/16, 7/18*

U.S. Cl. 424—49 **2 Claims**

1. In a method of polishing hypersensitive teeth the improvement, showing a significant amelioration after 3 to 8 days, and in which users are found to be pain-free after 15 days wherein there is rubbed or mechanically pressed into the exposed small dentine channels for 3 to 15 days finely divided apatite by application of a dentifrice containing at least 15% by weight of an apatite selected from the group consisting of amorphous hydroxyl apatite, fluoro apatite, and mixtures thereof, having a bulk density of less than 180 g/l having an average particle size of 8 millimicrons and an abrasion value (RDA) of less than 30 as the sole crystalline and polishing substance, said dentifrice containing no further soluble mineral salts.

4,634,590

CELL MEMBRANE PROTEINS, COMPOSITIONS CONTAINING THEM AND PROCEDURE FOR THEIR PREPARATION

Irun R. Cohen, and Meir Shinitzky, Rehovot, both of Israel, assignors to Yeda Research and Development Company Ltd., Rehovot, Israel

Filed Sep. 7, 1984, Ser. No. 648,802

Claims priority, application Israel, Sep. 11, 1983, 69686

Int. Cl.⁴ C07K *3/28*

U.S. Cl. 424—88 **7 Claims**

1. A method for recovering purified membrane proteins from T lymphocyte cells useful for preventing or treating a specific autoimmune disease which comprises:

(a) suspending T lymphocyte cells specific for the autoimmune disease in a buffer;

(b) subjecting the suspended cells to hydrostatic pressure and then releasing the pressure on the suspended cells so as to cause the cells to shed membrane proteins which retain biological activity;

(c) centrifuging the depressurized suspension to remove cell fragments and produce a supernatant containing the membrane proteins; and

(d) treating the supernatant by ultracentrifugation so as to recover the purified membrane proteins.

4,634,591

ANTI-GAGGING COMPOSITIONS AND METHOD OF TREATING GAGGING REFLEXES

Robert D. Westerman, 7931 Jefferson Hwy., Baton Rouge, La. 70809

Filed Sep. 6, 1985, Ser. No. 773,055

Int. Cl.⁴ A61K *38/06, 33/10, 33/14, 33/20*

U.S. Cl. 424—149 **7 Claims**

1. A method for controlling gagging of a patient susceptible to such reflexes in response to an oral procedure, which comprises administering to such patient prior to the onset of such gagging a pharmaceutical composition comprising the following electrolytes normally present in the blood stream:

Sodium: 136–145 mEg/l
Potassium: 3.5–5.5 mEg/l
Calcium: 4.5–5.5 mEg/l
Magnesium: 1.8–3.6 mEg/l
Chloride: 100–110 mEg/l
Bicarbonate: 24–31 mEg/l
Phosphate: 1.8–2.3 mEg/l.

4,634,592

PROCESS FOR THE MANUFACTURE OF AQUATIC BAIT BLOCKS

Jerry L. Faber, Decatur, and Richard W. Kent, Jr., Ft. Wayne, both of Ind., assignors to Central Soya Company, Inc., Ft. Wayne, Ind.

Filed Apr. 22, 1985, Ser. No. 725,982
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—1 5 Claims

1. A process for the manufacture and use of aquatic bait blocks comprising:

mixing in weight proportion in the final block up to about 35% ground filler material selected from the group consisting of corn and peanut hulls, up to about 35% inert ground mineral material, and about 10–30% dolomitic lime to produce a dry mixture with the proviso that the dry mixture contains an effective amount of ground filler material or inert ground mineral material,

mixing said dry mixture with a liquid mixture including about 5–25% of an animal product selected from the group consisting of condensed fish solubles, fish meal, fish by-products, crustacean by-products, fish oil, meat by-products and poultry by-products, and about 25–50% of a sugar-based product having a brix approximating that of molasses to provide a wet mixture,

filling the fluid mixture into cubicle containers to provide blocks with the combined mixing and filling time being less than about 5 minutes, and curing the blocks at ambient temperature for up to about 24 hours to provide an aquatic bait block having a water degradability of from about 18 to 96 hours and installing an aquatic block in fishing waters as a bait.

4,634,593

COMPOSITION AND METHOD FOR PROVIDING CONTROLLED RELEASE OF SWEETENER IN CONFECTIONS

John J. Stroz, Randolph, N.J., and Wayne J. Puglia, Bayville, N.Y., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jul. 31, 1985, Ser. No. 761,205
Int. Cl.[4] A23G *3/30*
U.S. Cl. 426—5 11 Claims

1. A process for effecting controlled release of a dry particulate sweetener from a chewing gum composition comprising

forming an agglomeration in which said sweetener is intimately contacted by mix-mulling with an insoluble fat material having a softening point of higher than about 100° F. at a weight ratio of said sweetener to said fat material of about 6:1 to 1.5:1, and

mixing said sweetener/fat agglomeration with gum base and other chewing gum composition ingredients to form a chewing gum composition at a temperature and by a method whereby said agglomeration retains its integrity in said gum composition.

4,634,594

METHOD FOR CHILLING POULTRY

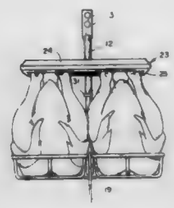
J. Douglas Cagle, 170 Houze Way, Roswell, Ga. 30075; Harold D. Olson, 740 Parkway Dr., SE., Smyrna, Ga. 30080, and Charles Addison, 7919D Roswell Rd., Dunwoody, Ga. 30335

Division of Ser. No. 477,269, Mar. 21, 1983, Pat. No. 4,513,476. This application Mar. 4, 1985, Ser. No. 707,791
Int. Cl.[4] A23L *3/36*
U.S. Cl. 426—393 9 Claims

1. A method of chilling poultry preparatory to packaging as fresh produce comprising the steps of:

(a) mounting a bird in an inverted compacted, trussed position in a shackle having a basket and a canopy located above the basket with the breast resting and supported in the basket, the thighs pressed against the breast, the hocks held in by the canopy and the wings tucked in between the thighs; and

(b) conveying the bird while mounted in the compacted position in the shackle through a refrigerated space for a period of time sufficient to chill the bird so as to cause it



to self-retain the compacted position at least briefly when dismounted from the shackle whereby it may then be packaged in the compact position.

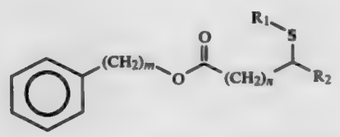
4,634,595

THIOALKANOIC ACID ESTERS OF PHENYLALKANOLS

Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven; Manfred H. Vock, Locust; Domenick Luccarelli, Jr., Neptune; Kevin P. Miller, and Charles Wiener, both of Middletown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 20, 1985, Ser. No. 778,506
The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.
Int. Cl.[4] A23L *1/226, 1/231, 1/235*
U.S. Cl. 426—535 11 Claims

1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff from about 0.001 ppm up to about 250 ppm of a thioalkanoic acid ester of a phenylalkanol having the structure:



wherein M represents an integer selected from the group consisting of 1, 2 or 3; N is 0, 1 or 2; R_1 represents methyl or hydrogen and R_2 represents methyl or hydrogen.

4,634,596

COLD WATER SWELLING STARCH COMPOSITION

James E. Eastman, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Sep. 25, 1985, Ser. No. 780,047
Int. Cl.[4] A23L *1/195*
U.S. Cl. 426—578 8 Claims

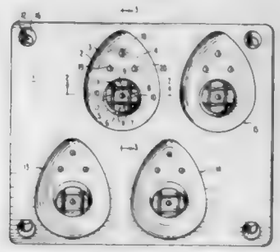
1. A cold water swelling starch composition comprised of a blend of at least two distinct starch components, wherein one starch component is essentially amylose free, the second starch component containing at least 20 percent amylose, wherein said essentially amylose free starch component comprises from about 15 to about 85 percent of said starch composition, and wherein said starch components have been heat processed together in an aqueous C_1–C_3 alkanol medium at a temperature of about 148° to about 182° C. under autogenous pressure for about 30 seconds to about 30 minutes to impart cold water swelling characteristics.

4,634,597

SIMULATED EGG TREATS FOR PETS

Albert Spiel, Yonkers, N.Y.; James Roe, Wayne, and Henry C. Spanier, West Milford, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Feb. 8, 1984, Ser. No. 578,040
Int. Cl.[4] A23K *1/20*
U.S. Cl. 426—635 8 Claims



1. A method of making a dry, hard pet egg treat biscuit having a base portion supporting a smaller portion comprising:

preblending dry ingredients of a base egg white portion including 40%–50% by weight of flour, 10%–15% by weight of meal, and 10%–15% by weight of egg solids;

adding water and mixing to form a dough;

separately preblending dry components of a smaller egg yolk portion including 15%–25% by weight of flour, 4%–8% by weight of meal, 12%–18% by weight of a sugar and 15%–20% by weight of egg solids, adding 30%–40% by weight of water and mixing;

forming said base egg white dough portion into a predetermined egg shape with a rotary molder, producing a substantially planar lower surface and a substantially parallel, planar upper surface and an indentation in said upper surface which has a substantially planar lower surface therein containing grooves for receiving said egg yolk portion;

injecting said smaller egg yolk portion into said indentation to form a pet treat; and

baking said pet treat at a temperature in a range of 200° F. to 600° F. to form a biscuit in which said base portion and said yolk portion adhere and bond together, and drying said pet treat until a final dried weight of said pet treat is in a range of 70% to 80% of a prebaking weight of said pet treat;

all percentages being based upon uncooked biscuit weight.

4,634,598

FLAVORANT CAPSULES

Richard T. Liu, Worthington; Winston R. Nickerson, and Charles H. Anderson, both of Marysville, all of Ohio, assignors to Nestec S. A., Vevey, Switzerland

Continuation of Ser. No. 333,172, Dec. 21, 1981, Pat. No. 4,576,826, which is a continuation-in-part of Ser. No. 203,389, Nov. 3, 1980, abandoned, which is a continuation of Ser. No. 931,503, Aug. 7, 1978, abandoned. This application Aug. 26, 1985, Ser. No. 769,852
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.
Int. Cl.[4] A23L *1/221;* A23F *3/40, 5/46*
U.S. Cl. 426—650 2 Claims

1. Flavorant capsules having a particle size of from 250 μm to 3.5 μm comprising a continuous hardened, impervious shell of edible protein material, carbohydrate material or a combination of protein and carbohydrate material having a wall thickness of from about 20 μm to 400 μm and having impregnated therein a flavor and/or aroma essence, derived from a frozen aqueous solution of the flavor and/or aroma essence, surrounding a hollow core empty of flavor and/or aroma essence.

2. Flavorant capsules produced by a process which comprises:

(a) adding particulated frozen aqueous flavor and/or aroma essence solution to a powdered wall material, having a particle size of from 60 μm to 150 μm, in a ratio of from 1:4 to 1:50 by weight of particulated frozen aqueous essence solution to powdered wall material, said wall material being selected from the group consisting of edible proteins, carbohydrates and combinations thereof, and forming by agitation at ambient temperature a continuous coating layer of the wall material on the frozen aqueous essence solution and allowing a water flux from the frozen aqueous essence particle to the surrounding wall material;

(b) curing the coated particles by continuing agitation until the water flux ceases such that the wall thickness is from about 20 μm to 400 μm surrounding a hollow core and such that the aqueous flavor and/or aroma essence solution is impregnated within the wall material; and then

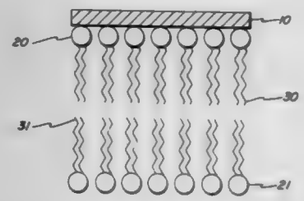
(c) collecting the capsules having a particle size in the range of from 250 μm and 3.5 μm.

4,634,599

METHOD FOR MAKING ORDERED MONOLAYERS OF MACROMOLECULES

Egidijus E. Uzgiris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 2, 1985, Ser. No. 729,609
Int. Cl.[4] A01N *1/02;* B32B *9/00*
U.S. Cl. 427—2 6 Claims



1. A method for effecting the nucleation of macromolecules as an ordered monolayer on a hydrophilic region of a supported lipid polylayer having at least two hydrophilic regions and at least one interior lipophilic region comprising,

(1) effecting contact between the macromolecules and a hydrophilic region of the lipid polylayer in an aqueous medium and

(2) incubating the resulting mixture for a time sufficient to allow for the ordering of such macromolecules,

where the lipid polylayer is anchored onto a supporting hydrophilic substrate through one of its hydrophilic regions.

4,634,600

SURFACE TREATMENT PROCESS

Yasuhiro Shimizu, and Akira Doi, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 19, 1985, Ser. No. 746,388
Claims priority, application Japan, Jun. 29, 1984, 59-136024
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—38 10 Claims

1. A surface treatment process for forming a thin film on the surface of a substrate positioned in an evaporation chamber for treatment, comprising the following steps:

(a) vaporizing an evaporation metal in said evaporation chamber,

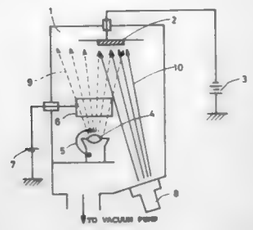
(b) ionizing said metal vapor,

(c) depositing said ionized metal vapor on said substrate, and

(d) simultaneously with steps (a), (b), and (c) accelerating

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metal or nonmetal ions into said evaporation chamber for a simultaneous implanting of accelerated metal or non-



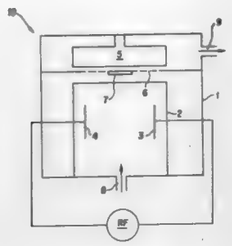
metal ions in or on said substrate for forming a coating of improved hardness and adhesion on said substrate.

4,634,601

METHOD FOR PRODUCTION OF SEMICONDUCTOR BY GLOW DISCHARGE DECOMPOSITION OF SILANE

Yoshihiro Hamakawa, Kawanishi; Hideo Yamagishi, Kyoto, and Yoshihisa Tawada, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 26, 1985, Ser. No. 716,302
Claims priority, application Japan, Mar. 28, 1984, 59-61650
Int. Cl.⁴ B05D *3/06, 5/12*
U.S. Cl. 427—39 **2 Claims**



1. A method for the production of a semiconductor by the glow discharge decomposition of a silane type gas, characterized by effecting said glow discharge decomposition of introduced silane type gas with a plurality of opposed electrodes disposed substantially perpendicular to a substrate and insulated from the ground potential and subsequently allowing the product of said decomposition to be deposited on said substrate disposed so as to be exposed to said introduced silane type gas.

4,634,602

PRIMER COMPOSITION

Robert J. Sirkoch, Pittsburgh, and Kenneth W. Niederst, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 2, 1986, Ser. No. 815,698
Int. Cl.⁴ B05D *3/06;* **C08F** *8/00*
U.S. Cl. 427—44 **17 Claims**

12. A process comprising the steps of:

(a) applying to a substrate a composition comprising

(i) a radiation sensitive compound having ethylenic unsaturation and at least one moiety selected from the group consisting of a urea moiety, a urethane moiety and mixtures thereof,

(ii) a radiation insensitive compound having a number average molecular weight of at least about 400, comprising at least about 40 percent, by weight, based on the weight of said radiation insensitive compound, of aromatic ring moieties and having a hydroxyl group equivalent weight of between about 200 and 1500, and

(iii) a crosslinking agent reactive with the hydroxyl groups present in said radiation insensitive compound, said crosslinking agent being selected from the group consisting of an aminoplast resin, a blocked isocyanate and mixtures thereof, such that said composition is capable of being cured using heat and either ionizing radiation or ultraviolet light.

(b) partially curing said composition in a first curing step; and

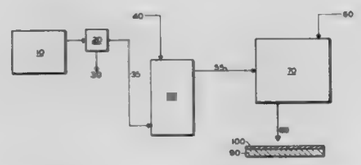
(c) further curing said composition in a second curing step; wherein one of said curing steps comprises exposing said coated substrate to either ultraviolet light or ionizing radiation and the other curing step comprises exposing said coated substrate to heat.

4,634,603

METHOD OF ABRASIVE CLEANING AND SPRAY COATING

Alder R. Gruss, New Rochelle, N.Y., and Theodore A. Shapiro, West Haven, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 22, 1985, Ser. No. 725,848
Int. Cl.⁴ B05D *1/06, 1/34, 3/12*
U.S. Cl. 427—96 **4 Claims**



1. A method of simultaneously abrading at least one surface of a circuit board assembly and applying a film-forming coating composition thereto with a spray gun having a compressed gas stream supply and a film-forming composition stream supply, comprising

introducing glass microballoons into the compressed gas stream supply of the spray gun, such that the glass microballoons are entrained in the compressed gas stream and carried by the gas stream to and out of at least one spray nozzle in the spray gun; and directing the film-forming coating composition stream to and out of at least one spray nozzle in the spray gun such that the glass microballons are simultaneously sprayed along with the film-forming composition from the spray gun, resulting in the film-forming coating composition and the glass microballoons simultaneously impinging upon at least one surface of the circuit board assembly,

thereby abrading the surface and resulting in a film of the coating composition being simultaneously applied to the surface, wherein substantially all of the glass microballoons are blown off the surface by the compressed gas stream, thereby producing a coating which is substantially free of glass microballoons and is adherent to the surface of the assembly.

4,634,604

METHOD FOR PRODUCING A BIOCOMPATIBLE LAYER ON THE SURFACE OF PARTICLES OF POROUS SYNTHETIC SORBENTS

Marie Tlustakova; Jiri Horak, both of Prague; Josef Vavrouch, Libice n/Cidl.; Jiri Kulisek, Zasmuky, and Jaroslav Kalal, Prague, all of Czechoslovakia, assignors to Ceskoslovenska adademie ved, Czechoslovakia

Filed Jun. 20, 1984, Ser. No. 622,671
Claims priority, application Czechoslovakia, Jun. 23, 1983, 4619-83
Int. Cl.⁴ B01J *13/02*
U.S. Cl. 427—213.33 **6 Claims**

1. Method for producing a biocompatible layer on the surface of particles of porous synthetic sorbents, wherein a solution of biocompatible polymer of the acrylate or methacrylate type, or its monomer in the presence of polymerization initiators, acts on a suspension of the sorbent, which is stirred by steam, said biocompatible polymer forming on the surface of said particles as a thin coherent layer, such that the resulting coated particles retain their initial sorption capacity.

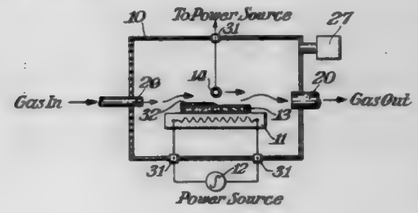
4. The method according to claim 1, wherein the biocompatible polymer is crosslinked poly(2-hydroxyethyl methacrylate).

4,634,605

METHOD FOR THE INDIRECT DEPOSITION OF AMORPHOUS SILICON AND POLYCRYSTALLINE SILICONE AND ALLOYS THEREOF

Harold J. Wiesmann, Vactronic Lab. Equipment, Inc., 65 Brightside Ave., E. Northport, N.Y. 11731

Continuation-in-part of Ser. No. 613,310, May 23, 1984, abandoned. This application Jul. 16, 1985, Ser. No. 755,668
Int. Cl.⁴ C23C *16/24, 16/32*
U.S. Cl. 427—249 **29 Claims**



1. A method of depositing a thin film of a material on a substrate comprising the steps of:

a. placing the substrate in a chamber containing a member having a surface capable of being heated to a temperature greater than 600° .C and the member having a heated surface area less than the area of the substrate;

b. introducing a gas into the chamber, the gas containing chemical precursors of the material;

c. maintaining a pressure in the chamber of at least 0.01 Torr;

d. controlling the temperature of the substrate to a temperature below 600° C. by providing a source of heat to the substrate;

e. applying heat to the member to maintain the temperature of the member greater than the decomposition temperature of the gas to thermally decompose the gas into decomposition products; and

f. moving the member and substrate relative to each other to deposit the gas decomposition products as a thin film on the temperature controlled substrate with the relative movement being at a rate selected to avoid exessive heating of the substrate.

4,634,606

WASHABLE MARKING FLUID FORMULATION FOR SOFT GELATIN CAPSULES AND USE THEREOF

George A. Skogg, Kingsford, Mich., assignor to The Nelson Paint Company, Kingsford, Mich.

Filed Oct. 9, 1985, Ser. No. 785,856
Int. Cl.⁴ B05D *7/24;* **B32B** *1/06;* **C09D** *11/00;* **F42B** *13/36*
U.S. Cl. 427—256 **20 Claims**

1. A washable marking fluid formulation comprising from about 94 to about 99% vt weight of a nonionic polyoxyethylene derivative of fatty acid partial esters of sorbitol anhydride, about 0.5 to about 5.0% by weight of a colored pigment, about 0.3 to about 3.0% by weight of a suspending agent and about 0.05 to about 0.8% by weight of an antifoaming agent, wherein the percentages by weight are based on the weight of the total marking fluid composition.

9. A soft gelatin marking capsule comprising a soft gelatin capsule containing a washable marking fluid formulation of claim 1.

15. A method of marking an article with a washable marking fluid which comprises projecting a soft gelatin capsule of claim 9 from a projecting instrument, said capsule rupturing only on impact with the article to thereby mark it with the washable marking fluid formulation contained in the capsule.

4,634,607

APPLYING DESIGNS TO AUTO EXTERIORS

Earl R. Ernsberger, Dublin, Pa., assignor to Custon Auto Exteriors, Doylestown, Pa.

Continuation-in-part of Ser. No. 510,644, Jul. 1, 1983, abandoned. This application Jul. 11, 1985, Ser. No. 753,929
Int. Cl.⁴ B05D *1/32*
U.S. Cl. 427—282 **6 Claims**

1. A method for applying designs to an auto body which comprises:

(1) securing on said auto body a precut mask fabricated from a polyvinyl chloride sheet to which has been applied on one side a rubber based adhesive, said sheet having a thickness of from about 1.75–2.50 mils; and

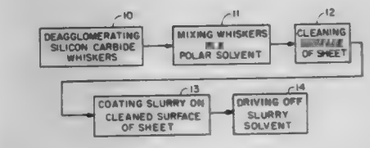
(2) brushing onto and within said mask a heavily pigmented enamel having a high concentration of drying oils.

4,634,608

METHOD OF MAKING SILICON CARBIDE WHISKER SHEET COMPOSITES

Lewis A. Short, Piedmont, and Ottis J. Horne, Greer, both of S.C., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 335,449, Dec. 29, 1981, Pat. No. 4,532,182. This application May 20, 1985, Ser. No. 736,026
Int. Cl.⁴ B05D *3/02, 3/12;* **B32B** *13/14, 17/12*
U.S. Cl. 427—327 **19 Claims**



12. A method of preparing a sheet having a surface coated with silicon carbide whiskers, comprising the steps of:

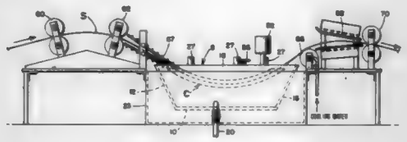
(a) deagglomerating a mass of silicon carbide whiskers by mixing said whiskers in a polar solvent and then driving off said solvent;

(b) forming a slurry of said deagglomerated whiskers by mixing said whiskers in a polar solvent;

(c) cleaning a surface of said sheet which surface is to be coated with said whiskers;

(d) coating said slurry upon said cleaned surface of said sheet; and
(e) driving off said solvent from said slurry to produce a sheet coated with a substantially uniform dispersion of silicon carbide whiskers.
13. The method of claim 12, wherein said sheet is metallic.

4,634,609
PROCESS AND APPARATUS FOR COATING
Eugene S. Fabiny, Pittsburgh; George W. Hessler, Sewickley, and John H. Bradel, Jr., Baden, all of Pa., assignors to Hussey Copper, Ltd., Leetsdale, Pa.
Filed Jun. 18, 1985, Ser. No. 746,035
Int. Cl.⁴ B05C *3/12, 19/02*; B05D *1/18, 1/40*
U.S. Cl. 427—345 **5 Claims**



1. A process for applying a metallic coating material to the surface of a metallic sheet which comprises:
(a) establishing a coating zone that is composed of two separate streams of molten coating liquid that diverge outwardly and upwardly in two different directions from an incoming supply of molten coating liquid,
(b) discharging said separate diverging streams of molten coating liquid in the form of two spaced apart liquid overflow zones,
(c) introducing the sheet to be coated downwardly through one of said two overflow zone countercurrently to one of said diverging streams of molten coating liquid and withdrawing the coated sheet upwardly through the other of said overflow zones concurrently with the other of said diverging streams of molten coating liquid,
(d) recovering the molten coating liquid from said overflow zones by collecting it in a reservoir having a liquid surface that is located at a level lower than the liquid surface of said overflow zones,
(e) continuously removing a portion of the molten coating liquid in said reservoir and introducing it into said coating zone at a point intermediate said two spaced overflow zones, and
(f) controlling the flow of molten coating liquid through said coating zone so that contaminants contained in said molten coating liquid will be continuously and rapidly displaced from the surfaces of said overflow zones into said reservoir below said overflow zones, thus minimizing the opportunity for the contaminants to adhere to the sheet as it passes through said two overflow zones.

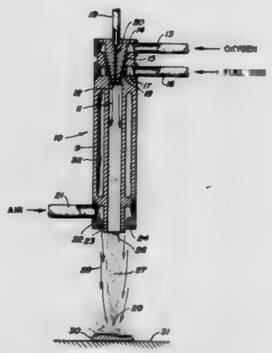
4,634,610
HEAT CURABLE SILICONE POLYIMIDE COMPOSITIONS
Francis L. Keohan, Schenectady, and Larry N. Lewis, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Oct. 31, 1985, Ser. No. 793,359
Int. Cl.⁴ B05D *3/02*
U.S. Cl. 427—387 **9 Claims**

1. A heat curable composition comprising
(A) imide substituted silicone block copolymer having chemically combined blocks selected from
(i) polydiorganosiloxane having chemically combined $\equiv SiH$ or $\equiv SiC_2H_3$ units, and
(ii) a mixture of (i) and polyimide,
(B) a polyfunctional organosilicon material having at least two chemically combined $\equiv SiH$ units or $\equiv SiC_2H_3$ units, and
(C) an effective amount of a cyclometallized platinum phosphite catalyst having the formula

$$(RO)_2POR^1Pt[P(OR^2)_3]X,$$

where (A) and (B) are capable of undergoing a polyaddition reaction involving addition between chemically combined $\equiv SiH$ units of (A) with $\equiv SiC_2H_3$ units of (B), or $\equiv SiC_2H_3$ units of (A) with $\equiv SiH$ units of (B), (B) is selected from the class consisting of organosilanes, organopolysilanes, organosiloxanes, organopolysiloxanes, and cyclopolyorganosiloxanes, and mixtures thereof, R and R^2 are selected from $C_{(1-14)}$ monovalent hydrocarbon radicals and substituted $C_{(1-14)}$ monovalent hydrocarbon radicals, R^1 is selected from $C_{(6-14)}$ monovalent aromatic hydrocarbon radicals and substituted $C_{(6-14)}$ monovalent aromatic hydrocarbon radicals and X is a halogen radical.

4,634,611
FLAME SPRAY METHOD AND APPARATUS
James A. Browning, Hanover, N.H., assignor to Cabot Corporation, Boston, Mass.
Filed May 31, 1985, Ser. No. 739,721
Int. Cl.⁴ B05B *7/20*
U.S. Cl. 427—423 **9 Claims**



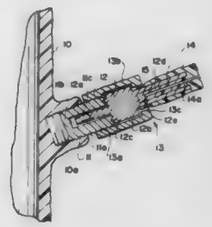
5. In a method for flame spraying a coating of the type in which an oxy-fuel mixture is combusted in a duct to produce a high temperature and high velocity columnar flame jet which is used to heat and propel a solid material from the duct toward a substrate, the improvement comprising the steps of: providing a stream of uncombusted compressed air separate from the oxy-fuel mixture, heating said stream of air above ambient temperature by flowing said stream along the exterior of said duct while absorbing heat therefrom, and maintaining the exit velocity of said flame jet subsonic while surrounding said columnar flame jet with a co-axial sheath of expanded compressed air having a velocity which is sufficiently close to the velocity of said flame jet so that there is little initial mixing of said sheath and said jet.

4,634,612
DECORATIVE RIBBON AND SHEET MATERIAL
David L. Nelson, Woodbury; Bernard S. Truskolaski, and Paul E. Hansen, both of Lake Elmo, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Apr. 15, 1985, Ser. No. 722,234
Int. Cl.⁴ D04D *7/10*
U.S. Cl. 428—4 **27 Claims**



1. Decorative sheet material comprising
(a) A thermally bonded nonwoven tissue-like base layer having at least 50 weight percent polymeric, staple fibers having a length in the range of ¼ to 6 inches and up to about 50 weight percent other fibrous material, at least the outer portion of said fibers being thermally bondable, and
(b) at least a monolayer of a multiplicity of substantially parallel, continuous, non-cellulosic, multifilament yarns substantially covering a first side of said base layer and thermally laminated to said base layer,
at least one side of said base layer being sonically bondable to a fibrous substrate.

4,634,613
BOUGH TO TREE TRUNK CONNECTION FOR ARTIFICIAL TREE
Douglas S. Potter, 1252 Lakeshore Dr., Naples, Fla. 33940
Filed Jul. 18, 1984, Ser. No. 631,993
Int. Cl.⁴ A47G *33/06*
U.S. Cl. 428—20 **5 Claims**



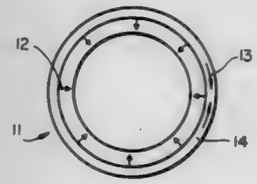
1. Apparatus for removably connecting an artificial bough to the trunk of an artificial tree comprising:
a cylindrical externally threaded stem plug one end of which is inserted into the trunk of an artificial tree,
an elongated bough end fixture attached to the end of an artificial bough, and
an internally threaded ring-shaped connector encircling the bough end fixture and screwed onto the threaded stem plug to join together the fixture and the stem plug.

4,634,614
DEVICES FOR PERFUMING AMBIENT AIR AND ENCLOSED SPACES
Günter Holzner, Grand-Lancy, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland
PCT No. PCT/CH84/00001, § 371 Date Sep. 13, 1984, § 102(e) Date Sep. 13, 1984, PCT Pub. No. WO84/02654, PCT Pub. Date Jul. 19, 1984
PCT Filed Jan. 9, 1984, Ser. No. 653,267
Claims priority, application Switzerland, Jan. 14, 1983, 206/83
Int. Cl.⁴ A61L *9/04*
U.S. Cl. 428—35 **5 Claims**



1. A device for perfuming ambient air or enclosed spaces which comprises at least one chamber containing an active fragrant substance and having at least one wall made of polymeric material enabling the vapours of the active fragrant substance to diffuse into the environment, the outer surface of said polymeric wall being covered with a thin paper layer, said layer being covered with a sheet of polymeric material to which there adheres a sheet of protective material impermeable to the vapours of the active substance.

4,634,615
HEAT RECOVERABLE COEXTRUDED ARTICLES
Willem M. Versteegh, 457 Maar Ave., Fremont, Calif. 94538; Lester T. Toy, 33235 Pheasant St., Fremont, Calif. 94536, and Christine Holland, 2904 Monterey St., San Mateo, Calif. 94403
Continuation-in-part of Ser. No. 597,771, Apr. 6, 1984, abandoned. This application Apr. 4, 1985, Ser. No. 720,121
Int. Cl.⁴ F16L *9/14*
U.S. Cl. 428—36 **11 Claims**

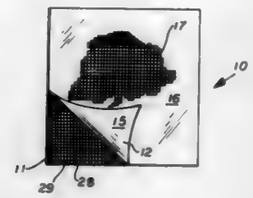


1. A heat-recoverable tubular composite article comprising:
(a) an inner layer comprising a crosslinked elastomeric polymeric material having a modulus at 100% elongation at 20° C. of about 40 to about 900 pounds per square inch; and
(b) an outer layer comprising a thermoplastic material having a 2% secant modulus at 20° C. of about 5,000 to about 100,000 pounds per square inch;
said composite article (1) being formed by coextrusion, (2) having a direct bond maintaining said layers permanently bonded together, said bond having a peel strength of at least 6 pounds per linear inch, and (3) being in a radially expanded configuration, said thermoplastic outer layer being capable of retaining the elastomeric inner layer in an expanded configuration at ambient temperature and incapable of retaining the elastomeric layer in an expanded configuration at an elevated temperature thereby permitting both layers of said composite

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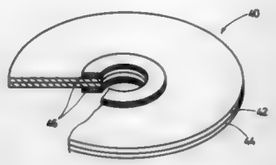
article to recover, when heated, to or toward its unexpanded configuration.

4,634,616
STENCIL ART OVERLAYS
Louis P. Musante, 6663 Old Ridge Rd., Fairview, Pa. 16415, and Lynda L. Scott, 3082 W. 12th St., Apartment 2, Erie, Pa. 16505
Filed Jan. 30, 1986, Ser. No. 824,192
Int. Cl.⁴ G09B *19/20*
U.S. Cl. 428—40 **5 Claims**



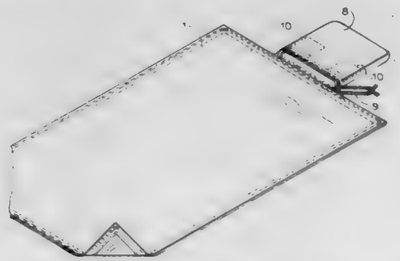
1. A craft kit comprising a sheet of transparent film sheet having adhesive on one side, covered with a removable backing sheet, and having horizontal and vertical rows of intersecting lines forming a grid with square spaces therebetween of a size similar to a grid of a sheet of plastic canvas,
some of said grid on said film sheet being highlighted to define a picture on said sheet of transparent film sheet being adapted to overlie the corresponding parts of said grid on said plastic canvas sheet,
said transparent film sheet being adapted to be used by removing said backing sheet from said transparent material,
adhering said film to said plastic canvas sheet with the strands of said grid of said transparent film sheet overlying and coextensive with the strands of said grid on said plastic canvas sheet,
cutting said plastic canvas to the shape of said picture, removing said transparent film sheet and stitching through said grid spaces in said plastic canvas with a heavy yarn, conforming to said picture, thereby doing a needlework design in accordance with said pattern on said transparent film sheet.

4,634,617
OPTICAL MEMORY DISC
Kenji Ohta, Yao; Akira Takahashi; Tetsuya Inui, both of Nara; Takao Hyuga, Soraku, and Hideyoshi Yamaoka, Matsubara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Aug. 8, 1984, Ser. No. 638,674
Claims priority, application Japan, Aug. 18, 1983, 58-151009
Int. Cl.⁴ B32B *3/02*
U.S. Cl. 428—65 **13 Claims**



1. An optical memory disc comprising:
a substrate having central circular aperture of a predetermined size;
a plurality of concentric information tracks formed on said substrate;
a centering device having a central circular aperture of a size less than the predetermined size of the aperture of said substrate secured to said substrate in a manner that the center of said centering device is positioned at the center of said concentric information tracks; and
a photo-polymer adhesive interposed between said substrate and said centering device to secure said centering device to said substrate.

4,634,618
WEIGHTED TOWEL
Keith B. Greer, and O'Neil J. Greer, both of 3195 Foxcroft Rd., #F203, Miramar, Fla. 33025
Filed Jan. 19, 1985, Ser. No. 746,506
Int. Cl.⁴ B32B *3/08*
U.S. Cl. 428—81 **3 Claims**

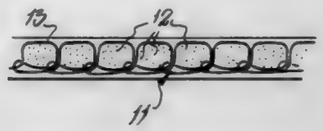


1. A flat material suitable for use as a beach towel, outdoor blanket or mat, said material having
a weighted cord affixed along substantially all the perimeter thereof; and
a carry bag affixed at one end thereof.

4,634,619
PROCESS FOR ELECTROLESS METAL DEPOSITION
Deborah J. Lindsay, Princeton, N.J., assignor to Surface Technology, Inc., Princeton, N.J.
Continuation of Ser. No. 310,785, Oct. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 204,495, Nov. 6, 1980, abandoned. This application Feb. 10, 1984, Ser. No. 578,829
Int. Cl.⁴ B44D *1/14*
U.S. Cl. 427—97 **29 Claims**

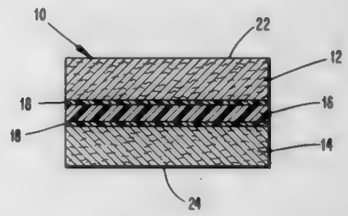
1. A process for the metallization of a substrate by electroless plating or chemical plating comprising
a. contacting said substrate with a composition comprising and adsorption modifier, said modifier being a polyelectrolyte, thereby providing a path for the increased catalytic site density,
b. rinsing said substrate to remove excess adsorption modifier, and thereafter without the use of a sensitizing step
c. contacting said treated substrate with a catalytic composition, said composition comprising a catalytic metal capable of electroless plating initiation, which directly or serving as a precursor leads to the catalytic sites which are capable of electroless plating initiation and wherein said non-noble catalytic metal may be either in the elemental state, an alloy, a compound, or a soluble complex, and mixtures thereof, and then
d. contacting said substrate with a compatible electroless plating bath to deposit a metallic layer.

4,634,620
STITCH BONDED ELECTRICALLY INSULATING BOARD
Malcolm Otty, 27 Column Road, West Kirby, Liverpool, England
Filed Jul. 18, 1984, Ser. No. 631,896
Claims priority, application United Kingdom, Jul. 20, 1983, 8319564
Int. Cl.⁴ B05D *5/12*
U.S. Cl. 428—102 **10 Claims**



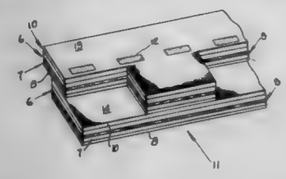
1. An electrically insulating board comprising a stitch bonded fabric comprising high temperature fibres impregnated with resin, the resin being cured by hot pressing.

4,634,621
SCRIM REINFORCED, CLOTH-LIKE COMPOSITE LAMINATE AND A METHOD OF MAKING
James H. Manning, and Cedric A. Dunkerly, II, both of Appleton, Wis., assignors to The James River Corporation, Richmond, Va.
Filed May 17, 1984, Ser. No. 611,145
Int. Cl.⁴ B32B *5/12*
U.S. Cl. 428—110 **25 Claims**



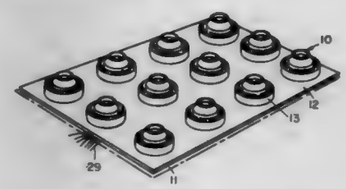
1. A method of making a cloth-like composite laminate comprising the steps of:
(a) inserting a scrim coated with a thermoplastic binder between two nonwoven layers each of the nonwoven layers being formed of cellulosic fibers bound with a latex adhesive; and
(b) heating the scrim and the two nonwoven layers to a temperature sufficient to activate the thermoplastic binder, the heating being performed without pressing the scrim and the nonwoven layers together so as to form a cloth-like composite laminate having a nonwoven layer of cellulosic fibers continously bound to opposite sides of the scrim, the surface of each nonwoven layer being planar and uninterrupted by the scrim.

4,634,622
LIGHTWEIGHT ASPHALT BASED BUILDING MATERIALS AND PROCESS FOR MAKING SAME
Kenneth L. Jenkins, Littleton; Stanley C. Sahaka, Englewood; Rick L. Dolin, Littleton, all of Colo.; Allan R. LaRoche, Lewiston, Me.; Robert E. Hodgson, Littleton, Colo.; Neil R. Such, Englewood, Colo.; Douglas D. Smith, Highlands Ranch, Colo.; Frank R. Newton, and Richard N. Canningham, both of Littleton, Colo., assignors to Manville Corporation, Denver, Colo.
Continuation-in-part of Ser. No. 669,202, Jan. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 615,183, May 30, 1984, abandoned. This application Sep. 16, 1985, Ser. No. 776,252
Int. Cl.⁴ B32B *11/02, 11/10*; B05D *1/12*
U.S. Cl. 428—143 **19 Claims**



1. A flexible composite roofing element, comprising:
a preformed flexible web; and
a filled asphalt-based coating adhered to said web, said coating comprising asphalt and particulate filler distributed throughout the asphalt, the specific gravity of the coating being less than 1.0 and the filler having an effective specific gravity in the approximate range of 0.10–0.50;
the filler comprising particles having hollow, gas filled inclusions.

4,634,623
CONDUCTIVE ELASTOMERIC INK COMPOSITION
Richard L. Watkins, Westminster, Colo., assignor to The Gates Corporation, Denver, Colo.
Division of Ser. No. 515,823, Jul. 18, 1983, Pat. No. 4,518,833. This application Feb. 4, 1985, Ser. No. 698,058
Int. Cl.⁴ B32B *3/00*
U.S. Cl. 428—208 **13 Claims**



1. An electrically conductive elastomeric ink composition which comprises an elastomeric silicone binder and finely divided nickel particles interspersed therein in an amount from about 25 to about 90 percent by weight based on the weight of the composition, the nickel particles having a size in the range from about 0.05 to about 32 microns.

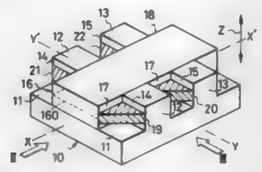
4,634,624
COMBINED STRUCTURE COMPRISING PARTS HAVING DIFFERENT COEFFICIENTS OF THERMAL EXPANSION
Atsushi Tajima; Nobuo Suzuki, both of Fujisawa, and Tsutomu Kuse, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 18, 1986, Ser. No. 829,825
Claims priority, application Japan, Feb. 28, 1985, 60-37443
Int. Cl.⁴ B32B *7/02*
U.S. Cl. 428—212 **5 Claims**

1. A combined structure comprising parts having different coefficients of thermal expansion comprising:

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a first structural part having at least a projection part on a surface thereof;

a second structural part having a coefficient of thermal expansion different from that of the first structural part and which is capable of being combined with the first structural part through the projection part; and



elastic connecting members positioned to connect the side wall surface of said first structural part and the side wall surface of said second structural part at a level of a neutral plane of said second structural part, so that said first structural part and said second structural part are firmly connected to each other.

4,634,625

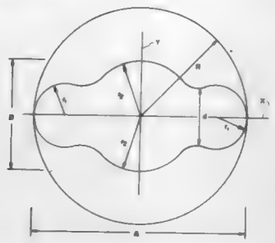
NEW FABRICS, YARNS AND PROCESS

John S. Franklin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 23, 1984, Ser. No. 664,803

Int. Cl.⁴ B05D *1/36, 5/00;* **D02G** *3/00;* **D02D** *15/00*

U.S. Cl. 428—258 **4 Claims**



1. An improved combination woven fabric, comprising textured continuous filament polyester warp yarns in combination with spun filling yarns, the improvement characterized in that said textured continuous filament polyester yarns comprise filaments of denier about 1 to about 4.5 derived by draw-texturing feed yarn filaments of elongation to break about 80 to 180% and of scalloped-oval cross-section with average dimensions within the following ranges: A/B from 1.4 to 2.4; r_1/R from 0.2 to 0.45; r_2/r_1 from 0.8 to 2.1; d/r_1 from 1.2 to about 2; whereby the fabric has the combination of a soft hand and natural luster without objectionable glitter.

4,634,626

CORROSION-PREVENTING STRUCTURE

Ikutoshi Yamaguchi, Chigasaki; Katsuhiko Kashiwagi, Yokohama; Hideo Goto, Yokosuka, and Susumu Inoue, Yokohama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

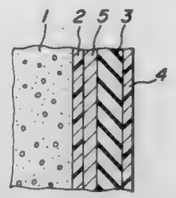
Filed Feb. 11, 1986, Ser. No. 828,126

Claims priority, application Japan, Feb. 15, 1985, 60-26371

Int. Cl.⁴ B32B *13/00, 3/26*

U.S. Cl. 428—312.4 **9 Claims**

1. A corrosion-preventing structure for protecting reinforcing bars in reinforced concrete to be protected from corrosion, comprising an adhesive layer, a swelling agent layer with a water-absorbing polymer blended therein, and a protective cover layer which layers are successively formed onto the surface of the reinforced concrete.



2. A corrosion-preventing structure according to claim 1, wherein a foam layer is interposed between the adhesive layer and the swelling agent layer.

4,634,627

MAGNETIC RECORDING MEDIUM COMPRISING A SURFACE-TREATED ABRASIVE

Kuniharu Fujiki, and Hiroshi Togashi, both of Mito, Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Nov. 8, 1985, Ser. No. 796,521

Claims priority, application Japan, Nov. 12, 1984, 59-236599

Int. Cl.⁴ G11B *3/70*

U.S. Cl. 428—323 **6 Claims**

1. A magnetic recording medium comprising a nonmagnetic support, and a magnetic recording layer formed on said support, said magnetic recording layer being formed of a composition which comprises a magnetic powder and an abrasive powder dispersed in a resin binder, said abrasive powder having a coating of an isocyanate compound having at least two isocyanate groups in one molecule thereof and being used in an amount of from 0.5 to 20 parts by weight per 100 parts by weight of said magnetic powder.

4,634,628

RECORDING MEDIUM AND IMAGE RECORDING PROCESS

Hirohide Munakata; Yoshinori Tomida, both of Yokohama; Masahiro Haruta, Funabashi; Yutaka Hirai, Tokyo; Yukuo Nishimura, Sagamihara, and Takashi Hamamoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1984, Ser. No. 680,663

Claims priority, application Japan, Dec. 22, 1983, 58-240938

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—325 **9 Claims**

1. An image recording process comprising:

(a) light-irradiating a recording medium according to a prerecorded pattern which recording medium comprises (1) a photosensitive layer comprising (i) an enzyme the activity of which can be increased or decreased by light irradiation and (ii) a carrier on which the enzyme is fixed and (2) a recording layer comprising a mixture of a recording material and a substance which is decomposable by the action of the enzyme only in the presence of a developing liquid and is removable by the developing liquid, to form a latent image in the photosensitive layer due to the difference in enzymatic activity in the irradiated and non-irradiated regions of the photosensitive layer; and

(b) applying the developing liquid to the recording medium to decompose and remove the recording layer and develop a relief image.

4,634,629

LIFT-OFF TAPE USABLE MANY TIMES

Masatsugu Inaba, Settsu, and Takumi Murasaki, Neyagawa, both of Japan, assignors to Fuji Kagakushi Kogyo Co., Ltd., Japan

Filed Mar. 7, 1985, Ser. No. 709,045

Claims priority, application Japan, Mar. 9, 1984, 59-45950; Nov. 27, 1984, 59-251176

Int. Cl.⁴ C09J *7/02;* **B32B** *27/08;* **B41J** *31/05*

U.S. Cl. 428—343 **17 Claims**

1. A reusable pressure-sensitive lift-off correction element for removing correctable images of type ink containing a polyamide resin which are typed onto an original sheet, which comprises a flexible foundation, and a pressure-sensitive layer coated on one surface of the flexible foundation, said pressure-sensitive layer comprising a rubber-like resin binder material, a tackifier resin, and from 0.5 to 50 parts by weight, per each 10 parts by weight of the tackifier resin of a plasticizer for plasticizing the polyamide resin of the correctable images of type ink, whereby correctable images which are adhered to said layer and removed from said original sheet are rendered adhesive by said plasticizing action to permit additional correctable images of type ink to be adhered thereto during reuse.

4,634,630

TELLURIUM OXIDE WHISKERS AND A METHOD OF PRODUCING THE SAME

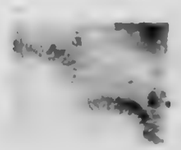
Yoshimi Kamijyo, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Nov. 13, 1985, Ser. No. 797,641

Claims priority, application Japan, Nov. 13, 1984, 59-239009

Int. Cl.⁴ D02G *3/00*

U.S. Cl. 428—399 **4 Claims**



1. A whisker comprising a needle-shaped single crystal of tellurium oxide.

4,634,631

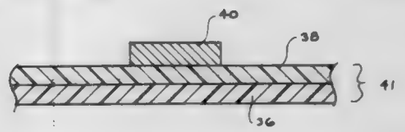
FLEXIBLE CIRCUIT LAMINATE AND METHOD OF MAKING THE SAME

Samuel Gazit, Willimantic, and Cathy A. Fleischer, Thompson, both of Conn., assignors to Rogers Corporation, Rogers, Conn.

Filed Jul. 15, 1985, Ser. No. 755,074

Int. Cl.⁴ B32B *27/08, 15/08*

U.S. Cl. 428—421 **15 Claims**



1. A laminated circuit material consisting essentially of:

a first layer of polyimide film;

a first glass reinforced fluoropolymer adhesive film on said first layer of polyimide film, said glass having a short, noncontinuous configuration; and

first conductive sheet means disposed on at least a portion of said glass reinforced fluoropolymer adhesive film.

4,634,632

MAGNETIC RECORDING MEDIUM

Hiroshi Ogawa; Shinji Saito, and Yasuo Tamai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 10, 1984, Ser. No. 680,217

Claims priority, application Japan, Dec. 9, 1983, 58-233076

Int. Cl.⁴ G11B *5/76*

U.S. Cl. 428—425.9 **29 Claims**

1. A magnetic recording medium comprising a non-magnetic support having coated thereon a magnetic layer which is prepared by the process comprising

(1) mixing a solution of at least one copolymer of vinyl chloride, vinyl acetate and vinyl alcohol having 3 to 20 wt.% of vinyl alcohol and a degree of polymerization of 200 to 600, the concentration of the copolymer in the solution being 30 to 50 wt%, with ferromagnetic particles and kneading them, the solution and the ferromagnetic particles having a viscosity of 1,000 poises or more; and

(2) adding a solution of at least one rubber-type resin and at least one additive thereto and dispersing the resulting composition, which has a viscosity of about 1 poise to 500 poises, to prepare a coating composition.

9. A process for preparing a magnetic recording medium comprising

(1) mixing a solution of at least one copolymer of vinyl chloride, vinyl acetate and vinyl alcohol having 3 to 20 wt.% of vinyl alcohol and a degree of polymerization of 200 to 600, the concentration of the copolymer in the solution being 30 to 50 wt%, with ferromagnetic particles and kneading them, the solution and the ferromagnetic particles having a viscosity of 1,000 poises or more;

(2) adding a solution of at least one rubber-type resin and at least one additive thereto and dispersing the resulting composition, which has a viscosity of about 1 poise to 500 poises; and

(3) coating the resulting composition on a non-magnetic support.

4,634,633

MAGNETIC RECORDING MEDIUM

Yoshinobu Ninomiya; Masashi Somezawa, and Kiyokazu Oiyama, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 678,814

Claims priority, application Japan, Dec. 15, 1983, 58-236911; Dec. 19, 1983, 58-239530

Int. Cl.⁴ G11B *5/72*

U.S. Cl. 428—425.9 **101 Claims**

1. A magnetic recording medium comprising a non-magnetic substrate and a magnetic layer formed thereon composed mainly of magnetic powder and an irradiation hardened binder, said binder containing a thermoplastic polyurethane-urea resin obtained by the polyaddition reaction of

(A) a long chain diol having a molecular weight in the range of about 500 to 5000;

(B) a short chain diol having a molecular weight in the range of about 50 to 500;

(C) an organic diamine;

(D) an organic diisocyanate; and

(E) a compound having unsaturated bonds sensitive to irradiation,

said resin having a total concentration of urea groups and urethane groups between 1.8 and 3.0 m mol/g.

37. A magnetic recording medium comprising a non-magnetic substrate and a magnetic layer formed thereon composed mainly of magnetic powder and a binder, said binder contain-

ing a thermoplastic polyurethane-urea resin having unsaturated bonds sensitive to irradiation and being obtained by the polyaddition reaction of

(A) a long chain diol having a molecular weight in the range of about 500 to 5000;

(B) a short chain diol having a molecular weight in the range of about 50 to 500;

(C) an organic diamine;

(D) an organic diisocyanate;

(E) a compound having unsaturated bonds sensitive to

(F) a compound having at least one hydrophilic polar group selected from the group consisting of the groups represented by the following formulas:

$-SO_3M$, $-OSO_3M$, $-COOM$ and

$$-P(OM')_2 \quad (=O)$$

wherein M is hydrogen or alkali metal and M' is hydrogen, alkali metal or a hydrocarbon group, said thermoplastic polyurethane-urea resin being hardened under irradiation, the total concentration of urea groups and urethane groups in said resin being between 1.8 and 3.0 m mol/g.

4,634,634

GLAZE CERAMIC BASE

Kazuo Kondo, and Masahiko Okuyama, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Continuation of Ser. No. 435,204, Oct. 19, 1982, abandoned. This application Dec. 24, 1985, Ser. No. 814,177

Claims priority, application Japan, Oct. 19, 1981, 56-166780; Jul. 6, 1982, 57-117115

Int. Cl.⁴ C03C *3/22, 5/02;* **C04B** *33/26*

U.S. Cl. 428—432 **12 Claims**

1. A glazed ceramic base comprising a ceramic base having provided and calcined thereon a glaze composition comprising from 56 to 71 mol% SiO_2, 15.5 to 28 mol% BaO, and 6 to 16 mol% Al_2O_3 as necessary ingredients, and one or more members of up to 10 mol% SrO, up to 8 mol% B_2O_3, up to 10 mol% CaO, and up to 3 mol% MgO as a first group of auxiliary ingredients, with the combined content of the first group of auxiliary ingredients being not more than 10 mol% of the total content.

4,634,635

BLACK ORNAMENT

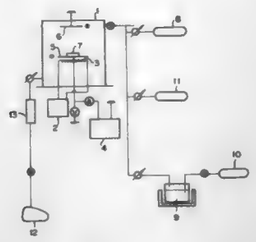
Yasuhisa Shiraishi, Tokyo; Takashi Fujita, Ebina; Yoshiharu Ochi, Ichihara; Masahiko Hirose, Yokohama; Katsutarou Ichihara, Kawagoe, and Takashi Ishigami, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1984, Ser. No. 655,223

Claims priority, application Japan, Sep. 30, 1983, 58-180392

Int. Cl.⁴ B32B *13/04*

U.S. Cl. 428—446 **7 Claims**



1. A black ornament comprising (1) a substrate with a surface roughness of 20 μm or less and (2) a high luster coating the thickness being not less than 1 μm applied to said substrate, said coating comprising silicon carbide and having a color tone in which, relative to the CIE 1976 L*a*b* color space provided in JIS Z 8105–1982, Item No. 2068, each of L*, a* and b* satisfies the relationship of $30\% \leqq 50\%$, and $(a^*)^2+(b^*)^2 \leqq 25$.

4,634,636

POLYACETYLENE COMPOSITE

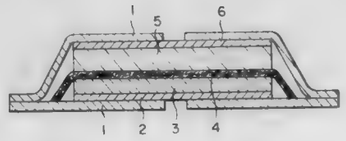
Akira Yoshino, Fujisawa, and Kenichi Sanechika, Kawasaki, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 7, 1984, Ser. No. 679,399

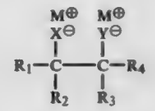
Claims priority, application Japan, Dec. 13, 1983, 58-233648; Dec. 13, 1983, 58-233649

Int. Cl.⁴ B32B *27/00;* **C25B** *3/00;* **H01M** *4/60*

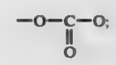
U.S. Cl. 428—500 **12 Claims**



1. A polyacetylene composite comprising a polyacetylene polymer having a coating formed thereon, said coating containing at least one ionic compound represented by the general formula (I):



wherein M denotes at least one member selected form the group consisting of alkali metals; X and Y are the same or different and represent —O or



R_1, R_2, R_3, and R_4 each are at least one member selected from the goup consisting of hydrogen, substituted or unsubstituted alkyl groups of 1 to 5 carbon atoms, and substituted or unsubstituted alkoxy groups of 1 to 5 carbon atoms, or R_1 and R_2 or R_3 and R_4 in combination form a cyclic structure.

4,634,637

SOLAR CONTROL FILM

Dell B. Oliver, Gilbert, and Peter Jahoda, Chandler, both of Ariz., assignors to Gila River Products, Inc., Chandler, Ariz.

Filed Nov. 22, 1985, Ser. No. 801,084

Int. Cl.⁴ B32B *15/08, 7/02*

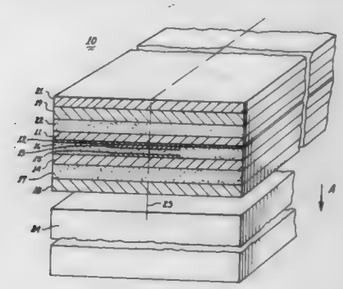
U.S. Cl. 428—622 **10 Claims**

1. A flexible, solar control, composite sheet for use on the inside surface of a motor vehicle window comprising:

a first optically clear polymeric stratum having a layer of an alloy of nickel and chromium applied by conventional vacuum deposition to one of its surfaces and having a stripe of stainless steel applied by conventional vaccum deposition over said nickel chromium layer at one edge of said first polymeric stratum, said nickel chromium alloy layer having a density great enough to reduce the visible light transmission value to about 50–70% and said stainless steel stripe having a density great enough to give a combined visible light transmission with said nickel chromium layer of about 21%;

a second optically clear polymeric stratum having a stripe of an alloy of nickel and chromium applied by conventional vacuum deposition along one side to one edge of said second stratum and having a density great enough to reduce the visible light transmission value through the striped portion to about 35%;

said first polymeric stratum being bonded to said second polymeric stratum with the said stripe of stainless steel and



the said stripe of nickel chromium alloy next to and facing each other, the light transmission value of said stainless steel nickel chromium stripe with said nickel chromium layer being about 7 to 12%, said bonding comprising an optically clear adhesive; and

an optically clear adhesive layer for mounting said composite sheet with said second polymeric stratum to the inside surface of a motor vehicle window.

4,634,638

HIGH MELTING POINT COPPER-GOLD-TIN BRAZING ALLOY FOR CHIP CARRIERS

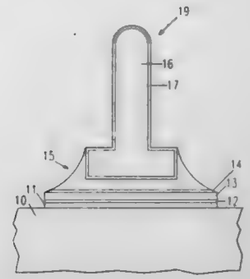
Norman G. Ainslie, Croton-on-Hudson; Joseph M. Harvilchuck, Lagrangeville; Mario J. Interrante, New Paltz; William J. King, Jr., Poughkeepsie; Paul H. Palmateer, Wappingers Falls, all of N.Y., and John F. Sullivan, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1981, Ser. No. 331,717

The portion of the term of this patent subsequent to Aug. 13, 2001, has been disclaimed.

Int. Cl.⁴ H05K *7/06*

U.S. Cl. 428—671 **8 Claims**



1. In a metallic joint, the improvement comprising a brazing alloy consisting essentially of gold and tin in eutectic proportions and having copper interdiffused therein.

4,634,639

ELECTROLUMINESCENT PANEL HAVING A LIGHT ABSORPTION LAYER OF GERMANIUM OXIDE

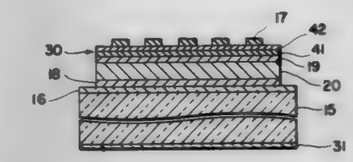
Hisao Kawai, Yamanashi, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Apr. 29, 1985, Ser. No. 728,595

Claims priority, application Japan, Apr. 30, 1984, 59-87363; Apr. 30, 1984, 59-87364

Int. Cl.⁴ H01J *1/62, 63/04;* **B32B** *9/00, 19/00*

U.S. Cl. 428—690 **8 Claims**



1. An electroluminescent panel comprising:

a transparent electrode;

a back electrode opposite to said transparent electrode;

an electroluminescent layer laid between said transparent and said back electrodes for emitting electroluminescent light; and

a light absorption layer between said back electrode and said electroluminescent layer, said light absorption layer essentially consisting of a lower-order oxide of germanium represented by GeO_x where x represents a positive number which is smaller than two.

4,634,640

DENSE SHAPED ARTICLES CONSISTING OF POLYCRYSTALLINE HEXAGONAL BORON NITRIDE AND PROCESS FOR THEIR MANUFACTURE BY ISOSTATIC HOT-PRESSING

Klaus Hunold, Kempten; Alfred Lipp, Bad Worishofen, and Klaus Reinmuth, Durach, all of Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Fed. Rep. of Germany

Division of Ser. No. 454,164, Dec. 29, 1982, Pat. No. 4,495,123. This application Aug. 31, 1984, Ser. No. 646,627

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1982, 3201563

The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.

Int. Cl.⁴ B32B *5/16, 15/02, 21/02, 27/02*

U.S. Cl. 428—704 **2 Claims**

1. A shaped boron nitride article having a density of at least 95% of the theoretical density consisting of polycrystalline hexagonal boron nitride having a free boric oxide content of not more than 1% by weight and having a homogeneous isotropic microstructure.

4,634,641

SUPERLATTICE PHOTOELECTRODES FOR PHOTOELECTROCHEMICAL CELLS

Arthur J. Nozik, Boulder, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

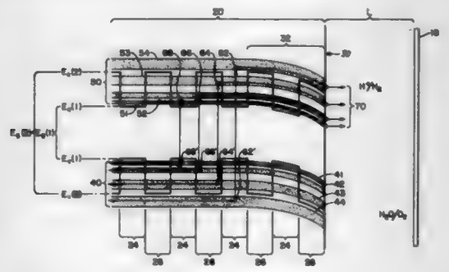
Filed Jul. 3, 1985, Ser. No. 751,413

Int. Cl.⁴ H01M *6/36*

U.S. Cl. 429—111 **20 Claims**

1. Photoelectrochemical cell apparatus, comprising first

photoelectrode means for injecting charge carriers into an electrolyte and second electrode means for injecting oppositely charged carriers into the electrolyte, said first electrode means including a superlattice semiconductor.

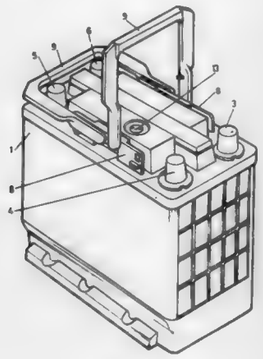


4,634,642

ELECTRIC STORAGE BATTERY

Juan A. Lopez-Doriga Lopez-Doriga, Madrid, Spain, assignor to Sociedad Espanola del Acumulador Tudor, S.A., Madrid, Spain

Filed Nov. 27, 1985, Ser. No. 802,365
Claims priority, application Spain, Jul. 22, 1985, 545.458
Int. Cl.⁴ H01M *2/26*
U.S. Cl. 429—121 **4 Claims**



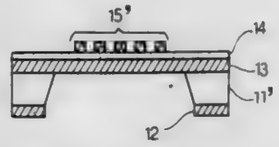
1. An electric storage battery of the type comprising a container of generally upright form closed at the top by a cover through which cover connection terminals extend wherein the container is subdivided on the inside into two or more cells which house alternating positive and negative electrodes with intermediate separators, characterized in that said cover is intersected by four terminals, said terminals being connected electrically in pairs by two bridges which run under said cover, said cover having two externally mounted handles pivotally mounted over a central part of said cover in a predetermined position whereby said handles can rotate between two limit positions, one being a rest position in which said handles are lowered over said cover to lie in a coplanar position and define an upper support platform above said terminals, and the other limit position being a raised work position in which both handles are generally parallel and approximately perpendicular to the cover.

4,634,643

X-RAY MASK AND METHOD OF MANUFACTURING THE SAME

Katsumi Suzuki, Tokyo, Japan, assignor to NEC, Japan

Filed Apr. 15, 1985, Ser. No. 723,052
Claims priority, application Japan, Apr. 18, 1984, 59-77745
Int. Cl.⁴ H01L *71/30*
U.S. Cl. 430—5 **6 Claims**



1. A mask for X-ray exposure comprising an X-ray absorbing layer of tungsten having a thickness in the order of 0.5 μm to 0.7 μm and having a desired pattern, a membrane which is transparent to X-ray for supporting said X-ray absorbing layer, a frame member reinforcing and supporting said membrane at the periphery thereof and a thin metallic film of titanium or nickel which has a thickness in the order of 50 Å to 200 Å and which is transparent to X-rays; or titanium and nickel which is transparent to X-ray and is provided between said X-ray absorbing layer and said membrane, the metallic film being present across the entire surface of said membrane.

2. A method of manufacturing a mask for X-ray exposure which comprises the steps of:

forming a membrane which is transparent to X-ray, said membrane being on one side of a substrate;

forming a film of Ti or Ni which is transparent to X-ray and a layer of W or films of Ti and Ni which are transparent to X-ray and a layer of W, in this order, on the membrane which is transparent to X-ray;

forming a desired resist pattern on the W layer according to electron beam exposure techniques:

subjecting the W layer to reactive ion etching using the resist as a mask and using the film of Ti or Ni; or Ti and Ni as an etching stopper to obtain a desired pattern of the W layer; and

removing a part of the substrate by etching the other side of the substrate to make it free from the films.

4,634,644

PROCESS FOR THE PRODUCTION IMAGES USING SEQUENTIALLY GASEOUS POLYMERIZING AGENTS AND PHOTOCURING

Edward Irving, Burwell, and Terence J. Smith, Royston, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 10, 1984, Ser. No. 679,973
Claims priority, application United Kingdom, Dec. 20, 1983, 8333853
Int. Cl.⁴ G03C *5/16*
U.S. Cl. 430—18 **20 Claims**

1. A process for the production of an image which comprises

(a) applying to a substrate a layer of a liquid composition containing a residue that is polymerizable on contact with a gaseous polymerizing agent, and a photocurable residue,

(b) contacting the composition with a gaseous polymerizing agent such that the layer solidifies but remains photocurable,

(c) exposing the solidified layer to actinic radiation in a predetermined pattern such that exposed parts of the layer are photocured, and

(d) removing those parts of the layer which have not become substantially photocured by treatment with a solvent therefor.

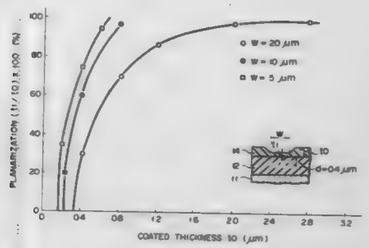
20. A substrate bearing an image produced by a process according to claim **1**.

4,634,645

METHOD OF FORMING RESIST MICROPATTERN

Tadahito Matsuda; Katsuhiro Harada; Shigeru Moriya, all of Isehara, and Tetsuyoshi Ishii, Zama, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Apr. 9, 1985, Ser. No. 721,306
Claims priority, application Japan, Apr. 13, 1984, 59-74690; Feb. 25, 1985, 60-35692
Int. Cl.⁴ G03C *5/00*
U.S. Cl. 430—30 **23 Claims**



1. A method of forming a resist pattern on a substrate, comprising the steps of:

(a) forming a resist on a substrate;

(b) radiating an energy beam carrying predetermined pattern information onto said resist and forming a recessed pattern in a surface portion of the resist so as not to extend through said resist;

(c) forming a planar mask layer on said resist including said recessed pattern;

(d) uniformly etching said mask layer along a direction of thickness thereof until at least a surface of said resist is exposed to allow said mask layer to remain on at least a bottom of said recessed pattern, thereby forming a mask pattern comprising the remaining residual mask layer; and

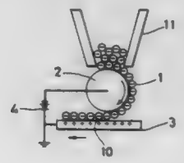
(e) etching said resist by using said mask pattern as an etching mask.

4,634,646

METHOD FOR THE FORMATION OF ELECTROPHOTOGRAPHIC IMAGES

Yumiko Sano, Ibaraki, and Teruyo Morimoto, Kobe, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jun. 17, 1985, Ser. No. 745,120
Claims priority, application Japan, Jun. 20, 1984, 59-126908
Int. Cl.⁴ G03G *13/22*
U.S. Cl. 430—31 **7 Claims**



1. A method for the formation of images comprising:

(1) uniformly inducing an electrostatic charge on a photoconductive toner, having an average particle diameter of 6 μm or less, by friction between the toner and at least one of a wall of a hopper containing said toner therein and a magnetic carrier,

(2) applying a bias potential having a different polarity from the charging polarity of said toner to a conductive substrate,

(3) feeding said charged toner to said charged conductive substrate to uniformly and intimately form a toner layer of 1 to 8 layers on said conductive substrate, while controlling the bias potential at a certain level depending upon the amount of electrostatic charges on said toner,

(4) uniformly charging said toner layer, and

(5) exposing said toner layer to form an electrostatic latent image thereon corresponding to an original.

4,634,647

ELECTROPHOTOGRAPHIC DEVICES CONTAINING COMPENSATED AMORPHOUS SILICON COMPOSITIONS

Frank Jansen, Walworth; Joseph Mort, Webster; Michael A. Morgan, Penfield; Steven J. Grammatica, East Rochester, all of N.Y., and John C. Knights, Palo Alto, Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 524,801, Aug. 19, 1983. This application Jan. 29, 1985, Ser. No. 695,990
Int. Cl.⁴ G03G *5/085*
U.S. Cl. 430—84 **30 Claims**

1. An electrophotographic photoresponsive device comprised of a supporting substrate, and an amorphous silicon composition containing in substantially equal amounts from about 25 parts per million by weight to about 1 weight percent of boron compensated with from about 25 parts per million by weight to about 1 weight percent of phosphorous.

4,634,648

ELECTROPHOTOGRAPHIC IMAGING MEMBERS WITH AMORPHOUS CARBON

Frank Jansen, Walworth, and Joseph Mort, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 5, 1985, Ser. No. 751,820
Int. Cl.⁴ G03G *5/082*
U.S. Cl. 430—84 **49 Claims**

1. A photoresponsive imaging member comprised of hydrogenated amorphous carbon, or halogenated amorphous carbon wherein there is present from about 5 to about 70 atomic percent of hydrogen, or from about 5 to about 70 atomic percent of halogen.

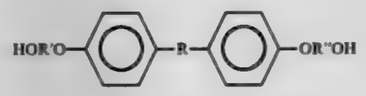
4,634,649

DEVELOPER COMPOSITIONS

John F. Knapp, Fairport, and Robert J. Gruber, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 566,754, Dec. 27, 1983, which is a continuation-in-part of Ser. No. 219,674, Dec. 24, 1980, abandoned. This application Mar. 20, 1985, Ser. No. 713,975
Int. Cl.⁴ G03G *9/10*
U.S. Cl. 430—109 **16 Claims**

1. An improved two-component contamination free developer composition of: a toner having magnetite and a polyester resin comprised of the polymeric esterification product of a dicarboxylic acid or anhydride selected from the group consisting of fumaric and maleic, and a diol comprising a diphenol of the following formula



wherein R, R' and R'' are the same or different and each is selected from substituted or unsubstituted lower alkyl radicals; and carrier particles; said magnetite being about 15 to about 50 percent, and said polyester resin being about 50 to about 85 percent, by weight of the toner.

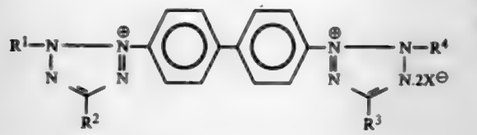
4,634,650

TONER FOR DEVELOPING LATENT ELECTROSTATIC IMAGES, CONTAINING CHARGE CONTROL AGENT

Tetsuro Suzuki, Fuji, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 26, 1985, Ser. No. 759,324
Claims priority, application Japan, Jul. 31, 1984, 59-158679
Int. Cl.[4] G03G 9/08
U.S. Cl. 430—110 18 Claims

1. A toner for developing latent electrostatic images consisting essentially of particles of a mixture of a colorant, a binder agent and a charge controlling agent in a charge controlling effective amount of the formula



wherein R^1, R^2, R^3 and R^4 each represent an unsubstituted or substituted aryl group; and X represents an anionic functional group.

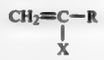
4,634,651

NON-AQUEOUS TYPE RESIN AND ELECTROPHOTOGRAPHIC DEVELOPER CONTAINING THE SAME

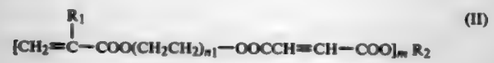
Makoto Okawara, Tokyo, and Kazuo Tsubuko, Numazu, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1985, Ser. No. 768,882
Claims priority, application Japan, Aug. 31, 1984, 59-183266; Aug. 31, 1984, 59-183269
Int. Cl.[4] G03G 9/12; C08L 23/04, 25/02
U.S. Cl. 430—114 10 Claims

1. A non-aqueous resin dispersion obtained by polymerizing, under suspension polymerization conditions, a copolymerizable monomer composition mixed in an aliphatic hydrocarbon solvent, in the presence of a polymerization initiator, said copolymerizable monomer composition containing monomer A having the formula



wherein R is H or CH_3, X is $COOC_nH_{2n+1}$ or $OCOC_nH_{2n+1}$ and n is an integer of from 6 to 20, and monomer B having the formula



(II)

wherein R_1, is H or CH_3, n_1 is an integer of from 1 to 20, m is an integer of from 1 to 3, and R_2 selected from the group consisting of H, Na, K, Mg, Mn, Ca, Li, Al and Co.

7. A liquid developer for electrophotography containing the non-aqueous resin dispersion of claim 1, and a pigment.

4,634,652

OVERLAY LIGHT-SENSITIVE PROOFING FILM WITH TRANSPARENT ALUMINUM OXIDE AND TRANSPARENT MAGNESIUM FLUORIDE LAYERS THEREIN

O. Alfred Barton, Florham Park, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Jul. 25, 1985, Ser. No. 758,894
Int. Cl.[4] G03C 1/80, 1/84
U.S. Cl. 430—156 19 Claims

1. An improved overlay proofing film comprising a substantially transparent polyester base film which has vapor deposit thereon a substantially uniform transparent adhesive layer comprising aluminum oxide, which adhesive layer has vapor deposited thereon a substantially uniform transparent optical layer comprising magnesium fluoride, which optical layer has a coating thereon comprising a light sensitive mixture of

(a) a resinous binder in sufficient quantity amount to function as binder for binding the colorant and the light-sensitive material in a coating;
(b) a colorant in sufficient quantity amount to enable a color of a color proofing image to be obtained in a coating; and
(c) a positive acting or negative acting light sensitive material in sufficient quantity amount to form a color proofing image in an actinic light imaged and developed coating.

4,634,653

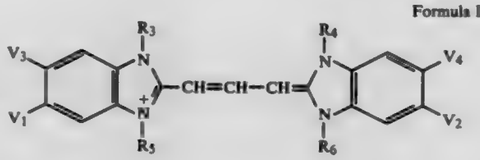
DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC EMULSION

Ichizo Toya; Yuji Mihara, and Haruo Takei, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 526,926, Aug. 26, 1983, abandoned. This application Mar. 18, 1985, Ser. No. 712,474
Claims priority, application Japan, Aug. 27, 1982, 57-148843
Int. Cl.[4] G03C 5/54, 1/40, 1/28, 1/19
U.S. Cl. 430—217 35 Claims

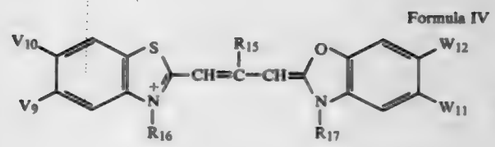
13. A diffusion transfer photographic material comprising a photosensitive unit having at least one layer of an internal latent image type direct positive silver halide emulsion associated with a non-diffusible dye image-providing material capable of releasing a diffusible dye in proportion to the amount of developed silver in said silver halide emulsion layer, a dyeing unit for receiving said diffusible dye, and a processing composition unit for processing the photosensitive unit, said internal latent image type silver halide emulsion containing at least one sensitizing dye selected from the group consisting of dyes represented by general formulae II and IV and the compound represented by general formula V

Formula II



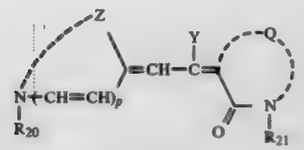
wherein V_1, V_2, V_3, and V_4 each represents a hydrogen atom, a halogen atom, a trifluoromethyl group, a cyano group, a carboxy group, an alkoxycarbonyl group, an aminosulfonyl group, or an alkylsulfonyl group; R_3, R_4, R_5, and R_6 each represents an alkyl group or substituted alkyl group X_1 represents an acid anion; and n_1 represents 0 or 1;

Formula IV



wherein R_{15} represents an alkyl group; R_{16} and R_{17} each represents an alkyl group or a substituted alkyl group V_9, V_{10}, W_{11}, and W_{12} each has the same significance as W_1 in general formula I; X_3 represents an acid anion; and n_3 represents 0 or 1;

Formula V



wherein Z represents a non-metallic atomic group necessary for completing a thiazole nucleus, a thiazoline nucleus, a selenazole nucleus, a selenazoline nucleus, a pyrrolidine nucleus, a pyridine nucleus, an oxazole nucleus, an oxazoline nucleus, an imidazole nucleus, an indolenine nucleus, a tetrazole nucleus, a benzothiazole nucleus, a benzoselenazole nucleus, a benzimidazole nucleus, a benzoxazole nucleus, a naphthothiazole nucleus, a naphthoselenazole nucleus, a naphthoxazole nucleus, a napthoimidazole nucleus, or a quinoline nucleus; Q represents a non-metallic atomic group necessary for completing a rhodanine nucleus, a 2-thiooxazolidine-2,4-dione nucleus, a 2-thioselenazolidine-2,4-dione nucleus, a barbituric acid nucleus, a 2-thoibarbituric acid nucleus, or a 2-thiohydantoin nucleus; R_{20} and R_{21} each represents a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, or an allyl group; Y represents a hydrogen atom, an alkyl group, or an aryl group; and p represents 0 or 1 wherein said photographic material contains a fogging agent which, during development or pre-bath processing, preferentially forms surface development nuclei.

4,634,654

PHOTOGRAPHIC PRODUCTS EMPLOYING NONDIFFUSIHLE 4-ARYLAZO-1-HYDROXY-2-CARBOXY ESTER SUBSTITUTED NAPHTHOIC IMAGE DYE-PROVIDING COMPOUNDS

Stephen P. Singer, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 13, 1985, Ser. No. 733,152
Int. Cl.[4] G03C 1/40, 5/54
U.S. Cl. 430—223 16 Claims

1. A photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a nondiffusible 4-arylazo-1-napthol image dye-providing compound or precursor thereof capable of releasing a diffusible dye moiety wherein the 2-position of said napthol compound comprises a carboxylic ester substituent and the 5-position comprises sulfonamido substituent, wherein said 4-arylaxo moiety is unsubstituted or is substituted with cyano, sulfo, sulfonyl, halogen, nitro, sulfito, sulfinyl, sulfamoyl, carbamoyl, alkyl, alkoxy or mercapto, and wherein said compound is capable of a reversible hypsochromic absorption shift from the protonated form to the anionic form thereof.

16. A photographic assemblage comprising:

(a) a photographic element according to any of claims 1 to 8 and 12 to 18;
(b) a dye image-receiving layer; and
(c) an alkaline processing composition with means for discharging same within said assemblage;

said assemblage also comprising a silver halide developing agent.

4,634,655

METHOD OF FORMING CORROSION RESISTANT FILM ON THE SURFACE OF SUBSTRATE COMPOSED OF COPPER OR COPPER ALLOY

Katsutoshi Yanagimoto, and Shoichi Nagai, both of Hikone, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed May 15, 1985, Ser. No. 734,441
Claims priority, application Japan, Jun. 4, 1984, 59-115169; Feb. 6, 1985, 60-22164
Int. Cl.[4] G03C 1/495, 1/68, 1/71, 1/76
U.S. Cl. 430—277 3 Claims

1. A method of forming a corrosion resistant film on the surface of a substrate composed of copper or copper alloy comprising

(a) applying to the substrate a solution comprising
  (i) a film forming amount of a water-soluble high molecular weight compound,
  (ii) ammonium dichromate in an amount effective to achieve sensitization of the solution, and
  (iii) an amount of an aliphatic amine sufficient to adjust the pH of said solution to between 6.1 and 7.8;
(b) drying the solution-coated substrate such that a photosensitive film is formed on the substrate;
(c) exposing the photosensitive film to light; and
(d) developing the exposed film so as to form said film for a specified image.

4,634,656

ALUMINUM ALLOY, A SUPPORT OF LITHOGRAPHIC PRINTING PLATE AND A LITHOGRAPHIC PRINTING PLATE USING THE SAME

Azusa Ohashi; Akira Shirai; Hirokazu Sakaki, all of Shizuoka; Zenichi Tanabe; Shin Tsuchida, and Yoshikatsu Hayashi, all of Aichi, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa and Sumitomo Light Metal Industries, Ltd., Tokyo, both of, Japan

Filed Jun. 1, 1983, Ser. No. 500,130
Claims priority, application Japan, Jun. 1, 1982, 57-92079
The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.
Int. Cl.[4] G03C 1/94; C22C 21/06; C25F 3/00, 3/04
U.S. Cl. 430—278 10 Claims

1. An aluminum alloy lithographic printing plate, comprising:

a printing plate support comprised of a plate of an aluminum alloy containing 0.20 to 1.0% by weight of Fe; 0.005 to 0.1% by weight of at least one element selected from the group consisting of Sn, In and Ga; and the remainder being Al, based on the total weight of said aluminum alloy;
the support having a chemically etched surface, which is etched so as to form a uniform grain structure; and
a light-sensitive layer provided on the chemically etched surface of said support.

4. An aluminum alloy lithographic printing plate support, comprising a plate of an aluminum alloy containing 0.20 to 1.0% by weight of Fe; 0.005 to 0.1% by weight of at least one element selected from the group consisting of Sn, In and Ga; and the remainder being Al, based on the total weight of said aluminum alloy, wherein a surface of the support is chemically etched to form a uniform grain structure.

7. An aluminum alloy lithographic printing plate support as claimed in claim 4, wherein the chemically etched surface of

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the support has an anode oxdiation film provided thereon by anodic oxidation treatment in an aqueous solution containing sulfuric acid, phosphoric acid, oxalic acid, or a mixture of two of these acids using DC or AC current.

4,634,657

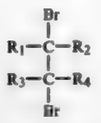
PHOTOIMAGING COMPOSITIONS CONTAINING SUBSTITUTED 1,2-DIBROMOETHANES

Bruce Holman, III, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 23, 1984, Ser. No. 643,397
Int. Cl.[4] G03C *1/68, 1/52*
U.S. Cl. 430—281 19 Claims

1. A printout photoimaging composition consisting essentially of an admixture of

(a) a substituted 1,2-dibromoethane of the formula

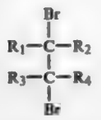


wherein a first bond dissociation energy for the C—Br bond of the carbon atom attached to R_1 and R_2 is not greater than 59 kilocalories per mol.°C. and is not greater than the dissociation energy of the second C—Br bond, R_1 and R_2 are individually either chlorine or CCl_3; R_3 and R_4 independently are H—, F—, Cl—, lower alkyl of 1 to 3 carbon atoms, F_3C—, ClH_2C—, and straight chain α-monofluorinated aliphatic radical optionally branched and/or unsaturated only beyond the γ-carbon atom, said α-carbon atom being that nearest the carbon holding the second carbon-bromine bond;

(b) a leuco dye in leuco form which is the reduced form of the dye having one or two hydrogen atoms, the removal of which together with an additional electron produces a differently colored compound.

6. A photoimaging photopolymerizable composition consisting essentially of an admixture of

(a) a substituted 1,2-dibromoethane of the formula



wherein a first bond dissociation energy for the C—Br bond of the carbon atom attached to R_1 and R_2 is not greater than 59 kilocalories per mol.°C. and is not greater than the dissociation energy of the second C—Br bond, R_1 and R_2 are individually either chlorine or CCl_3; R_3 and R_4 independently are H—, F—, Cl—, lower alkyl of 1 to 3 carbon atoms, F_3C—, ClH_2C—. and straight chain α-monofluorinated aliphatic radical optionally branched and/or unsaturated only beyond the γ-carbon atom, said α-carbon atom being that nearest the carbon holding the second carbon-bromine bond;

(b) a leuco dye in leuco form which is the reduced form of the dye having one or two hydrogen atoms, the removal of which together with an additional electron produces a differently colored compound;

(c) at least one nongaseous ethylenically unsaturated compound having a boiling point above 100° C. at normal atmospheric pressure;

(d) a photoinitiator taken from the group consisting of -4-trichloromethyl-2,5-cyclohexadienones, benzophenones, alkylaryl ketones, and mixtures thereof; and

(e) optionally at least one organic polymeric binder.

4,634,658

PROCESS FOR PREPARING SURPRINT PROOF OF AN IMPROVED SUPPORT

Van B. Johnson, and Douglas G. Adolphson, both of Towanda, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 686,919, Dec. 27, 1984, abandoned. This application Apr. 14, 1986, Ser. No. 851,919
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—293 9 Claims

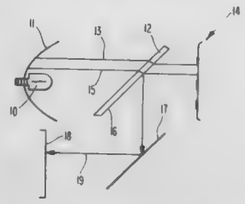
1. In a process of preparing a surprint multicolor proof having at least three nonplanar nonsilver halide photoimaged elements having a color-toned layer, sequentially laminated to a support, said elements in their unexposed state comprising a nontacky photohardenable material with ethylenically unsaturated or benzophenone type groups and a contiguous layer of a nonphotosensitive, tacky organic material wherein each color-toned photoimaged element has been exposed through a different color separation negative and the respective color-toned contiguous layers have been colored in a spectral region corresponding to the color separation used for the exposure, and wherein said support has a peel adhesion value with respect to said contiguous layer of at least 250 grams/inch (98.4 grams/cm) and a total luminous transmission not in excess of 25%, the improvement, which substantially curtails increases in equivalent dot areas of halftone dot images, wherein the support to which the color-toned photoimaged elements are laminated is a paper coated with an organic polymeric layer, having a permeability to air of less than 0.1 cm^3/second.

4,634,659

PROCESSING-FREE PLANOGRAPHIC PRINTING PLATE

Kunio Esumi, Hanyo, Japan; Anthony M. Schwartz, Rockville, Md., and Albert Zettlemoyer, Bethlehem, Pa., assignors to Lehigh University, Bethlehem, Pa.

Filed Dec. 19, 1984, Ser. No. 683,918
Int. Cl.[4] G03F *7/10;* G03C *1/72;* B41N *3/00*
U.S. Cl. 430—302 3 Claims



1. A method for making a planographic printing plate by means of a photosensitive element comprising two discrete layers substantially adhering to one another, the first of said layers consisting essentially of a support that has suitable rigidity, the second of said layers comprising a polymeric compound having a photo oxidation sensitive hydrophobic surface, and compound being selected from among the group consisting of polystyrene, polymethylvinyl ketone, cellulose triacetate, polydiphenylsiloxane, polyvinyl chloride, (alpha-methylphenyl) trichlorosilane, polyacrolein, polyethylene, poly (styrene co-allyl alcohol), polyacetal resin, polyester, polyamide, polymethylhydrosiloxane, and polymethylhydro (40–60%) methylcyanopropylsiloxane, said compound being receptive to oleophilic printing ink and non-receptive to the aqueous fountain solution of a printing press, said polymeric compound also being directly convertible, upon exposure to radiation to a hydrophilic surface, said method comprising impinging radiation in a defined image upon the surface of the second polymeric layer for causing, selectively and discretely, the formation of hydrophilic areas on said second layer, the areas not having been impinged upon by the radiation remaining hydrophobic, said hydrophilic areas, without further processing,

being selectively receptive to the aqueous fountain solution of a printing press.

4,634,660

DEVELOPMENT-PROCESSING METHOD FOR SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hiroyuki Mifune; Koki Nakamura, and Shoji Ishiguro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

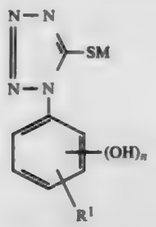
Continuation of Ser. No. 542,925, Oct. 18, 1983, abandoned. This application May 10, 1985, Ser. No. 732,819
Claims priority, application Japan, Oct. 18, 1982, 57-182606
Int. Cl.[4] G03C *5/30*
U.S. Cl. 430—375 46 Claims

1. A method for development-processing an image-wise exposed silver halide photographic material having at least one light-sensitive silver halide emulsion layer on a support by forming a metal silver image on a black-and-white development-processing, comprising:

development-processing the material by developing the material in the presence of a compound of the general formula I and in a development-processing solution selected from the groups consisting of:

a solution containing both dihydroxybenzene and 3-pyrazolidones; and a solution containing both dihydroxybenzenes and aminophenoles;

wherein the compound of the general formula (I) is:



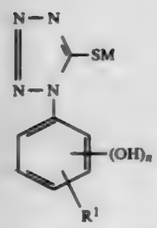
(I)

wherein M represents a hydrogen atom, an alkali metal atom, NH_4 or a mercapto group-protecting moiety which can be split-off in the presence of an alkali, said mercapto group-protecting moiety being —COR^3, —$COOR^3$, —$CH_2CH_2COOR^3$, —$CH_2CH_2COR^3$, —$CH_2CH_2CONR^3R^4$, —CH_2CH_2CN or —$CH_2CH_2SO_2R^3$ wherein R^3 and R^4 each represents a hydrogen atom, or an unsubstituted alkyl, aryl or aralkyl group containing up to 20 carbon atoms in total; n represents 1, 2 or 3; R^1 represents a hydrogen atom or —$COOR^2$; and R^2 represents a hydrogen atom, an alkali metal atom, NH_4, or an unsubstituted or substituted alkyl, aryl or aralkyl group, the compound of general formula (I) being used in an amount sufficient to suppress the generation of development fog.

18. A method for development-processing an image-wise exposed silver halide photographic material having at least one light-sensitive silver halide emulsion layer on a support by forming a dye image by color development of a coupler with a color developing agent, comprising:

development-processing the material by developing the material in the presence of a compound of the general formula I and in a color development-processing solution containing a primary aromatic amine color developer,

wherein the compound of the general formula (I) is:



(I)

wherein M represents a hydrogen atom, an alkali metal atom, NH_4 or a mercapto group-protecting moiety which can be split-off in the presence of an alkali, said mercapto group-protecting moiety being —COR^3, —$COOR^3$, —$CH_2CH_2COOR^3$, —$CH_2CH_2COR^3$, —$CH_2CH_2CONR^3R^4$, —CH_2CH_2CN or —$CH_2CH_2SO_2R^3$ wherein R^3 and R^4 each represents a hydrogen atom, or an unsubstituted alkyl, aryl or aralkyl group containing up to 20 carbon atoms in total; n represents 1, 2 or 3; R^1 represents a hydrogen atom or —$COOR^2$; and R^2 represents a hydrogen atom, an alkali metal atom, NH_4, or an unsubstituted or substituted alkyl, aryl or aralkyl group, the compound of general formula (I) being used in an amount sufficient to suppress the generation of development fog.

4,634,661

HIGH CONTRAST PHOTOGRAPHIC ELEMENTS EXHIBITING STABILIZED SENSITIVITY

Anthony Cavallaro, East Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 18, 1985, Ser. No. 756,157
Int. Cl.[4] G03C *1/34*
U.S. Cl. 430—567 14 Claims

1. A negative working photographic element capable of producing a high contrast silver image comprised of

a support,

a contrast enhancing arylhydrazide, and

a gelatino-silver halide emulsion layer comprised of surface latent image forming monodispersed silver halide grains having a mean diameter of less than 0.7 μm,

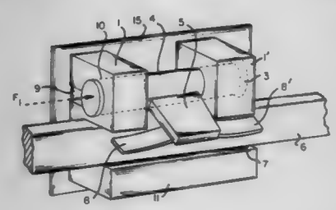
further characterized in that said emulsion layer contains in an amount sufficient to stabilize sensitivity a carboxyalkyl-3H-thiazoline-2-thione.

4,634,662

ORTHODONTIC BRACKET HAVING ARCHWIRE SEATING AND LOCKING MECHANISM

Farel Rosenberg, 10535 Wilshire Blvd., Los Angeles, Calif. 90024

Filed Feb. 3, 1986, Ser. No. 825,452
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—10 2 Claims



1. An in a second embodiment:

(a) A block containing a tapered cylindrical cavity to accommodate a cylindrical, tapered plug and provided with a first rectangular, horizontal slot cut into its front surface to hold an archwire and provided with a second horizon-

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tal slot cut into its rear surface communicating along its length with said two piece cylindrical cavity and provided with a vertical slot intersecting the cylindrical cavity and both horizontal slots, said vertical slot dividing the cylindrical cavity into two portions;

(b) a cylindrical, tapered plug which is rotatably and slidably mounted in said cylindrical cavity;

(c) a lever attached to and extending radially from said plug, terminating in leaf springs which can be brought to bear and seat an archwire placed in the first rectangular slot, said lever, leaf springs and plug being a pre-assembly which can be brought into the cylindrical cavity through said second horizontal slot;

(d) a bonding base joined to the rear surface of the block after assembly to serve as an attachment surface to a tooth;

whereby rotation of the plug causes the lever and springs to exert pressure on the archwire, and simultaneously forcing the plug laterally into frictional contact with the tapered cylindrical cavity seats the archwire to the bottom of its slot and locks it; conversely, forcing the plug out of contact with the two piece tapered cylindrical cavity unlocks the archwire to permit its removal.

4,634,663

METHOD AND REAGENT FOR QUANTITATIVE DETERMINATION OF N-ACETYLHEXOSAMINE

Tatsuo Horiuchi, Noda, Japan, assignor to Noda Institute for Scientific Research, Japan

Filed Feb. 15, 1984, Ser. No. 580,246

Claims priority, application Japan, Feb. 28, 1983, 58-30802

Int. Cl.⁴ C12Q *1/26, 1/00, 1/28, 1/34*

U.S. Cl. 435—25 **4 Claims**

1. A method for quantitative determination of N-acetylhexosamine which comprises (a) allowing an N-acetylhexosamine oxidase to act upon an N-acetylhexosamine-containing liquid in the presence of oxygen and then (b) determining the amount of oxygen consumed in the oxidation reaction or the amount of hydrogen peroxide or N-acetylhexosaminic acid formed in the oxidation reaction, the N-acetylhexosamine being selected from the group consisting of N-acetylglycosamine, N-acetylgalactosamine, N-acetylmuramic acid, N,N-diacetylchitobiose and N-acetylmannosamine.

4,634,664

PROCESS FOR THE PRODUCTION OF HUMAN MONO-CLONAL ANTIBODIES

Lars Oestberg, Vienna, Austria, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jan. 20, 1983, Ser. No. 459,731

Claims priority, application Switzerland, Jan. 22, 1982, 409/82

Int. Cl.⁴ C12P *21/00;* **C12N** *15/00, 5/00;* **C12R** *1/91*

U.S. Cl. 435—68 **21 Claims**

1. A hybridoma cell line comprising an immortalizing cell fused to a cell producing a predetermined human antibody, the immortalizing cell comprising a xenogeneic hybridoma cell fused from an immortalizing cell and a non-transformed partner cell, said human antibody producing cell being genetically compatible with said non-transformed partner cell.

4,634,665

PROCESSES FOR INSERTING DNA INTO EUCARYOTIC CELLS AND FOR PRODUCING PROTEINACEOUS MATERIALS

Richard Axel, New York; Michael H. Wigler, Cold Spring Harbor, and Saul J. Silverstein, Irvington, all of N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation of Ser. No. 124,513, Feb. 25, 1980, Pat. No. 4,399,216. This application Aug. 11, 1983, Ser. No. 522,408

The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.

Int. Cl.⁴ C12P *21/00;* **C12N** *15/00, 5/00;* **C12R** *1/91*

U.S. Cl. 435—68 **23 Claims**

1. A process for inserting foreign DNA I into a suitable eucaryotic cell which comprises cotransforming said eucaryotic cell with said foreign DNA I and with unlinked foreign DNA II which codes for a selectable phenotype not expressed by said eucaryotic cell, said cotransformation being carried out under suitable conditions permitting survival or identification of eucaryotic cells which have acquired said selectable phenotype, said foreign DNA II being attached to bacterial plasmid or phage DNA.

4,634,666

HUMAN-MURINE HYBRIDOMA FUSION PARTNER

Edgar G. Engleman, Atherton; Steven K. H. Foung, San Francisco, and F. Carl Grumet, Stanford, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Jan. 6, 1984, Ser. No. 568,739

Int. Cl.⁴ C12N *5/00, 15/00*

U.S. Cl. 435—68 **14 Claims**

9. A method of producing a human monoclonal antibody which is specific against a selected antigen, comprising

providing a fusion partner produced by fusing mouse myeloma cells and non-malignant human B-lymphocytes, selecting fusion products which show stable immunoglobulin secretion and HLA surface antigen production in culture, treating the selected fusion products with a mutagen, and selecting mutagenized fusion products which retain the ability to produce HLA surface antigen, show no immunoglobulin secretion, and are unable to survive in a growth medium which allows growth of a successful fusion product formed by fusing the fusion partner with a human immunoglobulin-secreting B-lymphoid cell,

fusing the fusion partner with a non-malignant B-lymphoid cell derived from a human donor exposed to the selected antigen, and

selecting fusion products which are viable in such medium and which secrete antigen-specific monoclonal antibody.

4,634,667

PROCESS FOR PREPARING A HETEROPOLYSACCHARIDE, HETEROPOLYSACCHARIDE OBTAINED THEREBY, ITS USE, AND STRAIN NCIB 11883

John D. Linton, Sittingbourne; Michael W. Evans, Chichester, and Andrew R. Godley, Sittingbourne, all of England, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 24, 1984, Ser. No. 653,627

Claims priority, application United Kingdom, Sep. 22, 1983, 8325445

Int. Cl.⁴ C12P *19/04*

U.S. Cl. 435—101 **7 Claims**

1. A process for preparing a heteropolysaccharide which comprises growing strain NCIB 11883 in an aqueous nutrient medium by aerobic fermentation of an assimilable carbohydrate and nitrogen source and recovering the heteropolysaccharide.

4,634,668

4-METHYLCYCLOHEXA-3,5-DIENE-1,2-DIOL-1-CARBOXYLIC ACID PRODUCED BY *PSEUDOMONAS PUTIDA* ATCC NO. 39119

Scott Hagedorn, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 415,129, Sep. 7, 1982, Pat. No. 4,532,209. This application Aug. 15, 1984, Ser. No. 640,846

Int. Cl.⁴ C12P *7/42;* **C12R** *1/40*

U.S. Cl. 435—146 **1 Claim**

1. An aqueous solution of 4-methylcyclohexa-3,5-diene-1,2-diol-1-carboxylic acid produced by microbiological conversion of p-xylene with *Pseudomonas putida* Biotype A strain ATCC 39119.

4,634,669

PROCESS AND DEVICE FOR THE DIFFERENTIATION OF PARTICLES IN A MEDIUM

William M. Arnold, Aachen, and Ulrich Zimmermann, Hurtgenwald-Gey, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich, Jülich, Fed. Rep. of Germany

Filed Jul. 18, 1984, Ser. No. 631,847

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1983, 3325860

Int. Cl.⁴ C12N *13/00*

U.S. Cl. 435—173 **4 Claims**

1. A process for the differentiation of particles belonging to at least two groups of particles in a medium, said particles being capable of rotating around an axis of rotation parallel to the axis of rotation of a rotating electrical field, comprising the steps of:

exposing the particles to a rotating electrical field of variable rotational frequency,

adjusting the frequency of the rotating field to a frequency at which the particles to be differentiated rotate in different directions.

4,634,670

PROCESS FOR THE PREPARATION OF CELLULASE

Seigo Takasawa, and Yasushi Morikawa, both of Kanagawa, Japan, assignors to Shin Nenryoyu Kaihatsu Gijutsu Kenkyu Kumiai, Toyko, Japan

Filed Jul. 27, 1984, Ser. No. 634,940

Claims priority, application Japan, Jul. 27, 1983, 58-137256

Int. Cl.⁴ C12N *9/42, 15/00, 1/14;* **C12R** *1/885*

U.S. Cl. 435—209 **7 Claims**

1. A process for the preparation of cellulase in which a microorganism of the genus Trichoderma, which is capable of producing cellulase, is cultured in order to accumulate cellulase in the culture medium and the resultant cellulase is harvested from the culture medium, characterised in that the said microorganism is a mutant strain of the genus Trichoderma, which exhibits increased inducibility of cellulase by L-sorbose relative to that of a given parent strain.

4,634,671

WATER-SOLUBLE CROSS-LINKED POLYMER OF LYSYL ENDOPEPTIDASE, PROCESS FOR PREPARING SAME AND USE OF SAME

Yoshitsugu Sakata, Kyoto; Akinori Shintani, Hyogo; Tetsuya Matsuo, Osaka; Haruhiko Sugiyama, Shiga, and Nobuyuki Tokioka, Hyogo, all of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 19, 1983, Ser. No. 533,730

Claims priority, application Japan, Sep. 18, 1982, 57-162976

Int. Cl.⁴ C12N *9/96, 9/50, 9/52;* **C12P** *21/00*

U.S. Cl. 435—188 **22 Claims**

1. A water-soluble, intermolecularly cross-linked polymer of Achromobacter protease I having a molecular weight of between 400,000 to 700,000 prepared by the process comprising polymerizing, in solution, about 0.2 to about 20 wt% of Achromobacter protease I derived from *Achromobacter lyticus* with about 1 to about 5 wt% of a polyaldehyde or a polyisocyanate cross-linking agent, at about pH 7.0 at about 30° C. for several minutes to 30 hours.

4,634,672

IMMOBILIZATION OF CELLS IN POLYURETHANE HYDROGEL

Jörg Baumgarten; Werner Frommer, both of Wuppertal; Theo Mann, Langenfeld; Imre Pascik, Monheim; Hans-Georg Rast, Leichlingen, and Dietmar Schüpel, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 594,876, Mar. 29, 1984, abandoned. This application Aug. 12, 1985, Ser. No. 764,688

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1983, 3312578

Int. Cl.⁴ C12N *11/04, 11/08;* **C07G** *15/00*

U.S. Cl. 435—182 **7 Claims**

1. A biologically active composition comprising a polyurethane hydrogel containing (i) surface active coal having a specific surface according to BET of above 50 m^2/g, (ii) a polymer having cationic groups, and (iii) cells having enzymatic activity and being capable of growth.

4,634,673

ENZYME PURIFICATION PROCESS

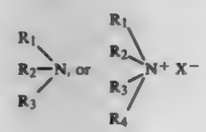
Richard A. Johnson, Clinton, Iowa, and Norman E. Lloyd, Ridgefield, Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Mar. 28, 1984, Ser. No. 594,188

Int. Cl.⁴ C12N *9/92*

U.S. Cl. 435—234 **19 Claims**

1. A process for separating glucose isomerase values from aqueous solution which comprises contacting said aqueous solution with an amine compound of the formula



wherein:

R_1 is a hydrocarbyl radical of at least 6 carbon atoms;

R_2 is a hydrocarbyl radical of from about 8 to about 20 carbon atoms;

R_3 is lower alkyl;

R_4 is H or lower alkyl; and

X is an anion;

and recovering the enzyme-containing precipitate thus produced.

4,634,674

PLANT REGENERATION FROM PROTOPLASTS

Elias A. Shahin, Moraga, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 25, 1983, Ser. No. 478,955

Int. Cl.⁴ A01B *79/00;* **C12N** *5/00, 5/02*

U.S. Cl. 435—240 **46 Claims**

1. An in vitro method for preconditioning cultivated tomato plants that will be used as sources of protoplast donating plant tissue when extracting protoplasts to be used for regenerating cultivated tomato plants from cultured protoplasts, said in vitro preconditioning method comprising:

(a) germinating a surface sterilized protoplast donating tomato plant seed, derived from cultivated tomato plants, until a shoot extends from said seed,

(b) growing said shoot from step (a) in a nutrient medium, to which no exogenous plant hormones have been added,

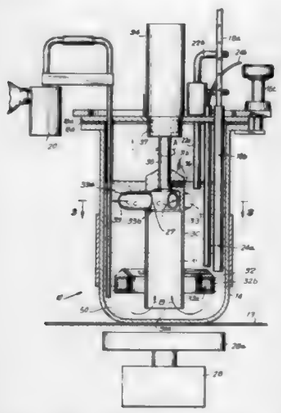
until said shoot develops into a small tomato plantlet having expanded leaves and a substantial stem,
(c) exposing said tomato plantlet from step (b) to total darkness,
(d) excising tissue from said tomato plantlet of step (c),
(e) treating said excised tomato plant tissue of step (d) with "pre-enzyme treatment" (PET) solution, said PET solution being comprised essentially of an osmoticum to which exogenous plant hormones have been added, and
(f) using said excised, tomato plant tissue from step (e) as a source of protoplast donating tomato plant tissue when extracting protoplasts to be used for regenerating cultivated tomato plants from cultured tomato protoplasts.

4,634,675

AGITATOR FOR A FERMENTATION AND TISSUE CULTURING VESSEL

David Freedman, Highland Pk., and Zheng Zhenbin, New Brunswick, both of N.J., assignors to New Brunswick Scientific Co., Inc., Edison, N.J.

Filed Dec. 29, 1983, Ser. No. 566,628
Int. Cl.[4] C12M *3/02*
U.S. Cl. 435—286 **16 Claims**



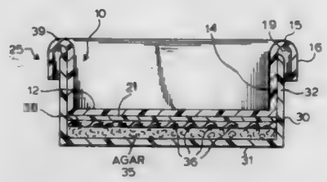
1. An agitator for use with a fermentation and tissue culturing vessel which comprises:
displaceably mountable hollow body means having a lower open end for placement facing a bottom surface of said vessel and an upper closed end and formed with at least one side opening at a point spaced from said open end; and
at least one tubulation means affixed to said hollow body means at said side opening in the hollow body means, said tubulation means having at least an input opening in registration with the side opening in the hollow body means and an exit opening, the exit opening being oriented so that when said hollow body and tubulation means are displaced a suction force is generated at said tubulation means exit opening operating to draw fluid into said hollow body means at its lower open end, out of said hollow body means through the side opening into the tubulation means, and through said tubulation means to said exit opening.

4,634,676

REPLICA PLATING DEVICE

Bruno V. Sapatino, Oxnard, Calif., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jun. 6, 1984, Ser. No. 617,669
Int. Cl.[4] C12M *1/28*
U.S. Cl. 435—294 **13 Claims**



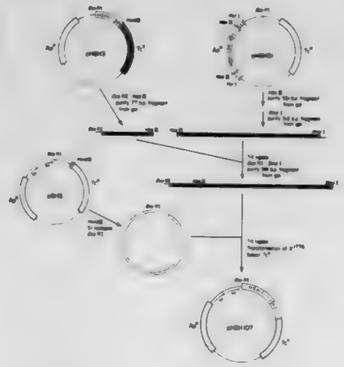
1. A replica plating assembly for obtaining print-replicas of cells or the like comprising:
a petri dish having a bottom surface and an annular rim extending upwardly from said bottom surface;
a semi-solidified culture medium on the bottom surface in said petri dish with colonies of cells arranged on the top surface of said culture medium;
a replica filter positioned over said cells and the top surface of said culture medium; and
a replica plating device including a pressing surface lying in substantially parallel juxtaposition with the top surface of said culture medium, an annular flange extending upwardly from said pressing surface and positioned inwardly from the annular rim of said petri dish, and an annular skirt extending from said flange over said rim and depending downwardly along the exterior surface of said rim; whereby movement of said pressing surface toward said culture medium presses said filter against said cells to thereby plate-print said cells onto said filter in the same arrangement which said cells appeared on said culture medium surface.

4,634,677

PLASMID CAPABLE OF EXPRESSING HUMAN GROWTH HORMONE

David V. Goeddel, and Herbert L. Heyneker, both of Burlingame, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 55,126, Jul. 5, 1979, Pat. No. 4,342,832. This application Aug. 26, 1981, Ser. No. 296,099
Int. Cl.[4] C12N *1/00, 15/00*
U.S. Cl. 435—317 **7 Claims**



1. A replicable bacterial plasmid which, in a transformant bacterium, will express a gene for human growth hormone unaccompanied by the human growth hormone leader sequence or other extraneous protein bound thereto.

4,634,678

PLASMID CLONING AND EXPRESSION VECTORS FOR USE IN MICROORGANISMS

John S. Salstrom, Edina; Dawn Newman; Douglas F. Harbrecht, both of Hopkins, and Shiu-Lok Hu, Minnetonka, all of Minn., assignors to Molecular Genetics Research and Development Limited Partnership, Minnetonka, Minn.

Filed Dec. 13, 1982, Ser. No. 449,187
Int. Cl.[4] C12N *1/00, 15/00, 1/20;* C12P *21/00, 21/02, 19/34*
U.S. Cl. 435—317 **38 Claims**

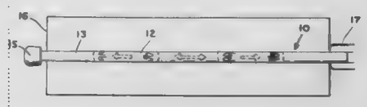
1. A DNA cloning and expression vector capable of incorporating a nucleic acid sequence and providing strong expression without further vector manipulation after ligation of the sequence and of propagating in a microbial host, which comprises from upstream to downstream:
(a) a Plac promoter;
(b) an Olac operator;
(c) a lacZ and a λcro Shine-Dalgarno nucleotide sequence;
(d) a translation start codon encoded by a cro gene amino terminus fragment.
(e) a cloning segment;
(f) a portion of the lacI gene fused to a lacZ gene carboxy-terminal fragment; and
(g) an antibiotic resistance marker.

4,634,679

METHOD OF DETERMINING ADHESION OF A LIQUID SAMPLE

C. Russell Horres, Jr., Chapel Hill, N.C., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Nov. 10, 1982, Ser. No. 440,541
Int. Cl.[4] G01N *1/10, 33/48*
U.S. Cl. 436—63 **6 Claims**



1. A method for determining platelet adhesion for a blood sample, comprising:
placing a microsample of blood in a capillary tube having an interior surface to form a column of blood sample therein;
forming a fluid column in the tube at each end of the blood sample column, said fluid being immiscible with the blood sample;
pulsing the blood sample column in the tube between the fluid columns to thereby cause adhesion of platelets in the blood to the interior surface of the tube; and
withdrawing the blood sample from the tube; and
determining platelets in the blood sample which adhere to the interior surface of the tube.

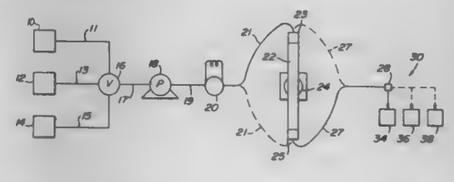
4,634,680

SEQUENTIAL ELUTION PROCESS

Ilse S. Kingsley, Bethlehem, Pa., assignor to International Coal Refining Company, Allentown, Pa.

Filed Jul. 14, 1983, Ser. No. 513,543
Int. Cl.[4] G01N *33/24;* B01D *11/02*
U.S. Cl. 436—178 **12 Claims**

1. A continuous elution process for analysis and separation of a sample derived from a coal liquefaction process containing respective fractions comprised of distillate oils, asphaltenes and preasphaltenes by sequential solvent elution through a fluidized bed or inert low surface area solids to acquire the same quantity of said fractions of distillate oils, asphaltenes and preasphaltenes as are initially present in said sample without transfer by co-solubility of any one of said fractions of said sample to another of said fractions which are eluted from said sample, which process comprises:
(a) passing a flow of a first stream of a weakest solvent of eluting solvents upwardly through a bed of low surface area, inert material in a vertically extending column to fluidize said low surface area, inert material and maintaining said fluidization of said low surface area, inert material;
(b) injecting a measured predetermined quantity of said sample into said weakest solvent stream;
(c) continuing said flow of said weakest solvent stream for a first period of time;
(d) collecting a first effluent from said vertically extending column during said flow of said weakest solvent in a first collection container, said first effluent resulting from said flow of said sample and said weakest solvent stream and containing said weakest solvent and said distillate oils fraction of said sample;
(e) terminating said flow of said weakest solvent at the end of said first time period;



(f) passing a flow of a next-to-weakest solvent through said vertically extending column for a second period of time;
(g) collecting a second effluent from said vertically extending column during said flow of said next-to-weakest solvent in a second collection container, said second effluent resulting from said flow of said sample and said next-to-weakest solvent and containing said next-to-weakest solvent and said asphaltenes fraction of said sample;
(h) terminating said flow of said next-to-weakest solvent at the end of said second period of time;
(i) passing a flow of a strongest solvent through said vertically extending column for a third period of time; and
(j) collecting a third effluent from said vertically extending column during said flow of said strongest solvent in a third collection container, said third effluent resulting from said flow of said sample and said strongest solvent stream and containing said strongest solvent and said preasphaltenes fraction of said sample, said bed of inert material being fluidized during contact of said solvents with said sample during said elution process to an extent such that co-solubilization of said fractions is eliminated during the elution process.

4,634,681

DIAGNOSTIC METHOD OF DETERMINING THE PRESENCE OR ABSENCE OF SELECT PROTEINS IN A LIQUID SAMPLE

Ivar Giaever, Schenectady, and Charles R. Keese, Schoharie, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 29, 1984, Ser. No. 665,902
Int. Cl.[4] G01N *33/543*
U.S. Cl. 436—518 **14 Claims**

1. The diagnostic method for determining the presence or absence of select protein in a liquid sample comprising the steps of:
(a) preparing an emulison in which a first liquid is dispersed as a large number of small protein-coated liquid droplets in a second liquid, said second liquid being an aqueous medium, said first liquid being relatively immiscible with

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said second liquid, and the protein coating said droplets including molecules of a protein having the property of interacting specifically with said select protein;

(b) contacting the protein-coated droplets in said emulsion with a solution containing proteinaceous material for a suitable period of inoculation;

(c) adding tagged protein molecules to the emulsion, said tagged protein having the property of interacting specifically with said select protein, but not with the protein coating said droplets;

(d) removing tagged protein molecules not affixed directly or indirectly to said droplets from the emulsion;

(e) breaking said emulsion to produce a continuous phase of said first liquid spaced from said second liquid by a thin interfacial layer, and

(f) determining the presence or absence of tags in said interfacial layer.

4,634,682

RADIOIMMUNOASSAYS FOR THE SERUM THYMIC FACTOR (FTS)

Bruce W. Erickson, Closter, N.J.; Kam-Fook Fok; Genevieve S. Incefy, both of New York, N.Y., and Kazuhiro Ohga, Tokyo, Japan, assignors to Sloan-Kettering Institute for Cancer, New York, N.Y.

Continuation of Ser. No. 445,382, Nov. 30, 1982, abandoned. This application May 23, 1985, Ser. No. 737,177

Int. Cl.⁴ G01N *33/543, 33/544*

U.S. Cl. 436—518 **10 Claims**

1. Radioimmunoassay of serum thymic factor (FTS) in a test sample, comprising:

(a) contacting a first aliquot of said sample with anti-FTS antibody, with a known amount of FTS hormone standard and a known amount of radiolabeled FTS analogue; and

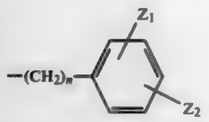
(b) contacting a second aliquot of said sample with anti-FTS antibody and a known amount of radiolabeled FTS analogue; and

(c) measuring the radioactivity of the antigen-antibody complex in each aliquot; and

(d) calculating the amount of FTS in the test sample, wherein the hormone standard and the radiolabeled analogue are of the formula



wherein X is ^{125}I for the radiolabeled analogue or hydrogen for the hormone standard and Y is hydrogen or a compound of the formula



wherein n is 1 to 4 and Z_1 and Z_2 are hydrogen and/or halogen; A is hydrogen or NH_2; B is alanine or another amino acid; and m is an integer from zero to 2.

4,634,683

BARIUM AND/OR STRONTIUM ALUMINOSILICATE CRYSTAL-CONTAINING GLASSES FOR FLAT PANEL DISPLAY DEVICES

William H. Dumbaugh, Jr., Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 23, 1985, Ser. No. 790,370

Int. Cl.⁴ C03C *14/00, 3/085*

U.S. Cl. 501—32 **1 Claim**

1. A phase separated glass essentially free from alkali metal oxide consisting of extremely fine-grained crystals homogeneously dispersed in a glass matrix, said glass exhibiting transparency, an annealing point higher than 900° C., a linear coefficient of thermal expansion over the temperature range of 25°–300° C. between about 30–40$\times 10^{-7}$/°C., and consisting essentially, expressed in terms of mole percent on the oxide basis, of about

SiO_2: 68–80

Al_2O_3: 18–26

BaO and/or SrO: 2–6.

4,634,684

STRONTIUM ALUMINOSILICATE GLASS SUBSTRATES FOR FLAT PANEL DISPLAY DEVICES

William H. Dumbaugh, Jr., Painted Post, N.Y., assignor to Corning Glass Works, New York, N.Y.

Filed Oct. 23, 1985, Ser. No. 790,369

Int. Cl.⁴ C03C *3/085*

U.S. Cl. 501—69 **2 Claims**

1. A clear, transparent, homogeneous strontium aluminosilicate glass capable of being melted at temperatures no higher than about 1800° C. which exhibits an annealing point greater than 875° C., a linear coefficient of thermal expansion over the temperature range of 25°–300° C. of about 30–40$\times 10^{-7}$/°C., a liquidus temperature not exceeding about 1400° C., and a liquidus viscosity of at least 1×10^5 poises, said glass being essentially free from alkali metal oxide, MgO, CaO, ZnO, La_2O_3, and MnO, and consisting essentially, expressed in terms of mole percent on the oxide basis, of about

9–12% SrO,

9–12% Al_2O_3,

77–82% SiO_2.

4,634,685

REFRACTORY ARTICLE SUITABLE FOR CASTING MOLTEN METAL

Siegfried Pohl, Heidenrod; Ernst Lührsen, Bad Schwalbach; Peter Jeschke, Walluf; Ortwin Rave, Marktredwitz; Martin Kienow, Krefeld, and Werner Richter, Krefeld-Fischeln, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 31, 1985, Ser. No. 793,687

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3439954

Int. Cl.⁴ C04B *35/52*

U.S. Cl. 501—100 **17 Claims**

1. A refractory article suitable for casting molten metal, which comprises, based on the weight of said article:

30 to 64% of Al_2O_3;

20 to 40% of graphite;

10 to 20% of a synthetic resin;

1 to 8% of a metallic powder; and

4 to 20% of a flux component comprising a first flux having a melting point of 550° to 900° C. and a second flux having a melting point of 1350° to 1550° C., the weight ratio of said first flux to said second flux being 2:1 to 1:15.

4,634,686

YTTRIUM SILICATE MOLECULAR SIEVES

Michael J. Desmond, Cleveland Hts.; Frederick Pesa, Aurora, and Reza Eshraghi, Sayamore Hills, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 2, 1985, Ser. No. 729,594

Int. Cl.⁴ B01J *29/04*

U.S. Cl. 502—60 **38 Claims**

9. A method for preparing a molecular sieving yttrium silicate comprising maintaining a mixture of a source of silicon, a source of yttrium, a source of alkali metal and water at a temperature in the range of about 50° C. to about 350° C. for an effective period of time to provide said yttrium silicate, wherein said mixture has a mole ratio of silicon to yttrium in the range of about 1:1 to about 200:1, a mole ratio of H_2O to Y in the range of about 50:1 to about 2500:1, and a mole ratio of alkali metal to yttrium in the range of about 1:1 to about 25:1.

35. A method of making an ion-exchanged yttrium silicate comprising:

mixing a yttrium silicate and an ammonium salt or a salt of a catalytically active metal in water to provide a mixture, said yttrium silicate comprising a complex represented in terms of mole ratios of oxides as follows:

$$aA_2O:Y_2O_3:bSiO_2:cH_2O$$

wherein A is an alkali metal; a is a number ranging from about 0.5 to about 20; b is a number ranging from about 2 to about 400; and c is a number ranging from about 1 to about 500; and

maintaining said mixture at an effective temperature for an effective period of time to provide the desired ion-exchanged yttrium silicate.

37. The product of claim 35.

4,634,687

PROCESS FOR POLYMERIZATION OF OLEFINS

Masahito Fujita; Masami Kizaki; Makoto Miyazaki, and Naomi Inaba, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 647,766, Sep. 6, 1984, abandoned. This application Dec. 19, 1985, Ser. No. 811,556

Claims priority, application Japan, Sep. 22, 1983, 58-174299

Int. Cl.⁴ C08F *4/64*

U.S. Cl. 502—121 **24 Claims**

1. A cocatalyst comprising:

a. an organoaluminum compound represented by the formula $R^1R^2R^3Al$ wherein R^1, R^2 and R^3, which may be the same or different, each denotes a C_1–C_{20} alkyl, alkenyl, cycloalkyl, aryl, aralkyl, or alkoxy group, or a hydrogen atom,

b. an organoaluminum halide represented by the formula $R^4_{3-n}AlX_n$ wherein R^4 denotes a C_1–C_{20} alkyl, alkenyl, cycloalkyl, aryl, aralkyl or alkoxy group, X denotes a halogen atom and n is equal to or greater than 1,

c. an electron donor compound containing a nitrogen atom, sulfur atom, oxygen atom or phosphorous atom, and

d. an aromatic carboxylic acid ester, wherein the molar ratio of component a. to b. is in the range of 90:10 to 30:70, the molar ratio of component c. to d. is in the range of 5:95 to 70:30 and the molar ratio of component a.+b. to component c.+d. is in the range of 50:50 to 85:15.

4,634,688

3'-FLUORO-3'-DEOXYKANAMYCIN A

Hamao Umezawa; Sumio Umezawa, both of Tokyo; Tsutomu Tsuchiya, Yokohama, and Yoshiaki Takahashi, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan

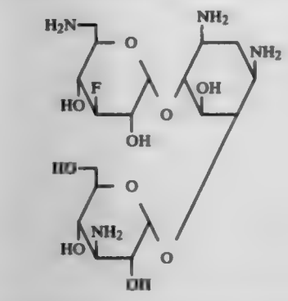
Filed Jul. 25, 1985, Ser. No. 758,819

Claims priority, application Japan, Aug. 2, 1984, 59-161615

Int. Cl.⁴ A61K *31/71;* **C07H** *15/22*

U.S. Cl. 514—41 **2 Claims**

1. 3'-Fluoro-3'-deoxykanamycin A of the formula



(I)

and a pharmaceutically acceptable acid addition salt thereof.

2. An antibacterial composition comprising an antibacterially effective amount of 3'-fluoro-3'-deoxykanamycin A as defined in claim 1 or a pharmaceutically acceptable acid addition salt thereof as the active ingredient, in association with a pharmaceutically acceptable carrier for the active ingredient.

4,634,689

PHOSPHINYLALKANOYL IMINO ACIDS

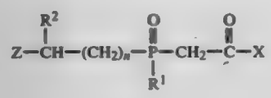
Joseph T. Witkowski, Morris Township, Morris County, and Michael F. Czarniecki, Westfield, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Oct. 31, 1985, Ser. No. 793,078

Int. Cl.⁴ A61K *31/54;* **C07D** *285/32, 285/26;* **C07F** *9/65*

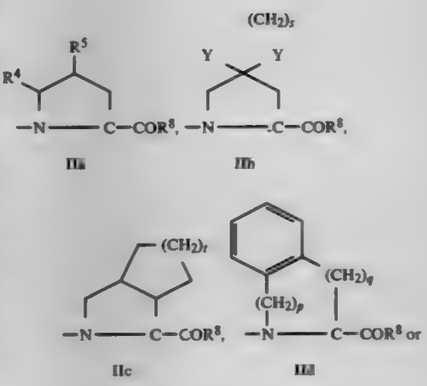
U.S. Cl. 514—80 **21 Claims**

1. A compound represented by the formula

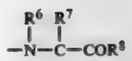


wherein

X is

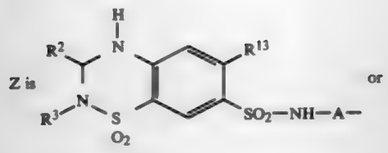


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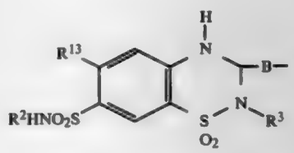
IIe

Y is —S— or —O—;



or

IIIa



IIIb

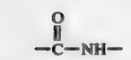
A is —$(CH_2)_m$— —$(CH_2)_r$—D—,

—$(CH_2)_x$—C(=O)—NH— or a bond;

B is —$(CH_2)_n$— —$(CH_2)_r$—D—,

—$(CH_2)_r$—C(=O)—NH— or a bond;

D is



or a bond;

m, n, and r are independently 0–14;

x is 1–4;

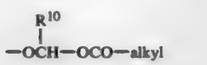
p and q are independently 0 or 1, provided that the sum of p and q is 1 or 2;

s is 2 or 3;

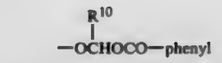
t is 1–3;

R is hydrogen, lower alkyl, halogen-substituted lower alkyl, cycloloweralkyl, —$(CH_2)_u$-cycloloweralkyl, or —$(CH_2)_v$—C_6H_5, wherein u is 1–4 and v is 0–4;

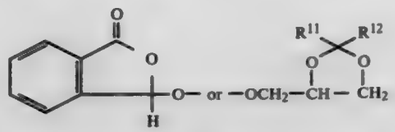
R^1 is hydroxy, alkoxy having from 1 to 8 carbon atoms, phenylloweralkoxy, allyloxy, R^9—Q_w—$(CH_2)_y$—O—, wherein Q is oxygen or sulfur, w is 0 or 1 and y is 2 to 4,



wherein the alkyl has from 3 to 8 carbon atoms,



wherein the phenyl may be substituted with group T defined below, 1-glyceryl,



R^2 is R or heterocycloloweralkyl, wherein heterocyclo is a 5- or 6-membered aliphatic or aromatic ring of 3 to 5 carbon atoms and 1 to 3 heteroatoms selected from nitrogen, sulfur and oxygen;

R^3 is hydrogen or lower alkyl;

R^4 and R^5 are independently hydrogen, lower alkyl or cycloloweralkyl, or R^4 and R^5 together with the carbon atoms to which they are attached form a 5- or 6-membered ring;

R^6 and R^7 are independently hydrogen, lower alkyl or cycloloweralkyl, or R^6 and R^7 together with the nitrogen and carbon atoms to which they are attached form a 4-, 6-, 7- or 8-membered ring;

R^8 is R^1, amino, hydroxylamino, mono- or disubstituted amino wherein the substituents are lower alkyl, phenyl or phenylloweralkyl, and wherein the phenyl may be substituted with group T defined below;

R^9 is phenyl, substituted phenyl wherein the substituents are chosen from group T, 1-naphthyl or 2-naphthyl;

T is halogen, hydroxy, trifluoromethyl, lower alkoxy, lower alkyl, 2-furanyl, 3-furanyl, 2-thienyl, 3-thienyl, phenyl and substituted phenyl wherein the substituents are chosen from halogen, hydroxy, trifluoromethyl, lower alkoxy or lower alkyl;

R^{10} is hydrogen or alkyl having from 1 to 8 carbon atoms;

R^{11} is hydrogen, lower alkyl, unsubstituted or substituted phenyl and substituted or unsubstituted phenylloweralkyl wherein phenyl may be substituted by group T;

R^{12} is hydrogen or lower alkyl;

R^{13} is chloro or trifluoromethyl;

or a pharmaceutically acceptable salt thereof.

20. A method of reducing blood pressure in hypertensive mammals which comprises administering to a hypertensive mammal a antihypertensive effective amount of a compound of claim **1**.

4,634,690

SUBSTITUTED PYRIMIDINYL ORGANOPHOSPHORUS INSECTICIDES

Mark A. Dekeyser, Waterloo; Benjamin J. Pierce, Guelph, both of Canada; Richard C. Moore, Wallingford, and Winchester L. Hubbard, Woodbridge, both of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn. and Uniroyal, Ltd., Don Mills, Canada

Continuation-in-part of Ser. No. 485,779, Apr. 18, 1983, Pat. No. 4,472,389, which is a division of Ser. No. 329,157, Dec. 10, 1981, Pat. No. 4,395,551. This application Jul. 18, 1984, Ser. No. 632,139

The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.

Int. Cl.⁴ A01N *57/16*; C07F *9/65*

U.S. Cl. 514—81 **5 Claims**

1. An oganophosphorus compound of the formula



where R is C_1–C_4 alkyl; R^1 is hydrogen or methyl; or R and R^1 together are a diradical having the formula —SC(Y)=Z—, where Y is halogen, hydrogen or C_1–C_2 alkyl; and Z is nitrogen, CH, $C(CH_3)$ or $C(C_2H_5)$ with the proviso that if Y is hydrogen, Z cannot be CH; R^2 is hydrogen, chlorine or bromine; R^3 is methyl or ethyl; R^4 is methoxy, ethoxy, —SCH_3 or —SC_2H_5; and X is oxygen or sulfur and their hydrochlorides.

3. A method of controlling insects or nematodes comprising applying to said insects or nematodes an insecticidally or a nematocidally effective amount of the compound of claim **1**.

4,634,691

METHOD FOR INHIBITING TUMOR METASTASIS

Walter L. Hedglin, Fairfield, and Raymond R. Martodam, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 297,462, Aug. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 194,750, Oct. 7, 1980, abandoned. This application Jan. 19, 1983, Ser. No. 459,164

Int. Cl.⁴ A61K *31/66*

U.S. Cl. 514—108 **8 Claims**

1. A method for inhibiting the formation of new tumor metastases without treating the underlying cancer itself in humans or animals comprising administering an amount, which is safe and sufficient to inhibit the formation of tumor metastases, of a compound selected from the group consisting of ethane-1-hydroxy-1,1-diphosphonic acid, dichloromethane diphosphonic acid and pharmaceutically-acceptable salts thereof to a patient having breast cancer, lung cancer or prostate cancer.

4,634,692

SYNTHESIS OF 1α,25-DIHYDROXY-24R-FLUOROCHOLECALCIFEROL AND 1α,25-DIHYDROXY-24S-FLUOROCHOLECALCIFEROL

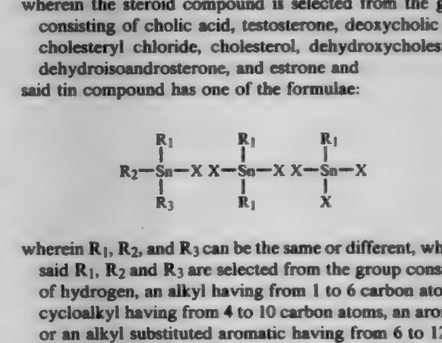
John J. Partridge, Upper Montclair; Shian-Jan Shiuey, Nutley, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 405,854, Aug. 6, 1982, which is a continuation-in-part of Ser. No. 297,446, Aug. 28, 1981, abandoned. This application Apr. 11, 1984, Ser. No. 599,086

Int. Cl.⁴ A61K *31/59*

U.S. Cl. 514—167 **3 Claims**

1. A method of treating osteoporosis which comprises administering to a mammal in need of such treatment an effective amount of a compound of the formula



wherein F is fluorine and the absolute configuration of C-24 is R or S or a R,S mixture.

4,634,693

TIN STEROIDS AND THEIR USES

Nathan F. Cardarelli, 439 Crestwood Ave., Akron, Ohio 44302, and Sebastian V. Kanakkanatt, 2459 Audubon Rd., Akron, Ohio 44320

Continuation-in-part of Ser. No. 518,073, Jul. 28, 1983, Pat. No. 4,541,956. This application Aug. 12, 1985, Ser. No. 764,650

Int. Cl.⁴ C07J *1/00*; A01N *45/00*

U.S. Cl. 514—169 **15 Claims**

1. A method for inhibiting the growth of tumor cells or for killing, microbes, insects and larve,

which comprises administering a tin steroid compound, said tin steroid compound being the reaction product of a steroid compound and a tin compound,

wherein the steroid compound is selected from the group consisting of cholic acid, testosterone, deoxycholic acid, cholesteryl chloride, cholesterol, dehydroxycholesterol, dehydroisoandrosterone, and estrone and

said tin compound has one of the formulae:

wherein R_1, R_2, and R_3 can be the same or different, wherein said R_1, R_2 and R_3 are selected from the group consisting of hydrogen, an alkyl having from 1 to 6 carbon atoms, a cycloalkyl having from 4 to 10 carbon atoms, an aromatic or an alkyl substituted aromatic having from 6 to 12 carbon atoms, and an aromatic substituted alkyl having from 7 to 12 carbon atoms, and where X is selected from the group consisting of hydroxyl, halide, hydroxide oxide wherein R_2 and R_3 do not exist, a dicarboxylic acid having from 2 to 10 carbon atoms, and a moncarboxylic acid having from 2 to 6 carbon atoms.

4,634,694

NOVEL Δ^4- AND Δ^5-ANDROSTENE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THESE DERIVATIVES

Hubert J. J. Loozen, Uden, and Pieter J. N. van Luit, Ja Oss, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

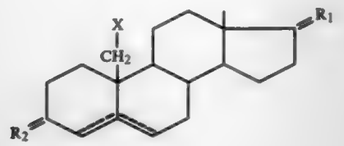
Filed Jan. 2, 1985, Ser. No. 688,368

Claims priority, application Netherlands, Jan. 14, 1984, 8400126

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—177 **8 Claims**

1. Novel Δ^4- and Δ^5-androstene derivatives having the formula:



wherein

X=S—S—R_4;

R_1=O or H (βR_5);

R_2=O or H (βR_6);

R_4=acyl (1–18 C) or alkyl (1–18 C), which is unsubstituted or substituted by hydroxy, oxo, alkoxy, mercapto, alkylthio, amino, substituted amino, carboxyl and/or ester groups;

R_5=OH, O-acyl (1–18 C) or an ether group;

R_6=OH, O-acyl (1–18 C) or an ether group; and the dotted lines represent a carbon-carbon bond in 4,5- or 5,6-position.

4,634,695

STEROID DERIVATIVES

Vesperto Torelli, Maisons-Alfort; Jean G. Teutsch, Pantin, and Daniel Philibert, La Varenne Saint Hilaire, all of France, assignors to Roussel Uclaf, Paris, France

Continuation-in-part of Ser. No. 614,440, May 25, 1984, Pat. No. 4,519,946, which is a division of Ser. No. 595,267, Mar. 30, 1984, abandoned, which is a division of Ser. No. 386,967, Jun. 10, 1982, Pat. No. 4,447,424, which is a continuation-in-part of Ser. No. 338,077, Jan. 9, 1982, Pat. No. 4,386,085. This application Jan. 22, 1985, Ser. No. 693,682

Claims priority, application France, Jan. 9, 1981, 81 00272

The portion of the term of this patent subsequent to May 31, 2000, has been disclaimed.

Int. Cl.[4] C07J *1/00*; A61K *31/56*

U.S. Cl. 514—178 **35 Claims**

1. A compound selected from the group consisting of 11β-(4-dimethylamino-phenyl)-13β-ethyl-17α-(prop-1-ynyl)-$\Delta^{4,9}$-gonadiene-17β-ol-3-one, 11β-(4-dimethylamino-phenyl)-17α-(3-hydroxy-prop-1-ynyl)-$\Delta^{4,9}$-estradiene-17β-ol-3-one, 11β-(4-aminophenyl)-17α-(prop-1-ynyl)-$\Delta^{4,9}$-estradiene-17β-ol-3-one, 11β-(4-methylamino-phenyl)-17α-(prop-1-ynyl)-$\Delta^{4,9}$-estradiene-17β-ol-3-one, N-[4-{17α-(prop-1-ynyl)-$\Delta^{4,9}$-estradiene-17β-ol-3-one-11β-yl}]-phenyl-acetamide, 11β-(4-dimethylamino-phenyl)-19-nor-17α-$\Delta^{4,9}$-pregnadiene-17β-ol-3-one-20-yne-21-carboxylic acid and its salts with non-toxic, pharmaceutically acceptable cations and their non-toxic, pharmaceutically acceptable acid addition salts.

15. A method of inducing menses in warm-blooded animals comprising administering to warm-blooded animals an antiprogestomimetically effective amount of at least one compound of claim 1.

4,634,696

NOVEL 11 BETA-SUBSTITUTED-19-NOR-STEROIDS

Jean-Georges Teutsch, Pantin; Vesperto Torelli, Maisons-Alfort; Roger Dersedt, Pavillons-sous-Bois, and Daniel Philibert, La Varenne-Saint-Hilaire, all of France, assignors to Roussel Uclaf, Paris, France

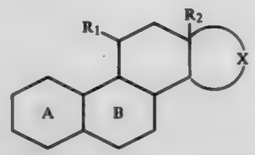
Division of Ser. No. 501,373, Jun. 6, 1983, Pat. No. 4,547,493. This application Jul. 30, 1985, Ser. No. 760,703

Claims priority, application France, Jun. 11, 1982, 82 10205

Int. Cl.[4] C07J *1/00*; A61K *31/56*

U.S. Cl. 514—179 **1 Claim**

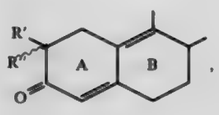
1. A method of treating hormonal irregularities and hormonodependent cancers in warm-blooded animals comprising administering to warm-blooded animals an amount of at least one compound selected from the group consisting of 19-nor-steroids of the formula



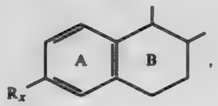
I

wherein R_1 is an organic group of 1 to 18 carbon atoms optionally containing at least one heteroatom with the atom immediately adjacent the 11-carbon atom being carbon, R_2 is a hydrocarbon of 1 to 8 carbon atoms, X is the remainder of a pentagonal or hexagonal ring optionally substituted and optionally containing one unsaturated bond, the A and B rings are selected from the group consisting of

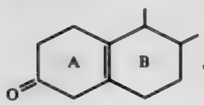
(a)



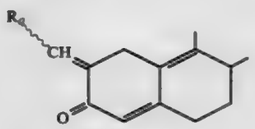
(b)



(c)



(d)



and

(e)

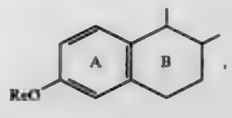


R′ and R″ are individually selected from the group consisting of hydrogen, —CN and alkyl of 1 to 4 carbon atoms with at least one being other than hydrogen, R_x is selected from the group consisting of hydrogen and OR_e, R_e is selected from the group consisting of hydrogen, optionally substituted alkyl of 1

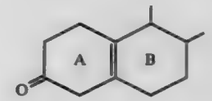
to 6 carbon atoms and acyl, R_a may be in the E or Z positions as indicated by the wavy line and is selected from the group consisting of



and acyloxy, R_a' and R_a'' are alkyl of 1 to 4 carbon atoms or taken together with the nitrogen atom form a heterocycle of 5 to 6 chain members optionally containing another heteroatom with the provisio that when A and B are



R_1 contains at least one nitrogen, phosphorus or silicium atom and when A and B are



R_1 is not a linear alkyl and their non-toxic, pharmaceutically acceptable acid addition salts sufficient to treat hormonal irregularity and hormonodependent cancers.

4,634,697

CARBOXYALKENAMIDOCEPHALOSPORINS

Yoshio Hamashima, Kyoto, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

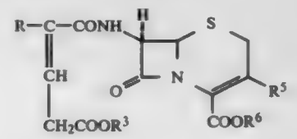
Continuation-in-part of Ser. No. 656,731, Oct. 1, 1984, abandoned. This application Mar. 12, 1985, Ser. No. 711,017

Claims priority, application Japan, Oct. 4, 1983, 58-186601; Feb. 3, 1984, 59-18563; May 18, 1984, 59-100890

Int. Cl.[4] A61K *31/545*; C07D *501/22, 501/24*

U.S. Cl. 514—202 **18 Claims**

1. A compound of the formula



wherein

R is 2-aminothiazol-4-yl the amino group of which is unprotected or protected with a protecting group,

R^3 is (1) hydrogen, (2) a pharmacologically acceptable salt forming group, (3) phthalidyl, (4) phenacyl, (5) C_{2-7}alkenyl, (6) diphenylmethyl, (7) trityl, (8) phenylalkyl of 7 to 15 carbon atoms said group being unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 2 carbon atoms, nitro, amino or hydroxy or (9) a lower alkyl group,

R^5 is hydrogen, methyl, vinyl, cyanovinyl, trifluoropropenyl, methoxymethyl, carbamoyloxymethyl, methylthiomethyl, cyanomethylthiomethyl, thiadiazolylthiomethyl, triazolylthiomethyl, aminomethylthiadiazolylthiomethyl, aminothiadiazolylthiomethyl, methoxy, fluoroethylthio, trifluoroethylthio, or halogen, and

R^6 is (1) hydrogen, (2) a pharmacologically acceptable salt forming atom or group, (3) a lower alkyl group, (4) a lower alkenyl group (5) phthalidyl, (6) phenacyl, (7) diphenylmethyl, (8) trityl or (9) phenylalkyl of 7 to 15 carbon atoms said group being unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 2 carbon atoms, nitro, amino or hydroxy.

4,634,698

ANTIGLAUCOMA AGENTS

David R. Andrews, Bloomfield, and Federico C. A. Gaeta, Rockaway Township, Morris County, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

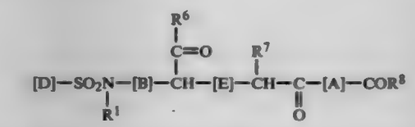
Continuation-in-part of Ser. No. 653,186, Sep. 24, 1984, Pat. No. 4,556,655. This application Apr. 8, 1985, Ser. No. 721,015

The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/54*

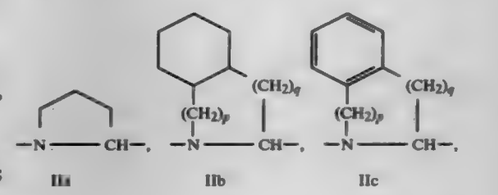
U.S. Cl. 514—222 **10 Claims**

1. A topical ophthalmologically acceptable composition useful for reducing intraocular pressure which comprises an intraocular pressure reducing effective amount of a compound represented by the formula:

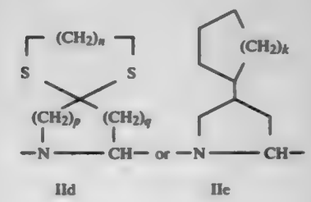


and the pharmaceutically acceptable salts thereof, wherein:

A is



IIa IIb IIc



IId IIe

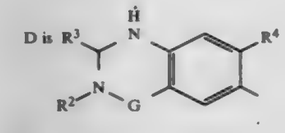
K is 1 or 2;

n is 0 or 1;

p and q are 0, 1 or 2, provided that in structures IIb and IIc the sum of p and q is 1 or 2, and that in formula IId, p is not 0;

B is -[J]-[L]-[M]-;

D is



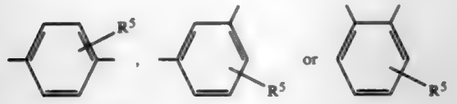
IIa

E is —NH—, —O—, —S—, or —CH_2—;

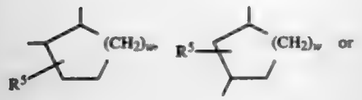
G is —SO_2—;

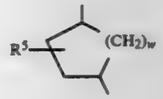
J is —$(CH_2)_s$— or —$((CH_2)_t$—W)—;

L is a chemical bond, cis- or trans-lower alkene, lower alkyne, -Z-aryl-, -aryl-Z-, -Z-cycloalkyl-, or -cycloalkyl-Z-, wherein aryl is



and cycloalkyl is





wherein w is 1, 2 or 3;
M is $-(CH_2)_u-$ or $-((CH_2)_r-X-(CH_2)v)-$;
W is

X and Z are independently a chemical bond, $-NR^9-$, $-O-$, $-S-$,



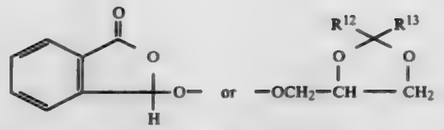
s, u and v are independently 0–5;
t is 1–5;
R^1, R^2 and R^9 are independently hydrogen, lower alkyl or lower acyl;
R^3 is hydrogen, lower alkyl, halo- and dihaloloweralkyl, trifluoroethylthiomethyl, phenylloweralkyl, (cycloalkyl)-loweralkyl, aminomethyl, loweralkylaminomethyl, phenyl(lower)alkylaminomethyl, (cycloalkyl)loweralkylaminomethyl, loweralkylthiomethyl or halologweralkylthiomethyl;
R^4 is chlorine or CF_3;
R^5 is hydrogen, halogen, lower alkyl, lower acyl, lower alkoxy, haloloweralkyl or phenylloweralkyl;
R^7 is hydrogen, lower alkyl or aminoloweralkyl;
R^6 and R^8 are independently hydroxy, alkoxy having from 1 to 8 carbon atoms, benzyl, allyl, $R^{10}—Q_r—(CH_2)_m—O—$, wherein Q is oxygen or sulfur, r is 0 or 1 and m is 2 to 4,



wherein the alkyl has from 3 to 8 carbon atoms,



wherein the phenyl may be substituted with group T defined below, 1-glyceryl,



R^{10} is phenyl, substituted phenyl wherein the substituents are chosen from group T, 1-naphthyl or 2-naphthyl;
T is halogen, hydroxy, trifluoromethyl, lower alkoxy, lower alkyl, 2-furanyl, 3-furanyl, 2-thienyl, 3-thienyl, phenyl and substituted phenyl wherein the substituents are chosen from halogen, hydroxy, trifluoromethyl, lower alkoxy or lower alkyl;
R^{11} is hydrogen or alkyl having from 1 to 8 carbon atoms;
R^{12} is hydrogen, lower alkyl, unsubstituted or substituted phenyl and substituted or unsubstituted phenyl lower alkyl, wherein phenyl may be substituted by group T;
R^{13} is hydrogen or lower alkyl;
provided that if L is alkene or alkyne, J is $—(CH_2)_s—$ wherein s is 1–5; provided that if L is -Z-aryl- or -Z-cycloalkyl-, J is $—(CH_2)_s—$ wherein s is 2–5; provided that if L is alkene, alkyne, -aryl-Z- or -cycloalkyl-Z-, M is $—(CH_2)_u—$ wherein u is 1–5; provided that if s and u are each zero, L is aryl or cycloalkyl (i.e. Z is a bond); and provided that if s and v are each zero, L is aryl or cycloalkyl (ie. Z is a bond);
in combination with an ophthamologically acceptable carrier for topical use.

4,634,699

BRANCHED CHAIN PHENOTHIAZINE

John D. McDermed; John W. A. Findlay, both of Durham, N.C., and Geoffrey G. Coker, Bromley, England, assignors to Burroughs Wellcome Co., Research Triangle park, N.C.

Continuation of Ser. No. 678,249, Dec. 15, 1984, abandoned, which is a continuation-in-part of Ser. No. 616,296, Jun. 1, 1984, abandoned. This application Jul. 26, 1985, Ser. No. 759,506
Claims priority, application Israel, Nov. 30, 1983, 70359
Int. Cl.⁴ A61K *31/54*; C07D *279/28*
U.S. Cl. 514—223 **13 Claims**

1. 2-[10-(2-Dimethylaminopropyl)-2-phenothiazinyl]-2-methylpropionic acid.

7. A method of obtaining an antihistaminic effect in a human in need thereof comprising administering to said human an effective antihistaminic amount of 2-[10-(2-Dimethylaminopropyl)-2-phenothiazinyl]-2-methyl-propionic acid.

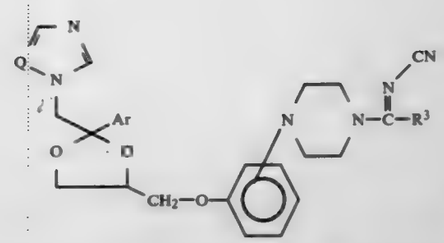
4,634,700

1,3-DIOXOLANYL DERIVATIVES, A PROCESS FOR THEIR PREPARATION, THEIR USE AND PHARMACEUTICAL PREPARATIONS CONTAINING THESE COMPOUNDS

Helmut Schickaneder, Eckental; Klaus Höxer, Altdorf, and Kurt H. Ahrens, Nuremberg, all of Fed. Rep. of Germany, assignors to Ludwig Heumann & Co., GmbH, Fed. Rep. of Germany

Filed Dec. 28, 1984, Ser. No. 687,297
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404819
Int. Cl.⁴ A61K *31/41*; C07D *405/14*
U.S. Cl. 514—227 **10 Claims**

1. 1,3-dioxolanyl compound of the formula



wherein Q is CH or N, Ar is a phenyl group which is unsubstituted or substituted with 1 to 3 halogen atoms and R^3 is an amino group, a pyrrolidine, piperidine, morpholine or piperazine ring which is unsubstituted or substituted in the four position by methyl or acetyl, or a lower alkoxy, phenoxy or thio lower alkyl group, and the physiologically acceptable hydrates and salts thereof.

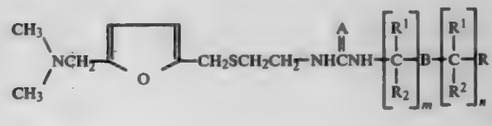
4,634,701

FURAN DERIVATIVES HAVING ANTI-ULCER ACTIVITY

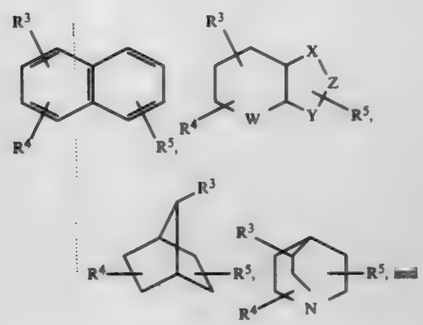
Leonardo De Vincentiis, Rome, Italy, assignor to Ausonia Farmaceutici s.r.l., Rome, Italy

Filed May 28, 1985, Ser. No. 738,668
Claims priority, application Italy, Jun. 6, 1984, 21273 A/84
Int. Cl.⁴ A61K *31/34*; C07D *307/52, 307/54*
U.S. Cl. 514—232 **25 Claims**

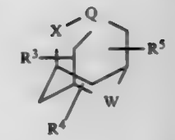
1. A compound selected from the group consisting of
(a) a furan derivative of the formula:



wherein
A is $=CHNO_2$ or $=NCN$;
B is $—CH_2—$, $—S—$, $—O—$, or a direct bond;
each of R^1 and R^2, independently of the other, is hydrogen or alkyl of 1 to 4 carbon atoms;
each of n and m, independently of the other, has a value of 0, 1, 2, 3, or 4; and
R is the monovalent radical derived from a polycyclic selected the group consisting of



-continued



in which
each of R^3, R^4, and R^5, independently of the other, is hydrogen; halo; nitro; hydroxy; alkyl of 1 to 4 carbon atoms which is unsubstituted or substituted with nitro, hydroxy, mercapto, halo, amino, C_1–C_4 alkylamino or C_1–C_4 dialkylamino, piperidino, pyrrolidino, piperazino, or morpholino, or the chain of which group is interrupted with oxygen, sulfur or nitrogen; alkenyl of 2 to 4 carbon atoms which is unsubstituted or substituted with nitro, hydroxy, mercapto, halo, amino, C_1–C_4 alkylamino or C_1–C_4 dialkylamino, piperidino, pyrrolidino, piperazino, or morpholino, or the chain of which group is interrupted with oxygen, sulfur or nitrogen;
alkynyl of 2 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms; or alkylthio of 1 to 4 carbon atoms;
W is —O—, —S—, $—CH_2—$, or —NH—;
each of X, Y, and Z independently of the other is —O—, —S—, $—CH_2—$, —NH—, or $—CH_2CH_2—$ and Q is —N= or —CH=;
(b) the pharmaceutically acceptable acid addition salts thereof; and
(c) the hydrates thereof.

24. Pharmaceutical compositions having anti-ulcer, antisecretive and antihistaminic H_2 activities, containing as the active principle at least one of compound according to claim 1, with suitable pharmaceutical diluents or carriers, optionally in association with other active principles.

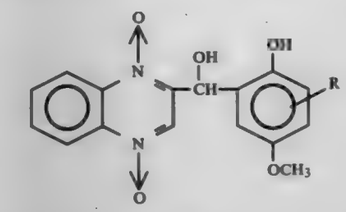
4,634,702

QUINOXALINEMETHANOL COMPOUNDS FOR COMBATTING SWINE DYSENTERY AND AS GROWTH PROMOTING FACTORS, METHOD OF PREPARATION, AND COMPOSITIONS CONTAINING THEM

Daniele Gatti, Via Sacco & Vanzetti, 3, 27020 Travacò Siccomario, Italy

Filed Oct. 19, 1984, Ser. No. 662,836
Claims priority, application Italy, Nov. 7, 1983, 23605 A/83
Int. Cl.⁴ C07D *241/52*; A61K *31/495*
U.S. Cl. 514—249 **4 Claims**

1. A compound for combatting swine dysentery, endowed with growth promoting action, but devoid of mutagenic action when tested by the conventional Ames test, and having the formula (I):



(I)

wherein R is H or a 1–4 C alkyl group.

4. A growth promoting factor comprising as active ingredient a compound of the formula (I) of claim 1, in association with a pharmaceutically acceptable carrier.

4,634,703

METHOD FOR ALLEVIATION OF PANIC DISORDERS

Neil M. Kurtz, Westport, Conn.; Roger E. Newton, Evansville, Ind., and Davis L. Temple, Jr., Wallingford, Conn., assignors to Bristol-Myers Company, New York, N.Y.

Filed Oct. 25, 1985, Ser. No. 791,182
Int. Cl.[4] A61K *31/50, 31/495*
U.S. Cl. 514—252 8 Claims

1. A method for alleviation of panic disorders which comprises administering a non-toxic therapeutically effective dose of buspirone or a pharmaceutically acceptable acid addition salt thereof to a patient in need of such treatment.

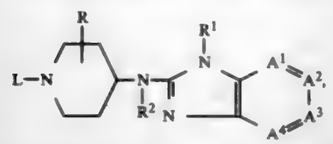
4,634,704

ANTI-ALLERGIC FIVE MEMBERED HETEROCYCLIC RING CONTAINING N-(BICYCLIC HETEROCYCYL)-4-PIPERIDINAMINES

Frans E. Janssens, Bonheiden; Joseph L. G. Torremans, Beerse; Jozef F. Hens, Nijlen, and Theophilus T. J. M. Van Offenwert, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 539,597, Oct. 6, 1983, abandoned. This application Jun. 27, 1984, Ser. No. 625,343
Int. Cl.[4] A61K *31/445;* C07D *401/00*
U.S. Cl. 514—253 6 Claims

1. A chemical compound having the formula



(I)

a pharmaceutically acceptable acid addition salt or a possible stereochemically isomeric form thereof, wherein:

A^1=A^2—A^3=A^4 is a bivalent radical having the formula

—CH=CH—CH=CH—, (a)

—N=CH—CH=CH—, (b)

—CH=N—CH=CH—, (c)

—CH=CH—N=CH—, (d)

or

—CH=CH—CH=N—, (e)

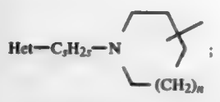
wherein one or two hydrogen atoms in said radicals (a)-(e) may, each independently from each other, be replaced by halo, lower alkyl, lower alkyloxy, trifluoromethyl or hydroxy;

R is a member selected from the group consisting of hydrogen and lower alkyl;

R^1 is a member selected from the group consisting of hydrogen, alkyl, cycloalkyl, Ar^1 and lower alkyl substituted with one or two Ar^1 radicals;

R^2 is a member selected from the group consisting of hydrogen, lower alkyl, cycloalkyl, (lower alkyl)—CO—, (lower alkyl—O)—CO and Ar^2—lower alkyl;

L is a member selected from the group consisting of a radical of formula



(f)

a radical of formula

$Het—C_sH_{2s}—Y—Alk—$ (g);

and a radical of formula



(h)

wherein n is 0 or the integer 1 or 2;

s is 0 or an integer of from 1 to 6 inclusive;

Alk is lower alkanediyl;

Y is O, S, NR^3 or a direct bond;

X is O, S, CH—NO_2 or NR^4;

Z is O, S, NR^5 or a direct bond; and

Het is a member selected from the group consisting of thiazolyl, 4,5-dihydrothiazolyl, oxazolyl, imidazolyl, tetrazolyl, 1,3,4-thiadiazolyl, benzimidazolyl, benzothiazolyl, benzoxazolyl, and indolyl whereby each of the said Het-radicals may optionally be substituted with up to two substituents selected from the group consisting of lower alkyl, Ar^1, Ar^1—lower alkyl, amino, (aminoiminomethyl-)amino, mono- and di(lower alkyl)amino, Ar^1—amino, nitro and pyrimidinyl, said Het being connected to C_sH_{2s} on a carbon atom;

said R^3 being hydrogen, lower alkyl, (Ar^2)lower alkyl, 2-lower alkyloxy-1,2-dioxoethyl or a radical of formula —C(=X)—R^6, R^6 being hydrogen, lower alkyl, Ar^2, Ar^2—lower alkyl, lower alkyloxy, Ar^2—lower alkyloxy, mono- or di(lower alkyl)amino, Ar^2—amino, Ar^2—lower alkylamino or Ar^2—lower alkyl(lower alkyl)amino;

said R^4 being hydrogen, lower alkyl, cyano, nitro, Ar^2—sulfonyl, lower alkylsulfonyl, lower alkylcarbonyl or Ar^2—carbonyl; and

said R^5 being hydrogen or lower alkyl; provided that:

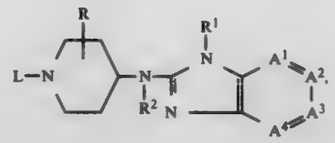
(i) when A^1=A^2—A^3=A^4 is a bivalent radical of formula (a) or (b), then Het is other than 1-(lower alkyl)pyrrolyl;

(ii) when A^1=A^2—A^3=A^4 is a bivalent radical of formula (a) or (b) and L is a radical of formula (g) wherein s is 0 and Y is NR^3,

then Het is other than 1H-benzimidazol-2-yl or Ar^1—Loweralkyl-1H-benzimidazol-2-yl;

wherein Ar^1 is a member selected from the group consisting of phenyl, being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl and lower alkyl—CO—; thienyl; halothienyl; furanyl; lower alkyl substituted furanyl; pyridinyl; pyrazinyl; thiazolyl and imidazolyl optionally substituted by lower alkyl; and wherein Ar^2 is a member selected from the group consisting of phenyl being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl and (lower alkyl)CO.

5. A method of treating allergic diseases in warm-blooded animals suffering from same which method comprises the systemic administration to warm-blooded animals of an effective anti-allergic amount of a compound having the formula



(I)

a pharmaceutically acceptable acid addition salt or a possible stereochemically isomeric form thereof, wherein:

A^1=A^2—A^3=A^4 is a bivalent radical having the formula

—CH=CH—CH=CH—, (a)

—N=CH—CH=CH—, (b)

—CH=N—CH=CH—, (c)

—CH=CH—N=CH—, (d)

or

—CH=CH—CH=N—, (e)

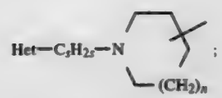
wherein one or two hydrogen atoms in said radicals (a)-(e) may, each independently from each other, be replaced by halo, lower alkyl, lower alkyloxy, trifluoromethyl or hydroxy;

R is a member selected from the group consisting of hydrogen and lower alkyl;

R^1 is a member selected from the group consisting of hydrogen, alkyl, cycloalkyl, Ar^1 and lower alkyl substituted with one or two Ar^1 radicals;

R^2 is a member selected from the group consisting of hydrogen, lower alkyl, cycloalkyl, (lower alkyl)—CO—, (lower alkyl—O)—CO and Ar^2—lower alkyl;

L is a member selected from the group consisting of a radical of formula

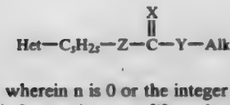


(f)

a radical of formula

$Het—C_sH_{2s}—Y—Alk—$ (g);

and a radical of formula



(h)

wherein n is 0 or the integer 1 or 2;

s is 0 or an integer of from 1 to 6 inclusive;

Alk is lower alkanediyl;

Y is O, S, NR^3 or a direct bond;

X is O, S, CH—NO_2 or NR^4;

Z is O, S, NR^5 or a direct bond; and

Het is a member selected from the group consisting of thiazolyl, 4,5-dihydrothiazolyl, oxazolyl, imidazolyl, tetrazolyl, 1,3,4-thiadiazolyl, benzimidazolyl, benzothiazolyl, benzoxazolyl, and indolyl whereby each of the said Het-radicals may optionally be substituted with up to two substituents selected from the group consisting of lower alkyl, Ar^1, Ar^1, Ar^1—lower alkyl, amino, (aminoiminomethyl)amino, mono- and di(lower alkyl)amino, Ar^1—amino, nitro and pyrimidinyl, said Het being connected to C_sH_{2s} on a carbon atom;

said R^3 being hydrogen, lower alkyl, (Ar^2)lower alkyl, 2-lower alkyloxy-1,2-dioxoethyl or a radical of formula —C(=X)—R^6, R^6 being hydrogen, lower alkyl, Ar^2, Ar^2—lower alkyl, lower alkyloxy, Ar^2—lower alkyloxy, mono- or di(lower alkyl)amino, Ar^2—amino, Ar^2—lower alkylamino or Ar^2—lower alkyl(lower alkyl)amino;

said R^4 being hydrogen, lower alkyl, cyano, nitro, Ar^2—sulfonyl, lower alkylsulfonyl, lower alkylcarbonyl or Ar^2—carbonyl; and

said R^5 being hydrogen or lower alkyl; provided that:

(i) when A^1=A^2—A^3=A^4 is a bivalent radical of formula (a) or (b), then Het is other than 1-(lower alkyl)pyrrolyl;

(ii) when A^1=A^2—A^3=A^4 is a bivalent radical of formula (a) or (b) and L is a radical of formula (g) wherein S is 0 and Y is NR^3, then Het is other than 1H-benzimidazol-2-yl or Ar^1-loweralkyl-1H-benzimidazol-2-yl;

wherein Ar^1 is a member selected from the group consisting of phenyl, being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl and lower alkyl—CO—; thienyl; halothienyl; furanyl; lower alkyl substituted furanyl; pyridinyl; pyrazinyl; thiazolyl and imidazolyl optionally substituted by lower alkyl; and wherein Ar^2 is a member selected from the group consisting of phenyl being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl and (lower alkyl)CO.

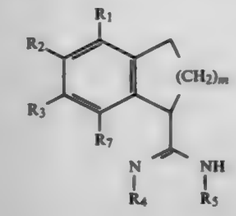
4,634,705

ADRENERGIC AMIDINES

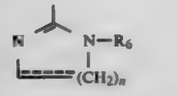
John F. DeBernardis, Lake Villa, and Fatima Z. Basha, Lake Bluff, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 617,770, Jun. 6, 1984, abandoned. This application Mar. 7, 1986, Ser. No. 838,212
Int. Cl.[4] A61K *31/505;* C07D *239/06*
U.S. Cl. 514—256 15 Claims

1. A compound of the formula



wherein m is 0, 1 or 2; R_1, R_2, R_3 and R_7 are taken from the group consisting of hydrogen, hydroxy, loweralkyl, loweralkoxy, halo, amino, acetamido or $NHSO_2R$ wherein R is taken from the group consisting of hydrogen or loweralkyl, provided that R_1, R_2, R_3 and R_7 cannot simultaneously be hydrogen or halo, and provided that when one of R_1, R_2, R_3 and R_7 is halo, the others cannot simultaneously be hydrogen and when two of R_1, R_2, R_3 and R_7 are halo, the other two cannot simultaneously be hydrogen and when three of R_1, R_2, R_3 and R_7 are halo, the other cannot simultaneously be hydrogen, and provided that R_1 and R_7 cannot simultaneously be methoxy each when R_2 and R_3 are hydrogen; R_1 and R_2 or R_2 and R_3 or R_3 and R_7 taken together can form a methylenedioxy or ethylenedioxy ring, or R_1 and R_2 or R_2 and R_3 or R_3 and R_7 taken together with the aromatic ring can form a benzimidazole or indole ring; and R_4 and R_5 are hydrogen or taken together form a closed ring of the formula



wherein n is 1 or 2, and the combined solid and dashed line

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represents a single or double bond when n is 1, and R_6 is taken from the group consisting of hydrogen or loweralkyl, or a pharmaceutically acceptable salt thereof.

15. A method of treating hypertension which comprises administering to a patient a therapeutically effective amount of a compound of the formula of claim 1.

4,634,706

GRISEOLIC ACID DERIVATIVES, AND THEIR USE AS ENZYME INHIBITORS

Masakatsu Kaneko; Misako Kimura; Yoshinobu Murofushi; Mitsuo Yamazaki; Nobuyoshi Iwata, and Fumio Nakagawa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

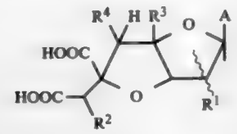
Filed Oct. 25, 1984, Ser. No. 664,866

Claims priority, application Japan, Oct. 28, 1983, 58-202362

Int. Cl.[4] A61K *31/52;* **C07D** *473/00, 473/30, 473/34, 473/38, 473/40*

U.S. Cl. 514—262 **38 Claims**

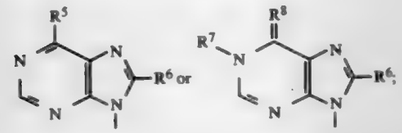
1. A griseolic acid compound of the formula:



(I)

wherein:

A represents a group of formula:



R^1, R^2, R^5 and R^6 are the same or different and each represents a hydrogen or halogen atom, the azido group, or a group of formula $—OR^9$, $—NR^{10}R^{11}$ or $—SR^9$;

R^3 represents a hydrogen or halogen atom or a C_1–C_{20} aliphatic acyloxy or a (C_6–C_{20} aromatic)acyloxy or C_1–C_6 alkoxy group;

R^4 represents a hydrogen or halogen atom; or

R^3 and R^4 together represent an extra carbon-carbon bond between the carbon atoms to which they are attached; or

R^3 and R^2 together represent an oxygen atom bridging the carbon atoms to which they are attached;

R^7 represents an optionally substituted C_1–C_6 alkyl, C_3–C_6 alkenyl or aralkyl group (wherein the alkyl moiety has from 1 to 6 carbon atoms), the substituents being selected from halogen atoms, C_1–C_4 alkoxy groups, (C_1–C_4 alkoxy)carbonyl groups and (where R^7 is substituted aralkyl) C_1–C_4 alkyl groups;

R^8 represents an oxygen or sulfur atom or the imino group;

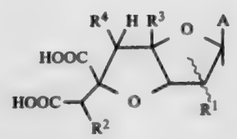
R^9 represents hydrogen, a C_1–C_6 alkyl group, a heterocyclic group (having 5 or 6 ring atoms, of which from 1 to 3 are oxygen, nitrogen or sulfur, and being unsubstituted or having from 1 to 3 C_1–C_4 alkyl or alkoxy substituents), a tri(C_1–C_4 alkyl)silyl group, an alkylsulfonyl group, a haloalkylsulfonyl group, a benzenesulphonyl optionally substituted with a C_1–C_3 alkyl group, a C_1–C_{20} aliphatic acyl group or a C_6–C_{20} aromatic acyl group;

R^{10} and R^{11} are the same or different and each represents hydrogen, hydroxy, a C_1–C_6 alkyl group, a C_1–C_6 hydroxyalkyl group, a C_1–C_6 aminoalkyl group, an aralkyl group, an aryl group, a C_1–C_6 alkoxy group, the amino group, a C_1–C_{20} aliphatic acyl group or a C_6–C_{20} aromatic acyl group; or R^{10} and R^{11}, together with the nitrogen atom to which they are attached, represent a 5- or 6-membered heterocyclic group having at least one other heteroatom selected from oxygen, and nitrogen atoms and optionally having one C_1–C_4 alkyl substituent;

and pharmaceutically acceptable salts and esters thereof;

but excluding 7'(R)-griseolic acid itself and salts thereof.

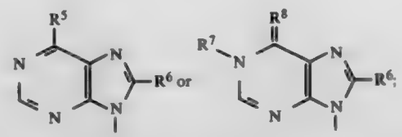
7. A pharmaceutical composition comprising an effective amount of at least one active compound in admixture with a pharmaceutically acceptable carrier or diluent, wherein the active compound is selected from griseolic acid compounds of the formula:



(I)

wherein:

A represents a group of formula:



R^1, R^2, R^5 and R^6 are the same or different and each represents a hydrogen or halogen atom, the azido group, or a group of formula $—OR^9$, $—NR^{10}R^{11}$ or $—SR^9$;

R^3 represents a hydrogen or halogen atom or a C_1–C_{20} aliphatic acyloxy or a (C_6–C_{20} aromatic) acyloxy or C_1–C_6 alkoxy group;

R^4 represents a hydrogen or halogen atom; or

R^3 and R^4 together represent an extra carbon-carbon bond between the carbon atoms to which they are attached; or

R^3 and R^2 together represent an oxygen atom bridging the carbon atoms to which they are attached;

R^7 represents an optionally substituted C_1–C_6 alkyl, C_3–C_6 alkenyl or aralkyl group (wherein the alkyl moiety has from 1 to 6 carbon atoms), the substituents being selected from halogen atoms, C_1–C_4 alkoxy groups, (C_1–C_4 alkoxy)carbonyl groups and (where R^7 is substituted aralkyl) C_1–C_4 alkyl groups;

R^8 represents an oxygen or sulfur atom or the imino group;

R^9 represents hydrogen, a C_1–C_6 alkyl group, a heterocyclic group (having 5 or 6 ring atoms, of which from 1 to 3 are oxygen, nitrogen or sulfur, and being unsubstituted or having from 1 to 3 C_1–C_4 alkyl or alkoxy substituents), a tri(C_1–C_4 alkyl)silyl group, an alkylsulfonyl group, a haloalkylsulfonyl group, a benzenesulphonyl optionially substituted with a C_1–C_3 alkyl group, a C_1–C_{20} aliphatic acyl group or a C_6–C_{20} aromatic acyl group;

R^{10} and R^{11} are the same or different and each represents hydrogen, hydroxy, a C_1–C_6 alkyl group, a C_1–C_6 hydroxyalkyl group, a C_1–C_6 aminoalkyl group, an aralkyl group, an aryl group, a C_1–C_6 alkoxy group, the amino group, a C_1–C_{20} aliphatic acyl group or a C_6–C_{20} aromatic acyl group; or R^{10} and R^{11}, together with the nitrogen atom to which they are attached, represent a 5- or 6-membered heterocyclic group having at least one other heteroatom selected from oxygen, and nitrogen atoms and optionally having one C_1–C_4 alkyl substituent;

and pharmaceutically acceptable salts and esters thereof;

but excluding 7'(R)-griseolic acid itself and salts thereof.

4,634,707

5-PYRIMIDINECARBOXAMIDES AND TREATMENT OF LEUKEMIA AND TUMORS THEREWITH

Arthur D. Brewer, Puslinch, Canada, and John A. Minatelli, Watertown, Conn., assignors to Uniroyal Chemical Company, Middlebury, Conn. and Uniroyal Ltd., Don Mills, Canada

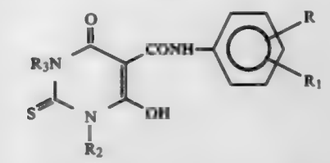
Continuation-in-part of Ser. No. 665,201, Oct. 26, 1984, abandoned, and Ser. No. 562,693, Dec. 19, 1983, abandoned. This application Feb. 8, 1985, Ser. No. 699,776

Claims priority, application Belgium, Dec. 18, 1984, 0/214,179

Int. Cl.[4] A61K *31/515;* **C07D** *239/66, 239/68*

U.S. Cl. 514—270 **24 Claims**

1. A compound of the formula



wherein:

R is hydrogen, 2- or 3-halo, 2-methyl, 4-fluoro, 2- or 4-alkoxy having from 1 to 6 carbon atoms, 2 or 4-trifluoromethyl, and R_1 is hydrogen; or

R is 2-fluoro and R_1 is 4-fluoro; or

R is 2-methoxy and R_1 is 5-methyl; and

R_2 and R_3 are hydrogen atoms or carbohydrate residues selected from the group consisting of furanosyl, pyranosyl, gluocopyranosyl or galactopyranosyl groups, their deoxy derivatives, and hydroxyalkoxyalkyl and polyhydroxyalkyl groups having from 2–12 carbon atoms in each of the alkoxy and alkyl moieties thereof; and,

with the exception of the compound wherein R is 4-methoxy and R_1 is hydrogen, the pharmacologically acceptable acid-addition salts thereof.

12. A method for inducing regression of leukemia and inhibition of the growth of tumors in mammals, which comprises administering an effective amount of the compound of claim 1 to mammals.

4,634,708

INDOLOPHENANTHRIDINES USEFUL AS DOPAMINERGIC AND ANALGESIC AGENTS

Alexander Hagenbach, Pfeffingen; Max P. Seiler, Basel, and Hans J. Wüthrich, Kehrsatz, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

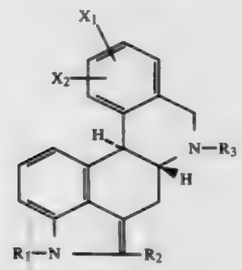
Filed Jan. 25, 1985, Ser. No. 695,191

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1984, 3402392

Int. Cl.[4] A61K *31/475;* **C07D** *471/06*

U.S. Cl. 514—280 **17 Claims**

1. A compound of formula I



I

wherein

R_1 and R_3 independently are hydrogen, (C_{1-4})alkyl, (C_{3-5})alkenyl wherein the double bond is not adjacent to the nitrogen atom, (C_{3-6})cycloalkyl(C_{1-3})alkyl, phenyl(C_{1-3})alkyl optionally substituted in the phenyl ring by (C_{1-4})alkyl, (C_{1-4})alkoxy, hydroxy or halogen, or 2- or 3-furyl(C_{1-3})alkyl,

R_2 is hydrogen, chlorine, bromine or methyl,

X_1 and X_2 independently are hydrogen, (C_{1-4})alkyl, (C_{1-4})alkoxy, hydroxy, halogen or trifluoromethyl,

in free base or acid addition salt form.

5. A pharmaceutical composition useful in the treatment of Parkinson's disease, conjective cardiac insufficiency, hypertension, renal failure with reduced urine excretion or pain comprising a therapeutically effective amount of a compound according to claim 1 in pharmaceutically acceptable form, in association with a pharmaceutical carrier or diluent.

6. A method of treating a subject suffering from Parkinson's disease, congestive cardiac insufficiency, hypertension, renal failure with reduced urine excretion or pain, which comprises administering a therapeutically effective amount of a compound of claim 1 in pharmaceutically acceptable form.

4,634,709

PLATELET AGGREGATION INHIBITORY AGENTS AND INTERMEDIATES THEREFOH

Andrew Lassio, Memphis; Ronald P. Quintana, Germantown; Marion Dugdale, and Randy W. Johnson, both of Memphis, all of Tenn., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 368,863, Apr. 15, 1982, Pat. No. 4,443,450. This application Jan. 16, 1984, Ser. No. 571,326

Int. Cl.[4] A61K *31/445;* **C07D** *401/12, 211/60*

U.S. Cl. 514—316 **19 Claims**

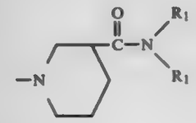
18. A pharmaceutical composition in unit dosage form suitable for administration to an animal in need thereof comprising a pharmaceutically acceptable carrier and a blood platelet aggregation inhibiting amount of a compound having the structural formula:

[A]



Wherein

R is



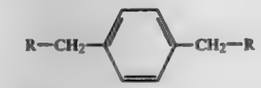
and

R_1 is C_1–C_{10} alkyl; and

[B] addition salts thereof with pharmaceutically acceptable acids.

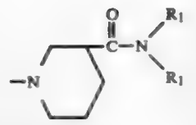
19. A method for the inhibition of blood platelet aggregation comprising administering to an animal in need thereof a blood platelet aggregation inhibiting amount of a compound having the structural formula:

[A]



Wherein

R is



and

R_1 is C_1–C_{10} alkyl; and

[B] addition salts thereof with pharmaceutically acceptable acids.

4,634,710

TRICYCLIC IMIDAZOLE DERIVATIVES

Albert Fischli, Riehen; Anna Krasso, Basel; Henri Ramuz, Birsfelden, and André Szente, Riehen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

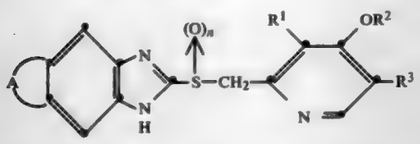
Filed Apr. 8, 1985, Ser. No. 720,775

Claims priority, application Switzerland, Apr. 19, 1984, 1966/84

Int. Cl.⁴ C07D *401/12;* A61K *31/415*

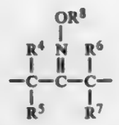
U.S. Cl. 514—338 **30 Claims**

1. A compound of the formula



I

wherein one of R^1 and R^3 is lower alkyl and the other is hydrogen or lower alkyl, R^2 is lower alkyl, n is the number 0 or 1, A is



(c)

wherein R^4, R^5, R^6 and R^7 each is lower alkyl and R^8 is hydrogen or lower alkyl; or a pharmaceutically acceptable acid addition salt thereof.

4,634,711

PYRIDYLALKYL IMIDAZOLE-2-THIOLS

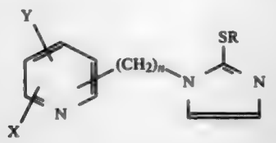
Carl Kaiser, Haddon Heights; Lawrence I. Kruse, Haddonfield, both of N.J., and Stephen T. Ross, Berwyn, Pa., assignors to Smithkline Beckman Corporation, Philadelphia, Pa.

Filed Aug. 2, 1985, Ser. No. 761,936

Int. Cl.⁴ A61K *31/415;* C07D *401/06*

U.S. Cl. 514—341 **21 Claims**

1. A compound of the Formula:



in which:

Y is hydrogen, hydroxy, or C_{1-4} alkoxy;

X is hydrogen, halogen, halo C_{1-4} alkyl, or any accessible combination thereof up to three substituents;

n is 1–5; and

R is hydrogen or C_{1-4} alkyl; or a pharmaceutically acceptable salt or hydrate thereof.

4,634,712

ANTIHYPERTENSIVE ESTERS OF 1,4-DIHYDRO-2,6-DIMETHYL-3-(ALKOXYCARBONYL OR ALKOXYALKOXYCARBONYL)-4-(SUBSTITUTED PHENYL)-PYRIDINE-5-CARBOXYLIC ACID

Dante Nardi; Amedeo Leonardi, and Giorgio Bianchi, all of Milan, Italy, assignors to Recordati S.A., Switzerland

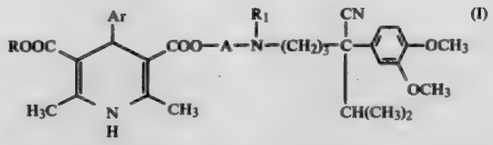
Filed May 14, 1985, Ser. No. 734,024

Claims priority, application United Kingdom, May 24, 1984, 8413385

Int. Cl.⁴ C07D *211/90;* A61K *31/455*

U.S. Cl. 514—356 **18 Claims**

1. An ester of 1,4-dihydro-2,6-dimethyl-3-(alkoxycarbonyl or alkoxyalkoxycarbonyl)-4-(substituted phenyl)pyridine-5-carboxylic acid, the ester having the general formula



(I)

wherein

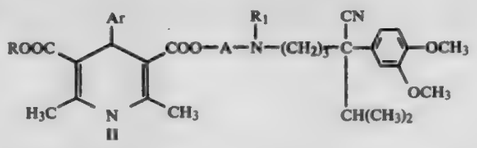
Ar represents a 3-nitrophenyl or 2,3-dichlorophenyl group,

A represents a straight chain or branched chain alkylene group having from 2 to 6 carbon atoms,

R represents a straight chain or branched chain alkyl group having from 1 to 6 carbon atoms, optionally mono-substituted by an alkoxy group having from 1 to 6 carbon atoms, and

R_1 represents an alkyl group having from 1 to 4 carbon atoms, or a stereoisomer or pharmaceutically acceptable acid addition salt of said ester.

18. A method of controlling hypertension in a mammal afflicted with hypertension which comprises administering to said mammal an effective amount for controlling hypertension of an ester of 1,4-dihydro-2,6-dimethyl-3-(alkoxycarbonyl or alkoxyalkoxycarbonyl)-4-(substituted phenyl)-pyridine-5-carboxylic acid, the ester having the general formula I



II

wherein

Ar represents a 3-nitrophenyl or 2,3-dichlorophenyl group,

A represents a straight chain or branched chain alkylene group having from 2 to 6 carbon atoms,

R represents a straight chain or branched chain alkyl group having from 1 to 6 carbon atoms, optionally mono-substituted by an alkoxy group having from 1 to 6 carbon atoms, and

R_1 represents an alkyl group having from 1 to 4 carbon atoms, or a stereoisomer or pharmaceutically acceptable acid addition salt of said ester.

4,634,713

ANTIHYPERTENSIVE 3-(UREIDOCYCLOHEXYLENEAMINO)PROPANE-1,2-DIOL DERIVATIVES

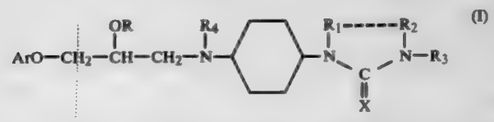
Lincoln H. Werner, Summit, N.J., and Neville Ford, University City, Mo., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 499,602, May 31, 1983, abandoned, which is a continuation-in-part of Ser. No. 383,049, May 28, 1982, abandoned. This application Aug. 19, 1985, Ser. No. 767,232

Int. Cl.⁴ A61K *31/415;* C07D *233/34*

U.S. Cl. 514—392 **20 Claims**

15. A method of treating glaucoma comprising the topical administration to a mammal in need thereof of an effective intraocular pressure-lowering amount ot a compound of the formula



(I)

wherein Ar represents phenyl or phenyl substituted by one to three members selected from lower alkyl, alkenyl, alkynyl, alkanoyl, mono- or di-alkylamino, alkanoylamino, alkylsulfonylamino, alkoxycarbonyl, alkylcarbamoyl, alkylsulfamoyl, alkoxy, alkylthio, alkylsulfonyl, alkenyloxy and alkynyloxy, hydroxy, cyano, halo, pyrrolyl, amino, 5 to 7-membered (alkylene, oxalkylene, thialkylene)imino, benzyloxy, phenyl, 5 to 7-membered cycloalkyl, carbamoyl, sulfamoyl, and from 3 to 7-membered cycloalkyl-, phenyl-, hydroxy-, lower alkoxy-, lower alkoxycarbonylamino-, lower alkylthio-, lower alkylsulfinyl-, lower alkylsulfonyl- and carbamoyl-substituted (lower alkyl and lower alkoxy); R represents hydrogen, lower alkanoyl, nicotinoyl, benzoyl, or benzoyl substituted by one to three of lower alkyl, lower alkoxy, halo or trifluoromethyl; R_1 and R_2 represent hydrogen or lower alkyl; or R_1 and R_2 combined represent unbranched or branched alkylene of 2 to 5 carbon atoms separating the two nitrogen atoms thereto attached by 2 to 4 carbon atoms; R_3 and R_4 represent hydrogen or lower alkyl; and X represents O or S; or a pharmaceutically acceptable salt thereof; in combination with one or more pharmaceutically acceptable carriers.

4,634,714

INHIBITION OF PROLACTIN RELEASE BY A BENZODIOXINYLIMIDAZOLINE DERIVATIVE

Eric L. Lien, Paoli, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Dec. 1, 1983, Ser. No. 557,084

Int. Cl.⁴ A61K *31/415*

U.S. Cl. 514—397 **2 Claims**

1. A method for lowering blood serum prolactin levels in warm-blooded animals which comprises administering, orally or parenterally, to a warm-blooded animal in need of a lowered serum prolactin level an amount of 2-(2,3-dihydro-1,4-benzodioxin-2-yl)-4,5-dihydro-1H-imidazole, or a pharmaceutically acceptable acid addition salt thereof, sufficient to lower said serum prolactin level.

4,634,715

AZA ANALOGS OF CARBOXYALKYL DIPEPTIDE DERIVATIVES AS ANTIHYPERTENSIVES

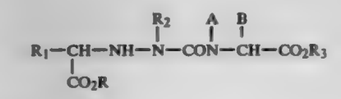
William J. Greenlee, Teaneck, and Eugene D. Thorsett, Fanwood, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 338,035, Jan. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 235,321, Feb. 17, 1981, abandoned. This application Jul. 27, 1983, Ser. No. 517,869

Int. Cl.⁴ A61K *31/40;* C07D *207/04*

U.S. Cl. 514—423 **16 Claims**

15. A method of treating hypertension which comprises administering to a patient in need of such treatment a pharmaceutically effective amount of a compound having the formula:



I

wherein:

R and R_3 are independently hydrogen, loweralkyl, loweralkenyl, loweralkynyl, aralkyl;

R_1 is aralkyl, and substituted aralkyl wherein the substituents are amino, halo, aminoloweralkyl, hydroxy, loweralkoxy, loweralkyl, loweralkenyl, and loweralkynyl; loweralkyl substituted by amino, acylamino, aryloxy, arylthio, and hydroxyl;

R_2 is hydrogen, loweralkyl, lowralkenyl, loweralkynyl, amino loweralkyl, amino loweralkenyl, aminoloweralkynyl, aralkyl;

A andB are joined together to form proline and, the pharmaceutically acceptable salts thereof wherein the aralkyl groups have from one to six carbon atoms in the alkyl portion thereof; aryl, is selected from the group consisting of phenyl, naphthyl or biphenyl; and acyl is a loweralknoyl or aroyl group.

4,634,716

SUBSTITUTED N-CARBOXYMETHYL-AMINOACYLAMINOALKANOIC ACIDS USEFUL AS ANTIHYPERTENSIVE AGENTS

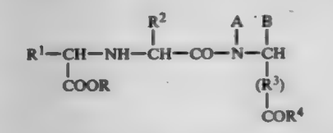
William H. Parsons, Rahway, and David Taub, Metuchen, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 430,916, Sep. 30, 1982, abandoned. This application May 16, 1983, Ser. No. 492,991

Int. Cl.⁴ C07D *207/09, 401/04, 401/12, 405/04, 417/12, 417/04, 409/12, 409/04;* A61K *31/44, 31/47, 31/425, 31/40*

U.S. Cl. 514—423 **7 Claims**

7. A method of treating hypertension comprising administering to a patient in need of such treatment an antihypertensively effective amount of a compound of the formula:



(I.)

wherein:

R is hydrogen; loweralkyl; aralkyl; aryl; or mono- or disubstituted aryl wherein the substituents are chloro;

R^1 is hydrogen; alkyl of from 1 to 12 carbon atoms which include branched, cyclic and unsaturated alkyl groups; substituted loweralkyl wherein the substituent can be halo, hydroxy, carboxy, carboxamido, loweralkylthio, loweralkoxy, loweralkoxycarbonyl, loweraralkoxycarbonyl, amino, loweralkylamino, lowerdialkylamino, loweralkanoylamino, aroylamino; substituted loweralkylamino wherein the substituent can be halo, hydroxy, alkoxy or

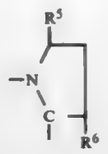
VOL 1074 ISS 1 JA 6 1987 UMI

cyano; arloweralkylamino; cyclic amino; oxo, thio or ureido; aryloxy; arylthio; aralkyloxy; aralkylthio; benzofused cycloalkyl or bicycloalkyl of from 8–12 carbon atoms; aryl or heteroaryl which may be mono-, di- or trisubstituted by loweralkyl, hydroxy, loweralkoxy, halo, amino, loweralkanoylamino, aroylamino, loweralkylthio or aminoloweralkyl; benzofused cycloalkyl or bicycloalkyl of from 8 to 12 carbon atoms; arloweralkyl; arloweralkenyl; heteroloweralkyl and heteroloweralkenyl in which the aryl or heteroaryl rings may be mono-, di- or tri-substituted by halo, loweralkyl, hydroxy, loweralkoxy, amino, loweralkylamino, diloweralkylamino, aminoloweralkyl, loweralkanoylamino, aroylamino, carboxy, haloloweralkyl, nitro, cyano or sulfonamido; aralkyl or heteroaralkyl which include branched loweralkyl groups; substituted aralkyl or substituted heteroaralkyl which include branched loweralkyl groups wherein the loweralkyl groups can be substituted by amino, loweralkanoylamino, aroylamino, or hydroxyl and the aryl and heteroaryl groups can be substituted by halo, dihalo, loweralkyl, hydroxy, loweralkoxy, aryloxy, aroyl, arylthio, amino, aminoloweralkyl, loweralkanoylamino, aroylamino, lowerdialkylamino, loweralkylamino, hydroxy, hydroxyloweralkyl, trihaloloweralkyl, nitro, cyano, or sulfonamido; any of the arloweralkyl or alkenyl and heteroloweralkyl or alkenyl groups described above in which the aryl or heteroaryl ring is partially or completely hydrogenated; substituted loweralkyl having the formula $R_A^1(CH_2)_n$—Q—$(CH_2)_m$ wherein n is 0–2, m is 1–3, R_A^1 is aryl or heteroaryl optionally substituted by amino, lowerdialkylamino, loweralkylamino, hydroxy, hydroxyloweralkyl, aminoloweralkyl, trihaloloweralkyl, cyano, nitro, sulfonamido, aroyl, loweralkyl, halo, dihalo, and loweralkoxy, and Q is O, S, SO, SO_2, N—R_B^1, CONR$_C^1$, NR$_C^1$CO, CH=CH wherein R_B^1 is hydrogen, loweralkyl, aryl, aralkyl, loweralkanoyl, or aroyl, and R_C^1 is hydrogen, or loweralkyl;

R^2 is hydrogen; loweralkyl; hydroxyloweralkyl; loweralkanoylamino; aminoloweralkyl; dimethylaminoloweralkyl; haloloweralkyl; guanidinoloweralkyl; mercaptoloweralkyl; loweralkylthioloweralkyl; aralkyl, heteroaralkyl, substituted aralkyl, or substituted heteroaralkyl, where the alkyl portion is loweralkyl and the substituents are halo, dihalo, loweralkyl, hydroxy, loweralkoxy, aryloxy, aroyl, arylthio, amino, aminoloweralkyl, loweralkanoylamino, aroylamino, lowerdialkylamino, loweralkylamino, hydroxyloweralkyl, trihaloloweralkyl, nitro, cyano, or sulfonamido; mercaptoloweralkyl; or loweralkylthioloweralkyl; in the group:



A and B are joined, together with the nitrogen and carbon atoms to which they are attached to form a pyrrole ring having the formula:



wherein R_5 is hydrogen, lower alkyl, aralkyl, or aryl; R_6 is hydrogen; loweralkyl; cycloalkyl; aryl; araikyl; heteroaryl; loweralkyloxy; loweralkylthio; aryloxy; arylthio; arloweralkyloxy; arloweralkylthio; hydroxy; loweralkanoyloxy; loweralkanoyl; halo; amino; loweralkylamino; arloweralkylamino; heteroloweralkylamino; acylamino in which the acyl group may be loweralkanoyl, aroyl, heteroaroyl or heteroloweralkanoyl; carbamoyl or N-substituted carbamoyloxy; including any of these groups containing an aromatic ring wherein said ring may be mono-, di- or trisubstituted by loweralkyl, loweralkoxy, loweralkylthio, halo, hydroxy, aryl, aryloxy, arylthio or aralkyl;

R^3 is



n is 1–3; and the R^a's and R^b's on each carbon are independently hydrogen; or loweralkyl; and

R^4 is hydroxy; loweralkoxy; aralkoxy; or aryloxy, or mono- or disubstituted aryloxy wherein the substituents are chloro; and

a pharmaceutically acceptable salt thereof wherein in said R–R^6 groups the aralkyl and heteroaralkyl substituents represent aryl or heteroaryl groups attached through a straight or branched chain hydrocarbon of from one to six carbon atoms selected from the group consisting of benzyl, phenethyl, 3,3-diphenylpropyl, 3-indolylmethyl; aryl represents phenyl, naphthyl, or biphenyl; and, heteroaryl represents any 5- or 6-membered aromatic ring containing from one to three nitrogen, oxygen and sulfur heteroatoms and is selected from the group consisting of pyridyl, thienyl, furyl, imidazolyl, and thiazolyl, as well as any bicyclic group in which any of the above heterocyclic rings is fused to another aromatic ring, and which is selected from the group consisting of indolyl, quinolinyl, isoquionolinyl, benzimidazolyl, benzothiazolyl, benzthienyl, and naphthyridyl.

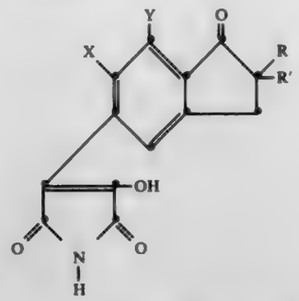
4,634,717

SUBSTITUTED-3-(2,3-DIHYDRO-1H-INDEN-5-YL)-4-HYDROXY-1H-PYRROLE-2,5-DIONES, USEFUL FOR TREATING PERSONS WITH GRAY MATTER EDEMA

Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 1, 1984, Ser. No. 605,738
Int. Cl.[4] A61K *31/40*; C07D *207/40*
U.S. Cl. 514—425 **1 Claim**

1. A method of treating persons with gray matter edema which comprises administering to such a person an effective amount of a compound of the formula:



in which R and R′ are different entities and wherein

R is C_3–C_6 cycloalkyl, C_4–C_7 cycloalkyl-lower alkyl, aryl selected from phenyl, halophenyl, methoxyphenyl, hydroxyphenyl, heterocyclic including thienyl, aralkyl selected from benzyl and phenethyl, C_1–C_4 lower alkyl, lower alkenyl or lower alkynyl;

R′ is C_1–C_4 lower alkyl, lower alkenyl or lower alkynyl;

X and Y are each selected from methyl and chloro.

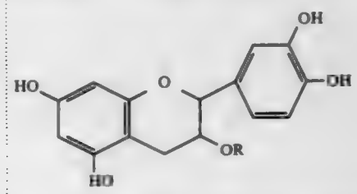
4,634,718

USE OF O-SUBSTITUTED DERIVATIVES OF (+)-CYANIDAN-3-OL AS COMPOUNDS HAVING IMMUNOMODULATING PROPERTIES

Pierre Courbat, Nyon; André Weith, Prangins, and Alban Albert, Avully, all of Switzerland, assignors to Zyma SA, Nyon, Switzerland

Continuation of Ser. No. 713,561, Mar. 18, 1985, abandoned, which is a continuation of Ser. No. 531,809, Aug. 25, 1983, abandoned, which is a continuation of Ser. No. 247,961, Mar. 26, 1981, abandoned. This application Feb. 28, 1986, Ser. No. 834,507
Claims priority, application Switzerland, Apr. 3, 1980, 2679/80
Int. Cl.[4] A61K *31/35*
U.S. Cl. 514—460 **2 Claims**

1. A method of stimulating the immune response of a mammal, in a mammal requiring such stimulation, comprising administering to said mammal by enteral or parenteral administration an immune response stimulating effective daily amount of a 3-O-substituted-(+)-cyanidan-3-ol of the formula



in which R is a radical of an alkanecarboxylic acid containing from 3 to 18 carbon atoms.

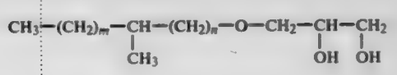
4,634,719

α-MONO (METHYL-BRANCHED ALKYL) GLYCERYL ETHER AND A SKIN CARE COSMETIC COMPOSITION CONTAINING THE SAME

Naotake Takaishi; Kouichi Urata, both of Ichikai; Yoshiaki Inamoto, Utsunomiya; Hisao Tsutsumi, Miyashiro, and Junichi Kawano, Sakura, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 181,659, Aug. 26, 1980, abandoned. This application May 12, 1982, Ser. No. 377,444
Claims priority, application Japan, Sep. 4, 1979, 54-113188
Int. Cl.[4] A61K *47/00*
U.S. Cl. 514—772 **2 Claims**

1. A skin care cosmetic composition selected from the group consisting of vanishing cream, cold cream, hand cream, cleansing cream, milky lotion and cosmetic lotion, comprising water, oil and as an emulsifier of oil and water about 0.1% by weight to about 30% by weight of a α-mono(methyl-branched alkyl)-glyceryl ether represented by the formula



(I)

where m is an integer of 2 to 14, n is an integer of 3 to 11, and the total of m+n is 11 to 17.

4,634,720

PROCESS FOR THE PREPARATION OF HARD TISSUE PROSTHETICS

Linneaus C. Dorman, Midland, Mich., and Paul A. Meyers, Dublin, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 19, 1985, Ser. No. 702,999
Int. Cl.[4] C08J *9/26, 9/28*
U.S. Cl. 521—63 **18 Claims**



1. A process for the preparation of a composite material containing from about 25 to about 75 percent by weight of a calcium phosphate biomaterial and about 75 to about 25 percent by weight of an α-amino acid polymer which comprises polymerizing in situ an N-carboxyanhydride of an α-amino acid in the presence of a powdered calcium phosphate biomaterial, said polymerization taking place in an inert organic solvent, said process including the additional step of adding a pore-forming agent to the composite material prepared by said in situ polymerization.

4,634,721

NITRO-UREA BASED BLOWING AGENTS

Byron A. Hunter, Alpine, Utah; Donald G. Rowland, and Warren J. Peascoe, both of Woodbridge, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Division of Ser. No. 764,267, Aug. 9, 1985, Pat. No. 4,585,802, which is a division of Ser. No. 678,311, Dec. 5, 1984, Pat. No. 4,554,294. This application Mar. 18, 1986, Ser. No. 841,067
Int. Cl.[4] C08J *9/10*
U.S. Cl. 521—92 **2 Claims**

1. A gas expandable composition comprising a gas expandable polymer and an effective amount of the blowing agent composition consisting of a mixture of azodicarbonamide, nitro-urea and zinc oxide.

4,634,722

COPOLYMERS AND HYDROGELS: PROCESS AND ARTICLES MADE THEREOF

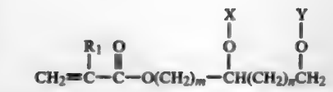
Paul M. Gallop, Chestnut Hill, Mass., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 265,304, May 20, 1981, Pat. No. 4,401,797. This application Aug. 29, 1983, Ser. No. 527,550
The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.
Int. Cl.[4] C08F *22/20*; G02B *1/04*
U.S. Cl. 523—106 **16 Claims**

1. A process for making a hydrogel contact lens, comprising the steps of:

(A) forming a button from a polymer material, said polymer material being a free radical bulk polymerization product of:

(a) a first monomer of the formula:



wherein:
R_1 is hydrogen or methyl;
m is an integer from 1 to 4;
n is an integer from 0 to 1; and
X and Y are protecting groups and are independently selected from the group consisting of:
(1) —C(O)OR$_2$
wherein R_2 is an alkyl group containing from 1 to 8 carbon atoms;
(2) hexahydropyranyl; and
(3) where X and Y together form one protecting group, selected from the group consisting of:



(i)

wherein R_3 is a lower alkyl group containing 1 to 6 carbon atoms, cycloalkyl group containing 3 to 6 carbon atoms; and aryl selected from the group consisting of phenyl, tolyl and naphthyl;



(ii)

wherein R_4 and R_5 are independently hydrogen and lower alkyl groups containing from 1 to 6 carbon atoms and together may form a cyclic ring containing from 2 to 6 carbon atoms;



(iii)



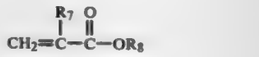
(iv)

wherein R_6 is a lower alkyl group containing from 1 to 6 carbon atoms; and



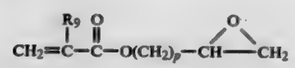
(v)

(b) a second, substantially water insoluble monomer of the formula:



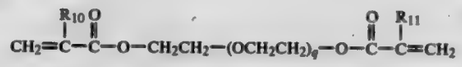
wherein:
R_7 is hydrogen or methyl; and
R_8 is lower alkyl having 1 to 6 carbon atoms or cycloalkyl having from 3 to 6 carbon atoms; the molar ratio of said first monomer to said second monomer being between about 1:30 and 20:1; and, optionally,

(c) a third, substantially water insoluble monomer of the formula:



(i)

wherein:
R_9 is hydrogen or methyl; and
p is an integer from 1 to 6; or of the formula:



(ii)

wherein:
R_{10} and R_{11} are independently hydrogen or methyl, and
q is an integer from 0 to 5; the concentration of said third monomer, when present, being between about 0 and 30 percent by weight of the first monomer;
(B) machining, shaping and polishing said button into the shape of a contact lens, using water compatible oils, abrasives and polishes; and
(C) removing said protecting group(s) from said polymer button, as formed into the shape of a contact lens, by chemical means and replacing said protecting group(s) with hydroxyl groups.

5. The process of claim 1 for making a hydrogel contact lens, comprising the additional step of:
(D) hydrating said polymer button, as formed into the shape of a contact lens, after said protecting group(s) have been removed.

10. A hydrated hydrogel contact lens made according to the process of claim 5.

4,634,723

FURFURYL ALCOHOL BINDERS, METHODS FOR THEIR PRODUCTION AND USE

Arno Gardziella, Witten; Alois Kwasniok, Iserlohn; Harald Heerdegen, Hagen, and Gerhard Janocha, Iserlohn, all of Fed. Rep. of Germany, assignors to Rütgerswerke Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 22, 1985, Ser. No. 714,746
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412104
Int. Cl.[4] B22C *1/16;* **C08J** *3/24;* **C08K** *5/15;* **C08L** *71/06*
U.S. Cl. 523—144 **2 Claims**

1. A binder material based on furfuryl alcohol for the preparation of formed bodies and molded bodies comprising the following composition in percent by weight based on the total composition:
40–60 weight percent furfuryl alcohol formaldehyde condensation product, wherein there are more than 4 furane nuclei rings per molecule
28–40 weight percent furfuryl alcohol formaldehyde condensation product, wherein there are from 2 to 4 furane nuclei rings per molecule
12–25 weight percent 2,5-bis-hydroxymethylfuran
0–8 weight percent furfuryl alcohol.

4,634,724

CRACK RESISTANT COATING FOR MASONRY STRUCTURES

John D. Harvey, Versailles, and André V. Gindre, Gif s/Yvette, both of France, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 645,989, Aug. 31, 1984, Pat. No. 4,562,109. This application Sep. 3, 1985, Ser. No. 771,746
Int. Cl.[4] C08K *3/40, 7/20, 7/28*
U.S. Cl. 523—219 **9 Claims**

1. A composition for application to masonry structures as a crack absorbing layer comprising a plurality of solid or cellular beads which are essentially spherical in structure and which have a diameter of from about 1 mm to about 6 mm, which are homogeneously mixed throughout a resin binder solution which is comprised of a resin binder and a suitable solvent wherein said resin binder solution has a viscosity of from about 0.5 to about 10 poise at 10,000 seconds^{-1} and a Brookfield viscosity of at least 600 poise at 10 rpm.

4,634,725

ROD-SHAPED POLYMER LATEX, ROD-SHAPED POLYMER FINE POWDER AND DISPERSION COMPRISING THE FINE POWDER DISPERSED IN NON-AQUEOUS MEDIUM

Kaoru Tsujii, and Akira Yoshimatsu, both of Utsunomiya, Japan, assignors to KAO Corporation, Tokyo, Japan

Filed Feb. 21, 1985, Ser. No. 703,667
Claims priority, application Japan, Feb. 28, 1984, 59-36380; Jun. 8, 1984, 59-117511
Int. Cl.[4] C08J *3/02*
U.S. Cl. 523—221 **9 Claims**

1. A rod-shaped polymer latex which comprises latex particles having a major axis of from 0.1 to 100 μm and a minor axis of less than ½ the major axis, an aqueous dispersion of the particles at a concentration of not larger than 15 wt % having a thixotropy index, $\eta 3/\eta 30$, of not less than 1.5 in which $\eta 3$ and $\eta 30$, respectively, represent viscosities when measured by means of the Brookfield viscometer at 3 and 30 r.p.m.

4,634,726

CUSHION STOCK FOR POWER TRANSMISSION BELTS

Billy P. Martin, Lincoln, Nebr., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 12, 1983, Ser. No. 560,777
Int. Cl.[4] C08J *5/15*
U.S. Cl. 524—34 **24 Claims**

1. A rubbery composition comprising an elastomer, a melamine and an organosilane.

4,634,727

EMULSION ADHESIVES

Takeshi Kamikaseda, Suita; Masahiro Furudate, Osaka, and Makoto Yamamoto, Shiga, all of Japan, assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Dec. 3, 1985, Ser. No. 804,212
Claims priority, application Japan, Dec. 10, 1984, 59-261577
Int. Cl.[4] C08K *5/52*
U.S. Cl. 524—145 **4 Claims**

1. An aqueous emulsion adhesive composition comprising a vinyl acetate homopolymer or copolymer emulsion containing 0.5 to 3.0 weight parts lecithin per 100 parts nonvolatile matter.

4,634,728

POLYOL CARBOXYALKYLTHIOALKANOAMIDOPHENOL COMPOUNDS AND ORGANIC MATERIAL STABILIZED THEREWITH

Neil Dunski; Ali A. Bazzi, both of Creve Coeur, and Henry J. Buehler, St. Louis, all of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

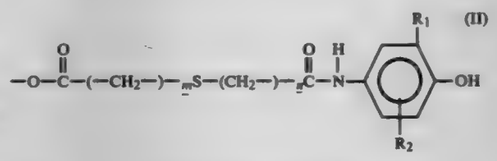
Continuation-in-part of Ser. No. 692,079, Jan. 17, 1985, abandoned. This application Aug. 20, 1985, Ser. No. 767,548
Int. Cl.[4] C08K *5/36;* **C07C** *149/41*
U.S. Cl. 524—219 **16 Claims**

1. A polyol carboxyalkylthioalkanoamidophenol compound having the following Formula I:



(I)

where Y is a monovalent group having the following Formula II:



(II)

where R_1 is an alkyl group containing from one to eight carbon atoms or a cycloalkyl group containing from five to 12 carbon atoms; R_2 is hydrogen, an alkyl group containing from one to eight carbon atoms or a cycloalkyl group containing from 5 to 12 carbon atoms; m is a selected integer from 1 to about 10, and n is a selected integer from 1 to about 14; and Z is —CH_2Y or an alkyl group containing from one to about 8 carbon atoms.

6. A composition of matter comprising an organic material normally subject to oxidative deterioration and a stabilizing amount of the compound of claim 1.

4,634,729

TERPENE-BASED ESTER TACKIFIERS

Mark S. Pavlin, Lawrenceville, and Richard L. Veazey, East Windsor Township, Mercer County, both of N.J., assignors to Union Camp Corporation, Wayne, N.J.

Filed Sep. 23, 1985, Ser. No. 778,676
Int. Cl.[4] C08K *5/10*
U.S. Cl. 524—285 **14 Claims**

3. In an adhesive formulation comprising a polymeric resin and a tackifying proportion of a tackifier compound, the improvement, which comprises; the presence of a terpene-based ester as a tackifier ingredient, said terpene-based ester being of the formula:

$(R')_nAP$

wherein R' is the residue of a conjugated triene terpene compound following Diels-Alder reaction with an acrylate-polyol ester; AP represents the reaction residue of the acrylate-polyol ester; and n is a whole number integer equal to the number of reacted acrylate groups in the acrylate-polyol ester.

4,634,730

CARPET TILES

John Bogdany, Fort Oglethorpe, Ga., assignor to GenCorp Inc., Akron, Ohio

Division of Ser. No. 615,860, May 31, 1984, Pat. No. 4,595,617. This application Dec. 2, 1985, Ser. No. 803,185
Int. Cl.[4] C08K *3/26*
U.S. Cl. 524—425 **6 Claims**

1. An aqueous composition comprising
a. a latex of a vinyl polymer selected from the group consisting of polyvinyl chloride, polyvinylidene chloride, copolymers of vinyl chloride and vinylidene chloride and copolymers of at least 50% by weight of at least one monomer selected from the group consisting of vinyl chloride and vinylidene chloride and the balance essentially at least one copolymerizable ethylenically unsaturated monomer, other than said vinyl chloride or vinylidene chloride, having from 2 to 14 carbon atoms and mixtures of said polymers,
b. an aqueous emulsified compatible plasticizer for said vinyl

polymer in an amount (dry) sufficient to plasticize said vinyl polymer to achieve flexibility on fusing,

c. from about 100 to 500 parts by weight of finely divided inorganic filler per 100 parts by weight (dry) of said vinyl polymer and

d. a frothing agent in an amount by weight (dry) sufficient to froth said composition.

4,634,731

FLAME-RETARDANT MOLDED COMPOSITION WHICH INCORPORATES A POLY(STYRENE-CO-MALEIC ANHYDRIDE-CO-DIBROMOSTYRENE) COPOLYMER

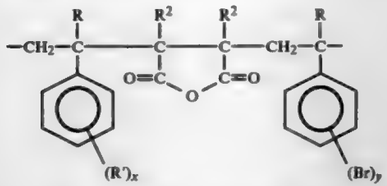
Usama E. Younes, Newtown Square, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 24, 1984, Ser. No. 685,366

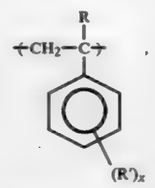
Int. Cl.⁴ C08F *214/16*; C08K *3/20*; C08L *25/00*

U.S. Cl. 524—502 **4 Claims**

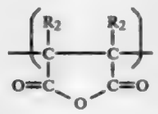
1. A moldable composition comprising a random copolymer comprised of the following recurring units:



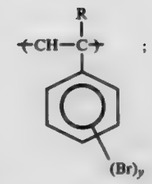
wherein each R separately represents —H, —CH_3, or —CH_2CH_3; R^1 represents —CH_3, —CH_2CH_3, —$CH(CH_3)_2$, —$C(CH_3)_3$, —OH, OCH_3, —CO_2H, —$CONH_2$, or —$CON(CH_3)_2$; each R^2 separately represents —H or —CH_3; x represents an integer of from 0 to 3 and, y represents an integer of from 1 to 3 and wherein said random copolymer contains in weight percent from about 5 to about 95 of the first depicted recurring unit



from about 1 to about 50 of the second depicted recurring unit



and from about 4 to about 94 of the third depicted recurring unit



a flame-retardant synergist; and, a thermoplastic resin, with the proviso that the random copolymer and the thermoplastic resin cannot be the same.

4,634,732

THERMOPLASTIC MOLDING COMPOSITIONS

Curtis M. Miller, Parkersburg; Charles L. Myers, Vienna, both of W. Va., and Charles F. Parsons, Little Hocking, Ohio, assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed Aug. 6, 1985, Ser. No. 762,889

Int. Cl.⁴ C08L *51/00, 69/00*

U.S. Cl. 524—504 **16 Claims**

1. A thermoplastic molding composition comprising a blend of an ABS copolymer and a copolymer of an unsaturated dicarboxylic acid anhydride, and a minor portion of an alkylene oxide block copolymer, wherein said alkylene oxide block copolymer consists essentially of polyoxyethylene and polyoxypropylene blocks.

4,634,733

METHOD OF PRODUCING A SILICONE WATER-BASED ELASTOMER

Therese M. Bauman, and Alan L. Freiberg, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 830,418, Feb. 18, 1986. This application May 28, 1986, Ser. No. 867,723

Int. Cl.⁴ C08J *9/30*

U.S. Cl. 524—859 **16 Claims**

1. A method of producing a silicone elastomer which is derived from ingredients comprising

(A) 100 parts by weight of an anionically stabilizer, hydroxyl endblocked polydiorganosiloxane having a weight average molecular weight of above 50,000, the organic radicals being monovalent hydrocarbon radicals containing less than seven carbon atoms per radical or 2-(perfluoroalkyl)ethyl radicals having less than seven carbon atoms per radical, present as an emulsion of dispersed particles in water, the emulsion having a pH of greater than 9,

(B) from 0.1 to 2.0 parts by weight of dialkyltindicarboxylate,

(C) from 1 to 10 parts by weight of alkylorthosilicate of the formula $Si(OR')_4$ where R' is a lower alkyl radical of from 1 to 4 carbon atoms inclusive,

(D) from 0 to 100 parts by weight of colloidal silica,

(E) optionally additional water, and

(F) optionally from 1 to 10 parts by weight of fibers having a diameter of from 1 to 10 micrometers and a length of from 30 micrometres to 10 millimeters with a length to diameter ratio of greater than 10 to 1, or from 0.2 to 1.5 parts by weight of lauryl alcohol, or mixtures thereof, consisting essentially of admixing the ingredients such that (A) and (B) are mixed only when (C) is present, the ingredients being stored before mixing as two parts, Part I and Part II, to produce an emulsion of the ingredients dispersed in water, which emulsion can be used immediately without a gestation period; and removing the water to produce the silicone elastomer.

4,634,734

THERMOPLASTIC MOLDING MATERIAL

Juergen Hambrecht, Heidelberg; Burghard Schmitt, Worms; Johann Swoboda; Georg Wassmuth, both of Ludwigshafen; Claus Bernhard, Eisenberg, and Rudolf Stephan, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 15, 1984, Ser. No. 580,220

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1981, 3149358

Int. Cl.⁴ C08L *33/08*

U.S. Cl. 525—85 **3 Claims**

1. A thermoplastic molding material consisting of

(A) 1 to 25 percent by weight based on the weight of A+B+C of at least one elastomeric polymer which has a glass temperature, Tg, of less than 0° C. and consists of:

(1) 50 to 99.9 percent by weight of at least one alkyl acrylate having 1 to 8 carbon atoms in the alkyl radical

(2) 0.1 to 5 percent by weight of a polyfunctional monomer having a cross-linking effect and

(B) 5 to 40 percent by weight based on the weight of A+B+C of a shell grafted to the elastomeric polymer A the graft polymer having an average particle size of 200 to 750 nm (d_{50} - value of the integral mass distribution) wherein the polymerization of the grafted shell consisting of (B) takes place in two stages with 30 to 70 percent by weight of a monomer (B1) selected from the group consisting of styrene, α-methylstyrene and para-methylstyrene in the first stage and 30 to 70 percent by weight of a mixture of the monomer (B1) and a monomer (B2) of acrylonitrile in a weight ratio of 90:10 to 60:40 in the second stage and

(C) 35 to 94 percent by weight based on the weight of A+B+C of a copolymer consisting of a styrene/acrylonitrile copolymer.

4,634,735

POLYPROPYLENE COMPOSITIONS WITH HIGH IMPACT STRENGTH

Jean P. Thiersault, Martigues, and Alain Senez, Callas-Cabriès, both of France, assignors to BP Chemicals Limited, London, England

Continuation of Ser. No. 319,146, Nov. 9, 1981, abandoned. This application Apr. 18, 1984, Ser. No. 601,124

Claims priority, application France, Nov. 13, 1980, 80 24095

Int. Cl.⁴ C08L *23/12, 23/16, 23/18, 53/00*

U.S. Cl. 525—88 **10 Claims**

1. Polypropylene compositions of high impact strength, in which the polymeric component consists essentially of:

(a) from 50 to 97% by weight of isotactic polypropylene

(b) from 2 to 49% by weight of elastomer which is a rubber of the EPM or EPDM type

(c) from 1 to 10% by weight of linear low density polyethylene formed by low pressure polymerisation in the gaseous phase in a fluidized bed and having a density of up to 0.928.

4,634,736

PROCESS FOR PRODUCING TERTIARY AMINO GROUP-CONTAINING VINYL POLYMERS AND CURABLE RESIN COMPOSITIONS BASED ON THESE POLYMERS

Masataka Ooka, 6-11-4, Tomigaoka, Nara-shi, Nara-ken; Shinichi Kuwamura, 4-17, Jyonan-cho, Izumi-ohtsu-shi, Osaka-fu, and Yoichi Murakami, 920-110, Ohkubo, Kumatori-cho, Sennan-gun, Osaka-fu, all of Japan

Division of Ser. No. 708,938, Mar. 6, 1985. This application Jan. 29, 1986, Ser. No. 823,794

Claims priority, application Japan, Mar. 8, 1984, 59-42827; Mar. 8, 1984, 59-42828

Int. Cl.⁴ C08F *8/32*

U.S. Cl. 525—117 **9 Claims**

1. A curable resin composition comprising as essential ingredients

(A) a vinyl polymer containing a tertiary amino group obtained by subjecting (a-1) a vinyl polymer containing a carboxylic anhydride group obtained by copolymerizing maleic anhydride, itaconic anhydride or mixtures thereof with at least one copolymerizable monomer and (a-2) a compound containing one primary amino group and one tertiary amino group for each molecule to a ring-opening reaction, and thereafter dehydrocyclizing the resulting adduct to form an imide ring containing polymer, and

(B) a polyepoxy compound.

4,634,737

COPOLYESTER-CARBONATE COMPOSITION

Ping Y. Liu, Naperville, Ill., and Edward L. Belfoure, New Harmony, Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Continuation-in-part of Ser. No. 683,661, Dec. 19, 1984, abandoned. This application Nov. 19, 1985, Ser. No. 799,475

Int. Cl.⁴ C08L *69/00*

U.S. Cl. 525—146 **30 Claims**

1. A glass free copolyester carbonate composition exhibiting improved resistance to mild organic solvents consisting essentially of, in admixture:

(i) at least one high molecular weight thermoplastic aromatic copolyester-carbonate resin containing from about 25 to about 90 mole percent ester bonds;

(ii) at least one polyester resin containing the reaction products of

(a) at least one polyol selected from 1,4-cyclohexanedimethanol or a mixture of 1,4-cyclohexanedimethanol and ethylene glycol, and

(b) at least one aromatic dicarboxylic acid or its ester forming reactive derivative selected from isophthalic acid, terephthalic acid, or mixtures thereof; and

(iii) at least one polymer selected from

(a) an olefin acrylate copolymer,

(b) a polyolefin, and

(c) an olefin diene terpolymer;

components (ii) and (iii) being present in amounts at least effective to impart to said composition a resistance to mild organic solvents greater than that possessed by said copolyester-carbonate resin.

4,634,738

HIGH SOLIDS CURABLE RESIN COATING COMPOSITION

J. Owen Santer, East Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 26, 1985, Ser. No. 705,590

Int. Cl.⁴ C08L *61/28*

U.S. Cl. 525—162 **10 Claims**

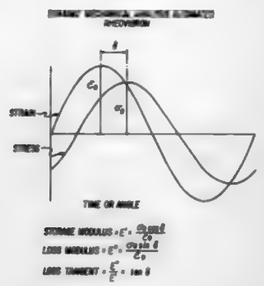
1. A curable polymer resin coating composition comprising

a. a hydroxy-containing resin selected from the group consisting of acrylic and polyester hydroxy-containing resins

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containing about 1.3 to 10 weight percent hydroxy and an acid number in the range of 2 to about 12 and

b. a mixed ether aminoplast of degree of polymerization in the range of about 1 to about 3, comprising nuclei selected from the group consisting of melamine, acetoguanamine, adipoguanamine and benzoguanamine and attached



thereto alkyloxymethyl groups in the range of about 2n-2 to about 2n per nucleus where n is the number of amino groups per nucleus, the alkoxymethyl groups being selected from C_8 to C_{12} alkyloxymethyl and methoxymethyl groups in the ratio within the range of about 0.2 to about 0.5 C_8 to C_{12} alkoxymethyl group per methoxymethyl group.

4,634,739

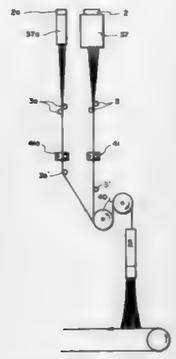
BLEND OF POLYETHYLENE AND POLYPROPYLENE

George Vassilatos, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 686,917, Dec. 27, 1984, abandoned. This application Oct. 22, 1985, Ser. No. 788,351

Int. Cl.⁴ C08L *23/06, 23/12*

U.S. Cl. 525—240 **4 Claims**



1. In a blend consisting essentially of low density polyethylene and crystalline polypropylene, the improvement wherein

the polyethylene amounts to 65 to 95% by weight of the blend and has a density in the range of 0.90 to 0.92 g/cm³, a melting temperature of less than 107° C. and a melt index of at least 25, and

the polypropylene amounts to 5 to 35% of weight of the blend and has a melt flow rate of at least 3, and a ratio of weight-to-number average molecular weight of at least 4.

4,634,740

POLYPROPYLENE COMPOSITION

Yuji Fujita; Tadao Ikeda, both of Saitama, and Tokuo Makishima, deceased, late of Saitama, all of Japan (by Nobuko Makishima, legal representative), assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1985, Ser. No. 720,823

Claims priority, application Japan, Apr. 9, 1984, 59-69241

Int. Cl.⁴ C08L *23/06, 23/16*

U.S. Cl. 525—240 **3 Claims**

1. A polypropylene composition which comprises 65 wt% to 95 wt% crystalline polypropylene and 5 wt% to 35 wt% of an ethylene-propylene random copolymer containing higher than 70 wt% to 85 wt% ethylene wherein said ethylene-propylene random copolymer is produced by copolymerizing ethylene with propylene in the presence of a polymerization catalyst comprising a titanium trichloride containing catalyst component, an organoaluminum cocatalyst and a Lewis base.

4,634,741

PROCESS FOR PREPARING IMPROVED HALOGENATED BUTYL RUBBERS

Irwin J. Gardner, Scotch Plains; James V. Fusco, Red Bank, both of N.J., and Francis P. Baldwin, Coupeville, Wash., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 597,188, Apr. 5, 1984. This application Dec. 9, 1985, Ser. No. 806,552

Int. Cl.⁴ C08F *8/20*

U.S. Cl. 525—355 **8 Claims**

1. A process for treating a brominated butyl rubber to isomerize the rubber thereby shifting a substantial fraction of the bromine from an initial secondary allylic configuration to a primary allylic configuration which comprises contacting a solution of the rubber with HBr at a temperature of less than 40° C. for a time sufficient to effect the isomerization, the molar ratio of HBr to brominated rubber being about 0.5/1 to about 50/1.

4,634,742

POLYARYLENE POLYETHERS WITH PENDANT VINYL GROUPS AND PROCESS FOR PREPARATION THEREOF

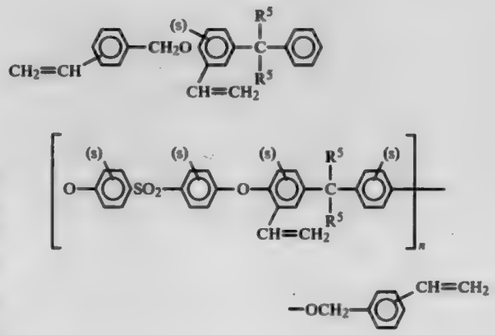
Virgil Percec, Pepper Pike, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 8, 1984, Ser. No. 669,641

Int. Cl.⁴ C08G *65/48;* **C08F** *283/00;* **C08L** *71/04*

U.S. Cl. 525—390 **2 Claims**

1. A polyfunctionalized substantially linear cross-linkable thermoplastic polyarylene polyether oligomer having at least two pendant vinyl groups, represented by the structural formula:



wherein, (s) on any substitutable ring carbon atom represents H or R^1, R^2, R^3 or R^4;

R^1, R^2, R^3 and R^4 are inert substituents, any of which, if present on any phenyl ring, may each be the same or different, and are selected from the group consisting of halogen, alkyl having from 1 to about 18 carbon atoms, and alkoxy having from 1 to about 18 carbon atoms, said alkyl and alkoxy being each chosen without regard for the spatial configuration of the carbon atoms;

R^5 represents hydrogen, lower alkyl having from 1 to about 5 carbon atoms, phenyl and the halogen substituents thereof, and R^5 may each be the same of different; and,

n represents an integer in the range from about 2 to about 10.

4,634,743

NOVEL POLYETHER POLYCARBONATE BLOCK COPOLYMERS AND POLYURETHANES PREPARED THEREFROM

Donald G. Prier, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 525,523, Aug. 22, 1983, abandoned. This application May 6, 1985, Ser. No. 731,176

Int. Cl.⁴ C08F *69/00*

U.S. Cl. 525—462 **33 Claims**

1. A polyether polycarbonate block copolymer comprising

(a) the residue of a hydrocarbon or a hydrocarbyloxy hydrocarbon compound containing 3 or more functional groups with active hydrogens;

(b) an alkylene polyether, polyamide, aromatic polycarbonate, polyester, aromatic polyether, polyimide, polysulfide, polysulfone or polysaccharide block wherein such a block is bonded to the residue of each active hydrogen-containing functional group; and

(c) polyether polycarbonate blocks which comprise ether and carbonate ether units arranged in random order, wherein the polyether polycarbonate blocks are bonded to the blocks defined in (b).

4,634,744

METHOD OF CATALYST DEACTIVATION

Yu-Tang Hwang; Lloyd Pebsworth, both of Clinton, Iowa; Robert A. Dombro, and Raymond E. Hoff, both of Palatine, Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Filed Jan. 9, 1985, Ser. No. 689,953

Int. Cl.⁴ C08F *2/38*

U.S. Cl. 526—84 **31 Claims**

1. In a method of continuously homopolymerizing ethylene or interpolymerizing ethylene with one or more 1-olefins or diolefins having at least three carbon atoms wherein said ethylene or said ethylene and said one or more 1-olefins or diolefins are polymerized under polymerizing conditions in a reactor in the presence of a catalyst which comprises a transition metal derivative, and wherein the polymer so formed is discharged from said reactor in a molten solution stream containing components of said catalyst, and constituents of said stream are removed therefrom by vaporization at a pressure which is reduced compared to that of said reactor, the improvement which comprises the step of terminating said polymerization reaction by injecting into said molten solution prior to discharge of the same from said reactor and vaporization of components therefrom a catalyst deactivator in an amount effective to terminate said reaction, said deactivator comprising one or more members of the group consisting of:

(a) natural hydrotalcite minerals and synthetic hydrotalcite-like materials selected from the group consisting of synthetic magnesium-aluminum-hydroxide-carbonate hydrates and synthetic magnesium-aluminum-hydroxide hydrates;

(b) Group IIIA metal salts of monocarboxylic acids;

(c) alkali metal and alkaline earth metal salts of alkarylsulfonic acids;

(d) alkali metal and alkaline earth metal salts of alkyl and alkaryl sulfuric acids;

(e) organophosphites of a formula selected from the group consisting of $(RO)_3P$ and $(RO)_2POH$ where R is a hydrocarbon group containing 1 to 22 carbon atoms, inclusive;

(f) ethoxylated hydrocarbylamines of the formula $R'_{3-n}N[(OCH_2CH_2)_mOH]_n$ where R' is hydrogen or a hydrocarbon group containing 1 to 22 carbon atoms, inclusive, and at least one R' is a hydrocarbon group, n is 1 or 2, and m is an integer between 1 and 22, inclusive;

(g) monocarboxylic acid esters of triethanolamine of the formula $(RCOOCH_2CH_2)_3N$ where R is a hydrocarbon group containing 1 to 22 carbon atoms, inclusive; and

(h) organotin salts of maleic acid of the formula $[—Sn(R-)_2OOCCH{=}CHCOO—]$ where R is a hydrocarbon group containing 1 to 22 carbon atoms, inclusive.

4,634,745

TERPOLYMER PRODUCTION

Raymond J. Ehrig, Pittsburgh, and John J. Godfrey, Murrysville, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 718,591, Apr. 1, 1985, abandoned. This application Mar. 14, 1986, Ser. No. 840,482

Int. Cl.⁴ C08F *10/08*

U.S. Cl. 526—87 **6 Claims**

1. Method of making a modified polypropylene in hexane slurry, said polypropylene having improved low-temperature thermal properties comprising (a) maintaining in a first stage under polymerizing conditions, including a pressure of about 140 psig to about 160 psig, a hexane-catalyst slurry in equilibrium with a gas phase composition comprising about 93.9% propylene, about 4.65% to about 5.15% 1-butene, and about 1.14% to about 1.26% ethylene, to form a dispersion in said slurry of terpolymer particles, and (b) then imposing on said slurry of terpolymer particles, under polymerizing conditions in a second stage, a concentration of ethylene in the gas phase increased to about 2% to about 4%, thereby forming a substrate terpolymer including about 3% to about 4% ethylene and about 3% to about 5.6% 1-butene, and recovering a polymer product having a melting point of about 130° C. to about 140° C.

4,634,746

POLYMERIZATION CATALYST, PRODUCTION AND USE (P-1010)

Bradley P. Etherton, Houston, and Malcolm J. Kaus, Humble, both of Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 637,641, Aug. 3, 1984, Pat. No. 4,565,797. This application Sep. 18, 1985, Ser. No. 777,393

Int. Cl.⁴ C08F *4/62, 4/64, 4/68, 4/70*

U.S. Cl. 526—124 **24 Claims**

1. A process for the polymerization of ethylene and alpha-olefins having from 1 to 20 carbon atoms or mixtures of ethylene, alpha-olefins and diolefins, which process comprises polymerizing in the presence of a catalyst system comprising (a) an organo aluminum compound of the formula $AlR''_nX''_{3-n}$ wherein R'' is hydrogen or a hydrocarbyl group having from 1 to 20 carbon atoms, X is halogen and n is a number from 1 to 3, and (b) a transition metal containing catalyst component comprising the solid reaction product obtained by treating an inert solid support material in an inert solvent sequentially with (A) an organometallic compound of a Group IIa, IIb or IIIa metal wherein all the metal valencies are satisfied with a hydrocarbon group, (B) an oxygen containing compound selected from ketones, aldehydes, alcohols, siloxanes or mixtures thereof, (C) optionally one or more halogen containing compounds selected from chlorosilanes and/or Cl_2, Br_2 or interhalogens, (D) at least one transition metal compound of a Group IVb, Vb, VIb or VIII metal, (E) optionally Cl_2, Br_2 or an interhalogen, and (F) treating the transition metal contain-

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ing component with an organometallic compound of a Group IIa, IIb or IIIa metal, with the proviso that if a chlorosilane is not employed in step (C), then Cl_2, Br_2 or an interhalogen is employed in at least one of steps (C) or (E), if a chlorosilane is employed in step (C), then Cl_2, Br_2 or an interhalogen is additionally employed in step (C) and/or step (E), and with the further proviso that the inert solid support material can also be treated with (i) the (A) organometallic compound and the (B) oxygen containing compound simultaneously, (ii) the reaction product of the (A) organometallic compound and (B) oxygen containing compound or (iii) the (B) oxygen containing compound followed by treating with the (A) organometallic compound.

4,634,747

POLYMERIZATION CATALYST, PRODUCTION AND USE

Steven A. Best, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 638,167, Aug. 6, 1984, Pat. No. 4,564,606.
This application Sep. 18, 1985, Ser. No. 777,395
Int. Cl.[4] C08F *4/62, 4/64, 4/68, 4/70*
U.S. Cl. 526—124 **21 Claims**

1. A process for the polymerization of ethylene and alpha-olefins having from 1 to 20 carbon atoms or mixtures of ethylene, alpha-olefins and diolefins which process comprises polymerizing in the presence of a catalyst system comprising (a) an organo aluminum compound of the formula $AlR''_nX''_{3-n}$ wherein R'' is hydrogen or a hydrocarbyl group having from 1 to 20 carbon atoms, X is halogen and n is a number from 1 to 3, and (b) a transition metal containing catalyst component comprising the solid reaction product obtained by treating an inert solid support material in an inert solvent sequentially with, optionally (A) Cl_2, Br_2, an interhalogen or mixtures thereof, (B) an organometallic compound of a Group IIa, IIb or IIIa metal wherein all the metal valencies are satisfied with a hydrocarbon group, (C) an oxygen containing compound selected from ketones, aldehydes, alcohols or mixtures thereof, (D) an acyl halide, (E) at least one transition metal compound of a Group IVb, Vb, VIb or VIII metal, and (F) Cl_2, Br_2, an interhalogen or mixtures thereof, with the proviso that the inert solid support material can alternatively be treated with (i) the (B) organometallic compound and the (C) oxygen containing compound simultaneously, (ii) the reaction product of the (B) organometallic compound and (C) oxygen containing compound or (iii) the (B) organometallic compound and at least one of (A) and (F) treatment is performed.

4,634,748

POLYMERIZATION CATALYST, PRODUCTION AND USE

Steven A. Best, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 638,165, Aug. 6, 1984, Pat. No. 4,558,024.
This application Sep. 18, 1985, Ser. No. 777,394
Int. Cl.[4] C08F *4/62, 4/64, 4/68, 4/70*
U.S. Cl. 526—124 **18 Claims**

1. A process for the polymerization of ethylene and alpha-olefins having from 1 to 20 carbon atoms or mixtures of ethylene, alpha-olefins and diolefins which process comprises polymerizing in the presence of a catalyst system comprising (a) an organo aluminum compound of the formula $AlR''_nX''_{3-n}$ wherein R'' is hydrogen or a hydrocarbyl group having from 1 to 20 carbon atoms, X is halogen and n is a number from 1 to 3, and (b) a transition metal containing catalyst component comprising the solid reaction product obtained by treating an inert solid support material in an inert solvent sequentially with (A) an organometallic compound of a Group IIa, IIb, or IIIa metal wherein all the metal valencies are satisfied with a hydrocarbon group, optionally (B) an oxygen containing compound selected from ketones, aldehydes, alcohols, siloxanes or mixtures thereof, (C) at least one transition metal compound of a Group IVb, Vb, VIb or VIII metal, and (D) a Group IIIa metal hydrocarbyl dihalide with the proviso that if the oxygen containing alcohol, aldehyde, ketone or siloxane is employed, the inert solid support material can be treated with (i) the (A) organometallic compound and the (B) oxygen containing compound simultaneously, (ii) the reaction product of the (A) organometallic compound and (B) oxygen containing compound or (iii) the (B) oxygen containing compound followed by treating with the (A) organometallic compound.

4,634,749

POLYMERIZATION CATALYST, PRODUCTION AND USE

Steven A. Best, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 638,168, Aug. 6, 1984, Pat. No. 4,558,025.
This application Sep. 18, 1985, Ser. No. 777,396
Int. Cl.[4] C08F *4/62, 4/64, 4/68, 4/70*
U.S. Cl. 526—124 **19 Claims**

1. A process for the polymerization of ethylene and alpha-olefins having from 1 to 20 carbon atoms or mixtures of ethylene, alpha-olefins and diolefins which process comprises polymerizing in the presence of a catalyst system comprising (a) an organo aluminum compound of the formula $ALR''_nX''_{3-n}$ wherein R'' is hydrogen or a hydrocarbyl group having from 1 to 20 carbon atoms, X is halogen and n is a number from 1 to 3, and (b) a transition metal containing catalyst component comprising the solid reaction product obtained by treating an inert solid support material in an inert solvent sequentially with (A) an organometallic compound of a Group IIa, IIb or IIIa metal wherein all the metal valencies are satisfied with a hydrocarbon group, (B) an oxygen containing compound selected from ketones, aldehydes, alcohols or mixtures thereof, (C) an acyl halide, (D) at least one transition metal compound of a Group IVb, Vb, VIb or VIII metal, (E) a Group IIIa metal hydrocarbyl dihalide with the proviso that the inert solid support material can alternatively be treated with (i) the (A) organometallic compound and the (B) oxygen containing compound simultaneously, (ii) the reaction product of the (A) organometallic compound and (B) oxygen containing compound or (iii) the (B) oxygen containing compound followed by treating with the (A) organometallic compound.

4,634,750

POLYMERIZATION CATALYST, PRODUCTION AND USE

Steven A. Best, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 680,880, Dec. 12, 1984, Pat. No. 4,578,374.
This application Dec. 9, 1985, Ser. No. 806,589
Int. Cl.[4] C08F *4/68*
U.S. Cl. 526—129 **12 Claims**

1. A process for the polymerization of ethylene and alpha-olefins having from 1 to 20 carbon atoms of mixtures of ethylene, alpha-olefins or diolefins which process comprise polymerizing one or more olefins in the presence of the catalyst system comprising (A) an organo aluminum cocatalyst, and (B) a vanadium-containing catalyst component obtained by sequentially treating an inert solid support material in an inert solvent with (i) a dihydrocarbyl magnesium compound, (ii) optionally an oxygen-containing compound which is an alcohol, ketone or aldehyde, (iii) a vanadium compound, and (iv) a Group IIIa metal halide.

4. The process as in claim 1 wherein the inert solid support material is an inorganic oxide or mixtures of inorganic oxides.

5. The process as in claim 4 wherein the inorganic oxide is silica.

4,634,751

POLYMERIZATION CATALYST, PRODUCTION AND USE

Steven A. Best, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 680,871, Dec. 12, 1984, Pat. No. 4,579,835.
This application Dec. 9, 1985, Ser. No. 806,730
Int. Cl.[4] C08F *4/68*
U.S. Cl. 526—129 **9 Claims**

1. A process for polymerization of ethylene and alpha-olefins having from 1 to 20 carbon atoms or mixtures of ethylene, alpha-olefins and diolefins which process comprises polymerizing one or more olefins in the presence of the catalyst system comprising (a) an organoaluminum cocatalyst, and (b) a vanadium containing catalyst component obtained by treating an inert solid support material in an inert solvent with

(i) an organoaluminum compound represented by the formula R_mAlX_{3-m}, wherein R represents an alkyl group, cycloalkyl group or aryl group having from 1 to 18 carbon atoms, X represents halogen atoms, and $1 \leqq m \leqq 3$,

(ii) an acyl halide, and

(iii) a vanadium compound.

4. A process as in claim 1 wherein the inert solid support material is an inorganic oxide or mixtures of inorganic oxides.

5. A process as in claim 4 wherein the inorganic oxide is silica.

4,634,752

PROCESS FOR PREPARING ALPHA-OLEFIN POLYMERS

Robert O. Hagerty, Edison; Irena B. Petsche, Cranbury, and Kenneth G. Schurzky, Bridgewater, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 657,642, Oct. 4, 1984, Pat. No. 4,562,169.
This application Sep. 3, 1985, Ser. No. 771,740
Int. Cl.[4] C08F *4/02, 4/64*
U.S. Cl. 526—129 **28 Claims**

1. In a process for preparing a polymer of at least one C_2–C_{10} alpha-olefin, the polymer containing at least about 80 percent by weight of ethylene units, the process comprising conducting the polymerization in the presence of a catalyst prepared by combining a catalyst precursor with at least one catalyst promoter, the catalyst precursor being prepared by a process comprising the steps of:

(i) heating a solid, porous carrier having reactive OH groups;

(ii) contacting the solid, porous carrier with a first liquid, said first liquid containing at least one organomagnesium composition having the empirical formula

$$R_nMgR'_{(2-n)} \quad (I)$$

where R and R' are the same or different and they are C_1–C_{12} hydrocarbyl groups, provided that R' may also be a halogen, and n is 0, 1 or 2, the number of moles of said organomagnesium composition being in excess of the number of moles of said OH groups on said carrier;

(iii) removing said first liquid from step (i) to obtain a magnesium-containing carrier in the form of a dry, free-flowing powder; and

(iv) contacting said powder of step (iii) with a solution comprising a second liquid and at least one transition metal compound, said transition metal compound being soluble in said second liquid, and said magnesium of said carrier being substantially insoluble in said second liquid, whereby a compound of transition metal, which is insoluble in said second liquid becomes incorporated onto said carrier;

an improvement comprising heating the solid, porous carrier in step (i) in the atmosphere of an oxygen-containing gas.

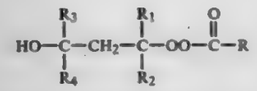
4,634,753

HYDROXY-T-ALKYL PEROXYESTER

Jose Sanchez, Grand Island, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 496,357, May 20, 1983, Pat. No. 4,525,308.
This application Mar. 29, 1985, Ser. No. 717,756
Int. Cl.[4] C08F *2/00, 4/32, 4/38*
U.S. Cl. 526—216 **5 Claims**

1. A process of polymerizing ethylenically unsaturated monomers comprising adding to the reaction mass of said monomers an initiating amount of a hydroxy-t-alkyl peroxyester of the structure

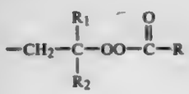


having a ten-hour half-life temperature below about 75° C., where

R_1 and R_2 are selected from alkyl of 1 to 4 carbons,

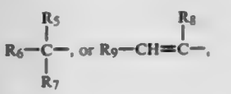
R_3 and R_4 selected from hydrogen or alkyl of 1 to 4 carbons,

R_1 and R_3 can be connected together to form a lower alkyl substituted 3 carbon atom alkylene bridge and R_3 can additionally be



and

R is selected from



where

R_5 is selected from hydrogen or alkyl of 1 to 8 carbons,

R_6 is selected from alkyl of 1 to 8 carbons,

R_7 is selected from the group consisting of alkyl of 1 to 8 carbons, alkenyl of 1 to 8 carbons, alkoxy of 1 to 6 carbons, and aryloxy of 6 to 10 carbons, and

R_8 and R_9 are selected from alkyl of 1 to 4 carbons, and polymerizing said reaction mass until completion.

4,634,754

FLUORINE-CONTAINING COPOLYMER AND COMPOSITION CONTAINING THE SAME FOR CURING

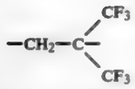
Akira Ohmori, Ibaraki; Nobuyuki Tomihashi, Takatsuki, and Yoshiki Shimizu, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 690,021, Jan. 9, 1985, abandoned. This application Jul. 17, 1985, Ser. No. 755,765
Claims priority, application Japan, Jan. 10, 1984, 59-2370
Int. Cl.[4] C08F *14/18*
U.S. Cl. 526—242 **3 Claims**

1. A fluorine-containing copolymer comprising 20 to 70% by mole of structural units of the formula (a):

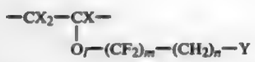
$$—CH_2—CHF— \quad (a)$$

20 to 70% by mole of structural units of the formula (b):



(b)

and 0.5 to 30% by mole of structural units of the formula (c):



(c)

wherein X is —H or —F, Y is —OH, —COOH or



l is 0 or 1, m is 0 or an integer of 1 to 6 and n is 0 or an integer of 1 to 4, provided that Y is —COOH when n is 0 and provided that m and n are not both zero when l is 1.

4,634,755

METHOD FOR MAKING NORBORNANE ANHYDRIDE SUBSTITUTED POLYORGANOSILOXANE

John E. Hallgren, Scotia, and Diane V. Brezniak, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 3, 1986, Ser. No. 835,491
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—23 **6 Claims**

1. A method which comprises,

(1) equilibrating under neat conditions a mixture comprising a norbornane anhydride organosiloxane and cyclopolydiorganosiloxane in the presence of an acidic equilibration catalyst,

(2) quenching the resulting mixture of (1) with an organosilazane, utilizing at least two moles of organosilazane, per mole of acidic equilibration catalyst and

(3) heating the resulting mixture of (2) under reduced pressure to effect the removal of volatiles.

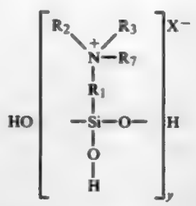
4,634,756

ELECTRICAL RESISTOR

Satchidanand Mishra, and Leon A. Teuscher, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1985, Ser. No. 801,451
Int. Cl.[4] C08G *77/26*
U.S. Cl. 528—38 **11 Claims**

1. An electrical resistor comprising an insulating substrate, a thin continuous siloxane film of a reaction product of a hydrolyzed silane coated on said insulating substrate, said hydrolyzed silane having the general formula:



wherein R_1 is an alkylidene group containing 1 to 20 carbon atoms, R_2, R_3 and R_7 are independently selected from the group consisting of H, a lower alkyl group containing 1 to 3 carbon atoms and a phenyl group, X is an anion of an acid or acidic salt, and y is 1, 2, 3 or 4, and at least two spaced apart electrodes in electrical contact with said thin continuous siloxane film on said insulating substrate.

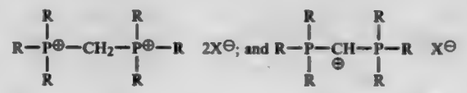
4,634,757

FUSION PRODUCT

Clifford D. Marshall, Spring, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 15, 1985, Ser. No. 755,025
Int. Cl.[4] C08G *59/02, 59/68*
U.S. Cl. 528—89 **15 Claims**

1. A process for preparing an advanced epoxy resin, the process comprising reacting a polyepoxide containing at least one vic-epoxy group with a compound selected from the group consisting of phenols, carboxylic acids and carboxylic acid anhydrides in the presence of a catalyst selected from the group consisting of



where R is a hydrocarbyl or inertly substituted hydrocarbyl group and X is a compatible anion, in a reaction mixture of polyepoxide, compound and catalyst having a water content greater than about 0.01 percent by weight of the weight of said reaction mixture.

4,634,758

PROCESS FOR PREPARING ALKOXY-MODIFIED PHENOLIC RESOLE RESINS

Robert A. Laitar, Woodridge, and Eduardo Gomez, Chicago, both of Ill., assignors to Acme Resin Corporation, Westchester, Ill.

Continuation-in-part of Ser. No. 660,170, Oct. 12, 1984, Pat. No. 4,546,124. This application Sep. 30, 1985, Ser. No. 781,568
Int. Cl.[4] C08G *8/36*
U.S. Cl. 528—129 **12 Claims**

1. A process for preparing an alkoxy-modified phenolic resole resin useful as the polyhydroxy component of a urethane binder composition comprising the steps of (a) reacting a phenol with a molar excess of an aldehyde in the presence of an alkaline catalyst, selected from the group alkali and alkaline earth metal hydroxides, and then (b) reacting the product of Step (a) with sufficient monohydric alcohol to ensure that the alkoxy-modified phenolic resole resin will have at least one alkoxymethylene group for every ten phenolic nuclei present in the resin, Step (b) being carried out at a pH between about 4.0 and 6.5.

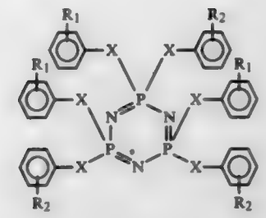
4,634,759

FIRE AND HEAT RESISTANT LAMINATING RESINS BASED ON MALEIMIDO SUBSTITUTED AROMATIC CYCLOTRIPHOSPHAZENE POLYMER

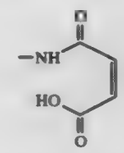
Devendra Kumar, Shakarpur Extension, India; George M. Fohlen, Millbrae, and John A. Parker, Los Altos, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 599,126, Apr. 11, 1984, Pat. No. 4,550,177. This application Jul. 30, 1985, Ser. No. 760,374
Int. Cl.[4] C08G *73/10, 79/02*
U.S. Cl. 528—321 **17 Claims**

1. A polymer produced by thermally polymerizing a cyclotriphosphazene derivative having the structure:

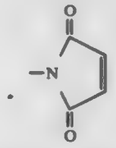


wherein R_1 is a maleamic acid group of the formula (a);



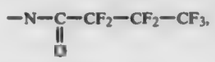
(a)

or a maleimido group of the formula (b);



(b)

X is O or NH and R_2 is selected from the class of hydrogen, primary amino, the maleamic acid group of formula (a), a perfluoroamic acid group of the formula



the maleimido group of formula (b) or a 2,2,3,3-tetrafluorosuccinylimido group.

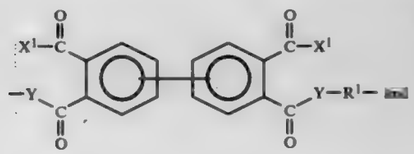
4,634,760

NOVEL COPOLYIMIDES AND POLYAMIC ACID PRECURSORS THEREFOR

Tohru Takekoshi, Scotia; Donald C. Clagett, Rensselaer, both of N.Y., and Stephen M. Cooper, Evansville, Ind., assignors to General Electric Company, Schenectady, N.Y.

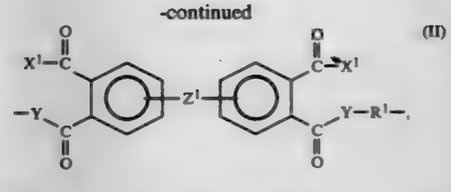
Filed Nov. 14, 1985, Ser. No. 798,090
Int. Cl.[4] C08G *69/26*
U.S. Cl. 528—353 **13 Claims**

1. A polymer comprising structural units having the formulas



(I)

-continued



(II)

wherein:

X^1 is OH and Y is NH, or X^1 and Y taken together are N;

R^1 is an aromatic hydrocarbon radical containing about 6–20 carbon atoms, or a halogenated derivative thereof, an alkylene or cycloalkylene radical containing about 2–20 carbon atoms, or a bis-alkylene poly(dialkylsiloxane) radical;

Z^1 is $—R^2—$, —O—, —CO—, $—S_x—$, $—SO_2—$, —O—Q—O—, —S—Q—S— or $—SO_2—Q—SO_2—$;

R^2 is a divalent aliphatic or alicyclic radical containing about 1–12 carbon atoms;

Q is a divalent aliphatic or aromatic radical; and

x is 1 or 2;

said polymer containing about 2–50 mole percent of structural units having formula I.

4,634,761

CONTINUOUS METHOD FOR ISOLATING POLYMER RESIN FROM SOLUTION WHEREIN ORGANIC SOLVENT RESIN SOLUTION IS FED INTO AQUEOUS FEED

Ashok K. Mendiratta, Schenectady, and Wayne F. Morgan, Mechanicville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 681,457, Dec. 14, 1984, abandoned. This application Aug. 16, 1985, Ser. No. 766,225
Int. Cl.[4] C08J *3/10*
U.S. Cl. 528—500 **22 Claims**

1. A process for isolating polymer resin from an organic solvent solution, said process comprising

(a) feeding, with agitation, an organic solvent solution of about 1 to 50% by weight polymer resin into an aqueous solution feed to provide an admixture;

(b) matching the feed rates for said aqueous solution and said organic solution to provide a weight ratio of water to polymer within the admixture having a value of from about 2–50;

(c) volatilizing the organic solvents within the admixture at a rate sufficiently low to permit solidification of said polymer resin followed by agglomeration of said polymer resin to form polymer granules;

(d) recovering solid polymer granules and said aqueous solution from said admixture;

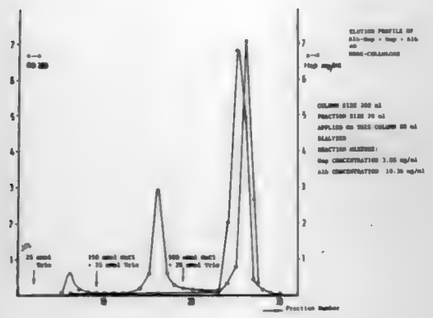
(e) interrupting the feed of said organic solvent solution of polymer resin upon formation of polymer granules within said admixture of a desired average size to dry the polymer granules; and

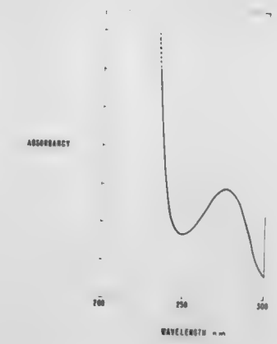
(f) resuming the feed of said organic solvent solution of polymer resin upon drying substantially all of the polymer granules within said admixture.

4,634,762
CONJUGATES OF ANTICOAGULANT AND PROTEIN

Jan Feijen, Hengelo, and Wilhelmus E. Hennink, Enschede, both of Netherlands, assignors to Sentron v.o.f., Roden, Netherlands

Division of Ser. No. 449,248, Dec. 13, 1982, Pat. No. 4,526,714. This application Mar. 26, 1985, Ser. No. 716,197
Claims priority, application Netherlands, Dec. 15, 1981, 8105636
Int. Cl.[4] C08B *37/10*
U.S. Cl. 530—350 24 Claims





Tyr	17	Ser	12
Leu	8	Thr	6
Ile	4	Asp	17
Met	10	Arg	9
Val	24	His	2
Ala	24	Lys	9
Gly	22	Phe	5
Pro	11	½ Cys	14
Glu	22.		

1. A process for the preparation of a conjugate for coating the surface of a medical device to enhance the blood compatibility of the surface, the conjugate being of an anticoagulant and a protein, wherein the process includes coupling said anticoagulant to said protein in the presence of a coupling agent and wherein the improvement comprises providing an anticoagulant-protein conjugate that is covalently bonded by using a coupling agent that is an amide bond forming agent to form an amide linkage between said anticoagulant and said protein, said providing step includes selecting a heparinous material as the anticoagulant and selecting the protein of the protein-anticoagulant conjugate to be a water soluble protein that is non-crosslinked when coated onto the surface of the medical device in order to provide a non-crosslinked protein moiety biocompatible surface spacer between said anticoagulant and the surface of the medical device.

4,634,763
AMYLASE INHIBITOR AND PREPARATION AND USE THEREOF

Masami Sugiyama, and Yasushi Kasahara, both of Tokyo, Japan, assignors to Fujizoki Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 428,918
Claims priority, application Japan, Nov. 16, 1981, 56-182316
Int. Cl.[4] C07K *15/10, 3/20*
U.S. Cl. 530—375 2 Claims

1. An amylase inhibitor having inhibitory activity on human salivary amylase and which exhibits a ratio of the inhibition rate against pancreatic amylase to the inhibition rate against salivary amylase of less than 0.1, said inhibitor having the following characteristics:

(a) a molecular weight of between about 23,000 and 24,000 as determined by gel filtration using Sephadex G-100;

(b) an ultraviolet absorption spectrum of a 0.22 percent aqueous solution of said inhibitor substantially as shown in FIG. 1;

(c) an infrared absorption spectrum of said inhibitor substantially as shown in FIG. 2;

(d) an isoelectric point of said inhibitor of 5.0; and

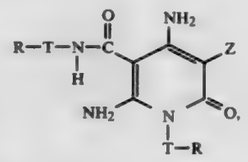
(e) an amino acid composition substantially as follows:

4,634,764
NON-AZO AND AZO COMPOUNDS CONTAINING AT LEAST ONE 4,6-DIAMINO-1-SUBSTITUTED-5-SUBSTITUTED CARBAMOYLPYRID-2-ONE GROUP

Manfred Greve, Dornach, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Nov. 10, 1983, Ser. No. 550,954
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1982, 3243092
Int. Cl.[4] C09B *29/42, 31/153, 31/28, 44/08*
U.S. Cl. 534—759 12 Claims

1. A compound of the formula



wherein
each R is independently $-N(R_1)_2$, $-N^{\oplus}(R_1)_3A^{\ominus}$ or hydroxy, wherein
each R_1 is independently hydrogen; C_{1-12}alkyl; C_{1-12}alkyl substituted by halo, cyano, hydroxy, phenyl or carbamoyl; cyclohexyl; cyclohexyl substituted by 1 to 3 C_{1-4}alkyl groups; phenyl or phenyl substituted by 1 to 3 C_{1-4}alkyl groups or
$-N(R_1)_2$ is piperidino, morpholino, piperazino, N'-C_{1-4}alkylpiperazino or pyrrolidino,
each R_2 is independently C_{1-12}alkyl; C_{1-12}alkyl substituted by halo, cyano, hydroxy, phenyl or carbamoyl; cyclohexyl; cyclohexyl substituted by 1 to 3 C_{1-4}alkyl groups; phenyl or phenyl substituted by 1 to 3 C_{1-4}alkyl groups or
$-N^{\oplus}(R_2)_3$ is N-R_2-piperidinium, N-R_2-morpholinium, N-R_2-piperazinium, N-R_2-N'-C_{1-4}alkylpiperazinium, N-R_2-pyrrolidinium, pyridinium or pyridinium substituted by 1 to 3 C_{1-4}alkyl groups, wherein R_2 is as defined above, and
$A^{\ominus}$ is a non-chromophoric anion,

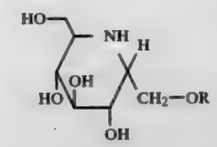
each T is independently C_{1-12}alkylene or C_{3-12}alkenylene, and Z is hydrogen or $-N{=}N-D$, wherein D is a diazo component radical.

4,634,765
HOMODISACCHARIDE HYPOGLYCEMIC AGENTS

Paul S. Liu, Indianapolis, Ind., assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Dec. 18, 1984, Ser. No. 683,127
Int. Cl.[4] C07H *17/02*
U.S. Cl. 536—17.4 7 Claims

1. A compound of the formula:



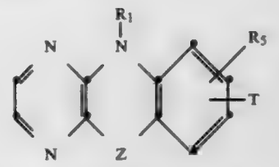
wherein R is a glycosyl or acylated glycosyl radical containing from 1 to 3 hexose or pentose units and attachment is at the 1-position of the glycosyl radical; and the pharmaceutically acceptable acid addition salts thereof.

4,634,766
1,4-DIAZA-PHENOTHIAZINES

Joseph G. Atkinson, Montreal; Yvan Guindon, Closse Ile Bizard; Patrice C. Bélanger, Dollard des Ormeaux, and Joshua Rokach, Laval, all of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Continuation-in-part of Ser. No. 547,161, Oct. 31, 1983, abandoned. This application Oct. 15, 1984, Ser. No. 660,595
Int. Cl.[4] C07D *498/04, 513/04*
U.S. Cl. 544—34 8 Claims

1. A compound of Formula I:



I

wherein the substituents are selected from:

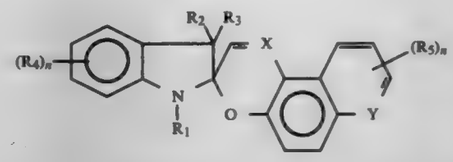
Z	R_1	R_5	T
S	H	H	7-OCH_3
S	H	8-Cl	7-OCH_3
S	CH_3	8-Cl	7-OCH_3
S	CH_3	8-Cl	7-OH
S	CH_3	H	7-OCH_3
S	H	H	7-OH
S	CH_3	H	7-OH
SO	H	H	7-OCH_3
SO	CH_3	H	7-OCH_3
S	SO_2Ph—p-Me	H	7-OCH_3
SO_2	H	H	7-OCH_3
S	$COCH_3$	H	7-OCH_3
S	$COCH_3$	H	H
S	$CH_2CO_2C_2H_5$	H	H
S	CH_2CO_2H	H	H
S	CO_2CH_3	H	H
S	$CH{=}CHCO_2CH_3$	H	H

4,634,767
METHOD FOR PREPARING SPIRO(INDOLINE)-TYPE PHOTOCHROMIC COMPOUNDS

Charles H. Hoelscher, Doylestown, and Douglas S. McBain, Norton, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

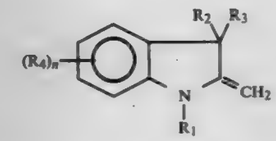
Filed Sep. 3, 1985, Ser. No. 771,920
Int. Cl.[4] C07D *491/10, 498/00, 498/10*
U.S. Cl. 544—71 18 Claims

1. A process for preparing spiro (indoline)-type compounds represented by the following graphic formula,



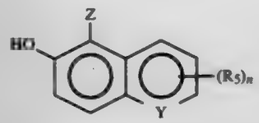
wherein R_1 is selected from the group consisting of hydrogen, C_1–C_8 alkyl, phenyl, phen (C_1–C_4)alkyl, allyl and mono- and di-substituted phenyl, said phenyl substituents being selected from C_1–C_4 alkyl and C_1–C_5 alkoxy; R_2 and R_3 are each selected from the group consisting of hydrogen, C_1–C_5 alkyl, phenyl, mono- and di-substituted phenyl, benzyl or combine to form a cyclic ring selected from the group consisting of a C_6–C_8 alicyclic ring, norbornyl and adamentyl, said phenyl substituents being selected from the group consisting of C_1–C_4 alkyl and C_1–C_5 alkoxy; R_4 is selected from the group consisting of C_1–C_5 alkyl, halogen, C_1–C_5 alkoxy, nitro, cyano, C_1–C_4 haloalkyl, C_1–C_4 polyhaloalkyl, and C_1–C_8 alkoxy carbonyl; R_5 is selected from the group consisting of halogen and C_1–C_4 alkoxy; X and Y are each selected from the group consisting of carbon and nitrogen; and n is 0, 1 or 2, which comprises mixing:

(a) a solution of Fischer's Base in non-polar organic solvent, said reactant being represented by the following graphic formula,



wherein R_1, R_2, R_3, R_4 and n are as defined herein, and

(b) a slurry of a second reactant in polar organic solvent, said second reactant being represented by the following graphic formula,



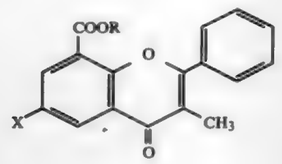
wherein R_5, Y, and n are as defined above and Z is nitroso or formyl, in a reaction vessel at tempertures sufficient to cause condensation of the aforesaid reactants, while removing co-product water, said non-polar organic solvent and polar organic solvent being miscible.

4,634,768
HALO-CONTAINING 3-METHYLFLAVONE-8-CARBOXYLIC ACID DERIVATIVES

Hiroshige Inoue, Osaka; Kenichi Fukushima, Arita, and Ikuzo Nishiguchi, Hirakata, all of Japan, assignors to Yamamoto Chemical Industrial Co., Ltd., Wakayama and Osaka Municipal Government, Osaka, both of, Japan

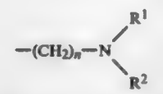
Continuation of Ser. No. 538,009, Sep. 30, 1983, abandoned. This application Apr. 4, 1985, Ser. No. 719,025
Claims priority, application Japan, Sep. 30, 1982, 57-171303
Int. Cl.[4] C07D *309/32, 405/12, 413/12*
U.S. Cl. 544—151 **10 Claims**

1. A derivative of 3-methylflavone-8-carboxylic acid represented by the formula (I)



(I)

wherein R represents a hydrogen atom, a lower alkyl group or a group



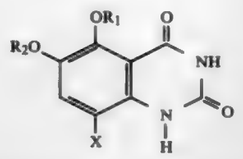
(wherein R^1 and R^2 represent a lower alkyl group or R^1 and R^2, when taken together with the nitrogen atom to which they are attached, may form a heterocyclic ring with or without an intervening hetero atom, and n is an integer of 1 to 4), and X represents a halogen atom.

4,634,769
PROCESS FOR THE PREPARATION OF 8-HALO-5,6-DIALKOXYQUINAZOLINE-2,4-DIONES AND THEIR SALTS

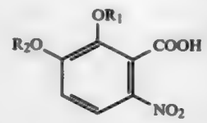
Victor T. Bandurco, Bridgewater; Robert A. Mallory, Somerville; Jeffrey B. Press, Rocky Hill, and Harvey M. Werblood, Bridgewater, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Sep. 25, 1984, Ser. No. 654,350
Int. Cl.[4] C07D *239/80*
U.S. Cl. 544—285 **7 Claims**

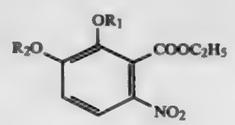
1. The process for the preparation of a compound of the formula



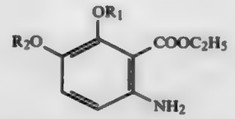
which comprises reacting a compound of the formula



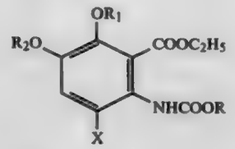
with an esterifying agent to form a nitro ester of the formula



reacting the nitro ester with a reducing agent to form an amino ester of the formula



reacting the amino ester first with an alkyl chloroformate to form a benzenecarbamate and reacting the benzenecarbamate with a halogenating agent to form a halogenated benzenecarbamate of the formula



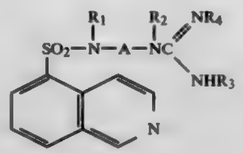
and reacting the halogenated benzenecarbamate with a cyclizing agent wherein X is chloro or bromo and R, R_1 and R_2 are the same or different lower alkyl.

4,634,770
ISOQUINOLINESULFONAMIDE DERIVATIVES

Hiroyoshi Hidaka, c/o Medical Department, Mie University, 174, Edobashicho 2-chome, Tsu-shi, Mie-ken, and Takanori Sone, Nobeoka, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha and Hiroyoshi Hidaka, both of, Japan

Filed Nov. 4, 1983, Ser. No. 548,722
Claims priority, application Japan, Nov. 18, 1982, 57-201085
Int. Cl.[4] C07D *217/02*
U.S. Cl. 546—145 **11 Claims**

1. A compound of Formula (I):



wherein A is a single bond; a C_{1-10} alkylene group; or a C_{1-10} alkylene group having one or two groups selected from the groups consisting of C_{1-10} alkyl group, a phenyl group or a phenylalkyl having a C_{1-2} alkyl portion;

R_1 and R_2 each is a hydrogen atom;

R_3 and R_4 each is a hydrogen atom or a C_{1-6} alkyl group; or a pharmaceutically acceptable acid addition salt thereof.

4,634,771
METHOD FOR CONVERTING CARBOXYLIC ACID GROUPS TO TRICHLOROMETHYL GROUPS

Kyung S. Shim, Irvington, N.Y.; Arthur D. F. Toy, Stamford, Conn., and James B. Heather, Hercules, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 25, 1985, Ser. No. 759,003
Int. Cl.[4] C07D *401/00, 211/72, 211/84, 213/72*
U.S. Cl. 546—286 **6 Claims**

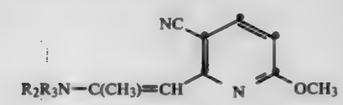
1. A method for the conversion of a carboxylic acid group on the ring of an aromatic or N-heteroaromatic compound to a trichloromethyl group which comprises contacting at a temperature of from about 100° C. to about 250° C. the aromatic or N-heteroaromatic compound with (i) from about 0.5 to about 2.0 molar equivalents of phenylphosphonous dichloride per carboxylic acid group to be converted, (ii) phosphorus trichloride, and (iii) chlorine; wherein the molar ratio of chlorine to PCl_3 is from about 1:1 to about 3:1.

4,634,772
2-[2-(DI-LOWER-ALKYLAMINO)-1-PROPENYL]-6-METHOXY-3-PYRIDINECARBONITRILES, INTERMEDIATES FOR CARDIOTONIC AGENTS

George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 811,040, Dec. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 765,900, Aug. 14, 1985, abandoned, which is a continuation-in-part of Ser. No. 695,603, Jan. 28, 1985, abandoned. This application Jan. 6, 1986, Ser. No. 816,591
Int. Cl.[4] C07D *213/64*
U.S. Cl. 546—288 **2 Claims**

1. 2-[2-(di-lower-alkylamino)-1-propenyl]-6-methoxy-3-pyridinecarbonitirle having the formula IIIa



IIIa

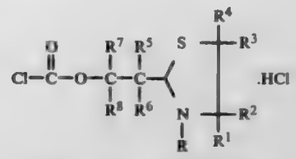
and acid-addition salt thereof, where R_2 and R_3 are each lower-alkyl.

4,634,773
THIAZOLIDINYLETHYLCHLOROCARBONATES

William J. Cumming, North Chelmsford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 514,700, Jul. 18, 1983, abandoned. This application Jun. 10, 1985, Ser. No. 742,927
Int. Cl.[4] C07D *277/04*
U.S. Cl. 548—146 **5 Claims**

1. A compound of the formula



wherein R is selected from alkyl containing 1 to 20 carbon atoms, aryl selected from phenyl and biphenyl, phenyl-substituted alkyl wherein said alkyl contains 1 to 20 carbon atoms and alkyl-substituted phenyl wherein said alkyl contains 1 to 20 carbon atoms; R^1 is selected from hydrogen, carboxy, N,N-dialkylcarboxamido wherein each alkyl contains 1 to 20 carbon atoms, alkyl containing 1 to 20 carbon atoms, aryl selected from phenyl and biphenyl, phenyl-substituted alkyl wherein said alkyl contains 1 to 20 carbon atoms and alkyl-substituted phenyl wherein said alkyl contains 1 to 20 carbon atoms; R^5 is selected from hydrogen and carboxy; and R^2, R^3, R^4, R^6, R^7 and R^8 each are selected from hydrogen, alkyl containing 1 to 20 carbon atoms, aryl selected from phenyl and biphenyl, phenyl-substituted alkyl wherein said alkyl contains 1 to 20 carbon atoms, and alkyl-substituted phenyl wherein said alkyl contains 1 to 20 carbon atoms.

4,634,774
PROCESS FOR PREPARING 3-HYDROXY-5-METHYLISOXAZOLE

Tadashi Murakami, and Kazuo Tomita, both of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Apr. 5, 1984, Ser. No. 597,170
Claims priority, application Japan, Apr. 12, 1983, 58-63046
Int. Cl.[4] C07D *261/12*
U.S. Cl. 548—243 **8 Claims**

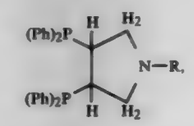
1. A process for preparing 3-hydroxy-5-methylisoxazole, consisting essentially of continuously reacting diketene with unsubstituted hydroxylamine to form a reaction mixture containing acetoacetohydroxamic acid and quickly acidifying to produce said 3-hydroxy-5-methylisoxazole.

4,634,775
OPTICALLY ACTIVE 3,4-BIS-(DIPHENYLPHOSPHINO)-PYRROLIDINE, AND RHODIUM COMPLEXES, CONTAINING IT AS CHIRAL LIGANDS

Wolfgang Beck, Munich, and Ulrich Nagel, Weichs, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 2, 1985, Ser. No. 688,360
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1984, 3403194
Int. Cl.[4] C07F *15/00, 9/65*
U.S. Cl. 548—402 **10 Claims**

1. An optically active 3,4-bis-(diphenylphosphino)-pyrrolidine of the formula:



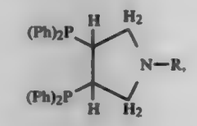
(I)

where Ph is a phenyl group and R is hydrogen, an alkyl group, an aralkyl group or an acyl group of the formula R_1—CO— where R_1 is hydrogen, lower alkyl, phenyl, naphthyl, lower alkoxymethyl, poly(lower alkoxy)methyl of the formula $R_3O(R_4O)_m$—CH_2— where R_3 and R_4 are lower alkyl groups and m is an integer of at least 1 or alkoxy.

5. A rhodium complex of the formula

$$[Rh(en)_2A]^+X^- \quad \text{(II)}$$

wherein $(en)_2$ is two molecules of a monoolefin or one molecule of a diolefin, A is an optically active 3,4-bis-(diphenylphosphino)-pyrrolidine of the formula



(I)

wherein Ph is a phenyl group and R is hydrogen, an alkyl group, an aralkyl group or an acyl group of the formula R_1—CO— where R_1 is hydrogen, lower alkyl, phenyl, naphthyl, lower alkoxymethyl, poly(lower alkoxy)methyl of the formula $R_3O(R_4O)_m$—CH_2 where R_3 and R_4 are lower alkyl groups

and m is an integer of at least 1 or alkoxy and X^- is a tetrafluoroborate, hexafluorophosphate or a perchlorate anion.

4,634,776

3-ARYLCARBONYL-AND 3-CYCLOALKYLCARBONYL-1-AMINOALKYL-1H-INDOLES

Malcolm R. Bell, East Greenbush, N.Y., assignor to Sterling Drug, Inc., New York, N.Y.

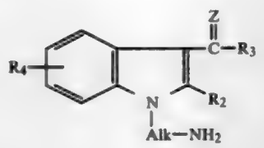
Continuation of Ser. No. 755,239, Jul. 15, 1985, Pat. No. 4,581,354, which is a continuation-in-part of Ser. No. 637,931, Aug. 6, 1984, abandoned. This application Dec. 19, 1985, Ser. No. 810,942

The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.

Int. Cl.[4] **C07D** *209/12, 209/14, 403/10*

U.S. Cl. 548—493 **3 Claims**

1. A member of the group consisting of (A) compounds having the formula:



wherein:

R_2 is hydrogen, lower-alkyl, chloro, phenyl or benzyl (or phenyl or benzyl substituted by from one to two substituents selected from halo, lower-alkyl, lower-alkoxy, hydroxy, amino, lower-alkylmercapto, lower-alkylsulfinyl or lower-alkylsulfonyl);

R_3 is phenyl substituted by from one to two substituents selected from halo, lower-alkoxy, hydroxy, benzyloxy, lower-alkyl, nitro, amino, lower-alkylamino, di-lower-alkylamino, lower-alkoxy-lower-alkylamino, lower alkanoylamino, benzoylamino, trifluoroacetylamino, lower-alkylsulfonylamino, carbamylamino, lower-alkylmercapto, lower-alkylsulfinyl, lower-alkylsulfonyl, cyano, formyl or oximinomethylene, or R_3 is cyclohexyl, lower-alkoxycyclohexyl, methylenedioxyphenyl, 3- or 4-hydroxy-1-piperidinylphenyl, 1-piperazinylphenyl, (1H-imidazol-1-yl)phenyl, (1-pyrrolyl)phenyl, aminomethylphenyl, guanidinylmethylphenyl, N-cyanoguanidinylmethylphenyl, styryl, lower-alkyl-substituted-styryl, fluoro-substituted-styryl, 2- or 4-biphenyl, 1- or 2-naphthyl (or 1- or 2-naphthyl substituted by from one to two substituents selected from lower-alkyl, lower-alkoxy, hydroxy, bromo, chloro, fluoro, lower-alkoxycarbonyl, carbamyl, cyano, lower-alkylmercapto, lower-alkylsulfinyl, lower-alkylsulfonyl or trifluoromethyl), thienyl, furyl, benzo[b]furyl, benzo[b]thienyl, quinolyl or (N-lower-alkyl)pyrrolyl;

R_4 is hydrogen or from one to two substituents selected from lower-alkyl, hydroxy, lower-alkoxy or halo in the 4-, 5-, 6- or 7-positions;

C═Z is C═O or C═NOH; and

Alk is α,ω-lower-alkylene having the formula $(CH_2)_n$ where n is an integer from 2 to 6, or such lower-alkylene substituted on the α- or the ω-carbon atom by a lower-alkyl group; and (B) acid-addition salts thereof.

4,634,777

[(1,3-DIOXO-1,3-PROPANEDIYL)DIIMINO)]BISBENZOIC ACID DERIVATIVES

Toshio Satoh; Hitoshi Matsumoto; Hisao Kakegawa, all of Tokushima; Yoshiko Kato, Kobe; Juichi Riku, Uji; Junji Yoshinaga, Neyagawa, and Yoshifumi Kanamoto, Kashihara, all of Japan, assignors to Sawai Pharmaceutical Co., Ltd., Japan

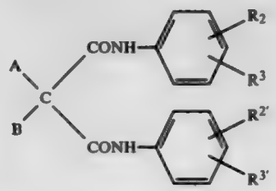
Filed Feb. 1, 1985, Ser. No. 697,573

Claims priority, application Japan, Feb. 8, 1984, 59-22360; Aug. 13, 1984, 59-169702; Aug. 27, 1984, 59-179064; Sep. 17, 1984, 59-195219; Sep. 20, 1984, 59-197836

Int. Cl.[4] **C07C** *102/153*

U.S. Cl. 548—561 **5 Claims**

1. A compound of the general formula:



wherein A and B are both hydrogen, or one of A and B is a group (G) of the formula:



and the other is a group R^5, wherein Rhu **1** is an aryl group or a substituted aryl group wherein the substituent is halogen, hydroxy, C_{1-6} lower alkoxy, C_{1-6} lower alkylenedioxy, halo (C_{1-6}) lower alkyl, cyano, nitro, mono- or di-(C_{1-6}) alkylamino or C_{1-6} lower alkanoylamino; or a 5-membered or 6-membered C_{1-6} alkyl substituted or unsubstituted heterocyclic group containing a heteroatom selected from oxygen, nitrogen and sulfur, or a condensed heterocyclic group consisting of a heterocycle as defined above and a benzene nucleus, and R^4 and R^5 are both hydrogeh or together form a single chemical bond, R^2 and $R^{2'}$ are independently hydrogen, halogen, nitro, (C_{1-6}) lower alkyl or (C_{1-6}) lower alkoxy, and R^3 and $R^{3'}$ are independently carboxy or its functional derivative, with the proviso that

(a) when A and B are both hydrogen, then R^2 and $R^{2'}$ cannot be hydrogen or (C_{1-6}) lower alkyl, and

(b) when one A and B is the group (G) and the other is the group R^5 wherein R^4 and R^5 together form a single chemical bond, R^1 is unsubstituted aryl and R^2 and $R^{2'}$ are independently hydrogen or C_{1-6} lower alkyl, then R^3 and $R^{3'}$ are independently carboxy or its functional derivative other than methyl ester, and, where applicable, pharmaceutically acceptable salts thereof.

4,634,778

PROCESS FOR PREPARING CHLORINATED ETHYLENIC DERIVATIVES

Gerard Mignani, Lyons; Didier Morel, Villiers sur Orge, and Pierre Chabardès, Sainte Foy les Lyon, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

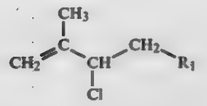
Filed Nov. 16, 1984, Ser. No. 671,880

Claims priority, application France, Nov. 18, 1983, 83 18390

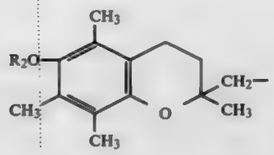
Int. Cl.[4] **C07D** *333/48*

U.S. Cl. 549—80 **4 Claims**

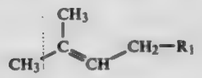
1. A process for preparing a chlorinated ethylenic derivative of the formula:



in which R_1 represents halogen; acetyl; formyl which may be in the form of an acetal radical; hydroxy which may be in the form of an ether or ester; an alkyloxycarbonyl radical whose alkyl part has 1 to 4 carbon atoms; an alkyl radical of from 1 to 12 carbon atoms and substituted by one or more identical or different radicals chosen from halogen, acetyl, formyl which may be in the form of an acetal radical, hydroxy which may be in the form of an ether or ester, or an alkyloxycarbonyl radical whose alkyl part has 1 to 4 carbon atoms; an alkenyl radical of 2 to 12 carbon atoms and one or more double bonds which is unsubstituted or substituted by one or more identical or different radicals chosen from halogen, acetyl, formyl which may be in the form of an acetal radical, hydroxy which may be in the form of an ether or ester, or an alkyloxycarbonyl radical whose alkyl part has 1 to 4 carbon atoms; or R_1 represents a 3-sulpholenyl radical or a radical of the formula:



in which R_2 is hydrogen or acetyl, which process comprises chlorinating a compound of the formula:



with chlorine in a nonpolar aprotic organic solvent at a temperature of between −10° and 100° C.

4,634,779

CYANOGENATION OF BENZOPYRONES AND NAPHTHOPYRONES

Peter Möckli, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

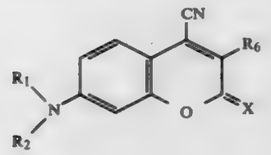
Division of Ser. No. 949,939, Oct. 10, 1978, Pat. No. 4,550,171. This application Sep. 30, 1982, Ser. No. 430,413

Claims priority, application Luxembourg, Oct. 13, 1977, 78311

Int. Cl.[4] **C07D** *417/04*

U.S. Cl. 546—269 **10 Claims**

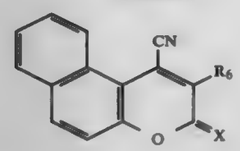
1. A process for producing a dye of the formulae I or II



(I)

or

-continued



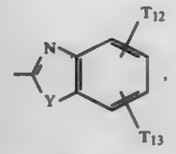
(II)

in which

R_1 and R_2 independently of one another are each hydrogen, alkyl of 1 to 7 carbon atoms unsubstituted or substituted by hydroxyl, low-molecular alkoxy or carbalkoxy, phenoxy, cyano, carbonamido, halogen, acetoxy, cyclohexyl, methylcyclohexyl, benzyl, phenethyl or β-phenyl-β-hydroxyethyl, unsubstituted or substituted naphthalene or phenyl substituted by lower alkyl, lower alkoxy, acylamino, halogen, hydroxyl, cyano, rhodan, amino, mono- or dialkylamino, phenylamino, N-phenyl-N-alkylamino, phenyl, phenoxy, nitro, acyl or acyloxy,

X is ═NH or ═O, and

R_6 is the cyano group, or the radical



in which Y is oxygen, sulfur or the grouping



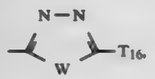
T_{14} is hydrogen, alkyl or benzyl, phenethyl or β-phenyl-β-hydroxyethyl,

T_{12} is hydrogen, alkyl, halogen or alkoxy, and

T_{13} is hydrogen or alkyl, or

T_{12} and T_{13} together can also form a further fused-on, unsubstituted or substituted aromatic ring,

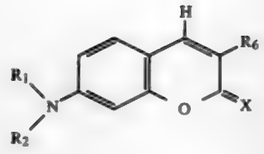
or R_6 is the radical



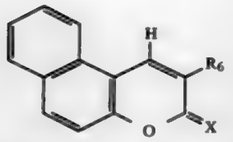
in which W is oxygen or sulfur, and T_{16} is unsubstituted or substituted alkyl, cycloalkyl, aralkyl, phenyl, pyridyl or the radicals —OZ, —SZ or



in which Z is unsubstituted or substituted alkyl, cycloalkyl, aralkyl, aryl or heteroaryl, and Z_1 and Z_2 independently of one another are hydrogen, or unsubstituted or substituted alkyl, cyloalkyl, aralkyl or aryl, and Z_1 and Z_2 together with the nitrogen atom can form a heterocyclic ring, which process comprises reacting a compound of the formulae III or IV



or



wherein the substituents R_1, R_2, R_6 and X have the same meaning as in formulae I and II; in a polar solvent, with a cyanide salt, and simultaneously or subsequently treating the reaction product with an oxidizing agent.

4,634,780

PROCESS FOR THE PRODUCTION OF LACTONES

Howard Alper, Ottawa, Canada, and David J. H. Smith, Camberley, England, assignors to The British Petroleum Company p.l.c., London, England

Filed Sep. 24, 1985, Ser. No. 779,784

Claims priority, application United Kingdom, Sep. 27, 1984, 8424376

Int. Cl.⁴ C07D *309/30*

U.S. Cl. 549—273 **12 Claims**

1. A process for the production of a lactone which process comprises

reacting an unsaturated alcohol having the formula ROH wherein R is an olefinically unsaturated hydrocarbyl group in which the olefinic unsaturation is not more than three carbon atoms removed from the hydroxy substituent and said unsaturated alcohol being capable of intramolecular esterification to form a 5- or a 6-membered lactone ring,

with carbon monoxide in the presence of a protonic acid and a catalyst comprising (a) at least one of the metals palladium, rhodium, ruthenium, iridium and cobalt, and (b) at least one of the metals copper, molybdenum and iron, the metals (a) and (b) being in the form of either the elemental metal or a compound thereof.

4,634,781

ALPHA TOCOPHEROL PROCESS

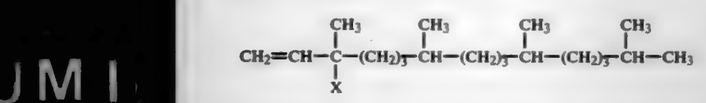
Jeffrey L. Finnan, Southgate, Mich., assignor to BASF Corporation, Wyandotte, Mich.

Filed Sep. 30, 1982, Ser. No. 430,154

Int. Cl.⁴ C07D *311/72*

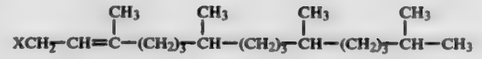
U.S. Cl. 549—411 **19 Claims**

1. A process for producing alpha tocopherol comprising reacting, in the presence of an inert organic solvent, trimethylhydroquinone with a phytyl derivative selected from the group consisting of at least one of



anil

(III)



wherein X is a leaving group, in the presence of at least one aprotic Lewis acid, at least one protonic strong acid, and about 0.05 percent to about 5 percent by weight, based upon the weight of said phytol derivative, of at least one salt of an amine having about 7 to about 24 carbon atoms wherein said salt of an amine is the reaction product of a non-oxidizing protonic acid and said amine.

(IV)

4,634,782

7-FLUORO-DIHYDRO PGI COMPOUNDS

George W. Holland, North Caldwell; Hans Maag, Upper Montclair, and Perry Rosen, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

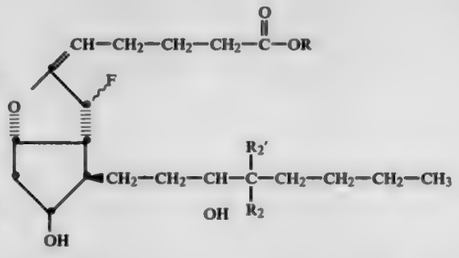
Filed Jun. 24, 1985, Ser. No. 747,740

Int. Cl.⁴ C07D *307/935*

U.S. Cl. 549—465 **12 Claims**

1. A prostacyclin selected from the group consisting of a compound of the formula

I-A



wherein

R is hydrogen or lower alkyl, R_2 is hydrogen, methyl or fluoro; and R_2' is fluoro or trifluoromethyl; with the proviso that when R_2' is trifluoromethyl, R_2 is hydrogen or methyl;

pharmaceutically acceptable salts, optical antipodes and racemates thereof.

4,634,783

NOVEL AMIDINE COMPOUND

Setsuro Fujii, Toyonaka; Toyoo Nakayama, Funabashi; Shigeki Nunomura, Chiba; Ryoji Matsui, Ichikawa; Shin-ichi Watanabe; Kimio Sudo, both of Funabashi; Toshiyuki Okutome, Tokyo; Masatera Kurumi, Narita; Yojiro Sakurai, Kamakura, and Takuo Aoyama, Sakura, all of Japan, assignors to Torii & Co. Ltd., Tokyo, Japan

Filed Jan. 23, 1984, Ser. No. 573,268

Claims priority, application Japan, Jan. 28, 1983, 58-12190

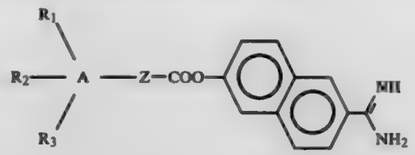
The portion of the term of this patent subsequent to Jan. 7, 2003, has been disclaimed.

Int. Cl.⁴ C07D *307/54, 307/56, 307/64, 307/66*

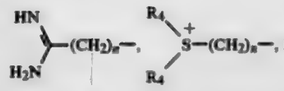
U.S. Cl. 549—475 **1 Claim**

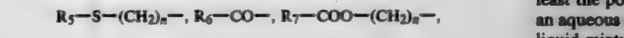
1. Amidine compounds of formula (I)

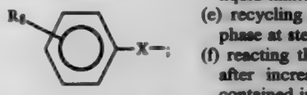
(I)



wherein R_1, R_2 and R_3 represent each a hydrogen atom, R_4, halogen, NO_2,



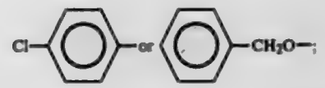




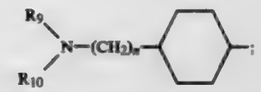
R_4 represents a C_1 to C_4 straight or branched chain alkyl group;

R_5 represents a hydrogen atom, a C_1 to C_4 straight or branched chain alkyl or benzyl group;

R_6 represents a C_1 to C_4 straight or branched chain alkyl group,



R_7 represents a C_1 to C_4 straight or branched chain alkyl group or



R_8 represents a hydrogen atom, NO_2 or a guanidino group;

X represents a single bond, $-(CH_2)_2-$ or $-CH=CH-$;

n is 0 to 4;

R_9 and R_{10} each represent a hydrogen atom or $R_{12}CO-$, wherein R_{12} represents a C_1 to C_4 straight or branched chain alkyl group, a benzyloxycarbonyl or t-butoxycarbonyl group;

Z represents a single bond, a C_1 to C_4 straight or branched chain alkylene, a C_1 to C_4 straight or branched chain alkenylene or a C_1 to C_4 straight or branched chain alkynylene group; and

A represents



and pharmaceutically acceptable acid addition salts thereof.

4,634,784

PROCESS FOR PRODUCTION OF EPICHLOROHYDRIN

Nobuyuki Nagato; Hideki Mori; Kenichiro Maki, and Ryoji Ishioka, all of Kawasaki, Japan, assignors to Showa Denko Kabushiki Kaisha, Japan

Filed Jun. 4, 1985, Ser. No. 741,053

Claims priority, application Japan, Jun. 4, 1984, 59-113172

Int. Cl.⁴ C07D *301/26*

U.S. Cl. 549—521 **2 Claims**

1. A process for producing epichlorohydrin comprising the steps of:

(a) reacting allyl alcohol with chlorine at a temperature of −30° C. to 20° C. under a pressure of 0 to 10 atm (gauge) in an aqueous hydrogen chloride solution containing more than 45% but not more than 70% by weight of hydrogen chloride to form 2,3-dichloro-1-propanol;

(b) separating at least a portion of the hydrogen chloride by heating the reaction mixture obtained at step (a) to recover the hydrogen chloride in the form of gas;

(c) recycling the hydrogen chloride recovered at step (b) to step (a);

(d) separating the resultant liquid mixture after recovering at least the portion of the hydrogen chloride at step (b) into an aqueous phase and an oil phase by cooling the resultant liquid mixture to a temperature of 40° C. or less;

(e) recycling at least a portion of the separated aqueous phase at step (d) to step (a); and

(f) reacting the oil phase separated at step (d) directly or after increasing the purity of 2,3-dichloro-1-propanol contained in the oil phase by a separation operation with an aqueous alkaline solution or suspension at a temperature of 40° C. to 110° C. to form epichlorohydrin.

4,634,785

TITANIUM AND ZIRCONIUM PYROPHOSPHATES, THEIR PREPARATION AND USE

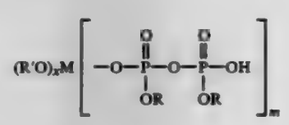
Gerald Sugerman, Allendale, N.J., and Salvatore J. Monte, Staten Island, N.Y., assignors to Kenrich Petrochemicals, Inc., Bayonne, N.J.

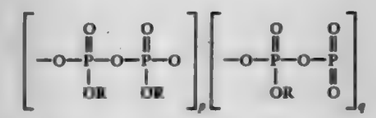
Filed Sep. 14, 1984, Ser. No. 651,119

Int. Cl.⁴ C07F *7/28*

U.S. Cl. 556—17 **27 Claims**

1. An organo-metallic pyrophosphate having the following formula:





wherein R and R′ are independently selected from monovalent hydrocarbon groups optionally substituted with halogen or ether oxygen substituents; M is zirconium or titanium; $x+m+2p+q=4$; x is an integer from 0 to 3; m and q are each integers from 0 to 4; p is an integer from 0 to 2; $x+q$ are greater than 0; provided, however, that, when M is titanium, if $x+m=4$, then $x=0$; and, if $x+m=0$, then R has at least 6 carbon atoms.

4,634,786

HYDROCARBON AND CHLORINATED HYDROCARBON-SOLUBLE MAGNESIUM DIALKOXIDES

Conrad W. Kamienski, Gastonia, N.C., assignor to Lithium Corporation of America, Gastonia, N.C.

Filed Sep. 27, 1984, Ser. No. 655,226

Int. Cl.⁴ C07F *5/06*

U.S. Cl. 556—187 **36 Claims**

1. In a process for the preparation of hydrocarbon- or chlorinated hydrocarbon- solvent solutions of magnesium dialkoxides, the steps which comprise reacting a suspension of magnesium metal or magnesium amide, or a solution of a dialkylmagnesium compound in a volatile hydrocarbon or chlorinated hydrocarbon solvent with an alcohol selected from the group of (a) aliphatic 2-alkyl-substituted C_4–C_{12} primary monohydric alcohols; or (b) mixtures of said (a) alcohols with C_3–C_{12} aliphatic secondary or tertiary alcohols; or (c) mixtures of said (a) alcohols with C_1–C12 aliphatic primary linear unsubsti-

tuted alcohols; the mole ratios of said (a) to said (b), and said (a) to said (c), alcohols being 1 of said (a) alcohols to 0.1 to 2 of said (b) and said (c) alcohols; and removing hydrogen or ammonia which forms during the reaction.

4,634,787

PROCESS FOR PREPARING (2,2,2-TRIHALO-1, 1-DIHYDROCARBYL-ETHOXY) TRIHYDROCARBYLSILANES

Pen-Chung Wang, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 8, 1985, Ser. No. 796,121
Int. Cl.⁴ C07F *7/08, 7/18*
U.S. Cl. 556—470 **22 Claims**

1. A process of forming (2,2,2-trihalo-1,1-dihydrocarbylethoxy)trihydrocarbylsilanes (Wang compounds) without forming stoichiometric amounts of by-products comprising contacting (1) a silane of the formula

$$X_3CSi(R^1)_3 \quad (I)$$

in which X is independently halo and each R^1 is independently a monovalent hydrocarbon radical, or one R^1 is a monovalent hydrocarbon radical, and the remaining two R^1 are collectively a divalent hydrocarbon radical, or all three R^1 are collectively a trivalent hydrocarbon radical, with (2) a carbonyl of the formula

$$R^2-\overset{O}{\overset{\|}{C}}-R^2 \quad (II)$$

in which each R^2 is independently hydrogen or a monovalent hydrocarbon radical, provided at the most, one R^2 is hydrogen, or both R^2 are collectively a hydrocarbylene radical, in the presence of a catalytic amount of the fluoride ion under conditions sufficient to produce a Wang compound of the formula,

$$X_3C-\overset{R^2}{\overset{|}{C}}-OSi(R^1)_3, \quad (III)$$
$$R^2$$

in which X, R^1 and R^2 are as previously defined, said hydrocarbon radicals represented by R^1 and R^2 may contain one or more substituents and may contain one or more heteroatoms.

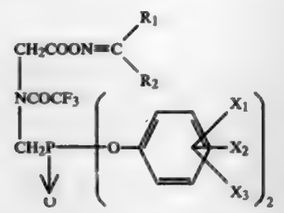
4,634,788

HERBICIDAL GLYPHOSATE OXIME DERIVATIVES

Om P. Dhingra, Creve Coeur; John E. Franz, Crestwood, and Harrison R. Hakes, Ballwin, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

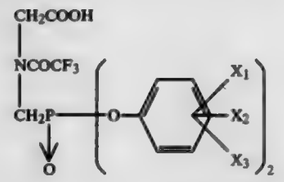
Filed Jun. 6, 1985, Ser. No. 741,930
Int. Cl.⁴ C07F *9/40*
U.S. Cl. 558—145 **9 Claims**

1. A compound having the formula:



wherein R_1 is hydrogen or R_2 and R_2 is selected from alkyl, aryl, aralkyl and haloalkyl; and X_1 X_2 and X_3 are each independently hydrogen, halogen, nitro or C_1–C_4 alkyl or alkoxy groups.

5. A process for the production of the glyphosate oxime derivatives of claim 1 which comprises reacting a compound having the formula:



with an oxime having the formula $HON=C(R_1)(R_2)$ in an aprotic organic solvent and in the presence of a tertiary amine base and N,N¹-dicylcohexylcarbodiimide.

4,634,789

CONVERSION OF ACETONITRILE TO GLYCOLONITRILE AND/OR GLYCOLAMIDE

Raymond G. Teller, Aurora; James F. Brazdil, Mayfield Village, and Linda C. Glaeser, Middleburg Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 22, 1984, Ser. No. 643,207
The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.
Int. Cl.⁴ C07C *121/34, 121/36, 102/08*
U.S. Cl. 558—451 **10 Claims**

1. The production of glycolonitrile or glycolamide by the vapor phase oxidation of acetonitrile with molecular oxygen in the absence or presence of water vapor and in the presence of a vanadium oxide based catalyst having the elements and the proportions indicated by the following empirical formula:

$$A_aB_bV_cO_x$$

where

A is one or more of K, Na, Rb, Cs, Tl, Mg, Ca, Li;
B is one or more of Ti, Cr, Mn, Fe, Co, Ni, Cu, Ag, Zn, Au, Zr, Nb, Mo, Ta, W, Th, La Ce, Pr, Nd, Sm, Eu, Sb, Te, and Sn
a=0–2
b=0–3
c=2–15,
c≧(a+b) and
x is determined by the oxidation state of the other elements present, wherein glycolamide is produced only when water is present.

4,634,790

PROCESS FOR PRODUCING α-L-ASPARTYL-L-PHENYLALANINE METHYL ESTER OR ITS HYDROHALIDE

Emiko Shinohara, Saga; Katsumi Sugiyama, Yokosuka; Masanao Ozaki, Yokohama, and Keizo Matsuda, Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Feb. 11, 1985, Ser. No. 700,034
Claims priority, application Japan, Feb. 21, 1984, 59-30987
Int. Cl.⁴ C07C *101/32;* C07K *5/06*
U.S. Cl. 560—40 **4 Claims**

1. A process for producing α-L-aspartyl-L-phenylalanine methyl ester or its hydrohalide, which comprises contacting 3-benzyl-6-carboxymethyl-2,5-diketopiperazine with a strong acid in a solvent mixture comprising methanol and water for a time period sufficient to cause partial hydrolysis, wherein said contacting is carried out at a temperature of from about 20° C. to about 80° C., wherein the concentration of said strong acid is less than about 10 molar, and wherein the water-methanol solvent has a molar ratio of methanol to water of from about 0.01 to about 1.0.

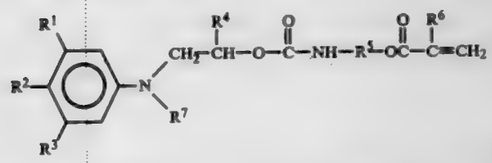
4,634,791

ARYLAMINE DERIVATIVES WHICH CAN BE INCORPORATED AS CO-POLYMERIZED UNITS IN UNSATURATED RESINS, THE PREPARATION OF THESE DERIVATIVES AND THEIR USE AS CURING ACCELERATORS

Helmut-Martin Meier, Hattingen; Rolf Dhein, Krefeld; Jens Winkel, Cologne; Gerhard Klein, Monheim, and Werner Klöker, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

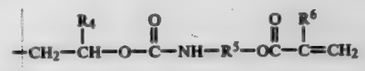
Filed Nov. 29, 1984, Ser. No. 676,485
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3345104
Int. Cl.⁴ C07C *125/06*
U.S. Cl. 560—163 **2 Claims**

1. Compounds of the formula



wherein

R^1 to R^3 represent hydrogen, C_1–C_{18}-alkyl, C_5–C_8-cycloalkyl, C_6–C_{14}-aryl or halogen,
R^4 represents hydrogen, C_1–C_{18}-alkyl or C_5–C_8-cycloalkyl,
R^5 represents C_1–C_{18}-alkylene, C_5–C_8-cycloalkylene or C_6–C_{14}-arylene,
R_6 represents hydrogen or C_1–C_4-alkyl and
R^7 represents hydrogen, a saturated or unsaturated hydrocarbon radical having 1–18 carbon atoms, a hydroxy-substituted saturated or unsaturated hydrocarbon radical having 1 to 18 carbon atoms, or the radical



having the meaning given above for R^4 to R^6.

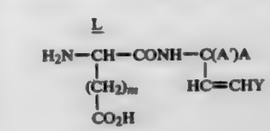
4,634,792

L-AMINODICARBOXYLIC ACID AMINOALKENOIC ACID ESTER AMIDES

Paul R. Zanno, Nanuet; Ronald E. Barnett, Suffern, and Glenn M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 6, 1985, Ser. No. 730,986
Int. Cl.⁴ C07C *101/26;* C07K *5/06*
U.S. Cl. 560—169 **16 Claims**

1. A compound represented by the formula:



wherein

A is CO_2R wherein R is alkyl containing 1–3 carbon atoms;
A′ is hydrogen or alkyl containing 1–3 carbon atoms;
Y is alkyl containing 4–11 carbon atoms, and
M=0 or 1;
and food-acceptable salts thereof.

4,634,793

PROCESS FOR THE DIMERIZATION OF OLEFINS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 754,882, Jul. 15, 1985, abandoned. This application Oct. 3, 1985, Ser. No. 783,712
Claims priority, application United Kingdom, Nov. 9, 1984, 8428347
Int. Cl.⁴ C07C *2/02*
U.S. Cl. 560—243 **22 Claims**

1. A process for the dimerization in the liquid phase of an aliphatic mono-olefin having 2 to 12 carbon atoms which process comprises contacting said olefins with a catalytic system formed by combining, in the presence of water, an alcohol, or a carboxylic acid,

a. a palladium compound,
b. a chelate ligand comprising an organic compound containing as coordinating atoms at least two atoms of Group Va of the Periodic System of Elements which are connected through a chain comprising 2 to 6 carbon atoms, and
c. a compound containing an anion of an acid with the exception of hydrohalogenic acids.

4,634,794

PROCESS FOR THE PRODUCTION OF ALLYL ACETATE

Charles A. Drake, and Stephen E. Reiter, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Division of Ser. No. 663,629, Oct. 22, 1984, Pat. No. 4,587,229. This application Jan. 24, 1986, Ser. No. 821,929
Int. Cl.⁴ C07C *67/05*
U.S. Cl. 560—245 **7 Claims**

1. A process for preparing allyl acetate comprising reacting propylene, acetic acid, water, and oxygen in the presence of a catalyst consisting essentially of metals on a support said metals consisting essentially of palladium, bismuth, and rubidium.

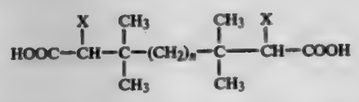
4,634,795

LONG-CHAIN α,ω-DI-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Jacob Bar-Tana, Jerusalem, Israel, assignor to Epis S.A., Zug, Switzerland

Continuation of Ser. No. 443,315, Nov. 22, 1982, abandoned. This application Aug. 27, 1985, Ser. No. 769,765
Claims priority, application Israel, Dec. 15, 1981, 64542
Int. Cl.⁴ C07C *55/02, 55/32, 69/34, 121/20*
U.S. Cl. 562—590 **4 Claims**

1. A compound of the formula



(II)

wherein X is hydrogen, lower alkyl, fluoro, chloro or bromo, and n is an integer from 8 to 14; or a lower alkyl ester, alkali metal salt, alkaline earth metal salt or a NH_4 salt thereof; with the proviso that when X is hydrogen, then n is other than 8.

4,634,796

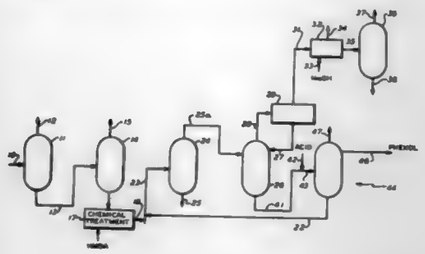
PRODUCTION OF HIGH PURITY PHENOL

George D. Suciu, Ridgewood, and Ali M. Khonsari, Bloomfield, both of N.J., assignors to Lummus Crest, Inc., Bloomfield, N.J.

Filed Mar. 25, 1985, Ser. No. 715,884
Int. Cl.⁴ C07C *37/76*
U.S. Cl. 568—757 **14 Claims**

1. A process for producing high purity phenol, comprising: steam distilling in a steam distillation column a phenol prod-

uct feed containing alpha-methylstyrene byproduct and methylbenzofuran impurity to recover a light produce comprising phenol, water, alphamethylstyrene and methylbenzofuran, and a heavy product comprising phenol



having a reduced quantity of MBF, said phenol product having been treated with a base without acidification; treating said heavy product with an acid; and distilling in a high purity phenol column the acidified heavy product to recover high purity phenol.

4,634,797

COUPLING OF CHLOROPERFLUOROALKANES

Arthur J. Elliott, Sloatsburg, N.Y., assignor to Halocarbon Products Corporation, Hackensack, N.J.

Filed Feb. 7, 1985, Ser. No. 698,989
Int. Cl.⁴ C07C *17/26*
U.S. Cl. 570—171 **9 Claims**

1. A process for the coupling of a chloroperfluoroalkane of the formula

$$Cl(CF_2—CFCl)_nCl$$

in which n is 2 to 7,
which comprises heating the alkane at a temperture of about 150° to 260° C. in the presence of at least about 0.1 times the molar amount of each of copper and zinc at a mole ratio of copper; zinc from about 2:1 to 1:2.

4,634,798

SYNTHESIS PROCESS FOR PRODUCING ALKYLATE HYDROCARBONS

Hartley Owen, Belle Mead; Samuel A. Tabak, Wenonah, and Bernard S. Wright, East Windsor, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 23, 1985, Ser. No. 779,369
Int. Cl.⁴ C07C *1/20, 2/00*
U.S. Cl. 585—331 **17 Claims**

1. A process for converting oxygenate feedstock comprising methanol, dimethyl ether or mixtures thereof to liquid hydrocarbons comprising the steps of

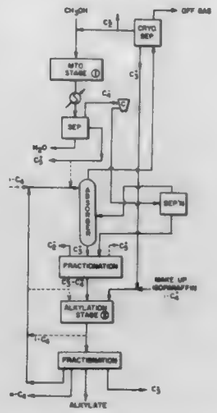
contacting the feedstock with zeolite catalyst in a primary catalyst stage at elevated temperature and moderate pressure to convert feedstock to light hydrocarbons comprising ethene and C_3+ olefin components;

fractionating the light hydrocarbons in a sorption fractionation unit in contact with a liquid C_4+ isoparaffinic sorbent to selectively sorb C_3+ olefin;

fractionating C_3+ sorbate to recover C_5+ gasoline and provide a C_3–C_4 olefin rich stream;

reacting a portion of the C_4+ isoparaffin with the C_3–C_4 olefin stream in an alkylation reactor in the presence of acid alkylation catalyst to produce C_7+ paraffinic alkylate;

separating the alkylation reactor effluent to obtain unreacted C_4+ isoparaffin and C_7+ alkylate product; and



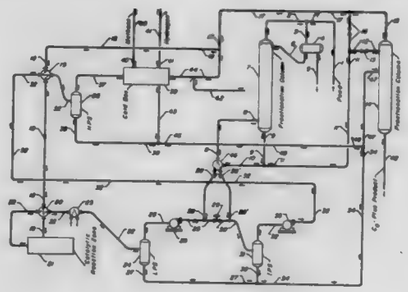
recycling at least a portion of the unreacted C_4+ isoparaffin to the sorption fractionation unit as lean sorbent.

4,634,799

PRODUCT RECOVERY METHOD FOR DEHYDROCYCLODIMERIZATION PROCESS

Edward C. Hamm, Glendale Heights, and David A. Hamm, Hinsdale, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Nov. 21, 1985, Ser. No. 800,245
Int. Cl.⁴ C07C *15/42*
U.S. Cl. 585—415 **25 Claims**



1. A hydrogen producing hydrocarbon conversion process which comprises the steps of:

(a) passing a feed stream comprising a C_2–C_5 hydrocarbon into a catalytic reaction zone maintained at conversion conditions including a temperature of about 920–1100 degrees Fahrenheit and a pressure under 100 psig and wherein C_6-plus hydrocarbons and hydrogen are produced, and producing a reaction zone effluent stream comprising ethane, hydrogen and C_6-plus hydrocarbons;

(b) separating the reaction zone effluent stream by a series of steps comprising cooling, partial condensation and vapor-liquid separation into a vapor-phase first process stream comprising hydrogen and ethane and a liquid-phase second process stream which comprises C_6-plus hydrocarbons;

(c) passing the second process stream into a first fractional distillation zone and recovering C_6-plus hydrocarbons from the first fractional distillation zone;

(d) heating the vapor-phase first process stream by compression;

(e) cooling the first process stream by indirect heat exchange, with the first process stream being employed as a heating media used to reboil a second fractional distillation zone, and partially condensing the first process stream; and,

(f) separating the thus partially condensed first process stream into a liquid-phase third process stream and a vapor-phase fourth process stream having a higher concentration of hydrogen than the first process stream.

4,634,800

METHANE CONVERSION PROCESS

Howard P. Withers, Jr., Douglassville; C. Andrew Jones, Newtown Square; John J. Leonard, Springfield, and John A. Sofranko, Malvern, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 600,656, Apr. 16, 1984, Pat. No. 4,523,049, and Ser. No. 600,670, Apr. 16, 1984, Pat. No. 4,523,050. This application May 24, 1985, Ser. No. 738,115
Int. Cl.⁴ C07C *2/00*
U.S. Cl. 585—500 **23 Claims**

1. In an improved method for converting methane to higher hydrocarbon products and coproduct water wherein a gas comprising methane and a gaseous oxidant are contacted with a solid comprising at least one reducible oxide of at least one metal which oxide when contacted with methane at a temperature within the range of about 500 to 1000° C. is reduced and produces higher hydrocarbon products and water, the improvement which comprises conducting the contacting in the presence of at least one promoter selected from the group consisting of halogens and compounds thereof.

4,634,801

MOTOR FUEL ALKYLATION PROCESS UTILIZING LOW ACID

Joseph A. Kocal, Gurnee, and Tamotsu Imai, Mount Prospect, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 764,707, Aug. 12, 1985. This application Oct. 25, 1985, Ser. No. 791,289
Int. Cl.⁴ C07C *3/52, 3/54*
U.S. Cl. 585—724 **4 Claims**

1. A process for the alkylation of an isoparaffin with an olefin acting agent comprising contacting the isoparaffin with the olefin acting agent at alkylation conditions in the presence of a catalyst consisting essentially of an anhydrous, nonalcoholic mixture of from about 5 to 15 wt. % methyl tert-butyl ether and from 85 to 95 wt. % hydrofluoric acid wherein the volumetric ratio of hydrofluoric acid to isoparaffin and olefin acting agent is less than 0.75.

4,634,802

HYDROCARBON DEHYDROGENATION

C. Andrew Jones, Newtown Square, and John A. Sofranko, Malvern, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 600,655, Apr. 16, 1984, abandoned, which is a continuation-in-part of Ser. No. 522,937, Aug. 12, 1983, Pat. No. 4,499,322, which is a continuation-in-part of Ser. No. 522,936, Aug. 12, 1983, Pat. No. 4,495,374, and a continuation-in-part of Ser. No. 683,118, Dec. 18, 1984. This application Jan. 17, 1985, Ser. No. 745,726
Int. Cl.⁴ C07C *5/333*
U.S. Cl. 585—656 **24 Claims**

1. A method for dehydrogenating alkanes to form the corresponding olefins which comprises contacting a gas comprising said alkanes at a temperature within the range of about 500° to 850° C. with a solid comprising:

(a) at least one reducible oxide of Ge,

(b) at least one promoter selected from the group consisting of alkali metals and compounds therefore, and

(c) a support comprising at least one member of the group consisting of oxides of alkaline earth metals.

9. A method for dehydrogenating alkanes to form the corresponding olefins which comprises contacting a gas comprising said alkanes at a temperature within the range of about 500° to 1000° C. with a solid consisting essentially of:

(a) at least one reducible oxide of Sb,

(b) at least one promoter selected from the group consisting of alkali metals and compounds thereof, and

(c) a support consisting essentially of at least one member of the group consisting of oxides of alkaline earth metals,

said contacting being conducted in the substantial absence of catalytically effective Ni, Rh, Pd, Ag, Os, Ir, Pt and Au.

17. A method for dehydrogenating alkanes to form the corresponding olefins which comprises contacting a gas comprising said alkanes at a temperature within the range of about 500° to 850° C. with a solid consisting essentially of:

(a) at least one reducible oxide of Bi

(b) at least one promoter selected form the group consisting of alkali metals and compounds thereof, and

(c) a support consisting essentially of at least one member of the group consisting of oxides of alkaline earth metals,

said contacting being conducted in the substantial absence of catalytically effective Ni, Rh, Pd, Ag, Os, Ir, Pt and Au.

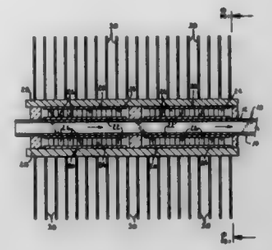
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4,634,803

METHOD OF OBTAINING OPTIMUM PERFORMANCE FROM A THERMOELECTRIC HEATING/COOLING DEVICE

Balakrishnan Mathiprakasam, Overland Park, Kans., assignor to Midwest Research Institute, Kansas City, Mo.

Filed Feb. 25, 1985, Ser. No. 705,109
Int. Cl.[4] H01L *35/28*
U.S. Cl. 136—212 4 Claims



1. A method of constructing a thermoelectric heating/cooling device which is to have a specified heating/cooling capacity and which includes thermoelectric modules each having a plurality of thermoelectric elements arranged in couples, a process channel on one side of each module for receiving a process fluid at a preselected initial temperature, and a heat exchanger on the other side of each module for receiving a second fluid flowing in a predetermined direction relative to the process fluid at a preselected initial temperature, where the factor $H=I/v$, the factor $\mu=nv$, I is the electric current passing through the elements, v is the ratio of the cross sectional area of each element to its length, and n is the total number of couples in the device, said method comprising the steps of:

expressing the heat balance in the device in terms of a pair of differential equations which recognize the temperature changes of the fluids as they move along the process channel and heat exchanger and which recognize the direction of flow of the second fluid relative to the process fluid;

solving the differential equations to obtain expressions for the outlet temperatures of the process and second fluids in terms of the factors H and μ and physical properties of the device;

assuming a plurality of different values of H;

assuming a plurality of different values of μ for each assumed value of H;

calculating the heating/cooling capacity of the device for each set of assumed values of H and μ based on the solutions to the differential equations;

selecting the value of μ which provides the specified heating/cooling capacity for each assumed value of H, thereby providing for each assumed value of H a corresponding value of μ which permits the device to meet the specified heating/cooling capacity;

calculating the coefficient of performance for each assumed value of H and the corresponding value of μ;

selecting the value of H and the corresponding value of μ which results in the maximum coefficient of performance; and

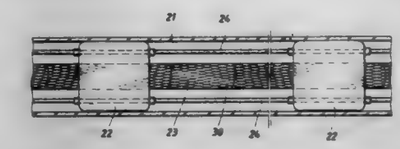
constructing the thermoelectric heating/cooling device using the values of H and μ which result in maximum coefficient of performance.

4,634,804

STREAMER CABLE WITH PROTECTIVE SHEATHS FOR CONDUCTOR BUNDLE

Philip C. Spalding, League City, Tex., assignor to GECO Geophysical Company Incorporated, Houston, Tex.

Filed May 17, 1985, Ser. No. 735,344
Int. Cl.[4] H01B *7/04*
U.S. Cl. 174—24 3 Claims



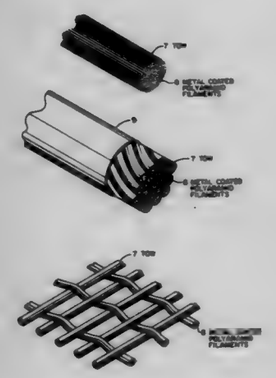
1. In a marine streamer cable having a bundle of conductor wires and a plurality of wire rope strain members enclosed in an oil-filled flexible tubing having spacers positioned along its length, the improvement comprising a plurality of protective sheath members surrounding said conductor wire bundle and covering said bundle throughout substantially the entire length thereof, each of said sheath members having generally parallel, spaced-apart fibers extending in opposite helical directions to enable expansion and contraction of said members to different diameters during assembly, said sheath members positively preventing rubbing of said wire rope strain members against said conductor wires and consequent abrasion and tearing of the insulation of said wires.

4,634,805

CONDUCTIVE CABLE OR FABRIC

Ralph F. Orban, Columbus, Ohio, assignor to Material Concepts, Inc., Columbus, Ohio

Filed May 2, 1985, Ser. No. 729,774
Int. Cl.[4] H01B *5/08*
U.S. Cl. 174—128 R 7 Claims

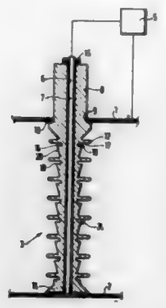


1. A conductive cable comprising a plurality of polyaramid tows, each of said tows comprising a multiplicity of individual filaments in substantially straight parallel untwisted relationship to each other, each of said filaments being coated with an adherent metal coating, said tows being combined together.

4,634,806
HIGH-VOLTAGE INSULATOR

Gottlob Haag, Markgröningen; Karl-Heinz Hügele, Vaihingen, and Helmut Hürer, Remseck, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 675,046
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1984, 3404987
Int. Cl.⁴ H01B *17/56, 17/50*
U.S. Cl. 174—211 3 Claims



1. An electrical insulator having improved soot deposition burn-off characteristics, comprising a columnar body provided with an exterior surface having a series of substantially equally spaced offstanding ribs spaced along the length thereof and including upper and lower parallel surfaces, an adjoining insulator part axially arranged between each of said ribs and having a radial circumference less than that of each of said ribs, one of said parallel surfaces of each of said ribs having an inwardly extending reentrant portion forming an associated recess disposed at an innermost extremity of said parallel surface, each said recess having first and second opposed walls forming an annular area immediately adjacent only one side of each of said ribs, said first wall of each said recess being coplanar with said parallel surface and said second opposed wall of each said recess defining with said insulator a sharp outer edge, each said sharp outer edge being arranged to limit a discharge path across each associated said recess and each associated said rib, said adjoining insulator part being disposed axially adjacent said sharp outer edge of each said recess and including an uninterrupted extent terminating in an adjacent rib, said insulator being disposed between adjacent potential surfaces, and each said sharp outer edge is disposed on the side of said associated rib oriented toward a cathode and one parallel surface of each said rib defines a discharge path on the side oriented toward an anode, whereby at least that portion of said insulator lying beneath each said discharge path is maintained virtually free of soot contaminants.

4,634,807
SOFTWARE PROTECTION DEVICE

Bernard J. Chorley, Hampton; Graeme I. P. Parkin, London; Brian A. Wichmann, Woking, and Simon M. Elsom, Feltham, all of England, assignors to National Research Development Corp., London, England

Filed Aug. 23, 1985, Ser. No. 768,717
Claims priority, application United Kingdom, Aug. 23, 1984, 8421418
Int. Cl.⁴ H04L *9/02*
U.S. Cl. 178—22.08 12 Claims

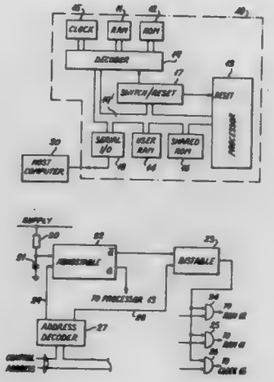
1. Apparatus for use in protecting wherein the software is independent of the operating system of a host computer comprising

first storage means adapted to contain at least one decryption key,

second storage means containing instructions for decrypting another key using a key held in the first storage means and for decrypting encrypted software using the said other key,

a processor for carrying out the instructions held by the second storage means, and

switch means having first and second modes in which the first storage means are, and are not, in communication with the processor, respectively,



the switch means being constructed to enter its first mode automatically under predetermined conditions and while in this first mode to cause the processor to execute a sequence of the instructions held in the second storage means which end with an instruction which causes the switch means to enter its second mode,

the first and second storage means, the processor and the switch means being contained in a tamper resistant housing, and the apparatus including an interface constructed to allow the processor to communicate with other apparatus external to the housing.

4,634,908
DESCRAMBLER SUBSCRIBER KEY PRODUCTION SYSTEM UTILIZING KEY SEEDS STORED IN DESCRAMBLER

Karl E. Moerder, Poway, Calif., assignor to M/A-COM Government Systems, Inc., San Diego, Calif.

Filed Mar. 15, 1984, Ser. No. 589,741
The portion of the term of this patent subsequent to Sep. 23, 2003, has been disclaimed.
Int. Cl.⁴ H04L *9/00*
U.S. Cl. 178—22.14 24 Claims

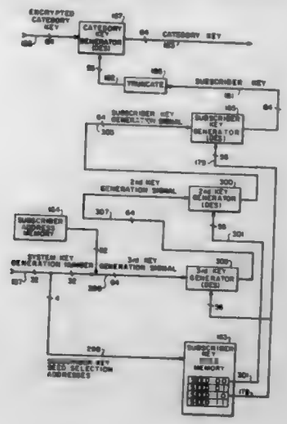
1. A system for reproducing in a descrambler a subscriber key signal that is unique to the descrambler and was used in encrypting a key signal that must be decrypted for use in descrambling a signal received by the descrambler, wherein the scrambled signal is received by the descrambler together with the encrypted key signal and an address for accessing a predetermined area in a memory contained in the descrambler, the system comprising

means for providing a subscriber key generation signal;

a subscriber key generator for reproducing said unique subscriber key signal by processing the subscriber key generation signal in accordance with a predetermined encryption algorithm upon said algorithm being keyed by a prescribed subscriber key seed signal that is unique to the descrambler;

a first memory storing the prescribed subscriber key seed signal, and for providing the prescribed seed signal to key

the algorithm when the area of the memory containing the prescribed seed signal is accessed by the address received with the received key generation number; and

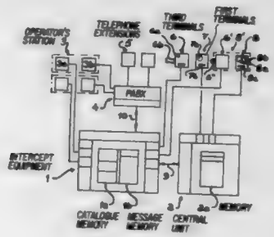


means for accessing the first memory with the received address.

4,634,809
TERMINAL SYSTEMS

Kurt Paulsson, Filipstadsbacken 50, 123 43 Farsta, and Trok, Beniamin, Bivägen 5, 136 75 Handen, both of Sweden

Filed Nov. 27, 1984, Ser. No. 675,304
Claims priority, application Sweden, Nov. 28, 1983, 8306547
Int. Cl.⁴ H04M *1/57*
U.S. Cl. 379—91 22 Claims



1. An arrangement in a terminal system comprising first and second terminals connected to central equipment common thereto, in which the first terminals and the central equipment operate in a first functional mode, in which persons utilizing this mode are provided with identification means by means of which said persons can transfer information over said system by activating a first activation means in said first terminals, characterized in that the central equipment is arranged operates in a second functional mode in parallel with the first functional mode; in that cooperating with the second functional mode are at least one second terminal for the insertion, relaying, and storage in said central equipment of individual messages to said persons and of identification associated therewith and connecting respective messages with respective persons; in that respective first terminals are provided with a second means which is actuable in the second functional mode when information concerning a given person is stored in the central equipment and said person, in order to put into effect a procedure in the first functional mode, simultaneously activates through his/her identification means said first means of said first terminal; and in that said second means is arranged, when activated, to carry out at least one of the following procedures;

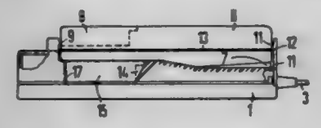
(a) provide indication that a message is held in the central equipment for the person concerned,

(b) produce an audio and/or visual reproduction of the message.

4,634,810
STATION FOR THE ACCOMMODATION OF A CHARGEABLE CORDLESS TELEPHONE

Erwin Grassl, and Rudolf Waechtler, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 23, 1984, Ser. No. 674,339
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1984, 3400294
Int. Cl.⁴ H04Q *7/04*
U.S. Cl. 379—61 6 Claims



1. A cordless telephone system, comprising:

a base station means for communication with a location-independent cordless telephone;

the base station means having a trough-like hollow having a shape matched or corresponding to that of the telephone;

the cordless telephone having a cassette provided with a chargeable battery connected to feed power to the telephone;

charging means in the base station means for charging the batteries when the telephone is inserted into the hollow;

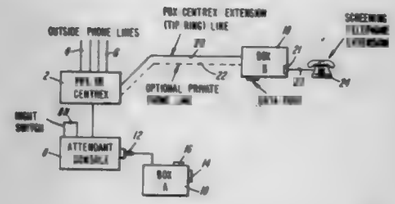
the base station means being provided with a trough-like recess means for accommodating a separate additional cassette with chargeable batteries having a shape the same as the cassette in the telephone, the recess means having a shape corresponding to contours of the separate cassette; and

means associated with the troughlike recess means for charging the batteries in the cassette from the base station charging system.

4,634,811
CALL SCREENING SYSTEM

William J. Curtin, and Stephen Soto, both of Madison, Wis., assignors to Amtel Communications, Inc., McFarland, Wis.

Filed Jun. 28, 1984, Ser. No. 625,637
Int. Cl.⁴ H04M *1/27, 1/56, 3/58*
U.S. Cl. 379—211 20 Claims



1. A call screening system to be added onto and used with a PBX or Centrex telephone system having an attendant answering means, said call screening system enabling incoming calls for various telephone extensions to be directed to another

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telephone extension in the system for screening such incoming calls and said call screening system comprising:

a DTMF tone generator coupled to the attendant answering means for generating a first DTMF coded signal for enabling the attendant answering means to call a screening telephone extension within the telephone system and generating a second DTMF coded signal that provides an indication as to the particular telephone extension within the telephone system for the person that the incoming caller is calling; and

screening means coupled between a single tip/ring line from the PBX or Centrex and a tip/ring line to a screening telephone extension of a user screening incoming calls for other telephone extensions, said screening means receiving a call from the attendant answering means when the associated screening telephone extension has been called by a generated first DTMF coded signal for such screening telephone extension, receiving a generated second DTMF coded signal generated by said DTMF tone generator for indicating which of the telephone extensions being screened the call is for and generating an indication signal indicating which telephone extension the call is for, and after receiving such second DTMF coded signal, said screening means coupling the screening telephone extension to the tip/ring line from the PBX or Centrex system for establishing a voice path connection.

4,634,812

METHOD OF TRANSFERRING INFORMATION BETWEEN MICROCOMPUTERS IN A DECENTRALIZED PROCESS CONTROL SYSTEM, PARTICULARLY FOR TELEPHONE SYSTEMS

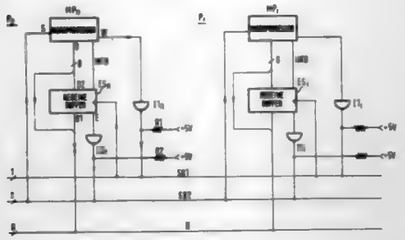
Detlev Hornburger, Pinneberg; Albrecht Schaffert, Stuttgart, and Henner Schneider, Dieburg, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 28, 1984, Ser. No. 625,760

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1983, 3324504

Int. Cl.⁴ H04Q *3/42*

U.S. Cl. 379—269 **3 Claims**



1. A method of transferring information between a plurality of microcomputers in a decentralized process control system wherein the microcomputers are interconnected by a multi-wire data bus (B) for transmission and reception of data thereover, a first single-wire control bus (SB1), and a second single-wire control bus (SB2) and each comprises a microprocessor (MP) and an associated bus controller (BS), particularly for telephone systems, comprising the steps of:

providing a selectable address at one port of each microprocessor;

connecting each of said ports to the data bus (B) via a receive buffer (ES_0 to ES_n) in each of said bus controllers, said receive buffers being bypassed during transmission by the microprocessor,

sending a first byte of a message from whichever microprocessor (MP_i) is to send in a data-transfer sequence through a first inverter (I1) in said bus controller to the first single-wire control bus (SB1),

sending the message first byte to the receive buffers (ES_1 to ES_n) of the other microcomputers,

causing each of said receive buffers (ES_1 to ES_n), upon receiving said message first byte, to send an interrupt request signal (INTB) to its respective associated microprocessor;

causing each of said receive buffers (ES_1 to ES_n) upon receiving a response to said interrupt request signal (INTB) to send a computer-ready signal through as second inverter located in its respective bus controller to said second single-wire control bus (SB2); and

causing said second single-wire control bus (SB2) to prompt, if computer-ready signals from all of said receive buffers have been received, the sending microprocessor (MP_i) to send a next byte of said message.

4,634,813

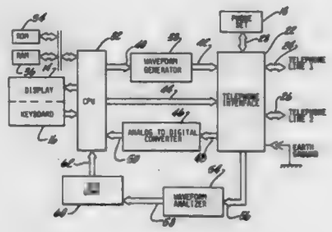
WIRE TAP DETECTION DEVICE

Robert P. Hensley, Mountainview, Calif., assignor to Secom General Corp., Southfield, Mich.

Filed Feb. 7, 1985, Ser. No. 699,359

Int. Cl.⁴ H04M *1/68*

U.S. Cl. 379—6 **9 Claims**



1. A device for detecting the presence of an intruder listening device on a telephone or data line comprising:

means electrically connected between the telephone or data line and a telephone for measuring the values of a plurality of electrical characteristics of the telephone or data line,

means for reiteratively comparing said measured values with predetermined values for each of said electrical characteristics,

means for indicating when any of said measured values varies from its respective preset value by a predetermined amount,

means for generating a signal onto the telephone or data line,

means for measuring a reflection of said signal from said telephone or data line,

means for comparing said measured reflected signal with a value of a previously measured reflection of said signal, and

means for activating said indicating means when the measured reflected signal varies from said previously measured reflected signal by more than a predetermined amount.

4,634,814

SURGE PROTECTED ELECTRONIC SWITCH FOR TELEPHONE VOICEBAND CIRCUITS

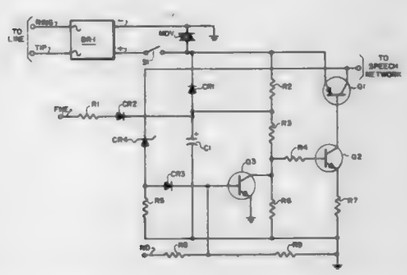
Karl E. Pommer, II, Los Alamos, N. Mex., assignor to GTE Communication Systems Corp., Northlake, Ill.

Filed Feb. 4, 1985, Ser. No. 697,672

Int. Cl.⁴ H04M *1/31*

U.S. Cl. 379—377 **8 Claims**

1. A surge protected electronic switch adapted for connecting and disconnecting an associated telephone speech network to a telephone line, said electronic switch comprising: a switching element connected between said telephone line and said speech network; biasing means for said switching element comprising a constant current source connected to said switching element; a source of DC bias for said constant current source comprising a low pass filter connected between said telephone line and said current source; a series protection circuit connected between said speech network and said constant current source; a first input circuit connected between a source of logic signals and said switching element, operated in response to a first signal to enable said switching means to connect said speech network to said telephone line; and a second input circuit connected between said source of logic signals and said constant current source operated in response to a second signal to disable said switching means and thereby disconnect said speech network from said telephone line.



4,634,815

IN-THE-EAR HEARING AID

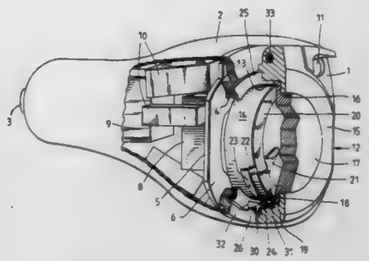
Tierry Marquis, Flamatt, Switzerland, assignor to Gfeller AG, Bern, Switzerland

Filed Feb. 19, 1985, Ser. No. 702,968

Claims priority, application Switzerland, Feb. 21, 1984, 831/84

Int. Cl.⁴ H04R *25/02*

U.S. Cl. 387—68.4 **7 Claims**



1. An in-the-ear hearing aid to be inserted in the auditory canal, of the type having a face plate, a housing adjoining and tapering away from said face plate, a button cell having a sidewall, and a cover hinged to said housing, wherein the improvemnt comprises:

said face plate including a central passage,

said cover including a recess having a cylindrical inside wall in the side of said cover nearest said housing and an opening in the side of said cover remote from said housing,

a pushbutton passing through said opening,

a mounting plate disposed on the side of said face plate nearest said housing,

a pressure switch dispoeed substantially in the middle of said central passage of said face plate on the side of said mounting plate nearest said face plate, and

means for holding said button cell axially displaceable between said pressure switch and said pushbutton in such a way that pressure exerted upon said pushbutton causes said button cell to move toward and rest against said pressure switch, thereby actuating said pressure switch.

4,634,816

COMMUNICATIONS HEADSET

Kieran O'Malley, Louisburgh; John Preisler, Riverside, and Bernl Larkin, Callan, all of Ireland, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 20, 1985, Ser. No. 713,930

Claims priority, application United Kingdom, May 21, 1984, 8412899

Int. Cl.⁴ H04M *1/05*

U.S. Cl. 379—430 **10 Claims**



1. A communication headset comprising an arcuate flexible headband extending in a plane; an arcuate member attached to each end of said headband, each arcuate member extending in a plane normal to said plane of said headband, each arcuate member extending in the same direction relative to said headband; a pivot member at each end of each arcute member, said pivot members of an arcuate member defining a pivotal axis parallel to said plane of said headband; an earpiece pivotally mounted in each arcuate member on said pivot members, the earpieces pivotal abut said pivotal axis parallel to said plane of said headband; an attachment member rotatably mounted on a back surface of one of said earpieces, the rotational axis of said attachment member being normal to the pivotal axis of the earpiece; a microphone boom attached at one end to said attachment member for rotational and swinging movement; an electret transmitter attached to the other end of said boom; a receiver in at least the earpiece havig the attachment member mounted thereon; and an electrical cord connection to the receiver and to the transmitter.

4,634,817

TROLLEY POLE RAISING AND LOWERING APPARATUS

Thomas W. Griffiths, and Vladimir Suris, both of Lexington, Ohio, assignors to Harvey Hubbell Incorporated, Orange, Conn.

Filed Oct. 30, 1985, Ser. No. 792,889

Int. Cl.⁴ B60L *5/12*

U.S. Cl. 191—67 **15 Claims**

1. A current collector apparatus comprising the commbination of

a base plate mountable on a vehicle;

a trolley pole support structure pivotably mounted on said base plate for pivotal movement about a first substantially horizontal axis;

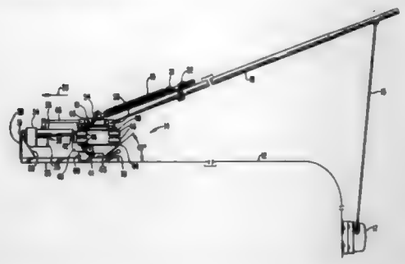
a trolley pole pivotably mounted on said support structure for movement about a second substantially horizontal axis;

spring means coupled between said support structure and said pole for urging said pole toward a raised position;

an actuator mounted on said base plate, said actuator having extendible arms means connected to said support structure for pivoting said support structure about said first hori-

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zontal axis between an upright position and a tilted, stowed position;
control means for selectively energizing said actuator to extend and retract said extendible arm means;
a pole support collar mounted for rotation about an axis which is substantially vertical when said support structure is in said upright position, said trolley pole being pivotably mounted on said collar;



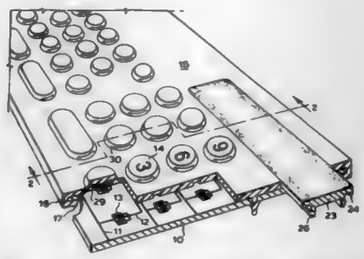
means on said collar defining a recess facing radially away from said substantially vertical axis; and
a latch member pivotably mounted on said support structure and extending below said recess in said upright position so that, when said support structure is tilted away from said upright position, said latch member enters said recess and substantially prevents rotation of said collar.

4,634,818

SWITCHES AND KEYBOARDS

Richard P. Hayes-Pankhurst, and Brian D. Smith, both of London, United Kingdom, assignors to NPM International, London, England

PCT No. PCT/GB85/00049, § 371 Date Sep. 26, 1985, § 102(e) Date Sep. 26, 1985, PCT Pub. No. WO85/03595, PCT Pub. Date Aug. 15, 1985
PCT Filed Feb. 4, 1985, Ser. No. 783,927
Claims priority, application United Kingdom, Feb. 3, 1984, 8402974
Int. Cl.⁴ H01H *13/70*
U.S. Cl. 200—5 A **10 Claims**



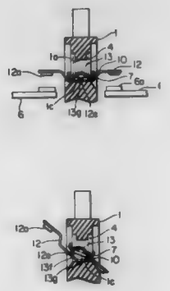
1. A keypad consisting of a combined cover and membrane (15) of resiliently deformable material and a substrate (10) bearing open-circuit conductors (12, 13) against which substrate (10) of the combined cover and membrane (15) is positioned with otherwise unsupported integral touch pads (14) disposed in an array and each raised from the surrounding membrane (15) by an angled wall (30) arranged so that finger pressure on any touch pad (14) depresses it until a conductive surface (29) on the underside of the touch pad (14) contacts the substrate (10) and makes the circuit between the conductors (12, 13), characterized in that:
(a) each touch pad (14) and the surrounding membrane (15) are relatively thick and the wall (30) is relatively thin, and the thickness and angle of the wall are such that each touch pad (14) can be depressed without deflecting the surrounding membrane (15);
(b) the length of each wall (30) between the membrane and the associated touch pad is relatively small in comparison with the width of the associated touch pad (14) and each wall (30) is arranged to give way through an over-center position to give a tactile sensation; and
(c) each conductive surface (29) occupies most of the width of the associated touch pad (14), the conductive surface (20) being convex with a radius of curvature selected in relation to the length and angle of the wall (30) and the touch pad (14) size (ϕB) and travel so that the conductive surface (29) makes face to face contact with the substrate (10) over the full range of angles to which the touch pad (14) tilts when the finger pressure is asymmetric.

4,634,819

MOVABLE CONTACT ASSEMBLY FOR A SWITCH

Kosaku Ikeda, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 19, 1985, Ser. No. 746,319
Claims priority, application Japan, Jun. 20, 1984, 59-90684[U]
Int. Cl.⁴ H01H *1/20, 15/04*
U.S. Cl. 200—16 A **5 Claims**



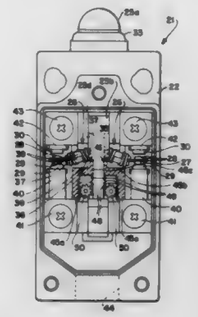
1. A movable contact assembly of a switch for use with a stationary contact assembly including stationary contact elements comprising:
movable contact elements engageable with the stationary contact elements;
a movable contact arm carrying said movable contact elements;
an electrically insulating contact holder movable between open and closed positions, said contact holder holding said movable contact arm;
a compression spring for resiliently holding said movable contact arm relative to said contact holder;
a spring retainer disposed between said compression spring and said movable contact arm;
means for guiding said movable contact arm into a predetermined operative positional relationship relative to said movable contact holder under the spring force of said compression spring including means on said spring retainer defining a laterally spaced pair of first and second oppositely facing sloped guiding surfaces;
means on said movable contact arm defining a pair of first and second sloped guided surfaces facing said pair of first and second guiding surfaces of said spring retainer;
said sloped guiding surfaces of said spring retainer, in cooperation with the sloped guiding surfaces of said movable contact arm, guiding said movable contact arm into a predetermined operative positional relationship relative to said movable contact holder due to the spring force of said compression spring.

4,634,820

QUICK-BREAK ELECTRICAL SWITCH WITH RECTILINEARLY MOVABLE PLUNGER ACTUATOR

Masayoshi Noguchi, Tottori, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 26, 1984, Ser. No. 674,748
Claims priority, application Japan, Nov. 24, 1983, 58-181872[U]; Dec. 19, 1983, 58-195956[U]
Int. Cl.⁴ H01H *15/00*
U.S. Cl. 200—16 A **12 Claims**



1. An electrical switch comprising, a plunger adapted to receive an external axial force applied thereto and movable along its axial direction, at least one movable piece extending substantially normal to the plunger and having at least one movable contact securely fixed to an end of the movable piece, a fixed contact securely fixed to a fixed member opposite to the movable contact, a compression spring means engaged between an intermediate portion of the plunger and an intermediate portion of the movable piece such that the movable piece is driven along the axial direction of the plunger through a toggle action of the compression spring means as the plunger is actuated along its axial direction, said switch further comprising:
a disengagement member; and
a force transmitting means comprising rack and pinion gear means for transmitting said axial force applied to the plunger to the disengagement member;
the disengagement member having a driving surface for pressing against the movable piece along a direction parallel to the motion of the movable contact away from the fixed contact as the axial force applied to the plunger is transmitted to the disengagement member by the force transmitting means.

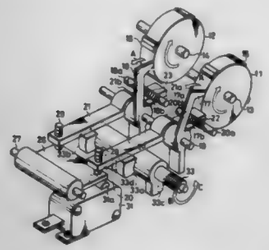
4,634,821

SWITCHING APPARATUS FOR A TIME SWITCH

Ichiro Fujiwara, Hiroshima, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 12, 1985, Ser. No. 743,839
Claims priority, application Japan, Jun. 12, 1984, 59-122481; Jun. 12, 1984, 59-122483; Jun. 12, 1984, 59-122484; Jun. 12, 1984, 59-122485
Int. Cl.⁴ H01H *43/06*
U.S. Cl. 200—38 FB **8 Claims**

1. A switching apparatus, comprising:
a plurality of scale disks rotating with different periods;
setting means disposed on circumferential portions of said disks for defining switching timing;
a plurality of lever means, rotatable independently from each other, for rotating with respect to said setting means;
a lever connected to at least one of said lever means at at least one time point within any given time interval and rotatable in a first direction by the rotation in a second direction opposite said first direction, of any one of said lever means;
a switch actuated by the position of said lever; and



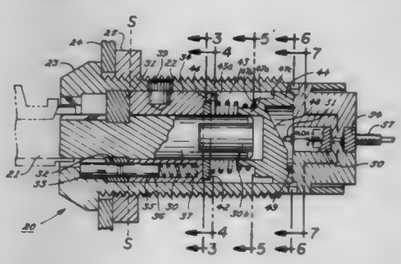
mechanical defeating means for preventing the rotation of said lever in any direction regardless of the rotations of said lever means.

4,634,822

MULTIPLE OPERATION SWITCH LOCK

Alan G. Goeke, River Grove, Ill., assignor to Fort Lock Corporation, River Grove, Ill.

Filed Nov. 15, 1985, Ser. No. 798,327
Int. Cl.⁴ H01H *27/06*
U.S. Cl. 200—43.08 **16 Claims**



1. A key actuated tubular lock capable of a plurality of locking functions, each with switch operating capability, said lock comprising:
an outer substantially cylindrical barrel having forward and rear ends, a stationary tumbler sleeve having forward and rear ends telescoped into the rear end portion of said barrel, a locking spindle extending through and rotatably mounted in said stationary tumbler sleeve, a rotatable driver sleeve fixed to said spindle and disposed within said barrel in face-to-face relation with the forward end of said stationary tumbler sleeve, axially extending and angularly spaced driver and tumbler pins slidably mounted in holes in said stationary tumbler sleeve and said rotatable driver sleeve and normally operable to prevent rotation of said spindle with respect to said stationary tumbler sleeve,
a multiple operation switch operating assembly adapted to be operated by rotation of said locking spindle through use of a proper key, said switch assembly comprising:
a first member adapted to be received to be receiver over the spindle for rotation therewith, said member having means adapted to interfit with stop means provided on the rear end of said stationary sleeve,
a second member having a front end adapted to be coupled to said spindle for rotation therewith and a rear end having a contoured cross sectional surface,
spring means interposed between said first and second members and rigidly attached in a removable manner to the latter, said spring also having means capable of abutting

said stop means on the stationary sleeve in order to offer resistance to rotational motion of said second member, and

a switch subassembly, including a microswitch and a switch operating member associated therewith, positioned with said operating member facing said contoured surface on the second member whereby the operating member is contacted so that said microswitch is off when the locking spindle is in a first position and on when the spindle is key actuated to a second position,

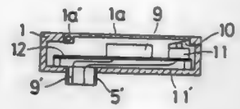
said first and second members and said spring means of the multiple operation switch assembly being adapted to be assembled according to a plurality of arrangements so that they coact differently with each other and with said stop means on said stationary sleeve, thereby providing the plurality of locking functions for the lock.

4,634,823

UNIT-TYPE OPERATING APPARATUS

Yoshifumi Fusaka, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 5, 1985, Ser. No. 762,323
Claims priority, application Japan, Aug. 6, 1984, 59-166858
Int. Cl.⁴ H01H *3/16*
U.S. Cl. 200—61.58 R **4 Claims**



1. A unit-type operating apparatus for controlling operation of electrical devices of an apparatus main unit having a plurality of operation stations comprising:

at least one operating unit having a predetermined shape and size;

at least one electrical control switch positioned within said operating unit for controlling at least one operation of at least one electrical device of the apparatus main unit;

at least one operating unit electrical connector operatively connected to said operating unit and in electrical contact with said at least one electrical control switch;

an operating part mounted to the apparatus main unit having at least two receiving parts each having a receptacle of predetermined size and shape as the at least one operating unit;

at least one operating part electrical connector located within each receiving part operatively connected to said operating part and in electrical contact with an electrical device of the apparatus main unit, that is compatible and comes into electrical contact with the at least one operating unit electrical connector when said at least one operating unit is received in the receptacle of one of said at least two receiving parts;

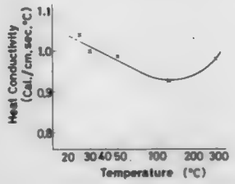
one of said at least two receiving parts is positioned at the left side of the apparatus main unit and one of said at least two receiving parts is positioned at the right side of the apparatus main unit relative to a person operating the apparatus main unit for positioning said at least one operating unit at the left or right side of the apparatus main unit for providing greater operating efficiency by reducing the distance between the at least one electrical control switch and an operation station of the apparatus main unit and for eliminating the need and extra cost for duplicate operating units.

4,634,824

MINIATURIZED ELECTRIC CONTACT ASSEMBLY FOR MICROSWITCH

Tetsuo Takano, 446 Tachihongo, Yatsuomachi, Nei-gun, Toyama-ken, Japan

Continuation-in-part of Ser. No. 430,357, Sep. 30, 1982, abandoned. This application Mar. 1, 1985, Ser. No. 707,404
Claims priority, application Japan, Oct. 13, 1981, 56-161974; Dec. 28, 1981, 56-209726; Jul. 26, 1982, 57-129009
Int. Cl.⁴ H01H *1/02*
U.S. Cl. 200—266 **4 Claims**



1. A contact assembly for a microswitch, comprising:

a base material having a hole formed therein; and

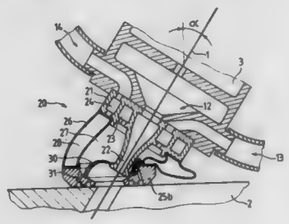
a contact material inserted into and calked in the hole in the shape of a rivet, wherein said base material comprises a copper alloy having iron phosphide crystallized therein, having an electrical conductivity of 96–97 (% IACS), having a heat transfer rate of not less than 1.0 (cal/cm, sec, °C.) at a temperature of approximately 20° C. and having a chemical composition of 0.025 to 0.040% by weight of phosphorus, 0.05 to 0.15% by weight of iron and the remainder copper.

4,634,825

APPARATUS FOR SCAVENGING THE EROSION ZONE OF SPARK-EROSIVE CUTTING PLANTS

Josef Budin, Minusio; Boris Sciaroni, Locarno; Beat Kilcher, Arcegno, and Gideon Levy, Orselina, all of Switzerland, assignors to AG fur industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

Filed May 14, 1985, Ser. No. 734,411
Claims priority, application Switzerland, May 16, 1984, 2409/84
Int. Cl.⁴ B23H *7/10*
U.S. Cl. 219—69 W **16 Claims**



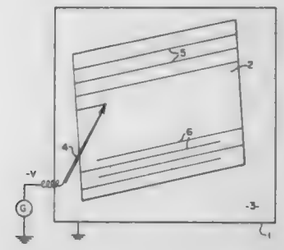
1. In a spark-erosive cutting plant having a wire or strip-like tool electrode and tool electrode guide means arranged above and below a workpiece to be machined for guiding the tool electrode through the workpiece and controllable for optionally setting the tool electrode at an angle relative to the workpiece during machining, an erosion zone being formed between the tool electrode and the workpiece, an apparatus for scavenging the erosion zone with a fluid scavenging medium during the spark-erosive machining of the workpiece comprising: a scavenging chamber located on at least one side of the workpiece and formed as a deformable annular sleeve surrounding the tool electrode, the scavenging chamber being operatively connected at one end to the tool electrode guide means by a substantially fluid tight seal; and a circumferential slide ring means attached to the other end of the scavenging chamber and adapted to slideably seal against the workpiece surface around the tool electrode; the scavenging chamber further comprising wall means for adapting the scavenging chamber to the position of the slide ring means on the workpiece surface during machining.

4,634,826

METHOD FOR PRODUCING ELECTRIC CIRCUITS IN A THIN LAYER, THE TOOL TO IMPLEMENT THE METHOD, AND PRODUCTS OBTAINED THEREFROM

Ionel Solomon, Boulogne; Jacques Méot, Paris, and Patrick Meligne, Mennecy, all of France, assignors to Solems S.A., France

Filed Feb. 20, 1985, Ser. No. 703,571
Claims priority, application France, Feb. 20, 1984, 84 02490
Int. Cl.⁴ H01L *21/326;* **B23H** *7/02*
U.S. Cl. 219—69 M **8 Claims**



1. A method of producing desired electric circuits in a thin layer having certain electrical conductivity, comprising the steps of:

depositing the thin layer onto an insulating electric substrate;

submerging the thin layer into an environment which, when properly stimulated, is capable of electro-chemically changing the chemical composition of the thin layer;

applying the tip of an electro-erosion tool to the thin layer for producing between the tip and the thin layer an electro-erosion arc, the arc and the environment electro-chemically changing the thin layer at the point of the arc contact for producing an insulating compound having chemical composition different from the thin layer at the contact point thereof; and

moving the tool in relation to the thin layer along a predetermined insulation path for producing in the thin layer the desired circuits.

4,634,827

ELECTRICAL DISCHARGE MACHINING APPARATUS INCLUDING GAP CONDITION DETECTION CIRCUITRY

Roland L. Syria, Utica; John J. Purrett, Troy, and Eric Jefferson, Detroit, all of Mich., assignors to Xermac, Inc., Royal Oak, Mich.

Filed Feb. 15, 1985, Ser. No. 702,130
Int. Cl.⁴ B23H *1/02, 7/18*
U.S. Cl. 219—69 G **5 Claims**

1. An electrical discharge machining apparatus comprising:

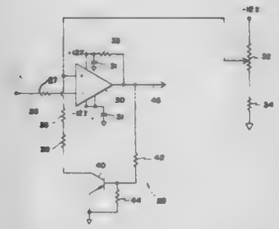
first generating means for generating intermittent electrical discharges between an electrode and an electrically conductive workpiece, each of said discharges having a voltage waveform including an ignition voltage and a cutting voltage, the value of the cutting voltage being less than the value of the ignition voltage;

regulating means for regulating the relative displacement between the electrode and the workpiece;

conditioning means for conditioning the voltage waveforms to provide a conditioned voltage signal related to the magnitude of the ignition voltages, the magnitude of the ignition voltages defining a discharge envelope;

second generating means for generating in succession first and second reference voltage signals, the value of the first reference voltage signal being greater than the value of the second reference voltage signal; and

determining means for determining when the value of the conditioned voltage signal falls below the value of the first reference voltage signal and providing a first control signal, said second generating means automatically stopping generation of said first reference signal and starting generation of said second reference voltage signal in response to said first control signal wherein said regulating means is responsive to said first control signal to increase the displacement between the electrode and the workpiece, the duty cycle of said first generating means decreasing in response to said first control signal and wherein said determining means determines when the value of the conditioned voltage signal is greater than the value of the second reference voltage signal and providing a second control signal, said second generating means automatically stopping generation of said second reference signal and starting generation of said first reference signal in response to said second control signal, said regulating means decreasing the relative displacement between the electrode and the workpiece in response to the second control signal and the duty cycle of said first generating means increasing in response to the second control signal whereby said second generating means provides a dynamic reference voltage signal to prevent the electrode from backing off from the workpiece an inordinate amount when a contamination problem exists in the gap between the electrode and the workpiece.



4,634,828

CONTROL METHOD OF RESISTANCE WELDING

Yoshio Okabe, and Masato Furudate, both of Kanagawa, Japan, assignors to Dengensha Manufacturing Company Limited, Kanagawa, Japan

Filed Sep. 20, 1985, Ser. No. 778,467
Claims priority, application Japan, Sep. 21, 1984, 59-199250
Int. Cl.⁴ B23K *11/24*
U.S. Cl. 219—117.1 **2 Claims**

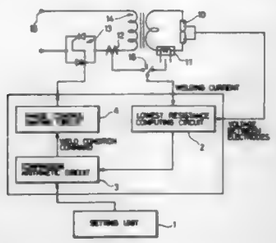
1. A control method of resistance welding for controlling weld conditions in response to a change in material of weldments, comprising the steps of

detecting a local lowest value of resistance between electrode tips appearing in an initial welding period,

comparing the lowest value detected with a plurality of preset reference resistance values which correspond to different weldment materials and which are divided into

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plural classes to determine the material of a weldment in progress, and



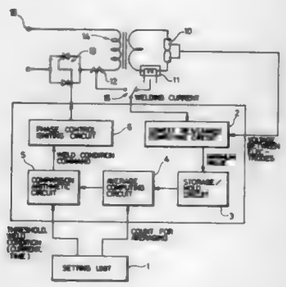
changing the weld conditions depending upon the determined material.

4,634,829

CONTROL METHOD OF SPOT WELDING

Yoshio Okabe, and Masato Furudate, both of Kanagawa, Japan, assignors to Dengensha Manufacturing Company Limited, Kanagawa, Japan

Filed Sep. 20, 1985, Ser. No. 778,454
Claims priority, application Japan, Sep. 21, 1984, 59-199249
Int. Cl.⁴ B23K *11/24*
U.S. Cl. 219—117.1 **1 Claim**



1. A spot welding control method for controlling welding conditions in response to changes in the shape of the points of the welding electrodes, comprising;

monitoring the electrical resistance between said welding electrodes in the course of each welding operation, to detect the minimum resistance between said electrodes at least during an initial period of each welding operation;

holding and storing successive minimum resistance values so detected;

maintaining a set of said successive minimum resistance values, said set being comprised of the most recent detected value plus a fixed predetermined number of successive previously detected values;

computing the average of said set of successive minimum resistance values;

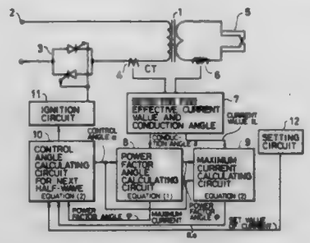
comparing said average with a plurality of threshold values; and, each time said average reaches one of said threshold values, modifying said welding conditions to compensate for the change in said average, such that said welding conditions are maintained constant so long as said average remains between successive threshold values, said threshold values being selected in correspondence with the degree of wear of said welding electrodes.

4,634,830

METHOD OF CONTROLLING CONSTANT-CURRENT FOR RESISTANCE WELDING MACHINES

Masato Furudate, Kanagawa, Japan, assignor to Dengensha Manufacturing Company Limited, Japan

Filed Nov. 19, 1985, Ser. No. 799,685
Claims priority, application Japan, Nov. 19, 1984, 59-244238
Int. Cl.⁴ B23K *11/24*
U.S. Cl. 219—117.1 **3 Claims**



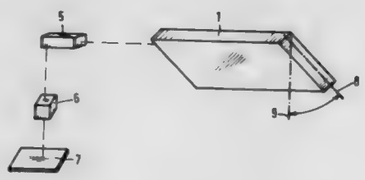
1. A method of controlling constant-current for a resistance welding machine, comprising the steps of: detecting the current flowing into the primary coil or the secondary coil of a welding transformer; applying a first half-wave of current having a predetermined first phase control angle of approximately 120° to 150°; detecting the magnitude of current and the current conduction angle during said first half-wave; calculating a power factor angle of said resistance welding machine from said detected conduction angle and said first phase control angle; calculating a second phase control angle, by which a value of current corresponding to a previously set value of the next half-wave of current is obtained, from said calculated power factor angle, said detected conduction angle and said detected current value; and applying said next half-wave of current at said second phase control angle through a thyristor circuit to a work to be welded.

4,634,831

LASER-MACHINING APPARATUS

Hinrich Martinen, Quickborn; Samuel S. Simonsson, Winsen/-Bahlburg, and Peter Wirth, Winsen/Ludorf, all of Fed. Rep. of Germany, assignors to Rofin-Sinar Laser, Hamburg, Fed. Rep. of Germany

Filed Jan. 30, 1984, Ser. No. 575,227
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1983, 8304141[U]
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 LG **4 Claims**



1. A laser apparatus comprising

resonator means for emitting a laser beam,

means for circularly polarizing the laser beam emitted from the resonator means,

lens means for focusing the laser beam from said circular polarizing means to a workpiece, said laser beam from said circular polarizing means to said lens means having a longitudinal axis, and

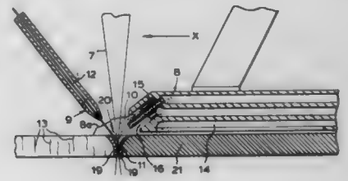
said resonator means having folding mirror means for linearly polarizing said laser beam, said folding mirror means having a plane of reflection, said resonator means being positioned relative to said circular polarizing means so that the plane of reflection of said mirror means is approximately 45 degrees to said longitudinal axis.

4,634,832

LASER-BEAMWELDING

David R. Martyr, Newcastle upon Tyne, England, assignor to British Shipbuilders, Newcastle upon Tyne, England

Filed Apr. 18, 1984, Ser. No. 601,424
Claims priority, application United Kingdom, Apr. 20, 1983, 8310630; Apr. 20, 1983, 8310631; Apr. 20, 1983, 8310632
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 LC **10 Claims**



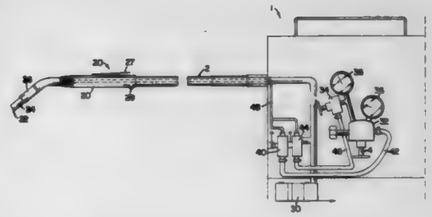
1. A method for the welding together of portions of metal plate comprising the steps of: locating the portions to be welded in as close contact as their surfaces permit; causing a focussed high-energy laser beam to travel along the said line of best contact, said laser beam having power in the range of 5 to 25 kW; continuously feeding a separate compatible beam-interceptor wire so as to locate it generally at the beam focus; and directing a supply of gas towards the beam focus to at least partially confine a plasma at least partially formed by impingement of the focussed beam upon the interceptor wire.

4,634,833

FIRE EXTINGUISHING SYSTEM FOR AN ELECTRIC ARC WELDING APPARATUS

Christian Chemaitz, Allerupvej 5, Hjallerup DK-9320, Denmark

Continuation-in-part of Ser. No. 574,269, Jan. 26, 1984, abandoned. This application Nov. 8, 1985, Ser. No. 796,271
Claims priority, application Denmark, Feb. 16, 1983, 668/83
Int. Cl.⁴ B23K *9/16*
U.S. Cl. 219—137 R **3 Claims**



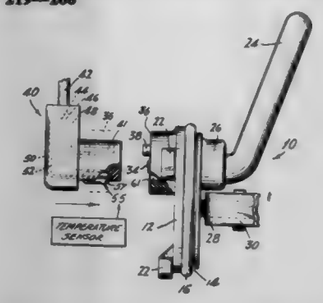
1. A method of extinguishing fires from an electric arc welder having a welding torch with an electrode and an outlet to supply a non-flammable gas to the welding site, the gas being supplied from a single supply through flow restrictor means having two levels of flow, each activated by switch means in said welding torch comprising the steps of activating said switch means to provide a first predetermined gas flow to shield the welding site from air, and activating said switch means to provide a second and greater flow of gas to the welding site to extinguish the fire.

4,634,834

TEMPERATURE CONTROLLED ELECTRIC ENGINE BLOCK

Peter J. Lupoli, Hamden, and Donald J. Mattis, Norwalk, both of Conn., assignors to Casco Products Corporation, Bridgeport, Conn.

Filed Oct. 17, 1985, Ser. No. 788,336
Int. Cl.⁴ H05B *1/02, 3/82;* F02N *17/04;* H01C *7/04*
U.S. Cl. 219—208 **9 Claims**



1. A heater for internal combustion engines, comprising in combination:

(a) a base member having means for attaching it in an opening of an engine block,

(b) an electric heater element carried by said base member, said element being adapted to be exposed to the interior area of the block and being adapted to heat the coolant thereof,

(c) electric terminals carried by the base member and connected to said heater element to effect energization of the same,

(d) an electric supply cable having a molded plug detachably mounted on the base member, said plug having termial means cooperable with said electric terminals to effect an electrical circuit therethrough, and

(e) a heat-responsive sensor device carried by the plug to respond to transfer of heat from the base member thereto for the purpose of controlling the energization of the heater element,

(f) said terminal means comprising elongate connectors,

(g) said plug having a boss surrounding said connectors and mounting the same,

(h) said sensor device being inbedded in said boss of the plug,

(i) said base member having an encircling integral side wall portion in which the boss of the plug is received,

(j) said sensor device having an exposed sloping leading surface at a side of the boss to facilitate insertion of the plug into said boss receiving side wall portion, and said sensor device engaging and bearing against the inside of said encircling side wall portion of the base member in good heat-exchanging relation therewith.

4,634,835

ANTI-DAZZLE DEVICE FOR A REARVIEW MIRROR OF A MOTOR VEHICLE

Masaru Suzaki, Chiryu, Japan, assignor to Kabushiki Kaisha Tokai Denki Seisakusho, Aichi, Japan

Filed Aug. 1, 1985, Ser. No. 761,569
Claims priority, application Japan, Aug. 1, 1984, 59-163339
Int. Cl.⁴ H05B *3/36*
U.S. Cl. 219—219 **8 Claims**

1. An anti-dazzle device for a rearview mirror of a motor vehicle having a driver's seat positioned adjacent the rearview mirror and a headlight lighting circuit comprising:

a mirror member having a reflective mirror layer;

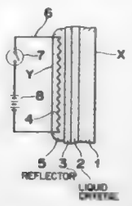
a heat sensitive color-changing film layer applied across the reflective mirror layer;

an electric heater attached to the mirror member for providing heat energy to the heat sensitive film layer, the heat sensitive, color changing layer being transparent or at least so dim a color that light can easily pass through the

layer at normal ambient temperatures of the mirror member, while it becomes translucent or so dark a color that light can hardly pass through when it is heated by the heater;

a power source for the heater;

operating switch means provided adjacent the driver's seat for activiating the electric heater; and



a contact circuit connected to the power source and connectable to the operating switch means to enable the electric heater at the option of a driver, the operating switch means being operatively connectable to one of the contact circuit and the headlight lighting circuit at the option of the driver.

4,634,836

ELECTRIC TRAVEL IRON USING A HAIR-DRYER AS A COMPONENT

Yücel Yamac, Graz, Austria, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

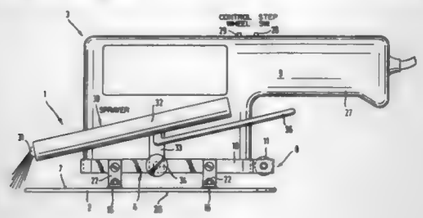
Division of Ser. No. 451,151, Nov. 30, 1982, Pat. No. 4,524,263. This application Dec. 5, 1984, Ser. No. 678,278

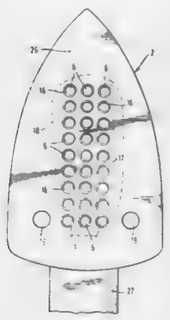
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115696; Nov. 29, 1982, 3202978

The portion of the term of this patent subsequent to Jun. 18, 2002, has been disclaimed.

Int. Cl.⁴ D06F *75/00*; A45D *20/12*; H05B *1/00*

U.S. Cl. 219—249 **12 Claims**





1. Electric iron, comprising:

a hand-held hot air type hair-dryer constituting an upper component of the iron, sair hair dryer having a hand grip, providing its heating unit as a heat source for the iron, and having an oulet duct for discharge of a hot air stream from an open end of said duct;

an ironing plate, and

means (**8**) for connecting said ironing plate to said hot air outlet duct and holding said ironing plate facing said open end of said duct and spaced therefrom, thereby presenting a direct hot-air impingement surface region of said ironing plate lying directly in front of said open duct and for impingement of hot air thereagainst,

said ironing plate (**2**, **2***a*) being rigidly fastened to said connecting means so as to be held in a position such as to deflect air laterally in all directions, having a plane upper side (**7**) facing said open duct end (**4**, **4***a*) and extending laterally outward from said direct hot-air impingement surface region and hence beyond the contour (**18**, **18***a*) of said open duct end (**4**, **4***a*) for providing a rim region capable of being heated by hot air laterally deflected from said direct hot-air impingement surface region, and having holes (**6**) for access of air to material being ironed, said holes being located in said direct hot-air impingement surface region of said ironing plate, and at least a predominant number of said holes being located in a group (**17**,**17***a*) shaped corresponding to said contour (**18**, **18***a*) of said open duct end (**4**, **4***a*).

4,634,837

SINTERED CERAMIC HEATER ELEMENT

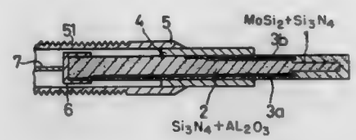
Norwei Ito, Nukata; Kinya Atsumi, Toyohashi; Hitoshi Yoshida, and Morihiro Atsumi, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Mar. 29, 1985, Ser. No. 717,875

Claims priority, application Japan, Apr. 9, 1984, 59-70670

Int. Cl.⁴ H05B *3/12*; F02P *19/02*

U.S. Cl. 219—270 **4 Claims**



1. A ceramic heater comprising:

(1) a heater element formed of an electrically conductive ceramic sintered body;

(2) a heater support member formed of an electrically insulating ceramic sintered body, said heater element being affixed to one end of said heater support member; and

(3) an electric current supply means for supplying an electric current to said heater element;

said heater element being formed of a sintered body of a mixture consisting essentially of $MoSi_2$ powder and 35 to 75 mol% of Si_3N_4 powder, the average particle diameter of $MoSi_2$ powder being not greater than 2 μm and the average particle diameter of said Si_3N_4 powder being at least twice as large as that of said $MoSi_2$ powder.

4,634,838

ELECTRICALLY HEATED COFFEE PERCOLATOR

Hans-Peter Berz, Zurich, Switzerland, assignor to Intropa S.A., Panama, Panama

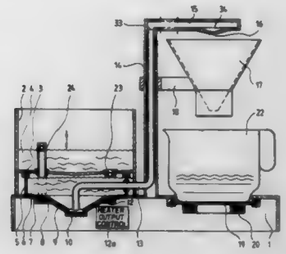
Filed May 14, 1984, Ser. No. 609,723

Claims priority, application European Pat. Off., Nov. 29, 1983, 83109772.0

Int. Cl.⁴ H05B *1/00*; A47J *31/057, 31/56*

U.S. Cl. 219—297 **13 Claims**

1. In an electrically heated coffee percolator of the type including a fresh water container, a heatable hot water chamber receiving water from said fresh water container through a non-return valve, and a riser pipe extending from said hot water chamber to a boiling water outlet, the improvement comprising said hot water chamber having a sufficient volumetric capacity to receive, through said nonreturn valve, and retain about 30 to 60% of the volumetric amount of fresh water required for a complete coffee infusion, said fresh water container being disposed immediately above said hot water chamber and a fresh water container bottom wall having said nonreturn valve located therein separating said hot water chamber from said fresh water container and serving as a common wall therebetween.



4,634,839

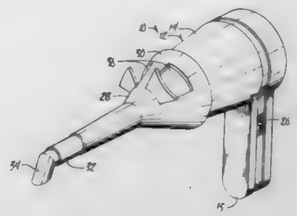
FILTERED WARM AIR DRYING DEVICE

John E. Gilbertson, 2200 Ashworth Rd., West Des Moines, Iowa 50265

Filed Jan. 7, 1985, Ser. No. 689,457

Int. Cl.⁴ H05B *1/00*; A45D *20/08*; F24H *3/04*

U.S. Cl. 219—373 **5 Claims**



1. An air drying device comprising:

a housing having air inlet and air outlet openings;

a plurality of rotatable fan blades within said housing for drawing air through said inlet opening and projecting air out said outlet opening toward an enlarged area to be dried;

motor means operatively connected to said fan blades for rotating said blades;

a detachable nozzle having a first open end mounted over said air outlet opening and having a second open end with a cross-sectional area less than that of said first end for directing air toward a reduced area to be dried;

said nozzle having an exhaust vent between said first and second ends for escape of air thereby preventing overheating of said motor means;

said nozzle further including an air deflector adjacent said exhaust vent for directing the escaping air away from said second end of said nozzle; and

a removable air filter means for removing microscopic impurities from the air prior to projection of the air from said second end of said nozzle.

3. The device of claim 1 further comprising heating means within said housing for warming the air drawn into said device prior to projection therefrom.

4,634,840

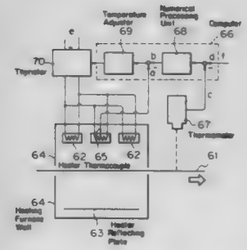
METHOD OF HEATING THERMOPLASTIC RESIN SHEET OR FILM

Naomichi Yamagishi; Kenji Mori; Tsuguo Okumura, all of Ibaraki; Tatsufumi Hiratsuka, and Masayoshi Sugiyama, both of Tsuchiura, all of Japan, assignors to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed Apr. 3, 1985, Ser. No. 719,289

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—388 **7 Claims**



1. A method of continuously heating a broad and continuous thermoplastic film by using a plurality of radiation heating furnaces, wherein in the interior of each radiation heating furnace, at least one row of heaters are arranged perpendicularly to the travelling direction of the film to be heated, a thermometer for measuring the temperature of the film is arranged in the vicinity of an outlet for the film outside each radiation heating furnace, and outputs of heaters arranged within the radiation heating furnaces located just before the respective thermometers are controlled based on the temperatures detected by the respective thermometers by using a computer.

4,634,841

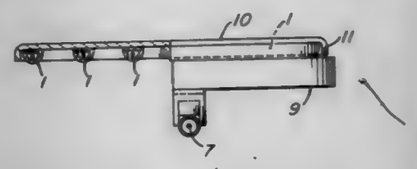
COVER FOR COOKING STOVE HEATING ELEMENT

James C. Laughrey, 2334 McNary Blvd., Pittsburgh, Pa. 15235

Filed Jun. 18, 1985, Ser. No. 745,930

Int. Cl.⁴ H05B *3/68*

U.S. Cl. 219—464 **6 Claims**



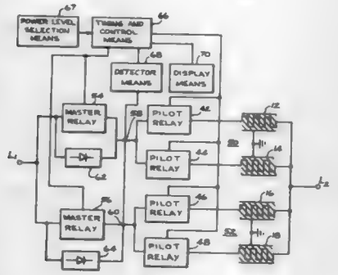
1. A cover for a heating element of a cook stove comprising a thin flat plate having a depending skirt formed around the periphery and formed of an electrical insulating ceramic material which comprises about 45% clay, 35% kyanite and about 25% talc.

4,634,842

DIAGNOSTIC TESTING ARRANGEMENT FOR AN ELECTRIC COOKING APPLIANCE INCORPORATING COMMUTATED RELAY SWITCHING CIRCUITS

Thomas R. Payne, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 28, 1984, Ser. No. 687,461
Int. Cl.⁴ H05B 1/02
U.S. Cl. 219—486 **10 Claims**



1. A power control and diagnostic circuit for an appliance of the type having a plurality of electric heating units and user actuable input means enabling the user to select from a plurality of power settings for each unit, said control and diagnostic circuit comprising:

a plurality of pilot relays, each relay having contacts serially connected to an associated one of the heating units forming a pilot relay/heating unit combination; said pilot relay/heating unit combinations being divided into two or more sets, within each set, said combinations being connected in parallel to form a parallel array for each set.

a master relay associated with each of said parallel arrays, having a set of contacts serially connecting its associated one of said parallel arrays to an external AC power supply;

a commutating diode associated with each master relay operatively coupled in parallel with the contacts of said associated master relay;

timing and control means for controlling switching of said master and pilot relays during operation in a normal mode to control the output power of said heating units in accordance with user selected power settings, said timing and control means including means for periodically interrupting operation in the normal mode for operation in a diagnostic mode in which said master relays and pilot relays are switched to predetermined states, independently of the user selected power settings, in a predetermined switching sequence selected to separately test said master relays, diodes and pilot relays respectively for failure to operate properly;

said timing and control means including means for monitoring the voltage at the junction of said master relay contacts and said pilot relay contacts to detect failures of said master relays, pilot relays and diodes, and means operative in response to detection of a failure, to de-energize said master and pilot relays for that one of said parallel arrays in which the failure is detected and to enable said other parallel array arranged to continue normal operation upon completion of the diagnostic mode; and

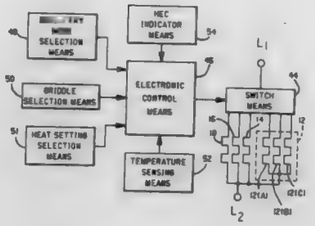
display means responsive to said timing and control means operative to provide a user discernible signal informing the user that a failure has been detected and which of said arrays contains the failure.

4,634,843

DUAL MODE POWER CONTROL ARRANGEMENT FOR COOKING APPLIANCE

Thomas R. Payne, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 16, 1986, Ser. No. 819,388
Int. Cl.⁴ H05B 1/02
U.S. Cl. 219—486 **12 Claims**



1. A power control arrangement for a cooking appliance of the type having at least two surface units adapted for energization by an external electrical power supply, which surface units are selectively operable in a normal mode and a dual mode in which a utensil is supported on and extends over the first and second surface units for heating by both units, a first one of the surface units having a higher wattage rating than the second one of the surface units, said power control arrangement comprising:

temperature sensing means for sensing the temperature of a utensil supported on one of the first or second surface units;

user operable input selection means including means for selecting the desired steady state temperature range for said one of the surface units, means for selecting the desired heat setting for the other surface unit, and means for selecting the dual operating mode; and

electronic power control means for controlling energization of the surface units, effective in the normal mode to operate said one surface unit at a power level established as a function of the selected temperature range and the sensed utensil temperature and to independently operate said other surface unit at a power level corresponding to the selected heat setting, and effective in response to selection of the dual operating mode to operate said one surface unit at a power level established as a function of the selected temperature and the sensed utensil temperature and to operate said other surface unit at a power level established as a function of the power level applied to said one surface unit to compensate for the characteristic wattage difference between said surface units whereby the effective heating level of both surface units is controlled as a function of the sensed utensil temperature and the heating level of said first surface unit is approximately equal to the effective heating level of said second surface unit resulting in relatively even heating of the utensil.

4,634,844

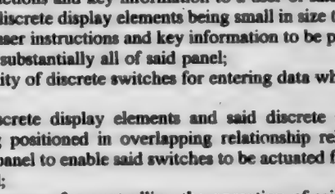
ELECTROWELDABLE SOCKET AND A DEVICE OF MANUFACTURING SUCH A SOCKET

Bernhard Lodder; Hans Overeijnder, both of Hardenberg, and Jan P. van Dongeren, Bergentheim, all of Netherlands, assignors to Wavin B.V., Zwolle, Netherlands

Filed Mar. 14, 1985, Ser. No. 711,637
Claims priority, application Netherlands, Mar. 14, 1984, 8400816
Int. Cl.⁴ H05B 3/58; F16L 13/02
U.S. Cl. 219—544 **8 Claims**

1. The method of manufacturing an electroweldable socket of thermoplastic material wherein the socket is provided internally in at least a local area with a lining of electrically conductive material near the inner wall of the socket comprising the steps of

(a) continuously passing an electrically conductive material into a transverse extrusion path of a source of thermoplastic material flowing from an extruder to form a conductive lining which is embedded in the extruded thermoplastic material,



(b) continuously drawing the extruded thermoplastic material and the electrically conductive material together in the form of a pipe from an extrusion source,

(c) thereafter cooling the thus extruded plastic pipe and electrically conductive material therein, and

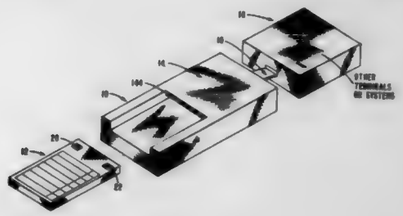
(d) thereafter cutting the pipe to the desired socket length.

4,634,845

PORTABLE PERSONAL TERMINAL FOR USE IN A SYSTEM FOR HANDLING TRANSACTIONS

William J. Hale; William R. Horst, both of Dayton, and Ellen P. Riley, Centerville, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 24, 1984, Ser. No. 685,622
Int. Cl.⁴ G06K 5/00
U.S. Cl. 235—350 **17 Claims**



1. A data handling device comprising:

a panel;

a plurality of discrete display elements arranged relative to said panel to present, when selectively energized, user instructions and key information to a user of said device; said discrete display elements being small in size to enable said user instructions and key information to be presented over substantially all of said panel;

a plurality of discrete switches for entering data when actuated;

said discrete display elements and said discrete switches being positioned in overlapping relationship relative to said panel to enable said switches to be actuated from said panel;

control means for controlling the operation of said device including said discrete display elements and said discrete switches so as to facilitate the displaying and entry of data;

said control means comprising:

means for storing data and a plurality of machine instructions; and

means for executing said machine instructions including means for selectively energizing said display elements so as to present on said panel that key information and those of said user instructions which are associated with those of said discrete switches which are to be used in association with said machine instructions being executed so as to present to said user a variable user instruction format and a variable key format which are a function of said machine instructions being executed as said machine instructions are executed so as to facilitate the entry of data; and

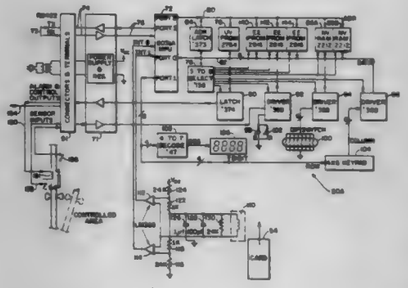
said device also including means for transferring data between said device and a second data handling device.

4,634,846

MULTIMODE PROGRAMMABLE STAND-ALONE ACCESS CONTROL SYSTEM

Roy L. Harvey, Milton, and Douglas Mason, Newton Center, both of Mass., assignors to American District Telegraph Company, New York, N.Y.

Filed May 22, 1984, Ser. No. 612,686
Int. Cl.⁴ G06K 5/00
U.S. Cl. 235—382 **13 Claims**



1. A card reader for decoding a user passcard having digitally encoded information thereon according to a system format, comprising:

a card sensor producing a sensor signal, corresponding to the passcard encoded signal;

means for providing a first and a second signal corresponding to said sensor signal; and

processor means for providing general card reader system processing and decoding of said passcard encoded signal according to said first and said second signal, wherein

said first and said second signal each produce an interrupt condition in said processor, causing other system processing to become suspended and begin a first and a second interrupt service routine to process the first and second signals to decode the card signal, wherein

said first and said second interrupt routines are operable to reconstruct the encoded digital signals from said first and said second digital signal.

4,634,847

CAPACITIVE DATA CARRIER READER

Machate Jürgen, Münchner Strasse 17c, 8017 Ebersberg, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,636
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3411240
Int. Cl.⁴ G06K 7/08
U.S. Cl. 235—451 **6 Claims**

1. Device for capacitive reading of data carriers

comprising a substrate of non-conductive material which carries a marking of conductive material at at least one of a plurality of predetermined mark locations,

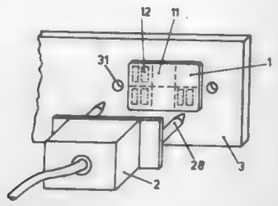
comprising an alternating voltage generating means (25, 26) which has two outputs for two transmission alternating voltage of the same amplitude in phase opposition,

characterized in that for each mark location of the data carrier there are provided:

(a) a pair of electrically conductive transmitting faces (21,

22) which are arranged in a plane adjacent each other and are each coupled to one of the transmission alternating voltage outputs,

(b) a pair of receiving faces (23, 24) which are arranged symetrically with respect to the transmitting faces (21, 22) in such a manner that the transmission alternating



voltages in phase opposition supplied to the transmitting faces generates substantially no voltage between the receiving surfaces when no effective data carrier marking is in the vicinity of said faces (21–24), and

(c) a differential amplifier which comprises two inputs which are connected to the receiving faces (23, 24) and an output to which a load means is connected.

4,634,848

CARD INFORMATION SELECTING SYSTEM

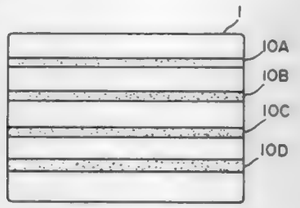
Yoshitsugu Shinohara, Shiga, and Masazumi Ichihashi, Kurita, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 14, 1984, Ser. No. 579,998

Claims priority, application Japan, Feb. 15, 1983, 58-23630; Feb. 15, 1983, 58-23631

Int. Cl.⁴ G06K *7/08*

U.S. Cl. 235—449 **8 Claims**



1. A system for reading a plurality of information channels provided on a card, each corresponding to a respective transaction type, said system comprising:

a card reader comprising:

a plurality of reading heads respectively associated with said information channels;

a plurality of signal processing circuits respectively connected to the outputs of said reading heads; and,

a card sensor for sensing when a card inserted into said card reader is in a position to be read;

means responsive to said card sensor for causing said reading heads to read information recorded on all of said information channels and for storing as data at respective storage locations signals at the outputs of said plurality of signal processing circuits;

means for selecting an information channel corresponding to a desired transaction; and,

means responsive to said selecting means for extracting for processing stored data corresponding to a selected channel.

4,634,849

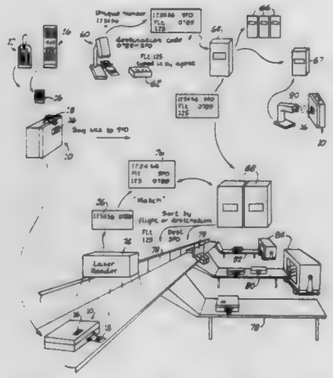
UNIQUELY NUMBERED BAGGAGE SPLIT TAG AND SYSTEM FOR HANDLING BAGGAGE

Leonard G. Klingen, 10700 SW. 134 Ter., Miami, Fla. 33176

Filed Apr. 2, 1985, Ser. No. 719,082

Int. Cl.⁴ G06K *19/00*

U.S. Cl. 235—487 **18 Claims**



1. An identification tag assembly of split construction primarily designed to identify a luggage piece during transport thereof, at least partially by a mechanically readable code, said tag assembly comprising:

(a) a base including a first surface and a second surface, said first surface disposed to define a first exposed surface of said tag assembly,

(b) a split construction comprising a plurality of tags supported on said base and secured to said second surface in aligned relation to one another so as to collectively define a second exposed surface of said tag assembly,

(c) said plurality of tags comprising a first tag separable from said base and structured for removable positioning on an exposed surface of a passenger's luggage piece, a second tag separable from said first tag and removably positionable on the passenger's luggage piece in spaced relation to said first tag, and a third tag separable from said base and said first and second tags and structured for carrying with the passenger,

(d) a first indicia means for identifying the luggage piece formed on said first tag and said second tag and structured to define coded indicia structured for mechanical reading thereof,

(e) a second indicia means for identifying the luggage piece and formed on said third tag and at least one of said first and second tags, and

(f) said first indicia means disposed and structured for mechanical reading thereof both when disposed, via said respective tags, on and off the luggage piece.

4,634,850

QUAD DENSITY OPTICAL DATA SYSTEM

Gerald A. Pierce, Redwood City, and James L. Buxton, East Palo Alto, both of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.

Continuation of Ser. No. 541,166, Oct. 12, 1983, abandoned. This application Nov. 4, 1985, Ser. No. 794,336

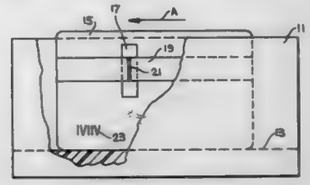
Int. Cl.⁴ G06K *19/00*

U.S. Cl. 235—487 **23 Claims**

1. An optical data storage and retrieval system comprising, an optical data storage medium having optically readable digital data encoded by microscopic spots in specified data cell positions on said medium thereby changing optical characteristics of the medium, said data cell positions forming a grid with perpendicular non-overlapping, rows

and columns of cell positions, said columns aligned with the length of said medium, and

a linear CCD array aligned perpendicular to said columns of cell positions, said array having a plurality of fixed posi-



tion detector cells imaging each specified data cell position in a row of cells, wherein at least two detector cells image a specified data cell position, with groups of detector cells simultaneously imaging a plurality of cell positions.

4,634,851

CONTROL DEVICE FOR AUTOMATIC FOCUSING

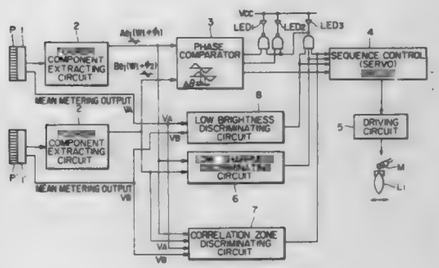
Akira Ogasawara, Yokohama; Sakuji Watsaabe, Warabi; Nobuhiko Terui, Tokyo; Ken Utagawa, Yokohama, and Kunihisa Hoshino, Kawasaki, all of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Continuation of Ser. No. 746,016, Jun. 19, 1985, abandoned, which is a continuation of Ser. No. 432,437, Oct. 4, 1982, abandoned. This application Feb. 19, 1986, Ser. No. 831,059

Claims priority, application Japan, Oct. 13, 1981, 56-163078

Int. Cl.⁴ G01J *1/20;* **G03B** *3/10*

U.S. Cl. 250—204 **15 Claims**



1. Focus adjusting apparatus for a camera in which an image of an object to be photographed is formed on a predetermined plane through a phototaking lens comprising:

(a) position detecting means for detecting an amount of and a direction of deviation of said object image with respect to said predetermined plane and generating a position detection signal indicating the detected amount and direction of the deviation;

(b) driving means for driving said phototaking lens in such a manner as to form said object image on said predetermined plane in accordance with said position detection signal;

(c) position discriminating means adapted for discriminating that said object image is positioned within a vicinity range around said predetermined plane and accordingly generating a position discrimination signal;

(d) contrast discriminating means adapted for discriminating that the contrast of said object is below a predetermined level and accordingly generating a contrast discrimination signal; and

(e) means for impeding said driving means from driving said phototaking lens in response to generation of both said position discriminating signal and said contrast discrimination signal but permitting said driving when only said position discrimination signal is generated.

4,634,852

SENSOR USING FIBER OPTIC INTERFEROMETER

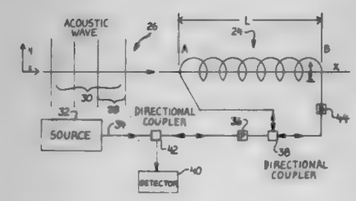
Herbert J. Shaw, Stanford, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

PCT No. PCT/US83/00534, § 371 Date Dec. 13, 1983, § 102(e) Date Dec. 13, 1983, PCT Pub. No. WO83/03685, PCT Pub. Date Oct. 27, 1983

Continuation-in-part of Ser. No. 368,422, Apr. 14, 1982, abandoned. This PCT application Apr. 13, 1983, Ser. No. 564,998

Int. Cl.⁴ H01J *5/16*

U.S. Cl. 250—227 **36 Claims**



1. An apparatus for sensing an acoustic wave, comprising:

a fiber optic waveguide coiled into a number of turns to form a coil where the diameter of the turns and spacing thereof are such that the component of said acoustic wave which propagates down the longitudinal axis of said coil travels at the same axial rate that an optical signal propagating in said waveguide around said longitudinal axis moves down said axis; and

a detector for sensing the effect that said acoustic wave has upon the phase of said optical signal.

4,634,853

OPTICAL INFORMATION READING APPARATUS

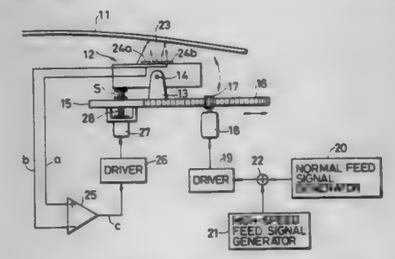
Hitoshi Kanamaru, Saitama, Japan, assignor to Pioneer Electronic Corporation, Japan

Filed Apr. 26, 1984, Ser. No. 604,246

Claims priority, application Japan, Apr. 27, 1983, 58-63397[U]

Int. Cl.⁴ G01J *1/20;* **G11B** *21/10*

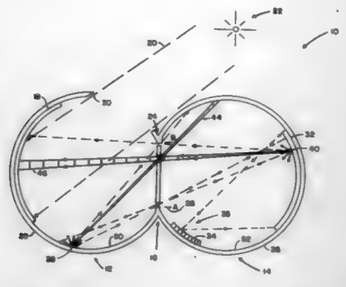
U.S. Cl. 250—201 **10 Claims**



1. In an optical information reading apparatus having a servo system in which offset in a relation of perpendicularity between an optical axis of a first light beam used for reading recorded information and which is focused onto a recording medium with a lens and a recording plane of a recording medium is detected and employed by tilt control means for maintaining said relation of perpendicularity, the improvement wherein said means for detecting the offset in said relation of perpendicularity comprises light-emitting means for producing a second light beam directed onto said recording plane, and

light-detecting means for detecting light from said light-emitting means reflected from said recording plane and having an output corresponding to a degree of offset in said relation of perpendicularity between said optical axis of said first light beam and said recording plane, said light-emitting means and said light-detecting means being disposed such that said second light beam and said light from said second light beam reflected from said recording plane do not pass through said lens, and said tilt control means is driven in accordance with said output of said light-detecting means.

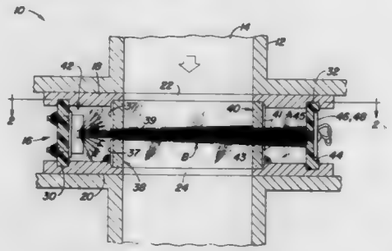
4,634,854
MOVING APERTURE DEVICE FOR REDUCING SCATTERED LIGHT IN AN OPTICAL SYSTEM
Michael P. Wirick, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jan. 10, 1985, Ser. No. 690,541
Int. Cl.⁴ H01J 3/14
U.S. Cl. 250—216 **9 Claims**



1. A moving aperture device for substantially reducing internally scattered radiant energy in an optical system having a collecting optical chamber and a secondary optical chamber, said moving aperture device mounted between said chambers in a first focal plane, said moving aperture device comprising:
means for reducing the overall intensity of radiant energy entering into said secondary optical chamber, said means for reducing having therein an extended field of view;
means for scanning across said extended field of view for selectively allowing radiant energy to enter said secondary optical chamber, said means for scanning being a multi-apertured device having a plurality of staggered slits, each of said slits traversing said field of view along different paths, only one of said slits traversing said field of view at any one time, said paths covering said extended field of view;
means for guiding said means for scanning past said extended field of view;
means for driving said means for scanning across said extended field of view;
means for cryogenically cooling said means for scanning to reduce thermal emissions therefrom.

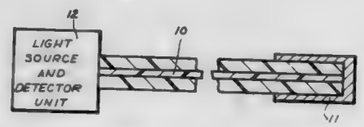
4,634,855
PHOTOELECTRIC ARTICLE SENSOR WITH FACING REFLECTORS
Kenneth D. Friend, and Vijay M. Dharia, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Sep. 10, 1984, Ser. No. 649,098
Int. Cl.⁴ G01V 9/04
U.S. Cl. 250—222.1 **14 Claims**

1. In an article sensor having a generator for generating a radiation beam, an article flow path for directing articles through the beam and a beam detector for detecting beam radiation transmitted through the flow path, the improvement wherein:
the beam generator comprises an array of radiation emitters forming a substantially diffused radiation beam which entirely illuminates a cross-sectional portion of the flow path;
the beam detector comprises a planar radiation responsive surface facing towards the array, the detector generating a signal which is a function of the amount of beam radiation received thereby; and



a pair of oppositely facing radiation reflectors extending along opposite sides of the flow path between the generator and the detector, the generator, detector and reflectors cooperating so that any article in the flow path will measurably influence the amount of beam radiation received by the detector.

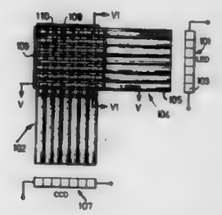
4,634,856
FIBER OPTIC MOISTURE SENSOR WITH MOISTURE-ABSORBING REFLECTIVE TARGET
Randy R. Kirkham, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Aug. 3, 1984, Ser. No. 637,627
Int. Cl.⁴ H01J 5/16
U.S. Cl. 250—227 **2 Claims**



1. A method for monitoring environmental moisture changes, comprising the following steps:
locating a optical fiber assembly within the environmental area being monitored;
transmitting light signals through the optical fiber assembly from a light source to and from a target whose reflectance is a function of the target's moisture content;
measuring the returned light reflected by the target;
and detecting changes in the light signals transmitted through the optical fiber assembly from the light source as an indication of the moisture conditions to which the optical fiber assembly is subjected.

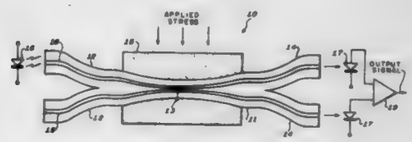
4,634,857
IMAGING ARRANGEMENT FOR SCANNING USING STATIONARY OPTICS
Hans-Jürgen Fey, Aalen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany
Filed Jan. 27, 1984, Ser. No. 574,679
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1983, 3302800
Int. Cl.⁴ H01J 5/16
U.S. Cl. 250—227 **13 Claims**

1. An imaging arrangement for illuminating and scanning an object and transmitting an image thereof, the imaging arrangement comprising:
a plurality of stationary individual light sources disposed one next to the other;
drive means for sequentially exciting said light sources for generating a travelling light spot moving in a first coordinate direction;
a stationary first optical system for transforming said travelling light spot into a travelling light band and projecting



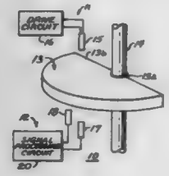
the same onto the object, said light band extending in a direction perpendicularly to said first coordinate direction;
a stationary linear detector array arranged so as to also extend in a direction perpendicularly to said first coordinate direction; and,
a stationary second optical system for imaging the entire region of the object scanned by said light band onto said detector array in a second coordinate direction perpendicular to said first coordinate direction.

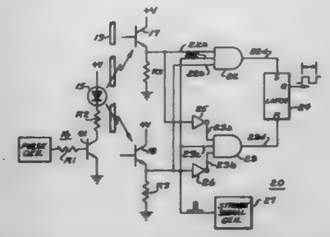
4,634,858
VARIABLE COUPLER FIBEROPTIC SENSOH
David W. Gerdt, and Lawrence H. Gilligan, both of Charlottesville, Va., assignors to Sperry Corporation, New York, N.Y.
Filed Oct. 17, 1984, Ser. No. 661,630
Int. Cl.⁴ H01J 5/16, 40/14
U.S. Cl. 250—227 **6 Claims**



1. A fiberoptic sensor comprising:
fiberoptic coupler means having a plurality of input optical fibers each having a core, said cores of said optical fibers merged and fused in a waist region to form a common optical core wherefrom a plurality of output optical fibers emerge, said fiberoptic coupler for distributing light energy incident to one of said input optical fibers between said plurality of output optical fibers,
means having refractive index variable with stress applied thereto for encapulating said common optical core, such that said incident light energy is distributed between said plurality of output optical fibers as a function of stress applied to said refractive index means, and
detector means coupled to said plurality of output optical fibers for providing output signals representative of said optical energy distribution in said plurality of output optical fibers.

4,634,859
OPTICAL ENCODER WITH TWO PHOTOSENSORS
Dennis J. Martell, Naperville, Ill., assignor to Northern Illinois Gas Company, Aurora, Ill.
Filed Apr. 2, 1984, Ser. No. 596,236
Int. Cl.⁴ G01B 11/00; G01D 5/34
U.S. Cl. 250—231 SE **17 Claims**





16. An encoder apparatus for indicating revolution of a shaft comprising: activating means; first and second sensing means; barrier means driven by the shaft to overlie said first and second sensing means during a portion of each revolution of the shaft; said first and second sensing means each producing an output when activated by said activating means, said first and second sensing means being located in a spaced-apart relationship to be activated in sequence as said barrier means is driven by the shaft, and said barrier means being configured to enable concurrent activation of said first and second sensing means; and signal processing means responsive to first outputs provided by said first and second sensing means upon concurrent activation thereof to provide an indication of the completion of a revolution of the shaft and to thereafter be responsive to second outputs provided by said first and second sensing means upon a subsequent illumination thereof only when both said first outputs terminate prior to said subsequent concurrent illumination of said first and second sensing means whereby said signal processing means provides an unambiguous indication at the completion of each revolution of the shaft.

4,634,860
DEVICE FOR DETERMINING THE POSITION OF A MOVING PART AND DRILLING MACHINE INCLUDING SUCH A DEVICE
Giovanni Aiello, Montereau, and Jean-Pierre Hamelin, Boulogne, both of France, assignors to Soletanche, France
Filed Apr. 26, 1984, Ser. No. 604,073
Claims priority, application France, Apr. 28, 1983, 83 07041
Int. Cl.⁴ G01D 5/34
U.S. Cl. 250—231 SE **8 Claims**

1. A device for determining the position of a moving part even when the part is subjected to vibrations which are not to be included in the position determination, comprising:
sensor means coupled to the part for supplying a first signal, A, which alternates between logic values 0 and 1 as the part moves and a second signal, B, which alternates between logic values 0 and 1 out of phase with the first signal, A, as the part moves;
monostable circuit means responsive to said first and second signals for generating front detecting pulses QMA1, QMA2, QMB1, and QMB2, wherein QMA1 is generated

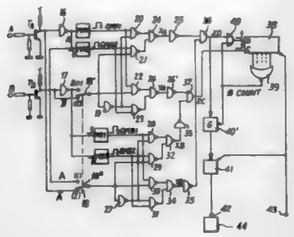
in response to a rising front of said first signal A, QMA2 is generated in response to a descending front of said first signal A, QMB1 is generated in response to a rising front of said second signal B and QMB2 is generated in response to a descending front of said second signal B;

a first logical circuit means responsive to said front detecting pulses for generating a downcounting pulse, ZD, such that ZD satisifies the logic equation:

$$ZD = XA \cdot YB,$$

wherein

$$XA = (QMA1 \cdot \bar{B}) + (QMA2 \cdot \bar{B})$$



$$YB = (QMB1 \cdot \bar{A}) + (QMB2 \cdot A);$$

up-down counter means responsive to said downcounting pulse ZD for detecting oscillation of the first and second signals supplied by said sensor means when said part is subjected to vibrations; and

gate means coupled to said first logical circuit means and responsive to said up-down counter means for transmitting said downcounting pulse ZD to a consuming device when said up-down counter is in a zero count state and for blocking said downcounting pulse ZD when said up-down counter is not in a zero count state.

4,634,861

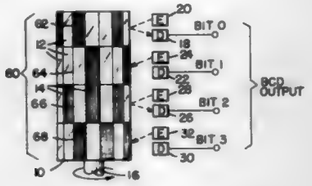
ROTARY SWITCH WITH REFLECTOR CODED ACTUATOR DRUM

Stephen Ching, San Jose; Frank B. Babbitt, Jr., Palo Alto, and Adnan Merchant, San Jose, all of Calif., assignors to General Instrument Corporation, New York, N.Y.

Filed Dec. 19, 1984, Ser. No. 683,600

Int. Cl.⁴ G01D *5/34*

U.S. Cl. 250—231 SE **5 Claims**



1. A multi-position rotary switch comprising:

an actuator drum divided into a plurality of different n-bit codes where each bit is represented by a reflective area of a non-reflective area on the drum;

a plurality of emitter-detector pairs each including an emitter means for providing radiation; and

detector means for reading the n-bit codes by detecting said radiation reflected off the reflective area of said drum, said pairs each arranged to emit radiation to and detect radiation from a different bit in the n-bit codes;

a circuit board positioned adjacent to said drum with said emitter-detector pairs facing said drum and longitudinally arranged to correspond to said longitudinal strips;

means for rotating said drum to successively bring the different n-bit codes into view of said radiation detector means;

whereby each different n-bit code detected by said radiation detector means is indicative of a particular switch position.

4,634,862

METHOD OF FABRICATING ROTOR OF OPTICAL ROTARY ENCODER

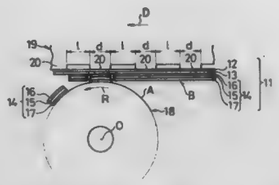
Hiroshi Matsunaga; Yoji Shimojima, and Ichiro Tokunaga, all of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jul. 19, 1984, Ser. No. 632,440

Claims priority, application Japan, Jul. 19, 1983, 58-130319

Int. Cl.⁴ G01D *5/30*

U.S. Cl. 250—231 SE **3 Claims**



1. A method of fabricating the rotor of an optical rotary encoder using a belt to which a reflector is stuck, the reflector consisting of a metal foil whose one surface is coated with a lacquer, the reflector being stuck to the surface of a carrying sheet on which a release agent is coated such that the layer of the lacquer is in contact with the coating of the release agent, the other surface of the foil being coated with an adhesive, said method comprising the steps of:

disposing the body of the rotor that is rotatably held and a die which can move along the rotating surface of the body of the rotor in a given direction in such a way that the outer periphery of the body of the rotor is close and opposed to convex pressing portions formed in a row on the die in the given direction at suitable intervals;

inserting the belt between the body of the rotor and the opposite die in such a way that the surface on which the adhesive is applied is opposed to the body of the rotor;

rotating the body of the rotor and, at the same time, pressing the die on the body of the rotor;

moving the die in the given direction at a velocity equal to the peripheral velocity of the outer periphery of the body while heating the die; and

pressing the reflector of the belt on the outer periphery of the body with the convex pressing portions while carrying the reflector with the body of the rotor and the die to transfer pieces of the reflector onto the outer periphery.

4,634,863

NUCLEAR DETECTOR SYSTEM WITH REDUCED DEAD-TIME PROCESSOR CIRCUIT

Robert J. Schwartz, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Mar. 28, 1984, Ser. No. 594,445

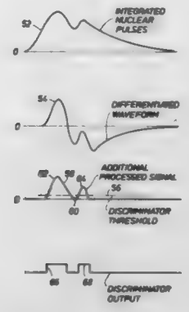
Int. Cl.⁴ G01V *5/04*; G01T *1/17*

U.S. Cl. 250—262 **18 Claims**

1. For use in a well logging system which has a nuclear event detector forming an output signal of randomly spaced peaks having amplitudes within a specified range, a reduced dead-time processor circuit which comprises:

(a) input means adapted to be connected with a nuclear event detector in a sonde to provide an input signal having pulses occurring at random spacing and wherein the pulse amplitudes are within a specified range;

(b) a signal path through the circuit from said input means wherein the signal path includes a series capacitor means having an output side, and further including a discriminator connected to the output side of said capacitor means, said capacitor means providing a signal to said discriminator for forming an output pulse indicative of a nuclear event input thereto;



(c) a current source connected to the output side of said capacitor means for controllably providing a charging current to said capacitor means; and

(d) biased diode means connected to the output side of said capacitor means for selectively controlling and blocking current flow paths for current from said current source, said diode means directing current flow from said current source to said capacitor means during the trailing edge of pulses in the signal flowing along said signal path to shorten the fall time of such pulses.

4,634,864

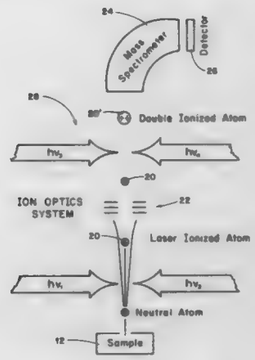
ULTRASENSITIVE METHOD FOR MEASURING ISOTOPE ABUNDANCE RATIOS

Thomas B. Lacatorto, Washington, D.C.; Charles W. Clark, Gaithersburg, Md., and Tom J. Whitaker, Kennewick, Wash., assignors to Atom Sciences, Inc., Oak Ridge, Tenn.

Filed Oct. 27, 1983, Ser. No. 546,052

Int. Cl.⁴ B01D *59/44*

U.S. Cl. 250—282 **28 Claims**



1. A method for measuring the isotope abundance ratio between a selected isotope and at least one other isotope having a different atomic mass or mass number, in a sample of a given chemical element, said abundance measuring method being capable of determining isotope abundance ratios of at least one part in 10^{12} with an overall abundance sensitivity exceeding 10^{16}, comprising the steps of:

producing a vapor of certain atoms/molecules of said sample of said chemical element;

preferentially ionizing a selected isotope within said vapor by using Doppler-free resonant multiphoton ionization to produce an enhanced ratio of said selected isotope, said ionization being laser induced;

in an additional step preferentially ionizing said selected isotope from said first ionization step by using Doppler-free resonant ionization to produce an additional isotope enhancement, said additional step of ionization being laser induced;

injecting ions produced by said additional step of ionization into a mass spectrometer;

performing isotopic separation of said ions by said mass spectrometer; and

detecting ions from said isotopic separation to determine said isotope abundance ratio.

4,634,865

INTRODUCTION OF SAMPLES INTO A MASS SPECTROMETER

John K. Conway, Cambridge, England, assignor to Prutec Limited, London, England

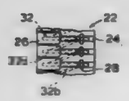
PCT No. PCT/GB84/00399, § 371 Date Jul. 19, 1985, § 102(e) Date Jul. 19, 1985, PCT Pub. No. WO85/02491, PCT Pub. Date Jun. 6, 1985

PCT Filed Nov. 20, 1984, Ser. No. 760,736

Claims priority, application United Kingdom, Nov. 22, 1983, 8331094

Int. Cl.⁴ H01J *49/04*

U.S. Cl. 250—288 **6 Claims**



1. A magazine for introducing samples into the inlet system of a mass spectrometer, characterised in that the magazine (22) comprises a flat plate having upper and lower surface which are generally horizontal during use, a zig-zag groove (32) in the lower surface engageable by a reciprocable pin to advance the magazine by increments relative to an aperture (12) of the inlet system of the mass spectrometer and recesses (24) in the upper surface of the magazine (22) for receiving tubes (16) containing samples for analysis, the recesses (24) extending transversely to the direction of movement of the magazine (22) and being arranged at a regular pitch equal to that of the groove (32) in the lower surface.

4,634,866

INTRODUCTION OF SAMPLES INTO A MASS SPECTROMETER

John K. Conway, Cambridge, England, assignor to Prutec Limited, London, England

PCT No. PCT/GB84/00400, § 371 Date Jul. 19, 1985, § 102(e) Date Jul. 19, 1985, PCT Pub. No. WO85/02492, PCT Pub. Date Jun. 6, 1985

PCT Filed Nov. 20, 1984, Ser. No. 760,738

Claims priority, application United Kingdom, Nov. 22, 1983, 8331095

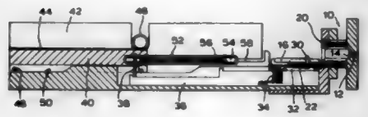
Int. Cl.⁴ H01J *49/04*

U.S. Cl. 250—288 **6 Claims**

1. A feed system for picking a sample tube (16) off a magazine (22) and introducing the sample tube (16) into the inlet system (10) of a mass spectrometer, characterised by a pick-up tube (52) adapted at its forward end to fit over a sample tube (16) resting on the magazine (22) and to grip the sample tube

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(16), a carriage (40) supporting the pick-up tube (52) in a horizontal attitude, a motor for moving the carriage (40) towards



and away from the inlet system (10), and a ramp (50) for raising the pick-up tube (52) after a sample tube (16) has been gripped to the level of the inlet system (10).

4,634,867

INTRODUCTION OF SAMPLES INTO A MASS SPECTROMETER

Thomas W. Ottley, Framfield, and John K. Conway, Cambridge, both of England, assignors to Prutec Limited, London, England

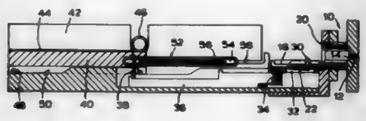
PCT No. PCT/GB84/00398, § 371 Date Jul. 19, 1985, § 102(e) Date Jul. 19, 1985, PCT Pub. No. WO85/02490, PCT Pub. Date Jun. 6, 1985

PCT Filed Nov. 20, 1984, Ser. No. 762,068

Claims priority, application United Kingdom, Nov. 22, 1983, 8331093

Int. Cl.⁴ H01J *49/04*

U.S. Cl. 250—288 **4 Claims**



1. A method of introducing a sample for analysis into the inlet system of a mass spectrometer, characterised by the steps of placing the sample in a tube (16) open at only one end, placing around the tube (16) an O-ring (30) which is free to slide along the outer wall of the tube (16), placing the sample tube (16) with its open end adjacent an aperture (12) of the inlet system of the mass spectrometer applying an axially directed force to the O-ring (30) to compress the O-ring (30) into radial sealing engagement with the outer wall of the tube (16) and axial sealing engagement with the inlet system of the mass spectrometer, the sample tube (16) upon evacuation by the inlet system of the mass spectrometer forming part of the vacuum retaining wall.

4,634,868

NON-DESTRUCTIVE TESTING BY STIMULATED ELECTRON EMISSION CAPTURE

Thomas J. DeLacy, Los Altos, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Dec. 17, 1984, Ser. No. 682,642

Int. Cl.⁴ G01N *23/04*

U.S. Cl. 250—306 **11 Claims**

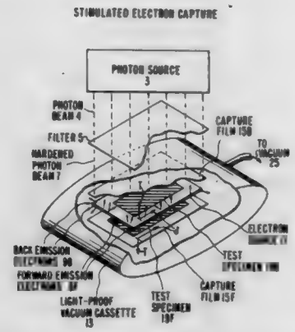
1. Apparatus for recording the mass density distribution of a first test specimen, said apparatus comprising:

means for emitting a medium-to-high-energy beam of photons;

an electron source disposed to receive the photon beam and generate in response thereto a stimulated beam of emergent electrons generally oriented to interrogate said test specimen; and

a first capture film disposed to record emergent electrons that are transmitted through the test specimen; wherein

the test specimen is sandwiched between the electron source and the capture film, and absorbs and scatters some of the electrons in the electron beam, wherein the electrons not absorbed and not widely scattered by the test specimen



produce on the capture film an image that is representative of the mass density distribution of the test specimen.

4,634,869

LIQUID SCINTILLATION COUNTER

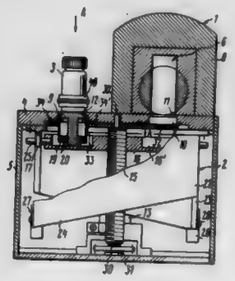
Leonid G. Korobchenko, and Sergei I. Prokofiev, both of Moscow, U.S.S.R., assignors to Institut Molekulyarnoi Genetiki Akademii Nauk SSSR, Moscow, U.S.S.R.

Filed Jul. 28, 1983, Ser. No. 518,138

Claims priority, application U.S.S.R., Aug. 11, 1982, 3494123; Nov. 19, 1982, 3514721

Int. Cl.⁴ G01T *7/08, 1/204*

U.S. Cl. 250—328 **10 Claims**



1. A liquid scintillation counter, comprising: a detector having a measuring chamber, a hole in the bottom portion of said measuring chamber for delivering thereto a test specimen, and photomultiplier tubes;

a protective shell encompassing said detector;

means for delivering a test specimen to said measuring chamber, said means moving the test specimen substantially downwardly, then towards said detector and substantially upwardly into said measuring chamber wherefrom said test specimen is moved back in reverse order; said means for delivering having a receiving assembly for mounting the test specimen;

a horizontal plate having a first and a second hole; said first hole accommodating said receiving assembly;

said detector being positioned over said second hole so that said hole in the bottom portion of said measuring chamber is aligned with said second hole in said plate;

said means for delivering the test specimen having power means;

a screw assembly having a lead screw rotated by said power means and positioned stationary relative to said horizontal plate, substantially parallel to the longitudinal axis of said counter and symmetrically relative to geometrical axes of

said first and second holes in said plate, said screw assembly having a nut for mounting of said receiving assembly, said nut being screwed on said lead screw for movement along thereof, during movement of the test specimen, said nut being turned around said lead screw while the test specimen is turned towards said detector and back from it;

guide means enabling progressive movement of said nut;

at least one slot provided in said guide means;

at least one roller secured on butt end of said nut and cooperating with said slot to prevent turning of said nut relative to said lead screw;

a shutter postioned at an outlet of said slot of said guide means and cooperating with said roller to convert the turning movement of said nut into a translational upward movement;

said nut comprising means for causing said receiving assembly to move so that it being positioned precisely within said first or second hole in said plate as said nut being turned and lifted.

4,634,870

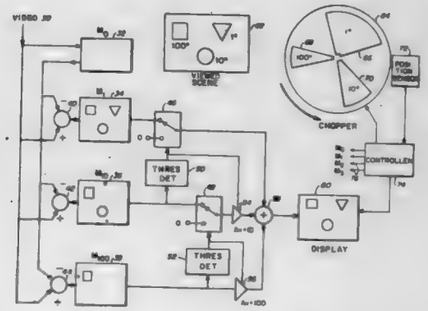
THERMAL IMAGE DYNAMIC RANGE EXPANDER

Travis W. Metcalf, El Cajon, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 6, 1985, Ser. No. 730,880

Int. Cl.⁴ G01J *5/38, 5/62*

U.S. Cl. 250—332 **4 Claims**



1. An apparatus for dynamic range expansion to be used with a gas cell infrared imaging sensor system which contains an array of expandable gas cells oriented to receive incident infrared radiation emitted from a scene being viewed; a laser interferometer with a signal beam that monitors the expansion of the gas cells and a reference beam that is interferometrically combined with the signal beam; a television vidicon tube which senses the resultant intensity of the combined signal and reference beams; a digitizer for converting the signal output from the vidicon tube to digital format; and a video display which displays the visualized image of the viewed scene; said apparatus for dynamic range expansion comprising:

means for regulating the amount of incident infrared radiation reaching the gas cells;

means, connected to the digitizer, for storing a digitized quiescent reference level signal from the digitizer that converts the signal output from the vidicon tube, said reference level signal occuring when the means for regulating completely blocks passage of the incident infrared radiation to the gas cells;

a plurality of subtracting means with each subtracting means having one input connected to the digitizer that converts the signal output from the vidicon tube and a second input connected to the output of the means for storing, wherein each subtracting means creates a difference signal by subtracting the stored quiescent reference level signal from an immediate signal being output from the digitizer;

a plurality of holding means with each holding means connected to a subtracting means such that each holding means stores a preselected portion of the difference signal;

means for controlling connected to the means for regulating, the video display, and the holding means, such that said means for controlling synchronizes the combined operation of the means for regulating, the video display, and the various holding means;

means for switching connected to the outputs of the holding means, said means for switching allowing only one predetermined holding means to output its stored signal at a time; and

means for amplifying connected to the output of the means for switching, such that said means for amplifying multiplies an output signal by a preset factor, said preset factor determined by which holding means output said signal through the means for switching, and wherein a signal output from said amplifying means is then transmitted onto the video display.

4,634,871

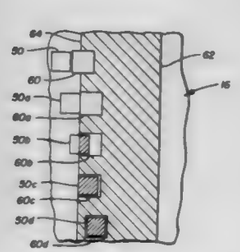
METHOD AND APPARATUS FOR SPOT SHAPING AND BLANKING A FOCUSED BEAM

Wolfgang Knauer, Malibu, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 14, 1985, Ser. No. 691,253

Int. Cl.⁴ H01J *3/14, 3/26*

U.S. Cl. 250—398 **16 Claims**



1. An apparatus for scanning a focused beam across a target to expose a feature on the target, comprising:

a charged particle source for producing a beam of charged particle;

a first aperture plate in the beam path, said first aperture plate having a first aperture therein to produce a shaped beam;

a second aperture plate serially along the beam path, said second aperture plate having a second aperture therein defined by boundary edges, the second aperture plate being adapted to block the beam on opposite sides of the second aperture;

deflection means between said first aperture plate and said second aperture plate for progressively deflecting the beam through the second aperture between beam blocking positions on opposites sides of the second aperture;

focusing means for focusing the portion of the beam transmitted through said second aperture onto a target plane;

scanning means between said second aperture plate and the target plane for scanning the portion of the beam transmitted through the second aperture across the target plane; and

control means controlling the deflection and scanning means to progressively deflect the beam from a first beam blocking position on one side of the second aperture across an edge of the second aperture to a position aligned with the second aperture, to thereafter scan the aligned beam with s substantially constant cross section per scan across a desired portion of the target plane, and to thereafter pro-

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gressively deflect the beam from a position aligned with the second aperture across an edge of the second aperture to a second beam blocking position on the opposite side of the second aperture from the first beam blocking position, the progressive deflection of the beam across the second aperture edges at each end of the scan providing high scanning edge resolution at the target plane corresponding to the second aperture edges.

4,634,872

PROCESS FOR CHECKING THE AUTHENTICITY OF DOCUMENTS AS WELL AS APPARATUS THEREFOR

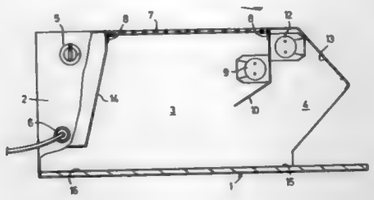
Cornelis D. Janus, Bilthoven, and Alle Wielenga, Nieuwerkerk a/d IJssel, both of Netherlands, assignors to Jadrimex Automation Group B.V., Bunnik, Netherlands

Filed Mar. 2, 1984, Ser. No. 585,476

Claims priority, application Netherlands, Mar. 3, 1983, 8300784

Int. Cl.[4] F21V *9/16*; G01T *1/04*

U.S. Cl. 250—458.1 8 Claims



1. An apparatus for examining the authenticity of a valuable document, said apparatus comprising:

a housing;

light means mounted in said housing for irradiating said document with incident light;

lamps means mounted in said housing for irradiating said document with one of transmitted light and flood light;

a first compartment containing said lamp means;

platform means for transmitting light from said lamp means;

a first screening location located on said platform means for examining a document by transmitted light from below said platform means;

a second compartment containing said light means;

a second screening location being illuminated by incident light from said light means; and

a third screening location illuminated from above by floodlight from said lamp means.

4,634,873

APPARATUS FOR FITTING A RADIOACTIVE SOURCE INTO A CYLINDRICAL RECESS

Christian Bezer, Savigny S/Orge; André Olombel, Brîis s/s Forges, and Georges Viel, Orsay, all of France, assignors to Commissariat a l'Energie Atomique, France

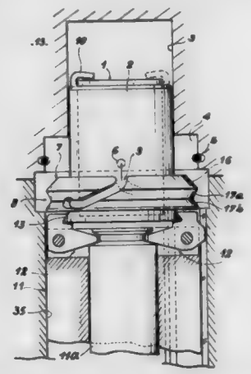
Filed Jan. 14, 1985, Ser. No. 691,067

Claims priority, application France, Jan. 20, 1984, 84 00880

Int. Cl.[4] G21F *5/00*, *5/02*

U.S. Cl. 250—497.1 6 Claims

1. An apparatus for fitting into a cylindrical recess a radioactive source locked within a cylindrical source holder, wherein the cylindrical recess is higher than a larger diameter cylindrical recess in the walls of which are partly fitted at least one locking ring and at least one lug and wherein the source holder has in its lower part a flange, which is chamfered in its upper part, having an annular groove for receiving the unfitted part of the locking ring, and at least one slot which slopes with respect to the axis of revolution of the source holder and whose width is at least equal to the diameter of said lug, issuing onto the upper face of said flange, the slot ensuring the guidance of the lug in such a way that the position of the lug in the



bottom of the slot corresponds to that of the locking ring in the annular groove.

4,634,874

ELECTRON LITHOGRAPHY APPARATUS

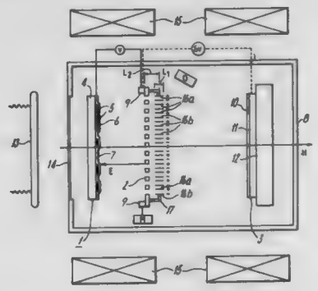
Rodney Ward, Ifield, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 26, 1984, Ser. No. 654,436

Claims priority, application United Kingdom, Sep. 26, 1983, 8325670

Int. Cl.[4] H01J *37/30*

U.S. Cl. 250—492.2 20 Claims



1. An electron image projector for projecting a beam of electrons with substantially unity magnification comprising

an electron emissive photocathode for emitting a beam of electrons under a substantially uniform electric field in a predetermined spacial pattern extending transversely to said electric field,

an anode including an anode grid structure having an array of electron permeable regions, said array being at least as extensive as said spacial pattern, said anode grid structure being disposed parallel to said photocathode, wherein said electric field in operation is produced between said photocathode and said anode grid structure,

a target receiving said beam of electrons, wherein said anode grid structure is disposed intermediate to said photocathode and said target,

first means for producing a substantially uniform magnetic field parallel to said electric field to focus a patterned beam of electrons onto said target, and

second means for deflecting electrons of said beam transversely to both said electric field and said magnetic field, said second means including electrostatic deflection plates

arranged for deflecting at least a part of said beam of electrons during passage from a surface of said anode grid structure facing said photocathode to said target.

4,634,875

TRANSITORY STORAGE FOR HIGHLY-RADIOACTIVE WASTES

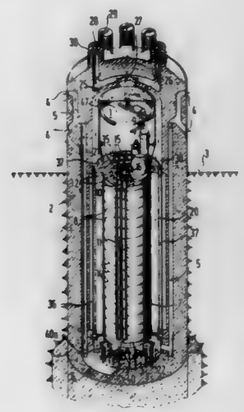
Kurt Kugeler, Julich; Ulrich Jaroni, Aachen; Wieland Keim, Herzogenrath; Peter W. Philippen, Aachen; Peter Schmidtlein, Duisburg, and Manfred Kugeler, Julich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,636

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 3301735

Int. Cl.[4] G21F *5/00*

U.S. Cl. 250—506.1 20 Claims



1. A storage vessel for radioactive waste comprising:

outside storage walls forming an enclosed storage space;

an axially extending storage container supported in the storage space and forming a plurality of axially extending storage shafts for receiving the radioactive waste;

a primary cooling circuit for conducting a cooling fluid from a source thereof, through the storage container, and to heat a sink to remove heat produced in the storage container, the primary cooling circuit including a multitude of axially extending cooling conduits forming a pattern encompassing the storage shafts; and

a cooling mantle extending around the storage container and forming therewith an axially extending cooling air passageway for conducting air upward past the outside of the storage container;

the outside storage walls and the storage container forming an air distribution chamber, below the storage container, to distribute cooling air to the air passageway;

the outside storage walls including internal air conduit means for conducting air downward, through the storage walls, from an upper portion of the storage vessel to the distribution chamber

said cooling air passageway, air distribution chamber, and internal air conduit means comprising an auxiliary, air cooling circuit for the storage container.

4,634,876

OBJECT POSITION DETECTING APPARATUS USING ACCUMULATION TYPE SENSOR

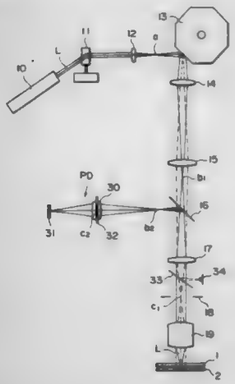
Naoki Ayata, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1984, Ser. No. 606,537

Claims priority, application Japan, May 13, 1983, 58-82789; Feb. 10, 1984, 59-21896

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—548 7 Claims



1. An apparatus for detecting a position of an object, comprising:

means for producing a light beam;

means for scanningly deflecting said beam with respect to the object;

means for sensing an image of said object resulting from the scan and accumulating information therefrom as an electric signal;

means for outputting said signal from said sensing and accumulating means when the scan is complete; and

means for detecting the position of the object on the basis of said signal output from said sensing and accumulating means.

4,634,877

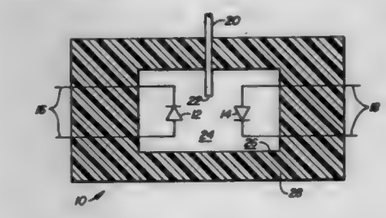
OPTICAL TRANSMITTER RECEIVER SWITCH

Harry D. Wills, Mentor, Ohio, assignor to General Electric Company, San Jose, Calif.

Filed Jun. 10, 1985, Ser. No. 743,007

Int. Cl.[4] G02B *27/00*

U.S. Cl. 250—551 11 Claims



1. An optical transmitter receiver switch comprising:

a photoemitting transducer having leads for electrically exciting the photoemitting transducer;

a photodetecting transducer having leads for detecting the light induced electrical response of the photodetecting transducer;

a fiber optic light guide having a first end;

an optial coupler simultaneously optically coupling the

VOL 1074 ISS 1 JA 6 1987 UMI

photoemitting transducer, the photodetecting transducer, and the first end of the light guide; and

an opaque housing enclosing the optical coupler, the photoemitting transducer, the photodetecting transducer, and the first end of the light guide; wherein

the photoemitting transducer and the photodetecting transducer are electrically isolated from each other.

4,634,878

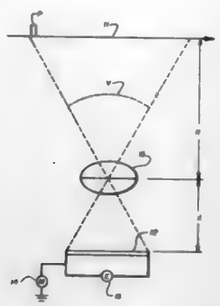
LASER DETECTOR WITH DISTANCE-TO-BEAM STRIP SENSOR

William C. Fricke, Sandy Hook, Conn., assignor to The Perkin Elmer Corporation, Norwalk, Conn.

Filed Jun. 3, 1985, Ser. No. 740,933

Int. Cl.⁴ G01N *21/86*; G01V *9/04*

U.S. Cl. 250—560 **7 Claims**



1. A system for detecting a laser beam as it traverses a remotely located path, comprising:

strip sensor means for generating electrons along its length in response to light;

lens means disposed between the path and said strip sensor means for projecting scattered light from localized time varying phenomena of the laser traveling along the path onto said strip sensor means such that an image of the scattered light moves down the length of said strip sensor means at a speed related to the speed of light;

voltage source means connected to said strip sensor means providing a voltage across the length of said strip sensor means causing electrons generated therein to travel the length of said strip sensor at the same speed as the light projected thereon by said lens means;

meter means connected to the end of said strip sensor means for detecting the charge at said end caused by the accumulation of electrons at said end.

4,634,879

METHOD AND SYSTEM FOR DETERMINING SURFACE PROFILE INFORMATION

Carl M. Penney, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 21, 1985, Ser. No. 714,416

Int. Cl.⁴ G01N *21/86*; G01B *11/24*

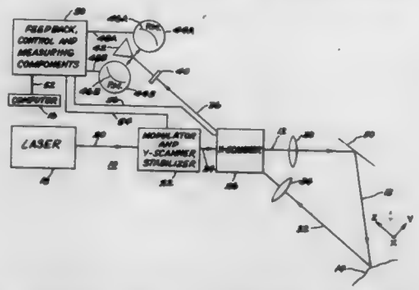
U.S. Cl. 250—560 **9 Claims**

1. A system for determining profile information from a surface of an object comprising:

(a) an optical beam source for generating an optical beam for application to the surface;

(b) an image stabilization beam adjustor operable to receive the beam from said optical beam source and alter a beam deflection angle; and

(c) sensor system means adapted to sense reflected optical energy corresponding to an image from the beam hitting the surface, and operable to sense any changes in the image position which are caused by variations in surface height, and connected to said image stabilization beam adjustor and being operable for causing the image stabilization beam adjustor to alter the beam deflection angle dependent on the sensed changes in the image position



from a reference position in a Y-direction, said system tending to maintain the image in its reference position independent of variations in surface height, and wherein said sensor system means determines the surface height by detecting the amount of the beam deflection alteration.

4,634,880

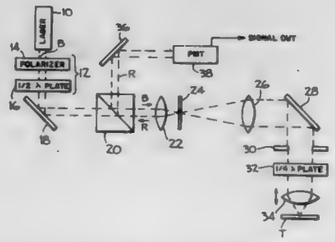
CONFOCAL OPTICAL IMAGING SYSTEM WITH IMPROVED SIGNAL-TO-NOISE RATIO

James T. Lindow, Saratoga; Simon D. Bennett, and Ian R. Smith, both of Los Gatos, all of Calif., assignors to SIScan Systems, Inc., Campbell, Calif.

Continuation-in-part of Ser. No. 725,082, Apr. 19, 1982. This application Feb. 19, 1986, Ser. No. 830,964

Int. Cl.⁴ G01N *21/88*

U.S. Cl. 250—566 **8 Claims**



1. A confocal optical imaging system with an improved signal-to-noise ratio for directing a coherent beam onto a spot on a target and determining the reflectance therefrom, said system comprising means for producing a linearly polarized light beam; a photodetector for receiving a reflected light beam from the target; a beam splitter for passing at least a portion of the transmitted beam from the beam producing means to the target and for receiving and directing at least a portion of the reflected beam from the target to the photodetector; a plurality of optical elements positioned between the beam splitter and the target including a pinhole plate, a lens for contracting the transmitted beam to focus it at the pinhole in the plate, an expansion lens for redirecting the transmitted beam to the target after it has passed through the pinhole, and a focusing lens for focusing the transmitted beam on the target; a retardation plate located in the beam path between the pinhole plate and the target for altering the polarization of the transmitted beam relative to the reflected beam; and polarization means for passing only the reflected beam from the target to the photodetector and rejecting those beams reflected from the optical elements between the retardation plate and the beam splitter

4,634,881

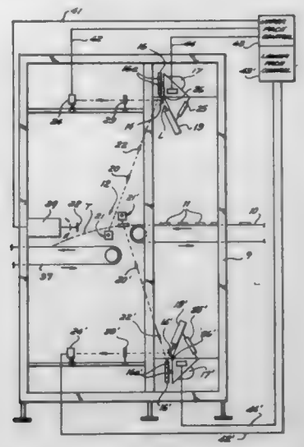
APPARATUS FOR DETECTING IMPURITIES IN TRANSLUCENT BODIES

Leo Billion, Herent, Belgium, assignor to Supernova Systems, Inc., Sioux Falls, S. Dak.

Continuation of Ser. No. 440,374, Nov. 9, 1982, abandoned. This application Jan. 28, 1985, Ser. No. 750,872

Int. Cl.⁴ G01N *21/88*; B07C *5/342*

U.S. Cl. 250—572 **2 Claims**



1. An apparatus for detecting impurities in translucent bodies, comprising:

(a) a source for producing a concentrated light beam, the light beam having a relatively small cross-sectional area,

(b) transport means for moving translucent bodies through the light beam, light from the source impinging upon a pure translucent body being diffused within the body so as to illuminate a surface area of the body larger than the cross-sectional area of the light beam, but light from the source impinging upon an impurity in the translucent body being diffused to a lesser extent,

(c) receiving means for receiving light from the translucent bodies, the receiving means having a field of view much larger than the cross-sectional area of the light beam so that the receiving means receives less light when the beam impinges upon an impurity than when the beam impinges upon the translucent body without impurities, and the receiving means producing a signal proportional to the intensity of the light it receives, and

a mirror operatively interposed between the concentrated light beam source and the transport means, the light beam passing through an opening in the mirror, and the mirror being arranged to reflect light, from translucent bodies passing through the beam, to the receiving means.

4,634,882

OPTICAL DEVICE FOR DISPLAYING A LARGE TWO DIMENSIONAL IMAGE

Eric R. Craine; David Forbes; Thomas A. Sargeat, all of Tucson, Ariz., and John S. Scott, Melbourne, Fla., assignors to Karmar Research Partnership, Torrance, Calif.

Filed Feb. 19, 1985, Ser. No. 702,950

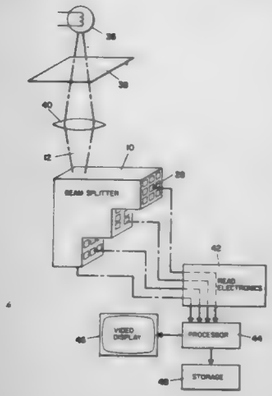
Int. Cl.⁴ H01J *40/14*; H04N *1/00*

U.S. Cl. 250—578 **26 Claims**

1. An optical device for displaying a two dimensional image, comprising:

beam splitter means for receiving said image having at least four display surfaces for displaying said image upon each of said four surfaces;

a plurality of photosensor means mounted in at least four mosaiclike patterns, in juxtaposition with said at least four surfaces; and



each mosaiclike pattern juxtaposed with each surface having a different pattern from said remaining mosaiclike patterns.

4,634,883

IMAGE SENSOR COMPRISING A PLURALITY OF PHOTOSENSORS AND SWITCHES

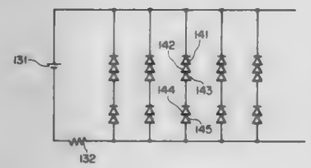
Masaharu Nishiura, and Masakazu Ueno, both of Kanagawa, Japan, assignors to Fuji Electric Company Ltd., Kanagawa, Japan

Filed Feb. 7, 1985, Ser. No. 699,432

Claims priority, application Japan, Feb. 9, 1984, 59-23531; Feb. 9, 1984, 59-23532

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—578 **7 Claims**



1. An image sensor comprising:

a plurality of photosensors disposed in an array, each of said photosensors being composed of a plurality of photodiodes connected in series;

a voltage source;

a plurality of switches for selectively applying a reverse bias from said voltage source to said plurality of photosensors, each photosensor in said array being successively reverse biased by operation of a corresponding one of said switches; and

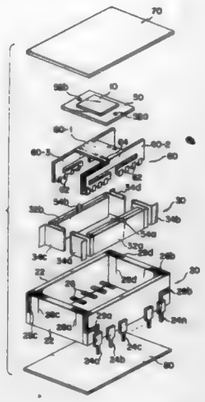
an output resistor for detecting current flowing through a reverse biased photosensor selected by one of said switches.

4,634,884

SWING-DRIVEN SOLID-STATE IMAGE SENSOR

Yoshiaki Hayashimoto, Yokohama; Chiaki Tanuma, Tokyo; Katsunori Yokoyama, Ebina, and Nozomu Harada, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 10, 1984, Ser. No. 629,562
Claims priority, application Japan, Jul. 12, 1983, 58-126676
Int. Cl.⁴ H01J *40/14*
U.S. Cl. 250—578 **7 Claims**



1. An image sensing device comprising:
solid-state image sensor means for receiving incoming image light to produce an electrical image pickup signal;
swing-driver means for vibrating said image sensor means on a plane substantially perpendicular to the image light and for causing said image sensor means to perform an image pickup operation in such a manner that said image sensor means periodlcally shifts to different sampling positions at different time periods in one frame period with said swing-driver means comprising a pair of plate-like piezoelectric elements which face each other and stably support said image sensor means on facing side surfaces thereof;
package means for sealing said image sensor means and said piezoelectric elements, said package means comprising,
elastic support means for elastically mounting said piezoelectric elements in said package means and hence allowing swinging of said piezoelectric elements at a minimum vibration loss, said elastic support means being electrically conductive and connected with said pair of piezoelectric elements to serve as electrodes for supplying a drive voltage to said piezoelectric elements.

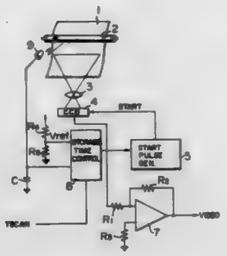
4,634,885

APPARATUS FOR DRIVING CCD-SENSOR

Yasuo Inoue, Yokohama, and Masaharu Tadauchi, Hitachi, both of Japan, assignors to Hitachi, Ltd, Tokyo, Japan

Filed Nov. 23, 1983, Ser. No. 554,724
Claims priority, application Japan, Nov. 25, 1982, 57-205458
Int. Cl.⁴ H01J *40/14*; H09N *3/14*
U.S. Cl. 250—578 **9 Claims**

1. An apparatus for driving a CCD-sensor comprising: light quantity detecting means for detecting the quanity of light emitted by a light source for illuminating a material to be read by the CCD sensor; storage time determining means for determining the storage time of said CCD-sensor on the basis of an output signal from said light quantity detecting means; and driving means responsive to said storage time determining means for driving said CCD sensor periodically at a time



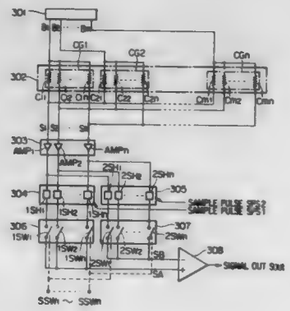
interval corresponding to the storage time determined by said storage time determining means.

4,634,886

PHOTOELECTRIC IMAGER WITH A HIGH S/N RATIO

Katsunori Hatanaka, Yokohama; Yasuo Kuroda, Sagamihara, and Shunichi Uzawa, Naka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,588
Claims priority, application Japan, Mar. 2, 1983, 58-34293
Int. Cl.⁴ H04N *5/30*
U.S. Cl. 250—578 **3 Claims**



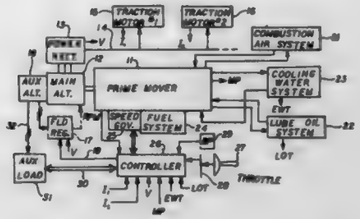
1. A photoelectric converter comprising:
signal amplifying means having m photosensor element groups each consisting of n photosensor elements and n signal amplifying elements each commonly and electrically connected to a respective corresponding one of said photosensor elements in each said photosensor element group;
first and second sample and hold means each having n sample and hold elements electrically connected to corresponding ones of said signal amplifying elements;
first and second input signal selecting means separately and electrically connected to said first and second sample and hold means, respectively, each of said first and second input signal selecting means having n input signal selecting elements provided corresponding to the respective sample and hold elements of each of said sample and hold means; and
differential signal amplifying means for amplifying the difference between the values of signals to be transferred from each of said first and second input signal selecting means and outputting the difference as a signal.

4,634,847

LOAD RATE LIMITING MEANS FOR A LOCOMOTIVE ENGINE

Edgar T. Balch; Richard E. Bilski, and Ajith K. Kumar, all of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Jun. 24, 1985, Ser. No. 747,628
Int. Cl.⁴ B601 *11/02*
U.S. Cl. 290—3 **17 Claims**



1. A locomotive propulsion system comprising a variable-speed, multiple-cylinder diesel engine having a combustion air intake manifold and an exhaust manifold, controllable means for supplying diesel fuel to the engine cylinders, turbocharging means connected to both of the exhaust and intake manifolds of the engine and having a rotatable turbine that is driven by the engine exhaust gases and that in turn drives a centrifugal compressor for supplying pressurized air to the intake manifold, electric power generating means mechanically driven by the engine, excitation means for controlling the power output of the generating means, a plurality of traction motors supplied with electric current from the generating means, means for sensing the magnitude of power output (KVA) of the generating means, means for indicating the power (HP) developed by the diesel engine, throttle means having multiple power settings, and a controller coupled to the fuel supplying means, to the excitation means, to the the KVA sensing means, and to the throttle means and operative to provide a variable engine speed command signal for controlling the fuel supply means and to provide a variable control signal for controlling the excitation means so that both the speed of the engine and the power output of the generating means are normally dependent on the power setting of the throttle means, wherein the controller includes improved rate control means coupled to the engine power indicating means and effective in response to the throttle means advancing to a higher power setting for varying said control signal in a manner to increase KVA at a rate that varies, between predetermined minimum and maximum limits, with HP.

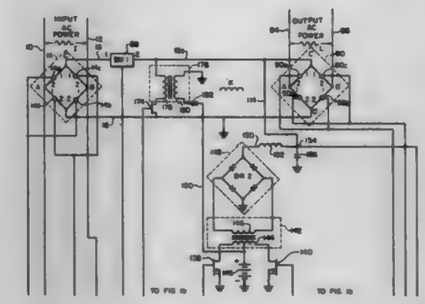
4,634,888

UNINTERRUPTIBLE POWER SUPPLY

Joe E. Deavenport, 5062 Edgeworth Rd., San Diego, Calif. 92109

Filed Feb. 12, 1985, Ser. No. 700,650
Int. Cl.⁴ H02J *3/32*
U.S. Cl. 307—48 **22 Claims**

1. An apparatus for supplying continuous output power from at least one of two sources of input power comprising;
rectification means for converting an input alternating current from a first source of input power, into a first unidirectional current, said first unidirectional current varying in magnitude with time;
first sense means responsive to the voltage provided by said first source of input power for providing a first control signal when the voltage provided by said first source of input power is within a predetermined range of voltages and providing a second control signal when the voltage provided by said first source of input power is at a voltage other than a voltage within said predetermined range of voltages, said second control signal inhibiting said rectification means for providing said first unidirectional current;
inverter means for converting an input direct current from a second source of input power into a second unidirectional current, said second unidirectional current varying in magnitude with time;
second sense means responsive to said first and second control signals for providing a third control signal to said inverter means so as to control the time-varying magnitude of said second unidirectional current provided by said inverter means, said second sense means in response



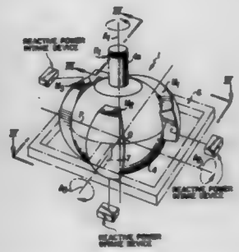
to said first control signal providing said third control signal so as to limit the magnitude of said second unidirectional current to a magnitude substantially less than said first unidirectional current and said second sense means in response to said second control signal providing said third control signal so as to control the magnitude of said second unidirectional current to a magnitude sufficient to maintain continuous output power; and
demodulator means for converting at least one of said first or second unidirectional currents into a continuous output alternating current so as to maintain continuous output power.

4,634,889

ELECTRO-MECHANICAL CONVERTER WITH SEVERAL DEGREES OF FREEDOM

Albert A. Foggia, Lozanne, and Jean-Claude Sabonnadiere, Meylan, both of France, assignors to L'Etat Francais, Paris, France

Filed Dec. 7, 1983, Ser. No. 558,980
Claims priority, application France, Dec. 7, 1982, 82 20450
Int. Cl.⁴ H01F *27/06*
U.S. Cl. 307—104 **23 Claims**



1. An electromagnetic converter having three degrees of freedom comprising:
a body having a substantially spherical outer surface and three orthogonal rotation axes;
a structure associated with and proximate to said body;
electromagnetic means comprising three independent induc-

tors spatially located from said body and substantially corresponding in shape to substantially spherical surfaces of said body, for generating a crossed magnetic flow acting upon said body to cause a total and reversible relative rotation between the body and the structure on one of said three orthogonal rotation axes and a partial and reversible relative rotation between the body and the structure on a second and third ones of said three orthogonal rotation axes; and

connecting means for connecting said body with a static support.

4,634,890

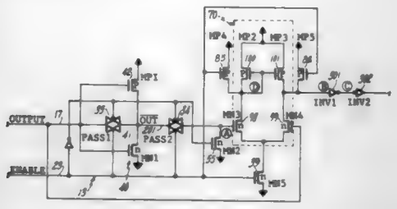
CLAMPING CIRCUIT FINDING PARTICULAR APPLICATION BETWEEN A SINGLE SIDED OUTPUT OF A COMPUTER MEMORY AND A DIFFERENTIAL AMPLIFIER SENSING CIRCUIT

Robert D. Lee, Denton, Tex., assignor to Thomson Components-Mostek Corporation, Carrollton, Tex.

Filed Sep. 6, 1984, Ser. No. 648,092

Int. Cl.⁴ H03K *17/16*

U.S. Cl. 307—200 B **3 Claims**



1. A clamping circuit for connection between a single sided output of a memory and the twin inputs of a differential amplifier sensing circuit comprising:

a CMOS inverter including a pair of complementary transistors serially connected and an output at the node between the two transistors with the input of each transistor coupled to the single sided output,

a first transmission gate whose input is connected to the single-sided output and whose output is connected to the output of the inverter,

a second transmission gate whose input is connected to the output of the invertor and whose output is connected to one of the twin inputs of the differential amplifier, the other of the twin inputs being connected to said single-sided output; and

means for synchronously enabling the first and second transmission gates.

4,634,891

GATE TURN-OFF THYRISTOR MODULE

Kozo Yamagami, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 592,208

Claims priority, application Japan, Mar. 22, 1983, 58-48151

Int. Cl.⁴ H03K *17/72, 17/14*

U.S. Cl. 307—252 C **9 Claims**

1. A gate turn-off thyristor module comprising:

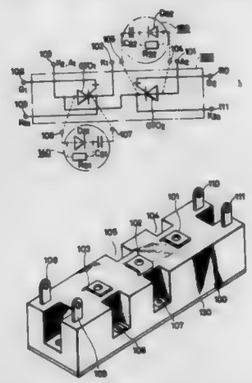
a package;

at least one gate turn-off thyristor chip housed in said package;

a main anode terminal, a main cathode terminal, and a gate control terminal disposed on an upper face of said package provided for said gate turn-off thyristor chip and connected to an anode electrode, a cathode electrode, and a gate electrode of said gate turn-off thyristor chip;

snubber circuit connecting terminals for a snubber circuit external to said module disposed at a position different in height from that of said main anode terminal and said main cathode terminal provided for said gate turn-off thyristor chip and connected to said anode electrode and cathode electrode of the gate turn-off thyristor chip; and

internal connecting wires extending from said anode elec-



trode and said cathode electrode to said snubber circuit connecting terminals which are shorter than internal connecting wires connecting said anode electrode and said cathode electrode to said main anode terminal and said main cathode terminal, respectively.

4,634,892

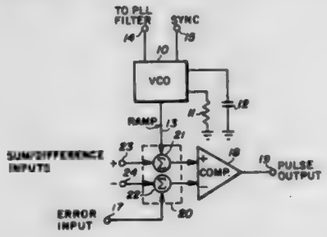
PULSE WIDTH MODULATOR CIRCUIT FOR SWITCHING REGULATORS

Tim D. Isbell, San Jose, and Walter R. Davis, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 16, 1984, Ser. No. 571,274

Int. Cl.⁴ H03K *3/017, 5/04, 7/00*

U.S. Cl. 307—265 **4 Claims**



1. A pulse width modulator circuit receiving an input control voltage and an error voltage and having an output terminal for supplying an output pulse that is width modulated by said error voltage, said circuit comprising:

a voltage controlled oscillator for developing a ramp voltage having a frequency determined by said input control voltage and a predetermined slope;

a summing block having a ramp input terminal coupled to receive said ramp voltage, an error voltage input terminal coupled to receive said error voltage, differential sum and difference input terminals and a pair of output terminals; and

a comparator having a pair of input terminals coupled to said output terminals of said summing block and an output terminal for supplying said output pulse whereby said output pulse can be width modulated by said error voltage and by the voltages applied to said sum and difference input terminals without affecting the frequency or slope of said ramp voltage.

4,634,893

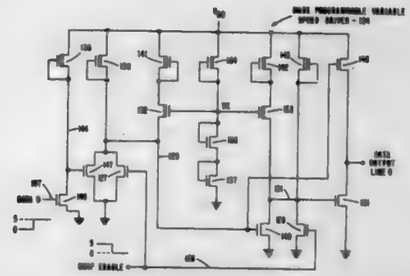
FET DRIVER CIRCUIT WITH MASK PROGRAMMABLE TRANSITION RATES

Donald G. Craycraft, Spring Valley, and Giao N. Pham, Centerville, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Division of Ser. No. 456,938, Jan. 10, 1983. This application Feb. 25, 1985, Ser. No. 705,296

Int. Cl.⁴ H03K *5/12, 17/693, 19/092, 19/094*

U.S. Cl. 307—270 **2 Claims**



1. An integrated driver circuit for programmably prescribing the rate of change of the output signal, comprising:

an amplifier having series connected, push-pull connected output FETs responsive respectively to oppositely transitioned potentials on first and second capacitively acting nodes;

means for selectively limiting the rate of change of the potential on the first capacitive node by providing current to charge said first capacitive node at a programmed rate; and

means for selectively limiting the rate of change of the potential on the second capacitive node by providing current to charge said second capacitive node at a programmed rate.

4,634,894

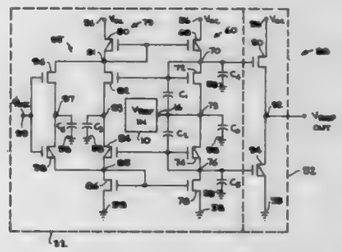
LOW POWER CMOS REFERENCE GENERATOR WITH LOW IMPEDANCE DRIVER

Lee-Lean Shu, Milpitas; Tai C. Shyu, San Jose, and Patrick T. Chuang, Cupertino, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 4, 1985, Ser. No. 707,726

Int. Cl.⁴ G05F *3/24*

U.S. Cl. 307—297 **36 Claims**



1. A low power, low output impedance on-chip voltage reference with high current dirve capability for accepting a V_{REFIN} signal from the output terminal of a high output impedance voltage reference and for providing a V_{REFOUT} signal where the magnitude of V_{REFOUT} is about equal to the magnitude of V_{REFIN}, said low output impedance voltage reference comprising:

a preamplifier, including a first plurality of interconnected transistors, having an input terminal coupled to the output terminal of the high output impedance voltage reference, with said preamplifier for preventing a substantial amount of current from flowing into or out of the output terminal of said high output impedance voltage reference and for providing first and second preamplifier output signals at first and second preamplifier output terminals, respectively;

a source follower output stage, including a second plurality of interconnected transistors, having first and second inputs coupled to said first and second preamplifier outputs, respectively, and for providing the V_{REPOUT} signal at an output stage output terminal and for providing a high source/sink current driving capability and low output impedance; and

means for biasing the transistors in said first and second plurality in the subthreshold region to minimize power dissipation.

4,634,895

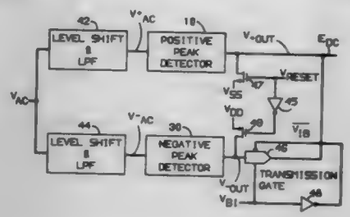
CMOS PEAK DETECTOR AND AC FILTER

Mark Y. F. Luong, Wyomissing, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 11, 1984, Ser. No. 629,811

Int. Cl.⁴ G01R *19/02, 19/22*

U.S. Cl. 307—350 **7 Claims**



1. A circuit for detecting the DC voltage level of an AC input signal, the circuit comprising

positive peak detection means for determining a peak positive value of the AC input signal;

negative peak detection means for determining a peak negative value of said AC input signal;

means for averaging the peak positive value and the peak negative value of said AC input signal to form the DC voltage level, the averaging means including a CMOS transmission gate disposed between the output of the positive peak detection means and the negative peak detection means, said transmission gate responsive to both the negative peak detection means and an external clock source for coupling together the outputs of said negative peak detection means and the positive peak detection means in response to a predetermined clock signal from said external clock source.

4,634,896

METHOD AND APPARATUS FOR QUALIFYING VALID DATA PEAKS IN A READ/WRITE CHANNEL

Louis J. Shrinkle, Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Nov. 30, 1984, Ser. No. 676,750

Int. Cl.⁴ H03K *5/01, 5/153;* **G01R** *29/02*

U.S. Cl. 307—351 **14 Claims**

1. A method for qualifying data peaks in a raw readout signal comprising the steps of:

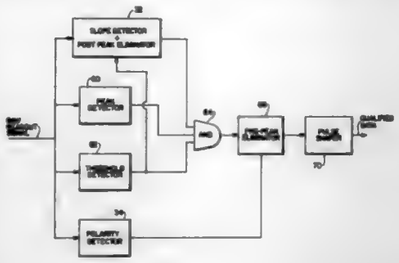
(a) detecting peaks in said raw readout signal and generating a peak output pulse indicating said peaks;

(b) detecting slopes in said raw readout signal meeting specified conditions of amplitude and polarity, and generating a slope output pulse indicating said slopes;

(c) comparing the two output pulses generated in steps (a)

and (b), and generating a qualified peak output pulse upon the occurrence of said two output pulses; and

(d) eliminating all but one of the qualified peak output pulses generated in step (c) whenever a plurality of said qualified



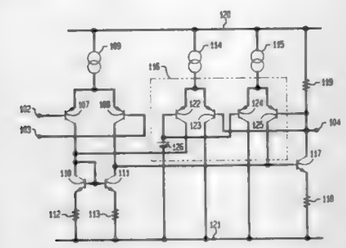
peak output pulses occur within a same polarity region of the raw readout signal, whereby only one qualified peak output pulse remains for each of the same polarity regions of said raw readout signal.

4,634,897

COMPARATOR HAVING A HYSTERESIS CHARACTERISTIC

Takakazu Yoshioka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,433
Claims priority, application Japan, Sep. 6, 1983, 58-163459
Int. Cl.⁴ H03K *5/24*
U.S. Cl. 307—359 **7 Claims**



1. A comparator circuit comprising first and second input terminals, first and second input transistors having their bases respectively connected to said first and second input terminals, first means for connecting said first and second transistors as a differential amplifier having first and second output nodes, an output terminal coupled to one of said first and second output nodes, second means for feeding a first constant current to said first output node, third means for feeding a second constant current to said second output node, and fourth means responsive to a voltage potential at said output terminal for selectively actuating said second means or said third means.

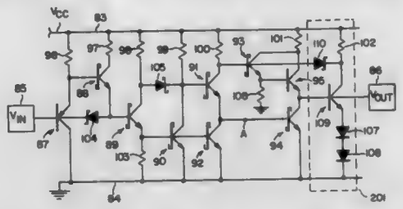
4,634,898

TTL BUFFER CIRCUIT INCORPORATING ACTIVE PULL-DOWN TRANSISTOR

Gary Gouldsberry; Albert Chan; Cyrus Tsui, and Mark Fitzpatrick, all of San Jose, Calif., assignors to Monolithic Memories, Inc., Santa Clara, Calif.

Filed Nov. 22, 1983, Ser. No. 554,474
Int. Cl.⁴ H03K *19/013, 19/088, 17/04, 17/60*
U.S. Cl. 307—456 **6 Claims**

1. In a double inversion buffer incorporating a first circuit means to invert a digital input signal, a second circuit means to produce re-inversion of said digital input signal, and output stage means for receiving said twice inverted signal and providing an external output signal, including an output line, pull-up means and a pull-down transistor connected between said output line and ground, the improvement comprising:



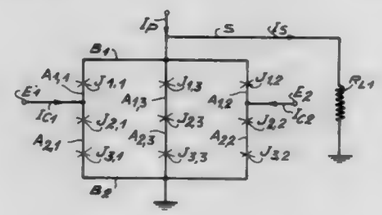
a transistor connected between the base of said pull-down transistor and ground to fully discharge said pull-down transistor in response to the operation of said first circuit means.

4,634,899

CURRENT INJECTION LOGIC DEVICE WITH JOSEPHSON DIODE NETWORK

Gérard Matheron, Echirolles, and Philippe Migny, Seyssins, both of France, assignors to Commissariat a l'Energie Atomique, France

Filed Feb. 24, 1984, Ser. No. 582,398
Claims priority, application France, Mar. 2, 1983, 83 03417
Int. Cl.⁴ H03K *19/195*
U.S. Cl. 307—462 **11 Claims**



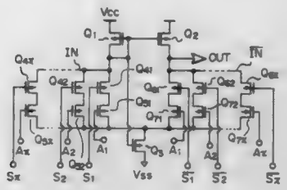
1. A logic device with Josephson diodes, wherein it comprises a first main electrode and a second earthed main electrode, a network of Josephson diodes constituted by M branches connected in parallel, and each having series-connected Josephson diodes, the first and last Josephson diodes of each of said M branches being respectively connected to the first and second main electrodes, M being an integer at least equal to 2, K branches of said M branches each having N Josephson diodes, which thus have N−1 intermediate electrodes, K being an integer at least equal to one and less than the number M, N being an integer at least equal to three, the M−K remaining branches each having at least one Josephson diode, L inputs respectively connected to L intermediate electrodes of said K branches and used for the injection of electric currents into said network, L being an integer at least equal to 1, and an output connected to the first main electrode and which is to be raised to a logic level determined as a function of the values of said currents.

4,634,900

SENSE AMPLIFIER

Atuo Koshizuka, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 10, 1984, Ser. No. 648,507
Claims priority, application Japan, Sep. 17, 1983, 58-171683
Int. Cl.⁴ H03K *5/24*; G11C *7/06*
U.S. Cl. 307—530 **9 Claims**



1. A sense amplifier comprising

a pair of input circuit portions, each said input circuit portion receiving a respective one of each of a plurality of pairs of complementary input signals,

each said input circuit portion having a respective first terminal, at which said input circuit portions are commonly connected, and a second terminal,

a first one of said input circuit portions including a plurality of circuit units each generating an amplifier output corresponding to the respective one of said input signals of a respective one of said pairs of said complementary input signals, in response to a respective address signal applied thereto, and the other input circuit portion comprising a plurality of circuit units each generating an amplifier output corresponding to the other one of each respective pair of said complementary input signals, in response to said respective address signal applied thereto,

a constant current circuit connected between said commonly connected first terminals of said input circuit portions and to a first voltage level, and

two load circuits, each being connected between a second voltage level and said second terminal of a respective one of said input circuit portions,

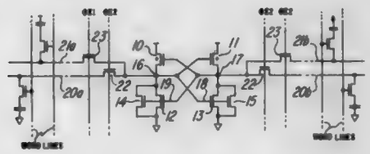
wherein each said pair of complementary input signals is selected in accordance with the respective address signal and an output signal is provided from a predetermined one of said second terminals and corresponding to the respective selected pair of said complementary input signals, and power is provided to said sense amplifier by said first and second voltage levels.

4,634,901

SENSE AMPLIFIER FOR CMOS SEMICONDUCTOR MEMORY DEVICES HAVING SYMMETRICALLY BALANCED LAYOUT

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 2, 1984, Ser. No. 636,937
Int. Cl.⁴ H03K *17/687*
U.S. Cl. 307—530 **14 Claims**



1. A CMOS sense amplifier circuit for a semiconductor memory device formed in a face of a semiconductor body, comprising:

a pair of P-channel transistors, and first and second pairs of N-channel transistors, each of said transistors having a source-to-drain path and a gate,

means connecting the source-to-drain paths of the P-channel transistors separately between a pair of sense nodes and voltage supply means, said sense nodes being separately coupled to bit lines,

means connecting the source-to-drain paths of the first pair of N-channel transistors separately between said pair of sense nodes and grounding means,

means connecting the source-to-drain paths of said second pair of N-channel transistors separately in parallel with the source-to-drain paths of said first pair of N-channel transistors,

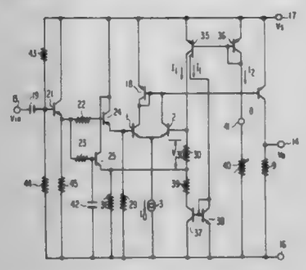
means cross-coupling the gate of each one of the P-channel transistors to said sense node to which the other one of the P-channel transistors is connected, and means cross-coupling the gates of each one of the first and second pair of N-channel transistors to said sense node to which the other one of said first and second pair is connected.

4,634,902

CIRCUIT ARRANGEMENT CAPABLE OF ADJUSTING A THRESHOLD LEVEL OF A DIFFERENTIAL TRANSISTOR CIRCUIT

Kouichi Tanaka; Takeshi Kuwajima, and Kiyoshi Amazawa, all of Tokyo, Japan, assignors to NEC Corporation and Clarion Co., Ltd., both of Japan

Filed Nov. 16, 1983, Ser. No. 552,518
Claims priority, application Japan, Nov. 17, 1982, 57-201725; Nov. 17, 1982, 57-201726
Int. Cl.⁴ H03K *5/153, 5/08*
U.S. Cl. 307—542 **11 Claims**



1. A circuit arrangement comprising a differential amplifier having first and second input terminals, input signal supplying means for supplying said first input terminal with an input signal;

a first current circuit having a first reference current terminal and first and second current terminals for producing a first reference current and first and second current through said first reference terminal and said first and second current terminals, respectively, each of said first and second currents being related to said first reference current;

a second current circuit having a third current terminal and a second current reference terminal connected to said second current terminal for causing a third current and said second current to flow through said third current terminal and said second current reference terminal, respectively, said third current being dependent on said second current and substantially equal to said first current;

a resistor connected between said first current terminal and said third current terminal for producing a comparison voltage; and

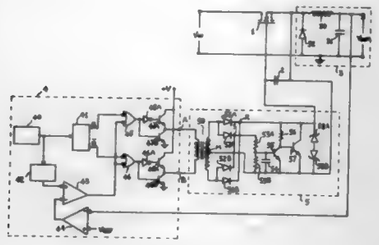
means for coupling one end of said resistor to said second input terminal of said differential amplifier to supply said comparison voltage to said second input terminal.

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4,634,903
POWER FET DRIVING CIRCUIT

Gianpaolo Montorfano, Milan, Italy, assignor to Honeywell Information Systems Italia, Milan, Italy

Filed Jan. 31, 1985, Ser. No. 696,987
Claims priority, application European Pat. Off., Feb. 20, 1984, 84101753.6
Int. Cl.⁴ H03K 17/687, 3/33
U.S. Cl. 307—571 4 Claims



1. Power FET driving circuit, said FET having gate, drain and source terminals and an intrinsic capacitance between said gate terminal and said source terminal, said driving circuit being coupled to a control circuit which controls the switching ON/OFF of said FET, said control circuit providing on a first (A) and second output (B) respectively a first and a second pulse voltage with fixed frequency and duty cycle ratio which varies up to a maximum of 50%, said first and second pulse voltage having the same polarity as to a common reference ground and being shifted 180° out of phase each from the other, characterized in that it comprises:

a transformer having a primary and at least a secondary winding, the ends of said primary winding being connected to said first and second output of said control circuit,

rectifying means having input and output said input being connected to the ends of said at least secondary winding of said transformer and rendering available at said output a third pulse voltage having one of two possible logical-/electrical levels and a frequency twice that one of said first and second pulse voltages and duty cycle ratio which varies up to a maximum of 100%, under control of said control circuit, and

switch means connected to said output and controlled by said third pulse voltage to apply said third voltage to said intrinsic capacitance when said third voltage is at one of said two logical/electrical levels and to short circuit said intrinsic capacitance when said third voltage changes to the other of said two logical/electrical levels, whereby said power FET is switched-on and switched-off at the frequency of said third pulse voltage with a duty cycle ratio which varies up to a maximum of 100%.

4,634,904
CMOS POWER-ON RESET CIRCUIT

Anthony Y. Wong, Cupertino, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

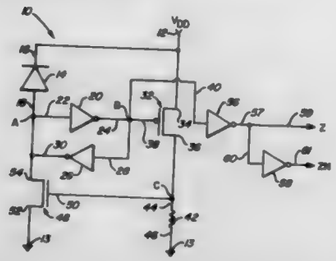
Filed Apr. 3, 1985, Ser. No. 719,285
Int. Cl.⁴ H03K 17/22
U.S. Cl. 307—594 6 Claims

1. A power-on reset circuit comprising,

a capacitance means having a first electrode connected to a power supply and a second electrode, said capacitance means for capacitively coupling said second electrode to said power supply when said power supply is switched on,

a latch means having a first terminal connected to said second electrode of said capacitance means and a second terminal, said latch means for grounding said second terminal of the latch means when said first terminial of the latch means is coupled to said power supply and coupling said second terminal of the latch means to said power supply when said first terminal of the latch means is at ground potential,

a voltage divider means having an input connected to said power supply, a first output, a ground reference terminal and control means, said control means connected to said second terminal of said latch means for resistively coupling said first output to said input when said second terminal of the latch means is at ground potential at said ground reference terminal,



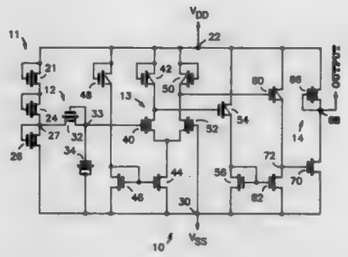
a threshold detection means connected to said first output of said voltage divider means and connected to said first terminal of said latch means for grounding said first terminal of said latch means when said first output of said voltage divider means reaches a voltage threshold, and

an output means connected to said second terminal of said latch means for generating at least one output of the circuit.

4,634,905
POWER-ON-RESET CIRCUIT HAVING A DIFFERENTIAL COMPARATOR WITH INTRINSIC OFFSET VOLTAGE

Jules D. Campbell, Jr., Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 23, 1985, Ser. No. 779,370
Int. Cl.⁴ H03K 5/153, 5/24, 17/687
U.S. Cl. 307—594 9 Claims



1. A circuit for providing an output voltage and resetting the output voltage to a predetermined level upon coupling a predetermined power supply voltage to a power terminal of the circuit, comprising:

voltage divider means coupled to the power terminal for providing a predetermined portion of the power supply voltage;

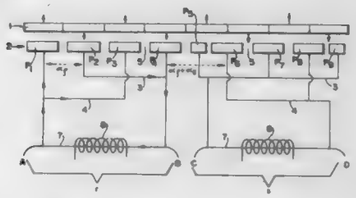
differential comparator means comprising a differential input pair of transistors having predetermined different threshold voltages, a first of the transistors having a control electrode coupled to a reference voltage terminal and a second of the transistors having a control electrode coupled to the voltage divider means, said comparator means comparing the predetermined portion of the power supply voltage with an offset voltage of the comparator created by the different threshold voltages and providing a control voltage in response thereto; and

output means coupled to the differential comparator means for providing the output voltage in response to the control voltage.

4,634,906
MULTIPHASE MOTOR WITH MAGNETIZED ROTOR HAVING N PAIRS OF POLES WITH AXIAL MAGNETIZATION

Michel Grosjean, 1, rue des Narcisses, CH-2504 Bienne, Switzerland

PCT No. PCT/CH84/00118, § 371 Date Mar. 28, 1985, § 102(e) Date Mar. 28, 1985, PCT Pub. No. WO85/00704, PCT Pub. Date Feb. 14, 1985
PCT Filed Jul. 30, 1984, Ser. No. 720,408
Claims priority, application Switzerland, Jul. 28, 1983, 4129/83
Int. Cl.⁴ H02K 37/00
U.S. Cl. 310—49 R 6 Claims



1. A multiphase motor with a magnetized rotor having N pairs of rotor poles, the axis of magnetization of each rotor pole being parallel to the axis of rotation of said rotor,

wherein the magnetization axes of the rotor poles are regularly distributed around the axis of rotation of said rotor, the adjacent rotor poles having opposite polarities,

wherein the rotor is mounted opposite a stator, said stator formed with m phases where $m=N/2n$, n being an integer and m being an integer greater that 1, each phase comprising two substantially coplanar polar pieces, one of which is interpositioned in the other one and being separated therefrom by a sinuous air-gap,

wherein for m−1 phases as well as for a first polar piece of the remaining phase, the stator poles of every polar piece, being $n=N/2m$ in number, are full and spaced apart by an angular interval at least approximately two times larger than that between the adjacent rotor poles, (N/2m)−1 stator poles of a second polar piece of the remaining phase being full,

wherein the m remaining stator poles of said second polar piece are fractional, the sum of the arcs of all fractional stator poles being at least approximately equal to the arc of a full pole,

wherein the phases are phase-shifted with respect to one another,

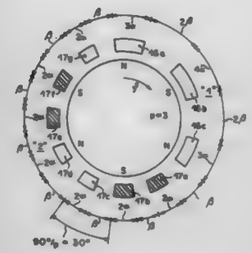
wherein the two polar pieces of every phase are magnetically connected to first and second ends, respectively, of a respective core, and

wherein each core has at least one coil wound thereon.

4,634,907
SINGLE PHASE STEPPING MOTOR WITH IMPROVED POLE ARRANGEMENT

Hubert Lechner, Zug, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Dec. 2, 1985, Ser. No. 803,543
Claims priority, application Switzerland, Dec. 6, 1984, 5809/84
Int. Cl.⁴ H02K 37/00
U.S. Cl. 310—49 R 4 Claims



1. A single-phase stepping motor, comprising:

a permanently magnetized rotor, having an axis, and having at least one pair of magnetic poles of alternating polarity evenly distributed around the circumference of said rotor;

a substantially ring-shaped exciter coil, concentric with, and surrounding said rotor so as to form a concentric space between said exciter coil and said rotor;

a stator of magnetic material, surrounding said exciter coil and said rotor, and having a first side and a second side;

a first plurality of stator pole arms extending from said first side of said stator into said concentric space between said rotor and said exciter spool, said first plurality of stator pole arms being arranged in at least one first type of group having an odd number of stator pole arms of identical polarity such that said stator pole arms at each extremity of said first type of group each subtend an angle of approximately 3α about said axis, and each inner stator pole arm of said first type of group subtends an angle of approximately 4α about said axis, such that the angle subtended about said axis between adjacent said stator pole arms of said first type of group is 2β;

a second plurality of stator pole arms extending from said first side and said second side of said stator in an axial direction into said concentric space between said rotor and said exciter spool, said second plurality of stator pole arms being arranged in at least one second type of group having an odd number of stator pole arms sequentially arranged in pairs of alternating plurality with the addition of one unpaired stator pole arm such that each said stator pole arm of said second type of group subtends an angle of 2α about said axis and such that the angle subtended about said axis between each said stator pole arm and its neighboring stator pole arm is β, said second type group alternating with said first type of group around said rotor in such a manner that said unpaired stator pole arm of said second type of group is of the same polarity as said stator pole arms of said first type of group;

the relationship between α and β being such that twice α plus β is equal to 90° divided by the number of pairs of said rotor poles;

whereby the direction of rotation of said rotor is from said unpaired stator pole arm of said second type of group to said neighboring stator pole arm of said first type of group.

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4,634,908

EXTERNAL ROTOR MOTOR WITH SCREWED ON MOTOR FLANGE

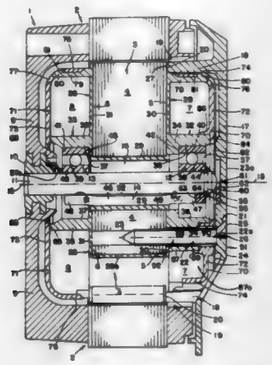
Gerhard Sturm, Mulfingen, Fed. Rep. of Germany, assignor to ebm Elektrobau Mulfingen GmbH & Co., Fed. Rep. of Germany

Filed Jun. 14, 1985, Ser. No. 744,933

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1984, 3422743

Int. Cl.⁴ H02K *5/18*

U.S. Cl. 310—64 **18 Claims**



1. External rotor motor of the kind having an overhung external rotor and a stator connected with a motor flange having an internal side facing the stator and having an external side, the stator having a stator winding and a stator lamination pack, an insulating layer made of platic and sprayed over the inner side of an axial stator bore of the stator lamination pack and, at least in areas, over the front sides of the stator lamination pack, and a rotatable rotor shaft which penetrates the stator bore and is connected with the rotor in a fixed manner on the shaft end opposite the motor flange, said motor characterized by:

at least one metal heat conducting element provided by a bolt which interconnects the stator with the motor flange in good heat transfer relation;

each said bolt extending through a corresponding hole in the motor flange and having a bolt head abutting on the external side of the motor flange;

and each said bolt having a shank engage directly into a hole of the lamination pack,

whereby heat is conducted from the stator lamination pack to the motor flange by way of the bolts.

4,634,909

ELECTRIC MACHINE

Ernst Brem, Schlieren, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

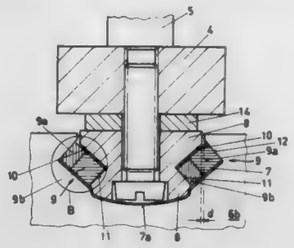
Filed Jul. 9, 1985, Ser. No. 753,148

Claims priority, application Switzerland, Aug. 8, 1984, 3808/84

Int. Cl.⁴ H02K *5/00*

U.S. Cl. 310—91 **16 Claims**

1. An electric machine comprising a laminated stack (6) which has on its outside a plurality of grooves (7) which extend axially and are distributed over the entire circumference of said laminated stack (6), said laminated stack (6) being suspended by means of wedges extending in its longitudinal direction in a stator housing (1), in which arrangement said wedges are joined to wedge carriers (4) which extend parallel to said wedges, said wedge carriers (4) being fixed on said stator housing (1), each of said wedges comprising a centre part (8) which is detachably connected to a corresponding one of said wedge carriers (4) and lateral clamping means (9) which can be



axially actuated so as to extend completely inside a corresponding one of said grooves (7).

4,634,910

ROTOR OF AN ELECTRICAL MACHINE HAVING A DIRECTLY COOLED ROTOR WINDING

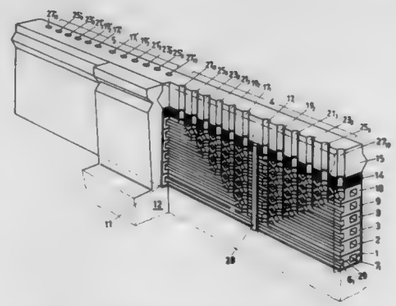
Karl Schöllhorn, Birr, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Aug. 12, 1985, Ser. No. 764,748

Claims priority, application Switzerland, Aug. 27, 1984, 4082/84

Int. Cl.⁴ H02K *1/32*

U.S. Cl. 310—214 **6 Claims**



1. A rotor of an electrical machine having a directly cooled rotor winding, comprising:

plural winding conductors forming a conductor bundle and located one above the other in a groove, the conductors of each bundle including an uppermost conductor beneath which the other conductors of the respective bundle are located, the conductors of each bundle fastened in said groove by means of a groove wedge, the winding conductors each having at least two adjacent half cooling ducts running in a longitudinal direction of the conductors;

at least two gas outlets provided in a central section of the bundle and offset relative to one another in a rotor peripheral direction;

separating means provided in the central section for interrupting the half cooling ducts at plural interruption points;

at each interruption point, each half cooling duct being in connection with a respective approximately radially extending duct which ends at an upper surface of the rotor;

the gas outlets of a conductor bundle being offset relative to one another in the conductor longitudinal direction, and the radial ducts emerging into holes passing approximately radially through the groove wedges;

wherein the radially extending duct associated with each conductor, except the uppermost conductor, extends

completely through the winding conductors located above the respective conductor.

4,634,911

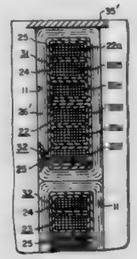
HIGH VOLTAGE DYNAMOELECTRIC MACHINE WITH SELECTIVELY INCREASED COIL TURN-TO-TURN INSULATION STRENGTH

Stanley A. Studniarz, Murrysville Boro, Pa.; John C. Botts, Hilton Head Island, S.C., and John S. Johnson, Murrysville Boro, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 16, 1985, Ser. No. 723,775

Int. Cl.⁴ H02K *23/60*

U.S. Cl. 310—215 **4 Claims**



1. A dynamoelectric machine comprising:

a stator core having a plurality of coil slots, each of said coil slots having a number of half-coils each comprising a plurality of coil turns arranged in a stack therein; and

an insulation system for said plurality of coil turns comprising turn insulation of uniform thickness about each of said coil turns, group insulation of uniform thickness about each of a plurality of groups of said plurality of coil turns, each of said groups including a plurality of said coil turns that are adjacent each other in said stack, and ground wall insulation of uniform thickness about the entirety of said stack of said coil turns, said insulation system providing increased insulation strength between coil turns at extremities of said stack as compared to that between coil turns within each of said plurality of groups.

4,634,912

ELECTROMECHANICAL TRANSDUCER HAVING A SELF-INDUCTANCE CANCELLING COIL ASSEMBLY

Marc A. Heyraud, La Chaux-de-Fonds, Switzerland, assignor to Asgalium S.A., Switzerland

Filed Jul. 31, 1985, Ser. No. 760,813

Claims priority, application Switzerland, Aug. 10, 1984, 3852/84

Int. Cl.⁴ H02K *3/28, 11/00, 16/04*

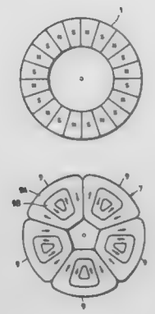
U.S. Cl. 310—268 **12 Claims**

1. An electromechanical transducer of the type having two parts, one fixed and the other rotatable about an axis constituting the axis of the transducer, wherein the improvement comprises:

magnet means included in one of said parts and arranged for providing in a space adjacent said one part a permanent, non-uniform magnetic field; and

an assembly of coils included in the other of said parts, said coils being distributed about said axis, in said space, and comprising windings having active winding segments intersected by said magnetic field upon a rotation of said transducer and connecting winding segments not intersected by said magnetic field;

each of said coils comprising two portions, each of said portions comprising two said active winding segments and two said connecting winding segments and both said portions of each of said coils being connected to one another and arranged in such a way that the effects of the mutual inductance provided by each portion onto the other upon a variation of the current in said coils are



opposite to the effects, upon said current variation, of the self-inductance in each of said portions.

4,634,913

APPLICATION OF LITHIUM TETRABORATE TO ELECTRONIC DEVICES

Roger W. Whatmore, Bletchley, and Iain M. Young, Malvern, both of England, assignors to Plessey Overseas Limited, Ilford, England

Continuation-in-part of Ser. No. 625,590, Jun. 29, 1984, Pat. No. 4,523,119, which is a continuation of Ser. No. 271,112, Jun. 8, 1981, abandoned. This application Feb. 21, 1985, Ser. No. 703,653

Claims priority, application United Kingdom, Jun. 11, 1980, 8019062; Dec. 23, 1980, 8041183

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—313 A **8 Claims**



1. A piezo-electric device comprising a body of piezoelectric active material and electrodes adjacent to and in contact with said body, wherein said body is of single crystal lithium tetraborate material.

4,634,914

PIEZOELECTRIC SAW DEVICE WITH A CORRUGATED SURFACE

Arthur Ballato, Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 9, 1985, Ser. No. 732,120

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—313 D **8 Claims**

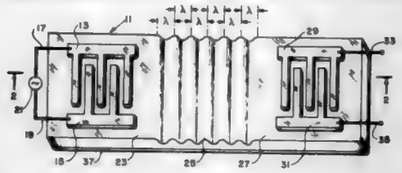
1. An acoustic surface wave device comprising:

a substrate of material capable of supporting both surface acoustic waves and bulk acoustic waves;

input means for launching surface acoustic waves upon said substrate;

output means for receiving surface acoustic waves propagating upon said substrate; and

a plurality of groups of periodic corrugations disposed upon the surface of said substrate between said input and said output means, each of said groups serving to attenuate



surface acoustic waves of a respective predetermined wavelength traversing said surface, each of said groups of corrugations causing scattering of said respective surface acoustic waves of predetermined wavelength to produce bulk acoustic waves.

4,634,915

MOUNT FOR SURFACE WAVE MOTOR

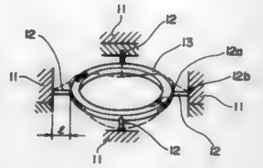
Hitoshi Mukoujima; Akira Hiramatsu, both of Yokohama; Hiroyasu Murakami, Tokyo, and Makoto Katsuma, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 663,144, Oct. 22, 1984, abandoned. This application Sep. 9, 1985, Ser. No. 774,166

Claims priority, application Japan, Oct. 26, 1983, 58-200371

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—323 **25 Claims**



1. A surface wave motor comprising:

(a) a ring-shaped vibration member having a plurality of electrostrictive elements to which an A.C. voltage is applied, for generating a traveling surface wave;

(b) a rotor driven by the traveling surface wave generated by said ring-shaped vibration member; and

(c) at least three auxiliary vibration members arranged equidistantly around an outer periphery of said ring-shaped vibration member for supporting said ring-shaped vibration member to an outer wall of said motor.

4,634,916

PIEZOELECTRIC ROTARY DRIVER

Kozo Okada; Michiyuki Masuda, both of Nagoya, and Sadayuki Ueha, Machida, all of Japan, assignors to NGK Spark Plug Co., Ltd., Japan

Filed Sep. 30, 1985, Ser. No. 782,211

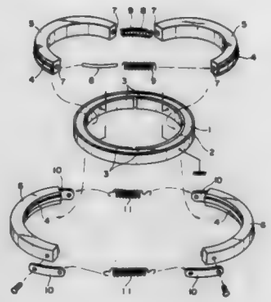
Claims priority, application Japan, Oct. 2, 1984, 59-207670; Dec. 12, 1984, 59-263648; Mar. 8, 1985, 60-46981

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—323 **6 Claims**

1. A rotary driver comprising:

a solenoidal oscillation element consisting of an electrostriction element polarized in radial directions or vertical directions and provided with electrodes on pair opposite surfaces perpendicular to the direction of polarization, the electrode on either one of said pair opposite surfaces being uniformly divided by x greater than four, AC voltages of $V_o \sin \omega t$ shifted in circumferential phase from each other by $2\pi/x$ being applied to said division electrodes; and



a driven member being held in contact with at least one of said opposite surfaces of said solenoidal oscillation element.

4,634,917

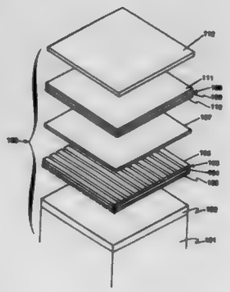
ACTIVE MULTI-LAYER PIEZOELECTRIC TACTILE SENSOR APPARATUS AND METHOD

James E. Dvorsky, Norwich Township, Muskingum County, Ohio; Brian A. Kelley, Bethesda, Md.; Robert B. McCown, Upper Arlington, and G. Frederick Reamer, Clinton Township, McKean County, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Dec. 26, 1984, Ser. No. 686,124

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—328 **60 Claims**



1. A tactile sensing apparatus comprising:

a. a piezoelectric energizing layer having a plurality of conductors disposed on one surface of a piezoelectric material and a plurality of conductors disposed on the opposite surface of the piezoelectric material, the plurality of conductors having electrical connections adapted to be connected to electrical energizing means;

b. an electrical insulating layer disposed adjacent the piezoelectric energizing layer; and

c. a piezoelectric sensing layer, having conducting surfaces disposed on opposite surfaces thereof, and disposed adjacent the insulating layer.

4,634,918

CATHODE RAY TUBE APPARATUS WITH LIQUID COOLED FRONT PANEL

Hiroshi Kato, Kawasaki; Tomosuke Chiba, Matsudo, and Masahiro Kikuchi, Shinagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

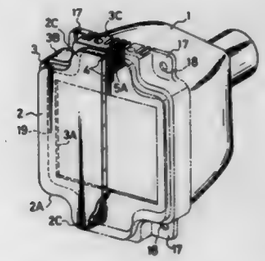
PCT No. PCT/JP84/00062, § 371 Date Oct. 18, 1984, § 102(e) Date Oct. 18, 1984, PCT Pub. No. WO84/03390, PCT Pub. Date Aug. 30, 1984

PCT Filed Feb. 22, 1984, Ser. No. 667,496

Claims priority, application Japan, Feb. 24, 1983, 58-29809

Int. Cl.⁴ H01J *29/86, 7/24*

U.S. Cl. 313—36 **3 Claims**



1. A liquid cooling type cathode ray tube apparatus comprising a cathode ray tube having a flat plate shaped front transparent panel on which a phosphor screen is deposited, a metal spacer provided on said front panel to surround said phoshor screen, said metal spacer serving as a heat radiator, and a separate flat plate shaped transparent panel disposed in opposing relation to said front panel of said cathode ray tube with a predetermined distance therebetween, wherein both of said panel and said spacer form a liquid tight space therebetween, a transparent liquid coolant is sealed in said space, said separate transparent panel is provided at least on its upper end side with a protruded portion which is protruded upwards from the upper marginal edge of said front panel wherein said protruded portion and said metal spacer form an extended space therebetween, said extended space being filled by said liquid coolant.

4,634,919

BULB

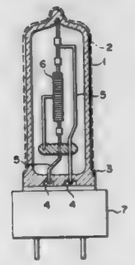
Yooji Yuge, Chigasaki; Ariyoshi Ishizaki, Yokohama; Tokuyoshi Saito, Ichihara, and Takeshi Ishii, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Nippon Soda Co., Ltd., Tokyo, both of, Japan

Filed Aug. 17, 1984, Ser. No. 641,776

Claims priority, application Japan, Aug. 22, 1983, 58-151724

Int. Cl.⁴ F21M *3/14*

U.S. Cl. 313—113 **11 Claims**



1. A bulb comprising a glass bulb sealing a light-emitting member therein, and an optical interference film formed on at least one of inner and outer surfaces of said glass bulb and consisting of alternately formed thin titanium oxide layers and thin metal oxide layers of a lower refractive index than that of the thin titanium oxide layers, wherein the thin titanium oxide layers are formed by coating a mixture and thermally decomposing the coated mixture, the mixture consisting of:

(A) 5 to 50 parts by weight of an organic compound A obtained by substituting some or all of alkoxyl groups of a titanium alkoxide having a general formula:

$Ti(OR)_4$

(wherein R are the same or different alkyl groups having 1 to 18 carbon atoms) with one or more substituting groups selected from the group consisting of a residual group, —OCOR′ of a carboxylic acid having a general formula:

HOCOR′

(wherein R′ is an alkyl group having 1 to 18 carbon atoms), and a residual group: —X of an organic compound having a formula HX and capable of forming a chelate ring with titanium; and

(B) 95 to 50 parts by weight of an organic titanium compound polymer B obtained by substituting some or all of substituting groups, —OR of a titanium alkoxide polymer obtained by polymerization under water addition of the same or different titanium alkoxides having a general formula:

$Ti(OR)_4$

(wherein R are the same or different alkyl groups having 1 to 18 carbon atoms) with one or more substituting groups selected from the group consisting of a residual group, —OCOR′ of a carboxylic acid having a general formula:

HOCOR′

(wherein R′ is an alkyl group having 1 to 18 carbon atoms) and a residual group, —X of an organic compound having a formula HX and capable of forming a chelate ring with titanium.

4,634,920

ELECTRICAL LAMP HAVING A SLEEVE MOUNTED IN A LAMP CAP OF SYNTHETIC MATERIAL

Josephus F. Rijckaert, and Rudolf Sanders, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,709

Claims priority, application Netherlands, Jan. 9, 1984, 8400064

Int. Cl.⁴ H01J *5/48, 5/50*

U.S. Cl. 313—318 **4 Claims**

1. An electrical lamp comprising

a transparent lamp vessel sealed in a vacuum-tight manner, and having a pinch seal,

an electrical element arranged within the lamp vessel,

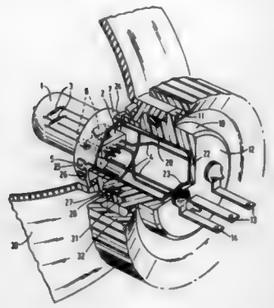
current conductors extending through the wall of the lamp vessel to the electrical element,

a metal clamping plate having lugs; an opening though which the pinch seal extends and in which the pinch seal is held fast by said lugs; and a substantially circular-cylindrical flange,

a cup-shaped lamp cap of synthetic material having a projecting collar and a bottom, and contacts secured to and projecting below said bottom, to each of which contacts a respective current conductor is connected, and

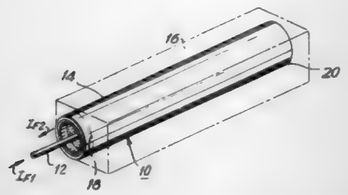
a substantially circular-cylindrical metal sleeve secured to and projecting beyond said cap, telescopically secured to the circular-cylindrical flange of said plate,

characterized in that said metal sleeve is shaped as a cup having a substantially flat bottom, and is mechanically



secured to said cap by fixing said cup bottom to the bottom of the lamp cap.

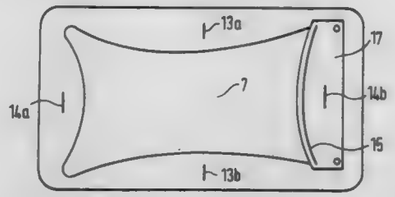
4,634,921
THERMIONIC CATHODE HEATER
Kenneth E. Williams, Andover; William A. Frutiger, Beverly, and Kenneth E. Hall, Lynnfield, all of Mass., assignors to Sony Corporation, Tokyo, Japan
Filed Jul. 3, 1984, Ser. No. 627,649
Int. Cl.⁴ H01J *1/15*
U.S. Cl. 313—342 **17 Claims**



1. A heater for insertion into a thermionic cathode capable of providing a strip electron beam, the heater comprising:
- a first current carrying means extending in a predetermined direction; and
- a second current carrying means disposed in series with and substantially surrounding said first current carrying means along said predetermined direction for substantially preventing the creation of a magnetic field causing deflection of the electron beam by said heater when electric current flows in opposite directions along said first and second carrying means;
- said second current carrying means having a higher resistance to electrical current and generating greater I^2R heating than said first current carrying means.

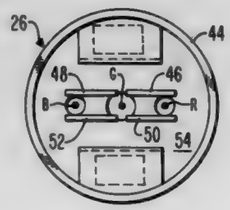
4,634,922
METHOD OF MANUFACTURING AND ADJUSTING A COLOR PICTURE REPRODUCTION UNIT
Eberhard Nill, Oberesslingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.
Filed Dec. 17, 1984, Ser. No. 682,669
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1983, 3346363
Int. Cl.⁴ H01J *29/07, 29/51*
U.S. Cl. 313—402 **9 Claims**

1. A color picture tube comprising:
- a glass bulb having a non-transparent interior coating;
- three electron gun systems disposed in said glass bulb;
- a screen closing one end of said glass bulb;
- a shadow mask assembly disposed between said three electron gun systems and said screen;
- at least four phosphor strip portions on said shadow mask assembly on the side thereof facing said three electron gun systems, each of said phosphor strip portions transmitting light upon impingement by an electron beam and each of said phosphor strip portions being associated with the center of a corresponding edge of said shadow mask as-



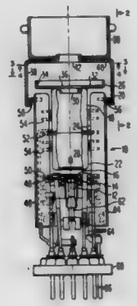
sembly, a plurality of openings in said interior coating, each of said openings optically coupled with a corresponding one of said phosphor strips; and
- photo sensitive means outside said glass bulb for detecting light emitted from said phosphor strip portions through said plurality of openings; and
- a substantially vertical phosphor strip on said shadow mask assembly which extends in such a way that each line of a line raster intersects said vertical phosphor strip near the beginning of the line.

4,634,923
COLOR PICTURE TUBE HAVING IMPROVED ELECTRON GUN
Roger C. Alig, Princeton Junction, N.J., assignor to RCA Corporation, Princeton, N.J.
Filed Nov. 15, 1979, Ser. No. 94,557
Int. Cl.⁴ B65B *21/02*
U.S. Cl. 313—413 **6 Claims**



1. In a color picture tube having an inline electron gun for generating and directing three electron beams, comprising a center beam and two outer beams, along coplanar paths toward a screen of said tube, said electron gun including a shield cup having a base with three apertures therein corresponding to the electron beam paths, wherein the beams pass through a deflection zone adapted to have vertical and horizontal magnetic deflection fields established therein, the improvement comprising
- four magnetically permeable horizontally extending rails located on said base of said shield cup, said rails being positioned in parallel pairs above and below each of said outer beams in a fringe of the deflection zone, the horizontal spacing between the two upper rails and between the two lower rails being less than the diameter of the center aperture of said shield cup, thereby causing the horizontally extending lines of magnetic flux that form a portion of the vertical magnetic deflection field to sufficiently bow outwardly in the gap between the two upper rails and between the two lower rails to compress the magnetic flux lines near the center beam thus nonlinearly increasing the effect of the vertical magnetic deflection field on the center beam relative to the outer beams with increasing angles of vertical deflection of the beams.

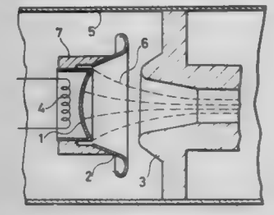
4,634,924
ELECTRON GUN HAVING CYLINDRICAL FOCUS LENS
Karl G. Hernqvist, Princeton Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.
Filed Aug. 6, 1985, Ser. No. 762,852
Int. Cl.⁴ H01J *29/62, 29/50, 29/82*
U.S. Cl. 313—414 **3 Claims**



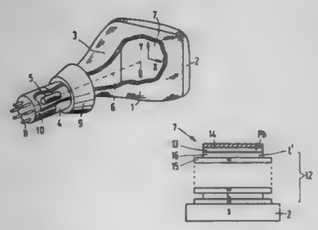
1. In an electron gun for generating and directing three electron beams along paths, said electron gun including an electrostatic main focusing lens which is formed by two spaced electrodes, the improvement comprising
- a first of the main focusing lens electrodes including a first cylindrical portion and a first apertured portion, the first apertured portion closing one end of the first cylindrical portion, and the first apertured portion including three apertures therein, and
- a second of the main focusing lens electrodes including a second cylindrical portion having a diameter larger than the diameter of the first cylindrical portion of said first main focusing lens electrode, and a second apertured portion closing one end of the second cylindrical portion, the second apertured portion including three apertures therein, at least part of the first cylindrical portion of said first main focusing lens electrode being located within the second cylindrical portion of said second main focusing lens electrode,
- whereby one component of the main focusing lens is established by the first and second cylindrical portions, and other components of the main focusing lens are established by adjacent apertures in the first and second main focusing lens electrodes.

4,634,925
ELECTRON GUN FOR A HIGH POWER KLYSTRON
Hiroshi Ieki, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 18, 1984, Ser. No. 651,854
Claims priority, application Japan, Oct. 7, 1983, 58-188994
Int. Cl.⁴ H01J *29/46*
U.S. Cl. 313—454 **6 Claims**

1. An electron gun for a high power klystron, which comprises:
- a cathode which emits electrons;
- a first cylindrical electrode portion adjacently arranged and connected to said cathode;
- a second cylindrical electrode portion arranged adjacent to said first cylindrical electrode portion;
- support means, composed of a material of high resistivity, that electrically connects said first cylindrical electrode portion and said second cylindrical electrode portion to reduce discharge currents;
- focus electrode means constituted by said first cylindrical electrode portion, said second cylindrical electrode portion and said supporting member which produces an electron beam from the electrons emitted from said cathode; and
- an anode which accelerates said electron beam produced by said focus electrode means.



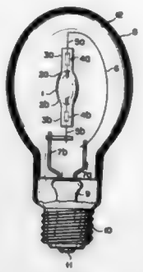
4,634,926
DISPLAY TUBE PROVIDED WITH AN INTERFERENCE FILTER
Leendert Vriens; Johannes H. M. Spruit; Johannes C. N. Rijpers, and Titus E. C. Brandsma, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 18, 1984, Ser. No. 662,311
Claims priority, application Netherlands, Jul. 20, 1984, 8402304
Int. Cl.⁴ H01J *29/28, 29/89*
U.S. Cl. 313—474 **17 Claims**



1. A display tube comprising in an evacuated envelope a display screen which is provided on the inside of a display window in the wall of the envelope, which display screen comprises luminescent material, and a multilayer interference filter is provided between said material and the display window, said filter comprising a number of layers manufactured alternately from a material having a high refractive index and a material having a low refractive index, characterized in that the filter is composed substantially of 6 to 30 layers each having an optical thickness nd, wherein n is the refractive index of the material of the layer and d is the thickness, said optical thickness nd being between $0.2\lambda_f$ and $0.3\lambda_f$ in which λ_f is equal to $p\times\lambda$, in which λ is the desired central wavelength selected from the spectrum emitted by the luminescent material and p is a number between 1.15 and 1.45.

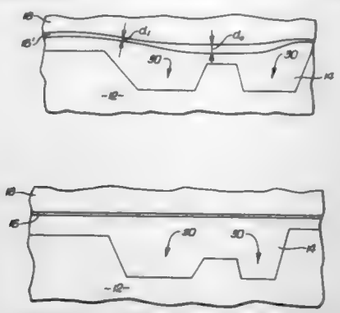
VOL 1074 ISS 1 JA 6 1987 UMI

4,634,927
SMALL METAL HALIDE LAMP
Yasuki Mori, Yokohama, and Akihiro Kamiya, Yokosuka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Dec. 14, 1982, Ser. No. 449,690
Claims priority, application Japan, Dec. 25, 1981, 56-215571
Int. Cl.⁴ H01J *1/63, 61/20, 61/35*
U.S. Cl. 313—486 **8 Claims**



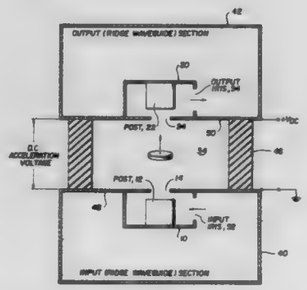
1. A small metal halide lamp adapted for a power input of not more than 100 watts, comprising:
an arc tube having a pair of electrodes spaced apart from each other and containing a rare gas, mercury, sodium halide and scandium halide therein, with a mixing ratio of sodium halide to scandium halide based on weight within the range of 3:1 to 10:1, and a total content of said sodium halide and said scandium halide within the range of 10 to 40 mg per unit volume (cc) of said arc tube; and
an envelope for housing said arc tube with at least one phosphor applied on an inner surface of said envelope so that the chromaticity of light produced by said lamp does not greatly deviate from the black body locus standard, and wherein said phosphor is at least one of the phosphors selected from the group consisting of a manganese-activated magnesium fluorogermanate phosphor and a cerium-activated yttrium aluminate phosphor.

4,634,928
SUPERLUMINESCENT LIGHT-EMITTING DIODE AND RELATED METHOD
Luis Figueroa, Torrance; Joseph W. Niesen, Fullerton; Lawrence M. Zinkiewicz, Rancho Palos Verdes, and Charles B. Morrison, San Pedro, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed Apr. 19, 1985, Ser. No. 724,870
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 313—499 **16 Claims**



1. A superluminescent light-emitting diode comprising:
a semiconductor structure including an active semiconductor layer at a junction between two semiconductor materials of opposite conductivity types;
an anti-reflective coating on at least one facet of the structure, to inhibit lasing within the active layer;
electrical contact means for applying a forward-bias voltage across the junction to produce emission of light; and
means within the structure for producing a non-uniform gain profile along the active layer, whereby the non-uniformity of gain profile results in a broadening of the frequency spectrum of light emitted from the device, as the power is increased.

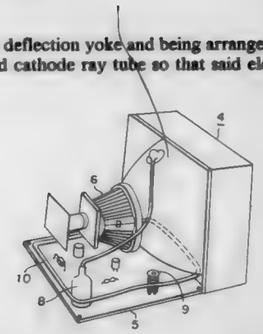
4,634,929
BROADBAND MULTIPACTOR DEVICE
Paul Fischer, Oakhurst, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Feb. 27, 1984, Ser. No. 583,920
Int. Cl.⁴ H01J *25/10*
U.S. Cl. 315—5.39 **11 Claims**



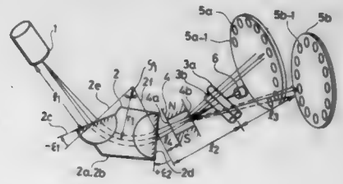
1. An electronic device operable in the microwave millimeter wave frequency range comprising, in combination:
microwave/millimeter wave transmission means;
an array of closly spaced multipactor cavity pairs consisting of input cavities and output cavities arranged in opposed relationship on opposite sides of a DC electric field region coextending longitudinally with said transmission line means;
aligned apertures connecting each cavity pair to said DC electric field region;
an input RF coupling iris and an outut RF coupling iris operably disposed on each of said cavity pairs;
each cavity pair tuned to a respective resonant frequency corresponding to its said input and output coupling irises, the respective resonent frequencies of the cavity pairs varying from pair to pair in the array along said transmission line means.

4,634,930
DISPLAY DEVICE
Masayuki Toshiyasu, Muko, and Toshinari Kawahara, Nagaoka-Kyo, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 1, 1985, Ser. No. 697,527
Claims priority, application Japan, Apr. 13, 1984, 59-75242
Int. Cl.⁴ H01J *29/06*
U.S. Cl. 315—8 **13 Claims**

1. A display device for a computer mounted in close proximity thereto, said display device comprising:
a cabinet,
a cathode ray tube mounted in said cabinet;
an electromagnetic deflection yoke mounted on said cathode ray tube;
a horizontal width adjusting coil mounted in said cabinet; and
a canceling coil mounted in said cabinet for canceling electromagnetic field noise generated from said electromagnetic deflection yoke and being arranged in the vicintiy of said cathode ray tube so that said electromagnetic field noise induces a current to flow therein, which causes a magnetic feed to be formed which reduces said electromagnetic field noise.



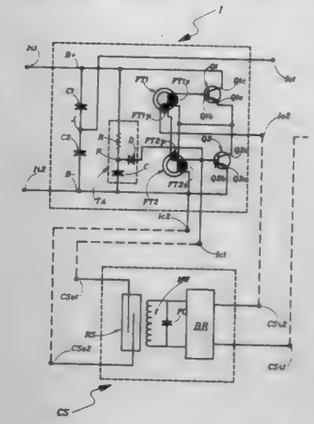
4,634,931
ION IMPLANTER
Shunroku Taya, Mito, and Susumu Kozasa, Kashiwa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 2, 1984, Ser. No. 636,996
Claims priority, application Japan, Aug. 10, 1983, 58-146126
Int. Cl.⁴ H01J *7/24;* **H05B** *31/26*
U.S. Cl. 315—111.81 **10 Claims**



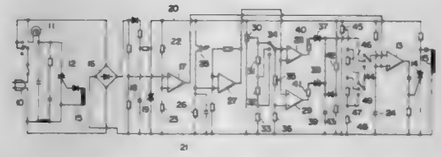
1. An ion implanter comprising:
a means for generating ions;
a means for dispersing said ions; and
a means for selectively extracting ions of a predetermined mass number from the thus-dispersed ions, so that said ions which are extracted can be implanted into a sample;
wherein a plane of incidence of ions in said dispersion means is so formed that the angle of incidence of said ions on said plane of incidence has a negative value, and a plane of emission of ions of said dispersion means is so formed that the angle of emission of ions of said predetermined mass number which are emitted from said plane of emission has a positive value.

4,634,932
LIGHTING SYSTEM
Ole K. Nilssen, Caesar Dr., Barrington Hills, Ill. 60010
Continuation of Ser. No. 447,304, Jan. 18, 1983, abandoned. This application Apr. 30, 1985, Ser. No. 729,074
Int. Cl.⁴ H05B *37/00, 41/00*
U.S. Cl. 315—119 **15 Claims**

1. A lighting system adapted to be powered from a source of DC voltage and comprising:
inverter conditionally operative to convert the DC voltage into an AC voltage provided at a pair of output terminals, the inverter being capable of self-oscillating through positive feedback by way of a feedback circuit, thereby to provide said AC voltage and operable by way of momentary disruption of the positive feedback to be brought out of oscillation, thereby to cease to provide said AC voltage;
lighting means connected with said output terminals; and
current sensing means connected in circuit with said output terminals and said feedback circuit and operative, in case current drawn from these output terminals exceeds a pre-determined magnitude, to provide said momentary disruption of the positive feedback, thereby to cause the inverter to be brought out of oscillation, thereby substantially to remove the AC voltage from said terminals.



4,634,933
PHOTOGRAPHIC ILLUMINATION APPARATUS
Akio Kamon, Tokyo, and Yukio Odaka, Kanagawa, both of Japan, assignors to Kabushiki Kaisha Sunpak, Tokyo, Japan
Filed Dec. 5, 1984, Ser. No. 678,264
Int. Cl.⁴ H05B *37/02*
U.S. Cl. 315—151 **5 Claims**



1. A photographic lighting apparatus comprising a lamp; an AC power source which supplies power to the lamp; a thyristor provided between and connected to the lamp and the AC power source; a photometric circuit which measures the intensity of illumination of the object and generates a voltage corresponding to the measured intensity of illumination of the object; a comparator which receives the output voltage of the photometric circuit, compares the measured intensity of illumination of the object with a specific value and changes the output mode thereof at least when the intensity of illumination of the object is higher than the specific value and when the intensity of illumination of the object is lower than the specific value; and a conduction angle control circut connected to both the comparator and the thyristor to diminish the conduction angle of the thyristor when the output mode of the comparator corresponds to the intensity of illumination of the object being in excess of the specific value and to increase the conduction angle of the thyristor when the output mode of the comparator corresponds to the intensity of illumination of the object being lower than the specific value, wherein said comparator is capable of taking three output modes, namely, a high output mode, a moderate output mode and low output mode, according to the intensity of illumination of the object, and wherein said conduction angle control circuit is capable of diminishing

the conduction angle when the output mode of the comparator is the high output mode, increases the conduction angle when the output mode is the low output mode and holds the existing conduction angle when the output mode of the comparator is the moderate output mode.

4,634,934

ELECTROLUMINESCENT DISPLAY DEVICE

Takao Tohda, Ikoma; Tomizo Matsuoka, Neyagawa; Yosuke Fujita, Ashiya; Atsushi Abe, Ikoma, and Tsuneharu Nitta, Katano, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma, Japan

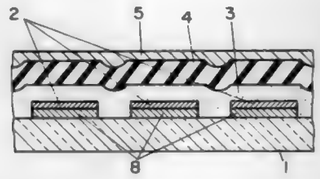
PCT No. PCT/JP83/00146, § 371 Date Jan. 18, 1984, § 102(e) Date Jan. 18, 1984, PCT Pub. No. WO83/04123, PCT Pub. Date Nov. 24, 1983

PCT Filed May 18, 1983, Ser. No. 572,415

Claims priority, application Japan, May 19, 1982, 57-85138; Mar. 25, 1983, 58-50678

Int. Cl.⁴ H05B *37/00*

U.S. Cl. 315—169.3 **2 Claims**



1. An electroluminescent display device suitable for ac and unipolar pulse voltage operation, comprising:

a transparent electrically insulating substrate;

an electroluminescent layer comprised of zinc sulfide (ZnS) and at least one luminescingly active material;

an electrically insulating layer formed on one surface of said electroluminescent layer; and

first and second energizing means for applying signal voltages across said electroluminescent layer and said insulating layer corresponding to information to be displayed,

wherein said first energizing means is interposed between said transparent substrate and said electroluminescent layer, and includes a plurality of semiconductive electrodes which contact said electroluminescent layer and which are comprised of a semiconductive material containing at least one chemical compound selected from the group consisting of the chemical compounds of Groups II–VI, each of said plurality of semiconductive electrodes including a semiconductive portion and a conductive portion having a conductivity higher than that of said semiconductive portion, said semiconductive portion being interposed between said conductive portion and said electroluminescent layer, and being a plurality of semiconductive strips arranged in parallel to one another, and said conductive portion being a plurality of conductive strips arranged in parallel to one another, one conductive strip being provided for each of said semiconductive strips, and each of said semiconductive strips covering one of said conductive strips and having tapered edges so that the surface thereof which contacts said electroluminescent layer has a surface area which is smaller than the surface area of the surface thereof which contacts said transparent substrate and

wherein said second energizing means is arranged on said insulating layer on the surface thereof opposite said electroluminescent layer.

4,634,935

GAS-DISCHARGE DISPLAY DEVICE WITH A POST-ACCELERATION SECTION

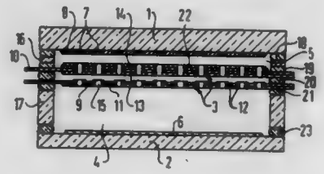
Bernhard Hillenbrand, Uttenreuth; Wilhelm Huber, Goldach; Burkhard Littwin, Hohenschäftlarn, and Karl Schuster, Marloffstein-Adlitz, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 10, 1984, Ser. No. 640,008

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3329106

Int. Cl.⁴ H01J *17/49*

U.S. Cl. 315—169.4 **17 Claims**



1. Gas discharge display device comprising

(a) a gas-filled, vacuum-tight envelope with a front plate and a back plate which is parallel to the latter, and

(b) a control unit which is located in the interior of said envelope, and provided with regular perforations, and which divides the interior of the envelope into a gas discharge space, and a post-acceleration space;

(c) at least one cathode, and at least one anode in the gas-discharge space, between which the gas discharge is ignited in the operating state;

(d) a cathodo-luminescent layer attached to the backside of the front plate which is covered by a post-acceleration anode;

(e) a post-acceleration cathode whose distance from the post-acceleration anode is so small that no gas discharge is ignited in the post acceleration space in the operating state, the combination therewith

wherein the post-acceleration cathode is coated with an implantation protection layer of a high-melting metal selected from the subgroups A of the fourth to eighth group and of the fifth to sixth period of the periodic system of elements.

4,634,936

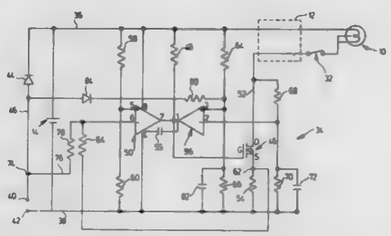
INTRINSICALLY SAFE MINER'S LAMP

Kenneth R. Gentry, Bramalea, and Michael Nikolich, Toronto, both of Canada, assignors to Levitt-Safety Limited, Toronto, Canada

Filed Jan. 25, 1984, Ser. No. 573,651

Int. Cl.⁴ G05F *1/00*; H05B *37/02, 39/04, 41/14*

U.S. Cl. 315—307 **15 Claims**



1. A battery pack for electrically powering an electrical device through an electrical cable, said battery pack having means for electronically determining an overcurrent condition in said cable or device and limiting current flow or switching off the voltage of said power pack, said electronic means comprising an electronic variable resistance device for controlling current through said cable, means for electronically sensing the current through said cable and said electronic variable resistance device limiting current through said cable to a predetermined maximum value in substantially instantaneous response to said sensing means sensing a current in excess of or equal to said predetermined maximum value, means for latching said electronic variable resistance device in the off condition after a predetermined time that said electronic variable resistance device has maintained current at or below said predetermined maximum value, means for resetting said latch means to permit said electronic variable resistance device to switch on and resume current through said cable.

4,634,937

EAST-WEST CORRECTION CIRCUIT

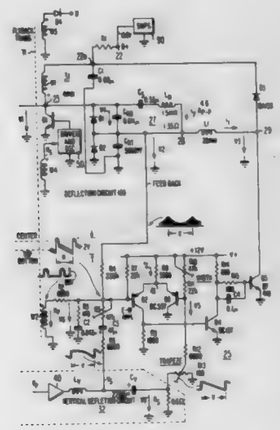
Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 17, 1984, Ser. No. 651,301

Claims priority, application United Kingdom, Nov. 23, 1983, 8331283

Int. Cl.⁴ H01J *29/56*

U.S. Cl. 315—371 **24 Claims**



1. A deflection circuit, comprising:

a deflection winding;

switching means coupled to said deflection winding and operated at a deflection rate to generate scanning current in said deflection winding during a trace interval of a deflection cycle;

a source of supply energy;

a supply inductance coupled to said switching means and said source of supply energy for producing therein a retrace pulse voltage during the retrace interval of the deflection cycle;

first retrace capacitance that forms a retrace resonant circuit with said deflection winding during the retrace interval of the deflection cycle;

a load circuit coupled to said supply inductance and energized during the retrace interval;

a second retrace capacitance coupled to said retrace resonant circuit for coupling a voltage obtained from said retrace pulse voltage that is developed in said supply inductance to said retrace resonance circuit to replenish energy losses in said deflection winding during the deflection cycle;

an impedance, that at the retrace frequency of said scanning curent is of substantially higher value than that of said deflection winding; and

a source of modulation current coupled to said retrace resonant circuit through said impedance for producing modulation of saidscanning current as said modulation current varies in a manner to reduce pincushion distortion, wherein said impedance is interposed in a current path between said retrace resonant circuit and said supply inductance for reducing substantial energy transfer between said retrace resonant circuit and said load circuit during each retrace interval.

4,634,938

LINEARITY CORRECTED DEFLECTION CIRCUIT

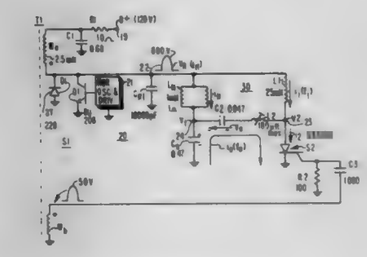
Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 25, 1985, Ser. No. 802,019

Claims priority, application United Kingdom, Dec. 13, 1984, 8431548; Apr. 17, 1985, 8509833

Int. Cl.⁴ H01J *29/56*

U.S. Cl. 315—371 **8 Claims**



1. A linearity corrected deflection circuit comprising:

a deflection winding;

a trace capacitance coupled to said deflection winding for developing a trace voltage;

a retrace capacitance coupled to said deflection winding;

first switching means coupled to said deflection winding and operated at a deflection rate for applying said trace voltage to said deflection winding during a trace interval of a deflection cycle to generate a trace deflection current in said deflection winding, said retrace capacitance and said deflection winding forming a resonant retrace circuit during a retrace interval of said deflection cycle for developing a retrace pulse voltage and for generating a retrace deflection current in said deflection winding;

a first inductance;

a resonant capacitance coupled to said first inductance for forming a second resonant circuit having a resonant frequency about or greater than the retrace frequency of said resonant retrace circuit;

second switching means coupled to said second resonant circuit and to said trace capacitance and switching conductive states within said retrace interval to generate during said retrace interval an oscillatory current pulse in said second resonant circuit, in accordance with the resonant frequency thereof, for removing a predetermined amount of charge from said trace capacitance; and

a second inductance coupled to said resonant retrace circuit and having applied thereto said retrace pulse voltage for supplying a correction current to said trace capacitance via said resonant capacitance during said trace interval to provide a predetermined amount of linearity correction to said trace deflection current.

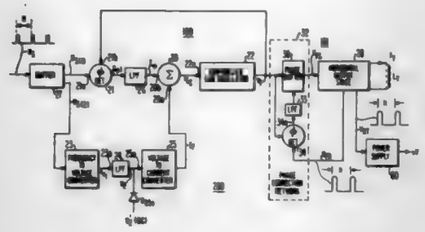
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4,634,939

CIRCUIT SYNCHRONIZED BY A SIGNAL AT A DEFLECTION FREQUENCY

Wolfgang F. W. Dietz, New Hope, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 24, 1985, Ser. No. 813,397
Int. Cl.⁴ H01J *29/70, 29/76*
U.S. Cl. 315—399 **13 Claims**



1. A video display deflection apparatus responsive to a synchronizing input signal that contains synchronizing phase information for generating a deflection current that is synchronized to said input signal, comprising:

a source of an output signal at a controllable phase;

a phase detector responsive to said synchronizing input and output signals for generating in a first terminal a first control current that is coupled to said source to control the phase of said output signal in accordance with the phase of said input signal;

a frequency-to-voltage converter responsive to said synchronizing input signal for generating a voltage that is indicative of the frequency of said synchronizing input signal;

a voltage-to-current converter configured as a current source and responsive to said voltage that is generated by said frequency-to-voltage converter for generating in a second terminal a second control current that is indicative of the frequency of said synchronizing input signal and that is independent of the voltage at said second terminal;

means coupled to said first and second terminals for combining said first and second control currents that produce a combined current that is coupled to a control terminal of said source for controlling in accordance with said combined current the frequency of said output signal; and

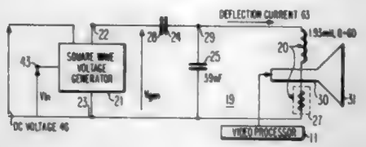
a deflection circuit output stage responsive to said output signal for generating said deflection current.

4,634,940

SINE WAVE DEFLECTION CIRCUIT FOR BIDIRECTIONAL SCANNING OF A CATHODE RAY TUBE

Willem H. Groeneweg, Affoltern am Albis, and Juergen F. Hemme, Meilen, both of Switzerland, assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 29, 1984, Ser. No. 594,823
Int. Cl.⁴ H01J *29/76*
U.S. Cl. 315—408 **19 Claims**



1. An apparatus for generating a generally sinusoidal periodic scanning current in a deflection winding of a cathode ray tube, comprising:

a voltage generator for generating a periodic square wave voltage;

a first circuit branch that includes a first capacitance;

a second circuit branch that includes said deflection winding; and

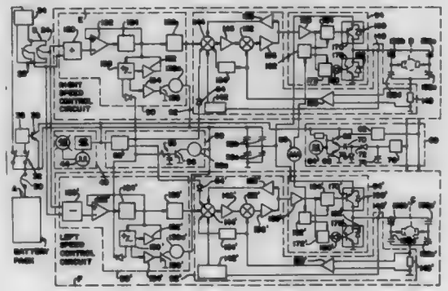
a third circuit branch that includes a second capacitance coupled in series with said square wave voltage, said third circuit branch forming with said first and second circuit branches three separate branches of a parallel resonant circuit that is driven by said voltage generator and that filters out from said scanning current a current at a harmonic thereof such that the inductance of said resonant circuit that significantly determines a ratio between the amplitudes of said harmonic and scanning currents is mainly provided by said deflection winding.

4,634,941

ELECTRIC WHEELCHAIR WITH IMPROVED CONTROL CIRCUIT

Robert G. Klimo, Parma, Ohio, assignor to Invacare Corporation, Elyria, Ohio

Division of Ser. No. 351,990, Feb. 24, 1982, Pat. No. 4,511,825, which is a continuation-in-part of Ser. No. 254,443, Apr. 15, 1981, Pat. No. 4,387,325. This application Apr. 10, 1985, Ser. No. 721,572
Int. Cl.⁴ G05D *1/00*
U.S. Cl. 318—139 **17 Claims**



1. An electric vehicle for the physically impaired comprising:

(a) at least one battery;

(b) at least one motor for driving the vehicle;

(c) a speed selecting means for selecting the motor speed; and,

(d) a control circuit including:

(i) a power relay having relay contacts;

(ii) a motor speed control circuit including reference signal means for producing a reference signal which varies with the selected motor speed, the reference signal means being operatively connected with the speed selecting means, motor speed detecting means for producing an actual motor speed signal which varies with the actual speed of the motor, the speed sensing means being operatively connected with the motor, speed comparing means for comparing the reference signal and the actual motor speed signal to produce a variance signal which varies with the variance between the selected and actual motor speeds; and a variable power regulator operatively connected with the speed comparing means and the motor for regulating the electric power supplied to the motor, the power regulator being controlled by the comparing means to vary the power supplied in accordance with the variance signal;

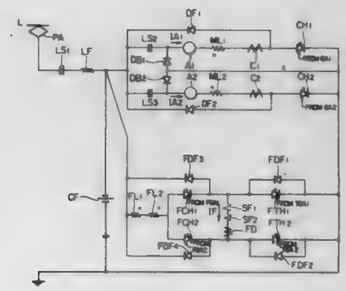
(iii) a low battery power sensing circuit for sensing whether the battery has become discharged below a preselected stored power level, the low battery sensing circuit being operatively connected with the motor speed control circuit to cause the motor speed control circuit to stop supplying electric power to the motor through the relay contacts.

4,634,942

APPARATUS FOR CONTROLLING ELECTRIC CARS

Masashi Naruto, Osaka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 589,779, Mar. 15, 1984, abandoned. This application Oct. 30, 1985, Ser. No. 792,246
Claims priority, application Japan, Mar. 25, 1983, 58-50914
Int. Cl.⁴ H02P *5/16*
U.S. Cl. 318—338 **5 Claims**



1. An apparatus for controlling electric cars comprising:

d-c shunt-wound motors adapted to be connected to a d-c source and having armatures and field windings;

first chopper circuit means connected in series with the armatures of said d-c shunt-wound motors and controlling the flow of armature currents in both directions upon receipt of timing signals;

second chopper circuit means connected in series with the field windings of said d-c shunt-wound motors and controlling the flow of field currents in both directions upon receipt of timing signals;

reactors having first and second coils, the first coils being connected in series with said armatures, the second coils being connected in series with said field windings, and said first coils and second coils being magnetically coupled together maintaining such a relation that said field currents decrease with the decrease in said armature currents.

4,634,943

CONTROL DEVICE FOR A DIRECT CURRENT SEMICONDUCTOR REGULATOR

Horst Reick, Effeltrich, and Gerhard Kratz, Heroldsbach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

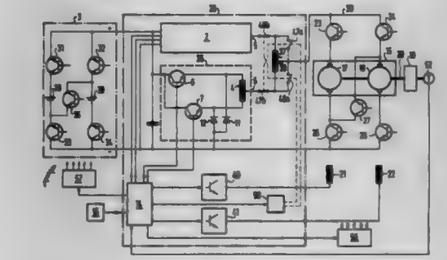
Filed Sep. 12, 1985, Ser. No. 775,473
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1984, 3433886
Int. Cl.⁴ H02P *7/00*
U.S. Cl. 318—432 **11 Claims**

1. A control device for a switching arrangement with a direct current source feeding a load through a semiconductor rectifier regulator unit having two controllable semiconductor rectifier elements of identical conductance direction as part of the regulator unit; a device for generating clock signals as part of the control device connected to the controllable semiconductor rectifier elements; an inductive impedance connected to an output of each semiconductor rectifier element to provide an output terminal connection to the load; an input connection to each semiconductor rectifier element connected with a positive terminal of the direct current source; wherein each output connection of the semiconductor rectifier elements are connected by the inductive impedance to the load and each is also connected by a discharge diode to the negative terminal of the direct current power supply; the control device providing two clock frequency signals electrically offset by 180 degrees to the two controllable semiconductor rectifier elements through regulators such that said semiconductor elements are conducting and non-conducting 180 degrees offset from each other and this control device characterized by having:

a direct current motor as the load;

a dual winding, buck-boost, autotransformer with a center tap between the dual windings as the inductive impedance;

a reference value generator providing control of a duty cycle of the clock frequency signals connected within the control device;



an additional semiconductor rectifier regulator unit and an additional buck-boost autotransformer in parallel with and identical to the first semiconductor rectifier regulator unit with the center tap point of the first buck-boost autotransformer and a center tap point of the additional buck-boost autotransformer connected to opposite ends of a third buck-boost autotransformer; and

a center tap point of the third buck-boost autotransformer connected to a power input terminal of the load;

wherein the control device generates identical duty cycle clock frequency signals for the four semiconductor rectifier elements; and the clock frequency signals generated for the two parallel semiconductor rectifier regulators are electrically offset by 90 degrees from each other.

4,634,944

CYCLIC SPEED MOTOR CONTROL CIRCUIT

John D. Hastings, and Dennis K. Siemer, both of Mankato, Minn., assignors to Johnson Fishing Inc., Mankato, Minn.

Filed May 2, 1985, Ser. No. 729,808
Int. Cl.⁴ H02P *7/00*
U.S. Cl. 318—443 **13 Claims**

6. A motor control circuit for supplying power to a motor, said circuit comprising:

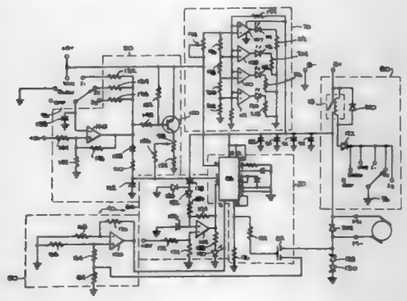
a source of electrical power;

switching circuit means for alternatingly completing and breaking an electrical circuit including said source and the motor to apply electrical power from said source to the motor, and to interrupt the supply of electrical power from said source to the motor, said switching circuit means controlling the application of power to the motor responsive to a first control signal; and

speed control circuit means for generating the first control signal for controlling said switching circuit means, said speed control circuit means being operable in a first mode, in which said speed control circuit means generates the

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first control signal to have first and second time-dependent driving values for providing intermittent speed



changes to the motor, thereby continuously driving said motor alternately at two different speeds.

4,634,945

APPARATUS FOR AUTOMATICALLY OPENING AND CLOSING AN OPENING COVERING MEMBER

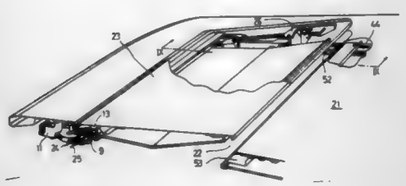
Shinji Takemura, Toyota; Tsuneo Hida, Toyokawa; Yutaka Matsuzaki, Nagoya, and Kenichi Ohnishi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Nov. 28, 1984, Ser. No. 675,666

Claims priority, application Japan, Nov. 28, 1983, 58-223897

Int. Cl.⁴ B60J *7/05*

U.S. Cl. 318—469 **10 Claims**



1. An apparatus for automatically opening and closing a closure member associated with an opening, comprising

an electric drive mechanism including an electric motor and an opening and closing mechanism which drives a closure member associated with an opening in an opening or closing direction in response to a forward or reverse rotation of the electric motor;

signal generating means for generating an electrical signal which corresponds to a movement of the opening and closing mechanism;

means for detecting a load acting upon the opening and closing mechanism;

reference means for establishing an overload reference value;

means for detecting an overload by comparing the load acting upon the opening and closing mechanism against the reference value;

a motor driver for energizing the electric motor for forward or reverse rotation;

open/close command switch means for commanding an opening or closing movement of the closure member;

alarm means;

an alarm driver for energizing the alarm means;

an open/close control means responsive to a signal generated by the signal generating means and the operation of the open/close command switch means for causing the motor driver to energize the electric motor for forward or reverse rotation and to stop the motor, for causing the alarm driver to give an alarm whenever a signal generated by the signal generating means indicates an opening within a given range of opening and the motor is being driven toward its fully closed position, and for causing the motor driver to stop the motor in the event an overload is detected;

said signal generating means comprises a switch actuating cam in the form of a disc coupled to the electric drive mechanism for rotation with the electric motor, the cam being peripherally formed with two pairs of high and low areas which are effective to actuate switches, a first switch disposed in opposing relationship with one pair of high and low areas so as to be operated thereby to be closed or opened, and a second switch disposed in opposing relationship with the other pair of high and low areas so as to be operated thereby to be opened and closed, the combination of the switch signals representing their open and closed conditions being effective to define four operational modes, one of which is allocated to denote the given range of opening.

4,634,946

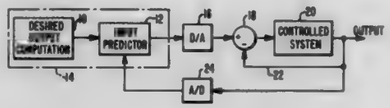
APPARATUS AND METHOD FOR PREDICTIVE CONTROL OF A DYNAMIC SYSTEM

Clinton W. Moulds, III, Millersville, and George S. Axelby, North Linthicum, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 2, 1985, Ser. No. 782,860

Int. Cl.⁴ G05B *13/00*

U.S. Cl. 318—561 **16 Claims**



1. A predictive method for controlling the output of a sample dynamic system, said method including the steps of:

providing a plurality of future output values defining the desired future output of the controlled system for each sample period up to a predetermined prediction horizon of future sample periods;

acquiring data values corresponding to past values of inputs to the controlled system;

using model weight values and said past values of inputs to determine assumed future inputs for predicting the output of the controlled system only at a time corresponding to the prediction horizon;

comparing the predicted output with the corresponding desired output to provide an error value;

compensating said error value with the model weights to provide a correction value;

adjusting the assumed future inputs by said correction value to provide a corrected input; and

applying the corrected input to the controlled system.

4,634,947

METHOD FOR EVALUATING ECHO SIGNALS OF AN ULTRASONIC SENSOR ON A ROBOT ARM

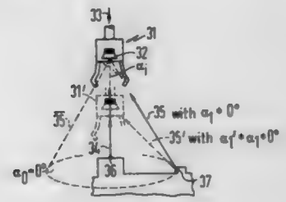
Valentin Magori, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 29, 1984, Ser. No. 645,340

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335421

Int. Cl.⁴ G05B *19/00*; **G01S** *15/06*

U.S. Cl. 318—568 **14 Claims**



1. A method of evaluating ultrasonic echo signals reflected from an object to be detected and from other objects after continual transmission of a plurality of successive ultrasonic transmit pulses incident on all of said objects from at least one ultrasonic transducer, said transducer being mounted on a movable part and said signals being used at least in part for guiding movement of said movable part, said method comprising the steps of:

receiving a first plurality of echo signals from all of said objects in chronological sequence associated with a first transmit pulse and storing said first plurality of echo signals in a memory at first addresses ordered corresponding to said chronological sequence;

receiving a second plurality of echo signals from all of said objects in chronological sequence associated with a second transmit pulse and storing said second plurality of echo signals in a memory at second addresses ordered corresponding to said chronological sequence;

shifting the contents of said first and second memory addresses relative to each other by at least one selected amount for compensating for movement of said movable part relative to said object to be detected between said first and second transmit pulses;

integrating the contents of the shifted first and second memory addresses for emphasizing selected echo signals thereby identifying said object to be detected; and

repeating the steps of receiving, shifting and integrating for echo signals associated with each successive transmit pulse.

4,634,948

STEPPING MOTOR WINDING FOR BIPOLAR DRIVE

Robert N. Brigham, Monroe, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed May 17, 1985, Ser. No. 735,209

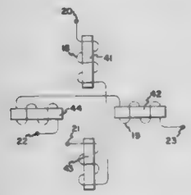
Int. Cl.⁴ H02P *8/00*

U.S. Cl. 318—696 **8 Claims**

1. A stator for a stepping motor, comprising:

(a) a plurality of salient poles; and

(b) at least two windings, each winding comprising at least two conductors each of which is wound upon at least one



pole associated with that conductor only, the conductors within each winding being connected in series.

4,634,949

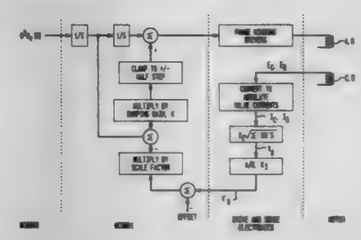
CONTROL DEVICES FOR USE WITH A STEPPING MOTOR

Harvey L. Golladay, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 7, 1985, Ser. No. 709,268

Int. Cl.⁴ H02P *8/00*

U.S. Cl. 318—696 **12 Claims**



1. A control device for use with a stepping motor comprising a stator having phase winding means for generating a magnetic field which has a direction that can be varied with time in dependence on the current provided to the winding means for energization thereof, a rotor having a plurality of alternating north and south magnetic poles about a peripheral region thereof, said poles being substantially equiangularly spaced about the axis of the rotor, and sense coil means associated with the stator for generating first and second electrical voltages each varying in accordance with a sinusoidal function having a period proportional to the period of rotation of the rotor, the first and second voltages being in quadrature with each other, said control device comprising means for generating from said first and second voltages a signal representative of a number that is proportional to the square root of the sum of the squares of the first and second voltages, and means for utilizing said signal to modify the energizing current provided to the phase winding means.

4,634,950

ELECTRIC APPARATUS

Frederick W. Klatt, 36 Ripley Rd., Medford, Mass. 02155

Continuation-in-part of Ser. No. 380,052, May 20, 1982, Pat. No. 4,459,530. This application Jul. 2, 1984, Ser. No. 626,696

Int. Cl.⁴ H02P *5/34*

U.S. Cl. 318—732 **81 Claims**

1. An electric machine comprising;

a first electric machine having at least one stationary winding and associated moving winding,

a second electric machine having at least one stationary winding and associated moving winding,

both said first and second electric machines having a common carrier so as to provide motion at the same velocity,

said common carrier comprising a moving common carrier and a stationary common carrier,

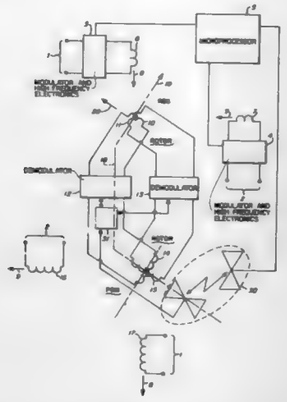
means coupling the moving winding of the first electric machine to the moving winding of the second electric machine whereby the moving winding of the second electric machine is excited from the first machine,

means coupling a first frequency signal to the stationary winding of the first electric machine,

means coupling a second frequency signal to the stationary winding of the second electric machine,

means for communicating electrical signals between the moving common carrier and the stationary common carrier,

whereby synchronous overall operation occurs for any moving speed of the axial,



said means for communicating including a communication transducer system including a moving member associated with either rotor and a stationary member associated with the corresponding stator,

said first frequency being substantially greater than said second frequency whereby the torque of the machine is chiefly dependent on the second electric machine,

said first frequency coupling means comprising modulating means for receiving a third frequency signal substantially the same as said second frequency signal and continuously modulating said first frequency by said third frequency,

said first electric machine having windings which are physically and electrically smaller than those of said second electric machine whereby the physical size of the overall machine is dependent primarily upon the second electric machine.

4,634,951

REDUCED VOLTAGE STARTER WITH VOLTAGE RAMP CONTROL

Julian C. Kampf, Grafton; Jeffrey A. Reichard, Milwaukee; James T. Libert, Waukesha; Earl J. Curran, Jr., South Milwaukee, and Richard J. Graefe, Bayside, all of Wis., assignors to Square D Company, Palatine, Ill.

Continuation of Ser. No. 443,002, Nov. 19, 1982. This application Jun. 3, 1985, Ser. No. 743,862

Int. Cl.⁴ H02P *1/28, 1/30*

U.S. Cl. 318—778 **9 Claims**

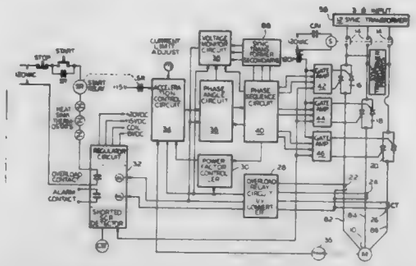
1. In a reduced voltage starter for controlling the application of a voltage derived from a line voltage to a motor, a voltage ramp acceleration control circuit comprising:

means for generating a ramp voltage having a predetermined rate of rise;

means for controlling said voltage applied to said motor in response to said ramp voltage;

means for sensing that said motor is running at substantially full speed;

means responsive to said means for sensing that said motor is running at substantially full speed for increasing said predetermined rate of rise of said ramp voltage, whereby



under conditions where said motor is running at substantially full speed before said voltage applied to said motor reaches said line voltage, then said voltage applied to said motor will rise at said increased predetermined rate of rise of said ramp voltage.

4,634,952

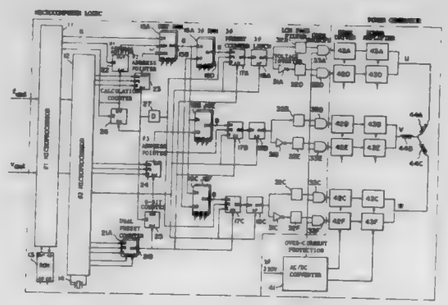
INVERTER

Hozo Yoshino; Mitsuo Koshi, and Osamu Sumiyoshi, all of Tokyo, Japan, assignors to System Homes Company, Ltd., Tokyo, Japan

Filed Nov. 30, 1983, Ser. No. 556,321

Int. Cl.⁴ H02P *5/40*

U.S. Cl. 318—811 **10 Claims**



1. An inverter for calculating and encoding a pulse width modulated sine wave on a semi-real time basis upon selecting instructed output frequency and voltage independently of each other, containing a carrier frequency within a certain frequency range by having different number of samplings for each of plural output frequency groups, and for decoding said modulated sine wave to be applied to motor windings of an induction motor on a real time basis, said inverter comprising:

a microcomputer logic means having

first means having a first microprocessor means for calculating and preparing a sampled, quantized and coded sine function for the next inverter application and a second microprocessor means for generating timing signals;

second means for storing sampled values of a plurality of differently sampled sine waves with unity magnitude and for storing the maximum and minimum voltage/frequency envelopes with respect to said induction motor;

third means for generating a base clock pulse for producing various timing signals;

fourth means having a first portion and a second portion

which function alternately as a writing portion for storing a voltage weighted, sampled and quantized one-phase sine function and a reading portion for reading out the previously stored contents when it functioned as a writing portion to generate a three-phase sine wave;

fifth means having a first portion and a second portion which function alternately as writing portions for storing sampled, quantized and coded three-phase sine function and as reading portions for delivering the previously stored contents when they functioned as writing portions for decoding;

sixth means for discriminating the number of leading "0"s or "1"s of the pulse train representing a value of sampling from the coded binary sampled data transferred from said fifth means;

seventh means for decoding the pulse width modulated sine waves from said sixth means;

eighth means having a first preset counter and a second preset counter which alternately function as a waiting portion for presetting the number of base clock pulses for the next cycle and as a working portion for counting down said base clock pulse supplied from said third means at a varying time rate determined by said preset value so as to generate a first level clock pulse for use with said sixth means;

ninth means having a first pointer for successively storing said sampled, quantized and coded sine function into said writing portion of said fourth means, a second pointer for editing and generating said three-phase sine waves from said one-phase sine wave, and a third pointer for incrementing the addresses of both said writing and reading portions of said fifth means and for generating a third level clock pulse for alternating said fifth means;

tenth means for counting down said first level clock pulse supplied from said eighth means to generate a second level clock pulse for said second and third address pointers in said ninth means;

eleventh means for counting down said clock pulse supplied from said tenth means to generate a clock pulse for said first address pointer;

twelfth means for obtaining a preset signal for said sixth means from the reset signal to said sixth means; and

thirteenth means for inverting the polarities of the outputs from said seventh means to generate pulse width modulated six-phase sine waves; and

fourteenth means for delaying the build-up time of the positive-going pulses of the decoded signal from said seventh means; and a power generator means having

fifteenth means for transforming an alternating current line voltage power source into a direct current power source;

sixteenth means for amplifying the signal from said fourteenth means to supply enough current sources to the following seventeenth means; and

seventeenth means having tandemly connected power transistors for amplifying the current level supplied from said fourteenth means; and

eighteenth means for receiving the current source from said seventeenth means.

4,634,953

ELECTRONIC EQUIPMENT WITH SOLAR CELL

Hideyuki Shoji, and Kazufumi Usui, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,528

Claims priority, application Japan, Apr. 27, 1984, 59-61373[U]; Apr. 27, 1984, 59-61374[U]

Int. Cl.⁴ H02J *9/00*; **G04C** *10/02*

U.S. Cl. 320—1 **20 Claims**

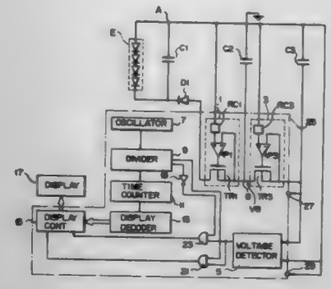
1. Electronic equipment using a solar energized power source, comprising:

a solar cell for generating electrical power at an output voltage in response to light irradiation;

load means for performing a predetermined operation;

capacitor means, connected in parallel with said solar cell and charged by said solar cell, said capacitor means being capable of charging to a first voltage higher than a minimum operating voltage at which said load means can be normally operated;

voltage converting means, connected to said capacitor means and said load means, for converting the first volt-



age of said capacitor means into a second voltage which is lower than the first voltage and higher than the minimum operating voltage of said load means, and for supplying the second voltage to said load means as an operating voltage; and

quick start means for dividing the output voltage of said solar cell with said capacitor means to supply the first voltage to said voltage converting means when the charged voltage of said capacitor means is lower than the first voltage.

4,634,954

VOLTAGE REGULATOR FOR ALTERNATING CURRENT GENERATOR

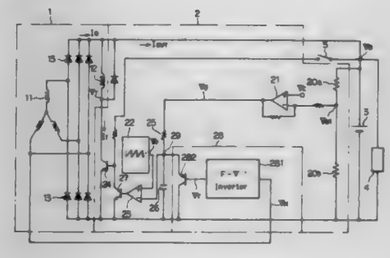
Hidetoshi Kato, Suzuka; Nobuo Mayumi; Shin Kusase, both of Ohbu, and Hajime Matsuhashi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 27, 1984, Ser. No. 635,181

Claims priority, application Japan, Sep. 22, 1983, 58-175779

Int. Cl.⁴ H02J *7/14*

U.S. Cl. 322—28 **8 Claims**



1. A voltage regulator for an alternating current generator comprising;

a battery mounted on an automotive vehicle;

an armature winding for generating an output current to be charged on said battery;

a field winding connected to said armature winding, a portion of said output current flowing through said field winding as a field current;

a switching transistor connected to said field winding for

permitting said field current to flow through said field winding when said switching transistor is made conductive;

voltage regulating means for comparing a battery voltage with a predetermined value and driving said switching transistor so that when the battery voltage is lower than said predetermined value, said switching transistor is made conductive; and

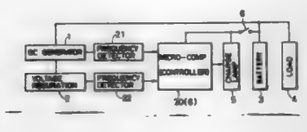
current limiting means for detecting a rotational speed of said generator, for limiting said field current to less than a maximum field current value predetermined to increase as the rotational speed of said generator increases at a range of lower speed, whereby the remaining output current actually efffective to charge said battery takes its maximum value for the detected rotational speed of said generator, and said remaining output current increases with an increase in the rotational speed of said generator.

4,634,955

MALFUNCTION DETECTOR FOR DETECTING OPEN-CIRCUIT CONDITION AT DC GENERATOR OUTPUT TERMINAL

Hifumi Wada, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1984, Ser. No. 659,476
Claims priority, application Japan, Oct. 18, 1983, 58-196566
Int. Cl.⁴ H02P *9/00*; G01R *31/00*; H02J *7/14*
U.S. Cl. 322—99 **4 Claims**



1. A malfunction detecting device for detecting an open-circuit state at an output circuit of a vehicle-mounted DC generator driven by an engine of a vehicle and including a voltage regulator, comprising: means for comparing a frequency of a signal derived from an armature winding of said DC generator and a control frequency of said voltage regulator, and indicating means responsive to an output of said comparing means for indicating a malfunction when said control frequency is equal to or greater than said frequency of said signal derived from said armature winding.

4,634,956

DC TO DC CONVERTER

Walter L. Davis, Coral Springs; Michael J. DeLuca, Boca Raton, and William G. Siegel, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 10, 1985, Ser. No. 690,216
Int. Cl.⁴ G05F *1/10*
U.S. Cl. 323—222 **15 Claims**

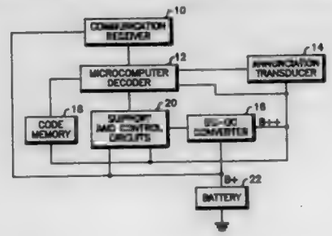
1. A DC to DC converter comprising:

power input means for receiving power at an input voltage,

current-controlled means coupled to the power input means for providing output power at a predetermined output voltage, and

control means providing selectively for continuous mode and intermittent mode operation of the converter, the continuous mode providing a first output current level and the intermittent mode providing a second reduced output current level,

the control means sequentially actuating the current-controlled means when the converter is in said intermittent mode, wherein the current-controlled means is alternately



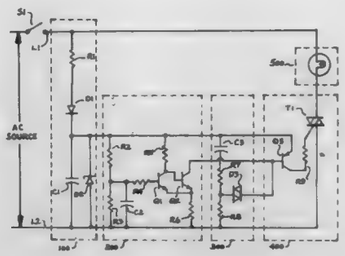
actuated ON for a first predetermined time period and OFF for a second predetermined time period to provide the reduced power output level.

4,634,957

REMOTELY CONTROLLED LIGHT FLASHER

Jerrell P. Hollaway, 1330 Meadowbrook Rd., NE., Palm Bay, Fla. 32905

Filed Feb. 7, 1986, Ser. No. 827,088
Int. Cl.⁴ G05F *1/40*
U.S. Cl. 323—242 **19 Claims**



1. A control circuit for controlling the application of power to an electrical load comprising:

(a) first and second input terminals for receiving the application of power from an electrical power source,

(b) first and second output terminals for coupling said circuit to an electrical load; and

(c) power control means, coupled between said input and output terminals, for causing power to be coupled to said output terminals and thereby said load in accordance with a first prescribed timing characteristic in reponse to the termination, at said input terminals, of a power interruption that has lasted for a period of time in excess of a prescribed period of time, and for causing power to be coupled to said output terminals and thereby said load in accordance with a second prescribed timing characteristic, different from said first prescribed timing characteristic, in response to the termination of a power interruption that has lasted for a period of time equal to or less than said prescribed period of time.

4,634,958

TRANSFORMER UTILIZING SELECTIVELY LOADED REACTANCE TO CONTROL POWER TRANSFER

Lionel B. Cornwell, Madison, Conn., assignor to Intermag Incorporated, Madison, Conn.

Filed Mar. 12, 1984, Ser. No. 588,680
Int. Cl.⁴ G05F *7/00*
U.S. Cl. 323—255 **12 Claims**

1. Apparatus for controlling the power transfer in an electrical induction device having a plurality of coils arranged to

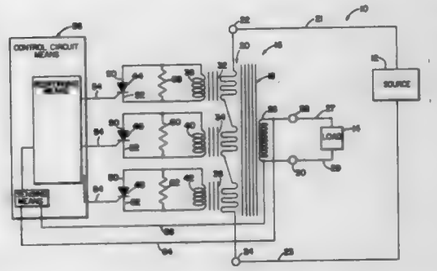
induce an electrical current in a first coil when an electrical potential is impressed across a second coil wherein the waveshape of the transferred electrical power is maintained across the first coil without distortion and degradation, said apparatus comprising:

means for sensing the electrical power transferred to said first coil;

means for providing a reactance, and

means responsive to said sensing means for selectively coupling said reactance means to said second coil to control the electrical power transferred to said first coil;

said electrical induction device including a power transformer having a power core and said first coil and said second coil encircling said power core, one of said first



and said second coils being arranged to be connected to a source of alternating current electrical power and the other of said first and said second coils being arranged to be connected to a load, and,

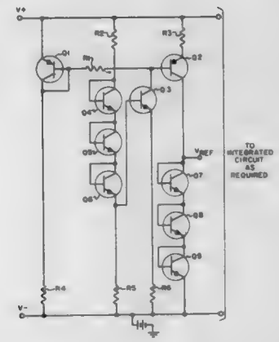
said reactance means including other of said plurality of coils, said other coils being control coils and said reactance means further including a plurality of cores of which each core is associated with a single control coil which coil encircles its associated core and one of said first and said second coils further being arranged to encircle said plurality of control cores and coils and the other of said first and second coils such that said coil connected to the power source is coupled to the choking reactance of said plurality of control cores and coils.

4,634,959

TEMPERATURE COMPENSATED REFERENCE CIRCUIT

Eduard F. B. Boeckmann, Huntsville, Ala., assignor to GTE Communication Systems Corp., Northlake, Ill.

Filed Dec. 16, 1985, Ser. No. 809,656
Int. Cl.⁴ G05F *3/16*
U.S. Cl. 323—313 **6 Claims**



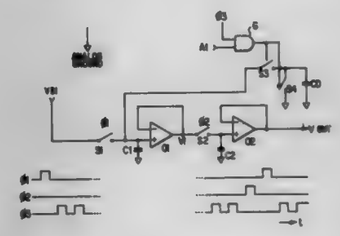
1. A temperature compensated voltage reference circuit connected to an input voltage source, said reference circuit comprising; a diode reference string and a current gate serially connected in shunt across said input source; a a primary bias circuit connected in shunt across said input voltage source and including an output connected to said current gate; a secondary bias circuit including an output connected to said current gate; biasing means forsaid at secondary bias circuit connected in shunt across said input voltage source and including an output connected to said secondary bias circuit; said diode reference string and said biasing means for said secondary bias circuit each including a plurality of matching transistors; and a reference voltge output connected to a junction between said reference string and said current gate, said current gate forcing current through the diode reference string to develop a temperature compensated reference voltage at said reference voltage output.

4,634,960

AUTOMATIC LINEAR COMPRESSION CIRCUIT

David L. Lynch, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 4, 1985, Ser. No. 784,491
Claims priority, application Canada, Feb. 13, 1985, 474209
Int. Cl.⁴ G05B *24/02*
U.S. Cl. 323—350 **15 Claims**



1. An attenuator circuit comprising an input terminal, for an input signal which is to be attenuated, an output terminal at which the attenuated signal is to be output, first and second capacitors, first, second and third switches, the first switch being connected between the input terminal and the first capacitor, the second switch being connected between the first capacitor and the second capacitor and the third switch being connected between the first capacitor and the output terminal, means for closing the first switch over a first time interval to sample the input signal on to the first capacitor, means for closing the second switch over a plurality of subsequent time intervals thereby to discharge each time through the second capacitor a portion of the voltage on the first capacitor such that the voltage on the first capacitor is reduced by a factor C1/(C1+CD) to the power N where C1 is the capacitance of the first capacitor, CD the capacitance of the second capacitor and N is the number of subsequent time intervals, and means for closing the third switch after a predetermined number of subsequent time intervals has elapsed whereby the attenuated voltage on the first capacitor is fed to the output terminal.

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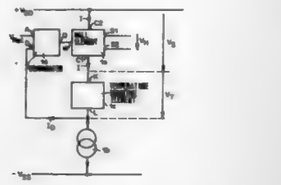
VOL 1074 ISS 1 JA 6 1987 UMI

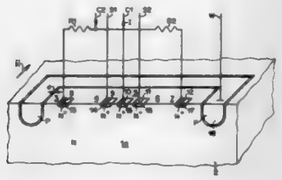
4,634,961

METHOD AND CIRCUIT FOR THE TEMPERATURE COMPENSATION OF A HALL ELEMENT

Radivoje Popovic, Zug, and Jean-Luc Berchier, Menzingen, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Apr. 15, 1985, Ser. No. 723,040
Claims priority, application Switzerland, Apr. 18, 1984, 1939/84
Int. Cl.⁴ H03H *5/10*
U.S. Cl. 323—368 **14 Claims**





1. A method for providing temperature compensation to a Hall element, said Hall element comprising two current terminals and at least one control terminal, said Hall element defining a current flow channel between said current terminals, said current channel having an effective thickness t_{eff}, said method comprising the steps of:

comparing at least the voltage between said current terminals with a reference voltage to generate a control signal, and

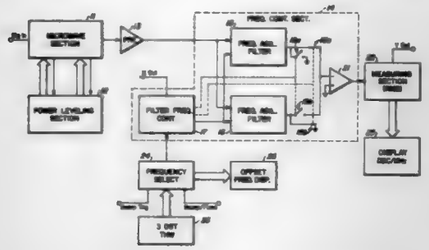
applying said control signal to said control terminal said control signal acting on said effective thickness so as to oppose changes in said effective thickness t_{eff} caused by variations in temperature, whereby said effective thickness t_{eff} is maintained approximately independent of temperature.

4,634,962

PHASE NOISE ANALYZER

George A. Banura, and Richard L. Noland, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 5, 1985, Ser. No. 708,459
Int. Cl.⁴ G01R *23/16, 27/00*
U.S. Cl. 324—57 N **7 Claims**



1. A phase noise analyzer for analyzing phase noise of a desired frequency range in the microwave region in relation to carrier level comprising:

a microwave section for receipt of a signal to be analyzed having an attenuation circuit, a phase detector, and an output circuit;

a power leveling section connected to said microwave section and effective to control said attenuation circuit therein to set the level of said output circuit to a predetermined datum level;

a narrow band frequency control section effectively connected to said output circuit and including a tunable narrow bandpass filter means with center frequency controlled by a filter center frequency controller for passing electrical energy having a frequency within a predetermined range; and

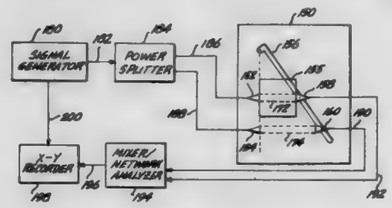
a measuring section connected to said narrow band frequency control section for determining the amplitude value of electrical energy passed by said narrow band frequency control section in relation to said carrier level and frequency separation from said carrier level.

4,634,963

METHOD AND APPARATUS FOR THE TESTING OF DIELECTRIC MATERIALS

Clarence D. Lunden, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 21, 1983, Ser. No. 534,210
Int. Cl.⁴ G01R *27/04*
U.S. Cl. 324—58 A **27 Claims**



21. An apparatus for the nondestructive testing of a sheet of dielectric material having opposite faces conductively surfaced and edges of exposed dielectric, comprising:

a signal generator for producing microwave energy;

a transmitter connected to receive microwave energy from said signal generator and adapted to radiate said microwave energy as a directional beam, said transmitter being positionable adjacent an edge of the sheet such that said beam enters the sheet at said edge and travels through the sheet along a path in the plane of the sheet;

a microwave receiver;

means for positioning the microwave receiver a variable distance from the transmitter, such that the microwave receiver is positionable adjacent an edge of the sheet to receive said beam as its exits from the sheet;

means for directing a portion of said microwave energy along an air path whose length is in a fixed ratio to the length of the path through the sheet; and

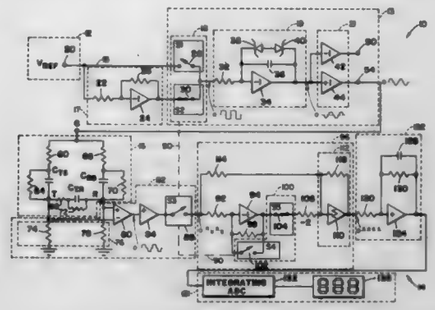
means for comparing the phase delay of the microwave energy passing through the sheet with the phase delay of the microwave energy passing along the air path.

4,634,964

INSTRUMENTS AND SYSTEMS FOR MEASURING CABLE CAPACITANCES

Leo M. Chattler, San Leandro, Calif., assignor to DCM Industries, Inc., San Leandro, Calif.

Filed Jul. 30, 1984, Ser. No. 635,662
Int. Cl.⁴ G01R *11/52, 27/26*
U.S. Cl. 324—60 C **27 Claims**



1. A system for measuring capacitance in an electric signal conductor cable, the system comprising;

(a) signal generating means for generating a regularly varying test signal;

(b) connecting means for coupling one end of a conductor in a cable in which capacitance is to be measured to the signal generating means;

(c) sensing means for connection to the other end of the cable in which capacitance is to be measured, the sensing means being operable to sense the magnitude of each of the signals which pass from the cable in response to said test signals; and

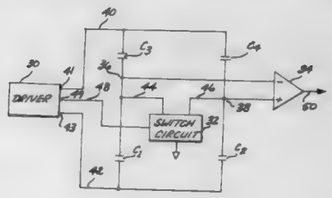
(d) means for integrating the response signals, to produce output signals which measure capacitance in the cable.

4,634,965

CHARGE BALANCING DETECTION CIRCUIT

Steven A. Foote, Redmoad, Wash., assignor to Sundstrand Data Control, Inc., Redmoad, Wash.

Filed Dec. 31, 1984, Ser. No. 687,648
Int. Cl.⁴ G01R *27/26*
U.S. Cl. 324—60 C **6 Claims**



1. A detection circuit for measuring the difference between the capacitances of first and second capacitive elements, comprising:

a first capacitor having a fixed capacitance value, the first capacitor being serially connected to the first capacitive element at a first common node to form a first series circuit;

a second capacitor having a fixed capacitance value, the second capacitor being serially connected to the second capacitative element at a second common node to form a second series circuit;

switch means connected between the first and second common nodes and a reference potential, the switch means having a first state in which each common node is connected to the reference potential and a second state in which each common node is isolated from the reference potential and from the other common node;

drive means for applying a drive signal across both series circuits simultaneously, the drive signal comprising a series of first voltage transitions operative to vary the total voltage drop across each series circuit;

switch activation means for changing the switch means from the first state to the second state at or prior to each first voltage transition; and

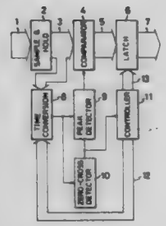
means for measuring the voltage difference between the first and second common nodes.

4,634,966

BINARY PROCESSING OF SOUND SPECTRUM

Tomofumi Nakatani, Yokohama, and Shogo Nakamura, Matsudo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 19, 1985, Ser. No. 713,431
Claims priority, application Japan, Mar. 22, 1984, 59-55478
Int. Cl.⁴ G01R *23/16*
U.S. Cl. 324—77 B **3 Claims**



1. A system of processing a spectrum of sound to be binary-valued, comprising:

sample and hold means for sampling and holding a parallel signal of said spectrum of sound;

converting means for converting said parallel signal into a time series signal;

peak detecting means for detecting a peak of said time series signal and for producing a peak-detected signal;

zero-cross detecting means for detecting zero-crossing of said time series signal and for producing a zero-cross signal;

comparing means for comparing the level of said parallel signal with the level of said peak-detected signal and for supplying a binary output signal as a result of a comparison using said peak-detected signal as a threshold;

means for supplying a control signal in association with said zero-cross signal; and

latching means for latching the binary output signal from said comparing means in accordance with said control signal.

4,634,967

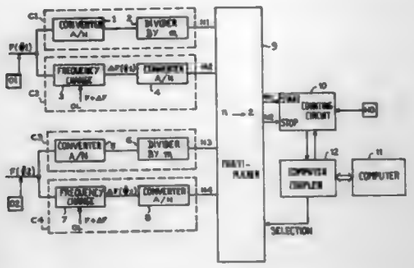
PHASE COMPARATOR

Philippe Virieux, Boulogne, and Isabelle Azemard, Paris, both of France, assignors to Thomson-CSF, Paris, France

Filed Dec. 29, 1983, Ser. No. 566,733
Claims priority, application France, Dec. 30, 1982, 82 22077
Int. Cl.⁴ G01R *25/00*
U.S. Cl. 324—83 D **9 Claims**

1. A phase comparator for comparing the phase of a plurality of signals at the same frequency supplied by respective oscillators comprising a system of pairs of measuring cascades, in which each pair has a first and a second measuring cascade connected in parallel to an oscillator and supplied by the signal transmitted by said oscillator, said first cascade having an analog-digital converter followed by a digital divider, in order to supply a first signal, said second cascade having a frequency

changing circuit, followed by an analog-digital converter, for supplying a second signal; a multiplexer receiving the signal supplied by each cascade and supplying in pairs the signals relating to the two cascades of the same type; a counting circuit synchronized by a counting clock receiving in pairs the signals supplied by the multiplexer, one of these signals representing a count start signal and the other representing a count



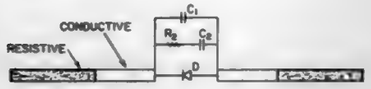
stop signal, in order to count the time separating the arrival of the start signal and the arrival of the stop signal and transmit a counting signal; a computer giving selection orders of the output signals of the multiplexer, supplying control signals for the counting circuit and receiving the counting signal; and a circuit for coupling the computer, the counting circuit and the multiplexer.

4,634,968

WIDE RANGE RADIATION MONITOR

Edward E. Aslan, Plainview, N.Y., assignor to The Narda Microwave Corporation, Hauppauge, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,041
Int. Cl.⁴ G01R *21/10, 19/22*
U.S. Cl. 324—95 **6 Claims**



1. An electric field sensitive probe comprising a diode connected to a dipole antenna, shunt capacitive means connected in parallel with said diode, and a circuit comprising series-connected resistive means and capacitive means in parallel with said diode, said dipole having conductive portions connected to said diode and resistive portions remote from the connections with said diode, the impedance of said components being selected to establish a voltage across said diode that is substantially independent of frequency over a particular range, that decreases substantially proportional to the square of the frequency below said range, and that decreases substantially proportional to the frequency above said range.

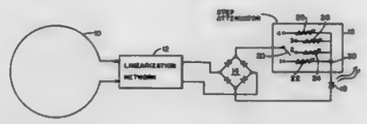
4,634,969

TIME VARYING MAGNETIC FIELD SAFETY PROBE

George R. Edlin, and Robert A. Snead, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 14, 1984, Ser. No. 610,219
Int. Cl.⁴ G01R *29/08, 33/02*
U.S. Cl. 324—95 **3 Claims**

1. A passive magnetic field safety probe for use in a time varying electromagnetic field and comprising: passive sensing means, a full wave diode bridge rectification means for providing a direct current output, linearization means coupled between said passive sensing means and said rectification means, and a resistance attenuating means and indicating means connected in series with said direct current output for indicating the presence or absence of predetermined minimum levels of electromagnetic radiation present on said passive sensing



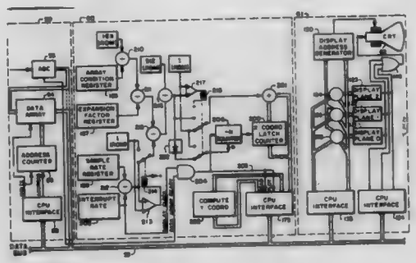
means, said passive sensing means being a loop antenna having a single, unbroken loop between first and second terminals, and said linearization means being a frequency dependent filter coupled to said antenna terminals.

4,634,970

DIGITAL WAVEFORM PROCESSING OSCILLOSCOPE WITH DISTRIBUTED DATA MULTIPLE PLANE DISPLAY SYSTEM

Randall K. Payne, and Russell H. Nord, both of Fort Atkinson, Wis., assignors to Norland Corporation, Fort Atkinson, Wis.

Filed Dec. 30, 1983, Ser. No. 567,055
Int. Cl.⁴ G01R *13/34, 13/22*
U.S. Cl. 324—121 R **4 Claims**



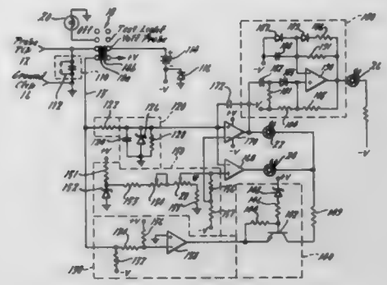
1. A raster-display digital oscilloscope instrument, comprising:
input circuit means for deriving and storing at a predetermined constant acquisition rate digital data signals indicative of the level of an applied signal;
at least one display plane having a plurality of memory locations;
means for conveying said data signal in succession from said input circuit means to individual memory location in said display plane;
a cathode ray tube;
display circuit means operatively associated with said cathode ray tube and said display plane for successively and repeatedly reading out at a predetermined display rate said memory locations to said cathode ray tube; and
data distribution means for directing N successive data signals to each memory location when said acquisition rate is greater than said display rate to substantially evenly distribute every KN the data signal among said memory locations, where K and N are positive integers and N is greater than one.

4,634,971

PORTABLE HAND-HELD VOLTAGE SENSOR WITH MANUALLY ADJUSTABLE REFERENCE VOLTAGE FOR COMPARISON WITH SENSED VOLTAGE

Robert C. Johnson, Dearborn; David L. Perry, Canton, and Bernd E. Peitsch, Sterling Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1982, Ser. No. 429,415
Int. Cl.⁴ G01R *19/165, 15/08*
U.S. Cl. 324—133 **6 Claims**



1. A voltage sensor device comprising:
a portable housing suitably sized for hand-held use;
a first conductor means extending from one end of said housing for contacting a first voltage potential;
a second conductor means extending from said housing for connection to a ground potential;
means within said housing for providing a first adjustable reference D.C. voltage level;
means connected to said first adjustable reference voltage providing means for providing a second reference D.C. voltage level that is continuously less than said first reference voltage level by a predetermined amount;
thumbwheel means accessible on the outside of said portable housing for allowing manual adjustment of said first reference voltage level;
means connected to said first adjustable reference voltage level providing means, said second reference voltage level providing means and said first conductor means to compare the first voltage potential with both said first reference voltage level, for providing a first D.C. output signal when said first voltage potential is less than said first reference voltage level, and said second reference voltage level, for providing a second D.C. output signal when said first voltage potential is greater than said second reference voltage level; and
means for distinctively indicating the presence or absence of any of said output signals.

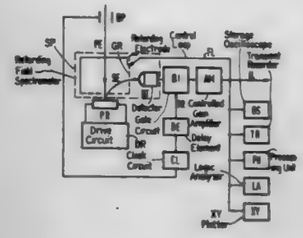
4,634,972

METHOD FOR MEASURING LOW-FREQUENCY SIGNAL PROGRESSIONS WITH AN ELECTRON PROBE INSIDE INTEGRATED CIRCUITS

Peter Fazekas, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 20, 1984, Ser. No. 633,009
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334494
Int. Cl.⁴ G01R *31/28*
U.S. Cl. 324—158 R **9 Claims**

1. A method for measurement of a signal progression at a given operating frequency at measuring points of a circuit specimen by use of an electron probe, comprising the steps of:
employing a pulsed electron probe during a search for the measuring points having the operating frequency signal progression thereon and also for actual measurement of the operating frequency signal progression at the measuring points;
providing a pulse repetition frequency of said electron probe which is independent of the operating frequency of said circuit specimen;



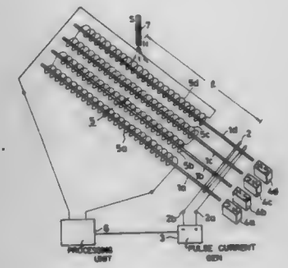
measuring resulting secondary electrons with a detecting spectrometer; and
processing detected signals with a gate circuit, the gate circuit being triggered synchronously with the electron probe via a delay element.

4,634,973

POSITION DETECTING APPARATUS

Azuma Murakami, Tokyo, and Yoshinori Taguchi, Ageo, both of Japan, assignors to Wacom Co., Ltd., Saitama, Japan

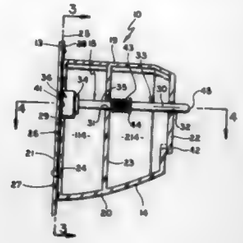
Filed Jun. 27, 1984, Ser. No. 625,281
Claims priority, application Japan, Jun. 29, 1983, 58-117968; Jun. 29, 1983, 58-117969
Int. Cl.⁴ G01B *7/14*
U.S. Cl. 324—207 **6 Claims**



1. A position detecting apparatus comprising:
a plurality of magnetostrictive transmission medium elements arranged substantially in parallel with one another;
a first coil wound commonly around one end of said magnetostrictive transmission medium elements;
a second coil composed of a plurality of second coil elements wound around respective magnetostrictive transmission medium elements over a large length of said magnetostrictive transmission medium elements, said second coil elements being connected in series or in parallel;
a pulse current generator for applying a pulse current to either one of said second coil and said first coil so as to produce magnetostrictive vibration waves in each of said magnetostrictive transmission medium elements simultaneously;
a processing unit for detecting the time length between the moment at which said magnetostrictive vibration wave is produced and the moment at which a voltage is induced in the other of said second coil and said first coil by said magnetostrictive vibration wave; and
a position appointing magnetism generator which is not connected to any part of the apparatus.

VOL 1074 ISS 1 JA 6 1987 UMI

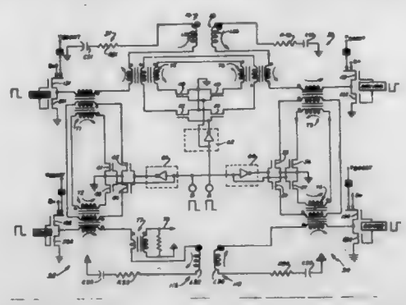
4,634,974
DEVICE INCLUDING MOVEABLE SHAFT AND MAGNET FOR SENSING MAGNETIC METAL
Rudolf A. Hunter, 6548 E. Conifer St., Agoura Hills, Calif. 91301
Filed Jan. 31, 1985, Ser. No. 697,066
Int. Cl.[4] G01N *27/72*; G01R *33/12*
U.S. Cl. 324—228 **4 Claims**



3. A magnetic sensing device comprising:
a hollow body having a wall at a predetermined side thereof which contains an opening and which is adapted to be moved to a position closely proximate a surface of a workpiece and to be moved along said surface;
a permanent magnet contained movably within said hollow body;
means, including a shaft secured to said magnet, mounting said magnet for movement relative to said body and said wall thereof along a predetermined axis between an active position near said surface of the workpiece and within said opening in said wall and a retracted position offset outwardly from said surface, said shaft having an end portion projecting from said body to the exterior thereof and exposed for manual actuation from the outside of the body to move the magnet from said retracted position to said active position;
yielding means within said body urging said magnet toward said retracted position thereof;
said magnet being adapted to be retained magnetically in said active position within said opening when the magnet is received opposite a portion of a workpiece formed of magnetic material; and
a sheet of cushioning material carried by said body at an outer side of said wall for contact with the workpiece and having a portion bridging across said opening in the wall to prevent contact of said magnet with the workpiece.

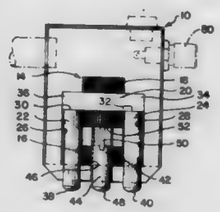
4,634,975
METHOD AND APPARATUS FOR PRODUCING ELECTROMAGNETIC SURVEILLANCE FIELDS
Larry Eccleston; James C. Cook, II, both of Marshall, and Earl R. Goodrich, II, East Lansing, all of Mich., assignors to Progressive Dynamics, Inc., Marshall, Mich.
Filed Sep. 17, 1984, Ser. No. 651,576
Int. Cl.[4] G08B *13/24*; G01R *33/00*
U.S. Cl. 324—232 **63 Claims**

1. A method of applying controlled electrical excitation to the field-generating coil windings in an alternating electromagnetic field-type surveillance system, comprising the steps: generating an alternating electromagnetic surveillance field across a surveillance passage by using at least a pair of inductance coils; applying electrical excitation to said coils by coupling a power supply means thereto through an electrical drive circuit for each of said coils; monitoring at least one of the current flow characteristics constituting circulating current maxima and phasing present in at least one of said drive circuits and producing a control signal representative thereof; and variably controlling the electrical excitation applied to at least selected ones of said coils in response to and as a function of



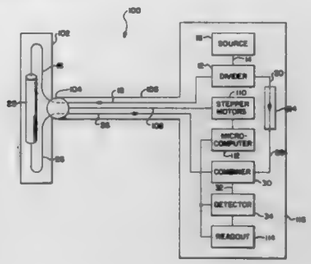
said control signal so as to conform the actual current flow in such selected coils to a substantially uniform characteristic.

4,634,976
BARKHAUSEN NOISE METHOD FOR STRESS AND DEFECT DETECTING IN HARD STEEL
Seppo I. Tiitto, Pittsburgh, Pa., assignor to American Stress Technologies, Inc., Pittsburgh, Pa.
Continuation-in-part of Ser. No. 491,981, May 5, 1983, abandoned. This application Oct. 4, 1983, Ser. No. 539,006
Int. Cl.[4] G01N *27/82*; G01R *33/12*; G01L *1/12*
U.S. Cl. 324—240 **1 Claim**



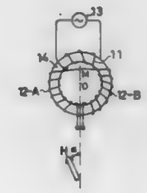
1. A method for generating information relative to the presence or absence of stress and defects in a piece of hard steel having at least one nonplanar surface comprising the steps of:
(a) providing a Barkhausen noise sensor having a magnetizing core composed of ferrite and a sensing coil assembly having a ferrite core;
(b) positioning the sensing coil assembly of said sensor relative to said magnetizing core thereof to cause, when said sensor is energized, Barkhausen noise generated by electromagnetic coupling between said magnetizing core and said sensing coil assembly to be less intense than Barkhausen noise generated within said piece of steel;
(c) effecting simultaneous contact by said magnetizing core and said core of said sensing coil assembly with said nonplanar surface of said piece of steel;
(d) generating Barkhausen noise within said piece of steel; and
(e) sensing the Barkhausen noise so generated to develop said information.

4,634,977
HIGH ACCURACY MAPPING OF MAGNETIC FIELDS WITH A FIBER OPTIC INTERFEROMETER
James E. Lenz, Brooklyn Park, and Gordon L. Mitchell, New Brighton, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 27, 1982, Ser. No. 453,196
Int. Cl.[4] G01R *33/032*
U.S. Cl. 324—244 **18 Claims**



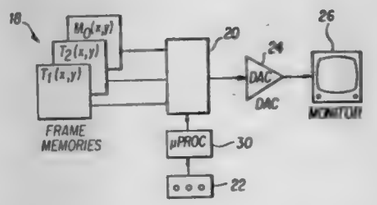
1. A method of mapping at least a portion of a magnetic field with an interferometer having an output, wherein said interferometer includes an optical fiber sensitive to magnetic fields and clad with a magnetostrictive material, comprising:
determining the approximate direction of the magnetic field lines of said magnetic field within said portion of said magnetic field;
placing said optical fiber substantially transverse to said magnetic field lines;
positioning said optical fiber variously within said magnetic field, while maintaining said optical fiber substantially transverse to said magnetic field lines; and
recording said output for each of said various positions.

4,634,978
MAGNETOMETER DIRECTION MEASURING SYSTEM REQUIRING NO EXTERNAL COMPASS
Yoshiteru Watanabe, Iwatsuki, Japan, assignor to Kabushiki Kaisha Saura Keiki Seisakusho, Tokyo, Japan
Filed Jul. 19, 1983, Ser. No. 515,258
Claims priority, application Japan, Jul. 31, 1982, 57-134591
Int. Cl.[4] G01K *33/04*; G01C *17/28*
U.S. Cl. 324—253 **1 Claim**



1. A direction measuring system requiring no external compass for measuring a direction of an imaginary line of said system in relation to a geomagnetic field direction and for providing output pulses having equal pulsewidths corresponding thereto comprising:
a magnetometer including a toroidal magnetic core having an AC excitation winding and an output winding wound thereon, wherein said AC excitation winding and said output winding are magnetically coupled by said toroidal magnetic core and wherein said output winding consists of a pair of series connected coils having an equal number of turns arranged so as to have first and second terminals and a third common terminal located between said pair of coils;
a comparator circuit having inputs respectively connected to said first terminal of said output winding and to a reference voltage, wherein said second terminal of said output winding is connected to a reference point which is common to said comparator circuit such that said comparator outputs a first voltage when a voltage across said output winding is greater than said reference voltage and outputs a second voltage when said voltage across said output winding is less than or equal to said reference voltage;
wherein, when an alternating current is supplied to said AC excitation winding with an amplitude which is sufficient to saturate said magnetic core, said comparator circuit outputs pulses having equal pulsewidths which are proportional to an angle between the geomagnetic field direction and an imaginary line drawn between a geometric center of said toroidal magnetic core and said third terminal located between said pair of coils.

4,634,979
AUTOMATED NUCLEAR MAGNETIC RESONANCE IMAGE SYNTHESIS
Stephen J. Riederer, and James N. Lee, both of Durham, N.C., assignors to Duke University, Durham, N.C.
Continuation-in-part of Ser. No. 550,198, Nov. 9, 1983, Pat. No. 4,573,014. This application Apr. 26, 1985, Ser. No. 727,674
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—307 **6 Claims**



1. A video processor for synthesizing and displaying images derived from NMR measurements of a body comprising:
means for performing NMR measurements on a body using a predetermined pulse sequence;
control means for selectably establishing a first set of parameters controlling the characteristic of the pulse sequence including at least one of pulse delay time τ and repetition time T_R;
first storage means for storing data from said means for performing measurements;
means for calculating from said data a plurality of intrinsic parameters for each pixel of a matrix of pixels representative of points in the body, said parameters including at least one of spin-lattice relaxation time T_1, spin-spin relaxation time T_2 and net magnetization M_o;
second storage means including means for storing said parameters;
means for computing a value for each pixel in said matrix representative of a brightness level, each said value being derived from the intrinsic parameter values for the point, a selected pulse sequence relationship and selected parameters T_R and τ said selected parameters possibly being different from said first set of parameters, thereby forming a matrix representing a displayable image, wherein said second storage means further includes a means for storing said computed value for said matrix of pixels which represents said displayable image; and
means for displaying said image.

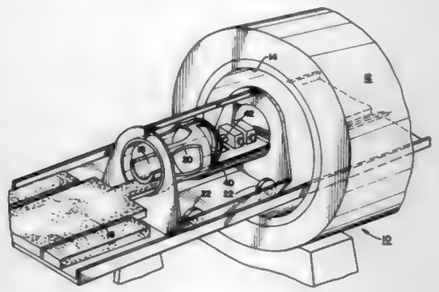
VOL 1074 ISS 1 JA 6 1987 UMI

4,634,980

. NUCLEAR MAGNETIC RESONANCE RADIO FREQUENCY ANTENNA

George J. Misic, Hiram; Aarne Lillo, North Royalton; John L. Patrick, Solon, and G. Neil Holland, Chagrin Falls, all of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Aug. 16, 1984, Ser. No. 641,570
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—322 6 Claims



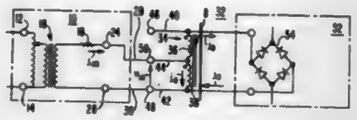
1. An antenna arrangement for transmitting and receiving high frequency energy in the range of 30 to 95 MHZ for use in NMR patient imaging, comprising an insulating cylindrical base of diameter suitable for enclosing a human head, metallic foil on said base forming an antenna structure having a resonant frequency in the range of 30 to 95 MHZ and including a pair of diametrically opposite arcuate electrical conductors, each conductor subtending a predetermined arc, short circuiting strips interconnecting said conductors at one end thereof, wing strips extending circumferentially from each side of each conductor at the other end thereof, and conductive feed strips interconnecting the wing strips of each conductor and lying in planes transverse to the planes of the wing strips.

4,634,981

METHOD FOR TESTING A CIRCUIT BREAKER USING A THREE TERMINAL CURRENT TRANSFORMER

Alan B. Shimp, Monroeville Boro, and Derek A. Paice, Murrysville Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 19, 1984, Ser. No. 662,646
Int. Cl.[4] G01R *31/32*
U.S. Cl. 324—424 5 Claims



1. A method for testing a circuit interrupter which has a current transformer which monitors current in an electrical conductor to be served by the circuit interrupter where the current transformer has two relatively equal coil portions serially connected to form a coil transformer midpoint where a first terminal is connected to the midpoint and second and third terminals are connected, respectively, to the other ends of each of said coil portions, comprising the steps of:

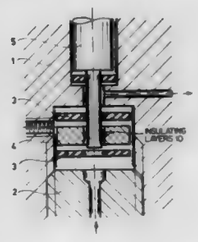
(A) interconnecting a source of controlled electrical current between said first and said second terminals;
(B) changing the current of step (A) over a period of time;
(C) monitoring the changing current of step (B);
(D) noting at which value of current of step (C) the circuit interrupter trips;
(E) interconnecting a source of controlled electrical current between said first and said third terminals;
(F) changing the current of step (E) over a period of time;
(G) monitoring the changing current of step (F); and
(H) noting at which value of current of step (G) the circuit interrupter trips, if the value of the current in step (H) is generally within a predetermined range equal to the value of the current in step (D), then the tripping value of the circuit interrupter is generally equal to that value.

4,634,982

CAPACITIVE MEASURING ELEMENT FOR OSCILLOMETRIC MEASUREMENT OF CONDUCTANCE OF STREAMING SOLUTIONS AND METHOD OF DETERMINING THE DIMENSIONS THEREOF

Ernö Pungor; Klára Tóth; Ferenc Pál; Béla Erös; József Nagy, and László Bihátsi, all of Budapest, Hungary, assignors to Magyar Tudomanyos Akademia Kozponti Hivatala, Hungary

Filed Sep. 13, 1983, Ser. No. 531,784
Int. Cl.[4] G01N *27/02*
U.S. Cl. 324—448 10 Claims



1. Capacitive measuring element for oscillometric measurement of streaming solutions by flow-through measuring techniques, comprising a measuring electrode and a grounding electrode disposed around said measuring electrode in a concentric arrangement defining a measuring space having a volume in a range of 2 to 50 μl, further comprising an electric insulating layer which coats respective surfaces of said measuring electrode and said grounding electrode defining said measuring space, said electrodes being arranged to ensure a measuring capacitance relative to vacuum at least as high as their stray capacitance, whereby both conductivity and permittivity of said streaming solutions may be measured.

4,634,983

CIRCUIT ARRANGEMENT FOR CONVERTING AN A.C. SIGNAL INTO A BINARY SIGNAL

Hans R. Schemmel, and Hermann Schönamsgruber, both of Nuremberg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

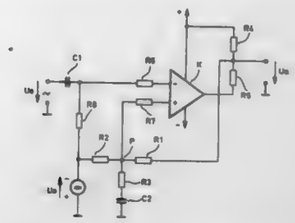
Filed May 10, 1985, Ser. No. 733,274
Claims priority, application Fed. Rep. of Germany, May 12, 1984, 3417624
Int. Cl.[4] H03K *5/08, 5/01, 3/29*
U.S. Cl. 328—28 2 Claims

1. A circuit arrangement for converting an alternating current signal (Ue) into a binary output signal (Ua), wherein

(a) the alternating current signal (Ue) is applied to the inverting input of a feed-back comparator having a non-inverting input and an output (K),
(b) the feedback is effected through a first voltage divider (R1, R2) whose tap (P) is connected to the non-inverting input of the comparator (K) and the binary output signal (Ua) is applied to one terminal of the first voltage divider (R1, R2),

characterized in that,

(c) another terminal of the first voltage divider (R1, R2) is connected to the negative pole of a direct voltage source (Uo) whose positive pole is connected to a reference potential,
(d) the negative pole of said voltage source (Uo) is connected to the inverting input of the comparator (K) through a first resistor (R8),
(e) the tap (P) of the first voltage divider (R1, R2) is connected through the series arrangement of a second resistor (R3) and a capacitor (C2) to the reference potential.

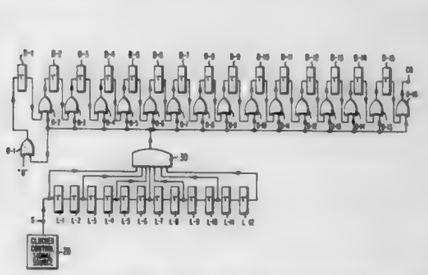


4,634,984

DURATION-SENSITIVE DIGITAL SIGNAL GATE

Leopold A. Harwood, Bridgewater, and Kirk A. Law, East Windsor, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 18, 1985, Ser. No. 724,646
Int. Cl.[4] H03K *5/153*
U.S. Cl. 328—112 5 Claims



1. A duration-sensitive signal gate for use with a clocked source of signals alternatively exhibiting a "1" or a "0" level, comprising:

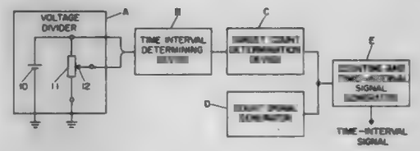
delay means having a plurality of successive signal takeoff points; the amount of delay between successive ones of said takeoff points being the same; the input of said delay means being responsive to the output of said signal source;
a plurality of signal paths, each connected to a respectively different one of said signal takeoff points;
an "and" gate having a plurality of inputs equal in number to said plurality of signal paths, each of said signal paths terminating at a respectively different one of said plurality of inputs of said "and" gate;
a plurality of delay devices, each imparting the same predetermined amount of delay; and
a succession of two-input "or" gates, each associated with a respectively different one of said plurality of delay devices, with one input of each of said succession rendered responsive to the output of said "and" gate, and with the other input of each of said succession coupled to the output of the associated one of said plurality of delay devices;
means for supplying the output of the last of said succession of "or" gates to an output terminal;
means for delivering the output of each of the remainder of said succession of "or" gates to the input of the delay device associated with the next succeeding one of said succession; and
means for rendering the input of the delay device associated with the first of said succession of "or" gates responsive only to the output of said "and" gate.

4,634,985

TIME-INTERVAL SIGNAL GENERATING APPARATUS

Shoji Sasaki, Tochigi, Japan, assignor to Fuji Electric Co., Ltd., Japan

Filed Feb. 27, 1985, Ser. No. 706,157
Claims priority, application Japan, May 24, 1984, 59-105327
Int. Cl.[4] G01R *29/02*
U.S. Cl. 328—129.1 3 Claims



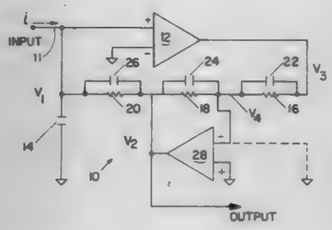
1. Time-interval generating apparatus comprising voltage divider means including a variable resistor connected as a potentiometer to a DC power source, the total voltage applied to the variable resistor corresponding to maximum time interval and a selected time interval corresponding to a partial voltage obtained from a movable contact of the variable resistor, time-interval determining means for comparing the partial voltage and the total voltage to determine a set time interval proportional to a ratio of said voltages, target count determination means for determining a target count on the basis of the ratio determined by the time-interval determination means, count signal generator means for generating count signals at a predetermined rate, and time-interval signal generator means for counting the number of count signals generated by the count signal generator means and comparing the obtained count and the target count.

4,634,986

LOG AMPLIFIER WITH POLE-ZERO COMPENSATION

William Brookshier, Downers Grove, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 8, 1985, Ser. No. 699,878
Int. Cl.[4] G06G *7/24;* G06F *7/556*
U.S. Cl. 328—145 8 Claims



1. A log amplifier circuit responsive to an input signal current for developing an amplified output signal and characterized by poles and zeros which vary with the input signal amplitude, said log amplifier circuit comprising:

a first operational amplifier having an input terminal to which the input signal current is provided and an output terminal at which a first voltage is developed;
a first feedback network coupled between the input terminal of said first operational amplifier and an intermediate

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point and including a nonlinear log element across which a second voltage which varies with the input signal current is developed; and

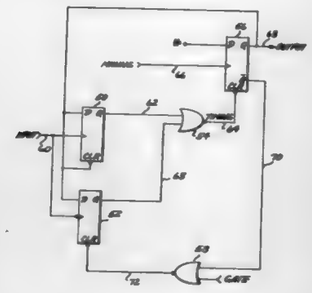
a second feedback network including a second inverting operational amplifier coupled between the output terminal of said first operational amplifier and said intermediate point and responsive to said first voltage for developing a compensation signal and applying said compensation signal to said first feedback network in generating a compensated feedback signal at the input terminal of said first operational amplifier.

4,634,987

FREQUENCY MULTIPLIER

David B. Nolte, Prescott, Ariz., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Oct. 1, 1984, Ser. No. 656,257
Int. Cl.[4] G06G 7/16; H03K 3/017
U.S. Cl. 328—160 14 Claims



1. A device for receiving an input signal having a frequency, for doubling the frequency of the input signal to produce a doubled input signal, and for mixing the doubled signal with a mixing signal to produce an output signal having first and second states, the device comprising means for generating a trigger signal in response to each low-to-high transition and each high-to-low transition of the input signal that occurs when the output signal is in its second state, and bistable means for generating the output signal, the bistable means being responsive to the trigger signal to cause the output signal to be in its first state and responsive to a periodic characteristic of the mixing signal to cause the output signal to be in its second state, whereby a transition of the input signal that occurs when the output signal is in its second state results in the output signal entering its first state and remaining in its first state until the next periodic characteristic of the mixing signal occurs.

13. A circuit for multiplying the frequency of an input signal by two, comprising:

first detection means for detecting a first transition of the input signal and generating a first detection signal;

second detection means for detecting a different second transition of the input signal and generating a second detection signal; and

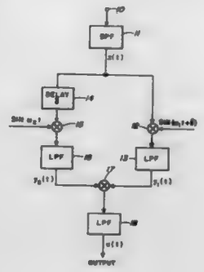
logic means for combining said first and second detection signals to generate an output signal having a frequency that is twice the input signal frequency, the logic means including feedback means for feeding back said output signal to said first and second detection means.

4,634,988

DETECTION OF UNSTABLE NARROWBAND SIGNALS

Frank P. Romeo, Jr., Saratoga, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 18, 1972, Ser. No. 218,848
Int. Cl.[4] H04B 15/00
U.S. Cl. 328—167 10 Claims



1. Apparatus for detecting a varying narrow band signal in a background of noise which comprises:

means for generating an electrical signal in response to an acoustical signal;

means for delaying said electrical signal to produce a delayed electrical signal;

means for multiplying said delayed electrical signal with a sinusoid of a first frequency;

means for multiplying said electrical signal with a sinusoid of a second frequency;

means for multiplying said multiplied delayed electrical signal with said multiplied electrical signal to produce a test signal; and

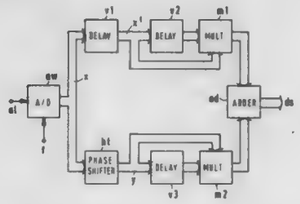
means for testing the test signal for the presence of the narrow band signal.

4,634,989

DIGITAL FM DETECTOR FOR A DIGITAL SIGNAL

Soenke Mehrgardt, March-Neuershausen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed May 6, 1985, Ser. No. 731,130
Claims priority, application European Pat. Off., May 15, 1984, 84105478.6
Int. Cl.[4] H03D 3/00
U.S. Cl. 329—112 20 Claims



1. A digital FM detector comprising

an analog to digital converter for receiving FM analog signals and deriving digital signals therefrom, the output of said analog-to-digital converter being coupled to first terminals;

a digital 90° phase shifter having inputs coupled to said first terminals;

a first delay element having an input coupled to said first terminals and providing a delay equal to the delay of said phase shifter;

a second delay element coupled to the output of said first delay element and providing a predetermined delay;

a first multiplier having first inputs coupled to the output of said first delay element, second inputs coupled to the output of said second delay element, and having an output;

a third delay element coupled to the output of said phase shifter and providing said predetermined delay;

a second multiplier having a first input coupled to the output of said phase shifter, a second input coupled to the output of said third delay element, and having an output; and

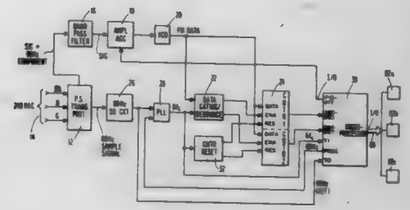
an adder having a first input coupled to said first multiplier output, a second input coupled to said second multiplier output and an output, said adder output being coupled to output terminals.

4,634,990

APPARATUS FOR DEMODULATING DIFFERENTIAL PHASE SHIFT KEYED SIGNALS

John C. Tate, Garland, and Eric K. Weeren, Carrollton, both of Tex., assignors to General Electric Company, King of Prussia, Pa.

Filed Jun. 25, 1985, Ser. No. 748,530
Int. Cl.[4] H03D 3/00
U.S. Cl. 329—126 10 Claims



1. An apparatus for demodulating differential phase shift keyed signals, said apparatus comprising:

(a) means for receiving a differential phase shift keyed analog signal;

(b) means for generating a plurality of pulses at a frequency which varies as a function of the amplitude of said analog signal;

(c) means for counting said pulses during predetermined in-phase intervals and intervals which are quadrature phase related to said in-phase intervals;

(d) means for determining an in-phase sample difference between (i) the number of in-phase interval pulses counted during a counting period in each of a plurality of successive bit intervals and (ii) a reference pulse count number, and for determining the sign of said in-phase sample difference;

(e) means for determining a quadrature-phase sample difference between (i) the number of quadrature-phase interval pulses counted during said counting period in each of said plurality of successive bit intervals and (ii) said reference pulse count number, and for determining the sign of said quadrature-phase sample difference; and

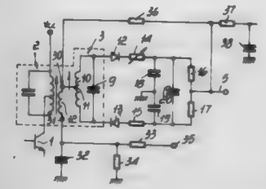
(f) means for indicating a phase change when the signs of said in-phase sample difference and said quadrature-phase sample difference on any of said bit intervals are different from the signs of said in-phase and quadrature phase sample differences, respectively, on an immediately-preceding bit interval.

4,634,991

RATIO DISCRIMINATOR

Ettore Mastrojeni, Astillo, Italy, assignor to SGS-ATES Componenti Elettronici S.p.A., Catania, Italy

Filed Mar. 25, 1985, Ser. No. 715,999
Claims priority, application Italy, Apr. 3, 1984, 20375 A/84
Int. Cl.[4] H03D 3/10
U.S. Cl. 329—129 7 Claims



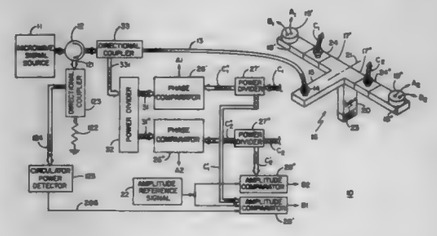
1. A ratio discriminator comprising a modulated signal input; an intermediate frequency circuit formed of first and second inductively coupled tuned oscillating circuits, said first oscillating circuit being connected to said modulated signal input and said second oscillating circuit having a secondary winding provided with an intermediate tap; a tertiary winding having first and second terminals; said first terminal of said tertiary winding being connected to said secondary winding intermediate tap; and a detector circuit coupled to said second oscillating circuit and having an output terminal; a voltage divider coupled to said tertiary winding, connected to a supply voltage and having an intermediate terminal, wherein said second terminal of said tertiary winding is connected to said intermediate terminal of said voltage divider, said second terminal being also connected to ground through a capacitor and said first terminal of said tertiary winding being connected to said detector output terminal through a resistor having a high resistance value.

4,634,992

MAGNETRON AMPLIFIER POWER COMBINER

William C. Brown, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 26, 1985, Ser. No. 748,784
Int. Cl.[4] H03F 3/54, 3/60
U.S. Cl. 330—47 7 Claims



1. A power combining circuit comprising:

a first and second frequency tunable and amplitude controllable amplifier, each having an input and an output;

a source of a microwave input signal;

a microwave load;

a microwave circuit connecting said first and second amplifier inputs to said input signal source and connecting said first and second amplifier outputs to said load and to said signal source, said first and second amplifier outputs being in-phase at said load and out-of-phase at said connection to said signal source;

means responsive to the output of each of said first and second amplifiers and to said input signal to provide phase

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error signals to control the frequency of said first and second amplifiers, respectively, to minimize said error signals; and

means responsive to the output amplitude of each of said first and second amplitude signals to provide first and second amplitude signals to control the amplitude of said first and second amplifier outputs, respectively, to be equal to each other.

4,634,993

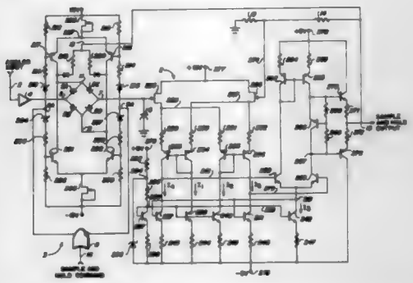
HIGH GAIN, LOW DRIFT OPERATIONAL AMPLIFIER FOR SAMPLE AND HOLD CIRCUIT

Myron J. Koen, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Filed Aug. 23, 1985, Ser. No. 768,868

Int. Cl.⁴ H03F 3/45

U.S. Cl. 330—253 **6 Claims**



5. A method of operating an operational amplifier to achieve high gain and stable, low input offset voltage, the method comprising the steps of:

(a) applying a first input voltage to the gate of a first field effect transistor and applying a second input voltage that is fed back from an output of the operational amplifier to the gate of a second field effect transistor;

(b) shifting the level of the source voltage of the first field effect transistor to a first input of a first buffering circuit that has a second input and a high impedance output, and shifting the level of the source voltage of the second field effect transistor to the second input of the first buffering circuit, to cause the output of the first buffering circuit to undergo a first voltage change that has a predetermined relationship to the difference between the voltages of the sources of the first and second input voltages;

(c) shifting the level of the source voltage of the second field effect transistor to a first input of a second buffering circuit that has a second input and a high impedance output, and shifting the level of the source voltage of the first field effect transistor to the second input of the second buffering circuit, to cause the output of the second buffering circuit to undergo a second voltage change that has a predetermined relationship to the difference between the voltage of the sources of the first and second input voltages;

(d) providing a first NPN constant current source transistor with its collector coupled to the high impedance output of the first buffering circuit, and a second NPN constant current source transistor with its collector coupled to the first high impedance output of the second buffering circuit;

(e) applying the first and second voltage changes to the bases of first and second emitter-coupled transistors in a differential amplifier stage, an output of which is coupled to the output of the operational amplifier; and

(f) biasing the bases of the first and second NPN constant current source transistors by coupling the voltage of the common emitters of the first and second emitter-coupled transistors to the bases of the first and second NPN constant current source transistors so that their collector voltages each have predetermined operating points relative to their base voltages, respectively.

4,634,994

BIPOLAR LOGICAL CIRCUIT ARRANGEMENT FOR SIGNAL REGENERATION

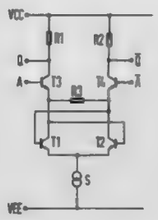
Wilhelm Wilhelm, and Peter Sehrig, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 13, 1985, Ser. No. 733,533

Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418214

Int. Cl.⁴ H03F 3/45

U.S. Cl. 330—260 **1 Claim**



1. Bipolar semiconductor circuit arrangement with transistors of one conduction type having a differential amplifier stage formed by a first and a second transistor with collectors coupled back crosswise to bases thereof and with emitters thereof connected to one terminal of a current source having another terminal which is at supply potential, the first and second transistor each having a collector circuit wherein a respective resistance is connected, comprising a pair of control transistors having respective collectors and emitters and respective collector-emitter paths connected between the respective resistances and the collectors of the first and the second transistors of the differential amplifier stage, said control transistors having respective base terminals connected to a source of complementary input signals, the respective collectors of said control transistors serving as a source of complementary output signals, and a resistor connecting the respective emitters to one another for causing negative feedback.

4,634,995

ELECTRONIC CIRCUITRY UTILIZING AN INERTED DARLINGTON AMPLIFIER OUTPUT STAGE TO BE OPERABLE WITH A LOW SUPPLY VOLTAGE

Isao Nakagawa; Akihiro Yamamoto, both of Katsuta; Koichi Hirose, Yokohama; Yoshinori Okada, and Mitsuru Kudo, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 25, 1983, Ser. No. 460,812

Claims priority, application Japan, Jan. 28, 1982, 57-10971; Jul. 28, 1982, 57-130304

Int. Cl.⁴ H03F 3/45

U.S. Cl. 330—261 **4 Claims**

1. An electronic circuit operable with a low voltage supply comprising:

a differentially connected pair of transistors each having a first conductivity type;

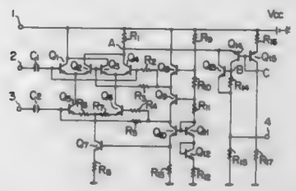
a first constant current source for supplying a bias current for operating said differentially connected pair of transistors;

a first resistor connected between a reference voltage and a collector of at least one of said transistor of said differentially connected pair of transistors;

a first transistor having a second conductivity type opposite to said first conductivity type, said first transistor having an emitter connected to a junction point of said first resistor and said collector of said at least one of said transistors of said differentially connected pair of transistors; and

a second transistor having said first conductivity type, said second transistor having a collector connected to said junction point,

wherein a base of said second transistor is coupled to a collector of said first transistor so that said first transistor and said second transistor form an inverted Darlington amplifier, and



wherein said electronic current further comprises a third transistor coupled in diode connection and having it base connected to the base of the first transistor, for unevenness and temperature compensation of the base voltage of said first transistor, and further

wherein a second constant current source is connected to a collector of said third transistor and there is a correlation between a current value of said first constant current source and a current value of said second constant current source.

4,634,996

OPERATIONAL AMPLIFIER

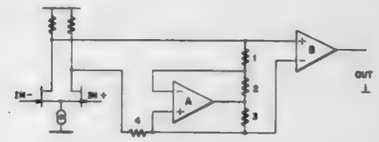
Zdzislaw Gulczynski, 19 Greenhalge St., Medford, Mass. 02155

Filed Feb. 14, 1985, Ser. No. 701,640

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405821

Int. Cl.⁴ H03F 3/45

U.S. Cl. 330—261 **9 Claims**



1. Operational amplifier (OA) with reduced offset voltage for amplifying an input voltage applied to positive and negative signal input terminals thereof, comprising:

two operational amplifiers; OA A and OA B, each having a positive, a negative input terminal, an output terminal and a pair of power supply terminals, and

first, second, third and fourth resistor, arranged in series;

the positive signal input terminal being connected to the positive input of the OA B and the first resistor and the negative input signal terminal being connected to the fourth resistor;

the negative input terminal of the OA A being connected to the first and the second resistor, the positive input terminal of the OA A being connected to the negative input terminal of the OA B, the third and the fourth resistor and the output of the OA A being connected to the second and the third resistor;

the output voltage of the OA appearing between output of the OA B and ground.

4,634,997

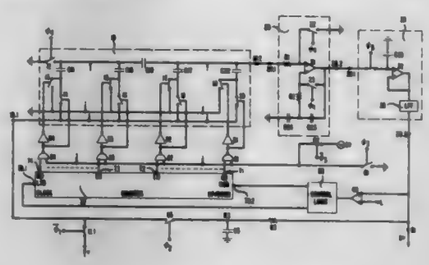
AUTOMATIC GAIN CONTROL AMPLIFIER CIRCUIT

Michael F. Tompsett, Summit, and Edward J. Zimany, Jr., Morristown, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 13, 1984, Ser. No. 670,819

Int. Cl.⁴ H03G 3/30

U.S. Cl. 330—284 **4 Claims**



1. An automatic gain control circuit comprising

(a) a digital electronic counter;

(b) a multiplying digital-to-analog converter connected for directly attenuating an input signal in accordance with the instantaneous reading of the counter, to produce an attenuated signal;

(c) an amplifier arrangement connected for receiving the attenuated signal and for developing an amplified output signal in accordance with the attenuated signal;

(d) a comparator means connected for receiving the amplified output signal and for generating a binary comparator output signal to increase or decrease the reading of the counter depending upon whether the amplified output signal is above or below a prescribed level; and

(e) a latency network, connected for intergrating the binary comparator output signal and for enabling the reading of the counter to increase or decrease when and only when the binary signal integrates to a value which is above or below, respectively, first or second reference values.

4,634,998

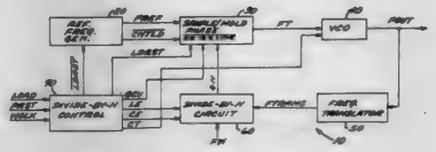
FAST PHASE-LOCK FREQUENCY SYNTHESIZER WITH VARIABLE SAMPLING EFFICIENCY

James A. Crawford, Fullerton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 17, 1985, Ser. No. 756,409

Int. Cl.⁴ H03L 7/18

U.S. Cl. 331—1 A **11 Claims**



1. A phase-locked frequency synthesizer comprising:

a voltage controlled oscillator (VCO) for providing an output signal having a selectable output frequency;

divider means responsive to said VCO output signal for dividing by a division ratio N and for providing a divide-by-N signal, said VCO output frequency being related to said division ratio N;

ramp generating means for providing a ramp signal;

means for providing a reference frequency signal;

means for starting said ramp signal in response to said reference frequency signal and for stopping the ramp signal in response to said divide-by-N signal; and

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sample-and-hold means having variable efficiency for sampling the ramp signal in response to said divide-by-N signal to provide a sampled signal for controlling said voltage controlled oscillator.

4,634,999

RF OSCILLATOR FREQUENCY STABILIZING CIRCUIT USING SELF-MIXING WITH REFERENCE FREQUENCY

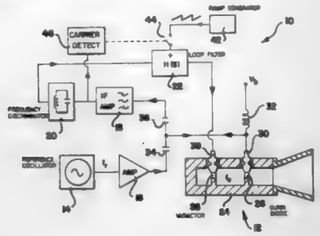
Robin M. Braun, Cape Town, South Africa, assignor to Plessey South Africa Limited, Retreat, South Africa

Filed May 31, 1985, Ser. No. 739,694

Claims priority, application South Africa, Jun. 5, 1984, 84/4215

Int. Cl.⁴ H03L *7/12, 7/24*

U.S. Cl. 331—4 **10 Claims**



1. A frequency stable RF oscillator, which comprises:

a variable frequency RF source for converting power from a power supply to RF energy, the RF source including an active element with a non-linear characteristic, and a power supply terminal for connecting the active element to the power supply;

a frequency stable reference oscillator whose output is coupled to the RF source via the power supply terminal for causing harmonic mixing, in said active element, of the reference oscillator output with the RF energy;

IF circuitry having its input coupled to the RF source via the power supply terminal and being responsive to the difference frequency between the frequency of the RF source and the second or higher harmonic of the frequency of the reference oscillator; and

control means operable in response to the IF circuitry to control the frequency of the RF source.

4,635,000

TEMPORAL PIXEL CLOCK SYNCHRONIZATION SYSTEM

Melvin E. Swanberg, Claremont, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 12, 1985, Ser. No. 797,352

Int. Cl.⁴ H03L *7/08*; H04N *1/04*

U.S. Cl. 331—10 **4 Claims**

1. A temporal pixel clock synchronization system with jitter correction for an optical line scanner system having a polygon scanner, including

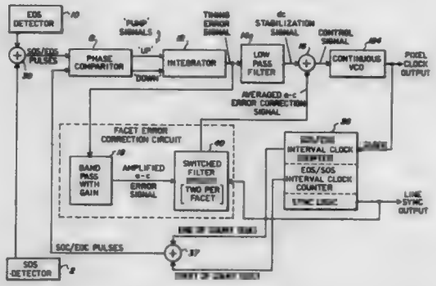
first means for generating both a start of scan pulse and an end of scan pulse,

second means for generating both a start of pixel count pulse and an end of pixel count pulse,

third means coupled to said first and second means and supplied with said pulses for generating a timing error signal having an amplitude representing any error between the phase of the start of scan pulse and the start of count pulse and any error between the phase of the end of scan pulse and the end of count pulse,

fourth means for generating a continuous oscillatory signal,

fifth means coupled to the output of said third means and to the input of said fourth means and including a switched filter circuit with two storage elements for each facet of said polygon for generating from said error signal a frequency correction signal for said fourth means, and



sixth means for coupling the output of said fourth means to the input of said second means.

4,635,001

BEARING ARRANGEMENT IN A TUNABLE MAGNETRON

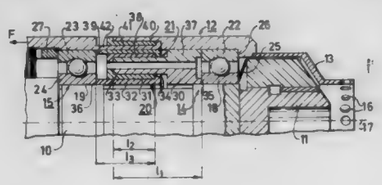
Andras Agoston, Täby, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 16, 1985, Ser. No. 755,747

Claims priority, application Sweden, Jul. 17, 1984, 8403747

Int. Cl.⁴ H01J *25/50*

U.S. Cl. 331—90 **7 Claims**



1. An arrangement in a tunable magnetron comprising a sleeve-shaped body which by means of first and second bearings is rotatably journalled on a longitudinally extending supporting member and which at one end supports a tuning body projecting into resonance cavities of the magnetron, an inner bearing part of one of the bearings having a fixed position relative to the supporting member and an outer bearing part of one of the bearings having a fixed position relative to the sleeve-shaped body, the distance between the bearings being determined by at least one temperature-compensated distance means, characterized in that for the purpose of temperature compensation said at least one distance means comprises at least three elements which partly overlap each other in the longitudinal direction of the supporting member, at least two of the elements consisting essentially of materials having different linear expansion coefficients, said overlapping elements including two end elements and at least one intermediate element, the two end elements each having one end abutting a respective one of the bearings, adjacent elements adjoining each other at their ends so that with temperature variations two of said ajacent elements will impart to the distance means formed thereby length variations in opposite directions, the total length of all elements producing length variations in one direction being selected relative to the total length of all elements producing length variations in the opposite direction and relative to the linear expansion coefficients of the materials of the different elements, that a predetermined variation of the total length of the distance means with the temperature is obtained.

4,635,002

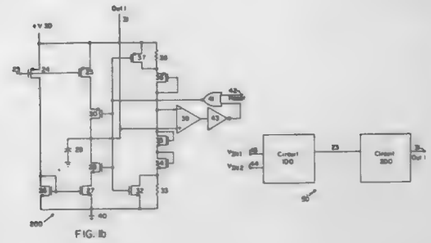
METAL OXIDE SEMICONDUCTOR LOGARITHMIC VOLTAGE CONTROLLED OSCILLATOR

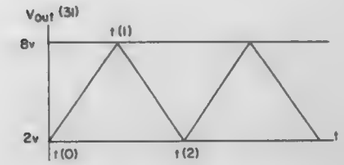
G. Fred Riebeek, San Jose, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed Aug. 6, 1984, Ser. No. 638,096

Int. Cl.⁴ H03B *5/14*

U.S. Cl. 331—108 R **4 Claims**





1. A voltage controlled oscillator which receives an input voltage and which provides an output signal having a frequency which increases exponentially in response to a linearly increasing input voltage, said exponential increase being provided by an MOS field effect transistor biased to operate in its subthreshold range.

4,635,003

OSCILLATOR MIXER CIRCUIT WITH REACTION-TREE COUPLING

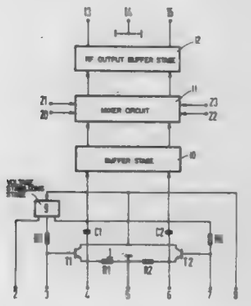
Josef Fenk, Eching/Ottenburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 6, 1985, Ser. No. 742,087

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421278

Int. Cl.⁴ H03C *3/00*

U.S. Cl. 332—16 R **15 Claims**



1. An oscillator and mixer circuit arrangement of an integrated UHF/VHF modulator circuit, comprising a single oscillator active circuit to be connected to frequency-determining passive circuits for UHF and multichannel VHF operation, a single mixer circuit for mixing an oscillator signal from said active oscillator circuit with a signal to be mixed with the oscillator signal, and a reaction-free coupling connected between said single oscillator active circuit and said single mixer circuit.

4,635,004

SINGLE-SIDEBAND GENERATOR SUITABLE FOR INTEGRATED CIRCUITS

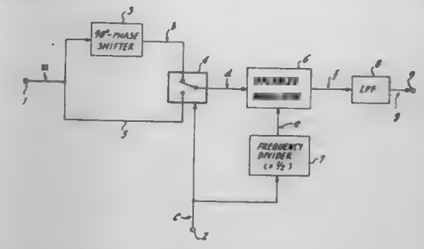
Yukinobu Ishigaki, Tokyo, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Dec. 27, 1985, Ser. No. 813,862

Claims priority, application Japan, Jan. 4, 1985, 60-58; Feb. 4, 1985, 60-19642

Int. Cl.⁴ H03C *1/60*

U.S. Cl. 332—45 **6 Claims**



1. A single-sideband generator, comprising:

90-degree phase shifter means for delaying the phase of a modulating signal by 90 degrees;

modulator means;

switching means for alternately switching the delayed and nondelayed modulating signals to the modulator means at a rate corresponding to the frequency of a carrier; and

frequency divider means for halving the frequency of said carrier and applying the frequency-halved carrier to said modulator means to cause it to modulate the frequency-halved carrier with the output of said switching means.

4,635,005

QUADRUPOLE FOR MATCHING OF A REACTANCE, INDEPENDENTLY OF THE OPERATING FREQUENCY

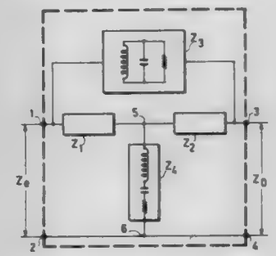
Didier Kaminsky, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jul. 9, 1984, Ser. No. 628,774

Claims priority, application France, Jul. 12, 1983, 83 11613

Int. Cl.⁴ H03H *7/38*

U.S. Cl. 333—32 **9 Claims**



1. A quadrupole for matching a reactance independently of the operating frequency, said quadrupole presenting an input impedance Z_e between its two input terminals and an output impedance Z_o between its two output terminals, comprising:

between a first input terminal and a first output terminal, a first circuit and a second circuit connected in series having impedances Z_1 and Z_2 respectively, and a third circuit having impedance Z_3 connected in parallel with said first and second circuits;

a fourth circuit having impedance Z_4 connected between the point common to said first and second circuits and the point common to the second input terminal and the second output terminal, at least one of the third circuit or a fourth circuit being the reactance which is to be matched, the values of these four impedances being linked by the relationship:

$$Z_e Z_2 Z_3 + Z_0^2(Z_1+Z_2+Z_3) = Z_1 Z_3(Z_0+Z_2+Z_4) + \cdots$$
$$Z_2 Z_3 Z_4$$

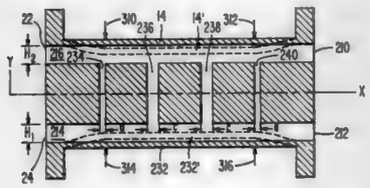
so that $Z_e = Z_o$, the quadrupole appoaches a pure impedance and approaches a zero reactance at its input/output terminals, irrespective of the operating frequency.

4,635,006

ADJUSTABLE WAVEGUIDE BRANCH DIRECTIONAL COUPLER

Krishna Praba, Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 18, 1984, Ser. No. 683,237
Int. Cl.⁴ H01P *5/04, 5/18*
U.S. Cl. 333—111 **3 Claims**



1. An adjustable directional coupler, comprising:

first and second rectangular waveguide sections, each including a pair of conductive wide walls and means for spacing apart each of said wide walls of each said pair, and first and second rectangular waveguide sections being oriented parallel to each other;

a plurality of spaced branch waveguides extending from one of said wide walls of said first waveguide section to one of said wide walls of said second waveguide section for providing coupling between said first and second waveguides; and

means for pressing the other of said wide walls in said first and second waveguide sections towards each other for mechanically controlling said spacing between said walls of each pair of wide walls to control said coupling between said first and second waveguides.

4,635,007

SURFACE ACOUSTIC WAVE TAPPED MEANDER DELAY LINE

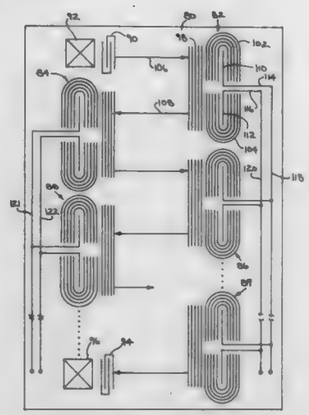
Edward G. Magill, Brooklyn, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 22, 1985, Ser. No. 725,573
Int. Cl.⁴ H03H *9/42*
U.S. Cl. 333—153 **7 Claims**

1. In a surface acoustic wave, SAW, delay line having input signal transducer means and transducing an input RF signal to a SAW signal, said delay line being formed by one or more track changers which reflect said SAW in folded back serpentine manner to provide a meander type delay line, the improvement comprising RF tap means disposed within at least one of said track changers for tapping a signal from said line,

wherein said RF tap means comprises conductive strip lossless coupling means removing a portion of said SAW signal without transducer means and without generation of spurious SAW signals otherwise requiring absorption,

and comprising output signal transducer means transducing said SAW signal to an output RF signal, said input and output signal transducer means establishing the bandwidth of said delay line,



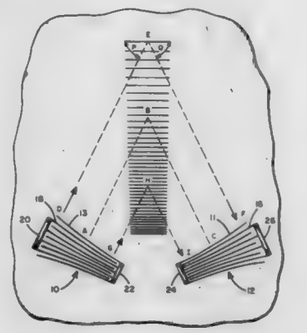
and wherein said portion of said SAW signal removed by said RF tap means conductive strip lossless coupling means is removed over the entire bandwidth of said delay line established by said input and output signal transducer means.

4,635,008

DISPERSIVE SAW FILTER WITH TAPERED TRANSDUCERS

Leland P. Solie, Burnsville, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 19, 1985, Ser. No. 799,719
Int. Cl.⁴ H03H *9/64*
U.S. Cl. 333—195 **3 Claims**



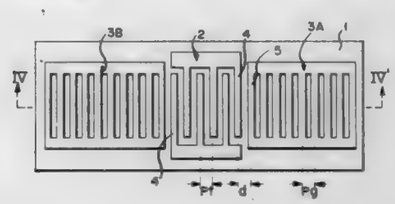
1. In a dispersive single bounce Surface Acoustic Wave (SAW) filter comprising a dispersive reflective array comprising a series of parallel reflectors, an input transducer for producing a SAW and an output transducer for receiving a SAW, wherein said transducers are symmetrically aligned with respect to said array so that the angle of incidence of a SAW from said input transducer is substantially equal to the angle of reflection of said SAW from said reflective array to said output transducer over the entire range of said dispersive reflective array, the improvement wherein said transducers each comprise first and second electrodes, each of which comprise a plurality of curved interdigital electrode fingers that are each formed as segments of hyperbolic curves positioned such that the spacing between said fingers varies from point-to-point along said transducer and the spacing between said fingers is substantially constant at any given point in order to provide a frequency response which is matched to the periodicity of said dispersive array.

4,635,009

SURFACE ACOUSTIC WAVE RESONATOR

Yasuo Ebata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 10, 1985, Ser. No. 807,446
Claims priority, application Japan, Dec. 17, 1984, 59-264426
Int. Cl.⁴ H03H *9/25, 9/145*
U.S. Cl. 333—195 **13 Claims**



1. A surface acoustic wave resonator comprising:

a piezoelectric substrate;

a plurality of grating reflector means provided on a surface of said piezoelectric substrate, each grating reflector means being comprised of a plurality of reflective arrays arranged to be separated by first distances; and

interdigital electric signal/surface acoustic wave transducer means provided on the surface of said piezoelectric substrate between said plurality of grating reflector means, wherein said transducer means comprises a pair of comb transducers, each of which has a plurality of electrode fingers having the same structure as that of said reflective arrays, and in which said electrode fingers of each of said comb transducers are alternatively arranged and separate by second distances, the second distances satisfying (95% of the first distance)≦(each second distance)<(the first distance) or (the first distance)<(each second distance)≦(105% of the first distance), a distance between the electrode finger of said interdigital transducer means nearest said grating reflector means and the reflective array of said grating reflector means nearest said interdigital transducer means is a third distance, the third distance satisfying (95% of the first distance)≦(the third distance)<(the first distance) or (the first distance)<(the third distance)≦(105% of the first distance), and the reflectivity of the surface acoustic wave of said reflective arrays and said electrode fingers is not less than 1%.

4,635,010

PORTABLE ELECTROPHOTOGRAPHIC COPY MACHINE

Kiyoshi Miyai; Shuhei Uotani, both of Himeji, and Toyohiko Tsunemine, Hyogo, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

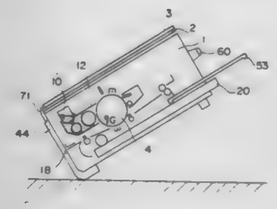
Filed Feb. 12, 1985, Ser. No. 700,681
Claims priority, application Japan, Feb. 16, 1984, 59-27595; Feb. 22, 1984, 59-33129; Feb. 22, 1984, 59-25001[U]; Sep. 7, 1984, 59-188459
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—3 R **9 Claims**

1. An electrophotographic machine including apparatus for protecting the machine when standing on end or in transport, and for facilitating manual transport of the machine, said apparatus comprising:

a housing serving as an outer body including in an operating position of said machine, a bottom, top, rear side front side, and right-hand and left-hand sides;

a handle rigidly mounted on said front side of said housing;

a sheet feed cassette, and a sheet discharge tray, respectively, each being slideably mounted through openings in the front side of said housing,



a manual sheet feed plate projecting from the rear side of said housing; and

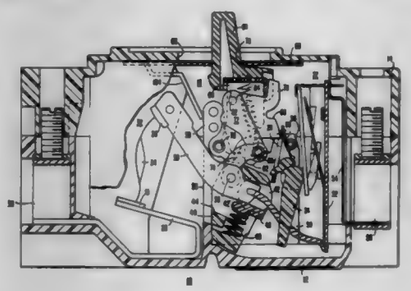
cushion members mounted upon the rear side of said housing, said cushion members projecting away from the rear side to a greater extent than said sheet feed plate, whereby whenever said apparatus is lifted to stand on a surface upon its rear side, said cushion members serve to both protect said housing and said sheet feed plate, by preventing the latter from contacting the aforesaid surface.

4,635,011

CIRCUIT BREAKER WITH ARM LATCH FOR HIGH INTERRUPTING CAPACITY

David A. Leone, Aliquippa, and Douglas C. Marks, N. Braddock, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 1, 1985, Ser. No. 729,436
Int. Cl.⁴ H01H *75/00*
U.S. Cl. 335—16 **6 Claims**



1. An electric circuit breaker with contact arm latch, comprising:

a circuit breaker unit having a pair of separable contacts operable between open and closed positions;

the circuit breaker unit including a releasable member;

a trip mechanism movable in response to a first force caused by the occurrence of a predetermined electric current overload to release the releasable member;

the circuit breaker unit including a contact arm carrying one of the contacts;

a repulsion magnetic force sustained between the contacts which force is proportional to the current load flowing through the contacts;

mounting means mounting the contact arm for movement above a first pivot upon actuation of the trip mechanism;

the mounting means also including a second pivot for the contact arm and including spring biasing means for maintaining the contact arm in the contact closed position;

the spring biasing means having a second force less than the first force and greater than the repulsion magnetic force to cause the arm to anticipate opening of the contacts in response to the current greater than the predetermined current overload, and

the spring biasing means including a coil spring and a spring follower, the spring follower having a first flat latching surface and a ramp surface which surfaces intersect at an intersection, the contact arm including a tail portion on the side of the second pivot opposite the contact which portion comprises a camming surface and a second flat latching surface, the latching surfaces being in surface-to-surface abutment adjacent to the intersection and the axis of the coil spring being perpendicular to the plane of said abutment when the contacts are closed, and the camming surface engaging the ramp surface when the contacts are open.

4,635,012

CONTACTOR STRUCTURE OF CIRCUIT BREAKER

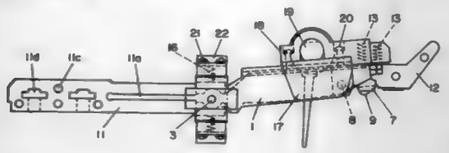
Akihiko Kohanawa, Fukiage, and Kiyoshi Kandatsu, Okabe, both of Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 8, 1985, Ser. No. 763,814

Claims priority, application Japan, Aug. 10, 1984, 59-168039

Int. Cl.⁴ H01H *75/00, 77/00, 83/00*

U.S. Cl. 335—16 **4 Claims**



1. In a circuit breaker, a contactor structure comprising

a first stationary conductive connection member one of whose ends is bifurcated to define a pair of legs, each of whose free end has an arc-like surface defining therebetween a substantially circular receptor space, and,

a second conductive member including at one end the main movable contact for opening or closing a connection to a fixed contact and at the other end a contact region which is substantially circular in cross section and is enclosed within the receptor space for making sliding contact with the enclosing arc-like surfaces of the first member, and means for rotating said second member with respect to said first member for opening or closing the connection with the fixed contact.

4,635,013

ADDITIVE BLOCK COUPLABLE TO A CIRCUIT BREAKER

Pierre Lemarquand, and Henri Pierrot, both of Dijon, France, assignors to La Telemecanique Electrique, France

Filed Mar. 21, 1985, Ser. No. 714,339

Claims priority, application France, Mar. 26, 1984, 84 04636

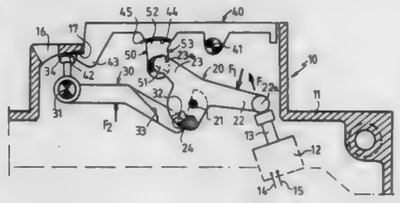
Int. Cl.⁴ H01H *83/00*

U.S. Cl. 335—20 **11 Claims**

1. An additive block couplable to a circuit breaker comprising at least two separable contacts and having a set state in which said contacts are applied on each other and a tripped state in which said contacts are separated from each other, at least a main tripping mechanism adapted for separating said contacts in response to a control movement, at least a tripping element adapted for applying on said main tripping mechanism a first control movement and means for resetting said tripping mechanism, wherein said additive block comprises in a case:

an auxiliary tripping member adapted for generating a second control movement;

a transmission mechanism connecting said tripping mechanism of the circuit breaker and said auxiliary tripping member so as to communciate said first control movement to said auxiliary tripping mechanism and said second control movement to said main tripping mechanism, said transmission mechanism having an interlocking piece adapted for assuming a first position when said circuit breaker is in its set state and a second position when said circuit breaker is in its tripped state;



a manual resetting member adapted for having a reset position in which it engages the transmission mechanism so as to mechanically reset said auxiliary tripping member of the circuit breaker while said interlocking piece is in its second position, and a set position in which the interlocking piece in its first position is in engagement with said manual resetting member so as to prevent manual actuation thereof.

4,635,014

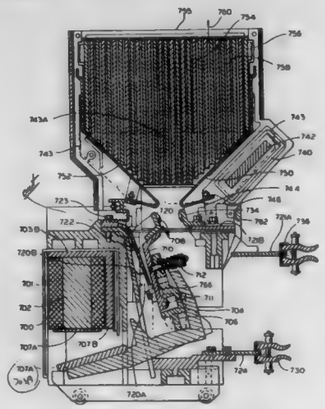
CONTACTOR HAVING A Z-SHAPED CURRENT PATH FOR BLOW-OUT FORCE REDUCTION

Fred Erb, and Miklos J. Orosz, both of Columbia, S.C., assignors to Square D Company, Palatine, Ill.

Filed Jul. 12, 1985, Ser. No. 754,874

Int. Cl.⁴ H01H *3/00*

U.S. Cl. 335—195 **5 Claims**



1. A contactor having a frame, a stationary contact attached to said frame, a first conductor supplying said stationary contact, an armature rotatably mounted in said frame, a movable contact attached to said armature, and a second conductor supplying said movable contact, comprising:

an arm having a first arm end supporting said movable contact and a second arm end attached to said armature so that said movable contact moves substantially in a plane when said armature rotates;

a rod conductor attached to said frame, said rod conductor located substantially in said plane, and said arm and said movable contact are located between said stationary contact and said rod conductor, said rod conductor connected at a first rod end to said second conductor, said rod conductor having a second rod end near to said movable contact when said movable contact is in an open position;

a flexible link having a first link end attached to said arm near said second arm end, and having a second link ene attached to said rod conductor at said second rod end, thereby placing said flexible link substantially in said plane and substantially between said arm and said rod conductor, so that current flow through said arm is substantially anti-parallel to current flow through said flexible link, thereby permitting at least a partial cancellation of magnetic forces generated by current flow from said arm, through said flexible link, and through said rod conductor.

4,635,015

SWITCHING DEVICE FOR SHORTING AT LEAST ONE SUPERCONDUCTING MAGNET WINDING

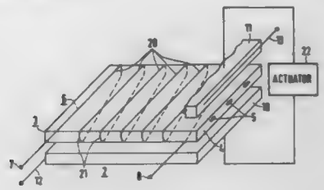
Holger Franksen, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 25, 1985, Ser. No. 694,775

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 3402828

Int. Cl.⁴ H01F *7/22*

U.S. Cl. 335—216 **20 Claims**



1. A switching device for shorting the ends of at least one superconducting magnet winding comprising:

(a) a partially stabilized superconductor having a predetermined number of turns such that it forms a current path with a resistance at least 200 ohms in the normally conducting state adapted to have its ends connected to the ends of the winding;

(b) a switchable heating device in thermal contact with and electrically insulated from said turns;

(c) at least two contacts of normally conducting material, each of which is adapted to be connected to an end of the magnet winding via an electric conductor and to be cooled by a cryogenic medium; and

(d) actuating means for joining the normally conducting contacts to the partially stabilized superconductor in such a manner that a plurality of sections of the superconductor extend between said contacts in parallel to thereby form a completely stabilized normally conducting path when said switch is closed.

4,635,016

POLARIZED ELECTROMAGNET WITH BI OR MONOSTABLE OPERATION

Jean-Pierre Guery, Bezons, and Jacques Olifant, Nanterre, both of France, assignors to La Telemecanique Electrique, France

Filed Aug. 19, 1985, Ser. No. 767,221

Claims priority, application France, Aug. 20, 1984, 84 12974

Int. Cl.⁴ H01F *7/08*

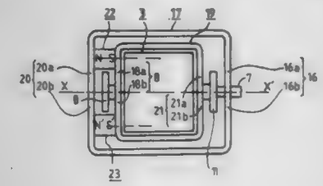
U.S. Cl. 335—230 **13 Claims**

1. In a polarized electromagnet comprising:

a coil adapted to be supplied with DC current;

a magnetizable core which is movable between two longitudinal end positions occupied alternately by sliding inside the carcase of this coil and which has two opposite widened pole portions extending transversely with respect to the axis of the coil;

a fixed yoke having axially, on each side of each widened pole portion, a pair of pole extensions having opposite magnetic polarities which are conferred thereon by permanent magnetic means placed therebetween and orientated so that their magnetic axes are parallel to said axis; said widened pole portions cooperating with said extensions so that, for each of the two end positions, the magnetic flux sent by these magnetic means through the core is of reverse direction, two pairs of extensions, of the same first magnetic sign, placed symmetrically with respect to said axis of the coil form part of a first rectangular flux channelling piece surrounding a second flux channelling piece, which connects together two other pairs of symmetrical extensions having signs opposite to the first one and which surround a coil whose carcase is substantially traversed by the magnetic axes of permanent magnets disposed between transverse flux channelling branches.



4,635,017

MAGNETIC APPARATUS OF A SYSTEM FOR NUCLEAR SPIN TOMOGRAPHY WITH A SHIELDING DEVICE

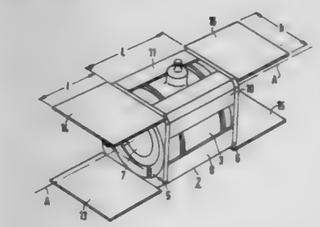
Günter Ries, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 30, 1985, Ser. No. 782,502

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1984, 3437529

Int. Cl.⁴ H01F *7/00*

U.S. Cl. 335—301 **14 Claims**



1. Magnetic apparatus of a system for nuclear spin tomography having a plurality of magnet coils which surround an interior space suitable for receiving a body to be examined and which generate therein an at least largely homogeneous magnetic field, and having an approximately cylindrical shielding device surrounding the coils, the shielding device comprising ferromagnetic material which comprises at least four substantially identical beam-like shielding elements which are arranged distributed in the circumferential direction regularly on a common cylinder surface and, having at the end faces thereof, a disc-shaped part having a central opening of a predetermined radius relative to the cylinder axis, and wherein, at each of the two end faces of the shielding device, two additional shielding plates are arranged parallel to each other such that they extend two of the beam-like shielding elements in the

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longitudinal direction beyond the respective disc-shaped part by a predetermined amount.

4,635,018

CORE CONTAINING AMORPHOUS FERROMAGNETIC STRIP MATERIAL

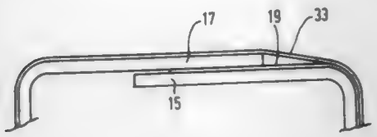
Jacob de Groot, Tilburg, and Thomas A. J. Haus, Veldhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 4, 1986, Ser. No. 825,838

Claims priority, application Netherlands, Feb. 7, 1985, 8500338

Int. Cl.⁴ H01F *27/24*

U.S. Cl. 336—178 **12 Claims**



1. A core for an electric coil or transformer comprising: a number of concentric turns of a ferromagnetic strip material having an inner core portion which includes at least one turn made of a non-amorphous material and an outer core portion which encloses the inner core portion and comprises an amorphous material, characterized in that a transition between the inner and the outer core portion is formed by a welded joint between overlapping outer and inner end portions of an outer turn of the inner core portion and with an inner end portion of an inner turn of the outer core portion being disposed therebetween.

4,635,019

COIL APPARATUS WITH DIVIDED WINDINGS

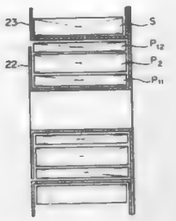
Yoshiaki Akachi, and Takeo Matsumaru, both of Chiba, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Aug. 14, 1985, Ser. No. 765,704

Claims priority, application Japan, Aug. 21, 1984, 59-173715

Int. Cl.⁴ H01F *27/28*

U.S. Cl. 336—180 **4 Claims**



1. A coil apparatus comprising an inner coil bobbin with a central axis and having a hollow member on which at least two primary windings are fitted, each primary winding having at least one terminal not connected to a terminal of the other primary winding and adapted to receive a voltage different from the voltage to the other primary winding, and an outer coil bobbin having a hollow member on which at least a secondary winding is fitted having terminals at least one of which is not connected to any terminal of a primary winding, said hollow member of said inner bobbin being inserted into said hollow member of said outer bobbin, characterized in that

one of said primary windings is divided into two windings which are electrically connected in series with each other and the said remaining other primary winding is sandwiched between said two divided windings, and all the primary windings are piled one on top of the other in the direction perpendicular to the said axis.

4,635,020

THERMAL-TYPE OVER LOAD RELAY

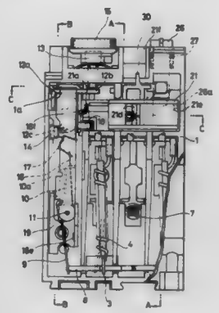
Yuji Sako, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1985, Ser. No. 741,920

Claims priority, application Japan, Jun. 6, 1984, 59-82883[U]; Jun. 6, 1984, 59-82884[U]; Jun. 6, 1984, 59-82885[U]; Nov. 5, 1984, 59-166396[U]

Int. Cl.⁴ H01H *61/00, 71/16*

U.S. Cl. 337—49 **11 Claims**



1. A thermal-type over load relay comprising:

a normally closed contact mechanism having normally closed contacts;

a normally open contact mechanism having normally open contacts;

a thermal element atuated by heat produced by a heater through which a main circuit current flows for opening said normally closed contacts;

a movably mounted operating rod for opening said normally open contacts of said normally open contact mechanism and for closing normally open contacts in response to operation of said normally closed contact mechanism when said normally closed contacts are opened by actuation of said thermal element; and

a housing enclosing said operating rod, said thermal element, said normally closed contact mechanism, and said normally open contact mechanism;

said operating rod having an operating portion projecting externally of said housing for closing said normally open contacts by manually moving said operating rod externally of said housing.

4,635,021

AUTOMATIC OVERLOAD TRIPPER

Teng-Jui Hsieh, No. 16, Lane 136, Hsin Shu Rd., Hsin Chuang, Taiwan

Filed Jun. 14, 1985, Ser. No. 744,735

Int. Cl.⁴ H01H *71/04, 71/16*

U.S. Cl. 337—76 **16 Claims**

1. An automatic overload tripper comprising:

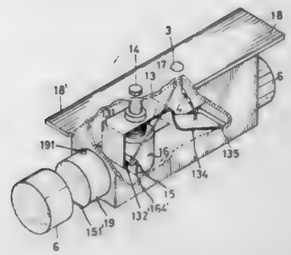
a main body having first and second terminals;

a bimetal strip electrically connected to said first terminal at a first end and having a 90° angle bend turning said bimetal strip downward on a second end thereof opposite said first end, said second end having a hook portion thereof turning upward at the tip of said second end;

a contact plate electrically connected to said second terminal at a first end and having a second end opposite said first end and substantially normal to said downward turning portion of said bimetal strip, the underside of said second end being adapted to engage said hook portion of said bimetal strip;

a spring in contact with a fixing block on said main body and with said portion of said bimetal strip near said 90° bend so as to bias said hook portion of said bimetal strip upward; and

a push button operatively connected with said bimetal strip to press said bimetal strip against said contact and having a surface thereof exposed on the surface of said main body.



4,635,022

FUSE CUT-OUT CARTRIDGE

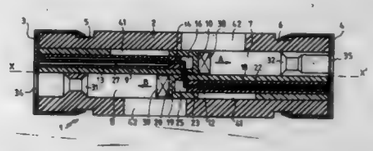
Elie Belbel, Epinay sur Seine; Thierry Baron; Christian Blanchard, both of Rueil Malmaison; André Haury, Le Raincy, and Michel Lauraire, Courbevoie, all of France, assignors to La Telemecanique Electrique, France

Filed Jan. 21, 1986, Ser. No. 820,296

Claims priority, application France, Jan. 23, 1985, 85 00915

Int. Cl.⁴ H01H *85/04, 85/38*

U.S. Cl. 337—158 **16 Claims**



1. A fuse cartridge comprising an insulating material body with longitudinal axis, having two opposite end faces perpendicular to said axis and comprising respectively two end pieces made from a conducting material and a fuse element connected electrically to the two end pieces, further comprising:

two insulating pistons housed in the body parallel to the axis thereof and movable in translation in opposite directions from each other between a rest position assumed before appearance of an electric arc and a position in which the arc is sheared, the two pistons being pierced laterally, respectively, with two orifices coming opposite each other and having passing therethrough a reduced section portion of the fuse element when the pistons are in the rest position, each orifice communicating with an expansion volume space defined inside the associated piston and intended for collecting gases produced during melting of the fuse element, so that when the electric arc produced by the melting fuse element appears in the orifices, the pressure of the gases released by the arc exerts on each of the pistons a force which causes movement thereof in opposite directions towards the position where the arc is sheared;

stop forming means housed in the body and associated with each piston for receiving this latter at the end of travel;

means for discharging the gases after propulsion of each piston.

4,635,023

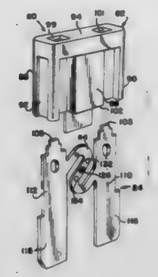
FUSE ASSEMBLY HAVING A NON-SAGGING SUSPENDED FUSE LINK

Seibang Oh, Elk Grove Village, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.

Filed May 22, 1985, Ser. No. 736,181

Int. Cl.⁴ H01H *85/04*

U.S. Cl. 337—163 **15 Claims**



1. In a fuse assembly for interrupting a current flowing therethrough upon certain high current conditions, said assembly including: a housing made of electrically insulating material and having a space therein;

a conductive fuse-forming element secured in said housing including a pair of terminals that are adapted to be connected into a circuit; and

a fuse link connected between said terminals and suspended in said space without support between end portions thereof so that it can sag against the housing walls when softened below the blowing temperature, and said link having a hot spot portion along its length at which said link is expected to blow under said high current conditions as a result of high temperature effected melting caused by said high current condition in said link, the improvement wherein said link includes fuse blowing current-reducing material spaced from and on opposite sides of said hot spot portion of the fuse link in the region of the fuse where sagging is expected, the spacing of said material being such as to inhibit the softening and sagging tendency of the unsupported portions of the fuse link prior to the desired blowing thereof

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4,635,024

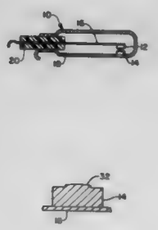
WELDING METHOD AND THERMOSTAT PRODUCED

Robert M. Wells, 4371 Ira Rd., Akron, Ohio 44313, and Alton R. Wells, 4573 W. Trade Winds Ave., Lauderdale-by-the-Sea, Fla. 33308

Division of Ser. No. 419,774, Sep. 20, 1982, Pat. No. 4,489,228. This application Aug. 20, 1984, Ser. No. 642,517

Int. Cl.⁴ H01H *37/52, 37/64*

U.S. Cl. 337—373 **2 Claims**



1. A thermostat, motor protector or the like including:

a case;

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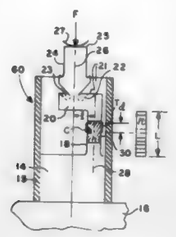
a bimetal strip extending into said case as a cantilever and having a hole formed in the cantilever part thereof;
a metal contact member within said case on said strip for making and breaking an electrical circuit; and
said contact member having an uncontaminated center area extending across its contact surface,
said contact member being made from pure unoxidized, uncontaminated metal, and said contact has a tang extending through said hole to secure said contact member to said strip.

4,635,025

CONSTANT BENDING MOMENT DEVICE FOR STRAIN GAUGE TRANSDUCERS

Sherif S. Gindy, Troy, and Ronald R. Tremonti, Utica, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 22, 1985, Ser. No. 736,919
Int. Cl.⁴ G01L *1/22*
U.S. Cl. 338—5 **7 Claims**



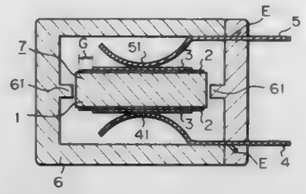
1. A constant bending moment beam device for strain gauge transducer measurement and/or monitoring of force applied to an object by means of bending moment and other parameters derivable therefrom, said device comprising:
a base member adapted to engage an object,
a first column member extending away from a side of the base member facing away from the object and having a longitudinal extending neutral bending axis,
a first moment arm extending generally orthogonally from the first column member in overhanging relationship to the base member, said first moment arm having a portion thereof adapted to receive and direct a force along a longitudinally extending loading axis that is substantially parallel to the first column member neutral axis and displaced therefrom by a prescribed distance,
said first column member having a substantially constant cross-sectional configuration substantially along the length thereof between the base member and the moment arm transverse to the neutral axis thereof adapted to enable the first column member to bend a measurable amount in response to the force being applied to the object,
at least one strain gauge secured to the first column member along the length thereof having said substantially constant cross-sectional configuration, and
said first moment arm having a cross-sectional configuration in a direction substantially parallel to the column member neutral axis adapted to maintain the orthoginal relationship between the moment arm and the first column member neutral axis while constraining the force along the loading axis while applying a bending moment to the column member measurable by the strain gauge that is the product of the force times the prescribed distance between the loading axis and the first column member neutral axis and which is substantially constant along the length of the column member between the moment arm and the base member enabling a greater degree of freedom in the location of said strain gauge along the length of the first column member having said substantial constant cross-sectional configuration for measuring the bending moment imparted to the first column member by the force as well as eliminating any bending moment gradient across the strain gauge.

4,635,026

PTC RESISTOR DEVICE

Michikazu Takeuchi, Akita, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 647,032
Claims priority, application Japan, Sep. 9, 1983, 58-139929[U]
Int. Cl.⁴ H01C *7/10*
U.S. Cl. 338—22 SD **10 Claims**



1. A positive temperature coefficient (PTC) resistor device comprising:
(a) a PTC resistor element having a semiconductor PTC, ceramics plate (7) with positive temperature coefficient resistance comprising a flat plate having opposite surfaces, a pair of first conductive layers (2) attached on both said opposite surfaces, and a pair of second conductive layers (3) each attached on a respective first conductive layer,
(b) a housing (6) of insulation material in which said PTC resistor element is mounted,
(c) a pair of terminals in said housing, each terminal having a connector chip (4,5) extending outside of the housing for coupling the PTC resistor device with an external circuit, each terminal having a convex portion (41,51) and a central portion between said connector chip and said convex portion, said terminals being of a resilient conductive material and said convex portion having a spring action, wherein the improvements comprise:
(d) the size of each of said second layers (3) is smaller in area than that of said respective first layer (2) to which it is attached so that a gap space G is provided at the peripheral portion of each of said first conductive layers (2), where the respective second conductive layer (3) does not extend;
(e) said first layers (2) are of metal that is not silver, and said second conductive layers (3) are of metal, the main component of which is silver, and
(f) said PTC resistor element is supported by said convex portions of said pair of terminals with spring action so that said convex portions press said second layers and do not contact said first layers.

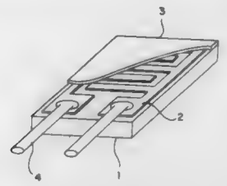
4,635,027

RESISTANCE-VARIATION TYPE MOISTURE SENSOR

Shuji Miyoshi, and Masaya Hijikigawa, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 1, 1985, Ser. No. 761,494
Claims priority, application Japan, Aug. 28, 1984, 59-181287
Int. Cl.⁴ H01R *13/44*
U.S. Cl. 338—34 **2 Claims**

1. A resistance-variation type moisture sensor comprising a moisture sensitive film made of a moisture sensitive material which consists essentially of sodium styrenesulfonate, methylene-bis-acrylamide, polyvinyl alcohol and polyethylene glycol, said polyethylene glycol being contained in the moisture sensitive film in an amount ranging from 3 to 7 parts by weight per 100 parts by weight of sodium styrenesulfonate.

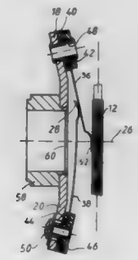


4,635,028

SLIDER FOR RESISTOR AND SLIP CONDUCTORS

Kurt Oelsch, and Klaus Schulz, both of Berlin, Fed. Rep. of Germany, assignors to Oelsch Kommanditgesellschaft, Berlin, Fed. Rep. of Germany

Filed Apr. 8, 1985, Ser. No. 720,867
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3413741
Int. Cl.⁴ H01C *10/32*
U.S. Cl. 338—171 **6 Claims**



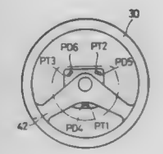
1. Slider adapted to be moved in a direction of movement along an electrically conducting element and to establish electrical contact therewith, comprising
(a) a generally u-shaped slider support having a central portion and two substantially parallel legs, and defining an interior area between said legs,
(b) a first leaf spring depending from said slider support and extending into said interior area, said first leaf spring having a first end and a second end, said first end of said first leaf spring being attached to one of said legs of said slider support and said second end of said first leaf spring having contact means for contacting said electrically conducting element,
(c) a second leaf spring depending from said slider support and extending into said interior area in a direction substantially opposite to a first direction, said second leaf spring having a first end and a second end, said first end of said second leaf spring being attached to the other one of said legs of said slider support and said second end of said second leaf spring, with a bias, engaging said first leaf spring on the side thereof remote from said electrically conducting element, said leaf springs forming an obtuse angle,
(d) said second leaf spring being dimensioned, relative to said first leaf spring, to vary the bias torque, which is exerted by said second leaf spring on said first leaf spring under the action of an inertial force acting on said second leaf spring in said first direction parallel to said direction of movement and due to an acceleration of said slider in a second, opposite direction, said bias torque variation substantially compensating a torque on said first leaf spring due to the action of the inertial force on said first leaf spring caused by said same acceleration.
(e) whereby, in operation, the contact force between said contact means and said electrically conducting element is maintained on a substantially constant low level, when inertial forces parallel to said direction of movement act on said leaf springs.

4,635,029

SIGNAL TRANSMISSION APPARATUS FOR STEERING CONTROL BOARD

Takahiro Yamada, Tokyo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Jun. 17, 1983, Ser. No. 505,549
Claims priority, application Japan, Jun. 19, 1982, 57-105782
Int. Cl.⁴ B60Q *1/00*
U.S. Cl. 340—22 **7 Claims**



1. A signal transmission apparatus for a steering control board comprising:
a steering control board disposed near a steering wheel in a floating relation with respect to said steering wheel and equipped with switches;
stationary member for supporting said steering wheel;
at least two light emitting means disposed on at least either one of said steering control board and said stationary member at different positions located outside of the position where at least one spoke for supporting said steering wheel is supported, so that all of said light emitting means are not entered in the projected area of said spoke at the same time;
at least two light receiving means disposed on at least the other one of said steering control board and said stationary member at positions opposite to said light emitting means, respectively, whereby at least one light path between one of the light emitting means and the opposed light receiving means is maintained at all times during rotation of the steering wheel;
a light emission energizing means adapted to energize said light emitting means;
a modulating means connected to said light emission energizing means;
a first control means adapted to control said modulating means;
a signal detecting means connected to said light receiving means;
a demodulating means connected to said signal detecting means; and
a second control means adapted to control said demodulating means.

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4,635,030

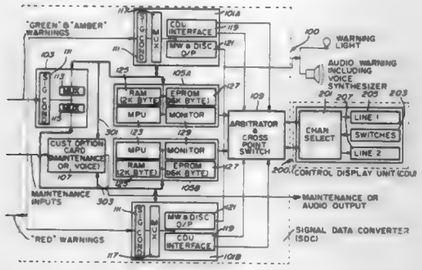
STATUS DISPLAY SYSTEM

Sol Rauch, Nepean, Canada, assignor to Canadian Marconi Company, Montreal, Canada

Continuation-in-part of Ser. No. 635,839, Jul. 30, 1984, abandoned, which is a continuation-in-part of Ser. No. 414,919, Sep. 3, 1982, abandoned. This application Mar. 28, 1985, Ser. No. 716,972

Int. Cl.⁴ B60Q *1/00*; G08B *25/00*

U.S. Cl. 340—52 F **19 Claims**



1. A status display system for aircraft for receiving signals from sensors/transducers monitoring a plurality of parameters and subsystems of said aircraft and for providing a display to identify faulty ones of the parameters or subsystems in a prioritized sequence;

comprising:

a signal data converter (SDC) having input means for receiving said signals and output means; and

means for presenting indications of said faulty parameters and subsystems, said means for presenting having input means and output means;

said SDC output means being connected to said means for presenting input means;

said SDC comprising:

means for processing said signals to determine which parameters and subsystems are faulty and for determining the priority of faulty ones thereof; and

means for transmitting information to said means for presenting relating to said faulty parameters and subsystems and to the priorities thereof;

whereby, said means for presenting provides indications to identify the faulty parameters and subsystems in the prioritized sequence;

wherein said visual display means comprises at least upper and lower lines for presenting text; and

further including means for displaying the highest priority one of said faulty ones of said parameters on said upper line, and means for scrolling at least some of the remainder of said faulty ones of said parameters in order of priority on at least said lower line.

4,635,031

ELECTRONIC WHEEL SLIP SENSOR FOR VEHICLE BRAKE SYSTEMS

Folke I. Blomberg, Duvstigen 4, S-181 40 Lindingo, and Jan-Olov M. Holst, Skogsduvevagen 14, S-752 52 Uppsala, both of Sweden

Filed Nov. 1, 1984, Ser. No. 667,210

Claims priority, application Sweden, Nov. 1, 1983, 8306000

Int. Cl.⁴ B60Q *1/00*; B60T *8/72*

U.S. Cl. 340—52 R **15 Claims**

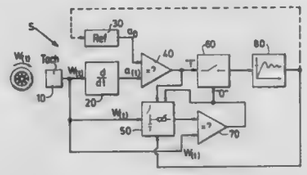
1. An electronic sensor for responding to the rate of change of changing rotational speeds of a vehicle wheel which is coupled with a brake including a braking force modulator for subjecting the vehicle wheel to modulated braking forces and comprising:

tachometer means operatively connected to the vehicle wheel and responsive to vehicle wheel rotation for generating an electrical speed signal indicative of the rotational speed of the vehicle wheel,

threshold means operatively coupled to said tachometer means and responsive to vehicle wheel rotation for generating an electrical excessive rate signal indicative of occurrences of an excessive rate of change in changing rotational speeds of the vehicle wheel,

reference means electrically connected with said threshold and tachometer means for receiving electrical signals therefrom and for generating a changing electrical reference signal indicative of an acceptable rate of change in changing rotational speeds of the vehicle wheel,

means operatively associated with the vehicle for responding to variations in vehicle operating conditions and with said reference means for varying the rate of change of said reference signal in predetermined relation to variations in vehicle operating conditions,



comparator means electrically connected with said tachometer means and reference means for receiving electrical signals therefrom and for comparing the speed and reference signals and for generating a logic signal indicative of the relation of the speed and reference signals, and

electrical switching means electrically connected with said threshold means and comparator means for receiving electrical signals therefrom and for generating an electrical output signal for transmission to the braking force modulator and indicative of a brake relief phase of modulation of braking force.

4,635,032

MOBILE DOOR CLOSURE INTERRUPTING DETECTOR

Kalervo M. Virtanen, Metsäpekkalantie 2, 15610 Lahti 61, Finland

Continuation of Ser. No. 446,010, Dec. 1, 1982, abandoned. This application Nov. 22, 1985, Ser. No. 800,898

Claims priority, application Finland, Jan. 7, 1982, 813507; Oct. 27, 1982, 823674

Int. Cl.⁴ B60Q *1/00*; B66B *3/00*

U.S. Cl. 304—52 R **5 Claims**

1. A signaling device for vehicles comprising:

a tube having resilient walls;

a detecting element arranged within said tube for detecting the compression thereof, said detecting element including a light transmitter and a light receiver between which a light beam passes, said light receiver producing an output signal indicative of the intensity of said light beam transmitted through said tube by said light transmitter;

a first detection circuit means coupled to said light receiver for producing a signal in response to a change in said output signal above a predetermined limit occurring within a predetermined time, said change being caused by a compression of said tube;

a second detection circuit means coupled to said detecting element for producing a compensating change in the intensity of said light beam emitted by said light transmitter in response to a change in said output signal occurring beyond said predetermined time and an automatic gain control circuit which is coupled between said delay circuit and a current generator coupled to said light transmitter, said automatic gain control circuit producing a correction in the intensity of said light beam of said light transmitter.

4,635,033

DISPLAY SYSTEM FOR AUTOMOTIVE VEHICLE

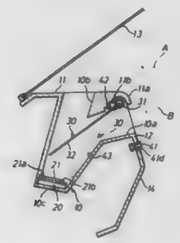
Kazuo Inukai, Nagoya, and Takeshi Haluyama, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 27, 1985, Ser. No. 716,458

Claims priority, application Japan, Mar. 28, 1984, 59-60037

Int. Cl.⁴ B60Q *1/00*

U.S. Cl. 340—52 F **6 Claims**



1. A display system adapted to be disposed in a dashboard in a vehicle compartment, the dashboard including an instrument panel and a hood located above the instrument panel and below a front windshield of said vehicle compartment, wherein the instrument panel is provided with a first opening directed toward a driver's seat in the vehicle compartment, and the hood is provided with a second opening directed toward an internal surface of the front windshield, said display system comprising:

indicator means mounted within said dashboard, for forming an inverted image indicative of display information, a display surface of said indicator means being opposed to the internal surface of the windshield through the second opening;

mirror means, arranged within the dashboard and movable between a first position and a second position, for, in the first position: (1) reflecting visual rays representative of the display information on said indicator means before such rays reach the second opening toward the first opening to provide the information as an erected virtual image within a frame of the first opening, and (2) blocking the visual rays propagating toward the second opening and for, in the second position: (a) permitting the visual rays to propagate toward the second opening to provide the information as an erected virtual image on the internal surface of said windshield and (b) blocking the visual rays toward the first opening and

means for selectively actuating said mirror means between the first and second positions.

4,635,034

DISPLAY APPARATUS FOR VEHICLE

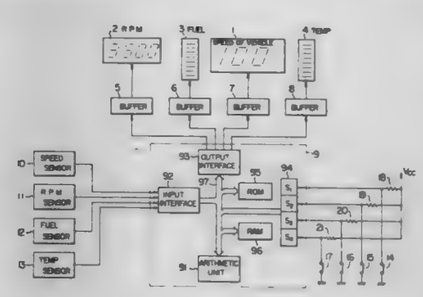
Keiichi Tokuyama; Shotaro Naito, and Mitsuhiro Masuda, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 11, 1983, Ser. No. 493,501

Claims priority, application Japan, May 12, 1982, 57-78303

Int. Cl.⁴ B60Q *1/00*

U.S. Cl. 340—52 F **4 Claims**



1. A display apparatus for a vehicle comprising:

display means for displaying a value of a parameter relating to an operation condition of the vehicle in a predetermined unit of measurement of the parameter which is speed of the vehicle;

sensor means for detecting the parameter and producing a first signal representing an actual value of the parameter in the predetermined unit of measurement;

storage means for storing a plurality of programs, each program enabling processing of the first signal to produce a second signal representing a displaying value of the parameter in the predetermined unit of measurement by which the parameter is displayed by said display means, said programs being previously prepared based on, respectively, predetermined different relationships between the actual value of the parameter in the predetermined unit of measurement and the displaying value of the parameter in the predetermined unit of measurement;

means for selecting one of said programs;

arithmetic means receiving the first signal for processing the first signal according to the selected one of said programs so as to produce the second signal representing the displaying value in accordance with the predetermined relationship between the actual value and the displaying value corresponding to the one selected program; and

means for applying the second signal produced by said arithmetic means to said display means for enabling display of the displaying value of the parameter in the predetermined unit of measurement.

4,635,035

VEHICLE AUTOMATIC SWITCHING BURGLAR ALARM

Moshe Ratzabi, 1915 Avenue M, Brooklyn, N.Y. 11230

Filed Mar. 20, 1984, Ser. No. 591,489

Int. Cl.⁴ B60R *25/00*

U.S. Cl. 340—63 **15 Claims**

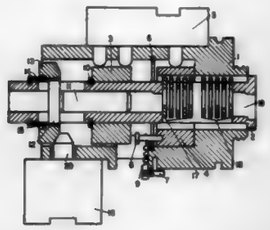
1. Apparatus for arming and disarming a vehicle alarm in response to locking and unlocking of an entranceway to the vehicle comprising:

a housing adapted to be mounted on said vehicle adjacent said entranceway;

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locking and unlocking means including a cylinder mounted in said housing and adapted to be rotated relative thereto by the turning of a key inserted therein in one direction for locking said entranceway and the opposite direction for unlocking said entranceway;

sensing means responsive to said locking and unlocking means for sensing the locking and unlocking of said entranceway; and



remote switch means responsive to said sensing means and having a first switch state for arming said alarm in response to the locking of said entranceway and a second switch state for disarming said alarm in response to the unlocking of said entranceway and means responsive to said sensing means for providing a tactile indication that said alarm has been armed.

4,635,036

ANALOG-TO-DIGITAL CONVERTER

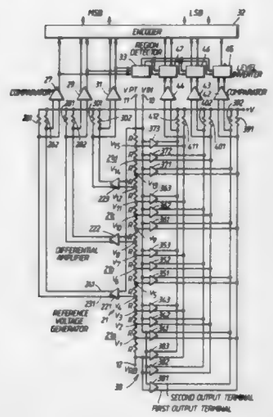
Hisayasu Yoshizawa, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 22, 1985, Ser. No. 790,175

Claims priority, application Japan, Nov. 15, 1984, 59-241386

Int. Cl.[4] H03M *1/36*

U.S. Cl. 340—347 AD **7 Claims**



1. An analog to digital converter for converting an analog input signal into an output digital signal, comprising:

a pair of terminals between which a predetermined voltage is applied;

reference voltage generator means, connected to said terminals, for generating first comparison reference voltages by dividing said voltage applied between said terminals into a plurality of reference regions and for generating second comparison reference voltages by dividing each of said first comparison reference voltages;

first comparator means for comparing said first comparison reference voltages with said analog input signal;

first coding means for coding outputs of said first comparator means so as to provide most significant bits of said output digital signal;

region detector means, coupled to an output of said first comparator means, for detecting which region of said reference regions the level of said analog input signal corresponds to;

an odd number of groups of differential amplifiers, each group having the same number of amplifiers therein, each amplifier having a pair of input terminals to which one of said second comparison reference voltages and said analog input voltage are respectively applied, and first and second output terminals, the differential amplifier of odd number groups producing a high level output signal at said first output terminal of its amplifier and a low level output signal at said second output terminal of its amplifier, while the differential amplifier of even number groups producing a low level output signal at said first output terminal of its amplifier and a high level output signal at said second output terminal of its amplifier when the analog input signal applied to a particular amplifier is greater than the second comparison reference voltage applied to that amplifier;

first adding means for adding output signals produced at said first output terminals of corresponding differential amplifiers of said respective groups;

second adding means for adding output signals produced at said second output terminals of corresponding differential amplifiers of said respective groups;

second comparator means for comparing outputs of said first adding means with output of said second adding means;

inverting circuit means for selectively inverting the level of outputs of said second comparator means in response to an output from said region detector means; and

second coding means for coding an output from said inverting circuit means so as to provide least significant bits of said output digital signal.

4,635,037

ANALOG TO DIGITAL CONVERTER

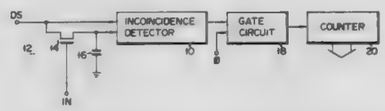
Jun Iwamura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 3, 1982, Ser. No. 414,912

Claims priority, application Japan, Sep. 7, 1981, 56-140777

Int. Cl.[4] H03K *13/02*

U.S. Cl. 340—347 AP **20 Claims**



1. In an A/D conversion circuit responsive to a strobe signal having first and second levels, said circuit operating to generate a digital output proportional to an analog input, the combination comprising:

timing means including a MOS transistor with a gate to which the analog input is supplied, one end of a channel of said MOS transistor being connected to receive said strobe signal the other end of said channel of said MOS transistor connected to a first plate of a capacitor, a second plate of said capacitor grounded, and a capacitor connected to the other end of the channel, said capacitor being charged by said strobe signal in response to the transition of said strobe signal from said first to said second level, said timing means outputting an output signal from a point of connection between said other end of said channel and said first plate of said capacitor;

control means for comparing said strobe signal and said output signal from said timing means, said control means being responsive to the transition of said strobe signal from said first to said second level for generating a counter drive signal and for terminating said counter drive signal when said output signal from said timing means reaches a threshold level while said strobe signal is at said second level; and

counter means operated by said counter drive signal to produce said digital output proportional to said analog input.

4,635,038

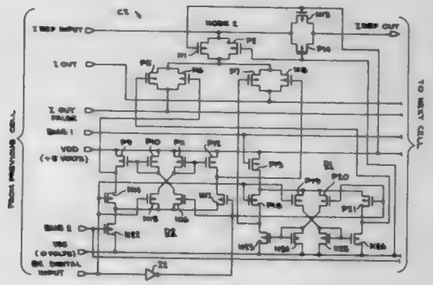
CMOS-TRANSISTOR-BASED DIGITAL-TO-ANALOG CONVERTER

John M. Winn, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 8, 1985, Ser. No. 796,668

Int. Cl.[4] H03M *1/78*

U.S. Cl. 340—347 DA **20 Claims**



1. A digital-to-analog converter for converting a digital signal having a plurality of binary bits into an analog output signal comprising:

an R-2R ladder network forming a plurality of switching cells corresponding in number to the number of said binary bits;

each switching cell being formed of first, second, and third pairs of CMOS transistors defining cross resistances of the ladder network and of a fourth pair of CMOS transistors defining a series resistance of the ladder network, each of first through fourth pairs including a P-channel MOS transistor and an N-channel MOS transistor having the drain of the NMOS transistor connected to the source of the PMOS transistor and the source of the NMOS transistor connected to the drain of the PMOS transistor;

the NMOS drain and PMOS source of said first pair being connected to the NMOS drain and PMOS source of said fourth pair to define a ladder node, the NMOS source and PMOS drain of said first pair being connected to the NMOS drain and PMOS source of said second pair and to the NMOS drain and PMOS source of said third pair, the NMOS source and PMOS drain of said second pair being coupled to a common line and the NMOS source and PMOS drain of said third pair being coupled to a common output current summing line, the NMOS source and PMOS drain of said fourth pair being connected to a next ladder node of a succeeding switching cell;

the gates of said P-channel transistors in said first and fourth pairs being connected to a first supply voltage for rendering them to be constantly conductive and the gates of said N-channel transistors in said first and fourth pairs being connected to a second supply voltage for rendering them to be constantly conductive; and

switching means having inputs responsive to a respective binary bit of said digital signal and having outputs connected to the gates of the P-channel and N-channel transistors in said second and third pairs for selectively turning on or off said second pair and turning off or on said third pair respectively dependent upon the logic state of said respective binary bit.

4,635,039

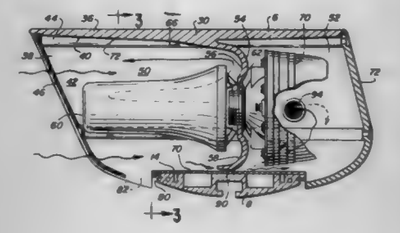
LOW DRAG WARNING SYSTEM FOR EMERGENCY VEHICLES

Earl W. Gouswiller, Clarendon Hills, Ill., assignor to Federal Signal Corporation, Oakbrook, Ill.

Filed May 16, 1983, Ser. No. 494,799

Int. Cl.[4] G08B *3/00*; E04F *17/04*

U.S. Cl. 340—384 R **8 Claims**



5. A low drag warning system for emergency vehicles comprising:

a speaker housing coupled to at least one lighting globe assembly, said speaker housing defining a flat, perforated grill at its forward end, said flat grill of the speaker housing being positioned so that the upper end thereof is positioned forwardly of the lower end to cause said flat speaker grill to slope inwardly in a downward direction, said speaker housing containing a front speaker cone, said low drag warning system being mounted on the roof of the vehicle and spaced therefrom to permit the passage of air between the vehicle and the warning system, whereby flowing air is directed by said speaker grill between said warning system and the vehicle roof in increased quantity to reduce the drag of said warning system during operation.

4,635,040

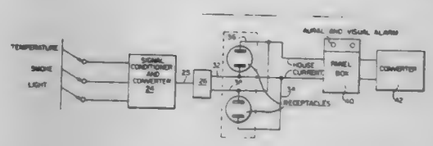
FIRE DETECTION ALARM SYSTEM

Oscar V. Masot, Doral Beach, Compejo Turistico "El Morro", Puerto La Cruz, Venezuela

Filed Mar. 12, 1985, Ser. No. 710,672

Int. Cl.[4] G08B *1/08*; H04Q *7/00*

U.S. Cl. 340—533 **17 Claims**



1. An alarm system for circuit protective devices utilizing the existing electrical wiring; comprising

a plurality of wall mounted electrical receptacles connected to the existing electrical wiring;

at least one sensing means directly affixed to each of said receptacles for sensing the presence of a fire condition in the environment in proximity to said receptacles, said sensing means providing a signal when the presence of a fire condition has been detected;

a plurality of first conversion means connected between said sensing means and said electrical wiring for converting the signal produced by said sensing means to an encoded

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RF signal and conducting said signal over said existing electrical wiring, each of said first conversion means connected to one of said sensing means and each of said first conversion means provided with an encoder for producing an encoded signal different than the signal produced by at least one other first conversion means;

a panel box provided with a plurality of circuit protective devices therein, said panel box connected to said electrical wiring downstream from each of said first conversion means;

alarm means associated with said panel box for aurally or visually indicating the presence of a fire condition in the environment in proximity to one of said enclosures; and

second conversion means connected between each of said first conversion means and said alarm means for converting the respective encoded RF signal produced by each of said first conversion means and transmitted over the existing wiring to said second conversion means to an electrical or electronic signal, said electrical or electronic signal produced by said second conversion means activating said alarm means.

4,635,041

THEFT PROTECTION SYSTEM PARTICULARLY FOR SHOP AREAS

Mogens Maimann, and Bent Sv dsen, both of Roskilde, Denmark, assignors to 2 M Security Systems APS, Denmark

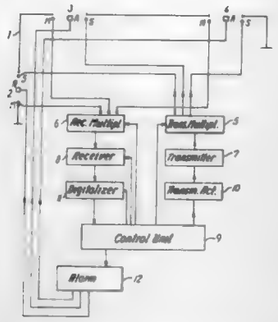
PCT No. PCT/DK84/00027, § 371 Date Dec. 11, 1984, § 102(e) Date Dec. 11, 1984, PCT Pub. No. WO84/04191, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 10, 1984, Ser. No. 690,497

Claims priority, application Denmark, Apr. 12, 1983, 1596/83

Int. Cl.[4] G08B *13/24*

U.S. Cl. 340—572 **6 Claims**



1. A theft protection system, particularly for a shopping area, for recording the unauthorized removal of objects to which a preferably passive protection device is affixed having a resonance circuit tuned to a given frequency, through one of a number of exit passages each of which comprises an antenna system having a transmitting antenna for transmitting electromagnetic interrogation signals of said given frequency and a receiving antenna for the resonance signals generated by the unauthorized removal of an object bearing a said resonance circuit through the passage, an alarm device being connected to a receiver connected with said receiving antenna to generate an alarm in response to reception of said resonance signal, said antenna systems for the exit passages being connected to a common transmitter and a common receiver through a transmitting multiplexer and a receiving multiplexer, a common control unit is connected to and controls said multiplexers, said transmitter and said receiver for sequential coupling of said antenna systems to said transmitter and said receiver in successive time frames for individual ones of said exit passages and actuation of said transmitter and said receiver in a sequence of transmitting and receiving intervals within each time frame, said control device being further connected to a number of separate alarm generators, one for each of said exit passages for actuating an alarm generator associated with a given exit passage in response to compliance with at least one alarm criterion associated with the transmitting and receiving intervals associated with the exit passage.

4,635,042

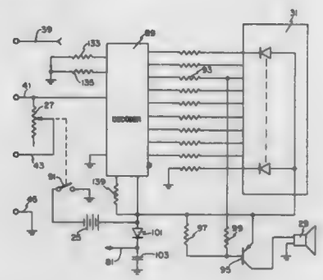
VACUUM LEAK DETECTOR

Donald R. Andrews, Mesquite, Tex., assignor to Michael Ede, Plano, Tex.

Filed Mar. 21, 1984, Ser. No. 591,677

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—605 **5 Claims**



1. A device for locating sources of ultrasonic sound waves within a relatively narrow frequency band indigenous to vacuum leaks, comprising:

a hand held probe;

a frequency sensitive ultrasonic transducer supported within the probe for providing an electrical output in response to incident ultrasound waves, and having a greater sensitivity to ultrasound waves within said narrow band than to at least certain other frequencies, the transducer exhibiting a sensitivity peak within the narrow band at about 40 kilohertz and at least one other sensitivity peak outside the narrow band;

frequency selective means coupled to the transducer and located within the probe for amplifying the transducer electrical output, said amplifying means exhibiting a greater gain to electrical signals having frequencies within the narrow band than to at least certain other frequencies, the amplifying means comprising a series of concatenated amplifier stages, each having a low frequency blocking alternating current input circuit and a high frequency passing negative feedback circuit for reducing amplifier gain at higher frequencies, the two circuits jointly effective to endow the amplifying means with relatively narrow band pass characteristics, a half-wave rectifier circuit connected to the output of the last of the concatenated stages and a direct current amplifier for providing an output voltage level proportional to the magnitude of the halfwave rectifier output;

an electrically conductive shield within the probe surrounding the amplifying means; and

an indicator containing packet comprising display means coupled to the amplifying means and located remotely from the probe for providing a visible qualitative indication of the intensity of the ultrasound waves within the narrow band incident the transducer, the display means comprising a multisegment bar graph connected to the direct current amplifier; the indicator containing packet adapted to also contain a battery, operator actuable sensitivity control means for selectively varying the gain of the direct current amplifier, and an audible alarm device a threshold circuit coupling the audible alarm device to the direct current amplifier and to the display means for

sounding the alarm device when the output voltage level exceeds a preselected level as indicated by one of the segments of the bar graph.

4,635,043

LEVEL INDICATION

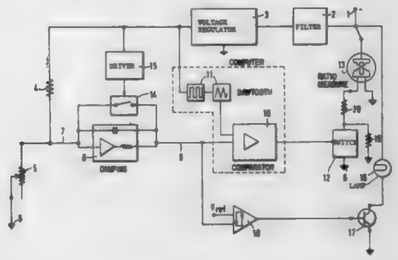
Harmut Kronenberg, Schwalbach, and Bernhard v. Pentz, Kronberg, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 21, 1985, Ser. No. 747,543

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1984, 3425212

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—618 **10 Claims**



1. In a liquid level indicator having a transmitter whose electrical resistance is variable as a function of the level for providing a signal voltage, the indicator including an electric measurement mechanism, the improvement comprising

an electronic pulse-width modulation system with a damping device, said damping being connected to said transmitter for damping said signal voltage, and wherein the measurement mechanism is a ratio measurement mechanism having a first and a second coil, said first coil being connected via said system and said damping device to the signal voltage, said second coil being connected to a reference voltage,

said electronic system including modulation means serially connected between said damping device and said first coil for pulsing the signal voltage to provide a pulse-width modulation with a variable duty ratio dependent on the magnitude of said signal voltage.

4,635,044

FAILED FUSE DETECTOR AND DETECTING METHOD FOR ROTATING ELECTRICAL EQUIPMENT

William H. South, McKeesport, Pa., assignor to Westinghouse Electic Corp., Pittsburgh, Pa.

Filed Oct. 16, 1980, Ser. No. 197,732

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—638 **7 Claims**

1. A brushless exciter with a failed fuse detector, comprising:

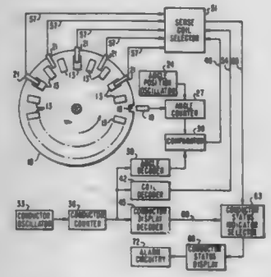
a rotating member of said brushless exciter;

a plurality of diodes fixed to said rotating member and arranged in a manner which rectifies alternating current and produces a direct current field for excitation of a turbine generator;

a plurality of fuses fixed to said rotating member and connected individually in series with each of said diodes;

a plurality of fixed current sensing means disposed about the circumference of said rotating member proximate to the circular path of said fuses during rotation of the rotating member; and

means for synchronizing the use of the current sensing means with the rotation of the rotating member to enable the selective determination of the conducting status of each of said fuses, said synchronizing means comprising means for measuring the instantaneous angular displacement of the rotating member and relating that displacement to a reference position of said rotating member.



4,635,045

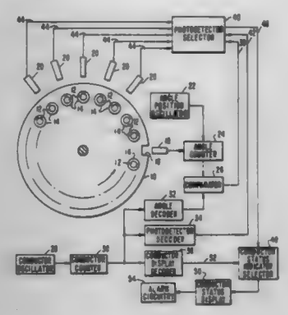
FAILED FUSE DETECTOR AND DETECTING METHOD FOR ROTATING ELECTRICAL EQUIPMENT

Robert C. Miller, Penn Hills, and Dale I. Gorden, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 22, 1980, Ser. No. 219,095

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—638 **23 Claims**



1. A brushless exciter with a failed fuse detector, comprising:

a rotating member of said brushless exciter;

a plurality of diodes fixed to said rotating member and arranged in a manner which rectifies alternating current and produces a direct current field for excitation of a turbine generator;

a plurality of fuses fixed to said rotating member with each of said fuses connected in series with one of said diodes;

a plurality of current transformers fixed to said rotating member and disposed individually about each of said fuses;

a plurality of light emitting diodes fixed to said rotating member and individually connected in series with the secondary winding of each of said current transformers;

a plurality of stationary photodetectors disposed about said rotating member proximate the circular path of said light emitting diodes described during rotation of said rotating member; and

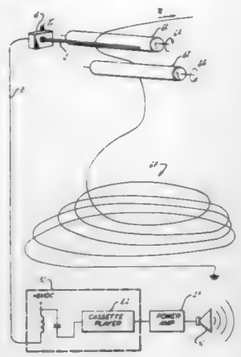
means for synchronizing the use of the photodetectors with the rotation of the rotating member to enable the selective determination of the conducting status of each of said fuses.

4,635,046

WIRE TANGLE SENSOR

Randall C. Graham, Nashville, Tenn., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Oct. 18, 1985, Ser. No. 788,901
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—677 **2 Claims**



1. A wire tangle sensor, comprising:

an elongated metallic probe for placement in close proximity to grounded wire payed out from a coil in a basket, said probe for touching tangled wire, said touching causing the grounding of said probe; and

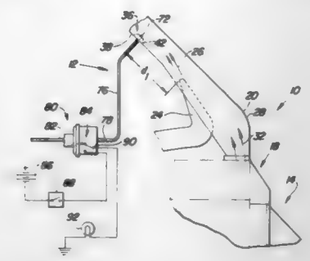
signalling means, connected to said probe, responsive to said touching of said metallic probe to a tangled wire for causing a current to be conducted through said probe and said grounded wire and for providing a tangle signal indicative of a tangled wire condition.

4,635,047

AIR SYSTEM MONITOR FOR A COTTON HARVESTER

Robert E. Fox, Minburn, and Bruce L. Hubbard, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.

Continuation of Ser. No. 644,485, Aug. 27, 1984, abandoned. This application May 5, 1986, Ser. No. 861,101
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—684 **21 Claims**



1. In a cotton harvester having a row unit for removing cotton from plants, a receptacle for receiving harvested cotton, a walled duct extending between the row unit and the receptacle, and an air jet for introducing air into the duct downstream of the row unit to suck cotton from the unit and propel the cotton through the duct downstream to the receptacle, a monitor comprising:

aspirator means positioned at a preselected location in the duct for providing a vacuum signal dependent upon the velocity of the air in the duct at said preselected location, said aspirator means including a conduit portion terminating in an aperture projecting into the duct and wherein said vacuum signal is produced by air flow over the aperture;

a vacuum switch connected to the aspirator means and responsive to the vacuum signal, said switch having a first state when the vacuum signal corresponds to an air flow above a preselected velocity and a second state when the flow is below said preselected velocity; and

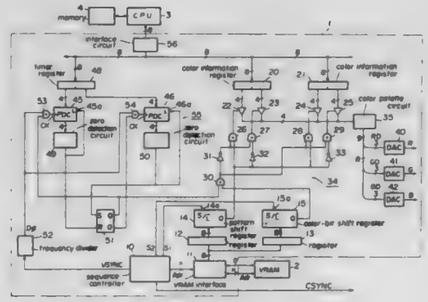
an indicator connected to the vacuum switch for providing an indication of the state of the switch.

4,635,048

VIDEO DISPLAY CONTROLLER

Kazuhiko Nishi; Takatoshi Ishii; Ryozo Yamashita, all of Tokyo; Shigemitsu Yamaoka, and Takatoshi Okumura, both of Hamamatsu, all of Japan, assignors to Ascii Corporation, Tokyo and Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, both of, Japan

Filed Feb. 6, 1985, Ser. No. 698,877
Claims priority, application Japan, Feb. 8, 1984, 59-021334
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—703 **7 Claims**



1. A video display controller adapted to be connected to a video display unit for displaying each of selected ones of a plurality of display patterns on a respective one of display portions of a screen of the video display unit in accordance with synchronization signals generated therein, said video display controller comprising:

(a) color information register means comprising a plurality of registers each for storing a pair of color code data representative of colors of a foreground and a background of a display pattern;

(b) memory means having first, second and third memory areas, said first memory area storing a plurality of pattern data each corresponding to a respective one of the plurality of display patterns, said second memory area storing a plurality of pattern name data each designating one of the display patterns to be displayed on a respective one of the display portions of the screen, and said third memory area storing a plurality of color selection data each corresponding to a respective one of the display portions of the screen;

(c) sequence control means responsive to the synchronization signals for sequentially reading said pattern name data and color selection data from said second and third memory areas, said sequence control means reading from said first memory area pattern data designated by the pattern name data read from said second memory area;

(d) color selection control means for selecting one of said registers in accordance with said color selection data read from the third memory area and for reading one of the pair of color code data from the selected register in accordance with said pattern data read from said first memory area; and

(e) color signal generating means responsive to said color code data read from the selected register for generating a color signal corresponding thereto, said color signal being supplied to the video display unit;

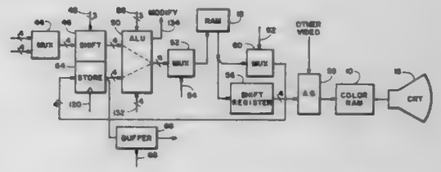
(f) whereby each of the display patterns designated by said pattern name data is displayed on the screen in the pair of colors selected by the respective one of the color selection data in the third memory area of said memory means.

4,635,049

APPARATUS FOR PRESENTING IMAGE INFORMATION FOR DISPLAY GRAPHICALLY

Warren Dodge, Portland, and Rebecca Wirfs-Brock, Sherwood, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 27, 1984, Ser. No. 624,890
Int. Cl.[4] G09G *1/06*
U.S. Cl. 340—721 **6 Claims**



1. A graphics display apparatus for producing a plurality of display images individually or in superimposed relation, including memory means for storing plural pixel maps wherein corresponding pixel locations in each map may be collectively employed to define a pixel on the display, said memory means being divisible into groups each storing a pixel map corresponding to an image to be displayed, comprising:

means for receiving common based input information in the form of one or more parallel bits comprising a location index to the memory means of a selected pixel map to enable writing to corresponding pixel locations in one or more pixel maps in said memory means;

and means for shifting the bits of said input information to write to a memory means group storing the pixel maps corresponding to an image to which it is desired to provide input information, wherein said means for shifting includes a gating structure for receiving the parallel bits of said input information, with the gating structure having:

selectively enabled groups of a first type of gates each receiving the parallel bits of said input information in successively displaced bit location;

means for combining corresponding output signals of said groups of the first type of gates; and

means for enabling a selected group of the first types of gates, according to the bit displacement desired for shifting, for writing to corresponding pixel locations in a group of memory means storing the pixel map corresponding to an image to which it is desired to provide input information.

4,635,050

DYNAMIC STROKE PRIORITY GENERATOR FOR HYBRID DISPLAY

Steven P. Grothe, Glendale, and Parm L. Narveson, Phoenix, both of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Apr. 10, 1984, Ser. No. 598,563
Int. Cl.[4] G09G *1/14*
U.S. Cl. 340—734 **12 Claims**

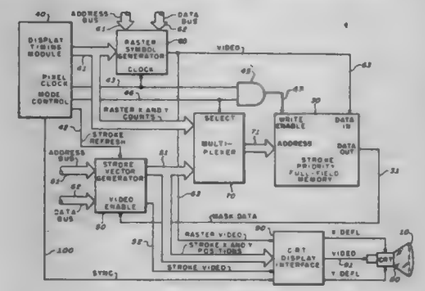
1. In a cathode ray tube hybrid display system of the type having a stroke vector display generator for supplying stroke vector information and a raster symbol generator for supplying raster scan information to the cathode ray tube, and means for preferentially masking at least a portion of the stroke vector display within selected regions, wherein the improvement comprises:

means for providing first and second coordinate positional data to said raster symbol generator,

means for providing priority control data to said raster symbol generator during a stroke display interval, said data representative of a desired mask of stroke symbology,

addressable memory means responsive to said coordinate positional data and said priority data for storing stroke priority command words corresponding to an orthogonal array of picture elements of said cathode ray tube in which each picture element has a unique binary address corresponding to increments of said raster scan along said first and second coordinates and for providing mask data signals to said stroke vector generator,

means for providing stroke vector positional signals,



means coupled to said raster symbol generator for writing said priority data corresponding to said stroke symbology mask in said memory during a raster display interval as said memory is addressed in regular increments of said coordinate positional data at a clock defined rate corresponding to incremental displacements of said picture elements, thereby storing a stroke priority field corresponding to said mask of stroke symbology,

means coupled to said stroke generator for reading said priority data from said memory in synchronism with said clock rate during a stroke display interval and for modulating said stroke vector generator in accordance with said mask of stroke symbology, and

mode control means for alternately applying said raster scan information and signals derived from said modulated stroke vector generator to said cathode ray tube to provide a superimposed masked stroke vector and raster scan display.

4,635,051

HIGH-SPEED ELECTRO-OPTICAL LIGHT GATE AND FIELD SEQUENTIAL FULL COLOR DISPLAY SYSTEM INCORPORATING SAME

Philip J. Bos, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 26, 1983, Ser. No. 535,524
Int. Cl.[4] G09G *3/04*
U.S. Cl. 340—757 **27 Claims**

1. A high-speed electrooptical light gate which receives light from a light source, comprising:

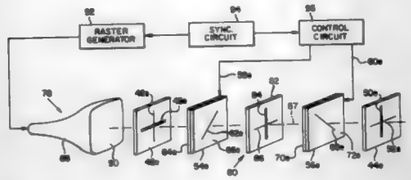
a pair of variable optical retarding means positioned between a pair of spaced-apart light polarizing means,

each one of the pair of variable optical retarding means including a liquid crystal cell that comprises liquid crystal material which has directors and is contained between a pair of generally parallel electrode structures, each electrode structure including a director alignment layer which has been conditioned so that the directors of the liquid crystal material in contact therewith become substantially uniformly aligned to form tilt bias angles with the conditioned surfaces, the tilt bias angles of the directors in

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contact with one conditioned surface being defined in a rotational sense opposite to the tilt bias angles of the directors in contact with the other conditioned surface, and

each one of the pair of variable optical retarding means having an optic axis and a light communicating surface on which the optic axis is projected, the pair of variable optical retarding means being arranged so that the projections of the optic axes on the light communicating surfaces are orthogonally related; and



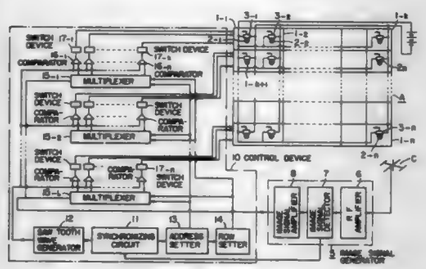
control means in communication with the pair of variable optical retarding means to provide first and second optical transmission states, the first optical transmission state providing for the transmission of light coupled through the light gate and the second optical transmission state providing for the extinction of light coupled through the light gate.

4,635,052

LARGE SIZE IMAGE DISPLAY APPARATUS

Nanjou Aoike; Katsuyuki Ide, both of Yokohama; Hisao Kobayashi, Fujisawa, and Mitsuhiro Hamaguchi, Yokohama, all of Japan, assignors to Toshiba Denzai Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1983, Ser. No. 516,983
Claims priority, application Japan, Jul. 27, 1982, 57-130579
Int. Cl.⁴ G09G *3/00*
U.S. Cl. 340—811 **12 Claims**



1. Image display apparatus comprising:

a display board on which a plurality of luminous elements are arrayed;

means for generating a video signal indicative of a video image to be displayed by said display board;

control means responsive to said video signal for generating control signals establishing periods of lighting of said respective luminous elements required to produce an intensity corresponding to said video signal;

each of said display elements comprising a low pressure gas discharge lamp; and

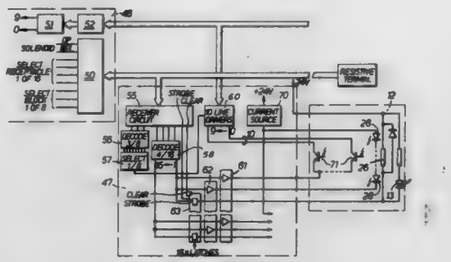
high frequency generator means controlled by said control means for supplying high frequency power to said low pressure gas discharge lamps, said frequency being sufficiently high to decrease an attenuation time of a transient oscillation of said display elements.

4,635,053

APPARATUS FOR SUPERVISING ACCESS TO INDIVIDUAL ITEMS

Edward J. K. Banks, 1, Fox Close, Wiggington, Tring, Hertfordshire, HP23 6ED, and David J. Richardson, 7, Marigold Walk, Widmer End, High Wycombe, Buckinghamshire, HP13 6HZ, both of England

Filed Sep. 6, 1984, Ser. No. 647,724
Int. Cl.⁴ H04Q *9/00*; G08B *5/00*
U.S. Cl. 340—825.31 **10 Claims**



1. Apparatus for monitoring access to individual items each of which is provided with a unique identifying code, comprising:

(a) a plurality of identical receptacles for receiving one of a plurality of individual items, respectively, each of said receptacles including

(1) means for interrogating the unique identifying code of each item;

(2) means for releasably securing an item within said receptacle; and

(3) indicator means for indicating the presence and absence of an item relative to said receptacle;

(b) identfication means operable by a potential user for identifying himself and a desired item;

(c) detection means for detecting in which one receptacle of said plurality of receptacles the desired item is arranged; and

(d) control means connected between said receptacles and said identification and detection means for operating said securing means associated with said one receptacle to release the desired item in response to the correct identification of the potential user and the desired item, said control means further operating said indicator means associated with said one receptacle when said securing means associated with said one receptacle is released.

4,635,054

OPERATOR INTERACTIVE DEVICE VERIFICATION SYSTEM

Robert N. Goldman, Honolulu, Hi., assignor to Light Signatures, Inc., Los Angeles, Calif.

Filed Jul. 10, 1985, Ser. No. 753,737
Int. Cl.⁴ H04Q *9/00*; G06K *5/00*
U.S. Cl. 340—825.34 **10 Claims**

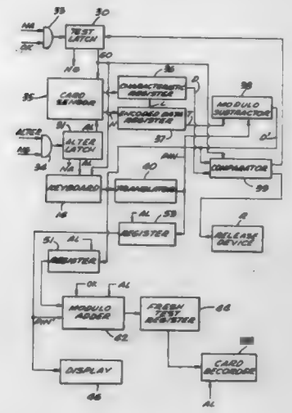
1. An operator interactive verification system for use with a card or the like, having a uniqueness characteristic and a machine transducible record, said system comprising:

means for an operator to provide input personal identification data signals;

means for sensing said transducible record of said card to provide transducible data signals derived from signals representing an arithmetic combination of the personal identification data and the uniqueness characteristic data of said card;

means for sensing said uniqueness characteristic of said card to provide representative sensed characteristic data signals;

means for arithmetically combining said personal identification data signals and said transducible data signals to provide comparison data signals clear of said personal identification data; and



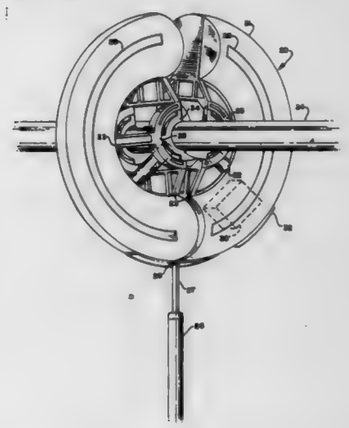
means to correlate said comparison data signals and said sensed characteristic data signals to provide representations.

4,635,055

APPARATUS FOR MEASURING THE TEMPERATURE AND OTHER PARAMETERS OF AN ELECTIC POWER CONDUCTOR

Roosevelt A. Fernandes, Liverpool, N.Y.; William R. Smith-Vaniz, Darien, Conn.; John E. Burbank, III, Ridgefield, Conn., and Richard L. Sieron, Fairfield, Conn., assignors to Niagara Mohawk Power Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 484,681, Apr. 13, 1983. This application Dec. 23, 1983, Ser. No. 564,924
Int. Cl.⁴ B08C *19/00*
U.S. Cl. 340—870.17 **17 Claims**



1. Apparatus for measuring the temperature of an electric power conductor comprising:

a housing with an opening for receiving said power conductor;

said housing including means for mounting said housing on a hot stick;

at least one conductor temperature sensor resiliently mounted to said housing for engagement with said conductor and for measuring the temperature of said conductor with said housing in an open position;

said housing including means for transmitting said measured temperature to a ground receiver; and

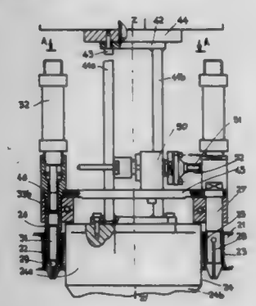
said housing further including a battery for powering said temperature sensor and said means for transmitting, whereby instantaneous measurements of said conductor can be made at arbitrary points along said conductor.

4,635,056

DEVICE FOR THE DIMENSIONAL TESTING OF THE CENTER DISTANCE BORES OR OF TWO CYLINDERS

Etienne Merle, and Hubert Genton, both of Lyons, France, assignors to Framatome & Cie., Courbevoie, France

Filed Aug. 24, 1984, Ser. No. 643,946
Claims priority, application France, Aug. 26, 1983, 83 13768
Int. Cl.⁴ G08C *19/08*
U.S. Cl. 340—870.36 **7 Claims**



1. A device for the dimensional testing of the center distance of two bores or two cylinders with parallel axes in a structure with high dimensional accuracy, which device comprises

(a) a base plate (24) having a part (24*a*) which complements a part (25) of the structure (21) for the accurate positioning of the device,

(b) two centering pins (26 and 27) comprising means (29, 31, 32) for their engagement in a perfectly coaxial position on the bores or cylinders (22, 23) whose axes are parallel to the axes of the bores (22, 23) when the base plate (24) is in position on the structure (21),

(c) two unit assemblies (33, 33') each carrying one of the centering pins (26, 27), articulated on the base plate (24), for moving the pins (26, 27) in any direction at right angles to the direction of the axes of the bores (22, 23) with a restricted amplitude, and

(d) a distance detector transmitting transducer (50) fixed on a support (45) fixed integrally to one of the pins (26) and joined to the other pin (27) so as to permit a limited relative movement of the pins (26, 27) in the direction of the center distance xx', comprising a sensing rod (51) mounted capable of moving on the detector (50) in the direction of the center distance xx' corresponding to its own direction and held with its end in contact with the pin (27) which is moveable relative to the support (45).

4,635,057

REMOTE SENSOR WITH COMPENSATION FOR LEAD RESISTANCE

Maurice E. Schaefer, Tremont, Ill., assignor to Caterpillar Inc., Peoria, Ill.

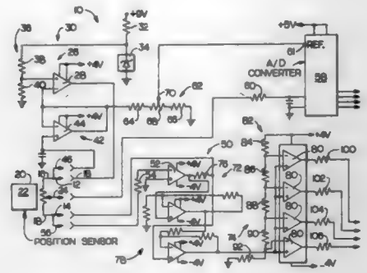
Filed Jun. 24, 1985, Ser. No. 748,081
Int. Cl.⁴ G08C *19/04*
U.S. Cl. 340—870.39 **12 Claims**

1. An apparatus for compensating for a resistance induced voltage drop across a first and a second lead line, each of said first and second lead lines having first and second ends respec-

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tively connected to opposite terminals of a resistive type sensing element and said apparatus, said apparatus comprising:

first means for sensing the magnitude of the resistance of said first lead line and delivering a first voltage signal to said second end of said first lead line, said first voltage signal having a magnitude responsive to the magnitude of said first lead line resistance; and



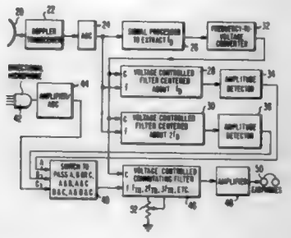
second means for sensing the magnitude of the resistance of said second lead line and delivering a second voltage signal to the second end of said second lead line, said second voltage signal having a magnitude responsive to the magnitude of said second lead line resistance.

4,635,058

VEHICLE IDENTIFICATION SYSTEM USING RADAR AND ACOUSTIC INFORMATION

Eldon M. Satphin, Jr., Hillsboro Township, Hillsboro County, N.H., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 14, 1983, Ser. No. 561,271
Int. Cl.⁴ G01S *13/86*
U.S. Cl. 342—52 **5 Claims**



5. A vehicle identification system for identifying a moving vehicle which includes a vehicle propelling means having a portion moving at a multiple of the speed of the vehicle, said propelling means comprising individual elements, comprising in combination:

means for directing a continuous wave carrier signal toward said vehicle and for receiving reflected return signals therefrom frequency shifted in accordance with the speed of the vehicle and its propelling means and for removing the carrier leaving the doppler frequencies due to motion of the vehicle and its propelling means, said doppler frequencies including a frequency component f_D due to the motion of the vehicle and a frequency component $X\text{-}f_D$ (X greater than 1) due to motion of said portion of said propelling means moving at said multiple X, said frequency components being modulated in accordance with the sound made by the propelling means;

means responsive to frequency f_D for producing a control signal having a parameter corresponding to the value of f_D;

a microphone directed toward said vehicle for receiving therefrom signals corresponding to the sounds made thereby;

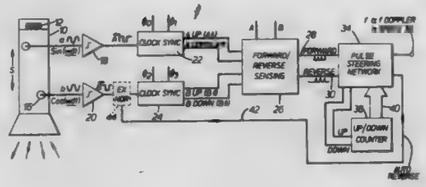
means receptive of said control signal and of said microphone signals for producing a signal corresponding to the sound made by the vehicle as it moves, whereby a determination of the type of vehicle may be made.

4,635,059

VEHICLE MOUNTED DOPPLER RADAR SYSTEM

Alan K. Ball, Weedon, England, assignor to Plessey Overseas Limited, Ilford, England

Filed May 24, 1983, Ser. No. 497,687
Claims priority, application United Kingdom, May 25, 1982, 8215268
Int. Cl.⁴ G01S *13/60, 13/62*
U.S. Cl. 342—117 **7 Claims**



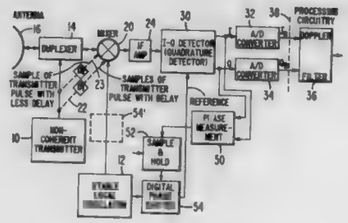
1. A doppler radar system for mounting on a vehicle including: at least two detectors spaced to provide in-phase and phase quadrature doppler frequency output signals with respect to one another; amplifying means for amplifying and wave squaring said detector output signals; logic means for producing from said amplified and wave squared detector output signals two pulse trains indicative of forward and reverse motion; and, combining means for summing together said forward and reverse pulse trains to produce a net output signal proportional to the forward motion of the vehicle, the logic means including respective first and second clock synchronism circuits for said amplified and squared in-phase and quadrature doppler signals in which the rising and falling edges of the signals are each synchronized with respective clocks from a four phase clock to produce four pulse trains, each individual pulse of which is non-synchronous with any other pulse and in which the four pulse trains are compared with the amplified and squared wave in-phase and quadrature doppler signals in a forward/reverse sensing circuit to produce said forward and reverse pulse trains.

4,635,060

COHERENT-ON-RECEIVE RADAR WITH PREPHASE CORRECTION CIRCUIT

Lawrence E. Mertens, Palm Bay, Fla., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 5, 1984, Ser. No. 617,559
Int. Cl.⁴ G01S *7/30, 7/40*
U.S. Cl. 342—194 **13 Claims**



1. In a coherent-on-receive radar system of the type which includes:

first means for producing periodic radio frequency (rf) pulses which are not necessarily in phase with one another,

second means for transmitting the periodic pulses into space and for receiving return pulses reflected from targets (if any) impinged by the transmitted pulses;

third means for producing an rf reference signal having a reference phase; and

fourth means responsive to each second means return pulse and third means signal for producing a signal, a parameter of which represents the phase difference between the pulse and signal from the second and third means respectively, the improvement comprising:

fifth means for providing to said fourth means, at a time following the transmission of each periodic pulse and before any return signals from any targets of interest are received, a signal corresponding to the phase of said transmitted pulse;

said fourth means being responsive to the signal from said fifth means and third means for determining the difference in phase between the transmitted pulse and reference signal;

sixth means for storing a signal repeseenting said phase difference between said transmitted pulse and reference signal until the next successive transmitted pulse occurs; and

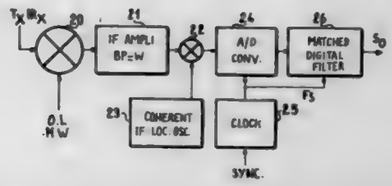
seventh means responsive to the stored signal for altering the phase of one of the return signal and reference phase signal as applied to the fourth means whereby said fourth means produces signals representing substantially the phase difference between the transmitted pulse and resulting return signals.

4,635,061

RECEIVER FOR A PULSED DOPPLER RADAR SYSTEM

Guy Lepere, St. Cyr L'Ecole; Rolland Younes, St. Maur, and Cristobal M. Ramirez, Paris, all of France, assignors to Thomson-CSF, Paris, France

Filed May 14, 1984, Ser. No. 609,819
Claims priority, application France, May 26, 1983, 83 08728
Int. Cl.⁴ G01S *13/76*
U.S. Cl. 342—195 **11 Claims**



1. Receiver apparatus for a pulsed Doppler radar which has a duplexer, a local microwave oscillator, and a transmitter whose pulses are triggered by a SYNC signal, comprising:

input mixer means adapted for receiving input signals from said duplexer and said microwave oscillator, and for mixing these input signals and providing a mixer output signal;

IF amplifier means for receiving said mixer output signal and providing an amplifier output signal, said amplifier means operating at an intermediate frequency and having a passband substantially equal to $2n \times k/\delta$, where n is an integer, K is Boltzman's constant, and δ is the pulse duration of the transmitter pulses;

coherent IF oscillator means for providing an IF oscillator output signal;

phase detector means for receiving the output signals from said IF amplifier means and said coherent IF oscillator means, and for providing a phase detector output signal;

clock means, adapted for receiving said SYNC signal, and for providing a sampling signal having a frequency substantially equal to $2n \times K/\delta$, said clock means being triggered by said SYNC signal to cause said sampling signal to be synchronized with the output signal from said IF amplifier means;

A/D coder means for receiving said sampling signal and said phase detector output signal, and for providing sample signals coded as binary words, said sample signals having a frequency substantially equal to the frequency of said sampling signal; and

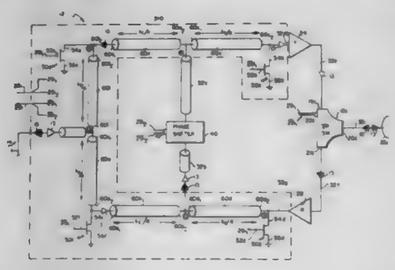
matched digital filter means for receiving said sample signals and said sample signal, and for providing a receiver output signal, said digital filter means having a pulse response matched to the transmitter pulses.

4,635,062

TRANSCEIVER ELEMENT FOR PHASED ARRAY ANTENNA

Robert W. Bierig, Hopkinton, and Robert A. Pucel, Needham, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 353,124, Mar. 1, 1982, abandoned. This application Dec. 10, 1984, Ser. No. 680,023
Int. Cl.⁴ H01Q *3/22, 3/24, 3/26*
U.S. Cl. 342—372 **28 Claims**



18. A phased array antenna for producing collimated and directed beams of transmitted and received electromagnetic energy comprising:

a plurality of transceiver elements each one of said elements having a pair of terminals, each of said elements comprising:

an independently controllable phase shifter to provide a selected phase shift to transmitted and received electromagnetic energy;

switching means, for steering transmitted and received electromagnetic energy between the pair of terminals of the transceiver and through the phase shifter, said means including a pair of signal paths;

a transmitting amplifier;

a receiving amplifier; and

wherein the transmitting amplifier is disposed in a first one of said signal paths and the receiving amplifier is disposed in a second one of said signal paths and said transmitted and received energy is steered in the same direction through the phase shifter by the switching means.

4,635,063

ADAPTIVE ANTENNA

Donald C. D. Chang, and Eng-Chong Ha, both of Torrance, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 6, 1983, Ser. No. 492,073
Int. Cl.⁴ G01S *3/16*
U.S. Cl. 342—380 **10 Claims**

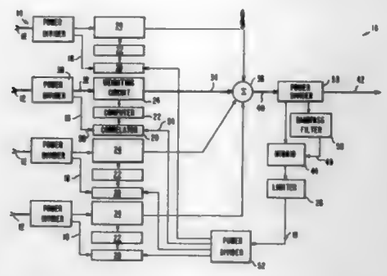
1. An adaptive antenna comprising:

sensors;

divider means associated with each said antenna sensor and having first and second outputs, said divider means being

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adapted for dividing a signal received by the respective of said sensors between said first and second outputs;
weighting means associated with each antenna sensor for modifying a signal according to a predetermined function, said weighting means being operatively connected to the first output of the respective of said divider means and adapted to receiving a signal therefrom, each said weighting means having an output;
summing means operatively connected to said outputs of said weighting means for summing the signals thereform;



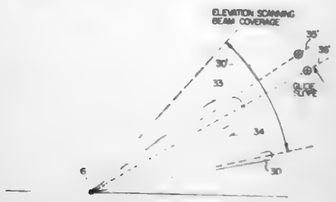
limiter means for limiting the dynamic range of a signal output of said summing means;
correlator means associated with each sensor for correlating a signal output from the second output of the respective of said dividers with a signal output of said limiter means; and
algorithm means associated with each sensor for determining the function of the respective weighting means in response to a respective correlator signal output.

4,635,064

MICROWAVE LANDING SYSTEM

John P. Chisholm, Olympic Valley, Calif., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Apr. 4, 1985, Ser. No. 719,849
Int. Cl.⁴ G01S *1/16*
U.S. Cl. 342—408 **27 Claims**



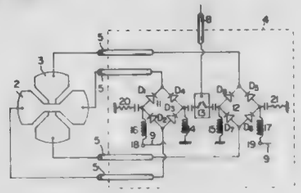
1. The method of providing MLS aircraft landing guidance and independently monitoring the accuracy of that MLS guidance for a prescribed approach path by transmitting from ground based antenna means in a repeating sequence of allocated MLS time intervals plural diverse guidance functions respectively including scanning beam precision landing guidance functions interspersed with fixed-beam precision guidance functions, including the steps of:
(a) scanning said scanning beam in first and second opposed directions across an approach region including the prescribed approach path to provide said scanning beam function, the scanning beam being transmitted within its own allocated MLS time intervals in the sequence and starting and stopping on opposite sides of the prescribed approach path;
(b) transmitting during non-interfering MLS time intervals fixed-beam guidance beams paired along opposite sides of the prescribed approach path such that the radiation patterns of the paired beams overlap the prescribed approach path by the same amount to provide said fixed beam function, whereby their intensities as measured along the prescribed approach path are mutually equal;
(c) receiving in an approaching aircraft said transmitted guidance beams to provide received signals;
(d) processing the signals received from the scanning beam guidance function to provide a first output signal which varies in proportion to the time between the reception in the aircraft of the scanning beam passing in said first direction and the reception of the scanning beam passing in the second direction at the present location of the aircraft, and using such first output signals to generate scanning beam guidance signals with respect to the prescribed approach path;
(e) processing the signals received from the paired fixed-beam guidance function by comparing their relative amplitudes to provide a second output signal which varies in proportion to the relative strengths thereof as received at the present location of the aircraft, and using such second output signals to generate fixed beam guidance signals with respect to the prescribed approach path; and
(f) comparing said first output signals and said second output signals, and providing for aircraft guidance said scanning beam guidance signals when the first and second output signals substantially agree.

4,635,065

ANTENNA DEVICE FOR DIRECTION FINDERS

Kenzo Mori; Hyo Yasuda, both of Tokyo, and Minoru Suzuki, Yamato, all of Japan, assignors to Taiyo Musen Co. Ltd., Tokyo, Japan

Filed Jul. 31, 1984, Ser. No. 636,218
Claims priority, application Japan, Jan. 13, 1984, 59-3520
Int. Cl.⁴ G01S *5/04*
U.S. Cl. 342—435 **4 Claims**



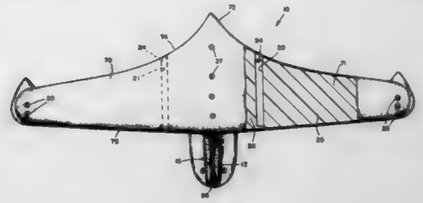
1. An antenna device for a direction finder, comprising:
(a) a substantially grounded conductive base plate including a conductive plate mounted on said base plate;
(b) a plurality of web-shaped antenna elements mounted in spaced relation on said base plate and having central portions extending in crisscross relation and insulated from each other said web-shaped antenna elements having widths progressively increased toward their ends and spaced from said conductive plate by a distance progressively increased toward said ends of the antenna elements so that said antenna elements have substantially uniform characteristic impedances, said antenna elements being grounded through resistors having resistances substantially equal to the characteristic impedances thereof;
(c) an electronic switching circuit for alternately grounding ends of said antenna elements and picking up reception outputs from opposite ends of said antenna elements at a constant period with said antenna elements being switched out of phase at an angle corresponding to the angle at which said antenna elements extend across each other; and
(d) a circuit for combining outputs from said antenna elements.

4,635,066

MULTIBAND MULTIMODE AIRCRAFT ANTENNA

Gordon St. Clair, El Toro, and Evert C. Alseas, Newport Beach, both of Calif., assignors to Avionics Antenna Systems, Huntington Beach, Calif.

Filed Mar. 8, 1984, Ser. No. 587,740
Int. Cl.⁴ H01Q *1/28*
U.S. Cl. 343—705 **11 Claims**



1. A multiband, multimode antenna suitable for use with an aircraft, said antenna comprising:
(a) an upper wing element;
(b) a central leg element mechanically connected to said wing element;
(c) a fairing extending below said wing element and connected to said central leg element, said upper wing, central leg element and said fairing constituting a monopole antenna section;
(d) a first outer leg element;
(e) a second outer leg element, said outer leg elements being substantially equally spaced from said central leg element and being mechanically connected to said wing element, said outer leg elements, in conjunction with said central leg element, constituting a directional antenna section;
(f) said elements consisting of an insulating material;
(g) an electrically conductive coating on the outer surface of said central leg and said wing elements and said fairing, except for the bottom area of said central leg element and said fairing, for insulation and for electrically connecting said elements and fairing; and
(h) said outer leg elements being provided with an internal electrically conductive wire, whereby said central leg element will reflect electromagnetic radiation to said outer leg elements.

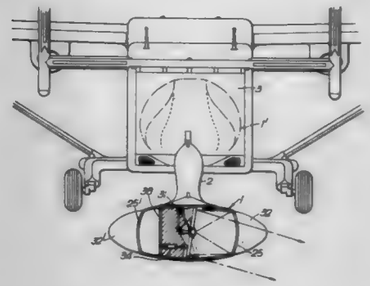
4,635,067

AERODYNAMIC RADAR POD WITH EXTERNAL INFLATABLE PORTION

Roger S. Fitzpatrick, Somerset, England, assignor to GEC Avionics Limited, England

Filed Oct. 4, 1984, Ser. No. 657,774
Claims priority, application United Kingdom, Oct. 10, 1983, 8327075
Int. Cl.⁴ H01Q *1/28, 1/42*
U.S. Cl. 343—705 **8 Claims**

1. An airborne scanner arrangement comprising:
(a) an aircraft fuselage elongated along a longitudinal dimension and having a transverse dimension extending generally perpendicular to the longitudinal dimension,
(b) an aerodynamic radar pod having at least one external inflatable portion,
(c) a radar scanner mounted for rotation within said pod about an axis,
(d) means for deploying said pod from and retracting said pod into said aircraft fuselage,
(e) means for internally pressurizing said portion when the pod is deployed to inflate said portion and thereby define part of the aerodynamic shape of the pod, and



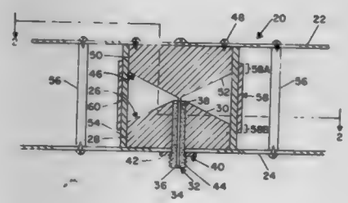
(f) means for depressurizing said portion on retraction of said pod into the aircraft fuselage.

4,635,068

DOUBLE-TUNED DISC LOADED MONOPOLE

Harold A. Wheeler, Smithtown, and Clifford H. Friedman, East Northport, both of N.Y., assignors to Hazeltine Corporation, Commack, N.Y.

Filed Jun. 5, 1985, Ser. No. 741,333
Int. Cl.⁴ H01Q *9/38*
U.S. Cl. 343—749 **15 Claims**



1. A disc loaded monopole antenna comprising:
ground means for establishing a ground plane;
a disc of conductive material spaced apart from said ground means and parallel thereto;
tuning means disposed between said disc and said ground means for tuning said antenna, said tuning means including a central conductive post with an upper portion connected to the disc and a lower portion coaxial with the upper portion and connected to the ground means, said portions defining a radially tapered opening therebetween;
said tuning means further including non-central conductive posts interconnecting the disc and the ground means;
a coaxial transmission line inside said lower portion having an outer conductor in contact with said lower portion and an inner conductor in contact with the upper portion; and
means for supporting said disc parallel to said ground means.

4,635,069

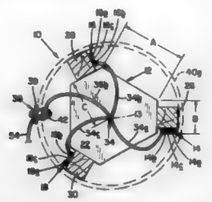
MUTUAL-COUPLING MULTI-ELEMENT FM ANTENNA

James R. Waltonen, Haines, Oreg., assignor to IRT, Inc., Haines, Oreg.

Filed Apr. 2, 1984, Ser. No. 595,627
Int. Cl.⁴ H01Q *21/20*
U.S. Cl. 343—799 **7 Claims**

1. An FM antenna which is tuned for receiving a range of signals having a known median wavelength (λ) for use with a radio receiver comprising

a non-electrically conductive elongate frame,
three mutually equidistantly spaced generally mutually parallel dipole pairs mounted on said frame, said dipole pairs being disposed generally equiangularly about and parallel with said frame's major axis, said dipole pairs being spaced



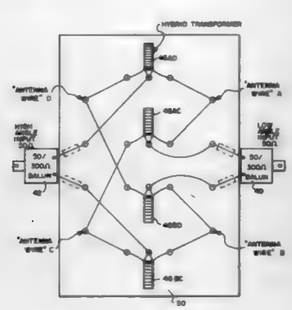
at a distance of less than 0.01 λ from said frame's major axis,
coupling means operatively, simultaneously, connected to said dipole pairs, and
lead means joined to said coupling means and connectable to a radio receiver.

4,635,070

DUAL MODE ANTENNA HAVING SIMULTANEOUS OPERATING MODES

William G. Hoover, Los Altos Hills, Calif., assignor to Granger Associates, Santa Clara, Calif.

Filed Dec. 19, 1983, Ser. No. 563,288
Int. Cl.⁴ H01Q *1/36, 3/24*
U.S. Cl. 343—852 **17 Claims**



1. An antenna, comprising: a plurality of radiators; means for supporting said radiators in electrically insulated relationship to one another relative to a fixed reference; first means connectable with all of said radiators in a first specific operating mode for energizing all of the radiators at a first particular frequency in order to cause them to produce a first specific radiation pattern at said first frequency relative to said fixed reference; second means connectable with all of said radiators in a second specific operating mode different from said first mode for energizing all of the radiators at a second different frequency in order to cause them to produce a second different specific radiation pattern at said second frequency relative to said fixed reference; and means for simultaneously connecting said first and second radiator energizing means with all of said radiators in their respective first and second operating mode without any appreciable electrical interference with one another in order to cause said radiators to simultaneously produce each of said first and second radiation patterns at said first and second frequencies, respectively, as if the other were not present; said radiators including first, second, third and fourth radiators; said radiator support means supporting said four radiators around the outer surface of an imaginary cone; said first, second, third and fourth radiators being supported so as to define successively interlaced first, second third and fourth conical spiral windings; each of said first and second radiator energizing means including means for providing first and second alternating currents having the same amplitude and a given frequency but 180° out of phase with one another; said connecting means including first current connecting means simultaneously electrically connecting said first current to the lowermost ends of said first and second radiators and said second current to the lowermost ends of said third and fourth radiators for energizing said radiators in said first operating mode in order to cause them to produce said first radiation pattern relative to said reference plane; said connecting means also including second current connecting means simultaneously connecting said first current to the lowermost ends of said first and third radiators and said second current to the lowermost ends of said second and fourth radiators for energizing said radiators in said second operating mode in order to cause them to produce said second radiation pattern relative to said reference; each of said first and second radiator energizing means including its own one of said alternating current providing means; said first current connecting means including first isolating means for preventing the connections of said radiators in said second operating mode by said second current connecting means from affecting the energization of the radiators in said first operating mode; said second current connecting means including second isolating means for preventing the connections of said radiators in said first operating mode by said first current connecting means from affecting the energization of the radiators in said second operating mode; said first isolating means including first impedance means located electrically between said current providing means on one side and said first and second radiators on the other side and functioning as an effective short circuit to the current energizing the radiators in said first operating mode while functioning as an effective open circuit to the current energizing these same radiators in said second operating mode; said first isolating means including second impedance means located electrically between said current providing means on one side and said third and fourth radiators on the other side and functioning as an effective short circuit to the current energizing these radiators in said first operating mode while functioning as an effective open circuit to the current energizing these same radiators in said second operating mode; said second isolating means including its own first impedance means located electrically between said current providing means on one side and said first and third radiators on the other side and functioning as an effective short circuit to the current energizing these radiators in said second operating mode while functioning as an effective open circuit to the current energizing these same radiators in said first operating mode; and said second isolating means including its own second impedance means located electrically between said current providing means on one side and said second and fourth radiators on the other side and functioning as an effective short circuit to the current energizing these radiators in said second opeating mode while functioning as an effective open circuit to the current energizing these same radiators in said first operating mode.

4,635,071

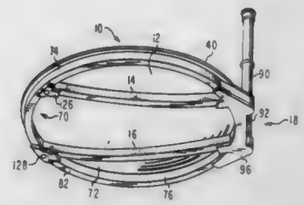
ELECTROMAGNETIC RADIATION REFLECTOR STRUCTURE

Raj N. Gounder, West Windsor; Chi-Fan Shu, Cranbury, and Brian D. Jacobs, South Orange, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 10, 1983, Ser. No. 521,913
Int. Cl.⁴ H01Q *15/16*
U.S. Cl. 343—897 **11 Claims**

1. An electromagnetic radiation reflector structure comprising:
a sheet of laminated material shaped to form an electromagnetic radiation reflector, said sheet being a section of a surface of revolution; and
a peripheral stiffening rib of laminated material attached at a surface of and extending about the periphery of said sheet;

said sheet and rib each comprising a laminated material including a plurality of plies where each ply includes a plurality of layers of graphite fiber reinforced epoxy (GFRE), the fibers in at least two adjacent layers being oriented relative to each other to form a quasi-isotropic ply, said quasi-isotropic plies being combined to have a plane of symmetry within said laminated sheet and rib,



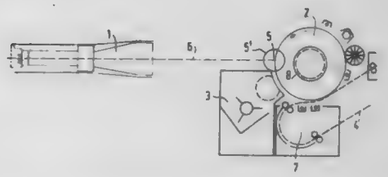
each layer of said sheet comprising a plurality of tapes of said GFRE fibers, said tapes each having a pair of elongated edges parallel to the fibers thereof, said tapes abutting said edges to form a continuous solid coplanar sheet, said tapes each having a transverse dimension relatively small compared to its length, the fibers in each layer being substantially coplanar and of substantially uniform spacing.

4,635,072

PRINTING APPARATUS AND METHODS FOR COMPENSATING SYNCHRONIZATION ERRORS

Norbert Conrads, Herzogenrath; Ulrich Schiebel, Aachen, and Rolf Kirchhoff, Freusburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 494,217, May 13, 1983, abandoned.
This application Aug. 30, 1985, Ser. No. 771,473
Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218120
Int. Cl.⁴ G01D *15/06, 9/12*
U.S. Cl. 346—1.1 **4 Claims**



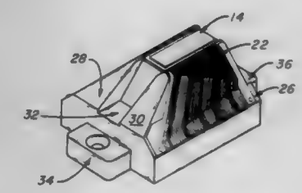
1. A method for compensating synchronization errors in an actual transport speed of a rotating cylindrical record carrier in a non-impact matrix printer in which a line of print is formed by picture lines which are successively recorded on the record carrier in a horizontal direction parallel to the longitudinal axis of the record carrier, each picture line being recorded by a recording beam being deflected at a deflection frequency, a given spacing between a picture line having a first informational content and a successive picture line having a second informational content being predetermined, an actual spacing between a picture line and a successive picture line being dependent upon the deflection frequency of the recording beam and the actual transport speed of the record carrier, the method comprising the steps of:
deriving a control value from a difference between the actual transport speed and a predetermined transport speed of the record carrier;
recording a picture line having a first informational content;
deflecting the recording beam for a successive picture line having a second informational content, the deflection being in a vertical direction transverse of the longitudinal axis of the record carrier, the deflection being an amount dependent upon the control value;
comparing the amount to the given spacing, and
recording the successive picture line if the deflection amount is less than the given spacing, and delaying recording the successive picture line by a deflection period of the recording beam if the amount is equal to or greater than the given spacing.

4,635,073

REPLACEABLE THERMAL INK JET COMPONENT AND THERMOSONIC BEAM BONDING PROCESS FOR FABRICATING SAME

Gary E. Hanson, Boise, Id., assignor to Hewlett Packard Company, Palo Alto, Calif.

Filed Nov. 22, 1985, Ser. No. 801,034
Int. Cl.⁴ G01D *15/18*
U.S. Cl. 346—1.1 **12 Claims**



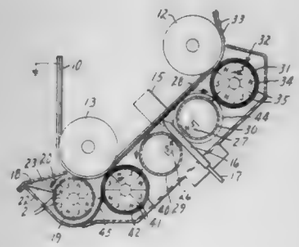
1. A process for fabricating a replaceable thermal ink jet print head which includes the steps of:
a. providing a thin film resistor print head substrate having a plurality of resistive heater elements thereon and a corresponding plurality of conductive leads connected to said resistive heater elements,
b. providing a beam lead intercognect circuit having a plurality of beam leads with spacings to match those of said conductive leads on said print head substrate, and
c. thermosonically bonding in sequence each of said beam leads to each of said corresponding plurality of conductive traces so that said beam leads and said conductive traces lie in a adjacent parallel planes to thereby enhance the packing density of said thermal ink jet print head.

4,635,074

ELECTROGRAPHIC STYLUS RECORDING APPARATUS

James D. Young, Cazenovia, N.Y., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 13, 1986, Ser. No. 829,394
Int. Cl.⁴ G01D *15/06*
U.S. Cl. 346—74.2 **6 Claims**



1. An improved electrographic apparatus for use with magnetically attractable toner powder, the electrographic apparatus including a receptor recording member; a stylus array spaced from the receptor recording member for providing a recording region, the receptor recording member adapted for

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movement past said stylus array; a hopper for holding a supply of toner powder from which toner powder is provided to the recording region; a magnet disposed adjacent one side of the stylus array establishing a magnetic field at the first electrode to attract toner powder toward the ends of the stylii of the stylus array, the magnet also attracting toner powder presented adjacent the recording region; a first cylindrical sleeve member of non-magnetic material disposed about the magnet and adapted for rotation to carry toner powder attracted toward the magnet away from said recording region; a second cylindrical sleeve member of non-magnetic material with a magnetic field producing means adapted for rotation and disposed within the second cylindrical sleeve member, the second cylindrical sleeve member positioned close to the first cylindrical sleeve member to cause the magnetic field producing means to attract toner powder carried by the first cylindrical sleeve member to the second cylindrical sleeve member and move such toner powder attracted to the second cylindrical sleeve member to at least one end portion of the second cylindrical sleeve member; the improvement including

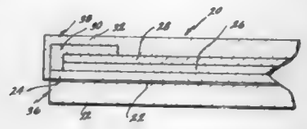
a toner powder transport means for transporting the toner powder from the one end portion of the second cylindrical sleeve member to the hopper, including a magnetic field producing means disposed within and at the end portion of the first cylindrical sleeve member opposite the one end portion of the second cylindrical sleeve member for attracting toner powder from the one end portion of the second cylindrical sleeve member to said end portion of the first cylindrical sleeve member, the rotation of the first cylindrical sleeve member carrying such toner powder away from said last-mentioned magnetic field producing means; a third cylindrical sleeve member adapted for rotation and having an end portion disposed near said end portion of the first cylindrical sleeve member; a magnetic field producing means disposed opposite said end portion of the first cylindrical sleeve member and within said third cylindrical sleeve member for attracting toner powder from said one end portion of the first cylindrical sleeve member to said end portion of said third cylindrical sleeve member, the rotation of said third cylindrical sleeve member carrying toner powder attracted to said last-mentioned end portion away from said last-mentioned magnetic field producing means for further movement by said toner powder transport means to the hopper.

4,635,075

THERMAL PRINT HEAD AND PROCESS FOR PRODUCING

William L. Grummer, Canyon Country, and Clifton A. Blake, Jr., Pasadena, both of Calif., assignors to Datametrics Corporation, Chatsworth, Calif.

Filed Dec. 4, 1985, Ser. No. 804,543
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **4 Claims**



1. A thermal printing head for thermally marking a thermally sensitive record material comprising:

a substrate member of low thermal conductive material having at least one planar surface;

a continuous common electrode bar of conductive material on said planar surface extending in a first direction parallel to one edge of said substrate member;

a continuous bar of insulative material overlying said bar of conductive material in a first plane parallel to said planar surface, said bar leaving an exposed margin of said conductive material extending in said first direction and adjacent said substrate edge;

a plurality of printing electrode bars of conductive material spaced from each other overlying said planar surface in a second plane, substantially parallel to said planar surface and extending in a direction orthogonal to said first direction, each of said printing electrode bars being insulated and isolated from said common electrode bar;

a resistive printing bar member overlying said exposed margin of said common electrode bar extending in a third plane, substantially parallel to said planar surface and in electrical contact with all of said individual printing electrode bars to provide interplanar conductive paths between said printing electrode bars and said common electrode bar; and

a protective wear coating covering said resistive printing bar, said printing electrode bars and said common electrode bar to provide a printing surface

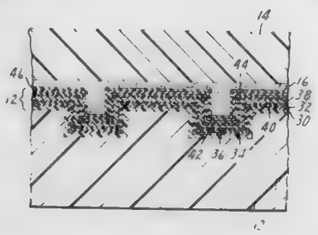
whereby the passage of electrical current between a selected printing electrode and said common electrode bar through said printing bar resistive material produces a temperature rise at the printing surface sufficient to impart to thermally sensitive paper in contact therewith, a mark whose size and shape is determined by the temperature of the surface, the area of the electrical current path, the width of each printing electrode bar and the distance between adjacent printing electrode bars.

4,635,076

TWO-SIDED OPTICAL RECORDING MEDIUM

Richard F. Willson, Hudson, Wis., and Thomas A. Rinehart, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 14, 1985, Ser. No. 711,526
Int. Cl.[4] G01D *15/34*; B05D *3/06*; B32B *15/04*; G03C *1/00*
U.S. Cl. 346—135.1 **18 Claims**



1. Optical recording medium comprising a transparent substrate having on one face

inner and outer thin-film recording layers, each of which is independently optically addressable by energy directed from one side of the medium toward the closer layer, and

a thin-film opaque reflective barrier between said inner and outer layers preventing the more distant layer from responding to such energy, and

a transparent, thin-film spacer layer between the opaque reflective layer and each recording layer.

4,635,077

INK JET RECORDING HEAD

Susumu Itoh, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

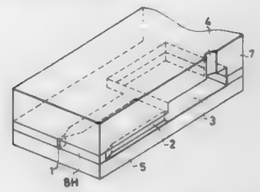
Filed Feb. 19, 1985, Ser. No. 702,680
Claims priority, application Japan, Mar. 1, 1984, 59-37303
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **10 Claims**

1. An ink jet recording head comprising:

a substrate;

a hardened photosensitive resin film on said substrate for forming at least portions of an ink path and an ink reservoir;

a cover for said ink path and said ink reservoir, said cover having a surface with a recess formed at an area thereof facing said ink reservoir; and



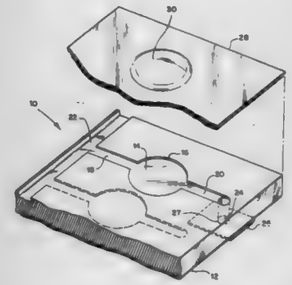
an orifice for discharging ink from said ink path, said orifice being defined by said substrate, said resin film and said surface of said cover.

4,635,079

SINGLE ELEMENT TRANSDUCER FOR AN INK JET DEVICE

David W. Hubbard, Stamford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 11, 1985, Ser. No. 700,582
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **5 Claims**



1. Ink ejecting portion of an ink jet printer, comprising:

a plate;

a cavity in said plate;

a first channel in said plate extending from said cavity;

a recess confluent with said first channel;

a second channel in said plate extending from said cavity;

an opening in said plate confluent with said second channel;

a crystal disposed upon said plate and extending over said cavity to form a chamber therewith, said crystal having a free standing convex configuration at the location of said cavity; and

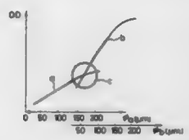
means for applying a voltage to said crystal; whereby, upon a voltage being applied to said crystal said convex portion of said crystal will shorten and contract into said chamber.

4,635,078

INTERMEDIATE GRADIENT IMAGE PRODUCING METHOD

Nobuaki Sakurada, Yokohama; Hideaki Kawamura, and Takashi Sasaki, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1984, Ser. No. 603,229
Claims priority, application Japan, Apr. 28, 1983, 58-75859; Jul. 8, 1983, 58-125077; Jul. 15, 1983, 58-129246
Int. Cl.[4] G01D *15/18*; H04N *1/46*
U.S. Cl. 346—140 R **16 Claims**





1. An image producing method comprising the steps of:

forming microdots using plural colorants having different concentrations;

variably controlling the size of said dots;

establishing a plurality of optical density regions, including an overlapped region which may be produced by applying either of said plural colorants, a lower optical density region which may be produced by the lower concentration colorants among said plural colorants and which has an optical density lower than that of said overlapped region, and a higher optical density region which is produced by the higher concentration colorants among said plural colorants and which has an optical density higher than that of said overlapped region;

expressing said lower optical density region by using only said lower concentration colorants, said higher optical density region by using only said higher concentration colorants, and said overlapped region by using both of said colorants; and

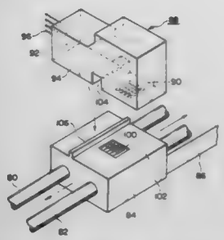
controlling the relative amounts of said colorants used to form the microdots in accordance with a desired reproduction optical density.

4,635,080

LIQUID INJECTION RECORDING APPARATUS

Kenjiro Watanabe, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1985, Ser. No. 715,413
Claims priority, application Japan, Mar. 30, 1984, 59-60580; Mar. 30, 1984, 59-60581
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **4 Claims**



1. A liquid injection recording apparatus comprising:

(A) a liquid injection recording head including:

(a) means defining orifices for discharging liquid there through to form flying droplets;

(b) energy generating members for generating energy utilized to form said droplets;

(c) means defining a bottom surface; and

(d) electrical contacts provided on said bottom surface of

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said recording head for inputting an electrical signal to said energy generating members therethrough;

(B) a mounting member for mounting said liquid injection recording head thereon and having an upper surface, said mounting member having electrical contacts on the upper surface thereof, said electrical contacts of said mounting member being adapted to be connected to said electrical contacts of said recording head when said recording head is mounted on said mounting member, and

(C) partition means for partitioning said electrical contacts of said recording head and said electrical contacts of said mounting member from said orifices of said recording head, said partition means being provided in at least one of said bottom surface of said recording head and said upper surface of said mounting member, whereby the flow of liquid from said orifices to the electric contacts is prevented by said partition means.

4,635,061

APPARATUS AND METHOD FOR GENERATING DOT-MATRIX CHARACTERS IN GRAPHIC PATTERNS

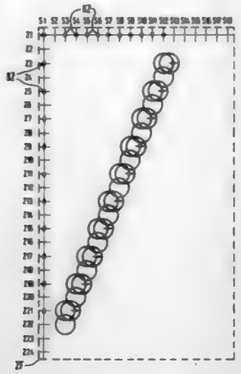
Manfred Wiedemer, Ismaning, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

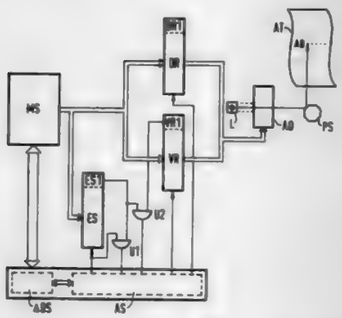
Filed Jul. 9, 1984, Ser. No. 628,717

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1983, 3324758

Int. Cl.⁴ G01D *15/14*

U.S. Cl. 346—160 **7 Claims**





1. Apparatus for generating characters or graphic patterns in dot-matrix form, including means for moving a recording means for generating image dots along a recording medium in line-by-line fashion, comprising, in combination, a matrix memory for storing a plurality of character fields of identical size in the form of binary sequences of elements each representing a single column or row of a pattern or character, drive means connected to said matrix memory for receiving said character fields, said drive means being connected to said recording means for supplying drive signals thereto, address and control means connected to said matrix memory for causing said matrix memory to read out a character field to said drive means, recognition means connected to the output of said matrix memory for recognizing an identifier character which identifies a character field containing displaceable elements, and means connected between said recognition means and said drive means for selectively delaying said drive signals in response to recognition of said identifier character, whereby the drive signals provided to said recording means are delayed in response to said identifier character and at least one of the dots produced in response to the character field associated with said identifier or character is displaced along the line of movement of said recording means, said character fields being stored in said matrix memory in the form of first and second groups of character fields, and each said character field incorporating a group identifier as said identifier character for identifying such character field as a member of the first or second group.

4,635,082

THERMO-OPTIC LIGHT MODULATION ARRAY

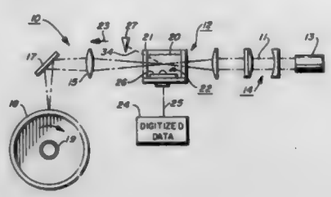
Gerald A. Domoto, and Aron Sereny, both of Briarcliff Manor, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 611,457, May 17, 1984, abandoned.

This application Jan. 30, 1986, Ser. No. 823,977

Int. Cl.⁴ G01D *15/14*

U.S. Cl. 346—160 **13 Claims**



1. A thermo-optic light modulation array for use in an electrophotographic printer to produce electrostatic latent images on a moving, precharged photoconductive member of the printer comprising:

a source of collimated light;

a first lens means for converting the collimated light into a sheet of unpolarized light and for directing the sheet of light in a path toward the photoconductive member, said first lens means focusing the sheet of light as a focal line at a first location intermediate the light source and photoconductive member;

a transparent homogeneous medium being positioned in the light path to intercept the sheet of light and being adapted to transmit the sheet of light therethrough, the transparent medium location being such that the focal line first location of the sheet of light is within the transparent medium;

a linear array of selectively energizable thermal heating elements positioned adjacent the transparent medium and in intimate contact therewith, so that the linear array of heating elements is substantially perpendicular to the direction of the sheet of light, the heating elements providing means for selectively applying thermal energy pulses to predetermined portions of the transparent medium in response to digitized data signals, so that the refractive index of said transparent medium is changed in those portions receiving the thermal energy to modulate portions of said sheet of light passing therethrough;

the focal line of the sheet of light being parallel to and located above but very close to the linear array of heating elements, so that said unmodulated sheet of light passes through said transparent medium substantially parallel with and closely adjacent the heating element array in a substantially grazing fashion while the modulated portions of the sheet of light are substantially entirely deflected;

stop means to block alternatively either the modulated or unmodulated portions of the sheet of light; and

a second lens means for focusing said unblocked portions of the sheet of light exiting the transparent medium as a second focal line on the surface of said photoconductive member, so that the modulation array functions as an optical image bar which produces an electrostatic latent image on the photoconductive member one line of picture elements at a time by discharging the precharged region that form the background areas of the latent image.

4,635,083

MEMORY DEVICE

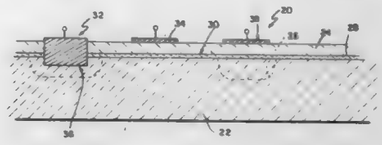
James A. Cooper, Jr., West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Continuation of Ser. No. 609,447, May 11, 1984, abandoned.

This application Apr. 10, 1986, Ser. No. 851,273

Int. Cl.⁴ H01L *29/161, 29/78*

U.S. Cl. 357—16 **10 Claims**



1. A memory cell comprising a first semiconductor layer, a second semiconductor layer, the second layer having a side adjacent the first layer and an opposite side, a barrier between the first and second layers preventing the migration of minority carriers from the first layer to the second layer, a source of minority carriers in the first layer, and means for providing a transfer terminal and a storage terminal on the opposite side of the second layer, the storage terminal determining the location of a potential well in the first layer adjacent the barrier, the well adapted for storing minority carriers from the first layer, the presence or absence of a substantial number of minority carriers in the well determining the state of the cell, the transfer terminal controlling the flow of minority carriers between the source of minority carriers and the well.

4,635,084

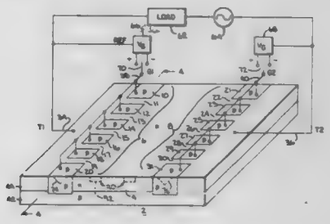
SPLIT ROW POWER JFET

James A. Benjamin, Waukesha, Wis.; Robert W. Lade, Fort Myers, Fla., and Herman P. Schutten, Milwaukee, Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 8, 1984, Ser. No. 618,432

Int. Cl.⁴ H01L *29/80*

U.S. Cl. 357—22 **3 Claims**



1. A bidirectional power JFET for AC operation comprising:

a semiconductor substrate of one conductivity type comprising a thin flat wafer lying in a horizontal plane and having top and bottom horizontal major surfaces;

a left set of a plurality of layers of alternating conductivity type semiconductor material each extending vertically up-down and horizontally left-right, said layers being layered in a horizontal forward-rearward direction to provide a first forward-rearward row in said substrate, the layers of said one conductivity type defining a plurality of horizontal left-right channels interdigitated with layers of the other conductivity type and forming a plurality of respective interface channel junctions therewith, said channel junctions extending vertically up-down and horizontally left-right;

a right set of a plurality of layers of alternating conductivity type semiconductor material each extending vertically up-down and horizontally left-right in said substrate, said layers being layered in a horizontal forward-rearward direction of layering to provide a second forward-rearward row in said substrate, the layers of said one conductivity type defining a plurality of horizontal left-right channels interdigitated with layers of the other conductivity type and having a plurality of respective interface channel junctions therewith, each said channel junction extending vertically up-down and horizontally left-right;

a common drift region of said one conductivity type in said substrate between said left and right rows;

first main terminal means operatively coupled to the left ends of said channels in said left row;

second main terminal means operatively coupled to the right ends of said channels in said right row;

a source of alternating voltage impressed across said first and second main terminal means;

first gate terminal means operatively coupled to said other conductivity type layers in said left row;

second gate terminal means operatively coupled to said other conductivity type layers in said right row;

first gate voltage bias means connected to said first gate terminal means and applying a gating bias potential to said other conductivity type layers in said left row,

such that for a first polarity of said first gate bias means, said channel junctions of said left row are forward biased and depletion regions therearound shrink horizontally forward-rearward toward said channel junctions to open a conductive horizontal left-right current path through said channels between said first main terminal means and said common drift region, and

such that for a second polarity of said first gate bias means, said channel junctions of said left row are reverse biased and depletion regions therearound expand horizontally forward-rearward away from said channel junctions to close said horizontal left-right current paths and block conduction between said first main terminal means and said common drift region;

second gate voltage bias means connected to said second gate terminal means and applying a gating bias potential to said other conductivity type layers of said right row,

such that for a first polarity of said second gate bias means, said channel junctions of said right row are forward biased and depletion regions therearound shrink horizontally forward-rearward toward said channel junctions to open a conductive horizontal left-right current path through said channels between said second main terminal means and said common drift region, and

such that for a second polarity of said second gate bias means, said channel junctions of said right row are reverse biased and depletion regions therearound expand horizontally forward-rearward away from said channel junctions to close said horizontal left-right current path and block conduction between said second main terminal means and said common drift region, wherein:

said first gate terminal means is connected both to said other conductivity type layers in said left row and to said one conductivity type layers in said left row forming said channels;

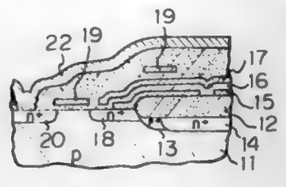
said first gate bias means is referenced to said first main terminal means;
said second gate terminal means is connected both to said other conductivity type layers in said right row and to said one conductivity type layers in said right row forming said channels;
said second gate bias means is referenced to said second main terminal means; and
comprising means preventing electrical shorting of said first gate terminal means to said one conductivity type layers in said left row when said channel junctions of said left row are forward biased and said first gate bias means is at said first polarity; and
comprising means preventing electrical shorting of said second gate terminal means to said one conductivity type layers in said right row when said channel junctions of said right row are forward biased and said second gate bias means is at said first polarity.

4,635,085

SEMICONDUCTOR MEMORY DEVICE

Masao Taguchi, Segamihara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 28, 1983, Ser. No. 508,501
Claims priority, application Japan, Jun. 30, 1982, 57-113239
Int. Cl.⁴ H01L *29/94, 29/46*
U.S. Cl. 357—23.6 **14 Claims**



1. A semiconductor memory device including memory cells formed in a semiconductor substrate, and an insulating layer formed on the semiconductor substrate, each of the memory cells comprising:
a switching transistor formed in the semiconductor substrate; and
a storage capacitor, formed in and on the semiconductor substrate and on the insulating layer, an impurity-doped getter region of a conductivity type opposite to that of the semiconductor substrate being formed in the semiconductor substrate, in contact with the insulating layer, and below said storage capacitor, for collecting minority carriers so as to avoid soft errors.

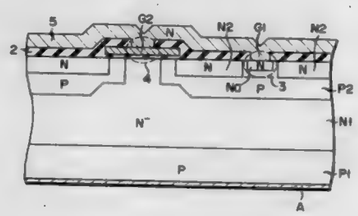
4,635,086

SELF TURNOFF TYPE SEMICONDUCTOR SWITCHING DEVICE

Junichi Miwa, and Minoru Kato, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 28, 1985, Ser. No. 706,615
Claims priority, application Japan, Oct. 8, 1984, 59-209767
Int. Cl.⁴ H01L *29/74*
U.S. Cl. 357—38 **4 Claims**

1. A semiconductor switching device comprising:
a first semiconductor layer of a first conductivity type;
a second semiconductor layer of a second conductivity type adjacent to said first layer;
a third semiconductor layer of the first conductivity type adjacent to said second layer such that a junction between said second and third semiconductor layers is partially exposed at an external surface;
a fourth semiconductor layer of the second conductivity type adjacent to said third layer such that a junction between said third and fourth semiconductor layers is also partially exposed at said external surface;
a first electrode electrically connected to said first layer;
a second electrode electrically connected to said fourth layer;
a first current control gate portion having a rectifying contact and being formed in an area of said third semiconductor layer, such that said first gate portion responds to a voltage of a first polarity for causing non-conduction of said device between said first and second electrodes and does not change the conduction of said device in response to a voltage of a second polarity;



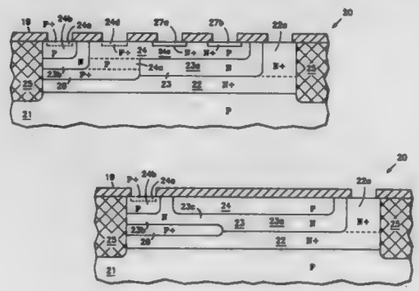
a second voltage control gate portion overlying said junctions between said second and third and between said third and fourth semiconductor layers in said external surface such that said second gate portion causes conduction between said first and second electrodes in response to a voltage of said second polarity and does not change the conduction of said device in response to a voltage of said first polarity; and
a common gate terminal for coupling a control voltage signal to said first gate portion and said second gate portion.

4,635,087

MONOLITHIC BIPOLAR SCR MEMORY CELL

Mark S. Birrittella, Phoenix, and Walter C. Seelbach, Fountain Hills, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 28, 1984, Ser. No. 687,530
Int. Cl.⁴ H01L *29/74, 27/02, 29/72;* **G11C** *11/34*
U.S. Cl. 357—38 **9 Claims**



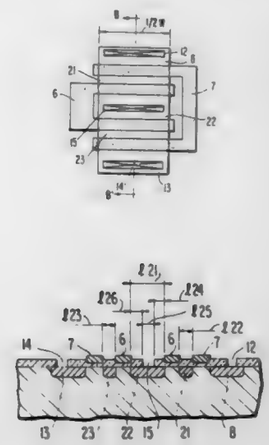
1. A monolithic semiconductor device formed in a monolithic semiconductor body, comprising:
a vertical NPN transistor;
a vertical PNP transistor adjacent to said vertical NPN transistor without an intervening isolation wall;
wherein the collector of said vertical NPN and the base of said vertical PNP transistor are formed in a common N region and connected together within said semiconductor body by a portion of said common N region; and
wherein the collector of said vertical PNP and the base of said vertical NPN are formed in separate P regions which have partially overlapping portions, and wherein the partially overlapping portions are internally connected within said monolithic semiconductor body.

4,635,088

HIGH SPEED-LOW POWER CONSUMING IGFET INTEGRATED CIRCUIT

Hirotugu Eguchi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Japan

Continuation of Ser. No. 240,434, Mar. 4, 1981, abandoned. This application Oct. 17, 1984, Ser. No. 661,837
Claims priority, application Japan, Mar. 10, 1980, 55-29972
Int. Cl.⁴ H01L *29/78, 27/02, 23/48*
U.S. Cl. 357—41 **6 Claims**



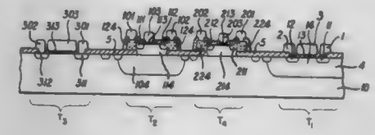
1. A semiconductor integrated circuit comprising a first and a second input terminal, a first insulated gate field effect transistor having a first gate electrode connected to said first input terminal, an output terminal connected to one end of said first transistor, a second insulated gate field effect transistor connected to the other end of said first transistor and having a second gate electrode connected to said second input terminal, a power supply terminal, and means connected between said power supply terminal and said output terminal for supplying electric charges to said output terminal, said first transistor including a first region of one conductivity type formed in a semiconductor substrate of the opposite conductivity type and having first and second sides extending in parallel in one direction, a second region of said one conductivity type formed in said substrate along said first side of said first region, said second region being elongated in said one direction in parallel with and not beyond said first side of said first region, a third region of said one conductivity type formed in said substrate along said second side of said first region, said third region being independently provided of said second region and extending in said one direction in parallel and not beyond said second side of said first region, a portion of said first gate electrode being disposed on a portion of said substrate between said first and second regions via a gate insulator and a remaining portion of said first gate electrode being disposed on a portion of said substrate between said first and third regions via a gate insulator, the both portions of said first gate electrode being connected in common to said first input terminal, said output terminal being connected to said first region, and said second transistor including said second region, a fourth region of said one conductivity type formed in said substrate along such a side of said second region that is opposite to said first region, said fourth region being elongated in said one direction in parallel with said second region with a length equal to that of said second region, a portion of said second gate electrode being disposed on a portion of said substrate between said second and fourth regions via a gate insulator and connected to said second input terminal, said third region, a fifth region of said one conductivity type formed in said substrate along such a side of said third region that is opposite to said first region, said fifth region being elongated in said one direction in parallel with said third region with a length equal to that of said third region, said fifth region being provided independently of said fourth region and a remaining portion of said second gate electrode being disposed on a portion of said substrate between said third and fifth regions via a gate insulator and connected to said second input terminal.

4,635,089

MIS-INTEGRATED SEMICONDUCTOR DEVICE

Masafumi Shimbo, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Continuation of Ser. No. 430,991, Sep. 30, 1982. This application Feb. 19, 1986, Ser. No. 831,063
Claims priority, application Japan, Oct. 28, 1981, 56-172334
Int. Cl.⁴ H01L *27/12, 29/78, 27/02, 29/06*
U.S. Cl. 357—42 **2 Claims**



1. A MIS integrated semiconductor device comprising: one chip having thereon a first MIS transistor comprising an insulating gated field effect MIS transistor having a first channel region of one conduction type comprising a portion of a first well of the one conduction type formed in a substrate crystal of an opposite conduction type to said one conduction type, first source and drain regions of said opposite conduction type formed in said first well, a first gate insulating film on said first channel region and a first gate electrode on said first gate insulating film, and also on the one chip a second MIS transistor comprising a MIS static induction transitor having a second channel region of said one conduction type with an impurity concentration lower than that of said first channel region, second source and drain regions of said opposite conduction type formed in said second channel region in spaced-apart relation along the length direction thereof, a second gate insulating film on said second channel region, and a second gate electrode on said second gate insulating film and having a narrower width in said length direction than the length of said second channel region between said second source and drain regions, wherein said second channel region comprises a solid-phase epitaxial layer grown on a second well of said one conduction type formed simultaneously with said first well or on an elongated portion of said first well and has an impurity concentration determined by the impurity diffusion from said second well or said elongated portion of said first well.

4,635,090

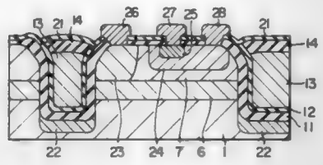
TAPERED GROOVE IC ISOLATION

Yoichi Tamaki; Tokuo Kure, both of Kokubunji; Akira Sato, Hachioji, and Hisayuki Higuchi, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 303,133, Sep. 17, 1981, abandoned. This application May 13, 1985, Ser. No. 733,406
Claims priority, application Japan, Sep. 17, 1980, 55-127987; Jul. 8, 1981, 56-105574; Aug. 19, 1981, 56-128760
Int. Cl.⁴ H01L *27/04, 21/302*
U.S. Cl. 357—50 **23 Claims**

1. A semiconductor integrated circuit device having a plu-

rality of elements formed in a surface region of a semiconductor substrate to be isolated from each other by a groove formed on said substrate, said groove having a gentle slope at its upper side wall to provide a gentle slope at the surface region of the



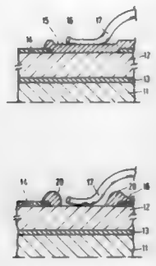
substrate and a steep slope at its lower side wall, and the inside of said groove being filled with an insulating material, wherein the upper and lower slopes of said groove are at about 30° to 65° and 70° to 90°, respectively with respect to the main surface of said semiconductor substrate.

4,635,091

SEMICONDUCTOR DEVICE HAVING OVERLOAD PROTECTION

Bernard P. Roger, Carpiquet, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 10, 1984, Ser. No. 639,642
Claims priority, application France, Aug. 17, 1983, 83 13372
Int. Cl.⁴ H01L *23/48, 27/02, 29/46, 29/62*
U.S. Cl. 357—67 **8 Claims**



1. A semiconductor device comprising a support, a semiconductor body soldered on said support and comprising a surface, metallic connection contact areas on said surface, at least one contact wire connected to one of said contact areas, and means for protecting said device from overloads, at least one of said metallic areas comprising a material capable of forming a eutectic with the semiconductor body formed from an alloy of said material having a melting point whose temperature is lower than the temperature of formation of said eutectic and higher than the temperature of soldering the semiconductor body on its support so that said at least one metallic area will melt prior to the formation of said eutectic upon overload of said device.

4,635,092

TAPE AUTOMATED MANUFACTURE OF POWER SEMICONDUCTOR DEVICES

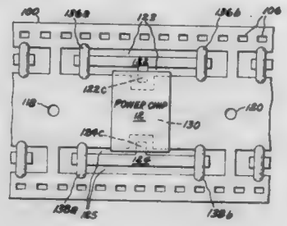
Alexander J. Yerman, and James A. Loughran, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 4, 1984, Ser. No. 616,756
Int. Cl.⁴ H01L *23/48, 23/02;* H02G *13/08;* B22F *3/26*
U.S. Cl. 357—68 **5 Claims**

1. A power semiconductor device comprising:

(a) a metal tape carrier including a series of sprocket holes adapted to be engaged by a drive mechanism for automated movement of said metal tape;

(b) a plate-shaped power semiconductor chip having first and second main current electrodes on first and second major chip surfaces, respectively;



(c) said second main current electrode being bonded to a main current portion of said metal tape; and

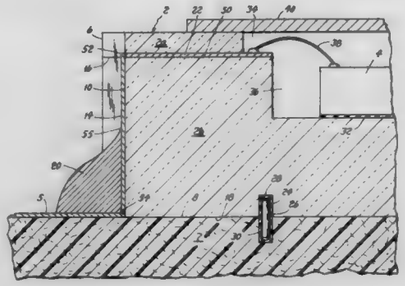
(d) said metal tape carrier comprising a metal having a thermal expansion coefficient no greater than about twice that of said power semiconductor chip.

4,635,093

ELECTRICAL CONNECTION

Arthur L. Ross, Bala Cynwyd, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Jun. 3, 1985, Ser. No. 740,955
Int. Cl.⁴ H01L *39/02;* H02G *13/08;* H01R *9/00*
U.S. Cl. 357—80 **15 Claims**



1. An electrical connection between a surface of a printed circuit-carrying substrate and a leadless carrier for semiconductor chips positioned on said substrate surface, said chip carrier including first and second mutually spaced, substantially parallel carrier surfaces and at least one lateral surface therebetween, said second carrier surface being in contact with said substrate;

a plurality of grooves in said lateral surface extending between said parallel surfaces, each of said grooves including a groove face substantially parallel to said lateral surface;

a metallization layer on each of said groove faces bounded by first and second mutually spaced layer ends, said second layer end being located substantially at said second carrier surface; and

a relatively rigid solder fillet associated with each of said grooves, each of said fillets being fused to said circuit on said substrate surface and to a portion of said layer on the corresponding groove face, said fused layer portion extending from said second layer end to a terminating line positioned short of said first layer end;

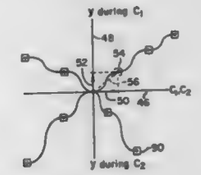
whereby the unfused portion of said layer between said terminating line and said first layer end is capable of flexing to permit said fused layer portion to move relative to said lateral surface substantially without damage to said solder fillet whenever a differential movement occurs between said carrier and said substrate surface due to unequal expansion or contraction of said carrier and said substrate.

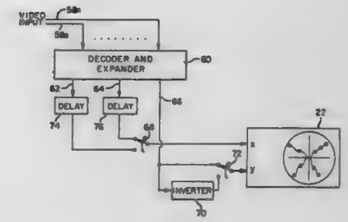
4,635,094

METHOD AND APPARATUS FOR MEASUREMENT OF COMPONENT VIDEO SIGNAL CHARACTERISTICS USING AN OSCILLOSCOPE

Tran Thong, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 19, 1984, Ser. No. 662,718
Int. Cl.⁴ H04N *17/02*
U.S. Cl. 358—10 **14 Claims**





8. An apparatus for measurement of characteristics of a video signal in the form of a luminance component signal and first and second chrominance component signals, each component signal occurring in a succession of discrete segments and each segment of each chrominance component signal being substantially time-coincident with a corresponding segment of the luminance component signal, the apparatus comprising:

(a) display means having a display surface, the display surface having first and second distinct display areas, and the display means being capable of producing in each display area a visual representation of the vector sum of two component vectors that lie along respective coordinate axes of a Cartesian coordinate system, each component vector being representative of the magnitude of a display signal; and

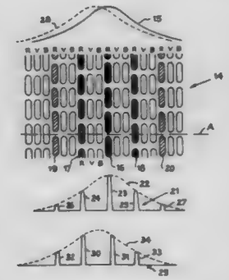
(b) input means for providing the luminance component signal and the first chrominance component signal to the display means as the display signals for the first display area and for providing the luminance component signal and the second chrominance component signal to the display means as the display signals for the second display area.

4,635,095

METHOD FOR MEASURING THE CONVERGENCE OF A THREE-GUN SHADOW-MASK CATHODE-RAY TUBE AND A DEVICE FOR THE APPLICATION OF SAID METHOD

Guy Legrand, Ruff les Echirey, and Michel Faivre, Dijon, both of France, assignors to Videocolor, Montrouge, France

Filed Mar. 21, 1984, Ser. No. 591,749
Claims priority, application France, Mar. 25, 1983, 83 04981
Int. Cl.⁴ H04N *17/02*
U.S. Cl. 358—10 **10 Claims**



8. Apparatus for measuring vertical or horizontal convergence components of a three-gun shadow mask cathode-ray tube, comprising:

means for generating horizontal and vertical bars and a signal for modulating the bars, the modulating signal having a Gaussian distribution waveform, the generating means being connected through a selector to the electron guns of the cathode-ray tube;

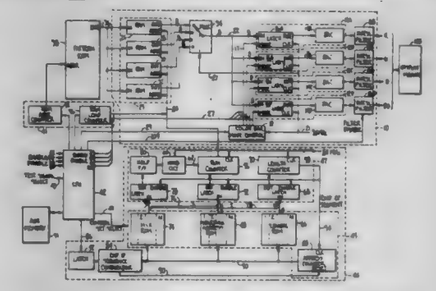
at least one photosensor connected to a computation circuit synchronized with the selector, the computation circuit determining the relative locations of the photocenters of the bars with respect to a reference point of the photosensor, the computation circuit further calculating the mutual distance between the reference point of the photosensor and the locations of the photocenters of the bars.

4,635,096

TEST SIGNAL GENERATOR

Donald E. Morgan, Saratoga, Calif., assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 8, 1983, Ser. No. 483,376
Int. Cl.⁴ H04N *17/00, 17/04*
U.S. Cl. 358—10 **28 Claims**



1. A test signal generator comprising an output terminal;

means for generating a plurality of test signals;

means for selecting one or more of said test signals;

means for memorizing the order of selection of said selecting means;

means for supplying said selected test signals to said output

terminal sequentially in response to said order memorizing means; and

means for controlling said supplying means so as to change the time duration for the continuation of each of said selected test signals.

4,635,097

METHOD AND SYSTEM FOR PROCESSING DIGITAL VIDEO SIGNAL INCORPORATING PHASE-CORRECTION FEATURE

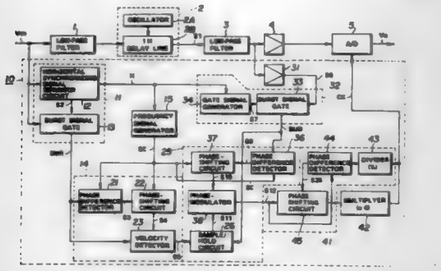
Mitsuhige Tatami, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 11, 1985, Ser. No. 700,733

Claims priority, application Japan, Feb. 14, 1984, 59-25900

Int. Cl.⁴ H04N *7/13*

U.S. Cl. 358—13 **24 Claims**



1. A method for processing a digital video signal including conversion of an analog input video signal into a digital output signal by sampling analog video signal values in response to sampling signals, which method comprises the steps of:

measuring the phase of the analog input video signal at a given timing relative to a reference pulse signal phase and deriving a measured phase difference therebetween;

delaying the input video signal for a given period to obtain a delayed video signal;

measuring possible spurious phase error in the input video signal by measuring the rate of change of the phase difference between the input video signal and said reference pulse signal;

producing a predetermined number of clock pulses in each horizontal line interval, said clock pulses being derived from said reference pulse signal by shifting the phase of every pulse of said reference pulse signal by said measured phase difference so as to be in phase with said input video signal and shifting the phase of each pulse of said phase-shifted reference pulse signal to an extent derived by distributing the measured spurious phase error among the predetermined number of clock pulses for each horizontal line; and

deriving said sampling signals from said clock pulses.

4,635,098

METHOD AND SYSTEM FOR IMPROVED RECONSTRUCTION OF VIDEO IMAGES IN LINE SEQUENTIAL CHROMA FORMAT

Tran Thong, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 9, 1984, Ser. No. 569,434

Int. Cl.⁴ H04N *11/18*

U.S. Cl. 358—14 **30 Claims**

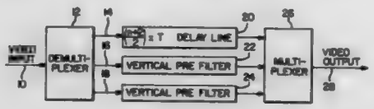
1. A method of operating a television transmitting and receiving system, comprising:

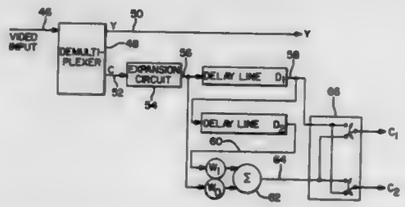
generating a first video signal having a luminance portion representing spatial samples at line frequency of a luminance componant and a chrominance portion representing spatial samples at line frequency of at least one chrominance component, the luminance samples occurring in a succession of time slots and the chrominance samples occurring in the same time slots as corresponding luminance samples,

generating a video signal in line sequential chroma format and having a luminance portion and a chrominance portion, by filtering the chrominance portion of the first video signal to attenuate spatial frequencies greater than one-half of a selected submultiple of line frequency, delaying the luminance portion of the first video signal relative to the chrominance portion thereof by an interval equal to the duration of at least one time slot, selecting samples of said one chrominance component at said selected submultiple of line frequency, and multiplexing the selected chrominance samples with the luminance samples, so that samples of said one chrominance component other than the selected chrominance samples are omitted from the line sequential signal,

transmitting the line sequential signal,

receiving the line sequential signal, and filtering the chrominance portion of the received line sequential signal to reconstruct a segment of said one chrominance component between samples thereof and to attenuate spatial frequencies of the chrominance portion greater than one-half of said selected submultiple of line frequency, the filtering operation being effective to delay samples of said one chrominance component and bring them into coinci-





dence with the corresponding samples of the luminance component.

30. A system for processing an input video signal having a luminance component and at least one chrominance component, comprising:

(a) means for receiving the input video signal and generating a second video signal in line sequential chroma format, the line sequential signal having a luminance portion representing spatial samples of the luminance component at line frequency and a chrominance portion representing spatial samples of said one chrominance component at a selected submultiple of line frequency, the chrominance portion having been filtered to attenuate spatial frequencies greater than one-half the frequency of spatial sampling;

(b) means for impressing the line sequential signal on a medium; and

(c) means for extracting the line sequential signal from the medium and generating a third video signal by filtering the chrominance portion of the extracted line sequential signal to reconstruct a segment of said one chrominance component between samples thereof and to attenuate spatial frequencies of the chrominance portion greater than one-half the frequency of spatial sampling,

the means for generating the second video signal and the means for generating the third video signal being effective

to delay samples of said one chrominance component during filtering of the chrominance portion, and at least one of the means for generating the second video signal and the means for generating the third video signal including means for delaying the luminance portion of the video signal so that the samples of said one chrominance component of the third video signal coincide with the corresponding samples of the luminance component.

4,635,099

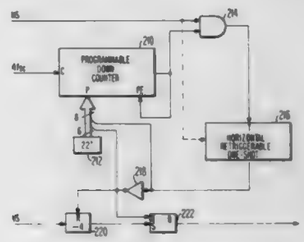
APPARATUS FOR DETECTING NONSTANDARD VIDEO SIGNALS

Warren H. Nicholson, Plainsboro, and Walter E. Sepp, Plainsboro Township, Middlesex County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 4, 1985, Ser. No. 697,907

Int. Cl.⁴ H04N *9/44*, *5/04*

U.S. Cl. 358—17 **18 Claims**



1. In a video signal processing system including a source of composite video signals which may include a color burst signal component and a horizontal synchronizing pulse signal component, and means coupled to said source for developing a clock signal having a frequency substantially proportional to the frequency of said color burst signal, a nonstandard signal detector comprising:

frequency dividing means coupled to said clock signal developing means and responsive to a control signal being in first and second states for alternatively providing one of first and second pulse signals respectively, said first pulse signal having a frequency substantially equal to the average frequency of said horizontal synchronizing pulse signal and said second pulse signal having a frequency significantly different from the average frequency of said horizontal synchronizing pulse signal, the pulse width of said first and second pulse signals being less than twice the period of said clock signal;

means coupled to said source of composite video signals for developing a horizontal pulse signal which is substantially synchronized to said horizontal synchronizing pulse signal component and which has a pulse width that is less than one-half of the period of said color burst signal component; and

coincidence detecting means coupled to said frequency dividing means and to said horizontal pulse signal developing means for generating a control signal for said frequency dividing means that is in said first state when the pulses of the signal provided by said frequency dividing means overlap the pulses of said horizontal pulse signal at least once in a predetermined number of periods of said horizontal pulse signal and that is in said second state otherwise.

4,635,100

DIGITAL AUTOMATIC VIDEO DELAY SYSTEM

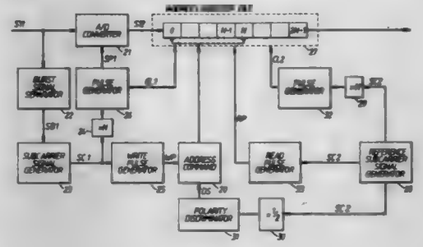
Sauji Hirakawa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Aug. 7, 1984, Ser. No. 638,572

Claims priority, application Japan, Sep. 26, 1983, 58-148584[U]

Int. Cl.⁴ H04N *9/44*, *9/45*

U.S. Cl. 358—19 **4 Claims**



1. A digital automatic video delay system for a television signal comprising:

means for digitizing the television signal with sampling clock signals having a frequency corresponding to an integer N times the frequency of the color subcarrier of the television signal;

a memory having at least two portions, each portion having a number of addresses corresponding to at least the integer N for storing digitized television signals corresponding to at least 2N of the sampling clock signals;

means for generating a reference signal coordinated in phase relationship with the phase of the color subcarrier signal;

means governed by clock signals derived from said reference signal for reading out from memory digitized television signal resident in one of said at least two portions of said memory; and

means for writing said digitized television signal at a write address determined with respect to the phase of the color subcarrier into one portion of said memory at times when said read out means is reading out a digitized television signal from another one of said two portions of said memory.

4,635,101

IMAGE CONVERSION APPARATUS FOR TELEVISION SIGNALS

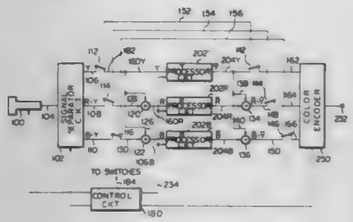
Yoshiaki Nakayama, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 16, 1984, Ser. No. 600,814

Claims priority, application Japan, Apr. 19, 1983, 58-67750

Int. Cl.⁴ H04N *9/74*

U.S. Cl. 358—21 R **17 Claims**



1. Apparatus for use with imaging means that detects an image that is carried on an image recording medium and pro-

duces a first video signal representative of the image, wherein the first video signal includes a composite of a first luminance signal and a first color difference signal, the apparatus receiving the first video signal and converting the first video signal into a second video signal representative of a negative of the image associated therewith, comprising:

first signal conversion means for receiving the composite of the first luminance and color difference signals to produce first separated color signals including a first luminance separated color signal and a first color difference separated color signal;

first signal processor means, operative in response to the first luminance separated signal, for inverting the first luminance separated signal and controlling a level of the inverted first luminance separated signal to produce a second luminance signal;

second signal processor means operative in response to the first separated color signals for inverting the first separated color signals and controlling a level of the inverted first separated color signals to produce second separated color signals; and

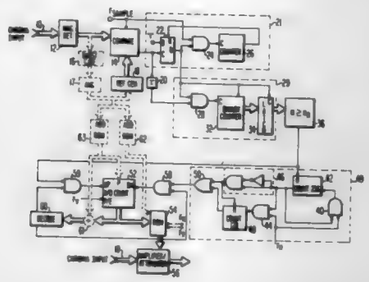
second signal conversion means operative in response to the second luminance and the second separated color signals for producing therefrom a second color difference signal.

4,635,102

CHROMA SIGNAL AMPLITUDE CONTROL APPARATUS

Thomas V. Bolger, Merchantville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 24, 1984, Ser. No. 664,332
Int. Cl.⁴ H04N 9/68
U.S. Cl. 358—27 **14 Claims**



1. A system for developing a chroma gain control signal for sampled data chroma signals including a burst component, comprising:

means for applying said chroma signal;

a source of reference signal;

a source of reference value;

means responsive to said chroma signal for developing an overload signal pulse when the number of chroma signal samples exceeding said reference value in a predetermined time interval exceeds a predetermined number;

means responsive to said reference signal for developing periodic pulses in the absence of overload signal pulses for a predetermined period; and

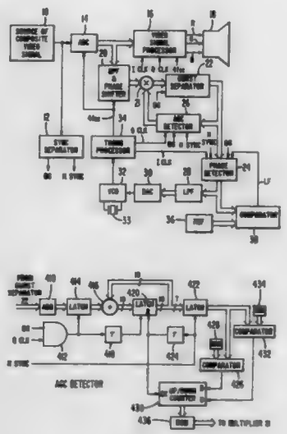
circuitry for developing a range of gain control signals having a first input terminal coupled to the means for developing overload signal pulses, a second input terminal coupled to said means for developing periodic pulses and an output port at which said chroma gain control signal is available, wherein pulses occurring at said first input terminal decrements the value of the gain control signal and pulses occurring at said second input terminal increments the gain control signal.

4,635,103

PHASE LOCKED LOOP SYSTEM INCORPORATING AUTOMATIC GAIN CONTROL

Steven A. Steckler, Clark, and Alvin R. Balaban, Lebanon, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 3, 1984, Ser. No. 677,379
Int. Cl.⁴ H04N 9/68
U.S. Cl. 358—27 **11 Claims**



1. In a sampled data signal processing system including a source of reference signal having a predetermined frequency and phase and a phase locked loop having first and second operational modes for developing a sampling clock signal having an indeterminate phase relationship with said reference signal in said first operational mode and having a predetermined phase relationship with said reference signal in said second operational mode, automatic gain control apparatus comprising:

first means coupled to said source and to said phase locked loop and responsive to said clock signal for developing first and second alternatingly interleaved sequences of samples representing said reference signal;

second means responsive to said first sequence of samples to the substantial exclusion of said second sequence of samples for developing a signal representing the average magnitude of said first sequence of samples; and

third means, coupled between said first means and said phase locked loop and responsive to the magnitude signal provided by said second means, for changing the magnitudes of said first and second sequences of samples by amounts inversely proportional to said average magnitude signal to develop a signal for application to said phase locked loop.

4,635,104

METHOD AND SYSTEM FOR INTERFERENCE SUPPRESSION IN A COLOR TELEVISION SYSTEM

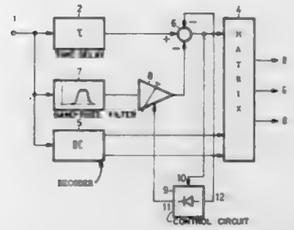
Michael Hausdörfer, Mühtal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 27, 1984, Ser. No. 675,194
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343262
Int. Cl.⁴ H04N 9/78
U.S. Cl. 358—31 **10 Claims**

1. Method of suppressing interference in the luminance channel of a color television decoder, including the step of lowering the amplitude of a portion of the luminance signal, which portion is within the frequency range of the chroma subcarrier,

comprising the steps of

subtracting a controlled portion of the amplitude of a part of the television (TV) signal, which part is within the frequency range of the chroma subcarrier, from the TV signal, to produce a modified TV signal;



rectifying said portion of the luminance signal, which is within the frequency range of the chroma subcarrier, to derive a control signal; and

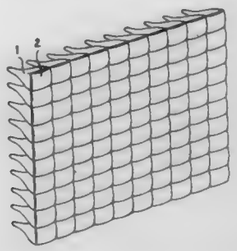
controlling the amplitude, of said controlled portion being subtracted, by said control signal.

4,635,105

LARGE SCREEN VIDEO DISPLAY COMPRISING A MATRIX ARRAY OF CATHODE-RAY TUBES OPERATED AT INCREASED VERTICAL AND HORIZONTAL SCAN RATES

Michel Favreau, Neuilly, France, assignor to Thomson CSF, Paris, France

Filed Jul. 11, 1984, Ser. No. 629,974
Claims priority, application France, Jul. 22, 1983, 83 12175
Int. Cl.⁴ H04N 9/24, 9/16, 5/68; H01Q 1/00
U.S. Cl. 358—67 **6 Claims**



1. A device for displaying a large-size television picture, comprising:

a plurality of cathode-ray tubes placed next to one another to form a matrix of N rows and M columns (N and M being integers greater than 1), each cathode-ray tube containing at least one electron beam which displays a rectangular portion of the picture to be displayed on a luminescent screen;

a plurality of optical devices located adjacent to the luminescent screens, each said optical device being associated with one luminescent screen, said optical devices acting to enlarge the picture portions displayed on the screens in such a manner that the enlarged picture portions appear contiguous in spite of joints between the cathode-ray tubes;

a plurality of picture-portion memories, each said memory being associated with one cathode-ray tube and storing data corresponding to the picture portion displayed on the associated cathode-ray tube;

means for controlling the memories; and

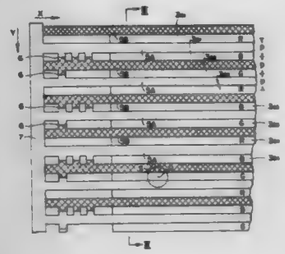
scanning means to display each picture portion with a vertical scan having a period at least N times less than the period of a vertical analysis scan used to analyze an image to be displayed as said large-size television picture.

4,635,106

BEAM INDEX COLOR CATHODE RAY TUBE WITH COLOR-IDENTIFYING PATTERNS OF STRIPES DISPOSED IN BEAM RUN-IN AREA OF DISPLAY SURFACE

Kinya Shinkai, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP83/00304, § 371 Date May 4, 1984, § 102(e) Date May 4, 1984, PCT Pub. No. WO84/01255, PCT Pub. Date Mar. 29, 1984
PCT Filed Sep. 12, 1983, Ser. No. 610,302
Claims priority, application Japan, Sep. 13, 1982, 57-159353
Int. Cl.⁴ H04N 9/24; H01J 29/10, 29/74, 29/56
U.S. Cl. 358—68 **8 Claims**



1. A television receiver characterized in that a plurality of image-displaying fluorescent lines are disposed on a display surface of a cathode ray tube so as to extend along a main-scanning direction of an electron beam, said lines are disposed in a side-by-side relationship in a sub-scanning direction normal to said main-scanning direction, first and second beam detection stripes are alternately arranged on guard band portions that are disposed parallel to and between adjacent ones of said fluorescent lines, said first and second beam detection stripes being so adapted that corresponding first and second beam detection signals can be respectively obtained from said stripes, and in that the position of the electron beam relative to said fluorescent lines is compensated on the basis of said first and second beam detection signals obtained respectively from said first and second beam detection stripes and in that said beam detection stripes are extended outwardly to a beam run-in area of a raster area of said display surface and include color identifying means extending in said sub-scanning direction added to said beam detection stripe portions disposed in said run-in area.

4,635,107

ELECTRON BEAM POSITION CONTROL FOR COLOR DISPLAY

John A. Turner, Colchester, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 20, 1984, Ser. No. 642,222
Int. Cl.⁴ H04N 9/24
U.S. Cl. 358—68 **8 Claims**

1. An arrangement for controlling the position of a scanning electron beam in a cathode-ray tube of the type having a light emitting phosphor coating on an inner surface of a face plate of the tube, comprising

electron gun associated with the cathode-ray tube for producing an electron beam of desired intensity,

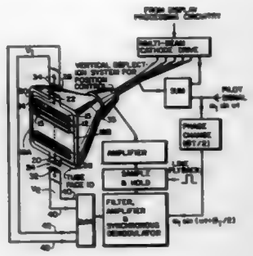
deflecting means associated with the cathode-ray tube for deflecting the electron beam so that the electron beam scans substantially along a predetermined path on the phosphor coating, the phosphor coating emitting light the intensity of which corresponds to a condition of the elec-

tron beam at each point on the phosphor coating along which the electron beam scans,

a series of spaced apart, horizontally disposed, parallel conductive strips adjacent the face plate of the tube, wherein the spaces between said conductive strips coincide with said predetermined path along which said electron beam is to be scanned,

pilot signal means coupled to said electron gun means for modulating said electron beam with a predetermined pilot signal,

detecting means, coupled to said conductive strips, for detecting said pilot signal and for producing a corresponding position control signal in the event said electron beam



deviates from said predetermined path and impinges on one of said conductive strips by an amount greater than the electron beam impinges on an adjacent conductive strip along said predetermined path, said detecting means including means for producing oppositely phased signals in response to the respective impingements on said adjacent conductive strips, the position control signal being equal to the magnitude difference between said oppositely phased signals, and

beam position correction means coupled to said detecting means and to said deflecting means for returning said electron beam to said predetermined path in response to said position control signal.

4,635,108

SCANNER-PREVIEWER COMBINATION INCLUDING A PROGRAMMABLE SAMPLING CIRCUIT FOR PERMITTING AN ENTIRE FRAME OF AN ORIGINAL TO BE STORED IN A FIXED-CAPACITY MEMORY

Nicholas J. Reeber, Hauppauge, and Sheldon J. Kerbel, Merrick, both of N.Y., assignors to 501 Hazeltine Corporation, Commack, N.Y.

Filed Sep. 9, 1983, Ser. No. 531,144

Int. Cl.⁴ G03F *3/10*; H04N *1/04, 1/06, 1/46*

U.S. Cl. 358—76 **12 Claims**

8. An apparatus comprising:

a scanner comprising:

(a) scanning means for scanning an original and providing first signals corresponding to the color content of the original; and

(b) computer means responsive to operator controls for providing adjusted signals corresponding to the first signals;

said apparatus further comprising:

(1) sampling means for sampling the adjusted signals provided by the computer means of the scanner;

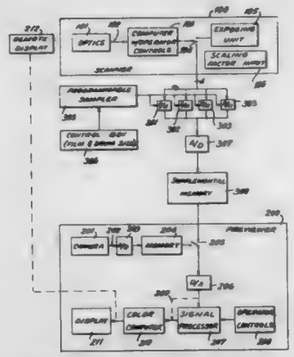
(2) a memory for storing the adjusted signals sampled by said sampling means;

(3) converting means for converting the stored signals into TV signals;

(4) a color computer for adjusting the TV signals so as to produce adjusted TV signals to simulate a printing process;

(5) a display for displaying the adjusted TV signals; and

(6) programmable control means for controlling said sampling means to sample the adjusted signals so that the number of samples produced, per an entire frame of said



original, corresponds to an amount no greater than the storage capability of said memory.

4,635,109

METHOD AND DEVICE FOR REMOTELY IDENTIFYING TV RECEIVERS DISPLAYING A GIVEN CHANNEL BY MEANS OF AN IDENTIFICATION SIGNAL

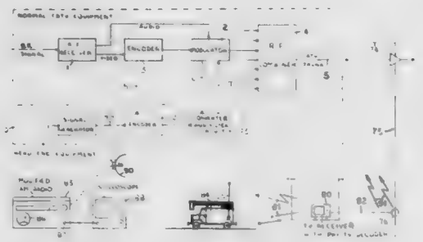
René Cousenu, Alma, Canada, assignor to Cablovision Alma Inc., Quebec, Canada

Filed Oct. 19, 1984, Ser. No. 662,694

Claims priority, application Canada, Jun. 6, 1984, 455985

Int. Cl.⁴ H04N *17/04*

U.S. Cl. 358—84 **24 Claims**



1. In a television system comprising source means for producing a television signal including a video signal and corresponding to a specific television channel, a plurality of television receivers each situated at a respective position remote from said source means, each provided with video reproducing means and each connected to related equipments, and means for transmitting said television signal from said source means to each of said television receivers, a device for remotely identifying television receivers tuned to said channel and displaying said video signal amongst said plurality of television receivers, comprising:

means for generating an identification signal during predetermined time intervals of said video signal;

means for introducing the generated identification signal in said television signal before transmission of this television signal through the transmitting means, said identification signal being therefore transmitted as part of said television signal from the source means to each of said television receivers through the transmitting means, said introducing means comprising means for introducing the identification signal in the television signal so that said identification signal is detected by each television receiver tuned to said channel and displaying said video signal, and applied to the video reproducing means of such a television receiver, the nature of the identification signal being selected so that it is irradiated in the air through said video reproducing means of each television receiver tuned to said channel and displaying said video signal and through at least a part of said related equipments connected to such a television receiver, the video reproducing means of each of said television receivers including a video screen and said predetermined time intervals being selected so that the identification signal is not visible on the video screen of the television receivers tuned to said channel and displaying said video signal when these receivers have a standard adjustment; and

means for detecting the irradiated identification signal, which detecting means comprise means for indicating, when brought in the proximity of one of said television receivers tuned to said channel and displaying said video signal, detection of the irradiated identification signal for the purpose of identifying said one television receiver as a receiver amongst said receivers tuned to said channel and displaying said video signal.

4,635,110

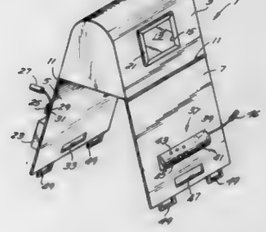
PORTABLE VIDEO AND AUDIO EQUIPMENT HOLDER FOR USE IN AN AUTOMOBILE

Lee S. Weinblatt, 797 Winthrop Rd., Teaneck, N.J. 07666

Filed Sep. 13, 1985, Ser. No. 775,674

Int. Cl.⁴ H04N *7/18*

U.S. Cl. 358—93 **15 Claims**



1. Apparatus for use on the front seat of an automobile to hold a video display device, such as a television set, utilized for viewing by back seat passengers, comprising:

means adapted for resting on the backrest of the front seat and having an opening in a rear surface thereof for securely receiving said video display device, the face of said device being visible through said opening;

a first panel rotatably mounted at one end to the rear surface of said video display device receiving means, said first panel being positioned on the receiving means and sized so that when it is rotated upward it covers the face of said device;

means to secure the video display device receiving means to the automobile;

a second panel rotatably connected at one end to a front surface of said video display device receiving means and including means to securely retain a portable video player therein;

an audio source carried on said first panel; and

power source means for applying electric power to the video display device, the audio source, and the portable video player.

4,635,111

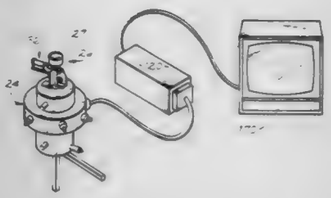
OPTICAL FIBER INSPECTION SYSTEM

Francis W. Moore, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 5, 1985, Ser. No. 720,448

Int. Cl.⁴ H04N *7/18*

U.S. Cl. 358—106 **1 Claim**



1. A remote inspection apparatus for optically inspecting exterior surfaces of objects, comprising:

an enclosure;

at least one inspection head mounted within the enclosure for receiving a supply of objects to be inspected; said inspection head having an object passageway extending downwardly thereinto, through which objects being inspected pass;

collimating means for orienting the objects into a desired orientation for passage through the inspection head;

transparent window means forming a section of said object passageway;

a plurality of lens means arranged circumferentially about the window means for gathering and transmitting light reflected from surfaces of said objects;

a plurality of light guide means receiving an optical image from said lens means and for conveying the optical images therethrough;

a television camera for converting optical images conveyed by the light guide means into electronic signals representative of the optical images;

signal processing means for integrating said electronic signals for producing a singular image of an object;

a television monitor for converting said electronic signal into a visible image representative of surfaces of the objects;

staging means for stationarily positioning an object within said window means so that exterior surfaces of the object can be viewed by the lens means;

light source guides adjacent to the window means for beaming light onto objects positioned upon the staging means;

first singular feed means for supplying objects to said staging means in a singular manner;

second singular feed means below said staging means for holding inspected objects;

at least two exit passageways through which objects can be directed depending upon the outcome of inspection; and

controllable routing means for directing objects into one of said exit passageways.

4,635,112

METHOD AND APPARATUS FOR RECORDING SCRAMBLED TELEVISION SIGNALS

Masao Tomioka, Yamato; Takashi Okada, Yokohama, and Takao Mogi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 24, 1984, Ser. No. 583,318

Claims priority, application Japan, Feb. 28, 1983, 58-32019

Int. Cl.⁴ H04N *7/167*

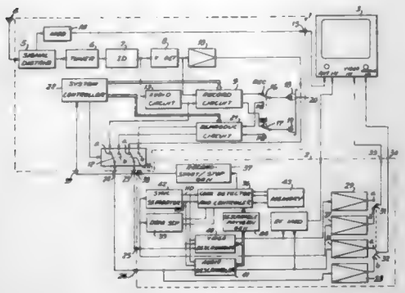
U.S. Cl. 358—122 **18 Claims**

1. Apparatus for automatically recording transmitted scrambled signals including a scrambled video program signal, a descrambling signal transmitted at least at the start of said

scrambled video program signal, and a stop signal transmitted at the end of said scrambled video program signal, the apparatus comprising:

tuner means for receiving said transmitted scrambled signals;

decoder means receiving said transmitted scrambled signals from said tuner means and detecting said descrambling signal and said stop signal for producing a corresponding record start signal in response to an initial detection of said descrabling signal and a corresponding record stop signal



in response to detection of said stop signal, respectively; and

video recording means receiving said transmitted scrambled signals from said tuner means and said record start signal and said record stop signal from said decoder means for automatically commencing recording said transmitted signals from said tuner means upon receiving said record start signal and for automatically stopping recording upon receiving said record stop signal.

4,635,113

APPARATUS FOR DESCRAMBLING TRANSMITTED SCRAMBLED TELEVISION SIGNALS

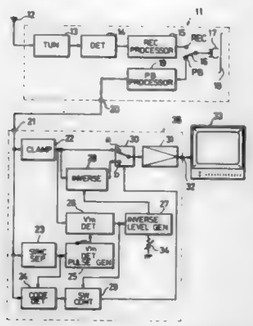
Takashi Okada, Kanagawa; Takao Mogi; Shoji Ohmori, both of Tokyo; Yutaka Tanaka, Kanagawa, and Hiroyuki Kobayashi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 29, 1984, Ser. No. 626,155

Claims priority, application Japan, Jul. 7, 1983, 58-123614

Int. Cl.⁴ H04N *7/167*

U.S. Cl. 358—124 **4 Claims**



1. Apparatus for descrambling transmitted scrambled television signals which include a scrambled video signal having selected fields inverted in polarity about a predetermined turn-up level in accordance with a first scrambling pattern, a scrambled screen control signal transmitted in lieu of said video signal for a predetermined period comprised of a plurality of fields during which adjacent portions of successive fields are alternately inverted about said predetermined turn-up level in accordance with a second scrambling pattern, and descrambling signals including key code signals respectively signifying said first and second scrambling patterns and an identification signal having a level proportionate to said predetermined turn-up level, the apparatus comprising:

monitor means;

means for detecting said key code signals signifying said first and second scrambling patterns and providing corresponding first and second descrambling pattern signals;

means for detecting the level of said identification signal as an indication of said turn-up level of said scrambled video signal and scrambled screen control signal, as received;

means receiving the detected identification signal level for generating therefrom a controlled turn-up level and including control means actuable for adjusting said controlled turn-up level; and

descrambling means including inverting means receiving said controlled turn-up level and being operative in response to said second descrambling pattern signal to selectively reinvert about said controlled turn-up level the inverted portions of the scrambled screen control signal for descrambling the latter and displaying the descrambled screen control signal on the monitor means while said control means is actuated to adjust said controlled turn-up level in the sense for eliminating any flicker from the display, whereupon, said inverting means is made operative in response to said first descrambling pattern signal to selectively reinvert said inverted fields of said scrambled video signal with reference to the adjusted controlled turn-up level for accurate display on said monitor means of the resulting descrambled video signal.

4,635,114

ADAPTIVE TELEVISION TRANSMISSION SYSTEM

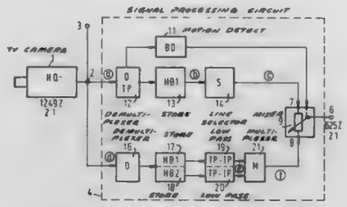
Broder Wendland, Waltrop, and Hartmut Schroeder, Dortmund, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 670,143

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1983, 3341298

Int. Cl.⁴ H04N *7/01*

U.S. Cl. 358—140 **4 Claims**



1. A television transmission system for use in connection with another TV transmission system operating with a standard number of scanning lines per video frame, comprising means for scanning a scene by a line interlace scanning technique at a higher line number than that of the standard video frame, signal processing means coupled to said scanning means and including a motion detector for detecting motion in the picture to be transmitted, said processing means producing, in the presence of scene motion from picture fields scanned at high line number, output picture fields having a line number corresponding to the standard video signal, and in the absence of the scene motion, producing from a single picture field scanned with a high line number, output picture fields having a line number corresponding to the standard video signal.

4,635,115

SYNCHRONOUS SEPARATION CIRCUIT

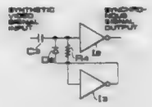
Kiyoshi Kamiya, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1984, Ser. No. 667,801

Claims priority, application Japan, Nov. 4, 1983, 58-207274

Int. Cl.⁴ H04N *5/08*

U.S. Cl. 358—153 **5 Claims**



1. A synchronous separation circuit for a television receiver, comprising:

(a) a first capacitor, one end of which is arranged to receive a synthetic video signal;

(b) a first C-MOS inverter, an input terminal of which is connected to the other end of said first capacitor and one end of a diode;

(c) a first resistor, one end of which is connected to said other end of said first capacitor and the other end of which is connected to an input terminal of a second C-MOS inverter; and

(d) said input terminal of said second C-MOS inverter being connected to the other end of said diode, and an output terminal of said second C-MOS inverter being connected to said input terminal of said second C-MOS inverter.

4,635,116

VIDEO SIGNAL DELAY CIRCUIT

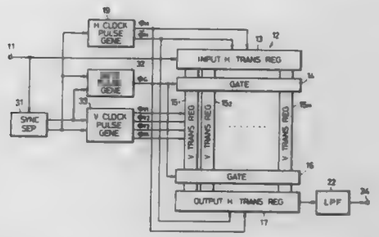
Akira Hirota, Chigasaki, and Takuya Tsushima, Ayase, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 26, 1985, Ser. No. 705,733

Claims priority, application Japan, Feb. 29, 1984, 59-38134; Mar. 6, 1984, 59-43643; Mar. 6, 1984, 59-32627[U]

Int. Cl.⁴ H04N *5/14*; G11C *27/02*

U.S. Cl. 358—160 **16 Claims**



1. A video signal delay circuit comprising:

an input horizontal transfer register serially supplied with an input composite video signal for transferring horizontally every time an input horizontal transfer clock pulse is applied thereto sampled signals obtained by sampling the input composite video signal by the input horizontal transfer clock pulse;

an input vertical transfer gate supplied in parallel with the sampled signals from said input horizontal transfer register, for passing the sampled signals during a time period in which said input horizontal transfer register does not perform a horizontal transfer;

a plurality of columns of vertical transfer registers supplied with the sampled signals from said input vertical transfer gate, each of said columns of vertical transfer registers having a constant number of stages and successively transferring vertically one of said sampled signals supplied thereto every time a vertical transfer clock pulse is applied thereto;

an output vertical transfer gate for gating parallel output signals of said columns of vertical transfer registers;

an output horizontal transfer register for temporarily storing said parallel output signals of said output vertical transfer gate and for transferring horizontally the stored signals every time an output horizontal transfer clock pulse is applied thereto so as to serially produce a delayed composite video signal;

a horizontal transfer clock pulse generating circuit for generating the input and output horizontal transfer clock pulses based on a horizontal synchronizing signal within the input composite video signal and for supplying the input and output horizontal transfer clock pulses to said input and output horizontal transfer registers;

a vertical transfer clock pulse generating circuit for generating the vertical transfer clock pulse based on horizontal and vertical synchronizing signals within the input composite video signal, said output horizontal transfer register producing a composite video signal delayed by M horizontal scanning periods when said vertical transfer clock pulse generating circuit supplies the vertical transfer clock pulse to said vertical transfer registers at a rate of once per one horizontal scanning period of the input composite video signal, where M is a natural number greater than one, said output horizontal transfer register producing a composite video signal delayed by N horizontal scanning periods when said vertical transfer clock pulse generating circuit supplies the vertical transfer clock pulse to said vertical transfer registers at a rate of once per one horizontal scanning period of the input composite video signal and one or more times at specific positions within said N horizontal scanning periods, where N is a natural number less than M; and

a vertical transfer gate pulse generating circuit for generating input and output vertical transfer gate pulses which are in phase synchronism with the output vertical transfer clock pulse of said vertical transfer clock pulse generating circuit based on the horizontal and vertical synchronizing signals within the input composite video signal and for supplying the input vertical transfer gate pulse to said input vertical transfer gate and the output vertical transfer gate pulse to said output vertical transfer gate.

4,635,117

METHOD AND DEVICE FOR LEVEL CORRECTION FOR A TELEVISION IMAGE

Georges Labb, Pontoise, France, assignor to Thomson CSF, Paris, France

Filed May 8, 1984, Ser. No. 608,197

Claims priority, application France, May 11, 1983, 83 07905

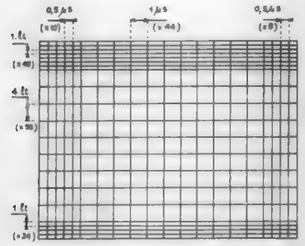
Int. Cl.⁴ H04N *5/14*

U.S. Cl. 358—160 **5 Claims**

1. A method of correcting level defects in a television image, said method comprising the steps of:

dividing the image into a predetermined number of correction points forming a grid of vertical and horizontal bands, said grid having a varying pitch which determines correction points spaced apart from each other at different distances, the length of the pitch of the grid being smaller towards the edges of the image than at the center of the image;

storing correction data for each correction point during an acquistion precedure; and



correcting video frequency signals relating to a correction point by combining them with the correction data stored for the correction point.

4,635,118

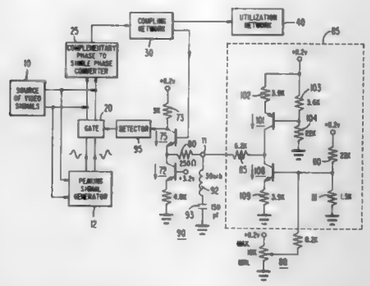
INTERFACE CIRCUIT FOR VIDEO SIGNAL PEAKING CONTROL

Ram S. Batra, Carmel, and Kenneth A. Pitcher, Indianapolis, both of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Jan. 28, 1985, Ser. No. 695,299

Int. Cl.[4] H04N *5/14, 5/208*

U.S. Cl. 358—166 **10 Claims**



1. A frequency selective video signal processor responsive to video signals including high frequency and DC components for developing an output video signal encompassing a given range of video signal high frequency components to the substantial exclusion of video signal DC components, comprising:

a gain controllable amplifier with a signal input responsive to said video signals including said DC component, a control input, and a signal output coupled to a load impedance;

a source of current coupled to said control input of said amplifier for providing operating current for said amplifier;

a filter coupled between said control input of said amplifier and a reference potential, said filter exhibiting a first impedance at DC such that said amplifier exhibits a first gain at DC, and a second impedance at a frequency within said given frequency range such that said amplifier then exhibits a second gain substantially greater than said first gain;

a source of control signal; and

an interface circuit for coupling said control signal to said amplifier, said interface circuit comprising an active current source network with an input coupled to said source of control signal, and a high impedance output coupled to said control input of said amplifier for coupling said control signal to said amplifier to control the conduction thereof.

4,635,119

INTEGRATED CIRCUIT OF A DIGITAL FILTER FOR THE LUMINANCE CHANNEL OF A COLOR-TELEVISION RECEIVER

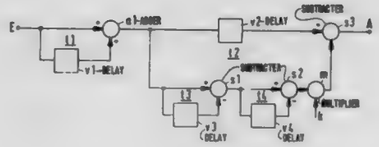
Peotr Baker, Allington, Great Britain, assignor to ITT Industries, Inc., New York, N.Y.

Filed Sep. 24, 1984, Ser. No. 654,635

Claims priority, application European Pat. Off., Sep. 24, 1983, 83109517.9

Int. Cl.[4] H04N *5/21*

U.S. Cl. 358—166 **18 Claims**



1. An integrated digital filter circuit for use in a digital luminance channel of a color television receiver to provide image enhancement (peaking), said circuit comprising:

filter input and output terminals;

a first and second subnetwork is connected in cascade between said filter input and output terminals;

said first subnetwork comprising first input and first output terminals; a first delay element having its input coupled to said first input terminal; a first adder having a first input coupled to said first input terminal and the output of said first delay element; said first adder having its output coupled to said first output terminal;

said second subnetwork comprising second input and output terminals; a third subnetwork having a third input terminal coupled to said second input terminal and having a third output terminal; a fourth subnetwork having a fourth input terminal coupled to said third output terminal and having a fourth output terminal; a multiplier having a first input receiving a factor determining the measure of image enhancement (peaking factor); a second input coupled to said fourth output terminal and having an output; a second delay element having an input coupled to said second input terminal and having an output; a third subtracter having a minuend input coupled to said second delay element output, a minuend input coupled to said multiplier output and having an output coupled to said filter output to deliver the output signal of said digital filter;

said third subnetwork comprising a first subtracter having a minuend input coupled to said third input terminal, having a subtrahend input and having an output coupled to said third output; a third delay element coupled between said third input terminal and said first subtracter subtrahend input;

said fourth subnetwork comprising a second subtracter having a minuend input coupled to said fourth input terminal, having a subtrahend input, and having an output coupled to said fourth output, a fourth delay element coupled between said fourth input terminal and said second subtracter subtrahend input;

said first and second delay elements each providing a delay equal to an integral multiple of four times the period of a chrominance-subcarrier frequency used in said color television receiver.

4,635,120

NOISE REDUCTION CIRCUIT FOR VIDEO SIGNAL

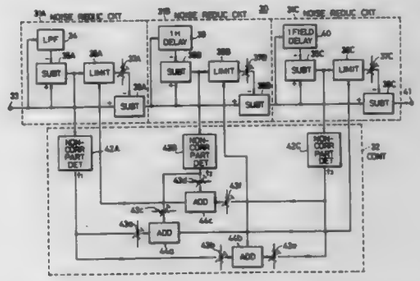
Yutaka Ichinoi, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 12, 1985, Ser. No. 754,628

Claims priority, application Japan, Jul. 13, 1984, 59-145691

Int. Cl.[4] H04N *5/213*

U.S. Cl. 358—167 **5 Claims**



1. A noise reduction circuit for a video signal, said noise reduction circuit comprising:

a plurality of noise reduction circuit parts coupled in series, each of said plurality of noise reduction circuit parts comprising a delay circuit for delaying an input video signal supplied thereto, a first subtracting circuit for subtracting an output signal of said delay circuit from said input video signal, a limiter circuit for limiting the amplitude of an output signal of said first subtracting circuit, and a second subtracting circuit for subtracting an output signal of said limiter circuit from said input video signal and for producing a signal which is reduced of a noise component within said input video signal, said delay circuit in each of said plurality of noise reduction circuit parts having a different delay time in accordance with a kind of correlation existing in information contents of said input video signal; and

a control circuit comprising a plurality of detecting circuits provided in correspondence with said plurality of noise reduction circuit parts and a control signal supplying circuit, each of said plurality of detecting circuits being supplied with the output signal of said first subtracting circuit of a corresponding noise reduction circuit part and detecting large amplitude signal components thereof, said control signal supplying circuit supplying the output signal of said detecting circuit as a control signal to the limiter circuits of the noise reduction circuit parts other than said corresponding noise reduction circuit part,

said limiter circuit in each of said noise reduction circuit parts having an interval between upper and lower limiting levels thereof set to a relatively small predetermined interval, said interval of said limiter circuit in each of said noise reduction circuit parts being widened during a time period in which said control signal is supplied thereto from said control circuit.

4,635,121

ARRANGEMENT FOR THE PROGRAMMABLE CONTROL OF A RADIO AND/OR TELEVISION RECEIVER

Hans Hoffman, Quickborn, and Frank Heubach, Hamburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

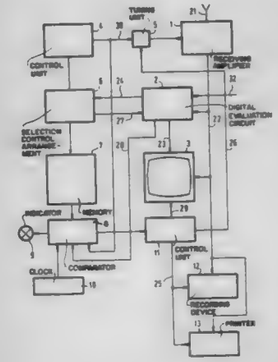
Filed Nov. 21, 1983, Ser. No. 553,730

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1982, 3243610

Int. Cl.[4] H04N *5/50*; H04B *1/16*

U.S. Cl. 358—188 **5 Claims**

1. An arrangement for programmably controlling a radio and/or televison receiver having means for receiving various transmissions, a tuning unit for tuning said receiving means to one of said various transmissions, and a display for displaying said one transmission, said arrangement including a control unit with which a user enters sets of programming data including the dates, times, and transmitters of transmissions to be transmitted in the future, a memory for storing said sets of programming data, a clock for generating identification data including the current data and time, a comparator circuit for comparing the date and time in each set or programming data stored in said memory with said identification data, and a further control unit which, in response to said comparator circuit, causes said tuning unit to tune said receiving means to the transmission corresponding to the set of programming data having the date and time which agree with said identification data, said further control unit also activating said display for



displaying said transmission, characterized in that said programming data further includes priority data and blocking data, both selected and entered by the user via said control unit and stored with each set or programming data in said memory, said comparator circuit comprising means for detecting said blocking data and for preventing said further control unit from activating said display when a set of programming data containing said blocking data includes a date and time which agree with said identification data, and said comparator circuit further comprising intermediate storing means for storing the priority data of the transmission being displayed, said comparator circuit further comparing said intermediately stored priority data with the priority data of another set of programming data having a date and time which agree with said identification data, thereby providing another comparison criterion for said comparator circuit.

4,635,122

IMAGE PICKUP DEVICE OF THE FRAME TRANSFER TYPE AND IMAGE PICKUP ARRANGEMENT USING THE SAME

Toshio Kato; Takao Kinoshita, both of Tokyo, and Akihiko Tojo, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 541,698, Oct. 13, 1983, abandoned. This application Mar. 17, 1986, Ser. No. 842,742

Claims priority, application Japan, Oct. 15, 1982, 57-181809

Int. Cl.[4] H04N *3/14*

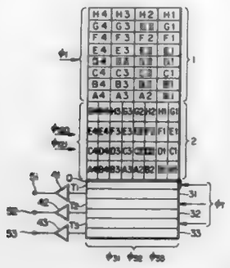
U.S. Cl. 358—213 **23 Claims**

1. An image pickup device of the frame transfer type comprising:

(a) an image pickup array consisting of a plurality of photoelectric converting cells which form rows and columns;

(b) a storage array which consists of a plurality of charge accumulating cells forming rows and columns and is shielded against the light, the number of columns of said

storage array being two or more times the number of columns of said image pickup array; and



(c) register means for sequentially reading out the charges of each row of said storage array.

4,635,123

IMAGE PICK-UP DEVICE FOR USE WITH AN ILLUMINATING DEVICE

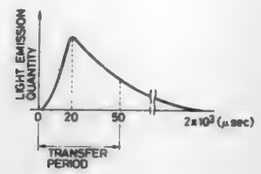
Makoto Masunaga, and Nobuo Tezuka, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1983, Ser. No. 467,368

Claims priority, application Japan, Feb. 26, 1982, 57-31224; Feb. 26, 1982, 57-31226; Feb. 26, 1982, 57-31227; Feb. 26, 1982, 57-31229

Int. Cl.⁴ H04N *3/14*

U.S. Cl. 358—213 **81 Claims**



1. An image pick-up device for use with illuminating means for illuminating an object to be photographed, said device comprising:

(a) photoelectric converting means for converting the image of the object into electrical image information;

(b) memory means for storing therein the electrical image information formed in said photoelectric converting means; and

(c) inhibiting means for inhibiting the illuminating operation of the illuminating means during at least the time the electrical image information formed in said photoelectric converting means is transferred to said memory means.

4,635,124

AUXILIARY FOCUSING CIRCUIT FOR AUTOMATIC FOCUSING CAMERA

Evo Andreatti, Jr., Rheems, and Frank S. Krafka, Mount Joy, both of Pa., assignors to RCA Corporation, Princeton, N.J.

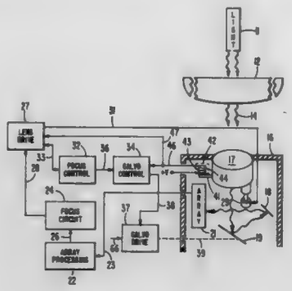
Filed Nov. 26, 1985, Ser. No. 802,228

Int. Cl.⁴ G03B *3/00*

U.S. Cl. 358—227 **4 Claims**

1. An auxiliary focusing circuit for an automatic focusing camera, said camera including a focusing lens, a focusing motor for moving said lens, a focus control circuit and a switch for reversing said motor when said lens fails to focus, said camera being responsive to imaging apparatus including a light responsive imaging medium, and scanning means for scanning light from said camera across said imaging medium, said auxiliary focusing circuit comprising:

control means, responsive to said switch, for providing a control signal upon actuation of said switch; and



drive means, responsive to said control signal for moving said scanning means at least one increment in response to said control signal whereby said lens can focus when said motor reverses.

4,635,125

REAL-TIME LIGHT-MEASURING SYSTEM FOR SINGLE-LENS REFLEX CAMERAS

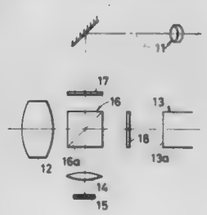
Shin-ichi Mihara; Toshihiro Imai; Kazuo Ikari, all of Hachiouji, and Toru Fujii, Hino, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1985, Ser. No. 724,336

Claims priority, application Japan, Apr. 18, 1984, 59-076562

Int. Cl.⁴ H04N *5/238*

U.S. Cl. 358—228 **5 Claims**



1. A light-measuring system for a single-lens reflex camera, comprising:

a partially reflecting means disposed on the photographing optical axial to split a light coming from an object to be photographed and to lead the split lights toward an image-pickup device having an image-pickup surface of a high reflectivity and toward a view-finder optical system, respectively, said partially reflecting means being a cemented face of a cemented prism constructed as a polarizer by an application thereonto of a thin film coating having a high refractive index; and

a light-measuring means disposed on the optical axis of a light from said image-pickup surface reflected by said partially reflecting means to receive the said light from said image-pickup surface, said light-measuring system further comprising a polarizing plate disposed between said cemented face and said view-finder optical system, and a ¼ wavelength plate disposed between said cemented face and said image-pickup surface.

4,635,126

IMAGE PICK-UP SYSTEM

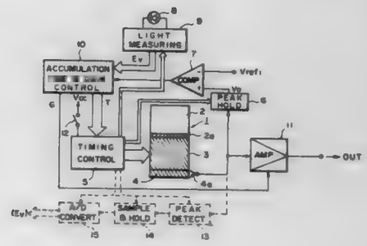
Takao Kinoshita, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 770,011, Aug. 28, 1985, which is a continuation of Ser. No. 449,180, Dec. 13, 1982, abandoned. This application Jan. 3, 1986, Ser. No. 815,793

Claims priority, application Japan, Dec. 18, 1981, 56-205781; Dec. 18, 1981, 56-205782

Int. Cl.⁴ H04N *5/26*

U.S. Cl. 358—228 **24 Claims**



1. A radiation sensing system comprising:

(A) accumulation type radiation sensing means which produces an electrical output corresponding to the accumulation of received radiation over a controlled accumulation time;

(B) processing means for processing the output of said sensing means, said processing means having a variable gain element;

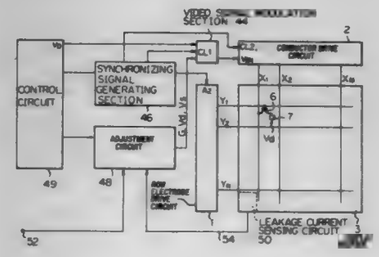
(C) intensity detecting means for detecting the intensity of said radiation received by said sensing means, said intensity detecting means producing an electrical output indicative of the detected radiation intensity;

(D) control means for controlling the accumulation time of said sensing means and said variable gain element in said processing means on the basis of the output of said intensity detecting means;

dark current detecting means for detecting the level of a dark current generated in said sensing means, said dark current detecting means producing an electrical output indicative of the detected dark current level; and

limit means for controlling, on the basis of the output of said dark current detecting means, the upper limit of the controllable accumulation time of said control means.

plurality of row conductors, a plurality of column conductors, an array of picture elements disposed at the intersections of said row conductors and column conductors to form a plurality of rows of said picture elements, each of said picture elements comprising a display element including a data holding capacitance and a switching element coupled to said display element and each of said row conductors being coupled to a set of said switching elements of a corresponding one of said rows of picture elements, for controlling switching operation by said switching elements, each of said switching elements developing a leakage current, said matrix display device further having a source of video data signals, column drive means for applying said video data signals to said column conductors, and row drive means for applying scanning signals to said row conductors for sequentially activating said sets of picture elements to store said video data signals from said column conductors into



corresponding ones of said display elements, with all of said rows of said array of picture elements being successively scanned during each of sequentially repeated scanning field intervals, whereby the polarity of said video data signals applied to said column conductors is periodically inverted with a repetition interval which is shorter than the duration of said each of sequentially repeated scanning field intervals, and further comprising sensing the level of said leakage current of the switching element provided in said array of picture elements, said sensed leakage current level being representative of said leakage currents developed by said switching elements of said array of picture elements, deriving a control signal in accordance with said sensed leakage current, and applying said control signal to adjust the amplitude of said video data signals applied to said column conductors such as to compensate for the effects of leakage currents of said switching elements upon the operation of said display device.

4,635,127

DRIVE METHOD FOR ACTIVE MATRIX DISPLAY DEVICE

Seigo Togashi, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 562,674

Claims priority, application Japan, Dec. 21, 1982, 57-222925

Int. Cl.⁴ H04N *5/70*

U.S. Cl. 358—236 **17 Claims**

1. A method of driving a matrix display device having a

4,635,128

POCKET MACHINERY CABINET

Mitsuru Toyoda, Suwa, Japan, assignor to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1984, Ser. No. 620,790

Claims priority, application Japan, Jun. 29, 1983, 58-117288; Sep. 14, 1983, 58-143106[U]; Feb. 6, 1984, 59-20601

Int. Cl.⁴ H04N *5/74*

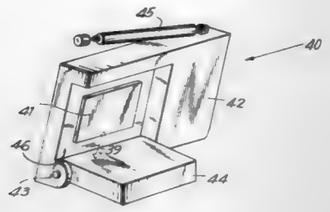
U.S. Cl. 358—236 **34 Claims**

1. A device having a transmissive liquid crystal display member, comprising:

first cabinet means for holding the liquid crystal display member, said first cabinet means having a cavity at its rear, said liquid crystal display member being mounted to said first cabinet means within the cavity so as to be visible from the front of said first cabinet means;

second cabinet means fitting within the cavity and being removable from said cavity;

reflector means on a surface of the second cabinet means,



said reflector means being positioned, when said second cabinet means is removed from said cavity, to reflect ambient light to the liquid crystal display member; and

light transmissive means between the liquid crystal display member and the reflector means for transmitting incident light to the liquid crystal display member;

whereby the removal of the second cabinet means from the cavity in the first cabinet means exposes the liquid crystal display member.

4,635,129

IMAGE SCANNING APPARATUS

Ken Miyagi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1984, Ser. No. 593,353

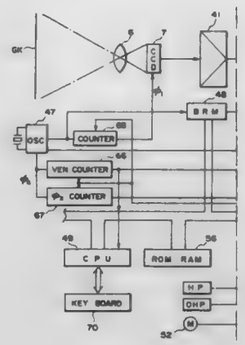
Claims priority, application Japan, Mar. 30, 1983, 58-52744

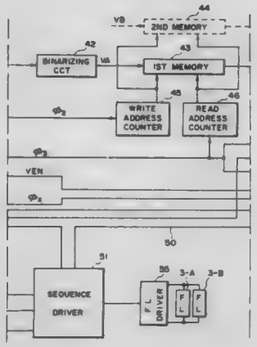
Int. Cl.⁴ H04N *1/04*

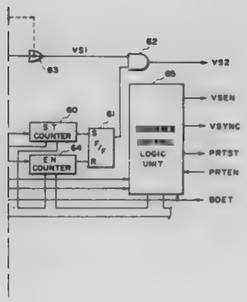
U.S. Cl. 358—285 **15 Claims**

1. An image scanning apparatus comprising:

scan means for scanning an original sheet; measuring means for measuring a time required for said scan means to move from a first position to a second position; and







timing means for determining a start timing of image processing in accordance with the time measured by said measuring means.

4,635,130

IMAGE READING/RECORDING APPARATUS

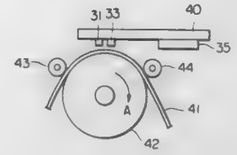
Takato Oi, Tokyo, Japan, assignor to Fumiaki Nukada, Japan

Filed Feb. 8, 1985, Ser. No. 699,634

Claims priority, application Japan, Feb. 11, 1984, 59-24153

Int. Cl.⁴ H04N *1/21, 1/23, 1/04, 1/10*

U.S. Cl. 358—296 **9 Claims**



1. An image reading/recording apparatus comprising

a substrate;

a reading portion formed on one side of said substrate for reading an image on a subject copy and converting said image to image information, said reading portion having a contact-type one-dimensional image sensor consisting of a linear array of a plurality of reading elements, and a plurality of amplifiers having control terminals, inputs and outputs and being switchable between an operating state and a non-operating state by control signals to their control terminals, inputs of said amplifiers being respectively connected to said reading elements;

a recording portion formed on said one side of said substrate for reproducing an image on a recording paper sheet based on image information, said recording portion having a contact-type one-dimensional recording head consisting of a linear array of a plurality of recording elements, and a plurality of amplifiers having control terminals, inputs and outputs and being switchable between an operating state and a non-operating state by control signals to their control terminals, outputs of said recording portion amplifiers being respectively connected to said recording elements and inputs of said reading portion amplifiers;

a selector switch portion formed on said one side of said substrate for scanning said reading portion and recording portion, said selector switch portion having a plurality of switches, each switch having two switch terminals, one of said switch terminals of all of said switchs being connected to respective outputs of said amplifier of said reading portion and the other of said switch terminals of all of said switches being connected to a common data input-/output terminal, said selector switch portion including a shift register having control terminals respectively connected to said switches for repeatedly and sequentially controlling an ON-OFF operation of said switches; and

a first paper feeding roller disposed adjacent said one side of said substrate for feeding either a subject copy or a recording paper sheet past said one side of said substrate.

4,635,131

METHOD OF AND APPARATUS FOR PRODUCING HALFTONE DOT FILM OF GRADATED DENSITY DISTRIBUTION

Shinichi Terada, Toyonaka; Kozo Masuda, Ashiya, and Yoshimitsu Adachi, Osaka, all of Japan, assignors to D. S. Scanner Co., Ltd., Osaka and Dainippon Screen Mfg. Co., Ltd., Kyoto, both of, Japan

Filed Oct. 9, 1985, Ser. No. 785,711

Claims priority, application Japan, Oct. 11, 1984, 59-214600

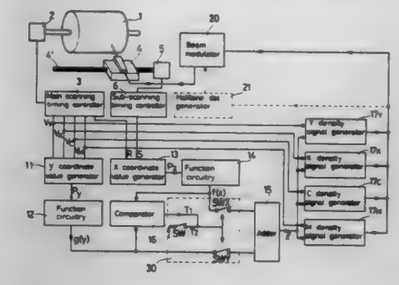
Int. Cl.⁴ H04N *1/21, 1/40*

U.S. Cl. 358—296 **16 Claims**

1. A method of forming a halftone dot on a photosensitive material in correspondence with a density value to be recorded thereon in an image reproduction system, comprising the steps of:

(a) obtaining a signal representative of main scanning (y) and sub-scanning (x) direction coordinate values of a recording position on the photosensitive material;

(b) generating signals representative of functions f(x) and g(y) composing an equation $l=f(x)+g(y)$ corresponding



to a specific figure in accordance with said coordinate value signals, where l is a mediate value;

(c) obtaining the mediate value l by summing the values of the functions f(x) and g(y); and

(d) generating a density signal representative of a density value to be recorded corresponding to said mediate value l.

4,635,132

PRINTER USED FOR A TELEVISION RECEIVER

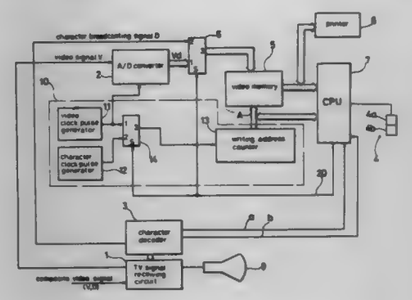
Shunichi Nakamura, Osaka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 5, 1984, Ser. No. 617,603

Claims priority, application Japan, Jun. 8, 1983, 58-103601

Int. Cl.⁴ H04N *1/21, 1/23, 7/08, 1/32*

U.S. Cl. 358—296 **2 Claims**



1. A printer used for a television receiver, the printer comprising:

a television signal receiving circuit for taking video signals from composite video signals including picture and character images;

a cathode ray tube for displaying said video signals in a substantially continuous manner as a series of moving images;

an A/D converter for converting the video signals representative of the picture images into gradation density signals;

a character decoder for taking character broadcasting signals representative of the character images from the composite video signals and decoding same;

a copy key for selectively initiating the printing out of either the picture images or the character images;

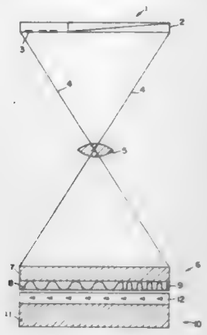
a video memory for storing the gradation density signals or the character broadcasting signals;
a signal selector for selecting either the gradation density signals from the A/D converter or the character broadcasting signals from the video memory, the selection being initiated by the copy key;
a writing address control circuit for delivering address signals to the video memory so as to enable the gradation density signals or the character broadcasting signals to be written in the video memory, the delivering being initiated by the copy key;
a read-out control circuit for reading out the gradation density signals or the character broadcasting signals stored in the video memory; and
a printer for printing out the read-out gradation density signals or the character broadcasting signals without interrupting the series of moving images on the cathode ray tube.

4,635,133

PHOTOGRAPHIC METHOD FOR THE PRODUCTION OF DOCUMENTS

Pierre H. Nys, Berchem, and Leon L. Vermeulen, Herenthout, both of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Dec. 20, 1984, Ser. No. 684,104
Claims priority, application European Pat. Off., Dec. 29, 1983, 83201868.3
Int. Cl.[4] H04N *1/21, 1/23;* **G03B** *27/02*
U.S. Cl. 358—298 **11 Claims**



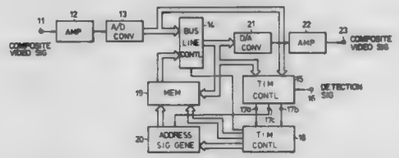
1. Method for the photographic production of a composite reproduction of a continuous tone original and a graphic data pattern original in a single simultaneous photographic exposure stage and developing the images thus produced, which comprises the steps of exposing the continuous tone original to a light source and projecting the thereby image-wise modulated light image through a screen dividing said light-image in dots of varying size onto one area of a photographic light-sensitive material, and simultaneously exposing the graphic data pattern original to the same light source and projecting onto another area of said light-sensitive material the thereby pattern-wise modulated light image through a screen dividing the original halftone pattern in dots of substantially same size within a dot percentage range of 50 to 99%.

4,635,134

VIDEO SIGNAL PROCESSING APPARATUS FOR PROCESSING VIDEO SIGNALS AT THE TIME OF A SPECIAL REPRODUCTION MODE

Kohei Sasamura, Sagamihara, and Junsuke Tokumitsu, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 17, 1985, Ser. No. 692,302
Claims priority, application Japan, Jan. 18, 1984, 59-6488; Jan. 18, 1984, 59-5090[U]; Feb. 27, 1984, 59-27120[U]
Int. Cl.[4] H04N *9/88, 5/94*
U.S. Cl. 358—312 **7 Claims**



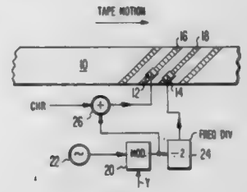
1. A video signal processing apparatus for processing a video signal at the time of a special reproduction mode in which a reproduced video signal is obtained by demodulating a frequency modulated signal reproduced from pre-recorded tracks on a recording medium, said recording medium being moved during said special reproduction mode at such a speed that a relative speed between a reproducing element and said recording medium is different from that at the time of a recording so that the envelope level of the reproduced frequency modulated signal is greater than a predetermined level during a time period which is one track scanning period before a time period in which the envelope level of the frequency modulated signal reproduced from an arbitrary track is smaller than said predetermined level, said video signal processing apparatus comprising:
an analog-to-digital converter for converting a video signal reproduced from said recording medium into a first digital video signal;
a memory at least having a memory capacity for storing said first digital video signal corresponding to one field;
switching means for selectively producing said first digital video signal or a second digital video signal read out from said memory;
first timing control means supplied with said first and second digital video signals and a detection signal which indicates a specific time period in which the envelope level of the frequency modulated signal becomes smaller than said predetermined level for at least generating first and second pulse signals, said first pulse signal having a pulse width corresponding to a predetermined time period made up of the specific time period and a constant time period in a vicinity of the specific time period, said second pulse signal being generated by detecting a relative phase difference between horizontal synchronizing signals of said first and second digital video signals within said constant time period and determining a read-out timing of said memory so that the phase difference decreases;
second timing control means supplied with said first and second pulse signals for causing a read-out from said memory, causing said switching means to selectively produce said second digital video signal, and controlling a read-out timing of said memory by a signal based on said second pulse signal during a first time period approximately corresponding to a pulse width of said first pulse signal, and for causing said switching means to selectively produce said first digital video signal and causing a write-in of said first digital video signal into said memory during a second time period other than said first time period; and
a digital-to-analog converter for subjecting said first or second digital video signal produced from said switching means to a digital-to-analog conversion so as to obtain a reproduced composite video signal.

4,635,135

RECORDING BIAS METHOD AND CIRCUIT

Henry R. Warren, Belle Mead, N.J., assignor to RCA Corporation, Princeton, N.J.

Continuation of Ser. No. 88,563, Oct. 26, 1979, abandoned. This application Jun. 1, 1981, Ser. No. 268,916
Int. Cl.[4] H04N *9/491;* **G11B** *5/03*
U.S. Cl. 358—330 **10 Claims**



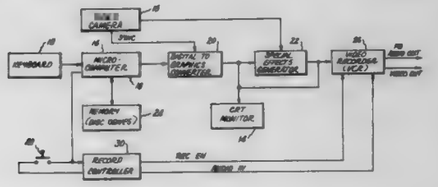
1. A circuit for use with a carrier signal source and for recording first and second signals comprising:
a frequency modulator having first input means for receiving the first signal, a second input means for receiving the carrier signal, and an output means for providing a frequency modulated carrier; a first recording head for receiving a signal in accordance with said modulated carrier; deriving means coupled to said modulator output for deriving from said modulated carrier an alternating current recording bias signal having a frequency that is a multiple substantially greater than one of the instantaneous frequency of the signal applied to said first recording head; an adder having a first input means for receiving the second signal, a second input means coupled to said deriving means for receiving said alternating current recording bias signal, and an output, and a second recording head coupled to said adder output for direct simultaneous recording with said first head.

4,635,136

METHOD AND APPARATUS FOR STORING A MASSIVE INVENTORY OF LABELED IMAGES

John A. Ciampa, Victor, and James T. Robinson, Dobbs Ferry, both of N.Y., assignors to Rochester Institute of Technology, Rochester, N.Y.

Continuation of Ser. No. 577,634, Feb. 6, 1984, abandoned. This application Jan. 13, 1986, Ser. No. 818,070
Int. Cl.[4] H04N *5/785*
U.S. Cl. 358—342 **16 Claims**



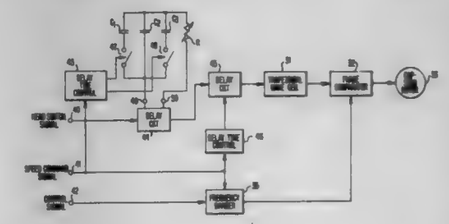
1. The method of gathering a massive visual inventory of different images with the aid of a computer system having digital data processing, storage and display means which comprises storing a data file containing different digital information corresponding separately to said different images, accessing with said data processing means said digital information for a succession of said images, translating said accessed digital information into successive visual displays on said display means displaying human readable information with respect to said images, monitoring said displays, scanning said images with a video camera successively in an order corresponding to the order of the displays of said accessed digital information to produce a sequence of tv signals each for a different one of said images, and producing a video disc record containing a plurality of frames from said tv signals, each image on a different frame of said video disc record.

4,635,137

PHASE CONTROL SYSTEM FOR A VIDEO TAPE RECORDER

Tokikazu Matsumoto, Osaka, and Kouichi Igata, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

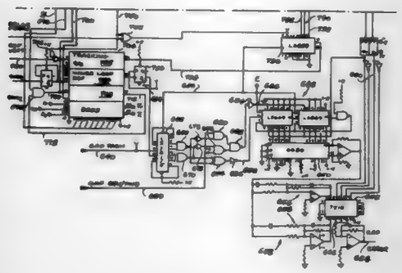
Filed Oct. 4, 1983, Ser. No. 538,926
Claims priority, application Japan, Oct. 6, 1982, 57-175719
Int. Cl.[4] H04N *5/78*
U.S. Cl. 360—10.2 **5 Claims**

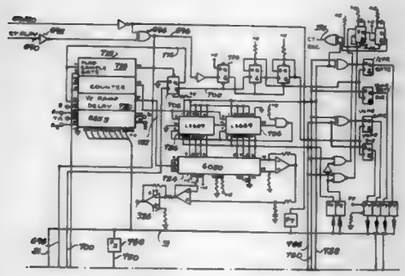


2. A phase control system for a video tape recorder, comprising:
a first delay circuit for delaying one of a head switching signal representing a rotary phase of a rotary cylinder having video heads mounted thereon and a control signal reproduced from a magnetic tape and representing a transportation phase of said magnetic tape;
a second delay circuit for delaying an output signal of said first delay circuit;
a means for producing a speed command signal specifying a reproduction speed of said video tape recorder;
a first delay time control circuit responsive to said speed command signal for controlling said first delay circuit;
a second delay time control circuit responsive to said speed command signal for controlling said second delay circuit; and
a phase control circuit for comparing phases of an output signal of said second delay circuit with the other of said head switching signal and said control signal which is not delayed by said first delay circuit and for controlling a rotary phase of a tape transporting capstan motor of said video tape recorder so as to thereby control the transportation phase of said magnetic tape to allow said video heads obtain an optimum tracking;
wherein said first delay time control circuit controls said first delay circuit in such a manner that delay times of said first delay circuit at double and triple reproduction speeds are substantially $(\frac{1}{2})L_1$ and $(\frac{1}{3})L_3$, respectively, where L_1 is a delay time of said first delay circuit at a normal reproduction speed.

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4,635,138
MICROPROCESSOR CONTROLLED REPRODUCING APPARATUS HAVING ASYNCHRONOUS REPRODUCING CAPABILITY
Kenneth Louth, Los Altos, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Continuation of Ser. No. 364,793, Apr. 2, 1982, abandoned. This application Oct. 2, 1984, Ser. No. 660,453
Int. Cl.⁴ G11B *15/52*
U.S. Cl. 360—10.3 **7 Claims**





5. In a tape transport servo system for a magnetic tape reproducing apparatus of the type in which the longitudinal tape speed is regulated to synchronize a control signal recorded on the tape with a reference signal, apparatus for enabling the reproduction of video information to be selectively expanded or compressed relative to a standard rate of reproduction, comprising:

a programmable counter that receives an input signal having a frequency related to the speed of the tape during said standard rate of reproduction, and that produces said reference signal, said reference signal being delayed relative to said input signal by an amount corresponding to a predetermined number programmed therein; and

means for inhibiting the responsiveness of said counter to said input signal and for programming said counter to produce a reference signal that is at a frequency other than the frequency of said input signal.

4,635,139
ASPERITY BURST WRITER
Son V. Nguyen, Rochester, and James M. Severson, Byron, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 26, 1985, Ser. No. 769,276
Int. Cl.⁴ G11B *5/02, 27/36*; G05F *1/00*
U.S. Cl. 368—25 **3 Claims**

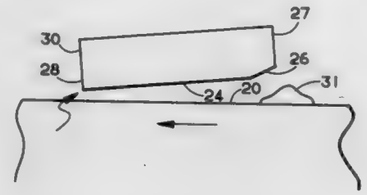
1. Apparatus for testing a magnetic recording surface for asperities comprising

a glide head which travels over the magnetic surface on a film of air;

said glide head being skewed at an acute angle to the magnetic surface track to permit the trailing edge of the slider to first approach each track in the direction of glide head access;

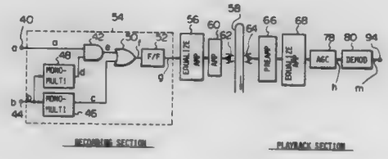
a transducer attached to said glide head and adapted to selectively write on said surface;

non-magnetic detecting means for ascertaining when said glide head overlies an asperity on the magnetic surface; and



means for writing a pattern of data on a portion of the current track beginning when said detecting means indicates that said glide head overlies an asperity, whereby said magnetic surface may be analyzed by examining the asperity that is positioned adjacent the start of a written pattern.

4,635,140
DIGITAL RECORDING/PLAYBACK SYSTEM WITH LIMITED FREQUENCY RANGE
Takashi Uchimi, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan
Filed May 2, 1983, Ser. No. 490,895
Claims priority, application Japan, May 8, 1982, 57-77258; May 8, 1982, 57-77259
Int. Cl.⁴ G11B *5/09*
U.S. Cl. 360—40 **10 Claims**



1. A system for converting an analog signal into a digital signal and recording the digital signal into and reproducing the digital signal out of a recording medium, said system comprising:

original data generating means for generating original data by a digital pulse code modulation of the analog signal;

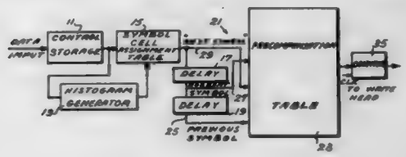
modulating means for modulating the original data to generating a digital signal which has a maximum reversal interval equal to a bit period of the original data and a minimum reversal interval equal to one half the bit period;

frequency selecting means for selecting frequencies for a first frequency component in the digital signal which is equal to the reciprocal of the minimum reversal interval and a second frequency component which is equal to the reciprocal of the maximum reversal interval, such that the playback level of the first frequency component becomes lower than the playback level of the second frequency component; and

performing means operable during reproduction of the digital signal for making the first frequency component in the reproduced digital signal attenuated relative to the second frequency component and removing the first frequency component;

said performing means comprising delay means for delaying the reproduced digital signal and adder means for providing the sum of the delayed signal and the non-delayed signal whereby the first frequency component is suppressed compared to the second frequency component.

4,635,141
METHOD AND APPARATUS FOR STORING DATA ON MAGNETIC OR OPTICAL MEDIA
Douglas Coulter, Chantilly, Va., assignor to United States Design Corporation, Lanham, Md.
Filed Oct. 13, 1982, Ser. No. 433,880
Int. Cl.⁴ G11B *5/09*
U.S. Cl. 360—44 **34 Claims**



1. A method of storing data on a recording medium comprising the steps of:

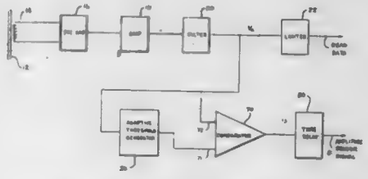
grouping digital binary signals into chucks of N bits wherein N is an integer number greater than 1;

determining the value of each of N bit chunks;

converting said N bit chunks to a corresponding symbol cell, each of said symbol cells having a duration which is dependent upon the value of the corresponding N bit chunk and which is equal to the sum of the minimum transition period for the recording medium and an incremental time period, said incremental time period being directly proportional to the value of said N bit chunk, the maximum duration of said incremental time period being less than the time duration of the minimum transition period; and

recording said symbol cells onto a recording medium.

4,635,142
AMPLITUDE SENSOR WITH ADAPTIVE THRESHOLD GENERATION
Steve E. Haugland, Boulder County, Colo., assignor to Storage Technology Corporation, Louisville, Colo.
Filed Nov. 22, 1983, Ser. No. 554,425
Int. Cl.⁴ G11B *5/02, 5/03*
U.S. Cl. 360—46 **6 Claims**



1. An amplitude sensing system for sensing the presence of a cyclic analog signal produced by a magnetic head as it converts magnetic flux variations on a magnetic recording medium having a predetermined density and speed of recording into electric variations, said system comprising:

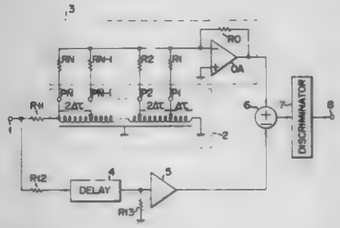
(a) peak detecting means connected to said analog signal for sensing voltage peaks and for providing a first output voltage substantially equal to said voltage signal peaks for a long time period relative to the frequency of said analog signal;

(b) means for generating a threshold voltage proportional to said first output voltage;

(c) first comparator means for comparing said analog signal to said threshold voltage and for producing a second output voltage having first and second levels, said second output voltage changing from said first level to said second level when said analog signal exceeds said threshold voltage, and said second output voltage changing from said second level to said first level when said analog signal becomes less than said threshold voltage, whereby said second output voltage cycles follow said analog signal cycles; and

(d) time delay means for receiving said second output voltage and for generating an amplitude sensor voltage having first and second levels, said time delay means comprised of a NOR circuit receiving said second output voltage, second comparator means including a first resistance-capacitance network coupled to said NOR circuit for determining a drop time period, an inverter coupled to receive the output of said second comparator means, and third comparator means including a second resistance-capacitance network coupled to receive the output of said inverter for determining a pick time period, wherein said amplitude sensor voltage changes from said first level to said second level after a number of cycles of said second output voltage representative of said pick time period, and said amplitude sensor voltage changes from said second level to said first level after a number of cycles of said second output voltage representative of said drop time period.

4,635,143
WAVEFORM EQUALIZER FOR SIGNAL REPRODUCED FROM MAGNETIC RECORDING MEDIUM
Hiroshi Suzuki, Saitama, and Makoto Imamura, Kanagawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 28, 1984, Ser. No. 625,616
Claims priority, application Japan, Jun. 30, 1983, 58-119336; Sep. 29, 1983, 58-181271
Int. Cl.⁴ G11B *5/45, 5/09*
U.S. Cl. 360—65 **15 Claims**



1. A waveform equalizer for equalizing a waveform of a signal reproduced from a magnetic recording medium, comprising:

a tapped delay line having a first end, a second end and at least one tap, said first end being connected to receive the signal;

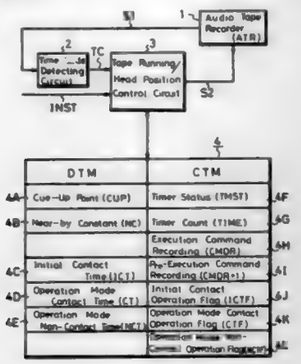
reflecting means, connected to said second end of said tapped delay line, for reflecting at said second end the reproduced signal supplied to said first end; and

weighting means for weighting a voltage at said tap of said tapped delay line.

4,635,144
TAPE RUNNING CONTROL APPARATUS FOR AUDIO TAPE RECORDER

Hideaki Goto, and Ichiro Ninomiya, both of Shinagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP84/00505, § 371 Date Jun. 24, 1985, § 102(e) Date Jun. 24, 1985, PCT Pub. No. WO85/02052, PCT Pub. Date May 9, 1985
PCT Filed Oct. 25, 1984, Ser. No. 749,627
Claims priority, application Japan, Oct. 25, 1983, 58-199554
Int. Cl.⁴ G11B *5/54, 15/22, 27/32*
U.S. Cl. 360—72.2 **2 Claims**



1. A method of tape running control for use with apparatus that reproduces a time code signal recorded on a tape indicitive of an absolute address of the tape thereby to detect a present address of the tape and which has a time code comparing circuit for detecting an address difference between the present address and a desired address, thereby to indicate a desired tape position and a tape running controller for determining a tape running direction and a tape running speed on the basis of an output signal from the time code comparing circuit and a tape run command signal, thereby to transport the tape to the desired address, and a tape head and moving element for placing the tape head into and out of contact with the tape, the method of tape running control comprising the steps of:

transporting the tape in response to an output signal of the time code comparing circuit and the tape run command signal and placing the tape in contact with a head for a predetermined time period;

transporting the tape at a high speed when the address difference, as detected by the time code and comparing circuit, within the predetermined time period is more than a predetermined value and placing the tape in contact with the head intermittently; and

transporting the tape at a low speed within the predetermined time period when the address difference within the predetermined time period is within the predetermined values.

4,635,145
FLOPPY DISK DRIVE WITH STAND-BY MODE

Nobuyuki Horie, Yamatokoriyama; Noriaki Sakamoto, Nara; Toshiaki Fujikawa, and Toshihiro Yamanaka, both of Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 21, 1985, Ser. No. 703,901
Claims priority, application Japan, Feb. 22, 1984, 59-34556
Int. Cl.⁴ G11B *19/00, 21/08*
U.S. Cl. 360—78 **4 Claims**

1. A floppy disk drive control system comprising:

a floppy disk having a plurality of tracks;

floppy disk drive-means for accessing data on said floppy disk;

a floppy disk controller for providing control signals to said drive-means to control the operation thereof;

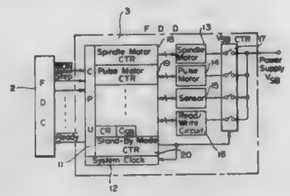
said drive-means including,

a read-write head for performing data reading and writing operations on a designated track of said floppy disk,

a spindle motor for rotating said disk to enable said head to perform said reading and writing operations,

a head-positioning motor for positioning said head over a designated track of said disk,

a CPU responsive to said control signals from said controller for placing said drive-means in a normal mode for performing said reading and writing operations, or in a stand-by mode when no reading or writing operations are to be performed,



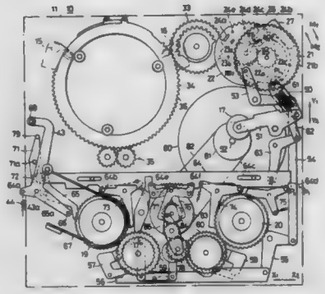
wherein said CPU includes first means for storing the instantaneous track position of said head during the normal mode, and second means for storing the track position of said head at the time of transition from the normal mode to the stand-by mode,

such that after said CPU receives a normal mode control signal from said controller while said drive-means is in the stand-by mode, said read-write head is transferred to a reference track of said disk to reset said first means, and is advanced over said tracks in a stepwise manner until the track positions stored in said first and second means are equal, thus enabling total power shut-off in the stand-by mode.

4,635,146
REEL BRAKE AND ASSOCIATED TENSION ARM CONTROL DEVICE FOR A REVERSIBLE TAPE RECORDING AND/OR REPRODUCING APPARATUS

Kazuo Koda, and Jun Etoh, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 20, 1984, Ser. No. 591,477
Claims priority, application Japan, Mar. 22, 1983, 58-41146[U]
Int. Cl.⁴ G11B *5/027, 5/008, 15/00, 17/00*
U.S. Cl. 360—85 **4 Claims**



1. A reel brake and associated tension arm control device for a reversible tape recording and/or reproducing apparatus which has a stop mode, a forward recording or reproduction mode and a reverse reproduction mode, said reversible tape recording and/or reproducing apparatus comprising a guide drum having at least one head for recording an/or reproducing a signal on and/or from a tape, supply and take-up reel discs engageable with a tape cassette which is loaded in said apparatus, tape guiding means for guiding said tape in a predetermined path in which said tape extends out of said tape cassette and makes contact with said guide drum, driving means for driving said tape in said predetermined path so that said tape moves in a forward direction during said forward recording or reproduction mode and in a reverse direction during said reverse reproduction mode, and braking means for braking said supply and take-up reel discs so that said tape stops during said stop mode, said reel brake and associated tension arm control device comprising:

a tension control mechanism for controlling a tension in said tape, said tension control mechanism comprising a rotary tension arm biased in one direction for making contact with said tape at a tip end of said tension arm and for applying a pressure to said tape at a tension-applied position, and a supply reel disc braking member formed as a part of said braking means for braking said supply reel disc, said supply disc braking member being connected to said tension arm;

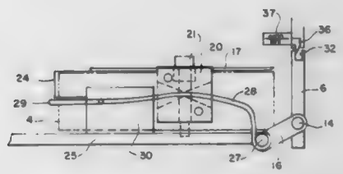
a rotary cam body which rotates to first, second and third rotational positions when said reversible tape recording and/or reproducing apparatus assumes said stop mode, said forward recording or reproduction mode and said reverse reproduction mode, respectively; and

cam and link means engageable with said tension arm and undergoing a displacement responsive to a rotation of said rotary cam body, said cam and link means undergoing a displacement from a first position to a second position when said rotary cam body rotates from said first rotational position to said second rotational position, in response to which said tension arm is displaced in said one direction to said tension-applied position and said supply reel disc braking member is tensioned, said cam and link means undergoing a further displacement from said second position to a third position when said rotary cam body rotates from said second rotational position to said third rotational position, in response to which said tension arm is displaced in the other direction from said tension-applied position to a predetermined recessed position whereby said supply reel disc braking member is simultaneously released from the supply reel disc.

4,635,147
CARTRIDGE LOADING AND EJECTING MECHANISM FOR USE IN A TAPE TRANSPORT SYSTEM

Charles A. Durand, Aurora, and Larry R. Gadsby, Littleton, both of Colo., assignors to Electronic Processors, Inc., Englewood, Colo.

Filed Nov. 25, 1983, Ser. No. 555,183
Int. Cl.⁴ G11B *5/008, 15/00, 17/00*
U.S. Cl. 360—93 **7 Claims**



1. A mechanism for use in a tape transport system for loading a single reel tape cartridge having a drive hub and a tape access door into said transport system and for ejecting said cartridge from said transport system, said transport system having a frame and a hub driving mechanism engageable with said hub of said cartridge supported by said frame, including in combination:

a sleeve adapted to receive a cartridge, said sleeve having an open front portion through which a cartridge can be loaded and ejected, a bottom portion to support a cartridge and defining an open portion to receive said hub driving mechanism, opposed side walls bracketing an open front portion, and a stop carried by said sleeve at a location opposed to said open front portion to limit the movement of a cartridge into said sleeve, said sleeve being vertically movable between a first position for loading and ejecting a cartridge from said sleeve through said open front portion and a second position wherein the hub of a cartridge loaded in said sleeve is located in hub driving engagement with said hub driving mechanism through said open bottom portion of said sleeve;

means for guiding said sleeve between said first position and said second position, said guiding means including a fulcrum, said sleeve guiding means being adjacent said opposed sides of said sleeve and mounted on said frame;

means for positioning said sleeve, said positioning means connected to said opposed sides of said sleeve and located and designed to ride on said guiding means;

a spring to bias said sleeve from said first position to said second position, said biasing spring being connected between said frame and said sleeve positioning means with said biasing spring bearing on said fulcrum of said sleeve guiding means;

means for activating said sleeve biasing spring, said activating means being in said mechanism but located to not make direct contact with a cartridge;

means in said mechanism for releasing said sleeve biasing spring, whereby when said biasing spring is activated said biasing spring bears down on said fulcrum of said sleeve guiding means causing said sleeve guiding means and said connected sleeve to move from its said first position to its said second position, and which, when said biasing spring is released said biasing spring bears up on said fulcrum to return said sleeve positioning means and said connected sleeve from its said second position to its said first position;

means to eject a cartridge from said sleeve; and means for activating said cartridge ejecting means, said ejecting means being associated with said biasing spring and being movable between a first position located at or behind the plane of said stop so that when said sleeve is biased by said spring to its said second position said ejecting means does not exert any force or pressure on a cartridge inserted into said sleeve, and a second position for said ejecting means wherein after said biasing spring is released and said sleeve is returned to its first position said ejecting means can be caused to bear against a cartridge in said sleeve in response to said means for activating said cartridge ejecting means and urge such a cartridge to move through and out of the open front portion of said sleeve.

4,635,148
CASSETTE-RECEIVING DOOR DEVICE FOR CASSETTE TAPE RECORDER

Hiroki Kusaka, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 10, 1984, Ser. No. 648,434
Claims priority, application Japan, Sep. 10, 1983, 58-140416[U]
Int. Cl.⁴ G11B *15/18*
U.S. Cl. 360—96.6 **3 Claims**

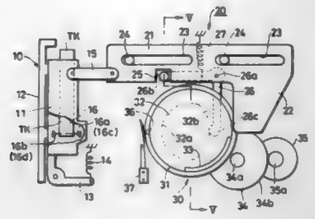
1. A cassette-receiving door device for a cassette tape recorder, comprising:

cassette-receiving means for receiving and holding a magnetic tape cassette, said cassette-receiving means being supported in such a manner that it can be freely opened and closed;

drive means for opening and closing said cassette-receiving section; and

switch means arranged at a lower end of said cassette-receiving section, said switch means detecting the presence of a magnetic tape cassette inserted into said cassette-receiving section, an output signal of said switch means being applied to activate said drive means thereby to automatically close said cassette-receiving section when a cassette has been correctly inserted into said cassette-receiving section;

wherein said drive means comprises a slider mounted to be slidable in a direction perpendicular to a plane of said cassette-receiving means when said cassette-receiving means is in a closed position, said slider having a linear part and a regulating part extending perpendicular to said linear part, said linear part having a locking slot formed in an edge portion thereof; a locking stop level pivotally mounted at a central portion thereof and having first and second arms, said first arm comprising a locking pin en-



gageable with said locking slot, and said second arm having a cam follower at an end thereof; spring means for rotatably biasing said locking stop lever in a direction so as to urge said locking pin in a direction of said locking slot; a rotary member comprising a gear, a cam portion formed coaxially with said gear, a protruding arc formed along a peripheral portion of said rotary member, and an operating protrusion formed on a peripheral portion of said rotary member, said cam follower of said locking stop lever being positioned to be engageable with said cam portion of said rotary member, and said rotary member being mounted at a position where said protruding arc can selectively engage said regulating part of said slider; motor means for rotating said gear; switch means positioned to be operated by said operating protrusion; and circuit means operating in response to outputs of said first-mentioned switch means and said second switch means for driving said motor.

4,635,149

LOADING AND EJECTING MECHANISM IN A RECORDING AND REPRODUCING APPARATUS

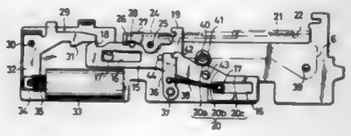
Masao Okita, Furukawa; Kunihiko Gunji, Miyagi, and Yukio Saito, Furukawa, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jun. 15, 1984, Ser. No. 620,912

Claims priority, application Japan, Jun. 15, 1983, 58-90499[U]; Jun. 15, 1983, 58-90500[U]

Int. Cl.⁴ G11B *17/02*

U.S. Cl. 360—97 **8 Claims**



1. A recording and reproducing apparatus for a disk cartridge, comprising:

(a) means including a cartridge holder adapted to hold a disk cartridge for movement between a first position for moving said cartridge into and out of said apparatus and a second position in which a disk cartridge fully inserted in said cartridge holder is moved to engage a magnetic head in said apparatus, said cartridge holder having an insertion end disposed toward a forward end of said apparatus and a distal end disposed toward a rearward end of said apparatus;

(b) means including a load lever mounting said cartridge holder for moving said cartridge holder between said first and second positions;

(c) means including a movable lock member engageable with a distal end of said load lever for holding said cartridge holder in said first position prior to full insertion of said disk cartridge in said cartridge holder;

(d) means including a cam plate resiliently urged by biasing means forwardly in said apparatus and movable rearwardly by abutting engagement with a disk cartridge inserted in said cartridge holder of said apparatus, said cam plate having a first engagement portion;

(e) means including a lock lever in said apparatus having a second engagement portion, said second engagement portion being resiliently moved by said first engagement portion into engagement therewith when said cam plate is moved rearwardly for holding said cam plate in its rearward position when said disk cartridge has been fully inserted in said cartridge holder;

(f) said cam plate having a release member for moving said lock lever to release said distal end of said load lever from engagement with said lock member when said cam plate is moved to its rearward position, thereby allowing said cartridge holder to move to said second position, and a cam surface engaging a member on said load lever for moving said cartridge holder from said second position back to said first position upon movement of said cam plate forwardly for ejection of said cartridge; and

(g) means including a solenoid energizable in response to an eject signal for moving said lock lever to bring said second engagement portion out of engagement with said first engagement portion of said cam plate to allow said cam plate to move forwardly for ejection of said cartridge.

4,635,150

APPARATUS FOR AUTOMATICALLY SELECTING AND REPRODUCING A RECORDING MEDIUM

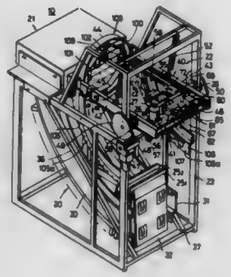
Hiroyasu Kato, Hino, and Hirokazu Denda, Fussa, both of Japan, assignors to Victor Company of Japan Ltd., Yokohama, Japan

Filed Feb. 18, 1983, Ser. No. 467,819

Claims priority, application Japan, Feb. 22, 1982, 57-26994; Mar. 9, 1982, 57-37026; Mar. 12, 1982, 57-34771[U]; Apr. 16, 1982, 57-63665

Int. Cl.⁴ G11B *5/012*

U.S. Cl. 360—98 **3 Claims**



1. A reproducing apparatus for automatically selecting and playing a recording medium, said reproducing apparatus comprising:

a frame;

a reproducing device mounted horizontally with respect to said frame for playing a recording medium loaded therein;

a storing part for storing a plurality of recording mediums in a radial arrangement, said storing part comprising a plurality of chambers each of which stores one of the recording mediums and has an address assigned thereto, said storing part being provided within a predetermined space defined by two parallel vertical planes extending perpendicularly to a horizontal plane passing through said reproducing device and first and second arcuate planes having a common center axis, said first arcuate plane having a radius of curvature less than that of said second arcuate plane, said predetermined space being located within said frame below said horizontal plane;

designating means for designating an address corresponding to one storing chamber out of said plurality of storing chambers;

holding and carrying means including first means comprising an arm structure for carrying said one recording medium to and from said storing part and for loading and unloading said one recording medium into and from said reproducing device and second means for supporting said arm structure for rotation substantially about said common center axis, said first means holding said one recording medium taken out from said designated chamber and moving between said storing part and said reproducing device by undergoing an angular rotation so as to carry said one recording medium and load said one recording medium into said reproducing device, said first means taking out said one recording medium from said designated chamber in a direction toward said common center axis crossing said first arcuate plane and loading said one recording medium into said reproducing device in a substantially horizontal direction away from said common center axis,

said first means further comprising a base movable back and forth along said arm structure, a clamping mechanism mounted on said base for clamping one end of said one recording medium, base moving means for moving said base toward a tip end of said arm structure when clamping said one recording medium within said storing part and when loading said one recording medium into said reproducing device, and for moving said base toward a rear end of said arm structure when extracting said one recording medium from said reproducing device, and a mechanism for angularly rotating said arm structure when carrying said one recording medium between said storing part and said reproducing device,

said holding and carrying means further comprising third means for angularly rotating said clamping mechanism by 180° for reversing a playing side of said one recording medium, a ring-shaped member fixedly mounted at the tip end of said arm structure, and a rotary frame member rotatably fitted within said ring-shaped member for supporting said one recording medium at an end thereof opposite the end clamped by said clamping mechanism, said one recording medium and said rotary frame member being rotated by said third means when reversing the playing side of said one recording medium.

4,635,151

ROTARY ACTUATOR HAVING PRELOADED SPRING CRASH STOP

Henry B. Hazebrouck, Sunnyvale, Calif., assignor to Prism Corporation, San Jose, Calif.

Filed Jan. 25, 1985, Ser. No. 694,704

Int. Cl.⁴ G11B *21/06*

U.S. Cl. 360—105 **7 Claims**

1. A rotary actuator and crash stop assembly comprising

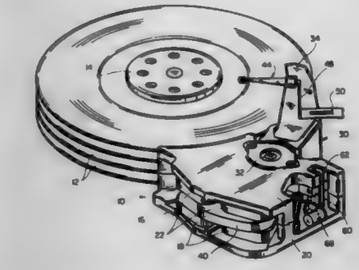
a support structure for supporting a plurality of magnets in spaced relationship and for supporting a pivot block assembly, said support structure including a slot for receiving and maintaining a leaf spring in compression,

a plurality of magnets positioned in said support structure,

a plurality of bearings mounted in said support structure,

a shaft rotatably mounted in said bearings,

a folded leaf spring having two opposing spring arms joined by a base portion, means affixing said base portion to said support structure with said two opposing spring arms positioned in compression in said slot, and



a pivot block assembly mounted on said shaft for rotation therewith, said pivot block assembly including a coil extending from one side of said pivot block assembly and positioned between said plurality of magnets, at least one pickup head support arm extending from the opposite side of the pivot block assembly for positioning pickup heads, and two projecting ears, said leaf spring being positioned between said two projecting ears which engage said compressed leaf spring at the limits of travel of said pivot block whereby said leaf spring functions as a crash stop for said pivot block assembly.

4,635,152

MAGNETIC RESONANCE-TYPE PLAYBACK APPARATUS INCLUDING A MAGNETIC MATERIAL HAVING MAGNETIC ANISOTROPY

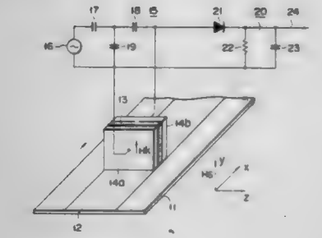
Hitoshi Iwasaki, Tokyo; Shu Chiba, and Norikazu Sawazaki, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 24, 1984, Ser. No. 633,912

Claims priority, application Japan, Jul. 29, 1983, 58-138829; Jul. 29, 1983, 58-138830

Int. Cl.⁴ G11B *5/14*

U.S. Cl. 360—110 **20 Claims**



1. An apparatus for reproducing a signal recorded on a magnetic recording medium, comprising:

a magnetic head having a thin film of magnetic material, said magnetic-material thin film having uniaxial magnetic anisotropy to produce an anisotropic magnetic field in a single direction therein and said magnetic-material thin film being adapted to receive a signal magnetic field resulting from a signal recorded on said magnetic recording

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medium when said magnetic head contacts said magnetic recording medium to reproduce the signal;

high frequency circuit means coupled to said magnetic head for applying a high frequency current to said magnetic head to produce a high-frequency magnetic field in said magnetic-material thin film so as to cause a ferromagnetic resonance in said magnetic-material thin film using at least the anisotropic magnetic field and the high-frequency magnetic field; and

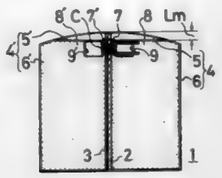
reproducing circuit means coupled to said high-frequency circuit means for reproducing the signal recorded on said recording medium in response to a variation of a high-frequency output signal of said high frequency circuit means resulting from a variation in a high frequency characteristic of said magnetic-material thin film with the signal magnetic field, the high frequency characteristic of said magnetic material thin film depending on the ferromagnetic resonance.

4,635,153

MAGNETIC TRANSDUCER HEAD

Toshiki Shimamura, Yokohama, and Kiyonori Hayakawa, Ebina, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 29, 1983, Ser. No. 527,464
Claims priority, application Japan, Aug. 30, 1982, 57-150323
Int. Cl.⁴ G11B *5/127, 5/187*
U.S. Cl. 360—125 **1 Claim**



1. Magnetic transducer head for perpendicular mode recording comprising:

a main magnetic pole made of a thin film of soft magnetic material; and

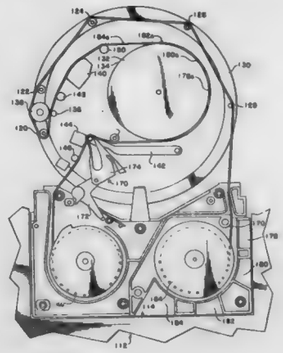
a pair of guard blocks bonded to said main magnetic pole as a unitary body so as to grip said main magnetic pole from both sides thereof, wherein said guard blocks are each formed of a nonmagnetic material portion extended from a magnetic record medium contact surface to a predetermined position, and a magnetic material portion, grooves are formed on bonded boundary surfaces between said nonmagnetic material portions and said magnetic material portions, and spaced from the main magnetic pole by the width of an auxiliary magnetic pole portion, said grooves separating auxiliary magnetic pole portions magnetically connected to said main magnetic pole to become auxiliary magnetic poles of a predetermined width, from return path portions which become the return path of magnetic fluxes from said main magnetic pole, said boundary surfaces between said nonmagnetic material portions and said magnetic material portions diverge away from the plane of said magnetic record medium contact surface and from the plane perpendicular to said main magnetic pole at a pointed portion of said auxiliary magnetic poles adjacent the main pole, said grooves being bridged with said nonmagnetic material portions over a range from said auxiliary magnetic pole portions to said return path portions, and a coil is wound around said main magnetic pole through said grooves.

4,635,154

CLEANING RIBBON AND METHOD FOR CLEANING A VIDEO PLAYER/RECORDER

James D. Allsop, and Elvind Clausen, both of Bellingham, Wash., assignors to Allsop, Inc., Bellingham, Wash.

Filed Dec. 23, 1983, Ser. No. 565,206
Int. Cl.⁴ G11B *5/10, 5/127, 5/41, 23/02*
U.S. Cl. 360—128 **22 Claims**



1. In a cleaning device particularly adapted to clean a drum and playing head of a player/recorder apparatus which has an operating mode in which a magnetic tape is located in a receiving area of the apparatus, and the tape moves relative to the playing head and the drum, said device having a housing adapted to be placed in said receiving area and a cleaning ribbon which is capable of being wetted and which is mounted to said housing and has an outer back surface and an inner contact surface which, in a cleaning mode of said device, comes into frictional cleaning engagement with at least said drum, with the contact surface and the head moving relative to one another in a cleaning action,

an improvement comprising:

said ribbon having a lengthwise axis and a contact surface plane which is parallel to said lengthwise axis and at which said ribbon contacts said drum, said ribbon comprising a plurality of first raised sections and second recessed sections, extending across said lengthwise axis, which sections are positioned alternately with respect to one another in parallel planes, each of said first sections having a planar inner cleaning surface portion which is positioned in said contact surface plane, each of said second sections being contoured relative to adjacent ones of said first sections in a manner that an inner surface portion of each of said second sections is spaced outwardly from the inner cleaning surface portions of the adjacent first section;

whereby, when said cleaning ribbon has a cleaning solution applied thereto, and is placed into frictional cleaning engagement with said drum, said cleaning ribbon exerts a relatively smaller resisting frictional force against said drum in comparison with a ribbon having a substantially uniform contact surface.

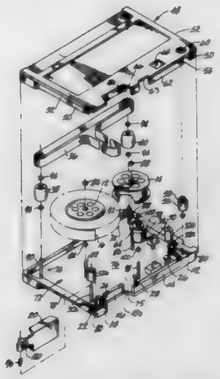
4,635,155

MAGNETIC TAPE CARTRIDGE WITH INCREASED DATA TRACK PACKING DENSITY

Harold H. Georgens, Rancho Santa Fe, and Dean L. Christensen, Vista, both of Calif., assignors to Data Electronics, Inc., San Diego, Calif.

Filed Sep. 19, 1983, Ser. No. 533,640
Int. Cl.⁴ G11B *15/32;* G03B *1/04*
U.S. Cl. 360—132 **12 Claims**

1. Apparatus for increasing the data recording track packing density in a belt-driven tape cartridge of the type which includes a cartridge housing, a pair of reels in the housing for holding a magnetic tape, an endless belt extending around portions of the tape carried on the reels, and a belt-driving roller for engagement with a drive capstan of a tape transport for driving the belt to move the tape past a magnetic read/write head in the tape transport and in contact with a portion of the tape in the cartridge housing, in which the cartridge housing comprises a base plate joined to a cover plate for forming the cartridge housing, opposing side flanges extending at an intermediate elevation along opposite sides of the cartridge housing, in which opposing upper grooves extend along opposite side walls of the cover plate at an elevation above the side flanges, in which the side flanges extend along opposite



side walls of the base plate, and in which opposing lower recessed regions extend along the opposite side walls of the base plate below the side flanges, the side walls of the cover plate and the base plate being juxtaposed when the two plates are joined to form the cartridge housing, and in which the lower recessed regions of the base plate extend along opposite sides of a stepped down wall portion of the base plate for providing sufficient depth to the internal spacing within the cartridge housing below the side flanges of the housing for permitting the tape contained within the housing to be greater than ¼ inch in width, the tape being wound on reels within the cartridge housing of sufficient width to accommodate the width of the tape.

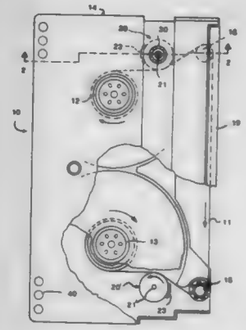
4,635,156

CLEANING CASSETTE FOR MAGNETIC TAPE APPARATUS

Stéphane d'Alayer de Costemore d'Arc, Brussels, Belgium, assignor to Staar, S.A., Brussels, Belgium

Filed Aug. 24, 1983, Ser. No. 526,122
Claims priority, application Belgium, Sep. 13, 1982, 209004; Sep. 13, 1982, 209006
Int. Cl.⁴ G11B *5/41;* A47K *7/02*
U.S. Cl. 360—132 **7 Claims**

1. A cleaning cassette including a cassette housing, a pair of reel hubs mounted in said housing, a tape connected to be driven between said reel hubs, a source of cleaning liquid including roller means rotatably supported in said housing to contact the tape and having a core of absorbent material, and means for applying liquid from said source to wet a surface of said tape intermittently including absorbent material exposed only on a portion of the surface of said roller to contact the tape and apply liquid received from the core to intermittent portions of the tape as the tape is continuously driven from one of the reel hubs to the other, said cassette housing having an



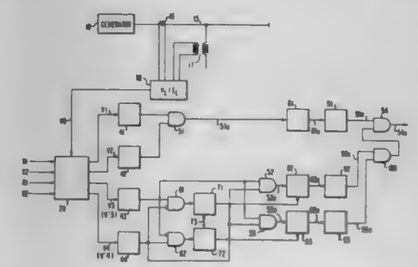
opening permitting the introduction of cleaning liquid to said core.

4,635,157

GENERATOR PROTECTING RELAY

Toshinobu Ebisaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1985, Ser. No. 693,901
Claims priority, application Japan, Jan. 27, 1984, 59-11882
Int. Cl.⁴ H02H *7/06*
U.S. Cl. 361—20 **10 Claims**



1. A protective relay protecting an electrical generator having terminal voltage and current and being of the type characterized by output performance limit curves, said protective relay having an operational boundary matched substantially to the output performance limit characteristics of said generator to enhance the protection thereof, said protective relay comprising:

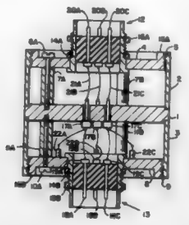
first means for generating a signal representative of a discriminating impedance based on measurements of said generator's terminal voltage and current;

second means for generating a plurality of vector signals based on said generated discriminating impedance signal and a representation of said output performance limit curves of said generator; and

means for determining when said generator is generating beyond its output performance limit characteristics based on a function of said plurality of vector signals.

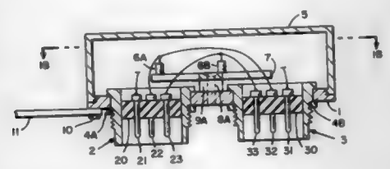
VOL 1074 ISS 1 JA 6 1987 UMI

4,635,158
FILTERING TRANSIENT VOLTAGE SUPPRESSION DEVICE ASSEMBLY
Leon H. Riley, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Nov. 22, 1985, Ser. No. 801,024
Int. Cl.[4] H02H 9/04
U.S. Cl. 361—111 **6 Claims**



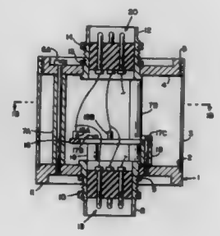
1. A filtering transient electrical suppression device comprising first, second and third electrical conductive plates; first and second enclosure means attached to said plates so as to create at least one protected enclosure between said plates; said enclosure means electrically connecting said plates; at least one connector having an electrical path passing from outside said enclosure through said first plate to inside said enclosure and back outside through said third plate; filter means equal in number to the number of conductors for protecting against transient rate of rise and fall current flow; said filter means being mounted to said second plate; and each filter means being electrically connected respectively to one conductor inside said enclosure so as to prevent transient electrical energy in the conductor from passing outside the device by way of the conductor when a transient condition occurs.

4,635,159
TRANSIENT VOLTAGE SUPPRESSION DEVICE ASSEMBLY
Leon H. Riley, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Sep. 23, 1985, Ser. No. 778,941
Int. Cl.[4] H02H 9/04
U.S. Cl. 361—111 **5 Claims**



1. A transient over-voltage suppression device comprising an electrical conductive plate; first and second openings in said plate; cover means attached to said plate so as to create a protected enclosure between said plate and cover; an electrical conductive base positioned in said enclosure and being electrically connected to said plate; at least four connectors having individual electrical conductive paths passing from outside said enclosure through the first opening in said plate to inside said enclosure and back through the second opening in said plate to outside; voltage protection means equal in number to the number of conductors for protecting against transient voltage; said protection means having first and second electrical sides and being mounted to said base such that the first side is electrically connected to said base; and the second side of each protection means being electrically connected respectively to a different conductor inside said enclosure so as to shunt electrical energy from the conductor to the base when an over-voltage occurs.

4,635,160
TRI-PLANE TRANSIENT VOLTAGE SUPPRESSION DEVICE ASSEMBLY
Leon H. Riley, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Nov. 12, 1985, Ser. No. 797,345
Int. Cl.[4] H02H 9/04
U.S. Cl. 361—111 **4 Claims**

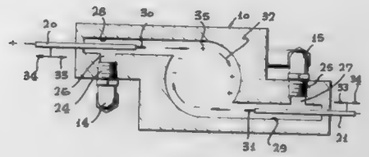


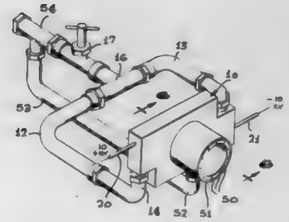
1. A feed-through transient over-voltage suppression device comprising first and second electrical conductive plates; enclosure means attached to said plates so as to create a protected enclosure between said plates; an electrical conductive base positioned in said enclosure and being electrically connected to at least one of said plates; a plurality of connectors passing from outside said enclosure through said first plate to inside said enclosure and back outside through said second plate; a plurality of voltage protection means equal in number to the number of conductors for protecting against transient voltage; said protection means having first and second electrical sides and being mounted to said base such that the first side is electrically connected to said base; and the second side of each protection means being electrically connected respectively to a different conductor inside said enclosure so as to shunt electrical energy from the conductor to the base when a transient voltage occurs; thereby preventing electrical energy from feeding back outside through said second plate.

4,635,161
DEVICE FOR REMOVING STATIC CHARGE, DUST AND LINT FROM SURFACES
Allan D. Le Vantine, 18225 Rancho St., Tarzana, Calif. 91356
Filed Nov. 4, 1985, Ser. No. 794,773
Int. Cl.[4] H05F 3/06
U.S. Cl. 361—213 **10 Claims**

1. A static charge eliminating and dust and lint eliminating device comprising:
- a housing means for enclosing and containing elements of the device having connection means for gas or air lines and means for the introduction of a positive high voltage cable and a negative high voltage cable and having an opening means for the exit of static and dust and lint eliminating gas or air,
- a vortex forming means with ducting connecting to a compressed air or gas source and a chamber means within which the vortex is formed and within which positive charged air or gas and negative charged air or gas are formed into separate concentric axially aligned streams that form helices within the vortex and whereby said helices are made to interlace such that the vortex is made up of alternate bands of positive and negative air or gas

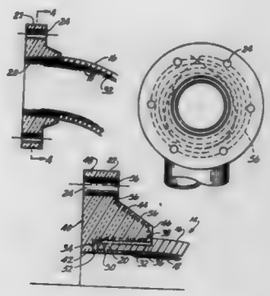
and having an opening through which the vortex exits the chamber and flows into the adjacent atmosphere,
- a metering means for reducing the air or gas flow to the vortex forming means,
- a positive ionizing means for ionizing air or gas located within the vortex forming means, said positive ionizing means being connected by an electrical conductor to a positive high voltage source,





- a negative ionizing means for ionizing air or gas located within the vortex forming means, said negative ionizing means being connected by an electrical conductor to a negative high voltage source,
- an adjustment means for varying the degree of ionization of the air or gas entering the vortex forming chamber.

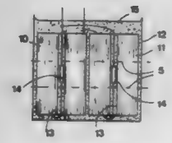
4,635,162
CONDUCTIVE FLANGES FOR PIPE FITTINGS
Hugh T. McLaughlin, Santa Ana, Calif., assignor to Ameron, Inc., Monterey Park, Calif.
Filed Nov. 8, 1985, Ser. No. 796,275
Int. Cl.[4] H05F 3/02
U.S. Cl. 361—215 **5 Claims**

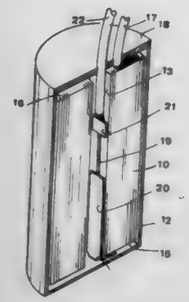


1. A conductive flange adapted to be secured to a conduit end to ground static electrical charges comprising:
- a body of non-conductive material having an axial bore to receive the conduit end and an annular im including a plurality of holes to receive electrically conductive bolts for coupling to a like body;
- at least one strand of conductive yarn incorporated into said body, said yarn disposed at the bore to be in conductive contact with the conduit and extending to said rim to be in conductive contact with at least one of the said bolts; and means for grounding said one bolt such that the yarn and conduit will be grounded to carry away static charges.

4,635,163
SELF-REGENERATING CAPACITOR PROTECTED BY ATHERMAL CIRCUIT-BREAKER AND A PROCESS FOR ITS MANUFACTURE
Franz Vogiaire, Braine L'Alleud, Belgium, assignor to Asea Jumet Societe Anonyme, Jumet, Belgium
Filed May 8, 1985, Ser. No. 732,037
Claims priority, application European Pat. Off., May 8, 1984, 84200653; May 22, 1984, 84870064; Apr. 2, 1985, 85870049
Int. Cl.[4] H01G 1/11
U.S. Cl. 361—275 **17 Claims**





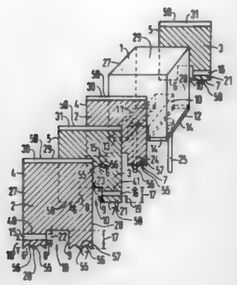


1. A self-regenerating capacitor comprising:
- a plurality of insulating strips having lateral edges;
- a plurality of metallized strips mounted on said insulating strips, said metallized strips having plural zones, the thickness in each zone being varied as a function of the distance of each zone from said lateral edges of said insulating strips, wherein said insulating and metallized strips are rolled to form a coil having first and second end faces, and wherein a mean thickness of said metallized strips decreases toward said lateral edges to leave a median zone of metallization of normal thickness located at a predetermined distance from said lateral edges of said insulating strips;
- contact electrodes applied to said first and second end faces of said coil; and
- a thermal circuit breaker disposed along an axis of said coil positioned at said predetermined distance, said thermal circuit breaker being electrically connected to said contact electrodes.

4,635,164
ELECTRICAL CAPACITOR AND METHOD FOR THE MANUFACTURE THEREOF

Reinhard Behn, Munich, and Ferdinand Utner, Regensburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 19, 1986, Ser. No. 841,262
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510518
Int. Cl.⁴ H02B *1/04*; H01G *13/06, 4/08*
U.S. Cl. 361—306 **20 Claims**

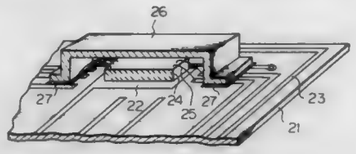


1. An electrical capacitor, comprising:
a consolidated stack formed of a plurality of dielectric layers layered on top of one another, said dielectric layers being composed of plastic films;
two projections formed in said stack by an incision in the direction of the thickness of said stack perpendicular to said dielectic layers and substantially in the center of one side thereof;
metal layers formed by metal spraying on at least an end surface of said two projections;
a metal coating composed of regenerably thin layers of valve metal and covering one surface of each of said dielectric layers, said metal coatings on alternate layers extending to alternate ends of said two projections to contact said metal end surface layers and form antipolar coatings, said metal coatings extending substantially to the edges at the longitudinal sides of said dielectric layers;
said metal coatings defining metal-free insulating strips alternating from dielectric layer to dielectric layer on said two projections, said metal-free insulating strips forming remaining metal strips at the ends of said two projections, and said incision having a depth greater than said remaining metal strips;
alternating first ones of said dielectric layers having wave cut edges at the ends of said two projections and smooth cut edges at a side opposite said wave cut edge, said wave cut edges forming wave hills and wave valleys; and
alternating second ones of said dielectric layers having smooth cut edges at the ends of said two projections and at a side opposite said two projections, said second ones of said dielectric layers being offset from said first ones of said dielectric layers to dispose said smooth cut edges at said two projections between said wave hills and said wave valleys of said wave cut edges.

4,635,165
PRINTED-CIRCUIT CONSTRUCTION WITH EPROM IC CHIP MOUNTED THEREON

Hiroshi Okuaki, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1984, Ser. No. 676,402
Claims priority, application Japan, Nov. 30, 1983, 58-224393
Int. Cl.⁴ H05K *7/06*
U.S. Cl. 361—400 **3 Claims**

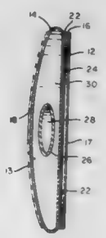


1. A printed-circuit construction comprising:
(a) an insulating glass epoxy resin baseboard having heat-resistant characteristics and having on a primary surface thereof a conductive chip support region and a plurality of conductive wiring patterns;
(b) an EPROM IC chip having a plurality of pad electrodes on the surface thereof and fixed on said chip support region of said insulating baseboard with an electrically conductive adhesive;
(c) a plurality of thin metal wires each which connects each pad electrode of said EPROM IC chip with each of said electrically conductive wiring patterns; and
(d) a hollow cap made of a material capable of transmitting ultraviolet rays therethrough and fixed on said primary surface of said insulating baseboard with a synthetic resin adhesive so as to cover said EPROM IC chip and said thin metal wires.

4,635,166
CHEMICAL EMERGENCY LIGHT

Robert W. Cameron, 7725 115th Pl. NE., Kirkland, Wash. 98033

Filed Aug. 28, 1985, Ser. No. 770,630
Int. Cl.⁴ F21K *2/00*
U.S. Cl. 362—34 **20 Claims**

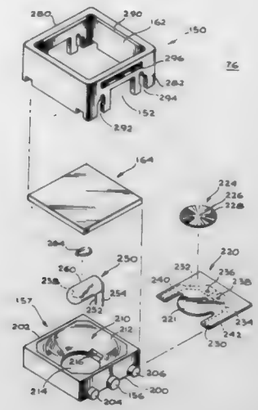


1. A directional, light emitting chemiluminescent safety light, comprising:
a base having a planar light reflective surface;
a substantially transparent, resilient outer wall connected to the base to a side outward of the reflective surface and forming with the base a fluid-tight outer compartment for a two-component chemiluminescent system;
a breakable, fluid-tight inner compartment within the outer compartment containing the first chemical component; and
a second chemical component within the outer compartment and external to the breakable inner compartment whereupon deformation of the outer wall breaks the inner compartment and mixes the chemical components, a portion of the light produced being reflected off the reflected surface and transmitted through the outer wall.

4,635,167
LOW PROFILE LAMP ASSEMBLY

Mark S. Schlosser, Seattle, Wash., assignor to Bell Industries, Inc., Redmond, Wash.

Filed May 13, 1985, Ser. No. 733,698
Int. Cl.⁴ F21V *33/00*
U.S. Cl. 362—85 **15 Claims**

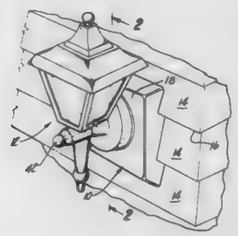


1. A low profile lamp assembly comprising:
a flat translucent chip having front and rear faces;
reflector means comprising a substantially concave parabolic surface truncated by a flat surface, said parabolic surface and said flat surface being highly reflective;
diffraction grating means comprising a plurality of fine grooves formed in said flat surface;
means mounting said reflector means close to said translucent chip with said flat surface oriented substantially parallel to and spaced from said chip rear face;
a lamp having an energizable illumination means therein; and
means mounting said lamp between said translucent chip rear face and said reflector means wherein said illumination means will illuminate said parabolic and flat surfaces to reflect light onto said chip rear face.

4,635,168
LIGHT FIXTURE MOUNTING PEDESTAL AND METHOD OF INSTALLING SAME

Charles H. Crowley, 1330 Tracilee Dr., Howell, Mich. 48843

Filed Jun. 17, 1985, Ser. No. 745,543
Int. Cl.⁴ F21S *1/02*
U.S. Cl. 562—147 **10 Claims**

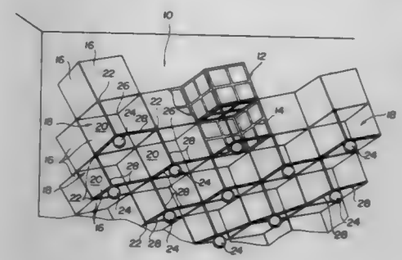


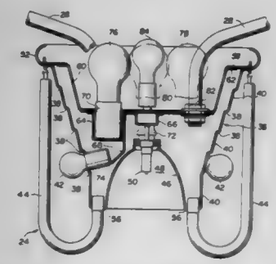
1. A pedestal for mounting a lamp on the exterior surface of stepped siding comprising:
a pedestal body having a front surface which is substantially planar, a rear surface and a depth between said front and rear surfaces which is greater than that of steps forming said siding, the rear surface being configured to define at least two parallel but noncoplanar levels separated by a step having a depth same as that of the steps in said siding to conform with said stepped siding in flush contact therewith;
said body having an aperture extending from the front surface to the rear surface.

4,635,169
ILLUMINATION APPARATUS

Nobuhiro Enaka, Tokyo, Japan, assignor to Shimizu Construction Co., Ltd., Tokyo, Japan

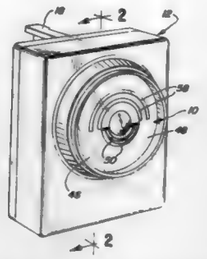
Filed Jul. 18, 1985, Ser. No. 756,199
Claims priority, application Japan, Jul. 19, 1984, 59-150293; Jul. 19, 1984, 59-109224[U]
Int. Cl.⁴ F21S *1/02*; F21V *9/10, 21/02*
U.S. Cl. 362—147 **4 Claims**





1. An illumination apparatus comprising:
(a) a wall having a plurality of recessed wall portions disposed in honeycombed manner in the wall, each recessed wall portion having an outer shape of an equilateral polygon;
(b) a plurality of electric illuminating means each comprising a plurality of electric lamps, each lamp adapted to emit light of a different color, said lamps including white lamps for emitting while light, red lamps for emitting red light, blue lamps for emitting blue light, and green lamps for emitting green light; the white lamp, the red lamp, the blue lamp, and the green lamp of each illuminating means being disposed to light the corresponding recessed wall portion in a superposing manner;
(c) a plurality of supporting means, mounted on the wall, for supporting a corresponding illuminating means so as to light a corresponding recessed wall portion; and
(d) means, electrically connected to each illuminating means, for separately controlling illumination of each illuminating means and each lamp thereof.

4,635,170
REFLECTOR FOR ELECTRIC LIGHT
John L. Beiswenger, Salem, Wis., assignor to Rayovac Corporation, Madison, Wis.
Filed Dec. 18, 1985, Ser. No. 810,216
Int. Cl.[4] F21L 7/00
U.S. Cl. 362—157 21 Claims



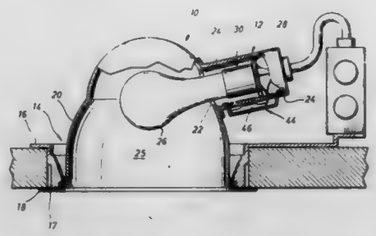
1. In a reflector for an electric light having a first reflector member defining socket means for carrying a light bulb, and a second reflector member positioned generally forward of said socket means, the improvement comprising in combination:
a first angular segment of said first reflector defines curved reflector means for reflecting light from a light bulb in the socket into a collimated beam, the remaining angular segment of said first reflector defining a transversely directed, curved reflector for focusing light from said light bulb back to the filament in said light bulb to increase the filament temperature.

4,635,171
COMPACT ELECTRIC LIGHT
John L. Beiswenger, Salem, Wis., assignor to Rayovac Corporation, Madison, Wis.
Filed Nov. 18, 1985, Ser. No. 798,991
Int. Cl.[4] F21L 7/00
U.S. Cl. 362—187 17 Claims



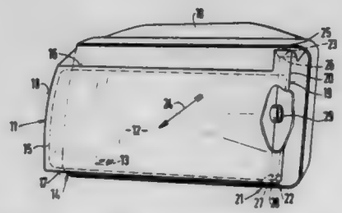
1. In an electric light having a casing, a reflector, a light bulb, and power transmission means to provide illuminating power to the light bulb, the improvement comprising, in combination: said casing having a depth that is less than one-half as great as its width, said width being measured generally parallel to the beam of light emitted by said electric light, said reflector defining a first reflector member, said light bulb projecting centrally and forwardly through said first reflector member, said reflector also defining a second reflector member positioned forward of said light bulb, said second reflector member comprising a light transmissive element defining reflector ring means, said first reflector member and reflector ring means being positioned to intercept most of the light emitted forwardly from said bulb and to direct it into a substantially parallel beam.

4,635,172
RECESSED LIGHTING FIXTURE HAVING THERMAL PROTECTION
Earl Steinke, Glen Ellyn, Ill., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Mar. 4, 1985, Ser. No. 710,282
Int. Cl.[4] F21V 21/29
U.S. Cl. 362—276 8 Claims



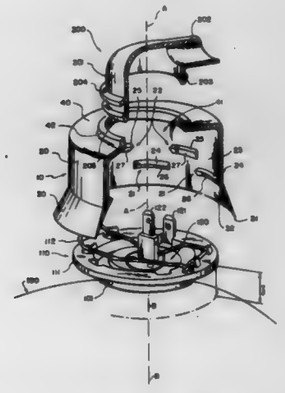
1. A recessed lighting fixture of the type including a frame adapted to be mounted in an opening in a ceiling, a light reflector mounted to said frame defining a first interior volume and including a neck portion extending from said reflector defining a second interior volume substantially separate from said first interior volume, an incandescent light bulb socket mounted within said neck, second interior volume, said socket adapted to be electrically coupled to a power supply wherein the improvement in the fixture comprises:
heat sensor means mounted in close proximity to an outer surface of said neck adjacent said socket; and
electrical switch means connected in series with said power source in said socket and being operatively associated with said heat sensor means for disconnecting said power source from said socket when said heat sensor means reaches a predetermined temperature.

4,635,173
HEADLIGHT FOR MOTOR VEHICLES
Helmut Dressler, Leutenbach; Peter Engenhart, Korntal; Klaus Jahnel, Stuttgart; Heinrich Kochendörfer, Kernen; Ulrich Kuhn, Renningen; Karl H. Matthäs, Stuttgart, and Kurt Schuster, Reutlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Feb. 13, 1986, Ser. No. 829,700
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1985, 3512852
Int. Cl.[4] B60Q 1/06
U.S. Cl. 362—294 13 Claims



1. A headlight for a motor vehicle, comprising a housing with a reflector, and a diffusing lens which hermetically encloses and forms with said housing an interior of the headlight, said housing having an air inlet positioned in a bottom part thereof and an air outlet diametrally opposing said inlet; and a conduit exposed to air streams due to travelling of the motor vehicle, said outlet opening into said conduit, said conduit having an inflow opening for admitting air of the air streams, and an outflow opening for discharging said air, said conduit being positioned on said diffusing lens which is made of plastics.

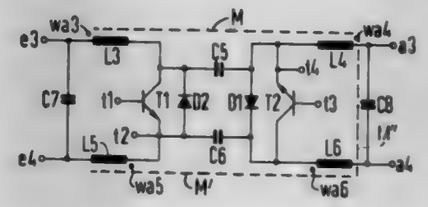
4,635,174
UNIVERSAL PROTECTIVE CAP FOR MOTOR VEHICLE HEADLAMPS
Maurice Montet, Bagnolet, France, assignor to Cibie Projecteurs, France
Filed Jun. 27, 1985, Ser. No. 749,297
Claims priority, application France, Jun. 27, 1984, 84 10151
Int. Cl.[4] F21V 31/02
U.S. Cl. 362—457 12 Claims



1. A protective cap for a motor vehicle headlamp, said cap being for mounting on the rear of a reflector incorporated in said headlamp and being of the type comprising an enveloping sleeve which includes inwardly-directed projecting fastening means for co-operating with a rim on the headlamp, and a peripheral flexible sealing lip which rests, in use, against said reflector, the cap including the improvements whereby:
said fastening means include a plurality of axially-spaced levels of generally annular structures projecting from the inside face of the sleeve; and
said sealing lip is generally flared in shape towards its free edge and is adapted to withstand deformation tending to increase the flare thereof such that the radial component (y) of said deformation is of the same order of magnitude as the axial separation (x) existing between two adjacent levels of said projecting structures, while still providing proper sealing against the rear surface of said reflector.

4,635,175
SWITCHED DC-DC CONVERTER HAVING INPUT AND OUTPUT INDUCTANCES COUPLED BY SWITCHES AND STORAGE CAPACITANCES
Harald Probst, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Feb. 9, 1983, Ser. No. 465,119
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1982, 3206767
Int. Cl.[4] H02M 3/155
U.S. Cl. 363—16 7 Claims

1. A DC-DC converter arrangement for a telecommunication system, comprising:
first and second input terminals for receiving non-pulsating direct current;
first and second output terminals for delivering non-pulsating direct current;
a first inductance connected to said first input terminal;
a second inductance connected to said first output terminal;
a common magnetic core carrying said first and second inductances;
a third inductance carried-on said common core;
a fourth inductance carried on said common core;
a first capacitor connected between and in series with said first and second inductances and therewith defining first and second junctions;
a second capacitor connected in series between said second input terminal and said second output terminal;
said third inductance connected between said second input terminal and said second capacitor and therewith defining a third junction;
said fourth inductance connected between said second output terminal and said second capacitor and therewith defining a fourth junction;



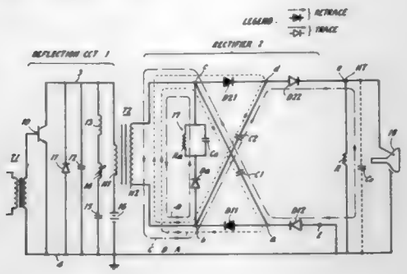
said first and second inductances inductively coupled to one another, and said third and fourth inductances inductively coupled to one another;
a first switch connected between said first and third junctions, and a second switch connected between said second and fourth junctions, said first and second switches alternately operated to switch said first capacitor between said first inductance and said input terminal via said third inductance and to switch said second inductance to said second output terminal via said fourth inductance, to switch said first capacitor between said second inductance and said second output terminal via said second capacitor and said fourth inductance and to connect said first inductance to said second input terminal via said third inductance, whereby the connection of said first capacitor to said second input terminal and to said second output terminal occurs via said second capacitor.

4,635,176
HIGH VOLTAGE DC GENERATOR WITH REDUCED RINGING AND VOLTAGE FLUCTUATION
Hideo Hishiki, and Shunji Onodera, both of Iwai, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan
Filed Apr. 12, 1985, Ser. No. 722,500
Claims priority, application Japan, Apr. 15, 1984, 59-75372; Sep. 11, 1984, 59-189873
Int. Cl.[4] H02M 3/335
U.S. Cl. 363—21 19 Claims

1. A high voltage DC generator comprising:
a setup transformer having primary and secondary windings, the primary winding being responsive to a pulse from a pulse generating circuit for inducing a high-voltage potential in said secondary winding;
a first pair of first and second diodes connected in series in a first circuit from a first end terminal of said secondary winding to a first output terminal of said generator;
a second pair of first and second diodes connected in series in a second circuit from a second end terminal of said secondary winding to a second output terminal of said generator;
a first capacitor connected between said second end terminal and a junction of the diodes of the first pair;
a second capacitor connected between said first end terminal and a junction of the diodes of said second pair, the first

diodes of said pairs being arranged to simultaneously conduct in response to said pulse to cause a current to pass through said first and second capacitors in a first direction and the second diodes of said pairs being arranged to simultaneously conduct in response to the cessation of said pulse to cause a current to pass through said first and second capacitors in a second, opposite direction;

a bleeder resistor connected across said first and second output terminals; and



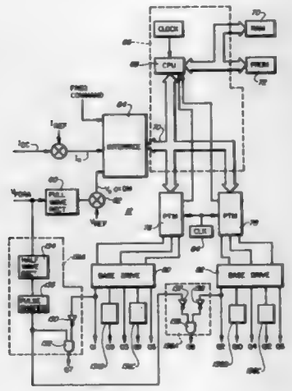
a ringing reduction circuit comprising a resistive element, a capacitive element and a diode element, said diode and capacitive elements being arranged such that when one of said first and second diodes of each pair conducts, said diode element is conductive to charge said capacitive element, said resistive element being in circuit with said capacitive element to pass a current therethrough in response to the cessation of said pulse.

4,635,177

CONTROL FOR A NEUTRAL POINT CLAMPED PWM INVERTER

Sampat S. Shekhawat; P. John Dhyanchand, and Pierre Thollot, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 16, 1984, Ser. No. 672,305
Int. Cl.⁴ H02M *1/12, 1/14*
U.S. Cl. 363—41 **16 Claims**



1. A control circuit for on-line control of a neutral-clamped PWM inverter having a pair of switches connected in series across a DC power source which are operated to produce an output at a junction therebetween, the junction being connected to a neutral voltage by a third switch, comprising:

means for generating a depth of modulation signal representing the deviation of the output from a desired level;

a microprocessor for calculating switching points for the inverter switches during operation of the inverter based upon the depth of modulation signal for a given number of pulses to be produced during each half-cycle of the output, the microprocessor including a CPU for calculating the result:

$$\alpha_{RN} = \frac{90}{FP}(2N-1) - \frac{180}{\pi F} DM \qquad \int_{\frac{90}{P}(2N-2)}^{\frac{90}{P}(2N-1)} \sin\theta d\theta$$

$$\alpha_{FN} = \frac{90}{FP}(2N-1) + \frac{180}{\pi F} DM \qquad \int_{\frac{90}{P}(2N-1)}^{\frac{90}{P}(2N)} \sin\theta d\theta$$

where α_{RN} is the rising edge of a pulse N in a switch control signal, α_{FN} is the falling edge of a pulse N in the switch control signal, F is the desired frequency of the inverter output, P is the number of pulses to be produced in a half-cycle of the inverter output and DM is the depth of modulation; and

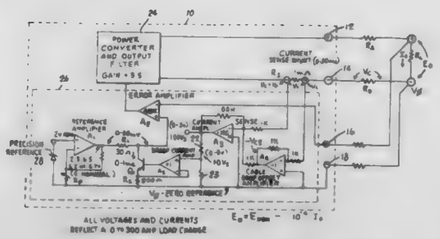
means coupled to the microprocessor for developing switch control signals for each switch from the switching points so that the switches are operated to reduce the deviation of the output from the desired level.

4,635,178

PARALLELED DC POWER SUPPLIES SHARING LOADS EQUALLY

Frank E. Greenhalgh, Amityville, N.Y., assignor to CEAG Electric Corp., Hauppauge, N.Y.

Filed Nov. 4, 1983, Ser. No. 549,259
Int. Cl.⁴ H02J *1/10*
U.S. Cl. 363—65 **1 Claim**



1. A power supply system comprising:

a plurality of paralleled power supplies each having a positive output terminal and a negative output terminal for connection across said load via power cables, a current sense shunt resistor at the power supply side of the negative output terminal, and a positive sense input terminal and a negative sense input terminal for connection across the load via sense leads;

each power supply further having a monitoring and control circuit which is connected to the negative input sense terminal to use it as a zero reference and comprises a precision reference providing a selected nominal voltage relative to the zero reference, a reference amplifier receiving the nominal voltage at its positive input, a programming resistor connected between the negative input of the reference amplifier and the zero reference and having selectable resistance, an error amplifier, a series resistor connected between the output of the reference amplifier and the positive input of the error amplifier, a lead connecting the negative input of the error amplifier to the positive sense input terminal, the output of the error amplifier being connected to control the voltage across the power supply's output terminals, a cable drop offset amplifier having its positive input connected to the zero reference and its negative input connected to the terminal side of the shunt resistor, a current sense amplifier having its negative input connected to the output of the cable drop offset amplifier and its positive input connected to the zero reference, a voltage divider connected between the output of the current sense amplifier and the zero reference, a droop current amplifier having its positive input connected to the voltage divider and its negative input to the zero reference, a transistor having its collector connected to the positive input of the error amplifier, its emitter connected to the zero reference and to the negative input of the droop current amplifier and having its base connected to the output of the droop current amplifier;

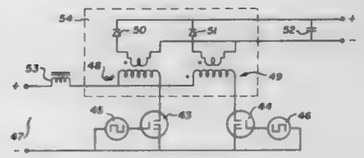
wherein the recited elements are selected and interconnected to cause the voltage across the power supply's output terminals to decrease linearly from a selected level with increase of current flow through the shunt resistor over a selected current range and to maintain the output voltage vs. current characteristics of the respective power supplies substantially the same as between different power supplies to thereby cause substantially equal load sharing.

4,635,179

TRANSFORMER RECTIFIER

Bruce W. Carsten, West Vancouver, Canada, assignor to Eldec Corporation, Lynnwood, Wash.

Filed Oct. 25, 1985, Ser. No. 794,043
Int. Cl.⁴ H02M *7/08*
U.S. Cl. 363—70 **18 Claims**



2. A transformer-rectifier assembly comprising a first closed-loop ferromagnetic core, a first primary winding wound on one leg of said first ferromagnetic core, a second closed-loop ferromagnetic core and a second primary winding wound on one leg of said second ferromagnetic core, wherein said first and second ferromagnetic cores are placed adjacent each other with said first and second primary windings in near contact;

a single-turn secondary winding closely wound around said first and second primary windings, to form a first and second transformer, said secondary winding being electrically connected to a common connection via rectifiers such that inductances in said assembly are minimized by the resulting integration of said transformer and rectifiers into a single assembly.

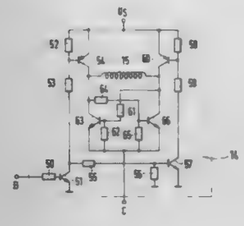
4,635,180

DEVICE FOR CONTROLLING AND REGULATING CURRENT FLOWING THROUGH AN ELECTROMAGNETIC CONSUMER, PARTICULARLY FOR USE IN CONNECTION WITH AN INTERNAL COMBUSTION ENGINE

Werner Nitschke, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 10, 1985, Ser. No. 722,187
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1984, 3420611
Int. Cl.⁴ H02P *13/20*; G05F *1/56*
U.S. Cl. 363—98 **4 Claims**

1. A device for controlling and/or regulating current flowing through an electromagnetic consumer, particularly for use in connection with a control system of an internal combustion engine, comprising a current direction changing circuit including four current controlling units connected into a bridge circuit an each having a control input; said electromagnetic consumer being connected across one diagonal of said bridge circuit; a power source having a terminal connected to a junction point of another diagonal of said bridge circuit; a current intensity control circuit including a series connection of an additional current controlling unit with a measuring resistor, said additional current controlling unit having a control input,



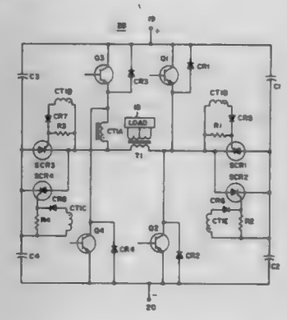
said series connection being connected between another terminal of said power source and an opposite junction point of said other diagonal so as to pass through said measuring resistor a current flowing through said consumer; means for generating a current intensity control signal; means for generating a polarity control signal; said current intensity control signal being applied to said control input of said additional current controlling unit; and each of said current controlling units of said current direction control circuit having a control input coupled to said means for generating the polarity control signal.

4,635,181

BRIDGE CIRCUIT FOR REDUCED SWITCHING LOSSES

Leo B. Bourgeault, Wall, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 28, 1984, Ser. No. 687,312
Int. Cl.⁴ H02M *7/538*
U.S. Cl. 363—132 **8 Claims**



3. A switching type power supply, having a bridge configured output for supplying power to a load, comprising:

four transistors connected jn a bridge configuration;

four flywheel diodes one connected in parallel around each switching transistor;

a first pair of controlled switching devices, connected to opposite sides of the load, which start to conduct when one diagonially opposite pair of the output switching transistors are turned off and a second pair of controlled switching devices, connected to opposite sides of the load, which start to conduct when the other diagonially opposite pair of output switching transistors are turned off; and,

capacitive means connected around said bridge configured

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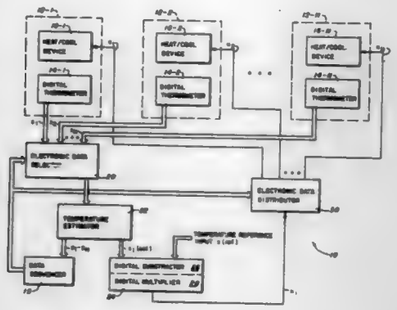
output for transferring energy with the load, through the conducting first or second pair of controlled switching devices, when the first or second pair of controlled switching devices conduct current.

4,635,182

APPARATUS FOR CONTROLLING MULTIPLE TIME-VARYING PROCESSES

Kenneth J. Hintz, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 3, 1984, Ser. No. 627,707
Int. Cl.[4] G06F *15/46*; G05B *13/02*
U.S. Cl. 364—138 **5 Claims**



1. An apparatus for controlling multiple time-varying processes comprising:

a plurality of processes 1 through N to be controlled and being configured so as to generate data z_1 through z_N corresponding to each of said plurality of processes;

an electronic data selector operatively connected to said plurality of processes and being configured to respond to a sequencer signal so as to route a selected one z_I of the data z_1 through z_N to the output thereof;

first means operatively connected at its input to the output of said electronic data selector for estimating the values x_1 through x_N of the data z_1 through z_N of each one of said plurality of processes 1 through N as well as measuring of the uncertainties p_1 through p_N in each of the estimates, said first means being configured to output at one output the uncertainties p_1 through p_N and to output at another output the largest x_I(est) of the estimated values x_1 through x_N;

a data sequencer operatively connected at its input to the one output of said first means and at its output to said electronic data selector, said data sequencer being configured to compare the uncertainties p_1 through p_N for each estimate x_1 through x_N so as to select the greatest uncertainty p_i, the greatest uncertainty p_i then being used to generate the sequencer signal at the output of said data sequencer; and

second means operatively connected to the another output of said first means, to said data sequencer and to said plurality of processes 1 through N to be controlled for controlling the appropriate one of said plurality of processes 1 through N as a function of the largest estimated value x_I(est) and a reference value x(ref) as controlled by said data sequencer.

4,635,183

CONTROL UNIT PROVIDED WITH STATUS DISPLAY

Shinichi Isobe, Hino, and Mikio Yoneikura, Hachioji, both of Japan, assignors to Fanuc Limited, Hino, Japan

PCT No. PCT/JP83/00416, § 371 Date Jul. 12, 1984, § 102(e) Date Jul. 12, 1984, PCT Pub. No. WO84/02205, PCT Pub. Date Jun. 7, 1984
PCT Filed Nov. 21, 1983, Ser. No. 631,438
Claims priority, application Japan, Nov. 22, 1982, 57-203726
Int. Cl.[4] G05B *11/01, 9/02*; G09G *1/06*
U.S. Cl. 364—141 **6 Claims**



1. A control unit for controlling a device, said control unit including a timing analysis means incorporated into said control unit, said timing analysis means comprising:

a keyboard means for specifying desired conditions to be displayed, a desired intake time of said display condition, and a desired intake stop condition of said desired display condition, said desired stop condition being supplied either from an external unit of said control unit or from an internal unit of said control unit;

a timer means, operatively connected to said keyboard means, for generating a clock signal having a frequency determined in response to said intake time;

a memory means, operatively connected to said timer means, to an external unit, and to internal units in said control unit, for intaking, in response to said clock signal from said timer means, said desired conditions to be displayed during a desired intake time interval determined by said desired intake time and said desired intake stop condition, said desired conditions to be displayed being supplied from said external unit or from said internal units;

a display means, operatively connected to said memory means, for displaying, after said intake stop conditions are met, data intaken in said memory means; and

a processor means, operatively connected to said keyboard means, said timer means, said memory means, and said display means, for controlling said memory and said display means in synchronization with said clock signal.

4,635,184

DISTRIBUTED CONTROL WITH MUTUAL SPARE SWITCH OVER CAPABILITY

Jack A. Schuss, West Hartford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 17, 1984, Ser. No. 682,382
Int. Cl.[4] G06F *15/46, 11/00*
U.S. Cl. 364—187 **4 Claims**

1. In a distributed control system of the type having a plurality of process control computers corresponding in number to the number of subporcesses controlled by the distributed control system, a method of controlling a plurality of subprocesses upon the failure of a process control computer controlling one of the subprocesses, the method comprising the steps of:

(a) each process control computer in the distributed control system receiving input signals of operational parameters of an associated first subprocess of the distributed control system;

(b) each process control computer in the distributed control system executing a preprogrammed set of instructions based upon the input signals;

(c) each process control computer generating in response to the input signals and in accordance with the preprogrammed instructions, control signals to control the first subprocess;

(d) each process control computer in the distributed control system receiving input signals commensurate with the operational safety of the associated first subprocess;

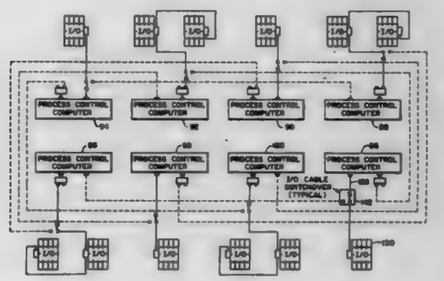
(e) each process control computer in the distributed control system executing a preprogrammed set of instructions based upon the operational safety of the associated first subprocess input signals;

(f) each process control computer generating in response to the input signals commensurate with the operational safety of the associated first subprocess and in accordance with the preprogrammed instructions, control signals for shutting down the associated first subprocess when an unsafe operating condition is approached;

(g) each process control computer in the distributed control system receiving input signals of operational parameters commensurate with the operational safety of a second subprocess of the distributed control system;

(h) each process control computer in the distributed control system executing a preprogrammed set of instructions based upon the operational safety of the second subprocess input signals;

(i) each process control computer in the distributed control system generating in response to the input signals commensurate with the operational safety of the second subprocess and in accordance with the preprogrammed instructions, control signals for shutting down the second subprocess when an unsafe operating condition is approached;



(j) each process control computer in the distributed control system executing a spare preprogrammed set of instructions to control a third subprocess;

(k) each process control computer in the distributed control system executing a spare preprogrammed set of instructions for shutting down the third subprocess when an unsafe operating condition is approached;

(l) each process control computer in the distributed control system executing a spare preprogrammed set of instructions for shutting down a fourth subprocess when an unsafe operation condition is approached;

(m) each process control computer in the distributed control system receiving input signals for the spare preprogrammed instructions of steps (j)–(l) from input ports with no inputs attached thereto;

(n) each process control computer in the distributed control system generating in response to the input signals for the spare preprogrammed instructions and in accordance with the spare preprogrammed instructions control signals for controlling the third subprocess;

(o) each process control computer in the distributed control system generating in response to the input signals for the spare preprogrammed instructions and in accordance with the spare preprogrammed instructions control signals for shutting down the third subprocess when an unsafe operating condition is approached;

(p) each process control computer in the distributed control system generating in response to the input signals for the spare preprogrammed instructions and in accordance with the spare preprogrammed instructions control signals for shutting down the fourth subprocess when an unsafe operating condition is approached;

(q) detecting the removal from service of one of the process control computers of the distributed control system controlling a subprocess;

(r) upon detecting the removal from service of one of the process control computers switching the input and output connections from the process control computer removed from service to another process control computer of the distributed control system that has not been removed from service; and

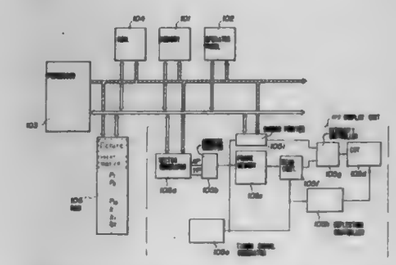
(s) controlling the subprocess formerly controlled by the process control computer removed from service with the process control computer to which the input and output connections are switched.

4,635,185

MACHINING AREA SPECIFYING METHOD FOR AN AUTOMATIC PROGRAMMING SYSTEM

Hajime Kishi; Kunio Tanaka, and Takashi Takegahara, all of Tokyo, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP84/00136, § 371 Date Nov. 28, 1984, § 102(e) Date Nov. 28, 1984, PCT Pub. No. WO84/03958, PCT Pub. Date Oct. 11, 1984
PCT Filed Mar. 27, 1984, Ser. No. 680,252
Claims priority, application Japan, Mar. 28, 1983, 58-052018
Int. Cl.[4] G06F *15/46*; G05B *19/18*
U.S. Cl. 364—191 **6 Claims**



1. A machining area specifying method for an automatic programming system for specifying a partial path to be machined, the path being part of a closed path, said method comprising the steps of:

(a) displaying a closed path trajectory comprising a number of path blocks on a display screen by using path data prepared beforehand;

(b) obtaining starting point coordinates for each path block forming a part of the path trajectory based on the path data;

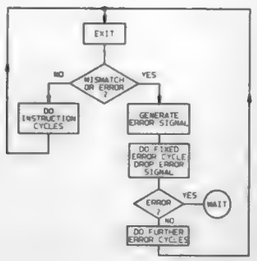
(c) entering first and second points on the closed path by designating the points with a cursor, the first and second points being designated by displaying the cursor at the starting point of a designated path block by using the starting point coordinates;

(d) designating by the cursor one of a first path and a second path which are connected to the first and second points; and

(e) specifying an area to be machined by operating a machining area input switch when the first path is being designated by the cursor in a case where the first path is to be machined, and operating the machining area input switch when the second path is being designated by the cursor in a case where the second path is to be machined.

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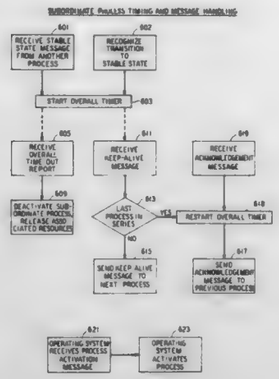
4,635,186
DETECTION AND CORRECTION OF MULTI-CHIP SYNCHRONIZATION ERRORS
Price W. Oman, Rhinebeck, N.Y.; Mark A. Rinaldi, Wilsonville, Oreg.; Vito W. Russo, Kingston, and Gregory Salyer, Woodstock, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 20, 1983, Ser. No. 506,488
Int. Cl.⁴ G06F *11/00, 13/00*
U.S. Cl. 364—200 **10 Claims**



1. A method of synchronizing operation of a plurality of modules comprising a processing system, comprising the steps of:
decoding in each of said plurality of modules a current instruction independently of each other said module;
generating an EXIT signal in each module upon completion of execution of said decoded instruction by said module;
sampling in each said module the EXIT signal state of all of said modules at a predetermined time;
detecting in each said module the absence of one or more of said EXIT signals from said modules at said predetermined time; and
setting each said module to a predetermined state in response to said detection of absence of an EXIT signal from one or more of said modules at a predetermined time.

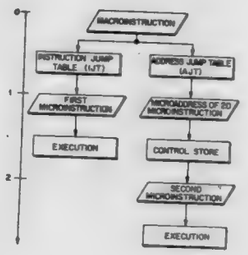
4,635,187
CONTROL FOR A MULTIPROCESSING SYSTEM PROGRAM PROCESS
Donna M. Baron, Joliet; David E. Espenlaub, Carol Stream; Vicki A. Haines, Wheaton; Gerald A. Inberg, Naperville; Steve A. Shilling; James B. Truesdale, both of Wheaton, and Robert J. Willett, Winfield, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Dec. 19, 1983, Ser. No. 563,255
Int. Cl.⁴ G06F *9/00*
U.S. Cl. 364—200 **18 Claims**

1. In a multiprocessing system, a method of deactivating a program process comprising the steps of:
starting an overall timer, set to time out after a first predetermined period of time, for said program process;
executing said program process as a plurality of tasks interposed between a plurality of real time breaks;
determining whether there is a need to maintain said program process active;
starting a keep-alive message timer set to time out after a second predetermined period of time during one of said plurality of real time breaks if it is determined that there is a need to maintain said program process active, said second predetermined of time being less than said first predetermined period of time;
repetitively generating and sending a keep-alive message to said program process and repetitively restarting said keep-alive message timer when said keep-alive message timer was most recently started more than said second predetermined period of time in the past;
receiving said keep-alive message in said program process;
restarting said overall timer when said program process receives said keep-alive message;
terminating said step of repetitively generating and sending and repetitively restarting when it is determined that there



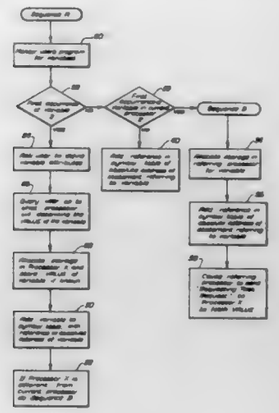
is no longer a need to maintain said program process active; and
deactivating said program process when said overall timer was most recently started more than said first predetermined period of time in the past.

4,635,188
MEANS FOR FAST INSTRUCTION DECODING FOR A COMPUTER
Donald A. Williamson, Cupertino, and John F. Shelton, Aptos, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jul. 29, 1983, Ser. No. 518,609
Int. Cl.⁴ G06F *9/22*
U.S. Cl. 364—200 **5 Claims**



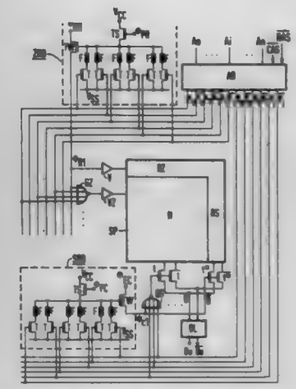
1. An apparatus for fast instruction decoding in a computer comprising:
a means for accessing a plurality of decoding means in response to a macroinstruction opcode;
a first decoding means being accessed by said accessing means for providing a first level emulation instruction for execution in response to said macroinstruction opcode;
a second decoding means being accessed simultaneously with the first decoding means by said accessing means for providing a microaddress code in response to said macroinstruction opcode; and
a third decoding means for providing a second level emulation instruction for execution in response to said microaddress code.

4,635,189
REAL-TIME DISTRIBUTED DATA-BASE MANAGEMENT SYSTEM
Burton Kendall, Saratoga, Calif., assignor to Measurex Corporation, Cupertino, Calif.
Filed Mar. 1, 1984, Ser. No. 585,003
Int. Cl.⁴ G06F *12/00*
U.S. Cl. 364—200 **16 Claims**



1. In a system having
local processors each connected to a located memory,
a communications channel between the local processors, and
a data base of a multiplicity of data varibles distributed over the local memories,
an improvement to a method of operating a Distributed Data Base Management System (DDBMS) by
executing at the local processors local programs, which are referencing the data variables within the data base, and
originating each data variable at an originating one of the local processors,
the improvement to the method of operating a DDBMS comprising:
first locally storing in each local memory an original of each data variable which is originated by the associated local processor;
second locally storing in each local memory a copy, obtained across the communication channel, of each data variable not originated by the associated local processor which each data variable is at any time referenced by the associated local processor;
WHEREIN both the first and second locally storing of each data variable is at an absolute address, meaning an address designation of the local processor which does originate the data varible in addition to an address in local memory at which the data variable is first locally stored;
referenceing, responsive to a local program executing on each local processor which local program makes references to data variables, each data variable only at the absolute address of said data variable
supplying, responsive to said referencing, each data variable from the assoicated memory of the local processor making reference, regardless that the data variable should be the original or the copy;
executing a procedure within each local processor, called by the local program executing therein, for updating the copy of a data variable stored within the associated local memory by obtaining the original of the data variable across the communication channel.

4,635,190
INTEGRATED DYNAMIC WRITE-READ MEMORY WITH A DECODER BLOCKING THE DATA PATH FROM THE MEMORY MATRIX
Willibald Meyer, and Jürgen Wawersig, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Mar. 23, 1984, Ser. No. 592,870
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1983, 3311427
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—200 **14 Claims**



1. In an integrated dynamic write-read memory including a memory matrix for storing digital data formed of individual identical memory cells said memory matrix having a portion intended for normal operation, and at least one redundant row and/or column initially excluded from normal operation of the memory, but available for normal operation as a replacement on the basis of addressing pulses, at least one row decoder connected to the memory matrix and at least one column decoder connected to the memory matrix for addressing with respect to the individual memory cells, means for feeding a column address pulse to the memory matrix for initiating addressing by matrix columns, means for feeding a row address pulse to the memory matrix for initiating addressing by matrix rows, and a normal data path for the stored digital data leading out of the memory matrix, the improvement comprising a data output for the memory in the form of a tristate output connected to the normal data path and actuated by addressing with the stored digital data, and an additional circuit part in the form of another decoder connected in the normal data path between the memory matrix and said tristate output with an output connected to said tristate output, said other decoder blocking the normal data path from the memory matrix to said tristate output upon addressing each row or column of the portion of the memory matrix intended for normal operation replaced by a redundant row or column and upon simultaneous external activation of said other decoder, and said other decoder indicating the insertion of a redundant row or column in place of a row or column in the portion of the memory matrix intended for normal operation with the appearance of a uniform indicating signal as said data output.

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4,635,191

METHOD FOR CONTROLLING DATA TRANSFER BETWEEN A DATA TRANSMITTER AND A DATA RECEIVER THROUGH A BUS BY MEANS OF A CONTROL DEVICE CONNECTED TO THE BUS, AND A CONTROL DEVICE FOR CARRYING OUT THE METHOD

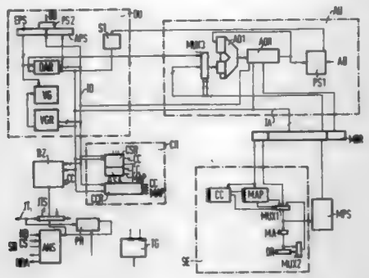
Werner Böning, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 31, 1983, Ser. No. 546,895

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1982, 3241402

Int. Cl.⁴ G06F *13/00, 9/00*

U.S. Cl. 364—200 **9 Claims**



1. Method for controlling data transfer between a data transmitter and a data receiver through a bus by means of a control device connected to the bus, and by means of a memory connected to the bus for storing a channel program containing transfer commands including conditional control commands the control device including a comparison device and first and second registers connected to the comparison device including mutually correlated register positions, the contents of the register positions being used for indicating one of several possible termination causes by setting the contents of the register positions to a logical 0 or 1, comprising the steps of: controlling by means of the control device, the data transfer between the data transmitter and data receiver as a function of the channel program stored in the memory, processing a transfer command in the control device, setting a register position content to indicate a termination cause in the first register after terminating the processing of the transfer command, setting the register positions of the second register correlated with the register positions of the first register with a control command for execution of a conditional control after the transfer command, comparing mutually correlated register positions of the first and second registers with each other to produce a comparison result, and executing the conditional control command or a command of the channel program following the conditional control command as a function of the comparison result.

4,635,192

SELF CONFIGURING BUS STRUCTURE FOR COMPUTER NETWORK

Claude R. Ceccon, and Paul C. Mioduski, both of Tucson, Ariz., assignors to Tri Sigma Corporation, Scottsdale, Ariz.

Filed Dec. 6, 1983, Ser. No. 558,778

Int. Cl.⁴ G06F *13/00, 13/40*

U.S. Cl. 364—200 **7 Claims**

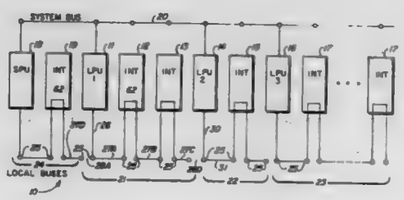
1. A reconfigurable bus structure in a system including a first processor and a first group of interface circuits for connection to said first processor, said first processor and each of said interface circuits each being in electrical communication with a plurality of edge connector conductors, said reconfigurable bus structure comprising in combination:

a mother board having a plurality of edge connecting means for connection to the edge connector conductors of various ones of said interface circuits and said first processor;

a plurality of local bus segments disposed on said mother board, each of said local bus segments including a first number of conductors each having separate first and second electrical contact areas which are disposed on opposite sides of adjacent ones of said edge connecting means;

a first processor board on which said first processor is disposed, said first processor board having a second number of edge connector conductors, each of which has a first electrical contact area, for electrically contacting said first electrical contact areas of a corresponding one of said local bus segments, said second number being equal to said first number; and

a first group of interface boards on which said interface circuits of said first group are disposed, respectively, each of said interface boards having thereon a third number of edge connector conductors, each of which has a first electrical contact area for electrically contacting corresponding ones of said first electrical contact area of conductors of one of said local bus segments on a first side of one of said edge connecting means into which that interface board is plugged, each of said third number of edge connector conductors also having a second electrical contact area for electrically contacting corresponding ones of said second electrical contact areas of conductors of another one of said local bus segments on a second side



of that edge connecting means, said third number being equal to said first number, wherein when said first processor board is plugged into a first edge connecting means of said mother board, the first electrical contact areas of each of the edge connector conductors of said first processor board electrically contacts corresponding ones of the first electrical contact areas of conductors of one of said local bus segments on a first side of a first one of said edge connecting means, wherein when each of said interface boards of said first group is plugged into a respective, successive one of the rest of said edge connecting means, the first electrical contact areas of the edge connector conductors of that interface board respectively electrically contact corresponding ones of the first electrical contact areas of conductors at another one of said local bus segments on a first side of of that edge connecting means, and the second electrical contact areas of the edge connector conductors of that interface board respectively electrically contact corresponding ones of the second electrical contact areas of conductors of another one of said local bus segments on a second side of that edge connecting means, whereby physical insertion of said first processor board and said interface boards of said first group into successive edge connecting means of said mother board automatically creates a local bus of the needed length operatively connecting said first processor to said interface circuits of said first group.

4,635,193

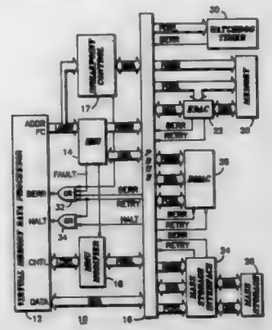
DATA PROCESSOR HAVING SELECTIVE BREAKPOINT CAPABILITY WITH MINIMAL OVERHEAD

William C. Moyer, Austin, Tex.; John E. Zolnowsky, Menlo Park, Calif., and David S. Mothersole, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 625,065, Jun. 27, 1984, abandoned. This application May 13, 1986, Ser. No. 867,404

Int. Cl.⁴ G06F *9/22, 11/00*

U.S. Cl. 364—200 **5 Claims**



3. A data processor having selective breakpoint capability with minimal overhead by communicating operands with a peripheral device, comprising:

register means for storing instructions to be executed by the data processor; and

control means for controlling the execution of the stored instructions in the register means, for directing the peripheral device to either send a control signal directing a breakpoint or send a successive instruction in response to executing a predetermined breakpoint instruction, for receiving and storing the successive instruction in the register means as a next instruction to be executed, and for executing the successive instruction.

4,635,194

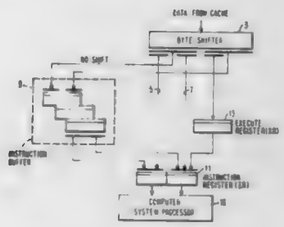
INSTRUCTION BUFFER BYPASS APPARATUS

Mark E. Burger; Steven L. George, both of Endicott, and Chuck H. Ngai, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 2, 1983, Ser. No. 490,813

Int. Cl.⁴ G06F *9/30*

U.S. Cl. 364—200 **4 Claims**



1. In a computer system including a central storage facility for storing a plurality of instructions and at least one special instruction, an instruction buffer connected to the central storage facility for retrieving each of the plurality of instructions and said special instruction in sequence form said storage facility, and an instruction register connected to the instruction buffer for retrieving an instruction from the instruction buffer and holding at least some of the bytes of said instruction therein during execution thereof, the improvement comprising:

bypass path means connected between said central storage facility and said instruction register for bypassing said instruction buffer when the special instruction is held in said instruction register for execution, another instruction being transferred from said central storage facility to said instruction register via said bypass path means during execution of said special instruction thereby bypassng said instruction buffer and preventing the destruction of the contents of said buffer; and execute register means connected between said central storage facility and said instruction register for storing one or more additional bytes of said another instruction during the transfer of said another instruction from said central storage facility to said instruction register via said bypass path means when the byte length of said another instruction is greater than the byte length of said instruction register.

4,635,195

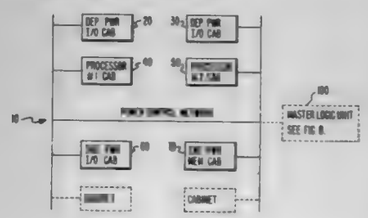
POWER CONTROL NETWORK USING RELIABLE COMMUNICATIONS PROTOCOL

James H. Jeppesen, III, El Toro, and Bruce E. Whittaker, San Juan Capistrano, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sep. 25, 1984, Ser. No. 654,080

Int. Cl.⁴ G06F *13/00, 13/42, 11/30*

U.S. Cl. 364—200 **5 Claims**



1. In a network of interconnected digital modules wherein each module includes an associated slave power logic unit means, an associated internal power control switching means, and an associated internal power supply means, and wherein each of said associated power control switching means can execute power control instruction data received from said associated slave power logic unit means which is connected to a master power logic unit means, the power control system comprising;

(a) a plurality of interconnected digital modules, each module including:

(a1) said associated internal power supply means;

(a2) said associated internal power control switching means connected to regulate and to switch said associated internal power supply means;

(a3) said associated slave power logic unit means for receiving and storing address and said power control instruction data from said master power logic unit means, said slave unit means including:

(a3a) means for differentiating said address data from said instruction data via a flag bit attached to said data;

(a3b) means for storing a copy of first received data;

(a3c) means for sending a copy of said first received data back to said master unit means for verification by said master unit means;

(a3d) means for receiving a second duplicate of said first received data and comparing said second duplicate with said first received data;

(a3e) means for accepting and using said first received

data when said second duplicate and said first received data match each other;

(b) said master power logic unit means connected for sensing the power status of each of said modules and for transmitting said control instruction data for regulating and for switching the power status of a selectively addressed module, or modules, or all of said modules, said master unit means including:

(b1) means for generating power control instruction data in response to instructions from a human operator;

(b2) means for generating a flag bit to differentiate said address data from said instruction data;

(b3) means for transmitting and storing a first copy of first transmitted data, said transmitted data being sent to said slave unit means;

(b4) means for receiving a second copy, from said slave unit means, of said first transmitted data, for comparison with said first copy of said first transmitted data;

(b5) means for generating a second transmission of said first transmitted data to said slave unit means when said first transmitted data and said received second copy match each other.

4,635,196

TAX OR EXEMPTION SELECTING ELECTRONIC CASH REGISTER

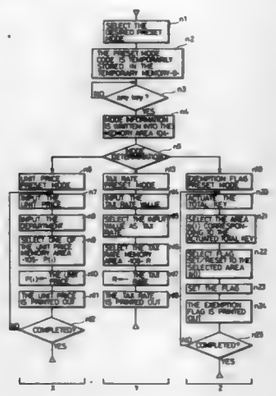
Yasuhide Nakamura, Yamatokoriyama, and Shigeyuki Yamamura, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 26, 1984, Ser. No. 625,002

Claims priority, application Japan, Jun. 30, 1983, 58-120794

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 364—405 **6 Claims**



1. An electronic cash register comprising:

input means for introducing sale data including sale information and classification information, and function information into said electronic cash register;

mode selection means for selecting one of a plurality of operation modes, said plurality of operation modes including an exemption flag preset mode, and a registration mode;

a plurality of registration keys, each of said plurality of registration keys being operable in said exemption flag preset mode and said registration mode, a said registration key being actuated in said registration mode subsequent to the introduction of said sales data by said input means;

a plurality of exemption flags each corresponding to a one of said plurality of registration keys, each said flag having a set state representing an exemption state associated with said sales data and a reset state representing a tax state associated with said sales data;

means for setting and resetting said plurality of exemption flags in said exemption flag preset mode;

detection means for detecting the set or the reset state of any one of said plurality of exemption flags corresponding to said plurality of registration keys in said registration mode after input of said sale information; and

selection means, responsive to said detection means, for selectively calculating a total sale price from said sale data and said set or reset state of said flags.

4,635,197

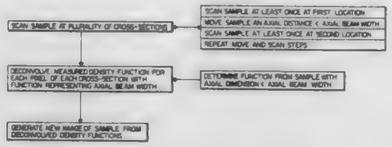
HIGH RESOLUTION TOMOGRAPHIC IMAGING METHOD

Harold J. Vinegar, and Scott L. Wellington, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 29, 1983, Ser. No. 566,619

Int. Cl.⁴ G06F *15/42;* **G01N** *23/00;* **G01T** *1/20*

U.S. Cl. 364—414 **13 Claims**



1. A method for increased spatial resolution in the axial direction of a computerized axial tomographic scanner (CAT), said method comprising the steps of: scanning said sample at a plurality of cross sections that are separated by a distance that is less than an axial width of the beam of said CAT to determine measured density functions for a plurality of pixels in each of said plurality of cross sections; deconvolving the measured density functions for each of said plurality of pixels with a function representing said beam width for said CAT to obtain the actual density function for said plurality of pixels; using said actual density function to generate an image of said sample that has a spatial resolution in the axial direction that is smaller than the width of said beam of said CAT.

4,635,198

APPARATUS FOR MEASURING CROSS-SECTIONS ON OBJECTS, MORE ESPECIALLY ON PARTS OF THE BODY

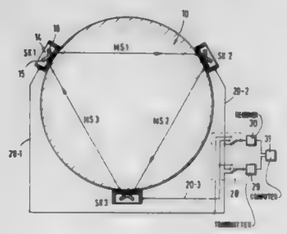
Hans Hohlweck, Bonn; Gernold Plath, Hennef, and Friedhelm Baisch, Neunkirchen-Seelscheid, all of Fed. Rep. of Germany, assignors to Deutsche Forschungs-und Versuchsanstalt für Luft-und Raum-fahrt e.V., Fed. Rep. of Germany

Filed Aug. 9, 1984, Ser. No. 639,017

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1983, 3329134

Int. Cl.⁴ G06F *15/42;* **G01B** *17/00*

U.S. Cl. 364—414 **35 Claims**



1. Apparatus for measuring cross-sections of objects comprising at least three sound heads which are adapted to be positioned about the periphery of an object whose cross-section is to be determined, each sound head includes oscillator means for selectively transmitting and receiving ultrasonic waves, said sound heads setting-off a polygon defined by the distance set-off between each pair of sound heads, computer means for transforming ultrasonic waves received from said oscillator means reflective of the distance between each pair of sound heads into the crossection of an associated object, each said oscillator means includes a pair of angularly disposed legs each having an oscillating surface, each leg of each pair of legs of one sound head is positioned facing one other leg of one other pair of legs of another sound head, and switching means between said sound heads and said computer means for switching over said sound heads between transmission and reception to establish all distances set-off between each pair of sound heads whereby the ultrasonic waves received from said oscillator means are thereby transferred into the cross-section of an associated object.

4,635,199

PIVOT-TYPE MACHINE TRANSLATING SYSTEM COMPRISING A PRAGMATIC TABLE FOR CHECKING SEMANTIC STRUCTURES, A PIVOT REPRESENTATION, AND A RESULT OF TRANSLATION

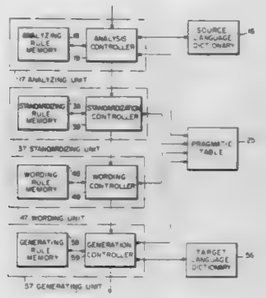
Kazunori Muraki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 30, 1984, Ser. No. 605,159

Claims priority, application Japan, Apr. 28, 1983, 58-74993; Apr. 28, 1983, 58-74994

Int. Cl.⁴ G06F *15/38;* **G09B** *19/06;* **G10L** *5/02*

U.S. Cl. 364—419 **3 Claims**



1. A machine translating system comprising:

a dictionary of a first language for storing word units of said first language and pivot words representative of said word units;

a dictionary of a second language for keeping word units of said second language and pivot words representative of said second language word units, common pivot words stored in said first language dictionary;

a pragmatic table for storing pairs of pivot words and those pragmatic data for each pivot word pair which define a semantic relationship between the pivot words of the pivot word pair in at least three languages which comprise a pivot language and said first and said second languages, said pivot language serving as a pivot on carrying out translation between those of said at least three languages which do not include said pivot language;

analyzing means for analyzing a first string of word units of one of said first and said second languages, which is selected as a source language with the other of said first and said second languages used as a target language, by referring to the dictionary of said source language and to said pragmatic table to provide selected pivot words in compliance with the first string word units and to produce a source semantic structure by said selected pivot words and by said selected pivot words and by semantic relationships which are allowed by the pragmatic data in said source language and have features of said source language;

standardizing means for standardizing said semantic structure by referring to said pragmatic table to provide a pivot representation by using the pivot words of said semantic structure and by semantic relationships which are allowed by the pragmatic data in said pivot language and are free from the features of said source language;

wording means for wording said pivot representation by referring to said pragmatic table to provide a target semantic structure by using the pivot words of said pivot representation and by semantic relationships which are allowed by the pragmatic data in said pivot language and comply with wording of said target language; and

translating means for translating said target semantic structure by referring to the dictionary of said target language and to said pragmatic table to provide a second string of selected word units which are selected from the word units of said target language to represent the pivot words of said target semantic structure, said second string being allowed by the pragmatic data in said target language.

4,635,200

SYSTEM FOR CONTROLLING AIR-FUEL RATIO IN AN INTERNAL COMBUSTION ENGINE

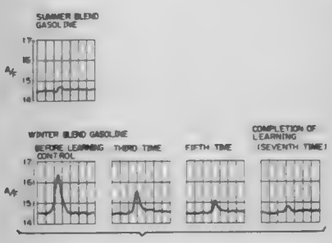
Tsuneyuki Egami, Aichi; Tsutomu Saito, Okazaki; Tokio Kohama, Nishio; Kimitaka Saito; Kunihiko Sato, both of Okazaki, and Hiroshi Takahashi, Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 11, 1984, Ser. No. 619,210

Claims priority, application Japan, Jun. 16, 1983, 58-106697; Jul. 26, 1983, 58-135260

Int. Cl.⁴ F02B *3/00*

U.S. Cl. 364—431.05 **3 Claims**



1. A system for controlling the air-fuel ratio to a predetermined value in an internal combustion engine comprising:

first sensor means for sensing an actual air-fuel ratio and issuing a signal having two levels, one level corresponding to an air fuel ratio larger than the predetermined value, the other level corresponding to an air-fuel ratio smaller than the predetermined level;

second sensor means for detecting a change in engine conditions from a steady state to a transient state;

processing means for performing the following functions: (a) calculating a basic amount of fuel to be supplied to the engine, which amount is determined in accordance with engine operating conditions, (b) in response the signal from said first sensor means, increasing a first correcting factor for correcting the basic fuel amount when said signal has one level, and decreasing the first factor when said signal has another level, in order to maintain the actual fuel ratio to the predetermined value, (c) calculating the difference in value between the value of the first correcting factor during the preceding steady state and the value of the first correcting factor when a change to the transient state is sensed by the second sensor means, (d) calculating a second correcting factor for correcting the basic fuel amount based on the value of said difference

and (e) calculating a final fuel amount from the basic fuel amount and the first correcting factor but not the second correcting factor during the steady state and from the basic fuel amount and at least the second correcting factor during the transient state, said second correcting being calculated to eliminate said difference during the transient state; and

means for providing a supply of fuel to the engine so that the calculated final fuel amount is supplied to the engine.

4,635,201

APPARATUS FOR DETECTING AMOUNT OF CHANGE IN ROTATIONAL SPEED OF INTERNAL COMBUSTION ENGINE

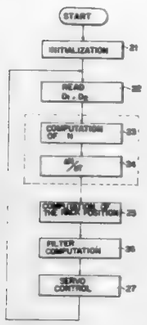
Kouichi Izumi, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Japan

Filed Jun. 11, 1984, Ser. No. 619,036

Claims priority, application Japan, Jun. 10, 1983, 58-102697; Jun. 10, 1983, 58-102698

Int. Cl.⁴ F02D *5/00*

U.S. Cl. 364—431.07 **9 Claims**



1. An apparatus for detecting the amount of change in the rotational speed of an internal combustion engine, comprising:

means for generating a reference pulse each time the crankshaft of the internal combustion engine reaches a reference rotational position;

a first computing means for computing the average engine speed over one combustion cycle of the internal combustion engine on the basis of the time intervals between the reference pulses;

a second computing means for computing the rate of speed change of the internal combustion engine after every m reference pulses (m=1, 2, . . .) from the average engine speed (N_0) computed by said first computing means at that time and the average engine speed (N_m) computed m pulses earlier; and

a third computing means for computing an updated integration value of the speed change rate obtained by said second computing means to obtain the amount of change in the rotational speed of the internal combustion engine.

4,635,202

NAVIGATION APPARATUS FOR AUTOMOBILE

Fumio Tsujii; Yoji Matsuoka, both of Mito; Akira Endo, Mito; Jiro Takezaki, and Hiroshi Shirai, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

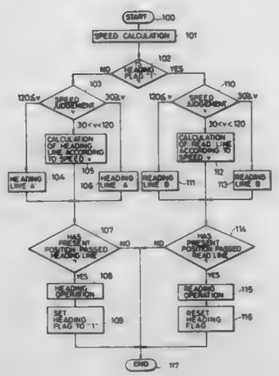
Filed Jul. 18, 1984, Ser. No. 632,068

Claims priority, application Japan, Jul. 20, 1983, 58-131015

Int. Cl.⁴ G06F *15/50*

U.S. Cl. 364—449 **4 Claims**

1. A navigation apparatus including: distance-traveled detection means for detecting the distance traveled by a vehicle; direction detection means for detecting the direction of travel of said vehicle; data memory means for holding map data; signal calculation processing means for calculating the present position of said vehicle from signals received from said distance-traveled detection means and said direction detection means, and for outputting display signals for said present position and display signals for map data read out from said data memory means corresponding to a map area including said present position; and display means for displaying said display signals; said signal calculation processing means including



means for updating said map data to a different map area according to the movement of the vehicle as indicated by the calculated present position of the vehicle when the position of the vehicle is heading into said different map area, and means for initiating operation of said updating means when the present position of the vehicle reaches a point which is spaced from the boundary of said map area by an amount determined by the speed of said vehicle.

4,635,203

PASSIVE RANGE MEASUREMENT APPARATUS AND METHOD

John Merchant, Needham, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 6, 1984, Ser. No. 597,629

Int. Cl.⁴ G01C *3/00*; **G01S** *13/89*

U.S. Cl. 364—458 **11 Claims**



1. A method for mapping a desired scene of interest from a first and a second image obtained from a first sensor viewing said scene from a first position and a second position, respectively, said first sensor having a predetermined axis system, said method comprising the steps of:

A. digitizing said first and second images of said desired scene, thereby creating a first and second digitized image respectively of said desired scene, each of said digitized images having intensity values which are located at different addresses;

B. estimating the relative position of said first sensor between said first and second positions, respectively, said relative position described by information relating to the rotation of said first sensor about said axis system, the displacement of said first sensor relative to said axis system, and the direction of the normal to a first plane which is substantially coplanar with said scene, said direction measured relative to said axis system;

C. selecting a range along said normal in order to determine the portions of said first image which are positioned on a second plane which is parallel to said first plane substantially at said range from said first sensor;

D. modifying said addresses of said intensity values of said second image by use of an address modification function having initial address modification coefficients, thereby producing a first warped image having said intensity values at a plurality of said addresses which said intensity values is substantially equal to said intensity values at each of said corresponding addresses of said first image;

E. correlating said first digitized image and said first warped image;

F. deriving corrections to said address modification function by correcting said initial address modification coefficients in order to increase the number of addresses having substantially equal intensity values;

G. solving in order to correct said relative position information based upon said corrections to said address modification function;

H. repeating said steps of modifying, correlating, deriving and solving until the maximum number of said addresses have substantially equal intensity values;

I. computing the derivatives of said address modification function having corrected address modification coefficients, with respect to said selected range, for each address of said first warped image; and

J. Calculating, for each said addresses of said first image, the altitude relative to said selected range, from said derivatives of said address modification function and the difference in intensity between said first image and said first warped image at each of said addresses.

4,635,204

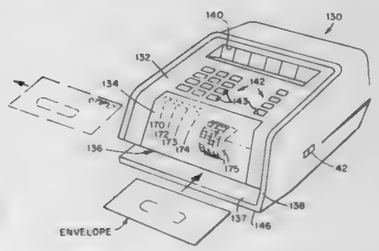
POSTAL METER WITH DATE CHECK REMINDER MEANS

Howell A. Jones, Southport; John H. Soderberg, Stratford; Alton B. Eckert, Norwalk, all of Conn., and Easwaran C. N. Nambudiri, Hicksville, N.Y., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 8, 1982, Ser. No. 447,914

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 364—464 **16 Claims**



1. In a postal meter constructed and arranged to be connected to a source of supply of power for energization of the meter, wherein said meter has a cover including a hinged lid which may be opened by an operator for access thereunder, wherein said meter has printing means including means for printing postage values and a selected date, and wherein the meter has means for displaying a plurality of segments, means for entering data, computer means electrically connected to all of the aforesaid means and programmed for processing data for controlling the operation thereof, and means under the lid and connected to the printing means for selecting one of a plurality of dates, an improvement for reminding an operator of the postal meter to check the selected date, the improvement comprising:

(a) said computer means programmed for causing said displaying means to start displaying and flashing a predetermined code in response to energization of said postal meter, said code including at least one unique check date indicator segment;

(b) said data entering means including a first depressible key for entering data into said computer means, said first key being located under the lid and thus in sufficiently close proximity to said date selecting means to remind an operator to check the selected date; and

(c) said computer means programmed for causing said displaying means to stop displaying said at least one segment on display in response to the depression of said first key.

4,635,205

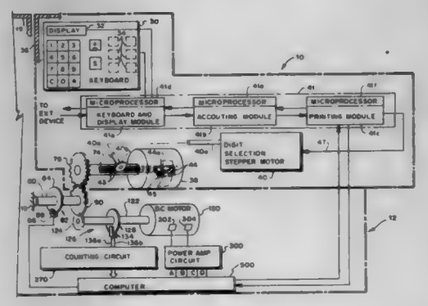
MICROPROCESSOR CONTROLLED D.C. MOTOR FOR INDEXING POSTAGE VALUE CHANGING MEANS

Alton B. Eckert, Jr., Norwalk; Wallace Kirschner, Trumbull, and Edilberto I. Salazar, Brookfield, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 4, 1984, Ser. No. 657,706

Int. Cl.⁴ G06F *15/20*; **H02P** *5/06*; **H02K** *37/00*

U.S. Cl. 364—464 **32 Claims**



1. In combination with a postage meter including a rotary postage printing drum having means for changing respective postage values to be printed, and including means for actuating the changing means, an improvement for indexing the changing means into engagement with the actuating means, the improvement comprising:

(a) a d.c. motor coupled to the drum for rotation thereof;

(b) means for sensing angular displacement of the drum; and,

(c) computer means coupled to the sensing means and to the d.c. motor, the computer means comprising:

(i) means for providing respective amounts representative of desired angular displacements of the drum during successive sampling time periods,

(ii) means responsive to the sensing means for providing respective amounts representative of actual angular displacements of the drum during successive sampling time periods, and

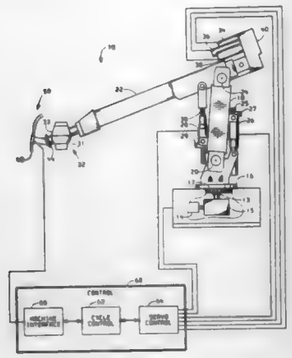
(iii) means for compensating for the difference between desired and actual angular displacements and generating a d.c. motor control signal for controlling rotation of the motor to cause the changing means to be indexed into engagement with the actuating means.

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4,635,206
METHOD AND APPARATUS FOR OSCILLATING A TOOL CARRIED BY A MANIPULATOR

Madhukar Bhatia, Naperville, Ill., and Brian J. Resnick, Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Oct. 15, 1984, Ser. No. 661,000
Int. Cl.[4] G06G *7/64*; G05B *19/18*; B25J *9/00*; B23K *9/12*
U.S. Cl. 364—474 10 Claims



1. A method for oscillating a tool centerpoint in a line through a predetermined location, the tool centerpoint being associated with a function element carried by a manipulator having movable members and actuators for effecting motion of the members, a predetermined pattern of motion being defined by input signals representing pattern parameters measured relative to a pattern longitudinal axis and including pattern pitch and pattern amplitude, the line of oscillation having a direction defined by further input signals, the rate of motion of the tool centerpoint being defined by an input signal representing velocity, and the duration of oscillation being determined in response to input signals representing functions selectably defining a predetermined period of time and an indefinite period terminating on occurrence of a predetermined event, the method comprising the steps of:

(a) moving a workpiece feature relative to the predetermined location in response to the input signal representing a function;

(b) periodically producing iteration interval signals, each iteration interval signal representing a period of time during which an increment of motion of the tool centerpoint is to be effected by the manipulator;

(c) producing an accumulated pattern distance signal in response to the input signals representing velocity and pattern pitch and the iteration interval signal, the accumulated pattern distance signal representing a distance along the pattern longitudinal axis;

(d) producing an excursion amplitude signal in response to the input signals representing pattern parameters and the accumulated pattern distance signal, the excursion amplitude signal representing the pattern amplitude corresponding to the accumulated pattern distance;

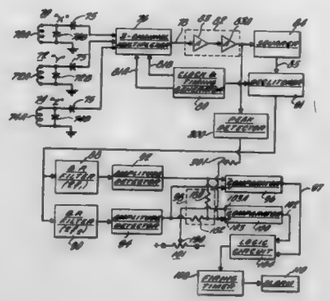
(e) effecting motion of the tool centerpoint on the line of oscillation to a point spaced from the predetermined location by the distance defined by the excursion amplitude signal;

(f) iterating steps (b) through (e) for the period defined by the input signal representing a function to oscillate the tool centerpoint in the oscillation line thereby producing relative motion of the tool centerpoint and the workpiece feature in accordance with the predetermined pattern.

4,635,207
FIELD MEASURING SYSTEM

Earl R. Payne, Urbana, Ill., assignor to ICI Americas Inc., Wilmington, Del.

Filed Nov. 19, 1984, Ser. No. 673,007
Int. Cl.[4] G01R *23/02*
U.S. Cl. 364—484 6 Claims



1. A method for producing signals representative of the scalar magnitude of a selected frequency component of a vector field, comprising:

sensing the magnitudes of a plurality of mutually-orthogonal directional components of said vector field to produce separate time-varying signals each having an amplitude representative of the magnitude of a corresponding one of said directional components;

sampling said separate time-varying signals sequentially and repetitively at a rate greater than twice the frequency of said selected frequency components, to produce corresponding samples thereof;

squaring the amplitudes of said corresponding samples to produce a squared-sample signal having successive values of amplitude proportional to the squares of the amplitudes of said corresponding samples;

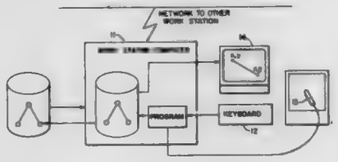
filtering said squared-sample signals to provide relative enhancement of frequency components thereof substantially at the second harmonic of the frequency of said selected frequency component; and

detecting the amplitudes of said second harmonic components to provide a detected signal having a magnitude representative of said amplitude of said second harmonic components.

4,635,208
COMPUTER-AIDED DESIGN OF SYSTEMS

Stanley E. Coleby, and Michael H. Forster, both of Salt Lake County, Utah, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 18, 1985, Ser. No. 692,725
Int. Cl.[4] G06F *15/70*
U.S. Cl. 364—491 12 Claims



1. A computer-performed method of designing a system comprising:

inputting to said computer a plurality of stored data records, each representing a primitive element in said system and a plurality of manipulative programs linked to each data record, said manipulative programs performing the necessary operations on said primitive elements for the design of said system;

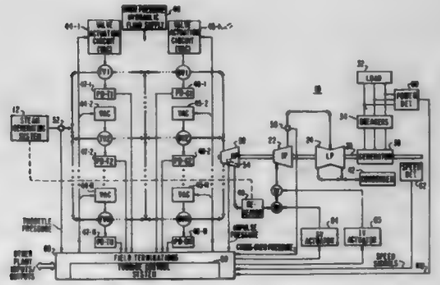
linking said data records in a hierarchy of primitive elements which represent said system; and

inputting to said computer a series of high order commands which operate selected manipulative programs in said hierarchy.

4,635,209
OVERSPEED PROTECTION CONTROL ARRANGEMENT FOR A STEAM TURBINE GENERATOR CONTROL SYSTEM

Eddie Y. Hwang, Winter Park, Fla., and Wu-Shi Shung, South Windsor, Conn., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 31, 1984, Ser. No. 666,711
Int. Cl.[4] G06F *15/46*; G05B *15/00*; F01D *17/02*
U.S. Cl. 364—494 17 Claims



1. An improved OPC arrangement for a turbine control system having at least one central controller in two-way digital data communication with a plurality of motive fluid admission valve control circuits for controlling motive fluid admission to the turbine, comprising:

(A) at least three OPC circuits each including programmable digital computer means in two-way digital data communication with said controller;

(B) at least three speed transducers positioned to derive respective output signals indicative of turbine shaft rotational speed;

(C) each of said OPC circuit including circuit means operable to convert a respective one of said speed transducer output signals to a pulse waveform of a frequency greater than the frequency of the received speed transducer output signal;

(D) means for counting the pulses of said waveform and for sampling the count in repetitive predetermined periods of time for transfer to said digital computer means;

(E) said digital computer means being operable to calculate turbine speed and provide a turbine speed signal (RPM), in response to said counts transferred to it;

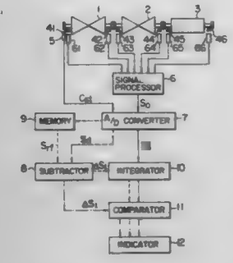
(F) means for providing said turbine speed signal to said other OPCs, as well as said central controller;

(G) said digital computer means being responsive to RPM signals received from other OPCs to validate its own RPM signal if it is in agreement with a predetermined number of other received RPM signals.

4,635,210
METHOD OF AND APPARATUS FOR DETECTING CRACK CONDITION

Kouki Shiohata, Ibaraki; Kazuo Satoh, Kitaibaraki; Motoji Ohmori, Hitachi; Katsuaki Kikuchi, Tsuchiura, and Ryoichi Kaneko, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 25, 1983, Ser. No. 460,811
Claims priority, application Japan, Feb. 19, 1982, 57-26456
Int. Cl.[4] G01M *7/00*
U.S. Cl. 364—508 9 Claims

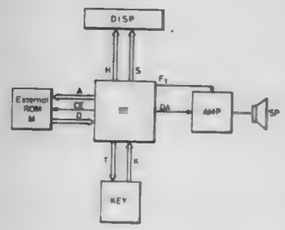


1. A method for detecting a condition of a crack in a rotor of a rotary machine during operation thereof, comprising the steps of continuously detecting over a number of revolutions of the rotor the oscillations on journal portions of the rotor born by the bearings of the rotary machine to produce a detected signal representing said oscillations; and comparing a characteristic of the waveform of each half of at least one cycle of the detected rotor oscillations as indicated by said detected signal to one another to detect the condition of said crack.

4,635,211
SPEECH SYNTHESIZER INTEGRATED CIRCUIT

Hideo Yoshida, Kashihara, and Hisao Kunita, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 15, 1982, Ser. No. 434,500
Claims priority, application Japan, Oct. 21, 1981, 56-169337; Oct. 21, 1981, 56-169338; Oct. 21, 1981, 56-169339; Oct. 30, 1981, 56-175103
Int. Cl.[4] G10L *5/00*
U.S. Cl. 364—513.5 19 Claims



1. An electronic apparatus for performing a synthesized sound generating function and a diverse processing function comprising;

a single chip integrated circuit including,

input control means for controlling input data developed externally of said single chip integrated circuit,

calculation control means, operatively connected to said input control means for handling said input data and for performing said diverse processing function and said synthesized sound generating function,

internal read only memory means for storing and provid-

ing to said calculation control means a synthesis control program for controlling said synthesized sound generating function, and

random access memory means for storing and providing to said calculation control means data used by said calculation control means in performing said diverse processing function and said synthesized sound generation function; and

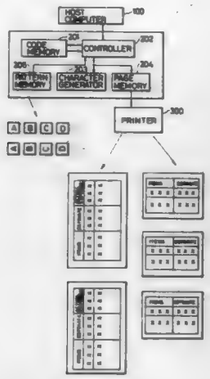
external read only memory means, operatively connected to said calculation control means, for storing a diverse processing application program for controlling said diverse processing function of said calculation control means and sound data used by said calculation control means to synthesize desired sounds.

4,635,212

METHOD FOR GENERATING A ROTATED PRINT PATTERN

Kikuo Hatazawa, Atsugi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 14, 1982, Ser. No. 449,668
Claims priority, application Japan, Dec. 25, 1981, 56-209216
Int. Cl.⁴ G06F *15/40, 15/626*
U.S. Cl. 364—518 **3 Claims**



1. A method for generating rotated print pattern, in which print data in the form of character codes having a first arrangement for one page of data is received and converted into a print pattern expressed in terms of dot patterns corresponding to said character codes in which the print data appears in a second arrangement to be printed which is rotated by 90 degrees as compared to said first arrangement, the character codes being located in said first arrangement according to first coordinate information, and in which the dot patterns forming the rotated print pattern are written in a memory for storing the print pattern for one page of data and for allowing the dot patterns of said one-page print pattern to be read out in the order of a predetermined sequence of addresses and to be fed to a printer, comprising the steps of:

(a) converting a first portion of said print data having said first arrangement into a converted print pattern in which each character code is represented by a dot pattern;

(b) generating first address signals representing said first coordinate information according to said first arrangement of the print data for each dot of said converted portion contained in said print pattern;

(c) generating second address signals forming second coordinate information according to said second arrangement of the print data in which the print pattern is rotated by 90 degrees from said first arrangement by converting said first coordinate information to said second coordinate information for each dot of said converted print pattern;

(d) writing said converted print pattern in locations in said memory in accordance with said generated second address signals; and

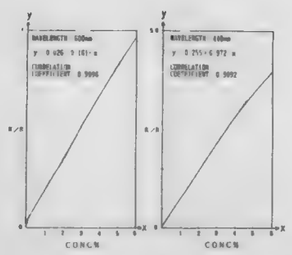
(e) repeating the preceding steps (a) to (d) for another portion of said print data.

4,635,213

METHOD OF ESTIMATING THE RESULT OF COLORATION AND OF REPRODUCING A GIVEN COLOR

Yukio Murata, Takatsuki, and Masakazu Suzuka, Ibaraki, both of Japan, assignors to Sumitomo Chemical Co., Limited, Osaka, Japan

Filed Feb. 21, 1985, Ser. No. 704,041
Claims priority, application Japan, Feb. 21, 1984, 59-32215
Int. Cl.⁴ G01J *3/46*
U.S. Cl. 364—526 **18 Claims**



1. A method of estimating, in terms of spectral reflectivity, the result of coloration by a given colorant recipes including i colorants ($i \geqq 1$), each colorant contained in said given recipe being a known concentration M_i, characterized by the steps of:

(a) coloring reference pieces by each colorant i with some steps of concentration Ci;

(b) measuring the spectral reflectivity (R_i') of each colored reference piece and also deriving the non-boundary reflectivity (R_i) from the said spectral reflectivity (R_i') and the boundary reflectivity (Rg_i) in the accordance with the following equation:

$$R_i = R'_i - Rg_i$$

(c) deriving an optial density (θoi) of the colored layer of each colored reference piece from said non-boundary reflectivity (R_{oi}) of the same colored reference piece according to a known equation, and also calculating an optical density (αoi) per unit colorant concentration by dividing the optical density (θoi) by said concentration (C_i);

(d) calculating an optical density (θi) of each colorant (i) contained in said given colarant recipe by multiplying the optical density (θoi) per unit concentration of said colorant by said concentration (M_i) of said colorant (i);

$$\theta i = \alpha oi \cdot M_i$$

(e) summing the optical density (θi) for i colorants contained in said given colorant recipes to obtain the total optical density θmix:

$$\theta \text{mix} = \Sigma \theta i$$

and

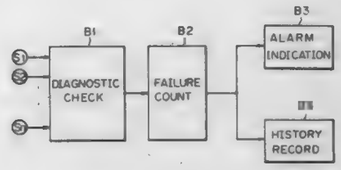
(f) calculating the spectral reflectivity (R') of said possible colored material from said total optical density θmix, thereby estimating the color attained by the given colorant recipe.

4,635,214

FAILURE DIAGNOSTIC PROCESSING SYSTEM

Hitoshi Kasai; Yasuyoshi Asagi, both of Kawasaki; Toshihiro Hattori, Ayase; Hideo Saito, Hiratsuka, and Katsuya Shishido, Fujisawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 29, 1984, Ser. No. 626,234
Claims priority, application Japan, Jun. 30, 1983, 58-119164
Int. Cl.⁴ G06F *15/36*
U.S. Cl. 364—551 **13 Claims**



1. A failure diagnostic processing system for an apparatus supervised by sensors which detect individual conditions of the apparatus, said system comprising:

checking means, operatively connected to the sensors, for achieving diagnostic checks with respect to the sensors to produce first and second diagnostic signals regarding each of the sensors, the first and second diagnostic signals indicating that a failure condition exists and does not exist, respectively;

counting means, operatively connected to said checking means, for generating a count number by incrementing and decrementing selectively in response to the first and second diagnostic signals, respectively;

alarm means, operatively connected to said counting means, for providing an alarm indication in accordance with the count number of said counting means; and

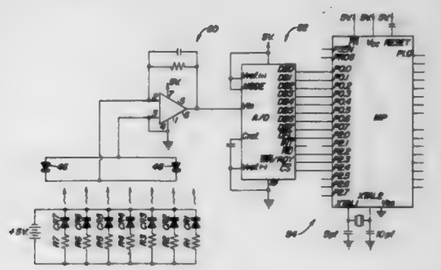
recording means, operatively connected to said counting means, for creating a history of failures by recording the count number of said counting means after the count number exceeds a first predetermined reference number.

4,635,215

ARTICLE OR SEED COUNTER

Kenneth D. Friend, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 10, 1984, Ser. No. 649,108
Int. Cl.⁴ G01N *21/00, 21/85;* G01V *9/04*
U.S. Cl. 364—555 **9 Claims**



1. A signal processor for processing a signal of an article sensor which generates a variable signal which has a relationship to the quantity of articles within the sensor, the signal processor comprising:

means for generating an offset value representing a steady state magnitude of the variable signal produced by the article sensor when no articles are in transit through the article sensor;

means for deriving a first value by subtracting an input value from the offset value, wherein the input value represents an actual magnitude of the variable signal;

means for deriving an area value by repetitively integrating the first value; and

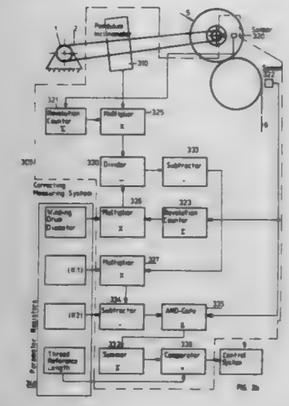
means for comparing the area value to an estimated area value and for generating an output signal when the area value is not less than the estimated area value.

4,635,216

LENGTH MEASURING DEVICE FOR A THREAD

Hansruedi Stutz, Dietlikon, and Beat De Coi, Wetzikon, both of Switzerland, assignors to Loepfe Brothers Limited, Wetzikon, Switzerland

Filed Mar. 26, 1984, Ser. No. 593,105
Claims priority, application Switzerland, Mar. 29, 1983, 1737/83
Int. Cl.⁴ G01B *7/04*
U.S. Cl. 364—562 **31 Claims**



29. A length measuring device for determining when a desired length of a thread has been wound up on a cross-wound package in a thread-winding device, especially a textile thread, wherein the diameter of the cross-wound package is sensed and each revolution thereof is sensed, comprising:

a measuring system including:

a diameter sensor for sensing the diameter of the cross-wound package and for generating a diameter size signal indicative of the sensed diameter;

at least one revolution sensor for sensing each revolution of the cross-wound package and for generating a revolution count signal indicative of each sensed revolution;

the thread-winding device having kinematic characteristics and the cross-wound package having geometric characteristics representable by predeterminate parameters;

a parameter register system for containing said predeterminate parameters relative to the thread-winding device and to the cross-wound package and for transmitting parameter signals indicative of said predeterminate parameters;

a control system for controlling a predetermined device;

said measuring system being connected to said control system and to said parameter register system;

said predeterminate parameters including a reference value of the length of the thread corresponding to the desired length of the thread; and

said measuring system being provided for processing said diameter size signal of said diameter sensor and said revolution count signal of said revolution sensor as well as said parameter signals of the parameter register system indica-

VOL 1074 ISS 1 JA 6 1987 UMI

tive of momentary values of said geometric and kinematic characteristics and for generating therefrom an output signal indicative of substantial equality between a momentary value of the length of thread wound up on the cross-wound package and said reference value and for transmitting said output signal to said control system;

a winding drum having a predetermined diameter for driving the cross-wound package;

the cross-wound package being subject to a slippage relative to the winding drum driving said cross-wound package and guiding said thread; and

said measuring system comprising a compensating measurement system operatively connected with said measuring system, said parameter register system and said control system for compensating the length measurement for said slippage.

4,635,217

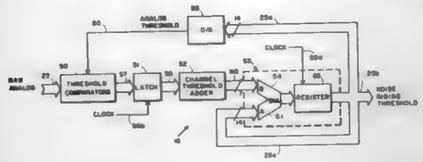
NOISE THRESHOLD ESTIMATOR FOR MULTICHANNEL SIGNAL PROCESSING

Michael O'Connor, Cupertino; Randall L. Jackson, Fremont, and David P. Marple, Palo Alto, all of Calif., assignors to GTE Government Systems Corporation, Stamford, Conn.

Filed Oct. 9, 1984, Ser. No. 659,055

Int. Cl.⁴ G06F *15/20*; G06G *7/19*

U.S. Cl. 364—574 **6 Claims**



1. Signal processing apparatus for defining a noise threshold level for a plurality of N analog channels such that X analog channels are above the noise threshold level and N-X analog channels are below the noise threshold level, said apparatus comprising:

threshold comparison means having N signal inputs, a feedback input, and N outputs, said N signal inputs for receiving in parallel said N analog channels, and said feedback input for receiving a noise threshold voltage, said comparison means comparing the signal level of each N analog channels with the noise threshold voltage level and providing at each output during selected intervals of time: a first state binary signal if the signal level at the corresponding signal input is above the level of the noise threshold voltage, and a second state binary signal if the signal level at the corresponding signal input is below the level of the noise threshold voltage;

first logic means having N signal inputs and an output, said N signal inputs connected to said N outputs of said threshold comparison means, said first logic means adding the number of input signals at said first state during the selected intervals of time and scaling said added number by a predetermined scaling factor to produce a second binary signal;

second logic means having an input and an output, said input connected to said first logic means output, said second logic means providing during the selected intervals of time a third binary signal equal to the digital sum of the second binary signal and said third binary signal from the previous selected interval of time;

converter means having a converter input connected to said second logic means output and having a converter output connected to said feedback input, said converter means converting said third binary signal into a corresponding analog voltage and thereby providing to said threshold comparison means a noise threshold signal for comparison with each of said N channels during the next selected time interval.

4,635,218

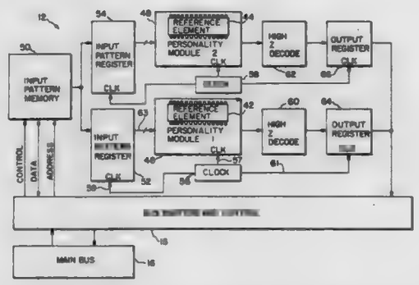
METHOD FOR SIMULATING SYSTEM OPERATION OF STATIC AND DYNAMIC CIRCUIT DEVICES

L. Curtis Widdoes, Jr., Sunnyvale, Calif., assignor to Valid Logic Systems, Mountain View, Calif.

Continuation-in-part of Ser. No. 492,985, May 9, 1983, Pat. No. 4,590,581. This application Jan. 30, 1984, Ser. No. 574,813

Int. Cl.⁴ G06G *7/48, 11/00*

U.S. Cl. 364—578 **17 Claims**



1. In an apparatus for simulating operation of a digital circuit system, a method for modeling operation of a digital device in said digital circuit system, comprising:

employing a physical specimen of said digital device as a reference element;

segregating strobe input signals from nonstrobe input signals; and

preserving order of strobe input signal transitions relative to each other and between strobe input signal transitions and nonstrobe input signal transitions while ignoring the order of nonstrobe input signal transitions relative to other nonstrobe input signal transitions in order to minimize required memory size while preserving a history of relevant input patterns to be presented to said reference element.

4,635,219

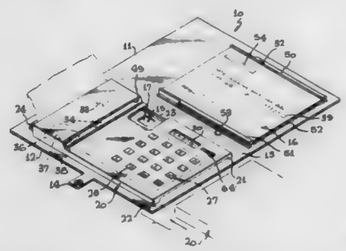
PRINTING CALCULATOR

Lawrence K. Howard, 13015 Willard, North Hollywood, Calif. 91605

Filed Sep. 28, 1983, Ser. No. 536,631

Int. Cl.⁴ G06F *3/12*; B41J *3/36*; G06K *3/12*

U.S. Cl. 364—710 **16 Claims**



1. A portable printing calculator comprising the combination of:

a calculating means;

a printing medium;

a printing means for printing information on said printing medium under control of said calculating means;

guidance means operably disposed between said printing means and said print medium for guiding the path of said printing means along a line parallel to an edge of said printing medium;

said printing medium consists of pads of leaves, bound at one edge;

said printing means insertable between any pair of said leaves for printing of said information;

said calculating means includes an input means coupled to a memory means for entering information thereto;

said printing means is operative to print the information derived from said memory means; and

said printing medium consists of two pads, one of which has perforations along said bound edge.

4. A portable printing calculator comprising the combination of:

a calculating means;

a printing medium;

a carriage means movably carried on said printing medium;

printing means mounted on said carriage means under control of said calculating means for recording information on said printing medium in response to movement of said carriage means;

said calculating means includes as input means coupled to a memory means for entering information thereto;

said printing means being operative to print the information derived from said memory means;

a timing means disposed between said printing medium and said carriage means for sensing the linear movement of said calculating means with respect to said printing medium;

said calculating means is mounted on said carriage means;

a gear and rack arrangement disposed between said printing medium and carriage means constituting a slidable support therebetween; and

said timing means includes a photoelectric arrangement interacting between said carriage means and said gear and rack arrangement.

4,635,220

BINARY CODED DECIMAL NUMBER DIVISION APPARATUS

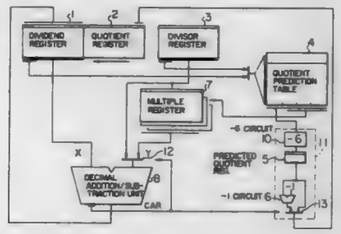
Hideaki Yabe; Yoshio Oshima; Sako Ishikawa; Toru Ohtsuki, and Masaharu Fukuta, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 8, 1983, Ser. No. 549,809

Claims priority, application Japan, Nov. 9, 1982, 57-196618

Int. Cl.⁴ G06F *7/52*

U.S. Cl. 364—763 **5 Claims**



1. A binary coded decimal number division apparatus for determining a quotient on a digit-by-digit basis from a dividend and a divisor represented by binary coded decimal notation by referring to a quotient prediction table comprising:

(a) dividend input means for storing a dividend;

(b) divisor input means for storing a divisor;

(c) quotient output means for storing a quotient developed as a result of processing the dividend and divisor;

(d) register means including a plurality of divisor multiple registers connected to said divisor input means for holding divisor multiples, each multiple register being individually addressable and holding a value equal to said divisor multiplied by a different single digit decimal value;

(e) arithmetic means having one input connected to the output of said dividend input means and another input selectively connected to said divisor input means or said register means and having an output connected to the input of said dividend input means;

(f) storage means connected to said dividend input means and said divisor input means for storing a table of modified quotient prediction values which is accessed by a pair of addresses represented by predetermined numbers of the more significant bits of said dividend and said divisor, respectively, to read out a modified predicted quotient which has a digital value corresponding to a predetermined number added to a predicted quotient which forms a correct quotient or a value greater than the correct quotient by one, said predetermined number being selected such that one part of said read out modified predicted quotient directly specifies the address of one of said multiple registers, and including means for directly applying said one part of said modified predicted quotient to said register means to select one of said multiple registers;

(g) quotient decision means connected to receive said modified predicted quotient read out from said storage means and responsive to said arithmetic means for determining a true quotient and for sending said true quotient to said quotient output means, including reconversion means connected to said storage means for subtracting said predetermined number from the modified predicted quotient read out from said storage means to produce said predicted quotient and means responsive to said arithmetic means for decrementing said predicted quotient or applying said predicted quotient directly to said quotient output means as a true quotient.

4,635,221

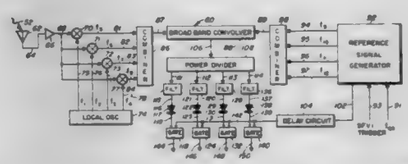
FREQUENCY MULTIPLEXED CONVOLVER COMMUNICATION SYSTEM

Leo A. Kerr, Woodstock, Md., assignor to Allied Corporation, Morristown, N.J.

Filed Jan. 18, 1985, Ser. No. 692,798

Int. Cl.⁴ H03K *3/00*; G06G *7/195*

U.S. Cl. 364—821 **14 Claims**



1. Apparatus for recovering data from a first signal having a carrier frequency and at least one of a plurality of predetermined orthogonal modulations thereon comprising:

first means for generating a plurality of spaced apart first frequencies,

means for mixing said first signal with each of said plurality of spaced apart first frequencies to provide a plurality of second signals at a plurality of predetermined spaced apart second frequencies,

means for combining said plurality of second signals to form a third signal,

a convolver having a first and second input for convolving signals and having an output terminal,

means for coupling said third signal to said first signal input of said convolver,

means for generating a plurality of fourth signals at at least

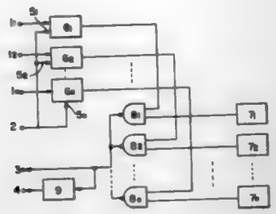
two of said plurality of predetermined spaced apart second frequencies,
second means for generating said plurality of predetermined orthogonal modulations,
means for modulating each of said fourth signals with respective ones of said plurality of orthogonal modulations to provide a plurality of fifth signals,
means for combining said plurality of fifth signals to form a sixth signal,
means for coupling said sixth signal to said second input of said convolver to provide a seventh signal at said output terminal indicative of the convolution of said third and sixth signals,
means for dividing the power of said seventh signal to form a plurality of eighth signals, and
means for filtering each plurality of eighth signals with a respective frequency bandpass to provide a plurality of ninth signals representative of the convolution of reference signals having respective orthogonal modulations with said first signal.

4,635,222

INTERFACE DEVICE FOR CONVERTING A COMPUTER PRINTER PORT INTO AN INPUT/OUTPUT PORT

Satoru Tokui; Susumu Saeyoshi, and Keiichiro Naniba, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Japan

Filed Aug. 19, 1983, Ser. No. 524,633
Claims priority, application Japan, Aug. 20, 1982, 57-144169
Int. Cl.⁴ G06F *3/00*
U.S. Cl. 364—900 5 Claims



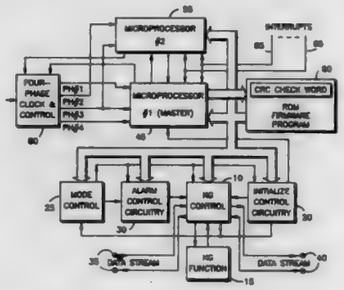
1. An interface device which is adapted to convert a computer printer port, having a number of data terminals for outputting N data signals from a computer for selecting one of N sensors, a strobe terminal for outputting strobe signals from the computer, a status terminal for receiving status information and a request terminal for receiving a request signal for the next data output, into an input/output port adapted to select one of the N sensors and then feed a status signal representing the status of the selected sensors back to the computer, said interface device comprising:
connecting means adapted to be connected to receive and latch the N data signals and the strobe signals from the computer printer port and output the status information and the request signal to the computer printer port; and
logic means connected to said connecting means to receive the N data signals for selectively monitoring one of said N sensors and providing status signals to said connecting means, in response to the N data signals strobed from said connecting means and the status of the selected sensor, said connecting means providing status signals of the selected sensor to said status terminal and said request terminal of said computer printer port via said connecting means.
said logic means comprising a plurality of NAND gates, each having a first input connected to receive said N data signals of said connecting means, and a second input connected to said N sensors, the output of said NAND gates being connected in an OR configuration and adapted to provide the status signals of the selected sensor to said connecting means.

4,635,223

FAIL SAFE PROTECTION CIRCUITRY FOR A COMMERICAL MICROPROCESSOR IN ENCRYPTION EQUIPMENT

Susan L. Boone, Gilbert, and Hugh D. Stuart, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumberg, Ill.

Continuation of Ser. No. 495,234, May 16, 1983. This application Jun. 18, 1986, Ser. No. 876,290
Int. Cl.⁴ G06F *9/00*
U.S. Cl. 364—900 2 Claims



1. Fail Safe protection circuitry for a commercial microprocessor in encryption equipment comprising:
a first microprocessor, including instruction registers, connected to perform predetermined functions and control additional external circuitry in accordance with a specific program;
a second microprocessor similar to said first microprocessor and connected to said first microprocessor for comparing bits stored in the instruction registers;
a memory having the specific program stored therein and connected to said first and second microprocessors for control thereof in accordance with the stored program; and
a plural phase clock connected to said first and second microprocessors causing said first microprocessor to step in response to each pulse in a first clock phase with certain instruction bits being stored in the instruction register thereof, said second microprocessor to step in response to each pulse in a second clock phase with certain instruction bits being stored in the instruction register thereof, the bits in the instruction registers of the first microprocessor to be compared to the bits in the instruction registers of the second microprocessor in response to each pulse in a third clock phase, and the instructions from one of said first and second microprocessors to be executed in response to each pulse in a fourth clock phase if a comparison occurs.

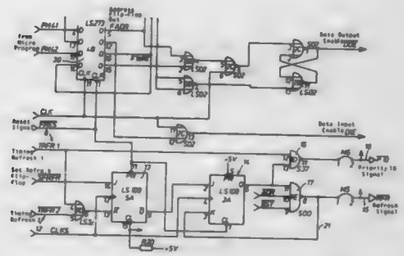
4,635,224

PROCESS AND SYSTEM FOR TRANSMITTING A REFRESH SIGNAL TO A SEMICONDUCTOR MEMORY

Otto Müller, Am Guckenbühl 10, D-7750 Constance 16, Fed. Rep. of Germany

Continuation of Ser. No. 412,304, Aug. 27, 1982, abandoned.
This application Feb. 25, 1986, Ser. No. 834,145
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133838
Int. Cl.⁴ G06F *9/46;* G11C *7/00*
U.S. Cl. 364—900 3 Claims

1. A circuit arrangement for the transmission of a refresh signal to a semi-conductor memory which is connected to a central computer bus having a plurality of different aggregates attached thereto, each with a designated priority relative to the others, in which the refresh signal originates from a central processing unit (CPU) at a specific priority in comparison to other aggregates connected to the computer bus, to be delivered to a semi-conductor memory, in which the refresh signal is divided to at least two chronologically consecutive sub-intervals and the transmission of the refresh signal during the duration of the first sub-interval has a lower priority onto the computer bus and that, in the case of transmission of the refresh signal not being possible during the duration of the first sub-interval, the transmission of the refresh signal onto the computer bus is achieved at higher priority during the duration of the later sub-interval, characterized as: that the refresh signal (**24**) is divided into two sub-intervals (TRFR 1, TRFR2) by applying a clock cycle to an input of a divider circuit (**2, 3, 4**) an output of the divider circuit is applied to an input of a D-flip-flop (**5**) which outputs said two sub-intervals, and that during the duration of the first sub-interval (TRFR 1), a controller (**13, 14, 17**) generates the associated refresh signal $\overline{RFR}$



for the semi-conductor memory, said controller comprises a flip-flop (**13**) for receiving the two sub-intervals (TRFR 1 and TRFR2) and for generating an output to an input of a further flip-flop **14**, an output of said flip-flop **14** is connected to one input (input **11**) of a NAND-gate (**17**), the other inputs of said NAND-gate (**17**) are connected to receive status signals (ADR, BSY) to indicate the transmission readiness of an address line and the computer bus are connected; and that during the later sub-interval, the first sub-interval signal (TRFR 1) changes its logic status, the signal on said one input (input **11**) of the NAND-gate (**17**) and on the output of said flip-flop (**14**) is connected to the input (input **13**) of a further NAND-gate (**16**) on whose other input (input **12**) the first sub-interval signal (TRFR 1) is placed; and that the signal ($\overline{P10}$) generated on the output (output **11**) of the further NAND-gate (**16**) is placed as a higher level priority signal via a priority controller (**19**) onto the computer bus, with a result that the lower priority aggregates are caused to release the address line and the computer bus (**26**).

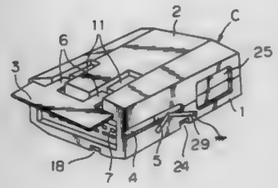
4,635,225

MAGNETIC BUBBLE CASSETTE

Satoru Imai, and Toshiaki Sukeda, both of Suzaka, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 31, 1983, Ser. No. 527,959
Claims priority, application Japan, Sep. 6, 1982, 57-154877; Sep. 6, 1982, 57-154878; Sep. 8, 1982, 57-156387
Int. Cl.⁴ G11C *19/08*
U.S. Cl. 365—1 5 Claims

1. A magnetic bubble cassette comprising
a case for being inserted into an external unit, wherein said case is made of an electrically insulating material and is grooved on its outside surface to define a proper insertion into said external unit,
a magnetic bubble device contained in said case, said magnetic bubble device including a magnetic bubble chip, a drive coil, and a bias magnet and said magnetic bubble device having a respective part to be grounded when inserted in said external unit,
a respective connector contained in said case for electrically connecting said magnetic bubble device to said external unit when inserted therein,
a cover pivotably mounted by means of a support pin on the end of said case so as to be opened and closed when said case is inserted into and removed from said external unit, respectively,



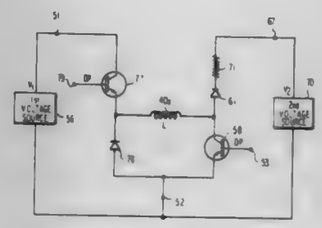
said connector of said case being provided on the inside of said cover of said case, and
a grounding metal piece provided in at least one of said grooves of said case, each said metal piece being connected to said part of said magnetic bubble device to be grounded.

4,635,226

BLOCH LINE PAIR DRIVING DEVICE CAPABLE OF QUICKLY DRIVING EACH BLOCH LINE PAIR AT A LOW VOLTAGE

Kousuke Takahashi, and Hachiro Yamada, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 7, 1984, Ser. No. 607,471
Claims priority, application Japan, May 9, 1983, 58-80374; Jun. 17, 1983, 58-108684
Int. Cl.⁴ G11C *19/08*
U.S. Cl. 365—6 15 Claims



1. A Bloch line pair driving device for use in combination with a Bloch line memory device in which a multiplicity of Bloch line pairs are produced substantially parallel to a predetermined direction by information signals, respectively, in a domain wall of each magnetic domain, said driving device being adapted to apply a growing and disappearing magnetic field having an asymmetrical waveform to said each magnetic domain in said predetermined direction to drive each Bloch line pair along said domain wall transversely of said predetermined direction and comprising:
a first, a second, and a third terminal;
first means for supplying a first voltage between said first and said third terminals;
second means for supplying a second voltage between said second and said third terminals, said second voltage being different from said first voltage;
an inductor circuit having an axis and being for coupling to said memory device with said axis directed parallel to said predetermined direction, said inductor circuit further having a first end supplied from said first means with said first voltage through said first terminal and a second end,

said inductor circuit being adapted to allow an electric current to flow therethrough to produce said magnetic field;

a first current path circuit between said second end and said second terminal, said first current path circuit having an active and a passive state of providing and not providing a first current path for discharging the electric current produced in said inductor circuit, respectively; and

a first switch between said second end and said third terminal, said first switch being controllably put in an on and an off state of putting said first current path circuit in said passive state to make said first voltage produce the growing electric current in said inductor circuit and of putting said current path circuit in said active state to expedite disappearance of the electric current from said inductor circuit so that said magnetic field rapidly changes to drive the Bloch line pair, respectively.

4,635,227

READING HEAD FOR THE MAGNETIC SCANNING OF ELONGATE BISTABLE MAGNETIC ELEMENTS

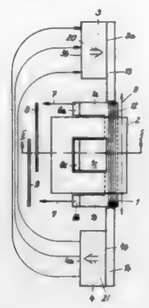
Norbert Normann, Pforzheim, Fed. Rep. of Germany, assignor to Dodduco KG Dr. Eugen Durrwachter, Pforzheim, Fed. Rep. of Germany

Filed Nov. 2, 1984, Ser. No. 667,359

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1983, 3340600

Int. Cl.⁴ G11C *11/00*; G11B *5/02*

U.S. Cl. 365—133 **8 Claims**



1. In a reading head for the magnetic scanning of a pluarity of juxtaposed elongated bistable magnetic elements arranged in two parallel rows, cmprising

means defining a reading surface,

an E-shaped soft magnetic core which comprises an elongated backbone defining a longitudinal direction thereof, an upper leg, a lower leg, and an intermediate leg between them, which legs are in parallel and protruding from said backbone and terminate with their respective free leg ends in said reading surface, whereas the backbone is spaced from said reading surface,

an electrically conductive detector winding surrounding said intermediate leg, and

two short permanent magnets having large north and south pole faces, the same magnetic flux density at their pole faces and a direction of magnetization which is approximately parallel to said reading surface, one of the magnets being spaced upwardly from the upper leg and the other magnet being spaced below the lower leg of said E-shaped core,

said permanent magnets being arranged to establish between them a magnetic field which on opposite sides of said core has antiparallel flux components which are approximately parallel to said backbone and are separated by a neutral zone,

the improvement residing in that

two low-reluctance sheet metal elements are respectively carried by the north poleface of one of said permanent magnets and by the south poleface of the other of said permanent magnets,

said low-reluctance elements converge toward and terminate in said reading surface where they are spaced apart by a distance which slightly exceeds the length of said core,

said free leg ends have in said reading surface such a spacing from said low-reluctance elements in a direction which is transverse to the longitudinal direction of said backbone that said free leg ends are disposed in the vicinity of the neutral zone of said magnetic field.

4,635,228

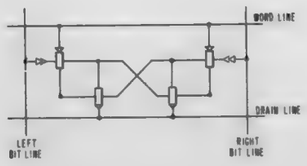
RANDOM ACCESS MEMORY EMPLOYING UNCLAMPED COMPLEMENTARY TRANSISTOR SWITCH (CTS) MEMORY CELLS AND UTILIZING WORD TO DRAIN LINE DIODE SHUNTS

George J. Jordy, Wappingers Falls, and Joseph M. Mosley, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1984, Ser. No. 682,391

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—154 **2 Claims**



1. In a solid state randon access memory, said solid state memory including:

at least first and second pairs of bit lines, each pair of bit lines including a left bit line an a right bit line;

at least first and second pairs of word-drain lines, each pair of word-drain lines including a word line and a drain line;

at least first, second, third and fourth unclamped complementary transistor switch (CTS) memory cells, each of said first, second, third and fourth unclamped complementary transistor switch memory cells in cluding cross-coupled first and second NPN transistors and first and second PNP load transistors,

said first and second unclamped CTS memory cells each being connected between said word line and said drain line of said first pair of word-drain lines and respectively between said first and second pairs of bit lines,

said third and fourth unclamped CTS memory cells each being connected between said word line and said drain line of said second pair of word-drain lines and respectively between said first and second pairs of bit lines; and

said solid state random access memory being characterized by the inclusion of first and second shunt circuit means, said first and second shunt circuit means respectively connected across said word line and drain line of said first word-drain line pair and said word line and drain line of said second word-drain line pair, said first and second shunt circuit means respectively limiting word line to drain line voltage and also controlling the saturation of said NPN transistors employed in said unclamped CTS memory cells, said solid state random access memory being further characterized in that said first and second shunt circuit means are respectively PN diodes or diode connected transistors.

4,635,229

SEMICONDUCTOR MEMORY DEVICE INCLUDING NON-VOLATILE TRANSISTOR FOR STORING DATA IN A BISTABLE CIRCUIT

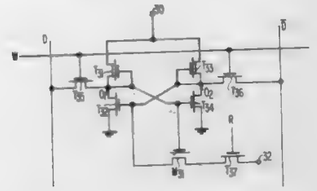
Koichiro Okumura, and Takeshi Watanabe, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jan. 17, 1985, Ser. No. 692,087

Claims priority, application Japan, Jan. 18, 1984, 59-6606

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—154 **10 Claims**



1. A semiconductor memory device having a plurality of memory cells on a single semiconductor chip, each of said memory cells comprising; a bistable circuit coupled between a reference voltage source and a power supply terminal and having two output terminals, one of said two output terminals being coupled to a true digit line via a first transfer gate, and the other output terminal being coupled to a complementary digit line via a second transfer gate, means for selectively supplying a first voltage or a second voltage higher than said first voltage to said bistable circuit through said power supply terminal, a non-volatile memory transistor having a control electrode coupled to one of said two output terminals of said bistable circuit, and having one of a source and drain coupled to the other of said two output terminals of said bistable circuit, for selectively storing the contents of said bistable circuit, and switching means coupled to the other of said source and drain of said non-volatile memory transistor for applying a driving voltage thereto, and a power-on reset circuit provided on said semiconductor chip and generating a reset signal when power for driving the memory device is supplied to said semiconductor chip, said switching means being activated by said reset signal to apply a driving voltage at the other of said source and drain of said non-volatile memory transistor.

4,635,230

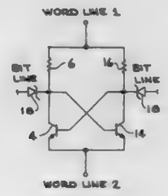
EMITTER COUPLED LOGIC BIPOLAR MEMORY CELL

Mammen Thomas, and Wen C. Ko, both of San Jose, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 18, 1984, Ser. No. 683,287

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—175 **4 Claims**



1. An improved ECL bipolar memory cell having a first Schottky diode, formed from a portion of a polysilicon layer and a metal silicide connected between a bit line and the collector of a first transistor; a second Schottky diode also formed from a portion of the same polysilicon layer and a metal silicide connected between a second bit line and the collector of a second transistor; said first transistor having its base connected to said collector of said second transistor, said second transistor having its base connected to the collector of said first transistor whereby a flip-flop circuit is formed; and said first and second transistors having their collectors respectively coupled to a first word line through a polysilicon load device also formed from portions of said polysilicon layer and their emitters connected together in a buried layer which is connected to a second word line to reduce alpha strike-induced errors; said cell having enhanced resistance to latch-up because of the low minority carrier efficiency of said Schottky diodes.

4,635,231

SEMICONDUCTOR MEMORY WITH CONSTANT READOUT CAPABILITY

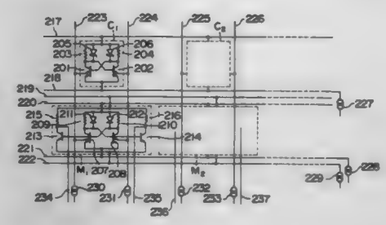
Toshiki Mori, Ibaraki; Haruyasu Yamada, Hirakata; Kenichi Hasegawa, Osaka, and Kunitoshi Aono, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 19, 1984, Ser. No. 662,900

Claims priority, application Japan, Oct. 24, 1983, 58-197573

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—190 **5 Claims**



4. A semiconductor memory device comprising:

first and second cross-coupled multi-emitter transistors each having two emitters, the first emitter of each of said multi-emitter transistors being commonly connected to a negative word line and the second emitter of each of said multi-emitter transistors being connected to respective bit lines;

first and second parallel connections of a resistor and a Schottky barrier diode respectively connected between each collector of said first and second multi-emitter transistors and a positive word line; and

first and second transistors having bases respectively connected to the collectors of said first and second multi-emitter transistors, collectors connected in common to a constant voltage source through respective resistors, and emitters connected in common.

4,635,232

SEMICONDUCTOR MEMORY DEVICE

Hiroshi Iwahashi, and Fujio Masuoka, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 23, 1983, Ser. No. 477,880

Claims priority, application Japan, Mar. 25, 1982, 57-47723

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—200 **10 Claims**

1. A semiconductor memory device for providing error correction, said memory device being coupled to a source of power, being responsive to an address signal, and comprising:

a main memory including main memory word lines connected to different ones of a plurality of main memory cells;

an auxiliary memory including auxiliary memory word lines;

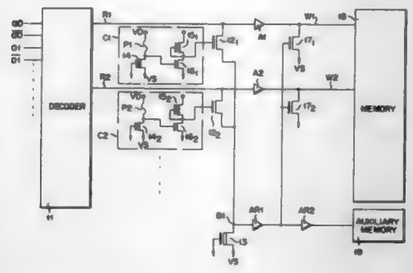
a decoder for decoding said address signal and for producing a decoded address signal identifying one of said main memory word lines;

selecting means for selecting one of said main memory word

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lines and a corresponding one of said auxiliary memory word lines according to said decoded address signal, said selecting means including at least one first MOS transistor having an output current path connected between said selected one main memory word line and said corresponding selected one auxiliary memory word line, and having a gate supplied with a control signal, whereby said selecting means selects said main memory word line when said control signal has a first logic level, and selects said corresponding selected one auxiliary memory word line when said control signal has a second logic level; and

control means for generating said control signal at said first logic level when all of said main memory cells connected to said selected one main memory word line are correct, and for generating said control signal at said second level when any of said main memory cells connected to said selected one main memory word line is in error, said control means including:



a fuse element being set in a first state if all of said main memory cells connected to said selected one main memory word line are correct, and being set in a second state if any of said main memory cells connected to said selected one main memory word line is in error, said fuse element having one end connected to said power source,

a second MOS transistor having a current path connected between a second end of said fuse element and a reference voltage, and having a gate also connected to said reference voltage, and

an inverter having an input terminal connected to the junction of said fuse element and said second MOS transistor, and having an output terminal constituting an output terminal of said control means and producing said control signal, said output terminal of said inverter being connected to said gate of said first MOS transistor of said selecting means.

4,635,233

SEMICONDUCTOR MEMORY DEVICE

Tetsuro Matsumoto, Tachikawa, and Kazuhiko Kajigaya, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 11, 1984, Ser. No. 649,296
Claims priority, application Japan, Sep. 12, 1983, 58-166635
Int. Cl.⁴ G11C *8/00*
U.S. Cl. 365—230 **23 Claims**

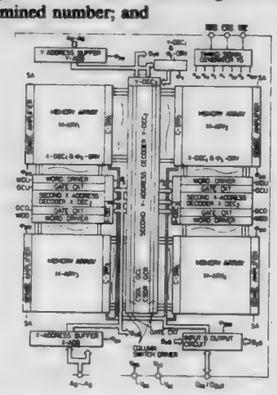
1. A semiconductor memory device comprising:

a plurality of memory cells;

control means which forms first, second and third select signals and a timing signal;

first select means which receives said first select signals and produces fourth select signals for selecting a first predetermined number of memory cells designated by said first select signals from said plurality of memory cells;

second select means which receives said second and fourth select signals and produces fifth select signals for selecting a second predetermined number of memory cells from the memory cells selected by said first selection means, the second predetermined number being less than said first predetermined number; and



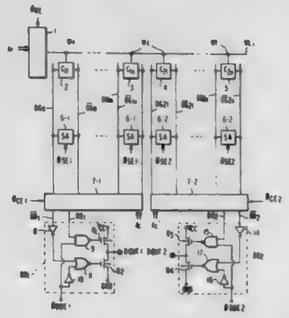
third select means which receives said third select signals, said timing signal and said fifth select signals and produces a sixth select signal for selecting at least one memory cell from the memory cells selected by said second selection means.

4,635,234

MEMORY CIRCUIT WITH AN IMPROVED OUTPUT CONTROL CIRCUIT

Takashi Yamaguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 13, 1984, Ser. No. 630,799
Claims priority, application Japan, Jul. 15, 1983, 58-129007
Int. Cl.⁴ G11C *11/40*
U.S. Cl. 365—233 **10 Claims**



1. In a multibit-output memory circuit of the type having, a plurality of memory cells arranged at the intersection of at least one word line and a plurality of bit lines, said word line connected to at least first and second groups of adjacent memory cells, means for applying a word line active signal to said word line whereby the delay characteristics of said word line results in the sequential application of said signal to said first and second groups of adjacent memory cells, at least first and second output circuits associated with said first and second groups of adjacent memory cells, respectively, and at least first and second selection means associated with said first and second groups of adjacent memory cells, respectively, each said selection means being operable to selectively connect the bit lines associated with a selected memory cell to an associated output circuit, the improvement comprising:

means for applying activating timing signals to said selection means and output circuits to cause operation of said selection means and output circuits in a sequence according to the memory cell groups to which they are associated and the nearness of said groups to the application point

in said word line of said word line active signal, wherein said means for applying comprises,

first timing means for applying an activation timing signal to said first selection means and a subsequent activation timing signal to said first output circuit to enable the operation of said means and said circuit after said word line active signal is applied to all said memory cells in said first group,

second timing means for applying an activation timing signal to said second selection means and a subsequent activation timing signal to said second output circuit to enable the operation of said means and said circuit after said word line active signal is applied to all said memory cells in said second group,

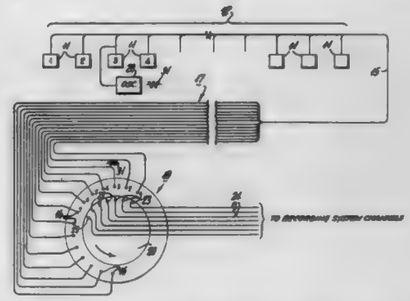
wherein said second selection means is activated after said first selection means, and said second output circuit is activated after said first output circuit.

4,635,235

SEISMIC EXPLORATION SYSTEM IMPROVEMENT

Joe M. Bearden, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 25, 1983, Ser. No. 516,494
Int. Cl.⁴ H04B *17/00*; G01V *13/00*
U.S. Cl. 367—13 **5 Claims**



1. In a seismic exploration system having a plurality of geophone locations along a survey line with at least one geophone connected to each of a plurality of separate circuits connected to corresponding terminals of a roll-along common depth point switch, means for identifying a specific one of said geophone locations as said switch changes connections, comprising

means for superimposing a signal outside the useful range of seismic energy signals generated by said geophones on the one of said separate circuits connected to said specific geophone location whereby said location may be identified on the changed connection side of said switch.

4,635,236

SUBMERGED MARINE STREAMER LOCATOR

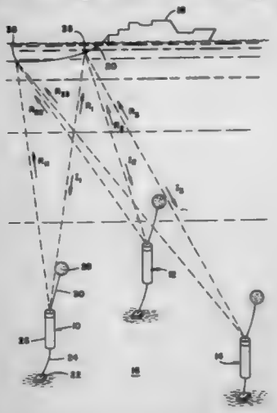
F. Alex Roberts, Brea, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 306,795, Sep. 29, 1981. This application Aug. 3, 1984, Ser. No. 637,445
The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.
Int. Cl.⁴ G01S *15/06*; G01V *1/38*
U.S. Cl. 367—19 **7 Claims**

1. Apparatus for use in determining relative to known geographic locations on a sea floor the position of a moving submerged marine seismic streamer while being towed through the sea by an exploration vessel, which comprises:

a plurality of spaced apart acoustic receivers and at least one acoustic transducer-receiver carried by said streamer, said transducer-receiver being capable of emitting acoustic command signals when triggered by means controllable from the moving vessel and said receivers being capable of receiving and distinguishing distinctly different acoustic frequencies to transmit distinguishable signals responsive thereto along the streamer to recording means on the vessel;

at least three sea floor transponders spatially displaced from each other at known positions relative to the sea floor and each of the transponders being capable of responding to a single acoustic command signal from said transducer-receiver in said moving streamer while being towed by



said vessel, each of said transponders emitting signals of a distinctly different frequency; and

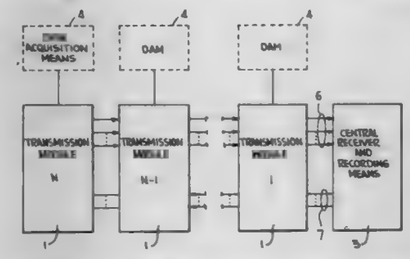
means for recording the time interval from initiation of a command signal from said streamer transducer to the receipt of each signal relayed along said streamer from each of said receivers in response to said signals from said transponders, whereby the distance of each of said streamer receivers from each of said known positions of said transponders may be calculated.

4,635,237

DATA TRANSMISSION SYSTEM FOR SEISMIC STREAMERS

Otto Benestad, Jar; Kjell Hatteland, Ryken, and Paul Fredriksen, Oslo, all of Norway, assignors to Geophysical Company, Hovik, Norway

Filed Nov. 28, 1983, Ser. No. 555,546
Claims priority, application Norway, Apr. 5, 1983, 831203
Int. Cl.⁴ G01V *1/22, 1/38*
U.S. Cl. 367—20 **7 Claims**



1. A system for transmitting information between a plurality of seismic data acquisition means and a central receiver and recording means comprising:

a plurality of transmission modules which each are adapted to a respective data acquisition means and which are interconnected through a plurality of transmission lines of which at least two lines constitute outgoing data transmission lines and transmit information from the central receiver and recording means to the data acquisition means, and at least a second two lines constitute the incoming transmission lines for transmitting information from the data acquisition means to the central receiver and record-

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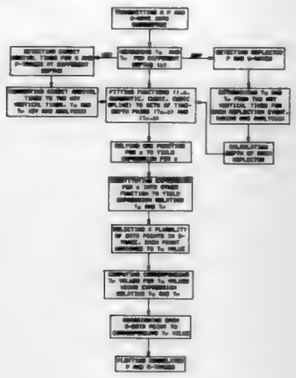
ing means, the transmission modules for each of the outgoing transmission lines comprising separate line receiver means and line transmitter means for each of the outgoing data transmission lines;
each of the transmission modules also comprising separate information decoder means which independently of each other generate a separate set of commands from each of the associated outgoing transmission lines;
a selector means pointing out which of the outgoing transmission lines at any time is to be used and accordingly also which of these sets of commands are to be regarded as valid;
and a matrix of transmission line switching means comprising separate switches organized in rows and columns so that the number of rows is equal to the number of outgoing transmission lines, and each row in the matrix is constituted by two selectors which both are arranged in the signal path of its associated outgoing transmission line, a first selector being able to break the signal path in the line in question and a second selector performing cross connection of the signals from one line to the other line(s), said matrix of transmission line switching means being controlled by commands from the information decoders via control signal multiplexer units which select a valid command set according to the control signal from selector means, in such a way that the signals from the selected one of the outgoing transmission line are transmitted further to the next transmission module on all the outgoing transmission lines.

4,635,238

DATA PROCESSING METHOD FOR CORRECTING P AND S WAVE SEISMIC TRACES

Joseph G. Gallagher, and Kay D. Wyatt, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 12, 1984, Ser. No. 649,632
Int. Cl.[4] G01V *1/36*
U.S. Cl. 367—40 **17 Claims**



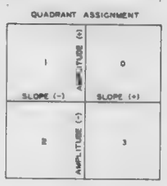
1. A method of processing seismic data enabling the correlation of P and S-wave wiggle traces comprising the steps of:
(a) transmitting a P-wave and an S-wave into the subsurface of the earth;
(b) measuring the two-way vertical travel times of the S-wave to different depths in the subsurface, thereby yielding a set of S-wave time-depth pairs wherein each time-depth pair includes a depth value z and a corresponding S-wave two-way vertical travel time value T_s;
(c) measuring the two-way vertical travel times of the P-wave to different depths in the subsurface, thereby yielding a set of P-wave time-depth pairs, wherein each time-depth pair includes a depth value z and a corresponding P-wave two way vertical travel time value Tp;
(d) fitting a first mathematical function relating T_s and depth z to the set of S-wave time depth pairs;
(e) fitting a second mathematical function relating T_p and depth z to the set of P-wave time depth pairs;
(f) combining the first and second functions so as to yield an expression relating respective S and P-wave two-way vertical travel time values T_s and T_p.

4,635,239

DATA PROCESSING

Dennis B. Neff, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 24, 1984, Ser. No. 613,685
Int. Cl.[4] G01V *1/36*
U.S. Cl. 367—47 **13 Claims**



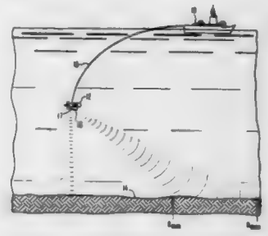
1. A method for determining the phase misalignment between at least a first part of a first sinusoidal waveform and at least a first part of a second sinusoidal waveform, wherein said first sinusoidal waveform and said second sinusoidal waveform are produced in response to the reception of seismic energy from a seismic source by an array of seismic detectors, said method comprising the steps of:
(a) selecting a plurality of data points in said first part of said first sinusoidal waveform and said first part of said second sinusoidal waveform, wherein said plurality of data points are equally spaced apart;
(b) assigning a quadrant value to each data point selected in step (a) for said first sinusoidal waveform and said second sinusoidal waveform, wherein a first quadrant value is assigned to a data point if the data point has a positive amplitude and a positive slope, wherein a second quadrant value is assigned to a data point if the data point has a positive amplitude and a negative slope, wherein a third quadrant value is assigned to a data point if the data point has a negative amplitude and a negative slope and wherein a fourth quadrant value is assigned to a data point if the data point has a negative amplitude and a positive slope;
(c) selecting a first window for said first part of said first sinusoidal waveform and said first part of said second sinusoidal waveform, wherein said window contains a plurality of the data points selected in step (a);
(d) shifting said second sinusoidal waveform with respect to said first sinusoidal waveform by a first phase shift;
(e) comparing the quadrant value assigned to the first data point in said first window for said first sinusoidal waveform to the quadrant value assigned to the first data point in said first window for said second sinusoidal waveform shifted by said first phase shift to establish a first correlation value, wherein said first correlation value has a first value if the compared quadrant values are equal and has a second value if the compared quadrant values are not equal;
(f) repeating step (e) for all data points contained in said first window for said first sinusoidal waveform and said second sinusoidal waveform shifted by said first phase shift, wherein each data point in said first sinusoidal waveform is compared to a corresponding data point in said second sinusoidal waveform;
(g) summing all correlation values established in steps (e) and (f) to establish a total correlation value for said first window for said first phase shift; and
(h) repeating steps (d)–(g), wherein different phase shifts are applied in step (d) and wherein the total correlation values derived for each phase shift gives the phase misalignment between said first sinusoidal waveform and said second sinusoidal waveform in said first window.

4,635,240

SONAR NAVIGATION SYSTEM

Kenneth P. Geohegan, Jr., Catonsville, and Charles W. Allen, Arnold, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 26, 1985, Ser. No. 716,304
Int. Cl.[4] G01S *9/66, 9/68, 15/00*
U.S. Cl. 367—89 **9 Claims**



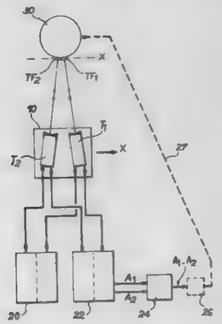
1. A sonar navigation system comprising:
(A) sonar means on a sonar platform operable to forwardly transmit a broadband acoustic signal toward the bed of a body of water over which the platform is traveling and to repeat the transmission of said signal in repetitive transmission cycles, during the course of said travel;
(B) means on said platform for receiving acoustic returns resulting from said transmissions;
(C) means forming a plurality of individual receiver beam signals in response to a single transmission and reception;
(D) means for cross-correlating segments of each beam signal from one transmission with respective corresponding beam signals from another transmission to derive a delay indication for each said segment cross-correlation;
(E) means responsive to said delay indications to derive a velocity value indicative of platform speed;
(F) means responsive to said cross-correlation of all of said segments of all of said beams to derive a cross-correlation amplitude value for each said beam;
(G) means responsive to all of said beam amplitude values to derive a value for platform angular deviation from its travel path, from one transmission to a next.

4,635,241

ULTRASONIC DEVICE

Robert Saglio, Antony, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 22, 1983, Ser. No. 525,343
Claims priority, application France, Aug. 31, 1982, 82 14855
Int. Cl.[4] G01S *15/06*
U.S. Cl. 367—95 **4 Claims**



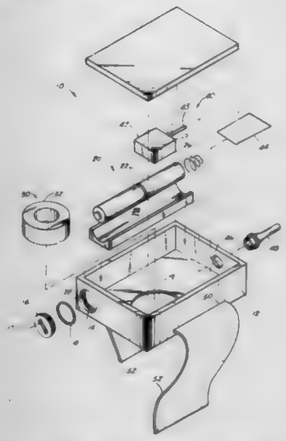
1. A device for locating an object in a plane, said object have a surface located in said plane, said device comprising two ultrasonic emitter-receiver transducers located at a certain distance from said surface, each transducer emitting an ultrasonic focused wave beam directed onto said plane, each beam impinging on said surface and forming thereon a spot, the two spots of the two beams partially overlaping and being displaced with respect to one another, the displacement of the spots defining a direction, said two beams being reflected by the surface of the object and giving rise to two reflected beams directed onto said two transducers, said two transducers suppling two corresponding receiving signals, said device comprising also a receiving signal processing circuit comprising two sample and hold means connected to said two transducers and a difference circuit connected to said sample and hold means, said difference circuit supplying a signal which is responsive to the location of the object with respect to said direction.

4,635,242

UNDERWATER SIGNALLING DEVICE

James E. Hart, P.O. Box 8857, Metairie, La. 70011

Filed Jul. 20, 1984, Ser. No. 632,937
Int. Cl.[4] H04B *11/00*
U.S. Cl. 367—134 **17 Claims**



1. An underwater signalling device, comprising:
a. a waterproof housing;
b. an acoustic signal means mounted in said housing;
c. a power source mounted in said housing;
d. a waterproof switch connected between said power source and said signal means for selective activation of said signal means, said switch including means for biasing said switch from a second to a first position thereof; and
e. circuit means connected between said switch and said signal means for varying the output of said signal means, said switch comprising a three-position switch movable between said first position opening said circuit for preventing emission of an audible signal from said signal means, said second position for providing a momentary closing of said circuit for providing a momentary pulsed audible signal from said signal means and a third position closing said circuit for providing a constant audible signal from said signal means.

4,635,243

OPTICAL INFORMATION PROCESSING APPARATUS

Masamichi Tateoka, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1984, Ser. No. 679,934
Claims priority, application Japan, Dec. 16, 1983, 58-237277
Int. Cl.[4] G11B *7/125*
U.S. Cl. 369—44 **4 Claims**

1. An optical information processing apparatus comprising:
means for recording or reproducing information by projecting a main light beam onto an information track on a recording medium;

means for projecting at least two or more than two subsidiary light beams onto said information track to form light spots which are larger in size in the longitudinal direction of said information track than in the transversal direction thereof, at different positions in the transversal direction



of said information track by said respective light beams; and

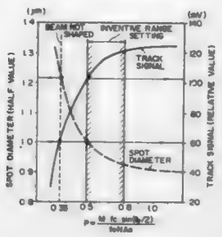
means for detecting said subsidiary beams reflected by the recording medium to derive a tracking signal for guiding said main beam correctly on the information track.

4,635,244

OPTICAL BEAM SHAPING SYSTEM

Hiroshi Gotoh, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 5, 1985, Ser. No. 752,356
Claims priority, application Japan, Jul. 5, 1984, 59-139458
Int. Cl.[4] G11B *7/00*; G02B *3/06*
U.S. Cl. 369—112 4 Claims



1. An optical system comprising a semiconductor laser for emitting a laser beam, a coupling lens for converting the laser beam a parallel beam, an optical beam shaping system for increasing the diameter of the parallel beam in a direction in which said semiconductor laser has a smaller far field pattern, and an objective lens for focusing a beam shaped by said optical beam shaping system into a spot, said optical beam shaping system having a magnification selected to fall in the following range:

$$0.55 \leq \frac{M \cdot fc \cdot \sin(\theta \,/\!/\, /2)}{fo \cdot NAo} \leq 0.8 \qquad (7)$$

where

M: magnification of the optical beam shaping system;

fc: focal length of the coupling lens;

θ//: divergent angle of the laser beam in a direction parallel to the junction plane of the semiconductor laser;

fo: focal length of the objective lens; and

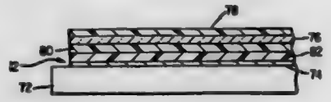
NAo: numerical aperture of the objective lens.

4,635,245

ERASABLE OPTICAL READ/WRITE DATA STORAGE DISC

James L. Smith, Grand Prairie, Tex., assignor to LTV Aerospace and Defense Company, Dallas, Tex.

Division of Ser. No. 499,738, May 31, 1983, Pat. No. 4,598,395.
This application Feb. 13, 1986, Ser. No. 829,411
Int. Cl.[4] G11B *7/24*, *7/26*
U.S. Cl. 369—275 19 Claims



1. An erasable optical read/write data storage element comprising:

a substrate member;

a film of temperature sensitive phase change material overlying said substrate member; and

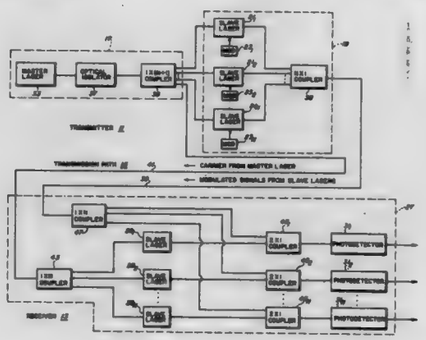
a substantially durable protective film overlying said film of phase change material.

4,635,246

FREQUENCY MULTIPLEX SYSTEM USING INJECTION LOCKING OF MULTIPLE LASER DIODES

Henry F. Taylor, Alexandria, Va.; Joseph F. Weller, Fort Washington, Md., and Lew Goldberg, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 20, 1983, Ser. No. 543,680
Int. Cl.[4] H04B *9/00*
U.S. Cl. 370—3 22 Claims



1. A transmitter comprising: a source of signals of different frequencies; and a multiplexer connected to the source and having N branches, each branch including a slave laser adjusted to operate at approximately the frequency of one of the source signals to transmit a corresponding carrier signal at the frequency, and each branch also including an associated modulator for modulating the output of each slave laser by a different channel information signal;

a receiver including a demultiplexer having N branches, each branch including a slave laser adjusted to operate at approximately the frequency of one of the source signals; and

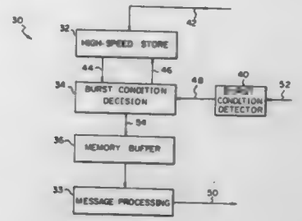
a transmission path connecting the transmitter to the receiver.

4,635,247

HIGH-SPEED BURST SIGNAL MONITORING DEVICE

Shunichiro Tejima, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Feb. 22, 1985, Ser. No. 704,287
Claims priority, application Japan, Feb. 24, 1984, 59-32575
Int. Cl.[4] H04J *1/16*, *3/14*
U.S. Cl. 370—13 4 Claims



1. A high-speed burst monitoring device for constantly monitoring receipt conditions of a stream of burst signals received in respective time frames in a time division multiplex access (TDMA) communications system and, depending upon a result of examining each of the receipt conditions, generating, if necessary, a control message for transmission to a station which has transmitted a particular burst signal, said burst monitoring device comprising:

burst condition detecting means for detecting a burst condition of a particular received burst signal in a current time frame and generating a current burst condition signal;

burst condition decision means for providing current burst condition data in response to the current burst condition signal output from said burst condition detecting means, and further in response to burst record data indicative of burst condition data derived from corresponding burst signals in prior time frames, determining whether generation of a control message is necessary and, if necessary, generating a control message transmission request signal for requesting generation of such above-mentioned control message;

high-speed store means for storing the current burst condition data, said data being indexed by a burst identification number which is assigned thereto so as to enable said current burst condition data to be read out of said high-speed store means as burst record data for succeeding time frames;

a memory buffer for temporarily storing the control message transmission request signal output from the burst condition decision means and the corresponding burst identification number and

message processing means for receiving from said memory buffer a stored control message transmission request signal and the corresponding stored burst identification number to generate a control message associated with the burst condition of the particular received burst signal and provide such control message to a transmitter for transmission.

4,635,248

START-STOP SYNCHRONOUS DATA TRANSMISSION-SYSTEM WITH A REDUCED REDUNDANCY

Tadahiro Yoshida, Kawasaki, Japan, assignor to Nittsuko Limited, Kawasaki, Japan

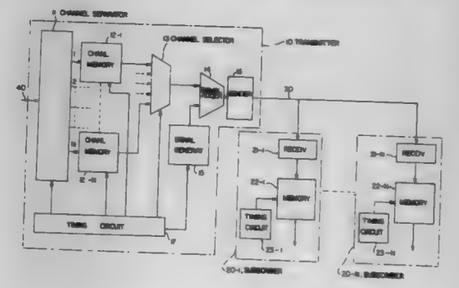
Filed Feb. 11, 1985, Ser. No. 700,294
Claims priority, application Japan, Feb. 9, 1984, 59-20767
Int. Cl.[4] H04L *5/24*; H04J *3/00*
U.S. Cl. 370—48 7 Claims

1. A start-stop synchronous data transmission system wherein a main equipment receives a time division multiplex signal having data signals of a plurality of (N) channels in each frame thereof from an external equipment through a highway, and sends out N channel data signals together with start bit signals, stop bit signals and address data signals added thereto to a common transmission line as a fresh N channel time division multiplex signal so that said N channel data signals are delivered to N sub-equipments, respectively, which comprises:

channel separating means for separating said N channels in each one frame of said time division multiplex signal from one another and providing said N channel data signals at different N output ports, respectively;

N channel data signal storing means connected to said N output ports of said channel separating means, respectively, each channel data signal storing means storing channel data signals of the corresponding channel in sequential frames of said time division multiplex signal, and reading out the channel data signals of a predetermined number (n, n≧2) of sequential frames at a given time after the channel data signals of said n frames are stored therein;

timing signal generating means coupled to said storing means and providing reading-out timing signals to said N channel data signal storing means, respectively, so that



said N channel data signal effect the reading-out operation of said channel data signals in succession;

selection means for selecting the read-out signals from said N channel data signal storing means in succession;

signal generation means for generating the start bit signal, the stop bit signal, and N different address data signals representing addresses of said N sub-equipments, respectively;

signal adding means for adding to the one of said read-out signals selected by said selection means said start bit signal, said stop bit signal and a corresponding one of said N address data signals, so as to form a fresh channel signal consisting of said start bit, said corresponding address data signal, said n frame channel data signals, and said stop bit signal, whereby N fresh channel signals are provided from said signal adding means one after the other in response to the selecting operation of said selection means; and

transmitting means for sending out said N fresh channel signals sequentailly onto said common transmission line as said fresh N channel time division multiplex signal.

4,635,249

GLITCHLESS CLOCK SIGNAL CONTROL CIRCUIT FOR A DUPLICATED SYSTEM

Edward J. Bortolini, Fort Collins; John S. Helton, Lafayette, and Dwight W. Kohs, Broomfield, all of Colo., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed May 3, 1985, Ser. No. 730,385
Int. Cl.[4] H04Q *11/04*; H04L *7/00*
U.S. Cl. 370—58 25 Claims

1. A method of operating a switching system having duplicated facilities including clock signal sources operated on an on-line/off-line basis, said system comprising facilities for controllable interchanging the on-line/off-line status of said duplicated facilities in a manner that does not cause alterations of the voice and/or data traffic signals then being extended

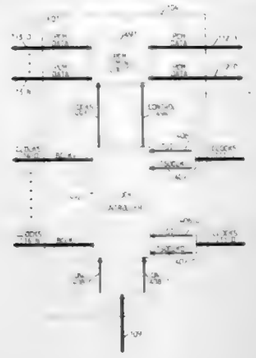
through said system for calls between connected parts of said system; said method comprising the steps of:

(1) generating a clock signal in each of said duplicated sources with the phase of the clock signal of the current on-line source leading the phase of the clock signal of said currently off-line source by n nanoseconds,

(2) applying both of said clock signals to a clock control circuit (PDI),

(3) operating said PDI to generate an output clock signal under control of said applied clock signal from said current on-line source whereby said output signal has edge transitions corresponding to and coincident with edge transitions of said clock signal of said current on-line source,

(4) applying said output signal to clock utilization circuits including said ports of said system to control the transmission of said voice and/or data traffic signals through said system,



(5) applying a control signal to said PDI specifying an on-line/off-line status switch of said duplicated facilities including said clock sources,

(6) operating said PDI in response to the receipt of said control signal to switch the control of the generation of said output clock signal from the clock signal of said current on-line source to the clock signal of the source that is to be switched from off-line to on-line, and

(7) operating said PDI during the interval of said status switch of said duplicated facilities including said clock sources so that said output clock signal generated during the interval of said switch has no additional edge transitions above and beyond of those contained in the clock signals of either one of said sources for the duration of the interval of said status switch.

4,635,250

FULL-DUPLEX ONE-SIDED CROSS-POINT SWITCH

Christos J. Georgiou, White Plains, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1984, Ser. No. 599,874

Int. Cl.[4] H04Q *3/00*

U.S. Cl. 370—58 **18 Claims**

1. A duplex cross-point switch comprising:

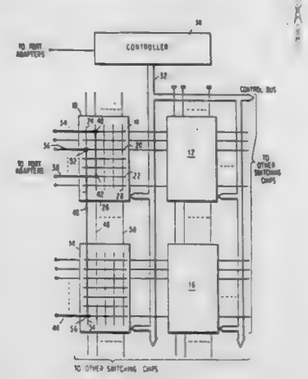
M inputs lines;

M outputs lines, said input and output lines being arranged in pairs of input/output lines;

N pairs of bi-directional interconnection lines; and

M×N duplex cross-points, N cross-points being connected to each pair of input/output lines, two selected cross-points directly connecting two pairs of input/output lines to a selected one of said N pairs of interconnection lines;

wherein each duplex cross-point comprises four AND gates connected between said input/output lines and said interconnection lines for selectively passing data from an input line to either of said pair of interconnection lines and from either of said pair of interconnection lines to an output line.



4,635,251

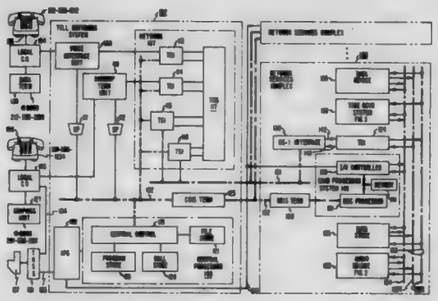
MEET-ME CONFERENCE WITH CONTROL CAPABILITIES

Keith R. Stanley, Winfield, Ill., and David F. Winchell, Hollis, N.H., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 31, 1985, Ser. No. 761,068

Int. Cl.[4] H04Q *11/04*; **H04M** *3/00*

U.S. Cl. 370—62 **8 Claims**



1. For use in a communication network having a conference arrangement, a plurality of customer stations, and switching means for interconnecting said customer stations with said conference arrangement to form a conference, said conference arrangement comprising

a conference bridge having a plurality of ports each being connectable to a corresponding one of said stations,

receiver means effective when coupled to one of said stations for controlling said conference, and

coupling means responsive to the receipt of a first code from a calling one of said stations for coupling said calling station to said bridge and responsive to the receipt of a second code from another of said stations for coupling said other station to said bridge and to said receiver means.

4,635,252

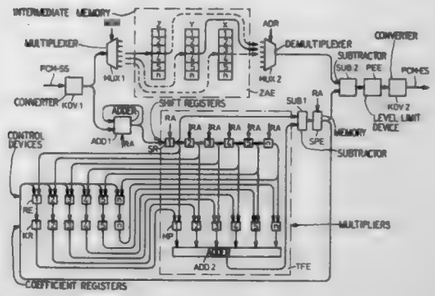
CONFERENCE CIRCUIT FOR DIGITAL COMMUNICATION SYSTEMS

Heinrich Küchler, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 22, 1985, Ser. No. 757,656

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—62 **2 Claims**



1. A circuit arrangement for conference connections in digital communications systems, particularly in PCM telephone systems, for interposition in a -PCM highway, wherein digitized voice signals of the conference participants are added in the conference circuit and are transmittable to all conference participants minus the voice signal generated by the respective conference participants, comprising:

a first converter device for receiving and recoding voice signals at the transmitting side into linear samples;

a first multiplexer connected to said first converter;

a first adder connected to said first converter;

an intermediate memory connected to said multiplexer for accepting the recoded samples frame-by-frame;

first and second subtractors;

a demultiplexer connected between said intermediate memory and said second subtractor for transmitting samples delayed by two frames to said second subtractor;

a transverse filter connected to said first adder and to said first subtractor;

a plurality of control devices connected to said transverse filter and a plurality of coefficient registers respectively connected to said control devices and connected to said transverse filter;

said transverse filter comprising a second adder and operable to provide that the sum of a momentary sample of all conference participants are compared by said first subtractor to a number of sums of respectively preceding samples of all conference participants, the number of sums corresponding to the number of frames, whereby the sum of the momentary sample and the sum of the respectively preceding samples of the conference participants, dependent on the phase position relative to the sum of the momentary sample of all conference participants, multiplied by a correction value determined by a respective one of said control devices and stored in the respective coefficient register together with the corresponding sum of the momentary sample or, respectively, with the sum of the respectively preceding samples of said second adder adding all sum signals, are supplied to said transverse filter;

a memory connected between said first and second subtractors and connected to said control devices and operable to provide an output signal which is the difference between the sum of the momentary sample and the sum of all preceding samples respectively multiplied by the corresponding correction value; and

a second converter for recoding the linear samples into digitized voice signals.

4,635,253

EXCHANGE SYSTEM INCLUDING PLURAL TERMINALS FOR VOICE AND DATA TRANSMISSION

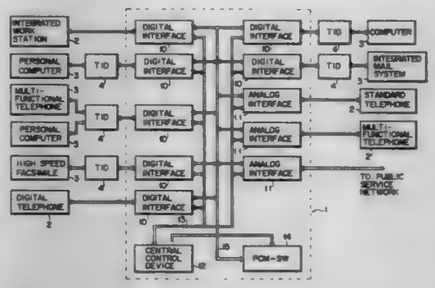
Kiyoshi Urui, Yokohama; Kiyoshi Ishikawa, Yokosuka, and Michiaki Okano, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 6, 1984, Ser. No. 637,832

Claims priority, application Japan, Aug. 12, 1983, 58-147353

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—67 **3 Claims**



1. An exchange system comprising:

a plurality of interface means;

a plurality of terminal means coupled with the plurality of said interface means and for transmitting signal data and control data in a predetermined format between said interface means and said terminal means;

a control highway connected to said plurality of interface means for transmitting said control data;

a PCM highway connected to said plurality of interface means for transmitting said signal data; and

control means connected to said control and PCM highways for assigning to said PCM highway a time slot with a length determined by mode data supplied from one of said interface means and transmitted through said control highway, in order to transmit signal data from one of said terminal means, and for transmitting within the time slot thus assigned the data part which is specified by said mode data and which is included in the signal data with said predetermined format, through said PCM highway to one of said interface means which is selected according to the control data;

wherein each of said interface means includes a mode data generator, which is capable of selectively generating one of a plurality of mode data representing the type of signal data to be transmitted by said interface means, for generating the selected of the plurality of mode data.

4,635,254

COHERENT INTERFACE WITH WRAPAROUND RECEIVE MEMORY

Bhalchandra R. Tulpule, Vernon, Conn., and Matthew S. Blaha, Cambridge, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 13, 1984, Ser. No. 681,151

Int. Cl.[4] H04J *3/00*

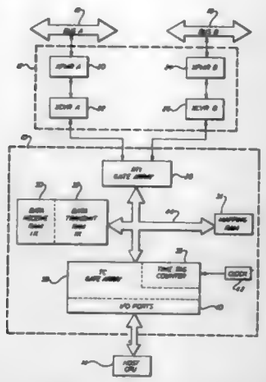
U.S. Cl. 370—85 **2 Claims**

1. A bus interface circuit for coherently transferring digital signals as words of a specified number of bits formatted in message with each message having a specified maximum number of words between a signal processor and an asynchronous serial data bus comprising:

remote terminal interface (RTI) means, responsive to incoming digital signals in serial form from the serial data bus for transferring said incoming serial signals in parallel form, and responsive to outgoing digital signals in parallel form from the signal processor for transferring said outgoing parallel signals in serial form to the serial data bus;

wraparound receive memory means, responsive to said incoming serial signals in parallel form from said RTI for sequentially storing received messages at successive memory addresses starting at the beginning of said wraparound memory and then continuing regardless of message number until the end of said wraparound memory is reached and then continuing sequential storing at the beginning again of said wraparound memory, said wraparound memory providing read access to stored words to the signal processor;

transmit memory means, having its memory addresses organized in predefined message blocks of the specified maximum number of words responsive to said outgoing parallel signals from the signal processor for storing message words in said predefined message block addresses for subsequent transmission; and



terminal controller (TC) means, responsive to said incoming serial signals in parallel form from said RTI for providing start and stop addresses of complete and valid messages to the signal processor for algorithmically preventing signal processor read access to an individual message stored in wraparound receive memory until said individual message has been entirely and correctly received, said TC responsive to said outgoing signals in parallel form for algorithmically preventing signal processor write access to an individual block in said transmit memory if said RTI is read accessing said individual block and for otherwise being responsive to two storing of a first word by the signal processor for transmission in said individual block and preventing RTI read access to said individual block until said first word for transmission is stored in said individual block.

4,635,255

DIGITAL SUBSCRIBER CONTROLLER

Alan T. Clark, Austin, Tex.; Hadi Ibrahim, and Arthur F. Lange, both of Sunnyvale, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 26, 1985, Ser. No. 759,622
Int. Cl.[4] H04J *3/00*
U.S. Cl. 370—110.1 **8 Claims**

1. A controller for use with subscriber telephone equipment providing subscriber-selectable bidirectional data paths between a plurality of analog voice interfaces providing a plurality of analog ports and a plurality of digital data interfaces providing a plurality of time-multiplexed serial ports, and a subscriber interface to a digital telecommunication network having plurality of voice/data channels and a plurality of control/data channels, said data path selection effected by subscriber-programmable means operably connected to said controller for receiving and storing subscriber commands and for generating on a bus external to said controller said subscriber commands, said controller comprising:

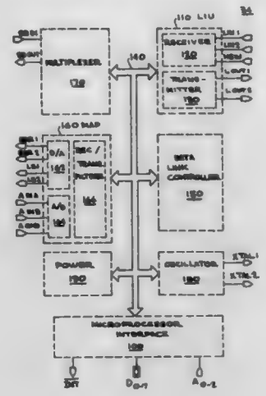
clock means for generating timing signals;

a plurality of internal bidirectional control/data busses;

at least a first, a second, a third and a fourth internal bidirectional data bus;

control logic and programming interface means providing at least one of said plurality of digital data interfaces connected to said external bus and to said internal control/data busses responsive to said subscriber commands for generating on said internal control busses signals representative of said subscriber-selected data paths;

multiplexer means connected to said internal control/data busses, providing at least one of said plurality of time-multiplexed send/ports integral with said multiplexer means, responsive to said control signals generated by said control logic and programming interface means for establishing said subscriber-selected data paths and for generating time-multiplexed signals at said integral serial port;



line interface means connected to said subscriber interface and connected to said control logic and programming interface means via said internal control/data busses and connected to said multiplexer means via said first internal bidirectional data bus for receiving from, and transmitting signals onto, said subscriber interface and for receiving and transmitting onto said first internal bidirectional data bus said voice/data signals; and

main audio processor means providing at least one of said plurality of analog interfaces connected to said control logic and programming interface means via said internal control/data busses and connected to said multiplexer means via said second internal bidirectional data bus for receiving from, and transmitting signals onto, subscriber-selectable ones of said analog ports and for processing signals received on said second bidirectional data bus.

4,635,256

FORMATTER FOR HIGH SPEED TEST SYSTEM

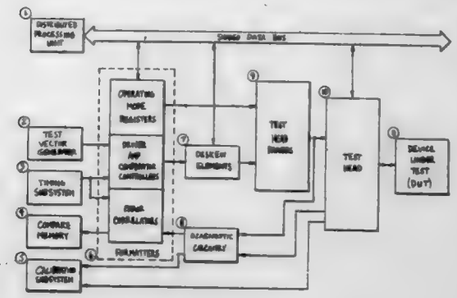
Richard F. Herlein, San Jose, Calif., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

Continuation-in-part of Ser. No. 518,499, Aug. 1, 1983, abandoned. This application May 17, 1984, Ser. No. 611,446
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—1 **12 Claims**

1. In an automatic test system for the testing of an integrated circuit in a test head, the system controlled by a data processing unit and including a timing subsystem for providing timing signals including a cyclical test period clock signal, signal, a formatting circuit comprising:

operating mode register means coupled to the data processing unit for storing data received therefrom indicative of a test to be performed;

test head controller means coupled to the operating mode register means add to the timing subsytem for controlling the test head in response to the state of the operating mode register means, the test head controller means including means for supplying stimuli signals to the test head during



at least test period cycle subsequent to the test period cycle from which the stimuli signals originated; and

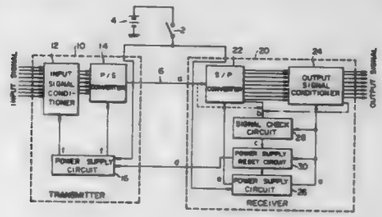
error correlator means coupled to receive the timing signals from the timing subsystem, coupled to the register means and coupled to receive response signals from the test head, the error correlator means for associating the response signals with the test period from which the stimuli signals originated.

4,635,257

FAIL SAFE CIRCUIT FOR MULTI-SIGNAL TRANSMISSION SYSTEM

Toshio Shinohara, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 16, 1984, Ser. No. 641,485
Claims priority, application Japan, Aug. 26, 1983, 58-156163
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—12 **7 Claims**



1. A fail safe transmission system, comprising:

a transmitter unit including:

(a) means for transmitting a signal;

(b) means for controlling said transmitting;

(c) means for supplying power to said transmitter unit, said supplying means being remotely controllable to have an on state where power is supplied and an off state where power is not supplied; and

(d) power-up reset means for initially resetting said transmitter unit when power is applied thereto; and

a receiver unit, coupled to said transmitter unit, including:

(a) means for a receiving a signal from said transmitter unit;

(b) means for determining whether a predetermined indicia of failure is present in said receiving signal;

(c) means for supplying power to said receiver unit, having an on state where power is supplied and an off state where power is not supplied;

(d) power-up reset means for initially resetting said receiver unit when power is applied thereto; and

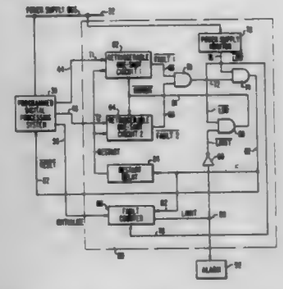
(e) power supply reset means, responsive to said determining means, for controlling said supplying means of both of said receiver unit and of said transmitter unit to said off state for a predetermined time period when a predetermined number of said indicia of failure are detected by said determining means, allowing both of said transmitter and receiver to be reset on power up.

4,635,258

SYSTEM FOR DETECTING A PROGRAM EXECUTION FAULT

Seymour Salowe, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 22, 1984, Ser. No. 663,242
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—16 **11 Claims**



1. In a programmed digital signal processing system operative to execute a program having an initial state; and including means for initializing said program execution to said initial state in response to a reset signal, a system for detecting a fault in the program execution of said processing system comprising:

means for generating a plurality of trigger signals, each trigger signal indicative of the execution of a corresponding predetermined portion of said processing system's program, lack of trigger signal generation being indicative of a potentially faulty condition with respect to the execution of the program portion associated therewith;

a plurality of monitoring means, one corresponding to each trigger signal, each monitoring means operative to generate a fault signal in response to a lack of generation of its corresponding trigger signal; and

logic means responsive to a fault signal generation from said plurality of monitoring means to generate said reset signal to reinitialize program execution, and to generate a restart signal which is provided to said plurality of monitoring means to suspend said fault signal generation.

4,635,259

METHOD AND APPARATUS FOR MONITORING RESPONSE SIGNALS DURING AUTOMATED TESTING OF ELECTRONIC CIRCUITS

John Schinabeck, Pleasanton, and James R. Murdock, San Jose, both of Calif., assignors to Fairchild Semiconductor Corporation, Cupertino, Calif.

Continuation-in-part of Ser. No. 518,499, Aug. 1, 1983, abandoned. This application May 17, 1984, Ser. No. 611,448
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—20 **11 Claims**

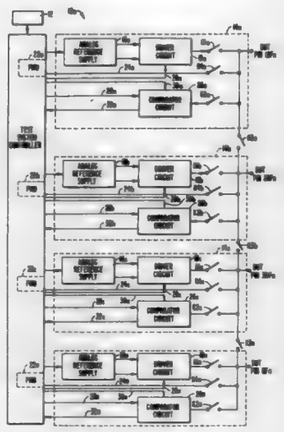
1. A method for repeatedly monitoring the response signal at a node of a deivce under test caused by a test signal applied to the node by digitally programmed source means switchably connected by a first switch means to the node and comparison

means switchably connected by a second switch means to the node, the method comprising the steps of:

connecting the test signal to the node;

repetitively comparing the response signal voltage and current with programmed reference voltage and current levels; and

repetitively providing an indication of the relative magnitude of the response signal voltage and current with respect tothe programmed reference levels.



4,635,260

DATA TRANSMISSION TELEMONITORING EQUIPMENT AND SYSTEM

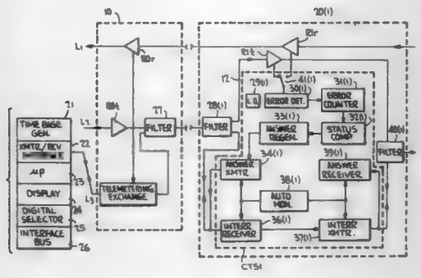
Franco Sestan, Vimercate, Italy, assignor to Telefonia Elettronica e Radio S.p.A., Milan, Italy

Filed May 14, 1984, Ser. No. 609,881

Claims priority, application Italy, May 18, 1983, 21154 A/83

Int. Cl.⁴ G06F *11/00*; H04B *3/46*

U.S. Cl. 371—22 **16 Claims**



1. In a data transmission system of the type in which plural transceiver-type repeaters are spaced in sequence from 1 to n along a data transmission line, a method of monitoring the status of the repeaters comprising the steps of:

generating an interrogation signal only at a single supervisory terminal and transmitting the interrogation signal along said transmission line;

in response to receiving the interrogation signal at repeater i in said sequence, where i is a number between 1 and n, transmitting status information relating to repeater i back to said supervisory terminal from repeater i, and transmitting said interrogation signal from repeater i to repeater i+1 in said sequence along said transmission line; and

monitoring and displaying only at said single supervisory terminal the status information transmitted by all of said repeaters;

whereby each of the first n−1 repeaters in said sequence receives the interrogation signal successively and transmits information reflecting its status back to the supervisory terminal and transmits the interrogation signal on the transmission line to the next repeater in said sequence.

4,635,261

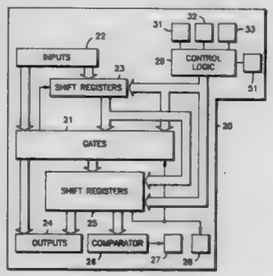
ON CHIP TEST SYSTEM FOR CONFIGURABLE GATE ARRAYS

Floyd E. Anderson, Round Rock, Tex., and Liang-Tsai Lin, San Diego, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 26, 1985, Ser. No. 748,885

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 371—25 **12 Claims**



1. An integrated circuit including a system for testing a plurality of gates forming a logic circuit on said integrated circuit, said system selectively operating in one of a plurality of modes, said integrated circuit having a plurality of inputs, each of said inputs for coupling to receive one of a plurality of input signals, and a plurality of outputs, each of said outputs for coupling to provide one of a plurality of output signal, said gates coupled between said plurality of inputs and said plurality of outputs wherein both said input signals are transmitted asynchronously from said inputs to said logic circuit and said output signals are transmitted asynchronously from said logic circuit to said output when said system is in a first of said plurality of modes, said system comprising:

first shift register means coupled between said plurality of inputs and said logic circuit for synchronously transmitting said input signals from said inputs through said first shift register means to said logic circuit when said system is in a second of said plurality of modes;

second shift register means coupled between said logic circuit and said plurality of outputs for synchronously transmitting said output signal from said logic circuit through said second shift register means for said outputs when said system is in said second mode and coupled to said first shift register means for serially transmitting said input signals from said inputs through said first shift register means and said second shift register means, respectively, to said outputs when said system is in a third of said plurality of modes; and

control logic means coupled to said logic circuit, said first shift register means and said second shift register means and coupled to a control signal input for selecting said one of said plurality of modes.

4,635,262

METHOD OF DETECTING SYNCHRONIZATION ERRORS IN A DATA TRANSMISSION SYSTEM USING A LINEAR BLOCK CODE

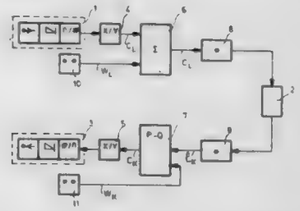
Ludwig Kittel, Heroldsgberg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 11, 1984, Ser. No. 618,976

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1983, 3320948

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—42 **5 Claims**



1. A method of synchronizing a data sink with a data source in a data transmission system in which data provided by the data source is encoded as code words (c_L) in a linear block code and such code words are transmitted as messages over a transmission channel in the form of sequentially linked modified code words (c'_L), the modified code words (c'_L) being formed by linking each data code word (c_L) to a protection word (w_L) which is transmitted over such transmission channel, characterized in that: each protection word (w_L) identifies the position within the transmitted message of the code word (c_L) linked thereto; the modified code words (c'_L) are interleaved bit-sequentially, transmitted, and at the receiver are de-interleaved to derive received code words (c_K); and each received code word (c_K) is linked to a check word (w_K) which characterizes the position of such code word (c_K) within the received message.

4,635,263

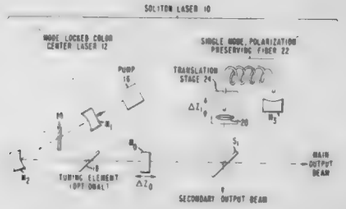
SOLITON LASER

Linn F. Mollenauer, Colts Neck, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 518,683, Jul. 29, 1983, abandoned. This application Apr. 10, 1986, Ser. No. 851,274

Int. Cl.⁴ H01S *3/098*

U.S. Cl. 372—3 **17 Claims**



1. In a laser, apparatus comprising

a laser active medium for generating optical radiation at a predetermined wavelength,

means for generating mode-locked optical first pulses from said medium,

an essentially single-mode, polarization-preserving optical waveguide which is capable of supporting solitons at said predetermined wavelength, and

means for causing said first pulses to propagate through said waveguide thereby shortening the duration of said first pulses, and for causing at least a portion of the power of said shortened pulses to be coupled back into said active medium essentially coincident and in phase with said first pulses, thereby causing said active medium to generate pulses of shortened duration.

4,635,264

METHOD AND AN APPARATUS FOR THE SYNCHRONOUS MODE LOCKING OF THE LONGITUDINAL LASER MODES OF A SEMICONDUCTOR DIODE LASER

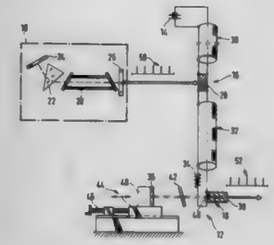
Ernst O. Göbel, Leinfelden-Echterdingen; Jürgen Kuhl, Leonberg, and Gustav Veith, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Fed. Rep. of Germany

Filed Mar. 15, 1985, Ser. No. 712,257

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1984, 3410051

Int. Cl.⁴ H01S *3/098*

U.S. Cl. 372—18 **10 Claims**



1. A method for the synchronous mode locking of the longitudinal laser mode in a semiconductor diode laser, comprising the steps of:

(a) operating a master laser to generate a series of pulses;

(b) controlling an optoelectronic pulse generator with said master laser;

(c) synchronously exciting a semiconductor laser diode with said optoelectronic pulse generator; and

(d) operating said semiconductor laser diode in an external resonator configuration to generate a laser output.

4,635,265

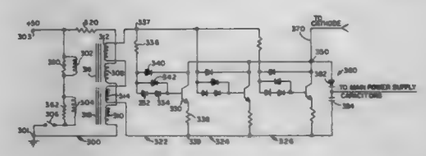
POWER SWITCHING CIRCUIT FOR A PULSED LASER

Dale G. O'Harra, II, Belmont, Calif., assignor to Edward Weck & Company, Inc., Research Triangle Park, N.C.

Filed Jun. 13, 1984, Ser. No. 620,291

Int. Cl.⁴ H01S *3/09*

U.S. Cl. 372—25 **8 Claims**



1. A power switching circuit for providing variable pulse width drive signals for a laser in response to variable pulse width control signals comprising:

a transformer circuit for providing variable pulse width switching signals;

a power transistor output circuit comprising transistor means coupled between the electrodes of said laser and said transformer circuit for providing said drive signals thereto in response to said switching signals, said transformer circuit further comprising:

input terminals coupled to a power source;

a first pair of primary windings coupled through a switch to

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said input terminals, said switch responsive to said variable pulse width control signals;

a pair of secondary windings associated with said first pair of primary windings and coupled to said output circuit for providing, said variable pulse width switching signals thereto; and

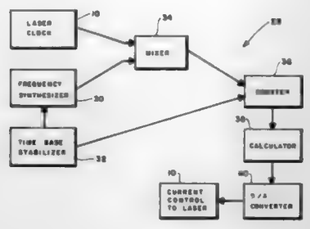
a second pair of primary windings coupled to said input terminals with a polarity opposite to that of said first pair for continuously biasing said transformer circuit toward saturation in one direction.

4,635,266

ACTIVE DISPERSION CONTROL FOR A DOPPLER BROADENED LASER

Roger L. Facklam, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 11, 1984, Ser. No. 680,432
Int. Cl.[4] H01S 3/13
U.S. Cl. 372—32 **2 Claims**



1. A method for controlling the output of a laser in a laser clock to compensate for changes in said output due to optical dispersion in said laser, said method comprising the steps of:

a. measuring the output frequency of said laser clock;

b. comparing said laser clock frequency to a standard of known frequency;

c. calculating the change in laser discharge current corresponding to any difference in said laser clock frequency as compared to said standard required to adjust said laser clock frequency to a predetermined frequency value; and

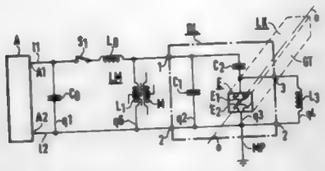
d. adjusting said laser discharge current to a value corresponding to said predetermined laser clock frequency.

4,635,267

EXCITATION SYSTEM FOR GENERATING A FAST PULSED HIGH-VOLTAGE DISCHARGE, PARTICULARLY FOR EXCITING A HIGH-POWER LASER

Hans-Jürgen Cirkel, and Willi Bette, both of Erlangen, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Oct. 31, 1983, Ser. No. 546,899
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1982, 3240372
Int. Cl.[4] H01S 3/097
U.S. Cl. 372—38 **17 Claims**



1. Excitation system for generating a fast pulsed high-voltage discharge into a load, especially for exciting a high-power laser, by an arc-free capacitor discharge which is as homogeneous as possible, the system having:

(a) a laser chamber including a gas space, at least two laser electrodes enclosed in the laser chamber, disposed opposite and spaced from one another, the electrodes extending parallel to an optical axis of the laser chamber and an electrode path connecting said laser electrodes; and

(b) a high-voltage supply unit; and

(c) a pulse forming network

(c1) connectible on the input side to the high-voltage supply unit and connected on the output side to the laser electrodes;

(c2) having serially connected first and second stripline capacitors connected in parallel with the electrode path of the laser;

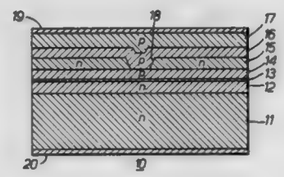
the pulse-forming network further comprising a plurality of shunt branches, including a given shunt branch connected in series with each of the stripline capacitors, at least one fast high-voltage switching element, due to the activation of which via the pulse-forming network, the high-voltage pulses at the lase electrodes are generatable, said fast high-voltage switching element being formed as a saturable magnetic reactor having a magnetizing current making the reactor go into saturation in response to the charging voltage across the stripline capacitors rising to nearly the peak value thereof, thereby forming a series circuit encompassing said first and second stripline capacitor and the laser electrode path.

4,635,268

SEMICONDUCTOR LASER DEVICE HAVING A DOUBLE HETEROJUNCTION STRUCTURE

Nawoto Motegi, Kanagawa; Masaki Okajima, Kunitachi, and Yuhei Muro, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Jul. 5, 1984, Ser. No. 627,818
Claims priority, application Japan, Jul. 4, 1983, 58-121371
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—45 **8 Claims**



1. In a semiconductor laser device having a double heterojunction structure made of compound semiconductor materials, said device comprising:

a substrate having a first conductivity type:

a first clad layer formed on said substrate, said first clad layer having said first conductivity type;

an active layer formed on said first clad layer;

an optical waveguide layer formed on said active layer, said optical waveguide layer having a second conductivity type;

a current confinement layer formed on said optical waveguide layer so as to form a stripe-shaped groove extending to the optical waveguide layer in the direction perpendicular to the surface of said current confinement layer, said current confinement layer having said first conductivity type;

a second clad layer formed on said current confinement layer and in said groove, said second clad layer having said second conductivity type; and

a pair of electrodes connected to said substrate and said second clad layer, respectively;

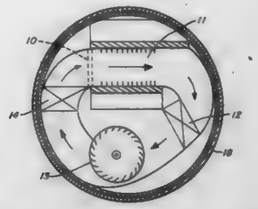
wherein said optical waveguide layer has a refractive index greater than the refractive index of said first and second clad layers and has a sufficient thickness so as to maintain the density of the impurities in said optical waveguide layer at least $2\times10^{18}cm^{-3}$.

4,635,269

FLOWING GAS LASER HAVING SCREENING FOR SMOOTHING LOW TURBULENCE FLOW

James P. Reilly, Lexington, and M. John Yoder, Andover, both of Mass., assignors to Laser Corporation of America, Wakefield, Mass.

Filed Feb. 8, 1985, Ser. No. 699,672
Int. Cl.[4] H01S 3/22
U.S. Cl. 372—58 **4 Claims**



1. In a flowing gas laser of the kind normally operating in the flow discharge mode and having a glow discharge region through which the gas flows with low turbulence while the glow discharge occurs, the improvement comprisng

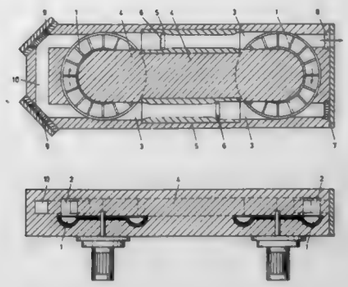
a flow smoothing screen disposed in the gas flow path upstream of the glow discharge region, the flow smoothing screen being of wire mesh and spaced from the beginning of the region by a distance not less than ten times the distance between the centers of adjacent holes of the screen said screen being disposed in the flow path at a loaction where said screen produces a Reynold's number that is below the critical value at which a turbulent wake is shed whereby the flow smoothing screen causes a lessening of the turbulence in the gas flow in the discharge region.

4,635,270

LASER APPARATUS

Karl Gürs, Eschborn, Fed. Rep. of Germany, assignor to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 12, 1983, Ser. No. 560,378
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1982, 3245958
Int. Cl.[4] H01S 3/22, 3/223
U.S. Cl. 372—58 **13 Claims**



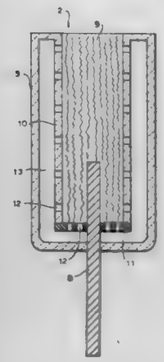
1. In a gas transport laser with fast longitudinal gas flow, the gas transport apparatus comprising at least one tangential blower wheel with adjacent ring channel for the circulation of gas, the ring channel merging tangentially into at least two longitudinal channels, the ring channel extending along the circumference of the blower wheel from one longitudinal channel to the other so that the ring channel and the longitudinal channels form a closed loop for the laser gas, and where at least one longitudinal channel is equipped with end mirrors perpendicular to the tube axis which form a laser resonator.

4,635,271

GAS LASER DISCHARGE TUBE WITH COPPER HALIDE VAPORS

Nikola V. Sabotinov; Nikolay K. Vutshkov, and Dimo N. Astadjov, all of Sofia, Bulgaria, assignors to Institute po Physika na Tvardoto Tyalo, Sofia, Bulgaria

Filed Apr. 18, 1985, Ser. No. 724,607
Claims priority, application Bulgaria, Apr. 18, 1984, 65131
Int. Cl.[4] H01S 3/03
U.S. Cl. 372—61 **1 Claim**



1. In a gas laser discharge tube with copper halide vapors, comprising a vacuum tight quartz casing equipped with at least two electrodes which are disposed in quartz extensions of the quartz casing, said electrodes being made up of copper particles with irregular form and making contact with vacuum tight terminals, the improvement wherein the copper particles are piled in quartz tubes disposed coaxially within the quartz extensions so that between each quartz tube and the respective quartz extension of each electrode there is formed a cavity, each quartz tube being perforated along its entire surface and being plugged by a perforated transverse copper plate through which each respective vacuum tight terminal passes, the apertures of the perforated quartz tube and of the perforated copper plate having a smaller diameter than the size of the copper particles.

4,635,272

LASER DISCHARGE TUBE

Noboru Kamide, Tokyo; Hiroshi Hijikata, Urawa; Katsumi Tokudome, Saitama; Michio Ishikawa, Kawagoe, and Yuji Hayashi, Tokyo, all of Japan, assignors to Kimmon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 437,124, Oct. 28, 1982. This application Feb. 28, 1986, Ser. No. 836,222
Claims priority, application Japan, Nov. 4, 1981, 56-176850; Nov. 4, 1981, 56-176851; Nov. 4, 1981, 56-176852
Int. Cl.[4] H01S 3/097
U.S. Cl. 372—87 **21 Claims**

1. A metal vapor positive column discharge laser tube comprising:

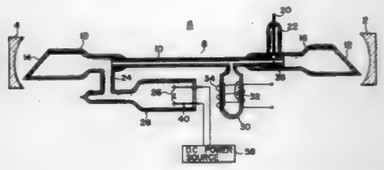
an envelope including a capillary tube and a sidearm forming a part of said envelope;

an active lasing medium contained in the envelope;

an anode disposed in said sidearm and spaced from a cathode disposed in the envelope;

means for causing a discharge along a discharge path in said capillary tube between said anode and cathode to thereby energize the laser medium;

said anode having a tip extending from said sidearm to be in close proximity to said capillary tube;



said capillary tube having means defining an opening therein adjacent to the extended tip of said anode to narrow the discharge path adjacent said extended anode tip and thereby substantially reduce noise in the emitted laser beam.

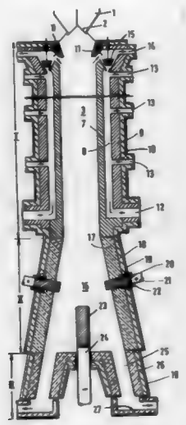
4,635,273

METHOD AND APPARATUS FOR THE THERMAL PRODUCTION OF METAL CARBIDES AND METALS

Siegfried Wilkening, Alfter-Oedekoven, Fed. Rep. of Germany, assignor to Vereinigte Aluminium Werke Aktiengesellschaft Division of Ser. No. 211,054, Nov. 28, 1980, Pat. No. 4,441,920. This application Aug. 9, 1982, Ser. No. 406,890

Int. Cl.⁴ H05B *3/60*

U.S. Cl. 373—120 **6 Claims**



1. An apparatus for the thermal production of metal carbides comprising a vertical furnace including an upper inlet section and a lower bifurcated discharge section, said upper and lower sections being in open communication with one another;

an indirectly heated vertical muffle in said upper section for calcining material introduced to said upper inlet section, and at least two electrodes extending into the lower section of said furnace and mounted on the sidewalls thereof, and a third electrode mounted in a discharge area in the center of said lower section, said lower section capable of reducing material calcined in said upper section.

4,635,274

BIDIRECTIONAL DIGITAL SIGNAL COMMUNICATION SYSTEM

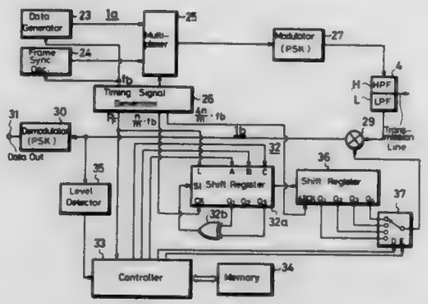
Ichiro Kubota, and Masakatsu Toyoshima, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 25, 1985, Ser. No. 727,356

Claims priority, application Japan, Apr. 27, 1984, 59-86762

Int. Cl.⁴ H04K *1/00*

U.S. Cl. 375—1 **11 Claims**



1. A bidirectional digital signal communication system including a plurality of terminal units in communication with a center unit, wherein each of said terminal units comprises:

signal generating means for generating digital data spread with a pseudo-noise code;

modulating means for modulating said digital data on a carrier; and

means for transmitting said modulated digital signal to said center unit;

and said center unit comprises:

receiving means for receiving said modulated digital signal;

a pseudo-noise code generator for generating a pseudo-noise code which corresponds to the pseudo-noise code of one of said terminal units;

a multiplier responsive to said receiving means and said pseudo-noise code generator to produce a digital signal de-spread from said pseudo-noise code;

demodulating means connected to said multiplier to reproduce the digital data from said modulated digital signal;

a detector for detecting a maximum level of the digital signal from said multiplier and producing a corresponding level indication signal; and

presetting means including a memory containing a preset code for presetting said pseudo-noise code generator with said preset code in response to said level indication signal.

4,635,275

METHOD AND APPARATUS FOR DETECTING SYNCHRONOUS OR ASYNCHRONOUS DATA TRANSMISSION

Kevin E. Borg, and Craig E. Forman, both of Indianapolis, Ind., assignors to AT&T Technologies, Inc., Murray Hill, N.J.

Filed Jun. 22, 1984, Ser. No. 623,754

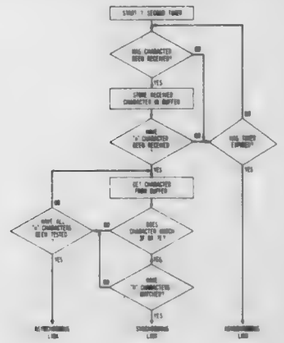
Int. Cl.⁴ H04L *7/00*

U.S. Cl. 375—8 **16 Claims**

10. A method for detecting both a synchronous and asynchronous format of initially received data from an external source for establishing initial communications with the external source, the method comprising the steps of:

controlling the operation of a data transmission channel in response to receipt of a particular sequence of data elements in the initially received data; and

configuring data for transmission over the transmission channel to the external source in a selected format upon



receipt of a predetermined number of the particular sequence of data elements.

4,635,276

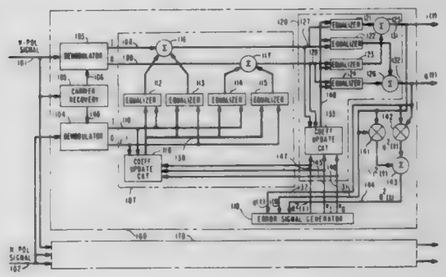
ASYNCHRONOUS AND NON-DATA DECISION DIRECTED EQUALIZER ADJUSTMENT

Peter D. Karabinis, Atkinson, N.H., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 25, 1985, Ser. No. 758,697

Int. Cl.⁴ H04B *3/04*

U.S. Cl. 375—15 **15 Claims**



1. Apparatus for adjusting an equalizer which compensates for the distortion in a modulated carrier signal comprising component signals and a time-varying signal envelope, said apparatus comprising

means for extracting data signals individually from said carrier signal, each of said data signals having less distortion than an associated one of said component signals and each of said data signals being a component of said signal envelope,

means for forming a predetermined combination of said data signals,

first means for comparing said combination of data signals to a threshold, and

means responsive to said comparing means for generating an equalizer adjustment signal from said data signals and said combination of data signals.

4,635,277

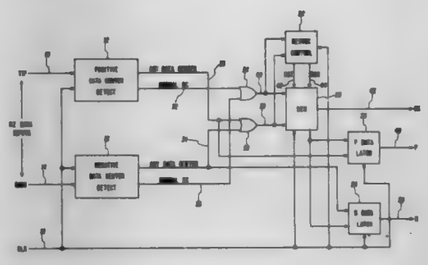
DIGITAL CLOCK RECOVERY CIRCUIT APPARATUS

John K. Blake, and Blaine J. Nelson, both of Plano, Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 21, 1985, Ser. No. 789,541

Int. Cl.⁴ H03K *5/19*

U.S. Cl. 375—20 **5 Claims**



2. Data center detection apparatus comprising, in combination:

signal input first means for supplying bipolar return to zero signals occurring at no more than a maximum nominal rate N;

clock signal second means having a clock signal rate of at least 8N;

signal sample and storage third means, connected to said first and second means for receiving data and clock signals therefrom, for sampling the amplitude of signals supplied at the clock rate and storing a given logic value whenever the signals sampled exceed a predetermined threshold; and

logic fourth means, connected to said second and third means, for correlating, at given clock times, the logic value of signals stored by said third means and providing output signals indicative of (1) whether the signal sampled had a duration of at least two clock signals and therefore was a valid data center, (2) whether the signal sampled had a duration of more than a first number of clock signals and less than a second number of clock signals and therefore was a normal data center, and (3) and (4) whether the signal sampled was a positive data center or a negative data center.

4,635,278

AUTOREGRESSIVE DIGITAL TELECOMMUNICATIONS SYSTEM

Richard A. Maloon, Amherst, and Harvey C. Woodsum, Nashua, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Sep. 12, 1983, Ser. No. 530,928

Int. Cl.⁴ H04L *27/26;* **H04J** *1/00;* **G06F** *7/38*

U.S. Cl. 375—45 **18 Claims**

1. A digital communication systems for transmitting bytes of information from a data source to a destination, each byte having N bits of information, the system comprising:

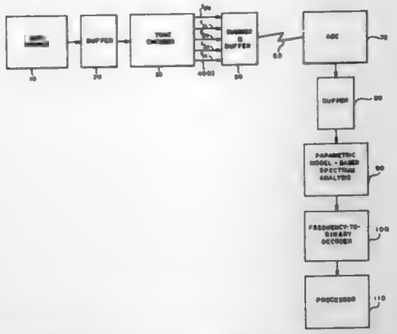
A. means for encoding each bit as a tone pulse, the frequency of each tone pulse being selected from among a set of predetermined frequencies each of which corresponds uniquely to the logical value of a predetermined one of said N bits within a byte;

B. means for sending to the destination, via a communications channel, the tone pulses for all of the bits of a byte simultaneously, such that a composite waveform is formed thereby;

C. at the destination, means for providing digital samples of a received version of the composite waveform;

D. means for performing a parametric model-based spectrum analysis on the received version of the composite

waveform from the digital samples thereof, for determining the tonal components present therein; and



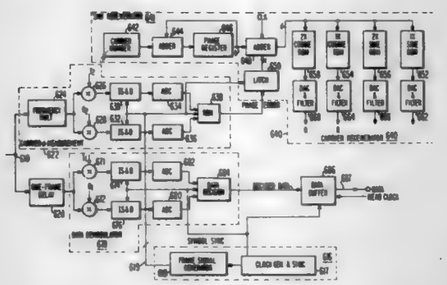
E. means for decoding said tonal components to provide a reconstruction of the N-bit byte from which the composite waveform was generated.

4,635,279

ARRANGEMENT FOR COHERENTLY GENERATING SINUSOIDS OF DIFFERENT FREQUENCIES, AND ANGLE MODULATION DATA RECEIVER USING THE ARRANGEMENT

Edward J. Nossen, Camden County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 25, 1985, Ser. No. 758,959
Int. Cl.⁴ H03D *3/00*; H03K *9/06*
U.S. Cl. 375—78 **20 Claims**



11. An arrangement for generating coherent sinusoidal signals, comprising:

sawtooth generating means for generating recurrent digital sawtooth signals;

first memory means coupled to said sawtooth generating means for being addressed thereby, said first memory means being preprogrammed for generating a first sinusoidal signal each complete cycle of which occurs during a time equal to the duration of a first portion of one of said sawtooth signals; and

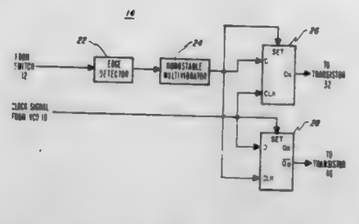
second memory means coupled to said sawtooth generating means for being addressed thereby, said second memory means being preprogrammed for generating a second sinusoidal signal each complete cycle of which occurs during a time equal to the duration of a second portion of said one sawtooth signal, said duration of said second portion being less than said duration of said first portion.

4,635,280

BIT SYNCHRONIZER FOR DECODING DATA

Donald E. Smith, and Richard D. Roberts, both of Palm Bay, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed May 28, 1985, Ser. No. 737,999
Int. Cl.⁴ H03D *3/24*
U.S. Cl. 375—120 **9 Claims**



1. Apparatus for producing a clock signal for use in decoding a Miller-encoded data signal, comprising:

means for providing an output pulse of a predetermined duration at each transition of the Miller-encoded data signal;

voltage-controlled oscillator means for producing the clock signal;

processor means responsive to the clock signal and said output pulses for producing a first synchronizing signal at a first output terminal, wherein said first synchronizing signal is a plurality of pulses when the clock signal is phase-lagging the Miller-encoded data signal and is at a constant value otherwise, and for producing a second synchronizing signal at a second output terminal, wherein said second synchronizing signal is a plurality of pulses when the clock signal is phase-leading the Miller-encoded data signal and is a constant value otherwise;

integrator means responsive to said first and said second synchronizing signals for producing an integrated signal in response thereto;

wherein said voltage-controlled oscillator means is responsive to said integrated signal for controlling the frequency and phase of said clock signal such that the clock signal and the Miller-encoded data signal are phase coherent.

4,635,281

MEANS FOR COUNTING DROPS

J. Paul Jones, R.D. 1 Box 171-C, Glenmoore, Pa. 19343

Filed Nov. 23, 1984, Ser. No. 674,406
Int. Cl.⁴ G02B *5/14*; A61M *5/16*
U.S. Cl. 377—21 **4 Claims**

1. For use with means to permit a body of clear fluid to move downwardly drop by drop, mechanism to count the number of drops comprising:

a pair of elongated members made of light conducting material;

on each said member, a gap surface formed as a light refractive grating;

means supporting said members to extend in a generally vertical direction with said gap surfaces facing one another to form a generally vertically extending gap;

each member, at the top end of said gap, being formed with a slanted surface, the slanted surfaces facing one another and forming a guide to receive each of said drops and direct each drop into said gap;

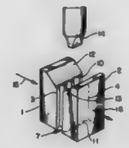
said slanted guide surfaces attracting the fluid of a drop impinging thereon with the attraction forces between the fluid and the slanted surfaces and the cohesive force of the fluid, providing that the fluid moves down through the guide as a unitary mass into the gap under the influence of gravity;

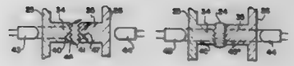
said gap surfaces attracting the fluid of the drop entering the gap with the attraction forces between the fluid and gap surfaces providing that the fluid moves down as a unitary mass through the gap under the influence of gravity;

a light source adjacent to one of said members and a light receiver adjacent to the other of said members, the light source being oriented to project a beam of light through said first member, through said gap, through said second member, and thence to said light receiver;

said gap surfaces, in the absence of said liquid therebetween, refracting the light from the source so that the quantum of light received by the light receiver is less than the quantum of light from the source, and with the presence of said liquid between said gap surfaces changing the amount of said refraction whereby the quantum of light received by the receiver is substantially increased, said increase in light reaching the receiver signifying the presence or absence of a drop in said gap; and

means connected to said receiver and operative as a function of said change in light to count the number of changes and thereby count the number of drops passing through said gap.





4,635,282

X-RAY SOURCE AND X-RAY LITHOGRAPHY METHOD

Ikuo Okada; Yasunao Saitoh, both of Isehara; Hideo Yoshihara, Yokohama, and Satoshi Nakayama, Sayama, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan

Filed Feb. 7, 1985, Ser. No. 699,402
Claims priority, application Japan, Feb. 14, 1984, 59-24496
Int. Cl.⁴ G21K *5/00*
U.S. Cl. 378—34 **18 Claims**

1. An X-ray source comprising:

a gas plenum for storing a gas;

a vacuum vessel;

a pair of cylindrical electrodes opposed to each other substantially in coaxial relationship in the vacuum vessel;

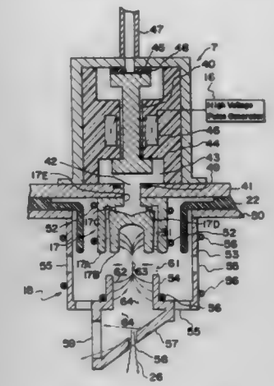
a gas valve for injecting the stored gas between said electrodes so that a cylindrical gas jet for the production of a plasma is formed;

means for applying a voltage between said electrodes to perform discharge therebetween so that a discharge plasma is produced between said electrodes, said plasma being a linear plasma which has a high temperature and a high density and which is produced by the pinch of the plasma due to its own magnetic field produced by the current flowing through the plasma, so that X-rays are emitted from said linear plasma;

an X-ray extraction window located below said pair of electrodes along the axis of said pair of electrodes; and

an electrically grounded beam reflector for reflecting charged particles emitted from said plasma, said plasma, and said injected gas, said beam reflector being interposed between said pair of electrodes and said X-ray extraction window and having a reflecting plane with an X-ray passing window, said reflecting plane being inclined at a predetermined angle relative to the axis of said pair of electrodes,

wherein at least one of said pair of electrodes has a center hole, and X-rays are extracted in the direction of linear plasma produced substantially along the axis of said pair of electrodes.

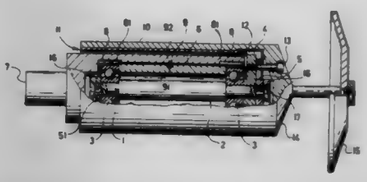


4,635,283

MOUNTING FOR THE ROTARY ANODE OF AN X-RAY TUBE

Frantisek Starek, Brno; Vilem Machacek, Rajhrad, and Pavel Manhalter, Brno, all of Czechoslovakia, assignors to ZVL Vyzkumny ustav pro valiva loziska Brno, Brno, Czechoslovakia

Filed Mar. 26, 1984, Ser. No. 593,622
Claims priority, application Czechoslovakia, Mar. 31, 1983, 2251-83
Int. Cl.⁴ H01J *35/26*
U.S. Cl. 378—132 **2 Claims**



1. A mounting for the rotary anode of an x-ray tube, comprising

a first, radially outer sleeve forming the rotor of an electric motor,

a rotary anode of an x-ray tube attached centrally to one end of the rotor,

means for supporting the rotor and the anode comprising

a second, radially intermediate anode-supporting sleeve telescoped within the first, outer sleeve and spaced radially therefrom, the second sleeve being disposed coaxially of the first sleeve and having

a supporting means attached to the end thereof which is remote from the anode,

a central shaft extending longitudinally of the first sleeve and the second sleeve coaxially of said sleeves,

a third, intermediate sleeve extending longitudinally of the shaft and other sleeves, and disposed between the shaft and the second sleeve and spaced radially from both the shaft and the second intermediate sleeve,
an antifriction bearing at each end of the shaft, each of the bearings having
an inner race and
an outer race, the inner race of each bearing being mounted upon the shaft at respective opposite ends thereof, the outer race of each of the bearings being telescoped within and attached to the respective ends of the third intermediate sleeve,
means for preventing the third intermediate sleeve from appreciable axial movement with respect to the second supporting sleeve,
an annular connecting member extending between and connecting the first, rotor sleeve and the inner race of one of the bearings and the shaft at such bearing, and
resilient annular means disposed between the second, supporting sleeve and the third, intermediate sleeve in transverse alignment with each of the anti-friction bearings, and
a centering sleeve mounted within, and accurately engaging the inner wall of the first, rotor sleeve, the centering sleeve at the end thereof adjacent the anode having the shape of a collet, the end wall of which is spaced from the inner wall of the first rotor sleeve which is adjacent the anode, the outer peripheral surface of the member connecting the rotor sleeve with the inner race of the bearing adjacent the anode, and the end of the central shaft at such location having an interference fit with the circular inner peripheral surface of the collet.

4,635,284

X-RAY EXAMINATION APPARATUS COMPRISING A C-SHAPED OR U-SHAPED SUPPORT FOR THE X-RAY SOURCE AND DETECTOR

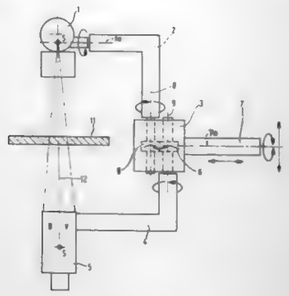
Dieter H. C. Christiansen, Schönberg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 2, 1985, Ser. No. 751,415

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1984, 3425650

Int. Cl.⁴ H05G *1/02*; A61B *6/02*

U.S. Cl. 378—197 **6 Claims**



1. An X-ray examination apparatus comprising:
a C-shaped or U-shaped support having first and second opposite ends, said support being pivotable about a first axis;
an X-ray source arranged on the first end of the support; and
an X-ray detector arranged on the second end of the support opposite the X-ray source, a connecting line between the source and the detector being perpendicular to the first axis;
characterized in that:
the support comprises first and second arms, the X-ray source being mounted on the first arm and the X-ray detector being mounted on the second arm, each arm being pivotable about a pivot axis which is substantially parallel to the connecting line; and
the support comprises means for coupling the first arm to the second arm such that when one arm is pivoted in a first direction, the other arm is pivoted with an equal angular velocity in the opposite direction.

4,635,285

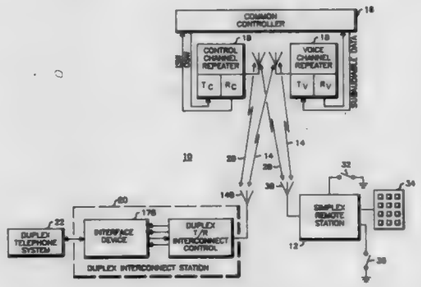
COMMUNICATION SYSTEM WITH VOICE PRIORITY FOR REMOTE STATIONS

Daniel J. Coombes, Winfield, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 12, 1984, Ser. No. 599,319

Int. Cl.⁴ H04Q *7/04*

U.S. Cl. 379—63 **15 Claims**



1. A two-way radio communication system for communicating with a duplex telephone system comprising:
a common controller;
a duplex interconnect station providing a communication link between the duplex telephone system and the two-way radio communication system;
a plurality of simplex remote stations, each having means for generating a demand-to-talk signal for transmission on a control channel to said common controller at any time including the time when a land telephone party in the duplex telephone system is transmitting on a voice channel via said duplex interconnect station;
said common controller having means responsive to said demand-to-talk signal for transmitting a control signal to said duplex interconnect station, and
said duplex interconnect station having means responsive to said control signal for establishing a communications path for transmitting audio from the remote station generating said demand-to-talk signal to the telephone land party.

4,635,286

SPEECH-CONTROLLED ELECTRONIC WATCH

Ngoc C. Bui; Jean-Georges Michel, both of Neuchatel, and Jean-Jacques Monbaron, Malvilliers, all of Switzerland, assignors to Asulab S.A., Bienne, Switzerland

Continuation of Ser. No. 378,779, May 17, 1982, abandoned. This application Oct. 9, 1985, Ser. No. 786,157

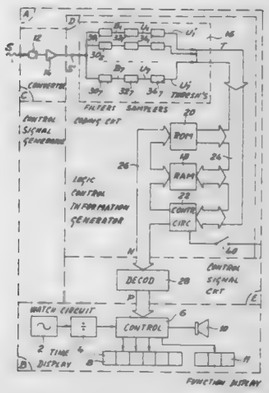
Claims priority, application Switzerland, Jul. 24, 1981, 4827/81

Int. Cl.⁴ G10L *1/00*

U.S. Cl. 381—43 **11 Claims**

1. A spoken command sensitive watch wherein a vocabulary of spoken commands is capable of controlling a plurality of functions according to one out of a plurality of possible sequences of commands, each of said sequences comprising a first command for selecting a function and at least two subsequent time information commands, said watch comprising:
a time base generator;
a frequency divider connected to said time base generator;

spoken command analysing means for converting said spoken commands into binary representations thereof;
memory means for storing binary reference representations of all the spoken commands of said vocabulary;
means for comparing said binary representations of spoken commands with said binary reference representations stored in said memory means;
means for selecting among said stored binary reference representations the compared reference representation which is closest to the respective instant representation of spoken command;
a control circuit responsive to said frequency divider and to said selecting means for performing the operations corresponding to selected stored binary reference representations;
means for causing the control circuit to (a) initially assume a configuration corresponding to the performance of one out of said plurality of selectable functions of said watch in response to at least said first spoken command in said sequence of commands, said first spoken command being selected among the commands of said vocabulary pertaining to said functions, and (b) subsequently perform time information operations corresponding to the so selected



function in response to subsequent spoken commands in the sequence of commands after the control circuit has assumed the desired configuration, each of said subsequent spoken commands being selected among a plurality of possible spoken commands in said vocabulary pertaining to time information, said means for causing including means for (a) associating a first control signal to at least the first binary reference representation selected by said selecting means, wherein said control circuit is responsive to said first control signal for assuming a configuration corresponding to the performance of said selected function of said watch; and, (b) associating a plurality of second control signals to subsequent binary reference representations selected by said selecting means, wherein said control circuit is responsive to said plurality of second control signals for performing time information operations corresponding to said previously controlled given function;
display means controlled by said control circuit for displaying symbols corresponding respectively to said functions of the watch and to at least two time digits; and
means for associating each of said second control signals to distinct time information operations and corresponding time digits of said display means.

4,635,287

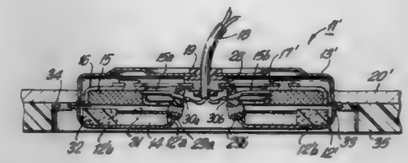
AUDIO-FREQUENCY ELECTROMECHANICAL VIBRATOR

Mutsuo Hirano, c/o Sanden Corporation, 20, Kotobuki-cho, Isesaki-shi, Gunma-ken, Japan

Filed Oct. 17, 1984, Ser. No. 661,916

Int. Cl.⁴ H04R *1/04, 9/00*

U.S. Cl. 381—194 **11 Claims**



1. An audio frequency electromechanical vibrator comprising:
an open-topped flat case of a magnetic material with a cover plate closing the open end;
a annular drive coil unit for receiving an audiofrequency power signal and being disposed within said case, said coil unit comprising a annular coil housing of magnetic material with an open axial end and a coil contained in, and fixed to, said coil housing;
a flat ring-shaped permanent magnet having an axial end and being axially magnetized, said ring-shaped permanent magnet being disposed coaxial with, and adjacent, said annular coil unit in an axial direction so that said axial end of said permanent magnet faces said open axial end of said coil housing with an axial gap left therebetween; and
a spring damper plate being supported in said case for elastically supporting one of said coil unit and said magnet, the other one of said coil unit and said magnet being fixedly mounted to an inner bottom of said case.

4,635,288

ELECTRICAL SIGNAL MIXING APPARATUS

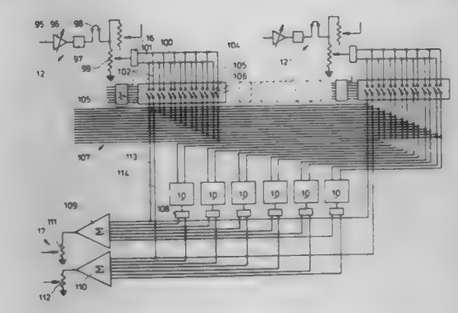
John R. Stadius, Sunbury-on-Thames, England, assignor to Soundout Laboratories, Ltd., Surrey, England

Filed Apr. 18, 1984, Ser. No. 601,602

Claims priority, application United Kingdom, Apr. 22, 1983, 8311034; Oct. 13, 1983, 8327406

Int. Cl.⁴ H04B *1/00*

U.S. Cl. 381—119 **11 Claims**



1. In an electrical signal mixing apparatus having a plurality of input channels,
means on each input channel for connecting a respective individual source of analogue electrical signals thereto,
a plurality of destination channels, and
means for selectively interconnecting each said input chan-

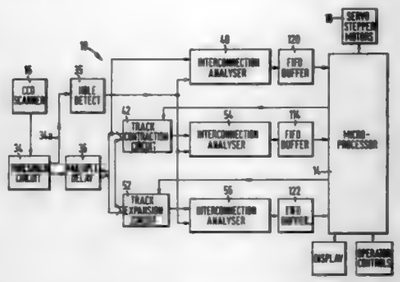
nel to one or a plurality of independently selectable destination channels,
the improvement wherein said selective interconnection means includes;
a plurality of analogue signal lines each connected to respective said destination channels,
electronic digitally controlled analogue switching means at each input channel, operative to interconnect the associated said input channel with selected ones of said analogue signal lines,
a plurality of address lines interconnecting said input channels and said output channels,
a microprocessor operative sequentially to apply signals to said address lines whereby sequentially to address said input channels and said destination channels,
selectively operable channel routing selector means interconnected between said address lines and said electronic digitally controlled analogue switching means, each said channel routing selector means including:
a single manually operable selector switch means, and
channel identification means connected to said address lines and operable to enable operation of said selector switch means when said channel identification matches the address signals applied to said address lines by said microprocessor whereby said electronic digitally controlled analogue switching means operates to control the routing from any selected input channel to any selected destination channel in dependence on the status of said selectively operable channel routing selectors.

4,635,289

METHOD AND APPARATUS FOR INSPECTING PRINTED WIRING BOARDS

Keith G. Doyle, and Roy A. Lloyd, both of Sunbury-on-Thames, England, assignors to Lloyd Doyle Limited, Surrey, England

Filed Jul. 23, 1984, Ser. No. 633,436
Claims priority, application United Kingdom, Jul. 25, 1983, 8320016
Int. Cl.⁴ G06K *9/00*
U.S. Cl. 382—8 **38 Claims**



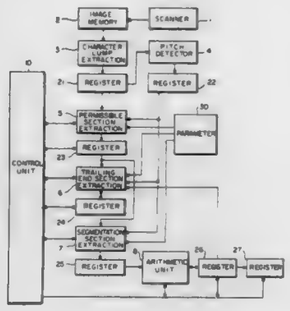
1. Apparatus for testing a printed wiring board comprising means for optically scanning a board to be tested in two orthogonal, X-Y axes such that for each scan in the Y direction it scans a narrow strip of the board of predetermined width w in the X direction, the scanning means being arranged to provide n.m discrete signals for each scan in the Y direction, wherein n is a predetermined number of signals representative of characteristics of the board across the width w of the strip and m is a number dependent upon the dimension of the board to be scanned in the Y direction such that the n.m signals are representative of the characteristics of the board at the corresponding n.m positions along the strip, and processing means for processing the signals in groups of n′×m′ where n′ is less than or equal to n and m′ is less than or equal to m to provide signals representative of the characteristics of the board along said strip and means for storing said signals, control means arranged to cause the scanning means repeatedly to scan the board in the Y direction and to step the scanned strip a predetermined amount in the X direction at the end of each scan until a required area of the board has been scanned and the processing means has processed a plurality of said groups of signals, the processing means being further arranged to identify common areas of each conductive track such that at the completion of a test, the storage means contains information representative of the X-Y coordinates of a plurality of datum areas and of the ones of said datum areas which are interconnected.

4,635,290

SECTIONING APPARATUS AND METHOD FOR OPTICAL CHARACTER READER SYSTEMS

Yoshitake Tsuji, and Ko Asai, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 19, 1984, Ser. No. 683,576
Claims priority, application Japan, Dec. 20, 1983, 58-240335; Feb. 7, 1984, 59-20299; Feb. 7, 1984, 59-20300
Int. Cl.⁴ G06K *9/34*
U.S. Cl. 382—9 **18 Claims**



12. A method of segmenting a character string image into individual characters comprising the steps of:
(a) identifying character lumps and blank spaces within said character string;
(b) estimating a character pitch;
(c) defining segmentation candidate sections comprising segmentation candidate positions based on said character pitch;
(d) measuring a distance between each segmentation candidate position within a first segmentation candidate section and a segmentation candidate position within a second segmentation candidate section adjacent to said first segmentation candidate section;
(e) calculating an appreciation standard as a function of said distance measurements for a segmentation candidate position in each segmentation candidate section;
(f) selecting an optimum segmentation candidate position for each segmentation candidate section, wherein said optimum segmentation candidate position minimizes said appreciation standard for the respective segmentation candidate section; and
(g) segmenting said character string image at said optimum segmentation candidate positions.

4,635,291

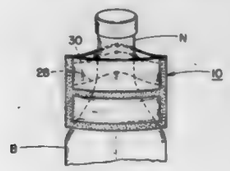
FOOD POUCH WITH INTEGRAL COLLAR

Lewis Bartos, 87 Chelsea Rd., Garden City, N.Y. 11530

Filed Oct. 1, 1984, Ser. No. 656,608
Int. Cl.⁴ B65D *33/14*
U.S. Cl. 383—24 **6 Claims**

1. A flexible pouch having a generally parallelpiped configuration and including a sealed product-containing pocket for a viscous flowable food product and integral collar-forming structure externally of said pocket enabling said pouch to be

suspended from an object, said pouch comprising two sheets each constituted of a liquid-impervious laminated flexible material including a plastic film web arranged to provide two superimposed facing plastic film webs, seals extending about three edges of said pouch for adhering said plastic film webs of said laminated material to each other, a further seal extending in parallel with the unsealed edge and being offset relative to



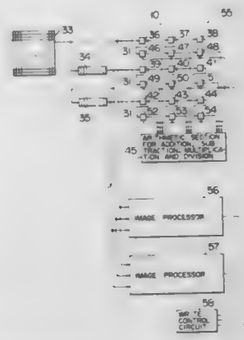
said edge, said sealed pocket being located intermediate said seals, and a surface area of said pouch being located intermediate said pocket and the unsealed edge; a pair of parallel space continuous slits extending through at least one of said sheets of laminated material in said surface area and extending in parallel with the unsealed edge whereby separation of the laminated material sheets along said continuous slits provides a loop-like strip constituting sid collar structure.

4,635,292

IMAGE PROCESSOR

Toshiki Mori, Ibaraki; Haruyasu Yamada, Hirakata; Kenichi Hasegawa, Osaka, and Kunitoshi Aono, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 17, 1984, Ser. No. 682,321
Claims priority, application Japan, Dec. 19, 1983, 58-239104; Dec. 19, 1983, 58-239235; Jun. 8, 1984, 59-118483; Jun. 8, 1984, 59-118484; Jun. 21, 1984, 59-127905
Int. Cl.⁴ G06F *9/28, 15/66;* **G06K** *9/36*
U.S. Cl. 382—41 **5 Claims**



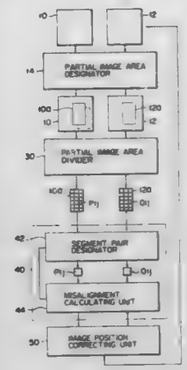
1. In a partial image processor which divides image input data into partial image data pieces of m rows×n columns and processes said partial image data, an image processor comprising:
a partial image memory to which said m×n partial image data pieces are supplied in parallel;
a program memory for storing a program;
a control circuit for controlling said program memory to read;
an adder-subtractor;
a multiplier;
a first data memory for storing the output of said adder-subtractor;
a second data memory for previously storing constants;
a reciprocal number memory in which the reciprocals of addresses are stored at the respective addresses;
means for selecting two data outputs from the image outputs of said partial data memory, said first data memory, said adder-subtractor and said multiplier and supplying said two pieces of data to said adder-subtractor;
means for selecting one data output from the data outputs of said partial image memory and said adder-subtractor and supplying said one data output to said multiplier as a multiplicand; and
means for selecting one output data from the data outputs of said first and second data memories and supplying said one output data directly to said multiplier as a multiplier or supplying said one output data through said reciprocal number memory, by which said one output data is converted to the reciprocal thereof, to said multiplier as a multiplier.

4,635,293

IMAGE PROCESSING SYSTEM

Mutsumi Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 30, 1985, Ser. No. 696,491
Claims priority, application Japan, Feb. 24, 1984, 59-33581
Int. Cl.⁴ G06K *9/32*
U.S. Cl. 382—44 **11 Claims**



1. An image processing apparatus comprising:
first processor means for extracting a desired partial image area from each of a pair of first and second images to be subjected to position alignment;
second processor means for dividing each of said partial image areas into n x m image segments arranged in a matrix form, where n and m are positive integers;
third processor means for detecting, in a first mode, misalignment between each corresponding image segment pair of said first and second picture images by using a first evaluation parameter defined based upon correlation coefficient data, and for more accurately detecting, in a second mode, the misalignment between the same image segment pair of said first and second picture images by using a second evaluation parameter which is defined based upon pixel density difference data as well as the correlation coefficient data; and
fourth processor means for aligning said first and second picture images based on misalignment data obtained for all of said image segment pairs by said third processor means.

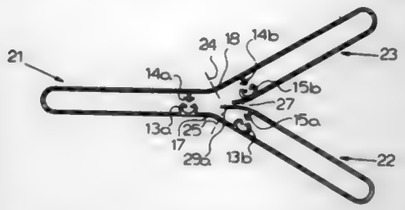
VOL 1074 ISS 1 JA 6 1987 UMI

4,635,294

MATERIAL FOR MAKING THREE RECLOSABLE BAG SECTIONS FROM EXTRUDED PLASTIC MATERIAL

Per Bentsen, Suffern, N.Y., assignor to Minigrip Incorporated, Orangeburg, N.Y.

Filed Apr. 5, 1985, Ser. No. 720,420
Int. Cl.[4] B65D *33/24*
U.S. Cl. 383—37 17 Claims



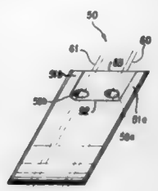
1. Material for making 3 reclosable bag sections from separable fastener equipped web, comprising:
- a bag making web having opposite free portions and an intervening portion;
- said intervening portion being folded upon itself and said free portions being folded inwardly upon themselves, whereby to provide 3 bag sections extending from a juncture in a generally Y orientation and each section having a bag top adjacent to said juncture;
- and a respective separable profile fastener assembly comprising separably interlockable fastener profiles on each of said bag tops adjacent to said juncture.

4,635,295

TAPED BAG WITH EXTENDED SIDE SEALS

Robert A. Odabashian, Greer, and Benjamin G. Wofford, Spartanburg, both of S.C., assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Sep. 18, 1984, Ser. No. 651,722
Int. Cl.[4] B65D *30/00, 33/00*
U.S. Cl. 383—127 5 Claims



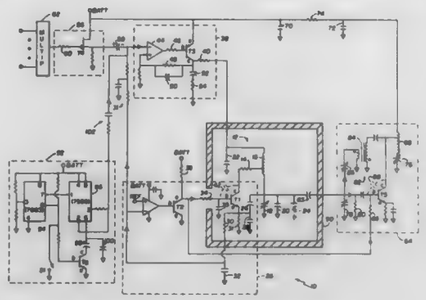
1. A flexible thermoplastic side-seal bag having a mouth and sides, said bag comprising:
- a front panel defining the mouth of the bag, said front panel comprising two marginal portions extending a length A beyond said mouth;
- a rear panel comprising a lip portion extending a length B beyond said mouth, said rear panel having at least one tape releasably attached to an exterior surface thereof;
- side seals joining said front panel to said rear panel, said seals defining the sides of the bag,
- wherein length A is less than or equal to length B and length A and said side seals have termination points extending beyond the mouth of the bag and said marginal portions and said side seals at least past the point at which said tape is attached to said rear panel;
- whereby, during loading of a product into said bag, while taped, the plane of action of loading forces intersects said side seals at a point substantially removed from said termination points.

4,635,296

WIDE BANDWIDTH ULTRA HIGH STABILITY FM TELEMETRY TRANSMITTER

Mark T. Dinsmore, Newton, Mass., assignor to Transkinetic Systems, Inc., Canton, Mass.

Filed Feb. 22, 1985, Ser. No. 704,654
Int. Cl.[4] H04B *1/04*
U.S. Cl. 455—113 20 Claims



1. An ultra stable wide bandwidth transmitter for providing frequency modulation of predetermined input signals, comprising:
- a variable frequency oscillator including a wide bandwidth tuneable circuit, a transistor having a base, a collector, an emitter, and a collector-to-base capacitance, and a regenerative feedback loop connected between said tuneable circuit and said transistor in such a way that said collector-to-base capacitance is an operative part of said wide bandwidth tuneable circuit;
- means coupled to said variable frequency oscillator for establishing and maintaining a preselected constant emitter biasing current through said transistor for regulating and stabilizing the collector current of said transistor against changing temperature induced variations;
- said constant emitter biasing current establishing and maintaining means includes a voltage reference, and a negative feedback loop connected between said voltage reference and said emitter of said transistor for driving said base of said transistor of said variable frequency oscillator for maintaining said constant emitter current;
- means coupled to said variable frequency oscillator for establishing and maintaining a constant biasing voltage at said collector of said transistor of said variable frequency oscillator for regulating and stabilizing said collector-to-base capacitance against changing temperature induced variations;
- means coupled to said variable frequency oscillator for controllably varying said collector-to-base capacitance and therewith the frequency of said tuned circuit in response to said input signals to provide frequency modulated signals representative thereof;
- an output stage coupled to said variable frequency oscillator including an antenna; and
- means coupled between said output stage and said variable frequency oscillator for compensating and neutralizing antenna loading induced frequency variations.

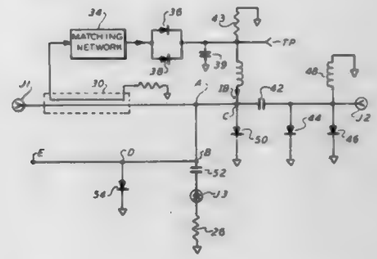
4,635,297

OVERLOAD PROTECTOR

Andrey Polischuk, Succasunna, N.J., assignor to Litton Systems, Inc., Morris Plains, N.J.

Continuation of Ser. No. 589,812, Mar. 15, 1984, abandoned.
This application Dec. 26, 1985, Ser. No. 814,292
Int. Cl.[4] H04B *1/10*; H03G *11/02*
U.S. Cl. 455—217 32 Claims

28. An overload protector operating at at least a radio frequency for safely transferring signals from an input to an output, comprising:
- a power-dissipating element;
- a detection means coupled to said input for providing a bias current in response to a signal at the input in excess of a predetermined magnitude;
- diversion means coupled to said input, to said output, to said power-dissipating element and to said detection means for receiving said bias current, said diversion means being operable in response to said bias current to redirect power at said input away from said output to said power-dissipating element, said diversion means including reloading means connected to said power-dissipating element for gating thereto signals from said input in response to said bias current, said diversion means comprising:
- a diversion transmission means coupled between said input and said power-dissipating element for conveying signals therebetween and a second transmission means coupled between said reloading means and said power-dissipating element for conveying signals therebetween, said diversion transmission means and second transmission means each being in effect longer than one-eighth of the wavelength of the radio frequency signals therein.

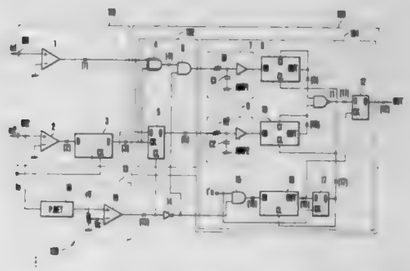


4,635,298

INTERFERENCE WAVE DETECTION CIRCUIT FOR USE IN RADIO RECEIVER

Kouzou Kage, and Hiroshi Watanabe, both of Tokyo, Japan, assignors to NEC Corporation and Nippon Telegraph & Telephone Public Corp., both of Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 684,824
Claims priority, application Japan, Dec. 29, 1983, 58-249794
Int. Cl.[4] H04B *1/10*
U.S. Cl. 455—295 27 Claims



1. An interference wave detection circuit for detecting a beat due to the difference between two carrier wave frequencies included in a received signal of a radio receiver to output an interference detection signal representing the occurrence of interference wherein the receiver provides a signal within a voice frequency band and an envelope signal of the intermediate frequency signal comprising:

first means adapted to provide a predetermined time difference between said signal within a voice frequency band and the envelope signal so that either the signal at a voice frequency band or the envelope signal is delayed relative to the other and to produce first and second binary output signals shifted in time to each other in a binary form;

second means for detecting that a carrier wave is modulated with a spoken message of said received signal to produce a spoken message detection signal as long as it is detected that said carrier wave is modulated therein; and

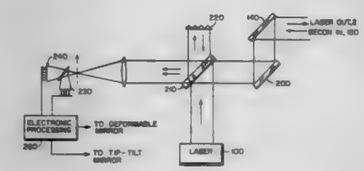
third means for detecting a correlation between said first and second binary output signals from said first means for a time duration, except for a period of time during which said spoken message detection signal is outputted from said second means, to produce the interference detection signal when said correlation therebetween is found.

4,635,299

DISCRETE PHASE CONJUGATE TECHNIQUE FOR PRECOMPENSATION OF LASER BEAMS TRANSMITTED THROUGH TURBULENCE

Alan J. MacGovern, Acton, Mass., assignor to United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 11, 1985, Ser. No. 743,550
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—606 6 Claims



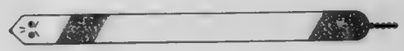
1. In combination with a laser transmitter which produces a laser beam, and in combination with a target beam which is received, a beam control system comprising:
- a shared aperture component which receives and splits said laser beam from said laser transmitter to produce an outgoing laser beam and a sample beam, said shared aperture component receiving and reflecting a conjugated sample beam, said shared aperture component also passing said target beam through it;
- a retroreflector array which receives said sample beam from said shared aperture component, said retroreflector array producing a conjugated sample beam by reflecting said sample beam while conjugating errors in said sample beam, said retroreflector array sending said conjugated sample beam back to said shared aperture component;
- a means for measuring subaperture tilt differences between beams, said measuring means receiving said conjugated sample beam and said target beam from said shared aperture component, said measuring means producing a first output signal by measuring subaperture tilt differences between said conjugate sample beam and said target beam, said measuring means producing a second output signal by measuring aperture tilt differences between said target beam and said conjugated sample beam; and
- servo-controlled optical elements which receive said first and second output signals from said measuring means, said servo-controlled optical elements receiving said outgoing laser beam from said shared aperture component, said servo-controlled optical elements adjusting said outgoing laser beam so that it becomes a conjugate of said target beam by adjusting said outgoing laser beam to remove any aperture tilt difference and subaperture tilt differences between it and said target beam.

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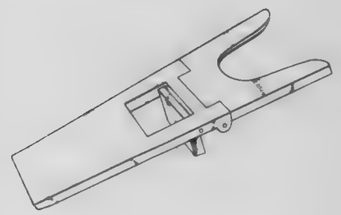
287,540
ATHLETIC SHOE WITH POCKET
Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., Chesterfield, Mo.
Division of Ser. No. 427,637, Sep. 29, 1982, and a continuation-in-part of Ser. No. 314,136, Oct. 23, 1981. This application Jul. 22, 1985, Ser. No. 728,209
The portion of the term of this patent subsequent to Oct. 29, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D2—309



287,541
NECK SCARF
Marilyn Mezer, 1699 NE. 141 St., North Miami, Fla. 33181
Filed Jan. 11, 1984, Ser. No. 570,035
Term of patent 14 years
U.S. Cl. D2—508



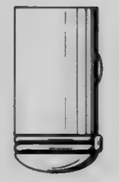
287,542
DOOTJACK
Warren S. Wilkinson, and Carlton G. Schenken, Jr., both of San Antonio, Tex., assignors to Alamo Iron Works, San Antonio, Tex.
Filed Jul. 30, 1984, Ser. No. 635,524
Term of patent 14 years
U.S. Cl. D2—642



287,543
UMBRELLA HANDLE
Ann S. Cain, Cincinnati, Ohio, assignor to 'totes', incorporated, Loveland, Ohio
Continuation-in-part of Ser. No. 742,024, Jun. 6, 1985, abandoned. This application Oct. 18, 1985, Ser. No. 788,958
Claims priority, application Taiwan, Mar. 21, 1985, 74301302
Term of patent 14 years
U.S. Cl. D3—12



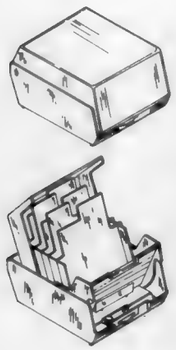




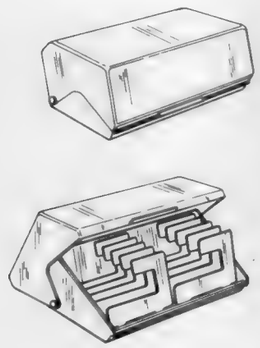


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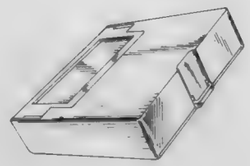
287,544
DISKETTE STORAGE CONTAINER FOR FLOPPY DISKETTES
Jerry M. Long, Pleasanton, and James A. Womack, Los Gatos, both of Calif., assignors to Innovative Concepts, Inc., San Jose, Calif.
Filed May 18, 1984, Ser. No. 611,908
Term of patent 14 years
U.S. Cl. D3—35

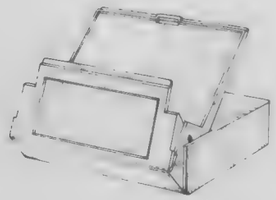


287,545
STORAGE AND DISPLAY CONTAINER FOR FLOPPY DISKETTES
Jerry M. Long, Pleasanton, and James A. Womack, Los Gatos, both of Calif., assignors to Innovative Concepts, Inc., San Jose, Calif.
Filed May 18, 1984, Ser. No. 612,008
Term of patent 14 years
U.S. Cl. D3—35

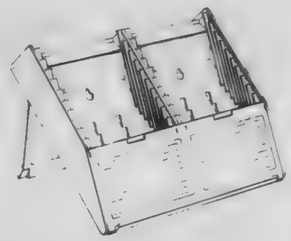


287,546
STORAGE AND DISPLAY FILE FOR COMPUTER SOFTWARE FLOPPY DISCS
Eugene M. Bernstein, Morton Grove, Ill., assignor to Gene Bernstein & Associates, Inc., Niles, Ill.
Filed Apr. 30, 1984, Ser. No. 605,153
Term of patent 14 years
U.S. Cl. D3—35

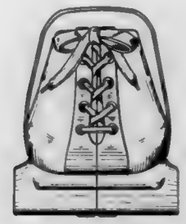


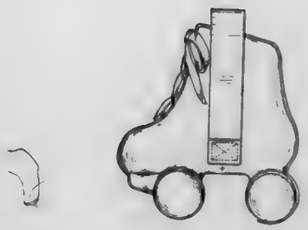


287,547
MAGNETIC DISC STORAGE CONTAINER
Robert Rager, 1908 Rainbow Dr., Silver Spring, Md. 20904
Filed Aug. 7, 1984, Ser. No. 638,657
Term of patent 14 years
U.S. Cl. D3—35



287,548
ROLLER SKATE CASE
Therese M. Kraynack-Simon, 2464 S. Hubbard Rd., Lowellville, Ohio 44436
Filed Jul. 11, 1983, Ser. No. 512,386
Term of patent 14 years
U.S. Cl. D3—36

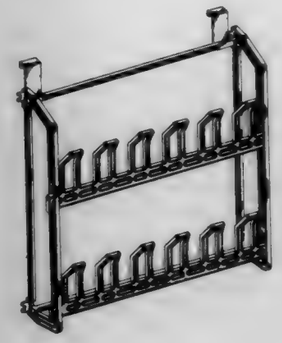




287,549
TOOTH-BRUSH
Daniel Arnaud, 41 rue Chambre de l'Edit, Castres 81100, France
Filed Jan. 31, 1983, Ser. No. 546,867
Term of patent 14 years
U.S. Cl. D4—107



287,550
DOOR-MOUNTED SHOE RACK
Richard M. Tocci, Leominster, Mass., assignor to American Hanger, Inc., Leominster, Mass.
Filed Dec. 4, 1984, Ser. No. 677,823
Term of patent 14 years
U.S. Cl. D6—320



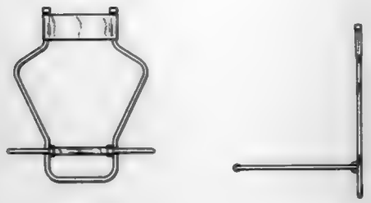
287,551
UPHOLSTERED CHAIR
Sally S. Lewis, 8950 St. Ives Dr., Los Angeles, Calif. 90069
Filed Jun. 6, 1983, Ser. No. 501,440
Term of patent 14 years
U.S. Cl. D6—334



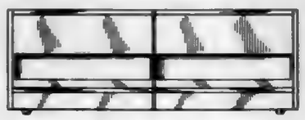
287,552
CHAISE LOUNGE
Robert D. Vanderminden, Granville, N.Y., assignor to The Telescope Folding Furniture Co., Inc., Granville, N.Y.
Filed May 18, 1984, Ser. No. 611,705
Term of patent 14 years
U.S. Cl. D6—361

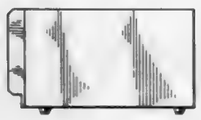


287,553
BOATCHAIR
Richard P. Rossi, 22 Deerfield Dr., Montpelier, Vt. 05602
Filed Jul. 25, 1984, Ser. No. 634,074
Term of patent 14 years
U.S. Cl. D6—368



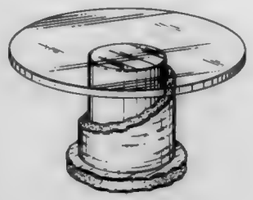
287,554
CASSETTE STORAGE CABINET
Lee Radtke, Lake Zurich, Ill., assignor to Tiger Electronics, Inc., Mundelein, Ill.
Continuation-in-part of Ser. No. 684,572, Dec. 21, 1984. This application Feb. 26, 1985, Ser. No. 704,270
Term of patent 14 years
U.S. Cl. D6—446







287,555
TABLE
Douglas E. Bickle, 9025 Keith Ave., #202, Los Angeles, Calif. 90069
Filed Aug. 15, 1984, Ser. No. 641,002
Term of patent 14 years
U.S. Cl. D6—486



287,556
EXTENSION SLIDE FOR A TABLE OR SIMILAR ARTICLE
Ruca Chien, 77 Kuang Rong La., Sec. 2, Chung Shan Rd., Pan-Chiao, Taipei Hsien, Taiwan
Filed Mar. 24, 1984, Ser. No. 593,283
Term of patent 14 years
U.S. Cl. D6—491



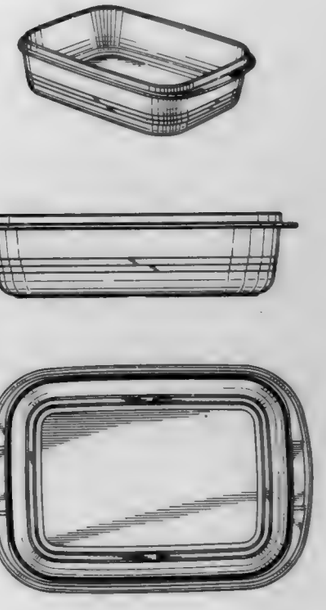
287,557
FURNITURE PANEL
Laura L. Hull, Huntington Beach, Calif., assignor to H. W. Hull & Sons, Inc., Gardena, Calif.
Filed Aug. 24, 1984, Ser. No. 643,790
Term of patent 14 years
U.S. Cl. D6—494



287,558
FURNITURE PANEL
Laura L. Hull, Huntington Beach, Calif., assignor to H. W. Hull & Sons, Inc., Gardena, Calif.
Filed Aug. 24, 1984, Ser. No. 643,791
Term of patent 14 years
U.S. Cl. D6—494



287,559
CASSEROLE DISH OR THE LIKE
Robert H. C. M. Daenen, Hekelgem; Pieter K. J. DeCoster, Aalst, both of Belgium, and Martin J. Wolff, North Providence, R.I., assignors to Dart Industries, Inc., Northbrook, Ill.
Filed Sep. 21, 1984, Ser. No. 653,387
Term of patent 14 years
U.S. Cl. D7—21

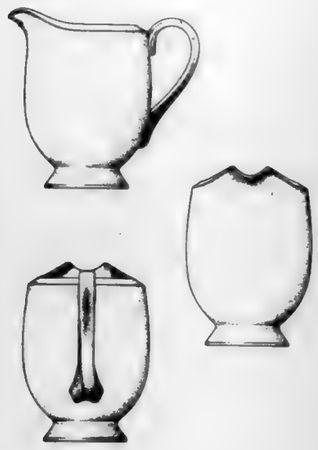


287,560
DISH OR SIMILAR ARTICLE
James L. Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed May 24, 1984, Ser. No. 613,465
Term of patent 14 years
U.S. Cl. D7—28

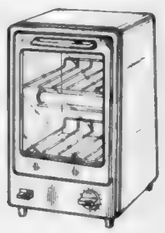


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287,561
CREAM PITCHER
Helene Uglow, New York, N.Y., assignor to American Commercial Incorporated, Secaucus, N.J.
Filed Dec. 31, 1984, Ser. No. 687,748
Term of patent 14 years
U.S. Cl. D7—319



287,562
TOASTER OVEN
Kazuo Takada, Nara; Tadanori Fujiwara, Hirakata; Miyo Izumi, Osaka; Yayoi Ogata, Nishinomiya; Hitomi Mikami, Amagasaki, and Eriko Yabe, Kobe, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed Jul. 9, 1984, Ser. No. 628,768
Claims priority, application United Kingdom, Jun. 11, 1984, 1020211
Term of patent 14 years
U.S. Cl. D7—350



287,563
HANDLE FOR A CULINARY TOOL
Roger L. Kelly, Eau Claire, Wis., assignor to Ekco Housewares, Inc., Franklin Park, Ill.
Filed Apr. 9, 1984, Ser. No. 598,177
Term of patent 14 years
U.S. Cl. D7—395



287,564
TREE BRANCH CLIP
Peter K. McCully, Henderson, New Zealand assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Dec. 17, 1984, Ser. No. 682,138
Term of patent 14 years
U.S. Cl. D8—1



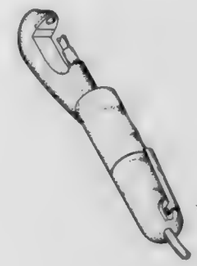
287,565
RETRIEVER FOR FALLEN FRUIT, DEBRIS OR SIMILAR USE
Murray L. Merritt, Gen. Del. Meaford, Ontario, Canada N0H 1Y0
Filed Feb. 27, 1984, Ser. No. 583,598
Claims priority, application Canada, Dec. 16, 1983, 16-12-83-4
Term of patent 14 years
U.S. Cl. D8—14



287,566
FLUID-POWERED HAND PUNCH
Michael J. Chouinard, 88 Milton St., Milton, Mass. 02186
Filed Jan. 6, 1984, Ser. No. 568,579
Term of patent 14 years
U.S. Cl. D8—61



287,567
FLUID-POWERED HAND PUNCH
Michael J. Chouinard, 88 Milton St., Milton, Mass. 02186
Filed Jan. 19, 1984, Ser. No. 572,214
Term of patent 14 years
U.S. Cl. D8—61



287,568
HANDLEBAR GRIP
Marie-Louise Hernqvist, Storbåtsvägen 8, 302 71, Halmstad, Sweden
Filed Nov. 14, 1983, Ser. No. 551,521
Claims priority, application Sweden, May 11, 1983, 83-1353
Term of patent 14 years
U.S. Cl. D8—303



287,569
SHELF BRACKET
John S. Shepard, Windsor, Colo., assignor to SISU Shelving Corporation, Fort Collins, Colo.
Filed Jul. 16, 1984, Ser. No. 631,461
Term of patent 14 years
U.S. Cl. D8—381

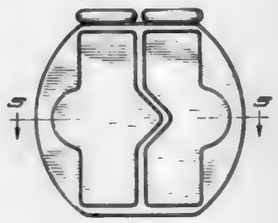


VOL 1074 ISS 1 JA 6 1987 UMI

287,570
COMBINED SAMPLE TUBE, SCREW CAP AND MARKING PLUG
Henning Olsen, Roskilde, Denmark, assignor to A/S Nunc, Roskilde, Denmark
Filed May 26, 1983, Ser. No. 498,479
Term of patent 14 years
U.S. Cl. D9—306



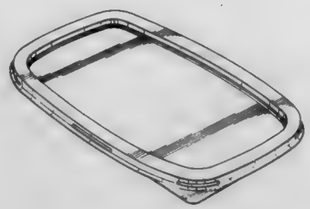
287,571
COMPARTMENTED BOTTLE OR THE LIKE
Stephan K. Hutchins, 2946 Queen Ave. N., Minneapolis, Minn. 55411
Filed Aug. 13, 1984, Ser. No. 639,628
Term of patent 14 years
U.S. Cl. D9—313



287,572
BAG PACK
H. Gordon Dancy, Middletown, Ohio, assignor to Sonoco Products Company, Hartsville, S.C.
Filed May 17, 1984, Ser. No. 611,559
Term of patent 14 years
U.S. Cl. D9—341



287,573
CONTAINER LID
Frank S. Tyler, Kent, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Jan. 20, 1984, Ser. No. 572,487
Claims priority, application United Kingdom, Jul. 27, 1983, 1014339
Term of patent 14 years
U.S. Cl. D9—435

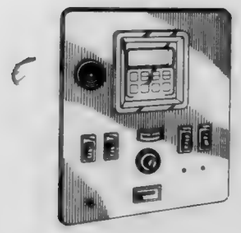


287,574
TOY GUN WATCH
Shigeru Nakane, Narashino, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 30, 1984, Ser. No. 616,420
Term of patent 14 years
U.S. Cl. D10—33





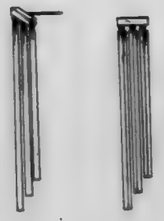
287,575
CONTROL PANEL FOR MONITORING THE CONCENTRATION OF DISSOLVED METAL IN A PLATING SOLUTION
Charles L. Newton, Clearwater, Fla., assignor to Shipley Company Inc., Newton, Mass.
Filed Mar. 7, 1984, Ser. No. 586,979
Term of patent 14 years
U.S. Cl. D10—81



287,576
EMERGENCY ROAD REFLECTOR
Hugo E. Anderson, and Mary Ann Poeschl Anderson, both of 1609 Darlene St., St. Paul, Minn. 55119
Filed Sep. 17, 1984, Ser. No. 650,682
Term of patent 14 years
U.S. Cl. D10—114



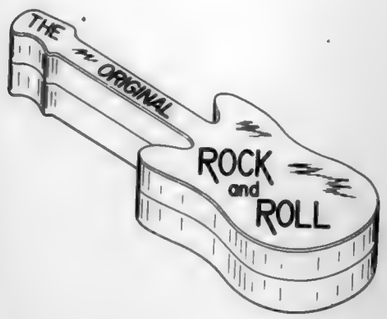
287,577
EARRING
Marcia Lerberfeld, 500 E. 77th St., Apt. 532, New York, N.Y. 10021
Filed May 8, 1984, Ser. No. 608,150
Term of patent 14 years
U.S. Cl. D11—43

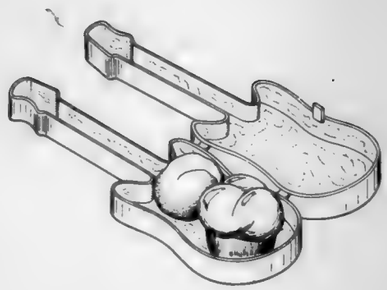




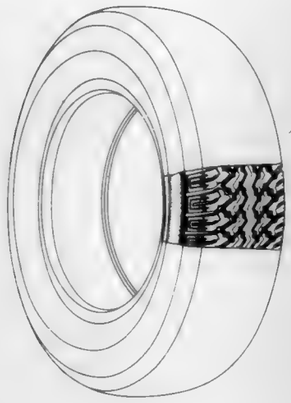
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287,578
NOVELTY GUITAR CASE
Stuart Shay, 9939C Boca Garden Trail, Boca Raton, Fla. 33434, and Terra L. Perry, 5519 Richard Ave., Dallas, Tex. 75206
Filed Jun. 29, 1984, Ser. No. 626,057
Term of patent 14 years
U.S. Cl. D11—157

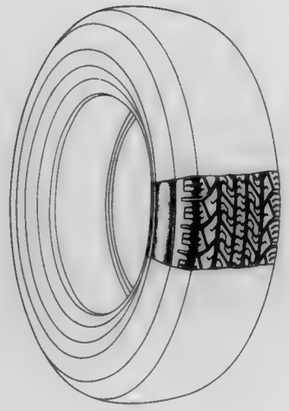




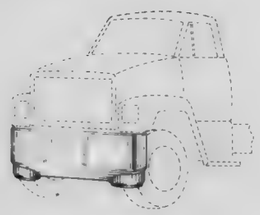
287,579
TIRE
Michael W. Cain, Simpsonville, S.C., assignor to Michelin Recherche et Technique S.A., Basel, Switzerland
Filed Nov. 15, 1984, Ser. No. 672,103
Term of patent 14 years
U.S. Cl. D12—147



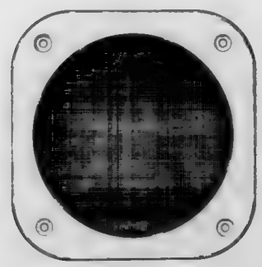
287,580
TIRE
Michael W. Cain, Simpsonville, S.C., assignor to Michelin Recherche et Technique S.A., Basel, Switzerland
Filed Nov. 15, 1984, Ser. No. 672,104
Term of patent 14 years
U.S. Cl. D12—147



287,581
AIR DAM
Donald R. Herpel, 29466 Candlewood, Southfield, Mich. 48076
Filed Dec. 4, 1984, Ser. No. 678,272
Term of patent 14 years
U.S. Cl. D12—181

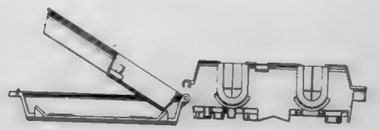


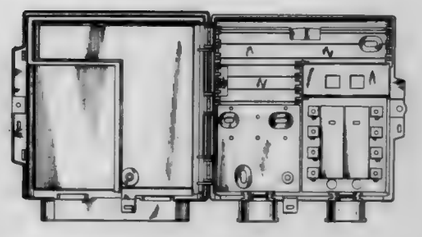
287,582
SPEAKER COMPONENT
Mervin A. Dayan, Eatontown, N.J., assignor to Royal Sound Company, Inc., Eatontown, N.J.
Filed Dec. 21, 1983, Ser. No. 564,004
Term of patent 14 years
U.S. Cl. D14—39





287,583
PROTECTOR HOUSING FOR TELECOMMUNICATION EQUIPMENT
Thomas J. Smith, Bay Shore, and Michael A. Savona, Coram, both of N.Y., assignors to TII Industries, Inc., Copiague, N.Y.
Filed Jul. 5, 1984, Ser. No. 627,677
Term of patent 14 years
U.S. Cl. D14—52





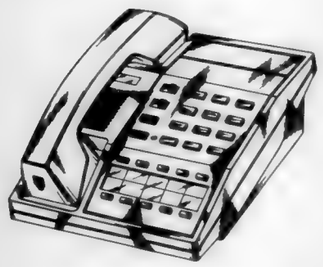
287,584
TELEPHONE SET
Lobo Huang, Taipei, Taiwan, assignor to Columbia Telecommunications Group, Inc., New York, N.Y.
Filed Aug. 15, 1984, Ser. No. 641,045
Term of patent 14 years
U.S. Cl. D14—53

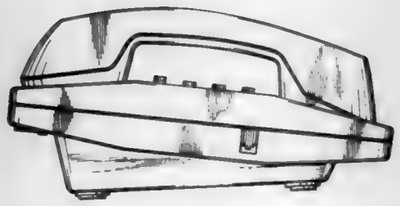




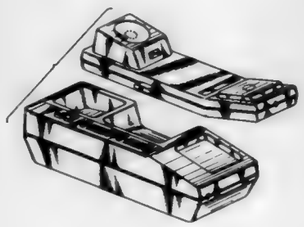
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287,585
TELEPHONE SET
Wilbert C. Brown, Fairfield, Conn.; Roger J. Testo, Yorktown Heights, N.Y., Eric K. Babbitt, Shelton, John Cuccio, Westport, both of Conn., assignors to TIE/Communications, Inc., Shelton, Conn.
Filed Apr. 13, 1984, Ser. No. 600,132
The portion of the term of this patent subsequent to Dec. 30, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—53

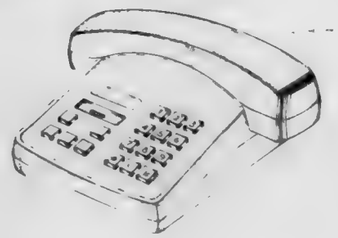


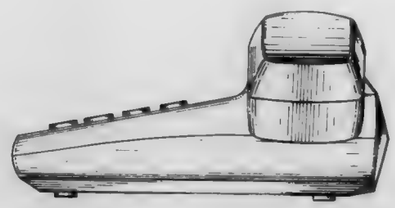


287,586
HANDSET TELEPHONE AND STAND UNIT
Fumio Tanaka, Tokyo, and Shin'ichi Imoto, Iwaki, both of Japan, assignors to Alpine Electronics Inc., Japan
Filed Nov. 9, 1984, Ser. No. 669,936
Term of patent 14 years
U.S. Cl. D14—53



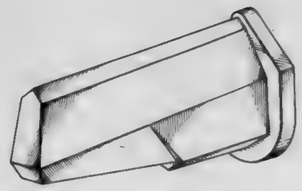
287,587
HANDSET AND TELEPHONE STAND UNIT
George Perkins, Burbank, Calif., assignor to Telequest, Inc., Burbank, Calif.
Filed Nov. 23, 1984, Ser. No. 674,247
Term of patent 14 years
U.S. Cl. D14—53



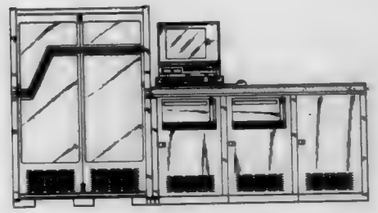




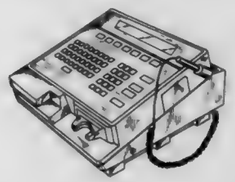
287,588
SATELLITE DISH FEED HORN COVER
Steven B. Ulch, Redding, Calif., assignor to Paradigm Manufacturing, Inc., Redding, Calif.
Filed Dec. 17, 1984, Ser. No. 682,613
Term of patent 14 years
U.S. Cl. D14—90



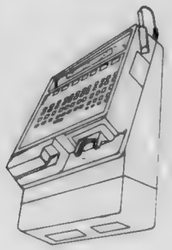
287,589
AUTOMATIC TEST SUPPORT SYSTEM
Eddie Kovacs, Kings Park; Arthur Faraci, Hauppauge, and Robert S. Metz, Jr., E. Setauket, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed May 11, 1984, Ser. No. 609,374
Term of patent 14 years
U.S. Cl. D14—102



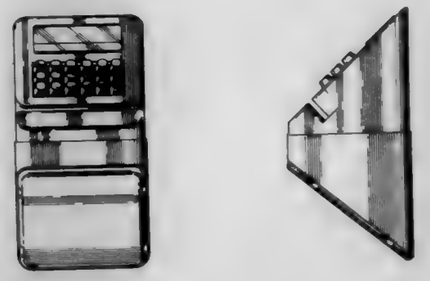
287,590
DESK MOUNTED FACTORY DATA COLLECTION TERMINAL OR SIMILAR ARTICLE
Jay A. Kaplan, Wayland; Peter Place, Ashland, and Harold G. Wood, Acton, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.
Filed Sep. 30, 1983, Ser. No. 538,014
Term of patent 14 years
U.S. Cl. D14—105



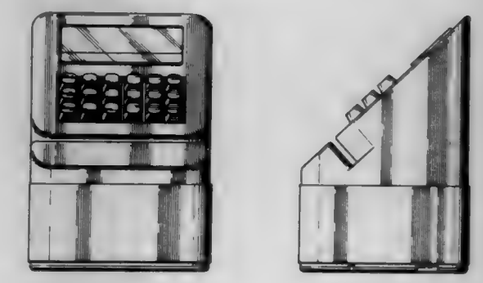
287,591
WALL MOUNTED FACTORY DATA COLLECTION TERMINAL OR SIMILAR ARTICLE
Jay A. Kaplan, Wayland; Peter Place, Ashland, and Harold G. Wood, Acton, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.
Filed Sep. 30, 1983, Ser. No. 538,047
Term of patent 14 years
U.S. Cl. D14—105



287,592
MAGNETIC CARD ACCESSED INFORMATION TERMINAL
Claudio Perissinotto, Udine, Italy, assignor to Solari & C/Udine S.p.A., Italy
Filed Aug. 21, 1984, Ser. No. 642,936
Claims priority, application Italy, Feb. 21, 1984, 20925-B/84
Term of patent 14 years
U.S. Cl. D14—105



287,593
MAGNETIC CARD ACCESSED INFORMATION TERMINAL
Claudio Perissinotto, Udine, Italy, assignor to Solari & C/Udine S.p.A., Italy
Filed Aug. 21, 1984, Ser. No. 642,939
Claims priority, application Italy, Feb. 21, 1984, 20924-B/84
Term of patent 14 years
U.S. Cl. D14—105

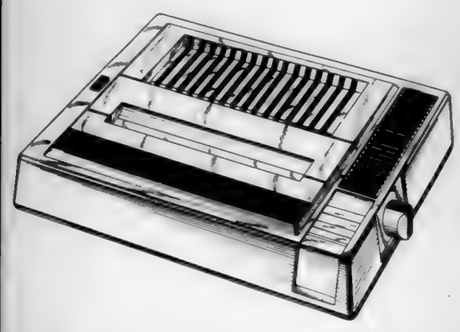


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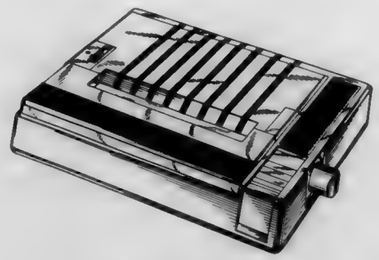
287,594
MAGNETIC CARD ACCESSED INFORMATION TERMINAL
Claudio Perissinotto, Udine, Italy, assignor to Solari & C/Udine S.p.A., Italy
Filed Aug. 21, 1984, Ser. No. 642,940
Claims priority, application Italy, Feb. 21, 1984, 20939-B/84
Term of patent 14 years
U.S. Cl. D14—105



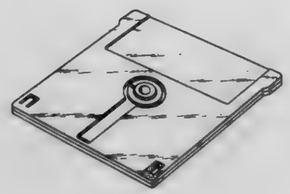
287,595
SERIAL PRINTER
Shigemasa Kato, Zama, and Sanae Takada, Chofu, both of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan
Filed Sep. 20, 1984, Ser. No. 652,758
Claims priority, application Japan, Mar. 26, 1984, 59-11688
Term of patent 14 years
U.S. Cl. D14—111



287,596
PRINTER
Shigemasa Kato, Zama, and Sanae Takada, Chofu, both of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan
Filed Sep. 20, 1984, Ser. No. 652,769
Claims priority, application Japan, Mar. 30, 1984, 59-12477
Term of patent 14 years
U.S. Cl. D14—111



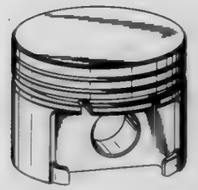
287,597
MAGNETIC DISC CASSETTE
Mitsuaki Naoi, Tokyo, Japan, assignor to Mitsumi Electric Co., Ltd., Tokyo, Japan
Filed Jan. 23, 1984, Ser. No. 572,857
Claims priority, application Japan, Jul. 26, 1983, 58-32715
Term of patent 14 years
U.S. Cl. D14—114



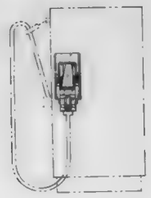
287,598
COMPOSITE KEY ASSEMBLY FOR DIRECTIONAL CONTROL OF A CURSOR ON A COMPUTER DISPLAY SCREEN
William G. Moggridge, Palo Alto, Calif., assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jul. 5, 1984, Ser. No. 627,881
Term of patent 14 years
U.S. Cl. D14—114



287,599
PISTON
Edward J. Murray, Ilkley, England, assignor to AE PLC, Warwickshire, England
Filed Dec. 1, 1983, Ser. No. 557,103
Claims priority, application United Kingdom, Jun. 3, 1983, 1013400
Term of patent 14 years
U.S. Cl. D15—5



287,600
NOZZLE RECEPTACLE FOR FUEL DISPENSER
Thomas C. Wilson, Denver, and Alan F. Schwimmer, Littleton, both of Colo., assignors to Dresser Industries, Inc., Dallas, Tex.
Filed Jul. 23, 1984, Ser. No. 633,772
Term of patent 14 years
U.S. Cl. D15—9.1

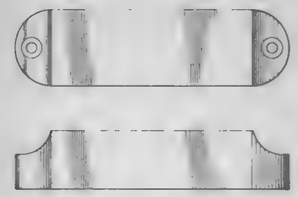


287,601
GRINDING DISC
Jan Sidén, Skellefteå, Sweden, assignor to Fiskiparna AB, Skellefteå, Sweden
Filed Oct. 26, 1984, Ser. No. 665,532
Claims priority, application Sweden, Apr. 26, 1984, 84-1344
Term of patent 14 years
U.S. Cl. D15—126





287,602
PICKUP COVER FOR ELECTRIC GUITARS
Daniel J. Smith, 390 Peamar Ave.; Charles H. Todd, III, 410 W. Electric Ave., both of La Habra, Calif. 90631, and John F. Page, 12613 Gabbett, La Mirada, Calif. 90638
Continuation-in-part of Ser. No. 492,262, May 6, 1983. This application May 1, 1984, Ser. No. 605,820
Term of patent 14 years
U.S. Cl. D17—20

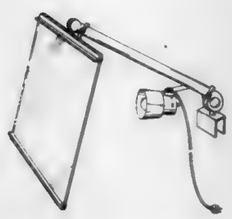


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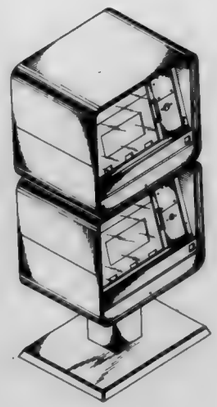
287,603
WRITING PEN
Bernhard Bruhn, Halstenbek, Fed. Rep. of Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.
Filed Jun. 19, 1984, Ser. No. 622,319
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1983, 66 MR 11757
Term of patent 14 years
U.S. Cl. D19—48



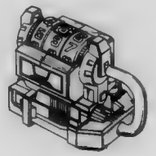
287,604
COMBINED BOOK HOLDER AND LIGHT ASSEMBLY
Bruce W. Creed, 4379 S. Dye Rd., Swartz Creek, Mich. 48473
Filed Apr. 23, 1984, Ser. No. 602,918
Term of patent 14 years
U.S. Cl. D19—91



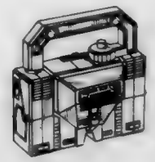
287,605
NEWSPAPER VENDING MACHINE
Jack S. Chalabian, Huntington Beach, Calif., assignor to K-Jack Engineering Company, Inc., Gardena, Calif.
Filed Dec. 19, 1983, Ser. No. 563,062
The portion of the term of this patent subsequent to Dec. 2, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D20—6



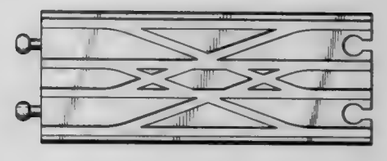
287,606
RECONFIGURABLE TOY LOCK
Masaki Maruyama, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Aug. 16, 1984, Ser. No. 641,371
Claims priority, application Japan, May 22, 1984, 59-20708
Term of patent 14 years
U.S. Cl. D21—109



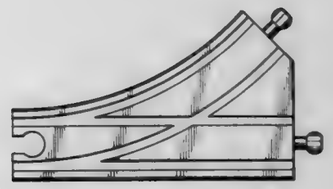
287,607
RECONFIGURABLE TOY LOCK
Masaki Maruyama, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Aug. 16, 1984, Ser. No. 641,373
Claims priority, application Japan, May 22, 1984, 59-20707
Term of patent 14 years
U.S. Cl. D21—109



287,608
RAIL ELEMENT FOR A TOY RAILWAY
Nils A. I. Petersson, Killeberg, Sweden, assignor to Brio Toy AB, Osby, Sweden
Division of Ser. No. 397,076, Jul. 14, 1982, Pat. No. Des. 280,919. This application Mar. 1, 1985, Ser. No. 707,243
Claims priority, application Sweden, Jan. 22, 1982, 820129
Term of patent 14 years
U.S. Cl. D21—143



287,609
RAIL ELEMENT FOR A TOY RAILWAY
Nils A. I. Petersson, Killeberg, Sweden, assignor to Brio Toy AB, Osby, Sweden
Division of Ser. No. 397,076, Jul. 14, 1982, Pat. No. Des. 280,919. This application Mar. 1, 1985, Ser. No. 707,244
Claims priority, application Sweden, Jan. 22, 1982, 820129
Term of patent 14 years
U.S. Cl. D21—143



287,610
TOY HEDGEHOG GLOVE PUPPET
Christine A. Nicholls, Peakridge, England, assignor to Avon Products Inc., New York, N.Y.
Filed Jul. 25, 1984, Ser. No. 634,154
Claims priority, application United Kingdom, Jan. 25, 1984, 1017507
Term of patent 14 years
U.S. Cl. D21—153



287,611
TOY PENGUIN
Akito Sato, Aichi, Japan, assignor to Pilot Ink Co., Ltd., Aichi, Japan
Filed Aug. 2, 1984, Ser. No. 637,176
Term of patent 14 years
U.S. Cl. D21—160

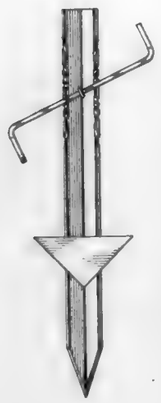


287,612
STUFFED FIGURE TOY
Andrea Tebenceff, Little Ferry, N.J., and Sheri Robinette, East Providence, R.I., assignors to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Jun. 18, 1984, Ser. No. 623,136
Term of patent 14 years
U.S. Cl. D21—185



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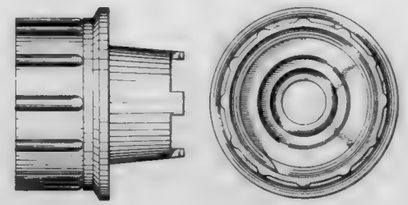
287,613
FISHING POLE HOLDER OR SIMILAR ARTICLE
Garthop Upton, P.O. Box 206, Arroyo Grande, Calif. 93420
Filed May 29, 1984, Ser. No. 614,856
Term of patent 14 years
U.S. Cl. D22—147



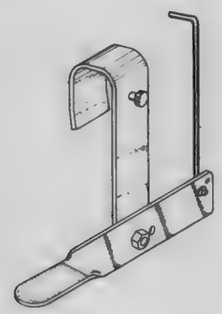
287,614
TARGET
Kenneth J. Mosser, P.O. Box 242, Clarissa, Minn. 56440
Filed May 7, 1984, Ser. No. 607,519
Term of patent 14 years
U.S. Cl. D22—113



287,615
COMBINED VALVE BODY AND SPLASH GUARD
Fred Pritchitt, Saugerties, N.Y., assignor to Marpac Industries, Inc., Waldwick, N.J.
Filed Jun. 8, 1983, Ser. No. 502,148
Term of patent 14 years
U.S. Cl. D23—19



287,616
TOILET SEAT LIFTER, OR THE LIKE
William S. Marcomb, 35871 Ash, Ingleside, Ill. 60041
Filed Nov. 21, 1983, Ser. No. 553,795
Term of patent 14 years
U.S. Cl. D23—71



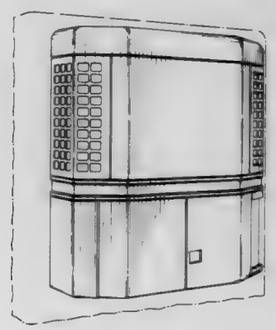
287,617
ELECTRIC RADIANT HEATER
Kazuharu Nakamura, Nagoya, Japan, assignor to Toyotomi Kogyo Co., Ltd., Aichi, Japan
Continuation-in-part of Ser. No. 549,710, Nov. 8, 1983. This application May 2, 1984, Ser. No. 606,098
Claims priority, application Japan, May 19, 1983, 58-21237
Term of patent 14 years
U.S. Cl. D23—123



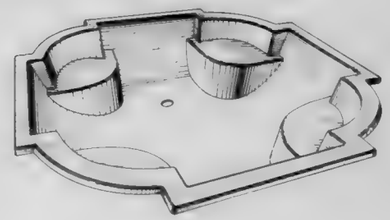
287,618
FIREWOOD HOLDER RACK, OR SIMILAR ARTICLE
Ralph L. Henderson, 1856 S. Santa Fe, Wichita, Kans. 67211
Filed Apr. 4, 1985, Ser. No. 719,984
Term of patent 14 years
U.S. Cl. D23—138.5



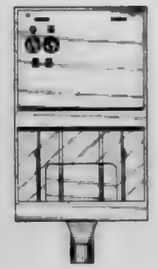
287,619
COVER FOR A TRANSPORT REFRIGERATION UNIT
Peter B. Allard, Minnetonka; Lowell M. Anderson, Bloomington, and Rodney H. Volk, Eden Prairie, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.
Filed Oct. 17, 1984, Ser. No. 661,557
Term of patent 14 years
U.S. Cl. D23—142



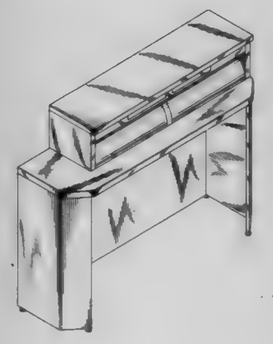
287,620
HYDROTHERAPY POOL
Jean-Claude Delepine, 23, rue Clapeyron, 75008 Paris, France
Filed Dec. 22, 1983, Ser. No. 564,485
Claims priority, application France, Jun. 27, 1983, 83 2392
Term of patent 14 years
U.S. Cl. D24—38



287,621
CLEAN AIR WORK STATION
William R. Shields, Los Alamos, N. Mex., assignor to Environmental Air Control, Inc., Hagerstown, Md.
Filed Apr. 12, 1984, Ser. No. 599,139
Term of patent 14 years
U.S. Cl. D24—1.1

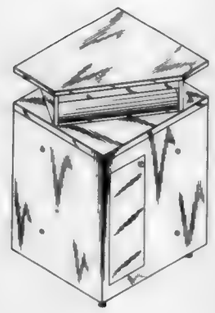


287,622
SIDE CABINET MODULE
Ned Landan, Westport, Conn., and Jon A. Becker, Clover, S.C., assignors to Pelton and Crane Company, Charlotte, N.C.
Filed Feb. 29, 1984, Ser. No. 584,573
Term of patent 14 years
U.S. Cl. D24—1.1

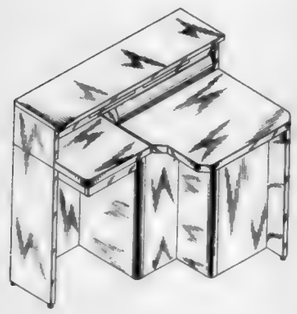


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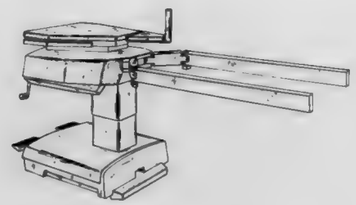
287,623
CORNER MODULE
Arthur L. Jones, Charlotte, N.C., and Ned Landan, Westport, Conn., assignors to Pelton and Crane Company, Charlotte, N.C.
Filed Feb. 29, 1984, Ser. No. 584,574
Term of patent 14 years
U.S. Cl. D24—1.1



287,624
OPERATORY SUPPORT CENTER
Ned Landan, Westport, Conn.; Jon Becker, Clover, S.C., and Bobby Miller, Greensboro, N.C., assignors to Pelton and Crane Company, Charlotte, N.C.
Filed Feb. 29, 1984, Ser. No. 584,575
Term of patent 14 years
U.S. Cl. D24—1.1



287,625
ORTHOPEDIC TABLE
Thomas Brendgord; Ward L. Sanders, and Dennis C. Coon, all of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.
Filed Mar. 6, 1984, Ser. No. 586,667
Term of patent 14 years
U.S. Cl. D24—3



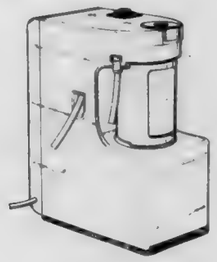
287,626
OPERATING TABLE
John L. Wilson, N. Hollywood, and Nolan M. Maples, Burbank, both of Calif., assignors to Cal-Surgical, Inc., Sun Valley, Calif.
Filed Apr. 30, 1984, Ser. No. 605,423
Term of patent 14 years
U.S. Cl. D24—3



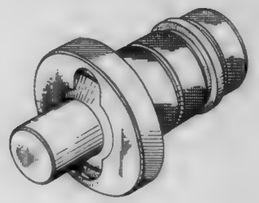
287,627
DENTAL AIR SCALER
Henri Leonard, Besancon, France, assignor to Micro-Mega S.A., Besancon, France
Filed May 12, 1983, Ser. No. 475,299
Term of patent 14 years
U.S. Cl. D24—10



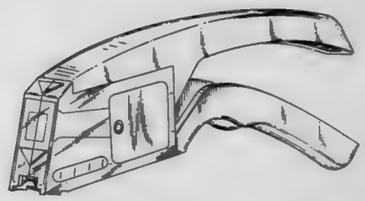
287,628
DEVICE FOR CLEANING TEETH
Fred Schiavo, Hauptstrasse 23, Kreuzlingen, CH-8280, Switzerland; Dieter Enderlein, Am See 28, Konstanz 19, D-7750, Fed. Rep. of Germany, and Zeljko Zuppa, Weinstrasse 42, Kreuzlingen, CH-8280, Switzerland
Filed Jan. 4, 1984, Ser. No. 568,064
Claims priority, application Hagne, Jul. 5, 1983, 73329
Term of patent 14 years
U.S. Cl. D24—15



287,629
OPTICAL COUPLER FOR AN ARTHOSCOPE OR SIMILAR ARTICLE
Richard E. Feinbloom; Melvin Levine, both of New York; Lung T. Yee, Brooklyn, and Kai Leung, New York, all of N.Y., assignors to Designs for Vision, Inc., Ronkonkoma, N.Y.
Filed Apr. 30, 1984, Ser. No. 605,264
Term of patent 14 years
U.S. Cl. D24—17



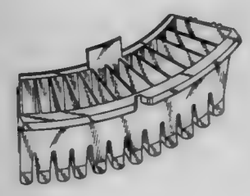
287,630
SURGICAL STAPLER
Edward J. Sharkany, Huntington; Richard J. Mathews, Sr., Stratford; Carl R. Thompson, and Sharyn A. Thompson, both of Fairfield, all of Conn., assignors to Acme United Corporation, Fairfield, Conn.
Filed Mar. 26, 1984, Ser. No. 593,538
Term of patent 14 years
U.S. Cl. D24—26



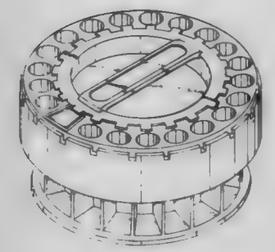
287,631
COMBINED SHAFT BEARING SLEEVE AND ATTACHMENT COLLAR FOR SURGICAL CUTTING TOOLS
William E. Anspach, Jr., 1349 S. Killian Dr., Lake Park, Fla. 33403
Filed Feb. 9, 1984, Ser. No. 578,404
Term of patent 14 years
U.S. Cl. D24—29



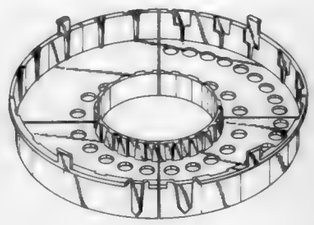
287,632
FLUID CONTAINER FOR CHEMICAL ANALYZER OR THE LIKE
Larry W. Moore, Plano, Tex., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Jun. 8, 1984, Ser. No. 618,643
Term of patent 14 years
U.S. Cl. D24—29



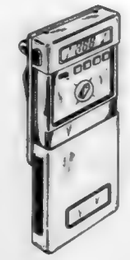
287,633
CAROUSEL FOR CHEMICAL ANALYZER OR THE LIKE
Robert C. Hollar, Wildwood, and Tung M. Huang, Elk Grove Village, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Jun. 8, 1984, Ser. No. 618,642
Term of patent 14 years
U.S. Cl. D24—31



287,634
CAROUSEL FOR CHEMICAL ANALYZER OR THE LIKE
David B. Carr, Grand Prairie; Keith M. Lingenfelter; James E. Mitchell, both of Dallas; Larry W. Moore, Plano, all of Tex.; Palmer L. Tag, Barrington, and Robert Case, Chicago, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Jun. 12, 1984, Ser. No. 619,764
Term of patent 14 years
U.S. Cl. D24—31



287,635
HOUSING FOR A TRANSCUTANEOUS ELECTRONIC NERVE STIMULATOR
Richard L. Walus, Norwell, Mass., assignor to Codman & Shurtleff, Inc., Randolph, Mass.
Filed Apr. 10, 1984, Ser. No. 598,757
Term of patent 14 years
U.S. Cl. D24—41



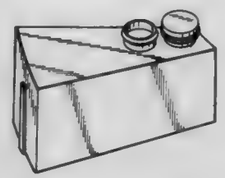
287,636
NURSING BOTTLE OR SIMILAR ARTICLE
Robert F. Callju, Sparks, Nev., assignor to Inventek, Inc., Virginia City, Nev.
Filed Apr. 16, 1984, Ser. No. 601,059
Term of patent 14 years
U.S. Cl. D24—47



287,637
EMBOSSED PANTY LINER
Louis Grasso, Merrick, N.Y., assignor to Personal Products Company, Milltown, N.J.
Filed May 9, 1983, Ser. No. 492,964
Term of patent 14 years
U.S. Cl. D24—51



287,638
REAGENT CONTAINER OR THE LIKE
Larry W. Moore, Plano, and Keith M. Lingenfelter, Dallas, both of Tex., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Jun. 8, 1984, Ser. No. 618,636
Term of patent 14 years
U.S. Cl. D24—56



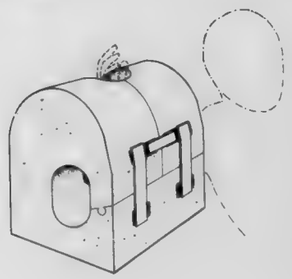
287,639
SAMPLE CUP OR THE LIKE
Larry W. Moore, Plano, and Keith M. Lingenfelter, Dallas, both of Tex., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Jun. 8, 1984, Ser. No. 618,650
Term of patent 14 years
U.S. Cl. D24—56



287,640
REMOVABLE THUMB SHEATH WITH A WRIST COLLAR
George A. Primiano, 125 S. Green St., E. Stroudsburg, Pa. 18301
Filed Nov. 25, 1983, Ser. No. 555,057
Term of patent 14 years
U.S. Cl. D24—64



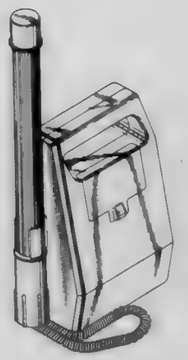
287,641
ARM ELEVATOR
Daniel J. Schaefer, Greenville, S.C., assignor to Span America Medical Systems, Inc., Greenville, S.C.
Filed May 11, 1984, Ser. No. 609,437
Term of patent 14 years
U.S. Cl. D24—64



287,642
TORCH
Kung Chi-hung, Kwai Chung, Hong Kong, assignor to Freezinhot Bottle Company Limited, Kowloon, Hong Kong
Filed Jul. 8, 1983, Ser. No. 511,936
Claims priority, application United Kingdom, Jan. 13, 1983, 1010780
Term of patent 14 years
U.S. Cl. D26—40

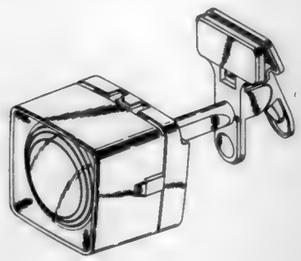


287,643
COMBINED PORTABLE FLUORESCENT LIGHT AND INCANDESCENT LANTERN
Chung S. Leung, Tsuen Wan, Hong Kong, assignor to Foster Industries Company Limited, Tsuen Wan, Hong Kong
Filed Jun. 20, 1984, Ser. No. 623,767
Claims priority, application United Kingdom, Apr. 21, 1984, 1019334
Term of patent 14 years
U.S. Cl. D26—42



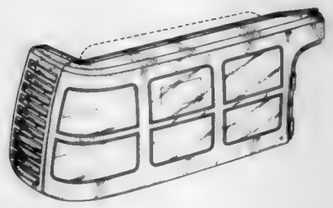
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287,644
RECHARGEABLE TASK LIGHT
Martin R. Gierke, Arnold, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Feb. 21, 1984, Ser. No. 581,609
Term of patent 14 years
U.S. Cl. D26—60



287,645
INDUSTRIAL FLOODLIGHT
Robert L. Ewing, Newark; James S. Hughes, and Bruce G. Bruggeman, both of Columbus, all of Ohio, assignors to Manville Service Corporation, Denver, Colo.
Filed May 9, 1983, Ser. No. 492,514
Term of patent 14 years
U.S. Cl. D26—63

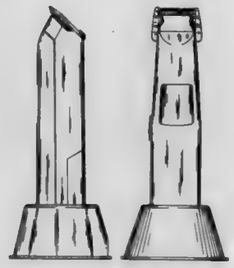
287,646
COMBINED AUTOMOBILE TAILLIGHT LENS AND GRILL
Hisato Ayukawa, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Aug. 21, 1984, Ser. No. 642,891
Term of patent 14 years
U.S. Cl. D26—120



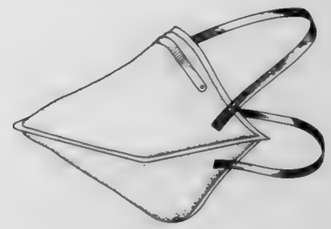
287,647
COMBINED PIPE RACK AND TOBACCO JAR
Louis A. Ringle, Wilmington, Del., assignor to Decatur Industries, Inc., Decatur, Ind.
Filed Oct. 22, 1984, Ser. No. 663,851
Term of patent 14 years
U.S. Cl. D27—6



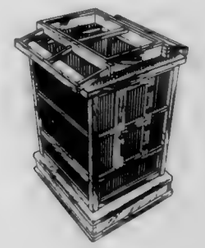
287,648
COMBINED ELECTRIC HAIR TRIMMER AND STAND THEREFOR
Gregory S. Wahl; Randy L. Miller, both of Sterling, and Kenneth M. Hattori, Bensenville, all of Ill., assignors to Wahl Clipper Corporation, Sterling, Ill.
Continuation of Ser. No. 573,834, Jan. 24, 1984, Pat. No. D. 283,736. This application Sep. 27, 1985, Ser. No. 780,965
Term of patent 14 years
U.S. Cl. D28—53



287,649
DISPOSABLE RESPIRATOR
Joseph Z. Zdrok, Webster; Joseph A. Maisano, Southbridge, and James J. Krusas, Sturbridge, all of Mass., assignors to American Optical Corporation, Southbridge, Mass.
Continuation-in-part of Ser. No. 292,312, Aug. 21, 1981, abandoned. This application Feb. 17, 1984, Ser. No. 581,358
Term of patent 14 years
U.S. Cl. D29—7



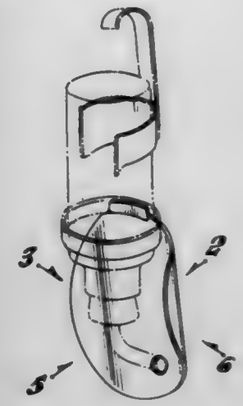
287,650
BIRD CAGE
Horst Braeuner, Hanover Park, Ill., assignor to The Original Vogelbauer Corp., Hanover Park, Ill.
Filed Aug. 1, 1984, Ser. No. 636,814
Term of patent 14 years
U.S. Cl. D30—4



287,651
ANIMAL FEEDER
John H. Scott, 5050 Maple Ave., St. Louis, Mo. 63113
Filed Nov. 21, 1984, Ser. No. 673,598
Term of patent 14 years
U.S. Cl. D30—13

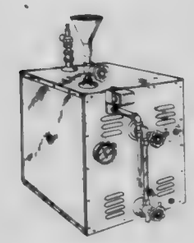


287,652
SHIELD AND ATTRACTANT FOR A HUMMINGBIRD FEEDER
John D. Mack, 14425 Dittmar Dr., Whittier, Calif. 90603
Filed Jan. 9, 1984, Ser. No. 569,333
Term of patent 14 years
U.S. Cl. D30—14



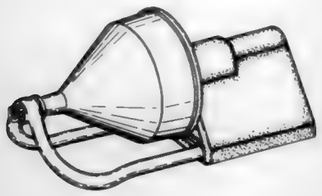


287,653
STEAM CLEANER
Clinton D. Nelson, Mount Prospect, Ill., assignor to CD Nelson Consulting, Inc., Chicago, Ill.
Filed Dec. 4, 1984, Ser. No. 678,084
Term of patent 14 years
U.S. Cl. D32—1

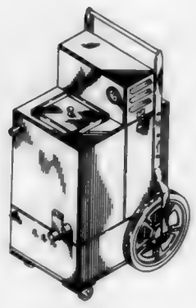


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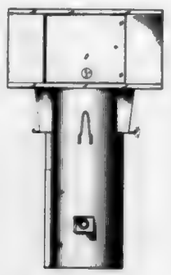
287,654
ROTARY DRAIN CLEANER
David A. Boelens, 2805 NE. 117th Ave., Portland, Oreg.
Filed Mar. 22, 1984, Ser. No. 592,023
Term of patent 14 years
U.S. Cl. D32—14



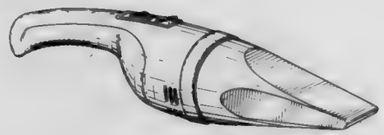
287,655
CARPET DYEING MACHINE
Mark Schmitz, Dallas, Tex., assignor to Schmitz Industries, Inc., Dallas, Tex.
Filed Jul. 16, 1984, Ser. No. 631,476
Term of patent 14 years
U.S. Cl. D32—15



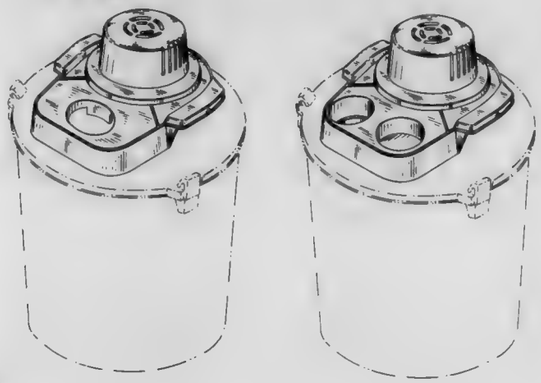
287,656
COMBINED AUTOMOTIVE AIR PUMP, VACUUM CLEANER AND DISPENSING UNIT FOR ANTIFREEZE AND AIR FRESHENER
Don L. Waldrep, 1000 Woodcreek, and H. Gene Ludwig, 508 E. Denton No. 53, both of Euless, Tex. 76039
Filed Nov. 23, 1983, Ser. No. 554,522
Term of patent 14 years
U.S. Cl. D32—21

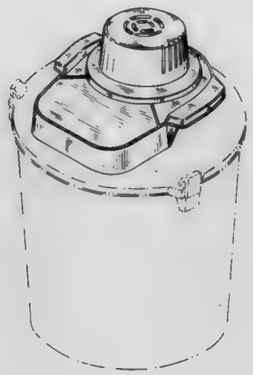


287,657
RECHARGEABLE BATTERY POWERED VACUUM CLEANER
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Mar. 13, 1984, Ser. No. 589,027
Claims priority, application United Kingdom, Sep. 14, 1983, 1 015102
Term of patent 14 years
U.S. Cl. D32—21

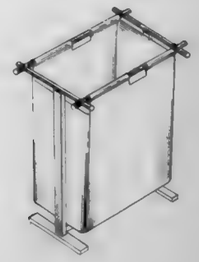


287,658
MOTOR HOUSING FOR CANISTER TYPE ELECTRIC VACUUM CLEANER
Robert C. Berfield, Jersey Shore; Ronald F. Meland, Muncy, and Robert L. Crevling, Jr., Williamsport, all of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.
Filed Jan. 18, 1984, Ser. No. 571,849
The portion of the term of this patent subsequent to Oct. 29, 1999 has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—25





287,659
MINIATURE STEAM AND DRY IRON
Hong H. Wu, No. 50, Kuang Chou Rd., Tainan, Taiwan
Filed Dec. 12, 1984, Ser. No. 680,938
Term of patent 14 years
U.S. Cl. D32—70



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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF JANUARY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Eastman, James E., 4,634,596, Cl. 426-578.000.
Niekamp, Carl W.; and Wideman, James D., 4,634,472, Cl. 127-60.000.

A & M Cousin & Cie: *See*—
Pipon, Yves, 4,634,181, Cl. 297-362.000.

A. O. Smith Corporation: *See*—
Crawford, Bradly A., 4,634,298, Cl. 384-209.000.

A.R. Brasch Advertising, Inc.: *See*—
Brasch, Miles E.; and Campbell, Allan G., III, 4,633,607, Cl. 40-530.000.

A. R. Wilfley and Sons, Inc.: *See*—
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AB Electrolux: *See*—
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Abbott Laboratories: *See*—
DeBernardis, John F.; and Basha, Fatima Z., 4,634,705, Cl. 514-256.000.

Abe, Atsushi: *See*—
Tohda, Takao; Matsuoka, Tomizo; Fujita, Yosuke; Abe, Atsushi; and Nitta, Tsuneharu, 4,634,934, Cl. 315-169.300.

Abe, Masahiro: *See*—
Mase, Yasukazu; Abe, Masahiro; and Aoyama, Masaharu, 4,634,496, Cl. 156-643.000.

Abe, Taizou; and Tsukahara, Kenji, to Nippondenso Co., Ltd. Variable displacement fluid pump. 4,634,349, Cl. 417-219.000.

Achtnig, Peter: *See*—
Forberg, Horst; Hegner, Gunter; Achtnig, Peter; and Delakowitz, Bernd, 4,634,209, Cl. 339-147.00R.

Acme Resin Corporation: *See*—
Laitar, Robert A.; and Gomez, Eduardo, 4,634,758, Cl. 528-129.000.

Adachi, Yoshimitsu: *See*—
Terada, Shinichi; Masuda, Kozo; and Adachi, Yoshimitsu, 4,635,131, Cl. 358-296.000.

Adams, Frederick J., to TRW Cam Gears Limited. Valve assemblies. 4,633,907, Cl. 137-625.220.

Adamson, Fletcher D.; and Caldwell, James M., to Russell Corporation. Automatic garment portion loader. 4,633,604, Cl. 38-2.000.

Addison, Charles: *See*—
Cagle, J. Douglas; Olson, Harold D.; and Addison, Charles, 4,634,594, Cl. 426-393.000.

Adolph Coors Company: *See*—
Rusnock, Kevin R., 4,634,007, Cl. 206-620.000.

Adolphson, Douglas G.: *See*—
Johnson, Van B.; and Adolphson, Douglas G., 4,634,658, Cl. 430-293.000.

Advanced Micro Devices, Inc.: *See*—
Clark, Alan T.; Ibrahim, Hadi; and Lange, Arthur F., 4,635,255, Cl. 370-110.100.
Shu, Lee-Lean; Shyu, Tai C.; and Chuang, Patrick T., 4,634,894, Cl. 307-297.000.
Thomas, Mammen; and Ko, Wen C., 4,635,230, Cl. 365-175.000.
Wincn, John M., 4,635,038, Cl. 340-347.0DA.

Advanced Sports Corporation: *See*—
Wood, Robert L., 4,634,393, Cl. 441-129.000.

Aegis, Inc.: *See*—
Scherer, Jeremy D., 4,633,573, Cl. 29-589.000.

AG fur industrielle Elektronik AGIE Losone b. Locarno: *See*—
Budin, Josef; Sciaroni, Boris; Kilcher, Beat; and Levy, Gideon, 4,634,825, Cl. 219-69.00W.

Agari, Norimasa, to Nippon Thompson Co. Ltd. Track surface of a roller bearing for an infinite rectilinear motion. 4,634,295, Cl. 384-44.000.

Agarwal, Pawan K.: *See*—
Duvdevani, Ilan; Wagensommer, Joseph; and Agarwal, Pawan K., 4,634,542, Cl. 252-47.500.

AGFA-Gevaert N.V.: *See*—
Nys, Pierre H.; and Vermeulen, Leon L., 4,635,133, Cl. 358-298.000.

Agoston, Andras, to U.S. Philips Corporation. Bearing arrangement in a tunable magnetron. 4,635,001, Cl. 331-90.000.

Ahlstrom Corp: *See*—
Simola, Markku A.; and Haapoja, Vesa, 4,634,521, Cl. 209-17.000.

Ahrens, Kurt H.: *See*—
Schickaneder, Helmut; Hoxer, Klaus; and Ahrens, Kurt H., 4,634,700, Cl. 514-227.000.

Aiello, Giovanni; and Hamelin, Jean-Pierre, to Soletanche. Device for determining the position of a moving part and drilling machine including such a device. 4,634,860, Cl. 250-231.0SE.

Aihara, Takayuki: *See*—
Kawakami, Kazuo; Nagai, Yawara; and Aihara, Takayuki, 4,634,575, Cl. 422-63.000.

Aine, Harry E.; and Block, Barry. Miniature thermal fluid flow sensors and batch methods of making same. 4,633,578, Cl. 29-612.000.

Ainslie, Norman G.; Harvilchuck, Joseph M.; Interrante, Mario J.; King, William J., Jr.; Palmateer, Paul H.; and Sullivan, John F., to International Business Machines Corporation. High melting point copper-gold-tin brazing alloy for chip carriers. 4,634,638, Cl. 428-671.000.

Air Products and Chemicals, Inc.: *See*—
Santangelo, Joseph G.; Weber, James J.; Sinclair, Richard G.; and Tenaglia, Richard D., 4,633,929, Cl. 164-34.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Hashimoto, Nobuyuki; and Nishio, Shigeru, 4,634,179, Cl. 297-284.000.
Nishikawa, Masumi; Ishikawa, Masanobu; Sato, Hiroki; Toyoda, Shuhei; and Ishii, Hakumi, 4,633,732, Cl. 74-493.000.
Ogasawara, Tsunehiko; Arakawa, Yoshichika; Sumiya, Koji; and Sakaguchi, Yoshikazu, 4,633,739, Cl. 74-869.000.
Takemura, Shinji; Hida, Tsuneo; Matsuzaki, Yutaka; and Ohnishi, Kenichi, 4,634,945, Cl. 318-469.000.
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Yamada, Takahiro, 4,635,029, Cl. 340-22.000.

Aisin Warner Kabushiki Kaisha: *See*—
Ogasawara, Tsunehiko; Arakawa, Yoshichika; Sumiya, Koji; and Sakaguchi, Yoshikazu, 4,633,739, Cl. 74-869.000.
Sakakibara, Shiro; Kawamoto, Mutsumi; and Ando, Masahiko, 4,633,736, Cl. 74-689.000.

Ajinomoto Co., Inc.: *See*—
Shinohara, Emiko; Sugiyama, Katsumi; Ozaki, Masanao; and Matsuda, Keizo, 4,634,790, Cl. 560-40.000.

Ajioka, Syohei; and Tanaka, Toshio, to Nippon Kayaku Kabushiki Kaisha. Method for dyeing of natural leathers using reactive dyes. 4,634,448, Cl. 8-436.000.

Akachi, Yoshiaki; and Matsumaru, Takeo, to TDK Corporation. Coil apparatus with divided windings. 4,635,019, Cl. 336-180.000.

Akashi, Akira: *See*—
Suda, Yasuo; Ishizaki, Akira; Ohtaka, Keiji; Akashi, Akira; and Hiramatsu, Akira, 4,634,255, Cl. 354-406.000.

Akasu, Masahira, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing control apparatus for engine. 4,633,835, Cl. 123-425.000.

Aktiebolaget Somas Ventiler: *See*—
Hubertson, Folke H., 4,634,097, Cl. 251-173.000.

Akzo N.V.: *See*—
Loozen, Hubert J. J.; and van Luit, Pieter J. N., 4,634,694, Cl. 514-177.000.

Alas, Jacques, to Valeo. Torsional damper device comprising two coaxial parts disposed to rotate relative to one another. 4,634,398, Cl. 464-64.000.

Albany International Corp.: *See*—
Josef, Michael J., 4,633,596, Cl. 34-116.000.

Albert, Alban: *See*—
Courbat, Pierre; Weith, Andre ; and Albert, Alban, 4,634,718, Cl. 514-460.000.

Alexander, Linc W. Wind powered propulsion device. 4,634,136, Cl. 280-213.000.

Alexander, William, to American Colloid Company. Water swellable clay composition and method to maintain stability in salt contaminated water. 4,634,538, Cl. 252-8.512.

Alexander, William E. Retainer assembly. 4,633,636, Cl. 52-512.000.

Alfa-Laval AB: *See*—
Ehnstrom, Lars, 4,634,416, Cl. 494-27.000.

Alig, Roger C., to RCA Corporation. Color picture tube having improved electron gun. 4,634,923, Cl. 313-413.000.

Allen, Charles W.: *See*—
Geohegan, Kenneth P., Jr.; and Allen, Charles W., 4,635,240, Cl. 367-89.000.

Allen, Ronald; and Chen, Tu, to Komag, Inc. Disk and plug. 4,634,512, Cl. 204-298.000.

Allflex International Limited: *See*—
Cohr, Lindsay W. J., 4,633,606, Cl. 40-301.000.

Allied Corporation: *See*—
Bourgeault, Leo B., 4,635,181, Cl. 363-132.000.
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Hambrecht, Juergen; Schmitt, Burghard; Swoboda, Johann; Wassmuth, Georg; Bernhard, Claus; and Stephan, Rudolf, 4,634,734, Cl. 525-85.000.
McAliley, John E.; and Crozier, James R., Jr., 4,633,550, Cl. 28-272.000.
Merger, Franz; and Schwarz, Wolfgang, 4,634,558, Cl. 260-404.000.

BASF Corporation: *See*—
Finnan, Jeffrey L., 4,634,781, Cl. 549-411.000.
Foye, Thomas E.; and Sasamoto, Edward K., 4,634,471, Cl. 106-262.000.

Basha, Fatima Z.: *See*—
DeBernardis, John F.; and Basha, Fatima Z., 4,634,705, Cl. 514-256.000.

Bath, Duncan T.; and Ferguson, James H., to Canadian General Electric Co., Ltd. Method for securing conductor bar in machine slot while closing slot. 4,633,574, Cl. 29-596.000.

Batra, Ram S.; and Pitcher, Kenneth A., to RCA Corporation. Interface circuit for video signal peaking control. 4,635,118, Cl. 358-166.000.

Battelle-Institut e.V.: *See*—
Gurs, Karl, 4,635,270, Cl. 372-58.000.

Battelle Memorial Institute: *See*—
Dvorsky, James E.; Kelley, Brian A.; McCown, Robert B.; and Renner, G. Frederick, 4,634,917, Cl. 310-328.000.

Bauder, Richard C.: *See*—
Morrell, Albert M.; Masterton, Walter D.; and Bauder, Richard C., 4,634,247, Cl. 354-1.000.

Bauer, Willi: *See*—
Dassler, Armin A.; and Bauer, Willi, 4,633,600, Cl. 36-134.000.

Baughman, David R.: *See*—
Huff, Ray V.; Axen, Steven G.; and Baughman, David R., 4,634,187, Cl. 299-4.000.

Bauman, Therese M.; and Freiberg, Alan L., to Dow Corning Corporation. Method of producing a silicone water-based elastomer. 4,634,733, Cl. 524-859.000.

Baumann, Hans-Georg, to Jenoptik Jena G.m.b H. Front lens group for immersion microscope objective in BD versions of high aperture. 4,634,234, Cl. 350-414.000.

Baumgarten, Jorg; Frommer, Werner; Mann, Theo; Pascik, Imre; Rast, Hans-Georg; and Schapel, Dietmar, to Bayer Aktiengesellschaft. Immobilization of cells in polyurethane hydrogel. 4,634,672, Cl. 435-182.000.

Bavaro, Vito: *See*—
Blackmore, William; and Bavaro, Vito, 4,633,776, Cl. 100-158.00R.

Baxter, Anthony G.; Bostock, Stephen B.; and Greenwood, David, to Imperial Chemical Industries PLC. Water-soluble copper phthalocyanine dyes free from cellulose reactive groups. 4,634,555, Cl. 540-126.000.

Baxter Travenol Laboratories: *See*—
Kamen, Dean L., 4,634,426, Cl. 604-65.000.

Bayer Aktiengesellschaft: *See*—
Baumgarten, Jorg; Frommer, Werner; Mann, Theo; Pascik, Imre; Rast, Hans-Georg; and Schapel, Dietmar, 4,634,672, Cl. 435-182.000.
Meier, Helmut-Martin; Dhein, Rolf; Winkel, Jens; Klein, Gerhard; and Kloker, Werner, 4,634,791, Cl. 560-163.000.

Bayliner Marine Corporation: *See*—
Flowers, John P., 4,633,803, Cl. 116-334.000.

Bazzi, Ali A.: *See*—
Dunski, Neil; Bazzi, Ali A.; and Buehler, Henry J., 4,634,728, Cl. 524-219.000.

BBC Brown, Boveri & Company Limited: *See*—
Amstutz, Hermann; Heimgartner, Dieter; Kaufmann, Meinolph; and Scheffer, Terry J., 4,634,229, Cl. 350-346.000.
Brem, Ernst, 4,634,909, Cl. 310-91.000.
Gobrecht, Jens; and Rossinelli, Marco, 4,634,495, Cl. 156-643.000.
Schollhorn, Karl, 4,634,910, Cl. 310-214.000.

Beard, Harold J.; and Cox, Raleigh L. Filter for intra-channel clarification. 4,634,528, Cl. 210-277.000.

Bearden, Joe M., to Texaco Inc. Seismic exploration system improvement. 4,635,235, Cl. 367-13.000.

Beardmore, Geoffrey; and Capaldi, Nicholas R. Gyroscope apparatus. 4,633,722, Cl. 74-5.460.

Beccaris, Carlo; and Lanzarini, Ernesto, to Valeo. Torsional damper device for a clutch disk. 4,634,397, Cl. 464-68.000.

Bechem, Werner; Peters, Hubertus; Solbach, Werner; and Wolfhard, Dietrich, to Hoesch Aktiengesellschaft. Process for the electrodeposition of metals. 4,634,504, Cl. 204-28.000.

Beck, Wolfgang; and Nagel, Ulrich, to Degussa Aktiengesellschaft. Optically active 3,4-bis-(diphenylphosphino)-pyrrolidine, and rhodium complexes, containing it as chiral ligands. 4,634,775, Cl. 548-402.000.

Becker, Philip D., to Buell Industries, Inc. Impact plug assembly. 4,634,018, Cl. 220-233.000.

Becton Dickinson and Company: *See*—
Horres, C. Russell, Jr., 4,634,679, Cl. 436-63.000.
Sapatino, Bruno V., 4,634,676, Cl. 435-294.000.

Behn, Reinhard; and Utner, Ferdinand, to Siemens Aktiengesellschaft. Electrical capacitor and method for the manufacture thereof. 4,635,164, Cl. 361-306.000.

Behrend, Donald A. Device for aligning artificial teeth and crowns. 4,634,377, Cl. 433-73.000.

Behrens, Hugh C., to Dow Chemical Company, The. Molten metal shot size and delivery mechanism for continuous casting operations. 4,633,930, Cl. 164-66.100.

Beiswenger, John L., to Rayovac Corporation. Reflector for electric light. 4,635,170, Cl. 362-157.000.

Beiswenger, John L., to Rayovac Corporation. Compact electric light. 4,635,171, Cl. 362-187.000.

Belanger, Patrice C.: *See*—
Atkinson, Joseph G.; Guindon, Yvan; Belanger, Patrice C.; and Rokach, Joshua, 4,634,766, Cl. 544-34.000.

Belbel, Elie; Baron, Thierry; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, to La Telemecanique Electrique. Fuse cut-out cartridge. 4,635,022, Cl. 337-158.000.

Belfoure, Edward L.: *See*—
Liu, Ping Y.; and Belfoure, Edward L., 4,634,737, Cl. 525-146.000.

Bell & Howell Company: *See*—
Hertel, Heinz E., 4,634,071, Cl. 242-71.100.
Vandersyde, Gary L.; and Rabindran, K. George, 4,634,107, Cl. 270-56.000.

Bell Industries, Inc.: *See*—
Schlosser, Mark S., 4,635,167, Cl. 362-85.000.

Bell, Malcolm R., to Sterling Drug, Inc. 3-arylcarbonyl-and 3-cycloalkylcarbonyl-1-aminoalkyl-1H-indoles. 4,634,776, Cl. 548-493.000.

Bellin, Matthew E.: *See*—
Marino, Joseph A., Jr.; and Bellin, Matthew E., 4,634,434, Cl. 604-246.000.

Benestad, Otto; Hatteland, Kjell; and Fredriksen, Paul, to Geophysical Company. Data transmission system for seismic streamers. 4,635,237, Cl. 367-20.000.

Bengtsson, Wilhelm: *See*—
Glifberg, Nils B.; and Bengtsson, Wilhelm, 4,633,956, Cl. 171-25.000.

Benjamin, James A.; Lade, Robert W.; and Schutten, Herman P., to Eaton Corporation. Split row power JFET. 4,635,084, Cl. 357-22.000.

Benn, Raymond C., to Inco Alloys International, Inc. Process for producing a single crystal article. 4,634,491, Cl. 156-603.000.

Bennes Marrel: *See*—
Tardy, Maurice, 4,633,762, Cl. 91-461.000.

Bennett, Simon D.: *See*—
Lindow, James T.; Bennett, Simon D.; and Smith, Ian R., 4,634,880, Cl. 250-566.000.

Benoit, Louis: *See*—
Morell, Joseph; Benoit, Louis; and Bonnet, Maurice, 4,633,599, Cl. 36-50.000.

Benson, Robert J., to Intertherm Inc. Supplemental ventilation apparatus for manufactured housing. 4,633,768, Cl. 98-34.600.

Benson, S.A.: *See*—
Jeremijevic, Vojin, 4,634,252, Cl. 354-324.000.

Bentsen, Per, to Minigrip Incorporated. Material for making three reclosable bag sections from extruded plastic material. 4,635,294, Cl. 383-37.000.

Benyon, Carl W., Jr.: *See*—
Swartz, George A.; and Benyon, Carl W., Jr., 4,634,473, Cl. 148-1.500.

Berchem, Rutger, to Berchem & Schaberg GmbH. Forged steel grinding element for ball milling. 4,534,062, Cl. 241-184.000.

Berchem & Schaberg GmbH: *See*—
Berchem, Rutger, 4,634,062, Cl. 241-184.000.

Berchier, Jean-Luc: *See*—
Popovic, Radivoje; and Berchier, Jean-Luc, 4,634,961, Cl. 323-368.000.

Bergdahl, Sven G.: *See*—
Widlund, Leif U. R.; and Bergdahl, Sven G., 4,634,440, Cl. 604-383.000.

Berger, Jean-Claude, to Tetras. Picture taking assembly for copier apparatus. 4,634,256, Cl. 355-1.000.

Bergman, Gustav A. Shotgun gauge adapter. 4,633,781, Cl. 102-446.000.

Bergs, Franciscus H., to Wagemans Mastricht B.V. Resilient hinge. 4,633,546, Cl. 16-277.000.

Bergson, Benjamin J., to Paccar Inc. High-strength, low-alloy cast steel. 4,634,476, Cl. 420-73.000.

Bergvik Kemi AB: *See*—
Canestri, Giuseppe, 4,634,552, Cl. 252-356.000.
Ljusberg-Wahren, Helena, 4,634,450, Cl. 44-51.000.

Berman, Herbert L.: *See*—
Christol, James T.; Jacobs, Michael R.; and Berman, Herbert L., 4,634,294, Cl. 374-170.000.

Bernard, Daniel, to LCC.CICE-Compagnie Europeenne de Composants Electroniques. Method of continuous fabrication of mother-capacitors. 4,633,551, Cl. 29-25.420.

Bernhard, Claus: *See*—
Hambrecht, Juergen; Schmitt, Burghard; Swoboda, Johann; Wassmuth, Georg; Bernhard, Claus; and Stephan, Rudolf, 4,634,734, Cl. 525-85.000.

Bernstein, Isadore A.: *See*—
Kantrowitz, Adrian; Freed, Paul S.; Vaughan, Frizell L.; Bernstein, Isadore A.; and Gray, Robert H., 4,634,422, Cl. 604-49.000.

Berry, Gordon C.: *See*—
Kortering, Randall L.; and Berry, Gordon C., 4,633,789, Cl. 108-152.000.

Bertiller, Roland; Kellner, Gerd; and Reudelsterz, Helmut, to Mauser-Werke Oberndorf GmbH. Gastight seal of a gun barrel. 4,633,755, Cl. 89-29.000.

Berube, Gilles; and Langlois, Raymond, to Minister of National Defence of Her Majesty's Canadian Government. Centering adaptor for an anti-armour kinetic energy penetrator. 4,633,782, Cl. 102-518.000.

Berz, Hans-Peter, to Intropa S.A. Electrically heated coffee percolator. 4,634,838, Cl. 219-297.000.

Bessiere, Jacques: *See*—
Jdid, El A.; Blazy, Pierre; Bessiere, Jacques; and Floreancig, Antoine, 4,634,580, Cl. 423-100.000.

Best Lock Corporation: *See*—
Foshee, William R., 4,633,690, Cl. 70-451.000.

Best, Steven A., to Exxon Research & Engineering Co. Polymerization catalyst, production and use. 4,634,747, Cl. 526-124.000.

Best, Steven A., to Exxon Research & Engineering Co. Polymerization catalyst, production and use. 4,634,748, Cl. 526-124.000.

Best, Steven A., to Exxon Research & Engineering Co. Polymerization catalyst, production and use. 4,634,749, Cl. 526-124.000.

Best, Steven A., to Exxon Research & Engineering Co. Polymerization catalyst, production and use. 4,634,750, Cl. 526-129.000.

Best, Steven A., to Exxon Research & Engineering Co. Polymerization catalyst, production and use. 4,634,751, Cl. 526-129.000.

Betlinski, Glenn M.: *See*—
Cameron, Thomas M.; and Betlinski, Glenn M., 4,634,346, Cl. 416-247.00R.

Bette, Willi: *See*—
Cirkel, Hans-Jurgen; and Bette, Willi, 4,635,267, Cl. 372-38.000.

Beudat, Emile; and Tersaeus, Stig G., to Beudat, Emile. Lock device. 4,633,688, Cl. 70-279.000.

Beyer, Hans-Hermann; Diehl, Walter; Eckert, Karlheinz; Eiermann, Kurt; and Ringelstein, Hans-Martin, to Degussa Aktiengesellschaft. Process and apparatus for the production of fillings in teeth. 4,634,383, Cl. 433-226.000.

Beyersbergen van Henegouwen, Cornelis M.; van de Kerkhof, Hubertus F. W.; Koken, Karel G. M.; and Olierook, John C. J., to U.S. Philips Corporation. Cassette with a latching pivoted cover. 4,634,020, Cl. 220-335.000.

Bezer, Christian; Olombel, Andre ; and Viel, Georges, to Commissariat a l'Energie Atomique. Apparatus for fitting a radioactive source into a cylindrical recess. 4,634,873, Cl. 250-497.100.

Bhatia, Madhukar; and Resnick, Brian J., to Cincinnati Milacron Inc. Method and apparatus for oscillating a tool carried by a manipulator. 4,635,206, Cl. 364-474.000.

Bianchi, Giorgio: *See*—
Nardi, Dante; Leonardi, Amedeo; and Bianchi, Giorgio, 4,634,712, Cl. 514-356.000.

Bieber, Gerold: *See*—
Rogner, Horst; Schacherer, Roland; and Bieber, Gerold, 4,633,987, Cl. 192-0.092.

Bierig, Robert W.; and Pucel, Robert A., to Raytheon Company. Transceiver element for phased array antenna. 4,635,062, Cl. 342-372.000.

Biffin, Martin: *See*—
Syred, Nicholas; and Biffin, Martin, 4,634,456, Cl. 55-52.000.

Biggs, Bradley M.; Brown, Jimmy L.; and Kerns, Thomas M., to Motorola, Inc. Timing apparatus for a fuse. 4,633,779, Cl. 102-215.000.

Bigler, Lenard L.: *See*—
Gresham, Tony R., 4,633,955, Cl. 171-1.000.

Bihatsi, Laszlo : *See*—
Pungor, Erno ; Toth, Klara; Pal, Ferenc; Eros, Bela; Nagy, Jozsef; and Bihatsi, Laszlo , 4,634,982, Cl. 324-448.000.

Billion, Leo, to Supernova Systems, Inc. Apparatus for detecting impurities in translucent bodies. 4,634,881, Cl. 250-572.000.

Bilski, Richard E.: *See*—
Balch, Edgar T.; Bilski, Richard E.; and Kumar, Ajith K., 4,634,887, Cl. 290-3.000.

Binder, Perry S. Hydrogel seton. 4,634,418, Cl. 604-8.000.

Biomedical Dynamics Corporation: *See*—
Marino, Joseph A., Jr.; and Bellin, Matthew E., 4,634,434, Cl. 604-246.000.

Birrittella, Mark S.; and Seelbach, Walter C., to Motorola, Inc. Monolithic bipolar SCR memory cell. 4,635,087, Cl. 357-38.000.

Bishop, Robert J. Hand-operated mixing device. 4,634,284, Cl. 366-47.000.

Bitsch, Harald: *See*—
Kaufmann, Karl-Ernst; Saeftel, Josef-Paul; Bitsch, Harald; and Oldewurtel, Otto, 4,634,078, Cl. 242-158.00R.

Bitumen Development Corporation Limited: *See*—
Angelov, Georgi; and Shibley, Paul W. M., 4,634,520, Cl. 208-309.000.

Blackmore, William; and Bavaro, Vito. Branch compactor. 4,633,776, Cl. 100-158.00R.

Bladon, John J.: *See*—
Gulla, Michael; Dutkewych, Oleh B.; and Bladon, John J., 4,634,468, Cl. 106-1.110.

Blaha, Matthew S.: *See*—
Tulpule, Bhalchandra R.; and Blaha, Matthew S., 4,635,254, Cl. 370-85.000.

Blake, Clifton A., Jr.: *See*—
Grummer, William L.; and Blake, Clifton A., Jr., 4,635,075, Cl. 346-76.00PH.

Blake, Daniel M.: *See*—
Cambridge, Edward L.; Loutfy, Raouf O.; Withers, James C.; and Blake, Daniel M., 4,634,581, Cl. 423-126.000.

Blake, John K.; and Nelson, Blaine J., to Rockwell International Corporation. Digital clock recovery circuit apparatus. 4,635,277, Cl. 375-20.000.

Blanchard, Christian: *See*—
Belbel, Elie; Baron, Thierry; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,635,022, Cl. 337-158.000.

Blanco, Antonio G.: *See*—
Filips, Chester P.; and Blanco, Antonio G., 4,633,863, Cl. 128-165.000.

Blazy, Pierre: *See*—
Jdid, El A.; Blazy, Pierre; Bessiere, Jacques; and Floreancig, Antoine, 4,634,580, Cl. 423-100.000.

Blickenderfer, Charles: *See*—
Hasenwinkle, Earl D.; Wislocker, Frank; and Blickenderfer, Charles, 4,633,924, Cl. 144-242.00E.

Block, Barry: *See*—
Aine, Harry E.; and Block, Barry, 4,633,578, Cl. 29-612.000.

Block, Thomas S., to Cooper Industries. Floor treating machine. 4,633,541, Cl. 15-49.00R.

Blomberg, Folke I.; and Holst, Jan-Olov M. Electronic wheel slip sensor for vehicle brake systems. 4,635,031, Cl. 340-52.00R.

Blommaert, Paul A. G., to Total Compagnie Francaise des Petroles. Consistometer container for testing rheologically evolutive material. 4,633,708, Cl. 73-59.000.

Blough, Leonard P., to Mesta Engineering Company. Plate levelling machine. 4,633,697, Cl. 72-164.000.

Bock, Erich: *See*—
Mueller-Storz, Hans-Friedrich; and Bock, Erich, 4,633,664, Cl. 57-406.000.

Boden, Richard M.; and Helm, John R., to International Flavors & Fragrances Inc. Organoleptic uses of bicyclononenyl alcohols. 4,634,547, Cl. 252-522.00R.

Bodinger, Donald C.: *See*—
Przybylinski, Phillip G.; and Bodinger, Donald C., 4,633,787, Cl. 105-406.100.

Boeckmann, Eduard F. B., to GTE Communication Systems Corp. Temperature compensated reference circuit. 4,634,959, Cl. 323-313.000.

Boeing Company, The: *See*—
Chee, Wan T., 4,634,081, Cl. 244-54.000.
Joner, Bruno A.; and Williams, John W., 4,633,778, Cl. 102-411.000.
Lunden, Clarence D., 4,634,963, Cl. 324-58.00A.

Bogdany, John, to GenCorp Inc. Carpet tiles. 4,634,730, Cl. 524-425.000.

Boggia, Joseph: *See*—
Yuhas, Drew J.; and Boggia, Joseph, 4,634,124, Cl. 273-73.00G.

Bohaychick, John: *See*—
Laemmle, Joseph T.; Bohaychick, John; and Lansdale, Willie, 4,634,469, Cl. 106-38.240.

Bolger, Thomas V., to RCA Corporation. Chroma signal amplitude control apparatus. 4,635,102, Cl. 358-27.000.

Bolin, Michael L.: *See*—
Zunkel, Gary D.; and Bolin, Michael L., 4,633,944, Cl. 166-51.000.

Bombardieri, Guiseppe. Device for the automatic insulin or glucose infusion in diabetic subjects, based on the continuous monitoring of the patient's glucose, obtained without blood withdrawal. 4,633,878, Cl. 128-635.000.

Bongers, Bernd: *See*—
Brunsch, Klaus; Sappl, Peter; and Bongers, Bernd, 4,634,399, Cl. 464-87.000.

Boning, Werner, to Siemens Aktiengesellschaft. Method for controlling data transfer between a data transmitter and a data receiver through a bus by means of a control device connected to the bus, and a control device for carrying out the method. 4,635,191, Cl. 364-200.000.

Bonnet, Maurice: *See*—
Morell, Joseph; Benoit, Louis; and Bonnet, Maurice, 4,633,599, Cl. 16-50.000.

Boone, Susan L.; and Stuart, Hugh D., to Motorola, Inc. Fail safe protection circuitry for a commerical microprocessor in encryption equipment. 4,635,223, Cl. 364-900.000.

Borg, Kevin E.; and Forman, Craig E., to AT&T Technologies, Inc. Method and apparatus for detecting synchronous or asynchronous data transmission. 4,635,275, Cl. 375-8.000.

Borg-Warner Chemicals, Inc.: *See*—
Miller, Curtis M.; Myers, Charles L.; and Parsons, Charles F., 4,634,732, Cl. 524-504.000.

Borgeson, Frank A.: *See*—
Hockert, Eric N.; Orensteen, Bruce D.; Bradshaw, Thomas I.; and Borgeson, Frank A., 4,634,220, Cl. 350-167.000.

Bork, Carl R., Jr.: *See*—
Danko, Oliver L.; Bork, Carl R., Jr.; Steiss, William C.; and Levengood, Donald A., 4,634,099, Cl. 251-335.300.

Bortolini, Edward J.; Helton, John S.; and Koha, Dwight W., to AT&T Information Systems Inc. Glitchless clock signal control circuit for a duplicated system. 4,635,249, Cl. 370-58.000.

Bos, Philip J., to Tektronix, Inc. High-speed electro-optical light gate and field sequential full color display system incorporating same. 4,635,051, Cl. 340-757.000.

Bosak, Alan A.: *See*—
Lachmas, John C.; Moorman, Lewis B.; and Bosak, Alan A., 4,633,918, Cl. 140-71.00R.

Bostock, Stephen B.: *See*—
Baxter, Anthony G.; Bostock, Stephen B.; and Greenwood, David, 4,634,555, Cl. 540-126.000.

Botts, John C.: *See*—
Studniarz, Stanley A.; Botts, John C.; and Johnson, John S., 4,634,911, Cl. 310-215.000.

Boundy, Bruce K.; and Miller, Craig M., to Westinghouse Electric Corp. Terminal block mount. 4,634,212, Cl. 339-198.00R.

Bourgeault, Leo B., to Allied Corporation. Bridge circuit for reduced switching losses. 4,635,181, Cl. 363-132.000.

Bovone, Enrico. Optical-probe control device for drying ovens for mirror protective paint. 4,633,594, Cl. 34-48.000.

Bowden, John E.; Hook, Roy E.; and Miller, E. Craig, to Wendy's International, Inc. Griddle mounted hot dog turner with lift off detachable drive unit. 4,633,772, Cl. 99-332.000.

Boyer, Kirk A.; and Imai, Tesuo, to Yamaha Hatsudoki Kabushiki Kaisha. Snowmobile. 4,633,964, Cl. 180-190.000.

BP Chemicals Limited: *See*—
Thiersault, Jean P.; and Senez, Alain, 4,634,735, Cl. 525-88.000.

Bracht, Philip E.: *See*—
Persem, Jake; Quinn, Mike; Emery, Walter C.; and Bracht, Philip E., 4,633,672, Cl. 62-126.000.

Bradel, John H., Jr.: *See*—
Fabiny, Eugene S.; Hessler, George W.; and Bradel, John H., Jr., 4,634,609, Cl. 427-345.000.

Brademeyer, David L.; and Welch, Timothy M., to General Motors Corporation. Quick take-up master cylinder valve arrangement. 4,633,669, Cl. 60-578.000.

Bradshaw, Thomas I.: *See*—
Hockert, Eric N.; Orensteen, Bruce D.; Bradshaw, Thomas I.; and Borgeson, Frank A., 4,634,220, Cl. 350-167.000.

Bramhall, George H.: *See*—
Sovis, John F.; Smith, Robert M.; and Bramhall, George H., 4,633,543, Cl. 15-344.000.

Brandsma, Titus E. C.: *See*—
Vriens, Leendert; Spruit, Johannes H. M.; Rijpers, Johannes C. N.; and Brandsma, Titus E. C., 4,634,926, Cl. 313-474.000.

Brandt Engineering Company: *See*—
Zilbermann, Andre H., 4,633,937, Cl. 165-22.000.

Brandt, Raymond W. Bullet affecting/deflecting material. 4,633,528, Cl. 2-2.500.

Brandt, Timothy B.; and Parr, Erwin W., to Parr Manufacturing, Inc. Pressure regulator. 4,633,901, Cl. 137-510.000.

Brasch, Miles E.; and Campbell, Allan G., III, to A.R. Brasch Advertising, Inc. Multiple axis hinged display assembly. 4,633,607, Cl. 40-530.000.

Braun Aktiengesellschaft: *See*—
Yamac, Yucel, 4,634,836, Cl. 219-249.000.

Braun, Robin M., to Plessey South Africa Limited. RF oscillator frequency stabilizing circuit using self-mixing with reference frequency. 4,634,999, Cl. 331-4.000.

Brazdil, James F.: *See*—
Teller, Raymond G.; Brazdil, James F.; and Glaeser, Linda C., 4,634,789, Cl. 558-451.000.

Breckenridge, George J., Jr.: *See*—
Kalnin, Ilmar L.; Goldberg, Harris A.; and Breckenridge, George J., Jr., 4,634,546, Cl. 252-506.000.

Brem, Ernst, to BBC Brown, Boveri & Company Limited. Electric machine. 4,634,909, Cl. 310-91.000.

Bresciani, Paolo, to Tongiani Domenico S.p.A. Endless saw and method for cutting annular rock bodies. 4,633,848, Cl. 125-21.000.

Bretzger, Reinhard: *See*—
Mueller, Helmut; and Bretzger, Reinhard, 4,634,401, Cl. 464-136.000.

Brewer, Arthur D.; and Minatelli, John A., to Uniroyal Chemical Company; and Uniroyal Ltd. 5-Pyrimidinecarboxamides and treatment of leukemia and tumors therewith. 4,634,707, Cl. 514-270.000.

Brewer, Donaldee; Seiler, Ronald R.; and Niedergeses, Thomas J., to Bandag Licensing Corporation. Bead seal ring unit. 4,634,357, Cl. 425-36.000.

Brezniak, Diane V.: *See*—
Hallgren, John E.; and Brezniak, Diane V., 4,634,755, Cl. 528-23.000.

Bridgers, Frank: *See*—
Yawn, James M.; Whitaker, Huby M.; and Bridgers, Frank, 4,633,586, Cl. 30-168.000.

Bridgestone Corporation: *See*—
Tamura, Akira, 4,633,926, Cl. 152-209.00R.
Yamaguchi, Ikutoshi; Kashiwagi, Katsuhiko; Goto, Hideo; and Inoue, Susumu, 4,634,626, Cl. 428-312.400.

Briggs & Stratton Corporation: *See*—
Santi, John D., 4,633,556, Cl. 29-159.200.

Brigham, Robert N., to Superior Electric Company, The. Stepping motor winding for bipolar drive. 4,634,948, Cl. 318-696.000.

Bright, Stephen A.: *See*—
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Scalisi, Joseph M.; and Bzowycky, Peter, 4,633,730, Cl. 74-477.000.
Zaveri, Vikram; Heling, Dennis H.; and Radyko, Keith S., 4,634,180, Cl. 297-341.000.

Chuang, Patrick T.: *See*—
Shu, Lee-Lean; Shyu, Tai C.; and Chuang, Patrick T., 4,634,894, Cl. 307-297.000.

Ciampa, John A.; and Robinson, James T., to Rochester Institute of Technology. Method and apparatus for storing a massive inventory of labeled images. 4,635,136, Cl. 358-342.000.

Ciba-Geigy Corporation: *See*—
Ehrenfreund, Josef; Fory, Werner; Meyer, Willy; and Topfl, Werner, 4,634,465, Cl. 71-91.000.
Irving, Edward; and Smith, Terence J., 4,634,644, Cl. 430-18.000.
Mockli, Peter, 4,634,779, Cl. 546-269.000.
Werner, Lincoln H.; and Ford, Neville, 4,634,713, Cl. 514-392.000.

Cibie Projecteurs: *See*—
Montet, Maurice, 4,635,174, Cl. 362-457.000.

Cicognani, Mario: *See*—
Tangorra, Giorgio; Cicognani, Mario; and Macchiarulo, Vincenzo, 4,634,410, Cl. 474-153.000.

Cigolotti, Jean-Pierre; and Leblanc, Jean, to Robert Bosch GmbH. Apparatus for adjusting the spring characteristic of a helical spring. 4,634,109, Cl. 267-170.000.

Cincinnati Milacron Inc.: *See*—
Bhatia, Madhukar; and Resnick, Brian J., 4,635,206, Cl. 364-474.000.

Cirkel, Hans-Jurgen; and Bette, Willi, to Kraftwerk Union Aktiengesellschaft. Excitation system for generating a fast pulsed high-voltage discharge, particularly for exciting a high-power laser. 4,635,267, Cl. 372-38.000.

Citizen Watch Co., Ltd.: *See*—
Kamiya, Kiyoshi, 4,635,115, Cl. 358-153.000.
Togashi, Seigo, 4,635,127, Cl. 358-236.000.

City Technology Limited: *See*—
Tantram, Anthony D. S.; and Chan, Yat S., 4,633,704, Cl. 73-23.000.

Claas Saulgau GmbH: *See*—
Arnold, Rudolf, 4,633,657, Cl. 56-98.000.

Clagett, Donald C.: *See*—
Takekoshi, Tohru; Clagett, Donald C.; and Cooper, Stephen M., 4,634,760, Cl. 528-353.000.

Clarion Co., Ltd.: *See*—
Tanaka, Kouichi; Kuwajima, Takeshi; and Amazawa, Kiyoshi, 4,634,902, Cl. 307-542.000.

Clark, Alan T.; Ibrahim, Hadi; and Lange, Arthur F., to Advanced Micro Devices, Inc. Digital subscriber controller. 4,635,255, Cl. 370-110.100.

Clark, Charles W.: *See*—
Lucatorto, Thomas B.; Clark, Charles W.; and Whitaker, Tom J., 4,634,864, Cl. 250-282.000.

Clark, Robert E.; and Amos, Dennis R., to Westinghouse Electric Corp. Method for repairing a steam turbine or generator rotor. 4,633,554, Cl. 29-156.40R.

Clarke, Ronald A. W. Traffic marker and housing. 4,634,310, Cl. 404-15.000.

Clausen, Eivind: *See*—
Allsop, James D.; and Clausen, Eivind, 4,635,154, Cl. 360-128.000.

Clausen, Peter J. M.: *See*—
Petersen, Jorgen H.; Clausen, Peter J. M.; and Rasmussen, Hilmar O., 4,634,481, Cl. 156-89.000.

Clayman, Henry; and Longacre, James R. Posterior chamber intra-ocular lens with the lens body within a carrier. 4,634,441, Cl. 623-6.000.

Cleer, Clarence W., Jr. Liquid heating apparatus. 4,633,821, Cl. 122-155.00A.

Clemar Manufacturing Corporation: *See*—
Lobato, Toribio, 4,634,288, Cl. 368-200.000.

Closmann, Philip J., to Shell Oil Company. Steam drive from fractured horizontal wells. 4,633,948, Cl. 166-271.000.

CMU-Gesellschaft fuer Materialrueckgewinnung: *See*—
Riemann, Hanns-Helmut; Skaletz, Heinz-Josef; and Sonnenschein, Hans, 4,634,060, Cl. 241-74.000.

Coal Industry (Patents) Limited: *See*—
Syred, Nicholas; and Biffin, Martin, 4,634,456, Cl. 55-52.000.

Coca-Cola Company, The: *See*—
Credle, William S., Jr., 4,634,350, Cl. 417-393.000.

Cocksedge, George T. Tricycle and drive therefor. 4,634,137, Cl. 180-256.000.

Coe, Frederick L.: *See*—
Hannula, Donald L.; and Coe, Frederick L., 4,634,427, Cl. 604-93.000.

Coffee, Ronald A.; Noakes, Timothy J.; and Anstey, Robert A., to Imperial Chemical Industries PLC. Pumps and pump components. 4,634,057, Cl. 239-690.000.

Cogema et Framatome: *See*—
Vere, Bernard; Mathevon, Paul; and Decarsin, Michel, 4,633,569, Cl. 29-514.000.

Cohen, Irun R.; and Shinitzky, Meir, to Yeda Research and Development Company Ltd. Cell membrane proteins, compositions containing them and procedure for their preparation. 4,634,590, Cl. 424-88.000.

Cohr, Lindsay W. J., to Allflex International Limited. Tag. 4,633,606, Cl. 40-301.000.

Coker, Geoffrey G.: *See*—
McDermed, John D.; Findlay, John W. A.; and Coker, Geoffrey G., 4,634,699, Cl. 514-223.000.

Cole, Robert W.: *See*—
Pilkington, Mervin V.; Cole, Robert W.; and Schisler, Robert C., 4,633,912, Cl. 138-132.000.

Coleby, Stanley E.; and Forster, Michael H., to Hewlett-Packard Company. Computer-aided design of systems. 4,635,208, Cl. 364-491.000.

Colombo, Piero, to Coatinua International Continuous Casting. Coatinuous casting plant. 4,633,933, Cl. 164-154.000.

Color Dynamics, Inc.: *See*—
Jacobs, Ralph S., 4,633,740, Cl. 81-3.090.

Columbia University in the City of New York, The Trustees of: *See*—
Axel, Richard; Wigler, Michael H.; and Silverstein, Saul J., 4,634,665, Cl. 435-68.000.

Combustion Engineering, Inc.: *See*—
Carty, Michael W.; and Kraus, Guenther M., 4,633,913, Cl. 138-147.000.
Grusha, John, 4,634,054, Cl. 239-423.000.
Horlitz, Carl F., Jr.; and Swietek, Franciscek J., 4,633,818, Cl. 122-4.00D.
Schuss, Jack A., 4,635,184, Cl. 364-187.000.

Comeau, Rene , to Cablovision Alma Inc. Method and device for remotely identifying TV receivers displaying a given channel by means of an identification signal. 4,635,109, Cl. 358-84.000.

Cominetta, Gilberto; and Oggionni, Claudio, to BS Smogless S.p.A. Modular plastic packing for the biological treatment of waste waters by percolation. 4,634,534, Cl. 210-150.000.

Command Automation, Inc.: *See*—
Simjian, Luther G., 4,634,130, Cl. 273-176.0FA.

Commissariat a l'Energie Atomique: *See*—
Bezer, Christian; Olombel, Andre ; and Viel, Georges, 4,634,873, Cl. 250-497.100.
Matheron, Gerard; and Migny, Philippe, 4,634,899, Cl. 307-462.000.
Saglio, Robert, 4,635,241, Cl. 367-95.000.
Spitz, Jean, 4,633,623, Cl. 51-439.000.
Tilliette, Zephyr, 4,633,819, Cl. 122-32.000.

Common Market Investment Ltd.: *See*—
McClure, Murray C., 4,634,147, Cl. 283-56.000.

Compagnie Generale des Etablissements Michelin: *See*—
Tournier, Jean-Louis, 4,634,488, Cl. 156-285.000.

Compagnie Industrielle des Lasers Cilas Alcatel: *See*—
Jano, Patrice; and Tron, Michele, 4,634,271, Cl. 356-5.000.

Connor, Richard C.; and Rule, Dennis A., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Under-bridge access assembly. 4,633,975, Cl. 182-63.000.

Conrads, Norbert; Schiebel, Ulrich; and Kirchhoff, Rolf, to U.S. Philips Corporation. Printing apparatus and methods for compensating synchronization errors. 4,635,072, Cl. 346-1.100.

Consolidated Solar Industries Corp.: *See*—
Kranz, William J., 4,633,967, Cl. 180-274.000.

Continua International Continuous Casting: *See*—
Colombo, Piero, 4,633,933, Cl. 164-154.000.

Contour Roll Company: *See*—
Gutowski, Timothy A.; and Tucker, Merl T., 4,633,742, Cl. 83-13.000.

Control Specialties Co., Inc.: *See*—
Lohn, Paul, 4,633,911, Cl. 138-44.000.

Conway, John K., to Prutec Limited. Introduction of samples into a mass spectrometer. 4,634,865, Cl. 250-288.000.

Conway, John K., to Prutec Limited. Introduction of samples into a mass spectrometer. 4,634,866, Cl. 250-288.000.

Conway, John K.: *See*—
Ottley, Thomas W.; and Conway, John K., 4,634,867, Cl. 250-288.000.

Cook, Incorporated: *See*—
Osborne, Thomas A., 4,634,433, Cl. 604-171.000.

Cook, James C., II: *See*—
Eccleston, Larry; Cook, James C., II; and Goodrich, Earl R., II, 4,634,975, Cl. 324-232.000.

Coombes, Daniel J., to Motorola, Inc. Communication system with voice priority for remote stations. 4,635,285, Cl. 379-63.000.

Cooper Industries: *See*—
Block, Thomas S., 4,633,541, Cl. 15-49.00R.

Cooper Industries, Inc.: *See*—
Kilmer, Paul R., 4,633,921, Cl. 140-124.000.
Steinke, Earl, 4,635,172, Cl. 362-276.000.

Cooper, James A., Jr., to Purdue Research Foundation. Memory device. 4,635,083, Cl. 357-16.000.

Cooper LaserSonics, Inc.: *See*—
Kreizman, Alexander; and Broadwin, Alan, 4,634,419, Cl. 604-22.000.

Cooper, Stephen M.: *See*—
Takekoshi, Tohru; Clagett, Donald C.; and Cooper, Stephen M., 4,634,760, Cl. 528-353.000.

Coppa, Anthony P., to General Electric Company. Apparatus and method for constructing and disassembling a truss structure. 4,633,566, Cl. 29-429.000.

Coquelet, Andre , to Mitchell Sports. Brake for fish casting reel. 4,634,073, Cl. 242-84.50A.

Cordis Corporation: *See*—
Smith, Kevin, 4,634,042, Cl. 228-173.400.

Corey, John A., to Mechanical Technology Incorporated. Two piston V-type Stirling engine. 4,633,668, Cl. 60-526.000.

Cornelius, Thomas E., III: *See*—
Logan, Douglas P.; Cornelius, Thomas E., III; and Rey, Susan P., 4,634,532, Cl. 210-697.000.

Corning Glass Works: *See*—
Dumbaugh, William H., Jr., 4,634,683, Cl. 501-32.000.
Dumbaugh, William H., Jr., 4,634,684, Cl. 501-69.000.

Cornwell, Lionel B., to Intermag Incorporated. Transformer utilizing selectively loaded reactance to control power transfer. 4,634,958, Cl. 323-255.000.

Coulon, Jean-Claude: *See—*
Poncelet, Denis; Coulon, Jean-Claude; Chaumette, Jacques; and Letourneur, Pierre, 4,634,231, Cl. 350-311.000.

Coulter, Douglas, to United States Design Corporation. Method and apparatus for storing data on magnetic or optical media. 4,635,141, Cl. 360-44.000.

Courbat, Pierre; Weith, Andre ; and Albert, Alban, to Zyma SA. Use of O-substituted derivatives of (+)-cyanidan-3-ol as compounds having immunomodulating properties. 4,634,718, Cl. 514-460.000.

Covell, Walter R. Rudder for electric trolling motor. 4,634,388, Cl. 440-6.000.

Cowan, James H.; and Spector, George. Spring actuated cue stick. 4,634,123, Cl. 273-69.000.

Cox, Darryl R.: *See—*
Cox, Francis C.; and Cox, Darryl R., 4,633,962, Cl. 180-65.100.

Cox, Francis C.; and Cox, Darryl R. Articulated wheel chair. 4,633,962, Cl. 180-65.100.

Cox, Raleigh L.: *See—*
Beard, Harold J.; and Cox, Raleigh L., 4,634,528, Cl. 210-277.000.

Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. Substituted-3-(2,3-dihydro-1H-inden-5-yl)-4-hydroxy-1H-pyrrole-2,5-diones, useful for treating persons with gray matter edema. 4,634,717, Cl. 514-425.000.

Craig, W. Dale, to United States of America, Navy. Double-stage air filter. 4,634,458, Cl. 55-316.000.

Crandell, Stephen L., to PPG Industries, Inc. Curtainwall system. 4,633,631, Cl. 52-235.000.

Crawford, Bradly A., to A. O. Smith Corporation. Self-aligning bearing retention system. 4,634,298, Cl. 384-209.000.

Crawford, Gregan F., to Hewlett Packard Company. Electrical connectors. 4,634,210, Cl. 339-176.0MP.

Crawford, James A., to Hughes Aircraft Company. Fast phase-lock frequency synthesizer with variable sampling efficiency. 4,634,998, Cl. 331-1.00A.

Craycraft, Donald G.; and Pham, Giao N., to NCR Corporation. FET driver circuit with mask programmable transition rates. 4,634,893, Cl. 307-270.000.

Credle, William S., Jr., to Coca-Cola Company, The. Double acting diaphragm pump and reversing mechanism therefor. 4,634,350, Cl. 417-393.000.

Critten, Donald L., to National Research Development Corporation. Natural-light illumination enhancement assembly. 4,634,222, Cl. 350-263.000.

Cross, Virginia R.: *See—*
Tauster, Samuel J.; Montagna, Angelo A.; Steger, John J.; Fung, Shun C.; and Cross, Virginia R., 4,634,517, Cl. 208-138.000.

Crowe, Curtis W., to Dowell Schlumberger Incorporated. Method of preventing precipitation of ferrous sulfide and sulfur during acidizing. 4,633,949, Cl. 166-279.000.

Crowley, Charles H. Light fixture mounting pedestal and method of installing same. 4,635,168, Cl. 562-147.000.

Crowley, Patrick J.: *See—*
Noon, Robert A.; Crowley, Patrick J.; and Worthington, Diana M., 4,634,466, Cl. 71-92.000.

Crozier, James R., Jr.: *See—*
McAliley, John E.; and Crozier, James R., Jr., 4,633,550, Cl. 28-272.000.

Crystal Technologies Corporation: *See—*
Yaniv, Meir, 4,634,146, Cl. 281-15.00R.

Cuesta, Eugenio M.; and Spector, George. Whistle kite. 4,634,085, Cl. 244-153.00R.

Cuisinarts, Inc.: *See—*
Williams, James E., 4,634,061, Cl. 241-101.00R.

Cumming, William J., to Polaroid Corporation. Thiazolidinylethylchlorocarbonates. 4,634,773, Cl. 548-146.000.

Cunningham, Richard N.: *See—*
Jenkins, Kenneth L.; Suhaka, Stanley C.; Dolin, Rick L.; LaRoche, Allan R.; Hodgson, Robert E.; Such, Neil R.; Smith, Douglas D.; Newton, Frank R.; and Cunningham, Richard N., 4,634,622, Cl. 428-143.000.

Curran, Earl J., Jr.: *See—*
Kampf, Julian C.; Reichard, Jeffrey A.; Libert, James T.; Curran, Earl J., Jr.; and Graefe, Richard J., 4,634,951, Cl. 318-778.000.

Currie, Edmund; and Frankel, Hillel. Collapsible support stand for an electronic musical keyboard and the like. 4,634,090, Cl. 248-544.000.

Curt G. Joa, Inc.: *See—*
Lammers, Donald W., 4,634,482, Cl. 156-164.000.

Curtin, William J.; and Soto, Stephen, to Amtel Communications, Inc. Call screening system. 4,634,811, Cl. 379-211.000.

Custon Auto Exteriors: *See—*
Ernsberger, Earl R., 4,634,607, Cl. 427-282.000.

Cuu, Cwo-Liang. Cover for a disposable syringe. 4,634,428, Cl. 604-110.000.

Czarniecki, Michael F.: *See—*
Witkowski, Joseph T.; and Czarniecki, Michael F., 4,634,689, Cl. 514-80.000.

Czeczerski, Nordfried. Massager. 4,633,857, Cl. 128-50.000.

D-M Design Corp.: *See—*
McKeag, William E., 4,634,171, Cl. 296-108.000.

D. S. Scanner Co., Ltd.: *See—*
Terada, Shinichi; Masuda, Kozo; and Adachi, Yoshimitsu, 4,635,131, Cl. 358-296.000.

Dacomed Corporation: *See—*
Walsh, John J., 4,633,864, Cl. 128-207.150.

Daffini, Jean-Pierre: *See—*
Tisserand, Philippe; and Daffini, Jean-Pierre, 4,633,813, Cl. 119-14.040.

Dagenais, Georges; Michaud, Ghislain; and Presseau, Michel, to Les Epiciers Unis Metro-Richelieu Inc. Method and apparatus for automatically packing sausage links. 4,633,652, Cl. 53-444.000.

D'Agostino, John A.; and Lillie, Thomas J., to United States of America, Army. Battlefield environment thermal analyzer. 4,634,293, Cl. 374-124.000.

Daido Tokushuko Kabushiki Kaisha: *See—*
Yanagiya, Toshio; Isokawa, Kenji; Ohta, Hisashi; and Inaba, Hideaki, 4,634,573, Cl. 420-127.000.

Daikin Kogyo Co., Ltd.: *See—*
Ohmori, Akira; Tomihashi, Nobuyuki; and Shimizu, Yoshiki, 4,634,754, Cl. 526-242.000.

Dainippon Screen Mfg. Co., Ltd.: *See—*
Terada, Shinichi; Masuda, Kozo; and Adachi, Yoshimitsu, 4,635,131, Cl. 358-296.000.
Yanagimoto, Katsutoshi; and Nagai, Shoichi, 4,634,655, Cl. 430-277.000.

d'Alayer de Costemore d'Arc, Stephane, to Staar, S.A. Cleaning cassette for magnetic tape apparatus. 4,635,156, Cl. 360-132.000.

Dan, Masahiro: *See—*
Yokoo, Sadao; Shimomura, Tadashi; Torisawa, Soichi; Dan, Masahiro; and Kaneda, Tsuyoshi, 4,634,270, Cl. 355-125.000.

Dana Corporation: *See—*
Jones, Charles R., 4,633,725, Cl. 74-473.00R.

Danfoss A/S: *See—*
Petersen, Jorgen H.; Clausen, Peter J. M.; and Rasmussen, Hilmar O., 4,634,481, Cl. 156-89.000.

Daniell, Michael G.; and Martin, Gerald S., to Fisher & Paykel, Private Bag. Clamp valves. 4,634,092, Cl. 251-7.000.

Danko, Oliver L.; Bork, Carl R., Jr.; Steiss, William C.; and Levengood, Donald A., to Nupro Company. High pressure inverted bellows valve. 4,634,099, Cl. 251-335.300.

Dantlgraber, Jorg, to Mannesmann Rexroth GmbH. Hydraulic pump. 4,634,354, Cl. 418-31.000.

Danzik, Mitchell, to Chevron Research Company. Process for removing naphthenic acids from petroleum distillates. 4,634,519, Cl. 208-263.000.

Darden, Bruce V.: *See—*
Cannon, Thomas C., Jr.; Carlisle, Arthur W.; Darden, Bruce V.; and Myers, Clyde J., 4,634,214, Cl. 350-96.200.

Dassler, Armin A.; and Bauer, Willi, to Puma AG Rudolf Dassler Sport. Outer sole for an athletic shoe having cleats with exchangeable snap-on gripping elements. 4,633,600, Cl. 36-134.000.

Data Electronics, Inc.: *See—*
Georgens, Harold H.; and Christensen, Dean L., 4,635,155, Cl. 360-132.000.

Datametrics Corporation: *See—*
Grummer, William L.; and Blake, Clifton A., Jr., 4,635,075, Cl. 346-76.0PH.

Dataproducts, Inc.: *See—*
West, Daniel A.; Nyi, Lawrence S.; and Ravelo, Ramon J., 4,634,302, Cl. 400-124.000.
West, Daniel A.; Nyi, Lawrence S.; and Ravelo, Ramon J., 4,634,303, Cl. 400-124.000.

David, Pierre. Snow removal apparatus. 4,633,603, Cl. 37-197.000.

Davis, John W. Release mechanism. 4,634,021, Cl. 221-3.000.

Davis, Newton G.: *See—*
Burgit, Richard A.; Davis, Newton G.; Goyert, Josita M.; Johnson, Keith, Jr.; Long, Robert A.; and Stachura, Joseph F., 4,633,570, Cl. 29-564.400.

Davis, Walter L.; DeLuca, Michael J.; and Siegel, William G., to Motorola, Inc. DC to DC converter. 4,634,956, Cl. 323-222.000.

Davis, Walter R.: *See—*
Isbell, Tim D.; and Davis, Walter R., 4,634,892, Cl. 307-265.000.

Dayco Corporation: *See—*
Foster, Randy C., 4,634,408, Cl. 474-135.000.
Hollaway, Gerald C., Jr., 4,634,413, Cl. 474-263.000.
Oliver, Larry R., 4,634,411, Cl. 474-244.000.
Quick, Terrence R.; Miranti, Joseph P., Jr.; and Foster, Randy C., 4,634,405, Cl. 474-13.000.

Dayen, Leonid: *See—*
Hanks, James V.; Raines, Charles D.; and Dayen, Leonid, 4,633,991, Cl. 192-85.0CA.

DCM Industries, Inc.: *See—*
Chattler, Leo M., 4,634,964, Cl. 324-60.00C.

De-Icing System K.B.: *See—*
Magnusson, Kjell-Eric, 4,634,084, Cl. 244-134.00C.

De La Rue Giori S.A.: *See—*
Germann, Albrecht J., 4,633,777, Cl. 101-177.000.

Dean, Raymond H., to Tempmaster Corporation. Thermostatically adjustable pressure regulator. 4,634,047, Cl. 236-49.000.

Deavenport, Joe E. Uninterruptible power supply. 4,634,888, Cl. 307-48.000.

Debbaut, Christian A., to Raychem Corporation. Apparatus and method for protection of a substrate. 4,634,207, Cl. 339-116.00C.

DeBernardis, John F.; and Basha, Fatima Z., to Abbott Laboratories. Adrenergic amidines. 4,634,705, Cl. 514-256.000.

Decarsin, Michel: *See—*
Vere, Bernard; Mathevon, Paul; and Decarsin, Michel, 4,633,569, Cl. 29-514.000.

Dechelette, Helen, to Molex Incorporated. Low profile stacking connector for printed circuit boards. 4,634,200, Cl. 339-17.00M.

De Coi, Beat: *See—*
Stutz, Hansruedi; and De Coi, Beat, 4,635,216, Cl. 364-562.000.

Deere & Company: *See—*
Anstey, Henry D.; and Viaud, Jean, 4,633,659, Cl. 56-341.000.
Fox, Robert E.; and Hubbard, Bruce L., 4,635,047, Cl. 340-684.000.
Friend, Kenneth D.; and Dharia, Vijay M., 4,634,855, Cl. 250-222.100.
Friend, Kenneth D., 4,635,215, Cl. 364-555.000.
Lindstrom, Harold R.; and Haverdink, Virgil D., 4,633,791, Cl. 111-86.000.

Degremont: *See—*
Louboutin, Robert; Savall, Vincent; and Vion, Patrick, 4,633,909, Cl. 137-888.000.

de Groot, Jacob; and Haus, Thomas A. J., to U.S. Philips Corporation. Core containing amorphous ferromagnetic strip material. 4,635,018, Cl. 336-178.000.

Degussa AG: *See—*
Kuhn, Werner; and Zilske, Wolfgang, 4,634,505, Cl. 204-44.300.

Degussa Aktiengesellschaft: *See—*
Beck, Wolfgang; and Nagel, Ulrich, 4,634,775, Cl. 548-402.000.
Beyer, Hans-Hermann; Diehl, Walter; Eckert, Karlheinz; Eiermann, Kurt; and Ringelstein, Hans-Martin, 4,634,383, Cl. 433-226.000.

Deimen, Michael L. Construction block. 4,633,639, Cl. 52-590.000.

Dekeyser, Mark A.; Pierce, Benjamin J.; Moore, Richard C.; and Hubbard, Winchester L., to Uniroyal Chemical Company, Inc.; and Uniroyal, Ltd. Substituted pyrimidinyl organophosphorus insecticides. 4,634,690, Cl. 514-81.000.

DeLacy, Thomas J., to Ford Aerospace & Communications Corporation. Non-destructive testing by stimulated electron emission capture. 4,634,868, Cl. 250-306.000.

Delakowitz, Bernd: *See—*
Forberg, Horst; Hegner, Gunter; Achtnig, Peter; and Delakowitz, Bernd, 4,634,209, Cl. 339-147.00R.

de Larosiere, Pierre J. Container reinforcement. 4,634,028, Cl. 222-464.000.

Delhommer, Harold J.; and Walker, Clarence O., to Texaco Inc. Method for controlling lost circulation of drilling fluids with hydrocarbon absorbent polymers. 4,633,950, Cl. 166-295.000.

Dellbrugge, Herbert, to Windmoller & Holscher. Apparatus for flattening and withdrawing blown continuous plastic tubular films. 4,634,358, Cl. 425-72.00R.

Delloye, Nicolas; and Denimal, Philippe, to Jeumont-Schneider Corporation. Device permitting reduction of thermosiphon effects in fast neutron nuclear reactors. 4,634,569, Cl. 376-203.000.

Delonghi, Adriano G. A., to Fabricacion de Maquinas, S.A. Bottle carrier. 4,634,002, Cl. 206-158.000.

DeLuca, Michael J.: *See—*
Davis, Walter L.; DeLuca, Michael J.; and Siegel, William G., 4,634,956, Cl. 323-222.000.

DeLuca, Robert D., to Johnson & Johnson Dental Products Company. Method for joining ceramic components in precise spatial relationship. 4,634,561, Cl. 264-17.000.

Del Vecchio, Robert M.: *See—*
Holland, James R.; and Del Vecchio, Robert M., 4,634,567, Cl. 376-152.000.

Demarest, Henry M., Jr.; Kunkle, Gerald E.; and Moxie, Clement C., to PPG Industries, Inc. Method of melting raw materials for glass or the like with staged combustion and preheating. 4,634,461, Cl. 65-27.000.

Denda, Hirokazu: *See—*
Kato, Hiroyasu; and Denda, Hirokazu, 4,635,150, Cl. 360-98.000.

Dengensha Manufacturing Company Limited: *See—*
Furudate, Masato, 4,634,830, Cl. 219-117.100.
Okabe, Yoshio; and Furudate, Masato, 4,634,828, Cl. 219-117.100.
Okabe, Yoshio; and Furudate, Masato, 4,634,829, Cl. 219-117.100.

Denimal, Philippe: *See—*
Delloye, Nicolas; and Denimal, Philippe, 4,634,569, Cl. 376-203.000.

Denk, Walter, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG. Slide valve with partial-vacuum actuator. 4,633,898, Cl. 137-315.000.

Deraedt, Roger: *See—*
Teutsch, Jean-Georges; Torelli, Vesperto; Deraedt, Roger; and Philibert, Daniel, 4,634,696, Cl. 514-179.000.

DeRocher, Benjamin K., to General Motors Corporation. Speaker retainer. 4,633,972, Cl. 381-188.000.

Desmond, Michael J.; Pesa, Frederick; and Eshraghi, Reza, to Standard Oil Company, The. Yttrium silicate molecular sieves. 4,634,686, Cl. 502-60.000.

Desmond, Michael J.: *See—*
Callahan, James L.; Desmond, Michael J.; and Pepera, Marc A., 4,634,502, Cl. 204-23.000.

Detroit Stoker Company: *See—*
Knox, Harold L., 4,633,849, Cl. 126-182.000.

Detter, Gary C.; Norling, Samuel A.; Penney, Janet S.; and Tolnar, Emil J., Jr., to General Motors Corporation. Electrical connector with connector position assurance/assist device. 4,634,204, Cl. 339-91.00R.

Detty, Michael R.; Murray, Bruce J.; and Scozzafava, Michael, to Eastman Kodak Company. Novel 4H-tellurin tellurane electron-accepting sensitizers for electron-donating photoconductive compositions. 4,634,553, Cl. 540-1.000.

Deutsche Forschungs-und Versuchsanstalt fur Luft-und Raum-fahrt e.V.: *See—*
Hohlweck, Hans; Plath, Gernold; and Baisch, Friedhelm, 4,635,198, Cl. 364-414.000.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Forster, Jurgen, 4,634,150, Cl. 285-24.000.

Deutsche ITT Industries GmbH: *See—*
Mehrgardt, Soenke, 4,634,989, Cl. 329-112.000.

Devaney, Christopher M.; Martineau, Robert J.; Miles, John L.; and Wong, Theodore T. S., to United States of America, Air Force. Method for making semiconductor crystals. 4,634,493, Cl. 156-616.00R.

De Vincentiis, Leonardo, to Ausonia Farmaceutici s.r.l. Furan derivatives having anti-ulcer activity. 4,634,701, Cl. 514-232.000.

Dewey, Dave, to Unerman Greenman Berger Limited. Knock-down fittings. 4,634,309, Cl. 403-407.100.

Dewez, Vincent: *See—*
Calevo, Robert; Dewez, Vincent; and Garcia, Marcel, 4,634,216, Cl. 350-96.210.

DeWoskin, Irvin S., to Barnhart Industries, Inc. Fasteners for apparel and methods of manufacturing them. 4,633,565, Cl. 29-417.000.

Dharia, Vijay M.: *See—*
Friend, Kenneth D.; and Dharia, Vijay M., 4,634,855, Cl. 250-222.100.

Dhein, Rolf: *See—*
Meier, Helmut-Martin; Dhein, Rolf; Winkel, Jens; Klein, Gerhard; and Kloker, Werner, 4,634,791, Cl. 560-163.000.

Dhingra, Om P.; Franz, John E.; and Hakes, Harrison R., to Monsanto Company. Herbicidal glyphosate oxime derivatives. 4,634,788, Cl. 558-145.000.

Dhyanchand, P. John: *See—*
Shekhawat, Sampat S.; Dhyanchand, P. John; and Thollot, Pierre, 4,635,177, Cl. 363-41.000.

Diamond Shamrock Chemicals Company: *See—*
Lipowski, Stanley A.; Villa, Jose L.; Miskel, John J., Jr.; and Grinstein, Reuben H., 4,634,451, Cl. 44-51.000.

Diaz, Manuel, to Fluid Packaging Company, Inc. Apparatus for improving the surface characteristics of waxy materials. 4,634,368, Cl. 425-453.000.

Didier-Werke AG: *See—*
Pohl, Siegfried; Luhrsen, Ernst; Jeschke, Peter; Rave, Ortwin; Kienow, Martin; and Richter, Werner, 4,634,685, Cl. 501-100.000.

Dieban, Peter H.; and Ziller, Helmut, to Man Gutehoffnungshuette GmbH. Pedestal unit having raisable and lowerable platforms. 4,633,625, Cl. 52-30.000.

Diederen, Werner; and Sonnleitner, Herbery, to Saint-Gobain Vitrage. Loading device for a horizontal continuous furnace for the heating of glass plates. 4,634,329, Cl. 414-159.000.

Diehl, Walter: *See—*
Beyer, Hans-Hermann; Diehl, Walter; Eckert, Karlheinz; Eiermann, Kurt; and Ringelstein, Hans-Martin, 4,634,383, Cl. 433-226.000.

Diesel Kiki Co., Ltd.: *See—*
Izumi, Kouichi, 4,635,201, Cl. 364-431.070.

Dieterich Standard Corp.: *See—*
Mesnard, David R.; and Kalin, Horst W., 4,633,713, Cl. 73-866.500.

Dietz, Karl-Jurgen: *See—*
Khan, Imran A.; Dietz, Karl-Jurgen; Waelbroeck, Francoise; and Wienhold, Peter, 4,634,454, Cl. 55-16.000.

Dietz, Wolfgang F. W., to RCA Corporation. Circuit synchronized by a signal at a deflection frequency. 4,634,939, Cl. 315-399.000.

Dinsmore, Mark T., to Transkinetic Systems, Inc. Wide bandwidth ultra high stability FM telemetry transmitter. 4,635,296, Cl. 455-113.000.

Dittell, Edward W. Cooling and heating apparatus. 4,633,676, Cl. 62-238.600.

Diversified Products Corporation: *See—*
Rockwell, Gary L., 4,634,127, Cl. 272-134.000.

Dixon, Glen A.; McCloskey, Clark E.; Chambers, David L.; Hawk, Woodrow D.; and McCracken, Oliver W., to Otis Engineering Corporation. Well production controller system. 4,633,954, Cl. 166-372.000.

Dr. Welp Entwicklungs-KG: *See—*
Welp, Ullrich; Kramer, Willi; Girke, Michael; and Lack, Bernd, 4,634,269, Cl. 355-100.000.

Dodge, Warren; and Wirfs-Brock, Rebecca, to Tektronix, Inc. Apparatus for presenting image information for display graphically. 4,635,049, Cl. 340-721.000.

Doduco KG Dr. Eugen Durrwachter: *See—*
Normann, Norbert, 4,635,227, Cl. 365-133.000.

Doi, Akira: *See—*
Shimizu, Yasuhiro; and Doi, Akira, 4,634,600, Cl. 427-38.000.

Dolin, Rick L.: *See—*
Jenkins, Kenneth L.; Suhaka, Stanley C.; Dolin, Rick L.; LaRoche, Allan R.; Hodgson, Robert E.; Such, Neil R.; Smith, Douglas D.; Newton, Frank R.; and Cunningham, Richard N., 4,634,622, Cl. 428-143.000.

Dombro, Robert A.: *See—*
Hwang, Yu-Tang; Pebsworth, Lloyd; Dombro, Robert A.; and Hoff, Raymond E., 4,634,744, Cl. 526-84.000.

Domoto, Gerald A.; and Sereny, Aron, to Xerox Corporation. Thermo-optic light modulation array. 4,635,082, Cl. 346-160.000.

Don Marketing Management Limited: *See—*
Donovan, John A., 4,634,149, Cl. 283-102.000.

Donat Flamand Inc.: *See—*
Giguere, Jean-Paul, 4,633,616, Cl. 49-425.000.
Donnerdal, Jan O.: *See—*
Andreasson, Bo C.; Donnerdal, Jan O.; and Aronsson, Tore A., 4,633,832, Cl. 123-335.000.
Donovan, James G.; and Wittemen, Charles O., to Avco Corporation. Positioning device. 4,633,920, Cl. 140-105.000.
Donovan, John A., to Don Marketing Management Limited. Label. 4,634,149, Cl. 283-102.000.
Donovan, William J.: *See—*
Kausek, James H.; Klugman, Alfred; and Donovan, William J., 4,633,867, Cl. 128-80.00C.
Doran Brothers Inc.: *See—*
Butterly, Edward R., Jr.; and Stoppel, Doyle E., 4,634,333, Cl. 414-331.000.
Dorman, Linneaus C.; and Meyers, Paul A., to Dow Chemical Company, The. Process for the preparation of hard tissue prosthetics. 4,634,720, Cl. 521-63.000.
Doubrava KG: *See—*
Heinbuchner, Johann, 4,633,641, Cl. 52-747.000.
Doumoto, Yasuo: *See—*
Naruahima, Tsugio; Arai, Tsutomu; and Doumoto, Yasuo, 4,634,304, Cl. 400-691.000.
Dover Corporation: *See—*
Hamman, Reed K., 4,634,337, Cl. 414-563.000.
Dow Chemical Company, The: *See—*
Behrens, Hugh C., 4,633,930, Cl. 164-66.100.
Dorman, Linneaus C.; and Meyers, Paul A., 4,634,720, Cl. 521-63.000.
Novak, Leo R.; and Milligan, Dennis J., 4,634,506, Cl. 204-80.000.
Prier, Donald G., 4,634,743, Cl. 525-462.000.
Wang, Pen-Chung, 4,634,787, Cl. 556-470.000.
Dow Corning Corporation: *See—*
Bauman, Therese M.; and Freiberg, Alan L., 4,634,733, Cl. 524-859.000.
Dowell Schlumberger Incorporated: *See—*
Crowe, Curtis W., 4,633,949, Cl. 166-279.000.
Downey, Raymond E., to Goodyear Tire & Rubber Company, The. Photocurable polyvinyl chloride composition. 4,634,562, Cl. 264-22.000.
Doyle, Keith G.; and Lloyd, Roy A., to Lloyd Doyle Limited. Method and apparatus for inspecting printed wiring boards. 4,635,289, Cl. 382-8.000.
Doyle, Thomas B.: *See—*
Hoehn, Robert A.; and Doyle, Thomas B., 4,633,784, Cl. 104-162.000.
Drake, Charles A.; and Reiter, Stephen E., to Phillips Petroleum Co. Process for the production of allyl acetate. 4,634,794, Cl. 560-245.000.
Drent, Eit, to Shell Oil Company. Process for the dimerization of olefins. 4,634,793, Cl. 560-243.000.
Dresser Industries, Inc.: *See—*
Cameron, Thomas M.; and Betlinski, Glenn M., 4,634,346, Cl. 416-247.00R.
Dressler, Helmut; Engenhart, Peter; Jahnel, Klaus; Kochendorfer, Heinrich; Kuhn, Ulrich; Matthas, Karl H.; and Schuster, Kurt, to Robert Bosch GmbH. Headlight for motor vehicles. 4,635,173, Cl. 362-294.000.
Drexler Technology Corporation: *See—*
Pierce, Gerald A.; and Buxton, James L., 4,634,850, Cl. 235-487.000.
Dreyer, John F., Jr., to Minnesota Mining and Manufacturing Company. Automatic focus for overhead projector. 4,634,246, Cl. 353-91.000.
DuBrucq, Denyse C.; and Kondracki, Henry C. Electronic temperature probe. 4,633,885, Cl. 128-736.000.
Duchin, Daniel, to Monarch Marking Systems, Inc. Tag dispensing and attaching apparatus. 4,634,036, Cl. 227-67.000.
Duda, Henry J. Flexible hinge rain sealing mechanism. 4,634,172, Cl. 296-163.000.
Dudley Industries Limited: *See—*
Fielding, Robert M. G., 4,634,192, Cl. 312-37.000.
Dudley, Wayne C., to Top-Air Manufacturing, Inc. Break away joint boom assembly. 4,634,051, Cl. 239-168.000.
Dugdale, Marion: *See—*
Laszlo, Andrew; Quintana, Ronald P.; Dugdale, Marion; and Johnson, Randy W., 4,634,709, Cl. 514-316.000.
Duke University: *See—*
Riederer, Stephen J.; and Lee, James N., 4,634,979, Cl. 324-307.000.
Dumbaugh, William H., Jr., to Corning Glass Works. Barium and/or strontium aluminosilicate crystal-containing glasses for flat panel display devices. 4,634,683, Cl. 501-32.000.
Dumbaugh, William H., Jr., to Corning Glass Works. Strontium aluminosilicate glass substrates for flat panel display devices. 4,634,684, Cl. 501-69.000.
Dumican, Barry L.; Kaganov, Alan L.; and Ritter, Thomas A., to American Cyanamid Company. Surgical repair mesh. 4,633,873, Cl. 128-334.00R.
Dunkerly, Cedric A., II: *See—*
Manning, James H.; and Dunkerly, Cedric A., II, 4,634,621, Cl. 428-110.000.
Dunski, Neil; Bazzi, Ali A.; and Buehler, Henry J., to Mallinckrodt, Inc. Polyol carboxyalkylthioalkanoamidophenol compounds and organic material stabilized therewith. 4,634,728, Cl. 524-219.000.
du Plessis, Gysbert J., to Rotaque (Proprietary) Limited. Hoppers and bogies. 4,633,785, Cl. 105-176.000.
Dupommier, Jean M., to Goodyear Tire & Rubber Company, The. Device for transferring a tire carcass band. 4,634,489, Cl. 156-403.000.
Du Pont de Nemours, E. I., and Company: *See—*
Franklin, John S., 4,634,625, Cl. 428-258.000.
Holman, Bruce, III, 4,634,657, Cl. 430-281.000.
Johnson, Van B.; and Adolphson, Douglas G., 4,634,658, Cl. 430-291.000.
Paulson, Charles M., Jr., 4,634,280, Cl. 356-385.000.
Swartling, Lennart G., 4,634,025, Cl. 222-161.000.
Vassilatos, George, 4,634,739, Cl. 525-240.000.
Durand, Charles A.; and Gadsby, Larry R., to Electronic Processors, Inc. Cartridge loading and ejecting mechanism for use in a tape transport system. 4,635,147, Cl. 360-93.000.
Dutkewych, Oleh B.: *See—*
Gulla, Michael; Dutkewych, Oleh B.; and Bladon, John J., 4,634,468, Cl. 106-1.110.
Duval Corporation: *See—*
Ochs, Leonard R., 4,634,467, Cl. 75-117.000.
Duvdevani, Ilan; Wagensommer, Joseph; and Agarwal, Pawan K., to Exxon Research and Engineering Company. Novel interpolymer complexes of sulfonated- octene-1 copolymer. 4,634,542, Cl. 252-47.500.
Dvorsky, James E.; Kelley, Brian A.; McCown, Robert B.; and Renner, G. Frederick, to Battelle Memorial Institute. Active multi-layer piezoelectric tactile sensor apparatus and method. 4,634,917, Cl. 310-328.000.
Dybel, Frank R.; and Dybel, William P. Load monitoring system for progressive dies. 4,633,720, Cl. 73-862.530.
Dybel, William P.: *See—*
Dybel, Frank R.; and Dybel, William P., 4,633,720, Cl. 73-862.530.
Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Jungwirth, Dieter; Thielen, Gerd; and Langwadt, Otmar, 4,633,540, Cl. 14-22.000.
Dynacast International Limited: *See—*
Ferguson, James M., 4,633,932, Cl. 164-131.000.
Dynapac AB: *See—*
Persson, Gert, 4,634,188, Cl. 299-39.000.
Dzuik, Peter, to J.S. Staedtler, Firma. Writing point for writing or recording instruments and process for its manufacture. 4,634,306, Cl. 401-215.000.
Earthship Enterprise, Inc.: *See—*
Britz, Richard D., 4,633,629, Cl. 52-169.110.
Eastern Company, The: *See—*
Wolnik, Stanley C.; Laabs, Timothy P.; and Schulz, Richard H., Jr., 4,633,689, Cl. 70-379.00R.
Eastman, James E., to A. E. Staley Manufacturing Company. Cold water swelling starch composition. 4,634,596, Cl. 426-578.000.
Eastman Kodak Company: *See—*
Cavallaro, Anthony, 4,634,661, Cl. 430-567.000.
Detty, Michael R.; Murray, Bruce J.; and Scozzafava, Michael, 4,634,553, Cl. 540-1.000.
Hopfner, Clemens, 4,634,221, Cl. 350-255.000.
Jacobs, Michael E., 4,633,807, Cl. 118-657.000.
Pike, Susan C., 4,634,286, Cl. 366-320.000.
Singer, Stephen P., 4,634,654, Cl. 430-223.000.
Eastman, Winthrop A.; and Gale, John A., to Mobion, Inc. Floating calf feeder for feeding calves. 4,633,814, Cl. 119-71.000.
Eaton Corporation: *See—*
Benjamin, James A.; Lade, Robert W.; and Schutten, Herman P., 4,635,084, Cl. 357-22.000.
Buente, Stephen M., 4,633,827, Cl. 123-90.550.
Gindy, Sherif S.; and Tremonti, Ronald R., 4,635,025, Cl. 338-5.000.
Light, Gerard M., 4,633,988, Cl. 192-58.00B.
Light, Gerard M., 4,633,994, Cl. 192-58.00B.
Magill, Edward G., 4,635,007, Cl. 333-153.000.
Ebata, Yasuo, to Kabushiki Kaisha Toshiba. Surface acoustic wave resonator. 4,635,009, Cl. 333-195.000.
Eberhardt, H. Alfred, to Hale Fire Pump Company. Fluid proportioning apparatus. 4,633,895, Cl. 137-98.000.
Ebisaka, Toshinobu, to Mitsubishi Denki Kabushiki Kaisha. Generator protecting relay. 4,635,157, Cl. 361-20.000.
ebm Elektrobau Mulfingen GmbH & Co.: *See—*
Sturm, Gerhard, 4,634,908, Cl. 310-64.000.
Eccleston, Larry; Cook, James C., II; and Goodrich, Earl R., II, to Progressive Dynamics, Inc. Method and apparatus for producing electromagnetic surveillance fields. 4,634,975, Cl. 324-232.000.
Eckels, Stanley: *See—*
Triporo, Pedro R.; and Eckels, Stanley, 4,634,365, Cl. 425-398.000.
Eckert, Alton B.: *See—*
Jones, Howell A.; Soderberg, John H.; Eckert, Alton B.; and Nambudiri, Easwaran C. N., 4,635,204, Cl. 364-464.000.
Eckert, Alton B., Jr.; Kirschner, Wallace; and Salazar, Edilberto I., to Pitney Bowes Inc. Microprocessor controlled d.c. motor for indexing postage value changing means. 4,635,205, Cl. 364-464.000.
Eckert, Charles E., to Aluminum Company of America. Fluid flow control process. 4,634,559, Cl. 261-76.000.
Eckert, Charles E., to Aluminum Company of America. Aspirator pump and metering device. 4,634,560, Cl. 261-76.000.
Eckert, Karlheinz: *See—*
Beyer, Hans-Hermann; Diehl, Walter; Eckert, Karlheinz; Eiermann, Kurt; and Ringelstein, Hans-Martin, 4,634,383, Cl. 433-226.000.
Eckert, Robert L.; and Gorrell, Walter T. Bobbin and method of winding said bobbin. 4,634,076, Cl. 242-118.700.

Eckhart, Charles G.: *See—*
Jenkins, John K.; Chiu, John S.; Eckhart, Charles G.; McNamara, Paul E.; Rosenhouse, Stanley; and Youngstrom, Richard E., 4,634,556, Cl. 540-310.000.
Eckle, Otto; and Roser, Walter, to Komet Stahlhalter-und Werkzeugfabrik Robert Bruening GmbH. Tool holder with radial adjustment means for a tool, in particular a rotary tool. 4,634,324, Cl. 409-209.000.
Ede, Michael: *See—*
Andrews, Donald R., 4,635,042, Cl. 340-605.000.
Edholm, Thomas; and Stahl, Ulf, to Kamas Industri AB. Arrangement in machines for separating materials having different aerodynamic properties. 4,634,522, Cl. 209-154.000.
Edlin, George R.; and Snead, Robert A., to United States of America, Army. Time varying magnetic field safety probe. 4,634,969, Cl. 324-95.000.
Edmunds, Raymond S. Apparatus and method for extruding and packaging portions of extrudable, form retaining products. 4,633,651, Cl. 53-435.000.
Edward Weck & Company, Inc.: *See—*
O'Harra, Dale G., II, 4,635,265, Cl. 372-25.000.
Edwards, Christopher J.; George, Robert D.; and Sherlock, Paul, to Sherwood Medical Company. Anti-reflux drain tube and drainage meter combination. 4,633,887, Cl. 128-762.000.
Edwards, Douglas F., to J. B. Foote Foundry Co., The. Simplified disc brake. 4,633,979, Cl. 188-72.700.
Effenberger, Leo T. Actuator mount for valves. 4,633,897, Cl. 137-315.000.
Egami, Tsuneyuki; Saito, Tsutomu; Kohama, Tokio; Saito, Kimitaka; Sato, Kunihiko; and Takahashi, Hiroshi, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. System for controlling air-fuel ratio in an internal combustion engine. 4,635,200, Cl. 364-431.050.
Egami, Tsuneyuki: *See—*
Saito, Tsutomu; Egami, Tsuneyuki; Kohama, Tokio; Saito, Kimitaka; Takahashi, Hiroshi; and Sato, Kunihiko, 4,633,840, Cl. 123-489.000.
Egbers, Gerhard: *See—*
Artzt, Peter; Egbers, Gerhard; and Rottmayr, Hans, 4,633,660, Cl. 57-263.000.
Eggert, Walter S., Jr.: *See—*
Freeman, Richard B.; and Eggert, Walter S., Jr., 4,633,626, Cl. 52-71.000.
Eguchi, Hirotugu, to Nippon Electric Co., Ltd. High speed-low power consuming IGFET integrated circuit. 4,635,088, Cl. 357-41.000.
Ehlert, Klaus-Peter; Kubon, Achim; and Voss-Spilker, Peter, to Mannesmann Aktiengesellschaft. Horizontal continuous casting method. 4,633,934, Cl. 164-484.000.
Ehnstrom, Lars, to Alfa-Laval AB. Outlet arrangement for a centrifugal separator. 4,634,416, Cl. 494-27.000.
Ehrenfreund, Josef; Fory, Werner; Meyer, Willy; and Topfl, Werner, to Ciba-Geigy Corporation. Fused N-phenylsulfonyl-N'-pyrimidinylureas and N-phenylsulfonyl-N'triazinylureas. 4,634,465, Cl. 71-91.000.
Ehrig, Raymond J.; and Godfrey, John J., to United States Steel Corporation. Terpolymer production. 4,634,745, Cl. 526-87.000.
Ehring, Carolyn C., to Cairns & Brother, Inc. Multilayered protective trouser assembly. 4,633,527, Cl. 2-2.000.
Eibofner, Eugen: *See—*
Moesle, Walter; and Eibofner, Eugen, 4,634,376, Cl. 433-29.000.
Eiermann, Kurt: *See—*
Beyer, Hans-Hermann; Diehl, Walter; Eckert, Karlheinz; Eiermann, Kurt; and Ringelstein, Hans-Martin, 4,634,383, Cl. 433-226.000.
Eikmeyer, Peter, to Feldmuehle Aktiengesellschaft. Apparatus for the inspection of continuous sheets of material. 4,634,281, Cl. 356-431.000.
Einlehner, Hans. Abrasion testing apparatus. 4,633,701, Cl. 73-7.000.
Eldec Corporation: *See—*
Carsten, Bruce W., 4,635,179, Cl. 363-70.000.
Electra Form, Inc.: *See—*
Brun, Philip L.; and Bright, Stephen A., 4,634,366, Cl. 425-526.000.
Electronic Processors, Inc.: *See—*
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Elektro-Thermit GmbH: *See—*
Kempa, Bernd-Joachim, 4,634,087, Cl. 246-430.000.
Elektroschmelzwerk Kempten GmbH: *See—*
Hunold, Klaus; Lipp, Alfred; and Reinmuth, Klaus, 4,634,640, Cl. 423-704.000.
Elliott, Arthur J., to Halocarbon Products Corporation. Coupling of chloroperfluoroalkanes. 4,634,797, Cl. 570-171.000.
Elliott, John D.; and King, Steven P., to Foster Wheeler Energy Corporation. Method of quenching heated coke to limit coke drum stress. 4,634,500, Cl. 201-39.000.
Ellis, Darwin L.; and Kelly, Frank M., to Aluminum Company of America. Capping head. 4,633,646, Cl. 53-331.500.
Elsom, Simon M.: *See—*
Chorley, Bernard J.; Parkin, Graeme I. P.; Wichmann, Brian A.; and Elsom, Simon M., 4,634,807, Cl. 178-22.080.
Emerson Electric Co.: *See—*
Stanek, Terrence L.; and Lathrop, David R., 4,634,345, Cl. 416-244.00R.
Emery, Walter C.: *See—*
Persem, Jake; Quinn, Mike; Emery, Walter C.; and Bracht, Philip E., 4,633,672, Cl. 62-126.000.
Empak Inc.: *See—*
Mortensen, Roger L., 4,634,004, Cl. 206-387.000.
Enaka, Nobuhiro, to Shimizu Construction Co., Ltd. Illumination apparatus. 4,635,169, Cl. 362-147.000.
Endo, Akira: *See—*
Tsujii, Fumio; Matsuoka, Yoji; Endo, Akira; Takezaki, Jiro; and Shirai, Hiroshi, 4,635,202, Cl. 364-449.000.
Endo, Hiroshi, to Nissan Motor Company, Limited. Optical radar system with an array of photoelectric sensors. 4,634,272, Cl. 356-5.000.
ENFO Grundlagenforschungs AG: *See—*
Simson, Dionizy, 4,633,903, Cl. 137-624.130.
Engenhart, Peter: *See—*
Dressler, Helmut; Engenhart, Peter; Jahnel, Klaus; Kocheadorfer, Heinrich; Kuhn, Ulrich; Matthas, Karl H.; and Schuster, Kurt, 4,635,173, Cl. 362-294.000.
Engle, Elbert, to Chesebrough-Pond's Inc. Apparatus for sewing a curved seam. 4,633,793, Cl. 112-121.110.
Engleman, Edgar G.; Foung, Steven K. H.; and Grumet, F. Carl, to Leland Stanford Junior University, The Board of Trustees of the. Human-murine hybridoma fusion partner. 4,634,666, Cl. 435-68.000.
Entrikin, Raymond A., to Epworth Manufacturing Co., Inc. Mechanical seal. 4,634,134, Cl. 277-12.000.
Entringer, David C.; and Nelsen, Gerald F., to Brunswick Corporation. Engine coupler for stern drive. 4,634,391, Cl. 440-75.000.
Epis S.A.: *See—*
Bar-Tana, Jacob, 4,634,795, Cl. 562-590.000.
Eptaminitakis, Yannis, to Vickers Public Limited Company. Vessel having demountable submerged propeller unit. 4,634,389, Cl. 440-53.000.
Epworth Manufacturing Co., Inc.: *See—*
Entrikin, Raymond A., 4,634,134, Cl. 277-12.000.
Era, Susumu: *See—*
Iwasaki, Kishiro; Era, Susumu; Yokokura, Hisao; Nakata, Tadao; and Mukoh, Akio, 4,634,228, Cl. 350-341.000.
Erb, Fred; and Orosz, Miklos J., to Square D Company. Contactor having a Z-shaped current path for blow-out force reduction. 4,635,014, Cl. 335-195.000.
Erhardt, Manfred; Loos, Herbert; and Reichert, Gerhard, to Carl Hurth Maschinen-und Zahnradfabrik GmbH & Co. Apparatus for the manufacture or machining of gears by rolling on a tool having abrasive working surfaces. 4,633,619, Cl. 51-105.0GG.
Erickson, Bruce W.; Fok, Kam-Fook; Incefy, Genevieve S.; and Ohga, Kazuhiro, to Sloan-Kettering Institute for Cancer. Radioimmunoassays for the serum thymic factor (FTS). 4,634,682, Cl. 436-518.000.
Eriksson, Karl E. S. Tool handle with eccentric tool gripping assembly. 4,633,552, Cl. 29-80.000.
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Favreau, Michel, to Thomson CSF. Large screen video display comprising a matrix array of cathode-ray tubes operated at increased vertical and horizontal scan rates. 4,635,105, Cl. 358-67.000.

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Knapp, John F.; and Gruber, Robert J., 4,634,649, Cl. 430-109.000.

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Pommer, Karl E., II, 4,634,814, Cl. 379-377.000.

GTE Government Systems Corporation: *See*—
O'Connor, Michael; Jackson, Randall L.; and Marple, David P., 4,635,217, Cl. 364-574.000.

GTE Laboratories Incorporated: *See*—
Buhrer, Carl F., 4,634,239, Cl. 350-486.000.

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Jacquot, Jean-Paul; and Guillery, Patriok, 4,634,570, Cl. 376-247.000.

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Haddox, Mark L., to Jodon Engineering Associates, Inc. Method and apparatus for measuring engine compression ratio, clearance volume and related cylinder parameters. 4,633,707, Cl. 73-47.000.

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Hagenbach, Alexander; Seiler, Max P.; and Wuthrich, Hans J., to Sandoz Ltd. Indolophenanthridines useful as dopaminergic and analgesic agents. 4,634,708, Cl. 514-280.000.

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Hahn, Norbert; and Olson, Arthur A., Jr., to Rite-Hite Corporation. Vehicle restraint. 4,634,334, Cl. 414-401.000.

Hailey, Robert W. Heating and handling system for metal consolidation process. 4,634,375, Cl. 432-121.000.

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Baron, Donna M.; Espenlaub, David E.; Haines, Vicki A.; Inberg, Gerald A.; Shilling, Steve A.; Truesdale, James B.; and Willett, Robert J., 4,635,187, Cl. 364-200.000.

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Dhingra, Om P.; Franz, John E.; and Hakes, Harrison R., 4,634,788, Cl. 558-145.000.

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Bantel, Thomas E.; Lahrman, David F.; and Halase, John F., III, 4,634,291, Cl. 374-7.000.

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Hall, Roger E. Locator plug for baseball base. 4,634,120, Cl. 273-25.000.

Hallgren, John E.; and Brezniak, Diane V., to General Electric Company. Method for making norbornane anhydride substituted polyorganosiloxane. 4,634,755, Cl. 528-23.000.

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Ringgenberg, Paul D., 4,633,952, Cl. 166-336.000.
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Zunkel, Gary D., 4,633,943, Cl. 166-51.000.
Zunkel, Gary D.; and Bolin, Michael L., 4,633,944, Cl. 166-51.000.

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Elliott, Arthur J., 4,634,797, Cl. 570-171.000.

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Inukai, Kazuo; and Haluyama, Takeshi, 4,635,033, Cl. 340-52.00F.

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Hamamoto, Takashi: *See*—
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Tuchman, Michael, 4,633,906, Cl. 137-625.170.

Hambrecht, Juergen; Schmitt, Burghard; Swoboda, Johann; Wassmuth, Georg; Bernhard, Claus; and Stephan, Rudolf, to BASF Aktiengesellschaft. Thermoplastic molding material. 4,634,734, Cl. 525-85.000.

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LeBlond, Charles E.; and LeBlond, Henri, 4,634,189, Cl. 301-63.0PW.

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Aiello, Giovanni; and Hamelin, Jean-Pierre, 4,634,860, Cl. 250-231.0SE.

Hamilton, James M.: *See*—
Woods, Lonnie K.; and Hamilton, James M., 4,634,142, Cl. 280-707.000.

Hamilton, Ray V. Portable hot air circulator. 4,633,851, Cl. 126-110.0AA.

Hamm, David A.: *See*—
Haun, Edward C.; and Hamm, David A., 4,634,799, Cl. 585-415.000.

Hamman, Reed K., to Dover Corporation. Integrated wheel lift wrecker. 4,634,337, Cl. 414-563.000.

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Hancock, Kendal, to Texas Recreation Corporation. Method of making a composite foamed resin ski. 4,634,563, Cl. 264-46.700.

Hanks, James V.; Raines, Charles D.; and Dayen, Leonid, to Horton Manufacturing Co., Inc. Coupling clutch having axially captured, rotatable housing. 4,633,991, Cl. 192-85.0CA.

Hanna, Timothy D.: *See*—
Hardesty, Dennis L.; Hanna, Timothy D.; Wendt, Frank J.; and White, Kendall D., Jr., 4,634,498, Cl. 162-13.000.

Hannula, Donald L.; and Coe, Frederick L., to American Hospital Supply Company. Implantable demand medication delivery assembly. 4,634,427, Cl. 604-93.000.

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Nelson, David L.; Truskolaski, Bernard S.; and Hansen, Paul E., 4,634,612, Cl. 428-4.000.

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Happycard International Limited: *See*—
Ostermeier, Heinrich, 4,634,248, Cl. 354-75.000.

Hara, Tadayuki, to Mitsubishi Denki Kabushiki Kaisha. Electromagnetic solenoid device for oil pressure control. 4,634,096, Cl. 251-129.150.

Harada, Hisashi: *See*—
Uzaki, Nagato; Itoh, Shigeru; Kanayama, Ryoji; Harada, Hisashi; and Kawamura, Yasutaro, 4,633,928, Cl. 164-19.000.

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Matsuda, Tadahito; Harada, Katsuhiro; Moriya, Shigeru; and Ishii, Tetsuyoshi, 4,634,645, Cl. 430-30.000.

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Hayashimoto, Yoshiaki; Tanuma, Chiaki; Yokoyama, Katsunori; and Harada, Nozomu, 4,634,884, Cl. 250-578.000.

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Salstrom, John S.; Newman, Dawn; Harbrecht, Douglas F.; and Hu, Shiu-Lok, 4,634,678, Cl. 435-317.000.

Hardesty, Dennis L.; Hanna, Timothy D.; Wendt, Frank J.; and White, Kendall D., Jr., to United States Gypsum Company. Method for the production of high density fiberboard. 4,634,498, Cl. 162-13.000.

Hardman, Ronald P. Universal toilet tank shut-off assembly. 4,633,534, Cl. 4-412.000.

Hardy, Frederick E.: *See*—
Burns, Michael E.; and Hardy, Frederick E., 4,634,551, Cl. 252-102.000.

Hardy, Gilbert F. Spring loop key holder. 4,633,691, Cl. 70-456.00B.

Harer, Helmut: *See*—
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Hargrove, Homer G.; Kratz, Jay L.; Sabatino, Raymond A.; and Weyant, Perry A., to Westinghouse Electric Corp. Process for restricted lead content soldering of copper fins to copper alloy tubing with controlled copper contamination of the molten solder reservoir. 4,634,044, Cl. 228-183.000.

Haroutel, Jean-Claude; and Galceran, Christian, to Societe Anonyme dite: SMH ALCATEL. Device for inserting bundles into envelopes. 4,633,644, Cl. 53-258.000.

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Julich, Paul M.; and Pearce, Jeffrey B., 4,634,110, Cl. 371-11.000.
Smith, Donald E.; and Roberts, Richard D., 4,635,280, Cl. 375-120.000.

Harrison, Christopher R. B., to Wilkinson Sword Limited of Sword House. Spring-biased garden pruners. 4,633,587, Cl. 30-261.000.

Hart, James E. Underwater signalling device. 4,635,242, Cl. 367-134.000.

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Harting, Dietmar; Nagel, Hans; and Piewitt, Gunter, 4,634,206, Cl. 339-103.00M.

Hartmann, Achim; and Schonherr, Dietrich W., to Kronos Titan-GmbH. Method for the cooling of hot gaseous solids suspensions of titanium dioxide. 4,633,935, Cl. 165-1.000.

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Schulze, Eckehart, 4,633,759, Cl. 91-368.000.

Harumi, Fujio: *See*—
Takebayashi, Hiroaki; Harumi, Fujio; Nakamura, Kiyoshi; and Inoue, Koichi, 4,634,300, Cl. 384-548.000.

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Griffiths, Thomas W.; and Suris, Vladimir, 4,634,817, Cl. 191-67.000.

Harvey, John D.; and Gindre, Andre V., to Goodyear Tire & Rubber Company, The. Crack resistant coating for masonry structures. 4,634,724, Cl. 523-219.000.

Harvey, Roy L.; and Mason, Douglas, to American District Telegraph Company. Multimode programmable stand-alone access control system. 4,634,846, Cl. 235-382.000.

Harvilchuck, Joseph M.: *See*—
Ainslie, Norman G.; Harvilchuck, Joseph M.; Interrante, Mario J.; King, William J., Jr.; Palmateer, Paul H.; and Sullivan, John F., 4,634,638, Cl. 428-671.000.

Harwood, Leopold A.; and Law, Kirk A., to RCA Corporation. Duration-sensitive digital signal gate. 4,634,984, Cl. 328-112.000.

Hasegawa, Akira, to Toyota Jidosha Kabushiki Kaisha. Power steering apparatus. 4,633,963, Cl. 180-143.000.

Hasegawa, Kenichi: *See*—
Mori, Toshiki; Yamada, Haruyasu; Hasegawa, Kenichi; and Aono, Kunitoshi, 4,635,231, Cl. 365-190.000.
Mori, Toshiki; Yamada, Haruyasu; Hasegawa, Kenichi; and Aono, Kunitoshi, 4,635,292, Cl. 382-41.000.

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Fish, Gordon E.; Hasegawa, Ryusuke; and Buff, Ernest D., 4,634,462, Cl. 65-29.000.

Hasenwinkle, Earl D.; Wislocker, Frank; and Blickenderfer, Charles, to Weyerhaeuser Company. Variable curve linebar. 4,633,924, Cl. 144-242.00E.

Hashimoto, Nobuyuki; and Nishio, Shigeru, to Aisin Seiki Kabushiki Kaisha. Air lumbar support device. 4,634,179, Cl. 297-284.000.

Haskell, Weston W.; and Ngan, Danny Y., to Shell Oil Company. Slurry treatment of a gas oil or kerosene feed stock for a steam cracking procedure. 4,634,516, Cl. 208-91.000.

Hasse, Erich, to ASCA Equipamentos Industriais LTDA. Low-profile encapsulated diaphragm valve for the thermal control of condensate water drainage. 4,634,048, Cl. 236-58.000.

Hasstedt, Kenneth L. Vehicle seat. 4,634,169, Cl. 296-65.00A.

Hastings, John D.; and Siemer, Dennis K., to Johnson Fishing Inc. Cyclic speed motor control circuit. 4,634,944, Cl. 318-443.000.

Hatanaka, Katsunori; Kuroda, Yasuo; and Uzawa, Shunichi, to Canon Kabushiki Kaisha. Photoelectric imager with a high S/N ratio. 4,634,886, Cl. 250-578.000.

Hatazawa, Kikuo, to Hitachi, Ltd. Method for generating a rotated print pattern. 4,635,212, Cl. 364-518.000.

Hatteland, Kjell: *See*—
Benestad, Otto; Hatteland, Kjell; and Fredriksen, Paul, 4,635,237, Cl. 367-20.000.

Hattori, Masaichi; Hanaki, Akira; and Kihira, Kouichi, to Kabushiki-Kaisha Tokai Rika Denki Seisakusho. Manually operated mode-selecting valve device. 4,633,908, Cl. 137-637.100.

Hattori, Shintaroo: *See*—
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Taguchi, Takasi; Ueno, Yoshiki; and Hattori, Tadashi, 4,634,242, Cl. 350-588.000.

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Kasai, Hitoshi; Asagi, Yasuyoshi; Hattori, Toshihiro; Saito, Hideo; and Shishido, Katsuya, 4,635,214, Cl. 364-551.000.

Haugland, Steve E., to Storage Technology Corporation. Amplitude sensor with adaptive threshold generation. 4,635,142, Cl. 360-46.000.

Haun, Edward C.; and Hamm, David A., to UOP Inc. Product recovery method for dehydrocyclodimerization process. 4,634,799, Cl. 585-415.000.

Hauni-Werke Korber & Co. KG.: *See*—
Hinzmann, Alfred, 4,633,923, Cl. 141-116.000.

Haury, Andre : *See*—
Belbel, Elie; Baron, Thierry; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,635,022, Cl. 337-158.000.

Haus, Thomas A. J.: *See*—
de Groot, Jacob; and Haus, Thomas A. J., 4,635,018, Cl. 336-178.000.

Hausdorfer, Michael, to Robert Bosch GmbH. Method and system for interference suppression in a color television system. 4,635,104, Cl. 358-31.000.

Hauser, Hugo, to Tritec Industries, Inc. External bottle cap. 4,634,029, Cl. 222-567.000.

Haverdink, Virgil D.: *See*—
Lindstrom, Harold R.; and Haverdink, Virgil D., 4,633,791, Cl. 111-86.000.

Havstad, Harold R., to Hudson Oxygen Therapy Sales Company. Percussor subassembly for generating gas bursts. 4,633,856, Cl. 128-40.000.

Hawk, Woodrow D.: *See*—
Dixon, Glen A.; McCloskey, Clark E.; Chambers, David L.; Hawk, Woodrow D.; and McCracken, Oliver W., 4,633,954, Cl. 166-372.000.

Hawkins, David E. Arm wrestling and curling machine apparatus. 4,634,115, Cl. 272-67.000.

Hawkins, Ralph G.; and Fields, George, Jr., to General Electric Company. Range oven vent system. 4,633,850, Cl. 126-21.00R.

Haworth, Inc.: *See*—
Kortering, Randall L.; and Berry, Gordon C., 4,633,789, Cl. 108-152.000.

Hay, John; Smith, Leonard I.; and Foster, George E., to Norton Company. Ceramic bonded grinding wheel. 4,634,453, Cl. 51-293.000.

Hayakawa, Kiyonori: *See*—
Shimamura, Toshiki; and Hayakawa, Kiyonori, 4,635,153, Cl. 360-125.000.

Hayashi, Yoshikatsu: *See*—
Ohashi, Azusa; Shirai, Akira; Sakaki, Hirokazu; Tanabe, Zenichi; Tsuchida, Shin; and Hayashi, Yoshikatsu, 4,634,656, Cl. 430-278.000.

Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Cooling system for automotive engine or the like. 4,633,822, Cl. 123-41.210.

Hayashi, Yuji: *See*—
Kamide, Noboru; Hijikata, Hiroshi; Tokudome, Katsumi; Ishikawa, Michio; and Hayashi, Yuji, 4,635,272, Cl. 372-87.000.

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Hayes-Pankhurst, Richard P.; and Smith, Brian D., to NPM International. Switches and keyboards. 4,634,818, Cl. 200-5.00A.

Hazebrook, Daniel W., to GKN Automotive Components Inc. Universal joint capable of accommodating thrust loads. 4,634,402, Cl. 464-141.000.

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Hazeltine Corporation: *See*—
Wheeler, Harold A.; and Friedman, Clifford H., 4,635,068, Cl. 343-749.000.

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Shim, Kyung S.; Toy, Arthur D. F.; and Heather, James B., 4,634,771, Cl. 546-286.000.

Heberlein Hispano S.A.: *See*—
Vignon, Louis, 4,633,663, Cl. 57-340.000.

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Gardziella, Arno; Kwasniok, Alois; Heerdegen, Harald; and Janocha, Gerhard, 4,634,723, Cl. 523-144.000.

Hegemann, Manfred, to Johnson & Johnson Products Inc. Valve for incontinent patients. 4,634,421, Cl. 604-34.000.

Hegner, Gunter: *See*—
Forberg, Horst; Hegner, Gunter; Achtnig, Peter; and Delakowitz, Bernd, 4,634,209, Cl. 339-147.00R.

Heider, Fritz: *See*—
Wagner, Ralf; Fischer, Horst; and Heider, Fritz, 4,634,323, Cl. 409-167.000.

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Amstutz, Hermann; Heimgartner, Dieter; Kaufmann, Meinolph; and Scheffer, Terry J., 4,634,229, Cl. 350-346.000.

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Helal, Basil H., to OEC Europe Limited. Joint prosthesis. 4,634,445, Cl. 623-21.000.

Heling, Dennis H.: *See*—
Zaveri, Vikram; Heling, Dennis H.; and Radyko, Keith S., 4,634,180, Cl. 297-341.000.

Helm, John R.: *See*—
Boden, Richard M.; and Helm, John R., 4,634,547, Cl. 252-522.00R.

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Bortolini, Edward J.; Helton, John S.; and Kohs, Dwight W., 4,635,249, Cl. 370-58.000.

Hemme, Juergen F.: *See*—
Groeneweg, Willem H.; and Hemme, Juergen F., 4,634,940, Cl. 315-408.000.

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Sustmann, Scarlet; and Marini, Ingo G., 4,634,438, Cl. 604-376.000.
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Feijen, Jan; and Hennink, Wilhelmus E., 4,634,762, Cl. 530-350.000.

Hens, Jozef F.: *See*—
Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef F.; and Van Offenwert, Theophilus T. J. M., 4,634,704, Cl. 514-253.000.

Hensen, Helmuth: *See*—
Kupper, Wilhelm; and Hensen, Helmuth, 4,634,065, Cl. 242-18.00R.

Hensley, Robert P., to Secom General Corp. Wire tap detection device. 4,634,813, Cl. 379-6.000.

Herchenbach, Horst: *See*—
Wolter, Albrecht; and Herchenbach, Horst, 4,634,583, Cl. 423-344.000.

Hercules Machinery Corporation: *See*—
Jinnings, John W.; and Jinnings, Orrin H., 4,634,311, Cl. 404-90.000.

Herko, Robert W., to Surefire, Inc. Windscreen for lighter jacket. 4,634,374, Cl. 431-146.000.

Herlein, Richard F., to Fairchild Semiconductor Corporation. Formatter for high speed test system. 4,635,256, Cl. 371-1.000.

Hernqvist, Karl G., to RCA Corporation. Electron gun having cylindrical focus lens. 4,634,924, Cl. 313-414.000.

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Hertel, Heinz E., to Bell & Howell Company. Light tight film cartridge with floating light seal. 4,634,071, Cl. 242-71.100.

Hertel, Richard J., to Varian Associates, Inc. Wafer transfer system. 4,634,331, Cl. 414-217.000.

Herzfeld, Ronald; Wydra, Karl; and Uebel, Alexander, to Knorr-Bremse Fluidics GmbH. Handle for a fluidic cleaning and/or massaging device. 4,634,053, Cl. 239-315.000.

Hessler, George W.: *See*—
Fabiny, Eugene S.; Hessler, George W.; and Bradel, John H., Jr., 4,634,609, Cl. 427-345.000.

Heubach, Frank: *See*—
Hoffman, Hans; and Heubach, Frank, 4,635,121, Cl. 358-188.000.

Hewlett-Packard Company: *See*—
Coleby, Stanley E.; and Forster, Michael H., 4,635,208, Cl. 364-491.000.
Crawford, Gregan F., 4,634,210, Cl. 339-176.0MP.
Hanson, Gary E., 4,635,073, Cl. 346-1.100.
Williamson, Donald A.; and Shelton, John F., 4,635,188, Cl. 364-200.000.

Hey, Heinz-Herbert, to C.E.M.A.N. Special-Container GmbH. Cargo carrier. 4,633,799, Cl. 114-72.000.

Heyneker, Herbert L.: *See*—
Goeddel, David V.; and Heyneker, Herbert L., 4,634,677, Cl. 435-317.000.

Heyraud, Marc A., to Asgalium S.A. Electromechanical transducer having a self-inductance cancelling coil assembly. 4,634,912, Cl. 310-268.000.

HGM, Incorporated: *See*—
Chaffee, Edwin G.; Holtman, Steve; Nelson, George A.; and Tanner, Howard M. C., 4,633,872, Cl. 128-303.100.

Hi-Ranger, Inc.: *See*—
Holmes, William K., 4,633,977, Cl. 187-9.00R.

Hicks, Jimmy L., to P & H Sales Co. Shopping cart friction wheel assembly. 4,633,544, Cl. 16-35.00R.

Hicks, John W., Jr., to Polaroid Corporation. Single material optical fiber and method. 4,634,218, Cl. 350-96.300.

Hida, Tsuneo: *See*—
Takemura, Shinji; Hida, Tsuneo; Matsuzaki, Yutaka; and Ohnishi, Kenichi, 4,634,945, Cl. 318-469.000.

Hidaka, Hiroyoshi; and Sone, Takanori, to Asahi Kasei Kogyo Kabushiki Kaisha; and Hidaka, Hiroyoshi. Isoquinolinesulfonamide derivatives. 4,634,770, Cl. 546-145.000.

Higuchi, Hisayuki: *See*—
Tamaki, Yoichi; Kure, Tokuo; Sato, Akira; and Higuchi, Hisayuki, 4,635,090, Cl. 357-50.000.

Higuchi, Megumu: *See*—
Nakata, Moritsune; Yanai, Tokiyoshi; Yamaguchi, Hirotsugu; Higuchi, Megumu; Aoyama, Yutaka; and Shibahata, Yasuji, 4,634,135, Cl. 280-90.000.

Hijikata, Hiroshi: *See*—
Kamide, Noboru; Hijikata, Hiroshi; Tokudome, Katsumi; Ishikawa, Michio; and Hayashi, Yuji, 4,635,272, Cl. 372-87.000.

Hijikigawa, Masaya: *See*—
Miyoshi, Shuji; and Hijikigawa, Masaya, 4,635,027, Cl. 338-34.000.

Hikawa, Tetsuo: *See*—
Taji, Satoru; Yoshida, Norio; and Hikawa, Tetsuo, 4,634,494, Cl. 156-628.000.

Hilker, Dieter: *See*—
Haas, Werner; Hilker, Dieter; and Slezak, Pavel J., 4,633,823, Cl. 123-41.610.

Hill, Gilman A.; Passamaneck, Richard S.; and Touryan, Kenell J., to Mt. Moriah Trust. Well treating method for stimulating recovery of fluids. 4,633,951, Cl. 166-308.000.

Hillenbrand, Bernhard; Huber, Wilhelm; Littwin, Burkhard; and Schuster, Karl, to Siemens Aktiengesellschaft. Gas-discharge display device with a post-acceleration section. 4,634,935, Cl. 315-169.400.

Himeno, Yoshiaki: *See*—
Matumura, Takeshi; and Himeno, Yoshiaki, 4,634,238, Cl. 350-432.000.

Hintz, Kenneth J., to United States of America, Navy. Apparatus for controlling multiple time-varying processes. 4,635,182, Cl. 364-138.000.

Hinzmann, Alfred, to Hauni-Werke Korber & Co. KG. Apparatus for filling ink cartridges. 4,633,923, Cl. 141-116.000.

Hipple, James H.; Smith, Don W.; and Reed, Neil E., to Babcock & Wilcox Company, The. Local display technique for fiber optic illuminator/hood system. 4,633,711, Cl. 73-293.000.

Hirai, Yutaka: *See*—
Munakata, Hirohide; Tomida, Yoshinori; Haruta, Masahiro; Hirai, Yutaka; Nishimura, Yukuo; and Hamamoto, Takashi, 4,634,628, Cl. 430-325.000.

Hirakawa, Shuji, to Kabushiki Kaisha Toshiba. Digital automatic video delay system. 4,635,100, Cl. 358-19.000.

Hiramatsu, Akira: *See*—
Mukoujima, Hitoshi; Hiramatsu, Akira; Murakami, Hiroyasu; and Katsuma, Makoto, 4,634,915, Cl. 310-323.000.
Suda, Yasuo; Ishizaki, Akira; Ohtaka, Keiji; Akashi, Akira; and Hiramatsu, Akira, 4,634,255, Cl. 354-406.000.

Hirano, Mutsuo. Audio-frequency electromechanical vibrator. 4,635,287, Cl. 381-194.000.

Hiraoka, Shinitiro: *See*—
Matsuda, Hideo; and Hiraoka, Shinitiro, 4,634,113, Cl. 271-259.000.

Hiratsuka, Tatsufumi: *See*—
Yamagishi, Naomichi; Mori, Kenji; Okumura, Tsuguo; Hiratsuka, Tatsufumi; and Sugiyama, Masayoshi, 4,634,840, Cl. 219-388.000.

Hirose, Koichi: *See*—
Nakagawa, Isao; Yamamoto, Akihiro; Hirose, Koichi; Okada, Yoshinori; and Kudo, Mitsuru, 4,634,995, Cl. 330-261.000.

Hirose, Masahiko: *See*—
Shiraishi, Yasuhisa; Fujita, Takashi; Ochi, Yoshiharu; Hirose, Masahiko; Ichihara, Katsutaros; and Ishigami, Takashi, 4,634,635, Cl. 428-446.000.

Hirose, Masataka; Ueno, Tsuyoshi; and Suzuki, Katsumi, to Kabushiki Kaisha Toshiba. Amorphous silicon film forming apparatus. 4,633,809, Cl. 118-719.000.

Hirota, Akira; and Tsushima, Takuya, to Victor Company of Japan, Ltd. Video signal delay circuit. 4,635,116, Cl. 358-160.000.

Hirota, Motoya: *See*—
Oguri, Hitoshi; and Hirota, Motoya, 4,634,492, Cl. 156-605.000.

Hishiki, Hideo; and Onodera, Shunji, to Victor Company of Japan, Ltd. High voltage DC generator with reduced ringing and voltage fluctuation. 4,635,176, Cl. 363-21.000.

Hitachi, Ltd.: *See*—
Hatazawa, Kikuo, 4,635,212, Cl. 364-518.000.
Isogai, Masato; Hattori, Shintaroo; Iwaskai, Kishiro; Mukoh, Akio; Umeda, Takao; and Nagae, Yoshiharu, 4,634,226, Cl. 350-332.000.
Iwasaki, Kishiro; Era, Susumu; Yokokura, Hisao; Nakata, Tadao; and Mukoh, Akio, 4,634,228, Cl. 350-341.000.
Kudo, Tetsuichi; Kawamura, Go; and Ishikawa, Akira, 4,634,585, Cl. 423-419.00R.
Matsumoto, Tetsuro; and Kajigaya, Kazuhiko, 4,635,233, Cl. 365-230.000.
Nakagawa, Isao; Yamamoto, Akihiro; Hirose, Koichi; Okada, Yoshinori; and Kudo, Mitsuru, 4,634,995, Cl. 330-261.000.
Shiohata, Kouki; Satoh, Kazuo; Ohmori, Motoji; Kikuchi, Katsuaki; and Kaneko, Ryoichi, 4,635,210, Cl. 364-508.000.
Tajima, Atsushi; Suzuki, Nobuo; and Kuse, Tsutomu, 4,634,624, Cl. 428-212.000.
Tamaki, Yoichi; Kure, Tokuo; Sato, Akira; and Higuchi, Hisayuki, 4,635,090, Cl. 357-50.000.
Taya, Shunroku; and Kozasa, Susumu, 4,634,931, Cl. 315-111.810.
Tokuyama, Keiichi; Naito, Shotaro; and Masuda, Mitsuhiro, 4,635,034, Cl. 340-52.00F.
Tsujii, Fumio; Matsuoka, Yoji; Endo, Akira; Takezaki, Jiro; and Shirai, Hiroshi, 4,635,202, Cl. 364-449.000.
Yabe, Hideaki; Oshima, Yoshio; Ishikawa, Sako; Ohtsuki, Toru; and Fukuta, Masaharu, 4,635,220, Cl. 364-763.000.
Yokoo, Sadao; Shimomura, Tadashi; Toriswa, Soichi; Dan, Masahiro; and Kaneda, Tsuyoshi, 4,634,270, Cl. 355-125.000.

Hitachi, Ltd: *See*—
Inoue, Yasuo; and Tadauchi, Masaharu, 4,634,885, Cl. 250-578.000.

Hitachi Microcomputer Engineering Ltd.: *See*—
Yokoo, Sadao; Shimomura, Tadashi; Toriswa, Soichi; Dan, Masahiro; and Kaneda, Tsuyoshi, 4,634,270, Cl. 355-125.000.

Hitson, Herbert A., to Monitor Manufacturing Company. Adjustable seat belt attachment for vans. 4,634,184, Cl. 297-468.000.

Hluchy, Heinz: *See*—
Korth, Knut; and Hluchy, Heinz, 4,633,860, Cl. 128-305.000.

Hockert, Eric N.; Orensteen, Bruce D.; Bradshaw, Thomas L.; and Borgeson, Frank A., to Minnesota Mining and Manufacturing Company. Directionally imaged sheeting. 4,634,220, Cl. 350-167.000.

Hodgson, Robert E.: *See*—
Jenkins, Kenneth L.; Suhaka, Stanley C.; Dolin, Rick L.; LaRoche, Allan R.; Hodgson, Robert E.; Such, Neil R.; Smith, Douglas D.; Newton, Frank R.; and Cunningham, Richard N., 4,634,622, Cl. 428-143.000.

Hoehn, Robert A.; and Doyle, Thomas B., to Lico, Inc. Clamping device for high speed indexing. 4,633,784, Cl. 104-162.000.

Hoelscher, Charles H.; and McBain, Douglas S., to PPG Industries, Inc. Method for preparing spiro(indoline)-type photochromic compounds. 4,634,767, Cl. 544-71.000.

Hoesch Aktiengesellschaft: *See*—
Bechem, Werner; Peters, Hubertus; Solbach, Werner; and Wolfhard, Dietrich, 4,634,504, Cl. 204-28.000.
Steinfeld, Horst E.; and Westerdorff, Gerd, 4,634,049, Cl. 228-44.000.

Hoff, Raymond E.: *See*—
Hwang, Yu-Tang; Pebsworth, Lloyd; Dombro, Robert A.; and Hoff, Raymond E., 4,634,744, Cl. 526-84.000.

Hoff, Stephen J., to Hoffco, Inc. Brake caliper includes mechanical actuator with camming device and manual wear compensator. 4,633,978, Cl. 188-71.700.

Hoffco, Inc.: *See*—
Hoff, Stephen J., 4,633,978, Cl. 188-71.700.

Hoffman, Hans; and Heubach, Frank, to U.S. Philips Corporation. Arrangement for the programmable control of a radio and/or television receiver. 4,635,121, Cl. 358-188.000.

Hoffmann-Glewe, Manfred; and Prause, Dieter, to Pfaff Haushaltmaschinen. Sewing machine material feeder. 4,633,796, Cl. 112-314.000.

Hoffmann-La Roche Inc.: *See*—
Fischli, Albert; Krasso, Anna; Ramuz, Henri; and Szente, Andre , 4,634,710, Cl. 514-338.000.
Holland, George W.; Maag, Hans; and Rosen, Perry, 4,634,782, Cl. 549-465.000.
Partridge, John J.; Shiuey, Shian-Jan; and Uskokovic, Milan R., 4,634,692, Cl. 514-167.000.

Hofling, Erich: *See*—
Maly, Zdenek; and Hofling, Erich, 4,634,508, Cl. 204-181.600.

Hoge, Rudiger: *See*—
Osypka, Peter; and Hoge, Rudiger, 4,633,880, Cl. 128-642.000.

Hohlweck, Hans; Plath, Gernold; and Baisch, Friedhelm, to Deutsche Forschungs-und Versuchsanstalt fur Luft-und Raum-fahrt e.V. Apparatus for measuring cross-sections on objects, more especially on parts of the body. 4,635,198, Cl. 364-414.000.

Holland, Christine: *See*—
Versteegh, Willem M.; Toy, Lester T.; and Holland, Christine, 4,634,615, Cl. 428-36.000.

Holland, G. Neil: *See*—
Misic, George J.; Lillo, Aarne; Patrick, John L.; and Holland, G. Neil, 4,634,980, Cl. 324-322.000.

Holland, George W.; Maag, Hans; and Rosen, Perry, to Hoffmann-La Roche Inc. 7-fluoro-dihydro PGI compounds. 4,634,782, Cl. 549-465.000.

Holland, James R.; and Del Vecchio, Robert M., to United States of America, Energy. Multishell inertial confinement fusion target. 4,634,567, Cl. 376-152.000.

Hollaway, Gerald C., Jr., to Dayco Corporation. Method of making a fiber-loaded polymeric sheet. 4,634,413, Cl. 474-263.000.

Hollaway, Jerrell P. Remotely controlled light flasher. 4,634,957, Cl. 323-242.000.

Hollmann, Bernd, to Kochsiek Maschinenbau GmbH Soltau. Method and apparatus for manufacturing folding paper sacks. 4,634,414, Cl. 493-213.000.

Hollstein, Thomas E.; O'Ryan, David E.; and Waryu, Joseph C., to Nordson Corporation. Powder spray gun. 4,634,058, Cl. 239-697.000.

Holman, Bruce, III, to Du Pont de Nemours, E. I., and Company. Photoimaging compositions containing substituted 1,2-dibromoethanes. 4,634,657, Cl. 430-281.000.

Holmes, William K., to Hi-Ranger, Inc. Manual override control handle selectively engageable with the valve spool of a servo valve. 4,633,977, Cl. 187-9.00R.

Holst, Jan-Olov M.: *See*—
Blomberg, Folke I.; and Holst, Jan-Olov M., 4,635,031, Cl. 340-51.00R.

Holt, Joseph C. Glad hand extension. 4,634,151, Cl. 285-38.000.

Holtman, Steve: *See—*
Chaffee, Edwin G.; Holtman, Steve; Nelson, George A.; and Tanner, Howard M. C., 4,633,872, Cl. 128-303.100.
Holtz, Glen D., to Federal-Mogul Corporation. Self-tensioning belt tightener. 4,634,407, Cl. 474-112.000.
Holzman, Richard W.: *See—*
Schunck, Richard A.; and Holzman, Richard W., 4,633,938, Cl. 165-47.000.
Holzner, Gunter, to Firmenich S.A. Devices for perfuming ambient air and enclosed spaces. 4,634,614, Cl. 428-35.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Kashio, Yoshiaki, 4,634,486, Cl. 156-253.000.
Moriki, Shinichi; and Okui, Kazuyuki, 4,634,167, Cl. 296-31.00P.
Nishikawa, Masao; Sakai, Shinzo; and Miyake, Junichi, 4,633,737, Cl. 74-866.000.
Tsurumi, Yasuyuki; and Matsuzaki, Akio, 4,633,965, Cl. 180-279.000.
Watanabe, Kazuo; Shougase, Hajime; and Umeoka, Akio, 4,634,139, Cl. 280-288.000.
Yagasaki, Akio, 4,633,532, Cl. 2-424.000.
Yamaguchi, Fumio; Nakaniwa, Yoshiaki; Masuda, Yoshiaki; Sakurai, Hisayuki; and Nakashima, Waichiro, 4,633,931, Cl. 164-110.000.
Yasuoka, Akimasa; Iwata, Takahiro; and Kiuchi, Takeo, 4,633,839, Cl. 123-488.000.
Honeywell Inc.: *See—*
Lenz, James E.; and Mitchell, Gordon L., 4,634,977, Cl. 324-244.000.
Merchant, John, 4,635,203, Cl. 364-458.000.
Honeywell Information Systems Inc.: *See—*
Noyes, Robert W., 4,634,203, Cl. 339-91.00R.
Honeywell Information Systems Italia: *See—*
Montorfano, Gianpaolo, 4,634,903, Cl. 307-571.000.
Honmoto, Syuichi: *See—*
Yoshieda, Keiichi; Sodeno, Toshiaki; and Honmoto, Syuichi, 4,633,580, Cl. 29-767.000.
Hook, Roy E.: *See—*
Bowden, John E.; Hook, Roy E.; and Miller, E. Craig, 4,633,772, Cl. 99-332.000.
Hooker, Howard W.: *See—*
Svoboda, Daniel; Hordinski, Steven; Severns, Dale R.; and Hooker, Howard W., 4,634,330, Cl. 414-198.000.
Hoover, William G., to Granger Associates. Dual mode antenna having simultaneous operating modes. 4,635,070, Cl. 343-852.000.
Hopfner, Clemens, to Eastman Kodak Company. Focusing mechanism. 4,634,221, Cl. 350-255.000.
Horak, Jiri: *See—*
Tlustakova, Marie; Horak, Jiri; Vavrouch, Josef; Kulisek, Jiri; and Kalal, Jaroslav, 4,634,604, Cl. 427-213.330.
Hordinski, Steven: *See—*
Svoboda, Daniel; Hordinski, Steven; Severns, Dale R.; and Hooker, Howard W., 4,634,330, Cl. 414-198.000.
Horie, Nobuyuki; Sakamoto, Noriaki; Fujikawa, Toshiaki; and Yamanaka, Toshihiro, to Sharp Kabushiki Kaisha. Floppy disk drive with stand-by mode. 4,635,145, Cl. 360-78.000.
Horiuchi, Tatsuo, to Noda Institute for Scientific Research. Method and reagent for quantitative determination of N-acetylhexosamine. 4,634,663, Cl. 435-25.000.
Horlacher, Albert F., Jr. Vacuum cleaner hose adapter. 4,634,197, Cl. 339-16.00R.
Horlitz, Carl F., Jr.; and Swietek, Franciscek J., to Combustion Engineering, Inc. Mobile coal-fired fluidized bed power unit. 4,633,818, Cl. 122-4.00D.
Hornburger, Detlev; Schaffert, Albrecht; and Schneider, Henner, to International Standard Electric Corporation. Method of transferring information between microcomputers in a decentralized process control system, particularly for telephone systems. 4,634,812, Cl. 379-269.000.
Horne, Ottis J.: *See—*
Short, Lewis A.; and Horne, Ottis J., 4,634,608, Cl. 427-327.000.
Horres, C. Russell, Jr., to Becton Dickinson and Company. Method of determining adhesion of a liquid sample. 4,634,679, Cl. 436-63.000.
Horsch, Rudolf, to J. I. Case Company. Crawler track hydraulic transmission control system. 4,633,960, Cl. 180-6.700.
Horst, William R.: *See—*
Hale, William J.; Horst, William R.; and Riley, Ellen P., 4,634,845, Cl. 235-350.000.
Horton Manufacturing Co., Inc.: *See—*
Hanks, James V.; Raines, Charles D.; and Dayen, Leonid, 4,633,991, Cl. 192-85.0CA.
Horvath, Richard A.; Rank, William E.; and Whelan, James E., to General Motors Corporation. Strut damper with base valve and cup retention. 4,633,983, Cl. 188-322.140.
Hoshii, Toshifumi: *See—*
Fukaya, Hideshi; Hoshii, Toshifumi; and Yuzawa, Keiji, 4,633,751, Cl. 84-1.030.
Hoshino, Kunihisa: *See—*
Ogasawara, Akira; Watanabe, Sakuji; Terui, Nobuhiko; Utagawa, Ken; and Hoshino, Kunihisa, 4,634,851, Cl. 250-204.000.
Hoskins Manufacturing Company: *See—*
Lachman, John C.; Moorman, Lewis B.; and Bosak, Alan A., 4,633,918, Cl. 140-71.00R.
Hotate, Makoto: *See—*
Matsuura, Masahiko; Kaneko, Tadashi; Kaide, Tadayoshi; and Hotate, Makoto, 4,633,841, Cl. 123-492.000.
Howard, Lawrence K. Printing calculator. 4,635,219, Cl. 364-710.000.
Hoxer, Klaus: *See—*
Schickaneder, Helmut; Hoxer, Klaus; and Ahrens, Kurt H., 4,634,700, Cl. 514-227.000.
Hoya Corporation: *See—*
Kawai, Hisao, 4,634,639, Cl. 428-690.000.
Hoyt, John G. Double wishbone rig. 4,633,797, Cl. 114-91.000.
Hsiao, Charles H., to Key Pharmaceuticals, Inc. Sustained release quinidine dosage form. 4,634,587, Cl. 424-19.000.
Hsieh, Teng-Jui. Automatic overload tripper. 4,635,021, Cl. 337-76.000.
Hu, Shiu-Lok: *See—*
Salstrom, John S.; Newman, Dawn; Harbrecht, Douglas F.; and Hu, Shiu-Lok, 4,634,678, Cl. 435-317.000.
Hubbard, Bruce L.: *See—*
Fox, Robert E.; and Hubbard, Bruce L., 4,635,047, Cl. 340-684.000.
Hubbard, David W., to Pitney Bowes Inc. Single element transducer for an ink jet device. 4,635,079, Cl. 346-140.00R.
Hubbard, Winchester L.: *See—*
Dekeyser, Mark A.; Pierce, Benjamin J.; Moore, Richard C.; and Hubbard, Winchester L., 4,634,690, Cl. 514-81.000.
Huber, Hans G., to Hans Huber GmbH. Device for removing screened or sifted material from liquid flowing in a gutter. 4,634,524, Cl. 210-158.000.
Huber, Wilhelm: *See—*
Hillenbrand, Bernhard; Huber, Wilhelm; Littwin, Burkhard; and Schuster, Karl, 4,634,935, Cl. 315-169.400.
Hubertson, Folke H., to Aktiebolaget Somas Ventiler. Sealing device for throttle valves. 4,634,097, Cl. 251-173.000.
Hudson Oxygen Therapy Sales Company: *See—*
Havstad, Harold R., 4,633,856, Cl. 128-40.000.
Hudson, Philip, to Lucas Industries public limited company. Braking arrangement for a rotary drive system. 4,633,984, Cl. 192-9.000.
Hudson Products Corporation: *See—*
Monroe, Robert C., 4,634,341, Cl. 415-129.000.
Huff, Ray V.; Axen, Steven G.; and Baughman, David R., to ISL Ventures, Inc. Method of in-situ leaching of ores. 4,634,187, Cl. 299-4.000.
Hufschmid, Eric B. Multiple speed transmission for bicycles. 4,634,406, Cl. 474-49.000.
Hughes Aircraft Company: *See—*
Chang, Donald C. D.; and Ha, Eng-Chong, 4,635,063, Cl. 342-380.000.
Crawford, James A., 4,634,998, Cl. 331-1.00A.
Knauer, Wolfgang, 4,634,871, Cl. 250-398.000.
Hughes, Thomas R.: *See—*
Buss, Waldeen C.; and Hughes, Thomas R., 4,634,518, Cl. 208-138.000.
Humpe, Gilbert. Truck trailer loading bridge assembly. 4,634,145, Cl. 280-769.000.
Hunold, Klaus; Lipp, Alfred; and Reinmuth, Klaus, to Elektroschmelzwerk Kempten GmbH. Dense shaped articles consisting of polycrystalline hexagonal boron nitride and process for their manufacture by isostatic hot-pressing. 4,634,640, Cl. 428-704.000.
Hunter, Byron A.; Rowland, Donald G.; and Peascoe, Warren J., to Uniroyal Chemical Company, Inc. Nitro-urea based blowing agents. 4,634,721, Cl. 521-92.000.
Hunter Douglas, Inc.: *See—*
Anderson, Richard N., 4,633,635, Cl. 52-489.000.
Hunter, Rudolf A. Device including moveable shaft and magnet for sensing magnetic metal. 4,634,976, Cl. 324-228.000.
Huperz, Adalbert, to Woma-Apparatebau Wolfgand Maasberg & Co. GmbH. Valve head for high-pressure pumps. 4,634,353, Cl. 417-564.000.
Hussey Copper, Ltd.: *See—*
Fabiny, Eugene S.; Hessler, George W.; and Bradel, John H., Jr., 4,634,609, Cl. 427-345.000.
Hutter, Gerhard P. Wall anchor or support. 4,633,640, Cl. 52-704.000.
Hwang, Eddie Y.; and Shung, Wu-Shi, to Westinghouse Electric Corp. Overspeed protection control arrangement for a steam turbine generator control system. 4,635,209, Cl. 364-494.000.
Hwang, Yu-Tang; Pebsworth, Lloyd; Dombro, Robert A.; and Hoff, Raymond E., to Chemplex Company. Method of catalyst deactivation. 4,634,744, Cl. 526-84.000.
Hydrafit, Inc.: *See—*
Kishton, Donald L., 4,634,153, Cl. 285-255.000.
Hydrel AG: *See—*
Maurer, Martin, 4,633,744, Cl. 83-128.000.
Hyuga, Takao: *See—*
Ohta, Kenji; Takahashi, Akira; Inui, Tetsuya; Hyuga, Takao; and Yamaoka, Hideyoshi, 4,634,617, Cl. 428-65.000.
Ibrahim, Hadi: *See—*
Clark, Alan T.; Ibrahim, Hadi; and Lange, Arthur F., 4,635,255, Cl. 370-110.100.
Ichihara, Katsutarou: *See—*
Shiraishi, Yasuhisa; Fujita, Takashi; Ochi, Yoshiharu; Hirose, Masahiko; Ichihara, Katsutarou; and Ishigami, Takashi, 4,634,635, Cl. 428-446.000.
Ichihashi, Masazumi: *See—*
Shinohara, Yoshitsugu; and Ichihashi, Masazumi, 4,634,848, Cl. 235-449.000.
Ichikawa, Koji, to Fuji Photo Film Co., Ltd. Notcher with improved waste chip removal means. 4,633,743, Cl. 83-100.000.
Ichinoi, Yutaka, to Victor Company of Japan, Ltd. Noise reduction circuit for video signal. 4,635,120, Cl. 358-167.000.
ICI Americas Inc.: *See—*
Payne, Earl R., 4,635,207, Cl. 364-484.000.

Ide, Katsuyuki: *See—*
Aoike, Nanjou; Ide, Katsuyuki; Kobayashi, Hisao; and Hamaguchi, Mitsuhiro, 4,635,052, Cl. 340-811.000.
Idemitsu Kosan Company Limited: *See—*
Okada, Tahei; and Takesue, Masahiko, 4,634,543, Cl. 252-78.500.
Ieki, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Electron gun for a high power klystron. 4,634,925, Cl. 313-454.000.
Igata, Kouichi: *See—*
Matsumoto, Tokikazu; and Igata, Kouichi, 4,635,137, Cl. 360-10.200.
Ikari, Kazuo: *See—*
Mihara, Shin-ichi; Imai, Toshihiro; Ikari, Kazuo; and Fujii, Toru, 4,635,125, Cl. 358-228.000.
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Jenkins, Kenneth L.; Suhaka, Stanley C.; Dolin, Rick L.; LaRoche, Allan R.; Hodgson, Robert E.; Such, Neil R.; Smith, Douglas D.; Newton, Frank R.; and Cunningham, Richard N., to Manville Corporation. Lightweight asphalt based building materials and process for making same. 4,634,622, Cl. 428-143.000.

Jenoptik Jena G.m.b.H.: *See—*
Baumann, Hans-Georg, 4,634,234, Cl. 350-414.000.

Jensen, Peter A. Cooperative exercising apparatus. 4,634,118, Cl. 272-117.000.

Jeppesen, James H., III; and Whittaker, Bruce E., to Burroughs Corporation. Power control network using reliable communications protocol. 4,635,195, Cl. 364-200.000.

Jeremijevic, Vojin, to Benson, S.A. Development installation and storage device for electrostatic printer using a liquid developer. 4,634,252, Cl. 354-324.000.

Jeschke, Peter: *See—*
Pohl, Siegfried; Luhrsen, Ernst; Jeschke, Peter; Rave, Ortwin; Kienow, Martin; and Richter, Werner, 4,634,685, Cl. 501-100.000.

Jeumont-Schneider Corporation: *See—*
Delloye, Nicolas; and Denimal, Philippe, 4,634,569, Cl. 376-203.000.

Jinnings, John W.; and Jinnings, Orrin H., to Hercules Machinery Corporation. Pavement breaking apparatus. 4,634,311, Cl. 404-90.000.

Jinnings, Orrin H.: *See—*
Jinnings, John W.; and Jinnings, Orrin H., 4,634,311, Cl. 404-90.000.

Jobin, Daniel. Flashing device for motion picture camera. 4,634,244, Cl. 352-72.000.

Jodon Engineering Associates, Inc.: *See—*
Haddox, Mark L., 4,633,707, Cl. 73-47.000.

Johnson, David W.; and Tyler, Keith A., to Goodyear Tire & Rubber Company, The. Idler pulley. 4,634,409, Cl. 474-152.000.

Johnson Fishing Inc.: *See—*
Hastings, John D.; and Siemer, Dennis K., 4,634,944, Cl. 318-443.000.

Johnson, John S.: *See—*
Studniarz, Stanley A.; Botts, John C.; and Johnson, John S., 4,634,911, Cl. 310-215.000.

Johnson & Johnson Dental Products Company: *See—*
DeLuca, Robert D., 4,634,561, Cl. 264-17.000.

Johnson & Johnson Products Inc.: *See—*
Hegemann, Manfred, 4,634,421, Cl. 604-34.000.

Johnson, Keith, Jr.: *See—*
Burgit, Richard A.; Davis, Newton G.; Goyert, Josita M.; Johnson, Keith, Jr.; Long, Robert A.; and Stachura, Joseph F., 4,633,570, Cl. 29-564.400.

Johnson, Randy W.: *See—*
Lasalo, Andrew; Quintana, Ronald P.; Dugdale, Marion; and Johnson, Randy W., 4,634,709, Cl. 514-316.000.

Johnson, Richard A.; and Lloyd, Norman E., to Nabisco Brands, Inc. Enzyme purification process. 4,634,673, Cl. 435-234.000.

Johnson, Robert C.; Perry, David L.; and Peitsch, Bernd E., to Ford Motor Company. Portable hand-held voltage sensor with manually adjustable reference voltage for comparison with sensed voltage. 4,634,971, Cl. 324-133.000.

Johnson, Roger N.: *See—*
Leonard, Gary L.; and Johnson, Roger N., 4,634,351, Cl. 417-395.000.

Johnson, Van B.; and Adolphson, Douglas G., to Du Pont de Nemours, E. I., and Company. Process for preparing surprint proof of an improved support. 4,634,658, Cl. 430-293.000.

Joint Medical Products Corporation: *See—*
Noiles, Douglas G., 4,634,444, Cl. 623-20.000.

Joner, Bruno A.; and Williams, John W., to Boeing Company, The. Surface minelaying system for craft of opportunity. 4,633,778, Cl. 102-411.000.

Jones, Aroll A. Door brace assembly. 4,634,158, Cl. 292-260.000.

Jones, C. Andrew; and Sofranko, John A., to Atlantic Richfield Company. Hydrocarbon dehydrogenation. 4,634,802, Cl. 585-656.000.

Jones, C. Andrew: *See—*
Withers, Howard P., Jr.; Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,634,800, Cl. 585-500.000.

Jones, Charles R., to Dana Corporation. Transmission and range box control. 4,633,725, Cl. 74-473.00R.

Jones, Howell A.; Soderberg, John H.; Eckert, Alton B.; and Nambudiri, Easwaran C. N., to Pitney Bowes Inc. Postal meter with date check reminder means. 4,635,204, Cl. 364-464.000.

Jones, J. Paul. Means for counting drops. 4,635,281, Cl. 377-21.000.

Jones, Rick O.; Price, Walter F., Jr.; Siemer, Glenn E.; and Ulrich, Michael H., to International Business Machines Corporation. Photocopier scanning apparatus and method for adjustment. 4,634,267, Cl. 355-66.000.

Jonker, Johan, to 501 Elektrotechnisch Bureau Moekotte B V. Apparatus for developing photographs and photographic strips. 4,634,251, Cl. 354-312.000.

Joo, Katsuhiro, to Shikoku Kakooki Co., Ltd. Packaging machine. 4,633,645, Cl. 53-282.000.

Jordy, George J.; and Mosley, Joseph M., to International Business Machines Corporation. Random access memory employing unclamped complementary transistor switch (CTS) memory cells and utilizing word to drain line diode shunts. 4,635,228, Cl. 365-154.000.

Josef, Michael J., to Albany International Corp. Paper machine clothing. 4,633,596, Cl. 34-116.000.

Judd & Judd, Inc.: *See—*
Bundy, Donald E.; and Bundy, Ronald W., 4,634,163, Cl. 293-117.000.

Julich, Paul M.; and Pearce, Jeffrey B., to Harris Corporation. Fault detection and redundancy management system. 4,634,110, Cl. 371-11.000.

Jungwirth, Dieter; Thielen, Gerd; and Langwadt, Otmar, to Dyckerhoff & Widmann Aktiengesellschaft. Tension tie member. 4,633,540, Cl. 14-22.000.

Jurgen, Machate. Capacitive data carrier reader. 4,634,847, Cl. 235-451.000.

Kasi, Takeshi: *See—*
Umeda, Tatsutoshi; Tani, Yoshio; Kasi, Takeshi; Nakano, Keiichi; and Izui, Yoshio, 4,633,824, Cl. 123-41.650.

Kabushiki Kaisha Alpha Giken: *See—*
Tanaka, Yoshinobu; and Yokoi, Hiromitsu, 4,634,023, Cl. 222-105.000.

Kabushiki Kaisha Asano Kenkyusho: *See—*
Asano, Kazuo, 4,633,745, Cl. 83-455.000.

Kabushiki Kaisha Daikin Seisakusho: *See—*
Fukutake, Heiji; and Iwata, Shozo, 4,633,990, Cl. 192-70.270.
Yoneda, Kazuhiko, 4,633,989, Cl. 192-70.270.

Kabushiki Kaisha Daini Seikosha: *See—*
Shimbo, Masafumi, 4,635,089, Cl. 357-42.000.

Kabushiki Kaisha Four Brain: *See—*
Kusano, Takae; and Ueno, Masato, 4,634,381, Cl. 433-172.000.
Kusano, Takae; and Ueno, Masato, 4,634,382, Cl. 433-182.000.

Kabushiki Kaisha Kanemitsu: *See—*
Kanemitsu, Yukio, 4,633,557, Cl. 29-159.00R.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Shimogori, Kazutoshi; Satoh, Hiroshi; and Kamikubo, Fumio, 4,634,478, Cl. 148-421.000.
Sugimoto, Koichi; Kamei, Kiyoshi; Murakami, Yotaro; Sugimoto, Takashi; Nishimura, Takashi; and Takashima, Takahiro, 4,634,477, Cl. 148-402.000.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Kamide, Takao; Ueda, Norio; and Nemoto, Akira, 4,634,332, Cl. 414-273.000.
Karakama, Tadao, 4,633,666, Cl. 60-421.000.

Kabushiki Kaisha Ohmori Seisakusho: *See—*
Ohmori, Hatsutaro, 4,634,074, Cl. 242-84.21R.

Kabushiki Kaisha Saura Keiki Seisakusho: *See—*
Watanabe, Yoshiteru, 4,634,978, Cl. 324-253.000.

Kabushiki Kaisha Sunpak: *See—*
Kamon, Akio; and Odaka, Yukio, 4,634,933, Cl. 315-151.000.

Kabushiki Kaisha Tokai Denki Seisakusha: *See—*
Suzuki, Masaru, 4,634,835, Cl. 219-219.000.

Kabushiki-Kaisha Tokai Rika Denki Seisakusho: *See*—
Hattori, Masaichi; Hanaki, Akira; and Kihira, Kouichi, 4,633,908, Cl. 137-637.100.

Kabushiki Kaisha Toshiba: *See*—
Ebata, Yasuo, 4,635,009, Cl. 333-195.000.
Hayashimoto, Yoshiaki; Tanuma, Chiaki; Yokoyama, Katsunori; and Harada, Nozomu, 4,634,884, Cl. 250-578.000.
Hirakawa, Shuji, 4,635,100, Cl. 358-19.000.
Hirose, Masataka; Ueno, Tsuyoshi; and Suzuki, Katsumi, 4,633,809, Cl. 118-719.000.
Iwasaki, Hitoshi; Chiba, Shu; and Sawazaki, Norikazu, 4,635,152, Cl. 360-110.000.
Mase, Yasukazu; Abe, Masahiro; and Aoyama, Masaharu, 4,634,496, Cl. 156-643.000.
Matsui, Yutaka, 4,633,883, Cl. 128-660.000.
Miwa, Junichi; and Kato, Minoru, 4,635,086, Cl. 357-38.000.
Motegi, Nawoto; Okajima, Masaki; and Muro, Yuhei, 4,635,268, Cl. 372-45.000.
Shimazaki, Ayako, 4,634,497, Cl. 156-646.000.
Shiraishi, Yasuhisa; Fujita, Takashi; Ochi, Yoshiharu; Hirose, Masahiko; Ichihara, Katsutarou; and Ishigami, Takashi, 4,634,635, Cl. 428-446.000.
Suzuki, Hiroshi; and Imamura, Makoto, 4,635,143, Cl. 360-65.000.
Takebayashi, Hiroaki; Harumi, Fujio; Nakamura, Kiyoshi; and Inoue, Koichi, 4,634,300, Cl. 384-548.000.
Urui, Kiyoshi; Ishikawa, Kiyoshi; and Okano, Michiaki, 4,635,253, Cl. 370-67.000.
Watanabe, Junji, 4,634,260, Cl. 355-7.000.
Watanabe, Mutsumi, 4,635,293, Cl. 382-44.000.
Yoshizawa, Hisayasu, 4,635,036, Cl. 340-347.0AD.
Yuge, Yooji; Ishizaki, Ariyoshi; Saito, Tokuyoshi; and Ishii, Takeshi, 4,634,919, Cl. 313-113.000.

Kabushiki Kaisha Universal: *See*—
Kimura, Yutaka, 4,634,126, Cl. 273-129.00S.

Kabushiki Kaisya Advance Kaihatsu Kenkyujo: *See*—
Imai, Hideki; and Sasaki, Minoru, 4,633,884, Cl. 128-696.000.

K.K. Toyota Chuo Kenkyusho: *See*—
Oshima, Yujiro; Yamada, Masatoshi; Mori, Nobuyuki; Sugiyama, Katsuhiko; Aoyama, Taro; Saito, Akinori; and Kozuka, Kazuhiro, 4,633,830, Cl. 123-276.000.

Kaganov, Alan L.: *See*—
Dumican, Barry L.; Kaganov, Alan L.; and Ritter, Thomas A., 4,633,873, Cl. 128-334.00R.

Kage, Kouzou; and Watanabe, Hiroshi, to NEC Corporation; and Nippon Telegraph & Telephone Public Corp. Interference wave detection circuit for use in radio receiver. 4,635,298, Cl. 455-295.000.

Kaide, Tadayoshi: *See*—
Matsuura, Masahiko; Kaneko, Tadashi; Kaide, Tadayoshi; and Hotate, Makoto, 4,633,841, Cl. 123-492.000.

Kaisei Kogyo Corporation: *See*—
Yasunaga, Suezaki, 4,633,925, Cl. 144-343.000.

Kaiser, Carl; Kruse, Lawrence I.; and Ross, Stephen T., to Smithkline Beckman Corporation. Pyridylalkyl imidazole-2-thiols. 4,634,711, Cl. 514-341.000.

Kaiser, Willard D.; Koenig, Mark J.; and LeBlanc, William K., to Shafer Valve Company, The. Torque and friction tester. 4,633,702, Cl. 73-9.000.

Kajigaya, Kazuhiko: *See*—
Matsumoto, Tetsuro; and Kajigaya, Kazuhiko, 4,635,233, Cl. 365-230.000.

Kakegawa, Hisao: *See*—
Satoh, Toshio; Matsumoto, Hitoshi; Kakegawa, Hisao; Kato, Yoshiko; Riku, Juichi; Yoshinaga, Junji; and Kanamoto, Yoshifumi, 4,634,777, Cl. 548-561.000.

Kalal, Jaroslav: *See*—
Tlustakova, Marie; Horak, Jiri; Vavrouch, Josef; Kulisek, Jiri; and Kalal, Jaroslav, 4,634,604, Cl. 427-213.330.

Kalin, Horst W.: *See*—
Mesnard, David R.; and Kalin, Horst W., 4,633,713, Cl. 73-866.500.

Kalnin, Ilmar L.; Goldberg, Harris A.; and Breckenridge, George J., Jr., to Celanese Corporation. Process for the intercalation of graphitic carbon employing fully halogenated hydrocarbons. 4,634,546, Cl. 252-506.000.

Kaltenbach & Voigt GmbH & Co.: *See*—
Moasle, Walter; and Eibofner, Eugen, 4,634,376, Cl. 433-29.000.

Kamamura Photographic Co., Ltd.: *See*—
Tomidokoro, Kanji, 4,634,249, Cl. 354-108.000.

Kamas Industri AB: *See*—
Edholm, Thomas; and Stahl, Ulf, 4,634,522, Cl. 209-154.000.

Kamatsu Zenoah Co.: *See*—
Miyazaki, Hiroshi; Sawada, Toshiharu; and Nakajima, Kazuo, 4,634,457, Cl. 55-276.000.

Kamei, Kiyoshi: *See*—
Sugimoto, Koichi; Kamei, Kiyoshi; Murakami, Yotaro; Sugimoto, Takashi; Nishimura, Takashi; and Takashima, Takahiro, 4,634,477, Cl. 148-402.000.

Kamemoto, Mituo: *See*—
Yoshida, Mamoru; and Kamemoto, Mituo, 4,634,275, Cl. 356-121.000.

Kamen, Dean L., to Baxter Travenol Laboratories. Medical infusion controller and user interface. 4,634,426, Cl. 604-65.000.

Kamide, Kenji; and Okajima, Kunihiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Cellulose dope, process for preparation and method for application thereof. 4,634,470, Cl. 106-163.100.

Kamide, Noboru; Hijikata, Hiroshi; Tokudome, Katsumi; Ishikawa, Michio; and Hayashi, Yuji, to Kimmon Electric Co., Ltd. Laser discharge tube. 4,635,272, Cl. 372-87.000.

Kamide, Takao; Ueda, Norio; and Nemoto, Akira, to Kabushiki Kaisha Komatsu Seisakusho; and Komatsu Fork Lift Co. Ltd. Automatic control system for a loading and unloading vehicle. 4,634,332, Cl. 414-273.000.

Kamienski, Conrad W., to Lithium Corporation of America. Hydrocarbon and chlorinated hydrocarboon-soluble magnesium dialkoxides. 4,634,786, Cl. 556-187.000.

Kamijyo, Yoshimi, to Alps Electric Co., Ltd. Tellurium oxide whiskers and a method of producing the same. 4,634,630, Cl. 428-399.000.

Kamikaseda, Takeshi; Furudate, Masahiro; and Yamamoto, Makoto, to National Starch and Chemical Corporation. Emulsion adhesives. 4,634,727, Cl. 524-145.000.

Kamikubo, Fumio: *See*—
Shimogori, Kazutoshi; Satoh, Hiroshi; and Kamikubo, Fumio, 4,634,478, Cl. 148-421.000.

Kaminsky, Didier, to Thomson-CSF. Quadrupole for matching of a reactance, independently of the operating frequency. 4,635,005, Cl. 333-32.000.

Kamiya, Akihiro: *See*—
Mori, Yasuki; and Kamiya, Akihiro, 4,634,927, Cl. 313-486.000.

Kamiya, Kiyoshi, to Citizen Watch Co., Ltd. Synchronous separation circuit. 4,635,115, Cl. 358-153.000.

Kamiya, Sigeru: *See*—
Ito, Seitoku; Iwashita, Shigeo; Kamiya, Sigeru; Noguchi, Hiroshi; and Mori, Nobuhisa, 4,633,706, Cl. 73-28.000.

Kamiya, Yoshinori, to Nissan Motor Co., Ltd. Vehicle body having rear parcel shelf. 4,634,174, Cl. 296-195.000.

Kamon, Akio; and Odaka, Yukio, to Kabushiki Kaisha Sunpak. Photographic illumination apparatus. 4,634,933, Cl. 315-151.000.

Kampf, Julian C.; Reichard, Jeffrey A.; Libert, James T.; Curran, Earl J., Jr.; and Graefe, Richard J., to Square D Company. Reduced voltage starter with voltage ramp control. 4,634,951, Cl. 318-778.000.

Kanai, Hidefumi: *See*—
Oishi, Mitsugu; and Kanai, Hidefumi, 4,634,259, Cl. 355-4.000.

Kanai, Takayuki: *See*—
Sato, Minoru; and Kanai, Takayuki, 4,633,654, Cl. 53-511.000.

Kanakkanatt, Sebastian V.: *See*—
Cardarelli, Nathan F.; and Kanakkanatt, Sebastian V., 4,634,693, Cl. 514-169.000.

Kanamaru, Hitoshi, to Pioneer Electronic Corporation. Optical information reading apparatus. 4,634,853, Cl. 250-201.000.

Kanamoto, Yoshifumi: *See*—
Satoh, Toshio; Matsumoto, Hitoshi; Kakegawa, Hisao; Kato, Yoshiko; Riku, Juichi; Yoshinaga, Junji; and Kanamoto, Yoshifumi, 4,634,777, Cl. 548-561.000.

Kanarvogel, Leon, to MVM Valve Co., Inc. Liquid dispensing apparatus and an anti-drip valve cartridge therefor. 4,634,027, Cl. 222-380.000.

Kanayama, Ryoji: *See*—
Uzaki, Nagato; Itoh, Shigeru; Kanayama, Ryoji; Harada, Hisashi; and Kawamura, Yasutaro, 4,633,928, Cl. 164-19.000.

Kandatsu, Kiyoshi: *See*—
Kohanawa, Akihiko; and Kandatsu, Kiyoshi, 4,635,012, Cl. 335-16.000.

Kaneda, Tsuyoshi: *See*—
Yokoo, Sadao; Shimomura, Tadashi; Torisawa, Soichi; Dan, Masahiro; and Kaneda, Tsuyoshi, 4,634,270, Cl. 355-125.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Hamakawa, Yoshihiro; Yamagishi, Hideo; and Tawada, Yoshihisa, 4,634,601, Cl. 427-39.000.

Kaneko, Masakatsu; Kimura, Misako; Murofushi, Yoshinobu; Yamazaki, Mitsuo; Iwata, Nobuyoshi; and Nakagawa, Fumio, to Sankyo Company Limited. Griseolic acid derivatives, and their use as enzyme inhibitors. 4,634,706, Cl. 514-262.000.

Kaneko, Ryoichi: *See*—
Shiohata, Kouki; Satoh, Kazuo; Ohmori, Motoji; Kikuchi, Katsuaki; and Kaneko, Ryoichi, 4,635,210, Cl. 364-508.000.

Kaneko, Shinobu: *See*—
Murayama, Kimimasa; Ikawa, Shoji; and Kaneko, Shinobu, 4,633,696, Cl. 72-88.000.

Kaneko, Tadashi: *See*—
Matsuura, Masahiko; Kaneko, Tadashi; Kaide, Tadayoshi; and Hotate, Makoto, 4,633,841, Cl. 123-492.000.

Kanemitsu, Yukio, to Kabushiki Kaisha Kanemitsu. Method of making poly-V pulleys. 4,633,557, Cl. 29-159.00R.

Kang, Young W. Assembly of tag pins with a cap avoiding an entwinement between heads. 4,633,605, Cl. 40-24.000.

Kantrowitz, Adrian; Freed, Paul S.; Vaughan, Frizell L.; Bernstein, Isadore A.; and Gray, Robert H. Percutaneous access device and method for implanting same. 4,634,422, Cl. 604-49.000.

KAO Corporation: *See*—
Tsujii, Kaoru; and Yoshimatsu, Akira, 4,634,725, Cl. 523-221.000.

Kao Soap Co., Ltd.: *See*—
Takaishi, Naotake; Urata, Kouichi; Inamoto, Yoshiaki; Tsutsumi, Hisao; and Kawano, Junichi, 4,634,719, Cl. 514-772.000.

Karabinis, Peter D., to AT&T Bell Laboratories. Asynchronous and non-data decision directed equalizer adjustment. 4,635,276, Cl. 375-15.000.

Karakama, Tadao, to Kabushiki Kaisha Komatsu Seisakusho. Integrated hydraulic system. 4,633,666, Cl. 60-421.000.

Karl, Rupert: *See*—
Burkhard, Ludwig; Schuller, Edmund; Lovas, Kurt; and Karl, Rupert, 4,634,064, Cl. 242-18.0PW.

Karmar Research Partnership: *See*—
Graine, Eric.R.; Forbes, David; Sargent, Thomas A.; and Scott, John S., 4,634,882, Cl. 250-578.000.

Karo, Jorma H., to Karolon Oy. Method of producing scaffolds. 4,634,487, Cl. 156-256.000.

Karolon Oy: *See*—
Karo, Jorma H., 4,634,487, Cl. 156-256.000.

Kasada, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Carburetion type burning apparatus. 4,634,367, Cl. 431-29.000.

Kasahara, Yasushi: *See*—
Sugiyama, Masami; and Kasahara, Yasushi, 4,634,763, Cl. 530-375.000.

Kasai, Hitoshi; Asagi, Yasuyoshi; Hattori, Toshihiro; Saito, Hideo; and Shishido, Katsuya, to Fujitsu Limited. Failure diagnostic processing system. 4,635,214, Cl. 364-551.000.

Kashio, Yoshiaki, to Honda Giken Kogyo Kabushiki Kaisha. Upholstery material for seats and method of making the same. 4,634,486, Cl. 156-253.000.

Kashiwagi, Katsuhiko: *See*—
Yamaguchi, Ikutoshi; Kashiwagi, Katsuhiko; Goto, Hideo; and Inoue, Susumu, 4,634,626, Cl. 428-312.400.

Kassai, Kenzou, to Aprica Kassai Kabushikikaisha. Children's automobile-mounted safety seat. 4,634,185, Cl. 297-487.000.

Kataoka, Hiroshi. Winding apparatus for sheet strip. 4,634,069, Cl. 242-65.000.

Kato, Chiaki: *See*—
Katsuya, Hiroo; Kato, Chiaki; and Fujii, Yoshiharu, 4,633,805, Cl. 118-60.000.

Kato, Heizaburo, to Sankyo Manufacturing Co., Ltd. Roll feed apparatus. 4,634,034, Cl. 226-142.000.

Kato, Hidetoshi; Mayumi, Nobuo; Kusase, Shin; and Matsuhashi, Hajime, to Nippondenso Co., Ltd. Voltage regulator for alternating current generator. 4,634,954, Cl. 322-28.000.

Kato, Hiroshi; Chiba, Tomosuke; and Kikuchi, Masahiro, to Sony Corporation. Cathode ray tube apparatus with liquid cooled front panel. 4,634,918, Cl. 313-36.000.

Kato, Hiroyasu; and Denda, Hirokazu, to Victor Company of Japan Ltd. Apparatus for automatically selecting and reproducing a recording medium. 4,635,150, Cl. 360-98.000.

Kato, Kenji, to Janome Sewing Machine Co., Ltd. Device for detecting fabric thickness of a sewing machine. 4,633,794, Cl. 112-121.110.

Kato, Minoru: *See*—
Miwa, Junichi; and Kato, Minoru, 4,635,086, Cl. 357-38.000.

Kato, Toshio; Kinoshita, Takao; and Tojo, Akihiko, to Canon Kabushiki Kaisha. Image pickup device of the frame transfer type and image pickup arrangement using the same. 4,635,122, Cl. 358-213.000.

Kato, Yoshihisa, to Sumitomo Metal Mining Company Limited. Method of making a lead frame for integrated circuits. 4,633,583, Cl. 29-827.000.

Kato, Yoshiko: *See*—
Satoh, Toshio; Matsumoto, Hitoshi; Kakegawa, Hisao; Kato, Yoshiko; Riku, Juichi; Yoshinaga, Junji; and Kanamoto, Yoshifumi, 4,634,777, Cl. 548-561.000.

Katsuma, Makoto: *See*—
Mukoujima, Hitoshi; Hiramatsu, Akira; Murakami, Hiroyasu; and Katsuma, Makoto, 4,634,915, Cl. 310-323.000.

Katsuya, Hiroo; Kato, Chiaki; and Fujii, Yoshiharu, to Sumitomo Electric Industries, Ltd. Release agent applicator for copying machine. 4,633,805, Cl. 118-60.000.

Kaufmann, Karl-Ernst; Saeftel, Josef-Paul; Bitsch, Harald; and Oldewurtel, Otto, to Mannesmann Ag. Rope guide. 4,634,078, Cl. 242-158.00R.

Kaufmann, Meinolph: *See*—
Amstutz, Hermann; Heimgartner, Dieter; Kaufmann, Meinolph; and Scheffer, Terry J., 4,634,229, Cl. 350-346.000.

Kaus, Malcolm J.: *See*—
Etherton, Bradley P.; and Kaus, Malcolm J., 4,634,746, Cl. 526-124.000.

Kausek, James H.; Klugman, Alfred; and Donovan, William J., to Kausek, James H. Knee brace for control of ligament instability. 4,633,867, Cl. 128-80.00C.

Kawahara, Toshinari: *See*—
Toshiyasu, Masayuki; and Kawahara, Toshinari, 4,634,930, Cl. 315-8.000.

Kawai, Hisao, to Hoya Corporation. Electroluminescent panel having a light absorption layer of germanium oxide. 4,634,639, Cl. 428-690.000.

Kawakami, Kazuo; Nagai, Yawara; and Aihara, Takayuki, to Olympus Optical Co., Ltd. Automatic cuvette loading apparatus. 4,634,575, Cl. 422-63.000.

Kawamoto, Mutsumi: *See*—
Sakakibara, Shiro; Kawamoto, Mutsumi; and Ando, Masahiko, 4,633,736, Cl. 74-689.000.

Kawamura, Go: *See*—
Kudo, Tetsuichi; Kawamura, Go; and Ishikawa, Akira, 4,634,585, Cl. 423-419.00R.

Kawamura, Hideaki: *See*—
Sakurada, Nobuaki; Kawamura, Hideaki; and Sasaki, Takashi, 4,635,078, Cl. 346-140.00R.

Kawamura, Yasutaro: *See*—
Uzaki, Nagato; Itoh, Shigeru; Kanayama, Ryoji; Harada, Hisashi; and Kawamura, Yasutaro, 4,633,928, Cl. 164-19.000.

Kawano, Junichi: *See*—
Takaishi, Naotake; Urata, Kouichi; Inamoto, Yoshiaki; Tsutsumi, Hisao; and Kawano, Junichi, 4,634,719, Cl. 514-772.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nishida, Hiroshi, 4,634,392, Cl. 440-88.000.

Kawaura, Masafumi: *See*—
Sakaida, Atsuo; Kawaura, Masafumi; Chikaoka, Yasuji; Iwata, Hiroshi; and Asano, Kiyomitsu, 4,634,301, Cl. 400-124.000.

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Kedzierski, Heinrich, to WABCO Westinghouse Steuerungstechnik GmbH & Co. Double-acting working cylinder having a piston-dampening arrangement. 4,633,758, Cl. 91-44.000.

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Kemka, Rudy F., to United States of America, Navy. Connector/-nitinol Δ contact force device. 4,634,201, Cl. 339-30.000.

Kempa, Bernd-Joachim, to Elektro-Thermit GmbH. Grooved rail switch with a tongue rail device. 4,634,087, Cl. 246-430.000.

Kendall, Burton, to Measurex Corporation. Real-time distributed database management system. 4,635,189, Cl. 364-200.000.

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Kulzer, Darrell A.; and Rohm, Martin L., to B & R Plastics, Inc. Package and method for use in displaying merchandise for sale. 4,634,005, Cl. 206-477.000.
Kumar, Ajith K.: *See*—
Balch, Edgar T.; Bilski, Richard E.; and Kumar, Ajith K., 4,634,887, Cl. 290-3.000.
Kumar, Devendra; Fohlen, George M.; and Parker, John A., to United States of America, National Aeronautics and Space Administration. Fire and heat resistant laminating resins based on maleimido substituted aromatic cyclotriphosphazene polymer. 4,634,759, Cl. 528-321.000.
Kunita, Hisao: *See*—
Yoshida, Hideo; and Kunita, Hisao, 4,635,211, Cl. 364-513.500.
Kunkle, Gerald E.: *See*—
Demarest, Henry M., Jr.; Kunkle, Gerald E.; and Moxie, Clement C., 4,634,461, Cl. 65-27.000.
Kuno, Akira: *See*—
Numata, Koji; Tanaka, Hiroaki; and Kuno, Akira, 4,633,709, Cl. 73-178.00R.
Kuosa, Harri; and Kultaranta, Tapani, to Oy Wartsila AB. Control device for a roll press. 4,633,774, Cl. 100-43.000.
Kupper, Wilhelm; and Hensen, Helmuth. Device for inserting the thread end of a textile bobbin into a bobbin sleeve. 4,634,065, Cl. 242-18.00R.
Kurai, Nobuyoshi: *See*—
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, 4,633,826, Cl. 123-90.310.
Kurata, Hidenori, to Nissan Motor Co., Ltd. Steering system equipped with steering wheel center pad anti-rotation mechanism. 4,633,731, Cl. 74-492.000.
Kure, Tokuo: *See*—
Tamaki, Yoichi; Kure, Tokuo; Sato, Akira; and Higuchi, Hisayuki, 4,635,090, Cl. 357-50.000.
Kurihara, Masaru: *See*—
Nakagawa, Yukio; Oto, Katsufumi; and Kurihara, Masaru, 4,634,531, Cl. 210-639.000.
Kuroda, Yasuo: *See*—
Hatanaka, Katsunori; Kuroda, Yasuo; and Uzawa, Shunichi, 4,634,886, Cl. 250-578.000.
Kurosawa, Kazuyuki: *See*—
Takashima, Susumu; Tokimoto, Toyotarou; and Kurosawa, Kazuyuki, 4,633,748, Cl. 84-1.010.

Kurtz, Neil M.; Newton, Roger E.; and Temple, Davis L., Jr., to Bristol-Myers Company. Method for alleviation of panic disorders. 4,634,703, Cl. 514-252.000.

Kurumi, Masateru: *See*—
Fujii, Setsuro; Nakayama, Toyoo; Nunomura, Shigeki; Matsui, Ryoji; Watanabe, Shin-ichi; Sudo, Kimio; Okutome, Toshiyuki; Kurumi, Masateru; Sakurai, Yojiro; and Aoyama, Takuo, 4,634,783, Cl. 549-475.000.

Kusaka, Hiroki, to Pioneer Electronic Corporation. Cassette-receiving door device for cassette tape recorder. 4,635,148, Cl. 360-96.600.

Kusano, Takae; and Ueno, Masato, to Molten Corp.; and Kabushiki Kaisha Four Brain. Partial dental prosthesis. 4,634,381, Cl. 433-172.000.

Kusano, Takae; and Ueno, Masato, to Molten Corp.; and Kabushiki Kaisha Four Brain. Attachment for dental prosthesis. 4,634,382, Cl. 433-182.000.

Kusase, Shin: *See*—
Kato, Hidetoshi; Mayumi, Nobuo; Kusase, Shin; and Matsuhashi, Hajime, 4,634,954, Cl. 322-28.000.

Kuse, Tsutomu: *See*—
Tajima, Atsushi; Suzuki, Nobuo; and Kuse, Tsutomu, 4,634,624, Cl. 428-212.000.

Kuwajima, Takeshi: *See*—
Tanaka, Kouichi; Kuwajima, Takeshi; and Amazawa, Kiyoshi, 4,634,902, Cl. 307-542.000.

Kuwamura, Shinichi: *See*—
Ooka, Masataka; Kuwamura, Shinichi; and Murakami, Yoichi, 4,634,736, Cl. 525-117.000.

Kuwana, Tadashi, to Yamamoto Electric Industrial Co., Ltd. Method of producing armature winding and apparatus therefor. 4,633,576, Cl. 29-597.000.

Kwasniok, Alois: *See*—
Gardziella, Arno; Kwasniok, Alois; Heerdegen, Harald; and Janocha, Gerhard, 4,634,723, Cl. 523-144.000.

La Telemecanique Electrique: *See*—
Belbel, Elie; Baron, Thierry; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,635,022, Cl. 337-158.000.
Guery, Jean-Pierre; and Olifani, Jacques, 4,635,016, Cl. 335-230.000.
Lemarquand, Pierre; and Pierrot, Henri, 4,635,013, Cl. 335-20.000.

Laabs, Timothy P.: *See*—
Wolniak, Stanley C.; Laabs, Timothy P.; and Schulz, Richard H., Jr., 4,633,689, Cl. 70-379.00R.

Laauwe, Robert H.: *See*—
O'Halloran, P. Joseph; Laauwe, Robert H.; Roggenburg, Stanley L., Jr.; and Tully, Michael E., 4,634,022, Cl. 222-95.000.

LaBate, Michael D., II. Device for placing slag retention means in tapping converter. 4,634,106, Cl. 266-236.000.

Labo, Georges, to Thomson CSF. Method and device for level correction for a television image. 4,635,117, Cl. 358-160.000.

Labelle, H. M. Robert, to Martinray Industries Ltd. Barrel rings. 4,633,927, Cl. 160-133.000.

Laboratoires Pharmascience: *See*—
Taravel, Bernard, 4,633,542, Cl. 15-167.00R.

Lach, John S. Device for holding hinged structure in open position. 4,634,170, Cl. 296-76.000.

Lachman, John C.; Moorman, Lewis B.; and Bosak, Alan A., to Hoskins Manufacturing Company. Coil hanger and handling method. 4,633,918, Cl. 140-71.00R.

Lack, Bernd: *See*—
Welp, Ullrich; Kramer, Willi; Girke, Michael; and Lack, Bernd, 4,634,269, Cl. 355-100.000.

Lade, Robert W.: *See*—
Benjamin, James A.; Lade, Robert W.; and Schutten, Herman P., 4,635,084, Cl. 357-22.000.

Ladney, Michael: *See*—
Loren, Norman S., 4,633,559, Cl. 29-243.500.

Laemmle, Joseph T.; Bohaychick, John; and Lansdale, Willie, to Aluminum Company of America. Parting composition comprising glycerol trioleate, castor oil and copper corrosion inhibitor. 4,634,469, Cl. 106-38.240.

LaFlame, Thomas R. Carrier for a percussion instrument or other object. 4,634,032, Cl. 224-265.000.

Lagasse, Paul R., to United States of America, Energy. Tube wall thickness measurement apparatus. 4,633,590, Cl. 33-148.00R.

Lahmann, Ernst; Walder, Werner; and Burger, Friedhelm, to Mila Hardware & Machinery (UK) Limited. Handle fitting for a drive rod locking arrangement for windows, doors and the like. 4,634,160, Cl. 292-336.300.

Lahrman, David F.: *See*—
Bantel, Thomas E.; Lahrman, David F.; and Halase, John F., III, 4,634,291, Cl. 374-7.000.

Laitar, Robert A.; and Gomez, Eduardo, to Acme Resin Corporation. Process for preparing alkoxy-modified phenolic resole resins. 4,634,758, Cl. 528-129.000.

Lakeside Equipment Corporation: *See*—
Salkeld, Melvin R.; Langeland, Wayne E.; and Kennedy, Jerry L., 4,634,526, Cl. 210-194.000.

Lambert, Gerald G.: *See*—
Butzow, Neil W.; and Lambert, Gerald G., 4,634,400, Cl. 464-81.000.

Lambertson, William A. Rotary motion damping means. 4,633,980, Cl. 188-84.000.

Lamerant, Jean-Michel: *See*—
Maurel, Pierre; Lamerant, Jean-Michel; and Pallez, Francois, 4,634,579, Cl. 423-17.000.

Lammers, Donald W., to Curt G. Joa, Inc. Method for securing elastic strands to disposable absorbent articles. 4,634,482, Cl. 156-164.000.

Landrum, Christy B., Jr.: *See*—
Layh, Ricky L.; and Landrum, Christy B., Jr., 4,633,602, Cl. 37-195.000.

Lang, Richard D.; and Napolitano, James E., to Carrier Corporation. Double wall condenser orifice. 4,633,680, Cl. 62-507.000.

Lange, Arthur F.: *See*—
Clark, Alan T.; Ibrahim, Hadi; and Lange, Arthur F., 4,635,255, Cl. 370-110.100.

Langeland, Wayne E.: *See*—
Salkeld, Melvin R.; Langeland, Wayne E.; and Kennedy, Jerry L., 4,634,526, Cl. 210-194.000.

Langhans, Horst; and Wehner, Erwin, to NUKEM GmbH. Process for the production of plate-shaped fuel elements for research reactors. 4,634,571, Cl. 376-416.000.

Langlois, Raymond: *See*—
Berube, Gilles; and Langlois, Raymond, 4,633,782, Cl. 102-518.000.

Langwadt, Otmar: *See*—
Jungwirth, Dieter; Thielen, Gerd; and Langwadt, Otmar, 4,633,540, Cl. 14-22.000.

Lansdale, Willie: *See*—
Laemmle, Joseph T.; Bohaychick, John; and Lansdale, Willie, 4,634,469, Cl. 106-38.240.

Lanzarini, Ernesto: *See*—
Beccaris, Carlo; and Lanzarini, Ernesto, 4,634,397, Cl. 464-68.000.

Larkin, Berni: *See*—
O'Malley, Kieran; Preisler, John; and Larkin, Berni, 4,634,816, Cl. 379-430.000.

LaRoche, Allan R.: *See*—
Jenkins, Kenneth L.; Suhaka, Stanley C.; Dolin, Rick L.; LaRoche, Allan R.; Hodgson, Robert E.; Such, Neil R.; Smith, Douglas D.; Newton, Frank R.; and Cunningham, Richard N., 4,634,622, Cl. 428-143.000.

Larsson, Peter L.; Parker, Robert; and Ratzlaff, Thomas D., to Raychem Corporation. Connectors for power distribution cables. 4,634,213, Cl. 339-275.00T.

Laser Corporation of America: *See*—
Reilly, James P.; and Yoder, M. John, 4,635,269, Cl. 372-58.000.

Laskaris, Evangelos T., to General Electric Company. Horizontal cryostat insert with a vertical service stack. 4,633,682, Cl. 62-514.00R.

Lassio, Andrew; Quintana, Ronald P.; Dugdale, Marion; and Johnson, Randy W., to Research Corporation. Platelet aggregation inhibitory agents and intermediates therefor. 4,634,709, Cl. 514-316.000.

Lathrop, David R.: *See*—
Stanek, Terrence L.; and Lathrop, David R., 4,634,345, Cl. 416-244.00R.

La Tour, June T. Method for making a body wrap composition. 4,634,436, Cl. 604-290.000.

Lauber, Ernst, to Willy Habegger AG. Convertible rope pulling and walking machine. 4,634,101, Cl. 254-228.000.

Laughrey, James C. Cover for cooking stove heating element. 4,634,841, Cl. 219-464.000.

Lauraire, Michel: *See*—
Belbel, Elie; Baron, Thierry; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,635,022, Cl. 337-158.000.

Law, Kirk A.: *See*—
Harwood, Leopold A.; and Law, Kirk A., 4,634,984, Cl. 328-112.000.

Layh, Ricky L.; and Landrum, Christy B., Jr. Method and apparatus for padding pipe. 4,633,602, Cl. 37-195.000.

LCC.CICE-Compagnie Europeenne de Composants Electroniques: *See*—
Bernard, Daniel, 4,633,551, Cl. 29-25.420.

Lea, Randy J.; and Lea, Richard P. Keg cooler. 4,633,678, Cl. 62-457.000.

Lea, Richard P.: *See*—
Lea, Randy J.; and Lea, Richard P., 4,633,678, Cl. 62-457.000.

Lear Siegler, Inc.: *See*—
Hagan, Lyle M.; and Pierce, William C., 4,634,141, Cl. 280-704.000.

Leblanc, Jean: *See*—
Cigolotti, Jean-Pierre; and Leblanc, Jean, 4,634,109, Cl. 267-170.000.

LeBlanc, Oliver H., Jr., to General Electric Company. Article and method for determining the concentration of metal ionic complexes in a solution. 4,634,501, Cl. 204-1.00T.

LeBlanc, William K.: *See*—
Kaiser, Willard D.; Koenig, Mark J.; and LeBlanc, William K., 4,633,702, Cl. 73-9.000.

LeBlond, Charles E.; and LeBlond, Henri, to Hamelin Industries, Inc. Wheel hub including structure for attachment of accessories. 4,634,189, Cl. 301-63.0PW.

LeBlond, Henri: *See*—
LeBlond, Charles E.; and LeBlond, Henri, 4,634,189, Cl. 301-63.0PW.

LeBoeuf, Harry P.; Verret, Allen J.; and Broussard, Paul D., to Texaco Inc. Method for offshore production of hydrocarbons concurrently with the installation of a structure therefor. 4,633,953, Cl. 166-358.000.

Lec Tec Corporation: *See*—
Ong, Lincoln, 4,633,879, Cl. 128-641.000.

Lechner, Hubert, to LGZ Landis & Gyr Zug AG. Single phase stepping motor with improved pole arrangement. 4,634,907, Cl. 310-49.00R.

Lee, James N.: *See*—
Riederer, Stephen J.; and Lee, James N., 4,634,979, Cl. 324-307.000.

Lee, Robert D., to Thomson Components-Mostek Corporation. Clamping circuit finding particular application between a single sided output of a computer memory and a differential amplifier sensing circuit. 4,634,890, Cl. 307-200.00B.

Legge, Gerald A. Method for cutting tube-walls. 4,633,555, Cl. 29-157.400.

Legrand, Guy; and Faivre, Michel, to Videocolor. Method for measuring the convergence of a three-gun shadow-mask cathode-ray tube and a device for the application of said method. 4,635,095, Cl. 358-10.000.

Lehigh University: *See*—
Esumi, Kunio; Schwartz, Anthony M.; and Zettlemoyer, Albert, 4,634,659, Cl. 430-302.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Engleman, Edgar G.; Foung, Steven K. H.; and Grumet, F. Carl, 4,634,666, Cl. 435-68.000.
Goodwin, David A.; and Meares, Claude F., 4,634,586, Cl. 424-1.100.
Shaw, Herbert J.; and Pavlath, George A., 4,634,282, Cl. 356-150.000.
Shaw, Herbert J., 4,634,852, Cl. 250-227.000.

Lemarquand, Pierre; and Pierrot, Henri, to La Telemecanique Electrique. Additive block couplable to a circuit breaker. 4,635,013, Cl. 335-20.000.

Lemforder Metallwaren AG: *See*—
Munch, Gunter, 4,634,108, Cl. 267-57.10R.

Lenz, James E.; and Mitchell, Gordon L., to Honeywell Inc. High accuracy mapping of magnetic fields with a fiber optic interferometer. 4,634,977, Cl. 324-244.000.

Lenzing Aktiengesellschaft: *See*—
Sustmann, Scarlet; and Marini, Ingo G., 4,634,439, Cl. 604-376.000.

Leonard, Gary L.; and Johnson, Roger N., to General Electric Company. Diaphragm pump. 4,634,351, Cl. 417-395.000.

Leonard, Henri, to Micro-Mega. Dental drill. 4,634,378, Cl. 433-102.000.

Leonard, John J.: *See*—
Withers, Howard P., Jr.; Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,634,800, Cl. 585-500.000.

Leonardi, Amedeo: *See*—
Nardi, Dante; Leonardi, Amedeo; and Bianchi, Giorgio, 4,634,712, Cl. 514-356.000.

Leone, David A.; and Marks, Douglas C., to Westinghouse Electric Corp. Circuit breaker with arm latch for high interrupting capacity. 4,635,011, Cl. 335-16.000.

Leorat, Francois, to Regie Nationale des Usines Renault. Control of the supply pressure of a hydraulic actuator. 4,633,985, Cl. 192-0.055.

Lepere, Guy; Younes, Rolland; and Ramirez, Cristobal M., to Thomson-CSF. Receiver for a pulsed Doppler radar system. 4,635,061, Cl. 342-195.000.

Lepperhoff, Gerhard: *See*—
Pischinger, Franz; and Lepperhoff, Gerhard, 4,634,459, Cl. 55-418.000.

Les Epiciers Unis Metro-Richelieu Inc.: *See*—
Dagenais, Georges; Michaud, Ghislain; and Presseau, Michel, 4,633,652, Cl. 53-444.000.

Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. 2-[2-(di-lower-alkylamino)-1-propenyl]-6-methoxy-3-pyridinecarbonitriles, intermediates for cardiotonic agents. 4,634,772, Cl. 546-288.000.

L'Etat Francais: *See*—
Foggia, Albert A.; and Sabonnadiere, Jean-Claude, 4,634,889, Cl. 307-104.000.

Letourneur, Pierre: *See*—
Poncelet, Denis; Coulon, Jean-Claude; Chaumette, Jacques; and Letourneur, Pierre, 4,634,231, Cl. 350-311.000.

Levacher, Friedrich K.; and Federmann, Helmut, to Felten & Guilleaume Energietechnik GmbH. High tensile wire provided with light guide sensor. 4,634,217, Cl. 350-96.230.

Le Vantine, Allan D. Device for removing static charge, dust and lint from surfaces. 4,635,161, Cl. 361-213.000.

Levengood, Donald A.: *See*—
Danko, Oliver L.; Bork, Carl R., Jr.; Steiss, William C.; and Levengood, Donald A., 4,634,099, Cl. 251-335.300.

Lever Brothers Company: *See*—
Kerslake, Andrew J., 4,634,564, Cl. 264-75.000.

Leviton Manufacturing Company, Inc.: *See*—
Poliak, John M.; Lopez, Juan M.; and Gritz, Robert W., 4,634,211, Cl. 339-196.00M.

Levitt-Safety Limited: *See*—
Gentry, Kenneth R.; and Nikolich, Michael, 4,634,936, Cl. 315-307.000.

Levy, Gideon: *See*—
Budin, Josef; Sciaroni, Boris; Kilcher, Beat; and Levy, Gideon, 4,634,825, Cl. 219-69.00W.

Lewis, Larry N.: *See*—
Keohan, Francis L.; and Lewis, Larry N., 4,634,610, Cl. 427-387.000.

LGZ Landis & Gyr Zug AG: *See*—
Lechner, Hubert, 4,634,907, Cl. 310-49.00R.
Popovic, Radivoje; and Berchier, Jean-Luc, 4,634,961, Cl. 323-368.000.

Li, Lehmann K.; and Marra, Michael, to American Cyanamid Company. Skin stapler. 4,634,035, Cl. 227-19.000.

Libert, James T.: *See*—
Kampf, Julian C.; Reichard, Jeffrey A.; Libert, James T.; Curran, Earl J., Jr.; and Graefe, Richard J., 4,634,951, Cl. 318-778.000.

Licentia Patent-Verwaltungs-GmbH: *See*—
Frank, Werner, 4,634,111, Cl. 271-34.000.

Lichti, Robert D., to Metal Alloys, Inc. System for automatically consolidating a plurality of bodies formed of powder. 4,634,572, Cl. 419-44.000.

Lico, Inc.: *See*—
Hoehn, Robert A.; and Doyle, Thomas B., 4,633,784, Cl. 104-162.000.

Lien, Eric L., to American Home Products Corporation. Inhibition of prolactin release by a benzodioxinylimidazoline derivative. 4,634,714, Cl. 514-397.000.

Life Key Corporation: *See*—
Foster, Dwight R.; and Foster, Diane, 4,634,245, Cl. 353-95.000.

Light, Gerard M., to Eaton Corporation. Fluid coupling device with improved modulation capability. 4,633,988, Cl. 192-58.00B.

Light, Gerard M., to Eaton Corporation. Viscous fan drive and axially movable valve element. 4,633,994, Cl. 192-58.00B.

Light Signatures, Inc.: *See*—
Goldman, Robert N., 4,635,054, Cl. 340-825.340.

Lightsey, Raymond, to Walker Peenimpac Machine, Inc. Shot cleaning apparatus with gravity fed auxiliary impeller. 4,633,622, Cl. 51-423.000.

Lillie, Thomas J.: *See*—
D'Agostino, John A.; and Lillie, Thomas J., 4,634,293, Cl. 374-124.000.

Lillo, Aarne: *See*—
Misic, George J.; Lillo, Aarne; Patrick, John L.; and Holland, G. Neil, 4,634,980, Cl. 324-322.000.

Limbacher, Bernhard; Muller, Karl; and Mader, Gottfried, to Fichtel & Sachs AG. Hydraulically operated clutch release bearing. 4,633,993, Cl. 192-98.000.

Lin, Liang-Tsai: *See*—
Anderson, Floyd E.; and Lin, Liang-Tsai, 4,635,261, Cl. 371-25.000.

Lin, Po-Chi. Fluid supply device with periodically positive and reverse flow cleaning cycle. 4,634,523, Cl. 210-140.000.

Linder, Ernst: *See*—
Babitzka, Rudolf; Linder, Ernst; and Polach, Wilhelm, 4,633,837, Cl. 123-478.000.

Lindow, James T.; Bennett, Simon D.; and Smith, Ian R., to SiScan Systems, Inc. Confocal optical imaging system with improved signal-to-noise ratio. 4,634,880, Cl. 250-566.000.

Lindsay, Deborah J., to Surface Technology, Inc. Process for electroless metal deposition. 4,634,619, Cl. 427-97.000.

Lindstrom, Harold R.; and Haverdink, Virgil D., to Deere & Company. Opener assembly including a compact, arc-shaped opener. 4,633,791, Cl. 111-86.000.

Link, William J., to American Hospital Supply Corporation. Intraocular lens with a vaulted optic. 4,634,442, Cl. 623-6.000.

Linssen, Mathias: *See*—
Hans, Waldemar; Linssen, Mathias; and Sauer, Rudolf, 4,634,055, Cl. 239-533.300.

Linton, John D.; Evans, Michael W.; and Godley, Andrew R., to Shell Oil Company. Process for preparing a heteropolysaccharide, heteropolysaccharide obtained thereby, its use, and strain NCIB 11883. 4,634,667, Cl. 435-101.000.

Lipowski, Stanley A.; Villa, Jose L.; Miskel, John J., Jr.; and Grinstein, Reuben H., to Diamond Shamrock Chemicals Company. Aqueous carbonaceous mixtures. 4,634,451, Cl. 44-51.000.

Lipp, Alfred: *See*—
Hunold, Klaus; Lipp, Alfred; and Reinmuth, Klaus, 4,634,640, Cl. 428-704.000.

Lisle Corporation: *See*—
Pool, James L., 4,634,166, Cl. 294-103.100.

Lissoni, Adelio, to S.I.A.T. Societa Internazionale Applicazioni Techniche S.p.A. Pressure roller device for laterally retaining boxes in packaging machines with automatic box feed. 4,633,642, Cl. 53-137.000.

Lithium Corporation of America: *See*—
Kamienski, Conrad W., 4,634,786, Cl. 556-187.000.

Littelfuse, Inc.: *See*—
Oh, Seibang, 4,635,023, Cl. 337-163.000.

Litton Systems, Inc.: *See*—
Butler, Alfred L., 4,634,091, Cl. 248-637.000.
Mark, John G., 4,634,283, Cl. 356-350.000.
Polischuk, Andrey, 4,635,297, Cl. 455-217.000.

Littwin, Burkhard: *See*—
Hillenbrand, Bernhard; Huber, Wilhelm; Littwin, Burkhard; and Schuster, Karl, 4,634,935, Cl. 315-169.400.

Litz, Steven D. Baseball shin guards. 4,633,529, Cl. 2-22.000.

Liu, Mike. Cabinet for storing small parts such as bolts screws or the like. 4,634,193, Cl. 312-107.000.

Liu, Paul S., to Merrell Dow Pharmaceuticals Inc. Homodisaccharide hypoglycemic agents. 4,634,765, Cl. 536-17.400.

Liu, Ping Y.; and Belfoure, Edward L., to General Electric Company. Copolyester-carbonate composition. 4,634,737, Cl. 525-146.000.

Liu, Richard T.; Nickerson, Winston R.; and Anderson, Charles H., to Nestec S. A. Flavorant capsules. 4,634,598, Cl. 426-650.000.

Ljusberg-Wahren, Helena, to Bergvik Kemi AB; and Fluidcarbon International AB. Coal-water dispersion. 4,634,450, Cl. 44-51.000.

LKC Systems, Inc.: *See*—
Massof, Robert W.; and Mangat-Rai, John N., 4,634,243, Cl. 351-243.000.

Lloyd, Benjamin L. Paper towel dispenser. 4,634,033, Cl. 225-73.000.

Lloyd Doyle Limited: *See*—
Doyle, Keith G.; and Lloyd, Roy A., 4,635,289, Cl. 382-8.000.

Lloyd, Norman E.: *See—*
Johnson, Richard A.; and Lloyd, Norman E., 4,634,673, Cl. 435-234.000.

Lloyd, Roy A.: *See—*
Doyle, Keith G.; and Lloyd, Roy A., 4,635,289, Cl. 382-8.000.

Lobato, Toribio, to Clemar Manufacturing Corporation. Auxiliary timing source for ac-powered electronic clocks. 4,634,288, Cl. 368-200.000.

Lodder, Bernhard; Overeijnder, Hans; and van Dongeren, Jan P., to Wavin B.V. Electroweldable socket and a device of manufacturing such a socket. 4,634,844, Cl. 219-544.000.

Loepfe Brothers Limited: *See—*
Stutz, Hansruedi; and De Coi, Beat, 4,635,216, Cl. 364-562.000.

Logan, Douglas P.; Cornelius, Thomas E., III; and Rey, Susan P., to Calgon Corporation. Orthophosphate-containing desalination scale inhibitors. 4,634,532, Cl. 210-697.000.

Lohn, Paul, to Control Specialties Co., Inc. Orifice plate seal. 4,633,911, Cl. 138-44.000.

Long, Robert A.: *See—*
Burgit, Richard A.; Davis, Newton G.; Goyert, Josita M.; Johnson, Keith, Jr.; Long, Robert A.; and Stachura, Joseph F., 4,633,570, Cl. 29-564.400.

Longacre, James R.: *See—*
Clayman, Henry; and Longacre, James R., 4,634,441, Cl. 623-6.000.

Looper, Ernest F. Apparatus and method for measuring and packaging elastic products. 4,634,070, Cl. 242-67.200.

Loos, Herbert: *See—*
Erhardt, Manfred; Loos, Herbert; and Reichert, Gerhard, 4,633,619, Cl. 51-105.0GG.

Loozen, Hubert J. J.; and van Luit, Pieter J. N., to Akzo N.V. Novel Δ^4- and Δ^5-androstene derivatives and pharmaceutical compositions containing these derivatives. 4,634,694, Cl. 514-177.000.

Lopez-Doriga Lopez-Doriga, Juan A., to Sociedad Espanola del Acumulador Tudor, S.A. Electric storage battery. 4,634,642, Cl. 429-121.000.

Lopez, Juan M.: *See—*
Polak, John M.; Lopez, Juan M.; and Gritz, Robert W., 4,634,211, Cl. 339-196.00M.

Lord, Phillip E. Device for providing a temporary remedy for ceiling leaks. 4,633,899, Cl. 137-357.000.

Loren, Norman S., to Ladney, Michael. Apparatus for staking. 4,633,559, Cl. 29-243.500.

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Lovato, Attilio, to ITW Fastex Italia S.p.A. Releasable buckle particularly for bags, satches and similar articles. 4,633,549, Cl. 24-615.000.

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Lunden, Clarence D., to Boeing Company, The. Method and apparatus for the testing of dielectric materials. 4,634,963, Cl. 324-58.00A.

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Figueroa, Luis; Niesen, Joseph W.; Zinkiewicz, Lawrence M.; and Morrison, Charles B., 4,634,928, Cl. 313-499.000.

Nigrelli, Biagio J., Sr., to Nigrelli Systems, Inc. Case packer. 4,633,655, Cl. 53-543.000.

Nigrelli Systems, Inc.: *See—*
Nigrelli, Biagio J., Sr., 4,633,655, Cl. 53-543.000.

Nikolich, Michael: *See—*
Gentry, Kenneth R.; and Nikolich, Michael, 4,634,936, Cl. 315-307.000.

Nill, Eberhard, to ITT Industries, Inc. Method of manufacturing and adjusting a color picture reproduction unit. 4,634,922, Cl. 313-402.000.

Nilsen, Ole K. Lighting system. 4,634,932, Cl. 315-119.000.

Nilsson, Bjarne. Rotatable disc filter. 4,634,529, Cl. 210-331.000.

Nilsson, Sven M. Heat exchanger. 4,633,936, Cl. 165-8.000.

Nimmons, Kenneth W., to Schutt Manufacturing Co., Inc. Tension mounting for face guard. 4,633,531, Cl. 2-424.000.

Ninomiya, Ichiro: *See—*
Goto, Hideaki; and Ninomiya, Ichiro, 4,635,144, Cl. 360-72.200.

Ninomiya, Morimasa: *See—*
Sakurai, Masao; Hamada, Yousuke; Ninomiya, Morimasa; Takechi, Toshihide; Nakagawa, Kunihiro; and Fujii, Takashi, 4,633,735, Cl. 74-675.000.

Ninomiya, Yoshinobu; Somezawa, Masashi; and Oiyama, Kiyokazu, to Sony Corporation. Magnetic recording medium. 4,634,633, Cl. 428-425.900.

Nippon Athletic Industry Company: *See—*
Yoneyama, Takeshi, 4,633,888, Cl. 128-784.000.

Nippon Electric Co., Ltd.: *See—*
Eguchi, Hirotugu, 4,635,088, Cl. 357-41.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Fujimori, Junichi; and Sugiyama, Jun, 4,633,749, Cl. 84-1.010.
Koike, Tatsuhiro; and Masubuchi, Takamichi, 4,633,752, Cl. 84-1.030.
Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; and Okumura, Takatoshi, 4,635,048, Cl. 340-703.000.
Takahashi, Horoyoshi, 4,633,753, Cl. 84-220.000.

Nippon Kayaku Kabushiki Kaisha: *See—*
Ajioka, Syohei; and Tanaka, Toshio, 4,634,448, Cl. 8-436.000.

Nippon Kogaku K. K.: *See—*
Aono, Yasuhiro; and Yonezawa, Yasuo, 4,634,237, Cl. 350-427.000.
Ogasawara, Akira; Watanabe, Sakuji; Terui, Nobuhiko; Utagawa, Ken; and Hoshino, Kunihisa, 4,634,851, Cl. 250-204.000.

Nippon Rubber Co., Ltd.: *See—*
Moronaga, Yoshiharu; and Izumi, Junji, 4,633,598, Cl. 36-44.000.

Nippon Sheet Glass Co., Ltd.: *See—*
Yokoo, Sadao; Shimomura, Tadashi; Torisawa, Soichi; Dan, Masahiro; and Kaneda, Tsuyoshi, 4,634,270, Cl. 355-125.000.

Nippon Soda Co., Ltd.: *See—*
Yuge, Yooji; Ishizaki, Ariyoshi; Saito, Tokuyoshi; and Ishii, Takeshi, 4,634,919, Cl. 313-113.000.

Nippon Soken, Inc.: *See—*
Egami, Tsuneyuki; Saito, Tsutomu; Kohama, Tokio; Saito, Kimitaka; Sato, Kunihiko; and Takahashi, Hiroshi, 4,635,200, Cl. 364-431.050.
Ito, Novuei; Atsumi, Kinya; Yoshida, Hitoshi; and Atsumi, Morihiro, 4,634,837, Cl. 219-270.000.
Ito, Seitoku; Iwashita, Shigeo; Kamiya, Sigeru; Noguchi, Hiroshi; and Mori, Nobuhisa, 4,633,706, Cl. 73-28.000.
Numata, Koji; Tanaka, Hiroaki; and Kuno, Akira, 4,633,709, Cl. 73-178.00R.
Saito, Tsutomu; Egami, Tsuneyuki; Kohama, Tokio; Saito, Kimitaka; Takahashi, Hiroshi; and Sato, Kunihiko, 4,633,840, Cl. 123-489.000.
Taguchi, Takasi; Ueno, Yoshiki; and Hattori, Tadashi, 4,634,242, Cl. 350-588.000.

Nippon Telecommunication Engineering Company: *See—*
Sakaida, Atsuo; Kawaura, Masafumi; Chikaoka, Yasuji; Iwata, Hiroshi; and Asano, Kiyomitsu, 4,634,301, Cl. 400-124.000.

Nippon Telegraph and Telephone Corporation: *See—*
Matsuda, Tadahito; Harada, Katsuhiro; Moriya, Shigeru; and Ishii, Tetsuyoshi, 4,634,645, Cl. 430-30.000.

Nippon Telegraph & Telephone Public Corp.: *See—*
Kage, Kouzou; and Watanabe, Hiroshi, 4,635,298, Cl. 455-295.000.
Okada, Ikuo; Saitoh, Yasunao; Yoshihara, Hideo; and Nakayama, Satoshi, 4,635,282, Cl. 378-34.000.

Nippon Thompson Co. Ltd.: *See—*
Agari, Norimasa, 4,634,295, Cl. 384-44.000.
Watanabe, Hitoshi, 4,634,296, Cl. 384-45.000.

Nippondenso Co., Ltd.: *See—*
Abe, Taizou; and Tsukahara, Kenji, 4,634,349, Cl. 417-219.000.
Inukai, Kazuo; and Haluyama, Takeshi, 4,635,033, Cl. 340-52.00F.
Ito, Novuei; Atsumi, Kinya; Yoshida, Hitoshi; and Atsumi, Morihiro, 4,634,837, Cl. 219-270.000.
Kato, Hidetoshi; Mayumi, Nobuo; Kusase, Shin; and Matsuhashi, Hajime, 4,634,954, Cl. 322-28.000.
Numata, Koji; Tanaka, Hiroaki; and Kuno, Akira, 4,633,709, Cl. 73-178.00R.
Sakurai, Masao; Hamada, Yousuke; Ninomiya, Morimasa; Takechi, Toshihide; Nakagawa, Kunihiro; and Fujii, Takashi, 4,633,735, Cl. 74-675.000.

Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; and Okumura, Takatoshi, to Ascii Corporation; and Nippon Gakki Seizo Kabushiki Kaisha. Video display controller. 4,635,048, Cl. 340-703.000.

Nishida, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Pressure relief device for engine room of a small watercraft. 4,634,392, Cl. 441-38.000.

Nishiguchi, Ikuzo: *See—*
Inoue, Hiroshige; Fukushima, Kenichi; and Nishiguchi, Ikuzo, 4,634,768, Cl. 544-151.000.

Nishikawa, Masao; Sakai, Shinzo; and Miyake, Junichi, to Honda Giken Kogyo Kabushiki Kaisha. Method and apparatus for minimizing pressurized fluid flow in an automatic transmission. 4,633,737, Cl. 74-866.000.

Nishikawa, Masumi; Ishikawa, Masanobu; Sato, Hiroki; Toyoda, Shuhei; and Ishii, Hakumi, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Shaft and bush device and tilting steering equipment with the shaft and bush device. 4,633,732, Cl. 74-493.000.

Nishimura, Norihisa; Suga, Yuko; Miyachi, Takeshi; and Masaki, Yuichi, to Canon Kabushiki Kaisha. Optical modulating device having projection on substrate for registration. 4,634,227, Cl. 350-334.000.

Nishimura, Takashi: *See—*
Sugimoto, Koichi; Kamei, Kiyoshi; Murakami, Yotaro; Sugimoto, Takashi; Nishimura, Takashi; and Takashima, Takahiro, 4,634,477, Cl. 148-402.000.

Nishimura, Yukuo: *See—*
Munakata, Hirohide; Tomida, Yoshinori; Haruta, Masahiro; Hirai, Yutaka; Nishimura, Yukuo; and Hamamoto, Takashi, 4,634,628, Cl. 430-325.000.

Nishio, Shigeru: *See—*
Hashimoto, Nobuyuki; and Nishio, Shigeru, 4,634,179, Cl. 297-284.000.

Nishiura, Masaharu; and Ueno, Masakazu, to Fuji Electric Company Ltd. Image sensor comprising a plurality of photosensors and switches. 4,634,883, Cl. 250-578.000.

Nishiyama, Yoshihisa, to Tokyo Electric Co., Ltd. Load cell having a thin film strain-inducible element. 4,633,721, Cl. 73-862.670.

Nishizawa, Hitoshi; and Shibata, Kazuyoshi, to NGK Insulators, Ltd. Electrochemical apparatus and method of manufacturing the same. 4,634,514, Cl. 204-406.000.

Niskanen, Hannu, to Valmet Oy. Power transmission arrangement in a tractor. 4,633,961, Cl. 180-53.700.

Nissan Motor Company, Limited: *See—*
Endo, Hiroshi, 4,634,272, Cl. 356-5.000.
Hayashi, Yoshimasa, 4,633,822, Cl. 123-41.210.
Iwasa, Yoshio, 4,633,670, Cl. 60-603.000.
Kamiya, Yoshinori, 4,634,174, Cl. 296-195.000.
Kubota, Hitoshi, 4,633,757, Cl. 91-32.000.
Kurata, Hidenori, 4,633,731, Cl. 74-492.000.
Mochida, Haruo, 4,633,724, Cl. 74-471.00R.
Nakata, Moritsune; Yanai, Tokiyoshi; Yamaguchi, Hirotsugu; Higuchi, Megumu; Aoyama, Yutaka; and Shibahata, Yasuji, 4,634,135, Cl. 280-90.000.
Shimura, Ryoji; and Seko, Osamu, 4,634,156, Cl. 292-216.000.
Uchida, Katsuyoshi, 4,634,159, Cl. 292-336.300.

Nitschke, Werner, to Robert Bosch GmbH. Device for controlling and regulating current flowing through an electromagnetic consumer, particularly for use in connection with an internal combustion engine. 4,635,180, Cl. 363-98.000.

Nitsuko Limited: *See—*
Yoshida, Tadahiro, 4,635,248, Cl. 370-48.000.

Nitta, Tsuneharu: *See—*
Tohda, Takao; Matsuoka, Tomizo; Fujita, Yosuke; Abe, Atsushi; and Nitta, Tsuneharu, 4,634,934, Cl. 315-169.300.

Noakes, Timothy J.: *See—*
Coffee, Ronald A.; Noakes, Timothy J.; and Anstey, Robert A., 4,634,057, Cl. 239-690.000.

Noda Institute for Scientific Research: *See—*
Horiuchi, Tatsuo, 4,634,663, Cl. 435-25.000.

Nogavich, Daniel. Immersion electroplating system. 4,634,503, Cl. 204-27.000.

Nogawa, Masato, to Oppama Kogyo Kabushiki Kaisha. Lawn mower. 4,633,658, Cl. 56-255.000.

Noguchi, Hiroshi: *See—*
Ito, Seitoku; Iwashita, Shigeo; Kamiya, Sigeru; Noguchi, Hiroshi; and Mori, Nobuhisa, 4,633,706, Cl. 73-28.000.

Noguchi, Masayoshi, to Omron Tateisi Electronics Co. Quick-break electrical switch with rectilinearly movable plunger actuator. 4,634,820, Cl. 200-16.00A.

Nogueira, Eduardo D.; and Tezanos, Enrique H. Process for the production of lead from sulphide ores. 4,634,507, Cl. 204-118.000.

Noiles, Douglas G., to Joint Medical Products Corporation. Semi-constrained artificial joint. 4,634,444, Cl. 623-20.000.

Noland, Richard L.: *See—*
Banura, George A.; and Noland, Richard L., 4,634,962, Cl. 324-57.00N.

Nolte, David B., to Sundstrand Data Control, Inc. Frequency multiplier. 4,634,987, Cl. 328-160.000.

Noon, Robert A.; Crowley, Patrick J.; and Worthington, Diana M., to Imperial Chemical Industries PLC. Triazoles and use as fungicides and plant growth regulators. 4,634,466, Cl. 71-92.000.

Nord, Russell H.: *See—*
Payne, Randall K.; and Nord, Russell H., 4,634,970, Cl. 324-121.00R.

Nordson Corporation: *See—*
Hollstein, Thomas E.; O'Ryan, David E.; and Waryu, Joseph C., 4,634,058, Cl. 239-697.000.

Norfolk, Michael P., to Santrade Limited. Conveyor system. 4,633,998, Cl. 198-465.300.

Norland Corporation: *See—*
Payne, Randall K.; and Nord, Russell H., 4,634,970, Cl. 324-121.00R.

Norling, Samuel A.: *See—*
Detter, Gary C.; Norling, Samuel A.; Penney, Janet S.; and Tolnar, Emil J., Jr., 4,634,204, Cl. 339-91.00R.

Normann, Norbert, to Doduco KG Dr. Eugen Durrwachter. Reading head for the magnetic scanning of elongate bistable magnetic elements. 4,635,227, Cl. 365-133.000.

Northern Illinois Gas Company: *See—*
Martell, Dennis J., 4,634,859, Cl. 250-231.0SE.

Northern Telecom Limited: *See—*
Banerjee, Hari N., 4,634,039, Cl. 228-118.000.
Lynch, David L., 4,634,960, Cl. 323-350.000.
O'Malley, Kieran; Preisler, John; and Larkin, Berni, 4,634,816, Cl. 379-430.000.

Northup, Aldrich H., Jr.: *See—*
Sliger, A. Glenn; O'Donnell, James J.; Cares, W. Ronald; and Northup, Aldrich H., Jr., 4,634,582, Cl. 423-243.000.

Norton Company: *See—*
Hay, John; Smith, Leonard I.; and Foster, George E., 4,634,453, Cl. 51-293.000.

Nossen, Edward J., to RCA Corporation. Arrangement for coherently generating sinusoids of different frequencies, and angle modulation data receiver using the arrangement. 4,635,279, Cl. 375-78.000.

Novak, Leo R.; and Milligan, Dennis J., to Dow Chemical Company, The. Process for preparing olefin oxides. 4,634,506, Cl. 204-80.000.

Noyes, Robert W., to Honeywell Information Systems Inc. Universal internal latch and lock D shell connector. 4,634,203, Cl. 339-91.00R.

Nozik, Arthur J., to United States of America, Energy. Superlattice photoelectrodes for photoelectrochemical cells. 4,634,641, Cl. 429-111.000.

NPM International: *See—*
Hayes-Pankhurst, Richard P.; and Smith, Brian D., 4,634,818, Cl. 200-5.00A.

Nukada, Fumiaki: *See—*
Oi, Takato, 4,635,130, Cl. 358-296.000.

NUKEM GmbH: *See—*
Langhans, Horst; and Wehner, Erwin, 4,634,571, Cl. 376-416.000.

Numata, Koji; Tanaka, Hiroaki; and Kuno, Akira, to Nippondenso Co., Ltd.; and Nippon Soken, Inc. Vehicle turn angle detecting device. 4,633,709, Cl. 73-178.00R.

Nunomura, Shigeki: *See—*
Fujii, Setsuro; Nakayama, Toyoo; Nunomura, Shigeki; Matsui, Ryoji; Watanabe, Shin-ichi; Sudo, Kimio; Okutome, Toshiyuki; Kurumi, Masateru; Sakurai, Yojiro; and Aoyama, Takuo, 4,634,783, Cl. 549-475.000.

Nupro Company: *See—*
Danko, Oliver L.; Bork, Carl R., Jr.; Steiss, William C.; and Levengood, Donald A., 4,634,099, Cl. 251-335.300.

Nyi, Lawrence S.: *See—*
West, Daniel A.; Nyi, Lawrence S.; and Ravelo, Ramon J., 4,634,302, Cl. 400-124.000.
West, Daniel A.; Nyi, Lawrence S.; and Ravelo, Ramon J., 4,634,303, Cl. 400-124.000.

Nys, Pierre H.; and Vermeulen, Leon L., to AGFA-Gevaert N.V. Photographic method for the production of documents. 4,635,133, Cl. 358-298.000.

O.M.V. Officine Meccaniche Vilminore S.p.A.: *See—*
Pezzoli, Luigi, 4,633,915, Cl. 139-1.00C.

O'Boyle, Matthew, to Windsor Medical, Inc. Multiple re-entry implantable septum and method of using same. 4,634,424, Cl. 604-51.000.

Ochi, Yoshiharu: *See—*
Shiraishi, Yasuhisa; Fujita, Takashi; Ochi, Yoshiharu; Hirose, Masahiko; Ichihara, Katsutarou; and Ishigami, Takashi, 4,634,635, Cl. 428-446.000.

Ochs, Leonard R., to Duval Corporation. Hydrometallurgical process for copper recovery. 4,634,467, Cl. 75-117.000.

O'Connor, Michael; Jackson, Randall L.; and Marple, David P., to GTE Government Systems Corporation. Noise threshold estimator for multichannel signal processing. 4,635,217, Cl. 364-574.000.

Odabashian, Robert A.; and Wofford, Benjamin G., to W. R. Grace & Co., Cryovac Div. Taped bag with extended side seals. 4,635,295, Cl. 383-127.000.

Odaka, Yukio: *See—*
Kamon, Akio; and Odaka, Yukio, 4,634,933, Cl. 315-151.000.

O'Donnell, James J.: *See—*
Sliger, A. Glenn; O'Donnell, James J.; Cares, W. Ronald; and Northup, Aldrich H., Jr., 4,634,582, Cl. 423-243.000.

OEC Europe Limited: *See—*
Helal, Basil H., 4,634,445, Cl. 623-21.000.

Oelsch Kommanditgesellschaft: *See—*
Oelsch, Kurt; and Schulz, Klaus, 4,635,028, Cl. 338-171.000.

Oelsch, Kurt; and Schulz, Klaus, to Oelsch Kommanditgesellschaft. Slider for resistor and slip conductors. 4,635,028, Cl. 338-171.000.

Oestberg, Lars, to Sandoz Ltd. Process for the production of human mono-clonal antibodies. 4,634,664, Cl. 435-68.000.

Oetiker, Hans. Method for preforming a substantially flat blank of an open clamp. 4,633,698, Cl. 72-168.000.

Ogasawara, Akira; Watanabe, Sakuji; Terui, Nobuhiko; Utagawa, Ken; and Hoshino, Kunihisa, to Nippon Kogaku K. K. Control device for automatic focusing. 4,634,851, Cl. 250-204.000.

Ogasawara, Takio: *See—*
Takeuchi, Toshio; Tomita, Hiroshi; and Ogasawara, Takio, 4,633,834, Cl. 123-424.000.

Ogasawara, Tsunehiko; Arakawa, Yoshichika; Sumiya, Koji; and Sakaguchi, Yoshikazu, to Aisin Seiki Kabushiki Kaisha; and Aisin Warner Kabushiki Kaisha. System for controlling automatic transmission having communication control valve means. 4,633,739, Cl. 74-869.000.

Ogawa, Hiroshi; Saito, Shinji; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,634,632, Cl. 428-425.900.

Oggionni, Claudio: *See—*
Cominetta, Gilberto; and Oggionni, Claudio, 4,634,534, Cl. 210-150.000.

Ogihara, Masuo; Ishida, Hiroaki; Nagaoka, Shinji; and Sato, Koji, to Seiko Koki Kabushiki Kaisha. Electromagnetically actuated shutter for a camera. 4,634,254, Cl. 354-403.000.

Oguri, Hitoshi; and Hirota, Motoya, to Sumitomo Cement Co., Ltd. Chrysoberyl single crystal and method of producing the same. 4,634,492, Cl. 156-605.000.

Oh, Seibang, to Littelfuse, Inc. Fuse assembly having a non-sagging suspended fuse link. 4,635,023, Cl. 337-163.000.

O'Halloran, P. Joseph; Lasuwe, Robert H.; Roggenburg, Stanley L., Jr.; and Tully, Michael E. Fixture for bag-type liquid dispenser. 4,634,022, Cl. 222-95.000.

O'Harra, Dale G., II, to Edward Weck & Company, Inc. Power switching circuit for a pulsed laser. 4,635,265, Cl. 372-25.000.

Ohashi, Azusa; Shirai, Akira; Sakaki, Hirokazu; Tanabe, Zenichi; Tsuchida, Shin; and Hayashi, Yoshikatsu, to Fuji Photo Film Co., Ltd.; and Sumitomo Light Metal Industries, Ltd. Aluminum alloy, a support of lithographic printing plate and a lithographic printing plate using the same. 4,634,656, Cl. 430-278.000.

Ohashi, Kaoru: *See—*
Asami, Ken; Ohashi, Kaoru; Onuma, Toshio; and Buma, Shuuichi, 4,634,143, Cl. 280-707.000.

Ohga, Kazuhiro: *See—*
Erickson, Bruce W.; Fok, Kam-Fook; Incefy, Genevieve S.; and Ohga, Kazuhiro, 4,634,682, Cl. 436-518.000.

Ohi Seisakusho Co., Ltd.: *See—*
Kobayashi, Fumio; and Yamagishi, Jun, 4,633,613, Cl. 49-227.000.
Shimura, Ryoji; and Seko, Osamu, 4,634,156, Cl. 292-216.000.

Ohki, Hiroshi: *See—*
Watanabe, Hideji; Ohki, Hiroshi; and Watanabe, Keizou, 4,634,063, Cl. 242-1.10R.

Ohkumo, Hiroya, to Fuji Jukogyo Kabushiki Kaisha. Fuel cutoff system for a motor vehicle. 4,633,831, Cl. 123-325.000.

Ohmori, Akira; Tomihashi, Nobuyuki; and Shimizu, Yoshiki, to Daikin Kogyo Co., Ltd. Fluorine-containing copolymer and composition containing the same for curing. 4,634,754, Cl. 526-242.000.

Ohmori, Hatsutaro, to Kabushiki Kaisha Ohmori Seisakusho. Spinning type fishing reel with line untwisting capability. 4,634,074, Cl. 242-84.21R.

Ohmori, Motoji: *See—*
Shiohata, Kouki; Satoh, Kazuo; Ohmori, Motoji; Kikuchi, Katsuaki; and Kaneko, Ryoichi, 4,635,210, Cl. 364-508.000.

Ohmori, Shoji: *See—*
Okada, Takashi; Mogi, Takao; Ohmori, Shoji; Tanaka, Yutaka; and Kobayashi, Hiroyuki, 4,635,113, Cl. 358-124.000.

Ohnishi, Kenichi: *See—*
Takemura, Shinji; Hida, Tsuneo; Matsuzaki, Yutaka; and Ohnishi, Kenichi, 4,634,945, Cl. 318-469.000.

Ohsuga, Kamemaru, to Yamaho Kogyo Co., Ltd. Vegetable activator and method for manufacturing same. 4,634,463, Cl. 71-34.000.

Ohta, Hisashi: *See—*
Yanagiya, Toshio; Isokawa, Kenji; Ohta, Hisashi; and Inaba, Hideaki, 4,634,573, Cl. 420-127.000.

Ohta, Kenji; Takahashi, Akira; Inui, Tetsuya; Hyuga, Takao; and Yamaoka, Hideyoshi, to Sharp Kabushiki Kaisha. Optical memory disc. 4,634,617, Cl. 428-65.000.

Ohtaka, Keiji: *See—*
Suda, Yasuo; Ishizaki, Akira; Ohtaka, Keiji; Akashi, Akira; and Hiramatsu, Akira, 4,634,255, Cl. 354-406.000.

Ohtsuki, Toru: *See—*
Yabe, Hideaki; Oshima, Yoshio; Ishikawa, Sako; Ohtsuki, Toru; and Fukuta, Masaharu, 4,635,220, Cl. 364-763.000.

Oi, Takato, to Nukada, Fumiaki. Image reading/recording apparatus. 4,635,130, Cl. 358-296.000.

Oishi, Mitsugu; and Kansi, Hidefumi, to Casio Computer Co., Ltd.; and Casio Electronics Manufacturing Co., Ltd. Apparatus for maintaining distinct edges between two colors in a two-color image forming device. 4,634,259, Cl. 355-4.000.

Oiyama, Kiyokazu: *See—*
Ninomiya, Yoshinobu; Somezawa, Masashi; and Oiyama, Kiyokazu, 4,634,633, Cl. 428-425.900.

Oka, Kozo: *See—*
Yoshino, Masaki; Oka, Kozo; and Koide, Fuminori, 4,634,257, Cl. 355-3.0CH.

Okabe, Yoshio; and Furudate, Masato, to Dengensha Manufacturing Company Limited. Control method of resistance welding. 4,634,828, Cl. 219-117.100.

Okabe, Yoshio; and Furudate, Masato, to Dengensha Manufacturing Company Limited. Control method of spot welding. 4,634,829, Cl. 219-117.100.

Okada, Ikuo; Saitoh, Yasunao; Yoshihara, Hideo; and Nakayama, Satoshi, to Nippon Telegraph & Telephone Public Corp. X-ray source and X-ray lithography method. 4,635,282, Cl. 378-34.000.

Okada, Kozo; Masuda, Michiyuki; and Ueha, Sadayuki, to NGK Spark Plug Co., Ltd. Piezoelectric rotary driver. 4,634,916, Cl. 310-323.000.

Okada, Tahei; and Takesue, Masahiko, to Idemitsu Kosan Company Limited. Shock absorber fluid composition and shock absorber containing said composition. 4,634,543, Cl. 252-78.500.

Okada, Takashi; Mogi, Takao; Ohmori, Shoji; Tanaka, Yutaka; and Kobayashi, Hiroyuki, to Sony Corporation. Apparatus for descrambling transmitted scrambled television signals. 4,635,113, Cl. 358-124.000.

Okada, Takashi: *See—*
Tomioka, Masao; Okada, Takashi; and Mogi, Takao, 4,635,112, Cl. 358-122.000.

Okada, Yoshinori: *See—*
Nakagawa, Isao; Yamamoto, Akihiro; Hirose, Koichi; Okada, Yoshinori; and Kudo, Mitsuru, 4,634,995, Cl. 330-261.000.

Okajima, Kunihiko: *See—*
Kamide, Kenji; and Okajima, Kunihiko, 4,634,470, Cl. 106-163.100.

Okajima, Masaki: *See—*
Motegi, Nawoto; Okajima, Masaki; and Muro, Yuhei, 4,635,268, Cl. 372-45.000.

Okano, Michiaki: *See—*
Urui, Kiyoshi; Ishikawa, Kiyoshi; and Okano, Michiaki, 4,635,253, Cl. 370-67.000.

Okawara, Makoto; and Tsubuko, Kazuo, to Ricoh Co., Ltd. Non-aqueous type resin and electrophotographic developer containing the same. 4,634,651, Cl. 430-114.000.

Oki Electric Industry Co., Ltd.: *See—*
Okuaki, Hiroshi, 4,635,165, Cl. 361-400.000.

Okimoto, Haruo, to Mazda Motor Corporation. Ignition timing control for a supercharged engine. 4,633,844, Cl. 123-559.000.

Okita, Masao; Gunji, Kunihiko; and Saito, Yukio, to Alps Electric Co., Ltd. Loading and ejecting mechanism in a recording and reproducing apparatus. 4,635,149, Cl. 360-97.000.

Okuaki, Hiroshi, to Oki Electric Industry Co., Ltd. Printed-circuit construction with EPROM IC chip mounted thereon. 4,635,165, Cl. 361-400.000.

Okuda, Toshio, to 'totes', Incorporated. Umbrella rib tipping system. 4,633,894, Cl. 135-34.000.

Okui, Kazuyuki: *See—*
Moriki, Shinichi; and Okui, Kazuyuki, 4,634,167, Cl. 296-31.00P.

Okumura, Koichiro; and Watanabe, Takeshi, to NEC Corporation. Semiconductor memory device including non-volatile transistor for storing data in a bistable circuit. 4,635,229, Cl. 365-154.000.

Okumura, Takatoshi: *See—*
Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; and Okumura, Takatoshi, 4,635,048, Cl. 340-703.000.

Okumura, Tsuguo: *See—*
Yamagishi, Naomichi; Mori, Kenji; Okumura, Tsuguo; Hiratsuka, Tatsufumi; and Sugiyama, Masayoshi, 4,634,840, Cl. 219-388.000.

Okutome, Toshiyuki: *See—*
Fujii, Setsuro; Nakayama, Toyoo; Nunomura, Shigeki; Matsui, Ryoji; Watanabe, Shin-ichi; Sudo, Kimio; Okutome, Toshiyuki; Kurumi, Masateru; Sakurai, Yojiro; and Aoyama, Takuo, 4,634,783, Cl. 549-475.000.

Okuyama, Masahiko: *See—*
Kondo, Kazuo; and Okuyama, Masahiko, 4,634,634, Cl. 428-432.000.

Oldewurtel, Otto: *See—*
Kaufmann, Karl-Ernst; Saeftel, Josef-Paul; Bitsch, Harald; and Oldewurtel, Otto, 4,634,078, Cl. 242-158.00R.

Olierook, John C. J.: *See—*
Beyersbergen van Henegouwen, Cornelis M.; van de Kerkhof, Hubertus F. W.; Koken, Karel G. M.; and Olierook, John C. J., 4,634,020, Cl. 220-335.000.

Olifant, Jacques: *See—*
Guery, Jean-Pierre; and Olifant, Jacques, 4,635,016, Cl. 335-230.000.

Oliver, Dell B.; and Jahoda, Peter, to Gila River Products, Inc. Solar control film. 4,634,637, Cl. 428-622.000.

Oliver, Larry R., to Dayco Corporation. Endless power transmission belt construction and method of making the same. 4,634,411, Cl. 474-244.000.

Olombel, Andre : *See—*
Bezer, Christian; Olombel, Andre ; and Viel, Georges, 4,634,873, Cl. 250-497.100.

Olsen, Karl H., to Velsmidjan GL. Olsen. Apparatus for storing and launching a float or the like vessel from a ship. 4,633,802, Cl. 114-367.000.

Olson, Arthur A., Jr.: *See—*
Hahn, Norbert; and Olson, Arthur A., Jr., 4,634,334, Cl. 414-401.000.

Olson, Harold D.: *See—*
Cagle, J. Douglas; Olson, Harold D.; and Addison, Charles, 4,634,594, Cl. 426-393.000.

Olsson, Seth I. S.: *See—*
Sohlberg, Jan-Henrik; and Olsson, Seth I. S., 4,633,650, Cl. 53-415.000.

Olympus Optical Co., Ltd.: *See—*
Baba, Kazuo, 4,633,855, Cl. 128-6.000.
Galle, Kevin; Orimo, Ryoichi; Sakurada, Masahiko; Banno, Taiichi; and Manabe, Sugio, 4,634,576, Cl. 422-102.000.
Kawakami, Kazuo; Nagai, Yawara; and Aihara, Takayuki, 4,634,575, Cl. 422-63.000.
Koiwai, Tamotsu, 4,634,250, Cl. 354-195.110.
Matsuo, Kazumasa; and Nakada, Akio, 4,633,882, Cl. 128-660.000.
Mihara, Shin-ichi; Imai, Toshihiro; Ikari, Kazuo; and Fujii, Toru, 4,635,125, Cl. 358-228.000.
Shinozuka, Minoru, 4,633,871, Cl. 128-321.000.

Olympus Winter & Ibe, GmbH: *See—*
Korth, Knut; and Hluchy, Heinz, 4,633,860, Cl. 128-305.000.

O'Malley, Kieran; Preisler, John; and Larkin, Berni, to Northern Telecom Limited. Communications headset. 4,634,816, Cl. 379-430.000.

Oman, Price W.; Rinaldi, Mark A.; Russo, Vito W.; and Salyer, Gregory, to International Business Machines Corporation. Detection and correction of multi-chip synchronization errors. 4,635,186, Cl. 364-200.000.

Omron Tateisi Electronics Co.: *See—*
Ikeda, Toshio; Sakamoto, Tamaki; and Masuo, Yoshihisa, 4,634,292, Cl. 374-109.000.
Noguchi, Masayoshi, 4,634,820, Cl. 200-16.00A.
Shinohara, Yoshitsugu; and Ichihashi, Masazumi, 4,634,848, Cl. 235-449.000.

Ong, Lincoln, to Lec Tec Corporation. Electrode with disposable interface member. 4,633,879, Cl. 128-641.000.

Onodera, Shunji: *See—*
Hishiki, Hideo; and Onodera, Shunji, 4,635,176, Cl. 363-21.000.

Onuma, Toshio: *See—*
Asami, Ken; Ohashi, Kaoru; Onuma, Toshio; and Buma, Shuuichi, 4,634,143, Cl. 280-707.000.

Ooka, Masataka; Kuwamura, Shinichi; and Murakami, Yoichi. Process for producing tertiary amino group-containing vinyl polymers and curable resin compositions based on these polymers. 4,634,736, Cl. 525-117.000.

Operschall, Hermann; Steiner, Klaus-Alfred; and Voggenthaler, Ludwig, to Kraftwerk Union Aktiengesellschaft. Device for electropolishing the inner surface of hollow cylindrical bodies. 4,634,511, Cl. 204-212.000.

Oppama Kogyo Kabushiki Kaisha: *See—*
Nogawa, Masato, 4,633,658, Cl. 56-255.000.

Opsal, Jon: *See—*
Rosencwaig, Allan; and Opsal, Jon, 4,634,290, Cl. 374-5.000.

Orban, Ralph F., to Material Concepts, Inc. Conductive cable or fabric. 4,634,805, Cl. 174-128.00R.

Orensteen, Bruce D.: *See—*
Hockert, Eric N.; Orensteen, Bruce D.; Bradshaw, Thomas I.; and Borgeson, Frank A., 4,634,220, Cl. 350-167.000.

Orimo, Ryoichi: *See—*
Galle, Kevin; Orimo, Ryoichi; Sakurada, Masahiko; Banno, Taiichi; and Manabe, Sugio, 4,634,576, Cl. 422-102.000.

Orosz, Miklos J.: *See—*
Erb, Fred; and Orosz, Miklos J., 4,635,014, Cl. 335-195.000.

Ortho Pharmaceutical Corporation: *See—*
Bandurco, Victor T.; Mallory, Robert A.; Press, Jeffrey B.; and Werblood, Harvey M., 4,634,769, Cl. 544-285.000.

Orthomatic Limited: *See—*
Morrison, Ronald F., 4,633,539, Cl. 5-508.000.

O'Ryan, David E.: *See—*
Hollstein, Thomas E.; O'Ryan, David E.; and Waryu, Joseph C., 4,634,058, Cl. 239-697.000.

Osaka Municipal Government: *See—*
Inoue, Hiroshige; Fukushima, Kenichi; and Nishiguchi, Ikuzo, 4,634,768, Cl. 544-151.000.

Osborne, Thomas A., to Cook, Incorporated. Flexible sheath assembly for an indwelling catheter. 4,634,433, Cl. 604-171.000.

Oshima, Yoshio: *See—*
Yabe, Hideaki; Oshima, Yoshio; Ishikawa, Sako; Ohtsuki, Toru; and Fukuta, Masaharu, 4,635,220, Cl. 364-763.000.

Oshima, Yujiro; Yamada, Masatoshi; Mori, Nobuyuki; Sugiyama, Katsuhiko; Aoyama, Taro; Saito, Akinori; and Kozuka, Kazuhiro, to K.K. Toyota Chuo Kenkyusho. Direct injection internal combustion engine of compression ignition type. 4,633,830, Cl. 123-276.000.

Ostermeier, Heinrich, to Happycard International Limited. Photographic camera for producing a composite picture. 4,634,248, Cl. 354-75.000.

Osypka, Peter; and Hoge, Rudiger, to Osypka, Peter. Surgical electrode. 4,633,880, Cl. 128-642.000.

Otema, Martin. Store fixtures. 4,634,010, Cl. 211-96.000.

Otis Engineering Corporation: *See*—
Dixon, Glen A.; McCloskey, Clark E.; Chambers, David L.; Hawk, Woodrow D.; and McCracken, Oliver W., 4,633,954, Cl. 166-372.000.

Oto, Katsufumi: *See*—
Nakagawa, Yukio; Oto, Katsufumi; and Kurihara, Masaru, 4,634,531, Cl. 210-639.000.

Ottley, Thomas W.; and Conway, John K., to Prutec Limited. Introduction of samples into a mass spectrometer. 4,634,867, Cl. 250-288.000.

Otty, Malcolm. Stitch bonded electrically insulating board. 4,634,620, Cl. 428-102.000.

Outboard Marine Corporation: *See*—
Flaig, John D., 4,633,825, Cl. 123-73.00V.

Ove, Olsson; and Ingegard, Olsson, to Ove Olsson and Ingegard Olsson. Device for controlled discharge of liquid to animals. 4,633,816, Cl. 119-72.500.

Ove Olsson and Ingegard Olsson: *See*—
Ove, Olsson; and Ingegard, Olsson, 4,633,816, Cl. 119-72.500.

Overeijnder, Hans: *See*—
Lodder, Bernhard; Overeijnder, Hans; and van Dongeren, Jan P., 4,634,844, Cl. 219-544.000.

Owen, Hartley; Tabak, Samuel A.; and Wright, Bernard S., to Mobil Oil Corporation. Synthesis process for producing alkylate hydrocarbons. 4,634,798, Cl. 585-331.000.

Owen, Lawrence B.; and Green, Sidney J., to Terra Tek, Inc. Forced refreezing method for the formation of high strength ice structures. 4,634,315, Cl. 405-217.000.

Oxley, Andrew N.; and Oxley, Douglas A. J., to PZ Products Limited. Control device for an inertia reel seat belt. 4,634,075, Cl. 242-107.200.

Oxley, Douglas A. J.: *See*—
Oxley, Andrew N.; and Oxley, Douglas A. J., 4,634,075, Cl. 242-107.200.

Oy Kaukas AB: *See*—
Malkki, Raimo; Kuisma, Antti; and Verkasalo, Matti, 4,634,068, Cl. 242-65.000.

Oy Wartsila AB: *See*—
Kuosa, Harri; and Kultaranta, Tapani, 4,633,774, Cl. 100-43.000.

Oy Wilh.Schauman AB: *See*—
Simola, Markku A.; and Haapoja, Vesa, 4,634,521, Cl. 209-17.000.

Ozaki, Masanao: *See*—
Shinohara, Emiko; Sugiyama, Katsumi; Ozaki, Masanao; and Matsuda, Keizo, 4,634,790, Cl. 560-40.000.

P & H Sales Co.: *See*—
Hicks, Jimmy L., 4,633,544, Cl. 16-35.00R.

P.L. Porter Co.: *See*—
Tanaka, Aki, 4,634,182, Cl. 297-379.000.

Paccar Inc: *See*—
Bergson, Benjamin J., 4,634,476, Cl. 420-73.000.

Page, Jimmy: *See*—
Neves, Fernando B.; and Page, Jimmy, 4,634,384, Cl. 434-44.000.

Paice, Derek A.: *See*—
Shimp, Alan B.; and Paice, Derek A., 4,634,981, Cl. 324-424.000.

Pal, Ferenc: *See*—
Pungor, Erno ; Toth, Klara; Pal, Ferenc; Eros, Bela; Nagy, Jozsef; and Bihatsi, Laszlo , 4,634,982, Cl. 324-448.000.

Pallez, Francois: *See*—
Maurel, Pierre; Lamerant, Jean-Michel; and Pallez, Francois, 4,634,579, Cl. 423-17.000.

Palmateer, Paul H.: *See*—
Ainslie, Norman G.; Harvilchuck, Joseph M.; Interrante, Mario J.; King, William J., Jr.; Palmateer, Paul H.; and Sullivan, John F., 4,634,638, Cl. 428-671.000.

Palmer, Malcolm G. Signalling device. 4,633,969, Cl. 181-118.000.

Panzer, Siegfried: *See*—
Schiller, Siegfried; Panzer, Siegfried; and Gaber, Klaus, 4,633,611, Cl. 47-1.300.

Parker Hannifin Corporation: *See*—
Jelinek, Jerry G., 4,634,132, Cl. 277-11.000.

Parker, John A.: *See*—
Kumar, Devendra; Fohlen, George M.; and Parker, John A., 4,634,759, Cl. 528-321.000.

Parker, Robert: *See*—
Larsson, Peter L.; Parker, Robert; and Ratzlaff, Thomas D., 4,634,213, Cl. 339-275.00T.

Parkin, Graeme I. P.: *See*—
Chorley, Bernard J.; Parkin, Graeme I. P.; Wichmann, Brian A.; and Elsom, Simon M., 4,634,807, Cl. 178-22.080.

Parr, Erwin W.: *See*—
Brandt, Timothy B.; and Parr, Erwin W., 4,633,901, Cl. 137-510.000.

Parr Manufacturing, Inc.: *See*—
Brandt, Timothy B.; and Parr, Erwin W., 4,633,901, Cl. 137-510.000.

Parsons, Charles F.: *See*—
Miller, Curtis M.; Myers, Charles L.; and Parsons, Charles F., 4,634,732, Cl. 524-504.000.

Parsons, William H.; and Taub, David, to Merck & Co., Inc. Substituted N-carboxymethyl-aminoacylaminoalkanoic acids useful as antihypertensive agents. 4,634,716, Cl. 514-423.000.

Partridge, John J.; Shiuey, Shian-Jan; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Synthesis of 1α,25-dihydroxy-24R-fluorocholecalciferol and 1α,25-dihydroxy-24S-fluorocholecalciferol. 4,634,692, Cl. 514-167.000.

Pascik, Imre: *See*—
Baumgarten, Jorg; Frommer, Werner; Mann, Theo; Pascik, Imre; Rast, Hans-Georg; and Schapel, Dietmar, 4,634,672, Cl. 435-182.000.

Passamaneck, Richard S.: *See*—
Hill, Gilman A.; Passamaneck, Richard S.; and Touryan, Kenell J., 4,633,951, Cl. 166-308.000.

Patel, Kirit, deceased: *See*—
Paul, Gunther; and Patel, Kirit, deceased, 4,633,661, Cl. 57-280.000.

Patel, Shakuntala, heiress: *See*—
Paul, Gunther; and Patel, Kirit, deceased, 4,633,661, Cl. 57-280.000.

Patrick, Charles L.: *See*—
Arora, Vas D.; Gill, William A.; and Patrick, Charles L., 4,634,154, Cl. 285-353.000.

Patrick, John L.: *See*—
Misic, George J.; Lillo, Aarne; Patrick, John L.; and Holland, G. Neil, 4,634,980, Cl. 324-322.000.

Pattle, David W.: *See*—
Withers, Christopher J.; and Pattle, David W., 4,634,105, Cl. 266-217.000.

Paul, Gunther; and Patel, Kirit, deceased (by Patel, Shakuntala, heiress), to FAG Kugelfischer Georg Schafer (KGaA). Rethreading arrangement for friction false-twisting unit for textile threads. 4,633,661, Cl. 57-280.000.

Paulson, Charles M., Jr., to Du Pont de Nemours, E. I., and Company. Method for measuring shape parameters of yarn. 4,634,280, Cl. 356-385.000.

Paulsson, Kurt; and Trok, Beniamin. Terminal systems. 4,634,809, Cl. 379-91.000.

Pavlath, George A.: *See*—
Shaw, Herbert J.; and Pavlath, George A., 4,634,282, Cl. 356-350.000.

Pavlick, Michael J., to Budd Company, The. Flexible transom connected between side frames of a railway truck to provide equalization. 4,633,786, Cl. 105-203.000.

Pavlin, Mark S.; and Veazey, Richard L., to Union Camp Corporation. Terpene-based ester tackifiers. 4,634,729, Cl. 524-285.000.

Payne, Earl R., to ICI Americas Inc. Field measuring system. 4,635,207, Cl. 364-484.000.

Payne, Randall K.; and Nord, Russell H., to Norland Corporation. Digital waveform processing oscilloscope with distributed data multiple plane display system. 4,634,970, Cl. 324-121.00R.

Payne, Thomas R., to General Electric Company. Diagnostic testing arrangement for an electric cooking appliance incorporating commutated relay switching circuits. 4,634,842, Cl. 219-486.000.

Payne, Thomas R., to General Electric Company. Dual mode power control arrangement for cooking appliance. 4,634,843, Cl. 219-486.000.

Peabody, Ralph C.; and Grimes, Charles E., to Tennant Company. Belt drive. 4,634,403, Cl. 474-1.000.

Pearce, Arthur W. Bale loader. 4,634,336, Cl. 414-546.000.

Pearce, Jeffrey B.: *See*—
Julich, Paul M.; and Pearce, Jeffrey B., 4,634,110, Cl. 371-11.000.

Peascoe, Warren J.: *See*—
Hunter, Byron A.; Rowland, Donald G.; and Peascoe, Warren J., 4,634,721, Cl. 521-92.000.

Pease, Robert E. Control system for longwall shearer. 4,634,186, Cl. 299-1.000.

Pebsworth, Lloyd: *See*—
Hwang, Yu-Tang; Pebsworth, Lloyd; Dombro, Robert A.; and Hoff, Raymond E., 4,634,744, Cl. 526-84.000.

Peitsch, Bernd E.: *See*—
Johnson, Robert C.; Perry, David L.; and Peitsch, Bernd E., 4,634,971, Cl. 324-133.000.

Pendergast, Hugh L. Dynamic foot support and kit therefor. 4,633,877, Cl. 128-581.000.

Penney, Carl M., to General Electric Company. Method and system for determining surface profile information. 4,634,879, Cl. 250-560.000.

Penney, Janet S.: *See*—
Detter, Gary C.; Norling, Samuel A.; Penney, Janet S.; and Tolnar, Emil J., Jr., 4,634,204, Cl. 339-91.00R.

Pennwalt Corporation: *See*—
Sanchez, Jose, 4,634,753, Cl. 526-216.000.

Pentz, Bernhard v.: *See*—
Kronenberg, Harmut; and Pentz, Bernhard v., 4,635,043, Cl. 340-618.000.

Pepera, Marc A.: *See*—
Callahan, James L.; Desmond, Michael J.; and Pepera, Marc A., 4,634,502, Cl. 204-23.000.

Percec, Virgil, to B. F. Goodrich Company, The. Polyarylene polyethers with pendant vinyl groups and process for preparation thereof. 4,634,742, Cl. 525-390.000.

Perkin Elmer Corporation, The: *See*—
Fricke, William C., 4,634,878, Cl. 250-560.000.

Perkins, Jimmie G.: *See*—
Manning, Steven F.; and Perkins, Jimmie G., 4,633,763, Cl. 91-530.000.

Perneczky, George C. Self-adjusting conveyor belt cleaning apparatus. 4,633,999, Cl. 198-499.000.

Perry, David L.: *See*—
Johnson, Robert C.; Perry, David L.; and Peitsch, Bernd E., 4,634,971, Cl. 324-133.000.

Persem, Jake; Quinn, Mike; Emery, Walter C.; and Bracht, Philip E., to Margaux Controls, Inc. Unequal compressor refrigeration control system. 4,633,672, Cl. 62-126.000.

Persson, Gert, to Dynapac AB. Rotary tool. 4,634,188, Cl. 299-39.000.

Pesa, Frederick: *See*—
Desmond, Michael J.; Pesa, Frederick; and Eshraghi, Reza, 4,634,686, Cl. 502-60.000.

Pesaro, Mario: *See*—
Helmlinger, Daniel; and Pesaro, Mario, 4,634,548, Cl. 252-522.00R.

Pesthy, Paul K. Resilient exercise machine with body support platform. 4,634,119, Cl. 272-144.000.

Peters, Hubertus: *See*—
Bechem, Werner; Peters, Hubertus; Solbach, Werner; and Wolfhard, Dietrich, 4,634,504, Cl. 204-28.000.

Petersen, Jorgen H.; Clausen, Peter J. M.; and Rasmussen, Hilmar O., to Danfoss A/S. Method of making fuel preparing elements for vapor burners fed with liquid fuel. 4,634,481, Cl. 156-89.000.

Petersen, Thomas D. Patellar resection sawguide. 4,633,862, Cl. 128-92.0VY.

Peterson, Jerry D.; and Knief, Gerald L., to Ritchie Industries, Inc. Waterer corner wear guard. 4,633,815, Cl. 119-72.000.

Petrie, Ross J.: *See*—
Morrison, Daniel R.; Petrie, Ross J.; and Savage, Kenneth D., 4,633,673, Cl. 62-129.000.

Petsche, Irena B.: *See*—
Hagerty, Robert O.; Petsche, Irena B.; and Schurzky, Kenneth G., 4,634,752, Cl. 526-129.000.

Pettit, John, to Vetco Offshore Industries, Inc. Casing hanger running tool. 4,634,152, Cl. 285-39.000.

Peyman, Gholam; and Viherkoski, Esa. Ophthalmic laser surgical method. 4,633,866, Cl. 128-303.100.

Pezzoli, Luigi, to O.M.V. Officine Meccaniche Vilminore S.p.A. Device for preventing dust deposits on weft feeders for weaving looms. 4,633,915, Cl. 139-1.00C.

Pfaff Haushaltmaschinen: *See*—
Hoffmann-Glewe, Manfred; and Prause, Dieter, 4,633,796, Cl. 112-314.000.

Pham, Giao N.: *See*—
Craycraft, Donald G.; and Pham, Giao N., 4,634,893, Cl. 307-270.000.

Pherigo, Douglas E., to J. L. Clark Manufacturing Co. Container with plastic hinge. 4,634,019, Cl. 220-334.000.

Philibert, Daniel: *See*—
Teutsch, Jean-Georges; Torelli, Vesperto; Deraedt, Roger; and Philibert, Daniel, 4,634,696, Cl. 514-179.000.
Torelli, Vesperto; Teutsch, Jean G.; and Philibert, Daniel, 4,634,695, Cl. 514-178.000.

Phillips Petroleum Co.: *See*—
Drake, Charles A.; and Reiter, Stephen E., 4,634,794, Cl. 560-245.000.
Gallagher, Joseph G.; and Wyatt, Kay D., 4,635,238, Cl. 367-40.000.
Gentry, Cecil C.; and Small, William M., 4,633,940, Cl. 165-159.000.
Neff, Dennis B., 4,635,239, Cl. 367-47.000.

Phlippen, Peter W.: *See*—
Kugeler, Kurt; Jaroni, Ulrich; Kelm, Wieland; Phlippen, Peter W.; Schmidtlein, Peter; and Kugeler, Manfred, 4,634,875, Cl. 250-506.100.

Piazzola, Gaetano. Heat transfer means to be installed around the barrel of an extruder or injection molding machine. 4,634,361, Cl. 425-190.000.

Picker International, Inc.: *See*—
Misic, George J.; Lillo, Aarne; Patrick, John L.; and Holland, G. Neil, 4,634,980, Cl. 324-322.000.

Pierce, Benjamin J.: *See*—
Dekeyser, Mark A.; Pierce, Benjamin J.; Moore, Richard C.; and Hubbard, Winchester L., 4,634,690, Cl. 514-81.000.

Pierce, Gerald A.; and Buxton, James L., to Drexler Technology Corporation. Quad density optical data system. 4,634,850, Cl. 235-487.000.

Pierce, Robert H., to Vetco Offshore Inc. Composite marine riser system. 4,634,314, Cl. 405-195.000.

Pierce, William C.: *See*—
Hagan, Lyle M.; and Pierce, William C., 4,634,141, Cl. 280-704.000.

Pierrot, Henri: *See*—
Lemarquand, Pierre; and Pierrot, Henri, 4,635,013, Cl. 335-20.000.

Piewitt, Gunter: *See*—
Harting, Dietmar; Nagel, Hans; and Piewitt, Gunter, 4,634,206, Cl. 339-103.00M.

Pike, Carl D. Motorcycle auxiliary gearshift. 4,633,727, Cl. 74-474.000.

Pike, Susan C., to Eastman Kodak Company. Electrographic development apparatus having a continuous coil ribbon blender. 4,634,286, Cl. 366-320.000.

Pikora, Alfred J. Digital image proportion analyzer. 4,633,591, Cl. 33-452.000.

Pilkington, Mervin V.; Cole, Robert W.; and Schisler, Robert C., to Goodyear Tire & Rubber Company, The. Hose construction. 4,633,912, Cl. 138-132.000.

Pilson, William: *See*—
Fryer, George E.; Pilson, William; Stephens, William J.; and Chandler, Charles H., 4,634,138, Cl. 280-278.000.

Pioneer Electronic Corporation: *See*—
Kanamaru, Hitoshi, 4,634,853, Cl. 250-201.000.
Kusaka, Hiroki, 4,635,148, Cl. 360-96.600.
Tokui, Satoru; Sueyoshi, Susumu; and Nanba, Keiichiro, 4,635,222, Cl. 364-900.000.

Pipon, Yves, to A & M Cousin & Cie. Round hinged-part for land, sea and air vehicle seats. 4,634,181, Cl. 297-362.000.

Pischinger, Franz; and Lepperhoff, Gerhard, to FEV Forschungsgesellschaft fur Energie-Technik und Verbrennungsmotoren GmbH. Particle filtration and removal system. 4,634,459, Cl. 55-418.000.

Pitcher, Kenneth A.: *See*—
Batra, Ram S.; and Pitcher, Kenneth A., 4,635,118, Cl. 358-166.000.

Pitney Bowes Inc.: *See*—
Eckert, Alton B., Jr.; Kirschner, Wallace; and Salazar, Edilberto I., 4,635,205, Cl. 364-464.000.
Hubbard, David W., 4,635,079, Cl. 346-140.00R.
Jones, Howell A.; Soderberg, John H.; Eckert, Alton B.; and Nambudiri, Easwaran C. N., 4,635,204, Cl. 364-464.000.

Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Miller, Kevin P.; and Wiener, Charles, to International Flavors & Fragrances Inc. Thioalkanoic acid esters of phenylalkanols. 4,634,595, Cl. 426-535.000.

Pittinger, Charles B., Jr. Bump-feed filament vegetation trimmer means and method. 4,633,588, Cl. 30-347.000.

Pivonka, Josef K., to Tweedy of Burnley Limited. Apparatus for slitting and folding dough pieces. 4,634,363, Cl. 425-306.000.

Plapp, Nile E.; and Willett, Ray W., to Centech Corporation. Vapor phase processing system. 4,634,000, Cl. 198-800.000.

Plath, Gernold: *See*—
Hohlweck, Hans; Plath, Gernold; and Baisch, Friedhelm, 4,635,198, Cl. 364-414.000.

Plessey Overseas Limited: *See*—
Ball, Alan K., 4,635,059, Cl. 342-117.000.
Whatmore, Roger W.; and Young, Iain M., 4,634,913, Cl. 310-313.00A.

Plessey South Africa Limited: *See*—
Braun, Robin M., 4,634,999, Cl. 331-4.000.

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Rosenberg, Farel. Orthodontic bracket having archwire seating and locking mechanism. 4,634,662, Cl. 433-10.000.

Rosencwaig, Allan; and Opsal, Jon, to Therma-Wave, Inc. Method and apparatus for detecting thermal waves. 4,634,290, Cl. 374-5.000.

Rosenhouse, Stanley: *See*—
Jenkins, John K.; Chiu, John S.; Eckhart, Charles G.; McNamara, Paul E.; Rosenhouse, Stanley; and Youngstrom, Richard E., 4,634,556, Cl. 540-310.000.

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Ross, Arthur L., to General Electric Company. Electrical connection. 4,635,093, Cl. 357-80.000.

Ross, Joseph; and Schmidt, Richard, to Robotic Vision Systems, Inc. Method of three-dimensional measurement with few projected patterns. 4,634,278, Cl. 356-376.000.

Ross, Joseph; and Schmidt, Richard, to Robotic Vision Systems, Inc. Method of three-dimensional measurement with few projected patterns. 4,634,279, Cl. 356-376.000.

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Roy, Glenn M.: *See*—
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Rubber- en Kunststoffabriek ENBI B.V.: *See*—
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Rudoi, Boris L. Bullet proof armor shield. 4,633,756, Cl. 89-36.020.

Ruiz, Robert, to James Industries Limited. Toilet chairs. 4,634,183, Cl. 297-433.000.

Rule, Dennis A.: *See*—
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Rusch, Randy A.; Kittle, Douglas A.; Ulfers, Bernhard G.; and Inman, Stephen L., to General Motors Corporation. Programming power paths in an IC by combined depletion and enhancement implants. 4,633,572, Cl. 29-576.00B.

Rush, Derek A., to Smiths Industries Public Limited Company. Electrical contact assemblies and components. 4,634,198, Cl. 339-17.0LC.

Rusnock, Kevin R., to Adolph Coors Company. Carton blank with perforated tear line. 4,634,007, Cl. 206-620.000.

Russell Corporation: *See*—
Adamson, Fletcher D.; and Caldwell, James M., 4,633,604, Cl. 38-2.000.

Russell, Robert C.; and Keeler, David J. Forceps having replaceable tips. 4,634,165, Cl. 294-99.200.

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Rutsch, Hubert; Golay, Gilbert; and Muhlemann, Daniele. Massage device with pinching action. 4,633,858, Cl. 128-59.000.

Rykaczewski, Stanley. Sliver retriever. 4,633,563, Cl. 29-270.000.

S.I.A.T. Societa Internazionale Applicazioni Techniche S.p.A.: *See*—
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Saglio, Robert, to Commissariat a l'Energie Atomique. Ultrasonic device. 4,635,241, Cl. 367-95.000.

Sain, Bernard S., to Trailer Marine Transport Corporation. Modular ventilation system for vehicles. 4,633,767, Cl. 98-6.000.

St. Clair, Gordon; and Alsenz, Evert C., to Avionics Antenna Systems. Multiband multimode aircraft antenna. 4,635,066, Cl. 343-705.000.

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Sumiyoshi, Osamu: *See*—
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Sundstrand Corporation: *See*—
Buford, John T., 4,634,479, Cl. 149-6.000.
Shekhawat, Sampat S.; Dhyanchand, P. John; and Thollot, Pierre, 4,635,177, Cl. 363-41.000.

Sundstrand Data Control, Inc.: *See*—
Chisholm, John P., 4,635,064, Cl. 342-408.000.
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Nolte, David B., 4,634,987, Cl. 328-160.000.

Suntory Limited: *See*—
Ueda, Toshihiro; Imanishi, Masamichi; Iyama, Kazuo; Fukuhara, Akio; and Iwase, Ken, 4,634,003, Cl. 206-221.000.

Superior Electric Company, The: *See*—
Brigham, Robert N., 4,634,948, Cl. 318-696.000.

Superior Graphite Co.: *See*—
Zaleski, Peter L.; and Gratt, Stanley H., 4,634,545, Cl. 252-29.000.

Supernova Systems, Inc.: *See*—
Billion, Leo, 4,634,881, Cl. 250-572.000.

Surefire, Inc.: *See*—
Herko, Robert W., 4,634,374, Cl. 431-146.000.

Surface Technology, Inc.: *See*—
Lindsay, Deborah J., 4,634,619, Cl. 427-97.000.

Suris, Vladimir: *See*—
Griffiths, Thomas W.; and Suris, Vladimir, 4,634,817, Cl. 191-67.000.

Sustmann, Scarlet; and Marini, Ingo G., to Henkel Kommanditgesellschaft auf Aktien. pH-regulating Cellulose products. 4,634,438, Cl. 604-376.000.

Sustmann, Scarlet; and Marini, Ingo G., to Lenzing Aktiengesellschaft. pH-regulating Cellulose fiber. 4,634,439, Cl. 604-376.000.

Sutphin, Eldon M., Jr., to RCA Corporation. Vehicle identification system using radar and acoustic information. 4,635,058, Cl. 342-52.000.

Suzuka, Masakazu: *See*—
Murata, Yukio; and Suzuka, Masakazu, 4,635,213, Cl. 364-526.000.

Suzuki, Akiyoshi; and Ina, Hideki, to Canon Kabushiki Kaisha. Optical apparatus using polarized light. 4,634,240, Cl. 350-508.000.

Suzuki, Hikoshiro, to Topre Corporation. Constant airflow control apparatus for air conditioning. 4,633,900, Cl. 137-504.000.

Suzuki, Hiroshi; and Imamura, Makoto, to Kabushiki Kaisha Toshiba. Waveform equalizer for signal reproduced from magnetic recording medium. 4,635,143, Cl. 360-65.000.

Suzuki, Katsumi, to NEC. X-ray mask and method of manufacturing the same. 4,634,643, Cl. 430-5.000.

Suzuki, Katsumi: *See*—
Hirose, Masataka; Ueno, Tsuyoshi; and Suzuki, Katsumi, 4,633,809, Cl. 118-719.000.

Suzuki, Masaru, to Kabushiki Kaisha Tokai Denki Seisakusha. Anti-dazzle device for a rearview mirror of a motor vehicle. 4,634,835, Cl. 219-219.000.

Suzuki, Minoru: *See*—
Mori, Kenzo; Yasuda, Hyo; and Suzuki, Minoru, 4,635,065, Cl. 342-435.000.

Suzuki, Nobuo: *See*—
Tajima, Atsushi; Suzuki, Nobuo; and Kuse, Tsutomu, 4,634,624, Cl. 428-212.000.

Suzuki, Sadahide: *See*—
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, 4,633,826, Cl. 123-90.310.

Suzuki, Takashi, to Canon Kabushiki Kaisha. Optical low-pass filter. 4,634,219, Cl. 350-162.220.

Suzuki, Tetsuro, to Ricoh Company, Ltd. Toner for developing latent electrostatic images, containing charge control agent. 4,634,650, Cl. 430-110.000.

Svendsen, Bent: *See*—
Maimann, Mogens; and Svendsen, Bent, 4,635,041, Cl. 340-572.000.

Svenska Sockerfabriks AB: *See*—
Glifberg, Nils B.; and Bengtsson, Wilhelm, 4,633,956, Cl. 171-25.000.

Svensson, Everth, to Schaktfirma Broderna Svensson AB. Arrangement for an axle and a method of mounting a bearing on the axle. 4,634,299, Cl. 384-271.000.

Svoboda, Daniel; Hordinski, Steven; Severns, Dale R.; and Hooker, Howard W., to Union Oil Company of California. Apparatus for introducing solids into a solids upflow vessel. 4,634,330, Cl. 414-198.000.

Svoboda, Johann. Cabinet with roll front to be opened in the upward direction. 4,634,194, Cl. 312-297.000.

Swan, George A.: *See*—
Bailey, George W.; and Swan, George A., 4,634,515, Cl. 208-91.000.

Swanberg, Melvin E., to Xerox Corporation. Temporal pixel clock synchronization system. 4,635,000, Cl. 331-10.000.

Swartling, Lennart G., to Du Pont de Nemours, E. I., and Company. Hopper mounting arrangement for an automatic toning apparatus. 4,634,025, Cl. 222-161.000.

Swartz, George A.; and Benyon, Carl W., Jr., to RCA Corporation. Method for fabricating a radiation hardened oxide having structural damage. 4,634,473, Cl. 148-1.500.

Sweat, Samuel F.: *See*—
Somerville, Robert L.; Sweat, Samuel F.; and Sullivan, John L., 4,634,533, Cl. 210-722.000.

Swietek, Franciscek J.: *See*—
Horlitz, Carl F., Jr.; and Swietek, Franciscek J., 4,633,818, Cl. 122-4.00D.

Swigert, Charles J. System for wide bandwidth damping. 4,633,982, Cl. 188-267.000.

Swiss Aluminium Ltd.: *See*—
Maly, Zdenek; and Hofling, Erich, 4,634,508, Cl. 204-181.600.

Swoboda, Johann: *See*—
Hambrecht, Juergen; Schmitt, Burghard; Swoboda, Johann; Wassmuth, Georg; Bernhard, Claus; and Stephan, Rudolf, 4,634,734, Cl. 525-85.000.

Syntex (U.S.A.) Inc.: *See*—
Gallop, Paul M., 4,634,722, Cl. 523-106.000.
Nash, John E., 4,634,379, Cl. 433-166.000.

Syred, Nicholas; and Biffin, Martin, to Coal Industry (Patents) Limited. Classification and/or grading. 4,634,456, Cl. 55-52.000.

Syria, Roland L.; Purrett, John J.; and Jefferson, Eric, to Xermac, Inc. Electrical discharge machining apparatus including gap condition detection circuitry. 4,634,827, Cl. 219-69.00G.

System Homes Company, Ltd.: *See*—
Yoshino, Hozo; Koshi, Mitsuo; and Sumiyoshi, Osamu, 4,634,952, Cl. 318-811.000.

Szente, Andre : *See*—
Fischli, Albert; Krasso, Anna; Ramuz, Henri; and Szente, Andre , 4,634,710, Cl. 514-338.000.

Szewczyk, Andrew F.: *See*—
Prasad, Chandrika; and Szewczyk, Andrew F., 4,634,041, Cl. 228-124.000.

Tabak, Samuel A.: *See*—
Owen, Hartley; Tabak, Samuel A.; and Wright, Bernard S., 4,634,798, Cl. 585-331.000.

Tachikawa Spring Co., Ltd.: *See*—
Yajima, Yutaka; and Matsushita, Kazuyoshi, 4,634,037, Cl. 228-6.100.

Tada, Mitsuro, to Sharp Kabushiki Kaisha. Automatic document feed type electrophotographic copying machine. 4,634,265, Cl. 355-3.0SH.

Tadauchi, Masaharu: *See*—
Inoue, Yasuo; and Tadauchi, Masaharu, 4,634,885, Cl. 250-578.000.

Taguchi, Masao, to Fujitsu Limited. Semiconductor memory device. 4,635,085, Cl. 357-23.600.

Taguchi, Takasi; Ueno, Yoshiki; and Hattori, Tadashi, to Nippon Soken, Inc. Defrostable outside rear view mirror for an automobile. 4,634,242, Cl. 350-588.000.

Taguchi, Yoshinori: *See*—
Murakami, Azuma; and Taguchi, Yoshinori, 4,634,973, Cl. 324-207.000.

Tahara, Akihiro; and Kondo, Katsuya, to Sumitomo Metal Industries, Ltd. Method of controlling the strip shape and apparatus therefor. 4,633,693, Cl. 72-8.000.

Taiho Seiki Kabushiki Kaisha: *See*—
Tsuge, Eiji; Yanagisawa, Taminori; Yamaguchi, Takaharu; and Fukatsu, Hiroshi, 4,634,338, Cl. 414-752.000.

Taiyo Musen Co. Ltd.: *See*—
Mori, Kenzo; Yasuda, Hyo; and Suzuki, Minoru, 4,635,065, Cl. 342-435.000.

Taji, Satoru; Yoshida, Norio; and Hikawa, Tetsuo, to Ricoh Company, Ltd. Etching of a phosphosilicate glass film selectively implanted with boron. 4,634,494, Cl. 156-628.000.

Tajima, Atsushi; Suzuki, Nobuo; and Kuse, Tsutomu, to Hitachi, Ltd. Combined structure comprising parts having different coefficients of thermal expansion. 4,634,624, Cl. 428-212.000.

Takahashi, Akira: *See*—
Ohta, Kenji; Takahashi, Akira; Inui, Tetsuya; Hyuga, Takao; and Yamaoka, Hideyoshi, 4,634,617, Cl. 428-65.000.

Takahashi, Hiroshi: *See*—
Egami, Tsuneyuki; Saito, Tsutomu; Kohama, Tokio; Saito, Kimitaka; Sato, Kunihiko; and Takahashi, Hiroshi, 4,635,200, Cl. 364-431.050.
Saito, Tsutomu; Egami, Tsuneyuki; Kohama, Tokio; Saito, Kimitaka; Takahashi, Hiroshi; and Sato, Kunihiko, 4,633,840, Cl. 123-489.000.

Takahashi, Horoyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Muffler mechanism for a piano. 4,633,753, Cl. 84-220.000.

Takahashi, Kousuke; and Yamada, Hachiro, to NEC Corporation. Bloch line pair driving device capable of quickly driving each Bloch line pair at a low voltage. 4,635,226, Cl. 365-6.000.

Takahashi, Sadao, to Ricoh Company, Ltd. Photosensitive member of recording apparatus. 4,634,264, Cl. 355-16.000.

Takahashi, Yoshiaki: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; and Takahashi, Yoshiaki, 4,634,688, Cl. 514-41.000.

Takaishi, Naotake; Urata, Kouichi; Inamoto, Yoshiaki; Tsutsumi, Hisao; and Kawano, Junichi, to Kao Soap Co., Ltd. α-Mono (methyl-branched alkyl) glyceryl ether and a skin care cosmetic composition containing the same. 4,634,719, Cl. 514-772.000.

Takano, Hiroshi, to Mitsuboshi Belting Ltd. Method of controlling rotation of a V-belt drive. 4,634,404, Cl. 474-11.000.

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Takano, Tetsuo. Miniaturized electric contact assembly for microswitch. 4,634,824, Cl. 200-266.000.

Takasago Perfumery Co. Ltd.: *See*—
Moroe, Michio, 4,634,588, Cl. 424-48.000.

Takasawa, Seigo; and Morikawa, Yasushi, to Shin Nenryoyu Kaihatsu Gijutsu Kenkyu Kumiai. Process for the preparation of cellulase. 4,634,670, Cl. 435-209.000.

Takashima, Susumu; Tokimoto, Toyotarou; and Kurosawa, Kazuyuki, to Casio Computer Co., Ltd. Electronic musical instrument. 4,633,748, Cl. 84-1.010.

Takashima, Takahiro: *See*—
Sugimoto, Koichi; Kamei, Kiyoshi; Murakami, Yotaro; Sugimoto, Takashi; Nishimura, Takashi; and Takashima, Takahiro, 4,634,477, Cl. 148-402.000.

Takebayashi, Hiroaki; Harumi, Fujio; Nakamura, Kiyoshi; and Inoue, Koichi, to Koyo Seiko Company Limited; and Kabushiki Kaisha Toshiba. Rotating member supporting apparatus. 4,634,300, Cl. 384-548.000.

Takechi, Toshihide: *See*—
Sakurai, Masao; Hamada, Yousuke; Ninomiya, Morimasa; Takechi, Toshihide; Nakagawa, Kunihiro; and Fujii, Takashi, 4,633,735, Cl. 74-675.000.

Takegahara, Takashi: *See*—
Kishi, Hajimu; Tanaka, Kunio; and Takegahara, Takashi, 4,635,185, Cl. 364-191.000.

Takei, Haruo: *See*—
Toya, Ichizo; Mihara, Yuji; and Takei, Haruo, 4,634,653, Cl. 430-217.000.

Takekoshi, Tohru; Clagett, Donald C.; and Cooper, Stephen M., to General Electric Company. Novel copolyimides and polyamic acid precursors therefor. 4,634,760, Cl. 528-353.000.

Takemura, Shinji; Hida, Tsuneo; Matsuzaki, Yutaka; and Ohnishi, Kenichi, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Apparatus for automatically opening and closing an opening covering member. 4,634,945, Cl. 318-469.000.

Takesue, Masahiko: *See*—
Okada, Tahei; and Takesue, Masahiko, 4,634,543, Cl. 252-78.500.

Takeuchi, Michikazu, to TDK Corporation. PTC resistor device. 4,635,026, Cl. 338-22.0SD.

Takeuchi, Toshio; Tomita, Hiroshi; and Ogasawara, Takio, to Sanshin Kogyo Kabushiki Kaisha. Spark timing control device for internal combustion engine. 4,633,834, Cl. 123-424.000.

Takezaki, Jiro: *See*—
Tsujii, Fumio; Matsuoka, Yoji; Endo, Akira; Takezaki, Jiro; and Shirai, Hiroshi, 4,635,202, Cl. 364-449.000.

Talalla, Andrew; and Bullara, Leo A. Stimulation of cauda-equina spinal nerves. 4,633,889, Cl. 128-784.000.

Tama Chemical Co., Ltd.: *See*—
Shimizu, Shumpei; Cho, Toshitsura; and Yagi, Osamu, 4,634,509, Cl. 204-182.400.

Tamai, Yasuo: *See*—
Ogawa, Hiroshi; Saito, Shinji; and Tamai, Yasuo, 4,634,632, Cl. 428-425.900.

Tamaki, Isao, to Sony Corporation. Audio-visual teaching apparatus. 4,634,386, Cl. 434-323.000.

Tamaki, Yoichi; Kure, Tokuo; Sato, Akira; and Higuchi, Hisayuki, to Hitachi, Ltd. Tapered groove IC isolation. 4,635,090, Cl. 357-50.000.

Tamamura, Hideo, to Canon Kabushiki Kaisha. Underwater photographable camera. 4,634,253, Cl. 354-403.000.

Tamura, Akira, to Bridgestone Corporation. Heavy duty pneumatic radial tire. 4,633,926, Cl. 152-209.00R.

Tanabe, Zenichi: *See*—
Ohashi, Azusa; Shirai, Akira; Sakaki, Hirokazu; Tanabe, Zenichi; Tsuchida, Shin; and Hayashi, Yoshikatsu, 4,634,656, Cl. 430-278.000.

Tanaka, Aki, to P.L. Porter Co. Seatback recliner mechanism and inertia operated lock. 4,634,182, Cl. 297-379.000.

Tanaka, Hiroaki: *See*—
Numata, Koji; Tanaka, Hiroaki; and Kuno, Akira, 4,633,709, Cl. 73-178.00R.

Tanaka, Kouichi; Kuwajima, Takeshi; and Amazawa, Kiyoshi, to Clarion Co., Ltd. Circuit arrangement capable of adjusting a threshold level of a differential transistor circuit. 4,634,902, Cl. 307-542.000.

Tanaka, Kunio: *See*—
Kishi, Hajimu; Tanaka, Kunio; and Takegahara, Takashi, 4,635,185, Cl. 364-191.000.

Tanaka, Minoru, to Yamatake-Honeywell Co. Limited. Control system using combined closed loop and duty cycle control functions. 4,634,046, Cl. 236-46.00F.

Tanaka, Toshio: *See*—
Ajioka, Syohei; and Tanaka, Toshio, 4,634,448, Cl. 8-436.000.

Tanaka, Toyoki; and Itoh, Ikuo, to Sharp Kabushiki Kaisha. Color copying machine with copy number counting device for individual color printing. 4,634,258, Cl. 355-4.000.

Tanaka, Yoshinobu; and Yokoi, Hiromitsu, to Kabushiki Kaisha Alpha Giken. Container. 4,634,023, Cl. 222-105.000.

Tanaka, Yutaka: *See*—
Okada, Takashi; Mogi, Takao; Ohmori, Shoji; Tanaka, Yutaka; and Kobayashi, Hiroyuki, 4,635,113, Cl. 358-124.000.

Tangorra, Giorgio, to Industrie Pirelli, S.p.A. Joint for the transmission of motion from a driving shaft to a driven shaft. 4,634,396, Cl. 464-33.000.

Tangorra, Giorgio; Cicognani, Mario; and Macchiarulo, Vincenzo, to Industrie Pirelli S.p.A. Toothed-pulley for transmission with a toothed-belt. 4,634,410, Cl. 474-153.000.

Tani, Yoshio: *See*—
Umeda, Tatsutoshi; Tani, Yoshio; Kasi, Takeshi; Nakano, Keiichi; and Izui, Yoshio, 4,633,824, Cl. 123-41.650.

Tanner, Howard M. C.: *See*—
Chaffee, Edwin G.; Holtman, Steve; Nelson, George A.; and Tanner, Howard M. C., 4,633,872, Cl. 128-303.100.

Tantram, Anthony D. S.; and Chan, Yat S., to City Technology Limited. Gas sensor. 4,633,704, Cl. 73-23.000.

Tanuma, Chiaki: *See*—
Hayashimoto, Yoshiaki; Tanuma, Chiaki; Yokoyama, Katsunori; and Harada, Nozomu, 4,634,884, Cl. 250-578.000.

Taravel, Bernard, to Laboratoires Pharmascience. Brush having resiliently retractable bristles, in particular for brushing surfaces of complex shape, such as teeth. 4,633,542, Cl. 15-167.00R.

Tardy, Maurice, to Bennes Marrel. Speed limiting device designed to equip the slide valve of a hydraulic system. 4,633,762, Cl. 91-461.000.

Targetti, Giampaolo, to Targetti Sankey S.p.A. Assembly of components trestle type for outside fittings. 4,633,624, Cl. 52-28.000.

Targetti Sankey S.p.A.: *See*—
Targetti, Giampaolo, 4,633,624, Cl. 52-28.000.

Tarmac Construction Limited: *See*—
Ash, Dennis E., 4,633,638, Cl. 52-562.000.

Tatami, Mitsuhige, to Sony Corporation. Method and system for processing digital video signal incorporating phase-correction feature. 4,635,097, Cl. 358-13.000.

Tate, John C.; and Weeren, Eric K., to General Electric Company. Apparatus for demodulating differential phase shift keyed signals. 4,634,990, Cl. 329-126.000.

Tateoka, Masamichi, to Canon Kabushiki Kaisha. Light source device for close spacing of two light beams. 4,634,232, Cl. 350-394.000.

Tateoka, Masamichi, to Canon Kabushiki Kaisha. Optical information processing apparatus. 4,635,243, Cl. 369-44.000.

Tatsumi, Masami; Sawada, Shin-ichi; and Nakai, Ryusuke, to Sumitomo Electric Industries, Ltd. Method of monitoring single crystal during growth. 4,634,490, Cl. 156-601.000.

Taub, David: *See*—
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Tauster, Samuel J.; Montagna, Angelo A.; Steger, John J.; Fung, Shun C.; and Cross, Virginia R., to Exxon Research and Engineering Company. Zeolite catalyst and process for using said catalyst (C-1591). 4,634,517, Cl. 208-138.000.

Tavener, John W., to Imperial Chemical Industries PLC. Ratchet mechanism. 4,633,733, Cl. 74-533.000.

Tawada, Yoshihisa: *See*—
Hamakawa, Yoshihiro; Yamagishi, Hideo; and Tawada, Yoshihisa, 4,634,601, Cl. 427-39.000.

Taya, Shunroku; and Kozasa, Susumu, to Hitachi, Ltd. Ion implanter. 4,634,931, Cl. 315-111.810.

Taylor, Derek, to Allied Corporation. Coupling system, especially for a connector. 4,634,202, Cl. 339-49.00R.

Taylor, Henry F.; Weller, Joseph F.; and Goldberg, Lew, to United States of America, Navy. Frequency multiplex system using injection locking of multiple laser diodes. 4,635,246, Cl. 370-3.000.

Taylor, Jackson H. Protective footwear for animals. 4,633,817, Cl. 119-96.000.

Taylor, Jerald M. Adjustable electric outlet box. 4,634,015, Cl. 220-3.700.

Taylor, Julian S. Multiple stage choke valve. 4,634,095, Cl. 251-121.000.

Taylor, Larry D.; Reel, David A.; and Renfro, Gene R., to General Electric Company. Variable discharge grill for room air conditioner. 4,633,770, Cl. 98-94.200.

TDK Corporation: *See*—
Akachi, Yoshiaki; and Matsumaru, Takeo, 4,635,019, Cl. 336-180.000.
Takeuchi, Michikazu, 4,635,026, Cl. 338-22.0SD.

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Vollenweider, Edward E., 4,634,024, Cl. 222-135.000.

Tejima, Shunichiro, to NEC Corporation. High-speed burst signal monitoring device. 4,635,247, Cl. 370-13.000.

Tektronix, Inc.: *See*—
Bos, Philip J., 4,635,051, Cl. 340-757.000.
Dodge, Warren; and Wirfs-Brock, Rebecca, 4,635,049, Cl. 340-721.000.
Golladay, Harvey L., 4,634,949, Cl. 318-696.000.
Thong, Tran, 4,635,094, Cl. 358-10.000.
Thong, Tran, 4,635,098, Cl. 358-14.000.

Telefonia Elettronica e Radio S.p.A.: *See*—
Sestan, Franco, 4,635,260, Cl. 371-22.000.

Teller, Raymond G.; Brazdil, James F.; and Glaeser, Linda C., to Standard Oil Company, The. Conversion of acetonitrile to glycolonitrile and/or glycolamide. 4,634,789, Cl. 558-451.000.

Temple, Davis L., Jr.: *See*—
Kurtz, Neil M.; Newton, Roger E.; and Temple, Davis L., Jr., 4,634,703, Cl. 514-252.000.

Tempmaster Corporation: *See*—
Dean, Raymond H., 4,634,047, Cl. 236-49.000.

Tenaglia, Richard D.: *See*—
Santangelo, Joseph G.; Weber, James J.; Sinclair, Richard G.; and Tenaglia, Richard D., 4,633,929, Cl. 164-34.000.

Tennant Company: *See*—
Peabody, Ralph C.; and Grimes, Charles E., 4,634,403, Cl. 474-1.000.

Terada, Shinichi; Masuda, Kozo; and Adachi, Yoshimitsu, to D. S. Scanner Co., Ltd.; and Dainippon Screen Mfg. Co., Ltd. Method of and apparatus for producing halftone dot film of gradated density distribution. 4,635,131, Cl. 358-296.000.

Terra Tek, Inc.: *See*—
Owen, Lawrence B.; and Green, Sidney J., 4,634,315, Cl. 405-217.000.

Tersaeus, Stig G.: *See*—
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Terui, Nobuhiko: *See*—
Ogasawara, Akira; Watanabe, Sakuji; Terui, Nobuhiko; Utagawa, Ken; and Hoshino, Kunihisa, 4,634,851, Cl. 250-204.000.

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Tetras: *See*—
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Teuscher, Leon A.: *See*—
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Teutsch, Jean G.: *See*—
Torelli, Vesperto; Teutsch, Jean G.; and Philibert, Daniel, 4,634,695, Cl. 514-178.000.

Teutsch, Jean-Georges; Torelli, Vesperto; Deraedt, Roger; and Philibert, Daniel, to Roussel Uclaf. Novel 11 beta-substituted-19-norsteroids. 4,634,696, Cl. 514-179.000.

Texaco Inc.: *See*—
Bearden, Joe M., 4,635,235, Cl. 367-13.000.
Delhommer, Harold J.; and Walker, Clarence O., 4,633,950, Cl. 166-295.000.
LeBoeuf, Harry P.; Verret, Allen J.; and Broussard, Paul D., 4,633,953, Cl. 166-358.000.

Texas Instruments Incorporated: *See*—
McElroy, David J., 4,634,901, Cl. 307-530.000.
Strasser, Werner, 4,633,579, Cl. 29-622.000.

Texas Recreation Corporation: *See*—
Hancock, Kendal, 4,634,563, Cl. 264-46.700.

Tezanos, Enrique H.: *See*—
Nogueira, Eduardo D.; and Tezanos, Enrique H., 4,634,507, Cl. 204-118.000.

Tezuka, Nobuo: *See*—
Masunaga, Makoto; and Tezuka, Nobuo, 4,635,123, Cl. 358-213.000.

Th. Kieserling & Albrecht, G.m.b.H. & Co.: *See*—
Wagner, Ralf; Fischer, Horst; and Heider, Fritz, 4,634,323, Cl. 409-167.000.

Therma-Wave, Inc.: *See*—
Rosencwaig, Allan; and Opsal, Jon, 4,634,290, Cl. 374-5.000.

Thielen, Gerd: *See*—
Jungwirth, Dieter; Thielen, Gerd; and Langwadt, Otmar, 4,633,540, Cl. 14-22.000.

Thiersault, Jean P.; and Senez, Alain, to BP Chemicals Limited. Polypropylene compositions with high impact strength. 4,634,735, Cl. 525-88.000.

Tholen, Arnold: *See*—
Strole, Ulrich; Farber, Jurgen; and Tholen, Arnold, 4,634,008, Cl. 206-628.000.

Thollot, Pierre: *See*—
Shekhawat, Sampat S.; Dhyanchand, P. John; and Thollot, Pierre, 4,635,177, Cl. 363-41.000.

Thomas Broadbent & Sons Limited: *See*—
Grimwood, Geoffrey L.; and Brook, Geoffrey G., 4,634,536, Cl. 210-781.000.

Thomas, Erwin: *See*—
Groesakinsky, Otto-Alfred; Frommer, Elmar; Ritz, Josef; Thomas, Erwin; and Weiss, Franz-Josef, 4,634,584, Cl. 423-265.000.

Thomas, Mammen; and Ko, Wen C., to Advanced Micro Devices, Inc. Emitter coupled logic bipolar memory cell. 4,635,230, Cl. 365-175.000.

Thompson, Robert R. Small animal trap. 4,633,610, Cl. 43-85.000.

Thomson Components-Mostek Corporation: *See*—
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Nakata, Moritsune; Yanai, Tokiyoshi; Yamaguchi, Hirotsugu; Higuchi, Megumu; Aoyama, Yutaka; and Shibahata, Yasuji, 4,634,135, Cl. 280-90.000.
Yanase, Shozaburo. Bag for mothers milk. 4,634,006, Cl. 206-604.000.
Yang, Tai-Her. Hammering tool with flexible handle. 4,633,741, Cl. 81-20.000.
Yaniv, Meir, to Crystal Technologies Corporation. Instruction manual and method of using instruction manual. 4,634,146, Cl. 281-15.00R.
Yano, Isamu; Fujita, Ryoji; and Kitakoga, Hidetoshi, to Mitsubishi Denki Kabushiki Kaisha. Steering wheel. 4,633,734, Cl. 74-552.000.
Yant, Howard W., to Westinghouse Electric Corp. Loose parts filter. 4,634,525, Cl. 210-171.000.
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Yasunaga, Suezaki, to Kaisei Kogyo Corporation. Method of pruning tree and tree pruning machine. 4,633,925, Cl. 144-343.000.
Yasuoka, Akimasa; Iwata, Takahiro; and Kiuchi, Takeo, to Honda Giken Kogyo Kabushiki Kaisha. Method for controlling the supply of fuel for an internal combustion engine. 4,633,839, Cl. 123-488.000.
Yawn, James M.; Whitaker, Huby M.; and Bridgers, Frank, to J. M. Huber Corporation. Safety chisel. 4,633,586, Cl. 30-168.000.
Yeda Research and Development Company Ltd.: *See*—
Cohen, Irun R.; and Shmitzky, Meir, 4,634,590, Cl. 424-88.000.
Yerman, Alexander J.; and Loughran, James A., to General Electric Company. Tape automated manufacture of power semiconductor devices. 4,635,092, Cl. 357-68.000.
Yeung, Edward S.: *See*—
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Yokoyama, Katsunori: *See*—
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Yoneda, Kazuhiko, to Kabushiki Kaisha Daikin Seisakusho. Structure for supporting a diaphragm spring in a clutch. 4,633,989, Cl. 192-70.270.
Yonekura, Mikio: *See*—
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Yoneyama, Takeshi, to Nippon Athletic Industry Company. Electrotherapeutical device. 4,633,888, Cl. 128-784.000.
Yonezawa, Yasuo: *See*—
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Yong, Putt C.: *See*—
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Yoshida, Mamoru; and Kamemoto, Mituo, to Toyota Jidosha Kabushiki Kaisha. Method of and apparatus for examining automotive headlamp. 4,634,275, Cl. 356-121.000.
Yoshida, Norio: *See*—
Taji, Satoru; Yoshida, Norio; and Hikawa, Tetsuo, 4,634,494, Cl. 156-628.000.
Yoshida, Tadahiro, to Nitsuko Limited. Start-stop synchronous data transmission system with a reduced redundancy. 4,635,248, Cl. 370-48.000.
Yoshieda, Keiichi; Sodeno, Toshiaki; and Honmoto, Syuichi, to Yoshida Kogyo K. K. Device for positioning slide fastener stringers in fastener finishing apparatus. 4,633,580, Cl. 29-767.000.
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Yoshino, Hozo; Koshi, Mitsuo; and Sumiyoshi, Osamu, to System Homes Company, Ltd. Inverter. 4,634,952, Cl. 318-811.000.
Yoshino, Masaki; Oka, Kozo; and Koide, Fuminori, to Fuji Xerox Co., Ltd. Electrostatic printing method. 4,634,257, Cl. 355-3.0CH.
Yoshioka, Hiroshi, to Yoshida Kogyo K.K. Apparatus for sewing slide fasteners to pairs of fabric pieces. 4,633,792, Cl. 112-104.000.
Yoshioka, Takakazu, to NEC Corporation. Comparator having a hysteresis characteristic. 4,634,897, Cl. 307-359.000.
Yoshiura, Shoichiro: *See*—
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Yoshizawa, Hisayasu, to Kabushiki Kaisha Toshiba. Analog-to-digital converter. 4,635,036, Cl. 340-347.0AD.
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Younes, Usama E., to Atlantic Richfield Company. Flame-retardant molded composition which incorporates a poly(styrene-co-maleic anhydride-co-dibromostyrene) copolymer. 4,634,731, Cl. 524-502.000.
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Young, James D., to Minnesota Mining and Manufacturing Company. Electrographic stylus recording apparatus. 4,635,074, Cl. 346-74.200.
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Yuge, Yooji; Ishizaki, Ariyoshi; Saito, Tokuyoshi; and Ishii, Takeshi, to Kabushiki Kaisha Toshiba; and Nippon Soda Co., Ltd. Bulb. 4,634,919, Cl. 313-113.000.
Yuhas, Drew J.; and Boggia, Joseph, to AMF Incorporated. Vibration damped sports racquet. 4,634,124, Cl. 273-73.00G.
Yuzawa, Keiji: *See*—
Fukaya, Hideshi; Hoshii, Toshifumi; and Yuzawa, Keiji, 4,633,751, Cl. 84-1.030.
Zagar, Irvin F.; and Choquette, Henry T., to A. R. Wilfley and Sons, Inc. Multi-element centrifugal pump impellers with protective covering against corrosion and/or abrasion. 4,634,344, Cl. 416-175.000.
Zahn, Eric H. Non-floating technique-male. 4,634,380, Cl. 433-181.000.
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Rogner, Horst; Schacherer, Roland; and Bieber, Gerold, 4,633,987, Cl. 192-0.092.
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Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; and Takahashi, Yoshiaki, 4,634,688, Cl. 514-41.000.
Zaleski, Peter L.; and Gratt, Stanley H., to Superior Graphite Co. Railroad track lubricant. 4,634,545, Cl. 252-29.000.
Zandel, Adam, to Press Technology Corporation. Crosshead ties and clearance holes arrangement for easy removal of said ties without dismantling of entire crosshead. 4,633,700, Cl. 72-455.000.
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., to General Foods Corporation. L-aminodicarboxylic acid aminoalkenoic acid ester amides. 4,634,792, Cl. 560-169.000.
Zauhar, Helmut: *See*—
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Zaveri, Vikram; Heling, Dennis H.; and Radyko, Keith S., to Keiper Recaro Incorporated; and Chrysler Motors Corporation. Vehicle easy entry seat latching mechanism. 4,634,180, Cl. 297-341.000.
Zemke, Ronald O.: *See*—
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Zettlemoyer, Albert: *See*—
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Zhenbin, Zheng: *See*—
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Zilbermann, Andre H., to Brandt Engineering Company. Method and apparatus for multi-zone air distribution system. 4,633,937, Cl. 165-22.000.
Ziller, Helmut: *See*—
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Zilske, Wolfgang: *See*—
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Zimany, Edward J., Jr.: *See*—
Tompsett, Michael F.; and Zimany, Edward J., Jr., 4,634,997, Cl. 330-284.000.
Zimmerman, Robert: *See*—
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Zimmermann, Ulrich: *See*—
Arnold, William M.; and Zimmermann, Ulrich, 4,634,669, Cl. 435-173.000.
Zinkiewicz, Lawrence M.: *See*—
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Zolnowsky, John E.: *See*—
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Zunkel, Gary D., to Halliburton Company. Gravel packer. 4,633,943, Cl. 166-51.000.
Zunkel, Gary D.; and Bolin, Michael L., to Halliburton Company. Gravel packer. 4,633,944, Cl. 166-51.000.
ZVL Vyzkumny ustav pro valiva loziska Brno: *See*—
Starek, Frantisek; Machacek, Vilem; and Manhalter, Pavel, 4,635,283, Cl. 378-132.000.
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Zyma SA: *See*—
Courbat, Pierre; Weith, Andre ; and Albert, Alban, 4,634,718, Cl. 514-460.000.
501 Elektrotechnisch Bureau Moekotte B V: *See*—
Jonker, Johan, 4,634,251, Cl. 354-312.000.
501 Hazeltine Corporation: *See*—
Reeber, Nicholas J.; and Kerbel, Sheldon J., 4,635,108, Cl. 358-76.000.
596801 Ontario Limited: *See*—
Varden, Arnold, 4,634,098, Cl. 251-188.000.

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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF JANUARY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Biba, Kenneth J.; and Picazo, Jose J., Jr., to Sytek, Inc. Multiple channel data communication system. Re. 32,327, Cl. 370-124.000.
Bom, Nicolaas, to Organon Teknika B.V. Heart examination by means of ultrasound waves. Re. 32,323, Cl. 128-660.000.
Du Pont de Nemours, E. I., and Company: *See*—
Smith, Malcolm S., Re. 32,325, Cl. 524-229.000.
IRD, Inc.: *See*—
Nagel, Robert H.; and Saylor, Richard, Re. 32,326, Cl. 358-83.000.
Kedem, Abraham. Mixing device. Re. 32,324, Cl. 366-265.000.
Nagel, Robert H.; and Saylor, Richard, to IRD, Inc. Row grabbing system. Re. 32,326, Cl. 358-83.000.
Organon Teknika B.V.: *See*—
Bom, Nicolaas, Re. 32,323, Cl. 128-660.000.
Picazo, Jose J., Jr.: *See*—
Biba, Kenneth J.; and Picazo, Jose J., Jr., Re. 32,327, Cl. 370-124.000.
Saylor, Richard: *See*—
Nagel, Robert H.; and Saylor, Richard, Re. 32,326, Cl. 358-83.000.
Smith, Malcolm S., to Du Pont de Nemours, E. I., and Company. Tack-free polymer pellets. Re. 32,325, Cl. 524-229.000.
Sytek, Inc.: *See*—
Biba, Kenneth J.; and Picazo, Jose J., Jr., Re. 32,327, Cl. 370-124.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Keystone International, Inc.: *See*—
Scobie, William B., B1 4,457,490, Cl. 251-174.000.
Lanham, William E.; Miller, Gene C.; and Lanham, William E., Jr. Proofers for bread products and conveyor systems which are adapted to use therein. B1 3,440,973, 1-6-87, Cl. 99-483.000.
Lanham, William E.; Miller, Gene C.; and Lanham, William E., Jr. Conveyor system. B1 3,680,493, 1-6-87, Cl. 34-207.000.
Lanham, William E., Jr.: *See*—
Lanham, William E.; Miller, Gene C.; and Lanham, William E., Jr., B1 3,440,973, Cl. 99-483.000.
Lanham, William E.; Miller, Gene C.; and Lanham, William E., Jr., B1 3,680,493, Cl. 34-207.000.
Miller, Gene C.: *See*—
Lanham, William E.; Miller, Gene C.; and Lanham, William E., Jr., B1 3,440,973, Cl. 99-483.000.
Lanham, William E.; Miller, Gene C.; and Lanham, William E., Jr., B1 3,680,493, Cl. 34-207.000.
Rivera, Aureo; and Rivera, Aureo E. Theft preventing system for vehicles. B1 3,548,373, 1-6-87, Cl. 340-64.000.
Rivera, Aureo E.: *See*—
Rivera, Aureo; and Rivera, Aureo E., B1 3,548,373, Cl. 340-64.000.
Scobie, William B., to Keystone International, Inc. High temperature valve and seat therefor. B1 4,457,490, 1-6-87, Cl. 251-174.000.

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A/S Nunc: *See*—
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Abbott Laboratories: *See*—
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Hollar, Robert C.; and Huang, Tung M., 287,633, Cl. D24-31.000.
Moore, Larry W., 287,632, Cl. D24-29.000.
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Moore, Larry W.; and Lingenfelter, Keith M., 287,639, Cl. D24-56.000.
Acme United Corporation: *See*—
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AE PLC: *See*—
Murray, Edward J., 287,599, Cl. D15-5.000.
Alamo Iron Works: *See*—
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Allard, Peter B.; Anderson, Lowell M.; and Volk, Rodney H., to Thermo King Corporation. Cover for a transport refrigeration unit. 287,619, 1-6-87, Cl. D23-142.000.
Alpine Electronics Inc.: *See*—
Tanaka, Fumio; and Imoto, Shin'ichi, 287,586, Cl. D14-53.000.
American Commercial Incorporated: *See*—
Uglow, Helene, 287,561, Cl. D7-319.000.
American Hanger, Inc.: *See*—
Tocci, Richard M., 287,550, Cl. D6-320.000.
American Optical Corporation: *See*—
Zdrok, Joseph Z.; Maisano, Joseph A.; and Krusas, James J., 287,649, Cl. D29-7.000.
American Sterilizer Company: *See*—
Brendgord, Thomas; Sanders, Ward L.; and Coon, Dennis C., 287,625, Cl. D24-3.000.
Anchor Hocking Corporation: *See*—
Thrush, James L., 287,560, Cl. D7-28.000.
Anderson, Hugo; and Poeschl Anderson, Mary Ann. Emergency road reflector. 287,576, 1-6-87, Cl. D10-114.000.
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Anspach, William E., Jr. Combined shaft bearing sleeve and attachment collar for surgical cutting tools. 287,631, 1-6-87, Cl. D24-29.000.
Arnaud, Daniel. Tooth-brush. 287,549, 1-6-87, Cl. D4-107.000.
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Landan, Ned; and Becker, Jon A., 287,622, Cl. D24-1.100.
Berfield, Robert C.; Meland, Ronald F.; and Crevling, Robert L., Jr., to Shop-Vac Corporation. Motor housing for canister type electric vacuum cleaner. 287,658, 1-6-87, Cl. D32-25.000.
Bernstein, Eugene M., to Gene Bernstein & Associates, Inc. Storage and display file for computer software floppy discs. 287,546, 1-6-87, Cl. D3-35.000.
Bickle, Douglas E. Table. 287,555, 1-6-87, Cl. D6-486.000.

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Gierke, Martin R., 287,644, Cl. D26-60.000.
Boelens, David A. Rotary drain cleaner. 287,654, 1-6-87, Cl. D32-14.000.
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Petersson, Nils A. I., 287,609, Cl. D21-143.000.
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Cain, Michael W., to Michelin Recherche et Technique S.A. Tire. 287,580, 1-6-87, Cl. D12-147.000.
Cal-Surgical, Inc.: *See*—
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Callju, Robert F., to Inventek, Inc. Nursing bottle or similar article. 287,636, 1-6-87, Cl. D24-47.000.
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Case, Robert: *See*—
Carr, David B.; Lingenfelter, Keith M.; Mitchell, James E.; Moore, Larry W.; Tag, Palmer L.; and Case, Robert, 287,634, Cl. D24-31.000.
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Chien, Ruca. Extension slide for a table or similar article. 287,556, 1-6-87, Cl. D6-491.000.
Chouinard, Michael J. Fluid-powered hand punch. 287,566, 1-6-87, Cl. D8-61.000.
Chouinard, Michael J. Fluid-powered hand punch. 287,567, 1-6-87, Cl. D8-61.000.
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Yuen, John S., to John Manufacturing Limited. Rechargeable battery powered vacuum cleaner. 287,657, 1-6-87, Cl. D32-21.000.
Zdrok, Joseph Z.; Maisano, Joseph A.; and Krusas, James J., to American Optical Corporation. Disposable respirator. 287,649, 1-6-87, Cl. D29-7.000.
Zuppa, Zeljko: *See*—
Schiavo, Fred; Enderlein, Dieter; and Zuppa, Zeljko, 287,628, Cl. D24-15.000.

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LIST OF PLANT PATENTEES

Bhat, Bal K.; and Menary, Robert C., to University of Tasmania, The. Chrysanthemum plant named Hypy. 5,848, 1-6-87, Cl. 74.000.

Jackson & Perkins Company: *See*—
Kordes, Reimer; Kordes, Werner; and Kordes, Hermann, 5,846, Cl. 20.000.

Kordes, Hermann: *See*—
Kordes, Reimer; Kordes, Werner; and Kordes, Hermann, 5,846, Cl. 20.000.

Kordes, Reimer; Kordes, Werner; and Kordes, Hermann, to Jackson & Perkins Company. Rose plant Korlingo. 5,846, 1-6-87, Cl. 20.000.

Kordes, Werner: *See*—
Kordes, Reimer; Kordes, Werner; and Kordes, Hermann, 5,846, Cl. 20.000.

Menary, Robert C.: *See*—
Bhat, Bal K.; and Menary, Robert C., 5,848, Cl. 74.000.

Turmes, Nicolas A., Jr. Variegated lemon-lime tree named Lemonine. 5,847, 1-6-87, Cl. 45.000.

University of Tasmania, The: *See*—
Bhat, Bal K.; and Menary, Robert C., 5,848, Cl. 74.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 6TH DAY OF JANUARY, 1987

Adolph, Horst G.: *See*—
Koppes, William M.; and Adolph, Horst G., H184, Cl. 568-590.000.

Bauer, Ralph, to Norton Company. Process for production of alpha alumina bodies by sintering seeded boehmite made from alumina hydrates. H189, 1-6-87, Cl. 423-111.000.

Beaudry, Bernard J.: *See*—
Takeshita, Takuo; Gschneidner, Karl A., Jr.; and Beaudry, Bernard J., H197, Cl. 423-263.000.

Bitner, Everett D.; and Lancaster, Earl B., to United States of America, Agriculture. Electronic temperature equalizer. H193, 1-6-87, Cl. 236-15.0BB.

Blanchard, Linden O., to United States of America, Air Force. Soldering method for cable connectors. H187, 1-6-87, Cl. 228-222.000.

Capistran, James D.: *See*—
Karasz, Frank E.; Lenz, Robert W.; Gagnon, David R.; and Capistran, James D., H183, Cl. 252-518.000.

Chen, Wayne Y., to United States of America, Energy. High temperature structural insulating material. H200, 1-6-87, Cl. 428-404.000.

Chenausky, Peter P.; Drinkwater, Erroll H.; and Laughman, Lanny M., to United States of America, Army. Ground slot waveguide laser. H199, 1-6-87, Cl. 51-326.000.

Daehler, Max, to United States of America, Navy. Satellite alignment sensor. H192, 1-6-87, Cl. 356-152.000.

DeWilde, Mark A., to United States of America, Army. Research burner. H195, 1-6-87, Cl. 431-160.000.

Drinkwater, Erroll H.: *See*—
Chenausky, Peter P.; Drinkwater, Erroll H.; and Laughman, Lanny M., H199, Cl. 51-326.000.

Edwards, Grant C.; and Rajagopalan, Kuppuswamy, to W. R. Grace & Co. Small particle zeolite containing catalytic cracking catalyst. H191, 1-6-87, Cl. 208-111.000.

Edwards, Grant C.; and Rajagopalan, Kuppuswamy, to W. R. Grace & Co. Large particle zeolite containing cracking catalyst exhibiting improved hydrothermal stability. H196, 1-6-87, Cl. 208-111.000.

Fields, Randy R.: *See*—
Marshall, Albert H.; Grimmer, Paul D.; Purvis, Edward J.; Fields, Randy R.; and Swiatosz, Edmund, H186, Cl. 434-18.000.

Gagnon, David R.: *See*—
Karasz, Frank E.; Lenz, Robert W.; Gagnon, David R.; and Capistran, James D., H183, Cl. 252-518.000.

Grimmer, Paul D.: *See*—
Marshall, Albert H.; Grimmer, Paul D.; Purvis, Edward J.; Fields, Randy R.; and Swiatosz, Edmund, H186, Cl. 434-18.000.

Gschneidner, Karl A., Jr.: *See*—
Takeshita, Takuo; Gschneidner, Karl A., Jr.; and Beaudry, Bernard J., H197, Cl. 423-263.000.

Gutleber, Frank S., to United States of America, Army. Notch antenna for a radio communications system. H190, 1-6-87, Cl. 342-384.000.

Heller, Clarence. Adjustable indicating device for load position. H182, 1-6-87, Cl. 340-568.000.

Karasz, Frank E.; Lenz, Robert W.; Gagnon, David R.; and Capistran, James D., to United States of America, Air Force. Conducting poly (p-xylylidenes). H183, 1-6-87, Cl. 252-518.000.

Koppes, William M.; and Adolph, Horst G., to United States of America, Navy. 2,2,2-trifluoroethoxy bis(2-fluoro-2,2-dinitroethoxy)methane and a method preparation. H184, 1-6-87, Cl. 568-590.000.

Lancaster, Earl B.: *See*—
Bitner, Everett D.; and Lancaster, Earl B., H193, Cl. 236-15.0BB.

Laughman, Lanny M.: *See*—
Chenausky, Peter P.; Drinkwater, Erroll H.; and Laughman, Lanny M., H199, Cl. 51-326.000.

Lenz, Robert W.: *See*—
Karasz, Frank E.; Lenz, Robert W.; Gagnon, David R.; and Capistran, James D., H183, Cl. 252-518.000.

Marshall, Albert H.; Grimmer, Paul D.; Purvis, Edward J.; Fields, Randy R.; and Swiatosz, Edmund, to United States of America, Navy. Recoil simulator for weapons. H186, 1-6-87, Cl. 434-18.000.

McMahon, Richard W., to United States of America, Army. Respirator perimetry device. H185, 1-6-87, Cl. 351-226.000.

Norton Company: *See*—
Bauer, Ralph, H189, Cl. 423-111.000.

Oakley, David J., to United States of America, Energy. Decontamination apparatus and method. H194, 1-6-87, Cl. 376-310.000.

Purvis, Edward J.: *See*—
Marshall, Albert H.; Grimmer, Paul D.; Purvis, Edward J.; Fields, Randy R.; and Swiatosz, Edmund, H186, Cl. 434-18.000.

Rajagopalan, Kuppuswamy: *See*—
Edwards, Grant C.; and Rajagopalan, Kuppuswamy, H191, Cl. 208-111.000.
Edwards, Grant C.; and Rajagopalan, Kuppuswamy, H196, Cl. 208-111.000.

Stone, William J., to United States of America, Army. Expanding projectile rotating band. H198, 1-6-87, Cl. 102-524.000.

Swiatosz, Edmund: *See*—
Marshall, Albert H.; Grimmer, Paul D.; Purvis, Edward J.; Fields, Randy R.; and Swiatosz, Edmund, H186, Cl. 434-18.000.

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Thomson, George M.; and Thomson, Sandra M., to United States of America, Army. Monitor for airborne dusts. H188, 1-6-87, Cl. 378-45.000.

Thomson, Sandra M.: *See*—
Thomson, George M.; and Thomson, Sandra M., H188, Cl. 378-45.000.

United States of America
Agriculture: *See*—
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America: *See*—
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Chen, Wayne Y., H200, Cl. 428-404.000.
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Koppes, William M.; and Adolph, Horst G., H184, Cl. 568-590.000.
Marshall, Albert H.; Grimmer, Paul D.; Purvis, Edward J.; Fields, Randy R.; and Swiatosz, Edmund, H186, Cl. 434-18.000.

W. R. Grace & Co.: *See*—
Edwards, Grant C.; and Rajagopalan, Kuppuswamy, H191, Cl. 208-111.000.
Edwards, Grant C.; and Rajagopalan, Kuppuswamy, H196, Cl. 208-111.000.

Yager, Paul, to United States of America, America. Biosensors from membrane proteins reconstituted in polymerized lipid bilayers. H201, 1-6-87, Cl. 436-151.000.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 6, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

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628 4,634,008

CLASS 208
91 4,634,515
4,634,516
138 4,634,517
4,634,518
263 4,634,519
309 4,634,520

CLASS 209
17 4,634,521
154 4,634,522

CLASS 210
140 4,634,523
150 4,634,534
158 4,634,524
171 4,634,525
194 4,634,526
232 4,634,527
277 4,634,528
331 4,634,529
500.23 4,634,530
639 4,634,531
697 4,634,532
722 4,634,533
780 4,634,535
781 4,634,536
784 4,634,537

CLASS 211
4 4,634,009
96 4,634,010

CLASS 215
6 4,634,011
203 4,634,012
228 4,634,013

CLASS 219
69 G 4,634,827
69 M 4,634,826
69 W 4,634,825
117.1 4,634,828
4,634,829
4,634,830
121 LC 4,634,832
121 LG 4,634,831
137 R 4,634,833
208 4,634,834
219 4,634,835
249 4,634,836
270 4,634,837
297 4,634,838
373 4,634,839
388 4,634,840
464 4,634,841
486 4,634,842
4,634,843
544 4,634,844

CLASS 220
1 H 4,634,014
3.7 4,634,015
89 4,634,016
203 4,634,017
233 4,634,018
334 4,634,019
335 4,634,020

CLASS 221
3 4,634,021

CLASS 222
95 4,634,022
105 4,634,023
135 4,634,024
161 4,634,025
218 4,634,026
180 4,634,027
464 4,634,028
567 4,634,029

CLASS 223
57 4,634,030

CLASS 224
205 4,634,031
265 4,634,032

CLASS 225
73 4,634,033

CLASS 226
142 4,634,034

CLASS 227
19 4,634,035
67 4,634,036

CLASS 228
6.1 4,634,037
17.5 4,634,038
118 4,634,039
119 4,634,040
124 4,634,041
173.4 4,634,042
180.2 4,634,043
183 4,634,044
212 4,634,045

CLASS 235
350 4,634,845
382 4,634,846
449 4,634,848
451 4,634,847
487 4,634,849
4,634,850

CLASS 236
46 F 4,634,046
49 4,634,047
58 4,634,048

CLASS 238
84 4,634,049

CLASS 239
14.2 4,634,050
168 4,634,051
205 4,634,052
315 4,634,053
423 4,634,054
533.3 4,634,055
661 4,634,056
690 4,634,057
697 4,634,058

CLASS 241
46 B 4,634,059
74 4,634,060
101 R 4,634,061
184 4,634,062

CLASS 242
1.1 R 4,634,063
18 PW 4,634,064
18 R 4,634,065
35.5 A 4,634,066
55.2 4,634,067
65 4,634,068
4,634,069
67.2 4,634,070
71.1 4,634,071
84.1 A 4,634,072
84.21 R 4,634,074
84.5 A 4,634,073
107.2 4,634,075
118.7 4,634,076
130 4,634,077
158 R 4,634,078
219 4,634,079

CLASS 244
13 4,634,080
54 4,634,081
100 R 4,634,082
122 R 4,634,083
134 C 4,634,084
153 R 4,634,085
173 4,634,086

CLASS 246
430 4,634,087

CLASS 248
60 4,634,088
311.2 4,634,089
544 4,634,090
637 4,634,091

CLASS 250
201 4,634,853
204 4,634,851
216 4,634,854
222.1 4,634,855
227 4,634,852
4,634,856
4,634,857
4,634,858
231 SE 4,634,859
4,634,860
4,634,861
4,634,862
262 4,634,863
282 4,634,864
288 4,634,865
4,634,866
4,634,867
306 4,634,868
328 4,634,869
332 4,634,870
398 4,634,871
458.1 4,634,872
492.2 4,634,874
497.1 4,634,873
506.1 4,634,875
548 4,634,876
551 4,634,877
560 4,634,878
4,634,879
566 4,634,880
572 4,634,881
578 4,634,882
4,634,883
4,634,884
4,634,885
4,634,886

CLASS 251
7 4,634,092
58 4,634,094
82 4,634,093
121 4,634,095
129.15 4,634,096
173 4,634,097
174 B1 4,457,490
188 4,634,098
335.3 4,634,099

CLASS 252
8.512 4,634,538
8.551 4,634,540
29 4,634,545
32.7 E 4,634,541
47.5 4,634,542
56 D 4,634,550
78.5 4,634,543
85 B 4,634,539
99 4,634,544
102 4,634,551
156 4,634,552
306 4,634,546
522 R 4,634,547
4,634,548
4,634,549

CLASS 254
213 4,634,100
228 4,634,101
278 4,634,102

CLASS 260
404 4,634,558

CLASS 261
76 4,634,559
4,634,560

CLASS 264
17 4,634,561
22 4,634,562
46.7 4,634,563
75 4,634,564
510 4,634,565
515 4,634,566

CLASS 266
80 4,634,103
158 4,634,104
217 4,634,105
236 4,634,106

CLASS 267
57.1 R 4,634,108
170 4,634,109

CLASS 270
56 4,634,107

CLASS 271
34 4,634,111
245 4,634,112
259 4,634,113

CLASS 272
67 4,634,114
4,634,115
77 4,634,116
99 4,634,117
117 4,634,118
134 4,634,127
144 4,634,119

CLASS 273
25 4,634,120
26 B 4,634,121
55 B 4,634,122
69 4,634,123
73 G 4,634,124
93 R 4,634,125
129 S 4,634,126
176 FA 4,634,130
192 4,634,131
246 4,634,128
255 4,634,129

CLASS 277
11 4,634,132
12 4,634,133
4,634,134

CLASS 280
90 4,634,135
213 4,634,136
256 4,634,137
278 4,634,138
288 4,634,139
610 4,634,140
704 4,634,141
707 4,634,142
4,634,143
763.1 4,634,144
869 4,634,145

CLASS 281
15 R 4,634,146

CLASS 283
56 4,634,147
70 4,634,148
102 4,634,149

CLASS 285
24 4,634,150
38 4,634,151
39 4,634,152
255 4,634,153
353 4,634,154

CLASS 290
3 4,634,887

CLASS 292
164 4,634,155
216 4,634,156
218 4,634,157
260 4,634,158
336.3 4,634,159
4,634,160
4,634,161
343 4,634,162

CLASS 293
117 4,634,163

CLASS 294
89 4,634,164
99.2 4,634,165
103.1 4,634,166

CLASS 296
31 P 4,634,167
35.1 4,634,168
65 A 4,634,169
76 4,634,170
108 4,634,171
163 4,634,172
188 4,634,173
195 4,634,174

CLASS 297
183 4,634,175
230 4,634,176
250 4,634,177
284 4,634,178
4,634,179
341 4,634,180
342 4,634,181
379 4,634,182
433 4,634,183
468 4,634,184
487 4,634,185

CLASS 299
1 4,634,186
4 4,634,187
39 4,634,188

CLASS 301
63 PW 4,634,189

CLASS 303
114 4,634,190

CLASS 304
52 R 4,635,032

CLASS 307
48 4,634,888
104 4,634,889
200 B 4,634,890
252 C 4,634,891
265 4,634,892
270 4,634,893
297 4,634,894
350 4,634,895
351 4,634,896
379 4,634,897
456 4,634,898
462 4,634,899
530 4,634,900
4,634,901
542 4,634,902
571 4,634,903
594 4,634,904
4,634,905

CLASS 310
89 R 4,634,906
4,634,907
64 4,634,908
90.5 4,634,191
91 4,634,909
214 4,634,910
215 4,634,911
268 4,634,912
313 A 4,634,913
313 D 4,634,914
323 4,634,915
4,634,916
328 4,634,917

CLASS 312
37 4,634,192
107 4,634,193
297 4,634,194

CLASS 313
36 4,634,918
113 4,634,919
318 4,634,920
341 4,634,921
402 4,634,922
413 4,634,923
414 4,634,924
454 4,634,925
474 4,634,926
486 4,634,927
499 4,634,928

CLASS 315
5.39 4,634,929
8 4,634,930
111.81 4,634,931
119 4,634,932
151 4,634,933
169.3 4,634,934
169.4 4,634,935
307 4,634,936
371 4,634,937
4,634,938
399 4,634,939
408 4,634,940

CLASS 318
139 4,634,941
338 4,634,942
432 4,634,943
443 4,634,944
469 4,634,945
561 4,634,946
568 4,634,947
606 4,634,948
4,634,949
732 4,634,950
778 4,634,951
811 4,634,952

CLASS 320
1 4,634,953

CLASS 323
4,634,954
99 4,634,955

CLASS 323
223 4,634,956
242 4,634,957
255 4,634,958
313 4,634,959
350 4,634,960
368 4,634,961

CLASS 324
57 N 4,634,962
58 A 4,634,963
60 C 4,634,964
4,634,965
77 B 4,634,966
83 D 4,634,967
95 4,634,968
4,634,969
121 R 4,634,970
133 4,634,971
158 R 4,634,972
207 4,634,973
228 4,634,974
232 4,634,975
240 4,634,976
244 4,634,977
253 4,634,978
307 4,634,979
322 4,634,980
424 4,634,981
448 4,634,982

CLASS 328
28 4,634,983
112 4,634,984
129.1 4,634,985
145 4,634,986
180 4,634,987
167 4,634,988

CLASS 329
112 4,634,989
126 4,634,990
129 4,634,991

CLASS 330
47 4,634,992
253 4,634,993
260 4,634,994
261 4,634,995
4,634,996
284 4,634,997

CLASS 331
1 A 4,634,998
4 4,634,999
10 4,635,000
90 4,635,001
104 R 4,635,002

CLASS 332
16 R 4,635,003
45 4,635,004

CLASS 333
32 4,635,005
111 4,635,006
153 4,635,007
195 4,635,008
4,635,009

CLASS 338
16 4,635,011
4,635,012
20 4,635,013
195 4,635,014
216 4,635,015
230 4,635,016
301 4,635,017

CLASS 336
178 4,635,018
180 4,635,019

CLASS 337
49 4,635,020
76 4,635,021
158 4,635,022
163 4,635,023
373 4,635,024

CLASS 338
5 4,635,025
22 SD 4,635,026
34 4,635,027
171 4,635,028

CLASS 339
5 R 4,634,196
16 R 4,634,197
17 F 4,634,195
17 LC 4,634,198
17 M 4,634,199
4,634,200
30 4,634,201
49 R 4,634,202
91 R 4,634,203
4,634,204
97 P 4,634,205
103 M 4,634,206
116 C 4,634,207
143 R 4,634,208
147 R 4,634,209
176 MP 4,634,210
196 M 4,634,211
198 R 4,634,212
275 T 4,634,213

CLASS 340
22 4,635,029
52 F 4,635,030
4,635,033
4,635,034
52 R 4,635,031
83 4,635,035
64 B1 3,548,373
347 AD 4,635,036
347 AP 4,635,037
347 DA 4,635,038
384 E 4,635,039
533 4,635,040
572 4,635,041
605 4,635,042
618 4,635,043
638 4,635,044
4,635,045
677 4,635,046
684 4,635,047
703 4,635,048
721 4,635,049
734 4,635,050
757 4,635,051
811 4,635,052
825.31 4,635,053
825.34 4,635,054
870.17 4,635,055
870.36 4,635,056
870.39 4,635,057

CLASS 342
52 4,635,058
117 4,635,059
194 4,635,060
195 4,635,061
372 4,635,062
380 4,635,063
408 4,635,064
435 4,635,065

CLASS 343
705 4,635,066
4,635,067
749 4,635,068
799 4,635,069
852 4,635,070
897 4,635,071

CLASS 346
1.1 4,635,072
4,635,073
74.2 4,635,074
76 PH 4,635,075
135.1 4,635,076
140 R 4,635,077
4,635,078
4,635,079
4,635,080
160 4,635,081
4,635,082

CLASS 350
96.16 4,634,215
96.20 4,634,214
96.21 4,634,216
96.23 4,634,217
96.30 4,634,218
162.22 4,634,219
167 4,634,220
255 4,634,221
263 4,634,222
276 SL 4,634,223
311 4,634,224
4,634,231
331 T 4,634,225
332 4,634,226
334 4,634,227
341 4,634,228
346 4,634,229
358 4,634,230
394 4,634,232
413 4,634,233
414 4,634,234
422 4,634,235
427 4,634,236
4,634,237
432 4,634,238
486 4,634,239
508 4,634,240
516 4,634,241
588 4,634,242

CLASS 351
243 4,634,243

CLASS 352
72 4,634,244

CLASS 353
95 4,634,245
98 4,634,246

CLASS 354
1 4,634,247
75 4,634,248
108 4,634,249
195.11 4,634,250
312 4,634,251
324 4,634,252
403 4,634,253
4,634,254
406 4,634,255

CLASS 355
1 4,634,256
3 CH 4,634,257
3 R 4,635,010
3 SH 4,634,265
4,634,258
4,634,259
7 4,634,260
8 4,634,261
14 R 4,634,262
14 SH 4,634,263
16 4,634,264
55 4,634,266
86 4,634,267
74 4,634,268
100 4,634,269
125 4,634,270

CLASS 356
5 4,634,271
4,634,272
73 4,634,273
73.1 4,634,274
121 4,634,275
305 4,634,276
315 4,634,277
350 4,634,282
4,634,283
376 4,634,278
4,634,279
385 4,634,280
431 4,634,281

CLASS 357
16 4,635,083
22 4,635,084
23.6 4,635,085
38 4,635,086
4,635,087
41 4,635,088
42 4,635,089
50 4,635,090
87 4,635,091
88 4,635,092
80 4,635,093

CLASS 358
10 4,635,094
4,635,095
4,635,096
13 4,635,097
14 4,635,098
17 4,635,099
19 4,635,100
21 R 4,635,101
27 4,635,102
4,635,103
31 4,635,104
67 4,635,105
68 4,635,106
4,635,107
76 4,635,108
83 Re.32,336
84 4,635,109
93 4,635,110
106 4,635,111
122 4,635,112
124 4,635,113
140 4,635,114
153 4,635,115
160 4,635,116
4,635,117
166 4,635,118
4,635,119
167 4,635,120
188 4,635,121
213 4,635,122
4,635,123
227 4,635,124
228 4,635,125
4,635,126
136 4,635,127
4,635,128
285 4,635,129
296 4,635,130
4,635,131
4,635,132
298 4,635,133
312 4,635,134
330 4,635,135
342 4,635,136

CLASS 360
100.2 4,635,137
100.3 4,635,138
40 4,635,140
44 4,635,141
46 4,635,142
65 4,635,143
72.2 4,635,144
78 4,635,145
85 4,635,146
93 4,635,147
96.1 4,635,148
97 4,635,149
98 4,635,150
105 4,635,151
110 4,635,152
125 4,635,153
128 4,635,154
132 4,635,155
4,635,156

CLASS 361
20 4,635,157
111 4,635,158
4,635,159
4,635,160
213 4,635,161
215 4,635,162
275 4,635,163
306 4,635,164
400 4,635,165

CLASS 362
34 4,635,166
88 4,635,167
147 4,635,169
157 4,635,170
187 4,635,171
270 4,635,172
294 4,635,173
457 4,635,174

CLASS 363
18 4,635,175
21 4,635,176
41 4,635,177
65 4,635,178
70 4,635,179
98 4,635,180
132 4,635,181

CLASS 364
138 4,635,182
141 4,635,183
187 4,635,184
191 4,635,185
200 4,635,186
4,635,187
4,635,188
4,635,189
4,635,191
4,635,192
4,635,193
4,635,194
4,635,195
405 4,635,196
414 4,635,197
4,635,198
419 4,635,199
431.05 4,635,200
431.07 4,635,201
449 4,635,202
458 4,635,203
464 4,635,204
4,635,205
474 4,635,206
484 4,635,207
491 4,635,208
494 4,635,209
508 4,635,210
513.5 4,635,211
518 4,635,212
526 4,635,213
551 4,635,214
555 4,635,215
562 4,635,216
574 4,635,217
578 4,635,218
710 4,635,219
763 4,635,220
821 4,635,221
900 4,635,222
4,635,223
4,635,224

CLASS 365
1 4,635,225
6 4,635,226
133 4,635,227
154 4,635,228
4,635,229
175 4,635,230
190 4,635,231
200 4,635,190
4,635,232
230 4,635,233
333 4,635,234

CLASS 366
47 4,634,284
68 4,634,285
265 Re.32,324
320 4,634,286

CLASS 367
13 4,635,235
19 4,635,236
20 4,635,237
40 4,635,238
47 4,635,239
89 4,635,240
93 4,635,241
134 4,635,242

CLASS 369
25 4,635,139
27 4,634,287
200 4,634,288
220 4,634,289

CLASS 369
44 4,635,243
112 4,635,244
275 4,635,245

CLASS 370
3 4,635,246
13 4,635,247
48 4,635,248
88 4,635,249
4,635,250
82 4,635,251
4,635,252
67 4,635,253
85 4,635,254
110.1 4,635,255
124 Re.32,327

CLASS 371
1 4,635,256
11 4,634,110
12 4,635,257
16 4,635,258
20 4,635,259
22 4,635,260
25 4,635,261
42 4,635,262

CLASS 372
3 4,635,263
18 4,635,264
25 4,635,265
32 4,635,266
38 4,635,267
45 4,635,268
58 4,635,269
4,635,270
61 4,635,271
87 4,635,272

CLASS 373
120 4,635,273

CLASS 374
5 4,634,290
7 4,634,291
109 4,634,292
124 4,634,293
170 4,634,294

CLASS 375
1 4,635,274
8 4,635,275
15 4,635,276
20 4,635,277
45 4,635,278
78 4,635,279
100 4,635,280

CLASS 376
132 4,634,567
154 4,634,568
203 4,634,569
247 4,634,570
416 4,634,571

CLASS 377
21 4,635,281

CLASS 378
34 4,635,282
132 4,635,283
197 4,635,284

CLASS 379
6 4,634,813
61 4,634,810
63 4,635,285
91 4,634,809
211 4,634,811
269 4,634,812
377 4,634,814
430 4,634,816

CLASS 381
43 4,635,286
119 4,635,288
188 4,633,972
194 4,635,287

CLASS 382
8 4,635,289
9 4,635,290
41 4,635,292
44 4,635,293

CLASS 383
24 4,635,291
37 4,635,294
127 4,635,295

CLASS 384
44 4,634,295
45 4,634,296
100 4,634,297
209 4,634,298
271 4,634,299
548 4,634,300

CLASS 387
68.4 4,634,815

CLASS 400
124 4,634,301
4,634,302
4,634,303
691 4,634,304

CLASS 401
151 4,634,305
215 4,634,306

CLASS 402
241 R 4,634,321

CLASS 403
194 4,634,307
407.1 4,634,309

CLASS 404
15 4,634,310
90 4,634,311

CLASS 406
139 4,634,312
184 4,634,313
195 4,634,314
217 4,634,315
229 4,634,316
230 4,634,319
259 4,634,317

4,634,318

CLASS 408

136 4,634,320

CLASS 409

138 4,634,322
167 4,634,323
209 4,634,324

CLASS 410

1111 4,634,325

CLASS 411

34 4,634,326
432 4,634,327

CLASS 414

117 4,634,328
159 4,634,329
198 4,634,330
217 4,634,331
273 4,634,332
331 4,634,333
401 4,634,334
494 4,634,335
546 4,634,336
563 4,634,337
752 4,634,338

CLASS 415

70 4,634,339
95 4,634,340
129 4,634,341
209 4,634,342

CLASS 416

3 4,634,343
175 4,634,344
244 R 4,634,345
247 R 4,634,346

CLASS 417

45 4,634,347
88 4,634,348
219 4,634,349
303 4,634,350
395 4,634,351
531 4,634,352
564 4,634,353

CLASS 418

31 4,634,354
226 4,634,355
4,634,356

CLASS 419

44 4,634,572

CLASS 420

73 4,634,476
127 4,634,573

CLASS 422

52 4,634,574
83 4,634,575
102 4,634,576
257 4,634,578

CLASS 423

17 4,634,579
100 4,634,580
126 4,634,581
243 4,634,582
284 4,634,583
265 4,634,584
419 R 4,634,585

CLASS 424

1.1 4,634,586
19 4,634,587
48 4,634,588
49 4,634,589
88 4,634,590
149 4,634,591

CLASS 425

36 4,634,357
72 R 4,634,358
89 4,634,359
130 4,634,360
190 4,634,361
287 4,634,362
306 4,634,363
335 4,634,364
398 4,634,365
453 4,634,368
526 4,634,366

CLASS 426

1 4,634,592
3 4,634,593
393 4,634,594
535 4,634,595
578 4,634,596
635 4,634,597
650 4,634,598

CLASS 427

1 4,634,599
38 4,634,600
39 4,634,601
44 4,634,602
96 4,634,603
97 4,634,619
213.33 4,634,604
249 4,634,605
256 4,634,606
282 4,634,607
327 4,634,608
345 4,634,609
387 4,634,610
423 4,634,611

CLASS 428

8 4,634,612
20 4,634,613
35 4,634,614
36 4,634,615
40 4,634,616
65 4,634,617
81 4,634,618
102 4,634,620
110 4,634,621
143 4,634,622
208 4,634,623
212 4,634,624
258 4,634,625
312.4 4,634,626
323 4,634,627
343 4,634,629
399 4,634,630
421 4,634,631
425.9 4,634,632
4,634,633
432 4,634,634
446 4,634,635
500 4,634,636
622 4,634,637
671 4,634,638
690 4,634,639
704 4,634,640

CLASS 429

111 4,634,641
121 4,634,642

CLASS 430

5 4,634,643
18 4,634,644
30 4,634,645
31 4,634,646
84 4,634,647
4,634,648
109 4,634,649
110 4,634,650
114 4,634,651
136 4,634,652
217 4,634,653
223 4,634,654
277 4,634,655
278 4,634,656
281 4,634,657
293 4,634,658
302 4,634,659
325 4,634,628
375 4,634,660
567 4,634,661

CLASS 431

3 4,634,369
29 4,634,367
116 4,634,371
140 4,634,374
202 4,634,370
4,634,372
328 4,634,373

CLASS 432

121 4,634,375

CLASS 433

10 4,634,662
29 4,634,376
73 4,634,377
102 4,634,378
166 4,634,379
172 4,634,381
181 4,634,380
182 4,634,382
226 4,634,383

CLASS 434

44 4,634,384
198 4,634,385
291 4,634,387
323 4,634,386

CLASS 435

25 4,634,663
68 4,634,664
4,634,665
4,634,666
101 4,634,667
146 4,634,668
173 4,634,669
182 4,634,672
188 4,634,671
209 4,634,670
234 4,634,673
240 4,634,674
286 4,634,675
294 4,634,676
317 4,634,677
4,634,678

CLASS 436

63 4,634,679
178 4,634,680
518 4,634,681
4,634,682

CLASS 440

6 4,634,388
53 4,634,389
63 4,634,390
75 4,634,391
88 4,634,392

CLASS 441

129 4,634,393

CLASS 446

36 4,634,394
222 4,634,395

CLASS 435

113 4,635,296
217 4,635,297
295 4,635,298
606 4,635,299

CLASS 464

55 4,634,396
68 4,634,397
4,634,398
87 4,634,399
88 4,634,400
136 4,634,401
141 4,634,402

CLASS 474

1 4,634,403
11 4,634,404
13 4,634,405
49 4,634,406
112 4,634,407
135 4,634,408
152 4,634,409
153 4,634,410
244 4,634,411
253 4,634,412
263 4,634,413

CLASS 493

213 4,634,414
353 4,634,415

CLASS 494

27 4,634,416

CLASS 501

32 4,634,683
69 4,634,684
100 4,634,685

CLASS 502

60 4,634,686
121 4,634,687

CLASS 514

41 4,634,688
80 4,634,689
81 4,634,690
108 4,634,691
167 4,634,692
169 4,634,693
177 4,634,694
178 4,634,695
179 4,634,696
202 4,634,697
222 4,634,698
223 4,634,699
227 4,634,700
232 4,634,701
249 4,634,702
252 4,634,703
253 4,634,704
256 4,634,705
262 4,634,706
270 4,634,707
280 4,634,708
316 4,634,709
338 4,634,710
341 4,634,711
356 4,634,712
392 4,634,713
397 4,634,714
423 4,634,715
4,634,716
425 4,634,717
460 4,634,718
772 4,634,719

CLASS 521

63 4,634,720
92 4,634,721

CLASS 523

1005 4,634,722
144 4,634,723
219 4,634,724
221 4,634,725

CLASS 524

34 4,634,726
145 4,634,727
219 4,634,728
229 Re.32,325
285 4,634,729
425 4,634,730
502 4,634,731
504 4,634,732
559 4,634,733

CLASS 525

85 4,634,734
88 4,634,735
117 4,634,736
146 4,634,737
162 4,634,738
240 4,634,739
4,634,740
355 4,634,741
390 4,634,742
462 4,634,743

CLASS 526

84 4,634,744
87 4,634,745
124 4,634,746
4,634,747
4,634,748
4,634,749
129 4,634,750
4,634,751
4,634,752
216 4,634,753
242 4,634,754

CLASS 528

23 4,634,755
38 4,634,756
89 4,634,757
129 4,634,758
321 4,634,759
353 4,634,760
500 4,634,761

CLASS 530

350 4,634,762
375 4,634,763

CLASS 534

759 4,634,764

CLASS 536

17.4 4,634,765

CLASS 540

1 4,634,553
126 4,634,555
145 4,634,557
310 4,634,556

CLASS 544

34 4,634,766
71 4,634,767
151 4,634,768
285 4,634,769

CLASS 546

145 4,634,770
269 4,634,779
460 4,634,771
1001 4,634,772

CLASS 548

146 4,634,773
243 4,634,774
402 4,634,775
493 4,634,776
501 4,634,777
950 4,634,554

CLASS 549

80 4,634,778
273 4,634,780
411 4,634,781
465 4,634,782
475 4,634,783
521 4,634,784

CLASS 554

17 4,634,785
187 4,634,786
470 4,634,787

CLASS 558

145 4,634,788
451 4,634,789

CLASS 560

40 4,634,790
163 4,634,791
199 4,634,792
243 4,634,793
245 4,634,794

CLASS 562

147 4,635,168
590 4,634,795

CLASS 568

757 4,634,796

CLASS 570

171 4,634,797

CLASS 585

331 4,634,798
415 4,634,799
500 4,634,800
656 4,634,802
724 4,634,801

CLASS 604

4 4,634,417
8 4,634,418
22 4,634,419
4,634,420
34 4,634,421
89 4,634,422
51 4,634,423
4,634,424
84 4,634,425
85 4,634,426
93 4,634,427
110 4,634,428
115 4,634,429
141 4,634,430
155 4,634,431
167 4,634,432
171 4,634,433
246 4,634,434
268 4,634,435
290 4,634,436
323 4,634,437
376 4,634,438
4,634,439
383 4,634,440

CLASS 623

6 4,634,441
4,634,442
14 4,634,443
20 4,634,444
21 4,634,445
33 4,634,446
66 4,634,447

D2—	309	287,540		28	287,560			287,580		9.1	287,600	D24—	1.1	287,621	
	308	287,541		319	287,561		181	287,581		126	287,601			287,622	
	642	287,542		330	287,562	D14—	39	287,582	D17—	20	287,602			287,623	D26—
D3—	12	287,543		395	287,563		52	287,583	D19—	48	287,603			287,624	
	35	287,544	D8—	1	287,564		53	287,584		91	287,604		3	287,625	
		287,545		14	287,565			287,585	D20—	6	287,605			287,626	
		287,546		61	287,566			287,586	D21—	109	287,606		10	287,627	
		287,547			287,567			287,587			287,607		15	287,628	D27—
	35	287,548		313	287,568		90	287,588		143	287,608		17	287,629	D28—
D4—	107	287,549		381	287,569		102	287,589			287,609		26	287,630	D29—
D6—	320	287,550	D9—	306	287,570		105	287,590		153	287,610		29	287,631	D30—
	334	287,551		313	287,571			287,591		160	287,611			287,632	
	361	287,552		341	287,572			287,592		185	287,612		31	287,633	
	388	287,553		435	287,573			287,593	D22—	113	287,614			287,634	D32—
	446	287,554	D10—	33	287,574			287,594		147	287,613		38	287,620	
	488	287,555		81	287,575		111	287,595	D23—	19	287,615		41	287,635	
	491	287,556		114	287,576			287,596		71	287,616		47	287,636	
	494	287,557	D11—	43	287,577		114	287,597		123	287,617		81	287,637	
		287,558		157	287,578			287,598		138.5	287,618		56	287,638	
D7—	21	287,559	D12—	147	287,579	D15—	8	287,599		142	287,619			287,639	

CLASSIFICATION OF PLANTS

P.—	10	5,846		43	5,847		74	5,848			

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102—	524	H190	236—	15 BB	H193			H190			H194			H197	
208—	111	H191	252—	518	H183	351—	226	H195	378—	45	H188	428—	404	H200	436—
		H190	340—	568	H182	356—	152	H190	423—	111	H189	431—	160	H195	568—

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PATENTS

01	:	4,633,604		4,634,077		[illegible]		4,634,641		4,634,618	4,634,541
		4,633,793		[illegible]		4,634,870		4,634,896		4,634,849	4,634,545
		4,634,033		4,634,091		4,634,871		4,635,142		4,634,956	4,634,596
		4,634,184		4,634,102		[illegible]		4,635,147		4,634,957	4,634,705
		4,634,186		4,634,116		[illegible]		4,635,249		4,635,060	4,634,737
		4,634,959		4,634,118		4,634,892	09 :	4,633,640		4,635,209	4,634,758
		4,634,969		4,634,132		[illegible]		4,633,818		4,635,280	4,634,799
		4,635,158		4,634,142		4,634,898		4,633,873	13 :	4,633,586	4,634,801
		4,635,159		4,634,152		4,634,904		4,634,018		4,633,622	4,634,822
		4,635,160		4,634,154		4,634,928		4,634,035		4,633,643	4,634,859
04	:	4,633,589		4,634,155		4,634,962		4,634,054		4,633,788	4,634,932
		4,633,779		4,634,157		4,634,964		4,634,061		4,634,067	4,634,986
		4,634,318		4,634,158		4,634,974		4,634,170		4,634,127	4,635,023
		4,634,460		4,634,182		[illegible]		4,634,333		4,634,214	4,635,039
		4,634,467		4,634,199		[illegible]		4,634,419		4,634,350	4,635,057
		4,634,581		4,634,213		4,635,000		4,634,424		4,634,394	4,635,172
		4,634,637		4,634,274		4,635,002		4,634,444		4,634,431	4,635,177
		[illegible]		4,634,282		4,635,038		4,634,631		4,634,594	4,635,187
		4,634,987		4,634,283		4,635,063		4,634,703		4,634,730	4,635,206
		4,634,993		4,634,288		4,635,064		4,634,834		3,440,973	4,635,207
		4,635,050		4,634,290		4,635,066		4,634,878		3,680,493	4,635,251
		4,635,087		4,634,294		4,635,070		4,634,948	15 :	4,635,054	4,635,285
		4,635,192		4,634,302		4,635,075		4,634,958	16 :	4,635,073	18 : 4,633,528
		4,635,223		4,634,303		4,635,096		4,635,079	17 :	4,633,531	4,633,555
05	:	4,633,714		4,634,325		4,635,138		4,635,184		4,633,558	4,633,572
06	:	Re.32,327		4,634,352		4,635,151		4,635,204		4,633,563	4,633,646
		4,633,534		4,634,375		4,635,155		4,635,205		4,633,564	4,633,690
		4,633,536		4,634,406		4,635,161		4,635,254		4,633,567	4,633,747
		4,633,537		4,634,415		4,635,162	10 :	4,633,626		4,633,584	4,633,787
		4,633,544		4,634,418		4,635,188		4,634,025		4,633,614	4,633,877
		4,633,553		4,634,427		4,635,189		4,634,280		4,633,620	4,633,978
		4,633,578		4,634,442		4,635,195		4,634,625		4,633,689	4,634,122
		4,633,582		4,634,443		4,635,217		4,634,657		4,633,720	4,634,151
		4,633,612		4,634,480		4,635,218		4,634,739		4,633,825	4,634,311
		4,633,637		4,634,503		4,635,219	11 :	4,634,864		4,633,866	4,634,433
		4,633,672		4,634,512		4,635,230	12 :	4,633,554		4,633,886	4,634,592
		4,633,691		4,634,518		4,635,236		4,633,615		4,633,904	4,634,765
		4,633,716		4,634,519		4,635,256		4,633,673		4,633,999	4,635,083
		4,633,717		4,634,568		4,635,259		4,633,681		4,634,019	4,635,118
		4,633,754		4,634,572		4,635,265		4,633,699		4,634,071	4,635,275
		4,633,776		4,634,586	08 :	4,633,713		[illegible]		4,634,090	19 : 4,633,610
		4,633,810		4,634,615		4,633,947		4,633,863		4,634,107	4,633,659
		4,633,833		4,634,662		4,633,951		4,634,016		4,634,165	4,633,791
		4,633,862		4,634,666		4,634,005		4,634,042		4,634,172	4,633,815
		4,633,887		4,634,674		4,634,007		4,634,044		4,634,197	4,633,901
		4,633,899		4,634,676		4,634,072		4,634,089		4,634,307	4,633,960
		4,633,982		4,634,677		4,634,178		4,634,110		4,634,327	4,633,962
		4,634,009		[illegible]		4,634,187		4,634,130		4,634,346	4,634,051
		4,634,014		4,634,813		4,634,267		4,634,285		4,634,472	4,634,166
		4,634,029		4,634,850		4,634,330		4,634,384		4,634,479	4,634,169
		4,634,031		4,634,852		4,634,344		4,634,441		4,634,498	4,634,357
		4,634,052		4,634,854		4,634,622		4,634,587		4,634,526	4,634,574
		4,634,076		4,634,861		4,634,623		4,634,613		4,634,538	4,634,673

		4,634,744		4,634,407		4,634,689		4,634,761		4,634,423	4,633,954
		4,634,839		4,634,422		4,634,692		4,634,771		4,634,949	4,633,970
		4,634,855		4,634,425		[illegible]		4,634,772		4,635,049	4,634,056
		4,635,047		4,634,436		4,634,711		4,634,776		4,635,051	4,634,119
		4,635,215		4,634,471		4,634,713		4,634,792		4,635,069	4,634,314
20	:	4,633,784		[illegible]		4,634,715		4,634,797		4,635,094	4,634,341
		4,634,047		4,634,720		4,634,716		4,634,879		[illegible]	4,634,345
		4,634,803		4,634,733		4,634,729		[illegible]	42 :	4,633,562	4,634,393
21	:	4,633,579		4,634,781		4,634,741		4,635,007		4,633,566	[illegible]
		4,633,635		4,634,787		4,634,752		4,635,035		4,633,570	4,634,516
		4,633,770		4,634,827		4,634,769		[illegible]		4,633,571	4,634,535
		4,633,850		4,634,971		4,634,782		[illegible]		4,633,631	4,634,563
		4,633,959		4,634,975		4,634,785		4,635,074		4,633,697	4,634,582
		4,634,395		4,635,025		4,634,796		[illegible]		4,633,786	4,634,746
		4,634,842		4,635,168		4,634,798		4,635,092		4,633,821	4,634,747
		4,634,843	27 :	4,633,648		4,634,914		4,635,108		4,633,893	[illegible]
22	:	4,633,953		4,633,676		4,634,923		4,635,136		4,633,895	4,634,749
		4,633,958		4,633,814		4,634,924		4,635,178		4,633,919	4,634,750
		4,634,390		4,633,864		4,634,929		4,635,186		4,633,929	4,634,751
		4,634,515		4,633,879		4,634,984		4,635,194		4,634,032	4,634,757
		4,634,528		4,633,964		4,634,997		4,635,228		4,634,043	4,634,804
		4,634,591		4,633,971		4,635,006		4,635,250		4,634,106	4,634,863
		4,634,743		4,633,991		4,635,071		4,635,291		4,634,120	[illegible]
		4,635,242		4,634,000		4,635,099		4,635,296		4,634,125	4,634,901
24	:	4,633,588		4,634,004		4,635,102	37 :	4,633,547		4,634,208	[illegible]
		4,633,974		4,634,220		4,635,103		4,634,021		4,634,247	[illegible]
		[illegible]		4,634,246		4,635,110		[illegible]		4,634,373	4,635,082
		4,634,148		4,634,403		4,635,135		4,634,195		4,634,379	4,635,193
		4,634,191		4,634,434		4,635,181		4,634,207		[illegible]	4,635,197
		4,634,230		4,634,485		4,635,263		4,634,679		4,634,461	4,635,235
		4,634,243		4,634,612		4,635,279		4,634,699		4,634,469	4,635,245
		4,634,946		4,634,678		4,635,297		4,634,786		4,634,525	4,635,255
		4,635,221		4,634,944	35 :	4,633,590		4,634,979		4,634,532	4,635,261
		4,635,240		4,634,977		4,633,602	39 :	4,633,577		4,634,559	4,635,277
25	:	4,633,548		[illegible]		4,633,955		4,633,591		4,634,560	4,457,498
		4,633,573		4,635,139		4,634,435		[illegible]		4,634,567	49 : 4,633,628
		4,633,632	29 :	4,633,565		4,634,814		4,633,702		4,634,602	4,633,872
		4,633,686		4,633,678		4,635,266		4,633,711		4,634,607	4,633,875
		4,633,740		4,633,768	36 :	Re.32,326		4,633,756		4,634,609	4,634,015
		4,633,798		4,633,846		4,633,533		4,633,772		4,634,616	4,634,315
		4,633,867		4,634,319		4,633,596		4,633,861		4,634,658	4,634,721
		4,633,881		4,634,345		4,633,634		4,633,874		[illegible]	[illegible]
		4,633,920		4,634,405		4,633,668		[illegible]		4,634,714	50 : 4,634,050
		4,633,997		4,634,408		4,633,679		4,633,912		4,634,717	4,634,117
		4,634,114		4,634,411		[illegible]		4,633,986		4,634,731	51 : 4,633,851
		4,634,138		4,634,413		4,633,682		4,633,979		4,634,745	[illegible]
		4,634,203		4,634,539		4,633,700		4,633,983		4,634,800	4,633,923
		4,634,218		4,634,728		4,633,729		4,634,058		4,634,802	[illegible]
		4,634,239		4,634,788		4,633,730		4,634,099		4,634,841	4,634,417
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		4,634,722		4,634,360		4,633,941		4,634,204		4,634,981	53 : 4,633,621
		4,634,738		4,634,426		4,633,942		4,634,273		4,635,011	4,633,727
		4,634,773		4,634,611		4,633,967		4,634,291		4,635,044	4,633,778
		4,634,846		4,635,058		4,634,013		4,634,298		4,635,045	4,633,803
		4,634,921		4,635,276		4,634,027		4,634,366		4,635,093	4,633,924
		4,634,950		4,635,278		4,634,036		4,634,429		4,635,124	4,634,081
		4,634,992	34 :	4,633,527		4,634,041		4,634,464		4,635,258	[illegible]
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		4,633,707		4,634,328		4,634,420		4,634,817		4,635,014	4,633,585
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		4,634,141		4,634,578		4,634,681		4,634,794		4,633,897	4,634,811
		4,634,144		4,634,593		4,634,683		4,635,238		4,633,911	4,634,951
		4,634,171		4,634,595		4,634,684		4,635,239		4,633,930	4,634,970
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		4,634,212		4,634,668		4,634,756		4,633,629		4,633,948	4,635,170
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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
January 13, 1987 Volume 1074 Number 2

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CONSOLIDATED LISTING OF OFFICIAL GAZETTE NOTICES RE PATENT AND TRADEMARK OFFICE PRACTICES AND PROCEDURES

PATENT NOTICES

The following is a compilation of the more important notices and rule changes which have been published in the Official Gazette from July 1, 1964, through December 31, 1986. These notices and rule changes are currently in effect unless otherwise noted.

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INFORMATION AND CORRESPONDENCE

(1) Official Patent Office Mailing Address Remains Washington, D.C.

The official mailing address for all communications sent to the Patent Office remains:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Any telegrams sent to the Patent Office must also bear the above identical address.

The physical location of the Patent Office is 2021 Jefferson Davis Highway, Arlington, Virginia. This address must not be used when addressing mail to the Patent Office.

No reference to Crystal Plaza, Virginia, should be made in the address of *any* communication intended for delivery to the Patent Office by the Post Office Department or Western Union.

Compliance with this instruction will help prevent any unnecessary delay in the delivery of mail, telegrams, etc.

C. A. KALK,
Feb. 20, 1969. *Director of Administration.*

(Office name change per Public Law 93–596, Jan. 2, 1975)

[860 O.G. 662]

(2) Group Number on all Communications Going to the Examining Groups

Applicants and their attorneys or agents are reminded that the Group number should be typed on amendments and other communications relating to matters handled in the examining groups in order to expedite the processing of mail. The number of the Group should be placed on right-hand side, opposite the serial number or name of the applicant.

This reminder does not apply to notices and reasons of appeal to the United States Court of Appeals for the Federal Circuit. These communications should be sent to the Solicitor at the address below:

Solicitor
Box 8
U.S. Patent and Trademark Office
Washington, D.C. 20231

Attention to these details will improve the efficiency and reduce the time necessary to process incoming mail.

THERESA A. BRELSFORD,
Nov. 23, 1983. *Assistant Commissioner for Administration.*

[1037 OG 25]

(3) Mailing of Papers to the PTO in Patent Interference Proceedings

Effective immediately, attorneys and agents are requested to address all papers mailed to the Patent and Trademark Office in connection with an interference proceeding, and any patent or application involved in an interference proceeding, as follows:

BOX INTERFERENCE
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Use of this address will considerably assist the Board in its administration of patent interference proceedings.

DONALD J. QUIGG,
Nov. 28, 1983. *Deputy Commissioner of Patents and Trademarks.*

[1037 OG 25]

(4) Identification for Application Correspondence

The Office is continuing to experience difficulty in matching incoming papers with the corresponding application files. This applies especially to responses to Office Actions, powers of attorney, changes of address, status letters, requests for extensions of time, and petitions.

A very necessary part of a complete identification of a pending application is the three-digit Group or Art Unit number, e.g., 110 or 111. Frequently, the Group Art Unit number is entirely omitted, or there are errors in this number. In the latter situation the error often occurs as a result of the case having been reassigned within the Office, and the communication is directed to an Examining Group other than that indicated in the most recent Office Action.

Where the Group Art Unit number is entirely omitted, the routine operations of the Application Branch must be interrupted solely for the purpose of determining the location of the application so that the communication can be properly routed. Under these circumstances the efficiency of the Application Branch is impaired and the incoming paper is delayed in reaching its proper destination. Where such papers are not essential to compliance with a statutory period or time limit for response, they may be returned for completion to identify the location of the files.

To assist the Office in expediting its business, it is requested that ALL papers relating to a pending application include the following information:

1. Serial number (checked for accuracy),
2. Group Art Unit number (copied from filing receipt or most recent Office Action),
3. Filing date,
4. Name of the Examiner who prepared the most recent Office Action.
5. Title of the invention.

To further reduce the burden on Application Branch and the Examining Groups, it is also requested that the submission of additional or supplemental papers on a newly filed application be deferred until a filing receipt has been received. In the same vein, it would be appreciated if the filing of additional papers, relating to an allowed application were deferred until a notice of allowance (POL-85) was received.

If the above suggestions are adopted the processing of both new and allowed applications could proceed more efficiently and promptly through the Patent Office.

RICHARD A. WAHL,
Mar. 5, 1971. *Assistant Commissioner.*

[885 O.G. 2]

(5) Identifying Application Correspondence With Issue Batch Number

Applicants or their attorney or agent can facilitate matching incoming papers with the corresponding application file by indicating the Issue Batch Number on all papers filed in the Office after receiving the Notice of Allowance and before the time the Issue Fee Receipt is received.

The Issue Batch Number is printed on the Notice of Allowance form in Box 4 in the lower left-hand corner below the address. The Issue Batch Number consists of a capital letter followed by two digits, for example; "A03," "D18," "F42," "J79." Any lower case letters before the Issue Batch Number should be ignored since they are the typist's initials. Use of the Issue Batch Numbers is important since the allowed applications are filed by these numbers.

Any paper filed after receiving the Issue Fee Receipt should include the indicated patent number rather than the Issue Batch Number. At this time in the processing, the Issue Batch Number is no longer useful since the application has been removed from the batch at the time the patent number was assigned.

RICHARD J. SHAKMAN,
Jan. 16, 1976. *Assistant Commissioner for Administration.*

[943 O.G. 519]

(6) Hand Delivery of Papers

The notices of November 10, 1969 (869 O.G. 345) and September 8, 1970 (879 O.G. 667), regarding "Hand Delivery of Papers," are superseded and the practice indicated below is hereby made effective.

Any paper which relates to a pending application may be personally delivered to an Examining Group. However, the Examining Group will accept the paper only if: (1) the paper is accompanied by some form of receipt which can be handed back to the person delivering the paper; and (2) the Examining Group being asked to receive the paper is responsible for acting on the paper.

The receipt may take the form of a duplicate copy of such paper or a card identifying the paper. The identifying data on the card should be so complete as to leave no uncertainty as to the paper filed. For example, the card should contain the applicant's name(s), Serial No., filing date and a description of the paper being filed. If more than one paper is being filed for the same application, the card should contain a description of each paper or item.

Under this procedure, the paper and receipt will be date stamped with the Group date stamp. The receipt will be handed back to the person hand delivering the paper. The paper will be correlated with the application and made an official paper in the file, thereby avoiding the necessity of processing and forwarding the paper to the Examining Group via the Mail Room.

The Examining Group will accept and date stamp a paper even though the paper is accompanied by a check or the paper contains an authorization to charge a Deposit Account. However, in such an instance, the paper will be hand carried by Group personnel to the Office of Finance for processing and then made an official paper in the file.

WILLIAM FELDMAN,
Jan. 29, 1974. *Deputy Assistant Commissioner for Patents.*

[919 O.G. 1070]

(7) Post Card Receipt Reminder

Applicants and their attorneys or agents are reminded of the provision in Section 717.01(a) (now Section 503) of the Manual of Patent Examining Procedure relating to the use of post cards as "receipts" of papers filed in the Patent Office.

If a receipt for any paper filed in the Patent Office is desired, it may be had by enclosing with the paper a self-addressed post card identifying the paper. The Patent Office will stamp the receipt date on the card and place it in the outgoing mail.

The identifying data on the card should be so complete as to match the paper with the application or other document to which it is to be associated. For example, the document should be identified by the applicant's name(s), Serial No., filing date, appeal number, interference number, etc., and the paper should be identified by specifying the type thereof, viz, affidavit, amendment, appeal, application papers, brief, drawings, fees, motions, supplemental oath or declaration, petition, etc.

When papers for more than one document are filed under a single cover a return post card should be attached to the paper for *each* document for which a receipt is desired.

RICHARD A. WAHL,
Nov. 21, 1968. *Assistant Commissioner.*

[857 O.G. 667]

(8) Acknowledgement of Receipt of a Patent or Trademark Application

When early notification of the serial number of newly filed application papers is desired, a *stamped, self-adressed post card* should be submitted with each application. Immediately after the mail has been opened in the Patent and Trademark Office, the post card will be stamped with both the receipt date and the serial number, and then returned to the addressee.

Within recent months, hundreds of cards could not be successfully returned because of insufficient postage or incomplete or nonexistent forwarding addresses. Accurate and complete addresses, including ZIP codes, are necessary to ensure prompt acknowledgement of the receipt of patent and trademark applications.

To assist in easy identification once the post card has been returned, it is suggested that the post card include applicant's names and title of invention.

When more than one set of application papers is filed under one cover, a return post card should be attached to each set of papers for which a receipt is desired.

THERESA A. BRELSFORD,
July 19, 1982. *Acting Assistant Commissioner for Administration.*

[1021 O.G. 96]

(9) Status Inquiries

In an effort to sharply reduce the volume and need for status inquiries, the past policy that diligence must be established by making timely status requests in connection with petitions to revive is hereby discontinued.

When an application has been abandoned for an excessive period before the filing of a petition to revive, an appropriate terminal disclaimer may be required. It should also be recognized that a petition to revive must be accompanied by the proposed response unless it has been previously filed (Rule 137). Also, under Rule 113, "Response to a final rejection or action must include cancellation of, or appeal from the rejection of, each claim so rejected and, if any claim stands allowed, compliance with any requirement or objection as to form."

New Applications

Current examining procedures now provide for the routine mailing from the Examining Groups of Form POL-327 in *every* case of allowance of an application except where an Examiner's Amendment is promptly mailed. Thus, the separate mailing of a Form POL-327 or an Examiner's Amendment in addition to a formal Notice of Allowance (POL-85) in all allowed cases would seem to obviate the need for status inquiries even as a precautionary measure where the applicant may believe his new application may have been passed to issue on the first examination. However, as an exception, a status inquiry would be appropriate where a Notice of Allowance is not received within three months from receipt of either a Form POL-327 or an Examiner's Amendment.

Current examining procedures also aim to minimize the spread in dates among the various examiner dockets of each Art Unit and Group with respect to actions on new applications. Accordingly, the dates of the "oldest new applications" appearing in the *Official Gazette* are fairly reliable guides as to the expected time frames of when the Examiners reach the cases for action.

Therefore, it should be rarely necessary to query the status of a new application.

Amended Applications

Amended cases are expected to be taken up by the examiner and an action completed within two months of the amendment date. Accordingly, a status inquiry is not in order after response by the attorney until five or six months have elapsed with no response from the Patent Office. A post card receipt for responses to Office actions, adequately and specifically identifying the papers filed, will be considered *prima facie* proof of receipt of such papers. Where such proof indicates the timely filing of a response, the submission of a copy of the post card with a copy of the response will ordinarily obviate the need for a petition to revive. Proof of receipt of a timely response to a final action will obviate the need for a petition to revive only if the response was in compliance with Rule 113.

In General

It is expected that this new policy will result in sharply reducing the number of status inquiries and permit the time now spent on them to be used in increasing Patent Office efficiency in other more essential areas.

Such status inquiries as may be still necessary may be more expeditiously processed by the Patent Office if each inquiry includes the application Serial Number, filing date, name of the applicant, name of the Examiner who prepared the most recent Office action, and Group Art Unit (taken from the most recent Office communication) in addition to the last known status of the application, and is accompanied by a stamped return-addressed envelope. Telephone inquiries regarding the status of applications should be directed to the group clerical personnel and not to the examiners. Inasmuch as the official records and applications are located in the clerical section of the Examining Groups, the clerical personnel can readily provide status information without consulting the examiners.

Status replies will be made by the Patent Office clerical support force and will only indicate whether the application is awaiting action by the Examiner or the applicant's response to an Office action. In the latter instance the mailing date of the Office action will also be given.

The Notices of Dec. 5, 1969 (869 O.G. 1031) and Sept. 22, 1965 (819 O.G. 444) are hereby superseded.

RICHARD A. WAHL,
Nov. 24, 1971. *Assistant Commissioner of Patents.*

[893 O.G. 810]

(10) Change of Address

There recently has been an increased incidence in the number of applications suffering from disruptions in communications stemming from failure to notify the Patent and Trademark Office of a change of address on the part of applicant's representative (attorney or agent of record) in each application wherein he holds an active power of attorney. Applications have become abandoned as a result of an Office action being mailed to the old, uncorrected address and thereby failing to reach the representative at his new address sufficiently early to permit him to file a timely response. Accordingly, the requirement set out below is published as a reminder and is designed to ameliorate this problem.

Where an attorney or agent of record (or applicant, if he is prosecuting his application pro se) changes his correspondence address, he is responsible for promptly notifying the Patent and Trademark Office of his new correspondence address (including ZIP code number). A separate notification must be filed in *each application* for which he is intended to receive communications from the Office. The notification should also include his telephone number.

While the notification need take no particular form, it should be provided in a manner calling attention to the fact that a change of address is being made. Thus, the mere inclusion, in a paper being filed for another purpose, of an address different from the previously provided correspondence address, without mention of the fact that an address change is being made, would not ordinarily be recognized or deemed as instructions to change the address on the file record.

It is emphasized that the above-delineated responsibility is *additional* to the separate obligation (see 37 CFR 1.347) of a registered attorney or agent to notify the Attorney's Roster of any change of his address for entry on the register, which must be done in a letter separate from any notice or change of address filed in individual applications. That obligation continues without change.

The degree of care exercised in adhering to the foregoing requirement for notification of change of address in each concerned application will be a factor for consideration in deciding petitions filed under 37 CFR 1.137 to revive applications which have become abandoned because of a failure to timely receive an Office action addressed to the old address. In such instances, the showing of the cause of unavoidable delay must include an adequate showing that a timely notification of the

change of address was filed in the concerned application, in a manner reasonably calculated to call attention to the fact that it was a change of address. If no such notification was made, or was made belatedly, the showing must include an adequate explanation of that failure or delay. A showing that notification was made on a paper filed in the Patent and Trademark Office listing *plural* applications as being affected will not be considered a proper notification.

WILLIAM FELDMAN,
May 28, 1975. *Deputy Assistant Commissioner for Patents.*

[935 O.G. 1352]

(11) **Change of Address or Practitioner in a Plurality of Patent Applications**

Change of Address

This notice is supplemental to the Notice of May 28, 1975, 935 O.G. 1352.

In those instances where a change in the correspondence address of a registered attorney or agent is necessary in a plurality of applications, and the number of applications is such as to cause undue hardship, the notification filed in each application may be a reproduction of a properly executed, original notification. The original notice may be sent to the Office of the Solicitor as notification to the Attorney's Roster of the change of address, or may be filed in one of the applications affected, provided that the notice includes an authorization for the public to inspect and copy the original notice in the event one of the applications containing a copy matures into a patent and the application containing the original paper is either pending or has become abandoned. The copies submitted in each affected application must identify where the original paper is located. Otherwise, the practice governing the filing of notifications of change of address remains the same.

Powers of Attorney

In the event of a need to file a change in the power of attorney in a plurality of applications of a common assignee or inventive entity, and the number of applications is such as to cause undue hardship, a single, original paper may be used provided that a reproduction of this original paper is supplied in each of the affected applications. The copy of the original paper must identify in which application the original paper is located and authorize the public to inspect and copy the original paper in the event one of the applications containing a copy matures into a patent and the application containing the original paper is pending or has become abandoned. The procedures and usual prerequisites for the filing of grants and/or revocations or power of attorney otherwise remain the same.

WILLIAM FELDMAN,
Sept. 9, 1976. *Deputy Assistant Commissioner for Patents.*

[951 O.G. 454]

(12) **Express Mail**

This notice is in response to a number of inquiries received in the Patent and Trademark Office regarding the notice on Express Mail of February 11, 1975, published in the *Official Gazette* of March 11, 1975 (932 O.G. 340).

There are two types of Express Mail delivery offered by the U.S. Postal Service—"Post Office to Addressee" and "Post Office to Post Office." The only type of service which can be used for Express Mail directed to the Patent and Trademark Office is "Post Office to Addressee." This service provides for delivery to one of our employees in Room 1627, Department of Commerce Building, Washington, D.C., no later than 3:00 p.m. of the next workday following its deposit before 5:00 p.m. at any postal facility with an Express Mail window.

The only address that should be used for Express Mail sent to the Patent and Trademark Office is:

"Commissioner of Patents and Trademarks
Washington, D.C. 20231."

"Post Office to Post Office" Express Mail *does not* provide for delivery but instead is retained at the postal facility of the addressee for pickup. The Postal Service *does not* notify the addressee that this type of Express Mail has been received and is awaiting pickup. If not picked up, this mail is held for 15 days and then returned to the sender.

Therefore, since the Patent and Trademark Office does not have resources for picking up any mail, including Express Mail, the "Post Office to Post Office" Express Mail will not reach the Patent and Trademark Office.

WILLIAM I. MERKIN,
May 15, 1975. *Acting Assistant Commissioner for Administration.*

[936 O.G. 1554]

(13) **Certificate of Mailing Procedures**

On November 1, 1976, the Patent and Trademark Office instituted the Certificate of Mailing Procedure by promulgating 37 CFR 1.8 in an attempt to reduce the number of problems resulting from late receipt of responses due to mail delays. This notice was published in the *Official Gazette* on October 26, 1976 (951 O.G. 1342 and TM 210). Guidelines relative to this procedure were published in the *Official Gazette* on November 16, 1976 (952 O.G. 918 and TM 174).

Although the new procedure has gained wide acceptance, it has not been entirely without problems. One major problem involves the correlation of the certification with the appropriate papers when presented on a separate sheet. In order to curtail this problem and other minor ones, the guidelines published on November 16, 1976, are superseded by the following guidelines. They are applicable to responses in both patent and trademark matters, as permitted by 37 CFR 1.8.

Guidelines

A) The certification requires a signature. Specifically, if the certification appears on a paper that requires a signature, two signatures are required, one for the paper and one for the certification. Although not specifically required by 37 CFR 1.8, it is preferred that the certificate be signed by the applicant, assignee, or registered practitioner.

B) When possible, the certification should appear on a portion of the paper being submitted. However, if there is insufficient space to make the certification on the same paper, such as in the case of the patent issue fee transmittal form PTO-85, the certification should be on a separate sheet securely attached to the paper.

C) When the certification is presented on a separate sheet, the sheet must (1) be signed and (2) fully identify and be securely attached to the paper it accompanies. The required identification should include the serial number and filing date of the application as well as the type of paper being filed, e.g., responses to rejection or refusal, Notice of Appeal, etc. An unsigned certification will not be considered acceptable.

Moreover, without the proper identifying data, a certification presented on a separate sheet will not be considered acceptable if there is any question or doubt concerning the connection between the sheet and the paper filed.

If the sheet should become detached from the paper and thereafter not associated with the appropriate file, evidence that this sheet was received in the Office can be supported by submitting a copy of a post card receipt specifically identifying this sheet and the paper and by submitting a copy of the sheet as originally mailed. Attention is directed to the notice of November 21, 1968 published in the *Official Gazette* (857 O.G. 667) relative to the use of post cards as receipts.

D) In situations wherein the correspondence includes papers for more than one application (e.g., a single envelope containing separate papers responding to Office actions in different applications) or papers for various parts of the Office (e.g., a patent issue fee transmittal form PTO-85 and an assignment), each paper must have its own certification as a part thereof or attached thereto.

E) In situations wherein the correspondence includes several papers directed to the same application (e.g., a proposed response under 37 CFR 1.116 and a Notice of Appeal), each paper should have its own certification as a part thereof or attached thereto.

Use of Stamped Certification

Some practitioners are placing the certification language on the first page of a paper with an inked stamp. Such a practice is encouraged because the certification is not only readily visible but also forms an integral part of the paper. An example of a preferred stamp is:

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on _____
(Date of Deposit)

_____
Name of applicant, assignee, or Registered Representative

_____
Signature

_____
Date of Signature

Interpretations

The phrase "prior to expiration of the set period" in 37 CFR 1.8(a) includes the last day of the set period, which last day may be the "next succeeding secular or business day" as set out in 35 U.S.C. 21. Also, the filing of a 37 CFR 3.54 form to effect a filing under 37 CFR 1.60 is considered the filing of an application and is, therefore, excluded from the Certificate of Mailing Procedure.

C. MARSHALL DANN,
Aug. 30, 1977. *Commissioner of Patents and Trademarks.*

[962 O.G. 20]

(14) **Change in Legal Holidays**

The Commissioner's Notice of Sept. 25, 1979, "Change in Legal Holidays," is hereby rescinded, in view of Public Law 98–144, enacted Nov. 2, 1983, which amended the listing of legal public holidays in 5 USC §6103. That amendment took effect in 1986 and added a new legal holiday relating to the birthday of Martin Luther King, Jr. This new holiday is designated for the third Mon. in Jan.

Section 6103, as amended, reads as follows:

New Year's Day, Jan. 1.
Birthday of Martin Luther King, Jr., the third Mon. in Jan.
Washington's Birthday, the third Mon. in Feb.
Memorial Day, the last Mon. in May.
Independence Day, July 4.
Labor Day, the first Mon. in Sept.
Columbus Day, the second Mon. in Oct.
Veterans Day, Nov. 11.
Thanksgiving Day, the fourth Thurs. in Nov.
Christmas Day, Dec. 25.

Each of the holidays enumerated will constitute a "Federal holiday within the District of Columbia," as referred to in Section 21, Title 35, United States Code. In accordance with 37 CFR 1.6(a) and 1.10(a), the Patent and Trademark Office will not receive papers on these holidays. Actions required to be taken on such days may be taken on the next succeeding day that the Office is open for business in accordance with 37 CFR 1.7.

DONALD J. QUIGG,
July 15, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[1069 OG 12]

(15) **Change in Drafting Practice**

Effective Apr. 12, 1982, the Patent and Trademark Office is terminating its drawing correction service.

In order to effect any changes in the drawings, applicants will be responsible for submitting either new drawings or having the drawings corrected by a bonded commercial draftsman, at applicant's expense, in the manner specified below. The new practice will permit applicants to delay correction of drawings in almost all cases until after the Notice of Allowance is mailed.

The initial list of bonded commercial draftsmen appears below. This list will be expanded as more commercial draftsmen are bonded. Applicants will, at least initially, be supplied with a current list of the bonded draftsmen with all Office actions requiring a drawing change.

The following is a letter which will be supplied, at least initially, to applicants in all Office actions requiring a drawing change. This letter explains the procedures for accomplishing the above, sets forth the time period within which the drawings must be corrected, and lists all of the currently bonded commercial draftsmen.

U.S.Department of Commerce, Patent and Trademark Office

Attachment to Paper Number
Serial No.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities (Draftsman's objections on PTO–948)

In order to correct any informalities in the drawings, applicants *MUST* comply with options (a) or (b) below. Failure to do so will result in *ABANDONMENT* of the application.

a) File new drawings with the changes incorporated therein. Applicant may delay filing the new drawings until the application is allowed by the examiner. If delayed, the new drawings *MUST* be filed within the *THREE MONTH* statutory period set for payment of the base issue fee in the "NOTICE OF ALLOWANCE AND BASE ISSUE FEE DUE" (PTOL–85). Also, if delayed, the drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsman and which indicates the following in the upper right hand corner:

Date of the Notice of Allowance
Issue Batch Number
Serial Number

b) Request a commercial bonded drafting firm (see list below) to make the necessary corrections.

A BONDED DRAFTSMAN MUST BE *AUTHORIZED, THE CORRECTIONS EXECUTED AND THE CORRECTED DRAWINGS RETURNED TO THE OFFICE* DURING THE THREE MONTH STATUTORY PERIOD SET FOR PAYMENT OF THE BASE ISSUE FEE IN THE "NOTICE OF ALLOWANCE AND BASE ISSUE FEE DUE" (PTOL-85). NOTE THAT THE STATUTE DOES NOT PERMIT EXTENSION OF THE THREE MONTH PERIOD SET TO PAY THE BASE ISSUE FEE.

2. Corrections other than Informalities Noted by the Draftsman on the PTO-948

All changes to the drawings, other than informalities noted by the Draftsman, *MUST* be made in the same manner as above except that, if delayed option (a) is selected, normally, a sketch of the changes to be incoroprated into the new drawings *MUST* be approved by the examiner before the application will be allowed. If option (b) is selected, normally, applicants must submit, in duplicate, a separate paper containing a sketch of the proposed changes before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

3. Listing of Bonded Draftsmen

Graphe-Tech
11301 Rockville Pike
Kensington, Md. 20895
(301) 881-9400

Ultra Graphics, Inc.
Suite 300
3720 Farragut Ave.
Kensington, Md. 20795
(301) 946-1343

Mantech International Corp.
2121 Eisenhower Ave.
4th Fl.
Alexandria, Va. 22301
(703) 548-3879

Ord-Marine Engineering
10315 Kensington Pkwy.
Kensington, Md. 20895
(301) 949-3282

Patent Reproduction Co.
26 "N" St., S.E.
Washington, D.C., 2003
(202) 488-7096

Alexandria, Va. 22314
(703) 838-5793

National Graphic Center
205 W. Jefferson St.
Falls Church, Va. 22046
(703) 533-8700

Kirby Lithograhic Co.
2900 South Eads St.
Arlington, Va. 22202
(703) 684-7600

Mil-R Productions
2107 Mt. Vernon Ave.
Quinn Pat. Drwg. Service Co.
2021 Crystal Plaza Dr.
Arlington, Va. 22202
(703) 521-1650

Technical Illustrator
1911 Jeff. Davis Hwy.
Suite 600-CM1
P.O. Box 2627
Arlington, Va. 22202
(703) 920-8900

IT IS SUGGESTED THAT APPLICANTS DETACH THIS LETTER FROM THE OFFICE ACTION AND ATTACH IT TO THE FRONT OF APPLICANT'S FILE AS A REMINDER THAT, IN ORDER TO AVOID ABANDONMENT, A BONDED DRAFTSMAN MUST BE *AUTHORIZED, THE CORRECTIONS EXECUTED AND THE CORRECTED DRAWINGS RETURNED TO THE OFFICE*, OR NEW DRAWINGS SUBMITTED, DURING THE THREE MONTH STATUTORY PERIOD SET FOR PAYMENT OF THE BASE ISSUE FEE. NOTE THAT THE STATUTE DOES NOT PERMIT EXTENSION OF THE THREE MONTH PERIOD SET TO PAY THE BASE ISSUE FEE.

Currently there is a large backlog of applications pending before the Office draftsmen. Applicants whose applications are part of this backlog are strongly encouraged to have the necessary drawing corrections made by one of the bonded commercial draftsmen to expedite the issuance of their applications. If there has been authorization to charge a deposit account for these corrections, the authorization will not be processed. If a fee has been paid with cash, a refund will be processed.

The requirement of 37 CFR §§1.85, 1.86(b) and 1.123(a), specifying that drawings, or corrections to the drawings, may or must be made by the Office, is hereby waived.

Mar. 16, 1982. GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

[1017 O.G. 4]

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(16) **Submission of Drawings**

As further clarification of the O.G. Notice of Oct. 29, 1985, drawings for patent applications do *not* need to be submitted on bristol board.

Since corrections are now the responsibility of applicants, it is more convenient for the original drawings to be kept in their possession. Copies only need to be supplied to the Patent and Trademark Office. Whether or not bristol board is used for the copies is the applicant's choice. However, the copies that are submitted to the Office must be on strong, white, smooth, and non-shiny paper. High quality copies are necessary not only for the patent examination process, but for printing purposes.

If corrections are necessary, they should be made to the original drawings. Either a good copy of the corrected drawings or the corrected original can then be submitted after the Notice of Allowability is mailed.

We will be revising 37 CFR to clarify the requirements for drawing submissions.

This change is being made for the convenience of applicants and attorneys.

Nov. 25, 1985. THERESA A. BRELSFORD,
Assistant Commissioner, for Administration.

[1061 OG 12]

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(17) **Discontinuation of Drawing Comparison Fee**

The Patent and Trademark Office no longer requires a $10 (ten dollar) comparison fee payment with the submission of formal sheets of drawings to replace originally filed informal drawings. Accordingly, no fee should be submitted, and all existing requirements for a drawing comparison fee are hereby rescinded.

June 9, 1982. THERESA A. BRELSFORD,
Acting Assistant Commissioner for Administration.

[1020 O.G. 10]

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(18) **New Patent Drawing Correction Procedures**

Drawings charged out from the Patent and Trademark Office, for the purpose of making changes or corrections, will be released from the Drafting Branch after the mailing of the Notice of Allowance. Most drawings should be available for charge out one week to ten days after the Notice of Allowance mail date. The major exception to this procedure will be when the examiner requires that drafting corrections be made prior to the Notice of Allowance issuance. We anticipate that this exception requirement will occur only for Design applications being appealed.

Unless a duplicate copy of the Drafting Letter has been filed by the attorney/applicant, the Office will not normally provide the commercial bonded draftsman with copies of either examiner approved drawing correction letters or a copy of the Patent and Trademark Office draftsman's noted informalities. It is the applicant's responsibility to provide copies of the necessary drawing corrections and the noted informalities. When drawings are borrowed from the Office draftsman, the serial number, batch number, and Notice of Allowance mailing date should be identified.

If for any reason a corrected and/or substitute drawing is not acceptable, a letter will be sent to the attorney/applicant. A bonded commercial draftsman must present a copy of this letter in order to borrow the unacceptable drawings.

June 28, 1982. THERESA A. BRELSFORD,
Acting Assistant Commissioner for Administration.

[1020 O.G. 18]

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(19) **Listing of Commercial Bonded Draftsmen**

The following listing of bonded draftsmen supersedes the listing published on Apr. 10, 1984, at 1041 O.G. 11:

American Future Design Co.
P.O. Box 365
1400 Ramsey Dr.
Mayo, Md. 21106
(301) 261-4975

John A. Ballard
432 Harry S. Truman Dr.
Largo, Md. 20772
(301) 336-7312

Anthony L. Costantino
12006 Lafayette Ct.
Silver Spring, Md. 20902

Draft-Art, Inc.
South Square
Woodstock, Va. 22664
(703) 459-2080

Fleit & Jacobson, Cohn & Price
1217 E St., N.W.
Washington, D.C. 20004
(202) 638-6666

Graphics By Gallo
1800 B. Swann St., N.W.
Washington, D.C. 20009
(202) 234-7700

John A. Haigh
9513 Brunett Ave.
Silver Spring, Md. 20901
(301) 588-6739

Ellsworth G. Jackson
101 Rittenhouse St., N.E.
Washington, D.C. 20011
(202) 726-0908

Kostolnik Associates
2575 S. Shirlington Rd.
Arlington, Va. 22202
(703) 920-8155

Robert MacCollum
Patent Drafting Service
1911 Jefferson Davis Hwy.
Suite 700
Arlington, Va. 22202
(703) 521-1115

Mil-R Production
2107 Mt. Vernon Ave.
Alexandria, Va. 22301
(703) 548-3879

Gerald M. Murphy
P.O. Box 2098
Eads St. Station
Arlington, Va. 22202

Suzanne Nahmias
701 S. 23rd St.
Arlington, Va. 22202
(703) 521-7802

Oliver Patent Drafting Service
1205 Darlington St.
Forestville, Md. 20747
(301) 336-0351

Patent Reproduction Co.
26 N St., S.E.
Washington, D.C. 20003
(202) 488-7096

Quality Patent Printing
P.O. Box 2404
556 S. 22nd St.
Arlington, Va. 22202
(703) 892-6212

Quinn Patent Drawing Service Co.
P.O. Box 1435
Alexandria, Va. 22313
(703) 548-3766

Karen L. Robertson
P.O. Box 1098
Eads St. Station
Arlington, Va. 22202

Campbell Philip Sweet
1755 S. Jefferson Davis Hwy.
Crystal Sq. 5, Suite 400
Arlington, Va. 22202
(703)521-5940

W. R. Taggert
9801 S. A1A, Lot 795-2
Jensen Beach, Fla. 33457

Aug. 23, 1985. THERESA A. BRELSFORD,
Assistant Commissioner, for Administration.

[1058 OG 27]

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(20) **Submission of Corrected Drawings in Allowed Applications**

When drawings need to be corrected in an allowed application, the applicant is *required* to submit *acceptable* corrected drawings within a three-month shortened statutory period. Within that three-month period, two weeks should be allowed for review of the correction by the Office. If a correction is determined to be unacceptable by the Office, the applicant must arrange to have an acceptable correction re-submitted within the original three-month period to avoid the necessity of obtaining an extension of time and of paying the extension fee. Therefore, the applicant should file corrected drawings as soon as possible following the setting of the three-month shortened statutory period.

Jan. 14, 1985. THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

[1051 OG 3]

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(21) **Regulations for the Use of the Facilities of the Patent and Trademark Office**

Revision of Regulations

Agency: Patent and Trademark Office, Commerce.
Action: Notice.
Summary: The Patent and Trademark Office gives notice of a revision of its "Regulations for the Public Use of Records in the Public Search Room for Patents of the

Patent and Trademark Office," published in the Federal Register of July 14, 1976, 41 FR 29009. The regulations publiahed in the Federal Register of July 14, 1976, are limited to the use of the Public Search Room for Patents. The revision is intended to allow public use of other Patent and Trademark Office record facilities with minimum risk to the security of Patent and Trademark Office personnel and government property.

Effective Date: June 26, 1979.

For Further Information Contact: Bradford R. Huther, Deputy Assistant Commissioner for Administration, Patent and Trademark Office, Washington, D.C. 20231, 703-557-2290.

Supplementary Information: This revision is an extension of the present regulations, published in the Federal Register of July 14, 1976, 41 FR 29009, to allow public use of Patent Examining Group Facilities and the Scientific Library under conditions which are as nearly as possible the same as those which apply to the Public Search Room for Patents.

All persons seeking use of the Public Search Room for Patents and/or the Patent Examining Group Facilities must obtain a User Pass. The guards at the entrances to the Public Search Room for Patents can direct prospective users to the pass issuance desk. User Passes will be issued to persons not under prohibition from using the facilities who agree to abide by the regulations of the Public Search Room for Patents and the Patent Examining Group Facilities.

The use of the Group facilities for search purposes by members of the public is strictly limited to the search of materials not available in the Public Search Room for Patents or the Scientific Library and when it does not conflict with the regular business of Patent and Trademark personnel and only between the hours of 8:45 a.m. and 4:45 p.m. on regular business days.

The Public Search Room for Patents is open 8:00 a.m.–8:00 p.m., Monday through Friday except on legal holidays. The hours of the Record Room are 8:00 a.m.–5:00 p.m. on the days the Public Search Room for Patents is open.

The revised regulations appear below:

Regulations

Regulations for members of the public using the facilities of the U.S. Patent and Trademark Office, including but not limited to the Public Search Room for Patents.

The Public Search Room for Patents is defined as that area comprising the foyers of the lobbies of Buildings 3 and 4 of Crystal Plaza; the offices; Microfilm Center; restrooms and telephone areas off these foyers; the stacks; Record Room public reception area; study and copier areas between the foyers; and the Mezzanine.

The facilities of the Patent Examining Groups are defined as those areas in Buildings 3, 34 and 4 of Crystal Plaza designating Examining Groups.

With the respect to the Group Facilities, authorized personnel under these Regulations, include Supervisory Patent Examiners and Examining Group Directors.

The Scientific Library is located on the second floor of Building 34 of Crystal Plaza.

To maintain and protect the patents and related records located in the Public Search Room for Patents and the Patent Examining Group Facilities, it is necessary to establish and to enforce certain rules and regulations pertaining to the use thereof. Under applicable statutes and regulations, including 40 U.S.C. 486(c); 41 CFR Subpart 101-20.3; and appropriate Sections of Department Organization Orders 30-3A and 30-3B of the Department of Commerce, the regulations appearing below are established for those using the facilities of the Patent and Trademark Office.

These regulations supersede all previous regulations on the subject.

1. All persons using the facilities of the Patent and Trademark Office are subject to the regulations governing conduct on property under the charge and control of the General Services Administration which appear in 41 CFR Subpart 101-20.3 [41 CFR §§101-20.300 through 101-20.314].
2. All posted Official Notices are to be complied with.
3. Smoking is not permitted except in designated areas.
4. No food or beverages in any form are to be consumed except in designated areas.
5. Loud talking, use of radios, and any other forms of activity which may disturb other members of the public and/or Patent and Trademark Office personnel are forbidden.
6. Children brought into the Patent and Trademark Office must not be allowed to disturb others.
7. Users of the facilities may not give the Patent and Trademark Office as a mailing address or otherwise suggest that mail may be received at the Patent and Trademark Office; nor may correspondence be conducted on official Patent and Trademark Office stationery.
8. Messages shall not be affixed to walls, desks, phone booths, or other public property, except designated message boards.
9. Patent records and any other property of the Patent and Trademark Office shall not be removed from their normal location without permission from an authorized official; nor shall such records or property be mutilated. Authorization will not be given to remove from any Group Facility, U.S. patents or any other material readily available through the Scientific Library.
10. The use of equipment such as reproducing machines, typewriters and photographic equipment is prohibited without prior permission from an authorized official. Relative to the Public Search Room, the use of dictation equipment is prohibited except in designated areas. Whenever permission is obtained, the use of such equipment must not conflict with Regulation 5.
11. In the Public Search Room for Patents, library trucks or carts are to be used for transporting bundles only. The trucks or carts are not to be used for storage while making searches.
12. In the Public Search Room for Patents, patents temporarily removed from bundles for any purpose must be returned to the proper place in the appropriate bundle.
13. In the Public Search Room for Patents, all bundles of patents must be promptly and properly replaced in the stacks by the user.
14. The reserving of seats and/or working areas is prohibited.
15. Users of the Public Search Room for Patents are not permitted to use Patent and Trademark Office facilities beyond the Public Search Room for Patents after 5:00 p.m.
16. The front portion of the Public Search Room for patents, i.e., that portion facing Crystal Plaza Drive and having a high ceiling shall not be occupied by users after 6:00 p.m.
17. A valid User Pass must be worn and visible at all times when Patent and Trademark Office facilities are being used. In addition, all persons holding User Passes must register with the designated representative in each Examining Group where they search and must sign a log (sign-in, sign-out sheet) indicating time-in, time-out, name, User Pass number, class(es) and subclass(es) users after 6:00 p.m.
18. User Passes are nontransferable and must be surrendered to authorized Patent and Trademark personnel upon request for cause.
19. Packages, briefcases or other personal effects brought into the Public Search Room for Patents or the Group Facilities are subject to search by authorized Patent and Trademark Office personnel upon request.
20. All packages, briefcases or other personal effects brought into the Group Search Rooms must be removed when leaving the Group Search Room areas.

21. Patents and other documents must not be removed from the Group patent shoes for any reason other than for cursory study thereof while kept in close proximity with the shoe and must not be moved out of their normal sequence.
22. All patent shoes must be promptly replaced in their proper location in the shoe cases.
23. All textbooks, journals and the like must be returned to their proper location.
24. All persons using the facilities of the Patent and Trademark Office are to refrain from engaging in any conduct which (1) is criminal in nature or (2) which causes or appears to cause an employee of the Patent and Trademark Office to violate the conflicts of interest regulations of the Department of Commerce [15 CFR §§0.735-1 through 0.735-41].
25. All verbal requests for compliance with these regulations or other posted Patent and Trademark Office Notices pertaining to activity in the Public Search Room for Patents and the Group Facilities, when made by authorized Patent and Trademark Office personnel, must be promptly complied with.

These regulations will be enforced in accordance with the Procedures for Enforcement published in the Federal Register of May 17, 1978, 43 FR 21345 (970 O.G. 114, published May 30, 1978).

Persons violating these regulations may be denied the use of the facilities in the Public Search Room for Patents and the Patent Examining Group Facilities and may further be subjected to prosecution under the Criminal Code. Additionally, the name of any person violating these regulations who is registered to practice before the Patent and Trademark Office may be forwarded to the Solicitor for appropriate action under 37 CFR 1.348.

These Regulations have been instituted in order to maintain high quality and completeness of patent files and to provide, an orderly environment for exploring, or studying in depth, the wealth of scientific and technological information contained in United States Patents. Although the Regulations may cause some inconvenience, the understanding and cooperation of users will insure that, for future users, the knowledge contained in United States Patents will be available in an environment conducive to study in the Public Search Room for Patents and the Patent Examining Group Facilities.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

June 20, 1979.

[984 O.G. 26]

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(22) Regulations Relating to the Use of Patent and Trademark Office Records Facilities

Establishment of Enforcement Procedures

Agency: Patent and Trademark Office, Commerce.

Action: Notice.

Summary: The Patent and Trademark Office is adopting procedures for enforcing existing regulations governing the use of the Public Search Room for Patents and the Patent Examining Group Search Facilities by members of the public. Enforcement of the existing regulations is necessary, and is intended by these procedures, to carry out the commitment of the Office to the public to promote an atmosphere conducive to research and maintain the integrity of the files in the Public Search Room for Patents and in the Examining Group Search Facilities.

Effective Date: 6-30-78.

For Further Information Contact: Bradford R. Huther, Deputy Assistant Commissioner for Administration, Patent and Trademark Office, Washington, D.C. 20231, (703) 557-2290.

Supplementary Information: The procedures will apply in enforcing the regulations for the public use of records of the Public Search Room for Patents and the Patent Examining Group Search Facilities. The regulations of the Public Search Room for Patents were published in the Federal Register for July 14, 1976, 41 F.R. 29009, and incorporated in a Search Room User Agreement entered into by each person who is issued a User Pass. Regulations for Users of the Patent Examining Group Search Facilities were established under Rule 2 of the regulations of the Public Search Room for Patents and were published in the OFFICIAL GAZETTE of March 22, 1977, 956 O.G. 1118. The procedures appear below.

PROCEDURES FOR ENFORCEMENT OF THE REGULATIONS FOR THE PUBLIC USE OF RECORDS IN THE PUBLIC SEARCH ROOM FOR PATENTS AND THE PATENT EXAMINING GROUP SEARCH FACILITIES

Under applicable statutes and regulations, including 40 U.S.C. 486(c); 41 CFR 101-20.3; and appropriate sections of Department Organization Orders 30-3A and 30-3B of the Department of Commerce, the procedures appearing below are established.

Violation Involving the Security System

1. *Unauthorized removal of government property.*

(a) The Public Search Room for Patents is equipped with a security system designed to sound an alarm when an attempt to remove government property from the Public Search Room is detected. Each alarm signal triggered by a person passing through an exit to the Public Search Room will be investigated by security guards stationed at the Public Search Room exits. The person involved will be required to stop and allow the security guards to determine the cause of the alarm. If non-government property is the cause for the alarm, the person will be allowed to proceed without further delay. If unauthorized possession of government property is found to be the cause of the alarm, the person in whose possession the property is found will be advised that a violation has occurred and will be required to surrender the property to the Manager of the Public Search Room. An oral explanation for the possession of such property will be requested by the Manager.

(b) The Manager of the Public Search Room will immediately report each incident involving unauthorized possession of government property to the Deputy Assistant Commissioner for Administration by telephone, and if requested submit a written report, together with the government property and User Pass involved to the Deputy Assistant Commissioner for Administration.

(3) If it shall appear to the Deputy Assistant Commissioner for Administration that unauthorized possession of government property, detected by the security system, was inadvertent or otherwise unintentional, no further action will be taken. Otherwise, the Deputy Assistant Commissioner for Administration will request the person involved to show cause in writing why his or her User Pass should not be suspended or revoked pursuant to the terms of the Search Room User Agreement. A written decision will be rendered by the Deputy Assistant Commissioner for Administration after consideration of any timely submitted response.

Other Violations of the Public Search Room Regulations

2. *All other violations of the Public Search Room Regulations.*

(a) Each observed or reported violation will be investigated by the Manager of the Public Search Room. If a violation has occurred and is not denied, the person involved will be verbally requested by the Manager to comply with the regulations. If the person involved denies that a violation has occurred, or refuses to comply with a verbal request of the Manager to comply with the regulations, or violates the regulations after

having agreed to comply with them, the person will be required to surrender his or her User Pass to the Manager of the Public Search Room.

(b) The Manager of the Public Search Room will submit a written report of each violation, and the UserPass, if surrendered, to the Deputy Assistant Commissioner for Administration.

(c) If the Deputy Assistant Commissioner for Administration is satisfied that a reported violation was inadvertent or otherwise unintentional, the User Pass, if surrendered, will be returned and no furt er action will be taken. In all other cases, the Deputy Assistant Commissioner for Administration will request the person involved to show cause in writing why his or her User Pass should not be suspended or revoked pursuant to the terms of the Search Room User Agreement. A written decision will be rendered by the Deputy Assistant Commissioner for Administration after consideration of any timely submitted response.

Violations of the Patent Examining Group Search Facilities Regulations

3. *Violations of the Regulations for Users of the Patent Examining Group Search Facilities.*

(a) Each observed or reported violation will be investigated by Authorized Official. If a violation has occurred, and is not denied, the person involved will be verbally requested to comply with the regulations. If the person involved denies that a violation has occurred, or refuses to comply with a verbal request to comply with regulations, or violates the regulations after having agreed to comply with them, the person involved will be required to surrender his or her User Pass to the Authorized Official.

(b) The Authorized Official will submit a written report of each violation, and the User Pass, if surrendered, to the Deputy Assistant Commissioner for Patents.

(c) If the Deputy Assistant Commissioner for Patents is satisfied that violation was inadvertent or otherwise unintentional, the User Pass, if surrendered, will be returned and no further action will be taken. In all other cases, the Deputy Assistant Commissioner for Patents will request the person involved to show cause in writing why his or her User Pass should not be suspended or revoked. A written decision will be rendered by the Deputy Assistant Commissioner for Patents after consideration of any timely submitted response.

Penalties

4. *Factors to be Considered in Assessing Penalties.*

(a) Penalties will be determined on a case-by-case basis. A record of penalties imposed for given violations will be kept and made available to the public upon request.

(b) Due weight may be given to prior violations of the regulations in assessing whether any given violation is willful, deliberate or intentional.

(c) Prior violations of the regulations will be considered in determining any specific penalty to be imposed. Depending upon the circumstances, the penalty for a first offense may range from an oral or written warning to a 60-day suspension of the User Pass. For a second offense, the penalty may be a suspension of from 5 days to 1 year. For a third offense, the penalty may range from a 30-day suspension to revocation of the User Pass.

General Provisions

5. *Use of Search Facilities During Suspension or After Revocation of User Pass.*

No individual will be permitted to use the Public Search Room for Patents or the Patent Examining Group Search Facilities while his or her User Pass is suspended or revoked.

6. *Temporary User Pass.*

Any person whose User Pass was surrendered, but not suspended or revoked, may be issued a temporary User Pass which shall be valid until the User Pass is returned or a decision is rendered pursuant to paragraph 1(c), 2(c), 3(c).

7. *Absence of the Deputy Assistant Commissioner for Administration.*

In the absence of the Deputy Assistant Commissioner for Administration, the Director of the Office of Patent and Trademark Services will carry out the functions and responsibilities assigned to the Deputy Assistant Commissioner for Administration in paragraph 1(b) and (c) and 2(b) and (c).

8. *Absence of the Manager of the Public Search Room.*

In the absence of the Manager of the Public Search Room, the Acting Manager will carry out the duties and responsibilities assigned to the Manager in paragraphs 1(a), 1(b), 2(a) and 2(b).

9. *Assistance.*

The Manager of the Public Search Room and the Authorized Official may, when necessary request the Security Officer of the Patent and Trademark Office or the GSA to provide assistance in carrying out their function in paragraphs 1(a), 2(a), and 3(a).

10. *Petitions.*

A decision rendered by the Deputy Assistant Commissioner for Administration, the Director of the Office of Patent and Trademark Services, or the Deputy Assistant Commissioner for Patents may be reviewed on petition to the Commissioner.

LUTRELLE F. PARKER,
May 5, 1978. *Acting Commissioner of Patents and Trademarks.*

[970 O.G. 114]

(23) **Revised Regulations and Procedures for Visitors to the Patent and Trademark Office**

Effective Oct. 1, 1982, all visitors to the Patent and Trademark Office (PTO) will be required to obtain and display a visitor pass while using PTO facilities. Passes will be available in building CP3, Room 1A01.

The current User Agreement will be replaced by the following Regulations for Visitors to the PTO:

These regulations are established for members of the public using the facilities of the PTO and will be enforced by designated officials of the PTO.

All persons using the facilities of the PTO are subject to regulations governing conduct on property under the charge and control of the General Services Administration which appear in 41 CFR Subpart 101-20.3 (41 CFR §§101-20.300 through 101-20.314).

Packages, briefcases and other personal effects brought into the PTO are subject to search by authorized personnel for reasonable cause.

All persons must comply with posted Official Notices.

User Passes

1. Individuals visiting any area of the PTO must obtain and display a valid, non-transferable User Pass at all times while on the premises.

2. Permanent User Passes may be obtained from the Manager of the Patent Public Search Room. The first User Pass is issued at no charge. Duplicate or replacement User Passes will be provided at a cost of $5.00 per Pass. Temporary User Passes may be obtained at no cost and are valid through the expiration date stamped thereon.
3. Permanent and Temporary User Passes must be surrendered to authorized PTO officials upon request for cause.

Use of Search Areas

4. When searching in a patent examining organization, visitors must register with the designated representative and sign a log indicating time entering and leaving the area, User Pass number, and class(es) and subclass(es) searched.
5. Documents removed from the files must be promptly returned to their proper location after use. No documents may be removed from the area in which they were obtained without specific authorization from a Group Director or a Supervisory Patent Examiner.
6. Use of Patent Examining Group search areas is strictly limited to searching materials unavailable in the Patent Public Search Room or the Scientific Library. Examining Group search areas may be used only when such use does not conflict with the regular business of the organization.
7. Trademark registrations may not be removed from the secured bundles in the registered file. Photocopying from bound volumes of trademarks is prohibited.

Prohibitions

8. Smoking and consumption of food or beverages in other than designated areas.
9. Loud talking or any conduct which is disruptive to others.
10. Use of radios, typewriters, photographic equipment, dictation equipment, and like items without permission from a designated official of the PTO.
11. Improper use, mutilation, destruction or removal of patent or trademark records or government property.
12. Reserving seats or work areas.
13. Affixing messages to walls, telephone booths or other government property, except designated message boards.
14. Use of the PTO as a mailing address, and use of PTO stationery.

Hours of Operations

15. Use of PTO facilities is limited to the following hours on regular business days:

Patent Public Search Room, High Ceiling Area	8:00 am–6:00 pm
Low Ceiling Area and Mezzanine	8:00 am–8:00 pm
Trademark Search Library	8:00 am–5:30 pm
Scientific Library, Assignment Search Room, Microfilm Center, Patent Examining Organizations, and all other public access areas of the PTO	8:45 am–4:45 pm

THERESA A. BRELSFORD,
Sept. 8, 1982. *Acting Assistant Commissioner for Administration.*

[1023 O.G. 3]

(24) **Unlawful Removal of Labels**

We have found a large number of security labels, torn from Search Room patent copies, in stack areas of the Public Search Room. We remind persons removing security labels or otherwise mutilating Search Room patent copies, or removing Search Room patent copies from the Search Room without authorization, that such acts are criminal offenses punishable by fine, imprisonment or both.

You should be aware that engaging in such acts violates the prohibition against "the willful destruction of or damage to property; the theft of property." 41 Code of Federal Regulations §101-20.303. Violations are punishable by "a fine of not more than $50 or imprisonment of not more than 30 days, or both." 41 Code of Federal Regulations §101-20.315.

You should also be aware that engaging in such acts subjects you to punishment under the following criminal provision in Title 18 U.S. Code, §2071:

> (a) Whoever willfully and unlawfully conceals, removes, mutilates, obliterates, or destroys, or attempts to do so, or, with intent to do so takes and carries away any record, proceeding, map, book, paper, document or other thing * * * shall be fined not more than $2,000 or imprisoned not more than three years, or both.
>
> (b) Whoever, having custody of any such record, proceeding, map, book, document, paper, or other thing, willfully and unlawfully conceals, removes, mutilates, obliterates, falsifies, or destroys the same, shall be fined not more than $2,000 or imprisoned not more than three years, or both; and shall forfeit his office and be disqualified from holding any office under the United States.

UNLESS THE REMOVAL OF SECURITY LABELS FROM SEARCH ROOM PATENT COPIES CEASES, THE OFFICE WILL TAKE APPROPRIATE ACTION, SUCH AS EXERCISING ITS AUTHORITY UNDER 41 CODE OF FEDERAL REGULATIONS§101-20.301 TO INSPECT PACKAGES, BRIEFCASES AND OTHER CONTAINERS BROUGHT INTO, WHILE ON, OR BEING REMOVED FROM THE SEARCH ROOM.

GERALD J. MOSSINGHOFF,
Mar. 28, 1983. *Commissioner of Patents and Trademarks.*

[1029 OG 136]

(25) **Out-of-Town Request for Files**

Delays are being experienced in receiving files ordered from the Federal Records Center in Suitland, Md. Therefore, more time must be allowed when out-of-town requestors are ordering patented files or abandoned or registered trademark files in advance of their arrival in the area. Until recently, a five-day notice was sufficient to obtain a file located in the Federal Records Center. Now we are suggesting that ten days be allowed when ordering Suitland files. A 24-hour notice is still normally adequate when the file is located in the PTO File Repository in Crystal City. Out-of-town requests for files should be directed to Ms. Jacqueline Waldo on (703) 557-2977. Requestors will be notified by phone, prior to planned arrival date, whether or not the requested file will be available.

THERESA A. BRELSFORD,
July 10, 1984 *Assistant Commissioner for Administration.*

[1045 O.G. 3]

(26) **Use of Certificate of Correction Forms**

The purpose of this notice is, to once again, remind patentees and their attorneys and agents to submit the text of any correction under 37 CFR 1.322 and 1.323 on

the Certificate of Correction form, PTO-1050, which is available free of charge from the Patent and Trademark Office. The presentation of all corrections on this form permits its use as camera copy for prompt, direct offset printing of the Certificate of Correction.

Instructions for use of Form PTO-1050 are printed on the top portion thereof, and are also set forth, in further detail, in Section 1402.02 of the Manual of Patent Examining Procedures. It is especially important that the typing be clean and clear. Both thin, light type and heavy, smudged type should be avoided. Changes and corrections are preferably made by use of white opaque correction fluid.

The typing should be within the borders printed on the form and a two-inch blank space should be left at the bottom of the last page of the form for the placement of the signature of the Attesting Officer.

Both sheets of the printed form should be forwarded to the Office. The copies should be stapled together only at the upper left-hand margin at the indicated location.

Copies of form PTO-1050 may be obtained, as needed, from either the Correspondence and Mail Division in Building 2, or from the receptionist in the lobby of Building 3, Crystal Plaza, Arlington, Va.

May 10, 1977. RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

[959 O.G. 3]

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(27) **ARS Patent Culture Collection Initiation of Fees**

As a result of recent policy changes, the ARS Culture Collection (NRRL) henceforth will charge a user fee for deposit and distribution of microbial cultures maintained in conjunction with U.S. and foreign patent applications. User fees apply to patent cultures only; as it has in the past, the ARS Culture Collection will continue to exchange other microbial germplasm with the scientific community without charge. The fee schedule will apply to all patent cultures deposited after Sept. 30, 1983. A fee of $500.00 will be charged for each strain, payable at the time of deposit. A $20.00 fee will be charged for the distribution of all released patent cultures that have been deposited after Sept. 30, 1983. There will be no charge for distribution of patent cultures already on deposit or for others received before this date. Checks, in U.S. dollars, should be made payable to the Agricultural Research Service, USDA. USDA laboratories and designated cooperators will be exempt from fee assessment. The types of microorganisms accepted by the ARS Culture Collection are the same as announced in the past and include industrially important bacteria, yeasts, molds, and *Actinomycetales*. Viruses and highly pathogenic or especially fastidious microorganisms are not accepted. Further information on types of microorganisms accepted and conditions for deposit may be obtained by contacting A. J. Lyons, Curator, ARS Patent Culture Collection, Northern Regional Research Center, USDA-ARS-NCR, 1815 N. University St., Peoria, Ill. 61604 (Tel. 309/685-4011).

[1033 OG 26]

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(28) **Notice to Subscribers**

The Patent and Trademark Office announces a change in the point of contact for subscribers who have not been receiving all of their copies of the Official Gazette, Manual of Patent Examining Procedures Revisions, Annual Indices, or other patent and trademark publications. All correspondence and inquiries concerning subscription services including requests for reinstatement or renewal of subscriptions should be directed to:

Mr. Michael F. DiMario
Assistant Public Printer
Superintendent of Documents (SD)
U.S. Government Printing Office
Washington, D.C. 20401

Furthermore, the Superintendent of Documents advises that expiration notices are sent out approximately three months before the expiration date. However, subscribers should not rely on this schedule. If a notice is not received within two months of the expiration date, the subscriber should renew the subscription with the Superintendent of Documents. Attach a label from the envelope in which the publication is received, together with a check covering the amount of the subscription. If a deposit account with the Superintendent of Documents is to be used, include the deposit account number with the renewal.

This notice is effective with the publication date and supersedes the notice published on this subject in 969 O.G. 2, dated Mar. 14, 1978.

Aug. 3, 1984. THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

[1045 O.G. 28]

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(29) **Subscription Pricing Information**

The subscription prices on the following publications have been changed as indicated below:

Title: Official Gazette, Patent Section

First-class domestic mailing	$375.00
Fourth-class domestic mailing	270.00
Fourth-class foreign mailing	337.50
Single copies each, domestic	13.00
Single copies each, foreign	16.25

Back copies will not be furnished.

This change is effective with Government Periodicals and Subscription Services Price List 36, dated Summer, 1984.

Foreign first-class mailing rates will be furnished upon request. Direct all inquiries and subscription requests to:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Checks for subscription orders should be made payable to the Superintendent of Documents. If a Deposit Account with the Superintendent of Documents is to be used, please include the Deposit Account Number with the order.

Sept. 11, 1984. THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

[1047 O.G. 11]

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(30) **Subscription Pricing Information**

The annual subscription prices on the following publication have been changed as indicated below:

Title: Patent and Trademark Office Notices

First-class domestic mailing	$ 71.00
First-class foreign mailing	not available
Third-class domestic mailing	57.00
Third-class foreign mailing	71.25

This change is effective with Government Periodicals and Subscription Services Price List 36, dated Summer 1984.

Direct all inquiries and subscription requests to:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Checks for subscription orders should be made payable to the Superintendent of Documents. If a Deposit Account with the Superintendent of Documents is to be used, please include the Deposit Account Number with the order.

May 7, 1984. THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

[1042 O.G. 58]

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(31) **Rules Service Company Address Change**

The Patent and Trademark Office has been notified of a change in the address and telephone number of the Rules Service Company which publishes a looseleaf Rules of Practice in Patent and Trademark Cases with a revision service. The new address and telephone numbers are:

Rules Service Company
4341 Montgomery Avenue
Bethesda, Maryland 20014
(301) 656-4660

Apr. 7, 1980. SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

[994 O.G. 10]

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(32) **Patent and Trademark Office Services**

The Patent and Trademark Office is making every effort to utilize its resources as effectively and efficiently as possible. However, delays in some services are being experienced. To improve services, the PTO is taking the following steps:

Beginning with the issue of January 1, 1980, the original formal drawing which is supplied by the patent applicant and is 8 1/2 by 14 inches (21.0 by 29.7 cm.) is being stored within the patented file in the Patent Search Division. This is a change from the earlier practice under which the drawing is stored in a separate location from the patent file wrappers. The new procedure will simplify obtaining the complete patented file. This procedure will be used for a three month trial period and then reevaluated for its effectiveness.

Effective December 3, 1979, sale of tokens and maintenance of all token operated photocopy and microfilm reader-printer equipment throughout the Patent and Trademark Office are being performed by a private contractor, T S Info Systems, Inc. (TSI). Improved quality and timeliness of copy service to the public are anticipated.

All token sales are made between the hours of 8:30 A.M. and 5:00 P.M. at the token sales booth in the Record Room located in Building CP-4. When purchasing tokens by check, please make the check payable to "TSI" rather than "Commissioner of Patents and Trademarks." Tokens will not be sold at the cashier's window in CP2.

Effective February 1, 1980, charges for tokens to PTO customer deposit accounts will no longer be accepted.

Effective immediately, no requests for new patent or trademark drawings will be accepted by the Patent and Trademark Office. New drawings will be prepared only for requests already received. All currently available drafting time and facilities are required to correct the backlog of drawings needing correction prior to issue. When this backlog has been eliminated, a notice will be issued to that effect and new drawings can again be prepared for the public.

Effective immediately, three additional special mail room boxes will be established in the PTO:

Box 4 will be used for all mail for the Office of Legislation and International Affairs.

Box 5 will be used for documents which are related to trademarks and for which *no fee* is required at the time of filing; e.g., amendments to applications and requests for extensions of time to file an opposition. For mail directed to the Trademark Trial and Appeal Board, put "Attention TTAB" on the envelope in addition to "Box 5."

Box 7 will be used for reissue applications which are involved in litigation and any subsequently filed papers for these applications.

Mail appropriately addressed will be sorted and forwarded on a more timely basis.

Applicants and other users of the PTO services can assist in improving the efficiency of office by doing the following:

Use the following special PTO box numbers for forwarding particular types of mail. The boxes should be used only for the specified purpose.

Box 2—Replenishment of funds in deposit accounts.

Box 4—Mail for the Office of Legislation and International Affairs.

Box 5—"No fee" mail related to trademarks.

Box 7—Reissue applications for patents involved in litigation and any subsequently filed papers for these applications.

Box 8—All papers for the Office of the Solicitor.

Box 9—Coupon orders for U.S. patent and trademark copies.

Box 10—Orders for certified copies of patent and trademark applications.

Box PCT—Mail related to applications filed under the Patent Cooperation Treaty.

Only that material for which the special box was established should be enclosed.

The special box numbers have been established to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Therefore, if any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they were intended.

Envelopes should be addressed:

Box _____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Consider the fact that some PTO services are experiencing delays, and allow sufficient lead time for services requested of the Office. Where possible, urgent items which require no fee should be hand delivered to the appropriate area.

Minimize the number of inquiries to the PTO regarding acknowledgment of receipt of applications, fee papers, orders for patent copies, etc.

Include a self addressed return post card with newly filed applications. The serial number assigned the application will be stamped on the post card, which will constitute the means by which the application can be identified.

Use commercial services for preparation of new patent and trademark application drawings.

On all papers which are filed in patent and trademark applications and are being sent to an examining group, include the appropriate identifying data, such as

examining group number, examiner's name, and the number of the application paper to which the response is directed. The paper should also identify the type of document being presented (e.g., response to Office action #___, amendment, etc.). The name and telephone number of the individual representing the applicant also should appear on all papers.

These steps have been devised in an effort to minimize delays in services. We solicit the help and cooperation of the public.

SIDNEY A. DIAMOND,
Jan. 4, 1980. *Commissioner of Patents and Trademarks.*

[990 O.G. 184]

(33) **Service of Court Papers on the Commissioner of Patents and Trademarks**

Those having occasion to serve papers associated with court proceedings by mail are reminded that a special mailing address has been established to provide prompt forwarding to the Office of the Solicitor. The use of this address will ensure that the papers will not be delayed in dispatch. In court proceedings in which the Commissioner is a party, the notices of appeal to the U.S. Court of Appeals for the Federal Circuit and all service copies of papers filed in courts should be addressed:

Solicitor
Box 8
U.S. Patent and Trademark Office
Washington, D.C. 20231

Service copies of briefs and papers hand-carried to the Mail Room of the Patent and Trademark Office should likewise be addressed as shown above.

Joseph Nakamura,
Sept. 10, 1982. *Solicitor.*

[1023 O.G. 3]

(34) **Sale of Copies of Reexamination Requests**

Copies of reexamination requests, all cited references, and the file wrapper and contents of the patent file for which reexamination is requested are available at a charge of $0.30 per page. Orders for such copies must indicate the control number assigned the reexamination request. Orders should be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Customer Services Division.

GERALD J. MOSSINGHOFF,
July 31, 1981. *Commissioner of Patents and Trademarks.*

[1010 O.G. 4]

(35) **Electronic Patent Data Dissemination Guidelines**

Introduction

The U.S. Patent and Trademark Office (PTO) has undertaken a program to fully automate its operations. As a result of the automation, new forms of patent data will be created and new techniques will become available to facilitate the end use of one of the largest technical information resources of the nation, the files of U.S. and foreign patents. To fulfill its mission to disseminate such information and to aid in the management of the electronic information resources, the PTO has formulated the following general principles and guidelines regarding electronic, digital patent data dissemination and distribution.

To the extent that formal regulations will be necessary to carry out these guidelines, separate formal rulemaking procedures will be undertaken. The purpose of this notice is to inform the public as early as possible of the PTO's present policies in automating its patent operations.

The public is urged to consider and submit comments on these guidelines. Please address comments to:

J. Howard Bryant
Administrator for Automation
U.S. Patent and Trademark Office
Washington, D.C. 20231

Background

In response to P.L. 96–517, the PTO prepared and submitted to Congress on Dec. 13, 1982, its plan for the complete automation of its operations by 1990. The mandate to develop the plan stemmed from the recognition that problems of increasing magnitude threaten the effectiveness of the U.S. patent system. These problems relate to the increasing difficulty of maintaining the integrity of the all-paper hand-file and retrieval search files on which patent examination depends. Surveys indicate that at any one time, about seven percent of the search files are missing or misfiled. The process of matching the 20,000 documents of correspondence and other items that arrive in the PTO daily to the 240,000 pending patent applications is prone to a high rate of error. The already enormous data base in the patent examining search files alone — more than 25,000,000 documents— is projected to double by the end of the century. The solution to these problems is the application of computer technology to the functions of the PTO. The automation plan was developed around the concept of an essentially paperless office, using computer processable, electronic data bases to replace the existing paper files. Data will be converted to computer processable form from applications and patent search files using a variety of technical methods — optical character recognition, digital facsimile scanning, and word processing. Once the electronic data base is created, patent examiners and other PTO personnel will use it to perform searches, conduct examinations, and prepare office actions. A specially configured electronic workstation will be used to support these functions. The electronic data base also will provide the data to print the *Official Gazette* and to make copies of patents for sale to the public.

Automation is being accomplished in three stages, beginning with the installation of a proof-of-concept system to prove and refine the application of the technology to the patent process. Once proven, the test installation will be expanded in the second stage to support all of the internal functions of the PTO. In the third stage, public access to patent information will be expanded, and electronic interconnections between cooperating foreign patent offices will be established.

Considerable progress has been made in implementing the automation plan. A $300 million contract has been awarded to the Planning Research Corp., teamed with the Chemical Abstracts Service (a not-for-profit arm of the American Chemical Society) to provide computer software and equipment, together with supporting services, for an Automated Patent System (APS). Installation of the Automated Patent System for Stage 1 will begin late in 1984 and its evaluation will be completed in the summer of 1985. Part of the electronic data base — the text of patents from 1970 to the present — is available as a by-product of patent printing. Two pending procurement actions will provide for the conversion into computer processable form of the remainder of the backfile of U.S. patents and all future applications. Agreements have been reached with the European and Japanese Patent Offices to exchange electronic patent data bases. In brief, the most significant initial steps leading to the automation of the PTO have been carried out as planned.

As a result of the automation program, the PTO plans to create or obtain and maintain the following electronic data bases in its Automated Patent System(APS):

1. All U.S. patents, patent application files, and releated patent data such as bibliographic, classification, status, and ownership information;
2. A comprehensive collection of foreign patent documents and related patent data such as bibliographic and classification information, captured by the PTO or obtained through exchanges with other patent offices, intergovernmental organizations, or other entities.
3. A collection of selected non-patent technical literature.

These data bases will be accessed using electronic workstations with dual, high-resolution displays, and software that provides the capability to use index and full text search techniques. These search techniques include the ability to search according to the current U.S. Patent Classification System, and an international patent classification system. The patent examiners will also be provided with access to selected commercial search data bases using their electronic workstations.

The PTO considered several approaches to the dissemination of patent data, and adopted the following general principles and guidelines.

I. Dissemination Goals and Objectives

It is the goal of the PTO to achieve effective, widespread dissemination of patent information to all segments of the U.S. public.

A. This will be accomplished directly by providing electronic data base search and retrieval services in public search facilities located in the PTO and other locations which may be established by the Government. To the extent technically feasible and economically viable, services also will be provided in cooperation with Patent Depository Libraries (PDLs), under provisions of 35 U.S.C. 13. PDLs are Federal, state and local government or non-commercial university libraries designated by the PTO to offer public, nonprofit access to patent collections.
B. The PTO will pursue its dissemination goal indirectly by encouraging the private sector to offer commercial patent search and retrieval services outside the public search facilities and PDLs. The PTO will seek to avoid competition with private sector firms in providing such services to the public.

II. Direct Dissemination to the Public

A. The PTO will seek to provide the following in the public search facilities:
   1. Electronic access to all the capabilities of the Automated Patent System (APS) that will be available to patent examiners, excluding pending and abandoned applications not accessible under 35 U.S.C. 122, at user fee rates based on the marginal cost of providing the access; and
   2. Access at commercial rates, to commercial data bases that are available to the patent examiners.
B. To the extent that it is technically feasible and economically viable, the PTO will seek to provide in the PDLs access to the capabilities of the Automated Patent System, excluding pending and abandoned applications not accessible under 35 U.S.C. 122, at user fee rates based on the marginal cost of providing those services.

III. Distribution to Commercial Data Base Vendors

The PTO will pursue its dissemination goals indirectly by making its electronic patent data available to commercial data base vendors that provide commercial search and retrieval services to the public. The PTO will provide its data to such commercial data base vendors under the following conditions:

A. All U.S. patent data created by the PTO will be made available in bulk form, that is on magnetic tape or another suitable medium.
B. In general, the PTO will not distribute the data received from another patent office but will seek to have contractual arrangements established directly between the other patent office and the commercial data base vendor. The PTO will not act as a service agent or representative of another office unless there is a special need that cannot be met otherwise.
C. Fees charged to commercial data base vendors for bulk U.S. patent data will be based on the marginal cost of providing such distribution services plus a fair market value charge for the data, as set by the PTO.
D. Normally, arrangements with commercial data base vendors will be non-exclusive. Bulk resale of PTO data by commercial data base vendors will be prohibited by the terms of the bulk sale agreement.

IV. Exchange of International Data

International electronic patent data exchanges between the PTO and other patent offices will be made when deemed to be advantageous. Dissemination of data obtained through data exchanges will be based on the following guideline: all data obtained by exchanges from other patent offices will be obtained under agreements that will permit the data to be incorporated into the Automated Patent System (APS). If the data cannot be incorporated into the Automated Patent System (APS), it will be governed by these guidelines as they apply to commercial data bases.

GERALD J. MOSSINGHOFF,
June 8, 1984. *Commissioner of Patents and Trademarks.*

[1044 O.G. 11]

(36) **Computer Aided Search for Class 364 Subclasses 200 and 900**

In 1975 the Patent and Trademark Office installed an experimental computer search system for searching the computer and digital data processing system arts classified in Class 364/200 and 900. This system, known as Computer - Controlled Microform Search System (CCMSS), functioned until 1983 when it could no longer be kept operational.

A new computer aided search system, Computer Aided Search and Patent Image Retrieval (CASPIR), has been installed and is available to the public. The new system possesses features similar to the previous system in that each subclass is searchable using a topic index list of approximately 400 terms, which may be combined with Boolean logic into a search question. The user is able to view from 5 to 12 pages of documents meeting the search strategy under computer control of a microfilm viewer.

CASPIR has all of the original data base of the CCMSS (which covered patents dated 1950–1981). In addition, its data base, coded and filmed, has been updated through Sept., 1984.

It is anticipated that CASPIR will be updated according to the following schedule. Once a month the codes assigned to new documents will be entered into the data base by Patent and Trademark Office personnel. Documents thus entered will not be available on the microfilm viewer but will show up on the data terminal in response to search questions. Users would need to consult search room paper files to see the documents. To assure efficient filming and maximum use of the film strips, the filming of coded documents will take place on a quarterly basis — Jan., Apr., July and Oct. Following this procedure, the coded data base should not be more than one to two months behind current patent issue dates and the filmed copies of coded documents should not be more than three to four months behind current patent issue dates.

Terminals are currently available for public use in Crystal Plz. 2, Room 5C–22. Reservations for terminal use may be made by calling 703–557–3651 during normal business hours. Patent and Trademark Office personnel are available to assist the user in terminal operation. Effective Mar. 11, 1985 these public terminals will

be moved to the Public Search Room in Crystal Plz. CP3–1A–3. Reservations for use may then be made by contacting Mr. Bernard Thomas at 703–557–2276.

EARL LEVY,
Feb. 5, 1985. *Director, Group 230*
Patent and Trademark Office.

[1052 OG 56]

(37) **Availability of Concordance — Fifth Edition**

The Patent and Trademark Office announces the availability of the "Concordance Fifth Edition-1985 United States Patent Classification to International Patent Classification" which relates the U.S. Patent Classification, as revised through Feb. 29, 1984, (Classification Order No. 929) to the Fourth Edition of the International Patent Classification, 1984, as published for the World Intellectual Property Organizations by Carl Heymanns Verlag K. G., Munich.

Copies of the Concordance are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, Stock Number 003-004-00611-1. The price for this publication is $6.50 for U.S. and $8.15 for foreign mailing.

WILLIAM S. LAWSON,
July 3, 1985. *Administrator for*
Documentation.

[1057 OG 20]

(38) **Availability of Copies of the Magnetic Tape of the Fourth Edition of the International Patent Classification (IPC)**

The Assembly of the IPC Union has decided to make available copies of the magnetic tapes of the IPC through the International Bureau of the World Intellectual Property Organization.

The IPC Assembly made the following decisions:

"The International Bureau should put at the disposal of the Industrial Property Offices of any country member of the IPC Union which so wishes the magnetic tape. . .of the IPC *at cost*, provided that any such Office receiving a tape accepts the three conditions set forth. . .below:

(i) the tape is used by those Offices. . .for the purposes of carrying out their functions,

(ii) no reproduction of the tape or its contents, in whole or in part, is made in the form of paper copies or microfiches, except in the case of online printouts, and

(iii) the tapes or copies thereof, in whole or in part, are not made available to any third party."

The Committee of Experts of the IPC Union decided that the tape (in English *or* French language) would be made available to Industrial Property Offices of countries being members of the IPC Union at the price of 1,000 Swiss francs.

In order to carry out its function of disseminating patent information contained on IPC tapes, the U.S. Patent and Trademark Office may need the assistance of qualified U.S. public organizations or private companies. Accordingly, the Office will consider requests from such organizations or companies interested in disseminating such information.

The Committee also decided that, subject to the conditions enumerated in (ii) and (iii) above, the tapes would be made available for the following prices to any public organization or private company authorized by its government:

- for internal use only, at the price of 5,000 Swiss francs; and
- for exploitation of the tape on a commercial basis, at the price of 30,000 Swiss francs.

The Patent and Trademark Office will authorize United States public organizations and private companies to purchase the tape under these conditions and at the agreed upon prices quoted.

For further information contact:

Office of International Patent Classification
Crystal Square, Bldg. 4, Room 108
U.S. Patent and Trademark Office
Washington, D.C. 20231
Tel: (703) 557-3756

WILLIAM S. LAWSON,
Feb. 1, 1985. *Administrator for*
Documentation.

[1052 OG 56]

(39) **Simultaneous Issue of Patents**

Applicants and their attorneys who desire the simultaneous issue of allowed applications must submit the request to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of Publications
CP-2, Room 5C26

The request must contain the following information about *each* allowed application for which simultaneous issue is requested:

(1) serial number
(2) filing date
(3) name(s) of inventor(s)
(4) title of invention
(5) date of allowance

Separate copies of the request must accompany *each* Issue Fee Transmittal (PTO-85b).

Questions concerning this practice may be directed to Mr. Stanley J. Banis, Director, Office of Publications, Area Code (703) 557-3794.

RICHARD J. SHAKMAN,
Aug. 25, 1978. *Assistant Commissioner*
for Administration.

[974 O.G. 16]

RECORDS AND FILES

(40) **Assignee Names**

Effective April 1, 1976, only the first appearing name of an assignee will be printed on the patent where multiple names for the *same* party are identified on the Base Issue Fee Transmittal form, POL-85b. Such multiple names may occur when both a legal name and an "also known as" or "doing business as" name is also included. This printing practice will not, however, affect the existing practice of recording assignments with the Office in the Assignment Division. The assignee entry on form POL-85b should still be completed to indicate the assignment data as recorded in the Office. For example, the assignment filed in the Office and therefore the POL-85b assignee entry might read "Smith Company doing business as (d.b.a.) Jones Company." The assignee entry on the printed patent will read "Smith Company."

For purposes of compiling and publishing the 1976 Annual Index of Patentees, this change will be retroactive to patents issuing on January 6, 1976.

RICHARD J. SHAKMAN,
Dec. 17, 1975. *Assistant Commissioner*
for Administration.

[942 O.G. 186]

(41) **Submission of Uniform Assignee Names on the Issue Fee Payment Form PTOL-85b**

The Patent and Trademark Office is experiencing problems when computer-sorting assignee names for the Patentee Index because of the non-uniform use of the names of certain companies and corporations on the issue fee payment form PTOL-85b. The use of different spellings or nomenclature for the same company requires the Office to expend time and effort to determine whether the various name forms are in fact for the same company. If such inconsistencies are not corrected, patents to the same company will appear in different locations in the Patentee Index. An example of inconsistent use is "ABC Company, Ltd." and "ABC Co., Limited."

Therefore, persons who list assignee names on issue fee payment form PTOL-85b should ensure that the same company name form is used for all patents issuing to a particular company.

RICHARD J. SHAKMAN,
Nov. 17, 1977. *Assistant Commissioner*
for Administration.

[965 O.G. 8]

(42) **Assignments Affecting Applications of Joint Inventors**

Over the past several years, the Assignment Branch of the Patent and Trademark Office has been charging a single fee for recording the assignment of a patent or patent application of joint inventors when separate assignment documents are executed by the joint inventors and then filed together for recording.

This practice is in error because it conflicts with 37 CFR 1.21 Miscellaneous Fees and Charges (h) Recording of Documents which states:

(1) For recording each assignment, agreement or other paper relating to the property in a patent or applications . . . . . $20.00.

Effective Nov. 1, 1984, the Assignment Branch will charge in accordance with the above regulation, the fee of $20.00 for each assignment document of the joint inventors which relates to the patent or patent applications.

THERESA A. BRELSFORD,
Oct. 1, 1984. *Assistant Commissioner*
for Administration.

[1047 O.G. 49]

(43) **Title of Invention Carried on Office Records**

The Patent and Trademark Office is experiencing an increased incidence in the number of newly filed applications in which the title of the invention is inconsistent within the papers. This has resulted in applicants requesting correction of the official filing receipt in many instances to indicate the title preferred by applicants.

Hereafter, whenever the title of the invention appears inconsistent within the papers of a newly filed application for patent, the records of the Office will carry the title as indicated on the first page of the specification and no corrected filing receipt will be issued to indicate another title. Note that 37 CFR 1.72(a) indicates that the title of the invention should appear as a heading on the first page of the specification.

It should also be noted that applicant may amend the title under 37 CFR 1.115 if any changes are subsequently desired before issuance of a patent.

BRADFORD R. HUTHER,
Aug. 31, 1977. *Acting Assistant Commissioner*
for Administration.

[962 O.G. 23]

(44) **Notice to Patent Owners and Parties Responsible for Paying Maintenance Fees Concerning Fee Address and Payor Number**

37 CFR 1.363, effective Nov. 1, 1984, provides for a "fee address" to be entered in the Office patent file records for use in all correspondence relating to maintenance fees. The "fee address" is in addition to the "correspondence address" under 37 CFR 1.33 which will continue to be used for all reexamination and interference purposes. If no separate "fee address" is specified, the "correspondence address" will also be used for maintenance fee correspondence.

In order to simplify changes in address by patent owners having several patents, and data input by the Patent and Trademark Office, a "payor number" will be assigned to each "fee address" when a "fee address" is presented to the Office in a patent or earlier upon request. A request for a "payor number" before a maintenance fee is paid or due will permit a patent owner to request that the "fee address" or "payor number" be recorded in the Office records of the patents owned on which maintenance fees are due so that all notices relating to maintenance fees will be sent to the "fee address".

The Patent and Trademark Office has established a procedure for assigning a "payor number" upon request by a patent owner or a party responsible for paying maintenance fees. Such a party may be, for example, the finance office of a corporation or of a separate organization specializing in maintenance fee payments. Under the procedure, a patent owner or other party may request a "payor number" for a particular "fee address" by writing to: Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231. Each request for a "payor number" should include:

— the "fee address" to be used by the Office, and
— the telephone number of the fee addressee to be used to resolve problems.

After receipt of a "payor number", it may be used to indicate to the Patent and Trademark Office the "fee address" to be used in particular patents on which maintenance fees will become due and in applications in which issue fees have been or are being paid. Any request for entry of a "payor number" or "fee address" in the Office records of a patent, however, must be signed by the patent owner or his or her attorney or agent of record.

After a "payor number" has been assigned, it should be used in all future maintenance fee payments and related correspondence. However, where a "payor number" has not been previously entered in the Office records for a patent, the mere indication of a "payor number" at the time of payment of the maintenance fee, without the signature of the patent owner or the owner's attorney or agent of record, will not serve to make the "payor number" of record in the Office for that patent.

THERESA A. BRELSFORD,
Oct. 19, 1984. *Assistant Commissioner*
for Administration.

[1048 O.G. 48]

(45) **New System To Monitor Patent Applications**

During this summer the Patent and Trademark Office will begin implementation of a new office-wide computer system, the Patent Application Locator and Monitor System (PALM 3), for monitoring the location and status of pending patent applications. The system will also have the ability to print data on certain form letters such as the Notice of Allowance, using computer-controlled printers located in the Examining Groups. This will permit the Notice of Allowance to be printed and mailed by the Groups shortly after the Examiner has decided that an application is in condition for allowance. Under the new system, the Notice of Allowance will be mailed

Amendment is required, it will normally be mailed as an attachment to the Notice of Allowance.

When existing printing backlogs have been eliminated, this accelerated mailing should reduce the time between allowance by the examiner and issuance of the patent grant in most cases. The nature and/or extent of the revisions or processing requirements subsequent to mailing of the Notice of Allowance may result in little or no reduction in the time required for the printing of a few patents. In addition, it is possible that, as a result of this additional processing, withdrawal or correction of the Notice for a given application may be required. For instance, prosecution might be reopened as a result of the Quality Review Program. In situations where the Base Issue Fee has been paid and the Notice of Allowance is subsequently withdrawn, the applicant may request that a refund be made or that the fee be credited to a Deposit Account.

Applicants will continue to receive a three part Notice of Allowance packet, but, as a result of automated printing, the Notice will be produced in a slightly revised format. This new format will have the following application data printed thereon:

—Serial Number
—Filing Date
—Total Claims Allowed
—Date of Mailing
—Examiner Name and Group Art Unit
—First Named Applicant
—Title of the Invention
—Base Issue Fee Due (Utility Applications Only)
—Attorney's Docket Number
—Class and Subclass Where Issued

Copy (a) of the new Notice of Allowance will be used as applicant's record copy in the current manner. Copy (b) will continue to be used as a transmittal for the fee with copy (c) required when a charge to a deposit account is authorized. The new version of copy (c) will also have a section to notify the Office of a change in an inventor's address. Note that this address change need not be signed by the inventor. This procedure eliminates the need for the separate Inventor's Address Change form (PTOL-231) now in use.

One other change to current practice will also be implemented as a result of the new system. Beginning with patents issuing in the late fall of this year, advance orders for patent copies will only be sent to the correspondence address of record in the application. This practice will permit computer generation of mailing labels for the orders and thereby eliminate the need for the separate, pink Advance Order form (PTO-721) now in use. Requests for advance orders will now be made in a special section of copy (b) of the Notice of Allowance. During the transition from the old order method to the new, it will be necessary to send some advance orders to the correspondence address of record in the application rather than some other address as has been requested on an earlier submitted Advance Order Form.

While the major impacts on the public will be limited to those discussed above, one other minor matter should be mentioned. It is anticipated that, due to the absence of data in the master data base, some information occasionally may not be printed on the Notice of Allowance or on other form correspondence. However, this does not necessarily mean that a corrected Notice or form letter is required. Furthermore, since the data base is not used for printing of the patent grant, the missing information should appear on the final issued patent if it is in the application file wrapper. This problem is expected to diminish as the implementation of the system proceeds and the data base becomes more complete. The cooperation of applicants and their representatives during this system implementation is sincerely appreciated by the Patent and Trademark Office.

SIDNEY A. DIAMOND,
June 16, 1980. *Commissioner of Patents and Trademarks.*

[997 O.G. 9]

(46) Policy Regarding Storage, Retention and Availability of the Foreign Patent Documents in the Numeric Collection of the Patent & Trademark Office*

The U.S. Patent and Trademark Office (PTO) maintains the largest collection of foreign patent documents in the United States. This collection is a major technical information resource that supports the patent examination function as well as the PTO's mission of disseminating technical information. The collection is divided into two parts—the classified collection which is distributed among the examiners' search files, and the numeric collection which is maintained by the PTO's Scientific Library. A large portion of the numeric collection is in paper form, but it also includes considerable microfilm with some overlap between the two forms. Some of the documents are republished versions of earlier publications (e.g., unexamined and examined applications). One of the PTO's objectives has been to reduce the bulky paper foreign patent files in the numeric collection by replacing them, where possible, with good quality microfilm and by eliminating duplicates. A number of other considerations bear on the management of this collection. Because of the importance of the collection, the PTO has established a policy intended to ensure the effective storage, retention, and availability of the foreign patent documents in its numeric collection. The purpose of this notice is to inform the public of this policy which is set forth below.

The public is invited to consider and submit comments on the policy. Please address comments to:

William S. Lawson
Administrator for Documentation
U.S. Patent and Trademark Office
Washington, D.C. 20231

General Policy

The U.S. Patent and Trademark Office (1) is the National repository for all foreign patent documents, except design patents; (2) will maintain, in numerically retrievable collections, as many as possible of these documents for which there is or may be a reasonable level of need, and (3) will make these documents conveniently accessible to the PTO and to the public.

Implementation

1. The Scientific Library is responsible for policy implementation.

2. At least all post-1920 foreign patent documents needed to meet "Minimum Documentation" requirements of the Patent Cooperation Treaty will be housed in the Scientific Library in either paper or microfilm form.

3. All paper copies of foreign patent documents not needed to meet "Minimum Documentation" requirements will be housed either in the Scientific Library or other storage space in accordance with usage activity. The documents with greater activity will be housed in the Scientific Library until space therein is exhausted and the remaining documents will be housed in the other storage space.

4. All foreign journals (official gazettes) will be housed in the Scientific Library.

5. All paper copies of foreign patent documents needed for copy request fulfillment will be stored in a form accessible for prompt retrieval.

6. Whenever feasible, paper copies of foreign patent documents will be replaced by good quality microfilm.

7. 16mm roll microfilm will be the microform preferred for PTO use and archival storage. If 16mm microfilm is not available or is unacceptable, the Library may decide, on a case-by-case basis, whether a different microform should be obtained.

8. All microfilm of foreign patent documents intended for use by the PTO and the public will be housed in the Scientific Library. All archival microfilm will be housed in a facility that is suitable for the preservation and protection of the microfilm and for needed access.

9. Paper copies of foreign patent documents will be disposed of if good quality microfilm of the corresponding documents is available in the Library, good quality *archival* microfilm is available in the PTO, and the PTO has the legal rights to sell paper copies made from the microfilm and to reproduce the microfilm for internal use; paper copies for which there is little or no demand may be disposed of despite the availability of only marginal-quality microfilm. Paper copies for which good quality microfilm is available in the Library, but for which the other conditions noted above are not met, will be retained, although they need not be stored in a form accessible for prompt retrieval. However, such documents will be stored in accordance with a procedure designed to ensure preservation of the documents, adequate records of stored material and efficient utilization of space.

10. Where an application has been republished, a decision will be made on a "country-by-country" basis as to whether the duplicate version or versions of the initial document will be retained. The basis for this decision will be the current or anticipated utility of the duplicate documents to the PTO and the public.

11. Collections of paper copies that are not needed by the PTO will be disposed of promptly. Such collections will first be offered, for a limited time, to developing countries through the World Intellectual Property Organization. Collections which cannot be disposed of in this manner may then be disposed of, preferably by offering them for sale, as part of some exchange, or as gifts. However, if unneeded paper copy collections cannot be disposed of in a beneficial manner within a reasonable period of time, they will be discarded.

12. Requests for copies of foreign patent documents from within the PTO and from the public will be fulfilled promptly.

13. Fees to the public for copies of foreign patent documents will be set at a level commensurate with full cost recovery and with the provision of prompt, efficient copy service.

14. As the complete text of foreign patent documents is captured in electronic form and becomes retrievable, numerically and otherwise, to the PTO and to the public, in the automated patent system, paper copies will be disposed of and the retention of microfilm reconsidered.

15. It is recognized that this policy does not provide for all possible circumstances regarding the foreign patent document collection and there may be limited instances where some deviation from the policy is justified. In such cases, the deviation will be justified in writing by the Program Manager of the Scientific Library and approved by the Administrator for Documentation and the Assistant Commissioner for Patents.

WILLIAM S. LAWSON,
Nov. 26, 1984. *Administrator for Documentation.*

[1052 OG 3]

*The PTO also maintains a very large, technologically classified collection of foreign patent documents. This policy *does not* apply to the classified collection.

FEES AND PAYMENT OF MONEY

(47) DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Parts 1 and 2

Revision of Patent and Trademark Fees

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.

Summary: The Patent and Trademark Office is amending the rules of practice in patent and trademark cases to establish fee related procedures and fees in amounts which would comply with the requirements of either Public Law 96-517 or H.R. 6260, dependent upon which is effective on Oct. 1, 1982. This action is necessary at this time in view of the requirements to establish fees and procedures contained in Public Law 96-517 and the requirements which would also be present under H.R. 6260 enacted as a Public Law. This final rule is being issued in two sections with the first section relating to patent fees and the second section relating to trademark fees. This final rule is also being issued in alternative form so that the proper fees and procedures will become effective on Oct. 1, 1982, under either Public Law 96-517 or the Public Law which results from enactment of H.R. 6260. Thus, if Public Law 96-517 remains fully effective on Oct. 1, 1982, the rule changes contained herein which are common to Public Law 96-517 and H.R. 6260, as well as those specific to Public Law 96-517, contained in Alternative A of each section, will become effective. Upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, the rule changes contained herein which are common to Public Law 96-517 and H.R. 6260, as well as those specific to H.R. 6260, contained in Alternative B of each section, will become effective. Thus, the intended effect of this action is to adopt rules which will be effective on Oct. 1, 1982, establishing patent and trademark fees and procedures regardless of whether Public Law 96-517 remains fully effective or whether H.R. 6260 has been enacted.

Effective Date: Oct. 1, 1982. However, prior to Oct. 1, 1982, the Department of Commerce will publish a document confirming the amendments under either Alternative A or Alternative B set forth herein depending upon enactment of H.R. 6260 as a Public Law.

For Further Information Contact: As to the patent rules contact R. Franklin Burnett by telephone at (703) 557-3054 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: R. Franklin Burnett, Rm. 3-11A13, Washington, D.C. 20231.

For Further Information Contact: As to the trademark rules contact Miss Maude Williams by telephone at (703) 557-2222 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: Miss Maude Williams, Rm. 3-11C17, Washington, D.C. 20231.

Supplementary Information:

SECTION I—REVISION OF PATENT FEES

Background

A notice of proposed rulemaking was published in the *Federal Register* on June 28, 1982, at 47 FR 28042-28063 and in the *Official Gazette* on June 29, 1982, at 1019 O.G. 57-120. An oral hearing was held on July 9, 1982. Fourteen written letters and statements were submitted. Five persons testified at the oral hearing. Full consideration has been given to all of the letters, statements, and testimony.

Objectives of Rule Changes

These rule changes are designed primarily to implement the Patent and Trademark Office fees which are provided for by Public Law 96-517, or which would be set in, or provided for by, the Public Law resulting from H.R. 6260.

Public Law 96-517

Public Law 96-517 presently requires that fees be established by the Commissioner for the processing of patent applications from filing through issuance or abandonment, for maintaining a patent in force, and for providing all other services and materials related to patents. Public Law 96-517 requires that by Oct. 1, 1982, fees for the processing of patent applications, other than design patents, be set by the Commissioner to recover in aggregate 25 per centum of the estimated average cost

to the Office of such processing. Similarly, fees for processing design patents are to be set to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. By Oct. 1, 1982, fees for all other services or materials related to patents are to be set to recover the estimated average cost to the Office of performing the service or furnishing the material.

Public Law 96-517 also requires that fees be set for maintaining all patents filed on or after Dec. 12, 1980, other than design patents, in force. It also requires that maintenance fees must recover 25 per centum of the estimated cost to the Office of processing patent applications, other than design patent applications, by the fifteenth fiscal year following Dec. 12, 1980. Under Public Law 96-517, the maintenance fees are due 3½, 7½, and 11½ years after grant of the patent.

Public Law 96-517 is presently effective and this rule change is designed to implement the fee provisions of that law if it remains fully effective on Oct. 1, 1982. The changes which will become effective on Oct. 1, 1982, under Public Law 96-517 (without enactment of H.R. 6260) are (1) the rule changes common to Public Law 96-517 and H.R. 6260, and (2) the rule changes under only Public Law 96-517, which appear in Alternative A.

H.R. 6260

On June 8, 1982, the House of Representatives passed H.R. 6260. H.R. 6260 would establish a number of statutory fees which the Commissioner is required to charge. Among the more significant of these are fees for filing a patent application, issuing, and maintaining a patent in force. The fees for filing a patent application and issuing a patent would be set forth in §41(a) of Title 35, United States Code, as proposed to be amended by H.R. 6260. Certain other fees, such as appeal fees, the fee for filing a disclaimer, and fees for filing petitions seeking to revive an abandoned application and for extensions of time, would also be set in §41(a) of Title 35, United States Code. Section 41(b) of Title 35, United States Code, as proposed to be amended by H.R. 6260, would set forth the fees for maintaining a patent in force. These fees would be due 3½, 7½, and 11½ years after grant of the patent or within a grace period of six months thereafter. Section 41(c) of Title 35, United States Code, as proposed to be amended by H.R. 6260, would provide for the acceptance of maintenance fees after the statutory grace period under certain conditions and with certain effects.

H.R. 6260 would also provide for the reduction by 50 per centum in the fees paid under §41(a) and (b) of Title 35, United States Code, by independent inventors, small business concerns, and nonprofit organizations, who meet the definitions established, and to be established therefor.

Section 41(d) of Title 35, Untied States Code, as proposed to be amended by H.R. 6260, would also provide that the Commissioner establish fees for all other processing, services, or materials related to patents which are not covered in §41(a)–(c) of Title 35, United States Code, to recover the estimated average cost to the Office of the processing, services, or materials.

The changes which will become effective on Oct. 1, 1982, *upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982*, are (1) the rule changes common to Public Law 96-517 and H.R. 6260, and (2) the rule changes under H.R. 6260, which appear in Alternative B. H.R. 6260 includes other provisions which would be the subject of other proposals for rulemaking.

DISCUSSION OF SIGNIFICANT CHANGES

This rulemaking places into the appropriate sections of Title 37, Code of Federal Regulations, the various fees which are due on filing, during the pendency of a patent application, or during the term of a patent. A number of significant changes are made in order to implement either Public Law 96-517 or H.R. 6260.

Under H.R. 6260, and Alternative B of this rule making, fees under §41(a) and (b) of Title 35, United States Code, would be reduced by 50 per centum for independent inventors, small business concerns, and nonprofit organizations. H.R. 6260 would give the Commissioner authority to establish regulations defining independent inventors and nonprofit organizations. H.R. 6260 defines small business concerns by reference to §3 of the Small Business Act and regulations established by the Small Business Administration. This rulemaking, in Alternative B, implements the fee system which would be established by H.R. 6260 and lists all applicable fees.

* * * * *

Another significant change relates to fees established under Public Law 96-517 and which would be established by H.R. 6260 for petitions for extensions of time to take actions required by the Commissioner in an application. H.R. 6260 would establish a fee of $50 for filing a petition for a first one-month extension of time, an additional fee of $100 for filing a petition for a second one-month extension of time which would expire two months after the end of the time period set for taking action, and an additional fee of $200 for filing a petition for a third one-month extension of time which would expire three months after the end of the time period set for taking action. A fourth one-month extension with an additional fee of $200 could be requested if additional time was available under the statute. Under H.R. 6260, the Commissioner would have authority to issue regulations providing when, within any maximum time period permitted by statute, petitions for extensions of time, and the required fee therefor, may be filed. The Commissioner would also not be precluded by H.R. 6260 from waiving the fee for filing a petition for an extension of time where the Office extends the period due to equity considerations or sufficient cause. This rulemaking implements the extension of time provisions of H.R. 6260 by permitting applicants in the majority of situations to file the petition for an extension of time and the fee at the time of and along with the filing of the response for which a non-statutory or shortened statutory time period has been set. This will reduce the amount of paperwork involved and should significantly reduce the expenses of applicants and the Office since resources now devoted to the separate processing of petitions for extensions of time will no longer be required to be expended thereon. The fees are set to provide a proper control on the number of extensions of time given. The same procedures relating to extensions of time which would be established under Alternative B and H.R. 6260 will also be established under Alternative A and Public Law 96-517. Thus, whether the rules are effective on Oct. 1, 1982, under Public Law 96-517 and Alternative A, or under H.R. 6260 and Alternative B, the same procedures for obtaining extensions of time will be in effect with the only differences being in the amount of the fees.

Another significant change relates to the implementation of the fee for revival of an unintentionally abandoned application which would be authorized under H.R. 6260. H.R. 6260 would establish two different fees for filing petitions with different standards to revive abandoned patent applications. The same two fees would be applicable to petitions to accept the delayed payment of the fee for issuing a patent. Under H.R. 6260, a fee of $50 is established in §1.17(1) for filing a petition for revival under §§133 or 151 of Title 35, United States Code, in accordance with standards presently in effect where the delay resulting in the abandonment, or the delay in payment of the issue fee, was unavoidable. Under H.R. 6260, a fee of $500 is established in §1.17(m) for filing each petition for revival, or for acceptance of the delayed payment of an issue fee, where the abandonment or the failure to pay the issue fee was unintentional. A mere statement that abandonment was unintentional plus the $500 fee is all that is required in this case for this purpose. Under H.R. 6260 and this rulemaking an applicant would have a choice of which

petition and fee to file seeking revival depending on the circumstances involved. The changes discussed in this paragraph cannot be made effective without enactment of H.R. 6260 as a Public Law.

The rulemaking also provides for fees for filing certain petitions which have, in some cases, heretofore, been decided without a charge. These fees are established under Public Law 96-517 and are provided for by the amendment of §41(d) of Title 35, United States Code, which would be introduced by H.R. 6260. Under §41 of Title 35, United States Code, as amended by Public Law 96-517 or as it would be amended by H.R. 6260, fees are authorized for the processing of various petitions desiring certain actions to be taken regarding patent applications, for the recording of assignments, for reexamination of patents, and for the processing of international applications under the Patent Cooperation Treaty. In general, fees are not being required for those petitions which are supervisory in nature. For example, where applicants are petitioning from an allegedly improper action of the examiner, it is felt that such petitions should be processed and decided without charge since they are not asking for any special privilege but are attempting to correct an allegedly incorrect Office holding. The changes discussed in this paragraph will be in effect on Oct. 1, 1982, whether the rules become effective under Public Law 96-517 and Alternative A, or under H.R. 6260 and Alternative B.

Many of the fees currently set forth in §1.21 are being increased to reflect the cost of currently performing that service.

DISCUSSION OF SPECIFIC SECTIONS CHANGED

The sections changed are grouped in this proposal under three different categories. Those changes which are common to Public Law 96-517 and H.R. 6260 appear first and are numbered 1–54. Those changes which relate only to Public Law 96-517 appear as Alternative A and are numbered 55–62. Those changes which are dependent upon enactment of H.R. 6260 appear as Alternative B and are numbered 63–71. The changes common to Public Law 96-517 and H.R. 6260 will become effective on Oct. 1, 1982, whether or not H.R. 6260 is enacted as a Public Law.

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Upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, Alternative B will become effective on Oct. 1, 1982, in which case Alternative A will not become effective.

Rule Changes Common To Public Law 96-517 and H.R. 6260

The following sections are changed, effective Oct. 1, 1982, under either Public Law 96-517 or H.R. 6260:

Section 1.11 is amended to change the reference for the reexamination request fee to §1.20(c).

Section 1.12 is amended to break the section into four paragraphs. Paragraph (a) maintains current practice but adds specific reference to §1.19(a)(5) which sets the cost of copies.

Paragraph (b) maintains current wording except for inserting "patent" after "abandoned" and changing "his" to "applicant's". Paragraph (c) includes new language relating to obtaining copies of assignment records not open to the public. Access can be obtained only with the applicant's permission or by petition with fee to the Commissioner for such access in particular situations. No change in the showing required by petition to obtain access is intended by this amendment. Paragraph (d) contains present language except for reference to the specific rule which sets forth the charge for time consumed in making assignment searches.

New paragraph (e) of §1.14, sets forth the two ways in which access can be obtained to patent applications which are not open to the public. The two ways are (1) by petitioning and paying the petition fee and approval of the Commissioner of such petition and (2) by obtaining written approval from the applicant.

New §1.19 provides fees for copies of various documents supplied by the Office. The fees have been grouped into 5 paragraphs. New paragraph (a) provides fees for uncertified copies. Subparagraphs (a)(1) and (2) indicate the prices of printed patent copies. Subparagraph (a)(3) provides a single fee for a copy of an application, as filed, for each 50 pages, or fraction thereof. This practice should make it much easier to determine the amount of the required fee. Subparagraph (a)(4) sets a single fee for a copy of each 100 pages, or fraction thereof, of a patent file wrapper. Subparagraph (a)(5) provides for a charge of 30 cents per page for copies of Office records other than those covered by subparagraphs (a)(1) through (4). Subparagraph (a)(6) provides a fee for a microfiche copy of a microfiche.

Paragraph (b) of §1.19 sets fees for certified copies of Office documents. Subparagraph (b)(1) sets a fee for certifying Office records. Subparagraph (b)(2) provides a single fee for searching assignment records, preparing an abstract of the title and certification thereof. Subparagraph (b)(3) provides a fee for comparing copies not prepared by the Office prior to certification in order to provide basis for certification. Paragraph 1.19(c) sets the fees for subscribing to all of the patents issued annually in particular subclasses. This charge is in addition to the normal copy charge under §1.19(a)(1) and (2). Paragraph 1.19(d) sets the fee for providing patent copies to libraries under 35 U.S.C. 13. Paragraph 1.19(e) provides fees for lists of United States patents in particular subclasses.

Section 1.21 is amended to contain those miscellaneous fees which do not relate to the topics covered in §§1.16–1.20. All of the fees in §1.21 are established under the authority given the Commissioner by 35 U.S.C. 41(d) as amended by Public Law 96-517 or as proposed in H.R. 6260. Paragraph 1.21(a) establishes fees for admission to the examination for registration to practice, registration, reinstatement and issuance of certificates of good standing of patent attorneys and agents. Subparagraph 1.21(b)(1) sets forth the fee for establishing and reinstating deposit accounts, while subparagraph 1.21(b)(2) sets forth the fee due when the balance at the end of each month is below $40. Paragraph 1.21(c) sets the fee for filing a disclosure document. Paragraph 1.21(d) sets the fee for renting a delivery box. Paragraph 1.21(e) sets the fee for an international-type search report. Although all national applications now receive what is known as an international-type search, if a report thereof is desired in addition to an Office action, the fee set in §1.21(e) is required. Paragraph 1.21(f) sets a fee for searching Office records for purposes not otherwise specified. Paragraph 1.21(g) sets the fee for tokens for copying machines. Paragraph 1.21(h) sets the fee for recording assignments, agreements, and other documents. Paragraph 1.21(i) sets forth the fee for publishing a notice of availability of a patent for licensing or sale in the *Official Gazette*. Paragraph 1.21(j) sets the fee for the Office providing a duplicate or replacement of a permanent Office user pass. Paragraph 1.21(k) indicates that the Commissioner may specify charges for items and services not otherwise specified at a level to recover the actual cost of providing such an item or service by the Office.

Section 1.24 is revised so that the denomination of coupons sold by the Office will be in more convenient amounts.

Section 1.25 is amended to provide, in paragraph (a), a reference to the fee for establishing a deposit account and a service charge if the end of the month balance is below $40.00. Paragraph (b) is amended by revising the present sentence to refer to post-issuance fees and by adding a second sentence which would specifically provide in the regulations for the possibility of an applicant giving a general authorization to charge any fee due under §§1.16–1.18 in a particular application to a deposit

account during the entire pendency of the application. This general authorization would not apply after the patent issues, e.g., to maintenance fees. The last sentence of paragraph (b) permits fees during reexamination to be charged to a deposit account by filing an authorization with the request for reexamination.

Section 1.26 is amended to provide in paragraph (a) that a withdrawal of a request for an oral hearing will not entitle appellant to a refund. Paragraph 1.26(a) raises the amount which will not be refunded without specific request from fifty cents to one dollar. Paragraph (b) relating to refunds of international search fees during subsequent examination of a national application is deleted since such refunds are now covered by reductions in the appropriate fees paid under §1.445 rather than solely by direct refunds. Paragraph (c) is amended to bring the spelling of "requester" into conformance with that used in other sections of the regulations.

Section 1.45 is amended to provide in paragraphs (b) and (c) for a petition and petition fee to be filed to correct misjoinder of inventorship situations in pending applications. The fee will cover the additional time required by the Office to process such applications.

Section 1.47 is amended to provide for petitions and fees for filing applications signed by less than all inventors, or a person not the inventor.

Section 1.51 is amended to refer to the filing fees in new §1.16 and to add a new paragraph (c) indicating that applicants may file authorizations to charge fees required under any of §§1.16–1.18 to deposit accounts.

Section 1.52 is amended to add a reference in paragraph (a) to new paragraph (d). New paragraph (d) provides in the rules for filing an application in a language other than English if a verified English translation and fee under §1.17(k) are timely submitted.

Section 1.55 is amended in paragraph (b) to require a petition and fee for processing priority papers submitted after the issue fee is paid.

Section 1.75 is amended to add a reference to §1.16 and a sentence referring to the fee for multiple dependent claims set forth in §1.16(d).

Section 1.85 is amended to delete the sentence relating to mounting of informal drawings.

Section 1.86 is removed to delete the reference to the Office draftsman making drawings since such service is no longer available.

Section 1.102 is amended by revising paragraph (a) and adding new paragraphs (c) and (d). Revised paragraph (a) refers to paragraph (b) and added paragraphs (c) and (d). Paragraph (c) requires a petition but no fee where the basis for the petition to make special is the applicant's age or health or the impact of the invention on improving the environment or conservation of energy. Paragraph (d) requires a petition and the fee set forth in §1.17(i) for petitions to make special on grounds other than those above.

Section 1.103 is amended in paragraph (a) to provide for filing a petition and the fee set forth in §1.17(i) for a suspension of action except that no fee would be required where the reason for the suspension is the fault of the Patent and Trademark Office. Paragraph (b) is amended to clearly indicate that suspensions are directed to actions by the Office and not responses by the applicant.

Section 1.104, paragraph (d) is amended to change the fee reference to correspond to §1.21(e).

Section 1.134 is added to indicate that unless applicant is notified of any non-statutory or shortened statutory period in an Office action, a maximum period for response of six months is allowed.

Section 1.135 is amended to provide that if no response is filed within the time set in the Office action under §1.134 or as it may be extended under §1.136, the application will be abandoned unless an Office action indicates that another consequence, such as disclaimer, will take place. Paragraph (b) is amended to include a reference to paragraph (a). Paragraph (c) is amended to add that applicant's reply must be a bona fide attempt to respond as well as to advance the case to final action in order for applicant to be given an opportunity to supply any omission.

Section 1.136 is amended to revise the title and provide for two distinct procedures to extend the period for action or response in particular situations. The procedure which is available for use in a particular situation will depend upon the circumstances. Paragraph 1.136(a) permits an applicant to file a petition for extension of time and a fee as in §1.17(a), (b), (c), or (d) up to four months after the end of the time period set to take action except (1) where prohibited by statute, (2) in interference proceedings, or (3) where applicant has been notified otherwise in an Office action. The petition and fee can be filed prior to or with the response. The filing of the petition and fee will extend the time period to take action up to four months dependent on the amount of the fee paid except in those circumstances noted above. Paragraph 1.136(a) will effectively reduce the amount of paperwork required by applicants and the Office since the extension will be effective upon filing of the petition and payment of the appropriate fee and without acknowledgment or action by the Office and since the petition and fee can be filed with the response. Paragraph (b) provides for requests for extensions of time upon a showing of sufficient cause when the procedure of paragraph (a) is not available. Although the petition and fee procedure of §1.136(a) will normally be available within 4 months after a set period for response has expired, an extension request for cause under §1.136(b) must be filed during the set period for response. The sentence in paragraph (b) relating to who may grant an extension under paragraph (b) is eliminated thereby providing additional flexibility to designate persons to act on requests under paragraph (b). Extensions of time in interference proceedings are governed by §1.245.

Section 1.165, paragraph (b) is amended to delete therefrom the last sentence which refers to a fee for mounting copies. Since little or no need has been found for this provision in the rules, it is deleted.

Section 1.171, as amended, adds a reference to §1.19 (b)(2) which sets forth the fee for title reports.

Section 1.177 is amended to require a petition and fee as set forth in §1.17(i) where it is desired that divisions of a reissue issue on different dates.

Section 1.181 is amended to indicate in paragraph (d) that if a petition to the Commissioner is filed under the provisions of a section which requires a petition fee and the required fee is not paid, the petition will be dismissed. The amendment to paragraph (g) deletes the reference to §1.183.

Section 1.182 is amended to add a sentence requiring any petition filed under this section to be accompanied by the petition fee set forth in §1.17(h).

Section 1.183 is amended to specifically refer to the inherent authority of the Commissioner to suspend or waive the rules at the Commissioner's initiative. The amendment also indicates the Commissioner's authority to designate others to act for the Commissioner in appropriate circumstances. The rule language also requires the payment of the petition fee set forth in §1.17(h) if a petition to suspend or waive the rules is filed.

Section 1.191 is amended to change the fee reference for filing a notice of appeal to §1.17(e) and delete the word "primary" since some actions which are subject to appeal are not made by a "primary" examiner.

Section 1.192, paragraph (a), is amended to refer to the fee for filing an appeal brief set forth in §1.17(f). The present language requiring a showing of sufficient cause for extensions of time for filing the brief and an indication that an oral hearing is desired at the time of filing the brief are removed from paragraph 1.192(a). Under the amendment to paragraph 1.192(a), the provisions of §1.136 will apply to extensions of time for filing the brief. The time for requesting an oral hearing is now set in §1.194(b).

Section 1.194 is amended to revise paragraphs (b) and (c) to refer to the fee for oral hearing in §1.17(g) and to indicate in paragraph (b) that any request for an oral hearing must be made within one month after the mailing date of the examiner's answer.

Section 1.197, paragraph (b), is amended to modify the last sentence relating to extensions of time to make the provisions of §1.136 applicable thereto. Paragraph 1.197(b) is also amended to limit requests for rehearing, reconsideration or modification of a Board decision to one. This will not significantly change present practice since such requests are now required to be filed within thirty days from the date of the original decision.

Section 1.231, paragraph (a)(1), is amended to change the reference to the fee for filing a request for reexamination to §1.20(c).

Sections 1.245 and 1.246 are amended to indicate that the provisions of §1.136 do not apply to time periods in interferences.

Section 1.263 is amended to add a reference to the fee for filing a disclaimer contained in §1.20(d).

New section 1.268 is added to provide a rule relating to the filing of interference settlement agreements. The rule generally follows 35 U.S.C. 135(c) and provides for filing of petitions and fees in paragraphs 1.268(b) and (c).

Section 1.292, paragraph (a), is amended to require the payment of the fee set forth in §1.17(j) with any petition for the institution of public use proceedings.

Section 1.304, paragraph (a), is amended to provide for extension of the time period for filing an appeal or civil action to be subject to the provisions of §1.136 and refer to the Court of Appeals for the Federal Circuit rather than to the Court of Customs and Patent Appeals.

Section 1.311 is amended to designate the present section as paragraph (a) and revise it in several ways. Paragraph (a) indicates that the notice of allowance will be sent to the correspondence address as indicated under §1.33. The issue fee (§1.18) is indicated as being due 3 months from the date of mailing of the notice of allowance. Paragraph 1.311(b) permits an authorization to be filed either before or after the mailing of the notice of allowance to charge the issue fee to a deposit account.

Section 1.312 is amended to divide the section into two paragraphs and require a petition and payment of the fee under §1.17(i) for any amendment filed after payment of the issue fee.

Section 1.313 is amended to provide in paragraph (a) clear basis for the Office withdrawing applications from issue on its own initiative or upon petition by applicant accompanied by the petition fee set forth in §1.17(i). Any accompanying amendment must comply with the requirements of §1.312. Paragraph (b) clarifies when an application will be withdrawn from issue after assignment of the issue date and patent number.

Section 1.314 is amended to revise the wording to eliminate reference to a portion of the issue fee and adds reference to the possibility that an application in which the issue fee was paid can be withdrawn from issue under§1.313 or the issuance thereof deferred pursuant to a petition by the applicant and the payment of the petition fee under §1.17(i).

Section 1.321 is amended to include references in both paragraphs (a) and (b) to the statutory disclaimer fee in §1.20(d) and delete the reference to §1.21.

Section 1.324 is amended to include reference to the fee in §1.20(b) and change the word "application" to "petition".

Section 1.331, paragraph (a), is amended to add a new sentence which gives the citation of the fee for recording assignments and to indicate that instruments recorded on the Government register under Part 7 of Title 37, Code of Federal Regulations, do not require payment of such fee.

Section 1.332 is amended to refer to the fee in §1.21 (h) for recording an assignment.

Section 1.334 is amended to divide the rule into three paragraphs and also require an address of the assignee so that correspondence can be directed to the assignee if required. New paragraph (c) provides for filing a petition and the fee set in §1.17(i) seeking to have the patent issue to the assignee where such assignment has not been recorded at the time the issue fee is paid.

Section 1.341, paragraph (h), is amended to refer to the fee set forth in §1.21(a)(2) for registration of an attorney or agent.

Section 1.347 is amended to add a sentence referring to the fee set forth in §1.21(a)(3) for reinstatement of an attorney or agent.

Section 1.445 is amended to increase the PCT transmittal fee and search fee to a level needed to cover the cost of performing the required functions. Paragraph 1.445(a)(2) is also amended to provide, in effect, for a reduction in the international search fee due to the United States Patent and Trademark Office as an International Searching Authority where a corresponding United States national application with fee has been filed. In addition, paragraph 1.445(a)(4) is amended to credit the national fee required under §1.16(a)–(d) where an international search fee has been paid on the corresponding international application to the United States as an International Searching Authority. Where the amount of the credit is in excess of that required for the national fee a request for a refund of the excess under §1.446(b) may be filed at the time of paying the national fee. The supplemental search fee for inventions in addition to the first, where lack of unity of invention has been found, is reduced since the present fee is more than is required to cover the costs. The national fee amount is the same as the national application filing fees in §1.16(a)–(d).

Section 1.446(b) is revised to permit a refund of a portion of the search fee to the extent set forth in §1.445(a)(4), if such refund is requested at the time of paying the national fee.

Section 1.451 is amended in paragraph (b) to revise the citation of the fees for a certified copy.

Section 1.510 is amended to cite the section which sets forth the fee for requesting reexamination. There is no change in the amount of this fee.

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Alternative B—Rule Changes Under H.R. 6260

The following sections will become effective on Oct. 1, 1982, upon enactment of H.R. 6260 as a Public Law prior to that date:

Section 1.16 in Alternative B establishes in the regulations those statutory fees which would be charged by the Commissioner for filing patent applications under H.R. 6260. Section 1.16 also includes additional filing fees set in 35 U.S.C. 41(a)(1) to cover the cost of examining complexities presented by certain applications, e.g., applications containing more than a specified number of claims and any application containing a multiple dependent claim. Section 1.16 also provides that fees will be charged when the number of claims is increased above the specified number or when a multiple dependent claim is first presented, whether on filing or at a later point in processing.

Under 35 U.S.C. 41(a) as it would be amended by H.R. 6260, the filing fee for an original patent, except in design or plant cases, is $300. In addition, on filing or on presentation at any other time, $30 is due for each claim in independent form which is in excess of three, $10 is due for each claim (whether independent or dependent) which is in excess of twenty, and $100 is due for each application containing a multiple dependent claim. The latter fee is a one-time charge per application due the first time a multiple dependent claim is presented for examination. For the purpose of computing fees, a multiple dependent claim as referred to in §112 of Title 35, United States Code, or any claim depending therefrom, is considered as separate dependent claims in accordance with the number of claims to which reference is made.

The fees in §1.16 are reduced by 50 per centum for applications filed by small entities, i.e., independent inventors, nonprofit organizations and small business concerns, in accordance with H.R. 6260. Therefore, two fees are listed under each paragraph.

New §1.16 relates to application filing fees. Paragraph (a) sets a basic filing fee of $300 which will be required

in all original patent applications. The term "original" as used in the regulations means "non-reissue". An "original" application can be a first filing, a division, a continuation, or a continuation-in-part application. Paragraph 1.16(b) provides for an additional fee of $30 for each independent claim in excess of 3 in an original application. New paragraph 1.16(c) provides for an additional fee of $10 for each claim in excess of 20, whether independent or dependent. A multiple dependent claim is considered to be that number of claims to which direct reference is made. Also, any claim which refers to a multiple dependent claim is considered for fee calculation purposes to be the number of claims to which direct reference is made in the multiple dependent claim. Paragraph 1.16(d) provides for a new fee of $100 in each application which contains one or more multiple dependent claims. The note following paragraph 1.16(d) is intended to clearly indicate that the applicant, attorney, or agent may pay any additional fees required under paragraphs (b), (c) and (d) of §1.16, or cancel such claims without payment of such additional fees, either at the time of filing or by the time a response is due to any notice of fee deficiency mailed by the Office. If the fees are not paid or the claims cancelled by the end of the period set for response to the notice of fee deficiency, the application will be held abandoned. New paragraph 1.16(e) establishes the amount of the surcharge for filing the basic filing fee or oath or declaration on a date later than the filing date of the application. This fee is being established at this time, but will only be made effective when the statutory authority for the late filing of the fee or the oath or declaration becomes effective under 35 U.S.C. 111, as it would be amended by H.R. 6260. New paragraph 1.16(f) provides for a filing fee of $125.00 for a design application.

Paragraphs 1.16(g) and (h) incorporate into the regulations the filing fees for plant and reissue applications.

Paragraphs 1.16(i) and (j) set forth the additional claim fees required in reissue applications based on claims in excess of those in the original patent.

New §1.17 relates to patent application processing fees which are normally due during the time a patent application is pending. New paragraphs (a), (b), (c) and (d) provide for the payment of an extension fee for obtaining an automatic extension of time upon filing a petition as provided for in §1.136(a). The extension fee can be paid during the period for which an extension of time to respond is desired, or after the original period for response has expired, provided that any maximum statutory period which may apply has not expired. The fees set forth in §1.17 are the total fees required under §1.136(a) for the periods indicated and any extension fee previously paid to extend a particular period is credited toward the total extension fee required. Paragraph (e) sets forth the fee for filing a notice of appeal to the Board of Appeals. Paragraph (f) sets forth the fee for filing an appeal brief for appellant. Paragraph (g) provides for a new fee for requesting an oral hearing before the Board of Appeals. Paragraphs (h) and (i) set forth fees which will be required with petitions to the Commissioner under those sections of the regulations which specifically indicate that such petition fees are required. The amount of the fees are set at two levels based on the degree of complexity of the petitions in order to recover the estimated average cost to the Office of processing the petitions. Paragraph (j) provides for a fee to be paid with any petition for institution of a public use proceeding to cover the estimated average cost of such a proceeding. Paragraph (k) sets forth a new fee for processing an application filed with a non-English language specification. The fee will cover the additional processing costs involved in such applications. New paragraph (l) incorporates into the regulations the fee which will be charged for filing a petition to revive or to accept late payment of the issue fee where the delay was unavoidable. New paragraph (m) incorporates into the regulations the fee which will be established in 35 U.S.C. 41(a)7, as amended by H.R. 6260, to be charged for a petition for the revival of an unintentionally abandoned application for patent or for the unintentionally delayed payment of an issue fee.

Since paragraphs 1.17(h), (i), (j) and (k) are established under the authority given the Commissioner under 35 U.S.C. 41(d) as it would be amended by H.R. 6260, only one level of fee is set. H.R. 6260 only provides for the reduction of fees charged to small entities of those fees established in 35 U.S.C. 41(a) and (b).

New §1.18 sets the amount of the issue fees specified by H.R. 6260. New paragraph (a) establishes an issue fee of $500.00 for all original and reissue patents except for designs and plants. New paragraph (b) sets the amount of the issue fee for a design patent. New paragraph (c) sets forth the issue fee for a plant patent. All fees in §1.18 will be reduced by 50 per centum for small entities.

New §1.20 sets fees for various post-issuance functions performed by the Office. New paragraph (a) sets forth a fee for providing a certificate of correction of an applicant's mistake. New paragraph (b) sets a fee to accompany a petition to correct inventorship in a patent under §1.324. New paragraph (c) transfers the $1,500.00 fee for requesting reexamination from present §1.21(x) to this new section. New paragraph (d) provides for a fee for filing a disclaimer under §1.321. Maintenance fees required by Public Law 96-517 and which would be set in H.R. 6260 are placed in this section. Specific maintenance fees, which are required by Public Law 96-517, for those patents resulting from applications filed on and after Dec. 12, 1980 and up to the date of enactment of H.R. 6260 are being established at this time in paragraphs 1.20(e)–(g). New paragraphs 1.20(h)–(j) incorporate into the regulations the maintenance fees which would be provided in 35 U.S.C. 41(b) by H.R. 6260. The fees in paragraphs 1.20(a)–(c) are only set at one level because they are established under 35 U.S.C. 41(d). The fees in paragraphs 1.20(e)–(g) are only set at one level because they are established under Public Law 96-517 and are not subject to reduction for small entities. The details implementing the payment of maintenance fees are not being established at this time.

Section 1.66 is amended to provide for the use of an apostille of a foreign official to attest to oaths or affirmations made in foreign countries in accordance with 35 U.S.C. 115 and 261, as amended by H.R. 6260.

Section 1.137, as amended, designates the existing section as part of paragraph (a), adds a reference to the new fee under §1.17(l) for a petition for revival where the delay which resulted in abandonment was unavoidable, indicates that the petition must be promptly filed, and states when the showing that the delay was unavoidable must be verified. New paragraph 1.137(b) provides for filing a statement and a fee under §1.17(m) for revival of an application which was unintentionally abandoned, and also indicates when such petitions can be filed. Paragraph (c) requires that any petition for revival under paragraph (a) of §1.137 be promptly filed and that a terminal disclaimer, equivalent to the period of abandonment of the application, be filed with any petition under paragraph (a) filed more than six months after the date of abandonment.

Section 1.155 is amended to refer in paragraph (a) to §1.18(b) which sets forth the issue fee for a design application. Paragraph 1.155(b), as amended, includes a reference to the fee for delayed payment of the issue fee set forth in §1.71(l) where the delay in payment was unavoidable, indicates that the petition must be promptly filed, and states when showings that the delay was unavoidable must be verified. New paragraph 1.155(c) provides for acceptance of the late payment of the issue fee where the delay was unintentional upon petition and payment of the fee set forth in §1.17(m). New paragraph 1.155(c) also indicates when such petitions can be filed. Paragraph 1.155(d) is added to require a terminal disclaimer equivalent to the period of abandonment of the application where petition under paragraph (b) of §1.155 is not filed within six months of the date of abandonment.

Section 1.316 is amended to implement the statutory provisions of 35 U.S.C 41(a) with regard to petition fees for revival of applications abandoned for failure to pay the issue fee. Paragraph (b) is amended to provide for petitions for revival with the fee in §1.17(l) where the delay in payment was unavoidable, to indicate that the petition must be promptly filed, and to state when showings that the delay was unavoidable must be verified. Paragraph (c) is added to provide for petitions for revival with the fee in §1.17(m) where the delay was unintentional. New paragraph (c) also indicates when such petitions can be filed. Paragraph (d) is added to require a terminal disclaimer equivalent to the period of abandonment of the application where a petition under paragraph (b) of §1.316 is not filed within six months of the date of abandonment.

Section 1.317 is amended to implement the statutory provisions of 35 U.S.C. 41(a) with regard to petition fees for patents lapsed for failure to pay the remaining balance of the issue fee. Paragraph (a) is amended to show that it applies only to patents in which the issue fee was paid prior to Oct. 1, 1982. Issue fees paid on or after that date will be in accordance with §1.18. Paragraph (b) is amended to provide for petitions with the fee in §1.17(l) where the delay in payment was unavoidable, to indicate that the petition must be promptly filed, and to state when showings that the delay was unavoidable must be verified. Paragraph (c) is added to provide for petitions with the fee in §1.17 (m) where the delay was unintentional. New paragraph (c) also indicates when such petitions can be filed. Paragraph (d) is added to require a terminal disclaimer equivalent to the period of lapse of the patent where a petition under paragraph (b) of §1.317 is not filed within six months of the date of lapse.

RESPONSE TO COMMENTS ON THE RULES

Specific comments were received on a number of the sections. All of the comments, including the written comments and the oral testimony, were considered in adopting the changes set forth herein.

Written comments were received from three patent law groups and eleven individuals. The three patent law groups were (1) the American Patent Law Association whose membership includes several thousand lawyers involved in the practice of law before the U.S. Patent and Trademark Office; (2) the Patent, Trademark and Copyright Section of the Virginia State Bar; and (3) the Patent, Trademark and Copyright Law Section of The Bar Association of the District of Columbia.

Oral comments were presented at the hearing on behalf of two patent law groups and by 3 individuals on their own behalf.

These comments appear below along with responses thereto.

Comments received relating to §§1.9, 1.27 and 1.28 and the forms of Part 3 are not discussed in substance in this rule change since additional time for submitting written comments is provided until Aug. 13, 1982. All comments presented to these rules will be discussed in a later rule promulgation.

Comment:

One person argued that it is unreasonable to require fees to lengthen a shortened statutory period.

Reply:

A shortened statutory time is provided for by statute. The shortened period helps reduce patent pendency time and speed the disclosure of technology and information about patent rights. Many applicants can reply within the present three month shortened period which has been in effect for over fifteen years. The fee for extending the time provides a positive method for applicants to obtain an extension of time while still expediting the prosecution of their applications.

Comment:

Another person commented that H.R. 6260 should be rejected in that the fee levels are too high.

Reply:

The consideration of the merits of H.R. 6260 is not before the Office in this rule change.

Comment:

Three patent bar groups and two individuals presented comments relating to the effect of the new extension of time fees in §1.17 and the effect thereof on the current practice of granting an automatic one-month extension of time if a timely first response to a final rejection is filed by the applicant.

Reply:

The Office plans to terminate the automatic one-month extension of time practice on Oct. 1, 1982. It is felt that the extensions of time which are readily available under §§1.17 and 1.136 will meet the needs of applicants. The amount of the fees required to obtain an extension will be the same for periods of response before and after final rejection.

Comment:

One suggestion was made to permit the filing of an appeal without the appeal fee where the Office has not acted on a timely response after final rejection by applicant.

Reply:

Such a procedure is not possible under the provisions of H.R. 6260 since it calls for the appeal fee "On filing an appeal" in §41(a)6.

Comment:

Two comments were received requesting that the rules be changed to make the due date for paying the fee for an oral hearing on appeal after the examiner's answer on appeal.

Reply:

A change in the rules has been made to provide that the fee for an oral hearing is due no later than one month after the date of mailing of the examiner's answer.

Comment:

Two comments were received requesting that no charge for revival of an abandoned application be made where the abandonment resulted from the non-receipt of an Office action by the applicant.

Reply:

It is present Office practice to remail any Office action which is not received at applicant's correspondence address and start anew the response period. This procedure will continue in the future under the revised rules.

Comment:

Three patent bar groups and two individuals indicated that the proposed deletion of the refund provisions due to PCT search reports in §1.26(b) and §1.446(b) would make the cost of filing under the Patent Cooperation Treaty prohibitively high and does not recognize the benefit of an earlier search on a corresponding application.

Reply:

In view of these comments, proposed §1.445(a) (2) and (4) and §1.446(b) have been amended to provide a credit of $250 where there is a corresponding application.

Comment:

One individual requested that the multiple dependent claim practice set forth in §1.75(c) be changed to permit one multiple dependent claim to refer to another multiple dependent claim as permitted under European practice.

Reply:

This suggestion cannot be adopted since it is contrary to 35 U.S.C. 112 and cannot therefore be changed by rule.

Comment:

One suggestion was made to change "official" to "Office" in §1.135(b).

Reply:

The suggestion has been adopted.

Comment:

One suggestion was made to allow refund of the oral hearing fee if an oral hearing is not held.

Reply:

This suggestion was not adopted since such refund is not appropriate in view of the fact that the fee is stated to be "for requesting an oral hearing" and not the actual conduct thereof.

Comment:
Three patent bar groups raised the question as to whether an applicant would be permitted to revive an unintentionally abandoned application under §1.137(b) after having been unsuccessful in the unavoidable approach under §1.137(a) and suggested that this be made clear when the proposed rules are promulgated.
Reply:
Yes, an applicant under certain conditions could use §1.137(b) after having been unsuccessful in the unavoidable approach under §1.137(a).
Comment:
Several comments related to the possibility of reviving applications unintentionally abandoned up to 15 years ago.
Reply:
In view of the comments received, §1.137(b) is being implemented to provide only for the revival of applications which were unintentionally abandoned for a reasonable but limited period of time. This should create no substantial problems in regard to intervening rights situations. It would permit some greater flexibility than that originally proposed but should have no significant effect on the current case backlog, pendency or number of interferences pending.
Comment:
One comment was received pointing out that the availability of an "unintentional abandonment" revival under §1.137(b) should not result in stricter holdings in "unavoidable abandonment" revival petitions under §1.137(a).
Reply:
The Office plans to continue to use the current criteria used to decide petitions to revive applications unavoidably abandoned.
Comment:
One written comment questioned whether the Commissioner has statutory authority to revive unintentionally abandoned applications.
Reply:
If Congress did not intend the Commissioner to have such authority there would have been no reason to establish fees in §41(a)7 in H.R. 6260. The legislative history of H.R. 6260, House Report No. 97-542 (Committee on the Judiciary), also makes the Congressional intent clear. The provisions in H.R. 6260 relating to unintentional abandonment are substantive in addition to setting the fee.
Comment:
One letter questioned what is intended by the statement in §1.137(b) that the Commissioner may require additional information where there is a question whether the abandonment was unintentional.
Reply:
Additional information would be required only where there is an indication that the abandonment was intentional, for example, where an express abandonment has been filed. The record should be clear how such an express abandonment was unintentional if the petition is to be granted.
Comment:
One comment raised the question as to whether in a petition to revive on grounds that the delay was unavoidable under §1.137(a), it would be sufficient that a registered attorney's statement be submitted which merely recites facts as related to him or her by another.
Reply:
Statements must be made, where possible, by the person having direct personal knowledge of the facts. No change in the "showing" required or the persons making them is intended in such petitions. The rule merely clarifies that a statement by a registered attorney or agent need not be in the form of an oath or declaration.
Comment:
One comment suggested that §1.317 be changed to provide for the situation where there was a lapse in a patent due to the unintentional delay in paying a balance of issue fee due.
Reply:
Section 1.317 has now been changed to provide for this lapse situation.
Comment:
Three patent bar groups and one individual indicated that a full credit of the amount equal to the international search fee be made where both a U.S. national and international seach are made by the United States Patent and Trademark Office.
Reply:
While a complete credit is not considered proper in view of additional processing work (including searching) required in the second application, a credit of $250 has been provided in revising §1.445(a) (2) and (4).
Comment:
One person commented that the term "patent" should be inserted after "abandoned" in §1.12(b).
Reply:
The suggestion has been adopted.

DISCUSSION OF SIGNIFICANT DIFFERENCES BETWEEN PROPOSED AND FINAL RULES

A number of other changes which have been made as a result of the comments received and further review of the proposed rulemaking are identified below.

Implementation of the changes to §1.9, new §§1.27 and 1.28, and the deletion of Part 3 are being deferred for further comments by Aug. 13, 1982. See the discussion below.

Subparagraph (a) (5) of §1.19 has been changed from that proposed by referring to subparagraphs (1) through (4) rather than (3) and (4) in order to clarify that copies of patents cannot be ordered at the rate set in subparagraph (a) (5). Instead, copies of patents must be ordered under paragraphs (a) (1) and (2) of §1.19.

Section 1.24 has been changed from that proposed to provide for the sale of 40-cent coupons. Coupons in this denomination may be useful in view of the charge of forty cents for a printed copy of a registered mark in §2.6(m) of Alternative A of the trademark rules.

Sections 1.137, 1.155 and 1.316 have been changed from that proposed in Alternative B to further specify the conditions under which unintentionally abandoned applications can be revived.

Sections 1.192 and 1.194 have been changed from that proposed so as to allow a request for an oral hearing and the payment of the required fee therefor to be made one month after the date of the examiner's answer. Previously, appellant was required to indicate a desire for an oral hearing at the time of filing the brief. The sections will now permit appellant to consider the examiner's answer before deciding whether to request an oral hearing and pay the required fee.

Section 1.317 has been changed in Alternative B to provide for the situation where there was a lapse in a patent due to the unintentional delay in paying a balance of issue fee due.

Section 1.445(a) (2) and (4) have been changed from that proposed to provide for a reduction in the international search fee where there has been a corresponding United States national application and a credit to the national fee where an international search fee has been paid in a corresponding international application and the international search has been made by the United States Patent and Trademark Office.

Section 1.446(b) has been changed from that proposed to permit a refund of a portion of the search fee to the extent set forth in §1.445(a) (4), if such refund is requested at the time of paying the national fee.

IMPLEMENTATION OF PATENT FEE REVISION

The effective date of the patent fee revisions contained in this rulemaking is Oct. 1, 1982.

* * * * *

The changes which will become effective on Oct. 1, 1982, upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, are (1) the rule changes common to Public Law 96-517 and H.R. 6260, and (2) the rule changes under H.R. 6260, which appear in Alternative B. The rule changes common to Public Law 96-517 and H.R. 6260 will become effective on Oct. 1, 1982, whether or not H.R. 6260 is enacted as a Public Law prior to Oct. 1, 1982.

* * * * *

Upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, the rule changes in Alternative B will become effective on Oct. 1, 1982, in which case the rule changes in Alternative A will not become effective on Oct. 1, 1982.

Any fee which is due and payable on or after Oct. 1, 1982, must be paid in the amount and in accordance with the procedures contained in this rulemaking. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing under §1.8 will be considered to be the date of receipt in the Office. In order to ensure clarity in the implementation a discussion of the implementation of specific sections is set forth below:

IMPLEMENTATION OF SPECIFIC SECTIONS

The various sections will be implemented in the manner set forth below:

§1.16 National application filing fees.

Any national patent application filing fees paid on or after Oct. 1, 1982, must be paid in the amounts set forth in this section. Any additional fees which become due under §1.16 in pending applications on or after Oct. 1, 1982, or which have not been paid prior to Oct. 1, 1982, must be paid in the amounts set forth in this section even though the application was filed prior to Oct. 1, 1982. For example, if an application filed prior to Oct. 1, 1982, is amended on or after Oct. 1, 1982, to include a multiple dependent claim for the first time, the fee set forth in §1.16(d) must be paid.

The surcharge in §1.16(e) of Alternative B is being established at this time, but will only be made effective when the statutory authority for the late filing of the fee or the oath or declaration becomes effective under 35 U.S.C. 111, as it would be amended by H.R. 6260. The statutory authority for the late filing of the fee or the oath or declaration becomes effective six months after enactment of H.R. 6260 as a Public Law.

§1.17 Patent application processing fees.

Any patent application processing fees paid on or after Oct. 1, 1982, must be paid in the amounts set forth in this section.

The extension fees which must accompany a petition for an extension of time become effective on Oct. 1, 1982, and apply to any application for which the period for responding, i.e., taking action, expires on Oct. 1, 1982, or thereafter. If a response or action by the applicant was due before Oct. 1, 1982, and was not filed timely or an extension of time until Oct. 1, 1982, or thereafter, was not obtained, then §1.136(a) cannot be used to obtain an extension. *Any response or action required before Oct. 1, 1982, cannot have its time extended by using §1.136(a).* If one or more previous extensions have been granted prior to Oct. 1, 1982, extending the time for taking action unitl Oct. 1, 1982, or thereafter, the fees which are due for additional extensions under §1.136(a) will be as set forth in §1.17(a)-(d) under either Alternative A or B.

* * * * *

The previous practice of extending the shortened statutory period an additional month upon the filing of a timely first response to a final rejection is being discontinued effective with any first response to a final rejection filed on or after Oct. 1, 1982. Applicants can obtain additional time for response after that date by paying the appropriate fee for the same. An object of the previous practice, as expressed in §714.13 of the Manual of Patent Examining Procedure, was to obviate the necessity for appeal or filing a continuing application merely to gain time to consider the examiner's position in reply to a response timely filed after final rejection. Under §1.136(a) the object of the previous practice can be achieved without continuing the previous practice. Thus, under §1.136(a) an applicant can file a timely first response to a final rejection within the initial period without having to file an appeal or a continuing application if the examiner's response is not received prior to the expiration of the initial period for response. If the timely first response places the application in condition for allowance no additional response and no extension fee from applicant is required. If the examiner's advisory action indicates the timely first response did not place the application in condition for allowance the applicant may then consider the examiner's position to determine whether further prosecution is desirable. If further prosecution is not desired the application can be abandoned without further response or expense. If further prosecution is desired, the applicant can petition and pay the necessary fee to extend the time to the extent appropriate up to the maximum permitted by statute. The availability of this flexibility under §1.136(a) eliminates the necessity for the previous practice. Further, under H.R. 6260 extensions of time would be granted in most instances by virtue of the payment of fees rather than without fees as in the previous practice. The elimination of the previous practice after final rejection is thus consistent with the letter and spirit of H.R. 6260.

After an applicant has petitioned and paid the extension fees of $550 for response within the fourth month pursuant to §1.136(a), any further extensions which are permitted under the statute must be obtained under §1.136(b).

A petition for extension of time under §1.136(a) may incorporate by reference a previously filed response without including an additional copy of the response in circumstances where the response was received late and the petition is filed to extend the time so that the response will be considered timely.

The appeal fees set forth in §1.17(e)-(g) are due for notices of appeal or briefs filed, or requests for oral hearings filed, on or after Oct. 1, 1982. If more than one appeal occurs in an application, the fees are due for each notice of appeal, each brief, and each request filed for an oral hearing as long as a decision on the merits by the Board of Appeals resulted from the first notice of appeal, brief, and request for an oral hearing. If the examiner reopens prosecution in the application after appeal and prior to the decision by the Board of Appeals then the fee for the notice of appeal, brief, and request for an oral hearing will apply to a later appeal which does result in a decision by the Board of Appeals. No refund of any appeal fees is permitted since such are due on filing or on requesting an oral hearing. No fee is required for a reply brief.

The fees for petitions set forth in §1.17(h)-(j) and (l) apply to any such petition filed on or after Oct. 1, 1982. The fee set forth in §1.17(m) of Alternative B would apply, with enactment of H.R. 6260 prior to Oct. 1, 1982, to petitions (1) for revival of an unintentionally abandoned application or (2) for the unintentionally delayed payment of the fee for issuing a patent. Section 1.137(b) of Alternative B would apply to applications unintentionally abandoned by failure to prosecute, e.g., failure to respond to an Office action. Sections 1.155(c) and 1.316(c) of Alternative B would apply to applications in which the payment of the fee for issuing a patent is unintentionally delayed. These sections would be implemented, with enactment of H.R. 6260 prior to Oct. 1, 1982, by making them effective as to any applications which would be covered by the literal language of the

sections. In addition, and for a transition period between Oct. 1, 1982, and Dec. 31, 1982, a petition to revive an unintentionally abandoned application would be granted if (i) the application received a decision on a petition to revive the application on or after Oct. 1, 1981, and before July 30, 1982, or (ii) a petition was filed or renewed on or after Oct. 1, 1981, and before July 30, 1982, provided in the case of both (i) and (ii) that a petition to revive was filed within one year of the date of abandonment. The dates in question were chosen so as to permit this remedial provision to be given as wide an application as possible to benefit applicants whose applications have previously been unintentionally abandoned, but who could not meet the previous requirements for a showing that the delay resulting in the abandonment was unavoidable. The dates were also chosen to prevent an applicant whose application has been abandoned for an unduly long period from attempting to take advantage of this new provision, possibly to the detriment of individuals or companies who had begun to make, use, or sell the subject matter of the application after the date of abandonment of the application. By using these dates the possibility of reviving the application of an applicant who has, in effect, abandoned the invention under 35 U.S.C. 102(c) is minimized. Implementing these sections in the manner set forth would be appropriate and proper in view of the legislative history of H.R. 6260, contained in House Report No. 97-542 (Committee on the Judiciary), which indicates that the Commissioner can establish time limits within which petitions to revive or to accept late payment of issue fees can be filed. Thus, it is entirely proper to limit such petitions in the manner set forth in order to prevent abuses from occurring. To ensure that abuses do not occur, §§1.137(b), 1.155(c), 1.316(c), and 1.317(c) specifically indicate that waivers of the time periods involved will not be considered via petitions under §1.183.

The fee set forth in §1.17(k) is required for any application filed on or after Oct. 1, 1982, with a specification in a non-English language.

§1.18 Patent issue fees.

Any patent issue fee paid on or after Oct. 1, 1982, must be paid in the amounts set forth in this section even if the notice of allowance was mailed prior to Oct. 1, 1982, and indicates different amounts due. If the issue fee is paid prior to Oct. 1, 1982, any balance of issue fee due must be paid in accordance with §1.317.

§1.19 Document supply fees.

The document supply fees set forth in this section will apply to all orders and requests received by the Patent and Trademark Office on or after Oct. 1, 1982.

§1.20 Post-issuance fees.

The post-issuance fees set forth in §1.20(a)–(d) apply to any petitions, requests, or actions filed on or after Oct. 1, 1982. The amounts of the maintenance fees are included in §1.20.

Maintenance fees will be required for any patent actually applied for on or after Dec. 12, 1980, whether or not the patent is entitled to the benefit of an earlier filing date under 35 U.S.C. 120 or a right of priority under 35 U.S.C. 119. For reissue patents, the controlling date would be the filing date of the original patent. For example, maintenance fees would only be required where the application for the original patent was filed on or after Dec. 12, 1980. As to patents resulting from international applications filed under the Patent Cooperation Treaty, maintenance fees will be required on all patents resulting from international applications having PCT filing dates on or after Dec. 12, 1980.

The details implementing payment of the maintenance fees are not being established at this time since such fees will not be due for some time and additional consideration of the problems thereof is required.

§1.21 Miscellaneous fees and charges.

The miscellaneous fees and charges set forth in this section will apply to all orders and requests received by the Patent and Trademark Office on or after Oct. 1, 1982.

§1.445 International application filing and processing fees.

Any international application filing and processing fees paid on or after Oct. 1, 1982, must be paid in the amounts set forth in this section.

Implementation Of Certain Sections Deferred For Further Comments

In view of the comments and the recommendations received at the hearing on July 9, 1982, the period for written comments on §1.9(c), (d), (e), and (f), and on §§ 1.27 and 1.28, has been extended until Aug. 13, 1982 (see 47 FR 32458, July 27, 1982). Comments received at the hearing on July 9, 1982, expressed the view that there is no necessity to publish final rules on §1.9(c), (d), (e), and (f), and on §§1.27 and 1.28, by August 2, 1982, and that further time for consideration and comment was necessary. Persons commenting stated a belief that the pressure of time does not apply to §§1.27 and 1.28 as it does apply to the fee rulemaking. Accordingly, the period for written comments on these sections is extended until Aug. 13, 1982. After receiving written comments by Aug. 13, 1982, the changes to §1.9 and proposed §§1.27 and 1.28 will be adopted as final rules with such modifications as are found to be appropriate after review of the comments. These rule changes, with any appropriate modifications thereof, must become effective on Oct. 1, 1982, with enactment of H.R. 6260 prior to Oct. 1, 1982. Accordingly, adoption of the changes to §1.9 and new §§1.27 and 1.28 is being deferred at this time to permit additional written comments by Aug. 13, 1982. However, these rule changes will be adopted, with any appropriate modifications, as soon as possible after receipt of the additional written comments. No additional proposal will be published and no additional hearing will be held prior to adoption of final rules on the changes to §1.9 and on new §§1.27 and 1.28.

As a result of additional comments presented during the hearing on the proposed trademark fees, the period for written comments on the deletion of Part 3 was also extended until Aug. 13, 1982, to provide an additional opportunity for interested persons to comment on this proposed change. Since it is not essential that this deletion be published by Aug. 2, 1982, it is appropriate to extend the period for comments. No additional proposal will be published and no additional hearing will be held prior to a decision on whether or not to delete Part 3 as proposed.

SECTION II—REVISION OF TRADEMARK FEES

Background

A notice of proposed rulemaking was published in the *Federal Register* on June 28, 1982, at 47 FR 28063–28065 and in the *Official Gazette* on June 29, 1982, at 1019 TMOG 110–119. An oral hearing was held on July 9, 1982. Three written letters and statements were submitted. Three persons testified at the oral hearing. Full consideration has been given to all of the letters, statements, and testimony.

Objectives of Rule Changes

These amendments establish fees for the filing and processing of an application for the registration of a trademark or other mark, and for providing all other services and materials relating to trademarks and other marks.

Public Law 96-517

Public Law 96-517 authorizes the Commissioner to establish fees for the filing and processing of an application for the registration of a trademark or other mark, and for providing all other services and materials relating to trademarks and other marks. Public Law 96-517 requires that by Oct. 1, 1982, fees for the filing and processing of an application for the registration of a trademark or other mark be set to recover in the aggregate 50 percent of the estimated average cost to the Office of such processing. Also by Oct. 1, 1982, fees for providing all other services and materials relating to trademarks and other marks are to be set to recover the estimated average cost to the Office of performing the service or furnishing the material.

H.R. 6260

On June 8, 1982, the House of Representatives passed H.R. 6260. This bill would amend the fee provisions to be implemented on Oct. 1, 1982. H.R. 6260 would repeal the provisions in Public Law 96-517 requiring that filing and processing fees be set to recover in the aggregate 50 percent of the estimated average cost of such processing to the Office, and that fees for providing all other services and materials relating to trademarks and other marks be set to recover the estimated average cost to the Office of performing the service or furnishing the material. In passing H.R. 6260, the House of Representatives recommended a fee schedule to the Commissioner for fiscal year 1983. The fees set in Alternative B adopt the House recommendation.

This rule change, therefore, is also designed in the alternative to implement the fee provisions as they would be amended by H.R. 6260. The rule change contains changes which are common to Public Law 96-517 and H.R. 6260, as well as alternative rule changes which are specific to Public Law 96-517 (Alternative A) and to H.R. 6260 (Alternative B).

DISCUSSION OF SIGNIFICANT CHANGES

This rulemaking places into the appropriate sections of Title 37, Code of Federal Regulations, the various fees which are due on filing, during the pendency of a trademark application, or during the life of a registration.

Rule changes for implementing provisions of Public Law 96-517 or H.R. 6260 other than the fee provisions have not been included. Rule changes for implementing provisions other than the fee provisions will be published in a later rulemaking proposal.

DISCUSSION OF SPECIFIC SECTIONS CHANGED

The sections changed are grouped in this document under three different categories. Those changes which are common to Public Law 96-517 and H.R. 6260 appear first and are numbered 72-76. The change which relates only to Public Law 96-517 appears as Alternative A and is numbered 77. The change which is dependent upon enactment of H.R. 6260 appears as Alternative B and is numbered 78. The changes common to Public Law 96-517 and H.R. 6260 will become effective on Oct. 1, 1982, whether or not H.R. 6260 is enacted as a Public Law. * * * * * Upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, Alternative B will become effective on Oct. 1, 1982, in which case Alternative A will not become effective.

The specific rules for which changes are made are §§2.6, 2.85, 2.101, 2.146, 2.162 and 2.167.

Rule Changes Common to Public Law 96-517 and H.R. 6260

Section 2.85, paragraph (e), is amended to delete reference to late filed fees for oppositions and affidavits. The manner in which such fees shall be handled is described in the pertinent sections for affidavits and oppositions.

Section 2.101, paragraph (c), is amended to delete the reference to a service charge which will no longer be charged for late-filed fees for oppositions.

Section 2.146, paragraph (b), is amended to add a fee for filing a petition to the Commissioner. Paragraph (f) of this section which indicates that no fee is required is deleted.

Section 2.162, paragraph (d), is amended to remove the reference to a service charge for late-filed fees on §8 affidavits.

Section 2.167, paragraph (g), is added to establish procedures relating to the fee for affidavits under §15, 15 U.S.C. 1065, and to state the Office's action when no fee or an insufficient fee is filed.

* * * * *

Alternative B—Rule Change Only Under H.R. 6260

Section 2.6 is revised to establish the fees recommended by the House of Representatives under H.R. 6260 for filing and processing applications for the registration of trademarks or other marks and for providing services and materials relating to trademarks or other marks. The $10 fee recommended by the House for certified copies appears in paragraphs (n) and (o) as a fee of $6.50 for a copy of a registered mark showing title and/or status and a fee of $3.50 for certification.

RESPONSE TO COMMENTS ON THE RULES

Specific comments were received on several of the sections. All of the comments included in the written submissions and the oral testimony were considered in adopting the changes set forth herein.

Written comments were received from three individuals. Oral comments were presented at the hearing on behalf of a patent and trademark law group, the American Patent Law Association, and an organization of trademark owners and lawyers, the United States Trademark Association. One individual spoke on behalf of a law firm and expanded upon the points raised in his previously submitted written comments.

These comments appear below along with responses thereto, where appropriate.

Comment:

The representative of the trademark association spoke favorably about the proposal presented. The organization opposed 100% recovery of trademark costs from user fees. It was felt that such an approach reflected a misconception that trademarks benefit only their owners and not consumers and the economy as a whole. The speaker solicited the assistance of the Patent and Trademark Office in altering this viewpoint.

Comment:

The representative of the bar group questioned the fairness of the Office in establishing the fees under Alternative B. It appeared that the Office had accepted the USTA proposals only where they were higher. In all cases where the USTA recommendations were lower than those proposed, the difference was split. The filing fee was singled out as the most unfair fee.

Reply:
In Alternative B, the rules adopt the fee levels recommended by the House Committee on the Judiciary in House Report No. 97-542. The Report recognizes that the Office needs to recover a certain amount of fee income over the next three years. The application filing fee is expected to furnish more than 60% of the estimated annual income. It could not be reduced further without endangering operations. The reduction from $200.00 to $175.00 per class was covered to a large extent by higher fees for other services.

Comment:
The philosophy of H.R. 6260 is to recover no more than 100%. Final fees should recover this level and no more.

Reply:
Projecting processing costs three years in advance can never be absolutely accurate. The Office must have sufficient funds to process anticipated workloads under the fees set during fiscal years 1983–1985 when costs are expected to be somewhat higher than present costs.

Comment:
One suggestion involved retaining Part 4 of 37 CFR, at least for the present. Occasional users of the registration system find it to be a readily available reference. Certain information in the forms is available from no other source. The speaker believed the time pressures to implement the fee changes precluded proper consideration of the merits of Part 4.

Reply:
The period for comment on deletion of Part 4 has been extended to August 13, 1982 to allow for additional public comment and internal consideration.

Comment:
The suggestion was made that references to affidavits and oppositions should be eliminated from §2.85(e) as the handling of late filed fees for these items is already covered directly in §§2.101(c), 2.162(d) and 2.167(g).

Reply:
This suggestion was implemented.

Comment:
A suggestion was made that §§2.101(c), 2.162(d) and 2.167(g) dealing with oppositions and affidavits under Section 8 and Section 15 be amended to require payment of all late filed fees within the time period specified in the notification by the Office.

Reply:
All of the sections state that the affidavit or opposition "will not be refused if the required fee(s) . . . are filed in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office." This language is considered sufficient to require payment of all fees or have the opposition, affidavit or declaration refused.

Comment:
One suggestion was made to either cite §2.6 in all sections being changed relative to fees or to cite it in none.

Reply:
Citations of §2.6 have been added to §2.101(c) and § 2.146(b) to conform to §2.162(d) and §2.167(g).

Comment:
It was suggested that the fee for a combined section 8 and 15 affidavit needed to be specified in the rules.

Reply:
Section 2.6 has been changed to provide this combined fee.

DISCUSSION OF SIGNIFICANT DIFFERENCES BETWEEN PROPOSED AND FINAL RULES

A number of changes which were made as a result of the comments received and further review of the proposed rulemaking are identified below.

Deletion of Part 4 has been deferred for further comments by Aug. 13, 1982 (see 47 FR 32458, July 27, 1982). As elimination of Part 4 is not essential to the setting of fees, and does not have to be in place 60 days before implementation, it was decided to ask for further public comment.

Section 2.85(e) has been revised to eliminate the references to oppositions and affidavits. Because the handling of late filed fees for these items is specified elsewhere, these references in §2.85(e) were redundant and confusing.

Both alternatives of §2.6 have been revised to add a fee for a combined affidavit under sections 8 and 15 of the Act. In order to prevent possible confusion by users of the Trademark system, it was included separately.

IMPLEMENTATION OF TRADEMARK FEE REVISION

The effective date of the trademark fee revisions contained in this rulemaking is Oct. 1, 1982.

* * * * *

The changes which will become effective on October 1, 1982, upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, are (1) the rule changes common to Public Law 96–517 and H.R. 6260, and (2) the rule changes under H.R. 6260, which appear in Alternative B. The rule changes common to Public Law 96–517 and H.R. 6260 will become effective on Oct. 1, 1982, whether or not H.R. 6260 is enacted as a Public Law prior to Oct. 1, 1982.

* * * * *

Upon enactment of H.R. 6260 as a Public Law prior to October 1, 1982, the rule changes in Alternative B will become effective on Oct. 1, 1982, in which case the rule changes in Alternative A will not become effective on Oct. 1, 1982.

Any fee which is due and payable on or after Oct. 1, 1982, must be paid in the amount and in accordance with the procedures contained in this rulemaking. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing under §1.8 will be considered to be the date of receipt in the Office. In order to ensure clarity in the implementation a discussion of the implementation of Section 2.6 is set forth below:

IMPLEMENTATION OF SECTION 2.6

Fees set forth in Section 2.6 must be paid in the amounts set forth in this section on or after Oct. 1, 1982. Any additional fees which become due under §2.6 in pending applications on or after Oct. 1, 1982, or which have not been paid prior to Oct. 1, 1982, must be paid in the amounts set forth in this section even though the application was filed prior to Oct. 1, 1982. For example, if an application filed prior to Oct. 1, 1982, is amended on or after Oct. 1, 1982, to include additional classes, the fee set forth in §2.6(a) must be paid per class added.

IMPLEMENTATION OF CERTAIN SECTIONS DEFERRED FOR FURTHER COMMENTS

As a result of additional comments presented during the hearing on the proposed trademark fees, the period for written comments on the deletion of Part 4 has also been extended until August 13, 1982, to provide an additional opportunity for interested persons to comment on this proposed change (see 47 FR 32458, July 27, 1982).

Since it is not essential that this deletion be published by Aug. 2, 1982, it is appropriate to extend the period for comments. No additional proposal will be published and no additional hearing will be held prior to a decision on whether or not to delete Part 4 as proposed.

OTHER CONSIDERATIONS RELATING TO PATENT AND TRADEMARK FEE REVISIONS

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Public Law 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et. seq.*).

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96–354) for several reasons. Public Law 96–517 and H.R. 6260 have both taken into consideration the impact they may have on small entities. The fees under Public Law 96–517 are set to recover 50% of patent and trademark processing costs rather than full costs and generally the rate of increase in the fees is less than that of inflation since the last increase in fees in 1965. Further, the rules implementing Public Law 96–517 take into consideration small entities by setting a lower patent filing fee than issue fee to recover the required level of patent processing costs. The lower filing fee permits a small entity to file a patent application for a relatively low cost and not have to pay the higher balance of fees required to achieve Public Law 96–517 recovery levels until examination is complete and it is known that a patent will issue. Under H.R. 6260 and this rulemaking, small entities would be able to pay reduced fees for filing patent applications and for the issuance and maintenance in force of patents. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, changing existing procedures where they can be simplified.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*, since no significant additional record keeping or reporting requirements are placed upon the public. In fact, some paperwork, especially that related to requests for extensions of time, will be reduced.

List of Subjects in 37 CFR Parts 1 and 2

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Nonprofit organizations, Small businesses, Trademarks.

AMENDMENT OF REGULATIONS

For the reasons indicated above and pursuant to the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, and under Sections 31 and 41 of the Trademark Act of July 5, 1946, 15 U.S.C. §§1113, and 1123, Parts 1 and 2 of Title 37, Code of Federal Regulations, are amended as set forth below.

July 14, 1982.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

* * * * *

[Note: H.R. 6260 became Public Law 97–247 on Aug. 27, 1982. Rules that became effective Oct. 1, 1982 are those rules common to Public Law 96–517 and H.R. 6260 and those set forth in Alternative B. The adopted rules are reproduced in the notice entitled "Revision of Patent and Trademark Fees Confirmation," published at 1022 O.G. 21, which is reprinted immediately following this notice.]

[1021 O.G. 19]

(48) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1 and 2
[Docket No. 2714–129]

Revision of Patent and Trademark Fees Confirmation

Agency: Patent and Trademark Office, Commerce.
Action: Confirmation of rules.
Summary: This document confirms certain rule changes for patent and trademark fees and fee-related procedures which take effect on Oct. 1, 1982. These rule changes implement H.R. 6260 which was enacted as Public Law 97–247 on Aug. 27, 1982.
Effective Date: Oct. 1, 1982.
For Further Information Contact: As to the patent rules contact: R. Franklin Burnett, by telephone at (703) 557–3054 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: R. Franklin Burnett, Rm 3–11A13, Washington, D.C. 20231.

As to the trademark rules contact: Miss Maude Williams, by telephone at (703) 557–2222 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: Miss Maude Williams, Rm. 3–11C17, Washington, D.C. 20231.
Supplementary Information: The Patent and Trademark Office is required by law to publish a notice in the Federal Register of its fees at least 60 days before the effective date thereof (35 U.S.C. 41(g)). Thus, on July 30, 1982 a final rule document was published at 47 FR 33086 setting forth rule changes for patent and trademark fees and procedures which take effect on Oct. 1, 1982. The document was based on the public law in effect at that time, Public Law 96–517, and on H.R. 6260, which was then pending but is now Public Law 97–247. The final rule document published on July 30, 1982, in the Federal Register sets out—

(1) rules that are common to both Pub. L. 96–517 and H.R. 6260 (now Pub. L. 97–247);
(2) Alternative A which contains rule changes implementing Pub. L. 96–517 alone; and
(3) Alternative B which contains rule changes implementing H.R. 6260 (now Pub. L. 97–247).

H.R. 6260 was enacted as Public Law 97–247 on Aug. 27, 1982, and the Patent and Trademark Office hereby confirms that the rule changes common to both Pub. L. 96–517 and H.R. 6260 and Alternative B are those which go into effect on Oct. 1, 1982. The rules under Alternative A are hereby withdrawn. Additional rule changes required by Public Law 97–247 will be made the subject of separate rulemakings.

List of Subjects in 37 CFR Parts 1 and 2

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Nonprofit organizations, Small businesses, Trademarks.

AMENDMENT OF REGULATIONS

For the reasons set out in the preamble, 37 CFR Parts 1 and 2 are confirmed as being amended by the final

rule published on July 30, 1982 at 47 FR 33086 as set forth below.

GERALD J. MOSSINGHOFF,
Sept. 14, 1982. *Commissioner of Patents and Trademarks.*

1. The rule changes made in Alternative A relating to patents which begin at 47 FR 33107 and in Alternative A relating to trademarks which begin at 47 FR 33112 are hereby withdrawn.
2. Confirmed as effective Oct. 1, 1982 are the rule changes published July 30, 1982 common to Public Law 96-517 and H.R. 6260 (now Public Law 97-247) and Alternatives B. The rule changes relating to patents common to Public Law 96-517 and H.R. 6260 (now Public Law 97-247) were published on July 30, 1982 at 47 FR 33099. The rule changes relating to patents under Alternative B were published at 47 FR 33108. The rule changes relating to trademarks common to Public Law 96-517 and H.R. 6260 (now Public Law 97-247) were published on July 30, 1982 at 47 FR 33111. The rule changes relating to trademarks under Alternative B were published at 47 FR 33112. Corrections to the July 30, 1982 publication were published on Aug. 4 and 5, 1982 at 47 FR 33688 and 33959.

(Text of adopted rules appears in 37 CFR, revised July 1, 1983.)

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(49) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1, 3 and 4
[Docket No. 2827-167]

Revision of Patent and Trademark Fees

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent and trademark cases to establish procedures for the payment of fees under §41 (a) and (b) of Title 35, United States Code, which are reduced by 50 per centum for independent inventors and nonprofit organizations as required by the public law resulting from H.R. 6260. This action is necessary at this time in order that the procedures for paying the reduced fees will be effective on Oct. 1, 1982, the effective date of the changes in the amounts of Patent and Trademark Office fees established by the public law resulting from H.R. 6260. This final rule also deletes Parts 3 and 4 which contain outdated sample forms and corrects a reference to a section which appears in §1.451.
Effective Date: Oct. 1, 1982.
For Further Information Contact: As to the patent rules contact R. Franklin Burnett by telephone at (703) 557-3054 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: R. Franklin Burnett, Rm. 3-11A13, Washington, D.C. 20231.

As to the trademark rules contact Miss Maude Williams by telephone at (703) 557-2222 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: Miss Maude Williams, Room 3-11C17, Washington, D.C. 20231

Supplementary Information: Notices of proposed rulemaking relating to the revision of patent and trademark fees were published in the *Federal Register* on June 28, 1982, at 47 FR 28042-28065 and in the *Official Gazette* on June 29, 1982, at 1019 O.G. 57-120. Oral hearings were held on July 9, 1982. Full consideration has been given to all of the letters, statements, and testimony received at the time. A final rule on "Revision of Patent and Trademark Fees" was published on July 30, 1982 at 47 FR 33086-33112 with corrections in the printing thereof being published on Aug. 4, 1982, at 47 FR 33688 and Aug. 5, 1982, at 47 FR 33959. The final rule was also published in the Official Gazette on Aug. 10, 1982, at 1021 O.G. 19-94. In view of comments received at the hearings, additional time for comment on the rules covered by this change was given until Aug. 13, 1982. The notice extending the time for comment was published on July 27, 1982 at 47 FR 32458.

This final rule is being adopted as soon as possible after the enactment of the public law resulting from H.R. 6260. The Patent and Trademark Office has determined that the requirement of 5 U.S.C. 553 (d) for publication not less than 30 days before its effective date does not apply to this final rule since it will reduce patent fees for independent inventors and nonprofit organizations.

Objectives of Rule Changes

These rule changes are designed to implement the Patent and Trademark Office fees and procedures which are provided for by the public law resulting from H.R. 6260.

Public Law Resulting From H.R. 6260

The public law resulting from H.R. 6260 provides that funds available under the act "shall be used to reduce by 50 per centum the payment of fees under section 41 (a) and (b) of Title 35, United States Code" by independent inventors, small business concerns, and nonprofit organizations. The public law resulting from H.R. 6260 gives the Commissioner authority to establish regulations defining independent inventors and nonprofit organizations. The public law resulting from H.R. 6260 defines small business concerns by reference to §3 of the Small Business Act and regulations established by the Small Business Administration. This rulemaking establishes regulations defining independent inventors and nonprofit organizations. The Small Business Administration is establishing the definition of a small business concern for the purpose of paying reduced fees under the public law resulting from H.R. 6260. This rulemaking also establishes the procedures which will be followed by independent inventors and nonprofit organizations when paying the reduced fees.The procedures to be followed by small business concerns when paying the reduced fees will be established in a separate final rule.

Discussion of Specific Sections

The following sections are changed by this final rule, effective Oct. 1, 1982:

Section 1.9, as amended, adds paragraphs (c), (e), and (f) which define "independent inventor" and "nonprofit organizations" as used in Title 37, Code of Federal Regulations, Chapter I. Each of these along with "small business concern" is identified as a "small entity" for purposes of paying fees which are set under §41 (a) and (b) of Title 35, United States Code, as amended by the public law resulting from H.R. 6260. Paragraph (d) of §1.9 relates to the definition of small business concern which is being established by the Small Business Administration. Accordingly, proposed paragraph 1.9(d) is not being promulgated at this time.

The public law resulting from H.R. 6260 authorizes the Commissioner to establish regulations defining independent inventors and nonprofit organizations. Section 1.9(c) defines an independent inventor as any inventor who (1) has not assigned, granted, conveyed, or licensed, and (2) is under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who could not likewise be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization. Once an individual sole inventor, or one of several joint inventors, has assigned, granted, conveyed, or licensed, or comes under an obligation to assign, grant, convey, or license, any rights to the invention to anyone who could not likewise obtain status as a small entity, the inventor(s) will no longer be entitled to pay fees in the amounts established for an independent inventor (§1.9(c)). Section 1.9 (c) will permit an individual inventor to make an assignment, grant, conveyance, or license of partial rights in the invention to another individual or individuals who could qualify as an independent inventor or inventors if they had made the invention. In addition,§1.9 (c) will permit an individual inventor to make an assignment, grant, conveyance, or license of partial rights in the invention to a small business concern or nonprofit organization. Under the circumstances described in the previous two sentences the individual inventor could still qualify as an independent inventor. However, if the independent inventor assigned, granted, conveyed, or licensed, or came under an obligation to assign, grant, convey, or license, any rights to the invention to any individual or organization which could not qualify as a small entity (§1.9 (f)), then the inventor would no longer qualify as an independent inventor.

Proposed section 1.9 (d) relating to the definition of a small business concern is not being promulgated at this time.

Section 1.9(e) defines a nonprofit organization by utilizing and broadening the definition contained in 35 U.S.C. 201 (i). The term "university or other institution of higher education" as used in §1.9 (e) means an educational institution which (1) admits as regular students only persons having a certificate of graduation from a school providing secondary education, or the recognized equivalent of such a certificate, (2) is legally authorized within the jurisdiction in which it operates to provide a program of education beyond secondary education, (3) provides an educational program for which it awards a bachelor's degree or provides not less than a two-year program which is acceptable for full credit toward such a degree, (4) is a public or other nonprofit institution, and (5) is accredited by a nationally recognized accrediting agency or association. The definition of "university or other institution of higher education" as set forth herein essentially follows the definition of "institution of higher education" contained in 20 U.S.C. 1141(a). Institutions which are strictly research facilities, manufacturing facilities, service organizations, etc., are not intended to be included within the term "other institution of higher education" even though such institutions may perform an educational function or publish the results of their work.

Section 1.9(f) identifies an independent inventor, a small business concern, or a nonprofit organization as a "small entity" for purposes of paying fees set under §41 (a) and (b) of Title 35, United States Code, as amended by the public law resulting from H.R. 6260. Fees established under §41 (c) or (d) of Title 35, United States Code, will not be reduced for small entities since such a reduction is not permitted or authorized by the public law resulting from H.R. 6260. Paragraphs (c), (e), and (f) of §1.9 should be read together with §§1.27 and 1.28 which deal with establishing status as a small entity and the effect thereof.

New §1.27 provides in paragraph (a) that any person seeking to establish as a small entity, as defined in §1.9 (f) for the purpose of paying reduced fees, must file a statement to that small entity. Paragraph 1.27(b) provides specifically for inventors filing statements claiming status as independent inventors. Paragraph 1.27 (c) relating to claiming status as a small business concern is not being promulgated at this time, but will be subject of a separate final rule. Paragraph 1.27 (d) provides for claiming status as a nonprofit organization. Under §1.27, as long as all of the rights remain in small entities, the fees established for a small entity can be paid. This includes circumstances where the rights were divided between an independent inventor, a small business concern and a nonprofit organization or any combination thereof.

New §1.28 provides guidance as to the effect of failure to establish, or notify the Office of any change from, small entity status. Paragraph 1.28 (a) provides that once status as a small entity has been established in an application or patent, without the filing of a further verified statement pursuant to §1.27, unless the Office is notified of a change in status. Under paragraph 1.28 (a), status as a small entity in one application or patent does not affect any other application or patent except in applications filed under §1.60 where a reference is made to a verified statement in a parent application. Paragraph 1.28 (b) requires that notification of any change in status resulting in loss of entitlement to small entity status be filed in the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. Section 1.28 also provides guidance as to the effect of improperly establishing status as a small entity. The intent of the reduced fees for small entities is to soften the impact of the fee increases under §41(a) and (b) of Title 35, United States Code, as such sections are amended by the public law resulting from H.R. 6260, upon those who are least able to absorb the increased fees without overall damage to their ability to participate in the patent system through the filing, issuing and maintaining of patents. Accordingly, any attempt to improperly establish status as a small entity will be viewed as a serious matter by the office and paragraph 1.28(d) indicates that any attempt to fraudulently establish status as a small entity or pay fees as a small entity will be considered as a fraud practiced or attempted on the Office. In addition, improperly and through gross negligence establishing status as a small entity or paying fees as a small entity will be considered as a fraud practiced or attempted on the Office. Normally, the Office will not question a claim to status as a small entity. However, if the Office must resolve such an issue in a question arising before it, the Office will look to the actual or practical status ot the individual or oganization claiming status as a small entity rather than the professed or apparent status.

Section 1.451, paragraph (b), is amended to correct a reference to another section of the regulations.

Parts 3 and 4 are removed to eliminate all of the patent and trademark forms from the Code of Federal Regulations. The Patent and Trademark Office has prepared a booklet entitled "Patent and Trademark Forms Booklet" which is available for sale to the public from the Superintendent of Documents and which includes full size copies of substantially all the forms in the Code of Federal Regulations in view of the difficulty of keeping such forms is not mandatory.

Discussion of Significant Differences Between Proposed and Final Rules

A number of changes which have been made to §§1.9, 1.27 and 1.28 as a result of the comments received and further review of the proposed rulemaking are identified below.

Paragraph (c) of §1.9 has been changed from that proposed to simplify the definition by removing the words "including (i) the right to make, use, or sell the invention, and (ii) the right to exclude others from making, using, or selling the invention". No change in substance is intended by removing these words since the phrase "any rights in the invention" obviously is inclusive of all rights regardless of how they are, or would be, transferred. The words "or otherwise" have also been removed to simplify the definition without a change in substance.

Paragraph (d) of §1.9 is not being promulgated by this rule change.

Paragraph (e) of §1.9 is changed from that proposed by adding the words "located in any country" in item (e) (1) to clarify the fact that a university or other institution of higher education can qualify regardless of location. Paragraph (e) is also changed from that proposed by adding an item (4) to clarify that a nonprofit organization if it could qualify as a nonprofit organization under item (2) or (3) of paragraph (e) "if it were located in this country." Thus, under paragraph (e) of §1.9 nonprofit organizations will be treated the same for purposes of paying fees regardless of location.

Paragraph (a) of §1.27 has been changed from that proposed by substituting the words "any fee paid as a

small entity". This change is intended to clarify the fact that a verified statement is not required with every fee.

Paragraph (b) of §1.27 has been changed from that proposed to clarify who is to file the verified statement. The verified statement for a small business concern or nonprofit organization is to be filed by "the owner of the small business concern, or an official of the small business concern or nonprofit organization empowered to act on behalf of the small business concern or nonprofit organization . . ." The term "official" as used in paragraph (b) is intended to include any officer, employee, or part-owner empowered to act on behalf of a small business concern or nonprofit organization.For example, an officer or employee of a corporation empowered to act for the corporation by its board of directors would be qualified to sign such a verified statement.

Paragraph (c) of §1.27 relating to claiming status as a small business concern is not being promulgated at this time, but will be the subject of a separate final rule.

Paragraph (d) of §1.27 has been changed from that proposed in the same manner as paragraph (b) of §1.27 has also been changed from that proposed by adding a reference to §1.9 (e)(4).

Paragraph (a) of §1.28 has been changed from that proposed by adding the words "or patent" in the first and third sentences since the failure to establish status as a small entity could occur in a patent as well as in an application. An exception to the requirement for a verified statement has also been inserted into paragraph (a) of §1.28 for applications filed under §1.60 where the status as a small entity has been established in a parent application and is still proper. Under this change in paragraph (a) of proposed §1.28, the application filed under §1.60 "must include a reference to a verified statement in a parent application if status as a small entity is still proper and desired."

Paragraph (b) of §1.28 has been completely rewritten from that proposed to remove the requirement that the notification of a change in status resulting in loss of entitlement to small entity status must be filed prior to paying the next fee due. Instead, paraggraph (b) of §1.28 provides that after establishment of small entity status, "fees as a small entity may thereafter be paid in that application or patent without regard to a change in status until the issue is due or any maintenance fee is due." Paragraph (b) of §1.28 is also changed from that proposed by removing the sentence stating that payment of any fee as a small entity serves "as a representation that such payment as a small entity is proper at the time the payment is made." This change does not sanction the payment of improper fees, but is no longer necessary in view of another change in paragraph (b) which specifically provides that notification of any change in status resulting in loss of entitlement to small entity status "must be filed in the application or patent prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate pursuant to §1.9." The effect of the changes to paragraph (b) of §1.28 is to permit status to be established and then checked only (1) at the payment of the issue fee and (2) at the time of payment of each maintenance fee. This means that only four checks are required during the pendency and term of a patent after initial establishment of small entity status if such establishment was prior to payment of the issue fee. The last sentence of paragraph (b) has been changed from that proposed by inserting the words "of change in status" after "notification" for clarity.

Paragraph (c) of §1.28 has been changed from that proposed to require a verified statement explaining how the error in good faith occurred only in situations where the error occurred. This change from paragraph (c) as proposed will reduce paperwork and will provide a three-month grace period to correct errors with no explanations required for correction during that three-month period. The change has also been made to alleviate concerns about paragraph (d) of §1.28 which is being adopted as proposed.

Response to Comments on the Patent Rules

Specific comments were received on a number of the sections. All of the comments, including the oral testimony and the written comments, were considered in adopting the changes set forth herein.

Written comments on the patent rules and forms affected by this final rule were received from three patent law groups and thirteen individuals. The three patent law groups were (1) the American Patent Law Association; (2) the Patent, Trademark, and Copyright Section of the Virginia State Bar; and (3) the Patent, Trademark and Copyright Law Section of the Bar Association of the District of Columbia.

Oral comments were presented at the hearing on behalf of two patent law groups.

The comments appear below along with replies thereto.

Comment:

One comment suggested that the definition of "independent inventor" be simplified.

Reply:

The definition of "independent inventor" has been simplified without a change in substance by removing the words "including (i) the right to make, use, or sell the invention, and (ii) the right to exclude others from making, using, or selling the invention."

Comment:

One comment suggested that there is no need to include any more than a simplified statement that a "non-profit organization includes a university or other institution of higher education"

Reply:

The suggestion has not been adopted since it is the intent of the rules to delireate as clearly as possible what organizations can qualify as nonprofit organizations without having to expend undue resources deciding each request on a case-by-case basis.

Comment:

One comment suggested that §1.9(e) discriminates against foreigners and thus violates the principle of national equality set forth in the Stockholm text of the Paris Convention for the Protection of Industrial Property.

Reply:

Section 1.9(e), as promulgated, defines a nonprofit organization in such a way that it is clear that foreigners are not excluded.

Comment:

One comment questioned whether or not government organizations can qualify as nonprofit organizations and more specifically, whether or not a government research facility can qualify under the broad definition of a nonprofit scientific or educational organization. Another comment recommended that §1.9(e) be expanded to include the U.S. Government in the definition of a "nonprofit organization."

Reply:

Government organizations as such, whether domestic or foreign, cannot qualify as nonprofit organizations as defined in §1.9(e). Section 1.9(e) was based upon 35 U.S.C. 201(i), as established by Public Law 96-517. The limitation to "an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c)(3)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a))" would by its nature exclude the U.S. government and its agencies and facilities, including research facilities and government corporations. State and foreign governments and governmental agencies and facilities would be similarly excluded. Section 1.9(e) is not intended to include within the definition of a nonprofit organization government organizations of any kind located in any country. A university or other institution of higher education located in any country would qualify, however, as a "nonprofit organization" under §1.9(e) even though it has some government affiliation since such institutions are specifically included.

Comment:

One comment was directed to, and opposed, Public Law 96-517 and H.R. 6260 rather than the specific provisions of §§1.9, 1.27 and 1.28 on the ground that the concept of a self-supporting agency is ill-conceived, shortsighted and wrong.

Reply:

Public Law 96-517 and H.R. 6260 are not issues for consideration in this rule change.

Comment:

One comment asserted that the imposition of different fees depending upon the status of an applicant is unwise, unworkable, and will not "improve the efficiency of the Patent Office", while another comment urged the Office to "disavow the proposal for a two-tier fee system and adopt a different approach to assuring that patent and trademark fees are set so that individual inventors and small businesses can continue to obtain the protection of the patent and trademark system." Another comment supported the two-tier fee system, particularly as related to universities.

Reply:

The imposition of different fees is a legislative mandate imposed by the public law resulting from H.R. 6260 and is not an issue for consideration in this rule change.

Comment:

Four comments expressed concern that small entity status is required to be confirmed each time a fee as a small entity is paid. Alternative procedures which involve (1) confirming status at the time of filing and at the time the issue fee is paid, or (2) allowing a statement of status to hold for a period of time were recommended.

Reply:

The last sentence in §1.27(a) states that "[s]uch a verified statement need only be filed once in an application or patent and remains in effect until changed." It was not intended that such statements would be required each time a fee is paid. In order to clarify §1.27(a), the first sentence has been changed to require the statement prior to or with the first fee paid as a small entity. Thereafter, notice is only required where a change in status occurs. In addition, §1.28(b) has been rewritten to provide that "[o]nce status as a small entity has been established in an application or patent, fees as a small entity may thereafter be paid in that application or patent without regard to a change in status until the issue fee is due or any maintenance fee is due."

Comment:

One comment suggested that a paragraph 1.27(e) be added which would require confirmation of small entity status at the time of paying the patent issue fee and each maintenance fee and that this be done by a statement which designates the applicant's small entity status as of the close of the last fiscal year next preceding the date of the statement.

Reply:

The suggested paragraph has not been added. However, paragraph (b) of §1.29 has been completely rewritten to permit status to be established and then checked only (1) at the payment of the issue fee and (2) at the time of payment of each maintenance fee. Instead of requiring papers to be filed confirming status as suggested in the comment, the rules as adopted require that "[n]otification of any change in status resulting in loss of entitlement to small entity status must be filed in the application or patent prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate pursuant to §1.9." Paragraph (b) of §1.28, as promulgated, is considered preferable to the suggested paragraph (e) of §1.27 since it will eliminate the filing of a confirming statement where there has been no change in status as a small entity. This reduces unnecessary paperwork.

Comment:

One comment suggested that verified statements of small entity status need not be filed in Rule 60 applications.

Reply:

The suggestion was adopted and is reflected by the change in §1.28(a). In such applications, it will be sufficient to include a reference to a verifie. statement establishing small entity status in a parent application if status as a small entity is still proper and desired.

Comment:

One comment suggested that proposed paragraph 1.28(b) be amended by inserting the words "believed to be" after "small entity is" in the second sentence.

Reply:

Paragraph (b) of §1.28 as promulgated does not contain the sentence to which the suggestion is directed.

Comment:

One comment suggested that paragraph (c) of §1.28 be amended by deleting the word "verified" so that a statement explaining how an error in good faith occurred can be made "on the basis of information and belief."

Reply:

The suggestion has not been adopted. However, paragraph (c) of §1.28 as promulgated permits the correction of errors without a verified statement if the correction is accomplished within three months after the date the error occurred.

Comment:

Three comments expressed concern about the provision dealing with fraud on the Patent and Trademark Office because of some questionable act in connection with paying fees as a small entity and indicated that some persons have raised a question as to the Office's authority to designate the payment of a lesser fee as fraud. The comments suggested that proposed §1.28 be withdrawn and turned over to an ad hoc group of Patent and Trademark Office officials and practitioners for immediate examination and timely comment.

Reply:

The period for comments was extended until Aug. 13, 1982, as an alternative to, and in response to, the suggestion that §1.28 be withdrawn and turned over to an ad hoc committee. The extended period for comments has now expired and all comments which have been received have been carefully considered. In response to the statement that some persons have raised a question regarding the Office's authority to designate payment of a lesser fee as fraud, no authority has been cited which would establish or suggest that the Office does not have the authority to adopt this section. Paragraph (d) of §1.28 has been strictly limited to those situations in which there is an attempt to fraudulently establish entity, or improperly and through gross negligence establish status or pay fees as a small entity. Paragraph (d) of §1.28 is clearly within the rule-making authority provided to the Commissioner pursuant to 35 U.S.C. 6 to protect the integrity of the system established by the public law resulting from H.R. 6260, whereby fees are reduced for small entities. In order to alleviate the concerns expressed about paragraph (d) of §1.28, paragraph (c) of §1.28 has been changed from that proposed to require a verified statement explaining how the error in good faith occurred only in situations where the error is not corrected within three months of the date on which the error occurred. This three-month grace period to correct errors with no explanations required for correction during that three-month period should reduce the concern about paragraph (d) of §1.28.

Comment:

One comment by an attorney (1) objected to and requested removal of the second sentence of §1.28(d) because he has to rely on the information provided by the client and does not have the facilities to check the reliability of information the client provides relating to the client's status as a small entity, and (2) raised the question as to how much investigation any attorney or other individual must make in order to avoid being guilty of "gross negligence" under §1.28(d).

Reply:

The rules do not authorize an attorney to sign a verified statement establishing status as a small entity on be-

half of a client. The client has to sign the verified statement. Paragraph (b) of §1.27 requires that any verified statement filed on behalf of an independent inventor must be signed by the independent inventor except as provided in §§1.42, 1.43, or 1.47. Paragraph (d) of §1.27 requires that any verified statement filed on behalf of a nonprofit organization must be signed by an official of the nonprofit organization empowered to act on behalf of the organization. The intent of paragraphs (b) and (d) of §1.27 is that the verified statement be signed by the person in the best position to know the facts as to whether or not status as a small entity can be properly established. Insofar as the attorney's irresponsibilities and duty to investigate are concerned, these do not differ from those presently owed the Office under §§1.56, 1.346, and 1.555.

Comment:

One comment suggested that paragraph (d) of §1.28 be replaced by a provision under which a "stiff fine" would be assessed against "a wrongdoer who has not paid fees in good faith."

Reply:

The suggestion has not been adopted. Assessing a fine as the only penalty against "a wrongdoer who has not paid fees in good faith" might tend to encourage the payment of incorrect fees on the theory that it is unlikely that such a matter would be brought to the attention of the Office.

Comment:

Three comments opposed the proposed deletion of Part 3 for the reasons that (1) it is useful to have an up-to-date set of forms and (2) there does not seem to be a pressing need to delete the forms.

Reply:

The Patent and Trademark Office has prepared a booklet entitled "Patent and Trademark Forms Booklet" which includes full size copies of substantially all of the forms in Part 3. Since the forms currently in Part 3 are not "up-to-date" as was suggested in the comment, no present need is seen to maintain Part 3.

Response to Comments on the Trademark Rules

Specific comments were received on the proposed deletions of Part 4. All of the comments included in the written submissions and the oral testimony were considered.

Written comments were received from four individuals. Oral comments restating previously submitted written comments on Part 4 were presented by one individual on behalf of his law firm.

These comments appear below along with replies thereto.

Comment:

One comment stated that there are rules in Part 4 which are not set forth elsewhere. Such guidelines and information include, among others, the types of commerce on which an application may be based and a requirement for the use of bond paper for typed drawings.

Reply:

Part 4 does not really carry the effect of rules because the forms are not mandatory, but are merely illustrative. The information referred to by this individual can be found elsewhere, such as in the Trademark Manual of Examining Procedure. Furthermore, despite the fact that the forms do not carry the force of rules, any correction or modification to them requires the cumbersome and time-consuming processes that are associated with a rules change.

Comment:

Several comments reflected the opinion that some attorneys, particularly those who do not specialize in trademark matters, may rely on the forms that appear in Part 4. It was believed that these individuals may not have or be aware of the compilation of forms identified as the "Patent and Trademark Office Forms Booklet." In the absence of such forms in Part 4, these individuals may devise their own application formats. Such a practice would result in increased informalities which, in turn, would result in unnecessary correspondence and delayed prosecution. In addition, the commenters believed that the number of written and oral inquiries to the Office of the Director of the Trademark Examining Operation would increase dramatically.

Reply:

The Office of the Director of the Trademark Examining Operation currently has a general information telephone line to answer inquiries and to accept requests for trademark application forms and related literature. While the Office of the Director indicates the availability of the forms booklet to many callers, copies of the appropriate trademark application form are sent to those individuals who request them. It is more likely that an individual who is unaware of the trademark application form would call the Office of the Director to request an application form than create one for the particular purpose.

Comment:

One individual, aware of the Office's plans for automation of the trademark program, saw the present deletion of the forms to be inappropriate. This individual felt that the deletion of the forms at this point would signal to the user community that the Office no longer had any interest in receiving applications in any particular format. To take such a position within a year or two of the introduction of a rigidly standardized application format was, in the opinion of this commenter, unwise. The adoption of a machine-readable application form would require greater, rather than diminished, reliance on a prescribed format.

Reply:

Within the next year or two, the Office will begin experimenting with the use of optical character recognition (OCR) equipment to automate the current data capture processes. Trademark application formats that are compatible with this equipment are likely to require special sizing and printing and, as such, are not acceptable for reduced size printing in the Code of Federal Regulations. If the existing forms were to be maintained in Part 4, they would remain available for use by applicants. As a result, the implementation of the new standardized application formats would be made more difficult.

Comment:

One commenter believed that since the next reprinting of Volume 37 of the Code of Federal Regulations will be in July, 1983, there is no pressing need to eliminate Part 4 at this time. This individual felt that users of the trademark registration system should be given additional opportunity to consider the significance of removing Part 4.

Reply:

Only four comments have been received on the deletion of Part 4. The elimination of Part 4 at this time will guarantee that the forms do not appear in the 1983 reprinting of the CFR. Of course, they will appear in the 1982 version of the CFR booklet and will be available until the new edition is published. In this matter, future access to these forms will be limited and those requiring help may contact the Office and receive the proper trademark forms.

Implementation of §§1.9, 1.27, and 1.28

Status as a small entity can be established in any application or patent for which a fee is due on or after Oct. 1, 1982, and in which small entity status is available and desired.

Other Considerations Relating to Patent and Trademark Fee Revisions

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conversation of energy resources.

This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Public Law 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et. seq.*).

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L 96-354) for several reasons. The public law resulting from H.R. 6260 has taken into consideration the impact the increase in fees may have on small entities. Under the public law resulting from H.R. 6260 and this rulemaking, small entities will be able to pay reduced fees for filing patent applications and for the issuance and maintenance in force of patents. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, changing existing procedures where they can be simplified.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse ju effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*, since no significant additional record keeping or reporting requirements are place upon the public.

List of Subjects in 37 CFR Parts 1, 3 and 4

Administrative practice and procedure, Colleges and universities, Courts, Fraud, Inventions and patents, Nonprofit organizations, Small businesses, Trademarks.

(Text of adopted rules appears in 37 CFR, revised July 1, 1983.)

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Aug. 26, 1982.

[1022 OG 29]

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(50) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 2909-187]

Revision of Patent and Trademark Fees

Agency: Patent and Trademark Office, Commerce
Action: Final rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent and trademark cases to establish a definition and procedures for the payment of fees under section 41(a) and (b) of Title 35, United States Code, by small business concerns as required by Pub. L. 97-247. This action adopts the definition of a "small business concern" for purposes of paying patent fees established by the Small Business Administration and is necessary at this time in order that the procedures for paying reduced fees will be effective on Oct. 1, 1982, the effective date of the changes in the amounts of Patent and Trademark Office fees established by Pub. L. 97-247.
Effective Date: Oct. 1, 1982
For Further Information Contact: R. Franklin Burnett by telephone at (703) 557-3054 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: R. Franklin Burnett, Room 3-11A13, Washington, D.C. 20231.
Supplementary Information: A notice of proposed rulemaking was published in the Federal Register on June 28, 1982, at 47 FR 28042-28063 and in the *Official Gazette* on June 29, 1982, at 1019 O.G. 57-120. Oral hearings were held on July 9, 1982. Full consideration has been given to all of the letters, statements, and testimony received at the time. A final rule on "Revision of Patent and Trademark Fees" was published on July 30, 1982 at 47 FR 33086-33112 with corrections in the printing thereof being published on Aug. 4, 1982, at 47 FR 33688 and on Aug. 5, 1982 at 47 FR 33959. The final rule was also published in the *Official Gazette* on Aug. 10, 1982, at 1021 O.G. 19-94. In view of comments received at the hearings, additional time for comment on certain rules, including those covered by this change, was given until Aug. 13, 1982. The notice extending the time for comment was published on July 27, 1982 at 47 FR 32458. A final rule relating to definitions of "independent inventor" and "nonprofit organizations" was published on Sept. 10, 1982 at 47 FR 40134-40140.

Objectives of Rule Changes

These rule changes are designed to implement the Patent and Trademark Office fees and procedures which are provided for by Pub. L. 97-247.

Public Law 97-247

Pub. L. 97-247, signed Aug. 27, 1982, provides that funds available under the act "shall be used to reduce by 50 per centum the payment of fees under section 41(a) and (b) of title 35, United States Code" by independent inventors, small business concerns, and nonprofit organizations. The Commissioner has established regulations defining independent inventors and nonprofit organizations. Pub. L. 97-247 defines small business concerns by reference to Section 3 of the Small Business Act and regulations established by the Small Business Administration. The Small Business Administration has now established the definition of a small business concern for the purpose of paying reduced fees under Pub. L. 97-247. That definition is hereby incorporated into the patent rules of practice in §1.9(d). This rulemaking also establishes the procedures which will be followed by small business concerns when paying the reduced fees.

Discussion of Specific Sections

The following sections are changed by this final rule, effective Oct. 1, 1982:

Section 1.9, as amended, adds paragraph (d) which defines small business concern as used in Title 37, Code of Federal Regulations, Chapter I. A small business concern is identified as a "small entity" for purposes of paying fees which are set under section 41(a) and (b) of Title 35, United States Code, as amended by Pub. L. 97-247.

Section 1.9(d) defines a small business concern by reference to and incorporation of §121.3-18 of Title 13, Code of Federal Regulations. A small business concern is defined therein as any business concern (1) whose number of employees, including those of its affiliates, does not exceed 500 persons and (2) which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who could not be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section. The section further defines affiliates of concerns and defines also the terms "employees" and "number of employees." Concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both. The number of employees a business concern has is determined by counting the number of persons of the concern and its affiliates employed on a full-time, part-time or temporary basis during the previous fiscal year of the concern and of its affiliates. The number of employees is the average over the fiscal year of the persons employed during each of the pay periods of the fiscal year. Business concerns lo-

cated in any country which meet the small business definition and which comply with the applicable procedures can qualify as a "small business concern". Under the definition, a small business concern would no longer qualify as a small business concern if any rights were assigned to any individual or concern which could not qualify as a small entity pursuant to §1.9(f), or if the concern came under an obligation to assign any rights to any individual or concern which could not qualify as a small entity.

Section 1.9(d) also incorporates paragraph (b) of 13 CFR 121.3–18 which provides for appeals to the Small Business Administration from Patent and Trademark Office adverse initial size determinations.

Paragraph 1.27(c) provides for claiming status as a small business concern. Any person seeking to establish status as a small entity, for the purpose of paying reduced fees, must file a statement to that effect prior to or with the payment of the first fee paid as a small entity. Under §1.27, as long as all of the rights remain in small entities, the fees established for a small entity can be paid. This includes circumstances where the rights were divided between an independent inventor, a small business concern and a nonprofit organization or any combination thereof.

A number of changes which have been made to §§1.9 and 1.27 as a result of the comments received and further review of the proposed rulemaking are identified below.

Paragraph (d) of §1.9 has been changed from that proposed so as to incorporate into §1.9(d), the definition established by the Small Business Administration in §121.3–18 of Title 13, Code of Federal Regulations. The definition differs from that proposed in specifying the number of employees constituting a small business concern and specifying that the concern must be one which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey or license any rights in the invention to any person or concern which could not be classified as an independent inventor, small business concern, or nonprofit organization.

Paragraph (c) of §1.27 has been changed from that proposed to clarify who is to file the verified statement. The verified statement for a small business concern is to be signed by "the owner or an official of the small business concern empowered to act on behalf of the concern." The term "official" as used in paragraph (c) is intended to include any officer, employee, or part-owner empowered to act on behalf of a small business concern. For example, an officer or employee of a corporation empowered to act for the corporation by its board of directors would be qualified to sign such a verified statement.

Response to Comments on the Patent Rules

Specific comments were received on a number of the sections. All of the comments, including the oral testimony and the written comments, were considered in adopting the changes set forth herein.

Written comments on the rules affected by this final rule were received from three patent law groups and a number of individuals. The three patent law groups were (1) the American Patent Law Association; (2) the Patent, Trademark, and Copyright Section of the Virginia State Bar; and (3) the Patent, Trademark and Copyright Law Section of the Bar Association of the District of Columbia.

Oral comments were presented at the hearing on behalf of two patent law groups.

The comments appear below along with replies thereto.

Comment

Two comments urged that in view of the "exceedingly complex" definitions of a "small business" in 13 CFR 121.3, the patent system and those associated with it would be best served by setting forth clear guidelines as to whether or not a business qualifies as a small business without reference to the Small Business Act and without incorporation by reference of "the too many pages of SBA regulatory definition."

Reply

Pub. L. 97–247 specifically refers to section 3 of the Small Business Act and regulations established by the Small Business Administration for determining whether or not a business concern qualifies as a small business concern. Pub. L. 97–247 therefore does not permit the establishment of guidelines without reference to the Small Business Act and regulations established by the Small Business Administration. Section 1.9(d), however, does incorporate the definition as established in §121.3–18 of Title 13, Code of Federal Regulations. This will enable persons to utilize §1.9(d) without also referring to a copy of Title 13, CFR.

Comment

One comment argued that §1.27 should be corrected or clarified to indicate that a small business concern would be entitled to the 50 percent fee reduction even though it may grant a non-exclusive or even an exclusive license to some non-small entity.

Reply

The suggestion has not been adopted. Section 1.27 requires that the concern qualify as a small business concern as defined in §1.9(d). Section 1.9(d) defines a small business concern by incorporating 13 CFR 121.3–18, which in turn defines a small business concern as one not exceeding a particular size "which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section." The intent of both 13 CFR 121.3–18 and 37 CFR 1.9(d) and 1.27(c) is to limit the payment of reduced fees under section 41 (a) and (b) of Title 35, United States Code, to those situations in which all of the rights in the invention are owned by small entities, i.e., independent inventors, small business concerns, or nonprofit organizations. To do otherwise would be clearly contrary to the intended purpose of the legislation which contains no indication that fees are to be reduced in circumstances where rights are owned by non-small entities. Adopting the suggestion might, for example, permit a non-small entity to transfer patent rights to a small business concern which would pay the reduced fees and grant an exclusive license to the non-small entity.

Comment

One comment suggested that the specific Small Business Administration regulations which are applicable be specified in §1.9(d).

Reply

The definition of a small business concern as established by the Small Business Administration is now incorporated into §1.9(d).

Implementation of §§1.9 and 1.27

Status as a small entity can be established in any application or patent for which a fee is due on or after Oct. 1, 1982, and in which the individual inventor, small business concern, or nonprofit organization meets the qualifications established for small entity status.

Other Considerations Relating to Patent and Trademark Fee Revisions

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et seq.*).

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96–354) for several reasons. Pub. L. 97–247 has taken into consideration the impact the increase in fees may have on small entities. Under Pub. L. 97–247 and this rulemaking, small entities will be able to pay reduced fees for filing patent applications and for the issuance and maintenance in force of patents.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no significant additional record keeping or reporting requirements are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Small businesses.

Amendment of Regulations

For the reasons indicated above and pursuant to the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, and Pub. L. 97–247, Part 1 of Title 37, Code of Federal Regulations, is amended as set forth below.

PART 1—RULES OF PRACTICE IN PATENT CASES

1. Section 1.9 is amended by adding a new paragraph (d) to read as follows:

§1.9 Definitions.

* * * * *

(d) A small business concern as used in this chapter means any business concern as defined by the Small Business Administration in 13 CFR 121.3–18, published on September 30, 1982 at 47 FR 43273. For the convenience of the users of these regulations, that definition states:

§121.3–18 Definition of small business for paying reduced patent fees under Title 35, U.S. Code

(a) Pursuant to Pub. L. 97–247, a small business concern for purposes of paying reduced fees under 35 U.S. Code 41 (a) and (b) to the Patent and Trademark Office means any business concern (1) whose number of employees, including those of its affiliates, does not exceed 500 persons and (2) which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section. For the purpose of this section concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both. The number of employees of the business concern is the average over the fiscal year of the persons employed during each of the pay periods of the fiscal year. Employees are those persons employed on a full-time, part-time or temporary basis during the previous fiscal year of the concern.

(b) If the Patent and Trademark Office determines that a concern is not eligible as a small business concern within this section, the concern shall have a right to appeal that determination to the Small Business Administration. The Patent and Trademark Office shall transmit its written decision and the pertinent size determination file to the SBA in the event of such adverse determination and size appeal. Such appeals by concerns should be submitted to the SBA at 1441 L Street, NW., Washington, D.C. 20416 (Attention: SBA Office of General Counsel). The appeal should state the basis upon which it is claimed that the Patent and Trademark Office initial size determination on the concern was in error; and the facts and arguments supporting the concern's claimed status as a small business concern under this section.

2. Section 1.27 is amended by adding a new paragraph (c) to read as follows:

§1.27 Statement of status as small entity.

* * * * *

(c) Any verified statement filed pursuant to paragraph (a) of this section on behalf of a small business concern must (1) be signed by the owner or an official of the small business concern empowered to act on behalf of the concern; (2) aver that the concern qualifies as a small business concern as defined in §1.9(d); and (3) aver that exclusive rights to the invention have been conveyed to and remain with the small business concern, or if the rights are not exclusive, that all other rights belong to small entities as defined in §1.9. Where the rights of the small business concern as a small entity are not exclusive, a verified statement must also be filed by the other small entities having rights averring to their status as such.

Sept. 23, 1982.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

[FR Doc.82-26941 Filed 9-29-82; 8:45 am]
BILLING CODE 3510-16-M

SMALL BUSINESS ADMINISTRATION
13 CFR Part 121

Definition of Small Business for Paying Reduced Patent Fees Under Title 35, United States Code

Agency: Small Business Administration.
Action: Final rule.
Summary: The Small Business Administration in conjunction with the Patent and Trademark Office is establishing a definition of small business for the purpose of paying patent fees under section 41 (a) and (b) of Title 35, United States Code, which are reduced by 50 per centum for small business concerns as required by Pub. L. 97–247. The definition would be implemented by the Patent and Trademark Office, which has recently published its regulations on the fee reduction procedures (47 FR 40134, Sept. 10, 1982).
Effective Date: Oct. 1, 1982.
For Further Information Contact:
R. Franklin Burnett (703) 557–3054.
Harvey Bronstein (202) 653–6373.
Supplementary Information: Pub. L. 97–247 provides that funds available under the Act to the Patent and Trademark Office "shall be used to reduce by 50 per centum the payment of fees under Section 41 (a) and (b) of Title 35, United States Code, by small business concerns as defined in Section 3 of the Small Business Act and by regulations established by the Small Business Administration."

A notice of proposed rulemaking relating to the definition of a small business was published in the **Federal Register** on Aug. 31, 1982 (47 FR 38331). The regulation being issued is the same as that which was proposed. In order to be a small business, the number of employees of

the concern, including those of its affiliates, may not exceed 500 persons. Concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both. The number of employees of a business concern is determined by counting the number of persons of the concern and its affiliates employed on a full-time, part-time or temporary basis during the previous fiscal year of the concern and of its affiliates. The number of employees is the average over the fiscal year of the persons employed during each of the pay periods of the fiscal year.

The definition also requires a small business for this purpose to be one "which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who could not be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section."

Discussion of Comments

One comment from the American Patent Law Association, whose membership includes several thousand lawyers involved in the practice of law before the U.S. Patent and Trademark Office, expressed "no comment regarding the definition" and expressed "[t]hanks for all that's been done toward a hopefully workable definition." The remaining comments were from individual patent attorneys rather than comments on behalf of any organization.

Two comments raised questions about the intended scope of the term "license." It was suggested that clarification is needed as to what is included within the scope of the term. One comment suggested that, "[a]t the very least, the record should reflect that the definition is not intended to reach implied licenses to use and resell patented articles purchased from a small business." The comment is correct insofar as it suggests that such "implied licenses" are not intended to be included within the scope of the term. Likewise, an order by the applicant to a firm to build a proto-type machine or product for the applicant's own use is not considered to constitute a license for purposes of the definition.

Another suggestion was that the regulation be reworded to deny small business status where revenue above a certain dollar amount was received from licensing rights under the invention to a concern which could not qualify as a small entity. It was also suggested that the term "exclusive license of any of the rights in the invention" be used instead of the term "license." The latter two suggestions have not been adopted. Adoption of these suggestions would cause the regulation to become more complicated, and does not appear necessary to aid small concerns in accord with the purposes of the legislation. In addition, it could substantially broaden the number of concerns which could qualify with a resulting excessive loss of revenue to the Patent and Trademark Office. It is not seen likely that the restriction on licensing would unduly or adversely affect the ability of the small business concern to participate in the patent system.

Another comment which was made related to a firm which is a subsidiary of a university or other nonprofit organization. The suggestion was made that the number of employees of the university or other nonprofit affiliate be excluded from consideration in determining whether or not the business concern qualifies as a small business concern. The suggestion has not been adopted since the situation raised is already treated under the definition of nonprofit organization established by the Patent and Trademark Office on Sept. 10, 1982, at 47 FR 40134–40140. Under that Patent and Trademark Office regulation, a wholly owned subsidiary of a nonprofit or university is considered a part of the university or nonprofit and thus is already eligible for the fee reduction.

One comment suggested that the regulation contain language specifying that concerns meeting its requirements are also independently owned and operated and not dominant in their field of operation under the Small Business Act. It is not necessary to include this language since this regulation already contains an affiliation test for this purpose; and it is generally unlikely that a small concern would be found to be dominant. The legislative history of the Small Business Act indicates that "The mere fact that a small business makes a particular product or item and is dominant in its field with respect to the particular product or item is not intended to disqualify it from the benefits of this Act * * *"(House Report 494, 83rd Congress, 1st Session 1953). SBA Size Appeals Board precedents have consistently stated that dominance under the Act and the SBA regulations is not viewed in narrow industry subdivisions. It, therefore, does not appear that concerns defined as small business under this provision would be dominant within the meaning of the Small Business Act.

Another comment suggested that foreign concerns should not be eligible as small business under this provision. Since this patent legislation was enacted by the Congress with knowledge of the Paris Convention for the Protection of Industrial Property, there is no indication that Congress intended that foreign small business not be eligible for the fee reduction. It is the view of the Patent and Trademark Office that excluding foreign small concerns would violate U.S. treaties in the patent area.

This comment also questioned whether the Patent and Trademark Office should make initial size determinations, or whether they could more appropriately be made by SBA. Since the fee reduction procedure is part of the patent application and of other Patent and Trademark Office actions and may involve Patent law questions, it would be administratively infeasible to have initial size determinations made by the SBA. The Patent and Trademark Office recently issued regulations (Sept. 10, 1982, 47 FR 40134) which set forth the fee reduction procedures.

Other Considerations Relating to the Rulemaking

Environmental, energy, and other considerations: The rule will not have a significant impact on the quality of the human environment or the conservation of energy resources.

Small business concerns will be benefited by the rule. The proposed rule will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96–354). Public Law 97–247 has taken into consideration the impact it may have on small entities and has reduced the fees, therefore, by 50 per centum.

The Small Business Administration has determined that this rule is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no significant additional record keeping or reporting requirements are placed upon the public.

List of Subjects in 13 CFR Part 121

Small businesses, Inventions and patents.

PART 121—SMALL BUSINESS SIZE STANDARDS

Accordingly, pursuant to Section 3 of the Small Business Act and Pub. L. 97–247, Part 121 of Title 13 of the Code of Federal Regulations is amended by adding §121.3–18 to read as follows:

§121.3–18 Definition of small business for paying reduced patent fees under Title 35, U.S. Code.

(a) Pursuant to Pub. L. 97–247, a small business concern for purposes of paying reduced fees under 35 U.S. Code 41 (a) and (b) to the Patent and Trademark Office means any business concern (1) whose number of employees, including those of its affiliates, does not exceed 500 persons and (2) which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section. For the purpose of this section concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both. The number of employees of the business concern is the average over the fiscal year of the persons employed during each of the pay periods of the fiscal year. Employees are those persons employed on a full-time, part-time or temporary basis during the previous fiscal year of the concern.

(b) If the Patent and Trademark Office determines that a concern is not eligible as a small business concern within this section, the concern shall have a right to appeal that determination to the Small Business Administration. The Patent and Trademark Office shall transmit its written decision and the pertinent size determination file to the SBA in the event of such adverse determination and size appeal. Such appeals by concerns should be submitted to the SBA at 1441 L Street, NW., Washington, D.C. 20416 (Attention: SBA Office of General Counsel). The appeal should state the basis upon which it is claimed that the Patent and Trademark Office initial size determination on the concern was in error and the facts and arguments supporting the concern's claimed status as a small business concern under this section.

ROBERT B. WEBBER,
Sept. 23, 1982. *Acting Administrator.*

[FR Doc. 82-20940 Filed 9-29-82; 8:45 am]
BILLING CODE 3525-01-M

[1023 O.G. 23]

(51) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 31-201-229]

Revision of Patent Practice

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Part 1 of 37 CFR, to clarify the practice under certain sections of Public Law 97-247 of 1982 and to make certain other changes and clarifications in practice which have been found desirable after some experience. The rulemaking changes the practice under §§1.27 and 1.28 with regard to subsequently establishing small entity status and qualifying for a refund of fees paid in full. The changes in other rules clarify and improve the practice in certain areas.
Effective Date: Apr. 1, 1984
For Further Information Contact: R. Franklin Burnett by telephone at (703) 557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed primarily to 1) clarify the small entity status of independent inventors, small business concerns and nonprofit organizations having funding agreements with a federal governmental agency as defined in 35 U.S.C. 202(c) (4); 2) rewrite §1.28 to provide a system for obtaining a refund of a portion of a fee paid in full when small entity status is established within two months of the date of such payment; 3) provide that a separate statement establishing small entity status is not required in an application filed under §1.62 when such status has been established in the parent application; and 4) modify certain other rules to clarify practice.

New §1.21(1) establishes a fee for processing and retaining any application which is abandoned for failing to complete the application pursuant to §1.53(d). This new paragraph, as well as the changes to §§1.53 and 1.78, indicate that in order to obtain benefit of a prior U.S. application, either the basic filing fee or the processing and retention fee of §1.21(1) must be paid. Section 1.53(d) further establishes that the application will be disposed of if the required fee is not paid within a set period. Section 1.56(b) requires submission of copies of foreign patent documents, non-patent publications, or other non-patent items of information disclosed pursuant to the duty to disclose. New §1.191(d) clarifies that §1.136 applies in patent applications and that §1.550(c) applies in reexamination proceedings to all time periods set forth in §§1.191-1.194, 1.196 and 1.197.

Discussion of Specific Rules and Significant Differences Between Proposed and Final Rules: Section 1.5, paragraph (a) is amended to remove a reference to §1.55, which is no longer appropriate and to clarify how letters to the Office are to be identified.

Section 1.6 is amended as proposed to clarify the manner in which letters and papers, including fees, filed in accordance with §1.10 by "Express Mail" are date stamped when received in the Patent and Trademark Office. Such letters and papers, which comply with §1.10, will be stamped with the date of deposit as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday or federal holiday within the District of Columbia, in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or a federal holiday within the District of Columbia. No papers are received in the Patent and Trademark Office on Saturdays, Sundays, or federal holidays within the District of Columbia.

Section 1.10, paragraphs (a) and (c), are amended to clarify that papers deposited as "Express Mail" on a Saturday, Sunday, or a federal holiday within the District of Columbia will be stamped with the date of the next succeeding day which is not a Saturday, Sunday, or a federal holiday within the District of Columbia. A cross reference to §1.6(a) has also been added to the rule. This change was not contained in the notice of proposed rulemaking but is being made to avoid confusion and to ensure that the Office's practice in date-stamping of papers is clearly understood. The change was suggested by a comment received on the proposed rules.

Section 1.14 is amended as proposed to revise paragraph (b) to clarify that only complete patent applications as defined in §1.51(a) which become abandoned will be retained for a period of twenty years from the filing date. Incomplete applications will be retained as provided in §§1.21 and 1.53.

Section 1.19, paragraph (b)(3), is amended as proposed to clarify that only copies made from Office records, but not prepared by the Office, will be compared with the original prior to certification of the copies. The Office will not compare copies made from some other copy or record with Office records for purposes of certification. The stated charge of ten cents per page would not be sufficient to make a word-by-word comparison. The requirements of the public appear to still be served by limiting the use of the comparison fee to Office records.

Section 1.21 is amended as proposed to revise paragraph (b) (2) and establish a new paragraph (1). The change in paragraph (b) (2) is in accord with the change in §1.25 (a). New paragraph (1) provides a fee for processing and retaining any application which is aban-

doned pursuant to §1.53(d). Such applications have received a filing date pursuant to 35 U.S.C. 111 but have been abandoned for failure to complete the application by filing the oath or declaration, filing fee or surcharge (§1.16(e)). The fee covers the handling, filming, processing, data input and storage required to retain an application. The fee is not due in any application in which the basic filing fee was paid.

Section 1.25 is amended as proposed to revise paragraph (a) to set the minimum deposit for a deposit account at $1000 and to clarify that an amount sufficient to cover all fees as well as services, copies, etc., requested must always be on deposit. This minimum amount is considered necessary and proper in view of the substantial increase in the amounts of fees being charged to deposit accounts and the processing costs of handling overdrawn accounts. Paragraph (b) clarifies that fees may be charged against a deposit account only where sufficient funds are on deposit to cover the entire amount of the fees. Paragraph (b) also clarifies that an authorization to charge a fee to a deposit account will not be considered payment on the date the authorization to charge is effective as to that fee unless sufficient funds are present in the account to cover the fee.

Section 1.27 is amended as proposed to revise paragraphs (b), (c) and (d) to provide clearly that an independent inventor, small business concern, or nonprofit organization, which is otherwise qualified as a small entity for purposes of paying reduced patent fees under 37 CFR 1.9 and 1.27, is not disqualified therefrom because of a license to a federal agency pursuant to 35 U.S.C. 202(c) (4). Section 1.27 is amended to state that such a license does not constitute a license or a conveyance of rights which would preclude qualifying for small entity status. The amendment is necessary for clarification and to avoid frustrating the intent of Public Law 97-247 and Public Law 96-517 when taken together.

The text of Title 35, United States Code, §202(c) (4) reads as follows:

§202. Disposition of rights

(c) Each funding agreement with a small business firm or nonprofit organization shall contain appropriate provisions to effectuate the following:

* * * * *

(4) With respect to any invention in which the contractor elects rights, the Federal agency shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world, and may, if provided in the funding agreement, have additional rights to sublicense any foreign government or international organization pursuant to any existing or future treaty or agreement.

Section 1.28 is amended as proposed to revise paragraph (a) to clarify that a separate verified statement is not required to be filed in a file wrapper continuing application filed pursuant to §1.62, if status as a small entity has been established in the parent application and is still proper. Section 1.28(a) also permits a refund of a fee timely paid in the full amount if within two months of the date of the full timely payment: (1) small entity status is properly established, and (2) a refund is requested. Under §1.28(a), no request for a refund filed later than two months after the date on which a full fee has been paid will be entertained even if additional time is sought to file the request. The two-month period referred to in §1.28(a) is not a period for response under §1.136 and cannot be extended. Section 1.28(a) provides for, in somewhat modified form, the practice presently in effect pursuant to a waiver of §1.28 published at 1023 O.G. 77 on Oct. 26, 1982 and extended at 1027 O.G. 115 on Feb. 15, 1983. The revised refund procedures in §1.28(a) will apply to any fees timely paid in full on or after the effective date of the final rule. The refund procedures set forth in the Patent and Trademark Office *Official Gazette* Notice entitled "Filing of Verified Statements Claiming Small Entity Status" published at 1023 O.G. 77 on October 26, 1982, and the *Official Gazette* Notice entitled "Requirement for Filing Verified Statements Claiming Small Entity Status" published at 1027 O.G. 115 on Feb. 15, 1983, continue in effect until the effective date of the final rule.

Section 1.52(d) is amended as proposed to clarify that the verified English translation of a non-English language application and the fee set forth in §1.17(k) can be filed with the application or within such time as may be set by the Office.

Section 1.53, paragraphs (b) and (d), are amended to clarify in paragraph (b) that the application for patent must be filed in the name of the actual inventor or inventors by giving all their names as required by §1.41. Paragraph 1.53(d) states that if a correspondence address is provided, notice will be provided to that address where the appropriate filing fee or oath or declaration does not accompany the application. Paragraph 1.53(d) also provides that if the required filing fee is not paid, or the processing and retention fee is not paid, within one year of the date of mailing of notification pursuant to paragraph 1.53(d) or within one year from the filing date if no correspondence address is included in the application, the application will be disposed of. The paragraph further indicates that no copies will be provided or certified by the Office of an application which has been disposed of or in which neither the basic filing fee nor the processing fee has been paid. Finally, paragraph 1.53(d) specifies that if no correspondence address is included in the application, applicant will have two months from the filing date to file the fee, oath or declaration and to pay the surcharge set forth in §1.16(e) in order to prevent abandonment of the application.

Section 1.55, paragraph (b), is amended as proposed to correct an error in referring to paragraph (a) of this section.

Section 1.56 is amended as proposed to revise paragraph (b) and add a new paragraph (j). Paragraph 1.56(b) requires that a copy of each foreign patent document, non-patent publication, or other non-patent item of information in written form being disclosed pursuant to §1.56 accompany such disclosures unless the copy is not in the possession of the person making the disclosure. In such a situation, a statement to that effect is required. Paragraph 1.56(b) also adds "or her" to refer to both genders. New paragraph 1.56(j) states that applicant will be notified if a copy or statement required pursuant to §1.56(b) is not submitted and that applicant will be given a time period within which to file the copy or a statement that the copy is not in the possession of the person making the disclosure. Such a time period would be extendable under §1.136. Failure to respond in a proper and timely manner would result in abandonment of the application.

Section 1.59 is amended as proposed to clarify that the Office will furnish copies of papers received in the Office at the usual cost only if the basic filing fee or the processing and retention fee has been paid.

Section 1.60 is amended to break the section into paragraph (a) and new paragraph (b). Paragraph (a) adds a reference to amended §1.78(a) to clarify the conditions under which continuation or divisional applications may be filed. New paragraph 1.60(b) provides that the signing of the oath or declaration can be omitted if the prior application was complete as set forth in §1.51(a). New paragraph 1.60(b) also requires that a true copy of the prior complete application be filed. The final rule also clarifies that the copy of the oath or declaration filed must show the applicant's signature or contain an indication it was signed. Paragraph 1.60(b) also provides that only amendments reducing the number of claims or adding a reference to the prior application will be entered before calculating the filing fee and granting the filing date.

Section 1.62 is amended as proposed to revise paragraphs (a) and (d). Paragraph 1.62(a) provides that the file wrapper continuing procedure is applicable only to prior complete applications under §1.51(a). Paragraph 1.62(d) clarifies that the filing fee referred to is the basic filing fee.

Section 1.78 is amended as proposed to change the title to more explicitly define the contents of the section. Paragraph 1.78(a) specifies that in order for an application to claim the benefit of a prior filed copending national application, the prior application must be complete as set forth in §1.51(a) or be entitled to a filing date as set forth in §1.53(b) and include the basic filing fee set forth in §1.16, or be entitled to a filing date as set forth in §1.53(b) and have paid the processing and retention fee set forth in §1.21(l) within the time period set forth in §1.53(d).

Section 1.121 is amended as proposed to revise paragraph (e) to specify how amendments to the description and claims are to be made in reissue applications.

Section 1.123 is amended as proposed to clarify that the sketch showing proposed amendments to the drawing with its cover letter should be a separate paper.

Section 1.135 is amended as proposed to remove paragraph (d) since it is not necessary in view of the ability to obtain extensions of time under §1.136(a) by petition and payment of fee.

Section 1.136 is amended as proposed to clarify in paragraphs (a) and (b) that the extension of time practice under this section does not apply in interference proceedings or in reexamination proceedings. Extension of time practice in interference proceedings, including extension of time for appeal or civil action (§1.304), is subject to §1.245. Extension of time practice in reexamination proceedings, including extension of time for appeal or civil action (§1.304), is subject to §1.550(c).

Section 1.191 is amended as proposed to add a new paragraph (d) to provide that the time periods for appeal and review set forth in §§1.191-1.194, 1.196 and 1.197 are subject to the provisions of §1.136 for patent applications or §1.550(c) for reexamination proceedings.

Section 1.192 is amended as proposed to revise paragraph (a) to delete the reference to §1.136 since it is provided for in new §1.191(d).

Section 1.197 is amended as proposed to revise paragraph (b) to delete the reference to §1.136 since it is provided for in new §1.191(d).

Section 1.304 is amended as proposed to clarify that extensions of time periods set forth therein are subject to the provisions of §1.245 for interferences or §1.550(c) where reexamination proceedings are involved rather than to §1.136 which applies in all other cases.

Section 1.550 is amended as proposed to revise paragraph (c) to clarify that the time for taking any action, including appeal, by a patent owner in a reexamination proceeding is governed solely by this section.

Section 1.555 is amended to revise paragraphs (a) and (b). In paragraph 1.555(a) "prior art" statement has been changed to "information disclosure" statement to conform to the language of §1.98. Paragraph 1.555(b) requires that disclosures pursuant to this paragraph be accompanied by a copy of each foreign patent document or non-patent printed publication which is being disclosed and which is in the possession of the person making the disclosure.

Responses to Comments on the Rules

Specific comments were received on a number of the sections. Thirty-five letters presenting written comments were received. No oral testimony was presented at the public hearing conducted on Oct. 18, 1983. All of the comments were considered in adopting the changes set forth herein. Comments appear below with responses thereto.

Comments from Associations

Comment:

The American Patent Law Association commented that they were in full accord with most of the proposed changes. They submitted comments and suggestions from some members. The Patent, Trademark and Copyright Section of the American Bar Association did not render an official section position on the proposed rule changes but polled its members and found the majority of the member responding either to favor the proposed rule changes or to view them as acceptable. They also submitted comments and suggestions from some members. The United States Trademark Association commented on the proposed rules concerning deposit accounts.

Reply:

The efforts and input of these organizations are appreciated. Specific comments and suggestions from individual members of the organizations are covered below.

Comments from Individuals

Comment:

One comment was received that the proposed amendment to §1.6 was unnecessary and possibly improper.

Reply:

The amendment to §1.6 has been adopted as proposed. The amended rule sets out the Patent and Trademark Office practice which has been in effect. No papers are stamped as having arrived in the Office on Saturday, Sunday, or a federal holiday within the District of Columbia no matter how the papers are filed. Article 4, C(3) of the Paris Convention says that the period of priority shall be extended until the first following working day "when the Office is not open for the filing of applications in the country where protection is claimed". To accept papers through use of "Express Mail" or some other way on Saturdays, Sundays or federal holidays within the District of Columbia would raise the possibility that the Office would be viewed as open for the filing of papers on such days and thereby remove the current ability to file a priority claiming application on the first working day if the priority year ended on a non-working day. The final rule avoids this implication.

Comment:

One comment indicated that the change to §1.6 should not be applied retroactively to papers filed before the clarifying language was placed in the rule.

Reply:

Any such fact situation will be reviewed through the normal petition procedure.

Comment:

One comment suggested that §1.10 be amended rather than §1.6 with regard to papers deposited as "Express Mail" on a Saturday, Sunday, or federal holiday within the District of Columbia.

Reply:

This comment has been adopted in that both §§1.6 and 1.10 have been amended to avoid any possible confusion.

Comment:

One comment suggested that §1.19(b) (3) be changed to permit the Office to certify material not copied from the records of the Office when reproduction of Office records is not feasible or possible.

Reply:

This comment has not been adopted. The Office will only certify that material is a copy of an Office record if, in fact, the material was reproduced from the Office record.

Comment:

One person commented that the $100 processing and retention fee under §1.21 was excessive and unnecessary.

Reply:

The fee is considered proper and necessary in view of the cost to the Office in handling, filming, processing and storage required to retain an application which has a filing date but in which no basic filing fee has been paid. If this expense is not covered by the applicant, it must be recovered from other sources.

Comment:

Twenty-seven comments were received on the proposal to amend §1.25 to raise to $1000 the minimum balance required in a deposit account. The amount is also

referred to in §1.21(b) (2). These comments generally suggested that the $1000 amount was too high for account holders who did not use their accounts for charges other than small fees such as for patent copies. Several comments received acknowledged that the minimum balance for deposit accounts should be raised and suggested various amounts less than the proposed $1000. Several comments suggested a separate account category for persons who do not use their accounts for other than small fees. Two comments suggested that the Office accept credit cards for payment of fees.

Reply:

These comments and suggestions have not been adopted. The fees for filing, processing and issuing of patent and trademark applications have increased so as to make the present $40 minimum balance for deposit accounts totally inadequate. A number of persons objecting to the $1000 minimum balance acknowledged that they used their deposit accounts as a safeguard against failure to calculate or to submit proper fees by a check. An account with a very low balance obviously cannot be effective as a safeguard when a patent filing fee is $300 and a patent issue fee is $500. Dealing with overdrawn accounts causes administrative problems for the Patent and Trademark Office. An authorization to charge an account without sufficient funds to cover a charge will not be effective as payment and may result in loss of rights to an applicant. Also, unnecessary expense will be incurred by an applicant if an insufficient balance in an account results in abandonment of an application and the necessity of filing a petition to revive under 37 CFR 1.137(b) with the requisite $500 fee. Experience has shown that many single practitioners and small firms have failed to have sufficient funds in their accounts when needed. The increase of the minimum balance in deposit accounts to $1000 is seen to be necessary and proper. A failure to raise the minimum balance in deposit accounts to $1000 would serve as an incorrect indication that the Patent and Trademark Office views a minimum balance of less than $1000 as acceptable. If it is not possible for a small firm or individual to maintain a minimum balance of $1000, the deposit account could still be retained and used by paying the service charge set forth in §1.21(b) (2) for any month in which the balance at the end of the month is below $1000. The use of credit cards is not considered viable since legislation would be required to do so.

Comment:

Two comments were received suggesting that a license to a federal agency in an invention made by a federal employee should not preclude the employee from qualifying as a small entity and that §1.27 should be amended to cover this situation.

Reply:

These comments have not been adopted. Such an amendment was not proposed and the public has not had an opportunity to comment on it.

Comment:

One comment suggested that the time for filing a verified statement claiming small entity status to obtain a refund of a filing fee pursuant to §1.28 should run from the date of mailing of the filing receipt due to difficulty in identifying the new application before the filing receipt is received. Three persons suggested that the period for establishing small entity status and requesting a refund should be three months rather than two months as proposed.

Reply:

These comments have not been adopted. An application may be identified before the filing receipt is issued in a number of ways including title, inventor's name, filing date and attorney docket number. Also, a postcard may be included with filing of the application to learn the application serial number. The two month period for obtaining a refund is seen to be adequate since the small entity practice is no longer new and the public has had time to become familiar with it. It allows sufficient time to have a small entity statement executed and sent to the Patent and Trademark Office.

Comment:

One comment suggested that it should be made clear that an application filed in a foreign language (§1.52(d)) without including a signed oath or declaration can receive a filing date under the provisions of §1.53(b).

Reply:

The regulations permit and this reply makes it clear that an application filed in a language other than English can receive a filing date by complying with §1.53(b).

Comment:

Three comments were received suggesting that the proposed language not be added to §1.53(b). One comment alleged that the requirement to name the inventors upon filing a patent application is not required or even authorized by statute.

Reply:

35 U.S.C. 111 says that application for patent "shall be made, or authorized to be made, by the inventor". The rules of practice (§1.41(a)) contain the same requirement. The amendment to §1.53(b) is only clarifying the rules by also placing the requirement in that section. Further, United States patent practice has long required that the inventors be named at the time of filing.

Comment:

One person commented that the language of §1.53(d) should be changed to reflect that only one of the filing fee or processing and retention fee must be paid to prevent the application being disposed of.

Reply:

The language of the rule is seen to be unambiguous in this regard.

Comment:

One person commented that the language of §1.53(d) should be changed to establish a time within which the processing and retention fee may be paid to prevent the application being disposed of when no correspondence address has been provided.

Reply:

The suggestion has been adopted.

Comment:

One person suggested that §1.56(b) which states that copies of disclosed documents must be filed is inconsistent with §1.56(j) which provides that such copies must be filed unless they are not in the possession of the person making the disclosure.

Reply:

The language of §1.56(b) has been modified to clarify this point.

Comment:

Three persons commented that the requirement of §1.56(b) that copies of disclosed documents be supplied was an unnecessary burden. One person commented similarly on the requirement of §1.555 that copies of disclosed documents be supplied. Another person suggested that the proposed amendment to §1.56(b) would require submission of a complete document even if only a small portion were relevant.

Reply:

The Office agrees with another person who commented that the "requirement that disclosers in application and reexamination proceedings provide copies of disclosed documents which they have is fair and reasonable and should aid the Examiner in making an informed as possible decision in any given proceeding". The portion of a document required to be submitted under §1.56(b) is the portion which is material to the examination of the application under §1.56(a).

Comment:

One person commented that the proposed amendment to §1.78(a) would appear to require that a petition for correction of inventorship under §1.48 be filed in a parent application as well as in the continuing application in which the inventorship was corrected.

Reply:

The amendment to §1.78 does not change the practice regarding the filing of petitions under §1.48.

Comment:

One person commented that §1.123 is unclear as amended in not referring to the paper requesting that amendments to the drawing be made.

Reply:

The Patent and Trademark Office no longer makes amendments to the drawings. Applicants must submit new drawings with the changes or use bonded draftsmen to make the amendments. A paper requesting that the Office make the amendments is therefore inappropriate.

Comment:

Four persons commented that §1.135(d) should not be deleted since they thought it desirable to be able to ratify unsigned papers without paying any fee.

Reply:

The statute and rules now provide for obtaining extensions of time through simple petition and payment of fee and for revival through a simple statement that the abandonment was unintentional and the payment of a fee. Further, a filing date can now be obtained on filing an application without the oath or declaration. The handling of unsigned papers by the Patent and Trademark Office causes administrative problems and expense to the Office and delays the processing of applications. The emergency-type situations involving loss of rights which the previous practice was intended to cover have been substantially eliminated by the changes in the law and rules.

Comment:

One person commented that §1.191(d) was undecipherable in that it refers to a number of other rules.

Reply:

This section was intended to serve as a point of summarization for the applicable extension of time rules in appeals before the Board of Appeals. The section is seen to adequately serve that purpose.

Comment:

One person commented that the final sentence of §1.555(b) needs clarification.

Reply:

This sentence was not changed by the proposed rules and is seen to be clear as written.

Comment:

One person commented that proposed §1.555(b) requires copies and does not make any exceptions or qualifications on this requirement.

Reply:

The language of §1.555(b) has been clarified to require filing of a copy of each foreign patent document or nonpatent printed publication which is being disclosed and which is in the possession of the person making the disclosure.

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96-354). Public Laws 96-517 and 97-247 have both taken into consideration the impact they may have on small entities.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*, since no significant additional record keeping or reporting requirements are placed upon the public. In fact, some paperwork, especially that related to filing of small entity statements in applications filed under §1.62 will be reduced.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and Public Law 97-247, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

37 CFR, Part 1, is amended as follows:

1. Section 1.5 is amended by revising paragraph (a) to read as follows:

§1.5 Identification of application, patent or registration.

(a) When a letter concerns an application for patent, it should state the name of the applicant, the title of the invention, the serial number or international application number of the application, the date of filing the same, and, if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

* * * * *

2. Section 1.6 is amended by revising paragraph (a) to read as follows:

§1.6 Receipt of letters and papers.

(a) Letters and other papers received in the Patent and Trademark Office are stamped with the date of receipt except where such letters and papers are filed in accordance with §1.10. Any such letters and papers filed in accordance with §1.10 will be stamped with the date of deposit as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday, or federal holiday within the District of Columbia in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or federal holiday within the District of Columbia. No papers are received in the Patent and Trademark Office on Saturdays, Sundays or federal holidays within the District of Columbia.

* * * * *

3. Section 1.10 is amended by revising paragraphs (a) and (c) to read as follows:

§1.10 Filing of papers and fees by "Express Mail" with certificate.

(a) Any paper or fee to be filed in the Patent and Trademark Office can be filed utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service and be considered as having been filed in the Office on the date the paper or fee is shown to have been deposited as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday, or federal holiday within the District of Columbia. See §1.6(a).

* * * * *

(c) The Patent and Trademark Office will accept the certificate of mailing by "Express Mail" and accord the paper or fee the certificate date under 35 U.S.C. 21(a) (unless the certificate date is a Saturday, Sunday, or federal holiday within the District of Columbia—see §1.6(a)) without further proof of the date on which the mailing by "Express Mail" occurred unless a question is present regarding the date of mailing. If more than a

reasonable time has elapsed between the certificate date and the Patent and Trademark Office receipt date or if other questions regarding the date of mailing are present, the person mailing the paper or fee may be required to file a copy of the "Express Mail" receipt showing the actual date of mailing and a statement from the person who mailed the paper or fee averring to the fact that the mailing occurred on the date certified. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

4. Section 1.14 is amended by revising paragraph (b) to read as follows:

§1.14 Patent applications preserved in secrecy.

* * * * *

(b) Except as provided in §1.11(b) abandoned applications are likewise not open to public inspection, except that if an application referred to in a U.S. patent, or in an application which is open to inspection pursuant to §1.139, is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant. Complete applications (§1.51(a)) which are abandoned may be destroyed after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation. Abandoned applications will not be returned.

* * * * *

5. Section 1.19 is amended by revising paragraph (b) (3) to read as follows:

§1.19 Document supply fees.

* * * * *

(b) * * *

(3) For comparing copies, made from Patent and Trademark Office records but not prepared by the Patent and Trademark Office, with the original, prior to certification of the copies, per page	$0.10

* * * * *

6. Section 1.21 is amended by revising paragraph (b) (2) and by adding a new paragraph (l) to read as follows:

§1.21 Miscellaneous fees and charges.

* * * * *

(b) * * *

(2) Service charge for each month when the balance at the end of the month is below $1000	$2.00

* * * * *

(l) For processing and retaining any application abandoned pursuant to §1.53(d) unless the required basic filing fee has been paid	$100.00.

7. Section 1.25 is revised to read as follows:

§1.25 Deposit accounts.

(a) For the convenience of attorneys, agents, and the general public in paying any fees due, in ordering services offered by the Office, copies of records, etc., deposit accounts may be established in the Patent and Trademark Office upon payment of the fee for establishing a deposit account (§1.21(b)(1)). A minimum deposit of $1000 or more, depending on the activity of the individual account, is required. At the close of each month's business, a statement will be rendered. A remittance must be made promptly upon receipt of the statement to cover the value of items or services charged to the account and thus restore the account to its established normal deposit value. An amount sufficient to cover all fees, services, copies, etc., requested must always be on deposit. A service charge (§1.21(b)(2)) will be assessed for each month that the balance at the end of the month is below $1000.

(b) Filing, issue, appeal, international-type search report, international application processing, petition, and post-issuance fees may be charged against these accounts if sufficient funds are on deposit to cover such fees. A general authorization to charge all fees, or only certain fees, set forth in §§1.16 to 1.18 to a deposit account containing sufficient funds may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed. An authorization to charge to a deposit account the fee for a request for reexamination pursuant to §1.510 and any other fees required in a reexamination proceeding in a patent may also be filed with the request for reexamination. An authorization to charge a fee to a deposit account will not be considered payment of the fee on the date the authorization to charge the fee is effective as to the particular fee to be charged unless sufficient funds are present in the account to cover the fee.

8. Section 1.27 is amended by revising paragraphs (b), (c) and (d) to read as follows:

§1.27 Statement of status as small entity.

* * * * *

(b) Any verified statement filed pursuant to paragraph (a) of this section on behalf of an independent inventor must be signed by the independent inventor except as provided in §§1.42, 1.43, or 1.47 of this part, and must aver that the inventor qualifies as an independent inventor in accordance with §1.9(c) of this part. Where there are joint inventors in an application, each inventor must file a verified statement establishing status as an independent inventor in order to qualify as a small entity. Where any rights have been assigned, granted, conveyed, or licensed, or there is an obligation to assign, grant, convey, or license, any rights to a small business concern, a nonprofit organization, or any other individual, a verified statement must be filed by the individual, the owner of the small business concern, or an official of the small business concern or nonprofit organization empowered to act on behalf of the small business concern or nonprofit organization averring to their status. For purposes of a verified statement under this paragraph, a license to a federal agency resulting from a funding agreement with that agency pursuant to U.S.C. 202(c)(4) does not constitute a license as set forth in §1.9 of this part.

(c) Any verified statement filed pursuant to paragraph (a) of this section on behalf of a small business concern must (1) be signed by the owner or an official of the small business concern empowered to act on behalf of the concern; (2) aver that the concern qualifies as a small business concern as defined in §1.9(d); and (3) aver that exclusive rights to the invention have been conveyed to and remain with the small business concern, or if the rights are not exclusive, that all other rights belong to small entities as defined in §1.9. Where the rights of the small business concern as a small entity are not exclusive, a verified statement must also be filed by the other small entities having rights averring to their status as such. For purposes of a verified statement under this paragraph, a license to a federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a license as set forth in §1.9 of this part.

(d) Any verified statement filed pursuant to paragraph (a) of this section on behalf of a nonprofit organization must (1) be signed by an official of the nonprofit organization empowered to act on behalf of the organization; (2) aver that the organization qualifies as a nonprofit organization as defined in §1.9(e) of this part specifying under which one of §1.9(e)(1), (e)(2), (e)(3), or (e)(4) of this part the organization qualifies; and (3) aver that exclusive rights to the invention have been conveyed to and remain with the organization or if the rights are not exclusive, that all other rights belong to small entities as defined in §1.9 of this part. Where the rights of the nonprofit organization as a small entity are not exclusive, a verified statement must also be filed by the other small entities having rights averring to their status as such. For purposes of a verified statement under this paragraph, a license to a federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a conveyance of rights as set forth in this paragraph.

9. Section 1.28 is amended by revising paragraph (a) to read as follows:

§1.28 Effect on fees of failure to establish status, or change status, as a small entity.

(a) The failure to establish status as a small entity (§§1.9(f) and 1.27 of this part) in any application or patent prior to paying, or at the time of paying, any fee precludes payment of the fee in the amount established for small entities. A refund pursuant to §1.26 of this part, based on establishment of small entity status, of a portion of fees timely paid in full prior to establishing status as a small entity may only be obtained if a verified statement under §1.27 and a request for a refund of the excess amount are filed within two months of the date of the timely payment of the full fee. The two-month time period is not extendable under §1.136. Status as a small entity is waived for any fee by the failure to establish the status prior to paying, at the time of paying, or within two months of the date of payment of, the fee. Status as a small entity must be specifically established by a verified statement filed in each application or patent in which the status is available and desired, except those applications filed under §1.60 or §1.62 of this part where the status as a small entity has been established in a parent application and is still proper. Once status as a small entity has been established in an application or patent, the status remains in that application or patent without the filing of a further verified statement pursuant to §1.27 of this part unless the Office is notified of a change in status. Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established, except those filed under §1.60 or §1.62 of this part. Applications filed under §1.60 or §1.62 of this part must include a reference to a verified statement in a parent application if status as a small entity is still proper and desired.

* * * * *

10. Section 1.52 is amended by revising paragraph (d) to read as follows:

§1.52 Language, paper, writing, margins.

* * * * *

(d) An application may be filed in a language other than English. A verified English translation of the non-English language application and the fee set forth in §1.17(k) are required to be filed with the application or within such time as may be set by the Office.

11. Section 1.53 is amended by revising paragraphs (b) and (d) to read as follows:

§1.53 Serial number, filing date, and completion of application.

* * * * *

(b) The filing date of an application for patent is the date on which (1) a specification containing a description pursuant to §1.71 and at least one claim pursuant to §1.75, and (2) any drawing required by §1.81(a), are filed in the Patent and Trademark Office in the name of the actual inventor or inventors as required by §1.41. No new matter may be introduced into an application after its filing date (§1.118).

* * * * *

(d) If the application which has been accorded a filing date pursuant to paragraph (b) of this section does not include the appropriate filing fee or an oath or declaration by the applicant, applicant will be so notified, if a correspondence address has been provided, and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application. If the required filing fee is not timely paid, or if the processing and retention fee set forth in §1.21(l) is not paid within one year of the date of mailing of the notification required by this paragraph, the application will be disposed of. No copies will be provided or certified by the Office of an application which has been disposed of or in which neither the required basic filing fee nor the processing and retention fee has been paid. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section. If no correspondence address is included in the application, applicant has two months from the filing date to file the fee, oath or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application or one year from the filing date to pay the processing and retention fee set forth in §1.21(l) to prevent disposal of the application.

* * * * *

12. Section 1.55 is amended by revising paragraph (b) to read as follows:

§1.55 Claim for foreign priority.

* * * * *

(b) An applicant may under certain circumstances claim priority on the basis of an application for an inventor's certificate in a country granting both inventor's certificates and patents. When an applicant wishes to claim the right of priority as to a claim or claims of the application on the basis of an application for an inventor's certificate in such a country under 35 U.S.C. 119, last paragraph (as amended July 28, 1972), the applicant or his or her attorney or agent, when submitting a claim for such right as specified in paragraph (a) of this section, shall include an affidavit or declaration including a specific statement that, upon an investigation, he or she has satisfied himself or herself that to the best of his or her knowledge the applicant, when filing his or her application for the inventor's certificate, had the option to file an application either for a patent or an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority.

13. Section 1.56 is amended by revising paragraph (b) and by adding a new paragraph (j) to read as follows:

§1.56 Duty of disclosure; fraud; striking or rejection of applications.

* * * * *

(b) Disclosures pursuant to this section must be accompanied by a copy of each foreign patent document,

non-patent publication, or other non-patent item of information in written form which is being disclosed or by a statement that the copy is not in the possession of the person making the disclosure and may be made to the Office through an attorney or agent having responsibility for the preparation or prosecution of the application or through an inventor who is acting in his or her own behalf. Disclosure to such an attorney, agent or inventor shall satisfy the duty, with respect to the information disclosed, of any other individual. Such an attorney, agent or inventor has no duty to transmit information which is not material to the examination of the application.

* * * * *

(j) If any disclosure pursuant to this section does not include a copy of each foreign patent document, non-patent publication, or other non-patent item of information in written form which is being disclosed or a statement that a copy thereof is not in the possession of the person making the disclosure, applicant will be so notified and given a period of time within which to file the copy or a statement that a copy is not in the possession of the person making the disclosure. The time period set may be extended under §1.136.

14. Section 1.59 is revised to read as follows:

§1.59 Papers of application with filing date not to be returned.

Papers in an application which has received a filing date pursuant to §1.53 will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost of any application in which either the required basic filing fee (§1.16) or the processing and retention fee (§1.21(1)) has been paid.

15. Section 1.60 is revised to read as follows:

§1.60 Continuation or divisional application for invention disclosed in a prior application.

(a) A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and §1.78(a)), which discloses and claims only subject matter disclosed in a prior application may be filed as a separate application before the patenting or abandonment of or termination of proceedings on the prior application.

(b) An applicant may omit signing of the oath or declaration in a continuation or divisional application if (1) the prior application was a complete application as set forth in §1.51(a) and (2) applicant files a true copy of the prior complete application as filed including the specification (including claims), drawings, oath or declaration showing the applicant's signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§1.78(a)) will be entered before calculating the filing fee and granting the filing date.

16. Section 1.62 is amended by revising paragraphs (a) and (d) to read as follows:

§1.62 File wrapper continuing procedure.

(a) A continuation, continuation-in-part, or divisional application, which uses the specification, drawings and oath or declaration from a prior complete application (§1.51(a)) to be abandoned, may be filed before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application. The filing date of an application filed under this section is the date on which a request is filed for an application under this section including identification of the Serial Number, filing date, and applicant's name of the prior complete application.

* * * * *

(d) If an application which has been accorded a filing date pursuant to paragraph (a) of this section does not include the appropriate basic filing fee pursuant to paragraph (b) of this section, or an oath or declaration by the applicant in the case of a continuation-in-part application pursuant to paragraph (c) of this section, applicant will be so notified and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification of a defect pursuant to paragraph (a) of this section.

* * * * *

17. Section 1.78 is amended by revising the title and paragraph (a) to read as follows:

§1.78 Claiming benefit of earlier filing date and cross-references to other applications.

(a) An application may claim an invention disclosed in the same applicant's prior filed copending national application or international application designating the United States of America. In order for an application to claim the benefit of a prior filed copending national application, the prior application must be (1) complete as set forth in §1.51, or (2) entitled to a filing date as set forth in §1.53(b) and include the basic filing fee set forth in §1.16; or (3) entitled to a filing date as set forth in §1.53(b) and have paid therein the processing and retention fee set forth in §1.21(1) within the time period set forth in §1.53(d). Any application claiming the benefit of a prior filed copending national or international application must contain or be amended to contain in the first sentence of the specification following the title a reference to such prior application, identifying it by serial number and filing date or international application number and international filing date and indicating the relationship of the applications. Cross-references to other related applications may be made when appropriate. (See §1.14(b)).

* * * * *

18. Section 1.121 is amended by revising paragraph (e) to read as follows:

§1.121 Manner of making amendments.

* * * * *

(e) In reissue applications, both the descriptive portion and the claims are to be amended by either (1) submitting a copy of a portion of the description or an entire claim with all matter to be deleted from the patent being placed between brackets and all matter to be added to the patent being underlined, or (2) indicating the exact word or words to be stricken out or inserted and the precise point where the deletion or insertion is to be made. Any word or words to be inserted must be underlined. See §1.173.

* * * * *

19. Section 1.123 is revised to read as follows:

§1.123 Amendments to the drawing.

No change in the drawing may be made except by permission of the Office. Permissible changes in the construction shown in any drawing may be made only by bonded draftsmen, at applicant's expense, or by the submission of substitute drawings by applicant. A sketch in permanent ink showing proposed changes, to become part of the record, must be filed for approval by the examiner and should be a separate paper.

20. Section 1.135 is amended by removing paragraph (d).

21. Section 1.136 is revised to read as follows:

§1.136 Filing of timely responses with petition and fee for extension of time and extensions of time for cause.

(a) If an applicant is required to respond within a nonstatutory or shortened statutory time period, applicant may respond up to four months after the time period set if a petition for an extension of time and the fee set in §1.17 are filed prior to or with the response, unless (1) applicant is notified otherwise in an Office action or (2) the application is involved in an interference declared pursuant to §1.207. The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See §1.245 for extension of time in interference proceedings and §1.550(c) for extension of time in reexamination proceedings.

(b) When a response with petition and fee for extension of time cannot be filed pursuant to paragraph (a) of this section, the time for response will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. In no case can any extension carry the date on which response to an Office action is due beyond the maximum time period set by statute or be granted when the provisions of paragraph (a) of this section are available. See §1.245 for extension of time in interference proceedings and §1.550(c) for extension of time in reexamination proceedings.

22. Section 1.191 is amended by adding a new paragraph (d) to read as follows:

§1.191 Appeal to Board of Appeals.

* * * * *

(d) The time periods set forth in §§1.191 through 1.194, 1.196 and 1.197 are subject to the provisions of §1.136 for patent applications or §1.550(c) for reexamination proceedings.

23. Section 1.192 is amended by revising paragraph (a) to read as follows:

§1.192 Appellant's brief.

(a) The appellant shall, within 2 months from the date of the notice of appeal under §1.191 in an application, reissue application, or patent under reexamination, or within the time allowed for response to the action appealed from, if such time is later, file a brief in triplicate. The brief must be accompanied by the requisite fee set forth in §1.17(f) and must set forth the authorities and arguments on which the appellant will rely to maintain the appeal. The brief must include a concise explanation of the invention which should refer to the drawing by reference characters, and a copy of the claims involved.

* * * * *

24. Section 1.197 is amended by revising paragraph (b) to read as follows:

§1.197 Action following decision.

* * * * *

(b) A single request for rehearing or reconsideration, or modification of the decision, may be made if filed within thirty days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Appeals so states.

* * * * *

25. Section 1.304 is amended by revising paragraph (a) to read as follows:

§1.304 Time for appeal or civil action.

(a) The time for filing the notice and reasons of appeal to the U.S. Court of Appeals for the Federal Circuit (§1.302) or for commencing a civil action (§1.303) is sixty days from the date of the decision of the Board of Appeals or the Board of Patent Interferences. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time provided pursuant to §1.197(b) or §1.256(b), the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. The time periods set forth herein are subject to the provisions of §1.136 or §1.550(c) as to decisions of the Board of Appeals, or §1.245 as to decisions of the Board of Patent Interferences.

* * * * *

26. Section 1.550 is amended by revising paragraph (c) to read as follows:

§1.550 Conduct of reexamination proceedings.

* * * * *

(c) The time for taking any action by a patent owner in a reexamination proceeding will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the patent owner is due, but in no case will the mere filing of the request effect any extension.

* * * * *

27. Section 1.555 is amended by revising paragraphs (a) and (b) to read as follows:

§1.555 Duty of disclosure in reexamination proceedings.

(a) A duty of candor and good faith toward the Patent and Trademark Office rests on the patent owner, on each attorney or agent who represents the patent owner, and on every other individual who is substantively involved on behalf of the patent owner in a reexamination proceeding. All such individuals who are aware, or become aware, of patents or printed publications material to the reexamination which have not been previously made of record in the patent file must bring such patents or printed publications to the attention of the Office. An information disclosure statement, preferably in accordance with §1.98, should be filed wihin two months of the date of the order for reexamination, or as soon thereafter as possible in order to bring such patents or printed publications to the attention of the Office.

(b) Disclosures pursuant to this section must be accompanied by a copy of each foreign patent document or non-patent printed publication which is being disclosed or by a statement that the copy is not in the possession of the person making the disclosure and may be made to the Office through an attorney or agent having responsibility on behalf of the patent owner for the reexamination proceeding or through a patent owner acting in his or her own behalf. Disclosure to such an attorney, agent or patent owner shall satisfy the duty of any other individual. Such an attorney, agent or patent owner has no duty to transmit information which is not material to the reexamination.

* * * * *

Nov. 30, 1983. GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

[1038 O.G. 275]

(52) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 40442-49092]

Final Rules for Patent Maintenance Fees

Agency: Patent and Trademark Office, Commerce
Action: Notice of final rulemaking
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Part I of Title 37, Code of Federal Regulations, to provide rules and procedures for the payment of patent maintenance fees. Public Law 96-517, enacted on Dec. 12, 1980 and Public Law 97-247, enacted on Aug. 27, 1982, provided for the payment of maintenance fees at intervals of 3½, 7½ and 11½ years from the date of grant of the patent for maintaining in force an original patent, a reissue patent of an invention, and under Public Law 96-517, a plant patent and reissues thereof. The changes provide specific rules and procedures which will assist patentees in avoiding the inadvertent expiration of a patent for failure to pay the appropriate maintenance fee.
Effective Date: Nov. 1, 1984
For Further Information Contact: R. Franklin Burnett by telephone at (703) 557-3054 or by mail to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed primarily to 1) establish a set of rules and procedures for the payment of patent maintenance fees; and 2) effect the provisions of Public Laws 96-517 and 97-247 with respect to payment of maintenance fees. The proposed rules were published on Apr. 24, 1984, in Vol. 49 of the *Federal Register*, pages 17692 through 17698; and on May 8, 1984, at Vol. 1042 of the *Official Gazette*, pages 22 through 38. A public hearing was held on the proposed rule changes on June 26, 1984.

A public briefing on the Office's maintenance fee payment plans was announced at 49 *Federal Register* 2806 on Jan. 23, 1984, and at 1038 *Official Gazette* 293 on Jan. 31, 1984. The public briefing was held on Feb. 22, 1984.

Discussion of Specific Rules

Section 1.1., is amended as proposed to add a new paragraph (d) to provide a "Box M. Fee" in the Patent and Trademark Office to which all maintenance fee correspondence and payments should be directed. Changes in small entity status in patents and changes in the "fee address" under §1.363, as well as payments of maintenance fees should be directed to "Box M. Fee".

Section 1.9, paragraph (d) is amended as proposed to make a change in citation and title of the rule of the Small Business Administration which relates to the small business size standard for paying reduced patent fees. This change was published in the Federal Register as a final rule on Feb. 9, 1984 at 49 Fed. Reg. 5024-5048. The wording of the rule itself was not changed. This change is made to bring the wording of title 37, Code of Federal Regulations into conformance with title 13, Code of Federal Regulations.

Section 1.17, is amended as proposed to establish in paragraph (h) a fee of $120 for review of a decision refusing to accept and record payment of a maintenance fee filed prior to the expiration of a patent. Paragraph (h) of §1.17 is also amended to establish a fee of $120 for reconsideration of a decision on petition refusing to accept the delayed payment of a maintenance fee in an expired patent.

Section 1.19, is amended as proposed to add new paragraphs (f) and (g). New paragraph (f) provides for a $10.00 fee for a microfiche copy of a patent file wrapper record. Microfiche copies of these patent files have recently become available for patents issued after Jan. 1, 1984. No fee had previously been set by rule for this service. This fee is not directly related to maintenance fees but is set at this time for convenience. New paragraph (g) establishes a $3.00 fee for providing an uncertified statement indicating either the status of payment of maintenance fees due on a patent or the expiration of a patent. This charge does not apply to any receipt normally provided to the fee addressee as a result of the payment of a maintenance fee, but does apply in any other instance when written evidence of the status of payment of maintenance fees on a patent is requested, whether by the patentee or a member of the public.

Section 1.20, is amended as proposed to add new paragraphs (k), (l) and (m). New paragraph (k) provides for a $100.00 surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982. Since Public Law 96-517 did not provide for small entities, the surcharge amount of $100 applies to all such patents. New paragraph (l) provides for a $100 surcharge for patentees other than a small entity and a $50 surcharge for small entity patentees when paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant based on an application filed on or after Aug. 27, 1982. This surcharge of $100 is subject to a 50% reduction for small entities pursuant to Public Law 97-247. New paragraph (m) provides for a $500 surcharge for accepting payment of a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee. This $500 surcharge applies only under Public Law 97-247 where the patent is based on an application filed on or after Aug. 27, 1982 and where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable. The requirement that the delay be "unavoidable" is the same as that for reviving an abandoned application under 35 U.S.C. 133. However, the amount of evidence required will depend upon when the showing that the delay was "unavoidable" is made. This surcharge does not apply to patents based on applications filed prior to Aug. 27, 1982 since acceptance of a maintenance fee after expiration of a patent for non-timely payment is not possible under Public Law 96-517. Since this surcharge is provided for under 35 U.S.C. 41(c), it is not subject to a 50% reduction for small entities. The surcharge in paragraph (m) is not in addition to the surcharge in paragraph (l), but is in lieu thereof.

Section 1.33 is amended as proposed to add a new paragraph (d) which allows a "correspondence address" or change thereto to be filed during the enforceable life of the patent. The "correspondence address" will be used in correspondence relating to maintenance fees unless a separate "fee address" has been specified. Paragraph (d) also includes a reference to §1.363 relating to the "fee address" to be used for maintenance fee purposes.

New §1.362 is added to provide for times for payment of maintenance fees. New paragraph (a) sets forth the requirement that maintenance fees as set forth in §1.20(e)-(j) must be paid in order to maintain a patent in force if the application maturing into a patent was filed on or after Dec. 12, 1980 and is subject to the payment of maintenance fees. The maintenance fee amounts set in §1.20(e)-(g) are subject to adjustment in accordance with the provisions of Public Law 96-517. The maintenance fee amounts set in §1.20(h)-(j) are subject to adjustment in accordance with the provisions of Public Law 97-247 on Oct. 1, 1985, and every third year thereafter, to reflect fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Other patent fees are also subject to similar adjustments.

New paragraph (b) of §1.362 stipulates that no maintenance fees are due for plant patents if the plant patent application was filed on or after Aug. 27, 1982 or for any design patents. Maintenance fees are not required for a reissue patent if the patent being reissued did not require maintenance fees. New paragraph (c) defines the pertinent application filing dates for purposes of determining whether maintenance fees are applicable. Paragraph (c) (1) establishes that for national applications not claiming benefit of an earlier application, the actual United States filing date controls. Paragraph (c) (2) establishes that for national applications claiming benefit of an earlier foreign application under 35 U.S.C. 119, the United States filing date controls. Paragraph (c) (3) provides that for continuing national applications claiming benefit of a prior application under 35 U.S.C. 120, the actual United States filing date of the continuing application is the controlling date. Paragraph (c) (4) provides that for a reissue application, the United States filing date of the application which matured into the original patent upon which the reissue application is based will control. Paragraph (c) (5) establishes that for an international application which has entered the United States as a Designated Office under 35 U.S.C. 371, the international filing date granted under Article 11(1) of the Patent Cooperation Treaty controls. This is consistent with 35 U.S.C. 363.

Paragraph (d) of new §1.362 sets forth the time periods when maintenance fees can be paid without a surcharge. Those periods, referred to generally as the "window period," are the six-month periods preceding each due date, i.e., 3 years through 3 years and six months, 7 years through 7 years and six months, and 11 years through 11 years and six months after grant of the patent. The "due dates" are defined in 35 U.S.C. 41(b). A maintenance fee paid on the last day of a window period can be paid without surcharge. The last day of a window period is the same date (anniversary date) the patent was granted 3 years and six months, 7 years and six months, or 11 years and six months after grant of the patent. Paragraph (d) has been modified from the proposal to add "and" between items (2) and (3) and change the comma at the end of the paragraph to a period.

Paragraph (e) of new §1.362 sets forth the grace periods during which maintenance fees, under either Public Law 96-517 or Public Law 97-247, may be paid with the surcharge under §1.20(k) or (l). The grace periods are the six-month periods immediately following each due date, i.e., after 3 years and six months and up to 4 years, after 7 years and six months and up to 8 years, and after 11 years and six months and up to 12 years after grant of the patent. A maintenance fee may be paid with the surcharge on the same date (anniversary date) the patent was granted in the 4th, 8th, or 12th year after grant to prevent the patent from expiring.

Paragraph (f) of new §1.362 specifies that where the last day for paying a maintenance fee falls on a Saturday, Sunday, or a federal holiday within the District of Columbia, the maintenance fee may be paid on the next succeeding day which is not a Saturday, Sunday, or federal holiday. For example, if the "window period" provided by paragraph (d) for paying a maintenance fee without surcharge ended on a Saturday, Sunday, or a federal holiday within the District of Columbia, the maintenance fee can be paid without surcharge on the next succeeding day which is not a Saturday, Sunday, or federal holiday. Likewise, if the grace period provided by paragraph (e) for paying a maintenance fee with surcharge ended on a Saturday, Sunday, or a federal holiday within the District of Columbia, the maintenance fee could be paid with surcharge on the next succeeding day which is not a Saturday, Sunday, or federal holiday. In the latter situation, the failure to pay the maintenance fee and surcharge on the next succeeding day which is not a Saturday, Sunday, or federal holiday will result in the patent expiring on a date (4, 8, or 12 years after the date of grant) earlier than the last date on which the maintenance fee and surcharge could be paid. This situation results from the provisions of 35 U.S.C. 21, but those provisions do not extend the expiration date of the patent if the maintenance fee and any required surcharge are not paid when required. For example, if the grace period ended on Saturday, the maintenance fee and surcharge could be paid on the next succeeding business day, e.g. Monday, but the patent will have expired at midnight on Saturday if the maintenance fee and surcharge were not paid on the following Monday. Paragraph (f) has been modified from the proposal to explicitly refer to "any necessary surcharge" for clarity since the ability to pay on the next succeeding day which is not a Saturday, Sunday, or federal holiday within the District of Columbia applies to the maintenance fee, including any necessary surcharge.

Paragraph (g) of new §1.362 establishes that if the proper fees are not received within the time period specified in paragraphs (d), (e), or (f) the patent expires at the end of the grace period set forth in paragraph (e). Paragraph (g) also specifies that a patent which expires for the failure to pay the maintenance fee will expire at the end of the same date (anniversary date) the patent was granted in the 4th, 8th, or 12th year after grant.

New §1.363 is added as proposed to provide for a "fee address" for maintenance fee purposes. New paragraph (a) specifies that the correspondence address used during prosecution of the application will be used unless 1) a "fee address" is provided for maintenance fee purposes when submitting the issue fee, 2) a correspondence address change for all purposes is filed after payment of the issue fee, or 3) a "fee address" or a change in the "fee address" is filed after payment of the issue fee.

Paragraph (b) of new §1.363 specifies that an assignment does not result in a change of address for maintenance fee purposes. Due to the possible expiration of a patent for failure to timely pay the appropriate maintenance fee, patentees should ensure that the Patent and Trademark Office is properly notified of the proper "fee address" to which all maintenance fee communications are to be directed. Under both Public Law 96-517 and Public Law 97-247 the burden is on the patentee to timely pay maintenance fees. The Patent and Trademark Office will attempt to assist patentees through appropriate courtesy notices. However, the failure to receive one or more notices will not relieve the patentee of the obligation to timely pay the appropriate maintenance fee to prevent the patent from expiring by operation of law if the maintenance fee is not paid. Section 1.363 does not provide for maintenance fee correspondence to be directed to more than one address.

New §1.366 is added to establish the guidelines and procedures for submission of maintenance fees, including any necessary surcharges. New paragraph (a) states that the patentee may pay maintenance fees and any necessary surcharges or any person or organization may pay maintenance fees and any necessary surcharges on behalf of the patentee without filing in the Patent and Trademark Office evidence of authorization by the patentee to pay maintenance fees. This will enable patentees to pay the maintenance fees and any necessary surcharges themselves or authorize some person or organization to pay maintenance fees and any necessary surcharges on

their behalf. No verification of the authority to pay maintenance fees and any necessary surcharges in a particular patent will be made by the Patent and Trademark Office. While anyone may pay the maintenance fees and any necessary surcharges on a patent, any Patent and Trademark Office notices relating to maintenance fees will be mailed to the "fee address" set forth in §1.363. Paragraph (a) has been modified from the proposal to explicitly refer to "any necessary surcharges" for clarity.

Paragraph (b) of new §1.366 specifies that a maintenance fee and any necessary surcharge for a patent must be submitted in the amount due on the date the maintenance fee and any necessary surcharge are paid, and at the proper time, i.e., within the periods set forth in §1.362. Paragraph (b) has been modified from the proposal by changing "proper amount" to "amount due on the date the maintenance fee and any necessary surcharge are paid." This change results from adoption of a suggestion that a maintenance fee payment made during the window period should not require adjustment if the maintenance fees are thereafter increased to reflect increases in the Consumer Price Index. Under paragraph (b) as adopted herein, if the amount of the maintenance fee is correct on the date it is paid and credited to the patent, a later change in the maintenance fees to reflect changes in the Consumer Price Index will not require a modification in the amount paid. However, in order for the maintenance fee to be considered paid it must be submitted in accordance with §1.366. Paragraph (b) has also been modified from the proposal to explicitly refer to §1.362(f) for purposes of clarity where the last day for paying a maintenance fee with or without a surcharge falls on a Saturday, Sunday, or a federal holiday within the District of Columbia. In such circumstances, the fee with any necessary surcharge may be paid on the next succeeding day which is not a Saturday, Sunday, or federal holiday. The maintenance fee and any necessary surcharge may be paid in the manner set forth in §1.23, i.e., it should be in United States specie, Treasury notes, national bank notes, post office money orders, or by certified check. As indicated in §1.23, if the maintenance fee payment is sent in any other form, the Office may delay or cancel the credit until collection is made. For example, a personal or other uncertified check drawn on a United States bank which is not immediately negotiable, e.g., because of lack of signature or insufficient funds, will not constitute payment of a maintenance fee. However, a personal check drawn on a United States bank can be used if it is immediately negotiable. Any remittance from foreign countries must be payable and immediately negotiable in the United States for the full amount of the maintenance fee required.

Paragraph (b) of new §1.366 also provides that maintenance fees may be paid by an authorization to charge a deposit account established pursuant to §1.25. The authorization to charge the deposit account must be submitted within the periods set forth in §1.362 and must be limited to maintenance fees payable on the date of submission. The authorization to charge the deposit account can not, under paragraph (b), be submitted prior to the third, seventh, or eleventh year after the grant of the patent. If an authorization to charge a deposit account were submitted to pay the maintenance fee due at three years and six months after grant, a new authorization to charge a deposit account or other form of payment will have to be submitted at the appropriate time for each of the maintenance fees due at 7 years and six months and 11 years and six months. Paragraph (b) also specifies that any payment or authorization filed at any time other than that set forth in §1.362(d), (e) or (f) will not serve as a payment of the maintenance fee, except insofar as a delayed payment of the maintenance fee is accepted by the Commissioner pursuant to §1.378. Paragraph (b) also specifies that a payment of less than the required amount, a payment in a manner other than that set forth in §1.23, or the filing of an authorization to charge a deposit account having insufficient funds, will not constitute payment of a maintenance fee on a patent. The authorization is required to authorize the immediate charging of the fee to the deposit account. An authorization would be improper if it only authorized the fee to be charged at a later date, e.g., on the last possible day of payment without surcharge. Such an authorization would not serve as payment of the maintenance fee. Any payment which fails to result in the entire proper amount of the maintenance fee being present on the due date will not constitute payment of the maintenance fee. Paragraph (b) also specifies that the certificate of mailing procedures of §1.8 or the mailing by "Express Mail" provisions of §1.10 may be utilized in paying maintenance fees. The specific requirements of either §1.8 or §1.10 must be fully complied with if either is used.

Paragraph (c) of new §1.366 establishes the data necessary and desired when submitting maintenance fee payments and any necessary surcharges. New paragraph (c) specifies that maintenance fee payments and any necessary surcharges must include at least the 1) patent number and 2) United States application serial number. Paragraph (c) has been modified from the proposal to explicitly refer to "any necessary surcharges" for clarity since the identifying information must also be supplied when submitting surcharges. The wording of §1.366(c) has also been changed from the proposal to clarify that the required application serial number is that of the application upon which the patent issued. This change from the proposal makes clear that the serial number required to be submitted is not that of a prior parent application but rather, the actual application which matured into the patent for which maintenance fees are to be paid. If the maintenance fee is being paid on a reissue patent, the serial number required is that of the reissue application. Since this required information will be used as a cross-check to ensure that the maintenance fee is properly credited, the application serial number must correspond to the patent which issued therefrom. If less than the required information is submitted, the Office will not credit the payment. Additionally, if notice is required that the proper identifying data has not been submitted, it would result in requiring the payment of a surcharge if the necessary data is submitted after the "window period" closes. If the required information is not submitted until after the end of the grace period, the patent would have expired because of the failure to properly identify the patent to which the maintenance fee payment is to be credited prior to the expiration of the grace period. The patentee in such a circumstance could proceed under §1.378, if appropriate, or could file a petition under §1.377 within the period set therein seeking to have the maintenance fee accepted as timely even though all of the proper identifying data was not present prior to the expiration of the grace period.

Paragraph (d) of new §1.366 specifies that the following information should also be submitted for each patent on which a maintenance fee or surcharge is paid: 1) whether it is the 3½, 7½, or 11½ year fee, 2) whether small entity status is being changed or claimed with the payment, 3) the amount of the maintenance fee and any surcharge being submitted, 4) any assigned payor number, 5) patent issue date and 6) United States application filing date. Paragraph (d) has been modified from the proposal to explicitly refer to "any necessary surcharges" for clarity. Paragraph (d) has also been changed from the proposal to emphasize that when the payment is being made on a reissue patent the required patent number and application serial number are those of the reissue patent and reissue application. Where the payment is a maintenance fee and any necessary surcharge on a reissue patent, in addition to the information requested for all payments, paragraph (d) as adopted herein also requests certain identifying data relating to the original patent, i.e., original patent number, original patent issue date, and original United States application filing date. The reason for requesting the original patent number, original patent issue date, and original United States application filing date is that the original filing and issue dates are the dates which control if and when maintenance fees must be paid to prevent the reissue patent from expiring. The reference to a payor number has been added. A payor number will be assigned to each "fee address" in order to facilitate data input and subsequent changes in the location of the "fee address." Details of the "payor number" system will be announced to the public in a future *Official Gazette* notice. Although the submission of the information requested in paragraph (d) is not mandatory, it would expedite the processing of the maintenance fee payments.

The final rule thus requires less mandatory information, i.e., the patent number and U.S. application serial number, than would have been required by the proposed rule. The required information is considered to be the least that is required to make a cross-check and thus assure that the maintenance fee is being credited to the proper patent. The patent issue date and the application filing date, which were included in the proposed rule as mandatory information, are included in the final rule as desirable, but not mandatory, information The effect of this change is that an error in either the patent issue date or the application filing date, or both, by the person paying the maintenance fee would not result in a refusal to accept the maintenance fee and to credit the payment thereof to the patent, if the patent number and United States application serial number were correct, i.e., in agreement. However, if any error included either the patent number or the United States application serial number such that they were not in agreement the payment would not be accepted and credited until correction was made. The date of the correction would be the date the maintenance fee payment is credited as being made.

Paragraph (e) of new §1.366 specifies that maintenance fee payments and any surcharges relating thereto must be submitted separate from any other payments for fees or charges, whether submitted in the manner set forth in §1.23 or by an authorization to charge a deposit account. Maintenance fee payments and surcharge payments relating thereto which are co-mingled with payments for other fees or charges, e.g., application filing fees, issue fees, petition fees, document supply fees, etc., will not be accepted. The maintenance fees require processing by a separate area of the Office and are not processed in the same manner as other fees and charges. Maintenance fees for a number of patents can be submitted together in one submission and one payment. Paragraph (e) specifies that if maintenance fee payments for more than one patent are submitted together, they should be submitted on as few sheets as possible, listing the patent numbers in increasing patent number order. If the payment submitted, which can be made as a single payment, is insufficient to cover the maintenance fees and any surcharges for all the listed patents, the payment will be applied in the order the patents are listed. In such a circumstance where the fees are insufficient, the maintenance fee and any surcharge for one or more of the last listed patents will not be paid.

Paragraph (f) of new §1.366 serves as a reminder to patentees of the necessity to check for the loss of small entity status prior to paying each maintenance fee on a patent. This is already a requirement of §1.28(b). Paragraph (f) provides that notification of any change in status resulting in loss of entitlement to small entity status must be filed in a patent prior to paying, or at the time of paying, the earliest maintenance fee due after the date on which status as a small entity is no longer appropriate. If status as a small entity has been previously established by filing a statement and such status is checked and is found to be proper, no notification is required. It is not necessary to file new verified statements claiming small entity status at this point if the status as a small entity has been established and is still proper even if rights have been transferred to a small entity who has not previously filed a verified statement. The requirement is to notify the Patent and Trademark Office of the loss of entitlement and to pay the maintenance fee in the proper amount for other than a small entity where appropriate. The refund provisions of §1.28(a) for later submitted small entity statements will apply to maintenance fees.

Paragraph (g) of new §1.366 provides that maintenance fees and surcharges relating thereto will not be refunded except in accordance with §§1.26 and 1.28(a). A patentee cannot obtain a refund of a maintenance fee which was due and payable on the patent. Any duplicate payment will be refunded to the fee address.

New §1.377 is added as proposed to provide a mechanism for review of a decision refusing to accept and record payment of a maintenance fee filed prior to the expiration of a patent. Paragraph (a) of new §1.377 specifies that a patentee who is dissatisfied with the refusal of the Patent and Trademark Office to accept and record a maintenance fee which was filed prior to the expiration of the patent may petition the Commissioner to accept and record the maintenance fee. This petition may be used, for example, in situations where an error is present in the identifying data required by §1.366(c) with the maintenance fee payment, i.e., either the patent number or the application serial number are incorrect. A petition under §1.377 would not be appropriate where there is a complete failure to include at least one correct mandatory identifier as required by §1.366(c) for the patent since no evidence would be present as to the patent on which the maintenance fee was intended to be paid. If the maintenance fee payment with an incorrect mandatory identifier was made near the end of the grace period, the patent might expire since the Office would not credit the fee to a patent. For patents based on applications filed between Dec. 12, 1980 and Aug. 27, 1982, there is no provision for acceptance of a maintenance fee after the grace period such as in §1.378 and so the filing of a petition under §1.377 would provide an avenue for seeking relief. A petition under §1.377 would not be appropriate where the patentee paid a maintenance fee on one patent when the patentee intended to pay the maintenance fee on a different patent but through error identified the wrong patent by patent number and application serial number. Likewise, a petition under §1.377 would not be appropriate where the entire maintenance fee payment, including any necessary surcharge, was not filed prior to expiration of the patent.

Paragraph (b) of new §1.377 specifies that any petition under new §1.377 must be filed within 2 months of the action complained of, or within such other time as may be set in the action complained of. The petition must be accompanied by the petition fee of $120 provided for in the amendment to §1.17(h). Paragraph (b) also provides that the petition may include a request that the petition fee be refunded if the refusal to accept and record the maintenance fee is determined to have resulted from an error by the Patent and Trademark Office.

Paragraph (c) of new §1.377 specifies that any petition filed under the section must comply with the requirements of paragraph (b) of §1.181 and must be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. A person or organization whose only responsibility insofar as the patent is concerned is the payment of a maintenance fee is not a party in interest for purposes of paragraph (c) of §1.377. The petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office. If the petition is signed by a person not registered to practice before the Patent and Trademark Office, the petition must include the authority of the person signing the petition as patentee, assignee, or other party in interest.

New §1.378 is added as proposed to establish the procedure for acceptance of the delayed payment of a maintenance fee in an expired patent in order to reinstate that patent. This procedure is only available under Public Law 97-247 where the application on which the patent is based was filed on or after Aug. 27, 1982. If the maintenance fee is due under Public Law 96-517, i.e., the application on which the patent is based was filed on or after Dec. 12, 1980, and before Aug. 27, 1982, the delayed payment of the maintenance fee is not provided for by statute and cannot be accepted after expiration of the patent, and the patent cannot be reinstated.

Paragraph (a) of new §1.378 provides that the Commissioner may accept the payment of any maintenance fee due on a patent based on an application filed on or after Aug. 27, 1982, after expiration of the patent if, upon petition, the delay in payment of the maintenance fee is shown to the satisfaction of the Commissioner to have been unavoidable. The surcharge set forth in §1.20(m) must be paid as a condition of accepting payment of the maintenance fee. No separate petition fee is required for this petition. If the Commissioner accepts payment of the maintenance fee upon petition, the patent shall be considered as not having expired, but will be subject to the intervening rights provisions of 35 U.S.C. 41(c) (2).

Paragraph (b) of new §1.378 specifies the requirements of a petition for acceptance of the delayed payment of a maintenance fee filed within six months of the expiration of the patent. Under paragraph (b), the petition must include the required maintenance fee set forth in §1.20(h)-(j); the surcharge set forth in §1.20(m); and a showing that the delay was unavoidable since reasonable care was taken to ensure that the maintenance fee would be paid timely. The showing must enumerate the steps taken to ensure timely payment of the maintenance fee. In view of the requirement to enumerate the steps taken to ensure timely payment of the maintenance fee, an argument that the patentee was ignorant of the requirement to pay maintenance fees will not constitute a showing of unavoidable delay. Evidence that despite reasonable care on behalf of the patentee and/or the patentee's agents, and reasonable steps to ensure timely payment, the maintenance fee was unavoidably not paid, could be submitted in support of an argument that the delay in payment was unavoidable. For example, an error in a docketing system could possibly result in a finding that a delay in payment was unavoidable if it were shown that reasonable care was exercised in designing and operating the system and if it were shown that the patentee took reasonable steps to ensure that the patent was entered into the system to ensure timely payment of the maintenance fees.

Paragraph (c) of new §1.378 specifies the requirements of a petition for acceptance of the delayed payment of a maintenance fee filed more than six months after the expiration of a patent. These requirements are much more stringent in view of the heavy burden of proof that the delay was unavoidable. The legislative history of Public Law 97-247, House Report No. 97-542 (Committee on the Judiciary), indicates that "[a]fter the expiration of a reasonable period of time, the patentee would bear a heavy burden of proof that the delay was unavoidable." The six month period provided for petition under paragraph (b) is considered to be a reasonable period of time within which to seek reinstatement of a patent which expired for failure to pay the maintenance fee. Any petition filed more than six months after expiration must meet the more stringent requirements of paragraph (c). Under paragraph (c), the petition must include the same elements as in paragraph (b) and, in addition, must demonstrate that the failure to pay the maintenance fee was unavoidable due to circumstances outside of the control of the patentee and those acting on behalf of the patentee in paying the maintenance fee. The showing in a petition under paragraph (c) must be sufficient in scope and content to meet the heavy burden of proof required to show that a delay in payment of the maintenance fee of more than six months after expiration of the patent was unavoidable. In contrast to a petition under paragraph (b), a showing in a petition under paragraph (c) of an error in a docketing system will not be sufficient to find that the delay was unavoidable. Instead, a petition filed under paragraph (c) must demonstrate that the circumstances resulting in the delay were entirely outside the control of the patentee and those acting on behalf of the patentee in paying the maintenance fee, e.g., serious efforts without success to raise the funds required to pay the maintenance fee.

Paragraph (d) of new §1.378 requires that a petition filed under §1.378 be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. A person or organization whose only responsibility insofar as the patent is concerned is the payment of a maintenance fee is not a party in interest for purposes of paragraph (d) of §1.378. Under paragraph (d), the petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office. If the petition is signed by a person not registered to practice before the Patent and Trademark Office, the petition must include the authority of the person signing the petition as patentee, assignee, or other party in interest.

Paragraph (e) of new §1.378 provides a mechanism for obtaining reconsideration of a decision refusing to accept a maintenance fee upon petition filed pursuant to paragraph (a). This mechanism is a petition for reconsideration which may be filed within two months of, or such other time as set in the decision refusing to accept the delayed payment of the maintenance fee. In contrast to petitions filed under paragraph (a), the petition for reconsideration filed under paragraph (e) of new §1.378 will require the separate petition fee set forth in the amendment to §1.17(h). Paragraph (e) also provides that after the decision on the petition for reconsideration, no further reconsideration or review of the matter will be undertaken by the Commissioner. Paragraph (e) also provides for refund of the maintenance fee and the surcharge set forth in §1.20(m) if the delayed payment of the maintenance fee is not accepted. The refund will be made following the decision on the petition for reconsideration, or after the expiration of the time for filing such a petition for reconsideration, if none is filed. Paragraph (e) specifies that the fee for filing the petition for reconsideration will not be refunded unless the refusal to accept and record the maintenance fee is determined to result from an error by the Patent and Trademark Office.

Response to Comments on the Rules

Specific comments were received on a number of the proposed rule changes. Eight letters submitting written comments were received. Oral testimony was presented by two persons (one person testified on behalf of the American Intellectual Property Law Association) at the public hearing conducted on June 26, 1984. All of the written and oral comments were considered in adopting the changes set forth herein. The comments submitted appear below along with responses thereto.

Comment:

One comment suggested that the surcharge set at 37 CFR 1.20(m) for accepting a maintenance fee after expiration of the patent should be reduced from $500.00 to $50.00 and that this amount should be reduced by 50 percent for small entities.

Reply:

The suggestion has not been adopted. The surcharge set at 37 CFR 1.20(m) is considered to be appropriate in view of the importance of the relief being obtained. Before a surcharge under 37 CFR 1.20(m) is due the patent will have already expired due to the failure to pay a maintenance fee within a one-year period provided for the payment. Setting a lower amount as the surcharge would tend to denigrate the importance of the relief obtained by the acceptance of a maintenance fee after expiration of a patent. Further, a lower surcharge amount is not justified in view of the ample opportunity for payment of the maintenance fee which is presented by the one-year period in which payment can be made and the fact that the public is now on notice that maintenance fees are due and payable. Further, the Patent and Trademark Office will provide courtesy notices regarding the need to pay maintenance fees at a plurality of points in time before the patent expires. Such a notice now appears on the patent grant and presently plans are to print such a courtesy notice on the Notice of Allowance and the Issue Fee Receipt. Notices will be printed in the *Official Gazette* listing the patent number ranges of patents on which maintenance fees can be paid and a notice will be mailed to the patentee during the grace period if the maintenance fee is not paid. Therefore, relatively few patentees should fail to pay the maintenance fee before expiration of the patent due to unavoidable circumstances. The surcharge set at 37 CFR 1.20(m) is established pursuant to 35 U.S.C. 41(c) and therefore the small entity provisions of Public Law 97-247 do not apply to this fee. Also, Public Law 97-247 provides that the surcharge set at 37 CFR 1.20(m) could be in addition to any surcharge established for payment of the maintenance fee during the grace period as set at 37 CFR 1.20(1). The Patent and Trademark Office has established a separate surcharge set at 37 CFR 1.20(m) not in addition to the surcharge set at 37 CFR 1.20(1), but in lieu thereof. The amount set at 37 CFR 1.20(m) is not seen to be excessive.

Comment:

Two comments suggested that the small entity reduced fee provisions of Public Law 97-247 should have been applied to maintenance fees required under Public Law 96-517.

Reply:

The maintenance fee amounts under Public Law 96-517 set at 37 CFR 1.20(e)-(g) were previously set and are not part of the present rulemaking. It should be noted, however, that Public Law 96-517 did not provide for reduction of fees for small entities. Reductions of fees for small entities were established in Public Law 97-247 only for fees under 35 U.S.C. 41(a) and (b) thereof. The maintenance fee levels in 37 CFR 1.20(e)-(g), however, were established under 35 U.S.C. 41(c) of Public Law 96-517 rather than 35 U.S.C. 41(a) or (b) of Public Law 97-247. Therefore, the fee amounts previously set at 37 CFR 1.20(e)-(g) are not seen to be subject to reduction for small entities.

Comment:

One comment suggested that the Office permit any of the maintenance fees to be paid in advance, either at the time of paying the issue fee or during any of the window periods. Another comment suggested that the Office should accept a fee payment earlier than the window period if the fee has no possibility of being changed due to changes in the Consumer Price Index.

Reply:

These suggestions have not been adopted. The second comment listed above points out the problem with regard to the suggestion in the first comment. Public Law 97-247 provided for adjustments of the maintenance fees every third year to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Allowing maintenance fees to be paid in advance would preclude such adjustments to these maintenance fees unless very burdensome administrative steps were implemented to require adjustments in the fee amount previously paid when the maintenance fees are adjusted at a later time. Requiring maintenance fees to be paid in a consistently time-ordered basis as in §1.362 will also be helpful administratively and for budgeting purposes. As to the second comment above, it is not seen that there would be substantial benefit to the public since the period would be short during which a maintenance fee could not change due to changes in the Consumer Price Index. Thus, the patentee would only be able to make the maintenance fee payment a short time before the period during which payment may be made pursuant to §1.362.

Comment:

Two comments suggested that a maintenance fee payment made during the window period should not require adjustment if the maintenance fees are thereafter increased toreflect increases in the Consumer Price Index.

Reply:

These comments have been adopted by an appropriate change in paragraph (b) of §1.366. Maintenance fees which are paid during the window period in the amount required on the date of payment will be accepted as proper and full payment. If the maintenance fees change after such a proper payment, no adjustment in the amount will be required or permitted. Thus, if the maintenance fee increases before the close of the window period, the patentee will not be required to make up any deficiency between the amount properly paid during the window period and the new increased fee. Likewise, if the maintenance fee decreases before the close of the window period, no refund will be permitted of part of the maintenance fee properly paid in the amount due when the payment was made. Payments must be made in the amount proper on the date of payment. For example, if payment is made during the grace period, the payment must be made in the amount then required irrespective of the amount of the maintenance fee which would have been due if payment had been made during the window period.

Comment:

Three comments were directed to the proposed requirements in §1.366(c) for data identifying the patent upon which maintenance fee payments are being made. One comment indicated that many computer annuity systems now existing have a data base designed to accept only two identifying numbers. This comment and one other comment suggested that the patent number and issue date be required to be submitted with the maintenance fee to identify the patent number. Another comment suggested that the required identifying data be the patent number, issue date, name of the inventor and title of the invention.

Reply:

The suggested changes to the proposed rule have been adopted in part. The requirement for identifying data to uniquely identify the patent for which maintenance fees are being paid is an important one. The Patent and Trademark Office and the public must be able to determine with certainty which patents are in force and which patents have expired because the maintenance fees were not paid. The comments seem to recognize that at least two identifiers are necessary so that a cross-check can be made to avoid errors. The suggested use of the issue date with the patent number would not provide a reliable cross-check. In excess of one thousand patents usually issue on each issue date. Therefore a mistake in the last four digits in the patent number supplied with the maintenance fee payment would often not be detected by use of the issue date as a cross-check. The Patent and Trademark Office has determined that the two best identifying data units for use as a cross-check are the patent number and the application serial number. These identifiers are unique since each is specific to one patent or application and are thus required to be provided with a maintenance fee payment by the final rule. The application serial number and the patent number are both listed on the issued patent and in the *Official Gazette* and therefore should be readily available to patentees.

Comment:

One comment suggested that no petition fee should be charged for filing a petition under 37 CFR 1.377 seeking review of a decision refusing to accept and record payment of a maintenance fee filed prior to expiration of a patent. The comment further suggested that, if a fee is charged, the filing of a petition thereunder should be presumed to be a request for a return of the petition fee if it is determined that the refusal to accept and record a maintenance fee payment was due to Patent and Trademark Office error.

Reply:

The suggestion that no petition fee be charged has not been adopted. The petition fee, although required in advance, will be retained by the Patent and Trademark Office only in those instances where the refusal to accept and record the fee resulted from an error on the part of someone other than the Patent and Trademark Office. In those instances where the refusal to accept and record the fee resulted from a Patent and Trademark Office error the Office intends to refund the petition fee, either based upon the request included in the petition or upon the initiative of the Office. The reason for including a request for a refund, where appropriate, in the petition is to ensure that such request is not inadvertently overlooked. In view of the expense involved, it would be inappropriate to process a petition without a petition fee where the

error necessitating the petition was made by the petitioner or someone acting on behalf of the patentee.

Comment:

One comment suggested that the term "unavoidable" should be more specifically defined in 37 CFR 1.378(b)(3) and (c)(3), if possible.

Reply:

As stated in this rulemaking, the requirement that the delay in payment of the maintenance fee be "unavoidable" is the same as that for reviving an abandoned application under 35 U.S.C. 133. This standard has been in effect for many years and should be well understood by the public. The rule is seen to be adequate as written, especially in view of the discussion in this rulemaking which includes several specific examples based on when the petition to accept the delayed payment of a maintenance fee is filed.

Comment:

One comment suggested that Public Law 97-247 should be "liberally interpreted" to permit acceptance of delayed payments of maintenance fees required under Public Law 96-517. Proposed 37 CFR 1.378 was limited to patents issuing on applications filed on or after Aug. 27, 1982, the effective date of Public Law 97-247.

Reply:

The final rule has not been changed from the proposal. The remedy suggested by the comment cannot be provided in view of the language of 35 U.S.C. 41(c)(1) which applies only to maintenance fees required by 35 U.S.C. 41(b) of Public Law 97-247. Section 17(a) of Public Law 97-247 clearly states "the maintenance fees provided for in section 3(b) of this Act shall not apply to patents applied for prior to the date of enactment of this Act."

Comment:

Several of the comments received were directed to proposed statutory changes which were said to be desirable in the area of maintenance fees.

Reply:

These comments were not suggesting that the proposed rules were not in compliance with the present statutes, but rather that the statutes themselves should be changed. These comments are beyond the scope and purpose of this rule change.

Implementation of Maintenance Fee Payment Procedures

The Patent and Trademark Office is presently developing its internal working procedures for processing maintenance fee payments and for notifying the public as to the status of maintenance fee payments on particular patents. The first maintenance fees become due early in 1985. In order to be as helpful as possible in informing the public as to the Patent and Trademark Office's current plans it is useful to outline the basic procedures the Patent and Trademark Office intends to adopt to process maintenance fees so that the interrelationship with the rules is understood. These basic procedures are subject to change as experience and circumstances dictate.

Notices by the Patent and Trademark Office

Under the statutes, the Patent and Trademark Office has no duty to notify patentees when their maintenance fees are due. It is the responsibility of the patentee to assure that the maintenance fees are paid to prevent expiration of the patent. The Patent and Trademark Office will, however, provide some notices as reminders that maintenance fees are due, but the notices, errors in the notices, or the lack of notices, will in no way relieve a patentee from the responsibility to make timely payment of each maintenance fee to prevent the patent from expiring by operation of law. The notices provided by the Patent and Trademark Office will be merely courtesy in nature and intended to aid patentees. These notices, errors in these notices, or the lack of notices, will in no way shift the burden of monitoring the time for paying maintenance fees on patents from the patentee to the Patent and Trademark Office.

Preprinted Standard Notice Wording

The patent grant currently includes a reminder that maintenance fees may be due. The Notice of Allowance and Issue Fee Receipt are presently planned to be revised to contain reminder notice wording that maintenance fees may be due.

Official Gazette Notice

A notice will appear in each issue of the *Official Gazette* which will indicate which patents have been granted 3, 7 and 11 years earlier, that the window period has opened and that maintenance fee payments will now be accepted for these patents.

Another *Official Gazette* notice published after expiration of the grace period will indicate any patent which has expired due to non-payment of maintenance fees and any patents which have been revived under 35 U.S.C. 41(c). An annual compilation of such expirations and revivals will also be published.

Courtesy Reminder Notice

Since patentees are expected to maintain their own record systems and since most patentees are expected to pay their maintenance fees during the "window period" to prevent payment of a surcharge, the Office will not send any reminder notices to patentees at the fee address until after the grace period has begun. This will reduce and simplify the mailing of notices but still give patentees an opportunity to pay their maintenance fees with surcharge during the grace period before expiration of their patents. Such notices will be mailed to the fee address as set forth in §1.363.

Action Notices

The Office will issue a receipt for payment of maintenance fees after entry of the maintenance fee payment. Such a receipt will provide an opportunity for the patentee to check if the Office has properly credited the payment. The original document submitted by the patentee when paying the maintenance fee will also be appropriately marked and returned to the fee address. If actual experience indicates that they are not needed, the receipt notices and/or the return of the original document may be discontinued.

The patentee will also be notified by mail at the fee address as set forth in §1.363 of any expiration or revival of the patent.

Fee Address

The patentee may provide the Patent and Trademark Office with a fee address under §1.363, which address may be different from the correspondence address under §1.33, when submitting the issue fee or in a separate later-filed paper. The fee address will be used by the Office for all correspondence directed to the patentee concerning maintenance fees. If no separate fee address is provided by the patentee under §1.363, the correspondence address under §1.33 will also be used for maintenance fee purposes.

Payment of Maintenance Fees

Transmittals of maintenance fees may be limited to a single patent or may involve several patents. If a transmittal involves several patents they should be listed in increasing numerical order. The following format is suggested for use when paying maintenance fees and any necessary surcharges. Although only the mandatory identification elements consisting of the patent number and United States application serial number, set forth in §1.366(c) are required, the items referred to in §1.366(d) should also be included to expedite processing of maintenance fees and any necessary surcharges. In addition,

February 22, 1987

Commissioner of Patents and Trademarks
Box M. Fee
Washington, D.C. 20231

Dear Sir:

Enclosed is a check drawn for the amount of $1,500 for the payment of the maintenance fees on the following patents.

Patent Number	Serial Number	Patent Date	Application Filing Date	Payment Year	Small Entity	Amount Paid	Surcharge	Fee Code
P.P.5,188	380,062	Feb. 7, 1984	May 20, 1981	4	—	$ 200.00	—	170
Re. 31,522	481,494	Feb. 14, 1984	April 1, 1983	4	—	$ 200.00	$100.00	170/176
*(4,374,741)	—	(Feb. 22, 1983)	(July 21, 1981)	—	—	—	—	—
4,429,419	339,620	Feb. 7, 1984	Jan. 15, 1982	4	—	$ 200.00	—	170
4,429,433	412,101	Feb. 7, 1984	Aug. 27, 1982	4	No	$ 400.00	—	173
4,429,439	458,474	Feb. 7, 1984	Jan. 17, 1983	4	Yes	$ 200.00	—	273
**4,432,000	380,681	Feb. 14, 1984	Aug. 26, 1981	4	—	$ 200.00	—	170
				Subtotals		$ 1,400.00	$100.00	
				Total Amount Paid		$1,500.00		

The Commissioner is hereby authorized to charge any deficiency in the required fee or to credit any overpayment to Account No. 12-3456.

Respectfully submitted,

John Doe
(703) 557-3054

*Note: Information from original patent is included in parenthesis for the reissue patent for which payment is being made.

**Note: Application filing Date is the PCT International Filing Date.

the indication of the fee code used by the Patent and Trademark Office would assist in proper financial crediting within the Office. It is also suggested that the telephone number of the person submitting the payment be supplied.

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). Public Law 97-247 has taken into consideration the impact it may have on small entities.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no siginificant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The maintenance fee payment information collection requirement contained in the final rules has been submitted to OMB for review under Section 3504(h) of the Paperwork Reduction Act. Comments relating to this requirement should be directed to the Office of Information and Regulatory Affairs of OMB, Attention: Desk Officer for Commerce, Patent and Trademark Office.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, Pub. L. 96-517 and Pub. L. 97-247, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

Part I [Amended]

37 CFR, Part I, is amended as follows:

1. Section 1.1 is amended by adding a new paragraph (d) to read as follows:

§1.1 All communications to be addressed to Commissioner of Patents and Trademarks.

* * * * *

(d) Payments of maintenance fees in patents and other communications relating thereto should be additionally marked "Box M. Fee."

§1.9 [Amended]

2. Paragraph (d) of §1.9 is amended by changing the citation "13 CFR 121.3-18, published on Sept. 30, 1982 at 47 FR 43273." to "13 CFR 121.12." and by changing the words "§121.3-18 Definition of small business for paying reduced patent fees under Title 35, U.S. Code" to "§121.12 Small business for paying reduced patent fees."

3. Section 1.17 is amended by adding to the end of paragraph (h) the following:

§1.17 Patent application processing fees.

* * * * *

(h) * * *

- §1.377 - for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent - §1.378(e) - for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent

4. Section 1.19 is amended by adding new paragraphs (f) and (g) to read as follows:

§1.19 Document supply fees.

* * * * *

(f) Microfiche copy of patent file record $10.00
(g) Uncertified statement as to status of the payment of maintenance fees due on a patent or expiration of a patent . . . . . $ 3.00

5. Section 1.20 is amended by adding new paragraphs (k), (l), and (m) to read as follows:

§1.20 Post-issuance fees.

* * * * *

(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . $100.00

(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9 (f)) . . . . . .$ 50.00
By other than a small entity $100.00

(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable $500.00

6. Section 1.33 is amended by adding a new paragraph (d) to read as follows:

§1.33 Correspondence respecting patent applications, reexamination proceedings, and other proceedings.

* * * * *

(d) A "correspondence address" or change thereto may be filed with the Patent and Trademark Office during the enforceable life of the patent. The "correspondence address" will be used in any correspondence relating to maintenance fees unless a separate "fee address" has been specified. See §1.363 for "fee address" used solely for maintenance fee purposes.

7. A new center heading and §1.362 is added to Subpart B to read as follows:

Maintenance Fees

§1.362 Time for payment of maintenance fees.

(a) Maintenance fees as set forth in §1.20(e)-(j) are required to be paid in all patents based on applications filed on or after Dec. 12, 1980, except as noted in paragraph (b) of this section, to maintain a patent in force beyond 4, 8 and 12 years after the date of grant.

(b) Maintenance fees are not required for plant patents based on applications filed on or after Aug. 27, 1982 or for any design patents. Maintenance fees are not required for a reissue patent if the patent being reissued did not require maintenance fees.

(c) The application filing dates for purposes of payment of maintenance fees are as follows:

(1) For an application not claiming benefit of an earlier application, the actual United States filing date of the application.

(2) For an application claiming benefit of an earlier foreign application under 35 U.S.C. 119, the United States filing date of the application.

(3) For a continuing (continuation, division, continuation-in-part) application claiming the benefit of a prior patent application under 35 U.S.C. 120, the actual United States filing date of the continuing application.

(4) For a reissue application, the United States filing date of the original non-reissue application on which the patent reissued is based.

(5) For an international application which has entered the United States as a Designated Office under 35 U.S.C. 371, the international filing date granted under Article 11(1) of the Patent Cooperation Treaty which is considered to be the United States filing date under 35 U.S.C. 363.

(d) Maintenance fees may be paid in patents without surcharge during the periods extending respectively from:

(1) 3 years through 3 years and 6 months after grant for the first maintenance fee,

(2) 7 years through 7 years and 6 months after grant for the second maintenance fee, and

(3) 11 years through 11 years and 6 months after grant for the third maintenance fee.

(e) Maintenance fees may be paid with the surcharge set forth in §1.20(k) or (l) during the respective grace periods after:

(1) 3 years and 6 months and through the day of the 4th anniversary of the grant for the first maintenance fee,

(2) 7 years and 6 months and through the day of the 8th anniversary of the grant for the second maintenance fee, and

(3) 11 years and 6 months and through the day of the 12th anniversary of the grant for the third maintenance fee.

(f) If the last day for paying a maintenance fee without surcharge set forth in paragraph (d) of this section, or the last day for paying a maintenance fee with surcharge set forth in paragraph (e) of this section, falls on a Saturday, Sunday, or a federal holiday within the District of Columbia, the maintenance fee and any necessary surcharge may be paid under paragraph (d) or paragraph (e) respectively on the next succeeding day which is not a Saturday, Sunday, or federal holiday.

(g) Unless the maintenance fee and any applicable surcharge is paid within the time periods set forth in paragraphs (d), (e) or (f) of this section, the patent will expire as of the end of the grace period set forth in paragraph (e) of this section. A patent which expires for the failure to pay the maintenance fee will expire at the end of the same date (anniversary date) the patent was granted in the 4th, 8th, or 12th year after grant.

8. A new §1.363 is added to Subpart B to read as follows:

§1.363 Fee address for maintenance fee purposes.

(a) All notices, receipts, refunds, and other communications relating to payment or refund of maintenance fees will be directed to the correspondence address used during prosecution of the application as indicated in §1.33(a) unless:

(1) a "fee address" for purposes of payment of maintenance fees is set forth when submitting the issue fee, or

(2) a change in the correspondence address for all purposes is filed after payment of the issue fee, or

(3) a "fee address" or a change in the "fee address" is filed for purposes of receiving notices, receipts and other correspondence relating to the payment of maintenance fees after the payment of the issue fee, in which instance, the latest such address will be used.

(b) An assignment of a patent application or patent does not result in a change of the "correspondence address" or "fee address" for maintenance fee purposes.

9. A new §1.366 is added to Subpart B to read as follows:

§1.366 Submission of maintenance fees.

(a) The patentee may pay maintenance fees and any necessary surcharges, or any person or organization may pay maintenance fees and any necessary surcharges on behalf of a patentee. Authorization by the patentee need not be filed in the Patent and Trademark Office to pay maintenance fees and any necessary surcharges on behalf of the patentee.

(b) A maintenance fee and any necessary surcharge submitted for a patent must be submitted in the amount due on the date the maintenance fee and any necessary surcharge are paid and may be paid in the manner set forth in §1.23 or by an authorization to charge a deposit account established pursuant to §1.25. Payment of a maintenance fee and any necessary surcharge or the authorization to charge a deposit account must be submitted within the periods set forth in §1.362(d), (e) or (f). Any payment or authorization of maintenance fees and surcharges filed at any other time will not be accepted and will not serve as a payment of the maintenance fee except insofar as a delayed payment of the maintenance fee is accepted by the Commissioner in an expired patent pursuant to a petition filed under §1.378. Any authorization to charge a deposit account must authorize the immediate charging of the maintenance fee and any necessary surcharge to the deposit account. Payment of less than the required amount, payment in a manner other than that set forth in §1.23, or the filing of an authorization to charge a deposit account having insufficient funds will not constitute payment of a maintenance fee or surcharge on a patent. The certificate of mailing procedures of either §1.8 or §1.10 may be utilized in paying maintenance fees and any necessary surcharges.

(c) In submitting maintenance fees and any necessary surcharges, identification of the patents for which maintenance fees are being paid must include the following:

(1) the patent number, and

(2) the serial number of the United States application for the patent on which the maintenance fee is being paid.

(d) Payments of maintenance fees and any surcharges should identify the fee being paid for each patent as to whether it is the 3½, 7½ or 11½ year fee, whether small entity status is being changed or claimed, the amount of the maintenance fee and any surcharge being paid, any assigned payor number, the patent issue date and the United States application filing date. If the maintenance fee and any necessary surcharge is being paid on a reissue patent, the payment must identify the reissue patent by reissue patent number and reissue application serial number as required by paragraph (c) of this section and should also include the original patent number, the original patent issue date and the original United States application filing date.

(e) Maintenance fee payments and surcharge payments relating thereto must be submitted separate from any other payments for fees or charges, whether submitted in the manner set forth in §1.23 or by an authorization to charge a deposit account. If maintenance fee and surcharge payments for more than one patent are submitted together, they should be submitted on as few sheets as possible with the patent numbers listed in increasing patent number order. If the payment submitted is insufficient to cover the maintenance fees and surcharges for all the listed patents, the payment will be applied in the order the patents are listed, beginning at the top of the listing.

(f) Notification of any change in status resulting in loss of entitlement to small entity status must be filed in a patent prior to paying, or at the time of paying, the earliest maintenance fee due after the date on which status as a small entity is no longer appropriate. See §1.28(b).

(g) Maintenance fees and surcharges relating thereto will not be refunded except in accordance with §§1.26 and 1.28(a).

10. A new §1.377 is added to Subpart B to read as follows:

§1.377 Review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent.

(a) Any patentee who is dissatisfied with the refusal of the Patent and Trademark Office to accept and record a maintenance fee which was filed prior to the expiration of the patent may petition the Commissioner to accept and record the maintenance fee.

(b) Any petition under this section must be filed within 2 months of the action complained of, or within such other time as may be set in the action complained of, and must be accompanied by the fee set forth in §1.17(h). The petition may include a request that the petition fee be refunded if the refusal to accept and record the maintenance fee is determined to result from an error by the Patent and Trademark Office.

(c) Any petition filed under this section must comply with the requirements of paragraph (b) of §1.181 and must be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. Such petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

11. A new §1.378 is added to Subpart B to read as follows:

§1.378 Acceptance of delayed payment of maintenance fee in expired patent to reinstate patent based on application filed on or after Aug. 27, 1982.

(a) The Commissioner may accept the payment of any maintenance fee due on a patent based on an application filed on or after Aug. 27, 1982, after expiration of the patent if, upon petition, the delay in payment of the maintenance fee is shown to the satisfaction of the Commissioner to have been unavoidable and if the surcharge required by §1.20(m) is paid as a condition of accepting payment of the maintenance fee. If the Commissioner accepts payment of the maintenance fee upon petition, the patent shall be considered as not having expired, but will be subject to the conditions set forth in 35 U.S.C. 41(c) (2).

(b) Any petition to accept the delayed payment of a maintenance fee filed under paragraph (a) of this section within six months of the expiration of the patent must include:

(1) the required maintenance fee set forth in §1.20(h)-(j);

(2) the surcharge set forth in §1.20(m); and

(3) a showing that the delay was unavoidable since reasonable care was taken to ensure that the maintenance fee would be paid timely. The showing must enumerate the steps taken to ensure timely payment of the maintenance fee.

(c) Any petition to accept the delayed payment of a maintenance fee filed under paragraph (a) of this section more than six months after the expiration of the patent must include:

(1) the required maintenance fee set forth in §1.20(h)-(j);

(2) the surcharge set forth in §1.20(m); and

(3) a showing that the delay was unavoidable since reasonable care was taken to ensure that the maintenance fee would be paid timely and the failure to timely pay the maintenance fee was due entirely to circumstances outside of the control of the patentee. The showing must enumerate the steps taken to ensure timely payment of the maintenance fee and the circumstances which were outside of the control of the patentee and those acting on behalf of the patentee in paying the maintenance fee. The showing must be sufficient in scope and content to meet the heavy burden of proof required to show that a delay in payment of the maintenance fee of more than six months after expiration of the patent was unavoidable.

(d) Any petition under this section must be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. Such petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

(e) Reconsideration of a decision refusing to accept a maintenance fee upon petition filed pursuant to paragraph

(a) of this section may be obtained by filing a petition for reconsideration within two months of, or such other time as set in, the decision refusing to accept the delayed payment of the maintenance fee. Any such petition for reconsideration must be accompanied by the petition fee set forth in §1.17(h). After decision on the petition for reconsideration, no further reconsideration or review of the matter will be undertaken by the Commissioner. If the delayed payment of the maintenance fee is not accepted, the maintenance fee and the surcharge set forth in §1.20(m) will be refunded following the decision on the petition for reconsideration, or after the expiration of the time for filing such a petition for reconsideration, if none is filed. The fee set forth in §1.17(h) for filing the petition for reconsideration will not be refunded unless the refusal to accept and record the maintenance fee is determined to result from an error by the Patent and Trademark Office.

GERALD J. MOSSINGHOFF,
July 30, 1984. *Commissioner of Patents and Trademarks.*

[1046 O.G. 28]

(53) **Revision of Patent and Trademark Fees**

The purpose of this notice is to remind the public of changes in patent and trademark fees, effective Oct. 1, 1982, pursuant to Public Law 97-247, enacted Aug. 27, 1982. A final rule on "Revision of Patent and Trademark Fees" was published on July 30, 1982, at 47 FR 33086-33112 with corrections in the printing thereof being published on Aug. 4, 1982, at 47 FR 33688 and on Aug. 5, 1982, at 47 FR 33959. The final rule was also published in the Patent and Trademark Office Official Gazette on Aug. 10, 1982, at 1021 O.G. 19-94. In view of the enactment of Public Law 97-247, the "Alternative A—Rule Changes Under Only Public Law 96-517" relating to both patents and trademarks will *not* become effective. Instead, the "Rule Changes Common To Public Law 96-517 and H.R. 6260" and "Alternative B—Rule Changes Under H.R. 6260" will become effective for other patents and trademarks on Oct. 1, 1982. H.R. 6260 is now Public Law 97-247.

The Patent and Trademark Office has recieved a number of questions regarding the implementation of the changes in fees. The final rule published in the Federal Register on July 30, 1982, and in the Official Gazette on Aug. 10, 1982, contains implementing instructions which should be carefully read and followed. The final rule includes in the implementing instructions the following.

"Any fee which is due and payable on or after Oct. 1, 1982, must be paid in the amont and in accordance with the procedures contained in this rulemaking. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing under §1.8 will be considered to be the date of receipt in the Office."

A "Certificate of Mailing under §1.8" is *not* "proper" for items which arespecifically excluded from the provisions of §1.8. Section 1.8 of Title 37, Code of Federal Regulations, should be consulted for those items for which a Certificate of Mailing is *not* "proper." Such items include, *inter alia*, the filing of national and international applications for patent and the filing of trademark applications. Any application for patent or trademark filed, i.e., received in the Office, on or after Oct. 1, 1982, must include the fees which are effective on Oct. 1, 1982, since §1.8 does not apply to, and specifically excludes from its provisions, the filing of applications for patents and trademarks.

GERALD J. MOSSINGHOFF,
Sept. 14, 1982. *Commissioner of Patents and Trademarks.*

[1022 O.G. 59]

(54) **Filing of Verified Statements Claiming Small Entity Status**

In view of the fact that the rules implementing the definition of small business concern were not published in the Federal Register until Sept. 30, 1982, any verified statement claiming small entity status will be accepted as timely filed if (1) the first fee in a patent application has been paid on or after Oct. 1, 1982, but before Feb. 27, 1983, in the amount established for a non-small entity and (2) such verified statement is filed within 3 months of the date of payment of the first fee in a patent application paid on or after Oct. 1, 1982, but before Feb. 27, 1983. If such a verified statement is timely filed within three months of the date of payment of the first fee paid on or after Oct. 1, 1982, but before Feb. 27, 1983, the statement will be treated as though it were present on the date the fee was paid. The correct amount of the fee will be determined and any excess will be refunded upon request. Section 1.28(a) of 37 CFR is waived until Feb. 27, 1983 to the extent it is inconsistent with this practice.

DONALD J. QUIGG,
Oct. 15, 1982. *Acting Commissioner of Patents and Trademarks.*

[1023 O.G. 77]

(55) **Effect on Small Entity Status of License Pursuant to 35 USC 202(c) (4)**

Public Law 96-517 added a new chapter 38 to Title 35 of the United States Code entitled "Patent Rights in Inventions Made With Federal Assistance." Under the provisions of the statute, each funding agreement between a Federal agency and an individual, small business firm or nonprofit organization must provide, inter alia, that ". . . the Federal agency shall have a nonexclusive, nontransferable, irrevocable, paid up license to practice or have practiced for or on behalf of the United States any subject invention . . ." See 35 U.S.C. 202(c) (4).

Under provisions of 37 CFR 1.9 and 1.27, an independent inventor, small business concern or nonprofit organization cannot qualify for reduced patent fees if it has assigned, granted, conveyed or licensed or is under an obligation under contract or law to assign, grant, convey or license any rights in the invention to other than an individual who could be classified as an independent inventor if that person had made the invention, a small business concern or a nonprofit organization. The Federal agencies do not qualify as nonprofit organizations for paying reduced patent fees under the rules. Applying this construction to the licensing of an invention to a Federal agency by an independent inventor, small business concern or nonprofit organization pursuant to a funding agreement under 35 U.S.C. 202(c) (4) would preclude their qualifying for paying reduced fees. This, however, would frustrate the intent of Public Law 97-247 and Public Law 96-517 when taken together.

This notice will serve as clarification that an independent inventor, small business concern or nonprofit organization, which is otherwise qualified as a small entity for purposes of paying reduced patent fees under 37 CFR 1.9 and 1.27, is not disqualified therefrom because of a license to a Federal agency pursuant to 35 U.S.C. 202(c) (4). A license to a Federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c) (4) does not constitute a license for purposes of 37 CFR 1.9 or a transfer of rights for purposes of 37 CFR 1.27. Any other license or rights to a Federal agency will, of course, preclude qualification as a small entity for purposes of paying reduced fees.

Applicants who have previously paid fees which were not reduced for small entity status because of a license to a Federal agency pursuant to 35 U.S.C. 202(c) (4) may claim a refund by filing the proper verified statement as required by 37 CFR 1.27 and by making reference to this notice.

GERALD J. MOSSINGHOFF,
Jan. 14, 1983. *Commissioner of Patents and Trademarks.*

[1027 OG 71]

(56)

(56) **Department of Commerce**
Patent and Trademark Office
37 CFR Part I
[Docket No. 50725-5025]

Revision of Patent Fees

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark office is amending the rules of practice in patent cases, Part I of title 37, Code of Federal Regulations to adjust fee amounts. This action is necessary at this time because operating costs have increased over the past three years and the Commissioner is authorized by §41(f) of title 35, United States Code, to adjust fees established in §41 (a) and § 41(b) of title 35, United States Code, on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index. Fees for other processing, services or materials related to patents as provided by § 41(d) and §376 of title 35, United States Code, are being adjusted to recover the estimated average cost to the Office of such processing, services or materials.
Effective Date: Oct. 5, 1985.
For Further Information Contact: Frances Michalkewicz by telephone at (703) 557-1610 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed primarily to adjust patent fees because costs have increased and the Commissioner is authorized to (1) adjust statutory patent fees set forth in §41(a) and §41(b) of title 35, United States Code, to reflect fluctuations occurring during the previous three years in the Consumer Price Index (CPI), as authorized by §41(f) of title 35, United States Code, (2) adjust fees for processing, services, or materials related to patents which have been established by the Commissioner in accordance with § 41(d) of title 35, United States Code, to recover the estimated average cost to the Office of such processing, services or materials, and (3) adjust fees for filing and processing an application under the Patent Cooperation Treaty which have been established by the Commissioner to recover the estimated average cost of such processing in accordance with Section 376 of title 35, United States Code.

Adjustments to fees for filing and processing a trademark application and for other processing, services or materials related to trademarks were not proposed at this time, pending review of trademark automation cost requirements.

A notice of proposed rulemaking was published in the *Federal Register* on June 21, 1985, at 50 FR 25896-25902. Corrections of typographical errors were published on July 1, 1985, at 50 FR 27030, and on July 15, 1985, at 50 FR 28596. The notice also was published in the *Official Gazette* on July 2, 1985, at Vol. 1056, pages 6 through 25. An oral hearing was held on July 18, 1985. Fifteen written letters and statements were submitted. One person testified at the oral hearing. Full consideration has been given to all of these letters, statements, and testimony.
Background Information: Patent and Trademark Office fees are authorized by sections 41 and 376 of title 35, United States Code. Section 41(a) of title 35, United States Code, establishes a number of statutory fees. Among the more significant of these are fees for filing a patent application and issuing a patent. Certain other fees, such as appeal fees, the fee for filing a disclaimer, fees for filing petitions seeking to revive an abandoned application and for extensions of time also are set in § 41(a) of title 35, United States Code. Section 41(b) of title 35, United States Code, sets forth the statutory fees for maintaining a patent in force if the application was filed on or after Aug. 27, 1982.

The provisions of Public Law 96-517 also authorize maintenance fees for applications other than design and plant patent applications filed on or after Dec. 12, 1980 and before Aug. 27, 1982. These maintenance fees are to recover 25 percent of the estimated cost to the Office of processing patent applications.

Section 1 of Public Law 97-247 authorized the reduction by 50 percent in the fees paid under §41(a) and §41(b) of title 35, United States Code, by independent inventors, small business concerns, and nonprofit organizations, who meet the definitions established. This authorization will expire on Sept. 30, 1985. Legialation has been introduced to authorize this reduction for an additional three years. If such authority is not continued, the small entity reduction will be rescinded and appropriate amendments to the regulations will be made.

Section 41(f) of title 35, United States Code, provides that fees established in §41(b) of title 35, United States Code, "may be adjusted by the Commissioner on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor." Section 41(f) also provides that changes of less than one percent may be ignored.

Policy for applying the Consumer Price Index: The Department of Labor's Consumer Price Index (CPI) is made public approximately twenty-one days after the end of the month being calculated. The time lag between the initiation and the completion of the rulemaking process dictated that the Mar. through Sept. 1985 inflation rate be projected in the original rulemaking proposal. This estimate resulted in a cumulative three-year CPI of 11.7 percent applied to patent fees.

Based upon actual data through June 1985 and projecting the CPI to Sept. 30, 1985, the Administration's revised projected cumulative CPI for the three-year (1982-1985) period is 11.8 percent. The Patent and Trademark Office has used the 11.8 percent projection in adjusting the fees established in §41(a) and §41(b) of title 35, United States Code. The revised CPI projection has not caused a change from the proposal in any of the §41(a) and §41(b) fees.

After application of the 11.8 percent projected fluctuation in the CPI to fees set forth in §41(a) and §41(b), amounts for all non-small entity fees were rounded by applying standard arithmetical rules so that the amounts rounded would be de minimis and convenient to the user. Fees of $100 or more were rounded to the nearest $10. Fees below $100 were rounded to the nearest even number so that all comparable small entity fees would be in whole numbers. Section 41(d) of title 35, United States Code, provides that the "Commissioner will establish fees for all other processing, services, or materials related to patents" which are not covered in §41(a) and §41(b) of title 35, United States Code, "to recover the estimated average cost to the Office of such processing, services or materials."

Section 376 of title 35, United States Code, authorizes the Commissioner to set fees for patent applications filed under the Patent Cooperation Treaty. The fees under the Patent Cooperation Treaty are keyed to full cost recovery of the processing costs under the Treaty.

The general guidelines used by the Patent and Trademark Office in determining the non-statutory fees are set forth in OMB Circular A-25. Costs were determined from the best available records and included direct and indirect costs to the Office of carrying out the activity.

Since these non-statutory fees are expected to remain in place for the three year fee cycle 1986-1988, the calculated costs were then adjusted by a mid-cycle inflation rate of 6.21 percent derived from the Administration's inflation projection. After application of the projected mid-cycle inflation rate, amounts were rounded by ap-

plying standard arithmetical rules so that the amounts rounded would be de minimis and convenient to the user. Fees of $100 or more were rounded to the nearest $10. Fees between $2 and $99 were rounded to the nearest whole number. Fees under $2 were rounded for convenience.

The fees established under §41(d) and §376 of title 35, United States Code have been modified from the proposal. For the first fee cycle (1983–1985), fees established under §41(d) and §376 were set in the aggregate to recover the estimated average cost to the Office of processing, services and materials as defined in PTO budget documents. Because of the significant increase in fees that was instituted on Oct. 1, 1982, as well as the establishment of new fees, the PTO did not have the necessary experience to accurately predict (nor could it control) fee volumes for the first fee cycle. First cycle fees were thus set at levels sufficient to maintain financial solvency despite possible fluctuations in costs or in workload. Fee amounts in most cases also were set at convenient integers (e.g., $5 or $10). For the second fee cycle (1986–1988), the PTO had proposed to set fees established under §41(d) and §376 using the same methodology. Several comments to the proposed rules suggested that the PTO should establish §41(d) and §376 fees to more precisely recover the estimated average cost to the Office of the processing, service or material. The fees have been modified to reflect the following: (1) PTO experience over the past two and one-half years in predicting fee volumes, (2) virtual elimination of the reserve income for fluctuations in cost or workload, and (3) greater reliance upon and use of the individual fee costs developed by the PTO's Office of Finance.

It is intended that the amount of any fee due and payable on or after Oct. 5, 1985 is the amount set in this rulemaking. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing, where authorized under § 1.8 of title 37, Code of Federal Regulations, will be considered to be the date of receipt in the Office. A "Certificate of Mailing under §1.8" is *not* "proper" for items which are specifically excluded from the provisions of §1.8. Section 1.8 of title 37, Code of Federal Regulations, should be consulted for those items for which a Certificate of Mailing is *not* "proper". Such items include, *inter alia*, the filing of national and international applications for patents and the filing of trademark applications. The provisions of §1.10 of title 37, Code of Federal Regulations relating to filing of papers and fees by "Express Mail" with certificate, however, do apply to *any paper or fee* (including patent and trademark applications) to be filed in the Office. If an application or fee is filed by "Express Mail" with a certificate of mailing dated on or after Oct. 5, 1985, the amount of the fee to be paid is the fee established herein if a change is being made in the fee.

It is further intended that the amount due and payable for services provided in Fiscal Year 1986 will be the amount set in this rulemaking even if the fee becomes due prior to Oct. 5, 1985. Such fees include, but are not limited to, the annual service charge for subscription services (§1.19(c)(1)) and the annual rental for a delivery box (§1.21(d)).

In order to ensure clarity in the implementation of the fee proposals, a discussion of specific sections is set forth below:

DISCUSSION OF SPECIFIC RULES

Section 1.16 National application filing fees

Section 1.16 is amended to adjust patent application filing fees established in §41(a) of title 35, United States Code and set forth in paragraphs (a)-(d) and (f)-(j) of this section to reflect fluctuations in the Consumer Price Index.

Section 1.16, paragraph (e) is amended to adjust the patent application surcharge fee authorized by §111 of title 35, United States Code. Paragraph (e) has been modified from the proposal to limit the adjustment to the surcharge fee to changes which occurred during the past three years in the Consumer Price Index.

Section 1.17 Patent application processing fees

Section 1.17 is amended to adjust patent application processing fees established in §41(a) of title 35, United States Code, and set forth in paragraphs (a)-(g), (l) and (m) of this section to reflect fluctuations in the Consumer Price Index. The wording of paragraph (l) has been broadened to include reference to applicaitons abandoned under §371(d) of title 35, United States Code.

Section 1.17, paragraphs (h)-(k) are amended to adjust the patent application processing fees authorized by §41(d) of title 35, United States Code, to recover the estimated average cost to the Office of such processing. Paragraphs (h)-(k) have been modified from the proposal to more precisely recover the estimated average cost to the Office of processing petitions to the Commissioner, public use proceedings, and non-English language specifications.

Section 1.18 Patent issue fees

Section 1.18 is amended to adjust patent issue fees established in §41(a) of title 35, United States Code and set forth in paragraphs (a)-(c) of this section to reflect fluctuations in the Consumer Price Index.

Section 1.19 Document supply fees

Section 1.19 is amended to adjust the fees authorized by §41(d) of title 35, United States Code for services and materials as set forth in paragraphs (a)-(c), (e) and (f) of this section to recover the estimated average cost to the Office of the specified services and materials. Paragraphs (a)-(c) have been modified from the proposal to more precisely recover the estimated average cost to the Office of supplying the documents specified in these paragraphs. Section 1.19 has been modified further to reduce the fees specified in paragraphs (e) and (f), which were not proposed for adjustment to more precisely recover the estimated average cost to the Office of supplying the documents.

Section 1.19, paragraph (a) is amended further to clarify the services and documents provided. It would provide for copies of specific documents at a flat fee. Copies of general Office records would be provided at a per page fee. Paragraph (a)(4) has been modified from the proposal to provide copies of a patent file wrapper and its contents at $75 for each 200 pages or a fraction thereof.

Section 1.19, paragraph (b) is amended further to delete subparagraph (3). A flat fee for comparing and certifying copies of documents made from Office records is provided in new paragraph (i) of this section.

Section 1.19, paragraph (c) is amended further to provide for ten subclasses with the annual service charge.

Section 1.19 is amended to provide in new paragraph (h) a $10 per document flat fee for an uncertified copy of a non-United States patent document. This fee would apply to copies of foreign patent applications such as those which are published at 18 months or when allowable for opposition.

Section 1.19 is amended to provide in new paragraph (i) a flat fee for comparison and certification of each copy of a document made from Office records but not prepared by the Office.

Section 1.19 is amended to provide in new paragraph (j) a fee for duplicate filing receipts and corrected filing receipts due to applicant error.

Paragraphs (i) and (j) have been modified from the proposal to more precisely recover the estimated average cost to the Office of supplying the documents specified.

Section 1.20 Post-issuance fees

Section 1.20, paragraphs (a)-(c) are amended to adjust patent post-issuance fees authorized by §41(d) of title 35, United States Code, to recover the estimated average cost to the Office of such processing. Section 1.20 has been modified from the proposal to more precisely recover the estimated average cost to the Office of the post-issuance fees set forth in paragraphs (b)-(c). Section 1.20 has been modified further to reduce the fee set forth in paragraph (a), which was not proposed for adjustment, to more precisely recover the estimated average cost to the Office of providing a certificate of correction.

Section 1.20, paragraphs (d) and (h)-(j), are amended to adjust patent post-issuance fees established in §41(a) and §41(b) of title 35, United States Code, to reflect fluctuations in the Consumer Price Index.

Section 1.20, paragraphs (e)-(g), are amended to adjust post-issuance fees authorized by Section 2 of Public Law 96–517, as modified by Section 404 of Public Law 98–622. These fees must be set at a level to eventually recover 25 percent of the estimated cost to the Office of processing patent applications. In order to achieve this level of recovery, these maintenance fees are adjusted to reflect fluctuations in the Consumer Price Index.

Section 1.20, paragraph (k), is amended to adjust the patent maintenance surcharge fee authorized by Section 2 of Public Law 96–517. Paragraph (k) has been modified from the proposal to limit the adjustment to the surcharge fee to changes which occurred during the past three years in the Consumer Price Index.

Section 1.20, paragraph (l), is amended to adjust the post-issuance fee authorized by §41(b) of title 35, United States Code. Paragraph (l) has been modified from the proposal to limit the adjustment to the surcharge fee to changes which occurred during the past three years in the Consumer Price Index.

Section 1.21 Miscellaneous fees and charges

Section 1.21 is amended to adjust the miscellaneous fees and charges authorized by §41(d) of title 35, United States Code and set forth in paragraphs (a)-(f), (h) and (i) of this section to recover the estimated average cost to the Office of such processing. Section 1.21 has been modified from the proposal to more precisely recover the estimated average cost to the Office of the miscellaneous services for which fees were set forth in paragraphs (a)(2)-(a)(6), (b)(1), (d)-(f), (h)(1) and (i). Section 1.21 has been modified further to reduce the fees specified in paragraphs (c) and (h)(2), which were not proposed for adjustment, to more precisely recover the estimated average cost to the Office of those services.

Section 1.21, paragraph (g), is modified from the proposal to change the term "copy machine tokens" to "CopiShare card."

Section 1.21, paragraph (k), is amended to change the word "section" to "part" to clarify that any charge not provided for in these rules would be made at actual cost.

Section 1.21 is amended to provide in new paragraph (m) a $20 fee for processing checks returned "unpaid" by a bank.

Section 1.24 Coupons

Section 1.24 is amended to adjust the fee for the purchase of coupons for patents to make it comparable to the fee required for the purchase of U.S. patents.

Section 1.24 is amended to delete reference to forty cent coupons which are no longer sold by the Patent and Trademark Office.

Section 1.25 Deposit accounts

Section 1.25 is amended to establish a restricted subscription deposit account to be used exclusively for subscription orders of patent copies as issued. A minimum deposit of $300 is required to establish and maintain, without payment of a monthly service fee, a restricted subscription deposit account.

Section 1.26 Refunds

Section 1.26 is amended to change paragraph (c) to provide for a refund of $1,300 if the Commissioner decides not to institute reexamination proceedings. The $1,300 refund would apply to those instances where the reexamination fee of $1,770 under §1.20(c) was paid. The current $1,200 refund will be made in those cases where the current $1,500 reexamination fee was paid.

Section 1.53 Serial number, filing date, and completion of application.

Section 1.53 is amended to change paragraph (c) to reduce to $15 the handling fee charged in the event a specification or drawing is not submitted within the time period set by the Office. Section 1.53 has been modified to more precisely recover the estimated average cost to the Office of handling an application with missing parts.

Section 1.297 Publication of statutory invention registration

Section 1.297, paragraph (b), is amended to modify the statement to be printed on each statutory invention registration. The language of the statement is modified so as to be more easily understood.

Section 1.445 International application filing and processing fees

Section 1.445, paragraphs (a)(1)-(a)(4), are amended to adjust the fees authorized by §376 of title 35, United States Code, for international application processing to recover the estimated average cost to the Office of such processing. The cost of the international search fee set forth in paragraph 1.445(a)(2)(i) has been reduced and the amount credited by the Office under paragraph 1.445(a)(2)(ii) is not changed. Paragraphs (a)(1) and (a)(3) have been modified from the proposal to more precisely recover the estimated average cost to the Office of processing international applications. However, the amount of the credit under 1.445(a)(4) is somewhat less than at present and is the same as in the proposed rules.

Section 1.445(a)(5) is amended to adjust the surcharge authorized by §371(d) of title 35, United States Code.

Paragraph (a)(5) has been modified from the proposal to limit the adjustment to the surcharge fee to changes which occurred during the past three years in the Consumer Price Index and to provide for a small and large entity amount to be consistent with §1.16(e).

Section 1.445(a)(6) is amended to adjust the processing fee for an English translation filed after 20 months from the priority date to recover the estimated average cost to the Office of such processing. Paragraph (a)(6) has been modified from the proposal to more precisely recover the estimated average cost to the Office of processing an English translation and to be consistent with §1.17(k).

Section 1.446 Refund of international application filing and processing fees.

Section 1.446 is amended to delete paragraph (b). The substance of the deleted material is included in section 1.445, paragraph (a)(4).

Response to Comments on the Rules

Specific comments were received on a number of the proposed rule changes. Fifteen letters submitting written comments and eight questions by telephone were received. Oral testimony was presented by one person at the public hearing conducted on July 18, 1985. All of the written and oral comments were considered in

adopting the changes set forth herein. The comments submitted appear below along with responses thereto.

Comment:

PTO fees are already too high and burdensome to the patent community.

Reply:

There has been no indication that PTO fees are burdensome to the patent community. In 1984, we expected to receive 107,000 patent applications and actually received 109,539. In 1985, we are currently receiving applications at an annual rate of approximately 116,000.

The PTO is adjusting patent processing and patent service fees because costs have increased. The Commissioner may adjust patent statutory fees by changes which have occurred during the past three years in the Consumer Price Index (CPI). This authority is provided by 35 U.S.C. 41(f). The intent of the Congress in indexing the statutory patent fees set in 1982 to the CPI was to assure that a precipitous drop in the level of recovery did not occur due to inflation. Indexing of statutory patent fees was not intended to raise additional revenues beyond the rate of inflation.

The Commissioner also is authorized to adjust non-statutory patent fees to recover the estimated average cost to the Office of processing, services and materials. This authority is provided by 35 U.S.C. 41(d). As previously discussed, several of the proposed fees have been modified to more precisely recover the estimated average cost to the Office of processing, materials and services.

Comment:

PTO has failed to abide by the provisions of Public Law 96–517 and the accompanying report (House Report 96–1307). Specifically, the PTO has failed to abide by the 50 percent recovery limitation for patent processing fees and the restrictions on the use of fee income.

Reply:

Public Law 96–517, although enacted into law, was never fully implemented because the Congress passed H.R. 6260 which was enacted as Public Law 97–247 on Aug. 27, 1982. Public Law 97–247 provides for an eventual 100 percent cost recovery through processing and maintenance fees except for the subsidy for certain small entities, and contains no restrictions on the use of income from fee revenues.

This rulemaking adjusts, by the Consumer Price Index (CPI), the patent processing (41(a)) and patent maintenance (41(b)) fees established by Public Law 97–247. The CPI adjustment allows the programs supported by §41(a) and (b) fees to keep pace with inflation. Any growth in the aggregate rate of recovery of fees versus costs in this second cycle of fees is due primarily to the first time collection of maintenance fee receipts.

The restrictions on the use of income from fee revenues, which were included in House Report 96–1307 accompanying Public Law 96–517, were based upon a 50 percent recovery of patent costs from user fees. Then-Commissioner Mossinghoff testified before the Subcommittee on Courts, Civil Liberties, and Administration of Justice, when Congress was considering H.R. 6260, that the Administration's PTO user fee program was proposed to improve the quality of service at the PTO by reducing patent pendency, trademark pendency and automating patent and trademark operations. The Commissioner went on to say that "The major increases in the three program areas will be paid for by the sharp increase in user fees that we are recommending." The Congressional debate on this proposal indicates that the Subcommittee approved these innovative fee provisions in order to improve the level of patent and trademark services provided to users of the Office.

Comment:

Fees should relate to the actual "costs of processing patent applications" and should not include "overhead" expenses.

Reply:

The fees applicable to patent filing, issuance and maintenance fees were established by the Congress and set forth in 35 U.S.C. §41(a) and (b). Regardless if Congress included "overhead" expenses when setting these statutory patent fees, these fees may be adjusted only to reflect the fluctuations in the CPI every three years. Fees for other processing, services or materials related to patents are set by the Commissioner pursuant to 35 U.S.C. 41(d) to recover the Office's estimated average cost. The legislative history of Public Law 97–247, including the accompanying House Report, does not provide guidance regarding how "estimated average cost" was to be determined. These fees were determined under the general guidelines of OMB Circular A-25, entitled "User Charges," which established general policies for developing an equitable and uniform system of charges for certain government services and property. Circular A-25 provides that a reasonable charge should be imposed to recover the full cost to the Government of rendering a service to an identifiable recipient, who receives a substantial benefit not accruing to the general public, e.g., receiving a patent. The concept of full cost recovery includes an appropriate overhead charge. Therefore, the inclusion of overhead expenses in calculating the costs of processing patent applications is appropriate.

Comment:

The PTO does not include a description of any cost containment measure.

Reply:

The PTO has taken all possible measures to contain costs. During fiscal year 1985, a zero-based analysis was conducted of all programs and their associated funding. The purpose of the review was to assure that adequate resources were available to meet the PTO's most important priorities while addressing unanticipated costs such as, the full absorption of the fiscal year 1985 pay raise, new pay scale for patent examiners, higher postal and telephone rates, greater use of PTO services, etc. The PTO's annual budget request is thoroughly reviewed by the Department of Commerce, by the Office of Management and Budget, and by the Congressional Appropriations Committees prior to enactment. The PTO is complying with the President's Deficit Reduction Program. The fiscal year 1986 budget request reflects reductions to travel, printing and consultants as required by the Deficit Reduction Act of 1984; administrative cost savings; and grade reductions and pay cuts. The PTO program to reduce patent pendency, once achieved in 1987, will require less resources than are currently expended. The Automation program, too, as it achieves its major milestones, will deliver cost benefits.

Comment:

The PTO has proposed to adjust fees because costs have increased but they did not include an explanation of how costs were calculated.

Reply:

Patent statutory fees, which are set forth in 35 U.S.C. 41(a) and (b), can be adjusted on Oct. 1, 1985 and every three years thereafter to reflect fluctuations which have occurred in the Consumer Price Index (CPI). The costs of processing a patent application from receipt to issue or abandonment were calculated in 1982 at the time the present fees were set by statute. The most significant elements of processing a patent application are compensation costs, space and the costs incurred for printing the *Official Gazette* and patent grants.

As a result of these increases to the major costs incurred in the processing of a patent application, the PTO is adjusting the statutory 41(a) and (b) patent fees by the full CPI of 11.8 percent in order to recover the projected budgeted collections for patent processing for the years 1986–1988.

Non-statutory patent and patent service fees are being set to recover the estimated average cost to the Office over the next three years (1986–1988) of processing, services and materials. Costs for goods and services were determined under the general guidelines set forth in OMB Circular A-25 entitled "User Charges," which establishes general policies for developing an equitable and uniform system of charges for certain Government services and property. The cost of all processing, services and/or materials associated with each non-statutory (§41(d)) patent fee was determined. Since these fees are expected to remain in place for three years (1986–1988), each cost was adjusted by a mid-cycle inflation rate of 6.21 percent which was derived from the Administration's 1986–1988 inflation projection.

Comment:

The PTO has proposed to set §41(d) fees at a level which exceeds the estimated average cost to the Office. PTO's cost calculations do not support the proposed § 41(d) fees.

Reply:

Fees established pursuant to 35 U.S.C. 41(d) and 376, non-statutory patent and patent service fees, are being set to recover the estimated average cost to the Office over the next three years (1986–1988) of processing, services and materials. Costs for goods and services were determined under the general guidelines set forth in OMB Circular A-25 entitled "User Charges," which establishes general policies for developing an equitable and uniform system of charges for certain Government services and property.

The PTO employed cost-finding techniques for determining the costs of all processing, services and/or materials associated with each non-statutory patent fee. These costs were documented by the Director, Office of Finance and reviewed by each responsible Assistant Commissioner. Since the revised fees are expected to remain in place for the next three years (1986–1988), each cost was adjusted by the mid-cycle inflation rate of 6.21 percent. The fee was then set based upon this inflated cost.

For the first fee cycle (1983–1985), fees established under §41(d) and §376 were set in the aggregate to recover the estimated average cost to the Office of processing, services and materials as defined in PTO budget documents. Because of the significant increase in fees that was instituted on Oct. 1, 1982, as well as the establishment of new fees, the PTO did not have the necessary experience to accurately predict (nor could it control) fee volumes for the first fee cycle. First cycle fees were thus set at levels sufficient to maintain financial solvency despite possible fluctuations in costs or in workload. Fee amounts in most cases also were set at convenient integers (e.g., $5 or $10). For the second fee cycle (1986–1988), the PTO had proposed to set fees established under §41(d) and §376 using the same methodology. Several comments to the proposed rules suggested that the PTO should establish §41(d) and §376 fees to more precisely recover the estimated average cost to the Office of the processing, service or material. The fees have been modified to reflect the following: (1) PTO experience over the past two and one-half years in predicting fee volumes, (2) virtual elimination of the reserve income for fluctuations in cost or in workload, and (3) greater reliance upon and use of the individual fee costs developed by PTO financial analysts.

In modifying the proposed fees, the PTO used the raw cost data derived for each fee, adjusted that amount by the projected mid-cycle inflation rate of 6.21 percent, and rounded the adjusted cost by applying standard arithmetical rules. Fees of $100 or more were rounded to the nearest $10. Fees between $99 and $2 were rounded to the nearest whole number. Fees under $2 were rounded for convenience.

Comment:

The increase in maintenance fees appears to be driven by non-cost considerations. Since they have just begun to be collected, there could be no actual cost histories on which to base the adjustments.

Comment:

The increase in claim fees seem to be proposed without any seemingly real increase in cost specifically attributable to these items.

Reply: Patent statutory fees such as claim and maintenance fees, which are set forth in 35 U.S.C. 41(a) and (b), may be adjusted every three years to reflect changes which have occurred in the Consumer Price Index (CPI) for the prior three years. The costs of processing, issuing and maintaining patents were calculated in 1982 at the time the present fees were set by statute. Patent maintenance fees as set forth in both Public Laws 96–517 and 97–247 are one of several sources of income available to the PTO to cover the costs of processing, issuing and maintaining a patent. The most significant elements of processing, issuing and maintaining patents are personnel compensation, benefits, space and printing costs. Since 1982, these costs have risen in an amount equal to and in some cases, in an amount exceeding, the CPI increase for the individual year.

As a result of these cost increases, the PTO is adjusting §41(a) and §41(b) patent fees and the Public Law 96–517 maintenance fees by the full CPI of 11.8 percent.

Comment:

PTO's proposed adjustments to §41(a) and §41(b) fees are higher than the 11.7 percent fluctuation in the Consumer Price Index because of the rounding principles PTO has applied.

Reply:

The intent of the Congress in indexing the statutory patent fees, 35 U.S.C. 41(a) and (b), to the CPI was to assure that a precipitous drop in the level of recovery did not occur due to inflation with regard to the fees set in 1982. Indexing of statutory patent fees was not intended to be a method of raising additional revenues, nor has the PTO used it for that purpose, but rather for administrative ease. Rounding will ease the administration of these fees by permitting the PTO and users to deal in increments of ten when the adjusted fee is $100 or greater or in even amounts when the fee is below $99. This will ease implementation of the 50 percent reduction in fees for small businesses, non-profit organizations and individuals. Moreover, any surpluses which may result are for the short-term only. By applying routine techniques, there should be a balancing out of shortfalls and surpluses in the long-run.

Comment:

The fee for a deferred declaration under 34 U.S.C. 111 should be changed so that such a fee would only be required if the declaration were filed later than three months from the actual filing date.

Reply:

The suggestion for permitting the declaration to be filed up to three months after the actual filing date without a surcharge has not been adopted. It would place administrative burdens on the Office since it would encourage the late filing of oaths or declaration.

Comment:

There appears to be no justification for the significant increase to the surchage fees.

Reply:

In proposing adjustments to penalty surcharge fees, the PTO considered the costs incurred in providing special handling to certain cases, and proposed to set the fee at a level that would recover costs and preclude unnecessary resort to pertinent procedures but not so high as to be burdensome where resort to these procedures is necessary. In response to several comments received on the proposed surcharge fees, the proposal has been modified to limit the adjustments to surcharge fees set forth in §1.16(e), §1.20(k), §1.20(l) and §1.445 (a)(5) to changes which have occurred during the past three years in the Consumer Price Index.

Comment:

Patent Cooperation Treaty (PCT) fee increases far exceed the 11.7 percent average increase applied to national applications. This increase could seriously affect use of PCT system.

Reply:

The PCT fees set under 35 U.S.C. 376 are based on cost recovery and are not adjusted by the Consumer Price Index. The fees under §1.445 are set to reflect estimated average processing costs. A reduction was made in the amount of the international search fee if performed by the U.S. Patent and Trademark Office. While the credit for a prior U.S. search is unchanged and other PCT fees are increased, the overall adjustment level of PCT fees is generally in line with the CPI.

Comment:
The small entity reduction should be adopted for the PCT surcharge.

Reply:
The final rule has been modified from the proposal to provide for small and large entity amounts in §1.445(a)(5). This is to correspond to a similar fee in §1.16(e).

Comment:
The proposed fees for a copy of a patent file wrapper and its contents (1.19(a)(4)) are unfair at the breakpoint. It would be more equitable to charge $75 for each 200 pages or fraction thereof.

Reply:
In proposing a fee of $75 for up to 200 pages and $350 for 201 pages or more for a copy of a patent file wrapper and its contents, the PTO was attempting to move to a flat fee for this service. Since there were objections to the breakpoint, the final rule has been modified from the proposal to reflect a fee of $75 for each 200 pages or fraction thereof.

Comment:
The proposed increase in §1.20(c) regarding requests for reexamination and the related decrease in §1.26(c) relating to refunds where reexamination is not ordered, appeared to be set from a revenue generating standpoint rather than being cost-driven.

Reply:
While the comment does not suggest what the fees should be, it is noted that the two fees have to be considered together. The notice of proposed rulemaking set a fee of $1,800 for filing a request for reexamination, which was an increase from the previous fee of $1,500. This fee has been modified from the proposal and is now set at $1770. The refund where reexamination is denied was proposed to be raised from $1,200 to $1,300, which raises the refund from the amount previously refunded. The amount refunded has not changed from the proposal. The relative amounts of the initial fee and the refund are set to obtain the necessary recovery of costs from reexamination.

Comment:
A separate schedule of fees should be instituted for interference proceedings, but such fees should apply only to junior parties, since interferences are conducted primarily for their benefit.

Reply:
The rules already provide for certain fees relating to interference proceedings; see §1.644(e) and (f), and §1.666(b) and (c). In general, however, the PTO decided in 1982 that the costs of interference proceedings should be factored into the fees charged in connection with the processing and examination of patent applications, because (1) an interference is a proceeding instituted by the PTO, and (2) it would not be administratively feasible to attempt to provide a fee schedule to cover the myriad of different situations which may occur in the course of an interference. Since these reasons are still considered applicable, the suggestion has not been adopted.

Comment:
The proposed fee for admission to the examination (1.21(a)(1)) for registration to practice is too high for students who often sit for the exam and it is inappropriate because administering the exam is not a service to the public but a cost of operating the PTO.

Reply:
The fee for admission to the examination for registration to practice reflects the costs of conducting the examination twice a year nationwide. The significant increase is due to the fact that the fee had been understated in relation to cost during the 1983–1985 fee cycle. Fees established in this rulemaking will more precisely recover the estimated average cost to the Office of administering and grading the examination and are consistent with the cost recovery principles of OMB Circular A-25.

Comment:
The proposed fee for requesting a regrading of an examination (1.21(a)(6)) should be waived if the regrading request was necessitated by a PTO error.

Reply:
Any fee may be refunded if paid by mistake or paid in excess of that required. See 35 U.S.C. 42(d).

Comment:
The PTO should retain the present fee for admission to the examination to practice before the Office (1.21(a)(1)) and increase the fee payable upon registration to practice (1.21(a)(2)).

Reply:
This suggestion has not been adopted in this rulemaking. The fees for admission to the examination and for registration to practice have been set to recover the cost of those services.

Comment:
The proposed fee for reviewing a decision of the Director of Enrollment and Discipline (1.21(a)(5)) appears to be low in view of the significant amount of time and effort involved in a review.

Reply:
The fee for this service, as modified, recovers the estimated average cost to the Office of providing the service.

Comment:
The fees for processing an application filed with a specification in a non-English language (1.17(k)) and for filing an English translation of an international application later than 20 months after the priority date (1.445 (a)(6)) appear to be in excess of cost.

Reply:
The final rules have been modified from the proposed to provide for a fee of $26, the cost of processing applications filed with non-English language specifications in both domestic and international cases.

Comment:
An extension of time to Aug. 16, 1985 for the submission of comments was requested.

Reply:
The PTO is required by 35 U.S.C. 41(g) to publish a notice of fee increases in the *Federal Register* at least 60 days prior to the effective date of the fee increase. In order to have the proposed fee increases become effective near the start of the fiscal year, the extension of time could not be granted.

Comment:
Why were there no proposals to adjust trademark fees?

Reply:
Adjustments to fees for filing and processing a trademark application and for other processing, services or materials related to trademarks were not proposed at this time, pending review of trademark automation cost requirements.

Comment:
Do we plan to verify the inflation rate before publication of the final rules?

Reply:
The projected inflation rate has been verified. The Administration's latest projected annual cumulative Consumer Price Index for the three year period 1982–1985 is 11.8 percent. Application of this index to §41(a) and §41(b) fees results in no change from the proposal.

Other Considerations: The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Public Law 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. There are no information collection requirements relating to patent fee rules.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Public Law 96-354). The principal impact of the major patent fees has already been taken into account in Public Law 97–247, which provided small entities with a 50 percent reduction in the major patent fees. Although that legislation will expire on Sept. 30, 1985, legislation has been introduced to reauthorize the 50 percent reduction in patent fees for an additional three years. The rule change adjusts fees to reflect the change in the Consumer Price Index and cost of processing services as provided by statute (35 U.S.C. 41(d) and 41(f)).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, 41, 111, 157, 302, and 376 and Public Laws 96–517, 97–247 and 98–622, the Patent and Trademark Office is amending 37 CFR Part 1 as set forth below.

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.16 is revised to read as follows:

§1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except design or plant cases:

By a small entity (§1.9(f)) $170.00
By other than a small entity $340.00

(b) In addition to the basic filing fee in an original application, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§1.9(f)) $17.00
By other than a small entity $34.00

(c) In addition to the basic filing fee in an original application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20. (Note that §1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes):

By a small entity (§1.9(f)) $6.00
By other than a small entity $12.00

(d) In addition to the basic filing fee in an original application, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§1.9(f)) $55.00
By other than a small entity $110.00

(If the additional fees required by paragraphs (b), (c) and (d) are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

(e) Surcharge for filing the basic filing fee or oath or declaration on a date later than the filing date of the application:

By a small entity (§1.9(f)) $55.00
By other than a small entity $110.00

(f) For filing each design application:

By a small entity (§1.9(f)) $70.00
By other than a small entity $140.00

(g) Basic fee for filing each plant application:

By a small entity (§1.9(f)) $110.00
By other than a small entity $220.00

(h) Basic fee for filing each reissue application:

By a small entity (§1.9(f)) $170.00
By other than a small entity $340.00

(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:

By a small entity (§1.9(f)) $17.00
By other than a small entity $34.00

(j) In addition to the basic filing fee in a reissue application; for filing or later presentation of each claim (whether independent or dependent) in excess of 20 and also in excess of the number of claims in the original patent. (Note that §1.75(c) indicates how multiple dependent claims are considered for fee purposes):

By a small entity (§1.9(f)) $6.00
By other than a small entity $12.00

(Note, see §1.445 for international application filing and processing fees).

(35 U.S.C. 6, 41, 111; Public Law 97–247)

3. Section 1.17 is amended by revising paragraphs (a)-(m) to read as follows:

§1.17 Patent application processing fees.

(a) Extension fee for response within first month pursuant to §1.136(a):

By a small entity (§1.9(f)) $28.00
By other than a small entity $56.00

(b) Extension fee for response within second month pursuant to §1.136(a):

By a small entity (§1.9(f)) $85.00
By other than a small entity $170.00

(c) Extension fee for response within third month pursuant to §1.136(a):

By a small entity (§1.9(f)) $195.00
By other than a small entity $390.00

(d) Extension fee for response within fourth month pursuant to §1.136(a):

By a small entity (§1.19(f)) $305.00
By other than a small entity $610.00

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:

By a small entity (§1.9(f)) $65.00
By other than a small entity $130.00

(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:

By a small entity (§1.9(f)) $65.00
By other than a small entity $130.00

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in appeal under 35 U.S.C. 134:

By a small entity (§1.9(f)) $55.00
By other than a small entity $110.00

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph $140.00

§1.47 — for filing by other than all the inventors or a person not the inventor.
§1.48 — for correction of inventorship.
§1.182 — for decision on questions not specifically provided for.
§1.183 —to suspend the rules.
§1.295 — for review of refusal to publish a statutory invention registration.
§1.377 — for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent.
§1.378(e) — for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent.
§1.644(e) — for petition in an interference.
§1.644(f) — for request for reconsideration of a decision on petition in an interference.
§1.666(c) — for late filing of interference settlement agreement.
§§5.12, 5.13, & 5.14 — for expedited handling of foreign filing license.
§5.15 — for changing the scope of a license.
§5.25 — for retroactive license.

(i) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph $72.00

§1.12 — for access to an assignment record.
§1.14 — for access to an application.
§1.55 — for entry of late priority papers.
§1.102 — to make application special.
§1.103 — to suspend action in application.
§1.177 — for divisional reissues to issue separately.
§1.312 — for amendment after payment of issue fee.
§1.313 — to withdraw an application from issue.
§1.314 — to defer issuance of a patent.
§1.334 — for patent to issue to assignee, assignment recorded late.
§1.666(b) — for access to interference settlement agreement.

(j) For filing a petition to institute a public use proceeding under §1.292 ..... $860.00

(k) For processing an application filed with a specification in a non-English language (§ 1.52(d)) $26.00

(l) For filing a petition (1) for the revival of an unavoidably abandoned application under 35 U.S.C. 133, or 371 or (2) for delayed payment of the issue fee under 35 U.S.C. 151:

By a small entity (§1.9(f)) $28.00
By other than a small entity $56.00

(m)For filing a petition (1) for revival of an unintentionally abandoned application or (2) for the unintentionally delayed payment of the fee for issuing a patent:

By a small entity (§1.19(f)) $280.00
By other than a small entity $560.00

(35 U.S.C. 6, 41, 157, 376; Public Law 97–247)

4. Section 1.18 is revised to read as follows:

§1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:

By a small entity (§1.9(f)) $280.00
By other than a small entity $560.00

(b) Issue fee for issuing a design patent:

By a small entity (§1.9(f)) $100.00
By other than a small entity $200.00

(c) Issue fee for issuing a plant patent:

By a small entity (§1.9(f)) $140.00
By other than a small entity $280.00

(35 U.S.C. 6, 41, Public Law 97–247)

5. Section 1.19 is amended by revising paragraphs (a)-(c), (e) and (f), and by adding new paragraphs (a)(7), and (h)-(j) to read as follows:

§1.19 Document supply fees.

The Patent and Trademark Office will supply copies of the following documents upon payment of the fees indicated:

(a) Uncertified copies of Office documents:
(1) Printed copy of a patent, including a design patent, statutory invention registration, or defensive publication document, except color plant patent or color statutory invention registration $1.50
(2) Printed copy of a plant patent or statutory invention registration in color $6.00
(3) Copy of patent application as filed ... $9.00
(4) Copy of patent file wrapper and contents, per 200 pages or a fraction thereof . $75.00
(5) Copy of Office records, except as otherwise provided in this section, per page . $.50
(6) Microfiche copy of microfiche, per microfiche ..... $.50
(7) Copy of patent assignment record $1.50

(b) Certified copies of Office documents:
(1) For certifying Office records, per certificate $3.00
(2) For a search of assignment records, abstract of title and certification, per patent . $12.00

(c) Subscription services:
(1) Subscription orders for printed copies of patents as issued, annual service charge for entry of order and ten subclasses $7.00
(2) For annual subscription to each additional subclass in addition to the ten covered by the fee under paragraph (c)(1) of this section, per subclass ..... $.70

* * * * *

(e) List of patents in subclass:
(1) For list of all United States patents and statutory invention registrations in a subclass, per 100 numbers or fraction thereof . $1.00
(2) For list of United States patents and statutory invention registrations in a subclass limited by date or number, per 50 numbers or fraction thereof $1.00

(f) Microfiche copy of patent file record $6.00

* * * * *

(h) Uncertified copy of a non-United States patent document, per document $10.00

(i) To compare and certify copies made from Patent and Trademark Office records but not prepared by the Patent and Trademark Office, per copy of document $5.00

(j) Additional filing receipts:

Duplicate $14.00
Corrected due to applicant error $14.00

(35 U.S.C. 6, 41, 157)

6. Section 1.20 is amended by revising paragraphs (a)-(l) to read as follows:

§1.20 Post-Issuance fees.

(a) For providing a certificate of correction of applicant's mistake (§1.323) $29.00

(b) Petition for correction of inventorship in patent (§1.324) $140.00

(c) For filing a request for reexamination (§1.510(a)) $1,770.00

(d) For filing each statutory disclaimer (§1.321):

By a small entity (§1.9(f)) $28.00
By other than a small entity $56.00

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant .. $225.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years, the fee is due by seven years and six months after the original grant .. $445.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 12 years; the fee is due by eleven years and six months after the original grant $670.00

(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) $225.00
By other than a small entity $450.00

(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)) $445.00
By other than a small entity $890.00

(j) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§1.9(f)) $670.00
By other than a small entity $1,340.00

(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 ..... $110.00

(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) $55.00
By other than a small entity $110.00

* * * * *

(35 U.S.C. 6, 41, 302; Public Laws 96–517, 97–247, 98–622)

7. Section 1.21 is amended by revising paragraphs (a)-(i) and (k), and adding a new paragraph (m) to read as follows:

§1.21 Miscellaneous fees and charges.

The Patent and Trademark Office has established the following fees for the services indicated:

(a) Registration of attorneys and agents:
(1) For admission to examination for registration to practice, fee payable upon application $250.00
(2) On registration to practice $81.00
(3) For reinstatement to practice $9.00
(4) For certificate of good standing as an attorney or agent $10.00
Suitable for framing $88.00
(5) For review of a decision of the Director of Enrollment and Discipline under §10.2(c) $92.00
(6) For requesting regrading of an examination under §10.7(c) $92.00

(b) Deposit accounts:
(1) For establishing or reinstating a deposit account $8.00
(2) Service charge for each month when the balance at the end of the month is below $1,000 ..... $20.00
(3) Service charge for each month when the balance at the end of the month is below $300 for restricted subscription deposit accounts used exclusively for subscription order of patent copies as issued $20.00

(c) Disclosure document: For filing a disclosure document $6.00

(d) Delivery box: Local delivery box rental, per annum $43.00

(e) International-type search reports: For preparing an international-type search report of an international-type search made at the time of the first action on the merits in a national patent application $28.00

(f) Search of Office records: For searching Patent and Trademark Office records for pur-

poses not otherwise specified, per one-half hour or fraction thereof $14.00

(g) CopiShare card: Cost per copy $0.20

(h) Recording of documents:
(1) For recording each assignment, agreement or other paper relating to the property in a patent or application $7.00
(2) Where a document to be recorded under paragraph (h)(1) of this section refers to more than one patent or application, for each additional patent or application $2.00

(i) Publication in *Official Gazette:* For publication in the *Official Gazette* of a notice of the availability of an application or a patent for licensing or sale, each application or patent $7.00

* * * * *

(k) For items and services, that the Commissioner finds may be supplied, for which fees are not specified by statute or by this part, such charges as may be determined by the Commissioner with respect to each such item or service actual cost

* * * * *

(m)For processing each check returned "unpaid" by a bank $20.00

(35 U.S.C. 6, 41)

8. Section 1.24 is proposed to be revised to read as follows:

§1.24 Coupons.

Coupons in denominations of one dollar for the purchase of trademark registrations and one dollar and fifty cents for the purchase of patents, designs, defensive publications, and statutory invention registrations are sold by the Patent and Trademark Office for the convenience of the general public; these coupons may not be used for any other purpose. The one dollar coupons are sold individually and in books of 50 with stubs for record for $50 and the one dollar and fifty cent coupons are sold individually and in books of 50 with stubs for record for $75. These coupons are good until used; they may be transferred but cannot be redeemed.

(35 U.S.C. 6)

9. Section 1.25, paragraph (a), is revised to read as follows:

§1.25 Deposit accounts.

(a) For the convenience of attorneys, and the general public in paying any fees due, in ordering services offered by the Office, copies of records, etc., deposit accounts may be established in the Patent and Trademark Office upon payment of the fee for establishing a deposit account (§1.21(b)(1)). A minimum deposit of $1,000 is required for paying any fees due or in ordering any services offered by the Office. However, a minimum deposit of $300 may be paid to establish a restricted subscription deposit account used exclusively for subscription order of patent copies as issued. At the end of each month, a deposit account statement will be rendered. A remittance must be made promptly upon receipt of the statement to cover the value of items or services charged to the account and thus restore the account to its established normal deposit. An amount sufficient to cover all fees, services, copies, etc., requested must always be on deposit. Charges to accounts with insufficient funds will not be accepted. A service charge (§1.21(b)(2)) will be assessed for each month that the balance at the end of the month is below $1,000. For restricted subscription deposit accounts, a service charge (§1.21(b)(3)) will be assessed for each month that the balance at the end of the month is below $300.

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(35 U.S.C. 6)

10. Section 1.26 is amended by revising paragraph (c) to read as follows:

§1.26 Refunds.

* * * * *

(c) If the Commissioner decides not to institute a reexamination proceeding, a refund of $1,300 will be made to the requester of the proceeding. Reexamination requesters should indicate whether any refund should be made by check or by credit to a deposit account.

(35 U.S.C. 6, 41)

11. Section 1.53 is amended by revising paragraph (c) to read as follows:

§1.53 Serial number, filing date, and completion of application.

* * * * *

(c) If any application is filed without the specification or drawing required by paragraph (b) of this section, applicant will be so notified and given a time period with which to submit the omitted specification or drawing in order to obtain a filing date as of the date of filing of such submission. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less a $15.00 handling fee.

* * * * *

12. Section 1.297, paragraph (b), is revised to read as follows:

§1.297 Publication of statutory invention registration.

* * * * *

(b) Each statutory invention registration published will include a statement relating to the attributes of a statutory invention registration. The statement will read as follows:

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

(35 U.S.C. 6, 157)

13. Section 1.445 is amended by revising paragraph (a) to read as follows:

§1.445 International application filing and processing fees.

(a) The following fees and charges are established by the Patent and Trademark Office under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14) $170.00

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:

(i) No corresponding prior United States national application with fee has been filed $420.00
(ii) Corresponding prior United States national application with fee has been filed $250.00

(3) A supplemental search fee when required (see PCT Art. 17(3)(a) and PCT Rule 40.2), per additional invention $140.00

(4) The national fee, that is, the amount set forth as the filing fee under §1.16(a) through (d) credited, if requested at the time of filing, by an amount of $170.00 where an international search fee as required by paragraph (a)(2)(i) of this section has been paid on the corresponding international application to the United States Patent and Trademark Office as an International Searching Authority. Only one such credit is permitted based on a single international search fee.

(5) Surcharge for filing the national fee or oath or declaration later than 20 months from the priority date:

By a small entity (§1.9(f)) $55.00
By other than a small entity $110.00

(6) For filing an English translation of an international application later than 20 months after the priority date (§1.61(b)) $26.00

* * * * *

(35 U.S.C. 6, 376)

14. Section 1.446 is amended by removing paragraph (b):

§1.446 Refund of international application filing and processing fees.

* * * * *

(b) [Reserved]

(35 U.S.C. 6, 376)

July 31, 1985. DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

[1057 OG 24]

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(57)

Public Law 96-517
96th Congress
An Act

To amend the patent and trademark laws.

Dec. 12, 1980
[H.R. 6933]
Patent and trademark laws, amendments.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That title 35 of the United States Code, entitled "Patents", is amended by adding after chapter 29 the following new chapter 30:

"CHAPTER 30–PRIOR ART CITATIONS TO OFFICE AND REEXAMINATION OF PATENTS

" Sec.
"301. Citation of prior art.
"302. Request for reexamination.
"303. Determination of issue by Commissioner.
"304. Reexamination order by Commissioner.
"305. Conduct of reexamination proceedings.
"306. Appeal.
"307. Certificate of patentability, unpatentability, and claim cancellation.

"§ 301. Citation of prior art 35 USC 301.

Any person at any time may cite to the Office in writing prior art consisting of patents or printed publications which that person believes to have a bearing on the patentability of any claim of a particular patent. If the person explains in writing the pertinency and manner of applying such prior art to at least one claim of the patent, the citation of such prior art and the explanation thereof will become a part of the official file of the patent. At the written request of the person citing the prior art, his or her identity will be excluded from the patent file and kept confidential.

"§ 302. Request for reexamination 35 USC 302.

"Any person at any time may file a request for reexamination by the Office of any claim of a patent on the basis of any prior art cited under the provisions of section 301 of this title. The request must be in writing and must be accompanie- by payment of a reexamination fee established by the Commissioner of Patents pursuant to the provisions of section 41 of this title. The request must set forth the pertinency and manner of applying cited prior art to every claim for which reexamination is requested. Unless the requesting person is the owner of the patent, the Commissioner promptly will send a copy of the request to the owner of record of the patent. Fee.

"§ 303. Determination of issue by Commissioner 35 USC 303.

"(a) Within three months following the filing of a request for reexamination under the provisions of section 302 of this title, the Commissioner will determine whether

a substantial new question of patentability affecting any claim of the patent concerned is raised by the request, with or without consideration of other patents or printed publications. On his own initiative, and any time, the Commissioner may determine whether a substantial new question of patentability is raised by patents and publications discovered by him or cited under the provisions of section 301 of this title.

Record. "(b) A record of the Commissioner's determination under subsection (a) of this section will be placed in the official file of the patent and a copy promptly will be given or mailed to the owner of record of the patent and to the person requesting reexamination, if any.

Refund. "(c) A determination by the Commissioner pursuant to subsection (a) of this section that no substantial new question of patentability has been raised will be final and nonappealable. Upon such a determination, the Commissioner may refund a portion of the reexamination fee required under section 302 of this title.

35 USC 304. **"§ 304. Reexamination order by Commissioner**

"If, in a determination made under the provisions of subsection 303(a) of this title, the Commissioner finds that a substantial new question of patentability affecting any claim of a patent is raised, the determination will include an order for reexamination of the patent for resolution of the question. The patent owner will be given a reasonable period, not less than two months from the date a copy of the determination is given or mailed to him, within which he may file a statement on such question, including any amendment to his patent and new claim or claims he may wish to propose, for consideration in the reexamination. If the patent owner files such a statement, he promptly will serve a copy of it on the person who has requested reexamination under the provisions of section 302 of this title. Within a period of two months from the date of service, that person may file and have considered in the reexamination a reply to any statement filed by the patent owner. That person promptly will serve on the patent owner a copy of any reply filed.

35 USC 305. **"§ 305. Conduct of reexamination proceedings**

"After the times for filing the statement and reply provided for by section 304 of this title have expired, reexamination will be conducted according to the procedures established for initial examination under the provisions of sections 132 and 133 of this title. In any reexamination proceeding under this chapter, the patent owner will be permitted to propose any amendment to his patent and a new claim or claims thereto, in order to distinguish the invention as claimed from the prior art cited under the provisions of section 301 of this title, or in response to a decision adverse to the patentability of a claim of a patent. No proposed amended or new claim enlarging the scope of a claim of the patent will be permitted in a reexamination proceeding under this chapter. All reexamination proceedings under this section, including any appeal to the Board of Appeals, will be conducted with special dispatch within the Office.

35 USC 132, 133.

35 USC 306. **"§ 306. Appeal**

"The patent owner involved in a reexamination proceeding under this chapter may appeal under the provisions of section 134 of this title, and may seek court review under the provisions of sections 141 to 145 of this title, with respect to any decision adverse to the patentability of any original or proposed amended or new claim of the patent.

35 USC 134.
35 USC 141–145.

35 USC 307. **"§ 307. Certificate of patentability, unpatentability, and claim cancellation**

"(a) In a reexamination proceeding under this chapter, when the time for appeal has expired or any appeal proceeding has terminated, the Commissioner will issue and publish a certificate canceling any claim of the patent finally determined to be unpatentable, confirming any claim of the patent determined to be patentable, and incorporating in the patent any proposed amended or new claim determined to be patentable.

35 USC 252. "(b) Any proposed amended or new claim determined to be patentable and incorporated into a patent following a reexamination proceeding will have the same effect as that specified in section 252 of this title for reissued patents on the right of any person who made, purchased, or used anything patented by such proposed amended or new claim, or who made substantial preparation for the same, prior to issuance of a certificate under the provisions of subsection (a) of this section."

SEC. 2. Section 41 of title 35, United States Code, is amended to read as follows:

35 USC 41. **"§ 41. Patent fees**

"(a) The Commissioner of Patents will establish fees for the processing of an application for a patent, from filing through disposition by issuance or abandonment, for maintaining a patent in force, and for providing all other services and materials related to patents. No fee will be established for maintaining a design patent in force.

"(b) By the first day of the first fiscal year beginning on or after one calendar year after enactment of this Act, fees for the actual processing of an application for

a patent, other than for a design patent, from filing through dispostion by issuance or abandonment, will recover in aggregate 25 per centum of the estimated average cost to the Office of such processing. By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for the processing of an application for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 50 per centum of the estimated average cost to the Office of such processing.

" (c) By the fifteenth fiscal year following the date of enactment of this Act, fees for maintaining patents in force will recover 25 per centum of the estimated cost to the Office, for the year in which such maintenance fees are received, of the actual processing all applications for patents, other than for design patents, from filing through disposition by issuance or abandonment. Fees for maintaining a patent in force will be due three years and six months, seven years and six months, and eleven years and six months after the grant of the patent. Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee.

"(d) By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for all other services or materials related to patents will recover the estimated average cost to the Office of performing the service or furnishing the material. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50.

35 USC 13.

Waiver "(e) The Commissioner may waive theany fee for any service or material related to patents in connection with an occasional or incidental request made by a department or agency of the Government, or any officer thereof. The Commissioner may provide any applicant issued a notice under section 132 of this title with a copy of the specifications and drawings for all patents referred to in that notice without charge.

35 USC 132.

"(f) Fees will be adjusted by the Commissioner to achieve the levels of recovery specified in this section; however, no patent application processing fee or fee for maintaining a patent in force will be adjusted more than once every three years.

Notice. "(g) No fee established by the Commissioner under this section will take effect prior to sixty days following notice in the Federal Register."

SEC. 3. Section 42 of title 35, United States Code, is amended to read as follows:

35 USC 42. **"§ 42. Patent and Trademark Office funding**

"(a) All fees for services performed by or materials furnished by the Patent and Trademark Office will be payable to the Commissioner.

"(b) All fees paid to the Commissioner and all appropriations for defraying the costs of the activities of the Patent and Trademark Office will be credited to the Patent and Trademark Office Appropriation Account in the Treasury of the United States, the provisions of section 725e of title 31, United States Code, notwithstanding.

"(c) Revenues from fees will be available to the Commissioner of Patents to carry out, to the extent provided for in appropriation Acts, the activities of the Patent and Trademark Office.

Refund. "(d) The Commissioner may refund any fee paid by mistake or any amount paid in excess of that required."

SEC. 4. Section 154 of title 35, United States Code, is amended by deleting the word "issue".

SEC. 5. Section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is amended to read as follows:

"§ 31. Fees

"(a) The Commissioner of Patents will establish fees for the filing and processing of an application for the registration of a trademark or other mark and for all other services performed by and materials furnished by the Patent and Trademark Office related to trademarks and other marks. Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or furnishing the material. However, no fee for the filing or processing of an application for the registration of a trademark or other mark or for the renewal or assignment of a trademark or other mark will be adjusted more than once every three years. No fee established under this section will take effect prior to sixty days following notice in the Federal Register.

Notice.

Waiver. "(b) The Commissioner may waive the payment of any fee for any service or material related to trademarks or other marks in connection with any occasional request made by a department or agency of the Government, or any officer thereof. The Indian Arts and Crafts Board will not be charged any fee to register Government trademarks of genuineness and quality for Indian products or for products of particular Indian tribes and groups."

Indian products, exception.

SEC. 6. (a) Title 35 of the United States Code, entitled "Patents", is amended by adding after chapter 37 the following new chapter 38:

"CHAPTER 38–PATENT RIGHTS IN INVENTIONS MADE WITH FEDERAL ASSISTANCE

"Sec.

"200. Policy and objective.
"201. Definitions.
"202. Disposition of rights.
"203. March-in rights.
"204. Preference for United States industry.
"205. Confidentiality.
"206. Uniform clauses and regulations.
"207. Domestic and foreign protection of federally owned inventions.
"208. Regulations governing Federal licensing.
"209. Restrictions on licensing of federally owned inventions.
"210. Precedence of chapter.
"211. Relationship to antitrust laws.

35 USC 200.

"§200. Policy and objective.

"It is the policy and objective of the Congress to use the patent system to promote the utilization of inventions arising from federally supported research or development; to encourage maximum participation of small business firms in federally supported research and development efforts; to promote collaboration between commercial concerns and nonprofit organizations, including universities; to ensure that inventions made by nonprofit organizations and small business firms are used in a manner to promote free competition and enterprise; to promote the commercialization and public availability of inventions made in the United States by United States industry and labor; to ensure that the Government obtains sufficient rights in federally supported inventions to meet the needs of the Government and protect the public against nonuse or unreasonable use of inventions; and to minimize the costs of administering policies in this area.

35 USC 201.

"§201. Definitions

"As used in this chapter—

"(a) The term 'Federal agency' means any executive agency as defined in section 105 of title 5, United States Code, and the military departments as defined by section 102 of title 5, United States Code.

"(b) The term 'funding agreement' means any contract, grant, or cooperative agreement entered into between any Federal agency, other than the Tennessee Valley Authority, and any contractor for the performance of experimental, developmental, or research work funded in whole or in part by the Federal Government. Such term includes any assignment, substitution of parties, or subcontract of any type entered into for the performance of experimental, developmental, or research work under a funding agreement as herein defined.

"(c) The term 'contractor' means any person, small business firm, or nonprofit organization that is a party to a funding agreement.

"(d) The term 'invention' means any invention or discovery which is or may be patentable or otherwise protectable under this title.

"(e) The term 'subject invention' means any invention of the contractor conceived or first actually reduced to practice in the performance of work under a funding agreement.

"(f) The term 'practical application' means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or Government regulations available to the public on reasonable terms.

"(g) The term 'made' when used in relation to any invention means the conception or first actual reduction to practice of such invention.

"(h) The term 'small business firm' means a small business concern as defined at section 2 of Public Law 85–536 (15 U.S.C 632) and implementing regulations of the Administrator of the Small Business Administration.

"(i) The term 'nonprofit organization' means universities and other institutions of higher education or an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a)) or any nonprofit scientific or educational organization qualified under a State nonprofit organization statute.

35 USC 202.

"§202. Disposition of rights

Funding agreement.

"(a) Each nonprofit organization or small business firm may, within a reasonable time after disclosure as required by paragraph (c)(1) of this section, elect to retain title to any subject invention: *Provided, however,* That a funding agreement may provide otherwise (i) when the funding agreement is for the operation of Government-owned research or production facility, (ii) in exceptional circumstances when it is determined by the agency that restriction or elimination of the right to retain title to any subject invention will better promote the policy and objectives of this chapter or (iii) when it is determined by a Government authority which is authorized by statute or Executive order to conduct foreign intelligence or counterintelligence activities that the restriction or elimination of the right to retain title to any subject invention is necessary to protect the security of such activities. The rights of the nonprofit organization or small business firm shall be subject to the provisions of paragraph (c) of this section and the other provisions of this chapter.

Written determination.

"(b)(1) Any determination under (ii) of paragraph (a) of this section shall be in writing and accompanied by a written statement of facts justifying the determination. A copy of each such determination and justification shall be sent to the Comptroller General of the United States within thirty days after the award of the applicable funding agreement. In the case of determinations applicable to funding agreements with small business firms copies shall also be sent to the Chief Counsel for Advocacy of the Small Business Administration.

Copy to Comptroller General.

Copy to SBA.

Contrary agency determinations.

"(2) If the Comptroller General believes that any pattern of determinations by a Federal agency is contrary to the policy and objectives of this chapter or that an agency's policies or practices are otherwise not in conformance with this chapter, the Comptroller General shall so advise the head of the agency. The head of the agency shall advise the Comptroller General in writing within one hundred and twenty days of what action, if any, the agency has taken or plans to take with respect to the matters raised by the Comptroller General.

Report to congressional committees.

"(3) At least once each year, the Comptroller General shall transmit a report to the Committees on the Judiciary of the Senate and House of Representatives on the manner in which this chapter is being implemented by the agencies and on such other aspects of Government patent policies and practices with respect to federally funded inventions as the Comptroller General believes appropriate.

Funding agreement requirements.

"(c) Each funding agreement with a small business firm or nonprofit organization shall contain appropriate provisions to effectuate the following:

"(1) A requirement that the contractor disclose each subject invention to the Federal agency within a reasonable time after it is made and that the Federal Government may receive title to any subject invention not reported to it within such time.

"(2) A requirement that the contractor make an election to retain title to any subject invention within a reasonable time after disclosure and that the Federal Government may receive title to any subject invention in which the contractor does not elect to retain rights or fails to elect rights within such time.

"(3) A requirement that a contractor electing rights file patent applications within reasonable times and that the Federal Government may receive title to any subject inventions in the United States or other countries in which the contractor has not filed patent applications on the subject invention within such times.

"(4) With respect to any invention in which the contractor elects rights, the Federal agency shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world, and may, if provided in the funding agreement, have additional rights to sublicense any foreign government or international organization pursuant to any existing or future treaty or agreement.

"(5) The right of the Federal agency to require periodic reporting on the utilization or efforts at obtaining utilization that are being made by the contractor or his licensees or assignees: *Provided,* That any such information may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code.

"(6) An obligation on the part of the contractor, in the event a United States patent application is filed by or on its behalf or by any assignee of the contractor, to include within the specification of such application and any patent issuing thereon, a statement specifying that the invention was made with Government support and that the Government has certain rights in the invention.

"(7) In the case of a nonprofit organization, (A) a prohibition upon the assignment of rights to a subject invention in the United States without the approval of the Federal agency, except where such assignment is made to an organization which has as one of its primary functions the management of inventions and which is not, itself, engaged in or does not hold a substantial interest in other organizations engaged in the manufacture or sale of products or the use of processes that might utilize the invention or be in competition with embodiments of the invention (provided that such assignee shall be subject to the same provisions as the contractor); (B) a prohibition against the granting of exclusive licenses under United States Patents or Patent Applications in a subject invention by the contractor to persons other than small business firms for a period in excess of the earlier of five years from first commercial sale or use of the invention or eight years from the date of the exclusive license excepting that time before regulatory agencies necessary to obtain premarket clearance unless, on a case-by-case basis, the Federal agency approves a longer exclusive license. If exclusive field of use licenses are granted, commercial sale or use in one field of use shall not be deemed commercial sale or use as to other fields of use, and a first commercial sale or use with respect to a product of the invention shall not be deemed to end the exclusive period to different subsequent products covered by the invention; (C) a requirement that the contractor share royalties with the inventor; and (D) a requirement that the balance of any royalties or income earned by the contractor with respect to subject inventions, after payment of expenses (including pay-

ments to inventors) incidental to the administration of subject inventions, be utilized for the support of scientific research or education.

"(8) The requirements of sections 203 and 204 of this chapter.

Rights, retention.

"(d) If a contractor does not elect to retain title to a subject invention in cases subject to this section, the Federal agency may consider and after consultation with the contractor grant requests for retention of rights by the inventor subject to the provisions of this Act and regulations promulgated hereunder.

Rights, transfer or assignment.

"(e) In any case when a Federal employee is a coinventor of any invention made under a funding agreement with a nonprofit organization or small business firm, the Federal agency employing such coinventor is authorized to transfer or assign whatever rights it may acquire in the subject invention from its employee to the contractor subject to the conditions set forth in this chapter.

Third-party licensing, prohibition.

"(f)(1) No funding agreement with a small business firm or nonprofit organization shall contain a provision allowing a Federal agency to require the licensing to third parties of inventions owned by the contractor that are not subject inventions unless such provision has been approved by the head of the agency and a written justification has been signed by the head of the agency. Any such provision shall clearly state whether the licensing may be required in connection with the practice of a subject invention, a specifically identified work object, or both. The head of the agency may not delegate the authority to approve provisions or sign justifications required by this paragraph.

"(2) A Federal agency shall not require the licensing of third parties under any such provision unless the head of the agency determines that the use of the invention by others is necessary for the practice of a subject invention or for the use of a work object of the funding agreement and that such action is necessary to achieve the practical application of the subject invention or work object. Any such determination shall be on the record after an opportunity for an agency hearing. Any action commenced for judicial review of such determination shall be brought within sixty days after notification of such determination.

35 USC 203.

"§203. March-in rights

"With respect to any subject invention in which a small business firm or nonprofit organization has acquired title under this chapter, the Federal agency under whose funding agreement the subject invention was made shall have the right, in accordance with such procedures as are provided in regulations promulgated hereunder to require the contractor, an assignee or exclusive licensee of a subject invention to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if the contractor, assignee, or exclusive licensee refuses such request, to grant such a license itself, if the Federal agency determines that such–

"(a) action is necessary because the contractor or assignee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of the subject invention in such field of use;

"(b) action is necessary to alleviate health or safety needs which are not reasonably satisfied by the contractor, assignee, or their licensees;

"(c) action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by the contractor, assignee, or licensees; or

"(d) action is necessary because the agreement required by section 204 has not been obtained or waived or because a licensee of the exclusive right to use or sell any subject invention in the United States is in breach of its agreement obtained pursuant to section 204.

35 USC 204.

"§204. Preference for United States industry

"Notwithstanding any other provision of this chapter, no small business firm or nonprofit organization which receives title to any subject invention and no assignee of any such small business firm or nonprofit organization shall grant to any person the exclusive right to use or sell any subject invention in the United States unless such person agrees that any products embodying the subject invention or produced through the use of the subject invention will be manufactured substantially in the United States. However, in individual cases, the requirement for such an agreement may be waived by the Federal agency under whose funding agreement the invention was made upon a showing by the small business firm, nonprofit organization, or assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible.

Waiver.

35 USC 205.

"§205. Confidentiality

"Federal agencies are authorized to withhold from disclosure to the public information disclosing any invention in which the Federal Government owns or may own a right, title, or interest (including a nonexclusive license) for a reasonable time in order for a patent application to be filed. Furthermore, Federal agencies shall not be required to release copies of any document which is part of an application for patent filed with the United States Patent and Trademark Office or with any foreign patent office.

"§206. Uniform clauses and regulations

35 USC 206.

"The Office of Federal Procurement Policy, after receiving recommendations of the Office of Science and Technology Policy, may issue regulations which may be made applicable to Federal agencies implementing the provisions of sections 202 through 204 of this chapter and the Office of Federal Procurement Policy shall establish standard funding agreement provisions required under this chapter.

"§207. Domestic and foreign protection of federally owned inventions

35 USC 207.

"Each Federal agency is authorized to–

"(1) apply for, obtain, and maintain patents or other forms of protection in the United States and in foreign countries on inventions in which the Federal Government owns a right, title, or interest;

"(2) grant nonexclusive, exclusive, or partially exclusive licenses under federally owned patent applications, patents, or other forms of protection obtained, royalty-free or for royalties or other consideration, and on such terms and conditions, including the grant to the licensee of the right of enforcement pursuant to the provisions of chapter 29 of this title as determined appropriate in the public interest;

35 USC 281 *et seq.*

"(3) undertake all other suitable and necessary steps to protect and administer rights to federally owned inventions on behalf of the Federal Government either directly or through contract; and

"(4) transfer custody and administration, in whole or in part, to another Federal agency, of the right, title, or interest in any federally owned invention.

"§208. Regulations governing Federal licensing

35 USC 208.

"The Administrator of General Services is authorized to promulgate regulations specifying the terms and conditions upon which any federally owned invention, other than inventions owned by the Tennessee Valley Authority, may be licensed on a nonexclusive, partially exclusive, or exclusive basis.

"§209. Restrictions on licensing of federally owned inventions

35 USC 209.

Development or marketing plan

"(a) No Federal agency shall grant any license under a patent or patent application on a federally owned invention unless the person requesting the license has supplied the agency with a plan for development and/or marketing of the invention, except that any such plan may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code.

Manufacture in U.S.

"(b) A Federal agency shall normally grant the right to use or sell any federally owned invention in the United States only to a licensee that agrees that any products embodying the invention or produced through the use of the invention will be manufactured substantially in the United States.

"(c)(1) Each Federal agency may grant exclusive or partially exclusive licenses in any invention covered by a federally owned domestic patent or patent application only if, after public notice and opportunity for filing written objections, it is determined that–

"(A) the interests of the Federal Government and the public will best be served by the proposed license, in view of the applicant's intentions, plans, and ability to bring the invention to practical application or otherwise promote the invention's utilization by the public;

"(B) the desired practical application has not been achieved, or is not likely expeditiously to be achieved, under any nonexclusive license which has been granted, or which may be granted, on the invention,

"(C) exclusive or partially exclusive licensing is a reasonable and necessary incentive to call forth the investment of risk capital and expenditures to bring the invention to practical application or otherwise promote the invention's utilization by the public; and

"(D) the proposed terms and scope of exclusivity are not greater than reasonably necessary to provide the incentive for bringing the invention to practical application or otherwise promote the invention's utilization by the public.

Antitrust factors.

"(2) A Federal agency shall not grant such exclusive or partially exclusive license under paragraph (1) of this subsection if it determines that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with the antitrust laws.

Small business preference.

"(3) First preference in the exclusive or partially exclusive licensing of federally owned inventions shall go to small business firms submitting plans that are determined by the agency to be within the capabilities of the firms and equally likely, if executed, to bring the invention to practical application as any plans submitted by applicants that are not small business firms.

Antitrust factors.

"(d) After consideration of whether the interests of the Federal Government or United States industry in foreign commerce will be enhanced, any Federal agency may grant exclusive or partially exclusive licenses in any invention covered by a foreign patent application or patent, after public notice and opportunity for filing written objections, except that a Federal agency shall not grant such exclusive or partially exclusive license if it determines that the grant of such license will tend

substantially to lessen competition or result in undue concentration in any section of the United States in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with antitrust laws.

Record. "(e) The Federal agency shall maintain a record of determinations to grant exclusive or partially exclusive licenses.

Terms and conditions. "(f) Any grant of a license shall contain such terms and conditions as the Federal agency determines appropriate for the protection of the interests of the Federal Government and the public, including provisions for the following:

"(1) periodic reporting on the utilization or efforts at obtaining utilization that are being made by the licensee with particular reference to the plan submitted: *Provided*, That any such information may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code;

"(2) the right of the Federal agency to terminate such license in whole or in part if it determines that the licensee is not executing the plan submitted with its request for a license and the licensee cannot otherwise demonstrate to the satisfaction of the Federal agency that it has taken or can be expected to take within a reasonable time, effective steps to achieve practical application of the invention;

"(3) the right of the Federal agency to terminate such license in whole or in part if the licensee is in breach of an agreement obtained pursuant to paragraph (b) of this section; and

"(4) the right of the Federal agency to terminate the license in whole or in part if the agency determines that such action is necessary to meet requirements for public use specified by Federal regulations issued after the date of the license and such requirements are not reasonably satisfied by the licensee.

35 USC 210. **"§210. Procedence of chapter**

"(a) This chapter shall take precedence over any other Act which would require a disposition of rights in subject inventions of small business firms or nonprofit organizations contractors in a manner that is inconsistent with this chapter, including but not necessarily limited to the following:

"(1) section 10(a) of the Act of June 29, 1935, as added by title I of the Act of Aug. 14, 1946 (7 U.S.C. 427i(a); 60 Stat. 1085);

"(2) section 205(a) of the Act of Aug. 14, 1946 (7 U.S.C. 1624(a); 60 Stat. 1090);

"(3) section 501(c) of the Federal Mine Safety and Health Act of 1977 (30 U.S.C. 951(c); 83 Stat. 742);

91 Stat. 1320.

"(4) section 106(c) of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1395(c); 80 Stat. 721);

64 Stat. 154. "(5) section 12 of the National Science Foundation Act of 1950 (42 U.S.C. 1871(a); 82 Stat. 360);

68 Stat. 944. "(6) section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182; 68 Stat. 943);

"(7) section 305 of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457);

"(8) section 6 of the Coal Research Development Act of 1960 (30 U.S.C. 666; 74 Stat. 337);

"(9) section 4 of the Helium Act Amendments of 1960 (50 U.S.C. 167b; 74 Stat. 920);

"(10) section 32 of the Arms Control and Disarmament Act of 1961 (22 U.S.C. 2572; 75 Stat. 634);

"(11) subsection (e) of section 302 of the Appalachian Regional Development Act of 1965 (40 U.S.C. App. 302(e); 79 Stat. 5);

88 Stat. 1887. 42 USC 5908. "(12) section 9 of the Federal Nonnuclear Energy Research and Development Act of 1974 (42 U.S.C. 5901; 88 Stat. 1878);

"(13) section 5(d) of the Consumer Product Safety Act (15 U.S.C. 2054(d); 86 Stat. 1211);

"(14) section 3 of the Act of April 5, 1944 (30 U.S.C. 323; 58 Stat. 191);

"(15) section 8001(c)(3) of the Solid Waste Disposal Act (42 U.S.C. 6981(c); 90 Stat. 2829);

"(16) section 219 of the Foreign Assistance Act of 1961 (22 U.S.C. 2179; 83 Stat. 806);

"(17) section 427(b) of the Federal Mine Health and Safety Act of 1977 (30 U.S.C. 937(b); 86 Stat. 155);

"(18) section 306(d) of the Surface Mining and Reclamation Act of 1977 (30 U.S.C. 1226(d); 91 Stat. 455);

"(19) section 21(d) of the Federal Fire Prevention and Control Act of 1974 (15 U.S.C. 2218(d); 88 Stat. 1548);

"(20) section 6(b) of the Solar Photovoltaic Energy Research Development and Demonstration Act of 1978 (42 U.S.C. 5585(b); 92 Stat. 2516);

7 USC 178j. "(21) section 12 of the Native Latex Commercialization and Economic Development Act of 1978 (7 U.S.C. 178(j); 92 Stat. 2533); and

92 Stat. 1316. "(22) section 408 of the Water Resources and Development Act of 1978 (42 U.S.C. 7879; 92 Stat. 1360).

The Act creating this chapter shall be construed to take precedence over any future Act unless that Act specifically cites this Act and provides that it shall take precedence over this Act.

"(b) Nothing in this chapter is intended to alter the effect of the laws cited in paragraph (a) of this section or any other laws with respect to the disposition of rights in inventions made in the performance of funding agreements with persons other than nonprofit organizations or small business firms.

Rights, disposition. "(c) Nothing in this chapter is intended to limit the authority of agencies to agree to the disposition of rights in inventions made in the performance of work under funding agreements with persons other than nonprofit organizations or small business firms in accordance with the Statement of Government Patent Policy issued on Aug. 23, 1971 (36 Fed. Reg. 16887), agency regulations, or other applicable regulations or to otherwise limit the authority of agencies to allow such persons to retain ownership of inventions. Any disposition of rights in inventions made in accordance with the Statement or implementing regulations, including any disposition occurring before enactment of this section, are hereby authorized.

Disclosure. "(d) Nothing in this chapter shall be construed to require the disclosure of intelligence sources or methods or to otherwise affect the authority granted to the Director of Central Intelligence by statute or Executive order for the protection of intelligence sources or methods.

35 USC 211. **"§211. Relationship to antitrust laws**

"Nothing in this chapter shall be deemed to convey to any person immunity from civil or criminal liability, or to create any defenses to actions, under any antitrust law."

(b) The table of chapters for title 35, United States Code, is amended by adding immediately after the item relating to chapter 37 the following:

"38. Patent rights in inventions made with Federal assistance."

SEC. 7. AMENDMENTS TO OTHER ACTS.—The following Acts are amended as follows:

(a) Section 156 of the Atomic Energy Act of 1954 (42 U.S.C. 2186; 68 Stat. 947) is amended by deleting the words "held by the Commission or".

(b) The National Aeronautics and Space Act of 1958 is amended by repealing paragraph (g) of section 305 (42 U.S.C. 2457(g); 72 Stat. 436).

(c) The Federal Nonnuclear Energy Research and Development Act of 1974 is amended by repealing paragraphs (g), (h), and (i) of section 9 (42 U.S.C. 5908 (g), (h), and (i); 88 Stat. 1889–1891).

Effective dates. SEC. 8. (a) Sections 2, 4, and 5 of this Act will take effect upon enactment.

35 USC 41 note. (b) Section 1 of this Act will take effect on the first day of the seventh month beginning after its enactment and will apply to patents in force as of that date or issued thereafter.

(c) Section 3 of this Act will take effect on the first day of the first fiscal year beginning on or after one calendar year after enactment. However, until section 3 takes effect, the Commissioner may credit the Patent and Trademark Office appropriation account in the Treasury of the United States with the revenues from collected reexamination fees, which will be available to pay the costs to the Office of reexamination proceedings.

(d) Any fee in effect as of the date of enactment of this Act will remain in effect until a corresponding fee established under section 41 of title 35, United States Code, or section 1113 of title 15, United States Code, takes effect.

(e) Fees for maintaining a patent in force will not be applicable to patents applied for prior to the date of enactment of this Act.

(f) Sections 6 and 7 of this Act will take effect on the first day of the seventh month beginning after its enactment. Implementing regulations may be issued earlier.

(g) Sections 8 and 9 will take effect on the date of enactment of this Act.

Computerized data and retrieval system, report to Congress 35 USC 14 note. SEC. 9. The Commissioner of Patents and Trademarks shall report to Congress, within two years after the effective date of this Act, a plan to identify, and if necessary develop or have developed, computerized data and retrieval systems equivalent to the latest state of the art which can be applied to all aspects of the operation of the Patent and Trademark Office, and particularly to the patent search file, the patent classification system, and the trademark search file. The report shall specify the cost of implementing the plan, how rapidly the plan can be implemented by the Patent and Trademark Office, without regard to funding which is or which may be available for this purpose in the future.

SEC. 10. (a) Section 101 of title 17 of the United States Code is amended to add at the end thereof the following new language:

"Computer program." "A 'computer program' is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result."

(b) Section 117 of title 17 of the United States Code is amended to read as follows:

17 USC 117. **"§117. Limitations on exclusive rights: Computer programs**

17 USC 106. "Notwithstanding the provisions of section 106, it is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided:

"(1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or

"(2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.

"Any exact copies prepared in accordance with the provisions of this section may be leased, sold, or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale, or other transfer of all rights in the program. Adaptations so prepared may be transferred only with the authorization of the copyright owner."

Approved Dec. 12, 1980.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 96-1307, Pt. I (Comm. on the Judiciary) and No. 96-1307, Pt. 2 (Comm. on Government Operations).

CONGRESSIONAL RECORD, Vol. 126 (1980):

Nov. 17, considered and passed House.

Nov. 20, considered and passed Senate, amended.

Nov. 21, House concurred in Senate amendment.

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(58)

Public Law 97-247
97th Congress
An Act

To authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That there is authorized to be appropriated for the payment of salaries and necessary expenses of the Patent and Trademark Office to become available for fiscal year 1983, $76,000,000, and in fiscal years 1984 and 1985 such sums as may be necessary as well as such additional or supplemental amounts as may be necessary, for increases in salary, pay, retirement, or other employee benefits authorized by law. Funds available under this section shall be used to reduce by 50 per centum the payment of fees under section 41 (a) and (b) of title 35, United States Code, by independent inventors and nonprofit organizations as defined in regulations established by the Commissioner of Patents and Trademarks, and by small business concerns as defined in section 3 of the Small Business Act and by regulations established by the Small Business Administration. When so specified and the the extent provided in an appropriation Act, any amount appropriated pursuant to this section and, in addition, such fees as shall be collected pursuant to title 35, United States Code, and the Trademark Act of 1946, as amended (15 U.S.C. 1051 et seq.), may remain available without fiscal year limitation.

15 USC 632.

SEC. 2. Notwithstanding any other provision of law, there is authorized to be appropriated for the payment of salaries and expenses of the Patent and Trademark Office, $121,461,000 for the fiscal year ending September 30, 1982, and such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law.

SEC. 3. (a) Section 41(a) of title 35, United States Code, is amended to read as follows:

Fees.

"(a) The Commissioner shall charge the following fees:

"1. On filing each application for an original patent, except in design or plant cases, $300; in addition, on filing or on presentation at any other time, $30 for each claim in independent form which is in excess of three, $10 for each claim (whether independent or dependent) which is in excess of twenty, and $100 for each application containing a multiple dependent claim. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

35 USC 112.

"2. For issuing each original or reissue patent, except in design or plant cases, $500.

"3. In design and plant cases:

"a. On filing each design application, $125.

"b. On filing each plant application, $200.

"c. On issuing each design patent, $175.

"d. On issuing each plant patent, $250.

"4. On filing each application for the reissue of a patent, $300; in addition, on filing or on presentation at any other time, $30. for each claim in independent form which is in excess of the number of independent claims of the original patent, and $10 for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

"5. On filing each disclaimer, $50.

"6. On filing an appeal from the examiner to the Board of Appeals, $115; in addition, on filing a brief in support of the appeal, $115, and on requesting an oral hearing before the Board of Appeals, $100.

"7. On filing each petition for the revival of an unintentionally abondoned application for a patent or for the unintentionally delayed payment of the fee for issuing each patent, $500, unless the petition is filed under sections 133 or 151 of this title, in which case the fee shall be $50.

35 USC 133, 151.

"8. For petitions for one-month extensions of time to take actions required by the Commissioner in an application:

"a. On filing a first petition, $50.

"b. On filing a second petition, $100.

"c. On filing a third or subsequent petition, $200.".

(b) Section 41(b) of title 35, United States Code, is amended to read as follows:

Maintenance fees.

"(b) The Commissioner shall charge the following fees for maintaining a patent in force:

"1. Three years and six months after grant, $400.

"2. Seven years and six months after grant, $800.

"3. Eleven years and six months after grant, $1,200.

Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an application maintenance fee. No fee will be established for maintaining a design or plant patent in force."

Expiration.

Surcharge.

(c) Section 41(c) of title 35, United States Code, is amended to read as follows:

Maintenance fee, delayed payment. Surcharge.

"(c)(1) The Commissioner may accept the payment of any maintenance fee required by subsection (b) of this section after the six-month grace period if the delay is shown to the satisfaction of the Commissioner to have been unavoidable. The Commissioner may require the payment of a surcharge as a condition of accepting payment of any maintenance fee after the six-month grace period. If the Commissioner accepts payment of a maintenance fee after the six-month grace period, the patent shall be considered as not having expired at the end of the grace period.

"(2) No patent, the term of which has been maintained as a result of the acceptance of a payment of a maintenance fee under this subsection, shall abridge or affect the right of any person or his successors in business who made, purchased or used after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used. The court before which such matter is in question may provide for the continued manufacture, use or sale of the made, purchased, or used as specified, or for the manufacture, use or sale of which substantial preparation was made after the six-month grace period but before the acceptance of a maintenance fee under this subsection, and it may also provide for the continued practice of any process, practiced, or for the practice of which substantial preparation was made, after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced after the six-month grace period but before the acceptance of a maintenance fee under the subsection."

(d) Section 41(d) of title 35, United States Code, is amended to read as follows:

Fees.

"(d) The Commissioner will establish fees for all other processing, services, or materials related to patents not specified above to recover the estimated average cost to the Office of such processing, services, or materials. The yearly fee for providing a library specified in section 113 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50."

35 USC 13.

(e) Section 41(f) of title 35, United States Code, is amended to read as follows:

Adjusted fees.

"(f) The fees established in subsections (a) and (b) of this section may be adjusted by the Commissioner on October 1, 1985, and every third year thereafter, to reflect any fluctuations occuring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than 1 per centum may be ignored,".

(f) Subsection (a) of section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is amended by deleting "Fees will be set and adjusted by the Commissioner to recover the aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or funished the material.".

(g) Section 42(c) of the title 35, United States Code, is amended by adding the following sentence at the end thereof: "Fees available to the Commissioner under section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), shall be used exclusively for the processing of trademark registrations and for other services and materials related to trademarks.".

SEC. 4. Section 3(a) of title 35, United States Code is amended (1) by deleting the phrase "not more than fifteen"; and (2) by inserting the phrase "appointed under section 7 of this title" immediately after the phrase "examiners-in-chief".

SEC. 5. Section 111 of title 35, United States Code, is amended to read as follows:

Applications.

"SEC. 111. Application for patent shall be made, or authorized to be made, by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include (1) a specification as prescribed by section 112 of this

35 USC 112.
35 USC 113.
35 USC 115.

title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be accompanied by the fee required by law. The fee and oath may be submitted after the specification and any required drawing are submitted, within such period and under such conditions, including the payment of a surcharge, as may be prescribed by the Commissioner. Upon failure to submit the fee and oath within such prescribed period, the application shall be regarded as abandoned, unless it is shown to the satisfaction of the Commissioner that the delay in submitting the fee and oath was unavoidable. The filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office.".

Filing date.

SEC. (a) Section 116 of title 35, United States Code, is amended (1) by deleting the phrase "Joint inventors" from the title and inserting in its place "Inventors"; and (2) in the third paragraph, by deleting the phrase "a person is joined in an application for patent as joint inventor through error, or a joint inventor is not included in an application through error" and inserting in its place the phrase "through error a person is named in an application for patent as the inventor, or through error an inventor is not named in an application".

(b) Section 256 of title 35, United States Code, is amended to read as follows:

"§256. Correction of named inventor

"Whenever through error a person is named in an issued patent as the inventor, or through error an inventor is not named in an issued patent and such error arose without any deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate correcting such error.

"The error of omitting inventors or naming persons who are not inventors shall not invalidate the patent in which such error occurred if it can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly.".

SEC. 7. Section 6 of the title 35, United States Code, is amended by deleting paragraph (d) thereof.

SEC. 8. (a) Section 8(a) of the Trademark Act of 1946, as amended (15 U.S.C. 1058(a)), is amended (a) by deleting the word "still"; and (2) by inserting the phrase "in commerce" immediately after the word "use".

(b) Section 8(b) of the Trademark Act of 1946, as amended (15 U.S.C. 1058(b)), is amended (1) by deleting the word "stille"; and (2) by inserting the phrase "in commerce" immediately after the word "use".

SEC. 9. (a) Section 13 of the Trademark Act of 1946, as amended (15 U.S.C. 1063), is amended (1) by deleting the phrase "a verified" and inserting in its place the word "an"; (2) by adding the phrase "when requested prior to the expiration of an extension" immediately after the word "cause"; and (3) by deleting the fourth sentence.

(b) Section 14 of the Trademark Act of 1946, as amended (15 U.S.C. 1064), is amended by deleting the word "verified".

SEC. 10. Section 15 of the Trademark Act of 1946, as amended (15 U.S.C. 1065), is amended by deleting the phrase "the publication" and inserting in its place the word "registration".

SEC. 11. The first sentence of section 16 of the Trademark Act of 1946, as amended (15 U.S.C. 1066), is amended to read as follows: "Upon petition showing extraordinary circumstances, the Commissioner may declare that an interference exists when application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause confusion or mistake or to deceive.".

SEC. 12. Section 21 of title 35, United States Code, is amended–

(1) by deleting the phrase "Day for taking action falling on Saturday, Sunday, or holiday" from the title and inserting in its place the phrase "Filing date and day for taking action";

(2) by inserting the following as subsection (a):

Filing date.

"(a) The Commissioner may be rule prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service or would have been deposited with the United States Postal Service but for postal service interruptions or emergencies designated by the Commissioner.";

(3) by designating the existing paragraph as subsection (b); and

(4) by inserting the word "federal" in subsection (b), as designated above, immediately after the word "a".

SEC. 13. Section 6(a) of title 35, United States Code, is amended (1) by deleting the word "and", third occurrence, and inserting in its place a comma; (2) by inserting the phrase ", or exchanges of items or services" immediately after the word "programs"; and (3) by inserting the phrase "or the administration of the Patent and Trademark Office" immediately after the word "law", second occurrence.

SEC. 14. (a) Section 115 of title 35, United States Code, is amended by (1) deleting the phrase "shall be" and inserting in its place the word "is"; and (2) inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

(b) Section 261 of title 35, United States Code, is amended, in the third paragraph, by inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

(c) Section 11 of the Trademark Act of 1946, as amended (15 U.S.C. 1061), is amended by (1) deleting the phrase "shall be", first occurrence, and inserting in its place the word "is"; and (2) inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

SEC. 15. Section 13 of title 35, United States Code, is amended by deleting "(a)9" and inserting in its place "(d)".

SEC. 16. Section 173 of title 35, United States Code, is amended to read as follows: "Patents for designs shall be granted for the term of fourteen years."

Effective dates.
35 USC 41 note.

SEC. 17. (a) Sections 1, 2, 4, 7, and 13 through 15 of this Act shall take effect on the date of enactment of this Act. Sections 3 and 16 of this Act shall take effect on Oct. 1, 1982. The maintenance fees provided for in section 3(b) of this Act shall not apply to patents applied for prior to the date of enactment of this Act. Each patent applied for on or after the date of enactment of this Act shall be subject to the maintenance fees established pursuant to section 3(b) of this Act or to maintenance fees hereafter established by law, as to the amounts paid and the number and timing of the payments.

(b)(1) Title 35, United States Code, is amended by inserting after section 293 the following new section of chapter 29:

§294. Voluntary arbitration

"(a) A contract involving a patent or any right under a patent may contain a provision requiring arbitration of any dispute relating to patent validity or infringement arising under the contract. In the absence of such a provision, the parties to an existing patent validity or infringement dispute may agree in writing to settle such dispute by arbitration. Any such provision or agreement shall be valid, irrevocable, and enforceable, except for any grounds that exist at law or in equity for revocation of a contract.

Awards.
9 USC 1 *et seq.*
35 USC 282.

"(b) Arbitration of such disputes, awards by arbitrators and confirmation of awards shall be governed by title 9, United States Code, to the extent such title is not inconsistent with this section. In any such arbitration proceeding, the defenses provided for under section 282 of this title shall be considered by the arbitrator if raised by any party to the proceeding.

Modification.

"(c) An award by an arbitrator shall be final and binding between the parties to the arbitration but shall have no force or effect on any other person. The parties to an arbitration may agree that in the event a patent which is the subject matter of an award is subsequently determined to be invalid or unenforceable in a judgment rendered by a court to competent jurisdiction from which no appeal can or has been taken, such award may be modified by any court of competent jurisdiction upon application by any party to the arbitration. Any such modification shall govern the rights and obligations between such parties from the date of such modification.

Notices.

"(d) When an award is made by an arbitrator, the patentee, his assignee or licensee shall give notice thereof in writing to the Commissioner. There shall be a separate notice prepared for each patent involved in such proceeding. Such notice shall set forth the names and addresses of the parties, the name of the inventor, and the name of the patent owner, shall designate the number of the patent, and shall contain a copy of the award. If an award is modified by a court, the party requesting such modification shall give notice of such modification to the Commissioner. The Commissioner shall, upon receipt of either notice, enter the same in the record of the prosecution of such patent. If the required notice is not filed with the Commissioner, any party to the proceeding may provide such notice to the Commissioner.

Modification

"(e) The award shall be unenforceable until the notice required by subsection (d) is received by the Commissioner."

(2) The analysis for chapter 29 of title 35 of the United States Code is amended by adding at the end the following:

"294. Voluntary arbitration.".

(c) Sections 5, 6, 8 through 12, and 17(b) of this Act shall take effect six months after enactment.

Approved Aug. 27, 1982.

LEGISLATIVE HISTORY—H.R. 6260

HOUSE REPORT No. 97-542 (Comm. on the Judiciary).

CONGRESSIONAL RECORD, Vol. 128 (1982):

June 8, considered and passed House.

Aug. 12, considered and passed Senate.

WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS, Vol. 18, No. 36 (1982):

Aug. 28, Presidential statement.

(59) 97TH CONGRESS HOUSE OF REPRESENTATIVES REPORT
2d Session No. 97-542

PATENT AND TRADEMARK OFFICE AUTHORIZATION

May 17, 1982.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. KASTENMEIER, from the Committee on the Judiciary, submitted the following

REPORT

[To accompany H.R. 6260]

[Including cost estimate of the Congressional Budget Office]

The Committee on the Judiciary, to whom was referred the bill (H.R. 6260) to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

The amendment strikes out all after the enacting clause of the bill and inserts a new text which appears in italic type in the reported bill.

PURPOSE OF THE BILL

The purpose of H.R. 6260 is to authorize appropriations for the Patent and Trademark Office for fiscal years 1983 through 1985.

STATEMENT

The Subcommittee on Courts, Civil Liberties and the Administration of Justice previously held two days of hearings on the legislation, receiving testimony from a representative group of witnesses including the Commissioner of Patents and Trademarks, the American Bar Association Section of Patent, Trademark and Copyright Law, the American Patent Law Association, the Patent, Trademark and Copyright Section of the State Bar of Virginia, the United States Trademark Association and the General Patent Counsel of the General Electric Corporation.

H.R. 6260 reflects the recommendation of the Administration with three modifications as follows. First, the Administration proposal authorized the Commissioner of Patents and Trademarks to establish fees administratively. The subcommittee approved an amendment to set forth specific fees in the statute and limited the Commissioner's authority to raise fees. Second, the Administration recommended that user fees recover 100% of the costs of actual processing of patents and trademarks. The subcommittee amended the bill to reduce by 50% patent filing and maintenance fees for individual inventors, small businesses and not for profit institutions. The effect of the amendment is to increase by $8 million the authorized appropriation which would have been provided under the original Administration request. Third, the subcommittee adopted a recommendation of the Commissioner of Patents and Trademarks, the American Bar Association and a coalition of corporate patent counsel permitting arbitration of patent disputes.

H.R. 6260 was considered by the Full Committee on the Judiciary on May 11, 1982 and was approved as reported by the subcommittee with an amendment offered by Mr. Frank described below.

SYNOPSIS OF H.R. 6260

SECTIONS 1—3

Authorizes the Patent and Trademark Office for fiscal year 1983 at an appropriations level of $76,000,000 and for fiscal years 1984 and 1985 such sums as may be necessary. This would be augmented by additional fee income under the bill of approximately $79 million for a total budget of $155 million. In fiscal year 1982 the Patent and Trademark Office was authorized at a level of $118,961,000 of which $29,600,000 was provided through fee income. Fiscal year 1983 will be the first year in which fee income under P.L. 96-517 will be credited to the Patent and Trademark Office without being counted as part of its authorized appropriation. Had this new accounting procedure been applied to fiscal year 1982 the authorization and appropriation for the Patent and Trademark Office would have been $89 million. This constitutes the actual level of taxpayer support of the Office. Thus, H.R. 6260 authorizes the expenditure of tax revenue in fiscal 1983 to support the Patent and Trademark Office at a level $21 million lower than for fiscal 1982. H.R. 6260 proposes to double current fees as the means of making up for the difference between a lower level of taxpayer support and an increased total budget. Further, maintenance fees which were first authorized in P.L. 96-517 and which will not begin to be collected until fiscal year 1986 (Oct. 1, 1985) will also be doubled over the amounts provided for under P.L. 96-517.

The overall objective of H.R. 6260 is to provide for increased user support for the Patent and Trademark Office costs associated with the actual processing of patent applications by fiscal year 1996. The fee schedule is designed to return to the government 100% of actual costs. However, an amendment to the original Administration proposal adopted by the subcommittee would reduce by half the fees for individuals, small businesses and nonprofit inventors. At the present time less than 25% of the actual costs of processing patent applications are supported by fee revenue and under P.L. 96-517, which becomes effective on

Oct. 1, 1982, this amount will gradually begin to rise but will only reach 50% of actual costs in 1996.

The amendment offered by Mr. Frank and approved by the Committee modifies that portion of Section 3 of H.R. 6260 dealing with Trademark fees. Public Law 96-517 (35 United States Code, section 31(a)) provides, "Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost. . .of performing the service or furnishing the material."

The Administration requested that the figure, "50 per centum", be changed to "100 per centum", thus mandating full recovery to the Treasury of all costs associated with processing trademarks.An amendment offered during subcommittee consideration of the legislation proposed to reduce fee generated revenue supporting processing of trademarks to less than the 100 per centum recovery level. The amendment was not agreed to. The author of the amendment, Mr. Frank, then proposed to amend the law to provide a statutory fee schedule which would return revenue to the Patent and Trademark Office at a level designed to recover 100 per centum of costs. However, following consultations with interested parties, Mr. Frank modified his amendment simply to repeal those portions of P.L. 96-517 which mandate a specified level of cost recovery for the processing of trademark registrations. Thus, the level of cost recovery for processing of trademark registrations will be within the discretion of the Commissioner. The Committee is aware of the concerns of users of the Trademark registration system, however, and intends to exercise vigorous oversight with respect to the Commissioner to ensure that fees remain at a reasonable level and that trademark registrations are processed in an efficient and cost effective manner. As part of this oversight, the Committee recommends the following fee structure to the Commissioner for Fiscal Year 1983.

Type of fee:	*Proposed fee*
Application filing fee per class	$175
Renewal fee	300
Late renewal	100
Section 12(c) claim	100
New certificate	100
Certificate of correction	100
Disclaimer to registration	100
Amendment to registration	100
Per class combines section 8 and 15 affidavit	200
Per class section 8 affidavit alone	100
Per class section 15 affidavit alone	100
All petitions to Commissioner	100
Cancellation opposition per class	200
TTAB appeal	100
Certified copies	10
Copies of trademarks	1
Assignments	(1)

[1]100 plus for each mark in addition to 1.

Section 3(d) also permits the Commissioner of Patents to accept late payment of maintenance fees where it is established that the delay in payment was unavoidable.

Section 4 permits the Commissioner of Patents and Trademarks to appoint temporary examiners in chief for the Board of Patent Appeals to deal more flexibly with workload.

Section 5 permits late filing of the oath and fee accompanying submission of specifications and drawings which accompany patent claims.

Section 6 permits greater flexibility in correcting mistakes in the naming of inventors on a patent application.

Section 7 allocates funds from the Patent and Trademark Office to the Department of State to pay the financial obligations of administering the patent Cooperation Treaty.

Section 8 clarifies the Trademark law with respect to what constitutes use of a mark "in commerce".

Section 9 deletes the burdensome technical requirement that trademark oppositions be verified.

Section 10 makes the date of registration rather than the date of publication the crucial date for purposes of establishing the incontestability of a trademark. This eliminates an ambiguity in the present law.

Section 11 limits the declaration of interferences under the trademark law to situations where extraordinary circumstances exist.

Section 12 authorizes the Commissioner of the Patent and Trademark Office the flexibility to deal with problems of delay in filing due to postal service breakdowns.

Section 13 permits the Commissioner of Patents to enter into cooperative studies, programs, exchanges and similar ventures associated with the administration of the Patent Office.

Section 14 conforms U.S. Patent and Trademark Law to a recent international treaty governing diplomatic or consular legalization of documents.

Section 15 corrects a mistaken citation in P.L. 96-517.

Section 16 creates a uniform term for design patents.

Section 17 establishes the effective dates for provisions of the Act. Increased filing fees would apply to all applications made on or after the date of enactment of H.R. 6260.

Section 18 permits voluntary arbitration of patent disputes.

SECTION-BY-SECTION ANALYSIS

SECTION 1

This section authorizes appropriations for the Patent and Trademark Office for the payment of salaries and necessary expenses of the Office. For Fiscal Year 1983, this section authorizes appropriations of $76,000,000, and in fiscal years 1984 and 1985 such sums as may be necessary, as well as such additional and supplemental amounts as may be necessary to cover any increases in salary, pay, retirement, or employee benefits which may be authorized by law. Funds made available by these appropriations are to be used to reduce by 50 per centum the amount of the fees to be paid under title 35, United States Code, section 41(a) and (b) by independent inventors and nonprofit organizations as defined in regulations established by the Commissioner of Patents and Trademarks, and by small business concerns as defined in section 3 of the Small Business Act and by regulations established by the Small Business Administration.

In addition, fees collected pursuant to title 35, United States Code, and the Trademark Act of 1946, as amended (15 U.S.C. 1051 et seq.), will augment the authorized appropriation to provide the resources needed to conduct the operations of the Office for fiscal year 1983. The total resources for the Office in fiscal year 1983, that is, the amount appropriated pursuant to this section plus fees collected pursuant to the patent and trademark laws, which will be available to the Office, are estimated to be $154,934,000. The corresponding levels for fiscal year 1984 and fiscal year 1985 are estimated in the President's Budget to be $167 million and $176 million, respectively. Any additional amounts to cover increases in salary, pay, retirement, or other employee benefits which may be authorized by law will be in addition to, and will therefore increase, those program levels. Finally, any funds appropriated pursuant to this section and all fees collected, when specified in an appropriation act, will remain available without any fiscal year limitation.

SECTION 2

This section provides that, notwithstanding any other provision of law, there is authorized to be appropriated to the Patent and Trademark Office for fiscal year 1982, $121,461,000 and such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law. This section increases the amount authorized for the Patent and Trademark Office by 2.5 million over that authorized in Public law 97-35. The President is recommending a supplemental appropriation of $2,500,000 for the Patent and Trademark Office for fiscal year 1982 in order to carry out the program recommendations included in his fiscal year 1983 Budget.

SECTION 3

This section establishes certain statutory fees which are to be charged by the Commissioner and authorizes the Commissioner to establish other fees whose amounts are not specifically set. Thus, the major routine fees which are applicable to patents and patent application processing are established (e.g., filing, issuance, and maintenance fees). The Commissioner is authorized to establish fees for all other processing, services, or materials related to patents which are not specifically established by statute. The processing and service fees, which would be established at a level to recover the estimated average costs to the Office. A more specific discussion of the various provisions of this section is set forth below.

Section 3(a) amends section 41(a) of title 35 to provide the amounts of the fees for filing and issuance of patent applications. In addition, the section includes provisions for increasing the filing fees due to increased complexities presented by certain applications, e.g., applications containing more than a specified number of claims and any application containing a multiple dependent claim. The section also provides that fees will be charged when the number of claims is increased above the specified number or when a multiple dependent claim is first presented, whether on filing or at a later point in processing.

Under section 41(a)1, the filing fee for an original patent, except in design or plant cases, is $300. In addition, on filing or on presentation at any other time, $30 is due for each claim in independent form which is in excess of three, $10 is due for each claim (whether independent or dependent) which is in excess of twenty, and $100 is due for each application containing a multiple dependent claim. The latter fee is a one-time charge per application due the first time a multiple dependent claim is presented for examination. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of title 35, United States Code, or any claim depending therefrom, will be considered as separate dependent claims in accordance with the number of claims to which reference is made. Under the section, errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner. This will enable the Commissioner to establish regulations whereby patent applications may correct, without prejudice, errors in payment of the additional fees, i.e., those in addition to the basic fees established.

Under section 41(a)2, the fee for issuing all original and reissue patents, except in design or plant cases, would be a uniform amount of $500. No supplemental issue fees are required.

Section 41(a)3 establishes fixed fees for filing applications for, and issuance of design and plant patents. For design patent cases, the filing fee would be $200 and the issue fee $250.

Section 41(a)4 relates to fees in reissue cases and establishes a fee of $300 for filing each application for the reissue of a patent. In addition, on filing or on presentation at any other time, $30 is due for each claim in independent form which is in excess of the number of independent claims of the original patent, and $10 is due for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of

claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

Under section 41(a)5, a fee of $50 would be established for filing each disclaimer in a patent or patent application.

Section 41(a)6 establishes a fee due on filing an appeal from the examiner to the Board of Appeals of $115. In addition, a fee of $115 is due on filing a brief in support of the appeal, and a fee of $100 is due for requesting an oral hearing before the Board of Appeals.

Section 41(a)7 establishes two different fees for filing petitions with different standards to revive abandoned patent applications. The same two fees are applicable to petitions to accept the delayed payment of the fee for issuing a patent. The fees set forth in this section are due on filing the petition. Since the section provides for two alternative fees with different standards, the section would permit the applicant seeking revival or acceptance of a delayed payment of the fee for issuing a patent to choose one or the other of the fees and standards under such regulations as the Commissioner may establish. Under the section the Commissioner could establish time limits within which petitions under each of the different fees and standards can be filed. The section establishes a fee of $500 for filing each petition for revival or for acceptance of the delayed payment of an issue fee where the abandonment or the failure to pay the issue fee is unintentional. In order to prevent abuse and injury to the public the Commissioner could require a terminal disclaimer equivalent to the period of abandonment and could require applicants to act promptly after becoming aware of the abandonment. The section establishes a fee of $50 for filing a petition under sections 133 or 151 of title 35 in accordance with standards presently in effect requiring that the delay resulting in the abandonment, or the delay in payment of the issue fee, be unavoidable. Under this section a petition accompanied by either a fee of $500 or a fee of $50 would not be granted where the abandonment or the failure to pay the fee for issuing the patent was unintentional as opposed to being unintentional or unaviodable. This section would permit the Commissioner to have more discretion than present law to revive abandoned applications and accept late payment of the fee for issuing a patent in appropriate circumstances.

Section 41(a)8 establishes fees for filing of petitions for extensions of time. Various time periods are set by the Office for taking actions on matters relating to patent applications. These time periods are set pursuant to statute or by regulations established by the Commissioner under the authority granted to the Commissioner by statute. This section would provide for fees for filing petitions to extend the time periods set pursuant to statute or by regulations for taking action within any limitations set by statute.

A fee of $50 is established for filing a request for a first one month extension of time, an additional fee of $100 for filing a request for a second one month extension of time which would expire two months after the end of the time period set for taking action, and an additional fee of $200 for filing a request for a third one month extension of time which would expire three months after the end of the time period set for taking action. A subsequent or fourth extension could be requested if additional time was available under the statute. In no case could a period be extended beyond the maximum time set by statute.

The Commissioner may issue regulations providing when, within any maximum period permitted by statute, petitions for extensions of time, and the required fee therefor, may be filed. This section does preclude the Commissioner from waiving the fee for filing a petition for an extension of time where the Office extends the period due to equity considerations or sufficient cause.

Section 41(b) provides that the Commissioner charge the following fees for maintaining a patent other than a design or plant patent, in force: at three years and six months after grant, $400; at seven years and six months after grant, $800; and at eleven years and six months after grant, $1,200. Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace priod the late payment of a maintenance fee.

In order to avoid an inequitable loss of patent rights, the Commissioner is given the authority to accept payment of any maintenance fee after the six-month grace period if it is established that the delay in payment was unavoidable. It is intended that the Commissioner will issue regulations establishing guidelines for acceptance of late payment. After the expiration of a reasonable period of time, the patentee would bear a heavy burden of proof that the delay was unavoidable. A surcharge may be imposed by the Commissioner as a precondition to acceptance of a late fee. This surcharge may be in addition to any surcharge imposed for payment during the grace period.

A provision is included to protect the rights of one who began using or who took steps to begin use of a patent which expired for failure to pay a maintenance fee and which was subsequently reestablished by acceptance of the late payment. The intervening rights provision in section 41(c)(2) is similar to the intervening rights provision in 35 U.S.C. 252 concerning reissued patents.

Section 41(d) provides that the Commissioner establish fees for all other processing services, or materials related to patents not specified in section 41 at an amount calculated to recover the estimated average cost to the Office of such processing, services, or materials. Such processing and other services includes, but is not limited to, the processing of various petitions desiring certain actions to be taken regarding patent applications, recording of assignments, reexamination of patents and the processing of international applications. Fees for materials include the price of patent copies, certifications and other copying services. The yearly fee for providing a library specified in section 13 of title 35 with uncertified copies of the specifications and drawings for all patents issued in that year is set at $50.

Section 41(f) provides that the fees established in subsections (a) and (b) of section 41 may be adjusted by the Commissioner on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than one per centum may be ignored by the Commissioner in making such adjustments.

Subsection (a) of section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is being changed to grant the Commissioner discretion to establish the level of recovery of office costs related to trademarks. It is expected that the Commissioner will set the fees in a way that the filing fee will be kept as low as possible to foster use of the Federal registration system. This may require that other fees for services or materials related to trademarks recover more than their actual estimated cost in order that the Commissioner achieve in the aggregate adequate cost recovery for the entire trademark operation.

A provision is inserted in section 42(c) of title 35 in order to ensure that the trademark fees collected are used to fund trademark operations only and not the processing of patent applications.

SECTION 4

Section 3 of title 35 is amended by deleting specific reference to the number of examiners-in-chief in the first sentence. Elimination of the upper limit on the number of permanent members of the Board of Appeals would provide greater flexibility in filling most of its personnel needs, thereby avoiding an excess of examiner details. The authority to appoint acting examiners-in-chief, however, is maintained in order that temporary fluctuations in the workload of the Board may be accommodated.

SECTION 5

Under revised section 111 of title 35, the filing date of an application would be that on which the specification and any required drawings are received by the Patent and Trademark Office. The oath or declaration and filing fee could be submitted at such later time as established by the Commissioner, without any loss of the original filing date. Under the amendment, an applicant could either file the oath or declaration (including the applicant's signature) and fee together with an application or submit them at a later time as determined by the Commissioner.

The section would also authorize the imposition of a surcharge as a condition for accepting filing of the oath of payment of the filing fee after the filing date of the application. Since an application filed without the oath or declaration would not be signed or "made" by the applicant, the amendment permits a patent attorney or agent, authorized by the applicant, to submit the specification and drawings for the purpose of obtaining a filing date. Should the applicant, however, fail to file the oath or declaration, or pay the filing fee within the time limits set by the Commissioner, the application would be regarded as having been abandoned.

SECTION 6

The third paragraph of section 116 of title 35 is amended to enlarge the possibilities for correcting misnamed inventive entities. As a consequence, correction would be permitted also in cases where the person originally named as inventor was in fact not the inventor of the subject matter contained in the application. If such error occurred without any deceptive intention on the part of the true inventor, the Commissioner would have the authority to substitute the true inventor for the erroneously named person. Although probably rarer, instances such as changes from a mistakenly identified sole inventor to a different, but actual, joint inventors, conversions from erroneously identified joint inventors to different but actual, joint inventors, and conversions from erroneously identified joint inventors to a different, but actual, sole inventor would also be permitted. In each instance, however, the Commissioner must be assured of the presence of innocent error, without deceptive intention on the part of the true inventor or inventors, before permitting a substitution of a true inventor's name.

The ability to receive a filing date based on a specification and drawings without signature as set forth in revised section 111 of title 35, and to file the oath or declaration and pay the filing fee within such period as determined by the Commissioner is also available to joint inventors.

Section 256 of title 35, which is a companion to section 116, would be amended to similarly enlarge the possibilities for correction of misnamed inventors in issued patents.

SECTION 7

Section 6(d) of title 35, which provides for the allocation of appropriated Patent and Trademark Office funds to the Department of State for payment of United States financial obligations under the Patent Cooperation Treaty, is deleted. The Department of State has traditionally assumed responsibility for financial obligations for international agreements to which the United States adheres.

SECTION 8

Section 8(a) of the Trademark Act is amended to clarify that the continued use required to be shown in the sixth year be use "in commerce". Although it is believed by some that omission of the words "in commerce" may have been inadvertent in the 1946 Act, this section has been interpreted so that use in a foreign country, or use in intrastate commerce, is

sufficient. Such interpretation is fundamentally in conflict with other requirements of the Act.

Section 8(b) of the Act is also amended to clarify that the continued use required to be shown in the sixth year be use "in commerce" . Although it is believed by some that omission of the words " in commerce" may have been inadvertent in the 1946 Act, this section has interpreted so that use in a foreign country, or use in intrastate commerce, is sufficient. Such interpretation is fundamentally in conflict with other requirements of the Act.

Section 8(b) of the Act is also amended to clarify that the continued use required to be shown in the sixth year be use "in commerce" for registrations published under section 12(c) of the Act. (This pertains to registrations issued under the Act of Mar. 3, 1881 and the Act of Feb. 20, 1905).

The word "still" has been deleted from section 8(a) and 8(b). Thus, the owner of a registration issued on the basis of a foreign registration under the provisions of section 44(e) of the Act will have to submit an affidavit to the effect that the mark is in use in commerce. Since the mark need not be used in commerce when it is registered, the requirement cannot be required to state that it is "still" in such use.

SECTION 9

Section 13 of the Trademark Act is amended to delete the requirement that an opposition be verified. The sentence which allowed an unverified application to be verified at a later date has been deleted. In addition, a phrase has been added to make it clear that any subsequent extension of time to file an opposition, beyond the first extension, must be requested before the end of the preceding extension.

Section 14 of the Trademark Act would also be amended to delete the requirement that a petition to cancel a registration be verified.

SECTION 10

Section 15 of the Trademark Act is amended to change the term "the publication" to "registration" in the first sentence. This change makes the date of registration rather than the date of publication the crucial date for purposes of incontestablility. It will also make section 15 consistent with sections 22 and 33 of the Act.

SECTION 11

Section 16 of the Trademark Act is amended to limit the declaration of interferences to those situations where a petition to the Commissioner shows that extraordinary circumstances exist, the rights of the parties can be determined adequately by the existing opposition and cancellation procedures. Additionally, if an interference is declared between an application and a registration and the applicant wins, a cancellation must still be initiated against the registration.

SECTION 12

A new subsection (a) has been added to section 21 of title 35 to authorize, but not to require, the Commissioner of Patents and Trademarks to give as the filing date of any paper or fee which is required to be filed in the Patent and Trademark Office the date on which the paper or fee was deposited with the United States Postal Service. The Commissioner may also give as the filing date of any paper or fee which was required to be filed in the Patent and Trademark Office the date it would have been deposited with the United States Postal Service but for postal service interruptions or emergencies which the Commissioner designates. The requirements governing whether any given paper or fee may be given the filing date of the day on which it was, or would have been deposited with the United States Postal Service will be set forth in regulations established by the Commissioner.

Section 21(b) of title 35 is identical to existing section 21 with two minor amendments. The word "federal" has been inserted before the phrase "holiday within the District of Columbia" to clarify the nature of the holiday.

SECTION 13

This section clarifies the authority of the Commissioner in section 6(a) of title 35 to enter into a wide range of cooperative agreements concerning the patent and trademark laws or the administration of the Patent and Trademark Office. These agreements are in addition to the exchange of publications authorized in 35 U.S.C. 11(b) and 12. These cooperative agreements may take the form of studies, programs, exchanges, and other similar ventures. Thus, the Patent and Trademark Office could, for example, exchange patent copies, non-patent literature, tapes or services in return for goods or services of value to the Patent and Trademark Office.

SECTION 14

The amendments of 35 U.S.C. 115 and Section 11 of the Trademark Act of 1946 recognize the Hague "Convention Abolishing the Requirement of Legalization for Foreign Public Documents" which entered into force in the United States on Oct. 15, 1981. The Convention abolishes the requirement of diplomatic or consular legalization for foreign public documents which are sworn to or acknowledged by a notary public in any of the countries adhering to the Convention. For documents executed by a notary public of all other for-

eign countries, diplomatic or consular legalization will still be required.

The amendment of 35 U.S.C. 261 is intended to give affirmative effect to acknowledgments executed pursuant to the Hague Convention.

SECTION 15

This section corrects an incorrect citation. Public Law 96–517 amended section 41 of title 35, United States Code, in a way which eliminated 35 U.S.C. §41(a)(9). Unfortunately, section 13 of title 35, United States Code, was not amended accordingly by Public Law 96–517. This section corrects that oversight.

SECTION 16

This section sets a uniform term of fourteen years for all design patents.

SECTION 17

Sections 17(a) and (c) specify the effective dates of the Act. Section 17(a) also specifies that the maintenance fees provided for in section 3(b) of this Act will only apply to patents in which the application was filed on and after the date of enactment or to maintenance fees later established by law.

Section 17(b) adds a section to title 35 providing for the voluntary arbitration of patent disputes by the parties to the dispute. The section requires that the Commissioner be notified in writing of an award made by an arbitrator or modified by a court. Such notification will be entered in the record of the prosecution of the patent.

At present, agreements to arbitrate some aspects of disputes arising under patent licenses are enforceable by the courts; however, there have been court decisions that have disapproved arbitration of disputes concerning patent validity or infringement. In this regard, see, for example, *Zip Mfg. Co.* v. *Pep Mfg. Co.* 44 F.2d 184, 7 U.S.P.Q. 62 (D. Del. 1930) and *Beckman Instruments, Inc.* v. *Technical Developments Corp.* 433 F.2d 55, 167 U.S.P.Q. 10 (7th Cir. 1965).

Partly as a reaction to those decisions, during the 93rd Congress both the Department of Commerce and the Department of Justice endorsed a provision specifically authorizing arbitration of validity and infringement disputes. This provision, included in an omnibus patent law revision bill, S. 2504, was never enacted due tot he many controversial aspects of that legislation.

In the view of the Committee, a statutory authorization of voluntary agreements to arbitrate validity and infringement disputes would benefit both the parties to these disputes and the public.

Statutory endorsement of arbitration agreements would assure the parties that they could avail themselves of the numerous advantages of arbitration without the possibility of having to reargue the dispute in court. The advantages of arbitration are many: it is usually cheaper and faster than litigation; it can have simpler procedural and evidentiary rules; it normally minimizes hostility and is less disruptive of ongoing and future business dealings among the parties; it is often more flexible in regard to scheduling of times and places of hearings and discovery devices; and, arbitrators are frequently better versed than judges and juries in the area of trade customs and the technologies involved in these disputes.

The enforcement of voluntary arbitration provisions would serve the public in two ways. First, the availablity of arbitration with its numerous advantages will enhance the patent system and thus will encourage innovation. This view is supported by the Committee for Economic Development in their Jan. 1980 statement entitled "Stimulating Technological Progress." Secondly, arbitration could relieve some of the burdens on the overworked Federal courts. Chief Justice Burger in his speech to the American Bar Association on Jan. 24, 1982, generally endorsed the use of arbitration to reduce the judicial backlog. Also, I think it is important to note that the American Bar Association's Section on Patent, Trademark and Copyright Law has endorsed court enforcement of arbitration agreements calling for arbitration of validity and infringement.

The recommendations of the Secretary of Commerce to increase substantially patent and trademark user fees were made on the promise that such increases "will lay the groundwork for revitalizing the patent and trademark systems." The Secretary committed to three major goals: (1) to reach an average patent application pendency time of 18 months by FY 1987, (2) to issue an examiner's first action on trademark registrability in three months and disposal of an application within 13 months, and (3) to move realistically toward a fully automated Office by the 1990's. In accepting the Administration's recommendations on user fees, the Committee fully expects the Administration to live up to its end of the bargain to bring about a first-class Patent and Trademark Office. To provide an opportunity for timely and effective Committee oversight of progress toward improving the Patent and Trademark Office, the Committee directs that the Secretary of Commerce report annually to the Committee on progress toward achieving the three major goals of the Patent and Trademark Office, as outlined above, and, in addition, promptly inform the Committee at any time it appears that any of the goals, for any reason, is viewed as not attainable.

OVERSIGHT STATEMENT

The Committee on the Judiciary has oversight responsibility over the Patent and Trademark Office in the Department of Commerce. In addition to its ongoing oversight, the Committee's Subcommittee on Courts, Civil Liberties and the Administration of Justice held an oversight hearing with respect to the Patent and Trademark Office on Mar. 4,

1981, published as Oversight Hearings Before the Subcommittee on Courts, Civil Liberties and the Administration of Justice of the Committee on the Judiciary, House of Representatives, Ninety-Seventh Congress, First Session on the Copyright Office, The U.S. Patent and Trademark Office, and the Copyright Royalty Tribunal. Serial No. 17.

The Committee expects to continue its oversight activities in this area.

STATEMENT OF THE BUDGET COMMITTEE

No statement has been received on H.R. 6260 from the House Committee on the Budget.

STATEMENT OF THE CONGRESSIONAL BUDGET OFFICE

Pursuant to clause 7, rule XIII of the Rules of the House of Representatives and section 403 of the Congressional Budget Act of 1974, the following is the cost estimate of H.R. 6260, as amended, prepared by the Congressional Budget Office.

U.S. CONGRESS
CONGRESSIONAL BUDGET OFFICE,
Washington, D.C., May 13, 1982.

Hon. PETER W. RODINO, Jr.,
Chairman, Committee on the Judiciary, House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: Pursuant to Section 403 of the Congressional Budget Act of 1974, the Congressional budget Office has prepared the attached cost estimate for H.R. 6260, a bill to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

Should the Committee so desire, we would be pleased to provide further details on this estimate.

Sincerely

ALICE M. RIVLIN, *Director.*

CONGRESSIONAL BUDGET OFFICE, COST ESTIMATE

1. Bill number: H.R. 6260.

2. Bill title: A bill to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

3. Bill status: As ordered reported by the House Committee on the Judiciary, May 11, 1982.

Bill purpose: H.R. 6260 would authorize 1982 appropriations at a level $2.5 million above the amount already appropriated, and would provide a $76 million authorization level in 1983 to carry out the activities of the Patent and Trademark Office (PTO). In addition, such sums as may be necessary are authorized for fiscal years 1984 and 1985, plus such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other benefits authorized by law for each fiscal year 1983 thorugh 1985. PTO would also have available for obligation offsetting fee collections as provided for in Public Law 96–517, plus the additional fees as specified in H.R. 6260.

Assuming enactment of H.R. 6260, total PTO collections over time would result in recovery of approximately 100 percent of patent and trademark processing costs. Individuals, small businesses, and non-profit institutions would be exempt from the proposed additional fees, however, but would continue to follow the fee schedule outlined in P.L. 96–517, which assumes the ultimate recovery of approxiamtely 50 percent of all processing costs.

The President's 1982 budget includes a request for a $2.5 million supplemental for the PTO. The Administration has recommended increasing user fees to ultimately recover 100 percent of processing costs beginning in 1983, but does not provide for any exemptions to the proposed fee increases relative to current law. The effect of exemptions is to increase by approximately $8 million the authorized level of appropriations relative to the Administration's request.

In addition, the bill would make a number of other changes that are not expected to have a cost impact.

5. Cost estimate:

[By fiscal years, in millions of dollars]

	1982	1983	1984	1985	1986
Authorization level:					
Specified	2.5	76.0	....	....	....
Estimated	....	6.8	86.4	86.8	....
Subtotal	2.5	82.8	86.4	86.8	....
Total estimated outlays	2.4	61.8	82.4	82.8	5.5

Including outlays from appropriations to date for PTO, total 1982 outlays are estimated to be $121.5 million, and total 1983 outlays are estimated to be $79.8.

The costs of this bill fall within budget subfunction 376.

6. Basis of estimate: The authorization levels for PTO for 1982 and 1983 are those specified in the bill. The estimate authorization levels for 1984 and 1985 assume a level of funding sufficient to maintain a program level of $167 million and $176 million, respectively, including offsetting collections. In addition, authorization for increases in pay and other benefits of approximately $6.8 million, $7.4 million, and $7.8 million for fiscal years 1983 through 1985, respectively, were estimated based on CBO's current inflators. Outlays are based on historical spending patterns.

The estimated collections to PTO as a result of fees charged to cover the costs of processing trademarks and patents were provided by the agency, and assume the fee structure outlined in the bill. The estimated collections, under current law and under H.R. 6260, are shown in the table below.

[By fiscal years, in millions of dollars]

	1982	1983	1984	1985	1986
Estimated offsetting collections:					
Current law	....	47.8	52.7	57.7	....
Added by H.R. 6260	....	31.2	35.3	39.3	....
Total—H.R. 6260	....	79.0	88.0	97.0	....

7. Estimate comparison: None.
8. Previous CBO estimate: None.
9. Estimate prepared by: Mary B. Maginniss.

10. Estimate approved by: C. G. Nuckols (James L. Blum, Assistant Director for Budget Analysis).

COMMITTEE VOTE

The Committee on the Judiciary ordered H.R. 6260 as amended reported by a voice vote, without objection being heard, with a quorum of Members being present.

CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3 of Rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italics, existing law in which no change is proposed is shown in roman):

TITLE 35, UNITED STATES CODE
PART 1—PATENT AND TRADEMARK OFFICE

* * * * *

CHAPTER 1—ESTABLISHMENT, OFFICERS, FUNCTIONS

* * * * *

§3. Officers and employees.

(a) There shall be in the Patent and Trademark Office a Commissioner of Patents and Trademarks, a Deputy Commissioner, two Assistant Commissioners, and [not more than fifteen] examiners-in-chief *appointed under section 7 of this title.* The Deputy Commissioner, or, in the event of a vacancy in that office, the Assistant Commissioner senior in date of appointment shall fill the office of Commissioner during a vacancy in that office until the Commissioner is appointed and takes office. The Commissioner of Patents and Trademarks, the Deputy Commissioner, and the Assistant Commissioners shall be appointed by the President, by and with the advice and consent of the Senate. The Secretary of Commerce, upon the nomination of the Commissioner, in accordance with law shall appoint all other officers and employees.

* * * * *

§6. Duties of Commissioner.

(a) The Commissioner, under the direction of the Secretary of Commerce, shall superintend or perform all duties required by law respecting the granting and issuing of patents and the registration of trademarks; shall have the authority to carry on studies [and] programs, *or exchanges of items or services* regarding domestic and international patent and trademark law *or the administration of the Patent and Trademark Office,* and shall have charge of property belonging to the Patent and Trademark Office. He may, subject to the approval of the Secretary of Commerce, establish regulations, not inconsistent with law, for the conduct of proceedings in the Patent and Trademark Office.

(b) The Commissioner, under the direction of the Secretary of Commerce, may, in coordination with the Department of State, carry on programs and studies cooperatively with foreign patent offices and international intergovernmental organizations, or may authorize

such programs and studies to be carried on, in connection with the performance of duties stated in subsection (a) of this section.

(c) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, transfer funds appropriated to the Patent and Trademark Office, not to exceed $100,000 in any year, to the Department of State for the purpose of making special payments to international intergovernmental organizations for studies and programs for advancing international cooperation concerning patents, trademarks, and related matters. These special payments may be in addition to any other payments or contributions to the international organization and shall not be subject to any limitations imposed by law on the amounts of such other payments or contributions by the Government of the United States.

[(d) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, allocate funds appropriated to the Patent Office, to the Department of State for the purpose of payment of the share on the part of the United States to the working capital fund established under the Patent Cooperation Treaty. Contributions to cover the share on the part of the United States of any operating deficits of the International Bureau under the Patent Cooperation Treaty shall be included in the annual budget of the Patent Office and may be transferred by the Commissioner, under the direction of the Secretary of Commerce, to the Department of State for the purpose of making payments thereof to the International Bureau.]

* * * * *

§13. Copies of patents for public libraries.

The Commissioner may supply printed copies of specifications and drawings of patents to public libraries in the United States which shall maintain such copies for the use of the public, at the rate for each year's issue established for this purpose in section 41 [(a)9] *(d)* of this title.

* * * * *

CHAPTER 2—PROCEEDINGS IN THE PATENT AND TRADEMARK OFFICE

* * * * *

§21. [Day for taking action falling on Saturday, Sunday, or holiday] *Filing date and day for taking action.*

(a) The Commissioner may by rule prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service or would have been deposited with the United States Postal Service but for postal service interruptions or emergencies designated by the Commissioner.

(b) When the day, or the last day, for taking any action or paying any fee in the United States Patent and Trademark Office falls on Saturday, Sunday, or a *Federal* holiday within the District of Columbia, the action may be taken, or the fee paid, on the next succeeding secular or business day.

* * * * *

CHAPTER 4—PATENT FEES

* * * * *

§41. Patent fees

[(a) The Commissioner of Patents will establish fees for the processing of an application for a patent, from filing through disposition by issuance or abandonment, for maintaining a patent in force, and for providing all other services and materials related to patents. No fee will be established for maintaining a design patent in force.

[(b) By the first day of the first fiscal year beginning on or after one calendar year after enactment of this Act, fees for the actual processing of an application for a patent, other than for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 25 per centum of the estimated average cost to the Office of such processing. By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for the processing of an application for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 50 per centum of the estimated average cost to the Office of such processing.

[(c) By the fifteenth fiscal year following the date of enactment of this Act, fees for maintaining patents in force will recover 25 per centum of the estimated cost to the Office, for the year in which such maintenance fees are received, of the actual processing all applications for patents, other than for design patents, from filing through disposition by issuance or abandonment. Fees for maintaining a patent in force will be due three years and six months, seven years and six months, and eleven years and six months after the grant of the patent. Unless payment of the applicable maintenance fee is received in the Patent and Tradmark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee.

[(d) By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for all other services or materials related to patents will recover the estimated average cost to the Office of performing the service or furnishing the material. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50.]

(a) The Commissioner shall charge the following fees:

1. On filing each application for an original patent, except in design or plant cases, $300; in addition, on filing or on presentation at any other time, $30 for each claim in independent form which is in excess of three, $10 for each claim (whether independent or dependent) which is in excess of twenty, and $100 for each application containing a multiple dependent claim. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

2. For issuing each original or reissue patent, except in design or plant cases, $500.

3. In design and plant cases:

a. On filing each design application, $125.

b. On filing each plant application, $200.

c. On issuing each design patent, $175.

d. On issuing each plant patent, $250.

4. On filing each application for the reissue of a patent, $300; in addition, on filing or on presentation at any other time, $30 for each claim in independent form which is in excess of the number of independent claims of the original patent, and $10 for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

5. On filing each disclaimer, $50.

6. On filing an appeal from the examiner to the Board of Appeals, $115; in addition, on filing a brief in support of the appeal, $115, and on requesting an oral hearing before the Board of Appeals, $100.

7. On filing each petition for the revival of an unintentionally abandoned application for a patent or for the unintentionally delayed payment of the fee for issuing each patent, $500, unless the petition is filed under sections 133 or 151 of this title, in which case the fee shall be $50.

8. For petitions for one-month extensions of time to take actions required by the Commissioner in an application:

a. On filing a first petition, $50.

b. On filing a second petition, $100.

c. On filing a third or subsequent petition. $200.

(b) The Commissioner shall charge the following fees for maintaining a patent in force:

1. Three years and six months after grant, $400.

2. Seven years and six months after grant, $800.

3. Eleven years and six months after grant, $1,200.

Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee. No fee will be established for maintaining a design or plant patent in force.

(c)(1) The Commissioner may accept the payment of any maintenance fee required by subsection (b) of this section after the six-month grace period if the delay is shown to the satisfaction of the Commissioner to have been unavoidable. The Commissioner may require the payment of a surcharge as a condition of accepting payment of any maintenance fee after the six-month grace period. If the Commissioner accepts payment of a maintenance fee after the six-month grace period, the patent shall be considered as not having expired at the end of the grace period.

(2) No patent, the term of which has been maintained as a result of the acceptance of a payment of a maintenance fee under this subsection, shall abridge or affect the right of any person or his successors in business who made, purchased or used after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used. The court before which such matter is in question may provide for the continued manufacture, use or sale of the thing made, purchased, or used as specified, or for the manufacture, use or sale of which substantial preparation was made after the six-month grace period but before the acceptance of a maintenance fee under this subsection, and it may also provide for the continued practice of any process, practiced, or for the practice of which substantial preparation was made, after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced after the six-month grace period but before the acceptance of a maintenance fee under the subsection.

(d) The Commissioner will establish fees for all other processing, services, or materials related to patents not specified above to recover the estimated average cost to the Office of such processing, services, or materials. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50.

(3) The Commissioner may waive the payment of any fee for any service or material related to patents in connection with an occasional or incidental request made by a department or agency of the Government, or any officer thereof. The Commissioner may provide any applicant issued a notice under section 132 of this title with a copy of the specifications and drawings for all patents referred to in that notice without charge.

[(f) Fees will be adjusted by the Commissioner to achieve the levels of recovery specified in this section; however, no patent application processing fee or fee for maintaining a patent in force will be adjusted more than once every three times.]

(f) The fees established in subsection (a) and (b) of this section may be adjusted by the Commissioner on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than 1 per centum may be ignored.

(g) No fee established by the Commissioner under this section will take effect prior to sixty days following notice in the Federal Register.

§42. Patent and Trademark Office funding.

(a) All fees for services performed by or materials furnished by the Patent and Trademark Office will be payable to the Commissioner.

(b) All fees paid to the Commissioner and all appropriations for defraying the costs of the activities of the Patent and Trademark Office will be credited to the Patent and Trademark Office Appropriation Account in the Treasury of the United States, the provisions of section 725e of title 31, United States Code, notwithstanding.

(c) Revenues from fees will be available to the Commissioner of Patents to carry out, to the extent provided for in appropriation Acts, the activities of the Patent and Trademark Office. *Fees available to the Commissioner under section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), shall be used exclusively for the processing of trademark registrations and for other services and materials related to trademarks.*

(d) The Commissioner may refund any fee paid by mistake or any amount paid in excess of that required.

PART II—PATENTABILITY OF INVENTIONS AND GRANT OF PATENTS

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CHAPTER 11—APPLICATION FOR PATENT

* * * * *

[§111. Application for patent

[Application for patent shall be made by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include: (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be signed by the applicant and accompanied by the fee required by law.]

SEC. 111. Application for patent shall be made, or authorized to be made, by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be accompanied by the fee required by law. The fee and oath may be submitted after the specification and any required drawing are submitted, within such period and under such conditions, including the payment of a surcharge, as may be prescribed by the Commissioner. Upon failure to submit the fee and oath within such prescribed period, the application shall be regarded as abandoned, unless it is shown to the satisfaction of the Commissioner that the delay in submitting the fee and oath was unavoidable. The filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office.

* * * * *

§115. Oath of applicant

The applicant shall make oath that he believes himself to be the original and first inventor of the process, machine, manufacture, or composition of matter, or improvement thereof, for which he solicits a patent; and shall state of what country he is a citizen. Such oath may be made before any person within the United States authorized by law to administer oaths, or when, made in a foreign country, before any diplomatic or consular office of the United States authorized to administer oaths, or before any officer having an official seal and authorized to administer oaths in the foreign country in which the applicant may be, whose authority [shall be] *is* proved by certificate of a diplomatic or consular officer of the United States, *or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States* and such oath shall be valid if it complies with the laws of the state or country where made. When the application is made as provided in this title by a person other than the inventor, the oath may be so varied in form that it can be made by him.

§116. [Joint inventors] *Inventors.*

When an invention is made by two or more persons jointly, they shall apply for patent jointly and each sign the application and make the required oath, except as otherwise provided in this title.

If a joint inventor refuses to join in an application for patent or cannot be found or reached after diligent effort, the application may be made by the other inventor on behalf

of himself and the omitted inventor. The Commissioner, on proof of the pertinent facts and after such notice to the omitted inventor as he prescribes, may grant a patent to the inventor making the application, subject to the same rights which the omitted inventor would have had if he had been joined. The omitted inventor may subsequently join in the application.

Whenever [a person is joined in an application for patent as joint inventor through error, or a joint inventor is not included in an application through error] *through error a person is named in an application for patent as the inventor, or through error an inventor is not named in an application,* and such error arose without any deceptive intention on his part, the Commissioner may permit the application to be amended accordingly, under such terms as he prescribes.

* * * * *

CHAPTER 16—DESIGNS

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§173. Term of design patent.

[Patents for designs may be granted for the term of three years and six months, or for seven years, or for fourteen years, as the applicant, in his application, elects.]

Patents for designs shall be granted for the term of fourteen years.

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PART III—PATENTS AND PROTECTION OF PATENT RIGHTS

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CHAPTER 25—AMENDMENT AND CORRECTION OF PATENTS

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[§256. Misjoinder of inventor.

[Whenever a patent is issued on the application of persons as joint inventors and it appears that one of such persons was not in fact a joint inventor, and that he was included as a joint inventor by error and without any deceptive intention, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate deleting the name of the erroneously joined person from the patent.

[Whenever a patent is issued and it appears that a person was a joint inventor, but was omitted by error and without deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate adding his name to the patent as a joint inventor.

[The misjoinder or nonjoinder of joint inventors shall not invalidate a patent, if such error can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly.]

§256. Correction of named inventor.

Whenever through error a person is named in an issued patent as the inventor, or through error an inventor is not named in an issued patent and such error arose without and deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate correcting such error.

The error of omitting inventors or naming persons who are not inventors shall not invalidate the patent in which such error occurred if it can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly.

CHAPTER 16—OWNERSHIP AND ASSIGNMENT

* * * * *

§261. Ownership; assignment.

Subject to the provisions of this title, patents shall have the attributes of personal property.

Applications for patent, patents, or any interest therein, shall be assignable in law by an instrument in writing. The applicant, patentee, or his assigns or legal representatives may in like manner grant and convey an exclusive right under his application for patent, or patents, to the whole or any specified part of the United States.

A certificate of acknowledgment under the hand and official seal of a person authorized to administer oaths within the United States, or, in a foreign country, of a diplomatic or consular officer of the United States or an officer authorized to administer oaths whose authority is proved by a certificate of a diplomatic or consular officer of the United States, *or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States,* shall be prima facie evidence of the execution of an assignment, grant or conveyance of a patent or application for patent.

An assignment, grant or conveyance shall be void as against any subsequent purchaser or mortgagee for a valuable consideration, without notice, unless it is recorded in the Patent and Trademark Office within three months from its date or prior to the date of such subsequent purchase or mortgage.

CHAPTER 29—REMEDIES FOR INFRINGEMENT OF PATENT, AND OTHER ACTIONS

Sec.

281. Remedy for infringement of patent.

* * * * *

294. Voluntary arbitration.

* * * * *

§294. Voluntary arbitration.

(a) A contract involving a patent or any right under a patent may contain a provision requiring arbitration of any dispute relating to patent validity or infringement arising under the contract. In the absence of such a provision, the parties to an existing patent validity or infringement dispute may agree in writing to settle such dispute by arbitration. Any such provision or agreement shall be valid, irrevocable, and enforceable, except for any grounds that exist at law or in equity for revocation of a contract.

(b) Arbitration of such disputes, awards by arbitrators and confirmation of awards shall be governed by title 9, United States Code, to the extent such title is not inconsistent with this section. In any such arbitration proceeding, the defenses provided for under section 282 of this title shall be considered by the arbitrator if raised by any party to the proceeding.

(c) An award by an arbitrator shall be final and binding between the parties to the arbitration but shall have no force or effect on any other person. The parties to an arbitration may agree that in the event a patent which is the subject matter of an award is subsequently determined to be invalid or unenforceable in a judgment rendered by a court to competent jurisdiction from which no appeal can or has been taken, such award may be modified by any court of competent jurisdiction upon application by any party to the arbitration. Any such modification shall govern the rights and obligations between such parties from the date of such modification.

(d) When an award is made by an arbitrator, the patentee, his assignee or licensee shall give notice thereof in writing to the Commissioner. There shall be a separate notice prepared for each patent involved in such proceeding. Such notice shall set forth the names and addresses of the parties, the name of the inventor, and the name of the patent owner, shall designate the number of the patent, and shall contain a copy of the award. If an award is modified by a court, the party requesting such modification shall give notice of such modification to the Commissioner. The Commissioner shall upon receipt of either notice, enter the same in the record of the prosecution of such patent. If the required notice is not filed with the Commissioner, any party to the proceeding may provide such notice to the Commissioner.

(e) The award shall be unenforceable until the notice required by subsection (d) is received by the Commissioner.

* * * * *

TRADEMARK ACT OF 1946

* * * * *

Sec. 8 (a). Duration of registration—Cancelation at end of 6 years unless affidavit of use filed.

Each certificate of registration shall remain in force for 20 years: *Provided,* That the registration of any mark under the provisions of this Act shall be canceled by the Commissioner at the end of 6 years following its date, unless within 1 year next preceding the expiration of such 6 years the registrant shall file in the Patent and Trademark Office an affidavit showing that said mark is [still] in use *in commerce* or showing that its nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark. Special notice of the requirement for such affidavit shall be attached to each certificate of registration.

Sec. 8(b). Cancelation of republished prior registrations unless affidavit of use filed.

Any registration published under the provisions of subsection (c) of section 12 of this Act shall be canceled by the Commissioner at the end of 6 years after the date of such publication unless within 1 year next preceding the expiration of such 6 years and registrant shall file in the Patent and Trademark Office an affidavit showing that said marks is [still] in use

in commerce or showing that its nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark.

* * * * *

Sec. 11. Acknowledgments and verifications.

Acknowledgments and verifications required hereunder may be made before any person within the United States authorized by law to administer oaths, or, when made in a foreign country, before any diplomatic or consular officer of the United States or before any official authorized to administer oaths in the foreign country concerned whose authority [shall] *is* proved by a certificate of a diplomatic or consular officer of the United States *or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States,* and shall be valid if they comply with the laws of the state or country where made.

* * * * *

Sec. 13. Opposition to registration of marks on the Principal Register.

Any person who believes that he would be damaged by the registration of a mark upon the principal register may upon payment of the required fee, file [a verified] *an* opposition in the Patent and Trademark Office, stating the grounds therefor, within thirty days after the publication under subsection (a) of section 12 of this Act of the mark sought to be registered. Upon written request prior to the expiration of the thirty-day period, the time for filing opposition shall be extended for an additional thirty days, and further extensions of time for filing opposition may be granted by the Commissioner for good cause *when requested prior to the expiration of an extension.* The Commissioner shall notify the applicant 86 of each extension of the time for filing opposition. [An unverified opposition may be filed by a duly authorized attorney, but such opposition shall be null and void unless verified by the opposer within a reasonable time after such filing to be fixed by the Commissioner.] An opposition may be amended under such conditions as may be prescribed by the Commissioner.

SEC. 14. A [verified] petition to cancel a registration of a mark, stating the grounds relied upon, may, upon payment of the prescribed fee, be filed by any person who believes that he is or will be damaged by the registration of a mark on the principal register established by this Act, or under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905—

(a) within five years from the date of the registration of the mark under this Act; or

(b) within five years from the date of publication under section 12(c) hereof of a mark registered under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905; or

(c) at any time if the registered mark becomes the common descriptive name of an article or substance, or has been abandoned, or its registration was obtained fraudulently or contrary to the provisions of section 4 or of subsections (a), (b), or (c) of section 2 of this Act for a registration hereunder, or contrary to similar prohibitory provisions of said prior Acts for a registration thereunder, or if the registered mark is being used by, or with the permission of, the registrant so as to misrepresent the source of the goods or services in connection with which the mark is used; or

(d) at any time if the mark is registered under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905, and has not been published under the provisions of subsection (c) of section 12 of this Act; or

(e) at any time in the case of a certification mark on the ground that the registrant (1) does not control, or is not able legitimately to exercise control over, the use of such mark, or (2) engages in the production or marketing of any goods or services to which the certification mark is applied, or (3) permits the use of the certification mark for purposes other than to certify, or (4) discriminately refuses to certify or to continue to certify the goods or services of any person who maintains the standards or conditions which such mark certifies:

> *Provided,* That the Federal Trade Commission may apply to cancel on the grounds specified in subsections (c) and (e) of this section any mark registered on the principal register established by this Act, and the prescribed fee shall not be required.

Sec. 15. Incontestability under certain conditions of right to use mark.

Except on a ground for which application to cancel may be filed at any time under subsections (c) and (e) of section 14 of this Act, and except to the extent, if any, to which the use of a mark registered on the principal register infringes a valid right acquired under the law of any State or Territory by use of a mark or trade name continuing from a date prior to the date of [the publication] *registration* under this Act of such registered mark, the right of the registrant to use such registered mark in commerce for the goods or services on or in conncection with which such registered mark has been in continuous use for 5 consecutive years subsequent to the date of such registration and is still in use in commerce, shall be incontestable: *Provided,* That—

(1) there has been no final decision adverse to registrant's claim of ownership of such mark for such goods or services, or to registrant's right to register the same or to keep the same on the register; and

(2) there is no proceeding involving said rights pending in the Patent Office or in a court and not finally disposed of; and

(3) an affidavit is filed with the Commissioner within 1 year after the expiration of any such 5-year period setting forth those goods or services stated in the registration on or in connection with which such mark has been in continuous use for such 5 consecutive years and is still in use in commerce, and the other matters specified in subsections (1) and (2) hereof; and

(4) no incontestable right shall be acquired in a mark which is the common descriptive name of any article or substance, patented or otherwise.

Subject to the conditions above specified in this section, the incontestable right with reference to a mark registered under this Act shall apply to a mark registered under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905, upon the filing of the required affidavit with the Commissioner within 1 year after the expiration of any period of 5 consecutive years after the date of publication of a mark under the provisions of subsection (c) of section 12 of this Act.

The Commissioner shall notify any registrant who files the above-prescribed affidavit of the filing thereof.

Sec. 16. Interference.

[Whenever application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause *confusion or mistake or to deceive, the Commissioner may declare that an interference exists.* [*Upon petition showing extraordinary circumstances, the Commissioner may declare that an interference exists when application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause confusion or mistake or to decieve.* No interference shall be declared between an application and the registration of a mark the right to the use of which has become incontestable.

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§31. Fees

Aug. 27, 1982

[H.R. 6260]

Patent and Trademark Office

Appropriation authorization

(a) The Commissioner of Patents will establish fees for the filing and processing of an application for the registration of a trademark or other mark and for all other services performed by and materials furnished by the Patent and Trademark Office related to trademarks and other marks. [Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or furnishing the material.] However, no fee for the filing or processing of an application for the registration of a trademark or other mark or for the renewal or assignment of a trademark or other mark will be adjusted more than once every three years. No fee established under this section will take effect prior to sixty days following notice in the Federal Register.

(b) The Commissioner may waive the payment of any fee for any service or material related to trademarks or other marks in connection with an occasional request made by a department or agency of the Government, or any officer thereof. The Indian Arts and Crafts Board will not be charged any fee to register Government trademarks of genuineness and quality for Indian products or for products of particular Indian tribes and groups.

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(60) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 1

Rules of Practice in Patent Cases; Reexamination Proceedings

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending its rules of practice in patent cases to provide procedures for the reexamination of patents. Public Law 96–517 amended the patent act to authorize reexamination proceedings as a means for improving the quality of United States patents. The Patent and Trademark Office intends, through this amendment of its rules, to provide patent owners and the public with guidance on the procedures the Office will follow in conducting reexamination proceedings.
Date: Effective date: July 1, 1981.
For Further Information Contract: Mr. R. Franklin Burnett by telephone at [703]557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks. Washington, D.C. 20231.
Supplementary Information: This rule change relates to a procedure for reexamination of patents as provided for in Public Law 96–517, section 1 of which relates to reexamination and becomes effective on July 1, 1981.

Background

A notice of proposed rulemaking was published in the Federal Register on Jan. 13, 1981 at 46 FR 3162–3175 and in the *Official Gazette* on Feb. 17, 1981 at 1003 O.G. 36–47.

The proposed rulemaking set forth two somewhat distinct procedures directed towards determining and improving the quality and reliability of United States patents. The procedures were (1) provisions for reexamination of patents as provided for in Pub. L. 96–517, section 1 of which relates to reexamination and becomes effective on July 1, 1981, and (2) provisions for inter partes protest proceedings in a patent application between the patent applicant and a member (or members) of the public who has (have) access to the application file.

An oral hearing was held on Apr. 16, 1981. Fifty-nine written letters and statements were submitted. Nineteen persons testified at the oral hearing which resulted in 107 pages of testimony.

Discussion of General Issues Involved

After careful consideration of the comments which have been received, the part of the proposed rulemaking relating to reexamination of patents as set forth in new Chapter 30 which Pub. L. 96-517 added to Title 35 of the United States Code [35 U.S.C. 301-307] is being adopted with certain changes. The remainder of the proposal relating to inter partes protest proceedings is not being adopted.

The comments relating to the proposed rules for inter partes protest proceedings were generally mixed, with a majority of persons and associations submitting comments either opposed to these proposed rules or indicating that adoption of the proposed rules should be delayed or deferred for further study and consideration.

A number of comments were received requesting some further changes to the rules be made. The thrust of some of the suggested changes would be to remove public access to reissue applications and to limit public participation in the examination of reissue applications. The changes suggested included restoring the rules in these areas to essentially their pre-1977 form. In particular, it was suggested that §1.175 be amended to eliminate paragraph (a)(4). These changes were not a part of the published proposal and are not being adopted at this time. Their consideration and adoption would require a new notice of proposed rulemaking.

Further, since the subject matter of reissue applications is already known to the public the necessity for maintaining them in confidence is not compelling. The elimination of paragraph (a)(4) of §1.175 would not have a significant effect since less than one-fourth of the currently filed reissue applications are based solely upon the 1977 change to §1.175. Under the present circumstances, it is more appropriate to defer any consideration of such changes until this issue has been reviewed further and possibly until some experience is gained under the rules adopted herein relating to reexamination. Such experience may indicate the desirability of either retaining the 1977 change to §1.175, deleting the 1977 change, or making different changes in the rules.

The comments relating to reexamination were generally favorable with most of the comments indicating general approval of the proposed rules. Among the more often mentioned specific comments were suggestions relating to public notice of reexamination requests and/or orders. A number of comments also related to requester and/or third party participation in the reexamination proceeding and also to the scope of the proceeding.

After careful review of the comments and suggestions it has been decided to adopt the suggestions relating to the publication in the *Official Gazette* of requests for reexamination for which the fee has been paid. In addition, any reexaminations ordered at the initiative of the Commissioner will also be announced in the *Official Gazette*. The announcement will include at least the date of the request or any Commissioner initiated order, a reexamination request or order control number, the patent number, title, class and subclass, name of the inventor, name of the patent owner of record, and the examining group to which the reexamination is assigned.

The suggestions and comments relating to more participation in the reexamination proceeding by the requester and third parties have been adopted only to a limited degree. The requester will in general have only that participation provided by the rules as proposed. However, any citations under §1.501 by any person will be entered in the patent file up until the date of an order to reexamine. The essentially ex parte nature of the proceeding is believed to be in keeping with the spirit and intent of the statute even though the statute does not require ex parte proceedings. Ex parte proceedings will minimize the costs and other effects of reexamination requests on patentees, especially individuals and small businesses.

The scope of the reexamination proceeding which was originally proposed has been essentially adopted in the final rules. The suggestions that the rules be broadened to include other issues have not been adopted since the other issues would unduly complicate the proceedings, raise the expense of the proceedings and raise questions whether such issues can be considered under Pub. L. 96-517.

Discussion of the Major Specific Issues Involved

The rules relating to reexamination proceedings are directed to the procedures set forth in new Chapter 30 of Title 35 of the United States Code (35 U.S.C. 301-307). This Chapter provides for the citation of prior art in patents, filing of requests for reexamination, decisions on such requests, reexamination and appeal from reexamination decisions, and the issuance of a certificate at the termination of the reexamination proceedings. Present§§1.1, 1.5, 1.11, 1.33, 1.34, 1.36, 1.104, 1.107, 1.109, 1.111, 1.112, 1.113, 1.115, 1.116, 1.121, 1.191, 1.192, 1.196, 1.197, 1.231, 1.248, 1.301, and 1.303 are amended to provide for reexamination procedures. A new "Subpart D-Reexamination of Patents" includes new §§1.501, 1.510, 1.515, 1.520, 1.525, 1.530, 1.535, 1.540, 1.550, 1.552, 1.555, 1.560, 1.565, and 1.570. Paragraph (b) of §1.291, relating to prior art citations in patents, is deleted, since provisions therefor appear in §1.501.

Section 1.1, as amended, provides for communications relating to reexamination proceedings to be marked "Box Reexam" to speed internal Office mail processing. No comments were received concerning this section. The proposal has been modified to indicate that only requests should be marked "Box Reexam".

Section 1.5, as amended, provides for all letters relating to a reexamination proceeding to be identified by patent number and a reexamination request control number. No comments were received concerning this section. Section 1.5 has been modified to also include reference to the Group Art Unit and the examiner, if known.

Section 1.11, as amended, provides for all papers made of record in reexamination proceedings to be open to inspection and copying by the public. Eighteen comments were received relating to publication of a notice in the *Official Gazette*. A new paragraph (c) has been added which provides for the publication of requests with sufficient fees paid and orders initiated by the Commissioner. Proposed paragraph "c" has been adopted as paragraph "d".

Section 1.33, as amended, has a new paragraph (c) relating to which address communications for the patent owner will be sent and who may sign papers filed. Four comments were received on this section relating to whom the mail should be addressed. One proposal, which suggested use of the current address of the attorney or agent of record, was adopted.

Section 1.34, as amended, provides for the appointment of an attorney or agent in a reexamination proceeding. Only one comment was received on this section which proposed a rule specifically allowing attorneys to file requests without identifying their clients. Since any person may request reexamination, such a rule is not felt necessary.

Section 1.36, as amended, provides for the revocation and withdrawal of powers of attorney in a reexamination proceeding. No comment was received. Section 1.36 is adopted as proposed with an additional change which added "or her" near the end.

Section 1.104, as amended, broadens the present section to also include reexamination. Three comments were received on §1.104. All comments indicated that the examiner should not make a prior art search. Although no complete new search by the examiner is required, the use of patents and printed publications in addition to those submitted by the requester is clearly

indicated in 35 U.S.C. 303(a). According, §1.104 is adopted as proposed.

Section 1.107, as amended, provides for the citation of prior art by the examiner in a reexamination proceeding. The amended rule also refers to foreign published applications, as well as patents. No comments were received on this section. It is adopted as proposed.

Section 1.109, as amended, provides for the examiner to supply reasons for allowance in a reexamination proceeding if the examiner believes that the record does not make clear the reasons for allowing a claim or claims. No comments were received on this section. Except for a clarifying change in language, it is adopted as proposed.

Section 1.111, as amended, provides for replies by the patent owner in a reexamination proceeding. One comment was received which suggested a clarification. The suggestion was adopted. Other non-substantive changes have been made in the proposed section to shorten the sentences for clarity.

Section 1.112, as amended, provides for reexamination and reconsideration of the patent under reexamination after responses by the patent owner. Three comments were received on this section.

The wording has been changed as suggested to avoid any confusion between "reexamination" and "reexamine". The sentences have also been shortened for clarity.

Section 1.113, as amended, provides for a final rejection or action in a reexamination proceeding. One comment was received which pointed out a possible conflict between the amendment rights of section 305 and the final rejection of section 1.113. No problem is seen in this regard because of the provision of section 305 which states that"reexamination will be conducted according to the procedures established for initial examination." The section is adopted as proposed with the last sentence being divided into two sentences for clarity.

Section 1.115, as amended, provides for amendments by the patent owner in a reexamination proceeding. No comments were received concerning this section. The section is adopted as proposed with minor changes for clarity.

Section 1.116, as amended, provides for amendments after final action in reexamination proceedings. One comment was received which was the same as that mentioned and responded to in Section 1.113 above. The sentences have been shortened for clarity.

Section 1.121, as amended, contains a new paragraph (f) which requires a complete copy of any new or amended claim when presented during reexamination proceedings. Two persons commented on this section. One proposed side-by-side presentation of amended and original claims. The other proposed that exactly the same procedure be used as is now in effect for amending reissue claims. Neither suggestion was adopted since neither lends itself to printing only the amended claims in a certificate as easily as the procedure set forth in §1.121(f). The proposed section was revised to also provide for the amendment of the description. In addition, the last three sentences of §1.510(e) have been inserted as the last three sentences of §1.121(f) in order to provide a more complete description therein of the manner of making amendments, including the numbering of claims, the restriction on scope of the claims and the prohibition against the introduction of new matter.

Section 1.191, as amended, provides for appeal to the Board of Appeals by the patent owner from any decision adverse to patentability, in accordance with 35 U.S.C. 306. One comment was received on proposed §1.191 which urged that the requester should also be entitled to appeal. This proposal was not adopted because it is not provided for in the law and could result in harassment if permitted. The section is adopted as proposed except that "primary" contained in the existing rule is retained.

Section 1.192, as amended, provides two months from the date of the Notice of Appeal for the patent owner to file an appeal brief in a reexamination proceeding. Five comments were received relating to §1.192 which proposed that the period for filing an appeal brief in a reexamination appeal be two months as in other appeals. The proposed rule has been adopted with the suggested two month period. The sentences have been shortened for clarity.

Section 1.196 and §1.197 are being amended to refer to "appellants", which is a term which includes both applicants and patent owners.

These two sections were not published for comment, however, the issues involved were presented in proposed§§1.191 and 1.192. Paragraph (c) of §1.197 has also been rewritten for clarity.

Section 1.231(a)(1), as amended, provides for a motion that a patent claim is unpatentable in an interference proceeding where reexamination thereof has also been requested.

Three comments were received concerning §1.231. All comments related to when interference or reexamination proceedings would be suspended. Section 1.565 provides basis for such suspensions. Decisions will be made on a case by case basis, depending on the particular fact situation. The sentences in §1.231(a)(1) have been shortened and rearranged for clarity.

An amendment was proposed to delete the last two sentences of §1.247 relating to proof of service. No comments were received concerning this section but, on reconsideration, no need for such deletion is felt necessary and no change is being adopted.

Section 1.248, as amended, includes a new paragraph (b) relating to methods of serving papers and proof of service. No comments were received concerning this section. The section is adopted as proposed with minor changes for clarity and to conform to the Federal Rules of Civil Procedure.

Section 1.291, as amended, deletes paragraph (b). Former paragraph (b) dealt with the citation of prior art provisions. It was deleted since the provisions are now covered by §1.501. Five persons commented on §1.291. One comment relating to filing protests in reexamination proceedings was not adopted since such proceedings are ex parte in nature and are limited to consideration of prior art patents and printed publications cited by the public prior to the order. Two persons mentioned providing a procedure for citation of prior art by patentees. Citation of prior art by patentees is included in §1.501. The two other comments related to the content of protest proceedings, which are not part of this final rule. Section 1.291 is adopted as proposed except that the paragraph designation of (c) is not being changed.

Section 1.301, as amended, provides for appeal by the owner of a patent in reexamination proceedings to the U.S. Court of Customs and Patent Appeals. Four comments were received relating to §1.301. One person suggested the insertion of "any" as the fourth word in the section. This suggestion was adopted. The other three comments related to appeals in inter partes protest proceedings which are not a part of this promulgation. Section 1.301 is adopted as proposed with only the above mentioned change.

Section 1.303, as amended, provides for remedy by civil action under 35 U.S.C. 145 for the owner of a patent in reexamination proceedings. No comments were received concerning this section. The changes from the proposal are the insertion of "any" as the fourth word in the section as suggested in §1.301 and the addition of, "306" to the title.

New §1.501 provides a system for citation of patents and printed publications to the Patent and Trademark Office for placement in the patent file by any person during the period of enforceability of the patent in accordance with 35 U.S.C. 301. Seventeen persons commented on §1.501. Nine comments indicated that citations should be limited to patents or printed publications. Six comments indicated that persons citing art should be required to apply it to at least one claim. Three persons held the opposite view. The final rule wording provides for citations limited to patents and printed publications where the person making the cita-

tion states the pertinency and applicability of the citation to the patent and the bearing the citation has on the patentability of at least one claim of the patent. The final rule provides that a citation made by the patent owner may include an explanation of how the claims differ from the prior art cited. Any citations which include items other than patents and printed publications will not be entered in the patent file. This does not, of course, limit in any manner the kinds and types of information which can be relied upon in protests against pending patent applications, whether such be original applications or reissue applications. Four persons stated that a separate letter requesting confidentiality should be required in cases desiring confidentiality. This provision was not considered to be necessary. One comment requested clarification of the term "period of enforceability of a patent." The meaning of this term appears to be clear since it includes any period for which recovery can be had for infringement. Under usual circumstances, this would be the term of the patent plus the six years provided by 35 U.S.C. 286. Five comments were received relating the paragraph (c) concerning service of citations on the patent owner. The wording has been clarified. A suggestion was made that prior art copies and translations of non-English documents be required. This suggestion was not adopted since such documents are not absolutely essential until a request for reexamination has been filed. However, if the person citing the patents or printed publications desires that they be considered in any subsequent reexamination proceedings, copies and any necessary English translation should be included with the citation. A proposal was also made to charge a fee to prevent harassment. This proposal was not adopted since the mere citation of prior art is not considered to constitute harassment. A suggestion was made to change the title of the section. This suggestion was adopted in slightly modified form.

New §1.510 sets forth procedures for any person to request reexamination in accordance with 35 U.S.C. 302. Paragraph (a) of new §1.510 limits the period for such request to the period of enforceability of the patent for which the request is filed and requires payment of the fee for requesting reexamination. Paragraph (b) of new §1.510 indicates what each request for reexamination must include. Paragraph (c) of new §1.510 indicates under which conditions a request for reexamination will be considered. Paragraph (d) of new §1.510 indicates the date on which the entire fee is received will be considered to be the date of the request for reexamination. Upon reconsideration of the paragraph as proposed, it was considered more appropriate to base the filing date of the request for reexamination on the receipt of the fee for requesting reexamination rather than include other matters. Proposed paragraph (d) has been amended accordingly and is adopted. Paragraph (e) of new §1.510 covers amendments which a patent owner can propose. Such amendments can accompany a request for reexamination by the patent owner. The paragraph, with changes in wording for clarity, is adopted as proposed. A new paragraph (f) was added to clarify that requests for reexamination may be filed by attorneys or agents on behalf of a requester. Nineteen persons commented on §1.510. One person inquired as to whether confidential requests would be accepted. In response thereto, §1.510 provides that any person may file a request for reexamination. That person's name will not be maintained in confidence. One suggestion was made to permit comment and rebuttal before the decision under §1.515. No need for such a procedure is seen since the only question to be considered is whether or not a substantial new question of patentability has been raised. An opportunity for comment and rebuttal is provided after the issuance of the order. One comment was received which desired provision for supplemental requests at a reduced fee. This proposal was not adopted since it is felt that all requesters should share equally in the cost. One comment was received which proposed that duplicate copies of the request be filed in the Office so that one copy would be available for public inspection at all times. This proposal was not adopted since it would appear to create more problems than it would solve. One comment was received that only "readily available" translations should be required. It is felt that if a document is considered to be sufficiently pertinent to request reexamination, that an English translation should be provided to insure complete and proper consideration. A suggestion was made relating to paragraph (b)(5) that direct service be limited to registered patent attorneys. No need for such a restriction is seen. Various other comments relating to procedures were considered but were not adopted.

New §1.515 relates to a determination as to whether the request has presented a substantial new question of patentability under 35 U.S.C. 303. Paragraph (a) of new §1.515 requires that the determination be made within 3 months of the filing date of the request. Paragraph (b) of new §1.515 refers to the refund provisions. Paragraph (c) of new §1.515 provides for review by petition to the Commissioner of any decision refusing reexamination. Seven persons commented on §1.515. Several comments were received suggesting that the term "reexamination" should be dropped before "examiner". This proposal was adopted. Several persons requested that all art cited in the patent file at the time of the order under §1.525 be considered when deciding whether a substantial new question of patentability is presented in the request. This is possible under the provision of §1.515(a) which permits "consideration of other patents or printed publications", but is not required insofar as prior art not relied upon in the request is concerned. One person suggested that "is" be changed to-affirms-in paragraph (c). This proposal has been adopted. One commentor questioned whether a right to review was available under paragraph (c) if reexamination was ordered. No right to review exists in such a case because all claims will be reviewed in view of all prior art during the reexamination under §1.550.

New §1.520 provides for reexamination at the initiative of the Commissioner under the provisions of the last sentence of paragraph (a) of 35 U.S.C. 303. Six persons commented on §1.520. One comment was received that indicated that the section did not include a reference to patents "discovered by the Commissioner" which is contained in 35 U.S.C. 303(a). This phrase has been added to the rule. A request was made that the sentence "Normally requests from outside-will not be considered." be deleted from the rule. The sentence is being retained since the rule wording provides an easy reference for Office policy. Two comments were received that indicated a desire to have any decisions not to reexamine in Commissioner initiated situations be made part of the patent file. This proposal was not adopted since the basis for not reexamining may involve many policy issues in addition to whether a substantial new question of patentability exists in the case. If all papers in such a case would be made part of a file, it may lead to conclusions that there are no new questions of patentability when this question may not have been addressed because the reexamination was not ordered for other reasons such as little or no interest in a patent about to expire. One comment stated that the section safeguards the rights of the patentee. The language referring to the designation and delegation of authority to appropriate Patent and Trademark Office officials is deleted as unnecessary since the Commissioner's authority to designate and delegate is implicit and understood.

New §1.525 provides for ordering reexamination where a substantial new question of patentability has been found pursuant to §§1.515 or 1.520. Six comments were received relating to §1.525. One comment was made that the attorney should be able to return notices to the sender if he is unable to contact the patent owner. This topic has not been added to the rules but will be handled on a case by case basis. One comment requested that the patent owner have the option to request that the reexamination be performed by an examiner (1) other than the original examiner, or (2) other than the examiner who issued the order. Comments were also received on both sides of the question as to whether the original examiner should conduct the reexamination. In response, it would appear to be inappropriate to allow an interested party to select the examiner. Under the section, the only limitation placed on the selection of the examiner by the Office is that the same examiner whose decision was reversed on petition ordinarily will not conduct the reexamination. Paragraph (b) has been changed to provide that the notices published in the *Official Gazette* will be considered to be constructive notice.

New §1.530 relates to the statement and proposed amendments provided for in the second sentence of 35 U.S.C. 304. Amendments submitted by the patent owner cannot enlarge the scope of a claim in the patent. Amendments will not be effectively entered into the patent until the certificate under §1.570 and 35 U.S.C. 307 is issued. Nine comments were received on §1.530. Several persons felt that the patent owner should be allowed to comment before the decision under §1.515 is made. Providing for such a comment would delay the decision under §1.515 which must be made within three months following the filing date of the request. Further, no need is seen for a statement relating to whether a new question of patentability is present since the patent owner has the opportunity to address any issues of patentability only after the first Office action. One comment questioned whether paragraph (d) also related to the description. This paragraph has been amended to clarify the matter. One person questioned whether an amendment could be filed with a statement. Paragraph (b) clearly answers this question in the affirmative. Several comments requested more time than two months for the patent owner to file a statement. In reply, the law in section 304 indicates that a reasonable period of not less than two months be provided for the patent owner's statement. If the period is too short in particular situations, extensions of time can be requested. It is felt that two months should be retained in the rule in view of the "Special Dispatch" required in reexamination cases. The proposed second sentence of paragraph (b) has not been adopted since §1.525(b) now provides for the publication of notices of the filing of all requests which are accompanied by the proper fee.

New §1.535 provides for reply by the reexamination requester to the statement under §1.530 of the patent owner and for service on the patent owner of any such reply. The last sentence of proposed §1.540 has been added as the last sentence of §1.535. Five persons commented on §1.535. Four persons indicated that the requester should be given additional opportunity to comment. The reasons for the limited participation are that it is all that is required under the law, it prevents to a great degree, harassment of a patent owner, it results in a less expensive proceeding for all parties, and it results in an earlier conclusion of the proceedings.

New §1.540 relates to the consideration of statements under §1.530 and replies under §1.535. One comment was received that the phrase "may result in their being refused" was worded too loosely. In the absence of any specific suggestion, the proposed wording is considered to be adequate and is adopted as proposed. In addition, it is appropriate that the Office retain discretion as to consideration in such cases.

New §1.550 covers the basic items relating to the conduct of reexamination proceedings. These proceedings basically follow the same procedures used for examining patent applications. The patent owner will be required to serve the reexamination requester with any response by the patent owner to the Office, in order to remove the necessity of the requester having to continuously monitor the file wrapper. Fourteen persons commented on §1.550.

Several persons commented that they felt that at least some input by third parties should be permitted. Paragraph (e) has been revised to permit third party input up until the time of the order. Several comments were received that the periods for response should be extended to be similar to those in regular application Office actions. Although problems may arise in certain cases and extensions of time may be granted, it is felt that relatively short response times are necessary in order to process reexaminations with "special dispatch." A question was raised as to the effect of failure to respond to an Office action. Paragraph (d) has been amended to clarify this matter.

New §1.552 covers the scope of reexamination in a reexamination proceeding. While it is not intended that the examiners will routinely complete a new search when conducting reexamination, the examiners will be free to, and will, very likely, conduct additional searches and cite and apply additional prior patents and publications when they consider it is appropriate and beneficial to do so. Insofar as the actual reexamination is concerned, the examination as to original patent claims is only on the basis of patents or printed publications. However, narrowed amended claims or new claims limited to the original disclosure will also be examined for compliance with other sections of the statute (35 U.S.C. 112 and 132) which are necessary in order to ensure that any amended or new claims are supported, valid, and do not introduce new matter. New §1.552 also provides that questions relating to matters other than those identified in paragraphs (a) and (b) of the section would merely be noted by the examiner as being an open question in the record. Patent owners could then file a reissue application if they wish such questions to be resolved. Ten persons commented on §1.552. Several persons commented that the question of fraud should be considered in reexamination proceedings. Comments were also received that the proceedings should be limited to patents and printed publications. The rules have been written to follow the statute which speaks only to reexamination based on patents and printed publications. Mixed comments were also received concerning the retention of the second sentence of paragraph (c). The paragraph is being adopted as proposed with the addition of a reference to the fact that the examiner will note the existence of unresolved questions in an Office action. In addition, the phrase "raised or" has been deleted from paragraph (c) as unnecessary.

New §1.555 covers the duty of disclosure by a patent owner in a reexamination proceeding involving the owner's patent. Nine persons commented on §1.555. Four persons supported placing a duty of disclosure on the patent owner. One comment was received that an oath or declaration be required of the patent owner in a reexamination so as to minimize the appearance and occurrence of any fraudulent acts and to emphasize the patentee's obligation of candor. While the suggestion for an oath or declaration has not been adopted, §1.555 does place an obligation of candor on the patent owner insofar as bringing patents or printed publications to the attention of the Office is concerned. The necessity for an oath or declaration in addition to the obligation placed on the patent owner by §1.555 is not apparent at this time. Accordingly, the suggestion has not been adopted. Two persons felt the duty of disclosure should apply to both the patent owner and requester. This proposal was not adopted since no sanction could be easily applied against the requester who violated such a rule. One person suggested broadening the duty requirements to include information in addition to patents and printed publications. Although such a practice may be desirable, no need is seen to require information under the reexamination rules which cannot be used during the reexamination. One person felt that there should be no duty of disclosure requirement in reexamination proceedings since the Office will be considering specific prior art and the presence or absence of other prior art does not seem terribly relevant. This suggestion was not adopted since the issue of patentability is not limited to the specific prior art presented and the duty to disclose is consistent with current practice under §1.56. The section is adopted as proposed except for the indication that prior art statements should be filed in accordance with §1.98. Also, the section has been divided into two sentences for clarity.

New §1.560 relates to the conduct of interviews in reexamination proceedings. Seven comments were received directed to §1.560. One comment requested elimination of interviews. This suggestion was not adopted since interviews have been found to be very helpful in resolving issues. Five comments were received which

indicated that the requester should be permitted to attend all interviews. This suggestion was not adopted because of the otherwise ex parte nature of the examination. Two comments were received which indicated that interviews should be permitted before the first Office action. This suggestion was not adopted since such interviews would be held at a time when the Office has not yet taken a position on the allowability of the claims under reexamination. Section 1.560 is adopted as proposed.

New §1.565 provides for the Commissioner to determine which, if any, proceedings should be stayed, consolidated, or suspended, if concurrent proceedings involving the patent under reexamination are instituted or in progress. Four comments were received concerning§1.565. One comment pointed out the desirability of combining copending reexamination proceedings. This concept has been accepted and a new paragraph (c) has been added to cover this matter. Two comments voiced concern over the possibility of delay resulting from stayed, suspended or combined cases. Although some delay may result, it is felt that a resolution of all issues should occur at an earlier date. Decisions as to whether to delay or combine cases will be made on a case by case basis to minimize delays and to protect the interests of all parties concerned. One comment was made to allow the patent owner to comment prior to any decision to stay proceedings by the Commissioner. The desirability of such comment will be decided on a case by case basis and is not considered desirable for placement in the rules. The addition of paragraph (c) and the insertion of "is or" before "becomes" in the first sentence of paragraph (b) are the only changes from the proposed rule.

New §1.570 concerns the issuance of the reexamination certificate under 35 U.S.C. 307 after conclusion of reexamination proceedings. The certificate will cancel any patent claims determined to be unpatentable, confirm any patent claims determined to be patentable, and incorporate into the patent any amended or new claim determined to be patentable. Three commentors mentioned §1.570. Two persons questioned the statutory authority for paragraph (d). In response to the concern for statutory authority, it is the position of the Office that once all of the claims have been canceled from the patent, the patent ceases to be enforceable for any purpose. Accordingly, any pending reissue or other Office proceeding relating to a patent in which such a certificate has been issued will be terminated. This provides a degree of assurance to the public that patents with all the claims canceled via reexamination proceedings will not again be asserted. One commentor indicated that copies of the certificate should be part of subsequently sold copies of the patent. Such a practice is intended but is not being made part of the regulations.

Environmental, energy, and other consideration: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291.

[Text of adopted rules appears in 37 CFR. revised July 1, 1982.]

RENE D. TEGTMEYER,
May 12, 1981. *Acting Commissioner of Patents and Trademarks.*

ROBERT B. ELLERT,
May 15, 1981. *Acting Assistant Secretary for Productivity, Technology, and Innovation.*

[FR Doc. 81-14031 Filed 5-26-81; 9:45 am]

[1007 O.G. 30]

(61)

Department of Commerce
Patent and Trademark Office
37 CFR Parts 1 & 5
[Docket No. 21223-259]

Revision of Patent Procedure

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Part 1 of 37 CFR, to implement the sections of Public Law 97-247 of 1982 which become effective on Feb. 27, 1983, and to make other miscellaneous changes. The other miscellaneous changes are being made to clarify and improve the rules where appropriate. The rulemaking also is amending Part 5 of 37 CFR to establish procedures for expediting the granting of a license under 35 U.S.C. 184 permitting the filing of a patent application in a foreign country.
Effective Date: Feb. 27, 1983.
For Further Information Contact: R. Franklin Burnett by telephone at (703) 557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed primarily to 1) implement the changes in practice in the Patent and Trademark Office provided for in Public Law 97-247 enacted on Aug. 27, 1982; 2) clarify or rewrite certain rules; and 3) expedite the granting of licenses under 35 U.S.C. 184.

This rule change contains a number of changes in practice designed to benefit both the Patent and Trademark Office in its handling of its mission and the public the Office serves.

Certain of the changes are housekeeping in nature.

A number of final rules have already been issued to implement Public Law 97-247. A final rule on "Revision of Patent and Trademark Fees" was published on July 30, 1982 at 47 FR 33086-33112 with corrections in the printing thereof being published on Aug. 4, 1982, at 47 FR 33688 and on Aug. 5, 1982, at 47 FR 33959. The final rule was also published in the Official Gazette on Aug. 10, 1982, at 1021 O.G. 19-94. A final rule relating to definitions of "independent inventor" and "nonprofit organizations" was published on Sept. 10, 1982 at 47 FR 40134-40140 and on Sept. 21, 1982 at 1022 O.G. 29-46. A "Revision of Patent and Trademark Fees Confirmation" was published on Sept. 17, 1982 at 47 FR 41272-41283 and on Sept. 28, 1982 at 1022 O.G. 61-97. A final rule relating to the definition of "small business concern" was published on Sept. 30, 1982 at 47 FR 43272-43276 and on Oct. 19, 1982 at 1023 O.G. 23-29.

Discussion of Specific Rules and Significant Differences Between Proposed and Final Rules:

Section 1.4

Section 1.4 is amended as proposed to add a reference to Subpart D relating to citation of prior art and reexamination.

Section 1.6

Section 1.6 is amended as proposed to insert "federal" before "holidays" in paragraphs 1.6(a)-(c) in accordance with §21(b) of Title 35, United States Code, as amended by Public Law 97-247. New paragraph 1.6(d) will establish in the regulations a procedure under which papers and fees which could not be filed on a particular date because of an interruption or emergency in the United States Postal Service which is so designated by the Commissioner, may be promptly filed after the ending of such a designated interruption or emergency and be considered as having been filed on that particular date. Authority for such a practice is found in §21(a) of Title 35, United States Code, as amended by Public Law 97-247.

Section 1.7

Section 1.7 is amended as proposed to insert "federal" before "holiday" in accordance with 35 U.S.C. 21(b), as amended by Public Law 97-247.

Section 1.8

Section 1.8 is amended to remove in paragraph 1.8(a) the references to §§3.55 and 4.23, which sections were removed from the rules by the rulemaking entitled "Revision of Patent and Trademark Fees" published in the Federal Register on September 10, 1982 at 47 Fed. Reg. 40134-40140. The change in paragraph 1.8(a)(i) results from the change made in §111 of Title 35, United States Code, by Public Law 97-247. Under the revised rule, the certificate of mailing procedure would be available for filing patent oaths or declarations and filing fees. However, the certificate of mailing procedure could not be used for filing patent specifications and drawings to obtain a filing date. Such papers can be filed under new §1.10. The final rule clarifies that each paper or fee filed under §1.8 must include its own certificate of mailing. The proposed amendment to §1.8(a)(viii) referring to the Court of Appeals for the Federal Circuit rather than to the Court of Customs and Patent Appeals, has been adopted as a final rule as published on Oct. 26, 1982 at 47 FR 47380-47382 and therefore is not republished here.

Section 1.10

Section 1.10 is amended as proposed to provide a procedure for assigning the date on which any paper or fee is deposited as "Express Mail" with the United States Postal Service as the filing date of the paper or fee in the Patent and Trademark Office. Authority for the Commissioner to establish such a procedure is provided in §21(a) of Title 35, United States Code, as amended by Public Law 97-247 for any paper or fee required to be filed in the Patent and Trademark Office. This procedure covers the filing of all documents, including patent and trademark applications, and fees since they are required to be filed in the Patent and Trademark Office for processing. Questions were raised during the public hearing and in the written comments regarding the authority of the Commissioner to promulgate §1.10 insofar as it would provide for the use of "Express Mail" to file patent and trademark applications. The argument advanced was that the amendment of 35 U.S.C. 21(a) by Public Law 97-247 did not permit the Commissioner to adopt rules whereby "Express Mail" could be used to file patent and trademark applications since such applications are not papers or fees "required to be filed in the Patent and Trademark Office." It was urged that this language of 35 U.S.C. 21(a), in conjunction with amended 35 U.S.C. 111 which states that the "filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office," prevents adoption of proposed§1.10.

The arguments presented are not supported by the legislative history or by the literal language of the statute. Section 111 of Title 35, United States Code, before and after Public Law 97-247, requires patent applications to be made "in writing to the Commissioner." This is apparent from the first sentence of 35 U.S.C. 111 which provides that "[a]pplication for patent shall be made. . .in writing to the Commissioner." Thus, one seeking a patent is "required" to make application for the same "in writing to the Commissioner." The written application clearly constitutes a "paper or fee required to be filed in the Patent and Trademark Office." Section 21(a) of Title 35, United States Code, authorizes the Commissioner to adopt rules whereby "any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service." The authority provided by section 21(a) extends to "any paper or fee" to which the Commissioner, by an appropriate rulemaking, so extends it. The Commissioner can, therefore, by rule, establish that "any paper or fee," including a patent or trademark application, is "filed" or "received in the Patent and Trademark Office" when it is deposited with the United States Postal Service. The terms "filed" and "received" as used in 35 U.S.C. 21(a) and 111 can therefore be given the same meaning by an appropriate rulemaking by the Commissioner.

The legislative history, H.R. Rep. No. 542, 97th Cong., 2nd Sess. 8A (1982), clearly supports the interpretation set forth herein. In discussing new subsection (a) which has been added to section 21 of Title 35, United States Code, the Report emphasizes that the authority extends to "any paper or fee which is required to be filed" in the Patent and Trademark Office. The Report specifically states that the "requirements governing whether any given paper or fee may be given the filing date of the day on which it was. . .deposited with the United States Postal Service will be set forth in regulations established by the Commissioner." Clearly no restrictions were placed by the statute or the legislative history on the types of papers or fees which the Commissioner can consider as having been filed in the Patent and Trademark Office on the date of deposit with the United States Postal Service.

The new procedure, in paragraph 1.10(a), requires the use of the "Express Mail Post Office to Addressee" service of the United States Postal Service. This service provides for the use of a mailing label on which the Post Office clearly indicates the date on which it was deposited. Paragraph 1.10(b) requires (1) that the number of the "Express Mail" mailing label be placed on each paper or fee and (2) that a certificate of mailing by "Express Mail", signed by the person mailing the paper or fee, be included on each paper or fee and state the date of deposit as "Express Mail" in the United States Postal Service. The requirement that each paper or fee have the number of the "Express Mail" mailing label and the certificate of mailing by "Express Mail" included thereon is necessary so that the Patent and Trademark Office can verify when each paper or fee was filed if questions relating thereto arise. The number and certificate must be placed on each separate paper and each fee transmittal either directly on the document or by a separate paper firmly and securely attached thereto. It is not necessary that the number and certificate be placed on each page of a particular paper or fee transmittal. Merely placing the number and certificate in one prominent location on each separate paper or fee transmittal will be sufficient.

Under new paragraph 1.10(c), the Office will accord the paper or fee the date of deposit as "Express Mail" as the filing date without further proof unless a question is present regarding the date of mailing. If, however, more than a reasonable time has elapsed between the certificate date and the Patent and Trademark Office receipt date, or if other questions regarding the date of mailing are present, new paragraph 1.10(c) provides that the person mailing the paper or fee may be required to file (1) a copy of the "Express Mail" receipt showing the actual date of mailing and (2) a statement from the person who mailed the paper or fee averring to the fact that the mailing occurred on the date certified. Such statement must be a verified statement (oath or declaration) unless made by a person registered to practice before the Patent and Trademark Office.

The certificate of mailing procedure of §1.8(a) continues to be available in addition to the proposed procedure under §1.10. The final rule (§1.10) has been changed from that proposed to allow for a reasonable time between mailing and delivery rather than only for one day since actual delivery in one day is not always provided from all areas of the country. The final rule clarifies that each paper or fee must include its own certificate of mailing by "Express Mail." This rule is being promulgated at this time so that individuals who desire to use the service may do so after the effective date.

The "Express Mail" service is seen to be preferable to other types of postal services because a readily legible mailing date is provided to both the applicant and the Patent and Trademark Office on the "Express Mail" label. Also, the labels are of uniform size and can therefore be kept on file relatively easily by the Office, if such is determined to be necessary or desirable. Registered mail and certified mail, on the other hand, provide only a postmark for the mailing date when such mail arrives in the Patent and Trademark Office and such postmarks are often illegible. Also, such mail arrives in various size envelopes which do not easily lend themselves to being filed so that the postmark may be retained. Administrative burdens including lack of certainty of mailing date and storage are considered greater for registered or certified mail than for "Express Mail." The Patent and Trademark Office will monitor closely the use of "Express Mail" by the public and may reconsider permitting the use of other forms of service provided by the United States Postal Service.

Section 1.17

Section 1.17, paragraph (h), is amended as proposed to remove the reference to §1.45 and add a reference to new §1.48 relating to the correction of inventorship in patent applications.

Section 1.22

Section 1.22 is amended to recognize that filing dates may be assigned without payment of the basic filing fee as authorized by §111 of Title 35, United States Code, as amended by Public Law 97-247. New paragraph 1.22(b) indicates that fees paid to the Office should be itemized in such a manner that the purpose for which the payment is submitted can be clearly determined by Office personnel for proper processing. The final rule includes clarification that it refers to patent and trademark fees and charges.

Section 1.24

Section 1.24 is amended as proposed to remove the reference to coupons in denominations of forty cents since coupons in this denomination are no longer necessary.

Section 1.41

Section 1.41 is amended as proposed to require in paragraph 1.14(a) that a patent be applied for in the name of the actual inventor or inventors and that the full names of the inventors be stated. Paragraph 1.41(b), as amended, clarifies the definition of the word "applicant". New paragraph 1.41(c) permits any person authorized by the applicant to file an application for patent in order to receive a filing date on behalf of the inventor or inventors, but the oath or declaration for the application must be made by all of the actual inventors in accordance with §§1.63 and 1.64. Under new paragraph 1.41(d), a showing may be required from the person initially filing an application that the filing was authorized.

Sections 1.42 and 1.43

Sections 1.42 and 1.43 are amended as proposed to remove the requirement that the legal representative sign the application papers in view of the changes in 35 U.S.C. 111, as amended by Public Law 97-247. The oath or declaration must still be signed. Several occurrences of the masculine gender in §1.42 have been removed.

Section 1.45

Section 1.45 is amended as proposed to remove present paragraphs 1.45(b) and (c) in view of new §1.48 and remove the requirement that joint inventors sign the application papers. The joint inventors are, however, still required to make the oath or declaration in accordance with new §§1.63 and 1.64.

Section 1.46

Section 1.46 is amended as proposed, with two commas being added for clarity, to permit anyone to file the application if authorized by the inventor or inventors or one of the persons mentioned in §§1.42, 1.43, or 1.47.

Section 1.47

Section 1.47 is amended as proposed to change the reference for the rule on oaths or declarations from §1.65 to §1.63.

Section 1.48

Section 1.48 adds a new section relating to correction of inventorship as authorized by §116 of Title 35, United States Code, as amended by Public Law 97-247. Under §1.48, if the correct inventor or inventors are not named in an application for patent, the application could be amended to name only the actual inventor or inventors so long as the error in the naming of the inventor or inventors occurred without any deceptive intention on the part of the actual inventor or inventors. Section 1.48 requires that the amendment be diligently made and be accompanied by (1) a petition including a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred; (2) an oath or declaration by each actual inventor or inventors as required by §1.63; (3) the fee set forth in §1.17(h); and (4) the written consent of any assignee. Correction will be permitted, if diligently requested, in cases where the person originally named as inventor was in fact not the inventor of the subject matter contained in the application. If such error occurred without any deceptive intention on the part of the true inventor, the Office has the authority to substitute the true inventor for the erroneously named person. If deceptive intention was present on the part of other individuals substantively involved in the preparation or prosecution of the application their conduct will be considered and appropriate action taken under 37 CFR 1.56. Although probably rarer, instances such as changes from a mistakenly identified sole inventor to different, but actual, joint inventors; conversions from erroneously identified joint inventors to different but actual, joint inventors; and conversions from erroneously identified joint inventors to a different, but actual, sole inventor will also be permitted. In each instance, however, the Office will have to be assured of the presence of innocent error, without deceptive intention on the part of the true inventor or inventors, before permitting a substitution of a true inventor's name. The final rule language has been modified from that proposed to follow more precisely the language of the statute and the legislative history by permitting correction where the error occurred without any deceptive intention on the part of the actual inventor or inventors.

Section 1.51

Section 1.51 is amended to change the reference in paragraph (a)(2) to new §1.63 for the requirements of an oath or declaration and to change paragraph (b) with regard to the required time for filing information disclosure statements. The final rule has been modified from that proposed by eliminating the word "material" before the "information disclosure statement" and the title has been changed to substitute "a complete" for "an" to be more precise.

Section 1.52

Section 1.52 is amended as proposed to revise paragraph 1.52(c) relating to interlineations, erasures, cancellations or other alterations in application papers to specify that such changes must be made before the signing of any accompanying oath or declaration and should be dated and initialed or signed by the applicant on the same sheet of paper. Paragraph 1.52(c), as amended, prohibits making alterations in the application papers after the signing of an oath or declaration referring to such application papers. Under paragraph 1.52(c), as amended, amendments to application papers made after the signing of an oath or declaration referring to the application papers can only be made in the manner provided by §§1.121 and 1.123-1.125.

Section 1.53

Section 1.53 is amended to revise the title to indicate that the section, as amended, relates to application serial numbers, filing dates and completion of applications. Paragraph 1.53(a) indicates that a serial number is assigned to any filed application for identification purposes, even if the application is incomplete or informal. Paragraph 1.53(b) provides that a filing date is assigned to an application as of the date a specification containing a description and claim and any required drawing are filed in the Patent and Trademark Office. Although the filing fee and oath or declaration can be submitted later, no amendments can be made to the specification or drawings which will introduce new matter. This practice is authorized by 35 U.S.C. 111 as amended by Public Law 97-247. New paragraph 1.53(c) provides for notifying applicant of any application incomplete because the specification or drawing is missing and giving the applicant a time period to correct any omission. If the omission is not corrected within the time period given, the application will be returned or otherwise disposed of and a handling fee of $50.00 will be retained from any refund of a filing fee. New paragraph 1.53(d) provides that, where a filing date has been assigned to a filed specification and drawing, the applicant will be notified and be given a period of time in which to file the missing fee, oath or declaration and to pay the surcharge due. The time period the Office plans to set is one month from the date of notification by the Patent and Trademark Office, but in no case less than two months after the date of filing of the application. New paragraph 1.53(e) indicates that a patent application will not be forwarded for examination on the merits until all required parts have been received. New paragraph 1.53(f) indicates that international applications filed under the Patent Cooperation Treaty which designate the United States of America are considered to have a United States filing date under PCT Article 11(3), except as provided in 35 U.S.C. 102(e), on the date the requirements of PCT Article 11(1)(i) to (iii) are met. Paragraphs 1.53(b) and (c) have been modified from those proposed by changing the word "received" to the word "filed." The word "receipt" in paragraph 1.53(c) has also been changed to "filing". These changes have been made to ensure that the language of §1.53 cannot be considered to conflict with the use of "Express Mail" to file patent applications and obtain a filing date as of the date of deposit as "Express Mail" with the United States Postal Service.

Section 1.54

Section 1.54 is amended as proposed to designate the existing section as paragraph (a) and add a reference to §1.53. Paragraph 1.54(b) is added to indicate that applicant will be informed of the serial number and filing date of the application.

Section 1.55

Section 1.55 is amended to limit the section to claims for foreign priority by removing paragraphs (a) and (d) and redesignating paragraphs (b) and (c) as paragraphs (a) and (b). Paragraph 1.55(a) is amended to change the reference from §1.65 to new §1.63. The final rule language includes a reference to 35 U.S.C. 172 which modifies 35 U.S.C. 119 for design patents.

Section 1.56

Section 1.56 is amended to revise paragraph (c) to remove reference to signing of the application but to add reference to signing of the oath or declaration pursuant to new §1.63. Paragraph 1.56(c) has also been modified from that proposed to break it down into four items as suggested by a comment. Under paragraph 1.56(c), an application may be stricken from the files if an oath or declaration pursuant to §1.63 is signed in blank, is signed without review of the oath or declaration by the person making the oath or declaration, or is signed without the review of the specification, including the claims, as required by §1.63(b). Paragraph 1.56(c) also provides for an application to be stricken from the files if application papers filed in the Office are altered after the signing of an oath or declaration pursuant to §1.63 referring to those application papers.

Section 1.57

Section 1.57 is removed as proposed since the requirements relating to applicant's signature to the oath or declaration of the application are adequately covered in other sections.

Section 1.59

Section 1.59 is rewritten as proposed to refer to and conform with the changes proposed in §1.53.

Section 1.60

Section 1.60 is amended to require the applicant to supply a copy of the originally signed application in all cases where the §1.60 filing procedure is used. The Office will no longer prepare copies. The Office, by a separate final rule, published at 47 F.R. 47242 on October 25, 1982, has adopted a new §1.62 to provide for the filing of a file wrapper continuing application which greatly lessens the need for the Office to continue to prepare copies under §1.60. The final rule language makes clear that the statement accompanying a true copy of the parent application must be a verified statement unless made by a person registered to practice before the Office.

Section 1.62

Section 1.62 is amended to avoid inconsistency with 35 U.S.C. 111 which becomes effective on February 27, 1983. 35 U.S.C. 111 as of that date permits filing dates to be granted to patent applications without receipt of the basic filing fee, or oath or declaration. Section 1.62 is therefore being amended to permit the granting of a filing date in accordance with §111. This amendment of §1.62 is necessary to ensure compliance with 35 U.S.C. 111. The Patent and Trademark Office finds that it would be impractical not to amend §1.62 so as to grant a filing date in accordance with 35 U.S.C. 111 and not doing so might also be construed to prevent applicants from taking advantage of the provisions of 35 U.S.C. 111 authorizing the delay in the filing of the fee and oath or declaration. If §1.62 is not amended in the manner set forth in this final rule, questions may be raised as to compliance with 35 U.S.C. 111 as it will exist effective February 27, 1983. Revised paragraph 1.62(a) indicates the minimum requirements for granting of a filing date. Paragraphs 1.62(b) and (c) cover the filing fee and oath or declaration requirements, respectively. Paragraph 1.62(d) relates to later filing of the filing fee or oath or declaration as provided for in 35 U.S.C. 111. Paragraphs 1.62(e)-(i) are identical to former paragraphs 1.62(b)-(f).

Section 1.63

Section 1.63 is added to replace 1.65 relating to the required content and execution of an oath or declaration

filed as a part of a patent application and is intended to state the minimum contents thereof. An applicant may, if desired, choose to include one or more additional averments in the oath or declaration such as, for example, stating that the patent is not barred under the provisions of 35 U.S.C. 102. Paragraph 1.63(a) provides that the oath or declaration, (1) be executed in accordance with §1.66 or §1.68, (2) identify the specification to which it is directed in some definite manner such as giving the title of the invention or serial number of the application, if previously filed, (3) identify each inventor and his or her residence and country of citizenship, and (4) state whether the inventor is a sole or joint inventor of the claimed invention.

Paragraph 1.63(b) further requires the oath or declaration to state that the person signing the oath or declaration (1) has reviewed and understands the contents of the identified specification, (2) believes the named inventor is the original and the first inventor, and (3) acknowledges the duty to disclose information which is material. While paragraph 1.63(b) requires the person signing the oath or declaration to review and understand the specification including the claims, it is not intended to require that such person be skilled in patent law so as to grasp the legal implications of claim language and drafting. The person must recognize, however, that what is being claimed is the subject matter which that person regards as his or her invention pursuant to 35 U.S.C. 112.

Paragraph 1.63(c) requires that any application in which a claim for foreign priority is made identify in the oath or declaration the foreign application for patent or inventor's certificate on which priority is claimed, and any foreign application having a filing date before that of the application on which priority is claimed.

Paragraph 1.63(d) requires that the oath or declaration in a continuation-in-part application, which discloses and claims subject matter in addition to that disclosed in the prior copending application, state that the person making the oath or declaration acknowledges the duty to disclose material information as defined in §1.56(a) which occurred between the filing date of the parent application and the national or PCT international filing date of the continuation-in-part application. This latter requirement is not new, but is included to serve as a reminder to the person making the oath or declaration of this duty to disclose material information such as foreign patenting, publication, or public use or sale in the United States which occurred more than one year prior to the filing date of the continuation-in-part application. For example, in circumstances where the claims of the continuation-in-part application are not fully supported by the disclosure of the parent application so as to be entitled to an earlier effective filing date under 35 U.S.C. 120, the duty to disclose extends to any material information, as defined in §1.56(a) measured from the filing date of the continuation-in-part application. This would include the first foreign patenting, and any foreign patenting subsequent to the first which materially differs therefrom, of the subject matter of the parent application which occurred more than one year prior to the national or PCT international filing date of the continuation-in-part application. Any publication of the parent application, other than foreign patenting, or any public use or sale in the United States of the subject matter of the prior application, which occurred more than one year prior to the national or PCT international filing date of the continuation-in-part application, would also come within §1.56(a) in such circumstances. See *In re Ruscetta and Jenny*, 118 U.S.P.Q. 101 (C.C.P.A. 1958); *In re van Langenhoven*, 458 F. 2d 132, 173 U.S.P.Q. 426 (C.C.P.A. 1972), and *Chromalloy American Corp.* v. *Alloy Surfaces, Co., Inc.*, 339 F. Supp. 859, 173 U.S.P.Q. 295 (Del. 1972).

Section 1.64

Section 1.64 is added as proposed to clearly indicate who must sign the oath or declaration of a patent application.

Section 1.65

Section 1.65 is removed as proposed because the oath or declaration requirements set forth therein are covered by new §1.63.

Section 1.67

Section 1.67 is amended as proposed to remove all of paragraphs (a) and (b) and substitute therefor new wording. Paragraph 1.67(a) indicates that a supplemental oath or declaration meeting the requirements of new §1.63 may be required to correct deficiencies or inaccuracies present in an earlier oath or declaration. Paragraph 1.67(b) requires a supplemental oath or declaration to be filed (1) when a claim is presented embracing material not originally claimed and (2) when a subsequently filed oath or declaration under §1.53(d) refers to an amendment which includes improper new matter. Paragraph 1.67(b) also clearly states the prohibition against entry of new matter after the filing date of the application.

Section 1.69

Section 1.69, paragraph (b), is amended as proposed to change the time at which a translation of a non-English language oath or declaration which has not been supplied by the Office must be filed. The time period for filing the translation is changed to two months after notification that a translation is required. The reference to §1.65 in paragraph 1.69(b) is changed to §1.63.

Section 1.70

Section 1.70 is amended to refer to §1.63 for the requirements to be met when an oath or declaration is filed under 35 U.S.C. 371(c)(4). The wording of the title in the final rule is changed to reflect more clearly the subject matter of the rule.

Section 1.77

Section 1.77 is amended as proposed to change paragraphs (h) and (i) to refer to the abstract of the disclosure and signed oath or declaration, respectively.

Section 1.97

Section 1.97 is amended to change the title from "prior art statement" to "information disclosure statement". This change is appropriate since the designation "information disclosure statement" more accurately characterizes the nature and content of the information which may be included in such a statement. Information which is required to be submitted pursuant to §1.56 may ultimately be determined not to be "prior art," but nevertheless may be "material" pursuant to §1.56. Section 1.97 has also been modified from that proposed by eliminating the word "material" since information submitted pursuant to §1.97 may be considered to be of questionable materiality or may be determined, upon examination, not to be "material". Section 1.97 now provides that an information disclosure statement should be filed with the application or within the later of three months after the filing date of the application or two months after applicant receives the filing receipt. Paragraph 1.97(b) has been amended in recognition that applicant may choose to furnish other material information in another manner or statement. Paragraph 1.97(b) now also refers to section 1.56(a) for the definition of "material information". The amendments to paragraph 1.97(b) do not in any manner reduce the obligation to submit material information as defined in §1.56(a).

Section 1.98

Section 1.98 indicates that information disclosure statements should list prior art with all of the information which is required to print such citations on the front page of a patent. The final rule states clearly that the publication date indicated on the document should be submitted. This will not serve to preclude a showing of a different, actual publication date. Another purpose of the citation requirements in this section is to permit ready reference to the document from its citation.

Section 1.99

Section 1.99 is amended to change the title to be consistent with the amendment to §1.97.

Section 1.101

Section 1.101 is amended to indicate specifically that applications which are to have their examination advanced pursuant to §1.102 will be taken up for examination out of order by the examiner. The final rule is also modified to set out when international applications which have complied with the requirements of 35 U.S.C. 371(c) are taken up for action.

Section 1.118

Section 1.118 is amended as proposed to designate the previous section as new paragraph (a) and amend it to clearly state that no new matter may be introduced into an application and to make specific reference to §§1.53, 1.63 and 1.67. New paragraph 1.118(b) indicates how improper amendments which introduce new matter in the specification or claims will be handled by the examiner.

Section 1.123

Section 1.123 is amended to require all corrections to drawings to be made by bonded draftsmen at applicant's expense since the Office does not have sufficient draftsmen to make such corrections. Sketches of any desired corrections will, however, still require approval of the examiner. The final rule makes clear that changes in the drawing may be made by submission of substitute drawings.

Section 1.125

Section 1.125 is amended to relax the prohibition against substitute specifications which are not required by the examiner. The section, however, adds the requirement that any substitute specification filed must be accompanied by a statement that the substitute specification includes no new matter. Under the section the statement must be a verified statement if made by a person not registered to practice before the Office. The final rule specifies that a substitute specification may not be accepted unless it is clear to the examiner that processing of the application would be facilitated thereby.

Section 1.131

Section 1.131 is amended as proposed to refer to the use of affidavits or declarations under the section during reexamination of a patent as long as the patent upon which the rejection is based does not claim the rejected invention. Section 1.131 cannot be used to overcome a rejection based upon a United States patent claiming the rejected invention. This is true regardless of whether the rejected claims are contained in an application being examined or a patent being reexamined. Section 1.131 is inapplicable if the same invention is being claimed by the United States patent upon which the rejection is based. Under the section as amended, the same person or persons who would make the affidavit or declaration in an application will be required to make the affidavit or declaration on behalf of the owner of the patent under reexamination.

Section 1.132

Section 1.132 is amended as proposed to refer to the use of affidavits or declarations under the section during reexamination of a patent.

Section 1.137

Section 1.137 is amended as proposed to except from the provisions of paragraph (b) those applications abandoned pursuant to §1.53(d) because the fee, oath, or declaration and the surcharge were not submitted. Section 111 of Title 35, United States Code, as amended by Public Law 97-247, requires that any delay in submission of the fee and oath be shown to be unavoidable. Thus, paragraph (b) of §1.137 permitting revival where abandonment was unintentional is inapplicable to the revival of applications which become abandoned pursuant to §1.53(d).

Section 1.141

The proposed amendments to §1.141 are withdrawn infra to permit the public to study the issues involved and make any further recommendations considered appropriate.

Section 1.153

Section 1.153 is amended to change the reference for oath and declaration requirements from §1.65 to §1.63 and to conform the language of the rule to be consistent therewith.

Section 1.154

Section 1.154 is amended as proposed to revise paragraph (e) to refer to the signed oath or declaration requirements of §1.153(b).

Section 1.162

Section 1.162 is amended as proposed to change the reference from §1.65 to §1.63.

Section 1.163

Section 1.163 is amended as proposed to change the wording of the section to clearly indicate that a signed oath or declaration is required rather than a signed specification.

Section 1.172

Section 1.172 is amended to indicate clearly that the reissue oath is signed and sworn to rather than the reissue application. The final rule has been modified from that proposed by referring to a "reissue oath" rather than to "reissue oaths".

Section 1.174

Section 1.174 is amended as proposed to remove the requirement that photoprints of original drawings be securely mounted or pasted on sheets of drawing board because paper drawings are acceptable.

Section 1.175

Section 1.175 is amended as proposed to change the reference to the oath or declaration from §1.65 to §1.63.

Sections 1.301, 1.302 and 1.303

The proposed amendments to sections 1.301, 1.302 and 1.303, referring to the Court of Appeals for the Federal Circuit rather than to the Court of Customs and Patent Appeals, have been adopted as final rules as

published on Oct. 26, 1982 at 47 FR 47380-47382 and corrected on Nov. 5, 1982 at 47 FR 50142 and therefore are not republished here.

Section 1.324

Section 1.324 is amended to include wording similar to that in §1.48 for correction of inventorship in applications.

Section 1.325

Section 1.325 is amended as proposed to include reference to the reexamination procedure.

Section 1.335

Section 1.335 is added as proposed to provide a new section relating to the filing in the Patent and Trademark Office of notices of arbitration awards. Such filing is required under §294 of Title 35, United States Code, as added by Public Law 97-247. The final rule has also been modified in response to a comment to indicate that the notices of arbitration awards are intended to be placed in the patent files.

Section 1.565

The proposed amendments to §1.565 are withdrawn infra to permit the public to study the issues involved and make any further recommendations considered appropriate.

Section 5.12

Section 5.12 is amended as proposed to separate the section into two paragraphs. Paragraph (a) provides that the filing of an application for an invention made in the United States is considered to include a petition for a license for foreign filing. If a license is granted, it will be indicated on the filing receipt. If it is not granted, no indication of the denial will appear. Failure to grant a license should be considered a denial of a first petition for a license. A subsequent petition may be filed under §5.12(b). Section 5.12(b) is essentially the text of §5.12 in its previous form. No rights to file a petition for license are being removed.

Withdrawal of Proposed Amendments To Sections 1.141 and 1.565.

A number of the speakers at the public hearing held on Dec. 16, 1982, urged that the amendments to §§1.141 and 1.565 be deferred or dropped pending further study. Those urging that the proposed amendments to §1.141 not be adopted at this time included speakers from the American Patent Law Association, from Committee 103 of the American Bar Associations's Patent, Trademark & Copyright Section, and from the Bar Association of the District of Columbia. The Boston Patent Law Association urged that the amendment to §1.565 be removed or held in abeyance. The American Patent Law Association indicated that more time was needed for its committees to analyze the issues in the proposed amendments to §§1.141 and 1.565.

In response to the recommendations received at the public hearing, the proposed amendments to §§1.141 and 1.565 are being withdrawn at this time to permit the public to study the issues involved and make any further recommendations considered appropriate. Pending the further study referred to by the speakers at the hearing and consideration of any recommendations resulting therefrom, the Office will continue to operate under present §§1.141 and 1.565 as interpreted by the Manual of Patent Examining Procedure and relevant Patent and Trademark Office and judicial precedents.

Responses to Comments on the Rules

Specific comments were received on a number of the sections. All of the comments, including the written comments and the oral testimony, were considered in adopting the changes set forth herein.

Forty-eight letters presenting written comments were received and seven persons testified at the public hearing on Dec. 16, 1982.

Comments appear below along with responses thereto.

Comment:

One comment objected to inadequate notice regarding these proposed rule changes.

Reply:

The proposed rules notice was published in the Federal Register on Oct. 27, 1982. This is more than seven weeks prior to the date of the hearing and four months prior to the effective date of the final rules. Such periods are considered to be reasonable in view of the fact that the legislation requiring the rule changes was only enacted on Aug. 27, 1982 and that other rule changes were required to be implemented by Oct. 1, 1982.

Comment:

One comment proposed that "Patent and Trademark Office" should be used in the rules rather than merely "Office".

Reply:

The proposal has been adopted in the final rules in those locations where confusion may otherwise result.

Comment:

Five comments requested that promulgation of §§1.10, 1.63, 1.97, 1.141 and 1.565(e) be delayed and the period for comment extended until Mar. 30, 1983.

Reply:

Amendments to §§1.141 and 1.565 are not being promulgated at this time to provide time for further consideration and study as requested. If after study, a rule change is felt desirable, a new proposal will be issued. New §1.10 is being promulgated to make it available to applicants as it was intended in the statute. New §1.63 is being added and §1.65 deleted to reduce the formal statements required. If desired, the old oath and declaration forms may continue to be used if the statement is included that applicant "has reviewed and understands the contents of the specification, including the claims". For continuation-in-part applications, it is necessary to also include language is conformance with §1.63(d). Section 1.97 is being promulgated to remove problems relating to the time period in the current wording and to clarify the section in general.

Comment:

One person questioned why Sunday was not mentioned in §1.6(b) or (c).

Reply:

Section 1.6(b) and (c) are limited to weekdays which by definition excludes Sunday.

Comment:

Two comments were received which proposed that only a certificate of mailing procedure as in §1.8(a) be used for determining the date of deposit under 35 U.S.C. 21.

Reply:

The filing date of an application is considered to be much more critical than the filing dates of papers accepted under §1.8. The application filing date is often critical for determining if a statutory bar exists, whether foreign priority can be claimed and who is the senior party in an interference. Therefore, papers filed for purposes of receiving an application filing date should have some clear indication of the date of receipt by the United States Postal Service. Such a practice would also probably require storing all of the envelopes in the file wrapper for record purposes.

Comment:

Three comments were received which stated that private courier services should also be provided for in §1.10.

Reply:

Section 21(a) as amended by Public Law 97-247 provides for filing dates being given only when "deposited with the United States Postal Service." Although private courier services may be used to deliver papers to the Patent and Trademark Office, the actual date of receipt by the Patent and Trademark Office will be considered to be the filing date.

Comment:

A comment was received which argued that the Post Office date stamp should be stamped on the mailing label instead of having to enter the label number on each document.

Reply:

Stamping the mailing label would not add anything since the postal clerk receiving the "Express Mail" must already indicate the date and time of deposit and initial the label. A purpose of placing the label number on each paper is to permit several papers to be placed in a single envelope. The mailing labels may be retained in the Patent and Trademark Office for later verification.

Comment:

Seven comments were received that the requirement that the item be received the following day (§1.10(b)) was unnecessarily restrictive.

Reply:

Section 1.10 does not require that the item be received the next day in the Patent and Trademark Office in order to receive the date of deposit as the mailing date. The one day reference has been deleted. Further proof of mailing may be required where an unreasonable period of time is involved and supporting evidence is not otherwise available to the Patent and Trademark Office. Documents deposited with the United States Postal Service will be given a filing date which corresponds to the date of receipt indicated by the postal clerk on the "Express Mail" mailing label.

Comment:

Four comments indicated that §1.10 does not assist in placing applicants and attorneys outside the Washington area on the same footing as those in Washington.

Reply:

The main purpose of §1.10 is to implement 35 U.S.C. 21(a) in a manner which would provide for granting filing dates for papers and fees as of the date of their deposit with the United States Postal Service. Certainly these provisions using "Express Mail," together with the certificate of mailing procedure available under §1.8, will go a long way in reducing last minute deliveries to the Patent and Trademark Office by persons outside the Washington area.

Comment:

Two comments stated that the comments accompanying§1.10(c) should be clarified to explain the meaning of "more than one day."

Reply:

The final rule has been clarified.

Comment:

It was proposed by one person that the "affidavit or declaration" under §1.10(c) be waived if the statement is made by a registered attorney or agent.

Reply:

The suggestion has been adopted.

Comment:

It was indicated by one person that certified mail provides proof of mailing date under §1.10 by virtue of the Post Office stamp on the certified mail receipt card.

Reply:

The information on the certified mail receipt card is of no benefit to the Patent and Trademark Office since it is immediately returned to the sender. The Patent and Trademark Office would not be able to retain any information which gives proof of the date of mailing.

Comment:

Three comments raised questions as to the need to make the acceptance of the "Express Mail" contingent upon the performance of the Post Office in §1.10(c).

Reply:

The acceptance of the "Express Mail" is not contingent upon "next day delivery". The reference in §1.10(c) to proof of mailing merely provides a basis for the Office requiring proof of mailing where an explanation appears to be necessary to clarify the record. Such information is expected to be required only in a few instances. The rule has also been revised to clarify this matter.

Comment:

Five persons suggested the use of registered or certified U.S. mail for obtaining filing dates under 35 U.S.C. 21.

Reply:

Registered mail does not provide any information or evidence to the Patent and Trademark Office as to the date of mailing other than the postmark, which is often unreadable. Storage of envelopes containing such postmarks is also burdensome. The deficiency of certified mail has already been discussed.

Comment:

One person questioned what treatment will be accorded a paper placed in an "Express Mail" box receptacle after the box has been cleared for the last time on a given day.

Reply:

The paper will be considered to be deposited as of the date of receipt indicated on the "Express Mail" mailing label by the Postal Service clerk.

Comment:

One person commented that he found the idea of using a declaration or affidavit to establish a date of deposit unacceptable because it exposes the integrity of the assignment of filing dates to the risk of deception.

Reply:

The use of declarations or affidavits is usually intended to help explain activities which can be supported by exhibits. For example, if the Office copy of the mailing label was not entirely readable, applicant's copy of the "Express Mail" mailing label could accompany a declaration and serve as the basis for granting a filing date.

Comment:

Three persons objected to permitting only the individual who places the correspondence in an "Express Mail" facility to execute the certificate of express mailing under§1.10(c).

Reply:

The wording of §1.10(c) differs from §1.8 because the documents which are expected to be filed under §1.10 are patent and trademark applications. The filing dates of such documents are very important and should therefore be based on personal knowledge.

Comment:

One comment was received which suggested that §1.10 be adopted with an effective date retroactive to a year earlier.

Reply:

Such an earlier date is not possible since the statutory authority for §1.10 does not come into effect until Feb. 27, 1983.

Comment:

One comment proposed designating the Patent and Trademark Office as an "Express Mail" Post Office to make lower rates available.

Reply:

Such a designation is not possible.

Comment:

One person requested that the Patent and Trademark Office publish a form of certificate of mailing by "Express Mail" suitable for purposes of §1.10(b).

Reply:

A suggested form is included in the preamble of this rule change.

Comment:

One comment proposed that §1.10(c) clearly state what evidence will be necessary and sufficient to prove a filing date by mailing.

Reply:
A specific answer cannot be given since it is dependent upon the particular fact situation and what evidence is actually available.
Comment:
Two comments questioned whether P.L. 97-247 authorized a rule such as §1.10 granting filing dates as of the mailing date.
Reply:
The question raised by this comment has been treated in the discussion of §1.10 supra.
Comment:
One comment proposed that §1.10 be corrected to read—Any paper or fee *required* to be filed—to more closely conform with 35 U.S.C. 21(a).
Reply:
No need is seen to change §1.10 as suggested since, if a patent is desired, it is "required" that each paper relating to an application be filed in the Patent and Trademark Office.
Comment:
One comment indicated that the requirement to place the "Express Mail" label number on each paper and fee is not realistic.
Reply:
The placement of the label number on each paper or fee allows later verification of the mailing dates of all different papers mailed in one envelope and is not seen to be overly burdensome.
Comment:
A question was raised as to whether the "Express Mail" label number should be placed on every page.
Reply:
The label number need not be placed on each page. It should, however, be placed on the first page of each separate document, such as, a new application, amendment, assignment, and transmittal letter for a fee, along with the certificate of mailing by "Express Mail". Although the label number may be on checks, such a practice is not required.
Comment:
A question was raised by one party as to the location within the Patent and Trademark Office of the mailing labels where papers to different applications are placed in the same envelope.
Reply:
The mailing labels from all "Express Mail" packages are expected to be removed and initially retained centrally in the Mail Room of the Patent and Trademark Office. The number on each document will allow direct access to the appropriate mailing label if any questions should arise.
Comment:
One comment suggested that §1.22(b) be amended to exclude itemization of all fees where a general authorization to charge a deposit account has been given.
Reply:
Even where fees are charged to a deposit account, it is desirable to know specifically which fees are to be paid. Therefore, the suggestion has not been adopted.
Comment:
One comment was received which suggested adding a sentence to §1.41(d) indicating that the filing of an oath or declaration executed by the applicant would constitute proof of authority to file the application.
Reply:
Such an additional sentence is not considered to be necessary since the Patent and Trademark Office does not intend to utilize the provisions of §1.41(d) unless a controversy arises.
Comment:
One comment was received which suggested the addition to the end of §1.42 of the words "except for patents granted to the assignee either of the inventor or of the legal representative of the inventor."
Reply:
No change is considered to be necessary since few, if any, problems have arisen without such additional wording in the past. The existing rule wording "upon proper intervention" also provides protection for assignees.
Comment:
One comment was received which indicated that §1.46 does not clearly authorize an assignee of a part interest to cause an application to be placed on file.
Reply:
Although §1.46 may not make this point clear, it is clear from §1.41(c).
Comment:
One comment recommended that the requirement to show diligence in correcting inventorship under §1.48 be deleted.
Reply:
It is felt that corrections of inventorship should be diligently made in patent applications. The naming of correct inventorship is necessary for the Patent and Trademark Office to make decisions on topics such as double patenting, priority claims and first inventorship.
Comment:
It was recommended in one comment that the verified statement of facts required by §1.48 "by the original named inventor or inventors" be replaced by a requirement that he or they merely assent to the statement of the facts since others may be better able to provide the best evidence.
Reply:
Since it is the original inventorship that is being changed, it is believed that all of the previously named inventors should positively indicate their agreement with the facts in the case. Affidavits by other individuals may also be supplied where such persons have direct personal knowledge of certain aspects of the case.
Comment:
One comment indicated that "it seems a reasonable presumption that if ownership is unaffected, deceptive intent is absent" in a §1.48 correction of inventorship situation and that such a presumption could be written into the rules.
Reply:
Even if applications are commonly owned, the wrong inventorship could be deceptively named to obtain rights which are only available to the same inventive entities. The report on Public Law 97-247 also states that "the commissioner must be assured of the presence of innocent error, without deceptive intention . . ." before permitting a substitution of a true inventor's name.
Comment:
One person suggested that the deceptive intent in §1.48 refer to the acts of the actual inventors rather than to both the alleged and actual inventor or inventors.
Reply:
This suggestion has been adopted in both §§1.48 and 1.324, but deceptive intention on the part of other parties is subject to review under §1.56.
Comment:
One person suggested that in §1.48, line 3 "may" be changed to—must—.
Reply:
The suggestion has not been adopted. Corrections may only be made if the conditions set forth in §1.48 are satisfied.
Comment:
Two comments objected to the insertion of "material" in §1.51(b).
Reply:
This word has been removed and does not appear in the final rule.
Comment:
One comment suggested changing "an" to—a complete—in the title of §1.51.
Reply:
This suggestion has been adopted.
Comment:
One comment indicated that §§1.52(c) and 1.56(c) seemed overly inflexible and harsh when considering minor grammatical changes.

Reply:
Although §1.56 indicates that applications "may" be stricken, rather than "must" be stricken, it is still considered important to maintain a clear line in the regulations against changes in the original applications made after the execution of the application oath or declaration. The line between grammatical changes and changes relating to the merits is frequently unclear.
Comment:
Three comments noted an apparent inconsistency between proposed §§1.10 and 1.53 as to whether §1.10 relates to the filing of patent applications.
Reply:
Section 1.10 does relate to the filing of patent applications. In order to clarify the wording, "received" in §1.53(b) has been changed to "filed".
Comment:
One comment was received suggesting that a sentence be added to §1.53(d) to indicate that PCT applicants cannot submit late filing fees, oaths or declarations under 35 U.S.C. 371.
Reply:
Such a reference in §1.53 does not appear appropriate because this section relates to "filing dates". In the PCT situation, the filing date was already granted at the time of filing the PCT international application.
Comment:
One comment was received which suggested that §1.53(a) be rewritten to indicate all applications are assigned serial numbers but not accorded filing dates.
Reply:
The proposal was not adopted since it is considered unnecessary.
Comment:
One person suggested that §1.53(b) be amended to specify that only "a specification *purporting* to contain a description and at least one claim . . ." is needed to obtain a filing date.
Reply:
No change is being made since a determination must be initially made as to whether or not a specification has been filed. In any case, sufficiency of the specification must later be checked by the examiner.
Comment:
One person indicated that the time period for filing a correction to a defect in an application is left entirely within the discretion of the Commissioner and that any setting of periods of time would be tantamount to an exercise of rulemaking authority. Section 1.53(d) should be provided with an explicit time limitation.
Reply:
No specific time period is considered to be necessary in the regulations. The Commissioner has full authority and discretion under the statute in 35 U.S.C. 111 to set periods of time. The statute does not require the Commissioner to use the rulemaking process to set time periods for response to an action or requirement by the Patent and Trademark Office in a patent application.
Comment:
Two comments were received objecting to the use of the words "or otherwise disposed of" in §1.53(c).
Reply:
This wording has existed in §1.53(b) in the past without objection. No need is seen to depart from this wording at this time.
Comment:
One person questioned whether the change in §1.54(b) would result in return post cards not being stamped with the application serial number.
Reply:
No change is intended in the existing return post card practice.
Comment:
One comment proposed adding another sentence to §1.154(b) indicating that foreign priority claims will be acknowledged on the filing receipt.
Reply:
This proposal is not being adopted since the examiner must determine whether the statutory requirements of 35 U.S.C. 119 have been met before an acknowledgment can be sent.
Comment:
One comment suggested that the Patent and Trademark Office indicate on the filing receipt both the filing date under §1.10 and the actual date of receipt.
Reply:
The actual date of receipt can be obtained by requesting a receipt from the Postal Service. The actual date of receipt cannot be placed on the filing receipt because of current computer limitations. The suggestion is therefore not being adopted at this time.
Comment:
One comment was received indicating that it is not clear whether or not an application based on a specification and drawing, but containing no oath or declaration or filing fee, could serve as the basis for a priority claim under 35 U.S.C. 120.
Reply:
If the filed specification and drawings fully disclose the invention as required by 35 U.S.C. 112, the application may serve as a basis for a priority claim under §120 even if no oath or declaration, or no fee has been filed, as long as the continuing application is filed prior to the abandonment of the first application under §1.53(d).
Comment:
One comment suggested that §1.55(b) be removed since the requirements of the statute are fully set forth in 35 U.S.C. 119.
Reply:
Although the statutory requirements set forth basic requirements, it is felt that the more specific details of §1.55(b) provide needed guidance for applicants.
Comment:
Two persons questioned the meaning of "inspection and review" in §1.56(c) and suggested certain amendments.
Reply:
The words "inspection and" are being removed to eliminate any redundancy. The paragraph has also been broken down into four items as proposed by a comment.
Comment:
One suggestion was made that applicant be allowed to order a copy of the parent patent, with payment of fee, when filing a §1.60 application.
Reply:
Such a practice is contrary to the intent of the rule change. The problems the Patent and Trademark Office is attempting to solve by the change, which are caused by poor copies and delays in processing, would remain with such a practice.
Comment:
Two persons suggested that §1.60 be amended to drop "and claimed" from the title.
Reply:
The suggestion has been adopted.
Comment:
One person suggested that §1.60 be modified to drop the requirement for verification by affidavit when the statement is made by a registered patent attorney or agent.
Reply:
The suggestion has been adopted.
Comment:
One comment noted that there is no specific requirement in §§1.56, 1.63 or 1.98 to identify foreign applications filed more than one year prior to the U.S. filing date.
Reply:
Section 1.63(b)(3) broadly requires applicant to acknowledge the duty to disclose information material to the examination of the application. This information includes foreign patents based on applications filed more than a year prior to the filing date of the United States application and which issue before the filing date of the United States application.
Comment:
One person felt that §1.63(b)(1) will be a disaster for the patent system since the inventor may not be physi-

cally able to review and understand the invention or because the legal language format used in claims may not be understood by the inventor. Five persons argued that adoption of §1.63 would result in raising the defense that the inventor did not understand the claims in each patent infringement suit.

Reply:

The inventor is not expected to understand all the legal interpretations or limitations in a claim. The inventor is expected to recognize that what is being claimed is the subject matter which the inventor regards as his or her invention pursuant to 35 U.S.C. 112. The physical factors have to some extent existed in past practice and have been handled on a case-by-case basis where necessary. The situation outlined would exist in any signing of a legal document. The wording of §1.63 has been explained in the preamble to minimize occurrences of problems.

Comment:

One comment noted that many inventors do not know whether additional subject matter is claimed in a continuation-in-part application under §1.63(d).

Reply:

The wording in §1.63(d) is considered to be appropriate and in accordance with case law. If uncertainty exists the attorney or agent, if any, should clarify the matter and §1.63(d) should be followed.

Comment:

One person proposed that §1.63(d) be modified to explicitly require the disclosure of foreign patents granted before the filing of the continuation-in-part application.

Reply:

Section 1.63(d) has been amended to clearly indicate that material information pursuant to §1.56(a) between the filing date of the parent application and the filing date of the continuation-in-part application must be disclosed. The discussion of new §1.63 refers to material foreign patents published during this time interval.

Comment:

Two comments indicated concern with the parenthetical language in proposed §1.63(d) in that it would create severe problems.

Reply:

Paragraph (d) of §1.63 has been amended to remove such problems.

Comment:

One comment suggested adding—he or she is aware of—after information in §1.63(b)(3) and (d).

Reply:

This suggestion is not adopted since such wording is already present in §1.56(a).

Comment:

One comment suggested that §1.63(c) clarify what is intended by "the first filed foreign application," particularly in view of 35 U.S.C. 119, third paragraph.

Reply:

The rule has been amended to clarify the matter.

Comment:

One comment was received suggesting changes be made in the title and that paragraph (b) of §1.70 refer to §1.63 instead of "this section."

Reply:

The change suggested to the title has been made. The suggestion to paragraph (b) has not been made since it is considered unnecessary.

Comment:

Three comments were received which indicated that the wording of §1.97(a) would require an immediate filing of disclosure information if the filing receipt is received just before three months after filing.

Reply:

The wording of §1.97(a) has been changed to remove this problem.

Comment:

One comment was received which urged that the title of §1.97 and contents of §1.97(b) not be changed, since the proposed wording would not require filing of the closest prior art.

Reply:

The proposed changes are not intended to make any changes in the type of information which is to be submitted to the Office. The proposal has been adopted in modified form.

Comment:

One person indicated preference for the use of "prior art" in §§1.51(b), 1.97, 1.98, and 1.99 since it does not create an inferred admission that the information submitted is material. Five comments favored the removal of "prior art" from §1.97 but objected to the addition of "material".

Reply:

The rule change was proposed to answer arguments that the use of the term "prior art" implied that the information was a reference against applicant's invention. Since the majority of the comments supported modifying the rule, the use of the terms "prior art" as well as "material" are being dropped.

Comment:

Two comments were received concerning §1.98(a) suggesting that the "place of publication" be clarified or removed.

Reply:

This suggestion has not been adopted since the "place of publication" is not mandatory. It is intended to mean the city and country of publication. Also the citation of the "place of publication" is consistent with the §1.107(a) requirements.

Comment:

It was suggested by one person that §1.101 be amended to clarify when PCT international applications which have entered the national stage should be taken up for examination.

Reply:

An amendment has been made to §1.101 as suggested to clarify that they are taken up in order based on the date they have entered the national stage by compliance with the requirements of 35 U.S.C. 371(c).

Comment:

One comment was presented suggesting that the words "which are not examined on the merits" in §1.101 be removed.

Reply:

The suggestion has been adopted.

Comment:

One comment urged returning to the use of the Office draftsmen for minor corrections to reduce the burden under proposed §1.123.

Reply:

Some minor corrections may be made by the Office draftsmen on a time-available basis. However, since the Office currently has only a few draftsmen who are responsible for reviewing and approving all drawings, very little time is presently available for making corrections.

Comment:

Four suggestions were made to amend §1.123 to specifically provide for the filing of substitute drawings if corrections are required.

Reply:

These suggestions have been adopted.

Comment:

One comment was received indicating that §1.125 should indicate to whom it should be clear that acceptance of a substitute specification would facilitate processing.

Reply:

An amendment has been made to clarify that it should be clear to the examiner.

Comment:

One comment suggested removal of the last sentence of §1.137(b) to permit §1.183 petitions to be filed to waive time periods for requesting revival of unintentionally abandoned applications.

Reply:

No change in §1.137(b) is considered to be appropriate at this time since §1.137(b) only became effective on Oct. 1, 1982.

(Since changes to §1.141 are not being promulgated in this rule change, comments and replies to this section are not included.)

Comment:

One comment pointed out that the reference to a "period of twelve months" in §1.153 was indefinite.

Reply:

Section 1.153 has been amended to remove the indefiniteness.

Comment:

One comment was presented which suggested that §1.172 refer to a "reissue oath" rather than to "reissue oaths."

Reply:

This suggestion has been adopted.

Comment:

One comment suggested the insertion of "the filing of" before "each patent" in §1.335(a) and (b).

Reply:

The suggestion has been adopted.

(Since the proposed addition of a new paragraph (e) to §1.565 is not being adopted in this rule change, comments and replies to this section are not included.)

Comment:

One suggestion was made that a procedure be designed in which foreign filing licenses could be granted by return post card without losing the time required to send the filing receipts.

Reply:

It is felt that the procedure under §5.12 should be adopted at this time and be placed into operation. If after some experience additional modifications are found desirable, further changes could be made. To introduce several alternative procedures at this time is considered to be too complex and may endanger the success of the proposed procedure.

Comment:

One comment requested that the Office grant a prospective foreign filing license under §5.12 for all data and amendatory material to be filed abroad.

Reply:

Such petitions are not part of this proposed change but this concept is being considered in a separate rule change proposal.

Comment:

One comment suggested that the Filing Receipt specifically indicate whether or not a license has been denied under §5.12.

Reply:

The proposed practice under §5.12 would indicate on the Filing Receipt when a license is granted. On other cases in which a license is not granted further review is required. A license may still be granted at a later date.

Comment:

One comment stated that it should be possible to petition at any early date for a foreign filing license as well as obtain one on the filing receipt.

Reply:

It will still be possible to petition earlier for a license under revised §5.12.

Implementation Of Patent Procedure Revisions

The effective date of the patent procedure revisions contained in this rulemaking is Feb. 27, 1983. The various sections will be implemented in the manner set forth below:

§1.10 Filing of papers and fees by "Express Mail" with certificate.

The "Guidelines under §1.10" set forth below provide guidance in implementing §1.10:

Guidelines under §1.10

A) The certification under §1.10 requires a signature of the person depositing the paper with the United States Postal Service as "Express Mail". Specifically, if the certification under §1.10 appears on a paper that requires a signature, two signatures are required, one for the paper and one for the certification under §1.10.

B) When possible, the certification under §1.10 should appear on an upper portion of the first page of the paper being submitted. However, if there is insufficient space to make the certification on the same paper, such as in the case of the patent issue fee transmittal form PTO-85, the certification should be on a separate sheet securely attached to the paper.

C) When the certification is presented on a separate sheet, that sheet must (1) be signed and (2) fully identify and be securely attached to the paper or fee it accompanies. The required identification should include the serial number and filing date of the application as well as the type of paper being filed, e.g., complete application, specification and drawings, responses to rejection or refusal, notice of appeal, etc. If the serial number of the application is not known, the identification should include at least the name of the inventor(s) and the title of the invention. An unsigned certification will not be considered acceptable.

Moreover, without the proper identifying data, a certification presented on a separate sheet will not be considered acceptable if there is any question or doubt concerning the connection between the sheet and the paper filed.

D) In situations wherein the correspondence includes papers for more than one application e.g., a single envelope containing separate applications or papers for various parts of the Patent and Trademark Office, each paper must have its own certification and the "Express Mail" label number as part thereof or attached thereto.

E) In situations wherein the correspondence includes several papers directed to the same application (e.g., a proposed response under 37 CFR 1.116 and a notice of appeal), each paper should also have its own certification as a part thereof or attached thereto.

F) Practitioners may place the certification language on the first page of a paper with an inked stamp. Such a practice is encouraged because the certification is not only readily visible but also forms an integral part of the paper. An example of a preferred stamp is:

"Express Mail" mailing label number _____
Date of Deposit _____

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

_____
(Typed or printed name of person mailing paper or fee)

_____
(Signature of person mailing paper or fee)

§1.48 Correction of inventorship.

Any patent application pending on or after Feb. 27, 1983, is subject to the provisions of this section.

§1.53 Serial number, filing date, and completion of application.

The provisions of this section apply to any patent application filed on or after Feb. 27, 1983.

§1.63 Oath or declaration.

The provisions of §1.63 will become effective on Feb. 27, 1983, and will apply to any oath or declaration filed on or after that date. However, in order to provide a smooth transition from the old oath or declaration requirements to the new, the Office will continue to accept between Feb. 27, 1983, and June 30, 1983, any oath or declaration in compliance with §1.65 as it existed im-

mediately prior to Feb. 27, 1983, so long as that oath or declaration is attached to and was executed as a part of an application to be filed in the Patent and Trademark Office.

Effective July 1, 1983, all oaths or declarations filed under §1.51(a)(2) as a part of a patent application must fully comply with §1.63.

A suggested format for a declaration is set forth below:

Declaration For Patent Application

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

_____

the specification of which

(check one) ☐ is attached hereto.
☐ was filed on _____ as Application Serial No. _____ and was amended on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

			Priority Claimed	
(Number)	(Country)	(Day/Month/Year Filed)	☐ Yes	☐ No
(Number)	(Country)	(Day/Month/Year Filed)	☐ Yes	☐ No
(Number)	(Country)	(Day/Month/Year Filed)	☐ Yes	☐ No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor _____
Inventor's signature _____ _____
Date
Residence _____
Citizenship _____
Post Office Address _____ _____
Full name of second joint inventor, if any _____
Second Inventor's signature _____ _____
Date
Residence _____
Citizenship _____
Post Office Address _____ _____

(Supply similar information and signature for third and subsequent joint inventors.)

The declaration form set forth above is specifically designed for use where the specification is attached to the form and the specification and declaration are filed at one time, and also where the declaration form is filed after the specification and drawings in accordance with §1.53. The form can be used where foreign priority is claimed under 35 U.S.C. 119 and where the benefit of one or more United States applications is claimed under 35 U.S.C. 120. Appropriate modifications can be made in the form so long as compliance with the rules is maintained. For example, if the form is being used as a supplemental declaration form which is being submitted after numerous amendments the form might appropriately be modified by changing the words "was amended on" to "with amendments through."

§1.335 Filing of notice of arbitration awards.

The written notices required by this section should be directed to the attention of the Office of the Solicitor, which Office will be responsible for processing of such notices.

Other Considerations

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act. (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*

The rule change will not have a significant averse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96-354) for several reasons. Public Law 97-247 has taken into consideration the impact it may have on small entities. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, changing existing procedures where they can be simplified.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*, since no significant additional record keeping or reporting requirements are placed upon the public. In fact,

some paperwork, especially that related to foreign filing license petitions, will be reduced.

List of Subjects in 37 CFR Parts 1 and 5

Administrative practice and procedure, Courts, Inventions and patents.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and Public Law 97-247, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

37 CFR, Parts 1 and 5, are amended as follows:

1. Section 1.4 is amended by revising paragraph (a) to read as follows:

§1.4 Nature of correspondence.

(a) Correspondence with the Patent and Trademark Office comprises: (1) correspondence relating to services and facilities of the Office, such as general inquiries, requests for publications supplied by the Office, orders for printed copies of patents or trademark registrations, orders for copies of records, transmission of assignments for recording, and the like, and (2) correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing, processing, or other proceedings of national applications in Subpart B, §§1.31 to 1.352; of international applications in Subpart C, §§1.401 to 1.482; of reexamination of patents in Subpart D, §§1.501 to 1.570; and of trademark applications, §§2.11 to 2.189.

* * * * *

2. Section 1.6 is revised to read as follows:

§1.6 Receipt of letters and papers.

(a) Letters and other papers received in the Patent and Trademark Office are stamped with the date of receipt. No papers are received in the Patent and Trademark Office on Saturdays, Sundays or federal holidays within the District of Columbia.

(b) Mail placed in the Patent and Trademark Office pouch up to midnight on weekdays, excepting Saturdays and federal holidays, by the post office at Washington, D. C., serving the Patent and Trademark Office, is considered as having been received in the Patent and Trademark Office on the day it was so placed in the pouch.

(c) In addition to being mailed or delivered by hand during office hours, letters and other papers may be deposited up to midnight in a box provided at the guard's desk at the lobby of building 3 of the Patent and Trademark Office at Crystal Plaza, Arlington, Virginia and at the main entrance (14th Street) of the Department of Commerce Building, Washington, D. C., on weekdays except Saturdays and federal holidays, and all papers deposited therein are considered as received in the Patent and Trademark Office on the day of deposit.

(d) If interruptions or emergencies in the United States Postal Service which have been so designated by the Commissioner occur, the Patent and Trademark Office will consider as filed on a particular date in the Office any paper or fee which is (1) promptly filed after the ending of the designated interruption or emergency and (2) accompanied by a statement indicating that such paper or fee would have been filed on that particular date if it were not for the designated interruption or emergency in the United States Postal Service. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

3. Section 1.7 is revised to read as follows:

§1.7 Times for taking action: Expiration on Saturday, Sunday or federal holiday.

Whenever periods of time are specified in this part in days, calendar days are intended. When the day, or the last day fixed by statute or by or under this part for taking any action or paying any fee in the Patent and Trademark Office falls on Saturday, Sunday, or on a federal holiday within the District of Columbia, the action may be taken, or the fee paid, on the next succeeding day which is not a Saturday, Sunday, or a federal holiday. See §1.304 for time for appeal or for commencing civil action.

4. Section 1.8 is amended by revising the introductory text of paragraph (a) and paragraph (a)(1), (a)(2) introductory text, and (a)(2)(i) to read as follows:

§1.8 Certificate of mailing.

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if: (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D. C. 20231, and deposited with the U.S. Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they also include a certificate for each paper or fee stating the date of deposit. The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated. The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(i) The filing of a national patent application specification and drawing or other papers for the purpose of obtaining an application filing date;

* * * * *

5. A new section 1.10 is added to read as follows:

§1.10 Filing of papers and fees by "Express Mail" with certificate.

(a) Any paper or fee to be filed in the Patent and Trademark Office can be filed utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service and be considered as having been filed in the Office on the date the paper or fee is shown to have been deposited as "Express Mail" with the United States Postal Service.

(b) Any paper or fee filed by "Express Mail" must have the number of the "Express Mail" mailing label placed thereon prior to mailing, be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and any such paper or fee must also include a certificate of mailing by "Express Mail" which states the date of mailing by "Express Mail" and is signed by the person mailing the paper or fee.

(c) The Patent and Trademark Office will accept the certificate of mailing by "Express Mail" and accord the paper or fee the certificate date under 35 U.S.C. 21(a) without further proof of the date on which the mailing by "Express Mail" occurred unless a question is present regarding the date of mailing. If more than a reasonable time has elapsed between the certificate date and the Patent and Trademark Office receipt date or if other questions regarding the date of mailing are present, the person mailing the paper or fee may be required to file a copy of the "Express Mail" receipt showing the actual date of mailing and a statement from the person who mailed the paper or fee averring to the fact that the mailing occurred on the date certified. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

6. Section 1.17 is amended by revising paragraph (h) to read as follows:

§1.17 Patent application processing fees.

* * * * *

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph—$120.00

—§1.47—for filing by other than all the inventors or a person not the inventor
—§1.48—for correction of inventorship
—§1.182–for decision on questions not specifically provided for
—§1.183–to suspend the rules
—§1.268–for late filing of interference settlement agreement

* * * * *

7. Section 1.22 is revised to read as follows:

§1.22 Fees payable in advance.

(a) Patent and trademark fees and charges payable to the Patent and Trademark Office are required to be paid in advance, that is, at the time of requesting any action by the Office for which a fee or charge is payable with the exception that under §1.53 applications for patent may be assigned a filing date without payment of the basic filing fee.

(b) All patent and trademark fees paid to the Patent and Trademark Office should be itemized in each individual application, patent or other proceeding in such a manner that it is clear for which purpose the fees are paid.

8. Section 1.24 is revised to read as follows:

§1.24 Coupons.

Coupons in denominations of one dollar are sold by the Patent and Trademark Office for the convenience of regular purchasers of U.S. patents and trademark registrations; these coupons may not be used for any other purpose. The one dollar coupons are sold individually and in books of 50 with stubs for record for $50. These coupons are good until used; they may be transferred but cannot be redeemed.

9. Section 1.41 is revised to read as follows:

§1.41 Applicant for patent.

(a) A patent must be applied for in the name of the actual inventor or inventors. Full names must be stated, including the family name and at least one given name without abbreviation together with any other given name or initial.

(b) Unless the contrary is indicated the word "applicant" when used in these sections refers to the inventor or joint inventors who are applying for a patent, or to the person mentioned in §§1.42, 1.43, or 1.47 who is applying for a patent in place of the inventor.

(c) Any person authorized by the applicant may file an application for patent on behalf of the inventor or inventors, but an oath or declaration for the application (§1.63) can only be made in accordance with §1.64.

(d) A showing may be required from the person filing the application that the filing was authorized where such authorization comes into question.

10. Section 1.42 is revised to read as follows:

§1.42 When the inventor is dead.

In case of the death of the inventor, the legal representative (executor, administrator, etc.) of the deceased inventor may make the necessary oath or declaration, and apply for and obtain the patent. Where the inventor dies during the time intervening between the filing of the application and the granting of a patent thereon, the letters patent may be issued to the legal representative upon proper intervention.

11. Section 1.43 is revised to read as follows:

§1.43 When the inventor is insane or legally incapacitated.

In case an inventor is insane or otherwise legally incapacitated, the legal representative (guardian, conservator, etc.) of such inventor may make the necessary oath or declaration, and apply for and obtain the patent.

12. Section 1.45 is amended by removing paragraphs (b) and (c) and the designation (a) to the first paragraph and by revising the text to read as follows:

§1.45 Joint inventors.

Joint inventors must apply for a patent jointly and each must make the required oath or declaration: neither of them alone, nor less than the entire number, can apply for a patent for an invention invented by them jointly, except as provided in §1.47.

13. Section 1.46 is revised to read as follows:

§1.46 Assigned inventions and patents.

In case the whole or a part interest in the invention or in the patent to be issued is assigned, the application must still be made or authorized to be made, and an oath or declaration signed, by the inventor or one of the persons mentioned in §§1.42, 1.43, or 1.47. However, the patent may be issued to the assignee or jointly to the inventor and the assignee as provided in §1.334.

14. Section 1.47 is revised to read as follows:

§1.47 Filing when an inventor refuses to sign or cannot be reached.

(a) If a joint inventor refuses to join in an application for patent or cannot be found or reached after diligent effort, the application may be made by the other inventor on behalf of himself or herself and the omitted inventor. The oath or declaration in such an application must be accompanied by a petition including proof of the pertinent facts and by the required fee (§1.17(h)) and must state the last known address of the omitted inventor. The Patent and Trademark Office shall forward notice of the filing of the application to the omitted inventor at said address. Should such notice be returned to the Office undelivered, or should the address of the omitted inventor be unknown, notice of the filing of the application shall be published in the *Official Gazette*. The omitted inventor may subsequently join in the application on filing an oath or declaration of the character required by §1.63. A patent may be granted to the inventor making the application, upon a showing satisfactory to the Commissioner, subject to the same rights which the omitted inventor would have had if he or she had been joined.

(b) Whenever an inventor refuses to execute an application for patent, or cannot be found or reached after diligent effort, a person to whom the inventor has assigned or agreed in writing to assign the invention or who otherwise shows sufficient proprietary interest in the matter justifying such action may make application for patent on behalf of and as agent for the inventor. The oath or declaration in such an application must be accompanied by a petition including proof of the pertinent facts and a showing that such action is necessary to preserve the rights of the parties or to prevent irreparable damage, and by the required fee (§1.17(h)) and must state the last known address of the inventor. The assignment, written agreement to assign or other evidence of proprietary interest, or a verified copy thereof, must be filed in the Patent and Trademark Office. The Office shall forward notice of the filing of the application to the inventor at the address stated in the application. Should such notice be returned to the Office undelivered, or should the address of the inventor be unknown, notice of the filing of the application shall be published in the *Official Gazette*. The inventor may subsequently join in the application on filing an oath or declaration of the character required by §1.63. A patent may be granted to the inventor upon a showing satisfactory to the Commissioner.

15. A new section 1.48 is added to read as follows:

§1.48 Correction of inventorship.

If the correct inventor or inventors are not named in an application for patent through error without any deceptive intention on the part of the actual inventor or inventors, the application may be amended to name only the actual inventor or inventors. Such amendment must be diligently made and must be accompanied by (1) a petition including a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred; (2) an oath or declaration by each actual inventor or inventors as required by §1.63; (3) the fee set forth in §1.17(h); and (4) the written consent of any assignee.

16. Section 1.51 is amended by revising paragraphs 1.51(a)(2) and (b) to read as follows:

§1.51 General requisites of a complete application.

(a) * * * * *
(2) An oath or declaration, see §§1.63 and 1.68.

* * * * *

(b) Applicants are encouraged to file an information disclosure statement. See §§1.97 through 1.99.

17. Section 1.52 is amended by revising paragraph (c) to read as follows:

§1.52 Language, paper, writing, margins.

* * * * *

(c) Any interlineation, erasure, cancellation or other alteration of the application papers filed must be made before the signing of any accompanying oath or declaration pursuant to §1.63 referring to those application papers and should be dated and initialed or signed by the applicant on the same sheet of paper. No such alterations in the application papers are permissible after the signing of an oath or declaration referring to those application papers (§1.56(c)). After the signing of the oath or declaration referring to the application papers, amendments may only be made in the manner provided by §§1.121 and 1.123–1.125.

* * * * *

18. Section 1.53 is revised to read as follows:

§1.53 Serial number, filing date, and completion of application.

(a) Any application for a patent received in the Patent and Trademark Office will be assigned a serial number for identification purposes.

(b) The filing date of an application for patent is the date on which (1) a specification containing a description pursuant to §1.71 and at least one claim pursuant to §1.75, and (2) any drawing required by §1.81(a), are filed in the Patent and Trademark Office. No new matter may be introduced into an application after its filing date (§1.118).

(c) If any application is filed without the specification or drawing required by paragraph (b) of this section, applicant will be so notified and given a time period within which to submit the omitted specification or drawing in order to obtain a filing date as of the date of filing of such submission. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less a $50.00 handling fee.

(d) If an application which has been accorded a filing date pursuant to paragraph (b) of this section does not include the appropriate filing fee or an oath or declaration by the applicant, applicant will be so notified and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section.

(e) An application for a patent will not be placed upon the files for examination until all its required parts, complying with the rules relating thereto, are received, except that certain minor informalities may be waived subject to subsequent correction whenever required.

(f) The filing date of an international application designating the United States of America shall be treated as the filing date in the United States of America under PCT Article 11(3), except as provided in 35 U.S.C. 102(e).

19. Section 1.54 is revised to read as follows:

§1.54 Parts of application to be filed together; filing receipt.

(a) It is desirable that all parts of the complete application be deposited in the Office together; otherwise a letter must accompany each part, accurately and clearly connecting it with the other parts of the application. See §1.53 with regard to completion of an application.

(b) Applicant will be informed of the application serial number and filing date by a filing receipt.

20. Section 1.55 is revised to read as follows:

§1.55 Claim for foreign priority.

(a) An applicant may claim the benefit of the filing date of a prior foreign application under the conditions specified in 35 U.S.C. 119 and 172. The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by §1.63. The claim for priority and the certified copy of the foreign application specified in the second paragraph of 35 U.S.C. 119 must be filed in the case of interference (§1.224); when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner; and in all other cases they must be filed not later than the date the issue fee is paid. If the papers filed are not in the English language, a translation need not be filed except in the three particular instances specified in the preceding sentence, in which event a sworn translation or a translation certified as accurate by a sworn or official translator must be filed. If the priority papers are submitted after the date the issue fee is paid, they must be accompanied by a petition requesting their entry and the fee set forth in §1.17(i).

(b) An applicant may under certain circumstances claim priority on the basis of an application for an inventor's certificate in a country granting both inventor's certificates and patents. When an applicant wishes to claim the right of priority as to a claim or claims of the

application on the basis of an application for an inventor's certificate in such a country under 35 U.S.C. 119, last paragraph (as amended July 28, 1972), the applicant or his attorney or agent, when submitting a claim for such right as specified in paragraph (b) of this section, shall include an affidavit or declaration including a specific statement that, upon an investigation, he or she has satisfied himself or herself that to the best of his or her knowledge the applicant, when filing his or her application for the inventor's certificate, had the option to file an application either for a patent or an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority.

21. Section 1.56 is amended by revising paragraph (c) to read as follows:

§1.56 Duty of disclosure; fraud; striking or rejection of applications.

* * * * *

(c) Any application may be stricken from the files if:
(1) An oath or declaration pursuant to §1.63 is signed in blank;
(2) An oath or declaration pursuant to §1.63 is signed without review thereof by the person making the oath or declaration;
(3) An oath or declaration pursuant to §1.63 is signed without review of the specification, including the claims, as required by §1.63(b);
or
(4) The application papers filed in the Office are altered after the signing of an oath or declaration pursuant to §1.63 referring to those application papers.

* * * * *

§1.57 [Removed]

22. Section 1.57 is removed.

23. Section 1.59 is revised to read as follows:

§1.59 Papers of application with filing date not to be returned.

Papers in an application which has received a filing date pursuant to §1.53 will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost.

24. Section §1.60 is revised to read as follows:

§1.60 Continuation or divisional application for invention disclosed in a prior application.

A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121), which discloses and claims only subject matter disclosed in a prior application may be filed as a separate application before the patenting or abandonment of or termination of proceedings on the prior application. Signing and execution of the application papers by the applicant may be omitted provided the copy is supplied by and accompanied by a statement by, the applicant or his or her attorney or agent that the application papers comprise a true copy of the prior application as filed. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§1.78(a)) will be entered before calculating the filing fee and granting the filing date.

25. Section §1.62 is revised to read as follows:

§1.62 File wrapper continuing procedure.

(a) A continuation, continuation-in-part, or divisional application, which uses the specification and drawings from a prior application to be abandoned, may be filed before the payment of the issue fee, abandonment of, or termination of proceedings on a prior application. The filing date of an application filed under this section is the date on which a request is filed for an application under this section including identification of the Serial Number, filing date, and applicant's name of the prior application.

(b) The filing fee for a continuation, continuation-in-part, or divisional application under this section is based on the number of claims remaining in the application after entry of any preliminary amendment and entry of any amendments under §1.116 unentered in the prior application which applicant has requested to be entered in the continuing application.

(c) In the case of a continuation-in-part application which adds and claims additional disclosure by amendment, an oath or declaration as required by §1.63 must also be filed. In a continuation or divisional application which discloses and claims only subject matter disclosed in a prior application, no additional oath or declaration is required.

(d) If an application which has been accorded a filing date pursuant to paragraph (a) of this section does not include the appropriate filing fee pursuant to paragraph (b) of this section, or an oath or declaration by the applicant in the case of a continuation-in-part application pursuant to paragraph (c) of this section, applicant will be so notified and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification of a defect pursuant to paragraph (a) of this section.

(e) An application filed under this section will utilize the file wrapper and contents of the prior application to constitute the new continuation, continuation-in-part, or divisional application but will be assigned a new application serial number.

(f) The filing of an application under this section will be construed to include a waiver of secrecy by the applicant under 35 U.S.C. 122 to the extent that any member of the public who is entitled under the provisions of 37 CFR 1.14 to access to, or information concerning either the prior application or any continuing application filed under the provisions of this section may be given similar access to, or similar information concerning, the other application(s) in the file wrapper.

(g) The filing of a request for a continuing application under this section will be considered to be a request to expressly abandon the prior application as of the filing date granted the continuing application.

(h) The applicant is urged to furnish the following information relating to the prior application to the best of his or her ability:
(1) Title as originally filed and as last amended;
(2) Name of applicant as originally filed and as last amended;
(3) Current correspondence address of applicant;
(4) Identification of prior foreign application and any priority claim under 35 U.S.C. 119.

(i) Envelopes containing only application papers and fees for filing under this section should be marked "Box FWC".

26. A new section 1.63 is added to read as follows:

§1.63 Oath or declaration.

(a) An oath or declaration filed under §1.51(a)(2) as a part of an application must:
(1) Be executed in accordance with either §1.66 or §1.68;
(2) Identify the specification to which it is directed;

(3) Identify each inventor and the residence and country of citizenship of each inventor; and
(4) State whether the inventor is a sole or joint inventor of the invention claimed.

(b) In addition to meeting the requirements of paragraph (a), the oath or declaration must state that the person making the oath or declaration:
(1) Has reviewed and understands the contents of the specification, including the claims, as amended by any amendment specifically referred to in the oath or declaration;
(2) Believes the named inventor or inventors to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought; and
(3) Acknowledges the duty to disclose information which is material to the examination of the application in accordance with §1.56(a).

(c) In addition to meeting the requirements of paragraphs (a) and (b) of this section, the oath or declaration in any application in which a claim for foreign priority is made pursuant to §1.55 must identify the foreign application for patent or inventor's certificate on which priority is claimed, and any foreign application having a filing date before that of the application on which priority is claimed, by specifying the application number, country, day, month and year of its filing.

(d) In any continuation-in-part application filed under the conditions specified in 35 U.S.C. 120 which discloses and claims subject matter in addition to that disclosed in the prior copending application, the oath or declaration must also state that the person making the oath or declaration acknowledges the duty to disclose material information as defined in §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

27. A new section 1.64 is added to read as follows:

§1.64 Person making oath or declaration.

(a) The oath or declaration must be made by all of the actual inventors except as provided for in §§1.42, 1.43, or 1.47.

(b) If the person making the oath or declaration is not the inventor (§§1.42, 1.43, or 1.47), the oath or declaration shall state the relationship of the person to the inventor and, upon information and belief, the facts which the inventor is required to state.

§1.65 [Removed]

28. Section 1.65 is removed.

29. Section 1.67 is revised to read as follows:

§1.67 Supplemental oath or declaration.

(a) A supplemental oath or declaration meeting the requirements of §1.63 may be required to be filed to correct any deficiencies or inaccuracies present in an earlier filed oath or declaration.

(b) A supplemental oath or declaration meeting the requirements of §1.63 must be filed (1) when a claim is presented for matter originally shown or described but not substantially embraced in the statement of invention or claims originally presented, and (2) when an oath or declaration submitted in accordance with §1.53(d) after the filing of the specification and any required drawings specifically and improperly refers to an amendment which includes new matter. No new matter may be introduced into an application after its filing date even if a supplemental oath or declaration is filed (§1.53(b); §1.118). In proper cases the oath or declaration here required may be made on information and belief by an applicant other than inventor.

30. Section 1.69 is amended by revising paragraph (b) to read as follows:

§1.69 Foreign language oaths and declarations.

* * * * *

(b) Unless the text of any oath or declaration in a language other than English is a form provided or approved by the Patent and Trademark Office, it must be accompanied by a verified English translation, except that in the case of an oath or declaration filed under §1.63, the translation may be filed in the Office no later than two months from the date applicant is notified to file the translation.

31. Section 1.70 is amended by revising the title and paragraph (a) to read as follows:

§1.70 Oath or declaration under 35 U.S.C. 371(c)(4).

(a) When an applicant of an international application, if the inventor, desires to enter the national stage under 35 U.S.C. 371, he or she must file an oath or declaration in accordance with §1.63.

* * * * *

32. Section 1.77 is amended by revising paragraphs (h) and (i) to read as follows:

§1.77 Arrangement of application elements.

* * * * *

(h) Abstract of the disclosure.
(i) Signed oath or declaration.

* * * * *

33. The center heading preceding §1.97 and section 1.97 are revised to read as follows:

INFORMATION DISCLOSURE STATEMENT

§1.97 Filing of information disclosure statement.

(a) As a means of complying with the duty of disclosure set forth in §1.56, applicants are encouraged to file an information disclosure statement at the time of filing the application or within the later of three months after the filing date of the application or two months after applicant receives the filing receipt. If filed separately, the disclosure statement should, in addition to the identification of the application, include the Group Art Unit to which the application is assigned as indicated on the filing receipt. The disclosure statement may either be separate from the specification or may be incorporated therein.

(b) A disclosure statement filed in accordance with paragraph (a) of this section shall not be construed as a representation that a search has been made or that no other material information as defined in §1.56(a) exists.

34. Section 1.98 is amended by revising the title and paragraph (a) to read as follows:

§1.98 Content of information disclosure statement.

(a) Any disclosure statement filed under §1.97 or §1.99 shall include: (1) A listing of patents, publications or other information and (2) a concise explanation of the relevance of each listed item. The disclosure statement shall be accompanied by a copy of each listed patent or publication or other item of information in written form or of at least the portions thereof considered by the person filing the disclosure statement to be pertinent. All United States patents listed should be identified by their patent numbers, patent dates and names of the patentees. Each foreign published application or patent should be cited by identifying the country or office which issued it, the document number and publication date indicated

on the document. Each printed publication should be identified by author (if any), title of the publication, pages, date and place of publication.

* * * * *

35. Section 1.99 is revised to read as follows:

§1.99 Updating of information disclosure statement.

If prior to issuance of a patent an applicant, pursuant to his or her duty of disclosure under §1.56, wishes to bring to the attention of the Office additional patents, publications or other information not previously submitted, the additional information should be submitted to the Office with reasonable promptness. It may be included in a supplemental information disclosure statement or may be incorporated into other communications to be considered by the examiner. Any transmittal of additional information shall be accompanied by explanations of relevance and by copies in accordance with the requirements of §1.98.

36. Section 1.101 is amended by revising paragraph (a) to read as follows:

§1.101 Order of examination.

(a) Applications filed in the Patent and Trademark Office and accepted as complete applications are assigned for examination to the respective examining groups having the classes of inventions to which the applications relate. Applications shall be taken up for examination by the examiner to whom they have been assigned in the order in which they have been filed except for those applications in which examination has been advanced pursuant to §1.102 and those applications in which the Office has accepted a request for waiver of patent rights filed under §1.139. International applications which have complied with the requirements of 35 U.S.C. 371(c) will be taken up for action based on the date on which such requirements were met. However, unless a request has been filed under 35 U.S.C. 371(f), no action may be taken prior to 21 months from the priority date.

* * * * *

37. Section 1.118 is revised to read as follows:

§1.118 Amendment of disclosure.

(a) No amendment shall introduce new matter into the disclosure of an application after the filing date of the application §1.53(b)). All amendments to the specification, including the claims, and the drawings filed after the filing date of the application must conform to at least one of them as it was at the time of the filing of the application. Matter not found in either, involving a departure from or an addition to the original disclosure, cannot be added to the application after its filing date even though supported by an oath or declaration in accordance with §1.63 or §1.67 filed after the filing date of the application.

(b) If it is determined that an amendment filed after the filing date of the application introduces new matter, claims containing new matter will be rejected and deletion of the new matter in the specification and drawings will be required even if the amendment is accompanied by an oath or declaration in accordance with §1.63 or §1.67.

38. Section 1.123 is revised to read as follows:

§1.123 Amendments to the drawing.

No change in the drawing may be made except by permission of the Office. Permissible changes in the construction shown in any drawing may be made only by bonded draftsmen, at applicant's expense, or by the submission of substitute drawings by applicant. A sketch in permanent ink showing proposed changes, to become part of the record, must be filed for approval by the examiner. The paper requesting amendments to the drawing should be separate from other papers.

39. Section 1.125 is revised to read as follows:

§1.125 Substitute specification.

If the number or nature of the amendments shall render it difficult to consider the case, or to arrange the papers for printing or copying, the examiner may require the entire specification, including the claims, or any part thereof, to be rewritten. A substitute specification may not be accepted unless it has been required by the examiner or unless it is clear to the examiner that acceptance of a substitute specification would facilitate processing of the application. Any substitute specification filed must be accompanied by a statement that the substitute specification includes no new matter. Such statement must be a verified statement if made by a person not registered to practice before the Office.

40. Section 1.131 is amended by revising paragraph (a) to read as follows:

§1.131 Affidavit or declaration of prior invention to overcome cited patent or publication.

(a) When any claim of an application or a patent under reexamination is rejected on reference to a domestic patent which substantially shows or describes but does not claim the rejected invention, or on reference to a foreign patent or to a printed publication, and the applicant or the owner of the patent under reexamination shall make oath or declaration as to facts showing a completion of the invention in this country before the filing date of the application on which the domestic patent issued, or before the date of the foreign patent, or before the date of the printed publication, then the patent or publication cited shall not bar the grant of a patent to the applicant or the confirmation of the patentability of the claims of the patent, unless the date of such patent or printed publication is more than one year prior to the date on which the applicant's or patent owner's application was filed in this country.

* * * * *

41. Section 1.132 is revised to read as follows:

§1.132 Affidavits or declarations traversing grounds of rejection.

When any claim of an application or a patent under reexamination is rejected on reference to a domestic patent which substantially shows or describes but does not claim the invention, or on reference to a foreign patent, or to a printed publication, or to facts within the personal knowledge of an employee of the Office, or when rejected upon a mode or capability of operation attributed to a reference, or because the alleged invention is held to be inoperative or lacking in utility, or frivolous or injurious to public health or morals, affidavits or declarations traversing these references or objections may be received.

42. Section 1.137 is amended by revising paragraph (b) to read as follows:

§1.137 Revival of abandoned application.

* * * * *

(b) An application unintentionally abandoned for failure to prosecute, except pursuant to §1.53(d), may be revived as a pending application if the delay was unintentional. A petition to revive an unintentionally abandoned application must be filed within one year of the date on which the application became abandoned or be filed within three months of the date of the first decision on a petition to revive under paragraph (a) of this section which was filed within one year of the date of abandonment of the application. A petition to revive an unintentionally abandoned application must be accompanied by (1) a statement that the abandonment was unintentional, (2) a proposed response unless it has been previously filed, and (3) a petition fee as set forth in §1.17(m). Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the abandonment was unintentional. The three month period set forth in this paragraph may be extended under the provisions of §1.136(a), but no further extensions under §1.136(b) will be granted. Petitions to the Commissioner under §1.183 to waive any time periods for requesting revival of an unintentionally abandoned application will not be considered, but will be returned to the applicant.

* * * * *

43. Section 1.153 is amended by revising paragraph (b) to read as follows:

§1.153 Title, description and claim, oath or declaration.

* * * * *

(b) The oath or declaration required of the applicant must comply with §1.63.

44. Section 1.154 is amended by revising paragraph (e) to read as follows:

§1.154 Arrangement of specification.

* * * * *

(e) Signed oath or declaration (See §1.153(b)).

45. Section 1.162 is revised to read as follows:

§1.162 Applicant, oath or declaration.

The applicant for a plant patent must be the person who has invented or discovered and asexually reproduced the new and distinct variety of plant for which a patent is sought (or as provided in §§1.42, 1.43, and 1.47). The oath or declaration required of the applicant, in addition to the averments required by §1.63, must state that he or she has asexually reproduced the plant. Where the plant is a newly found plant the oath or declaration must also state that it was found in a cultivated area.

46. Section 1.163 is amended by revising paragraph (b) to read as follows:

§1.163 Specification.

* * * * *

(b) Two copies of the specification (including the claim) must be submitted, but only one signed oath or declaration is required. The second copy of the specification may be a legible carbon copy of the original.

47. Section 1.172 is amended by revising paragraph (a) to read as follows:

§1.172 Applicants, assignees.

(a) A reissue oath must be signed and sworn to or declaration made by the inventor or inventors except as otherwise provided (see §§1.42, 1.43, 1.47), and must be accompanied by the written assent of all assignees, if any, owning an undivided interest in the patent, but a reissue oath may be made and sworn to or declaration made by the assignee of the entire interest if the application does not seek to enlarge the scope of the claims of the original patent.

* * * * *

48. Section 1.174 is amended by revising paragraph (a) to read as follows:

§1.174 Drawings.

(a) The drawings upon which the original patent was issued may be used in reissue applications if no changes whatsoever are to be made in the drawings. In such cases, when the reissue application is filed, the applicant must submit a temporary drawing which may consist of a copy of the printed drawings of the patent or a photoprint of the original drawings of the size required for original drawing.

* * * * *

49. Section 1.175 is amended by revising the introductory text of paragraph (a) to read as follows:

§1.175 Reissue oath or declaration.

(a) Applicants for reissue, in addition to complying with the requirements of §1.63, must also file with their applications a statement under oath or declaration as follows:

* * * * *

50. Section 1.324 is revised to read as follows:

§1.324 Correction of inventorship in patent.

Whenever a patent is issued and it appears that the correct inventor or inventors were not named through error without deceptive intention on the part of the actual inventor or inventors, the Commissioner may, on petition of all the parties and the assignees and satisfactory proof of the facts and payment of the fee set forth in §1.20(b), or on order of a court before which such matter is called in question, issue a certificate naming only the actual inventor or inventors.

51. Section 1.325 is revised to read as follows:

§1.325 Other mistakes not corrected.

Mistakes other than those provided for in §§1.322, 1.323, 1.324, and not affording legal grounds for reissue or for reexamination, will not be corrected after the date of the patent.

52. A new §1.335 is added to read as follows:

§1.335 Filing of notice of arbitration awards.

(a) Written notice of any award by an arbitrator pursuant to 35 U.S.C. 294 must be filed in the Patent and Trademark Office by the patentee, or the patentee's assignee or licensee. If the award involves more than one patent a separate notice must be filed for placement in the file of each patent. The notice must set forth the patent number, the names of the inventor and patent owner, and the names and addresses of the parties to the arbitration. The notice must also include a copy of the award.

(b) If an award by an arbitrator pursuant to 35 U.S.C. 294 is modified by a court, the party requesting the

modification must file in the Patent and Trademark Office, a notice of the modification for placement in the file of each patent to which the modification applies. The notice must set forth the patent number, the names of the inventor and patent owner, and the names and addresses of the parties to the arbitration. The notice must also include a copy of the court's order modifying the award.

(c) Any award by an arbitrator pursuant to 35 U.S.C. 294 shall be unenforceable until any notices required by paragraph (a) or (b) of this section are filed in the Patent and Trademark Office. If any required notice is not filed by the party designated in paragraph (a) or (b) of this section, any party to the arbitration proceeding may file such a notice.

53. Section 5.12 is revised to read as follows:

§5.12 Petition for license.

(a) Filing of an application for patent for inventions made in the United States will be considered to include a petition for license under 35 U.S.C. 184 for the subject matter of the application. The filing receipt will indicate if a license is granted. If the initial automatic petition is not granted, a subsequent petition may be filed under paragraph (b) of this section.

(b) Petitions for license under 35 U.S.C. 184 should be presented in letter form and should include petitioner's address, and full instructions for delivery of the requested license when it is to be delivered to other than the petitioner.

Dec. 23, 1982. GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

[1027 OG 9]

(62) Deposit Accounts—Statutory Fee Charges

Beginning on May 1, 1966, and until further notice, statutory fees, including filing fees for patent, design, and trademark applications, issue fees, appeal fees and opposition, cancellation and petition fees may be charged against the deposit accounts provided for by Rule 25(a) of the Rules of Practice in patent cases. During this period the prohibition of Rule 25(b) against such charges will be suspended.

In view of the facts that these fees are indispensable parts of the actions to which they relate and that the charging of a fee against an account which does not contain sufficient funds to cover it cannot be regarded as a payment of the fee, it is evident that the overdrawing of a deposit account may result in the loss of a vital date and may also impose a substantial burden on the Patent Office in making appropriate correction of its records. It is, therefore, necessary that effective steps be taken to avoid such overdrafts, as follows:

Checks of all accounts will be made periodically, and if any account is found to have been overdrawn, it will be immediately removed from the active accounts and no further drafts on it will be honored. Prompt payment of the outstanding balance will be required and the depositor or his attorney may be called on for an itemized statement identifying all statutory fees charged against the account during the period in question in order that it may be ascertained whether any previously granted date should be withdrawn.

It is emphasized that the success of the procedure outlined above depends upon the maintenance of a sufficient balance in deposit accounts at all times to meet any charges made against them. The Office must, therefore, strictly refuse to permit any depositor who has once overdrawn his account to maintain such an account in the future and in the event that any substantial number of overdrafts occurs it may be necessary to reestablish the prohibition of Rule 25(b) against charging statutory fees against deposit accounts.

Accordingly, effective May 1, 1966, the requirement of Rule 25(a) that an amount sufficient to cover all charges made against an account must always be on deposit will be strictly enforced, regardless of whether any fee is included in such charges and where this requirement is not complied with the account involved will be removed from the active accounts.

Feb. 23, 1966. EDWARD J. BRENNER,
Commissioner.

[824 O.G. 1200]

(63) Request for Refunds

In order to expedite the processing of refunds for payment of fees by actual mistake or in excess of the designated fees, attorneys and applicants requesting refunds should direct their correspondence to the attention of the "Refund Section, Accounting Division, Office of Finance." This procedure should be followed whether the request is for a refund check or for a credit to the deposit account. The problems of misrouting the request for a refund in the Patent and Trademark Office would be alleviated and the payment of refunds accelerated.

BRADFORD R. HUTHER,
Assistant Commissioner for Finance & Planning.

[1024 O.G. 59 (11-23-82)]

(64) Deposit Account Authorizations

The rules of practice were amended effective Oct. 1, 1982, at 37 CFR 1.25(b) to state that: "A general authorization to charge all fees, or only certain fees, set forth in §§1.16 to 1.18 to a deposit account may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed." A general authorization would not apply to document supply fees under §1.19, such as those required for certified copies; to post-issuance fees under §1.20, such as those required for maintenance fees; or to miscellaneous fees and charges under §1.21, such as assignment recording fees.

Many applications filed prior to Oct. 1, 1982, contain broad language authorizing *any* additional fees which might have been due to be charged to a deposit account. The Patent and Trademark Office does not interpret such broad authorizations, filed prior to Oct. 1, 1982, to include authorization to charge to a deposit account the issue fee or other fees in sections 1.16, 1.17 and 1.18 except those associated with the paper containing the broad authorization. However, such a broad authorization filed in an application on or after Oct. 1, 1982, will be interpreted as authorization to charge the issue fee; as well as any other fee set forth in §§1.16, 1.17 or 1.18. Fees under sections 1.19, 1.20 and 1.21 will not be charged as a result of a general authorization under section 1.25.

It is recommended that authorizations to charge fees to deposit accounts include reference to the particular fees or fee sections of the rules which applicant intends to authorize. For example, if filing and processing fees under §§1.16 and 1.17 only are intended to be included in the authorization, and not the issue fee under §1.18, the authorization could read: "The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required during the entire pendency of the application to Deposit Account No. _____." Such an authorization would clearly exclude issue fees under 37 CFR 1.18 while including all the filing and processing fees listed in 37 CFR 1.16 and 1.17. Similarly, if it were intended to authorize the charging of fees relating only to a specific paper, the authorization could read "The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by this paper to Deposit Account No. _____." Such authorizations would cover situations in which a check to cover a filing and processing fee under 37 CFR 1.16 and 1.17 was omitted or was for an amount less than the amount required.

It is extremely important that the authorization be clear and unambiguous. If applicants file authorizations which are ambiguous and which deviate from the usual forms of authorizations, the Office may not interpret the authorizations in the manner applicants intend. In such cases applicants could be subject to further expenses, petitions, etc. in order to correct fees which were not charged as intended due to an ambiguous authorization.

July 1, 1983. GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

[1032 OG 32]

(65) Notice to All Deposit Account Holders

Beginning Oct. 7, 1983, please *mail deposit account remittances only* to:

Patent and Trademark Office
P.O. Box 70541
Chicago, Ill. 60673

To expedite credit to your deposit account and the treasury, and arrangement has been made between the Patent and Trademark Office, Treasury Department, and the First National Bank of Chicago utilizing a special "lockbox" depositary to receive deposit account remittances.

Checks should continue to be made payable to the Commissioner of Patents and Trademarks and be accompanied by *the top portion of your deposit account statement.* Submit only remittances for deposit accounts to this new address. All other correspondence should continue to be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

LEONARD L. NAHME,
Director Office of Finance.

[1035 OG 27]

(66) Use of Restricted Deposit Account for Electronic Ordering of Patent and Trademark Copies

Effective July 1, 1986, the restricted deposit account will be made available to those members of the public who wish to use it for electronic ordering of patent and trademark copies. The restricted deposit account requires maintenance of a minimum balance of $300.00 at the end of each month, as compared to the unrestricted account which requires a minimum balance of $1,000.00.

In FY 1986, the Office established the restricted deposit account for use in charging subscriptions for copies of newly issued patents by subject matter classification. Establishment of a PTO deposit account is a prerequisite for subscription service.

Recently, the Office established an electronic ordering service (EOS), a method of ordering copies of patents and trademarks through the use of a computer terminal and modem. EOS is available only to PTO deposit account holders.

Many people who are interested in using EOS to order copies of patents and trademarks and who do not have PTO deposit accounts find the $1,000.00 balance required for the unrestricted account prohibitive. Therefore, the use of restricted account is being expanded to incorporate EOS ordering. Subscription and EOS ordering are the only two services for which restricted accounts may be used. If you have any questions on subscriptions or EOS, please call Mary Brown on (703) 557-3236. If you have questions on deposit accounts, please call Delores Riley on (703) 557-3227.

June 23, 1986. THERESA A. BRELSFORD,
Assistant Commissioner, for Administration.

[1068 OG 37]

APPLICATION CONTENT

(67) Use of Metric System of Measurements in Patent Applications

In order to minimize the necessity in the future for converting dimensions given in the English system of measurements to the metric system of measurements when using printed patents as research and prior art search documents, all patent applicants are strongly encouraged to use either (1) only metric (S.I.) units, or (2) English units together with their metric system equivalents, when describing their inventions in the specifications of patent applications. This practice, however, is not being made mandatory at this time.

The initials S.I. stand for "Systeme International d'Unites," the French name for the International System of Units, a modernized metric system adopted in 1960 by the International General Conference of Weights and Measures based on precise unit measurements made possible by modern technology.

This request is made as part of the long-range program for conversion to metric units currently being conducted by the Federal Government.

Publications dealing with the metric system are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 and the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.

July 1, 1974. C. MARSHALL DANN,
Commissioner of Patents.

[924 O.G. 1104]

(68) Filing of Patent Applications Pursuant to 37 CFR 1.60

Applicants are reminded that 37 CFR 1.60 was amended effective Feb *27*, 1983 to require applicants to furnish a copy of the prior application upon filing.

Some applicants continue to request that the copy be made by the Patent and Trademark Office as was done under the practice prior to Feb. 27, 1983. Others are filing a copy of the specification of the prior application, but not a copy of the oath or declaration. The Office will no longer make such copies as part of processing the new application.

The requirements of 37 CFR 1.60 must be complied with before a filing date will be granted for the continuing application.

It should be noted that 37 CFR 1.60 has been amended effective Apr. 1, 1984 to divide the section into paragraph (a) and new paragraph (b). Paragraph (a) adds a reference to amended 37 CFR 1.78(a) to clarify the conditions under which continuation or divisional applications may be filed. New paragraph (b) requires that the prior application be complete as set forth in 37 CFR 1.51(a) in order to properly file an application under 37 CFR 1.60. A complete application under 37 CFR 1.51(a) includes a signed oath or declaration. If the prior application was not a complete application (37 CFR 1.51(a)), a continuation or divisional application cannot be filed utilizing the provisions of 37 CFR 1.60 and any

continuation or divisional application must include new application papers and be filed in accordance with 37 CFR 1.53.

Paragraph (b) of 37 CFR 1.60 also requires that a true copy of the prior complete application be filed. The copy must include the specification (including claims), drawings, oath or declaration showing the applicant's signature or an indication (on the oath or declaration) that it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. See the final rulemaking published in the Jan. 4, 1984 Federal Register at 49 FR 548-556 and reprinted in the Jan. 24, 1984 Official Gazette at 1038 O.G. 275-283.

GERALD J. MOSSINGHOFF
Apr. 6, 1984. *Commissioner of Patents and Trademarks.*

[1042 O.G. 18]

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(69) **Information in Oath/Declaration Necessary to Identify the Specification in Accordance with 37 CFR 1.63**

Section 1.63 of 37 CFR requires that an oath or declaration "identify the specification to which it is directed." Since filing dates are now granted on applications with the oath or declaration being filed later with a surcharge, the question has arisen as to what information must be supplied in the oath or declaration to identify the specification to which it is directed and to comply with the rule.

The declaration form suggested by the Office includes spaces for filling in the names of the inventors, title of invention, application serial number, filing date, foreign priority application information and United States priority application information. While this information should be provided, it is not essential that all of these spaces be filled in in order to adequately identify the specification in compliance with 37 CFR 1.63.

The following combinations of information supplied in an oath or declaration are acceptable as minimums for identifying a specification:

(1) name of inventor and application serial number;
(2) name of inventor, attorney docket number which was on the application as filed, and filing date of the application;
(3) name of inventor, title of invention and filing date;
(4) name of inventor, title of invention and reference to a specification which is attached to the oath or declaration at the time of execution and filed with the oath or declaration;
(5) name of inventor, title of invention and a statement by a registered attorney or agent that the application filed in the PTO is the application which the inventor executed by signing the oath or declaration.

If the oath or declaration is filed with an "attached" specification as indicated in item (4) above, it must be accompanied by a statement that the "attached" specification is a copy of the specification and any amendments thereto which were filed in the Office in order to obtain a filing date for the application. Such statement must be a verified statement if made by a person not registered to practice before the Office.

Oaths or declarations which do not meet the requirements set forth above will not be accepted as complying with 37 CFR 1.63 for completing an application. Any variance from the above guidelines will only be considered upon the filing of a petition for waiver of the rules under 37 CFR 1.183 accompanied by a petition fee (37 CFR 1.17(h)). Supplemental oaths or declarations in accordance with 37 CFR 1.67 will be required in applications in which the oaths or declarations are not completely filled in but contain sufficient information to identify the specifications to which they apply as detailed above.

GERALD J. MOSSINGHOFF,
Sept. 12, 1983. *Commissioner of Patents and Trademarks.*

[1035 OG 3]

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(70) **Extension of Transition Period to File Oaths or Declarations in Compliance with 37 CFR 1.63**

The Federal Register of Jan. 20, 1983 indicated at 48 FR 2706 that all oaths or declarations filed on and after Feb. 27, 1983, must comply with the requirements of 37 CFR 1.63 except for the transition period as noted below.

The Office indicated that it would continue to accept any oath or declaration in compliance with 37 CFR 1.65 as it existed immediately prior to Feb. 27, 1983 during a transition period ending June 30, 1983, provided that the oath or declaration was attached to and was executed as a part of an application.

Although the Office is not required to do so, it intends to make translated declaration forms available to the public in at least the more frequently required non-English languages. Since these non-English language translations are not yet available, the transition period is extended to end on Sept. 30, 1983 rather than on June 30, 1983. During this period, the Patent and Trademark Office will continue to accept any oath or declaration in compliance with 37 CFR 1.65 as it existed immediately prior to Feb. 27, 1983, if the oath or declaration is attached to and was executed as a part of an application to be filed in the Patent and Trademark Office.

Effective Oct. 1, 1983, all oaths or declarations filed under 37 CFR 1.51(a)(2) as a part of a patent application must fully comply with 37 CFR 1.63.

DONALD J. QUIGG,
May 31, 1983. *Acting Commissioner of Patents and Trademarks.*

[1031 OG 53]

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(71) **Graphical Illustrations in the Specification**

For convenience many applicants have been including graphs or other types of graphical illustrations in the text portion of the specification. These illustrations do not come within the purview of 37 C.F.R. 1.58 which permits tables and chemical and mathematical formulas in the specification in lieu of formal drawings. Frequently, these graphical illustrations do not have satisfactory reproduction characteristics. Moreover, these reproductions are generally less than satisfactory due to the fact that the illustrations are usually reduced in size in order to fit a column of the printed patent page. Accordingly, effective immediately, graphs and graphical type illustrations in the specification will be objected to under 37 C.F.R. 1.58(a) and drawings pursuant to 37 C.F.R. 1.81 will be required.

WILLIAM FELDMAN,
Jan. 12, 1978. *Deputy Assistant Commissioner for Patents.*

[967 O.G. 2]

(72) **Use of Color Drawings in Utility Patents**

Under 37 CFR 1.84, the drawings of a utility patent application must be in black and white. However, on occasion, color drawings may be necessary under 35 U.S.C. 112. In this circumstance, the Patent and Trademark Office will entertain a petition under 37 CFR 1.183 to waive the requirements of §1.84 to the extent that color drawings on DIN size A4 sheets (21.0 by 29.7 cm.) will be accepted for the purposes and under the conditions set forth below.

The petition must be accompanied by five (5) sets of color drawings on DIN size A4 sheets (21.0 by 29.7 cm.) for examination, copying and archival purposes. In light of the substantial administrative and economic burden associated with printing a utility patent with color drawings, the Letters Patent and the patent copies which are printed at issuance of the application will depict the drawings in black and white only. However, copies of the patent with color drawings will be provided by the Patent and Trademark Office upon special request and payment of the fee necessary under 37 CFR 1.21(k) to recover the actual costs associated therewith. Accordingly, the petition must also be accompanied by a proposed amendment to insert the following language as the first paragraph in the portion of the specification containing a brief description of the drawings:

> The file of this patent contains at least one drawing executed in color to meet the requirements of 35 U.S.C. 112. Copies of this patent with color drawing(s) will be provided by the Patent and Trademark Office upon request and payment of the necessary fee.

Such a petition will be granted only when color drawings are determined to be necessary under 35 U.S.C. 112. The petition should be directed to the Office of the Deputy Assistant Commissioner for Patents.

RENE D. TEGTMEYER,
Aug. 6, 1986. *Assistant Commissioner for Patents.*

[1070 OG 10]

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(73) **Multiple Dependent Claims and New Drawing Filing Requirements**

Introduction

On January 24, 1978, Public Law 94-131 (pages 108–115 of "Patent Laws," August 1976 issue) and the Patent Cooperation Treaty came into force. This public law amends the patent statute, Title 35, United States Code, by providing for procedures and requirements set forth in the Patent Cooperation Treaty. Some of these statutory amendments also effect the laws governing the processing and examination of regular United States national applications filed on and after January 24, 1978.

The amendments of the patent law which will affect *U.S. patent applications filed on and after January 24, 1978,* relate to two elements of the patent application: the claims and the drawings. With regard to claims, the amendments to 35 U.S.C. 41 and 112 provide for multiple dependent claims in accordance with PCT Rule 6.4. With regard to drawings, the amendment to 35 U.S.C. 113 changes the requirements for filing drawings in order to obtain a filing date in accordance with PCT Article 7.

Purpose

This memorandum establishes in more detail the new procedures required by the amended statute. Any questions concerning these instructions may be directed to either Mary Turowski (extension 7-3776) in the administration area or Louis Maassel (extension 7-3070) in the examining area.

Revised 37 CFR sections 1.75(c), (f) and (g); and 1.81 and 1.83(c) were published in the *Official Gazette* of February 21, 1978.

Multiple Dependent Claims

Generally, a multiple dependent claim is a dependent claim which refers back in the alternative to more than one preceding independent or dependent claim.

The second paragraph of 35 U.S.C. section 112 has been revised in view of the multiple dependent claim practice introduced by the Patent Cooperation Treaty. Thus, section 112 authorizes multiple dependent claims, as long as they are in the alternative form (e.g., "A machine according to claims 3 *or* 4, further comprising . . ."). Cumulative claiming (e.g., "A machine according to claims 3 *and* 4, further comprising . . .") is *not* permitted. A multiple dependent claim may refer in the alternative to only one set of claims. A claim such as "A device as in claims 1, 2, 3 or 4, made by a process of claims 5, 6, 7 or 8" is improper. Section 112 allows reference to only a particular claim. Furthermore, a multiple dependent claim may *not* serve as a basis for any other multiple dependent claim, either directly or indirectly. These limitations help to avoid undue confusion in determining how many prior claims are actually referred to in a multiple dependent claim.

The amendment of the second paragraph of section 112 further clarifies that the limitations or elements of each claim incorporated by reference into a multiple dependent claim must be considered separately. Thus, a multiple dependent claim, as such, does not contain all the limitations of all the alternative claims to which it refers, but rather, contains in any one embodiment only those limitations of the particular claim referred to for the embodiment under consideration. Hence, a multiple dependent claim must be considered in the same manner as a plurality of single dependent claims.

Restriction Practice

For restriction purposes, each embodiment of a multiple dependent claim will be considered in the same manner as a single dependent claim. Therefore, restriction may be required between the embodiments of a multiple dependent claim. Also, some embodiments of a multiple dependent claim may be held withdrawn while other embodiments are considered on their merits.

Handling of Multiple Dependent Claims by the Application Division

The Application Division will be responsible for verifying whether multiple dependent claims filed with the application are in proper alternative form, that they depend only upon prior independent and single dependent claims and also for calculating the amount of the filing fee. A new form, PTO-1360, has been designed to be used in conjunction with the current fee calculation form PTO-875.

Handling of Multiple Dependent Claims by the Examining Group Clerical Staff

The examining group clerical staff is responsible for verifying compliance with the statute and rules of multiple dependent claims added by amendment and for calculating the amount of any additional fees required. This calculation should be performed on form PTO-1360.

If a multiple dependent claim (or claims) is added in an amendment without the proper fee, the amendment will not be entered until the fee has been received. In view of the requirements for multiple dependent claims, no amendment containing new claims or changing the dependency of claims will be entered before checking whether the paid fees cover the costs of the amended

claims. The applicant, or his attorney or agent, will usually be contacted to pay the additional fee in the same manner as currently in existence for such defects. Where a letter is written in insufficient fee situations, a copy of the multiple dependent claim fee calculation form PTO-1360 will be included for applicant's information.

Handling of Dependent Claims by the Examiner

Should any multiple dependent claim be in an application filed prior to January 24, 1978 or include a claim association or claim structure that violates any of the prohibitions, the claim will be objected to as not being in proper form as required by 37 CFR 1.75 in the next Office action. Such an improper claim will not be further treated on the merits.

When referring to a singular dependent claim or a single embodiment of a multiple dependent claim, as when making a rejection, such a claim or embodiment will be referred to by using the number of all of the claims involved in that claim or embodiment, starting with the highest. For example, if claim 2 was dependent on claim 1, the notations would be 2/1. If in the same application, claim 3 was independent and claim 4 was multiple dependent on claims 2 or 3, the notations would be 4/2/1 and 4/3. Furthermore, if claim 5 depended from claim 4, the notations would be 5/4/2/1 and 5/4/3. Each of these embodiments will be treated individually. It would be possible for claim 4/2/1 to be rejected under section 102 and claim 4/3 to be indicated as avoiding the prior art and being allowable if rewritten in independent form. A number of embodiments may be grouped together if there is a common ground of rejection, but it must be clear how each embodiment is treated.

A claim, such as claim 4, will not be allowed until all embodiments covered thereby are allowable. If an embodiment of a multiple dependent claim avoids the art while other embodiments are rejected over prior art, a statement will be made that that embodiment avoids the art and would be allowed if rewritten in separate dependent or independent form. Wording similar to the following may be used:

> "Embodiment _____ would be allowable if rewritten as a proper dependent or independent claim which contains only the limitations of this embodiment."

Calculation of Fees When Multiple Dependent Claims are Presented, Use of Form PTO–1360

To assist in the computation of the fees for multiple dependent claims, a separate "Multiple Dependent Claim Fee Calculation Sheet," form PTO-1360, has been designed for use with the current "Patent Application Fee Determination Record," form PTO-875. Form PTO-1360 will be placed in the file wrapper by the Application Division where multiple dependent claims are in the application as filed. If multiple dependent claims are not included upon filing, but are later added by amendment, the examining group clerical staff will place the form in the file wrapper. If there are multiple dependent claims in the application, the total number of independent and dependent claims for fee purposes will be calculated on form PTO-1360 and the total number of claims and number of independent claims will then be placed on form PTO-875 for final fee calculation purposes.

If at least $65 is included with the application on filing, but the total fee is insufficient, a "Notice of Insufficient Fee," form PTO-1094, is placed in the file wrapper by the Application Division as is currently done. The notice will be mailed by the examining group in accordance with established procedures.

Calculating Fees for Multiple Dependent Claims Proper Multiple Dependent Claims

Amended section 41(a) of title 35, U.S.C., provides that claims in multiple dependent form cannot be considered as single dependent claims for the purpose of calculating fees. Thus, a multiple dependent claim would be considered to be that number of dependent claims to which it refers. Any proper claim depending directly or indirectly from a multiple dependent claim would also be considered as the same number of dependent claims as referred to in the multiple dependent claim from which it depends.

Improper Multiple Dependent Claim

If any multiple dependent claim is improper, Application Division may indicate that fact by placing an encircled numeral "1" in the "Dep. Claims" column of form PTO-1360. The fee for any improper multiple dependent claim, whether it is defective for not being in the alternative form or for being directly or indirectly dependent on a prior multiple dependent claim, will only be one, since only an objection to the form of such a claim will normally be made.

This procedure also greatly simplifies the calculation of fees. Any claim depending from an improper multiple dependent claim will also be considered to be improper and be counted as one dependent claim.

FEE CALCULATION EXAMPLE

Claim Number

1 Independent
2 Dependent on claim 1
3 Dependent on claim 2
4 Dependent on claim 2 or 3
5 Dependent on claim 4
6 Dependent on claim 5
7 Dependent on claim 1 or 4
8 Dependent on claim 1 or 5
9 Dependent on claim 8
10 Independent
11 Dependent on claim 1 or 10
12 Dependent on claim 1 and 10

FORM PTO-1360 (1/79) U.S. DEPT. COMM. PAT. AND TMK. OFF.

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET

(FOR USE WITH FORM PTO-875)

	AS FILED		AFTER 1ST AMDT		AFTER 2ND AMDT	
	IND.	DEP.	IND.	DEP.	IND.	DEP.
1	1					
2		1				
3		1				
4		2				
5		2				
6		2				
7		⑧				
8		⑧				
9		⑧				
10	1					
11		2				
12		⑫				
TOTAL IND.	2					
TOTAL DEP.	14	↵		↵		↵
TOTAL CLAIMS	16					

Comments on Fee Calculation Example

Claim 1.–This is an independent claim; therefore, a numeral "1" is placed opposite claim number 1 in the "Ind." column.

Claim 2.–Since this is a claim dependent on a single independent claim, a numeral "1" is placed opposite claim number 2 in the "Dep." column.

Claim 3.–Claim 3 is also a single dependent claim, so a numeral "1" is placed in the "Dep." column.

Claim 4.–Claim 4 is a proper multiple dependent claim. It refers directly to two claims in the alternative, namely, claims 2 or 3. Therefore, a numeral "2" to indicate direct reference to two claims is placed in the "Dep." column opposite claim number 4.

Claim 5.–This claim is a singularly dependent claim depending from a multiple dependent claim. For fee calculation purposes, such a claim is counted as being that number of claims to which direct reference is made in the multiple dependent claim which it depends. In this case, the multiple dependent claim number 4 it depends from counts as 2 claims; therefore, claim 5 also counts as 2 claims. Accordingly, a numeral "2" is placed opposite claim number 5 in the "Dep." column.

Claim 6.–Claim 6 depends indirectly from a multiple dependent claim 4. Since claim 4 counts as 2 claims, claim 6 also counts as 2 dependent claims. Consequently, a numeral "2" is placed in the "Dep." column after claim 6.

Claim 7.–This claim is a multiple dependent claim since it refers to claims 1 or 4. However, as can be seen by looking at the "2" in the "Dep." column opposite claim 4, claim 7 directly depends from a multiple dependent claim. This practice is improper under 35 U.S.C. 112 and Rule 1.75(c). Following the procedure for calculating fees for improper multiple dependent claims, a numeral "1" is placed in the "Dep." column with a circle drawn around it to alert the examiner that the claim is improper.

Claim 8.–This claim is a multiple dependent claim since it refers to claims 1 or 5. However, since claim 5 depends from multiple dependent claim 4, claim 8 indirectly depends from multiple dependent claim 4 through claim 5. This practice is improper. See MULTIPLE DEPENDENT CLAIMS, paragraph 2, above. Consequently, a numeral "1" is placed in the dependent claim column with a circle drawn around it.

Claim 9.–Claim 9 is improper since it depends from an improper claim. If the base claim is in error, this error cannot be corrected by adding additional claims depending therefrom. Therefore, a numeral "1" with a circle around it is placed in the "Dep." column.

Claim 10.–Here again we have an independent claim which is always indicated with a numeral "1" in the "Ind." column opposite the claim number.

Claim 11.–This claim refers to two independent claims in the alternative. A numeral "2" is therefore placed in the "Dep." column opposite claim 11.

Claim 12.–Claim 12 is a dependent claim which refers to two claims in the conjunctive ("1 *and* 10") rather than in the alternative ("1 *or* 10"). This form is improper under 35 U.S.C. 112 and Rule 1.75(c). Accordingly, since claim 12 is improper, an encircled numeral "1" is placed in the "Dep." column opposite claim 12.

Calculation of Filing Fee

After the numbers of "Ind." and "Dep." claims are noted on form PTO-1360, each column is added. In this example., there are 2 independent claims and 14 dependent claims or a total of 16 claims. The number of independent and total claims can then be placed on form PTO-875 and the fee calculated. In this example, the total number of claims 16 minus 10 leaves 6, which is multiplied by $2 for an additional total claim fee of $12. The total number of independent claims in the example is 2, which minus 1 is 1, which times the $10 rate is $10. The total filing fee is therefore $65 + $12 + $10, or total of $87.

Drawing Requirements

Revised 35 U.S.C. 113 relaxes the previous requirements for submission of drawings on filing under certain conditions. The first sentence of 35 U.S.C. 113 does require a drawing to be submitted upon filing where such drawing is necessary for the understanding of the invention. In this situation the lack of a drawing renders the application incomplete and as such, the application cannot be given a filing date until the drawing is received. The second sentence of 35 U.S.C. 113 deals with the situation wherein a drawing is not necessary for the understanding of the invention but the case admits of illustration and no drawing was submitted on filing. The lack of the drawing in this situation does not render the application incomplete but rather is treated much in the same manner as an informality. The examiner should require such drawings in almost all such instances. Such drawings could be required during the processing of the application but do not have to be furnished at the time the application is filed. The applicant is allowed at least two months from the date of the letter requiring drawings to submit them.

Handling of Drawing Requirements Under the First Sentence of 35 U.S.C. 113

Under the revised provisions the Application Division examiner will continue to make the initial decision in all new applications as to whether a drawing is "necessary" under the first sentence of 35 U.S.C. 113.

If during examination an examiner feels that a filing date should not have been granted in an application because it does not contain drawings, the matter will be brought to the attention of the Supervisory Primary Examiner (SPE) for review. If the SPE decides that drawings are required to understand the subject matter of the invention, the SPE will return the application to the Application Division with a memorandum requesting cancellation of the filing date and identifying the subject matter required to be illustrated.

Handling of Drawing Requirements Under the Second Sentence of 35 U.S.C. 113

35 U.S.C. 113 also deals with the situation wherein the drawing is not necessary for the understanding of the invention, but the subject matter admits of illustration by a drawing and the applicant has not furnished a drawing. The lack of the drawing in this situation does not render the application incomplete but rather is treated as an informality. A filing date will be accorded with the original presentation of the papers, despite the absence of drawings. In these situations, a drawing or further illustration will normally be required by the examiner. This may be done either prior to examination in a separate letter or in the first Office action and may be handled in much the same manner as informal photocopy drawings are presently handled. The examiner should require drawings where appropriate as early as possible, since the possession of the drawing at that time would facilitate the examination process. A letter requiring drawings may contain wording similar to the following:

> "The examiner has decided that the subject matter of this applicaton admits of illustration by a drawing and that a drawing would facilitate the understanding of the subject matter disclosed. (Continue with a specific mention of those items of which drawings are desired.) Applicant is required to furnish a drawing under 37 CFR 1.81. (Incorporate in Office action or set two-month period for response.)"

The applicant will be given at least two months from the date of such requirement to submit drawings. If the requirement for drawings is included in an Office action, the time for supplying the drawings will be the same as the time of response to the Office action. Upon receipt

of the drawing within the period set, the examiner will check the drawings for new matter. If new matter is included, the drawing will not be entered. It will be objected to as containing new matter. A new drawing without such new matter may be required if the examiner still feels a drawing is needed under 37 CFR 1.81 or 1.83. The examiner's decision would be reviewable by petition to the Commissioner under Rule 1.181. The decision on such a petition would be handled by the Group Director. If a drawing is not timely received in response to a letter from the examiner which requires a drawing, the application becomes abandoned for failure to respond.

RENE D. TEGTMEYER,
Feb. 8, 1978. *Assistant Commissioner for Patents.*

[968 O.G. 7]

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(74) Use of Symbol "Ø" in Patent Applications

The Greek letter Phi has long been used as a symbol in equations in all technical disciplines. It further has special uses which include the indication of an electrical phase or clocking signal as well as an angular measurement. The recognized symbols for the upper and lower case Greek Phi characters, however, do not appear on most typewriters. This apparently has led to the use of a symbol composed by first striking a zero key and then backspacing and striking the "cancel" or "slash" key to result in "Ø" which is an approximation of accepted symbols for the Greek character Phi. In other instances the symbol is composed using the upper or lower case letter "O" with the "cancel" or "slash" superimposed thereon by backspacing or is simply handwritten in a variety of styles. These expedients result in confusion because of the variety of type sizes and styles available on modern typewriters.

In recent years, the growth of data processing has seen the increasing use of this symbol ("Ø") as the standard representation of zero. The "slashed" or "cancelled zero" is used to indicate zero and avoid confusion with the upper case letter "O" in both text and drawings.

Thus, when the symbol "Ø" in one of its many variations, as discussed above, appears in patent applications being prepared for printing, confusion as to the intended meaning of the symbol arises. Those (such as examiners, attorneys, and applicants) working in the art can usually determine the intended meaning of this symbol because of their knowledge of the subject matter involved, but editors preparing these applications for printing have no such specialized knowledge and confusion arises as to which symbol to print. The result, at the very least, is delay until the intended meaning of the symbol can be ascertained.

Since the Office does not have the resources to conduct a technical editorial review of each application before printing, and in order to eliminate the problem of printing delays associated with the usage of these symbols, any questions about the intended symbol will be resolved by the editorial staff of the Office of Publications by printing the symbol "Ø" whenever that symbol is used by the applicant. Any Certificate of Correction necessitated by the above practice will be at the patentee's expense (37 CFR 1.323) because the intended symbol was not accurately presented by the Greek upper or lower case Phi letters (I, 0) in the patent application.

RICHARD J. SHAKMAN,
Dec. 20, 1978. *Assistant Commissioner for Administration.*

[978 O.G. 152]

(75) U.S. Accession to Hague Convention Abolishing the Requirement of Legalization for Foreign Public Documents

On Oct. 15, 1981, the Hague "Convention Abolishing the Requirement of Legalization for Foreign Public Documents" entered into force between the United States and twenty-eight foreign countries that are parties to the Convention. The Convention applies to any document submitted to the United States Patent and Trademark Office for filing or recording, which is sworn to or acknowledged by a notary public in any one of the member countries. The Convention abolishes the certification of the authority of the notary public in a member country by a diplomatic or consular officer of the United States and substitutes certification by a special certificate, or apostille, executed by an officer of the member country. Accordingly, the Office will accept for filing or recording a document sworn to or acknowledged before a notary public in a member country if the document bears, or has appended to it, an apostille certifying the notary's authority. The requirement for a diplomatic or consular certificate, specified in 37 CFR 1.66 and note 1 of 37 CFR 3.45, will not apply to a document sworn to or acknowledged before a notary public in a member country if an apostille is used.

The member countries that are parties to the Convention are:

Austria	Italy	Spain
Bahamas	Japan	Suriname
Belgium	Lesotho	Swaziland
Botswana	Liechtenstein	Switzerland
Cyprus	Luxembourg	Tonga
Fiji	Malawi	U.K. of Great
France	Malta	Britain and
Germany	Mauritius	N. Ireland
Fed. Rep. of	Netherlands	United States
Hungary	Portugal	Yugoslavia
Israel	Seychelles	

The Convention prescribes the following form for the apostille:

Model of certificate

The certificate will be in the form of a square with sides at least 9 centimetres long

APOSTILLE
(Convention de La Haye du Oct. 5, 1961)

1. Country: .....
This public document
2. has been signed by .....
3. acting in the capacity of .....
4. bears the seal/stamp of .....
.....

Certified

5. at ..... 6. the .....
7. by .....
8. No. .....
9. Seal/stamp: 10. Signature:
.....

GERALD J. MOSSINGHOFF,
Nov. 5, 1981. *Commissioner of Patents and Trademarks.*

[1013 O.G. 3]

(76) Simulated or Predicted Tests or Examples

In order to provide for uniform practice before the Patent and Trademark Office, the following clarification of current Office practice relating to simulated or predicted tests or examples is being set forth. This notice specifies the Office policy which is currently in effect and is considered to have been in effect in the past in this area. The wording of the MPEP provisions prior to this amendment went further than was intended. The amended sections below spell out more clearly the Office's position from the start.

The following wording will be substituted in revision number 8 for that presently in paragraph D of section 608.01(p) of the Manual of Patent Examining Procedure.

MPEP §608.01(p)

"D. Simulated or Predicted Test Results or Prophetic Examples

Simulated or predicted test results and prophetical examples (paper examples) are permitted in patent applications. Working examples correspond to work actually performed and may describe tests which have actually been conducted and results that were achieved. Paper examples describe the manner and process of making an embodiment of the invention which has not actually been conducted. Paper examples should not be represented as work actually done. No results should be represented as actual results unless they have actually been achieved. Paper examples should not be described using the past tense."

The first and last paragraphs of MPEP section 707.07(1) are being deleted.

DONALD J. QUIGG,
Apr. 15, 1982. *Deputy Commissioner of Patents and Trademarks.*

[1018 O.G. 27]

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(77) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 50716-5116]

Variety Naming Requirements for Plant Patent Applications

Agency: Patent and Trademark Office, Commerce.
Action: Notice of proposed rulemaking.
Summary: The Patent and Trademark Office proposes to amend certain of the rules of practice for plant patent applications. Under the proposed rules of practice, an applicant for a plant patent will, in addition to the present requirements for obtaining a plant patent, also be required to designate and record a variety name for the plant. These proposed rules fulfill an obligation imposed by the Convention of the International Union for the Protection of New Plant Varieties, to which the United States adheres.
Date: Comments on the proposed rules must be submitted by Oct. 31, 1985, to assure their consideration in formulating the rules put into effect.
Addresses: Address comments to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231. All comments received will be made publicly available in the Patent and Trademark office, Crystal Plz., Arlington, Va., Rm. 3–11C28. No public hearing is planned.
For Further Information Contact: Mr. Stanley D. Schlosser, Office of Legislation and International Affairs, by telephone at (703) 557-3065 or by mail addressed to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231.
Supplementary Information: The requirement for designating a variety by name and recording that name arises from Article 13 of the UPOV (International Union for the Protection of New Plant Varieties) Convention. This Convention became applicable to the United States on Nov. 8, 1981. In the terminology of Article 13, this designation and recordation is referred to as the registration of the variety name. Registration is required for each plant variety protected in a member state of this Union (hereafter referred to as a member state) either by means of a plant patent or an award of breeders' rights.

It is left to each member state to determine exactly how registration will be effected. For the United States, the issuance of a plant patent, including in the patent the name of the variety patented, will constitute registration. The patent examining process will include a consideration of the suitability for registration of the proposed variety name.

A variety name will be registered if it is judged by the Patent and Trademark Office as not likely to mislead or cause confusion regarding the characteristics, value or identity of the variety, or the identity of the breeder. Also, a variety name to the registered must not impair or conflict with any trademark or another name in which other person has a proprietary right. Ordinarily, the patent applicant will be required to register the same variety name (or a translation thereof) for a particular variety in each member state adhering to the UPOV Convention. These are, in broad terms, the conditions set forth in UPOV Article 13 for the registration of a variety name.

A variety name is the generic name by which the variety is popularly or commonly known. The commercial use of a registered variety name, however, will not be regulated by the Patent and Trademark Office. Rather, use of a variety name, whether registered or unregistered (in cases where the variety is not patented), will be regulated by any applicable state and federal unfair competition and trademark laws.

Variety names are referred to in the UPOV Convention as "variety denominations" and often in plant breeding circles as "cultivar names." For the purposes of these rules of practice, the three terms are considered synonymous.

Attention is called to the Commissioner's Notice (**Federal Register**/Vol. 46, No. 22/Oct. 20, 1981) stating that appropriate rules for the naming of plant varieties, as required by the UPOV Convention, will be issued. The **Federal Register** Notice also provides information about interim procedures to be followed until rules of practice are adopted.

The proposed amendments to the rules of practice when finally adopted will replace the interim procedures announced in the **Federal Register** on Oct. 20, 1981, in regard to the patenting in the United States of asexually reproduced plants. These proposed amendments will not apply, however, to any protection sought under the Plant Variety Protection Act (7 U.S.C. 2321 et seq.), administered by the Department of Agriculture and applying only to sexually reproduced plant varieties.

The proposed amendment to §1.163 prescribes the obligation (as set forth in the UPOV Convention) for registering the name of each patented plant variety. The proposed name will be selected by the patent applicant for inclusion in the title of the application, where it will be easiest for a reader of the patent to find. It will be judged for registrability by the examiner to whom the patent application is assigned for examination, who, however, may receive advice or information from officials of the trademark examining operation. As examples of suitable naming practice, note the titles of plant patents Nos. 5,413 and 5,414, "Plum Tree 'Mr. Paul' " and "Chrysanthemum Plant Named Foxy," respectively.

The requirement for registration applies only to plant patent applications actually filed in the United States on or after Nov. 1, 1981, the date on which the UPOV Convention took effect for the United States, even though the application may be entitled to an earlier United States filing date under the provisions of 35 U.S.C. 120, or claim the right of priority in accordance with 35 U.S.C. 119.

The procedure for judging registrability of a variety name will utilize the Office's compilation of variety names in use in the United States and foreign countries. This compilation has been and will continue to be obtained from horticultural, agriculture, floral and other professional societies, other national examination offices, the UPOV Secretariat, standard references, and other sources. Designation of a variety by name is a formal requirement for obtaining a patent, and will be generally administered in the same manner as other formal requirements.

Proposed new §1.166(a) sets forth the requirement for naming a variety to be patented. The criteria to be applied will be those set forth in the International Code of Nomenclature for Cultivated Plants—1980. Its articles 1 to 32 provide substantive rules for naming varieties. The other articles, concerned with non-statutory registration authorities, earlier publication, amendment of the Code and other matters unrelated to the registration criteria, of course, will not be involved. Copies of the Code are available from any of the following: The International Bureau for Plant Taxonomy and Nomenclature, Tweede Transitorium, Uithof, Utrecht, Netherlands; the American Horticultural Society, Mt. Vernon, Va. 22121; the Crop Science Society of America, 677 S. Sego Rd., Madison, Wis. 53711; and the Royal Horticultural Society, Vincent Sq., London, SW IP, 2PE, Great Britain.

Registrability will also take into account the Office's file of both registered trademarks and those proposed for registration. If a conflict exists between a proposed variety name and a registered trademark or one proposed for registration, the variety name will not be registered and a new name will be required.

Proposed §1.168(b) concerns patent applications failing to include a proposed variety name. The examiner will require the submission of a variety name and set a period for compliance.

Proposed §1.168(c) and (d) concern an examiner's refusal to register a proposed variety name. Paragraph (c) requires the applicant, upon a final determination of unregistrability, to submit another variety name. Paragraph (d) assures the applicant's right instead to petition the Commissioner in cases where the proposed name is not accepted. The petition will be subject to a fee and the other requirements of these rules applicable to petitions.

The UPOV Convention requires the breeder to identify the patented variety by the same variety (or a translation thereof) in all member states. A different name may be registered in a particular member state, however, in cases where the name registered earlier in another member state is unsuitable for registration. The Convention's requirements for the consistent naming of varieties are incorporated in proposed §1.168(e). The applicant may during the course of prosecuting the application be required to inform the Office of any other names by which the variety is known, either in the United States or foreign countries, and to provide a translation into English of any such names.

Specific criteria for unsuitability cannot always be defined in advance, but must develop on a case-by-case basis. Certain criteria for unsuitability can be stated at the outset, however. Names that are difficult to pronounce by English speakers, names having adverse business connotations, and names in non-English characters are examples of unsuitability. The applicant must when submitting a name for registration different from that used in another member state explain in writing why the name used in that other state is unsuitable.

A patent owner or the assignee of a patent will, at times, learn that the registered variety name conflicts with another person's trademark or other proprietary right, or be ordered by a court to commercialize the variety under another name. At other times, a registered variety name may turn out to conflict with an earlier-registered variety name or one already in use. Also, changes in language or custom may render an earlier-registered variety name unsuitable for commercial use. In these cases, a different or substitute name may be submitted for registration. Proposed §1.168(f) concerns the issuance of a certificate of correction under 35 U.S.C. 255 for the registration of a substitute name in such situations. The patent owner in applying for the registration of a substitute name will be required to explain in writing why it is necessary to do so.

It is, of course, in the patent applicant's interest to know or learn as early as possible if the proposed variety name conflicts with another's trademark or other proprietary right. Accordingly, proposed §1.168(g) authorizes the Patent and Trademark Office to publish in the *Trademark Official Gazette* each proposed variety name. The Office will also regularly publish in the *Trademark Official Gazette* lists of registered variety names, and such names will be identified in each plant patent and in the *Patent Official Gazette.*

The publication of proposed variety names should greatly reduce the possibility of later conflicts. Conflicts between proposed variety names and proprietary rights will be resolved in an ex parte manner. No inter partes proceedings will be held to resolve a conflict.

Any substitute name registered for a variety will also be published in the *Trademark Official Gazette,* and a certificate of correction containing the substitute name will be issued. If the patent has been assigned, the opportunity to register a different variety name will be available only to the assignee.

In the event a plant breeder proceeds to protect a plant variety under the provisions of section 101 of the patent laws (title 35, U.S.C), the variety naming requirements of these proposed rules shall also apply to that patent application. This possibility is acknowledged in the proposed amendment to section 1.71. Applications for the patenting of microorganisms under section 101 will, however, not be subjected to this variety naming requirement.

Article 13 of the UPOV Convention of Oct. 23, 1978, referred to above, reads:

Article 13

Variety Denomination

(1) The variety shall be designated by a denomination destined to be its generic designation. Each member State of the Union shall ensure that subject to paragraph (4) no rights in the designation registered as the denomination of the variety shall hamper the free use of the denomination in connection with the variety, even after the expiration of the protection.

(2) The denomination must enable the variety to be identified. It may not consist solely of figures except where this is an established practice for designating varieties. It must not be liable to mislead or to cause confusion concerning the characteristics, value or identity of the variety or the identity of the breeder. In particular, it must be different from every denomination which designates, in any member State of the Union, an existing variety of the same botanical species or of a closely related species.

(3) The denomination of the variety shall be submitted by the breeder to the authority referred to in Article 30(1)(b). If it is found that such denomination does not satisfy the requirements of paragraph (2), that authority shall refuse to register it and shall require the breeder to propose another denomination within a prescribed period. The denomination shall be registered at the same time as the title of protection is issued in accordance with the provisions of Article 7.

(4) Prior rights of third parties shall not be affected. If, by reason of a prior right, the use of the denomination of a variety is forbidden to a person who, in accordance with the provisions of paragraph (7), is obliged to use it, the authority referred to in Article 30(1)(b) shall require the breeder to submit another denomination for the variety.

(5) A variety must be submitted in member States of the Union under the same denomination. The authority referred to in Article 30(1)(b) shall register the denomination so submitted, unless it considers that denomination unsuitable in its State. In the latter case, it may require the breeder to submit another denomination.

(6) The authority referred to in Article 30(1)(b) shall ensure that all the other such authorities are informed of matters concerning variety denominations, in particular the submission, registration and cancellation of denominations. Any authority referred to in Article 30(1)(b) may address its observations, if any, on the registration of a denomination to the authority which communicated that denomination.

(7) Any person who, in a member State of the Union, offers for sale or markets reproductive or vegetative propagating material of a variety protected in that State shall be obliged to use the denomination of that variety, even after the expiration of the protection of that variety, in so far as, in accordance with the provisions of paragraph (4), prior rights do not prevent such use.

(8) When the variety is offered for sale or marketed, it shall be permitted to associate a trademark, trade name or other similar indication with a registered variety denomination. If such an indication is so associated, the denomination must nevertheless be easily recognizable.

UPOV Article 30(1)(b), referred to in Article 13, reads as follows:

Article 30

Implementation of the Convention on the Domestic Level; Contracts on the Joint Utilisation of Examination Services

(1) Each member State of the Union shall adopt all measures necessary for the application of this Convention; in particular, it shall:

(a). . .

(b) set up a special authority for the protection of new varieties of plants or entrust such protection to an existing authority;

(c). . .

Other Considerations: The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. There are no information collection requirements in the proposed rule change.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the proposed rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The variety naming requirement will impose very little or no extra work on patent applicants (whether small or large businesses or individuals). The rule will help avoid litigation over variety names and trademark rights, which are far more burdensome than the procedures under the proposed rule.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents.

For the reasons set out in the preamble, 37 CFR Part 1 is proposed to be amended by amending §§1.71, 1.163, 1.168 and 1.17 as set forth below. All proposed additions are printed between arrows.

Part 1—Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C., unless otherwise noted.

2. Section 1.17 is proposed to be amended by adding the following items in numerical order to the list in paragraph (h) to read as follows:

§1.17 Patent application processing fees.

* * * * *

(h) * * *

►—1.168(d) For petitioning the Commissioner to register a plant variety name. . . .

—§1.168(e) For petitioning the Commissioner to register a substitute plant variety name. . . .◄

* * * * *

3. Section 1.17 is proposed to be amended by adding paragraph (d) to read as follows:

§1.71 Detailed description and specification of the invention.

* * * * *

►(d) In the case of an application for the patenting of a plant variety filed under the provisions of section 101 of title 35, United States Code, the requirements for the naming of a variety specified under §§1.163 and 1.168 shall apply thereto.◄

4. Section 1.163 is proposed to be amended by adding the following three sentences at the end of paragraph (a):

§1.163 Specification

(a)* * * ►The title of the invention must include a proposed name for the variety to be patented, where it may be easily recognized as such. A substitute variety name may be proposed during the pendency of the application provided its consideration will not significantly delay disposition of the application. The granting of the patent will be deemed the registration of the variety name for the patented plant for purposes of complying with Article 13 of the International Convention for the Protection of New Varieties of Plants (UPOV), as revised on Oct. 23, 1978.◄

* * * * *

5. A new §1.168 is proposed to be added, which reads as follows:

►§1.168 Variety name, submission to the Office, examination.

(a) The variety name submitted by the patent applicant under §1.163 or §1.71(d) will be examined for compliance with §1.163 using as guidelines for this examination the cultivar naming requirements of the International Code of Nomenclature for Cultivated Plants —1980.

(b) If a proposed variety name is not included as part of the title of the application, as filed, the examiner will set a period of not less than thirty days for providing such name.

(c) If the examiner determines that a proposed variety name is not suitable for registration, or that the proposed name conflicts with a registered trademark or a trademark proposed for registration, the examiner shall refuse registration and set forth in an Office action the reasons for such refusal. Such reasons shall be included in the examiner's action provided under §1.104, subject to the provisions of §1.105. An applicant in disagreement with such refusal may request reconsideration and withdrawal of the refusal, giving the reasons therefor. If the examiner's refusal to register a proposed variety name is repeated and made final, the examiner will at the same time require the applicant to propose another variety name for registration.

(d) After a final requirement by the examiner for submission of a proposed new variety name, the applicant, in addition to making any response due on the remainder of the action, may in lieu of proposing a new variety name petition the Commissioner for review of the examiner's holding together with the fee set forth in §1.17(h).

(e) The applicant will be required to submit for registration the same variety name (or a translation thereof) as that previously registered or proposed for registration in an earlier filed application for protection of the variety in another UPOV member state. Such applicant may submit another name for registration, however, upon a showing satisfactory to the examiner as to why the name originally submitted in another UPOV member state is unsuitable for registration. During the pendency of an application, the examiner may require the applicant to provide any name for the same variety registered or proposed for registration in other UPOV member states before the United States application was filed. If not in English characters, a translation or transliteration of such name or names may be required. An applicant dissatisfied with the examiner's decision concerning the unsuitability of a variety name may petition the Commissioner, together with that fee set forth in §1.17(h).

(f) A patentee, in order to avoid a conflict between a registered variety name and a trademark, or where the registered variety name is likely to be confused with another variety name, or where a registered variety name had acquired an adverse connotation, may propose for registration a substitute variety name for that already registered. Such a proposal shall be in the form of a petition to the Commissioner, together with the fee set forth in §1.17(h). The proposed substitute name will be examined in the same manner as the name originally registered, and upon registration shall be promptly published in the *Official Gazette*. A certificate of correction indicating such substitute name shall be issued for the patent. If the patent has been assigned, only the assignee of record may apply for registration of a substitute name.

(g) The Commissioner shall upon its receipt in the Office promptly publish in the *Trademark Official Gazette* any variety name proposed for registration and the genus and species of the plant involved. Correspondence from a person other than the patent applicant concerning the registrability of a proposed or registered variety name shall be served on the applicant by such person and a certificate of such service shall appear on the copy of the correspondence filed in the Patent and Trademark Office. Such correspondence will be placed in the official file, and in the case of an application will be considered by the examiner in an ex parte manner during the examination of the application.◄

DONALD J. QUIGG,
July 11, 1985. *Acting Commissioner of Patent and Trademarks.*

[FR Doc. 85-19401 Filed 8-15-85; 8:45 am]
Billing Code 3510-16-M

[1058 OG 28]

EXAMINATION OF APPLICATIONS

(78) Examination of Claims For Patentability Under 35 U.S.C. 103

The purpose of this notice is to inform the public of the current Patent and Trademark Office policy concerning determinations of obviousness under 35 U.S.C. 103 in view of the recent Supreme Court decision in *Sakraida* v. *Ag Pro*, 189 USPQ 449 (1976).

The following text is a copy of a memorandum issued to all patent examining personnel relative to this topic. "A clarification of the policy of the Patent and Trademark Office in the examination of claims for patentability under 35 U.S.C. 103 seems in order at this time in view of the Supreme Court's decision in *Sakraida* v. *Ag Pro*, 189 USPQ 449 (decided April 20, 1976) which is similar to the Court's earlier decision in *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.*, 163 USPQ 673 (decided December 8, 1969). "Office policy has consistently been to follow *Graham* v. *John Deere Co.*, 148 USPQ 4559 (decided February 21, 1966) in the consideration and determination of obviousness under 35 U.S.C. 103. The three factual inquiries enunciated therein as a background for determining obviousness are as follows:

1. Determination of the scope and content of the prior art;
2. Ascertaining the differences between the prior art and the claims in issue; and
3. Resolving the level of ordinary skill in the pertinent art.

"Attention is directed to MPEP Section 706 for a more complete discussion of the application of the Graham test. "The Supreme Court reaffirmed and relied upon the Graham three-pronged test in its consideration and determination of obviousness in the fact situations presented in both the Ag Pro and Black Rock decisions. In each case, the Court went on to discuss whether the claimed combinations produced a 'new or different function' and 'a synergistic result,' but clearly decided whether the claimed inventions were unobvious 'on the basis of the three-way test in Graham. Nowhere in its decisions in those cases does the Court state that the 'new or different function' and 'synergistic result' tests supersede a finding of unobviousness or obviousness under the Graham test. "Accordingly, examiners should continue to apply the test for patentability under 35 U.S.C. 103 set forth in Graham. It should be noted that the Supreme Court's application of the Graham test to the fact circumstances in Ag Pro is somewhat stringent, as it was in Black Rock."

C. MARSHALL DANN,
July 8, 1976. *Commissioner of Patents & Trademarks.*

[949 O.G. 3]

(79) Translations of Foreign Language References

Frequently, Office actions cite references that are in a foreign language. In the event a translation of the entire text or portion of the text of the reference is readily available in the examiners' search files, a copy of the translation will normally be included with the Office action. However, applicants are cautioned that the inclusion of a translation with a foreign language reference should not be construed to mean that the examiner used or relied on the translation, or that it is accurate or an official translation made by the Patent and Trademark Office.

While this service may be infrequent, it could be increased by the submission of translations by the applicant to the Office. Accordingly, it is requested that translations of foreign language references be transmitted to the Office, and in particular be transmitted with the response to the Office action or in a separate envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. In addition, it would be of great assistance to the Office in filing the translation, if the translation carried the following: 1. an identification of the foreign language reference and, where possible. 2. its location in the examiners' search files (e.g. location should be known if reference was cited in Office action). If indentifying information is not available, the incoming translation should carry the name "Scientific Library" thereon so that it can be processed by the Library.

WILLIAM FELDMAN,
Oct. 26, 1977. *Deputy Assistant Commissioner for Patents.*

[964 O.G. 24]

(80) Restriction Between Inventions

The practice set out in the notice of June 20, 1968 (852 O.G. 509) is hereby revised as follows.

Under the statute an application may properly be required to be restricted to one of two or more claimed inventions only if they are able to support separate patents and they are either independent or distinct.

If it is demonstrated that two or more claimed inventions have no disclosed relationship ("independent"), restriction should be required, and it is not necessary to further show that the claimed inventions are distinct. If it is demonstrated that two or more claimed inventions have a disclosed relationship ("dependent"), then a showing of distinctness is required to substantiate a restriction requirement.

Where inventions are neither independent nor distinct, one from the other, or they are not sufficiently different to support more than one patent, their joinder in a single application must be permitted.

Every requirement to restrict has two aspects, (1) the reasons (as distinguished from the mere statement of conclusion) why the inventions *as claimed* are either independent or distinct, and (2) the reasons for insisting upon restriction therebetween.

In order to support a requirement to restrict between combination and subcombination inventions, two-way distinctness must be demonstrated.

If it can be shown that a combination, as claimed (1) does not require the particulars of the subcombination as claimed for patentability, and (2) the subcombination can be shown to have utility either by itself or in other and different relations, the inventions are distinct. When these factors cannot be shown, such inventions are not distinct.

Two or more claimed subcombinations, disclosed as usable together in a single combination, and which can be shown to be separately usable, are usually distinct from each other.

In applications claiming inventions in different statutory categories only one-way distinctness is needed to support a restriction requirement. For example, in applications containing claims to both process and apparatus, distinctness may be shown if (1) the process as claimed can be practiced by hand or by another materially different apparatus, or (2) the apparatus as claimed can be used to practice another and materially different process.

As in the notice of May 1, 1974 concerning Markush-Type claims (922 O.G. 1016), if the search and examination of an entire application can be made without serious burden, the examiner is encouraged to examine it on the merits, even though it includes claims to distinct or independent inventions.

WILLIAM FELDMAN,
Apr. 9, 1975. *Deputy Assistant Commissioner for Patents.*

[934 O.G. 450]

(81) Restriction Policy and Practice

The purpose of this notice is to inform the public of the results of the survey that was conducted on restriction requirements made under 35 U.S.C. 121 in the Patent Examining Groups and to report clarifications that have been implemented as a result of a review of restriction policy and practice.

The survey involved about 320 patent applications in which a restriction only Office action had been prepared by an examiner in the period between July—Sept. 1983. The selection of applications was proportioned among Groups according to the volume of restriction requirements during the period. The statistics collected (Appendix A) and the definitions (Appendix B) for each item on the survey form are provided at the end of this notice.

Some of the significant findings of the survey include:

- 19% (61/320) of the requirements surveyed were not reasonable based on a review of the record
- 35% (88/249) of the requirements surveyed (not involving an election of species) were not supported by any reasons, or contained reasons which were clearly inapplicable to the facts
- 41% (53/128) of the actions following an election and traverse did not address the arguments contained in the traverse
- 91% (48/53) of a sample of 53 applications surveyed —the attorney or agent of record had no record of receiving a telephone call requesting an oral election

In response to the results of this survey, existing guidelines in Chapter 800 of the Manual of Patent Examining Procedure (MPEP) have been reviewed with each examiner and supervisor in the Patent Examining Corps in order to promote uniformity of practice and compliance with existing guidelines. A follow-up survey will be conducted in early 1985. In addition, as a result of a review of our existing policy and guidelines, the following clarifications have been made:

(1) Telephone Practice (MPEP 812.01) -
Except in those cases where the requirement for restriction is complex, the application is being prosecuted by the applicant pro se, or the examiner knows from past experience that an election will not be made by phone, the examiner should make a telephone call to the attorney or agent of record and request an oral election in accordance with MPEP 812.01, first paragraph.
If an election cannot, or will not, be made orally at the time of the call or within a reasonable time thereafter, generally three working days, the Office action requiring the election in writing should contain the following sentence
"A telephone call was made to (name of attorney or agent) on (date) to request an oral election to the above restriction requirement, but did not result in an election being made."

(2) Multiple Inventions In A Continuing Application
Where claims to multiple inventions within the meaning of 35 U.S.C. 121 are presented in a continuing application (continuation, division, continuation-in-part including those which may be filed under 37 CFR 1.60 or 1.62), the examiner should make (or repeat) an appropriate requirement for restriction and require an election by the applicant UNLESS
(1) the applicant acknowledges the previous requirement in the parent application and clearly indicates which invention is to be prosecuted if the requirement is repeated. The examiner should make any proper requirement for restriction in the first Office action, state how applicant has indicated an election (e.g. statement in a preliminary amendment or transmittal letter), and include an action on the merits on the claims of the elected invention;

or

(2) The application is a continuation, but not a division or CIP filed as a File Wrapper Continuation (FWC) under 37 CFR 1.62. The examiner should assume that the requirement and election made in the parent application carries over unless otherwise indicated by applicant. The exmainer's first action should include a repetition of the restriction requirement made in the parent application to the extent it is still applicable in the continuation and an indication that prosecution is being continued on the invention elected and prosecuted by applicant in the parent application.

The policy and practice of making requirements final and seeking review by way of petition (37 CFR 1.144) remains unchanged in a continuing application, whether a requirement for election was first made in the parent and renewed in the continuation application or was made for the first time in the continuation application.

(3) Product, Process of Making, Process of Using (MPEP 806.05(i))

Practice in this situation is being amended to conform to Rule 13.2(i) of the Patent Cooperation Treaty (PCT) so that a three way requirement can be required only where the process of making is not "specially adapted" to make the product (i.e. the requirements of MPEP 806.05(f) are met). Otherwise, the process of using must be joined with the claims directed to the product and the process of making the product even though a showing of distinctness between the product and process of using the product (MPEP 806.05(h)) could be made. A determination of the patentability of the product need not be made prior to making a requirement for restriction.

The Manual of Patent Examining Procedure will be revised to reflect these clarifications in the next revision.

GERALD MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Aug. 1, 1984.

[1046 O.G. 2]

(82) **Restriction Practice Survey II**

This notice is intended to inform the public of the results of a follow-up survey of applications containing a written restriction requirement. The results of the first survey were reported in the Official Gazette on Sept. 4, 1984 (1046 OG 2; Restriction Policy and Practice). Survey II involved 319 applications selected at random in the Patent Examining Groups from those in which a restriction only action had been credited to an examiner in the period of July—Sept. 1984. This period was after the Corps Management Meeting on June 5, 1984 in which restriction policy and practice were reviewed with all SPEs and Directors, and followed the distribution of review materials to all examiners. The results of Survey II showed significant improvements over the results of Survey I, but the results were still not considered satisfactory in several aspects.

Survey Procedure: The selection of applications was generally proportioned among the Groups to correspond to the relative proportion of restriction only actions that were completed in each Group in the last quarter of FY 84. A minimum of ten applications were surveyed from each Group. The distribution was as follows:

110 – 16	210 – 11	310 – 10
120 – 37	220 – 10	320 – 18
130 – 33	230 – 10	330 – 24
150 – 47	240 – 30	340 – 30
	250 – 13	350 – 20
	260 – 10	
TOTALS 133	84	102

The survey team consisted of the same people who conducted the first survey. One person from the survey team reviewed each selected application file and completed the survey form regarding the restriction requirement(s) in the file. The same survey form was used in each survey.

In the event an application file could not be located or was not readily available, a different application was selected for the survey. In general, the substitute application was selected from those requirements completed by the same examiner assigned to the original application.

The survey did not include any design applications.

Survey Results: Statistical results of the survey are set forth on the survey form used in the Appendix including summaries on a Corps and discipline level. References in this notice to "Item ____" refer to the numbered items indicated on the survey form. These results indicate an improvement in all areas which were identified as acute problems in the first survey. We did not do a telephone survey to determine whether applicant's representative had been called prior to writing the requirement.

In addition to the survey, the statistics on restriction requirements before and after the training effort following the first survey are of interest. Statistics show that the number of restriction only actions has decreased 36% Corps-wide (52% in Group 120 which had the highest volume in the first survey) following our training effort. These statistics are shown below.

Quarter	Total First Actions	Total Corps Restriction Requirements	Group 120 Restriction Requirements
Apr–Jun 1984	32,035	2,771	514
Jul–Sep 1984	32,216	1,939	220
Oct–Dec 1984	28,158	1,522	212
	(32,358)*	(1,775)*	(247)*
Oct–Dec vs Apr–Jun		−36%	−52%.

*Figures adjusted (7/6 of actual) to reflect a 7 pay period quarter for comparison with the Apr.–June and July–Sept. quarters which included 7 pay periods.

In addition, 24% of the applications in the second survey contained a specific reference to a telephone call that was made by the examiner, but did not result in an election being made. It was also apparent that some of the requirements were sufficiently complex to warrant a written communication.

The applications reviewed in the second survey resulted in the conclusion that 9% of the requirements that were made were not reasonable on the record that was reviewed (Item 10 – 30/319). This compares to 19% (61/320) in the first survey. Of the 30 cases in which a conclusion of unreasonableness was made, the requirement was traversed in 22 (73%) of those cases, not traversed in 7 cases (23%), and no response was filed in 1 case. In the 22 cases where the unreasonable requirement was traversed, the requirement was withdrawn in 10 cases, not withdrawn in 8 cases, and no subsequent action had been made in 4 cases. In the first survey, 11 unreasonable requirements were withdrawn out of 61 made. The survey form on each of the unreasonable requirements in the second survey was returned and discussed with the Group Director.

In our opinion, the reasons provided by the examiner for insisting upon restriction were not proper (either non-existent or based on the wrong criteria) in 18% (Item 5j – 57/319) of the applications surveyed — compared to 35% in the first survey. In many of these cases, the reviewer determined that the requirement was justified, but for reasons which the examiner did not set forth in the requirement.

Our second survey revealed that applicant had traversed the requirements in 134 cases (Item 7c), and that where the examiner had given another action in those cases (Item 8 – 98), the reasons in the traverse had not been responded to in 30% (Item 8b – 30/98) of the cases. This represents a very modest improvement of the results in the first survey where 41% (53/128) had not responded to the arguments presented in applicants traverse.

In addition to the statistical results, the survey team met to discuss some of the problems observed during the survey. Several members of the team again observed that problems were more likely to arise where complex requirements involving a large number of claims and/or inventions are encountered, and where the claim schedule required the application of combination—subcombination criteria to show patentable distinctness (MPEP 806.05c – two-way distinctness). Where three or more inventions are presented in a single application, it was observed that the examiner rarely showed distinctness among all of the combinations of groups (e.g. I–II, II–III, I–III). Another observation that was frequently made was that many of the problems with incomplete requirements could have been avoided by the use of the form paragraphs and associated instructions.

Further Action: While the second survey indicated that significant improvements have been realized in our pursuit of uniformity in restriction practice, we have not achieved an acceptable level of performance in several areas. The same types of problems predominated in each survey, but are now at a reduced level. There is clearly a continuing need for supervisory review.

Supervisors will take the opportunity to emphasize the following points to examiners in their Art Units:

(1) Use of telephone when appropriate to minimize pendency time;
(2) Reasons to support the requirement (to satisfy the criteria for independence of patentable distinctness) *and* reasons for insisting upon restriction should be given in each written requirement. Mere conclusions are not sufficient;
(3) The substance of arguments contained in applicant's traverse should be responded to in the Office action following the traverse;
(4) A showing of two-way distinctness is required in situations where combination-subcombination criteria are applicable (MPEP 806.05c); and
(5) Use of appropriate form paragraphs should be encouraged.

In addition, each Group will review all restriction requirements made in the Group in a pay period at least once every six months.

Finally, review of restriction practice will not be made a component part of the Quality Review Program on an ongoing basis because of the desirability of identifying problems of this type before prosecution is over and the desirability of maintaining their focus on substantive issues. Of course, the Quality Review Staff will continue to bring problems with restriction requirements to the attention of the Director when they are encountered in the course of their review procedures.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

[1053 OG 5]

(83) **Revised Practice Re Markush-Type Claims**

This notice deals with Markush-type generic claims which include a plurality of alternatively usable substances or members. In most cases, a recitation by enumeration is used because there is no appropriate or true generic language. In many cases, the Markush-type claims include independent and distinct inventions. This is true where two or more of the members are so unrelated and diverse that a prior art reference anticipating the claim with respect to one of the members would not render the claim obvious under 35 U.S.C. 103 with respect to the other member(s).

In applications containing claims of that nature, the Examiner may require a provisional election of a single species prior to examination on the merits. The provisional election will be given effect in the event that the Markush-type claim will be examined fully with respect to the elected species and further to the extent necessary to determine patentability. Should the Markush-type claim be found not allowable, examination will be limited to the Markush-type claim and claims to the elected species, with claims drawn to species patentably distinct from the elected species held withdrawn from further consideration.

As an example, in the case of an application with a Markush-type claim drawn to the compound C-R, wherein R is a radical selected from the group consisting of A, B, C, D, and E, the Examiner may require a provisional election of a single species, CA, CB, CC, CD, or CE. The Markush-type claim would then be examined fully with respect to the elected species and any species considered to be clearly unpatentable over the elected species. If on examination the elected species is found to be anticipated or rendered obvious by prior art, the Markush-type claim and claims to the elected species shall be rejected, and claims to the non-elected species would be held withdrawn from further consideration. As in the prevailing practice, a second action on the rejected claims would be made final.

On the other hand, should no prior art be found that anticipates or renders obvious the elected species, the search of the Markush-type claim will be extended. If prior art is then found that anticipates or renders obvious the Markush-type claim with respect to a *non-elected species*, the Markush-type claim shall be rejected and claims to the non-elected species held withdrawn from further consideration. The prior art search, however, will not be extended unnecessarily to cover all non-elected species. Should applicant, in response to this rejection, as by amending the Markush-type claim to exclude the species anticipated or rendered obvious by the prior art, the amended Markush-type claim will be re-examined. The prior art search will be extended to the extent necessary to determine patentability of the Markush-type claim. In the event prior art is found during the re-examination that anticipates or renders obvious the amended Markush-type claim, the claim will be rejected and the action made final. Amendments submitted after the final rejection further restricting the scope of the claim will not be entered.

If the members of the Markush group are sufficiently few in number or so closely related that a search and examination of the entire claim can be made without serious burden, the Examiner is encouraged to examine all claims on the merits, even though they are directed to independent and distinct inventions. In such a case, the Examiner will not follow the above procedure and will not require restriction.

This notice supersedes the practice set out in 922 O.G. 1016. dated May 1, 1974.

Although the above practice is now in effect, a rule change proposal is also being considered to provide for prosecution of multiple inventions in a single patent application by submission of additional fees.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

Oct. 23, 1978.

[976 O.G. 128]

(84) **Unity of Invention Practice in International Applications and National Phase Applications Entered Under 35 U.S.C. 371**

The purpose of this notice is to set forth procedural guidelines for deciding questions of unity of invention which may arise in international applications when searched by the United States Patent and Trademark Office (USPTO) as an International Searching Authority and when examined during the national phase in the United States as a Designated Office after entry under 35 U.S.C. 371 in connection with the Patent Cooperation Treaty (PCT).

The May 28, 1986, decision in *Caterpillar Tractor Co. v. Commissioner of Patents and Trademarks*, Civil Action No. 84–1212–A, (E.D. Va.) held the Patent and Trademark office interpretation of 37 CFR 1.141(b)(2) as applied to unity of invention determinations in international applications was not in accordance with the Patent Cooperation Treaty and its implementing legislation. In the Caterpillar international application, the USPTO, when acting as an International Searching Authority, held lack of unity of invention between a set of claims directed to a process for forming a sprocket and a set of claims drawn to an apparatus (die) for forging such a sprocket. The court stated that it was an unreasonable interpretation to say that the expression "specifically

designed" as found in PCT Rule 13.2(ii) means that the process and apparatus can only be used with each other as set forth in the Manual of Patent Examining Procedure (MPEP) §806.05(e).

Therefore, in considering international applications as an International Searching Authority and during the national phase as a Designated Office under 35 U.S.C. 371, PCT Rule 13.1 and 13.2 as interpreted in *Caterpillar* will be followed when considering unity of invention of claims of different categories without regard to 37 CFR 1.141. No change is being made in the restriction practice under 37 CFR 1.141(b) and (c) in United States national applications filed under 35 U.S.C. 111 outside the PCT. No change in practice is being made in regard to claims of the same category of invention either in PCT or U.S. national applications. Such a change in U.S. national restriction practices would require a statutory change in the fee levels to cover the additional examining effort required in individual patent applications.

PCT Rules 13.1 and 13.2 are reproduced below:

PCT RULE 13
Unity of Invention

13.1 Requirement

The international application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept ("requirement of unity of invention").

13.2 Claims of Different Categories

Rule 13.1 shall be construed as permitting, in particular, one of the following three possibilities:

(i) in addition to an independent claim for a given product, the inclusion in the same international application of an independent claim for a process specially adapted for the manufacture of the said product, and the inclusion in the same international application of an independent claim for a use of the said product, or

(ii) in addition to an independent claim for a given process, the inclusion in the same international application of an independent claim for an apparatus or means specifically designed for carrying out the said process, or

(iii) in addition to an independent claim for a given product, the inclusion in the same international application of an independent claim for a process specially adapted for the manufacture of the product, and the inclusion in the same international application of an independent claim for an apparatus or means specifically designed for carrying out the process.

PCT Rule 13 only will be applied in the restriction practice used in national phase applications entered under 35 U.S.C. 371 because 35 U.S.C. 372(b)(2) provides that "The Commissioner may cause the question of unity of invention to be reexamined under section 121 of this title, within the scope of the requirements of the treaty and the Regulations".

Guidelines As to Implementation of Revised Unity of Invention Practice in International Applications and National Phase Applications Entered Under 35 U.S.C. 371

(1) The revised practice for international and national phase applications will *not* be used for national applications filed under 35 U.S.C. 111.

(2) The revised practice will *not* affect the treatment of the claims of any applications (national or international) where the question of lack of unity of invention relates to other than different categories of invention issues. Therefore, restriction and unity of invention practice involving, for example, Markush type claims, genus-species, intermediate-final product or combination-subcombination situations are *not* affected for any applications by this notice.

(3) The expression "and as set forth in §§1.141" in 37 CFR 1.481(a) will no longer be considered operative in view of the decision in *Caterpillar Tractor Co.*, supra. The criteria of §1.141 continue to be applicable to U.S. national applications filed under 35 U.S.C. 111 as they were in effect prior to the Caterpillar decision and essentially the same as the practice which was in effect for many years prior to the PCT implementation. That is, practice will continue as set forth in MPEP Chapter 800 as modified in 1046 OG 2 for the practice relating to product, process of making and process of using. The practice in this latter situation is that a three way requirement for restriction can only be required where the process of making is distinct from the product (i.e., the requirements of MPEP 806.05(f) are met). Otherwise, the process of using must be joined with the claims directed to the product and the process of making the product even though a showing of distinctness between the product and process of using the product (MPEP 806.05(h)) could be made. A determination of the patentability of the product need not be made prior to making a requirement for restriction.

(4) The criteria of PCT Rule 13 will be applied when determining unity of invention of claims to different categories of invention in considering international applications as an International Searching Authority and during the national phase as a Designated Office under 35 U.S.C. 371.

(5) The revised practice will apply to all international applications before the PTO as an International Searching Authority in which no search report has been issued and in all pending national stage applications entered under 35 U.S.C. 371 in which a holding of lack of unity of invention (requirement for restriction) has not been made final by the examiner or acquiesced in by the applicant as of the date of this notice.

(6) In applying PCT Rule 13 to international applications as an International Searching Authority and to national phase applications under 35 U.S.C. 371, examiners will consider for unity of invention all of the claims to different categories of invention in the application and will permit retention in the same application for searching and/or examination, of claims to the categories which meet the requirements of any one of PCT Rule 13.1(i) to (iii).

In view of the court's treatment of the USPTO's distinctness test in Caterpillar, the USPTO will also permit in the same international application the following two combinations:

(a) an independent claim for a given product and an independent claim for a process specially adapted for the manufacture of said product.

(b) an independent claim for a given product and an independent claim for a process of using the said product.

If the different categories of claims do not fall within any *one* of PCT Rule 13.2(i) to (iii) or additional combinations (a) or (b) above, i.e., they claim more or less categories of invention than permitted in any one of PCT Rule 13.2(i) to (iii) or combination (a) or (b) above, unity of invention may not be present. Further, an independent claim for a use in PCT Rule 13.2(i) and combination (b) above is construed as being limited to a claim directed to a process.

In determining unity of invention under PCT Rule 13.2(i) and (iii) and combination (a) above, the examiner will consider the word "specially" which appears before "adapted" to be an emphasis word rather than a limitation. In determining unity of invention under PCT Rule 13.2(ii), the examiner will consider the word "specifically" which appears before "designed" to be an emphasis word rather than a limitation.

Detailed Explanation

Under PCT Rule 13.2, Unity of Invention as to different categories of inventions is covered on the basis of 4 different categories of invention. They are:

A. a product
B. a process (for manufacture)
C. a use of the said product
D. an apparatus or means for carrying out the process for manufacture.

PCT Rule 13.2 provides for grouping of certain of these different categories of inventions and retaining unity of invention.

i. PCT Rule 13.2(i) provides for grouping claims to:

A. a product
B. a process for the manufacture of said product
C. a use of the said product

ii. PCT Rule 13.2(ii) provides for grouping claims to:

B. a process (e.g. for the manufacture of a product)
D. an apparatus or means for carrying out the said process.

iii. PCT Rule 13.2(iii) provides for grouping claims to:

A. a product
B. a process for the manufacture of the product
D. apparatus or means for carrying out the process.

Also permitted by the USPTO are combinations:

(a) A. a product
B. a process for the manufacture of said product

(b) A. a product
C. a use of the said product

If an application includes claims to all the categories of invention set forth in any one of PCT Rule 13.2(i), (ii), (iii), combinations (a) or (b) above, and no additional categories of invention are present, unity of invention exists and no additional search fees should be required or restriction requirement made.

For example, if an application contains claims to only a process for the manufacture of a product and claims to a use of a product and no product claims is present, there is lack of unity of invention since the provisions of Rule 13.2(i) do not apply and the process for manufacture of a product is independent of the use of the product since neither is dependent on the other. Also, if claims to all three categories of PCT Rule 13.2(i) are present at the time of the first Office action and all the product claims are canceled in the response to the first Office action, a requirement for restriction could be made, if appropriate, in the second Office action in view of the independent inventions remaining in the application. PCT Rule 13.2(i) would no longer apply since all three categories of claims would no longer be present in the application. However, the fact that claims to a certain category of invention are unpatentable does not affect the question of unity of invention provided the unpatentable claims are retained in the application.

Where claims to a category of invention in addition to those listed in any one of PCT Rule 13.2(i), (ii), (iii) or combinations (a) or (b) above included in an application, unity of invention may be lacking between the claims drawn to the categories set forth in any *one* of PCT Rule 13.2(i), (ii), (iii) or combinations (a) or (b) above, and the claims to the additional category of invention. For example, if an application contained claims to a process for manufacture, claims to an apparatus or means for carrying out the process and claims to a use of the product manufactured, there could be lack of unity of invention. In such a situation the examiner should group the claims to the process for manufacture and the claims for an apparatus or means for carrying out the process because unity of these two categories exists under PCT Rule 13.2(ii). The claims to the use of the product could be separately grouped if the "use" is shown to be "independent and distinct" of both the "process for manufacture" and the "apparatus or means for carrying out the process" as provided in Chapter 800 of the Manual of Patent Examining Procedure (MPEP).

When the claims presented in an application are directed to several categories of invention so that more than one paragraph of PCT Rule 13.2 and combinations (a) or (b) above applies, the examiner will inspect the claims to see if the categories of invention set forth in PCT Rule 13.2, paragraphs (i), (iii) and (ii), and then combinations (a) or (b) above are present in the application in that order. For example, if the categories of PCT Rule 13.2(i) are found in the application, the claims to those categories stated in PCT Rule 13.2(i) will be considered as one invention and any claims to different categories of invention will be reviewed to determine if they are "independent and distinct" of *all* the claims covered in PCT Rule 13.2(i) in accordance with theprovisions of Chapter 800 of the MPEP.

Under PCT Rule 13.2 and combinations (a) and (b) above, unity will exist where the claims are limited to one invention in each category of invention recited. For example, under PCT Rule 13.2(i), claims are permitted to one product, one process of manufacturing and one use. If multiple products, processes of manufacture or uses are claimed, the first invention in the category first mentioned in the claims will be considered as the elected invention. The first recited invention of each additional category which is related as described in paragraph 7 below with the first invention as indicated in the previous sentence will be considered elected. Accordingly, for example, if multiple products are claimed, the first recited product is constructively elected and the first recited process, if multiple processes adapted for making and/or using the product are claimed, is also constructively elected. Any such holding by the examiner will be made in the form of a restriction requirement in an application entered in the USPTO under 35 U.S.C. 371. Such a restriction requirement would be made on the basis of criteria set forth in MPEP Chapter 800. Applicant would have the right to traverse such a restriction requirement in the response to the Office action.

(7) The inventions recited by the claims of different categories must be drawn to related rather than independent inventions. For example, the product as claimed in PCT Rule 13.2(i) and combinations (a) and (b) above must be able to be made by the claimed process for manufacture and the use claimed must be able to use the claimed product. Likewise in PCT Rule 13.2(ii), the apparatus as claimed must be able to carry out the claimed process. In PCT Rule 13.2(iii), the claimed process of manufacture must be able to make the claimed product and the claimed apparatus or means must be able to perform the claimed process of manufacture.

(9) Applicants should clearly indicate on all application papers filed for entry under 35 U.S.C. 371 and 37 CFR 1.61 that the filing is being made under 35 U.S.C. 371. Otherwise, the application papers will be treated as having been filed under 35 U.S.C. 111.

(10) Any prior notices or policies relating to unity of invention which are inconsistent herewith are superceded to the extent they are inconsistent with this notice.

Appropriate changes in the Code of Federal Regulations will be proposed in due course to adjust the level of the search fees and national fees of §1.445 to recover the cost of searching and examining international applications with claims to different categories of invention in a single international application. The fees were originally set based on the unity of invention practice previously in effect.

If necessary, additional guidance for processing applications under PCT Rule 13 will be issued as experience is gained.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Aug. 15, 1986.

[1070 OG 11]

(85) Revised Procedures for Recording Searches and Considerations of Certain Prior Art

In order to provide a more complete, accurate and uniform record of what has been searched and considered by the examiner for each application the Patent and Trademark Office has established revised procedures for recording search data in the application file. Such a record is of importance to anyone evaluating the strength and validity of a patent, particularly if the patent is involved in litigation. These new procedures will also facilitate the printing of certain search data on patents.

Under the revised procedures, searches are separated into two categories and listed, as appropriate, in either the "SEARCHED" box or a newly added "SEARCH NOTES" box on the file jacket.

Until file jackets can be reprinted to include a second search data box, all file jackets for new applications will have the "SEARCH NOTES" box stamped therein by the Mail Room. If additional space is required, entries will be continued on the outside right flap of the file jacket.

The revised procedures will apply to all new applications in which the first search is made after April 1, 1977 and do not affect the manner in which references are listed on the form PTO-892. "Notice of References Cited." Appropriate changes in the Manual of Patent Examining Procedure will be made.

A. "SEARCHED" Box Entries

Search entries made here, except those for search updates (see item A. 3 below), will be printed under "Field of Search" on the patent front page. Therefore, the following searches will be recorded in the "SEARCHED" box by the examiner along with the date and the examiner's initials, according to the following guidelines:

1. *A complete search of a subclass,* including all United States and foreign patent documents and other publications placed therein. The complete classification (class and subclass) will be recorded.
2. *A limited search of a subclass,* for example, a search that is restricted to an identifiable portion of the patent documents placed therein. If, however, only the publications in a subclass are searched, such an entry is to be made under "SEARCH NOTES" rather than under "SEARCHED." (See item B, 4 below.)
   The class and subclass, followed by the information defining the portion of the subclass searched in parenthesis, will be recorded.
3. *An update of a search previously made.*
   This search entry will be recorded in a manner to indicate clearly which of the previously recorded searches have been updated, followed by the expression "(updated)." Search update, entries, although recorded in the "SEARCHED" box, will not be printed.
   When a search made in a parent application is updated during the examination of a continuing application, those searches updated, followed by "(updated from parent S.N. _____)" will be recorded. If the parent has been patented, the patent number "Pat. N. _____" instead of serial number in the above phrase will be recorded.
4. *A mechanized search* of a file of documents in a specific art, conducted by using key terms to retrieve documents. The name of the mechanized search system as it appears in the following list will be recorded along with the expression "MS File" to indicate mechanized search file.

Mechanized Search Systems

Termatrex Systems:

Automatic Fuel Controls
Boots & Shoes
Chemical Testing
Combined Fasteners
Electrical Contact Materials
Surface Bonding Using Critical Metal

Edge-Notched Card System:

Fluid Devices

Punch Card Systems:

Electrolysis
Organometallics
Steroids

Computer Controlled Microfiche Search Systems (CCMSS):

A-D Convertors
Digital Data Processing Systems
Special Purpose Digital Processing Systems

When a search with a Termatrex or Edge-Notched card system is conducted, the examiner will complete form PTO-1041 in two copies, recording all queries searched, even those which yield only nonrelevant documents. All documents returned by the system in response to a query which are not actually reviewed will have an "X" drawn through their associated access and patent numbers. When conducting a search with a Punched Card system, the examiner will place in the application file the Code Sheet on which the terms searched have been marked along with the machine tape listing the documents retrieved. Any document not actually reviewed will have an "X" drawn through that document's number on the listing.

When conducting a search with the CCMSS search systems, the machine-produced search report, which lists the terms and tagged documents, will be placed in the application file on the right flap of the file jacket. Any tagged document not actually reviewed will have an "X" drawn through that document number on the search report.

B. "SEARCH NOTES" Box Entries

Entries made in the "SEARCH NOTES" box are of equal importance to those placed in the "SEARCHED" box; however, these entries will not be printed on any resulting patent. They are intended to complete the application file record of areas and/or documents considered by the examiner in the search. The examiner will record the following searches in the "SEARCH NOTES" box and in the manner indicated, with each search dated and initialled:

1. *A cursory search,* or scanning, of a subclass, i.e., a search usually made to determine if the documents classified there are relevant. The classification will be recorded, followed by "(Cursory)."
2. *A consultation* with other examiners to determine if relevant search fields exist in their areas of expertise. The class and subclass discussed, if not actually searched, will be recorded, followed by "(consulted)." This entry may also include the name of the examiner consulted and the art unit.
3. *A search of a publication* not located within the classified patent file, e.g., a library search, a text book search, a Chemical Abstracts search, etc. The following data will be recorded for each type of literature search:

   a. *Abstracting publications,* such as Chemical Abstracts or the Engineering Index—the name of the publication, the list of terms consulted in the index and the period covered will be recorded.
   b. *Periodicals*—The title and period or volumes covered, as appropriate will be recorded.
   c. *Books*—The title and author, edition or date, as appropriate, will be recorded.
   d. *Other types of literature* not specifically mentioned above (i.e., catalogs, manufacturer's literature, private collections, etc.).
   Unless the search is a cursory or browsing one, data as necessary to provide unique identification of material searched will be recorded. Specific materials cited by the examiner will not be recorded again here.
   e. *Computer search in Scientific Library*—An on-line computerized literature searching service which uses key terms and index terms to locate relevant publications in many large bibliographic data bases is available to examiners in the Scientific Library of the Patent and Trademark Office. A member of the library staff is assigned to assist examiners in selecting key terms and to program the search.
   There are two on-line search systems: The Lockheed Information Systems and the SDC Search Service.
   These search systems include many data bases.
   A copy of the search printout will be made and placed in the application file, attached to the right flap of the file jacket.
   The examiner will also indicate which publications were reviewed by initialling and dating the copy of the printout in the left margin adjacent to each reviewed publication. If only an abstract of a document was reviewed, the note of "ck'ed abst." will be made next to the initials and date. If the complete document was reviewed, the note "ck'ed doc." will be placed with the initials and date.
4. A search of only the *publications in a subclass.* The class and subclass followed by "(publications only)" will be recorded.
5. *A review of art cited in a parent application* or in an original patent, as required for all continuing and reissue applications, or a review of art cited in related applications or patents mentioned within the specification, such as those included to provide background of the invention. The serial number of a parent application that is still Pending or abandoned, followed by "refs. checked" or "refs. ck'ed" will be recorded. If for any reason not all of the references are checked because they are not available or clearly not relevant, such exceptions will be noted. The patent number of a parent or related application that was patented or of an original patent now being reissued will be recorded along with the expressions "refs. checked" or "refs. ck'ed."

C. Not Recorded

The following data will not be recorded in either of the search boxes, but will be noted in the application file as indicated below:

1. *Citations of prior art by applicants conforming to Rule 98 and the practice thereunder.*
   In each instance where all prior art referred to in a paper placed in the application file is considered, the examiner will place the notation "all ck'ed" and his or her initials adjacent to the citation.
2. *Citations of prior art by applicants not conforming to Rule 98 and the practice thereunder.*
   In each instance where an examiner considers, but does not cite on form PTO-892, specific prior art referred to in a paper placed in the application file, the examiner will place a notation adjacent to the reference. If all the references referred to in such a paper are reviewed, the examiner will place the notation "all ck'ed" and his or her initials adjacent the citation. If included in the specification, the examiner will write his or her initials adjacent to any reference(s) checked and enter "checked" or "ck'ed" in the left margin opposite the initials. If presented in a separate paper or in the remarks of an amendment, the examiner's initials and "checked" or "ck'ed" will be entered adjacent to the citation(s) or wherever possible to indicate clearly those checked.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Feb. 22, 1977.

[956 O.G. 1546]

(86) Prior Art Cited by Applicants

Effective immediately, applicants are encouraged to use new form PTO-1449, "List of Prior Art Cited by Applicant," when preparing a prior art statement under 37 CFR 1.97–1.99. A copy of the form is included herewith from which suitable reproductions can be made. This form, which will enable applicants to provide the PTO with a uniform listing of prior art citation, supersedes form PTO-3.72.

While the filing of prior art statements is voluntary, the procedure is governed by the guidelines of Section 609 of the Manual of Patent Examining Procedure and 37 CFR 1.97 through 1.99. To be considered a proper prior art statement, form PTO-1449 shall be accompanied by an explanation of relevance of each listed item, a copy of each listed patent or publication or other item of information and a translation of the pertinent portions of foreign documents (if an existing translation is readily available to the applicant), and should be submitted in a timely manner as set out in MPEP Sec. 609.

Examiners will consider all prior art citations submitted in conformance with 37 CFR 1.98 and MPEP Sec. 609 and place their initials adjacent the citations in the boxes provided on the form. Examiners will also initial citations not in conformance with the guidelines which may have been considered. A reference may be considered by the examiner for any reason whether or not the citation is in full conformance with the guidelines. A line will be drawn through a citation if it is not in conformance with the guidelines and has not been considered. A copy of the submitted form, as reviewed by the examiner, will be returned to the applicant with the next communication. The original of the form will be entered into the application file.

Each citation initialed by the examiner will be printed on the issued patent in the same manner as prior art cited by the examiner on form PTO-892.

The reference designations "AA," "AB," etc. (referring to applicant's reference A, Applicant's reference B, etc.) will be used by the examiner in the same manner as examiner's reference designations "A," "B," "C," etc. on Office Action Form PTO-1142.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Aug. 15, 1980.

[998 O.G. 8]

(87) Report on Results of an Oct. 1985—Feb. 1986 Survey on the Citation by Applicants of Information Disclosure Statements in Patent Applications

This report summarizes the data compiled from a sample of 1200 allowed utility applications surveyed in the Office of Quality Review during the period of Oct. 1, 1985 to Feb. 14, 1986.

For purposes of the survey, a "citation", whether appearing in the specification or in a separate paper, is defined as either (1) a listing of patents or publications together with a concise explanation of the relevance of each listed item (i.e. an "information disclosure statement" under 37 CFR 1.98(a)), or (2) a "mere listing" of patents or publications. In addition, a "reference", or "document", is defined as any patent or other publication cited by applicant.

This survey report is similar to and presented in the same general format as the survey reports published in the Official Gazette of Nov. 23, 1976, pages 1356 and 1357, of Sept. 26, 1978, pages 22 and 23, and of Aug. 12, 1980, pages 8 and 9. It should be noted, however, that the phrase "prior art statement" used throughout the three previous survey reports has been replaced by the more appropriate phrase "information disclosure statement" reflecting the current terminology of 37 CFR 1.97–1.99 as amended.

This survey indicates, among other things, that 60% of the sampled applications include citations by applicants. This is somewhat less than the 63% finding in the survey reported in the 1980 O.G. and the 64% finding in the 1978 survey but still represents an improvement over the 54% finding in the 1976 survey. In addition, more citations are being submitted later in the prosecution than previously. The percentage of applications having citations submitted in separate papers has increased while the percentage of applications having such papers submitted within three months of the filing of an application is down from 79% in 1978 and 73% in 1979 to 53% presently. Also, while the percentage of applications having citations accompanied by copies of references cited has increased, overall compliance with Office guidelines has decreased.

A separate, recent informal review of citations made after allowance similarly indicated frequent noncompliance with the guidelines of Section 609 of the Manual of Patent Examining Procedure. Often, citations were in the form of prior art search reports made by foreign patent offices many months or years earlier, submitted without copies of the references, discussion of materiality, or any explanation for the late submission. The Office is presently considering action to remedy these problems.

The statistics are otherwise presented without comment as follows:

		Chem.	Elec.	Mech.	Total
(1)	Number of applications in sample	350	415	435	1200
	(Percent of total sample)	29%	35%	36%	100%
Number of applications having citations submitted in:					
(2)	Separate papers only	69	82	82	233
	(Percent of sample 2/1)	20%	20%	19%	19%
(3)	Both separate paper *and* in specification	41	60	44	145
	(Percent of sample 3/1)	12%	14%	10%	12%
(4)	The specification only	121	94	121	336
	(Percent of sample 4/1)	35%	23%	28%	28%
(5)	Total number of applications having citations	231	236	247	714
	(Percent of sample 5/1)	66%	57%	57%	60%

Application in which the applicant submitted citations in the *specification*.

		Chem.	Elec.	Mech.	Total
(6)	Number of applications including citations in the specification	162	154	165	481
	(Percent of applications having citations in the specification 6/1)	46%	37%	38%	40%
(7)	Number of applications including mere listing of references in the specification	12	6	17	35
	(Percent of applications having mere listing of references in the specification 7/1)	3%	1%	4%	3%
(8)	Number of applications including information disclosure statements in the specification	150	148	148	446
	(Percent of applications having disclosure statements in the specification 8/1)	43%	36%	34%	37%
(9)	Number of applications including information disclosure statements in the specification which included copies of the refere nces	67	55	65	187
	(Percent of applications, with disclosure statements in the specification, having copies of the references 9/8)	45%	37%	44%	42%
(10)	Number of applications including information disclosure statements in the specification which comply fully with the guidelines (37 CFR 1.97–1.99; MPEP §609) (e.g. timely filed, translations where applicable, etc.)	46	45	40	131
	(Percent of applications, with disclosure statements in the specification, which fully comply with CFR and MPEP 10/8)	31%	30%	27%	29%
(11)	Number of applications including information disclosure statements citing non-English documents in the specification	60	36	31	127
	(Percent of applications, with disclosure statements in the specification, citing non-English documents 11/8)	40%	24%	21%	28%

Applications in which applicant submitted citations in *separate papers*.

		Chem.	Elec.	Mech.	Total
(12)	Number of applications including citations in a separate paper	110	142	126	378
	(Percent of applications having citations in separate papers 12/1)	31%	34%	29%	32%

(13)	Number of applications including separate paper citations submitted within 3 months of the filing date of the application	48	88	65	201
	(Percent of separate paper citations submitted within 3 months 13/12)	43%	62%	52%	53%
(14)	Number of applications including separate paper citations which include a copy(s) of the reference(s)	103	134	114	351
	(Percent of separate paper citations including copy(s) of the reference(s) 14/12)	94%	94%	90%	93%
(15)	Number of applications including separate paper citations which cited a non-English document	47	53	43	143
	(Percent of separate paper citations citing non-English documents 15/12)	43%	37%	34%	38%
(16)	Number of applications including separate papers with information disclosure statements	88	100	81	269
	(Percent of separate paper citations having disclosure statements 16/12)	80%	70%	64%	71%
(17)	Number of applications including separate paper citations which fully comply with the guidelines (37 CFR 1.97–1.99; MPEP §609)	31	58	37	126
	(Percent of separate paper citations which fully comply with CFR and MPEP 17/12)	28%	41%	29%	33%

Applications in which applicant submitted *more than ten* citations.

		Chem.	Elec.	Mech.	Total
(18)	Number of applications having more than ten citations	32	25	22	79
	(Percent of applications having more than ten citations 18/1)	9%	6%	5%	7%

Aug. 15, 1986.

DONALD J. QUIGG,
Commissioner of Patents and Trademarks.

[1070 OG 24]

(88) **Express Abandonments**

Experience over the past several months has indicated the need to clarify and re-emphasize existing practice regarding express abandonments submitted under 37 CFR 1.138

Since 1966, when Rule 138 was revised, it is no longer required that the applicant and the assignee of record, if any, sign an express abandonment. The revised rule indicates that a patent application may be expressly abandoned by an attorney or agent of record. Therefore, prior to signing a declaration of express abandonment of a patent application, it is imperative that the attorney or agent of record exercise every precaution in ascertaining that the abandonment of the application is in accordance with the desires and best interests of the applicant. Moreover, special care should be taken to insure that the appropriate application from a group of related applications is correctly identified in the letter of abandonment.

A declaration of abandonment signed by the applicant or his attorney or agent of record becomes effective when an appropriate official of the Office takes action in recognition of the declaration. When so recognized, the date of abandonment may be the date of recognition or a different date if so specified in the declaration itself. For example, where a continuing application is filed with a request to abandon the prior application as of the filing date accorded the continuing application, the date of the abandonment of the prior application will be in accordance with the request once it is recognized.

Action in recognition of an express abandonment may take the form of an acknowledgement by the examiner or the Patent Issue Division of the receipt of the express abandonment, indicating that it is in compliance with 37 CFR 1.138 (see Section 711.01 MPEP). Alternatively, recognition may be no more than the transfer of drawings to a new application pursuant to instructions which include a request to abandon the application containing the drawings to be transferred (see 37 CFR 1.60 and Section 608.02(i) MPEP).

It is suggested that divisional applications being submitted under 37 CFR 1.60 be reviewed before filing to ascertain whether the prior application should be abandoned. Recent experience reveals that some divisional applications are being filed under 37 CFR 1.60 with requests to transfer the drawings from, and abandon, the prior application. Following the recognition of the abandonment, the attorney or agent signing the request informs the Office that the request was made by mistake for any one of a number of reasons. Care should be exercised in situations such as these as the Office looks on express abandonments as acts of deliberation, intentionally performed.

Another common situation involves the submission of an express abandonment following the allowance of an application The express abandonment may not be recognized unless it is actually received by appropriate officials in time to act before the date of issue. In those cases, once a patent number and issue date have been assigned to the application, it is considered too late to act on the express abandonment unless a petition under Rule 313(b) or Rule 183 is granted (see Section 711.01 of MPEP).

Apr. 7, 1975.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

[934 O.G. 2]

(89) **Notice of Abandonment for Failure to Prosecute Application**

Effective immediately the Patent Examining Corps will mail a communication, concerning all applications becoming abandoned in the Corps for failure to prosecute, to the correspondence address of record.

The communication to be mailed will merely comprise a copy of the first page of the Office action, to which applicant failed to properly respond, the copy including stamped language thereon indicating that the application has become abandoned and the date that the copy was mailed. The language stamped on the copy will be as follows: APPLICATION HAS BECOME ABANDONED. THIS NOTICE MAILED: _____. In no case will the mere failure to receive a notice of abandonment affect the status of an abandoned application.

This new procedure should enable applicants to take appropriate and diligent action to reinstate an application inadvertently abandoned for failure to timely respond to an official communication. In most cases, a petition to revive under 37 CFR 1.137 will be the appropriate remedy. It may be that a response to the Office action was mailed to the Office with a certificate of mailing declaration as a part thereof (notice of October 26, 1976: 951 O.G. 1342) but was not received in the Office. In this instance, adequate relief may be available by means of a petition to withdraw the holding of abandonment.

In any instance, if action is not taken promptly after receiving the notice of abandonment, appropriate relief may not be granted.

If a lack of diligent action is predicated on the contention that neither the Office action nor the notice of abandonment was received, one may presume that there is a problem with the correspondence address of record. Accordingly, your attention is directed to recent notices of May 28, 1975, and September 9, 1976, dealing with changes of address (935 O.G. 1352 and 951 O.G. 454). In essence, it is imperative that a paper notifying the Office of a change of address be filed promptly in *each* application in which the correspondence address is to be changed.

If an application is abandoned or a patent lapsed for an excessive time a terminal disclaimer may be required. A terminal disclaimer may also be required where the holding of abandonment or lapse is withdrawn but a determination is made that action attempting to correct the problem should have been taken in a more diligent manner.

WILLIAM FELDMAN,
May 9, 1977. *Deputy Assistant Commissioner for Patents.*

[959 O.G. 24]

(90) **Requirement for a Response Under 37 CFR 1.136 and 1.137 Where a Continuing Application is Being Filed.**

This notice is intended to clarify the requirements for a response as required by 37 CFR 1.136 or 1.137 in situations involving a petition for extension of time or a petition to revive an abandoned application for the purpose of filing a continuing application.

In those instances where an extension of time or a revival of an abandoned application is sought solely for the purpose of filing a continuing application under 35 U.S.C. 120 and where the prior application is to be abandoned in favor of the continuing application, the filing of a response as required by 37 CFR 1.111, 1.113, 1.192 or other regulation is considered to be an unnecessary expenditure of resources by the applicant. Accordingly, in these situations, the Patent and Trademark Office will accept the filing of a continuing application as a response under 37 CFR 1.136 or 1.137.

To facilitate processing by the Office, any such petition for extension of time or petition to revive should specifically refer to the filing of a continuing application and also include an express abandonment of the prior application conditioned upon the granting of the petition and the granting of a filing date to the continuing application.

GERALD J. MOSSINGHOFF,
May 13, 1983. *Commissioner of Patents and Trademarks.*

[1031 OG 11]

(91) **Petitions Under 37 CFR 1.183 to Waive One the Year Time Period Requirement in 37 CFR 1.137(b), 1.155(c) and 1.316(c)**

Petitions to revive an unintentionally abandoned application (37 CFR 1.137(b)) or to accept an unintentionally late paid issue fee (37 CFR 1.155(c) or 1.316(c)) must befiled within one year of the date on which the application became abandoned.

In the last sentence of the above-noted subsections of 37 CFR, the Commissioner of Patents and Trademarks has indicated that petitions under 37 CFR 1.183 to waive any time period requirements for filing a request pursuant to these subsections will not be considered, but will be returned to the applicant. However, it has become apparent that under certain very limited conditions, the interests of the patent system would be better served by considering such petitions.

These very limited conditions arise when an application becomes abandoned due to an action or inaction by applicant and the Patent and Trademark Office performs a positive, documented and Official act* (e.g., by issuing an Official document) which could lead a reasonable individual to conclude that the action or inaction was appropriate. If this conclusion is a contributing factor in the applicant's failure to realize the true, abandoned status of his application in time to file a petition under one of the above-noted subsections, then conditions exist under which a §1.183 petition will be considered.

For example, if an applicant files papers for a continuing application under 37 CFR 1.60 or 1.62 on a date when the parent application is abandoned (e.g., the applicant neglected to obtain an extension of time in the parent application), the requirements of these regulations are not satisfied and the papers should not be processed into an application. However, if in spite of this error the Office issues a filing receipt for the continuing application, a reasonable individual could conclude that the continuing application had been properly filed on a date when the parent application was pending. Further, if the lack of copendency between the parent and the continuing applications is not discovered until after one year from the date on which the parent application became abandoned, the opportunity to obtain copendency by reviving the parent application under 37 CFR 1.137(b) is lost. As an additional example, if an applicant submits a check for payment of the issue fee and the payment is improper (e.g., the check is not timely submitted or is returned to the Office unpaid due to insufficient funds), the application should be held abandoned. However, if in spite of the improper issue fee payment the Office issues the application as a patent, a reasonable individual could conclude that the issue fee payment had been proper. Further, if the improper issue fee payment is not discovered until after one year from the date on which the application became abandoned, the opportunity to request acceptance of a late paid issue fee under 37 CFR 1.155(c) or 1.316(c) is lost.

The abandonment problems described in the above-noted examples are clearly attributed to an error on the part of the applicant. Nevertheless, such a problem could be aggravated when the Office performs a positive, documented and Official act* which, in the circumstances recounted above, may be a contributing factor in

the loss of an opportunity to rectify this problem by filing a petition under one of the above-noted subsections. In light of these factors, the Commissioner will exercise his authority under 37 CFR 1.183 to waive the one year period requirement for filing a petition pursuant to 37 CFR 1.137(b), 1.155(c) or 1.316(c) providing the following strictly limited conditions are present:

(1) The applicant's action or inaction which caused the application to become abandoned was clearly an unintentional oversight which resulted from a bona fide attempt, as evidenced by Patent and Trademark Office records, to comply with patent statutes, rules and procedures in order to keep the application pending as desired; and

(2) The Office performed a positive, documented and Official act* which could lead a reasonable individual to conclude that the action or inaction was proper and this conclusion was a contributing factor in the applicant's failure to realize the true abandoned status of his application in time to file a petition under one of the above-noted subsections; and

(3) A petition under 37 CFR 1.183 and one of the above-noted subsections is filed within three (3) months of the date applicant is notified by the Office or otherwise becomes aware of the abandoned status of the application; and

(4) The petition is accompanied by a terminal disclaimer with fee under 37 CFR 1.321 dedicating to the public a terminal part, equivalent to the period of abandonment, of the term of any patent granted on the application or on any application entitled to the benefit of the filing date of the application under 35 USC 120.

For a transitional period of three (3) months from the date of this Notice, the requirement for filing a petition within three (3) months of the date referred to in condition (3), above, will not be enforced providing:

(a) the abandoned application could have been restored to pending status if a petition under one of the above-noted subsections had been timely filed; and

(b) the applicant made a bona fide attempt, as evidenced by Patent and Trademark Office records, to restore the abandoned application to pending status within three months of the date applicant was notified by the Office or otherwise became aware of the abandoned status of the application.

Applicants should note that this is intended to be a very limited extension of the Commissioner's discretion in exercising his authority to waive the one year period required under the above-mentioned subsections. For this reason, the above-noted conditions and provisions will be strictly adhered to and any petition under §1.183 which fails to comply with these conditions or provisions will be denied.

*NOTE: THE FAILURE OF THE PATENT AND TRADEMARK OFFICE TO SEND AN OFFICIAL COMMUNICATION (E.G., A NOTICE OF ABANDONMENT) IS *NOT* CONSIDERED TO BE A POSITIVE, DOCUMENTED AND OFFICIAL ACT WITHIN THE MEANING OF THIS NOTICE.

JAMES E. DENNY,
Aug. 26, 1985. *Deputy Assistant, Commissioner for Patents.*

[1059 OG 4]

(92) **Procedure for Handling Amendments under 37 CFR 1.116**

On Oct. 1, 1982, pursuant to Public Law 97-247, the Patent and Trademark Office discontinued the previous practice in patent applications of extending without fee the shortened statutory period for response to a final rejection upon the filing of a timely first response to a final rejection (37 CFR 1.116). Since Oct. 1, 1982, applicants are able to obtain additional time for a first or subsequent response to a final rejection by petitioning and paying the appropriate fee under 37 CFR 1.136(a), provided the additional time does not exceed the six month statutory period.

In order to continue to encourage the early filing of any first response after a final rejection and to take care of any situations in which the examiner does not timely respond to a first response after final rejection which is filed early in the period for response, the Office is changing the manner in which the period for response is set on any final rejection mailed after Feb. 27, 1983.

Under the changed procedure, if an applicant initially responds within two months from the date of mailing of any final rejection setting a three-month shortened statutory period for response and the Office does not mail an advisory action until after the end of the three-month shortened statutory period, the period for response for purposes of determining the amount of any extension fee will be the date on which the Office mails the advisory action advising applicant of the status of the application, but in no event can the period extend beyond six months from the date of the final rejection. This procedure will apply only to a first response to a final rejection and will be implemented by including the following language in each final rejection mailed after Feb. 27, 1983:

> A shortened statutory period for response to this final action is set to expire three months from the date of this action. In the event a first response is filed within two months of the mailing date of this final action and the advisory action is not mailed until after the end of the three-month shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than six months from the date of this final action.

For example, if applicant initially responds within two months from the date of mailing of a final rejection and the examiner mails an advisory action before the end of three months from the date of mailing of the final rejection, the shortened statutory period will expire at the end of three months from the date of mailing of the final rejection. In such a case, any extension fee would then be calculated from the end of the three-month period. If the examiner, however, does not mail an advisory action until after the end of three months, the shortened statutory period will expire on the date the examiner mails the advisory action and any extension fee may be calculated from that date.

Statutory periods set in Office actions mailed before Feb. 28, 1983, will not be effected by this change in procedure.

GERALD J. MOSSINGHOFF,
Jan. 14, 1983. *Commissioner of Patents and Trademarks.*

[1027 OG 71]

(93) **Expedited Procedure for Processing Amendments and Other Responses After Final Rejection (37 CFR 1.116)**

In an effort to improve the timeliness of the processing of amendments and other responses under 37 CFR 1.116, and thereby provide better service to the public, the Patent and Trademark Office (PTO) is establishing, effective immediately, an expedited processing procedure which the public may utilize in filing amendments and other responses after final rejection under 37 CFR 1.116. In order for an applicant to take advantage of the expedited procedure the amendment or other response

under 37 CFR 1.116 will have to be marked as a "Response Under 37 CFR 1.116 — Expedited Procedure-Examining Group (Insert Examining Group Number)" on the upper right portion of the amendment or other response and the envelope must be marked "Box AF" in the lower left hand corner. The markings preferably should be written in a bright color with a felt point marker. If the response is mailed to the Office, the envelope should contain only responses under 37 CFR 1.116 and should be mailed to "Box AF, Commissioner of Patents and Trademarks, Washington, D.C. 20231." Instead of mailing the envelope to "Box AF" as noted above, the response may be hand-carried to the particular Examining Group or other area of the Office in which the application is pending and marked on the outside envelope "Response Under 37 CFR 1.116 — Expedited Procedure-Examining Group (Insert Examining Group Number)".

Upon receipt by the PTO from the Postal Service of an envelope appropriately marked "Box AF," the envelope will be specially processed by the PTO Mail Room and forwarded promptly to the Examining Group, via the Office of Finance if any fees have to be charged or otherwise processed. Upon receipt of the response in the Examining Group it will be promptly processed by a designated clerical employee and forwarded to the examiner, via the Supervisory Primary Examiner (SPE), for action. The SPE is responsible for ensuring that prompt action on the response is taken by the examiner. If the examiner to which the application is assigned is not available and will not be available for an extended period, the SPE will ensure that action on the application is promptly taken to assure meeting the PTO goal described below. Once the examiner has completed his or her consideration of the response, the examiner's action will be promptly typed and mailed by clerical employees designated to expedite the processing of responses filed under this procedure. The Examining Group supervisory personnel, e.g., the Supervisory Primary Examiners, Supervisory Applications Clerk, and Group Director are responsible for ensuring that actions on responses filed under this procedure are promptly processed and mailed.

The PTO goal is to mail the examiner's action on the response within one month from the date on which the amendment or response is received by the PTO. The PTO is establishing monitoring procedures to determine how well the goal is being achieved. If the goal of mailing the action on the response within one month or less is not achieved in a high percentage of applications, e.g., at least 90–95% of appropriately marked responses, after a reasonable trial period, the PTO will institute further changes in procedures in the future which will give approprite relief to applicants in cases where the delay is due to Office processing.

Applicants are encouraged to utilize this expedited procedure in order to facilitate PTO processing of responses under 37 CFR 1.116. If applicants do not utilize the procedure by appropriately marking the envelope and enclosed papers, the benefits expected to be achieved therefrom will not be attained. The procedure cannot be expected to result in achievement of the goal in applications in which the delay results from actions by the applicant, e.g., delayed interviews, applicant's desire to file a further response, or a petition by applicant which requires a decision and delays action on the response. In any application in which a response under this procedure has been filed and no action by the examiner has been received within the time referred to herein, plus normal mailing time, a telephone call to the SPE of the relevant Group Art Unit would be appropriate in order to permit the SPE to determine the cause for any delay. If the SPE is unavailable or if no satisfactory response is received, the Group Director of the Examining Group should be contacted.

Any comments on this expedited procedure during the trial period are invited and should be directed to the attention of Rene D. Tegtmeyer, Assistant Commissioner for Patents, U.S. Patent and Trademark Office, Washington, D.C. 20231.

DONALD J. QUIGG,
Sept. 20, 1985. *Commissioner of Patents and Trademarks — Designate.*

[1059 OG 19]

(94) New Procedures for Recordation of Interviews

This notice establishes within the Patent and Trademark Office additional general procedures for the recordation of interviews. Proposed procedures were published in the Official Gazette of June 28, 1977 (959 O.G. 36) for comment from interested members of the public by August 10, 1977. Fifteen written comments were received the majority of which were favorable to the proposed procedures. Careful consideration has been given to the comments and the procedures are being adopted with a few changes.

Under present practice it is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability as set forth in section 713.04 of the Manual of Patent Examining Procedure (MPEP). This practice is continued and further amplified as set forth below.

Recent surveys have indicated that the substance of many interviews has not been made of record or the text thereof is incomplete as to substantive matters. In some cases, the substance of an interview may be presented ac arguments in a subsequent response filed by the applicant but without any indication that they had been presented at the interview. In order to help insure a better record of examiner-applicant interviews in application files, the following new procedures are adopted to become effective for interviews conducted on and after January 1, 1978. Appropriate changes will be made in the Manual of Patent Examining Procedure (MPEP).

Examiners will complete a two-sheet carbon interleaf Interview Summary Form for each interview held where a matter of substance has been discussed by checking the appropriate boxes and filling in the blanks in neat handwritten form. Discussions regarding only procedural matters, directed solely to restriction requirements (for which interview recordation is otherwise provided for in Section 812.01 of the MPEP), or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below.

The Interview Summary Form shall be given an appropriate paper number, placed in the file and listed on the "Contents" list on the file wrapper. The docket and serial register cards will not be updated to reflect this interview. In a personal interview, the duplicate copy of the Form will be removed and given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephonic interview, the copy will be mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner before an allowance is not likely or if other circumstances dictate, the Form will be mailed promptly after the telephonic interview rather than with the next official communication. The original of the completed Form will be made of record and placed in the right hand flap of the file.

The Form provides for recordation of the following information:

—Serial Number of the application
—Name of applicant
—Name of examiner
—Date of interview
—Type of interview (personal or telephone)
—Name of participant(s) (applicant, attorney or agent, etc.)
—An indication whether or not an exhibit was shown or a demonstration conducted
—An identification of the claims discussed
—An identification of the specific prior art discussed
—An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). (Agreements as to allowability are tentative and do not restrict further action by the examiner to the contrary.)
—The signature of the examiner who conducted the interview
—Names of other Patent and Trademark Office personnel present.

The Form also contains a statement reminding the applicant of his responsibility to record the substance of the interview.

It is desirable that the examiner orally remind the applicant of his obligation to record the substance of the interview in each case unless both applicant and examiner agree that the examiner will record same. Where the examiner agrees to record the substance of the interview, or when it is adequately recorded on the Form or in an attachment to the Form, the examiner will check a box at the bottom of the Form informing the applicant that he need not supplement the Form by submitting a separate record of the substance of the interview.

It should be noted, however, that the Interview Summary Form will not be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview:

The complete and proper recordation of the substance of any interview should include at least the following applicable items:

1) A brief description of the nature of any exhibit shown or any demonstration conducted.
2) an identification of the claims discussed.
3) an identification of specific prior art discussed.
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the examiner.
5) a brief identification of the general thrust of the principal arguments presented to the examiner. The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he feels were or might be persuasive to the examiner.
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete or accurate, the examiner will take appropriate action as set forth in MPEP Section 713.04. If the record is complete and accurate, the examiner should place the indication "Interview record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

C. MARSHALL DANN,
Aug. 30, 1977. *Commissioner of Patents and Trademarks.*

[962 O.G. 21]

(95) Viewing of Video Tapes During Interviews

The Patent and Trademark Office has video tape equipment available in the facilities of the Patent Academy for viewing video tapes from applicants during interviews with patent examiners.

The video tape equipment may use VHS and UHS (½ inch tapeP cassettes.

Attorneys or applicants wishing to show a video tape during an examiner interview must be able to demonstrate that the content of the video tape has a bearing on an outstanding issue in the application and its viewing will advance the prosecution of the application. Prior approval of viewing of a video tape during an interview must be granted by the SPE. Also, use of the room and equipment must be granted by the Training Manager to avoid any conflict with the Patent Academy.

Requests to use video tape viewing equipment for an interview should be made at least one week in advance to allow the Patent Academy staff sufficient time to ensure the availability and proper scheduling of both a room and equipment.

Interviews using Office video tape equipment will be held only in the Academy facilities located in One Crystal Park, Rm. 502. Attorneys or applicants should not contact the Patent Academy directly regarding availability and scheduling of video equipment. All scheduling of rooms and equipment should be done through and by the examiner conducting the interview.

RENE D. TEGTMEYER,
May 6, 1986. *Assistant Commissioner for Patents.*

[1067 OG 4]

(96) Statements Filed Under Atomic Energy Act And NASA Act

Attention is called to the provisions of section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182) and section 305(c) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457). These statutes provide that the title to inventions useful in the production or utilization of special nuclear material or atomic energy, made or conceived in the course of or under any contract, subcontract, or arrangement entered into with or for the benefit of the Atomic Energy Commission, and any invention made in the performance of any work under any contract of the National Aeronautics and Space Administration, shall be vested in the United States. They also provide that no patent may be granted for any invention useful in the production or utilization of special nuclear material or atomic energy, or which in the opinion of the Commissioner has significant utility in the conduct of aeronautical or space activities, unless the applicant files with his application or within 30 days after request therefor by the Commissioner, a statement under oath setting forth (*a*) the full facts in regard to the making or conception of the invention, and (*b*) the situation with regard to the contractual relationships involving the Commission or the Administration. Careful attention should be given the exact wording of the requirements of whichever of these sections is pertinent in order to assure that all of the requirements are met. Since the duty of requiring the statements is placed by law on the Commissioner of Patents, it is incumbent on the Commissioner to determine whether the statements are timely filed and sufficient in substance to comply. Since these laws do not provide for any extension of the 30-day period or for reviving an applicaton which has become abandoned for failure to file a proper statement, it is important that such statements be timely filed and that they do so comply in order to avoid loss of valuable patent rights.

The "full facts" involved in the conception and making of an invention should include those which are unique to that invention. The use of form paragraphs or

printed forms which set forth only broad generalized statements of fact is not ordinarily regarded as meeting the requirements of these statutes.

This office has construed the word "applicant" in both of these statutes to mean the inventor or joint inventors in person. Accordingly, in the ordinary situation, the statements must be signed by the inventor or joint inventors, if available. This construction is consistent with the fact that no other person could normally be more knowledgeable of the "full facts concerning the circumstances under which such invention was made," (42 U.S.C. 2457) or, "full facts surrounding the making or conception of the invention or discovery" (42 U.S.C. 2182).

In instances where an applicant does not have first-hand knowledge whether the invention involved work under any contract, subcontract, or arrangement with or for the benefit of the Atomic Energy Commission, or had any relationship to any work under any contract of the National Aeronautics and Space Administration, and includes in his statement information of this nature derived from others, his statement should identify the source of his information. Alternatively, the statement by the applicant could be accompanied by a supplemental declaration or oath, as to the contractual matters, by the assignee or other person, e.g., an employee thereof, who has the requisite knowledge.

Where an applicant is deceased or incompetent, or where it is shown to the satisfaction of this Office that he refuses to furnish a statement or cannot be reached after diligent efforts, declarations or statements under oath setting forth the information required by the statutes may be accepted from an officer or employee of the assignee who has sufficient knowledge of the facts. The offer of such substitute statements should be based on the actual unavailability of or refusal by the applicant, rather than mere inconvenience. Where it is shown that one of joint inventors is deceased or unavailable, a statement by all of the other joint inventor(s) may be accepted.

WILLIAM FELDMAN,
Aug. 13, 1973. *Deputy Assistant Commissioner for Patents.*

[914 O.G. 2]

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(97) **NOTICE OF CHANGES IN THE ADMINISTRATION OF 42 U.S.C. 2182 AND 2457 (PROPERTY RIGHTS STATEMENTS TO DOE AND NASA).**

Effective Nov. 1, 1986, the PTO will change the procedures under which property rights statements to the Department of Energy (DOE), 42 U.S.C. 2182, or National Aeronautics and Space Administration (NASA), 42 U.S.C. 2457 are requested and processed. These statements are required before a patent can issue on any invention useful in the production or utilization of special nuclear material or atomic energy (for the Department of Energy) or having significant utility in the conduct of aeronautical and space activities (for the National Aeronautics and Space Administration).

Currently, the PTO waits until after an application is otherwise in condition for allowance before property rights statements are requested. Under the new procedure, if a statement is necessary, an informal request for the statement will be issued shortly after filing. The request will identify which chapter(s) of the statute apply and an informal period of 45 days will begin running from the mail date of the notice.

If no response is received within 45 days, a formal notice will be issued. The statutory period for response to the formal notice is 30 days. There is no provision for extension of this time limit, and the penalty for failure to file an acceptable, timely statement is abandonment. In view of these strict time limits and penalties, applicants are strongly urged to take advantage of the period for informal correspondence by responding to the so-called 45-Day Letter. Additionally, the new 45-Day Letter will provide extensive information on the format and content of an acceptable statement. This should relieve many of the difficulties applicants currently experience in generating the statement. See also 914 OG. 2 for additional information on the form and content of property rights statements.

The statement should be an accurate reflection of the ownership of the invention on which patent protection is granted. Thus, if during prosecution before the examiner the claimed invention is so changed or the property rights situation so altered as to impact the accuracy of a statement submitted earlier, a supplemental statement must be filed. In those rare situations where property rights may be changed by an amendment to the claims after the statement has been filed, applicants are reminded that failure to submit such additional information where appropriate may be considered a false representation of material facts and render the patent owner vulnerable to sanctions as set forth in the above statutes. The PTO will not review applications for this possibility. The responsibility for complying with the statutes rests with the applicants.

The text of the new 45-Day Letter is reproduced below.

* * * * *

The subject matter of this application appears to:

— be "useful in the production or utilization of special nuclear material or atomic energy " as recited in 42 U.S.C. 2181 (Department of Energy (DOE)).

— have significant utility in the conduct of aeronautical and space activities as recited in 42 U.S.C. 2457 (National Aeronautics and Space Administration (NASA)).

Accordingly, no patent can issue on this application unless applicant(s) file a statement (under oath or in the form of a declaration as provided by 37 CFR 1.68) setting forth (1) the full facts concerning the circumstances under which the invention was made and conceived and (2) the relationship (if any) of the invention to the performance of any work under any contract or other arrangement with the Agency(ies) noted above. On the reverse side of this form is an example of an acceptable format for this statement. The language appearing in paragraphs III and/or IV of the example *must* appear if applicant is attempting to establish that no relationship (under item 2 above) exists.

If the invention disclosed in this application was developed under a contract, grant or cooperative agreement between the Agency(ies) indicated above and a person, small business or nonprofit organization and rights to the invention have been determined by specific reference to 35 U.S.C. 202 in the contract, grant or cooperative agreement, then applicant need not submit the statement described above. Instead, applicant may file a verified statement (under oath or in the form of a declaration, 37 CFR 1.68) setting forth the information required by 35 U.S.C. 202(c)(6).

IF NO STATEMENT HAS BEEN RECEIVED WITHIN FORTY-FIVE DAYS OF THE MAIL DATE INDICATED ABOVE, a formal requirement for statement will then be issued. No provision is made for extension of the statutory thirty-day period for response to the formal requirement and the penalty for failure to file an acceptable and timely statement is abandonment of the application. Therefore, applicants are strongly encouraged to submit a statement at this time in order to avoid the issuance of a formal requirement.

IT IS IMPORTANT TO NOTE that the statement must accurately represent the property rights situation of the claimed invention if and when the application is found allowable. Thus, if during prosecution before the examiner, the claimed invention is so altered or the property rights situation so changed as to impact the accuracy of a statement submitted earlier, a supplemental statement must be filed. Failure to submit such additional information where appropriate may be considered as false representation of material facts and render the patent owner vulnerable to loss of patent rights and other sanctions as set forth in the statutes. The PTO will not review allowed applications for this possibility. The responsibility for complying with the statutes rests with the applicants.

Any questions regarding this requirement should be directed to Licensing and Review at (703) 557-4948.

* * * * *

The following is an example of an acceptable property rights statement. Statements of this type are, of course, only suitable for situations in which *NO* Agency funds or other considerations were involved in the making or conception of the invention. While this example is in the form of a declaration, a sworn document is equally acceptable.

* * * * *

I (We)_____,
citizens of _____residing at _____,
declare:

That I (we) made and conceived the invention described and claimed in patent application Serial Number _____filed in the United States of America on _____, titled _____

_____

_____

(Check and complete either I. or II. below)

_____I. (For Inventors Employed by an Organization)

That I (we made and conceived this invention while employed by _____

_____

That the invention is related to the work I am (we are) employed to perform and was made within the scope of my (our) employment duties;

That the invention was made during working hours and with the use of facilities, equipment, materials, funds, information and services of _____(name of employer)_____.
Other relevant facts are _____

_____

_____

_____

That to the best of my (our) knowledge and belief (and/or based upon information provided by _____

_____

of _____):

—OR—

_____II. (For Self-Employed Inventors)

that I (we) made and conceived this invention on my (our) own time using only my (our) own facilities, equipment, materials, funds, information and services.
Other relevant facts are _____

_____

_____

That to the best of my (our) knowledge and belief:

(Check III and/or IV below as appropriate)

_____III. The invention was not made or conceived in the course of, or in connection with, or under the terms of any contract, subcontract or arrangement entered into with or for the benefit of the United States Atomic Energy Commission or its successors: Energy Research and Development Administration or the Department of Energy.

—AND/OR—

_____IV. The invention was not made (conceived or first actually reduced to practice) under nor is there any relationship of the invention to the performance of any work under any contract of the National Aeronautics and Space Administration.

The undersigned inventor(s) declare further that all statements made herein of his or her (their) own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Inventor's Signature:
Post Office Address:
Date:

Inventor's Signature:
Post Office Address:
Date:

* * * * *

Information regarding these changes in the processing of property rights statements may be obtained by calling or writing Mr. Kenneth L. Cage, Director, Special Laws Administration, Group 220, Washington, D.C. 20231 (703-557-2877).

DONALD J. QUIGG,
Sept. 16, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[1071 OG 14]

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(98) **Extension of Time Limit**

This notice is intended to clarify certain misunderstandings and indicates the treatment given to requests for an extension of time in a situation where applicant has been given a time limit to complete an otherwise incomplete but bona fide attempt to respond to the previous Office action and advance the case to final action.

According to 37 CFR 1.135(c) when the applicant has filed a response to an examiner's action but consideration of some matter or compliance with some requirement has been inadvertently omitted, an opportunity to explain and supply the omission may be given before the question of abandonment is considered. According to the M.P.E.P., Section 710.02(c), the examiner may give applicant one month or the remainder of the period for response, whichever is longer, to complete the response. Neither the regulation nor the M.P.E.P. indicate that this time can be extended.

Under the regulation, the missing matter or lack of compliance must be considered by the examiner as being "inadvertently omitted." Once an inadvertent omission is brought to the attention of the applicant, the question of inadvertence no longer exists. Therefore, any further time to complete the response would not be appropriate under 37 CFR 1.135(c). Accordingly, no extension of time will henceforth be granted in these situations.

WILLIAM FELDMAN,
Nov. 28, 1977. *Deputy Assistant Commissioner for Patents.*

[965 O.G. 14]

(99) **TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS**

Chapter 1—Patent and Trademark Office, Department of Commerce

Part 1—Rules of Practice in Patent Cases

Patent Examining and Appeal Procedures

On October 4, 1976 notice was given in the Federal Register (41 FR 43729) of a proposal to amend sixteen sections of Title 37 of the Code of Federal Regulations relating to patent examining and appeal procedures. Interested persons were invited to comment on the proposal by December 7, 1976. One hundred seventy-five written letters and statements were submitted. A hearing was held in Arlington, Virginia on December 7, 1976 at which 21 persons testified orally. Careful consideration has been given to all comments received and the proposal is being adopted with certain changes.

The regulations adopted involve all sections that were proposed to be revised, amended or added—namely, §§1.11, 1.14, 1.52, 1.56, 1.65, 1.69, 1.97, 1.98, 1.99, 1.109, 1.175, 1.194, 1.196, 1.291, 1.292, and 1.346. Amendments also are being made in two sections which were not included in the published proposal—§§1.51 and 1.176. Since amendments to these sections are closely related to the substance of matters notice and public comment on these amendments are deemed unnecessary.

In addition, amendments are being adopted which were published for comment in two earlier, much less extensive proposals that concerned availability of certain files for public inspection. A notice of a proposed amendment to §1.14(b) was published on June 4, 1974 (39 FR 19786). A notice of a proposed amendment to §1.11(a) was published on September 17, 1974 (39 FR 33376). No negative comments were submitted with respect to either of these proposals and both are being adopted without change.

The text of the rules will be reproduced in the Patent and Trademark Office **Official Gazette** in about a month with additions indicated by arrows and deletions indicated by brackets to help readers identify the changes. A transcript of the hearing, the letters and written statements received, and a summary and analysis of the comments are available for public inspection in Room 11E10 of Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia.

Purpose of Rules

The purpose of the rules that are being adopted is to improve the quality and reliability of issued patents by strengthening patent examining and appeal procedures. It is desirable that patents be as dependable as possible, so as to enhance the incentives provided by the patent system to make inventions, to invest in research and development, to put new or improved products on the market, and to disclose inventions that otherwise would be kept as trade secrets. It is believed that the rules being adopted will help to maintain strong patent incentives.

The rules afford patent owners an opportunity, through the filing of a reissue application, to obtain a ruling from an examiner on the pertinence of additional prior art after a patent has been issued. The rules also broaden the public's opportunity for participation in the patent examining process, consistent with the limitations of statute, the protection of trade secrets, and the need to avoid making it unduly expensive to obtain a patent.

The rules set forth the duty of candor and good faith which applicants have to the Patent and Trademark Office and encourage them to provide information about the prior art in a way that will make it more useful to examiners. A provision for foreign language oaths by individuals who do not understand English is intended to make them more aware of their representations and of their obligations.

Under the rules more Patent and Trademark Office decisions that could have important precedent value will be available to the public, and some additional files will be available for inspection. Proceedings before the Board of Appeals are modified to help avoid the issuance of invalid patents. The rules encourage examiners to see that persons inspecting the file history of issued patents will be able to tell why the case was allowed.

Reissue Applications

Amended §1.175 permits a patent owner to have new prior art considered by the Office by way of a reissue application without making any changes in the claims or specification. It is adopted with no change from the proposal. The requirement for an oath or declaration alleging that the reissue applicant believes "the original patent to be wholly or partly inoperative or invalid. . . ." is dispensed within §1.175(a) (1) unless the applicant believes that to be the case. Section 1.175(a) (4) recognizes that reissues may be filed to have the patentability of the original patent considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

Thus, a patentee may file a reissue if he believes his patent is valid over prior art not previously considered by the Office but would like to have a reexamination. The procedure may be used at any time during the life of a patent. During litigation, a federal court may, if it chooses, stay proceedings to permit new art to be considered by the Office.

If a reissue application is filed as a result of new prior art with no changes in the claims or specification and the examiner finds the claims patentable over the new art, the application will be rejected as lacking statutory basis for a reissue, since 35 USC 251 does not authorize reissue of a patent unless it is deemed wholly or partly inoperative or invalid. However, the record of prosecution of the reissue will indicate that the prior art has been considered by the examiner.

A substantial majority of the comments received favored amended §1.175 as a means for improving the reliability of patents and avoiding unnecessary litigation costs. The negative comments generally questioned the statutory authority of the Commissioner to adopt this section. Authority for §1.175 is believed to exist in 35 U.S.C. 6, which is the Commissioner's rulemaking authority, and in 35 U.S.C. 251. The latter section of the statute requires that the patent be deemed wholly or partly inoperative or invalid before a reissue may be granted, but does not require such a belief by the patentee before a reissue application may be filed. The case law does not suggest that the approach of new §1.175(a)(4) is inconsistent with 35 U.S.C. 251.[1] Inasmuch as 35 U.S.C. 251 is a remedial provision,[2] it is believed that a liberal interpretation is justified and that adequate authority exists for the amended section.

Amended §1.11(b) opens all reissue applications to inspection by the general public. Section 1.11(b) also provides for announcement of the filings of reissue applications in the *Official Gazette*. This announcement will give interested members of the public an opportunity to submit to the examiner information pertinent to patentability of the reissue application. The announcement will include at least the filing date, reissue application and original patent numbers, title, class and subclass, name of the inventor, name of the owner of record, name of the attorney or agent of record, and examining group to which the reissue application is assigned. Section 1.11(b) is amended from the proposal to so indicate. Reissue applications already on file on the effective date of the section will not be automatically open to inspection and will not be announced in the *Official Gazette*. However,

[1]See *In re Clark*, F.2d 623, 187 USPQ 209 (CCPA 1975), at footnote 4 where the court declined to decide whether it is proper to seek reissue merely to disclose uncited prior art. See also *In re Altenpohl*, 500 F.2d 1151, 183 USPQ 38 (CCPA 1974).
[2]See it *In re Oda*. 443 F.2d 1200, 170 USPQ 268 (CCPA 1971).

a liberal policy will be followed in granting petitions for access to individual applications already on file.

In order that members of the public may have time to review the reissue application and submit pertinent information to the Office before the examiner's action, §1.176 is amended to provide that reissue applications will not be acted on sooner than two months after the *Official Gazette* announcement of filing.

A substantial majority of the comments received favored adoption of §1.11(b). The only opposition was based upon a suggestion that no statutory authority exists. However, since reissue applications contain no new disclosure, and therefore no trade secrets or confidential information, they are considered to present a "special circumstance" within the meaning of 35 U.S.C. 122.

The insertion of "all" as the fifth word of the first sentence of §1.11(b) is for clarity. The word "furnished" is changed to "obtained" in §1.11 for clarity.

Protests and Public Use Proceedings

Amended §§1.291 and 1.292 give greater recognition to the value of written protests and public use petitions in avoiding the issuance of invalid patents.

A substantial majority of the comments favored these sections and viewed them as improving the quality of issued patents. Entry of protests has been upheld in court.[3]

Section 1.291(a) provides that public protests against pending applications will be entered in the application file and will, if they meet stated requirements, be considered by the examiner. To guarantee consideration by the examiner, protests must be accompanied by copies of prior art documents relied upon, although protests without copies will not necessarily be ignored. This is similar to the requirement of new §1.98 that copies of patents and publications accompany prior art statements. Section 1.291 does not contemplate permitting a protester to participate as a party in further proceedings. In the case of applications available to the public, such as reissue applications, the protester may file papers rebutting statements made by the applicant. The examiner at his discretion may request a protester to submit additional written information or may provide extra time for comments by a protester to be filed.

To ensure consideration by the examiner, all protests must be timely submitted. Protests will generally be considered timely submitted, if they are filed before final rejection or allowance of the application by the examiner. The consideration given to protests filed after final rejection or allowance of the application by the examiner will depend upon the relevance of the prior art documents submitted and the point in time at which they are submitted. Obviously, if the prior art documents anticipate or clearly render obvious one or more claims they will not knowingly be ignored. It must be recognized, however, that the likelihood of consideration by the examiner decreases as the patent date approaches. Accordingly, protests must be filed early in order to ensure their consideration.

The first sentence of §1.291(a) is deleted as unnecessary. Section 1.291(a) also is changed from the proposal to make clear that it applies to pending applications and that all protests will be referred to the examiner having charge of the subject matter involved.

Section 1.291(b) incorporates the existing Office policy of permitting persons to submit prior art citations or copies of prior art after a patent has been granted. The section is changed from the proposal by the addition of the words "any papers related thereto" to recognize that statements as to the pertinence of prior art may be submitted. Both the citations and the related papers are to be entered without comments. The material submitted is not examined by the Office but is available to members of the public inspecting Office records.

Some suggestions were received for major modifications of §1.291. It was suggested that an advisory opinion of the examiner be placed in the patent file when protests were received after issuance of the patent. Several persons supported a suggestion for examiners to state whether a "new issue" was raised by prior art cited by a protester. Another suggestion was that a procedure similar to that used in the recent Trial Voluntary Protest Programs[4] be adopted on a continuing basis. These suggestions were carefully considered, but are not adopted. The suggestions extend substantially beyond §1.291 as proposed, and their benefits do not appear sufficient to justify the added cost at this time.

Materials submitted to the Office under §§1.291 and 1.292 are to be served upon the applicant, patentee, attorney or agent when possible. The term "patentee" is used in its ordinary sense as defined in 35 USC 100(d). If service is not possible, materials are to be submitted in duplicate so that the Office can attempt to send the duplicate copy. The proposal is changed by adding the words "with the Office" after "filed" in §§1.291(c) and 1.292(b) for clarity.

In §1.292, the requirement that petitioner bear the Office's expenses in conducting the public use proceeding is deleted. Section 1.292 is also amended to ensure that the existence of public use proceedings is recorded in the application file wrapper. Notice of a petition for a public use proceeding will be entered in the file in lieu of the petition itself when the petition and the accompanying papers are too bulky to accompany the file. Any public use papers not physically entered in the file will be publicly available whenever the application file wrapper is available.

Duty of Disclosure

Amended §1.56 defines the duty to disclose information to the Office and the criteria for striking an application when that duty is violated. The wording of the section is changed in several respects from the proposal, but the purpose and general scope are the same as in the proposal. The section codifies the existing Office policy on fraud and inequitable conduct, which is believed consistent with the prevailing case law in the federal courts. The expanded wording of the section is intended to be helpful to individuals who are not expert in the judicially developed doctrines concerning fraud. The section should have a stabilizing effect on future decisions in the Office and may afford guidance to courts as well.

A majority of comments received favored §1.56 as proposed or with modifications. Persons opposed expressed concern over the imprecise definition of the duty of disclosure and the possibility that the proposal would substantially increase the burden on patent applicants. Some stated that there would be increased litigation as a result of the proposal. Several suggestions were received on better ways to define the individuals who should disclose information and the kinds of information that should be disclosed.

The first sentence of §1.56(a) is changed from the proposal by adding the word "substantively," so that individuals having a duty of disclosure are limited to those who are "substantively involved in the preparation or prosecution of the application." This change is intended to make clear that the duty does not extend to typists, clerks, and similar personnel who assist with an application. This phrase, when taken with the last sentence of §1.56(a), is believed to provide an adequate indication of the individuals who are covered by the duty of disclosure. The word "with" is inserted in the first sentence of §1.56(a) before "the assignee" and before "anyone to whom there is an obligation to assign" to make clearer that the duty applies only to individuals, not to organizations.

Numerous comments concerned the term "relevance" that was used in the proposal. In response to the comments, language is substituted in §1.56 and related sections which is believed to establish a clearer standard for determining whether information need be disclosed to the Office. "Relevant" is replaced by "material" because the latter term connotes something more than a trivial

[3]*International Paper Co. v. Fibreboard Corp., 63 F.R.D. 88, 181 USPQ 740 (D. Del. 1974).*
[4]*923 O.G. 2; 930 O.G. 1454; 938 O.G. 945*

relationship. It appears to be more commonly used in court opinions. In addition, the third sentence of §1.56, which defines materiality, is rewritten. The sentence now states that information is material "where there is a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent." The sentence paraphrases the definition of materiality used by the Supreme Court in its recent decision in *TSC Industries* v. *Northway*.[5] Although in that case the court was concerned with rules promulgated by the Securities and Exchange Commission, the Court's articulation of materiality is believed consistent with the prevailing concept that has been applied by lower courts in recent patent cases.

The definition of materiality in §1.56 will have to be interpreted in the context of patent law rather than securities law. Principles followed by courts in securities cases should not be translated to patent cases automatically. It is noteworthy, however, that in formulating the definition of materiality in *TSC Industries* the Supreme Court considered some of the same matters over which concern was expressed in the public comments on proposed§1.56. The court noted that the standard of materiality should not be so low that persons would be "subjected to liability for insignificant omissions or misstatements," or so low that the fear of liability would cause management "simply to bury the shareholder in an avalanche of trivial information—a result that is hardly conducive to informed decision making."[6]

Although the third sentence of §1.56(a) refers to decisions of an examiner, it is intended that the duty of disclosure would apply in the same manner in the less common instances where the official making a decision on a patent application is someone other than an examiner—e.g., a member of the Board of Patent Interferences or the Board of Appeals. This is implicit in the duty "of candor and good faith" toward the Office that is specified in the first sentence of §1.56(a).

Comments and questions were received concerning the term "information" used in the second and third sentences of §1.56(a) and elsewhere. It means all of the kinds of information required to be disclosed under current case law. In addition to prior art patents and publications, it includes information on prior public uses, sales, and the like. It is not believed practicable to define information in the text of the rule at this time. However, the rule is not intended to require disclosure of information favorable to patentability—e.g., evidence of commercial success of the invention. Neither is it meant to require disclosure of information concerning the level of skill in the art for purposes of determining obviousness.

Several comments were received concerning the duty to disclose information the patent applicant regards as confidential, including information the applicant has received from another party under an injunction of secrecy. This problem has existed prior to amendment of §1.56. The Patent and Trademark Office, of course, keeps information disclosed by applicants confidential until a patent is issued. It has been suggested that the Office should develop a mechanism for continuing to hold information in confidence after issuance of a patent if in the judgment of the examiner the information is not material to the examination of the application. The feasibility of offering a rule for public comment on this topic at a later date will be considered.

New §1.56(b) is added to make clear that information may be disclosed to the Office through an attorney or agent of record or through a pro se inventor, and that other individuals may satisfy their duty of disclosure to the Office by disclosing information to such an attorney, agent or inventor. Information that is not material need not be passed along to the Office.

Proposed sections 1.56 (b) and (c) have been revised and shortened and appear at §§1.56 (c) and (d). The proposal was criticized for leaving it open to the Office to apply a different standard of materiality from the one set forth in §1.56.[7] Section 1.56(d) as adopted states that an application "shall" be stricken when the criteria set forth are met. Thus §1.56(d) as adopted establishes a single standard for striking applications.

The term "inequitable conduct" is dropped from §1.56(d) as covering too great a spectrum of conduct to be subject to mandatory striking. Inequitable conduct that is equivalent to fraud is intended to come within the definition of fraud. The Court of Customs and Patent Appeals already has interpreted "fraud" in existing §1.56 to encompass conduct of this sort.[8] Moreover, §1.56(d) as adopted calls for striking an application either for fraud or for a violation of the duty of disclosure.

In §1.56(d) "bad faith" is substituted for the term "deliberate" that was used in the proposal. This change is to make clear than an intent to deceive (or gross negligence equivalent to such an intent) must be shown before an application will be stricken. Bad faith is not present if information is withheld as a result of an error in judgment or inadvertence.

Several comments concerned whether attorneys and agents could represent their clients' interests and at the same time comply with §1.56. Similar comments were directed to §§1.97 to 1.99. It is of course in the interest of the client to have a valid patent and this cannot be obtained without disclosure of known material facts. It is not inconsistent for an attorney or agent to fulfill his duty of candor and good faith to the Office and to act as an advocate for his client. The submission of information under §1.56 does not preclude the submission of arguments that such information does not render the subject matter of the application unpatentable.

In §1.65 a new third sentence is added to require the patent applicant to acknowledge the duty of disclosure. The language is changed from the proposal to be consistent with changes made in §1.56. To allow time for the Office and applicants to revise printed oath and declaration forms now in use, the mandatory acknowledgement of the duty of disclosure in amended §1.65 does not become effective until January 1, 1978. Applicants at their option may include the new language in oaths and declarations filed prior to the effective date. The Office will publish a separate notice in the Federal Register adding a sentence acknowledging the duty of disclosure to appropriate forms in 37 CFR Part 3, "Forms for Patent Cases."

The word "statement" is deleted from the title of §1.65 to avoid confusion with the prior art statement of §1.97 through 1.99.

Amended §1.346 emphasizes that there must be a reasonable basis to support every allegation of improper conduct made by a registered practitioner in any Office proceeding. The language that was proposed is clarified in the section as adopted. Although §1.346 is limited to papers filed in Office proceedings, the amendment to §1.346 is not intended to imply that disciplinary action never will be taken against a registered practitioner under§1.348 for a groundless allegation of improper conduct in a court proceeding.

Prior Art Statement

New §§1.97, 1.98 and 1.99 deal with prior art statements and provide a mechanism by which patent applicants may comply with the duty of disclosure provided in §1.56. The sections have been substantially changed from the proposal, in response to comments received.

Unlike the co rresponding part of the proposal, the sections as adopted are not mandatory, though applicants are strongly encouraged to follow the procedures described in them. Applications will be examined whether or not a prior art statement is filed and whether it complies with the rules or is defective. It is nevertheless believed that applicants will find that the use of prior art statements complying fully with the requirements of §§1.97 through 1.99 will be the best way to satisfy the duty of disclosure. The Patent and Trademark Office cannot assure that prior art disclosed in other ways will be considered by the examiner.

Sections i.97 through 1.99 do not prescribe the content of what materials should be submitted in the prior art statement; this is for the applicant and the attorney or agent to decide in the light of the duty of disclosure expressed in §1.56. The only criterion contained in §§1.97 through 1.99 as to content of the art cited is in §1.97(b). This subsection indicates that the statement will be construed as a representation that the prior are listed includes what the submitter considers to be the closest art of which he is aware. The submitter need not decide which particular items of prior art are the closest or identify any items as such; the representation is simply that he is not withholding known prior art which he considers closer than that which is submitted. Section 1.97(b) makes clear that the prior art statement is not representation that a search has been made or that no better art exists.

In §1.97(a) the time for filing the prior art statement is extended from the two months of the original proposal to three months. In most cases prior art submitted within three months will be available to the examiner before he takes up the case for action, though it will be helpful if citations are made as promptly as possible.

Section 1.98 lists the elements of the prior art statement: a listing of the art, a concise explanation of the relevance of each listed item, and copies of the art or the pertinent portions thereof.

The prior art statement resembles somewhat the "patentability statement" of the proposal and the "patentability brief" proposed elsewhere.[9] The name has been changed to reflect a change in the requirements of §1.98(a). Unlike the proposed version of this paragraph, which called for an explanation of why the claimed invention is believed patentable over the cited art, the paragraph as adopted calls only for a concise explanation of the relevance of each listed item. This may be nothing more than identification of the particular figure or paragraph of the patent or publication which has some relation to the claimed invention. It might be a simple statement pointing to similarities between the item of prior art and the claimed invention. It is permissible but not necessary to discuss differences between the prior art and the claims. It is thought that the explanation of relevance will be essentially as useful to the examiner as the formerly proposed explanation of patentability, and should be significantly less burdensome for the applicant to prepare.

Section 1.98 requires a copy of each patent or publication cited, including U.S. patents, to accompany the prior art statement. Several comments questioned the need for burdening the applicant to supply copies of materials that are present in the Office's files. However, substantial time and effort often is needed to locate a document in the Office's files. Since the person submitting the prior art statement generally has available a copy of the item being cited, it is believed that expense and effort can be minimized by having that person supply the copy in all cases. Consideration has been given to proposals to allow the applicant to submit an order for copies of the patents along with his statement instead of actually submitting copies. This will be further studied, but to date no way has been found to assure that the copies will be available to the examiner by the first action unless the applicant submits them with the prior art statement.

Other changes to §§1.97 through 1.99 from the proposal eliminate unnecessary language and clarify the requirements.

A notice published in 1974[10] contained guidelines for the citation of prior art by applicants. Many of those guidelines are repeated or superseded by §§1.97 through 1.99. In order to allow applicants, attorney and agents time to adjust their procedures to comply with the requirements for prior art statements, the effective date of §§1.97 through 1.99 will be July 1, 1977. Until these new sections become effective, applicants should continue to follow the 1974 guidelines. Issuance of a revised notice, to take effect July 1, 1977, is under study.

A survey conducted by the Office in 1976 concludes that many applicants have not been citing prior art to the Office.[11] It is hoped that with the duty of disclosure expresaly set forth in §1.56, applicants will perceive that it is to their advantage to use the procedures of §§1.97 through 1.99.

Section 1.51 is amended by designating the existing rule as §1.51(a) and adding new §1.51(b) which contains a reference to §§1.97 through 1.99.

Foreign Language Oaths

Amended §1.52 and new §1.69 are adopted as proposed.

Section 1.69 requires that oaths and declarations be in a language which is understood by the individual making the oath or declaration, i.e., a language which the individual comprehends. If the individual comprehends the English language, he must use it. If the individual cannot comprehend the English language, any oath or declaration must be in a language which the individual can comprehend. If an individual uses a language other than English for an oath or declaration, the oath or declaration must include a statement that the individual understands the content of any documents to which the oath or declaration relates. If the documents are in a language the individual cannot comprehend, the documents may be explained to him so that he is able to understand them.

The Office will provide approved translations for as many of the oath or declaration forms which appear in Part 3 of Title 37 of the Code of Federal Regulations as practicable, and in as many languages as practicable, probably using a side-by-side English/foreign language format. The availability of the foreign language forms will be announced in the *Official Gazette* at a later date.

The change in §1.52, providing for an exception to the requirement that oaths and declarations be in the English language, is necessitated by the adoption of § 1.69.

Although very few persons opposed §§1.52 and 1.69, several suggested that the philosophy behind the change be extended to the specification, requiring the specification to be in a language which the applicant understands, accompanied by an English translation. This suggestion was not considered feasible because of the obvious burdens on the applicant and the danger to the applicant and the public if the translation is not literally correct. Also, if a large number of applications were filed in a foreign language, there would be significant administrative burdens on the Office. Attention is directed to the Manual of Patent Examining Procedure. §608.1, which permits non-English language applications to be filed in certain limited circumstances.

Other suggested modifications of the proposed rule included: (1) using an English language oath or declaration with one additional clause in a language understood by the person making the oath or declaration, the clause stating that the person understands all the documents to which the oath or declaration relates; and (2) extending the two month grace period for filling an English translation of an oath or declaration filed under §1.65.

After due consideration, suggestion (1) was believed not to accomplish the objectives of the rule as well as the adopted rule. Suggestion (2) would cause unsatisfactory delays in the initial processing of applications.

Decisions and Files Made Public

Section 1.14(d) makes more explicit the conditions under which significant decisions of the Patent and Trade-

[5]U.S.—, 48 L. Ed. 2d 757, 96 S. Ct. 2126, 44 U.S.L.W. 4852, decided June 14, 1976.
[6]426 U.S. at—, 48 L. Ed. 2d at 763, 96 S. Ct. at 2132, 44 U.S.L.W. at 4855.
[7]See discussion accompanying proposed rules in Federal Register of Oct. 6, 19786, page 43731, first sentence.
[8]*Norton* v. *Curtiss*, 433 F.2d 779, 792, 167 USPQ 532, 543 (CCPA 1970).
[9]E.g., Federal Register of Sept. 9, 1968, 34 FR 14176, 866 O.G. 1402; S. 2255, 94th Congress, §131(b).
[10]Notice of Aug. 12, 1974, 926 O.G. 2.
[11]BNA's Patent. Trademark and Copyright Journal, No. 301, Oct. 28, 1976, page D-1.

mark Office will be made available to the public, and includes reference to decisions of the Board of Patent Interferences, in addition to decisions of the Board of Appeals and the Commissioner.

A large majority of the comments received were favorable. Several commentators felt that more decisions would be made available as a result of the proposed section and that it would assist in publicizing aspects of Office procedure which may not have been available previously.

Some negative comments were based on the view that the Freedom of Information Act[12] required all decisions of the Office to be made publicly available. A greater number of those opposing the proposed section, however, felt that applicants should have an absolute right to have their applications maintained in confidence and that no information should be made public without specific authorization from them. One commentator felt that rulemaking on this subject should be deferred until currently pending litigation[13] under the Freedom of Information Act was finally resolved.

The section as adopted is applicable to decisions deemed by the Commissioner to involve an interpretation of patent laws or regulations that would be of significant precedent value, where such decisions are contained in either pending or abandoned applications or in interference files not otherwise open to the public. It is applicable whether or not the decision is a final decision of the Patent and Trademark Office.

The parenthetical phrase in the first sentence of the proposed section, which cited other provisions of the rules under which decisions are open to public inspection, is deleted as unnecessary and possibly confusing. Also, in view of several comments received, the period of time during which an applicant or party in interest may object to having a decision made public is extended from one month to two months. At least twenty days is given to request reconsideration and seek court review before a decision is made public over an objection.

Section 1.14(d) is considered to place a duty on the Patent and Trademark Office to identify significant decisions and to take the steps necessary to inform the public of such decisions, by publication of such decisions, in whole or in part. It is anticipated, however, that no more than a few dozen decisions per year will be deemed of sufficient importance to warrant publication under the authority of this section.

Amended §1.14(b) allows public inspection of abandoned applications referred to in defensive publications. The comments received on the proposed amendment on this topic in 1974 expressed no opposition and the proposal is adopted without change.

The amendment is intended to encourage use of the defensive publication program provided under §1.139. The objective of that program is to make available to the public the technical disclosure of applications in which the owner prefers to publish an abstract in lieu of obtaining an examination. Existing §§1.11(b) and 1.139 open the complete defensive publication application to inspection by the general public upon publication of the abstract. With the amendment, an abandoned application referred to in a defensive publication application will likewise be open to public inspection, avoiding any need to repeat its contents in the defensive publication application. Thus, public availability of the applications involved should be of benefit both to the applicant and the public.

A suggestion was made that the section be extended still further to include abandoned applications referred to in foreign patents. This suggestion, however, goes too far beyond the proposal that was published and has too uncertain an impact to be adopted at this time.

Amended §1.11(a) provides earlier access to the file of an interference which involved a patent or an application on which a patent has issued. All comments that were submitted on the 1974 proposal on this topic were favorable and two commentators felt the proposal should be extended further. The proposal is being adopted without change.

Under present practice, access to the file of an interference is not permitted until judicial review of the decision of the Board of Patent Interferences has been exhausted. The amended section allows access to the file after final decision of the Board of Patent Interferences if that decision is an award of priority as to all parties. It is believed that such earlier access will be of benefit to members of the public by making available information relevant to the issuance of the patent whether or not the interference decision is still being adjudicated.

Patent Appeals

Section 1.194 clarifies the circumstances in which oral hearings should be requested, provides for oral arguments by or on behalf of examiners in certain appeals and reduces the time permitted for oral arguments.

Comments relating to this section were favorable by a very substantial majority, although there were several reservations to the effect that §1.194(a) tended to discourage or downgrade oral arguments. Participation by examiners was considered to be desirable not only from the standpoint of improving the overall presentation of the argument, particularly in complex cases, but also for the educational and experience benefits to the examiners themselves.

The only opposition to the section was based on the feeling that oral hearings would be discouraged. The rule is intended to discourage oral hearings only to the same extent as the Office's 1975 Official Gazette notice on the subject.[14] Section 1.194(a) indicates that oral hearings should not be requested as a matter of course in every appeal, but only in those circumstances where the appellant feels that such a hearing will be of material assistance to the proper presentation of the appeal. The section expressly provides that equal consideration will be accorded in deciding all appeals, whether or not an oral hearing is held.

In appeals where the appellant has requested an oral hearing §1.194(b) provides for oral argument by, or on behalf of, the primary examiner, if such argument is considered to be helpful by either the primary examiner or the Board. This provision incorporates the present practice of permitting examiners to present an oral argument before the Board.[15] It gives the Board additional discretionary authority to request presentation of an oral argument by, or on behalf of the examiner to ensure that all issues are fully and accurately presented.

Section 1.194(c) provides, as does existing §1.194, that appeals will be assigned for consideration and decision without an oral hearing where none has been requested by the appellant. Where an oral hearing has been requested, a day of hearing will be set, and both appellant and the primary examiner will be notified. A provision for notice to the examiner is added to the proposed version. Additionally, §1.194(c) reflects the present practice of limiting oral argument on behalf of the appellant to twenty minutes.[16] The time permitted for argument by the examiner has been shortened from twenty minutes, as proposed, to fifteen minutes. The examiner, unlike the appellant, will not ordinarily need time to present the facts of the case or for rebuttal.

In any appeal where oral argument is to be presented by, or on behalf of, the primary examiner, the appellant will be given due notice of that fact.

Proposed §1.196(b) would have authorized the Board of Appeals to reject allowed claims, in cases before it, whenever the Board had knowledge of grounds for so doing.

While a majority of those commenting on this section favored in principle the concept of allowing the Board

[12]USC 552.
[13]*Irons* v. *Gottschalk*; Slip Opinion, No. 74-1365 (D.C. Cir., Oct. 21, 1976).
[14]Mar. 20, 1975, 933 O.G. 1010.
[15]MPEP, §1209.
[16]See notice of Mar. 20, 1975, 933 O.G. 1010.

to have this right, significant concern was voiced that there was no statutory authority for the Board to actually reject allowed claims. Further, the question of proper authority for judicial review of such action by the Board was a matter of concern. Other reasons advanced in opposition to the section were that applicants would be inhibited from appealing by the risk of having allowed claims rejected and that the proposal would create a higher presumption of validity in cases reviewed by the Board. A significant number commented that it would be more appropriate for the Board to remand the case to the primary examiner for consideration of the grounds raised by the Board. This would afford the applicant an opportunity to demonstrate the patentability of the claims and would remove any question as to statutory authority.

In view of the comments received, existing §1.196(b) will not be modified, but a new §1.196(d) is added providing express authority for the Board of Appeals to include, in its decision, a statement of any grounds for rejecting any allowed claim that it believes should be considered by the primary examiner. Section 1.196(d) provides that the Board may remand the case to the examiner for such consideration, and that the applicant shall have an opportunity to respond to the grounds set forth by the Board prior to consideration, by the examiner. If the previously allowed claims are rejected by the examiner, the rejection may be appealed to the Board.

The new section further provides that a decision of the Board which includes a remand will not be considered as a final decision in the case, but that the Board, following conclusion of the proceedings before the primary examiner, will either adopt its earlier decision as final or will render a new decision based on all appealed claims, as it considers appropriate. In either case, final action by the Board will give rise to the existing alternatives available to an appellant following a decision by the Board.

In situations where the primary examiner concludes after consideration of all the evidence and argument that the remanded claims should be allowed, the new rule dealing with reasons for allowance (§1.109) provides an appropriate mechanism for him to explain, on the record, his reasoning for coming to this conclusion, notwithstanding the grounds set forth by the Board in its statement.

Promulgation of new §1.196(d) does not affect the Board's existing authority to remand a case to the primary examiner without rendering a decision in appropriate circumstances. Section 1.196(d) is not intended as an instruction to the Board to reexamine every allowed claim in every appealed application. It is, rather, intended to give the Board express authority to act when it becomes apparent, during the consideration of rejected claims, that one or more allowed claims may be subject to rejection on either the same or on different grounds from those applied against the rejected claims.

Reasons for Allowance

New §1.109 is intended to emphasize and formalize the examiner's authority to state his reasoning for allowing a claim or claims. The authority is discretionary with the examiner and is only to be used when the record does not otherwise reveal the reasons for allowance.

A majority of the comments received favored the rule as proposed because it would tend to provide courts and others who were reviewing the patent with a clearer record. Those who opposed the rule most often gave the reason that the examiner might fail to state all the reasons or the strongest reasons why a claim was allowed, which could place unnecessary limitations on the claims or create an estoppel in subsequent litigation or licensing.

To help insure that the examiner's statement of his reasoning in allowing a claim will not unnecessarily limit the claims or create an estoppel, a final sentence is added to the proposal which states that failure of the applicant to comment upon or rebut the examiner's reasoning "shall not give rise to any implication that the applicant agrees with or acquiesces in the reasoning of the examiner."

Several commenters suggested that stricter enforcement of §§1.111 and 1.133 would eliminate the need for a new rule concerning reasons for allowance. Situations exist, however, where a statement of reasons for allowance could be helpful, for example when an examiner withdraws a rejection for reasons not suggested by the applicant; when an applicant submits several arguments for allowing a claim and the examiner finds not all of them persuasive: when an examiner allows a claim on the first Office action after citing very close prior art: and when the examiner allows a claim after remand from the Board of Appeals (see new §1.196(d)).

The first sentence of the proposed rule is changed to define more precisely the circumstances in which an examiner's statement is appropriate, as well as to define more precisely the content of the statement. The statement will include the examiner's "reasoning." The examiner may state his reasoning whenever he "believes that the record of the prosecution as a whole does not make clear his reasons for allowing a claim or claims."

Several persons commented that the rule should provide a procedure for appeal from the examiner's statement of his reasoning. The rule does permit applicants to comment upon the examiner's reasoning. If the applicant does not wish to comment, he may reserve for a later proceeding, without prejudice, any rebuttal. [Text of adopted rules appears in 37 CFR, revised 7-1-77]

Effective Date. These amendments become effective on March 1, 1977, except for §§1.51, 1.97, 1.98, and 1.99 which become effective on July 1, 1977, and §§1.65 and 1.69 which become effective on January 1, 1978.

Jan. 18, 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Jan. 19, 1977.

Betsy Ancker-Johnson, Ph.D.
Assistant Secretary for Science and Technology.

[955 O.G. 1054]

(100) Guidelines for Implementation of Recently Revised Rules

Recently a number of rules relating to Patent Examining and Appeal procedures were revised. The new rules were published in the Federal Register at 42 F.R. 5588 on January 28, 1977, and in the *Official Gazette* at 955 O.G. 1054 on February 22, 1977. The following guidelines are being published to describe the procedures which are being followed in implementing 37 CFR sections 1.11, 1.97–1.99, 1.109, 1.194, 1.291 and 1.292.

Files Open to the Public

Section 1.11(b) is applicable only to those reissue applications filed on or after March 1, 1977. Those reissue applications already on file will not be automatically open to inspection but a liberal policy will be followed by the Office of the Solicitor in granting petitions for access to such applications.

(**Note.**—These sections as changed will be incorporated into the Manual text in Rev. 3 of the Manual.)

For those reissue applications filed on or after March 1, 1977, the following procedure will be observed:

1) The filing of reissue applications will be announced in the *Official Gazette* and will include certain identifying data as specified in section 1.11(b). Any

member of the general public may request access to a particular reissue application filed after March 1, 1977. Since no record of such request is intended to be kept, an oral request will suffice.

2) The reissue application files will be maintained in the examining groups and inspection thereof will be supervised by group personnel. Although no general limit is placed on the amount of time spent reviewing the files, the Office may impose limitation, if necessary, e.g., where the application is actively being processed.
3) Where the reissue application has left the examining group for administrative processing, requests for access should be directed to the appropriate supervisory personnel in the Division or Branch where the application is currently located.
4) Requests for copies of papers in the reissue application file must be in writing addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 and may be either mailed or delivered to the Office mailroom. The price for copies made by the Office is thirty cents per page.

Prior Art Statements

This notice supersedes the notices of August 12, 1974 (926 O.G. 2) and May 19, 1975 (935 O.G. 902) relating to citations of prior art. Although new sections 1.97 through 1.99 are not effective until July 1, 1977, and are not mandatory upon applicants, they provide an ideal mechanism for complying with the duty of disclosure under 37 CFR 1.56. The statements should be submitted in accordance with the following guidelines:

1) Prior art statements should be submitted at the time of filing the application or within three months thereafter and may be separate from the specification or incorporated therein. The statement shall serve as a representation that the person preparing it has included therein what he believes to be the closest prior art of which he is aware and shall not be construed as a representation that no better art exists or that a search has been made. If the first action in the application is received prior to three months after filling of the application and no prior art statement has been submitted, the prior art statement may be submitted with the response to the first action and be considered timely.
2) The statement shall include a listing of the patents, publications or other information which the preparer of the statement wishes to cite and a concise explanation of the relevance of each listed item. Copies of the pertinent portions of all listed documents shall be supplied along with the statement, both when incorporated into the specification and when filed separately. If two or more patents or publications considered material are substantially identical, a copy of a representative one shall be included with the statement and others may merely be listed with an indication of which are considered to be substantially identical.
3) A translation of the pertinent portions of foreign language patents or publications considered material should be transmitted if an existing translation is readily available to the applicant. It will be sufficient, however, to transmn an equivalent English language patent or publication so long as it is identified as an equivalent.

   Where the applicant has submitted copies of prior art, in accordance with these guidelines in a prior application, reference to the prior application and the submission therein will be sufficient for the continuing application as far as the copies are concerned. As far as the statement per se is concerned, the relevance of the prior art to the claimed subject matter must be indicated if it differs from its relevance as explained in the prior application.
4) If prior to the issuance of a patent an applicant pursuant to his duty of disclosure under 37 CFR 1.56, wishes to bring to the attention of the Office additional patents, publications or other information not previously submitted, the additional information should be submitted to the Office with reasonable promptness. It may be included in a supplemental prior art statement or may be incorporated into other communications to be considered by the examiner. Any transmittal of additional information shall be accompanied by explanations of relevance and by copies in accordance with the requirements aforementioned. The transmittal should include a statement explaining why the prior art was not earlier submitted.

While the Patent and Trademark Office will not knowingly ignore any prior art which might anticipate or suggest the claimed invention, no assurance can be given that cited art or other information not submitted in accordance with these guidelines will be considered by the examiner.

After the claims have been indicated as allowable by the examiner, e.g., by the mailing of an Ex parte Quayle action, a notice of allowability (PTOL—327), an examiner's amendment (PTOL—37), or a Notice of Allowance (PTOL—85), any citations submitted will be placed in the file. Since prosecution has ended, however, such submissions will not ordinarily be considered by the examiner unless the citation is accompanied by:

(*a*) A proposed amendment cancelling or further restricting at least one independent claim and narrowing the scope of protection sought;
(*b*) A timely affidavit under 37 CFR 1.131 with respect to the material cited; or
(*c*) A statement by the applicant or his attorney or agent that, in the judgment of the person making the statement, the prior art or other information cited raises a serious question as to the patentability of the claimed subject matter, or is closer prior art than that of record.

If the material is submitted after the base issue fee has been paid, it must also be accompanied by a petition under 37 CFR 1.183 requesting a waiver of 37 CFR 1.312. Such petition, if granted, would result in review of the art by the examiner and possible entry of the amendment.

In each instance where an examiner considers, but does not cite on form PTO—892, specific prior art referred to in a paper placed in the application file, the examiner will place a notation adjacent to the reference according to the following:

If included in the specification, the examiner will write his or her initials adjacent to any references checked and enter "checked" in the left margin opposite the initials. If presented in a separate paper or in the remarks of an amendment, the examiner's initials and "checked" will be entered adjacent to the citations or wherever possible to indicate clearly those checked.

Reasons for Allowance

One of the primary purposes of the change in Section 1.109 is to improve the quality and reliability of issued patents by providing a complete file history which should clearly reflect, as much as is reasonably possible, the reasons why the application was allowed. Such information facilitates evaluation of the scope and strength of a patent by the patentee and the public and may help avoid or simplify litigation of a patent.

The practice of stating the reasons for allowance is not new and the rule merely formalizes the examiner's existing authority to do so and provides applicants an opportunity to comment upon any such statement of the examiner.

When the examiner determines that it is necessary or desirable, a "Statement of Reasons for Allowance" will be prepared. The "Statement" will usually be an attachment to either a notice of allowability (PTOL—327) or Examiner's Amendment (PTOL—37). Any comments considered necessary by applicant must be submitted no later than the issue fee and should preferably *accompany* the issue fee. Submission with the issue fee avoids any delay in the processing of the application and avoids the necessity to associate the comments with the application while it is in issue except at the time the file must be pulled to record the payment of the issue fee. Such comments will be entered in the application file by the Allowed Files Branch with an appropriate notation on the "contents" list of the file wrapper, but will not be reviewed by the examiner.

Oral Hearings Before Board of Appeals

Section 1.194 clarifies the circumstances in which oral hearings should be requested and provides for oral arguments by, or on behalf of, primary examiners in certain appeals.

Under Section 1.194, the following procedures will be in effect:

1) In accordance with Section 1.192, appellants who desire an oral hearing must request the same at the time of filing the appeal brief.
2) If appellant has requested an oral hearing and the primary examiner intends to present an oral argument, the last paragraph of the examiner's answer will indicate this intention.
3) Notice of the oral hearing will be given to the appellant and, at the same time, to the primary examiner in those cases in which the primary examiner has indicated an intention to present an oral argument.
4) After an oral hearing has been confirmed and the date set as provided in Section 1.194(c), the application file will be delivered to the examiner via the appropriate Group Director at least one week prior to the date of the hearing for those cases in which the examiner is expected to be present at the hearing. In those cases where the Board requests the presentation of an oral argument by, or on behalf of, the primary examiner, the appellant will be so notified. The Board's request for an oral argument may, where appropriate, indicate specific points or questions to which the argument should be particularly directed. The application file will be returned to the Board before the hearing.
5) In those appeals in which an oral hearing has been confirmed and either the primary examiner or the Board has indicated a desire for oral argument, such oral argument may be presented whether or not appellant appears.

Protests and Public Use Proceedings

Amended sections 1.291 and 1.292 give greater recognition to the value of written protests and public use petitions and are intended as an aid in avoiding the issuance of invalid patents.

Under sections 1.291 (b) and (c) and 1.292(b), the following procedures will be observed:

1) Only in those instances where it has not been possible to serve protest papers upon the applicant, attorney or agent, should duplicates of the papers submitted be provided. In this case the appropriate examining group will attempt to get the duplicate copy to the applicant, attorney or agent. However, every effort should be made by the protester to effect service.
2) Citations of prior art and any papers related thereto may be entered in the file after a patent has been granted by submitting them to the attention of the Record Room, where they will be entered without comment by the Office. If after diligent effort it has not been possible to serve the prior art citations and related papers on the patentee, his attorney or agent, duplicate copies should be submitted in which case the Record Room will attempt to get the duplicate copy to the owner of record.
3) When public use petitions and accompanying papers are submitted they, or a notice in lieu thereof, will be entered in the application file. Duplicate copies should be submitted only when, after diligent effort, it has not been possible for petitioner to serve a copy of the petition on the applicant, his attorney or agent in which case the Office of the Solicitor will attempt to get the duplicate copy to the applicant, his attorney or agent.
4) To ensure consideration by the examiner, protests should be timely submitted, i.e., before final rejection or allowance. Consideration of protests filed after final rejection or allowance will depend upon the relevance of the prior art documents and the point in time at which they are submitted. Documents which clearly anticipate or render obvious one or more claims will not knowingly be ignored. If protests are not timely submitted or if they fail to comply with section 1.291(a) as to the submission of a copy of each prior art document relied upon, they will be acknowledged and referred to the examiner having charge of the subject matter involved for entry in the application file and such consideration as seems warranted.

In each instance where an examiner considers but does not cite on form PTO—892 specific prior art referred to in a protest, the examiner will place a notation in the protest paper adjacent to the reference which will include his or her initials and the term "checked."

Additional future guidelines as to protest procedures may be developed after gaining experience with the new practice.

C. MARSHALL DANN,
Mar. 18, 1977. *Commissioner of Patents and Trademarks.*

[957 O.G. 11]

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(101) **Further Guidelines Relating to 37 CFR 1.175 and 1.291, as Amended Effective March 1, 1977**

The experience with the above revised rules since their effective date has indicated the desirability of further guidelines relating to the manner in which they are to be implemented. The following guidelines are supplemental to those which have already been provided in the publication of the rules in the Federal Register of January 28, 1977 (42 F.R. 5588) (955 O.G. 1054, February 22, 1977), and in the earlier Guidelines published at 957 O.G. 11 on April 12, 1977. Copies of the latter two *Official Gazette* publications appear as items 59 and 60 of the current "Consolidated Listing of Recent Official Gazette Notices" published at 966 O.G. 22–32. The present guidelines are also supplemental to the appropriate sections of the Manual of Patent Examining Procedure, e.g., Sections 1401–1401.12 relating to reissue, and Section 1309.02 relating to protests. Sections 721 and 721.01 of the MPEP contain guidelines to be followed if either a reissue or other application, or a protest relative to any application, raises questions of "fraud" or "violation of the duty of disclosure." Accordingly, the above-noted materials should be consulted in addition to these further guidelines, which are in themselves not intended to completely treat the subjects involved. For the most part, the guidelines herein merely identify and clarify existing requirements and practices. The Patent and Trademark Office has a general study underway of the procedures for handling reissue applications and protests which may result in future modifications in these guidelines.

Section 1.175(a)(4) of the revised rules recognizes that reissues may be filed to have the patentability of the original patent, without changes therein, considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

The experience to date reveals the need to clarify what should be filed by the applicant in order to seek the reexamination contemplated by sub-section (a)(4) and also the type and content of the examination which

the examiner will give to applications filed under sub-section (a)(4).

First, sub-section (a)(4) does *not* contemplate, or permit, the filing of a reissue application without an oath or declaration. To the contrary, an oath or declaration is required, and such oath or declaration *must* comply with each of sub-sections (a)(4), (a)(5), and (a)(6). Thus, under sub-section (a)(4) the oath or declaration must particularly specify the "prior art or other information relevant to patentability, not previously considered by the Office," which the reissue applicant considers "might cause the examiner to deem the original patent wholly or partly inoperative or invalid." The reissue oath or declaration must also request, under sub-section (a)(4), that "if the examiner so deems, the applicant be permitted to amend the patent and be granted a reissue patent."

Under sub-section (a)(5), the reissue oath or declaration, including those filed under sub-section (a)(4), must particularly specify "the errors or what might be deemed to be errors relied upon, and how they arose or occurred." This sub-section has two specific requirements, *both of which must be complied with* in, or by, the reissue oath or declaration. Thus, insofar as (a)(4) reissue oaths or declarations are concerned, the oath or declaration must particularly specify "what might be deemed to be errors." For example, if the reissue applicant is seeking reexamination in view of particular prior art or other information, the reissue oath or declaration must point out "what might be deemed to be errors" in patentability in view of such prior art or other information. More specifically, the oath or declaration, in appropriate circumstances, might state that some or all claims might be deemed to be too broad and invalid in view of references X and Y which were not of record in the patented files. Usually, a general statement will suffice. But where appropriate, such as where the pertinence of the new references X and Y are not evident, more specificify about "what might be deemed to be errors" should be provided. Of course, the reissue applicant does *not* have to, and presumably does *not*, agree that "errors" exist. However, the reissue applicant does have to, in the reissue oath or declaration of the sub-section (a)(4) type, particularly specify "what might be deemed to be errors relied upon."

In addition to specifying "what might be deemed to be errors relied upon," sub-section (a)(5) also requires "particularly specifying" "how they arose or occurred." This means, of course, that the reissue oath or declaration must specify the manner in which that which "might be deemed to be errors" "arose or occurred." For example, if the (a)(4) reissue is being filed for reexamination in view of prior art or other information, the reissue oath or declaration must indicate when and the manner in which the reissue applicant became aware of the possible error in the patent, e.g., third party allegation, discovery of prior art or other information subsequent to issuance of patent, knowledge of prior art or other information before issuance of patent with significance being brought out after issuance by third party, through allegations made in litigation involving the patent, etc. It is particularly important that the reissue oath or declaration adequately specify how "what might be deemed to be errors" arose or occurred. If the reissue oath or declaration does not particularly specify "how," i.e., the manner in which any possible errors arose or occurred, the Office will be unable to adequately evaluate reissue applicant's statement in compliance with (a)(6) that the "errors, if any, arose 'without any deceptive intention' on the part of the applicant."

Sub-section (a)(6) specifically requires that the reissue oath or declaration, including those filed under sub-section (a)(4), contain the averment that the "errors, if any, arose 'without any deceptive intention' on the part of the applicant." This requirement must not be overlooked in filing since the requirement for an absence of "deceptive intention" is a necessary part of any reissue application, including those of the (a)(4) type.

The significance and importance of sub-sections (a)(5) and (a)(6) must not be overlooked or minimized insofar as reissue oaths or declarations are concerned, including those filed under sub-section (a)(4). These sub-sections, to a large extent, enable the Office to make its determination required by statute that any error is "without any deceptive intention."

In addition to meeting the requirements of Sections 1.175 (a)(4)–(a)(6) insofar as the reissue oath or declaration is concerned, the reissue applicant, at the time of filing the reissue application, including the (a)(4) type reissue application, must also be aware of the requirements of 37 CFR 1.56, as revised effective March 1, 1977. Reissue applicants may, of course, utilize new Sections 1.97–1.99 to comply with the duty of disclosure required by Section 1.56. While Section 1.97(a) provides for filing of the prior art statement within three months of the filing of the application, reissue applicants are encouraged to file the prior art statement at the time of filing the application in order that such prior art statements will be availale to the public during the two-month period provided by Section 1.176.

In situations in which the patent for which reexamination is being sought is, or has been, involved in litigation, which raised a question material to examination of the reissue application, such as the validity of the patent, or any allegation of fraud, the existence of such litigation must be brought to the attention of the Office at the time of, or shortly after, filing the application, either in the reissue oath or declaration, or in a separate paper, preferably accompanying the application as filed. Litigation begun after filing of the reissue application also should be promptly brought to the attention of the Office. The details and documents from the litigation, insofar as they are "material to the examination" of the reissue application as defined in 37 CFR 1.56(a), should accompany the application as filed, or be submitted as promptly thereafter as possible. For example, the defenses raised against validity of the patent, or charging fraud or inequitable conduct in the litigation, would normally be "material to the examination" of the reissue application. It would, in most situations, be appropriate to bring such defenses to the attention of the Office by filing in the reissue application a copy of the Court papers raising such defenses. As a minimum, the applicant should call the attention of the Office to the litigation, the existence and nature of any allegations relating to validity and/or "fraud" relating to the original patent, and the nature of litigation materials relating to these issues. Enough information should be submitted to clearly inform the Office of the nature of these issues so that the Office can intelligently evaluate the need for asking for further materials in the litigation. Thus, the existence of supporting materials which may substantiate allegations of invalidity or "fraud" should, at least, be fully described, or submitted. The Office is *not*, of course, interested in receiving voluminous litigation materials which are *not* relevant to the Office's consideration of the reissue application. The status of the litigation should be updated in the reissue application as soon as significant events happen in the litigation.

The Examination of Reissue Applications, Including Those Filed Under 37 CFR 1.175(a)(4)

The examination of reissue applications, including those filed under sub-section (a)(4), will be in accordance with Sections 1401–1401.12, M.P.E.P. Attention is particularly directed to Section 1401.09, M.P.E.P. which refers to the two aspects of reissue examination, i.e., examination in the same manner as an original application and examination for compliance with the reissue statute and rules. The purpose of the present guidelines is to supplement those presently in existence and to emphasize certain points, particularly as they relate to reissue applications filed under sub-section (a)(4).

When examining the reissue application the examiner will consider whether or not applicant, in the reissue oath or declaration, has complied with each of the requirements of 37 CFR 1.175. For example, in all reissue applications, the reissue oath or declaration must comply with the requirements of the first sentence of 37 CFR 1.65. When the reissue application is other than the (a)(4) type, the reissue oath or declaration must comply with the appropriate sub-sections (a)(1) to (a)(3) and sub-sections (a)(5) and (a)(6). When the reissue application is filed under sub-section (a)(4), the reissue oath or declaration must also comply with sub-sections (a)(5) and (a)(6). Thus, all reissue applications must comply with sub-sections (a)(5) and (a)(6). If the examination reveals a lack of compliance with any requirement of Section 1.175, e.g., the requirements of sub-sections (a)(5) and/or (a)(6), a rejection will be made on the basis that the reissue oath or declaration is insufficient. See Section 1401.08, M.P.E.P. Under no circumstances will any reissue application be passed for issue without full compliance with 37 CFR 1.175.

Applications filed under sub-section (a)(4) will not, of course, be passed for issue without amendment, but will be rejected as lacking statutory basis for a reissue if *there are no other grounds for rejection*, since 35 U.S.C. 251 does not authorize reissue of a patent unless the patent is deemed wholly or partly inoperative or invalid. If a reissue filed under sub-section (a)(4) is subsequently amended thereby converting it into an application under sub-sections (a)(1) to (a)(3), *a supplemental reissue oath or declaration must be filed containing the appropriate averments*, If such a proper supplemental oath or declaration is not filed, a rejection will be made on the basis that the reissue oath or declaration is insufficient. The supplemental oath or declaration insures compliance with 35 U.S.C. 251 by providing appropriate averments relating to actual errors rather than possible errors.

If the examiner becomes aware of litigation involving the patent sought to be reissued during examination of the reissue application, and applicant has not made the details regarding that litigation of record in the reissue application, the examiner, in the next office action, will inquire regarding the same. The following paragraph may be used for such an inquiry:

> "It has come to the attention of the examiner that the patent sought to be reissued by this application (is) (has been) involved in litigation. Any documents and/or materials, including the defenses raised against validity, or against enforceability because of fraud or inequitable conduct, which would be material to the examination of this reissue application are required to be made of record in response hereto. See 37 CFR 1.175(b)."

If the additional details of the litigation appear to be material to examination of the reissue application, the examiner may make such additional inquiries as necessary and appropriate under 37 CFR 1.175(b).

However, any application which indicates the existence of *a question* of "fraud" or "violation of the duty of disclosure" will be forwarded to the Office of the Assistant Commissioner for Patents pursuant to Section 721.01, M.P.E.P., as soon as the existence of *such question* is appreciated. For example, any reissue application which seeks reexamination in view of material prior art or other information known before issuance of the patent to a person having a duty under 37 CFR 1.56(a) must be forwarded under Section 721.01, M.P.E.P., to the Assistant Commissioner via the Group Director.

The Filing of Protests Under 37 CFR 1.291

The amendments to Section 1.291 reflected the increased value the Office places on appropriate written protests as an aid in avoiding the issuance of invalid patents. The present supplemental guidelines are in addition to those previously published and referred to above.

The nature of the protest, and the timeliness of its submission, are important factors in determining the consideration which is given the protest, and by whom it is considered. Insofar as the question of timeliness is concerned, the original publication of the rules at 955 O.G. 1054, the earlier Guidelines published at 957 O.G. 11, and Section 1309.02, M.P.E.P. adequately treat this question. Protests should obviously be submitted as early in the examination process as possible in order to be of maximum benefit to the Office in its examination of the application involved.

If the protest is being filed with regard to a reissue application, the protest should be filed within the two-month period following announcement of the filing of the reissue application in the Offical Gazette, if it is at all possible to do so. If, for some reason, the protest of the reissue application cannot be filed within the two-month period provided by 37 CFR 1.176, the protest can be submitted at a later time, but protestor must be aware that reissue applications are "special" and a later filed protest may be received after action by the examiner, if submitted later than the two months provided by 37 CFR 1.176. In the event a protest is intended against a reissue application, but cannot be submitted within the two months provided following the O.G. announcement, the protestor can request an additional specified period within which to file the protest, explaining why the additional time is necessary and the nature of the protest intended. A copy of any such request for additional time to protest a reissue application beyond the two months provided must be served on the reissue applicant. The request for additional time should be directed to the appropriate Group Director. The requests for additional time beyond the two months provided will be *critically reviewed as to demonstrated need* before being granted since the delay of examination of a reissue application of another party is being requested. Accordingly, the requests should be made *only where necessary, for the minimum period required* and with a justification establishing the necessity for the extension.

Any protest filed alleging "fraud" or "violation of the duty of disclosure" should be directed to the attention of the Assistant Commissioner for Patents, Building 3, Room 11A–13. Protests based on grounds other than "fraud" or "violation of the duty of disclosure" should be directed to the attention of the Director of the particular examining group in which the application is pending. If the protestor is unable to specifically identify the application to which the protest is directed, but, nevertheless, believes such an application to be pending, the protest should be directed to the attention of the Assistant Commissioner for Patents, Building 3, Room 11A–13, along with as much identifying data for the application as is available.

As indicated in the earlier publications, e.g., Section 1309.02, M.P.E.P., every effort should be made by a protestor to effect service of the protest upon the attorney or agent of applicant who is of record or upon the applicant. The protest filed in the Office should reflect that service has been made. Only in those instances where service is not possible should the protest be filed in duplicate in order that the Office can attempt service. Of course, the copy served upon applicant or applicant's attorney or agent should be accompanied by a copy of each prior art or other document relied upon in the same manner as required by Section 1.291(a) for the Office copy.

The Examiner's Consideration of Protests

Protests other than those alleging "fraud" or "violation of the duty of disclosure" will be received by, or forwarded to, the Group Director of the examining group where the application is, or may be, pending and then referred to the appropriate examiner. If it is then, or later, discovered that a question of "fraud" or "violation of the duty of disclosure" exists, the application and the protest, will be forwarded to the Office of the Assistant Commissioner for Patents pursuant to Section 721.01, M.P.E.P.

If no allegations or questions of "fraud" or "violation of the duty of disclosure" are found to exist, the examiner will consider the protest and report the results of the consideration to the Group Director. If the protest has been timely submitted, i.e., before final rejection or allowance, the examiner will consider each of the prior art or other documents submitted. At least those prior

art documents which the examiner relies on in rejecting claims will be made of record by means of form PTO—892. If the examiner does not cite all of the prior art or other documents of form PTO—892, the examiner will place a notation in the protest paper adjacent to the reference to the documents which will include the examiner's initials and the term "checked."

If the protest is filed after final rejection or allowance of the application, the consideration by the examiner will depend upon the relevance of the prior art documents submitted and the point in time at which they are submitted. Documents which clearly anticipate or render obvious one or more claims will not be knowingly ignored. Prosecution of the application will be reopened where necessary. However, protestor must be aware that the likelihood of consideration by the Examiner decreases as the patent issue date approaches. Accordingly, protests must be filed early in order to ensure their consideration.

If the protest is not accompanied by a copy of each prior art or other document relied upon as required by Section 1.291(a), the protestor cannot be assured that the examiner will consider the missing document. However, if the examiner does so, the examiner will either cite the document on form PTO—892 or place a notation in the protest paper adjacent to the reference to the document which will include the examiner's initials and the term "checked."

If, upon considering the protest or any submissions subsequent thereto, the examiner considers it desirable to obtain applicant's comments on the protest before further action, the examiner will offer applicant an opportunity to file comments within a set period, usually two months.

The following suggested format can be used to offer applicant an opportunity to file comments on the protest:

> "A protest against the issuance of a patent based on this application has been filed under 37 CFR 1.291 on . . . . and a copy (has been indicated as having been served on applicant) (is attached hereto). Any comments or response applicant desires to file before consideration of the protest must be filed by . . . ."

Section 1.291(a) indicates that protests are acknowledged and this acknowledgement will normally be made by the particular office to which the protest is ultimately directed for consideration. Protests alleging "fraud" or "violation of the duty of disclosure" will normally be acknowledged by the Office of the Assistant Commissioner for Patents. Other protests, i.e., those not alleging "fraud" or "violation of the duty of disclosure" will normally be acknowledged by the Group Director of the examining group where the application is, or may be, pending.

If the protest involves an application to which the protestor has access, e.g., a reissue application filed after March 1, 1977, or one in which protestor has been formally granted access, then protestor may monitor the proceedings and file such additional papers as protestor considers appropriate. If protestor has access to the application, protestor may request the Office to supply protestor with copies of Office actions or other documents mailed by the Office. Such a request should be directed to the particular area in which the application is pending, e.g., Office of Assistant Commissioner for Patents, or Director of the particular examining group. The request should explain why protestor needs the copies in question and should indicate an intent on protestor's part to assist the Office in its examination by supplying relevant comments. Normally, the Office will send copies of Office actions to protestors where the protestor indicates an intent to review actions and, if appropriate, comment to the Office on them. However, since protestor has no right to copies of the Office actions or other documents, the granting or denying of such requests will be within the sole discretion of, and for the convenience of the Office.

If the protestor has access to the application, the examiner may communicate with the protestor *in writing* to seek clarification and/or additional information if the examiner considers such clarification and/or additional information necessary to properly consider the protest. The following suggested format can be used by the examiner to seek clarification and/or additional information from a protestor having access to an application:

> "The protest, as filed_____, has been noted. However, clarification and/or additional information is desired. In particular [Examiner explains] any submission of the requested information should be made within ONE MONTH of the date of this letter and the submission must indicate service on applicant."

While the examiner should not normally need clarification and/or additional information from the protestor where the grounds involve only published prior art, e.g., patents, periodicals, etc., under some circumstances it may be necessary for the examiner to seek such clarification and/or additional information. For example, if the date of a reference is in question, or some question of public use is involved, and the information being sought is within the knowledge or control of the protestor, the examiner may find it necessary to communicate with the protestor to obtain the same.

Where the examiner feels that a protestor with access to an application can contribute significantly to the examination process, the protestor may be given a specific period, normally one month, within which to comment on responses submitted by patent applicants to Office actions. Such a comment period should only be provided where it would appear to be of benefit to the examination process and only with the approval of a Supervisory Primary Examiner. Where an applicant agrees to such participation by a protestor or where a Court has suspended litigation for consideration of a related application by the Patent and Trademark Office with an expression of its desire for such protestor participation, it should be more liberally granted.

Where a protestor requests permission to participate in any interview between an applicant and the examiner or requests on its own behalf to have an interview with the examiner, the request should be referred to the Office of the Assistant Commissioner for Patents for action. Normally, protestor participation in interviews with examiners will not be allowed unless special justifying circumstances exist. Where authorized, participation by the protestor in an interview will be according to conditions set down by the Patent and Trademark Office. Normally, any transcript of the interview, if authorized, will be at the expense of the party or parties requesting it and will be arranged by such party or parties. Where Office actions are being sent to a protestor or where a protestor is present for an interview, a copy of the Interview Summary Form and other records made of the interview will be provided to the protestor. Where protestor's participate in an interview, they may submit their own record of the interview which will be made of record in the file.

Interviews relating to a patent application with a protestor will not be permitted without the applicant present.

A protestor with access to an application appealed to the Board of Appeals who intends to file comments or a brief in opposition to appellant's brief should file an indication of such intention within one month after the notice of appeal is filed and serve a copy of the same upon appellant. The indication of intention should state that protestor agrees to file such comments or brief in triplicate, within one month after appellant's brief is filed, and also agrees to serve a copy of the comments or brief upon appellant. If such an indication is not filed and served, or the protestor's comments or brief is not timely filed in triplicate and served, no assurance is given that the Examiner will consider the protestor's comments or brief during the preparation of the Examiner's Answer.

A protestor who participates by the filing of comments or a brief in opposition to appellant's brief may also request, at the time of filing the comments or brief, to appear at any oral hearing. If a protestor does not file such comments or brief, the protestor cannot be present at any oral hearing. If a protestor does file such a request, the Board of Appeals, in its discretion, will decide whether or not the issues on appeal are such that protestor's participation at the hearing would be helpful. The Board of Appeals will notify protestor whether or not the request to appear at the hearing is granted and, if granted, how much time will be permitted. Of course, if appellant does not request an oral hearing, or provides timely notification to the Board and protestor that appellant will not appear, protestor will not be heard.

A copy of any examiner's letter or communication to a protestor will be mailed to applicant at the same time it is mailed to the protestor. While the examiner may communicate *in writing* with a protestor having access to the application, the examiner will *not* communicate orally and protestor must refrain from oral communications with the examiner except to ask purely procedural questions which have no relation to the substance of the protest or the merits of the application, unless specifically authorized *in writing* by the Assistant Commissioner for Patents.

Where the handling of a protest or the handling of a reissue application involved in related litigation requires an inordinately larger than normal amount of work on the part of an examiner and where otherwise warranted, Supervisory Primary Examiners may authorize the use of non-examining time for handling some or all of the examination.

The above guidelines are intended to make clearer the policies of the Patent and Trademark Office in respect to the handling of reissue applications, protests and "fraud" questions. The Office is especially interested in seeing that the consideration of reissue applications and protests is thorough and fair. It is interested in seeing that protestors have an opportunity to participate in the proceedings in the Office to the extent that such participation is helpful and appropriate in each case. It is also greatly interested in the completeness and accuracy of the file record, including indications whether or not prior art references and information mentioned in the record have been reviewed by the examiner.

The present guidelines which will be incorporated into the M.P.E.P. as soon as possible, when considered in conjunction with those previously issued and the M.P.E.P., should answer many of the questions being raised about the revised rules.

DONALD W. BANNER,
Nov. 13, 1978. *Commissioner of Patents & Trademarks.*

[977 O.G. 11]

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(102) Expedited Processing of Reissue Applications and Applications Having Issues of Fraud or Failure to Comply With The Duty of Disclosure

The Patent and Trademark Office has been experiencing increasing delays in the examination of reissue applications and other applications in which charges or questions of fraud or failure to comply with the duty of disclosure have been raised or are apparent on the record. Consideration of these charges involves considersble expenditures of resources and time. They also tend to delay prompt consideration on the merits in view of the prior art, etc. Considerable duplication of effort and expenditures of resources and time also may occur when the Office considers applications in circumstances where the same issues are concurrently being considered in Court.

Deferral of Fraud Issues

Effective immediately, the Office is instituting a policy of delaying consideration of issues of fraud or failure to comply with the duty of disclosure in any application until all other issues are settled.

Accordingly, under this procedure, applications having issues of fraud or failure to comply with the duty of disclosure will continue to be referred to the Office of the Assistant Commissioner for Patents, but will then be promptly returned, along with any appropriate examining instructions, to the Director of the Examining Group for immediate action by the Examiner. Decisions on Petitions to Strike applications pursuant to 37 CFR 1.56(d) will be deferred pending resolution of the patentability issues before the Examiner. Any such Petitions to Strike filed after the Office of the Assistant Commissioner has initially reviewed the application and returned it for immediate action will be acknowledged by the Examining Group Director and action on the Petition will be deferred pending completion of the patentability issues before the Examiner. Examiners will note in their Office actions the existence of issues of fraud or failure to comply with the duty of disclosure without commenting on the substance of such issues and will indicate that the issues will be considered after all other matters have been disposed of. Matters other than fraud or failure to comply with the duty of disclosure raised in a Petition to Strike, e.g., patentability in light of a reference, will be treated by the Examiner or other appropriate official. Petitions relating to procedural matters involving the examination of the applications, e.g., requests for protestor participation in interviews, will be decided by the appropriate Examining Group Director. Applications which have been referred to the Office of the Assistant Commissioner and which are required to be returned thereto before allowance or after abandonment of the application will have a notation placed on the face of the application file by the Office of the Assitant Commissioner requiring such return.

Suspension of Action Where There is Concurrent Litigation

In order to avoid duplication of effort, actions in applications in which there is an indication of concurrent litigation will be suspended automatically unless and until it is evident to the examiner, or the applicant indicates, that: (1) a stay of the litigation is in effect; (2) the litigation has been terminated; (3) there are no significant overlapping issues between the application and the litigation; or (4) it is applicant's desire that the application be examined at that time.

Expedited Examination of Reissues

All reissue applications, except those under suspension because of litigation, will be taken up for action ahead of other "special" applications; this means that all issues not deferred will be treated and responded to *immediately.* Furthermore, reissue applications involved in "stayed litigation" will be taken up for action in advance of other reissue applications.

Insofar as reissue applications for patents in litigation are concerned, the Office is presently considering modifications to the rules to provide for their examination within the two-month waiting period now provided by Section 1.176. Until appropriate modifications are made to the rules, the Office will entertain petitions under 37 CFR 1.183 to waive the delay period of 37 CFR 1.176. In addition, the Office is presently considering requiring the prompt disclosure of the existence of litigation related to a pending application.

Time monitoring systems are being put into effect which will closely monitor the time used by applicants, protestors, and examiners in processing reissue applications of patents involved in litigation in which the court has stayed further action.

Applicants in reissue applications involved in litigation which has been stayed, dismissed, etc. for consideration by the Patent and Trademark Office will normally be given one month to respond to Office actions in those situations where the Office determines that the reissue applicant can readily prepare a response in such time. This one month period may be extended upon a showing of clear justification. Of course, up to three months

may be set for response if the Examiner determines such a period is justified.

Applicants and protestors submitting papers for entry in reissue applications of patents involved in litigation are requested to mark the outside envelope and the top right hand portion of the paper with the words *"REISSUE LITIGATION"* and with the unit of the PTO in which the reissue application is located—e.g., Assistant Commissioner for Patents, Board of Appeals or Examining Group. The notations preferably should be written in a bright color with a felt point marker. Papers marked *"REISSUE LITIGATION"* will be given special attention. Also, the PTO will place a prominent notation on the application file to indicate the existence of litigation.

The purpose of these changes is to reduce the time between filing and final action insofar as possible while still giving all parties sufficient time to be heard. This notice is supplemental to, and in some respects modifies, the earlier published notices on this subject and particularly the notice published at 977 O.G. 11 on December 12, 1978.

DONALD W. BANNER,
June 5, 1979. *Commissioner of Patents and Trademarks.*

[983 O.G. 24]

(103) **Prior Art Cited by Patent Offices in Other Countries**

Section 1.56 of Title 37 of the Code of Federal Regulations requires patent applicants and others associated with the prosecution of a patent application before the U.S. Patent and Trademark Office to call to the Office's attention information which is material to examination. Where related or corresponding patent applications have been filed in other countries, prior art may be cited by the Patent Offices of those other countries in connection with the examination of the applications filed there. Where prior art is cited by those other Patent Offices while the U.S. application is pending, citations which are material to examination in this country and known to any of the individuals covered by Section 1.56 must be called to the attention of this Office. Attorneys and agents are reminded of their obligations in this respect.

It is suggested, of course, that such prior art be cited to the U.S. Patent and Trademark Office in a prior art statement which complies with the provisions of Section 1.97–1.99 of 37 CFR.

DONALD W. BANNER,
Apr. 23, 1979. *Commissioner of Patents and Trademarks.*

[982 O.G. 36]

(104) **Documents Cited in PCT International Search Report**

This notice is intended to clarify which documents listed on an international search report prepared under the Patent Cooperation Treaty (PCT) should during the national stage before the Patent and Trademark Office (PTO):

(1) be listed and copies thereof submitted by the applicant to the PTO in an information disclosure statement filed under 37 CFR §§1.97–1.99,
(2) be supplied to the applicant with an Office action, and
(3) be listed by the examiner for printing on the front page of any resulting patent.

If the United States is designated in an international (PCT) application a copy of the search report will be mailed to the United States as a Designated Office by the International Bureau about 19 months after the priority date. This search report, without copies of the cited documents is placed in the national stage application file.

Accordingly, examiners in the PTO who are examining a national stage application will have a copy of the listing of documents cited in the International Search Report but they may not have copies of the documents cited therein and/or they may not have any available English translations of the cited documents. While the PTO is presently receiving copies of documents cited in PCT search reports of the European Patent Office and the Japanese Patent Office in a temporary trial program, the program may be discontinued at any time and applicants cannot rely upon this program to provide the examiner with copies of references or with any available English translation.

Citation of International Search Report Documents in Information Disclosure Statements

Applicants and/or applicant's attorney in PCT national stage applications, to ensure compliance with 37 CFR 1.56, should cite and supply copies of the documents cited in the PCT International Search Report which are "material" as defined in 37 CFR 1.56, preferably by an information disclosure statement under 37 CFR §§1.97–1.99.

A primary concern of the Patent and Trademark Office and the applicant should be that prior art cited in the PCT International Search Report which is material to the examination of the United States national stage application be fully considered during the examination of the United States national stage application. The best manner of ensuring such consideration is through a cooperative effort by all of the persons involved in the prosecution and examination of the United States national stage application. The applicant and his or her foreign patent attorney or agent obviously have access to, and presumably consider, the citations in the PCT International Search Report. With rare exceptions, the International Search Reort is prepared prior to the time at which applicant enters the United States national stage under 35 U.S.C. 371. Thus, applicant and his or her foreign attorney or agent are in a position to have reviewed the citations in the PCT International Search Report and call the attention of the United States patent attorney to those documents which are material. Under present case law, e.g., *Gemveto Jewelry Company, Inc.* v. *Lambert Bros., Inc.*, 216 U.S.P.Q. 976 (S.D. N.Y. 1982), foreign patent attorneys representing applicants for U.S. patents through United States correspondent patent attorneys are held to the same standards of conduct which apply to their United States counterparts. Since foreign applicants and their foreign patent attorneys have presumably considered the citations in the PCT International Search Report, and are under a duty to disclose the material citations contained therein, the preferred practice is to have this disclosure made via an information disclosure statement under 37 CFR §§1.97–1.99.

This will ensure that material citations contained in the PCT International Search Reort are considered by the examiner during the exmination of the United States national stage application. To the extent that the examiner does review the citations without an information disclosure statement having been submitted, the foreign applicant will obviously benefit therefrom. However, the foreign applicant and applicant's attorney cannot rely upon such a review by the examiner being conducted so as to relieve them of their dury to adequately disclose material prior art.

Copies of Documents Supplied With Office Actions

Copies of documents cited by the examiner in U.S. national stage applications will be provided as set forth in Section 707.05(a) of the MPEP. That is, copies of documents cited by the examiner will be provided to applicant except where the documents:

(1) are cited at allowance
(2) have been referred to in applicant's disclosure statement, and
(3) where the documents are cited and have been provided to applicant by the PTO in a parent national or international application.

Listing of Documents Cited in PCT International Search Reports by Examiners for Printing on Patents

The examiner should review all copies of documents cited in the International Search Report and should cite those documents which are material to the subject matter claimed in the national stage application. In those instances where documents are cited in the PCT search report but neither a copy of the documents nor an English translation (or English family member) is provided, the examiner may exercise discretion in deciding whether to take the necessary steps to obtain the copy and/or translation.

Where an information disclosure statement has been filed and copies have been submitted in conformance with 37 CFR 1.98 and section 609 of the Manual of Patent Examining Procedure (MPEP), the examiner must list all citations on form PTO-892 as part of the next regular Office action following receipt thereof unless such citations are listed by applicant on form PTO-1449.

Insofar as the citation by the examiner in an Office action of all of the documents cited in a PCT International Search Report is concerned where 37 CFR 1.98 has not been followed, it is not seen to be appropriate for the examiner to automatically cite, in the national stage application, each document listed in the PCT international search report. It has been the experience of the PTO that many documents listed on the PCT international search report are not relevant to the claims in the U.S. national stage application or that an English language equivalent document is used by the examiner.

RENE D. TEGTMEYER,
May 23, 1986. *Assistant Commissioner for Patents.*

[1067 OG 32]

(105) **Extensions of Time in Reexamination Proceedings**

This notice is intended to clarify extension of time practice as it relates to reexamination proceedings, and supplement the provisions of Section 2265 of the Manual of Patent Examining Procedure (MPEP).

The provisions of 37 CFR 1.136(a) and (b) are *NOT* applicable to reexamination proceedings under any circumstances . Public Law 97-247 amended 35 U.S.C. 41 to authorize the Commissioner to charge fees for extensions of time to take action in an "application". A reexamination proceeding does not involve an "application". 37 CFR 1.136 authorizes extensions of the time period only in an application in which an applicant must respond or take action. There is neither an "application", nor an "applicant" involved in a reexamination proceeding.

Requests for an extension of time to file a patent owner's statement under 37 CFR 1.530 or respond to any Office action in a reexamination proceeding must be filed under 37 CFR 1.550(c). These requests for an extension of time will be granted only for sufficient cause and must be filed on or before the day on which action by the patent owner is due. In no case will mere filing of a request for extension of time automatically effect any extension. Although the appeal provisions of 37 CFR 1.192(a), 1.197(b), and 1.304(a) set time periods applicable to reexamination as well as application proceedings, they also include a further proviso making these time periods subject to the extension provisions of 37 CFR 1.136. However, for the reasons set forth above, the extension provisions of 37 CFR 1.136 are limited to application proceedings and do not apply to reexamination proceedings. Therefore, any request for an extension of time in a reexamination proceeding to file a brief or reply brief, a request for reconsideration or rehearing, or a notice and reasons of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action, will be considered under the provisions of 37 CFR 1.550(c). The regulations setting a time period in which any of these actions must be taken set a time for reply within the meaning of 37 CFR 1.550(b), which time can be extended under 37 CFR 1.550(c).

The extension-of-time practice in reexamination proceedings in which a final Office action has been mailed continues to be reflected in MPEP Section 2265. That is, the after-final practice in reexamination proceedings did not change Oct. 1, 1982, and the automatic extension of time policy for response to a final rejection and associated practice are still in effect in reexamination proceedings.

Extensions of time for a requester of a reexamination, who is not the patent owner, are available only in rare circumstances. A request for an extension of the time period to file a petition from the denial of a request for reexamination can only be entertained by filing a petition under 37 CFR 1.183 with appropriate fee to waive the time provisions of 37 CFR 1.515(c). No extensions will be permitted to the two-month time for filing a reply by the requester under 37 CFR 1.535. This two-month period is set by statute (35 U.S.C. 304) and cannot be extended.

GERALD J. MOSSINGHOFF,
Feb. 17, 1983. *Commissioner of Patents and Trademarks.*

[1028 OG 18]

(106) **Clarification of Reexamination Practice and Change in Reexamination Certificate Wording**

I. *Clarification of Reexamination Practice.*

This notice is intended to clarify the options open to the patent owner *in a reexamination proceeding* when an allowable dependent claim depends from a rejected or cancelled *patent* claim.

A. *Leave dependent claim in dependent form.*

It is unnecessary in a reexamination proceeding to rewrite an allowable dependent patent claim in independent form when the dependent patent claim depends from a rejected or cancelled *patent* claim. The allowable dependent patent claim may remain in the printed format as it appears in the patent even though the patent claim upon which it is dependent is cancelled. Since the or iginal patent claim numbers are not changed in a reexamination proceeding the content of the cancelled base patent claim would remain in the printed patent and would be available to be read as a part of the allowed dependent patent claim.

If a new claim (a claim other than a claim appearing in the patent) has been later cancelled, a claim which depends thereon will be rejected as incomplete and must be rewritten. New claims which depend from a rejected or cancelled patent claim do not have to be rewritten.

If the patent owner elects to leave a dependent claim (original or new) in dependent form when the independent patent claim is rejected or cancelled, the reexamination certificate would indicate (1) that the patentability of an allowed unamended dependent patent claim "is confirmed" or (2) that a new dependent claim is "determined to be patentable". The independent patent claim (cancelled or rejected at the time of the issuance of the reexamination certificate) would be indicated as "cancelled". Note that if the dependent patent claim which is left in dependent form is amended (e.g., correction of a misspelled word) the certificate would indicate the claim "to be patentable as amended". The independent patent claim is considered to be incorporated by reference in

the dependent claim even though the independent claim is cancelled from the patent by the certificate.

B. *Combine claims into independent claim.*
It is also permissible for the patent owner to amend either the dependent or independent patent claim to incorporate the subject matter of the other. If the patent owner elects to rewrite one of the dependent or independent claims to include the subject matter of the other and cancel the other claim, the rewritten claim would be indicated on the certificate as being "patentable as amended". The other claim which was cancelled would be indicated on the certificate as "cancelled".

C. *Present new claim and cancel patent claims.*
It is also permissible for the patent owner to present a new claim incorporating the subject matter of the independent and dependent patent claims and cancel the independent and dependent patent claims. In this case the certificate would indicate "new claim ___ is added and determined to be patentable". The cancelled independent and dependent patent claims would be indicated as "cancelled".

NOTE: This Practice Applies Only to Reexamination and Does Not Change Current Practice Relating to Original and Reissue Applications

II. *Change in Reexamination Certificate Wording.*
The Office is also modifying the language of reexamination certificates directed to claims that are cancelled (for any reason) by dropping the language "having been finally determined to be unpatentable" since the existing language may not be accurate in all cases and since the patent and reexamination files are open to the public and the record speaks for itself. The certificate will merely state such a claim "is cancelled". This change will be effective with the July 17, 1984, Official Gazette issue.

DONALD J. QUIGG,
June 14, 1984. *Deputy Commissioner of Patent and Trademarks.*

[1044 O.G. 11]

(107) Priority Claims Based on Inventors Certificates

Pursuant to the provisions of 35 U.S.C. 119, last paragraph (as amended July 28, 1972), 37 CFR 1.55(c) requires that when an applicant wishes to claim a right of priority on the basis of an application for an inventor's certificate, ". . . the applicant or his attorney or agent, when submitting a claim for such right . . . shall include an affidavit or declaration including a specific statement that, upon an investigation, he has satisfied himself that to the best of his knowledge the applicant, when filing his application for the inventor's certificate, had the option to file an application either for a patent or for an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority."

As such, it has been and remains the position of the Patent and Trademark Office that, in accordance with 35 U.S.C. 119, application for inventors' certificates shall give rise to a right of priority only when the country in which they are filed gives to applicants, at their discretion, the right to apply, on the same invention, either for a patent or for an inventor's certificate. The affidavit or declaration specified under 37 CFR 1.55(c) is only required for the purpose of ascertaining whether, in the country where the application for an inventor's certificate originated, this option generally existed for applicants with respect to the particular subject matter of the invention involved. The requirements of 35 U.S.C. 119 and 37 CFR 1.55(c) are not intended, however, to probe into the eligibility of the particular applicant to exercise the option in the particular priority application involved.

It is recognized that certain countries that grant inventors' certificates also provide by law that their own nationals who are employed in state enterprises may only receive inventors' certificates and not patents on inventions made in connection with their employment. This will not impair their right to be granted priority in the United States based on the filing of the inventor's certificate.

Accordingly, affidavits or declarations filed pursuant to 37 CFR 1.55(c) need only show that in the country in which the original inventor's certificate was filed, applicants generally have the right to apply at their own option either for a patent or an inventor's certificate as to the particular subject matter of the invention.

C. MARSHALL DANN,
Aug. 17, 1977. *Commissioner of Patents and Trademarks.*

[962 O.G. 14]

(108) Requirements for Priority Documents, Priority Based on Application for Industrial Design

In the Federal Republic of Germany, an application for protection of an industrial design may be accompanied by either a model or a drawing. It is understood that German residents file such applications with their local judicial authority ("Amtsgericht") rather than with the German Patent Office in Munich.

Questions have been raised in this connection as to:
(1) What sort of priority document under 35 U.S.C. 119 is required when the original filing has comprised a model rather than a drawing, and
(2) Whether it is necessary where the original filing was with a local judicial authority to obtain also a certificate from the national patent office.

As to the first question, the Patent and Trademark Office will receive under 35 U.S.C. 119, as evidence of an earlier filed design application which included the deposit of a model, drawings or acceptable photographs of the deposited model faithfully reproducing the design embodied therein together with other required information, certified by an official of the court or office with which the application was originally filed.

No additional certification by the national patent office will be required. Article 4D(3) of the Paris Convention refers to certification ". . . by the authority which received such application . . ." so the reference in 35 U.S.C. 119 to "patent office" will be construed to extend also to the authority in charge of the design register.

C. MARSHALL DANN,
Aug. 15, 1977. *Commissioner of Patents and Trademarks.*

[962 O.G. 14]

(109) Right of Priority (35 U.S.C. 119) Based on a Foreign Application Filed Under a Bilateral or Multilateral Treaty

Under Article 4A of the Paris Convention for the Protection of Industrial Property (21 UST 1583; 24 UST 2140; TIAS 6923, 7727; 852 O.G. 511) a right of priority may be based either on an application filed under the national law of a foreign country adhering to the Convention or on a foreign application filed under a bilateral or multilateral treaty concluded between two or more such countries. Examples of such treaties are the Hague Agreement Concerning the International Deposit of Industrial Designs, the Benelux Designs Convention, and the Libreville Agreement of September 13, 1962, relating to the creation of an African and Malagasy Industrial Property Office. The Convention on the Grant of European Patents and the Patent Cooperation Treaty will be further examples of such treaties once they enter into force.

The Priority Claim

In claiming priority of a foreign application previously filed under such a treaty, certain information must be supplied to the Patent and Trademark Office. In addition to the application number and the date of the filing of the application, the following information is required: (1) the name of the treaty under which the application was filed, (2) the name of at least one country other than the United States in which the application has the effect of, or is equivalent to, a regular national application, and (3) the name and location of the national or intergovernmental authority which received such application.

Certification of the Priority Papers

Section 119 of Title 35 of the United States Code requires the applicant to furnish a certified copy of priority papers. Certification by the authority empowered under a bilateral or multilateral treaty to receive applications which give rise to a right of priority under Article 4A(2) of the Paris Convention will be deemed to satisfy the certification requirement.

C. MARSHALL DANN,
Aug. 9, 1977. *Commissioner of Patents and Trademarks.*

[962 O.G. 2]

(110) Using Certificate of Correction to Perfect Claim for Priority Under 35 USC 119

Under 35 USC 119, an applicant may assert a right of priority and claim the benefit of an earlier filing date in a foreign country. In this regard, 35 USC 119 states:

> No application for patent shall be entitled to this right or priority unless a claim therefor and a certified copy of the original foreign application, specification and drawings upon which it is based are filed in the Patent and Trademark Office before the patent is granted. . . .

The failure to perfect a claim to foreign priority benefits prior to issuance of the patent may be cured by filing a reissue application; *Brenner* v. *State of Israel*, 158 USPQ 584 (CA DC 1968).

However, under certain conditions, this failure may also be cured by filing a Certificate of Correction request under 35 USC 255 and 37 CFR 1.323. For example, in the case of *In re Van Esdonk*, 187 USPQ 671 (Comr. 1975), the Commissioner granted a request to issue a Certificate of Correction in order to perfect a claim to foreign priority benefits. In that case, a claim to foreign priority benefits had not been filed in the application prior to issuance of the patent. However, the application was a continuation of an earlier application in which the requirements of 35 USC 119 had been satisfied. Accordingly, the Commissioner held that the "applicants' perfection of a priority claim under 35 USC 119 in the parent application will satisfy the statute with respect to their continuation application."

Although *In re Van Esdonk* involved the patent of a continuation application filed under 37 CFR 1.60, it is proper to apply the holding of that case in similar factual circumstances to any patented application having benefits under 35 USC 120. This is primarily because a claim to foreign priority benefits in a continuing application, where the claim has been perfected in the parent application, constitutes in essence a mere affirmation of the applicant's previously expressed desire to receive benefits under 35 USC 119 for subject matter common to the foreign, parent, and continuing applications.

In summary, a Certificate of Correction under 35 USC 255 and 37 CFR 1.323 may be requested and issued in order to perfect a claim to foreign priority benefits in a patented continuing application if the requirements of 35 USC 119 had been satisfied in the parent application prior to issuance of the patent and the requirements of 37 CFR 1.55(a) are met.

However, a claim to foreign priority benefits cannot be perfected via a Certificate of Correction if the requirements of 35 USC 119 had not been satisfied in the patented application, or its parent, prior to issuance and the requirements 37 CFR 155(a) are not met. In this latter circumstance, the claim to foreign priority benefits can be perfected only by way of a reissue application in accordance with the rationale set forth in *Brenner* v. *State of Israel, supra.*

RENE D. TEGTMEYER,
July 25, 1986. *Assistant Commissioner for Patents.*

[1069 OG 38]

(111) Abstract of the Disclosure

This notice is intended to announce a change in the examining practice concerning review of the abstract for compliance with the guidelines set forth in MPEP 608.01(b).

At present, the examiner is instructed to review the abstract for compliance with the guidelines when passing the case to issue, making any necessary revisions by examiner's amendment. This policy has led to the necessity for many changes by the examiner which could have and should have been made at an earlier point in the prosecution. For example, abstracts in excess of the 250 word limit require cancellation and/or rewriting of portions thereof. This 250 word limit is strictly enforced since it represents a requirement of the printing process and the printed patent format designed to present a maximum amount of information concerning a patent on a single page.

Effective immediately, examiners are to require correction of the abstract at the earliest point in the prosecution that non-compliance with the guidelines is detected. Applicants are expected to observe the guidelines in drafting the abstract and correct any defect that is identified in an Office action. Applicants are encouraged to make the necessary corrections not only to relieve the examiner of this burden, but also to help avoid any potential conflict with respect to altering the scope of the enabling disclosure. In this regard, it should be noted that the abstract of the disclosure has been interpreted to be a part of the specification for the purposes of compliance with paragraph 1 of 35 USC 112. *In re Armbruster*, 512 F2d 676, 185 USPQ 152 (CCPA 1975). However, although it is preferable for applicant to make any necessary changes, the examiner will retain the authority and responsibility for reviewing, editing and revising the abstract of the disclosure at the time of allowance of the application to assure compliance with the guidelines.

Section 608.01(b) of the Manual of Patent Examining Procedures will be amended appropriately.

WILLIAM FELDMAN,
Dec. 30, 1977. *Deputy Assistant Commissioner for Patents.*

[967 O.G. 2]

(112) Supplemental Guidelines for The Implementation of 37 CFR 1.109—Reasons for Allowance

A recent review of recorded statements of reasons for allowance indicates the need for a better understanding regarding implementation of new Rule 109 (37 CFR 1.109).

These guidelines are supplemental to those published in the Official Gazette at 957 O.G. 11 on April 12, 1977 and amplified in Section 1302.14 MPEP, Rev. 52, April 1977.

In determining whether reasons for allowance should be recorded the primary consideration lies in the first sentence of the Rule.

"If the examiner believes that the record of the prosecution *as a whole* does not make clear his reasons for allowing a claim or claims, the examiner may set forth such reasoning." (Emphasis added.)

In most cases the examiner's actions and the applicant's response make evident the reasons for allowance, satisfying the "record as a whole" proviso of the rule. This is particularly true when applicant fully complies with 37 CFR 1.111(b) and (c), 37 CFR 1.119 and 37 CFR 1.133(b). Thus where the examiner's actions clearly point out the reasons for rejection and the applicant's response explicitly represents reasons why claims are patentable over the reference, the reasons for allowance are in all probability evident from the record and no statement should be necessary. Conversely, where the record is not explicit as to reasons, but allowance is in order, then a logical extension of 37 CFR 1.111, 1.119 and 1.133 would dictate that the examiner should make reasons of record and such reasons should be specific.

Where specific reasons are recorded by the examiner, care must be taken to insure that such reasons are accurate, precise and do not place unwarranted interpretations, whether broad or narrow, upon the claims. The examiner should keep in mind the possible misinterpretations of his statement that may be made and its possible estoppel effects. Each statement should include at least: (1) the major difference in the claims not found in the prior art of record, and (2) the reasons why that difference is considered to define patentably over the prior art if either of these reasons for allowance is not clear in the record. The statement is not intended to necessarily state all the reasons for allowance or all the details why claims are allowed and should not be written to specifically or impliedly state that all the reasons for allowance are set forth.

Under the rule, the examiner must make a judgement of the individual record to determine whether or not reasons for allowance should be set out in that record. These guidelines, then, are intended to aid the examiner in making that judgement. They comprise illustrative examples as to applicability and appropriate content. They are not intended to be exhaustive.

Examples of When It Is Likely That a Statement Should Be Added to the Record

1. Claims are allowed on the basis of one (or some) of a number of arguments and/or affidavits presented and a statement is necessary to identify which of these were persuasive, for example:
   a. When the arguments are presented in an appeal brief.
   b. When the arguments are presented in an ordinary response with or without amendment of claims.
   c. When both an affidavit under 37 CFR 1.131 and arguments under 102 and 103 are presented.
2. First action issue:
   a. Of non-continuing application wherein claims are very close to cited prior art and differences have not been discussed elsewhere.
   b. Of continuing applications wherein reasons for allowance are not apparent from the record in the parent case or clear from preliminary filled matters.
3. Withdrawal of a rejection for reasons not suggested by applicant, for example:
   a. As a result of an appeal conference.
   b. When applicant's arguments have been misdirected or are not persuasive alone and the Examiner comes to realize that more cogent argument is available.
   c. When claims are amended to avoid a rejection under 35 USC 102 but arguments (if any) fail to address the question of obviousness.
4. Allowance after remand from the Board of Appeals.
5. Allowance coincident with the citation of newly found references that are very close to the claims, but claims are considered patentable thereover:
   a. When reference is found and cited (but not argued) by applicant.
   b. When reference is found and cited by Examiner.
6. Where the reasons for allowance *are* of record but in the Examiner's judgement, are unclear (e.g. spread throughout the file history) so that an unreasonable effort would be required to collect them.
7. Allowance based on claim interpretation which might not be readily apparent, for example:
   a. Article claims in which method limitations impart patentability.
   b. Method claims in which article limitations impart patentability.
   c. Claim is so drafted that "non-analogous" art is not applicable.
   d. Preamble or functional language "breathes life" into claim.

Examples of Statements of Suitable Content

1. The primary reason for allowance of the claims is the inclusion of .03 to .05 percent nickel in all the claims. Applicant's second affidavit, in example 5 shows unexpected results from this restricted range.
2. During two telephonic interviews with applicant's attorney, Mr.—on 5/6 and 5/10/77, the Examiner stated that Applicant's remarks about the placement of the primary teaching's grid member were persuasive, but he pointed out that applicant did not claim the member as being within the reactor. Thus, an amendment doing such was agreed to.
3. The instant application is deemed to be directed to an unobvious improvement over the invention patented in Pat. No. 3,953.224. The improvement comprises baffle means *12* whose effective length in the extraction tower may be varied so as to optimize and to control the extraction process.
4. Upon reconsideration, this application has been awarded the effective filing date of S.N. _____ Thus the rejection under 35 USC 102(d) and 103 over Belgian Patent No. 757,246 is withdrawn.
5. The specific limitation as to the pressure used during compression was agreed to during the telephone interview with applicant's attorney. During said interview, it was noted that applicants contended in their amendment that a process of the combined applied teachings could not result in a successful article within the amended pressure range. The Examiner agreed to rely on this statement (see page 3, bottom, of applicant's amendment), and the case was allowed.
6. In the Examiner's opinion, it would not be obvious to a person of ordinary skill in the art first to eliminate one of top members 4, second to eliminate plate 3, third to attach remaining member 4 directly to tube 2 and finally to substitute this modified handle for the handle 20 of Nania (see Fig. 1) especially in view of applicant's use of term "consisting."

Examples of Statements That Are Not Suitable as to Content

1. The 3 roll press couple has an upper roll 36 which is swingably adjustable to vary the pressure selectively against either of the two lower rolls. (Note: The significance of this statement may not be clear if no further explanation is given.)
2. The main reasons for allowance of these claims are applicant's remarks in the appeal brief and an agreement reached in the appeals conference.
3. The instant composition is a precursor in the manufacture of melamine resins. A thorough search of the prior art did not bring forth any compositions which corresponds to the instant compositions. The Examiner in the art also did not know of any art which could be used against the instant composition.
4. Claims 1–6 have been allowed because they are believed to be both novel and unobvious.

The examiner should *not* include in his statement any matter which does not relate directly to the reasons for allowance. For example:

5. Claims 1 and 2 are allowed because they are patentable over the prior art. If applicants are aware of better art than that which has been cited, they are required to call such to the attention of the Examiner.
6. The reference Jones discloses and claims an invention similar to applicant's. However, a comparison of the claims, as set forth below, demonstrates the conclusion that the inventions are non-interfering.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Jan. 24, 1978.

[968 O.G. 6]

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(113) **Practice/Re: New Grounds of Rejection After Appeal Brief Has Been Filed**

A new practice has been implemented in the Patent Examining Corps to promote uniformity and adherence to guidelines in situations where a new ground of rejection is made in an Office action after an appeal brief has been filed. Under this practice Supervisory Patent Examiner approval is required for any new ground of rejection made after the filing of an Appeal Brief. This requirement extends to new grounds of rejection made either in an examiner's answer or in an Office action reopening prosecution. Evidence of that approval should appear on applicant's copy of the Office action or answer as well as the record copy. Consultation with or approval by the Group Director is no longer required in these situations.

This new practice does not alter the existing guidelines for reopening prosecution (MPEP) 706.7(e) or for making a new ground of rejection in an examiner's answer (MPEP 1208.01). Appropriate modification will be made to applicable Sections of the Manual of Patent Examining Procedure in a future revision.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

[970 O.G. 94 (5-23-78)]

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(114) **Commercial Success and Other Considerations Bearing on Obviousness**

In order to clarify Office practice relative to considerations of commercial success and other items bearing on obviousness, the following changes are made in the Manual of Patent Examing Procedure.

In section 716, subsection 4, change the sub-title and first paragraph to read as follows:

4. *Commercial Success and Other Considerations Bearing on Obviousness*

Affidavits or declarations submitting evidence of commercial success, long-felt but unsolved needs, failure of others, etc., must be considered by the Examiner in determining the issue of obviousness of claims for patent-ability under 35 U.S.C. 103. Such evidence might be utilized to give light to circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or unobviousness, such evidence may have relevancy, *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966) ; *In re Palmer*. 172 USPQ 126, 451 F.2d 1100 (CCPA 1971) ; *In re Fielder and Underwood*, 176 USPQ 300, 471 F.2d 640 (CCPA 1973). The *Graham* v. *John Deere* pronouncements on the relevance of commercial success, etc. to a determination of obviousness were not negated in *Sakraida* v. *Ag Pro*,425 U.S. 273, 189 USPQ 449 (1976) or *Andersons Black Rock, Inc.* v. *Pavement Salvage Co., Inc.*, 396 U.S. 57, 163 USPQ 673 (1969), where reliance was placed upon *A & P Tea Co.* v. *Supermarket Corp.*, 340 U.S. 147 87 USPQ 303 (1950). See *Dann* v. *Johnston*, 425 U.S. 219, 189 USPQ 257 (1976), at 261, footnote 4.

The weight attached to evidence of commercial success, etc. by the Examiner will depend upon its materiality to the issue of obviousness and the amount and nature of the evidence. Note the great reliance apparently placed on this type of evidence by the Supreme Court in upholding the patent in *United States* v. *Adams*, 383 U.S. 39, 148 USPQ 479 (1966).

Evidence of commercial success, etc. must be commensurate in scope with the scope of the claims [*In re Tiffin*, 448 F.2d. 791. 171 USPQ 294 (1971)]. Further in considering evidence of commercial success, care should be taken to evaluate to the extent possible from the evidence submitted, whether the commercial success alleged is directly derived from the invention claimed, in a marketplace where the consumer is free to choose on the basis of objective principles, and that such success is *not* the result of heavy promotion or advertising, shift in advertising consumption by purchasers normally tied to applicant or assignee, or other business events extraneous to the merits of the claimed invention, etc. [*In re Mageli, et al.* 176 USPQ 305, (CCPA 1973)]; [*In re Noznick, et al*, 178 USPQ 43, (CCPA 1973)].

Similarly in considering evidence of longfelt but unsolved needs and failure of others, care should be taken to determine whether such failures were due to lack of interest or appreciation of an invention's potential or marketability rather than want of technical know-how [*Scully Signal Co.* v. *Electronics Corp. of America*, 196 USPQ 657 (1st Cir. 1977)].

In section 716, subsection 4, add the following as the last paragraph:

If, after evaluating the evidence, the examiner is still not convinced that the claimed invention is patentable, his action should include a simple statement to that effect, identifying the reason(s) (e.g., evidence of commercial success not convincing, the commercial success not related to the technology, etc.).

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

July 10, 1978.

[973 O.G. 34]

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(115) **Handling of Dependent Claims by the Examiner**

Effective immediately, the following practice will be followed by patent examiners when making reference to a dependent claim—either singular or multiple. The new practice is intended to simplify and streamline our current practice (MPEP 608.01(n), Revision 55, January 1978) which experience indicates was unnecessarily burdensome in many cases.

1. When identifying a singular dependent claim which does not include a reference to a multiple dependent claim, either directly or indirectly, reference should be made only to the number of the dependent claim.
2. When identifying the embodiments included within a multiple dependent claim, or a singular dependent claim which includes a reference to a multiple dependent claim, either directly or indirectly, each embodiment should be identified by using the number of the claims involved, starting with the highest, *to the extent necessary* to specifically identify each embodiment.

3. When all embodiments included within a multiple dependent claim or a singular dependent claim which includes a reference to a multiple dependent claim, either directly or indirectly, are subject to a common rejection, objection or requirement, reference may be made only to the number of the dependent claim.

The following table illustrates the intended differences between current and the revised practice where each embodiment of each claim must be treated on an individual basis:

Claim Number	Claim Dependency	Identification: Current Practice	Identification: Revised Practice
1	Independent	1	1
2	Depends from 1	2/1	2
3	Depends from 2	3/2/1	3
4	Depends from 2 or 3 .	4/2/1	4/2
		4/3/2/1	4/3
5	Depends from 3	5/3/2/1	5
6	Depends from 2, 3 or 5	6/2/1	6/2
		6/3/2/1	6/3
		6/5/3/2/1	6/5
7	Depends from 6	7/6/2/1	7/6/2
		7/6/3/2/1	7/6/3
		7/6/5/3/2/1	7/6/5

When all embodiments in a multiple dependent claim situation (claims 4, 6 and 7 above) are subject to a common rejection, objection or requirement, reference may be made only to the number of the individual dependent claim. For example, if 4/2 and 4/3 were subject to a common ground of rejection, reference should be made only to claim 4 in the statement of that rejection.

The provisions of 35 USC 132 require that each Office action make it explicitly clear what rejection, objection and/or requirement is applied to each claim embodiment.

WILLIAM FELDMAN,
Oct. 17, 1978. *Deputy Assistant Commissioner.*

[976 O.G. 128]

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(116) Microorganisms—Patentable Subject Matter

The decision of the Supreme Court in *Diamond* v. *Chakrabarty* (206 U.S.P.Q. 193) held that microorganisms produced by genetic engineering are not excluded from patent protection by 35 U.S.C. §101. It is clear from the Supreme Court decision that the question of whether or not an invention embraces living matter is irrelevant to the issue of patentability.

Accordingly, the Patent and Trademark Office is now examining patent applications including claims to microorganisms which had been under suspension. Assuming that the products involved were the result of human intervention and were not products of nature, such claims will not be rejected under 35 U.S.C. §101 as directed to unpatentable subject matter.

SIDNEY A. DIAMOND,
July 29, 1980. *Commissioner of Patents and Trademarks.*

[997 O.G. 24]

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(117) Department of Commerce
Patent and Trademark Office

Designation of International Depository Authorities under the Budapest Treaty

The Budapest Treaty and the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure came into force on Aug. 19, 1980 with respect to the United States, Bulgaria, France, Hungary, and Japan. A copy of the Treaty was published in the *Official Gazette* on Aug. 23, 1977 (961 O.G. 21–26).

This Treaty authorizes each State for which the Treaty is in effect to designate a depository on its territory to serve as an international depository authority. More than one depository may be designated. Each such depository will be authorized to receive and store deposits, and dispense samples thereof, in compliance with the Treaty and the patent laws of each State adhering thereto. The Treaty is open for adherence by any member State of the Paris Union for the Protection of Industrial Property.

The Commissioner of Patents and Trademarks hereby solicits requests from private and public depositories located in the United States to serve as international depository authorities. Requests should be addressed to: Sidney A. Diamond, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Each request must explain and, to the extent practicable, provide evidence of the depository's capacity to meet the obligations of the Treaty. Such request must also include an offer by the depository to assume the cost of transferring deposits made under the Treaty to another international depository authority in the event of default of any of its Treaty obligations. The availability of funds for such transfer, if needed, must be available through a bond, special reserve fund, escrow or other means judged suitable by the Commissioner.

Requests will be promptly evaluated by the Commissioner of Patents and Trademarks, and each requesting depository promptly notified of the decision reached. Questions or inquiries concerning this notice may be addressed to the Office of Legislation and International Affairs, at the following address: Box 4, Commissioner of Patents and Trademarks, Washington, D.C. 20231. The telephone number of the Office of Legislation and International Affairs is (703) 557-3065.

The World Intellectual Property Organization, in Geneva, Switzerland, the Secretariat for the Paris Union, has provided a memorandum explaining the role and obligations of international depository authorities. This memorandum is reproduced below for the guidance of depositories in requesting recognition as an international depository authority.

MEMORANDUM

For the purposes of prospective international depositary authorities under the Budapest Treaty

Introduction

1. This memorandum contains informations for the benefit of any depositary institutions (culture collections) that may wish to become "international depositary authorities" under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure (done at Budapest on Apr. 28, 1977). Its brevity is such that it cannot be exhaustive. Any interested person requiring full information should refer to the relevant provisions of the Budapest Treaty and the Regulations under it (any reference hereinafter to an "Article" or to a "Rule" is a reference to an Article of the Budapest Treaty or to a Rule of the Regulations under it).

Objectives of the Budapest Treaty

2. Disclosure of the invention is a generally recognized requirement for the grant of patents (for the purposes of this memorandum, the word "patent" also covers other titles of protection, such as inventors' certificates). Normally, an invention is disclosed by means of a written description. Where an invention involves the use of a microorganism that is not available to the public, such a description is not sufficient for disclosure, since the invention could not be used by a person skilled in the art. That is why in the patent procedure of an increasing number of countries it is necessary not only to file a written description but also to deposit, with a depositary institution, a sample of the microorganism. When protection for the invention is sought in several countries, the complex and costly procedures of the deposit of the microorganism might have to be repeated in each of those countries. The objective of the Budapest Treaty is precisely to obviate such multiple deposits: under the Treaty a single deposit with one "international depositary authority" is sufficient for the purposes of patent procedure before the industrial property offices of all Contracting States, and of inter-governmental organizations granting regional patents which have declared that they recognize the effects of the Treaty (Articles 3(1)(a) and 9(1)(a)).

General Remarks on International Depositary Authorities

3. "International depositary authorities" are depositary institutions that have acquired the status of international depositary authorities. To obtain this status, a depositary institution has to be located on the territory of a Contracting State or of a member State of one of the organizations referred to in the preceding paragraph, and has to benefit from "assurances" furnished by that Contracting State or organization to the effect that the institution complies and will continue to comply with the requirements referred to in paragraph 5 below (Article 6(1)). The action for acquiring this status is taken by the State or organization concerned (Article 7 and Rule 3). There is nothing to prevent it from making more than one depositary institution acquire such status: it is therefore possible for there to be several international depositary authorities located on the territory of one and the same State.

4. An international depositary authority can lose its status either entirely (in which case "termination of status" is spoken of) or partly, in other words in respect of certain types of microorganisms only (in which case "limitation of status" is spoken of). Loss of the status occurs if the State or organization whose action brought about the acquisition of the status denounces the Treaty or withdraws the declaration of recognition of the effects of the Treaty (in which case the loss of status can only be total), or if the State or organization withdraws its assurances regarding the international depositary authority, or again by virtue of a decision of the Assembly of Contracting States taken at the request of another Contracting State or another organization (Articles 8, 9(4) and 17(4); Rule 4).

Requirements Which Have to be Met by International Depositary Authorities

5. The requirements referred to in paragraph 3 above which a depositary institution has to meet in order to become a depositary authority are the following (Article 6(2) and Rule 2):

(a) The institution has to have a continuous existence. It has to be impartial and objective—which means among other things that it has to be free of any dependence on interests that are liable to prejudice the disinterested performance of its functions—and it has to be available, for the deposit of microorganisms, to any depositor under the same conditions. These requirements, which in fact seem self-evident, are designed to give the public in general and depositors in particular fundamental guarantees of reliability as to the smooth operation of the system. On the other hand, the legal status of the institution is irrelevant: it may be either public or private.

(b) The institution has to have the necessary staff and facilities to perform its scientific and administrative tasks, which consist among other things in:

(i) accepting for deposit any or certain kinds of microorganisms;

(ii) examining the viability of the microorganisms deposited with it and issuing a receipt to the depositor and any required viability statement (see paragraphs 7 and 8 below);

(iii) storing the deposited microorganism for at least 30 years (Rule 9(1)) in such a way as to keep them viable and uncontaminated;

(iv) providing for sufficient safety measures to minimize the risk of losing the deposited microorganisms,

(v) complying with respect to the microorganisms deposited under the Treaty with the requirement of secrecy which means giving no information to anyone on the question whether a microorganism has been thus deposited and giving no information to anyone (except to a person who is entitled to a sample—see paragraph 10 below) on any microorganism thus deposited (Rule 9(2));

(vi) furnishing, rapidly and in an appropriate manner, samples of the deposited microorganisms to all those who are entitled to such samples (see paragraph 10 below).

Handling of Microorganism Deposits by the International Depositary Authority

6. *Reception of the microorganism.* The international depositary authority may require that the microorganism be deposited in an appropriate form and quantity, and that it be accompanied by a form established by that authority. In such a case, the said authority has to communicate its requirements (and any amendments to them) to the International Bureau in order that the latter may communicate them to all the depositors concerned (Rules 6.3 and 13.2(b)(v)). When it receives the microorganism, the international depositary authority notes the date of receipt of the deposit and gives it an accession number (Rule 7.3(iii) and (v)). It issues a receipt to the depositor attesting the receipt and acceptance of the deposit (Rule 7). The model of the international form for the receipt, the use of which will be mandatory, will be established by the Director General of WIPO and communicated to all international depositary authorities.

7. *Viability test.* The international depositary authority promptly tests the viability of the microorganism; it also undertakes viability tests at reasonable intervals, depending on the kind of microorganism and its possible storage conditions, or at any time, if necessary for technical reasons or at the request of the depositor (Rule 10.1).

8. *Viability statement.* The international depositary authority issues a statement concerning the viability of the microorganism to the depositor or to any person receiving a sample of the microorganism (see paragraph 10 below) (Rule 10.2). The model of the international form for the viability statement, the use of which is mandatory, will be established by the Director General of WIPO and communicated to all international depositary authorities.

9. *Storage of the microorganism.* The international depositary authority stores the microorganism for a period of at least 30 years after the date of its deposit, or until five years have elapsed without its having received a request for a sample, the period expiring later being applicable (Rule 9.1). It complies with the requirement of secrecy at all times (see paragraph 5(v) above). Where it cannot furnish samples of the deposited microorganism for any reason, it notifies the depositor of the fact, indicating the reason and informing him that he is entitled to make a new deposit (Article 4).

10. *Furnishing of samples.* The Regulations contain detailed provisions specifying who is entitled to receive samples of the microorganism, and when (Rule 11). The depositor himself is entitled to receive a sample at any time. He may authorize third parties to have samples furnished to them, whereupon the third parties receive a sample on presentation of their authorizations. Any industrial property office to which the Treaty applies may

receive a sample on request if it needs the microorganism for the purposes of a patent procedure. Any other person may obtain a sample on request if an industrial property office to which the Treaty applies certifies that, under the applicable law, that person has a right to a sample of the microorganism concerned; the Regulations specify in detail the certification procedure. The use of a form (whose contents will be established by the Assembly and communicated by the International Bureau to all international depositary authorities) is mandatory for the request and certification. There is an alternative procedure wherey the industrial property office from time to time communicates to international depositary authorities lists of the accession numbers given to the deposit of the microorganisms referred to in the patents granted and published by it; the effect of this communication is to authorize those authorities to furnish samples of the microorganisms to anyone. It should be stressed that it follows from the foregoing that the international depositary never has to decide itself whether it has the right to furnish a sample since it only does so if it has the authorization of the depositor or of an industrial property office. The international depositary authority furnishes the sample in a container marked with the accession number given to the deposit and accompanied by a copy of the receipt for the deposit. It notifies the depositor of the furnishing of the sample.

11. *Communication of the scientific description and/or proposed taxonomic designation.* If the depositor has indicated a scientific description and/or proposed a taxonomic designation of the deposited microorganism, the international depositary authority must communicate it, on request, to any person entitled to receive a sample of the said microorganism (Rule 7.6).

12. *Fees.* For the procedure under the Treaty and the Regulations, the international depositary authority has the right to charge a fee in certain cases (specified in Rule 12.1). The two main fees are the fee for the storage of the microorganism (which is a single fee for the entire period of storage) and the fee for the furnishing of a sample (the furnishing of samples to industrial property offices is free of charge, however). The international depositary authority fixes the amounts of fees at its discretion, but they must not vary on account of the nationality or residence of the persons who have to pay them.

SIDNEY A. DIAMOND,
July 14, 1978. *Commissioner of Patents and Trademarks.*

[999 O.G. 2]

(118) **Entry Into Force of the Budapest Treaty**

The Patent and Trademark Office announces the entry into force on Aug. 19, 1980 of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure with respect to the United States, Hungary, Bulgaria, France and Japan. A copy of the Treaty was published in the Official Gazette on Aug. 23, 1977 (961 O.G. 21–36).

Following entry into force of the Treaty, each state adhering or acceding thereto will be authorized to nominate depositories on its territory to serve as international depositary authorities. Upon compliance with certain procedural steps set forth in the Treaty, each such depository will be designated an international depositary authority.

No depository in the United States or elsewhere has yet been nominated or designated to serve as an international depositary authority. It is expected, however, that some depositories will shortly be designated both in the United States and other States adhering to the Treaty. Public notice will be provided of the designation of each international depositary authority and its requirements for patent deposits.

An application for a patent in any adhering States involving the action of a microorganism, for which a deposit is required, may make the required deposit in any international depositary authority. The fact and date of making the deposit will be recognized for all patent purposes in each State adhering to the Treaty. No further deposit will be required for national patent processing or enforcement, provided a deposit is properly made under the provisions of the Treaty.

An application for a United States patent will not be required to proceed under the provisions of the Budapest Treaty, however. Such an applicant may rely instead on a deposit made in any depository meeting the requirements set forth in *In re Argoudelis, et al.*, 168 USPQ 99 (CCPA, 1970) and reprinted in section 608.01(p), Manual of Patent Examining Procedure.

Questions or information regarding the Budapest Treaty may be directed to the Office of Legislation and International Affairs, at the following address: Box 4, Commissioner of Patents and Trademarks, Washington, D.C. 20231. The telephone number of the Office of Legislation and International Affairs is (703) 557-3065.

SIDNEY A. DIAMOND,
July 14, 1980. *Commissioner of Patents and Trademarks.*

JORDAN J. BARUCH,
July 16, 1980. *Assistant Secretary for Productivity, Technology and Innovation.*

[997 O.G. 10]

(119) **Department of Commerce**
Patent and Trademark Office
Recognition of United States Depository as an International Depository Authority Under the Budapest Treaty

As provided in Article 7 of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, the United States announces recognition of the American Type Culture Collection, Rockville, Md., as an international depository authority. The communication of the Director General of the World Intellectual Property Organization according this recognition as of Jan. 31, 1981 follows:

SIDNEY A. DIAMOND,
Dec. 30, 1980. *Commissioner of Patents and Trademarks.*

BUDAPEST Notification No. 11

BUDAPEST TREATY ON THE INTERNATIONAL RECOGNITION OF THE DEPOSIT OF MICROORGANISMS FOR THE PURPOSES OF PATENT PROCEDURE

Communication of the United States of America Relating to the Acquisition of the Status of International Depositary Authority by the American Type Culture Collection

The Director General of the World Intellectual Property Organization (WIPO) presents his compliments to the Minister for Foreign Affairs and has the honor to notify him of the receipt, on Nov. 17, 1980, of a written communication from the Government of the United States of America, relating to the American Type Culture Collection, indicating that the said depositary institution is located on the territory of the United States of America and including a declaration of assurances to the effect that the said institution complies and will continue to comply with the requirements concerning the acquisition of the status of international depositary authority as specified in Article 6(2) of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, done at Budapest on Apr. 28, 1977.

The American Type Culture Collection will acquire the status of international depositary authority under the said Treaty as from Jan. 31, 1981, the date of publication of the said communication in the Jan. 1981 issue of *Industrial Property/La Propriete industrielle* (see Article 7(2) of the said Treaty).

Dec. 3, 1980.

[1002 O.G. 116]

(120) **Department of Commerce**
Patent and Trademark Office
Recognition of United States Depository as an International Depository Authority Under the Budapest Treaty

As provided in Article 7 of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, the United States announces recognition of the Agricultural Research Culture Collection, Peoria, Ill., as an international depository authority. The communication of the Director General of the World Intellectual Property Organization according this recognition as of Jan. 31, 1981 follows:

SIDNEY A. DIAMOND,
Dec. 30, 1980. *Commissioner of Patents and Tradmarks.*

BUDAPEST Notification No. 12

BUDAPEST TREATY ON THE INTERNATIONAL RECOGNITION OF THE DEPOSIT OF MICROORGANISMS FOR THE PURPOSES OF PATENT PROCEDURE

Communication of the United States of America Relating to the Acquisition of the Status of International Depositary Authority by the Agricultural Research Culture Collection

The Director General of the World Intellectual Property Organization (WIPO) presents his compliments to the Minister for Foreign Affairs and has the honor to notify him of the receipt, on Dec. 2, 1980, of a written communication from the Government of the United States of America, relating to the Agricultural Research Culture Collection, indicating that the said depositary institution is located on the territory of the United States of America and including a declaration of assurances to the effect that the said institution complies and will continue to comply with the requirements concerning the acquisition of the status of international depositary authority as specified in Article 6(2) of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, done at Budapest on Apr. 28, 1977.

The Agricultural Research Culture Collection will acquire the status of international depositary authority under the said Treaty as from Jan. 31, 1981, the date of publication of the said communication in the Jan. 1981 issue of *Industrial Property/La Propriete industrielle* (see Article 7(2) of the said Treaty).

Dec. 8, 1980.

[1002 O.G. 116]

(121) **Plant Life — Patentable Subject Matter**

The decision by the Board of Patent Appeals and Interferences in Ex Parte Hibberd (Sept. 18, 1985) held that the Plant Patent Act (35 USC 161–164) and the Plant Variety Protection Act (7 USC 2321 et seq.) do not represent the exclusive forms of protection for plant life covered by these acts, and that there is no irreconcilable conflict between these plant-specific statutes and 35 USC 101. It is clear from the Board decision that plant life is not excluded from patent protection under 35 USC 101.

Accordingly, the Patent and Trademark Office is now examining applications including claims to plant life — e.g., plants per se, seeds, plant parts. To the extent that the claimed subject matter is directed to a "nonnaturally occurring manufacture or composition of matter — a product of human ingenuity" (*Diamond* v. *Chakrabarty*, 447 U.S. 303 (1980)), such claims will not be rejected under 35 USC 101 as being directed to unpatentable subject matter.

DONALD J. QUIGG,
Oct. 8, 1985. *Commissioner of Patents and Trademarks—Designate.*

[1060 OG 4]

(122) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 21001-201]

File Wrapper Continuing Application Procedure

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases to provide a new procedure for filing continuation, continuation-in-part, and divisional patent applications. This procedure is being provided to simplify filing and processing of continuation, continuation-in-part and divisional patent applications which have heretofore required a new set of application papers. By using the application which is to be abandoned, the procedure will eliminate many of the problems currently involved in preparing and processing such continuing patent application papers.
Effective Date: Feb. 27, 1983.
For Further Information Contact: Mr. Louis O. Maassel by telephone at (703) 557-3070, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: The Patent and Trademark Office is amending the rules of practice for patent cases to permit an applicant to file a continuation or division of a pending patent application by simply filing a request therefor and paying the necessary application filing fee. To file a continuation-in-part application, an amendment adding the additional subject matter and an oath or declaration relating thereto is also required.

The "file wrapper continuing" (FWC) procedure is incorporated in the rules by adding a new §1.62. Under this simplified procedure, any continuing application such as a continuation, continuation-in-part, or divisional application may be filed by using the papers in the copending prior application, which application will become automatically expressly abandoned. Under the FWC procedure, a new serial number is assigned and the specification, drawings and other papers in the parent application file wrapper are used as the papers in the continuing application. Changes in inventorship may be made. The "file wrapper continuing" (FWC) procedure is available for utility, design, plant, and reissue applications to the full extent that continuing applications can now be filed in such applications. Use of the FWC procedure will automatically result in express abandonment of the prior application as of the date that the continuation, continuation-in-part, or divisional application is filed.

The FWC procedure could be used for any continuation, continuation-in-part or divisional application provided the applicant wishes the copending prior application to become abandoned. If a divisional application is desired without abandonment of the parent appli-

cation, the procedure under §1.60 should be used. Applicant also has the option of filing new application papers with a reexecuted oath or declaration.

Background

The notice of proposed rulemaking was published in the Federal Register on Nov. 7, 1980 at 45 FR 73965 and in the Official Gazette on Dec. 9, 1980 at 1003 O.G. 9. An oral hearing was held on Feb. 4, 1981.

Discussion of Major Issue Involved

A continuation or divisional application is an application in which the disclosure is identical to an earlier application. However, the claims may be changed. Continuation applications are often filed in situations where the applicant feels that the issue of patentability has not been satisfactorily resolved before the examiner and the application is not in condition for an appeal from the final rejection to the Board of Appeals. Divisional applications are filed voluntarily or as a result of a requirement for restriction by the examiner in a prior application. Continuation-in-part applications are filed where additional subject matter is added and claimed in the application. Under 35 U.S.C. 120 of the patent law, a continuation, continuation-in-part or divisional application may be filed during the pendency of the prior application and the benefit of the filing date of the prior application for the subject matter disclosed therein may be obtained.

The practice under §1.60 has resulted in a number of problems, especially difficulties in obtaining good-quality copies of prior applications. In addition, the practice involves unnecessary handling and processing delays.

Under new §1.62, the specification, claims and drawings, and any amendments in the prior application are made available for use in the continuation, continuation-in-part, or divisional application. A new filing fee is required in accordance with 35 U.S.C. 41 and 37 CFR 1.16. The only other statutory requirement under 35 U.S.C. 111 is a signed oath or declaration. Since a continuation or divisional application cannot contain new matter, the oath or declaration filed in the prior application would supply all the information required under the statute and rules to have a complete application and to obtain a filing date. Accordingly, the previously-filed oath or declaration will be considered to be the oath or declaration of the §1.62 continuation or division. However, if a continuation-in-part application is being filed, or a correction of inventorship is being made, then a new oath or declaration must be signed and filed by the applicant.

The original disclosure of an application filed under §1.62 will be the original parent application as executed by the inventor(s). However, the filing fee will be based on the claims in the §1.62 application after entry of any unentered amendments under §1.116 in the prior application and any preliminary amendment which may accompany the FWC request and filing fee. The Certificate of Mailing Procedure under 37 CFR 1.8 will not apply to filing a request for a "File Wrapper Continuing" application since the filing of such a request is considered to be a filing of application papers for the purpose of obtaining an application filing date (37 CFR 1.8(a)(i)).

The applicant may file a signed FWC request and the regular filing fee under §1.16 and other necessary papers with the Patent and Trademark Office, either by mail addressed to "Box FWC" or in person with the mail room. An individual check or deposit account authorization should accompany each FWC application, since combined checks delay processing.

The Correspondence and Mail Division will sort out all "Box FWC" envelopes upon receipt and deliver them to a reader for prompt special handling. The reader would apply the "Mail Room" date stamp and mark the categories of the fees. The papers for each FWC application would be assigned a regular national serial number and be placed in a "Jumbo" size file wrapper. The Special Handling Branch will review the FWC request for accuracy and completeness and assign the filing date if everything appears to be in order. Problems will be handled, insofar as possible, by calling the applicant or attorney by telephone. There will be no need for any processing of the FWC application by the Classification or Examination Branches of Application Division since there are no papers to be examined and the FWC application will be routed to the group assigned the prior application. When the FWC application file wrapper is received in the examining group, the parent application will be promptly obtained and processed by a clerical staff member.

All of the correspondence from the Office in a FWC application will refer to the FWC application serial number and filing date and will be processed in the same manner as any other continuation, continuation-in-part or divisional application. The first action final rejection procedures set forth in §706.07(b) of the Manual of Patent Examining Procedure will also apply to FWC applications filed under §1.62.

The PALM III system will supply information to authorized persons as to the location of the parent application file wrapper and will tie the parent application number to the FWC application number.

The provisions of §1.62 provide that if any application in the file wrapper is available to the public that all applications in the file wrapper will be available to the public.

Some of the anticipated benefits of the new §1.62 procedure are the following:

For the Applicant

1. Formal requirements will be minimal.
2. A more prompt first action in the continuing application should be received in view of reduced processing time. The Application Division can process promptly all §1.62 applications with minimal effort. In the examining groups, the applications will be given high priority for processing purposes.
3. Amendments made to the specification, drawings and claims of the prior application will carry over into the §1.62 continuing application and will not need to be resubmitted in the continuing application.

For the Public

1. The pendency of a series of applications should be reduced since the time delay before examination and issuance of a continuing application filed under the §1.62 procedure would be reduced.
2. The entire record of prosecution could be in one file wrapper under the §1.62 procedure, even if several continuing applications are filed. This will result in easier access by the public to a series of applications if a patent is later issued.

For the Patent and Trademark Office

1. The workload of reviewing and processing new application papers in the Application Division will be reduced.
2. The examining group clerks will not be required to again enter amendments made in the prior application.
3. Less storage space will be required under §1.62 since there will be fewer papers to store.
4. The prior application file history and references cited therein will be readily available to the examiner under§1.62 and will not need to be ordered from abandoned files.
5. The Office will not be required to prepare a copy of the prior application file under the §1.62 procedure.

Discussion of Comments Received

After careful consideration of the comments which have been received, the proposed rulemaking relating to file wrapper continuing application procedure is being adopted with certain changes. A total of 23 comment letters were received. Six of these letters were received from patent law organizations. Two persons presented oral comments at the hearing. The comments of 6 letters supported the proposed rulemaking without further suggestions for change. Only one letter opposed the proposal.

Seven of the letters urged adoption of a procedure whereby an applicant could pay a fee to have a final rejection withdrawn so that prosecution could be extended in an application rather than filing a continuing application. This suggestion was not adopted for several reasons. Such a procedure could not be used for filing of continuation-in-part applications, the average pendency of applications in the Office would be extended, and significant problems in internal record systems would be created.

A number of comments were received which presented specific suggestions to proposed §1.62. Four letters commented that the requirement of proposed §1.62(a)(4) to supply information as to title, applicant, correspondence address, etc. in order to file under §1.62 could easily lead to filing errors.

In final §1.62(a)(3) only the serial number, filing date and applicant's name of the prior application are required. The filing of information relating to the title, applicant's name, etc. is however urged in paragraph (e) of final §1.62 and is needed to prepare Office records and the filing receipt.

One comment letter was received which indicated that a specific reference should be made to unentered amendments filed under 37 CFR 1.116. Such a reference has been added to paragraph (a)(2) of §1.62.

Two letters objected to the requirement in proposed §1.62(a)(2) that a new set of claims be presented. This requirement has been deleted from final §1.62.

A number of general comments were also presented relating to §1.62. One comment argued that the proposed practice would encourage abuse by examiners of the second action final rejection practice. In response to this argument, it is felt that the proposed procedure would not create any new problems.

One comment indicated that problems involving access to the file wrapper may arise. It is felt, however, that access problems should not arise in view of paragraph (c) of final §1.62 which relates to waiver of secrecy. The current PALM III computer record system is capable of indicating the location of both the prior and continuing applications.

One comment was received relating to proposed §1.138 which indicated that the reference to §1.60 was confusing. The reference to §1.60 has been deleted in final§1.138.

New §1.62 sets forth the requirements of the file wrapper continuing procedure.

Section §1.138 is amended so that a registered attorney or agent could, without being of record, file a §1.62 application and expressly abandon a pending prior application. Such an action would not affect applicant's rights to any great extent since the prior application would only be expressly abandoned if a filing date was granted to a continuing application.

Other Considerations

Environmental, Energy, and Other Considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980(44 U.S.C. 3501 et seq.).

The rule change will not have a significant adverse economic impact on a substantial number of small entities because it adds no burdens and does simplify filing procedures (Regulatory Flexibility Act, Pub. L. 96-354).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no significant additional record keeping or reporting requirements are placed upon the public. In fact, some paperwork, especially that related to preparing application papers and amendments, will be reduced.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Lawyers.

(Text of adopted rules appears in 37 CFR, revised July 1, 1983.)

Sept. 30, 1982. GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

[FR Doc. 82-29283 Filed 10-23-82: 8:45 am]
BILLING CODE 3510-16-M

[1024 O.G. 59]

(123) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1

Reissue, Reexamination, Protest and Examination Procedures in Patent Cases

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases (1) to eliminate consideration of the so-called "no defect" reissue applications, (2) to limit the participation by protestors during the examination of patent applications, (3) to reject and permit appeal to the Board of Appeals for failure to comply with the duty of disclosure rather than striking applications without appeal rights, and (4) to clarify the interface between patent application examination and patent reexamination in certain areas. These changes are intended to (1) reduce the prosecution costs of patent applicants, and (2) permit some of the Patent and Trademark Office resources now devoted to consideration of the so-called "no defect" reissue applications, and to extensive participation by protestors during application examination, to be directed toward reduction of the backlog of pending patent applications. The changes are also intended to provide for review by the Board of Appeals of duty of disclosure issues which arise during patent application examination. The rule changes are further intended to clarify the interface between the duty of disclosure during patent application examination and the duty of disclosure during patent reexamination, as well as the treatment of concurrent reissue and reexamination proceedings on the same patent.
Effective Date: July 1, 1982.
For Further Information Contact: Mr. R. Franklin Burnett by telephone at (703) 557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks. Washington, D.C. 20231.

Supplementary Information:

Background

A notice of proposed rulemaking was published in the Federal Register on Nov. 10, 1981, at 46 FR 55666-55672 and in the Official Gazette on Dec. 8, 1981, at

1013 O.G. 19-25. An oral hearing was held on Feb. 4, 1982. Forty-two written letters and statements were submitted. Fourteen persons testified at the oral hearing which resulted in 113 pages of testimony. Consideration was also given to the comments presented at the oral hearing on Apr. 16, 1981, relating to the proposed rules for implementing patent reexamination.

Objectives of Rule Change

The rule change is designed to adopt and implement suggestions from members of the public for changes in patent examination practice considered desirable in light of the implementation of statutory patent reexamination, contained in Public Law 96-517. Many of the persons who commented in writing and at the hearing held on Apr. 16, 1981, on the proposed rules for implementing patent reexamination favored modification of patent examination rules as amended herein. This rule change is designed to implement the suggestions received and, in particular, to reduce the prosecution costs of patent applicants by limiting the amount of participation by protestors during the patent application examination process.

The rule change also seeks to reduce the amount of time required by the Patent and Trademark Office to examine protested applications by limiting protestor participation. The technical expertise of the Patent and Trademark Office will continue to be available to make determinations of patentability on the basis of prior art and related facts on an ex parte basis. However, the patent examiners in the Office are not trained as hearing examiners and have no substantial experience in handling inter partes matters. Under the rule change, protestor participation will be limited to the filing of papers in opposition to the grant of a patent with no Office communications to the protestor resulting therefrom beyond an acknowledgment of receipt of a protest or petition to strike in reissue applications. The opportunity to comment on Office actions and applicants' responses is eliminated. The rule change also intends to accomplish these purposes by eliminating the consideration of reissue applications not initially presented to correct defects pursuant to 35 U.S.C. 251.

The rule change is also designed to provide for review by the Board of Appeals of duty of disclosure issues which arise during patent application examination. This is accomplished by amending §1.56(d) to provide that the claims in an application be rejected if upon examination pursuant to 35 U.S.C. 131 and 132 it is found that applicant is not "entitled to a patent under the law" because of fraud or a violation of the duty of disclosure. The rejection would be made under the same conditions and circumstances previously used to strike an application, i.e., "clear and convincing evidence" of fraud or any violation of the duty of disclosure through bad faith or gross negligence. The statute, 35 U.S.C. 131, provides for examination of an application "and if on such examination it appears that the applicant is entitled to a patent under the law, the Commissioner shall issue a patent * * *" Section 132 of Title 35, United States Code, makes provision for the rejection of a claim for a patent as a result of the examination directed by 35 U.S.C. 131. While questions of fraud and violations of the duty of disclosure have historically been dealt with by the Commissioner through the mechanism of striking the affected application, there is no statutory requirement that the Commissioner act in that manner. Clearly the Commissioner can choose how, and by whom, the examination directed by 35 U.S.C. 131 can be made. 35 U.S.C. 132 authorizes a rejection in those circumstances where applicant is not "entitled to a patent under the law." The rule change simply modifies the mechanism and procedures which the Commissioner will use where the applicant is not "entitled to a patent under the law" because of failures to comply with §1.56(d).

The rule change is also designed to clarify the interface between patent application examination and patent reexamination in certain areas. The two areas involved are duty of disclosure and concurrent proceedings involving a patent under reexamination and for which a reissue application has been filed.

Sections 1.56, 1.106, 1.175, 1.193, 1.291, 1.555, 1.565, and 1.570 are amended to accomplish the purpose indicated above.

Discussion of Specific Rules

Access and Publication of Reissue Applications

The changes proposed in §1.11 are not being adopted since only one of the twenty-two comments favored the changes.

The publication of notices of the filing of reissues and provisions for public access to reissues will therefore continue as at present. Such publication eliminates the need for interested members of the public to periodically monitor the patent files to determine if a reissue application has been filed.

Amendments to §1.56

A large majority of the comments supported the amendments to §1.56. A number of comments questioned the advisability of having relatively inexperienced or non-attorney examiners handle questions of fraud or violation of the duty of disclosure. In response thereto, the amendments to the rule do not require that such questions be handled by the examiner who examines the application for questions of obviousness, enablement, etc. The Office presently plans to have questions of possible fraud or violation of the duty of disclosure examined by examiners with legal training assigned to the Office of the Assistant Commissioner for Patents. Several comments suggested that the provisions for striking an application pursuant to existing paragraph (c) of §1.56 are inconsistent with the rejection for fraud or violation of the duty of disclosure contemplated in the amendment to paragraph (d). In response thereto, it is pointed out that paragraph (c) of §1.56 makes striking of the application discretionary with the Commissioner. It is thus more appropriate to retain this authority to strike the application in appropriate circumstances rather than to make it subject to a rejection. No inconsistency is seen between the different routes under paragraphs (c) and (d) of §1.56. Several comments were received indicating concern about the possible delay of a decision by the Board of Appeals pending consideration of a fraud or duty of disclosure question. In response to these concerns, it is pointed out that less time overall will be required by having the Board of Appeals consider the matter once rather than in a series of separate decisions. Further, expense to the applicant will be minimized by one appeal rather than two. The amendments to §1.56 are adopted as proposed except for some clarifying changes in paragraph (g).

Section 1.56 is amended by revising the title and paragraph (d), and by adding new paragraphs (e) through (i). The revision to the title and paragraph (d) provides for the rejection of claims upon examination pursuant to 35 U.S.C. 131 and 132 on the ground that applicant is not entitled to a patent under the law if it is established by clear and convincing evidence (1) that any fraud was practiced or attempted on the Office in connection with the application, or in connection with any previous application upon which the application relies, or (2) that there was any violation of the duty of disclosure through bad faith or gross negligence in connection with the application, or in connection with any previous application upon which the application relies. Under amended paragraph (d), any rejection which would be made would include all the claims in the application.

The standards to be used in rejecting the claims under paragraph (d) as amended, would be the same as those utilized by the Commissioner in striking applications pursuant to present paragraph (d), i.e., clear and convincing evidence of fraud or any violation of the duty of disclosure through bad faith or gross negligence. Consistent with present practice, the revision of paragraph (d) looks to fraud or a violation of the duty of disclosure through bad faith or gross negligence with relation to the application under consideration or any previous application upon which the application relies.

The phrase "in connection with the application" is construed in the same manner as in the present unamended paragraph (d). For purposes of this section, a reexamination proceeding on a patent would be considered as being "in connection with the application" insofar as consideration of any subsequent reissue application is concerned. The phrase also includes within its scope the mere refiling of the subject matter of an application in another application without relying in the second application upon the first application. Thus, an appropriate rejection upon examination pursuant to 35 U.S.C. 131 and 132 based on conduct or actions proscribed by §1.56(d) could not be avoided merely by refiling the subject matter of the application in a second or subsequent application which did not rely upon the earlier application. The phrase "in connection with any previous application upon which the application relies" is intended to include all applications upon which the application under consideration relies, either directly or indirectly. For example, an application to reissue a patent obviously relies upon the application which resulted in the patent sought to be reissued. Likewise, continuation applications, continuation-in-part applications, and divisional applications also rely upon one or more parent applications.

New paragraph (e) of §1.56 normally delays the examination of an application for compliance with paragraph (d) of §1.56 until such time as (1) all other matters are resolved, or (2) appellant's reply brief pursuant to §1.193(b) has been received and the application is otherwise ready for consideration by the Board of Appeals, at which time the appeal will be suspended for examination pursuant to paragraph (d) of this section. Present plans are to have this examination on the question of fraud or violation of the duty of disclosure conducted by examiners with legal training assigned to the Office of the Assistant Commissioner for Patents. Paragraph (e), as added, would thus permit the resolution of issues arising under §1.56(d) to be delayed until consideration of such issues is necessary and appropriate. The practice under new paragraph (e) is generally consistent with present practice under paragraph (d) which normally delays the substantive resolution of fraud and duty of disclosure issues until other issues have been resolved in favor of applicant. Under new paragraph (e) an appeal would be suspended for examination pursuant to amended paragraph (d) of §1.56 once appellant's reply brief pursuant to §1.193(b) has been received and the application is otherwise ready for consideration by the Board of Appeals. If no questions of possible violation of §1.56 are raised or evident on the record before the examiner, no examination for compliance with paragraph (d) of §1.56 will be undertaken. New paragraph (e) provides for the reopening of prosecution of the application to the extent necessary to conduct the examination pursuant to amended paragraph (d) of §1.56 including any appeal pursuant to §1.191. New paragraph (e) also indicates that where an appeal has already been filed based on a rejection on other grounds, any further rejection under amended paragraph (d) will be treated in accordance with amended §1.193(c).

New paragraph (f) continues the present long standing practice whereby any member of the public can file a petition to strike an application from the files pursuant to paragraph (c) of §1.56. Such petitions are currently being filed without specific mention in §1.56. Under revised§1.56 petitions to strike an application for a violation of §1.56 are limited to violations of paragraph (c), with any violations of paragraph (d) being subject matter for rejection under paragraph (d). New paragraph (f) requires that any such petition alleging a violation of paragraph (c) which is entered in the application file must: (1) Be timely filed, (2) specifically identify the application to which the petition is directed, and (3) be served on the applicant or be filed with the Office in duplicate in the event service is not possible. New paragraph (f) does not specifically limit a "timely petition" to any particular point in the examination of the application. Such petitions will generally be considered "timely" if they are filed before final rejection or allowance of the application by the examiner. Whether or not a petition filed after final rejection or allowance of the application by the examiner is considered "timely" will depend upon the circumstances and the point in the prosecution at which the petition is submitted.

New paragraph (f) requires that the petition specifically identify the application to which the petition is directed. While an identification by application serial number is not essential, the identification must include enough specificity that the Office can determine with certainty the application to which the petition is directed. Paragraph (f) requires service of the petition on the applicant, or a duplicate copy in the event service is not possible, before the petition will be entered. While the Office might, in some circumstances, reproduce and serve a petition on the applicant, a member of the public would have no assurance that this would be done and, under paragraph (f), could not rely upon the Office doing so. Paragraph (f) also requires that any petition filed by an attorney or agent comply with §1.346.

New paragraph (g) of §1.56 assures a member of the public that a petition to strike an application for violation of paragraph (c) of §1.56 which meets the requirements of paragraph (f) will be considered by the Office. Language has been added to conform to additional language in §1.291(c). The Office will send petitioner an acknowledgment of the entry of a petition to strike in a reissue application file. However, the Office will not communicate with the member of the public filing such a petition in non-reissue applications, except for the return of any self-addressed postcard which was enclosed which merely acknowledges receipt of the petition. The member of the public filing the petition will not be permitted to contact the Office as to the disposition, or status, of the petition, or to participate in any Office proceedings relating to the petition. No further papers will be acknowledged or considered unless they raise new issues which could not have been earlier presented and thereby constitute a new proper petition. Mere arguments relating to the Office's decision on the petition or applicant's response to the petition would not qualify as a new proper petition. The disposition of the petition, once one has been filed, will, under paragraph (g), be an ex parte matter between the Office and the applicant. Paragraph (g) provides for communication by the Office with the applicant regarding a petition to strike the application which has been entered in the application file. Under new paragraph (g) the applicant could be required by the Office to respond to the petition. Any such response would be ex parte and would not be served on the member of the public filing the petition.

New paragraph (h) of §1.56 provides that any member of the public may seek to have the claims in an application rejected pursuant to the amended paragraph (d) of §1.56 by filing a timely protest in accordance with §1.291. New paragraph (h) also requires that any such protest filed by an attorney or agent seeking a rejection of claims pursuant to amended paragraph (d) of §1.56 must be in compliance with §1.346. One comment suggested that the last sentence of paragraph (h) is redundant since §1.346 applies without any specific mention. After careful consideration of the comment the sentence is being retained in order to emphasize and remind attorneys and agents of the obligations imposed by §1.346.

New paragraph (i) provides for the Office requiring the applicant to supply information pursuant to paragraph (a) of §1.56 in order for the Office to decide any issues relating to paragraphs (c) and (d) of §1.56, whether or not such issues arise as a result of a petition or a protest, or arise from other sources, e.g., an examiner discovering the issue while studying the application file. Any requirements for information under new paragraph (i) will be ex parte in nature between the Office and the

applicant. The ex parte nature of the requirements for information under new paragraph (i) differs from past practice under which information was required, or requested, from applicant and one or more petitioners or protestors in some cases.

Rejection of Claims

Five comments were submitted relating to new paragraph (c) of §1.106. Two of the comments favored the paragraph as written and three recommended modification or clarification of the paragraph to ensure that it is not inconsistent with *In re Ruff, et al.*, 45 CCPA 1037, 118 USPQ 340 (CCPA 1958), and subsequent decisions. No modification or clarification of the paragraph is considered necessary since the intent of the paragraph was not to change current practice, but was merely to emphasize the importance placed on admissions and to make §1.106 more closely reflect current practice, which includes practice following *In re Ruff, et al.*, and subsequent decisions. The amendments to §1.106 are adopted as proposed.

Section 1.106 is amended to include a new paragraph (c) which emphasizes the importance placed on admissions by the applicant or the patent owner in a reexamination proceeding insofar as matters affecting patentability are concerned. Paragraph (c) includes a reference to the use of rejections based upon facts within the knowledge of the examiner as provided in §1.107. Paragraph (c) does not constitute a change in practice, but does result in §1.106 more closely reflecting current practice.

Reissue Oath or Declaration

Ten persons commented on §1.175. Four comments were received in support of the proposed change. Three of these favorable comments were from patent law groups. Of the six comments received opposing the change, two were from patent law groups. Eleven comments received at the Apr. 16, 1981, hearing on reexamination argued for retraction of the "Dann Amendments" which included §1.175(a)(4). Four comments at the Apr. 16, 1981, hearing favored retaining the "Dann Amendments". The arguments supporting the change were generally that paragraph (a)(4) was not necessary in view of the new reexamination procedure. The arguments opposing the deletion were generally that an inter partes practice before the Office is desirable from the standpoint of the judiciary and for a complete resolution of issues. After careful consideration of all of the arguments and the resources available in the Patent and Trademark Office, it is felt that the practice under paragraph (a)(4) of §1.175 should be discontinued and paragraph (a)(4) should be cancelled.

The numbering of paragraphs (a)(5) and (6) is not being changed. Proposed paragraph 1.175(a)(6) is being adopted as new paragraph 1.175(a)(7). The proposed wording is otherwise being adopted without change.

Amended §1.175 eliminates paragraph (a)(4). Under paragraph (a)(4), the Office gave advisory opinions on patentability over additional prior art without any changes in the patent claims. The courts have generally refused to give preclusive effect to these advisory opinions. See *PIC, Inc.* v. *Prescon Corp.*, 485 F. Supp. 1302, 205 USPQ 228 (D. Del. 1980), and *Rohm and Haas Co.* v. *Mobil Oil Corp.*, 525 F. Supp. 1298, 212 USPQ 354 (D. Del. 1981). Accordingly, in view of the implementation of patent reexamination pursuant to Pub. L. 96-517 it is appropriate to discontinue the advisory opinions provided pursuant to §1.175(a)(4). Under amended §1.175 an applicant for reissue of a patent will be required to file with the reissue application a statement under oath or declaration specifically averring a defect in the patent, e.g., "a defective specification or drawing," or an excess or insufficiency in the claims. Amended §1.175 also requires, in paragraphs (a)(5) and (a)(6), that applicant specify "errors" as opposed to "what might be deemed to be errors." Amended §1.175 effectively eliminates Office consideration of the merits of "no defect" reissue applications since any such "no defect" reissue applications filed after July 1, 1982, the effective date of the changes to §1.175, will not be examined as to questions of patentability. In addition, §1.175(a)(7) has been added to parallel the provisions in §1.65 requiring the same acknowledgment of the duty of disclosure in the oath or declaration of reissue applications as in the case of non-reissue applications.

Delay in Examination of Reissue Applications

Six comments were received relative to the proposed changes in §1.176. One comment supported, and five comments opposed, deleting the two month waiting period before action could be taken by an examiner in a reissue application. The opposing comments favored retaining the two month period to provide an opportunity for interested parties to submit information relating to the examination of a reissue application after notice of the filing thereof has been published in the Official Gazette. Since the notices under §1.11 will continue to be published, no need is seen to change §1.176. The proposed change is therefore not adopted.

Examiner's Answer

Only one comment was made relating to the proposed addition of paragraph (c) to §1.193. It suggested including a minimum time period for response in the rule. This suggestion was not adopted because in some circumstances it may be appropriate to set a shorter or a longer period for the reply brief. The amendments to §1.193 are adopted as proposed.

Paragraph (c) adds to §1.193 a provision that any decision rejecting claims pursuant to §1.56(d) in an application already on appeal from a rejection based on other grounds shall constitute a supplemental examiner's answer introducing a new ground of rejection and removing the suspension of the appeal introduced pursuant to §1.56(e). Prior to entering any such supplemental examiner's answer under paragaph (c), the Office may require information from applicant pursuant to paragraph (i) of §1.56. Under paragraph (c) of §1.193, the appellant may file a reply to the supplemental examiner's answer. Paragraph (c) provides that the appellant's reply to the supplemental examiner's answer will be considered and responded to as necessary with appellant being provided with an additional month, or such other time as may be set, within which to reply to any such response from the Office. After introduction of a supplemental examiner's answer pursuant to paragraph (c) and any replies and response thereto, the application will be forwarded to the Board of Appeals for consideration.

Protests by the Public Against Pending Applications

Fifteen persons commented on the proposed amendment of §1.291. Two persons suggested that protests be acknowledged by more than the return of a self-addressed postcard. The suggestion has been adopted to the extent of providing for an acknowledgment of the entry of a protest in a reissue application file to be sent to the member of the public filing the protest. The suggestion has not been adopted insofar as original applications are concerned since these applications are generally required to be kept in confidence under 35 U.S.C. 122. Further, the use of return postcards is an established method of receiving acknowledgment from the Office that a paper has been filed. By merely returning the postcard to a protestor in an application for an original patent and directing Office initiated communications solely to applicant, the amount of Office resources required will be minimized.

Several persons commented that the protest proceeding should be more inter partes. The weight of the comments received at the hearings held on Apr. 16, 1981, and Feb. 4, 1982, and in writing, favored ex parte proceedings. To ensure that the proceedings are essentially ex parte, a sentence is being added to paragraph (c) of §1.291, indicating that active participation by a member of public ends with the filing of the protest. To retain the inter partes nature of the protest would be contrary to the majority of the comments received and to one of the major purposes of the rule change, i.e., to reduce the amount of time spent by the Office in examining protested applications. The amendments to paragraphs (a) and (b) of §1.291 are adopted as proposed and paragraph (c) is being revised as indicated above.

Amended §1.291 continues to permit protests by the public against pending original and reissue applications. The protest may include any grounds which the member of the public filing the protest believes to be applicable.

Amended paragraph (a) of §1.291 provides for entry of a protest in the application file if the protest specifically identifies the application, is timely submitted, and is either served upon the applicant in accordance with §1.248, or filed with the Office in duplicate, in the event service is not possible. The comments made above in the discussion of new paragraph (f) of §1.56 regarding the timeliness of the filing or submission, specific identification of the application, and service on the applicant, are also applicable to the amendments of paragraph (a) of §1.291. The requirement that the Office acknowledge the filing of a protest is deleted from paragraph (a), but is covered in paragraph (c).

New paragraph (b) of §1.291 assures members of the public that a protest will be considered by the Office if (1) it specifically identifies the application to which it is directed; (2) it is timely submitted; (3) it is properly served upon the applicant in accordance with §1.248, or is filed with the Office the duplicate in the event service is not possible; (4) it includes a listing of the patents, publications or other information relied upon and a concise explanation of the relevance of each listed item; (5) it includes a copy of each listed patent or publication or other item of information in written form, or at least the pertinent portions thereof; and (6) it includes an English language translation of all the necessary and pertinent parts of any non-English language document relied upon. It is considered desirable that §1.291 advise members of the public as to the contents which should be included in any protest since there will be no Office communications directed to the member of the public submitting the protest under paragraph (c). Thus, under paragraph (c) members of the public will not be given an opportunity to complete any protest which is incomplete. Amended paragraph (c) provides for the acknowledgment of the entry of a protest in a reissue application file.

Amended paragraph (c) of §1.291 provides that a member of the public filing a protest in an application for an original patent will not receive any communications from the Office relating to the protest, other than the return of a self-addressed postcard acknowledging receipt of the protest. Amended paragraph (c) of §1.291 does not permit the member of the public filing the protest, or any other member of the public, to contact the Office as to the disposition, or status, of the protest or to participate in any Office proceedings relating to the protest. The disposition of the protest, once it has been filed will, under paragraph (c), be an ex parte matter between the Office and the applicant. However, applications which are open to the public may be inspected pursuant to §1.11.

Amended paragraph (c) provides for the Office to communicate with the applicant regarding any protest entered in the application file. Under paragraph (c), the applicant could be required by the Office to respond to the protest. Any response would be ex parte and would not be served on the member of the public filing the protest. Paragraph (c) provides for the Office to require applicant to supply information pursuant to pargraph (a) of §1.56 in order for the Office to decide any issues raised by the protest. Requirements for information under paragraph (c) will be ex parte in nature between the Office and the applicant. The ex parte nature of the requirements for information under paragraph (c) differs from past practice under which information could be required, or requested, from applicant and one or more protestors. Under amended paragraph (c), the active participation of the protestor ends with the filing of the protest and no further submission on behalf of the protestor will be acknowledged or considered unless such submission raises new issues which could not have been earlier presented, and thereby constitutes a new protest. Mere arguments relating to an Office action or an applicant's response would not qualify as a new protest.

Duty of Disclosure in Reexamination Proceedings

Only two comments were received relative to proposed§1.555. One comment argued that the Office should never ignore a violation of the duty of disclosure or leave it hanging. In response thereto, neither the statute nor the presently existing reexamination rules provide for reexamination on grounds other than those based on patents or printed publications. The second comment questioned whether a patent owner has a duty to cite new prior art after a request but prior to an order to reexamine. No further clarification of the section is necessary since §1.555(a) specifies when the patent owner should file a prior art statement in a reexamination proceeding. The amendments to §1.555 are adopted as proposed.

Amended §1.555 makes the duty of disclosure in reexamination proceedings more consistent with the duty of disclosure in patent applications. Paragraph (a) of §1.555 specifies that a duty of candor and good faith toward the Patent and Trademark Office rests on the patent owner or involved employees of the patent owner, on each attorney or agent who represents the patent owner, and on every other individual who is substantively involved on behalf of the patent owner in a reexamination proceeding. This rule is consistent with the duty set forth in §1.56(a) insofar as patent applications are concerned, except that in paragraph (a) of §1.555 the patent owner is specified rather than the inventor as set forth in paragraph (a) of §1.56. This does not, however, impose the responsibility for compliance with the duty of disclosure on a corporate entity or organization but leaves the responsibility with involved individuals in the corporation or other organization. Paragraph (a) of §1.555 places a requirement on the individuals identified to bring to the attention of the Office patents or printed publications material to the reexamination which have not been previously made of record in the patent file and specifies how that should be accomplished.

Amended paragraph (b) of §1.555 essentially parallels existing paragraph (b) of §1.56 and makes similar provisions applicable to disclosures in reexamination proceedings.

Amended paragraph (c) of §1.555 provides that the duties of candor, good faith, and disclosure required in paragraph (a) of §1.555 have not been complied with if any fraud was practiced or attempted on the Office or there was any violation of the duty of disclosure through bad faith or gross negligence by, or on behalf of, the patent owner in the reexamination proceeding. The language of paragraph (c) refers to fraud or violation of the duty of disclosure in the reexamination proceeding since such conduct during the pendency of applications is covered by §1.56.

Amended paragraph (d) of §1.555 affirms that the responsibility for compliance with §1.555 rests upon the individuals identified in paragraph (a). Paragraph (d) also provides that no evaluation will be made in the reexamination proceeding by the Office as to compliance with §1.555. Paragraph (d) of §1.555 also provides that questions of compliance with §1.555 which are discovered during a reexamination proceeding will be noted as unresolved questions in accordance with present §1.552(c). Paragraph (d) will not preclude the patent owner from filing a reissue application to have questions of candor, good faith, and duty of disclosure considered and resolved, including such questions which arise dur-

ing a reexamination proceeding, so long as the requirements of 35 U.S.C. 251 have been met. Paragraph (d) does not preclude suspension or disbarment proceedings under present §1.348 based upon conduct during a reexamination proceeding.

Concurrent Office Proceedings

Four comments were received on §1.565. One comment proposed adding a sentence at the end of paragraph (b) of §1.565 reflecting that reexamination would only be stayed in extraordinary situations. This suggestion has not been adopted since it is considered inappropriate to attempt to further define by rule the circumstances under which a stay of the reexamination may be appropriate. Two comments were received raising questions as to the treatment, during a merged reissue and reexamination proceeding, of broader claims which are present therein because of a reissue application which contained broadened claims. No clarification or change is necessary since the broadened claims are properly in the merged proceeding during the period it is merged. Such broader claims which are present in both the reissue and reexamination files during the pendency of the merged proceeding will be treated in accordance with the reissue statute and case law during the pendency of the merged proceeding. If the merged proceeding ceases to exist because of the abandonment of the reissue application, the claims in the reexamination file, including any broadened claims, will be examined in accordance with the reexamination statute and rules. Finally, one comment did not agree with merging reissue and reexamination proceedings because the merger is not seen to produce cost savings or other salutary results. One of the reasons for the merged proceedings is to ensure that claims of differing scope and inconsistent responses are not presented at the same time in different proceedings in the same patent. Moreover, since the proceedings are concurrent rather than sequential, a significant savings in resources and overall pendency time may be realized by merging in many cases.

The amendment to §1.565 clarifies the proposed language of paragraph (b), eliminates from paragraph (b) the last two sentences relating to the treatment of concurrent reexamination and reissue proceedings, and adds a new paragraph (d) relating to this subject. The clarification in paragraph (b) is intended to avoid misinterpretations relating to stay determinations where concurrent litigation or reissue applications are involved.

Under new paragraph (d), which is consistent with the practice presently in effect under paragraph (b), if a reissue application and a reexamination proceeding on which an order pursuant to present §1.525 has been mailed are pending concurrently on a patent, a decision will normally be made to merge the two proceedings or to stay one of the proceedings. New paragraph (d) also provides that where merger of a reissue application and a reexamination proceeding is ordered, the merged examination will be conducted in accordance with present §§1.171–1.179. The examiner, in examining the merged proceeding, will apply the reissue statute and case law, in addition to applicable provisions of §§1.171–1.179, to the merged proceeding. This is appropriate in view of the fact that the statutory provisions for reissue applications and reissue application examination include, *inter alia*, provisions equivalent to 35 U.S.C. 305 relating to the conduct of reexamination proceedings. New paragraph (d) of §1.565 makes clear that the patent owner must place and maintain the same claims in the reissue application and the reexamination proceeding during the pendency of the merged proceeding. Under new paragraph (d) of §1.565 the examiner's actions and any responses by the patent owner in a merged proceeding will apply to both the reissue application and the reexamination proceeding and will be physically entered into both files. New paragraph (d) also provides that any reexamination proceeding merged with a reissue application shall be terminated by the grant of the reissued patent. The amendments to §1.565 are adopted with the changes or clarification indicated in paragraph (b).

Reexamination Certificate

Section 1.570, as amended, revises paragraph (e) to refer to new paragraph (d) of §1.565 rather than paragraph (b) in order to reflect the changes in §1.565.

No comments were received concerning the section and it is adopted without change.

Interim Procedures on Applications Pending on Effective Date

On July 1, 1982, the revised procedures of §§1.56(d) and 1.193(c) will apply to any applications then pending which have not been the subject of a final Office decision on questions of fraud or violation of the duty of disclosure. Any petition to strike an application from the files or any protest against a pending application filed prior to July 1, 1982, will be governed by the rules in effect prior to that date. Any applications filed under §1.175(a)(4) prior to July 1, 1982, will be examined until the application is amended and a reissue patent issues thereon or the application becomes abandoned. For a discussion of the interim practice in effect prior to July 1, 1982, see 1013 O.G. 18–19.

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96–354).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291.

List of Subjects in 37 CRF Part 1

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Lawyers.

Amendment of Regulations

(Text of adopted rules appear in 37 CFR, revised July 1, 1983.)

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Apr. 6, 1982.

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[1019 O.G. 37]

(124) Interim Reissue, Reexamination, Protest, And Examination Procedures In Patent Cases Pending Proposed Revision of 37 CFR §§1.11, 1.56, 1.106, 1.175, 1.176, 1.193, 1.291, 1.555, 1.565, and 1.570.

This notice sets forth, in general, the practice the Office intends to follow pending a final determination on the "Notice of proposed rulemaking" published in the Federal Register on November 10, 1981, at 46 F.R. 55666–55672. The "Notice of proposed rulemaking" is also being published in this issue of the Official Gazette.

Practice Relating To §1.11

Any reissue application which is presently open to inspection by the general public pursuant to present §1.11(b), and any reissue application filed before the effective date of a change in the rule, will continue to be open to inspection by the general public. No restriction of access to those reissue applications is contemplated at this time, either during their pendency before the Office, or after an abandonment of the reissue application. The filing of reissue applications will continue to be announced in the Official Gazette pending revision of §1.11(b).

Practice Relating To §1.56

Any issues arising under §1.56(d) prior to the effective date of a change in paragraph (d) will continue to be handled in accordance with paragraph (d) as it presently exists. If paragraph (d) is amended as proposed, the Office presently intends to apply the revised procedures to any applications then pending which have not been the subject of a final Office decision on questions of "fraud" or violation of the duty of disclosure.

Any petitions to strike applications from the files which have been filed prior to the date of publication of this Notice in the Official Gazette will continue to be treated in accordance with the practices in effect prior to this Official Gazette Notice via the appropriate sections of the Manual of Patent Examining Procedure.

Any petition to strike an application from the files which is filed after the date of publication of this Notice will be considered in accordance with the procedure set forth in the "Notice of proposed rulemaking" insofar as participation by the petitioner is concerned. Since the provisions of 37 CFR 1.56 now in effect do not guarantee a member of the public the right to participate fully in Office consideration of petitions to strike applications, it is considered appropriate and proper to restrict participation on behalf of a petitioner as set forth in the "Notice of proposed rulemaking" while such proposed rulemaking is pending. At this time the degree of participation is solely at the discretion of the Commissioner and the Commissioner is hereby acting in his discretion to restrict such participation. Accordingly, any petition to strike an application from the files which is filed after the date of publication of this Notice must include a self-addressed postcard specifically identifying the petition and the application to which the petition is directed if an acknowledgement of the filing of the petition is desired. A member of the public filing a petition to strike an application after the date of publication of this Notice will not receive any communications from the Office relating to the petition, other than the return of a self-addressed postcard which the Office will stamp and return in order to acknowledge receipt of the petition. All Office communications will be conducted with the applicant in accordance with the procedures set forth in the proposed rulemaking, which procedures are those currently in effect.

Practice Relating To §1.106

No interim practice is necessary regarding this proposed revision since it would not constitute a change in practice, but would merely make §1.106 more closely reflect current practice.

Practice Relating To §1.175

Any applications filed under §1.175(a)(4) prior to the effective date of any change in the rule will be examined until the application is amended and a reissue patent issues thereon or the application becomes abandoned.

Practice Relating To §1.176

The examination of any applications filed prior to the effective date of any change in the rule will continue to be delayed for two months after the announcement of the filing in the Official Gazette, except where the delay period is waived by a decision on a petition under 37 CFR 1.183.

Practice Relating To §1.193(c)

No interim practice is necessary regarding this proposed revision since the practice of rejecting claims pursuant to §1.56(d) will not be adopted prior to the effective date of a change in paragraph (d).

Practice Relating To §1.291

Any protest against a pending application which is filed after the date of publication of this Notice in the Official Gazette will be treated essentially in accordance with the procedures set forth in the "Notice of proposed rulemaking." Any protests which have been filed prior to the date of publication of this Notice in the Official Gazette will continue to be treated in accordance with the practices in effect prior to this Official Gazette Notice via the appropriate sections of the Manual of Patent Examining Procedure. Since the provisions of 37 CFR 1.291 now in effect do not guarantee a member of the public the right to participate fully in Office consideration of protests filed under §1.291, it is considered appropriate and proper to restrict participation on behalf of a protestor essentially as set forth in the "Notice of proposed rulemaking" while such proposed rulemaking is pending. At this time the degree of participation is solely at the discretion of the Commissioner and the Commissioner is hereby acting in his discretion to restrict such participation. Accordingly, any protest filed after the date of publication of this Notice will be acknowledged as set forth in present §1.291 on a self-addressed postcard which protestor is hereby advised to include with the protest. The self-addressed postcard must specifically identify the protest and the application to which the protest is directed, to the extent such identifying data for the application is known. A member of the public filing a protest against a pending application after the date of publication of this Notice will receive no communication from the Office relating to the protest, other than the self-addressed postcard which the Office will stamp and return in order to acknowledge receipt of the protest as set forth in present §1.291(a). All Office communications will be conducted with the applicant in accordance with the procedures set forth in the proposed rulemaking, which procedures are those currently in effect. Pending adoption of the proposed rulemaking the Office will consider protests which comply with present §1.291(a) even though the protest does not include all the items enumerated in proposed new paragraph (b) of §1.291.

Practice Relating To §1.555

No interim practice is necessary regarding this proposed revision since it merely makes §1.555 more closely parallel §1.56 and more specifically defines the responsibility of a patent owner in a reexamination proceeding.

Practice Relating To §1.565

No interim practice is necessary regarding this proposed revision since it merely clarifies, but does not change, present practice.

Practice Relating To §1.570

No interim practice is necessary since this proposed revision merely reflects the paragraph change proposed in §1.565.

CONCLUSION

The present interim procedures will be in effect until further notice and pending a final determination on the proposed rulemaking.

DONALD J. QUIGG,
Deputy Commissioner of Patents & Trademarks.

Nov. 16, 1981.

[1013 O.G. 18]

(125) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1 and 5
[Docket No. 40227-18]

Revision of Foreign Filing License Procedure

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Parts 1 and 5 of 37 CFR, to establish a streamlined procedure for granting licenses for foreign filing. The changes simplify the obtaining of licenses for filing foreign patent applications and for filing amendments, modifications, and supplements in foreign patent applications. Under the revised rules (1) the export, but not actual filing, of technical data to a foreign country for purposes related to the filing and prosecution of a patent application may be done either under appropriate export agencies' rules or by a license issued by the Commissioner of Patents and Trademarks, (2) certain licenses issued by the Commissioner for filing foreign patent applications include a license to file amendments, modifications, and supplements, containing additional matter in foreign applications, (3) specific contents of a petition for retroactive license are established and (4) fees are set for expedited handling of requests for foreign filing licenses and for certain petitions. These changes will result in reduced work for both patent applicants and the Patent and Trademark Office and at the same time strengthen national security protections.
Effective Date: June 1, 1984.
For Further Information Contact: Kenneth L. Cage by telephone at (703) 557-2877 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed primarily to simplify and expedite the granting of licenses under 35 U.S.C. 184. It contains a number of changes in practice designed to benefit both the Patent and Trademark Office in its handling of its mission and the public the Office serves. Notice of proposed rulemaking was published May 23, 1983, at 48 FR 23144 and corrected June 7, 1983, at 48 FR 26319.

Discussion of Specific Rules

Secton 5.11(a) has been substantially restructured and modified from the proposal. Under §5.11(a), a license from the Commissioner of Patents and Trademarks is always needed for the act of filing a patent application in a foreign patent office unless the six-month period has passed or the invention was not made in the United States.

Amended §5.11 (b) and (c) would clarify in the regulations that the export of technical data to a foreign country may be done under appropriate export agencies' rules controlling the export of technical data—Department of State (22 CFR Parts 121-130); Department of Commerce, International Trade Administration Office (15 CFR Part 379); or the Department of Energy (10 CFR Part 810)—or by license from the Commissioner. Compliance with the appropriate export agencies' rules or the license from the Commissioner is required before *exporting* technical data in the form of a patent application or data in any form if related to preparing, filing, and prosecuting a patent application in a foreign country, if the United States application has not been on file for six months at the time of export, or no application has been filed in the United States. It is optional from whom approval for export is obtained. In fact, for certain technical data being exported to certain countries, a specific request for a license or approval from any of the export agencies would not be necessary. However, a single license from the Commissioner would cover both export and filing and avoid any question whether a specific license or approval is required from any of the export agencies. Approval from the appropriate export agencies for export would require a separate additional license from the Commissioner for the filing of the foreign patent application. The rule changes will make the rules more closely conform with the regulations of other agencies which deal with the export of technical data to a foreign country.

The definition of export in these regulations will be controlled by the definition of export in the appropriate regulations of the export agencies having jurisdiction over the export of technical data related to the patent application. (15 CFR 379.1, 22 CFR 125.03 and 10 CFR 810.7).

The requirement of complying with the rules of the export agencies or the Commissioner before exporting an application to a foreign country is not intended to change long-standing Patent and Trademark Office interpretation of 35 U.S.C. 184 or in any way interpret the language in 35 U.S.C. 184 "file or cause or authorize to be filed" as requiring a license before technical data related to the filing or prosecution of an application is exported to a foreign country, such as to a foreign attorney or agent or corporation for review or revision for later filing. It does, however, reflect the delegations the Commissioner has received from other agencies and which are referenced in §§5.18, 5.19 and new §5.20 and clarifies that a patent applicant must be licensed for export of technical data abroad for purposes related to the preparation, filing or possible filing and prosecution of a foreign patent application either by appropriate export agencies or by the Commission. The language "related to the preparation, filing or possible filing and prosecution of a foreign patent application" in §5.11(b) is used rather than "support a patent application" as used in §5.18 or "foreign filing" as used in §5.19 to make clearer that the latter two phrases include the export of technical data in the form of explanations or possible claim language or the like sent to a foreign agent or other person in relation to a foreign patent application. However, a license from the Commissioner would not substitute for approvals required by appropriate export agencies if technical data is exported for purposes not related to the filing or possible filing and prosecution of a foreign patent application. For example, a license from the Commissioner would not cover export of technical data in a U.S. patent application to a foreign research laboratory to support a research project.

Further, the rule is intended to reflect that every exportation of technical data related to filing or possible filing or prosecution within six months of a United States filing without a license from the Commissioner is prohibited unless the applicant complies with the rules of the appropriate export agencies. For example, where an application has been exported to a foreign agent with an authorization to file a foreign patent application, the export of the application may be under a general license from the International Trade Administration of the Department of Commerce. A license from the Commissioner is always necessary for the actual filing of the foreign patent application. In another example, where a validated license is needed under 15 CFR Part 379 to export technical data in the form of a patent application, applicants will need to obtain an International Trade Administration license or obtain a Commissioner's license prior to the act of export. Under either example, a license from the Commissioner is required before the application is filed in a foreign patent office. In the latter example, a single license from the Commissioner will permit both export and filing of the application.

This rule is promulgated under the authority of 35 U.S.C. 6 and delegations to the Commissioner by regulation (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7) or otherwise under the Export Administration Act of 1979, as amended, the Arms Export Control Act, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978. Authority for this rule also exists under 35 U.S.C. 188.

The amended rule assures adequate protection of sensitive material under Title 35, United States Code and

provides regulatory consistency with the Arms Export Control Act, as amended, the Export Administration Act, as amended, the Atomic Energy Act of 1954, as amended, the Nuclear Non-Proliferation Act of 1978, and their implementing regulations. The sanctions which apply for failure to obtain a license from either the Commissioner or the appropriate export agencies prior to export are the sanctions specified in the export acts. The sanctions which apply for failure to obtain a license from the Commissioner prior to the filing of a foreign application are the sanctions specified in Title 35, United States Code.

Section 5.11(d), proposed as §5.11(b), states that applications under secrecy order under §5.2 cannot be exported to an international agency or filed in a foreign country except in accordance with §5.5.

Section 5.11(e), proposed as §5.11(c), states that a license pursuant to paragraph (a) is not required where the invention was not made in the United States, or the United States application was on file for six months without a secrecy order being issued.

Section 5.11(f), proposed as §5.11(d), states that a license for foreign filing may be revoked at any time upon written notice. Similarly, an authorization for foreign filing resulting from the passage of six months from the filing of a United States patent application may be revoked by the imposition of a secrecy order. The revocation is effective as of the date of the notice and is not intended to be applicable to any prior acts by applicants relying in good faith on the grant of a license.

The language of §§5.12(b), 5.13, and 5.14 have been clarified from the proposal to reflect that the §1.17(h) requirement for a fee is for the expedited handling of a license. No fee is required for a routine, non-expedited request for a foreign filing license.

Section 5.15 has been changed from the form proposed. Amended §5.15 defines licenses for foreign export and filing of two different scopes. The §5.15(a) scope license, the grant of which is indicated on the filing receipt in accordance with §5.12(a) published at 48 FR 2696. (Jan. 20, 1983) and 1027 OG 9 (Feb. 1, 1983), permits the subsequent export and filing of technical data for purposes related to the preparation, filing or possible filing and prosecution of the foreign application and of any amendments or modifications to the application in a foreign country, even if "additional subject matter" were introduced; provided the additional subject matter does not change the general nature of the subject matter disclosed and does not pertain to certain categories of potentially sensitive material which are set forth in §5.15(a)(4).

The phrase "change the general nature of the subject matter disclosed" is intended to cover situations where the additional subject matter so alters the character of the disclosure that national security review is appropriate. This phrase is intended to permit a broad range of amendments, modifications and supplements, including additional subject matter. The following examples are intended to further clarify the meaning of the language "general nature of the subject matter disclosed" in §5.15(a):

Example 1—The physical data on a named compound. If a licensed disclosure gives the name and structure of a compound, the general nature of the subject matter disclosed includes physical data such as boiling point, melting point or specific gravity of the compound. If a name of a compound is disclosed, the structure of the compound is also within the general nature. If the licensed disclosure deals with the hardness of a claimed alloy, the disclosure of tensile strength is within the general nature.

Example 2—A known specie of a known genus. If the genus "lower alkyl" is disclosed, the inclusion of the species "methyl" is within the general nature, as would be homologs and isomers of that genus.

Example 3—Comparison data of the disclosed compound to data on prior art compounds. If the licensed disclosure contains a disclosure of the compounds of a pesticide invention, and pesticidal activities, the comparison of pesticidal data of a known compound representing the closest prior art is within the general nature.

Example 4—A specific optimum temperature within a specified temperature range. If a licensed disclosure has a range of 0°C to 120°C, the disclosure of an optimum temperature of 100°C is within the general nature.

Example 5—Activity data on compounds of the invention. If activity data on 30 of 50 named compounds is disclosed, the disclosure of activity data on other named compounds of the invention is within the general nature.

Example 6—Additional subject matter and utilities. If a licensed disclosure describes a chemical herbicide for weed control, the disclosure of chemical warfare uses or human toxic properties (other than to demonstrate safety or absence of such toxicity) *is not* within the general nature. If a licensed disclosure describes an analog computer for microwave telephone transmission, the addition of a cryptographic encoding or decoding device and utility *is not* within the general nature. If a licensed disclosure describes a battery power source for a satellite, the addition or substitution of a nuclear isotopic power source *is* within the general nature, but would be within the control of §5.15(a)(4)(ii).

A §5.15(b) scope license is limited to the original subject matter disclosed at the time the license was granted and does not cover "additional subject matter" as the phrase is currently interpreted (*In re Gaertner,* 202 USPQ 714 (CCPA 1979)).

Under §5.15(c), a license with the scope of §5.15(a) could also be granted pursuant to a §5.13 or §5.14 petition. If granted, the §5.15(a) scope of license will be indicated on the license grant. For instance, under §5.15(c) an applicant who filed a United States patent application before Feb. 27, 1983, when the filing receipt license practice became effective could request a §5.15(a) scope license which, if granted, will cover the subsequent filing of amendments, modifications or supplements, including additional matter in a corresponding foreign patent application. The licenses under §§5.12(b), 5.13, and 5.14 are normally limited in scope to the original subject matter disclosed at the time the license was granted unless a license of the §5.15(a) scope is indicated on the license grant. If a petition for a license under §5.12(b) is granted prior to the grant of the §5.12(a) filing receipt license, the former would merge into the latter and would be considered a §5.12(a) license for the purpose of §5.15.

A new §5.20, not included in the proposal, sets forth the specific authority of the Commissioner to license foreign filing, possible filing or prosecution of a patent application in a foreign country under 35 U.S.C. 184 regarding unclassified activities in foreign atomic energy programs. This change only reflects the existing relationship between 37 CFR 5.11 and 10 CFR §810.7 and alerts patent applicants in this technology to the Commissioner's authority. The term "sensitive nuclear technology" used in paragraph (b) of §5.20 is defined in 10 CFR §810.3(q).

A new §5.25, proposed initially as §5.20 and modified, sets forth in the regulations the requirements to be met for the granting of a retroactive license. The requirements include (1) a list of the foreign countries in which the patent application material was filed; (2) the date(s) of filing of the foreign application(s); (3) an oath or declaration which (i) states that the subject matter filed is not subject to a secrecy order under 35 U.S.C. 181, (ii) makes a showing of diligence in attempting to obtain the license upon discovery of the error, and (iii) makes a showing of facts which support a conclusion of inadvertence; and (4) includes the required fee. The section also provides in paragraph (b) for review from a denial of a petition for a retroactive license. The section further provides in paragraph (c) that the granting of a retroactive license pursuant to §5.25 does not excuse any violation of regulations of the export agencies which may have occurred because of the failure to obtain an appropriate license prior to export.

Sections 5.21, 5.22 and 5.23 have been redesignated to become §§5.31, 5.32 and 5.33, respectively.

Significant Differences Between Proposed and Final Rules

Section 1.17

Section 1.17(h) is amended to include a specific reference to §5.25 petitions for retroactive licenses for which the petition fee is charged, rather than having the present retroactive license fee under §1.182 petitions. The fee for §5.12(b) licenses is new and applies only where expedited handling of these license requests is sought. This fee for expedited handling is also referred to in §§5.13 and 5.14. Section 5.15(c) provides for a fee for changing the scope of a license.

Section 5.1

The proposed amendment to §5.1 is not being adopted and is withdrawn.

Section 5.11

Section 5.11 is amended to control the *export* of technical data in the form of an application or data in any form if related to preparing, filing, or prosecuting a patent application in a foreign country, if the United States application has not been on file for at least six months prior to the date of transmittal, or if no application has been filed in the United States. Export approvals, if required, may be provided by appropriate export agencies—Department of State; Department of Commerce, International Trade Administration or Department of Energy—or by the Commissioner. This will enable the Patent and Trademark Office and the export agencies to better reflect and exercise the export control functions set forth in the Arms Export Control Act, as amended, the Export Administration Act of 1979, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, respectively.

Under these Acts, the export of technical data is the activity to be controlled. The final rule differs from the proposed rule in that the Patent and Trademark Office will not be the sole export control authority over technical data in the form of an application, or data in any form, if related to preparing, filing, or prosecuting a patent application. Applications will have the option to obtain necessary export approvals either (1) from appropriate export agencies or (2) from the Commissioner. The Commissioner will continue to be the sole licensing authority for the act of filing an application in a foreign patent office.

Paragraphs (a), (b), and (c) of §5.11 control export activity by requiring either an export agency approval or a Commissioner's license for export of technical data in connection with foreign filing of an application and to that extent implement the Arms Export Control Act, the Export Administration Act, the Atomic Energy Act and the Nuclear Non-Proliferation Act. If a license is obtained from the Commissioner under §5.12, §5.13 or §5.14, no separate approval for the export of technical data to a foreign country in connection with a patent application is required from the export agencies.

It is emphasized that the scope of the Commissioner's license is limited to exporting and filing technical data in the form of an application, or in any form, if related to preparing, filing and prosecuting a patent application or for consideration of the filing of a patent application in a foreign country. A Commissioner's license does not authorize selling or using technical data in a foreign country or exporting data for other purposes. These latter acts continue to require separate approvals from the appropriate export agencies.

Also, the export of technical data in any form to a foreign country for purposes other than related to filing or supporting the filing of a patent application is not controlled by Title 35, U.S.C. or the regulations in Part 5. The exportation of data to a foreign country in such cases would be subject only to other laws and regulations such as the export and arms control regulations. Approval for the export of such technical data for purposes related to filing, possible filing, or supporting the filing of a patent application will be available from the appropriate export agencies or the Commissioner. On the other hand, the Commissioner will be the sole licensing authority for the act of filing the application in a foreign patent office.

Section 5.11(d), proposed as §5.11(b), states that an application cannot be exported to a foreign country when the corresponding United States application is under secrecy order except under §5.5

Section 5.11(e), proposed as §5.11(c), states that no license is required if the invention was not made in the United States, or the application was on file in the United States at least six months and is not under a secrecy order issued under §5.2

Section 5.11(f), proposed as §5.11(d), states that any license for foreign filing may be revoked at any time by written notification. It has been amended to further clarify that revocation also applies to authorizations resulting from the passage of six months from the filing date of a United States patent application when a secrecy order is imposed.

Section 5.12

Section 5.12(b) is clarified from the proposal to specify that the fee is for expedited handling of a petition under §1.17(h).

Section 5.13

Section 5.13 is clarified from the proposal to specify that the fee is for expedited handling of a petition under §1.17(h).

Section 5.14

Section 5.14(a) is clarified from the proposal to specify that the fee is for expedited handling of a petition under §1.17(h).

The other changes in §5.14 make grammatical corrections and do not alter the intent of the section.

Section 5.15

Section 5.15(a) broadens the scope of licenses granted under §5.12(a). Section 5.15(a), as proposed, is changed to clarify the scope of a §5.15(a) license and delete certain of the exclusions originally proposed. This license permits exporting technical data to and filing corresponding subject matter in an application in any foreign country. The license also permits amendments, modifications, and supplements, including divisions, changes or supporting matter consisting of the illustration, exemplification, comparison, or explanation of subject matter disclosed in the application, to be exported and filed in any foreign country. This license includes additional matter which does not change the general nature of subject matter disclosed and does not pertain to certain prohibited subjects or areas listed on various export restriction lists established by the Department of State and the Department of Energy.

These changes also permit an applicant to take action in the prosecution of the foreign or international application and submit supporting data such as affidavits, test data or the like as long as it directly relates to the filing, possible filing or prosecution of the application and does not pertain to the prohibited subjects or areas enumerated in §5.15(a)(4). The changes in §5.15(a) obviate the problems in *In re Gaertner,* supra, by providing a license scope which covers the type of activity involved in that case.

Amended paragraph (b) of §5.15 is the same as proposed paragraph (b) except for changes for consistency.

Amended paragraph (c) of §5.15 differs from §5.15(c) as proposed by including a reference to §5.14 and specifically permitting an applicant to petition for a change of the scope of a license.

New paragraph (d) of §5.15 is similar to proposed paragraph (d) with only changes for consistency.

New paragraph (e) of §5.15 is similar to proposed paragraph (e) with only changes for consistency.

Paragraph (f) of §5.15 is similar to proposed paragraph (f) with only changes for consistency.

Paragraph (g) is adopted essentially as proposed.

Section 5.17

Section 5.17 is similar to proposed §5.17 with only consistency changes.

Section 5.20

Section 5.20, not included in the proposal, is new and clarifies the existing authority of the Commissioner under the unclassified activities in foreign atomic energy programs. Under 10 CFR 810.7, the license of the Commissioner under 37 CFR 5.11 pursuant to 35 U.S.C. 184 constitutes information available to the public and generally authorized activity.

Section 5.25

Section 5.25, proposed initially as §5.20, is new and sets forth the requirements for petitioning for a retroactive license.

Section 5.31 and 5.32

Sections 5.21 and 5.22 are redesignated as §§5.31 and 5.32, respectively.

Section 5.33

Section 5.23 is redesignated as §5.33 and adopted as proposed.

Responses to Comments on the Rules

Specific comments were received on a number of the sections. All of the comments, including the written comments and the oral testimony were considered.

Twenty-one letters presenting written comments were received and nine persons testified at the public hearing on July 20, 1983. Comments appear below along with the responses.

Comment: One comment objected to the amendment of §5.1 to include "transmittal for" filing.

Reply: This comment has been adopted by deleting the phrase from the final rule.

Comment: Three comments requested an explanation of the conditions when a license may be revoked under §5.11(d) be clearly set forth and asked whether, if revocation occurs, past acts are valid and whether there will be compensation for damages.

Reply: The section has been revised to further clarify the conditions under which a license may be revoked. The power to revoke licenses has been expressly included in all issued licenses for a number of years. Section 5.11(d) as proposed, merely recognizes in the rule the fact that licenses can be revoked. With the advent of the filing of a U.S. application becoming a request for a foreign filing license under §5.12(a), a regulatory procedure clarifying the revocation practice was appropriate. Revocation will be effective only as of the date of revocation and prior acts predicated on the license would be in compliance with 37 CFR Part 5. The rule as proposed has been clarified to indicate that revocation may apply either to a license specifically granted by the Commissioner or to an authorization to file a foreign application resulting from the passage of six months from the filing of a United States patent application. No compensation is available for revocation of a license.

Comment: Eighteen comments requested the amendment of §5.11 to eliminate the license requirement for "transmittal for filing" and substitute the requirement for "filing" only.

Reply: The proposal has been adopted by eliminating the requirement for a license from the Commissioner prior to transmitting or exporting an application abroad. The regulations have been clarified to emphasize the requirements for the export of technical data in the form of an application. An applicant has a choice of exporting such applications under authority of either (1) the appropriate export agencies controlling the export of technical data—Department of State; Department of Commerce, International Trade Administration; or Department of Energy or (2) a license from the Commissioner. While a license from the Commissioner is required only for filing an application abroad, the provisions of §§5.18, 5.19 and 5.20 reflect the Commissioner's authority to license the export of technical data in the form of an application for purposes related to filing in addition to the foreign filing of the application in a foreign country.

Comment: Six person objected to the transmittal license requirement and argued that the Patent and Trademark Office lacks authority under 35 U.S.C. 184 to require pre-filing (transmitting) licenses. It was also argued that foreign filing licensing is not the conduct of proceedings under 35 U.S.C. 6.

Reply: The final rules do not require a license from the Commissioner for export (or transmittal). The export provisions of §5.11 are issued under 35 U.S.C. 6 and pursuant to delegations under the regulations of the export agencies.

Comment: One comment argued that the constitutional right of freedom of speech would be impaired by requiring a license for published material.

Reply: A constitutional argument of prior restraint by export licensing of the International Traffic in Arms Regulations was reviewed by the Ninth Circuit in the case of *United States* v. *Edler,* 579 F. 2d 516 (9th Cir. 1978) cert. denied 449 U.S. 1084 (1981). No prior restraint within first amendment protection was found by the Court.

Comment: One comment stated that the $120 petition license fee under §5.12(b) is too high, and a $60 fee would be more reasonable.

Reply: The license fee under §5.12(b), §5.13 and §5.14 is not applicable to routine licensing requests. It is only applicable to expedited processing of license requests which require special efforts by the Patent and Trademark Office. The $120 petition fee better reflects the costs to the Patent and Trademark Office for providing expedited handling.

Comment: One comment proposed the deletion of the last sentence of paragraph §5.14(a) since under §5.12(a) only those cases having interest from a security standpoint are refused a license.

Reply: This suggestion has not been adopted because the provision may apply to petitions filed prior to receipt of a filing receipt license where expedited handling is requested.

Comment: One comment stated that §5.15(d) appears to be redundant since it applies only to cases on file for six months and on which no secrecy order has been imposed.

Reply: Under §5.15(d), a license is not needed for cases in this category if no additional subject matter is added. This section complements §5.15(b) where a license of narrow scope is granted.

Comment: One comment raised the question whether §5.15(a) as to amendments, supplements, and modifications includes continuation-in-part applications.

Reply: Continuation-in-part applications are included within the term "amendments, supplements, and modifications." *Beckman Instruments, Inc.* v. *Coleman Instruments,* 143 USPQ 278 (7th Cir. 1964).

Comment: Two comments requested that the express language in §5.15(a)(3) be amended to state that "Technical Data" relating to articles, materials and supplies be limited to the validated license requirements of §§379.4(c) and 379.4(d) of the Export Administration Regulations and no other sections, or alternatively, that paragraph (a)(3) be deleted in its entirety.

Reply: The final rules do not include §5.15(a)(3) as proposed.

Comment: Two comments proposed that the two-tier licensing structure of §5.15(a) and §5.15(b) be amended to reflect a broad one-tier system based on §5.15(a).

Reply: The two-tier system reflects different treatment for applications within the inspection scope of 35 U.S.C. 181 and those outside of its inspection scope. Security review occurs on all applications with inspection cases

having a narrow license grant, and noninspection cases having a broad license grant. This inspection case treatment is necessary for the Patent and Trademark Office to meet its responsibilities under 35 U.S.C. 184 and particularly 37 CFR 5.18, 5.19, and 5.20 where the State, Commerce and Energy Departments accept the Commissioner's licenses in lieu of their own export approval.

Comment: One comment indicated that proposed §5.15(a)(3) was of such wide scope that licenses will always be needed. The example cited was that this section would require licenses for all amendments filed in North Korea and Cuba.

Reply: The comment is correct and the provisions of §5.15(a)(3) have been deleted. The country of destination restrictions did not provide a workable mechanism for technology review under the provisions of 35 U.S.C. 181.

Comment: Three comments recommended making a §5.15(a) scope license available pursuant to a §5.14 petition where an application was filed prior to Feb. 27, 1983, or where an initial automatic §5.12(a) petition was not granted after Feb. 27, 1983 or where the general nature of the invention changed but is still outside of the provisions of §5.15(a)(4).

Reply: This provision has been adopted to allow the Commissioner to issue broadened licenses upon a §5.14 petition in the above circumstances. New §5.15(c) allows the Commissioner to convert the scope of a license from §5.15(b) to a §5.15(a) license.

Comment: Two comments proposed the extension of a §5.15(a) license upon petition after one or more years after the United States filing date or after grant of a §5.15(b) license.

Reply: This suggestion has been adopted in §5.15(c) which will provide the mechanism by petition at any time to convert the scope of a license. This is promulgated since errors may occur in the denial of a §5.15(a) license. Also, the initial determination of the sensitive nature of technology may be altered by changes in the security classification guidelines. Procedurally, such petitions will be referred to the appropriate defense agencies for their review of the technology prior to the grant of any license.

Comment: One comment requested clarification on how and under what circumstances a §5.12(b) license granted under §5.15(c) has the same scope as a license granted under §5.12(a).

Reply: Licenses granted under §5.12(a) will have the §5.15(a) scope because the applications are not within the inspection scope of a 35 U.S.C. 181 referred to the defense agencies for security review. Under §5.15(c), applications which are not referred to defense agencies pursuant to petitions under §§5.12, 5.13 and 5.14 will have a license of the scope of §5.15(a).

Comment: Three comments suggested an amendment to proposed §5.20(4) to delete the "inadvertence" standard and substitute "through error without deceptive intent."

Reply: Inadvertence is a statutory standard which cannot be altered by rulemaking. Further, judge-made law has determined the metes and bounds of this term which further proscribes the rulemaking authority of the Commissioner. In *Barr Rubber Products Co.* v. *Sun Rubber Co.*, 149 USPQ 204, 209 (S.D.N.Y., 1966) inadvertence was defined as "lack of care or attentiveness: inattention" or "an effect of inattention: a result of carelessness; an oversight, mistake, or fault from negligence."

Inadvertence signifies want of attention, and an action which is deliberately taken with full knowledge of the law and facts is not inadvertent. *In re Application of Nov. 22, 1952*, 153 USPQ 410, 411 (Asst. Commr. 1967).

Implementation of Patent Procedure Revisions

The various sections will be implemented by the Commissioner on the effective date of the rules by the acceptance of petitions under the various sections. The broadened license scope of §5.15(a) will apply as of the effective date of these rules to all cases having filing receipt licenses under §5.12(a) which became effective on Feb. 27, 1983. The provisions of this broad license do not apply to acts of export or filing which occurred prior to the effective date of these rules. No other action will be required by an applicant to receive the benefits of this change.

Other Considerations

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The Acting General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354) for several reasons. Under this rulemaking, small entities would be able to obtain licenses without filing separate requests therefor. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, simplifying existing procedures where possible.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increases in cost or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

Paperwork Reduction Act. The collection of information requirement of this rule is included in a PTO request for approval pending before the OMB. Upon assignment of a control number by OMB, we will publish an appropriate amendment of the affected rules.

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Lawyers, Small businesses.

37 CFR Part 5

Classified information, Foreign relations, Inventions and patents.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, 41 and 181-188 and by delegations to the Commissioner by regulation (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7) or otherwise under the Export Administration Act of 1979, as amended, the Arms Export Control Act, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, the Patent and Trademark Office is amending Parts 1 and 5 of Title 37 of the Code of Federal Regulations as set forth below:

PART 1—[AMENDED]

1. Section 1.17 is amended by revising paragraph (h) to read as follows:

§1.17 Patent application processing fees.

* * * * *

(h) For filing a petition to the Commissioner under a section of Part 1 or 5 listed below which refers to this paragraph $120.00

—§1.47—for filing by other than all the inventors or a person not the inventor
—§1.48—for correction of inventorship
—§1.182—for decision on questions not specifically provided for
—§1.183—to suspend the rules
—§1.268—for late filing of interference settlement agreement
—§§5.12, 5.13 & 5.14—for expedited handling of foreign filing license
—§5.15—for changing the scope of a license
—§5.25—for retroactive license

2. The table of contents and heading for Part 5 are revised to read as follows:

PART 5—SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES

Secrecy Orders

Sec.
5.1 Defense inspection of certain applications.
5.2 Secrecy order.
5.3 Prosecution of application under secrecy orders; withholding patent.
5.4 Petition for rescission of secrecy order.
5.5 Permit to disclose or modification of secrecy order.
5.6 General and group permits.
5.7 Compensation.
5.8 Appeal to Secretary.

Licenses for Foreign Exporting and Filing

5.11 License for filing in a foreign country an application on an invention made in the United States or for transmitting international application.
5.12 Petition for license.
5.13 Petition for license; no corresponding application.
5.14 Petition for license; corresponding U.S. application.
5.15 Scope of license.
5.16 Effect of secrecy order.
5.17 Who may use license.
5.18 Arms, ammunition, and implements of war.
5.19 Export of technical data.
5.20 Export of technical data relating to sensitive nuclear technology.
5.25 Petition for retroactive license.

General

5.31 Effect of modification, rescission or license.
5.32 Papers in English language.
5.33 Correspondence.

Authority: 35 U.S.C. 6, 41, 181-188 and the Export Administration Act of 1979, as amended, the Arms Export Control Act, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

3. The center heading preceding §5.11 and the text of §5.11 are revised to read as follows:

Licenses for Foreign Exporting and Filing

§5.11 License for filing in a foreign country an application on an invention made in the United States or for transmitting an international application.

(a) A license from the Commissioner of Patents and Trademarks under 35 U.S.C. 184 is required before filing any application for patent or for the registration of a utility model, industrial design, or model, in a foreign patent office or any foreign patent agency or any international agency other than the United States Receiving Office, if:

(1) An application on the invention has been on file in the United States less than six months prior to the date on which the application is to be filed, or

(2) No application on the invention has been filed in the United States.

(b) The license from the Commissioner of Patents and Trademarks referred to in paragraph (a) would also authorize the export of technical data abroad for purposes related to the preparation, filing or possible filing and prosecution of a foreign patent application without separately complying with the regulations contained in 22 CFR Parts 121-130 (International Traffic in Arms Regulations of the Department of State), 15 CFR Part 379 (Regulations of the Office of Export Administration, Department of Commerce) and 10 CFR Part 810 (Foreign Atomic Energy Programs of the Department of Energy).

(c) Where technical data in the form of a patent application, or in any form is being exported for purposes related to the preparation, filing or possible filing and prosecution of a foreign patent application, without the license from the Commissioner of Patents and Trademarks referred to in paragraphs (a) or (b) of this section, or on an invention not made in the United States, the export regulations contained in 22 CFR Parts 121-130 (International Traffic in Arms Regulations of the Department of State), 15 CFR Part 379 (Regulations of Office of Export Administration, International Trade Administration, Department of Commerce) and 10 CFR Part 810 (Foreign Atomic Energy Programs of the Department of Energy) must be complied with unless a license is not required because a United States application was on file at the time of export for at least six months without a secrecy order under §5.2 being placed thereon. The term "exported" means export as it is defined in 22 CFR Parts 121-130, 15 CFR Part 379 and 10 CFR Part 810.

(d) If a secrecy order has been issued under §5.2, an application cannot be exported to, or filed in, a foreign country (including an international agency in a foreign country), except in accordance with §5.5.

(e) No license pursuant to paragraph (a) of this section is required if:

(1) The invention was not made in the United States, or

(2) The United States application is not subject to a secrecy order under §5.2, and was filed at least six months prior to the date on which the application is filed in a foreign country.

(f) A license pursuant to paragraph (a) of this section can be revoked at any time upon written notification by the Patent and Trademark Office. An authorization to file a foreign patent application resulting from the passage of six months from the date of filing of a United States patent application may be revoked by the imposition of a secrecy order.

4. Section 5.12 is amended by revising paragraph (b) to read as follows:

§5.12 Petition for license.

* * * * *

(b) Petitions for license should be presented in letter form and must include the required fee (§1.17(h)), if expedited handling of the petition is also sought, the petitioner's address, and full instructions for delivery of the requested license when it is to be delivered to other than the petitioner.

5. Section 5.13 is revised to read as follows:

§5.13 Petition for license; no corresponding application.

If no corresponding national or international application has been filed in the United States, the petition for license under §5.12(b) must be accompanied by the required fee (§1.17(h)), if expedited handling of the petition is also sought, and a legible copy of the material upon which a license is desired. This copy will be re-

tained as a measure of the license granted. For assistance in the identification of the subject matter of each license so issued, it is suggested that the petition be submitted in duplicate and provide a title and other description of the material. The duplicate copy of the petition will be returned with the license or other action on the petition.

6. Section 5.14 is amended by revising paragraphs (a) and (c) to read as follows:

§5.14 Petition for license; corresponding U.S. application.

(a) When there is a corresponding United States application on file, a petition for license under §5.12(b) must include the required fee (§1.17(h)), if expedited handling of the petition is also sought, and must identify this application by serial number, filing date, inventor, and title, but a copy of the material upon which the license is desired is not required. The subject matter licensed will be measured by the disclosure of the United States application. Where the title is not descriptive, and the subject matter is clearly of no interest from a security standpoint, time may be saved by a short statement in the petition as to the nature of the invention.

* * * * *

(c) When the application to be filed or exported abroad contains matter not disclosed in the United States application or applications, including the case where the combining of two or more United States applications introduces subject matter not disclosed in any of them, a copy of the application as it is to be filed in the foreign country or international application which is to be transmitted to a foreign international or national agency for filing in the Receiving Office, must be furnished with the petition. If however, all new matter in the foreign or international application to be filed is readily identifiable, the new matter may be submitted in detail and the remainder by reference to the pertinent United States application or applications.

7. Section 5.15 is revised to read as follows:

§5.15 Scope of license.

(a) Grant of a license under §5.12(a) authorizes the export and filing of an application in a foreign country or the transmitting of an international application to any foreign patent agency or international patent agency when the subject matter of the foreign or international application corresponds to that of the domestic application. This license includes authority:

(1) To export and file all duplicate and formal papers to the foreign country or international agencies;

(2) To make amendments, modifications and supplements, including divisions, changes or supporting matter consisting of the illustration, exemplification, comparison, or explanation of subject matter disclosed in the application;

(3) To take any action in the prosecution of the foreign or international application; and

(4) To add subject matter or take any action under paragraphs (a) (1)–(3) of this section which does not change the general nature of the subject matter disclosed at the time of filing, unless the subject matter added involves technical data pertaining to:

(i) Defense services or articles designated in the United States Munitions List applicable at the time of foreign filing, the unlicensed exportation of which is prohibited pursuant to the Arms Export Control Act, as amended, and 22 CFR Parts 121–130; or

(ii) Restricted Data, sensitive nuclear technology or technology useful in the production or utilization of special nuclear material or atomic energy, the dissemination of which is subject to restrictions of the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, as implemented by the regulations for Unclassified Activities in Foreign Atomic Energy Programs, 10 CFR Part 810, in effect at the time of foreign filing.

(b) Grant of a license under §5.12(b) authorizes the export and filing of an application in a foreign country or the transmitting of an international application to any foreign patent agency or international patent agency. Further, this license includes authority to forward all duplicate and formal papers to the foreign patent agency or international patent agency and to make amendments, modifications or supplements to and take any action in the prosecution of the foreign or international application, provided subject matter additional to that covered by the license is not involved.

(c) A license granted under §5.12(b) pursuant to §5.13 or §5.14 shall have the scope indicated in paragraph (a) of this section, if it is so specified in the license. A petition, accompanied by the required fee (§1.17(h)), may also be filed to change a license having the scope indicated in paragraph (b) of this section to a license having the scope indicated in paragraph (a) of this section. The change in the scope of a license will be as of the date of the grant of the change in scope.

(d) In those cases in which no license is required to file the foreign application or transmit the international application, no license is required to file papers in connection with the prosecution of the foreign or international application not involving the disclosure of additional subject matter.

(e) Any paper filed abroad or transmitted to an international patent agency following the filing of a foreign or international application which changes the general nature of the subject matter disclosed at the time of filing or which involves the disclosure of subject matter listed in paragraphs (a)(4) (i) or (ii) of this section must be separately licensed in the same manner as a foreign or international application. Further, if no license has been granted under §5.12(a) on filing the corresponding United States application, any paper filed abroad or with an international patent agency which involves the disclosure of additional subject matter must be licensed in the same manner as a foreign or international application.

(f) Licenses separately granted in connection with two or more United States applications may be exercised by combining or dividing the disclosures, as desired, provided:

(1) Subject matter which changes the general nature of the subject matter disclosed at the time of filing or which involves subject matter listed in paragraphs (a)(4) (i) or (ii) of this section is not introduced and,

(2) In the case where at least one of the licenses was obtained under §5.12(b), additional subject matter is not introduced.

(g) A license does not apply to acts done before the license was granted. See §5.25 for petitions for retroactive licenses.

8. Section 5.17 is revised to read as follows:

§5.17 Who may use license.

Licenses may be used by anyone interested in the export, foreign filing, or international transmittal for or on behalf of the inventor or the inventor's assigns.

9. A new §5.20 is added to read as follows:

§5.20 Export of technical data relating to sensitive nuclear technology.

(a) Under regulations (10 CFR 810.7) established by the United States Department of Energy, an application filed in accordance with the regulations (37 CFR 5.11–5.33) of the United States Patent and Trademark Office and eligible for foreign filing under 35 U.S.C. 184, is considered to be information available to the public in published form and a generally authorized activity for the purposes of the Department of Energy regulations.

(b) Inquiries concerning the export of sensitive nuclear technology other than related to the filing or prosecution of a foreign patent application should be made to the Attention: Secretary, United States Department of Energy, Office of International Security Affairs, Washington, D.C. 20858.

§5.21 [Redesignated as §5.31]

10. Section 5.21 is redesignated as §5.31.

§5.22 [Redesignated as §5.32]

11. Section 5.22 is redesignated as §5.32.

12. A new §5.25 is added to read as follows:

§5.25 Petition for retroactive license.

(a) A petition of retroactive license under 35 U.S.C. 184 shall be presented in accordance with §5.13 or §5.14, and shall include:

(1) A listing of the foreign countries in which the patent application material was filed,

(2) The dates on which the material was filed,

(3) A verified statement containing:

(i) An averment that the subject matter in question was not under a secrecy order at the time it was filed abroad, and that it is not currently under a secrecy order.

(ii) A showing that the license has been diligently sought after discovery of the proscribed foreign filing, and

(iii) An explanation of why the material was inadvertently filed abroad without the required license under §5.11 first having been obtained, and

(4) The required fee (§1.17(h)).

The above explanation must include a showing of facts rather than a mere allegation of inadvertence. The showing of facts should include statements by those persons having personal knowledge of the acts regarding filing in a foreign country and should be accompanied by copies of any necessary supporting documents such as letters of transmittal or instructions for filing. The acts which are alleged to constitute inadvertence should cover the period from the time of filing until actual filing of the petition under this section.

(b) If a petition for a retroactive license is denied, a time period of not less than thirty days shall be set, during which the petition may be renewed. Failure to renew the petition within the set time period will result in a final denial of the petition. A final denial of a petition stands unless a petition is filed under §1.181 within two months of the date of the denial. If the petition for a retroactive license is denied with respect to the invention of a pending application and no petition under §1.181 has been filed, a final rejection of the application under 35 U.S.C. §185 will be made.

(c) The granting of a retroactive license does not excuse any violation of the export regulations contained in 22 CFR Parts 121–130 (International Traffic in Arms Regulations of the Department of State), 15 CFR Part 379 (Regulations of Office of Export Administration, International Trade Administration, Department of Commerce) and 10 CFR Part 810 (Foreign Atomic Energy Programs of the Department of Energy) which may have occurred because of the failure to obtain an appropriate license prior to export.

13. Section 5.23 is redesignated as §5.33 and revised to read as follows:

§5.33 Correspondence.

All correspondence in connection with this part, including petitions, should be addressed to "Commissioner of Patents and Trademarks (Attention Licensing and Review), Washington, D.C. 20231."

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Feb. 24, 1984.

[FR Doc. 84-8884 Filed 4-3-84; 8:45 am]
BILLING CODE 3510-16-M

[1042 O.G. 3]

(126) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1 and 5
[Docket No. 40227-18]

Revision of Foreign Filing License Procedure

Agency: Patent and Trademark Office, Commerce
Action: Final rule: Change of effective date
Summary: The Patent and Trademark Office amended the rules of practice in patent cases, Parts 1 and 5 of 37 CFR, to establish a streamlined procedure for granting licenses for foreign filing by publishing a notice in the Federal Register on Apr. 4, 1984, at 49 Fed. Reg. 13456–13463. The notice set an effective date of June 1, 1984. However, title 35, United States Code, section 41(g) provides that "No fee established by the Commissioner under this section will take effect prior to sixty days following notice in the Federal Register." Since these rules establish fees and the effective date of the rules was slightly less than 60 days after the publication of the final rule change in the Federal Register, it is necessary to set a later effective date.
Date: The effective date of the rule change published at 49 Fed. Reg. 13456–13463 is changed to June 4, 1984.
For further information contact: Kenneth L. Cage by telephone at (703) 557-2877 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Apr. 30, 1984.

[1042 O.G. 58]

(127) **Office of Patents and Trademarks**
Revision of the Scope of the Secrecy Order for Defense Agency Use

The Patent and Trademark Office (PTO) is revising the scope and format of the Secrecy Orders issued under the Invention Secrecy Act of 1951, 35 U.S.C. 181 et seq., 37 CFR Part 5. The present forms of Secrecy Orders are very restrictively worded to control disclosure or use of an invention under Secrecy Order. The PTO previously would only authorize disclosure or use of a Secrecy Order invention by the grant of a special permit. Permits authorize limited disclosure and permissible use of the invention depending upon the nature of the technical data and national security controls. To receive a permit, a patent applicant had to petition the Commissioner, or the defense agency sponsoring the Secrecy Order would issue or could have sua sponte issued a permit with the Order.

The revised Secrecy Orders will permit disclosure and use consistent with the national security controls needed on the technical data in a patent application. The features of existing permits are incorporated into the Orders which will eliminate the need, in many cases, for the applicant to separately petition for a permit to authorize various degrees of disclosure or use.

These revisions to the scope and format of a Secrecy Order are intended to place essentially the same national security controls on the technical data in patent applications as those on other types of technical data. With respect to publication or disclosure of information which would, in the opinion of the sponsoring Agency, be detrimental to the national security, the revised Secrecy Orders will be consistent with existing national security and export control procedures. The revised Secrecy Orders will also clarify the procedures for handling and custody of applications subject to a Secrecy Order.

The three new Secrecy Order formats to be used by the defense agencies of the Department of Defense are as follows:

(1) Secrecy Order and Permit for Foreign Filing in Certain Countries

This Secrecy Order will be used for those patent applications that contain technical data whose export is controlled by the guidelines contained in DOD Directive 5230.25, dated Nov. 6, 1984, (codified as 32 CFR Part 250) which relates to export control under 10 U.S.C. 140(c) and the Militarily Critical Technologies List (MCTL). See 50 U.S.C. App. 2404(d).

This Secrecy Order is intended to permit widest utilization of the technical data while still controlling any publication or disclosure which would result in an unlawful exportation. This type of Secrecy Order sets forth the applicable export controls for technical data in either the Commodity Control List (CCL) 15 CFR Parts 379, 399.1 or the Munitions List of the International Traffic in Arms Regulation (ITAR), 22 CFR Part 121.

The countries where corresponding patent applications may be filed will be identified in the Order. The Order specially authorizes use of the invention for legitimate business purposes. The definition of this term in the Order is identical to that found in DOD Directive 5230.25, 32 CFR Part 250. The level of security control requires that the subject matter must be safeguarded under conditions that provide adequate protection and prevent access by unauthorized persons. Additional modifications or permits to the Secrecy Order under 37 CFR 5.1 et seq. will only be needed where the level of disclosure is beyond that specified in the Order.

Following is a sample copy of this type of Secrecy Order.

Serial No.:
Filed:
Applicant:
Title:
Sponsoring Agency & Address:

ECCN[1] Reference

Goods Accompanied by Sophisticated Know-How
Keystone Equipment or Materials

ITAR[2] Reference

Goods Accompanied by Sophisticated Know-How

Secrecy Order and Permit for Foreign Filing in Certain Countries

(Title 35, United States Code, Sections 181–188 (1952))

NOTICE: To the applicant(s) above named; his, her, or their heirs; and any and all of the assignees, licensees, attorneys and agents, hereinafter designated principals:

You are hereby notified that the above-identified patent application has been found to contain subject matter which discloses critical technology with military or space application. The unauthorized disclosure of such subject matter would be detrimental to the national security, and you are ordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as specifically authorized herein.

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified application falls within the scope of this Order. If such other patent application is not under Secrecy Order imposed by the U.S. Patent and Trademark Office, it and the common subject matter need to be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231 as soon as possible.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patents and Trademarks, may subject the person publishing or disclosing the subject matter to the penalties of 35 U.S.C. 182, 185 and 186 (1952).

The principals may disclose, for legitimate business purposes,[3] the subject matter of the above-identified application to a U.S. citizen or to a person who is both admitted lawfully into the United States for permanent residence and is located in the United States provided the U.S. citizen or person is furnished with a copy of this Secrecy Order and is informed that this Secrecy Order is applicable to the subject matter disclosed.

Legitimate business purposes include both selling or producing products for the commercial domestic marketplace or for the commercial foreign marketplace, providing that any required expert license is obtained. Legitimate business purposes also include selling or otherwise disclosing technical data to foreign contractors or governments overseas after receiving the required export license or approval by the U.S. Government.

The principals shall notify the Commissioner of Patents and Trademarks if a validated license is obtained from the Office of Export Administration or a license is obtained from the Director, Office of Munitions Control under regulations governing the export of technical data (15 CFR 379 of the Export Administration Regulations or 22 CFR 125 of the International Traffic in Arms Regulations).

The subject matter of the above-identified application has been determined not to be encompassed by E.O. 10865, entitled "Safeguarding of Classified Information Within Industry" or E.O. 12356, entitled "National Security Information" and thus is not subject to the "Industrial Security Manual for Safeguarding Classified Information." However, since the disclosure of the subject matter would be detrimental to the national security, the subject matter must be safeguarded under conditions that will provide adequate protection and prevent access by unauthorized persons. When copies of the subject matter are no longer needed, they should be destroyed by any method that will prevent disclosure of the contents or reconstruction of the document.

The principals are permitted, subject to the conditions stated hereinafter, to file and prosecute a corresponding application for patent in each of the following countries: Australia, Belgium, Canada, Denmark, France, Federal Republic of Germany, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Sweden, Turkey and the United Kingdom. The papers for each foreign application and its prosecution shall be transmitted to the sponsoring agency, identified herein, for forwarding through diplomatic channels for filing in the foreign country either directly by the principals or through the principals' foreign patent attorney or agent if authorized by the foreign government. Correspondence exclusively relating to payments of taxes and fees need not be sent through the sponsoring agency and diplomatic channels provided that such correspondence contains no information pertaining to the subject matter of the above-identified application.

International reciprocal agreements providing for the filing of patent applications under a Secrecy Order in the above-identified countries require the principals to furnish to the sponsoring agency identified herein (in addition to the papers to be filed in the foreign patent office) a copy of the specification (including any drawings annexed thereto, any resume and the claims included in the patent application) filed in the patent office of the foreign country. This copy will be furnished to the appropriate defense agency of the foreign government *for information only* and without prejudice to any rights of the principals. The filing date and serial number of the patent application should also be furnished to the sponsoring agency.

The principals shall request the foreign patent office to place in secrecy the foreign patent applications corresponding to the above-identified application and shall furnish a copy of this Secrecy Order and permit with the first papers to be filed in the foreign patent office.

The foreign government may require a waiver in writing of any claim to compensation for loss or damage due solely to the imposition of secrecy on the invention. Belgium, France, the Federal Republic of Germany, the Netherlands, Turkey and the United Kingdom normally require such a waiver in writing.

This Order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration.

(2) Secrecy Order and Permit for Disclosing Classified Information

This Secrecy Order will be used for those patent applications which contain technical data that is either classified under Executive Order 12356, National Security Information, 47 FR 14874, Aug. 6, 1982, or properly classifiable under a security guideline where the patent application owner has a current DOD Security Agreement, DOD form 441. This Agreement requires the protection of classified technical data as prescribed in the Industrial Security Manual (ISM), DOD 5220.22–M.

The intent of this Secrecy Order is to treat classified technical data in a patent application in the same manner as any other classified material under the Industrial Security Manual (ISM). Accordingly, this Secrecy Order will include a notification of the classification level of the technical data in the application, and provided a level of protection at that classification level. The Order will apply to owners of patent applications who have a current DOD Security agreement (DD Form 441) under the ISM. Additional modifications or permits to the Secrecy Order under 37 CFR 5.1 et seq. will only be needed where the level of disclosure is beyond that specified in the order.

The following is a copy of this second type of Secrecy Order:

Serial No:
Filed:
Applicant:
Title:
To be protected at Classification Level of:
Top Secret, Secret, Confidential, or Special Instructions
Sponsoring Agency & Address:

Secrecy Order and Permit for Disclosing Classified Information

(Title 35, United States Code, sections 181–188 (1952))

NOTICE: To the applicant(s) above named, his, her, or their heirs; and any and all of the assignees, licensees, attorneys and agents, hereinafter designated principals:

You are hereby notified that the above-identified patent application has been found to contain subject matter which discloses classifiable information. The unauthorized disclosure of such matter would be detrimental to the national security, and you are ordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as specifically authorized herein.

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified patent application falls within the scope of this Order. If such other patent application is not under a Secrecy Order imposed by the U.S. Patent and Trademark Office, it and the common subject matter need to be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231 as soon as possible.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patent and Trademarks, may subject the person publishing or disclosing the subject matter to the penalties of 35 U.S.C. 182, and 186 (1951).

The subject matter of the above-identified application has been determined to be encompassed by E.O. 19865, entitled "Safeguarding of Classified Information Within Industry" or E.O. 12356, entitled "National Security Information" and thus is subject to the "Industrial Security Manual for Safeguarding Classified Information."

The principals shall protect the subject matter as required by the Industrial Security Manual for Safeguarding Classified Information and may disclose the subject matter of the above-identified application to other persons having the requisite clearance on a "need-to-know basis" *provided* the person to whom the subject matter is disclosed is furnished with a copy of this Secrecy Order and is informed that this Secrecy Order is applicable to the subject matter disclosed. The declassification, in whole or in part, of the subject matter of the above-identified application does not modify this Secrecy Order. The requirements of this Secrecy Order remain in effect until the Secrecy Order is rescinded or modified by the Commissioner of Patent and Trademarks. The fact that the subject matter as a whole is declassified should be brought to the attention of the sponsoring agency.

This permission to disclose does not authorize the disclosure of the subject matter of the above-identified application through (1) the filing of any foreign application without specific permission of the Patent and Trademark Office, or (2) the export of any item or data without any export license which may be required.

This order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration.

(3) Secrecy Order

This Secrecy Order will be used for those patent applications that contain properly classifiable technical data under a security guideline where the patent application owner does not have a DOD Security Agreement under the ISM.

This Secrecy Order is substantially the same as the Secrecy Order in use up to now, and will be used where the other types of Orders do not apply. This Order may be issued by direction of agencies other than the Department of Defense. Unless issued with the initial Order, modifications to the Secrecy Order and/or permits under 37 CFR 5.1 et seq. will be needed for additional disclosure.

The following is a copy of this third type of Secrecy Order:

Serial No:
Filed:
Application:
Title:
Sponsoring Agency & Address:

Secrecy Order

(Title 35, United States Code, sections 181–188 (1952))

NOTICE: To the applicant(s) above named; his, her or their heirs; and any and all of the assignees, licensees, attorneys and agents, hereinafter designated principals:

You are hereby notified that the above-identified patent application has been found to contain subject matter the unauthorized disclosure of which would be detrimental to the national security, and you areordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as specifically authorized by the Commissioner of Patents and Trademarks.

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified patent application falls within the scope of this Order. If such other patent application is not under a Secrecy Order imposed by the U.S. Patent and Trademark office, it and the common subject matter need to be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231 as soon as possible.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patents and Trademarks, may subject the person publishing or disclosing the subject matter to the penalties of 35 U.S.C. 182, 185 and 186 (1952).

Since the disclosure of the subject matter of the above-identified application would be detrimental to the national security, the subject matter must be safeguarded under conditions that will provide adequate protection and prevent access by unauthorized persons. When copies of the subject matter are no longer needed, they should be destroyed by any method that will prevent disclosure of the contents or reconstruction of the document.

This order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration.

Each Secrecy Order forbids the publication or disclosure of the invention except as specially authorized. By revising these Secrecy Orders to conform with existing export and classification authority, the burden on patent applicants to seek additional permits for disclosure and/or foreign filing under 37 CFR Part 5 will be reduced. The new Secrecy Orders reflect the level of secrecy required by law and regulation for various technologies and will place National Security and export controls on the patent application in harmony with other applicable export and classification controls. Also, this change will reduce the risk of disclosure of the subject matter of the invention by providing greater guidance on the safeguarding of the subject matter invention.

Information regarding the new Secrecy Orders may be obtained by calling Mr. Kenneth L. Cage, Director, Special Laws Administration Group, at (703) 557-2877 or by mail directed to Mr. Kenneth L. Cage, Director, Special Laws Administration, Group 220, Washington, D.C. 20231.

Sept. 9, 1986. DONALD W. PETERSON,
Deputy Commissioner of Patents and Trademarks.

[FR Doc. 86-21023 Filed 9-16-86; 8:45 am]

BILLING CODE 3510-16-M

[1071 OG 31]

[1]Export Control commodity Number (ECCN) on the Commodity Control List (Supplement No. 1 to 15 CFR 399.1).
[2]International Traffic in Arms Regulations (ITAR), 22 CFR 120-130.
[3]The term legitimate business purposes is to interpreted consistent with DOD Directive 5230.25 entitled "Withholding of Unclassified Technical Data From Public Disclosure," issued by the Secretary of Defense on Nov. 6, 1984, 32 CFR Part 250, 49 FR 484040 (Dec. 10, 1984).

(128) Guidelines for Extension of Patent Term Under 35 U.S.C. 156

This notice is intended to establish initial guidelines for patent owners who are seeking extensions of patent terms pursuant to newly enacted 35 U.S.C. 156. These guidelines will be effective until further notice. Section 156 of Title 35, United States Code, provides that a patent owner seeking an extension of the term of a patent pursuant to its provisions must submit an application to the Commissioner of Patents and Trademarks (hereinafter Commissioner) within a certain defined period of time. Section 156 specifies certain components the application is to contain, including "such patent or other information as the Commissioner may require." See 35 U.S.C. 156(d) (1) (E). Section 156(d) (4) also provides that "[a] n application for the extension of the term of a patent is subject to the disclosure requirements prescribed by the Commissioner." Section 156(h) provides that the "Commissioner may establish such fees as the Commissioner determines appropriate to cover the costs to the Office of receiving and acting upon applications under this section." The purpose of this notice is to provide the guidelines which a patent owner or its agent should use in deciding whether to submit an application for the extension of the term of a patent to the Patent and Trademark Office and in actually making the submission of such an application. This notice is divided into a number of sections set forth below which treat various determinations which have to be made by a patent owner or its agent prior to submission of an application and further includes guidelines as to the actual content of an application for extension of the term of a patent.

A patent owner or its agent should use the guidelines in the various sections set forth below in determining whether a patent is subject to, and meets the conditions for, extension of its term. If so, the patent owner or its agent should also use the guidelines set forth below in preparing and filing an application for extension of the patent term. If any application for extension of the term of a patent is filed in accordance with 35 U.S.C. 156 before the date on which this notice is published in the Official Gazette and is not in compliance with the requirements of this notice, applicant will be notified of the deficiencies in the application and will be given a period of time within which to correct the deficiencies.

Guidelines

§A. *Patents subject to extension of the patent term.*

(a) Any patent which claims a product as defined in paragraph (b) of this section, or a method of using such a product, or a method of manufacturing such a product, is subject to being extended in accordance with 35 U.S.C. 156.

(b) The term "product" referred to in paragraph (a) of this section means (1) a human drug product or (2) any medical device, food additive, or color additive subject to regulation under the Federal Food, Drug, and Cosmetic Act. The term "human drug product" means the active ingredient of a new drug, antibiotic drug, or human biological product (as those terms are used in the Federal Food, Drug, and Cosmetic Act and the Public Health Service Act) including any salt or ester of the active ingredient, as a single entity or in combination with another active ingredient.

§B. *Conditions for extension of term of a patent.*

The term of a patent may be extended if:
(a) the patent claims a product or a method of using or manufacturing a product as defined in §A of this notice;
(b) the term of the patent has never been previously extended except for any interim extension issued pursuant to 35 U.S.C. 156(e) (2);
(c) an application for extension is submitted pursuant to §D of this notice;
(d) the product has been subject to a regulatory review period as defined in 35 U.S.C. 156(g) and by the Secretary of Health and Human Services before its commercial marketing or use;
(e) the product has received permission for commercial marketing or use and (i) the application is submitted within the sixty day period beginning on the date the product first received permission for commercial marketing or used under the provision of law under which the applicable regulatory review period occurred, or (ii) in the case of a patent claiming a method of manufacturing the product which primarily uses recombinant DNA technology in the manufacture of the product, the application for extension is submitted within the sixty day period beginning on the date of the first permitted commercial marketing or use of a product manufactured under the process claimed in the patent;
(f) the term of the patent has not expired before the submission of an application pursuant to §D of this notice; and
(g) no other patent has been extended for the same regulatory review period for the product.

§C. *Applicant for extension of patent term.*

Any application for extension of a patent term must be submitted by the owner of record of the patent or its agent and must comply with the requirements of §D of this notice.

§D. *Application for extension of the term of a patent.*

(a) An application for extension of the term of a patent must be made in writing to the Commissioner of Patents and Trademarks. The filing date of an application for extension of the term of a patent is the date on which the complete application for extension and a duplicate of the papers thereof, certified as such, are received in the Patent and Trademark Office or filed pursuant to the provisions of 37 CFR 1.10. The provisions of 37 CFR 1.8 should not be used to file an application for the extension of the term of a patent.
(b) A complete application for the extension of the term of a patent comprises:
(1) a complete identification of the approved product as by appropriate chemical and physical structure or characteristics;
(2) a complete identification of the Federal statute including the applicable provision of law under which the regulatory review occurred;
(3) an identification of the date on which the product received permission for commercial marketing or use under the provision of law under which the applicable regulatory review period occurred;
(4) a statement that the application is being submitted within the sixty day period permitted for submission and an identification of the date of the last day on which the application could be submitted;
(5) a complete identification of the patent for which an extension is being sought by the name of the inventor, the patent number, and the date of issue;
(6) a copy of the patent for which an extension is being sought, including the entire specification (including claims) and drawings, in the form of a cut-up copy of the original patent with only a single column of the printed patent securely mounted or reproduced in permanent form on one side of a separate paper;
(7) a copy of any disclaimer, certificate of correction, receipt of maintenance fee payment, or reexamination certificate issued in the patent;
(8) a statement that the patent claims the approved product or a method of using or manufacturing the approved product, and a showing which lists each applicable patent claims and demonstrates the mannerin which each applicable patent claim reads on the approved product or a method of using or manufacturing the approved product;
(9) the relevant dates and information pursuant to 35 U.S.C. 156(g) in order to enable the Secretary of Health and Human Services to determine the applicable regulatory review period;
(10) a brief description of the activities undertaken by the applicant during the applicable regulatory review period with respect to the approved product and the significant dates applicable to such activities;
(11) a statement that in the opinion of the applicant the patent is eligible for the extension and a statement as to the length of extension claimed, including how the length of extension was determined;
(12) a statement that applicant acknowledges a duty to disclose to the Commissioner of Patents and Trademarks and the Secretary of Health and Human Services any information which is material to any determinations to be made relative to the application for extension; and
(13) the prescribed fee for receiving and acting upon the application for extension (see §F of this notice) and an oath or declaration as set forth in paragraph (c) of this section.
(c) Any application for extension of the term of a patent submitted pursuant to paragraphs (a) and (b) of this section must include an oath or declaration signed by the owner of record of the patent or its agent which specifically identifies the application papers and the patent for which an extension is sought and avers that the person signing the oath or declaration:
(1) has reviewed and understands the contents of the application being submitted pursuant to this section;
(2) believes the patent is subject to extension pursuant to §A of this notice;
(3) believes an extension of the length claimed is fully justified under 35 U.S.C. 156; and
(4) believes the patent for which the extension is being sought meets the conditions for extension of the term of a patent as set forth in §B of this notice.
(d) If any application for extension of the term of a patent submitted pursuant to this section is held to be incomplete, applicant may seek to have that holding reviewed by filing a petition pursuant to 37 CFR 1.182 within such time as may be set, or if no time is set, within one month of the date on which the application was held incomplete.

§E. *Interim extension of the term of a patent.*

An applicant who has filed an application for extension pursuant to §D of this notice may request one or more interim extensions for periods of up to one year pending a final determination on the application. Any such request should be filed at least three months prior to the expiration date of the patent. The Commissioner may issue interim extensions for periods of up to one year until a final determination is made without a request by the applicant. In no event will the interim extensions granted under this section be longer than the maximum period of extension to which the applicant would be eligible.

§F. *Fee for receiving and acting on an application for extension of the term of a patent.*

Pursuant to 35 U.S.C. 156(h) the Commissioner has determined that a fee of $750.00 is appropriate to cover the costs to the Patent and Trademark Office of receiving and acting upon applications for extension of the term of a patent filed pursuant to 35 U.S.C. 156. The fee should accompany the application when filed. If a fee in a different amount is adopted in Title 37 of the Code of Federal Regulations, applicant will be refunded any excess or required to submit any deficiency.

§G. *Address for application for extension of the term of a patent and communications relating thereto.*

All applications for extension of the term of a patent and any communcations relating thereto intended for the Patent and Trademark Office should be addressed to the Commissioner of Patents and Trademarks, Box Patent Ext., Washington, D.C. 20231. When appropriate, the

communication should also be marked to the attention of a particular individual.

§H. For further information contact:

R. Franklin Burnett by telephone at (703) 557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Summary

The initial guidelines set forth above are considered to be appropriate and authorized by 35 U.S.C. 156. They will provide appropriate guidance to patent owners and their agents pending appropriate changes which will be made in Title 37 of the Code of Federal Regulations.

Sept. 25, 1984. DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

[1047 O.G. 16]

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(129)

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Part 1
[Docket No. 60594-6094]

Rules for Extension of Patent Term

Agency: Patent and Trademark Office, Commerce.
Action: Notice of proposed rulemaking.
Summary: The Patent and Trademark Office proposes to amend the rules of practice in patent cases, Part 1 of Title 37, Code in Federal Regulations, to provide the rules and procedures under which extensions in the terms of patents may be sought pursuant to the provisions of 35 U.S.C. 156 which was enacted on Sept. 24, 1984 in Title II of Pub. L. 98-417, the "Drug Price Competition and Patent Term Restoration Act of 1984." The new 35 U.S.C. 156 provides that, upon application to the Commissioner of Patents and Trademarks, the term of a particular patent, which claims a product or a method of using or manufacturing a product as defined in the Public Law, may be extended under certain circumstances and conditions where the product has been subject to a regulatory review as defined in Public Law 98-417 and by the Secretary of Health and Human Services, before its commercial marketing or use. The proposed rules for amending Part 1 of Title 37 would provide specific procedures for the submission of such applications to the Patent and Trademark Office and for the determination and issuance of certificates of patent term extension by the Patent and Trademark Office on the applications submitted.
Dates: Comments must be submitted on or before Sept. 10, 1986; a public hearing will be held on Sept. 15, 1986 at 9:30 a.m., requests to present oral testimony should be received on or before Sept. 10, 1986.
Address: Address written comments and requests to present oral testimony to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Charles E. Van Horn, Rm. CP2-9A09. The hearing will be held in Rm. 11C10, on the 11th floor of Bldg. 3, Crystal Plz., located at 2021 Jefferson Davis Hwy., Arlington. Va. Written comments and a transcript of the public hearing will be available for public inspection in Rm. 9A09 of Bldg. 2, Crystal Plz. at 2011 Jefferson Davis Hwy., Arlington, Va.
For Further Information Contact: Charles E. Van Horn by telephone at (703) 557-3637 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: These proposed rules are designed primarily to implement Title II of Pub. L. 98-417 by (1) establishing the rules and procedures for the submission of applications for the extension of patent term to the Patent and Trademark Office and (2) by defining the procedure governing the extension determination and issuance of certificates of patent term extension by the Patent and Trademark Office based on the applications submitted.

Since new section 35 U.S.C. 156 came into effect on the date of enactment (Sept. 24, 1984) of Public Law 98-417, initial operating guidelines were published as "Guidelines For Extension of Patent Term Under 35 U.S.C. 156" in the *Official Gazette* of the Patent and Trademark Office on Oct. 9, 1984. The guidelines were also published in *BNA's Patent, Trademark and Copyright Journal* on Sept. 27, 1984. It is intended that those guidelines will continue in effect until the promulgation of final rules based on the proposed rulemaking. These proposed rules follow in most respects the practice and procedures set out in the guidelines but the proposed rules make some clarifications and additions to the guidelines. For example, proposed new §§1.775, 1.776, and 1.777 set out how the period of patent term extension is to be calculated, which was not covered in the guidelines.

The new section 35 U.S.C. 156 requires the Commissioner of Patents and Trademarks to notify the Secretary of Health and Human Services within sixty days of the submittal of an application for extension of patent term which complies with the section and to submit to the Secretary a copy of the application. Not later than thirty days after receipt of the application from the Commissioner, the Secretary is charged with determining the length of the applicable regulatory review period, notifying the Commissioner of the determination and publishing in the **Federal Register** a notice of such determination.

The secretary of Health and Human Services is responsible for publishing regulations to give guidance concerning the handling of applications for patent term extension in the Department of Health and Human Services.

Discussion of Specific Rules

Section 1.1, if amended as proposed, would indicate that applications for extension of patent terms and any communications relating thereto intended for the Patent and Trademark Office should be directed to "Box Patent Ext."

The filing of an application for an extension of the term of a patent would be considered timely if received in the Patent and Trademark Office on or before the statutory deadline, or if the application is deposited with the U.S. Postal Service in accordance with the provisions of §1.8 or §1.10 of this part before the statutory deadline. The filing of an application for an extension of the term of a patent would be treated in the same manner as the filing of any paper required to be filed in the Patent and Trademark Office within a set period of time and not subjected to the exceptions enumerated in 37 CFR 1.8(a).

Section 1.20, if amended a proposed, would add paragraph (n) to establish a fee of $550.00 for filing an application for extension of the term of a patent pursuant to § 1.740. This amount is appropriate to cover the costs to the Patent and Trademark Office of receiving and acting upon applications for extension of patent term as provided in 35 U.S.C. 156(h).

A new "Subpart F—Extension of Patent Term" is proposed to be added to Part 1 to include §§1.710 through 1.785.

Section 1.710, if added as proposed, would define the patents subject to extension of the patent term. Paragraph (a) of proposed §1.710 defines the patents subject to extension in terms of the subject matter being claimed therein. Under paragraph (a) of proposed §1.710 a patent to (1) a product, (2) a method of using a product, (3) or a method of manufacturing a product can be extended as long as the product meets the definition contained in paragraph (b) of proposed §1.710, and as long as the other conditions and requirements for extension of patent term are met. Paragraph (b) of proposed §1.710 follows the language of 35 U.S.C. 156 and defines a "product" as meaning (1) a human drug product or (2) any medical device, food additive, or color additive subject to regulation under the Federal Food, Drug, and Cosmetic Act. The term "human drug product" as defined in paragraph (b) of proposed §1.710 means the active ingredient of a new drug, antibiotic drug, or human biological product (as those terms are used in the Federal Food Drug, and Cosmetic Act and the Public Health Service Act) including any salt or ester of the active ingredient, as a single entity or in combination with another active ingredient.

Section 1.720, if added as proposed, would define the conditions under which the term of a patent may be extended. The conditions for extension would be:

(1) The patent must claim a product or a method of using or manufacturing a product as defined in proposed §1.710;

(2) The term of the patent must never have been previously extended except for any interim extension issued pursuant to §1.760;

(3) an application for extension must be submitted pursuant to proposed §1.740;

(4) The product must have been subject to a regulatory review period as defined in 35 U.S.C. 156(g) before its commercial marketing or use;

(5) The product must have received permission for commercial marketing or use and (i) the application must be submitted within the sixty day period beginning on the date the product first received permission for commercial marketing or use under the provision of law under which the applicable regulatory review period occurred, of (ii) in the case of a patent claiming a method of manufacturing the product which primarly uses recombinant DNA technology in the manufacture of the product, the application for extension must be submitted within the sixty day period beginning on the date of the first permitted commercial marketing or use of a product manufactured under the process claimed in the patent;

(6) The term of the patent must not have expired before the submission of an application pursuant to proposed §1.740; and

(7) No other patent must have been extended for the same regulatory review period for the product.

Section 1.730, if added as proposed, would require that an application for extension of a patent be submitted by the owner of record of the patent or its agent and that the application must comply with the requirements of proposed §1.740. The application papers submitted would be required to clearly reflect and establish the authority of the person submitting the application to do so on behalf of the owner. See proposed §1.740(c). For example, if the person submitting the application is the owner of record, the application papers would be required to so reflect. If the person submitting the application is doing so as the agent of the owner of record, the application papers must so reflect and establish the authority of the agent to act on behalf of the owner, e.g., as an officer of a corporate owner. A mere power of attorney to prosecute a patent application before the Patent and Trademark Office would not establish the agency relationship to apply for a patent term extension.

Section 1.740, if added as proposed, would establish the contents and requirements of an application for extension of patent term. Paragraph (a) of proposed §1.740 requires that the application be made in writing to the Commissioner of Patents and Trademarks and establishes as the filing date of the application the date on which the complete application for extension as defined in paragraph (b) of the section and a duplicate of the papers thereof, certified as such, are received in the Patent and Trademark Office or filed pursuant to the "Certificate of Mailing" provisions of 37 CFR 1.8 or by "Express Mail" pursuant to the provisions of §1.10. The certified duplicate of the application papers will serve as the copy to be submitted by the Commissioner to the Secretary of Health and Human Services in order that the Secretary may determine the applicable regulatory review period as required by Pub. L. 98-417.

Paragraph (b) of proposed §1.740 specifies the contents of a complete application for extension of patent. The complete application, and a certified duplicate thereof, must be submitted in order that a filing date for the application can be established. If the application is not complete when submitted it will be refused a filing date until such time as the omission is corrected. in accordance with paragraph (b) of proposed §1.740, a complete application for the extension of the term of a patent comprises:

(1) A complete identification of the approved product as by appropriate chemical and generic name, physical structure or characteristics that would permit the Commissioner to make a determination of whether the patent claims the approved product, or a method of making or using the approved product;

(2) A complete identification of the Federal statute including the applicable provision of law under which the regulatory review occurred;

(3) An identification of the date on which the product received permission for commercial marketing or use under the provision of law under which the applicable regulatory review period occurred;

(4) In the case of human drug product, an identification of each active ingredient in the product and as to the product and each active ingredient, a statement that they have not been previously approved for commercial marketing or use under the Federal Food Drug and Cosmetic Act, or a statement of when the active ingredient was approved for commercial marketing or use (either alone or in combination with other active ingredients) and the provision of law under which it was approved.

(5) A statement that the application is being submitted within the sixty day period permitted for submission pursuant to proposed §1.720 (e) and an identification of the date of the last day on which the application could be submitted;

(6) A complete identification of the patent for which an extension is being sought by the name of the inventor, the patent number, and the date of issue;

(7) A copy of the patent for which an extension is being sought, including the entire specification (including claims) and drawings;

(8) A copy of any disclaimer, certificate of correction, receipt or statement of maintenance fee payment, or reexamination certificate issued in the patent;

(9) A statement beginning on a new page that the patent claims the approved product or a method of using or manufacturing the approved product, and a showing which lists each applicable patent claim and demonstrates the manner in which each applicable patent claim reads on the approved product or a method of using or manufacturing the approved product;

(10) A statement beginning on a new page of relevant dates and information pursuant to 35 U.S.C. 156 (g) in order to enable the Secretary of Health and Human Services to determine the applicable regulatory review period.

(i) For a human drug product, this information will include the effective date of the investigational new drug (IND) application and the IND number; the date on which a new drug application (NDA) was initially submitted and the NDA number; and the date on which the NDA was approved;

(ii) For a food or color additive, this information will include the date a major health or environmental effects test on the additive was initiated and any available substantiation of that date; the date on which a petition for product approval under the Federal Food, Drug and Cosmetic Act was initially submitted and the petition number; and the date on which the application was approved;

(iii) For a medical device, this information will include the effective date of the investigational device

exemption (IDE) and the IDE number, if applicable, or the date on which the applicant began the first clinical investigation involving the device if no IDE was submitted and any available substantiation of that date; the date on which an application for product approval under section 515 of the Federal Food, Drug and Cosmetic Act was initially submitted and the number of the application; and the date on which the application was approved.

In the cases where there is no regulatory event to reflect the commencement of the testing or approval phase of the regulatory review period, applicants should include in applications the dates that they claim initiate either the approval or the testing phases and an explanation of their reasonable basis for why they conclude that these dates are the relevant dates. For instance, when the clinical trials are conducted outside the United States, the testing phase for a medical device begins on the date the clinical investigation involving the device was begun. An applicant should include an explanation as to why the date claimed is the date on which such clinical investigations had commenced. If the applicant had any means of substantiating that date, that information should be included in the application.

Finally, on this separate page in the application there should be a statement as to the length of the regulatory review period claimed including an explanation of how the applicant determined the length of the regulatory review period. It should be noted in the application that this particular calculation is made solely with respect to section 156(G)(1) thru (3) of Title 35 of the United States Code and does not take into account any other limitations or restrictions on the length of possible patent extension.

(11) A brief description beginning on a new page of the activities undertaken by the applicant during the applicable regulatory review period with respect to the approved product and the significant dates applicable to such activities. This description should include a summary of any communication of substance with the Food and Drug Administration (FDA) and the significant dates related to such communication and activities. For example, these activities would include the dates of the submission of any new data to the FDA, any communications between FDA and the applicant with respect to the appropriate protocols for testing the product, and any communications between FDA and the applicant that are attempts to define the particular requirements for premarketing approval of this particular product.

(12) A statement beginning on a new page that in the opinion of the applicant the patent is eligible for the extension and a statement as to the length of extension claimed, including how the length of extension was determined and whether the 14 year limit of 35 U.S.C. 156(c)(3), the five year limit of 35 U.S.C. 156(g)(4)(A) or (B) or the two year limit of 35 U.S.C. 156(g)(4)(C) applies.

(13) A statement that applicant acknowledges a duty to disclose to the Commissioner of Patents and Trademarks and the Secretary of Health and Human Services any information which is material to the determination of entitlement to the extensions sought (see §1.765);

(14) The prescribed fee for receiving and acting upon the application for extension (see §1.20(n));

(15) The name, address, and telephone number of the person to whom contacts and correspondence relating to the application for patent term extension are to be directed; and

(16) An oath or declaration as set forth in paragraph (c) of proposed §1.740.

Paragraph (c) of proposed §1.740 requires that an oath or declaration signed by the owner or record of the patent or its agent accompany the application as a part thereof. An application for extension filed without an oath or declaration is not a complete application and is not entitled to a filing date. The oath or declaration filed as a part of the application must specifically identify the application papers and the patent for which an extension is sought and include averments that the person signing the oath or declaration;

(1) Is the owner, an official of a corporate owner authorized to obligate the corporation, or has specific written authorization to sign the oath or declaration on behalf of the owner;

(2) Has reviewed and understands the contents of the application being submitted pursuant to §1.740;

(3) Believes the patent is subject to extension pursuant to § 1.710

(4) Believes an extension of the length claimed is fully justified under 35 U.S.C. 156 and the applicable regulations; and

(5) Believes the patent for which the extension is being sought meets the conditions for extension of the term of a patent as set forth in § 1.720.

In signing the oath or declaration referred to in paragraph (c) of proposed §1.740 an official of a corporate owner or a person having specefic written authorization to sign the oath or declaration on behalf of the owner is representing that he or she is the agent of the owner and has authority to act on behalf of the owner in filing the application for patent term extension. Note also proposed§1.730. Paragraph (d) of proposed §1.740 provides for review of a holding that an application for patent term extension is incomplete by the filing of a petition under 37 CFR 1.182. The failure to timely comply with any requirement of these regulations which is not an explicit requirement of the statute may be waived under appropriate circumstances. 37 CFR 1.183. While timely action is expected, relief under 37 CFR 1.183 may be appropriate in view of the tight time deadlines and other circumstances involved in filing an application for extension of the patent term. The petition must be filed with the required fee (37 CFR 1.17(h)) within such time as may be set, or if no time is set, within one month of the holding.

Section 1.750, if added as proposed, would cover the determination of eligibilty for extension of the term of a patent which will be made by the Patent and Trademark Office on the application for extension. As provided for by Pub. L. 98–417, and as set forth in this section, it is intended that the determination as to whether a patent is eligible for an extension can be made solely on the representations contained in the application for extension filed pursuant to proposed new §1.740 of this part. Proposed§1.750 does, however, provide that further information may be required by the Commissioner or other officials before a final determination is made on whether a patent is eligible for extension. In circumstances where further information is required by the Office the applicant will be given a time period within which to respond. The failure to file a response within the period provided will result in a final determination adverse to the granting of an extension of patent term unless the response period is extended. An extension of time to respond may be requested under the provisions of 37 CFR 1.136(b). The intentional failure to provide the information requested also will result in a final adverse determination. A final determination may be made at any time after an application is filed, but no later than when a certificate of extension is issued. Proposed §1.750 provides that a single request for reconsideration of a final determination may be filed within one month or within such other time period set in the final determination. Proposed §1.750 also provides that the determination may be delegated to appropriate Patent and Trademark Office officials. A notice will be mailed to applicant containing the determination as to eligibility of the patent for extension and the period of time of the extension of the term, if any This notice shall constitute the final determination as to eligibility and any period of extension of the patent term.

Section 1.760, if added as proposed, would provide for one or more interim extensions for periods of up to one year where a complete application pursuant to proposed§1.740 has been filed by an applicant and a final determination pursuant to proposed §1.750 has not been made on the application. Proposed §1.760 provides that the Commissioner may issue an interim extension with or without a request by the applicant. In order for an interim extension to be granted the application pursuant to proposed §1.740 must have been filed prior to the expiration date of the patent even though the interim extensions may not actually be granted until after the original expiration date of the patent. In no event will interim extensions be granted under proposed §1.760 for a period of extension longer than that to which the applicant would be eligible.

Section 1.765, if added as proposed, would define the duty of disclosure in patent term extension proceedings. Paragraph (a) of proposed §1.765 specifies the individuals on whom the duty rests and the extent of the duty. Paragraph (b) of proposed §1.765 requires that disclosures pursuant to the section be accompanied by a copy of each written document being disclosed and specifies to whom the submission is to be made, i.e., the Patent and Trandemark Office or the Secretary, as appropriate. Such disclosures would be able to be made through and attorney or agent.

Paragraph (c) of proposed §1.765 precludes a determination of eligibility for an extension or the issuance of a certificate if clear and convincing evidence of fraud or attempted fraud on the Office or the Secretary is determined to be present or the duty of disclosure is determined to have been violated through bad faith or gross negligence in connection with the patent term extension proceeding. Since the determination as to wheter a patent is eligible for extension pursuant to proposed §1.750 may be made solely on the basis of the representations made in the application for extension, a final determination to refuse a patent term extension because of fraud or a violation of the duty of disclosure is expected to be rare.

Paragraph (d) of proposed §1.765 precludes submissions to the Patent and Trademark Office by or on behalf of third parties, thereby making patent term extension proceedings in the Office an *ex parte* matter between the patent owner or its agent and the Commissioner. Under paragraph (d) of proposed §1.765, submissions by third parties to the Office will be returned, or otherwise disposed of, without consideration.

Paragraph (d) does not affect submissions authorized by Public Law 98–417 to be made to the Secretary during determination of the applicable regulatory review period.

Section 1.770, if added as proposed, would provide for the express withdrawal of an application for extension of the term of a patent if the written declaration of withdrawal signed by the owner of record or its agent is filed in the Office, in duplicate, before a determination is made pursuant to proposed §1.750. Under proposed § 1.770, and application for extension of the term of a patent may not be expressly withdrawn after the date of the final determination pursuant to proposed §1.750. Proposed §1.770 also provides that an express withdrawal is effective when acknowledged in writing by the Office and that the filing and acceptance of an express withdrawal does not entitle applicant to a refund of the filing fee for the application for patent term extension or any portion thereof.

Section 1.775, if added as proposed, would provide the procedure for calculating the patent term extension for a human drug product.

Proposed paragraph (a) would specify that the extension will run from the original expiration date of the patent or any earlier date set by terminal disclaimer.

Proposed paragraph (b) of §1.775 would provide that the patent term would be extended by the length of the regulatory review period for the product as determined by the Secretary of Health and Human Services but reduced, where appropriate, by the time periods provided in proposed paragraph (d).

Proposed paragraph (c) defines the length of the regulatory review period which is determined by the Secretary of Health and Human Services.

For a human drug product, the regulatory review period is defined in 35 U.S.C. 156(g)(1)(B) as the sum of:

(1) The number of days in the period beginning on the date an exemption under section 505 or 507 of the Federal Food, Drug, and Cosmetics Act became effective for the approved human drug product and ending on the date an application was initially submitted for the drug product under section 505 or 507 above or under section 351 of the Public Health Service Act; and

(2) The number of days in the period beginning on the date the application was initially submitted for the approved human drug product under section 351 of the Public Health Service Act or subsection (b) of section 505 or 507 of the Federal Food, Drug, and Cosmetic Act and ending on the date the application was approved under the section.

This period is then reduced, where appropriate, by the time periods described in proposed paragraph (d).

Paragraph (d) of proposed §1.775, would define the term of the patent extension by indicating that

(1) The time period determined from proposed paragraph (c) would be reduced, where appropriate by

(i) The number of days in the periods of proposed paragraph (c)(1) and (c)(2) of §1.775 which were on and before the date on which the patent issued

(ii) The number of days from paragraphs (c)(1) and (c)(2) of §1.775 during which it is determined under 35 U.S.C. 156(d)(2)(B) by the Secretary of Health and Human Services that applicant did not act with due diligence; and

(iii) One-half the number of days remaining in the period defined by proposed paragraph (c)(1) after the period has been reduced in accordance with paragraphs (d)(1)(i) and (d)(1)(ii) of §1.775. Half days will be ignored for purposes of subtraction.

(2) Adding the number of days determined in proposed paragraph (d)(1) to the original term of the patent as shortened by any terminal disclaimer;

(3) Adding 14 years to the date of approval of the application under section 351 of the Public Health Service Act, or subsection (b) of section 505 or section 507 of the Federal Food, Drug, and Cosmetic Act;

(4) Comparing the dates for the ends of the periods obtained from (d)(2) and (d)(3) with each other and selecting the earlier date;

(5) If the original patent issued after Sept. 24, 1984;

(i) By adding 5 years to the original expiration date of the patent or any earlier date set by terminal disclaimer; and

(ii) By comparing the dates obtained in paragraphs (d)(4) and (d)(5)(i) with each other and selecting the earlier date.

(6) If the original patent was issued before Sept. 24, 1984;

(i) If no request was submitted for an exemption under subsection (i) of section 505 or subsection (d) of section 507 of the Federal Food, Drug, and Cosmetic Act, by (A) adding 5 years to the original expiration date of the patent or any earlier date set by terminal disclaimer and (B) by comparing the dates obtained in paragraphs (d)(4) and (d)(6)(i)(A) with each other and selecting the earlier date;

(ii) If a request was submitted for an exemption under subsection (i) of section 505 or subsection (d) of section 507 of the Federal Food, Drug, and Cosmetic Act, and the commercial marketing or use of the product was not approved before Sept. 24, 1984, by (A) adding 2 years to the original expiration date of the patent or any earlier date set by terminal disclaimer, and (B) by comparing the dates obtained in paragraph (d)(4) and (d)(6)(ii)(A) with each other and selecting the earlier date.

Section 1.776, if added as proposed, would provide the procedure for calculating the patent term extension for a food additive or color additive. The paragraphs correspond to those proposed for §1.775.

Section 1.777, if added as proposed, would provide the procedure for calculating the patent term extension for a medical device. The paragraphs correspond to those proposed for §1.775 with the major difference being in the calculation of the regulatory review period.

Section 1.780, if added as proposed, would specify that once a determination is made pursuant to proposed §1.750 that a patent is eligible for extension, a certificate of extension, under seal, will be issued to the applicant for the extension of the term of the patent. Section 1.780

would also provide that the certificate would be recorded in the official file of the patent and will be considered as part of the original patent. Section 1.780 would also provide for notification of the issuance of the certificate of extension to be published in the *Official Gazette* of the Patent and Trademark Office.

No certificate or extension would be issued if the term of a patent cannot be extended, even though the patent is otherwise determined to be eligible for extension. In such situations the final determination made pursuant to §1.750 would indicate that no certificate will issue.

Section 1.785, if added as proposed, would specify the procedures to be followed where multiple applications are filed for extension of the same patent or of different patents for the same regulatory review period for a product. Pub. L. 98–417 and proposed §1.785 provide that only one patent may be extended for a regulatory review period for any product. Under proposed §1.785, if more than one application for extension of the same patent is filed, the certificate of extension of the term of the patent, if appropriate, would be issued based upon the first filed application for extension of patent term. If applications are filed for extension of the terms of different patents based upon the same regulatory review period for a product, the certificate of extension would be issued on the patent having the earliest date of issuance, if that patent is determined to be eligible for extension pursuant to proposed §1.750 and if the application for its extension is filed prior to the issuance of a certificate of extension of the later issued patent.

Other alternatives to proposed §1.785 were considered, but were not proposed in view of a number of complications which appeared to be present therein. For example, another alternative was to give preference to a patent owner who was also the marketing applicant before the FDA. However, neither patent owner may have been the marketing applicant, or each patent owner may have contributed resources which ultimately led to the approval for commercial marketing. In view of the complications which are apparent in the PTO attempting to make value judgments as to the relative contributions of different patent owners it was decided to propose an administratively straight forward approach and seek public comments as to other possible workable alternatives.

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or conservation of energy resources. The rule change is in conformity with the requirments of the Regulatory Flexibility Act (Pub. L. 96–354). Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities because patented drugs are generally not commercialized by small entities (Regulatory Flexibility Act. Pub. l. 96–364).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million.

There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The information collection requirement contained in this proposed rule has been submitted to OMB for review under section 3504(h) of the Paperwork Reduction Act. Comments relating to this requirement should be directed to the Office of Information and Regulatory Affairs Of OMB, Attention: Desk Officer for Commerce, Patent and Trademark Office.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interest, Courts, Inventions and patents, Lawyers.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and Pub. L. 98–417, the Patent and Trademark Office is proposing to amend Title 37 of the Code of Federal Regulations as set forth below.

PART 1–[AMENDED]

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 USC 6, unless otherwise noted.

2. Section 1.1 is proposed to be amended by adding a new paragraph (f) to read as follows:

§1.1 All communications to be addressed to the Commissioner of Patents and Trademarks

* * * * *

(f) All applications for extension of patent term and any communications relating thereto intended for the Patent and Trademark Office should be additionally marked "Box Patent Ext." When appropriate, the communication should also be marked to the attention of a particular individual, as where a decision has been rendered.

3. Section 1.20 is proposed to be amended by adding a new paragraph (n) to read as follows:

§1.20 Post-issuance fees

(n) For filing an application for extension of the term of a patent (§1.740) 550.00

* * * * *

4. A new "Subpart F—Extension of Patent Term" is proposed to be added to read as follows:

Subpart F—Extension of Patent Term

Sec.

1.710 Patents subject to extension of the patent term.
1.720 Conditions for extension of patent term
1.730 Applicant for extension of patent term.
1.740 Application for extension of patent term.
1.750 Determination of eligibility for extension of patent term.
1.760 Interim extension of patent term.
1.765 Duty of disclosure in patent term extension proceedings.
1.770 Express withdrawal of application for extension of patent term.
1.775 Calculation of the patent term extension for a human drug product.
1.776 Calculation of patent term for a food additive or color additive.
1.777 Calculation of patent term for a medical device.
1.780 Certificate of extension of patent term.
1.785 Multiple applications for extension of term of the same patent or of different patents for the same regulatory review period for a product.

Authority: 35 USC 6 and 156.

Subpart F-Extension of Patent Term

§1.710 Patents subject to extension of the patent term.

(a) A patent is eligible for extension of the patent term if the patent claims a product as defined in paragraph (b) of this section, or a method of using such a product, or a method of manufacturing such a product, and meets all other conditions and requirements of this part.

(b) The term "product" referred to in paragraph (a) of this section means (1) a human drug product which means the active ingredient of a new drug, antibiotic drug, or human biological product (as those terms are used in the Federal Food, Drug, and Cosmetic Act and the Public Health Service Act) including any salt or ester of the active ingredient, as a single entity or in combination with another active ingredient; or (2) any medical device, food additive, or color additive subject to regulation under the Federal Food, Drug, and Cosmetic Act.

§1.720 Conditions for extensions of patent term.

The term of patent may be extended if:

(a) The patent claims a product or a method of using or manufacturing a product as defined in §1.710 of this part;

(b) The term of the patent has never been previously extended except for any interim, extension issued pursuant to §1.760 of this part;

(c) An application for extension is submitted pursuant to §1.740 of this part;

(d) The product has been subject to a regulatory review period as defined in 35 U.S.C. 56(g) before its commercial marketing or use;

(e) The product is an approved product, that is it has received permission for commercial marketing or use and (i) the application is submitted within the sixty day period beginning on the date the product first received permission for commercial marketing or use under the provisions of law under which the applicable regulatory review period occurred, or (ii) in the case of a patent claiming a method of manufacturing the product which primarily uses recombinant DNA technology in the manufacture of the product, the application for extension is submitted within the sixty day period beginning on the date of the first permitted commercial marketing or use of a product manufactured under the process claimed in the patent;

(f) The term of the patent has not expired before the submission of an application pursuant to §1.740 of this part; and

(g) No other patent has been extended for the same regulatory review period for the product.

§1.730 Applicant for extension of patent term.

Any application for extension of a patent term must be submitted by the owner of record of the patent or its agent and must comply with the requirments of §1.740 of this part.

§1.740 Application for extension of patent term.

(a) An application for extension of patent term must be made in writing to the Commissioner of Patents and Trademarks. The filing date of an application for extension of patent term is the date on which the complete application for extension as set forth in paragraph (b) of this section, and a duplicate of the papers thereof, certified as such, are received in the Patent and Trademark Office or filed pursuant to the "Certificate of Mailing" provisions of 37 CFR 1.8 or "Express Mail" provisions of §1.10 of this part.

(b) A complete application for the extension of patent term comprises:

(1) A complete identification of the approved product as by appropriate chemical and generic name, physical structure or characteristics;

(2) A complete identification of the Federal statute including the applicable provision of law under which the regulatory review occurred;

(3) An identification of the date on which the product received permission for commercial marketing or use under the provision of law under which the applicable regulatory review period occurred;

(4) In the case of human drug product, an identification of each active ingredient in the product and as to each active ingredient, a statement that it has not been previously approved for commercial marketing or use under the Federal Food Drug and Cosmetic Act, or a statement of when the active ingredient was approved for commercial marketing or use (either alone or in combination with other active ingredients) and the provision of law under which it was approved.

(5) A statement that the application is being submitted within the sixty day period permitted for submission pursuant to §1.720(e) and an identification of the date of the last day on which the application could be submitted;

(6) A complete identification of the patent for which an extension is being sought by the name of the inventor, the patient number, and the date of issue;

(7) A copy of the patent for which an extension is being sought, including the entire specification (including claims) and drawings:

(8) A copy of any disclaimer, certificate of correction, receipt of maintenance fee payment, or reexamination certificate issued in the patent;

(9) A statement beginning on a new page that the patent claims the approved product or a method of using or manufacturing the approved product, and a showing which lists each applicable patent claim and demonstrates the manner in which each applicable patent claim reads on the approved product or a method of using or manufacturing the approved product;

(10) A statement beginning on a new page of the relevant dates and information pursuant to 35 U.S.C. 156(g) in order to enable the Secretary of Health and Human Services to determine the applicable regulatory review period as follows:

(i) For a patent that claims a human drug product, the effective date of the investigational new drug (IND) application and the IND number; the date on which a new drug application (NDA) was initially submitted and the NDA number; and the date on which the NDA was approved;

(ii) For a patent that claims a food or color additive, the date a major health or environmental effects test on the additive was initiated and any available substantiation of that date; the date on which a petition for product approval under the Federal Food, Drug and Cosmetic Act was initially submitted and the petition number; and the date on which the FDA published a **Federal Register** notice listing the additive for use;

(iii) For a patent that claims a medical device, the effective date of the investigational device exemption (IDE) and the IDE number; if applicable, or the date on which the applicant began the first clinical investigation involving the device if no IDE was submitted and any available substantiation of that data; the date on which an application for product approved under section 515 of the Federal Food, Drug and Cosmetic Act was initially submitted and the number of the application; and the date on which the application was approved.

(11) A brief description beginning on a new page of the activities undertaken by the applicant during the applicable regulatory review period with respect to the approved product and the significant dates applicable to such activities;

(12) A statement beginning on a new page that in the opinion of the applicant the patent is eligible for the extension and a statement as to the length of extension claimed, including how the length of extension was determined;

(13) A statement that applicant acknowledges a duty to disclose to the Commissioner of Patents and Trademarks and the Secretary of Health and Humans Services any information which is material to the determination of entitlement to the extension sought (see §1.765 of this part);

(14) The prescribed fee for receiving and acting upon the application for extension (see §1.20(n) of this part);

(15) The name, address, and telephone number of person to whom inquires and correspondence relating to the application for patent term extension are to be directed; and

(16) An oath or declaration as set forth in paragraph (c) of this section.

(c) Any application for extension of the term of a patent submitted pursuant to paragraph (a) and (b) of this section must include an oath of declaration signed by the owner of record of the patent or its agent which specifically identifies the papers and the patent for which an extension is sought and avers that the person signing the oath or declaration:

(1) Is the owner, an official of a corporate owner authorized to obligate the corporation, or has specific written authorization to sign the oath or declaration on behalf of the owner;

(2) Has reviewed and understands the contents of the application being submitted pursuant to this section;

(3) Believes the patent is subject to extension pursuant to §1.710 of this part;

(4) Believes an extension of the length claimed is fully justified under 35 U.S.C. 156 and the applicable regulations; and

(5) Believes the patent for which the extension is being sought meets the conditions for extension of the term of a patent as set forth in §1.720 of this part.

(d) If any application for extension of patent term submitted pursuant to this section is held to be incomplete, applicant may seek to have that holding reviewed by filing a petition with the required fee pursuant to §1.182 or §1.183, as appropriate, within such time as may be set, or if no time is set, within one month of the date on which the application was held incomplete.

§1.750 Determination of eligibilty for extension of patent term.

A determination as to whether a patent is eligible for extension may be made by the Commissioner solely on the basis of the representations contained in the application for extension filed pursuant to §1.740 of this part. This determination may be delegated to appropriate Patent and Trademark Office officials and may be made at any time before the certificate the extension is issued. The Commissioner or other appropriate officials may require further information before a final determination is made on whether a patent is eligible for extension. A notice will be mailed to applicant containing the determination as to the eligibility of the patent for extension and the period of time of the extension, if any. This notice shall constitute the final determination as to the eligibility and any period of extension of the patent. A single request for reconsideration of a final determination may be made if filed by the applicant within such time as may be set or, if no time is set, within one month from the date of the final determination.

§1.760 Interim extension of patent term.

An applicant who has filed a complete application for extension pursuant to §1.740 of this part may request one or more interim extensions for periods of up to one year pending a final determination on the application pursuant to §1.750 of this part. Any such request should be filed at least three months prior to the expiration date of the patent. The Commissioner may issue interim extensions, without a request by the applicant, for periods of up to one year until a final determination is made. In no event will the interim extensions granted under this section be longer than the maximum period of extension to which the applicant would be eligible.

§1.765 Duty of disclosure in patent term extension proceedings.

(a) A duty of candor and good faith toward the Patent and Trademark Office and the Secretary of Health and Human Services rests on the patent owner or its agent, on each attorney or agent who represents the patent owner, and on every other individual who is substantively involved on behalf of the patent owner in a patent term extension proceeding. All such individuals who are aware, or become aware, of information material to the determination of entitlement to the extension sought, which has not been previously made of record in the patent term extension proceeding must bring such information to the attention of the Office or the Secretary, as appropriate, in accordance with paragraph (b) of this section, as soon as it is practical to do so after the individual becomes aware of the information. Information is material where there is a substantial likelihood that the Office or the Secretary would consider it important in determinations to be made in the patent term extension proceeding.

(b) Disclosures pursuant to this section must be accompanied by a copy of each written document which is being disclosed. The disclosure must be made to the Office or the Secretary, as appropriate, unless the disclosure is material to determinations to be made by both the Office and the Secretary, in which case duplicate copies, certified as such, must be filed in the Office and with the Secretary. Disclosures pursuant to this section may be made to the Office or the Secretary, as appropriate, through an attorney or agent having responsibility on behalf of the patent owner or its agent for the patent term extension proceeding or through a patent owner acting on his or her own behalf. Disclosure to such an attorney, agent or patent owner shall satisfy the duty of any other individual. Such an attorney, agent or patent owner has no duty to transmit information which is not material to the determination of entitlement to the extension sought.

(c) No patent will be determined eligible for extension and no extension will be issued if it is determined that fraud on the Office or the Secretary was practiced or attemped or the duty of disclosure was violated through bad faith or gross negligence in connection with the patent term extension proceeding. If it is established by clear and convincing evidence (1) that any fraud was practiced or attempted on the Office of the Secretary in connection with the patent term extension proceeding or (2) that there was any violation of the duty of disclosure through bad faith or gross negligence in connection with the patent term extension proceeding, a final determination will be made pursuant to §1.750 that the patent is not eligible for extension.

(d) The duty of disclosure pursuant to this section rests on the individuals identified in paragraph (a) of this section and no submission on behalf of third parties, in the form of protests or otherwise, will be considered by the Office. Any such submission by third parties to the Office will be returned to the party making the submission, or otherwise disposed of, without consideration by the Office.

§1.770 Express withdrawal of application for extension of term.

An application for extension of patent term may be expressely withdrawn before a determination is made pursuant to §1.750 by filing in the Office, in duplicate, a written declaration of withdrawal signed by the owner of record of the patent or its agent. An application may not be expressly withdrawn after the date of the final determination on the application. An express withdrawal pursuant to this section is effective when acknowledged in writing by the Office. The filing of an express withdrawal pursuant to this section and it acceptance by the Office does not entitle applicant to a refund of the filing fee (§1.20(n)) or any portion thereof.

§1.775 Calculation of patent term extension for a human drug product.

(a) If a determination is made pursuant to §1.750 of this part that a patent for a human drug product is eligible for extension, the term shall be extended by the time as calculated in days in the manner indicated by this section. The patent term extension will run from the original expiration date of the patent or any earlier date set by terminal disclaimer (§1.321).

(b) The term of the patent for a human drug product will be extended by the length of the regulatory review period for the product as determined by the Secretary of Health and Human Services, reduced as appropriate pursuant to paragraphs (d)(1)-(6) of this section.

(c) The length of the regulatory review period for a human drug product will be determined by the Secretary of Health and Human Services. Under 35 U.S.C. 156(g)(1)(B), it is the sum of

(1) The number of days in the period beginning on the date an exemption under subsection (i) of section 505 or subsection (d) of section 507 of the Federal Food, Drug, and Cosmetic Act became effective for the approved human drug product and ending on the date an application was initially submitted for such drug product under those sections or under section 351 of the Public Health Service Act; and

(2) The number of days in the period beginning on the date the application was initially submitted for the approved human drug product under section 351 of the Public Health Service Act. subsection (b) of section 505 or section 507 of the Federal Food, Drug, and Cosmetic Act and ending on the date such application was approved under such section.

(d) The term of the patent as extended for a human drug product will be determined by

(1) Substracting from the number of days determined by the Secretary of Health and Human Services to be in the regulatory review period:

(i) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section which were on and before the date on which the patent issued;

(ii) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section during which it is determined under 35 U.S.C. 156(c)(2)(B) by the Secretary of Health and Human Services that applicant did not act with due diligence;

(iii) One-half the numbers of days remaining in the period defined by paragraph (c)(1) of this section after that period is reduced in accordance with paragraphs (d)(1)(i) and (ii) of this section; half days will be ignored for purposes of subtraction;

(2) By adding the number of days determined in paragraph (d)(1) of this section to the original term of the patent as shortened by any terminal disclaimer;

(3) By adding 14 years to the date of approval of the application under section 351 of the Public Health Service Act, or subsection (b) of section 505 or section 507 of the Federal Food, Drug, and Cosmetic Act;

(4) By comparing the dates for the ends of the periods obtained pursuant to paragraphs (d)(2) and (d)(3) of this section with each other and selecting the earlier date;

(5) If the original patent was issued after Sept. 24, 1984.

(i) By adding 5 years to the original expiration date of the patent or any earlier date set by terminal disclaimer; and

(ii) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(5)(i) of this section with each other and selecting the earlier date;

(6) If the original patent was issued before Sept. 24, 1984.

If not request was submitted for an exemption under subsection (i) of section 505 of subsection (d) of section 507 of the Federal Food, Drug, and Cosmetic Act, by (A) adding 5 years to the original expriation date of the patent or earlier date set by terminal disclaimer and (B) by comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) of this section with each other and selecting the earlier date;

(ii) If a request was submitted for an exemption under subsection (i) of section 505 or subsection (d) of section 507 of the Federal Food, Drug, or Cosmetic Act and the commercial marketing or use of the product was not approved before Sept. 24, 1984, by (A) adding 2 years to the original expiration date of the patent or earlier date set by terminal disclaimer, and (B) by comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(ii)(A) of this section with each other and selecting the earlier date.

§1.776 Calculation of patent term extension for a food additive or color additive.

(a) If a determination is made pursuant to §1.750 of this part that a patent for a food additive or color additive is eligible for extension, the term shall be extended by the time as calculated in days in the manner indicated by this section. The patent term extension will run from the original expiration date of the patent or earlier date set by terminal disclaimer (§1.321).

(b) The term of the patent for a food additive or color additive will be extended by the length of the regulatory review period for the product as determined by the Secretary of Health and Human Service, reduced as appropriate pursuant to paragraph (d)(1)–(6) of this section.

(c) The length of the regulatory review period for a food additive or color additive will be determined by the Secretary of Health and Human Services. Under 35 U.S.C. 156(g)(2)(B), it is the sum of

(1) The number of days in the period beginning on the date of major health or environmental effects test on the additive was initiated and ending on the date a petition was initially submitted with respect to the approved product under the Federal Food, Drug, and Cosmetic Act requesting the issuance of a regulation for use of the product; and

(2) The number of days in the period beginning on the date a petition was initially submitted with respect to the approved product under the Federal Food, Drug, and Cosmetic Act requesting the issuance of a regulation for use of the product, and ending on the date such regulation became effective or, if objections were filed to such regulation, ending on the date such objections were resolved and commercial marketing was permitted or, if commercial marketing was permitted and later revoked pending further proceedings as a result of such objections, ending on the date such proceedings were finally resolved and commercial marketing was permitted.

(d) The term of the patent as extended for a food additive or color additive will be determined by

(1) Subtracting from the number of days determined by the Secretary of Health and Human Services to be in the regulatory review period:

(i) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section which were on and before the date on which the patent issued:

(ii) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section during which it is determined under 35 U.S.S. 156(d)(2)(B) by the Secretary of Health and Human Services that applicant did not act with due diligence:

(iii) The number of days equal to one-half the number of days remaining in the period defined by paragraph (c)(1) of this section after that period is reduced in accordance with paragraphs (d)(1)(i) and (ii) of this section; half days will be ignored for purposes of subtraction;

(2) By adding the number of days determined in paragraph (d)(1) of this section to the original term of the patent as shortened by an terminal disclaimer;

(3) By adding 14 years to the date a regualtion for use of the product became effective or, if objections were filed to such regulation, to the date such objections were resolved and commercial marketing was permitted or, if commercial marketing was permitted and later revoked pending further proceedings as a result of such objections, to the date such proceedings were finally resolved and commercial marketing was permitted:

(4) By comparing the dates for the ends of the periods obtained pursuant to paragraphs (d)(2) and (d)(3) of this section with each other and selecting the earlier date;

(5) If the original patent was issued after September 24, 1984,

(i) By adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer; and

(ii) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(5)(i) of this section with each other and selecting the earlier date;

(6) If the original patent was issued before September 24, 1984.

(i) If no major health or environmental effects test was initiated and no petition for a regulation or application for registration was submitted, by (A) adding 5

years to the original expiration date of the patent or earlier date set by terminal disclaimer and (B) by comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) of this section with each other and selecting the earlier date:

(ii) If a major health or environmental effects test was initiated or a petition for a regulation or application for registration was submitted, and the commercial marketing or use of the product was not approved before September 24, 1984, by (A) adding 2 years to the original expiration date of the patent or earlier date set by terminal disclaimer, and (B) by comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(ii)(A) of this section with each other and selecting the earlier date.

§1.777 Calculation of patent term extension for a medical device.

(a) If a determination is made pursuant to §1.750 of this part that a patent for a medical device is eligible for extension, the term shall be extended by the time as calculated in days in the manner indicated by this section. The patent term extension will run from the original expiration date of the patent or earlier date as set by terminal disclaimer (§1.321).

(b) The term of the patent for a medical device will be extended by the length of the regulatory review period for the product as determined by the Secretary of Health and Human Services, reduced as appropriate pursuant to paragraphs (d)(1)–(6) of this section.

(c) The length of the regulatory review period for a medical device will be determined by the Secretary of Health and Human Services. Under 35 U.S.C. 156(g)(3)(B), it is the sum of

(1) The number of days in the period beginning on the date a clinical investigation on humans involving the device was begun and ending on the date an application was initially submitted with respect to the device under section 515 of the Federal Food, Drug, and Cosmetic Act; and

(2) The number of days in the period beginning on the date the application was initially submitted with respect to the device under section 515 of the Federal Food, Drug, and Cosmetic Act, and ending on the date such application was approved under such Act or the period beginning on the date a notice of completion of a product development protocol was initially submitted under section 515(f)(5) of the Act and ending on the date the protocol was declared completed under section 515(f)(6) of the Act.

(d) The term of the patent as extended for a medical device will be determined by

(1) Subtracting from the number of days determined by the Secretary of Health and Human Services to be in the regulatory review period pursuant to paragraph (c) of this section:

(i) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section which were on and before the date on which the patent issued:

(ii) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section during which it is determined under 35 U.S.C. 156(d)(2)(B) by the Secretary of Health and Human Services that applicant did not act with due diligence:

(iii) One-half the number of days remaining in the period defined by paragraph (c)(1) of this section after that period is reduced in accordance with paragraphs (d)(1)(i) and (ii) of this section; half days will be ignored for purposes of subtraction:

(2) By adding the number of days determined in paragraph (d)(1) of this section to the original term of the patent as shortened by any terminal disclaimer:

By adding 14 years to the date of approval of the application under section 515 of the Federal Food, Drug, and Cosmetic Act or the date a product development protocol was declared completed under section 515(f)(6) of the Act:

(4) By comparing the dates for the ends of the periods obtained pursuant to paragraphs (d)(2) and (d)(3) of this section with each other and selecting the earlier date:

(5) If the original patent was issued after September 24, 1984.

(i) By adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer; and

(ii) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(5)(i) of this section with each other and selecting the earlier date:

(6) If the original patent was issued before September 24, 1984,

(i) If no clinical investigation on humans involving the device was begun or no product development protocol was submitted under section 515(f)(5) of the Federal Food, Drug, and Cosmetic Act, by (A) adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer and (B) by comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) of this section with each other and selecting the earlier date;

(ii) If a clinical investigation on humans involving the device was begun or a product development protocol was submitted under section 515(f)(5) of the Federal Food, Drug, and Cosmetic Act and the commercial marketing or use of the product was not approved before September 24, 1984, by (A) adding 2 years to the original expiration date of the patent or earlier date set by terminal disclaimer, and (B) by comparing dates obtained pursuant to paragraphs (d)(4) and (d)(6)(ii)(A) of this section with each other and selecting the earlier date.

§1.780 Certificate of extension of patent term.

If a determination is made pursuant to §1.750 of this part that a patent is eligible for extension and that the term of the patent is to be extended, a certificate of extension, under seal, will be issued to the applicant for the extension of the patent term. Such certificates will be recorded in the official file of the patent and will be considered as part of the original patent. Notification of the issuance of the certificate of extension will be published in the Official Gazette of the Patent and Trademark Office. No certificate of extension will be issued if the term of the patent cannot be extended, even though the patent is otherwise determined to be eligible for extension. In such situations the final determination made pursuant to §1.750 will indicate that no certificate will issue.

§1.785 Multiple applications for extension of term of the same patent or of different patents for the same regulatory review period for a product.

Only one patent may be extended for a regulatory review period for any product (§1.720(g)). If more than one application for extension of the same patent is filed, the certificate of extension of patent term, if appropriate, will be issued based upon the first filed application for extension. If applications are filed for extension of the terms of different patents based upon the same regulatory review period for a product, the certificate of extension of patent term will be issued to the patent having the earliest date of issuance, if the patent is determined to be eligible for extension of patent term pursuant to § 1.750 and if the application for its extension is filed prior to the issuance of a certificate of extension of patent term of the later issued patent.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

May 23, 1986

(FR Doc. 86-17054 Filed 7-29-86; 8:45 am)
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[1069 OG 25]

(130) **Guidelines for the Submission of Applications for Interim Protection of Mask Works Under 17 U.S.C. 914**

Chapter 9 of Title 17 of the United States Code, the Semiconductor Chip Protection Act of 1984, establishes a new form of intellectual property protection for mask works that are fixed in semiconductor chips. Mask works are defined as a "series of related images, however fixed or encoded" that represent the three-dimensional patterns in the layers of a semiconductor chip. This chapter provides a 10 year term of protection for original mask works measured from their date of registration on first commercial exploitation anywhere in the world. Mask works must be registered in the United States Copyright Office within two years' of first commercial exploitation to maintain this protection.

This chapter denies protection to foreign owners of mask works unless the works are first commercially exploited in the United States. It is contemplated that foreign countries will eventually obtain full protection by concluding treaties or enacting chip protection legislation. In order to encourage steps toward a regime of internatonal comity in mask work protection, Section 914(a) provides that the Secretary of Commerce may extend the privilege of interim protection under the Semiconductor Chip Act to nationals of foreign nations under certain conditions. These are: (1) that the foreign nation in question is making progress (either by treaty negotiation or legislative enactment) toward a regime of mask work protection generally similar to that under the Act; (2) that its nationals and persons controlled by them (such as subsidiaries or affiliated companies) are not engaging and have not in the recent past engaged in chip piracy or the sale of products containing infringing semiconductor components; and (3) that entry of the Secretary's order would promote the purposes of the Act and of achieving international comity toward mask work protection.

This notice establishes initial guidelines that specify the content and procedures for the submission of petitions for the Secretary of Commerce to issue or to terminate an Order extending the privilege of making interim registrations for mask works pursuant to chapter 9 of Title 17 of the United States Code. The Assistant Secretary of Commerce and Commissioner of Patents and Trademarks has been delegated the responsibility to receive petitions, conduct proceedings, make findings, and issue or terminate Orders. These guidelines set forth, in accordance with the statutory provisions, the persons eligible to initiate such proceedings, the procedures to be followed, and the information required to be submitted so that the Commissioner can make the determination required by the statute.

A. DEFINITIONS

As used in these guidelines:

(a) "Commissioner" means the Assistant Secretary of Commerce and Commissioner of Patents and Trademarks.
(b) "Interim registration" means a registration of a mask work with the Register of Copyrights by a foreign national, domiciliary or sovereign authority made pursuant to an Order issued under these guidelines.
(c) "Order" means an action by the Commissioner issuing or terminating an Order extending to foreign nationals, domiciliaries and sovereign authorities the privilege of making interim registrations for mask works pursuant to Chapter 9 of title 17, U.S.C.
(d) "Petition" means a request that the Commissioner issue or terminate an Order extending to foreign nationals, domiciliaries and sovereign authorities the privilege of making interim registrations or mask works pursuant to Chapter 9 of title 17, U.S.C.
(e) "Proceeding" means a proceeding to issue or to terminate an Order extending to foreign nationals, domiciliaries and sovereign authorities the privilege of making interim registrations for mask works pursuant to Chapter 9, of title 17, U.S.C.
(f) "Secretary" means the Secretary of Commerce.

B. Effective Date of Guidelines

These guidelines shall come into force on the date of signature of H.R. 6163 by the President.

C. Initiation of Proceedings

(a) The Commissioner may initiate proceedings under these guidelines on his own motion or as directed by the Secretary.
(b) The Commissioner shall initiate proceedings under these guidelines upon receipt of a petition.

D. Submission of Petitions

(a) Petitions may be submitted at any time, however the effective date of any Order shall not precede the coming into force of Chapter 9 of 17 U.S.C.
(b) Petitions shall be submitted to the Commissioner for review and evaluation.

E. Content of Petitions

(a) Any petition requesting that the Commissioner issue an Order extending the privilege of making interim registration under Chapter 9 of 17 U.S.C. must include:
(1) A statement of the foreign governmental agency in charge of developing legislation or negotiating a treaty for the protection of mask works in a manner generally similar to the provisions of Chapter 9 of 17 U.S.C.: (i) that it is making good-faith efforts and reasonable progress toward developing and enacting such legislation or toward entering into such a treaty, and (ii) providing substantive information regarding the entity in the foreign nation to whom the responsibility has been delegated and the procedures that will be followed including any expected target dates for action.
(2) A statement by the appropriate foreign government or foreign governmental agency, including such supporting evidence as may be available, that neither that nation or persons controlled by them are engaged in the misappropriation, or unauthorized distribution or commercial exploitation of mask works.
(3) Information from the party submitting the petition that provides evidence of the progress or the actual efforts undertaken by the foreign nation. Such information should include:
(i) Copies of bills introduced in the foreign legislature;
(ii) Copies of legislative proposals by responsible agencies;
(iii) Records of international proceedings or negotiations showing efforts toward developing an appropriate treaty;
(iv) Reports of governmental or private sector commissions studying and making recommendations on appropriate measures to protect mask works in semiconductor chip products;
(v) Correspondence between private sector organizations and responsible governmental organizations; and
(vi) Any other material including executive proclamations, resolutions or regulations that would support the claim of good-faith efforts and the absence of misappropriations or the absence of unauthorized distribution or commercial exploitation of mask works.
(b) All materials furnished must be in the English language or provided with a certified English translation.

F. Proceeding

(a) A proceeding shall be initiated by the publication of a notice in the Federal Register providing interested parties with an opportunity to submit relevant comments.
(b) Based upon comments received or a review of any petition submitted, the Commissioner, at his discretion, may hold a hearing to permit interested parties and the petitioner to present additional information.
(c) The Commissioner shall review the petition, evaluate the evidence submitted, consider the results of any hearing conducted during the course of the proceeding, and issue or terminate an Order.
(d) If the Commissioner refuses to issue an Order the petitioner may, within 30 days and upon the submission of additional evidence, request reconsideration. If 30 days pass and no request for reconsideration is received, the refusal to issue an Order shall be considered final.
(e) The Commissioner may issue an Order that is valid for a period of up to three years. The Commissioner, in making a determination on the duration of the proposed Order, will be guided by the strength and weight of the evidence submitted.

G. Duration of Orders

(a) Orders shall endure for the period specified in accordance with Section F(e) above, but in no case longer than three years from the effective date of Chapter 9 of 17 U.S.C. in accordance with 17 U.S.C. 914(d)(l)(e) unless the authority of the Secretary is extended in accordance with 17 U.S.C. 914(f) (2).
(b) Orders shall be terminated if:

(1) The Commissioner finds after a proceeding under Section F above that the conditions upon which the Order was based no longer exist, or
(2) Mask works of nationals, domicilaries, and sovereign authorities of that foreign nation or mask works first commercially exploited in that nation become eligible for protection under: (i) a Presidential proclamation issued in accordance with 17 U.S.C. 902(a) (2), or (ii) that nation's own law for the protection of such works so long as that nation is a party to a treaty protecting such works to which the United States is also a party.

H. Mailing Address

(a) Petitions, requests for reconsideration, and all correspondence submitted pursuant to these guidelines shall be addressed to:
Commissioner of Patents and Trademarks
Box 4
Washington, D.C. 20231
(b) For further information contact:
Assistant Commissioner for External Affairs
703/557-3065
Mail inquiries should be directed to the same address indicated above to his attention.

SUMMARY

The initial guidelines set forth above are considered to be appropriate to implement Title 17 U.S.C. 914. They will become effective on the date of signature of H.R. 6163 by the President. They will provide appropriate guidance to mask work owners and their agents pending the issuance of regulations.

RENE D. TEGTMEYER
Nov. 1, 1984. *Acting Commissioner of Patents and Trademarks.*

[1048 O.G. 30]

(131) Errors in Notice of Allowance

The purpose of this notice is to clarify existing Office practice with respect to providing a new issue fee due date. Sometimes errors appear on the Notice of Allowance, such as an incorrect number of claims, the misspelling of an inventor's name, an incorrect inventorship, or an incorrect title. A duplicate Notice of Allowance correcting the errors may be requested from the Group that mailed the Notice. However, a new issue fee due date will not be provided if the information on the original Notice of Allowance is sufficient to allow a reasonable practitioner to timely file a proper issue fee in the correct application. Specifically, the mere filing of a request for a corrected or duplicate Notice of Allowance will not act to stay the period for paying the issue fee.

JAMES E. DENNY,
June 12, 1985. *Deputy Assistant Commissioner for Patents.*

[1056 OG 35]

(132) Initial Guidelines Implementing Changes in 35 U.S.C. 103, 116, and 120

The Patent and Trademark Office has established initial guidelines for patent examiners to use in implementing the changes made in 35 U.S.C. 103, 116, and 120 by Public Law 98-622, the Patent Law Amendments Act of 1984. As a service to the public, those guidelines are published below. A copy of Public Law 98-622 is also being published concurrently herewith. Some of the procedural aspects of matters contained in the guidelines will be incorporated into Title 37 of the Code of Federal Regulation through the rule-making process.

RENE D. TEGTMEYER,
Dec. 11, 1984. *Assistant Commissioner for Patents.*

Initial Guidelines As To Implementation Of 35 U.S.C. 103

Public Law 98-622 added a new sentence to 35 U.S.C. 103 which reads as follows:

"Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person."

The significant features resulting from this amendment to §103 are the following:

(1) The only prior art which is disqualified is prior art under §102(f) or (g) where the subject matter, i.e., the prior art, and the invention "were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person." (Person includes organization.)
(2) If the subject matter (prior art) qualifies as prior art under any other section, e.g., §102(a), (b), or (e), it is still prior art and can be used.
(3) Amendment applies only to subject matter which qualifies as prior art under §103; it does not affect subject matter which qualifies as prior art under §102, i.e., anticipatory prior art.
(4) Term "another person" means any inventive entity other than the inventor and includes the inventor and any other person.
(5) Term "developed" is to be read broadly and is not limited to any particular manner of development.
(6) Subject matter derived from another under §102(f) is prior art under §103 unless the derived subject matter and the claimed invention are owned by, or subject to an obligation of assignment to, the same person at the time the claimed invention was made.
(7) The disclosure of an earlier filed patent application which issues as a patent continues to be prior art under §102(e) against a later invented and filed application of another inventor even though the patent and the later application are owned by, or subject to an obligation of assignment to, the same person.
(8) Commonly owned applications, i.e., applications owned by the same person, may be refiled as a single application to avoid one or more of them becoming prior art against another under §§102(e) and 103.
(9) The phrase "owned by the same person" requires that the same person, persons, or organization own 100% of the subject matter (prior art) and 100% of the claimed invention.
(10) The phrase "subject to an obligation of assignment to the same person" requires that a legal obligation of assignment exist and not merely a moral or unenforceable obligation.
(11) As long as the same person owns the subject matter and the invention at the time the claimed invention was made, a license to another may be made without the subject matter becoming prior art.
(12) Amended §103 requires actual ownership (or obligation to assign) be in existence at the time the claimed invention is made for the subject matter to be disqualified as prior art; acquiring one or the other later is not sufficient.
(13) Burden of establishing that subject matter is disqualified as prior art is placed on patent applicant and not on the patent examiner once the examiner establishes a prima facie case of obviousness based on the prior art.
(14) Double patenting rejections may now be made in applications based on commonly owned patents of different inventive entities and double patenting rejections of the obviousness type can be overcome by terminal disclaimers.
(15) A double patenting rejection may also be made in a later filed application where the application/patent on which the rejection is based and the later filed application are not commonly owned as long as one of the inventors is common between the later filed application and the application/patent; such a rejection cannot be overcome by terminal disclaimer in view of the lack of common ownership.
(16) The Commissioner's Notice of January 9, 1967, "Double Patenting", 834 O.G. 1615 (Jan. 31, 1967) is withdrawn to the extent that it does not authorize a double patenting rejection where different inventive entities are present.
(17) Inventors of subject matter not commonly owned at the time of the invention may file as joint inventors in a single application. However, the claims in such an application are not protected from a §102(f)/103 or §102(g)/103 rejection.

Implementation Steps As To Amended 35 U.S.C. 103

A. *Applications To Be Considered*
(1) Amended §103 does not "affect any final decision made by the court or the Patent and Trademark Office before the date of enactment [November 8, 1984]... with respect to a patent or application for patent, if no appeal from such decision is pending and the time for filing an appeal has expired."
(2) The amendment of §103 will *not* be considered to apply to:
(a) Any application which has been abandoned prior to November 8, 1984, unless such application is revived pursuant to the provisions of 37 CFR 1.137(a) or (b) and is pending on or after November 8, 1984;
(d) Any application in which all the claims have been allowed and in which prosecution has been closed prior to November 8, 1984, e.g., by an *Ex parte Quayle* action, a Notice of allowability, or a Notice of Allowance. However, a continuing application would obtain the benefit of amended §103 if filed prior to the abandonment or issuance of the application; and
(c) Any application in which an appeal has been filed and is no longer pending or in which the time for filing an appeal has expired prior to November 8, 1984. However if the application contains allowed claims on or after November 8, 1984, the allowed claims are subject to amended §103.
(3) The amendment to §103 will be applied to any application (a) which is before the examiner for action and in which all the claims have not been allowed and the prosecution closed or (b) in which prosecution has been closed and is being reopened to reject the allowed claims on grounds other than §102(f)/103 or §102(g)/103.
(4) Applications not before the examiner for action, e.g., an application in which a response from applicant is required, will *not* be considered as to the applicability of amended §103 unless applicant takes timely action which properly requires an action on the merits by the examiner.

B. *Conflicting Co-pending Applications Of Different Inventive Entities With No Indication That They Are Commonly Owned*
(1) If the application files do not establish that they are owned by, or subject to an obligation of assignment to, the same person, the examiner will:
(a) assume that the applications are not commonly owned;
(b) examine the applications on all grounds other than any conflict between the applications;
(c) consider the applicability of §102(f)/103 or §102(g)/103 if one application refers to the other (if there is no cross-reference between the applications it would be inappropriate for the examiner to refer to one application in the other in view of 35 U.S.C. 122);
(d) consider interference if appropriate;
(e) suspend the later filed application if it is otherwise allowable until the earlier filed application is abandoned or issues as a patent and then reject the later filed application under §102(e)/103, if appropriate; and
(f) proceed under item C below if at any time during the examination a statement is made that the applications are commonly owned.

C. *Conflicting Co-pending Applications Of Different Inventive Entities Which Are Commonly Owned*
(1) Co-pending applications will be considered by the examiner to be owned by, or subject to an obligation of assignment to, the same person if (a) the application files refer to assignments recorded in the PTO in accordance with 37 CFR 1.331 which convey the entire rights in the applications to the same person(s) or organization(s); or (b) copies of unrecorded assignments which convey the entire rights in the applications to the same person(s) or organization(s) are filed in each of the applications; or (c) an affidavit or declaration by the common owner is filed which states that there is common ownership and explains why the affiant believes there is common ownership; or (d) other evidence is submitted which establishes common ownership of the applications in question, e.g., a court decision determining the owner. In circumstances where the common owner is a corporation or other organization an affidavit or declaration averring common ownership may be signed by an official of the corporation or organization empowered to act on behalf of the corporation or organization.
(2) If the application files establish that they are

owned by, or subject to an obligation of assignment to, the same person, the examiner will:

(a) examine the applications as to all grounds except §§102(f) and (g) as they apply through §103 if the application files establish common ownership at the time the later invention was made;
(b) examine the applications for double patenting, including double patenting of the obviousness type, and make a provisional rejection, if appropriate, (see *In re Mott*, 190 USPQ 536 (CCPA 1976);
(c) examine the later filed application under §102(e) as it applies through §103 and make a provisional rejection under §102(e)/103 in the later filed application, if appropriate;
(d) permit applicant of the later filed application to file an affidavit under 37 CFR 1.131 to overcome the provisional or actual §102(e)/103 rejection, if appropriate, and a terminal disclaimer to overcome the provisional or actual rejection on double patenting of the obviousness type.

Initial Guidelines As To Implementation Of 35 U.S.C. 116

Public Law 98–622 amended 35 U.S.C. 116 to clarify that each inventor need not "sign the application" in addition to making the required oath and to add a new sentence which reads as follows:

"Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent."

The significant features resulting from these amendments to §116 are the following:

(1) The joint inventors do not have to separately "sign the application," but only need apply for the patent jointly and make the required oath by signing the same; this is a clarification, but not a change in current practice.
(2) Inventors may apply for a patent jointly even though "they did not work together or at the same time," thereby clarifying (a) that it is not necessary that the inventors physically work together on a project, and (b) that one inventor may "take a step at one time, the other an approach at different times." (*Monsanto Co.* v. *Kamp*, 154 USPQ 259 (D.D.C. 1967)).
(3) Inventors may apply for a patent jointly even though "each did not make the same type or amount of contribution," thereby clarifying the "fact that each of the inventors plays a different role and that the contribution of one may not be as great as that of another does not detract from the fact that the invention is joint, if each makes some original contribution, though partial, to the final solution of the problem." *Monsanto*, supra.
(4) Inventors may apply for a patent jointly even though "each did not make a contribution to the subject matter of every claim of the patent."
(5) Inventors may apply for a patent jointly as long as each inventor made a contribution, i.e., was an inventor or joint inventor, of the subject matter of at least one claim of the patent; there is no requirement that all the inventors be joint inventors of the subject matter of any one claim.
(6) If an application by joint inventors includes more than one independent and distinct invention, restriction may be required with the possible result of a necessity to change the inventorship named in the application if the elected invention was not the invention of all the originally named inventors.
(7) The amendment to §116 increases the likelihood that different claims of an application or patent may have different dates of invention; when necessary the Office or court may inquire of the patent applicant or owner concerning the inventors and the invention dates for the subject matter of the various claims.

Implementation Steps As To Amended 35 U.S.C. 116

(1) See items (1) to (4) above under "Applications To Be Considered" for applications to be considered under amended §116.
(2) Pending applications will be permitted to be amended by complying with 37 CFR 1.48 to add claims to inventions by inventors not named when the application was filed as long as such inventions were disclosed in the application as filed since 37 CFR 1.48 permits correction of inventorship where the "correct inventor or inventors are not named in an application for patent through error without any deceptive intention on the part of the actual inventor or inventors".
(3) Under amended §116 an examiner will reject claims under §102(f) only in circumstances where a named inventor is not the inventor of at least one claim in the application; no rejection under §102(f) is appropriate if a named inventor made a contribution to the invention defined in any claim of the application.
(4) Under amended §116 considered in conjunction with amended §103, a rejection may be appropriate under §102(f)/103 where the subject matter, i.e., prior art, and the claimed invention were not owned by, or subject to an obligation of assignment to, the same person at the time the invention was made.
(5) Applicants are responsible for correcting, and will be required to correct, the inventorship in compliance with 37 CFR 1.48 when the application is amended to change the claims so that one (or more) of the named inventors is no longer an inventor of the subject matter of a claim remaining in the application.
(6) In requiring restriction in an application filed by joint inventors the examiner will remind applicants of the necessity to correct the inventorship pursuant to 37 CFR 1.48 if an invention is elected and the claims to the invention of one or more inventors are cancelled.
(7) The examiner will not inquire of the patent applicant concerning the inventors and the invention dates for the subject matter of the various claims until it becomes necessary to do so in order to properly examine the application.
(8) If an application is filed with joint inventors, the examiner will assume that the subject matter of the various claims was commonly owned at the time the inventions covered therein were made, unless there is evidence to the contrary. If inventors of subject matter, not commonly owned at the time of the later invention, file a joint application, applicants have an obligation pursuant to 37 CFR 1.56 to point out the inventor and invention dates of each claim and the lack of common ownership at the time the later invention was made in order that the examiner may consider the applicability of §102(f)/103 or §102(g)/103. The examiner will assume, unless there is evidence to the contrary, that applicants are complying with their duty of disclosure.

Initial Guidelines As To Implementation Of 35 U.S.C. 120

Public Law 98–622 amended 35 U.S.C. 120 by striking out "by the same inventor" and inserting in its place "which is filed by an inventor or inventors named in the previously filed application."

The amended first paragraph of 35 U.S.C. 120 (the bracketed portion was deleted and the underlined portion added) reads as follows:

§120. Benefit of earlier filing date in the United States

An appliction for patent for an invention disclosed in the manner provided by the first paragraph of section 112 of this title in an application previously filed in the United States, or as provided by section 363 of this title, [by the same inventor] *which is filed by an inventor or inventors named in the previously filed application* shall have the same effect, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application and if it contains or is amended to contain a specific reference to the earlier filed application."

The significant features of these amendments to §120 are the following:

(1) A later filed application by an inventor or inventors of a previously filed co-pending application may claim the benefit of the previously filed co-pending application under §120 even though the later filed application does not name all of the same inventors as the previously filed application.
(2) In order for the later filed application to be entitled to claim the benefit of the earlier filed co-pending application under §120 the earlier filed co-pending application must
   (a) have at least one inventor in common with the later filed application; and
   (b) disclose the common inventor's invention in the manner provided by the first paragraph of 35 U.S.C. 112, i.e., fully disclose and support at least one of the common inventor's claims found in the later application.
(3) When necessary the Patent and Trademark Office or a court may inquire of the patent applicant or owner as to who invented, and the date of invention of, the subject matter being claimed in any claims in the later filed application.
(4) Double patenting rejections may be applicable, whether or not the applications and patents are commonly owned as long as the applications/patent(s) have at least one inventor in common.
(5) If the applications and patents are commonly owned, the rejection of the applications on the grounds of double patenting can be overcome by an appropriate terminal disclaimer as long as the identical invention is not being claimed. See *In re Robeson*, 141 USPQ 485 (CCPA 1964), and *In re Kaye*, 141 USPQ 829 (CCPA 1964).
(6) If the applications and patents are not commonly owned, the double patenting rejection is entered in the later filed application and cannot be overcome by a terminal disclaimer since the ownership of the subject matter being claimed belongs to someone other than the owner of the later application.

Implementation Steps As To Amended 35 U.S.C. 120

(1) See items (1) to (4) above under "Applications To Be Considered" for applications to be considered under amended §120.
(2) The examiner will examine any earlier filed co-pending application to which priority is claimed under §120 to determine if
   (a) the earlier filed co-pending application has at least one inventor in common with the later filed application;
   (b) the other requirements for claiming benefit under §120 are met; and
   (c) a rejection on the grounds of double patenting is proper.
(3) As long as the formal requirements for claiming benefit under §120 are met, the examiner will permit the claim to be made without examining the earlier filed co-pending application for disclosure and support of at least one claim of the later filed application under the first paragraph of §112 unless it becomes necessary to do so, e.g. because of an interference or an intervening reference.
(4) The examiner will not inquire of the patent applicant as to who invented, and the date of invention of, the subject matter being claimed in any claims in the later filed application until it becomes necessary to do so in order to properly examine the application.
(5) The examiner will examine the earlier and later filed applications and make actual or provisional rejections for double patenting where appropriate, whether or not the applications are commonly owned.

Example 1 - Single Application - Plural Inventors

Inventors A and B, both employees of Company E with obligation to assign all their inventions to E develop inventions X and Y respectively. An application for patent is properly filed listing A and B as joint inventors and with claims to both X and Y as now possible under §116 as amended by Public Law 98–622.

Situation 1.

The claims to X and Y are not patentably distinct.

Examiner's Action:

If otherwise patentable over the prior art—allows application.

Situation 2.

The claims to X and Y are patentably distinct.

Examiner's Action:

Require restriction and election of claims to either X or Y. The applicant, after election, must correct the inventorship of the application to list only the inventor of the elected invention; for example, inventor A if claims to invention X were elected. A divisional application with B as inventor and claims to Y may claim benefit of the originally filed application under 35 U.S.C. 120 as amended by Public Law 98–622.

Situation 3.

The application contains a Markush-type claim to X and Y and separate species claims to X and Y.

Examiner's Action:

(a) Examine the application to determine if the inventions X and Y are restrictable. If so, the claims to elected invention X (assume X is elected by applicants) and the X portion of the Markush claim to X and Y are examined.
   (i) if the claim to X is allowable, the entire Markush claim and the species claim to Y must also be examined.
   (ii) if the claim to X is *not* allowable, no further action on species claim Y or the Y portion of the Markush claim is required.

The inventorship of the application at the time of allowance must be corrected, if necessary, to correspond to the inventions covered by the claims allowed.

Example 2 - Multiple applications - plural inventions

Inventors A and B, both employees of Company E, with obligation to assign all their inventions to E, develop inventions X and Y with Y being developed by B after knowledge of A's development of X. A files application on X before B's development of Y and B later files application. Both applications establish they are owned by Company E.

Situation 1.

The claims to X and Y are not patentably distinct.

Examiner's Action:

(a) Examine the applications as to all grounds except §102(f) and (g) as they apply through §103;
(b) Make a provisional rejection of the later filed application on the grounds of double patenting of the

obviousness type, if appropriate. If a terminal disclaimer is filed in accordance with §1.321(b), the provisional double patenting rejection of the obviousness type will be overcome;
(c) Examine the later filed application under §102(e)/103 and make a provisional rejection based on § 102(e)/103, if appropriate. An affidavit under §1.131 can be filed to overcome the rejection based on § 102(e)/103.

Situation 2.
After receiving the examiner's action in situation 1, A and B filed a continuation-in-part application with inventor C and claim A's invention, B's invention and an improvement they jointly developed with C. A and B abandon their prior applications.

Examiner's Action:
Examine the application in the normal manner; no double patenting and §102(e)/103 problems now exist.

Example 3 - Two copending applications with no indication in the record of common ownership
Inventor A files an application with claims to invention X. Another copending application is filed by inventor B claiming invention Y. There is no indication of common ownership.

Situation 1.
The claims in the two applications are directed to patentably distinct inventions.

Examiner's Action:
If the claims are otherwise allowable, the applications are both allowed.

Situation 2.
The claims in the two applications are *not* patentably distinct.

Examiner's Action:
The applications are prosecuted until one application is allowable. If the time difference between the two applications is too large to declare an interference, action on the later filed application is suspended until the earlier filed application issues as a patent. At that time the later filed application is rejected over the earlier filed application under §102(e)/103.
If the filing dates of the applications are sufficiently close to declare an interference, claims for an interference should be suggested. If the applications are commonly owned, the common owner must make the ownership known. When such common ownership is made known, a provisional double patenting rejection should be made in the later filed application. If the double patenting rejection is of the obviousness type, a terminal disclaimer under 37 CFR 1.321(b) may be filed. The later filed application should be examined under §102(e)/103 and a provisional rejection based on §102(e)/103 should be made in the later filed application, if appropriate. An affidavit under §1.131 can be filed to overcome a rejection based on §102(e)/103.

Example 4 - Claims in single application by different inventors.
An application for patent is filed in the Patent and Trademark Office in which the owner E sets forth the following information.
"The subject matter of claim 1 was invented by inventor A. The subject matter of claim 2 was invented by inventor B. Inventor B knew of the invention of inventor A at the time he made his invention. Both A and B made their inventions while working for owner E with a duty to assign". The inventions are different but not patentably distinct.

Examiner's Action:
If the claims are patentable over the prior art, the application should be allowed.

Public Law 98-622
Signed November 8, 1984

Ninety-eighth Congress of the United States of America

AT THE SECOND SESSION

Begun and held at the City of Washington on Monday, the twenty-third day of January, one thousand nine hundred and eighty-four

An Act

To amend title 35, United States Code, to increase the effectiveness of the patent laws, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "Patent Law Amendments Act of 1984".

TITLE I—PATENT IMPROVEMENT PROVISIONS

USE OF PATENTED INVENTIONS OUTSIDE THE UNITED STATES

SEC. 101.(a) Section 271 of title 35, United States Code, is amended by adding at the end thereof the following new subsection:
"(f)(1) Whoever without authority supplies or causes to be supplied in or from the United States all or a substantial portion of the components of a patented invention, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer.
"(2) Whoever without authority supplies or causes to be supplied in or from the United States any component of a patented invention that is especially made or especially adapted for use in the invention and not a staple article or commodity of commerce suitable for substantial noninfringing use, where such component is uncombined in whole or in part, knowing that such component is so made or adapted and intending that such component will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer."

STATUTORY INVENTION REGISTRATION

SEC. 102.(a) Chapter 14 of title 35, United States Code, is amended by adding at the end thereof the following new section:

"§157. Statutory invention registration

"(a) Notwithstanding any other provision of this title, the Commissioner is authorized to publish a statutory invention registration containing the specification and drawings of a regularly filed application for a patent without examination if the applicant:
"(1) meets the requirements of section 112 of this title;
"(2) has complied with the requirements for printing, as set forth in regulations of the Commissioner;
"(3) waives the right to receive a patent on the invention within such period as may be prescribed by the Commissioner; and
"(4) pays application, publication, and other processing fees established by the Commissioner.
If an interference is declared with respect to such an application, a statutory invention registration may not be published unless the issue of priority of invention is finally determined in favor of the applicant.
"(b) The waiver under subsection (a)(3) of this section by an applicant shall take effect upon publication of the statutory invention registration.
"(c) A statutory invention registration published pursuant to this section shall have all of the attributes specified for patents in this title except those specified in section 183 and sections 271 through 289 of this title. A statutory invention registration shall not have any of the attributes specified for patents in any other provision of law other than this title. A statutory invention registration published pursuant to this section shall give appropriate notice to the public, pursuant to regulations which the Commissioner shall issue, of the preceding provisions of this subsection. The invention with respect to which a statutory invention certificate is published is not a patented invention for purposes of section 292 of this title.
"(d) The Secretary of Commerce shall report to the Congress annually on the use of statutory invention registrations. Such report shall include an assessment of the degree to which agencies of the Federal Government are making use of the statutory invention registration system, the degree to which it aids the management of federally developed technology, and an assessment of the cost savings to the Federal Government of the use of such procedures.".
(b) The table of sections at the beginning of chapter 14 of title 35, United States Code, is amended by adding at the end thereof the following:

"157. Statutory invention registration.".

(c) The amendments made by this section shall take effect six months after the date of the enactment of this Act.

PRIOR ART

SEC. 103. Section 103 of title 35, United States Code, is amended by adding at the end thereof the following:
"Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person."

JOINT INVENTORS

SEC. 104. (a) Section 116 of title 35, United States Code, is amended by amending the first paragraph to read as follows:
"When an invention is made by two or more persons jointly, they shall apply for patent jointly and each make the required oath, except as otherwise provided in this title. Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent.".
(b) Section 120 of title 35, United States Code, is amended by striking out "by the same inventor" and inserting in lieu thereof "which is filed by an inventor or inventors named in the previously filed application".

ARBITRATION OF INTERFERENCES

SEC. 105. Section 135 of title 35, United States Code, is amended by adding at the end thereof the following new subsection:
"(d) Parties to a patent interference, within such time as may be specified by the Commissioner by regulation, may determine such contest or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of title 9 to the extent such title is not inconsistent with this section. The parties shall give notice of any arbitration award to the Commissioner, and such award shall, as between the parties to the arbitration, be dispositive of the issues to which it relates. The arbitration award shall be unenforceable until such notice is given. Nothing in this subsection shall preclude the Commissioner from determining patentability of the invention involved in the interference.".

EFFECTIVE DATE

SEC. 106. (a) Subject to subsections (b), (c), (d), and (e) of this section, the amendments made by this Act shall apply to all United States patents granted before, on, or after the date of enactment of this Act, and to all applications for United States patents pending on or filed after the date of enactment.
(b) The amendments made by this Act shall not affect any final decision made by the court or the Patent and Trademark Office before the date of enactment of this Act with respect to a patent or application for patent, if no appeal from such decision is pending and the time for filing an appeal has expired.
(c) Section 271(f) of title 35, United States Code, added by section 101 of this Act shall apply only to the supplying, or causing to be supplied, of any component or components of a patented invention after the date of enactment of this Act.
(d) No United States patent granted before the date of enactment of this Act shall abridge or affect the right of any person or his successors in business who made, purchased, or used prior to such effective date anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used, if the patent claims were invalid or otherwise unenforceable on a ground obviated by section 103 or 104 of this Act and the person made, purchased, or used the specific thing in reasonable reliance on such invalidity or unenforceability. If a person reasonably relied on such invalidity or unenforceability, the court before which such matter is in question may provide for the continued manufacture, use, or sale of the thing made, purchased, or used as specified, or for the manufacture, use, or sale of which substantial preparation was made before the date of enactment of this Act, and it may also provide for the continued practice of any process practiced, or for the practice of which substantial preparation was made, prior to the date of enactment, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced before the date of enactment.
(e) The amendments made by this Act shall not affect the right of any party in any case pending in court on the date of enactment to have their rights determined on the basis of the substantive law in effect prior to the date of enactment.

TITLE II—PATENT AND TRADEMARK OFFICE PROCEDURES

BOARD OF PATENT APPEALS AND INTERFERENCES

SEC. 201. (a) Sec tion 7 of title 35, United States Code, is amended to read as follows:

"§7. Board of Patent Appeals and Interferences

"(a) The examiners-in-chief shall be persons of competent legal knowledge and scientific ability, who shall be appointed to the competitive service. The Commissioner, the Deputy Commissioner, the Assistant Commissioners, and the examiners-in-chief shall constitute the Board of Patent Appeals and Interferences.
"(b) The Board of Patent Appeals and Interferences shall, on written appeal of an applicant, review adverse decisions of examiners upon applications for patents and shall determine priority and patentability of invention in interferences declared under section 135(a) of this title.

Each appeal and interference shall be heard by at least three members of the Board of Patent Appeals and Interferences, who shall be designated by the Commissioner. Only the Board of Patent Appeals and Interferences has the authority to grant hearings.

"(c) Whenever the Commissioner considers it necessary, in order to keep current the work of the Board of Patent Apeals and Interferences, the Commissioner may designate any patent examiner of the primary examiner grade or higher, having the requisite ability, to serve as examiner-in-chief for periods not exceeding six months each. An examiner so designated shall be qualified to act as a member of the Board of Patent Appeals and Interferences. Not more than one of the members of the Board of Patent Appeals and Interferences hearing an appeal or determining an interference may be an examiner so designated. The Secretary of Commerce is authorized to fix the pay of each designated examiner-in-chief in the Patent and Trademark Office at not to exceed the maxium rate of basic pay payable for grade GS-16 of the General Schedule under section 5332 of title 5. The rate of basic pay of each individual designated examiner-in-chief shall be adjusted, at the close of the period for which that individual was designated to act as examiner-in-chief, to the rate of basic pay which that individual would have been receiving at the close of such period if such designation had not been made.".

(b) The item relating to section 7 in the table of sections at the beginning of chapter 1 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

INTERFERENCES

SEC. 202. Section 135(a) of title 35, United States Code, is amended to read as follows:

"(a) Whenever an application is made for a patent which, in the opinion of the Commissioner, would interfere with any pending application, or with any unexpired patent, an interference may be declared and the Commissioner shall give notice of such declaration to the applicants, or applicant and patentee, as the case may be. The Board of Patent Appeals and Interferences shall determine questions of priority of the inventions and may determine questions of patentability. Any final decision, if adverse to the claim of an applicant, shall constitute the final refusal by the Patent and Trademark Office of the claims involved, and the Commissioner may issue a patent to the applicant who is adjudged the prior inventor. A final judgment adverse to a patentee from which no appeal or other review has been or can be taken or had shall constitute cancellation of the claims involved in the patent, and notice of such cancellation shall be endorsed on copies of the patent distributed after such cancellation by the Patent and Trademark Office.".

APPEALS AND CIVIL ACTIONS

SEC. 203. (a) Section 141 of title 35, United States Code, is amended—

(1) in the first sentence—

(A) by striking out "of the Board of Patent Appeals may appeal" and inserting in lieu thereof "in an appeal to the Board of Patent Appeals and Interferences under section 134 of this title may appeal the decision"; and

(B) by striking out ", thereby waiving his right" and inserting in lieu thereof ". By filing such an appeal the applicant waives his or her right";

(2) in the second sentence—

(A) by striking out "board of patent interferences on the question of priority may appeal" and inserting in lieu thereof "Board of Patent Appeals and Interferences on the interference may appeal the decision";

(B) by striking out "according to" and inserting in lieu thereof " in accordance with"; and

(C) by striking out "he" and inserting in lieu thereof "the party"; and

(3) by amending the last sentence to read as follows: "If the appellant does not, within thirty days after the filing of such notice by the adverse party, file a civil action under section 146, the decision appealed from shall govern the further proceedings in the case.".

(b) Section 145 of title 35, United States Code, is amended—

(1) in the first sentence by striking out "Appeals may" and inserting in lieu thereof "Patent Appeals and Interferences in an appeal under section 134 of this title may,"; and

(2) in the second sentence by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(c) Section 146 of title 35, United States Code, is amended by striking out "board of patent intereferences on the question of priority" and inserting in lieu thereof "Board of Patent Appeals and Interferences on the interference".

TECHNICAL AND CONFORMING AMENDMENTS

SEC. 204. (a) Section 41(a)(6) of title 35, United States Code, is amended—

(1) by striking out "Appeals" each place it appears and inserting in lieu thereof "Patent Appeals and Interferences"; and

(2) by inserting "in the appeal" after "oral hearing".

(b)(1) Section 134 of title 35, United States Code, is amended—

(A) in the section caption by striking out "APPEALS" and inserting in lieu thereof "PATENT APPEALS AND INTERFERENCES"; and

(B) by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(2) The item relating to section 134 in the table of sections at the beginning of chapter 12 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(c) Section 305 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

AMENDMENTS TO OTHER PROVISIONS OF LAW

SEC. 205. (a) Section 1295(a)(4)(A) of title 28, United States code, is amended by striking out "Appeals or the Board of Patent" and inserting in lieu thereof "Patent Appeals and".

(b) Section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182) is amended in the third paragraph—

(1) by striking out "a Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences"; and

(2) by striking out "the Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

(c)(1) Section 305(d) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457(d)) is amended—

(A) by striking out "a Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences"; and

(B) by striking out "the Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

(2) Section 305(e) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457(e)) is amended by striking out "a Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

SAVINGS PROVISION

SEC. 206. Any individual who, on the effective date of this title, is an examiner-in-chief of the Board of Patent Appeals of the Patent and Trademark Office or an examiner of interferences of the Board of Patent Interferences of such office shall be entitled to continue in office as a member of the Board of Patent Appeals and Interferences of the Patent and Trademark Office as of such effective date.

EFFECTIVE DATE

SEC. 207. Section 206 of this Act and the amendments made by this title shall take effect three months after the date of the enactment of this Act.

TITLE III—NATIONAL COMMISSION ON INNOVATION AND PRODUCTIVITY

ESTABLISHMENT

SEC. 301. There is hereby established a National Commission on Innovation and Productivity (hereinafter in this title referred to as the "Commission").

MEMBERSHIP OF COMMISSION

Sec. 302. (a) The Commission shall be composed of —

(1) three Members of the Senate appointed by the President of the Senate;

(2) three Members of the House of Representatives apointed by the Speaker of the House of Representatives; and

(3) three members appointed by the President of the United States, one of whom the President shall designate as Chairman.

Of the members appointed by the President, one member should be an appropriate officer or employee of the United States, one member should be an employer who employs inventors, and one member should be an employed inventor.

(b) At no time shall more than two of the members appointed under paragraph (1), (2), or (3) of subsection (a) be persons who are members of the same political party.

(c) Any vacancy in the Commission shall not affect its powers but shall be filled in the same manner in which the original appointment was made, and subject to the limimtation set forth in subsection (b) with respect to the original appointment.

(d) Six members of the Commission shall constitute a quorum, but a lesser number may conduct hearings.

DUTIES OF THE COMMISSION

SEC. 303. The Commission shall make a full and complete review and study of the level of innovation and producitivity of employed inventors. Such study shall include an analysis of the various methods available to inspire or stimulate individual and corporate innovation and productivity, including an assessment of the techniques used in other countries to achieve this objective. Such study may include an assessment of those aspects of other areas of intellectual property law that inspire or stimulate such innovation and productivity. The Commission shall make recomendations for such revisions of the laws of the United States, including the repeal of unnecessary or undesirable statutes, and such other changes as the Commission considers will better foster innovation and productivity.

COMPENSATION OF MEMBERS OF THE COMMISSION

SEC. 304. (a) A member of the Commission who is a Member of Congress or a full-time officer or employee of the United States shall receive no additional compensation by reason of his or her service on the Commission.

(b) Subject to amounts provided in advance in appropriations Acts, a member of the Commission from private life shall receive the daily equivalent of the annual rate of basic pay payable for level III of the Executive Schedule for each day (including traveltime) during which such member is engaged in the actual performance of duties vested in the Commission, plus reimbursement for travel, subsistence, and other necessary expenses incurred in the performance of such duties, in accordance with subchapter I of chapter 57 of title 5, United States Code.

DIRECTOR AND STAFF

SEC. 305. (a) The Commission shall have a Director who shall be appointed by the Commission and who shall be paid at a rate not to exceed the rate of basic pay payable for level IV of the Executive Schedule. The Director, subject to the direction of the Commission, shall supervise the activities of persons emloyed by the Commission and the preparation of the reports of the Commission and shall perform such other duties as may be assigned to the Director by the Commission.

(b) The Commission may appoint and fix the pay of such additional personnel as it considers appropriate.

(c) The staff of the Commission may be appointed without regard to the provisions of title 5, United States Code, governing appointments in the competitive service, and may be paid without regard to the provisions of chapter 51 and subchapter III of chapter 53 of such title relating to classification and General Schedule pay rates, except that no individual so appointed may receive pay in excess of the maximum annual rate of basic pay payable for GS-16 of the General Schedule.

(d) The Chairman of the Commission may procure temporary and intermittent services under section 3109(b) of title 5, United States Code.

GOVERNMENT AGENCY COOPERATION

SEC. 306. The Commission is authorized to request from any department, agency, or independent instrumentality of the Government any information and assistance it considers necessary to carry out its functions under this title. Each such department, agency, and instrumentality is authorized to cooperate with the Commission and, to the extent permitted by law, to furnish such information and assistance to the Commission.

REPORT OF THE COMMISSION; TERMINATION

SEC. 307. The Commission shall submit interim reports on its activities to the President and the Congress at such times as the Commission considers appropriate, except that at least one such report shall be so submitted within one year after the date of the enactment of this Act. The Commission shall submit its final report on its activities to the President and the Congress within two years after such date of enactment. The Commission shall cease to exist sixty days after the date of the submission of its final report.

ADMINISTRATIVE SERVICES

SEC. 308. The General Services Administration shall provide administrative services for the Commission on a reimbursable basis.

AUTHORIZATION OF APPROPRIATIONS

SEC. 309. There is authorized to be appropriated $250,000 to carry out this title.

EFFECTIVE DATE

SEC. 310. This title shall take effect on January 21, 1985.

TITLE IV—MISCELLANEOUS PROVISIONS

INTERNATIONAL STAGE

SEC. 401. (a) Section 361(d) of title 35, United States Code, is amended in the first sentence by inserting "or within one month after the date of such filing" after "application".

(b) Section 366 of title 35, United States Code, is amended—

(1) in the first sentence—

(A) by inserting "after the date of withdrawal," after "effect"; and

(B) by inserting before the period the following: ", unless a claim for the benefit of a prior filing date under section 365(c) of this part was made in a national application, or an international application designating the United States, filed before the date of such withdrawal"; and

(2) in the second sentence by inserting "withdrawn" after "such".

NATIONAL STAGE

SEC. 402. (a) Section 371(a) of title 35, United States Code, is amended—

(1) by striking out "is" and inserting in lieu thereof "may be"; and

(2) by striking out", except those filed in the Patent Office".

(b) Section 371(b) of title 35, United States Code, is amended to read as follows:

"(b) Subject to subsection (f) of this section, the national stage shall commence with the expiration of the applicable time limit under article 22(1) or (2) of the treaty.".

(c) Section 371(c)(2) of title 35, United States Code, is amended—

(1) by striking out "received from" and inserting in lieu thereof "communicated by"; and

(2) by striking out "verified" before "translation".

(d) Section 371(d) of title 35, United States Code, is amended to read as follows:

"(d) The requirements with respect to the national fee referred to in subsection (c)(1), the translation referred to in subsection (c)(2), and the oath or declaration referred to in subsection (c)(4) of this section shall be complied with by the date of the commencement of the national stage or by such later time as may be fixed by the Commissioner. The copy of the international application referred to in subsection (c)(2) shall be submitted by the date of the commencement of the national stage. Failure to comply with these requirements shall be regarded as abandonment of the application by the parties thereof, unless it be shown to the satisfaction of the Commissioner that such failure to comply was unavoidable. The payment of a surcharge may be required as a condition of accepting the national fee referred to in subsection (c)(1) or the oath or declaration referred to in subsection (c)(4) of this section if these requirements are not met by the date of the commencement of the national stage. The requirements of subsection (c)(3) of this section shall be complied with by the date of the commencement of the national stage, and failure to do so shall be regarded as a cancellation of the amendments to the claims in the international application made under article 19 of the treaty.".

(e) Section 372(b) of title 35, United States Code, is amended—

(1) by striking out the period at the end of paragraph (2) and inserting in lieu thereof "; and"; and

(2) by adding at the end thereof the following:

"(3) the Commissioner may require a verification of the translation of the international application or any other document pertaining to the application if the application or other document was filed in a language other than English.".

(f) Section 372 of title 35, United States Code, is amended by striking out subsection (c).

(g) Section 376(a) of title 35, United States Code, is amended by striking out paragraph (5) and redesignating paragraph (6) as paragraph (5).

TECHNICAL AMENDMENTS

SEC. 403. (a) Title 35, United States Code, is amended by striking out "Patent Office" each place it appears and inserting in lieu thereof "Patent and Trademark Office".

(b) The table of parts at the beginning of title 35, United States Code, is amended by adding at the end thereof the following:

"IV. Patent Cooperation Treaty . . . . . 351".

PATENT FEES

SEC. 404. (a) Notwithstanding section 41 of title 35, United States Code, as in effect before the enactment of Public Law 97-247 (96 Stat. 317), no fee shall be collected for maintaining a plant patent in force.

(b) Notwithstanding section 41(c) of title 35, United States Code, as in effect before the enactment of Public Law 97-247 (96 Stat. 317), the Commissioner of Patents and Trademarks may accept, after the six-month grace period referred to in such section 41(c), the payment of any maintenance fee due on any patent based on an application filed in the Patent and Trademark Office on or after December 12, 1980, and before August 27, 1982, to the same extent as in the case of patents based on applications filed in the Patent and Trademark Office on or after August 27, 1982.

TRADEMARK TRIAL AND APPEAL BOARD

SEC. 405. Section 3 of title 35, United States Code, is amended by adding at the end thereof the following:

"(e) The members of the Trademark Trial and Appeal Board of the Patent and Trademark Office shall each be paid at a rate not to exceed the maximum rate of basic pay payable for GS-16 of the General Schedule under section 5332 of title 5."

EFFECTIVE DATE

SEC. 406. (a) Section 404 of this Act and the amendments made by section 403 of this Act shall take effect on the date of the enactment of this Act.

(b) The amendments made by sections 401, 402, and of this Act shall take effect six months after the date of the enactment of this Act.

[1050 OG 316]

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(133) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket no. 41269-5018]

Final Rules for Miscellaneous Patent Provisions

Agency: Patent and Trademark Office, Commerce
Action: Notice of final rulemaking
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Part I of Title 37, Code of Federal Regulations, to provide rules and procedures for the miscellaneous patent provisions enacted into law by Public Laws 98-620 and 98-622, on Nov. 8, 1984, in which statutory invention registrations, changes in appeals to the courts, prior art and joint inventor provisions and PCT international application filing and processing procedures were established or amended. The rulemaking provides specific rules and procedures for the new and amended provisions.
Effective Date: May 8, 1985
For Further Information Contact: R. Franklin Burnett by telephone at (703) 557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: This rule change is designed primarily to establish a set of rules and procedures for the various requirements of Public Laws 98-620 and 98-622 concerning appeals to the courts, statutory invention registrations, rejections based on prior art and double patenting, and filing of international applications under the Patent Cooperation Treaty. The proposed rules were published on Jan. 25, 1985 in Volume 50 of the Federal Register, pages 3712 through 3725. A public hearing was held on the proposed rule changes on Feb. 8, 1985.
Background Information: Most of the rule changes contained herein are necessary as a result of Public Laws 98-620 or 98-622, both of which were signed by President Reagan on Nov. 8, 1984. The following is a summary of the purposes of the various statutory amendments.

Amended 35 U.S.C. 103 - Unpublished knowledge of prior art.

Public Law 98-622 changes a complex body of case law which discourages communication among members of research teams working in corporations, universities or other organizations. It amended 35 U.S.C. section 103 by adding a new sentence which provides that subject matter developed by another which qualifies as "prior art" only under subsections 102(f) or (g) of 35 U.S.C. is not to be considered when determining whether an invention sought to be patented is obvious under 35 U.S.C. 103, provided the subject matter and the claimed invention were commonly owned at the time the invention was made.

"Prior art" is the existing body of technical information against which the patentability of an invention is judged. Publicly known information is always considered in determining whether an invention would have been obvious. However, under *In re Bass*, 474 F. 2d 1276, 177 USPQ 178 (CCPA 1973), and *In re Clemens*, 622 F.2d 1029, 206 USPQ 289 (CCPA 1980), an earlier invention which is not public could have been treated under 35 U.S.C. 102(g), and possibly under 102(f), as prior art with respect to a later invention made by another employee of the same organization.

New technology often is developed by using background scientific or technical information known within an organization but unknown to the public. Public Law 98-622, by disqualifying such background information from prior art, encourages communication among members of research teams, and leads to more public dissemination through patents of the results of team research.

The subject matter that is disqualified as prior art under 35 U.S.C. 103 is strictly limited to subject matter that qualifies as prior art only under 35 U.S.C. 102(f) or 102(g). If the subject matter qualifies as prior art under any other subsection—e.g., subsection 102(a), 102(b) or 102(e)—it will not be disqualified as prior art under the amendment to section 103.

The contents of a patent of the same or different ownership as an application, continues to be available as prior art against the application under section 103 by virtue of section 102(e) as of the application filing date of the patent. If subject matter becomes potential prior art under section 102 (e) because a patent application is filed on such subject matter before a commonly owned claimed invention is made the subject matter of a later application the two applications may be combined (under amended §§116 and 120) into a single application and such subject matter (with the abandonment of the two applications) would no longer constitute potential prior art under section 102(e) or under section 103 since it would not be "described in a patent granted on an application for patent by another."

It is important to recognize that the amendment to the law applies only to consideration of prior art for purposes of section 103. It does not apply to or affect subject matter which qualifies as prior art under section 102. A patent applicant urging that subject matter is disqualified has the burden of establishing that it was commonly owned at the time the claimed invention was made.

Public Law 98-622 was not intended to permit anyone other than the inventors to be named in a patent application or patent. Also, the amendment was not intended to enable appropriation of the invention of another.

The Patent and Trademark Office has withdrawn the Commissioner's Notice of Jan. 9, 1967, "Double Patenting", 834 O.G. 1615 (Jan. 31, 1967), to the extent that it does not authorize a double patenting rejection where different inventive entities are present. See the Commissioner's Notice of Dec. 11, 1984, "Initial Guidelines Implementing Changes in 35 U.S.C. 103, 116, and 120", 1050 O.G. 316 (Jan. 8, 1985). The Office is reinstituting, in appropriate circumstances, the practice of rejecting claims in commonly owned applications of different inventive entities on the ground of double patenting. See 130 Cong. Rec. H 10527, column 3 (daily ed. Oct. 1, 1984) (statement of Rep. Kastenmeier); *In re Rogers*, 394 F.2d 566, 567 n. 4, 157 USPQ 569, 570 n. 4 (CCPA 1964). This is in accordance with existing case law and prevents an organization from obtaining two or more patents with different expiration dates covering nearly identical subject matter. See *In re Zickendraht*, 319 F.2d 225, 138 USPQ 22 (CCPA 1963) ("The doctrine is well established that claims in different applications need be more than merely different in form or content; and that *patentable distinction* must exist to entitle applicants to a second patent") and *In re Christensen*, 330 F.2d 652, 141 USPQ 295 (CCPA 1964) (". . . the correct procedure for double patenting cases is to analyze the claims to determine the inventions defined therein, and then decide whether such inventions, as claimed are *patentably distinct* and therefore qualified to be claimed in separate patents"). In accordance with established patent law doctrines, double patenting rejections can be overcome in certain circumstances by disclaiming, pursuant to the existing provisions of 37 CFR 1.321, the terminal portion of the term of the later patent and including in the disclaimer a provision that the patent shall be enforceable only for and during the period the patent is commonly owned with the application or patent which formed the basis for the rejection, thereby eliminating the problem of extending patent life.

Information learned from or transmitted to persons outside the organization is not disqualified as prior art.

The term "subject matter" will be construed broadly, in the same manner the term is construed in the remainder of §103. The term "another" as used in §103 means any inventive entity other than the inventor and would include the inventor and any other persons. The term "developed" is to be read broadly and is not limited by the manner in which the development occurred. The term "commonly owned" means wholly owned by the same person, persons, or organization at the time the invention was made.

Amended 35 U.S.C. 116 - Joint inventor filing

35 U.S.C. 116 as amended by Public Law 98-622 recognizes the realities of modern team research. A research project may include many inventions. Some inventions may have contributions made by individuals who are not involved in other, related inventions.

Amended 35 U.S.C. 116 allows inventors to apply for a patent jointly even though (i) they did not physically work together or at the same time, (ii) each did not make the same type or amount of contribution, or (iii) each did not make a contribution to the subject matter of every claim of the patent. Items (i) and (ii) adopt the rationale stated in decisions such as *Monsanto* v. *Kamp*, 269 F. Supp. 818, 154 USPQ 259 (D.D.C. 1967). Item (iii) adopts the rationale of cases such as *SAB Industries AB* v. *Bendix Corp.*, 199 USPQ 95 (E.D. Va. 1978).

Like other patent applications, jointly-filed applications are subject to the requirements of 35 U.S.C. 121 that an application be directed to only a single invention. If more than one invention is included in the application, the Patent and Trademark Office may require the application to be restricted to one of the inventions. In such a case, a "divisional" application complying with

35 U.S.C. 120 would be entitled to the benefit of the earlier filing date of the original application.

It is possible that different claims of an application or patent may have different dates of invention even though the patent covers only one independent and distinct invention within the meaning of 35 U.S.C. 121. When necessary, the Patent and Trademark Office or a court may inquire of the patent application or owner concerning the inventors and the invention dates for the subject matter of the various claims.

Amended 35 U.S.C. 120 - Benefit of prior U.S. application

35 U.S.C. 120 was amended by Public Law 98-622 to provide that an application can obtain the benefit of the filing date of an earlier application when not all inventors named in the joint application are the same as those named in the earlier application. This amendment permits greater latitude in filing "divisional" applications. For example, if the previously filed application named inventors A and B as the inventors, a later application by either A or B could be filed during the pendency of the previously filed application and claim benefit of the previously filed application. In order for a claim to be entitled to the benefit of an earlier pending application, the subject matter of the claim of the later application would have to be disclosed in the earlier application.

Similarly, if inventor A filed an application on an invention and during the pendency of that application made an improvement on the subject matter of the application as a joint inventor with inventor B, the joint application filed on behalf of inventors A and B could claim the benefit of A's previously filed sole application to the extent that the later filed joint application contained claims directed solely to A's subject matter which was disclosed in the earlier filed pending application in the manner provided by the first paragraph of section 112 of title 35, U.S.C.

Likewise, an application filed by inventors A and C could claim the benefit of an earlier filed pending application of inventors A and B, to the extent that the requirements of section 120 could be met.

Like other patent applications, jointly-filed applications will continue to be subject to the requirement of 35 U.S.C. 121 that an application be directed to only a single invention. If more than one invention is included in the application, the Patent and Trademark Office may require the application to be restricted to one of the inventions. In such a case, a "divisional" application would be entitled to the benefit of the earlier filing date of the original application.

New 35 U.S.C. 157 - Statutory Invention Registration (SIR)

This section which is effective on May 8, 1985, establishes an optional procedure by which an inventor may secure protection which is strictly defensive in nature.

Under current law, there is no simple, practical method by which an inventor can protect his or her ability to exploit the invention without obtaining a patent. The new procedure confers on an inventor the same defensive rights that a patent provides to prevent others from patenting the invention. However, it does not permit the holder to exclude others from making, using or selling the invention.

Due to the fact that a SIR does not grant an exclusive right to an inventor, it is not necessary to subject a SIR to the lengthy examination process required for the granting of a patent. Such an examination is necessary if the SIR is subject to an interference proceeding to determine priority of invention. In all other instances, the Patent and Trademark Office will only review the application for adherence to formal printing and fee payment requirements and to ensure that the requirements of 35 U.S.C. 112 are satisfied.

An applicant desiring to have a SIR published will be required to file a regular complete application for a patent and to execute a request including a waiver of enforcement of patent rights. This waiver of the claimed invention will be effective at the time of publication. The original application can be abandoned in favor of a continuing application for a patent, claiming the filing date of the earlier filed application, by filing an express abandonment of the original application and a timely request or petition to withdraw the request for a SIR prior to publication of the SIR, thereby providing the applicant with flexibility during the pendency period of the application. Until the SIR is published the application remains an application for a patent. However, the holder of a SIR will not be able to file a reissue application to recapture the rights to exclusive use that were waived by the initial publication of the SIR.

The waiver of the right to receive a patent, required of all applicants electing to receive a SIR, applies to those remedies provided for the enforcement of a patent under section 183 and sections 271 through 289 of title 35, United States Code. The waiver also applies to remedies under other titles of the United States Code including sections 1337 and 1337a of title 19, section 2356 of title 22, and section 1498 of title 28. This waiver of enforcement applies only to the claimed subject matter of the SIR and not to any foreign patent arising from an application which might have served as the basis of a priority claim under the Paris Convention for the Protection of Industrial Property. Likewise, the waiver does not prevent the holder of a SIR from asserting any defenses provided in sections 271 through 289 of title 35, U.S.C. with respect to a charge of infringement of any other patent.

The Commissioner of Patents and Trademarks can refuse to accept the waiver in certain cases. For example, the waiver could not be accepted if the waiver is not a waiver of all the previously mentioned rights. The Commissioner also has discretion, which has not been exercised at this time, to set time limits on the waiver. This would allow the Commissioner to limit the ability of an inventor to keep inventions secret through a series of continuing patent applications followed by a conversion to a SIR.

The waiver of patent rights in the SIR to the subject matter claimed therein may affect the patentability of a claim in other related applications, particularly divisional applications, since the waiver of patent rights would be effective for all inventions claimed in the SIR and would be effective as a waiver of the right of the inventor to obtain a patent on the invention claimed in the same application or any other application, but not in any patent issued before the date the SIR is published. Where an application containing generic claims is published as a SIR, the waiver in that application applies to any other related applications, including divisions, continuations, and continuations-in-part, to the extent that the same invention claimed in the SIR is also claimed in the other related application.

The Patent and Trademark Office will apply standards similar to those which it applies in making determinations of "same invention" double patenting for purposes of determining whether or not a waiver by an inventor to claims in a SIR precludes patenting by the same inventor to subject matter in any other related application.

Therefore, the waiver would preclude patenting of an invention claimed by an inventor in a related application which is the same as the invention claimed by the same inventor in the SIR. When making this determination it is the claimed subject matter of the related application. Where the subject matter claimed in the related application is the same as the subject matter waived in the SIR, i.e., the "same invention" in the double patenting sense, the claims of the related application will be rejected as being precluded by the waiver in the SIR and cannot be overcome by a terminal disclaimer. The limitation of the scope of the waiver to the claimed invention would not

affect the application of existing §1.658(c) should the SIR become involved in an interference. If a divisional application is filed and published as a SIR claiming only a method, publication thereof will not normally effect a waiver on an application for a patent claiming only an apparatus. The waiver in a SIR would not affect any rights in a patent which issued prior to the date of publication of the SIR, but would preclude an already issued patent from being broadened by reissue if the rights to the subject matter to which broadened claims relate have been waived by publication of the SIR. The waiver applies to any rights of the same inventor in any application pending when the SIR is published even if the inventor is a joint applicant in the pending application and was a sole applicant in the application published as a SIR. The waiver would not affect the rights of any other inventor even though those rights are commonly owned by the same person.

The holder of a SIR containing the required waiver will be left without the offensive rights associated with a patent. In other respects a SIR will be the same as a patent, including the application which is published as a SIR serving as the basis for a priority claim in a foreign application under the Paris Convention. A SIR will be treated the same as a U.S. patent for all defensive purposes. The application, and the SIR published therefrom, could become involved in an interference; the SIR would be a "constructive reduction to practice" under 35 U.S.C. 102(g); it will be "prior art" under all applicable sections of 35 U.S.C. 102 including section 102(e); and it will be classified, cross-referenced and placed in the search files, disseminated to foreign patent offices, stored in the Patent and Trademark Office computer tapes, made available in commercial data bases, and announced in the *Official Gazette* of the Patent and Trademark Office. A published SIR is intended to be a fully viable publication for defensive purposes, usable as a reference as of its filing date in the same manner as a patent. A SIR will also serve as a basis to initiate or participate in an interference or priority proceeding under 35 U.S.C. 291 in a manner similar to a patent and can be used as a reference in defense of an infringement suit.

A SIR is based on a regularly filed application for a patent. Therefore, the filing date of the application will be a sufficient basis for a priority claim in a foreign application. Article 4, section A(3) of the Paris Convention states:

> "By a regular national filing is meant any filing that is adequate to establish the date on which the application was filed in the country concerned, whatever may be the subsequent fate of the application."

After a SIR is published, markings such as "patent pending" are improper under section 292 of title 35 of the United States Code.

The SIR will serve as a replacement for the current "defensive publication program" which was established by regulation under 37 CFR 1.139. Although publication under the "defensive publication program" was intended to provide rights similar to those of the SIR, publication under that program has been held not to be available as evidence of prior knowledge as of its filing date under section 102(a) of title 35, U.S.C. (*Ex parte Osmond*, 191 USPQ 334 (P.T.O. Bd. App. 1976)). The use of a "defensive publication" as a reference to prevent a patent from issuing on a subsequent application is therefore limited. A SIR, on the other hand, will have a clear statutory basis in title 35, U.S.C. The SIR will be "prior art" and a "constructive reduction to practice" under section 102(a) and section 102(g), respectively, as of the filing date of the application on which it is based.

A SIR will not be subject to reexamination under sections 302 to 307 of title 35, United States Code.

The Commissioner is authorized to issue SIRs for defensive purposes, but is not required to do so. The Commissioner has discretion in determining whether or not a SIR should be issued on a particular application. In circumstances where the subject matter is obviously not an invention, is too informal to print, and so forth, the Commissioner has the right to refuse to publish the SIR.

SIRs will be published sooner than patents because no substantive examination will normally be required for SIRs. To the extent that examination is required, it will be conducted in the same manner as in any other patent application. Maintenance fees will not be charged for SIRs.

Since the fees set by the Commissioner for the new SIR procedure under section 157 of title 35, U.S.C. are not established under section 41(a) or (b) of that title, they are not subject to reduction if the applicant has small entity status.

If the fee for requesting publication is not paid at the time of filing of the waiver of the right to receive a patent, the Commissioner may set a period within which the fee must be paid to prevent abandonment of the application. Such a period would be subject to petitions and fees for extensions of time. If abandonment should occur, the application may be revived.

In the final analysis, the SIR procedures set forth in the law should give inventors defensive protection more cheaply than they could get by obtaining a patent. The procedure will allow the government and the private sector to make inventions public knowledge. Last, the SIR would be particularly useful to those with limited resources such as universities and small businesses, who have a new, less expensive alternative to the traditional patenting of inventions.

Amended 35 U.S.C. 361, 366, 371, 372 and 376 - Miscellaneous provisions relating to the applications under the Patent Cooperation Treaty.

Section 361(d) of title 35, United States Code, was amended effective May 8, 1985, to provide a one-month grace period from the date of filing an international application for payment of the basic international fee and the transmittal and search fees.

Section 366 of title 35, United States Code, was amended, effective May 8, 1985, to clarify the effect of withdrawal of an international application on claims for the benefit of its filing date. The withdrawal of an international application designating the United States will not deprive an applicant of the right to claim the benefit of the filing date of such an international application in a later filed application, provided the claim for benefit is made before that international application is withdrawn. Stated otherwise, this clarifies that withdrawing the designation of the United States in an international application is comparable to abandoning a national application as far as a claim for an earlier filing date is concerned.

National Stage

As a general proposition, the amendments made to 35 U.S.C. 371 set forth a legislative scheme, effective May 8, 1985, to provide greater flexibility in the Patent and Trademark Office for the handling of international applications. In addition, by relaxing the requirements which international applicants must satisfy by the commencement of the national stage, the amendments give international applicants benefits similar to those given national applications by section 111, 35 U.S.C. as amended by Public Law 97-247 with respect to the time for filing the national fee and oath or declaration.

Section 372(b) of title 35, United States Code, is amended, effective May 8, 1985, to authorize the Commissioner to require a verification of the translation of an international application or any other document pertaining thereto if the application or other document was filed in a language other than English. An authorization for the Commissioner to require verification in appropriate cases is necessary since subsection (c)(2) of section 371 was amended to remove the requirement that the translation be verified in all cases.

Section 372(c) of title 35, United States Code, was deleted thereby discontinuing the requirement for payment of a special fee to maintain claims in an international ap-

plication which were not searched by an international searching authority. This deletion was made to place international applications processed in the national stage on the same footing as purely national applications.

Section 376(a) of title 35, United States Code, was also amended by Public Law 98–622 to delete mention of the special fee in order to conform with the amendment of section 372(c).

Discussion of Specific Rules

Section 1.11 is amended as proposed to add a reference to published statutory invention registrations in paragraph (a) to indicate that they are available to the public. The portion of present §1.11(a) which deals with interferences is transferred to a new paragraph (e) and rewritten.

The amendment to paragraph (b) deletes reference to § 1.139, which is being deleted in favor of the SIR, and inserts language which covers opening to the public defensive publications published under §1.139 as well as other applications laid open to the public such as the previously published abstracts and abbreviatures.

Section 1.11 is amended as proposed to delete the word "general" before public as unnecessary.

New paragraph (e) of §1.11 is added to cover the availability to the public of all interferences, including those which involved a statutory invention registration. This paragraph applies to interferences declared under the new rules which became effective on Feb. 11, 1985, 49 F.R. 48416, (Dec. 12, 1984) as well as the rules formerly in effect. The term "award of priority" is intended to refer to those decisions of the Board of Patent Interferences, or Board of Patent Appeals and Interferences, awarding priority in interferences conducted under the former rules. The term "judgment" refers to judgments entered by the Board of Patent Appeals and Interferences in interferences conducted under the new rules. The language of the proposed rule has been slightly modified for clarity in the final rule.

Section 1.14 is amended as proposed to delete reference to §1.139 since that section is being removed.

Section 1.17 paragraph (h) is amended as proposed to include the petition fee required by new §1.295.

Section 1.17 is amended to add new paragraphs (n) and (o) to establish fees for requesting publication of statutory invention registrations. Paragraph (n) establishes a $400.00 fee for requesting publication of a statutory invention registration where no first examiner's action pursuant to §1.104 has been issued in the application. The amount paid for basic filing fees under §1.16(a), (f) or (g) will be credited against this amount. For example, if a $300.00 filing fee was paid, only $100.00 additional would be required for requesting publication of a statutory invention registration.

The addition of paragraph (o) to §1.17 is similar to the addition of paragraph (n) but establishes a fee for requesting publication of applications, which have received any examiner's action pursuant to §1.104, as a statutory invention registration. The higher fee of $800.00 set in paragraph (o) is necessary in view of the expenditure of additional Office resources in examining the application prior to the filing of the request for a statutory invention registration.

Section 1.19 is amended as proposed to provide in paragraph (a)(1) a reference to the cost of a printed copy of a statutory invention registration and in paragraph (e) to provide reference to statutory invention registrations listed by subclass.

Section 1.20 is amended as proposed to delete the requirement to pay maintenance fees in all plant patents in view of the amendment in Public Law 98–622. Paragraph 1.20(m) is amended as proposed to provide that non-timely payment of maintenance fees may be accepted in patents based on applications filed prior to Aug. 27, 1982, in accordance with Public Law 98–622.

Public Law 98–622 provides that no maintenance fees are charged for plant patents, regardless of when filed. Without this provision that no maintenance fees be charged for plant patents, plant patent owners whose applications were filed between the dates of enactment of Public Law 96–517 and Public Law 97–247 (Dec. 12, 1980 to Aug. 27, 1982) would be subject to payment of maintenance fees, while plant patent owners whose applications were filed outside those dates would not be subject to such fees. Public Law 98–622 eliminates that inconsistency.

Section 1.45 is amended as proposed to reflect the change made by Public Law 98–622 in 35 U.S.C. 116. The previously existing paragraph is designated as paragraph (a). New paragraph (b) incorporates the wording added to 35 U.S.C. 116 by Public Law 98–622. New paragraph (c) indicates that each named inventor listed in an application must have made a contribution, individually or jointly, to the subject matter of at least one claim of the application and that the application will be considered to be a joint application under 35 U.S.C. 116.

Section 1.48 is amended to add new paragraphs (b) and (c). New paragraph (b) provides for deleting the names of persons originally properly included as inventors, but whose invention is no longer being claimed in the application. Such a situation would arise where claims have been amended or deleted because they are unpatentable or as a result of a requirement for restriction of the application to one invention, or for other reasons. Public Law 98–622 and §1.48(b) change the result reached in *Ex parte Lyon*, 146 USPQ 222, 1965 Dec. Comm'r. Pat. 362 (Bd. App. 1964). The final rule has fewer requirements than the proposed rule for correction of inventorship in this situation. The proposed rule would have required, in addition to the requirements of the final rule, an oath or declaration by each actual inventor or inventors as required by §1.63 and the written consent of any assignee. The final rule requires only a petition and fee with the petition including a statement identifying each named inventor who is being deleted and acknowledging that the inventor's invention is no longer being claimed in the application. The amendment would have to be diligently made under paragraph (b).

The final rule adds a paragraph (c) in response to a comment to provide for the situation where an application discloses unclaimed subject matter by an inventor or inventors not named in the application as filed. In such a situation, the application may be amended pursuant to paragraph (a) of §1.48 to add claims to the subject matter and also to name the correct inventors for the application. The claims would be added by an amendment and, in addition, an amendment pursuant to paragraph (a) of §1.48 would be required to correct the inventors named in the application. Any claims added to the application must be supported by the disclosure as filed and cannot add new matter.

Section 1.60 is amended to include wording which would permit an application to be filed under this section only if it named as inventors the same or less than all the inventors who were named and signed the oath or declaration in the prior application. This addition is necessary in view of the new provisions of 35 U.S.C. 120, as amended by Public Law 98–622, which permit continuing applications to be filed by different inventors. Under §1.60 additional inventors are not permitted to be named since the oath or declaration from the prior application is relied upon.

Section 1.61 is amended as proposed to incorporate the ability to file the translation, oath or declaration, and national fee after the 20 month deadline set forth in PCT Article 22(1) for entering the national phase in the United States Patent and Trademark Office.

Public Law 98–622 amended 35 U.S.C. 371(a) to provide greater flexibility for the PTO handling international applications. Also, 35 U.S.C. 371(a), by relaxing the requirements which international applicants must satisfy by the commencement of the national stage, gives international applicants benefits similar to those given national applicants under 35 U.S.C. 111 by P.L. 97–247 with respect to the time for filing the national fee and oath or declaration.

Paragraph (b) of §1.61 is amended to delete the 2 month time period to conform with the decision concerning PCT Article 22(2) adopted by the Assembly of the International Patent Cooperation Union (PCT Union) on Feb. 3, 1984. The amendment to the Article took effect on Jan. 1, 1985.

PCT Article 22(2) as amended, reads as follows:

> "Where the International Searching Authority makes a declaration, under Article 17(2)(a), that no international search report will be established, the time limit for performing the acts referred to in paragraph (1) of this Article shall be the same as that provided in paragraph (1)."

The additional wording to paragraph (b) of §1.61 sets forth the ability to comply with the requirements for entering the national phase before the Patent and Trademark Office as a Designated Office within 22 months of the priority date. If the national fee or oath or declaration is submitted later than 20 months after the priority date, a surcharge as set in §1.445(a) (5) is required to be paid. If a required English translation of the international application is filed later than 20 months after the priority date, a processing fee as set in §1.445(a) (6) is required to be paid.

New paragraph (c) of §1.61 provides that any amendments under PCT Article 19 which are not received along with any necessary English translation by the end of 20 months from the priority date will be considered as cancelled. This change is required in view of amended §371(d) of 35 U.S.C.

Paragraph (d) is added as proposed to §1.61 in view of §372(b) of title 35, United States Code, as amended by Public Law 98–622, which authorizes the Commissioner to require a verification of the translation of an international application or any other document pertaining thereto if the application or other document was filed in a language other than English. An authorization for the Commissioner to require verification in appropriate cases was necessary since subsection (c) (2) of 35 U.S.C. 371 was amended to remove the requirement that the translation be verified in all cases.

Section 1.62 is amended by revising paragraphs (a), (c), and (h) to include wording which would permit a continuing application to be filed under this section by the same or less than all the same inventors who filed and signed the oath or delcaration in the prior application. This addition is necessary in view of the new provisions of 35 U.S.C. 120, as amended by Public Law 98–622, which permit continuing applications to be filed by different inventors. Under §1.62, additional inventors may be added only in applications in which a new oath or declaration is required because additional subject matter is being claimed. Paragraph (h) has been amended to also request applicants to furnish the title of the invention and the names of the applicants in the continuing application to permit the Office to enter this information in its records in the Application Branch.

Section 1.78 is amended to provide in paragraph (a) that the inventorship in the continuing application may be different from the inventorship in the prior copending application and that the prior application must disclose the invention claimed in at least one claim of the later filed application in the manner provided by the first paragraph of 35 U.S.C. 112. The requirement that at least one claim be fully supported in the prior application to be entitled to priority benefit is not new, but is included to serve as a reminder that information such as foreign patenting, publication, or public use or sale in the United States which occurred more than one year prior to the filing date of the later application is available as prior art where the claims of the continuation-in-part application are not fully supported by the disclosure of the parent application so as to be entitled to an earlier effective filing date under 35 U.S.C. 120. See *In re Ruscetta*, 255 F. 2d 687, 118 USPQ 101 (CCPA 1958); *In re van Langenhoven*, 458 F. 2d 132, 173 USPQ 426 (CCPA 1972), and *Chromalloy American Corp.* v. *Alloy Surfaces Co., Inc.*, 339 F. Suppl. 859, 173 USPQ 295 (D. Del. 1972).

Paragraph (c) as amended provides for the reply to an examiner's inquiry as to first inventor of conflicting claims in commonly owned applications or an application and a patent to be either (1) a statement that the inventions were both commonly owned at the time the later invention was made or (2) an indication of the first inventor. Paragraph (c) has been changed from that proposed in response to comments to clarify that common ownership or an obligation of assignment to the same person has to exist at the time the later invention was made. New paragraph (d) provides for making a double patenting rejection where an application claims an invention which is not patentably distinct from an invention claimed in a commonly-owned patent with the same or different inventive entities. An obviousness-type double patenting rejection could be overcome by the assignee by submitting a terminal disclaimer complying with §1.321(b).

Section 1.101 is amended as proposed to delete reference to applications filed under §1.139 since this section is being removed.

Section 1.103 is amended as proposed to refer in paragraph (d) to a request "for a defensive publication" rather than a request "filed under §1.139" since §1.139 is being removed. Paragraph (d) is amended as proposed to also refer to "patent interference proceedings under Subpart E" rather than to "proceedings under §1.201(b)" since §1.201(b) has been removed.

Section 1.104 is amended as proposed to add a new paragraph (e) to specify the nature of the showing necessary before the examiner would consider co-pending applications to be owned by, or subject to an obligation of assignment to, the same person for purposes of 35 U.S.C. 102(f)/103, 102(g)/103, and paragraph (d) of §1.106. The rule permits the necessary showing to be made in different alternative ways. The necessary showing will be considered by the examiner to be present if the application files refer to assignments which are recorded in the Patent and Trademark Office in accordance with §1.331 as long as the assignments conveyed the entire rights in the applications to the same person or organization. A second alternative which can be used, if assignments have not been recorded, permits the examiner to consider copies of unrecorded assignments filed in each of the applications by the applicants as long as the unrecorded assignments convey the entire rights in the applications to the same person or organization. A third alternative permits an affidavit or declaration to be filed by the common owner stating that there is common ownership and stating facts which explain why the affiant or declarant believes there is common ownership. Under this alternative, sufficient facts will have to be presented in order to enable the examiner to conclude that a prima facie case of common ownership exists. The fourth alternative permits other evidence to be used which would establish common ownership of the applications, e.g., a court decision determining the owner. The terms "person" and "organization" in the rule would include circumstances where the ownership resided in more than one person and/or organization as long as the applications are owned jointly by the same owners. Paragraph (e) also provides that where the common owner is a corporation or other organization an affidavit or declaration averring common ownership may be signed by an official of the corporation or organization who is empowered to act on behalf of the corporation or organization. A mere power of attorney to prosecute a patent application will not make an individual an official of the corporation or organization or empower the individual to act on behalf of the corporation or organization.

The wording of §1.106(d) amends the rule to reflect the change in 35 U.S.C. 103 and refers to the "entire" rights to the subject matter and the claimed invention to make it clear that the term "commonly owned" means wholly owned by the same person, persons, or organization.

If the person, persons, or organization owned less than 100 percent of the subject matter which would oth-

erwise be prior art to the claimed invention, or less than 100 percent of the claimed invention, then common ownership would not exist. Common ownership requires that the person, persons, or organization own 100 percent of the subject matter and 100 percent of the claimed invention. As long as principal ownership rights to either the subject matter or the claimed invention reside in different persons or organizations common ownership does not exist. A license of the claimed invention to another by the owner where basic ownership rights are retained would not defeat ownership. The requirement for common ownership at the time the claimed invention was made is intended to preclude obtaining ownership of subject matter after the claimed invention was made in order to disqualify that subject matter as prior art against the claimed invention. The question of whether common ownership exists at the time the claimed invention was made is to be determined on the basis of the evidence presented and the facts of the particular case in question. Actual ownership of the subject matter and the claimed invention by the same individual or organization or a legal obligation to assign both the subject matter and the claimed invention to the same individual or organization must be in existence at the time the claimed invention was made in order for the subject matter to be disqualified as prior art. A moral or unenforceable obligation would not evidence common ownership.

The burden of establishing that subject matter is disqualified as prior art under the section is intended to be placed and reside upon the person or persons urging that the subject matter is disqualified. For example, the examiner would normally make what appears to be a proper 35 U.S.C. 102(f)/103 or 102(g)/103 rejection and the burden would be on the patent applicant to establish that subject matter is disqualified as prior art because it was commonly owned at the time the claimed invention was made. To place the burden upon the patent examiner would not be appropriate since evidence as to common ownership at the time the claimed invention was made might not be available to the patent examiner, but such evidence, if it exists, should be readily available to the patent applicant or the patentee.

The invention is made for purposes of the amendment to §103 when the conception is complete as defined in *Mergenthaler* v. *Scudder,* 11 App. D.C. 264, 1897 C.D. 724 (C.A.D.C. 1897), and in *In re Tansel,* 117 USPQ 188 (CCPA 1958).

> "The conception of the invention consists in the complete performance of the mental part of the inventive act. All that remains to be accomplished in order to perfect the act or instrument belongs to the department of construction, not invention. It is, therefore, the formation in the mind of the inventor of a definite and permanent idea of the complete and operative invention as it is thereafter to be applied in practice that constitutes an available conception within the meaning of the patent law."

Mergenthaler v. *Scudder,* supra, at page 731.

Paragraph (e) of §1.106 has been added in response to a comment that the rulemaking should leave no doubt as to the standard to be applied in determining the effect of a statutory invention registration waiver in one application on a related application. Paragraph (e) of §1.106 provides that the claims in any original application naming an inventor will be rejected as being precluded by a waiver in a published statutory invention registration naming that inventor if the same subject matter is claimed in the application and the statutory invention registration. Paragraph (e) of §1.106 also provides that the claims in any reissue application naming an inventor will be rejected as being precluded by a waiver in a published statutory invention registration naming that inventor if the reissue application seeks to claim subject matter which was not covered by claims issued in the patent prior to the date of publication of the statutory invention registration and which was the same subject matter waived in the statutory invention registration.

Section 1.108 is amended as proposed to delete the reference to filing a request under §1.139, which is being removed, and insert in its place a reference to a defensive publication.

A new section 1.110 is added as proposed to allow the examiner or other Office official to make inquiry as to the invention date, inventors and ownership at the time the invention was made when necessary for purposes of an Office proceeding.

Section 1.131 is amended to require that affidavits to overcome a rejection of a claim on a cited patent or publication be by the inventor or inventors of the subject matter of that claim. Section 1.131 has also been amended in response to a comment to permit the person qualified under §§1.42, 1.43, or 1.47 to make the required oath or declaration in appropriate circumstances.

Section 1.139 is being removed in view of the new statutory invention registration. The proposed rules made clear the intent to remove this section which established the defensive publication program although the section per se was not published as being removed. The defensive publication program is being replaced by the ability to obtain a statutory invention registration.

Section 1.193 is amended as proposed to change from twenty days to one month the time for filing a reply brief in response to an examiner's answer which raises new points of argument. This amendment is intended to simplify the docketing of this time period and make it consistent with the time period fixed for requesting an oral hearing in §1.194(b).

Section 1.293 is added to provide who may file a request for a statutory invention registration (SIR) and the requirements of such a request in accordance with 35 U.S.C. 157 added by Public Law 98-622. Paragraph (a) of §1.293 indicates that a request for publication of a statutory invention registration in a complete pending patent application for an original patent may be filed and be signed by the applicant, and any assignee of record, or the attorney or agent of record in the application. Paragraph (b) sets forth the requirements for a request for a statutory invention registration. Such a request must include:

(1) a waiver of the applicant's right to receive a patent. This waiver will become effective upon the date of publication. Therefore, it will be possible to petition to withdraw a request for publication of a statutory invention registration until such time that publication can not be terminated;

(2) payment of the fee for requesting publication of a statutory invention registration as set forth in §1.17(n) or (o). The fee is set at two levels to reflect the amount of resources used by the Patent and Trademark Office;

(3) a statement that the application meets the disclosure requirements of 35 U.S.C. 112. This provision is considered desirable in order to prevent publication of defective and insufficient disclosures; and

(4) a statement that the application oomplies with the formal requirements of the rules of practice relating to printing. This provision is required in order to provide the printer with drawings and specification which are suitable for printing in substantially the same format as a patent.

A suggested format for use in filing a request for a statutory invention registration is as follows:

Request for Statutory Invention Registration

Application Serial No. or [ ] Attached hereto
Filed:
Titled:
Applicants:

A. In the above identified patent application, I hereby
1. request and authorize the Commissioner of Patents and Trademarks to publish the above identified reg

Pularly filed patent application as a Statutory Invention Registration. (35 U.S.C. 157)

2. waive the right to receive a United States patent on the same invention claimed in the above identified patent application. These rights, which are waived, include those specified in 35 U.S.C. §183 and §§271 through 289 as well as all attributes specified for patents in any other provision of law other than title 35 United States Code. The waiver includes, but is not limited to, the remedies under 19 U.S.C. 1337 and 1337a, 22 U.S.C. 2356 and 28 U.S.C. 1498. (35 U.S.C. 157(c))
3. understand that the above waiver will be effective pursuant to 37 CFR 1.293 upon publication of the Statutory Invention Registration to waive the inventor's right to receive a United States patent on the invention claimed in the Statutory Invention Registration. (37 CFR 1.293(b) (1))
4. state that, in my opinion, the disclosure and claims of the above identified patent application meet the requirements of 35 U.S.C. 112. (37 CFR 1.293(b) (3))
5. state that, in my opinion, the above identified application complies with the requirements for printing as set forth in the Rules of Practice for Patent Cases, 37 CFR Part 1. (37 CFR 1.293(b) (4))
6. enclose the fee set forth in 37 CFR 1.17(n) or (o) for requesting publication of a Statutory Invention Registration.

[ ] A first examiner's action *has not* been mailed in the above application, 37 CFR 1.17(n) — $400.00 or
[ ] A first examiner's action *has* been mailed in the above application, 37 CFR 1.17(o) — $800.00
$_____

Minus Basic Filing Fee, if previously paid

	Small entity	Large entity
Basic filing fee for utility patent application set forth in 37 CFR 1.16(a)	[ ] $150.00	[ ] $300.00
Basic filing fee for design patent application set forth in 37 CFR 1.16(f)	[ ] $62.50	[ ] $125.00
Basic filing fee for plant patent application set forth in 37 CFR 1.16(g)	[ ] $100.00	[ ] $200.00

MINUS: $_____
Amount Due $_____

[ ] Amount enclosed by check or money order _____

[ ] Please charge Deposit Account No. _____ in the amount of _____

[ ] If payment of any additional fee is required for publication of the Statutory Invention Registration, charge such payment to Deposit Account No. _____

B. For printing on the Statutory Invention Registration front page list below the name(s) of not more than 3 registered patent attorneys or agents OR alternatively, the name of the firm having as a member a registered patent attorney or agent. If no name is listed below, no name will be printed. _____

C. Name of assignee, if any, for printing on the Statutory Invention Registration _____

Address (City and State or Country) _____
State of incorporation, if assignee is a corporation _____

(signature(s) (37 CFR 1.293(a))
[ ] applicant(s) and any assignee
[ ] attorney or agent of record

Paragraph (c) of §1.293 is added to define the effects of a waiver filed with a request for a statutory invention registration. The waiver is effective, upon publication of the SIR, to waive the inventor's right to receive a patent on the invention claimed in the SIR in any application for an original patent which is pending on, or filed after, the date of publication of the SIR. The waiver will affect pending or later applications the inventor filed as a joint inventor with others, but will not affect an application of another person, even if the application and the SIR were commonly owned. The waiver will affect a reissue application of an earlier patent of the inventor only to the extent that the reissue application seeks to enlarge the scope of the claims. Paragraph (c) of §1.293 has been modified from the proposal by inclusion of a reference to §1.106(e).

Section 1.294 is added as proposed to provide in paragraph (a) for a review of the request for publication of a statutory invention registration and the patent application to which it is directed. The request will be examined to determine if the requirements of §1.293 have been met. The application to which the request is directed will be examined to determine (1) if the subject matter of the application is appropriate for publication, (2) if the requirements for publication are met, and (3) if the requirements of 35 U.S.C. 112 and §1.293 are met. Under 35 U.S.C. 157, the Commissioner is authorized to publish a statutory invention registration, but is not required to do so. Thus, the Commissioner has discretion in determining whether or not a statutory invention registration should be issued on a particular patent. In circumstances where the subject matter was obviously not a patentable invention, was too informal to print, and so forth, the request to publish the statutory invention registration will be refused.

Paragraph (b) of §1.294 provides for notifying applicant of the results of the examination of the request for publication of the statutory invention registration. Paragraph (c) of §1.294 provides for the issuance of a notice of the intent to publish a statutory invention registration once the request has been examined and approved.

Section 1.295 is added to provide for the review of a final refusal to publish a statutory invention registration. The review would be by petition to the Commissioner for matters other than those arising from a rejection pursuant to 35 U.S.C. 112 and by appeal for a rejection pursuant to 35 U.S.C. 112. The language of the final rule is slightly different from that proposed to emphasize that the Board either affirms or reverses decisions rather than rejections. Paragraph (a) also differs from the proposal by including, in response to a comment, a provision for requesting return of the petition fee if the necessity for the petition resulted from an error by the Patent and Trademark Office.

Section 1.296 has been modified from the proposal to provide a specific period during which a request for a statutory invention registration may be withdrawn. Under §1.296, as modified, a request for a statutory invention registration may be withdrawn, at applicant's option, prior to the date of the notice of intent to publish a statutory invention registraiton issued pursuant to §1.294(c) by filing a request to withdraw the request for publication of a statutory invention registration. An applicant filing such a request to withdraw may also, under §1.296, request a refund of any amount paid in excess of the application filing fee and a handling fee of $100.00 which will be retained by the Office. Any request to withdraw the request for publication of a statutory invention registration filed on or after the date of the notice of intent to publish pursuant to §1.294(c) must be in the form of a petition pursuant to §1.183 accompanied by the fee set forth in §1.17(h).

Section 1.297 is added to provide for the publication of the statutory invention registration and of the notice of its publication in the *Official Gazette.* In response to a comment, §1.297 has been modified so that the statement on the statutory invention registration will specifically state that the statutory invention registration is not a patent.

Sections 1.301, 1.302 and 1.304 are amended as proposed to delete the requirement to give reasons for ap-

peal when filing an appeal to the Court of Appeals for the Federal Circuit in accordance with §414(a) of Public Law 98–620 which amended 35 U.S.C. 142, 143 and 144.

Section 1.378 is amended as proposed to delete from paragraph (a) the limitation that only applications filed on or after Aug. 27, 1982 may have the maintenance fee accepted after expiration of the patent. This change follows the change made by §404(b) of Public Law 98–622.

Section 1.431 is amended as proposed to provide for the later payment directly to the Receiving Office of the basic fee portion of the international fee and the transmittal and search fees within one month of the filing of an international application. The rule follows §361(d) of title 35 U.S.C. as amended by Public Law 98–622, to provide a one-month grace period from the date of filing of an international application for the payment of the basic international fee and the transmittal and search fees.

It should be noted that the designation fees continue to be required by 12 months after the priority date and that no subsequent grace period is provided in the Receiving Office for designation fees.

New paragraphs 1.431(d) and (e) incorporate into the regulations the provisions of PCT Rule 16 bis. Under these provisions the Receiving Office will charge any unpaid or insufficient fees to a deposit account maintained by the International Bureau. The applicant will then be notified by the International Bureau and be given one month to reimburse the amount charged plus a surcharge of 50%. The surcharge would not be less than 248 Swiss francs or more than 624 Swiss francs under the current fee schedule.

Section 1.445 is amended as proposed to clarify paragraph (a) (4) to clearly indicate that the national fee is credited by an amount of $250 only one time where a $500 search fee has been paid to the Patent and Trademark Office to act as an international searching authority. This is consistent with current practice. The special fee provisions in paragraph (a) (5) are being deleted in view of §402(g) of Public Law 98–622 which deleted the fee in 35 U.S.C. 376(a) (5). The wording of §1.445(a) (5) sets forth the surcharge required for filing of a national fee or oath or declaration later than 20 months from the priority date. Paragraph (a) (6) of §1.445 is added to require a fee of $20.00 for filing an English translation of an international application later than 20 months after the priority date. This makes the practice in international applications consistent with that in national applications where a fee of $20.00 is charged under §1.17(k) for processing an application filed with a specification in a non-English language.

Section 1.446 is amended as proposed to clarify the refund of a portion of the $500 search fee toward payment of the national fee.

Section 1.451 is amended as proposed to correct a rule citation in paragraph (b) and to amend paragraph (c) to provide for supplying a copy of the priority document to the Receiving Office in conformance with revised PCT Rule 17.1.

Section 1.461 is amended as proposed to delete provisions which relate to the applicant transmitting the record copy to the International Bureau. Provisions for such alternative transmittal were deleted from PCT Rule 22, effective Jan. 1, 1985. Accordingly, since the PCT rules no longer provide for such transmittal, the provisions therefor in the U.S. rules are also being deleted.

Response to Comments on the Rules

Specific comments were received on a number of the proposed rule changes. Six letters submitting written comments were received. Oral testimony was presented by four persons at the public hearing conducted on Feb. 8, 1985 and the oral testimony of two of these persons (representing the American Intellectual Property Law Association and Intellectual Property Owners, Inc.) was supplemented by written statements. All of the written and oral comments were considered in adopting the changes set forth herein. Comments suggesting modifications to the proposed rules appear below with responses thereto.

Comment: One Comment suggested that 37 CFR 1.11 be amended to create a waiver of secrecy of an application as of the date of filing of a notice of appeal to the Court of Appeals for the Federal Circuit. The comment suggests that secrecy could be maintained upon request by the appellant in such a situation.

Reply: The change was not published in the proposed rulemaking and is considered to be too substantial a change to be adopted without publication as a proposal to allow public comment. Further, if the suggestion were adopted appellants might simply include a request for secrecy with every notice of appeal.

Comment: One comment suggested that the $120.00 petition fee under §1.17(h) for review of a refusal to publish a statutory invention registration under §1.295 be returned to the petitioner if the refusal to publish is found to have occurred only through an administrative error of the PTO.

Reply: This suggestion has been adopted by an additional sentence being added to §1.295(a).

Comment: Three comments suggested that the proposed fees for a statutory invention registration were too high. One comment suggested the elimination of the fee proposed in §1.17(o).

Reply: Although lower fees would certainly be preferred by the public, the Office must recover its costs of processing and publishing statutory invention registrations. The two levels of fees permit an applicant whose application has not had a first Office action mailed to pay a minimum amount while those filing a request for a statutory invention registration later would share the average additional costs. The amounts proposed are the current estimates of expected costs and cannot be reduced. This will become apparent when it is realized that about $250.00 of the $400.00 fee which has been established for requesting publication of a statutory invention registration prior to the mailing of the first examiner's action pursuant to §1.104 is the cost of printing the statutory invention registration and does not include in-house publication staff costs. The remainder of the fee is used to cover the administrative processing costs and the limited examination which is required to be given pursuant to 35 U.S.C. 157. The higher fee of $800.00 which has been established is necessary to cover the additional costs to the Office when an applicant requests publication of a statutory invention registration after the office has begun examination of the application on which the applicant is requesting publication of a statutory invention registration. Since the rules permit the request to be filed at any time during the examination process substantial additional examination costs, including possibly appeal costs, may have been incurred in a particular application prior to the date on which the request for publication is made. Accordingly, the additional $400.00 is required to cover the extra costs to the Office where the applicant belatedly requests publication of a statutory invention registration. Applicants can avoid the higher costs to themselves and the Office by requesting publication of the statutory invention registration in a timely fashion prior to the mailing of the first examiner's action pursuant to §1.104. The possibility of reducing fees below costs to the Office does not exist since the legislative history of 35 U.S.C. 157 does not reflect any intent that other Office fees or appropriations be used to defer the costs of statutory invention registrations. Further, most of the comments received urged that the fees be set as low as possible, but not below the level necessary to recover costs.

Comment: One comment suggested that the Patent and Trademark Office should investigate less expensive procedures for printing statutory invention registrations to reduce the costs and thereby lower the fees.

Reply: If the registrations are not printed by a system using computer tape, the subject matter of the registrations would not be easily searchable in paper form and would not be fully available for searching under the planned automated "paperless" system. Further, the "section-by-section" analysis submitted for the Record by Representative Kastenmeier during discussion of H. R. 6286 on the floor of the House stated that the statutory invention registration "would be classified and cross-referenced, disseminated to foreign patent offices, stored in the Patent and Trademark Office computer tapes, made available in commercial data bases, and announced in the *Official Gazette* of the PTO." (130 Cong. Rec. H 10526 (1984), column 3). These uses of the statutory invention registrations preclude use of any informal method of printing which would be different from the method used for the printing of patents.

Comment: A number of comments were received concerning §1.48(b). The comments related to (1) the propriety of the fee required, (2) the incorporation of paragraph (b) into current §1.48, (3) the inclusion in the rules of a fixed and definite time period to correct inventorship, (4) the inclusion in the rules of a provision to add inventors claiming previously disclosed but unclaimed subject matter, and (5) a suggestion that the change in inventorship be simplified and possibly effected by a statement by applicant's attorney.

Reply: Each comment will be treated separately in order. (1) The fee of $120.00 to accompany a petition for correction of inventorship is considered appropriate since the consideration of such a petition and correction of Office records takes additional resources. Such a fee should also act as a discouragement to grouping marginal inventions and loosely related inventions into the same application. (2) Whether paragraph (b) is made part of §1.48 or established as a separate rule does not appear to be a substantive matter. Paragraph (b) is being made part of §1.48 to place all rules relating to correction of inventorship in applications in a single rule. (3) No specific time period for correction of inventorship was indicated in the proposed rules. The rule requires that the correction must be made diligently. Since the examiner will not normally be aware of when inventorship correction is required, the responsibility of making such a correction diligently must rest with the applicant. The time of the correction will vary from case to case. (4) The addition of claims to previously disclosed but unclaimed subject matter of additional inventors is considered to be an error in the application and is therefore corrected under §1.48(a). A new paragraph (c) has been added to §1.48 to make this clear. Such a correction must always include a new oath or declaration. (5) The correction of inventorship has been simplified from that proposed. Final §1.48(b) does not require a new oath or declaration of each actual inventor or written consent of any assignee as originally proposed. The final rule requires a petition including a statement identifying each named inventor who is being deleted and acknowledging that the inventor's invention is no longer being claimed in the application, and the fee set forth in §1.17(h). The petition could be signed by applicant's attorney who would then take full responsibility for ensuring that the inventor is not being improperly deleted from the application.

Comment: One comment suggested that proposed §§1.60 and 1.62 should be modified to permit the filing of such continuing applications with different inventive entities from the prior application.

Reply: The procedures under §§1.60 and 1.62 were developed to allow continuing applications to be filed without the necessity of again obtaining an inventor's signature to a declaration. The proposed rule wording has been modified in the final rule to permit inventors to be deleted in the continuing application. The addition of inventors is now permitted where a new oath or declaration would be required because of claims in the continuing application being drawn to additional subject matter.

Comment: One comment suggested that §§1.77 and 1.78 be modified to change the placement in a patent application of the information regarding cross-reference to related applications. It was suggested to require this information to be placed immediately after the Abstract, following the claims, so that the cross-reference information could be easily removed when filing the application outside the United States.

Reply: These changes were not included in the proposed rulemaking and therefore the public has not had an opportunity to comment on the suggestion. Accordingly, the suggestion has not been adopted.

Comment: One comment suggested that proposed §1.78(c) be modified to permit a statement that the claimed inventions were subject to an obligation of assignment to the same person at the time the inventions were made.

Reply: The suggestion has been adopted.

Comment: One comment suggested that the application of double patenting rejections to applications of different inventive entities which are commonly owned as set out in proposed §1.78(d) not be made until the effective date of this rulemaking.

Reply: The Commissioner's Notice of Dec. 11, 1984, "Initial Guidelines Implementing Changes in 35 U.S.C. 103, 116, and 120", 1050 O.G. 316 (Jan. 8, 1985), changed the practice in accordance with the intention of Congress in enacting Public Law 98–622. See 130 Cong. Rec. H 10527, column 3 (daily ed. Oct. 1, 1984) (statement of Rep. Kastenmeier) wherein the following statement appears:

> "The Committee expects that the Patent and Trademark Office will reinstitute in appropriate circumstances the practice of rejecting claims in commonly owned applications of different inventive entities on the ground of double patenting. This will be necessary in order to prevent an organization from obtaining two or more patents with different expiration dates covering nearly identical subject matter. In accordance with established patent law doctrines, double patenting rejections can be overcome in certain circumstances by disclaiming the terminal portion of the term of the later patent, thereby eliminating the problem of extending patent life."

Since the provisions of Public Law 98–622 became effective on Nov. 8, 1984, it was not appropriate to delay the change in practice.

Comment: One comment suggested that the policy of rejecting commonly-owned applications of different inventive entities on the grounds of double patenting, as set forth in proposed §1.78(d), was unnecessary in view of 35 U.S.C. 102(e).

Reply: The provisions of 35 U.S.C. 102(e) will not be effective to preclude double patenting in situations where the applicants of the later filed application can use the provisions of 37 CFR 1.131 to antedate the filing date of the earlier filed application or patent. Accordingly, the application of the prohibitions against double patenting is necessary in order to prevent an organization from obtaining two or more patents with different expiration dates covering nearly identical subject matter. See 130 Cong. Rec. H 10527, supra.

Comment: One comment suggested that proposed §1.78(c) was broader than required by statute and capable of being construed to conflict with proposed §1.106(d) by referring to common ownership at "the time the inventions were made" rather than at the time the later invention was made.

Reply: The wording of §1.78(c) has been revised from the proposal to clarify the problem spoken to in the comment.

Comment: One comment suggested that the proposed amendment to §1.131 not be made so that the "applicant" can make affidavits or declarations to overcome rejections. The comment suggested that the proposed rule provides no remedy in situations where the inventor is dead, insane, legally incapacitated, cannot be reached or refuses to join in the application.

Reply: The final rule has been changed in response to the comment to permit the person qualified under §§1.42, 1.43, or 1.47 to make the required oath or declaration in appropriate circumstances.

Comment: Two comments suggested that the scope of the waiver in a statutory invention registration be limit-

ed to the subject matter of the claims of the statutory invention registration and not to any obvious modifications thereof. Another comment suggested that the statutory invention registration applicant should be able to waive the right to a patent on all of the subject matter disclosed in the application if he wishes to do so. One comment suggested that the rulemaking should leave no doubt as to the standard to be applied in determining the effect of a statutory invention registration waiver in one application on a related application.

Reply: A new paragraph (e) has been added to §1.106 to clarify the standard to be applied in determining the effect of a statutory invention registration waiver. The suggestion that the scope of the waiver be limited to the subject matter of the claims of the statutory invention registration and not to any obvious modifications thereof has been adopted.

Comment: Three comments suggested that since a statutory invention registration is prior art as of its effective filing date, the time permitted between the effective filing date and the publication of the statutory invention registration should be limited. Several different approaches were suggested. One comment suggested that there was no problem in this regard. Another comment suggested that the organization is studying the question and will have recommendations in several months.

Reply: The statute makes it clear that the Commissioner is not required to publish a statutory invention registration in response to a request therefor. The case-by-case consideration of requests for publication of a statutory invention registration should safeguard the public without unduly placing limits on patent applicants. The Office will await further recommendations on this question and will observe actual experience prior to placing any time limitations on the use of statutory invention registrations.

Comment: Two comments suggested that §1.293 be modified to eliminate the requirement for a statement in the request for publication of a statutory invention registration that the application meets the requirements of 35 U.S.C. 112. One of these comments also suggested the elimination of the statement that the application meets formal requirements for printing. One comment suggested that if there is a requirement for a statement in the request for publication of a statutory invention registration that the application meets the requirements of 35 U.S.C. 112, there will not be a great necessity for the Office to spend a lot of time examining the application, although there has to be some examination.

Reply: The reason for the statements in §1.293 regarding compliance with 35 U.S.C. 112 and the formal requirements for printing as a patent was to reduce the cost of statutory invention registrations to the applicants and to the Office. The level of fees which have been established assumes that applicants will include the statements required by §1.293 in their requests and that the statements will accurately reflect the condition of the applications to which the requests are directed.

Comment: One comment suggested that the rules should include a fixed and definite time period in which an authorized party can withdraw a statutory invention registration after its approval and before its publication.

Reply: The suggestion has been adopted. Section 1.296 has been modified to permit a request to withdraw the request for publication of a statutory invention registration to be filed at any time prior to the date of the notice of intent to publish the statutory invention registration. After the date of the notice of intent to publish the statutory invention registration, any request to withdraw the request for publication of the statutory invention registration must be in the form of a petition pursuant to §1.183 accompanied by the fee set forth in §1.17(h).

Comment: One comment suggested that the statement to be printed on statutory invention registrations as set out in proposed §1.297(b) be modified to be easily understood by lay people.

Reply: The statement has been modified to specifically state that the statutory invention registration is not a patent.

Environmental, Energy, and Other Considerations: The final rule change will not have a significant impact on the quality of the human environment or conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96–354). In fact, the rule change will benefit small entities since the statutory invention registration procedures will provide a new, less expensive alternative to the traditional patenting of inventions in appropriate circumstances. Further, the ability to join multiple inventors in a single application in appropriate circumstances will be of particular benefit to small entities. Other changes, such as the elimination of the reasons for appeal, will also be beneficial to all inventors. See a "section-by-section" analysis submitted for the Record by Representative Kastenmeier during discussion of H.R. 6286 on the floor of the House in which the following statement appears (130 Cong. Rec. H 1057 (1984), column 1):

> "Last, the SIR would be particularly useful to those with limited resources such as universities and small businesses, who have a new less expensive alternative to the traditional patenting of inventions."

These rules, therefore, will have no significant adverse economic impact on small entities.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The information collection requirements contained in these rules were submitted to the Office of Management and Budget (OMB) at the time of the proposed rulemaking for review under Section 3504(h) of the Paperwork Reduction Act. OMB has approved the information collection requirements and has assigned OMB control number 0651–0018 thereto.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, Pub. L. 98–620 and 98–622, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

1. Section 1.11 is amended by revising paragraphs (a) and (b) and adding new paragraph (e) to read as follows:

§1.11 Files open to the public.

(a) After a patent has been issued or a statutory invention registration has been published, the specification, drawings and all papers relating to the case in the file of the patent or statutory invention registration are open to inspection by the public, and copies may be obtained upon paying the fee therefor. See §2.27 for trademark files.

(b) All reissue applications, all applications in which the Office has accepted a request to open the complete application to inspection by the public, and related papers in the application file, are open to inspection by the public, and copies may be furnished upon paying the fee therefor. The filing of reissue applications will be announced in the *Official Gazette*. The announcement shall include at least the filing date, reissue application and original patent numbers, title, class and subclass, name of the inventor, name of the owner of record, name of the attorney or agent of record, and examining group to which the reissue application is assigned.

* * * * *

(e) The file of any interference involving a patent, a statutory invention registration, or an application on which a patent has issued or which has been published as a statutory invention registration, is open to inspection by the public, and copies may be obtained upon paying the fee therefor, if: (1) the interference has terminated, or (2) an award of priority or judgment has been entered as to all parties and all counts.

2. Section 1.14 is amended by revising paragraph (b) to read as follows:

§1.14 Patent applications preserved in secrecy.

* * * * *

(b) Except as provided in §1.11(b) abandoned applications are likewise not open to public inspection, except that if an application referred to in a U.S. patent, or in an application in which the applicant has filed an authorization to open the complete application to the public, is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant.

* * * * *

3. Section 1.17 is amended by revising paragraph (h) and by adding new paragraphs (n) and (o) to read as follows:

§1.17 Patent application processing fees.

* * * * *

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph $120.00

§1.47	— for filing by other than all the inventors or a person not the inventor
§1.48	— for correction of inventorship
§1.182	— for decision on questions not specifically provided for
§1.183	— to suspend the rules
§1.295	— for review of refusal to publish a statutory invention registration
§1.377	— for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent
§1.378(e)	— for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent
§1.644(e)	— for petition in an interference
§1.644(f)	— for request for reconsideration of a decision on petition in an interference
§1.666(c)	— for late filing of interference settlement agreement
§§5.12, 5.13, & 5.14	— for expedited handling of foreign filing license
§5.15	— for changing the scope of a license
§5.25	— for retroactive license

* * * * *

(n) For requesting publication of a statutory invention registration prior to the mailing of the first examiner's acton pursuant to §1.104 . . . . . $400.00 reduced by the amount of the application basic filing fee paid

(o) For requesting publication of a statutory invention registration after the mailing of the first examiner's action pursuant to §1.104 . . . . . $800.00 reduced by the amount of the application basic filing fee paid

4. Section 1.19 is amended by revising paragraphs (a) and (e) to read as follows:

§1.19 Document supply fees.

The Patent and Trademark Office will supply copies of the following documents upon payment of the fees indicated:

(a) Uncertified copies of Office documents:

(1) Printed copy of a patent, including a design patent, statutory invention registration, or defensive publication document, except color plant patent $1.00

* * *

* * * * *

(e) List of patents in subclass:

(1) For list of all United States patents and statutory invention registrations in a subclass, per 100 numbers or fraction thereof 2.00

(2) For list of United States patents and statutory invention registrations in a subclass limited by date or number, per 50 numbers or fraction thereof 2.00

5. Section 1.20 is amended by revising paragraphs (e), (f), (g) and (m) to read as follows:

§1.20 Post-issuance fees.

* * * * *

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant $200.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant 400.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 12 years; the fee is due by

eleven years and six months after the original grant 600.00

* * * * *

(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable 500.00

6. Section 1.45 is revised by labeling the existing paragraph as (a) and by adding new paragraphs (b) and (c) to read as follows:

§1.45 Joint inventors.

(a) * * * * *

(b) Inventors may apply for a patent jointly even though

(1) they did not physically work together or at the same time,

(2) each inventor did not make the same type or amount of contribution, or

(3) each inventor did not make a contribution to the subject matter of every claim of the application.

(c) If multiple inventors are named in an application, each named inventor must have made a contribution, individually or jointly, to the subject matter of at least one claim of the application and the application will be considered to be a joint application under 35 U.S.C. 116.

7. Section 1.48 is amended by labeling the current paragraph as paragraph (a) and by adding new paragraphs (b) and (c) to read as follows:

§1.48 Correction of inventorship.

(a) * * * * *

(b) If the correct inventors are named in the application when filed and the prosecution of the application results in the amendment or cancellation of claims so that less than all of the originally named inventors are the actual inventors of the invention being claimed in the application, an amendment shall be filed deleting the names of the person or persons who are not inventors of the invention being claimed. The amendment must be diligently made and shall be accompanied by:

(1) a petition including a statement identifying each named inventor who is being deleted and acknowledging that the inventor's invention is no longer being claimed in the application, and

(2) the fee set forth in §1.17(h).

(c) If an application discloses unclaimed subject matter by an inventor or inventors not named in the application, the application may be amended pursuant to paragraph (a) of this section to add claims to the subject matter and name the correct inventors for the application. [OMB Control No. 0651-0018].

8. Section 1.60 is revised to read as follows:

§1.60 Continuation or divisional application for invention disclosed in a prior application.

(a) A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and §1.78(a)), naming as inventors the same or less than all the inventors named in a prior application and which discloses and claims only subject matter disclosed in the prior application may be filed as a separate application before the patenting or abandonment of or termination of proceedings on the prior application.

(b) An applicant may omit signing of the oath or declaration in a continuation or divisional application if (1) the prior application was a complete application as set forth in §1.51(a), (2) applicant files a true copy of the prior complete application as filed including the specification (including claims), drawings, oath or declaration showing the signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application, and (3) the inventors named in the continuation or divisional application are the same or less than all the inventors named in the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§1.78(a)) will be entered before calculating the filing fee and granting the filing date. If the continuation or divisional application is filed by less than all the inventors named in the prior application a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continuation or divisional application.

9. Section 1.61 is amended by revising the section heading and paragraphs (a) and (b) and adding paragraphs (c) and (d) to read as follows:

§1.61 Filing of applications in the United States of America as a Designated Office.

(a) To maintain the benefit of the international filing date and obtain an examination as to the patentability of the invention in the United States, the applicant shall furnish to the U.S. Patent and Trademark Office not later than the expiration of 20 months from the priority date: (1) a copy of the international application with any amendments under PCT Article 19, unless it has been previously communicated by the International Bureau or unless it was originally filed in the U.S. Patent and Trademark Office; (2) a translation of the international application and a translation of any amendments under PCT Article 19 into the English language, if originally filed in another language; (3) the national fee (see §1.445(a)(4)); and (4) an oath or declaration of the inventor (see §1.70).

(b) If the translation of the international application, oath or declaration, and national fee have not been submitted by the applicant within twenty (20) months from the priority date, such requirements may be met within twenty-two (22) months from the priority date. The payment of the surcharge set forth in §1.445(a)(5) is required as a condition for accepting the national fee or the oath or declaration later than 20 months after the priority date. The payment of the processing fee set forth in §1.445(a)(6) is required for acceptance of an English translation later than 20 months after the priority date. Failure to comply with these requirements will result in abandonment of the application. The provisions of §1.136 do not apply to the 22 month period of this section.

(c) If a copy of the amendments under PCT Article 19 is not communicated by the International Bureau or a copy thereof and any necessary English translation thereof is not received by the end of 20 months from the priority date, such failure will be regarded as cancellation of the amendments under PCT Article 19 in the international application.

(d) Verification of the translation of the international application or any other document pertaining to an international application may be required where it is considered necessary, if the international application or other document was filed in a language other than English.

10. Section 1.62 is amended by revising paragraphs (a), (c) and (h) to read as follows:

§1.62 File wrapper continuing procedure.

(a) A continuation, continuation-in-part, or divisional application, which uses the specification, drawings and oath or declaration from a prior complete application (§1.51(a)) which is to be abandoned, may be filed before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application. The filing date of an application filed under this section is the date on which a request is filed for an application under this section including identification of the Serial Number, filing date, and applicant's name of the prior complete application. If the continuation, continuation-in-part, or divisional application is filed by less than all the inventors named in the prior application a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continuation, continuation-in-part, or divisional application.

* * * * *

(c) In the case of a continuation-in-part application which adds and claims additional disclosure by amendment, an oath or declaration as required by §1.63 must also be filed. In those situations where a new oath or declaration is required due to additional subject matter being claimed, additional inventors may be named in the continuing application. In a continuation or divisional application which discloses and claims only subject matter dislcosed in a prior application, no additional oath or declaration is required and the application must name as inventors the same or less than all the inventors named in the prior application.

* * * * *

(h) The applicant is urged to furnish the following information relating to the prior and continuing applications to the best of his or her ability:

* * * * *

(5) The title of the invention and names of the applicants to be named in the continuing application.

* * * * *

11. Section 1.78 is amended by revising paragraphs (a) and (c) and by adding a new paragraph (d) to read as follows:

§1.78 Claiming benefit of earlier filing date and cross-references to other applications.

(a) An application may claim an invention disclosed in a prior filed copending national application or international application designating the United States of America. In order for an application to claim the benefit of a prior filed copending national application, the prior application must name as an inventor at least one inventor named in the later filed application and dislcose the named inventor's invention claimed in at least one claim of the later filed application in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, the prior application must be (1) complete as set forth in §1.51, or (2) entitled to a filing date as set forth in §1.53(b) and include the basic filing fee set forth in §1.16; or (3) entitled to a filing date as set forth in §1.53(b) and have paid therein the processing and retention fee set forth in §1.21(l) within the time period set forth in §1.53(d). Any application claiming the benefit of a prior filed copending national or international application must contain or be amended to contain in the first sentence of the specification following the title a reference to such prior application, identifying it by serial number and filing date or international application number and international filing date and indicating the relationship of the applications. Cross-references to other related applications may be made when appropriate. (See §1.14(b)).

* * * * *

(c) Where two or more applications, or an application and a patent naming different inventors and owned by the same party contain conflicting claims, and there is no statement of record indicating that the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, the assignee may be called upon to state whether the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, and if not, indicate which named inventor is the prior inventor. In addition to making said statement, the assignee may also explain why an interference should or should not be declared.

(d) Where an application claims an invention which is not patentably distinct from an invention claimed in a commonly owned patent with the same or a different inventive entity, a double patenting rejection will be made in the application. An obviousness-type double patenting rejection may be obviated by filing a terminal disclaimer in accordance with §1.321(b).

12. Section 1.101 is amended by revising paragraph (a) to read as follows:

§1.101 Order of examination.

(a) Applications filed in the Patent and Trademark Office and accepted as complete applications are assigned for examination to the respective examining groups having the classes of inventions to which the applications relate. Applications shall be taken up for examination by the examiner to whom they have been assigned in the order in which they have been filed except for those applications in which examination has been advanced pursuant to §1.102. International applications which have complied with the requirements of 35 U.S.C. 371(c) will be taken up for action based on the date on which such requirements were met. However, unless a request has been filed under 35 U.S.C. 371(f), no action may be taken prior to 21 months from the priority date.

* * * * *

13. Section 1.103 is amended by revising paragraph (d) to read as follows:

§1.103 Suspension of action.

* * * * *

(d) Action on applications in which the Office has accepted a request to publish a defensive publication will be suspended for the entire pendency of these applications except for purposes relating to patent interference proceedings under Subpart E.

14. Section 1.104 is amended by adding a new paragraph (e) immediately following the Note to paragraph (d) to read as follows:

§1.104 Nature of examination; examiner's action.

* * * * *

(e) Co-pending applications will be considered by the examiner to be owned by, or subject to an obligation of assignment to, the same person if (1) the application files refer to assignments recorded in the Patent and Trademark Office in accordance with §1.331 which convey the entire rights in the applications to the same person or organization; or (2) copies of unrecorded assignments which convey the entire rights in the applications to the same person or organization are filed in each of the applications; or (3) an affidavit or declaration by the common owner is filed which states that there is common ownership and states facts which explain why the affiant or declarant believes there is common ownership; or (4) other evidence is submitted which establishes common ownership of the applications. In circumstances where the common owner is a corporation or other organization an affidavit or declaration may be signed by an official of the corporation or organization empowered to act on behalf of the corporation or organization.

15. Section 1.106 is amended by adding new paragraphs (d) and (e) to read as follows:

§1.106 Rejection of claims.

* * * * *

(d) Subject matter which is developed by another person which qualifies as prior art only under 35 U.S.C. 102 (f) or (g) may be used as prior art under 35 U.S.C. 103 against a claimed invention unless the entire rights to the subject matter and the claimed invention were commonly owned by the same person or organization or subject to an obligation of assignment to the same person or organization at the time the claimed invention was made.

(e) The claims in any original application naming an inventor will be rejected as being precluded by a waiver in a published statutory invention registration naming that inventor if the same subject matter is claimed in the application and the statutory invention registration. The claims in any reissue application naming an inventor will be rejected as being precluded by a waiver in a published statutory invention registration naming that inventor if the reissue application seeks to claim subject matter (1) which was not covered by claims issued in the patent prior to the date of publication of the statutory invention registration and (2) which was the same subject matter waived in the statutory invention registration.

16. Section 1.108 is revised to read as follows:

§1.108 Abandoned applications not cited.

Abandoned applications as such will not be cited as references except those which have been opened to inspection by the public following a defensive publication.

17. Section 1.110 is added to read as follows:

§1.110 Inventorship and date of invention of the subject matter of individual claims.

When more than one inventor is named in an application or patent, the Patent and Trademark Office, when necessary for purposes of an Office proceeding, may require an applicant, patentee, or owner to identify the inventive entity of the subject matter of each claim in the application or patent. Where appropriate, the invention dates of the subject matter of each claim and the ownership of the subject matter on the date of invention may be required of the applicant, patentee or owner. See also §§1.78(c) and (d). [OMB Control No. 0651-0018].

18. Section 1.131 is amended by revising paragraph (a) to read as follows:

§1.131 Affidavit or declaration of prior invention to overcome cited patent or publication.

(a) When any claim of an application or a patent under reexamination is rejected on reference to a domestic patent which substantially shows or describes but does not claim the rejected invention, or on reference to a foreign patent or to a printed publication, and the inventor of the subject matter of the rejected claim, the owner of the patent under reexamination, or the person qualified under §§1.42, 1.43 or 1.47, shall make oath or declaration as to facts showing a completion of the invention in this country before the filing date of the application on which the domestic patent issued, or before the date of the foreign patent, or before the date of the printed publication, then the patent or publication cited shall not bar the grant of a patent to the inventor or the confirmation of the patentability of the claims of the patent, unless the date of such patent or printed publication is more than one year prior to the date on which the inventor's or patent owner's application was filed in this country.

* * * * *

§1.139 [removed]

19. Section 1.139 is removed.

20. Section 1.193 is amended by revising paragraph (b) to read as follows:

§1.193 Examiner's answer.

* * * * *

(b) The appellant may file a reply brief directed only to such new points of argument as may be raised in the examiner's answer, within one month from the date of such answer. However, if the examiner's answer states a new ground of rejection appellant may file a reply thereto within two months from the date of such answer; such reply may include any amendment or material appropriate to the new ground.

* * * * *

21. A new section 1.293 is added to read as follows:

§1.293 Statutory invention registration.

(a) An applicant for an original patent may request, at any time during the pendency of applicant's pending complete application, that the specification and drawings be published as a statutory invention registration. Any such request must be signed by (1) the applicant and any assignee of record or (2) an attorneyor agent of record in the application.

(b) Any request for publication of a statutory invention registration must include the following parts:
(1) a waiver of the applicant's right to receive a patent on the invention claimed effective upon the date of publication of the statutory invention registration;
(2) the required fee for filing a request for publication of a statutory invention registration as provided for in §1.17(n) or (o);
(3) a statement that, in the opinion of the requester, the application to which the request is directed meets the requirements of 35 U.S.C. 112; and
(4) a statement that, in the opinion of the requester, the application to which the request is directed complies with the formal requirements of this part for printing as a patent.

(c) A waiver filed with a request for a statutory invention registration will be effective, upon publication of the statutory invention registration, to waive the inventor's right to receive a patent on the invention claimed in the statutory invention registration, in any application for an original patent which is pending on, or filed after, the date of publication of the statutory invention registration. A waiver filed with a request for a statutory invention registration will not affect the rights of any other inventor even if the subject matter of the statutory invention registration and an application of another inventor are commonly owned. A waiver filed with a request for a statutory invention registration will not affect any rights in a patent to the inventor which issued prior to the date of publication of the statutory invention registration unless a reissue application is filed seeking to enlarge the scope of the claims of the patent. See also §1.106(e). [OMB Control No. 0651-0018].

22. A new section 1.294 is added to read as follows:

§1.294 Examination of request for publication of a statutory invention registration and patent application to which the request is directed.

(a) Any request for a statutory invention registration will be examined to determine if the requirements of §1.293 have been met. The application to which the request is directed will be examined to determine (1) if the subject matter of the application is appropriate for publication, (2) if the requirements for publication are met, and (3) if the requirements of 35 U.S.C. 112 and §1.293 of this part are met.

(b) Applicant will be notified of the results of the examination set forth in paragraph (a) of this section. If the requirements of §1.293 and this section are not met by the request filed, the notification to applicant will set a period of time within which to comply with the requirements in order to avoid abandonment of the application. If the application does not meet the requirements of 35 U.S.C. 112, the notification to applicant will include a rejection under the appropriate provisions of 35 U.S.C. 112. The periods for response established pursuant to this section are subject to the extension of time provisions of §1.136. After response by the applicant, the application will again be considered for publication of a statutory invention registration. If the requirements of §1.293 and this section are not timely met, the refusal to publish will be made final. If the requirements of 35 U.S.C. 112 are not met, the rejection pursuant to 35 U.S.C. 112 will be made final.

(c) If the examination pursuant to this section results in approval of the request for a statutory invention registration the applicant will be notified of the intent to publish a statutory invention registration.

23. A new section 1.295 is added to read as follows:

§1.295 Review of decision finally refusing to publish a statutory invention registration.

(a) Any requester who is dissatisfied with the final refusal to publish a statutory invention registration for reasons other than compliance with 35 U.S.C. 112 may obtain review of the refusal to publish the statutory invention registration by filing a petition to the Commissioner accompanied by the fee set forth in §1.17(h) within one month or such other time as is set in the decision refusing publication. Any such petition should comply with the requirements of §1.181(b). The petition may include a request that the petition fee be refunded if the final refusal to publish a statutory invention registration for reasons other than compliance with 35 U.S.C. 112 is determined to result from an error by the Patent and Trademark Office.

(b) Any requester who is dissatisfied with a decision finally rejecting claims pursuant to 35 U.S.C. 112 may obtain review of the decision by filing an appeal to the Board of Patent Appeals and Interferences pursuant to §1.191. If the decision rejecting claims pursuant to 35 U.S.C. 112 is reversed, the request for a statutory invention registration will be approved and the registration published if all of the other provisions of §1.293 and this section are met. [OMB Control No. 0651-0018].

24. A new section 1.296 is added to read as follows:

§1.296 Withdrawal of request for publication of statutory invention registration.

A request for a statutory invention registration, which has been filed, may be withdrawn prior to the date of the notice of the intent to publish a statutory invention registration issued pursuant to §1.294(c) by filing a request to withdraw the request for publication of a statutory invention registration. The request to withdraw may also include a request for a refund of any amount paid in excess of the application filing fee and a handling fee of $100 which will be retained. Any request to withdraw the request for publication of a statutory invention registration filed on or after the date of the notice of intent to publish issued pursuant to §1.294(c) must be in the form of a petition pursuant to §1.183 accompanied by the fee set forth in §1.17(h). [OMB Control No. 0651-0018].

25. A new section 1.297 is added to read as follows:

§1.297 Publication of statutory invention registration.

(a) If the request for a statutory invention registration is approved the statutory invention registration will be published. The statutory invention registration will be mailed to the requester at the correspondence address as provided for in §1.33(a). A notice of the publication of each statutory invention registration will be published in the *Official Gazette*.

(b) Each statutory invention registration published will include a statement relating to the attributes of a statutory invention registration. The statement will read as follows:
A statutory invention registration published pursuant to 35 U.S.C. 157 is not a patent but it has all of the attributes specified for patents in title 35, United States Code, except those specified in 35 U.S.C. 183 and sections 271 through 289. A statutory invention registration does not have any of the attributes specified for patents in any other provision of law other than title 35, United States Code. The invention with respect to which a statutory invention registration is published is not a patented invention for purposes of the marking provisions of 35 U.S.C. 292.

26. Section 1.301 is revised to read as follows:

§1.301 Appeal to U.S. Court of Appeals for the Federal Circuit.

Any applicant or any owner of a patent involved in a reexamination proceeding dissatisfied with the decision of the Board of Patent Appeals and Interferences, and any party to an interference dissatisfied with the decision of the Board of Patent Appeals and Interferences, may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal: (a) In the Patent and Trademark Office file a written notice of appeal directed to the Commissioner (see §§1.302 and 1.304); and (b) in the Court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court. The certified list of documents and any original or certified copies of such documents required by the Court will be transmitted to the Court by the Patent and Trademark Office.

27. Section 1.302 is revised to read as follows:

§1.302 Notice of appeal.

(a) When an appeal is taken to the U.S. Court of Appeals for the Federal Circuit, the appellant shall give notice thereof to the Commissioner within the time specified in §1.304.

(b) In interferences, the notice must be served as provided in §1.646.

28. Section 1.304 is amended by revising paragraph (a) to read as follows:

§1.304 Time for appeal or civil action.

(a) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (§1.302) or for commencing a civil action (§1.303) is sixty days from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time provided under §1.197(b) or §1.658(b), the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. Except for an appeal from or commencing a civil action after a decision of the Board of Patent Appeals and Interferences in a reexamination proceeding or an interference proceeding, the time periods set forth herein are subject to the provisions of §1.136. See §1.550(c) for extensions of time to appeal or commence a civil action in a reexamination proceeding. See §1.645(a) for extensions of time to appeal or commence a civil action in an interference. An examiner-in-chief, upon a showing of excusable neglect, may extend the time for seeking judicial review of a decision of the Board of Patent Appeals and Interferences in an interference case when a request is untimely filed after expiration of the time prescribed by this section.

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29. Section 1.378 is amended by revising the section heading and paragraph (a) to read as follows:

§1.378 Acceptance of delayed payment of maintenance fee in expired patent to reinstate patent.

(a) The Commissioner may accept the payment of any maintenance fee due on a patent after expiration of the patent if, upon petition, the delay in payment of the maintenance fee is shown to the satisfaction of the Commissioner to have been unavoidable and if the surcharge required by §1.20(m) is paid as a condition of accepting payment of the maintenance fee. If the Commissioner accepts payment of the maintenance fee upon petition, the patent shall be considered as not having expired, but will be subject to the conditions set forth in 35 U.S.C. 41(c)(2).

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30. Section 1.431 is amended by revising paragraphs (b)(3)(iii) and (c) and by adding new paragraphs (d) and (e) to read as follows:

§1.431 International application requirements.

• • • • •

(b)(3) • • •

(iii) The name of the applicant, as prescribed (note § §1.421-1.424);

(c) Payment of the basic portion of the international fee (PCT Rule 15.2) and the transmittal and search fees (§1.445) may be made in full at the time international application papers required by paragraph (b) of this section are deposited or within one month thereafter. Failure to make full payment within one month of the deposit of the international application papers required by paragraph (b) of this section will result in the fees being charged to the International Bureau under the provisions of paragraph (d) of this section and PCT Rule 16 bis.

(d) The United States Receiving Office will charge to the International Bureau in accordance with PCT Rule 16 bis and will consider as having been timely paid:

(1) the transmittal fee, the basic fee portion of the international fee, or the search fee where these fees have not been fully paid by the applicant within one month of the date of deposit of the international application, and

(2) the destination fee, or the amount necessary to cover all the designations made in the request which have not been paid by the applicant within one year from the priority date.

(e) The International Bureau will notify applicant of any amount charged under paragraph (d) of this section and invite the applicant to pay directly to the International Bureau within one month from the date of the notification, the amount charged, augmented by a surcharge of 50%, provided the surcharge will not be less and will not be more, than the amounts indicated in the Schedule of Fees appended to the PCT Rules. If the payment needed to cover the transmittal fees, the basic fee, the search fee, one designation fee and the surcharge is not timely made to the International Bureau, the International Bureau will notify the Receiving Office which will declare the international application withdrawn under PCT Article 14(3)(a). If the applicant makes timely payment of the fees referred to in the previous sentence, but the amount paid is not sufficient to cover all the designation fees, the Receiving Office will declare any designations not paid withdrawn under PCT Article 14(3)(b) in accordance with PCT Rule 16 bis. 2(c).

31. Section 1.445 is amended by revising paragraphs (a)(4) and (5) and adding paragraph (a)(6) to read as follows:

§1.445 International application filing and processing fees.

(a) • • •

(4) The national fee, that is, the amount set forth as the filing fee under §1.16(a) through (d) credited one time only by an amount of $250 where an international search fee of $500.00 has been paid on the corresponding international application to the United States Patent and Trademark Office as an International Searching Authority. Where the amount of the credit is in excess of that required for the national fee, a request for a refund of the excess under §1.446(b) may be filed at the time of paying the national fee. Only one such credit is permitted based on a single $500.00 international search fee.

(5) Surcharge for filing the national fee or oath or declaration later than 20 months from the priority date $100.00

(6) For filing an English translation of an international application later than 20 months after the priority date (§1.61(b)).. $20.00

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32. Section 1.446 is amended by revising the section heading and paragraph (b) to read as follows:

§1.446 Refund of international application filing and processing fees.

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(b) Refund of a portion of the search fee toward payment of the national fee may be made one time to the extent set forth in §1.445(a)(4) if requested at the time of paying the national fee provided that a $500 search fee has been paid.

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33. Section 1.451 is amended by revising paragraphs (b) and (c) to read as follows:

§1.451 The priority claim and priority document in an international application.

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(b) Whenever the priority of an earlier United States national application is claimed in an international application, the applicant may request in a letter of transmittal accompanying the international application upon filing with the United States Receiving Office or in a separate letter filed in the Receiving Office not later than 16 months after the priority date, that the Patent and Trademark Office prepare a certified copy of the national application for transmittal to the International Bureau (PCT Article 8 and PCT Rule 17). The fee for preparing a certified copy is stated in §1.19(a)(3) and (b)(1).

(c) If a certified copy of the priority document is not submitted together with the international application on filing, or, if the priority application was filed in the United States and a request and appropriate payment for preparation of such a certified copy do not accompany the international application on filing or are not filed within 16 months of the priority date, the certified copy of the priority document must be furnished by the applicant to the International Bureau or to the United States Receiving Office within the time limit specified in PCT Rule 17.1(a).

34. Section 1.461 is amended by deleting paragraph (b) and by revising paragraph (a) to read as follows:

§1.461 Procedures for transmittal of record copy to the International Bureau.

(a) Transmittal of the record copy of the international application to the International Bureau shall be made by the United States Receiving Office.

(b) (reserved)

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DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Feb. 14, 1985.

[1053 OG 10]

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(134) Establishing Common Ownership of Patent Applications and/or Patents Owned by a Corporation or Other Organization

This notice is intended to simplify the practice of establishing common ownership of patent applications and/or patents in circumstances where the common owner is a corporation or other organization. Under 37 CFR 1.104(e), in order to establish common ownership "[i]n circumstances where the common owner is a corporation or other organization an affidavit or declaration may be signed by an official of the corporation or organization empowered to act on behalf of the corporation or organization." A mere power of attorney to prosecute a patent application does not make an individual an official of a corporation or organization or empower the individual to act on behalf of the corporation or organization in making an affidavit or declaration averring to common ownership. However, such an affidavit could be made by a patent attorney, patent agent, or other individual if the attorney, agent, or other individual has been appointed in writing by the corporation or organization as an official of the corporation or organization specifically empowered to make affidavits or declarations on its behalf averring to common ownership. In circumstances where such a written appointment has been given to a patent attorney, patent agent, or other individual, that person could then make affidavits or declarations averring to common ownership as long as the affidavit or declaration referred to an attached copy of the written appointment and averred that the authority is still in effect. Under this practice the original signed copy of the written appointment would be retained by the affiant or declarant unless the Patent and Trademark Office specifically required it to be filed. Unless some question arose as to the authority of the individual to make the averment as to common ownership, the Patent and Trademark Office would ordinarily not need to require the original signed copy of the written appointment. While this practice should simplify the establishing of common ownership by necessitating only one original signed written appointment, corporations and other organizations must exercise care that the written appointment is only given to those persons who are in a position to know that common ownership does in fact exist and can therefore properly make affirmative representations to that effect to the Patent and Trademark Office.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patent and Trademarks.

May 12, 1986.

[1067 OG 11]

MISCELLANEOUS

(135) Hearings Before the Board of Appeals

In recent years the backlog of cases awaiting decision by the Board of Appeals has grown substantially. The average time elapsing between filing of the examiner's answer and final disposition is now roughly 17 months. Intensive effort by the Board and greater use of acting examiners-in-chief have been successful in raising the number of dispositions, but at the same time the number of appeals continues to grow. Thus in the first six months of 1974, the Board disposed of 1,193 appeals but received 1,915; in the last half of the year the Board disposed of 1,993 appeals but received 2,179.

In this connection it will be helpful if applicants and attorneys will dispense with oral hearings except where unusual circumstances are present which make a hearing important to the decision. Appeals submitted on brief receive just as careful consideration as those in which oral argument is presented, nor are any implications drawn as to the merits of the appeal from failure to request a hearing. It has been the Board's experience that in the ordinary case the hearing is not of great value in arriving at the ultimate decision.

Appellants are also encouraged to review cases where a hearing has already been requested, with a view to withdrawing the request if it is not necessary. It is particularly important that the Board be given timely notice whenever circumstances prevent the applicant or his representative from the appearing at a scheduled hearing.

Rule 194 (37 CFR 1.194) limits oral argument to thirty minutes unless otherwise ordered by the Board. It has been the Board's experience, however, that effective arguments can be presented in less than thirty minutes in most cases. Effective immediately the Board will be informing appellants in the notices of hearing mailed to them that oral argument will be limited to *twenty minutes* unless otherwise ordered before the hearing begins.

The assistance of the public will be appreciated.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Mar. 20, 1975.

[933 O.G. 1010]

(136) **Hearings Before the Board of Patent Appeals and Interferences**

During the past twelve months there has been an increase in the number of *ex parte* appeals pending before the Board of Patent Appeals and Interferences. In order to address the growing backlog of pending appeals, it is necessary to make the most effective use of the time of Examiners-in-Chief hearing appeals. Significant amounts of time are spent by Examiners-in-Chief preparing for the hearings. In an effort to conserve the time spent in the preparation for hearing by Examiners-in-Chief, notice is hereby given that *subsequent* to the confirmation of attendance at oral hearing, requests for postponement of the hearing will not be granted in the absence of a showing of dramatically unusual circumstances.

SAUL I. SEROTA,
June 6, 1985. *Acting Chairman*
Board of Patent Appeals and Interferences.

[1056 OG 44]

(137) **Hearings Before the Board of Patent Appeals and Interferences**

Rule 1.3 (37 CFR 1.3) provides that:

"[a]pplicants and their attorneys or agents are required to conduct their business with the Patent and Trademark Office with decorum and courtesy."

Notice is hereby given that persons attending hearings before the Board of Patent Appeals and Interferences are advised that the above provision also applies to dress. If an attendee at a hearing is not appropriately dressed, the attendee may be requested to leave the hearing room.

SAUL I. SEROTA,
June 6, 1985. *Acting Chairman*
Board of Patent Appeals and Interferences.

[1056 OG 45]

(138) **Access to Interference Settlement Agreements by Government Agencies**

Under the provisions of 35 U.S.C. §135(c), a party to an interference filing a copy of a settlement agreement may request that the copy be kept separate from the file of the interference, and made available only to Government agencies on written request, or to any person on a showing of good cause.

In order to provide the parties with a record of the inspection of such agreements by Government agencies, a representative of an agency will henceforth be required to present a written request, similar to the following, for each interference in which the inspection and/or copying of the agreement(s) is desired:

Date:_____

To: Clerk, Board of Patent Interferences

Pursuant to the provisions of 35 U.S.C. 135(c), please permit . . . . . the bearer(s) of this letter, to [ ] inspect and/or [ ] copy the settlement agreement(s) filed in Interference No. . . . . The information gained from such inspection and/or copying will be kept in confidence and will not be disclosed to any other person except for official investigative or law enforcement purposes.

. . . . . Name, Title

. . . . . Agency

The request will be placed in the folder containing the copy of the agreement, where it may be inspected by the parties or their authorized representatives.

This procedure will be applicable only to inspection or copying by the representatives of Government agencies, since no person other than a representative of a Government agency, or of a party, will be granted access to a copy of an interference settlement agreement which is kept separate from the interference file except by way of a petition for access thereto, see M.P.E.P. §1002.02(k), item 2, and the parties to the interference are normally provided with copies of any such petition.

LUTRELLE F. PARKER,
June 5, 1978. *Acting Commissioner of Patents and Trademarks.*

[972 O.G. 2]

(139) **Accessibility of Non-Final Discovery Opinions and Orders Issued by the Board of Patent Interferences**

A number of inquiries have been received from the patent bar and other interested persons relating to discovery practice under 37 C.F.R. §1.287 before the Board of Patent Interferences. The inquiries indicate a need for making available to the public non-final Board opinions, including concurring and dissenting opinions, as well as orders, made in the adjudication of discovery matters before the Board. While non-final opinions need not be made available to the public [5 U.S.C. §552(a)(2)], in order to satisfy the need, copies of non-final opinions issued by the Board will be kept in a file in the Service Branch of the Board in the U.S. Patent and Trademark Office (Crystal Plaza, Building 6, Eleventh Floor, Room 1116, Arlington, Virginia). Opinions in the file may be reviewed by the public during normal business hours (8:30 A.M. to 5:00 P.M.). Copies of opinions may be made by the public on reproducing equipment in the Service Branch with tokens at a cost of $0.15 per page or copies may be ordered at a cost of $0.30 per page [37 C.F.R. 1.21(b)].

In view of the provisions of 35 U.S.C. §122 and 37 C.F.R. §1.11(a), a consent will be obtained by the Office from all parties in an interference before an opinion issued in connection with the interference is placed in the file if the interference file is not otherwise available to the public. Preliminary indications are that the parties and their counsel generally consent.

In order to obtain optimum dissemination of the information contained in the file, opinions placed therein will be indexed according to specific topics. Copies of the index will be updated from time to time as the need occurs. Specific questions relating to the index and file may be directed to the Patent Interference Examiners.

The initial index is as follows:

Index

1.00 Discovery in general [37 C.F.R. §1.287]
- 1.10 Requests and service under §1.287(a)
- 1.20 Requests under §1.287(b)
- 1.30 Motions for additional discovery under §1.287(c)
  - 1.31 Related to derivation
  - 1.32 Related to abandonment, suppression, and concealment
  - 1.33 Related to inequitable conduct
  - 1.34 Other
- 1.40 Motions under §1.287(d)(1)
- 1.50 Action under §1.287(d)(2)
- 1.60 Agreements under §1.287(e)

C. MARSHALL DANN,
Mar. 5, 1976 *Commissioner of Patents and Trademarks.*

[944 O.G. 2098]

(140) **Petitions in Interference Cases From Decisions of The Board on Motions for Additional Discovery Under 37 CFR 1.287(c)**

Notwithstanding the clear statement in the last sentence of 37 CFR 1.287(c), parties in interference cases continue to seek review by the Commissioner of decisions of the Board of Patent Interferences on motions for additional discovery under 37 CFR 1.287(c). Review of such a decision can be had along with judicial review of a decision on the question of priority. *Cochran* v. *Kresock*, 530 F.2d 385, 188 USPQ 553 (CCPA 1976); *Comstock* v. *Kroekel*, 200 USPQ 548 (Comm'r. Pat. 1978). Accordingly, parties in interference cases are reminded that a petition to the Commissioner should not be filed for the purpose of seeking review of an interlocutory decision of the Board granting or denying a motion for additional discovery under 37 CFR 1.287(c). See also *Fenstermacher* v. *Daugherty*, 189 USPQ 536 (Comm'r. Pat. 1975) and *Sheehan* v. *Doyle*, 202 USPQ 783 (Comm'r. Pat. 1978). The filing of such a petition only serves to delay the ultimate disposition of interferences on the merits. The filing of a paper for the mere purpose of delay is not permitted by the rules. 37 CFR 1.346. The Board of Patent Interferences will no longer grant a stay of proceedings pending disposition of a petition to the Commissioner seeking review of a decision of the Board on a motion for additional discovery under 37 CFR 1.287(c).

SIDNEY A. DIAMOND,
Apr. 17, 1980. *Commissioner of Patents and Trademarks.*

[994 O.G. 28]

(141) **Commissioner's Notice Practice under 37 CFR §1.225(b)**

When a junior party to an interference is placed under an order to show cause why judgment should not be entered pursuant to 37 CFR §1.225 and requests final hearing to contest an ancillary matter, either the junior or senior party may file a motion for permission to take testimony pursuant to 37 CFR §1.225(b) and the last sentence of 37 CFR §1.251(b). However, some uncertainty has arisen as to when the motion must be filed and what it must contain.

Motion by the Junior Party

When a junior party is placed under an order to show cause and the junior party desired a testimony period, the motion for permission to take testimony should be filed preferably before the time set for responding to the order to show cause. The motion will be considered timely, however, if filed no later than twenty (20) days after the Board of Patent Interferences enters an order setting final hearing.

There are instances where the requested testimony relates to priority. For example, the junior party may occasionally desire to take testimony to establish prior inventive acts alleged in a preliminary statement even though those acts are subsequent to the senior party's effective filing date. This situation arises when (1) the junior party's preliminary statement dates fall between the filing date of the senior party's involved application and the filing date of a prior application accorded to the senior party, (2) the junior party has unsuccessfully contended in a motion under 37 CFR §1.231 that the senior party should not be accorded benefit of the prior application, and (3) the junior party has requested final hearing to review the examiner's adverse decision on the motion.

When the requested testimony includes priority testimony, the motion to take testimony may be *pro forma, viz.*, a simple request that a testimony period be set to obtain priority evidence. Normally, however, when a junior party seeks to take testimony under 37 CFR §1.225(b), the proposed testimony relates solely to ancillary matters. When the requested testimony relates solely to ancillary matters, the motion must comply with the provisions of 37 CFR §1.225(b)—a showing of good cause must be submitted and a *pro forma* request would not be sufficient. See generally Rivise & Caesar, *Interference Law and Practice*, Vol. III, §§376–377 (1947).

Motion by the Senior Party

There are occasions when a senior party may desire a testimony period even if the junior party does not request a testimony period. See e.g., *Lorenian* v. *Winstead*, 127 USPQ 501 (Bd.Int. 1959). When a senior party desires a testimony period, the motion for permission to take testimony should be filed promptly after the Board of Patent Interferences enters an order setting final hearing, but in no event later than twenty (20) days after entry of such order. A senior party should take into account the fact that a junior party will begin preparation of a brief for final hearing after receiving notice of the briefing schedule. Therefore, a senior party should not be permitted to let a junior party expend unnecessary energy preparing a brief for final hearing if the senior party plans to move to take testimony.

As in the case of a junior party, a request to take testimony relating to priority may be *pro forma*. A request to take testimony limited to ancillary matters must comply with 37 CFR §1.225(b). See 37 CFR 1.251(b), last sentence.

RENE D. TEGTMEYER,
June 15, 1981. *Acting Commissioner of Patents and Trademarks.*

[1008 O.G. 9]

(142) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
Docket No. 40104-4151

Patent Interference Proceedings

Agency: Patent and Trademark Office, Commerce
Action: Final rule.
Summary: The Patent and Trademark Office is amending its rules of practice in patent interference cases. The Patent Law Amendments Act of 1984, Public Law 98-622, §§201-202, abolished the Board of Appeals and Board of Patent Interferences and created in their place a Board of Patent Appeals and Interferences which will decide *ex parte* appeals from adverse decisions of patent examiners and interference cases. The Patent and Trademark Office, through this amendment of its rules, intends to provide guidance on the procedures the Office will be following in conducting interference cases before the Board of Patent Appeals and Interferences.
Date: The effective date of these rules is: Feb. 11, 1985.
For Further Information Contact: Fred E. McKelvey by telephone at (703) 557-4025 (if no answer, message may be left at 703-557-4103) or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: The Patent and Trademark Office (PTO) conducts interference proceedings to determine who as between two or more applicants for patent or one or more applicants and one or more patentees is the first inventor of a patentable invention. Heretofore, the determination was made by a Board of Patent Interferences. The Patent Law Amendments Act of 1984, Public Law 98-622, §§201-202 combines the Board of Appeals and the Board of Patent Interferences into a single Board of Patent Appeals and Interferences (Board) and authorizes the Board to consider priority and patentability in interference cases.

In view of the discretion given the Board under 35 U.S.C. §135(a), as amended by Public Law 98-622 ("The Board . . . . may determine questions of patentability . . . ."), these new rules will apply to all interferences

declared on or after Feb. 11, 1985, except in special circumstances, such as: (1) interferences which are declared as a result of a motion made in another interference which was pending before the Board before Feb. 11, 1985, (e.g., an interference declared as a result of a motion under 37 CFR §1.231 to declare an additional interference); (2) an interference related to another interference declared prior to Feb. 11, 1985 (e.g., an interference involving a method of using a compound where an interference involving the same parties and the compound was declared prior to Feb. 11, 1985); and (3) an interference reinstituted after having been dissolved under the old rules (37 CFR §§1.201-1.288)(e.g., an interference reinstituted after having been dissolved as a result of a motion under 37 CFR §1.231 to dissolve on the grounds of unpatentability where the applicant has obtained allowance of the claims held unpatentable in the decision on motions).

Through these new rules the PTO seeks to improve interference procedure so that the rights of parties in interferences are determined at an early date and the overall process of examining patent applications which become involved in interferences is simplified.

In order to obtain maximum input from the public prior to formally proposing revisions to the rules, on Aug. 1, 1983, the PTO published in the *Federal Register* an advance notice of proposed rulemaking for interference rules. 48 F.R. 34836-34855. The advance notice was not published in the *Official Gazette*. Twenty-one written comments were received. All comments are available for public inspection in Rm. 10C01, Crystal Gateway II, 1225 Jefferson Davis Hwy., Arlington, Va.

On Jan. 30, 1984, the PTO published in the *Federal Register* a notice of proposed rulemaking. 49 F.R. 3768-3802. The notice was also published in the *Official Gazette* on Feb. 14, 1984. 1039 O.G. 11; 1039 TMOG 11.The notice also appeared in the Bureau of National Affairs' Patent, Trademark & Copyright Journal, Vol. 27, pp. 312-346 (Feb. 2, 1984), hereinafter 'BNA." Eighteen written comments were received in response to the notice of proposed rulemaking. The comments are analyzed herein. A hearing was held on May 15, 1984. Three individuals appeared at the hearing. Oral comments made at the hearing are also analyzed herein. The eighteen comments and copy of the transcript of the hearing are available for public inspection in Rm. 10C01, Crystal Gateway II, 1225 Jefferson Davis Hwy., Arlington, Va.

The new rules for interferences are set forth herein in §§1.601 through 1.688. The new rules replace entirely the present interference rules (37 CFR §§1.201 through 1.288). A "six hundred" number series is used for the new rules. The use of a six hundred number series for the new rules will permit interested individuals to research published decisions (e.g., F.2d, USPQ) or computerized legal research services (e.g., LEXIS) citing the new rules.

An index of the headings of §§1.601-1.688 and a table correlating 37 CFR §§1.201 through 1.288 (old rules) to §§1.601 through 1.688 (new rules) appears below.

Under the new rules, interferences are decided by the Board. The Board has jurisdiction to determine (1) priority of invention, (2) patentability of any claim corresponding to a count both as to applicants and patentees, (3) any issue of interference-in-fact as to any count, and (4) any other issue necessary to resolve the interference. The rules permit an interference to be declared on the basis of a single count defining one patentable invention in interferences involving patents as well as applications. The Board also has jurisdiction to determine whether counts are patentably distinct.

When an interference is declared, an examiner-in-chief is assigned to handle the interlocutory stages of the interference. An examiner having full signatory authority determines when one or more applications or one or more applications and a patent claim the same patentable invention. When the examiner makes such determination, the examiner will forward any involved applications or patents to the Board. The examiner will designate, at the time the involved applications or patents are sent to the Board, the claims of any application and patent which correspond to each count. The examiner-in-chief can subsequently designate additional claims to correspond to a count. The examiner-in-chief assigned to handle the interference will issue a notice to the parties declaring the interference.

The object of the interference will be to resolve all controversies as to all interfering subject matter defined by one or more counts. A final decision in the interference will determine who, if anyone, is entitled to claims which correspond to a count. Any decision adverse to an applicant by the Board will constitute a final refusal by the PTO to that applicant of the claims involved. Any decision adverse to a patentee constitutes cancellation from the patent of the claims involved.

Any decision by the Board on any issue is binding on the examiner and would govern further proceedings in the PTO.

The designation of a single examiner-in-chief to handle the interlocutory phases of an interference will permit better management of, and control over, interference proceedings. The rules provide that times be set and the examiner-in-chief exercise control over proceedings in the interference such that pendency of the interference before the Board from declaration to final decision will not normally exceed 24 months. The examiner-in-chief should be familiar with the history of the interference and will be accessible to counsel for the parties. For example, an examiner-in-chief, where appropriate, may conduct telephone conference calls to obtain agreement of the parties on the setting of schedules. The rules also permit the examiner-in-chief to hold hearings in the PTO or by conference telephone call in order to expedite or settle interlocutory issues in interferences. Any hearing can be transcribed by a court reporter under such conditions as an examiner-in-chief or the Board deems appropriate. The examiner-in-chief, where appropriate, will be available by phone to rule on the admissibility of evidence in the event parties encounter unusual problems during the taking of depositions. The examiner-in-chief will also be available to rule on requests for production of documents which take place during cross-examination. Oral orders given by phone will be followed by written orders.

At the time an interference is declared, the examiner-in-chief will set a time for filing preliminary motions. The preliminary motions can include:

(1) A motion for judgment on the ground that a claim corresponding to the count is not patentable to an opponent under 35 U.S.C. §§102, 103, 112, or any other provision of law.

(2) A motion for judgment on the ground that there is no interference-in-fact between the claims of the opponents in the interference.

(3) A motion to add or to substitute new counts, to amend a claim corresponding to a count, to designate an application or patent claim to correspond to a count, to designate an application or patent claim as not corresponding to a count, or to require an applicant to present a claim to be designated to correspond to a count.

(4) A motion to substitute another application for the application involved in the interference or to add an application for reissue to the interference.

(5) A motion to declare another interference.

(6) A motion to be accorded the benefit of an earlier application or to attack the benefit of an earlier application which has been accorded to an opponent.

Other motions are permitted as necessary, such as a motion to amend the count and/or a claim corresponding to the count in response to a preliminary motion for judgment.

Oppositions to motions are permitted if filed within a time set by the examiner-in-chief. Replies are also authorized. Papers which are not authorized by the rules or requested by the examiner-in-chief can be returned unfiled.

A preliminary statement will be filed prior to or concurrently with the preliminary motions outlined above.

Motions will be decided by an examiner-in-chief, who may consult with an examiner on questions of patentability which have not previously been decided by the examiner. The examiner-in-chief may grant a motion, deny a motion, defer consideration on the merits of a motion to final hearing, or take such other action with respect to a motion as may be appropriate, e.g., dismiss an entirely inappropriate motion.

At the time preliminary motions are decided, the preliminary statements will be opened. If a decision on a motion or inspection of the preliminary statement results in entry of an order to show cause why a judgment should not be entered, the party against whom judgment might be entered can request a hearing before the examiner-in-chief and two additional examiners-in-chief. The decision will govern further proceedings. If adverse, the decision will constitute a final agency action. If favorable, the interference will proceed before the examiner-in-chief.

After preliminary motions are decided and assuming judgment does not result, a period may be set for the parties to file motions for additional discovery. The scope of the additional discovery would be the same as under current practice.

When a time period is set for filing discovery motions, or after discovery has closed, the examiner-in-chief will set a period for taking testimony. Any party wishing to take the testimony of a witness can elect to have the testimony of the witness taken by deposition or presented by affidavit. A transcript of an *ex parte* deposition can be used as an affidavit. If an affidavit is presented, the opposing party may then cross-examine on oral deposition. Any redirect will take place at the deposition. The party calling the witness is responsible for securing a court reporter and filing the transcript and record associated with cross-examination of its witness.

In the event a party needs testimony from a third-party who will not appear unless a subpoena is issued, including a hostile witness, direct and cross-examination testimony may be taken on oral deposition. The rules provide that prior authorization of an examiner-in-chief is required before a party can take testimony by issuance of a subpoena under 35 U.S.C. §24. The rule thus adopts the policy of *Sheehan* v. *Doyle*, 513 F.2d 895, 898, 185 USPQ 489, 492 (1st Cir.), *cert. denied*, 423 U.S. 874 (1975), and *Sheehan* v. *Doyle*, 529 F.2d 38, 40, 188 USPQ 545, 546 (1st Cir.), *cert. denied*, 429 U.S. 870 (1976), *rehearing denied*, 429 U.S. 987 (1976), and rejects the policy announced in *Brown* v. *Braddick*, 595 F.2d 961, 967, 203 USPQ 95, 101-102 (5th Cir. 1979). Testimony obtained in other proceedings, e.g., another interference or an infringement action, may be used if otherwise admissible.

Under the rules, the Federal Rules of Evidence are made applicable to interferences, except for those portions which relate to criminal actions, juries, and other matters not relevant to interferences. Those portions include:

(1) Rule 103(c).

(2) Rule 104(c), (d), and (e).

(3) The language in Rule 105 which reads "and instruct the jury accordingly."

(4) Rule 201(g).

(5) The language in Rule 403 which reads "or misleading the jury."

(6) Rule 404(a)(1) and (2).

(7) The word "charge" in Rule 405(b).

(8) The language "or criminal" and proviso (ii) in Rule 410.

(9) Rule 412.

(10) Rule 606.

(11) The language "whether by an accused" and "other" in the last sentence of Rule 607.

(12) The provisions of the first sentence of Rule 611 (c) relating to leading questions on direct examination do not apply to statements made in an affidavit authorized to be filed under the rules.

(13) The language "Except as otherwise provided in criminal proceedings by section 3500 of title 18, United States Code" and "except that in criminal cases when the prosecution elects not to comply, the order shall be one striking the testimony or, if the court in its discretion determines that the interests of justice so require, declaring a mistrial" in Rule 612.

(14) Rule 614.

(15) Rule 706.

(16) The language "excluding, however, in criminal cases matters observed by police officers and other law enforcement personnel" and "and against the Government in criminal cases" in Rule 803(8).

(17) The language "but not including, when offered by the Government in a criminal prosecution for purposes other than impeachment, judgments against persons other than the second" in Rule 803(22).

(18) The language "prosecution for homicide or in a" in Rule 804(b)(2).

(19) The language "A statement tending to expose the declarant to criminal liability and offered to exculpate the accused is not admissible unless corroborating circumstances clearly indicate the trustworthiness of the statement" in Rule 804(b)(3).

(20) Rule 1101(a), (b), (d)(2), (d)(3), and (e).

The examiner-in-chief will set a period for filing the record and briefs. Oral hearings normally will be held before a panel consisting of the examiner-in-chief assigned to the interference and two other examiners-in-chief. The panel will render a final decision in the interference. Requests for reconsideration are permitted.

In rendering its decision, the Board will consider only that evidence which can be made available to the public under §1.11(a). Accordingly, the Board will not consider evidence which is submitted under a protective order issued by a court if release of that evidence under §1.11(a) would be inconsistent with the terms of the court's order.

A final decision of the Board is reviewable in the U. S. Court of Appeals for the Federal Circuit or an appropriate U. S. district court. Any reviewing court can review all aspects of the decision including patentability, priority, and all relevant interlocutory orders, such as denials of discovery.

Except as noted above, these new rules are applicable to all interferences declared on or after Feb. 11, 1985. Interferences declared prior to Feb. 11, 1985, continue to be governed by the prior rules (37 CFR §§1.201-1.288 (July 1, 1984)) and will be decided by personnel of the Board of Patent Appeals and Interferences. Actions presently taken by a patent interference examiner or examiners of interferences will be taken by an examiner-in-chief.

An anticipated time schedule for a two-party interference follows.

Sections 1.601 through 1.688 would introduce new concepts in interference practice. Some of the more significant aspects of the rules, as well as some of the new concepts, include the following.

Section 1.1 codifies a practice announced in a Commissioner's Notice of Nov. 28, 1983, "Mailing of Papers to the PTO in Patent Interference Proceedings," 1037 *Official Gazette* 25 (Dec. 27, 1983) and authorizes a party in an interference to direct mail to the PTO intended for the interference to a special box in the Mail Room for interference papers. Amendments copying claims which are filed prior to the time an interference is declared would continue to be addressed in accordance with §1.5(a).

Section 1.5 provides that when a paper filed in the PTO concerns an interference which has been declared, it should state the names of the parties (e.g., *Smith* v. *Jones*) and the number of the interference. The name of the examiner-in-chief assigned to the interference (§1.610) and the name of the party filing the paper should also appear conspicuously on the first page of the paper. Identification of the examiner-in-chief assigned to the interference and the name of the party filing the paper will greatly assist the Board in its administration of interference cases.

Section 1.8 excludes from the certificate of mailing practice any paper in an interference which an examiner-in-chief orders filed by hand or "Express Mail." Papers filed by "Express Mail" in an interference case would be addressed as set forth in §1.1(e).

Section 1.11 sets forth when the interference file would become available to the public without a petition for access.

Section 1.48 provides that when a request is filed to correct inventorship of an application involved in an interference, the request shall comply with the requirements of §1.48 and shall be accompanied by a motion under §1.634. The request will be placed in the file of the application and the motion will be placed in the file of the interference. The request will be decided as part of the interference.

Section 1.138 permits an attorney or agent to sign and file a paper abandoning an application involved in an interference.

Section 1.196 more clearly sets forth the options open to an applicant when the Board makes a new ground of rejection under §1.196(b). The last sentence of paragraph (b)(1) is intended to clarify practice in certain situations. One situation involves a case where (1) the Board affirms an examiner's rejection of a "first" claim and makes a new ground of rejection under §1.196(b) of a "second" claim, (2) the applicant elects to have further proceedings before the examiner on the new ground of rejection on the second claim, and (3) those proceedings do not result in a further appeal (i.e., the second claim is allowed or is cancelled). The last sentence of §1.196(b)(1) permits the Board to make its decision final on the first claim. By making its decision final on the first claim, the time period under §1.304 for seeking judicial review begins. Another situation involves a case where (1) the Board affirms an examiner's rejection of a claim over reference A, (2) the Board also enters a new ground of rejection of the claim over reference B, (3) the applicant elects to have further proceedings before the examiner on the new ground of rejection, and (4) those proceedings result in applicant overcoming the new ground of rejection based on reference B. The last sentence of §1.196(b)(1) permits the Board to make its decision final as to its affirmance of the rejection over reference A. Entry of an order making its decision final would start the period under §1.304 for seeking judicial review. Thus, an applicant does not forego possible judicial review by electing further prosecution before the examiner when a new ground of rejection is made by the Board. Under paragraph (d), a recommendation by the Board that an allowed claim be rejected is binding on the examiner (rather than being a mere recommendation as was previously the case) in the absence of (1) an amendment, (2) showing of facts by affidavit or other appropriate evidence, or (3) both. The last sentence of paragraph (d) is intended to clarify that the Board may enter a final decision in certain circumstances. When the Board affirms an examiner's rejection of a "first" claim and makes a recommendation under paragraph (d) as to a "second" claim, the application is remanded to the examiner and the Board's decision affirming the rejection of the first claim is not a final decision. If proceedings before the examiner on remand do not result in a further appeal (i.e., the second claim is allowed or is cancelled), the Board may then make its decision final as to the first claim. By making its decision final as to the first claim, the time period under §1.304 for seeking judicial review starts. Thus, an applicant does not forego judicial review on the first claim merely because of the remand proceedings with respect to the second claim.

Most of the current interference rules (§§1.201 through 1.247 and 1.251 through 1.288) are removed, but will continue to govern interferences declared prior to Feb. 11, 1985. Section 1.248 is retained and governs service of papers in all patent cases except interference proceedings. Section 1.646 governs service of papers in interference proceedings.

Under §1.292, it is intended to modify public use proceedings only to the extent that public use and on sale issues which arise during an interference shall be raised by a preliminary motion under §1.633(a). There is no fee for filing the motion in the interference, but a fee would continue to be necessary when a petition is filed for institution of a public use proceeding apart from an interference. When a public use proceeding is instituted apart from an interference, the Commissioner will designate an appropriate official to conduct the proceeding including the setting of times for taking testimony under §§1.671 through 1.685. There will continue to be no "additional discovery" (see §§1.687 and 1.688) in public use proceedings.

Section 1.304 makes clear that the provisions of §1.136 do not apply when judicial review is sought of a decision of the Board of Patent Appeals and Interferences in (1) a reexamination proceeding or (2) an interference. An extension of time to seek judicial review of a decision of the Board in a reexamination proceeding may be obtained under §1.550(c). An extension of time to seek judicial review of a decision of the Board in an interference proceeding may be obtained under §1.645. Section 1.304 also establishes an "excusable neglect" standard for seeking judicial review in interference cases when a notice of appeal is untimely filed or a civil action is not timely commenced. The excusable neglect standard is intended to be the same as the standard under Rule 4(a)(5) of the Federal Rules of Appellate Procedure.

Section 1.322 provides that when a request for a certificate of correction under 35 U.S.C. §254 (PTO mistake) is filed to make a correction of a patent involved in an interference, the request shall comply with the requirements of §1.322 and shall be accompanied by a motion under §1.635. The request will be placed in the file of the patent and the motion will be placed in the file of the interference. The request will be decided as part of the interference.

Section 1.323 provides that when a request for a certificate of correction under 35 U.S.C. §255 (patentee's mistake) is filed to make a correction of a patent involved in an interference, the request shall comply with the requirements of §1.323 and shall be accompanied by a motion under §1.635. The request will be placed in the file of the patent and the motion will be placed in the file of the interference. The request will be decided as part of the interference.

Section 1.324 provides that when a request is filed to correct inventorship of a patent involved in an interference, the request shall comply with the requirements of §1.324 and shall be accompanied by a motion under proposed§1.634. The request will be placed in the file of the patent and the motion will be placed in the file of the interference. The request will be decided as part of the interference.

Section 1.565 provides that when a patent is involved in an interference proceeding and a reexamination proceeding, both the interference proceeding and the reexamination proceeding *will* continue unless one of the proceedings is stayed. A stay of a reexamination proceeding will be made by the Commissioner. A stay of an interference proceeding will be made by an examiner-in-chief, subject to review by the Commissioner. Section 1.565 continues the present practice of the Commissioner determining in every instance whether to stay a reexamination proceeding when the patent involved in the reexamination proceeding is sought to be reissued or becomes involved in litigation.

Under §1.601, the rules shall be construed to secure the just, speedy, and inexpensive determination of interferences. Section 1.601 defines various terms used in Subpart E including "additional discovery," "affidavit," "case-in-chief," "case-in-rebuttal," "count," "effective filing date," "filing date," "interference," "interference-in-fact," "junior party," "lead" attorney, "party," "phantom count," "same patentable invention," "separate patentable invention," "senior party," "sworn," and "United States." "Affidavits" include declarations under 35 U.S.C. §25 and 37 CFR §1.68 as well as statutory declarations under 28 U.S.C. §1746. The definition of "United States" is the same as the definition of United States in 35 U.S.C. §100(c).

The definition of "interference" permits an interference between one or more applications and one or more patents. Thus, these new rules follow the policy of Wilson v. Yakel, 1876 Dec. Comm'r. Pat. 245 (Comm'r.Pat. 1876) and, to the extent inconsistent therewith, do not follow the policy announced in *Touval* v. *Newcombe*, 194 USPQ 509 (Comm'r.Pat. 1976). However, in view of the statutory requirement for the presence of at least one application in an interference, if an applicant were to concede priority or otherwise be terminated from an interference involving only one application and more than one patent, the interference would have to be terminated for lack of subject matter jurisdiction unless one or more of the patentees filed an application for reissue which could be added to the interference under §1.633(h). A "count" defines interfering subject matter. An interference may have two counts only if the second count defines a "separate patentable invention" from the first count. The reason the second count must define a separate patentable invention is to permit the PTO to lawfully issue separate patents to different parties in an interference when a single party does not prevail as to all counts. A "separate patentable invention" is defined in §1.601(n):

> Invention (A) is a "separate patentable invention" with respect to invention (B) when invention (A) is new (35 U.S.C. §102) and non-obvious (35 U.S.C. §103) in view of invention (B) assuming invention (B) is prior art with respect to invention (A).

Section 1.602(a) continues the present PTO practice (37 CFR §1.201(c)) of not declaring or continuing an interference between (1) two or more applications owned by the same party or (2) an application and a patent owned by a single party unless good cause is shown. A corporation and its wholly-owned subsidiary are considered a "single party" within the meaning of §1.602(a). Under prior rules, when a patent and an application involved in an interference became commonly owned, the interference was not "dissolved." Rather, the PTO required that the interference be terminated with a judgment. *Chillas* v. *Weisberg*, 1928 Dec. Comm'r. Pat. 24 (Comm'r.Pat. 1928); *Malone* v. *Toth*, 202 USPQ 397 (Comm'r.Pat. 1978); and *Morehouse* v. *Armbruster*, 209 USPQ 514 (Comm'r.Pat. 1980). Under these new rules, all interferences, including those involving only applications, will be terminated with a judgment. As noted in *Chillas* v. *Weisberg, supra* at 25 "the common owner can allow a judgment against the junior party to be rendered by default or it can file a concession of priority from one party to the other." Paragraphs (b) and (c) of §1.602 continue the present PTO practice (37 CFR §1.201(c)) of requiring a party to notify the PTO of any real party in interest not apparent on the face of the notice declaring the interference (see §1.611) or of any change in the real party in interest after the interference is declared. The PTO needs to know the identity of any real party in interest to properly enforce §1.602(a) and to enable an examiner-in-chief to determine whether recusal is necessary or appropriate. A new requirement in paragraphs (b) and (c), not present in 37 CFR §1.201(c), is a 20-day time period for advising the PTO of the identity of, or any change in, the real party in interest.

Under §§1.601(f), 1.603, and 1.606, the interfering subject matter would be defined by one or more counts. All the claims in an application or a patent which define the same patentable invention as a count would be designated to correspond to the count. An interference would have two counts only if one count defines a separate patentable invention from another count. Under §1.606, at the time an interference is declared between a patent and an application, a count would not be narrower in scope than any patent claim which corresponds to the count. Thus, a patent claim would be presumed, subject to a motion under §1.633(c), not to embrace "separate patentable inventions." Some examples illustrate how the PTO would formulate counts and designate patent and application claims to correspond to counts.

Example 1: Application A contains patentable claim 1 (engine). Application B contains patentable claim 8 (engine). If an interference is declared, there would be one count (engine). Claim 1 of application A and claim 8 of application B would be designated to correspond to the count.

Example 2: Application C contains patentable claims 1 (engine) and 2 (6-cylinder engine). Application D contains patentable claim 8 (engine). An engine and a 6-cylinder engine define the same patentable invention. If an interference is declared, there would be one count (engine). Claims 1 and 2 of application C and claim 8 of application D would be designated to correspond to the count.

Example 3: Application E contains patentable claims 1 (engine), 2 (6-cylinder engine), and 3 (engine with a platinum piston). Application F contains patentable claims 11 (engine) and 12 (8-cylinder engine). Claims 1 and 2 of application E and claims 11 and 12 of application F define the same patentable invention. Claim 3 of application E defines a separate patentable invention from claims 1 and 2 of application E and claims 11 and 12 of application F. If an interference is declared, there would be one count (engine). Claims 1 and 2 of application E and claims 11 and 12 of application F would be designated to correspond to the count. Claim 3 of application E would not be designated to correspond to the count.

Example 4: Application G contains patentable claims 1 (engine), 2 (6-cylinder engine), and 3 (engine with a platinum piston). Application H contains patentable claims 11 (engine) and 15 (engine with a platinum piston). Claims 1 and 2 of application G and claim 11 of application H define the same patentable invention. Claim 3 of application G and claim 15 of application H define a separate patentable invention from claims 1 and 2 of application G and claim 11 of application H. If an interference is declared, there would be two counts: Count 1 (engine) and Count 2 (engine with a platinum piston). Claims 1 and 2 of application G and claim 11 of application H would be designated to correspond to Count 1. Claim 3 of application G and claim 15 of application H would be designated to correspond to Count 2.

Example 5: Application J contains patentable claims 1 (engine), 2 (combination of an engine and a carburetor) and 3 (combination of an engine, a carburetor, and a catalytic converter). Application K contains patentable claims 31 (engine), 32 (combination of an engine and a carburetor), and 33 (combination of an engine, a carburetor, and an air filter). The engine, combination of an engine and carburetor, and combination of an engine, carburetor, and air filter define the same patentable invention. The combination of an engine, carburetor, and catalytic converter define a separate patentable invention from engine. If an interference is declared, there would be one count (engine). Claims 1 and 2 of application J and claims 31, 32, and 33 of application K would be designated to correspond to the count. Claim 3 of application J would not be designated as corresponding to the count.

Example 6: The PTO will continue to follow *Waldeck* v. *Lewis*, 120 USPQ 88 (Comm'r.Pat. 1955). Application L contains patentable claims 1 (Markush group of benzene or toluene), 2 (benzene), and 3 (toluene). Application M contains patentable claim 11 (benzene). Benzene and toluene define the same patentable invention. If an interference is declared, there would be one count (Markush group of benzene or toluene). Claims 1, 2, and 3 of application L and claim 11 of application M would be designated to correspond to the count.

Example 7: Application N contains patentable claim 1 (benzene). Application P contains patentable claim 11 (xylene). Benzene and xylene define the same patentable invention. If an interference is declared, there would be one count (benzene or xylene). Claim 1 of application N and claim 11 of application P would be designated to correspond to the count.

Example 8: Application Q contains patentable claims 1 (Markush group of benzene or chloroform), 2 (benzene), and 3 (chloroform). Application R contains patentable claim 33 (benzene). If benzene and chloroform define the same patentable invention and an interference is declared, there would be one count (Markush group of benzene or chloroform). Claims 1, 2, and 3 of application Q and claim 33 of application R would be designated to correspond to the count. If chloroform defines a separate patentable invention from benzene and an interference is declared, there would be one count (benzene). Claims 1 and 2 of application Q and claim 33 of application R would be designated to correspond to the count. Claim 3 of application Q would not be designated to correspond to the count.

Example 9: Application S contains patentable claims 1 (Markush group of benzene or chloroform), 2 (benzene), and 3 (chloroform). Application T contains patentable claims 11 (Markush group of benzene or chloroform), 12 (benzene), and 13 (chloroform). If benzene and chloroform define the same patentable invention and an interference is declared, there would be one count (Markush group of benzene or chloroform). Claims 1, 2, and 3 of application S and claims 11, 12, and 13 of application T would be designated to correspond to the count. The PTO will continue to adhere to *Becker* v. *Patrick*, 47 USPQ 314 (Comm'r.Pat. 1939). An interference can have two counts only if one count defines a separate patentable invention from another count. If chloroform defines a separate patentable invention from benzene and an interference is declared, there would be two counts: Count 1 (benzene) and Count 2 (chloroform). Claims 1 and 2 of application S and claims 11 and 12 of application T would be designated to correspond to Count 1. Claims 1 and 3 of application S and claims 11 and 13 of application T would be designated to correspond to Count 2.

Example 10: Patent A contains claim 1 (engine). Application U contains patentable claim 11 (engine). If an interference is declared, there would be one count (engine). Claim 1 of patent A and claim 11 of application U would be designated to correspond to the count.

Example 11: Patent B contains claims 1 (engine) and 2 (6-cylinder engine). Application V contains patentable claim 8 (engine). An engine and a 6-cylinder engine define the same patentable invention. If an interference is declared, there would be one count (engine). Claims 1 and 2 of patent B and claim 8 of application V would be designated to correspond to the count.

Example 12: Patent C contains claims 1 (engine), 2 (6-cylinder engine), and 3 (engine with a platinum piston). Application W contains patentable claims 11 (engine) and 12 (8 cylinder engine). Claims 1 and 2 of patent C and claims 11 and 12 of application W define the same patentable invention. Claim 3 of patent C defines a separate patentable invention from claims 1 and 2 of patent C and claims 11 and 12 of application W. If an interference is declared, there would be one count (engine). Claims 1 and 2 of patent C and claims 11 and 12 of application W would be designated to correspond to the count. Claim 3 of patent C would not be designated to correspond to the count.

Example 13: Patent D contains claim 1 (engine), 2 (6-cylinder engine), and 3 (engine with a platinum piston). Application X contains patentable claims 11 (engine) and 15 (engine with a platinum piston). Claims 1 and 2 of patent D and claim 11 of application X define the same patentable invention. Claim 3 of patent D and claim 15 of application X define a separate patentable invention from claims 1 and 2 of patent D and claim 11 of application X. If an interference is declared, there would be two counts: Count 1 (engine) and Count 2 (engine with a platinum piston). Claims 1 and 2 of patent D and claim 11 of application X would be designated to correspond to Count 1. Claim 3 of patent D and claim 15 of application X would be designated to correspond to Count 2.

Example 14: Patent E contains claims 1 (Markush group of benzene or toluene), 2 (benzene), and 3 (toluene). Application Y contains patentable claim 11 (benzene). Benzene and toluene define the same patentable invention. If an interference is declared, there would be one count (Markush group of benzene or toluene). Claims 1, 2, and 3 of patent E and claim 11 of application Y would be designated to correspond to the count.

Example 15: In this example, the claims of patent E and application Y in Example 14 are reversed. Patent E contains claim 1 (benzene). Application Y contains patentable claims 11 (Markush group of benzene or toluene), 12 (benzene), and 13 (toluene). If an interference is declared, the count would be the same as the count in Example 14—(Markush group of benzene or toluene). Claim 1 of patent E and claims 11, 12, and 13 of application Y would be designated to correspond to the count.

Example 16: The PTO will continue to follow cases such as *Case* v. *CPC International, Inc.*, 730 F.2d 745, 221 USPQ 196 (Fed. Cir. 1984); *cert. denied*, 105 S.Ct. 233 (1984); *Aelony* v. *Arni*, 547 F.2d 566, 192 USPQ 486 (CCPA 1977); and *Nitz* v. *Ehrenriech*, 537 F.2d 539, 190 USPQ 413 (CCPA 1976), and declare interferences where interfering patent and application claims are mutually exclusive provided the claims define the same patentable inventicn. Patent F contains claim 1 (benzene). Application Z contains patentable claim 11 (xylene). Benzene and xylene define the same patentable invention. If an interference is declared, there would be one count (benzene or xylene). Claim 1 of patent F and claim 11 of application Z would be designated to correspond to the count.

Example 17: It will be the practice of the PTO under §1.606 to initially declare interferences with counts which are identical to or broader than patent claims which correspond to the counts. A single patent claim would be presumed, subject to a motion under §1.633(c), not to define separate patentable inventions. Patent G contains claim 1 (Markush group of benzene or chloroform), 2 (benzene), and 3 (chloroform). Application AA contains patentable claim 33 (benzene). If an interference is declared, initially it would be presumed by the PTO, subject to a later motion under §1.633(c), that benzene and chloroform define the same patentable invention. There would be one count (Markush group of benzene or chloroform). Claims 1, 2, and 3 of patent G and claim 33 of application AA would be designated to correspond to the count. If a party believes benzene and chloroform define separate patentable inventions, that party could file a motion under §1.633(c) to redefine the count and the claims corresponding to the counts.

Example 18: Patent H contains claims 1 (Markush group of benzene or chloroform), 2, (benzene), and 3 (chloroform). Application AB contains patentable claims 11 (Markush group of benzene or chloroform), 12 (benzene), and 13 (chloroform). Benzene and chloroform initially would be presumed, subject to a motion under §1.633(c), to define the same patentable invention, because they are recited as a Markush group in a single patent claim. If an interference is declared, there would be one count (Markush group of benzene or chloroform). Claims 1, 2, and 3 of patent H and claims 11, 12, and 13 of application AB would be designated to correspond to the count. If a party believes benzene and chloroform define separate patentable inventions, the party could move under §1.633(c) to substitute a count (benzene) for (Markush group of benzene or chlcrcfcrm) and to add a count (chloroform). See Example 36.

Example 19: Under §1.606, the PTO will continue to follow the practice announced in *Ex parte Card and Card*, 1904 Dec.Comm'r.Pat. 383 (Comm'r.Pat. 1904). Patent J contains claim 1 (method of mixing, grinding, and heating). Application AC ccntains patentable claim 8 (method of mixing and heating) and does not disclose or claim a grinding step. In the context of the inventions disclosed in patent J and application AC, a method of mixing, grinding, and heating is the same patentable invention as a method of mixing and heating. Under current practice, it would be said that "grinding" is an "immaterial" limitation in claim 1 of patent J. Under §1.606, the fact application AC does not disclose grinding would not preclude an interference. If an interference is declared, there would be one count (method of mixing and heating). Claim 1 of patent J and claim 8 of application AC would be designated to correspond to the count.

Under §1.605, timely filing of an amendment presenting a claim suggested by the examiner for purposes of an interference would stay *ex parte* proceedings in the application in which the claim is presented pending a determination by the examiner of whether an interference will be declared. Also under §1.605(a), when an examiner suggests a claim, the applicant will be required to copy verbatim the suggested claim. At the time the suggested claim is copied, however, the applicant may also (1) call the examiner's attention to other claims already in the application or which are presented with the copied claim and (2) explain why the other claims would be more appropriate to be included in any interference which may be declared.

Under §1.607(b), when an applicant seeks an interference with a patent, e.g., by copying claims from the patent, examination of the application including any appeal would be handled with special dispatch within the PTO. "Special dispatch" would be construed to be the same as special dispatch in a reexamination proceeding. See 35 U.S.C. §305.

Under §1.608, the PTO will continue current practice (37 CFR §1.204(c)) of requiring an applicant seeking to provoke an interference with a patent to submit evidence which demonstrates that the applicant is *prima facie* entitled to a judgment relative to the patentee. Evidence would be submitted only when the earlier of the filing date or effective filing date of the application is more than three months after the earlier of the filing date or effective filing date under 35 U.S.C. §120 of the patent. The evidence may relate to patentability and need not be restricted to priority. When the evidence (1) consists of prior printed publications and patents and (2) shows that the claims of the application are not patentable, the claims in the application would be rejected and the applicant could file a request for reexamination of the patent.

Section 1.609 sets forth what an examiner shall forward to the Board when an interference is declared. For the most part, §1.609 continues current practice. However, under §1.609(b)(3), the examiner would identify all claims in an application which the examiner believes are patentable over the proposed counts. Thus, a claim in an application would either correspond to a count or would be indicated as being patentable over the count. For instance, in Example 3, *supra*, the examiner would indicate that (1) claims 1 and 2 of application E and claims 11 and 12 of application F correspond to the count and (2) claim 3 of application E defines a separate patentable invention from the count.

Under §1.610, each interference will be declared by an examiner-in-chief. The examiner-in-chief enters all interlocutory orders in the interference. As necessary, another examiner-in-chief may act in place of the examiner-in-chief assigned to the interference. At the discretion of the examiner-in-chief assigned to the interference, a panel of two or more examiners-in-chief may enter an interlocutory order. The examiner-in-chief will set times and control proceedings such that pendency of the interference normally will not exceed 24 months. Under §1.610(d), the examiner-in-chief is authorized to hold conferences. Any conference can be by a telephone conference call. Under §1.610(e), an examiner-in-chief is authorized to determine a proper course of conduct for any situation not specifically covered by the rules.

Under §1.611(a), the PTO will normally notify each party at its correspondence address (37 CFR §1.33(a)) that an interference is declared. This practice will save the PTO the administrative burden of sending multiple notices as is required by the present rules. Under §1.611(a), the PTO could, in an appropriate circumstance, also send a notice to a patentee or an assignee. An appropriate circumstance for sending an additional notice would be a situation where a patent was issued on the basis of an application filed under 37 CFR §1.47. The matters to be specified in a notice declaring an interference are set out in §1.611(c). One item to be set out is the "order of the parties," meaning the order in which the parties will take testimony. If Jones is the junior party and Smith is the senior party, the order of the parties is: Jones v. Smith. The order of the parties may change as a result of the granting of a motion under §1.633(d), (f), or (g). Under §1.611(d), the notice declaring the interference may also set dates for filing preliminary statements, notices that preliminary statements have been filed, motions under §1.633, oppositions to those motions, and replies to the oppositions. Alternatively, an examiner-in-chief may set those times in a separate order before or after consultation with counsel for the parties. Under §1.611(e), the PTO may place a notice in the *Official Gazette* each time an interference is declared involving a patent. The notice would make it easier for patent practitioners throughout the country to determine whether a given patent is or has been involved in an interference.

Under §1.612, except for affidavits under §1.131 and any evidence and explanation under §1.608(b) filed separate from an amendment, each party shall have access to the file of every other party after an interference is declared. The files of applications and patents involved in an interference will be maintained if the Service Branch of the Board of Patent Appeals and Interferences for inspection and copying. Any explanation which is filed as part of an amendment or an amendment which discusses details contained in an affidavit under §1.131 would not be sealed under §1.612(a). Thus, §1.612(a) continues the practice discussed in *Moorman* v. *Martin*, 103 USPQ 273 (Comm'r.Pat. 1950) and Calvert, *An Overview of Interference Practice*, 62 J. Pat. Off. Soc'y. 290, 293 (1980). Under§1.612(b), each party will have access to an opponent's affidavit under §1.131 or an opponent's evidence and explanation under §1.608(b) when a decision is rendered on motions under §1.633. Under §1.612(c), a party would be required to serve any evidence and explanation under §1.608(b) if an order to show cause is issued under §1.617(a) and the party responds to the order under§1.617(b). Under §1.612(d), the parties may agree to exchange copies of their respective files.

Under §1.613(a), when a party has appointed more than one attorney or agent of record, the party may be required to designate a "lead" attorney or agent. A lead attorney or agent would be a registered attorney or agent of record who is primarily responsible for prosecuting an interference on behalf of a party and is the individual whom an examiner-in-chief can contact to set times and take other action in the interference. Section 1.613(b) continues the practice of not permitting the same attorney or agent to represent two or more parties in an interference except as permitted by Chapter 1, see e.g., §1.344. Under §1.613(c), an examiner-in-chief can make an appropriate inquiry to determine whether an attorney or agent should be disqualified from representing a party. A final decision to disqualify an attorney or agent is made by the Commissioner under 35 U.S.C. §32.

Section 1.614 specifies when the Board gains jurisdiction over an interference. The section also indicates when an interference becomes a contested case within the meaning of 35 U.S.C. §24. A remand to the examiner is authorized and may be useful in certain situations, such as, when a party moves under §1.633(c) to add a proposed count which is broader than any count in an interference. Alternatively, an examiner-in-chief would be able to obtain informal opinions from examiners during the course of an interference. Nothing in the rules, however, is intended to authorize informal conferences between an examiner-in-chief and an examiner with respect to the merits of an application before the Board in an *ex parte* appeal from an adverse decision of the examiner.

Section 1.616 permits an examiner-in-chief or the Board to impose appropriate sanctions against a party who fails to comply with the rules or with an order en-

tered in the interference. Paragraphs (a) through (e) set forth some of the possible sanctions which can be entered. The particular sanction to be entered would depend on the facts of a given case and ordinarily would not be entered prior to giving the affected party an opportunity to present its views. An individual examiner-in-chief could not impose a sanction granting judgment inasruch as entry of a judgment requires action by the Board. See §1.610(a). A party desiring sanctions imposed against an opponent could move under §1.635 for entry of an order imposing sanctions.

Section 1.617 retains summary judgment proceedings in those cases where a junior party applicant is required to file evidence and an explanation under §1.608(b). To avoid summary judgment, the junior party applicant must establish that it is *prima facie* entitled to judgment relative to the senior party patentee. For the most part, practice under §1.617 will be the same as the current practice under 37 CFR §1.228. The major changes would be the following: (1) A *prima facie* case could be based on patentability as well as priority. (2) A stricter standard would be imposed for presenting additional evidence after entry of an order to show cause. Under current practice (37 CFR §1.228), additional evidence may be submitted with a response to an order to show cause "when a showing in excuse of . . . [its] omission from the original" showing is made. The "good cause" showing required by §1.617(b) imposes a stricter standard than was required under the prior rules. The stricter standard is necessary to encourage applicants copying claims from a patent to better prepare their initial showings under proposed §1.608(b). Under current practice, the Board of Patent Interferences has found that substantial time is lost in issuing orders to show cause based on an inadequate initial showing only to have an adequate showing made with the response to the order to show cause. Under the "good cause" standard, ignorance by a party or counsel of the provisions of the rules or the substantive requirements of the law would not constitute good cause. (3) When an interference involves more than two parties, all opponents would be permitted to participate in summary judgment proceedings. Thus, the new rules overrule *Chan* v. *Akiba* v. *Clayton,* 189 USPQ 621 (Comm'r.Pat. 1975). (4) Currently, an applicant must file two copies of its initial showing under 37 CFR §1.204(c). Under §1.608(b), a party would file only one copy of the showing. However, any party responding to an order to show cause would be required to serve a copy of its initial showing under §1.608(b) with any response to the order to show cause. (5) A single examiner-in-chief may order an interference to proceed after issuance of an order to show cause under§1.608(b) and the filing of a response by an applicant under §1.617(b). Only the Board, however, may enter a summary judgment. See §1.617(b).

Under §1.618, the PTO has authority to return to a party any paper presented in an interference which is not authorized by, or is not in compliance with the requirements of, Subpart E. When an improper paper is filed, a party may be given an opportunity to file a proper paper under such conditions as an examiner-in-chief may deem appropriate. Two examples of improper papers are: (1) replies to replies which are not authorized by the rules and (2) papers presented which have attached thereto a paper previously filed in the interference.

Sections 1.621 through 1.629 govern preliminary statements which continue to be required in interference cases.

Under §1.621, a preliminary statement can be signed by any individual having knowledge of the facts (e.g., the inventor) or by an attorney or agent of record. Permitting an attorney or agent of record to sign a preliminary statement eliminates unnecessary mailing of papers between parties and their attorney or agent.

Under §1.622, the preliminary statement would identify the inventor who made the invention defined by each count. If the inventor identified in the preliminary statement is not an inventor named in the application or patent involved in the interference, a motion under §1.634 must be diligently filed to correct inventorship.

Sections 1.623, 1.624, and 1.625 respectively set out the allegations which should be made in, and the attachments which should accompany, a preliminary statement when (1) the invention was made in the United States, (2) the invention was made abroad and was introduced into the United States, and (3) derivation by an opponent from a party is to be an issue.

Section 1.626 permits a party to file a preliminary statement which states that the party only intends to rely on the filing date of an earlier United States or foreign application. Ordinarily, a junior party who fails to file a preliminary statement is not entitled to access to any other preliminary statement filed (see §1.631(b)). Section 1.626 would permit a junior party who only intends to rely on an earlier application to have access to any opponent's preliminary statement.

Section 1.628 sets out how an error in a preliminary statement may be corrected.

Section 1.629 sets out the effect of a preliminary statement. A party who fails to file a preliminary statement will not be permitted to prove (1) that the party made the invention defined by a count prior to the party's filing date or (2) that an opponent derived the invention from the party.

Under §1.631, preliminary statements normally will be opened for inspection when an examiner-in-chief decides preliminary motions filed under §1.633. A junior party who does not file a preliminary statement is not entitled to access to a preliminary statement of any other party. When an interference is terminated before preliminary statements are opened, any preliminary statement which has been filed will be returned unopened to the party who submitted the statement.

Under §1.632, a notice must be filed by a party who intends to argue that an opponent abandoned, suppressed, or concealed an actual reduction to practice. 35 U.S.C. §102(g). A party will not be permitted to brief (§1.656) or argue at final hearing (§1.654) that an opponent abandoned, suppressed, or concealed an actual reduction to practice unless the notice is timely filed. A notice is timely if filed within ten (10) days of the close of the testimony-in-chief period of an opponent. While a party has the burden of proving that an opponent abandoned, suppressed, or concealed, the burden may be discharged on the basis of the opponent's evidence alone. *Shindelar* v. *Holdeman,* 628 F.2d 1337, 207 USPQ 112 (CCPA 1980). See also *Correge* v. *Murphy,* 705 F.2d 1326, 217 USPQ 753 (Fed. Cir. 1983); *Horwath* v. *Lee,* 564 F.2d 948, 195 USPQ 701 (CCPA 1977); and *Peeler* v. *Miller,* 535 F.2d 647, 190 USPQ 117 (CCPA 1976). Under current practice where notice is not required, it is possible that a party may learn for the first time that abandonment, suppression, or concealment is an issue when the party receives an opponent's brief at final hearing. See *Klug* v. *Wood,* 212 USPQ 767, 771 n. 2 (Bd.Pat.Int. 1981). At that point, it is often too late to reopen proceedings in the interference. The purpose of requiring the notice under §1.632 is to make the parties and the Board aware during the interlocutory stage of an interference that abandonment, suppression, or concealment may be an issue in the interference. Early notice will permit the parties to ask for and the examiner-in-chief to set appropriate testimony periods for a party to present evidence related to abandonment, suppression, and concealment, particularly in those cases where long unexplained delays tend to prove the allegation of suppression or concealment. Early notice will also eliminate the need for the party moving to reopen the testimony period. *Klug* v. *Wood, supra.*

Under §1.633, a party may file preliminary motions for judgment, to redefine the interference, to substitute a different application in the interference, to declare an additional interference, to be accorded the benefit of an earlier application, to attack benefit previously accorded an opponent, or to add a reissue application to the interference. The motions are called "preliminary motions" in order to distinguish the motions from other motions

which might be filed during the course of an interference. The preliminary motions would replace motions currently authorized by 37 CFR §1.231.

Under §1.633(a), a motion to dissolve would be replaced with a motion for judgment. A party can file a motion for judgment on the ground that an opponent's *claim* corresponding to a count is unpatentable to the opponent. With two exceptions, unpatentability can be based on prior art (35 U.S.C. §§102, 103), insufficiency of disclosure (35 U.S.C. §112, first paragraph), indefiniteness of claims (35 U.S.C. §112, second paragraph), double patenting, estoppel, or any other ground which would support a holding that claims corresponding to a count are not patentable. The two exceptions are (1) priority of invention of the subject matter of a count by the moving party as against any opponent and (2) derivation of the subject matter of a count by the opponent from the moving party. The two exceptions are directed to issues which are traditional "priority" issues, e.g., which inventor made the invention defined by a count first or, when derivation is an issue, who made the invention. Resolution of those "priority" issues almost always requires the taking of testimony. A motion for judgment, however, would be proper when a party believed an individual not involved in the interference made the invention defined by the count prior to an opponent in the interference, but subsequent to the moving party. Thus, a patentability issue, such as that raised under 35 U.S.C. §102(g) in *Sutter Products Co.* v. *Pettibone Mulliken Corp.,* 428 F.2d 639, 166 USPQ 100 (7th Cir. 1970), properly could be raised with a motion for judgment under§1.633(a). Derivation by an opponent from an individual not involved in the interference could also be raised under §1.633(a).

Under §1.633(b), a party could move for a judgment when the party believes there is no interference-in-fact. A motion for judgment on the ground of no interference-in-fact is only proper under one of three conditions: (1) when an interference involves designs, (2) when the interference involves plant applications or a plant application and plant patent, or (3) when no claim of a party which corresponds to a count is identical to any claim of an opponent which corresponds to that count. An example illustrates when a motion under §1.636(b) is proper.

Example 20: Application AD contains patentable claim 1 (6-cylinder engine). Application AE contains patentable claim 3 (8-cylinder engine). An interference is declared with a single count (6 or 8-cylinder engine). Claim 1 of application AD and claim 3 of application AE are designated to correspond to the count. Applicant AD believes that a 6-cylinder engine is a "separate patentable invention" (see §1.601(n)) from an 8-cylinder engine. Applicant AD would file a motion under §1.633(b) for a judgment on the ground of no interference-in-fact stating why a 6-cylinder engine is patentably distinct from an 8-cylinder engine. If the Board ultimately agrees with applicant AD, a patent could issue to AD containing claim 1 of application AD and a second patent could issue to AE containing claim 3 of application AE.

Under §1.633(c), a party may move to redefine interfering subject matter. One way to redefine interfering subject matter would be to add or substitute a count. When a party seeks to add a count, the party is required to demonstrate that the proposed count to be added is directed to a "separate patentable invention" from every other count in the interference.

A motion may be filed to amend an application claim which has already been designated to correspond to a count. See §1.633(c)(2). Such a motion might be filed when a party believes an application claim designated to correspond to a count is unpatentable and the amended claim is believed to be patentable.

An applicant may move to add a claim to the applicant's application and to designate the claim to be added to correspond to a count. See §1.633(c)(2). Such a motion may be filed when the applicant discloses specific subject matter which is not claimed, would like to claim the subject matter, and wants the subject matter involved in the interference.

Another way to redefine interfering subject matter would be to designate a claim as corresponding or not corresponding to a count. See §1.633(c)(3) and (c)(4). Examples 21 and 22 illustrate this latter point.

Example 21: Application AF contains patentable claim 1 (engine). Patent K contains claims 3 (engine) and 5 (6-cylinder engine). Claim 1 of application AF and claim 3 of patent K are designated to correspond to the count. Applicant AF believes a 6-cylinder engine is the same patentable invention (see §1.601(n)) as engine. Applicant AF would file a motion under §1.633(c)(3) to designate claim 5 of patent K as corresponding to the count. If the motion is granted and applicant AF prevails in the interference, judgment would be entered against patentee K and both claims 3 and 5 of patent K would be cancelled under 35 U.S.C. §135(a).

Example 22: Application AG contains patentable claim 1 (engine). Patent L contains claims 3 (engine) and 5 (8-cylinder engine). An interference is declared with one count (engine). Claim 1 of application AG and claims 3 and 5 of patent L are designated to correspond to the count. Patentee L believes that an 8-cylinder engine defines a "separate patentable invention" (see §1.601(n)) from engine. Patentee L should file a motion under §1.633(c)(4) to designate claim 5 of patent L as "not corresponding" to the count. If the motion is granted and an adverse judgment is entered against patentee L, only claim 3 would be cancelled from the patent pursuant to 35 U.S.C. §135(a).

A motion to redefine the interfering subject matter may also request that an opponent who is an applicant be required to add a claim to the opponent's application and to designate the claim to correspond to a count. See §1.633(c)(5). Such a motion might be filed when a party sees that the opponent discloses, but does not claim, subject matter which the party believes should be involved in the interference.

Section 1.633(i) would continue present practice (37 CFR §1.231) of allowing a party to move to redefine the subject matter of the interference or substitute a different application when an opponent moves for judgment (see §1.633(a) and (b)) or to attack benefit (see §1.633(g)).

Paragraph (j) of §1.633 will permit an opponent to move for benefit when a party moves to add or substitute a count. Thus, when a motion to add a count is filed by a party and an opponent wants benefit of an earlier application in the event the motion to add is granted, the opponent should file a motion under §1.633(j) to be accorded benefit. The mere fact that the opponent had been accorded benefit of an earlier application when the interference was declared does not mean the opponent will be accorded benefit as to some other count which may be added on motion of some other party.

Section 1.634 authorizes a motion to correct inventorship in an application (see §1.48) or a patent (see §1.324) involved in an interference.

Section 1.635 authorizes the filing of motions other than those specified in §§1.633 or 1.634. Motions filed under §1.635 would be referred to as "miscellaneous motions" to distinguish from "preliminary motions" under §1.633. Instances where a miscellaneous motion would be filed include motions to correct an error in a preliminary statement, to extend time for taking action or to seek judicial review, to obtain permission to proceed under 35 U.S.C. §24, or to obtain additional discovery.

Section 1.636 sets out the times within which a motion would be filed.

Section 1.637 sets out the content of motions. In prior interference practice, parties and their counsel have had difficulty meeting all the "unwritten" requirements for motions under 37 CFR §1.231. Section 1.637 is quite specific in setting out the requirements for each type of motion, particularly the preliminary motions. By setting out with specificity the requirements for each type of motion, it is intended to minimize disposition of motions

on technicalities. A vast majority of the comments in response to the advanced notice published in the *Federal Register* on Aug. 1, 1983, commenting on then proposed §1.637 were in favor of the requirements for motions being specifically set out in the regulations.

Section 1.638 authorizes oppositions to motions. Any opposition would have to identify any material fact in dispute. A reply to an opposition would be authorized for all motions. A reply to a reply is not authorized.

Section 1.639 sets forth the evidence which may accompany a motion, opposition, or reply. Every material fact alleged in a motion, opposition, or an reply would have to be supported by proof. Section 1.639(b) authorizes affidavits to be used as proof for any motion. The affidavit may later be used by a party during the testimony period (see §§1.671(e) and 1.672(b)). When a party believes that testimony is necessary to decide a motion under §1.633 or §1.634, the party would have to describe the nature of the testimony needed. If an examiner-in-chief agrees that testimony is needed, appropriate interlocutory relief would be granted and testimony would be ordered.

Example 23: An interference is declared with one count between application AH and application AJ. Applicant AH files a preliminary motion under §1.633(c)(1) to redefine the interference by adding a second count. In order to succeed, applicant AH must show that the proposed count to be added is directed to a "separate patentable invention" (see §1.601(n)) from the count already in the interference. In the motion, applicant AH sets forth in detail the testimony which would be required to prove that the subject matter of the proposed count is to a separate patentable invention from the subject matter of the count in the interference. Applicant AJ opposes the motion on the ground that the proposed and present counts define the "same patentable invention" (see §1.601(n)). An examiner-in-chief determines that a material fact is in dispute and that applicant AH has established testimony is needed to properly rule on the motion. Under the circumstances, the motion would be deferred to final hearing and a testimony period would be ordered. The questions of (1) whether the proposed and present counts define the same patentable invention and (2) priority would be decided at final hearing.

Under §1.640, an examiner-in-chief would decide all motions. A hearing could be held on a motion in the discretion of an examiner-in-chief. Where appropriate, an examiner-in-chief could consult with an examiner on a question of patentability which arises in the first instance in the interference. Consultation would not be necessary where the examiner had already ruled on the patentability question which comes before the examiner-in-chief or the Board. Moreover, nothing in §1.640 authorizes conferences between examiners-in-chief and examiners in *ex parte* appeals under 35 U.S.C. §134 from an adverse decision of an examiner. A party is entitled to request reconsideration of a decision on a motion by a single examiner-in-chief. An opposition to a request for reconsideration could not be filed unless ordered by an examiner-in-chief or the Board, but the decision by the single examiner-in-chief would not normally be modified unless an opposition has been requested. The request for reconsideration would be acted on by a panel of the Board consisting of at least three examiners-in-chief, one of whom would normally be the examiner-in-chief who decided the motion. Several comments were received in response to the advance notice questioning why the examiner-in-chief who decided the motion would form part of the panel deciding the request for reconsideration. The decision to propose, and now adopt, a regulation which would permit the examiner-in-chief who decided the motion to participate in the decision on reconsideration was made after careful balancing of all the factors involved. It could have been proposed to permit the examiner-in-chief to individually decide the request for reconsideration. However, it is believed that parties in interference cases would feel that their requests for reconsideration are being more fully considered if more than one person considers their request. The two additional examiners-in-chief would be able to consult with the examiner-in-chief most familiar with the case, but would be able to control the decision on reconsideration by a majority vote. Use of the examiner-in-chief who decided the motion and two additional examiners-in-chief would (1) minimize delay which would occur if three new examiners-in-chief were used who were unfamiliar with the record and (2) minimize the possibility that reversible error occurred if only the examiner-in-chief who decided the motion also individually decided the request for reconsideration.

Under §1.644, petitions to the Commissioner are authorized in interference cases under certain restricted conditions. Petitions in interferences have been the source of substantial delay. Section 1.644 attempts to minimize those delays. Section 1.644 authorizes a petition to the Commissioner from a decision of an examiner-in-chief or a panel when the examiner-in-chief or the panel shall be of the opinion (1) that the decision involves a controlling question of procedure or an interpretation of a rule as to which there is a substantial ground for a difference of opinion and (2) that an immediate decision on petition would materially advance the ultimate termination of the interference. The standard is intended to be analogous to that of a district court certifying a question to a court of appeals under 28 U.S.C. §1292(b). A petition could be filed seeking to invoke the supervisory authority of the Commissioner. However, the petition could not be filed prior to entry of judgment and could not relate to the merits of priority or patentability or the admissibility of evidence under the Federal Rules of Evidence. A petition could also be filed seeking waiver of a rule. A fee of $120 would be charged for each petition and for each request for reconsideration of a decision on petition. Any petition would be decided on the record made before the examiner-in-chief or the Board and additional evidence could not be submitted with the petition. An opposition could not be filed unless ordered by the Commissioner. Where reasonably possible, service of a petition would have to be such that delivery is accomplished within one day. Service by hand or "Express Mail" would comply with this requirement.

Section 1.645 permits a party to file a motion to seek an extension of time to take action in an interference or to seek judicial review. The motion would have to be filed within sufficient time to actually reach an examiner-in-chief prior to expiration of the time for taking action. Under §1.645, a moving party would not be able to assume that a motion for an extension of time would be granted. Under §1.610(d)(6), a request for an extension of time could be made orally and an appropriate order would then be entered thus eliminating considerable paper work. The order would be the written record of the request and decision. See §1.2. Extensions of time have caused numerous delays in interference cases. Under present interference practice, some delays are caused because attorneys and agents on many occasions unexpectedly receive orders setting times. Under the new practice, attorneys and agents can expect times to be set for filing preliminary statements, preliminary motions, motions for additional discovery, testimony, and briefs after a conference call. It is expected that use of conference calls will permit an examiner-in-chief and attorneys or agents for parties to set a time schedule which is mutually satisfactory. A motion to extend time would not be granted unless a party shows good cause. The use of conference calls would allow schedules to be set before orders setting time are entered and therefore the press of other business which arises after the examiner-in-chief and attorneys and agents agree to times would not normally be considered good cause.

Under §1.647, when a party relies on a document in a foreign language, an English language translation of the document and an affidavit attesting to the accuracy of the translation would be required. The rule would apply to any document, including evidence submitted with motions, foreign applications for which a party seeks

benefit, testimony, and exhibits introduced in evidence during testimony.

Under §1.651, after a decision is entered on preliminary motions, an examiner-in-chief would set times for filing motions for additional discovery and for taking testimony. Any motion for additional discovery would be to obtain answers to interrogatories, requests for admissions, and documents and things necessary for a party to prepare its case-in-chief.

Section 1.653 sets out what shall be in the record to be considered by the Board at final hearing. The record would continue to be printed or typed on paper 8-1/2 Requested: Requested: by 11Requested: Requested: in size. Accordingly, when a party files an affidavit, the party should use 8-1/2Requested: Requested: by 11Requested: Requested: paper for the affidavit.

Section 1.654 continues the practice of holding a final hearing where oral argument may be presented by all parties. No fee would be charged for appearing at oral argument at final hearing in an interference.

Section 1.655 specifies the matters which can be considered in rendering a final decision. Patentability is an issue which may be raised. The Board can also consider whether any interlocutory order was manifestly erroneous or an abuse of discretion, although any interlocutory order would be presumed to be correct and burden of showing error shall be on the party attacking the order. This last procedural provision permits the Board to correct any manifest error before a party seeks judicial review of an interlocutory order along with judicial review of the Board's final decision.

Section 1.656 sets forth the requirements for briefs for final hearing. In large measure, §1.656 follows the requirements of Rule 28 of the Federal Rules of Appellate Procedure. An original and three copies of a brief is required. Under §1.656(h), if a party wants the Board in rendering its final decision to rule that any evidence is inadmissible, the party must file with its opening brief an original and three copies of a motion to suppress the evidence. Any previous objection to the admissibility of evidence is waived unless the motion to suppress is filed. This procedural provision makes clear that an objection to the admissibility of evidence must be renewed at final hearing and will be considered by the Board in rendering its final decision. When a junior party fails to file a brief, an order can be issued requiring the junior party to show cause why failure to file the brief should not be taken as a concession of priority.

Under §1.658 the Board would enter a final decision. The decision can (1) enter judgment, in whole or in part, (2) remand the interference to an examiner-in-chief, or (3) take further action not inconsistent with law. A judgment as to a count shall state whether or not each party is entitled to a patent containing claims which correspond to the count. When judgment is entered as to all counts, the decision of the Board is considered final for the purpose of judicial review. Section 1.658(c) defines the doctrine of interference estoppel as it is to be applied in the PTO after an interference is terminated. The definition of interference estoppel is designed to encourage parties in interference cases to settle as many issues as possible in one proceeding. Section 1.658(c) creates an estoppel both as to senior and junior parties unlike the present practice (37 CFR §1.257) which limits estoppel in some instances to junior parties. An estoppel would *not* apply with respect to any claims which correspond, or which properly could have corresponded, to a count as to which the party was awarded a favorable judgment. A few examples illustrate how estoppel would be applied.

Example 24: Junior party applicant AL and senior party applicant AK both disclose separate patentable inventions "A" and "B" and claim only invention A in their respective applications. An interference is declared with a single count to invention A. Neither party files a preliminary motion (see §1.633(c)(1)) to add a count to invention B. Judgment as to all of AL's claims corresponding to the sole count is awarded to junior party applicant AL. Senior party applicant AK would be estopped to thereafter obtain a patent containing claims to invention B, because applicant AK failed to move to add a count to invention B in the interference. Junior party applicant AL would not be estopped to obtain a patent containing claims to invention B.

Example 25: In this example, the facts are the same as in Example 24 except that judgment is awarded as to all AK's claims corresponding to the count to senior party applicant AK. Junior party applicant AL would be estopped to obtain a patent containing claims to invention B in the interference. Senior party applicant AK would not be estopped to obtain a patent containing claims to invention B.

Example 26: Junior party applicant AM and senior party applicant AP both disclose separate patentable inventions "C", "D", and "E" and claim inventions C and D in their respective applications. An interference is declared with two counts. Count 1 is to invention C and Count 2 is to invention D. Neither party files a preliminary motion to add a proposed Count 3 to invention E. Judgment as to all AM's claims corresponding to Counts 1 and 2 is awarded to junior party applicant AM. Senior party applicant AP would be estopped to thereafter obtain a patent containing claims to invention E, because applicant AP failed to move to add a count to invention E in the interference. Junior party applicant AM would not be estopped to obtain a patent containing claim to invention E.

Example 27: In this example, the facts are the same as in Example 26 except that judgment is awarded as to all AP's claims corresponding to Counts 1 and 2 to senior party applicant AP. Junior party applicant AM would be estopped to obtain a patent containing claims to invention E, because applicant AM failed to move to add a count to invention E in the interference. Senior party applicant AP would not be estopped to obtain a patent containing claims to invention E.

Example 28: In this example, the facts are the same as in Example 26 except that judgment is awarded on all of AM's claims corresponding to Count 1 to junior party applicant AM and judgment is awarded on all AP's claims corresponding to Count 2 to senior party applicant AP. Both parties would be estopped to obtain a patent containing claims to invention E, because neither moved to add a count to invention E during the interference. Assume that junior party AM could have properly moved under §1.633(f) to be accorded the benefit of an earlier application, but did not do so during the interference. Junior party AM would not be estopped in subsequent *ex parte* prosecution from asking for benefit of the earlier application as to the invention defined by Count 1. Accordingly, if the examiner were to reject junior party AM's claim corresponding to Count 1 on the basis of some newly discovered prior art, junior party AM could properly antedate the prior art by seeking the benefit under 35 U.S.C. §120 of the earlier application. Thus, even though junior party AM was a "losing party" as to Count 2 (an adverse judgment as to junior party AM's claims corresponding to Count 2 having been entered), junior party AM was awarded a favorable judgment (§1.658(c)) as to Count 1. Junior party AM would be estopped in subsequent *ex parte* prosecution from attempting to be accorded the benefit of the earlier application as to the invention of Count 2.

Example 29: Applicant AQ discloses and claims invention "F." Applicant AR discloses and claims separate patentable inventions "F" and "G." The assignee of applicant AQ also owns an application AS which discloses and claims invention "G." An interference is declared between applicant AQ and applicant AR. The sole count is directed to invention F. No motion is filed by applicant AQ or its assignee to declare an additional interference between applicant AR and applicant AS with a count to invention G. A judgment as to all of AR's claims corresponding to the sole count is awarded to applicant AR. Applicant AS and the assignee would be estopped to obtain a patent containing claims to invention G, because applicant AR and the assignee failed to

move to declare an additional interference with a count to invention G.

Example 30: The facts in this example are the same as the facts in Example 29 except that judgment as to all of AQ's claims corresponding the sole count is awarded to applicant AQ. Applicant AS and the assignee would not be estopped, because applicant AQ was not a "losing party" (§1.658(c)).

Example 31: Applicant AT discloses a generic invention to "solvent" and a species to "benzene." Application AT contains a patentable claim 1 (solvent) and no other claims. Applicant AU discloses the generic invention to "solvent" and species to "benzene" and "toluene." Application AU contains patentable claim 3 (solvent) and no other claims. An interference is declared with a single count (solvent). Claims 1 of application AT and claim 3 cf applicatcn AU are designated to correspond to the count. No preliminary motions are filed. A judgment is entered in favor of applicant AT on the claim corresponding to the sole count. Applicant AU would be estopped to obtain a patent containing a claim to benzene, because applicant AU failed to file a preliminary motion under §1.633(c)(1) seeking to add a count to benzene and benzene was disclosed in winning party AT's application. Applicant AU would also be estopped to obtain a patent containing a claim to toluene, unless "toluene" defines a "separate patentable invention" from "solvent ." A basis for interference estoppel (§1.658(c)) exists if "toluene" and "solvent" define the "same patentable invention," because a claim to "toluene" could properly have been added and designated to correspond to the count. See §1.633(c)(2).

Under §1.659, the Board would be able to make recommendations to examiners and the Commissioner, including recommendations that application claims not involved in the interference be rejected and that a patent be reexamined as to patent claims not involved in the interference.

Under §1.660, a party would be required to notify the Board when the party's patent or application becomes involved in other PTO proceedings (reexamination, reissue, or protest) or litigation.

Section 1.661 sets forth when an interference is considered terminated after a judgment is entered in the interference. For the purpose of filing copies of settlement agreements, an interference is considered terminated when the time for all appeals has expired. *Tallent* v. *Lemoine*, 204 USPQ 1058 (Comm'r.Pat. 1979). See also *Nelson* v. *Bowler*, 212 USPQ 760 (Comm'r.Pat. 1981).

Section 1.662 provides that a party may request that an adverse judgment be entered. The section also provides that when a written disclaimer (not a statutory disclaimer), concession of priority or unpatentability, abandonment of the invention, abandonment of an application, or abandonment of the contest is filed, the disclaimer, concession, or abandonment would be treated as a request for entry of an adverse judgment. Section 1.662(b) provides that when a patentee files a reissue application and omits all claims of a patent corresponding to the counts of an interference for the purpose of avoiding the interference, judgment would be entered against the patentee. Under §1.662(c), the filing of a statutory disclaimer would not be treated as a request for entry of an adverse judgment unless all patent claims corresponding to a count are disclaimed. Under §1.662(d), if after entry of a judgment or after filing of a statutory disclaimer no interference exists, the interference would be terminated as to any party against whom judgment has not been entered and any further prosecution of any application involved in the interference would be *ex parte* before the examiner.

Section 1.666 sets out the procedure for filing settlement agreements in interference cases. The PTC is merely a repository for copies of agreements filed under 35 U.S.C. §135(c) and does not undertake to rule on whether the statute requires that a copy of any particular agreement be filed. *Nelson* v. *Bowler*, 212 USPQ 760 (Comm'r.Pat. 1981).

Section 1.671 sets out what would be considered evidence. The Federal Rules of Evidence, with certain exceptions, are made applicable to interference cases. Under §1.671(e), a party cannot rely on a previously filed affidavit unless the affidavit is served and notice is given that the party intends to rely on the affidavit. The purpose for the notice is to permit an opponent to determine whether a deposition for cross-examination is necessary (see §§1.672(b) and 1.673(e)).

Section 1.671(e) is intended to overrule prior construction of PTO rules in *Holmes* v. *Kelly*, 586 F.2d 234, 237 n. 7, 199 USPQ 778, 782 n. 7 (CCPA 1978) and *Brecker* v. *Jennings*, 204 USPQ 663 (Bd.Pat.Int. 1978), which considered a Rule 132 affidavit in the file of an involved application to be part of the "record" in an interference. Under §1.671(e), a party intending to rely on such an affidavit must give notice and serve a copy of the affidavit on the oppcnent.

Under §1.671(f), the significance of documentary and other exhibits must be discussed with particularity by a witness during oral deposition or in an affidavit. Section 1.671(f) sets out in the regulations an evidentiary requirement imposed by precedent. See *Popoff* v. *Orchin*, 144 USPQ 762 (Bd.Pat.Int. 1963) (unexplained experimental data should not be considered); *Chandler* v. *Mock*, 150 F.2d 563, 66 USPQ 209 (CCPA 1945) (records standing alone were held to be meaningless), and *Smith* v. *Bousquet*, 111 F.2d 157, 45 USPQ 347 (CCPA 1940) (unexplained tests in stipulated testimony are entitled to little weight). See also *In re Borkowski*, 505 F.2d 713, 184 USPQ 29 (CCPA 1974) and *Triplett* v. *Steinmayer*, 129 F.2d 869, 54 USPQ 409 (CCPA 1942). Under §1.671(g), a party is required to obtain permission from an examiner-in-chief prior to proceeding under 35 U.S.C. §24. This requirement insures that a subpoena is necessary (e.g., a subpoena ordinarily should not be necessary where testimony of an opponent is sought) and that testimony sought through a §24 subpoena is relevant before a subpoena is issued. The motion seeking permission to proceed under §24, any opposition thereto, and the order of an examiner-in-chief authorizing the moving party to proceed under §24 will be of assistance to a federal court in the event a party is required to resort to a court to enforce the subpoena or to compel answers to questions propounded at any deposition where a witness is appearing pursuant to a subpoena. See *Sheehan* v. *Doyle*, 529 F.2d 38, 188 USPQ 545 (1st Cir.), *cert. denied*, 429 U.S. 870 (1976), *rehearing denied*, 429 U.S. 987 (1976).

Under §1.671(h), any evidence which is not taken or sought and filed in accordance with the regulations will not admissible.

Section 1.672 sets forth the manner in which testimony shall be taken. Testimony can be taken by deposition or affidavit at the election of the party presenting the testimony. A party presenting testimony by affidavit must file and serve the affidavit. If the party presents testimony by affidavit and an opponent elects to cross-examine the affiant, the party is required to notice a deposition for the purpose of cross-examination. Re-direct and re-cross will take place at the deposition. Where the parties agree, testimony can be presented by affidavit without opportunity for cross-examination (see §1.672(e)) or by an agreed statement of facts (see §1.672(f)).

Section 1.673 sets out how a deposition must be noticed. A deposition can be noticed for any reasonable place in the United States. The extent to which parties, witnesses, and attorneys or agents have to travel may be considered in determining whether a place is reasonable. Prior to serving a notice for a deposition, a party is required to take two procedural steps. Under §1.673(b), a party would be required to serve a copy of the documents and a list of the things in its possession, custody, and control upon which it intended to rely. Under §1.673(g), the party is required to have an oral conference (in person or by telephone) with all opponents to attempt to agree on a mutually acceptable time and place for taking the deposition. An examiner-in-chief may set the time and place if agreement is not reached.

A single notice listing all the witnesses and the general nature of their expected testimony is then served. Under §1.673(c) and except as provided, a party can not relv on any witness not mentioned in the notice, any document not served, or any thing not listed. Under §1.673(h), a copy of any notice must be attached to the certified transcript of each deposition filed.

Section 1.674 sets out the persons before whom depositions can be taken.

Section 1.675 sets out how a deposition is to be taken.

Section 1.676 sets out how a court reporter should prepare and file a certified transcript of a deposition. Section 1.676(d) sets out how exhibits are to be marked for identification, used at depositions, and filed. Provisions similar to those of Rule 30(f)(1)(A) and (B) of the Federal Rules of Civil Procedure are applicable to interferences.

Section 1.677 sets out the form of a transcript of a deposition.

Under §1.678, a transcript of a deposition must be filed in the PTO within 45 days of the date of the deposition.

Section 1.682 sets out how a party may introduce in evidence, if otherwise admissible, official records or printed publications. When a notice is served, a party is also required to serve (but not file) copies of the official records and printed publications. Any objection to the notice or to the admissibility of any official record or publication must be filed within 15 days of the date of service of the notice.

Section 1.683 sets out how a party may use testimony from another interference or proceeding.

Section 1.684 sets out how a party may take testimony in a foreign country.

Section 1.685 sets out how objections during the taking of depositions must be raised. Under §1.685(a), an error in a notice of deposition is waived unless a motion to quash the notice is filed as soon as the error is, or could have been, discovered. Under §1.685(b), any objection to the qualifications of an officer is waived unless (1) the objection is noted on the record of the deposition before a witness begins to testify or (2) if discovered after the deposition, a motion to suppress is filed as soon as the objection is, or could have been, discovered. Under §1.685(c), any error in the manner in which testimony is transcribed, the transcript is signed by a witness, or the transcript is prepared or otherwise handled by the court reporter is waived unless a motion to suppress is filed as soon as the error is, or could have been, discovered. Under §1.685(d), any objection on the merits to the admissibility of evidence (e.g., under the Federal Rules of Evidence is waived unless an objection is made on the record at the deposition stating the specific ground of objection. Often objections are cured by subsequent testimony. Accordingly, any objection which a party wants the Board to consider at final hearing must also be made the subject of a motion under §1.656(h).

Section 1.687 sets out how a party could seek and obtain additional discovery. "Additional discovery" is defined in §1.601(a). Section 1.687 does not change the standard ("interest of justice") for obtaining discovery.

Section 1.688 sets out how a party can introduce into evidence admissions and answers to interrogatories obtained as a result of additional discovery.

Changes in Text

Several changes have been made to the text of the proposed rules published in the *Federal Register* on Jan. 30, 1984. The changes are discussed below. Additional rationale for the changes are further discussed under the heading "Analysis of Comments."

All references to the "Board of Appeals and Interferences" have been changed to "Board of Patent Appeals and Interferences" in view of Public Law 98-622.

In §1.11(a) the language "or after termination of an interference without an award of judgment" has been deleted. This change has been made in view cf changes made in paragraphs (c) and (d) of §1.662.

In response to a comment, the fee required for a petition in an interference under §1.644(e) and a request for reconsideration of a decision on petition in an interference under §1.644(f) have been set out as separate items.

Section 1.136 was changed to refer to §1.611 rather than §1.610(a).

The following sentence was inadvertently omitted as the third sentence of §1.138 in the notice of proposed rulemaking: "A registered attorney or agent acting under the provision of §1.34(a), or of record, may also expressly abandon a prior application as of the filing date granted to a continuing application when filing such a continuing application." This sentence presently appears in §1.138.

In §1.196(d), second sentence, "thirty days" has been changed to "one month".

In §1.197(b), "thirty days" has been changed to "one month".

In the last sentence of §1.304, "The Commissioner" has been changed to "An examiner-in-chief" and "of a decision of the Board of Patent Appeals and Interferences in an interference case" has been inserted after "time for seeking judicial review." This change is made to limit the "excusable neglect" standard to interference cases only.

In §1.601(j), the language "all the claims of a party which correspond" has been changed to read "at least one claim of a party which corresponds". The language "all the claims of an opponent which correspond" has been changed to read "at least one claim of an opponent which corresponds".

Section 1.605(a) has been changed by deleting from the third sentence the language "a claim which is the same or substantially the same as" and by adding the following sentence as the fourth sentence: "At the time the suggested claim is presented, the applicant may also (1) call the examiner's attention to other claims already in the application or which are presented with the suggested claim and (2) explain why the other claims would be more appropriate to be included in any interference which may be declared." In the second sentence, "30 days" has been changed to "one month.

In the last sentence of §1.606, the language "to define one patentable invention" has been changed to read: "not to contain separate patentable inventions."

The word "and" has been inserted in §1.607(a) before "(3)". The word "must" in the first sentence of §1.607(c) has been changed to "shall" in response to a suggestion in a comment.

Pursuant to two separate suggestions, the following is being added after the first sentence in §1.608(b): "Where the basis upon which an applicant is entitled to judgment relative to a patentee is priority of invention, the evidence shall include affidavits by the applicant, if possible, and one or more corroborating witnesses, supported by documentary evidence, if available, each setting out a factual description of acts and circumstances performed or observed by the affiant, which collectively would *prima facie* entitle the applicant to judgment on priority with respect to the earlier of the filing date or effective filing date of the patent. To facilitate preparation of a record (§1.653(g) and (h)) for final hearing, an applicant should file affidavits on paper which is 8-1/2 by 11 inches (21.8 by 27.9 cm.)."

In §1.609(b)(1), the language "count or counts" has been changed to "proposed count or counts". In §1.609(b)(2), each occurrence of "the count" has been changed to "each count".

In §1.613(a), "§1.344" has been changed to "this Chapter." This change is being made to obviate the need to again amend §1.613 in the event new rules relating to practice before the PTO are issued. See the notice of proposed rulemaking published in the *Federal Register* on Aug. 24, 1984. 49 F.R. 33790, proposed §§10.62 and 10.66. The language "or members of the same firm of attorneys or agents" has been added after "agent" in §1.613(b).

In §1.615(a), second sentence, "which are" has been deleted and "in the interference" has been added after "will not be entered or considered".

Several changes have been made in §1.617. In §1.617(a), the language "the interference shall proceed before the examiner-in-chief" has been changed to read: "the interference shall proceed in the normal manner under the regulations of this part". The second sentence of §1.617(b) ("A response may include a request by the applicant for a hearing before the Board.") has been changed to read: "Any request by the applicant for a hearing before the Board shall be made in the response." This change was made to clarify when and how a hearing must be requested by the applicant. The second sentence of §1.617(d) has been changed to read: "The statement may set forth views as to why summary judgment should be granted against the applicant, but the statement shall be limited to discussing why all the evidence presented by the applicant does not overcome the reasons given by the examiner-in-chief for issuing the order to show cause." Section 1.617(e) has been re-written as follows: "Within a time authorized by the examiner-in-chief, an applicant may file a reply to any statement filed by any opponent." The language "examiner-in-chief or the" has been added after "by the applicant is timely filed, the" in the first sentence of §1.617(g). The language "Board decides that" has been deleted from the second sentence of §1.617(g). The language "If the Board decides otherwise" has been replaced with "Otherwise" in the third sentence of §1.617(g). The language "before the examiner-in-chief" in the third sentence of §1.617(g) has been changed to read: "in the normal manner under the regulations of this part." These changes will authorize either an examiner-in-chief or a Board to authorize an interference to proceed under §1.617(g). It will continue to be necessary for the Board to enter an order *granting* summary judgment. In the last sentence of §1.617(h), "patentee" has been changed to "any opponent".

The language "the name of" has been deleted from the first sentence of §1.622(a). The second sentence of §1.622(a) in the notice of proposed rulemaking ("When an inventor identified in the preliminary statement is not identical to the inventor named in the party's application or patent, the party shall file a motion . . . .") has been changed to read: "When an inventor identified in the preliminary statement is not an inventor named in the party's application or patent, the party shall file a motion . . . ." This change is being made in view of §105(a) of Public Law 98-622 which amended 35 U.S.C. §116 to permit joint inventors to be named "even though . . . (3) each did not make a contribution to the subject matter of every claim . . . ."

The following changes have been made in §1.623(c). In the first sentence, "copy of the drawing" has been changed to "copy of the first drawing". In the second sentence, "copy of the written description", has been changed to "copy of the first written description". In the third sentence, "when a drawing or written description" has been changed to "when a copy of the first drawing or first written description".

Several changes have been made to §1.624. The following has been added as a second sentence in §1.624(a)(5): "If an actual reduction to practice of the invention was not introduced into the United States, the preliminary statement shall so state." The following changes have been made in §1.624(c). Each occurrence of "was made" has been changed to "was introduced into the United States." In the first sentence, "copy of the drawing" has been changed to "copy of that drawing". In the second sentence, "copy of the written description" has been changed to "copy of that written description". In the third sentence, "a drawing or written description" has been changed to "a copy of the first drawing or first written description introduced in the United States".

The following changes have been made in §1.625(c). In the first sentence, "copy of the drawing" has been changed to "copy of the first drawing". In the second sentence, "copy of the written description" has been changed to "copy of the first written description". In the third sentence, "a drawing or written description" has been changed to "a first drawing or first written description".

The language of §1.628(b) which read: "because the drawing or written description is not in the party's possession, custody, or control, the party may file a motion . . to amend its preliminary statement promptly after it secures possession, custody, or control of a copy of the drawing or written description" has been changed to read as follows: "the party (1) shall show good cause and explain in the preliminary statement why a copy of the drawing or written description cannot be attached to the preliminary statement and (2) shall attach to the preliminary statement the earliest drawing or written description made in or introduced into the United States which is available. The party shall file a motion . . . to amend its preliminary statement promptly after the first drawing, first written description or drawing or written description first introduced into the United States becomes available."

The first sentence ("A preliminary statement should be carefully prepared.") has been deleted from §1.629(a).

In §1.629(b), the language "no earlier than" has been changed to "as early as".

In §1.629(d), the following has been added after "allegation: "unless the party complies with §1.628(b)."

A new §1.632 has been added to require a party to give timely notice of the party's intent to argue that an opponent has abandoned, suppressed, or concealed an actual reduction to practice. A companion change has been made to §1.654.

Two changes have been made to §1.633(c). Paragraph (c)(2) has been changed by adding thereto the following language: "or adding a claim in the moving party's application to be designated to correspond to a count". In addition, in §1.633(c), the "or" before "(4)" has been deleted and the following has been added to the end of the first sentence: ", or (5) requiring an opponent who is an applicant to add a claim and to designate the claim to correspond to a count."

Paragraph (j) has been added to §1.633.

In §1.636(b), "(i)" has been changed to "(i) or (j)" in view of the addition of paragraph (j) to §1.633. The language "filed as soon as practical" in §1.636(c) has been changed to "diligently filed" in order to conform §1.636 to §1.48. A party must exercise diligence in correcting inventorship. *Van Otteren* v. *Hafner*, 278 F.2d 738, 126 USPQ 151 (CCPA 1960).

Several changes have been made to §1.637. The language "Where appropriate," has been deleted from the following paragraphs of §1.637: (c)(1)(vi); (c)(2)(iv); (c)(3)(iii); (d)(4); (e)(1)(viii); (e)(2)(vii); and (h)(4). The following has been added in §1.637(c)(2) before "shall: "or adding a claim to be designated to correspond to a count". The language "amended claim" in §1.637(c)(2)(i) has been changed to read: "amended or added claim". The language "Apply the terms of each proposed claim to the disclosure of the application" in §1.637(c)(2)(ii) has been changed to read: "Show that the proposed or added claim defines the same patentable invention as the count." The language "proposed amended claim" in §1.637(c)(2)(iii) has been changed to read "amended or added claim." The language "adding the proposed claim" in §1.637(c)(2)(iii) has been changed to read: "making the amended or added claim".

The word "interferences" in §1.637(c)(4)(ii) has been corrected to read: "interference".

Subparagraph (c)(5) has been added to §1.637.

The following has been added as the last sentence to §1.637(f)(2): "If the earlier application filed abroad is not in English, the requirements of §1.647 must also be met."

In paragraph §1.637(f)(3), the language "discloses an embodiment with the scope" has been changed to read: "constitutes a constructive reduction to practice".

The first sentence, originally proposed in §1.638(b) ("A reply to an opposition shall not be filed unless authorized by this subpart or an examiner-in-chief or the motion was filed under §§1.633 or 1.634"), has been deleted. The language "any authorized reply" in §1.638(b) has been changed to "a reply".

The language "or a motion to correct inventorship under §1.634" has been added to the first sentence of §1.639(c) after "preliminary motion under §1.633."

The following has been added after the first sentence of §1.640(b)(1): "Failure or refusal of a party to timely present an amendment required by an examiner-in-chief shall be taken without further action as a disclaimer by that party of the invention involved." The fourth sentence of §1.640(c) ("A request for reconsideration will ordinarily not be granted unless an opposition has been requested by an examiner-in-chief or the Board") has been changed to read: "A decision of a single examiner-in-chief will not ordinarily be modified unless an opposition has been requested by an examiner-in-chief or the Board." In the last sentence of §1.640(c), the language "shall be decided by a panel" has been changed to read: "shall be acted on by a panel".

The word "application" in the paragraph heading and text of §1.642 has been changed to read: "application or patent".

Three changes have been made in §1.644. The following language has been added after "Commissioner" in §1.644(a)(2): "and is not filed prior to the decision of the Board awarding judgment and does not relate to (i) the merits of priority of invention or patentability or (ii) the admissibility of evidence under the Federal Rules of Evidence". The following language has been deleted from the second sentence of §1.644(b): "and shall not relate to (1) the merits of priority of invention or patentability or (2) the admissibility of evidence under rhe Federal Rules of Evidence". The language "A request for reconsideration will ordinarily not be granted unless" in the second sentence of §1.644(f) has been changed to read: "The decision will not ordinarily be modified unless such".

Two changes have been made in §1.645. The word "to" has been added before "file a notice of appeal" and "commence a civil action" in the first sentence of paragraph (a). The language ", accompanied by an affidavit," has been deleted from paragraph (b).

Three changes have been made to §1.646. The word "service" has been added after "additional" in the third sentence of paragraph (b). The language "or except as otherwise provided by this part," has been added after "otherwise ordered by an examiner-in-chief," in paragraph (c). The language in paragraph (c) "paper may be made" has been changed to "paper shall be made". The word "time" has been changed to "date" in the last sentence of paragraph (e).

A new paragraph (c) has been added to §1.654 to require that a party give timely notice of the party's intent to argue that an opponent has abandoned, suppressed, or concealed an actual reduction to practice. Section 1.632 specifies the time within which the notice shall be filed.

Three changes have been made in §1.658. The language "paragraph (a) of the section" in the last sentence of §1.658(b) has been changed to "paragraph (a) of this section". The "(i)" in the first sentence of §1.658(c) has been changed to "(j)" in view of the addition of §1.633(j). In the notice of proposed rulemaking, the second sentence of §1.658(c) read: "A party, other than a party awarded a favorable judgment as to all counts, who could have properly moved, but failed to move, under §§1.633 or 1.634, shall be estopped to take *ex parte* or *inter partes* action in the Patent and Trademark Office after the interference which is inconsistent with the party's failure to properly move." This sentence has been changed to read: "A losing party who could have properly moved, but failed to move, under §1.633 or 1.634, shall be estopped to take *ex parte* or *inter partes* action in the Patent and Trademark Office after the interference which is inconsistent with that party's failure to properly move, except that a losing party shall not be estopped with respect to any claims which correspond, or properly could have corresponded, to a count as to which that party was awarded a favorable judgment."

Several changes have been made in §1.662. In §1.662(a), the word "construed" has been changed to "treated. The first sentence of §1.662(c) in the notice of proposed rulemaking read: "The filing of a statutory disclaimer under 35 U.S.C. §253 by a patentee will not be treated as a request for entry of an adverse judgment against the patentee, but will delete any statutorily disclaimed claims from being involved in the interference." That first sentence has been changed to read: "The filing of a statutory disclaimer under 35 U.S.C. §253 by a patentee will delete any statutorily disclaimed claims from being involved in the interference." The second sentence of §1.662(c) in the notice of proposed rulemaking read: "A statutory disclaimer of any claim involved in an interference shall in subsequent proceedings have the same effect with respect to the patentee as an adverse judgment." That second sentence has been changed to read: "A statutory disclaimer will not be treated as a request for entry of an adverse judgment against the patentee unless it results in the deletion of all patent claims corresponding to a count." In view of this change, proposed §1.662(d) has been deleted as unnecessary, and a change has also been made in §1.11(a) to delete any reference to a termination of an interference by any means other than judgment.

The last sentence of §1.671(g) has been changed from "The motion shall describe the general nature and show the admissibility in the interference of the testimony, document, or thing" to: "The motion shall describe the general nature and the relevance of the testimony, document, or thing."

Three changes have been made to §1.672(b). In the second sentence after "witness by affidavit shall" the following has been added: ", prior to the close of the party's relevant testimony period". The language "file an affidavit" has been changed to "file and serve an affidavit". The following has been added after the third sentence: "A party shall not be entitled to rely on any document referred to in the affidavit unless a copy of the document is filed with the affidavit. A party shall not be entitled to rely on any thing mentioned in the affidavit unless the opponent is given reasonable access to the thing. A thing is something other than a document."

Several changes have been made in §1.673(b). The introductory sentence of paragraph (b) ("Unless the parties agree otherwise, at least three days prior to the conference required by paragraph (g) of this section, a party shall serve, but not file, the following:") has been changed to read: "Unless the parties agree otherwise, a party shall serve, but not file, at least three days prior to the conference required by paragraph (g) of this section, if service is made by hand or "Express Mail," or at least ten days prior to the conference if service is made by any other means, the following:" In §1.673(b)(1) the word "copy" has been changed to "list and copy".

In the last sentence of §1.675(d), the language "signed by the witness in the presence of any notary" has been changed to read "signed by the witness in the form of (1) an affidavit in the presence of any notary or (2) a declaration". This change conforms §1.675(d) to §1.68.

In §1.682(a)(4), ", where appropriate," has been added prior to "be accompanied" and "(§1.671(d))" has been added after "printed publication".

The word "admissible" in §1.684(a)(4) has been changed to "relevant".

The following sentence has been deleted from §1.687(b): "If the witness refuses to produce a requested document or thing, the party may file a motion (§1.635) for additional discovery under paragraph (c) of this section."

Section 1.688 has been revised to more clearly describe how a party may introduce in evidence an answer to a request for admission or an answer to a written interrogatory.

Analysis of Comments

Eighteen written comments were received. Three individuals testified at a hearing held on May 15, 1984.

The following is an analysis of the written comments and the oral comments made at the hearing.

One comment suggested that §1.8 not be amended to exclude from the certificate of mailing practice a paper in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail." The comment argues that "[s] ome parties might not have an attorney in the Washington area or they may live in an area not serviced by Express Mail." The suggestion is not being adopted. Experience has shown that there are situations in interferences where it is desirable to have and the parties need a prompt ruling on a written motion. It is difficult for an examiner-in-chief to render a prompt ruling if the motion and any opposition are not promptly served and filed. In those situations where a party has no Washington, D.C. metropolitan area attorney or where a party resides in an area not served by "Express Mail," it may not be possible to hand-file or use "Express Mail." The examiner-in-chief would then exercise discretion by not invoking the exception of new subparagraph (xii) of §1.8(a).

One comment suggested that it would be clearer if the fee for a petition in an interference and the fee for a request for reconsideration of a decision on petition in an interference were set out in §1.17(h) as separate items. This suggestion has been adopted and the two fees have been set out in §1.17(h) as separate items.

A suggestion was made that a reference be made in §1.136 to §1.611 rather than §1.610(a). The suggestion is being adopted, because a reference to §1.611 is believed to be more appropriate. Once an interference is declared involving an application, *ex parte* prosecution of the application is suspended and the applicant need not respond to any PTO action outstanding as of the date the interference is declared.

One comment made the following remark concerning §1.196: "I do not understand the need or desire of the PTO to start the time to appeal to a Court from a PTO *final* decision on one claim, while PTO action is continuing on a second claim." As explained in the notice of proposed rulemaking (49 F.R. 3770, columns 2-3; 1039 O.G. 20-21; 1039 TMOG 20-21), when there are further proceedings before the examiner following a decision by the Board of Patent Appeals and Interferences, judicial review is not appropriate. Hence, under §1.196, the PTO will not start a time for seeking judicial review of a PTO decision on one claim while PTO action is continuing on another claim. The last sentences of §1.196(b)(1) and §1.196(d) authorize the Board to enter an order making its decision final as to one claim when remand proceedings as to another claim result in a favorable decision for the applicant. Section 1.196 is intended to eliminate piecemeal appeals.

With respect to §1.292(c), one commentator said: "[a] party should be able to raise public use and [on] sale issues at any stage [of an interference proceeding] provided the issue is raised in a timely manner after learning of the use or sale." Public use and on sale issues are to be raised in interferences by way of a preliminary motion under §1.633(a). If a motion under §1.633(a) cannot be timely filed, a belated motion may be filed provided the moving party complies with the provisions of §1.645(b). Whether or not a belated motion will be accepted where a public use or sale is discovered after the time for filing §1.633(a) motions which has passed will manifestly depend on the facts of a given case.

One comment suggested that the language "speedy, and inexpensive" be deleted from the second sentence of the preamble of §1.601. This suggestion is not being adopted. The second sentence of the preamble of §1.601 provides that the rules "shall be construed to secure the just, speedy, and inexpensive determination of every interference." The provision is modeled in part after the second sentence of Rule 1 of the Federal Rules of Civil Procedure which states that the Federal Rules "shall be construed to secure the just, speedy, and inexpensive determination of every action." The "just, speedy, and inexpensive determination" provision of §1.601 will prove useful in construing other provisions in the rules.

Two comments were received which suggested a change in language in §1.601(j). One comment correctly noted that "[i] f even one claim of each party defines the same patentable invention, there is an interference-in-fact." The comment went on to correctly note that "[t] he remaining claims can be disposed of by a motion under§1.633(c)(4)." A second comment noted that under the definition proposed, all the claims of both parties corresponding to a count must define the same patentable invention. The comment went on to correctly note the intent of the PTO is, however, that an interference-in-fact exists if at least one of the claims of a party corresponding to a count defines the same patentable invention as one of the corresponding claims of an opponent. In view of the suggestions made in the two comments, §1.601(j) has been changed to state that an interference-in-fact exists when at least one claim of a party which corresponds to a count and at least one claim of an opponent which corresponds to the count defines the same patentable invention.

Two comments were received which suggested that the language "earliest filing date" in §1.601(m) be changed to read "earliest effective filing date." The suggestion is not being adopted. Section 1.601(m) defines "senior party." The definition of "senior party" in §1.601(m) is consistent with current practice and is intended to codify current practice. In an interference where there are no benefit applications, the "senior party" is the party with the earliest "filing date." There are interferences where a party may be "senior" with respect to a first count based on the filing dates of the applications involved in the interference and "junior" with respect to a second count because the opponent is entitled to benefit of an earlier application as to the second count only. Under these circumstances in the past, the PTO has designated the party who is "senior" based on the filing dates of the applications involved as the "senior party." The designation of the party as "senior party" is for procedural purposes only, i.e., setting who takes testimony first, and does not affect which party has the burden of proof. Section 1.601(m) preserves this past practice.

Comments were received regarding §1.601(n) which defines "same patentable invention" and "separate patentable invention." One written comment suggested that §1.601(n) be deleted. The commentator appeared at the hearing and also urged orally that §1.601(n) be deleted. The suggestion is not being adopted. In view of the nature of the comment and the importance of the definitions in §1.601(n), the written comment is reproduced in its entirety:

> *Comment*: The paragraph to be deleted contains an explicit definition of both "same patentable invention" and "separate patentable invention". It requires application of a two-prong test for determining "sameness" or "separateness". Two inventions are considered to be the "same patentable invention" when they are the same under 35 USC 102 or obvious variants under 35 USC 103 when one is considered as "prior art" with respect to the other. Application of this standard may lead to results which are anomalous or in conflict with statutory requirements if, as the proposed rules apparently assume, the award of priority as to counts embodying "separate patentable inventions" will inherently and finally resolve the question of entitlement to a patent as between the parties on involved claims corresponding to those counts. Three specific problems with the definition of Rule 601(n) have been identified as follows:
>
> (1) If the standard of separate patentability as between two counts is applied on a mutual basis (i.e., Invention A must be separately patentable from Invention B considered as prior art and Invention B must be separately patentable from Invention A considered as prior art), then the conduct of interferences with separate counts directed to both a generic invention and an included specific embodiment thereof (i.e., a species) are frustrated. If, however, such mutuality is not applied (i.e., if Invention A is the existing count, then a count directed to Invention B is proper so long as Invention B would be considered patentable over Invention A as prior art), then a number of irreconcilable anomalies in count modification through preliminary motions practice will be manifest.
>
> (2) "Separate patentability" as a non-obviousness issue is in every context *except* interference practice before the PTO determined with finality only when an *affirmative* determination has been reached or the applicant *elects* to discontinue further prosecution of any applications embodying the invention or to admit obviousness. Because in the ex parte context an applicant may continue to marshall additional evidence supportive of non-obviousness until separate patentability over a prior art invention has been established, "separate patentability" is always a fluid concept where ultimate resolution can neither be predicted nor foreclosed. On certain cases interference proceedings under the proposed rules will be conducted and judgment rendered on the assumption of a lack of "separate patentability", which would ordinarily be subject to change or rebuttal as additional argument, evidence or other supportive activity of non-obviousness were marshalled. Thus, simply determining a proposed count is not yet "separately patentable" for the purposes of count formation ought not to foreclose post-interference reconsideration of separate patentability questions when the party proposing the count would not have been foreclosed on priority grounds.
>
> (3) The underlying assumption that "separate patentability" is to be established under the proposed rules for one invention when a second invention is considered as "prior art" does not have any necessary correspondence to the *effect* of an adverse judgment in an interference on the question of priority. While a lost count in interference is not patentable to the loser, the lost count will be considered as "prior art" against the losing party only if the status of prior art for the purposes of 35 USC 103 is established by the record in the interference, (i.e., by representing a prior invention of another made in the United States, not abandoned, suppressed or concealed under 35 USC 102). A party entitled to priority for a count under the benefit provisions of 35 USC 119 creates no "prior art" under 35 USC 102(g)/103 against his opponent. Separate counts ought not to be created or denied in an interference on the basis of a rule which fails to account for whether the interference record will confirm the assumption in the definition that a lost count will become "prior art".
>
> The following examples are provided as indicative of perceived difficulties in the application of the definition embodied in Rule 601(n):
>
> *Example A*: Rule 601(n) is applied in a mutuality sense to an interference where the existing count (Invention A) is a broad genus over organic compounds. Both parties disclose a species (Invention B) which one of the parties alleges represents a "selection invention", i.e., is neither anticipated by the genus nor obvious therefrom. The party proposing to add a species count to Invention B must demonstrate that the genus was neither the same as nor obvious in view of the species, an impossibility since *disclosure of the species anticipates the genus under 35 USC 102.* In effect, no party could ever propose sub-generic or species counts included within broader generic counts. Since all potential patentability and priority questions with respect to possible sub-generic and species claims are intended to be resolved in the unified patentability/priority proceedings, loss of such a broad generic count might be construed as estopping the losing party from arguing entitlement to a patent for species and subgenera within the lost count. Since proof of a single species is dispositive of the question of priority as to a genus, no matter how large, this is a more severe result than would appear to be proper or intended.
>
> *Example B*: Under the facts of Example A, if the standard under which the propriety for including a second sub-generic or species count is merely that the *proposed* count must be non-obvious over the *existing* count considered as prior art, then, an interference could conceivably proceed with both the generic and the species count in the interference. The usual criteria for "selection inventions" could be employed. However, when an interference is declared with a species count embodying Invention A, then utilization of a test requiring that a proposed count be non-obvious over the existing count as prior art leads literally to the conclusion that a proposed count to a generic Invention B is *anticipated* by the existing species count and therefore may not be added to the interference. This artificial distinction can certainly not have been intended, and yet the rules provide no clear indication of which result is the "correct" one or whether another test will be employed, e.g., the narrower count need only be non-obvious over the broader count.
>
> *Example C*: A party moves to substitute two subgeneric counts to allegedly separately patentable inventions, Invention A and Invention B, in place of a broad generic count to the "Markush" group of Invention A *and* Invention B. The party alleges Invention B has surprising and unexpected properties over Invention A and is separately patentable thereover. Because, however, a consideration of Invention B as "prior art" suggests Invention A would not be non-obvious thereover, the motion is denied. The moving party establishes priority as to Invention B, but loses the sole count of the interference to an opponent who filed a foreign application disclosing a single species from Invention A. The result is that the moving party with clear evidence of priority apparently loses the right to patent an invention on the technicality of "count formation" in interference. The result is substantially more severe than had he been simply faced with a statutory bar!
>
> *Example D*: The senior party, a foreign applicant, relies on a priority application disclosing Embodiment A. Subsequently the junior party files a United States application directed to an Embodiment B. Thereafter both parties file applications in the United States disclosing a generic invention includingboth Embodiments A and B. An interference is declared on the generic invention and the junior party moves to substitute two counts, one count to Embodiment A and a second count to Embodiment B on the ground that they represent separate patentable inventions. Since the junior party's invention date for Embodiment B is after the senior party's priority date, the junior party will be obliged to concede priority on the sole count in the interference unless his motion to substitute counts is granted.
>
> Accordingly, the junior party undertakes laboratory tests which indicate that both Embodiments A and B achieve substantially the same result in substantially the same manner without any significant differences in effectiveness. Without evidence of separate patentability to support rhe motion to substitute, the junior party is unsuccessful and priority is awarded to the senior party.
>
> The junior party abandons his claim to the generic invention of the lost count, but persists in his assertion he is entitled to a patent on Embodiment B since the interference record indicates no actual priority for this embodiment in favor of the senior party. Ultimately, the junior party obtains evidence that Embodiment B is unexpectedly more useful than anticipated in a commercial setting, while Embodiment A is substantially unsuitable for any practical use in a commercial setting.
>
> Is the junior party entitled to a patent notwithstanding the disposition of the issue of its separate

patentability in an *inter partes* proceeding? If indeed, the junior party would be entitled to such a patent, must a second interference now be declared with the senior party to again litigate the issue of priority? Had the junior party failed to have made the motion to substitute counts in view of his utter lack of supporting evidence of separate patentability, would the estoppel under 37 CFR 1.658(c) have applied? Finally, would the ends of justice be better served by a standard for count formation which could be finally determined contemporaneously with the filing of the preliminary motions themselves? All of these questions suggest that the utilization of a fluid concept such as non-obviousness as the basis for count formation will give unintended and unsupportable results in situations where the lack of separate patentability is prematurely assumed.

Example E: In the scenario of Example D, the non-entitlement to contest Embodiment B as a separate count was premised on a failure to demonstrate that Embodiment B was non-obvious over Embodiment A considered as prior art. However, an award of priority to the senior party based on the disclosure of Embodiment A in a foreign priority application does not render Embodiment A as available prior art (35 USC 102(g)/103) inasmuch as Embodiment A would not have been a prior invention of another made in the United States which had not been abandoned, suppressed or concealed. The junior party's entitlement to a patent on Embodiment B should depend, therefore, solely on his entitlement to priority with respect to Embodiment B. Priority is a necessary condition for entitlement to a patent since both parties disclose the embodiment and a sufficient condition since regardless of the party entitled to priority on Embodiment A, it should not become obviousness-generating prior art. Therefore, any standard or count formation which fails to reach the result of the junior party is entitled to contest priority and a patent on Embodiment B is contrary to current statutory requirements for entitlement to a patent.

The proposed rules attempt to rationally define counts in an interference so that the judgment in the interference settles all questions of entitlement to a patent. This not only cannot be done *prospectively*, but should not be done at all. Judgment should be made on *claims*, not counts and unpatentability determinations made against a party subject to the normal ex parte standard that additional evidence of non-obviousness, or other evidence of patentability wholly independent of priority itself, could compel a reconsideration of the judgment of unpatentability.

With respect to paragraph (1) of the comment, the standard of patentability will *not* be applied "on a mutual basis." Thus, if a species is patentable over a genus, the species is a "separate patentable invention" from the genus. Compare *In re Taub*, 348 F.2d 556, 146 USPQ 384 (CCPA 1965)(fluorine species might be patentable over genus of Markush group of hydrogen and halogen). A first count to a genus and a second count to a species which is patentable over the genus may properly appear in an interference. See e.g., Example 4. The comment suggests that if "such mutuality is not applied . . . then a number of irreconcilable anomalies . . . will be manifest." The urged "irreconcilable anomalies" are not readily apparent to the PTO.

The PTO disagrees with the concept expressed in paragraph (2) of the comment that there should be "post-interference reconsideration of separate patentability." One of the principal objects of Public Law 98-622 and these new rules is to encourage complete determination of all rights between parties in an interference and to avoid post-interference reconsideration in an *ex parte* environment of issues which were or could have been raised *inter partes* in an interference.

The commentator remarks in paragraph (3) of the comment that "[a] party entitled to priority for a count under the benefit of 35 USC 119 creates no 'prior art' under 35 USC 102(g)/103 against his opponent." *In re McKellin*, 529 F.2d 1324, 188 USPQ 428 (CCPA 1976), arguable provides support for the commentator's remark. It should be noted, however, that in defining "same patentable invention" and "separate patentable invention" in §1.601(n), the PTO is not establishing a new definition of "prior art." Rather, the PTO is providing definitions which will determine—both initially and ultimately in an interference—how *claims* in an application or patent will be designated to correspond to counts. See §§1.603 and 1.606. Examples 1-19 illustrate how the PTO proposes to initially designate claims to correspond to counts. The designation of claims to correspond (or not correspond) to a count is significant because, as noted by the plurality opinion in *McKellin*, 529 F.2d at 1327, 188 USPQ at 432: "[a] n applicant [or patentee] who has lost an interference is not entitled to claims which correspond to the subject matter of the counts of the interference." Section 1.658(c) estops a party from obtaining a claim which could have been added and which would have been designated to correspond to the lost count. The definitions of "same patentable invention" and "separate patentable invention" in §1.601(n), the availability of motions to designate or not designate claims as corresponding to a count under §1.633(c), and the estoppel provisions of §1.658(c) provide the basis for accomplishing the PTO's objective of resolving *inter partes* in a single proceeding all issues which are or could have been raised between parties in an interference.

Examples illustrate how §§1.601(n), 1.633(c) and 1.658(c) accomplish the PTO's objective.

Example 32: Application AV discloses engines in general and in particular a 6-cylinder engine. Application AV contains only claim 1 (engine). Application AW discloses engines in general, but does not specifically disclose a 6-cylinder engine. Application AW contains only a single claim 3 (engine). The U. S. "filing date" (§1.601(h)) of the AV application is prior to the U. S. filing date of the AW application, but the AW application claims a foreign priority date under 35 U.S.C. 119 based on an application filed in a foreign country prior to the filing date of the AV application. An interference is declared. The sole count of the interference is to "an engine." Claim 1 of the AV application and claim 3 of the AW application are designated to correspond to the count. During the interference, applicant AV does not move under §1.633(c)(2) to add a claim to a 6-cylinder engine and to designate the claim to correspond to the count. Applicant AW is awarded a judgment in the interference based on the earlier filing date of the foreign patent application. After the interference, applicant AV adds claim 2 (6-cylinder engine) to the AV application. Whether AV would be entitled to a patent containing a claim to a 6-cylinder engine will depend solely on whether a 6-cylinder engine is a "separate patentable invention" from "engine"—the subject matter of the count. If a 6-cylinder engine is a "separate patentable invention" within the meaning of §1.601(n), applicant AV could not have successfully moved under §1.633(c)(2) to add claim 2 and to designate it to correspond to the count. Therefore applicant AV could obtain a patent containing claim 2. If, on the other hand, a 6-cylinder engine is not a "separate patentable invention," claim 2 of the AV application would be rejected on the basis of interference estoppel because claim 2 could have been added by a motion under §1.633(c)(2). See §1.658(c). See also Example 37.

Example 33: This example is basically the same as Example 32, except that application AV initially contains claim 1 (engine) and claim 2 (6-cylinder engine). When the interference is declared, both claims 1 and 2 of application AV are designated to correspond to the count. During the interference, applicant AV does not move under §1.633(c)(4) to designate claim 2 as not corresponding to the count. A judgment in the interference is entered for applicant AW based on the earlier filing date of the foreign patent application. After the interference, applicant AV would not be able to obtain a patent containing claim 2, because that claim was designated to correspond to a count and entry of the judgment constitutes a final decision by the PTO refusing to grant applicant AV a patent containing claim 2.

In the written comment, Examples A through E were set out to illustrate what the commentator believed were "perceived difficulties." These examples are set out above and are analyzed below.

Analysis of Commentator's Example A

Example A does not describe any practice under these rules, because "same patentable invention" and "separate patentable invention" under §1.601(n) are not intended to be "applied in a mutuality sense." Where a first count is to a genus and a second count is to a species within the scope of the genus, there may be two counts if the species is separately patentable from the genus. The species is "invention A" referred to in §1.601(n); the genus is "invention B" referred to in §1.601(n).

Analysis of Commentator's Example B

Commentator's Example B suggests—incorrectly—that if an interference is declared with a count to a species that no motion under §1.633(c)(1) to add a count to a genus can ever be granted. If the species ("invention A" referred to in §1.601(n)) is not anticipated by or obvious in view of the genus ("invention B" referred to in §1.601(n)), a motion to add a separate count to the genus may be proper. The commentator uses the language "selection inventions" in both Examples A and B. Insofar as the PTO is aware, the language is not a term of art in the patent law. The PTO has not ascribed any particular meaning to the language in analyzing Examples A or B.

Analysis of Commentator's Example C

The result suggested in commentator's Example C can come to pass only if the moving party accepts as final the denial of the motion to substitute two "sub-generic counts" for the "broad generic count." Unlike practice under the rules which have been in effect, under these new rules a decision denying a motion to substitute a count is reviewable by the Board (see §1.640(c) and §1.655(a), second sentence). Additionally, the party could seek judicial review (35 U.S.C. §§141, 146) of any final decision by the Board. However, if the party accepts as final the PTO's determination that inventions A and B are the "same patentable invention," the party would be precluded from obtaining a patent to invention B. After the interference is terminated, the only conceivable way that the moving party could seek to obtain a patent containing claims to invention B would be to first successfully move to reopen the interference for the purpose of presenting additional evidence. If the motion to reopen is granted (and it would be expected that such a motion will rarely be granted), the moving party would then have to successfully establish that invention A and invention B are not the same patentable invention. The PTO will continue to follow the general guidelines of 4 Rivise & Caesar, *Interference Law and Practice*, §821 *et seq.* (Michie Co. 1948), in determining motions to reopen an interference after entry of judgment. It should be additionally noted that interferences in which a judgment has been entered by a district court in an action brought under 35 U.S.C. §146 or a mandate has been entered by the U. S. Court of Appeals for the Federal Circuit (35 U.S.C. §141 or 28 U.S.C. §1295(a)(4)(C)) will not be reopened until the district court vacates its judgment and/or the Federal Circuit withdraws its mandate.

Analysis of Commentator's Example D

Several questions asked in the commentator's Example D can be answered as follows:

Question: Is the junior party entitled to a patent notwithstanding the disposition of the issue of its separate patentability in an *inter partes* proceeding? *Answer*: No. The junior party should have presented the "evidence that Embodiment B is unexpectedly more useful than anticipated in a commercial setting" during the interference. The PTO expects to resolve issues *inter partes* in the interference. If the PTO was to permit the evidence to be presented after the interference is terminated and after *ex parte* prosecution resumes, a principal purpose of the overall change to interference practice would be defeated. It may be unfortunate that the evidence was not known to the junior party. However, it may also be true that the winning party—had the evidence been presented in the interference—could have produced probative counter-evidence. Why should the winning party be put to the expense of a second interference?

Question: If indeed, the junior party would be entitled to such a patent, must a second interference now be declared with the senior party to again litigate the issue of priority? *Answer*: The premise in the question is not correct. The junior party is not entitled to a patent to Embodiment B and therefore there will not be a second interference.

Question: Had the junior party failed to have made the motion to substitute counts in view of his utter lack of supporting evidence of separate patentability, would the estoppel under 37 CFR 1.658(c) have applied? *Answer*: Yes, unless the junior party can successfully move to reopen the interference.

Question: Would the ends of justice be better served by a standard for count formation which could be finally determined contemporaneously with the filing of the preliminary motions themselves? *Answer*: While the question is not fully understood, it should be recognized that counts will initially be formed when an interference is declared and are subject to being changed by a motion (§1.633(c)) or by the Board (§1.640(c) and §1.655, second sentence). The correctness of the PTO's ultimate decision on what counts should be is subject to judicial review (35 U.S.C. §§141, 146).

Analysis of Commentator's Example E

The PTO, without agreeing or disagreeing with all of the commentator's statements in Example E, disagrees with any ultimate conclusion that the junior party is entitled to a patent on Embodiment B and that such a result "is contrary to current statutory requirements for entitlement to a patent." Interference estoppel precludes granting a patent claiming Embodiment B to the junior party even if Embodiment A is not prior art with respect to Embodiment B.

One comment asked whether "invention A" and "invention B" mentioned in §1.601(n) "refer to the entire scope of subject matter recited in a claim or to the disclosed embodiment(s) supporting the claim (a la *In re Vogel*,[422 F.2d 438,] 164 USPQ 619 (CCPA 1970))?" The question is somewhat difficult, if not impossible, to answer in the abstract. Whether "invention A" refers to the entire scope or to the embodiments which support a claim is not controlling under these new rules. One fundamental change being made under the new rules is that judgments will be in the form of whether an applicant or patentee is or is not entitled to a *claim*. In the past, the Board of Patent Interferences has entered an "award of priority." The use of an "award of priority" does not always accurately express the "judgment" entered in many interferences. See e.g., *Applegate* v. *Scherer*, 332 F.2d 571, 573 n. 1, 141 USPQ 796, 798 n. 1 (CCPA 1964). Whether an applicant or patentee is or is not entitled to a particular claim in any given interference will depend on many factors, some of which include the scope of the claim, the scope of the opponent's claim, and the prior art. An example illustrates the point.

Example 34: Applicant AX discloses an apparatus having fastening means. The specific means disclosed are rivets. Applicant AY discloses a similar apparatus having fastening means. The specific means disclosed are a

nut and bolt. The prior art reveals that items have been fastened with numerous fastening means including both rivets and nuts and bolts. In determining whether AX's apparatus with rivet fastening means is the "same patentable invention" as AY's apparatus with nut and bolt fastening means, it would be proper to consider the specific apparatus disclosed by AX, the specific apparatus disclosed by AY, the fact that both AX and AY disclose the use of "fastening means" broadly, and the prior art which shows rivets and nuts and bolts to be known fastening means.

One comment suggested that the last sentence of §1.604(b) and the last sentence of §1.607(c) be deleted in view of a proposed rule (§10.23(c)(7); 49 F.R. 10028; 49 F.R. 33809) which defines "misconduct" as including "[k] nowingly withholding from the Office information identifying a patent or application of another from which one or more claims have been copied." The proposed rule is still being considered. In any event, the last sentences of §§1.604(b) and 1.607(c) are instructions to examiners whereas proposed 37 CFR §10.23(c)(7) defines misconduct for those registered to practice before the PTO. Another comment suggested deletion of §1.604(b) because "existing rules [37 CFR §1.56] already provide a duty of disclosure of subject matter *material* to examination." There is no inconsistency between the rule relating to the duty of disclosure and §1.604. The comment also suggested that by identifying another application, an applicant "might be construed as having *admitted* that the claims" of the other application are directed to the same patentable invention as the claims in the applicant's application. The filing of such a paper is a statement by the applicant that the claims presented are "*known* to the applicant to define the same patentable invention" (emphasis added). If an applicant wishes to call another application to the attention of an examiner and the applicant believes that the other application does *not* claim the same patentable invention, but nevertheless may be relevant within the meaning of 37 CFR §1.56, the applicant may identify the other application and at the same time state why the invention claimed in the other application is not the same patentable invention as the invention claimed in the applicant's application. For the reasons given, the suggestions made in the two comments are not being adopted.

Three comments relating to §1.605 were received. One comment suggested that the language "or substantially the same as the suggested claim" be deleted from the third sentence of §1.605. The suggestion is being adopted to the extent that the language "a claim which is the same or substantially the same as" is being deleted. Under §1.605, when the examiner requests an applicant to copy a suggested claim, the applicant will be required to copy verbatim the claim suggested by the examiner. A second comment suggested that the second and third sentences of §1.605 be changed to read as follows:

> The applicant to whom the claim is suggested shall amend the application by presenting the suggested claim, or shall identify in the application one or more pending claims which the applicant regards as being directed to the same or substantially the same invention as the suggested claim, within a time specified by the Examiner, not less than thirty days. Failure or refusal of an applicant to timely present a claim or to timely identify one or more claims which are directed to the same or substantially the same invention as the suggested claim shall be taken without further action as a disclaimer by the applicant of the invention defined by the suggested claim.

A third comment suggested that the second and third sentences of §1.605 fail to take into account the case where an applicant is already claiming the invention. The third comment suggested addition of the following at the end of the third sentence of §1.605(a): ", unless the application already contains claims to the same patentable invention." The suggestions made in the second and third comments are not being adopted as such. However, the following sentence is being added as the fourth sentence of §1.605: "At the time the suggested claim is presented, the applicant may also (1) call the examiner's attention to other claims already in the application or which are presented with the suggested claim and (2) explain why the other claims would be more appropriate to be included in any interference which may be declared." A major deficiency of the suggestions made in the second and third comments was the inability of the PTO to efficiently and effectively handle situations where the applicant (1) presents a claim which is "substantially the same as" the suggested claim or (2) points to a claim already in the application *and* the examiner is of the opinion that the claim is not to the same patentable invention. Under these circumstances, the examiner could not properly declare an interference. Accordingly, the applicant will be required to present verbatim the suggested claim. The applicant may, however, also present any other claim which the applicant believes is more appropriate. Alternatively, the applicant, in addition to presenting verbatim the suggested claim, may also call the examiner's attention to a claim already in the application which the applicant believes is more appropriate for interference purposes. In either case, the applicant must explain to the examiner why a claim other than the suggested claim is more appropriate for inclusion in the interference. Upon consideration of the suggested claim and the applicant's alternative claims and any explanation, the examiner is in a position to forward the application to the Board for declaration of an interference. If the applicant is dissatisfied with the claims of the application designated to correspond to the count, the applicant may file an appropriate motion under§1.633(c).

Two comments were received which suggested that the last sentence of §1.606 is not entirely clear. One comment suggested that the language in the last sentence which reads: "to define one patentable invention" be changed to read: "not to contain separate patentable invention." This suggestion is being adopted. The use of the language "*one* patentable invention" was unfortunate and rendered the actual intent of the rule unclear. Under §1.606, at the time an interference is declared a *rebuttable* presumption will exist that any patent claim designated to correspond to a count does not embrace separate patentable inventions. Moreover, at the time the interference is declared, no count will be narrower in scope than the broadest patent claim designated to correspond to that count. The presumption is *rebuttable* and may be challenged and overcome by a motion under §1.633(c). Examples 17 and 18 illustrate practice under §1.606.

Two comments were received discussing §1.607. A first comment suggested that the word "must" in the first sentence of §1.607(c) be changed to "shall. The suggestion is being adopted. Use of "shall" makes §1.607(c) consistent with §1.604(b). A second comment asked the following question:

> "If the examiner determines that the applicant's claim is patentable but that there is no interfering subject matter, and the examiner accordingly allows the claim but refuses to declare an interference, is that determination appealable [to the Board of Appeals and Interferences under 35 U.S.C. §1.134]?"

The commentator suggests that "such a determination" is appealable and rationale in support of the commentator's position appears in Gholz, *Board of Appeals Jurisdiction Over Appeals from Decisions by Primary Examiners Refusing to Institute Interferences on Modified or Phantom Counts*, 64 J. Pat. Off. Soc'y 651 (1982). At the hearing, the commentator orally urged that the rules be amended to permit an appeal to the Board when an examiner allows a claim, but refuses to declare an interference involving the allowed claim. The suggestion is not being adopted. A decision by an examiner to allow a claim, but not to declare an interference involving the allowed claim, is petitionable and not appealable. See Gholz, *supra*, at 652 n. 13. The rule being suggested would enlarge the jurisdiction of the Board. Action by Congress would be necessary to accomplish what is embodied in the suggestion.

Several written comments and one oral presentation at the hearing were made concerning §1.608. One comment suggested that §1.608 be expanded to provide for summary judgment in interferences involving applications where the earlier of the filing date or effective filing date of one application was three months earlier than the date of the other application. This suggestion is not being adopted. Ordinarily, interferences are not declared between applications having effective dates more than three months apart. Moreover, expanding summary judgment proceedings to application-application interferences would result in delay in resolving interferences. Currently in application-patent summary judgment proceedings under 37 CFR §1.204(c), very few summary judgments are entered against applicants who are junior to a patentee by more than three months. There is no reason to expect that a significant number of summary judgments would be entered in application-application interferences. As noted in the notice of proposed rulemaking, the PTO has already declined to expand summary judgment proceedings to cases where a patentee is junior to an applicant by more than three months. See 49 F.R. 3775 (paragraph bridging columns 1 and 2); 1039 O.G. 34; 1039 TMOG 34; 27 BNA 319.

Two written comments were received which suggested that §1.608(b) should be more specific in indicating the kind of evidence which should be submitted when an applicant attempts to make out a *prima facie* case based on priority of invention. The suggestions in the comments are being adopted. The following sentence has been added to §1.608(b):

> Where the basis upon which an applicant is entitled to judgment relative to a patentee is priority of invention, the evidence shall include affidavits by the applicant, if possible, and one or more corroborating witnesses, supported by documentary evidence, if available, each setting out a factual description of acts and circumstances performed or observed by the affiant, which collectively would *prima facie* entitle the applicant to judgment on priority with respect to the earlier of the filing date or effective filing date of the patent.

Similar language appears in the current rule: 37 CFR §1.204(c). The PTO agrees entirely with the following discussion made by one commentator:

> The material added to Rule 608(b) currently appears in existing 37 CFR 1.204(c). A comparison of the existing language of 37 CFR 1.204(c) with the proposed rule might be construed as suggesting that the allegations which are now expressly required where priority is an issue will be changed, specifically relaxed in some manner. Since under proposed Rule 617 this clearly is *not* the case, the proposed addition to Rule 608(b) should assist the practitioner in understanding the intent of the PTO.

The commentator has accurately pointed out that the PTO intends to apply a stricter standard for filing additional evidence in summary judgment proceedings after an order to show cause has been issued. See the notice of proposed rulemaking. 49 F.R. 3775 (column 1); 1039 O.G. 34; 1039 TMOG 1039; 27 BNA 319 (column 1).

At the hearing, it was suggested that §1.608 should encourage the use of 8-1/2 by 11 inch paper for affidavits. This suggestion is being adopted and the following sentence has been added to §1.608(b): "To facilitate preparation of a record (§1.653(g) and (h)) for final hearing, an applicant should file affidavits on paper which is 8-1/2 x 11 inches (21.8 by 27.9 cm.)." The commentator at the hearing suggested that "many people submitting a Rule 608(b) showing are going to want to rely upon that showing under Rule 672(b)" in those cases where an interference is allowed to proceed. Use of 8-1/2 by 11 inch paper will facilitate preparation of the ultimate record.

Two comments were received with respect to §1.609. The first comment suggested that the language "count or counts" in §1.609(b)(1) be changed to "proposed count or counts" and that each occurrence of "the count" in §1.609(b)(2) be changed to "each count". The suggestion is being adopted. These changes are editorial in nature and are designed to enhance the clarity of the rule. A second comment indicated that it was not clear to the commentator why it was necessary under §1.609(b)(3) for the examiner to identify the claims in an application or patent which are deemed to be patentable over any count. The commentator went on to say that the examiner "could probably readily identify claims which would clearly be unpatentable over a count and perhaps this would be all that is needed. If the examiner simply said all claims are considered unpatentable over the count, what recourse does the applicant have if he disagrees?" The purpose of having the examiner identify all claims which are patentable over the count or counts is to place the parties on notice that those claims are allowable notwithstanding any decision in the interference. Thus, in an interference between Jones and Smith if the examiner indicates that claim 8 of Jones is patentable over the proposed count or counts, Smith will know that Jones may receive a patent containing claim 8 even if Smith wins the interference. This will permit Smith to move under §1.633(c) to add claim 8 as corresponding to a count if Smith believes claim 8 defines the same patentable invention as one of the counts. Contrary to the suggestion in the comment, an examiner will not indicate that a claim is unpatentable over a count; rather, the examiner will designate the claim to correspond to a count. Each claim in a patent or application which is directed to the same patentable invention as a count will be designated to correspond to the count. Under the new practice, an examiner will no longer have occasion to indicate that a claim will be rejected over a lost count. To fully answer the commentator's question, if a claim is designated to correspond to a count and the applicant believes the claim does not define the same patentable invention as the count, the applicant may move under §1.633(c) to designate the claim as *not* corresponding to the count. If the motion is granted, the examiner would be authorized to issue the applicant a patent containing the claim even if the applicant loses the interference.

Several comments were received which discuss §1.611. One comment suggested addition of a paragraph (f) to permit expanded summary judgment proceedings in application-application interferences. Since expanded summary judgment proceedings are not contemplated, the suggestion is not being adopted. See the discussion above under analysis of comments of §1.608(b). Two comments suggested that §1.611(c)(8), which provides that a notice declaring the interference shall specify among other things the "order of the parties," fails to take into account the fact one party may be "senior" as to one count and "junior" as to another count. As explained above in connection the analysis of the comments concerning §1.601(m), the "order of the parties" is a procedural tool. It indicates the "style" of the case—which practitioners are encouraged to use. If there are two counts and one party is "senior" as to one count and "junior" as to another count, the party has the burden of proof as to that count to which the party is "junior." See §1.657. Appropriate testimony periods will be set (§1.651(b)) to accommodate differing burdens of proof in cases where a party is "senior" on one count and "junior" on another count. The suggestions to change the meaning of "order of the parties" are not being adopted. Another comment suggested that §1.611(e) be changed to indicate that notice "shall" (as opposed to "may") be given in the *Official Gazette* when an interference has been declared involving a patent. No useful purpose would be served by changing "may" to "shall" inasmuch as the rights of parties involved in an interference are not affected by publication or non-publication of the fact that a patent is involved in the interference. By §1.611 the PTO intends to exercise discretion to publish in the *Official Gazette* an identification of patents which become involved in interferences; however, the PTO does not intend to undertake an absolute obligation to do so. The use of "may" better expresses the PTO's intent behind §1.611(e).

No written comments were received relating to §1.612. However, at the hearing two suggestions were made orally. The first suggestion was that where a "party" has obtained a copy of his "opponent's" affidavit under§1.131 or §1.608(b) (see §1.612(b)), the party should be required to notify the opponent. According to the suggestion, if the opponent then intends to rely on the affidavit (§1.671(e)), the opponent would have to "reserve" the affidavit on the party. This suggestion is not being adopted. When the party gains access to the affidavit under §1.612(b), the party may or may not make an accurate copy. On the other hand, the opponent knows exactly those portions of the affidavit upon which the opponent intends to rely. After careful consideration, the PTO believes on balance that it is better for the opponent to serve a copy of the evidence upon which the opponent intends to rely. Service avoids issues as to whether the party obtained under §1.612(b) a complete and/or accurate copy of the evidence upon which the opponent intends to rely.

The second suggestion concerning §1.612 made orally at the hearing was that a party should have access to an opponent's "predecessor application, even though the application may not be relied upon for 35 USC, Section 120 benefit." According to the suggestion, access to a "predecessor application" may be needed to uncover relevant evidence, including violations of 37 CFR §1.56. Specifically, the commentator called attention to *Driscoll* v. *Cebalo*, 731 F.2d 878, 221 USPQ 745 (Fed. Cir. 1984), *rehearing denied mem.*, (Fed. Cir. July 25, 1984). The suggestion is not being adopted. The Patent Statute (35 U.S.C. §122) provides that applications for patent will be preserved in secrecy by the PTO unless special circumstances are shown. Section 1.687(c) provides for "additional discovery" when required in the interest of justice. Additional discovery is believed to provide the necessary procedural vehicle for obtaining access to an opponent's "predecessor application."

One comment was received which suggested that the language "or members of the same firm of attorneys and agents" be added after "agent" in §1.613(b). The suggestion is being adopted, because it is believed to make the rule clearer.

One comment was received which said the following with respect to §1.616: "Sanctions should not be left to the Examiner-in-Chief (EIC) or BAI [Board of Patent Appeals and Interferences] - This Rule is unnecessary and should be deleted. An alternative would be to give sanction power only to the BAI." The suggestion to delete§1.616 is not being adopted. There are cases where sanctions are warranted. See e.g., *Woods* v. *Tsuchiya*, 207 USPQ 228 (Comm'r. Pat. 1979) and *Tezel* v. *Bellantoni*, 188 USPQ 688 (Bd.Pat.Int. 1975). The PTO continues to believe that imposition of a sanction (except judgment) by a single examiner-in-chief is appropriate. In any event, a party may ask a 3-member panel of the Board to reconsider any sanction which may be imposed by a single examiner-in-chief. See §1.640(c).

Several written and oral comments were received regarding§1.617.

One oral comment made at the hearing suggested that "it should be explicitly stated in Rule 617(a) that the decision of the examiner-in-chief to permit the interference to proceed is without prejudice to the right of any other party to attack the sufficiency of the Rule 608(b) showing when offered as Rule 672 testimony." The suggestion is not being adopted. While no explicit statement to that effect will be placed in §1.617(a), it necessarily follows that any opponent may attack the sufficiency of an applicant's showing under §1.608(b) when that showing is presented as evidence under §1.672. In summary judgment proceedings, all an applicant need do is make out a *prima facie* case. If the interference is allowed to proceed in the normal manner, the applicant must prove priority by a preponderance of evidence (when the application and the patent are copending) or beyond a reasonable doubt (when the application was filed after the patent issued). Manifestly, the burden in summary judgment proceedings is not as strict as the burden in proceedings following summary judgment. *Breuer* v. *DeMarinis*, 558 F.2d 22, 28, 194 USPQ 308, 313 (CCPA 1977) and *Schwab* v. *Pittman*, 451 F.2d 637, 640, 172 USPQ 69, 71 (CCPA 1971).

Several comments suggested that an applicant should be permitted as a matter of right to file a reply to any statement filed by any opponent under §1.617(d). The suggestion that a reply be permitted is being adopted. Accordingly, §1.617(e) has been changed to read: "[w]ithin a time authorized by the examiner-in-chief, an applicant may file a reply to any statement filed by any opponent." Some of the comments indicated that the applicant should be able to reply to a statement by a patentee or another opponent. The language "any opponent" in § 1.617(e) is intended to include both the patentee and any other opponent. The change in the last sentence of § 1.617(h) of "patentee" to "any opponent" is intended to make clear that all parties may appear at a hearing if the applicant requests a hearing.

One comment suggested that the patentee (and presumably any other opponent) should be allowed to present "evidence" during summary judgment proceedings. This suggestion is not being adopted. A change in the second sentence of §1.617(d) is intended to make clear that opponents may file statements in response to an applicant's "response," but the statement "shall be limited to discussing why all the evidence presented by the applicant does not overcome the reasons given by the examiner-in-chief for issuing the order to show cause." The PTO does not intend to expand summary judgment proceedings into a "mini-interference." An applicant presents evidence under §1.608(b). If the examiner-in-chief finds that evidence insufficient, an order to show cause stating reasons for the insufficiency is issued. An applicant may respond and, if appropriate, file "additional evidence." The PTO intends to be rather strict in permitting the filing of new evidence. After the applicant responds (with or without additional evidence), any opponent may file a statement. In the statement, the opponent should be free to comment on all the evidence (original and additional) which the applicant presents. Compare *In re Plockinger*, 481 F.2d 1327, 179 USPQ 103 (CCPA 1973). Under §1.617(d) the opponent may not urge a rationale for summary judgment which does not appear in the order to show cause issued by the examiner-in-chief. However, it is not the PTO's intent to interpret§1.617(d) in the narrow manner the Court of Customs and Patent Appeals interpreted 37 CFR §1.204(c) in *Kahl* v. *Scoville*, 609 F.2d 991, 995-996, 203 USPQ 652, 656 [headnote 6] (CCPA 1979). An example will illustrate how the PTO intends to interpret §1.617(d).

Example 35: An applicant copies claims from a patent and is required to submit a showing under §1.608(b). Upon review of the showing under §1.608(b), the examiner-in-chief concludes that the showing fails to make out a *prima facie* case of priority, because applicant has failed to show an actual reduction to practice. Applicant files a response and includes additional evidence which purports to show an actual reduction to practice. The patentee then files a statement in which two arguments are made. *First*, patentee argues that the additional evidence has not been properly authenticated. *Second*, patentee argues that even if applicant has shown an actual reduction to practice, summary judgment is nevertheless appropriate because applicant suppressed and concealed after the actual reduction to practice. The first argument is proper, but the second argument is not. A patentee may comment on the sufficiency of the applicant's evidence. Fairness, however, dictates that summary judgment be granted only after fair notice in the order to show cause. Accordingly, summary judgment will not be based on a rationale raised by a patentee in a statement which does not correspond to the rationale used by the examiner-in-chief in the order to show cause.

A change has been made in §1.617(a) and §1.617(g) to make clear that once summary judgment proceedings have concluded, an interference will proceed "in the normal manner." The change is intended to codify the decisions in *Walsh* v. *Sakai*, 167 USPQ 465 (Comm'r.Pat. 1967) and *Ing* v. *Chiou*, 207 USPQ 321 (Comm'r.Pat. 1979). This change is further discussed in the discussion of the comments received with respect to §1.635.

One comment was received which indicated that §1.618:

> "needs qualification. It may be appropriate to resubmit certain papers (See also 1.644(d) last sentence)."

The precise "qualification" needed was not set forth in the comment. Likewise, no example of "certain papers" was set forth. Under the circumstances, the PTO declines to make any change in §1.618.

Several comments were received which discussed the rules relating to preliminary statements.

Three comments were received which suggested that §1.622(a) be amended to "take into account several court decisions holding that joint inventors need not be joint inventors of [the subject matter of] all claims." Changes have been made in §1.622(a) consistent with the amendment to 35 U.S.C. §116 made by Public Law 98-622.

One comment was critical of §§1.623(c); 1.624(c); and 1.625(c), because §1.628(b) does not cover the possibility that a drawing might not be available, e.g., a drawing destroyed in "a fire." Section 1.628(b) has been amended to permit a party to allege a date when a first drawing or first written description was made in those circumstances where the first drawing or first written description is not available. The party will be required (1) to show good cause and explain in the preliminary statement why a copy of the drawing or written description cannot be attached to the preliminary statement and (2) attach to the preliminary statement the earliest drawing or written description made in or introduced into the United States which is available. The party would also be required to file a motion to amend its preliminary statement promptly after the drawing or written description becomes available. It is the PTO's intent by the amendment to §1.628(b) to overrule the holding of headnote[1] of *Reddy* v. *Davis*, 187 USPQ 386, 388 (Comm'r.Pat. 1975)

Another comment was critical of the language "conceived" in §1.623(a)(4). The current rules do not require a party to allege a conception; rather, they require one to allege the date of the certain acts which, if proved, would establish conception. See 37 CFR §1.216(a)(4). According to the commentator, an allegation of conception is "unprovable and meaningless." The use of "conception" in §1.623(a)(4) is intentional and is designed to permit a party to "plead" the earliest date on which it believes conception occurred. Contrary to the suggestion in the comment, "conception" is not meaningless and may be proved during the the testimony period. See *Gould* v. *Schawlow*, 363 F.2d 908, 150 USPQ 634 (CCPA 1966); *Meitzner* v. *Corte*, 410 F.2d 433, 161 USPQ 599 (CCPA 1969); and *Mergenthaler* v. *Scudder*, 11 App.D.C. 264, 1897 C.D. 724 (D.C.Cir. 1897). There is no need to prove "conception" in the preliminary statement.

A preliminary statement serves several useful purposes in an interference: (1) it serves to limit a party's proofs as to time, (2) it serves as a vehicle for permitting the examiner-in-chief or the Board to issue orders to show cause in those cases where it would be futile to take testimony, and (3) it serves as notice to an opponent of the case which is alleged by a party. Under the rules being announced herein, the issues which will be raised and decided by the Board at final hearing are made known during the interlocutory stage through (a) the preliminary statement, (b) motions under §1.633 and decisions thereon, and (c) notices under §1.632 of a party's intent to argue abandonment, suppression, or concealment. Section 1.632(a)(4) requires a party to allege a date of conception—it does not require proof of conception. The allegation puts the opponent on notice that the party intends to prove conception as of a date no earlier than the date alleged in the preliminary statement.

One comment suggested that the rules relating to preliminary statements are deficient because they do not permit one to allege allegations concerning tapes. Specifically, the commentator said: "What about a taped transcript of an invention, a practice being followed in a number of research departments of corporations?" If making a tape is the last act of conception, a party may allege the date the tape was made as the conception date under §1.623(a)(4).

Several comments were received which suggested that a party should not have to allege derivation in a preliminary statement because the party may not know derivation occurred until the testimony period. Section 1.625 requires a party to file a preliminary statement when derivation is an issue. If derivation is not known or discovered prior to the date the preliminary statement is due, a party may move to amend the preliminary statement and allege derivation promptly after existence of derivation is discovered.

Several comments discussing §1.624 were received. One comment suggested that §1.624(a)(5) should require a party to state, where appropriate, that no actual reduction to practice of an invention made in a foreign country was introduced into the United States. This suggestion is being adopted and a second sentence has been added to §1.624(a)(5) which provides: "If an actual reduction to practice of the invention was not introduced into the United States, the preliminary statement shall so state." This sentence conforms §1.624(a)(5) to the allegation required in the second sentence of §1.623(a)(5). Another comment suggested that the language "in the United States" be inserted after "reasonable diligence" in §1.624(a)(6) and that all occurrences of the language "was made" in §1.624(c) be changed to "was introduced into the United States". This suggestion is being adopted. As noted in the comment, "[t] he changes . . . are necessary to clarify that for an invention made abroad the only relevant activities are those which occur in the United States." See 35 U.S.C. §104.

One comment asked "how does one introduce 'an actual reduction to practice of the invention' in the United States?" *Breuer* v. *DeMarinis*, 558 F.2d 22, 194 USPQ 308 (CCPA 1971), illustrates a case where an actual reduction to practice abroad was introduced into the United States.

One comment suggested that §1.627(a) be changed to require preliminary statements "be enclosed in an outer envelope addressed to the Commissioner of Patents and Trademarks and be additionally marked Box Interference—Preliminary Statement." According to the comment, the confidentiality of preliminary statements "envisioned under the proposed rules would be further enhanced . . . ." The suggestion is not being adopted. The PTO believes it is sufficient if preliminary statements are enclosed in a sealed envelope as specified in §1.627(a). The Board will not permit access to preliminary statements which have not been ordered opened by an examiner-in-chief.

Several comments discussing §1.629 were received. One comment suggested that the first sentence ("A preliminary statement should be carefully prepared.") should not appear in §1.629(a). This suggestion is being adopted. The PTO agrees with the commentator that the sentence:

> "no longer appears necessary or appropriate in the context of rulemaking. The remainder of the paragraph makes the admonition redundant at best."

Two comments were received which suggested that the word "normally" be deleted from the last sentence of §1.629(d). The suggestions are not being adopted. A preliminary statement is a pleading. The Board does not evaluate or consider the content of a drawing or written description prior to final hearing. At final hearing, in fact, the Board will only consider the drawing or written description if a party places the drawing or written description in evidence. The word "normally" first appeared in 37 CFR §1.223(c), last sentence, in 1978 (see e.g., 973 TMOG 19 (Aug. 1, 1978)). The last sentence of 37 CFR §1.223(c) was intended to codify headnote [2] of *Reddy* v. *Davis*, 187 USPQ 386 (Comm'r.Pat. 1975).

The word "normally" appears in the rule to permit the Board to exercise discretion to evaluate or consider the content of a drawing or written description in some unusual and presently unforeseen circumstance.

One comment suggested that "no earlier than" in §1.629(b) be changed to "as early as". The suggestion is being adopted inasmuch as it is believed to more clearly state the intent of the rule.

One comment suggested that §1.629(d) "is improper because it fails to take into account testimony which can show that a drawing and/or written description were actually made even though the drawing and/or written description are not now available." A change to §1.628(d) and addition of "unless the party complies with §1.628(b)" to the first sentence of §1.629(d) eliminates the problem raised by the commentator.

One comment discussing §1.631(a) was received which expressed the view that a junior party should be required to send a copy of its preliminary statement to the senior party even if the senior party does not file a preliminary statement. According to the commentator, the senior party is *prima facie* the first inventor and at some time it will have to know the earliest dates alleged by the junior party. The rules require all parties to file a preliminary statement. If a junior party does not file a preliminary statement, it will be denied access to any other preliminary statement which is filed. A senior party, however, is always entitled to access to any preliminary statement filed by a junior party. See e.g., §1.631(b). However, a junior party will only be required to serve a senior party who files a statement.

Numerous comments were received discussing §1.633.

One commentator asked: "What sort of a judgment is in order if a count is not patentable over the prior art to an opponent?" Section 1.633(a) authorizes a party to bring a motion for judgment on the ground that the opponent's *claim* corresponding to a count is not patentable. It is important to note that the motion raises the patentability of the opponent's *claim* not the count. Accordingly, by a motion under §1.633(a), a party seeks entry of a judgment that the opponent is not entitled to a patent containing a claim corresponding to a count.

Two comments questioned the nature of the judgment when a motion under §1.633(b) is granted. Section 1.633(b) authorizes the filing of a motion for judgment on the ground that there is no interference-in-fact. If a motion under §1.633(b) is granted, the judgment would provide that each party is entitled to a patent containing that party's claims corresponding to the count. Judgments in interferences under these rules will determine a party's entitlement or lack of entitlement to *claims* corresponding to a count.

One comment expressed the hope that "third party inventorship" would not be made an issue in interferences. Contrary to the hope expressed by the commentator, "third party inventorship" can be made the subject of a motion under §1.633(a). Any ground of unpatentability may be made the subject of a motion under §1.633(a) except (1) priority of invention of the subject matter of a count by the moving party as against any opponent or (2) derivation of the subject matter of a count by an opponent from the moving party. It should be noted that under past practice, third party inventorship has not been considered "ancillary" to priority. *Sheffner* v. *Gallo*, 515 F.2d 1169, 185 USPQ 726 (CCPA 1975). However, under these rules, the question of whether an issue is "ancillary" no longer arises. See 130 Cong. Rec. H10528 (daily ed. Oct. 1, 1984)(statement by Rep. Kastenmeier). Public Law 98-622 gives the Board authority to consider priority and *patentability*. Third party inventorship involves a question of patentability. 35 U.S.C. §102(f). One comment pointed out that §1.633(e) adopts the estoppel rule approved by the Court of Customs and Patent Appeals in *Avery* v. *Chase*, 101 F.2d 205, 40 USPQ 343 (CCPA 1939), *cert. denied*, 307 U.S. 638 (1939), while rejecting the rule announced by the U. S. Court of Appeals for the District of Columbia Circuit in *International Cellucotton Products Co.* v. *Coe*, 35 F.2d 869, 30 USPQ 366 (D.C. Cir. 1936). See also *American Cyanamid Co.* v. *Coe*, 106 F.2d 851, 42 USPQ 302 (D.C. Cir. 1939). The commentator is correct in noting that the rules adopt the estoppel rule approved in *Avery* v. *Chase*. The following comment by the CCPA in its opinion in *In re Shimer*, 69 F.2d 556, 558, 21 USPQ 161, 163 (CCPA 1934), accurately expresses the intent of the PTO in promulgating §§1.633(e) and 1.658(c):

> It may be stated that this rule works no hardship to him who is diligent in pursuit of his rights. When an interference is declared, the files of his contestants are open to him. He has full cognizance of their disclosures and claims. So advised, it becomes his duty to put forward every claim he has. [Rule 1.633(e)] . . . affords him this opportunity. If the rule be not enforced or enforceable, then delays and litigation are greatly increased. It is quite obvious that the doctrine of estoppel, as applied in these cases, results in the better conduct of the business of the Patent[and Trademark] Office and in the public good.

One comment suggested that the following be added to the end of §1.633(c):

> A motion to add or substitute a count shall be construed as an automatic request for the benefit of any earlier application [filing] dates accorded the existing count, and also as encompassed by a contemporaneous motion under §1.633(f) or (g), unless indicated otherwise. Any opposition thereto must be raised in a motion opposition pursuant to §1.638.

The suggestion is not being adopted. A specific reference to §1.637(c) appears in §1.633(c). The provisions of §1.637(c) spell out in detail the steps which a moving party must take in filing a motion under §1.633(c). One of those steps requires the moving party to request benefit of any earlier application. The mere fact that benefit has been accorded for a "first" count does not establish that benefit should be accorded for a "second" count. The PTO believes the burden should be on the moving party to point out where an earlier application supports a count rather than placing the burden on an opponent in the first instance to point out where an earlier application fails to support particular subject matter. There is no compelling reason to force the opponent "to prove a negative." It should be noted that the language "Where appropriate," has been deleted in every instance from §1.637 to make clear that the burden lies on the moving party to request benefit when that party files a motion under §1.633.

At the hearing, one individual commented that §1.633(a) is not clear as to whether a motion for judgment based on "fraudulent appropriation of the moving party's invention by his opponent" excluded. The "fraudulent appropriation of the moving party's invention by his opponent" is derivation. Section 1.633(a)(2) excludes both "innocent" derivation (e.g., through a third party and unknown to either party in an interference) or "fraudulent" derivation (e.g., where one party knowingly takes the invention from an opponent). In either event if derivation by an opponent of a party's invention is proved, the party will be awarded judgment.

One comment made the following statement:

> An opponent faced with a motion for judgment on the ground that a count is unpatentable may not be able to prove patentability in the short time periods. Provision should be made for extensions of time in such cases.

Provisions for extensions of time are made in §1.645.

One comment addressed Example 23 which appeared in the notice of proposed rulemaking. Example 23 also appears in a slightly modified form herein and, as modified, takes into account discussion in the comment. The commentator believed that the motion mentioned in Example 23 should be denied and that a testimony period should be set. Accordingly to the commentator, the granting of the motion would shift the burden to the opponent of the motion. The commentator's point is well taken. Actually, the motion should be deferred to final hearing and a testimony period would be set. In ruling on motions under §1.633, it will not always be possible for the examiner-in-chief to grant or deny outright a motion. When testimony is needed to rule on a motion, the proper course of action is to defer a decision on the motion to final hearing and permit testimony. See §1.639(c). The moving party retains the burden. If testimony is taken on patentability, the parties would also have to take testimony on priority. With all testimony at its disposal, the Board would then be in a position to rule on all issues and award a judgment.

One comment asked how the claims of the parties would be designated to correspond to the counts if in Example 18 a motion to substitute Count 2 (benzene) and add Count 3 (chloroform) was granted. The following Example 36 answers the commentator's question.

Example 36: The facts in this example are the same as Example 18. Assume that applicant AB believes that benzene and chloroform define separate patentable inventions. Applicant AB would file a motion under §1.633(c)(1) to substitute Count 2 (benzene) for Count 1 (Markush group of benzene or chloroform) and add Count 3 (chloroform). If the examiner-in-chief grants the motion, the interference would be redeclared by deleting Count 1 and substituting in its place Counts 2 and 3. Claims 1 and 2 of the patent H and claims 11 and 12 of application AB would be designated to correspond to Count 2. Claims 1 and 3 of patent H and claims 11 and 13 of application AB would be designated to correspond to Count 3. If one party proves priority with respect to both benzene and chloroform, that party would be entitled to all claims in its application or patent corresponding to Counts 2 and 3. The other party would not be entitled to a patent containing any claim corresponding to Counts 2 and 3. If patentee H proves priority with respect to benzene and applicant AB proves priority with respect to chloroform (assuming there was no issue raised at final hearing with respect to the patentable distinctness of benzene and chloroform), the judgment would provide that patentee H is not entitled to a patent with claims 1 and 3, but is entitled to a patent with claim 2 and that applicant AB is not entitled to a patent with claims 11 and 12, but is entitled to a patent with claim 13. If an issue is properly raised at final hearing as to whether benzene and chloroform are the same patentable invention and the Board holds that they are the same patentable invention, the party proving the earliest priority as to either benzene or chloroform would prevail as to all claims. Thus, if patentee H invented benzene before applicant AB invented benzene or chloroform, patentee H would be entitled to a patent containing claims 1 through 3 even if applicant AB invented chloroform before patentee H invented chloroform. Applicant AB would not be entitled to a patent with claims 11 through 13.

An oral comment was received by telephone which raised the question of whether a party is, or could be, required to present in the party's application every claim which the party may ever seek to obtain in a patent based on the party's application. According to the commentator, such a requirement would prevent the party from proceeding *ex parte* after the interference on any claim on which a favorable judgment was not entered. It is not the PTO's intent to require a party who is an applicant to present at the outset all claims which the party may ever seek to obtain in a patent based on his application. Parties in interference cases should recognize, however, that the interference estoppel provisions of §1.658(c) have been expanded with the view to eliminating much of the *ex parte* maneuvering which has taken place in the past after an interference is terminated. Accordingly, a party who fails to move to place a matter in issue runs a considerable risk that the party will not be able to raise the issue *ex parte* after an interference is terminated. Nevertheless, the PTO has determined that it will not, at this time, adopt the requirement suggested by the commentator. The commentator also suggested, contingent on his earlier suggestion being rejected, that the rules provide that a party be authorized to file a motion to require an opponent who is an applicant to add a claim to the opponent's application and to designate the claim as corresponding to a count. This suggestion is being adopted by addition of §1.633(c)(5). Paragraph (c)(5) authorizes the filing of a motion to redefine the interfering subject matter by requiring an opponent who is an applicant to add a claim and to designate the claim to correspond to a count. A companion addition of paragraph (c)(5) to §1.637 sets out the requirements of a motion under §1.633(c)(5). Those requirements are: the moving party must (1) propose a claim to be added to the opponent's application, (2) show the patentability of the claim to the opponent and apply the terms of the claim to the disclosure of the opponent's application, (3) identify the count to which the proposed claim shall be designated to correspond, and (4) show that the proposed claim defines the same patentable invention as the count to which it will be designated to correspond. The following example illustrates how practice under §§1.633(c)(5) and 1.637(c)(5) is expected to occur.

Example 37: In this example, some of the facts set out in Example 32 will be used. Application AV discloses engines and in particular a 6-cylinder engine. Application AV contains only claim 1 (engine). Application AW discloses engines in general, but does not specifically disclose a 6-cylinder engine. Application AW contains only a single claim 3 (engine). Seeing that application AV specifically discloses a 6-cylinder engine and believing that a 6-cylinder engine is the same patentable invention as "engine," AW could move under §1.633(c)(5) to require applicant AV to add a claim (6-cylinder engine) and to have the claim designated to correspond to the count (engine). Applicant AV could oppose on the ground that a 6-cylinder engine is not the "same patentable invention" as "engine." If the motion is granted, applicant AV would be required to add a claim to 6-cylinder engine and the claim would be designated to correspond to the count. If applicant AV loses the interference, the judgment would preclude applicant AV from obtaining a patent with claims to "engine" or "6-cylinder engine." If the motion is denied on the basis that a 6-cylinder engine is not the same patentable invention, applicant AV would not be required to present a claim to 6-cylinder engine and would be able to pursue such a claim *ex parte* even if applicant AV loses the interference.

If an applicant is ordered by an examiner-in-chief to file an amendment to present a claim and the applicant fails or refuses to timely present the amendment, the failure or refusal will be taken without further action as a disclaimer by the applicant of the subject matter of the claim. See the second sentence of §1.640(b)(1).

At the hearing, one commentator indicated that it is not clear whether §1.635 "would permit a motion for judgment in a situation where a junior party's case-in-chief fails as a matter of law to overcome a senior party's effective filing date." Under the rules, it is not the intent of the PTO to allow a senior party to test the sufficiency of the case-in-chief of a junior party prior to final hearing. Thus, a "motion for a directed verdict" (see Rule 50(a) of the Federal Rules of Civil Procedure) at the conclusion of the junior party's case-in-chief and prior to a senior party's case-in-chief is not authorized under the rules. If a senior party believes the case-in-chief of the junior party is insufficient as a matter of law, the senior party may *elect* to proceed immediately to final hearing. If the senior party is incorrect, however, the senior party will have waived any right to present any case-in-chief or rebuttal. See e.g., *Comstock* v. *Kroekel*, 200 USPQ 548, 550 n. 4 (Comm'r.Pat. 1978); *Lorenian* v. *Winstead*, 127 USPQ 501, 508 (Bd.Pat.Int. 1959); and, more recently, *Burson* v. *Carmichael*, 731 F.2d 849, 221 USPQ 664 (Fed. Cir. 1984) ("There is no support in law for repeated bites at the apple"). This would be true even if the only evidence relied upon by the junior party is a showing under 1.608(b). In this respect, the rules codify the decision in *Walsh* v. *Sakai*, 167 USPQ 465 (Comm'r.Pat. 1970).

Two comments were received which suggested that the twenty-day period in §1.636(b) is too short. It was suggested that a longer time period be set and one comment suggested thirty (30) days. The suggestions are not being adopted. The time period set for filing oppositions

will normally be set during a telephone conference call between the examiner-in-chief and the attorneys for the parties. The twenty-day period appears in the rule in the event a specific time for filing oppositions is not set by an examiner-in-chief. The twenty-day period is deemed to be sufficient in most cases. Twenty days are currently allowed to respond to a motion. See 37 CFR §1.231(b). It should be noted that the twenty-day period is longer than the minimum period allowed by the Federal Rules of Civil Procedure for responding to motions. See Rule 6(d) and (e).

Two comments were received which discussed §1.637. Both comments suggested that a sentence be added to §1.637(f)(2) to require a translation to be filed when a party moves for benefit of an earlier foreign application which is not in English. The suggestions are being adopted and the following has been added as the last sentence of §1.637(f)(2): "If the earlier application filed abroad is not in English, the requirements of §1.647 must also be met." Section 1.647 requires a translation whenever a party relies on a document in a language other than English. One comment suggested that the language of §1.637(f)(3) ("Show that the earlier application discloses an embodiment within the scope of the each count.") may be "contrary to past decisions of the CCPA which have held a disclosure can be good without a specific embodiment." The critical issue in each benefit situation is whether the earlier application constitutes a constructive reduction to practice of the invention defined by the count. The issue is necessarily resolved on a case-by-case basis and the presence or absence of an embodiment is only one factor to be considered. Accordingly, the language of §1.647(f)(2) has been changed to read: "Show that the earlier application constitutes a constructive reduction to practice of each count." The comment also criticized the use of the word "each" in §1.647(f)(2). The term "each" is used to make clear that when there are two or more counts, the moving party must show that the earlier application constitutes a constructive reduction to practice for each count. There are cases where a disclosure in an earlier application would constitute a constructive reduction to practice for one count but not for another count.

Several changes have been made to §1.637 which were not made as a result of a comment submitted from the public. Each occurrence of the language "Where appropriate," in §1.637 has been deleted as being unnecessary and possibly confusing. Whenever a party wants or believes that it is entitled to benefit of an earlier application, the party must file a motion under §1.633(f) for benefit. The language "Where appropriate" may have given parties the mistaken impression that a motion was not necessary where benefit of the earlier application had been accorded in the papers declaring the interference. See the discussion above of the suggested change to §1.633(c) which was rejected.

The language "or adding a claim to be designated to correspond to a count" has been added to §1.637(c)(2). The change supplements a change made in §1.633(c)(2). Section 1.637(c)(2) sets out the requirements for a preliminary motion to redefine the interfering subject matter by adding a claim in the moving party's application and to designate the claim to correspond to a count.

In §1.637(c)(2)(ii), the language "Apply the terms of each proposed claim to the disclosure of the application" has been changed to "Show that the proposed or added claim defines the same patentable invention as the count". This change was made to add the requirement of showing that the new claim defines the same patentable invention as the count and to eliminate a requirement already contained in §1.637(c)(2)(iii).

Section 1.637(c)(2)(iii) was changed to refer to an "amended or added claim" and thereby conform the language of the section to the language of §1.633(c)(2).

Paragraph (c)(5) was added to set out the requirements of a motion under §1.633(c)(5) which permits a party to move to require an opponent who is an applicant to add a claim to the application and to designate the claim to correspond to a count. See Example 37.

Two comments were made concerning §1.638. One comment suggested that the twenty-day periods of paragraphs (a) and (b) were too short. The PTO has evaluated the time periods of paragraphs (a) and (b) and has decided that no change will be made to those periods. Attention is directed to the discussion above of the comments concerning §1.636(b) which also contains a twenty-day period.

Another comment made at the hearing suggested that a reply to an opposition to a motion should be permitted as a matter of course. Upon consideration of the comment, it has been decided to authorize the filing of replies to opposition to all motions. Presently, replies are permitting as a matter of course only for oppositions to motions under 37 CFR §1.231. Section 1.638(b), as changed, would permit the reply in every instance. The PTO over the years has received complaints concerning the inability of a party to file replies. The change being made in §1.638(b) will be reviewed sometime in the future to determine whether authorizing replies is helpful to the Board and/or whether undue delay in resolving interference occurs because replies are filed. Moreover, the PTO will make a judgment on whether "new issues" are being raised as a matter of course in replies. It can thus be seen that the change in authorizing replies may be considered experimental and could be changed in the future if found to be counter-productive or inconsistent with the objective of resolving interferences in a relatively prompt manner.

One comment discussing §1.639 was received. The comment states:

> The requirement that proofs of alleged material facts *must* be filed may be difficult or impossible to meet in view of the shortened times. [The] rule should make provisions for timely submission of proofs within reasonable times.

To the extent that the comment suggests setting specific times in the rules, the suggestion is not being adopted. It should be noted that if affidavits cannot be timely prepared to be filed with a motion, the moving party may wish to take advantage of paragraph (c) which requires a party to specify any testimony needed to resolve a motion.

One change was made in §1.639(c) to make clear that a moving party or an opponent may describe any testimony needed to resolve a motion under either §1.633 or §1.634. Often, testimony is needed to resolve inventorship disputes. Accordingly, a party may describe testimony needed to resolve motions to correct inventorship under §1.634. It should be noted that if a party relies solely on affidavits in support of a motion (under §1.633 or §1.634) and the issue raised in the motion is to be considered at final hearing, the party must comply with §1.671(e).

Several comments were received which discussed §1.640. One comment asked: "When the final sentence speaks of a panel deciding the request for reconsideration, does this mean that the panel decides whether to reconsider or whether to modify the decision?" It was the PTO's intent that the panel make a decision on whether to modify the decision made by the single examiner-in-chief. Accordingly, the language "shall be decided by a panel" in the last sentence of §1.640(c) has been changed to read: "shall be acted on by a panel. Another change in language to the fourth sentence of §1.640(c) has been made to make clear that a decision of a single examiner-in-chief will not ordinarily be modified by a panel without an opportunity to file an opposition.

Another comment suggested that §1.640(a) be changed to "allow, even encourage, the examiner-in-chief to travel to conferences where more convenient/practical for all concerned." This suggestion is not being adopted. The use of a telephone conference call eliminates the need to adopt the suggestion. The same comment suggested that the "speedy and inexpensive" language of the second sentence of §1.640(b) be deleted. The suggestion is not being adopted. The comment fails to explain why the language should be deleted. It is obvious that a motion cannot always be granted or denied; other action is often appropriate, e.g., deferring consideration of a motion to final hearing. Section 1.640(b) gives the examiner-in-chief discretion to take appropriate action and the "just, speedy, and inexpensive determination" language provides some standard which an examiner-in-chief may follow in those cases where granting or denying a motion is not appropriate.

One comment was received which suggested that §1.640 be changed to provide that an examiner-in-chief hold a hearing to determine whether an interference should proceed in those cases where a junior party fails to allege a date prior to the senior party and remains in an interference only because the junior party is alleging "fraud" by the senior party. The suggestion is not being adopted. If a party believes that an opponent has committed "fraud" or has engaged in "inequitable conduct," the party may file a motion under §1.633(a) for judgment. Obviously, a motion for judgment on the basis of "fraud" or "inequitable conduct" must make out a case by clear and convincing evidence. The examiner-in-chief has sufficient authority under the rules to preclude a party from proceeding in an interference on a baseless charge of "fraud" or "inequitable conduct."

One oral comment was received which suggested that the examiner-in-chief be required to consult with an examiner prior to deciding a preliminary motion for judgment under §1.633(a) based on patentability. The oral comment suggested alternate proposals:

(1) The examiner-in-chief will normally obtain a patentability report when deciding motions involving a question of patentability.

(2) The examiner-in-chief will consult with a primary examiner prior to deciding a motion raising an issue of patentability.

The suggestion of the oral comment is not being adopted. An examiner-in-chief is a person having "competent legal knowledge and scientific ability." 35 U.S.C. §7. Examiners-in-chief review decisions of examiners on questions of patentability. Accordingly, there is no reason to *require* an examiner-in-chief to consult with an examiner on a question of patentability. The PTO recognizes that many examiners possess special expertise in particular arts. It is for this reason that §1.640(b) provides that "[a] n examiner-in-chief *may* consult with an examiner in deciding motions involving a question of patentability" (emphasis added). Thus, an examiner-in-chief is authorized to consult with an examiner on a question of patentability where the examiner-in-chief believes consultation will be beneficial.

One comment suggested that §1.642 be changed to permit an examiner-in-chief to add a newly discovered patent, as well as newly discovered applications, to an interference. Inasmuch as 35 U.S.C. §135(a) authorizes interferences between applications and patents, the suggestion is being adopted. The language "application" in §1.642 has been changed to read: "application or patent.

Several comments discussing §1.644 were received. One commentator made four suggestions, none of which are being adopted. First, the commentator suggested that there should be no fee for a petition under §1.644(a)(1). This suggestion is not being adopted. A decision on a petition is a service performed by the PTO on behalf of a petitioner. The Commissioner is authorized to charge fees for services performed. 35 U.S.C. § 41(d). Second, the commentator suggested that the last sentence of §1.644(d) be deleted. This suggestion is not being adopted. In the past when parties have filed petitions, copies of documents already in the interference file have been attached to the petition. The copies tend to increase unnecessarily the size of the file of an interference. Inasmuch as the document submitted with the petition is already in the interference, there is no need to file a "second" copy of the document. Parties can expect that petitions will be returned (§1.618) if the petition is accompanied by documents which are already in the interference file. Third, the commentator argued that the "requirement of service within one (1) day is too onerous and should be deleted" from §1.644(g). No rationale was given in support of the argument. Petitions have caused considerable delay in interference cases in the past. To avoid unnecessary delay and surprise on the part of the opponent, the PTO has decided to require that service of a petition be such that delivery to the opponent is within one (1) working day. Service within one day should not ordinarily be difficult in view of "Express Mail" and numerous commercial one-day delivery services available. Lastly, the commentator suggested that §1.644(i) be changed to provide that decision on a petition would not be delegated to the examiner-in-chief handling the interference. The suggestion to change §1.644(i) is not being adopted. However, when a PTO employee is granted authority to decide a petition in an interference case, the employee would not be the examiner-in-chief handling the interference or an employee on a panel of the Board deciding the petition. It would be expected that an employee deciding a petition by delegation of authority would be one who could exercise independent judgment on the petition bearing in mind that a petition will be decided on the record made before the examiner-in-chief or the panel. In connection with this latter point, findings of fact by an examiner-in-chief or the Board will be presumed to be correct unless shown to be clearly erroneous. Discretionary action by an examiner-in-chief or the Board will not be overturned unless it is shown that an abuse of discretion occurred.

One commentator asked the following: "Is §1.644(g) intended to apply only to 'oppositions' to §1.644 petitions, or is it also applicable to §1.638 oppositions?" The provisions of §1.644(g) apply only to petitions filed under§1.644; those provisions do not apply to oppositions under §1.638.

Two comments suggested that §1.644(a)(2) be changed to include an express statement that a petition under paragraph (a)(2) could not be filed until after the Board has entered judgment and that the petition could not relate to the merits of priority of invention or patentability or a question of whether evidence is admissible under the Federal Rules of Evidence. The suggestions are being adopted and appropriate language has been added to §1.644(a)(2) after the word "Commissioner". The change was suggested by the commentators so that no reasonable person could possibly overlook the fact that a petition to exercise supervisory authority can be filed *only after entry of judgment.* It should be noted that the language "and shall not relate to (1) the merits of priority of invention or patentability or (2) the admissibility of evidence under the Federal Rules of Evidence" has been deleted from §1.644(b) in view of the change to §1.644(a)(2).

One comment suggested that the last sentence of § 1.644(f) be changed to make clear that a decision would not ordinarily be modified until the Commissioner had requested an opposition to a request for reconsideration. This suggestion has been adopted and an appropriate change has been made to the last sentence of §1.644(g).

One comment suggested that the word "shall" in the last sentence of §1.644(b) precludes the filing of an opposition beyond the 15-day period specified in the rules. According to the commentator, the opposition should also be considered timely if filed within "any appropriate extension." A party may move to extend the time for filing an opposition. See §1.645.

One comment argued that §1.644(a)(1) cannot "be squared with the statute as interpreted in *Myers* [v. *Feigelman,* 455 F.2d 596, 172 USPQ 580 (CCPA 1972)]." The rationale in support of the comment is the following:

> I presume that the limitation in subparagraph (b) that a petition under subparagraph (a)(2) "shall not relate to . . . the merits of priority of invention or patentability or . . . the admissibility of evidence" is intended to avoid conflict with *Myers* v. *Feigelman,* 172 USPQ 580 (CCPA 1972), and its progeny. However, I read *Myers* as saying that, if the board has statutory authority to make a decision (including all the myriad of ancillary decisions that the panels and/or the single examiner-in-chief will be making under the new procedure), then the Com-

missioner does not have authority to review the board's or the single examiner-in-chief's decision. Or, to put it the other way around, if the Commissioner reviews an examiner-in-chief's decision, he is stepping into the shoes of the examiner-in-chief, and the Commissioner's decision is in turn reviewable by the panel (which is, of course, the only entity authorized to exercise the *statutory* jurisdiction of the board—see *Knickerbacker Toy Co.* v. *Faultless Starch Co.*, 175 USPQ 417 n.8 (CCPA 1972)). Thus, I don't see how proposed section 1.644(a)(1) can possibly be squared with the statute as interpreted in *Myers*.

It is true that the CCPA has stated that, "in performing his duties, the Commissioner cannot usurp the functions or impinge upon the jurisdiction of the Board . . . established by 35 U.S.C. 135." *In re Dickinson*, 299 F.2d 954, 958, 133 USPQ 39, 43 (CCPA 1962). See also *Myers* v. *Feigelman, supra*, 455 F.2d at 599 n. 8, 172 USPQ at 583 n. 8. However, it is also true that the Commissioner "shall superintend or perform all duties required by law respecting the granting and issuing of patents . . . ." 35 U.S.C. §6; *Kingsland* v. *Carter Carburetor Corp.*, 83 U.S.App.D.C. 266, 168 F.2d 565, 77 USPQ 499 (D.C.Cir. 1948); *In re Staeger*, 189 USPQ 284, 285 n. 2 (Comm'r.Pat. 1974). The Commissioner, subject to approval of the Secretary of Commerce, establishes the procedure by which the examiners-in-chief and the Board will consider interference cases. 35 U.S.C. §6. See also 35 U.S.C. §23 relating to affidavits and depositions.

Under the rules, the Commissioner will not determine on petition either "priority of invention" or "patentability." See §1.644(b). Likewise, the Commissioner will not consider whether evidence should have been admitted or excluded under the Federal Rules of Evidence. The PTO believes that the federal courts, which routinely rule on admissibility under the Federal Rules, are in a better position to determine whether the Board properly interpreted the Federal Rules of Evidence.

While the Commissioner will not decide "priority of invention" or "patentability" under 35 U.S.C. §135(a), it does not follow that the Commissioner is precluded from interpreting PTO rules on procedural matters, including procedural matters related to the admissibility of evidence on some basis other than the Federal Rules of Evidence, e.g., whether a party has complied with a PTO rule such as §1.671(e)(procedure for relying on affidavits) or §1.671(g)(permission required for obtaining evidence by subpoena).

Full consideration has been given to the comment. The PTO nevertheless believes that §1.644(a)(1) is not inconsistent with law. Several comments concerning §1.645 were received. One comment suggested that "to" be inserted in the first sentence of paragraph (a) before "file a notice of appeal" and "commence a civil action". According to the comment, "[t] he use of parallel infinitive verb forms provides greater clarity to the rule." The suggestion has been adopted.

Another commentator said the following:

> "No good reason is seen to require a notarized oath from an attorney merely to explain why a paper was filed late, if there is no claim of substantive prejudice by other parties. Attorneys and examiners-in-chief should not be spending unnecessary time and effort on merely procedural formalities. That is contrary to the intent of the new rules."

The PTO agrees with the commentator and has deleted the language "accompanied by an affidavit" from §1.645(b).

One comment suggested that a reference to §1.610(d)(6) which provides for oral requests should be inserted into §1.645 to reflect intent stated in the comments[of the notice of proposed rulemaking] on proposed§1.645." This suggestion is not being adopted. As the commentator notes, §1.610(d) authorizes an examiner-in-chief to hold a conference call to resolve issues and to enter an appropriate order following the conference call. A conference call may be used to obtain an extension of time. If the examiner-in-chief grants the request, an order may be entered—in which case a written motion is not necessary. The order provides the written record required by 37 CFR §1.2. However, it would unduly lengthen the rules to insert a reference to §1.610(d) in each rule to which it may be applicable. Section 1.645(a) specifies the procedure to be used when a written motion is filed. It should be noted that an examiner-in-chief may require a written motion notwithstanding a conference call.

One comment stated that "[t] he 'other business' may be more pressing than the Interference. In order to serve the ends of justice, the PTO should be considerate in this matter." The PTO intends to evaluate each request for an extension of time on a case-by-case basis. However, extensions of time in interference cases have become "routine." A recent survey of a file in one interference revealed the following. The interference was declared on Mar. 30, 1976. Preliminary statements were filed on May 5, 1979. A decision on motions was entered on June 28, 1982. Testimony was filed on Jan. 3, 1984. During the period between declaration and filing of testimony, sixty-four (64) requests or stipulations for extension of time were filed.

When counsel and an examiner-in-chief agree to a schedule and times are set, the parties will be expected to adhere to the schedule unless there are unusual circumstances. Apart from work that counsel may have in an interference, an examiner-in-chief will have a docket and must manage not only the interference involving counsel, but numerous other interferences. The U. S. Court of Appeals for the Federal Circuit recently said the following in *Rosemount, Inc.* v. *Beckman Instruments, Inc.*, 727 F.2d 1540, 1549-1550, 221 USPQ 1, 10 (Fed. Cir. 1984):

> The conduct of a trial, granting of continuances and the like, is not, however, solely or entirely a matter of balancing conveniences of the parties. The Federal Rules of Civil Procedure recognize another consideration—the need for the exercise of discretion by the trial court in carrying out its duty of managing the judicial process, the business of the court, and the administration of justice.

Likewise, these rules also recognize the need for the exercise of discretion by an examiner-in-chief in carrying out his or her duty of managing the interference (§1.610), the business of the PTO (§1.610), and the administration of justice (§1.601).

Several comments were received which discussed §1.646. One comment suggested that it would be clearer if "service" was inserted after "additional" in the last sentence of §1.646(b). This suggestion has been adopted.

Another comment suggested that "or except as otherwise provided in these Rules" be added to §1.646(c) after "otherwise ordered by an examiner-in-chief". The commentator pointed out that the change was needed because certain rules (§§1.644(g) and 1.658(b)) require service by "Express Mail" or by hand. The commentator accurately pointed out that adding the suggested phrase "will call attention to the fact that there are other rules which have their own requirements for service of papers." The suggestion has been adopted, except that "this part" has been used instead of "these Rules."

One comment suggested changing "time" to "date" in the last sentence of §1.646(e). The suggestion has been adopted. The change is necessary to conform with the language of the rule to actual practice and other language in the rule.

Two comments suggested that §1.646(d), which authorizes an examiner-in-chief to order service by hand or "Express Mail," be deleted. This suggestion is not being adopted. The use of "Express Mail" or delivery by hand is often desirable to expedite matters or to avoid unnecessary delay. One comment argued that delivery by hand may be prohibitive. Commercial couriers may be used to accomplish delivery by hand. The fee charged by most commercial couriers is not "prohibitive." The other comment argued that "there are circumstances when . . . [delivery by hand] is [not] possible." The use of §1.646(d) is discretionary on the part of an examiner-in-chief. If delivery by hand, i.e., personal delivery or delivery by commercial courier, or by "Express Mail" is impossible, it would be expected that the examiner-in-chief would exercise discretion and permit service by first class mail.

One comment suggested that the language "present case," which was said to appear in §1.651(b)(1) and §1.651(c), be changed to "prepare case." The suggestion is not being adopted because the language "present case" does not appear in §1.651. In any event, a testimony period is set for a party to present its testimony—either case-in-chief or case-in-rebuttal.

One comment was received which made two suggestions regarding §1.652. First, the comment suggested that a period longer than 15 days be set for filing a response to a paper answering an order to show cause. This suggestion is not being adopted. The fifteen-day period is believed to be adequate in most cases. If more time is needed, a party may file a motion under §1.645. Second, the comment suggested that the party placed under an order to show cause should be permitted as a matter of course to file a "reply" brief. This suggestion is not being adopted. In those instances where the Board believes a "reply" brief is desirable it may authorize the filing of a "reply."

One comment argued that §1.653(i) "fails to make provision for exhibits which are too big to file or are too dangerous to file." If an "exhibit" cannot be filed, it will not be given consideration. A party will have to rely on testimony and/or pictures or sketches for "exhibits" (e.g., a large machine in a factory) which are too large or too dangerous to be filed in the PTO.

While no comments were received concerning §1.654, it should be noted that a new paragraph (c) has been added and paragraph (c) as set out in the notice of proposed rulemaking has been redesignated as paragraph (d). New paragraph (c) provides that a party shall not be entitled to argue that an opponent abandoned, suppressed, or concealed an actual reduction to practice unless a notice under §1.632 was timely filed.

Two comments discussing §1.655 were received. The first comment made the following statement regarding §1.655(a):

> Last sentence—interlocutory orders are reviewed only for 'manifest error' etc. It is not clear whether this includes show cause orders under 1.640 resulting from unpatentability determined under 1.633(a). However, if so, it precludes proper review of the patentability determination.

Patentability will initially be determined by a single examiner-in-chief. See §§1.610(a) and 1.640(b). If the examiner-in-chief determines that a claim of a party is unpatentable to that party, an order to show cause why judgment should not be entered as to that claim will be issued to that party. See §1.640(d). If a response to the order to show cause is filed, a decision will be entered by the Board. See §§1.610(a) and 1.640(e). If the Board determines that the claim is not patentable to the party, a final decision and judgment will be entered holding the claim to be unpatentable. Review of the final decision and judgment is by judicial review under 35 U.S.C. §§141 or 146. It should be noted, however, that if there are other claims in the party's application or patent which are deemed to be patentable, an interlocutory order would be entered holding only that certain claims are unpatentable. A final order holding those claims unpatentable would be entered after final hearing on other issues. Such a practice will avoid piecemeal judicial review.

Another comment suggested that §1.655 be changed to preclude consideration of patentability at final hearing. Public Law 98-622 authorizes consideration of patentability assuming patentability is properly raised by a party during the interlocutory phase of an interference.

Two comments discussing §1.656 were received. One comment suggested that "[b] riefs should be letter size for consistency." The PTO has no preference for the size of briefs. Briefs may be filed on letter or legal-size paper. Inasmuch as the federal courts now require letter-size paper, parties who intend to use a PTO brief as an exhibit in a federal court should use letter-size paper.

Another comment suggested that §1.656 be amended to preclude a single examiner-in-chief from ruling on admissibility of evidence. The introductory remarks to the notice of proposed rulemaking (and this notice) state that "[t] he examiner-in-chief, *where appropriate, will be available by phone to rule on the admissibility of evidence in the event parties encounter unusual* problems during the taking of depositions" (emphasis added). The commentator states:

> If an examiner-in-chief has ruled certain evidence inadmissible, that evidence would presumably not be before the Board at final hearing. Proposed Rule 1.656(h) provides a means for a party to obtain suppression of evidence to which he has made timely objection, but the Rule does not provide for any means for a party whose proffered evidence has been held inadmissible by the examiner-in-chief, to have that holding considered by the Board.

The change suggested by the comment will not be adopted. However, a brief explanation of how practice is expected to work is in order. The introductory remarks indicate that a single examiner-in-chief may rule on admissibility of evidence "where appropriate" and in "unusual" circumstances. There are times during interferences where a motion *in limine* can be helpful. For example, a junior party during its case-in-chief may wish to examine a witness on a document which was *not* served as required by §1.673(b)(1). The senior party objects and realizes that if the junior party is permitted to examine the witness on the document, extensive cross-examination using numerous documents would be necessary. In order to avoid wasting considerable time, the parties could contact the examiner-in-chief by phone for a determination *in limine* on whether the junior party should be able to examine the witness on the document. Under the circumstances outlined the examiner-in-chief in his or her discretion could enter an order excluding the document from evidence. The order would be subject to a request for reconsideration. See §1.640(c). Ordinarily, however, it would be expected that parties would present evidence subject to objection. See §1.675(c), last sentence. It is not envisioned that a single examiner-in-chiefwill routinely rule on the admissibility of evidence.

Several comments discussing §1.658 were received. One comment suggested that the 14-day time period in §1.658(b) is too short. Section 1.658(b) provides that a party may file a request for reconsideration with 14 days of a final decision by the Board. The 14-day time period is the same period authorized for filing requests for reconsideration by the U. S. Court of Appeals for the Federal Circuit. See Rule 40(a) of the Federal Rules of Appellate Procedure.

Several individuals suggested that a less restricted "interference estoppel" be set out in §1.658(c). While full consideration has been given to the suggestions, it has been decided to retain in these rules the interference estoppel provisions of §1.658(c) essentially as proposed. "Interference estoppel" under §1.658(c) is designed to implement the PTO's intent to have as many issues resolved as possible in a single *inter partes* proceeding. Numerous examples in this notice illustrate how practice is expected to take place under §1.658(c).

The language in the second sentence of §1.658(c) has been changed to more clearly state the nature of the estoppel and the exception to estoppel. The word "counts" in the second sentence of §1.658(c) means the counts as they exist at the time a final decision is entered.

One comment was received concerning §1.658(c) which requires a specific answer. The comment made the following statement:

> You state that an estoppel would not apply against a party awarded a favorable judgment as to *all* counts. However, it seems to me that there will be occasion when it would not be appropriate to have estoppel where there was a split decision. For instance, consider an interference between applicants

A and B in which A was awarded priority as to count 1 and B was awarded priority as to count 2. If I understand you correctly, A would be estopped in post-interference *ex parte* practice to present an additional claim X which was patentably indistinct from his claim corresponding to count 1 if B had support for claim X. I think this result would be unfortunate, and that A should be permitted to further refine his claim structure after the interference — that is, after he has been assured that he is entitled to claims to the basic invention recited in count 1. Under the circumstances described by the commentator, inventor A would *not* be estopped to present a claim to X because X is "patentably indistinct" (the proper terminology under the rules would be to say X is the "same patentable invention" as the subject matter of count 1) from the subject matter of count 1. Inventor A would be entitled to claim any disclosed invention which is directed to the "same patentable invention" as count 1. The change in the second sentence of §1.658(c) more clearly reflects the PTO's intent in this regard. Inventor A would *not* be entitled to claim any invention which is the "same patentable invention" as the subject matter of lost count 2. See Examples 26, 27, and 28 for illustrations of interference estoppel practice when a "split" judgment is entered.

Two comments were received discussing §1.659. One comment suggested that the first sentence of §1.659(b) should "reflect" that a reexamination may be based only on patents and printed publications. The suggestion is not being adopted. The basis upon which a reexamination may be instituted are set out elsewhere in the statute and rules. 35 U.S.C. 301-306; 37 CFR 1.501-1.570. There is no further need to set that basis out again in §1.659(b). Another comment suggested that the language "not involved in the judgment of the interference" be deleted from §1.659(b). The rationale in support of the comment was as follows:

> Besides introducing a potential ambiguity as to what claims were 'involved in the judgment,' there does not appear to be any good reasons to draw this distinction, particularly unless it is made more specific. Why should the Board be prevented from recommending reexamination of some (less relevant) patent claims and not other patent claims which are potentially even more relevant to the public, unless *all* of the *same art* has already been fully evaluated against the *same claims* in the Board's decision? (emphasis in original).

When a patent is involved in an interference, each claim of the patent will be designated to (1) correspond to a count *or* (2) not correspond to a count. All claims which are *ultimately* determined to correspond to a count will be "involved in the judgment of the interference." Inasmuch as they are involved in the judgment of the interference, there is no need to recommend reexamination of those claims. The claims involved in the interference are either patentable or unpatentable based on the final decision of the Board. Section 1.659(b) merely authorizes the Board to recommmend reexamination of patent claims which (1) are *not* involved in the judgment and (2) for one reason or another neither party saw fit to move to designate as corresponding to a count.

One comment was received which suggested that the requirements of §1.660 are unnecessary. The PTO disagrees. The requirements of §1.660 are designed to keep the PTO and a party's opponent informed of activity which is relevant to an interference. These rules attempt, to the extent possible, to eliminate procedural surprise. Inasmuch as mail delays occur and the PTO cannot react instantaneously to every paper filed in connection with every application or patent, the provisions of §1.660 are believed helpful in preventing surprise on the part of opponent's and unnecessary work by examiners-in-chief or the Board due to a lack of knowledge of relevant activity which may be taking place in the PTO.

One comment suggested that at the end of §1.661 the following be added: "and the time for any such available appeal or review has expired." The suggestion is not being adopted. Section 1.661 already provides for finality when "no appeal . . . can be taken . . . ." The language finds antecedent basis in 35 U.S.C. §135(a).

Several comments discussing §1.662 were received. Two comments suggested a change be made to provide that when a patentee files a statutory disclaimer under 35 U.S.C. §253 and deletes *all* claims corresponding to a count, the disclaimer will be treated as a request for judgment. As one of the comments pointed out, "[s]ince . . . [the filing of a statutory disclaimer disclaiming all claims corresponding to a count] by the patentee could have no other conceivable effect, the proposed rule should be changed to require judgment when all corresponding claims are disclaimed." The suggestion has been adopted and appropriate changes have been made to §1.662(c). In view of the changes, the following language in §1.662(c), as proposed, is not necessary: "A statutory disclaimer of any claim involved in an interference shall in subsequent proceedings have the same effect with respect to the patentee as an adverse judgment." When a patentee disclaims less than all claims corresponding to a count; the claims which remain in the patent continue to be involved in the interference and any patentability or priority issues involving those remaining claims will be involved in the judgment on the merits in the interference.

Two comments suggested that the word "dissolved" in §1.662(d) be changed to "terminated". This suggestion is being adopted, because §1.662(d) has been deleted. However, all interferences will be terminated with a "judgment." A change has been made in the language of §1.11(a) to delete any reference to terminating an interference other than by judgment.

One comment suggested that the word "construed" in §1.662(a) be changed to "treated". This suggestion has been adopted and more clearly states the intent of the PTO. The filing of the various papers mentioned paragraphs (a) and (c) of §1.662 will result in certain action by the PTO. The word "treated" more appropriately describes the consequences of filing such papers.

One comment suggested that §1.662(a) "is too sweeping." According to the commentator, a patentee may file a disclaimer because it has "become aware of a statutory bar or can not afford the expense of an interference." If the patentee becomes aware of a statutory bar, the patentee should call the "bar" to the attention of the PTO or file an appropriate motion under §1.633(a) for judgment if the "bar" applies to the opponent. If a junior party patentee decides than an interference is too expensive and for that reason files a disclaimer, there is no reason why judgment should not be entered in favor of the opponent. The comment also suggested that §1.662(c) "needs revision" because a patentee may disclaim one claim corresponding to a count, but not another. Section 1.662(c), as revised, takes into account the possibility that less than all claims corresponding to a count may be disclaimed. When some of the patent claims corresponding to a count are disclaimed, the interference proceeds on the basis of the remaining claims which correspond to the count. If all patent claims corresponding to a count are disclaimed, judgment will be entered.

One comment made the following statement regarding the third sentence of §1.662(a):

> What of abandonment in favor of a CIP [continuation-in-part application]? Would this be construed as [a] request to enter [an] adverse judgment? Language should reflect procedural moves of substituting CIP for abandoned application and/or declaring new interference.

The third sentence of §1.662(a) does not apply to an application which is *not* involved in an interference. If an applicant files a continuation-in-part application and successfully moves (§1.633(d)) to substitute the continuation-in-part for the application involved in the interference, abandonment of the application originally involved in the interference would have no bearing on the interference. Accordingly, no additional language is needed in §1.662(a).

Two comments discussing §1.663 were received. One comment suggested that an explanation of the status of patent claims involved in an adverse judgment should be stated in the rule. This suggestion is not being adopted. The status of patent claims involved in an adverse judgment is stated in 35 U.S.C. §135(a). Another comment suggested that the status of "claims which could have been counts . . . should be made of record." Unless a motion (§1.633(c)) to add claims to correspond to counts is filed, no reference will be made in a judgment as to claims "which could have been made counts."

One comment suggested that the language "then owned by either party but" be inserted after "application" in §1.665. This suggestion is not being adopted. The language "same parties" in §1.665 is intended to cover a party and any assignee. The suggested language "then owned" would narrow the scope of the rule in a manner not intended by the PTO.

An oral comment at the hearing suggested that §1.671(e) be changed so that a party would not have to serve copies of affidavits relied upon under §1.608(b) in those cases where an opponent had already obtained copies of the Rule 608(b) affidavits. This suggestion is not being adopted. See the discussion above answering comments related to §1.612(b). Another comment made at the hearing noted that the PTO is "adopting" the Federal Rules of Evidence. The Federal Rules include a "shop book" rule—Rule 803(b)(6). The commentator expressed the view that adopting of a "shop book" rule might make an important change in evidence which is admissible in interferences and suggested that "it would be helpful if the Patent and Trademark Office would publicly comment on this extremely important evidentiary rule . . . . " The PTO believes that adoption of Rule 803(b)(6) of the Federal Rules of Evidence does not constitute a change in the admissibility of "shop book" evidence in interference cases. Rule 803(b)(6) is very similar to the former Federal Shop Book Rule (28 U.S.C. §1732) which it replaced. The courts have articulated a rule of law which the PTO will continue to apply in determining admissibility of laboratory note books under the "shop book" Rule 803(b)(6) of the Federal Rules of Evidence. See e.g., *Alpert* v. *Slatin*, 305 F.2d 891, 134 USPQ 296 (CCPA 1962) and *Elliott* v. *Barker*, 481 F.2d 1337, 179 USPQ 100 (CCPA 1973).

One comment suggested that §1.671(f) be eliminated on the ground that a rule should not be used to train attorneys and agents. The suggestion is not being adopted. The problem addressed by §1.671(f) is significant. By providing in the rules that documentary evidence must be explained the PTO hopes to save both parties and the Board considerable difficulty in presenting and evaluating evidence.

One comment suggested that §1.671(g) should be changed to require a party only to show the "relevancy" of expected testimony as opposed to the "admissibility" of the testimony. This suggestion is being adopted and an appropriate change has been made to §1.671(g) to require a moving party to "describe the general nature and the relevance of the testimony, document, or thing."

An oral comment was received which asked whether permission to issue a subpoena would be needed in the event a party seeks to call a witness under the control of an opponent. Ordinarily, the examiner-in-chief can order a party to produce an individual for a deposition as long as the individual is a party or is under the control of the party, e.g., an employee of an assignee. Where so-called "third parties" are concerned, however, issuance of a subpoena may be necessary, because the PTO has no authority to compel attendance of third parties. Several comments concerning §1.672 were received. One comment at the hearing pointed out that use of 8-1/2 by 11 inch paper for affidavits appears to be optional. The commentator is correct in pointing out that the use is optional. By using 8-1/2 by 11 inch paper, however, a party will save considerable time when filing a record (§1.653).

Two comments asked questions concerning §1.672(b), and in particular, the meaning of the word "party" in the phrase "a party shall not be entitled to rely on any document or thing not mentioned in one or more of the affidavits . . . ." Specifically, one commentator stated:

> It is the scope of the words "the party" which leave doubt as to the meaning of the passage. If "the party" refers *only* to the party proffering the affidavit testimony, then the passage is fair since such party had the opportunity to use whatever documents it deemed favorable to its position. But if "the party" also encompasses the opponent, i.e., the cross-examining party not proffering the affidavit testimony, then the passage improperly restricts the scope of cross-examination. Surely, the proponent party cannot, simply by confining the affidavit to favorable documents, insulate the witness from cross-examination on unfavorable documents.

Section 1.672(b) refers to a "party" and an "opponent." The "party" is the party filing the affidavit and not an opponent of that party. Any "opponent" conducting cross-examination of an affiant may properly rely on documents and things not referred to in the affidavit.

One comment suggested that the language "a witness whose testimony will not be compelled under 35 U.S.C. 24" should be deleted or revised. According to the commentator:

> This is often not determinable in advance. Even a "voluntary" witness may develop cold feet and require a subpoena, or demand one for his own protection. Nor will all witnesses agreeable to affidavits be agreeable to depositions.

The suggestion is not being adopted. An affidavit may be used only when a witness agrees to sign the affidavit. If an individual refuses to sign an affidavit or voluntarily appear at a deposition, the party calling the witness will have to compel attendance at a deposition by a subpoena under 35 U.S.C. §24 after receiving permission from an examiner-in-chief.

One comment asked why there is "no express provision . . . [in the rules] for simply taking appropriate testimony of an adverse party by notice . . . rather than requiring a subpoena?" In many cases, notice will be sufficient inasmuch as an examiner-in-chief or the Board may generally order an adverse party to appear and give testimony. Thus, in many cases a subpoena is not needed to require attendance at a deposition of an adverse party.

Two comments suggested that a time be set out in the rules by which an affidavit should be filed. The suggestion is being adopted and the second sentence of §1.672(b) has been changed to provide that affidavits shall be filed prior to the close of the party's relevant testimony period. The two comments also suggested that the rules specify that documents relied upon in an affidavit be filed with the affidavit. This suggestion is also being adopted by an appropriate change to §1.672(b) which will provide that a party cannot rely on any document referred to in an affidavit unless a copy of the document is filed with the affidavit. Any document filed with an affidavit must also be served (§1.646). Section 1.672(b) will also provide that a party may not rely on any "thing" mentioned in an affidavit unless the opponent is given reasonable access to the "thing." A "thing" is something other than a document. The comments had suggested that the "things" be limited to those under the possession, custody, or control of the party submitting the affidavit. This suggestion is not being adopted. If a "thing" is not under the possession, custody, or control of a party, the party should resort the use of a deposition and compel production of the "thing" by a subpoena under 35 U.S.C. §24.

Four comments were received discussing §1.673. It was suggested that the time for service under §1.673(b) be three days if service is accomplished by hand or "Express Mail" and ten days if service is accomplished by any other means. This suggestion is being adopted. An

appropriate change has been made in the introductory sentence of §1.673(b). It was also suggested that the word "copy" in §1.673(b)(1) be changed to read "list and copy". In support of the suggestion, one commentator states:

> In connection with the service of documents, the amendment to the proposed rule would require that a listing of documents accompany the documents themselves. This would permit cross-checking between lists and documents to ascertain whether or not discrepancies exist and reduce the possibility for later controversy.

The suggestion is being adopted. Under §1.673(b)(1) a list of the documents would have to accompany the documents. One comment suggested that documents served should be "Bates numbered." While this suggestion is not being adopted in the sense of changing the language of a rule, it must be remembered that the party serving documents may be required to later prove exactly what was served. Using "Bates" numbers or an equivalent scheme may prove invaluable in later stages of an interference.

One comment discussing §1.682 suggested that the language "not identified on the record during the taking of testimony of a witness" be deleted. This suggestion is not being adopted. If an official record or printed publication is made an exhibit during a deposition or in an affidavit, it need not be submitted under §1.682. Section 1.682 permits a party to make an official record or printed publication part of the evidence being considered at final hearing without calling a witness. The official record or printed publication must, however, be self-authenticating. On the other hand, a party may present the official record or printed publication as an exhibit during testimony. When this latter course is followed, there is no need to take advantage of the provisions of §1.682. The comment also suggested that a change be made in §1.682(a)(4) because the requirement therein for a "certified" copy appeared to be inconsistent with §1.671(d) which provides that a record of the PTO need not be certified. The suggestion is being adopted by adding "where appropriate" at the beginning of §1.682(a)(4) and a reference to §1.671(d) at the end of §1.682(a)(4). If the official record is not a record of the PTO, it will be necessary to submit a certified copy of the official record.

Comments were received discussing §1.684. One comment suggested that language be inserted in §1.684(a) to make clear that the testimony authorized is for a case-in-chief or a case-in-rebuttal. The suggestion is not being adopted. The testimony authorized by §1.684(a) is necessarily testimony for a case-in-chief or a case-in-rebuttal. The commentator correctly notes that the use of written interrogatories under §1.684 "for cross-examination would seem neither appropriate or justified." Section 1.684 does not apply to cross-examination. If a party submits an affidavit under §1.672(b) or intends to rely on an affidavit under §1.617(e), the party must make the affiant available for cross-examination at a deposition. See §1.673(e). A deposition may be noticed only "for a reasonable time and place in the United States." See §1.673(a). Accordingly, it is not expected that §1.684(a) will be used to cross-examine affiants residing in foreign countries. The party filing the affidavit will be required to make the affiant available for cross-examination in the United States.

One comment suggested that the provisions of §1.685(d) are "harsher" than the corresponding provisions of 37 CFR §1.285(c). The comment is not fully understood. Section 1.685(d) requires an objection to be stated on the record. An objection to the admissibility of evidence must be stated on the record *and* a motion under§1.656(h) renewing the objection at final hearing must be filed. No longer will a party be permitted to attend a deposition and fail to enter an objection only to raise the objection at final hearing. The current practice permits a party to delay the objection until it is often too late to permit an opponent to correct the evidentiary basis on which the objection is bottomed.

One comment suggested that the second sentence of §1.687(b) ("If the witness refuses to produce a requested document or thing, the party may file a motion (§1.635) for additional discovery under paragraph (c) of this section.") be deleted. This suggestion is being adopted. The PTO agrees with the following remark by the commentator: "[o]mission of the sentence is recommended since it is clear from [paragraph] (c) [of §1.687] that such a motion could be made in an appropriate case."

One comment at the hearing suggested that the PTO's inability to enter protective orders makes discovery unduly complicated. The commentator suggested that under§1.687(c), as set out in the notice of proposed rulemaking, it is possible to obtain appropriate protective orders. The commentator correctly concedes that the maximum sanction which the PTO can enter upon a proven violation of a PTO entered protective order is judgment. See §1.616. The commentator suggested, however, that additional discovery may be conditioned on the issuance of a subpoena *duces tecum* under 35 U.S.C. §24. Upon issuance of the subpoena, the commentator stated that the opponent could move the district court for entry of a protective order. If a party violates a protective order entered by a district court, the party would be subject to such sanctions as the district court might deem appropriate as well as a sanction by the PTO, including entry of judgment against the party. The PTO, unlike the district court, would not be able to apply a sanction after an interference is terminated.

The commentator's suggestion is believed to be sound. No change in the language of §1.687(b) is believed to be necessary inasmuch as paragraph (b) authorizes the PTO to "specify the terms of conditions of such additional discovery." One of those terms could be requiring a party to issue a subpoena under 35 U.S.C. §24. By making a party proceed in the first instance in the PTO, appropriate PTO orders may be entered suggesting the scope of any protective order and stating the underlying basis for requiring a party to produce documents. The order could be of assistance to the district court in subsequent enforcement or contempt proceedings.

Additional discovery obtained under a protective order issued by either the PTO or a district court will not be admitted in evidence in the PTO in determining the interference. All evidence submitted in an interference must be made available to the public under the provisions of §1.11(a). Accordingly, any protective orders have to be vacated before a document could be admitted in evidence in the PTO which is subject to a protective order.

Example 38 illustrates how the practice would work.

Example 38:

An interference involves party X and party Y. During the interference, party X files a motion for additional discovery under §1.687(c) asking that party Y be required to produce certain documents. Party Y opposes on the sole ground that the documents contain trade secret and confidential information. Party Y indicates that it has no objection to producing the documents for inspection by counsel for party X, but insists that party X not be permitted to inspect the documents. Accordingly, party Y asks the examiner-in-chief to authorize the discovery subject to entry of a protective order. Party Y argues, however, that the sanctions of §1.616 are not sufficient in the event of a violation of the protective order. An examiner-in-chief concludes that additional discovery should be ordered, that a protective order is appropriate, and that the sanctions of §1.616 are not sufficient in the event of a violation of the protective order. Under the circumstances, the examiner-in-chief would enter an order directing party Y to produce the documents for inspection by counsel of party X on the condition that party X seek production of the documents by a subpoena *duces tecum* under 35 U.S.C. §24. Upon issuance of any subpoena, party Y could move the district court for entry of a protective order. If the district court enters the protective order, party Y can produce the documents to counsel for party X. If the protective order of the examiner-in-chief is violated, an appropriate sanction up to and including judgment may be entered by the Board. In addition, party Y would be in a position to seek contempt or other sanctions in the district court. The documents produced for inspection by counsel for party X could not be admitted in evidence in the interference (until the protective order is vacated), because those documents are not documents which can be made available to the public under §1.11(a).

The following is an anticipated time schedule for a two-party interference:

Event in Interference	Time from last event in the interference	Total time in interference
Interference declared (1.611)		
Filing of preliminary statements (1.621) and preliminary motions (1.633)	3 months	3 months
Filing oppositions to preliminary motions (1.638(a))	2/3 month	3-2/3 months
Filing replies to oppositions (1.638(b))	2/3 month	4-1/3 months
Decision on preliminary motions (1.640(b)(1)), open preliminary statements (1.631), set times for filing motions for discovery (1.687(c) and testimony (1.651(a))	1 month	5-1/3 months
Filing of motions for discovery (1.635, 1.651(a), 1.687(c))	1 month	6-1/3 months
Filing of opposition to motion for discovery (1.638(a))	2/3 months	7 months
Filing reply to opposition to motion for discovery (1.638(b))	2/3 months	7-2/3 months
Decision on motion for discovery	2/3 months	8-1/3 months
Time for compliance with any discovery	2/3 months	9 months
Junior party testimony (case-in-chief; 1.672(b)):		
Testimony	2 months	11 months
Senior party cross-examination of affiants if needed	1 month	12 months
Senior party testimony (case-in-chief and case- in-rebuttal, 1.672(b)):		
Testimony	2 months	13-2/3 months
Junior party cross-examination of affiants if needed	1 month	14-2/3 months
Junior party testimony (case-in-rebuttal):		
Testimony	2/3 month	16 months
Senior party cross- examination of affiants if needed	2/3 month	16-2/3 months
Filing of record (1.653(c))	1-1/3 months	18 months
Brief for junior party (1.656)	1 month	19 months
Brief for senior party (1.656)	1 month	20 months
Reply brief for junior party (1.656)	2/3 month	20-2/3 months
Final hearing (1.654)	1 month	21-2/3 months
Decision (1.658)	2 months	23-2/3 months

The following is an index for §§1.601 through 1.688:

Rule Index

§1.601 Scope of rules, definitions
§1.602 Interest in applications and patents involved in interference
§1.603 Interference between applications; subject matter of the interference
§1.604 Request for interference between applications by an applicant
§1.605 Suggestion of claim to applicant by examiner
§1.606 Interference between an application and a patent; subject matter of the interference
§1.607 Request by applicant for interference with patent
§1.608 Interference between an application and a patent; *prima facie* showing by applicant
§1.609 Preparation of interference papers by examiner
§1.610 Assignment of interference to examiner-in-chief, time period for completing interference
§1.611 Declaration of interference
§1.612 Access to applications
§1.613 Lead attorney, same attorney representing different parties in an interference, withdrawal of attorney or agent
§1.614 Jurisdiction over interference
§1.615 Suspension of *ex parte* prosecution
§1.616 Sanctions for failure to comply with rules or order

§1.617	Summary judgment against applicant
§1.618	Return of unauthorized papers
§1.621	Preliminary statement, time for filing, notice of filing
§1.622	Preliminary statement, who made invention, where invention made
§1.623	Preliminary statement; invention made in United States
§1.624	Preliminary statement; invention made abroad
§1.625	Preliminary statement; derivation by an opponent
§1.626	Preliminary statement; earlier application
§1.627	Preliminary statement, sealing before filing, opening of statement
§1.628	Preliminary statement, correction of error
§1.629	Effect of preliminary statement
§1.630	Reliance on earlier application
§1.631	Access to preliminary statement, service of preliminary statement
§1.632	Notice of intent to argue abandonment, suppression, or concealment by opponent
§1.633	Preliminary motions
§1.634	Motion to correct inventorship
§1.635	Miscellaneous motions
§1.636	Motions, time for filing
§1.637	Content of motions
§1.638	Opposition and reply, time for filing opposition and reply
§1.639	Evidence in support of motion, opposition, or reply
§1.640	Motions, hearing and decision, redeclaration of interference, order to show cause
§1.641	Unpatentability discovered by examiner-in-chief
§1.642	Addition of application or patent to interference
§1.643	Prosecution of interference by assignee
§1.644	Petitions in interference
§1.645	Extension of time, late papers, stay of proceedings
§1.646	Service of papers, proof of service
§1.647	Translation of document in foreign language
§1.651	Setting times for discovery and taking testimony, parties entitled to take testimony
§1.652	Judgment for failure to take testimony or file record
§1.653	Record and exhibits
§1.654	Final hearing
§1.655	Matters considered in rendering a final decision
§1.656	Briefs for final hearing
§1.657	Burden of proof as to date of invention
§1.658	Final decision
§1.659	Recommendation
§1.660	Notice of reexamination, reissue, protest or litigation
§1.661	Termination of interference after judgment
§1.662	Request for entry of adverse judgment; reissue filed by patentee
§1.663	Status of claim of defeated applicant after interference
§1.664	Action after interference
§1.665	Second interference
§1.666	Filing of interference settlement agreements
§1.671	Evidence must comply with rules
§1.672	Manner of taking testimony
§1.673	Notice of examination of witness
§1.674	Persons before whom depositions may be taken
§1.675	Examination of witness, reading and signing transcript of deposition
§1.676	Certification and filing by officer, marking exhibits
§1.677	Form of a transcript of deposition
§1.678	Transcript of deposition must be filed
§1.679	Inspection of transcript
§1.682	Official records and printed publications
§1.683	Testimony in another interference, proceeding, or action
§1.684	Testimony in a foreign country
§1.685	Errors and irregularities in depositions
§1.687	Additional Discovery
§1.688	Use of discovery

The following is a table correlating the present rules (37 CFR §1.201 through 1.288) to the rules (37 CFR §§1.601 through 1.688).

Rule Correlation Table

Old	New
1.201(a)	1.601(a)
1.201(b)	1.601(b), (c)
1.201(c)	1.602
1.202	none
1.203(a)	1.603(a), (b)
1.203(b)	1.605(a)
1.203(c)	1.605(b)
new	1.604(a)
1.203(d)	1.604(b)
1.204(a)	none
1.204(b)	1.608(b)
1.204(c)	1.608(c)
1.205(a)	1.606(a), (b)
1.205(b)	1.607(a), (c)
1.205(c)	1.607(d)
new	1.608(a)
1.206(a)	1.607(b)
1.207(a)	1.609
new	1.610
1.207(b)	1.611
1.208	1.613
1.211	1.614
1.212	1.615
new	1.616
1.228	1.617
new	1.618
1.215(a)	1.621(a)
1.215(b)	1.621(b)
1.215(c)	1.629(c)
1.216(a)	1.622(a), (b)
1.216(a)(1)-(6)	1.623(a)
1.216(b)	1.623(b), 1.624(b), 1.625(b)
1.216(c)	1.666
1.217(a)	1.624(a), 1.625(a)
1.217(b)	1.623(a)
1.218	1.621(a)
1.219	1.627
1.222	1.628
1.223	1.629
1.224	1.630
1.225	1.640(d), (e), and 1.651(c)(4)
1.226	1.612
1.227	1.631
new	1.632
1.231	1.633, 1.634
1.237	1.641
1.238	1.642
1.242	1.643
1.243	1.635, 1.636, 1.637(b) 1.638 through 1.640
1.244	1.644
1.245	1.645
1.246	1.645
1.247	1.646
1.248	1.646
new	1.647
1.251	1.651
1.252	1.652
1.253	1.653
1.254	1.656
1.255	1.656(c)
1.256	1.654
1.257(a)	1.657
1.257(b)	1.658(c), (d)
1.258	1.655
1.259	1.659
new	1.660
1.262	1.662(a)
1.263	1.662(a) and (d)
1.264	1.662(b) and (c)
new	1.662(e)
1.265	1.663
1.266	1.664
1.267	1.665
1.268	1.666
1.271	1.671
new	1.671(g)
1.272(a)	1.672(a), (b)
1.272(b)	1.672(c)
1.272(c)	1.672(d), (e)
1.273(a)	1.673(a), (c), (d),
new	1.673(e)
1.273(b)	1.673(f)
1.274	1.674
1.275	1.675
1.276	1.676
1.277	1.677
1.278	1.678
1.279	1.679
1.281	1.645
1.282	1.682
1.283	1.683
1.285	1.685
1.286	eliminated
1.287(a)(1)(i),(ii)	1.673(b)
1.287(a)(1)(iii)	1.673(a)
1.287(a)(2),(3)	eliminated
1.287(b)	eliminated
1.287(c)	1.687
1.287(d)(1)	1.673(c)
1.287(d)(2)	1.616
1.287(e)	1.687(d)
1.288	1.688

Other Considerations: These rules do not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rules are in conformity with the requirements of the (1) Regulatory Flexibility Act (Pub. L. 96-354), (2) Executive Order 12291, and (3) the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Small Business Administration that these rules will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act; Public Law 96-354). The rules govern the conduct of interference cases which arise in the Patent and Trademark Office. In fiscal 1983, the Patent and Trademark Office received 105,704 patent applications. During the same period, 180 interferences were declared. It is expected that the overall cost will be reduced for obtaining a patent based on application which become involved in an interference. See a "section-by-section" analysis submitted for the Record by Representative Kastenmeier during discussion of H. R. 6286 on the floor of the House in which the following statement appears (130 Cong.Rec. H10528, columns 2 and 3):

> it is expected that interferences will become simpler, more expeditious, and less costly. Under the bill, all issues of patentability and priority which arise in an interference can be decided in a single proceeding rather than in a series of complicated *inter partes* and *ex parte* proceedings.

These rules, therefore, will have no significant economic impact on small entities.

The Patent and Trademark Office has determined that this rule is not a major rule under Executive Order 12291. The annual effect on the economy would be less than $100 million. There would be no major increase in costs or prices for consumers, individual industries, federal state, or local government agencies, or geographic regions. There would be no adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

These rules do not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations, Conflict of interests, Courts, Inventions and patents, Lawyers.

PART 1 — RULES OF PRACTICE IN PATENT CASES

For the reasons set out in the preamble and under the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, 23, 41, and 135, Part 1 of Title CFR is amended as set forth below.

1. Section 1.1 is amended by adding a new paragraph (e) to read as follows:

§1.1 All communications to be addressed to Commissioner of Patents and Trademarks.

* * * * *

(e) Communications relating to interferences and applications or patents involved in an interference should be additionally marked "BOX INTERFERENCE."

2. Section 1.4 is amended by revising paragraph (a)(2) and reprinting the introductory text of paragraph (a) to read as follows:

§1.4 Nature of correspondence.

(a) Correspondence with the Patent and Trademark Office comprises:

* * * * *

(2) correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing, processing, or other proceedings of national applications in Subpart B, §§1.31 to 1.352; of international applications in Subpart C, §§1.401 to 1.482; of reexamination of patents in Subpart D, §§1.501 to 1.570; of interferences in Subpart E, §§ 1.601 to 1.688; and of trademark applications §§2.11 to 2.189.

* * * * *

3. Section 1.5 is amended by adding a new paragraph (e) to read as follows:

§1.5 Identification of application, patent or registration

* * * * *

(e) When a paper concerns an interference, it should state the names of the parties and the number of the interference. The name of the examiner-in-chief assigned to the interference (§1.610) and the name of the party filing the paper should appear conspicuously on the first page of the paper.

4. Section 1.8 is amended by adding to paragraph (a) a new subparagraph (xii) to read as follows:

§1.8 Certificate of mailing.

* * * * *

(xii) The filing of a paper in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail."

* * * * *

5. Section 1.9 is amended by adding a new paragraph (g) to read as follows:

§1.9 Definitions.

* * * * *

(g) For definitions in interferences see §1.601.

6. Section 1.11 is amended by revising paragraph (a) to read as follows:

§1.11 Files open to the public.

(a) After a patent has been issued, the specification, drawings and all papers relating to the case in the file of the patent are open to inspection by the general public, and copies may be obtained upon paying the fee therefor. After entry of a judgment in an interference by the Board of Patent Appeals and Interferences as to all parties, the file of any interference which involved a patent, or an application on which a patent has issued, is similarly open to public inspection and procurement of copies. See §2.27 for trademark files.

* * * * *

7. Section 1.14 is amended by removing from paragraph (d) the words "Board of Patent Appeals or the Board of Patent Interferences" and inserting, in their place, the words "Board of Patent Appeals and Interferences."

8. Section 1.17 is amended by revising paragraphs (e), (g), (h), and (l) to read as follows:

§1.17 Patent application processing fees.

* * * * *

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:

By a small entity (§1.9(f))	$ 57.50
By other than a small entity	115.00

* * * * *

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in appeal under 35 U.S.C. §134:

By a small entity (§1.9(f))	$ 50.00
By other than a small entity	100.00

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph $120.00

— §1.47 — for filing by other than all the inventors or a person not the inventor
— §1.48 — for correction of inventorship
— §1.182 — for decision on questions not specifically provided for
— §1.183 — to suspend the rules
— §1.377 — for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent
— §1.378(e) — for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent
— §1.644(e) — for petition in an interference
— §1.644(f) — for request for reconsideration of a decision on petition in an interference.
— §1.666(c) — for late filing of interference settlement agreement.
— §§5.12, 5.13 & 5.14 — for expedited handling of foreign filing license
— §5.15 — for changing the scope of a license
— §5.25 — for retroactive license

(i) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph ..... $ 60.00

— §1.12 — for access to an assignment record
— §1.14 — for access to an application
— §1.55 — for entry of late priority papers
— §1.102 — to make application special
— §1.103 — to suspend action in application
— §1.177 — for divisional reissues to issue separately
— §1.312 — for amendment after payment of issue fee
— §1.313 — to withdraw an application from issue
— §1.314 — to defer issuance of a patent
— §1.334 — for patent to issue to assignee, assignment recorded late
— §1.666(b) — for access to interference settlement agreement

* * * * *

9. Section 1.36 is revised as follows:

§1.36 Revocation of power of attorney or authorization; withdrawal of attorney or agent.

A power of attorney or authorization of agent may be revoked at any stage in the proceedings of a case, and an attorney or agent may withdraw, upon application to and approval by the Commissioner. An attorney or agent, except an associate attorney or agent whose address is the same as that of the principal attorney or agent, will be notified of the revocation of the power of attorney or authorization, and the applicant or patent owner will be notified of the withdrawal of the attorney or agent. An assignment will not of itself operate as a revocation of a power or authorization previously given, but the assignee of the entire interest may revoke previous powers and be represented by an attorney or agent of the assignee's own selection. See §1.613(d) for withdrawal of an attorney or agent of record in an interference.

10. Section 1.48 is revised as follows:

§1.48 Correction of inventorship.

If the correct inventor or inventors are not named in an application for patent through error without any deceptive intention on the part of the actual inventor or inventors, the application may be amended to name only the actual inventor or inventors. Such amendment must be diligently made and must be accompanied by (a) a petition including a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred; (b) an oath or declaration by each actual inventor or inventors as required by §1.63; (c) the fee set forth in §1.17(h); and (d) the written consent of any assignee. When the application is involved in an interference, the petition shall comply with the requirements of this section and shall be accompanied by a motion under §1.634.

11. Section 1.55 is amended by removing from paragraph (a) "1.224" and inserting, in its place, "1.630".

12. Section 1.59 is revised as follows:

§1.59 Papers of application with filing date not to be returned.

Papers in an application which has received a filing date pursuant to §1.53 will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost of any application in which either the required basic filing fee (§1.16) or the processing and retention fee (§1.21(l)) has been paid. See §1.618 for return of unauthorized and improper papers in interferences.

13. Section 1.68 is revised as follows:

§1.68 Declaration in lieu of oath.

Any document to be filed in the Patent and Trademark Office and which is required by any law, rule, or other regulation to be under oath may be subscribed to by a written declaration. Such declaration may be used in lieu of the oath otherwise required, if, and only if, the declarant is on the same document, warned that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. 1001) and may jeopardize the validity of the application or any patent issuing thereon. The declarant must set forth in the body of the declaration that all statements made of the declarant's own knowledge are true and that all statements made on information and belief are believed to be true.

14. Section 1.103 is amended by revising paragraph (d) as follows:

§1.103 Suspension of action.

* * * * *

(d) Action on applications in which the Office has accepted a request filed under §1.139 will be suspended for the entire pendency of these applications except for purposes relating to interference proceedings under §§1.601 through 1.688.

15. Section 1.122 is amended by revising paragraph (b) as follows:

§1.122 Entry and consideration of amendments.

* * * * *

(b) Ordinarily all amendments presented in a paper filed while the application is open to amendment are entered and considered, subsequent cancellation or correction being required of improper amendments. Untimely amendatory papers may be refused entry and consideration in whole or in part. For amendments presented during an interference see §1.664.

16. Section 1.136 is amended by removing "§1.207" and inserting, in its place, "§1.611" and by removing "§1.245" and inserting, in its place, "§1.645".

17. Section 1.138 is revised as follows:

§1.138 Express Abandonment.

An application may be expressly abandoned by filing in the Patent and Trademark Office a written declaration of abandonment signed by the applicant and the assignee of record, if any, and identifying the application. An application may also be expressly abandoned by filing a written declaration of abandonment signed by the attorney or agent of record. A registered attorney or agent acting under the provision of §1.34(a), or of record, may also expressly abandon a prior application as of the filing date granted to a continuing application when filing such a continuing application. Express abandonment of the application may not be recognized by the Office unless it is actually received by appropriate officials in time to act thereon before the date of issue.

18. Section 1.181 is amended by revising paragraph (a) as follows:

§1.181 Petition to the Commissioner.

(a) Petition may be taken to the Commissioner: (1) from any action or requirement of any examiner in the *ex parte* prosecution of an application which is not subject to appeal to the Board of Patent Appeals and Interferences or to the court; (2) in cases in which a statute or the rules specify that the matter is to be determined directly by or reviewed by the Commissioner; and (3) to invoke the supervisory authority of the Commissioner in appropriate circumstances. For petitions in interferences, see §1.644.

* * * * *

19. The center heading preceding §1.191 is revised to read "APPEAL TO THE BOARD OF PATENT APPEALS AND INTERFERENCES".

20. Section 1.191 is amended by revising the section heading and paragraphs (a) and (c) as follows:

§1.191 Appeal to Board of Patent Appeals and Interferences.

(a) Every applicant for a patent or for reissue of a patent, or every owner of a patent under reexamination, any of the claims of which have been twice rejected or who has been given a final rejection (§1.113), may, upon the payment of the fee set forth in §1.17(e), appeal from the decision of the examiner to the Board of Patent Appeals and Interferences within the time allowed for response.

* * * * *

(c) An appeal when taken must be taken from the rejection of all claims under rejection which the applicant or patent owner proposes to contest. Questions relating to matters not affecting the merits of the invention may be required to be settled before an appeal can be considered.

* * * * *

21. Section 1.194 is amended by removing the words "Board of Appeals" and inserting, in their place, the words "Board of Patent Appeals and Interferences."

22. Section 1.196 is revised as follows:

§1.196 Decision by the Board of Patent Appeals and Interferences.

(a) The Board of Patent Appeals and Interferences, in its decision, may affirm or reverse the decision of the examiner in whole or in part on the grounds and on the claims specified by the examiner. The affirmance of the rejection of a claim on any of the grounds specified constitutes a general affirmance of the decision of the examiner on that claim, except as to any ground specifically reversed.

(b) Should the Board of Patent Appeals and Interferences have knowledge of any grounds not involved in the appeal for rejecting any appealed claim, it may include in the decision a statement to that effect with its reasons for so holding, which statement shall constitute a new rejection of the claims. When the Board of Patent Appeals and Interferences makes a new rejection of an appealed claim, the appellant may exercise any one of the following three options:

(1) The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the examiner in which event the application will be remanded to the examiner and the decision of the Board of Patent Appeals and Interferences shall not be considered final for the purpose of judicial review. The statement shall be binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground for rejection stated in the decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

(2) The appellant may have the case reconsidered under§1.197(b) by the Board of Patent Appeals and Interferences upon the same record. Where request for such reconsideration is made the Board of Patent Appeals and Interferences shall, if necessary, render a new decision which shall include all grounds upon which a patent is refused.

(3) The appellant may treat the decision, including the new grounds for rejection given by the Board of Patent Appeals and Interferences, as a final decision in the case.

(c) Should the decision of the Board of Patent Appeals and Interferences include an explicit statement that a claim may be allowed in amended form, appellant shall

have the right to amend in conformity with such statement which shall be binding on the examiner in the absence of new references or grounds of rejection.

(d) Although the Board of Patent Appeals and Interferences normally will confine its decision to a review of rejections made by the examiner, should it have knowledge of any grounds for rejecting any allowed claim it may include in its decision a recommended rejection of the claim and remand the case to the examiner. In such event, the Board shall set a period, not less than one month, within which the appellant may submit to the examiner an appropriate amendment, a showing of facts or reasons, or both, in order to avoid the grounds set forth in the recommendation of the Board of Patent Appeals and Interferences. The examiner shall be bound by the recommendation and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection. Should the examiner make the recommended rejection final the applicant may again appeal to the Board of Patent Appeals and Interferences. Whenever a decision of the Board of Patent Appeals and Interferences includes a remand, that decision shall not be considered a final decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

23. Section 1.197 is amended by revising paragraphs (a) and (b) as follows:

§1.197 Action following decision.

(a) After decision by the Board of Patent Appeals and Interferences, the case shall be returned to the examiner, subject to the appellant's right of appeal or other review, for such further action by the appellant or by the examiner, as the condition of the case may require, to carry into effect the decision.

(b) A single request for reconsideration or modification of the decision may be made if filed within one month from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Patent Appeals and Interferences so states.

* * * * *

24. Section 1.198 is amended by removing the words "Board of Appeals" and inserting, in their place, the words "Board of Patent Appeals and Interferences."

25. The center heading preceding §1.201 is removed.

26. Sections 1.201 through 1.212 are removed.

27. The center heading preceding §1.215 is removed.

28. Sections 1.215 through 1.228 are removed.

29. The center heading preceding §1.231 is removed.

30. Sections 1.231 through 1.238 are removed.

31. The center heading preceding §1.242 is removed.

32. Sections 1.242 through 1.247 are removed.

33. A center heading preceding §1.248 is added which reads "MISCELLANEOUS PROVISIONS".

34. Section 1.248 is amended by adding paragraph (c) and revising the section heading as follows:

§1.248 Service of Papers; manner of service; proof of service in cases other than interferences.

* * * * *

(c) See §1.646 for service of papers in interferences.

35. The center heading preceding §1.251 is removed.

36. Sections 1.251 through 1.259 are removed.

37. The center heading preceding §1.261 is removed.

38. Sections 1.261 through 1.268 are removed.

39. The center heading preceding §1.271 is removed.

40. Sections 1.271 through 1.288 are removed.

41. Section 1.292 is amended by revising paragraph (a) and adding paragraph (c) as follows:

§1.292 Public use proceedings.

(a) When a petition for the institution of public use proceedings, supported by affidavits or declarations and the fee set forth in §1.17(j) is filed by one having information of the pendency of an application and is found, on reference to the examiner, to make a *prima facie* showing that the invention claimed in an application believed to be on file had been in public use or on sale more than one year before the filing of the application, a hearing may be had before the Commissioner to determine whether a public use proceeding should be instituted. If instituted, the Commissioner may designate an appropriate official to conduct the public use proceeding, including the setting of times for taking testimony, which shall be taken as provided by §§1.671 through 1.685. The petitioner will be heard in the proceedings but after decision therein will not be heard further in the prosecution of the application for patent.

* * * * *

(c) A petition for institution of public use proceedings shall not be filed by a party to an interference as to an application involved in the interference. Public use and on sale issues in an interference shall be raised by a preliminary motion under §1.633(a).

42. Section 1.301 is amended by removing the words "Board of Appeals" and the words "Board of Patent Interferences" and inserting, in each of their places, the words "Board of Patent Appeals and Interferences."

43. Section 1.302 is amended by removing from paragraph (b) "1.248" and inserting, in its place, "1.646" and by removing "and other contested cases".

44. Section 1.303 is amended by removing from paragraph (a) the words "Board of Appeals" and the words "Board of Patent Interferences" and inserting, in each of their places, the words "Board of Patent Appeals and Interferences" and by removing from paragraph (c) "1.248" and inserting, in its place, "1.646". 45. Section 1.304 is amended by revising paragraph (a) as follows:

§1.304 Time for appeal or civil action.

(a) The time for filing the notice and reasons of appeal to the U.S. Court of Appeals for the Federal Circuit (§1.302) or for commencing a civil action (§1.303) is sixty days from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time provided under §1.197(b) or §1.658(b), the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. Except for an appeal from or commencing a civil action after a decision of the Board of Patent Appeals and Interferences in a reexamination proceeding or an interference proceeding, the time periods set forth herein are subject to the provisions of §1.136. See §1.550(c) for extensions of time to appeal or commence a civil action in a reexamination proceeding. See §1.645(a) for extensions of time to appeal or commence a civil action in an interference. An examiner-in-chief, upon a showing of excusable neglect, may extend the time for seeking judicial review of a decision of the Board of Patent Appeals and Interferences in an interference case when a request is untimely filed after expiration of the time prescribed by this section.

* * * * *

46. Section 1.322 is amended by revising paragraph (a) as follows:

§1.322 Certificate of correction of Office mistake.

(a) A certificate of correction under 35 U.S.C. 254 may be issued at the request of the patentee or the patentee's assignee. Such certificate will not be issued at the request or suggestion of anyone not owning an interest in the patent, nor on motion of the Office, without first notifying the patentee (including any assignee of record) and affording the patentee an opportunity to be heard. When the request relates to a patent involved in an interference, the request shall comply with the requirements of this section and shall be accompanied by a motion under §1.635.

* * * * *

47. Section 1.323 is revised as follows:

§1.323 Certificate of correction of applicant's mistake.

Whenever a mistake of a clerical or typographical nature or of minor character which was not the fault of the Office, appears in a patent and a showing is made that such mistake occurred in good faith, the Commissioner may, upon payment of the fee set forth in §1.20(a), issue a certificate, if the correction does not involve such changes in the patent as would constitute new matter or would require reexamination. A request for a certificate of correction of a patent involved in an interference shall comply with the requirements of this section and shall be accompanied by a motion under §1.635.

48. Section 1.324 is revised as follows:

§1.324 Correction of inventorship in patent.

Whenever a patent is issued and it appears that the correct inventor or inventors were not named through error without deceptive intention on the part of the actual inventor or inventors, the Commissioner may, on petition of all the parties and the assignees and satisfactory proof of the facts and payment of the fee set forth in §1.20(b), or on order of a court before which such matter is called in question, issue a certificate naming only the actual inventor or inventors. A request to correct inventorship of patent involved in an interference shall comply with the requirements of this section and shall be accompanied by a motion under §1.634.

49. Section 1550 is amended by removing from paragraph (a) "Board of Appeals" and inserting, in its place, "Board of Patent Appeals and Interferences."

50. Section 1.565 is amended by revising paragraph (b) and adding paragraph (c) as follows:

§1.565 Concurrent office proceedings.

* * * * *

(b) If a patent in the process of reexamination is or becomes involved in litigation or a reissue application for the patent is filed or pending, the Commissioner shall determine whether or not to stay the reexamination or reissue proceeding.

* * * * *

(c) If a patent in the process of reexamination is or becomes involved in an interference, the Commissioner may stay reexamination or the interference. The Commissioner will not consider a request to stay an interference unless a motion (§1.635) to stay the interference has been presented to, and denied by, an examiner-in-chief and the request is filed within ten (10) days of a decision by an examiner-in-chief denying the motion for a stay or such other time as the examiner-in-chief may set.

51. A new subpart entitled "Subpart E—Interferences" is added which reads as follows:

SUBPART E—INTERFERENCES

Sec.

1.601 Scope of rules, definitions
1.602 Interest in applications and patents involved in interference
1.603 Interference between applications; subject matter of the interference
1.604 Request for interference between applications by an applicant
1.605 Suggestion of claim to applicant by examiner
1.606 Interference between an application and a patent; subject matter of the interference
1.607 Request by applicant for interference with patent
1.608 Interference between an application and a patent; *prima facie* showing by applicant
1.609 Preparation of interference papers by examiner
1.610 Assignment of interference to examiner-in-chief, time period for completing interference
1.611 Declaration of interference
1.612 Access to applications
1.613 Lead attorney, same attorney representing different parties in an interference, withdrawal of attorney or agent
1.614 Jurisdiction over interference
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1.617 Summary judgment against applicant
1.618 Return of unauthorized papers
1.621 Preliminary statement, time for filing, notice of filing
1.622 Preliminary statement, who made invention, where invention made
1.623 Preliminary statement; invention made in United States
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1.625 Preliminary statement; derivation by an opponent
1.626 Preliminary statement; earlier application
1.627 Preliminary statement, sealing before filing, opening of statement
1.628 Preliminary statement, correction of error
1.629 Effect of preliminary statement
1.630 Reliance on earlier application
1.631 Access to preliminary statement, service of preliminary statement
1.632 Notice of intent to argue abandonment, suppression, or concealment by opponent Preliminary motions
1.634 Motion to correct inventorship
1.635 Miscellaneous motions
1.636 Motions, time for filing
1.637 Content of motions
1.638 Opposition and reply, time for filing opposition and reply
1.639 Evidence in support of motion, opposition, or reply
1.640 Motions, hearing and decision, redeclaration of interference, order to show cause
1.641 Unpatentability discovered by examiner-in-chief
1.642 Addition of application or patent to interference
1.643 Prosecution of interference by assignee
1.644 Petitions in interference
1.645 Extension of time, late papers, stay of proceedings
1.646 Service of papers, proof of service
1.647 Translation of document in foreign language
1.651 Setting times for discovery and taking testimony, parties entitled to take testimony
1.652 Judgment for failure to take testimony or file record
1.653 Record and exhibits
1.654 Final hearing
1.655 Matters considered in rendering a final decision
1.656 Briefs for final hearing
1.657 Burden of proof as to date of invention

1.658 Final decision
1.659 Recommendation
1.660 Notice of reexamination, reissue, protest, or litigation
1.661 Termination of interference after judgment
1.662 Request for entry of adverse judgment; reissue filed by patentee
1.663 Status of claim of defeated applicant after interference
1.664 Action after interference
1.665 Second interference
1.666 Filing of interference settlement agreements
1.671 Evidence must comply with rules
1.672 Manner of taking testimony
1.673 Notice of examination of witness
1.674 Persons before whom depositions may be taken
1.675 Examination of witness, reading and signing transcript of deposition
1.676 Certification and filing by officer, marking exhibits
1.677 Form of a transcript of deposition
1.678 Transcript of deposition must be filed
1.679 Inspection of transcript
1.682 Official records and printed publications
1.683 Testimony in another interference, proceeding, or action
1.684 Testimony in a foreign country
1.685 Errors and irregularities in depositions
1.687 Additional Discovery
1.688 Use of discovery

Authority: 35 USC 6, 23, 41, and 135

SUBPART E — Interferences

§1.601 Scope of rules, definitions.

This subpart governs the procedure in patent interferences in the Patent and Trademark Office. This subpart shall be construed to secure the just, speedy, and inexpensive determination of every interference. For the meaning of terms in the Federal Rules of Evidence as applied to interferences, see §1.671(c). Unless otherwise clear from the context, the following definitions apply to this subpart:

(a) "Additional discovery" is discovery to which a party may be entitled under §1.687 in addition to discovery to which the party is entitled as a matter of right under §1.673(a) and (b).

(b) "Affidavit" means affidavit, declaration under §1.68, or statutory declaration under 28 U.S.C. §1746. A transcript of an *ex parte* deposition may be used as an affidavit.

(c) "Board" means the Board of Patent Appeals and Interferences.

(d) "Case-in-chief" means that portion of a party's case where the party has the burden of going forward with evidence.

(e) "Case-in-rebuttal" means that portion of a party's case where the party presents evidence in rebuttal to the case-in-chief of another party.

(f) A "count" defines the interfering subject matter between (1) two or more applications or (2) one or more applications and one or more patents. When there is more than one count, each count shall define a separate patentable invention. Any claim of an application or patent which corresponds to a count is a claim involved in the interference within the meaning of 35 U.S.C. §135(a). A claim of a patent or application which is identical to a count is said to "correspond exactly" to the count. A claim of a patent or application which is not identical to a count, but which defines the same patentable invention as the count, is said to "correspond substantially" to the count. When a count is broader in scope than all claims which correspond to the count, the count is a "phantom count." A phantom count is not patentable to any party.

(g) The "effective filing date" of an application or a patent is the filing date of an earlier application accorded to the application or patent under 35 U.S.C. §§119, 120, or 365.

(h) In the case of an application, "filing date" means the filing date assigned to the application. In the case of a patent, "filing date" means the filing date assigned to the application which issued as the patent.

(i) An "interference" is a proceeding instituted in the Patent and Trademark Office before the Board to determine any question of patentability and priority of invention between two or more parties claiming the same patentable invention. An interference may be declared between two or more pending applications naming different inventors when, in the opinion of an examiner, the applications contain claims for the same patentable invention. An interference may be declared between one or more pending applications and one or more unexpired patents naming different inventors when, in the opinion of an examiner, any application and any unexpired patents contain claims for the same patentable invention.

(j) An "interference-in-fact" exists when at least one claim of a party which corresponds to a count and at least one claim of an opponent which corresponds to the count define the same patentable invention.

(k) A "lead" attorney or agent is a registered attorney or agent of record who is primarily responsible for prosecuting an interference on behalf of a party and is the attorney or agent whom an examiner-in-chief may contact to set times and take other action in the interference.

(l) A "party" is (1) an applicant or patentee involved in the interference or (2) a legal representative or an assignee of an applicant or patentee involved in an interference. Where acts of a party are normally performed by an attorney or agent, "party" may be construed to mean the attorney or agent. An "inventor" is the individual named as inventor in an application involved in an interference or the individual named as inventor in a patent involved in an interference.

(m) A "senior party" is the party with earliest effective filing date as to all counts or, if there is no party with the earliest effective filing date as to all counts, the party with the earliest filing date. A "junior party" is any other party.

(n) Invention "A" is the "same patentable invention" as a invention "B" when invention "A" is the same as (35 U.S.C. §102) or is obvious (35 U.S.C. §103) in view of invention "B" assuming invention "B" is prior art with respect to invention "A". Invention "A" is a "separate patentable invention" with respect to invention "B" when invention "A" is new (35 U.S.C. §102) and nonobvious (35 U.S.C. §103) in view of invention "B" assuming invention "B" is prior art with respect to invention "A".

(o) "Sworn" means sworn or affirmed.

(p) "United States" means the United States of America, its territories and possessions.

§1.602 Interest in applications and patents involved in an interference.

(a) Unless good cause is shown, an interference shall not be declared or continued between (1) applications owned by a single party or (2) applications and an unexpired patent owned by a single party.

(b) The parties, within 20 days after an interference is declared, shall notify the Board of any and all right, title, and interest in any application or patent involved or relied upon in the interference unless the right, title, and interest is set forth in the notice declaring the interference.

(c) If a change of any right, title, and interest in any application or patent involved or relied upon in the interference occurs after notice is given declaring the interference and before the time expires for seeking judicial review of a final decision of the Board, the parties shall notify the Board of the change within 20 days of the change.

§1.603 Interference between applications; subject matter of the interference.

Before an interference is declared between two or more applications, the examiner must be of the opinion that there is interfering subject matter claimed in the applications which is patentable to each applicant subject to a judgment in the interference. The interfering subject matter shall be defined by one or more counts. Each count shall define a separate patentable invention. Each application must contain, or be amended to contain, at least one claim which corresponds to each count. All claims in the applications which define the same patentable invention as a count shall be designated to correspond to the count.

§1.604 Request for interference between applications by an applicant.

(a) An applicant may seek to have an interference declared with an application of another by (1) suggesting a proposed count and presenting a claim corresponding to the proposed count, (2) identifying the other application and, if known, a claim in the other application which corresponds to the proposed count, and (3) explaining why an interference should be declared.

(b) When an applicant presents a claim known to the applicant to define the same patentable invention claimed in a pending application of another, the applicant shall identify that pending application, unless the claim is presented in response to a suggestion by the examiner. The examiner shall notify the Commissioner of any instance where it appears an applicant may have failed to comply with the provisions of this paragraph.

§1.605 Suggestion of claim to applicant by examiner.

(a) The examiner may suggest that an applicant present a claim in an application for the purpose of an interference with another application or a patent. The applicant to whom the claim is suggested shall amend the application by presenting the suggested claim within a time specified by the examiner, not less than one month. Failure or refusal of an applicant to timely present the suggested claim shall be taken without further action as a disclaimer by the applicant of the invention defined by the suggested claim. At the time the suggested claim is presented, the applicant may also (1) call the examiner's attention to other claims already in the application or which are presented with the suggested claim and (2) explain why the other claims would be more appropriate to be included in any interference which may be declared.

(b) The suggestion of a claim by the examiner for the purpose of an interference will not stay the period for response to any outstanding Office action. When a suggested claim is timely presented, *ex parte* proceedings in the application will be stayed pending a determination of whether an interference will be declared.

§1.606 Interference between an application and a patent; subject matter of the interference.

Before an interference is declared between an application and an unexpired patent, an examiner must determine that there is interfering subject matter claimed in the application and the patent which is patentable to the applicant subject to a judgment in the interference. The interfering subject matter will be defined by one or more counts. Each count shall define a separate patentable invention. Any application must contain, or be amended to contain, at least one claim which corresponds to each count. All claims in the application and patent which define the same patentable invention as a count shall be designated to correspond to the count. At the time an interference is initially declared (§1.611), a count shall not be narrower in scope than any patent claim which corresponds to the count and any single patent claim will be presumed, subject to a motion under §1.633(c), not to contain separate patentable inventions.

§1.607 Request by applicant for interference with patent.

(a) An applicant may seek to have an interference declared between an application and an unexpired patent by (1) presenting a proposed count and a claim corresponding to the proposed count and, if any claim of the patent or application does not correspond exactly to the proposed count, explaining why an interference should be declared, (2) identifying the patent and indicating which claim in the application and which claim or claims of the patent correspond to the proposed count, and (3) applying the terms of the application claim corresponding to the count to the disclosure of the application.

(b) When an applicant seeks an interference with a patent, examination of the application, including any appeal to the Board, shall be conducted with special dispatch within the Patent and Trademark Office. The examiner shall determine whether there is interfering subject matter claimed in the application and the patent which is patentable to the applicant subject to a judgment in an interference. If the examiner determines that there is any interfering subject matter, an interference will be declared. If the examiner determines that there is no interfering subject matter, the examiner shall state the reasons why an interference is not being declared and otherwise act on the application.

(c) When an applicant presents a claim which corresponds exactly or substantially to a claim of a patent, the applicant shall identify the patent and the number of the patent claim, unless the claim is presented in response to a suggestion by the examiner. The examiner shall notify the Commissioner of any instance where an applicant fails to identify the patent.

(d) A notice that an applicant is seeking to provoke an interference with a patent will be placed in the file of the patent and a copy of the notice will be sent to the patentee. The identity of the applicant will not be disclosed unless an interference is declared. If a final decision is made not to declare an interference, a notice to that effect will be placed in the patent file and will be sent to the patentee.

§1.608 Interference between an application and a patent; *prima facie* showing by applicant.

(a) When the earlier of the filing date or effective filing date of an application is three months or less after the earlier of the filing date or effective filing date of a patent, the applicant, before an interference will be declared, shall file an affidavit alleging that there is a basis upon which applicant is entitled to a judgment relative to the patentee.

(b) When the earlier of the filing date or the effective filing date of an application is more than three months after the earlier of the filing date or the effective filing date under 35 U.S.C. §120 of a patent, the applicant, before an interference will be declared, shall file (1) evidence which may consist of patents or printed publications, other documents, and one or more affidavits which demonstrate that applicant is *prima facie* entitled to a judgment relative to the patentee and (2) an explanation stating with particularity the basis upon which the applicant is *prima facie* entitled to the judgment. Where the basis upon which an applicant is entitled to judgment relative to a patentee is priority of invention, the evidence shall include affidavits by the applicant, if possible, and one or more corroborating witnesses, supported by documentary evidence, if available, each setting out a factual description of acts and circumstances performed or observed by the affiant, which collectively would *prima facie* entitle the applicant to judgment on priority with respect to the earlier of the filing date or effective filing date of the patent. To facilitate preparation of a record (§1.653(g) and (h)) for final hearing, an applicant should file affidavits on paper which is 8-1/2 x

11 inches (21.8 by 27.9 cm.). The significance of any printed publication or other document which is self-authenticating within the meaning of Rule 902 of the Federal Rules of Evidence or §1.671(d) and any patent shall be discussed in an affidavit or the explanation. Any printed publication or other document which is not self-authenticating shall be authenticated and discussed with particularity in an affidavit. Upon a showing of sufficient cause, an affidavit may be based on information and belief. If a examiner finds an application to be in condition for declaration of an interference, the examiner will consider the evidence and explanation only to the extent of determining whether a basis upon which the applicant would be entitled to a judgment relative to the patentee is alleged and, if a basis is alleged, an interference may be declared.

§1.609 Preparation of interference papers by examiner.

When the examiner determines that an interference should be declared, the examiner shall forward to the Board:

(a) All relevant application and patent files and

(b) A statement identifying:

(1) The proposed count or counts;

(2) The claims of any application or patent which correspond to each count, stating whether the claims correspoad exactly or substantially to each count;

(3) The claims in any application which are deemed by the examiner to be patentable over any count; and

(4) Whether an applicant or patentee is entitled to the benefit of the filing date of an earlier application and, if so, sufficient information to identify the earlier application.

§1.610 Assignment of interference to examiner-in-chief, time period for completing interference.

(a) Each interference will be declared by an examiner-in-chief who may enter all interlocutory orders in the interference, except that only a panel consisting of at least three members of the Board shall (1) hear oral argument at final hearing, (2) enter a decision under §§1.617, 1.640(c) or (e), 1.652, 1.656(i) or 1.658 or (3) enter any other order which terminates the interference.

(b) As necessary, another examiner-in-chief may act in place of the one who declared the interference. Unless otherwise provided in this section, at the discretion of the examiner-in-chief assigned to the interference, a panel consisting of two or more members of the Board may enter interlocutory orders.

(c) Unless otherwise provided in this subpart, times for taking action by a party in the interference will be set on a case-by-case basis by the examiner-in-chief assigned to the interference. Times for taking action shall be set and the examiner-in-chief shall exercise control over the interference such that the pendency of the interference before the Board does not normally exceed two years.

(d) An examiner-in-chief may hold a conference with the parties to consider: (1) simplification of any issues, (2) the necessity or desirability of amendments to counts, (3) the possibility of obtaining admissions of fact and genuineness of documents which will avoid unnecessary proof, (4) any limitations on the number of expert witnesses, (5) the time and place for conducting a deposition (§1.673(g)), and (6) any other matter as may aid in the disposition of the interference. After a conference, the examiner-in-chief may enter any order which may be appropriate.

(e) The examiner-in-chief may determine a proper course of conduct in an interference for any situation not specifically covered by this part.

§1.611 Declaration of interference.

(a) Notice of declaration of an interference will be sent to each party.

(b) When a notice of declaration is returned to the Patent and Trademark Office undelivered, or in any other circumstance where appropriate, an examiner-in-chief may (1) send a copy of the notice to a patentee named in a patent involved in an interference or the patentee's assignee of record in the Patent and Trademark Office or (2) order publication of an appropriate notice in the *Official Gazette*.

(c) The notice of declaration shall specify:

(1) the name and residence of each party involved in the interference;

(2) the name and address of record of any attorney or agent of record in any application or patent involved in the interference;

(3) the name of any assignee of record in the Patent and Trademark Office;

(4) the identity of any application or patent involved in the interference;

(5) where a party is accorded the benefit of the filing date of an earlier application, the identity of the earlier application;

(6) the count or counts;

(7) the claim or claims of any application or any patent which correspond to each count; and

(8) the order of the parties.

(d) The notice of declaration may also specify the time for: (1) filing a preliminary statement as provided in §1.621(a); (2) serving notice that a preliminary statement has been filed as provided §1.621(b); and (3) filing preliminary motions authorized by §1.633, oppositions to the motions, and replies to the oppositions.

(e) Notice may be given in the *Official Gazette* that an interference has been declared involving a patent.

§1.612 Access to applications.

(a) After an interference is declared, each party shall have access to and may obtain copies of the files of any application set out in the notice declaring the interference, except for affidavits filed under §1.131 and any evidence and explanation under §1.608(b) filed separate from an amendment.

(b) After preliminary motions under §1.633 are decided (§1.640(b)), each party shall have access to and may obtain copies of any affidavit filed under §1.131 and any evidence and explanation filed under §1.608(b) in any application set out in the notice declaring the interference.

(c) Any evidence and explanation filed under §1.608(b) in the file of any application identified in the notice declaring the interference shall be served when required by §1.617(b).

(d) The parties at any time may agree to exchange copies of papers in the files of any application identified in the notice declaring the interference.

§1.613 Lead attorney, same attorney representing different parties in an interference, withdrawal of attorney or agent.

(a) Each party may be required to designate one attorney or agent of record as the lead attorney or agent.

(b) The same attorney or agent or members of the same firm of attorneys or agents may not represent two or more parties in an interference except as may be permitted under this Chapter.

(c) An examiner-in-chief may make necessary inquiry to determine whether an attorney or agent should be disqualified from representing a party in an interference. If an examiner-in-chief is of the opinion that an attorney or agent should be disqualified, the examiner-in-chief shall refer the matter to the Commissioner. The Commissioner will make a final decision as to whether any attorney or agent should be disqualified.

(d) No attorney or agent of record in an interference may withdraw as attorney or agent of record except with the approval of an examiner-in-chief and after reasonable notice to the party on whose behalf the attorney or agent has appeared. A request to withdraw as attorney or agent of record in an interference shall be made by motion (§1.635).

§1.614 Jurisdiction over interference.

(a) The Board shall assume jurisdiction over an interference when the interference is declared under §1.611.

(b) When the interference is declared the interference is a contested case within the meaning of 35 U.S.C. §24.

(c) The examiner shall have jurisdiction over any pending application until the interference is declared. An examiner-in-chief, where appropriate, may for a limited purpose restore jurisdiction to the examiner over any application involved in the interference.

§1.615 Suspension of *ex parte* prosecution.

(a) When an interference is declared, *ex parte* prosecution of an application involved in the interference is suspended. Amendments and other papers related to the application received during pendency of the int be entered or considered in the interference without the consent of an examiner-in-chief.

(b) *Ex parte* prosecution as to specified matters may be continued concurrently with the interference with the consent of the examiner-in-chief.

§1.616 Sanctions for failure to comply with rules or order.

An examiner-in-chief or the Board may impose an appropriate sanction against a party who fails to comply with the regulations of this part or any order entered by an examiner-in-chief or the Board. An appropriate sanction may include among others entry of an order:

(a) holding certain facts to have been established in the interference;

(b) precluding a party from filing a motion or a preliminary statement;

(c) precluding a party from presenting or contesting a particular issue;

(d) precluding a party from requesting, obtaining, or opposing discovery; or

(e) granting judgment in the interference.

§1.617 Summary judgment against applicant

(a) An examiner-in-chief shall review any evidence filed by an applicant under §1.608(b) to determine if the applicant is *prima facie* entitled to a judgment relative to the patentee. If the examiner-in-chief determines that the evidence shows the applicant is *prima facie* entitled to a judgment relative to the patentee, the interference shall proceed in the normal manner under the regulations of this part. If in the opinion of the examiner-in-chief the evidence fails to show that the applicant is *prima facie* entitled to a judgment relative to the patentee, the examiner-in-chief shall, concurrently with the notice declaring the interference, enter an order stating the reasons for the opinion and directing the applicant, within a time set in the order, to show cause why summary judgment should not be entered against the applicant.

(b) The applicant may file a response to the order and state any reasons why summary judgment should not be entered. Any request by the applicant for a hearing before the Board shall be made in the response. Additional evidence shall not be presented by the applicant or considered by the Board unless the applicant shows good cause why any additional evidence was not initially presented with the evidence filed under §1.608(b). At the time an applicant files a response, the applicant shall serve a copy of any evidence filed under §1.608(b) and this paragraph.

(c) If a response is not timely filed by the applicant, the Board shall enter a final decision granting summary judgment against the applicant.

(d) If a response is timely filed by the applicant, all opponents may file a statement within a time set by the examiner-in-chief. The statement may set forth views as to why summary judgment should be granted against the applicant, but the statement shall be limited to discussing why all the evidence presented by the applicant does not overcome the reasons given by the examiner-in-chief for issuing the order to show cause. Evidence shall not be filed by any opponent. An opponent may not request an oral hearing.

(e) Within a time authorized by the examiner-in-chief, an applicant may file a reply to any statement filed by any opponent.

(f) When more than two parties are involved in an interference, all parties may participate in summary judgment proceedings under this section.

(g) If a response by the applicant is timely filed, the examiner-in-chief or the Board shall decide whether the evidence submitted under §1.608(b) and any additional evidence properly submitted under paragraph (b) of this section shows that the applicant is *prima facie* entitled to a judgment relative to the patentee. If the applicant is not *prima facie* entitled to a judgment relative to the patentee, the Board shall enter a final decision granting summary judgment against the applicant. Otherwise, an interlocutory order shall be entered authorizing the interference to proceed in the normal manner under the regulations of this part.

(h) Only an applicant who filed evidence under §1.608(b) may request a hearing. If that applicant requests a hearing, the Board may hold a hearing prior to entry of a decision under paragraph (g) of this section. The examiner-in-chief shall set a date and time for the hearing. Unless otherwise ordered by the examiner-in-chief or the Board, the applicant and any opponent will each be entitled to no more than 30 minutes of oral argument at the hearing.

§1.618 Return of unauthorized papers.

(a) The Patent and Trademark Office shall return to a party any paper presented by the party when the filing of the paper is not authorized by, or is not in compliance with the requirements of, this subpart. Any paper returned will not thereafter be considered by the Patent and Trademark Office in the interference. A party may be permitted to file a corrected paper under such conditions as may be deemed appropriate by an examiner-in-chief.

(b) When presenting a paper in an interference, a party shall not submit with the paper a copy of a paper previously filed in the interference.

§1.621 Preliminary statement, time for filing, notice of filing.

(a) Within the time set for filing preliminary motions under §1.633, each party may file a preliminary statement. The preliminary statement may be signed by any individual having knowledge of the facts recited therein or an attorney or agent of record.

(b) When a party files a preliminary statement the party shall also simultaneously file and serve on all opponents in the interference a notice stating that a preliminary statement has been filed. A copy of the preliminary statement need not be served until ordered by an examiner-in-chief.

§1.622 Preliminary statement, who made invention, where invention made.

(a) A party's preliminary statement must identify the inventor who made the invention defined by each count and must state on behalf of the inventor the facts required by paragraph (a) of §§1.623, 1.624, and 1.625 as may be appropriate. When an inventor identified in the preliminary statement is not an inventor named in the party's application or patent, the party shall file a motion under §1.634 to correct inventorship.

(b) The preliminary statement shall state whether the invention was made in the United States or abroad. If made abroad, the preliminary statement shall state whether the party is entitled to the benefit of the second sentence of 35 U.S.C. §104.

§1.623 Preliminary statement; invention made in United States.

(a) When the invention was made in the United States or a party is entitled to the benefit of the second sentence of 35 U.S.C. §104, the preliminary statement must state the following facts as to the invention defined by each count:

(1) The date on which the first drawing of the invention was made.

(2) The date on which the first written description of the invention was made.

(3) The date on which the invention was first disclosed by the inventor to another person.

(4) The date on which the invention was first conceived by the inventor.

(5) The date on which the invention was first actually reduced to practice. If the invention was not actually reduced to practice by or on behalf of the inventor prior to the party's filing date, the preliminary statement shall so state.

(6) The date after the inventor's conception of the invention when active exercise of reasonable diligence toward reducing the invention to practice began.

(b) If a party intends to prove derivation, the preliminary statement must also comply with §1.625.

(c) When a party alleges under paragraph (a)(1) of this section that a drawing was made, a copy of the first drawing shall be filed with and identified in the preliminary statement. When a party alleges under paragraph (a)(2) of this section that a written description of the invention was made, a copy of the first written description shall be filed with and identified in the preliminary statement. See §1.628(b) when a copy of the first drawing or written description cannot be filed with the preliminary statement.

§1.624 Preliminary statement; invention made abroad.

(a) When the invention was made abroad and a party intends to rely on introduction of the invention into the United States, the preliminary statement must state the following facts as to the invention defined by each count:

(1) The date on which a drawing of the invention was first introduced into the United States.

(2) The date on which a written description of the invention was first introduced into the United States.

(3) The date on which the invention was first disclosed to another person in the United States.

(4) The date on which the inventor's conception of the invention was first introduced into the United States.

(5) The date on which an actual reduction to practice of the invention was first introduced into the United States. If an actual reduction to practice of the invention was not introduced into the United States, the preliminary statement shall so state.

(6) The date after introduction of the inventor's conception into the United States when active exercise of reasonable diligence in the United States toward reducing the invention to practice began.

(b) If a party intends to prove derivation, the preliminary statement must also comply with §1.625.

(c) When a party alleges under paragraph (a)(1) of this section that a drawing was introduced into the United States a copy of that drawing shall be filed with and identified in the preliminary statement. When a party alleges under paragraph (a)(2) of this section that a written description of the invention was introduced into the United States a copy of that written description shall be filed with and identified in the preliminary statement. See §1.628(b) when a copy of the first drawing or first written description introduced in the United States cannot be filed with the preliminary statement.

§1.625 Preliminary statement; derivation by an opponent.

(a) When the invention was made in the United States or abroad and a party intends to prove derivation by an opponent from the party, the preliminary statement must state the following as to the invention defined by each count:

(1) The name of the opponent.

(2) The date on which the first drawing of the invention was made.

(3) The date on which the first written description of the invention was made.

(4) The date on which the invention was first disclosed by the inventor to another person.

(5) The date on which the invention was first conceived by the inventor.

(6) The date on which the invention was first communicated to the opponent.

(b) If a party intends to prove priority, the preliminary statement must also comply with §1.623 or §1.624.

(c) When a party alleges under paragraph (a)(2) of this section that a drawing was made, a copy of the first drawing shall be filed with and identified in the preliminary statement. When a party alleges under paragraph (a)(3) of this section that a written description of the invention was made, a copy of the first written description shall be filed with and identified in the preliminary statement. See §1.628(b) when a first drawing or first written description cannot be filed with the preliminary statement.

§1.626 Preliminary statement; earlier application.

When a party does not intend to present evidence to prove a conception or an actual reduction to practice and the party intends to rely solely on the filing date of an earlier application filed in the United States or abroad to prove a constructive reduction to practice, the preliminary statement may so state and identify the earlier application with particularity.

§1.627 Preliminary statement, sealing before filing, opening of statement.

(a) The preliminary statement and copies of any drawing or written description shall be filed in a sealed envelope bearing only the name of the party filing the statement and the style (e.g., Jones v. Smith) and number of the interference. The sealed envelope should contain only the preliminary statement and copies of any drawing or written description. If the preliminary statement is filed through the mail, the sealed envelope should be enclosed in an outer envelope addressed to the Commissioner of Patents and Trademarks in accordance with §1.1(e).

(b) A preliminary statement may be opened only at the direction of an examiner-in-chief.

§1.628 Preliminary statement, correction of error.

(a) A material error arising through inadvertence or mistake in connection with (1) a preliminary statement or (2) drawings or a written description submitted therewith or omitted therefrom, may be corrected by a motion (§1.635) for leave to file a corrected statement. The motion shall be supported by an affidavit and shall show that the correction is essential to the ends of justice and shall be accompanied by the corrected statement. The motion shall be filed as soon as practical after discovery of the error.

(b) When a party cannot attach a copy of a drawing or a written description to the party's preliminary statement as required by §§1.623(c), 1.624(c), or 1.625(c), the party (1) shall show good cause and explain in the preliminary statement why a copy of the drawing or written description cannot be attached to the preliminary statement and (2) shall attach to the preliminary statement the earliest drawing or written description made in or introduced into the United States which is available. The party shall file a motion (§1.635) to amend its preliminary statement promptly after the first drawing, first written description, or drawing or written description first introduced into the United States becomes available. A copy of the drawing or written description may be obtained, where appropriate, by a motion (§1.635) for additional discovery under §1.687 or during a testimony period.

§1.629 Effect of preliminary statement.

(a) A party shall be strictly held to any date alleged in the preliminary statement. Doubts as to (1) definiteness or sufficiency of any allegation in a preliminary statement or (2) compliance with formal requirements will be resolved against the party filing the statement by restricting the party to the earlier of its filing date or effective filing date or to the latest date of a period alleged in the preliminary statement as may be appropriate. A party may not correct a preliminary statement except as provided by §1.628.

(b) Evidence which shows that an act alleged in the preliminary statement occurred prior to the date alleged in the statement shall establish only that the act occurred as early as the date alleged in the statement.

(c) If a party does not file a preliminary statement, the party:

(1) shall be restricted to the earlier of the party's filing date or effective filing date and

(2) will not be permitted to prove that:

(i) the party made the invention prior to the party's filing date or

(ii) any opponent derived the invention from the party.

(d) If a party files a preliminary statement which contains an allegation of a date of first drawing or first written description and the party does not file a copy of the first drawing or written description with the preliminary statement as required by §1.623(c), §1.624(c), or §1.625(c), the party will be restricted to the earlier of the party's filing date or effective filing date as to that allegation unless the party complies with §1.628(b). The content of any drawing or written description submitted with a preliminary statement will not normally be evaluated or considered by the Board.

(e) A preliminary statement shall not be used as evidence on behalf of the party filing the statement.

§1.630 Reliance on earlier application.

A party shall not be entitled to rely on the filing date of an earlier application filed in the United States or abroad unless (a) the earlier application is identified (§1.611(c)(5)) in the notice declaring the interference or (b) the party files a preliminary motion under §1.633 seeking the benefit of the filing date of the earlier application.

§1.631 Access to preliminary statement, service of preliminary statement.

(a) Unless otherwise ordered by an examiner-in-chief, concurrently with entry of a decision by the examiner-in-chief on preliminary motions filed under §1.633, any preliminary statement filed under §1.621(a) shall be opened to inspection by the senior party and any junior party who filed a preliminary statement. Within a time set by the examiner-in-chief, a party shall serve copies of its preliminary statement on every opponent who served a notice under §1.621(b).

(b) A junior party who does not file a preliminary statement shall not have access to the preliminary statement of any other party.

(c) If an interference is terminated before the preliminary statements have been opened, the preliminary statements will remain sealed and will be returned to the respective parties who submitted the statements.

§1.632 Notice of intent to argue abandonment, suppression or concealment by opponent.

A notice shall be filed by a party who intends to argue that an opponent has abandoned, suppressed, or concealed an actual reduction to practice (35 U.S.C. §102(g)). A party will not be permitted to argue abandonment, suppression, or concealment by an opponent unless the notice is timely filed. Unless authorized otherwise by an examiner-in-chief, a notice is timely when filed within ten (10) days of the close of the testimony-in-chief of the opponent.

§1.633 Preliminary Motions.

A party may file the following preliminary motions:

(a) A motion for judgment on the ground that an opponent's claim corresponding to a count is not patentable to the opponent. In determining a motion filed under this paragraph, a claim may be construed by reference to the prior art of record. A motion under this paragraph shall not be based on: (1) priority of invention of the subject matter of a count by the moving party as against any opponent or (2) derivation of the subject matter of a count by an opponent from the moving party. See §1.637(a)

(b) A motion for judgment on the ground that there is no interference-in-fact. A motion under this paragraph is proper only if: (1) the interference involves a design application or patent or a plant application or patent or (2) no claim of a party which corresponds to a count is identical to any claim of an opponent which corresponds to that count. See §1.637(a)

(c) A motion to redefine the interfering subject matter by (1) adding or substituting a count, (2) amending an application claim corresponding to a count or adding a claim in the moving party's application to be designated to correspond to a count, (3) designating an application or patent claim to correspond to a count, (4) designating an application or patent claim as not corresponding to a count, or (5) requiring an opponent who is an applicant to add a claim and to designate the claim to correspond to a count. See §1.637(a) and (c).

(d) A motion to substitute a different application owned by a party for an application involved in the interference. See §1.637(a) and (d).

(e) A motion to declare an additional interference (1) between an additional application not involved in the interference and owned by a party and an opponent's application or patent involved in the interference or (2) when an interference involves three or more parties, between less than all applications and any patent involved in the interference. See §1.637(a) and (e).

(f) A motion to be accorded the benefit of the filing date of an earlier application filed in the United States or abroad. See §1.637(a) and (f).

(g) A motion to attack the benefit accorded an opponent in the notice declaring the interference of the filing date of an earlier application filed in the United States or abroad. See §1.637(a) and (g).

(h) When a patent is involved in an interference and the patentee has on file or files an application for reissue under §1.171, a motion to add the application for reissue to the interference. See §1.637(a) and (h).

(i) When a motion is filed under paragraph (a), (b), or (g) of this section, an opponent, in addition to opposing the motion, may file a motion to redefine the interfering subject matter under paragraph (c) of this section or a motion to substitute a different application under paragraph (d) of this section.

(j) When a motion is filed under paragraph (c)(1) of this section an opponent, in addition to opposing the motion, may file a motion for benefit under paragraph

(f) of this section as to the count to be added or substituted.

§1.634 Motion to correct inventorship.

A party may file a motion to (a) amend its application involved in an interference to correct inventorship as provided by §1.48 or (b) correct inventorship of its patent involved in an interference as provided in §1.324. See §1.637(a).

§1.635 Miscellaneous motions.

A party seeking entry of an order relating to any matter other than a matter which may be raised under §§1.633 or 1.634 may file a motion requesting entry of the order. See §1.637(a) and (b).

§1.636 Motions, time for filing.

(a) A preliminary motion under §1.633(a) through (h) shall be filed within a time period set by an examiner-in-chief.

(b) A preliminary motion under §1.633(i) or (j) shall be filed within 20 days of the service of the preliminary motion under §1.633(a), (b), or (g) unless otherwise ordered by an examiner-in-chief.

(c) A motion under §1.634 shall be diligently filed after an error is discovered in the inventorship of an application or patent involved in an interference unless otherwise ordered by an examiner-in-chief.

(d) A motion under §1.635 shall be filed as specified in this subpart or when appropriate unless otherwise ordered by an examiner-in-chief.

§1.637 Content of motions.

(a) Every motion shall include (1) a statement of the precise relief requested, (2) a statement of the material facts in support of the motion, and (3) a full statement of the reasons why the relief requested should be granted.

(b) A motion under §1.635 shall contain a certificate by the moving party stating that the moving party has conferred with all opposing parties in an effort in good faith to resolve by agreement the issues raised by the motion. A moving party shall indicate in the motion whether any other party plans to oppose the motion. The provisions of this paragraph do not apply to a motion to suppress evidence (§1.656(h)).

(c) A preliminary motion under §1.633(c) shall explain why the interfering subject matter should be redefined.

(1) A preliminary motion seeking to add or substitute a count shall:

(i) Propose each count to be added or substituted.

(ii) When the moving party is an applicant, show the patentability to the applicant of all claims in, or proposed to be added to, the party's application which correspond to each proposed count and apply the terms of the claims to the disclosure of the party's application; when necessary a moving party applicant shall file with the motion an amendment adding any proposed claim to the application.

(iii) Identify all claims in an opponent's application which should be designated to correspond to each proposed count; if an opponent's application does not contain such a claim, the moving party shall propose a claim to be added to the opponent's application. The moving party shall show the patentability of any proposed claims to the opponent and apply the terms of the claims to the disclosure of the opponent's application.

(iv) Designate the claims of any patent involved in the interference which define the same patentable invention as each proposed count.

(v) Show that each proposed count defines a separate patentable invention from every other count in the interference.

(vi) Be accompanied by a motion under §1.633(f) requesting the benefit of the filing date of any earlier application filed in the United States or abroad.

(2) A preliminary motion seeking to amend an application claim corresponding to a count or adding a claim to be designated to correspond to a count shall:

(i) Propose an amended or added claim.

(ii) Show that the proposed or added claim defines the same patentable invention as the count.

(iii) Show the patentability to the applicant of each amended or added claim and apply the terms of the amended or added claim to the disclosure of the application; when necessary a moving party applicant shall file with the motion an amendment making the amended or added claim to the application.

(iv) Be accompanied by a motion under §1.633(f) requesting the benefit of the filing date of any earlier application filed in the United States or abroad.

(3) A preliminary motion seeking to designate an application or patent claim to correspond to a count shall:

(i) Identify the claim and the count.

(ii) Show the claim defines the same patentable invention as the count.

(iii) Be accompanied by a motion under §1.633(f) requesting the benefit of the filing date of any earlier application filed in the United States or abroad.

(4) A preliminary motion seeking to designate an application or patent claim as not corresponding to a count shall:

(i) Identify the claim and the count.

(ii) Show the claim does not define the same patentable invention as any other claim designated in the notice declaring the interference as corresponding to the count.

(5) A preliminary motion seeking to require an opponent who is an applicant to add a claim and designate the claim as corresponding to a count shall:

(i) Propose a claim to be added by the opponent.

(ii) Show the patentability to the opponent of the claim and apply the terms of the claim to the disclosure of the opponent's application.

(iii) Identify the count to which the claim shall be designated to correspond.

(iv) Show the claim defines the same patentable invention as the count to which it will be designated to correspond.

(d) A preliminary motion under §1.633(d) to substitute a different application shall:

(1) Identify the different application.

(2) Certify that a complete copy of the file of the different application, except for documents filed under §1.131 or §1.608(b), has been served on all opponents.

(3) Show the patentability to the applicant of all claims in, or proposed to be added to, the different application which correspond to each count and apply the terms of the claims to the disclosure of the different application; when necessary the applicant shall file with the motion an amendment adding a claim to the different application.

(4) Be accompanied by a motion under §1.633(f) requesting the benefit of the filing date of an earlier application filed in the United States or abroad.

(e) A preliminary motion to declare an additional interference under §1.633(e) shall explain why an additional interference is necessary:

(1) When the preliminary motion seeks an additional interference under §1.633(e)(1), the motion shall:

(i) Identify the additional application.

(ii) Certify that a complete copy of the file of the additional application, except for documents filed under §§1.131 or 1.608(b), has been served on all opponents.

(iii) Propose a count for the additional interference.

(iv) Show the patentability to the applicant of all claims in, or proposed to be added to, the additional application which correspond to each proposed count for the additional interference and apply the terms of the claims to the disclosure of the additional application; when necessary the applicant shall file with the motion an amendment adding a claim to the additional application.

(v) When the opponent is an applicant, show the patentability to the opponent of any claims in, or proposed to be added to, the opponent's application which correspond to the proposed count and apply the terms of the claims to the disclosure of the opponent's application.

(vi) When the opponent is a patentee, designate the claims of the patent which define the same patentable invention defined by the proposed count.

(vii) Show that each proposed count for the additional interference defines a separate patentable invention from all counts of the interference in which the motion is filed.

(viii) Be accompanied by a motion under §1.633(f) requesting the benefit of the filing date of an earlier application filed in the United States or abroad.

(2) When the preliminary motion seeks an additional interference under §1.633(e)(2), the motion shall:

(i) Identify any application or patent to be involved in the additional interference.

(ii) Propose a count for the additional interference.

(iii) When the moving party is an applicant, show the patentability to the applicant of all claims in, or proposed to be added to the party's application which correspond to each proposed count and apply the terms of the claims to the disclosure of the party's application; when necessary a moving party applicant shall file with the motion an amendment adding any proposed claim to the application.

(iv) Identify all claims in any opponent's application which should be designated to correspond to each proposed count; if an opponent's application does not contain such a claim, the moving party shall propose a claim to be added to the opponent's application. The moving party shall show the patentability of any proposed claims to the opponent and apply the terms of the claims to the disclosure of the opponent's application.

(v) Designate the claims of any patent involved in the interference which define the same patentable invention as each proposed count.

(vi) Show that each proposed count for the additional interference defines a separate patentable invention from all counts in the interference in which the motion is filed.

(vii) Be accompanied by a motion under §1.633(f) requesting the benefit of the filing date of an earlier application filed in the United States or abroad.

(f) A preliminary motion for benefit under §1.633(f) shall:

(1) Identify the earlier application.

(2) When the earlier application is an application filed in the United States, certify that a complete copy of the file of the earlier application, except for documents filed under §1.131 or §1.608(b), has been served on all opponents. When the earlier application is an application filed abroad, certify that a copy of the application filed abroad has been served on all opponents. If the earlier application filed abroad is not in English, the requirements of §1.647 must also be met.

(3) Show that the earlier application constitutes a constructive reduction to practice of each count.

(g) A preliminary motion to attack benefit under §1.633(g) shall explain, as to each count, why an opponent should not be accorded the benefit of the filing date of the earlier application.

(h) A preliminary motion to add an application for reissue under §1.633(h) shall:

(1) Identify the application for reissue.

(2) Certify that a complete copy of the file of the application for reissue has been served on all opponents.

(3) Show the patentability of all claims in, or proposed to be added to, the application for reissue which correspond to each count and apply the terms of the claims to the disclosure of the application for reissue; when necessary a moving applicant for reissue shall file with the motion an amendment adding a claim to the application for reissue.

(4) Be accompanied by a motion under §1.633(f) requesting the benefit of the filing date of an earlier application filed in the United States or abroad.

§1.638 Opposition and reply, time for filing opposition and reply.

(a) Unless otherwise ordered by an examiner-in-chief, any opposition to any motion shall be filed within 20 days after service of the motion. An opposition shall (1) identify any material fact set forth in the motion which is in dispute and (2) include an argument why the relief requested in the motion should be denied.

(b) Unless otherwise ordered by an examiner-in-chief, a reply shall be filed within 15 days after service of the opposition. A reply shall be directed only to new points raised in the opposition.

§1.639 Evidence in support of motion, opposition, or reply.

(a) Proof of any material fact alleged in a motion, opposition, or reply must be filed and served with the motion, opposition, or reply unless the proof relied upon is part of the interference file or the file of any patent or application involved in the interference or any earlier application filed in the United States of which a party has been accorded or seeks to be accorded benefit.

(b) Proof may be in the form of patents, printed publications, and affidavits.

(c) When a party believes that testimony is necessary to support or oppose a preliminary motion under §1.633 or a motion to correct inventorship under §1.634, the party shall describe the nature of the testimony needed. If the examiner-in-chief finds that testimony is needed to decide the motion, the examiner-in-chief may grant appropriate interlocutory relief and enter an order authorizing the taking of testimony and deferring a decision on the motion to final hearing.

§1.640 Motions, hearing and decision, redeclaration of interference, order to show cause.

(a) A hearing on a motion may be held in the discretion of the examiner-in-chief. The examiner-in-chief shall set the date and time for any hearing. The length of oral argument at a hearing on a motion is a matter within the discretion of the examiner-in-chief. An examiner-in-chief may direct that a hearing take place by telephone.

(b) Motions will be decided by an examiner-in-chief. An examiner-in-chief may consult with an examiner in deciding motions involving a question of patentability. An examiner-in-chief may grant or deny any motion or take such other action which will secure the just, speedy, and inexpensive determination of the interference.

(1) When preliminary motions under §1.633 are decided, the examiner-in-chief will, when necessary, set a time for filing any amendment to an application involved in the interference and for filing a supplemental preliminary statement as to any new counts involved in the interference. Failure or refusal of a party to timely present an amendment required by an examiner-in-chief shall be taken without further action as a disclaimer by that party of the invention involved. A supplemental preliminary statement shall meet the requirements specified in §§1.623, 1.624, 1.625, or 1.626, but need not be filed if a party states that it intends to rely on a preliminary statement previously filed under §1.621(a). After the time expires for filing any amendment and supplemental preliminary statement, the examiner-in-chief will, if necessary, redeclare the interference.

(2) After a decision is entered on preliminary motions filed under §1.633, a further motion under

§1.633 will not be considered except as provided by §1.655(b).

(c) When a decision on any motion under §§1.633, 1.634, or 1.635 is entered which does not result in the issuance of an order to show cause under paragraph (d) of this section, a party may file a request for reconsideration within 14 days after the date of the decision. The filing of a request for reconsideration will not stay any time period set by the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. No opposition to a request for reconsideration shall be filed unless requested by an examiner-in-chief or the Board. A decision of single examiner-in-chief will not ordinarily be modified unless an opposition has been requested by an examiner-in-chief or the Board. The request for reconsideration shall be acted on by a panel of the Board consisting of at least three examiners-in-chief, one of whom will normally be the examiner-in-chief who decided the motion.

(d) An examiner-in-chief may issue an order to show cause why judgment should not be entered against a party when:

(1) A decision on a motion is entered which is dispositive of the interference against the party as to all counts;

(2) The party is a junior party who fails to file a preliminary statement; or

(3) The party is a junior party whose preliminary statement fails to overcome the earlier of the filing date or effective filing date of another party.

(e) When an order to show cause is issued under paragraph (d) of this section, the Board shall enter a judgment in accordance with the order unless, within 20 days after the date of the order, the party against whom the order issued files a paper which shows good cause why judgment should not be entered in accordance with the order. Any other party may file a response to the paper within 20 days of the date of service of the paper. If the party against whom the order was issued fails to show good cause, the Board shall enter judgment against the party. If a party wishes to take testimony in response to an order to show cause, the party's response should be accompanied by a motion (§1.635) requesting the testimony period. See §1.651(c)(4).

§1.641 Unpatentability discovered by examiner-in-chief

During the pendency of an interference, if the examiner-in-chief becomes aware of a reason why a claim corresponding to a count may not be patentable, the examiner-in-chief may notify the parties of the reason and set a time within which each party may present its views. After considering any timely filed views, the examiner-in-chief shall decide how the interference shall proceed.

§1.642 Addition of application or patent to interference.

During the pendency of an interference, if the examiner-in-chief becomes aware of an application or a patent not involved in the interference which claims the same patentable invention as a count in the interference, the examiner-in-chief may add the application or patent to the interference on such terms as may be fair to all parties.

§1.643 Prosecution of interference by assignee.

(a) An assignee of record in the Patent and Trademark Office of the entire interest in an application or patent involved in an interference is entitled to conduct prosecution of the interference to the exclusion of the inventor.

(b) An assignee of a part interest in an application or patent involved in an interference may file a motion (§1.635) for entry of an order authorizing it to prosecute the interference. The motion shall show (1) the inability or refusal of the inventor to prosecute the interference or (2) other cause why the ends of justice require that the assignee of a part interest be permitted to prosecute the interference. The examiner-in-chief may allow the assignee of a part interest to prosecute the interference upon such terms as may be appropriate.

§1.644 Petitions in interferences.

(a) There is no appeal to the Commissioner in an interference from a decision of an examiner-in-chief or a panel consisting of more than one examiner-in-chief. The Commissioner will not consider a petition in an interference unless:

(1) The petition is from a decision of an examiner-in-chief or a panel and the examiner-in-chief or the panel shall be of the opinion (i) that the decision involves a controlling question of procedure or an interpretation of a rule as to which there is a substantial ground for a difference of opinion and (ii) that an immediate decision on petition by the Commissioner may materially advance the ultimate termination of the interference;

(2) The petition seeks to invoke the supervisory authority of the Commissioner and is not filed prior to the decision of the Board awarding judgment and does not relate to (i) the merits of priority of invention or patentability or (ii) the admissibility of evidence under the Federal Rules of Evidence; or

(3) The petition seeks relief under §1.183.

(b) A petition under paragraph (a)(1) of this section filed more than 15 days after the date of the decision of the examiner-in-chief or the panel may be dismissed as untimely. A petition under paragraph (a)(2) of this section shall not be filed prior to decision by the Board awarding judgment. Any petition under paragraph (a)(3) of this section shall be timely if it is made as part of, or simultaneously with, a proper motion under §§1.633, 1.634, or 1.635. Any opposition to a petition shall be filed within 15 days of the date of service of the petition.

(c) The filing of a petition shall not stay the proceeding unless a stay is granted in the discretion of the examiner-in-chief, the panel, or the Commissioner.

(d) Any petition must contain a statement of the facts involved and the point or points to be reviewed and the action requested. Briefs or memoranda, if any, in support of the petition or opposition shall accompany or be embodied therein. The petition will be decided on the basis of the record made before the examiner-in-chief or the panel and no new evidence will be considered by the Commissioner in deciding the petition. Copies of documents already of record in the interference shall not be submitted with the petition or opposition.

(e) Any petition under paragraph (a) of this section shall be accompanied by the petition fee set forth in §1.17(h).

(f) Any request for reconsideration of a decision by the Commissioner shall be filed within 15 days of the decision of the Commissioner and must be accompanied by the fee set forth in §1.17(h). No opposition to a request for reconsideration shall be filed unless requested by the Commissioner. The decision will not ordinarily be modified unless such an opposition has been requested by the Commissioner.

(g) Where reasonably possible, service of any petition, opposition, or request for reconsideration shall be such that delivery is accomplished within one working day. Service by hand or "Express Mail" complies with this paragraph.

(h) An oral hearing on the petition will not be granted except when considered necessary by the Commissioner.

(i) The Commissioner may delegate to appropriate Patent and Trademark Office employees the determination of petitions under this section.

§1.645 Extension of time, late papers, stay of proceedings.

(a) A party may file a motion (§1.635) seeking an extension of time to take action in an interference, to file a notice of appeal (§§1.302, 1.304), or to commence a civil action (§1.303, 1.304). The motion shall be filed within sufficient time to actually reach the examiner-in-chief before expiration of the time for taking action, filing the notice, or commencing the civil action. A moving party should not assume that the motion will be granted even if there is no objection by any other party. The motion will be denied unless the moving party shows good cause why an extension should be granted. The press of other business arising after an examiner-in-chief sets a time for taking action will not normally constitute good cause. A motion seeking additional time to take testimony because a party has not been able to procure the testimony of a witness shall set forth the name of the witness, any steps taken to procure the testimony of the witness, the dates on which the steps were taken, and the facts expected to be proved through the witness.

(b) Any paper belatedly filed will not be considered except upon motion (§1.635) which shows sufficient cause why the paper was not timely filed.

(c) The provisions of §1.136 do not apply to time periods in interferences.

(d) In an appropriate circumstance, an examiner-in-chief may stay proceedings in an interference.

§1.646 Service of papers, proof of service.

(a) A copy of every paper filed in the Patent and Trademark Office in an interference or an application or patent involved in the interference shall be served upon all other parties except:

(1) Preliminary statements when filed under §1.621; preliminary statements shall be served when service is ordered by an examiner-in-chief.

(2) Certified transcripts and exhibits which accompany the transcripts filed under §§1.676 or 1.684; copies of transcripts shall be served as part of a party's record under §1.653(c).

(b) Service shall be on an attorney or agent for a party. If there is no attorney or agent for the party, service shall be on the party. An examiner-in-chief may order additional service or waive service where appropriate.

(c) Unless otherwise ordered by an examiner-in-chief, or except as otherwise provided by this part, service of a paper shall be made as follows:

(1) By handing a copy of the paper to the person served.

(2) By leaving a copy of the paper with someone employed by the person at the person's usual place of business.

(3) When the person served has no usual place of business, by leaving a copy of the paper at the person's residence with someone of suitable age and discretion then residing therein.

(4) By mailing a copy of the paper by first class mail; when service is by mail the date of mailing is regarded as the date of service.

(5) When it is shown to the satisfaction of an examiner-in-chief that none of the above methods of obtaining or serving the copy of the paper was successful, the examiner-in-chief may order service by publication of an appropriate notice in the *Official Gazette*.

(d) An examiner-in-chief may order that a paper be served by hand or "Express Mail".

(e) Proof of service must be made before a paper will be considered in an interference. Proof of service may appear on or be affixed to the paper. Proof of service shall include the date and manner of service. In the case of personal service under paragraphs (c)(1) through (c)(3) of this section, proof of service shall include the names of any person served and the person who made the service. Proof of service may be made by an acknowledgment of service by or on behalf of the person served or a statement signed by the party or the party's attorney or agent containing the information required by this section. A statement of an attorney or agent attached to, or appearing in, the paper stating the date and manner of service will be accepted as *prima facie* proof of service.

§1.647 Translation of document in foreign language.

When a party relies on a document in a language other than English, a translation of the document into English and an affidavit attesting to the accuracy of the translation shall be filed with the document.

§1.651 Setting times for discovery and taking testimony, parties entitled to take testimony.

(a) At an appropriate stage in an interference, an examiner-in-chief shall set (1) a time for filing motions (§1.635) for additional discovery under §1.687(c) and (2) testimony periods for taking any necessary testimony.

(b) Where appropriate, testimony periods will be set to permit a party to:

(1) present its case-in-chief and/or case-in-rebuttal and/or

(2) cross-examine an opponent's case-in-chief and/or a case-in-rebuttal.

(c) A party is not entitled to take testimony to present a case-in-chief unless:

(1) the examiner-in-chief orders the taking of testimony under §1.639(c);

(2) the party alleges in its preliminary statement a date of invention prior to the earlier of the filing date or effective filing date of the senior party;

(3) a testimony period has been set to permit an opponent to prove a date of invention prior to the earlier of the filing date or effective filing date of the party and the party has filed a preliminary statement alleging a date of invention prior to that date; or

(4) a motion (§1.635) is filed showing good cause why a testimony period should be set.

(d) Testimony shall be taken during the testimony periods set under paragraph (a) of this section.

§1.652 Judgment for failure to take testimony or file record.

If a junior party fails to timely take testimony authorized under §1.651, or file a record under §1.653(c), an examiner-in-chief, with or without a motion (§1.635) by another party, may issue an order to show cause why judgment should not be entered against the junior party. When an order is issued under this section, the Board shall enter judgment in accordance with the order unless, within 15 days after the date of the order, the junior party files a paper which shows good cause why judgment should not be entered in accordance with the order. Any other party may file a response to the paper within 15 days of the date of service of the paper. If the party against whom the order was issued fails to show good cause, the Board shall enter judgment against the party.

§1.653 Record and exhibits.

(a) Testimony shall consist of affidavits under §1.672(b) and (e), transcripts of depositions under §§1.672(b) and (c), agreed statements of fact under §1.672(f), and transcripts of interrogatories, cross-interrogatories, and recorded answers under §1.684(c).

(b) An affidavit shall be filed as set forth in §1.672(b) or (e). A certified transcript of a deposition including a deposition cross-examining an affiant, shall be filed as set forth in §1.676. An original agreed statement shall be filed as set forth in §1.672(f). A transcript of interrogatories, cross-interrogatories, and recorded answers shall be filed as set forth under §1.684(c).

(c) In addition to the items specified in paragraph (b) of this section and within a time set by an examiner-in-chief each party shall file three copies and serve one copy of a record consisting of:

(1) An index of the names of each witness giving the pages of the record where the direct testimony and cross-examination of each witness begins.

(2) An index of exhibits briefly describing the nature of each exhibit and giving the page of the record

where each exhibit is first identified and offered into evidence.

(3) The count or counts.

(4) Each (i) affidavit, (ii) transcript, including transcripts of cross-examination of any affiant, (iii) agreed statement relied upon by the party, and (iv) transcript of interrogatories, cross-interrogatories, and recorded answers filed under paragraph (b) of this section.

(5) Each notice, official record, and publication relied upon by the party and filed under §1.682(a).

(6) Any evidence from another interference, proceeding, or action relied upon by the party under §1.683.

(7) Each request for an admission and the admission and each written interrogatory and the answer upon which a party intends to rely under §1.688.

(d) The pages of the record shall be consecutively numbered.

(e) The name of each witness shall appear at the top of each page of each affidavit or transcript.

(f) The record may be typewritten or printed.

(g) When the record is printed, it may be produced by standard typographical printing or by any process capable of producing a clear black permanent image. All printed matter except on covers must appear in at least 11 point type on opaque, unglazed paper. Margins must be justified. Footnotes may not be printed in type smaller than 9 point. The page size shall be 8-1/2 by 11 inches (21.8 by 27.9 cm.) with type matter 6-1/2 by 9-1/2 inches (16.5 by 24.1 cm.). The record shall be bound to lie flat when open.

(h) When the record is typewritten, it must be clearly legible on opaque, unglazed, durable paper approximately 8-1/2 by 11 inches (21.8 by 27.9 cm.) in size (letter size). Typing shall be double-spaced on one side of the paper in not smaller than pica-type with a margin of 1-1/2 inches (3.8 cm.) on the left-hand side of the page. The pages of the record shall be bound with covers at their left edges in such manner to lie flat when open in one or more volumes of convenient size (approximately 100 pages per volume is suggested). Multigraphed or otherwise reproduced copies conforming to the standards specified in this paragraph may be accepted.

(i) Each party shall file its exhibits with the record specified in paragraph (c) of this section. One copy of each documentary exhibit shall be served. Documentary exhibits shall be filed in an envelope or folder and shall not be bound as part of the record. Physical exhibits, if not filed by an officer under §1.676(d), shall be filed with the record. Each exhibit shall contain a label which identifies the party submitting the exhibit and an exhibit number, the style of the interference (e.g., Jones v. Smith), and the interference number. Where possible, the label should appear at the bottom right-hand corner of each documentary exhibit. Upon termination of an interference, an examiner-in-chief may return an exhibit to the party filing the exhibit. When any exhibit is returned, the examiner-in-chief shall enter an appropriate order indicating that the exhibit has been returned.

(j) Any testimony, record, or exhibit which does not comply with this section may be returned under §1.618(a).

§1.654 Final hearing.

(a) At an appropriate stage of the interference, the parties will be given an opportunity to appear before the Board to present oral argument at a final hearing. An examiner-in-chief shall set a date and time for final hearing. Unless otherwise ordered by an examiner-in-chief or the Board, each party will be entitled to no more than 60 minutes of oral argument at final hearing.

(b) The opening argument of a junior party shall include a fair statement of the junior party's case and the junior party's position with respect to the case presented on behalf of any other party. A junior party may reserve a portion of its time for rebuttal.

(c) A party shall not be entitled to argue that an opponent abandoned, suppressed, or concealed an actual reduction to practice unless a notice under §1.632 was timely filed.

(d) After final hearing, the interference shall be taken under advisement by the Board. No further paper shall be filed except under §1.658(b) or as authorized by an examiner-in-chief or the Board. No additional oral argument shall be had unless ordered by the Board.

§1.655 Matters considered in rendering a final decision.

(a) In rendering a final decision, the Board may consider any properly raised issue including (1) priority of invention, (2) derivation by an opponent from a party who filed a preliminary statement under §1.625, (3) patentability of the invention, (4) admissibility of evidence, (5) any interlocutory matter deferred to final hearing, and (6) any other matter necessary to resolve the interference. The Board may also consider whether any interlocutory order was manifestly erroneous or an abuse of discretion. All interlocutory orders shall be presumed to have been correct and the burden of showing manifest error or an abuse of discretion shall be on the party attacking the order.

(b) A party shall not be entitled to raise for consideration at final hearing a matter which properly could have been raised by a motion under §§1.633 or 1.634 unless (1) the motion was properly filed, (2) the matter was properly raised by a party in an opposition to a motion under §§1.633 or 1.634 and the motion was granted over the opposition, or (3) the party shows good cause why the issue was not timely raised by motion or opposition.

(c) To prevent manifest injustice, the Board may consider an issue even though it would not otherwise be entitled to consideration under this section.

§1.656 Briefs for final hearing.

(a) Each party shall be entitled to file briefs for final hearing. The examiner-in-chief shall determine the briefs needed and shall set the time and order for filing briefs.

(b) The opening brief of a junior party shall contain under appropriate headings and in the order indicated:

(1) A table of contents, with page references, and a table of cases (alphabetically arranged), statutes, and other authorities cited, with references to the pages of the brief where they are cited.

(2) A statement of the issues presented for decision in the interference.

(3) A statement of the facts relevant to the issues presented for decision with appropriate references to the record.

(4) An argument, which may be preceded by a summary, which shall contain the contentions of the party with respect to the issues to be decided, and the reasons therefor, with citations to the cases, statutes, other authorities, and parts of the record relied on.

(5) A short conclusion stating the precise relief requested.

(6) An appendix containing a copy of the counts.

(c) The opening brief of the senior party shall conform to the requirements of paragraph (b) of this section except:

(1) a statement of the issues and of the facts need not be made unless the party is dissatisfied with the statement in the opening brief of the junior party and

(2) an appendix containing a copy of the counts need not be included if the copy of the counts in the opening brief of the junior party is correct.

(d) Briefs may be printed or typewritten. If typewritten, legal-size paper may be used. The opening brief of each party in excess of 50 legal-size double-spaced typewritten pages or any other brief in excess of 25 legal-size double-space typewritten pages shall be printed unless a satisfactory reason be given why the brief should not be printed. Any printed brief shall comply with the requirements of §1.653(g). Any typewritten brief shall comply with the requirements of §1.653(h), except legal-size paper may be used and the binding and covers specified are not required.

(e) An original and three copies of each brief must be filed.

(f) Any brief which does not comply with the requirements of this section may be returned under §1.618(a).

(g) Any party, separate from its opening brief, but filed concurrently therewith, may file an original and three copies of concise proposed findings of fact and conclusions of law. Any proposed findings of fact shall be supported by specific references to the record. Any proposed conclusions of law shall be supported by citation of cases, statutes, or other authority. Any opposing party, separate from its opening or reply brief, but filed concurrently therewith, may file a paper accepting or objecting to any proposed findings of fact or conclusions of law; when objecting, a reason must be given. The Board may adopt the proposed findings of fact and conclusions of law in whole or in part.

(h) If a party wants the Board in rendering its final decision to rule on the admissibility of any evidence, the party shall file with its opening brief an original and three copies of a motion (§1.635) to suppress the evidence. The provisions of §1.637(b) do not apply to a motion to suppress under this paragraph. Any objection previously made to the admissibility of an opponent's evidence is waived unless the motion required by this paragraph is filed. An original and three copies of an opposition to the motion may be filed with an opponent's opening brief or reply brief as may be appropriate.

(i) When a junior party fails to timely file an opening brief, an order may issue requiring the junior party to show cause why the Board should not treat failure to file the brief as a concession of priority. If the junior party fails to respond within a time period set in the order, judgment may be entered against the junior party.

§1.657 Burden of proof as to date of invention.

A rebuttable presumption shall exist that, as to each count, the inventors made their invention in the chronological order of the earlier of their filing dates or effective filing dates. The burden of proof shall be upon a party who contends otherwise.

§1.658 Final decision.

(a) After final hearing, the Board shall enter a decision resolving the issues raised at final hearing. The decision may (1) enter judgment, in whole or in part, (2) remand the interference to an examiner-in-chief for further proceedings, or (3) take further action not inconsistent with law. A judgment as to a count shall state whether or not each party is entitled to a patent containing the claims in the party's patent or application which correspond to the count. When the Board enters a decision awarding judgment as to all counts, the decision shall be regarded as a final decision.

(b) Any request for reconsideration of a decision under paragraph (a) of this section shall be filed within 14 days after the date of the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. Any reply to a request for reconsideration shall be filed within 14 days of the date of service of the request for reconsideration. Where reasonably possible, service of the request for reconsideration shall be such that delivery is accomplished by hand or "Express Mail." The Board shall enter a decision on the request for reconsideration. If the Board shall be of the opinion that the decision on the request for reconsideration significantly modifies its original decision under paragraph (a) of this section, the Board may designate the decision on the request for reconsideration as a new decision.

(c) A judgment in an interference settles all issues which (1) were raised and decided in the interference, (2) could have been properly raised and decided in the interference by a motion under §1.633 (a) through (d) and (f) through (j) or §1.634 and (3) could have been properly raised and decided in an additional interference with a motion under §1.633(e). A losing party who could have properly moved, but failed to move, under §§1.633 or 1.634, shall be estopped to take *ex parte* or *inter partes* action in the Patent and Trademark Office after the interference which is inconsistent with that party's failure to properly move, except that a losing party shall not be estopped with respect to any claims which correspond, or properly could have corresponded, to a count as to which that party was awarded a favorable judgment.

§1.659 Recommendation.

(a) Should the Board have knowledge of any ground for rejecting any application claim not involved in the judgment of the interference, it may include in its decision a recommended rejection of the claim. Upon resumption of *ex parte* prosecution of the application, the examiner shall be bound by the recommendation and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection.

(b) Should the Board have knowledge of any ground for reexamination of a patent involved in the interference as to a patent claim not involved in the judgment of the interference, it may include in its decision a recommendation to the Commissioner that the patent be reexamined. The Commissioner will determine whether reexamination will be ordered.

(c) The Board may make any other recommendation to the examiner or the Commissioner as may be appropriate.

§1.660 Notice of reexamination, reissue, protest, or litigation.

(a) When a request for reexamination of a patent involved in an interference is filed, the patent owner shall notify the Board within 10 days of receiving notice that the request was filed.

(b) When an application for reissue is filed by a patentee involved in an interference, the patentee shall notify the Board within 10 days of the day the application for reissue is filed.

(c) When a protest under §1.291 is filed against an application involved in an interference, the applicant shall notify the Board within 10 days of receiving notice that the protest was filed.

(d) A party in an interference shall notify the Board promptly of any litigation related to any patent or application involved in an interference, including any civil action commenced under 35 U.S.C. §146.

§1.661 Termination of interference after judgment.

After a final decision is entered by the Board, an interference is considered terminated when no appeal (35 U.S.C. §141) or other review (35 U.S.C. §146) has been or can be taken or had.

§1.662 Request for entry of adverse judgment; reissue filed by patentee.

(a) A party may, at any time during an interference, request and agree to entry of an adverse judgment. The filing by an applicant or patentee of a written disclaimer of the invention defined by a count, concession of priority or unpatentability of the subject matter of a count, abandonment of the invention defined by a count, or abandonment of the contest as to a count will be treated as a request for entry of an adverse judgment against the applicant or patentee as to all claims which correspond to the count. Abandonment of an application by an applicant, other than an applicant for reissue having a claim of the patent sought to be reissued involved in the interference, will be treated as a request for entry of an adverse judgment against the applicant as to all claims

corresponding to all counts. Upon the filing by a party of a request for entry of an adverse judgment, the Board may enter judgment against the party.

(b) If a patentee involved in an interference files an application for reissue during the interference and omits all claims of the patent corresponding to the counts of the interference for the purpose of avoiding the interference, judgment may be entered against the patentee. A patentee who files an application for reissue other than for the purpose of avoiding the interference shall timely file a preliminary motion under §1.633(h) or show good cause why the motion could not have been timely filed.

(c) The filing of a statutory disclaimer under 35 U.S.C. §253 by a patentee will delete any statutorily disclaimed claims from being involved in the interference. A statutory disclaimer will not be treated as a request for entry of an adverse judgment against the patentee unless it results in the deletion of all patent claims corresponding to a count.

§1.663 Status of claim of defeated applicant after interference.

Whenever an adverse judgment is entered as to a count against an applicant from which no appeal (35 U.S.C. §141) or other review (35 U.S.C. §146) has been or can be taken or had, the claims of the application corresponding to the count stand finally disposed of without further action by the examiner. Such claims are not open to further *ex parte* prosecution.

§1.664 Action after interference.

(a) After termination of an interference, the examiner will promptly take such action in any application previously involved in the interference as may be necessary. Unless entered by order of an examiner-in-chief, amendments presented during the interference shall not be entered, but may be subsequently presented by the applicant subject to the provisions of this part provided prosecution of the application is not otherwise closed.

(b) After judgment, the application of any party may be held subject to further examination, including an interference with another application.

§1.665 Second interference.

A second interference between the same parties will not be declared upon an application not involved in an earlier interference for an invention defined by a count of the earlier interference. See §1.658(c).

§1.666 Filing of interference settlement agreements.

(a) Any agreement or understanding between parties to an interference, including any collateral agreements referred to therein, made in connection with or in contemplation of the termination of the interference, must be in writing and a true copy thereof must be filed before the termination of the interference (§1.661) as between the parties to the agreement or understanding.

(b) If any party filing the agreement or understanding under paragraph (a) of this section so requests, the copy will be kept separate from the file of the interference, and made available only to Government agencies on written request, or to any person upon petition accompanied by the fee set forth in §1.17(i) and on a showing of good cause.

(c) Failure to file the copy of the agreement or understanding under paragraph (a) of this section will render permanently unenforceable such agreement or understanding and any patent of the parties involved in the interference or any patent subsequently issued on any application of the parties so involved. The Commissioner may, however, upon petition accompanied by the fee set forth in §1.17(h) and on a showing of good cause for failure to file within the time prescribed, permit the filing of the agreement or understanding during the six month period subsequent to the termination of the interference as between the parties to the agreement or understanding.

§1.671 Evidence must comply with rules.

(a) Evidence consists of testimony and exhibits, official records and publications filed under §1.682, evidence from another interference, proceeding, or action filed under §1.683, and discovery relied upon under §1.688, and the specification (including claims) and drawings of any application or patent:

(1) Involved in the interference.

(2) To which a party has been accorded benefit in the notice declaring the interference or by a preliminary motion granted under §1.633.

(3) For which a party has sought, but has been denied, benefit by a preliminary motion under §1.633.

(4) For which benefit was rescinded by a preliminary motion granted under §1.633.

(b) Except as otherwise provided in this part, the Federal Rules of Evidence shall apply to interference proceedings. Those portions of the Federal Rules of Evidence relating to criminal actions, juries, and other matters not relevant to interferences shall not apply.

(c) Unless the context is otherwise clear, the following terms of the Federal Rules of Evidence shall be construed as follows:

(1) "Courts of the United States," "U.S. Magistrate," "court," "trial court," or "trier of fact" means examiner-in-chief or Board as may be appropriate.

(2) "Judge" means examiner-in-chief.

(3) "Judicial notice" means official notice.

(4) "Civil action," "civil proceeding," "action," or "trial," mean interference.

(5) "Appellate court" means United States Court of Appeals for the Federal Circuit or a United States district court when judicial review is under 35 U.S.C. §146.

(6) "Before the hearing" in Rule 703 means before giving testimony by oral deposition or affidavit.

(7) "The trial or hearing" in Rules 803(24) and 804(5) means the taking of testimony by oral deposition.

(d) Certification is not necessary as a condition to admissibility when the record is a record of the Patent and Trademark Office to which all parties have access.

(e) A party may not rely on an affidavit filed by that party during *ex parte* prosecution of an application, an affidavit under §1.608(b), or an affidavit under §1.639(b) unless (1) a copy of the affidavit is or has been served and (2) a written notice is filed prior to the close of the party's relevant testimony period stating that the party intends to rely on the affidavit. When proper notice is given under this paragraph, the affidavit shall be deemed filed under §1.672(b). A copy of the affidavit shall be included in the record (§1.653).

(f) The significance of documentary and other exhibits shall be discussed with particularity by a witness during oral deposition or in an affidavit.

(g) A party must file a motion (§1.635) seeking permission from an examiner-in-chief prior to taking testimony or seeking documents or things under 35 U.S.C. §24. The motion shall describe the general nature and the relevance of the testimony, document, or thing.

(h) Evidence which is not taken or sought and filed in accordance with this subpart shall not be admissible.

§1.672 Manner of taking testimony.

(a) Testimony of a witness may be taken by oral deposition or affidavit in accordance with this subpart.

(b) A party wishing to take the testimony of a witness whose testimony will not be compelled under 35 U.S.C. §24 may elect to present the testimony of the witness by affidavit or deposition. A party electing to present testimony of a witness by affidavit shall, prior to the close of the party's relevant testimony period, file and serve an affidavit of the witness or, where appropriate, a notice under §1.671(e). To facilitate preparation of the record (§1.653(g) and (h)), a party should file an affidavit on paper which is 8-1/2 by 11 inches (21.8 by 27.9 cm). A party shall not be entitled to rely on any document referred to in the affidavit unless a copy of the document is filed with the affidavit. A party shall not be entitled to rely on any thing mentioned in the affidavit unless the opponent is given reasonable access to the thing. A thing is something other than a document. After the affidavit is filed and within a time set by an examiner-in-chief, any opponent may file a request to cross-examine the witness on oral deposition. If any opponent requests cross-examination of an affiant, the party shall notice a deposition under §1.673(e) for the purpose of cross-examination by any opponent. Any redirect and recross shall take place at the deposition. At any deposition for the purpose of cross-examination of a witness whose testimony is presented by affidavit, the party shall not be entitled to rely on any document or thing not mentioned in one or more of the affidavits filed under this paragraph, except to the extent necessary to conduct proper redirect. A party electing to present testimony of a witness by deposition shall notice a deposition of the witness under §1.673(a). The party who gives notice of a deposition shall be responsible for obtaining a court reporter and for filing a certified transcript of the deposition as required by §1.676.

(c) A party wishing to take the testimony of a witness whose testimony will be compelled under 35 U.S.C. §24 must first obtain permission from an examiner-in-chief under §1.671(g). If permission is granted, the party shall notice a deposition of the witness under §1.673 and may proceed under 35 U.S.C. §24. The testimony of the witness shall be taken on oral deposition.

(d) Notwithstanding the provisions of this subpart, if the parties agree in writing, a deposition may be taken before any person authorized to administer oaths, at any place, upon any notice, and in any manner, and when so taken may be used like other depositions.

(e) If the parties agree in writing, the testimony of any witness may be submitted in the form of an affidavit without opportunity for cross-examination. The affidavit of the witness shall be filed in the Patent and Trademark Office.

(f) If the parties agree in writing, testimony may be submitted in the form of an agreed statement setting forth (1) how a particular witness would testify if called or (2) the facts in the case of one or more of the parties. The agreed statement shall be filed in the Patent and Trademark Office. See §1.653(a).

§1.673 Notice of examination of witness.

(a) A party electing to take testimony of a witness by deposition shall, after complying with paragraphs (b) and (g) of this section, file and serve a single notice of deposition stating the time and place of each deposition to be taken. Depositions may be noticed for a reasonable time and place in the United States. Unless the parties agree in writing, a deposition may not be noticed for any other place without approval of an examiner-in-chief (see §1.684). The notice shall specify the name and address of each witness and the general nature of the testimony to be given by the witness. If the name of a witness is not known, a general description sufficient to identify the witness or a particular class or group to which the witness belongs may be given instead.

(b) Unless the parties agree otherwise, a party shall serve, but not file, at least three days prior to the conference required by paragraph (g) of this section, if service is made by hand or "Express Mail," or at least ten days prior to the conference if service is made by any other means, the following:

(1) A list and copy of each document in the party's possession, custody, or control and upon which the party intends to rely at any deposition and

(2) A list of and a proffer of reasonable access to things in the party's possession, custody, or control and upon which the party intends to rely at any deposition.

(c) A party shall not be permitted to rely at any deposition on any witness not listed in the notice, or any document not served or any thing not listed as required by paragraph (b) of this section, (1) unless all opponents agree in writing or on the record to permit the party to rely on the witness, document, or thing or (2) except upon a motion (§1.635) promptly filed which is accompanied by any proposed notice, additional documents, or lists and which shows sufficient cause why the notice, documents, or lists were not served in accordance with this section.

(d) Each opposing party shall have a full opportunity to attend a deposition and cross-examine. If an opposing party attends a deposition of a witness not named in a notice and cross-examines the witness or fails to object to the taking of the deposition, the opposing party shall be deemed to have waived any right to object to the taking of the deposition for lack of proper notice.

(e) A party electing to present testimony by affidavit and who is required to notice depositions for the purpose of cross-examination under §1.672(b), shall, after complying with paragraph (g) of this section, file and serve a single notice of deposition stating the time and place of each cross-examination deposition to be taken.

(f) The parties shall nor take depositions in more than one place at the same time or so nearly at the same time that reasonable opportunity to travel from one place of deposition to another cannot be had.

(g) Before serving a notice of deposition and after complying with paragraph (b) of this section, a party shall have an oral conference with all opponents to attempt to agree on a mutually acceptable time and place for conducting the deposition. A certificate shall appear in the notice stating that the oral conference took place or explaining why the conference could not be had. If the parties cannot agree to a mutually acceptable place and time for conducting the deposition at the conference, the parties shall contact an examiner-in-chief who shall then designate the time and place for conducting the deposition.

(h) A copy of the notice of deposition shall be attached to the certified transcript of the deposition filed under §1.676(a).

§1.674 Persons before whom depositions may be taken.

(a) Within the United States or a territory or insular possession of the United States a deposition shall be taken before an officer authorized to administer oaths by the laws of the United States or of the place where the examination is held.

(b) Unless the parties agree in writing, the following persons shall not be competent to serve as an officer: (1) a relative or employee of a party, (2) a relative or employee of an attorney or agent of a party, or (3) a person interested, directly or indirectly, in the interference either as counsel, attorney, agent, or otherwise.

§1.675 Examination of witness, reading and signing transcript of deposition.

(a) Each witness before giving an oral deposition shall be duly sworn according to law by the officer before whom the deposition is to be taken.

(b) The testimony shall be taken in answer to interrogatories with any questions and answers recorded in their regular order by the officer or by some other person, who shall be subject to the provisions of §1.674(b), in the presence of the officer unless the presence of the officer is waived on the record by agreement of all parties.

(c) All objections made at the time of the deposition to the qualifications of the officer taking the deposition, the manner of taking it, the evidence presented, the conduct of any party, or any other objection to the proceeding shall be noted on the record by the officer. Evi-

dence objected to shall be taken subject to any objection.

(d) Unless the parties agree in writing or waive reading and signature by the witness on the record at the deposition, when the testimony has been transcribed a transcript of the deposition shall be read by the witness and then signed by the witness in the form of (1) an affidavit in the presence of any notary or (2) a declaration.

§1.676 Certification and filing by officer, marking exhibits.

(a) The officer shall prepare a certified transcript of the deposition by attaching to a transcript of the deposition a copy of the notice of deposition, any exhibits to be annexed to the certified transcript, and a certificate signed and sealed by the officer and showing:

(1) The witness was duly sworn by the officer before commencement of testimony by the witness.

(2) The transcript is a true record of the testimony given by the witness.

(3) The name of the person by whom the testimony was recorded and, if not recorded by the officer, whether the testimony was recorded in the presence of the officer.

(4) The presence or absence of any opposing party.

(5) The place where the deposition was taken and the day and hour when the deposition began and ended.

(6) The officer is not disqualified under §1.674.

(b) If the parties waived any of the requirements of paragraph (a) of this section, the certificate shall so state.

(c) The officer shall note on the certificate the circumstances under which a witness refuses to sign a transcript.

(d) Unless the parties agree otherwise in writing or on the record at the deposition, the officer shall securely seal the certified transcript in an envelope endorsed with the style of the interference (e.g., Smith v. Jones), the interference number, the name of the witness, and the date of sealing and shall promptly forward the envelope to BOX INTERFERENCE, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Documents and things produced for inspection during the examination of a witness, shall, upon request of a party, be marked for identification and annexed to the certified transcript, and may be inspected and copied by any party, except that if the person producing the documents and things desires to retain them, the person may (1) offer copies to be marked for identification and annexed to the certified transcript and to serve thereafter as originals if the person affords to all parties fair opportunity to verify the copies by comparison with the originals or (2) offer the originals to be marked for identification, after giving to each party an opportunity to inspect and copy them, in which event the documents and things may be used in the same manner as if annexed to the certified transcript. The exhibits shall then be filed as specified in §1.653(i). If the weight or bulk of a document or thing shall reasonably prevent the document or thing from being annexed to the certified transcript, it shall, unless waived on the record at the deposition by all parties, be authenticated by the officer and forwarded to the Commissioner in a separate package marked and addressed as provided in this paragraph.

§1.677 Form of a transcript of deposition.

(a) A transcript of a deposition must be typewritten on opaque, unglazed, durable paper approximately 8-1/2 by 11 inches (21.8 by 27.9 cm.) in size (letter size). Typing shall be double-spaced on one side of the paper in not smaller than pica-type with a margin of 1-1/2 inches (3.8 cm.) on the left-hand side of the page. The pages must be consecutively numbered throughout the entire record of each party (§1.653(d)) and the name of the witness must be typed at the top of each page (§1.653(e)). The questions propounded to each witness must be consecutively numbered unless paper with numbered lines is used and each question must be followed by its answer.

(b) Exhibits must be numbered consecutively and each must be marked as required by §1.653(i).

§1.678 Transcript of deposition must be filed.

Unless otherwise ordered by an examiner-in-chief, a certified transcript of a deposition must be filed in the Patent and Trademark Office within 45 days from the date of the deposition. If a party refuses to file a certified transcript, the examiner-in-chief or the Board may take appropriate action under §1.616. If a party refuses to file a certified transcript, any opponent may move for leave to file the certified transcript and include a copy of the transcript as part of the opponent's record.

§1.679 Inspection of transcript.

A certified transcript filed in the Patent and Trademark Office may be inspected by any party. The certified transcript may not be removed from the Patent and Trademark Office for printing (§1.653(g)) unless authorized by an examiner-in-chief upon such terms as may be appropriate.

§1.682 Official records and printed publications.

(a) A party may introduce into evidence, if otherwise admissible, any official record or printed publication not identified on the record during the taking of testimony of a witness, by filing a notice offering the official record or publication into evidence. If the evidence relates to the party's case-in-chief, the notice shall be filed prior to close of testimony of the party's case-in-chief. If the evidence relates to rebuttal, the notice shall be filed prior to the close of testimony of the party's case-in-rebuttal. The notice shall (1) identify the official record or printed publication, (2) identify the portion thereof to be introduced in evidence, (3) indicate generally the relevance of the portion sought to be introduced in evidence, and (4), where appropriate, be accompanied by a certified copy of the official record or a copy of the printed publication (§1.671(d)).

(b) A copy of the notice, official record, and publication shall be served.

(c) Unless otherwise ordered by an examiner-in-chief, any written objection to the notice or to the admissibility of the official record or printed publication shall be filed within 15 days of service of the notice. See also §1.656(h).

§1.683 Testimony in another interference, proceeding, or action.

(a) Prior to close of a party's appropriate testimony period or within such time as may be set by an examiner-in-chief, a party may file a motion (§1.635) for leave to use in an interference testimony of a witness from another interference, proceeding, or action involving the same parties, subject to such conditions as may be deemed appropriate by an examiner-in-chief. The motion shall specify with particularity the exact testimony to be used and shall demonstrate its relevance.

(b) Any objection to the admissibility of the testimony of the witness shall be made in an opposition to the motion. See also §1.656(h).

§1.684 Testimony in a foreign country.

(a) An examiner-in-chief may authorize testimony of a witness to be taken in a foreign country. A party seeking to take testimony in a foreign country shall, prior to the close of the party's appropriate testimony period or within such time as may be set by an examiner-in-chief, file a motion (§1.635):

(1) Naming the witness.

(2) Describing the particular facts to which it is expected that the witness will testify.

(3) Stating the grounds on which the moving party believes that the witness will so testify.

(4) Demonstrating that the expected testimony is relevant.

(5) Demonstrating that the testimony cannot be taken in this country at all or cannot be taken in this country without hardship to the moving party greatly exceeding the hardship to which all opposing parties will be exposed by the taking of the testimony in a foreign country.

(6) Accompanied by an affidavit stating that the motion is made in good faith and not for the purpose of delay or harassing any party.

(7) Accompanied by written interrogatories to be asked of the witness.

(b) Any opposition under §1.638(a) shall state any objection to the written interrogatories and shall include any cross-interrogatories to be asked of the witness. A reply under §1.638(b) may be filed and shall be limited to stating any objection to any cross-interrogatories proposed in the opposition.

(c) If the motion is granted, the moving party shall be responsible for obtaining answers to the interrogatories and cross-interrogatories before an officer qualified to administer oaths in the foreign country under the laws of the United States or the foreign country. The officer shall prepare a transcript of the interrogatories, cross-interrogatories, and recorded answers to the interrogatories and cross-interrogatories and shall transmit the transcript to BOX INTERFERENCE, Commissioner of Patents and Trademarks, Washington, D.C. 20231, with a certificate signed and sealed by the officer and showing:

(1) The witness was duly sworn by the officer before answering the interrogatories and cross-interrogatories.

(2) The recorded answers are a true record of the answers given by the witness to the interrogatories and cross-interrogatories.

(3) The name of the person by whom the answers were recorded and, if not recorded by the officer, whether the answers were recorded in the presence of the officer.

(4) The presence or absence of any party.

(5) The place, day, and hour that the answers were recorded.

(6) A copy of the recorded answers was read by or to the witness before the witness signed the recorded answers and that the witness signed the recorded answers in the presence of the officer. The officer shall state the circumstances under which a witness refuses to read or sign recorded answers.

(7) The officer is not disqualified under §1.674.

(d) If the parties agree in writing, the testimony may be taken before the officer on oral deposition.

(e) A party taking testimony in a foreign country shall have the burden of proving that false swearing in the giving of testimony is punishable as perjury under the laws of the foreign country. Unless false swearing in the giving of testimony before the officer shall be punishable as perjury under the laws of the foreign country where testimony is taken, the testimony shall not be entitled to the same weight as testimony taken in the United States. The weight of the testimony shall be determined in each case.

§1.685 Errors and irregularities in depositions.

(a) An error in a notice for taking a deposition is waived unless a motion (§1.635) to quash the notice is filed as soon as the error is, or could have been, discovered.

(b) An objection to a qualification of an officer taking a deposition is waived unless:

(1) The objection is made on the record of the deposition before a witness begins to testify.

(2) If discovered after the deposition, a motion (§1.635) to suppress the deposition is filed as soon as the objection is, or could have been, discovered.

(c) An error or irregularity in the manner in which testimony is transcribed, a certified transcript is signed by a witness, or a certified transcript is prepared, signed, certified, sealed, indorsed, forwarded, filed, or otherwise handled by the officer is waived unless a motion (§1.635) to suppress the deposition is filed as soon as the error or irregularity is, or could have been, discovered.

(d) An objection to the competency of a witness, admissibility of evidence, manner of taking the deposition, the form of questions and answers, any oath or affirmation, or conduct of any party at the deposition is waived unless an objection is made on the record at the deposition stating the specific ground of objection. Any objection which a party wishes considered by the Board at final hearing shall be included in a motion to suppress under §1.656(h).

(e) Nothing in this section precludes taking notice of plain errors affecting substantial rights although they were not brought to the attention of an examiner-in-chief or the Board.

§1.687 Additional Discovery.

(a) A party is not entitled to discovery except as authorized in this subpart.

(b) Where appropriate, a party may obtain production of documents and things during cross-examination of an opponent's witness or during the testimony period of the party's case-in-rebuttal.

(c) Upon a motion (§1.635) brought by a party within the time set by an examiner-in-chief under §1.651 or thereafter as authorized by §1.645 and upon a showing that the interest of justice so requires, an examiner-in-chief may order additional discovery, as to matters under the control of a party within the scope of the Federal Rules of Civil Procedure, specifying the terms and conditions of such additional discovery.

(d) The parties may agree to discovery among themselves at any time. In the absence of an agreement, a motion for additional discovery shall not be filed except as authorized by this subpart.

§1.688 Use of discovery.

(a) If otherwise admissible a party may introduce into evidence, an answer to a written request for an admission or an answer to a written interrogatory obtained by discovery under §1.687 by filing a copy of the request for admission or the written interrogatory and the answer. If the answer relates to a party's case-in-chief, the answer shall be filed prior to the close of testimony of the party's case-in-chief. If the answer relates to the party's rebuttal, the admission or answer shall be filed prior to the close of testimony of the party's case-in-rebuttal. Unless otherwise ordered by an examiner-in-chief, any written objection to the admissibility of an answer shall be filed within 15 days of service of the answer.

(b) A party may not rely upon any other matter obtained by discovery unless it is introduced into evidence under this subpart.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Nov. 8, 1984.

[1050 OG 385]

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(143) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 40104-4151]

Patent Interference Proceedings

Agency: Patent and Trademark Office, Commerce.

Action: Final rule; correction.

Summary: This document corrects clerical errors and adds material to the Analysis of Comments in the notice of final rule amending the Patent and Trademark rules of practice in patent interference cases, which were published in the Official Gazette of Jan. 29, 1985 (1050 OG 385 through 440).

For Further Information Contact: Fred E. McKelvey by telephone at (703) 557–4035 or by mail marked to his attention and addressed to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information:

Clerical Correction to the Preamble

The following corrections are made to the Official Gazette issue of Jan. 29, 1985:

Page 386

1. In the second column, line 32 (the fifth full paragraph, the second sentence) the word "an" is inserted after the word "or"

Page 387

2. In the second column, line 48 (the fifth full paragraph), after the word "agent", the following words "of record" are inserted.

Page 388

3. In the first column, line 29 (the first full paragraph, the third sentence), the words "of an interference" are removed and the words "in an interference" are inserted in their place; in line 39 (the first full paragraph, the last sentence), the words "Federal Rule" are removed and the words "Federal Rules" are inserted in their place; in line 41 (the second full paragraph, the first sentence), the word "provide" is removed and the word "provides" is inserted in its place.

4. In the second column, line 29 (the second full paragraph, the second sentence), the word "defined" is removed and the word "defines" is inserted in its place; in line 45 (the second full paragraph, the last sentence), the spelling of the word "in" is corrected; in line 48 (the last paragraph, the first sentence), the words "one of " are removed and the words "one or" are inserted in their place.

Page 391

5. In the second column, line 59 (the paragraph bridging the third column, the second sentence), quotation marks are placed around the word "lead".

6. In the third column, line 44 (the second full paragraph, the fourth sentence), the article "a" is inserted before the word "sanction".

Page 392

7. In the first column, line 12 (the second full sentence from the top of the page), the word "proposed" is removed; in line 30 (the seventh full sentence from the top of the page), the words "and applicant" are removed and the words "an applicant" are inserted in their place; in line 55 (the first full paragraph, the second sentence), the colon appearing after the word "appropriate" is deleted and a period is inserted in its place.

8. In the third column, line 5, the first letter of the word "while" is capitalized.

Page 394

9. In the second column, line 13 (the first full paragraph, the fourth sentence), the spelling of the word "Consultation" is corrected.

Page 395

10. In the first column, line 44 (the second full paragraph, the last sentence), the spelling of the word "necessary" is corrected; in line 59 (the last paragraph, the first sentence), the spelling of the word "specifies" is corrected.

11. In the second column, line 1, the word "the" is inserted after the word "and"; in line 14 (the first full paragraph, the third sentence), the words "is required" are removed and the words "are required" are inserted in their place.

Page 396

12. In the first column, line 5, the word "of" is removed.

13. In the second column, line 13 (the first full paragraph, the fourth sentence), the word "Claims" is removed and the word "Claim" inserted in its place.

Page 397

14. In the second column, line 2, the words "would be" are removed and the word "is" is inserted in its place; in line 6, the word "intended" is removed and the word "intends" is inserted in its place.

Page 399

15. In the second column, line 41 (the fifth full paragraph), the word "had" is removed and the word "has" is inserted in its place.

16. In the third column, line 37 (the third full paragraph, the last sentence), the comma after the word "language" is removed; in line 38, the comma after the word "affidavit" is removed.

Page 401

17. In the first column, line 11 (the first full paragraph, the first sentence), the words "of sale" are removed and the words "or sale" are inserted in their place.

Page 402

18. In the first column, line 4, the word "over" is removed and the word "of" is inserted in its place.

Page 403

19. In the first column, line 2, the spelling of the word "arguably" is corrected; in line 9, the spelling of the word "definitions" is corrected.

Page 404

20. In the first column, line 18 (the second full paragraph, the fourth sentence), the words "PTO was" are removed and the words "PTO were" are inserted in their place.

21. In the second column, line 26 (the first full paragraph, the fourth sentence), the spelling of the word "under" is corrected.

Page 406

22. In the third column, line 21 (the first full paragraph, the third sentence), a closing quotation mark is placed after the word "opponents's".

Page 407

23. In the first column, line 4 (the first full paragraph, the first sentence), the spelling of the word "suggested" is corrected.

Page 409

24. In the first column, line 21 (the first full paragraph, the third sentence), the words "do not" are inserted after the word "rules".

25. In the third column, line 33 (the first full paragraph, the first sentence), the word "is" is inserted before the word "excluded".

Page 411

26. In the third column, line 26 (the third full paragraph, the third sentence), the word "permitting " is removed and the word "permitted" is inserted in its place.

Page 413

27. In the second column, line 47 (the second full paragraph, the second sentence), the reference to "1.644(b)" should read "1.644(a)(2)".

28. In the third column, line 59 (the last paragraph, the first sentence), the first letter of the word "Interference" is made lower case.

Page 416

29. In the first column, line 1, the word "opponent's" is removed and the word "opponents" is inserted in its place.

30. In the second column, line 40 (the first full paragraph, the second sentence), the reference to "1662(a)" should read "1.662(a)"; in line 45 (the first full paragraph, the third sentence), the reference to "1633(d)" should read "1.633(d)".

Page 417

31. In the second column, line 49 (the second full paragraph, the third sentence from the end), quotation marks are placed around the word "things"; in line 55 (the second full paragraph, the last sentence), the word "to" is inserted after the words "should resort".

32. In the third column, line 11 (the first full sentence from the top of the page), the colon after the word "controversy" is removed and a period is inserted in its place; in line 54 (the first full paragraph, the penultimate sentence), the spelling of the word "appropriate" is corrected.

Page 418

33. In the second column, line 16 (the first full paragraph, the first sentence), the first letter of the word "Commentator's" is made lower case.

Page 419

34. In the table correlating the old rules 37 CFR 1.201 through 1.288 to the new rules 37 CFR 1.601 through 1.688, the following corrections are made to the entries under the section, designated as new:

RULE CORRELATION TABLE

Old	New
1.201(a)	1.601(i)
1.201(b)	1.601(i)
1.203(a)	1.603
1.204(b)	1.608(a)
1.204(c)	1.608(b)
1.205(a)	1.606
1.208	1.613(b)
1.216(b)	1.623(c), 1.624(c), 1.625(c)
1.245	1.645(a)
1.246	1.645(b)
1.257(b)	1.658(c)
1.263	1.622(c)
1.264	1.662(b)
1.271	1.671(h)
1.272(b)	1.672(d)
1.272(c)	1.672(e), (f)
1.281	1.645(a)
1.287(b)	1.687(b)
1.287(c)	1.687(c)

Additional Analysis of Comments

Page 404

1. In the second column after the last full paragraph, the following paragraph is added:

An oral comment was received by telephone concerning the declaration of an interference under §§1.603 and 1.606 with applications filed under the provisions of 35 U.S.C. 157—Statutory Invention Registration (SIR). Under 35 U.S.C. 157(c), a published SIR has all of the attributes specified for patents except those specified in 35 U.S.C. 183 and 271 to 289. Consequently, interferences will be declared between an application and either an application containing a request for a SIR (37 CFR 1.293) or a published SIR. Until sufficient experience is gained by the PTO, the interference will be conducted by procedure established on a case by case basis.

Page 415

In the second column, after the first full paragraph, the following paragraph is added:

Oral comments have been received by telephone concerning the doctrine of interference estoppel under 37 CFR 1.658(c) with respect to a party's failure to move under 37 CFR 1.633(e) to declare an "additional interference" between an additional application not involved in the interference and owned by the party and an opponent's application or patent involved in the interference on a separate patentable invention. Generally a party will be estopped for failure to move when the separate patentable invention (subject matter) which could have been the subject of the "additional interference" was *claimed* (during the pendency of the interference) (1) in the opponent's involved application or patent or (2) in a non-involved application owned by the party.

The following illustrates the general applicability of interference estoppel in certain situations where a party fails to move under 37 CFR 1.633(e) to declare an "additional interference" on a separate patentable invention.

Party's non-involved application	Opponent's involved application or patent	Estoppel
Claimed	Claimed	Yes
Disclosed	.do	Yes
Claimed	Disclosed	Yes
Disclosed	.do	No

Clerical Corrections to the Rules

1. On page 420 the second column, the amendment to §1.8, amendatory instruction 4 is corrected by changing "paragraph (a)(xii) to read "paragraph (a)(2)(xii)".

2. On page 421, the second column, in the second sentence of §1.59, the spelling of the word "required" is corrected and the reference to "§1.21(1)" is corrected to read "§1.21(*l*)".

3. On page 423, the third column, §1.324 is corrected by inserting in the second sentence the article "a" before the word "patent".

4. On page 424, the first column, in §1.565, in the first sentence of paragraph (b), "in filed" should have read "is filed".

5. On page 425, the first column, the last sentence of § 1.601(i) is corrected by removing the last occurrence of the word "patents" and inserting, in its place, the word "patent".

6. On page 425, the first column, §1.601(k) is corrected by removing the words "and interference" and inserting, in their place, the words "an interference".

7. On page 425, the second column the second sentence of §1.601(n) is corrected by removing the words "a invention" and inserting, in their place, the words "an invention".

8. On page 427, the first column, §1.611(d)(2) is corrected by inserting the word "in" after the word "provided".

9. On page 427, the second column, the reference to "1.608(b)" in the first sentence of §§1.612(a), 1.612(b) and 1.612(c) is corrected to read "1.608".

10. On page 427, the third column, the first sentence of §1.615(a) is corrected by placing in italics the words "ex parte".

11. On page 427, the third column, the second sentence of §1.616 is corrected by changing to upper case the first letter of the words "holding", "precluding" and "granting" in paragraphs (a) to (e).

12. On page 428, the first column, the first sentence of §1.617(b) is corrected by removing the first occurrence of the word "any" and inserting, in its place, the word "may".

13. On page 428, the first column, the last sentence of §1.617(b) is corrected by inserting the words "on each opponent" after the words "shall serve".

14. On page 428, the first column, the last sentence of §1.617(d) is corrected by removing the words "an oral" and inserting, in their place, the article "a".

15. On page 428, the first column, the last sentence of §1.617(g) is corrected by removing the word "part" and inserting, in its place, the word "subpart".

16. On page 428, the second column, the second sentence of §1.621(a) is corrected by inserting the word "by" after the first occurrence of the word "or".

17. On page 428, the second column, the first sentence of §1.621(b) is corrected by inserting a comma after the first occurrence of word "statement".

18. On page 428, the third column, the first sentence of §1.624(a) is corrected by removing the semicolon appearing after the word "count" and inserting, in its place, a colon.

19. On page 430, the first column, the last sentence of §1.631(a) is corrected by removing the words "a party shall serve copies of its preliminary statement on every opponent" and inserting, in their place, the words "a party shall serve a copy of its preliminary statement on each opponent".

20. On page 430, the first column, the heading of §1.633 is corrected by changing to lower case the first letter of the word "Motions".

21. On page 430, the third column, in §1.636(b) the reference to "§1.633(a), (b), or (g)" is corrected to read "§1.633(a), (b), (c)(1), or (g)".

22. On page 431, the second column, in §§1.637(d)(2) and 1.637(e)(1)(ii) the reference to "§1.608(b)" is corrected to read "§1.608".

23. On page 431, the second column, §1.637(e)(1)(iv) is corrected by removing the words "a claim" and inserting, in their place, the words "any claim".

24. On page 431, the third column, §1.637(e)(2)(iii) is corrected by removing the first occurrence of the word "party's" and inserting, in its place, the word "party".

25. On page 431, the third column, the second sentence of §1.637(e)(2)(iv) is corrected by removing the two occurrences of the word "claims" and inserting, in their place, the word "claim".

26. On page 431, the third column, in the first sentence of §1.637(f)(2), the reference to "§1.608(b)" is corrected to read "§1.608".

27. On page 432, the first column, §1.637(h)(3) is corrected by removing the words "a claim" and inserting, in their place, the words "any proposed claim".

28. On page 432, the second column, §1.640(b)(2) is corrected by removing the words "entered or" and inserting, in their place, the words "entered on".

29. On page 432, the third column, the penultimate sentence of §1.640(c) is corrected by inserting the article "a" before the words "single examiner-in-chief".

30. On page 432, the third column, §1.640(d)(1) is corrected by removing the words "all counts" and inserting, in their place, the words "any count".

31. On page 432, the third column, the first sentence of §1.640(e) is corrected by removing the word "filed" and inserting, in its place, the word "files".

32. On page 433, the second column, §1.644(i) is corrected by removing the word "petition" and inserting, in its place, "petitions".

33. On page 433, the second column, the first sentence of §1.645(a) is corrected by inserting the word "or" after "§§1.302," and after "§§1.303,".

34. On page 433, the third column, in the first sentence of §1.646(a), the spelling of the word "every" is corrected.

35. On page 433, the third column, §1.646(c) is corrected by removing the word "part" and inserting, in its place, the word "subpart".

36. On page 434, the third column, §1.653(c)(5) is corrected by removing the word "an" and inserting, in its place, the word "and".

37. On page 434, the third column, the last sentence of §1.653(g) is corrected by removing the word "found" and inserting, in its place, the word "bound".

38. On page 435, the first column, the penultimate sentence of §1.653(i) is corrected by removing the words "and exhibit" and inserting, in their place, the words "an exhibit".

39. On page 436, the third column, the second sentence of §1.664(a) is corrected by removing the word "part" and inserting, in its place, the word "subpart".

40. On page 437, the first column, the last sentence of §1.666(c) is corrected by removing the word "Commission" and inserting, in its place, "Commissioner".

41. On page 437, the second column, the first sentence of §1.671(b) is corrected by removing the word "part" and inserting, in its place, the word "subpart".

42. On page 437, the second column, in the first sentence of §1.671(e) the reference to "§1.608(b)" is corrected to read "§1.608".

43. On page 437, the third column, the third sentence of §1.672(b) is corrected by removing the words "a party shall file" and inserting, in their place, the words "a party should file".

44. On page 438, the third column, in §1.676(a), the spelling of the third occurrence of the word "transcript" is corrected.

45. On page 440, the first column, the second sentence of §1.684(c)(6) is corrected by removing the words "a witness refused to read" and inserting, in their place, the words "a witness refuses to read".

46. On page 440, the second column, §1.685(c) is corrected by inserting the word "or" after the first occurrence of the word "error," and by removing the word "indorsed" and inserting, in its place, the word "endorsed".

DONALD J. QUIGG,
May 21, 1985. *Acting Commissioner of Patents and Trademarks.*

[FR Doc. 85-13077 Filed 5-30-85; 8:45 am]

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[1059 OG 27]

(144) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 50103-6060]

Arbitration of Patent Interference Cases

Agency: Patent and Trademark Office, Commerce.
Action: Notice of proposed rulemaking.
Summary: Section 105 of the Patent Law Amendments Act of 1984, Pub. L. 98-622, provides for arbitration of patent interference cases. In this document, the Patent and Trademark Office is publishing a proposed regulation to implement the arbitration provision.
Date: Comments and suggestions should be received by Nov. 14, 1986. No hearing will be held.
Address: Address written comments to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

For Further Information Contact: Ian A. Calvert or Michael Sofocleous by telephone at (703) 557-4000 or by mail marked to the attention of either and addressed to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: Section 105 of the Patent Law Amendments Act of 1984, enacted on Nov. 8, 1984, provides for the arbitration of patent interference cases. Section 105, codified as 35 U.S.C. 135(d), provides:

Parties to a patent interference, within such time as may be specified by the Commissioner by regulation, may determine such contest or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of title 9 to the extent such title is not inconsistent with this section. The parties shall give notice of any arbitration award to the Commissioner, and such award shall, as between the parties to the arbitration, be dispositive of the issues to which it relates. The arbitration award shall be unenforceable until such notice is given. Nothing in this subsection shall preclude the Commissioner from determining patentability of the invention involved in the interference.

The Patent and Trademark Office (PTO) conducts interference proceedings to determine any question of patentability and priority of invention between two or more parties claiming the same patentable invention. An interference may be declared between two or more pending applications naming different inventors when, in the opinion of an examiner, the applications contain claims for the same patentable invention. An interference may be declared between one or more pending applications and one or more unexpired patents naming different inventors when, in the opinion of an examiner, any application and any unexpired patent contain claims for the same patentable invention. Patent interference cases can be quite expensive. Arbitration may prove useful to minimize expenses in interference cases. The proposed arbitration rule, if adopted, would apply to all pending interferences.

The PTO published an advance notice of rulemaking in the **Federal Register** of Jan. 16, 1985. (50 FR 2294 through 2296). The notice was also published in the *Official Gazette* on Feb. 12, 1985. 1051 *Official Gazette* 9-10; 1051 TMOG 10-11. The notice also appeared in the Bureau of National Affairs' Patent, Trademark & Copyright Journal, Vol. 29, pp. 310 [Jan. 24, 1985], hereinafter "BNA." Five written comments were received in response to the advance notice. The comments are analyzed herein. The five comments are available for public inspection in Rm. 10C01, Crystal Gateway II, 1225 Jefferson Davis Hwy., Arlington, Va.

Guidelines for Arbitration

From the tenor of the comments, it is apparent that the commentors desire guidance from the PTO concerning its policy with respect to the arbitration of patentability issues and extensions of time for arbitration.

Under proposed §1.690 the arbitrator could determine issues of patentability as between the parties but a determination that the subject matter is patentable would not be binding upon the PTO. If the arbitrator's award holds that a party's claims corresponding to the count are unpatentable over prior art or under 35 U.S.C. 112, that determination would be binding on that party vis-a-vis the party's opponent and would result in a judgment adverse to that party. The judgment, however, would not discharge the duty that each party has under 37 CFR 1.56 to bring to the attention of the examiner in charge of its respective application any prior art and/or reason relied upon by the arbitrator in the determination of unpatentability.

It is the longstanding practice of the PTO to favor the settlement of interferences and the PTO looks with favor on all proper efforts in that direction as being conducive to the termination of the proceeding. See 4 Rivise and Caesar, *Interference Law and Practice*, section 861, pp. 2956 (Michie Co. 1948) and the Commissioner's Notice of Nov. 9, 1976, titled, "Extensions of Time and Filing of Papers in Interferences," 953 *Official Gazette* 2 (Dec. 7, 1976). In this regard, the notice states that:

. . . stipulations or motions for extensions of time under 37 CFR 1.245 will not henceforth be approved or granted, respectively, unless accompanied by a detailed showing of facts sufficient to establish that the action for which the extension is sought could not have been or cannot be taken or completed during the time previously set therefor, and that the entire extension appears necessary for the taking or completion of that action. Since the Office favors the amicable settlement of interferences, the foregoing requirement will be liberally applied in the case of a first request for extension of time for the purpose of negotiating settlement.

Consequently, the examiner-in-chief could give favorable consideration to a motion for an extension of time for purposes of settlement; however, a further motion for an extension for that purpose would not be granted unless it is accompanied by a schedule of specific dates showing that the parties will make a good faith effort to promptly terminate the proceeding. If preliminary motions under 37 CFR 1.633 have not been filed, the examiner-in-chief would not normally extend the time for their filing merely for purposes of settlement. In these circumstances, the examiner-in-chief would require that the preliminary motions be filed or that their filing be waived.

If the proceeding is in the testimony stage, the examiner-in-chief could grant the parties' motion to extend all the unexpired testimony times to close concurrently on the date the record is due provided they file a stipulation that any evidence to be submitted will be in one of the forms specified in 37 CFR 1.672(e)and (f), i.e., affidavit testimony or a stipulation either as to what a particular witness would testify to if called or the facts in the case of any party.

Analogously, the aforesaid practice would apply to arbitration. Parties who intend to arbitrate an interference would be required to notify the examiner-in-chief in writing of their intention to arbitrate and file a copy of the arbitration agreement within 20 days of its execution. Pursuant to 35 U.S.C. 135(c) an agreement to arbitrate is considered to be one "made in connection with and in contemplation of the termination of the interference" and therefore would have to be in writing and a copy would have to be filed in the PTO. The notification would be made in a separate paper. Merely incorporating the notification in the settlement agreement under 35 U.S.C. 135(c) would not be sufficient to comply with proposed §1.690(a). The parties also would be required to adhere to a time schedule approved by the examiner-in-chief such that the interference proceeding can be expeditiously resolved so as to prevent the unnecessary postponement of the beginning of the running of the term of any patent resulting from an application involved in the interference. *Pritchard* v. *Loughlin*, 361 F.2d 483, 149 USPQ 841 (CCPA 1966).

If the parties desire to arbitrate an interference prior to the close of the motions period, the examiner-in-chief would not normally grant an extension of time for that purpose. The parties would be required to file their preliminary motions under 37 CFR 1.633. After the motions are filed, the examiner-in-chief could grant an extension only upon compliance with 37 CFR 1.645 which requires a showing of "good cause." Such a "good cause" showing would normally include a schedule, agreed to by the parties, setting forth, *inter alia*, the dates for (1) executing the arbitration agreement, (2) determining priority and (3) terminating the interference.

The arbitration agreement should include the following provisions:

(1) The name of the arbitrator or a date certain (not more than 30 days after the execution of the agreement) for his or her selection.

(2) The issues to be decided by the arbitrator.
(3) That the arbitrator's award is binding on the parties and that the Board can enter a judgment based thereon.

A copy of the arbitration award must be filed within 20 days from the date of the award or by the date set by the examiner-in-chief.

If the proceeding is in the testimony stage and the parties desire to arbitrate, the examiner-in-chief could grant a reasonable extension for that purpose. A motion for a further extension for that purpose would not be granted unless it is accompanied by a schedule, agreed to by the parties, setting forth, *inter alia*, the dates for (1) executing the arbitration agreement, (2) determining priority, and (3) terminating the interferences. If the parties were to submit the required schedule, a motion for a further extension could be granted. If the parties file a copy of the arbitration agreement and they agree that any evidence submitted in the proceeding will be in one of the forms specified by 37 CFR 1.672(e) of (f), the examiner-in-chief could give favorable consideration to the parties' motion that all the unexpired times be extended to close concurrently on the date the record is due. By that date, the parties would be required to file the arbitrator's award and their records, if necessary for the resolution of any issue not decided by the arbitrator. If the award is not dispositive of all the issues in the interference, the examiner-in-chief would set brief times so that the parties could explain their evidence relating to any issues which the arbitrator did not, or was unable to, decide. For example, the award might be dispositive of the issue of priority between the parties and leave for the Board's determination the question of substituting a new count raised in a preliminary motion under 37 CFR 1.633.

The arbitration award, filed by the parties, would be in the nature of a final decision and must include the following:

(1) The style (e.g., *Jones* v. *Smith*), the number of the interference and the names of the real parties in interest.
(2) The subject matter in issue, i.e., the counts and a table of counts, if necessary, indicating the relationship of the parties' claims corresponding to each count and those claims not corresponding thereto.
(3) The issues for decision before the arbitrator.
(4) The arbitrator's decision. The decision may also include a statement of the grounds and reasoning in support thereof.
(5) A summary, if appropriate, indicating, inter alia, that judgment should be awarded to one of the parties.

Any party to the arbitration can attack the award only in the manner provided by 9 U.S.C. 10 and 11.

9 U.S.C. 10 reads as follows:

In either of the following cases the United States court in and for the district wherein the award was made may make an order vacating the award upon the application of any party to the arbitration—
(a) Where the award was procured by corruption, fraud, or undue means.
(b) Where there was evident partiality or corruption in the arbitrators, or either of them.
(c) Where the arbitrators were guilty of misconduct in refusing to postpone the hearing, upon sufficient cause shown, or in refusing to hear evidence pertinent and material to the controversy; or of any other misbehavior by which the rights of any party have been prejudiced.
(d) Where the arbitrators exceeded their powers, or so imperfectly executed them that a mutual, final, and definite award upon the subject matter submitted was not made .
(e) Where an award is vacated and the time within which the agreement required the award to be made has not expired the court may, in its discretion, direct a rehearing by the arbitrators.

9 U.S.C 11 reads as follows:

In either of the following cases the United States court in and for the district wherein the award was made may make an order modifying or correcting the award upon the application of any party to the arbitration—
(a) Where there was an evident material miscalculation of figures or an evident material mistake in the description of any person, thing, or property referred to in the award.
(b) Where the arbitrators have awarded upon a matter not submitted to them, unless it is a matter not affecting the merits of the decision upon the matter submitted.
(c) Where the award is imperfect in matter of form not affecting the merits of the controversy.

The order may modify and correct the award, so as to effect the intent thereof and promote justice between the parties.

See, for example, *Fairchild & Co., Inc.* v. *Richmond, F. & .P. R. Co.*, 516 F.Supp. 1305 (D.D.C. 1981). If such an attack were to be made by one of the parties while the interference is pending before the Board, the Board would not stay the interference. Rather, the Board would issue its judgment in accordance with the award. So long as the award is in compliance with proposed §1.690, it would carry the presumption that the arbitrator acted correctly in making his decision and accordingly, the party designated by the award as the prevailing party would be entitled *prima facie* to a judgment in its favor. If the dissatisfied party brings an action in an appropriate United States district court and if the court vacates, modifies or corrects the award, the Board would take action consistent with the court's findings. No action would like in the PTO to vacate or correct an arbitration award, unless all parties agreed in writing.

The following examples illustrate the proposed practice of the PTO concerning arbitration.

Example 1

Arbitration Practice—Preliminary State

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The parties decide to arbitrate the interference in accordance with proposed §1.690 and file a motion for an extension of time so that they can "freely" arbitrate the interference, but do not file a waiver of their right to file motions.

The examiner-in-chief would deny the motion because the parties' intention to arbitrate, in and of itself, does not constitute a showing of "good cause" within the meaning of 37 CFR 1.645(a). Even if the parties file an agreement to arbitrate, the PTO would not grant any extension of time to permit the parties to "freely" arbitrate an interference prior to the expiration of the time for filing preliminary motions.

Example 2

Arbitration Practice—Testimony Stage

An interference is delcared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633. The parties file preliminary motions; the examiner-in-chief renders a decision thereon and sets the testimony times. The parties file a notice of intent to arbitrate the interference under proposed §1.690(a) and a motion for a one month extension of the testimony times. The examiner-in-chief could grant the motion, but would indicate that if the parties file another motion for an extension for that purpose, the motion must be accompanied by a schedule, agreed to by the parties, setting forth the dates for (1) executing the arbitration agreement, (2) determining priority and (3) terminating the interference.

The parties file a motion for an additional one month extension of time to permit the parties to arbitrate the interference. Accompanying the motion is a proposed schedule of times and a copy of the arbitration agreement which provides, inter alia, (i) the name of the arbitrator or a date certain for his selection, (ii) that the arbitrator's award will be binding on the parties, (iii) the issues to be decided by the arbitrator and (iv) that the award will be filed by the date the record is due. The parties also indicate that the evidence to be filed in the proceeding will be in one of the forms specified by 37 CFR 1.672(e) of (f). The examiner-in-chief could grant the motion and indicate that he will give favorable consideration to a motion to extend all the unexpired times to close concurrently on the date the record is due should the parties request such.

On the date for filing the record, the parties file the arbitrator's award and their evidentiary records, if necessary. The award states (i) the style and number of the interference and the real parties in interest, (ii) the subject matter in issue and the parties' claims which correspond thereto and which do not correspond thereto, (iii) the issues for decision before the arbitrator, (iv) the arbitrator's decision (which may include a statement of the grounds and reasoning in support thereof) and (v) that judgment should be awarded to one of the parties. The examiner-in-chief examines the award to ensure that it complies with proposed §1.690 and is dispositive of the issues in the interference which can be decided by the arbitrator. If the award is otherwise acceptable, the Board would issue a judgment based on the award. If the award is not dispositive of all the issues in the interference, the examiner-in-chief would determine how the interference will proceed.

Example 3

Arbitration Practice—Award Decides Interference-in-Fact Issue and Junior Party Takes No Testimony

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(b) on the ground that there is no interference-in-fact between his claims corresponding to the count and his opponent's claims corresponding thereto. The examiner-in-chief denies the motion, examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. On the date for filing the record, the junior party files the award together with a motion requesting that the interference be terminated in view of the award. He does not file a record. In his award the arbitrator holds that no interference-in-fact exists between the parties' claims corresponding to the count.

The motion would be denied because the award decides a matter of patentability which would not result in a judgment adverse to one of the parties. Consequently, the junior party would be placed under an order to show cause why judgment under 37 CFR 1.652 should not be entered against him for his failure to file an evidentiary record by the time set therefor. In response to the order, the junior party requests final hearing to review the examiner-in-chief's denial of the motion for judgment and a testimony period to show no interference-in-fact. The examiner-in-chief would grant the junior party's request to the extent that final hearing is set and would deny the request for testimony because the junior party already had the opportunity to take testimony on the matter.

Example 4

Arbitration Practice—Cannot Decide Patentability

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(a) on the ground that the claims corresponding to the count are unpatentable over prior art. In his decision on motions, the examiner-in-chief grants the motion and places both parties under an order pursuant to 37 CFR 1.640(d)(1) to show cause why judgment should not be entered against them as to the count. In response to the order, the senior party files a paper in accordance with 37 CFR 1.640(e) purportedly showing good cause why judgment should not be entered in accordance with the order and a motion requesting permission to arbitrate the patentability issue. The examiner-in-chief would deny the motion. The arbitrator is without authority to establish vis-a-vis the public that the subject matter of the count is patentable. Thus, the arbitration will serve no useful purpose. The Board would consider the senior party's paper and enter an appropriate order.

Example 5

Arbitration Practice—Award After Decision on Motions

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(a) on the ground that the claims corresponding to counts 1 and 2 are unpatentable over prior art. In his decision on motions, the examiner-in-chief grants the motion with respect to count 1, denies the motion with respect to count 2 and places both parties under an order pursuant to 37 CFR 1.640(d)(1) to show cause why judgment should not be entered against them as to count 1. The senior party files a paper in accordance with 37 CFR 1.640(e); the junior party, a response thereto. The Board considers the paper and the response thereto and based on the record enters judgment adverse to both parties as to count 1. Thereafter, the examiner-in-chief examines the preliminary statements and sets dates for taking testimony and filing the record.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. In his award, the arbitrator decides that judgment should be awarded to the junior party. On the date for filing the record, both parties file the award together with a motion requesting that the interference be terminated in view of the award. No record is filed.

The motion would be granted and accordingly it would be held that the senior party is not entitled to a patent containing his claims corresponding to count 2.

Example 6

Arbitration Practice—Award Decides Patentability

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions for judgment under 37 CFR 1.633 are filed and after the examination of the preliminary statements, the examiner-in-chief sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. In his award, the arbitrator finds (1) that the evidence is insufficient to establish a prior public use bar under 35 U.S.C. 102(b) against the junior party, (2) that the claims of the junior party corresponding to the count are patentable under 35 U.S.C. 103 over the prior art cited by the senior party to the junior party, and (3) that judgment on priority should be awarded to junior party. On the date for filing the record, the parties file their records and

the award together with a motion requesting that the interference be terminated in view of the award.

The motion would be granted and accordingly it would be held that the senior party is not entitled to a patent containing his claims corresponding to the count. After the termination of the proceeding, each party has the duty under 37 CFR 1.56 to bring before the primary examiner the evidence concerning the purported public use bar and the prior art cited by the senior party and/or considered by the arbitrator.

Example 7

Arbitration Practice—Award Grants Priority to Junior Party Contingent Upon Granting of Preliminary Motion Under 1.633(c)

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion under 37 CFR 1.633(c)(1) to substitute another count. The examiner-in-chief denies the motion, examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intention to arbitrate and enter into an arbitration agreement which is approved by the examiner-in-chief. The agreement provides that any evidence to be submitted by the parties will be in the form of a stipulation under 37 CFR 1.672(e) and (f). The parties file a motion requesting that all the unexpired testimony times be extended to close concurrently on the date the record is due. The motion would be granted.

On the date for filing the record, the junior party files his record and the award. The award states, inter alia, that if the Board at final hearing should grant the junior party's motion under 37 CFR 1.633(c)(1) to substitute a new count, judgment should be awarded to the junior party based on the evidence. Otherwise, the award states that judgment should be awarded to the senior party.

The examiner-in-chief sets the brief times and after the filing thereof the interference would be set for final hearing so that the Board can review the examiner-in-chief's denial of the junior party's motion under 37 CFR 1.633(c) and issue an appropriate judgment based on the award.

Example 8

Arbitration Practice —Award Attacked

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No preliminary motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intention to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief.

On the date for filing the record, both parties file their records. The junior party files the award which states that judgment should be awarded to him and a motion for judgment based on that award. The senior party files an opposition to the motion for judgment on the grounds (i) that the award contains errors of law, (ii) that the award was procured by "corruption, fraud or undue means" in violation of 9 U.S.C. 10(a), and (iii) that the arbitrator exhibited "evident partiality" in violation of 9 U.S.C. 10(b) and was "guilty of misconduct . . . in refusing to hear evidence pertinent and material" to the interference, citing 9 U.S.C. 10(c).

The Board would grant the judgment based on the award, holding that the senior party is not entitled to a patent containing his claims corresponding to the count. So long as the award is in compliance with the provisions of proposed §1.690, it would carry a presumption that the arbitrator acted properly in all respects. Consequently, before the PTO the award is binding upon the parties and the junior party is *prima facie* entitled to a judgment in its favor. Thus, no action lies in the PTO as regards the matter raised by the senior party. The senior party's action lies in an appropriate United States district court and the PTO would take any action consistent with the court's decision.

Example 9

Arbitration Practice—Award Cannot Modify Board's Final Decision

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference and enter into an arbitration agreement. Neither party notifies the examiner-in-chief of their intent to arbitrate nor do they file a copy of the agreement in the interference. Both parties timely file their records and briefs. Both waive oral agrument. The Board enters a final decision after consideration of the evidence in favor of the senior party.

The junior party requests reconsideration of the Board's final decision, submits a copy of the arbitration award and moves that the Board set aside its final decision and enter judgment in his favor based on the award. In support of its request, the junior party cites 9 U.S.C. 9, which provides that "any party to the arbitration may apply to the court so specified for an order confirming the award" and 35 U.S.C. 135(d) which provides that title 9 applies to interference arbitrations.

The Board would deny the motion to set aside. The parties did not comply with proposed §1.690(a), e.g., notify the examiner-in-chief in writing of their intention to arbitrate and file a copy of the arbitration agreement within twenty (20) days of its execution. The denial of the motion is an appropriate sanction under 37 CFR 1.616. Such action by the Board is considered consistent with long-standing interference practice. Cf. *Humphrey v. Fickert*, 1904 Dec. Comm'r. Pat. 447 (Comm'r. 1904) wherein the Board, after it had considered the evidence, refused to set aside its award of priority to Fickert and act upon the Fickert's concession of priority in favor of Humphrey, the losing party.

Example 10

Arbitration Award Filed With Record—No Notice to Examiner-in-Chief

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference and enter into an arbitration agreement. Neither party notifies the examiner-in-chief of the agreement. The junior party timely files its record together with a copy of the arbitration award and a motion for judgment based on the award.

The motion would be denied. Under the provisions of 37 CFR 1.616, the examiner-in-chief places both parties under an order to show cause why judgment should not be rendered against them for their failure to comply with proposed §1.690(a), i.e., failing to notify him of their intent to arbitrate and file a copy of the arbitration agreement.

Analysis of Comments

One commentor suggests that the parties should be able to arbitrate at any stage of the proceeding, including immediately after the declaration of the interference. Another commentor suggests that arbitration should not be instituted until after the motion period when the issues have been finally determined. The parties can begin arbitration at any stage of the interference; however, no extension of the time for filing preliminary motions will be granted for the purpose of arbitration. See Example 1. No change is necessary to the rule proposed in the advance notice.

One commentor suggests that the PTO should become involved in the selection of the arbitrator by maintaining a roster of arbitrators. This suggestion is not being adopted because the selection of an arbitrator is a matter for the parties.

One commentor notes that the American Arbitration Association (AAA) has developed rules for handling patent matters and requests that the PTO "give notice that following AAA rules is prima facie acceptable, as to the procedure used." In the PTO's view, the parties can stipulate the use of any procedure for resolving the arbitration.

One commentor suggests that the arbitrator should be able to "certify questions to the Board." The statute, 35 U.S.C. 135(d), and proposed §1.690 provide that the parties may determine the interference or "any aspect thereof by arbitration." If the parties elect to arbitrate, the arbitrator must decide the interference. He cannot "certify" questions to the Board since "certification" would defeat the purpose of arbitration.

One commentor suggests that

[The] arbitrator should have subpoena power or discovery authority to protect his own reputation in the event (a) a party is withholding information or (b) the parties are colluding in withholding information from the arbitrator.

While the arbitration proceeding is pending before him, the arbitrator has the authority under 9 U.S.C. 7 to summon in writing any person to attent . . . as a witness and in a proper case to bring with him . . . any book, record, document or paper which may be deemed material in the case.

If any person so summoned refuses or neglects to obey the summons, the arbitrator or a party may petition an appropriate United States district court pursuant to 9 U.S.C. 7 to compel the attendance of the person or to punish the person for contempt.

With respect to proposed §1.690(a), one commentor urges that the subparagraph be changed by deleting "or any aspects thereof" so that the arbitrator can determine priority in its totality. The commentor believes that the retention of this language would tend to cause undue delays, thus requiring the examiner-in-chief to exert strong control in maintaining the schedule for an interference. The suggestion is not being adopted because the statute 35 U.S.C. 135(d), provides:

Parties to a patent interference . . . may determine such contents *or any aspect thereof* by arbitration. [Emphasis added.]

To adopt this suggestion would constitute taking from interference parties a right conferred on them by statute.

With respect to proposed §1.690(a), one commentor suggests that a provision be added to the proposed rule requiring "advance notice to the examiner-in-chief of a proposed arbitration and specifying the issues to be arbitrated." This suggestion is being adopted and accordingly the following two sentences are added to proposed §1.690(a):

The parties must notify the Board in writing of their intention to arbitrate and specify the issues to be arbitrated. A copy of an agreement to arbitrate must be in writing and filed within twenty (20) days after its execution.

These two sentences require that the notification of intent to arbitrate must be in writing and should be presented in a separate paper, directed to the examiner-in-chief's attention and that the agreement to arbitrate must be in writing and be filed within twent (20) days after its execution.

With respect to proposed §1.690(b), one commentor states:

Proposed sub-section (b) states that "(b) An interference or any aspect thereof shall be arbitrated within such time as may be authorized on a case by case basis by an examiner-in-chief." Since this is indefinite, it would in actual practice require obtaining advance approval from the examiner-in-chief in every case before even initiating arbitration efforts. Since this provision provides no guidance to the examiner-in-chief it could also lead to arbitrarily restrictive decisions. That seems contrary to the intent of the statute, which is to broadly provide a generally available resolution of disputes by the parties outside of the PTO. Furthermore, this provision even seems inconsistent with the practice until now under interference rule 272(c) [37 CFR 1.272(c) (1984)] which already allowed the parties, without advance approval by anyone, to stipulate to dispositive facts at any time during the testimony period or before the record was due. Yet an arbitration may well constitute or provide such stipulations. As with stipulations under 272(c), since any arbitration decisions are to the direct benefit of the PTO in reducing issues which must otherwise be decided by the Board at final hearing, there is no logical reason to restrict the availability of arbitration at any time before the filing of final briefs with the Board. It is respectively submitted that, pursuant to the intent of the statute, it is really not the appropriate business of the PTO as to when the parties conduct arbitration as long as it does not interfere with the orderly operation of interferences or cause the Board to unnecessarily decide an issue which is being arbitrated. The purpose of this statute is to provide maximum flexibility to the parties, free of regulatory constraints, and that is what the enabling regulations for the statute should provide.

Accordingly, it is suggested that this proposed subsection (b) be changed to: — any arbitration shall be completed and noticed by the time set for the filing of final briefs.—

These comments, which are essentially directed to the guidelines for arbitration, the authority of the examiner-in-chief vis-a-vis the rights of the parties to "freely" arbitrate and an apparent inconsistency between the old practice and the new practice, have been carefully considered. In addition, the commentor suggests that proposed §1.690(b) be changed to state that the arbitration be completed and noticed by the time set for the filing of final briefs.

The arbitration guidelines are sufficiently discussed in the section, "Guidelines For Arbitration," *supra*, and will not be discussed below.

With respect to the authority of the examiner-in-chief and the rights of the parties, advance approval by the examiner-in-chief is required for the parties to arbitrate in order to prevent unnecessary work in the PTO. The parties must file their preliminary motions by the time set therefor and any arbitration must conform with the time schedule approved by the examiner-in-chief. If the parties are unable to meet the time schedule, they may file a motion for extension of time pursuant to the provisions of 37 CFR 1.645(a). Pursuant to 37 CFR 1.610(c), the examiner-in-chief must exercise control over the interference such that its pendency does not normally exceed two years. Consequently, the parties must notify the Board of their intention to arbitrate and file a copy of the arbitration agreement. When the award is filed, the examiner-in-chief must review the award to determine whether it is dispositive of all the issues in the interference. If the award is not, the examiner-in-chief must determine how the interference should proceed.

With respect to the assertion concerning an apparent inconsistency between proposed §1.690(b) and §1.672(e) and (f), the counterpart of §1.272(c), the guidelines show that none exists.The parties to an interference can agree to file stipulated evidence with respect to any issue whether or not it is decided by arbitration.

The suggestion that proposed §1.690(b) be changed is not being adopted in view of the language in proposed §1.690(c), infra.

Three commentors request that the arbitration award be made binding on the parties in order to save expense

and reduce the pendency time of the interference proceeding. It is urged that if the arbitration is not binding, the arbitration would "serve as a rehearsal for the usual interference procedure." This suggestion is being adopted and proposed §1.690(c) is being changed to require that the parties who desire to arbitrate must enter into a binding arbitration agreement.

One commentor suggests that if the arbitration is binding, then the reasons and conclusions need not be given but if the arbitration is not binding, then the reasons and conclusions for the award should be given so as to aid settlement. Another commentor concerned with possible "colusion" between the parties and the arbitrator and suggest that a "sufficient record" be created for the PTO and "interested third parties." These suggestions are being adapted in part. While the PTO would prefer that the award include a statement of the grounds and reasoning in support thereof, it is left to the discretion of the parties as to whether the award will contain such a statement. With respect to possible "collusion," the attorneys for the parties are subject to the Patent and Trademark Code of Professional Office Responsibility, 37 CFR 10.20 to 10.112, and any violation thereof can be brought to the attention of Director of Enrollment and Discipline. Accordingly, proposed §1.690(c) is being changed to state that the award may also include a statement of the grounds and reasoning in support thereof.

Two commentors suggest that proposed §1.690(c) be changed to read that the arbitration award should be filed on or prior to the date set for the filing of final briefs so that the PTO need not decide an interference which has already been resolved by the parties. This suggestion is being adopted to the extent that proposed §1.690(c) is being changed to require that the parties must file a copy of the arbitration award within twenty (20) days from the date of the award unless otherwise ordered by the examiner-in-chief.

One commentor requests that a "reasonable grace period" be provided for filing an inadvertently unfiled award. Proposed §1.690(c) has been changed to read that the parties must file the award within twenty (20) days from the date of the award unless otherwise ordered by the examiner-in-chief. If the award is not filed, the examiner-in-chief may issue appropriate sanctions under 37 CFR 1.616. Accordingly, this suggestion is not being adopted.

In view of the foregoing discussion, proposed §1.690(c) has been modified to read as follows:

An arbitration award will be given no consideration unless it is binding on the parties, is in writing and states in a clear and definite manner (1) the issue or issues arbitrated and (2) the disposition of each issue. The award may also include a statement of the grounds and reasoning in support thereof. Unless otherwise ordered by an examiner-in-chief, the parties shall give notice to the Board of an arbitration award by filing within twenty (20) days from the date of the award a copy of the award signed by the arbitrator or arbitrators. When an award is timely filed, the award shall, as to the parties to the arbitration, be dispositive of the issue or issues to which it relates.

Two commentors urge that patentability questions should not be arbitrated in view of the public interest. One would go further and amend subparagraph (d) to read that unless ordered by an examiner-in-chief, an arbitration award shall not decide a preliminary motion for judgement under §§1.633(a) or 1.633(b), a preliminary motion to redefine the interfering subject matter under §1.633(c), a preliminary motion to substitute a different application under §1.633(d) or a motion to declare an additional interference under §1.633(e). These suggestions are not being adopted. Subparagraph (d) makes clear that an arbitration award shall not preclude the Office from determining patentability of any invention in the interference. An arbitration award can decide a question of patentability which is binding on that party vis-a-vis his opponent and will result in a judgement adverse to that party. After the termination of the interference each party has the duty under 37 CFR 1.56 to bring to the attention of the examiner in charge of its application any evidence of unpatentability brought before or considered by the arbitrator. Consequently, the adoption of these suggestions could unduly restrict the parties' use of arbitration and prevent an arbitrator from deciding a proper matter of patentability.

Other Considerations

This rule does not have a significant impact on the quality of the human environment or the conservation of natural resources.

The rule is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the proposed rule will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96–354) because arbitration is intended to minimize expenses in interference cases.

The Patent and Trademark Office has determined that this rule is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The rule will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delations, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set out in the preamble and under the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 135, Part 1 of Title 37 CFR is proposed to be amended as follows:

PART 1–RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:
Authority: 35 U.S.C. 6 unless otherwise noted.

2. New section 1.690 is proposed to be added to read as follows:

§1.690 Arbitration of Interferences.

(a)Parties to a patent interference may determine the interference or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of Title 9, United States Code. The parties must notify the Board in writing of their intention to arbitrate. An agreement to arbitrate must be in writing, specify the issues to be arbitrated, the name of the arbitrator or a date not more than 30 days after the execution of the agreement for the selection of the arbitrator, and provide that the arbitrator's award shall be binding on the parties and that judgement thereon can be entered by the Board. A copy of the agreement must be filed within twenty (20) days after its execution. The parties shall be solely responsible for conducting proceedings before the arbitrator. Issues not disposed of by arbitration will be resolved in accordance with the procedures established in 37 CFR, Subpart E of Part 1, as determined by the examiner-in-chief.

(b) An interference or any aspect thereof shall be arbitrated within such time as may be authorized on a case-by-case basis by an examiner-in-chief.

(c) An arbitration award will be given no consideration unless it is binding on the parties, is in writing and states in a clear and definite manner (1) the issue or issues arbitrated and (2) the disposition of each issue. The award may also include a statement of the grounds and reasoning in support thereof. Unless otherwise ordered by an examiner-in-chief, the parties shall give notice to the Board of an arbitration award by filing within twenty (20) days from the date of the award a copy of the award signed by the arbitrator or arbitrators. When an award is timely filed, the award shall, as to the parties to the arbitration, be dispositive of the issue or issues to which it relates.

(d) An arbitration award shall not preclude the Office from determining patentability of any invention involved in the interference.

DONALD J. QUIGG,
Apr. 7, 1986 *Assistant Secretary and Commissioner of Patents and Trademarks.*

[FR Doc. 86–20629 Filed 9–9–86; 8:45 am]
BILLING CODE 3510–16–M

[1071 OG 25]

(145) Disclosure Document Program

This notice consolidates and supersedes the notices of Mar. 26, 1969 (862 O.G. 1) and Aug. 11, 1970 (878 O.G. 1) relating to the Patent Office Disclosure Document Program. Under this program the Patent Office accepts and preserves, for a period of two years, papers referred to as "Disclosure Documents." These papers may be used as evidence of the dates of conception of inventions.

The Program

A paper disclosing an invention and signed by the inventor or inventors may be forwarded to the Patent Office by the inventor (or by any one of the inventors when there are joint inventors), by the owner of the invention, or by the attorney or agent of the inventor(s) or owner. It will be retained for two years and then be destroyed unless it is referred to in a separate letter in a related patent application within said two years.

A Disclosure Document is not a patent application and the date of its receipt in the Patent Office will not become the effective filing date of any patent application subsequently filed. However, like patent applications, these documents will be kept in confidence by the Patent Office. If patent protection is desired, a patent application should be filed as soon as possible.

This program does not diminish the value of conventional witnessed and notarized records as evidence of conception of an invention, but it should provide a more credible form of evidence than that provided by the popular practice of mailing a disclosure to oneself or another person by registered mail. The program is made available as a service to those persons desiring to use it.

Content of Disclosure Document

Although there are no restrictions as to content and claims are not necessary, the benefits afforded by a Disclosure Document will depend directly upon the adequacy of the disclosure. Therefore, it is strongly urged that the document contain a clear and complete explanation of the manner and process of making and using the invention in sufficient detail to enable a person having ordinary knowledge in the field of the invention to make and use the invention. When the nature of the invention permits, a drawing or sketch should be included. The use or utility of the invention should be described, especially in chemical inventions.

The Disclosure Document must be limited to written matter or drawings on paper or other thin, flexible material, such as linen or plastic drafting material, having dimensions or being folded to dimensions not to exceed 8 1/2 by 13 inches. Photographs also are acceptable. Each page should be numbered. Text and drawings should be sufficiently dark to permit reproduction with commonly used office copying machines.

A $10 fee is charged for filing a Disclosure Document. Payment must accompany the Disclosure Document when it is submitted to the Patent Office.

In addition to the $10 fee, the Disclosure Document must be accompanied by a stamped, self-addressed envelope and a separate paper in duplicate, signed by the inventor, stating that he is the inventor and requesting that the material be received for processing under the Disclosure Document Program. The papers will be stamped by the Patent Office with an identifying number and date of receipt, and the duplicate request will be returned in the self-addressed envelope together with a warning notice indicating that the Disclosure Document may be relied upon only as evidence and that a patent application should be diligently filed if patent protection is desired. The inventor's request may take the following form:

"The undersigned, being the inventor of the disclosed invention, requests that the enclosed papers be accepted under the Disclosure Document Program, and that they be preserved for a period of two years."

Retention

The Disclosure Document will be preserved in the Patent Office for two years after its receipt and will then be destroyed unless it is referred to in a separate letter in a related patent application filed within the two-year period. The Disclosure Document must be referred to in the separate letter by title, number, and date of receipt. Acknowledgment of receipt of such letters will be made in the next official communication or in separate letter from the Patent Office. Unless it is desired to have the Patent Office retain the Disclosure Document beyond the two-year period, it is not required that it be referred to in a patent application.

Warning as to Limitations

The two-year retention period should not be considered to be a "grace period" during which the inventor can wait to file his patent application without possible loss of benefits. It should be recognized that in establishing priority of invention an affidavit or testimony referring to a Disclosure Document must usually also establish diligence in completing the invention or in filing the patent application since the filing of the Disclosure Document.

Inventors are also reminded that any public use or sale in the United States, or publication of the invention anywhere in the world, more than one year prior to the filing of a patent application on that invention will prohibit the granting of a patent on that invention.

If the inventor is not familiar with what is considered to be "diligence in completing the invention" or "reduction to practice" under the patent law, or if he has other questions about patent matters, the Patent Office advises him to consult an attorney or agent registered to practice before the Patent Office. Patent attorneys and agents may be found in the telephone directories of most major cities. Also, many large cities have associations of patent attorneys which may be consulted.

RICHARD A. WAHL,
Jan. 4, 1971. *Assistant Commissioner of Patents.*

[883 O.G. 3]

(146) Suspension of Action Under 37 CFR 1.103 and Under 37 CFR 1.212

The purpose of this notice is to clarify existing Office practice with respect to suspension of action. "Suspension of action" under 37 CFR 1.103 applies only to the situation where action is to be taken *by the Examiner*. In other words, action cannot be suspended in an application which contains an outstanding Office action awaiting response by the applicant.

Under 37 CFR 1.212, upon declaration of an interference, ex parte prosecution of an application is suspended and any outstanding Office actions are considered as withdrawn by operation of the rule. *Ex parte Peterson*, USPQ 119 (Commissioner of Patents, 1941). Upon termination of the interference, the Examiner will reinstate the action treated as withdrawn by operation of 37 CFR 1.212 and set a statutory period for response. The formats set forth in MPEP 1109.01 and MPEP 1109.02 may be followed.

Careful adherence to the distinction set forth above will prevent any question of abandonment from arising in connection with cases in which suspension of prosecution has occurred.

WILLIAM FELDMAN,
Mar. 7, 1978. *Deputy Assistant Commissioner for Patents.*

[969 O.G. 8]

(147) POSTAL SERVICE EMERGENCY CONTINGENCY PLAN

The U.S. Patent and Trademark Office is establishing the following contingency plan for filing any paper or paying any fee in the Office in the event of an emergency caused by any major interruption in the mail service in the United States. Upon determination by the Commissioner of Patents and Trademarks that such an emergency exists, a notice activating the plan will be issued by the Commissioner. The activating notice will be published in the Wall Street Journal and made available in a special recorded telephone message at area code 703, 557-3158. Also, certain publications, patent bar groups, and other organizations closely associated with the patent system, will be notified. Termination of the program will be similarly announced. Where the postal emergency is not nationwide, the Commissioner will designate the areas of the United States in which the procedures outlined below will be in effect.

U.S. Department of Commerce District Offices (formerly referred to as Department of Commerce Field Offices) will be designated on an emergency basis, as receiving stations for filing papers and paying fees in the U.S. Patent and Trademark Office.

Upon determination that an emergency exists, the following procedures may be followed: All papers and fees should be enclosed in a sealed envelope addressed to the Patent and Trademark Office and deposited in one of the District Offices. Such papers will be considered as received in the U.S. Patent and Trademark Office on the day of deposit. The District Office will date stamp each envelope and the accompanying receipt card which completely identifies the deposited papers. The receipt card will be returned to the depositor. Applicants or their representatives should assure the legibility of the date stamp.

District Office deposits should be limited to checks in payment of issue fees, new application papers wherein priority dates or statutory bars may be involved, amendments where the six month statutory period for response is about to expire, trademark oppositions, Section 8 affidavits, trademark renewals, and to other papers for which the patent and trademark statutes do not provide a remedy for failure to obtain a particular date.

Where papers originate from overseas, it is suggested that the papers be mailed to a registered agent in Canada, with a request that the papers be forwarded by courier to the nearest District Office in the United States.

In regard to pending applications, if the time for taking any action or paying any fee expires during the period that the Commissioner declares to be an emergency, the time will be extended until one month after the end of the emergency period, provided that such extension does not exceed the maximum period for response provided for in the statutes.

Since this extension of time will be automatic, there will be no record in the individual files to indicate that a response filed during the extended period is in fact timely. In order to provide a complete record, applicants or their representatives should file a paper referring to this notice in each case in which a response is filed during the extended period.

The addresses of the Department of Commerce District Offices, subject to subsequent changes, are as follows:

ALBUQUERQUE, N.M., 87101, Room 316, U.S. Courthouse (505) 766-2386.
ANCHORAGE, 99501, 632 Sixth Ave., Hill Bldg., Suite 412 (907) 265-4597.
ATLANTA, 30309, Suite 523, 1401 Peachtree St., NE. (404) 526-6000.
BALTIMORE, 21202, 415 U.S. Customhouse, Gay and Lombard Sts. (301) 962-3560.
BIRMINGHAM, ALA., 35205, Suite 200-201, 908 S. 20th St. (205) 325-3327.
BOSTON, 02116, 10th Floor, 441 Stuart St. (617) 223-2312.
BUFFALO, N.Y., 14202, Room 1312, Federal Bldg., 111 W. Huron St. (716) 842-3208.
CHARLESTON, W. VA., 25301, 3000 New Federal Office Bldg., 500 Quarrier St. (304) 343-6181, Ext. 375.
CHEYENNE, WYO., 82001, 6022 O'Mahoney Federal Center, 2120 Capitol Ave. (307) 788-2151.
CHICAGO, 60603, Room 1406, Mid-Continental Plaza Bldg., 55 E. Monroe St. (312) 353-4450.
CINCINNATI, 45202, 8028 Federal Office Bldg., 550 Main St. (515) 684-2944.
CLEVELAND, 44114, Room 600, 666 Euclid Ave. (216) 522-4750.
COLUMBIA, S.C., 29204, Forest Center, 2611 Forest Dr. (803) 765-5345.
DALLAS, 75202, Room 3E7, 1100 Commerce St. (214) 749-1515.
DENVER, 80202, Room 161, New Custom House, 19th and Stout Sts. (303) 837-3246.
DES MOINES, IOWA, 50309, 609 Federal Bldg., 210 Walnut St. (515) 284-4222.
DETROIT, 48226, 445 Federal Bldg. (313) 226-3650.
GREENSBORO, N.C., 27402, 203 Federal Bldg., W. Market St., P.O. Box 1950. (919) 275-9111, Ext. 345.
HARTFORD, CONN., 06103, Room 610-B, Federal Office Bldg., 450 Main St. (203) 244-3530.
HONOLULU, 96813, 286 Alexander Young Bldg., 1015 Bishop St. (808) 546-8694.
HOUSTON, 77002, 201 Fannin, 1017 Federal Office Bldg. (713) 226-4231.
INDIANAPOLIS, 46204, 355 Federal Office Bldg., 46 E. Ohio St. (317) 269-6214.
KANSAS CITY, MO., 64106, Room 1840, 601 E. 12th St. (816) 374-3142.
LOS ANGELES, 90024, 11201 Federal Bldg., 11000 Wilshire Blvd. (213) 824-7591.
MEMPHIS, 38103, Room 710, 147 Jefferson Ave. (901) 534-3213.
MIAMI, 33130, Rm. 821, City National Bank Bldg., 25 W. Flagler St. (305) 350-5267.
MILWAUKEE, 53203, Straus Bldg., 238 W. Wisconsin Ave. (414) 224-3473.
MINNEAPOLIS, 55401, 306 Federal Bldg., 110 S. Fourth St. (612) 725-2133.
NEW ORLEANS, 70130, Room 432, International Trade Mart, 2 Canal St. (504) 589-6546.
NEW YORK, 10007, 41st Floor, Federal Office Bldg., 26 Federal Plaza, Foley Sq. (212) 264-0634.

NEWARK, N.J., 07102, Gateway Bldg., (4th Floor) (201) 645-6214.
PHILADELPHIA, 19106, 9448 Federal Bldg., 600 Arch St. (215) 597-2850.
PHOENIX, ARIZ., 85004, 508 Greater Arizona Savings Bldg., 112 N. Central Ave. (602) 261-3285.
PITTSBURGH, 15222, 431 Federal Bldg., 1000 Liberty Ave. (412) 644-2850.
PORTLAND, ORE., 97205, 921 SW. Washington St., Suite 521, Pittock Block. (503) 221-3001.
RENO, NEV., 89502, 2028 Federal Bldg., 300 Booth St. (702) 784-5203.
RICHMOND, VA., 23240, 8010 Federal Bldg., 400 N. 8th St. (804) 782-2246.
ST. LOUIS, 63105, Chromalloy Bldg., 120 S. Central Ave. (314) 622-4243.
SALT LAKE CITY, 84111, 1201 Federal Bldg., 125 S. State St. (801) 524-5116.
SAN FRANCISCO, 94102, Federal Bldg., Box 36013, 450 Golden Gate Ave., (415) 556-5860.
SAN JUAN, P.R., 00902, Room 100, Post Office Bldg., (809) 723-4640.
SAVANNAH, 31402, 235 U.S. Courthouse and Post Office Bldg., 125-29 Bull St. (912) 232-4204.
SEATTLE, 98109, 706 Lake Union Bldg., 1700 Westlake Ave. North (206) 442-5615.

C. MARSHALL DANN,
July 18, 1975. *Commissioner of Patents and Trademarks.*

[937 O.G. 386]

(148) Examiner Testimony

As stated in Section 1701 of the Manual of Patent Examining Procedure, patent examiners are forbidden to testify as patent experts or to express opinions, in testimony or otherwise, as to the invalidity of any issued patent. Patent examiners have, in connection with litigation involving patent validity, been called to testify on factual matters. In those cases, the practice has been to permit the examiner to testify only upon the issuance of a subpoena.

Henceforth, patent examiners will be permitted to testify on deposition in patent suits, without the need for a subpoena, provided the following conditions are satisfied:

1. The party proposing to take the testimony will state in writing, that the questions to be asked of the examiner will be phrased to comply with the permissible scope of inquiry as outlined in the protective orders contained in the Court opinions in *In re Mayewsky*, 162 USPQ 86, 89 and *Shaffer Tool Works v. Joy Manufacturing Co.*, 167 USPQ 170, 171: ". . . the scope of the oral depositions of the patent examiners is hereby limited to matters of fact and must not go into hypothetical or speculative areas or the bases, reasons, mental processes, analyses, or conclusions of the patent examiners in acting upon the patent applications maturing into the patent [in suit]." 167 USPQ 171.
2. That in addition to complying with the requirements of Rule 30 of the Federal Rules of Civil Procedure, the party taking the testimony will agree to give notice of the taking of the deposition of the patent examiner to the Solicitor, at least thirty days prior to the date on which the taking of the deposition is desired.
3. That the party taking the deposition arrange with the Solicitor to notice the deposition at a place convenient to the Patent Office.

If the party desiring to take the testimony of the examiner does not agree to the conditions enumerated, the Patent Office will not permit the examiner to be deposed without a subpoena and compliance with the procedure set forth in Section 7.02, Department of Commerce Administrative Order 205-12, June 29, 1967 as amended April 10, 1970. That section states:

> In any case where it is sought by subpoena, order or other compulsory process or other demand of a court or other authority (hereinafter referred to as a "demand") to require the production or disclosure of any record in the files of the Department of Commerce or other information acquired by an officer or employee of the Department as a part of the performance of his official duties or because of his official status, the matter shall be immediately referred for determination to the appropriate official described in subsection 4.01 of this order. If such official has discretion with respect to disclosure and he determines that it would be improper to comply with the demand, or if he has no discretion with respect to disclosure, the matter shall be promptly referred to the Secretary of Commerce for final determination. Unless and until the Secretary determines that the records or information should be produced, the officer or employee who appears in answer to the demand shall inform the court or other authority (*a*) that the section 7 of this order prohibits the officer or employee from producing or disclosing the records or other information demanded without the prior approval of the Secretary of Commerce, and (*b*) that the demand has been, or is being, as the case may be, referred for the prompt consideration of the Secretary. The officer or employee shall also provide the court or other authority with a copy of the regulations prescribed in this section 7 of this order, and shall respectfully request the court or other authority to stay the demand pending the receipt of instructions or directions from the Secretary of Commerce concerning the demand.

ROBERT GOTTSCHALK,
Mar. 13, 1972. *Commissioner of Patents.*

[897 O.G. 762]

(149) No Change in Foreign Filing License Requirements

It should be noted that the change to 37 CFR 5.19 deleting the requirement to obtain an export license for filing a patent application in a foreign country does not in any way alter the provisions of 35 U.S.C. 184. 35 U.S.C. 184 requires that a foreign filing license be obtained from the Patent and Trademark Office before any patent application, based on an invention made in the United States, is filed abroad unless a corresponding application has been on file in the USPTO for over six months.

Further information may be obtained by contacting Mr. T. H. Tubbesing at 703-557-2897, or Mr. Edward Drazdowsky at 703-557-2167.

WILLIAM FELDMAN,
Nov. 24, 1980. *Acting Assistant Commissioner, for Patents.*

[1001 O.G. 28]

(150) Department of Commerce Patent and Trademark Office

United States Adherence to the International Union for the Protection of New Varieties of Plants (UPOV)

On Nov. 12, 1980, the United States deposited its instrument of acceptance of the 1978 text of the UPOV Convention. The United States was the second State to adhere to this text, New Zealand having earlier done so.

The UPOV Convention will take effect with respect to the United States and the other adherents to the 1978 text upon a total of five adherences, three of which must be by present member States (States adhering to the

1961 text of the Convention). We expect at least three present member States to adhere shortly and the 1978 text to take effect, therefore, during 1981.

The United States deposited its instrument of acceptance on the basis of the legal protection offered for asexually reproduced plants under the plant patent law (35 U.S.C. 161–164). Accordingly, the Convention will apply only to asexually reproduced plants protected under this law. Steps are now being taken, however, by the Plant Variety Protection Office of the Department of Agriculture to conform the implementation of the Plant Variety Protection Act (7 U.S.C. 2321 et seq.) to the Convention's requirements. When this is done, the United States will notify the UPOV Secretariat that the Convention is also applicable in the United States to sexually reproduced plants protected under that Act.

Questions concerning the UPOV Convention may be directed to the Office of Legislation and International Affairs of the Patent and Trademark Office. This Office may be addressed as follows: Box 4, Commissioner of Patents and Trademarks, Washington, D.C. 20231. The Office's telephone number is (703) 557–3065.

SIDNEY A. DIAMOND,
Dec. 16, 1980 *Commissioner of Patents and Trademarks.*

[1002 O.G. 102]

(151) **Taking Effect in the United States of the International Convention for the Protection of New Varieties of Plants**

The International Convention for the Protection of New Varieties of Plants (the UPOV Convention) will take effect in the United States on Nov. 8, 1981. It will apply to all applications for the patenting of plants under the provisions of Title 35, United States Code, which are filed on or after Nov. 8, 1981. The actual filing date will govern in determining whether the Convention will apply to an application, even though the application may be entitled to an earlier effective date under section 119 or 120 of Title 35, United States Code.

In addition to the United States, the UPOV Convention will be in effect as of Nov. 8, 1981, in the following fourteen States: Belgium, Denmark, Federal Republic of Germany, France, Ireland, Israel, Italy, Netherlands, New Zealand, Republic of South Africa, Spain, Sweden, Switzerland, and the United Kingdom.

No changes in the patent law are needed to implement the UPOV Convention in the United States. An applicant for a plant patent will be required, however, to submit for registration a variety name for the plant to be patented. Registration is required by Article 13 of the UPOV Convention.

Registrability shall be determined in accordance with the International Code of Nomenclature for Cultivated Plants (1980). As an interim procedure pending the promulgation of an appropriate rule, inclusion of the variety name in the application will be accepted as a submission of the name for registration. No plant patent as a result of an application filed on or after Nov. 8, 1981, shall be issued without the registration of a variety name. Questions concerning this variety naming requirement or the UPOV Convention may be addressed to:

Mr. Michael K. Kirk, Director
Office of Legislation and
International Affairs
Box 4
U.S. Patent and Trademark Office
Washington, D.C. 20231

Mr. Kirk's telephone number is (703) 557-3065.

GERALD J. MOSSINGHOFF,
Oct. 15, 1981. *Commissioner of Patents and Trademarks.*

[1011 O.G. 27]

(152) **Policy Regarding Exchange Agreements Under the Authority of 35 USC Section 6(a)**

Background

The Patent and Trademark Office (PTO), by virtue of Section 6(a) of Title 35, United States Code, is empowered to enter into exchange agreements with other organizations to further the use of patent and trademark information, and to facilitate the use and availability of that information. In recognition of these objectives, the PTO establishes the following guidelines and principles which shall apply when evaluating and entering into exchange agreements with other public, private, domestic and foreign agencies, firms and companies.

Nature of Exchange Agreements

Exchange agreements by the PTO will generally be for the purpose of (1) acquiring goods and services which will assist the PTO in accomplishing its mission and achieving its goals; (2) reducing the cost to the government of processing activities associated with the examination of applications for patent and trademark registration; (3) fostering the dissemination of information contained in patent and trademark documents; and (4) furthering the general goal of automating patent and trademark examination processes.

In exchange agreements, the PTO and the industrial or commercial concerns will share in the cost and risks of the endeavor. Terms and conditions of each agreement, including the business arrangements, are negotiable within the limits of prevailing statutes and regulations and will be commensurate with the risks, involvement, and investment of the parties to the agreements. The PTO's intent is to offer as much latitude as practical in the agreement.

Each agreement will be negotiated on a case-by-case basis. Agreements will vary in size, complexity, scope and the nature of the materials, services, and/or products being exchanged by the parties. All exchange agreements will be subject to the availability of funds.

Incentives

Incentives provided by the PTO for the purpose of entering into exchange agreements may include, but are not limited to (1) providing copies of PTO documents; (2) providing computer processable data obtained from patents, trademark applications, trademark registrations, and other data sources developed by the PTO; (3) providing government furnished equipment necessary for the other party to fulfill the agreement; and (4) entering into joint programs where each party funds its own participation.

Considerations

The factors to be considered by the PTO prior to entering into an exchange agreement or providing incentives shall include, but will not be limited to the following considerations: (1) public or social need for the product(s) of the agreement; (2) enhanced dissemination of technological information; (3) benefits accruing to the public or the U.S. Government from the endeavor; (4) the desirability of private sector involvement in PTO programs; (5) the merit of the research, development or application proposed; (6) the degree of risk and financial participation by the other party; (7) the amount of proprietary data or other information to be furnished by the concern; (8) the rights in data to be granted to the PTO and the concern as a result of their contributions; (9) the willingness and ability of the concern to market and sell any resulting new or enhanced products on a reasonable basis; and (10) the impact of PTO sponsorship upon a given industry or area of commercial endeavor.

Administration

The Administrator for Automation is delegated the authority to enter into negotiations. The Commissioner of Patents and Trademarks will approve exchange agreements on behalf of the PTO. Before proceeding into comprehensive evaluation of a joint endeavor, a preliminary assessment will be made of the merits of the offer. Exchange agreement proposals which are too sketchy or ill-defined to (1) establish the merit in the basic idea, (2) establish that the proposal is in accordance with PTO program objectives, or (3) establish that the proposing organization is willing to make significant contribution to the endeavor, will not be evaluated in depth and will be treated as correspondence or advertising. This preliminary assessment will be conducted by the Administrator for Automation or his or her designee to determine if the proposal warrants further consideration. If this determination is positive and if the parties agree to proceed with a joint endeavor, the Administrator for Automation will enter into detailed discussions and negotiations with the offeror regarding the technical and business aspects of the offer. Upon reaching a mutually satisfactory arrangement, the agreement will be submitted to the Commissioner of Patents and Trademarks for approval. Administration of the exchange agreement program will be performed by the Administrator for Automation.

Due to resource limitations and the necessity for diversity in the program, only one offer will normally be accepted for a given PTO incentive. If substantially similar offers are received within any 45-day period, they will be evaluated and/or negotiated together. The offer which provides the best total consideration for the Government will be accepted. Special consideration shall be given to small and minority businesses, as appropriate.

GERALD J. MOSSINGHOFF,
May 3, 1983. *Commissioner of Patents and Trademarks.*

[1030 OG 49]

(153) **Policy and Plans Regarding Exchange Agreements Entered into by the Patent and Trademark Office to Competitive Procurement Contracts**

Background

Under the authority of section 6(a) of title 35, United States Code, the Patent and Trademark Office (PTO) entered into exchange agreements with non-Federal entities to further the use of patent and trademark information and to facilitate the availability of that information. Some of these agreements will be converted to procurement contracts through competitive solicitations or assistance instruments, as appropriate. Toward this objective, the PTO establishes the following guidelines that shall apply to these conversions and to any subsequent business arrangements of a similar barter or exchange nature with private firms involving ADP resources. An inventory and description of the exchange agreements is also provided. Exchange agreements that will not be converted are identified and the reason for their exclusion explained.

Guidelines

From time to time the PTO needs goods and services to accomplish its goals for which it may offer other goods and services of comparable value as consideration rather than money. Such arrangements may be considered for a particular goal that might otherwise not be reached, in gaining access to published information and/or electronic data and/or in fostering the dissemination of intellectual property information. In return for goods and services it needs, the PTO may offer any or all of the following as full or partial compensation to the provider: (1) copies of PTO documents, (2) electronic data developed by the PTO from patents, trademark applications, trademark registrations, and other data sources, (3) Government-furnished equipment, and (4) other data and information resulting from special projects that may be undertaken. The use of consideration other than money will be in accord with the objectives of the Exchange Agreement provisions of P.L. 97–247.

Regardless of the barter or exchange nature and/or provisions of such arrangements, they will be developed as procurement contracts conforming to applicable procurement statutes and Federal Acquisition Regulations or assistance instruments as described in P.L. 95–224. Services which involve the delivery of ADP services will additionally conform to the Federal Information Resource Management Regulations. Agreements which have as their primary purpose the delivery of services to the public will be processed as assistance instruments under the provisions of the Grant and Cooperative Agreements Act of 1977, P.L. 95–224.

In seeking competitive procurements to replace exchange agreements, whenever possible, solicitation documents will (1) describe PTO needs in functional terms, (2) set forth the method that will be used in evaluating proposals, and (3) indicate the factors that will be considered and their relative weight or importance. Factors and weights will be based on the needs of the PTO and the interests of the public. When solicitation documents are ready for release, announcements will be published in the *Commerce Business Daily* (CBD) to inform prospective offerors of the date of the release. The PTO will competitively acquire the services of an independent audit or accounting firm to assign a fair market value to non-monetary considerations received or provided to assist in evaluating offers.

Contracts and assistance instruments will be awarded for one year with options for additional years, if required. The number of option years will be sufficient to provide an incentive for competitors to investment in an offering, but not for such a long period that future competition would be unreasonably limited.

Exclusive licenses will not be issued to any foreign owned firm or to any subsidiary or affiliate of a foreign owned firm. When feasible, competitive procurements will be structured to favor non-exclusive licenses. In any case, an exclusive license shall not impair the ability of the public to obtain data in a form historically provided by the PTO or in some equivalent form not subject to license restrictions. Licensees will not be entitled to obtain patent or trademark information not accessable by the public.

Exchange Agreements to be Converted by Competitive Procurement

Exchange agreements now in effect that are to be converted through competitive solicitations are listed below. The tentative date for issuance of the solicitation document is shown for each.

Exchange of Trademark Data and Information with Thomson and Thomson

Under an agreement with Thomson and Thomson (T&T), of 1 Monarch Dr., North Quincy, Mass. 02171, digitized images of the figurative elements of active trademark registrations in effect in 1983 and to be registered during the subsequent 10 year period were or are to be provided to the PTO. The same figurative elements were or are to be coded for retrieval using a coding system and manual developed jointly by T&T and the PTO. The textual information contained in the trademark applications and other trademark documents for the period from 1984 to 1992 were or are to be provided. All data furnished or to be furnished by T&T were or are to be provided on magnetic tape in an agreed upon format and standard. In return for this electronic data, the PTO furnished or will furnish paper copies of registration, application, and other Office doc-

uments, copies of Trademark *Official Gazettes* (OG), certain microfilm equipment, reports from certain special studies and analyses and electronic data representing updates to the text data base of active trademark registrations for the period corresponding to the term of the agreement, from 1984 to 1992.

It is contemplated that the provisions of this exchange agreement will be ended and the substance of it will be converted by one or more competitive procurements for different types of data. The solicitations are planned to issue in Feb. or Mar., 1986.

Exchange of Patent Data and Information with Derwent

Under an agreement with Derwent, Inc., of 684 Elm St., Suite 500, McLean, Va. 22101, paper copies of copyrighted English Abstracts of Derwent's coverage of world patents and electronic data corresponding to the bibliographic data and alerting abstracts of certain Derwent files (CPI, WPI, and EPI) are provided to the PTO. In addition, a royalty credit of 300 hours connect time to Derwent data available on-line from time-sharing services is provided. The PTO furnishes Derwent paper or microfilm copies of foreign patents it receives from other patent offices, for pick-up at those offices, *OG* copies, and the following electronic U.S. patent data: patent bibliographic data with all claims, the Patent Master Classification File and the Patent Assignment Transaction Data File (backfile and updates).

This agreement, will be ended and the substance of it together with some additional data, data uses, and services will be converted by competitive procurement. The solicitation is planned to issue in Mar. or Apr., 1986.

Exchange of Services and Patent Data with Mead Data Central

Mead Data Central, of P.O. Box 933, Dayton, Ohio 54401, provides services related to the use of its on-line data systems (LEXPAT, LEXIS, NEXIS) in the amount of service credits of $77,000 annually to the PTO. In return, the PTO has or is furnishing to Mead Data Central, the following electronic data: the Patent Full Text File (backfile and updates), the Patent Assignment Transaction Data File, the Manual of Classification File, and the file of the Index to U.S. Patent Classification and paper copies of Certificates of Correction and Notices of Litigation.

This agreement will be converted by competitive replacement or, alternatively, will be terminated. If a competitive acquisition is to be undertaken, the solicitation is planned to issue approximately in Mar., 1986; if it is to be terminated, it is planned to be terminated by Oct., 1986.

Exchange of Patent Data and Information with Research Publications, Inc.

Under an exchange agreement with Research Publications, Inc., of 12 Lunar Dr., Woodbridge, Conn. 06525, the PTO receives COM-generated 16mm microfilm of its classification data files in two sequences. The magnetic tape files are provided to Research Publications every six months in the record format in which it is normally produced through the PTO maintenance program.

The PTO plans to terminate this exchange agreement in Sept. 1986.

Exceptions to Conversion by Competitive Acquisitions

Exchange agreements that are to be replaced by other than competitive procurements are listed below. The reason for the exception is given.

Exchange with Compu-Mark S.A. Related to Trademark Backfile Data

Under the exchange agreement with N.V. COMPUMARK S.A. (CM) of P.O. Box 61, B2510 Mortsel, Belgium, CM provided or will provide the PTO with electronic data on magnetic tape consisting of the text data in all trademark registrations active in 1983 and registered before 1980 and of the character data contained in the assignment index cards as of 1984. The PTO provided or is providing CM with paper copies of the active registrations found in its bound volumes, assignment index cards, and other PTO documents and electronic copies of the text data corresponding to new registrations and applications post-1979 and other trademark case data for the period from 1983 to 1992.

The PTO intends to procure data obtained from CM on a sole source basis, as previously advertised in the *CBD* on Dec. 15, 1984. To the knowledge of the PTO, CM is the only source of this collection of data that meets the specifications of the PTO. The negotiated price is expected to be less than the cost of its replacement by other, competitive means. Estimates of the replacement cost obtained from other, independent firms will be used to validate the final price, contract terms and conditions. The sole source award is planned to be completed by Jan. 1986.

Exchange of Services and Patent Data with Pergamon Infoline

Pergamon Infoline (Pergamon) of 1340 Old Chain Bridge Rd., McLean, Va. 22101, provided or is providing the PTO with the following: electronic data corresponding to the bibliographic data, including abstracts, of approximately 130,000 U.S. patents issued between 1970 and 1974 for which no other electronic data are available in the PTO, services consisting of royalty credits in an amount of $10,000 annually applied to the use of Pergamon's on-line data base, and training of 300 patent examiners in the use of the Infoline system. The PTO furnishes Pergamon the following electronic data: the full text of the patent text backfile from 1975 to 1983, annual issuances of patent assignment transaction data, annual updates of patent bibliographic data with exemplary claims, annual issuances of the Patent Master Classification File; the annual issuance of the Attorney Roster File, periodic issuances of the Special Index Term File 364–200, and periodic issuances of the Special Index Term file 364–900.

The PTO plans to terminate this exchange agreement in Sept. 1986.

Administration

The PTO Administrator for Automation has been assigned responsiblity for administering all exchange agreements, their replacement, or their termination. Any requests for additional information about the agreements now in effect should be addressed to:

J. Howard Bryant
Administrator for Automation
Department of Commerce
U.S. Patent and Trademark Office
Washington, D.C. 20231

Information on the competitive solicitations should be addressed to:

Office of Procurement
Patent and Trademark Office
Box 6
Washington, D.C. 20231

At this time the PTO is seeking expressions of interest. Interested parties should write to the procurement office identified above citing the exchange agreement(s) for which subsequent receipt of a competitive solicitation is requested. Each competitive solicitation will be separately summarized in the CBD prior to issuance.

DONALD J. QUIGG,
Dec. 2, 1985. *Assistant of Secretary and Commissioner of Patents and Trademarks.*

[1062 OG 410]

(154) **Qualifications for Admission to the Examination for Registration to Practice Before the Patent and Trademark Office**

37 CFR 1.341(c) provides in pertinent part, "No person will be admitted to practice and registered unless he shall . . . establish to the satisfaction of the Commissioner that he is of good moral character and good repute and *** possessed of the legal and scientific and technical qualifications necessary to enable him to render applicants for patents valuable service ***. In order that the Commissioner may determine whether the person *** has the qualifications specified, satisfactory proof of good moral character and repute, and of sufficient basic training in scientific and technical matters must be submitted ***."

All persons requesting application forms are routinely furnished with a circular entitled "General Requirements For Admission To The Examination For Registration To Practice Before The Patent and Trademark Office". The circular contains a list of the subjects in which a person must have a bachelor's degree or the equivalency thereof in scientific and technical training to meet registration qualifications. It is strongly recommended that persons who do not have a bachelor's degree in one of those subjects comply with the instructions in the paragraph following the list to show their scientific and technical qualifications. If it is intended to rely on courses in computer science, no more than 3 semester hours of courses in computer programming will be accepted as providing part of the required basic training in scientific and technical matters. Computer science courses oriented away from the physical sciences or engineering, e.g., toward accounting or business, will not be accepted as providing any of the requisite basic training in scientific and technical matters.

Many applications for admission to an examination are filed on or just prior to the announced closing date for doing so, and these applications are frequently disapproved because the person does not furnish a satisfactory showing of his or her qualifications. For instance, persons with a bachelor's degree in a subject other than one of those listed in the circular frequently do not follow instructions in the circular and do not furnish both their transcripts and official course descriptions. Other persons list charges brought against them requiring further showings to overcome doubts raised by the charges about their character and reputation. Still others who failed one section of the examination three times do not furnish a satisfactory showing of sufficient additional legal training to pass the examination.

The Office of Enrollment and Discipline evaluates each application for admission to the examination on an individual basis as soon as practical after receipt in that office. Thereafter, notification is promptly mailed to each person whose application has been disapproved.

The Office of Personnel Management (OPM — formerly Civil Service Commission), which administers the examination, requires that it receive correct data from the Patent and Trademark Office identifying the locale of the examination and the number of persons to be tested well ahead of the examination date. *To afford adequate time to present a satisfactory supplemental showing to gain admission to the examination for which application is being made, it is recommended that all persons file their applications early, preferably at least two months before the closing date.*

All supplemental showings of qualifications and all applications filed after the announced closing date to apply for admission to an examination will be considered only in connection with the person's admission to the next succeeding examination. Admission to an examination given on a particular date is available only to persons who have filed a completed application form, a $75.00 admission fee, and a satisfactory showing of qualifications on or before the closing date for applying for admission to the examination. Examinations are given in Apr. and Oct. each year, and the respective closing dates for applying for admission to the examinations are the preceding Jan. 31 and July 31.

WILLIAM FELDMAN,
Sept. 18, 1984. *Director of Enrollment and Discipline.*

[1047 O.G. 35]

(155) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1, 2, and 10
Docket 407 88-4181

Practice before the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (PTO) is amending its rules governing practice before the PTO by attorneys and agents. These rules are needed to clarify and modernize the rules relating to admission to practice and the conduct of disciplinary cases. The rules are also needed to set out in the Code of Federal Regulations a PTO Code of Professional Responsibility. By amending the rules, the PTO believes the standards for admission to practice in patent cases will be more easily understood, that those practicing before the PTO will have ready access to a code of professional responsibility, and that procedure in disciplinary cases will be more easily understood. The PTO expects that the conduct of disciplinary proceedings under these rules will be more effective and less costly.
Dates: The effective date of these rules (except §1.21(a)(5) and (6)) is Mar. 8, 1985. Section 1.21(a)(5) and (6) is effective Apr. 8, 1985.
For Further Information Contact: Fred E. McKelvey by telephone at (703) 557-4025 (if no answer, message may be left at 703-557-4103) or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Attorneys and agents practice before the Patent and Trademark Office (PTO) in patent cases. 35 U.S.C. 31. Attorneys also practice before the PTO in trademark and other non-patent cases. 5 U.S.C. 500(b). A few agents also practice before the PTO in trademark cases under rules in force prior to Jan. 1, 1957.

A notice of proposed rulemaking for attorney and agent conduct and disciplinary procedure was published on Aug. 11, 1983 in the *Federal Register*, 48 F.R. 36478, and on Sept. 20, 1983 in the *Official Gazette*, 1034 O.G. 39, 1034 TMOG 33. A notice extending the comment period and setting a second hearing was published on Oct. 5, 1983 in the *Federal Register*, 48 F.R. 45424, and on Oct. 18, 1983, in the *Official Gazette*, 1035 O.G. 19, 1035 TMOG 17. The PTO decided to withdraw, and not adopt, the rules proposed in the *Federal Register* notice of Aug. 11, 1983. There were numerous objections to the proposed rules and the public indicated that a longer period for study and review of a code of conduct and disciplinary procedures was necessary.

An advance notice of proposed rulemaking setting out revised rules being considered for standards of conduct and disciplinary proceedings was published on Mar. 16, 1984, in the *Federal Register*, 49 F.R. 10012, and on Apr. 10, 1984, in the *Official Gazette*, 1041 O.G. 15, 1041 TMOG 13. Numerous organizations and individuals filed comments in response to the advance notice.

On Aug. 24, 1984, the PTO published in the *Federal Register* a notice of proposed rulemaking. 49 F.R. 33790. On Aug. 28, 1984, the notice was also published in the *Official Gazette*. 1045 O.G. 29; 1045 TMOG 25. The notice also appeared in the Bureau of National Affairs, *Patents, Trademark & Copyright Journal*, Vol. 28, No. 694, pp. 485-515 (Aug. 30, 1984). Twenty-two written comments were timely received in response to the notice of proposed rulemaking. The comments are analyzed here-

in. A hearing was held on Oct. 10, 1984. Five individuals appeared at the hearing. Oral comments made at the hearing are also analyzed herein. The twenty-two written comments and a copy of the transcript of the hearing are available for public inspection in Room 12B10, Crystal Gateway II, 1225 Jefferson Davis Hgw., Arlington, Va.

This notice of rulemaking sets out rules in three areas:

(1) Practice of attorneys and agents before the PTO in patent, trademark, and other non-patent cases (§§10.2 through 10.19);

(2) A PTO Code of Professional Responsibility (§§10.20 through 10.112); and

(3) Rules governing (a) investigation of possible violations of the PTO Code of Professional Responsibility and (b) disciplinary proceedings to reprimand, suspend, or exclude (disbar) individuals from practicing before the PTO who, after notice and opportunity for a hearing, are found to have violated a disciplinary rule of the PTO Code of Professional Responsibility (§§10.130 through 10.170).

Familiarity with the advance notice and notice of proposed rulemaking is assumed. Changes in the text of the rules published for comment in the notice of proposed rulemaking are discussed. Comments received in response to the notice of proposed rulemaking are discussed. Comments not timely received in response to the advance notice are also discussed.

Tables 1, 2, and 3 are included in this notice to assist readers in correlating present rules with the new rules and to find the principal source for the new rules. An indication in Tables 1, 2, or 3 that a section is "new" means that a corresponding section does not currently appear in Tile 37 of the Code of Federal Regulations.

Table 1 shows the principal sources of the new rules which relate to (1) admission to practice of attorneys and agents in patent cases and (2) practice in trademark and other non-patent cases.

Table 2 shows the principal sources of the rules for the new PTO Code of Professional Responsibility.

Table 3 shows the principal sources of the new rules for disciplinary proceedings.

Other sources for, and rationale in support of, the proposed rules are discussed in the Supplementary Information of the advance notice, 49 F.R. 10012-10022, and the Supplementary Information of the notice of proposed rulemaking, 49 F.R. 33790-33803.

In issuing these rules, the PTO has made every effort to minimize preemption of State control over the practice of law. Thus, in §10.1, second sentence, the new rules provide:

> Nothing in . . . [these rules] shall be construed to preempt the authority of each State to maintain control over the practice of law, except to the extent necessary for the Patent and Trademark Office to accomplish its federal objectives.

This provision of §10.1 is based on language in *Sperry* v. *Florida ex rel, Florida Bar,* 373 U.S. 379, 402 (1963), and makes clear the PTO's intent to regulate only conduct related or relevant to practice before the PTO.

In an effort to ascertain whether the proposed rules would have any adverse impact on the States, copies of both the advance notice of Mar. 16, 1984, and the notice of proposed rulemaking of Aug. 24, 1984, were sent to Bar Counsel in each State. The PTO received responses from Bar Counsel in Ala., Conn., Fla., Ga., Md., Miss., Nebr., Tex., and Vt. Comments were also received from the National Organization of Bar Counsel, the American Bar Association, and others.

Alaska Bar Counsel, contrary to other bar counsel filing comments, suggested that creation of a PTO Code of Professional Responsibility would be "inherently confusing" to any attorney practicing in a State and also before the PTO. The new rules, however, do not establish for the first time a PTO Code of Professional Responsibility. The current PTO code appears in 37 CFR §§1.344 and 2.12. Sections 1.344 and 2.12 merely incorporate by reference the Code of Professional Responsibility of the American Bar Association (1970). The new PTO code more appropriately sets out the standards of conduct relevant to the practice of law before the PTO. Alaska Bar Counsel also felt that it would be more appropriate if the PTO brought alleged ethics violations by attorneys to local state enforcement authorities. This view was not shared by other bar counsel who filed comments. The statute (35 U.S.C. 32) authorizes the Commissioner to administer discipline. The PTO has taken disciplinary action in instances where a State has declined to do so. Moreover, there are registered patent agents who are not subject to discipline by State enforcement agencies. Finally, Alaska Bar counsel suggested that "adjudicative agencies" are too closely involved in a disciplinary matter to be impartial. Congress has determined otherwise. 35 U.S.C. 32 and 5 U.S.C. 500(d).

Comments were received from the Statewide Grievance Committee of Connecticut in response to the advance notice. Many helpful suggestions were made in the comments. Most of the suggestions were adopted at the time the notice of proposed rulemaking was published.

The Florida Bar, through its Director of Lawyer Regulation, filed comments in response to the notice of proposed rulemaking. The Florida Bar commented on §§10.1(c) and 10.23(c) (5). The PTO's response to the comment appears later in this notice under a discussion of §10.1.

An Assistant General Counsel of the State Bar of Georgia filed a response to the advance notice. The response stated, among other things: "Although due to the press of business at the present time I am unable to provide a substantive response in this correspondence, I will respond within the appropriate time limits after having an opportunity to study the enclosed . . . [advance notice]." No further response was received.

Bar counsel for the Attorney Grievance Commission of Maryland filed a response to the advance notice. In his response Bar Counsel states in part:

> It does not appear to me that any of the proposed Rules would present any difficulty in the administration of discipline within Md.

Complaint Counsel for Miss. responded to the advance notice. He stated in part:

> I have not reviewed the proposed Code in comparison with the Code of Professional Responsiblity in great detail. In general however I can state that adoption of the proposed Code would not have an adverse effect upon the function of this office.

The General Counsel of the State Bar of Texas responded to the advance notice and did "not perceive that any problem would be created by . . . [the proposed rules] in Tex." The General Counsel did express the thought that the PTO's use of the word "practitioner" instead of "lawyer" would not prevent reciprocal discipline in Tex. based on disciplinary action by the PTO. The PTO sees no reason for disagreeing with the General Counsel. The word "practitioner" is used by the PTO to define registered attorneys, registered agents, *and* other attorneys authorized to practice in trademark and other non-patent cases before the PTO under 5 U.S.C. 500(b).

The Chairman of the Professional Conduct Board of Vermont responded to the advance notice. He states in part:

> I find nothing contained in the proposed rules which would present any difficulty in the administration of disciplinary matters within the State of Vermont. Further, I see no problems created vis-a-vis the Code of Professional Responsibility in this jurisdiction.

The President of the National Organization of Bar Counsel responded to the notice of proposed rulemaking. He expressed a concern as to whether the PTO intended to "provide for notice and information of . . . [each disciplinary violation by an attorney] to each jurisdiction where the attorney is licensed." Two provisions of the rules are designed to insure that States are notified of PTO disciplinary action. Section 10.158(b) (1) requires a disciplined attorney to notify all bars of which he or she is a member and to file a copy of the notice with the Director of Enrollment and Discipline of the PTO. Section 10.159(a) requires the Director to notify known state bars and appropriate bar associations of PTO disciplinary action. In addition, as a matter of policy, the PTO intends to notify the National Discipline Data Bank of the American Bar Association.

Comments were filed in response to the advance notice and the notice of proposed rulemaking by the Standing Committee on Professional Discipline of the American Bar Association. The comments filed in response to the advance notice were analyzed in the notice of proposed rulemaking and are not re-analyzed in this notice. In its comments responding to the notice of proposed rulemaking the Standing Committee made several helpful suggestions, some of which are being adopted. A full discussion of the PTO rationale for adopting or not adopting a particular suggestion appears under analysis of comments later in this notice. The Standing Committee urged adoption of the 1983 ABA Model Rules. The PTO is not now adopting the Model Rules *inter alia* because most States have not adopted those rules. If a significant number of states adopt the Model Rules, the PTO will consider further amendments to its Code of Professional Responsibility. The Standing Committee suggested changes to §10.23(c) (12) which are being adopted in part. The Standing Committee suggested that notice be given to a practitioner prior to any meeting of the Committee on Discipline. This suggestion is not being adopted. In most instances, a practitioner will be able to respond to a notice under 5 U.S.C. 558(c). The Committee will have the practitioner's response at the time of its deliberation. The Standing Committee urged that hearings in disciplinary matters should be open to the public. Others opposed this position. The PTO is not adopting this suggestion in view of 35 U.S.C. 122. Further rationale for not adopting the Standing Committee's suggestion appears later in the notice. The Standing Committee urged a change in §10.149 to make the burden for proving a disciplinary violation one of "clear and convincing evidence." This suggestion is being adopted. The Standing Committee urged that more discovery be permitted than was authorized by §10.152 as proposed. This suggestion is being adopted as explained further in this notice. The Standing Committee also thought §10.159 should provide for notice to the ABA National Discipline Data Bank when the PTO administers discipline. While §10.159 will not specifically mention the Data Bank, a change has been made to permit the Director to notify appropriate bar associations. The Data Bank is an appropriate bar association.

Changes in Text: Several changes have been made in the text of the new rules from the text of the proposed rules which were published for comment in the notice of proposed rulemaking. Those changes are discussed below.

In §1.8, the new subparagraph will be (xiii). Subparagraph (xii) was added when the rules relating to patent interference proceedings were amended. See 49 F.R. 48451 (Dec. 12, 1984).

In the first sentence of §1.31, the term "agent" has been changed to "registered agent" to make clear that only registered agents are intended.

Section 1.33(c) is being amended to delete a reference to former §§1.341 and 1.347 and to now refer to §§10.5 and 10.11.

Section 1.56(f) and (h) is being amended to delete a reference to former §1.346 and to now referred to §10.18.

In the second sentence of §10.1, "subpart shall" has been changed to "part shall" and "maintain control over" has been changed to "regulate." In the same sentence, "within its borders" has been deleted.

In §10.2(b) (1), "maintain the register" has been changed to "maintain the register provided for in §10.5".

In the next-to-the-last sentence of §10.7(b), "examining corps" has been changed to "patent examining corps".

The language "an alien" in §10.9(b) has been changed to read "a resident alien" to make clear that aliens registered under paragraphs (a) or (b) of §10.6 must be resident aliens.

In the first sentence of §10.14(c), "foreigner" has been changed to "foreign attorney or agent", "registered and in good standing" has been changed to "registered or in good standing", "applicants" has been changed to "parties" and "trademark applications" has been changed to "trademark cases".

In §10.18(a) (1), "the paper has been read" has been changed to "the paper has been read by the practitioner".

Several changes have been made in §10.23.

In §10.23(c) (4) (iii), "improperly" has been added before "bestowing."

In §10.23(c) (5), "on ethical grounds" has been added after the first occurrence of "attorney or agent" and "suspension or disbarment as an attorney or agent" (after "10.6(c)") has been deleted.

In §10.23(c) (7), "patent" has been added before "application of another" and the following has been added as a second sentence: "See §§1.604(b) and 1.607(c) of this Subchapter."

In §10.23(c) (8), "Failing to forward" has been changed to "Failing to inform a client or former client"; "inability to forward, to" has been changed to "inability to notify"; "client correspondence" has been changed to "client of correspondence"; "is correspondence which" has been changed to "is correspondence of which"; and "under the circumstances should be forwarded to the client or former client" has been changed to "under the circumstances the client or former client should be notified."

Section 10.23(c) (12) has been changed to read: "Knowingly filing, or causing to be filed, a frivolous complaint alleging a violation by a practitioner of the Patent and Trademark Office Code of Professional Responsibility."

In §10.23(c) (15), "including" has been changed to "making a" and "matter" has been changed to "statement".

In §10.36(b) (3), the language "in the locality" has been deleted.

The following language has been deleted from §10.40(c): ", and may not withdraw in other matters,".

In §10.62(b), the language "contemplated or pending litigation or" has been deleted.

In §10.63(a), the language "contemplated or pending litigation or" has been deleted. Both occurrences of "trial or" have been deleted from §10.63(a). The language "contemplated or pending litigation or" has been deleted from §10.63(b).

The following sentence has been added to §10.64(b): "A practitioner may, however, advance any fee required to prevent or remedy an abandonment of a client's application by reason of an act or omission attributable to the practitioner and not to the client, whether or not the client is ultimately liable for such fee."

In §10.84(a) (3), "§10.85" has been changed to "this part".

The following sentence has been added to §10.87(a): "It is not improper, however, for a practitioner to encourage a client to meet with an opposing party for settlement discussions."

Subparagraph (5) of §10.89(c) as it appeared in the notice of proposed rulemaking has been deleted. Subparagraph (6) of §10.89(c) as it appeared in the notice of proposed rulemaking has been changed to read: "(5) Engage in undignified or discourteous conduct before the Office (see §1.3 of this Subchapter)." Subparagraph (7) of §10.89(c) has been redesignated as subparagraph (6).

In §10.112(a), the language:

> maintained: (1) in the case of a practitioner whose office is located in the United States, the State in which the practitioner's office is situated or (2) in the case of a practitioner having an office in a foreign country or registered under §10.6(c) in the United States or the foreign country

has been changed to read:

maintained in the United States or, in the case of a practitioner having an office in a foreign country or registered under §10.6(c), in the United States or the foreign country.

In §10.131(a), the second sentence has been deleted as being unnecessary in view of §10.132(b). The second sentence of §10.131(a) in the notice of proposed rulemaking read: "The investigation shall be such as to determine whether there is probable cause to believe that a violation of a Disciplinary Rule by a practitioner has occurred."

In the first sentence of §10.132(a), the language "that there is probable cuase to believe" has been deleted. The Committee on Discipline, not the Director, shall determine whether there is probable cause to believe that a practitioner has violated a Disciplinary Rule. See §§10.4(b) and 10.132(b).

Several changes have been made in §10.133. In the first sentence of §10.133(b), the language "§§10.132(b) and 10.134" has been replaced with "§10.134". The reference to §10.132(b) is not necessary. The language "his or her resignation by filing" in §10.133(b) has been deleted as unnecessary. The second sentence of §10.133(b) has been modified to become new paragraphs (c) and (d). Paragraph (c) indicates the content of an affidavit of resignation filed prior to the date set by the administrative law judge (ALJ) for hearing. Paragraph (d) indicates the content of an affidavit of resignation filed on or after the date set by the ALJ for hearing. Paragraph (c) has been redesignated as new paragraph (e). In addition, the language "paragraph (b)" therein has been changed to "paragraphs (b) or (c)". Paragraphs (d) and (e) have been redesignated as new paragraphs (f) and (g), respectively.

In §10.135(a) (2) (i), "Committee on Enrollment" has been changed to "Director".

In §10.149, "a preponderance of" has been changed in both instances to "clear and convincing".

Several changes have been made to §10.152 to expand discovery. Paragraphs (a) and (b) of §10.152 as set out in the notice of proposed rulemaking have been redesignated as paragraphs (e) and (f), respectively, and new paragraphs (a) through (d) have been added. New paragraph (a) sets forth discovery which is authorized. New paragraph (b) sets forth matter which *cannot* be discovered. Paragraph (c) sets forth factors which an ALJ can consider in determining whether to authorize discovery. Paragraph (d) requires that a motion be filed which addresses specifically and separately each particular request for discovery. In paragraph (e) (formerly paragraph (a)), a new subparagraph (3) has been added to specify that the ALJ may require the parties to set out in a pre-hearing statement information related to expert witnesses. Old subparagraphs (3) and (4) have been redesignated as new subparagraphs (4) and (5), respectively.

In §10.154(b), a new subparagraph (5) has been added which states: "(5) any extenuating circumstances."

In §10.155(a), both occurrences of "on the respondent" have been deleted.

Several changes have been made to §10.158. In §10.158(b) (1), after "all clients of the practitioner" the following has been added "for whom he or she is handling matters before the Office". In §10.158(b) (2), "client's active case files" has been changed to "client's active Office case files". In §10.158(c), changes have been made to make paragraph (c) applicable to corporate patent departments and to prohibit a suspended or excluded practitioner from meeting in person or in the presence of another practitioner with an official of the PTO in connection with the prosecution of a patent, trademark, or other case.

The following has been added to the end of §10.159(a): "and any appropriate bar associations."

Several changes have been made in §10.160(c). "A practitioner has been suspended or excluded" has been changed to "An individual who has resigned under §10.133 or who has been suspended or excluded". The language "if the Director is satisfied" has been changed to "when the individual makes a clear and convincing showing". The language "suspended or excluded practitioner" has been changed to "individual".

Response to and Analysis of Comments: Twenty-two (22) written comments where timely received in response to the notice of proposed rulemaking. The comments have been analyzed. Some suggestions made in comments have been adopted and others have been rejected. A detailed analysis of the timely received comments follows. Several comments were not timely received by July 9, 1984, in response to the advance notice of proposed rulemaking of Mar. 16, 1984. These comments have now been considered and are analyzed herein.

Several comments were received which suggested that the rules purport to regulate attorney conduct beyond that necessary or proper for administration of federal programs by the PTO. It is not, and has never been, the intention of the PTO to regulate conduct except to the extent necessary for the accomplishment of federal objectives. Thus, only that conduct which is relevant to the practice of patent, trademark, or other law *before the PTO* is what the PTO seeks to regulate. The preamble of §10.1 indicates that Subpart 10 governs solely the practice of patent, trademark, and other law before the PTO. As noted in the preamble to §10.1, "[n]othing in this subpart shall be construed to preempt the authority of each State to regulate the practice of law, except to the extent necessary for the Patent and Trademark Office to accomplish its federal objectives." See *Sperry* v. *Florida ex rel. Florida Bar*, 373 U.S. 379, 402 (1963). See also *Michigan Canners and Freezers Ass'n.* v. *Agricultural Marketing and Bargaining Board*, 104 S. Ct. 2518, 2523 (1984) (State Law is preempted when it stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress) and *Fidelity Federal Savings and Loan Ass'n.* v. *de la Cuesta*, 102 S. Ct. 3014, 3022 (1982) (federal regulations have no less preemptive effect than federal statutes).

Several comments were received concerning §10.1. The Florida Bar noted that in the notice of proposed rulemaking the PTO indicated "that failure to pay State bar dues is not a basis for suspension or exclusion before the PTO because failure to pay the dues has no relationship to the federal objectives which the PTO seeks to accomplish." 49 F.R. 33795, column 1, third full paragraph. The Florida Bar suggested that "the loss of good standing [should] be of concern to the PTO." The PTO agrees in part. Suspension from a State bar for failure to pay dues will not be viewed by the PTO as "misconduct." See §10.23(c) (5), which has been changed to define misconduct as suspension or disbarment on ethical grounds. If an attorney is suspended by his or her State bar for failure to pay bar dues, and for that reason is no longer in good standing before the State bar, that attorney is no longer an attorney within the meaning of §10.1(c). An attorney suspended from his or her State bar for failure to pay bar dues would no longer be eligible to represent individuals before the PTO in trademark and other non-patent cases.

One commentator suggested that the second sentence of §10.1 be changed to read: "Nothing in this subpart shall be construed to preempt the authority of each State to regulate the practice of law, except to the extent necessary for the Patent and Trademark Office to accomplish its federal objectives." The suggestion is being adopted. The commentator noted that as originally proposed in the notice of proposed rulemaking, the phrase "to maintain control over the practice of law within its borders" is unduly restrictive. The commentator correctly pointed out that "[c]ertainly, New York would have the authority to regulate the practice of law by a New York attorney residing in Fla."

Another commentator noted the language "federal objectives" in §10.1 and felt it would be appropriate for the PTO "to set forth what the federal objectives really are." The PTO does not believe it is appropriate to set out in the regulations specific federal objectives. The PTO engages in the examination of applications for patents, reexamination of issued patents, examination of applications for registrations of trademarks, and numerous *inter partes* patent and trademark proceedings. The federal objectives of the PTO center around these activities.

With respect to §10.2(c), one commentator argued that "it is unfair to require the payment of a fee to review a final decision of the Director." The PTO disagrees. The review provided by §10.2(c) is a service preformed by the PTO for which a fee may be charged. There is no compelling reason for not charging a fee.

Several comments were received discussing §10.4. One commentator suggested "that a provision for no discovery or testimony from a member of the Committee on Discipline is unfair and inappropriate." The PTO does not believe that a "mini-trial" should be conducted in a subsequent disciplinary proceeding of how or why the Committee on Discipline reached its decision. The commentator also argued that 10.4(c) "would be in direct conflict with the Federal Rules of Civil Procedure" in any review in the U.S. District Court for the District of Columbia. Again, the PTO disagrees. The Federal Rules of Civil Procedure do not apply to disciplinary cases in the PTO. Moreover, those rules do not apply in cases seeking judicial reivew of a decision of the Commissioner in a disciplinary matter. Applicable law (35 U.S.C. 32 and Local Rule 1-26 of the district court) provides for review on the record made in the PTO. See also *Camp* v. *Pitts*, 411 U.S. 138 (1973). Hence, there is no discovery in a proceeding under 35 U.S.C. 32.

Comments were received which suggest that the associate and assistant solicitors in the Office of the Solicitor cannot be isolated from the Solicitor and the Deputy Solicitor. The associate and assistant solicitors are to be isolated so that (1) the associate and assistant solicitors may act as attorney for the Director in prosecuting a disciplinary proceeding and (2) the Solicitor and Deputy Solicitor may act as legal advisor to the Commissioner in deciding a disciplinary matter. In disciplinary matters, the associate and assistant solicitors will report directly to the Director. Associate and assistant solicitors will not have occasion to discuss disciplinary matters with the Solicitor or Deputy Solicitor.

The following discussion in the *Attorney General's Manual on the Administrative Procedure Act*, pp. 57-58 (1947), commenting on original §5(c) (now 5 U.S.C. 554(d)) is believed particularly relevant to the issues raised in the comments:

> Assuming that an agency will in many cases wish to consult with certain of its staff members, it may proceed in one of two ways. It may in a particular case consult with staff members who in fact have not performed investigative or prosecuting functions in that or a factually related case. In the alternative, the agency may find it feasible so to organize its staff assignments that the staff members whom it most frequently desires to consult will be free of all investigative and prosecuting functions.
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> * * * * *
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> [I]f the agency so organizes its staff that the general counsel is not responsible for the investigative and prosecuting functions, he would be regularly available to the agency for consultation on the decision of cases.[8]

Several commentators suggested that members of the public or the PTO bar should be members of the Committee on Discipline. This suggestion is not being adopted. As noted in the notice of proposed rulemaking (49 F.R. 33793, column 2, last paragraph), there are two reasons for not adopting the suggestion. Use of individuals outside the PTO is made difficult by 35 U.S.C. 122. Administrative delays would take place because it would be more difficult to schedule meetings.

One commentator suggested that the language "at least" in the phrase "at least three employees of the Office" should be deleted from the second sentence of §10.4(a). This suggestion is not being adopted. The "at least" language will permit the Commissioner to appoint alternate members to substitute for a member who may be disqualified or who may be unavailable for an extended period.

Section 10.10 provides that only practitioners who are registered under §10.6 or individuals given limited recognition under §10.9 will be permitted to prosecute patent applications of others before the PTO. One comment was received which noted that the rules do not address the "status" of (a) "an individual in a training program directed to the preparation and prosecution of applications for patent" or (b) "a long-time employee working within a patent organization in the area of preparation and prosecution of applications for patent, but has never become registered to practice as either a Patent Agent or Patent Attorney." The commentator suggested that the rules should state what such individuals or employees may do. The suggestion is not being adopted. Only registered practitioners (attorneys and agents) may practice patent law before the PTO. The commentator also suggested that the rules should provide that long-time corporate or government employees who have never been registered should be given limited recognition by the PTO. This suggestion is not being adopted. Limited recognition will be given only on a case-by-case basis. See §10.9.

One comment suggested that "applicants" and "trademark applications" in the first sentence of §10.14(c) rendered it unclear whether an individual authorized to practice before the PTO in trademark cases could prosecute post-registration cases, such as a cancellation proceeding. The rule has been clarified by changing "applicants" to "parties" and "trademark applications" to "trademark cases". An individual authorized to represent others under §10.14 is authorized to appear in any trademark case.

Several comments were received discussing §10.18. One comment made at the hearing suggested that the rule should specify who should read the paper being signed. The commentator stated: "I think it would be salutary if what you really mean is that the practitioner who signs it has read it." The suggestion is being adopted and the language of §10.18(a) (1) has been changed from "the paper has been read" to "the paper has been read by the practitioner".

Two individuals commented that requiring the signature of a practitioner would eliminate the "custom" of having an associate sign the name of a principal attorney on a paper which the principal authorizes the associate to file. Section 10.18 requires that the practitioner signing the paper sign his or her own name. The rule would permit associate attorney John Smith to sign on behalf of principal attorney David Jones by signing the paper as follows: "David Jones by John Smith." The rule would not permit Smith to merely sign Jones' name or to sign "David Jones by JS." The rule does not authorize a non-practitioner (e.g., a para-legal or secretary) to sign a paper on behalf of a practitioner.

One comment asked the following:

> Assume an inventor is under Final Rejection and the period for proper response is near at hand. The attorney is now instructed to "keep the case alive" until a CIP [continuation-in-part] is prepared and filed. For reasons outside the control of the attorney, the CIP cannot be filed in time. Assume now the attorney files a Notice of Appeal, *never intending* to prosecute the appeal, intending only to buy time until the CIP can be filed. Would the filing of the Notice of Appeal violate Rule 10.18 and subject the attorney to PTO disciplinary action?

A notice of appeal is a proper response to a final rejection. Accordingly, it would not appear under the circumstances outlined that the notice of appeal was "interposed for delay" within the meaning of §10.18(a) (4).

Three comments were received discussing §10.22. One comment suggested that modifiers, such as "knowingly"

[8]The general counsel's participation in rule making and in court litigation would be entirely compatible with his role in advising the agency in the decision of adjudicatory cases subject to section 5(c).

and "willfully" be inserted in paragraphs (a) and (b) of §10.22. The suggestion is not being adopted. A "materially false statement," a failure "to disclose a material fact," or furthering the application of another "known . . . to be unqualified" constitute acts which cannot be characterized as innocent. Accordingly, there is no need to insert the "modifiers" in the text of the rule. Another commentator suggested that the provisions of §10.22 are not relevant to the federal objectives of the PTO. The PTO disagrees. Practitioners who (1) fail to tell the truth, (2) fail to reveal material information or (3) knowingly further the application of an unqualified individual to a bar, demonstrate that they are "disreputable" within the meaning of 35 U.S.C. 32. A third commentator suggested that §10.22(b) is too broad because a practitioner could recommend an individual for membership in a bar and the individual might fail to pass the bar examination. Unless a practitioner has good reason to know that the individual will fail to pass a bar examination, it is not apparent how the practitioner's recommendation could amount to a violation of the PTO Code of Professional Responsibility.

Numerous comments were received discussing §10.23. One comment suggested that §10.23(c) (8) be changed to require notification of a client rather than requiring correspondence to be forwarded. This suggestion has been adopted by making appropriate changes to §10.23(c) (8).

A suggestion was made to delete the reference to $5000 in §10.23(c) (17). This suggestion is not being adopted. See the discussion in the advance notice, 49 F.R. 10016, column 1.

A suggestion was made that §10.23(c) (5) has "a built-in inequity as regards different patent attorneys in different states." According to the commentator, a practitioner suspended for an act by Ohio might not be suspended for the same act by New York. The commentator reasons it would be unfair for the Office to suspend the Ohio practitioner, but not the New York practitioner. The commentator's concern is not warranted in view of the second sentence of §10.1.

Another commentator noted that §10.23(a) (3) "points up the difficulty of superimposing . . . [a] set of rules on of the various local jurisdictions." Here again, the commentator's concern is not believed warranted in view of the second sentence of §10.1. Another commentator noted that "moral turpitude" is hard to define. It was suggested that possession of marijuana is regarded as a crime involving moral turpitude in some states where a 99-year sentence may be received. It was suggested that in other states possession of marijuana might result in "a slap on the wrist." If a practitioner is incarcerated for a crime in a state, it follows that the practitioner is not capable of representing individuals before the Office. This is true even if the same practitioner would not have been incarcerated in another state for the same act.

The Florida Bar raised a question concerning §10.23(c) (5) which is answered under the discussion above of §10.1. Section 10.23(c) (5) has been changed to make suspension or disbarment "on ethical grounds" a basis for suspension or disbarment by the Office. "Ethical grounds" would include incompetence, but would not include failure to pay State bar dues.

One comment suggested that "disreputable" and "gross misconduct" in §10.23(a) be defined. The terms "disreputable" and "gross misconduct" appear in 35 U.S.C. 32 and need no further definition in the rules. For a discussion of "disreputable," see *Poole* v. *United States*, 54 A.F.T.R. 2d (P-H) 84-5536 (D.D.C. June 29, 1984).

Several comments suggested that the Model Rules of Professional Conduct of the American Bar Association (1983) be adopted in place of §10.23. Adoption of the Model Rules was given consideration prior to publication of the advance notice and the notice of proposed rulemaking. The matter has been considered again. However, it has not been demonstrated to the Office that a large number of states have adopted the Model Rules. As noted in the notice of proposed rulemaking, at least Va. has rejected the Model Rules. Accordingly, the PTO will not, at this time, adopt the Model Rules. If a large number of states adopt the Model Rules in the future, the PTO would be willing to reconsider its position.

One comment suggested that "before the Office" be inserted after the word "conduct" in §10.23(b) (4), (5), and (6). This suggestion is not being adopted in view of the second sentence of §10.1.

A suggestion was received that "improperly" be inserted at the beginning of §10.23(c) (4) (iii). This suggestion has been adopted.

A suggestion was received that the word "patent" be inserted before "application" in §10.23(c) (7). This suggestion has been adopted.

A suggestion was received that §10.23(c) (15) be changed so that a trademark practitioner could present potentially scandalous subject matter in order to receive a determination on the merits of registrability. See e.g., *In re McGinley*, 660 F.2d 481, 211 USPQ 668 (CCPA 1981). Section 10.23(c) (15) has been changed to refer only "making a scandalous or indecent statement in a paper filed in the Office."

Several individuals suggested that it may be difficult to determine the identity of tunder §10.23(c) (8), particularly in corporate patent departments. The PTO will presume that practitioners know the identities of their clients and that information conveyed to the client is being conveyed in a manner acceptable to the client.

Section 10.23(c) (12) has been changed in response to comments which suggested that it would be difficult for practitioners to comply with §10.23(c) (12) on the one hand and §§10.24 and 10.131 on the other hand. The purpose of §10.23(c) (12) is to eliminate a frivolous complaint against practitioners. Accordingly, §10.23(c) (12) has been changed to define as misconduct "knowningly filing, or causing to be filed, a frivolous complaint alleging a violation by a practitioner of the Patent and Trademark Office Code of Professional Responsibility."

Several individuals criticized §10.24. The provisions of §10.24 are derived from DR 1-103 of the Code of Professional Responsibility of the American Bar Association (1970)—the rule currently applicable to practitioners. See 37 CFR §§1.344 and 2.13. The PTO is not aware that the current rule causes any problems. Accordingly, the numerous suggestions to delete or amend §10.24 are not being adopted.

One comment was received which suggested that charging another person with trademark infringement and requesting that the person withdraw a pending application "might be . . . interpreted as a violation" of §10.31(a). The PTO disagrees. A reasonable interpretation of the rule does not justify the unreasonable construction by the commentator.

At the hearing, an individual discussed §10.32. The individual suggested that three "practices" should be sanctioned under any PTO Code of Professional Responsibility and it was suggested that all three practices might be prohibited by §10.32. *First,* the individual suggested that "the giving of moderately priced presents . . . to established clients on appropriate occasions—Christmas, weddings of their daughters" should not constitute a violation of §10.32. The PTO agrees. The giving of a gift to an "established client" on the occasions suggested is not a gift "to a person for recommending the practitioner's services." *Second,* the individual suggested that a practitioner should not be prohibited from "paying for ordinary client entertainment." The PTO agrees. Again the "client" is not "a person recommending the practitioner's services" in return for being entertained. *Third,* the individual argued that the rules should not preclude an "exchange of cases with foreign practitioners." An "exchange" was said to occur "[w]here a foreign patent practitioner in his country sends cases to an American patent or trademark practitioner to prosecute before the PTO, and you send the foreign firm cases to prosecute before the foreign patent office, on the more or less explicit basis that it's something in the nature of a trade." According to the individual, the "exchange" ordinarily takes place without knowledge of the practitioner's client. The individual expressed the opinion that "exchanges" without knowledge of the client presently occur routinely. The PTO believes that the suggested "exchange" may ethically take place *only* when the practitioner's clients are fully advised of the exchange. Three other witnesses at the hearing expressed the view—correctly the PTO believes—that client knowledge is essential to an ethical exchange of the type contemplated. No change in §10.32 is being made.

A suggestion was received that "in matters before the Office" be inserted after "professional employment" in §10.33. The suggestion is not being adopted in view of the second sentence of §10.1. Another comment suggested that Rule 7.3 of the Model Rules of Professional Conduct (1983) be adopted in place of §10.33. The suggestion is not being adopted. Section 10.33 is based partly on Rule 7.3, but contains the additional language "under circumstances evidencing undue influence, intimidation, or overreaching." Section 10.33 is designed to prohibit so-called "ambulance chasing." In *Ohralik* v. *Ohio State Bar Ass'n.*, 436 U.S. 447 (1978), the Supreme Court held that a state could lawfully regulate ambulance chasing. In its opinion, the Supreme Court said:

> We need not discuss or evaluate each of these interests in detail as appellant has conceded that the State has a legitimate and indeed "compelling" interest in preventing those aspects of solicitation that involve fraud, undue influence, intimidation, overreaching, and other forms of 'vexatious conduct.' We agree that protection of the public from these aspects of solicitation is a legitimate and important state interest.

436 U.S. at 462. The additional language appearing in §10.33 is designed to limit the application of §10.33 to those situations in which the PTO has a legitimate interest. See also 35 U.S.C. 32 and §10.31(a).

A suggestion was received that §10.35(b) should be deleted. According to the suggestion, "[r]egulation of the practitioner's business arrangements should be left to state regulation." While the PTO is in general agreement with the rationale suggested, there exist partnerships of agents which are not subject to regulation by any state. Moreover, the commentator has not suggested or shown that §10.35(b) is inconsistent with the policy of any state. Practitioners should not be free to hold themselves out as being associated with a partnership or other organizations when an association does not in fact exist.

One comment suggested that "in the locality" be deleted from §10.36(b)(3). This suggestion is being adopted, because "in the locality" has no particular significance in the practice of patent and trademark law. Clients of patent and trademark practitioners are not necessarily located where counsel are located. Moreover, the practice is national in scope.

An individual at the hearing suggested that the PTO should delete subparagraphs (1) and (2) from §10.37(a). This suggestion is not being adopted. The individual suggested that a client need not know that "employment" has been referred to another practitioner or to a foreign practitioner. The PTO disagrees and so did three other individuals who expressed a view at the hearing. Moreover, the PTO believes that when "farming out" occurs with the consent of a client, that the fee division should be proportional to the services rendered. Under §10.37, "farming out" of work without knowledge and consent of a client will constitute a disciplinary rule violation.

One commentator suggested that §10.39 "may result in numerous claims to the effect that a practitioner brought a proceeding 'merely for the purpose of harassing or maliciously injuring another person.' " Section 10.39 continues existing policy (37 CFR §1.344 and DR 2-109 of the ABA Code (1970)). Under existing policy, the PTO has not experienced "numerous claims." Accordingly, there is no reason to expect such claims under §10.39.

A suggestion was received that the first sentence of §10.40(a) be changed to read: "A practitioner may withdraw from employment in a proceeding before the Office without permission from the Commissioner in those instances in which a substitute has been selected and is willing to serve." This suggestion is not being adopted. If "a substitute has been selected and is willing to serve," presumably with the consent of the client, a new power of attorney may be filed in the PTO. Another commentator suggested that §10.40 should not apply to corporate attorneys. This suggestion likewise is not being adopted. If a corporate atorney changes jobs, the attorney should withdraw from representing the "old" corporation *or* the old corporation should revoke any power of attorney.

One comment suggested that the PTO should be under a burden of deciding requests for permission to withdraw within thirty (30) days. This suggestion is not being adopted, but it is and will continue to be PTO policy to promptly decide requests for permission to withdraw.

One comment suggested that ", and may not withdraw in other matters," be deleted from §10.40(c). This suggestion has been adopted.

One comment asked whether a power of attorney given during prosecution of a patent application continues to be viable after the patent is issued. The answer is "yes." Communications received during reexamination proceedings are sent to the correspondence address established during prosecution of the application which matures into the patent being reexamined. See 37 CFR §1.525. Notices concerning maintenance fees likewise are mailed to the correspondence address. See 37 CFR §1.363, 49 F.R. 34725 (Aug. 31, 1984). The commentator also raised a question of who is the client when a case is filed on behalf of an individual, but the individual's assignee pays the practitioner's bills. Practitioners are expected to know the identities of their clients. If a practitioner is hired by a corporation and wishes to make that fact plain on the record of a patent application, the practitioner may file an assignment and a power of attorney signed by the assignee. If a dispute should then occur between the individual and the assignee, the record would be clear that the assignee is the client.

A comment suggested that §10.40(a) "would appear to be unreasonable" in view of the language "giving due notice to another practitioner." Such language does not appear in §10.40(a).

An oral comment was received by phone which questioned whether the use of para-legals or apprentices by a practitioner constitutes the unauthorized practice of law. If a para-legal or apprentice works under the direction of a practitioner and the practitioner does not allow the para-legal or apprentice to hold themselves out as a practitioner, there is no unauthorized practice of law problem within the meaning of §10.47.

One comment discussing §10.49 made the following statement:

> ". . . if the intent of this section is to prohibit a practitioner from forming a partnership with a lawyer who, while in good standing with his State bar, does not qualify to practice before the Office (either because he has not taken the patent examination or is not qualified to handle trademark matters), then it should be stricken."

As explained in the notice of proposed rulemaking (49 F.R. 33797, column 3), the PTO does not intend to prohibit formation of law firms by members of the Bar of any state.

One comment suggested that "in matters before the Office" should be inserted after "employment" in §10.62(a). This suggestion is not being adopted in view of the second sentence of §10.1.

Another comment suggested that §§10.62 and 10.63 be replaced with Rule 3.7(b) of the Model Rules of Professional Conduct of the ABA (1983). For reasons already discussed, the PTO is not adopting the Model Rules. The comment went on to suggest that practitioners would not be free testify concerning attorney diligence in patent interference cases. The PTO has made it plain

twice that it disagrees. See the advance notice (49 F.R. 10016, column 3 (Mar. 16, 1984)) and the notice of proposed rulemaking (49 F.R. 33797, column 3, last paragraph (Aug. 24, 1984)).

A comment suggested that language in §§10.62 and 10.63 is not clear. Specifically, the commentator referred to "solely to an uncontested matter" or "solely to a matter of formality." This language occurs in the current rules and has not caused any known difficulty.

Two comments were received which suggested that §10.64(b) should permit practitioners to pay fees which rightfully should be paid by a practitioner. This suggestion is being adopted and the following sentence has been added to §10.64(b): "A practitioner may, however, advance any fee required to prevent or remedy an abandonment of a client's application by reason of an act or omission attributable to the practitioner and not to the client, whether or not the client is ultimately liable for such fee." One of the commentators supplied the following rationale with which the PTO agrees:

> It sometimes happens that payment of a fee is necessitated by some act or omission for which the practitioner and not the client is responsible. One example is a fee for an extension of time to respond to an Office Action (see 37 C.F.R. §1.17 and §1.136), where the delay has resulted from the practitioner's workload for other clients, or from the practitioner's absence from his or her office for purposes unrelated to the client's business. Another example is a petition fee for revival of an application unintentionally abandoned through some inadvertent oversight on the practitioner's part. In these circumstances, it would seem unjust to require the client to bear the cost of the fee.

One comment suggested that §10.65 should be amended to indicate that it relates only to matters before the PTO. This suggestion is not being adopted in view of the second sentence of §10.1.

Another comment suggested that §10.65(a) "may limit a practitioner serving on the board of directors of a client." The commentator went on to say that practitioners serving on boards of directors is a common practice. Inasmuch as the client consents to practitioner serving on the board, it is believed that §10.65 does not limit a practitioner as suggested by the commentator.

One comment was received which suggested that §10.66(d) be changed to exclude corporate patent departments. According to the comment, "why should an entire corporate patent department have to withdraw if one of its members has to withdraw for disciplinary reasons?" In situations where it would not be appropriate for an entire firm or department to withdraw, §10.66(d) permits the Commissioner or the Director to so order. See e.g., *Sunkist Growers, Inc.* v. *The Benjamin Ansehl Co.*, 221 USPQ 1077 (Comm'r.Pat. 1984). Another comment suggested that §10.66 should be amended to indicate that it relates only to matters before the PTO. This suggestion is not being adopted in view of the second sentence of §10.1.

One comment was received which suggested that §10.67 be amended to indicate that it relates only to matters before the PTO. This suggestion is not being adopted in view of the second sentence of §10.1.

A comment was received which suggested that §10.68(c) might be construed to preclude a practitioner from joining a law firm where attorneys who are not registered to practice before the PTO "are in control," i.e., are the "senior" partners. The definition of practitioner (see §10.1(r)) precludes such a construction, because any attorney in good standing in any State is a practitioner. Another comment suggested that §10.68 be amended to indicate that it relates only to matters before the PTO. This suggestion is not being adopted in view of the second sentence of §10.1.

One comment was made at the hearing which suggested that modifiers, such as "knowingly, willfully, intentionally," be inserted in §10.77. This suggestion is not being adopted. The PTO believes §10.77 states clearly the prohibited conduct.

A comment was received which suggested that §§10.77, 10.78, and 10.84 be amended to indicate that they refer only to matters before the PTO. This suggestion is not being adopted in view of the second sentence of §10.1.

One comment suggested that the term "unwarranted" in §10.85(a) (2) is "too vague as to its limits." The PTO disagrees. Contrary to the suggestion by the commentator, it is believed that practitioners can readily determine whether they are advocating a position that is unwarranted under existing law.

A comment was received which suggested that §10.85(b) can place a difficult burden on patent counsel. In support of his position, the commentator gave two examples and commented on both examples as follows:

> *Example 1:* A client engages a patent attorney in the preparation of a patent application, and the patent attorney goes through the usual routine of advising the client of statutory bars, duty to disclose, etc. The attorney prepares and files the application, and during the course of the prosecution, the client informs the attorney of some activities that occurred a couple of years before filing the application, which activities might constitute an offer for sale. The attorney advises that this must be disclosed to the Patent Examiner, but the applicant refuses to follow this course of action and discharges the patent attorney. The client then engages another attorney to complete the prosecution, without telling the new attorney of the potentially damaging prior art.
> *Comment:* In accordance with my interpretation of §10.85(b), the first attorney would be required to disclose this situation to the Office, unless the term "prepetrated a fraud" as it appears in that rule does not include the deliberate failure to disclose relevant prior art. My concern is that this could make for some very poor relationships with the client who might not understand the attorney's duty of disclosure before the Office.
>
> *Example 2:* A rather poor inventor has managed to drum up enough money for the filing fee for a patent application and then proceeds to prepare and file his own patent application, without the assistance of a patent attorney. After a few months, the inventor obtains some financing from an investor, and the inventor and the investor consult the patent attorney to see if he would continue with the prosecution of the application. The attorney reviews the fact pattern and informs both the inventor and the investor that there is unquestionably some prior art, in the form of an earlier publication by the inventor, which must be disclosed before the Office. When the inventor and the investor find that the attorney intends to disclose this prior art as soon as he is engaged as their attorney, the inventor and the investor tell the attorney that they would rather engage the services of some other patent attorney, and that they will not tell the second attorney of the prior art.
> *Comment:* As I would interpret §10.85 (b), the first patent attorney would be obliged to inform the Office of the relevant prior art. The first patent attorney would likely have the serial number and filing date of the application, and it would appear to me that the patent attorney would have to disclose not only the prior art, but also disclose the intent of the inventor and the investor not to disclose the same. This is pretty harsh treatment, and I can see where the inventor and the investor would have some very hard feelings against the patent attorney.

The PTO agrees that under the circumstances of Example 1, a "client . . . might not understand the attorney's duty of disclosure . . . " Likewise, the PTO can understand "where the inventor and the investor [in Example 2] would have some very hard feelings against the patent attorney." Nevertheless, the commentator has correctly noted in each case that the practitioner is required to advise the PTO. The practitioner's obligation under §10.85(b) has not been changed by the rules and is mandated by *Kingsland* v. *Dorsey*, 338 U.S. 318 (1949). See also Nahstoll, *The Lawyer's Allegiance: Priorities Regarding Confidentiality*, 41 Wash. & Lee L. Rev. 421 (1984).

A comment was received which suggested that §10.85 be amended to indicate that it pertains only to matters before the PTO. The suggestion is not being adopted in view of the second sentence of §10.1.

Two comments were received which suggested that §10.87(a) could be construed to prohibit a practitioner from recommending that a client meet with an opposing party for settlement discussions. Both comments suggested that §10.87(a) be amended to permit a practitioner to recommend that a client engage in settlement discussions directly with an opposing party. The suggestion is being adopted and the following sentence has been added to §10.87(a): "It is not improper, however, for a practitioner to encourage a client to meet with an opposing party for settlement discussions."

A suggestion was made that §10.87 be amended to indicate that it pertains only to matters before the PTO. The suggestion is not being adopted in view of the second sentence of §10.1.

One comment suggested that §10.89(c) (5) be "eliminated on the grounds of vagueness" because one cannot "be expected to comply with apparently unpublished customs of courtesy or practice." The suggestion is being adopted. Subparagraph (6) of §10.89(c) is being redesignated as subparagraph (5) and has also been changed to read: "Engage in undignified or discourteous conduct before the Office (see §1.3 of this Subchapter)." Subparagraph (7) has been redesignated as subparagraph (6).

Another comment discussing §10.89 asked "since when must counsel cite to the Examiner in *ex parte* proceedings cases known to be directly adverse to the position being advocated?" Counsel are expected to advise patent and trademark examiners of known controlling authority which is contrary to a position being advocated. It is important for counsel to do so in *ex parte* cases because there is no *advocate* taking a position contrary to the position being taken by an applicant. See also *Southern Pacific Transportation Co.* v. *Public Utilities Commission of the State of Calif.*, 716 F.2d 1285, 1291 (9th Cir. 1983).

A commentator contended that §10.89(a) "makes no sense" because a decision of the PTO may have been overruled by the Federal Circuit. Section 10.89(a) is limited to "a decision of the Office made in the course of a proceeding." Practitioners are expected to follow interlocutory orders entered in PTO proceedings. Obviously if such an order is ultimately overruled or reversed by a court, it no longer need be followed. The same commentator suggested that §10.89(c) (3) is not appropriate. Specifically, the commentator indicated that practitioners often rely on the specification of a patent application and prior art. The specification and prior art are evidence, not the "practitioner's personal knowledge."

One commentator suggested that §§10.92 and 10.93 be amended to indicate that they relate solely to matters before the PTO. This suggestion is not being adopted in view of the second sentence of §10.1.

A commentator at the hearing suggested that §10.93 be changed to permit practitioners to discuss procedural matters with interlocutory examiners or members of the Board of Patent Interferences or the Trademark Trial and Appeal Board. In view of Public Law 98–622, November 8, 1984, the Board of Patent Interferences will cease to exist on February 8, 1985. All patent interference cases will be transfered to the Board of Patent Appeals and Interferences and will be assigned to an examiner-in-chief. Practitioners may consult an examiner-in-chief orally upon adequate notice to opposing counsel. A telephone conference call may be arranged when opposing counsel desires to participate in the oral consultation. The same is true of the interlocutory examiners or members of the Trademark Trial and Appeal Board. Questions of a purely procedural nature may be asked. However, an examiner-in-chief or the interlocutory examiner or member of the Trademark Trial and Appeal Board may nevertheless decline to answer procedural questions without opposing counsel being present or involved in a conference call.

One commentator suggested that §§10.101, 10.102, 10.103, and 10.111 be amended to indicate that they refer only to proceedings in the PTO. The suggestion is not being adopted in view of the second sentence of §10.1.

One comment suggested that practitioners residing in the United States should be able to maintain trust funds in a bank in any State. This suggestion is being adopted and §10.112(a) has been changed to implement the suggestion. However, if a State bar requires funds to be kept in a bank within the State, a practitioner would be required to keep funds in a bank in the State in order to comply with State rules. Another comment suggested that §10.112(c)(2) is not practical. According to the commentator, "invention samples and invention disclosures and drawings usually are the client's property, but keeping them in a safe deposit box is totally impractical." The commentator overlooks that portion of §10.112(c)(2) which reads "in a safe deposit box or other place of safekeeping . . . ." A client may consent to a practitioner keeping invention samples, invention disclosures, and drawings in the practitioner's office. The practitioner, of course, should see to it that the office is maintained with appropriate security.

An individual testified at the hearing that §10.112 is not clear. According to the individual, "I think the rules should specify that if you get money up front from a client, whether it's called a retainer, pre-payment, or whatever . . . that money has to be put into a trust fund or a trust account . . . and that you can't take the money out and spend it until you have performed the services and sent a bill to the client that says X dollars has come out of your trust account in payment of Y services." The PTO believes that §10.112(b)(2) specifies "that you can't take the money out and spent it until you have performed the services" and that §10.112(c)(3) specifies that you must send "a bill to the client." Accordingly, no change to §10.112 is necessary.

One commentator testified at the hearing that the PTO rules do not address "those individuals who, due to a mental or physical defect, are not able to bring themselves in conformity with the rules of conduct . . . ." On the contrary, §10.130 specifies that any practitioner shown to be "incompetent" may be suspended or excluded. The commentator at the hearing referred to an individual "who has a drinking problem or one who is mentally incapable of representing people before the . . . Office." The statute (35 U.S.C. 32) and the rules address such an individual. As noted in the advance notice, the PTO has declined to adopt the suggestion appearing in Manson, *Helping Lawyers Who Need Help (But Won't Ask for It!)*, 25 Va. Bar News 27 (June 1977). See 49 F.R. 10017, column 1 (Mar. 16, 1984). If an individual is suspended due to a drinking problem, reinstatement (see §10.160) may be conditioned on a clear and convincing showing that the drinking problem has been overcome.

One individual testified at the hearing that a "statute of limitations" should be inserted in §10.131. This suggestion is not being adopted. As the individual noted during testimony, statues of limitations do not apply in disciplinary proceedings.

A suggestion was received that §10.132 be changed to expressly provide that:

> No disposition adverse to the respondent shall be recommended by the Director until the respondent shall have been afforded the opportunity to be heard.

This suggestion is not being adopted. Section 10.132(a) provides that, where necessary, the Director shall comply with 5 U.S.C. 558(c) prior to calling a meeting of the Committee on Discipline. The relevant portion of 5 U.S.C. 558(c) provides:

> Except in cases of willfulness or those in which public health, interest, or safety required otherwise, the withdrawal, suspension, revocation, or annulment of a license is lawful only if, before the institution of agency proceedings therefor, the license has been given;

(1) notice by the agency in writing of the facts or conduct which may warrant the action; and
(2) opportunity to demonstrate or achieve compliance with all lawful requirements.

Where appropriate, a notice under §588(c) will be issued prior to the time the Director takes a case to the Committee on Discipline. Any reply to the §558 (c) notice will be reviewed by the Director and the Committee on Discipline prior to deciding whether a complaint should be filed.

Another suggestion was received which indicated that §10.132(c) should be changed so that the "accused practitioner . . . [would] have the right to select an administrative law judge from a panel of such judges, such panel including the names of at least two law judges." This suggestion is not being adopted. No rationale was given in support of the suggestion and there is no known reason to permit a respondent to select the particular administrative law judge (ALJ) to be assigned to hear the practitioner's case.

Several changes have been made in §10.133 by the PTO which are not in response to any comment or suggestion. The language "§§10.132(b) and 10.134" in the first sentence of §10.133(b) has been changed to §10.134". This change was made because a reference to §10.132(b) is not necessary. The language "his or her resignation by filing" in the first sentence of §10.133(b) has also been deleted as unnecessary. The second sentence of paragraph (b) of §10.133 has been replaced by new paragraphs (c) and (d). New paragraph (c) specifies the content of an affidavit of resignation filed prior to the date set by the ALJ for a hearing. New paragraph (d) specifies the content of an affidavit of resignation filed on or after the date set by the ALJ for a hearing. Old paragraph (c) has been redesignated as new paragraph (e) and the language "paragraph (b)" therein has been changed to read "paragraphs (b) and (c)". Old paragraphs (d) and (e) have been redesignated as new paragraphs (f) and (g), respectively.

New paragraph (c) of §10.133 has been added to define the conditions under which a practitioner may resign prior to the date set by the ALJ for a hearing. Experience has shown that practitioners do not readily resign prior to hearing if they are required to admit the charges against them and/or are required to admit that they could not have been defended against the charges or the subject of an investigation. Paragraph (c) does not require a practitioner to admit the charges or any lack of defense at the time of resignation. Rather, under §10.133(c)(5), any admission is operative at the time of a request for reinstatement and only for the *limited* purpose of determining the request for reinstatement. By deferring the time when the practitioner makes the admissions, it is believed that settlements are more likely. Once a hearing begins, however, there is no reason to permit a resignation without admission of the facts and a lack of defense. The admissions of paragraph (c)(5) are relevant in determining whether reinstatement should be granted and whether sufficient time has passed between resignation and any application for reinstatement.

One comment was made at the hearing which suggested that "if, in fact there is a real stalemate in a settlement discussion, that there be some avenue so that there be, in essence, binding arbitration" on the part of the respondent and the Director. This suggestion is not being adopted. There is no reason to impose binding arbitration in disciplinary matters. While settlements are to be encouraged, if the parties (the respondent and the Director) cannot reach a mutually agreeable settlement, the proper recourse is to proceed with the disciplinary proceeding.

A suggestion was received that the second sentence of §10.138 be deleted. The suggestion is not being adopted. The second sentence of §10.138 provides that evidence obtained by a subpoena under 35 U.S.C. 24 will not be admitted unless prior approval was obtained from the ALJ to proceed under §24. This provision is necessary to retain control over the proceedings in the ALJ. Moreover, an order authorizing a party to proceed under §24 can be helpful to any district court which is required to determine whether an individual should be compelled to answer counsel's questions. Additional rationale in support of the PTO's decision not to adopt the suggestion appears in the advance notice (49 F.R. 10019, columns 1 and 2) and in the notice of proposed rulemaking (49 F.R. 33800, column 1).

Two individuals testified at the hearing concerning §10.144. Section 10.144 provides that hearings in disciplinary cases will not be open to the public. One individual suggested that hearings in disciplinary matters should be opened to the public. The other individual took the opposite position and supported §10.144 as proposed. The suggestion to open hearings to the public is not being adopted at this time. The PTO believes that a practitioner should not unnecessarily be exposed to charges of alleged wrongdoing until the practitioner is found to have violated the PTO Code of Professional Responsibility. Unnecessary and premature exposure could cause a practitioner's clients to find other counsel based on mere allegations. Additionally, the PTO is required to maintain information concerning patent applications in secrecy. 35 U.S.C. 122. In most disciplinary cases information concerning a patent application is revealed at any hearing. Accordingly, the PTO will not provide for public hearings. However, the PTO intends to further study the possibility of hearings open to the public (e.g., in a disciplinary proceeding involving only trademark matters) and may, in the future, propose to modify §10.144.

Numerous comments were received which suggested that the burden of proof set forth in §10.149 should be changed from "preponderance of evidence" to "clear and convincing evidence." As announced at the hearing, this suggestion is being adopted. The "clear and convincing evidence" standard brings §10.149 in conformance with §10.158(d)(1)(ii) which also requires proof by clear and convincing evidence.

The term "clear and convincing evidence" is not succeptable to a precise definition. The PTO, therefore, deems it appropriate to set forth its views on what constitutes "clear and convincing evidence." "Clear and convincing evidence" falls somewhere between proof beyond a reasonable doubt and proof by a preponderance of evidence.

A reasonable doubt is a doubt based upon reason and common sense—the kind of doubt that would make a reasonable person hesitate to act. Proof beyond a reasonable doubt must, therefore, be proof of such a convincing character that a person would be willing to rely and act upon it unhesitatingly in the most important of his or her affairs. Devitt, *Federal Jury Practice and Instructions* §11.01 (2d ed. 1970).

To establish a fact by a preponderance of evidence means to prove that fact is more likely so than not so. A preponderance of evidence means such evidence as, when considered and compared with that opposed to it, has more convincing force, and produces in the mind of the trier of fact a belief that what is sought to be proved is more likely true than not true. Devitt, *supra* at §7.01.

Clear and convincing evidence is that measure or degree of proof which will produce in the mind of the trier of fact a firm belief or conviction as to an allegation sought to be established; it is more than a preponderance of evidence, but less than that required to establish guilt beyond a reasonable doubt. *Hobson* v. *Eaton*, 399 F.2d 781 (6th Cir. 1968). It does not mean clear and unequivocal." *Fred C. Walker Agency, Inc.* v. *Lucas*, 215 Va. 535, 540–541, 211 S.E.2d 88, 92 (1975).

Several comments were received which suggested that §10.150 be changed to make the Federal Rules of Evidence applicable to disciplinary proceedings. The suggestion is not being adopted. The PTO has explained, in both the advance notice (49 F.R. 10020, column 2) and the notice of proposed rulemaking (49 F.R. 338001, columns 1 and 2) why it cannot adopt the Federal Rules of Evidence in disciplinary cases. The "Federal Rules of Evidence . . . do not apply to administrative proceedings . . . ." Davis, *Administrative Law Treatise*, §14.01 (Supp. 1970). The controlling law is set out in 5 U.S.C. 556(d) which provides in part: "Any oral or documentary evidence may be received, but the agency as a matter of policy shall provide for the exclusion of irrelevant, immaterial, or unduly repetitious evidence. A sanction may not be imposed or rule or order issued except on consideration of the whole record or those parts thereof cited by a party and supported by and in accordance with the reliable, probative, and substantial evidence." It appears to be the concern of some of the comments that the Administrative Procedure Act does not articulate an appropriate standard of evidence and that hearsay may be admitted. Suffice it to say that many adjudications occur daily under the Administrative Procedure Act, including disciplinary proceedings. The following language appearing in an opinion of the Eleventh Circuit in *TRW-United Greenfield Division* v. *National Labor Relations Board*, 716 F.2d 1391, 1394 (11th Cir. 1983), may be helpful:

> At the hearing the ALJ refused to allow five additional employees to testify that other employees told them that such a statement had been made. TRW contends it was denied a full and fair hearing by the exclusion of this testimony. The general rule is that administrative tribunals are not bound by the strict rules of evidence governing jury trials. *Opp Cotton Mills, Inc.* v. *Administrator of Wage & Hour Div.*, 312 U.S. 126, 155, 61 S.Ct. 524, 537, 85 L.Ed. 624 (1971). Thus, the admission of testimony which would be deemed incompetent in judicial proceedings would not invalidate the administrative order. *Tagg Bros. & Moorhead* v. *United States*, 280 U.S. 420, 442, 50 S.Ct. 220, 225, 74 L.Ed. 524 (1930). But this assurance of a desirable flexibility in administrative procedure does not go so far as to justify orders without a basis in evidence having rational probative force. Mere uncorroborated hearsay or rumor does not constitute substantial evidence. *Consolidated Edison Co.* v. *N.L.R.B.*, 305 U.S. 197, 230, 59 S.Ct. 206, 217, 83 L.Ed. 126 (1938). Therefore, the hearsay testimony of other employees would not have amounted to substantial evidence sufficient to support a finding for the company. We find that TRW was not denied a full and fair hearing by the judge's refusal to admit hearsay testimony.

See also *Steadman* v. *Securities and Exchange Commission*, 450 U.S. 91, 98 n. 17 (1981); *Richardson* v. *Perales*, 402 U.S. 389, 410–411 (1971); *Brown* v. *Gamage*, 377 F.2d 154, 158 (D.C.Cir.), *cert. denied*, 389 U.S. 858 (1967); Annotation, *Hearsay Evidence In Proceedings Before Federal Administrative Agencies*, 6 ALR Fed 76 (1971); and Davis, *Hearsay in Administrative Proceedings*, 32 Geo. Wash. L. Rev. 689 (1964).

A suggestion was received that §10.151 be changed to make the deposition rules of the Federal Rules of Civil Procedure applicable to disciplinary proceedings. This suggestion is not being adopted. The discovery provisions of the Federal Rules of Civil Procedure are not being adopted by the PTO in disciplinary cases. Except for discovery which the parties agree to make voluntarily, all discovery under these rules will require the prior permission of the ALJ. This prior permission is designed to insure that the ALJ retains control over the proceeding. By requiring prior approval of the ALJ to take a deposition, the rules insure that the deposition will relate to evidence the ALJ deems to be relevant and will afford the ALJ the option of determining whether he or she wishes to observe the witness.

Several comments were received which suggested that §10.152 be changed to permit more discovery. Some commentators urged adoption of the discovery provisions of the Federal Rules of Civil Procedure relating to requests for admissions, interrogatories, and requests for production of documents. Other commentators felt that the discovery proposed in the notice of proposed rulemaking was not sufficient and that more discovery should be authorized. These latter commentators, however, did not urge adoption of the discovery provisions of the Federal Rules of Civil Procedure. As one commentator noted:

> Disciplinary proceedings are not in the nature of civil actions and full discovery within the scope of the Federal Rules of Civil Procedure is probably not needed or desirable.

The PTO agrees that more discovery is appropriate than would have been authorized under §10.152 as proposed. The PTO does not agree, however, that discovery should be commensurate in scope with the discovery provisions of the Federal Rules of Civil Procedure.

One commentator at the hearing who urged adoption of the discovery provisions of the Federal Rules of Civil Procedure, correctly recognized the existence of "concerns of the Patent [and Trademark] Office regarding what are alleged to be general discovery abuses." There is ample basis for the PTO's concern. See e.g., Pollack, *Discovery—Its Abuse and Correction*, 80 F.R.D. 219 (1979) (reproducing remarks made by Judge Pollack at the Fifth Circuit Judicial Conference on April 26, 1978 at New Orleans). The same commentator at the hearing went on to note, however, that if the ALJ "gets on top of a case and monitors a case very actively, then no discovery abuses will occur, and if they do, they will be dealt with swiftly and properly."

Advocates of discovery "reform" seemingly rely on two principles which are claimed to be the cure-all for discovery abuse: (1) active control by the judge and (2) sanctions. See e.g. *Second Report of the Special Committee for the Study of Discovery Abuse*, 92 F.R.D. 137 (1980). The PTO is not in a position to impose the most effective sanction—costs. However, the PTO can invest the ALJ with control over discovery. It is because the PTO can invest the ALJ with control over discovery that the suggestion for more discovery is being adopted. Section 10.152 has been changed to permit discovery which the PTO believes will be effective. The scope of the discovery, however, will not be commensurate in scope with the Federal Rules of Civil Procedure.

Paragraph (a) of §10.152 will permit *limited* discovery an answer is filed. Discovery is not authorized prior to the filing of an answer. A party seeking discovery will have to make out a clear and convincing case to the ALJ that discovery is necessary *and* relevant. If discovery is authorized, the ALJ may set conditions he or she deems appropriate to accomplish the discovery. For example, the ALJ may set the place and time for inspection of documents which are required to be produced or the ALJ can order a party to mail copies of the documents to the other party. Under paragraph (a) of §10.152, discovery is limited to a *reasonable* number of requests for admissions, interrogatories, or requests for production of documents and things. Consideration was given to setting numerical maximums for requests for admission, interrogatories and requests for production of documents and things. See e.g., Local Rule 11.1 of the U.S. District Court for the Eastern District of Virginia. However, numerical maximums are not presently specified. Should discovery become a problem, the PTO will give further consideration to limiting the number of discovery requests which a party may file.

Paragraph (b) of §10.152 specified certain matters which *cannot* be discovered. Matter which will be used by another party solely for impeachment or cross-examination cannot be discovered. Documents which will be used as part of the Director's case-in-chief or the respondent's case-in-rebuttal or affirmative defenses are subject to discovery. Patent applications not available to a respondent under 35 U.S.C. §122 are not subject to discovery. Matter relating to disciplinary proceedings commenced prior to the effective date of these rules is not available. For the most part, the reasons for a particular length of suspension or disbarment have not been stated in the past. Accordingly, disciplinary proceedings commenced prior to these rules are not particularly relevant. See *Poole* v. *United States*, 54 A.F.T.R. 2d (P-H) 84–5536 (D.D.C. June 29, 1984). Prior disciplinary proceedings which resulted in public discipline being imposed will continue to be available in the Office of the Director of Enrollment and Discipline. Respondents will continue to be free to inspect the files of those proceedings. Matters relating to experts, except as may be required by the ALJ under §10.152(e), likewise are not subject to

discovery. Privileged matter and attorney work product are excluded from matter which can be discovered.

Paragraph (c) sets forth some factors the ALJ can consider in determining whether to authorize discovery or to limit discovery which is authorized. The factors include delay (which is a major consideration in disciplinary matters), burden on the party required to produce discovery, availability of the discovery sought to the public (in which case, discovery may not be necessary), the extent to which the matter sought to be discovered is equally available to both parties, and the extent to which discovery is available from another source.

Paragraph (d) of §10.152 requires a party desiring discovery to file a motion which explains, in detail, how each request is relevant to an issue raised in the complaint or the answer.

Paragraph (e) of §10.152 sets out matter which the ALJ can require a party to produce in a pre-hearing statement. Subparagraph (4) states the matter the ALJ can require disclosed related to experts.

The PTO has every reason to believe that the discovery authorized by §10.152 will be useful and that sufficient authority has been given to the ALJ to effectively control discovery and prevent abuses. The PTO intends to monitor discovery closely in the future and will consider amending these rules if abuses occur.

One comment suggested that §10.154(b) be modified by adding "any extenuating circumstances" as a matter to be considered in imposing a penalty. This suggestion is being adopted. Another comment suggested that §10.154 should address "probation." This suggestion is not being adopted. Nevertheless, the PTO has authority to place a practitioner on probation for all or a portion of any suspension and to revoke the probation upon a showing of a violation. See *In re Dula*, 1030 *Official Gazette* 20 (May 17, 1983).

One comment suggested that §10.155 be modified to specify that the Director should serve a copy of any appeal "on the respondent or on the attorney for respondent." This suggestion is not being adopted. However, in view of the suggestion the language "on the respondent" (both occurrences) in §10.155(a) is being deleted. Section 10.142(a) specifies how service is made on a respondent who is represented by an attorney.

A suggestion was received that §10.157 be modified to provide that a stay would be entered in every case where a respondent seeks judicial review of a decision of the Commissioner. This suggestion was rejected at the time the notice of proposed rulemaking was published (49 F.R. 33802) and is not being adopted. There are cases where a stay is not appropriate, e.g., when the disbarred practitioner is incarcerated. There are other times when a stay may be appropriate. Accordingly, stays will be granted in the discretion of the Commissioner.

Several comments were received discussing §10.158. Some commentators suggested that §10.158 was "too lenient" and another suggested that it was "too hard" on suspended and excluded practitioners. Section 10.158 is designed to advise suspended practitioners as to what they can and cannot do during any period of suspension. The PTO believes that §10.158 strikes a reasonable balance in a difficult area. See the discussion concerning §10.158 in the advance notice (49 F.R. 10021, columns 2 and 3). One comment suggested that §10.158 should be made applicable to corporations. This suggestion is being adopted by appropriate changes in §10.158(c) to refer to client-employers. Another comment suggested that §10.158(b)(1) and (2) be changed to refer to matters before the PTO. This suggestion is also being adopted.

An oral comment was received asking whether the Director could conduct an investigation in connection with a determination under §10.158(d). The Director may conduct whatever investigation is warranted to determine whether a suspended or excluded practitioner seeking reinstatement has complied with regulations relating to suspended and excluded practitioners.

A comment was received regarding §10.159(a) which suggested that the Director notify the American Bar Association National Discipline Data Bank when a practitioner is suspended or excluded. This suggestion is not being adopted as such. However, §10.159(a) has been changed to authorize the Director to notify "any appropriate bar association." The PTO is not inclined to mention any particular bar association by name in the rules. It will be the practice of the PTO to notify the National Discipline Data Bank, among others, when a practitioner is disciplined. Another comment suggested that the entire file of a disciplinary proceeding should not be open to the public when only some, but not all, charges are sustained. This suggestion is not being adopted. In most disciplinary matters, it would be highly inconvenient to segregate the relevant from the irrelevant. Moreover, once discipline is imposed, the principal rationale for keeping the file secret no longer exists. The disciplined practitioner will suffer whatever public embarassment results from discipline apart from whether part or all of the file is open to the public.

With respect to §10.160, one commentator suggested that the burden on the suspended or excluded practitioner for reinstatment be stated in the rules. This suggestion is being adopted and a "clear and convincing showing" requirement has been added to §10.160(c). Section 10.149 sets out the burden on the Director for proof of allegations in the complaint and upon the respondent for proving affirmative defenses. The showing required by §10.158(d)(1) is by "clear and convincing evidence." One commentator suggested that the 5-year period of §10.160(b) should be changed to a 3-year period. This suggestion is not being adopted. According to the commentator, the PTO has failed to state why a 5-year period was proposed. The commentator believes a 3-year period is more appropriate, although no reason is given in support of the commentator's belief. The PTO, after considering the matter, has concluded that some period must be specified and there is no reason to change the 5-year period proposed. A commentator suggested that a practitioner suspended for less than six months should "automatically" be reinstated. This suggestion is not being adopted, because the Director, as a condition to any reinstatement, must find that the suspended practitioner complied with §10.158. Another commentator questioned whether the rules should provide for application for reinstatement during a period of probation. The PTO believes the rules need not make provision for application for reinstatement during probation. For example, if a practitioner is suspended for a period of three years and it is ordered that the practitioner be actually suspended for at least one year *and* that the last two years the practitioner be placed on probation, the practitioner would be able to apply for reinstatement after serving one year of the three year suspension.

The PTO disagrees with the following comment concerning§10.161(b). "This clause is ex post facto legislation as it seeks retroactively an increase of penalties regarding conduct which occurred prior to the legislation." No legislation is involved. Section 10.161(b) does not "increase penalties."

Table 1
Principal Source of Sections 10.2 through 10.19

Sec.	
10.1 (preamble)	35 USC 31; *Sperry* v. *Florida*, 373 U.S. 379, 402 (1963)
10.1	35 USC 25; 28 USC 1746
10.1(c)	5 USC 500(b)
10.1(q)	1 USC 1
10.1(aa)	35 USC 100(c)
10.2(a)	New
10.2(b) (1)	New, but see 37 CFR 1.341(i) (1983)
10.2(b) (2)	New, but see 37 CFR 1.348(a) (1983)
10.2(c)	New, but see 37 CFR 1.341(i) (1983)
10.3	37 CFR 1.341(i) (1983)
10.4(a)	New

10.4(b)	New, but see 37 CFR 1.348(a) (1983)
10.4(c)	New
10.5	37 CFR 1.341 (1983)
10.6(a)	37 CFR 1.341(a) (1983)
10.6(b)	37 CFR 1.341(b) (1983)
10.6(c)	37 CFR 1.341(e) (1983)
10.6(d)	37 CFR 1.341(f) (1983)
10.6(e)	37 CFR 1.341(g) (1983)
10.7(a), (b)	37 CFR 1.341(c) (1983)
10.7(c)	New
10.8	37 CFR 1.341(h) (1983)
10.9(a)	37 CFR 1.342 (1983)
10.9(b)	New
10.10	37 CFR 1.343 (1983)
10.11	37 CFR 1.347 (1983)
10.12	[reserved]
10.13	[reserved]
10.14	5 USC 500(b) and 37 CFR 2.12 (1983)
10.15	35 USC 32; 5 USC 500(d) (2); 37 CFR 1.343 (1983); and 37 CFR 2.12(f) (1983)
10.16	[reserved]
10.17	[reserved]
10.18(a)	37 CFR 1.346 (1983) and 37 CFR 2.15 (1983), see also Rule 11, FRCP
10.18(b)	35 USC 32 & Rule 11, FRCP
10.19	[reserved]

Table 2
Principle Source of Sections of 10.20 through 10.112, the PTO Code of Professional Responsibility

Abbreviations:
FRCP means Federal Rules of Civil Procedure
MCPR means Model Code of Professional Responsibility of the ABA (1980)
MRPC means Model Rules of Professional Conduct of the ABA (1983)
VCPR means the Virginia Code of Professional Responsibility (1984)

Sec.	
10.20	Preamble to MCPR (1980)
10.21	MCPR Canon 1 (1980)
10.22	MCPR DR 1–101 (1980)
10.23(a)	35 U.S.C. 32
10.23(b) (1)	35 U.S.C. 32 and MCPR DR 1–102(A) (1) (1980)
10.23(b) (2)–(6)	MCPR DR 1–102(A) (2)–(6) (1980)
10.23(c) (1)–(14)	PTO created
10.23(c) (15)	Rule 11, FRCP
10.23(c) (16)–(18)	PTO created
10.23(d)	*U.S.* v. *Beecroft*, 608 F.2d 753 (9th Cir. 1979)
10.24	MCPR 1–103 (1980)
10.25 through 10.29	(reserved)
10.30	MCPR Canon 2 (1980)
10.31(a)	35 U.S.C. 32
10.31(b)	5 U.S.C. 501
10.31(c)	37 CFR 1.345(c) (1983)
10.31(d)	Newly created
10.32	MRPC Rule 7.2 (1983)
10.33	MRPC Rule 7.3 (1983)
10.34	MRPC Rule 7.4 (1983)
10.35(a)	5 U.S.C. 501 and MRPC Rule 7.5 (1983)
10.35(b)	MRPC Rule 7.5 (1983)
10.36	MCPR DR 2–106 (1980)
10.37	MCPR DR 2–107 (1980)
10.38	MCPR DR 2–108 (1980)
10.39	MCPR DR 2–109 (1980)
10.40	MCPR DR 2–110 (1980)
10.41 through 10.45	(reserved)
10.46	MCPR Canon 3 (1980)
10.47(a), (c)	MCPR DR 3–101 (1980)
10.47(b)	New (but see e.g., *Crawford* v. *State Bar of California*, 7 Cal. Rptr. 746, 355 P.2d 490 (Cal. 1960))
10.48	MCPR DR 3–102 (1980)
10.49	MCPR DR 3–103 (1980)
10.50 through 10.55	(reserved)
10.56	MCPR Canon 4 (1980)
10.57	MCPR DR 4–101 (1980)
10.58 through 10.60	(reserved)
10.61	MCPR Canon 5 (1980)
10.62	MCPR DR 5–101 (1980)
10.63	MCPR DR 5–102 (1980)
10.64	MCPR DR 5–103 (1980)
10.65	MCPR DR 5–104 (1980)
10.66	MCPR DR 5–105 (1980)
10.67	MCPR DR 5–106 (1980)
10.68	MCPR DR 5–107 (1980)
10.69 through 10.75	(reserved)
10.76	MCPR Canon 6 (1980)
10.77	MCPR DR 6–101 (1980)
10.78	MCPR DR 6–102 (1980)
10.79 through 10.82	(reserved)
10.83	MCPR Canon 7 (1980)
10.84	MCPR DR 7–101 (1980)
10.85	MCPR DR 7–102 (1980)
10.86	(reserved)
10.87	MCPR DR 7–104 (1980)
10.88	MCPR DR 7–105 (1980)
10.89	MCPR DR 7–106 (1980)
10.90	(reserved)
10.91	(reserved)
10.92	MCPR DR 7–109 (1980)
10.93	VCPR DR 7–109 (1984)
10.94 through 10.99	(reserved)
10.100	MCPR Canon 8 (1980)
10.101(a)	MCPR DR 8–101 (1980)
10.101(b)	37 CFR 1.341(f) (1983) and 41 Cp. Att'y Gen. 21 (1949), *reprinted in* 1949 Dec. Comm'r Pat. 1
10.102	MCPR DR 8–102 (1980)
10.103	MCPR DR 8–103 (1980)
10.104 through 10.109	(reserved)
10.110	MCPR Canon 9 (1980)
10.111	MCPR DR 9–101 (1980)
10.112	MCPR DR 9–102 (1980)

Table 3
Principal Source of Sections 10.130 through 10.161

Section	*Source*
10.130	35 U.S.C. 32
10.131(a)	New, but see 37 CFR 1.348(a)
10.131(b)	MCPR DR 1–103 (1980)
10.131(c)	New
10.132(a), (c)	New
10.132(b)	New, but see 37 CFR 1.348(b) (1983)
10.133	New
10.134	37 CFR 1.348(b) (1983)
10.135(a) (1)	New
10.135(a) (2)	37 CFR 1.348(b) (1983)
10.135(a) (3)	New
10.135(b)	New
10.135(c)	New
10.135(d)	5 USC 500(f)
10.136(a)	37 CFR 1.348(c) (1983)
10.136(b)	New
10.136(c)	37 CFR 1.348(c) (1983)
10.136(d)	37 CFR 1.348(c) (1983)
10.136(e)	New
10.137	37 CFR 1.348(c) (1983)
10.138	New

10.139(a)	5 USC 3105
10.139(b)	5 USC 556(c)
10.139(c)	New
10.139(d)	New
10.139(e)	New
10.140(a)	5 USC 500(b)
10.140(b)	New
10.141	New
10.142	New
10.143	New
10.144	New
10.145	New
10.146–10.148	[reserved]
10.149	New
10.150(a)	5 USC 556(d)
10.150(b)	37 CFR 1.348 (d) (3) (1983)
10.150(c)	New
10.150(d)	New
10.150(e)	New
10.151	37 CFR 1.348(d) (3) (1983)
10.152	New, see *Silverman* v. *CFTC*, 549 F.2d 28 (7th Cir. 1977)
10.153	New, but see 5 USC 557(c)
10.154	See 5 USC 557(b) and 35 USC 32
10.155	New
10.156	New
10.157	35 USC 32, Local Rule 1–26 (D.D.C.)
10.158	New
10.159	New
10.160	New
10.161	New
10.162–10.169	[reserved]
10.170	New, but see 37 CFR 1.183

Other Considerations: The rules will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rules are in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354) and Executive Order 12291.

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the rules will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96–354). The rules regulate the conduct of attorneys and agents who represent individuals and juristic entities before the Patent and Trademark Office and would not be expected to result in an increase of fees charged by attorneys and agents to entities, including small entities.

The Patent and Trademark Office has determined that the rules are not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The information reporting requirements contained in the rules have been approved by the Office of Management and Budget, OMB Control No. 0651–0012 and OMB Control No. 0651–0017.

List of Subjects in 37 CFR Parts 1, 2 and 10.

Administrative practice and procedure, Authority delegations, Conflict of interests, Courts, Inventions and patents, Trademarks, Lawyers.

For the reasons given in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 5 U.S.C. 500; 15 U.S.C. 1123; and 35 U.S.C. 6, 31, 32, and 41. Parts 1, 2, and 10 of Title 37 of the Code of Federal Regulations are amended as set forth below:

Part 1—Rules of Practice in Patent Cases

1. Section 1.8 is amended by adding to paragraph (a) (12) a new subparagraph (xiii) to read as follows:

§1.8 Certificate of mailing.

(a) * * *

(2) * * *

(xiii) Papers filed in connection with a disciplinary proceeding under Part 10 of this Subchapter.

2. Section 1.21 is amended by adding to paragraph (a) two new subparagraphs (5) and (6) to read as follows:

§1.21 Miscellaneous fees and charges.

(a) * * *

(5) For review of a decision of the Director of Enrollment and Discipline under §10.2(c) 60.00

(6) For requesting regrading of an examination under §10.7(c) 60.00

* * * * *

3. Section 1.31 is revised to read as follows:

§1.31 Applicants may be represented by a registered attorney or agent.

An applicant for patent may file and prosecute his or her own case, or he or she may be represented by a registered attorney, registered agent, or other individual authorized to practice before the Patent and Trademark Office in patent cases. See §§10.6 and 10.9 of this Subchapter. The Patent and Trademark Office cannot aid in the selection of a registered attorney or agent.

4. Section 1.33 is amended by removing from paragraph (c) "1.341 and 1.347" and inserting in its place "10.5 and 10.11".

5. Section 1.34 is amended by revising paragraph (a) as follows:

§1.34 Recognition for representation.

(a) When a registered attorney or agent acting in a representative capacity appears in person or signs a paper in practice before the Patent and Trademark Office in a patent case, his or her personal appearance or signature shall constitute a representation to the Patent and Trademark Office that under the provisions of this Subchapter and the law, he or she is authorized to represent the particular party in whose behalf he or she acts. In filing such a paper, the registered attorney or agent should specify his or her registration number with his or her signature. Further proof of authority to act in a representative capacity may be required.

* * * * *

6. Section 1.56 is amended by removing from paragraphs (f) and (h) "1.346" and inserting in its place "10.18".

7. The center heading preceding §1.341 is removed.

8. Sections 1.341 through 1.348 are removed.

9. Section 1.455 is amended by removing from paragraph (a) "1.341" and inserting in its place "10.10".

Part 2—Rules of Practice in Trademark Cases

10. Section 2.11 is revised to read as follows:

§2.11 Applicants may be represented by an attorney.

The owner of a trademark may file and prosecute his or her own application for registration of such trademark, or he or she may be represented by an attorney or other individual authorized to practice in trademark cases under §10.14 of this Subchapter. The Patent and Trademark Office cannot aid in the selection of an attorney or other representative.

11. Sections 2.12 through 2.16 are removed.

12. Section 2.17 is amended by revising paragraph (a) as follows:

§2.17 Recognition for representation.

(a) When an attorney as defined in §10.1(c) of this Subchapter acting in a representative capacity appears in person or signs a paper in practice before the Patent and Trademark Office in a trademark case, his or her personal appearance or signature shall constitute a representation to the Patent and Trademark Office that, under the provisions of §10.14 and the law he or she is authorized to represent the particular party in whose behalf he or she acts. Further proof of authority to act in a representative capacity may be required.

* * * * *

13. Section 2.19 is revised to read as follows:

§2.19 Revocation of power of attorney or of other authorization to represent, withdrawal.

(a) Authority to represent an applicant or a party to a proceeding may be revoked at any stage in the proceedings of a case upon notification to the Commissioner; and when it is so revoked, the Office will communicate directly with the applicant or party to the proceeding or with such other qualified person as may be authorized. The Patent and Trademark Office will notify the person affected of the revocation of his or her authorization.

(b) An individual authorized to represent an applicant or party in a trademark case may withdraw upon application to and approval by the Commissioner.

14. The following Part 10 is added:

Part 10–Representation of others before the Patent and Trademark Office

Sec.

10.1	Definitions
10.2	Director of Enrollment and Discipline
10.3	Committee on Enrollment
10.4	Committee on Discipline
	Individuals Entitled to Practice Before the Patent and Trademark Office
10.5	Register of attorneys and agents in patent cases
10.6	Registration of attorneys and agents
10.7	Requirements for registration
10.8	Oath and registration fee
10.9	Limited recognition in patent cases
10.10	Individuals not registered or recognized to practice in patent cases
10.11	Removing names from the register
10.12–10.13	[reserved]
10.14	Individuals who may practice before the Office in trademark and other non-patent cases
10.15	Refusal to recognize a practitioner
10.16–10.17	[reserved]
10.18	Signature and certificate of practitioner
10.19	[reserved]
	Patent and Trademark Office Code of Professional Responsibility
10.20	Canons and Disciplinary Rules
10.21	Canon 1
10.22	Maintaining integrity and competence of the legal profession
10.23	Misconduct
10.24	Disclosure of information to authorities
10.25–10.29	[reserved]
10.30	Canon 2
10.31	Communications concerning a practitioner's services
10.32	Advertising
10.33	Direct contact with prospective clients
10.34	Communication of fields of practice
10.35	Firm names and letterheads
10.36	Fees for legal services
10.37	Division of fees among practitioners
10.38	Agreements restricting the practice of a practitioner
10.39	Acceptance of employment
10.40	Withdrawal from employment
10.41–10.45	[reserved]
10.46	Canon 3
10.47	Aiding unauthorized practice of law
10.48	Sharing legal fees
10.49	Forming a partnership with a non-practitioner
10.50–10.55	[reserved]
10.56	Canon 4
10.57	Preservation of confidences and secrets of a client
10.58–10.60	[reserved]
10.61	Canon 5
10.62	Refusing employment when the interest of the practitioner may impair the practitioner's independent professional judgment
10.63	Withdrawal when the practitioner becomes a witness
10.64	Avoiding acquisition of interest in litigation or proceeding before the Office
10.65	Limiting business relations with a client
10.66	Refusing to accept or continue employment if the interests of another client may impair the independent professional judgment of the practitioner
10.67	Settling similar claims of clients
10.68	Avoiding influence by others than the client
10.69–10.75	[reserved]
10.76	Canon 6
10.77	Failing to act competently
10.78	Limiting liability to client
10.79–10.82	[reserved]
10.83	Canon 7
10.84	Representing a client zealously
10.85	Representing a client within the bounds of the law
10.86	[reserved]
10.87	Communicating with one of adverse interest
10.88	Threatening criminal prosecution
10.89	Conduct in proceedings
10.90–10.91	[reserved]
10.92	Contact with witnesses
10.93	Contact with officials
10.94–10.99	[reserved]
10.100	Canon 8
10.101	Action as a public official
10.102	Statements concerning officials
10.103	Practitioner candidate for judicial office
10.104–10.109	[reserved]
10.110	Canon 9
10.111	Avoiding even the appearance of impropriety
10.112	Preserving identity of funds and property of client
10.113–10.129	[reserved]
	Investigations and Disciplinary Procedures
10.130	Reprimand, suspension or exclusion
10.131	Investigations

10.132	Initiating a disciplinary proceeding; reference to an administrative law judge
10.133	Conference between Director and practitioner; resignation
10.134	Complaint
10.135	Service of complaint
10.136	Answer to complaint
10.137	Supplemental complaint
10.138	Contested case
10.139	Administrative law judge; appointment; responsibilities; review of interlocutory orders; stays
10.140	Representative for Director or respondent
10.141	Filing of papers
10.142	Service of papers
10.143	Motions
10.144	Hearings
10.145	Proof; variance; amendment of pleadings
10.146–10.148	[reserved]
10.149	Burden of proof
10.150	Evidence
10.151	Depositions
10.152	Discovery
10.153	Proposed findings and conclusions; post-hearing memorandum
10.154	Initial decisions of administrative law judge
10.155	Appeal to the Commissioner
10.156	Decision of the Commissioner
10.157	Review of Commissioner's final decision
10.158	Suspended or excluded practitioner
10.159	Notice of suspension or exclusion
10.160	Petition for reinstatement
10.161	Savings clause
10.162–10.169	[reserved]
10.170	Suspension of rules

Authority: 5 U.S.C. 500: 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41

Part 10—Representation of others before the Patent and Trademark Office

§10.1 Definitions.

This part governs solely the practice of patent, trademark, and other law before the Patent and Trademark Office. Nothing in this part shall be construed to preempt the authority of each State to regulate the practice of law, except to the extent necessary for the Patent and Trademark Office to accomplish its federal objectives. Unless otherwise clear from the context, the following definitions apply to this part:

(a) "Affidavit" means affidavit, declaration under 35 U.S.C. 25 (see §1.68 and §2.20 of this Subchapter), or statutory declaration under 28 U.S.C. 1746.

(b) "Application" includes an application for a design, plant, or utility patent, an application to reissue any patent, and an application to register a trademark.

(c) "Attorney" or "lawyer" means an individual who is a member in good standing of the bar of any United States court or the highest court of any State. A "non-lawyer" is a person who is not an attorney or lawyer.

(d) "Canon" is defined in §10.20(a).

(e) "Confidence" is defined in §10.57(a).

(f) "Differing interests" include every interest that may adversely affect either the judgment or the loyalty of a practitioner to a client, whether it be a conflicting, inconsistent, diverse, or other interest.

(g) "Director" means the Director of Enrollment and Discipline.

(h) "Disciplinary Rule" is defined in §10.20(b).

(i) "Employee of a tribunal" includes all employees of courts, the Office, and other adjudicatory bodies.

(j) "Giving information" within the meaning of §10.23(c)(2) includes making (1) a written statement or representation or (2) an oral statement or representation.

(k) "Law firm" includes a professional legal corporation or a partnership.

(l) "Legal counsel" means practitioner.

(m) "Legal profession" includes the individuals who are lawfully engaged in practice of patent, trademark, and other law before the Office.

(n) "Legal service" means any legal service which may lawfully be performed by a practitioner before the Office.

(o) "Legal System" includes the Office and courts and adjudicatory bodies which review matters on which the Office has acted.

(p) "Office" means Patent and Trademark Office.

(q) "Person" includes a corporation, an association, a trust, a partnership, and any other organization or legal entity.

(r) "Practitioner" means (1) an attorney or agent registered to practice before the Office in patent cases or (2) an individual authorized under 5 U.S.C. 500(b) or otherwise as provided by this Subchapter, to practice before the Office in trademark cases or other non-patent cases. A "suspended or excluded practitioner" is a practitioner who is suspended or excluded under §10.156. A "non-practitioner" is an individual who is not a practitioner.

(s) A "proceeding before the Office" includes an application, a reexamination, a protest, a public use proceeding, a patent interference, an *inter partes* trademark proceeding, or any other proceeding which is pending before the Office.

(t) "Professional legal corporation" means a corporation authorized by law to practice law for profit.

(u) "Registration" means registration to practice before the Office in patent cases.

(v) "Respondent" is defined in §10.134(a)(1).

(w) "Secret" is defined in §10.57(a).

(x) "Solicit" is defined in §10.33.

(y) "State" includes the District of Columbia, Puerto Rico, and other federal territories and possessions.

(z) "Tribunal" includes courts, the Office, and other adjudicatory bodies.

(aa) "United States" means the United States of America, its territories and possessions.

§10.2 Director of Enrollment and Discipline.

(a) *Appointment.* The Commissioner shall appoint a Director of Enrollment and Discipline. In the event of the absence of the Director or a vacancy in the office of the Director, the Commissioner may designate an employee of the Office to serve as acting Director of Enrollment and Discipline. The Director and any acting Director shall be an active member in good standing of the bar of a State.

(b) *Duties.* The Director shall:

(1) Receive and act upon applications for registration, prepare and grade the examination provided for in §10.7(b), maintain the register provided for in §10.5, and perform such other duties in connection with enrollment and recognition of attorneys and agents as may be necessary.

(2) Conduct investigations into possible violations by practitioners of Disciplinary Rules, with the consent of the Committee on Discipline initiate disciplinary proceedings under §10.132(b), and perform such other duties in connection with investigations and disciplinary proceedings as may be necessary.

(c) *Review of Director's decision.* Any final decision of the Director refusing to register an individual under §10.6, recognize an individual under §§10.9 or 10.14(c), or reinstate a suspended or excluded petitioner under §10.160, may be reviewed by petition to the Commissioner upon payment of the fee set forth in §1.21(a)(5). A petition filed more than 30 days after the date of the decision of the Director may be dismissed as untimely. Any petition shall contain (1) a statement of the facts involved and the points to be reviewed and (2) the action requested. Briefs or memoranda, if any, in support of the petition shall accompany or be embodied therein. The petition will be decided on the basis of the record made before the Director and no new evidence will be considered by the Commissioner in deciding the petition. Copies of documents already of record before the Director shall not be submitted with the petition. An oral hearing on the petition will not be granted except when considered necessary by the Commissioner.

(OMB Control No. 0651–0012).

§10.3 Committee on Enrollment.

(a) The Commissioner may establish a Committee on Enrollment composed of one or more employees of the Office.

(b) The Committee on Enrollment shall, as necessary, advise the Director in connection with the Director's duties under §10.2(b)(1).

§10.4 Committee on Discipline.

(a) The Commissioner shall appoint a Committee on Discipline. The Committee on Discipline shall consist of the at least three employees of the Office, none of whom reports directly or indirectly to the Director or the Solicitor. Each member of the Committee on Discipline shall be a member in good standing of the bar of a State.

(b) The Committee on Discipline shall meet at the request of the Director and after reviewing evidence presented by the Director shall, by majority vote, determine whether there is probable cause to bring charges under §10.132 against a practitioner. When charges are brought against a practitioner, no member of the Committee on Discipline, employee under the direction of the Director, or associate solicitor or assistant solicitor in the Office of the Solicitor shall participate in rendering a decision on the charges.

(c) No discovery shall be authorized of, and no member of the Committee on Discipline shall be required to testify about, deliberations of the Committee on Discipline.

Individuals Entitled to Practice Before the Patent and Trademark Office

§10.5 Register of attorneys and agents in patent cases.

A register of attorneys and agents is kept in the Office on which are entered the names of all individuals recognized as entitled to represent applicants before the Office in the preparation and prosecution of applications for patent. Registration in the Office under provisions of this part shall only entitle the individuals registered to practice before the Office in patent cases.

§10.6 Registration of attorneys and agents.

(a) *Attorneys.* Any citizen of the United States who is an attorney and who fulfills the requirements of this part may be registered as a patent attorney to practice before the Office. When appropriate, any alien who is an attorney, who lawfully resides in the United States, and who fulfills the requirements of this part may be registered as a patent attorney to practice before the Office, *provided:* registration is not inconsistent with the terms upon which the alien was admitted to, and resides in, the United States and *further provided:* the alien may remain registered only (1) if the alien continues to lawfully reside in the United States and registation does not become inconsistent with the terms upon which the alien continues to lawfully reside in the United States or (2) if the alien ceases to reside in the United States, the alien is qualified to be registered under paragraph (c) of this section. See also §10.9(b).

(b) *Agents.* Any citizen of the United States who is not an attorney and who fulfills the requirements of this part may be registered as a patent agent to practice before the Office. When appropriate, any alien who is not an attorney, who lawfully resides in the United States, and who fulfills the requirements of this part may be registered as a patent agent to practice before the Office, *provided:* registration is not inconsistent with the terms upon which the alien was admitted to, and resides in, the United States, and *further provided:* the alien may remain registered only (1) if the alien continues to lawfully reside in the United States and registration does not become inconsistent with the terms upon which the alien continues to lawfully reside in the United States or (2) if the alien ceases to reside in the United States, the alien is qualified to be registered under paragraph (c) of this section. See also §10.9(b).

Note: All individuals registered prior to Nov. 15, 1938, were registered as attorneys, whether they were attorneys or not, and such registrations have not been changed.

(c) *Foreigners.* Any foreigner not a resident of the United States who shall file proof to the satisfaction of the Director that he or she is registered and in good standing before the patent office of the country in which he or she resides and practices and who is possessed of the qualifications stated in §10.7, may be registered as a patent agent to practice before the Office for the limited purpose of presenting and prosecuting patent applications of applicants located in such country, *provided:* the patent office of such country allows substantially reciprocal privileges to those admitted to practice before the United States Patent and Trademark Office. Registration as a patent agent under this paragraph shall continue only during the period that the conditions specified in this paragraph obtain.

(d) *Government employees.* Any officer or employee of the United States who is disqualified by statute (18 U.S.C. 203, 205) from practicing as an attorney or agent in proceedings or other matters before Government departments or agencies, may not be registered to practice before the Office. If any registered attorney or agent becomes an officer or employee of the United States who is disqualified by statute from practicing as an attorney or agent in proceedings and other matters before Government departments or agencies, his or her name shall be endorsed as inactive on the register during the period of any employment by the United States. An officer or employee of the United States whose official duties require the preparation and prosecution of applications for patent and who fulfills the requirements of this part may be registered to practice before the Office to the extent necessary to carry out his or her official duties. A written statement describing the official duties of the officer or employee and signed on behalf of the agency employing the officer or employee may be required by the Director.

(e) *Former Office employees.* No individual who has served in the Office will be registered after termination of his or her services, nor if registered before such service, be reinstated, unless he or she signs a written statement indicating that he or she has read 18 U.S.C. 207. No individual who has served in the patent examining corps of the Office will be registered after termination of his or her services, nor if registered before such service, be reinstated, unless he or she signs a written undertaking (1) not to prosecute or aid in any manner in the prosecution of any patent application pending in any patent examining group during his or her period of service therein and (2) not to prepare or prosecute or to assist in any manner in the preparation or prosecution of any patent application of another (i) assigned to such group for examination and (ii) filed within two years after the date he or she left such group, without written authorization of the Director. Associated and related classes in other patent examining groups may be required to be included in the undertaking or designated classes may be excluded from the undertaking. When an application for registration or reinstatement is made after

resignation from the Office, the applicant will not be registered or reinstated if he or she has prepared or prosecuted or assisted in the preparation or prosecution of any patent application as indicated in this paragraph.
(OMB Control No. 0651–0012)

§10.7 Requirements for registration.

(a) No individual will be registered to practice before the Office unless he or she shall:
(1) apply to the Commissioner in writing on a form supplied by the Director and furnish all requested information and material and
(2) establish to the satisfaction of the Director that he or she is:
(i) of good moral character and repute;
(ii) possessed of the legal, scientific, and technical qualifications necessary to enable him or her to render applicants for patents valuable service; and
(iii) is otherwise competent to advise and assist applicants for patents in the presentation and prosecution of their applications before the Office.
(b) In order that the Director may determine whether an individual seeking to have his or her name placed upon the register has the qualifications specified in paragraph (a) of this section, satisfactory proof of good moral character and repute and of sufficient basic training in scientific and technical matters must be submitted to the Director. Except as provided in this paragraph, each applicant for registration must take and pass an examination which is held from time to time. Each application for admission to take the examination for registration must be accompanied by the fee set forth in §1.21(a)(1) of this Subchapter. The taking of an examination may be waived in the case of any individual who has actively served for at least four years in the patent examining corps of the Office. The examination will not be administered as a mere academic exercise.
(c) Within two months from the date an applicant is notified that he or she failed an examination, the applicant may request regrading of the examination upon payment of the fee set forth in §1.21(a)(6). Any applicant requesting regrading shall particularly point out the errors which the applicant believed occurred in the grading of his or her examination.
(OMB Control No. 0651–0012)

§10.8 Oath and registration fee.

Before an individual may have his or her name entered on the register of attorneys and agents, the individual must, after his or her application is approved, subscribe and swear to an oath or make a declaration prescribed by the Commissioner and pay the registration fee set forth in §1.21(a)(2) of this Subchapter.
(OMB Control No. 0651–0012)

§10.9 Limited recognition in patent cases.

(a) Any individual not registered under §10.6 may, upon a showing of circumstances which render it necessary or justifiable, be given limited recognition by the Director to prosecute as attorney or agent a specified application or specified applications, but limited recognition under this paragraph shall not extend further than the application or applications specified.
(b) When registration of a resident alien under paragraphs (a) or (b) of §10.6 is not appropriate, the resident alien may be given limited recognition as may be appropriate under paragraph (a) of this section.

§10.10 Individuals not registered or recognized to practice in patent cases.

Only practitioners who are registered under §10.6 or individuals given limited recognition under §10.9 will be permitted to prosecute patent applications of others before the Office.

§10.11 Removing names from the register.

(a) Registered attorneys and agents shall notify the Director of any change of address. Any notification to the Director of any change of address shall be separate from any notice of change of address filed in individual applications.
(b) A letter may be addressed to any individual on the register, at the address of which separate notice was last received by the Director, for the purpose of ascertaining whether such individual desires to remain on the register. The name of any individual failing to reply and give any information requested by the Director within a time limit specified will be removed from the register and the names of individuals so removed will be published in the *Official Gazette*. The name of any individual so removed may be reinstated on the register as may be appropriate and upon payment of the fee set forth in §1.21(a)(3) of this Subchapter.
(OMB Control No. 0651–0012)

§§10.12–10.13 [reserved]

§10.14 Individuals who may practice before the Office in trademark and other non-patent cases.

(a) *Attorneys.* Any individual who is an attorney may represent others before the Office in trademark and other non-patent cases. An attorney is not required to apply for registration or recognition to practice before the Office in trademark and other non-patent cases.
(b) *Non-lawyers.* Individuals who are not attorneys are not recognized to practice before the Office in trademark and other non-patent cases, except that individuals not arrotneys who were recognized to practice before the Office in trademark cases under this chapter prior to Jan. 1, 1957, will be recognized as agents to continue practice before the Office in trademark cases.
(c) *Foreigners.* Any foreign attorney or agent not a resident of the United States who shall prove to the satisfaction of the Director that he or she is registered or in good standing before the patent or trademark office of the country in which he or she resides and practices, may be recognized for the limited purpose of representing parties located in such country before the Office in the presentation and prosecution of trademark cases, *provided:* the patent or trademark office of such country allows substantially reciprocal privileges to those permitted to practice in trademark cases before the United States Patent and Trademark Office. Recognition under this paragraph shall continue only during the period that the conditions specified in this paragraph obtain.
(d) Recognition of any individual under this section shall not be construed as sanctioning or authorizing the performance of any act regarded in the jurisdiction where performed as the unauthorized practice of law.
(e) No individual other than those specified in paragraphs (a), (b), and (c) of this section will be permitted to practice before the Office in trademark cases. Any individual may appear in a trademark or other non-patent case in his or her own behalf. Any individual may appear in a trademark case for (1) a firm of which he or she is a member or (2) a corporation or association of which he or she is an officer and which he or she is authorized to represent, if such firm, corporation, or association is a party to a trademark proceeding pending before the Office.

§10.15 Refusal to recognize a practitioner.

Any practitioner authorized to appear before the Office may be suspended or excluded in accordance with the provisions of this part. Any practitioner who is suspended or excluded under this subpart or removed under §10.11(b) shall not be entitled to practice before the Office.

§§10.16–10.17 [reserved]

§10.18 Signature and certificate of practitioner.

(a) Every paper filed by a practitioner representing an applicant or party to a proceeding in the Office must bear the signature of, and be personally signed by, such practitioner except those papers which are required to be signed by the applicant or party. The signature of practitioner to a paper filed by him or her, constitutes a certificate that:
(1) the paper has been read by the practitioner;
(2) the paper's filing is authorized;
(3) to the best of his or her knowledge, information, and belief, there is good ground to support the paper, including any allegations of improper conduct contained or alleged therein; and
(4) it is not interposed for delay.
(b) Any practitioner knowingly violating the provisions of this section is subject to disciplinary action. See §10.23(c)(15).

§10.19 [reserved]

Patent and Trademark Office Code of Professional Responsibility

§10.20 Canons and Disciplinary Rules.

(a) Canons are set out in §§10.21, 10.30, 10.46, 10.56. 10.61, 10.76, 10.83, 10.100, and 10.110. Canons are statements of axiomatic norms, expressing in general terms the standards of professional conduct expected of practitioners in their relationships with the public, with the legal system, and with the legal profession.
(b) Disciplinary Rules are set out in §§10.22–10.24, 10.31–10.40, 10.47–10.57, 10.62–10.68, 10.77, 10.78, 10.84, 10.85, 10.87–10.89, 10.92, 10.93, 10.101–103, 10.111, and 10.112. Disciplinary Rules are mandatory in character and state the minimum level of conduct below which no practitioner can fall without being subjected to disciplinary action.

§10.21 Canon 1.

A practitioner should assist in maintaining the integrity and competence of the legal profession.

§10.22 Maintaining integrity and competence of the legal profession.

(a) A practitioner is subject to discipline if the practitioner has made a materially false statement in, or if the practitioner has deliberately failed to disclose a material fact requested in connection with, the practitioner's application for registration or membership in the bar of any United States court or any State court or his or her authority to otherwise practice before the Office in trademark and other non-patent cases.
(b) A practitioner shall not further the application for registration or membership in the bar of any United States court, State court, or administrative agency of another person known by the practitioner to be unqualified in respect to character, education, or other relevant attribute.

§10.23 Misconduct.

(a) A practitioner shall not engage in disreputable or gross misconduct.
(b) A practitioner shall not:
(1) Violate a Disciplinary Rule.
(2) Circumvent a Disciplinary Rule through actions of another.
(3) Engage in illegal conduct involving moral turpitude.
(4) Engage in conduct involving dishonesty, fraud, deceit, or misrepresentation.
(5) Engage in conduct that is prejudicial to the administration of justice.
(6) Engage in any other conduct that adversely reflects on the practitioner's fitness to practice before the Office.
(c) Conduct which constitutes a violation of paragraphs (a) and (b) of this section includes, but is not limited to:
(1) Conviction of a criminal offense involving moral turpitude, dishonesty, or breach of trust.
(2) Knowingly giving false or misleading information or knowingly participating in a material way in giving false or misleading information, to:
(i) A client in connection with any immediate, prospective, or pending business before the Office.
(ii) The Office or any employee of the Office.
(3) Misappropriation of, or failure to properly or timely remit, funds received by a practitioner or the practitioner's firm from a client to pay a fee which the client is required by law to pay to the Office.
(4) Directly or indirectly improperly influencing, attempting to improperly influence, offering or agreeing to improperly influence, or attempting to offer or agree to improperly influence an official action of any employee of the Office by:
(i) use of threats, false accusations, duress, or coercion,
(ii) an offer of any special inducement or promise of advantage, or
(iii) improperly bestowing of any gift, favor, or thing of value.
(5) Suspension or disbarment from practice as an attorney or agent on ethical grounds by any duly constituted authority of a State or the United States or, in the case of a practitioner who resides in a foreign country or is registered under §10.6(c), by any duly constituted authority of:
(i) a State,
(ii) the United States, or
(iii) the country in which the practitioner resides.
(6) Knowingly aiding or abetting a practitioner suspended or excluded from practice before the Office in engaging in unauthorized practice before the Office under §10.158.
(7) Knowingly withholding from the Office information identifying a patent or patent application of another from which one or more claims have been copied. See §§1.604(b) and 1.607(c) of this Subchapter.
(8) Failing to inform a client or former client or failing to timely notify the Office of an inability to notify to a client or former client of correspondence received from the Office or the client's or former client's opponent in an *inter partes* proceeding before the Office when the correspondence (i) could have a significant effect on a matter pending before the Office, (ii) is received by the practitioner on behalf of a client or former client and (iii) is correspondence of which a reasonable practitioner would believe under the circumstances the client or former client should be notified.
(9) Knowingly misusing a certificate of mailing under §1.8 of this Subchapter or a certificate of "Express Mail" under §1.10 of this Subchapter.
(10) Violating the duty of candor or good faith requirements of §1.56(a) of this Subchapter.
(11) Knowingly filing, or causing to be filed, an application which is subject to being stricken under §1.56(c) of this Subchapter.
(12) Knowingly filing, or causing to be filed, a frivolous complaint alleging a violation by a practitioner of the Patent and Trademark Office Code of Professional Responsibility.
(13) Knowingly preparing or prosecuting a patent application in violation of an undertaking signed under §10.6(e).
(14) Knowingly failing to advise the Director in writing of any change which would preclude continued registration under §10.6.
(15) Knowingly signing a paper filed in the Office in violation of the provisions of §10.18 or making a scandalous or indecent statement in a paper filed in the Office.

(16) Willfully refusing to reveal or report knowledge or evidence to the Director contrary to §10.24 or paragraph (b) of §10.131.

(17) Representing before the Office in a patent case either a joint venture comprising an inventor and an invention developer or an inventor referred to the registered practitioner by an invention developer when (i) the registered practitioner knows, or has been advised by the Office, that a formal complaint filed by a federal or state agency, based on any violation of any law relating to securities, unfair methods of competition, unfair or deceptive acts or practices, mail fraud, or other civil or criminal conduct, is pending before a federal or state court or federal or state agency, or has been resolved unfavorably by such court or agency, against the invention developer in connection with invention development services and (ii) the registered practitioner fails to fully advise the inventor of the existence of the pending complaint or unfavorable resolution thereof prior to undertaking or continuing representation of the joint venture or inventor. "Invention developer" means any person, and any agent, employee, officer, partner, or independent contractor thereof, who is not a registered practitioner and who advertises invention development services in media of general circulation or who enters into contracts for invention development services with customers as a result of such advertisement. "Invention development services" means acts of invention development required or promised to be performed, or actually performed, or both, by an invention developer for a customer. "Invention development" means the evaluation, perfection, marketing, brokering, or promotion of an invention on behalf of a customer by an invention developer, including a patent search, preparation of a patent application, or any other act done by an invention developer for consideration toward the end of procuring or attempting to procure a license, buyer, or patent for an invention. "Customer" means any individual who has made an invention and who enters into a contract for invention development services with an invention developer with respect to the invention by which the inventor becomes obligated to pay the invention developer less than $5,000 (not to include any additional sums which the invention developer is to receive as a result of successful development of the invention). "Contract for invention development services" means a contract for invention development services with an invention developer with respect to an invention made by a customer by which the inventor becomes obligated to pay the invention developer less than $5,000 (not to include any additional sums which the invention developer is to receive as a result of successful development of the invention).

(18) In the absence of information sufficient to establish a reasonable belief that fraud or inequitable conduct has occurred, alleging before a tribunal that anyone has committed a fraud on the Office or engaged in inequitable conduct in a proceeding before the Office.

(d) A practitioner who acts with reckless indifference to whether a representation is true or false is chargeable with knowledge of its falsity. Deceitful statements of half-truths or concealment of material facts shall be deemed actual fraud within the meaning of this part.

§10.24 Disclosure of information to authorities

(a) A practitioner possessing unprivileged knowledge of a violation of a Disciplinary Rule shall report such knowledge to the Director.

(b) A practitioner possessing unprivileged knowledge or evidence concerning another practitioner, employee of the Office, or a judge shall reveal fully such knowledge or evidence upon proper request of a tribunal or other authority empowered to investigate or act upon the conduct of practitioners, employees of the Office, or judges.

(OMB Control No. 0651–0017)

§§10.25–10.29 [reserved]

§10.30 Canon 2.

A practitioner should assist the legal profesion in fulfilling its duty to make legal counsel available.

§10.31 Communications concerning a practitioner's services.

(a) No practitioner shall with respect to any prospective business before the Office, by word, circular, letter, or advertising, with intent to defraud in any manner, deceive, mislead, or threaten any prospective applicant or other person having immediate or prospective business before the Office.

(b) A practitioner may not use the name of a Member of either House of Congress or of an individual in the service of the United States in advertising the practitioner's practice before the Office.

(c) Unless authorized under §10.14(b), a non-lawyer practitioner shall not hold himself or herself out as authorized to practice before the Office in trademark cases.

(d) Unless a practitioner is an attorney, the practitioner shall not hold himself or herself out:

(1) to be an attorney or lawyer or

(2) as authorized to practice before the Office in non-patent and trademark cases.

§10.32 Advertising.

(a) Subject to §10.31, a practitioner may advertise services through public media, including a telephone directory, legal directory, newspaper, or other periodical, radio, or television, or through written communications not involving solicitation as defined by §10.33.

(b) A practitioner shall not give anything of value to a person for recommending the practitioner's services, except that a practitioner may pay the reasonable cost of advertising or written communication permitted by this section and may pay the usual charges of a not-for-profit lawyer referreal service or other legal service organization.

(c) Any communication made pursuant to this section shall include the name of at least one practitioner responsible for its content.

§10.33 Direct contact with prospective clients.

A practitioner may not solicit professional employment from a prospective client with whom the practitioner has no family or prior professional relationship, by mail, in-person or otherwise, when a significant motive for the practitioner's doing so is the practitioner's pecuniary gain under circumstances evidencing undue influence, intimidation, or overreaching. The term "solicit" includes contact in person, by telephone or telegraph, by letter or other writing, or by other communication directed to a specific recipient, but does not include letters addressed or advertising circulars distributed generally to persons not specifically known to need legal services of the kind provided by the practitioner in a particular matter, but who are so situated that they might in general find such services useful.

§10.34 Communication of fields of practice.

A registered practitioner may state or imply that the practitioner is a specialist as follows:

(a) A registered practitioner who is an attorney may use the designation "Patents," "Patent Attorney," "Patent Lawyer," "Registered Patent Attorney," or a substantially similar designation.

(b) A registered practitioner who is not an attorney may use the designation "Patents," "Patent Agent," "Registered Patent Agent," or a substantially similar designation, except that any practitioner who was registered prior to November 15, 1938, may refer to himself or herself as a "patent attorney."

§10.35 Firm names and letterheads.

(a) A practitioner shall not use a firm name, letterhead, or other professional designation that violates §10.31. A trade name may be used by a practitioner in private practice if it does not imply a current connection with a government agency or with a public or charitable legal services organzation and is not otherwise in violation of §10.31.

(b) Practitioners may state or imply that they practice in a partnership or other organization only when that is the fact.

§10.36 Fees for legal services.

(a) A practitioner shall not enter into an agreement for, charge, or collect an illegal or clearly excessive fee.

(b) A fee is clearly excessive when, after a review of the facts, a practitioner of ordinary prudence would be left with a definite and firm conviction that the fee is in excess of a reasonable fee. Factors to be considered as guides in determining the reasonableness of a fee include the following:

(1) The time and labor required, the novelty and difficulty of the questions involved, and the skill requisite to perform the legal service properly.

(2) The likelihood, if apparent to the client, that the acceptance of the particular employment will preclude other employment by the practitioner.

(3) The fee customarily charged for similar legal services.

(4) The amount involved and the results obtained.

(5) The time limitations imposed by the client or by the circumstances.

(6) The nature and length of the professional relationship with the client.

(7) The experience, reputation, and ability of the practitioner or practitioners performing the services.

(8) Whether the fee is fixed or contingent.

§10.37 Division of fees among practitioners.

(a) A practitioner shall not divide a fee for legal services with another practitioner who is not a partner in or associate of the practitioner's law firm or law office, unless:

(1) The client consents to employment of the other practitioner after a full disclosure that a division of fees will be made.

(2) The division is made in proportion to the services performed and responsibility assumed by each.

(3) The total fee of the practitioners does not clearly exceed reasonable compensation for all legal services rendered to the client.

(b) This section does not prohibit payment to a former partner or associate pursuant to a separation or retirement agreement.

§10.38 Agreements restricting the practice of a practitioner.

(a) A practitioner shall not be a party to or participate in a partnership or employment agreement with another practitioner that restricts the right of a practitioner to practice before the Office after the termination of a relationship created by the agreement, except as a condition to payment of retirement benefits.

(b) In connection with the settlement of a controversy or suit, a practitioner shall not enter into an agreement that restricts the practitioner's right to practice before the Office.

§10.39 Acceptance of employment.

A practitioner shall not accept employment on behalf of a person if the practitioner knows or it is obvious that such person wishes to:

(a) Bring a legal action, commence a proceeding before the Office, conduct a defense, assert a position in any proceeding pending before the Office, or otherwise have steps taken for the person, merely for the purpose of harassing or maliciously injuring any other person.

(b) Present a claim or defense in litigation or any proceeding before the Office that is not warranted under existing law, unless it can be supported by good faith argument for an extension, modification, or reversal of existing law.

§10.40 Withdrawal from employment.

(a) A practitioner shall not withdraw from employment in a proceeding before the Office without permission from the Office (see §§1.36, and 2.19 of this Subchapter). In any event, a practitioner shall not withdraw from employment until the practitioner has taken reasonable steps to avoid foreseeable prejudice to the rights of the client, including giving due notice to his or her client, allowing time for employment of another practitioner, delivering to the client all papers and property to which the client is entitled, and complying with applicable laws and rules. A practitioner who withdraws from employment shall refund promptly any part of a fee paid in advance that has not been earned.

(b) Mandatory withdrawal. A practitioner representing a client before the Office shall withdraw from employment if:

(1) the practitioner knows or it is obvious that the client is bringing a legal action, commencing a proceeding before the Office, conducting a defense, or asserting a position in litigation or any proceeding pending before the Office, or is otherwise having steps taken for the client, merely for the purpose of harassing or maliciously injuring any person;

(2) the practitioner knows or it is obvious that the practitioner's continued employment will result in violation of a Disciplinary Rule;

(3) the practitioner's mental or physical condition renders it unreasonably difficult for the practitioner to carry out the employment effectively; or

(4) the practitioner is discharged by the client.

(c) Permissive withdrawal. If paragraph (b) of this section is not applicable, a practitioner may not request permission to withdraw in matters pending before the Office unless such request or such withdrawal is because:

(1) the petitioner's client:

(i) insists upon presenting a claim or defense that is not warranted under existing law and cannot be supported by good faith argument for an extension, modification, or reversal of existing law;

(ii) personally seeks to pursue an illegal course of conduct;

(iii) insists that the practitioner pursue a course of conduct that is illegal or that is prohibited under a Disciplinary Rule;

(iv) by other conduct renders it unreasonably difficult for the practitioner to carry out the employment effectively;

(v) insists, in a matter not pending before a tribunal, that the practitioner engage in conduct that is contrary to the judgment and advice of the practitioner but not prohibited under the Disciplinary Rule; or

(vi) has failed to pay one or more bills rendered by the practitioner for an unreasonable period of time or has failed to honor an agreement to pay a retainer in advance of the performance of legal services.

(2) the practitioner's continued employment is likely to result in a violation of a Disciplinary Rule;

(3) the practitioner's inability to work with co-counsel indicates that the best interests of the client likely will be served by withdrawal;

(4) the practitioner's mental or physical condition renders it difficult for the practitioner to carry out the employment effectively;

(5) the practitioner's client knowingly and freely assents to termination of the employment; or

(6) the practitioner believes in good faith, in a proceeding pending before the Office, that the Office will find the existence of other good cause for withdrawal.

§§10.41-10.45 [reserved]

§10.46 Canon 3.

A practitioner should assist in preventing the unauthorized practice of law.

§10.47 Aiding unauthorized practice of law.

(a) A practitioner shall not aid a non-practitioner in the unauthorized practice of law before the Office.
(b) A practitioner shall not aid a suspended or excluded practitioner in the practice of law before the Office.
(c) A practitioner shall not aid a non-lawyer in the unauthorized practice of law.

§10.48 Sharing legal fees.

A practitioner or a firm of practitioners shall not share legal fees with a non-practitioner except that:
(a) An agreement by a practitioner with the practitioner's firm, partner, or associate may provide for the payment of money, over a reasonable period of time after the practitioner's death, to the practitioner's estate or to one or more specified persons.
(b) A practitioner who undertakes to complete unfinished legal business of a deceased practitioner may pay to the estate of the deceased practitioner that proportion of the total compensation which fairly represents the services rendered by the deceased practitioner.
(c) A practitioner or firm of practitioners may include non-practitioner employees in a compensation or retirement plan, even though the plan is based in whole or in part on a profit-sharing arrangement, providing such plan does not circumvent another Disciplinary Rule.

§10.49 Forming a partnership with a non-practitioner.

A practitioner shall not form a partnership with a non-practitioner if any of the activities of the partnership consist of the practice of patent, trademark, or other law before the Office.

§§10.50-10.55 [reserved]

§10.56 Canon 4.

A practitioner should preserve the confidences and secrets of a client.

§10.57 Preservation of confidences and secrets of a client.

(a) "Confidence" refers to information protected by the attorney-client or agent-client privilege under applicable law. "Secret" refers to other information gained in the professional relationship that the client has requested be held inviolate or the disclosure of which would be embarrassing or would be likely to be detrimental to the client.
(b) Except when permitted under paragraph (c) of this section, a practitioner shall not knowingly:
(1) Reveal a confidence or secret of a client.
(2) Use a confidence or secret of a client to the disadvantage of the client.
(3) Use a confidence or secret of a client for the advantage of the practitioner or of a third person, unless the client consents after full disclosure.
(c) A practitioner may reveal:
(1) Confidences or secrets with the consent of the client affected but only after a full disclosure to the client.
(2) Confidences or secrets when permitted under Disciplinary Rules or required by law or court order.
(3) The intention of a client to commit a crime and the information necessary to prevent the crime.
(4) Confidences or secrets necessary to establish or collect the practitioner's fee or to defend the practitioner or the practitioner's employees or associates against an accusation of wrongful conduct.
(d) A practitioner shall exercise reasonable care to prevent the practitioner's employees, associates, and others whose services are utilized by the practitioner from disclosing or using confidences or secrets of a client, except that a practitioner may reveal the information allowed by parargraph (c) of this section through an employee.

§§10.58-10.60 [reserved]

§10.61 Canon 5.

A practitioner should exercise independent professional judgment on behalf of a client.

§10.62 Refusing employment when the interest of the practitioner may impair the practitioner's independent professional judgment.

(a) Except with the consent of a client after full disclosure, a practitioner shall not accept employment if the exercise of the practitioner's professional judgment on behalf of the client will be or reasonably may be affected by the practitioner's own financial, business, property, or personal interests.
(b) A practitioner shall not accept employment in a proceeding before the Office if the practitioner knows or it is obvious that the practitioner or another practitioner in the practitioner's firm ought to sign an affidavit to be filed in the Office or be called as a witness, except that the practitioner may undertake the employment and the practitioner or another practitioner in the practitioner's firm may testify:
(1) If the testimony will relate solely to an uncontested matter.
(2) If the testimony will relate solely to a matter of formality and there is no reason to believe that substantial evidence will be offered in opposition to the testimony.
(3) If the testimony will relate solely to the nature and value of legal services rendered in the case by the practitioner or the practitioner's firm to the client.
(4) As to any matter, if refusal would work a substantial hardship on the client because of the distinctive value of the practitioner or the practitioner's firm as counsel in the particular case.

§10.63 Withdrawal when the practitioner becomes a witness.

(a) If, after undertaking employment in a proceeding in the Office, a practitioner learns or it is obvious that the practitioner or another practitioner in the practitioner's firm ought to sign an affidavit to be filed in the Office or be called as a witness on behalf of a practitioner's client, the practitioner shall withdraw from the conduct of the proceeding and the practitioner's firm, if any, shall not continue representation in the proceeding, except that the practitioner may continue the representation and the practitioner or another practitioner in the practitioner's firm may testify in the circumstances enumerated in paragraphs (1) through (4) of §10.62(b).
(b) If, after undertaking employment in a proceeding before the Office, a practitioner learns or it is obvious that the practitioner or another practitioner in the practitioner's firm may be asked to sign an affidavit to be filed in the Office or be called as a witness other than on behalf of the practitioner's client, the practitioner may continue the representation until it is apparent that the practitioner's affidavit or testimony is or may be prejudicial to the practitioner's client.

§10.64 Avoiding acquisition of interest in litigation or proceeding before the Office.

(a) A practitioner shall not acquire a proprietary interest in the subject matter of a proceeding before the Office which the practitioner is conducting for a client, except that the practitioner may:
(1) Acquire a lien granted by law to secure the practitioner's fee or expenses; or
(2) Contract with a client for a reasonable contingent fee; or
(3) In a patent case, take an interest in the patent as part or all of his or her fee.
(b) While representing a client in connection with a contemplated or pending proceeding before the Office, a practitioner shall not advance or guarantee financial assistance to a client, except that a practitioner may advance or guarantee the expenses of going forward in a proceeding before the Office including fees required by law to be paid to the Office, expenses of investigation, expenses of medical examination, and costs of obtaining and presenting evidence, provided the client remains ultimately liable for such expenses. A practitioner may, however, advance any fee required to prevent or remedy an abandonment of a client's application by reason of an act or omission attributable to the practitioner and not to the client, whether or not the client is ultimately liable for such fee.

§10.65 Limiting business relations with a client.

A practitioner shall not enter into a business transaction with a client if they have differing interests therein and if the client expects the practitioner to exercise professional judgment therein for the protection of the client, unless the client has consented after full disclosure.

§10.66 Refusing to accept or continue employment if the interests of another client may impair the independent professional judgment of the practitioner.

(a) A practitioner shall decline proffered employment if the exercise of the practitioner's independent professional judgment in behalf of a client will be or is likely to be adversely affected by the acceptance of the proffered employment, or if it would be likely to involve the practitioner in representing differing interests, except to the extent permitted under paragraph (c) of this section.
(b) A practitioner shall not continue multiple employment if the exercise of the practitioner's independent professional judgment in behalf of a client will be or is likely to be adversely affected by the practitioner's representation of another client, or if it would be likely to involve the practitioner in representing differing interests, except to the extent permitted under paragraph (c) of this section.
(c) In the situations covered by paragraphs (a) and (b) of this section a practitioner may represent multiple clients if it is obvious that the practitioner can adequately represent the interest of each and if each consents to the representation after full disclosure of the possible effect of such representation on the exercise of the practitioner's independent professional judgment on behalf of each.
(d) If a practitioner is required to decline employment or to withdraw from employment under a Disciplinary Rule, no partner, or associate, or any other practitioner affiliated with the practitioner or the practitioner's firm, may accept or continue such employment unless otherwise ordered by the Director or Commissioner.

§10.67 Settling similar claims of clients.

A practitioner who represents two or more clients shall not make or participate in the making of an aggregate settlement of the claims of or against the practitioner's clients, unless each client has consented to the settlement after being advised of the existence and nature of all the claims involved in the proposed settlement, of the total amount of the settlement, and of the participation of each person in the settlement.

§10.68 Avoiding influence by others than the client.

(a) Except with the consent of the practitioner's client after full disclosure, a practitioner shall not:
(1) Accept compensation from one other than the practitioner's client for the practitioner's legal services to or for the client.
(2) Accept from one other than the practitioner's client any thing of value related to the practitioner's representation of or the practitioner's employment by the client.
(b) A practitioner shall not permit a person who rec ommends, employs, or pays the practitioner to render legal services for another, to direct or regulate the practitioner's professional judgment in rendering such legal services.
(c) A practitioner shall not practice with or in the form of a professional corporation or association authorized to practice law for a profit, if a non-practioner has the right to direct or control the professional judgment of a practitioner.

§§10.69-10.75 [reserved]

§10.76 Canon 6.

A practitioner should represent a client competently.

§10.77 Failing to act competently.

A practitioner shall not:
(a) Handle a legal matter which the practitioner knows or should know that the practitioner is not competent to handle, without associating with the practitioner another practitioner who is competent to handle it.
(b) Handle a legal matter without preparation adequate in the circumstances.
(c) Neglect a legal matter entrusted to the practitioner.

§10.78 Limiting liability to client.

A practitioner shall not attempt to exonerate himself or herself from, or limit his or her liability to, a client for his or her personal malpractice.

§§10.79-10.82 [reserved]

§10.83 Canon 7.

A practitioner should represent a client zealously within the bounds of the law.

§10.84 Representing a client zealously.

(a) A practitioner shall not intentionally:
(1) Fail to seek the lawful objectives of a client through reasonably available means permitted by law and the Disciplinary Rules, except as provided by paragraph (b) of this section. A practitioner does not violate the provisions of this section, however, by acceding to reasonable requests of opposing counsel which do not prejudice the rights of the client, by being punctual in fulfilling all professional commitments, by avoiding offensive tactics, or by treating with courtesy and consideration all persons involved in the legal process.
(2) Fail to carry out a contract of employment entered into with a client for professional services, but a practitioner may withdraw as permitted under §§10.40, 10.63, and 10.66.
(3) Prejudice or damage a client during the course of a professional relationship, except as required under this part.
(b) In representation of a client, a practitioner may:
(1) Where permissible, exercise professional judgment to waive or fail to assert a right or position of the client.

(2) Refuse to aid or participate in conduct that the practitioner believes to be unlawful, even though there is some support for an argument that the conduct is legal.

§10.85 Representing a client within the bounds of the law.

(a) In representation of a client, a practitioner shall not:
(1) Initiate or defend any proceeding before the Office, assert a position, conduct a defense, delay a trial or proceeding before the Office, or take other action on behalf of the practitioner's client when the practitioner knows or when it is obvious that such action would serve merely to harass or maliciously injure another.
(2) Knowingly advance a claim or defense that is unwarranted under existing law, except that a practitioner may advance such claim or defense if it can be supported by good faith argument for an extension, modification, or reversal of existing law.
(3) Conceal or knowingly fail to disclose that which the practitioner is required by law to reveal.
(4) Knowingly use perjured testimony or false evidence.
(5) Knowingly make a false statement of law or fact.
(6) Participate in the creation or preservation of evidence when the practitioner knows or it is obvious that the evidence is false.
(7) Counsel or assist a client in conduct that the practitioner knows to be illegal or fraudulent.
(8) Knowingly engage in other illegal conduct or conduct contrary to a Disciplinary Rule.
(b) A practitioner who receives information clearly establishing that:
(1) A client has, in the course of the representation, perpetrated a fraud upon a person or tribunal shall promptly call upon the client to rectify the same, and if the client refuses or is unable to do so the practitioner shall reveal the fraud to the affected person or tribunal.
(2) A person other than a client has perpetrated a fraud upon a tribunal shall promptly reveal the fraud to the tribunal.

§10.86 [reserved]

§10.87 Communicating with one of adverse interest.

During the course of representation of a client, a practitioner shall not:
(a) Communicate or cause another to communicate on the subject of the representation with a party the practitioner knows to be represented by another practitioner in that matter unless the practitioner has the prior consent of the other practitioner representing such other party or is authorized by law to do so. It is not improper, however, for a practitioner to encourage a client to meet with an opposing party for settlement discussions.
(b) Give advice to a person who is not represented by a practitioner other than the advice to secure counsel, if the interests of such person are or have a reasonable possibility of being in conflict with the interests of the practitioner's client.

§10.88 Threatening criminal prosecution.

A practitioner shall not present, participate in presenting, or threaten to present criminal charges solely to obtain an advantage in any prospective or pending proceeding before the Office.

§10.89 Conduct in proceedings.

(a) A practitioner shall not disregard or advise a client to disregard any provision of this Subchapter or a decision of the Office made in the course of a proceeding before the Office, but the practitioner may take appropriate steps in good faith to test the validity of such provision or decision.
(b) In presenting a matter to the Office, a practitioner shall disclose:
(1) Controlling legal authority known to the practitioner to be directly adverse to the position of the client and which is not disclosed by opposing counsel or an employee of the Office.
(2) Unless privileged or irrelevant, the identities of the client the practitioner represents and of the persons who employed the practitioner.
(c) In appearing in a professional capacity before a tribunal, a practitioner shall not:
(1) State or allude to any matter that the practitioner has no reasonable basis to believe is relevant to the case or that will not be supported by admissible evidence.
(2) Ask any question that the practitioner has no reasonable basis to believe is relevant to the case and that is intended to degrade a witness or other person.
(3) Assert the practitioner's personal knowledge of the facts in issue, except when testifying as a witness.
(4) Assert the practitioner's personal opinion as to the justness of a cause, as to the credibility of a witness, as to the culpability of a civil litigant, or as to the guilt or innocence of an accused; but the practitioner may argue, on the practitioner's analysis of the evidence, for any position or conclusion with respect to the matters stated herein.
(5) Engage in undignified or discourteous conduct before the Office (see §1.3 of the Subchapter).
(6) Intentionally or habitually violate any provision of this Subchapter or established rule of evidence.

§10.90–10.91 [reserved]

§10.92 Contact with witnesses.

(a) A practitioner shall not suppress any evidence that the practitioner or the practitioner's client has a legal obligation to reveal or produce.
(b) A practitioner shall not advise or cause a person to be secreted or to leave the jurisdiction of a tribunal for the purpose of making the person unavailable as a witness therein.
(c) A practitioner shall not pay, offer to pay, or acquiesce in the payment of compensation to a witness contingent upon the content of the witness' affidavit, testimony or the outcome of the case. But a practitioner may advance, guarantee, or acquiesce in the payment of:
(1) Expenses reasonably incurred by a witness in attending, testifying, or making an affidavit.
(2) Reasonable compensation to a witness for the witness' loss of time in attending, testifying, or making an affidavit.
(3) A reasonable fee for the professional services of an expert witness.

§10.93 Contact with officials.

(a) A practitioner shall not give or lend anything of value to a judge, official, or employee of a tribunal under circumstances which might give the appearance that the gift or loan is made to influence official action.
(b) In an adversary proceeding, including any *inter partes* proceeding before the Office, a practitioner shall not communicate, or cause another to communicate, as to the merits of the cause with a judge, official, or Office employee before whom the proceeding is pending, except:
(1) In the course of official proceedings in the cause.
(2) In writing if the practitioner promptly delivers a copy of the writing to opposing counsel or to the adverse party if the adverse party is not represented by a practitioner.
(3) Orally upon adequate notice to opposing counsel or to the adverse party if the adverse party is not represented by a practitioner.

(4) As otherwise authorized by law.

§§10.94-10.99 [reserved]

§10.100 Canon 8.

A practitioner should assist in improving the legal system.

§10.101 Action as a public official.

(a) A practitioner who holds public office shall not:
(1) Use the practitioner's public position to obtain, or attempt to obtain, a special advantage in legislative matters for the practitioner or for a client under circumstances where the practitioner knows or it is obvious that such action is not in the public interest.
(2) Use the practitioner's public position to influence, or attempt to influence, a tribunal to act in favor of the practitioner or of a client.
(3) Accept any thing of value from any person when the practitioner knows or it is obvious that the offer is for the purpose of influencing the practitioner's action as a public official.
(b) A practitioner who is an officer or employee of the United States shall not practice before the Office in patent cases except as provided in §10.6(d).

§10.102 Statements concerning officials.

(a) A practitioner shall not knowingly make false statements of fact concerning the qualifications of a candidate for election or appointment to a judicial office or to a position in the Office.
(b) A practitioner shall not knowingly make false accusations against a judge, other adjudicatory officer, or employee of the Office.

§10.103 Practitioner candidate for judicial office.

A practitioner who is a candidate for judicial office shall comply with applicable provisions of law.

§10.104-10.109 [reserved]

§10.110 Canon 9.

A practitioner should avoid even the appearance of professional impropriety.

§10.111 Avoiding even the appearance of impropriety.

(a) A practitioner shall not accept private employment in a matter upon the merits of which he or she has acted in a judicial capacity.
(b) A practitioner shall not accept private employment in a matter in which he or she had personal responsibility while a public employee.
(c) A practitioner shall not state or imply that the practitioner is able to influence improperly or upon irrelevant grounds any tribunal, legislative body, or public official.

§10.112 Preserving identity of funds and property of client.

(a) All funds of clients paid to a practitioner or a practitioner's firm, other than advances for costs and expenses, shall be deposited in one or more identifiable bank accounts maintained in the United States or, in the case of a practitioner having an office in a foreign country or registered under §10.6(c), in the United States or the foreign country.
(b) No funds belonging to the practitioner or the practitioner's firm shall be deposited in the bank accounts required by paragraph (a) of this section except as follows:
(1) Funds reasonably sufficient to pay bank charges may be deposited therein.
(2) Funds belonging in part to a client and in part presently or potentially to the practitioner or the practitioner's firm must be deposited therein, but the portion belonging to the practitioner or the practitioner's firm may be withdrawn when due unless the right of the practitioner or the practitioner's firm to receive it is disputed by the client, in which event the disputed portion shall not be withdrawn until the dispute is finally resolved.
(c) A practitioner shall:
(1) Promptly notify a client of the receipt of the client's funds, securities, or other properties.
(2) Identify and label securities and properties of a client promptly upon receipt and place them in a safe deposit box or other place of safekeeping as soon as practicable.
(3) Maintain complete records of all funds, securities, and other properties of a client coming into the possession of the practitioner and render appropriate accounts to the client regarding the funds, securities, or other properties.
(4) Promptly pay or deliver to the client as requested by a client the funds, securities, or other properties in the possession of the practitioner which the client is entitled to receive.
(OMB Control No. 0651-0017)

§§10.113-10.129 [reserved]

Investigations and Disciplinary Proceedings

§10.130 Reprimand, suspension or exclusion.

(a) The Commissioner may, after notice and opportunity for a hearing, (a) reprimand or (b) suspend or exclude, either generally or in any particular case, any individual, attorney, or agent shown to be incompetent or disreputable, who is guilty of gross misconduct, or who violates a Disciplinary Rule.
(b) Petitions to disqualify a practitioner in *ex parte* or *inter partes* cases in the Office are not governed by §§10.130 through 10.170 and will be handled on a case-by-case basis under such conditions as the Commissioner deems appropriate.

§10.131 Investigations.

(a) The Director is authorized to investigate possible violations of Disciplinary Rules by practitioners. See §10.2(b) (2).
(b) Practitioners shall report and reveal to the Director any knowledge or evidence required by §10.24. A practitioner shall cooperate with the Director in connection with any investigation under paragraph (a) of this section and with officials of the Office in connection with any disciplinary proceeding instituted under §10.132(b).
(c) Any non-practitioner possessing knowledge or information concerning a violation of a Disciplinary Rule by a practitioner may report the violation to the Director. The Director may require that the report be presented in the form of an affidavit.

§10.132 Initiating a disciplinary proceeding; reference to an administrative law judge.

(a) If after conducting an investigation under §10.131(a) the Director is of the opinion that a practitioner has violated a Disciplinary Rule, the Director shall after complying where necessary with the provisions of 5 U.S.C. 558(c), call a meeting of the Committee on Discipline. The Committee on Discipline shall then determine as specified in §10.4(b) whether a disciplinary proceeding shall be instituted under paragraph (b) of this section.
(b) If the Committee on Discipline determines that probable cause exists to believe that a practitioner has violated a Disciplinary Rule, the Director shall institute a disciplinary proceeding by filing a complaint under

§10.134. The complaint shall be filed in the Office of the Director. A disciplinary proceeding may result in:
(1) a reprimand or
(2) suspension or exclusion of a practitioner from practice before the Office.
(c) Upon the filing of a complaint under §10.134, the Commissioner will refer the disciplinary proceeding to an administrative law judge.

§10.133 Conference between Director and practitioner; resignation.

(a) *General.* The Director may confer with a practitioner concerning possible violations by the practitioner of a Disciplinary Rule whether or not a disciplinary proceeding has been instituted.
(b) *Resignation.* Any practitioner who is the subject of an investigation under §10.131 or against whom a complaint has been filed under §10.134 may resign from practice before the Office only by submitting with the Director an affidavit stating his or her desire to resign.
(c) If filed prior to the date set by the administrative law judge for a hearing, the affidavit shall state that:
(1) the resignation is freely and voluntarily proferred;
(2) the practitioner is not acting under duress or coersion from the Office;
(3) the practitioner is fully aware of the implications of filing the resignation;
(4) the practitioner is aware (i) of a pending investigation or (ii) of charges arising from the complaint alleging that he or she is guilty of a violation of the Patent and Trademark Office Code of Professional Responsibility, the nature of which shall be set forth by the practitioner to the satisfaction of the Director;
(5) the practitioner acknowledges that, if and when he or she applies for reinstatement under §10.160, the Director will conclusively presume, for the limited purpose of determining the application for reinstatement, that:
(i) the facts upon which the complaint is based are true and
(ii) the practitioner could not have successfully defended himself or herself against (A) charges predicated on the violation under investigation or (B) charges set out in the complaint filed against the practitioner.
(d) If filed on or after the date set by the administrative law judge for a hearing, the affidavit shall make the statements required by subparagraphs (1) through (4) of paragraph (b) of this section and shall state that:
(1) the practitioner acknowledges the facts upon which the complaint is based are true; and
(2) the resignation is being submitted because the practitioner could not successfully defend himself or herself against (i) charges predicated on the violation under investigation or (ii) charges set out in the complaint.
(e) When an affidavit under paragraph (b) or (c) of this section is received while an investigation is pending, the Commissioner shall enter an order excluding the practitioner "on consent." When an affidavit under paragraphs (b) or (c) of this section is received after a complaint under §10.134 has been filed, the Director shall notify the administrative law judge. The administrative law judge shall enter an order transferring the disciplinary proceeding to the Commissioner and the Commissioner shall enter an order excluding the practitioner "on consent."
(f) Any practitioner who resigns from practice before the Office under this section and who intends to reapply for admission to practice before the Office must comply with the provisions of §10.158.
(g) Settlement. Before or after a complaint is filed under §10.134, a settlement conference may occur between the Director and a practitioner for the purpose of settling any disciplinary matter. If an offer of settlement is made by the Director or the practitioner and is not accepted by the other, no reference to the offer of settlement or its refusal shall be admissible in evidence in the disciplinary proceeding unless both the Director and the practitioner agree in writing.

§10.134 Complaint.

(a) A complaint instituting a disciplinary proceeding shall:
(1) Name the practitioner, who may then be referred to as the "respondent."
(2) Give a plain and concise description of the alleged violations of the Disciplinary Rules by the practitioner.
(3) State the place and time for filing an answer by the respondent.
(4) State that a decision by default may be entered against the respondent if an answer is not timely filed.
(5) Be signed by the Director.
(b) A complaint will be deemed sufficient if it fairly informs the respondent of any violation of the Disciplinary Rules which form the basis for the disciplinary proceeding so that the respondent is able to adequately prepare a defense.

§10.135 Service of complaint.

(a) A complaint may be served on a respondent in any of the following methods:
(1) By handing a copy of the complaint personally to the respondent, in which case the individual handing the complaint to the respondent shall file an affidavit with the Director indicating the time and place the complaint was handed to the respondent.
(2) By mailing a copy of the complaint by "Express Mail" or first-class mail to:
(i) a registered practitioner at the address for which separate notice was last received by the Director or
(ii) a non-registered practitioner at the last address for the respondent known to the Director.
(3) By any method mutually agreeable to the Director and the respondent.
(b) If a complaint served by mail under paragraph (a)(2) of this section is returned by the U.S. Postal Service, the Director shall mail a second copy of the complaint to the respondent. If the second copy of the complaint is also returned by the U.S. Postal Service, the Director shall serve the respondent by publishing an appropriate notice in the *Official Gazette* for four consecutive weeks, in which case the time for answer shall be at least thirty days from the fourth publication of the notice.
(c) If a respondent is a registered practitioner, the Director may serve simultaneously with the complaint a letter under §10.11(b). The Director may require the respondent to answer the §10.11(b) letter within a period of not less than 15 days. An answer to the §10.11(b) letter shall constitute proof of service. If the respondent fails to answer the §10.11(b) letter, his or her name will be removed from the register as provided by §10.11(b).
(d) If the respondent is represented by an attorney under §10.140(a), a copy of the complaint shall also be served on the attorney.

§10.136 Answer to complaint.

(a) *Time for answer.* An answer to a complaint shall be filed within a time set in the complaint which shall be not less than thirty days.
(b) *With whom filed.* The answer shall be filed in writing with the administrative law judge. The time for filing an answer may be extended once for a period of no more than thirty days by the administrative law judge upon a showing of good cause provided a motion requesting an extension of time is filed within thirty days after the date the complaint is filed by the Director. A copy of the answer shall be served on the Director.
(c) *Content.* The respondent shall include in the answer a statement of the facts which constitute the grounds of defense and shall specifically admit or deny each allegation set forth in the complaint. The respondent shall not deny a material allegation in the complaint which the respondent knows to be true or state that respondent is without sufficient information to form a belief as to the truth of an allegation when in fact the respondent possesses that information. The respondent shall also state affirmatively special matters of defense.
(d) *Failure to deny allegations in complaint.* Every allegation in the complaint which is not denied by a respondent in the answer is deemed to be admitted and may be considered proven. No further evidence in respect of that allegation need be received by the administrative law judge at any hearing. Failure to timely file an answer will constitute an admission of the allegations in the complaint.
(e) *Reply by Director.* No reply to an answer is required by the Director and any affirmative defense in the answer shall be deemed to be denied. The Director may, however, file a reply if he or she chooses or if ordered by the adminstrative law judge.

§10.137 Supplemental complaint.

False statements in an answer may be made the basis of a supplemental complaint.

§10.138 Contested case.

Upon the filing of an answer by the respondent, a disciplinary proceeding shall be regarded as a contested case within the meaning of 35 U.S.C. 24. Evidence obtained by a subpoena issued under 35 U.S.C. 24 shall not be admitted into the record or considered unless leave to proceed under 35 U.S.C. 24 was previously authorized by the administrative law judge.

§10.139 Administrative law judge; appointment; responsibilities; review of interlocutory orders; stays.

(a) *Appointment.* An administrative law judge, appointed under 5 U.S.C. 3105, shall conduct disciplinary proceedings as provided by this part.
(b) *Responsibilities.* The administrative law judge shall have authority to:
(1) Administer oaths and affirmations;
(2) Make rulings upon motions and other requests;
(3) Rule upon offers of proof, receive relevant evidence, and examine witnesses;
(4) Authorize the taking of a deposition of a witness in lieu of personal appearance of the witness before the adminstrative law judge;
(5) Determine the time and place of any hearing and regulate its course and conduct;
(6) Hold or provide for the holding of conferences to settle or simplify the issues;
(7) Receive and consider oral or written arguments on facts or law;
(8) Adopt procedures and modify procedures from time to time as occasion requires for the orderly disposition of proceedings;
(9) Make initial decisions under §10.154; and
(10) Perform acts and take measures as necessary to promote the efficient and timely conduct of any disciplinary proceeding.
(c) *Time for making initial decision.* The administrative law judge shall set times and exercise control over a disciplinary proceeding such that an initial decision under §10.154 is normally issued within six months of the date a complaint is filed. The administrative law judge may, however, issue an initial decision more than six months after a complaint is filed if in his or her opinion there exist unusual circumstances which preclude issuance of an initial decision within six months of the filing of the complaint.
(d) *Review of interlocutory orders.* An interlocutory order of an administrative law judge will not be reviewed by the Commissioner except:
(1) when the administrative law judge shall be of the opinion (i) that the interlocutory order involves a controlling question of procedure or law as to which there is a substantial ground for a difference of opinion and (ii) that an immediate decision by the Commissioner may materially advance the ultimate termination of the disciplinary proceeding or
(2) in an extraordinary situation where justice requires review.
(e) *Stays pending review of interlocutory order.* If the Director or a respondent seeks review of an interlocutory order of an administrative law judge under paragraph (b)(2) of this section, any time period set for taking action by the administrative law judge shall not be stayed unless ordered by the Commissioner or the administrative law judge.

§10.140 Representative for Director or respondent.

(a) A respondent may be represented before the Office in connection with an investigation or disciplinary proceeding by an attorney. The attorney shall file a written declaration that he or she is an attorney within the meaning of §10.1(c) and shall state:
(1) the address to which the attorney wants correspondence related to the investigation or disciplinary proceeding sent and
(2) a telephone number where the attorney may be reached during normal business hours.
(b) The Commissioner shall designate at least two associate solicitors in the Office of the Solicitor to act as representatives for the Director in disciplinary proceedings. In prosecuting disciplinary proceedings, the designated associate solicitors shall not involve the Solicitor or the Deputy Solicitor. The Solicitor and the Deputy Solicitor shall remain insulated from the investigation and prosecution of all disciplinary proceedings in order that they shall be available as counsel to the Commissioner in deciding disciplinary proceedings.

§10.141 Filing of papers.

(a) The provisions of §1.8 of this Subchapter do not apply to disciplinary proceedings.
(b) All papers filed after the complaint and prior to entry of an initial decision by the administrative law judge shall be filed with the administrative law judge at an address or place designated by the administrative law judge. All papers filed after entry of an initial decision by the administrative law judge shall be filed with the Director. The Director shall promptly forward to the Commissioner any paper which requires action under this part by the Commissioner.
(c) The administrative law judge or the Director may provide for filing papers and other matter by hand or by "Express Mail."

§10.142 Service of papers.

(a) All papers other than a complaint shall be served on a respondent represented by an attorney by:
(1) delivering a copy of the paper to the office of the attorney; or
(2) mailing a copy of the paper by first-class mail or "Express Mail" to the attorney at the address provided by the attorney under §10.140(a) (1); or
(3) any other method mutually agreeable to the attorney and a representative for the Director.
(b) All papers other than a complaint shall be served on a respondent who is not represented by an attorney by:
(1) delivering a copy of the paper to the respondent; or
(2) mailing a copy of the paper by first-class mail or "Express Mail" to the respondent at the address to which a complaint may be served or such other address as may be designated in writing by the respondent; or
(3) any other method mutually agreeable to the respondent and a representative of the Director.
(c) A respondent shall serve on the representative for the Director one copy of each paper filed with the administrative law judge or the Director. A paper may be served on the representative for the Director by:

(1) delivering a copy of the paper to the representative; or
(2) mailing a copy of the paper by first-class mail or "Express Mail" to an address designated in writing by the representative; or
(3) any other method mutually agreeable to the respondent and the representative.
(d) Each paper filed in a disciplinary proceeding shall contain therein a certificate of service indicating:
(1) the date on which service was made and
(2) the method by which service was made.
(e) The administrative law judge or the Commissioner may require that a paper be served by hand or by "Express Mail."
(f) Service by mail is completed when the paper mailed in the United States is placed into the custody of the U.S. Postal Service.

§10.143 Motions.

Motions may be filed with the administrative law judge. The adminstrative law judge will determine on a case-by-case basis the time period for response to a motion and whether replies to responses will be authorized. No motion shall be filed with the administrative law judge unless such motion is supported by a written statement by the moving party that the moving party or attorney for the moving party has conferred with the opposing party or attorney for the opposing party in an effort in good faith to resolve by agreement the issues raised by the motion and has been unable to reach agreement. If issues raised by a motion are resolved by the parties prior to a decision on the motion by the administrative law judge, the parties shall promptly notify the administrative law judge.

§10.144 Hearings.

(a) The administrative law judge shall preside at hearings in disciplinary proceedings. Hearings will be stenographically recorded and transcribed and the testimony of witnesses will be received under oath or affirmation. The administrative law judge shall conduct hearings in accordance with 5 U.S.C. 556. A copy of the transcript of the hearing shall become part of the record. A copy of the transcript shall be provided to the Director and the respondent at the expense of the Office.
(b) If the respondent to a disciplinary proceeding fails to appear at the hearing after a notice of hearing has been given by the administrative law judge, the administrative law judge may deem the respondent to have waived the right to a hearing and may proceed with the hearing in the absence of the respondent.
(c) A hearing under this section will not be open to the public except that the Director may grant a request by a respondent to open his or her hearing to the public and make the record of the disciplinary proceeding available for public inspection, *provided* agreement is reached in advance to exclude from public disclosure information which is privileged or confidential under applicable laws or regulations. If a disciplinary proceeding results in disciplinary action against a practitioner, and subject to §10.159(c), the record of the entire disciplinary proceeding, including any settlement agreement, will be available for public inspection.

§10.145 Proof; variance; amendment of pleadings.

In case of a variance between the evidence and the allegations in a complaint, answer, or reply, if any, the administrative law judge may order or authorize amendment of the complaint, answer, or reply to conform to the evidence. Any party who would otherwise be prejudiced by the amendment will be given reasonable opportunity to meet the allegations in the complaint, answer, or reply, as amended, and the administrative law judge shall make findings on any issue presented by the complaint, answer, or reply as amended.

§§10.146-10.148 [reserved]

§10.149 Burden of proof.

In a disciplinary proceeding, the Director shall have the burden of proving his or her case by clear and convincing evidence and a respondent shall have the burden of providing any affirmative defense by clear and convincing evidence.

§10.150 Evidence.

(a) *Rules of evidence.* The rules of evidence prevailing in courts of law and equity are not controlling in hearings in disciplinary proceedings. However, the administrative law judge shall exclude evidence which is irrelevant, immaterial, or unduly repetitious.
(b) *Depositions.* Depositions of witnesses taken pursuant to §10.151 may be admitted as evidence.
(c) *Government documents.* Official documents, records, and papers of the Office are admissible without extrinsic evidence of authenticity. These documents, records and papers may be evidenced by a copy certified as correct by an employee of the Office.
(d) *Exhibits.* If any document, record, or other paper is introduced in evidence as an exhibit, the administrative law judge may authorize the withdrawal of the exhibit subject to any conditions the administrative law judge deems appropriate.
(e) *Objections.* Objections to evidence will be in short form, stating the grounds of objection. Objections and rulings on objections will be a part of the record. No exception to the ruling is necessary to preserve the rights of the parties.

§10.151 Depositions.

(a) Depositions for use at the hearing in lieu of personal appearance of a witness before the administrative law judge may be taken by respondent or the Director upon a showing of good cause and with the approval of, and under such conditions as may be deemed appropriate by, the administrative law judge. Depositions may be taken upon oral or written questions, upon not less than ten days written notice to the other party, before any officer authorized to administer an oath or affirmation in the place where the deposition is to be taken. The requirement of ten days notice may be waived by the parties and depositions may then be taken of a witness and at a time and place mutually agreed to by the parties. When a deposition is taken upon written questions, copies of the written questions will be served upon the other party with the notice and copies of any written cross-questions will be served by hand or "Express Mail" not less then five days before the date of the taking of the deposition unless the parties mutually agree otherwise. A party on whose behalf a deposition is taken shall file a copy of a transcript of the deposition signed by a court reporter with the administrative law judge and shall serve one copy upon the opposing party. Expenses for a court reporter and preparing, serving, and filing depositions shall be borne by the party at whose instance the deposition is taken.
(b) When the Director and the respondent agree in writing, a deposition of any witness who will appear voluntarily may be taken under such terms and conditions as may be mutually agreeable to the Director and the respondent. The deposition shall not be filed with the administrative law judge and may not be admitted in evidence before the administrative law judge unless he or she orders the deposition admitted in evidence. The admissibility of the deposition shall lie within the discretion of the administrative law judge who may reject the deposition on any reasonable basis including the fact that demeanor is involved and that the witness should have been called to appear personally before the administrative law judge.

§10.152 Discovery.

Discovery shall not be authorized except as follows:
(a) After an answer is filed under §10.136 and when a party establishes in a clear and convincing manner that discovery is necessary and relevant, the administrative law judge, under such conditions as he or she deems appropriate, may order an opposing party to:
(1) answer a reasonable number of written requests for admission or interrogatories;
(2) produce for inspection and copying a reasonable number of documents; and
(3) produce for inspection a reasonable number of things other than documents.
(b) Discovery shall not be authorized under paragraph (a) of this section of any matter which:
(1) will be used by another party solely for impeachment or cross-examination;
(2) is not available to the party under 35 U.S.C. §122;
(3) relates to any disciplinary proceeding commenced in the Patent and Trademark Office prior to Mar. 8, 1985;
(4) relates to experts except as the administrative law judge may require under paragraph (e) of this section.
(5) is privileged; or
(6) relates to mental impressions, conclusions, opinions, or legal theories of any attorney or other representative of a party.
(c) the administrative law judge may deny discovery requested under paragraph (a) of this section if the discovery sought:
(1) will unduly delay the disciplinary proceeding;
(2) will place an undue burden on the party required to produce the discovery sought; or
(3) is available (i) generally to the public, (ii) equally to the parties; or (iii) to the party seeking the discovery through another source.
(d) Prior to authorizing discovery under paragraph (a) of this section, the administrative law judge shall require the party seeking discovery to file a motion (§10.143) and explain in detail for each request made how the discovery sought is necessary and relevant to an issue actually raised in the complaint or the answer.
(e) The administrative law judge may require parties to file and serve, prior to any hearing, a pre-hearing statement which contains

(1) A list (together with a copy) of all proposed exhibits to be used in connection with a party's case-in-chief,
(2) a list of proposed witnesses,
(3) as to each proposed expert witness:
(i) an identification of the field in which the individual will be qualified as an expert;
(ii) a statement as to the subject matter on which the expert is expected to testify; and
(iii) a statement of the substance of the facts and opinions to which the expert is expected to tesify,
(4) the identity of government employees who have investigated the case, and
(5) copies of memoranda reflecting respondent's own statements to administrative representatives.

(f) After a witness testifies for a party, if the opposing party requests, the party may be required to produce, prior to cross-examination, any written statement made by the witness.

§10.153 Proposed findings and conclusions; post-hearing memorandum.

Except in cases when the respondent has failed to answer the complaint, the administrative law judge, prior to making an initial decision, shall afford the parties a reasonable opportunity to submit proposed findings and conclusions and a post-hearing memorandum in support of the proposed findings and conclusions.

§10.154 Initial decision of administrative law judge.

(a) The administrative law judge shall make an initial decision in the case. The decision will include (a) a statement of findings and conclusions, as well as the reasons or basis therefore with appropriate references to the record, upon all the material issues of fact, law, or discretion presented on the record, and (b) an order of suspension or exclusion from practice, an order of reprimand, or an order dismissing the complaint. The administrative law judge shall file the decision with the Director and shall transmit a copy to the representative of the Director and to the respondent. In the absence of an appeal to the Commissioner, the decision of the administrative law judge will, without further proceedings, become the decision of the Commissioner of Patents and Trademarks thirty (30) days from the date of the decision of the administrative law judge.
(b) The initial decision of the administrative law judge shall explain the reason for any penalty of reprimand, suspension or exclusion. In determining any penalty, the following should normally be considered:
(1) the public interest;
(2) the seriousness of the violation of the Disciplinary Rule;
(3) the deterrent effects deemed necessary; and
(4) the integrity of the legal profession; and
(5) any extenuating circumstances.

§10.155 Appeal to the Commissioner.

(a) Within thirty (30) days from the date of the initial decision of the administrative law judge under §10.154, either party may appeal to the Commissioner. An appeal by the respondent will be filed with the Director in duplicate and will include exceptions to the decisions of the administrative law judge and supporting reasons for those exceptions. If the Director files the appeal, the Director shall serve a copy of the appeal. Within thirty (30) days after receipt of an appeal or copy thereof, the other party may file a reply brief in duplicate with the Director. If the Director files the reply brief, the Director shall serve a copy of the reply brief. Upon the filing of an appeal and a reply brief, if any, the Director shall transmit the entire record to the Commissioner.
(b) The appeal will be decided by the Commissioner on the record made before the administrative law judge.
(c) The Commissioner may order reopening of a disciplinary proceeding in accordance with the principles which govern the granting of new trials. Any request to reopen a disciplinary proceeding on the basis of newly discovered evidence must demonstrate that the newly discovered evidence could not have been discovered by due diligence.

§10.156 Decision of the Commissioner.

(a) An appeal from an initial decision of the administrative law judge shall be decided by the Commissioner. The Commissioner may affirm, reverse, or modify the initial decision or remand the matter to the administrative law judge for such further proceedings as the Commissioner may deem appropriate. Entry of a decision by the Commissioner is a final agency action in a disciplinary proceeding. In making a final decision, the Commissioner shall review the record or those portions of the record as may be cited by the parties in order to limit the issues. The Comissioner shall tranmit a copy of the final decision to the Director and to the respondent.
(b) A final decision of the Commissioner may dismiss a disciplinary proceeding, reprimand a practitioner, or may suspend or exclude the practitioner from practice before the Office.

§10.157 Review of Commissioner's final decision.

(a) Review of the Commissioner's final decision in a disciplinary case may be had by a petition filed in the United States District Court for the District of Colum-

bia. See 35 U.S.C. 32 and Local Rule 1-26 of the United States District Court for the District of Columbia.

(b) The Commissioner may stay a final decision pending review of the Commissioner's final decision.

§10.158 Suspended or excluded practitioner.

(a) A practitioner who is suspended or excluded from practice before the Office under §10.156(b) shall not engage in unauthorized practice of patent, trademark and other non-patent law before the Office.

(b) Unless otherwise ordered by the Commissioner, any practitioner who is suspended or excluded from practice before the Office under §10.156(b) shall:

(1) Within 30 days of entry of the order of suspension or exclusion, notify all bars of which he or she is a member and all clients of the practitioner for whom he or she is handling matters before the Office in separate written communications of the suspension or exclusion and shall file a copy of each written communication with the Director.

(2) Within 30 days of entry of the order of suspension or exclusion, surrender a client's active Office case files to (i) the client or (ii) another practitioner designated by the client.

(3) Not hold himself or herself out as authorized to practice law before the Office.

(4) Promptly take any necessary and appropriate steps to remove from any telephone, legal, or other directory any advertisement, statement, or representation which would reasonably suggest that the practitioner is authorized to practice patent, trademark or other non-patent law before the Office, and within 30 days of taking those steps, file with the Director an affidavit describing the precise nature of the steps taken.

(5) Not advertise the practitioner's availability or ability to perform or render legal services for any person having immediate, prospective, or pending business before the Office.

(6) Not render legal advice or services to any person having immediate, prospective, or pending business before the Office as to that business.

(7) Promptly take steps to change any sign identifying a practitioner's or the practitioner's firm's office and the practitioner's or the practitioner's firm's stationary to delete therefrom any advertisement, statement, or representation which would reasonably suggest that the practitioner is authorized to practice law before the Office.

(8) Within 30 days, return to any client any unearned funds, including any unearned retainer fee, and any securities and property of the client.

(c) A practitioner who is suspended or excluded from practice before the Office and who aides another practitioner in any way in the other practitioner's practice of law before the Office, may, under the direct supervision of the other practitioner, act as a para-legal for the other practitioner or perform other services for the other practitioner which are normally performed by lay-persons, *provided:*

(1) the practitioner who is suspended or excluded is:

(i) a salaried employee of:

(A) the other practitioner;

(B) the other practitioner's law firm; or

(C) a client-employer who employs the other practitioner as a salaried employee;

(2) the other practitioner assumes full professional responsibility to any client and the Office for any work performed by the suspended or excluded practitioner for the other practitioner;

(3) the suspended or excluded practitioner, in connection with any immediate, prospective, or pending business before the Office, does not:

(i) communicate directly in writing, orally, or otherwise with a client of the other practitioner;

(ii) render any legal services to a client of the other practitioner; or

(iii) meet in person or in the presence of the other practitioner with:

(A) any Office official in connection with the prosecution of any patent, trademark, or other case;

(B) any client of the other practitioner, the other practioner's law firm, or the client-employer of the other practitioner;

(C) any witness or potential witness which the other practitioner, the other practitioner's law firm, or the other practitioner's client-employer may or intends to call as a witness in any proceeding before the Office. The term "witness" includes individuals who will testify orally in a proceeding before, or sign an affidavit or any other document to be filed in, the Office.

(d) When a suspended or excluded practitioner acts as a para-legal or performs services under paragraph (c) of this section, the suspended or excluded practitioner shall not thereafter be reinstated to practice before the Office unless:

(1) the suspended or excluded practitioner shall have filed with the Director an affidavit which (i) explains in detail the precise nature of all para-legal or other services performed by the suspended or excluded practitioner and (ii) shows by clear and convincing evidence that the suspended or excluded practitioner has complied with the provisions of this section and all Disciplinary Rules, and

(2) the other practitioner shall have filed with the Director a written statement which (i) shows that the other practitioner has read the affidavit required by subparagraph (d) (1) of this section and that the other practitioner believes every statement in the affidavit to be true and (ii) states why the other practitioner believes that the suspended or excluded practitioner has complied with paragraph (c) of this section.

§10.159 Notice of suspension or exclusion.

(a) Upon issuance of a final decision reprimanding a practitioner or suspending or excluding a practitioner from practice before the Office, the Director shall give notice of the final decision to appropriate employees of the Office and to interested departments, agencies, and courts of the United States. The Director shall also give notice to appropriate authorities of any State in which a practitioner is known to be a member of the bar and any appropriate bar association.

(b) The Director shall cause to be published in the *Official Gazette* the name of any practitioner suspended or excluded from practice. Unless otherwise ordered by the Commissioner, the Director shall publish in the *Official Gazette* the name of any practitioner reprimanded by the Commissioner.

(c) The Director shall maintain records, which shall be available for public inspection, of every disciplinary proceeding where a practitioner is reprimanded, suspended, or excluded unless the Commissioner orders that the proceeding be kept confidential.

§10.160 Petition for reinstatement.

(a) A petition for reinstatement of a practitioner suspended for a period of less than five years will not be considered until the period of suspension has passed.

(b) A petition for reinstatement of a practitioner excluded from practice will not be considered until five years after the effective date of the exclusion.

(c) An individual who has resigned under §10.133 or who has been suspended or excluded may file a petition for reinstatement. The Director may grant a petition for reinstatement when the individual makes a clear and convincing showing that the individual will conduct himself or herself in accordance with the regulations of this part and that granting a petition for reinstatement is not contrary to the public interest. As a condition to reinstatement, the Director may require the individual to:

(1) meet the requirements of §10.7, including taking and passing an examination under §10.7(b) and

(2) pay all or a portion of the costs and expenses, not to exceed $1,500, of the disciplinary proceeding which lead to suspension or exclusion.

(d) Any suspended or excluded practitioner who has violated the provisions of §10.158 during his or her period of suspension or exclusion shall not be entitled to reinstatement until such time as the Director is satisfied that a period of suspension equal in time to that ordered by the Commissioner or exclusion for five years has passed during which the suspended or excluded practitioner has complied with the provisions of §10.158.

(e) Proceedings on any petition for reinstatement shall be open to the public. Before reinstating any suspended or excluded practitioner, the Director shall publish in the *Official Gazette* a notice of the suspended or excluded practitioner's petition for reinstatement and shall permit the public a reasonable opportunity to comment or submit evidence with respect to the petition for reinstatement.

§10.161 Savings clause.

(a) A disciplinary proceeding based on conduct engaged in prior to the effective date of these regulations may be instituted subsequent to such effective date, if such conduct would continue to justify suspension or exclusion under the provisions of this part.

(b) No practitioner shall be subject to a disciplinary proceeding under this part based on conduct engaged in before the effective date hereof if such conduct would not have been subject to disciplinary action before such effective date.

§10.162-10.169 [reserved]

§10.170 Suspension of rules.

(a) In an extraordinary situation, when justice requires, any requirement of the regulations of this part which is not a requirement of the statutes may be suspended or waived by the Commissioner or the Commissioner's designee, *sua sponte,* or on petition of any party, including the Director or the Director's representative, subject to such other requirements as may be imposed.

(b) Any petition under this section will not stay a disciplinary proceeding unless ordered by the Commissioner or an administrative law judge.

Dec. 21, 1984. GERALD J. MOSSINGHOFF
Commissioner of Patents and Trademarks

[1052 OG 4]

(156) Patent Cooperation Treaty (PCT) Update

Accession to the Patent Cooperation Treaty (PCT) by Barbados, ratification of the PCT by Italy and listing of PCT Member Countries.

The United States Patent and Trademark Office has received notification from the World Intellectual Property Organization (WIPO) that Barbados deposited its instrument of accession to the PCT on 12 Dec. 1984. Therefore, according to PCT Article 63(2), Barbados may be designated in international applications filed on and after 12 Mar. 1985.

The Office also received notification from WIPO that Italy deposited its instrument of ratification to the PCT on 28 Dec. 1984. Therefore, Italy may be designated in international applications filed on and after 28 Mar. 1985. It should be noted that only regional patent protection through the European Patent Office will be available for PCT applications designating Italy. Applicants who wish to secure an Italian national patent must file directly with the Italian Patent Office.

The entry into force of the PCT for Italy is of particular importance since it has the consequence that, as from 28 Mar. 1985, all countries party to the European Patent Convention (Austria, Belgium, France, Germany (Federal Republic of), Italy, Liechtenstein, Luxembourg, the Netherlands, Sweden, Switzerland and the United Kingdom) will also be party to the PCT. This opens the possibility of obtaining, by filing a single international application under the PCT, a European patent for all those countries with the same rights as would be conferred by a national patent granted in each country. Currently, about 5000 designations of Italy are made by applicants from the United States in European patent applications each year.

Listing of PCT Member Countries

	Country	Ratification or Accession	Date of Ratification or Accession	Date from which Country may be Designated
(1)	Central African Republic*	Accession	15 September 1971	01 June 1978
(2)	Senegal*	Ratification	08 March 1972	01 June 1978
(3)	Madagascar	Ratification	27 March 1972	01 June 1978
(4)	Malawi	Accession	16 May 1972	01 June 1978
(5)	Cameroon*	Accession	15 March 1973	01 June 1978
(6)	Chad*	Accession	12 February 1974	01 June 1978
(7)	Togo*	Ratification	28 January 1975	01 June 1978
(8)	Gabon*	Accession	06 March 1975	01 June 1978
(9)	United States of America	Ratification	26 November 1975	01 June 1978
(10)	Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11)	Congo*	Accession	06 August 1977	01 June 1978
(12)	Switzerland**	Ratification	14 September 1977	01 June 1978
(13)	United Kingdom**	Ratification	24 October 1977	01 June 1978
(14)	France**	Ratification	25 November 1977	01 June 1978
(15)	Soviet Union	Ratification	29 December 1977	01 June 1978
(16)	Brazil	Ratification	09 January 1978	01 June 1978
(17)	Luxembourg**	Ratification	31 January 1978	01 June 1978
(18)	Sweden**	Ratification	17 February 1978	01 June 1978
(19)	Japan	Ratification	01 July 1978	01 October 1978
(20)	Denmark	Ratification	01 September 1978	01 December 1978
(21)	Austria**	Ratification	23 January 1979	23 April 1979
(22)	Monaco	Ratification	22 March 1979	22 June 1979
(23)	Netherlands**	Ratification	10 April 1979	10 July 1979
(24)	Romania	Accession	23 April 1979	23 July 1979
(25)	Norway	Radification	01 October 1979	01 January 1980

(25)	Norway						
(26)	Liechtenstein**	Accession	19	December 1979	19	March 1980	
(27)	Australia	Accession	31	December 1979	31	March 1980	
(28)	Hungary	Ratification	27	March 1980	27	June 1980	
(29)	Democratic People's Republic of Korea (North Korea)	Accession	08	April 1980	08	July 1980	
(30)	Finland	Ratification	01	July 1980	01	October 1980	
(31)	Belgium**	Ratification	14	September 1981	14	December 1981	
(32)	Sri Lanka	Accession	26	November 1981	26	February 1982	
(33)	Mauritania*	Accession	13	January 1983	13	April 1983	
(34)	Sudan	Accession	16	January 1984	16	April 1984	
(35)	Bulgaria	Accession	21	February 1984	21	May 1984	
(36)	Republic of Korea (South Korea)	Accession	10	May 1984	10	August 1984	
(37)	Mali*	Accession	19	July 1984	19	October 1984	
(38)	Barbados	Accession	12	December 1984	12	March 1985	
(39)	Italy**	Ratification	28	December 1984	28	March 1985	

* Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI member countries. A designation of any country is an indication that all OAPI countries have been designated. Note: Only one designation fee is due regardless of the number of OAPI member countries designated.

**Member of European Patent Convention (EPC) regional patent system. Either national patents or European patents for member countries are available through PCT, except for France, Belgium and Italy, for which only European patents are available if PCT is used. Note: Only one PCT designation fee is due if European regional patent protection is sought for one, several or all EPC member countries.

Feb. 4, 1985.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

[1052 OG 52]

(157) Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
All cases:	1015.00
International fees	
Basic fee (first 30 pages):	430.00
Basic Supplemental fee (for each page over 30):	8.00
Designation fee for the first 10 national or regional offices:	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Sept. 30, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[1072 OG 8]

(158) Japanese Patent Office Introduction of an Accelerated Examination and Accelerated Appeal Examination System for Working-Related Patent (or Utility Model) Applications

Note for Foreign Applicants

1. The Japanese Patent office has decided, after long consideration, to introduce, through the administrative operation of the Patent Law and the Utility Model Law, an accelerated examination and accelerated appeal examination system for working-related patent (or utility model) applications, pursuant to the following basic polices:

(1) A part of the examination capability shall be allocated for accelerated examination and Accelerated appeal examination.

(2) The accelerated examination and accelerated appeal examination system shall initially begin on a test basis. The requirements and applications to which the accelerated examination and appeal examination are applied shall be reviewed, if necessary, taking into consideration the situation following the initial test period.

(3) Applicants shall be requested to submit the documents necessary for accelerated examination and accelerated appeal examination, such as the prior art search report and the comparison with prior art, that justify the accelerated procedure.

(4) Applicants shall be requested strictly to select requests for accelerated examination or accelerated appeal examination in order to attain fully the purpose of that system.

2. The acceptance of receipt by the Japanese Patent Office of the Explanation of Circumstances Concerning Accelerated Examination or Accelerated Appeal Examination for working-related patent (or utility model) applications shall commence on February 1, 1986.

3. The present text introduces the information that should be fully understood by foreign applicants who wish to make use of the above-mentioned system. Reference is made to the related Section of the Japanese Patent (or Utility Model) Law (Section 8):

(Patent administrator for residents abroad)

8. — (1) A person who has neither his domicile nor residence (nor, in the case of a legal entity, its establishment) in Japan (hereinafter referred to as "resident abroad") may not, except where a request for registration under subsection (3) is filed or as otherwise prescribed by Cabinet Order, proceed before the Office or institute a suit against any measure taken by an administrative agency in accordance with this Law or an order or ordinance thereunder, except through his representative with respect to his patent who has his domicile or residence in Japan (hereinafter referred to as "patent administrator").

(2) The patent administrator shall, in addition to the powers specially conferred on him, represent the principal in all procedures and in a suit instituted against measures taken by an administrative agency in accordance with this Law or an order or ordinance thereunder.

(3) Where a resident abroad is a patentee or has a registered right relating to a patent, the appointment or change of his patent administrator, the power of attorney or the extinguishment thereof shall not be effective against any third person unless it is registered.

4. Foreign applicants who submit the "Explanation of Circumstances Concerning Accelerated Examination or Accelerated Appeal Examination" for working-related patent (or utility model) applications shall proceed before the Japanese Patent Office in writing, in Japanese, through patent agents who have their domicile or residence in Japan.

5. The Guideline attached as an Appendix hereto should be fully reviewed by foreign applicants. The notes and italics appear especially for foreign applicants and are not contained in the original text of the Guideline.

6. The Guideline provides information necessary to patent agents who proceed before the Japanese Patent Office on behalf of foreign applicants. Therefore, foreign applicants are requested to consult fully with patent agents who have their domicile or residence in Japan and are familiar with such information.

Guideline for Accelerated Examination and Accelerated Appeal Examination System for Working-Related Patent (or Utility Model) Applications

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Introduction

The Japanese Patent Office is presently working on the promotion of comprehensive measures from a long-term perspective, represented by the following four major items designed to shorten the period of examination and appeal examination in order to deal with a greater number of pending applications:

(1) building up of a so-called "paperless system";
(2) guiding cooperation to improve patent management in domestic corporations;
(3) reformation of the patent system; and
(4) improvement in examination capacity.

As an immediate measure meeting applicants' needs before the establishment of such comprehensive measures, the accelerated examination and appeal examination system will be adopted in respect of working-related applications. The intention is to minimize the adverse effects that could accompany a delay in examination and appeal examination.

In introducing the accelerated examination and appeal examination system, however, a part of the examination capability will be allocated for accelerated examination and appeal examination with due regard to the effect on applications not eligible for accelerated examination and appeal examination. For that reason, the system will be put in practice as a test at the initial stage under certain conditions limiting the applicable objectives to working-related applications only. The accelerated appeal examination system will also be applied, for the time being,

only to those applications of particular urgency among working-related applications in view of the general importance of appeal cases.

From such points of view, applicants or patent agents concerned will be requested to submit the information necessary to justify accelerated examination and appeal examination for the purpose of attaining the goal of the accelerated procedure. At the same time, they will be requested also to select strictly such working-related applications as they really wish to be dealt with in an accelerated manner in order that the purpose of accelerated examination and appeal examination will fully be realized.

II. Accelerated Examination System

1. Accelerated Examination

(1) Applications eligible for accelerated examination.

The Japanese Patent Office may apply accelerated examination to patent (or utility model) applications that satisfy all the conditions mentioned below:

(a) a patent (or utility model) application for an invention that the applicant or one who has been granted a license*1 (licensee) from the applicant in respect of the invention has already worked or the working*2 of which has been scheduled to start by the applicant or his licensee within a period no longer than six months from the date of submission of "Explanation of Circumstances Concerning Accelerated Examination";
(b) examination by an examiner has not yet started;
(c) request for examination has already been made.

(2) Accelerated examination procedures.

(a) When the "Explanation of Circumstances Concerning Accelerated Examination" is submitted to the Patent Office, the Directors of the corresponding examination division shall decide whether or not the application is eligible for accelerated examination. The result of selection shall not be notified in writing.

(b) An examiner shall start promptly the examination of applications selected by the Directors as eligible for accelerated examination and shall speed up the entire examination process to the final decision, including the opposition procedure, without delay.

In the event, however, that the "Explanation of Circumstances Concerning Accelerated Examination" is submitted before the laying-open of applications for public inspection ("Kokai Koho"), the process shall be started promptly after the said laying-open of applications.

(c) As for the description for the state of working under the "Explanation of Circumstances Concerning Accelerated Examination", confirmation of the state of working by hearing or confirmation by field survey may be made if subsequently regarded as necessary.

[*Note 1*] The hearing shall not be open.

(3) Public access to documents.

The "Explanation of Circumstances Concerning Accelerated Examination" shall be open to public access as in the case of other application documents, regardless of the results of selection.

(4) Indication in the official publication ("Kokoku Koho").

Working-related applications concerning which publication is made following the accelerated examination procedure shall be so indicated in the official publication as follows:

(a) indication with certain mark in the table of contents; and
(b) indication of "Application through accelerated examination", in the official publication of patent (or utility model) applications.

2. Submission Procedures—Submission of "Explanation of Circumstances Concerning Accelerated Examination"

(1) Submitter.

A submitter of the "Explanation of Circumstances Concerning Accelerated Examination" for a working-related application eligible for accelerated examination shall be restricted to the applicant of the application concerned.

(2) Submission of documents.

Documents requesting accelerated examination shall either be submitted directly to the receiving window (Second Application Division, Japanese Patent Office; 3-1, Kasumigaseki 1-chome, Chiyoda-ku, Tokyo, Japan) or mailed to the Director General, Japanese Patent Office (4-3, Kasumigaseki 3-chome, Chiyoda-ku, Tokyo 100, Japan) with indication of "Explanation of Circumstances Concerning Accelerated Examination" on the envelope.

[*Note 2*] The contents of this matter relate only to patent agents who have their domicile or residence in Japan.

(3) Period of submission.

The "Explanation of Circumstances Concerning Accelerated Examination" may be submitted at any time after the request for examination has been made.

(4) Fee.

No fee shall be charged for the submission of the "Explanation of Circumstances Concerning Accelerated Examination".

(5) Documents to be submitted.

Documents concerning accelerated examination (the "Explanation of Circumstances Concerning Accelerated Examination") shall be submitted separately for each application requesting accelerated examination. (See II.3, below, for the preparation of the "Explanation of Circumstances Concerning Accelerated Examination".) The said submitted documents shall not be returned after receipt by the Patent Office.

(6) Supplement to submitted documents.

If the "Explanation of Circumstances Concerning Accelerated Examination" is submitted before the laying-open of the application concerned for public inspection, the supplement procedure for submitted documents shall be requested as follows:

(a) Supplementing documents on prior art investigation and comparison with prior art from the viewpoint of Section 29*bis* of the Patent Law and Section 3*bis* of the Utility Model Law shall be submitted after the laying-open of the application concerned.

[*Note 3*] (i) There are few advantages for both domestic and foreign applicants in submitting the "Explanation Concerning Accelerated Examination" before the laying-open of the applications concerned.
(ii) Since foreign applicants are not requested to investigate patent documents in Japanese unless they so wish, they need not submit a prior art investigation report from the viewpoints of Sections 29*bis* of the Patent Law and 3*bis* of the Utility Model Law.

(b) If all the invention information symbols of the IPC that appeared in the official publication of the said application ("Kokai Koho") are not included in the prior art investigation submitted before the laying-open of the application concerned, supplementary documents on prior art investigation covering fields of art defined by the IPC symbols not included in the original documents, and a comparison with prior art in respect of such additional fields from the viewpoint of Section 29(1) and (2) of the Patent Law and Section 3(1) and (2) of the Utility Model Law shall be submitted after the laying-open of the application concerned.

[*Note 4*] Since foreign applicants are not requested to investigate patent documents in Japanese unless they so wish, they need not submit supplementary documents on the prior art investigation and comparison with prior art from the above viewpoint.

3. Preparation of the "Explanation of Circumstances Concerning Accelerated Examination"

(1) Form

Explanation of Circumstances Concerning Accelerated Examination

To: Mr. Date:
The Director General of the Patent Office
1. Identification of the case:
2. Title of the invention (or utility model) and its IPC symbol appearing in the official publication ("Kokai Koho"): (IPC symbols)
3. Date of the request for examination of application:
4. Submitter (Applicant)
Domicile (residence):
Name: (seal)
5. Agent
Domicile (residence):
Name: (seal)
6. State of working
(1) Specification of the working-related act
(2) Period of working of the invention (or utility model)
(3) Relation between the invention (or utility model) and the specified working-related act
7. Prior art investigation and comparison with prior art
(1) Results of investigation
(2) Comparison with prior art
(3) Other particulars if necessary
8. List of attached documents

[*Note 5*] Contents of this matter relate only to patent agents who have their domicile or residence in Japan.

(2) Bibliography.

The spaces for bibliography (1–5) shall be completed in the following manner:

(a) For the space for "Identification of the case", the patent (or utility model) application number and the laying-open number of the patent (or utility model) application shall be entered. For an international application made in the Japanese language that includes Japan among the designated States or the elected States under the PCT, the patent (or utility model) application number shall be inserted as:

Patent (or utility model) application No.
WO **/*****.

and for an international application made in a foreign language that includes Japan among the designated States or the elected States under the PCT, the number shall be inserted as:

Patent (or utility model) application No.

Secondary publication number of an international application in the Japanese language ("Kohyo Koho") No. ...

(b) The IPC symbols consisting of invention information (the IPC symbols preceding double oblique strokes) appearing in the official unexamined publication of the application concerned ("Kokai Koho") shall be inserted in the space for the IPC symbols.

(c) Next to the domicile of the heading "Submitter (Applicant)" and "Agent", the telephone number of the submitter (applicant) or his agent shall be entered if possible.

(d) Other instruction shall be the same as items 1–3, proviso to 4, 6, 7, 10 and 12–14 of the Notes to Form No. 1 of the Regulations under the Patent Law.

As to the date of submission, the date of delivery in the case of direct submission to the receiving window of the Patent Office or the date of posting or receipt by the post office in the case of mailing shall be inserted.

[*Note 6*] Contents of this matter relate only to patent agents who have their domicile or residence in Japan.

(3) State of working.

The space for "state of working" in the "Explanation of Circumstances Concerning Accelerated Examination" shall be completed as follows:

(a) Specification of the working-related act. It shall be specified and described whether the act within Japan by the applicant or by his licensee comes under manufacturing, using, assigning, leasing, displaying for the purpose of assignment or lease, or importing to Japan.

(b) Period of working of the invention (or utility model). When the working-related act has started or is scheduled to start shall be described. However, the scheduled period within which working is to start shall be restricted to within six months from the date of submission of the "Explanation of Circumstances Concerning Accelerated Examination".

If, for example, the working-related act is manufacturing, the description may be as follows:

"Manufacturing since ..., 19..."; or
"Scheduled for manufacture from ..., 19..."

[*Note 7*] It is not necessary to identify the location of use or name of licensee, and additional materials to describe state of working are not required in principle.

*This note and the Guideline were prepared by the Japanese Patent Office. The French-language version of theis Note and of the Guideline will be published in the March issue of *La Propriete industrielle*.

*1 "License" as used herein includes any license contractes between foreigners.

*2 "Working of inventions" means manufacturing, use, assignment, importing and similar acts within Japan, as defined by Section*3 of the Japanese Patent Law.

*3 (Definitions)
2.–(1) "Invention" in this Law means the highly advanced creation of technical ideas by which a law of nature is utilized.
(2) "Patented invention" in this Law means an invention for which a patent jas been granted.
(3) "Working" of an invention in this Law means the following acts:
(i)in the case of an invention of a product, acts of manufacturing, using, assigning, leasing, displaying for the purpose of assignment or lease, or importing, the product;
(ii) in the case of an invention of a process, acts of using the process;
(iii) in the case of an invention of a process of manufacturing a product, acts of using, assigning, leasing, displaying for the purpose of assignment or lease, or importing, the product manufactured by the process, in addition to the acts mentioned in the preceding paragraph.

(c) Relation between invention (or utility model) and the specified working-related act. A description shall be given of how the invention (or utility model) that is the subject of the application is applied in the specified working-related act. If, for example, the working-related act is manufacturing, description may be given in that part of the product the art of the invention (or utility model) is applied.

[*Note 8*] The contents of the description in the explanation of the state of working are sufficient if they are provided to the extent as follows:

Examples of the Description in the Explanation of the State of Working

1. *When the working of an invention has commenced*

	Item	*Working by Applicant*
(i)	Specification of the working-related acts	Export to Japan
(ii)	Time of working	Exporting as from (month) 1984
(iii)	Relation between the specified working-related act and the invention concerned	Exporting bolts worked with the invention of this application whose screwdriver setting groove on the bolt-head is made in cross-groove

	Item	*Working by Licensee*
(i)	Specification of working-related acts	Export to Japan
(ii)	Time of working	Our licensee has been exporting as from (month) 1984
(iii)	Relation between the specified working-related act and the invention concerned	Exporting bolts worked with the invention of this application whose screwdriver setting groove on the bolt-head is made in cross-groove

2. *When the working of an invention is scheduled to start within six months from the date of submission of the "Explanation of Circumstances Concerning Accelerated Examination"*

	Item	*Working by Applicant*
(i)	Specification of working-related acts	Export to Japan
(ii)	Time of working	Scheduled to export as from (month) 1986
(iii)	Relation between the specified working-related act and the invention concerned	Preparing the export of bolts worked with the invention of this application whose screwdriver setting groove on the bolt-head is made in cross-groove.

	Item	*Working by Licensee*
(i)	Specification of working-related acts	Export to Japan
(ii)	Time of working	Our licensee is scheduled to export as from (month) 1986
(iii)	Relation between the specified working-related act and the invention concerned	Preparing the export of bolts worked with the invention of this application whose screwdriver setting groove on the bolt-head is made in cross-groove

(4) Prior art investigation and comparison with prior art.

On submitting the "Explanation of Circumstances Concerning Accelerated Examination", a description of the prior art investigation and comparison with prior art is requested to attain the objectives of accelerated examination. The prior art investigation and comparison with prior art should preferably be made in the manner in (a) through (e), below.

(a) Documents to be investigated

(i) The documents to be investigated shall cover at least Japanese unexamined publications, i.e., "Kokai Koho" (including the secondary publication of international applications in Japanese, i.e., "Kohyo Koho").

If, however, the submitter is a foreign applicant, the investigation of Japanese unexamined publications ("Kokai Koho") may be substituted by patent documents written in English, French or German.

(ii) *Depending on the particularity of the art, "specified publications" as shown in the attached material may be designated as documents to be investigated. If, however, the submitter is a foreign applicant, such publications as are in Japanese may be exempted from investigation.*

[*Note 9*] Foreign applicants are requested to investigate patent documents in any of the foreign language listed in (a)(i), above, from the viewpoint of Section 29(2) of the Patent Law and Section 3(2) of the Utility Model Law.

(Patentability of inventions)

29.—(1) Any person who has made an invention which is industrially applicable may obtain a patent therefor, except in the case of the following inventions:

(i) inventions which were publicly known in Japan prior to the filing of the patent application;
(ii) inventions which were publicly worked in Japan prior to the filing of the patent application;
(iii) inventions which were described in a publication distributed in Japan or elsewhere prior to the filing of the patent application.

(2) Where an invention could easily have been made, prior to the filing of the patent application, by a person with ordinary skill in the art to which the invention pertains, on the basis of an invention or inventions referred to in any of the paragraphs of subsection (1), a patent shall not be granted for such an invention notwithstanding subsection (1).

(Registrability of utility models)

3.—(1) Any person who has made a device which is industrially applicable and which relates to the shape or construction of articles or a combination of articles may obtain a utility model registration therefor, except in the case of the following devices:

(i) devices which were publicly known in Japan prior to the filing of the utility model application;
(ii) devices which were publicly worked in Japan prior to the filing of the utility model application;
(iii) devices which were described in a publication distributed in Japan or elsewhere prior to the filing of the utility model application.

(2) Where a device could very easily have been made, prior to the filing of the utility model application by a person with ordinary skill in the art to which the device pertains, on the basis of a device or devices referred to in any of the paragraphs of subsection (1), a utility model registration shall not be granted for such a device notwithstanding subsection (1).

[*Note 10*] List of "Specified Publications" in (a)(ii), above

Title of Publication	*Related IPC Symbols*
Chemical Abstract	A 01 N, A 61 K C 07 B,C,D,F,G,H,J,K C 09 B,K, D 06 P
Applied Optics	G 02 B, G 03 B, F,H

(b) Extent of investigation. If Japanese unexamined publications are investigated, the extent of investigation shall cover the fields of art at least centered around the IPC symbol or symbols consisting of the invention information (the IPC symbol or symbols preceding double oblique strokes) appearing in the publication of the unexamined application concerned ("Kokai Koho"). In that case, the period of investigation shall extend from 1971 to the date of issue of the publication of the unexamined application concerned ("Kokai Koho").

[*Note 11*] Foreign applicants are not requested to do so, unless they so wish.

(c) Results of investigation.

(i) In the space for results of investigation, the titles of related documents obtained as a result of the prior art investigation shall be described in the manner corresponding to the instruction shown in 42.31A of the "Examination Manual for Patents and Utility Models" compiled by the Patent Office. *If no related document has been found after the prior art investigation, documents showing the general state of the art as technical background to the application may be described.*

In the space for results of investigation, the names of institutions and services, etc., if used, may be entered.

(ii) *Copies of prior art documents shall be attached.*
(iii) *For prior art documents written in a foreign language, the necessary part shall be indicated on a copy of the document and the translation thereof that is submitted. In the case of English documents, a translation may be omitted.*
(iv) *In the place of a prior art investigation by a foreign applicant, documents cited as results of investigations by examining patent offices or intergovernmental organizations or by International Searching Authorities pursuant to the PCT may be entered in the space for the results of investigation.* In the place of a prior art investigation by a domestic applicant, documents cited as results of investigations by International Searching Authorities pursuant to the PCT or by the European Patent Office (EPO) may be entered in the space for the results of investigation. In those cases, the examining patent office or organization that made such investigation shall also be entered.
(v) When submitting the "Explanation of Circumstances Concerning Accelerated Examination" before the laying-open of an application, the IPC symbols which define the fields of art, the investigation of which fields the applicant has made in advance, shall be entered in the space for the result of the prior art investigation, since an additional prior art investigation may become necessary so as to cover all the fields of art defined by the invention information symbols of the IPC appearing in the publication of the unexamined application concerned ("Kokai Koho").

[*Note 12*] Foreign applicants are not requested to do so regarding paragraph (v), above, unless they so wish.

(d) Comparison with prior art.

In the space for comparison with prior art, a concrete and concise description of different points holding the better part of inventions claimed in the patent (or utility model) application and its effect should be given, compared with the prior art described in the listed documents in the light of Sections 29(1) and (2) and 29*bis* of the Patent Law and Sections 3(1) and (2) and 3*bis* of the Utility Model Law. In this case, due consideration should also be given to the completeness of the specification in the light of Section 36 of the Patent Law and Section 5 of the Utility Model Law. The above description should be prepared, for example, in the same manner as in preparing a written argument against the examiner's reasons for refusal.

If it does not seem possible to maintain patentability without amendment of the specification, a draft amendment of the specification shall be presented and the comparison with prior art should be made on the basis of that draft.

If the specification includes a detailed comparison with prior art in the light of Section 29(1) and (2) of the Patent Law and Section 3(1) and (2) of the Utility Model Law, the description in the space for comparison with prior art may be replaced by an indication of the appropriate part of the specification. However, the prior art investigation and comparison with prior art in the light of Section 29*bis* of the Patent Law and Section 3*bis* of the Utility Model Law shall be described.

[*Note 13*] Foreign applicants are not requested to investigate from the viewpoint of Section 29*bis* of the Patent Law or Section 3*bis* of the Utility Model Law.

(e) Other particulars, if necessary.

An applicant that is a small or medium enterprise or an individual may be exempted from the investigation of "specified publications" mentioned in subparagraph (a)(ii), above, and from attachment of copies of prior art documents mentioned in subparagraph (c)(ii), above. If an applicant that is a small or medium enterprise or an individual omits the investigation of "specified publications" and the attachment of copies as mentioned above, the applicant shall state in the space for "Other particulars, if necessary" the fact that the applicant is a small or medium enterprise as provided for in the Small and Medium Enterprise Basic Law or an individual.

For a small or medium enterprise, it is requested to state the type of small or medium enterprise as shown in the following table and also to indicate whether the number of employees and capital fall with the number of employees and capital provided for in the said Law.

Definition of Small and Medium Enterprises Established by the Small or Medium Enterprise Basic Law

Type of business	*Number of Employees*	*Amount of Capital*
Manufacturing, mining, etc.	not more than 300	not more than Y100,000,000
Wholesalers	not more than 100	not more than Y 30,000,000
Retailers and services	not more than 50	not more than Y 10,000,000

4. Inquiry

(1) Inquiry Window.

An answer by telephone shall be given to any inquiry on the matters relating to accelerated examination from an applicant (or patent agent).

Inquiry Window
Coordination Division
Second Examination Department
Japanese Patent Office
Tokyo, Japan
Tel. 03–(501)–1511.

[*Note 14*] Contents of this matter relate only to patent agents who have their domicile or residence in Japan.

III. Accelerated Appeal Examination System

1. Accelerated Appeal Examination

The procedures of accelerated examination shall apply correspondingly to accelerated appeal examination. The procedures that are particularly different are hereinafter introduced.

(1) Appeal cases eligible for accelerated appeal examination.

The Japanese Patent Office may apply accelerated appeal examination to appeal cases concerning patent (or utility model) applications satisfying all the conditions as specified below:

(a) Where the appeal case concerns a patent (or utility model) application for an invention which the demandant or one who has been granted a license*4 (licensee) in respect of that invention from the demandant has already worked or the working*5 of which has been scheduled to start by the demandant or his licensee within a period of no longer than six months from the date of submission of the "Explanation of Circumstances Concerning Accelerated Appeal Examination" and for which the granting of a patent is urgently required by the reason of (i) or (ii), below:

(i) in the case where any third party, without any consent of the demandant, has already worked the invention or in the case where the working of that invention has been scheduled to start by the third party without any prior consent of the demandant;

(ii) in the case where opposition to the grant of the patent was filed at the examination stage.

(b) When an appeal examination by a collegial body in charge has not yet commenced (in such an appeal case, since a patent (or utility model) application has proceeded again to the stage of appeal examination after reconsideration by the former examiner under Section 161*bis* of the Patent Law, appeal examination for the said case shall be deemed not to have started);

(c) Where the appeal case is against examiner's decision of refusal.

[*Note 15*] Accelerated appeal examination applies both to appeal cases proceeding to the appeal stage after the final decision of refusal by an examiner through accelerated examination and appeal cases for which demands for appeals have already been filed.

(2) Accelerated appeal examination procedures.

(a) When the "Explanation of Circumstances Concerning Accelerated Appeal Examination" is submitted to the Patent Office, the head of appeal examiner's group (appeal examiner-in-chief) of the corresponding appeal examiner's group shall decide whether or not the appeal case is eligible for accelerated appeal examination. The results of the selection shall not be notified in writing.

(b) A collegial body in charge shall promptly commence the examination of the appeal case as a case eligible for accelerated appeal examination by the head of appeal examiner's group and shall speed up the entire appeal examination process to the final decision, including the opposition procedure, without delay.

(c) As for descriptions in the space for the state of working, state of urgency, allegations concerning the completeness of the specification and allegations against the reasons for the examiner's refusal of the "Explanation of Circumstances Concerning Accelerated Appeal Examination", a request for the submission of materials, for a hearing or for suitable measures may be made if necessary.

[*Note 16*] Submitted documents and details of hearings are not open.

(3) Public access to documents.

The "Explanation of Circumstances Concerning Accelerated Appeal Examination" shall be open to public access as in the case of other appeal case documents, regardless of the results of selection.

(4) Indication in the official publication.

The procedure for indication in the publication of applications ("Kokoku Koho") through accelerated examination shall apply in the case of accelerated appeal examination.

2. Submission Procedures—Submission of "Explanation of Circumstances Concerning Accelerated Appeal Examination"

(1) Submitter.

A submitter of the "Explanation of Circumstances Concerning Accelerated Appeal Examination" shall be restricted to the demandant of the appeal case concerned.

(2) Submission of documents.

Documents concerning accelerated appeal examination ("Explanation of Circumstances Concerning Accelerated Appeal Examination") shall be either submitted directly to the receiving window (Clerical Division, Appeal Department, Japanese Patent Office; 3–1 Kasumigaseki 1–chome, Chiyoda-ku, Tokyo 100, Japan) or mailed to the Director-General, Japanese Patent Office (4–3, Kasumigaseki 3–chome, Chiyoda-ku, Tokyo 100, Japan) with indication of "Explanation of Circumstances Concerning Accelerated Appeal Examination" on the envelope. (The submission of documents shall be made by patent agents in the case of foreign demandants.)

[*Note 17*] The contents of this matter relate only to patent agents who have their domicile or residence in Japan.

(3) Period of submission.

The "Explanation of Circumstances Concerning Accelerated Appeal Examination" may be submitted at any time after the demand for appeal has been filed.

(4) Fee.

No fee is charged as in the case of accelerated examination.

(5) Documents to be submitted.

The documents concerning accelerated appeal examination ("Explanation of Circumstances Concerning Accelerated Appeal Examination") shall be submitted separately for each appeal case requesting accelerated appeal examination. (Refer to III.3, below, for the preparation of the "Explanation of Circumstances Concerning Accelerated Appeal Examination".)

The said submitted documents shall not be returned after receipt by the Patent Office.

3. Preparation of the "Explanation of Circumstances Concerning Accelerated Appeal Examination"

Form.

Explanation of Circumstances Concerning Accelerated Appeal Examination

Date

To: Mr.
The Director General of the Patent Office

1. Identification of the case
2. Title of invention (or utility model) and its IPC symbol appearing in the official publication ("Kokai Koho") (IPC symbol)
3. Submitter (Demandant for Appeal)
   Domicile (residence):
   Name: (seal)
4. Agent
   Domicile in Japan (residence in Japan):
   Name: (seal)
5. State of working
   (1) Specification of the working-related act
   (2) Period of working of the invention (or utility model)
   (3) Relation between the invention (or utitlity model) and the specified working-related act
6. State of Urgency
7. Allegations
   (1) Allegation concerning the completeness of the specification
   (2) Allegation against the examiner's reasons for refusal
8. List of attached documents

The "Explanation of Circumstances Concerning Accelerated Appeal Examination" may be quoted in the space for state of working, if there is no change in the subsequent state of working.

A hearing may be conducted for the submitter on the descriptions in the space for 6, 7 and 8, if necessary.

[*Note 18*] The contents of this matter relate only to patent agents who have their domicile or residence in Japan.

(2) Bibliography.

The space for bibliography (1–4) in the "Explanation of Circumstances Concerning Accelerated Appeal Examination" shall be completed as follows:

(a) For the space "Identification of the case", the appeal case number, patent (or utility model) application number and the laying-open number of the patent (or utility model) application shall be entered.

(b) The IPC symbols consisting of the invention information (the IPC symbols preceding double oblique strokes) appearing in the official unexamined publication of the application concerned ("Kokai Koho") shall be inserted in the space for IPC symbols.

(c) Next to the domicile under the headings "Submitter" and "Agent", the telephone number of the submitter or his agent shall be entered, if possible.

(d) Other instructions shall be the same as in items 1–3, 6, 7, 10 and 12–14 of the Notes to Form No. 1 of the Regulations under the Patent Law.

As to the date of submission, the date of delivery in the case of direct submission to the receiving window of the Clerical Division, Appeal Examination Department, Patent Office, or the date of posting or receipt by the post office in the case of mailing, shall be inserted.

[*Note 19*] The contents of this matter relate only to patent agents who have their domicile or residence in Japan.

3. State of working.

The space for "State of working" in the "Explanation of Circumstances Concerning Accelerated Appeal Examination" shall be completed as follows:

(a) Specification of the working-related act. Whether the act within Japan by the demandant or his licensee comes under manufacturing, using, assigning or leasing, displaying for the purpose of assignment or lease, or *importing to Japan* shall be specified and described.

(b) Period of working of the invention (or utility model). When the working-related act has started or is scheduled to start shall be described. However, the scheduled period to start working shall be restricted to within six months from the date of submission of the "Explanation of Circumstances Concerning Accelerated Appeal Examination".

If, for example, the working related act is manufacturing, the description may be as follows:

"Manufacturing since ..., 19..."; or
"Scheduled for manufacture from ..., 19 ..."

[*Note 20*] It is not necessary to identify the location of the use and name of the licensee, and additional materials to describe the state of working are not required in principle.

(c) Relation between the invention (or utility model) and the specified working-related act. A description shall be provided of how the invention (or utility model) of the application is applied in the specified working-related act. If, for example, the working-related act is manufacturing, a description shall be provided of to what part of the product the art of the invention (or utility model) is applicable.

(4) State of urgency.

In the space for "State of Urgency", an explanation shall be given of at least one of the following cases as provided in (a) or (b) where urgent granting of the patent is required.

If the matters necessary for clarifying such state fall within the scope of corporate secrecy and it may interfere with commercial dealings to submit such matters, the omission of the submission of such matters may be allowed by indicating that the demandant is prepared to clarify such matters in hearing.

The details of such a hearing shall not be open.

(a) Where any third party, without consent of the demandant, has already worked the invention or has

*4 "License" as used herein includes any license contracted between foreigners with a view to implementing such a license in Japan.

*5 "Working of inventions" means manufacturing, use, assignment, importing and similar acts within Japan, as defined by Section 2 of the Japanese Patent Law.

scheduled to start the working of the invention in an apparent manner.

Where a state of urgency is explained by this case, clarification of (A) the third party, (B) the working-related act by any third party and (C) the relation between the working-related act and the inventions claimed in the application concerned is required in principle. Where the third party has scheduled to start in an apparent manner the working of inventions claimed in the application concerned, clarification of the state of the schedule for working is required by means of attaching objective documents or other reliable materials.

A "third party" means any party other than the demandant in the appeal case and his licensee.

(b) When opposition to the grant of patent was filed in the stage of examination.

Where a state of urgency is explained by this case, the circumstances behind the grounds for the oppositions to the grant of the patent shall be explained in relation to inventions claimed in the patent (or utility model) application concerning which the examiner's decision of refusal has been brought about.

(5) Allegations.

Since it is necessary for an efficient accelerated appeal examination that the specification be complete and that the grounds against the reasons for refusal be based on the detailed description in the specificaiton, the following allegations are requested to be described for clarifying those matters.

(i) Allegation concerning the completeness of specification. In the space for "Allegation concerning the completeness of the specification", it shall be alleged that the explanation is complete in the following respects:

(a) It shall be explained, according to "the itemized descriptions of patent (or utility model) specification" specified in the Regulations (Note 14 to Form No. 16 of the Regulations under the Patent Law and Note 13 to Form No. 3 of the Regulations under the Utility Model Law), for example, how the purpose, constitution and effects of the invention (or utility model) are clearly described in the space for a detailed explanation of the invention:

[*Note 21*] Example where itemized description is preferable:

Detailed Description of the Invention

(a) Industrial Field of Utilization
(b) Prior Art
(c) Problems that the Invention is to solve
(d) Means of Solving the Problems
(e) Operation of the Invention
(f) Working Examples
(g) Effects of the Invention

(b) It shall be explained how the constitution of the claimed invention (or utility model) is accurately described in the space for a detailed explanation of the invention.

The explanations in (a) and (b), above, may be omitted where the patent (or utility model) application has been published in the examination stage in the official publication ("Kokoku Koho").

(ii) Allegation against examiner's reasons for refusal. In the space for "Allegation against examiner's reasons for refusal", the grounds against the examiner's reasons for refusal shall be concretely alleged indicating the duly corresponding described parts in the specification.

4. Inquiry.

(1) Inquiry Window.

An answer by telephone shall be given to any inquiry on the matters relating to accelerated appeal examination from a demandant (or his patent agent).

Inquiry Window
Clerical Division
Appeal Examination Department
Patent Office
Tel. 03–581–1101

[*Note 22*] Contents of this matter relate only to patent agents who have their domicile or residence in Japan.

Attached Material
List of Specified Publications

Title of Publication	*Related IPC Symbols*
Chemical Abstract	A 01 N, A 61 K C 07 B,C,D,F,G,H,J,K C 09 B,K, D 06 P
Applied Optics	G 02 B, G 03 B, F,H

[1064 OG 28]

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I. APPEALS

A. *Appeal Fees in Patent Cases*

Appeal fees deficiencies are frequent in the case of appeal fees, causing necessity for extension fees to cover the additional time consumed in making up the appeal fee deficiency.

II. APPLICATION FILES

A. *Requests for Allowed Patent Application Files*

Applicants or attorneys requesting files from the Publishing Division, Office of Publications, should make their request at least twenty-four hours in advance to ensure file availability. Attention is especially directed to out-of-town requesters who visit the Office, anticipating same day service. Although the Office is usually able to respond promptly, unexpected inconvenience can be avoided if arrangements are made in advance.

Inquiries and requests should be directed to the Correspondence Section at (703) 557–6397 or (703) 557–6398 between the hours of 8:30 a.m. through 5:00 p.m. on weekdays.

B. *Returning Files to the File Information Unit (FIU)*

As follow-up to a previously identified problem involving FIU file histories being left in the Public Search Room rather than being returned as required, all charge cards were monitored for a three week period.

Of the 2,011 files obtained, a total of 32 were not properly returned. Although the percentage of abuse is not great, customers are again reminded that files obtained through the FIU are official government records which must be returned by 7:45 p.m. on the same day they are obtained. Additionally, files obtained through the FIU shall not be removed from the confines of the Public Search Room at any time.

FIU personnel will continue to periodically monitor this problem. Should individual patterns of abuse be discerned, administrative sanctions up to termination of access privileges will be applied.

III. APPLICATION PAPERS

A. *Addressing Papers Involving Secrecy of Certain Inventions and Licenses to Export and File Applications in Foreign Countries (37 CFR 5)*

All correspondence in connection with 37 CFR 5 should be addressed to:

Commissioner of Patents and Trademarks
(Attention Licensing and Review)
Washington, D.C. 20231

Improperly addressing such correspondence may delay delivery and could result in violations of 37 CFR 5. See 37 CFR 5.33 regarding correspondence.

B. *Amendments After Final for Patent Applications*

Amendments under 37 CFR 1.116 would be greatly expedited if they were headlined with the title "Amendment After Final Rejection," with that title underlined in red. This would facilitate ready identification of these amendments by the PTO support staff and expedite docketing and delivery to the examiner for special treatment. In many cases this would avoid the necessity for extensions of time and filing unnecessary notices of appeal.

C. *Data To Be Included On Patent and Trademark Papers Filed in the PTO In Response To Office Actions*

Perhaps the greatest cause of delay and wasted time in the support sections of the PTO is in trying to match papers bearing incorrect or incomplete data with applications. Because some trademark papers are not clearly identified as pertaining to trademark applications, they are frequently misrouted to the patent examining group.

On all papers related to *patent* applications, type the word "Patent" in the upper right-hand corner of the document. Also, please include the correct serial number, filing date, inventor's name, and title of the invention. Additionally include the examiner's name, and group art unit number or other identifying data found on the most recent letter from the PTO (37 CFR 1.1(a)). However, please note that an organizational restructuring of the Patent Examining Corps has resulted in many applications being reassigned to new Groups and Art Units. Your attention is directed to the NOTICE OF CHANGES IN THE PATENT EXAMINING CORPS that appeared in the OFFICIAL GAZETTE on June 26, 1984, (1043 OG 23), which identifies the Group Art Unit of each examiner (1043 OG 40 through 1043 OG 67). Letters mailed from the Groups after Apr. 15, 1984, should reflect the current identifying data.

For all papers related to *trademark* applications, type the word "Trademark" in the upper right-hand corner of the document. Also, please set forth the applicant's name, correct serial number (including series number which currently is "73"), filing date, law office, examining attorney and mark.

Trademark documents for which no fee is required at the time of filing (e.g., amendments to applications and requests for extensions of time to file an opposition) should continue to be addressed:

Box 5
Commissioner of Patent and Trademarks
Washington, D.C. 20231

Mail directed to the Trademark Trial and Appeal Board should have "Attention TTAB" on the envelope in addition to "Box 5".

D. *Express Mail*

Many applicants are losing the advantage of receiving the date a paper or fee was deposited at the Post Office when "Express Mail" is used due to a failure of following proper procedures. According to 37 CFR §1.10, any such paper or fee must include a certificate of mailing by "Express Mail," signed by the person mailing the paper or fee.

Often, the certificate is missing, illegible, inaccurate, incomplete, or difficult to locate. As a result, the paper or fee is considered to have been filed on the date of receipt in the PTO.

To ensure papers and fees sent by "Express Mail" are accorded the proper certificate date, the following suggestions and reminders are offered:

1. Each document must have a certificate of mailing typed on or affixed to the document.
2. The certificate should be placed on the first page of the document or the covering letter to ensure easy accessibility.
3. The certificate should be legible.
4. Dates on the certificate must correspond to dates on the Express Mail label.
5. Each certificate must have an original signature.

The preferred wording and information to be included on this certificate is as follows:

"Express Mail" Mailing Label No. (*insert B no. from Express Mail label*)
Date of Deposit (*insert date from Express Mail Label*)

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office To Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

(*Typed or printed name of person mailing paper or fee*)
(*Signature of person mailing paper or fee*)

By following these procedures, problems concerning filing dates should be minimized.

E. *Express Mail (Continuation)*

The Patent and Trademark Office (PTO) continues to receive correspondence filed under the provisions of 37 CFR 1.10 in which the certificate of mailing by "Express Mail" certifies that the correspondence is being mailed on one date while the "Express Mail" label shows a "Date-In" on a different date. This usually occurs when the "Express Mail" package is deposited in a remote "Express Mail" receptacle or mailbox after the last pick-up and accordingly are not being picked-up and processed by the Postal Service until the next business day. The question as to the treatment of such a situation was covered in the final rulemaking published on Jan. 20, 1983, at 48 FR 2696–2714 and on Feb. 1, 1983, at 1027 O.G. 9. The following comments appear therein:

> "Comment: One person questioned what treatment will be accorded a paper placed in an 'Express Mail' box receptacle after the box has been cleared for the last time on a given day."
>
> "Reply: The paper will be considered to be deposited as of the date of receipt indicated on the 'Express Mail' mailing label by the Postal Service clerk."

While the number of such instances in which the certificate states one date and the receipt states a different date is not large when compared to the total number of filings under the provisions of 37 CFR 1.10, it does cause problems for the PTO and the applicants involved when it does occur.

In view of the above, it is recommended that where the filing date of a paper or fee is critical, e.g., the filing of a patent application, and particularly when the deposit by "Express Mail" is being made late in the business day, the correspondence should be personally delivered to a Post Office where receipt of the "Express Mail" package by the Postal Service on the date indicated in the certificate of mailing by "Express Mail" can be immediately obtained from a Postal Service clerk.

Applicants are also reminded that 37 CFR 1.10 requires that the certificate of mailing by "Express Mail" be signed by the person *actually mailing* the paper or fee; i.e., the person who actually deposits the paper or fee with the U.S. Postal Service. The PTO has encountered some instances in which the certificate of mailing by "Express Mail" was signed by an attorney and the deposit was made by the attorney's secretary or another member of the attorney's staff. This is improper under the provisions of 37 CFR 1.10. This section differs in that regard from 37 CFR 1.8.

F. *Information to be Included on Papers Filed in Pending Applications*

The Patent Examining Corps is currently in the midst of a workload balancing program among the Examining Groups. To facilitate prompt matching of incoming papers with applications it would be most helpful if the following information appears at the top of all papers filed in pending applications:

1. Serial Number (checked for accuracy)
2. Group Art Unit Number (from the most recent paper received from a Group Art Unit, or from the filing receipt if no paper has been received from a Group Art Unit)
3. Name of the Examiner (who prepared the most recent Office Action)
4. Title of the Invention
5. Filing Date (of the application)
6. Inventor's Name

G. *Mailing Responses to the PTO*

In general, it would eliminate or greatly reduce processing steps by the PTO support staff, and will avoid interruption of the examiner's work, if a few simple, general rules were followed in regard to mailing of the responses to the PTO.

1. After a patent or trademark application is filed, please avoid filing additional papers (other than those requesting a filing receipt or those required by the Office) until the filing receipt or return post card identifying the Serial Number and Patent Examining Group Art Unit or Trademark Law Office has been received.
2. In *patent* applications, requests for extensions of time, changes of address, proposed drawing corrections, and petitions are sometimes incorporated in the remarks section or at the beginning of papers entitled "Amendment" or "Response." In *trademark* applications, change of address and powers of attorney are sometimes incorporated in the remarks section or at the beginning of papers entitled "Amendment" or "Response". Please present such items in separate papers, appropriately titled, since they are all handled by different personnel (37 CFR 1.4(c)). However, please include a statement in the amendment/response describing the paper being filed.
3. Where a supplemental or preliminary amendment is found necessary in patent or trademark applications, please telephone the examiner and request that the examiner delay action for a certain time in order to avoid crossing in the mails of the amendment and the Office action.
4. File patent and trademark documents which have no particular time or sequence requirement with materials submitted in response to the statutory or regulatory requirements. Examples are certified copies of foreign documents to support priority and formal drawings in patent applications or changes of Power of Attorney or Mailing Address following first action.
5. If a disclosure statement is to be filed before an Office action, file it when the application is filed. Some Group Art Units have greatly reduced the pendency to first action. Hence, many examiners are taking up new applications before an information statement is matched with the application.
6. Assignment documents should be filed with accompanying transmittal letters bearing current return addresses to assure prompt processing.
7. Letter and coupon orders for patent copies must contain the requester's name and current mailing address so that the order can be filled.

H. *PTO Special Mail Boxes*

Special mail box numbers have been established to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Therefore, if any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they were intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

Box_____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 4	—	Mail for the Office of Legislation and International Affairs.
Box 5	—	"No fee" mail related to trademarks.
Box 7	—	Reissue applications for patents involved in litigation and any subsequently filed papers for these applications.
Box 8	—	All papers for the Office of the Solicitor.
Box 9	—	Coupon orders for U.S. patent and trademark copies.
Box 10	—	Orders for certified copies of patent and trademark applications.
Box 12	—	Contributions to the Examiner Education Program.
Box AF	—	Amendments or Correspondence after Final Rejection of patent applications.
Box Interference	—	Communications relating to interference and applica

tions and patents involved in interference.

Box M. Fee — Correspondence related to a patent that is subject to the payment of a maintenance fee.

Box Pat. Ext. — Applications for patent term extension.

Box PCT — Mail related to applications filed under the Patent Cooperation Treaty

Box Reexam — Mail related to reexamination applications.

I. *Reissue Amendments*

In order to avoid unnecessary delays in the issuance of reissue applications, applicants and their attorneys are reminded to exercise caution and give sufficient attention to 37 CFR 1.121(a) and (e) in presenting reissue amendments to the PTO. The practices and procedures vary somewhat from regular utility application amendments, and this frequently causes clerical problems and editorial revisions.

MPEP Sec. 1455 provides guidance for proper entry of amendments and claim numbering. Publication of the reissue application(s) may be needlessly postponed while formal irregularities are corrected.

J. *Reissue Oaths and/or Declarations*

Since standard oath and declaration forms are not used in reissue applications, applicants are commonly neglecting to include averments required by 37 CFR 1.63 per 37 CFR 1.175(a). The most frequent omissions involve the "duty of disclosure" acknowledgment, and the "reviewed and understands" statement. Such omissions usually necessitate additional handling and correspondence, and cause undue time delays, which result in postponement of publication of the reissue patent.

A frequent problem in reissue practice is the failure of applicants to satisfactorily comply with 37 CFR 1.175 regarding the description of all errors of the original patent in the reissue oath or declaration. Applicants are required to specify errors in the original reissue oath or declaration at the time of filing the reissue application. They must also specify, in a supplemental oath or declaration, any errors brought to their attention during the prosecution, as well as the circumstances surrounding the occurrence or discovery of these errors. Every departure from the original patent represents an "error" and must be particularly and distinctly specified and supported in the original, or a supplemental, reissue oath or declaration under 37 CFR 1.175. See MPEP Sec. 1414 and 1444. Postponement of publication of the reissue patent may result if these requirements are not met at the time of allowance.

K. *Response to Final Rejection — Avoiding Extension Fees*

In regular applications wherein a three (3) month Shortened Statutory Period (SSP) is set for response to a Final Rejection, the response would best be filed within two (2) months of the date of the Office Action. If filed within two (2) months, any Advisory Action mailed after the SSP expires will reset the SSP to expire on the date of the Advisory Action for extension fee purposes, but never more than six (6) months from the date of the Final Rejection.

L. *Response to Final Rejection — Expediting Processing and Reply by PTO*

In order to ensure the quickest reply to an amendment or response after Final Rejection the paper should be marked in the upper right portion:

"RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP (Insert Group Number)";

and the envelope should be marked in the lower left corner:

"BOX AF"

The marking on the paper preferably should be written in, highlighted by, or encircled with, a bright color felt-point marker.

If the paper is being hand-carried to the Examining Group (instead of mailing to Box AF), the envelope also should be marked:

"RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP (Insert Group Number)"

M. *Return Post Card*

If a receipt for any paper filed in the Patent and Trademark Office is desired, it may be obtained by enclosing with the paper a self-addressed post card identifying the paper. The Patent and Trademark Office will stamp the receipt date on the card and place it in the outgoing mail.

The identifying data on the card should be so complete as to clearly identify the paper for which receipt is requested. For example, the card should identify the applicant's names(s), serial number, filing date, interference number, etc. Also, the paper(s) should be identified by specifying the type thereof, namely affidavit, amendment, appeal, itemized components of applications, brief, drawings, fees, motions, supplemental oath or declaration, petition, etc.

A post card receipt which itemizes and properly identifies the papers which are being filed serves as prima facie evidence of receipt in the PTO of all the items listed thereon on the date stamped thereon by the PTO unless the post card receipt has been annotated by the PTO to indicate that one or more items were not received. A post card receipt will *not* serve as prima facie evidence of receipt in the PTO if the papers are not itemized in a detailed manner, e.g., number of pages of specification and number of sheets of drawings, or if the post card receipt has been annotated to indicate that one or more items was not received.

When papers for more than one document are filed under a single cover, a return addressed post card should be attached to the paper for each document for which a receipt is desired.

N. *Transmittal Letters*

When statutory fees are to be charged to a deposit account, the processing of the application can be facilitated by submitting the applicant's transmittal letter or other correspondence specifying the account to be charged in triplicate. Submission of these documents in triplicate will eliminate the need for the Mail Room to photocopy the document and thereby reduce the processing time of incoming mail.

IV. ASSIGNMENTS

When requesting correction or updating of a previously recorded patent or trademark assignment document, providing the reel and frame number of that document to the Assignment Branch will greatly expedite the recording process.

To ensure the correct printing of ownership information on a Trademark Registration at issue date, provide the Trademark Office examining attorney with the reel and frame number of the appropriate assignment document as soon as you are notified of it.

V. CERTIFICATES OF CORRECTION

A. *Accurate Requests*

Many requests for "Certificates of Correction" result from a perfunctory comparison of the issued patent with the attorney's application file, without investigating whether the recitation in the issued patent is correct. In many instances, change to the PTO file wrapper has been caused by the examiner prior to printing of the patent in order to make appropriate corrections to the file.

VI. CERTIFICATION SERVICES

A. *Certification Services*

Expedited service requests for certification of copies that have been made by the requester shall be limited to those files open for public inspection. If there is such a need for expedited service, the request should be made to the Manager, Examination Services Division. All other requests for copies must be made to the Certification Branch, which will fill your request within 7 days or less.

B. *Questions Frequently Asked*

Q. What does "certified" mean?
A. Authentication of copies by ribbon and seal of the PTO with the signature of an officer authorized by the Commissioner of Patents and Trademarks.

Q. What does an application consist of?
A. (1) Specification (2) Claims (3) Oath or Declaration (4) Drawings, when necessary, and (5) Filing Fee.

Q. What does a file wrapper and contents (file history) consist of?
A. The original application papers plus all correspondence between the applicant/attorney of record/assignee and the PTO.

Q. Why are certified copies of the application-as-filed required?
A. Since the rights granted by a U.S. patent extend only throughout the territory of the U.S. and have no effect in a foreign country, an inventor who wishes patent protection in other countries must apply for a patent in that country by filing a certified copy of his or her U.S. application.

Q. What regulations govern the filing of a U.S. application in a foreign country?
A. There is a treaty relating to patents which involves 92 countries and is known as the Paris Convention for the Protection of Industrial Property. It provides that each country guarantees to the citizens of other countries the same patent rights that it gives to its own citizens.

Q. How does one request copies of an application-as-filed?
A. By submitting a written order identifying the application by serial number, filing date, name of inventor and title of invention to:

U.S. Patent and Trademark Office
Box 10
Washington, D.C. 20231

Q. Can anyone request a copy of a pending application?
A. No. Pending applications are preserved in secrecy. No information or copies may be obtained without written authority of the applicant, attorney of record, or the assignee, if any. Such written consent must accompany the request for copies.

Q. Can orders for copies be placed by phone?
A. No. All orders must be in writing.

Q. May office copies of my application be sent to the PTO for certification?
A. No. We do not certify copies prepared outside the PTO.

Q. Will the PTO mail certified copies ordered directly to a foreign country?
A. No. With respect to the exportation of technical data, the PTO discontinued the practice of forwarding direct to any foreign country certified copies of U.S. applications ordered by residents of the United States.

Q. Are cited references in a file automatically furnished when a file wrapper and contents is requested?
A. No. Cited references are not included as papers comprising the file history. References cited are furnished only if specifically requested.

Q. Can cited references, when requested, be certified with the file wrapper and contents under one certificate?
A. No. Each reference must be certified separately.

Q. Are there instances when references are included in a file wrapper and contents?
A. Yes. If the references are submitted as attachments to a response from the applicant and if such response is entered and made a part of the file.

Q. Exclusive of applications-as-filed and file wrappers and contents of patented files, what other types of copies may be obtained from the Certification Branch?
A. The following items may be obtained:

1. Certified copies of issued U.S. patents and designs.

2. Certified copies of foreign patents.
3. Certified copies of publications from the Scientific Library.
4. Certified copies of Office letters.
5. Certified duplicate filing receipts.
6. Certified copies of an assignment and application-as-filed, under one certificate.
7. Copies of disclosure documents.
8. Copies of the following files:
   a. Defensive publication files.
   b. Reexamination files.
   c. Interference files.
   d. Trademark files.
   e. Opposition files.
   f. Concurrent use proceedings files.
   g. Statutory Invention Request.
   h. Certified copies of assignment documents.
   i. Abstract of title.

Q. What is required to have a file reconstructed?

A. Submit a written request along with a notice from the PTO Official Search unit stating that the file cannot be located.

Q. What procedures are used to reconstruct a file?

A. The Certification Branch requests the loan of a copy from the attorney of record, assignee or applicant.

Q. How long does it take to reconstruct a file?

A. The time is dependent upon the receipt of the copy from the attorney. Normally it takes about two months.

VII. DRAWINGS

A. *Application File Drawings*

Application Branch personnel are having some difficulty matching drawings with applications during pre-examination processing. It would be helpful if the applicant's name, docket number, and the title of the invention were put on the back of the drawings. This may be done by writing lightly on the drawings or by using gum labels.

When the Office receives formal or substitute drawings, a cover letter identifying the application by serial number should accompany them. It is extremely difficult to associate the drawings with the files when this information is missing. The application serial number should be placed on the sheet of drawing in accordance with 37 CFR 1.84(l).

According to 37 CFR 1.84(l), identifying indicia (such as the attorney's docket number, inventor's name, number of sheets, etc.) not to exceed 2½ inches may be placed in a centered location between the side edges within three-fourths inch of the top edge. Either this marking technique on the front of the drawing or the placement of this information on the back of the drawing is acceptable. However, for identification of the serial number, the PTO prefers that it be placed on the front.

B. *Submission of Corrected Drawings in Allowed Patent Applications*

When drawings need to be corrected in an allowed application, the applicant is *required* to submit *acceptable* corrected drawings within a three-month shortened statutory period. Within that three-month period, two weeks should be allowed for review of the correction by the Office. If a correction is determined to be unacceptable by the Office, the applicant must arrange to have an acceptable correction re-submitted within the original three-month period to avoid the necessity of obtaining an extension of time and of paying the extension fee. Therefore, the applicant should file corrected drawings as soon as possible following the setting of the three-month shortened statutory period.

C. *Submission of Drawings*

For your convenience and for more effective handling of any drawing corrections which may be necessary, please DO NOT SUBMIT ORIGINAL DRAWINGS WITH PATENT APPLICATIONS. DO SUBMIT THREE HIGH QUALITY COPIES. If the copies submitted pass the formality review and patent examination, no substitute drawings will be necessary. If corrections are necessary, they should be made to the original drawings. Either a good copy of the corrected drawings or the corrected original can then be submitted after the Notice of Allowability is mailed.

VIII. EXTENSIONS OF TIME

A. *Extension of Time Fees in Patent Cases*

Many requests for extension of time are being filed with insufficient fees. In the overwhelming majority of these cases the deficiency is due to the fact that an old fee schedule has been used.

In those instances where there is no authorization to charge an account, additional fees are necessary to cover the additional time consumed in making up the original deficiency. If the maximum six-month period has expired before the deficiency is noted and corrected, the application is held abandoned. In those instances where authorization to charge is included, processing delays are encountered in returning the papers to the PTO Finance Branch in order to apply these charges prior to action on the cases.

Please note that effective Oct. 5, 1985, the *extension fees* in *patent* cases are as follows:

	Small Entity	*Non-small Entity*
One Month Extension	$28	$56
Two Month Extension	85	170
Three Month Extension	195	390
Four Month Extension	305	610

B. *Extensions of Time for Patent Applications*

An extension of time under 37 CFR 1.136(a) is not permitted in the following instances:

1. Where an applicant is so notified in an Office action as, for example, in a Reissue application involving a litigated patent.
2. Where the application is involved in an interference declared pursuant to 37 CFR 1.207. See 37 CFR 1.245 for provisions governing extensions of time in interference proceedings.
3. In reexamination proceedings. See 37 CFR 1.550(c) for extensions of time in reexamination proceedings.
4. In PCT international applications. In PCT applications, the only extensions permitted are for corrections of PCT Article 14 defects in international applications before the Receiving Office.

C. *Extensions of Time in Patent Cases (Supplemental Amendments)*

If a timely and complete response has been filed after a *Non-Final* Office Action, an extension of time *is not required* to permit filing and/or entry of an additional amendment after expiration of the shortened statutory period.

If a timely response has been filed after a *Final* Office Action, an extension of time *is required* to permit filing and/or entry of a Notice of Appeal or filing and/or entry of an additional amendment after expiration of the shortened statutory period unless the timely-filed response placed the application in condition for allowance. Of course, if a Notice of Appeal has been filed within the shortened statutory period, the period has ceased to run.

D. *Extension of Time Policy*

Where an extension of time is required to file a response in a timely manner, the response is not considered complete until the response, fee, and request or petition for an extension of time are received. The fee and request or petition must be filed before the expiration of the extended period requested. The fee cannot be paid outside the statutory six-month limit for the period of response.

The extension of time policy for after final practice is set forth in MPEP §§706.07(f) and 1302.04. In essence, where applicants' approval is not needed to amend the claims, no extension of time is required. However, if applicants' approval is required and applicants did not file their response within two months of the FINAL REJECTION, the appropriate extension of time must be purchased.

If applicants have a deposit account, it is recommended that applicants file, in an individual application, a general authorization to charge any of the fees set forth in 37 CFR §§ 1.16 to 1.18 to a deposit account for the entire pendency of the application (1032 OG 32).

Also, it should be noted that extensions of time may be purchased for extending the time required to pay for the request for an oral hearing before the Board of Appeals. MPEP §1209(I). The time for a request and fee for an oral hearing is one month from the date of the Examiner's Answer or any supplemental Examiner's Answer.

E. *Extensions of Time in Patent Cases*

Submission of the appropriate extension fee under 37 CFR 1.136(a) is to no avail unless a request or petition for extension is filed. Frequently, the request is omitted, which then requires an additional extension fee to cover the period to the date of the request. Occasionally, the application is held abandoned because the six month maximum statutory period has expired before detection of the omission of the request for extension. It is critical that a paper specifically requesting the extension be filed with late responses. It is also wise to use the Certificate of Mailing practice when requesting extensions.

Extensions of time by fee payment under 37 CFR 1.136(a) are appropriate for filing of the Brief on Appeal in regular applications. No more than four months may be granted under 37 CFR 1.136(a). Beyond those four months, any further request must show sufficient cause under 37 CFR 1.136(b), and no additional extension fee is appropriate.

An extension of time is not required in order to hold an interview with the examiner. However, an extension is required for the purpose of filing a follow-up amendment by applicant and/or for the entry of an Examiner's Amendment requiring approval of the applicant.

Extensions of time are appropriate for the purpose of achieving continuity between parent and continuing applications. A separate paper requesting the extension of time must be filed in the *parent* application. It would be useful to file a *copy* of that request or petition with the papers constituting the filing of the continuing application.

IX. MAINTENANCE FEES

A. *Fee Address and Payer Number*

Effective Nov. 1, 1984, 37 CFR 1.363 provides for a "fee address" to be entered in the Office patent file records for use in all correspondence relating to maintenance fees. The fee address is in addition to the "correspondence address" under 37 CFR 1.33 which will continue to be used for all reexamination and interference purposes. If no separate fee address is specified, the correspondence address will also be used for maintenance fee correspondence.

In order to simplify changes in address by patent owners having several patents, and data input by the Patent and Trademark Office, a "payer number" will be assigned to each fee address when a fee address is presented to the Office in a patent or earlier upon request. A request for a payer number before a maintenance fee is paid or due will permit a patent owner to request that the fee address and payer number be recorded in the Office records of the patents owned on which maintenance fees are due so that all notices relating to maintenance fees will be sent to the fee address.

The Patent and Trademark Office has established a procedure for assigning a payer number upon request by a patent owner or a party responsible for paying maintenance fees. Such a party may be, for example, the finance office of a corporation or of a separate organization specializing in maintenance fee payments. Under the procedure, a patent owner or other party may request a payer number for a particular fee address by writing to:

Commissioner of Patents and Trademarks
Box M. Fee
Washington, D.C. 20231

Each request for a payer number should include:
— the fee address to be used by the Office,
and
— the telephone number of the fee addressee to be used to resolve problems.

After receipt of a payer number, it may be used to indicate to the Patent and Trademark Office the fee address to be used in particular patents on which maintenance fees will be-

come due and in applications in which issue fees have been or are being paid. Any request for entry of a payer number or fee address in the Office records of a patent, however, must be signed by the patent owner or his or her attorney or agent of record.

After a payer number has been assigned, it should be used in all future maintenance fee payments and related correspondence. However, where a payer number has not been previously entered in the Office records for a particular patent, the mere indication of a payer number at the time of payment of the maintenance fee, without the signature of the patent owner or the owner's attorney or agent of record, will not serve to make the payer number of record in the Office for that patent.

The problems which most often arise in connection with attempts to establish a fee address in a particular patent or group of patents is that the request is being signed by an attorney who is not of record in each of the patents. This results in the request being entered only in part.

Also, when the request is signed by an owner of the patent, the records of the Assignment Branch do not always reflect such ownership. Where the assignment was recorded prior to Dec. 1980, it would help the Office if the PTO reel and frame number of the assignment recordation were presented in the paper requesting that a fee address be entered, and if the person signing the request would indicate his or her title.

Lastly, as fees are now being submitted for payment in patents that issued three or four years ago, if a fee address has not been established, please be sure that the current correspondence address has been made of record.

B. *Maintenance Fee Transmittal Form Notice*

Where maintenance fee payments are to be made by authorization to charge a deposit account, the Maintenance Fee Transmittal Form, should reflect *both* the Payor's Name *and* signature in the bottom left corner thereof.

X. NEW APPLICATIONS

A. *Continuation or Divisional Application*

When filing under Rule 1.60 retain at least one original claim from the parent application to assure a complete application. Only amendments reducing the number of claims or adding a reference to the prior application (Rule 1.78(a)) will be entered, upon request, before calculating the filing fee and granting the filing date. *Reminder*: Applicant cannot file a CIP (continuation-in-part) under Rule 1.60.

B. *File Wrapper Continuation (FWC) Applications*

Many continuation applications filed under 37 CFR 1.62 (FWC) contain no preliminary amendment to the claims which were finally rejected in the parent application. The result is a first action final rejection of these claims. Applicants should file any desired amendments at the time the application is filed under 37 CFR 1.62, since the Office is treating these applications as "Special" and an action on the merits will be rendered quite promptly.

C. *File Wrapper Continuation*

To expedite processing under Rule 1.62, make certain that the parent serial number cited in the transmittal letter is the correct serial number.

D. *Information Cited on Form PTO–1449*

The Public is encouraged to use Form PTO–1449, "Information Disclosure Citation," when preparing a statement under 37 CFR 1.97–1.99 (see MPEP §609). This form provides the Office with a uniform way of listing the citations and a vehicle from which the information thereon can be printed on the issued patent.

Recently, citations are being presented on various forms prepared by the public rather than on Form PTO–1449. As a result, delays are cropping up in the printing process. Because the printer has difficulty in following the various formats and is having to query the examiner each time a non-PTO–1449 form is used, you are encouraged to use the Form PTO–1449 with any submission under 37 CFR 1.97–1.99.

Note that listing citations on Form PTO–1449 does not raise an irrebuttable presumption that the citation is prior art. A holding by an examiner that any citation on Form PTO–1449 is prior art to claimed subject matter can be rebutted by procedures commonly used to rebut the prior art status of an examiner's citations on Form PTO–892, "Notice of References Cited".

Among the information that should be provided on Form PTO–1449 is the date of the citation. In addition, it is helpful if the class and subclass of each citation is provided. It is appreciated that classification information may not be known at the time Form PTO–1449 is prepared. When classification information is not known, draw a line in the boxes under the class and subclass heading adjacent to the citation for which classification information is not known.

E. *New Application Filing Problems*

Applications continue to be filed incorrectly under both 37 CFR 1.60 and 37 CFR 1.62. This causes problems not only for applicants but also for the Patent and Trademark Office. Filing dates are not granted to applications which do not comply with the rules. As a result, petitions with fees are required to be filed in such applications before a filing date will be granted.

Most often, the problems that arise in this area can be characterized as the following:

1. Applicants continue to fail to comply with the requirements of 37 CFR 1.60 with regard to what must be submitted upon filing under the rule. This is true even after the clarifying amendments (effective Apr. 1. 1984) were made to the rule. This problem was also addressed in the Official Gazette Notice of May 8, 1984 entitled "Filing of Patent Applications Pursuant to 37 CFR 1.60."
2. A true copy of the prior application must be filed including the specification (including claims), drawings, oath or declaration showing the applicant's signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application.

3. Applicants are using transmittal forms which request filings under one rule when, in fact, they wish to file under another rule. For example, a transmittal form requesting filing under 37 CFR 1.62 may be filed when it was really desired to file a divisional application under 37 CFR 1.60 and not to abandon the parent application.

   Applications have also been filed with a transmittal form requesting filing under 37 CFR 1.60 when it was intended to file under 37 CFR 1.62. The confusion in the record of such applications must be clarified by a decision on petition before the applications can be processed for examination.
4. Some applicants fail to realize that the parent application is abandoned by the filing of a continuing application under 37 CFR 1.62. Paragraph (g) of 37 CFR 1.62 states:

   > "The filing of a request for a continuing application under this section will be considered to be a request to expressly abandon the prior application as of the filing date granted the continuing application."
   >
   > Correction after such a mistaken filing under 37 CFR 1.62 usually requires a revival of the parent application under 37 CFR 1.137(a) or (b) which expends resources of both the applicant and the PTO.

5. Some applicants are attempting to file continuing applications under 37 CFR 1.62 after payment of the issue fee in the parent application. Such applications are improper and are not entitled to a filing date. Additionally, such filings will not affect the prior application, i.e., the parent application may issue as a patent. Paragraph (a) of 37 CFR 1.62 specifies that continuing applications may be filed under 37 CFR 1.62 "before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application".
6. Some applicants are attempting to file continuation-in-part applications under 37 CFR 1.62 with a new specification rather than with the changes made by amendment to the prior application. As stated in 37 CFR 1.62(a) filings under 37 CFR 1.62 use the specification of the prior application.

   Paragraph (c) of 37 CFR 1.62 also states:

   > "In the case of a continuation-in-part application which *adds and claims additional disclosure by amendment*, an oath or declaration as required by §1.63 must also be filed. . ." (emphasis added)

F. *Patent Applications*

We are trying to expedite and improve preliminary processing of patent applications. Please help by putting patent applications and associated papers (e.g., assignments) in separate envelopes apart from all other mail. Identify on the outside of the envelope "PATENT APPLICATION"

Petition for License

Rule 5.12 states that "filing of an application for patent for inventions made in the United States will be considered to include a petition for license under 35 U.S.C. 184 for the subject of the application. The filing receipt will indicate a license is granted". There is no need to request a corrected filing receipt deleting the words "License Granted". Its intent is to provide the necessary acknowledgement for those filing abroad.

G. *NEW APPLICATIONS — Payment of Processing and Retention Fees*

An application, which has become abandoned pursuant to 37 CFR 1.53(d) for failure to pay the filing fee, will be disposed of unless the processing and retention fee set forth in §1.21(l) is paid within the 1-year period referred to in §1.53(d). Moreover, the processing and retention fee must be timely paid in order to obtain certified copies of the application (e.g., for convention priority purposes) or to establish in a later filed application the filing date benefit of an earlier copending application under 35 USC 120 and 37 CFR 1.78(a)(3). Therefore, an application which has become abandoned for the reasons set forth above should be immediately reviewed in order to timely determine the advisability of submitting a processing and retention fee payment.

H. *Surcharge for Filing a Patent Application*

Filing dates are accorded to applications filed without the basic filing fee and without the oath or declaration. In such cases, a notice is mailed by Application Branch requiring at least the basic filing fee and the oath or declaration, accompanied by a surcharge (37 CFR 1.16(e)). In numerous instances, applicants fail to submit the surcharge causing the application to become abandoned. See 37 CFR 1.53(d) and MPEP §506.

XI. PATENT COPIES

A. *Price of Patent Copies*

The price of a patent copy increased from $1.00 to $1.50 on Oct. 5, 1985. The new $1.50 coupons are available, but we will accept the old ones and provide a $.50 coupon refund as appropriate.

XII. PETITIONS TO REVIVE

A. *Petitions to Revive Abandoned Applications*

Frequently, a petition to revive an abandoned application is accompanied by an unnecessary request and fee for extension of time. Our policy is set forth in MPEP 711.03(c). Specifically, a response does not require a request and fee for extension of time as a condition of revival.

Further, a petition to revive an abandoned application is often accompanied by an unnecessary terminal disclaimer. A terminal disclaimer is required only when a grantable petition based on unavoidable delay is not filed within six months of the date of abandonment (37 CFR 1.137(a) and 1.137(c)). It follows that a terminal disclaimer should not accompany a petition based on unintentional

abandonment (37 CFR 1.137(b)). In these respects, analogous reasoning applies to petitions to accept late payment of the issue fee under 37 CFR 1.155 or 1.316.

Finally, when a terminal disclaimer is a necessary component of the petition, the period to be disclaimed must equal the number of months between the date of abandonment and the date a grantable petition is filed. The date of abandonment is the date the period for response has expired (see MPEP 711.04(a)). This is normally the end of the three month shortened statutory period. Moreover, the terminal disclaimer should employ the format shown in Figure 1.

XIII. PUBLIC SEARCH ROOM

A. *Loose Documents*

When photocopies are made of patented files, patent applications and patents in the Public Search Room, we have noticed that papers from files and pages of patents have been left on the copying machines. In general, some documents are not returned to files and patents are not stapled and refiled in the bundles.

XIV. POWER TO INSPECT

A. *Power of Attorney*

The Office receives letters granting power to inspect patent applications. These may only be granted by the attorney of record or inventor. Sometimes the person signing the power is not authorized to do so, causing delay until proper authorization is received. Copies of completed applications cannot be made during the pre-examination process. They can be inspected, but not pulled from the work flow to have copies made.

B. *Withdrawal of Attorney*

To expedite the handling of requests for permission to withdraw as attorney under 37 CFR §1.36, submit the request in triplicate (original and two copies) and indicate thereon the present mailing addresses of the attorney who is withdrawing and of the applicant. The examining group number should also appear on all such requests. Because the Office does not recognize law firms, each attorney of record must sign the notice of withdrawal, or the notice of withdrawal must contain a clear indication of one attorney signing on behalf of another.

A request to withdraw is effective when approved rather than when received. This is particularly important when such requests are submitted toward the end of the period for response. There should be at least thirty days between approval of withdrawal and the expiration date of a time response period so that the applicant will have sufficient time to obtain other representation or take other action. If less than thirty days remains in a running response period, a request to withdraw is normally disapproved.

It would be helpful if a request and fee, preferably an authorization to charge a deposit account, were included with a request to withdraw. Such would permit the Office to make sure, in most instances, that sufficient time remains in the period for response.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of
(NAME)
Serial No.
Filed:
For:

TERMINAL DISCLAIMER

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

Your petitioner, _____,
residing at _____,
represents that he is the owner of the entire interest in the above-identified application (by virtue of an assignment recorded at Reel _____, and Frame _____, filed on the _____day of _____, 19____).

Your petitioner, _____,
hereby disclaims the terminal _____months of any patent granted on the above-identified application or on any application which is entitled to the benefit of the filing date of this application under 35 U.S.C. 120. This agreement is to run with any patent so granted and to be binding upon the grantee, its successors or assigns.

IN WITNESS WHEREOF, I hereunto set my hand and seal this _____day of _____, 19____.

_____
(Signature)

FIGURE 1 — Terminal Disclaimer (see IX. Petitions to Revive)

XV. SMALL ENTITY STATUS

A. *Small Entity Statements*

Verified statements claiming small entity status, where appropriate, would best be signed and submitted at the time the application oath or declaration is signed to permit filing of the statement with the application. This would reduce correspondence between attorney and client, reduce paper handling by the PTO support staff and the PTO Finance Branch, and greatly simplify the processing of subsequent papers involving fees. If small entity status is being claimed for the first time at the time of payment of the issue fee, a verified statement claiming small entity status should be submitted with the fee. See MPEP §509.03.

XVI. TRADEMARKS

A. *Application Drawings*

To avoid delays in processing new trademark applications, the drawing should have the following information in the upper left hand corner.

1. Drawing title.
2. Applicant's name and address.
3. First use date.
4. First use in interstate commerce date.
5. Goods, services or both.

B. *Archive Room*

The Trademark Archive Room contains a number of trademark records that were previously stored in the Trademark Search Library. The Archive Room is located in Crystal Plz. 2, Rm. 3C24. Records contained in this room include:

1. Bound volumes of registrations in registration number order.
2. Bound volumes of the *Trademark Official Gazette*.
3. Adversary Proceedings Index (on cards and on microfilm) by Plaintiff's Name, Plaintiff's Mark, Defendant's Name, and Defendant's Mark.
4. Pending Renewal Index.
5. Pending application receipts in serial number order.
6. Bound volumes of Registrant's Index from 1881 to 1978.
7. Bound volumes of Applicant's Index from 1980 to present.
8. Microfilm of trademark applications starting with serial number 244,754 to present.
9. Microfilm of canceled and expired trademarks.
10. Microfilm of abandoned applications in alphabetic order.
11. Microfilm of registrations in registration number order.
12. Microfilm of docket cards, old series, 1–467,235, 1970 only.
13. Microfilm of docket cards, new series, 1–427,900, 1971 to present.
14. Microfilm of marks published for opposition.
15. Microfilm of Applicant's Index, 1922–1962, 1963–1971, and 1972–1979.

C. *File Histories*

When requesting trademark file histories, the "status date" (i.e., date, abandoned) must be provided to fill the order if the file is abandoned. If not known, this information can be obtained from TRAM. The request will be returned unfilled if this date is not provided.

D. *Trademark Search Library Photocopiers*

Photocopiers and reader/printers in the Trademark Search Library are operated by "Copishare" cards. These cards can be purchased from the cashier in the Patent Public Search Room, Crystal Plz. 3, North Stack area.

[1070 OG 46–59]

TRADEMARK RULES PROPOSALS AND COMMENTS

(160) NOTICE

Following is a corrected version of the Final Rule for the Revision of Trademark Fees that was published in the *Federal Register* on Aug. 4, 1986 at page 28052. The notice to correct the effective date to Oct. 4, 1986 and make other typographical corrections was published in the *Federal Register* on Aug. 8, 1986.

Department of Commerce
Patent and Trademark Office
37 CFR Parts 1 and 2
[Docket No. 60457–6119]
Revision of Trademark Fees

Agency: Patent and Trademark Office, Commerce

Action: Final rule

Summary: The Patent and Trademark Office is amending the rules of practice in patent and trademark cases, Parts 1 and 2 of title 37, Code of Federal Regulations, to adjust trademark fee amounts. This action is necessary at this time because trademark operating costs have increased over the past three and one-half years. The Commissioner is authorized by section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113), to establish fees for the filing and processing of an application for the registration of a trademark or other mark and for all other services and materials related to trademarks and other marks.

Effective Date: Oct. 4, 1986.

For Further Information Contact: Margaret M. Laurence, Assistant Commissioner for Trademarks by telephone at (703) 557–3061 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: This rule change is designed primarily to adjust trademark fees because costs have increased and the Commissioner is authorized to adjust fees for the filing and processing of an application for the registration of a trademark or other mark and for all other processing, services or materials related to trademarks which have been established by the Commissioner in accordance with section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113).

Adjustments to fees for filing and processing a patent application and for other processing, services or materials related to patents were made by rules published in the *Federal Register* on Aug. 6, 1985, at 50 FR 31818, effective Oct. 5, 1985.

Adjustments to fees for filing and processing a trademark application and for other processing, services or materials related to trademarks were not proposed at that time, pending review of automation cost requirements. The Patent and Trademark Office's proposal for an integrated Automated Trademark System was included in the President's FY 1987 Budget and the Office's revised Automation Master Plan that were submitted to the Congress in February 1986.

Background Information: Trademark fees are authorized by section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113). Section 31 grants the Commissioner the authority to establish trademark fees and the discretion to establish the level of Office costs to be recovered from trademark fees. The House Committee on the Judiciary, in House Report 97–542 accompanying H.R. 6260 that was enacted as Public Law 97–247, recommended a trademark fee schedule that was adopted by rule published in the *Federal Register* on Jul. 30, 1982 at 47 FR 33086, effective Oct. 1, 1982.

In House Report 97–542, the Committee stated that:

"...[it] is aware of the concerns of users of the Trademark registration system, however, and intends to exercise vigorous oversight with respect to the Commissioner to ensure that fees remain at a reasonable level and that trademark registrations are processed in an efficient and cost effective manner. As part of this oversight, the Committee recommends the following fee structure to the Commissioner for Fiscal Year 1983.

Type of Fee:	Proposed Fee
Application filing fee per class	$175
Renewal fee	300
Late renewal	100
Section 12(c) claim	100
New certificate	100
Certificate of correction	100
Disclaimer to registration	100
Amendment to registration	100
Per class combined section 8 and 15 affidavit	200
Per class section 8 affidavit alone	100
Per class section 15 affidavit alone	100
All petitions to Commissioner	100
Cancellation opposition per class	200
TTAB appeal	100
Certified copies	10
Copies of trademarks	1
Assignments	*

*$100 plus for each mark in addition to 1.

The Patent and Trademark Office (PTO) believes it is reasonable to use fluctuations in the Consumer Price Index (CPI) during the previous three years to define the maximum aggregate revenue level that may be recovered from trademark fees for the three-year period 1986–1988. Fees would then be set to recover, in the aggregate, projected costs for the fee cycle, but under no circumstances would total revenues exceed the maximum revenue level that would be recovered if fees were adjusted by the CPI. This is consistent with the method mandated by Public Law 97–247 for adjusting patent fees.

The first step in the trademark fee adjustment process was to determine the maximum level of recovery for the three-year fee cycle. This was done by (1) multiplying present fees by projected workload for fiscal years 1986–1988, (2) totalling the results, and (3) applying the rate of fluctuation in the Consumer Price Index as determined by the Secretary of Labor.

The second step in the trademark fee adjustment process was to establish the total cost to be recovered from trademark fees for the three-year period 1986–1988. The total costs for the filing and processing of an application for the registration of a trademark or other mark and for all other processing, services or materials related to trademarks were determined. The Office followed (1) the general guidelines set forth in OMB Circular A-25 entitled "User Charges", that establishes general policies for developing an equitable and uniform system of charges for certain Government services and property, and (2) the guidelines for accounting and reimbursement for sharing of information technology facilities as set forth in Appendix II to OMB Circular No. A-130 entitled "Management of Federal Information Resources."

The Office used cost-finding techniques for determining the costs of all processing, services and/or materials

associated with each trademark fee. Costs were determined from the best available records and included both direct and indirect costs. Costs were adjusted to reflect projected increases or decreases contained in the President's FY 1987 Budget. These cost figures were documented by the Director, Office of Finance and reviewed by each responsible Assistant Commissioner.

The total projected costs for the three-year period 1986–1988 are lower than the maximum level of recovery which would be allowed if fees were adjusted strictly according to changes in the CPI during the past three years. In its adjustment of Trademark fees, PTO is expected to recover the total projected costs in fiscal years 1987 and 1988 plus a contingency of two percent of the estimated fee income for fiscal years 1987–1988.

This rule continues to follow the suggested fee schedule contained in House Report 97–542, with the exception of increases to the fee for filing an application for registration and the fee for a printed copy of a registered mark. As a result of continuing to follow this suggested fee schedule, over the two-year period, some trademark fees would recover more than their actual estimated cost and some would recover less their actual estimated cost. Using the 1986–1988 workload projections, the total fee revenues generated by the adjusted fees for the three-year period, in the aggregate, would not exceed the total projected costs for trademarks for the same period, apart from the contingency.

It is intended that the amount of any fee due and payable on or after Oct. 4, 1986 is the amount set in this rulemaking. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing, where authorized under section 1.8 of title 37, Code of Federal Regulations, will be considered to be the date of receipt in the Office. A "Certificate of Mailing under section 1.8" is *not* "proper" for items which are specifically excluded from the provisions of section 1.8. Section 1.8 of title 37, Code of Federal Regulations, should be consulted for those items for which a Certificate of Mailing is *not* "proper." The provisions of section 1.10, relating to filing of papers and fees by "Express Mail" with certificate, however do apply to *any paper or fee* to be filed in the Office. If an application or fee is filed by "Express Mail" with a certificate of mailing dated Oct. 4, 1986, the amount of the fee to be paid is the fee established herein if a change is being made in the fee.

To ensure clarity in the implementation of the fee proposals, a discussion of specific sections is set forth below:

Discussion of Specific Changes

Section 1.24 Coupons

Section 1.24 is amended to adjust the fee for the purchase of coupons for trademarks to make it comparable to the proposed fee required for the purchase of a printed copy of a registered mark.

Section 2.6 Trademark fees

Section 2.6 is amended to adjust trademark fees established purusant to the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113) and set forth in paragraphs (a) and (n) of this section to more closely reflect the cost to the Office of such processing.

Section 2.6, paragraph (o) is amended to provide a $25 fee for the expedited handling of a request for a certified copy of a trademark record. Currently there is no procedure for such expedited handling, and the Office has received many requests that this service be provided.

Section 2.6, paragraph (q), is amended to clarify that the fee for recording documents applies to every paper which relates to the property in a registration or application. This is in accord with past and current Office policy.

Response to Comments on the Rules

Special comments were received on the proposed rule changes. Three letters submitting written comments were received. Oral testimony was presented by two people at the public hearing conducted on June 16, 1986. All of the written and oral comments were considered in adopting the changes set forth herein. The comments submitted appear below along with responses thereto.

Comment:

The trademark fee increases of 1982 were accompanied by a committment that the Trademark Operation would be shielded from government-wide cuts aimed at reducing the deficit. The applicability of the fiscal year 1986 Gramm-Rudman-Hollings sequestration of trademark funds represents a failure of the Federal Government to live up to its side of the bargain. Until these funds are restored to the Trademark Operation and the Administration states that it will not again undermine this provision of law, any effort to increase trademark fees must be deferred.

Reply:

Public Law 97–247, enacted Aug. 27, 1982, did not provide that the Trademark Operations are exempt from government-wide cuts in expenditures aimed at reducing the federal deficit. The only restriction, imposed by section 3(g), is that the fees collected from trademark activities "shall be used exclusively for the processing of trademark registrations and for other services and materials related to trademarks." The PTO has fully complied with this requirement. Moreover, the Supreme Court has recently decided the constitutionality of Gramm-Rudman-Hollings (The Balanced Budget and Emergency Deficit Control Act of 1985, Public Law 99–177, enacted Dec. 12, 1985), holding that the reductions to the federal deficit must be accomplished via the enactment of a joint resolution of the Congress. *See Bowsher v. Synar*, Nos. 85–1377, 85–1378, and 85–1379 slip op. at 20 (Jul. 7, 1986). Consequently, any budget reductions made by the PTO that are mandated by such a joint resolution will be pursuant to law. Therefore, the PTO is not required to defer increases in trademark fees since the provisions of Public Law 97–247 do not shield the Trademark Operations from such budget cuts and any such cuts are made pursuant to subsequent law.

Comment:

The House of Representatives and the Senate have passed differing versions of H.R. 2434. Both versions prohibit the use of user fees for the search rooms and the House version prohibits user fees for automation. The PTO should withdraw the curent proposal, and publish a new proposal for public comment, if needed, after Congress passes the authorization bill.

Reply:

The PTO already is in compliance with the provision of the Senate and House authorization bills that prohibits use of fees to fund the search room. In fiscal year 1986, unobligated appropriate funds carried forward from fiscal year 1985 are being used to fund the paper Trademark Search Room. Appropriated funds for the Search Room were requested in the pending FY 1987 President's Budget.

Although the House version of H.R. 2434 prohbits the use of fee income for automation expenditures, it does not provide appropriated funds. The Senate version of H.R. 2434 does not prohibit the use of fee income for automation expenditures. Since there are significant differences between the House and Senate versions on this and other provisions, the PTO must wait for final action by both the Congress and the President.

In the meantime, the PTO will continue to operate in accordance with the 1986 Appropriations Act and the pending FY 1987 President's Budget, which fund Automation through user fees. If legislation is ultimately passed by the Congress and signed by the President that is contradictory to this plan, appropriate adjustments will be made. The suggestion to withdraw the current proposal, and to publish a new proposal for public com-

ment, if needed, after Congress passes the authorization bill has not been adopted.

Comment:

It is important for the PTO to make available detailed information concerning activities that are not supported by appropriations since government operations which are supported by user fee income receive far less scrutiny from government authorities (cabinet level department officials, Office of Management and Budget, and appropriation committees in Congress) than operations which are supported by appropriations.

Reply:

The assertion that government operations supported by user fee income receive far less scrutiny from government authorities is not correct. Fee supported activities received the same amount of oversight as activities supported by appropriations. In Senate Report 99–305 accompanying bill H.R. 2434, the Committee on the Judiciary said that:

. . . Congress never envisioned that activities financed by user fees would be any more beyond the scrutiny of Congressional oversight than those activities that are paid for by appropriations. On the contrary, it is clear that the Office's authority to collect and spend user fee money does not remove these activities from Congressional oversight and control.

. . . Both the authority to raise general revenue and the authority to allow the Office to set fees rests with Congress. If Congress is to carry out the responsibilities attending both of these exercises of its power, it must carefully review the effectiveness and efficiency of all agency activities no matter how they are funded. While it may be proper to restrict the funding of certain activities to appropriations, such restrictions cannot be justified solely by reference to the need to increase oversight. That reasoning implies that Congress has less concern over how the agency spends user fee money. In the case of the Patent and Trademark Office, this would imply that most of the agency's activities are not subject to effective Congressional review, which, as pointed out above, is simply not true."

Specific examples of oversight include: (1) The budget process requires program levels to be fully justified regardless of funding sources; (2) the budget request is thoroughly analyzed and evaluated, without regard to revenue source, by the Department of Commerce, Office of Management and Budget (OMB) and the Appropriations Committees in the Congress; (3) fee revenues are appropriated annually by the Congress; (4) the use of fee money by the PTO is subject to the same OMB apportionment process as the use of appropriations; (5) Department of Treasury reports do not distinguish between funding sources; and (6) reprogramming (or redirection) of funds that vary from the enacted budget require Department and OMB approvals and Congressional notification, regardless of funding source.

In addition, since 1983 the PTO has routinely provided the Public Advisory Committee for Trademark Affairs with detailed reports which fully disclose the source and use of all trademark-related resources.

Comment:

It is contrary to existing law (Public Laws 96–517 and 97–247) to spend user fee income for the search rooms and automation.

Comment:

Despite representations that major capital expenses would be underwritten by General Fund revenues, not user fees, the PTO continues to rely on user fee income to finance its trademark automation project and the public search room.

Reply:

User fee income is not being spent on the paper Trademark Search Room in fiscal year 1986. The paper Trademark Search Room is being funded from unobligated appropriated funds carried forward from fiscal year 1985. For fiscal year 1987, the PTO has requested $322,000 in appropriated funds to maintain the paper Trademark Search Room. Reference page 41 of the PTO's 1987 Budget Submission to the Congress.

Public Law 96–517, although enacted into law, was never fully implemented because the Congress passed H.R. 6260 which was enacted as Public Law 97–247 on Aug. 22, 1982. The restrictions on the use of income from fee revenues, which were included in House Report 96–1307 accompanying Public Law 96–517, were based upon a 50 percent recovery of patent and trademark costs from user fees. Then-Commissioner Mossinghoff testified before the Subcommittee on Courts, Civil Liberties, and Administration of Justice, when Congress was considering H.R. 6260, that the Administration's PTO user fee program was proposed to improve the quality of service at the PTO by reducing patent pendency, trademark pendency and automating patent and trademark operations. The Commissioner went on to say that: "The major increases in the three program areas will be paid for by the sharp increase in user fees that we are recommending." The Congressional debate on this proposal indicates that the Subcommittee approved these innovative fee provisions in order to improve the level of patent and trademark services provided to users of the office. Expenditure of funds since 1983 is believed to have met this goal.

Comment:

There is no reason why any fee increases have to be in effect by Oct. 1, 1986.

Reply:

While there is no legal compulsion for an Oct. 1, 1986 effective date for the fee increase, there are financial reasons for adjusting fees at that time. For every one-month of delay beyond Oct. 1, 1986, the Trademark Operation will receive about $135,000 less in fee revenues which will mean that the program contemplated for fiscal year 1987 will be affected. The PTO's budget is prepared annually for the period Oct. 1 through Sept. 30 and it is important that planned expenditures equal planned income.

Comment:

The Notice of Proposed Rulemaking justifies the proposed fee increase on the ground that the amount of the increase is less than the increase that has occurred in the Consumer Price Index.

Reply:

The proposed fee increase is justified on the basis that costs have increased since Oct. 1982 when the present fee schedule was established, and the Commissioner is authorized by section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113) to adjust fees.

On page 18290 of the Notice of Proposed Rulemaking under Summary it is stated that: "This action [to adjust trademark fees] is necessary at this time because trademark operation costs have increased over the past three and one-half years." On the same page, third column, the methodology used to determine the costs associated with each trademark fee was described. The Notice of Proposed Rulemaking then goes on to say that: "The total projected costs for the three-year period 1986–1988 are lower than the maximum level of recovery which would be allowed if fees were adjusted strictly according to changes in the CPI during the past three years." In other words, Trademark Operation costs for 1987–1988 are projected to be less than changes in the CPI during the past three years.

Comment:

PTO has failed to justify why the trademark fee increases are necessary. The PTO should make calculations and other relevant information pertaining to the proposed increases available to the public and the Congress.

Reply:

Because of the volume, it was not feasible for the PTO to publish the calculations and other relevant information upon which the proposed fee increases were based. As stated in the third column of page 18290 of the Notice of Proposed Rulemaking, the Office followed OMB guidelines and the cost figures were documented by the Director, Office of Finance [a Certified Public Accountant] and reviewed by each responsible Assistant Commissioner. All of the backup documentation is available for review, upon request.

Comment:

If costs are reduced as they were through the forced reductions in the PTO's budget authority under the Deficit Reduction Act, the entire concept on which the PTO calculates its trademark fees must be reconsidered before further fee increases can be reasonably considered.

Reply:

The 1987 Federal budget submitted by the President to the Congress meets the 1987 deficit reduction goal established by the Balanced Budget and Emergency Deficit Control Act of 1985. Therefore, there is no basis for the PTO to assume alternative funding levels in 1987. The suggestion that the trademark unit cost calculations be reconsidered before further fee increases has not been adopted.

Comment:

In the Notice of Proposed Rulemaking, the PTO requested comments on the methodology it employed in calculating the need for a fee increase. It is impossible to comment on the process itself in the absence of more detailed information.

Reply:

The PTO did not request comments on the methodology it employed in calculating the need for a fee increase. On page 18291 of the Notice of Proposed Rulemaking, first column, it states that: "In its adjustment of Trademark fees, PTO seeks to recover total projected costs in FY 1987 and FY 1988 and to provide for a contingency of two percent of the estimated fee income for fiscal years 1987–1988. PTO seeks comments on this approach." No comments were received on the planned contingency. This fact notwithstanding, the PTO has adopted this approach as part of its excess fee policy.

Comment:

The Notice of Proposed Rulemaking does not explain what expenses of the Office will be paid with trademark fees. In particular, the notice does not explain what items are included in "indirect costs."

Reply:

The Commissioner has the authority to establish trademark fees and the discretion to establish the level of Office costs to be recovered from trademark fees. Since fiscal year 1983, the PTO has recovered 100 percent of the costs related to trademark processing, both direct and indirect. Direct costs are those represented by the Trademark budget activity (page 29 of the PTO's 1987 Budget Submission to the Congress): Trademark examination (including contractual costs for T-Search), the Trademark Trial and Appeal Board, and Trademark printing. Indirect costs are costs incurred by other offices in the PTO which carry out trademark activities: Customer Services (providing trademark copies to examining attorneys, processing certificates of correction and assignments, etc.), Publications (administration of the contract to print the Trademark *Official Gazette*), Management Planning (collecting and processing trademark fees), Administrative Services (mail processing, files repository, etc.) and Automation (TRAM operations, ATS implementation and operations, etc.). No trademark fees are used to fund the Office of the Commissioner, the Office of Legislation and International Affairs, the Office of the Solicitor, staff in the immediate Office of the Automation Administrator, or any other PTO function that is not directly related to trademark processing.

Comment:

The Notice of Proposed Rulemaking does not explain how the Office's revised automation plans have affected the need for fee increases.

Reply:

The Notice of Proposed Rulemaking, second column, page 18290 states that: "The Patent and Trademark Office's proposal for an integrated Automated Trademark System was included in the President's FY 1987 Budget and the Office's revised Automation Master Plan that were submitted to the Congress in Feb. 1986." The PTO's 1987 Budget Submission to the Congress, page 32 states that: "The PTO requests a net increase of $901,000 to fund an automation initiative providing further improvements in the capabilities, performance, availability, and efficiency of the existing systems through enhancements for an integrated ATS (Automated Trademark System). . . . The full cost of the increase has been partially offset by a decrease of $624,000 for the T-Search contract. ATS will provide automated support to all Trademark operations currently supported by TRAM and T-Search."

In addition to Automation, other increases, such as four new positions for the Trademark Trial and Appeal Board, have caused costs to increase thereby necessitating the fee increase.

Comment:

The Notice of Proposed Rulemaking contains no discussion of the policy of the House Judiciary Committee in 1982 of keeping the filing fee relatively low and recovering more than the actual cost for other trademark services or materials. Was this consideration taken into account in establishing the proposed fees?

Reply:

The suggestion of the House Committee on the Judiciary that the filing fee be kept as low as possible to foster use of the Federal registration system was the basis for the proposed fee adjustments. The Notice of Proposed Rulemaking, first column, page 18290, quoted the text of House Report 97–542 which suggested that the Commissioner ensure that fees remain at a reasonable level. Included in the quote was the House Committee's recommended fee schedule that was adopted by rule published in the *Federal Register* on July 30, 1982.

Further, on page 18291, first column, it is stated that: "This proposed rulemaking would continue to follow the suggested fee schedule contained in House Report 97–542, with the exception of proposed increases to the fee for filing an application for registration and the fee for a printed copy of a registered mark. As a result of continuing to follow this suggested fee schedule, over the two-year period, some trademark fees would recover more than their actual estimated cost and some would recover less than their actual estimated cost."

Comment:

The proposed increase of $25.00 for filing an application is against the concept of keeping the filing fee relatively low and recovering more than actual cost for other trademark services or materials.

Reply:

The projected cost for filing an application for fiscal years 1987–1988 is $242.84 per application, per class. The Office has set the application fee at $200.00 or 21.4 percent below cost. At that reduced level, the Trademark Operation will lose almost $6 million over the two-year period which must be made up from other Trademark fees. The Trademark Operation is also losing revenues on other fees directly related to the Federal registration of a trademark, i.e., fees for filing oppositions, appeals, and petitions. Combined with the application fee shortfall, the total loss over the two-year period will be almost $10 million. On the other hand, fees from renewals, Section 8 and 15 affidavits, and assignments are expected to generate excess revenues of about $9 million. This excess, plus another $1 million generated from some other trademark fees will equal the shortfall caused by the reduced fees for processing applications, oppositions, appeals and petitions.

Comment:

The PTO should explain why it charges $100 for a trademark assignment and only $7.00 for a patent assignment. The cost to the government of recording a trademark assignment could not even come close to the $100 fee being charged.

Reply:

The PTO charges more than the actual cost to record trademark assignments in order to subsidize the other areas of the Trademark Operation, specifically the processing of applications. This is in accordance with the fee structure suggested by the House Committee on the Judiciary in House Report 97–542 which accompanied the bill which was enacted as Public Law 97–247. This

policy was also recommended by various bar groups, including the Public Advisory Committee for Trademark Affairs.

Comment:

Trademark fees are becoming increasingly onerous, particularly on small businesses which must often select less than the total number of classes to which they are entitled to file, for economic reasons. The filing fee for a trademark application already exceeds that for a small entity filing a patent application.

Reply:

As reported on page 18291 of the Notice of Proposed Rulemaking, the General Counsel of the Department of Commerce certified to the Small Business Administration that the proposed rule change will not have a significant adverse economic impact on a substantial number of small entities because the increase is modest in comparison with the 400 percent increase in the application fee in Oct. 1982, and the increase then had no noticeable impact. While the Office has no way of ascertaining which applications are filed by small businesses, a review of the number of applications filed by individuals and partnerships during the years 1980–1982 prior to the 400 percent increase and the years 1983–1985 after the fee increase showed an increase, rather than a decrease, in the number of filings by individuals. This is confirmed by the total figures on filing which indicate that fees have not deterred applicants. The annual number of application classes filed for prior to the fee increase was 50,672, 52,149 and 55,152 in fiscal years 1979, 1980 and 1981, respectively. There was a dump of cases in Sept. 1982 to avoid the Oct. 1, 1982 fee increase, which distorts the filing data for fiscal years 1982 and 1983. However, filings have continued to increase at over five percent a year in 1984 and 1985 (61,480 and 64,677, respectively). Latest projections for 1986 indicate we will be receiving almost 68,800 applications, or 6.3 percent more than 1985.

Comment:

Trademark fee income has been diverted to non-trademark activities.

Reply:

No trademark fee income is used for any purpose other than trademark-related activities.

Comment:

The PTO has vastly underestimated and understated the number of requests it receives for trademark copies and, as a consequence, Trademarks is not receiving appropriate credit for the income this service generates.

Reply:

It is beyond the control of the PTO if a user buys a coupon for a patent copy and then uses it to pay for a trademak copy. To comply with the provisions of Public Law 97–247 that trademark fee income be used only for trademark-related activities, the Office of Finance has been crediting the Trademark account with revenues that equate to the number of trademark copies actually sold each month by the copy fulfillment contractor. The same accounting adjustment is being used for copies made on the vendor-operated copy machines.

Comment:

The notice does not explain the 50 percent increase in the cost of printed copies of registered marks.

Reply:

The cost of providing one trademark copy is $1.95 based on projected costs for fiscal years 1987 and 1988. These costs include $43,100 for personnel compensation and benefits, $53,200 for contractor costs, $25,300 for services, supplies and depreciation of capital equipment, and $24,500 for general and administrative expenses. Assuming 74,900 trademark copies will be sold over the two-year period, the unit cost if $1.95. The PTO proposed to increase the fee for a trademark copy by $.50 to $1.50 to more closely reflect the cost of providing a trademark copy, and to make it comparable to the fee for a patent copy for ease of administration.

Comment:

How is the $25.00 fee for expedited handling of certification requests justified?

Reply:

The Office followed OMB Circular A–25 Guidelines on "User Charges" to determine the projected direct and indirect costs for expedited handling of certification requests. Circular A–25 provides that a reasonable charge should be imposed to recover the full cost to the Government of rendering a service to an identifiable recipient.

The Assistant Commissioner for Trademarks has estimated that about 1,000 requests for expedited certification would be received each year. This estimate is based on the number of public inquiries presently received for special handling for certifications.

Assuming about 2,000 requests for expedited certification will be received during the two year period 1987–1988, it is estimated that the costs would be $49,248, or $25.00 per unit rounded to the nearest dollar. The costs include $40,982 for personnel compensation and benefits for 2.1 staff years of effort, and $8,266 for general and administrative expenses (20.17 percent of direct costs).

The PTO intends to issue guidelines regarding the expedited service procedures prior to Oct. 1, 1986. Requests delivered to the Trademark Services Division before noon will be available for pick-up or mailing no more than three working days thereafter.

Comment:

The Senate version of H.R. 2434 would require the PTO to report annually several items of statistical information concerning the Office's fee collections and expenses; i.e., a list of patent and trademark fee collections, and lists of the activities of the Office supported by patent fees, trademark fees and appropriations. This type of information should be made available to the public before any fees are increased.

Reply:

The PTO is already providing lists of patent and trademark fee collections in Table 4 of the Commissioner's Annual Report. The report is sent to the Congress and is available for public dissemination. Since 1983, the PTO has periodically provided detailed information to the Public Advisory Committee on Trademark Operations which includes a list of PTO activities supported by trademark fees. Upon enactment of an authorization bill, the PTO will comply with the requirements of both the legislation and the accompanying report.

Comment:

The PTO should expand the information contained in the Congressional budget under Fee Functions to show the amount of trademark and patent fee income dollars and the amount of appropriated dollars that are being used to support each item in its budget.

Reply:

The Congressional Budget is prepared in the format requested by the House and Senate Appropriations Subcommittees. As indicated above, the PTO will comply with any additional reporting requirements that may be included in enacted authorizing legislation.

With regard to trademark user fees, since 1983 the PTO has routinely provided the Public Advisory Committee for Trademark Affairs with detailed reports which fully disclose the source and use of all Trademark-related resources. The reports include resources (e.g., unobligated resources, balances carried forward from prior years, excess fees from prior years, and current-year's fees); expenditures for direct trademark activities (examination, T-Search, Trademarks Trial and Appeal Board, and printing), and indirect trademark activities (Customer Services, Publications, Management Planning, Administrative Services, and Automation); and backup documentation as requested. The PTO has regularly modified its reporting formats to accommodate the needs of the user community and is presently working with the Advisory Committee to develop a "business-type" financial report.

Comment:

The PTO should adopt a policy of giving the public a minimum of 60 days to comment after every rule change proposal is published in the *Federal Register.*

Reply:

The Administrative Procedure Act (5 U.S.C. 551 et. seq.) requires that the public be given the right to participate in the rulemaking process by commenting on proposed rules. The PTO makes every attempt to provide between 45 and 60 days but no less than 30 days for public comment. The public comment period is dependent on internal and external review requirements and effective date constraints.

Other Considerations: The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Public Law 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. There are no information collection requirements relating to trademark fee rules.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Public Law 96–354). Although these rules increase the trademark fees, the cost of Federal registration of a trademark is a small part of the cost of doing business. Furthermore, the incremental change is modest in comparison with the increase in the application fee in Oct. 1982, and the increase then had no noticeable impact. Office records show no decline in the number of applications filed by individuals and partnerships after the Oct. 1982 fee increases, and the rules maintain the present fee schedule for the most part, and limit the increase in the filing fee to the minimum amount possible.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Parts 1 and 2

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interest, Courts, Inventions and patents, Lawyers, Trademarks.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, 15 U.S.C. 1113 and 1123, and Public Law 97–247, the Patent and Trademark Office is amending title 37 of the Code of Federal Regulations as set forth.

PART 1 — RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

   Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.24 is proposed to be revised to read as follows:

§1.24 Coupons

Coupons in denominations of one dollar and fifty cents for the purchase of patents, designs, defensive publications, statutory invention registrations, and trademark registrations are sold by the Patent and Trademark Office for the convenience of the general public; these coupons may not be used for any other purpose. The one dollar and fifty cent coupons are sold individually and in books of 50 with stubs for record for $75. These coupons are good until used; they may be transferred but cannot be redeemed.

PART 2 — RULES OF PRACTICE IN TRADEMARK CASES

1. The authority citation for 37 CFR Part 2 would be revised to read as follows:

   Authority: 15 U.S.C. 1123; 35 U.S.C. 6, 25, unless otherwise noted.

2. Section 2.6 is amended by republishing the introductory text and revising paragraphs (a), (n), (o) and (q) to read as follows:

§2.6 Trademark fees.

The following fees and charges are established by the Patent and Trademark office for trademark cases:

(a) For filing and application, per class	$200.00
(n) For printed copy of registered mark Copy only	$1.50
(o) For certifying trademark records, per certificate	$3.50
For expedited handling of such certification, per record requested	$25.00
(q) For recording trademark assignments and agreements or other papers relating to the property in a registration or application, per document	$100.00

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Department of Commerce
Patent and Trademark Office
37 CFR Part 2
[Docket No. 40557–6118]
Miscellaneous Amendments of Trademark Rules

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending the rules of practice in trademark cases to correct two cross-references and a spelling error; to bring §§2.104 and 2.112(a) into conformity with sections 13 and 14 of the Trademark Act; to make §2.114(c), which relates to the withdrawal of a petition for cancellation, consistent with corresponding §2.106(c), which relates to the withdrawal of an opposition; and to specify that the Trademark Trial and Appeal Board may, in its discretion, grant a §2.132(a) motion even if the motion was filed after the opening of the testimony period of the moving party.
Effective Date: Sept. 10, 1986.
For Further Information Contact: Miss Janet E. Rice by telephone at (703) 557–3551 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: Miss Janet E. Rice, Crystal Square 5, Suite 1008, Washington, D.C. 20231.
Supplementary Information: Amendments to §§2.1, 2.101, 2.104, 2.112, 2.114, 2.132, and 2.145 were proposed in a rulemaking notice published in the **Federal Register** on June 11, 1984 at 49 FR 24033 and in the *Official Gazette* of July 3, 1984 at 1044 O.G. 2. Interested parties were requested to submit written comments on or before July 18, 1984. Written comments were submitted by one individual and one organization.

The purpose of these amendments is to make three "housekeeping" corrections; to bring the language of two rules into conformity with the corresponding provisions of the Trademark Act of 1946; and to modify a particular practice.

Several of the rules of practice in trademark cases were amended, effective Feb. 27, 1983, by a final rule notice published in the **Federal Register** on Jan. 28, 1983 at 48 FR 3972 and in the *Official Gazette* of Feb. 22, 1983 at 1027 O.G. 129. A substantial number of other rules of practice in trademark cases were amended, ef-

fective June 22, 1983, by final rule notice published in the **Federal Register** on May 23, 1983 at 48 FR 23122 and in the *Official Gazette* of June 21, 1983 at 1031 O.G. 13. As a result of these rule amendments, three further rule amendments of a "housekeeping" nature are now necessary. First, because the rule amendments included changes in some section numbers and in the location of some provisions, the cross-reference portion of §§2.1 and 2.145(d)(1) are being corrected. Second, §2.101(b), as amended effective Feb. 27, 1983, contains a spelling error which is being corrected. Third, §2.114(c), which relates to the withdrawal of a petition for cancellation, is being amended so that it will be consistent with §2.106(c), as amended effective June 22, 1983, which relates to the withdrawal of an opposition.

Additionally, §2.104 (which lists the content requirements for an opposition) and §2.112(a) (which lists the content requirements for a petition for cancellation) are being amended to bring them into conformity with sections 13 and 14 of the Trademark Act. These amendments are being made as a result of a comment contained in the recent case of *Selva & Sons, Inc.* v. *Nina Footwear, Inc.*, 705 F.2d 1316, 217 USPQ 641 (Fed. Cir. 1983). The comment, which appears in footnote 6 at page 648, reads as follows:

> 37 CFR 2.112 commands that a petition for cancellation "set forth a short and plain statement showing how the petitioner is or will be damaged by the registration." This directive is not, however, reflective of 15 USC 1064, which states that a petition to cancel the registration of a mark may be filed "by any person who *believes* that he is or will be damaged by the registration." (Emphasis ours.) Nor is it consistent with recent case law, discussed infra.

Finally, §2.132, as amended effective June 22, 1983, permits any party in the position of defendant to file a motion to dismiss for failure to take testimony where plaintiff has either (1) failed to take testimony or offer any other evidence (§2.132(a)) or (2) offered no evidence other than copies of Patent and Trademark Office records and such evidence is insufficient to show that upon the law and the facts plaintiff is entitled to relief (§2.132(b)). Paragraph (c) of the section, adopted effective June 22, 1983, provides that any motion filed under paragraph (a) or (b) must be filed before the opening of the testimony period of the moving party. However, in those cases where a plaintiff's testimony period has expired and plaintiff has in fact failed to take testimony or offer any other evidence in his behalf, it is in the interests of justice and judicial economy to grant a motion to dismiss under §2.132(a) even if the motion was not filed until after the opening of the defendant's testimony period. Accordingly, the Patent and Trademark office is amending Rule §2.132(c) to specify that the Trademark Trial and Appeal Board may grant such a motion even if the motion was not filed until after the opening of the testimony period of the moving party.

Discussion of Specific Sections Being Changed

Section 2.1 provides in part that §§1.1 to 1.26 of Part I of Title 37 of the Code of Federal Regulations are applicable to trademark cases except such parts thereof which specifically refer to patents and except §1.22 to the extent that it is inconsistent with §§2.85(e), 2.101(c) or 2.162(d). However, the pertinent provisions in §2.101(c) were relocated in modified form in §2.101(d) by amendment effective Feb. 27, 1983. Further by amendment effective Feb. 27, 1983, §2.111(c) adopted provisions which amplify that part of §2.85(e) relating to petitions for cancellation. Accordingly, the cross-reference portion of §2.1 is being amended by changing "§2.101(c)" to "§2.101(d)" and by adding a cross-reference to §2.111(c).

Section 2.101(b) is being amended by changing the spelling of the word "Principle" to "Principal".

Section 2.104 is being amended by deleting the requirement that the opposition "set forth a short and plain statement showing how the opposer would be damaged by the registration of the opposed mark" and substituting therefor a requirement that the opposition "set forth a short and plain statement showing why the opposer believes he would be damaged by the registration of the opposed mark." The subsitute requirement is in conformity with Section 13 of the Trademark Act, which states that any person "who believes that he would be damaged by the registration of a mark upon the principal register" may file an opposition in the Patent and Trademark Office.

Section 2.112(a) is being amended by deleting the requirement that the petition to cancel "set forth a short and plain statement showing how the petitioner is or will be damaged by the registration" and substituting therefor a requirement that the petition to cancel "set forth a short and plain statement showing why the petitioner believes he is or will be damaged by the registration." The substitute requirement is in conformity with section 14 of the Trademark Act, which states that a petition to cancel the registration of a mark may be filed "by any person who believes that he is or will be damaged by the registration."

Section 2.114(c), which provides in part that after an answer to a petition for cancellation is filed the petition may not be withdrawn without prejudice except with the consent of the registrant, is being amended to require the *written* consent of the registrant. The requirement is in conformity with the existing practice under § 2.114(c) and consistent with §2.106(c), which, as amended effective June 22, 1983, provides in part that after the answer to an opposition is filed, the opposition may not be withdrawn without prejudice except with the written consent of applicant.

Section 2.132(c), which provides that any motion filed under paragraph (a) or (b) of the section must be filed before the opening of the testimony period of the moving party, is being amended to specify that the Trademark Trial and Appeal Board may in its discretion grant a motion filed under paragraph (a) even if the motion was filed after the opening of the testimony period of the moving party.

Section 2.145(d)(1), which governs the time for filing an appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action, provides in part that if a request for rehearing or reconsideration or modification of the decision is filed within the time specified in §2.129(c) or §2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. Prior to June 22, 1983, §2.129(c) governed the filing of any request for rehearing or reconsideration or modification of a decision of the Trademark Trial and Appeal Board, including a decision on a motion which is finally dispositive of a case. However, under the trademark rules as amended effective June 22, 1983, a request for rehearing or reconsideration or modification of a decision issued after final hearing is governed by §2.129(c), but a request for rehearing, etc., of a decision on a motion which is finally dispositive of a case is governed by §2.127(b). Accordingly, §2.145(d)(1) is being amended to include a cross-reference to §2.127(b).

Response to Comments on the Rules

Comments responding to the notice of proposed rulemaking were submitted by the committee of one organization and by one individual. These comments have been given careful consideration. However, the only suggested modification has not been adopted.

Comment: The organization's committee indicated that while it believed that so me of the proposed amendments would have a substantive effect on practice before the Patent and Trademark Office, it found no reason not to endorse their enactment.

Response: The Patent and Trademark Office agrees that some of the amendments will have a substantive effect on practice before the Office.

Comment: With respect to the proposal to amend §§2.104 and 2.112(a) to bring them into conformity with the language of sections 13 and 14 of the Act relating to standing, i.e., to require that an opposition and a petition for cancellation, respectively, set forth a short and plain statement showing why the plaintiff believes he would be damaged by the registration of the mark in question, one individual, noting ". . . the recent changes in the 'standing' doctrine from a 'damage' showing to a 'real interest in the proceeding' showing, . . .", suggested that it might be less confusing if the two rules were amended to provide that opposers and petitioners must set forth a statement showing why (or how) they have " a real interest in the proceeding" rather than why they believe they will be damaged.

Response: The suggested modification is appealing because it reflects current case law. Nevertheless, since case law interpretation of statutory provisions is subject to change, it is concluded that the better approach is to incorporate into the rules the statutory wording, rather than case law language. Further, inasmuch as the "real interest" language is a legal concept which has no specific meaning apart from case law, it appears that the statutory "belief in damage" language is the more readily understandable way of expressing the standing requirement. Accordingly, the suggested modification has not been adopted.

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The General Counsel has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96–354). The rule change includes no additional or increased fees. Substantive rights to use valuable trademarks are not adversely affected.

This rule change does not contain a collection of information requirements under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant, adverse effects on competition, employment, investment, productivity, innovation, or on the ability of UStates-based enterprises to compete with foreign based enterprises in domestic or export markets.

List of Subject Terms in 37 CFR Part 2

Administrative practice and procedures, Courts, Lawyers, Trademark.

After consideration of the comments received and pursuant to the authority contained in Section 41 of the Trademark Act of July 5, 1946, as amended, and in 35 U.S.C. 6, Part 2 of Title 37 of the Code of Federal Regulations is amended as set forth below.

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

1. The authority citation for Part 2 is revised to read as follows:

Authority: 15 U.S.C. 1123, 35 U.S.C. 6, unless otherwise noted.

2. Section 2.1 is revised to read as follows:

§2.1 Sections of Part 1 applicable.

Sections 1.1 to 1.26 of this chapter are applicable to trademark cases except such parts thereof which specifically refer to patents and except §1.22 to the extent that it is inconsistent with §§2.85(e), 2.101(d), 2.111(c) or §2.162(d). Other sections of Part 1 incorporated by reference or referred to in particular sections of this part are also applicable to trademark cases.

3. Section 2.101 is amended by revising paragraph (b) to read as follows:

§2.101 Filing an opposition.

* * * * *

(b) Any person who believes that he would be damaged by the registration of a mark on the Principal Register may oppose the same by filing an opposition which should be addressed to the Trademark Trial and Appeal Board.

* * * * *

4. Section 2.104 is revised to read as follows:

§2.104 Contents of opposition.

The opposition must set forth a short and plain statement showing why the opposer believes he would be damaged by the registration of the opposed mark and state the grounds for opposition. A duplicate copy of the opposition, including exhibits, shall be filed with the opposition.

5. Section 2.112 is amended by revising paragraph (a) to read as follows:

§2.112 Contents of petition for cancellation.

(a) The petition to cancel must set forth a short and plain statement showing why the petitioner believes he is or will be damaged by the registration, state the grounds for cancellation, and indicate the respondent party to whom notification shall be sent. A duplicate copy of the petition, including exhibits, shall be filed with the petition.

* * * * *

6. Section 2.114 is amended by revising paragraph (c) to read as follows:

§2.114 Answer.

* * * * *

(c) The petition for cancellation may be withdrawn without prejudice before the answer is filed. After the answer is filed, the petition may not be withdrawn without prejudice except with the written consent of the registrant.

7. Section 2.132 is amended by revising paragraph (c) to read as follows:

§2.132 Involuntary dismissal for failure to take testimony.

* * * * *

(c) A motion filed under paragraph (a) or (b) of this section must be filed before the opening of the testimony period of the moving party, except that the Trademark Trial and Appeal Board may in its discretion grant a motion under paragraph (a) even if the motion was filed after the opening of the testimony period of the moving party.

8. Section 2.145 is amended by revising paragraph (d)(1) to read as follows:

§2.145 Appeal to court and civil action.

* * * * *

(d) Time for appeal or civil action. (1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is sixty days from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration or modification of the decision is filed within the time specified in §§2.127(b), 2.129(c) or 2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire at the end of the sixty day period or thirty days after action on the request, whichever is later. The sixty and thirty day periods may be extended by the Commissioner upon a showing of sufficient cause.

* * * * *

June 20, 1986.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[FR Doc. 86-17998 Filed 8-8-86; 8:45 am]

Billing Code 3510-16-M

[1070 TMOG 7]

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(162)

Department of Commerce
Patent and Trademark Office
37 CFR Part 2
[Docket No. 60729-6129]
Trademark Applications

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending the rules of practice in trademark cases to revise and clarify the requirements for drawings, to revise the requirements that an application must meet to receive a filing date, to revise the requirements for specimens submitted in connection with applications for service marks not used in printed or written form, and to abolish the practice of accepting informal drawings. The amendments are needed to reduce the computer system storage space required for drawings; to insure that all applications which are filed can be searched under the automated search system; to insure that drawings can be faithfully reproduced by photocomposition techniques; and to codify the existing practice in accepting audio cassette tape recordings as specimens in connection with sound mark applications.
Effective Date: Sept. 22, 1986.
For Further Information Contact: Ellen J. Seeherman by telephone at (703) 557-7464 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Amendments to §§2.21, 2.52 and 2.58 and the removal of §2.54 were proposed in a rulemaking notice published in the **Federal Register** on Aug. 1, 1984 at 49 FR 30749 and in the *Official Gazette* of Sept. 4, 1984 at 1046 O.G. 5. Interested parties were requested to submit written comments on or before Oct. 30, 1984. Written comments were submitted by four individuals, one company and two organizations.

Section 2.21(a)(3) is being amended to ensure that only applications which include a drawing of satisfactory reproduction characteristics, as defined in §2.52, will be accorded a serial number and filing date.

Section 2.52(a) and (b) are being amended to add clarifying language, but the reproduction standards of these sections have not been changed. Section 2.52(c) is being amended to limit the size of drawings to ensure that drawings submitted by applicants can be reproduced in the Official Gazette, on the certificate of registration and in the automated search system without the loss of detail that would occur if the drawings had to be reduced by the Patent and Trademark Office. Section 2.52(e) is being amended merely to reinforce the requirement of §2.52(a) that lines must not be fine or crowded.

Section 2.54 is being removed to abolish the practice of accepting informal drawings and thereby ensure that only applications with drawings of satisfactory reproduction characteristics for viewing on computer terminal display screens will be accorded a serial number and filing date.

Section 2.58(b) is being amended to reflect the current practice of the Office to accept audio cassette tapes as specimens of service marks not used in printed or written form.

Two commenters expressed unequivocal support for the proposed amendment to Rule 2.58, which the other commenters did not refer to this particular revision.

One commenter approved the proposed amendment to Rule 2.52, while two others questioned the clarity of the rule. One of these inquired whether Bristol board paper would still be considered acceptable for drawings. While Bristol board would be acceptable, it was not considered necessary to modify the rule to specifically refer to this type of paper since it is accepted under the current practice even though it is not specifically mentioned in the current rule. The second commenter indicated that clarification was necessary as to whether stippling or lining for shading is permitted. This suggestion has not been adopted because the proposed amendment specifically refers to color lining and lines used for shading. This same commenter also objected to the size limitation because detail may be lost. The commenter has suggested that the size of the drawing be increased to the maximum size compatible with the Patent and Trademark Office's automated equipment. This suggestion has not been adopted because the drawings must be of a reduced size in order to appear in the Official Gazette and on the certificate of registration. As the commenter has pointed out, reduction of a drawing may result in loss of detail, and it is thought preferable for the applicant to determine which detail should be eliminated and still retain the commercial impression of the trademark rather than having the Patent and Trademark Office arbitrarily reduce the drawings and perhaps eliminate detail important to the applicant.

All of the commenters expressed concern with the proposed revision to Rule 2.21. Several referred to the loss of rights under section 44(d) of the Lanham Act if a filing date were to be denied because of an unacceptable drawing. Another commenter stated that U.S. applicants wished to get their applications on file as quickly as possible, and to do this preferred to send a photograph of their mark rather than take the time to have a drawing prepared. In connection with these objections, the commenters expressed concern about the uncertainty about whether a filing date would be awarded, and long delays before applicants would be notified about rejections of informal drawings.

The Office's experience with examining applications as to whether they meet the requirements for receiving a filing date should alleviate these concerns. Under the current practice, Rule 2.21(c) provides that papers which do not satisfy the requirements of 2.21(a) are returned to the applicant. Office experience over the past three years, the period this rule has been in effect, shows that a determination that the papers are informal and the return of the papers occurs between 2 and 5 days of the date the papers are submitted. It is believed that this procedure will not harm applicants filing pursuant to the provisions of Section 44(d) or domestic applications. Section 44(d) applicants have six months from the filing of their foreign application to file a formal U.S. application. In order to ensure that their drawings are acceptable under the proposed rule, they need file them only a few weeks before the six month period expires. Since the right of priority provides an effective filing date as of the filing of the foreign application, even if the application had to be resubmitted because of a defective drawing the effective filing date would remain the same. As for domestic applicants, it is recognized that the Office examines applications in the order in which they are received; that where there are conflicting applications, it is the application with the earliest effective filing date which is allowed; and that a registration on the Principal Register is prima facie evidence of registrant's use of the mark shown therein for the goods or services specified in the registration from the filing date of the application which matured into the registration. However, it is believed that any disadvantage faced by a particular applicant whose filing date is delayed as a result of the rule of the rule amendments are outweighed by the benefits to the trademark system, the public and the Patent and Trademark Office in having a system where all marks can be searched.

Several commenters suggested an alternative procedure to the proposed rule, whereby applications with defective drawings would be given a filing date, but the applicant would have 30 days from the notification of the defect, or 60 days from the filing of the application, whichever is longer, to submit an acceptable drawing. This suggestion cannot be implemented because such marks would be unavailable in the automated search system when examining attorneys and the public require this information for searches. Currently, examining attorneys are performing searches on applications in less than 60 days, and the expectation is that this time will be further reduced. If these defective special form drawings are not available on the automated search system, examining attorneys will be unable to cite them as prior pending applications. The suggested alternative would also cause a disservice to the public, for even if copies of the defective drawings were placed in a paper file for searching, it would be a burden to hunt through a 60-day accumulation of these papers which personnel cost considerations would prevent being separated by subject matter and class.

Several commenters stated a fear of overzealous enforcement of the amended rules, with marks being excluded from the trademark registration system because of technicalities. One commenter suggested that the test for holding the application informal be whether or not the applicant had made a bona fide attempt to comply with the rule. To allay these concerns the rule is being amended to require "substantial" compliance with §2.52. The Office will make every effort to interpret the rule sensibly, and will accord an application a filing date as long as the drawing meets the size restrictions and consists of black lines on white paper, without gray or half tones. Detailed procedures and guidelines for the Office's clerical personnel should ensure a reasonable and evenhanded approach. The implementation of the rules will be monitored carefully for the first several months.

One commenter inquired about the fate of applications which had acceptable drawings when filed but the drawings were damaged by Patent and Trademark Office personnel. As in the case of other applications which are improperly returned, a filing date which is erroneously cancelled will be reinstated.

Environmental, energy, and other considerations:

The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96-354) since any additional burden would be minimal and not disproportionate in effect.

This rule contains no new information collection requirement for the purpose of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. The existing application requirements referenced in this rule have been approved by OMB (Approval No. 0651-0009).

The Patent and Trademark Office has determined that these changes do not constitute major rules as defined in section 1(b) of Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Part 2

Administrative practice and procedures, Courts, Lawyers, Trademarks.

After consideration of the comments received and pursuant to the authority contained in section 41 of the Trademark Act of July 5, 1946, as amended, and 35 U.S.C. 6, Part 2 of Title 37 of The Code of Federal Regulations is amended as set forth below.

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

1. The authority citation for 37 CFR Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123, 35 U.S.C.6, unless otherwise noted.

In §2.21 paragraph (a) introductory text is republished and paragraph (a)(3) is revised to read as follows:

§2.21 Requirements for receiving a filing date.

(a) Materials submitted as an application for registration of a mark will not be accorded a filing date as an application until all of the following elements are received:

* * * * *

(3) A drawing of the mark sought to be registered substantially meeting all the requirements of §2.52;

* * * * *

3. Section 2.52 is revised to read as follows:

§2.52 Requirements for drawings.

(a) *Character of drawing.* All drawings, except as otherwise provided, must be made with the pen or by a process which will provide high definition upon reproduction. A photolithographic reproduction or printer's proof copy may be used if otherwise suitable. Every line and letter, including color lining and lines used for shading, must be black. All lines must be clean, sharp, and solid, and must not be fine or crowded. Gray tones or tints may not be used for surface shading or any other purpose. The requirements of this paragraph are not necessary in the case of drawings permitted and filed in accordance with paragraph (d) of §2.51.

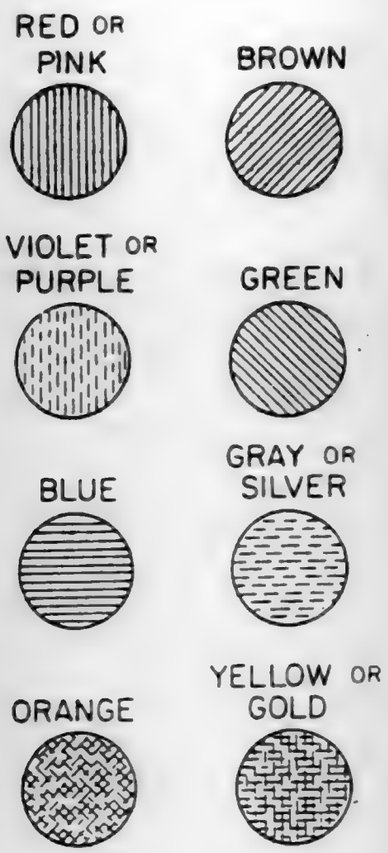
(b) *Paper and ink.* The drawing must be made upon paper which is flexible, strong, smooth, nonshiny, white and durable. A good grade of bond paper is suitable; however, water marks should not be prominent. India ink or its equivalent in quality must be used for pen drawings to secure perfectly black solid lines. The use of white pigment to cover lines is not acceptable.

(c) *Size of paper and margins.* The size of the sheet on which a drawing is made must be 8 to 8½ inches (20.3 to 21.6 cm.) wide and 11 inches (27.9 cm.) long. One of the shorter sides of the sheet should be regarded as its top. It is preferable that the drawing be 2.5 inches (6.1 cm.) high and/or wide, but in no case may it be larger than 4

inches (10.3 cm.) high and 4 inches (10.3 cm.) wide. If the amount of detail in the mark precludes a reduction to this size, such detail may be verbally described in the body of the application. There must be a margin of at least 1 inch (2.5 cm.) on the sides and bottom of the paper and at least one inch (2.5 cm.) between the drawing and the heading.

(d) *Heading.* Across the top of the drawing, beginning one inch (2.5 cm.) from the top edge and not exceeding one fourth of the sheet, there must be placed a heading, listing in separate lines, applicant's complete name, applicant's post office address, the dates of first use of the mark and first use of the mark in commerce (except for an application filed under section 44 of the Trademark Act), and the goods or services recited in the application or a typical item of the goods or services if a number of items are recited in the application. This heading should be typewritten.

(e) *Linings for color.* Where color is a feature of a mark, the color or colors employed may be designated by means of conventional linings as shown in the following color chart:



§2.54 [Removed]

4. Section 2.54 is removed.
5. Section 2.58(b) is revised to read as follows:

§2.58 Specimens or facsimiles in the case of a service mark.

* * * * *

(b) In the case of service marks not used in printed or written form, three audio cassette tape recordings will be accepted.

DONALD J. QUIGG,
July 3, 1986. *Assistant Secretary and Commissioner of Patents and Patents.*

[FR Doc. 86-18864 Filed 8-20-86; 8:45 am]

BILLING CODE 3510-16-M

[1070 TMOG 4]

TRADEMARK APPLICATION EXAMINATION AND CONTENT

(163) Interviews Involving Trademark Application

Interviews frequently result in a better understanding of the issues involved, shorten the prosecution and facilitate disposal of applications.

Interviews for discussion of registrability of the mark of a pending application will not be had before the first official Office action thereon and ordinarily not before filing the first response. Arrangements for an interview should be made in advance so that the Examiner may review the case and be familiar with the details involved.

Interviews on Friday will no longer be prohibited as a matter of policy but all interviews should be set at a time satisfactory to all parties concerned.

A memorandum summarizing the conclusions reached at the interview should be prepared by the Examiner and placed in the application file. The memorandum will be retained in the application file until the prosecution is completed. Such procedure will not, however, relieve the applicant of the responsibility of complying with the requirements of Trademark Rule 2.62.

HORACE B. FAY, JR.,
July 6, 1964. *Assistant Commissioner.*

This supersedes the notice of Feb. 10, 1958. (728 O.G. TM 1)

[804 O.G. TM 147]

(164) Trademark Examining Procedure for Amended Applications; Reporting Oldest Dates of Amended Trademark Applications

Effective immediately, the order in which amendments to trademark applications are examined is changed. Previously, Examiners have usually acted on amended cases in order of filing date of the application which the amendment concerned, i.e., amended cases with the oldest filing date were examined first. Under the new procedure, amended cases will normally be examined in the order in which the amendment or other response is received, i.e., amendments that are received first will normally be examined first.

Effective with this issue of the *Official Gazette* (Trademark Section) in order to reflect more accurately the condition of division dockets, the column reporting the date of the oldest amended application in each division has been changed to indicate the date of receipt of the oldest filed amendment. Under this new method of reporting the oldest date of receipt of a filed amendment upon which no action has been taken by an Examiner will be indicated for each division of the Trademark Examining Operation.

RENE D. TEGTMEYER,
July 15, 1971. *Assistant Commissioner.*

[889 O.G. TM 6]

(165) Trademark Office Actions

Effective immediately Applicants or their attorneys will be provided with only one carbon copy of any office action, and the mailing of an additional carbon copy will be discontinued.

This change is consistent with the current practice in the patent examining operations and should result in greater efficiency in the preparation and mailing of office actions.

ROBERT GOTTSCHALK,
Feb. 7, 1972. *Commissioner of Patents.*

[895 O.G. TM 238]

(166) Petition to Make Trademark Applications Special

The practice of expediting the prosecution of new trademark applications on request of the applicant (accelerated prosecution) was rescinded, effective Aug. 1, 1971 (36 F.R. 13231, July 16, 1971; 825 O.G. 2). This action was taken after a careful study of the practice, including a recommendation of the Public Advisory Committee for Trademark Affairs that the Patent Office terminate accelerated prosecution of trademark applications. The study considered both the effect of the procedure on the workload of the Trademark Operations and the broader interest of examining trademark applications in an order which is equitable to all applicants.

Since the termination of this practice, the Office has experienced some increase in the number of petitions requesting the Commissioner to invoke his supervisory authority pursuant to Rule 2.146 in order to advance the examination of applications out of their regular order. This was to be expected since applicants who might have been able to show special circumstances entitling them to advanced examination could previously achieve this special treatment without resorting to a petition. However, some of the petitions now being received are not considered sufficient to justify the extraordinary relief of invoking the supervisory authority of the Commissioner for the purpose of advancing the applications out of their regular order.

In particular, a number of such petitions have been based on the ground that the applicant is about to embark on an advertising campaign or to commit advertising or promotional expenditures in which the mark applied for is material. Such a ground is not considered to constitute appropriate circumstances justifying the advancement of the application out of its regular turn and the petitions based on such ground have been and will continue to be denied. The principal reason for the denial is that these circumstances are applicable to a substantial portion of the trademark applications filed in the Patent Office. The supervisory authority of the Commissioner should be exercised only where an extraordinary reason for such action has been disclosed. See *Anderson & Dyer* v. *Lewry,* 89 O.G. 1861, 1899 C.D. 230, and *Wilputte* v. *Van Ackeren,* 103 USPQ 235. Thus, the extraordinary remedy of invoking the supervisory authority of the Commissioner is not considered appropriate under these circumstances.

In the interest of equitable treatment of all applicants, the policy of the Office in granting such petitions will be restricted to those cases in which particular and very special circumstances exist, such as a demonstrable possibility of loss of substantial rights, rather than circumstances which would be equally applicable to a large number of other applicants for trademark registration.

ROBERT GOTTSCHALK,
Mar. 13, 1972. *Commissioner of Patents.*

[897 O.G. TM 2]

(167) Title 37—Patents, Trademarks, and Copyrights

Chapter I—Patent Office, Department of Commerce

Parts 2 and 6—Rules of Practice in Trademark Cases

International Trademark Classification

A proposal was published at 37 F.R. 6404 to revise §6.1 of the Rules of Practice in Trademark Cases. The Patent Office proposed to establish the "International Classification of Goods and Services to Which Trademarks Are Applied" (the subject of the "Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks" of 1957, as revised at Stockholm on July 14, 1967) as the primary classification of goods and services for registration of trademarks and service marks. Pursuant to the Notice, written comments have been received, and a public hearing was held on June 14, 1972. Full consideration has been given to all matter presented, and changes in the text of the original proposal have been made in view thereof. It has been determined that adoption of the international classification system is desirable.

The Patent Office has studied the international classification and, since Mar. 5, 1968, has indicated the appropriate international class in all publications and on all issued registrations and renewals as a subsidiary classification. Based on this experience and the comments received, it is now believed that adoption of the international schedule as the primary classification system is desirable. The international system is easier to administer because of fewer classes of goods and the availability of an alphabetical listing of goods and services.

The Nice Agreement provides for an International Committee of Experts whose objective is to keep the classification current. The classification of specific goods and services is set forth in the Alphabetical List entitled "International Classification of Goods and Services to Which Trademarks Are Applied" (published by the World Intellectual Property Organization). In addition, the International Trademark Classification List contains the names of the classes setting forth the basic contents of each class. The Alphabetical List also comprises explanatory notes which serve as guidelines for determining the appropriate international class for a specific product or service.

The alphabetical listing within the International Trademark Classification Manual is currently used by the Office as a guideline for determining the degree of particularity of identification of goods. See "Identification of Goods and Services in Trademark Applications," 36 F.R. 13232; July 16, 1971.

Applications for registrations filed on or after Sept. 1, 1973, and registrations issuing thereon, will be classified according to the international classification set forth in the new §6.1. Accordingly, the international classification is adopted under Section 30 of the Trademark Act of all purposes under the statute and rules; and, therefore, will be the criterion for determining, inter alia, fees.

Applications for the registration of marks filed on or before Aug. 31, 1973, appeals or petitions to revive or oppositions filed in connection with said applications, and affidavits, renewals and petitions for cancellation filed in connection with registrations issuing thereon, will continue to be processed under the classification system existing at the time the mark was registered.

All applications which are published and registrations which are issued will carry both the appropriate international classification and existing U.S. classification number.

An insufficient fee, in connection with an appeal or opposition on any application or in connection with an affidavit or renewal filed in connection with any registration, will not render the same unacceptable, if the proper fee is submitted within a time limit set forth in a

notification of the defect, providing the proper fee for at least one class has been originally submitted within the applicable time limit. This will be the case even if the full fee is not received within the sixth year in the case of an affidavit filed under Section 8 or before the end of the twentieth year, including the grace period, in the case of renewal applications, or within the six-month statutory response period in the case of an appeal, or within the thirty-day opposition period, or any extension thereof in the case of the filing of an opposition.

The existing classification system will continue to be used for searching registered and pending marks until all documents in the search file are organized on the basis of the international system of classification. Until this changeover is effected, the U.S. class designation will continue to be printed on all published applications and registrations issued under the existing or the international classification system to facilitate searching on the basis of the existing U.S. system of classification.

Until all applications filed on or before Aug. 31, 1973, have been disposed of, the trademark sections of the *Official Gazette*, which are organized by class, will include two sections: one for applications published or registrations issued on the basis of applications filed on or before Aug. 31, 1973, organized by class according to the U.S. schedule of classes; the other section for applications published or registrations issued on the basis of applications filed on or after Sept. 1, 1973, organized by class according to the new international schedule.

Certification marks and collective membership marks will continue to be classified as set forth in redesignated §§6.3 and 6.4.

Efforts will be made to have the International Trademark Classification List printed by the Government Printing Office or otherwise assure the availability of the List from local sources. Notification will appear in the *Official Gazette* when the List is available from local sources of the Government Printing Office.

The English edition of the "International Classification of Goods and Services to Which Trademarks Are Applied" can presently be ordered from:

Sales Branch, The Patent Office, Block C
Station Square House, St. Mary Cray
Orpington, Kent, England

Certain modifications and additions to the international trademark classification have been published as supplements and are also available from the British Office. In addition, and inasmuch as the World Intellectual Property Organization (WIPO) has issued the List in several languages, it is anticipated that an English version will be published by that organization.

We have been advised by the Patent Office of the United Kingdom that the only acceptable methods of payment for the International Trademark Classification List are by International Postal Money Order or by banker's draft payable in sterling and drawn on a bank in the United Kingdom.

* * * * *

ROBERT GOTTSCHALK,
May 14, 1973. *Commissioner of Patents.*

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

Published in 38 F.R. 41681, June 4, 1973

[911 O.G. TM 210]

(Note: Rule 2.85 (Classification schedules) was revised and Rule 6.1 (International schedule of classes of goods and services) was established as of September 1, 1973 by this notice; prior U.S. schedule of classes was redesignated as Rule 6.2.)

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(168) Wording In Verification or Declaration of Trademark Application

Applicants and attorneys are requested to use the following wording in the part of the verification or declaration of the trademark application which indicates the signer's belief that the mark applied for does not resemble another person's mark:

> —that no other person, firm, corporation, or association, to the best of his knowledge and belief, has the right to use such mark in commerce either in the identical form thereof or in such near resemblance thereto *as to be likely, when applied to the goods of such other person, to cause confusion, or cause mistake, or to deceive:*—

The wording emphasized conforms to the language of both Sections 1(a)(1) and 2(d) of the Trademark Act of 1946.

Some applicants and attorneys, instead of using the wording emphasized above, are still using the now obsolete wording "as might be calculated to deceive" which was promulgated in the forms under the Trademark Act of 1905 and inadvertently continued by the Act of 1946 up to October 1962 in Section 1(a)(1) and in the forms connected with the Act. Section 1(a)(1) of the 1946 Act was amended by Act of October 9, 1962 (Public Law 772, 87th Congress, 76 Stat. 769) to conform it to the language of Section 2(d) of the 1946 Act, since the language of Section 2(d) reflects the thinking at the time the 1946 Act was written. The wording of the trademark forms for the 1946 Act has also been amended appropriately.

It is desirable that proper wording be used. However, since the differences in wording referred to above are considered to be differences of form rather than of substance. Examiners will not require new verifications or declarations. When the obsolete wording is observed and a letter is to be written for other reasons, Examiners will at that time call attention to the fact that the wording is obsolete and should be modified in applications in the future.

RENE D. TEGTMEYER,
Mar. 25, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 186]

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(169) Standardized Disclaimers

Beginning with the Nov. 9, 1982 issue of the *Official Gazette*, disclaimers in marks published for opposition and in those registered on the Supplemental Register will be printed in a standardized form, regardless of the text submitted. Certificates of registration for marks issued on the Supplemental Register will also contain the standardized disclaimer as of that date. Certificates of registration for marks issued on the Principal Register will contain the uniform statement beginning Feb. 1, 1983. The disclaimed matter will be taken from the disclaimer of record and inserted into a standardized disclaimer for printing and data base purposes. The new disclaimer text will take the following form:

No claim is made to the exclusive right to use ——, apart from the mark as shown.

MARGARET M. LAURENCE,
Aug. 30, 1982. *Assistant Commissioner for Trademarks.*

[1022 TMOG 44]

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(170) Trademark "Revivals" and "Reinstatements"

It would be of great assistance to the Office if the heading or caption of "Petitions to Revive" or "Requests for Reinstatement" of abandoned trademark applications carried the following identifying data:

1. Address Paper to the Attention of:
   Office of Director, Trademark Examining Operation
2. Serial Number
3. Mark
4. Applicant's Name
5. A title indicating the nature of the paper

Use of this heading for "Petitions to Revive" or "Requests for Reinstatement" of abandoned trademark applications will help ensure that the papers are promptly routed to the proper Office, which will prevent needless delay in its consideration.

MARK M. NEWMAN,
Aug. 13, 1984. *Director, Trademark Examining Operation.*

[1046 TMOG 13]

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(171) T-Search Printouts as Section 2(d) References

As part of its ongoing automation program, the PTO is pleased to announce that on or about July 1, 1986, Trademark Examining Attorneys will use the automated Trademark search system (T-Search) exclusively for searching word marks. The Examining Attorneys will use computer printouts to advise applicants about Section 2(d) references. The printouts will include computer-generated facsimiles of the drawing where appropriate. The printouts will be used for word marks, whether the word is depicted in a typed drawing or in stylized form. Photocopies of certificates of registration will continue to be used for design marks.

The Patent and Trademark Office, in consultation with the Public Advisory Committee for Trademark Affairs, has established accuracy standards for the computerized data. Data elements which are not essential for examiner searching are being systematically checked and corrected. The following data elements which are essential for examiner searching purposes are essentially complete:

1. MARK
2. SERIAL NUMBER
3. REGISTRATION NUMBER
4. FILING DATE
5. REGISTRATION DATE
6. GOODS AND SERVICES
7. INTERNATIONAL CLASS
8. U.S. CLASS

Subject to the above caveat, the printouts will contain all the information that appears on the certificate of registration with one exception. If an application for registration was based on Section 44, 15 U.S.C. 1126, the printout will indicate that the registration or application was filed under the provisions of Section 44 (using the notation "SECT 44"). The printout will also show the priority date if the application was filed under the provisions of Section 44(d). However, it will not indicate the country or certificate number of the foreign registration on which the U.S. registration was based.

The printouts will also contain additional registration information which was not provided under the non-automated system, as follows:

A. Change in registration—This will indicate that a registration was changed after registration, such as by an amendment of the mark or identification of goods/services. The current information will be displayed in the printout.

B. Affidavits—This indicates that a Section 8 affidavit of continued use was accepted, that a Section 15 affidavit of incontestability was acknowledged, or that a mark was republished under the provisions of Section 12(c).

C. Renewals—Applicable renewal information, such as "1st Renewal" or "2nd Renewal" will be shown.

D. Owner—In addition to listing the original registrant, the last known owner, as the change of ownership is acknowledged by the Office by virtue of examining an affidavit or renewal, will be included.

The following provides an explanation of the terms/symbols used in the printout:

1. Goods or services appearing in double parentheses "(( ))" were not included in a Section 15 affidavit.
2. Goods or services appearing in brackets "[ ]" were deleted after registration by amendment, correction, restriction or at the time of renewal.
3. Dates will appear as year, month and day. For example, June 20, 1983 will appear as 1983.06.20.
4. Goods and services will be indicated with the international class (IC), the prior U.S. classification (US), the identification, date of first use and date of first use in commerce.
5. Registrants (OWNER) will be listed showing the owner's name, entity designation (e.g., individual, partnership, corporation), country of citizenship or state or country of incorporation, and address.
6. Pseudo mark—This material is merely a search aid and has no bearing on the registration information.
7. Design search code—This is also merely an aid for computerized searching of design marks, by which a number is assigned to describe a particular design element. It has no bearing on the registration information.
8. Mark drawing code—This indicates the appearance of the mark, and again is not part of the registration data. There are six mark drawing codes.

   1—typed drawing
   2—design only
   3—words, letters and/or numbers and design
   4—words, letters and/or number in block form (block letters; not typed drawing)
   5—words, letters and/or numbers in a stylized form
   6—sound marks

An example of a computer printout and a facsimile of a stylized word mark follow.

MARGARET M. LAURENCE,
June 23, 1986. *Assistant Commissioner for Trademarks.*

Document 1 of 1 for SS 1: FD 1351766/RN,SN

WORD MARK	LINEA ADRIANO
TRANSLATION	THE WORDS "LINEA ADRIANO" IN THE MARK MAY BE TRANSLATED INTO ENGLISH AS "LINE HADRIAN"
GOODS AND SERVICES	IC 025; US 039; G & S: ARTICLES OF CLOTHING FOR MEN, NAMELY JACKETS, COATS, SUITS, TROUSERS, JUMPERS, SHIRTS AND TIES
MARK DRAWING CODE	(5) WORDS, LETTERS, AND/OR NUMBERS IN STYLIZED FORM
SERIAL NUMBER	73-446850
FILING DATE	1983.10.06
CHANGE IN REGISTRATION	CHANGE IN REGISTRATION HAS OCCURRED
REGISTRATION NUMBER	1351766
REGISTRATION DATE	1985.07.30
OWNER NAME AND ADDRESS	(REGISTRANT) RITEX AG KLEIDERFABRIK ZOFINGEN CORPORATION SWITZERLAND FUNKENSTRASSE 10 ZOFINGEN AARGAU SWITZERLAND
SECTION 44 INDICATOR	SECT 44
FOREIGN PRIORITY DATES	1983.06.20
DISCLAIMER	NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO USE "LINEA" APART FROM THE MARK AS SHOWN
TYPE OF MARK	TRADEMARK
REGISTER	PRINCIPAL

TME59196 73446850

Linea Adriano

[1068 TMOG 7]

TRADEMARK POST REGISTRATION

(172) Trademark Rule 2.165 Requirement Where A Section 8 Affidavit Or Declaration Is Held Insufficient

Several recent Petitions to the Commissioner have indicated a failure on the part of registrants and their attorneys to follow the requirements of Trademark Rule 2.165. Therefore, reviewing certain basic elements of this rule is considered timely so as to alert registrants and attorneys to technical errors which might lead to the cancellation of a valuable trademark registration.

Part (*a*) of Rule 2.165 indicates that the examiner will notify the registrant when an affidavit or declaration of use under Section 8 of the Statute is insufficient and the reasons therefor. When the registrant wishes the examiner to reconsider the affidavit or declaration, or when the registrant has taken additional steps to rectify the deficiencies and desires to have the examiner reconsider the affidavit or declaration in light of those steps, the request for reconsideration must be submitted within 6 months of the date of mailing of the notice of insufficiency.

Note, however, that a supplemental or substitute affidavit or declaration required by Section 8 cannot be considered unless it is received before the expiration of the six year anniversary of the registration. Consequently, registrants should file their affidavits as early as possible during the sixth year following registration.

There are situations where correcting the deficiency in the affidavit or declaration requires recording an assignment with the Assignment Division of this Office. If the recording cannot be completed within 6 months, the registrant must at least respond to the examiner's notice of insufficiency within that period. The response must indicate the steps being taken to correct the deficiency. The examiner can then allow the registrant additional time or suspend action depending on the circumstances. Registrants must always observe the "six month response" period whenever responding to the examiner from an adverse action.

Part (*b*) of Rule 2.165 permits a registrant to request the Commissioner to review the action of the examiner when he is dissatisfied with that action. Review by the Commissioner should be sought only where it is believed that the examiner has erred in his action. In other words, the Commissioner's role is to review the correctness of the examiner's action and not to serve as an alter ego of the examiner before whom the registrant may seek to correct deficiencies.

When review by the Commissioner has been sought, the decision on that request constitutes the final action of the Patent and Trademark Office. If no review by the Commissioner is sought and if no request for reconsideration of an examiner's action is timely filed, the Commissioner will notify the registrant of the deficiency in the affidavit or declaration after the sixth year has expired. Such notice is never mailed prior to the expiration of the sixth year following registration nor until a reasonable time has elapsed following a six month period from the last action mailed by this Office. This notice constitutes the final action of the Patent and Trademark Office in those cases where the Commissioner's review has not been sought. Once this notice has been mailed, it is too late (under the Rules of Practice) to request the Commissioner to review the action of the examiner. Review would only be proper if an affiant could show circumstances sufficient to suspend the finality element of Rule 2.165(b) pursuant to Rule 2.148.

Registrants will be held to strict compliance with Rule 2.165 as it has been briefed above. Therefore, parties are urged to respond fully as soon as possible after an action is received from the examiner.

BERNARD A. MEANY,
Assistant Commissioner for Trademarks.

Dec. 12, 1977.

[966 TMOG 80]

(173) Late-Filed Renewal Fees

Sections 9 and 31 of the Lanham Act (15 U.S.C. §§1095 and 1113) require that an additional five dollar ($5.00) fee be submitted by a registrant who files a renewal application during the three-month period following expiration of its registration. The language of the statute requires that this additional fee be submitted within the three-month grace period. A number of registrants who have failed to submit the additional fee within the prescribed period have petitioned the Commissioner to allow their renewal applications. The Commissioner has granted petitions of this kind where the registrant or its attorney maintained a Patent and Trademark Office deposit account which contained, on the date the renewal application was filed, sufficient funds to cover the additional fee. Specifically, the Commissioner has exercised discretion under Trademark Rules 2.146(a)(3) and 2.147 to deem the authorizations to charge the deposit accounts to have taken place at the time the registrants filed their renewal applications, even though the authorizations were not confirmed until a later date. This Office policy was established by the Commissioner's decision in *In re Ralston Purina Co.*, 191 USPQ 154 (Comr. Pats. 1976).

The policy established by the *Ralston Purina* decision is being changed. Henceforth, the Commissioner will no longer exercise discretion to charge deposit accounts *nunc pro tunc* for trademark renewal application fees. To allow an authorization to charge a deposit account to relate back to a date on which no actual authorization existed is, in effect, to allow late payment. It is inequitable to permit those registrants who have deposit accounts (or those whose attorneys have such accounts) to make late payment of renewal fees, while those without deposit accounts may not.

Petitions relying on *Ralston Purina* will, after the date of this notice, be denied, unless the events that gave rise to those petitions occurred before publication of this notice.

MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Feb. 20, 1981.

[1004 O.G. 29]

(174) Renewal Applications and Section 8 Affidavits

There has been a noticeable increase in the number of petitions requesting provisional acceptance of defectively executed Section 8 Affidavits and Renewal Applications under 35 U.S.C. §26, the most common problem being a lack of notarization or a Rule 2.20 declaration. Often, such petitions are necessitated by the failure of registration owners to file the documents early enough to leave time in which to correct should they prove defective.

Section 8 Affidavits may be filed beginning with the fifth anniversary of the registration. The period for filing expires on the sixth anniversary of the registration. The period for filing Renewal Applications begins six months before the twentieth anniversary of the registration and extends three months beyond the expiration of the twenty year term. While the Post Registration Division may allow up to six months to respond to a notice of defect, it may not allow corrective action beyond the period for filing established by the Trademark Act. It is therefore in the registrant's best interest to file such documents as close to the opening date as possible to allow time for correction, if necessary. Provisional acceptance under 35 U.S.C. §26 has been, and will continue to be, given narrow application. Registrants should not rely on 35 U.S.C. §26 as a means of acquiring an extension of time.

We have also become aware of many delays caused by defects in the chain of title. Registrants are encouraged to keep Patent and Trademark Office assignment records current with regard to ownership of registrations.

The filing of Post Registration documents at the earliest date and maintenance of assignment records will help to avoid the cancellation or expiration of registrations of trademarks currently in use, and will result in a savings of time and expense for both the registrant and the Patent and Trademark Office.

MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Apr. 19, 1983.

[1030 TMOG 37]

(175) Trademark Examining Operation

Effective Dec. 1, 1983, all requests presented to the Patent and Trademark Office under the provisions of Section 7 of the trademark statute (15 U.S.C. 1057) will be considered by the Post Registration Section of the Trademark Examining Operation.

Necessary telephone inquiries concerning procedure or status should be directed to 703–557–1986.

MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Dec. 2, 1983.

[1038 TMOG 256]

(176) Expedited Service for Certified Copies of Trademark Registrations

On Oct. 4, 1986, expedited service for obtaining certified copies of trademark registrations will be available to the public. The cost of obtaining a certified copy showing title and/or status will be $10.00 plus $25.00 for the expedited service for a total of $35.00 per copy; a certified copy of the registered mark, not showing title or status, will be $5.00 plus $25.00 for expedited service for a total of $30.00. Requests received in the Post-Registration Section of the Trademark Services Division, Crys-

tal Plz. 2–4C24, before 12:00 noon on U.S. Patent and Trademark Office scheduled work days will be filled within three work days.

Requests for expedited service which are hand carried to the Post-Registration Section located in Crystal Plz. 2–4C24 will be available for pickup at the same location after 12:00 noon three work days later. Requests for expedited service which are mailed to the Patent and Trademark Office will be processed and mailed back to the requester three work days after they are received in the Post-Registration Section from the U.S. Patent and Trademark Office mail room. All requests for expedited service will be machine stamped when received in the Post-Registration Section and machine stamped upon completion by the Post-Registration Section.

Anyone requesting expedited service will be limited to five registration numbers per day. Limits on the number of registrations being certified are needed in order to ensure that service is not disrupted for routine requests for certified copies. The guarantee of service in three work days is based on the ability of the Post-Registration Section to process up to 1,000 expedited copies out of an average of 16,000 copies processed each year.

Inquiries about the service should be addressed to:

Patricia M. Davis
Administrator for Trademark Operations
Trademark Examining Operation
Crystal Plz. 2–3C06
(703) 557–3268

MARGARET M. LAURENCE,
Aug. 19, 1986. *Assistant Commissioner for Trademarks.*

[1070 TMOG 4]

TRADEMARK INFORMATION AND CORRESPONDENCE

(177) Powers of Attorney in Registered Trademark Files

On and after Feb. 1, 1967, communications advising of changes in the powers of attorney for registered trademarks will be placed in the registration files, but will not be acknowledged by the Patent Office. The information will thus be available to those who inspect the files, but since these powers of attorney do not directly concern the Patent Office, acknowledgments are not believed to be necessary.

C.M. WENDT,
Jan. 30, 1967. *Director.*

[835 TMOG 95]

(178) Initial Processing of Application

On Feb. 1, 1972, the operations of the Trademark Application Section of the Patent Office will be reorganized. The purpose of the reorganization is to provide the public and applicants with more current information concerning newly filed applications.

The prompt initial processing of trademark applications is necessary in order to fulfill one of the main Patent Office functions, that of producing a record, accessible to the public, of new trademark activity to facilitate the clearance of new marks for use, determine the registrability of proposed marks, and avoid conflicts with the rights of others. In order to maintain a record of marks applied for which reflects the most current information available to the Office concerning them, the early processing of drawings in order to have them placed in the search room is considered as a first priority. The processing of these drawings includes the assignment of serial numbers, initial classification, duplication of the drawing and the forwarding of copies of the drawing to the search room. Other functions which are necessary in the processing of applications, such as the processing and mailing of filing receipts, are secondary to the processing of drawings.

In past years, there have been delays in processing applications and forwarding application drawings to the search room. These delays have varied from several weeks to several months. In view of the importance, both to applicants and the public, of recording essential information concerning newly filed applications as quickly as possible, a reorganization of the workflow in the Application Section is being effected.

There is no change in the processing of applications through the mail room and finance branch to the Application Section. However, under the new plan, upon receipt in the Trademark Application Section, all applications will be stamped with a serial number, and the drawing of the mark will be reproduced immediately and placed in the search file. This processing will occur as soon as the application files reach the Application Section. Such procedures as determining whether or not an application will receive a filing date, preparation of the file jackets, and mailing of the filing receipt will take place at a later time.

Applicants who wish to be notified promptly of the date their papers were received in the office and their serial number, may send two self-addressed postcards with their application papers. The mail room will stamp both postcards with the date of receipt and return one to the applicant; the second postcard will be stamped with the serial number and forwarded to the applicant from the Application Section. The postcards should contain the applicant's name and the trademark which is the subject of the application. When more than one set of application papers are forwarded under one cover, postcards should be attached to each set of papers for which a receipt is desired.

Under the new system of processing application papers, your particular attention is directed to the following changes as compared to the present procedure.

1. Application drawings will be placed in the public search file prior to the mailing of the filing receipt.
2. By using the postcard system described above, applicants will be notified sooner of the date of receipt of their papers and the serial number of their application. Applicants are encouraged to use the postcard system.
3. Additional papers sent in by the applicant or attorney should be identified by serial number, thereby enabling the office to process these papers quickly.
4. When an application is accompanied by a petition to the Commissioner under §2.146, the petition will not be considered until processing by the Application Section is complete.

Effective date. The procedure outlined in this notice will become effective Feb. 1, 1972.

RICHARD A. WAHL,
Jan. 11, 1972. *Acting Commissioner of Patents.*

JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

Published in 37 F.R. 942; Jan. 21, 1972

[895 O.G. TM 193]

(179) Mail Delays and Petitions to Revive (Trademarks)

Since applications that become abandoned unintentionally present burdens to both the Patent office and the applicant, a simplified procedure has been devised to alleviate these burdens when the abandonment results from a delay in the mails. This procedure (which is similar to the procedure adopted for patent applications at 910 O.G. 402 and 910 O.G. TM 76) provides for an automatic petition to revive.

When a trademark communication which falls within the circumstances enumerated below is mailed to the Patent Office more than three full days prior to the due date, a conditional petition may be attached to the communication. If the communication is received in the Patent Office after the due date and the application becomes abandoned, the conditional petition will become effective, subject to the following requirements. The petition must include (1) an authorization to charge a deposit account for any required fees, including the petition fee, and (2) an oath or declaration signed by the person mailing the communication and also signed by the applicant or his attorney stating that the communication and petition were either placed in the United States mail as first class or air mail or placed in the mail outside the United States as air mail. Since mail handled in this manner may reasonably be expected to reach the Patent Office by the due date, any mail delays beyond such time will be considered to constitute unavoidable delay and sufficient cause to grant a petition to revive (Section 12(b) of the Trademark Act of 1946).

The circumstances under which this procedure may be used are those where the communication, if timely filed, (1) would be a proper and complete response to an action or request by the Patent Office, and (2) would stop a period for response from continuing to run. Accordingly, this procedure would be appropriate for:

1. A response to a non-final Office action.
2. A response to a final Office action which places the application in condition for publication or issue.
3. A notice of appeal and requisite fee.
4. An appeal brief.

ju A suggested declaration form for the petition is shown below:

Applicant:
Serial No.: Petition to Revive
Date Filed:
Mark:

I hereby declare that the attached communication is being deposited in ( ) the United States mail as first class or air mail, or ( ) the mail outside the United States as air mail, in an envelope addressed to: Commissioner of Patents, Washington, D.C. 20231, on _____, which date is more than three full days prior to the due date, at _____, by _____.
(Location) (Name of individual)

In the event that such communication is not timely filed in the Patent Office, it is requested that this paper be treated as a petition to revive and that the delay in prosecution be held unavoidable.

The petition fee is authorized to be charged to Deposit Account No. _____ in the name of _____.

The undersigned declares further that all statements made herein of his own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any registration resulting therefrom.

Date: (Signature of applicant or applicant's attorney)
And
Date: (Signature of person mailing, if other than the above)

Normal petition practices are not affected in those situations where this procedure is either not elected or not appropriate, nor does this procedure bar the granting of a petition in different fact situations where justified.

RENE D. TEGTMEYER,
Mar. 21, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 126]

(180) Dissemination Of Trademark Information

In order to clarify the policy regarding Trademark Examiners giving out Trademark information to the general public, the following directive has been promulgated:

Trademark Examiners are reminded that they may only be responsive to questions regarding applications pending before them. All other questions regarding Trademark matters must be directed to the Director of the Trademark Examining Operation, 703–557–3268.

BERNARD A. MEANY,
Feb. 15, 1978. *Assistant Commissioner for Trademarks.*

[968 TMOG 9]

(181) Requests for Information on Status of Trademark Registrations

The purpose of this notice is to explain the circumstances in which the Trademark Examining Operation can respond to written and telephone requests for information about the status of trademark registrations. Only limited information can be provided by telephone.

I. Orders for "Status" Copies

The most reliable means of obtaining status information concerning a registration is a written order for a "status" copy of the registration. Status copies show whether affidavits have been filed under Sections 8 and 15, whether the registration has been renewed or cancelled, and whether certain other actions have been taken with respect to the registration. The charge for copies of registrations showing status and/or title, if not certified, is $6.50, effective Oct. 1, 1982. The charge for a certified copy showing status and/or title is $10.00 effective the same date.

II. Telephone Information Available from the Search Library

If the caller has the registration number, he or she may leave a request for status information on an automatic answering machine in the Trademark Search Library (Search Room) at 703-557-3282. The Search Library staff will call back with the information requested within one working day. Callers are asked to limit their requests to two registration numbers per day.

The Search Library staff is not permitted to make "searches" to determine if particular marks are in the Office's search files. Neither is the staff able to supply information as to the ownership or assignment of registrations, or to read over the telephone lengthy passages of a registration, such as the identification of goods or services.

III. Telephone Information on Receipt of Section 8 and 15 Affidavits and Renewal Applications

The Post Registration Section can be reached by calling 703-557-2923. The staff of this section can advise only on whether an affidavit or a renewal application has or has not been received. Inquiries as to whether affidavits and renewals have been accepted should be directed to the Search Library.

MARGARET M. LAURENCE,
Sept. 15, 1982. *Assistant Commissioner for Trademarks.*

[1023 TMOG 15]

(182) Transmittals for Use of Deposit Accounts

When statutory fees are to be charged to a deposit account, the processing of the application can be

facilitated by submitting the applicant's transmittal letter or other correspondence specifying the account to be charged in triplicate. Submission of these documents in triplicate will eliminate the need for the Mail Room to photocopy the document and thereby reduce the processing time of incoming mail.

THERESA A. BRELSFORD,
Nov. 21, 1983. Assistant Commissioner for Administration.

[1037 TMOG 15]

(183) **Helpful Hints From The PTO**

- *Data To Be Included on Patent and Trademark Papers Filed In The PTO In Response To Office Actions*—Perhaps the greatest cause of delay and wasted time in the support sections of the PTO is in trying to match papers bearing incorrect or incomplete data with applications. Because some Trademark Papers are not clearly identified as pertaining to Trademark applications, they are frequently misrouted to the Patent Examining Groups.

On all papers related to *Patent* applications, type the word "PATENT" in the upper right-hand corner of the document. Also, please include the correct serial number, filing date, inventor's name, and title of the invention. Additionally, include the examiner's name, and group art unit number or other identifying data found on the most recent letter from the PTO. (37 CFR 1.1(a)).

However, please note that an organizational restructuring of the Patent Examining Corps has resulted in many applications being reassigned to new Groups and Art Units. Your attention is directed to the NOTICE OF CHANGES IN THE PATENT EXAMINING CORPS that appeared in the OFFICIAL GAZETTE on June 26, 1984, (1043 OG 23), which identifies the Group Art Unit of each examiner (1043 OG 40 through 1043 OG 67). Letters mailed from the Groups after Apr. 15, 1984, should reflect the current identifying data.

For all papers related to *Trademark* applications, type the word "TRADEMARK" in the upper right-hand corner of the document. Also, please set forth the applicatant's name, correct serial number (including the series number which currently is "73"), filing date, law office, examining attorney and mark.

Documents for which no fee is required at the time of filing (e.g., amendments to applications and requests for extensions of time to file an opposition) continue to be addressed:

Box 5
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Mail directed to the Trademark Trial and Appeal Board should have mark "Attention: TTAB" on the envelope in additon to "Box 5."

- *Mailing Responses To The PTO*—In general, it would eliminate or greatly reduce processing steps by the PTO support staff, and will avoid interruption of the examiner's work, if a few simple, general rules were followed in regard to mailing of the responses to the PTO:

1. After a Patent or Trademark application is filed, please avoid filing additional papers (other than those requesting a filing receipt or those required by the Office) until the filing receipt or return post card identifying the Serial Number and Patent Examining Group Art Unit or Trademark Law Office has been received.
2. In *Patent* applications, requests for extensions of time, changes of address, proposed drawing corrections, and petitions are sometimes incorporated in the remarks section or at the beginning of papers entitled "Amendment" or "Response." In *Trademark* applications, change of address and powers of attorney are sometimes incorporated in the remarks section or at the beginning of papers entitled "Amendment" or "Response". Please present such items in separate papers, appropriately titled, since they are all handled by different personnel (37 CFR 1.4(c)). However, please include a statement in the amendment/response describing the paper being filed.
3. Where a supplemental or preliminary amendment is found necessary in *Patent* or *Trademark* applications, please telephone the examiner and request that the examiner delay action for a certain time in order to avoid crossing in the mails of the amendment and the Office action.
4. File *Patent* and *Trademark* documents which have no particular time or sequence requirement, with materials submitted in response to the statutory or regulatory requirements. Examples are certified copies of foreign documents to support priority and formal drawings in Patent applications or changes in Power of Attorney or Mailing Address following first action.
5. If a disclosure statement is to be filed before an Office action, file it when the application is filed. Some Group Art Units have greatly reduced the pendency to first action. Hence, many examiners are taking up new applications before an information statement is matched with the application.

THERESA A. BRELSFORD,
July 10, 1984. *Assistant Commissioner for Administration.*

(1044 TMOG 44)

(184) **Published Trademark Applications**

Papers which are filed in the Patent and Trademark Office in connection with published trademark application files should be captioned to the attention of the Trademark Quality Review Clerk and addressed as follows:

Commissioner of Patents and Trademarks
Attention Box 5, Trademark Quality Review Clerk
Washington, D.C. 20231

This mailing should be used only for papers filed after publication but before issuance of the registration. This could include corrections to information which appears to have been inadvertently or incorrectly published in the Trademark Official Gazette, as well as changes of attorney or address papers or notification of filing an assignment. Corrections to information published in the TMOG must be received in the Office before the registration is issued.

Use of this mailing address for corrections will help ensure that such papers are properly routed within the Office. Telephone inquiries concerning corrections or other matters in relation to published trademark applications should be directed to (703) 557-4249.

MARGARET M. LAURENCE
Dec. 10, 1984. *Assistant Commissioner for Trademarks.*

[1050 TMOG 316]

(185) **Notices of Abandonment**

The Trademark Operation has begun notifying trademark applicants when their pending applications have been abandoned by the Office. Under this new procedure, a computer-generated post card bearing the notice, serial number, applicant name and abandonment date will be sent to the correspondence address designated by the applicant. The post cards will be mailed within 2 to 4 weeks after the application is declared abandoned.

MARGARET M. LAURENCE
Jan. 13, 1986.

[1063 TMOG 4]

(186) **Trademark Law Office Changes in Examination of Classes**

To evenly distribute the examination of applications filed among the Law Offices, the following International Classes are now being examined by the following Law Offices:

Class	Law Office No.
13	1
20	2
34	2
2	3
10	7
12	8
21	8

These changes will be incorporated into the listing of classes assigned to each Law Office in the Trademark Examining Operation which appears immediately after the Patent and Trademark notices in each Official Gazette.

Any questions concerning these classes generally or concerning applications filed in these classes should be directed to the listed Law Office.

MARGARET M. LAURENCE,
May 5, 1986. *Assistant Commissioner for Trademarks.*

[1067 TMOG 4]

(187) **Change of Correspondence Address in Trademark Applications**

Applicants are reminded that when an application is filed and a correspondence address is entered in the Official record, correspondence will continue to be sent to such address until the applicant or party, or the attorney-at-law or other authorized representative of the applicant or party, indicates *in writing* that correspondence is to be sent to another address. 37 CFR Section 2.18. The filing of a response to an Office action on letterhead stationery that indicates a different address from the correspondence address of record is insufficient notice that correspondence is to be sent to another address. Specific language is needed which can reasonably be interpreted to be a request to change the address. See TMEP Section 603.

If a power of attorney has been filed in an application, a subsequently filed power of attorney will be regarded as a written request to change the correspondence address, even if there is no specific language changing the address or revoking the prior power of attorney. See TMEP Section 603.

MARGARET M. LAURENCE,
May 15, 1986. *Assistant Commissioner for Trademarks.*

[1067 TMOG 7]

(188) **Use of Restricted Deposit Account for Electronic Ordering of Patent and Trademark Copies**

Effective July 1, 1986, the restricted deposit account will be made available to those members of the public who wish to use it for electronic ordering of patent and trademark copies. The restricted deposit account requires maintenance of a minimum balance of $300.00 at the end of each month, as compared to the unrestricted account which requires a minimum balance of $1,000.00

In FY 1986, the Office established the restricted deposit account for use in charging subscriptions for copies of newly issued patents by subject matter classification. Establishment of a PTO deposit account is a prerequisite for subscription service.

Recently, the Office established an electronic ordering service (EOS), a method of ordering copies of patents and trademarks through the use of a computer terminal and modem. EOS is available only to PTO deposit account holders.

Many people who are interested in using EOS to order copies of patents and trademarks and who do not have PTO deposit accounts find the $1,000.00 balance required for the unrestricted account prohibitive. Therefore, the use of restricted account is being expanded to incorporate EOS ordering. Subscriptions and EOS ordering are the only two services for which restricted accounts may be used. If you have any questions on subscriptions or EOS, please call Mary Brown on (703) 557-3236. If you have questions on deposit accounts, please call Delores Riley on (703) 557-3227.

THERESA A. BRELSFORD,
June 23, 1986. *Assistant Commissioner, for Administration.*

[1068 TMOG 4]

(189) **New Trademark Fees**

Effective Oct. 4, 1986, the trademark fee schedule (Rule 2.6, 37 CFR §2.6), is as follows:

(a)	For filing an application, per class	$200.00
(b)	For filing an applicaltion for renewal of a registration, per class	300.00
(c)	For filing to publish a mark under section 12(c), per class	100.00
(d)	For issuing a new certificate of registration upon request of assignee	100.00
(e)	For a certificate of correction of registrant's error	100.00
(f)	For filing a disclaimer to a registration	100.00
(g)	For filing an amendment to a registration	100.00
(h)	For filing an affidavit under §8 of the Act, per class	100.00
(i)	For filing an affidavit under §15 of the Act, per class	100.00
(j)	For filing a combined affidavit under §§8 and 15 of the Act, per class	200.00
(k)	For petitions to the Commissioner	100.00
(l)	For filing petition to cancel or notice of opposition, per class	200.00
(m)	For ex parte appeal to the Trademark Trial and Appeal Board, per class	100.00
(n)	For printed copy of registered mark	
	Copy only	1.50
	Copy showing title and/or status	6.50
(o)	For certifying trademark records, per certificate	3.50
	For expedited handling of such certification, per record requested	25.00
(p)	For photocopies or other reproductions of records, drawing, or printed material, per page of the material copied	0.30
(q)	For recording trademark assignments and agreements or other papers relating to the property in a registration or application, per document	100.00
	For each mark in addition to one assigned in the same document	20.00
(r)	For abstracts of title to each registration or application, including the search	12.00

(s) For special service handling of late filed fees in connection with a renewal 100.00

(t) For items and services that the Commissioner finds may be supplied, for which fees are not specified, such charges as may be determined by the Commissioner with respect to each such item or service ..... actual cost.

MARGARET M. LAURENCE,
Aug. 15, 1986. *Assistant Commissioner, for Trademarks.*

[1070 TMOG 10]

TRADEMARK PUBLICATIONS

(190) Separation of the Patent and Trademark Sections of the Official Gazette

Effective February 2, 1971, the *Official Gazette* will be separated into two parts to be known as the *Patent Official Gazette and the Trademark Official Gazette.*

* * * * *

Orders for subscriptions should be addressed to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Also effective February 2, 1971, the *Official Gazette* will no longer contain "Decisions in Patent and Trademark Cases." Decisions of the type heretofore found in the "Decisions in Patent and Trademark Cases" are published by non-Federal organizations such as, for example, the Bureau of National Affairs, Inc., 1231 25th St. NW., Washington, D.C. 20037, and West Publishing Co., 50 Kellogg Blvd., St. Paul, Minn. 55102.

Finally, the "Decisions Leaflet" of the *Official Gazette* will no longer be supplied as a separate subscription item after January 26, 1971. According to present plans, however, both the *Patent Official Gazette* and the *Trademark Official Gazette* will have identical "Patent Office Notices" sections containing notices of the various types heretofore published in the Gazette decision leaflet and Trademark Section. Those notices of particular interest to Patent Office employees will be accumulated and published approximately every fourth week, and distributed separately to employees.

WILLIAM E. SCHUYLER, JR.,
Dec. 29, 1970. *Commissioner of Patents.*

[882 O.G. TM 33]

(191) Changes in Format for Publishing Trademarks for Opposition

Because of the adoption of the International classification of goods and services by the United States as of September 1, 1973 (see *Official Gazette* of June 26, 1973, 911 O.G. TM 210), it is necessary to change the arrangement in the *Official Gazette* of the marks published for opposition.

Beginning with the issue of May 7, 1974, the section of the *Official Gazette* entitled "Marks Published for Opposition" will be divided into four sections instead of the present two sections. (For the preceding change from one to two sections, see *Official Gazette* of October 13, 1964, 807 O.G. TM 51.) Sections 1 and 2 will be according to international classification and will contain marks in applications filed on or after September 1, 1973, and Sections 3 and 4 will be according to prior United States classification and will contain marks in applications filed on or before August 31, 1973.

In Section 1, all marks presented in combined applications filed on or after September 1, 1973 for registration in more than one international class will be published with only one reproduction of each mark. The reproduction of the mark will be followed by the international class numbers, and under each class will appear the goods or services in connection with which the mark is used. If the date of first use applies to all classes, it will appear following the last class; otherwise, the dates of use will appear after each class.

In Section 2, all marks presented in applications filed on or after September 1, 1973 for registration in a single class will be published in international class order.

In Section 3, all marks presented in combined applications filed on or before August 31, 1973 for registration in more than one prior United States class will be published with only one reproduction of each mark. The reproduction of the mark will be followed by the prior United States class numbers and titles, and under each class will appear the goods or services in connection with which the mark is used. If the date of first use applies to all classes, it will appear following the last class; otherwise, the dates of use will appear after each class.

In section 4, all marks presented in applications filed on or before August 31, 1973 for registration in a single class will be published in the prior United States class order.

The following explanation will appear under the heading "Marks Published for Opposition":

> The following marks are published in compliance with section 12(a) of the Trademark Act of 1946. Applications for the registration of marks in more than one class have been filed as provided in section 30 of said act as amended by Public Law 772, 87th Congress, approved Oct. 9, 1962, 76 Stat. 769. Opposition under Section 13 may be filed within thirty days of the date of this publication. See Rules 2.101 to 2.105.
>
> A separate fee of twenty-five dollars for opposing each mark in each class must accompany the opposition.

Sections 1 through 4 will appear immediately after the above explanation, the sections being designated as follows:

Section 1. International classification—Application in more than one class
Section 2. International classification—Application in one class
Section 3. Prior United States classification—Application in more than one class
Section 4. Prior United States classification—Application in one class

The same procedure of dividing into four sections will be followed in the notice of the issuance of registrations on the Supplemental Register.

RENE D. TEGTMEYER,
Mar. 22, 1974. *Assistant Commissioner for Trademarks.*

[921 O.G. TM 122]

(192) Change in Official Gazette Entry to Show Cancellation of Fewer Than All Classes in a Multiple Class Registration

Effective with the *Official Gazette* issue of December 16, 1980, there will be a change in the *Official Gazette* listing entitled "Trademark Registrations Cancelled." Beginning with that issue, "Trademark Registrations Cancelled" will list:

(1) single class registrations cancelled;
(2) multiple class registrations cancelled in all classes;
(3) multiple class registrations cancelled in fewer than all classes.

For every entry in the listing, the specific classes cancelled will be included in parentheses, next to the registration number and mark.

For a single class registration and for a multiple class registration in which every class has been cancelled, the class number(s) shown in parentheses will represent every class to which the registration applied.

For a multiple class registration in which fewer than all classes have been cancelled, the *Official Gazette* entry will include the word "only" following the notation of classes in parentheses, for example: (Int. Cls. 12 and 20, only). In this example, the addition of the word "only" would indicate that there are classes in the registration in addition to Classes 12 and 20, but only Classes 12 and 20 have been cancelled.

MARGARET M. LAURENCE,
Oct. 29, 1980. *Assistant Commissioner, for Trademarks.*

[1000 TM 21]

(193) Single Copies of the Trademark Official Gazette

Members of the public ordering single copies of the Trademark Official Gazette from the Superintendent of Documents are reminded they must specify the date of the issue being ordered.

The date of the issue in which a mark will be published for opposition is shown on The Notice of Publication form mailed to applicants approximately two weeks before the publication date. This date must be included on each single copy order.

Orders received without an issue date may be filled from current weekly stock. The Superintendent of Documents cannot check on whether a particular mark is published in the issue then in stock. If the stock is exhausted at the time the order is received, the order will be returned unfilled.

MARGARET M. LAURENCE,
Mar. 3, 1981. *Assistant Commissioner for Trademarks.*

[1004 O.G. 36]

(194) Inadvertently Issued Registration Numbers

Effective Jan. 3, 1984, a new sub-section identified as "Inadvertently Issued Registration Numbers" will exist as the last category of cancellations listed under the "Trademark Registrations Canceled" section of the *Official Gazette.*

This new sub-section will provide public notice of the cancellation of registration numbers which have been inadvertently issued by the Patent and Trademark Office.

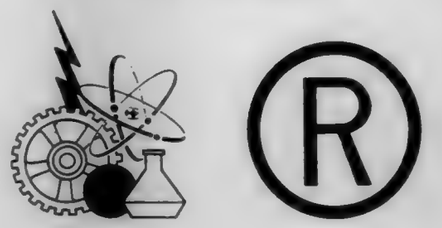
MARGARET M. LAURENCE,
Nov. 15, 1983. *Assistant Commissioner for Trademarks.*

[1037 TMOG 16]

(195) Availability of Patents and Trademarks Style Manual

The latest edition of Patents and Trademarks Style Manual will be available to the patent and trademark community soon. This edition will be published as a separate supplement to the GPO Style Manual. It is the first revision since 1973, and will be available in looseleaf form. The cover of this supplement is illustrated below:

PATENTS AND TRADEMARKS STYLE MANUAL



A Supplement to the
UNITED STATES GOVERNMENT PRINTING OFFICE
Style Manual

1984
UNITED STATES PATENT AND TRADEMARK OFFICE

Orders are now being accepted by the Superintendent of Documents. The stock number is 003–004–00606–4. Direct inquiries to:

Superintendent of Documents
U.S. Goverment Printing Office
Washington, D.C. 20402

Checks for orders should be made payable to the Superintendent of Documents. If a Deposit Account with the Superintendent of Documents is to be used, please include the Deposit Account Number with the order.

THERESA A. BRELSFORD,
June 29, 1984. *Assistant Commissioner for Administration.*

[1045 TMOG 3]

(196) USTA Publications of Looseleaf Rules of Practice

The United States Trademark Association has published *US Trademark Law; Rules of Practice, Forms and Federal Statutes.* The book, in looseleaf format to allow for supplements, includes the trademark Rules of Practice, sample forms, the Lanham Act and applicable provisions and cites of other statutes that deal with trademarks and the Patent and Trademark Office. In content and format, the USTA publication generally replaces the Government Printing Office looseleaf edition of the Rules of Practice which has been discontinued.

Information on ordering copies of *US Trademark Law: Rules of Practice, Forms and Federal Statutes* may be obtained from:

The United States Trademark Association
6 East 45th St.
New York, N.Y. 10017
(212) 986–5880

The Government Printing Office continues to publish the Rules of Practice as Title 37, Code of Federal Regulations, every July. Effective July 1, 1983, however, the CFR edition no longer includes forms.

MARGARET M. LAURENCE,
Apr. 30, 1984. *Assistant Commissioner for Trademark.*

[1042 TMOG 58]

(197) **Notice to Subscribers**

The Patent and Trademark Office announces a change in the point of contact for subscribers who have not been receiving all of their copies of the Official Gazette, Manual of Patent Examining Procedures Revisions, Annual Indices, or other patent and trademark publications. All correspondence and inquiries concerning subscription services including requests for reinstatement or renewal of subscriptions should be directed to:

Mr. Michael F. DiMario
Assistant Public Printer
Superintendent ofDocuments (SD)
U.S. Government Printing Office
Washington, D.C. 20401

Furthermore, the Superintendent of Documents advises that expiration notices are sent out approximately three months before the expiration date. However, subscribers should not rely on this schedule. If a notice is not received within two months of the expiration date, the subscriber should renew the subscription with the Superintendent of Documents. Attach a label from the envelope in which the publication is received, together with a check covering the amount of the subscription. if a deposit account with the Superintendent of Documents is to be used, include the deposit account number with the renewal.

This notice is effective with the publication date and supersedes the notice published on this subject in 969 O.G. 2, dated Mar. 14, 1978.

THERESA A. BRELSFORD,
Aug. 3, 1984. *Assistant Commissioner for Administration.*

[1045 TMOG 24]

(198) **Notification of Errors in Trademark Official Gazette**

In view of the establishment of in-house photocomposition of the Trademark Official Gazette, it is important that errors noted by the public be directed to a single office within the Trademark Examining Operation for verification and correction.

Written notification of errors in the publication of marks in the Trademark Official Gazette should include the correspondent's telephone number and should be addressed to the Paralegal Specialist, Office of the Deputy Assistant Commissioner for Trademarks, United States Department of Commerce, Patent and Trademark Office, Washington, D.C. 20231. Error notification may also be done by telephone to the Paralegal Specialist in the Office of the Deputy Assistant Commissioner for Trademarks, at 202–557–3268.

Applicants may use this procedure to notify the Office of errors in relation to marks published in the Official Gazette if the error is purely clerical (e.g. typographical error, drawing printed upside down, or incorrectly stated data). This procedure should not be used to dispute information that is actually of record in the application file. The Paralegal Specialist will review the notification of error and verify the existence of the clerical error, determine whether the error can be corrected without jurisdiction being restored to the Examining Attorney or republication being required, and coordinate the appropriate correction procedure.

Notification must be received by the Office within one week after the Official Gazette publication date to permit processing by the Office.

MARGARET M. LAURENCE
Apr. 11, 1985. *Assistant Commissioner for Trademarks.*

[1054 TMOG 4]

(199) **Subscription Pricing Information**

The subscription prices on the following publications have been changed as indicated below:

Title: Official Gazette, Patent Section	
First-class domesitc mailing	$384.00
Fourth-class domestic mailing	270.00
Fourth-class foreign mailing	337.50
Single copies each, domestic	18.00
Single copies each foreign	22.00
Title: Official Gazette, Trademark Section	
First-class domestic mailing	246.00
Surface mailing, foreign	307.50
Single copies each, domestic	7.00
Single copies, foreign	8.75

This change is effective with Government periodicals and Subscription Services Price List 36, dated Summer, 1986.

Foreign first-class mailing rates will be furnished upon request. Direct all inquiries and subscription requests to:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Checks for subscription orders should be made payable to the Superintendent of Documents. If a Deposit Account with the Superintendent of Documents is to be used, please include the Deposit Account Number with the order. Subscriptions can also be charged to your Master Charge or VISA, include your Account Number and expiration date.

This notice supersedes the notice published June 10, 1986, at 1067 OG 12, and 1067 TMOG 13.

THERESA A. BRELSFORD,
June 25, 1986. *Assistant Commissioner, for Administration.*

[1068 TMOG 5]

(200) **Printing of Use in Another Form Claims**

Effective immediately, all claims of prior use of the subject mark in another form contained in applications for Trademark registrations will be printed in the *Official Gazette* and on the registration certificates according to the following formats:

First used in another form on _____.
First used in commerce in another form on _____.

MARGARET M. LAURENCE,
July 15, 1986. *Assistant Commissioner for Trademarks.*

[1069 TMOG 4]

TRADEMARK MISCELLANEOUS

(201) **Recording of Documents Affecting Title**

The Patent Office is liberalizing its policy concerning the recording of documents, other than assignments, which affect title to trademark registrations and applications. Under Rule 2.185 of the Trademark Rules of Practice, instruments affecting title to a trademark registration or application, and licenses of trademarks which are the subject of trademark registrations or applications, will be recorded even though the recording thereof may not serve as constructive notice under Section 10 of the Trademark Act of 1946, as amended (15 U.S.C. 1060).

WILLIAM E. SCHUYLER, JR.,
June 16, 1971. *Commissioner of Patents.*

Published in 36 F.R. 13231; July 16, 1971

[889 O.G. TM 2]

(202) **International Protection of Government Emblems and Seals**

Change of Intent

The Patent and Trademark Office, Department of Commerce, intends to forward only the 50 State seals plus one department seal for each department listed in the publication "Seals and Other Devices in Use at the Government Printing Office" ("Seals") instead of the entire publication, as indicated on page 59366 of the Federal Register of Dec. 23, 1975.

Since the publication had been printed in 1975, it was assumed that few deletions and additions would be necessary. However, the response to the above notice, along with some necessary deletions, resulted in a large number of seals in the publication requiring deletion. This rendered the publication unacceptable for submission to the World Intellectual Property Organization (WIPO).

Therefore, the Patent and Trademark Office now intends to forward only the 50 State seals along with the departmental seal denoted "No. 1" for each department listed in the "Seals" publication. If this is not the preferred departmental or State seal, the department or State involved is requested to notify the Patent and Trademark Office by Sept. 21, 1976. This notification should either specify the number of the preferred seal, as it appears in the "Seals" publication, or provide a clear, black and white photograph, suitable for reproduction, of the preferred seal. The seal must be no larger than 1 1/2 inches in diameter.

These seals will then be forwarded to WIPO for protection under Article 6*ter* of the Paris Convention for the Protection of Industrial Property.

Address all correspondence to: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

C. MARSHALL DANN,
Aug. 18, 1976. *Commissioner of Patents and Trademarks.*

Published in 41 F.R. 35741

[950 O.G. TM 114]

(203) **Recording of "Territorial Assignments" in the Assignment Division of the Patent and Trademark Office**

It has been the practice of the Assignment Division for many years to refuse to record "territorial assignments," that is, assignments purporting to transfer rights in a trademark registration (not a concurrent use registration) for less than the entire United States. Hereinafter, such documents will be recorded as long as the requirements of the Rules of Practice are met by the documents submitted.

The Office is not addressing the validity or effect of such documents by recording same, but is merely recognizing that such transfers may affect title to a registered mark and therefore ought to be recorded. At the time a Section 8 affidavit or declaration or an application for renewal is filed, the Examiner of Trademarks will consider the effect of such a document.

BERNARD A. MEANY,
Oct. 7, 1977. *Assistant Commissioner for Trademarks.*

[964 TMOG 8]

(204) **Flexible Working Hours**

On Jan. 4, 1979 the Patent and Trademark Office is beginning a 15 month experiment with flexible working hours for its employees. Under the "flexitime" experiment many of the Office's employees will have flexibility to begin their workdays as early as 6:30 a.m. or as late as 9:30 a.m., and end their workdays between 3:00 p.m. and 6:30 p.m. Employees in every case shall of course work eight hours each day. All or most patent and trademark examiners will have flexible hours.

The public hours of the Patent and Trademark Office will continue to be 8:30 a.m. to 5:00 p.m. All units of the Office which deal directly with the public will be staffed to answer telephone calls and receive visitors during those hours. All employees will be on duty from 9:30 a.m. to 3:00 p.m. The patent public search room will continue to operate from 8:00 a.m. until 8:00 p.m. and the trademark search room from 8:00 a.m. until 5:30 p.m.

With the advent of flexible hours, it will be advisable for members of the public to make appointments in advance when they wish to interview examiners.

DONALD W. BANNER,
Dec. 13, 1978. *Commissioner of Patents and Trademarks.*

[978 TMOG 141]

(205) **THE RETENTION SCHEDULE FOR TRADEMARK RECORDS**

As with most government agencies, the Patent and Trademark Office disposes of old files, papers and records pursuant to a specific schedule. In an effort to clarify any questions concerning the procedures for disposing of Trademark records and in response to public inquiries, the present Retention Schedule for Trademark Records and other records including trademark matters which may be of interest to the public is set forth as follows:

International Intellectual Property Activities Case Files. Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports, records of international meetings concerning patents; trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.	*PERMANENT.* Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.
Proposed Intellectual Property Legislation Files. Documents accumulated in the preparation and processing of legislation proposed by or in the interests of the Patent and Trademark Office. Includes drafts of legislation, re-	*PERMANENT.* Transfer to FRC after 5 years. Offer to National Archives when 25 years old.

ports to committees on introduced legislation, and comments on legislative proposals.

Trademark Adversary Proceedings Files. Consists of Trademark Opposition, Cancellation, Interference, and Concurrent-Use proceedings files.	The past schedule to destroy after 10 10 years is in the process of being changed. At this time, these records are not being disposed of pending the new amendment to this section.
Canceled Trademark Registration Files. Consists of original application and all related correspondence.	Destroy 2 years after the date of cancellation.
Expired Trademark Registration Files. Consists of original application and all related correspondence.	Destroy 2 years after expiration of registration.
Abandoned Trademark Application Files. Consists of original application and all related correspondence.	Destroy 2 years after date of abandonment.
Trademark Renewal Index. Index to trademark registrations that are renewed.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Indexes to Trademark Applications. Index shows applicant's name, serial number of application, filing date, name of mark description of goods, attorney's name, and final disposition of the application.	
A. Applicant's Index.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
B. Serial Index.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Proceedings Index to Trademark Adversary Proceedings. Index arranged by type of proceeding. Shows status of proceeding prior to and immediately after a decision by the Board.	Destroy 3 years after termination of the proceeding.
Trademark Adversary Proceeding Records. Card file showing records of Trademark Adversary Proceedings.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Trademarks Published in Official Gazette. Clippings of marks from *Official Gazette.*	
a. Those which have been opposed.	*Retain in agency until no longer needed for reference.*
b. All others.	*Destroy when mark is registered.*
Trademark Registrant's Index. Index to Trademark registrant's name, includes serial and registration numbers, date of registration, line of goods and other related information.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Class of Goods Index. Card index used to indicate into what class any conceivable goods may fall.	Destroy after information transferred to magnetic media.
Index to Trademark Trial and Appeal Board Cases. Record of trademark trial and appeal board cases.	*PERMANENT.* Offer to National Archives when no longer needed for reference.
Public Advisory Committee for Trademark Affairs Files.	
a. Agenda, minutes, correspondence, reports and related supporting files.	*PERMANENT.* Transfer to Federal Records when 10 years old. Offer to National Archives when 25 years old.
b. papers and reference materials.	Destroy when 10 years old or no longer needed for reference, whichever is sooner.
Seminar in Trademark practice and Procedure Files. Record set of training materials used in training trademark examiners.	*PERMANENT.* Transfer to Federal Records Center when 10 years old. Offer to National Archives when 25 years old.
Trademark Petitions Files. Petitions to the Commissioner relating to trademarks with related materials.	
a. Original Petitions in trademark case file.	Dispose of with related case file.
b. Other copies.	Destroy when 2 years old.

Trademark Protest Letters. Letters of protest to the Commissioner related to trademarks.	Destroy when no longer needed or when three years old, whichever is earlier.
International Patent and Trademark Activities Case Files. Project case files showing Patent and Trademark Office activity relating to international patent and trademark programs.	
a. Records that supplement the International Property Activities Case Files (Item 103).	*PERMANENT.* Transfer to office responsible for international affairs after case is closed.
b. Other materials.	Destroy 5 years after close of case or sooner if no longer needed.
International Intellectual Property Activities Case Files. Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports; records of international meetings concerning patents; trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.	*PERMANENT.* Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.
Proposed Intellectual Property Legislation Files. Documents accumulated in the preparation and processing of legislation proposed by or in the interest of the Patent and Trademark Office. Includes drafts or legislation, reports to committees on introduced legislation, and comments on legislative proposals.	*PERMANENT.* Transfer to FRC after 5 years. Offer to National Archives when 25 years old.
Bulky Trademark Specimens. Trademark applications specimens which do not strictly meet the basic requirements for physical form of specimens which state:	Destroy 30 days after applicant is notified that the specimens are unacceptable, unless picked up sooner by the applicant.

1. That they be made of material suitable for being placed inside a manila file wrapper.

2. That they be capable of being arranged flat, such as being folded.

3. That they be of a size not to exceed 8 1/2 inches wide by 13 inches long. (Rule 2.56)

These requirements provide for specimens which will fit inside the application file wrapper, which is 9 × 14 inches in size and which will conveniently expand to about one inch thickness.

Specimens which do not meet the above requirements are referred to as "bulky" specimens and the Examiner must require that they be replaced by specimens of acceptable size and shape.

February 28, 1979.

SAUL LEFKOWITZ,
Acting Assistant Commissioner for Trademarks.

[980 TMOG 16]

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(206) **Public Advisory Committee for Trademark Affairs**

Reestablishment

In accordance with the provisions of the Federal Advisory Committee Act 5 U.S.C. App. (1976) and Office of Management and Budget Circular A-63 of Mar. 1974, and after consultation with GSA, it has been determined that the reestablishment of the Public Advisory Committee for Trademark Affairs is in the public interest in connection with the performance of duties imposed on the Department by law.

The Committee was first established in Sept., 1970, and its present charter expired on Jan. 10, 1979. Since its inception the purpose of the Committee has been to advise the Patent and Trademark Office concerning steps which can be taken to increase the efficiency and effectiveness of administration of the Trademark Act and to provide a continuing flow of knowledge from the private sector to the government in the field of trademarks. Approximately seventy-five per cent of the over one hundred twenty-five specific recommendations have been implemented at least in part. There is no question that the Committee has contributed greatly to the efficiency and effectiveness of the administration of the statute. In reviewing the Committee, the Secretary has sought continued effort towards this objective. The Committee's function cannot be accomplished by any organizational element or other committee of the Department.

As it was initially established, the Committee will continue to comprise the members of the Advisory Committee for Trademark Affairs of the United States Trademark Associa-

tion. The membership is balanced and is under the control of the President of the Association. The Committee will continue to operate in compliance with the provisions of the Federal Advisory Committee Act.

Copies of the Committee's revised charter will be filed with appropriate committees of Congress.

Any inquiries or comments may be addressed to Patricia M. Davis, Committee Control Officer, Office of Trademark Program Control, U.S. Patent & Trademark Office; Washington, D.C. 20231; telephone (703) 557-3881.

GUY W. CHAMBERLIN,
Mar. 15, 1979. *Assistant Secretary for Administration.*

[FR Doc. 79-8929; Filed 3-22-79; 8:45 am]

[982 TMOG 14]

(207) **Certified Copies of Trademark Applications/Registrations**

The Trademark Operation is in the process of microfilming its records and, as this proceeds, requests for certified copies of applications and, eventually, registrations, will be furnished from the microfilmed records. Such certified copies will not contain copies of the file jacket.

MARGARET M. LAURENCE,
Jan. 17, 1984. *Assistant Commissioner for Trademarks.*

[1039 TMOG 140]

(208) **TABLE OF OFFICIAL GAZETTE VOLUME NUMBERS: 1872–1990**

A table which relates volume numbers of the Official Gazette comprising collections of weekly issues of that publication to the month of their publication has found good use in the Patent and Trademark Office and Patent Depository Libraries in a variety of applications. The need for such a table arises, in part, from the fact that Official Gazette volumes have not been uniformly numbered on a monthly basis over the 110 year history of that publication. From Jan. 1872 through June 1883, they were numbered on a semi-annual basis; from July 1883 through Dec. 1902, quarterly; from Jan. 1902 through Dec. 1908, bi-monthly; and since Jan. 1909, the volume of issues for each month has been separately numbered. To fulfill the interest which has been expressed in this table, it is published below:

Calendar Table of Official Gazette Volume Numbers

Month-by-Month Volume Numbers: Jan. 1872 to Present

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1872*	1	1	1	1	1	1	2	2	2	3	3	4
1873	3	3	3	3	3	3	4	4	4	4	4	4
1874	5	5	5	5	5	5	6	6	6	6	6	6
1875	7	7	7	7	7	7	7	8	8	8	8	8
1876	9	9	9	9	9	9	10	10	10	10	10	10
1877	11	11	11	11	11	11	12	12	12	12	12	12
1878	13	13	13	13	13	13	14	14	14	14	14	14
1879	15	15	15	15	15	15	16	16	16	16	16	16
1880	17	17	17	17	17	17	18	18	18	18	18	18
1881	19	19	19	19	19	19	20	20	20	20	20	20
1882	21	21	21	21	21	21	22	22	22	22	22	22
1883*	23	23	23	23	23	23	24	24	24	25	25	25
1884	26	26	26	27	27	27	28	28	28	29	29	29
1885	30	30	30	31	31	31	32	32	32	33	33	33
1886	34	34	34	35	35	35	36	36	36	37	37	37
1887	38	38	38	39	39	39	40	40	40	41	41	41
1888	42	42	42	43	43	43	44	44	44	45	45	45
1889	46	46	46	47	47	47	48	48	48	49	49	49
1890	50	50	50	51	51	51	52	52	52	53	53	53
1891	54	54	54	55	55	55	56	56	56	57	57	57
1892	58	58	58	59	59	59	60	60	60	61	61	61
1893	62	62	62	63	63	63	64	64	64	65	65	65
1894	66	66	66	67	67	67	68	68	68	69	69	69
1895	70	70	70	71	71	71	72	72	72	73	73	73
1896	74	74	74	75	75	75	76	76	76	77	77	77
1897	78	78	78	79	79	79	80	80	80	81	81	81
1898	82	82	82	83	83	83	84	84	84	85	85	85
1899	86	86	86	87	87	87	88	88	88	89	89	89
1900	90	90	90	91	91	91	92	92	92	93	93	93
1901	94	94	94	95	95	95	96	96	96	97	97	97
1902	98	98	98	99	99	99	100	100	100	101	101	101
1903*	102	102	103	103	104	104	105	105	106	106	107	108
1904	108	108	109	109	110	110	111	111	112	112	113	113
1905	114	114	115	115	116	116	117	117	118	118	119	119
1906	120	120	121	121	122	122	123	123	124	124	125	125
1907	126	126	127	127	128	128	129	129	130	130	313	131
1908	132	132	133	133	134	134	135	135	136	136	137	137
1909*	138	139	140	141	142	143	144	145	146	147	148	149
1910	150	151	152	153	154	155	156	157	158	159	160	161
1911	162	163	164	165	166	167	168	169	170	171	172	173
1912	174	175	176	177	178	179	180	181	182	183	184	185
1913	186	187	188	189	190	191	192	193	194	195	196	197
1914	198	199	200	201	202	203	204	205	206	207	208	209
1915	210	211	212	213	214	215	216	217	218	219	220	221
1916	222	223	224	225	226	227	228	229	230	231	232	233
1917	234	235	236	237	238	239	240	241	242	243	244	245
1918	246	247	248	249	250	251	252	253	254	255	256	257
1919	258	259	260	261	262	263	264	265	266	267	268	269
1920	270	271	272	273	274	275	276	277	278	279	280	281
1921	282	283	284	285	286	287	288	289	290	291	292	293
1922	294	295	296	297	298	299	300	301	302	303	304	305
1923	306	307	308	309	310	311	312	313	314	315	316	317
1924	318	319	320	321	322	323	324	325	326	327	328	329
1925	330	331	332	333	334	335	336	337	338	339	340	341

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Calendar Table of Official Gazette Volume Numbers
Month-by-Month Volume Numbers: Jan. 1872 to Present—Continued

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1926	342	343	344	345	346	347	348	349	350	351	352	353
1927	354	355	356	357	358	359	360	361	362	363	364	365
1928	366	367	368	369	370	371	372	373	374	375	376	377
1929	378	379	380	381	382	383	384	385	386	387	388	389
1930	390	391	392	393	394	395	396	397	398	399	400	401
1931	402	403	404	405	406	407	408	409	410	411	412	413
1932	414	415	416	417	418	419	420	421	422	423	424	425
1933	426	427	428	429	430	431	432	433	434	435	436	437
1934	438	439	440	441	442	443	444	445	446	447	448	449
1935	450	451	452	453	454	455	456	457	458	459	460	461
1936	462	463	464	465	466	467	468	469	470	471	472	473
1937	474	475	476	477	478	479	480	481	482	483	484	485
1938	486	487	488	489	490	491	492	493	494	495	496	497
1939	498	499	500	501	502	503	504	505	506	507	508	509
1940	510	511	512	513	514	515	516	517	518	519	520	521
1941	522	523	524	525	526	527	528	529	530	531	532	533
1942	534	535	536	537	538	539	540	541	542	543	544	545
1943	546	547	548	549	550	551	552	553	554	555	556	557
1944	558	559	560	561	562	563	564	565	566	567	568	569
1945	570	571	572	573	574	575	576	577	578	579	580	581
1946	582	583	584	585	586	587	588	589	590	591	592	593
1947	594	595	596	597	598	599	600	601	602	603	604	605
1948	606	607	608	609	610	611	612	613	614	615	616	617
1949	618	619	620	621	622	623	624	625	626	627	628	629
1950	630	631	632	633	634	635	636	637	638	639	640	641
1951	642	643	644	645	646	647	648	649	650	651	652	653
1952	654	655	656	657	658	659	660	661	662	663	664	665
1953	666	667	668	669	670	671	672	673	674	675	676	677
1954	678	679	680	681	682	683	684	685	686	687	688	689
1955	690	691	692	693	694	695	696	697	698	699	700	701
1956	702	703	704	705	706	707	708	709	710	711	712	713
1957	714	715	716	717	718	719	720	721	722	723	724	725
1958	726	727	728	729	730	731	732	733	734	735	736	737
1959	738	739	740	741	742	743	744	745	746	747	748	749
1960	750	751	752	753	754	755	756	757	587	759	760	761
1961	762	763	764	765	766	767	768	769	770	771	772	773
1962	774	775	776	777	778	779	780	781	782	783	784	785
1963	786	787	788	789	790	791	792	793	794	795	796	797
1964	798	799	800	801	802	803	804	805	806	807	808	809
1965	810	811	812	813	814	815	816	817	818	819	820	821
1966	822	823	824	825	826	827	828	829	830	831	832	833
1967	834	835	836	837	838	839	840	841	842	843	844	845
1968	846	847	848	849	850	851	852	853	854	855	856	857
1969	858	859	860	861	862	863	864	865	866	867	868	869
1970	870	871	872	873	874	875	876	877	878	879	880	881
1971	882	883	884	885	886	887	888	889	890	891	892	893
1972	894	895	896	897	898	899	900	901	902	903	904	905
1973	906	907	908	909	910	911	912	913	914	915	916	917
1974	918	919	920	921	922	923	924	925	926	927	928	929
1975	930	931	932	933	934	935	936	937	938	939	940	941
1976	942	943	944	945	946	947	948	949	950	951	952	953
1977	954	955	956	957	958	959	960	961	962	963	964	965
1978	966	967	968	969	970	971	972	973	974	975	976	977
1979	978	979	980	981	982	983	984	985	986	987	988	989
1980	990	991	992	993	994	995	996	997	998	999	1000	1001
1981	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013
1982	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025
1983	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037
1984	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049
1985	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061
1986	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073
1987	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085
1988	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097
1989	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109
1990	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121

• SUMMARY OF CHANGES IN VOLUME NUMBERING:

Semi-annual:	*Jan. 1872 through Jun. 1883*
Quarterly:	*Jul. 1883 through Dec. 1902*
Bi-monthly:	*Jan. 1903 through Dec. 1908*
Monthly:	*Jan. 1909 to the present*

The *Official Gazette* was published on successive Wednesdays from 3 Jan. 1872 through 17 Jan. 1872. From 23 Jan. 1872 to the present, it has been published weekly on Tuesday.

(209) **Holiday Relating to Birthday of Martin Luther King**

Public Law 98–144 enacted Nov. 2, 1983, amended 5 USC 6103 to indicate that that the third Monday in Jan. would be a new legal holiday relating to the birthday of Martin Luther King and that this amendment would take effect in 1986.

Accordingly, Jan. 20, 1986, and the third Monday in Jan. thereafter, will be included as Federal holidays within the District of Columbia. The Patent and Trademark Office will not receive papers on that date in accordance with 37 CFR 1.6(a) and 1.10(a). Actions required to be taken on the third Monday in Jan. may be taken on the next succeeding day that the Office is open for business in accordance with 37 CFR 1.7.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Dec. 23, 1985.

[1062 TMOG 5]

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(210) **Proposed Records Control Schedule**

As with most government agencies, the Patent and Trademark Office periodically updates the schedule it uses to dispose of old files, papers and records. Set forth below is a recent update of the Patent and Trademark Office's Records Control Schedule. The schedule is currently being reviewed by the National Archives and Records Administration and, following its approval, will constitute the basis for disposing of Patent and Trademark Office records.

Any comments or questions related to the proposed schedule should be directed to John Hassett, (703) 557–0183. Written comments should be mailed to:

John Hassett, Director
Patent and Trademark Office
Crystal Plz. 1, Lobby
Washington, D.C. 20231

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

June 17, 1986.

Commissioner's and Deputy Commissioner's Records

1. *Commissioner's Correspondence and Subject Files.* Correspondence to and from other public officials, members of the public, and the Patent and Tradmark Office staff; reports; special investigations and survey reports; and related materials. (See index under Item 3).
   PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.
2. *Reports to the Commissioner.* Reports received by the Commissioner from the Patent and Trademark Office staff and maintained as separate series.
   PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.
3. *Index to Commissioner's Correspondence and Subject Files.* Card index to records described under Item 1.
   PERMANENT. Transfer to Federal Records Center with related files. Offer to National Archives with related files.
4. *Deputy Commissioner's Correspondence and Subject Files.* Correspondence to and from other public officials, members of the public, and the Patent and Trademark Office staff, with related materials (exclusive of records retained in Item 1).
   PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.
5. *Policy Documentation Files.* Formal policy and procedural issuances, current and obsolete, such as organizational charts, regulations, orders, circulars, manuals, and other types of directives, with related forms, recommendations, endorsements, clearances and comments.
   PERMANENT. Transfer to FRC when obsolete. Offer to National Archives when 25 years old.
6. *Work-Flow Control and/or Statistical Reports Files.* Various periodic statistical reports used to show the flow of work through the Patent and Trademark Office and the printers, such as PALM, TRAM, PMS Statistical Reports on Patents to printers, and similar reports.
   Destroy when 5 years old or sooner if no longer needed.
7. *Production and Pendency Reports Files.* Quarterly, monthly, and biweekly statistical reports prepared to show the production and quality output of examiners and clerks and the status of the assigned projects. Reports are mainly used to evaluate the efficiency of personnel for promotion purposes.
   a. Office of Assistant Commissioners or equivalent.
      Transfer to FRC when 5 years old. Destroy when 10 years.
   b. Other Offices.
      Destroy when updated report is received.
8. *Special Studies Files.* Report on special studies surveys, and inspections of operations, management and systems with related papers showing their inception, scope, procedure and results.
   PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 25 years old.
9. *Narrative and Statistical Reports Files.* Annual or other periodic narrative and statistical reports.
   a. Reports to the Office of the Commissioner and the Offices of the Assistant Commissioners.
      PERMANENT. Transfer to FRC when 10 years old. Offer to the National Archives when 25 years old.
   b. Other Offices.
      Destroy when 5 years old.
10. *Internal Administrative Files.* Administrative operations files of organizational offices, consisting of:
    a. Correspondence concerning routine or temporary internal administrative matters.
       Destroy when 2 years old.
    b. Office personnel files.
       Destroy after separation of employee.
    c. Completed requisitions for services, supplies and equipment, and travel documents.
       Destroy 1 year after action is completed.
    d. Records pertaining to charity drives, bond campaigns, blood donations, and other voluntary activities.
       Destroy on completion of program.
    e. Hand receipt files.
       Destroy when property is accounted for.
    f. Suspense files.
       Destroy when purpose is served.
    g. Chronological files.
       Destroy when 2 years old.
11. *Program Planning and Evaluation Files.* Files showing the overall development of Patent and Trademark Office plans and the evaluation of their effectiveness. Included are one copy of each staff study, evaluation report, system study, and related correspondence and background materials.
    PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.
12. *Surplus Property Case Files.* Case files on disposal of surplus real and related personal property.
    Transfer to FRC 3 years after close of file. Destroy 10 years after close of file.
13. *Excess Real Property Reports.* Reports of real property with related papers.
    Destroy when 10 years old.

14. *Budget Policy and Procedure Correspondence Files.* Correspondence files showing Patent and Trademark Office policy and procedure governing budget administration, and reflecting expenditures for Patent and Trademark Office programs.
    PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 25 years old.
15. *Budget Estimates Files.* File copies of budget estimated comprising appropriation language sheets, narrative statements, and related schedules and data.
    PERMANENT. Transfer to FRC after 10 years. Offer to National Archives when 25 years old.
16. *Records Disposition Files.* Descriptive inventories, disposal authorizations, schedules for retirement of records and correspondence or memoranda relating t o revisions.
    PERMANENT. Offer to National Archives when 25 years old or when no longer needed, whichever is longer.
17. *Forms Files.* One copy of each form with data showing the inception and scope of the form, the program or administrative purpose of the form, and the related procedure instituted, revised, superseded, or canceled.
    PERMANENT. Offer to National Archives when 25 years old or when no longer needed, whichever is longer.
18. *Systems Development Program Files.* Program documents, schedules, and correspondence pertaining to the execution, review, and analysis of Patent Office research and development programs, and relating to the general planning and supervision of the programs.
    PERMANENT. Transfer to FRC 5 years after completion to program. Offer to National Archives 20 years later or when 25 years old, whichever is sooner.
19. *Systems Development Task Force, Committee, and Board Files.* Agendas, directives, minutes of meetings, and related papers, of Task Forces, Committees, Board, etc. of which the Patent Office serves as Secretary, or Chairman thereof.
    PERMANENT. Transfer to FRC 5 years after close of file. Offer to National Archives 20 years later or after 25 years old, whichever is sooner.
20. *Technical Report Files.* One copy of each technical report of unpublished manuscript or report prepared in connection with a project, terminal narratives, statistical and graphic complications, summarizations, analyses, and related papers.
    PERMANENT. Transfer to FRC when 5 years old. Offer to National Archives when 25 years old.
21. *Systems Development Project Case Files.* Project case files reflecting a complete history of each project from initiation through research, development, design, and testing to completion.
    PERMANENT. Transfer to FRC 5 years after completion or termination of project. Offer to National Archives when 25 years old.

ADP Records
(also in GRS 20)

22. *ADP Planning Documents Files.* Planning documents consisting of master plan, feasibility studies with associated charts and diagrams, and supporting data that reflect on characteristics of the data automation activity.
    PERMANENT. When no longer needed or used offer to National Archives with related materials.
23. *ADP Program Management Files.* Program management documents consisting of the development of plans, policy, and procedures governing the conversion of electrical machine operations and the supervision, control, coordination, and operation of the mechanization program.
    PERMANENT. Offer to National Archives with related materials.
24. *ADP Standardizations Files.* Standardization files consisting of data elements and codes, standardization requests, and jusification for all data systems developed by or for the Patent Office.
    PERMANENT. Offer to National Archives with related materials.
25. *ADP Data Systems Planning Files.* Documents containing defin ition of the system.
    PERMANENT. Offer to National Archives with related materials.
26. *ADP Information Retrieval System Master Reference File.* Magnetic media containing an index to patents and trademarks and publications.
    PERMANENT. Offer to National Archives on termination of Patent and Trademark Office.
27. *Publication Tape File.* Magnetic media which are reproduced and disseminated as publication or used for reproducing a printed publication.
    PERMANENT. Offer to National Archives when publication needs cease.

Patent Records

28. *Advertising Files.* Copies of proposed advertising matter, circulars, letters, cards, and related correspondence intended to solicit patent business and submitted by registrants as required by regulations.
    Destroy when 25 years old.
29. *Complaint Files.* Case files relating to complaints made against attorneys registered to practice before the Patent Office.
    Destroy on death of attorney.
30. *Board of Appeals Decisions Files.* Copies of Board of Appeals decisions with related background materials.
    a. Cases patented.
    Destroy 10 years after patent issued.
    b. All others.
    Destroy 10 years after appeal is decided.
31. *Indexes to Appeal Cases.* Indexes, arranged in various ways, to the appeal cases.
    Destroy 30 years after date of appeal.
32. *Declaration of Assistance Received Files.* Form received from applicants showing assistance received, if any, in the preparation of application for patent (PTOL–284).
33. *Academy Lecture Files.* Lectures prepared by the Staff for presentation at the Academy. (These lectures are updated periodically to reflect the changing views of the Patent and Trademark Office)
    a. Historical Sample
    PERMANENT. Retain 1 copy of each basic lecture and of any major changes made to it. Offer to NARS when 25 years old.
    b. All other copies.
    Destroy when obsolete.
34. *Academy Training Sessions Files.* Background materials relating to each session of the Patent Office Academy, including names of attendees and instructors, schedule of classes, evaluation sheets, and related materials.
    PERMANENT. Offer to National Archives when 25 years old.
35. *Academy Examinations Files.* Completed examinations of persons attending the Academy.
    Destroy when 1 year old.
36. *Academy Application Files.* Applications for training in the Academy, including memoranda of agreement and personal history statements.
    Destroy when 2 years old.
37. *Academy Correspondence File.* Correspondence relating to the courses offered by the Patent Office Academy.
    Destroy when 5 years old.
38. *Disclosure Document File.* Documents submitted by inventors as evidence of the date of conception of an invention.
    a. Disclosure Documents referred to in a separate letter in a related patent application filed within two years.
    Dispose of with related patent application.

    b. Disclosure Documents *not* referred to.
    Destroy when 2 years old.
39. *Disclosure Documents Index.* Cross-reference index to Disclosure Documents maintained by inventor's name and includes DD number and date of receipt.
    Destroy with related DD's.
40. *Index to Patents Available for License or Sale.* Index created when a patent is made available for license or sale, issued to the U.S. Government or dedicated to the Public.
    Destroy when no longer needed for reference.
41. *General Correspondence File.* Consists mainly of inquiries and requests for information and publications. Also includes correspondence regarding the "Register of Patents Available for License or Sale."
    Destroy when 3 years old.
42. *Foreign Filing Licensing Documents.* Petitions to the Commissioner of Patents and Trademarks for license to file applications for patents in foreign countries.
    Destroy 25 years after date of issue.
43. *Indexes to Foreign Filing Licensing Documents.* Indexes to licensing documents described in Item 43.
    Destroy 25 years after issue.
44. *Transmittals to Other Agencies Files.* Copies of transmittal letters to other agencies enclosing correspondence and related enclosures sent to the Patent and Trademark Office for services rendered by other agencies, such as copyright information and requests for publications from the Government Printing Office.
    Destroy when 1 year old.
45. *D-1 Files.* Files relating to patent applications which may have a bearing on national security. Files usually consist of form listing serial number of application filing date, examining unit, title of invention, attorney assignee, and the concurrences listing the recommendation, signature, agency, and date; a memorandum summary indicating whether a secrecy order is required; the defense agency's request for a secrecy order; the secrecy order issued; and related materials.
    Destroy 35 years after date of receipt for review.
46. *Drawing Correction Slips.* Index arranged by serial number of application and used to locate orders for correction of drawings.
    Destroy when 2 years old.
47. *Inventor's Index to Patent Applications.* Index arranged alphabetically by name of the inventor. Each slip shows the inventor's name and residence, title of the invention, name and address of the attorney, application serial number and the filing date of the application.
    PERMANENT. Offer to National Archives when no longer needed for reference.
48. *Numerical (serial) Index to Patent Applications.* Index arranged by the serial number assigned to the application.
    PERMANENT. Offer to National Archives when no longer needed for reference.
49. *Assignment Document Files and Index.* Copies of documents assigning and transferring from one party to another the rights, title, and interest to trademarks and inventions and the letters patent obtained therefrom with related indexes.
    PERMANENT. Offer to the National Archives when no longer needed for current business.
50. *Indexes to Government Interests.* Indexes to patents in which the Federal government has an interest by virtue of either of ownership of the application or resulting patent, thru assignment, or receipt of a license.
    a. Government Agency Index.
    PERMANENT. Offer to National Archives when no longer needed for reference.
    b. Patent Number Index.
    Destroy when no longer needed for reference.
    c. Assignor Index.
    Destroy when no longer needed for reference.
51. *Petitions to the Commissioner.* Petitions to the Commissioner concerning patent applications.
    a. Original petitions in patent case file.
    Dispose of with related case file.
    b. Other copies.
    Destroy when 2 years old.
52. *Patent Protest Letters.* Protest to the grant of a patent (Rule 291).
    a. Letters filed in patent case file.
    Dispose of with related case file.
    b. Others.
    Destroy when 5 years old.
53. *Patent Docket Cards.* Cards used to control patent applications.
    Destroy when 6 months old.
54. *Classifications Definitions Files.* One copy of each issuance of *Classifications Definitions,* with related background papers.
    PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.
55. *Canceled Drawings.* Drawings that were canceled because they did not meet Patent and Trademark Office specifications. Copy of drawing is filed with application.
    Destroy 5 years after filing date.
56. *Abandoned Patent Application Files.* Patent applications that did not result in a patent.
    a. Those that are retained because they are referred to in another application that may have become patented.
    Dispose of with patent file in which cited.
    b. All others.
    Destroy when 20 years old.
57. *Patent Files.* Case files showing the prosecution of application for, and the granting of, a patent. Includes the original application, copy of drawing, and all material relating to the prosecution of the application and subsequent actions by the Patent and Trademark Office.
    a. Files selected by the Commissioner of Patents and Trademarks or the Archivist of the U.S.
    PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 40 years old.
    b. All others.
    Destroy when 35 years old.
58. *Patent File Charge-out Records.* Record showing name of person charging out a patent file.
    Destroy after file is returned and all papers are determined to be in file.
59. *Statistical Reports on Patents to Printers Files.* Weekly statistical report to management concerning the number of patents sent to the printers and the amount of backlog.
    a. Original Report.
    Destroy when 5 years old.
    b. Operating Unit Copy.
    Destroy when 2 years old.
60. *Quality Review of Sample of Allowed Applications.* Records relating to the examination of allowed applications sampled for quality review, includes query to the examining group and their reply.
    Destroy 1 year after ultimate disposition of related case.
61. *Sample Pull-Rate Files.* Form showing which of the allowed applications are to be selected for the quality review sample, includes the pull rate and list of applications by serial number.
    Destroy when 1 year old.
62. *Printer-Waiting Register Files.* Register showing status of Query Disposition Records return to a group for reply.
    Destroy when 1 year old.
63. *Query Disposition Record Files.* Form used to return printer-waiting cases to a group for answer to a specific query.
    Destroy 6 months after query is returned.
64. *Batch Control Sheet for Allowed Cases Files.* Form uses as input to PALM System showing routing

control and batch contents, such as PTO Form 1238–1.
Destroy when 1 year old.

65. *Checklist for Applications Allowed by Examiner File.* Form used in completing a final review of allowed applications before sending to the printer, such as PTO Form 1167.
Destroy when 1 year old.

66. *Patent Interference Files.* Case files produced in the process of resolving of adjudicating conflicts arising between parties in this matter of priority of invention.
a. Cases that reach the hearing stage.
PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 40 years old.
b. Cases that are abandoned before reaching a hearing.
Destroy when 40 years old.

67. *Board of Interference Decisions.* Copies of Board of Interference Decisions.
PERMANENT. Offer to the National Archives when 40 years old.

68. *Index to Patent Interferences.* Arranged numerically by interference number. Shows names of parties involved, application serial number and/or patent numbers involved, subject of interference, sections, date of hearings, decisions rendered, and other remarks.
PERMANENT. Offer to National Archives when 40 years old.

69. *Index to Interference Exhibits.* Describes exhibits in each interference.
Destroy when 40 years old.

70. *Proceedings Under AEC and NASA Acts.* Separate series of interference files relating to the SEC and NASA Acts.
Dispose of with related patent files.

71. *Settlement Agreements.* Files relating to the settlement agreed to by parties in the interference.
Dispose of with related interference case file.

72. *Court Cases.* Proceedings in cases where the Commissioner is a party of a civil suit.
a. Cases selected by the Solicitor as being precedent setting or of historical or political significance.
PERMANENT. Offer to the National Archives when 30 years old.
b. All other cases.
Destroy when 30 years old.

73. *Index to Court Cases.* Card index to cases described under Item 72.
Retain in agency until no longer needed for reference.

74. *Roster of Registered Patent Attorneys and Agents.* Printout listing registered patent attorneys and agents.
Destroy after undated listing is received.

75. *Case Folders of Registered Attorneys and Agents.* Application folders of the attorneys, agents, or firms registered to practice before the Patent and Trademark Office.
Destroy on death of attorney or agent.

76. *Unsuccessful Application for Registration to Practice before the Patent and Trademark Office.* Application folders of those applicants who failed to be registered.
Destroy 5 years after date of examination.

77. *Examination Papers of Applicants for Registration.* Examination answer papers to applications for registration to practice before the Patent and Trademark Office.
Destroy after grades are recorded.

Trademark Records

78. *Trademark Examiners Work Reports.* Records showing amount of work processed by examiners in a given time. Used to evaluate examiners work and progress.
Destroy when 5 years old.

79. *Trademark Adversary Proceedings Files.* Consists of Trademark Opposition, Cancellation, Interference, and Concurrent-Use proceedings files.
Destroy when 25 years old. Check with the Chairman of the Trademark Trial and Appeal Board before destruction. General Services should generate a list of files to be destroyed and send to the Search Room to destroy matching cards in Adversary Proceeding file.

80. *Canceled Trademark Registration Files.* Consists of original application and all related correspondence.
Destroy 2 years after the date of cancellation.

81. *Expired Trademark Registration Files.* Consists of original application and all related correspondence.
Destroy 2 years after expiration of registration.

82. *Abandoned Trademark Application Files.* Consists of original application and all related correspondence.
Destroy 2 years after date of abandonment.

83. *Trademark Renewal Index.* Index to trademark registrations that are renewed.
PERMANENT. Offer to National Archives when no longer needed for reference.

84. *Indexes to Trademark Applications.* Index shows applicant's name, serial number of application, filing date, name of mark description of goods, attorney's name, and final disposition of the application.
a. Applicant's Index.
PERMANENT. Offer to National Archives when no longer needed for reference.
b. Serial Index.
PERMANENT. Offer to National Archives when no longer needed for reference.

85. *Proceedings Index to Trademark Adversary Proceedings.* Index in the Trademark Public Search Library arranged by type of proceeding.
Destroy card from list sent by the Warehouse after matching Adversary Proceeding file is destroyed.

86. *Trademark Adversary Proceedings Records.* Card file maintained at the Trademark Trial and Appeal Board, showing records of Trademark Adversary Proceedings, with information on mark, parties, disposition, termination date, etc.
PERMANENT. Offer to National Archives when no longer needed for reference.

87. *Trademark Registrant's Index.* Index to Trademark registrant's name, includes serial and registration numbers, date of registration, line of goods and other related information.
PERMANENT. Offer to National Archives when no longer needed for reference.

88. *Index to Trademark Trial and Appeal Board Ex Parte Cases.* Record of Trademark Trial and Appeal Board cases in ex parte appeals.
PERMANENT. Offer to National Archives when no longer needed for references.

89. *Public Advisory Committee for Trademark Affairs Files.* Agenda, minutes, correspondence, reports, working papers, reference materials, and related supporting files.
Destroy when 10 years old or no longer needed for reference.

90. *Trademark Petitions Files.* Petitions and decisions to the Commissioner relating to trademarks, with related materials.
a. Original Petitions in trademark case file.
Dispose of with related case file.
b. Copies of petition decisions in petition number order and in subject order in the Assistant Commissioner's Office.
PERMANENT. Offer to the National Archives when no longer needed for references.
c. Other copies.
Destroy when 2 years old.

91. *Trademark Protest Letters.* Letters of protest to the Commissioner related to trademarks.
Destroy when no longer needed or when three years old, whichever is earlier.

Public Information and Service Records

92. *International Intellectual Property Activities Case Files.* Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports; records of international meetings concerning patents; trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.
PERMANENT. Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.

93. *Proposed Intellectual Property Legislation Files.* Documents accumulated in the preparation and processing of legislation proposed by or in the interest of the Patent and Trademark Office. Includes drafts of legislation, reports to committees on introduced legislation, and comments on legislative proposals.
PERMANENT. Transfer to FRC after 5 years. Offer to National Archives when 25 years old.

94. *Printed Articles Files.* Articles submitted for clearance and printed in magazines, journals, and other information media, including related background materials.
Destroy when 10 years old.

95. *Public Affairs Report.* Weekly, monthly, and quarterly reports relating to public affairs activities prepared for the Department of Commerce.
Destroy when 6 months old.

96. *Speakers Files.* Correspondence, schedules, travel material and related records concerning the scheduling of Patent and Trademark Office speakers.
Destroy when 3 years old.

97. *Exhibit Files.* Correspondence, photographs, reports and related materials concerning major exhibits developed by the Patent and Trademark Office, such as the 175th anniversary exhibit.
PERMANENT. Transfer to FRC when 10 years old. Offer to the National Archives when 30 years old.

98. *Photograph Files.* Photographs of key Patent and Trademark Office officials, major exhibits and other subjects that related to the functioning of the Patent and Trademark Office. Includes the negative and one positive print.
PERMANENT. Offer for transfer to the National Archives when 20 years old.

99. *Publications Files.* Official record copy of each publication that contributes to an understanding of the organization and functioning of the Patent and Trademark Office.
PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.

100. *Speech Files.* Official records copy of each speech given by the Commissioner and other Patent and Trademark Office executives.
PERMANENT. Transfer to FRC when 10 years old. Offer to the National Archives when 30 years old.

101. *News Release Files.* Official records copy of each new release.
PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 30 years old.

102. *Patents Received and Files Register.* Register showing date and number of patent cases received in search room and date filed.
Destroy 2 years after date of last entry in volume.

103. *Reports on Search Room Activities Files.* Weekly, monthly and other periodic reports showing production and general activities of the public search room, with related background papers.
a. Original Report.
Destroy when 1 year old.
b. Operating Office Copy.
Destroy when 2 years old.

104. *Patent and Trademark Reproduction Copy Files.* The master copy of patents and trademarks used for the photoreproduction of sales copies, includes original drawings and specifications.
Transfer to FRC when 10 years old. Destroy when 20 years old.

105. *Reprint Requisition File.* Requisitions, such as PTO Form 228, used for ordering the reprint or printed patents or trademarks after current stock is depleted.
Destroy when 1 year old.

106. *Sales Journal.* Shows statistical information on sales of copies of patents and trademarks.
Destroy when 5 years old.

107. *Correspondence and Sale Control Records.* Records used to control the flow of correspondence and sale of printed materials.
Destroy when 1 year old.

108. *Requests for Publications.* Correspondence requesting copies of certain publications and other printed materials.
Return requests with ordered materials.

109. *Microform Files.* Microform copies of applications as filed, printed patent files and printed trademark files.
a. Master microfilm files. (Certified as processed under 41 CFR 101–11.504)
PERMANENT. Transfer to classified site. Offer to National Archives when 25 years old.
b. All other microform copies
Non-Records

110. *Charged-Out Slips File.* Slips recording the charge-out of records to Patent and Trademark Office employees and the public, such as PTO Forms 124, 125, and 271.
Destroy when records are returned.

111. *Binding Instructions.* Cards showing instructions on how the various publications received by the library are to be bound.
Destroy when no longer needed.

112. *Charge-out Files of Library Materials.* Sets of 3" × 5" cards showing records of library materials on temporary or indefinite loan to researchers or Patent and Trademark Office staff.
Destroy when obsolete or on return of book.

113. *Interlibrary Loans Files.* Records of books borrowed from other libraries.
Destroy 2 years after return of book.

114. *Library Serial Order Cards.* 3" × 5" cards used to record purchase of journals, magazines, etc.
Destroy when no longer needed for reference.

115. *Library Book Order Cards.* 3" × 5" cards showing book purchases.
Destroy when no longer needed for reference.

116. *Foreign Patent Accession Register.* Bound volumes arranged by country. Each shows the patent number and the date that copy was received in the Patent and Trademark Office.
Destroy when no longer needed for reference.

117. *Inventor's Index.* Arranged alphabetically by name of inventor. Shows name and address of inventor, title of invention, serial number of application, patent number, date of issuance, attorney, and assignee.
PERMANENT. Offer to National Archives when no longer needed for reference.

118. *PTO Procurement Files.* Contract, requisition, purchase order, lease, and bond and surety records, including correspondence and related papers pertaining to award, administration, receipt, inspection and payment (other than those covered in Items 1, 2, 13, and 15).
a. Procurement or purchase organization copy, and related papers.
1. Transactions of more than $10,000 and all construction contracts exceeding $2,000.
Destroy 6 years and 3 months after final payment.
2. Transactions of $10,000 or less and construction contracts under $2,000.

Destroy 3 years after final payment. (Close file at the end of the fiscal year, retain 3 years and destroy, except that files on which actions are pending shall be brought forward to the next fiscal years's files for destruction therewith.)

b. Obligation copy.
Destroy when funds are obligated.

c. Other copies of record described above used by component elements of a procurement office for administrative purposes.
Destroy upon termination or completion.

119. *Solicited and Unsolicited Bids and Proposals Files.*

a. Successful bids and proposals.
Destroy with related contract case files (see item 118 of this schedule.)

b. Solicited and unsolicited unsuccessful bids and proposals.
1. When filed separately from contract case files.
Destroy when related contract is completed.
2. When filed with contract case files.
Destroy with related contract case files (see item 118 of this schedule.)

c. Cancelled Solicitations Files.
1. Formal solicitations of offers to provide products or services (e.g., Invitations for Bids, Requests for Proposals, Requests for Quotations) which were cancelled prior to award of a contract. The files include presolicitation documentation on the requirement, any offers which were opened prior to the cancellation, documentation on any government action up to the time of cancellation, and evidence of the cancellation.
Destroy 5 years after date of cancellation.
2. Unopened Bids.
Return to bidder.

d. Lists or Card Files of Acceptable Bidders.
Destroy when superseded or obsolete.

120. *Public Printer Files.* Records relating to requisitions on the Printer, and all supporting papers.

a. Printing procurement unit copy of requisition, invoice, specifications, and related papers.
Destroy 3 years after completion or cancellation of requisition.

b. Accounting copy of requisition.
Destroy 3 years after period covered by related account.

Non Record Materials

The Records Disposal Act of 1943, as amended, states that "library and museum material made or acquired and preserved solely for reference or exhibition purposes, extra copies of documents preserved only for convenience of reference, and stocks of publications and of processed documents are not included within the definition of the word 'records' as used in this Act." Non-record material is disposed of as soon as its purpose is served. The following list consists of those non-record materials that are unique to the Patent and Trademark Office.

121. *Foreign Patents.* Copies of patents issued by foreign countries.

122. *Translation of Foreign Patents and Publications and Related Indexes.* Typewritten copies of translations and related indexes.

123. *Card Catalogs.* 3" × 5" cards used as finding aids to the library.

124. *Patent Examiner's Search Files.* Reference file used by examiners in processing applications. Arranged by class and subclass and consist of U.S. patents, foreign patents, extracts from publications, and other materials relating to a certain class or subclass.

125. *Printed Trademark Registrations Reference Files.* Digest of Registered marks consisting of a set of registered work marks arranged alphabetically and secondarily by trademark registration number; a set of registrations comprising symbols, arranged according to the classification of the goods or services with which they are used; of registration arranged by registration number.

126. *Numerical Index to Patent Classification.* Arranged numerically by patent number and shows the class and subclass assignment of each patent.

127. *Shelf List of Classified Patents.* Listing of all U.S. Patent numbers comprising, respectively, the "original" and "cross reference" classification of patents according to the official classification of the Patent and Trademark Office.

128. *Public Search Files of U.S. Patents.* Printed or microfilm copies of U.S. Patents arranged in two series: 1) numerically by class and subclass assignment, and secondarily by patent number and 2) numerically by patent number.

129. *Legislative History Files.* Consist mainly of copies of published materials relating to legislation that is of interest to the Patent and Trademark Office. Includes copies of bills, public laws, Federal Register, Congressional Record, and similar materials.

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[1068 TMOG 5]

(211) Change in Legal Holidays

The Commissioner's Notice of Sept. 25, 1979, "Change in Legal Holidays," is hereby rescinded in view of Public Law 98–144, enacted Nov. 2, 1983, which amended the listing of legal public holidays in 5 USC §6103. That amendment took effect in 1986 and added a new legal holiday relating to the birthday of Martin Luther King, Jr. This new holiday is designated for the third Mon. in Jan.

Section 6103, as amended, reads as follows:
New Year's Day, Jan. 1
Birthday of Martin Luther King, Jr., the third Mon. in Jan.
Washington's Birthday, the third Mon. in Feb.
Memorial Day, the last Mon. in May
Independence Day, July 4
Labor Day, the first Mon. in Sept.
Columbus Day, the second Mon. in Oct.
Veterans Day, Nov. 11
Thanksgiving Day, the fourth Thurs. in Nov.
Christmas Day, Dec. 25.

Each of the holidays enumerated will constitute a "Federal holiday within the District of Columbia," as referred to in Section 21, Title 35, United States Code. In accordance with 37 CFR 1.6(a) and 1.10(a), the Patent and Trademark Office will not receive papers on these holidays. Actions required to be taken on such days may be taken on the next succeeding day that the Office is open for business in accordance with 37 CFR 1.7.

July 15, 1986.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1069 TMOG 5]

(212) Public Advisory Committee for Trademark Affairs Notice of Open Meeting

In accordance with Section 10(a)(2) of the Federal Advisory Committee Act (Public Law 92–463), announcement is made of the following Committee meeting:

The Public Advisory Committee for Trademark Affairs will meet from 9:30 a.m. until 5:00 p.m. on Sept. 4, 1986, at the U.S. Patent and Trademark Office in Rm. 11C24 of Bldg. 3, Crystal Plz., located at 2021 Jefferson Davis Hwy., Arlington, Va.

The agenda for the meeting is as follows:

(1) Status of Trademark Examining Operation Activities
(2) Operations of the Trademark Trial and Appeal Board
(3) Post-Registration Activities
(4) Quality of the Registration Process
(5) Financial Reports
(6) Automation Activities

The meeting will be open to public observation; approximately twelve (12) seats will be available for the public on a first-come first-served basis.

If time permits, oral comments by the public of three (3) minutes on each topic within the above agenda will be allowed. Written comments and suggestions will be accepted before or after the meeting on any of the matters discussed.

Copies of the minutes will be available upon request.

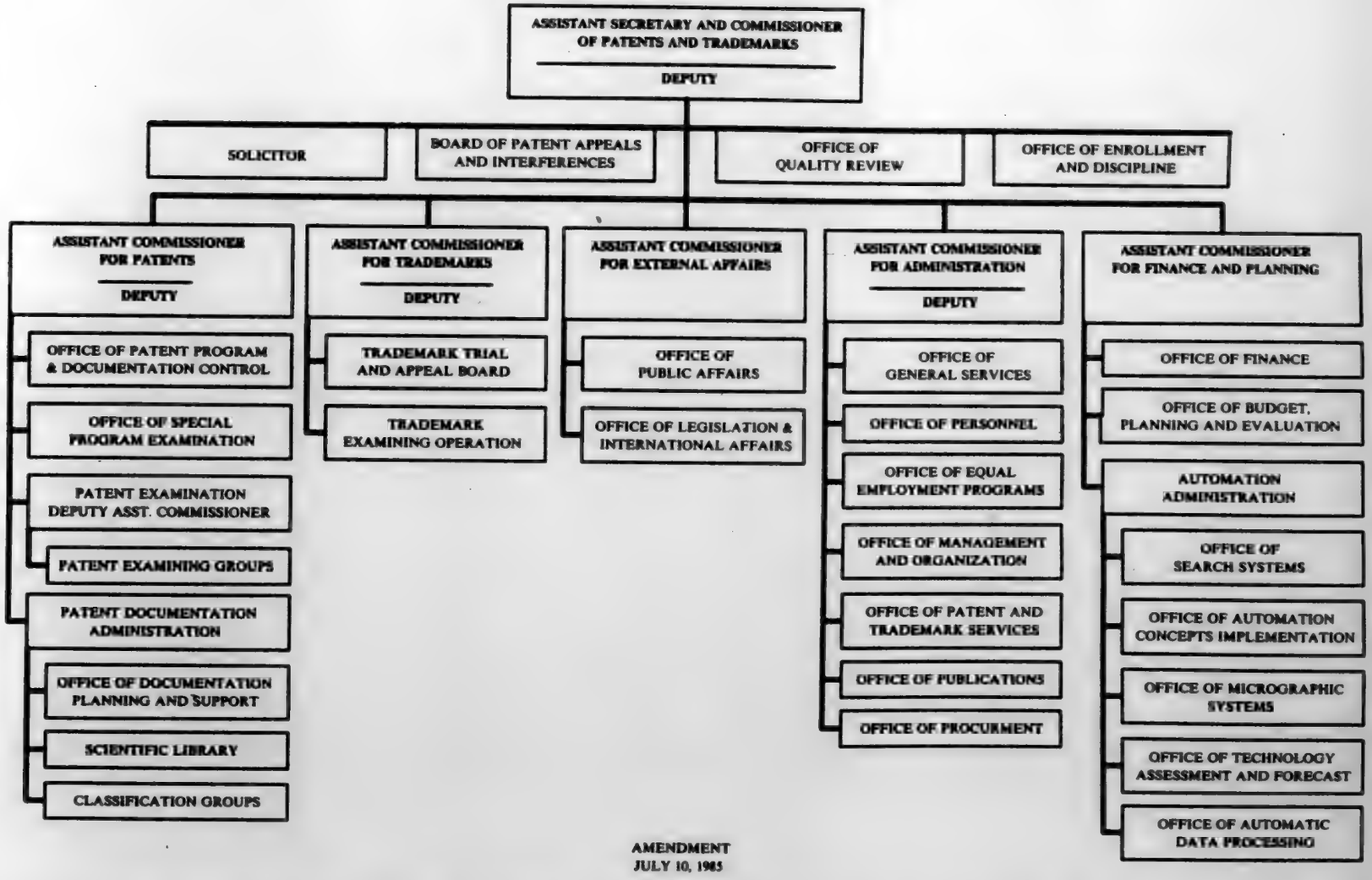
For further information, contact Ellen J. Seeherman, Office of the Assistant Commissioner for Trademarks, Rm. CP3–11C17, Patent and Trademark Office, Washington, D.C. 20231. Telephone: 703–557–7464.

Aug. 4, 1986.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1069 TMOG 4]

U.S. DEPARTMENT OF COMMERCE
PATENT and TRADEMARK OFFICE



AMENDMENT
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Ian A. Calvert Vice-Chairman 4000
Office of Quality Review, James D. Trammell . 3564

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Special Program Examination Unit 8384
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Petitions Examiner, Brad Garris 4282
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Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
All cases:	1015.00
International fees	
Basic fee (first 30 pages):	430.00
Basic Supplemental fee (for each page over 30):	8.00
Designation fee for the first 10 national or regional offices:	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Sept. 30, 1986.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Jan. 10, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,424,595 through 4,425,666
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED OCTOBER 26, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEE

Patent Number	Serial Number	Issue Date
4,355,436	06/226,396	10/26/82
4,355,474	06/224,059	10/26/82
4,355,481	06/224,393	10/26/82
4,355,483	06/222,583	10/26/82
4,355,574	06/248,025	10/26/82
4,355,598	06/233,902	10/26/82
4,355,626	06/288,310	10/26/82
4,355,628	06/343,780	10/26/82
4,355,649	06/232,145	10/26/82
4,355,674	06/227,627	10/26/82
4,355,676	06/240,925	10/26/82
4,355,716	06/217,456	10/26/82
4,355,722	06/228,871	10/26/82
4,355,731	06/243,680	10/26/82
4,355,736	06/239,925	10/26/82
4,355,757	06/240,924	10/26/82
4,355,758	06/242,016	10/26/82
4,355,777	06/313,410	10/26/82
4,355,793	06/232,077	10/26/82
4,355,802	06/244,768	10/26/82
4,355,803	06/218,540	10/26/82
4,355,807	06/227,865	10/26/82
4,355,810	06/219,295	10/26/82
4,355,813	06/291,707	10/26/82
4,355,829	06/220,861	10/26/82
4,355,831	06/223,825	10/26/82
4,355,849	06/241,233	10/26/82
4,355,867	06/222,114	10/26/82
4,355,870	06/219,640	10/26/82
4,355,876	06/244,474	10/26/82
4,355,879	06/237,663	10/26/82
4,355,889	06/276,716	10/26/82
4,355,895	06/232,761	10/26/82
4,355,958	06/303,591	10/26/82
4,355,981	06/272,835	10/26/82
4,356,043	06/297,401	10/26/82
4,356,047	06/235,094	10/26/82
4,356,053	06/262,598	10/26/82
4,356,056	06/235,707	10/26/82
4,356,071	06/330,530	10/26/82
4,356,075	06/278,165	10/26/82
4,356,087	06/295,840	10/26/82
4,356,138	06/225,288	10/26/82
4,356,173	06/255,087	10/26/82
4,356,181	06/247,896	10/26/82
4,356,191	06/270,075	10/26/82
4,356,192	06/270,070	10/26/82
4,356,193	06/270,071	10/26/82
4,356,194	06/270,069	10/26/82
4,356,200	06/290,054	10/26/82
4,356,206	06/231,387	10/26/82
4,356,213	06/236,788	10/26/82
4,356,275	06/312,225	10/26/82
4,356,282	06/280,565	10/26/82
4,356,284	06/316,292	10/26/82
4,356,292	06/265,521	10/26/82
4,356,298	06/265,721	10/26/82
4,356,311	06/332,782	10/26/82
4,356,335	06/233,715	10/26/82
4,356,337	06/317,626	10/26/82
4,356,364	06/255,701	10/26/82
4,356,369	06/233,926	10/26/82
4,356,376	06/263,235	10/26/82
4,356,380	06/215,617	10/26/82
4,356,385	06/268,686	10/26/82
4,356,474	06/241,268	10/26/82
4,356,498	06/259,807	10/26/82
4,356,500	06/255,708	10/26/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,277,321, Re. S.N. 925,416, Filed Oct. 31, 1986, Cl. 204/192.32 , TREATING MULTILAYER PRINTED WIRING BOARDS, Charles J. Bartlett, et al., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.*, Attorney or Agent: S. E. Hollander, et al., Ex. Gp.: 112

4,567,491, Re. S.N. 912,093, Filed Sept. 29, 1986, Cl. 346/136, PINCH ROLLER ASSEMBLY, James Lawrence, Owner of Record: *Sanders Associates, Inc., Nashua, N.H.*, Attorney or Agent: Richard I. Seligman, et al., Ex. Gp.: 216

4,588,267, Re. S.N. 925,673, Filed Oct. 31, 1986, Cl. 350/600, COMBINATION REAR VIEW MIRROR AND DIGITAL CLOCK, Ronald Pastore, Owner of Record: *Inventor*, Attorney or Agent: Alfred M. Walker, Ex. Gp.: 257

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

NATIONAL INVENTORS EXPO

The Patent and Trademark Office, the National Council of Patent Law Associations and the National Inventors Hall of Fame Foundation, Inc., will sponsor the Fifteenth Annual National Inventors Expo in the Public Search Rm. on Saturday, Feb. 7, 1987 from 1:00 to 5:00 p.m. and Sunday, Feb. 8, 1987 from 10:00 to 5:00 p.m. The Public is invited to view the exhibits on these days. Inventors will be inducted into the National Inventors Hall of Fame on Sunday, Feb. 8 at 2:00 p.m.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, Feb. 6, 1987 at 5:00 p.m. The removal of all personal property from the Search Room would be appreciated.

DONALD J. QUIGG,
Dec. 3, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Patents Available for License or Sale

Kenneth A. Allen is prepared to grant an exclusive license or non-exclusive licenses to domestic manufactures under the following recently issued patent:

Applications for licenses may be addressed to: Mr. Kenneth A. Allen, c/o Peter N. Jansson, Attorney, 245 Main St., Mezzanine Suite, Racine, Wis. 53403.

4,622,702. * DRAIN PLUNGER.

3,786,907. * DIODE-PUMPED YAG LASER, ERASER FOR A TYPEWRITER LASER-KINETICS CORP., 1735 N. Morningside St., Orange, Calif. 92667.

4,604,985. * FIRE ARM, *Alexander Kulgevich*, 1070 Ocean View Ave. #1-K Brooklyn, N.Y. 11235.

06,690,888. * ROTARY INTERNAL COMBUSTION ENGINE. *Joseph F. Frasca*, 5801 Yorkstown Rd., Lorain, Ohio 44053.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 13, 1987

Re. 31,580	4,581,334	4,599,191	4,611,139
Re. 32,223	4,581,340	4,599,490	4,611,869
D. 284,552	4,581,665	4,600,165	4,611,926
4,341,550	4,582,854	4,600,507	4,611,948
4,420,753	4,583,490	4,601,016	4,612,776
4,468,395	4,583,650	4,601,321	4,613,237
4,498,850	4,583,660	4,601,852	4,613,964
4,507,415	4,584,544	4,601,868	4,614,022
4,521,551	4,585,564	4,602,100	4,614,536
4,539,283	4,587,535	4,602,274	4,614,868
4,539,840	4,587,663	4,602,300	4,614,881
4,542,247	4,588,167	4,603,073	4,614,950
4,543,458	4,588,526	4,604,059	4,615,475
4,551,325	4,589,025	4,604,550	4,615,564
4,552,648	4,590,964	4,604,981	4,615,800
4,552,945	4,591,424	4,605,694	4,615,817
4,554,587	4,591,654	4,605,808	4,616,016
4,558,965	4,592,000	4,605,830	4,616,098
4,561,068	4,592,583	4,606,014	4,616,293
4,562,502	4,592,861	4,607,625	4,616,307
4,566,002	4,593,301	4,607,940	4,616,778
4,567,001	4,595,165	4,608,169	4,616,790
4,567,310	4,595,676	4,608,573	4,616,810
4,570,925	4,595,953	4,608,577	4,617,653
4,572,627	4,596,751	4,609,084	4,618,240
4,573,026	4,597,541	4,609,155	4,618,740
4,573,289	4,597,812	4,609,421	4,618,741
4,575,846	4,597,868	4,609,510	4,618,759
4,578,688	4,598,188	4,610,377	4,619,147
4,581,215	4,598,487	4,610,638	

Disclaimers

3,984,329. —*Lothar Wenzel*, Niefern and *Ulrich Kollmar*, Auf Dem Berg, Germany. DEVICE FOR EXTRACTING LIQUID FROM SLUDGE. Patent dated Oct. 5, 1976. Disclaimer filed May 6, 1986, by the assignee, *Firma Gebrueder Bellmer KG, Maschinenfabrik.*

Hereby enters this disclaimer to claims 1-5 of said patent.

4,272,100. —*Kenzou Kasai*, Osaka, Japan. COLLAPSIBLE BABY CARRIAGE. Patent dated June 9, 1981. Disclaimer filed Sept. 17, 1980, by the *inventor.*

The term of this patent subsequent to Mar. 4, 1997 has been disclaimed.

4,573,951.—*Masashi Nagano*, Osaka, Japan. DERAILLEUR FOR A BICYCLE. Patent dated Mar. 4, 1986. Disclaimer field Sept. 10, 1986 by the assignee, *Shimano Industrial Co. Ltd.*

Hereby enters this disclaimer to claim 1 of said patent.

4,595,235.—*Roger K. Leib*, Los Angeles, Calif. PATIENT'S DEFINED-MOTION CHAIR. Patent dated June 17, 1986. Disclaimer filed June 7, 1985, by the *inventor.*

The term of this patent subsequent to July 16, 2002, has been disclaimed.

Disclaimer and Dedication

4,236,207.—*Peter J. Rado*, Acton; *Srirama S. Durvasula*, Chelmsford; *William H. Angell*, Concord, Mass. MEMORY INITIALIZATION CIRCUIT. Patent dated Nov. 25, 1980. Disclaimer and Dedication filed July 24, 1986, by the assignee, *Digital Equipment Corp.*

Hereby disclaims and dedicates to the Public all claims of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

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	Los Angeles Public Library	(213) 612-3273
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Idaho	Moscow: University of Idaho Library	(208) 885-6235
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	Springfield: Illinois State Library	(217) 782-5430
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	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 6, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	8-15-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-29-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-15-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-25-85
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-19-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	7-03-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	6-22-84
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	11-06-84
DESIGN, GROUP 290—K. L. CAGE, Director	6-13-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	8-29-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	7-09-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during December 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,480,966 to 3,487,469, inclusive

Plant Patents ..... Numbers 2,945 to 2,958 inclusive

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REEXAMINATIONS

JANUARY 13, 1987

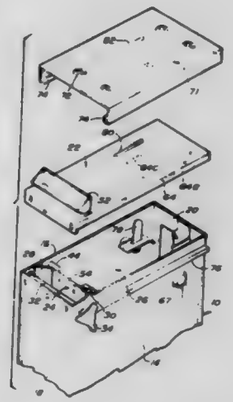
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,854,655 (618th)

CONTAINERS FOR BANKNOTES AND THE LIKE

John H. G. Armstrong, Freshfield, England, assignor to Volumatic Ltd., West Midlands, England

Reexamination Request No. 90/000,923, Dec. 13, 1985.
Reexamination Certificate for Patent No. 3,854,655, issued Dec. 17, 1974, Ser. No. 380,865, Jul. 19, 1973.
Claims priority, application United Kingdom, Jul. 28, 1972, 35312/72
Int. Cl.[4] A47G *29/00*
U.S. Cl. 232—4 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **15** is confirmed.

Claims **1, 2, 5, 13** and **16** are determined to be patentable as amended.

Claims **3, 4, 6–12** and **14** dependent on an amended claim, are determined to be patentable.

New claims **17** and **18** are added and determined to be patentable.

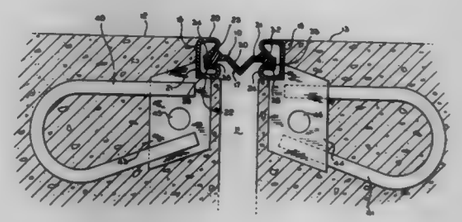
1. A container for storing substantially planar, resilient articles comprising means defining a reception chamber for receiving articles to be stored, means defining a storage chamber for storing such articles, means forming a constriction between the reception and storage chambers of width less than that of the smallest article to be handled, [and a plunger means for] *a lever pivotally mounted on said container for movement from a starting position, and an abutment member operably associated with said lever and constructed and arranged so that pivotal movement of said lever from said starting position causes said abutment member to project, thereby* forcing an article in the reception chamber through the constriction whereby it is caused to bow in passing through the constriction into the storage chamber, the arrangement being such that on passing beyond the constriction and into the storage chamber the article is permitted to straighten out to restrict its return through the restriction when the [plunger] *abutment member* is subsequently retracted *by return movement of said lever to its starting position.*

B1 4,290,713 (619th)

EXPANSION JOINT SEALING STRUCTURES

Delmont D. Brown, North Baltimore, Ohio, and Michael C. Rizza, Walnut Creek, Calif., assignors to The D. S. Brown Company, North Baltimore, Ohio

Reexamination Request No. 90/000,909, Nov. 18, 1985.
Reexamination Certificate for Patent No. 4,290,713, issued Sep. 22, 1981, Ser. No. 76,908, Sep. 19, 1979.
Int. Cl.[4] E01C *11/02*
U.S. Cl. 404—69



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2–7**, dependent on an amended claim, are determined to be patentable.

1. An expansion joint between adjacent pavement sections with an elastomer seal comprising a first frame of rolled steel mounted on and extending along one side of said joint, an opposing second frame of rolled steel mounted on and extending along the other side of said joint, and an elastomer sealing strip spanning the joint and having its respective longitudinal edges seated in a respective frame, said frames and said elastomer strip being characterized by an elongated strip of steel roll-formed into elongated, integral top, bottom and rear walls and an integral front wall which faces said joint on one frame opposing the front wall, which faces said joint, of said second frame, said front wall of each frame comprising a downwardly and rearwardly sloping upper segment integral with said top wall and an upwardly projecting, lower segment integral with said bottom wall, each segment having a longitudinal edge spaced from the longitudinal edge of the other segment to form a longitudinal slot in each front face, and said elastomer sealing strip having respective, longitudinal, edge members seated in the respective longitudinal slots of said frames[.], *said elastomer sealing strip having an elongated bead having passages to increase the deformability thereof.*

B1 4,457,370 (620th)

METHOD AND DEVICE FOR EFFECTING, BY MEANS OF SPECIALIZED TOOLS, SUCH OPERATIONS AS MEASUREMENTS IN HIGHLY INCLINED TO THE VERTICAL OR HORIZONTAL WELL PORTIONS

Christian Wittrisch, Rueil-Malmaison, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Reexamination Request No. 90/000,995, Apr. 23, 1986.
Reexamination Certificate for Patent No. 4,457,370, issued Jul. 3, 1984, Ser. No. 357,519, Mar. 12, 1982.
Claims priority, application France, Mar. 13, 1981, 81 05271
Int. Cl.[4] E21B *23/08, 43/112, 47/00*
U.S. Cl. 166—250



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-18 is confirmed.

1. A method for effecting logging or servicing operations in a predetermined zone of a bore hole having, from the ground surface downwardly, an initial portion substantially vertical or of slight inclination, followed by an inclined or horizontal portion, with said predetermined zone being located beyond said initial portion of the well, the method comprises the steps of, (a) fixedly securing at the ground surface a logging or servicing tool body to the lower end of a first rod of a string of rods, with said tool body being electrically connected to a first electric connector rigidly secured to said first rod and accessible from the upper portion thereof, (b) assembling the string of rods, by end-to-end connection of new drill rods above the first rod, and progressively lowering the assembly of the tool body and the string of rods into the well as it is assembled, and in the absence of an external conduit extending within said bore hole from the ground surface to said predetermined measuring zone, for supporting, at its lower end, said string of rods after assembled, (c) introducing a second plug-in electric connector for use in a liquid medium, in the string of rods, from the surface, with said second connector being mechanically secured to the lower end of an electric transmission cable and electrically connected to the surface through said cable, and with said method further comprising:

(1) lowering said second connector, secured to said cable and weighted, into the string of rods when the tool body is positioned substantially at the predetermined zone of the well, by sliding the cable through a sealing member secured at the surface to the string of rods, and with said sealing member comprising a special sub with a lateral port through which the cable is passed, and which is secured to the upper end of the string of rods;

(2) displacing said second connector through the inclined or horizontal portion of the string of rods by pumping a fluid through the string of rods from the surface in a manner so as to exert a moving force on said second connector until said second connector operatively connects to said first connector;

(3) displacing the tool through the well by adding a tubular string of rod elements above the special sub to thereby position the tool body in the predetermined zone of the well; and

(4) effecting the logging or servicing operation in said zone.

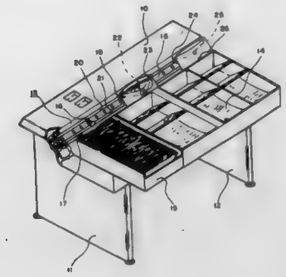
Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,328

MAIL EXTRACTING AND SORTING DESK

Robert J. Russell, Philadelphia, Pa., assignor to Opex Corporation, Cherry Hill, N.J.

Original No. 3,979,884, dated Sep. 14, 1976, Ser. No. 510,778, Sep. 30, 1974. Application for reissue Feb. 6, 1978, Ser. No. 875,602
Int. Cl.[4] B65B *43/30*
U.S. Cl. 53—381 R 13 Claims



1. Apparatus facilitating extracting and sorting of the contents from envelopes which have been opened on one edge only comprising:

a feed hopper into which a plurality of envelopes to be processed are placed;

fully exposed conveyor means having a feed station and an opening station[;], and of configuration to convey an envelope with the opened edge positioned generally upwardly fully exposed along the length of the conveyor means;

a substantially flat and continuous work surface extending along and above the conveyor means between the feed station and the [work] *opening* station;

feed means for feeding mail from the feed hopper to the feed station of the conveyor means at [predetermined times] *the start of each of a plurality of operating cycles of the apparatus;*

Conveyor indexing means operating the conveyor means to convey mail from the feed station to the [work] *opening* station at predetermined times *in relation to each said cycle;* and

separating means at the opening station only for drawing the side panels of the envelope apart to expose the contents thereof for ease of removal.

Re. 32,329

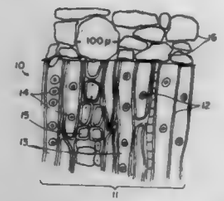
METHOD OF ADHERING MINERAL DEPOSIT IN WOOD FRAGMENT SURFACES

Laszlo Pazmer, 3906 W. 33rd Ave., Vancouver, British Columbia, Canada (V6N 2H8)

Original No. 4,339,405, dated Jul. 13, 1982, Ser. No. 21,775, Mar. 20, 1979. Application for reissue Jul. 13, 1984, Ser. No. 630,388
Int. Cl.[4] B28B *1/00*
U.S. Cl. 264—108 61 Claims

1. [The] *A* method of making a [molded] composite product [including] *by joining a plurality of individual members, each of which is made of* a [ligneus] *ligneous* plant material with surfaces having internal pore spaces, [which is bonded with a mineral binder which comprises] *the method comprising the steps of:*

(a) [providing] *applying* an aqueous solution of an ammonium phosphate or ammonium polyphosphate on the plant material [so as] *of the individual members in a manner to allow the aqueous solution* to be absorbed within the pore spaces and to wet the surfaces, [along with] *and* a particulate alkaline earth metal oxide, hydroxide, or carbonate on the wetted surfaces which reacts with the ammonium phosphate or ammonium polyphosphate *in the pore spaces*



and on the wetted surfaces to form an alkaline earth metal oxyphosphate *wet paste* as [the] *a* binder within the pores and as a [wet paste] coating on the [surfaces] *surface;* and

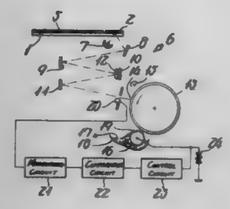
(b) [molding] *curing* the wet paste [coated material] until the oxyphosphate is solidified within the pores and on the surfaces *to bond with the ligneous plant material and to join the individual members* to form the composite product.

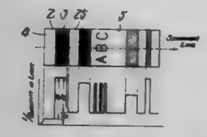
Re. 32,330

METHOD OF MAINTAINING THE CORRECT CONDITIONS OF AN ELECTROPHOTOGRAPHICALLY DUPLICATED IMAGE

Seiichi Miyakawa; Susumu Tatsumi, and Koji Sakamoto, all of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Original No. 4,215,930, dated Aug. 5, 1980, Ser. No. 880,175, Feb. 22, 1978. Continuation of Ser. No. 405,379, Aug. 5, 1982, abandoned. Application for reissue Nov. 18, 1983, Ser. No. 552,868
Claims priority, application Japan, Feb. 23, 1977, 52-18058; Feb. 23, 1977, 52-19908
Int. Cl.[4] G03G *15/04, 15/06*
U.S. Cl. 355—14 D 12 Claims





1. A method for maintaining correct the developing bias voltage, charge, exposure and other conditions of a duplicated image in an electrophotographic process having charging and exposing steps for forming an electrostatic latent image on a

photosensitive medium, which comprises setting a reference plate on a copy supporter together with an original copy so as to permit a duplicating process to proceed, said reference plate being provided with two areas dark-tone and light-tone having a predetermined density difference therebetween, detecting the difference between the quantities of light reflected from the dark-tone and light-tone areas of said reference plate to control each condition of the duplicating process so that a correct duplicated image may be obtained.

Re. 32,331

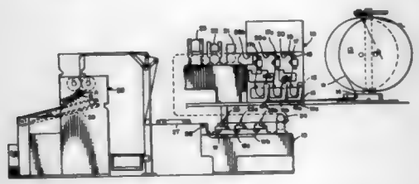
METHOD AND APPARATUS FOR CORRECTING STACK LEAN IN A ZIG-ZAG FOLDED WEB

James B. Fulk, Saratoga, Calif.; Jerry L. McKeefry, Pulaski, Wis.; George F. Schuning, DePere, Wis., and John J. Bradley, Green Bay, Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.

Original No. 4,392,844, dated Jul. 12, 1983, Ser. No. 275,796, Jun. 22, 1981. Application for reissue Oct. 1, 1984, Ser. No. 656,722

Int. Cl.[4] B31B *1/26, 7/00;* B26D *7/06*

U.S. Cl. 493—399 15 Claims



1. In a method for correcting stack lean in a zig-zag folded continuous web having selected longitudinally spaced lines of transverse perforation and a fold at each said selected line, the steps of feeding a web through a means for transversely perforating the web while the web is under tension, and applying a cyclically varying additional force to the web for the purpose of changing the longitudinal length between said selected lines as the web passes through the perforating means, *by producing an amount of motion in said web passing through the said perforating means greater than variables which cause a leaning stack,* the duration of [said] *the* cycle of said *cyclically varying additional* force extending at least over the *travel of* web length between three folds *said cyclically varying force being a substantially continuously acting sinusoidal force and adjusting the cyclically applied force to cancel the amount of cyclic motion from the machine and paper variables, the adjustment of said cyclically applied force being achieved by adjusting the phase relationship between said cyclically applied force and said cyclic motion resulting from the machine and paper variables.*

8. In a method for correcting stack lean in a zig-zag folded continuous web having longitudinally spaced lines of perforation, the steps of transversely perforating said web by advancing same through a perforating means, constraining and advancing said web at two longitudinally spaced points on opposite sides of the means for perforating the web, applying a [cyclically] *substantially continuously acting sinusoidally* varying force perpendicular to the plane of said web to change the longitudinal length between the lines of perforation by producing an amount of motion in said web passing through the said perforating means greater than the cyclic motion resulting from the machine and paper variables which cause a leaning stack, *the duration of a sine cycle of said force extending at least over the web length between three folds,* and adjusting the [cyclically] *sinusoidally* applied force to cancel the amount of cyclic motion from the machine and paper variables *while said web is being advanced, the adjustment of said sinusoidally varying force being achieved by adjusting the phase relationship between said sinusoidally varying force and said cyclic motion resulting from the machine and paper variables.*

PLANT PATENTS

GRANTED JANUARY 13, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,849

ROSE PLANT NAMED 'MACANGELI'

Samuel D. McGredy, 130 B Beach Rd., Castor Bay, Auckland 9, New Zealand

Filed Mar. 5, 1985, Ser. No. 708,407

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—8 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by heavily petaled glowing white flowers that hold color well through the development and aging.

5,850

ROSE PLANT

Samuel D. McGredy, 130 B Beach Rd., Castor Bay, Auckland 9, New Zealand

Filed Apr. 19, 1985, Ser. No. 724,965

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—8 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by orange-gold flowers with almost no tendency to fade but with orange red brushing on petal top surface as flowers age borne on an attractive, disease resistant, hardy plant.

5,851

ROSE PLANT NAMED LAVBLUE

Keith G. Laver, Mississauga, Canada, assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Dec. 17, 1984, Ser. No. 682,261

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by heavily petaled bright red flowers that hold color well through development and aging.

5,852

ROSE PLANT—CANADIAN WHITE STAR

George Maader, 2232 Gale Avenue, Coquitlam, British Columbia, Canada V3K 2Y8

Filed May 28, 1985, Ser. No. 737,724

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—14 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described, characterized particularly by very well formed, large, snow white flowers of symmetrical, star-like form borne one to a stem on a vigorous mildew-resistant plant and which are long lasting on the plant and as cut flowers.

5,853

ROSE PLANT NAMED BURSTAR

Joe J. Burks, Tyler, Tex., assignor to Co-Operative Rose Growers, Inc., Tyler, Tex.

Filed Dec. 10, 1984, Ser. No. 680,290

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—20 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class which is a sport of the rose known as "Tropicana", substantially as shown and described, characterized particularly by flowers generally redder in coloring than orange red of "Tropicana" and foliage which is darker and larger and more uniform plant habit than "Tropicana".

5,854

ROSE PLANT NAMED CORPUS CHRISTI

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761

Filed Feb. 4, 1985, Ser. No. 698,224

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—20 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described, characterized particularly by large, bright cardinal red flowers which retain color well upon aging borne one to a stem on a very vigorous plant.

5,855

ROSE PLANT NAMED INK SPOTS

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761

Filed Feb. 4, 1985, Ser. No. 698,223

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—20 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described, characterized particularly by well formed, very dark red flowers with blackish markings on the petals borne one to a stem on a vigorous plant with attractive foliage and which are long lasting on the plant and as cut flowers.

5,856

GRAPE VINE

John M. Garabedian, 3104 E. Huntington Blvd., Fresno, Calif. 93702

Filed Mar. 28, 1983, Ser. No. 479,821

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—47 1 Claim

1. A new and distinct variety of grape vine substantially as illustrated and described and being characterized by its early maturity, approximately one month earlier than the Thompson seedless grape variety; by berries which are greener in color than the Thompson seedless grape at similar conditions of ripening; by berries larger and more cylindrical than the natural ungibbrelled and ungirdled Thompson seedless grape berries at similar conditions of ripening; and by some berries having a residual seed trace.

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PATENTS

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ERRATA

For CLASS	See PATENT NO.
187-029	4,635,320
280-708	4,635,745
381-194	4,635,750
213-067	4,635,804
402-079	4,636,179
104-122	4,636,259
514-089	4,636,387
427-327	4,636,431
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379-240	4,636,584
379-167	4,636,585
379-390	4,636,586
379-362	4,636,588
379-159	4,636,589
379-386	4,636,590
381-159	4,636,591
381-187	4,636,592
365-098	4,636,933

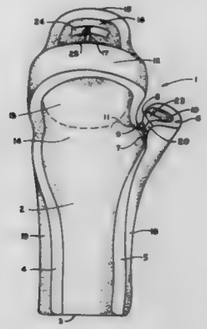
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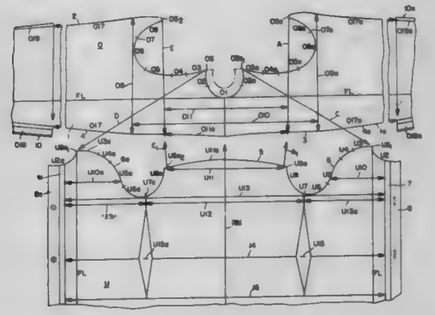
GENERAL AND MECHANICAL

4,635,300
KARATE GLOVE
Jhoon G. Rhee, 6210 Chillum Pl., NW., Washington, D.C. 20011
Filed Mar. 21, 1985, Ser. No. 714,395
Int. Cl.[4] A41D *13/10*
U.S. Cl. 2—16 5 Claims



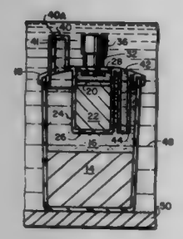
1. In a flexible, unitary molded, protective glove for wearing and use in the art of Karate and the like, and adapted to cover the back and sides of the hand including the fingers and thumb and also the entire wrist, comprising a rear portion having a wrist portion, a side portion, a thumb portion partially encircling the thumb, a front portion having a thickened portion, a looped portion, and a finger portion, an improvement for securing various portions of the glove to the fingers and thumbs comprising a restraining strap secured to opposite sides of the thumb portion and having a medial portion spanning the opposite sides of the thumb portion and opposite end portions, each opposite end portion comprising two wings extending outwardly from ends of the medial portion, one wing being secured to an inner surface of the thumb portion and one to an outer surface of the thumb portion.

4,635,301
UPPER BODY GARMENT CONSTRUCTION
Henry Sulser, Weite, Switzerland, assignor to Almopa Anstalt, Eschen, Liechtenstein
Filed Apr. 27, 1984, Ser. No. 604,697
Claims priority, application Switzerland, Apr. 27, 1983, 02258/83
Int. Cl.[4] A41B *1/08;* A41D *27/00*
U.S. Cl. 2—69 15 Claims



1. An upper body garment including a front body section, a back body section and two sleeves extending from the upper portion of the front and back sections for overcoming the front, back, shoulders and arms of a wearer, comprising one single closing seam (O17, O11*a*, U11*a*, O17*a*) which extends continuously from the outward end (10) of one sleeve across the upper portion of the back section of the garment (O11, U11) to the outward end (10*a*) of the second sleeve without interruption.

4,635,302
TOILET BOWL CLEANER DISPENSER
John E. Dolan, 15 New Main St., Haverstraw, N.Y. 10927
Continuation of Ser. No. 540,433, Oct. 11, 1983, abandoned. This application Oct. 17, 1985, Ser. No. 788,681
Int. Cl.[4] E03D *9/03*
U.S. Cl. 4—228 6 Claims



1. A toilet bowl cleaner dispenser for automatically discharging a predetermined amount of cleaning solution into the flush water of a toilet tank, said device comprising:

a container having a substantially horizontal, top wall and an intake-discharge opening through said top wall for enabling flush water to enter and form a reservoir of cleaning solution in the container, and for enabling the predetermined amount of solution to discharge through said intake opening during flushing;

a venting means, including a vent opening spaced laterally from said intake-discharge opening and extending through said top wall, for solely defining a measured amount of solution to be dispensed, said venting means communicating with the interior of said container by means of said vent opening so as to vent air responsive to the intake of flush water through said intake-discharge opening;

said venting means being in the form of an upstanding tube extending above said vent opening, which tube is closed by means of a wall at its upper end, said tube having a side opening immediately adjacent the closed upper end for enabling a further amount of solution, beyond said measured amount, to be discharged from said intake opening;

said venting means being operable such that as the flush water rises and enters said container through said intake-discharge opening the cleaning solution rises and completely fills said tube to a level above said intake-discharge opening, thereby metering an amount of solution external to said reservoir, such amount being the aforesaid measured amount;

the said measured amount of solution remaining in the venting means until the flush water in the tank is lowered to a point corresponding to the top of said tube, whereby the measured amount descends into said reservoir and displaces from said reservoir through said intake-discharge opening an amount of cleaning solution equivalent to said measured amount, and said further amount flows from said intake-discharge opening corresponding with an incremental amount of flush water which is permitted to

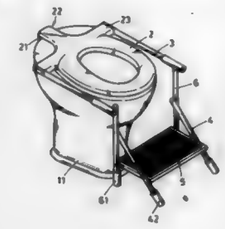
enter said venting means at said point due to said side opening.

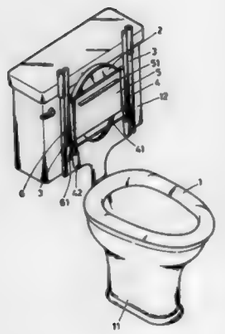
4,635,303

FOLDABLE TOILET-SEAT FOR CHILDREN

Peng Shih, 3rd Fl., No. 8, Alley 2, Lane 186, Kang Yao Street, Nei Hu District, Taipei, Taiwan

Filed Nov. 12, 1985, Ser. No. 796,696
Int. Cl.[4] E03D *11/00*
U.S. Cl. 4—254 6 Claims





1. A foldable mini toilet seat, parallel of set handrails and step assembly for children for use in combination with a conventional toilet including a stool, a seat therefore, pivotally mounted at an end thereof and water tank disposed behind and above said stool, said assembly comprising:

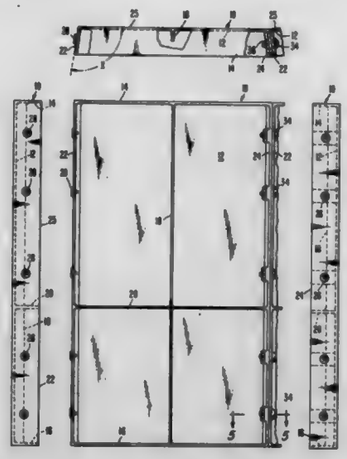
a mini toilet seat pivotally mounted on said toilet at an end thereof adjacent said tank and disposed in the lowered position to rest on said toilet seat; first and second handrails attached to said mini seat at ends adjacent the pivotal mounting and extending on either side thereof; first and second vertical support braces, pivotally mounted at ends thereof each to one of said handrails at ends opposite the ends attached to said mini toilet seat said vertical support braces adapted to support said hand rails when said mini seat rests on said toilet seat; first and second angular support braces pivotally attached at ends thereof, each to one of said vertical braces and extending outwardly and downwardly therefrom when said mini seat rests on said toilet seat; a foldable step extending between said vertical braces and pivotally mounted thereto at one end; and step support brace extending between said angular braces and adapted to support an end of said step opposite the end attached to said vertical support when said step rests thereon whereby when said assembly is in the lower position said mini seat will rest on the toilet seat with said handrails and said step supported by said braces in horizontal positions, and when said assembly is raised, the vertical and angular braces will fold against the underside of said mini seat so that the folded assembly will rest against the tank.

4,635,304

WALL SYSTEM FOR SWIMMING POOLS

Harija Zikmanis, East Brunswick; James Preslock, Somerset, and Paul Lahnstein, Middlesex, all of N.J., assignors to Cascade Industries, Inc., Edison, N.J.

Filed Apr. 29, 1985, Ser. No. 727,997
Int. Cl.[4] E04H *3/18*
U.S. Cl. 4—506 8 Claims



1. A modular swimming pool wall system for use in constructing a swimming pool wall of the vinyl-lined type, comprising:

(a) a first group of panels each of which is formed as a one-piece member having end and face surfaces wholly devoid of curvature, said member including

(1) a web having a face surface that is flat over the entire area of the web, said surface facing inwardly of the swimming pool that is being constructed to provide a backing surface for a liner within which water is to be confined in said pool,

(2) top, bottom, and side flanges, all of which are integral with the web and extend outwardly of the pool from the web, said side flanges having wholly flat faces constituting said end surfaces,

(3) means for interengaging and for joining together the side flanges of adjacent panels in abutting, face-to-face relation, the end surfaces on the side flanges of each panel being at predetermined obtuse angles to the plane of the web surface of the panel, said angles of each panel and the transverse dimension thereof as measured from one to the other of its side flanges, combining to form each group in the visual semblance of a true and continuous curve having a radius predetermined by said angles and dimension; and

(b) at least one additional group of panels formed similarly to those of the first group, with the exception that each panel of the additional group has the end surfaces on its side flanges at obtuse angles to the plane of its web surface, that are different from the corresponding obtuse angles of the panels of the first group.

4,635,305

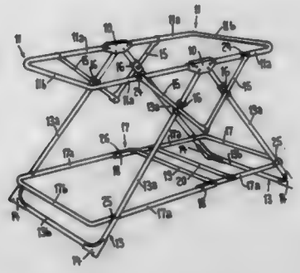
FOLDABLE BED

André Wyss, Avenue Neuchâtel 56, 2024 St.-Aubin, Switzerland

Filed Nov. 29, 1984, Ser. No. 675,994
Int. Cl.[4] A47C *29/00*; A47D *7/02*
U.S. Cl. 5—99 R 7 Claims

1. A foldable bed having a supporting frame defining two sides, a cloth forming side walls suspended on said frame, and a stiffening bottom plate supported on said frame, said frame

having a pair of upper central joint assemblies, a pair of upper U-shaped supporting tubes and a pair of U-shaped legs having a bottom yoke and two upwardly extending side-pieces, said upper supporting tubes and legs being pivotably assembled by means of said joint assemblies, lower supporting tubes bridging said side-pieces at a level suitable for supporting said bottom plate, and a pair of struts at each side of the bed, adjacent ends of each pair of struts being pivotably interconnected, the other end of each strut of each pair being pivotably interconnected with one of said upper supporting tubes, and each strut being pivotably connected to one side-piece of one of said legs, connecting means between each of said side-pieces and a strut,



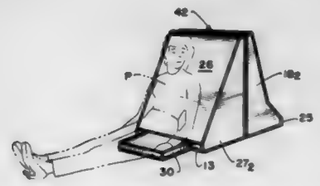
comprising a sliding member on said side-pieces and a pivot connection between said sliding member, and said struts being undivided, straight members, said lower supporting tubes being U-shaped and each having two side-pieces pivotably connected with said side-pieces of one of said legs and a yoke, pairs of side-pieces of said lower supporting tubes overlapping each other on each side of the bed and being pivotably interconnected at the end of one of said side-pieces, a strut bridging the ends of the other side-pieces and resting on said one side-piece when said lower supporting tubes are in their unfolded position thereby locking said lower supporting tubes in a common plane for supporting said bottom plate.

4,635,306

MULTI-POSITION THERAPY CUSHIONS

Donald E. Willey, Santa Barbara, Calif., assignor to Rose L. Arnold and Ned M. Rafter, both of Santa Barbara, Calif., part interest to each

Filed Jan. 22, 1985, Ser. No. 693,533
Int. Cl.[4] A47C *20/00, 27/00*
U.S. Cl. 5—431 8 Claims



1. In combination, therapy cushions arrangable in abutting relationship to support and orient a person for effective bronchial drainage comprising:

a first cushion having a first surface extending about 90° from a second surface that extends between a first abutment corner and a first end area and including an inclined surface extending from said first end area and merging at an obtuse angle with a first sloping portion that terminates at a first juncture with said first surface;

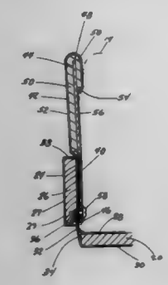
a second cushion having a third surface extending about 90° from a fourth surface between a second abutment corner and a second end area including a second sloping portion extending from said second end area to a second juncture with said fourth surface wherein the distance along corresponding normal axes of said second and third surfaces are equal, said first and second cushions arranged with the first and second abutment corners adjacent each other to form a first configuration when the second and third surfaces are placed against each other and a second configuration when the first and fourth surfaces are placed against each other.

4,635,307

WATERBED

Todd C. Grover, 8395 N. Meadowside Ct., Milwaukee, Wis. 53223

Continuation-in-part of Ser. No. 722,850, Apr. 12, 1985. This application Mar. 31, 1986, Ser. No. 845,980
Int. Cl.[4] A47C *27/08*
U.S. Cl. 5—451 18 Claims



1. In waterbed perimeter support means of the type around the perimeter of a rectangular water bladder which rests on a flat surface, the improvement comprising:

a frame base member formed of a dimensionally-stable pliant sheet to extend continuously along at least three sides of the bladder perimeter, said sheet having a lower portion securable between the bladder and the flat surface and a lateral portion connected thereto to extend upwardly therefrom adjacent to the bladder perimeter;

rigid elongated reinforcing boards along to the lateral portion of the frame base member, each of said boards extending lengthwise along a side of the bladder perimeter and widthwise from a lower edge near the flat surface upwardly to an upper edge between the flat surface and the bladder top, said boards having inside surfaces against which the outward force of the bladder is applied, said lateral portion of the frame base member having two layers forming an compartment along each side, each said compartment substantially enveloping an holding one of the reinforcing boards, and

resiliently-deformable elongated upper members extending lengthwise along each of the boards and widthwise upwardly from the boards to top edges along the bladder top.

4,635,308

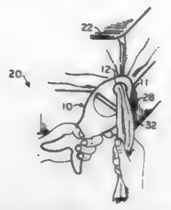
METHOD OF USING A BED SHEET STAY

Charles F. Maggio, 472 N. Country Rd., St. James, N.Y. 11780, and Angelina M. Spomblantti, 3 Jayne Ave., Huntington Station, N.Y. 11746

Filed Jul. 5, 1985, Ser. No. 751,897
Int. Cl.[4] A44B *21/00*
U.S. Cl. 5—508 2 Claims

1. The method of holding the corner of a bed sheet in place under a mattress comprising the steps of gathering the corner of said sheet, pulling the gathered corner of said sheet through the generally circular opening in a flat, elongated member, said member having a slot therethrough spaced from said circular

opening, a pinched waist, and a pair of rearwardly and outwardly projecting fins forming a part of and extending from said pinched waist at the other end of said stay, passing said gathered corner of the sheet through said slot and pulling the



sheet taut on said stay, and slipping said stay uder said mattress so that the bedding pressing against said mattress adjacent said waist prevents sliding movement of said stay, and said fins resisting tipping of said stay.

4,635,309

MULTIPLE USE HAND TOOL

Peter L. Larsen, 2186 Montgomery Ave., Apt. 6, Cardiff By The Sea, Calif. 92007

Filed May 17, 1985, Ser. No. 735,090
Int. Cl.⁴ B25F *1/04*
U.S. Cl. 7—158 **20 Claims**



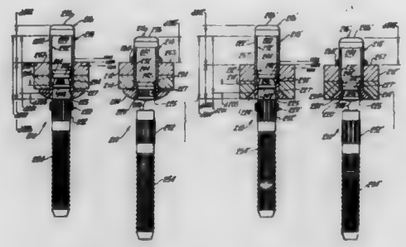
1. A multiple use tool comprising:
an elongated handle having longitudinal throughpassage;
a first tool and a second tool;
an elongated slide having first tool holding means on one end for holding said first tool and a second tool holding means on the other end thereof for holding said second tool, said elongated slide being slideably mounted in said through-passage;
stop means comprising a closed ended slot extending along said handle and having a plurality of notches therein for receiving a latch means; and
selective latch and release means comprising a spring arm on and extending along said slide means and having a finger extending outward therefrom for engaging said stop means for selectively retaining said slide in said through-passage, and for releasbly latching said slide in said housing and at selected positions along said through-passage and for enabling removal of said slide from said through-passage upon depressing said finger from said slot, said slot including notches positioned for selectively locking said first and second tools in operative positions, for selectively releasing said first and second tools, and for releasing said slide from said through-passage.

4,635,310

SYSTEM FOR PRODUCING TWO SEPARATE SETS OF FASTENERS

James W. Kendall, Huntington Beach, Calif., assignor to Huck Manufacturing Co., Irvine, Calif.

Filed May 24, 1985, Ser. No. 738,080
Int. Cl.⁴ B21K *1/58, 1/44*
U.S. Cl. 10—27 R **30 Claims**



1. In a system for producing two separate series of blind fasteners for securing workpieces varying in total thickness from a first fastener in each of said series having a first nominal grip for a first total workpiece thickness to a final fastener in each of said series having a final nominal grip for a final total workpiece thickness, each of said series including fasteners within said series varying in nominal grip in preselected, generally uniform increments from said first nominal grip to said final nominal grip, each of said fasteners within each of said series being adapted to secure a range of workpiece thicknesses varying from a minimum grip less than said nominal grip to a maximum grip greater than said nominal grip whereby any total thickness of workpieces within the range of said first total thickness to said final total thickness can be secured together by a selected one of said fasteners, each of said blind fasteners comprising a tubular sleeve adapted to be located in aligned openings in the workpieces, a pin and lock collar adapted to secure the plurality of workpieces together by means of a relative axial force applied between said pin and said sleeve, said sleeve having a relatively straight sleeve shank terminating at one end in an enlarged sleeve head, said sleeve having a through bore including an enlarged diameter bore portion at its opposite end, an intermediate reduced diameter bore portion and an enlarged conical bore portion at said enlarged sleeve head, a sleeve stop shoulder defined by the juncture of said enlarged and intermediate bore portions,

said pin having a pin shank terminating in an enlarged pin head at one end and being adapted to be assembled to said sleeve with said pin head overengaging said sleeve shank at said opposite end, said pin having an enlarged diameter shank portion of a diameter to be received within said enlarged bore portion and having an intermediate shank portion of reduced diameter to be received within said intermediate bore portion, a pin stop shoulder defined by the juncture of said enlarged and intermediate pin shank portions, an annular lock groove located adjacent to said intermediate pin shank portion, said pin stop shoulder located a preselected distance from said lock groove such that upon engagement with said sleeve stop shoulder said lock groove will be located in radial alignment with said conical bore portion to define a lock pocket,

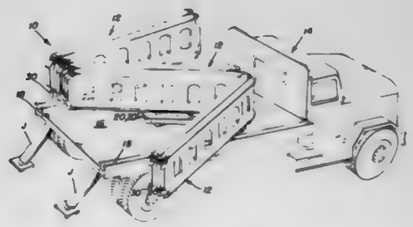
said lock collar being generally annular and adapted to be located within said conical bore portion, said pin in response to said relative axial force moving axially relative to said sleeve causing said enlarged diameter bore portion to bulb forming a blind head at the blind side of the workpieces, said pin continuing to move in response to said relative axial force until said pin shoulder engages said sleeve shoulder to initially stop further axial pin movement, said enlarged diameter pin portion and said intermediate diameter pin portion being of diameters adapted to be generally received in engagement with the corresponding one of said enlarged bore portion and said intermediate bore portion, respectively, said lock collar being urged into engagement with said pin by the relative axial force and being moved into said lock pocket to lock said pin and said sleeve together, said pin having a breakneck groove located a preselected distance from said pin stop shoulder whereby said breakneck groove will be located adjacent the outer surface of said sleeve head when said pin stop shoulder and said sleeve stop shoulder are engaged, said breakneck groove severing at a preselected magnitude of said relative axial force after said lock collar has been set, said pin shank between said pin breakneck groove and said pin head defining an operative portion of said pin shank remaining secured to said sleeve after pin break, said system comprising: producing a first of said two series of fasteners with said first series sleeve heads being a flush head type having a generally conical configuration adapted to be generally matably received within a conical bore at the open side of the workpieces to be secured, producing a second of said two series of fasteners with said second series sleeve heads being of protruding type having a generally streamlined low profile configuration adapted to engage the open side of the workpieces to be secured, each of said first series of said sleeves being related to each of said second series of said sleeves of the next largest grip increment such that the overall lengths of said first series of said sleeves and the related ones of said second series of said sleeves are substantially the same, said pins for said first series of said sleeves and the related ones of said second series of said sleeves being substantially the same such that they are interchangeable, said first series of fasteners having a first blind side clearance and said second series of fasteners having a second blind side clearance which varies therefrom by no more than around one half the grip increment, where blind side clearance is the distance that each of said sleeves extends beyond the blind side of the workpieces.

4,635,311

MILITARY TACTICAL BRIDGE SYSTEM, METHOD AND FOLDABLE MODULES

Richard W. Helmke, Stafford, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 10, 1985, Ser. No. 742,817
Int. Cl.⁴ E01D *15/12*
U.S. Cl. 14—2.4 **20 Claims**



1. A vehicle transportable, multi-foldable, multi-sectional prefabricated bridge module comprising:
a. multiple bridge units interconnected to constitute the foldable bridge module;
b. each bridge unit comprising a roadway portion which includes dual laterally spaced, truss-supported, longitudinal medially divided, roadway segments which are foldable via
i. first hinge means to pivotally connect and provide relative folding of separate laterally spaced trusses and corresponding divided roadway sections at laterally opposite edges about horizontal parallel axes; and
ii. second hinge means at the centerline of said roadway portion and having an axis parallel to the axes of said first hinge means for pivotally connecting said medially divided roadway sections together and for permiting said roadway sections to be first foled into collapsed essentially vertical side-by-side relationship;
c. third hinge means having vertical pivot axes and operatively connected to top and bottom end portion of said spaced trusses, to provide for both
i. selective interconnection of adjacent bridge units, and
ii. for permitting their respective pivotal folding around said vertical axes between two positions, one of which:
(a)' is side-by-side compactly folded while in said vertically collapsed condition, and the second
(b)' is a subsequent 180° unfolded elongated aligned orientation also while still vertically collapsed preparatory to further unfolding and deployment; and
d. each truss having an elongated high strength traversing beam coextensive therewith and with means for slidably mounting it within each truss, said beams having means for releasably interconnecting said beams in end-to-end relation when said bridge units are unfolded into 180° alignment; means associated with said traversing beams for effecting beam projection out from said module and across a chasm to be bridged, with said module adapted to traverse the chasm on said traversing beams while receiving the traversing beams back interiorly therewithin;
e. whereby said multi-foldable bridge units are uniquely characterized by their vertically collapsible and bilateral foldability and their self-contained traversing beams with the two distinct 90° orthogonally oriented sets of hinges and hinge axes for the foldable units during related orthogonal folding precedures, thereby providing greater linear feet of bridging per module in more compact, prefabricated, readily transportable modular form.

14. A method for emplacing a bridge apparatus, and more particularly for emplacing at least one folded bridge module having three pivotally connected bridge units, with each unit embodying dual vertically collapsible hinged roadway sections add dual trusses of the type recited in claim 1, and which module has been initially placed on a liftable rotatable turntable of a transport vehicle with the three bridge units with their roadway sections and trusses didposed in their first-folded vertically collaped position and second folded side-by-side relation, and oriented with the longitudinal axis of the units in the same fore-and-aft longitudinal orientation as that of the transport vehicle, and which vehicle has transported the bridge module to a site adjacent a chasm to be bridged thereby, said method comprising the steps of:
a. positioning the transport vehicle with its longitudinal axis generally closely parallel to the longitudinal axis of the chasm;
b. raising the folded bridge module slightly via the liftable turntable to overcome frictional drag against the support vehicle;
c. rotating the elevated module via the turntable to travel approximately 90° relative to said longitudinal vehicle axis with at least the center unit of the three bridge units supported directly on said turntable;
d. simultaneously further rotating the two outside bridge units in opposite directions away from their pivotal connections at opposite ends with the center bridge unit to unfold them from their second folded condition, so that said bridge units unfoldingly travel approximately another 90° in a balanced manner thereon and extend into elongated 180° alignment with each other and with the center bridge unit such that a significant portion of the bridge apparatus projects out over the chasm;
e. connecting adjacent ends of the unfolded bridge units rigidly together; and also rigidly connecting adjacent ends of traversing beams which are coextensive with and self-contained within each bridge unit;
f. laterally unfolding the collectively joined bridge units

from their initially stored first-folded vertically collaped condition into a laterally unfolded open roadway system;

g. sliding said connected traversing beams so that they project at least partly out of said bridge units sufficiently for temporary anchored or fixed support bearing on an opposite remote side of the chasm;

h. lifting the aligned collectively joined bridge units from the end opposite the end projecting over the chasm, while using the supporting transport vehicle as a fulcrum point until the remote ends of said traversing beams fixedly engage and bear supportingly upon the opposite remote shoulder of the chasm;

i. then moving said bridge units along the projected traversing beams over the chasm while receiving the beams back within said bridge units upon completion of their traversal over the chasm; and

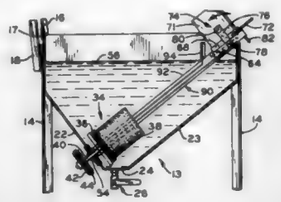
j. finally lowering said lifted end until it bears down securely upon the near shoulder of the chasm to complete the said emplacement including a temporary secuting thereof to said chasm shoulder.

4,635,312

APPARATUS FOR CLEANING CONTAINERS

William L. Byers, 1902 S. Calhoun St., Fort Wayne, Ind. 46804

Filed Oct. 23, 1985, Ser. No. 790,340
Int. Cl.[4] B08B *9/08*
U.S. Cl. 15—71 19 Claims



1. An apparatus for cleaning a container comprising:
a tank for receiving a cleaning fluid;
rotatable brush means for cleaning container and disposed in a bottom portion of said tank;
means for rotating said brush means;
a track disposed in said tank at an inclined angle with respect to the horizontal plane and extending generally toward said brush means; and
movable rack means for clamping a container and including means for engaging with said track whereby said rack is movable from a loading position wherein container is loaded into said rack in a substantially upright position, to a cleaning position wherein said container is inverted and said brush means is engaged with selected surfaces of the container, the rack remaining engaged with said track in both said loading and cleaning positions.

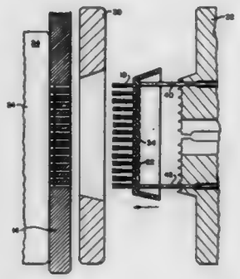
4,635,313

BRUSH WITH SELF RETAINING BRISTLES

Friedbert Fassler, Oswego; Frank Kigyos, Sugargrove, and Bobby L. Slaughter, Naperville, all of Ill., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 552,533, Nov. 16, 1983, abandoned.
This application Oct. 24, 1985, Ser. No. 792,621
Int. Cl.[4] A46B *3/04*; A46D *3/00*
U.S. Cl. 15—193 4 Claims

1. A brush comprising an injection molded body and at least one tuft of bristles having an end thereof retained in said body, characterized in that said end comprises a fused mass having a cross-sectional area larger than that of the tuft, said fused mass being disposed immediately adjacent a face of the body from which the tuft projects, thereby facilitating plugging of a tuft-receiving hole in a mold in which the body is formed, said body being molded around said fused mass such that it defines a cavity conforming to the shape of the fused mass and having in said face an opening with a cross-sectional area smaller than



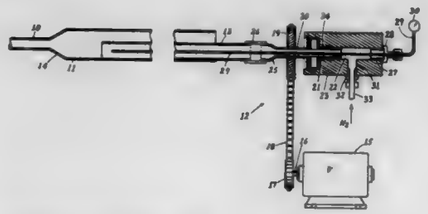
that of the fused mass, thereby effecting retention of the tuft end in the body.

4,635,314

ARRANGEMENT FOR REMOVING GLASS SOOT FROM AN EXHAUST TUBE DURING OPTICAL PREFORM FABRICATION

Robert Peckman, and Kamran Karbassiyoon, both of Roanoke, Va., assignors to ITT Corporation, New York, N.Y.

Continuation of Ser. No. 723,225, Apr. 15, 1985, abandoned.
This application May 1, 1986, Ser. No. 859,860
Int. Cl.[4] B08B *5/02*
U.S. Cl. 15—304 11 Claims



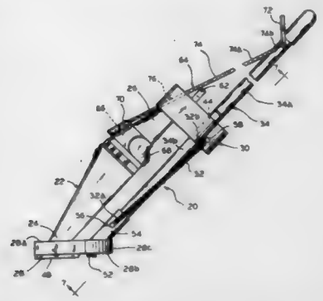
1. An arrangement comprising:
a substrate tube in which a CVD reaction can occur during an optical fiber preform fabrication process and from which a primary gaseous medium carrying glass soot particles can be exhausted;
an exhaust tube joined to said substrate tube for receiving the primary gaseous medium exhausted from said substrate tube;
a gas injection tube including a tubular portion received in the exhaust tube with radial spacing therefrom except at a contact zone and having a free end disposed at the region of joinder of the exhaust tube with the substrate tube for discharging an auxiliary gaseous medium into said region;
means for supplying the auxiliary gaseous medium into said gas injection tube for propagation through the same toward and out of said free end and into said region for mixing thereat with the emerging flow of the primary gaseous medium for joint flow through said spacing; and
means for effecting relative circumferential movement between said contact zone and at least the exhaust tube to release any soot accumulations present at said contact zone for entrainment of the released soot in the joint flow through said spacing and out of said exhaust tube.

4,635,315

UPRIGHT CONVERTER FOR PORTABLE VACUUM

Burton Kozak, 551 Clavey La., Highland Park, Ill. 60035

Filed Jul. 26, 1985, Ser. No. 759,414
Int. Cl.[4] A47L *9/00*
U.S. Cl. 15—329 22 Claims



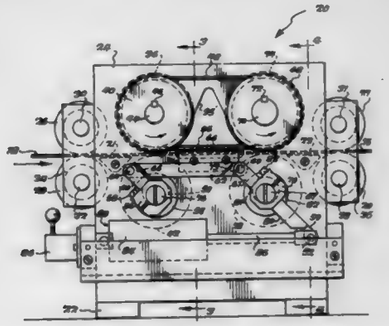
1. An upright converter for a portable hand-held vacuum having nozzle and handle portions, comprising:
an adapter cooperating with said nozzle portion of said vacuum in a position for operation thereof;
an adapter cooperating with said handle portion of said vacuum at a location remote from said nozzle adapter;
means interconnecting said nozzle adapter and said handle adapter such that said vacuum is retained between said nozzle adapter and said handle adapter; and
handle means extending from at least one of said nozzle and handle adapters to a position to be gripped by a user in upright vacuum fashion.

4,635,316

METHODS AND APPARATUS FOR PERFORATING FOOD CASING FILM AND CASING PRODUCED THEREBY

Clinton G. Towne, Danville, and Thomas R. Stanley, Downers Grove, both of Ill., assignors to Teepak, Inc., Oak Brook, Ill.

Filed Jun. 26, 1985, Ser. No. 749,345
Int. Cl.[4] B26D *3/00*
U.S. Cl. 17—1 R 31 Claims



1. A method of forming multiple perforations in food casing film, which comprises the steps of providing a first set of rotatable rolls and a second set of rotatable rolls, the first set of rolls comprising a perforating roll and a backup roll cooperating with the perforating roll forming a nip therebetween, said perforating roll having means for making multiple perforations in the film, the second set of rolls comprising at least one power roll and a cooperating roll forming a nip therebetween, said second set of rolls arranged parallel to the first set of rolls and linked thereto such that rotation of the perforating roll is controlled by rotation of the power roll, said method including the steps of engaging the film at the nips of the first and second sets of rolls, and advancing the film to rotate the power roll and turn the perforating roll to perforate the film.

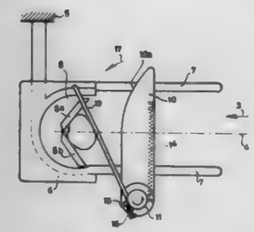
7. A prestuck food casing made according to the method of claim 1.

4,635,317

DRUMSTICK CUTTER

van der Eerden, Henricus F. J. M., Boxtel, Netherlands, assignor to Stork PMT B. V., An Boxmeer, Netherlands

Filed Apr. 8, 1985, Ser. No. 720,677
Claims priority, application Netherlands, Apr. 9, 1984, 8401125
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—11 4 Claims



1. A device for cutting through the heel joint of a leg of slaughtered poultry which is suspeneded from a conveyor track by the legs and transported in a forward direction comprising:
a poultry leg stop located below the conveyor track and being approximately aligned with the leg joint to be cut;
a vertically extending rotatable drive shaft;
a rotatale elongate cutting knife mounted on the drive shaft having an axis of rotation parallel to the conveyor track and rotating in the same direction as the conveyor track, the cutting knife being in alignment with the joint to be cut; and
a rotatable elongate pressure member spring-mounted on the drive shaft a short axial distance from the cutting knife and being partially rotatable about an axis of rotation parallel to that of the cutting knife, the pressure member also being attached to the cutting knife in such a manner as to precede the cutting knife as the pressure member and knife are rotated about the drive shaft until the pressure member presses against the poultry part to be cut.

4,635,318

APPARATUS FOR DECAPITATING FISH

Horst Braeger, Lübeck, Fed. Rep. of Germany, and Örn Johannesson, Reykjavik, Iceland, assignors to Nordischer Maschinenbau Rud. Baader GmbH & Co KG, Lubeck, Fed. Rep. of Germany

Filed Mar. 25, 1985, Ser. No. 715,980
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1984, 3411368
Int. Cl.[4] A22C *25/08, 25/14*
U.S. Cl. 17—63 6 Claims

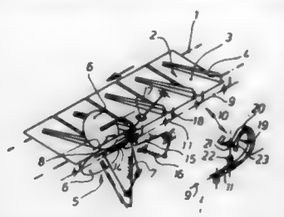
1. Apparatus for decapitating fish comprising:
a first conveyor;
said first conveyor including means for conveying a fish along a first conveying axis;
first and second opposed inclined knives positioned to sever a head of said fish as it is conveyed therepast along said first conveying axis;
at least one guide rail disposed closely adjacent said first

knife and having a guide edge parallel to said first conveying axis;

a second conveyor having a second conveying axis generally parallel to said first conveying axis;

said second conveyor including at least one entraining lever;

said at least one entraining lever having a trailing device pivotable transversely to said second conveying axis;



said trailing device including means for engaging said fish; and

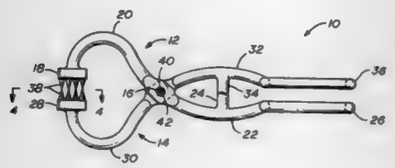
means for resiliently displacing said trailing device toward said at least one guide rail in a vicinity of said first knife until guiding contact is attained between said guide edge and a part of said fish, whereby said fish is positioned for minimum loss of flesh during decapitation.

4,635,319

SKINNING DEVICE

Daniel A. Gast, 4419 Trail Lake, Houston, Tex. 77045

Filed Oct. 25, 1985, Ser. No. 791,415
Int. Cl.[4] A22C *25/06*
U.S. Cl. 17—68 17 Claims



1. A hand operated animal skinning device, comprising:

(a) plural rows of opposing sets of pointed skin grasping teeth mounted for possible point-to-point contact in teeth carrier members with said carrier members being respectively mounted at the ends of elongated arcuately shaped jaw members;

(b) said jaw members being connected together through pivot means and adapted for pivotal movement from an open position into a forceful biting position of all of said teeth against the skin of an animal;

(c) a pair of handles respectively mounted at the ends of elongated handle members with said handle members being respectively joined with said jaw members at said pivot means; and

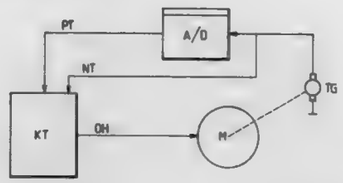
(d) said handle members being operative to drive said jaw members into biting position when forced together about said pivot means by one hand operation.

4,635,320

FLOOR SELECTOR FOR LIFT

Matti Kikkipuro, and Pekka Hikkinen, both of Hyvinkää, Finland, assignors to Elevator GmbH, Baar, Switzerland

PCT No. PCT/FI83/00080, § 371 Date Mar. 11, 1985, § 102(e) Date Mar. 11, 1985, PCT Pub. No. WO85/02832, PCT Pub. Date Jul. 4, 1985
PCT Filed Dec. 20, 1983, Ser. No. 713,390
Int. Cl.[4] B66B *3/02*
U.S. Cl. 187—29 R 1 Claim



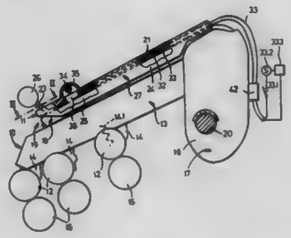
1. Pulse floor selector for a lift, with a floor and location determining system based on counting pulses which indicate the lift's velocity, with the aid of electronics appropriate for this purpose, characterized in that the said counting pulses (PT) required for floor selection are formed from the tachometer generator (TG) with the aid of an analog/digital converter (A/D), and that the floor datum is corrected by the aid of information obtained from the lift shaft at the floor level.

4,635,321

SPINNING MACHINES AND THE LIKE WITH SIGNAL OR INDICATOR DEVICES

Walter Dupper, Eschenbach; Roland Emberger, Süssen; Kurt Hack; Manfred Lattner, both of Ebersbach; Helmut Nickolay, Göppingen; Karl Riedel, Ebersbach, and Richard Schöllhammer, Göppingen, all of Fed. Rep. of Germany, assignors to Zinser Textilmaschines GmbH, Ebersbach, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 703,838
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1984, 3406215; Jun. 15, 1984, 3422270
Int. Cl.[4] D01H *13/14, 5/40*
U.S. Cl. 19—0.25 20 Claims



1. In a spinning machine, especially a ring or flyer spinning frame, said machine including:

lower drafting rollers mounted on said machine for each spinning station;

a movable pressure arm assembly for each station, said pressure arm assembly comprising:

a main arm,

a plurality of upper rollers mounted on said main arm and juxtaposed with respective lower rollers,

spring means connected to said main arm for exerting pressure on said upper rollers,

guides for said upper rollers, and

at least one operating lever arranged above said main arm and swingably connected with respect thereto for selectively shifting said main arm into a pressure exerting position and into an inoperative position, the improvement which comprises the combination therewith of

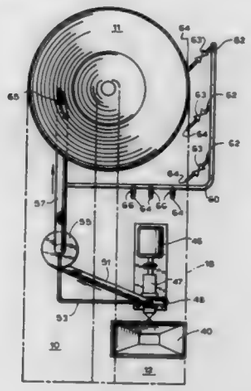
at least one signal light unit directly on said operating lever for indicating disruption at a respective station.

4,635,322

FIBER WASHER

Eduardo J. Villavicencio, San Angel, Mexico, and Jorge E. Arana, Bethesda, Md., assignors to Process Evaluation and Development Corp., Dallas, Tex.

Filed Oct. 22, 1984, Ser. No. 663,591
Int. Cl.[4] D01B *3/10*
U.S. Cl. 19—66 R 7 Claims



1. An improved U-shaped washer for cleaning fibrous materials comprising a plurality of roller mounted tines in one leg of said U-shaped washer to move said fibrous materials to the apex of the U-shaped washer while continuously submerging said fibrous materials; a deepened section at the apex of the U-shaped washer, and roller mounted paddles to move fiber from the apex of said U-shaped washer to the end of the other leg of said U-shaped washer, the improvement comprising means to remove water from the other leg of the U-shaped washer, cyclone means to remove particulate matter from the removed water, pump means to pressurize the removed water and conduit means to flow one part of said removed water tangentially into the apex of said U-shaped washer to thereby additionally propel fibrous materials through the apex of said U-shaped washer and another part upwardly into the other leg of said U-shaped washer to assist in centering the fibrous material in said other leg.

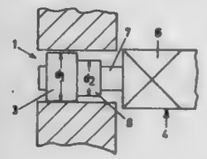
4,635,323

DRAWHEAD FOR DRAWING EQUIPMENT FOR DRAWING WOOLEN FLEECE OR THE LIKE

Josef Egerer, Schwabach, Fed. Rep. of Germany, assignor to Staedtler & Uhl, Schwabach, Fed. Rep. of Germany

Filed Dec. 4, 1985, Ser. No. 804,484
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1984, 3444272
Int. Cl.[4] D01H *5/02*; F16C *29/04*
U.S. Cl. 19—129 R 5 Claims

1. A drawhead for drawing equipment for the guidance and/or drive of a plurality of fallers disposed parallel to one another in a closed guideway having a support surface and kept at a predetermined distance from one another, wherein each faller has at least two pivot bearing elements of differing diameter, the pivot bearing elements being placed axially adjacent one another, the pivot bearing elements of adjacent fallers being disposed in such a manner that each pivot bearing element of larger diameter is adjoined in the direction of travel by two adjacent pivot bearing elements with a smaller diameter and that each pivot bearing element of smaller diameter is adjoined in the direction of travel by two adjacent pivot bearing elements with larger diameter, wherein the pivot axes of all pivot bearing elements are the same distance from said support surface of the guideway.

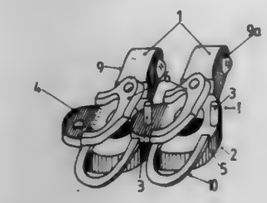


4,635,324

SLIDE FASTENER

Reiner Hoerkens, Bahnhofstrasse 31, D-6903 Neckargemünd, Fed. Rep. of Germany

Filed Sep. 12, 1984, Ser. No. 649,540
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1983, 3339319; Mar. 3, 1984, 3407897
Int. Cl.[4] A44B *19/06*
U.S. Cl. 24—413 2 Claims



1. In an ornamental slide fastener comprising:

a multiplicity of teeth arranged in two juxtaposed rows, each of said teeth having a front portion directed toward the other row and arranged to extend between and to interengage with the front portions of two adjacent teeth of the other row in a closed position of the fastener;

a slider, which is movable along said rows so as to accommodate and engage part of said teeth of each of said rows at a time and to open and close said fastener; and

interconnecting means connecting adjacent teeth of each of said rows to each other and resisting a separation of adjacent teeth of the same row along said rows while permitting adjacent rows of the same row to move relative to each other when said front portion of said teeth of each row are disengaged from the front portions of adjacent teeth of the other row;

the improvement residing in that

each of said teeth has a rear portion, which is wider than said front portion in the longitudinal direction of the corresponding row and is formed on mutually opposite sides with convexly curved side faces facing convexly curved side faces of said rear portions of adjacent teeth of the same row;

said interconnecting means consist of a plurality of projections, which are rigid with and laterally protrude from the rear portions of respective ones of said teeth of each of said rows, and of cooperating means, which are rigid with the rear portions of respective ones of said teeth of each of said rows and pivotally interengage with said projections to resist a separation of said rear portions of adjacent teeth of the same row along said row, said interconnecting

means including protruding members for securing said teeth to a support structure; and

said projections and cooperating means are the only means which are connected to said teeth of each of said rows and resist a separation of said rear portions of adjacent teeth of the same row along said row when said front portions of said teeth of each row are disengaged from the front portions of adjacent teeth of the other row;

each of said cooperating means comprises an apertured lug formed in said rear portion of one of said teeth; and

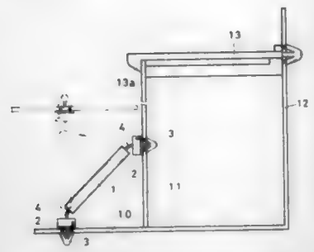
each of said projections comprises a laterally protruding pin having an enlarged head which is captively and pivotally held in one of said apertured lugs.

4,635,325

SUBSTRATE FASTENER

Masaru Yagi, Tsushima, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan

Filed Jul. 16, 1985, Ser. No. 755,585
Claims priority, application Japan, Oct. 3, 1984, 59-207629
Int. Cl.⁴ F16B *5/06*; H05K *13/00*
U.S. Cl. 24—453 **6 Claims**



1. A one piece synthetic resin substrate fastener for a printed circuit board connecting substrates at angles to one another, comprising:

(a) an elongated strut member;

(b) two opposed flexible thin walled hinges connected to opposite ends of said strut member;

(c) resilient support member connected to fore ends of said flexible hinges; and

(d) resilient coupling members extended out from said resilient support members, such that said coupling members is angled at 45° relative to said strut member and mutually angled by 90° due to the flexibility of said thin walled hinges;

(e) said resilient coupling members each having a snag portion capable of spreading out after insertion in a mounting hole in one substrate for securely gripping said one substrate between the resilient support member and the resilient coupling member while permitting said one substrate connected to one said resilient coupling member to turn toward and away from another substrate connected to another resilient coupling member of said fastener by the resiliency of said flexible hinges, whereby a mounting density of said substrates is increased.

4,635,326

SUBSTRATE FASTENER

Masaru Yagi, Tsushima, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan

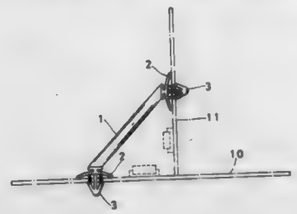
Filed Jul. 16, 1985, Ser. No. 755,583
Claims priority, application Japan, Sep. 12, 1984, 59-191297
Int. Cl.⁴ H05K *13/00*; F16B *5/06*
U.S. Cl. 24—453 **6 Claims**

1. A one-piece substrate fastener for a printed circuit board, said fastener being formed of a synthetic resin for connecting substrates at substantially right angles to one another, comprising:

(a) an elongated strut member having an elongate axis;

(b) a pair of resilient support members connected to the opposite ends of said strut member by means maintaining said resilient support members in a predetermined inclined state relative to said elongate axis; and

(c) umbrella-shaped resilient coupling members extending out from said resilient support members obliquely relative



to the axis of said elongated strut member, said coupling members each being connected relative to said strut member at angles of 45 degrees, such that said coupling members are mutally angled by approximately 90 degrees;

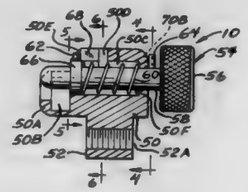
whereby said umbrella-shaped resilient coupling members are spread after insertion in mounting holes in substrates to be connected, for stably holding said subtrates at said predetermined angle to each other by said resilient support members and coupling members; and whereby a mounting density of said substrate is increased.

4,635,327

QUICK DISCONNECT LOCKING COUPLER

Frederick P. Netzsik, 8556 Central Park Ave., Skokie, Ill. 60076

Filed Aug. 1, 1984, Ser. No. 636,748
Int. Cl.⁴ E05B *69/00*
U.S. Cl. 24—653 **10 Claims**



1. A coupler for engaging generally cylindrical member having an aperture in one end thereof and including a recessed portion around the periphery thereof adjacent to said one end, said coupler comprising:

a housing having concave receptacle means adjacent a first end thereof for receiving and engaging the cylindrical member adjacent said one end thereof, said housing further including a bore continuous with said engaging means and extending the length of said housing and a groove and a first slot extending from said bore and oriented generally transverse with respect thereto wherein said groove is positioned adjacent the first end of said housing and said first slot is located in an intermediate portion of said housing;

an elongated coupling pin positioned within said bore and linearly displaceable therein between a first extended position wherein a first end of said coupling pin is positioned within said aperture for engaging said cylindrical member and a second retracted position, said coupling pin including first locking means positioned within said groove when said coupling pin is rotated in said first

extended position for locking said coupler in an engaged configuration and wherein said first locking means is positioned within said first slot when said coupling pin is rotated in a second retracted position wherein said coupling pin does not engage said lug for locking said coupler in a disengaged configuration; and

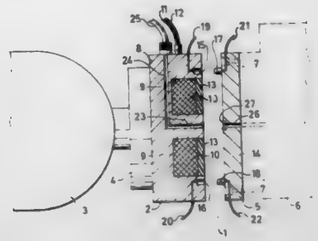
biasing means coupled to said coupling pin for urging said coupling pin toward said first extended position.

4,635,328

DEVICE FOR EXCHANGEABLE ATTACHMENT OF TOOLS ON AN INDUSTRIAL ROBOT

Lennart Palmér, Rinkabyholmsvägen 15, 394 77 Kalmar, Sweden

Filed Apr. 6, 1983, Ser. No. 482,452
Int. Cl.⁴ B23Q *3/155*
U.S. Cl. 29—26 A **2 Claims**



1. A device for exchangeably attaching tools on an industrial robot comprising an attachment device, characterized in that the attachment device (1) comprises a first member (2) rigidly attached to the outer portion (4) of a robot arm (3) and a second member (5) intended to be rigidly attached to each one or several tools (6), by which tools (6) the robot is to carry out operations, that said first member (2) comprises an electric coil (10) capable in a magnetic way to attract said second member (5), whereby said first member (2) and said second member (5) are retained in a magnetic way to each other when current flows through the coil (10), and that said first member (2) and said second member (5) are provided with means (15–18, 23, 24, 26) for transferring any combination of things selected from a group consisting of electric current, compressed air, vacuum, and other substances between a source connected to the first member (2) and a tool (6) attached to the second member (5), said means comprise at least guide holes (16,16) and guide pins (17,18) in said members (2,5) and said members have at least some of said guide holes (15,16) and said guide pins (17,18) which are complementary and intended to co-operate and have a structural connection with their associated members which enables a transfer of tool operational torque from either one of said associated members to the other one of said associated members when the members (2,5) are coupled together and that said at least some of said guide holes (15, 16) and guide pins (17, 18) are also connected to electric conductors for transferring electric current between said members.

4,635,329

TOOL HOLDER ASSEMBLY FOR MACHINE TOOLS

Franz Holy, Stockerau, and Karl Steiner, Vienna, both of Austria, assignors to Maschinenfabrik Heid Aktiengesellschaft, Vienna, Austria

Filed Nov. 1, 1984, Ser. No. 667,263
Claims priority, application Austria, Nov. 30, 1983, 4186/83
Int. Cl.⁴ B23B *7/04*; B23C *1/12*
U.S. Cl. 29—27 C **5 Claims**

1. A holder assembly for a lathe-type machine tool having a tool slide, comprising in combination;

a toolhead connected to said tool slide and provided with a single seat and with drive gearing;

a plurality of tool carriers selectively receivable in said seat and including:

a tool carrier with a fixed tool and

a tool carrier with a rotating tool,

said tool carrier with said rotating tool including a gear connected to said rotating tool and meshing with said drive gearing when said tool carrier with said rotating tool is received in said seat;

said seat being defined by at least one planar surface against which said tool carriers can be seated;



means for mounting a selected one of said tool carriers against said surface; and

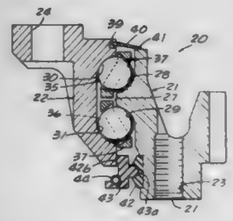
means for mounting said toolhead for rotation about an axis at an angle of 45° to said surface relative to said slide and for fixing said toolhead about said axis at one of two positions angularly offset by 180°, each of said tool carriers having a tool axis oriented by selection of said positions parallel to a longitudinal axis or to a transverse axis of a workpiece on said machine tool, said tool axis of each carrier including an angle of 45° with said axis of rotation of said toolhead in both positions thereof when the respective tool carrier is mounted on said surface.

4,635,330

METHOD OF ASSEMBLING HIGH-PERFORMANCE LOW-TORQUE ANTI-FRICTION BEARING ASSEMBLY

Conrad M. Fritz, Altadena, Calif., assignor to Keystone Engineering, Los Angeles, Calif.

Division of Ser. No. 431,357, Sep. 30, 1982, Pat. No. 4,523,793.
This application Mar. 28, 1984, Ser. No. 594,330
Int. Cl.⁴ B21H *1/12*, *1/14*
U.S. Cl. 29—148.4 A **11 Claims**



1. That method of assembling a heavy-duty anti-friction bearing assembly in preloaded contact with each of two rows of balls for supporting a stabilized platform or the like with minimal torque losses under loads capable to causing distortion of said assembly including simultaneously occuring axial, radial and moment loads and including first and second concentric rings one of which has an annular radial nose formed with an arcuate annular raceway on the opposite lateral sides thereof and the other of which is provided with a pair of

arcuate annular raceways each diagonally opposite a respective one of said nose ring raceways and wherein each of said raceways has the same radius and an arcuate width of substantially 90 degrees and wherein bisectors through said diagonally opposite pairs of said substantially 90 degree wide raceways lie on the opposite sides of a plane between and normal to the axis of said bearing assembly, said method comprising:

providing one of said rings with a ball charging passage opening radially through one of said raceways with the axis thereof lying generally in the midwidth of said one raceway;

supporting said first and second rings in partially overlapped concentric relation with the nose of said nose ring generally opposite the adjacent end of said ball charging passage;

charging a first row of balls into a plurality of ball separators located between the pair of raceways spaced farthest apart;

shifting said first and second rings substantially into fully assembled concentric relation;

inserting a second row of indtical balls through said ball charging passage which balls are sized to place all balls both rows thereof under a desired preload with minimal torque losses under simultaneously occuring axial, radial and moment loading conditions; and

closing said charging passage with plug means having substantially the entire inner end thereof shape to merge smoothly with and form a part of all contiguous portion of the adjacent one of said raceways.

4,635,331

METHOD FOR THE PRODUCTION OF A GUIDE RAIL

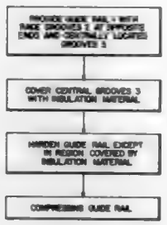
Lothar Walter, Schweinfurt, and Walter Reith, Bad Bocklet, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 14, 1983, Ser. No. 561,188

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246626

Int. Cl.⁴ B21D *53/12*

U.S. Cl. 29—148.4 R **8 Claims**



1. A method for production of a guide rail for linear guides, wherein at least one hardened linear race groove for rolling bodies is provided on each of a pair of opposite sides of the guide rail, the race grooves being parallel, the bottoms of said grooves being spaced apart a given distance along the connection line of minimum length between the bottoms of the groove; the improvement comprising initially spacing the bottoms of said race grooves to have a spacing along said connection line that differs from their ultimate desired dimensions A by an incremental dimension x, the central section of the guide rail between the race grooves having an elongated recessed region of reduced thickness along a plane normal to said connection line between said race grooves, said recessed region extending coextensively with and for the total length of said grooves, said plane being equally spaced from said bottoms of said grooves on opposite sides of said rail, said thickness being measured at right angles to said connection line, thereafter hardening the guide rail except in said recessed region and finally compressing the rail in a direction substantially perpendicular to said plane until the race grooves are separated by the final desired dimension A, by means of first pressing tools positioned respectively in said pair of opposing race grooves.

4,635,332

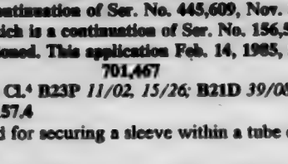
SEALED TELESCOPIC JOINT AND METHOD OF ASSEMBLY

Philip J. Cederwall, and Boris Glezer, both of San Diego, Calif., assignors to Solar Turbines Incorporated, San Diego, Calif.

Filed Sep. 13, 1985, Ser. No. 775,879

Int. Cl.⁴ B23P *15/00*; B21D *39/00*; F04D *31/00*

U.S. Cl. 29—156.8 R **11 Claims**



1. A method of assembling a sealed joint defined by a carrier telescopically disposed in a housing, said housing having an inner cylindrical surface and a longitudinal axis, said carrier defining an annular groove opening towards the inner cylindrical surface of the housing, said method comprising the steps of:

installing in the groove a radially-resilient annular seal having a radial peripheral surface;

moving a separate annular member to a first axial position at which the annular member is generally concentrically spaced around both the carrier and the seal, said annular member having an internal annular surface which at the first axial position is diametrically tapered along the longitudinal axis in decreasing fashion away from the seal;

moving the annular member to a second axial position around the carrier so that the tapered internal surface of the annular member directly contacts the radial peripheral surface of the seal and thereby radially-inwardly compresses the seal further in the groove;

telescopically assembling the housing and the carrier together and thereby displacing the annular member with the housing to a third axial position around the carrier at which the annular member is disposed out of direct contact with the radial peripheral surface of the seal thereby leaving the radial peripheral surface of the seal free to expand radially outwardly to sealedly contact the inner cylindrical surface of the housing; and

maintaining the annular member at the third axial position after telescopic assembly of the housing and the carrier.

4,635,333

TUBE EXPANDING METHOD

Curtis L. Finch, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 655,985, Sep. 27, 1984, Pat. No. 4,513,497, which is a continuation of Ser. No. 445,609, Nov. 30, 1982, abandoned, which is a continuation of Ser. No. 156,543, Jun. 5, 1980, abandoned. This application Feb. 14, 1985, Ser. No. 701,467

Int. Cl.⁴ B23P *11/02, 15/26*; B21D *39/08*

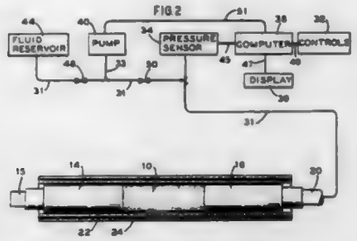
U.S. Cl. 29—157.4 **4 Claims**

1. A method for securing a sleeve within a tube comprising the steps of:

providing a hydraulic tube expander system including a hydraulic tube expander, volume pump means in fluid communication with said expander for incrementally decreasing the volume of the fluid system exclusive of the expander while a constant fluid mass is maintained in the system, and indicating means for indicating the fluid pressure of the system;

positioning the expander within the sleeve and the sleeve within the tube;

beginning operation of said pump means to incrementally decrease the volume of the system exclusive of the expander;



continually monitoring the indicated fluid pressure and the slope defined by the degree of change therein relative to the incremental decrease in system volume;

continuing operation of said pump means while noting that said slope decreases thereby indicating the onset of plastic deformation of the sleeve and then said slope increases indicating the elastic expansion of the tube; and,

ceasing operation of the pump means when the slope decreases indicating the onset of plastic yielding of the tube.

4,635,334

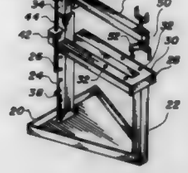
AUTOMATIC TRANSMISSION REBUILDING TOOL

Eusebio M. Diaz, 6450 Balboa Blvd., Van Nuys, Calif. 91406

Filed Oct. 31, 1985, Ser. No. 793,317

Int. Cl.⁴ B23P *19/04*

U.S. Cl. 29—226 **11 Claims**



1. A universal automatic transmission rebuilding tool for disembly and assembly of transmission components comprising:

(a) a triangular shaped base having a flat major bottom surface with upstanding flanges on the periphery thereof;

(b) a front leg distending upward from said base at one of the corners contiguous with said flanges;

(c) a rear tubular leg, slightly longer than said front leg, upstandingly positioned in alignment with the front leg midway between the remaining corners of said triangular shaped base, and contiguous with said flange;

(d) a working platform connected between said front leg and rear leg spacingly juxtapositioned with said base providing a surface to receive various components of said automatic transmission during rebuilding procedures;

(e) an adjustable height extension member having arm retaining sockets on the end slidingly embracing the inside surface of said rear tubular leg, disposed upwardly therefrom effectively increasing the height of said rear leg from said platform to the retaining sockets to accommodate various combinations of disembled elements of said transmission;

(f) height adjusting means attached between said extension member and said rear leg providing variable movement of the extension member within the rear leg by manual manipulation therewith;

(g) a plurality of differently sized cantilevered arms slidingly affixed through said arm retaining sockets and alternatively positioned for operation on the transmission components;

(h) a holding jig assembly adjustably disposed on each cantilevered arm at the end opposite the interface of the arm retaining socket for graspingly engaging and holding individual transmission components; and,

(i) jig compressing means drivingly connected between each cantilevered arm and each holding jig providing the necessary force to hold the transmission components in a constrained position between the arm and said working platform while in the assembly procedure during the rebuilding process of an automatic transmission.

4,635,335

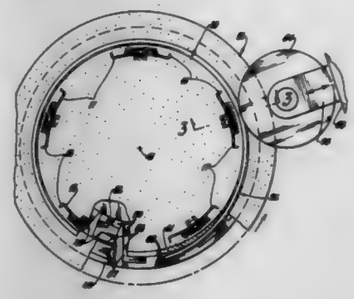
APPARATUS FOR ATTACHING A FLEXIBLE ANNULAR MEMBER TO A RIGID MEMBER

Trevor J. Brown, Rochester, and James E. Phillips, Clarkston, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 20, 1986, Ser. No. 831,428

Int. Cl.⁴ B23P *19/02*

U.S. Cl. 29—235 **2 Claims**



1. Apparatus for attaching a flexible annular member to a rigid member using a preformed resilient lock ring that is split so as to have oppositely facing ends and has a C-shaped cross-section with a radially outwardly facing peripheral side so as to be mountable over and clamp together annular beads on the members, said apparatus comprising a rotary table, a plurality of support members annularly arranged on the table, guide means for separately guiding each support member for radial movement on the table between a stop position and a lock ring assembly position, spring means for separately normally holding each support member in its stop position and resisting radial movement to its lock ring assembly position, support means on each of said support members for supporting said flexible annular member with said lock ring mounted on the bead thereof on all of said support members while in their stop positions, locator means on each of said support members for locating said flexible annular member concentric with said rotary table and holding said flexible annular member in a radially stretched condition so as to receive said rigid member with radial clearance therebetween, positioning means for positioning said rigid member within said flexible annular member and so that the bead thereon forcibly bears against the bead on said flexible annular member while the latter member is located and supported on said support members, roller means mounted separate from and radially movable relative to said

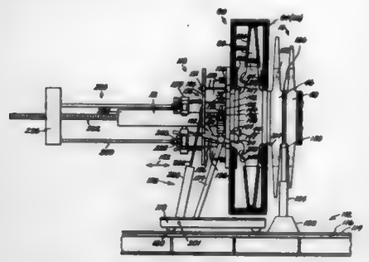
rotary table from a retracted position to an extended position to engage said lock ring near one of the ends thereof on said radially outwardly facing peripheral side and move same radially inward on the associated support members against the associated spring means so as to snap said one end over the bead on said rigid member and thus over the bead on both said rigid member and flexible annular member, and drive means for rotating said rotary table while said roller means is in its extended position engaging said lock ring to thereby cause said roller means to roll along and thereby force said lock ring into position about both said beads along their length to complete the attachment thereby.

4,635,336

TURBINE ROTOR HEATING, DISASSEMBLY, HANDLING AND REASSEMBLY METHOD AND APPARATUS

Adrian R. Ades, and George S. Schmidt, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 491,509, May 4, 1983, Pat. No. 4,567,649. This application May 7, 1985, Ser. No. 731,217
Int. Cl.[4] B23P 19/02
U.S. Cl. 29—252 **13 Claims**



1. A handling apparatus for transporting a turbine wheel along a shaft of a turbine rotor with said shaft disposed with its axis horizontal, comprising:

a handling spool adapted for encircling said shaft outward of said turbine wheel;

means for attaching a first end of said handling spool to said turbine wheel;

guiding means affixed to a second end of said handling spool for guidingly contacting a peripheral surface of said shaft and effective to provide support for said second end of said handling spool;

means connected with said handling spool for supporting substantially the entire weight of said wheel independently of said shaft; and

a handling trolley mounting said supporting means for movement of said handling spool and wheel parallel to said axis of said shaft.

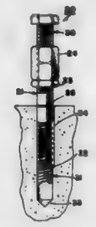
4,635,337

METHOD FOR REMOVABLE ANCHOR APPARATUS

J. Frank Helderman, 414 S. Maple St., Graham, N.C. 27253

Division of Ser. No. 393,668, Jun. 30, 1982, Pat. No. 4,536,115. This application May 6, 1985, Ser. No. 730,635
Int. Cl.[4] B23P 11/00
U.S. Cl. 29—432 **5 Claims**

1. A method for setting a shank member having a threaded upper portion and a threaded lower portion with substantially uniform helix diameter and flank angles comprising the steps of: starting an anchor device having a plurality of wire-like uniform diameter turns with an end turn that is circumferentially and helically expanded on the threaded lower portion of the shank member, axially urging the lower portion of the shank member with the anchor device positioned thereon into a hole while axially scoring the hole wall with said circumferentially expanded end turn, rotating the shank member and extending helically and circumferentially the plurality of turns



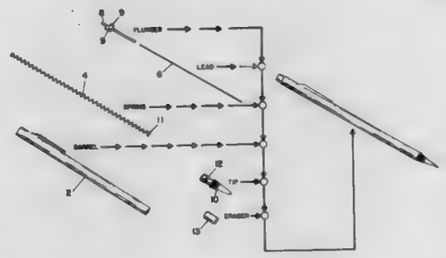
of the anchor device while rotatably lowering the shank member.

4,635,338

METHOD AND APPARATUS FOR ASSEMBLING AN AUTOMATIC AND DISPOSABLE PENCIL

William H. Walsh, 14005 Palawan Way, Marina del Rey, Calif. 90292

Filed Dec. 18, 1984, Ser. No. 683,913
Int. Cl.[4] B23P 11/00, 19/00
U.S. Cl. 29—436 **24 Claims**



1. A method for assembling an automatic pencil having a plurality of parts including: a barrel, a spring, a piece of lead, a lead plunger, and a barrel tip, comprising the steps of:

placing said lead plunger upon one end of said piece of lead;

placing said piece of lead and lead plunger into said spring;

placing said piece of lead, lead plunger and spring into said barrel;

extending one end of said spring opposite said plunger beyond said barrel into which it was placed;

pressing said barrel tip upon said one end of said extended spring; and

placing said barrel tip into one end of said barrel.

20. An apparatus for assembling an automatic pencil of the type which includes a barrel, a spring, a piece of lead, a plunger and a barrel tip, comprising:

means for placing said plunger upon one end of said lead;

means for placing said lead and plunger into said spring;

means for placing said lead, plunger and spring into said barrel;

means for extending one end of said spring opposite said plunger beyond said barrel into which it was placed;

means for pressing said barrel tip upon said one end of said extended spring; and

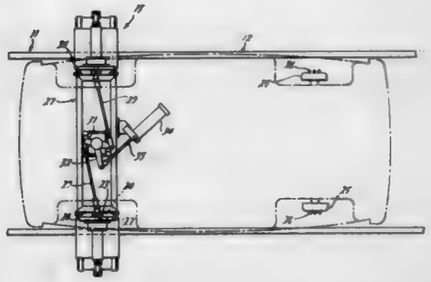
means for placing said barrel tip into one end of said barrel.

4,635,339

AUTOMATED WHEEL DECKING ASSEMBLING

Chester P. Kozlowski, Royal Oak, and Lawrence J. Lawson, Troy, both of Mich., assignors to Dominion Tool and Die Company, Roseville, Mich.

Filed May 16, 1984, Ser. No. 610,845
Int. Cl.[4] B23P 19/00; B60B 29/00
U.S. Cl. 29—526 R **12 Claims**



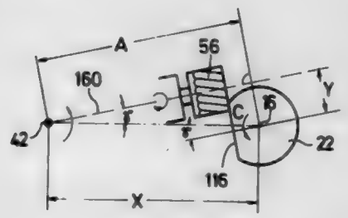
1. Fully automated apparatus for assembling wheels having attaching openings with mounted and inflated tires upon motor vehicles travelling along a conveyor the motor vehicles having hubs with threaded fastening means for cooperation with the wheel openings for attachments of the wheel-tire unit, said apparatus comprising means for automatically orienting each hub upon which a wheel is to be mounted with its threaded fastening means in a predetermined position, means for automatically orienting a wheel-tire unit with its attaching openings positioned in alignment with the positioned threaded fastening means of the associated hub, mounting means for automatically placing the wheel-tire unit onto the hub, and means for threading cooperating threaded fastening means onto the hub threaded fastening means for securing the wheel-tire unit to the hub.

4,635,340

METHOD OF MACHINING A WORKPIECE IN A TURRET LATHE AND AN NC LATHE FOR PERFORMING THIS METHOD

Helmut F. Link, Aichwald, Fed. Rep. of Germany, assignor to Index Werke Komm.-Ges. Hahn & Tessky, Esslingen, Fed. Rep. of Germany

Filed Aug. 2, 1984, Ser. No. 636,886
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1983, 3328327
Int. Cl.[4] B23B 5/36, 35/00
U.S. Cl. 29—558 **2 Claims**



1. A method of machining a circumferential portion of a rotating workpiece off-center comprising the following steps which are carried out simultaneously:

(a) rotating the workpiece about a first axis in a defined direction of rotation and with a defined angular velocity $d\gamma/dt$;

(b) rotating a tool for machining a circumferential portion of said workpiece about a second axis;

(c) pivoting the second axis about a third axis in the defined direction of rotation and with said angular velocity of said first axis;

said third axis being parallel to said first axis and said second axis extending radially from said third axis;

(d) displacing said third axis transversely to said first axis at a velocity dx/dt;

said velocities being the first derivatives of the following equations:

$$\gamma = \arctan \frac{Y_o - v_y \cdot t}{A}$$

$$X = \sqrt{A^2 + (Y_o - v_y \cdot t)^2}$$

wherein t, γ, X, A, Y_o, and v_y denote the following:

t=the time which is equal to zero when the tool touches the workpiece for the first time;

γ=the angle between the second axis and a first plane defined by the first and the third axes;

X=the distance of the third axis from the first axis;

A=the distance of the third axis from the normal projection of the first axis onto a second plane defined by the third and second axes, which plane pivots about the third axis;

Y=the distance of the first axis from said second plane, with Y_o being the value of Y when t equals zero;

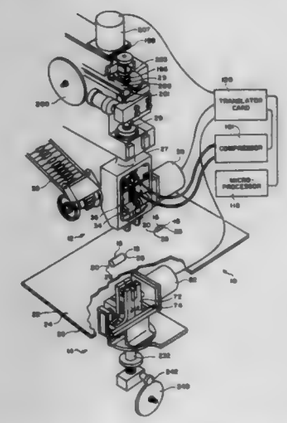
v_y=feed velocity (dY/dt) of the tool relative to the workpiece in the direction of diminishing values of Y.

4,635,341

VARIABLE CENTER DISTANCE INSERTION DEVICE

Frank X. Staudinger, Orlando, Fla., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed May 15, 1984, Ser. No. 610,462
Int. Cl.[4] B21F 1/00; H05K 3/30
U.S. Cl. 29—566.3 **26 Claims**



1. A variable center distance insertion device for attaching varying sized parts having first and second axial leads extending therefrom to a board having top and bottom faces and holes therethrough comprising:

(a) an inserter assembly located adjacent the top face of the board and comprising:

(1) a body;

(2) a first retainer and a second retainer connected with said body in a manner for being translatable bidirection-

ally relative to each other and to said body for thereby enabling positioning of said first and said second retainers adjacent said holes into which said first andsaid second leads are to be inserted;

(3) means for selectively translating said first and said second retainers such that a wide variety of different part sizes can be dealt with;

(4) first bending means and second bending means connected to said first and said second retainers, respectively, for bending said first and said second leads resectively; and

(5) first inserter means and second inserter means mounted on said first and said second retainers, respectively, for inserting said first and said second leads, respectively, into designated holes in the board;

(b) an anvil assembly located adjacent the bottom face of the board and comprising:

(1) a base;

(2) a first head and a second head connected with said base in a manner for being translatable bidirectionally relative to each other and to said base for thereby enabling positioning of said first and said second heads adjacent said holes into which said first and said second leads are inserted;

(3) means for selectively translating said first and said second heads; and

(4) first cutting and clinching means and second cutting and clinching means mounted on said first and said second heads, repsectively, for cutting and then clinching said first and said second leads, respectively, towards said bottom face of said board; and

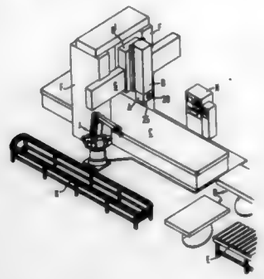
(c) synchronizing means for enabling simultaneous translation of said first retainer with said first head and of said second retainer with said second head.

4,635,342

PLANO-MILLING MACHINE

Victor H. Balding, Taverham, United Kingdom, assignor to Beaver Machine Tool Sales Limited, Norwich, England

Filed Feb. 11, 1985, Ser. No. 700,126
Int. Cl.⁴ B23Q *3/156*; B23C *1/12*
U.S. Cl. 29—568 **4 Claims**



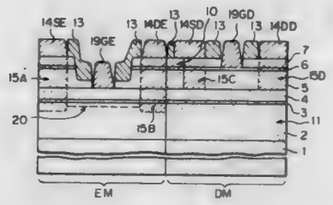
1. A plano-milling machine comprising a horizontal table over which workpieces are movable in a first, "X axis" direction, a bridge over the table, a saddle movable along the bridge in a second, horizontal "Y axis" direction at right-angles to said first direction, a slide vertically movable in a third, vertical, "Z axis" direction relative to the saddle, a head carried by the lower end of the slide and having collet spindles arranged with their respective axes of rotation perpendicularly related and interconnected to be commonly driven, the head being mounted in the machine to be displaceable in the direction of the axis of rotation of one of said collet spindles and at right-angles thereto with the attitude of said one spindle axis remaining constant and the head being rotatable relative to the slide about the "Z axis" whereby a tool held by a horizontal arbor of the head may be presented to different vertical surfaces of a workpiece on the table, a combined indexing mechanism and bearing whereby the slide rotatably supports the head, said combined indexing mechanism and bearing comprising relatively rotatable annular upper and lower portions through which drive means for a vertical spindle of the head passes, and angularly-spaced guides in which a vertically movable wedge member is selectively engageable to lock the two portions of the bearing against relative rotation when in a chosen angular relationship, said indexing mechanism comprising means for introducing fluid under pressure to a part-annular chamber between said bearing portions on one side or the other of a vane in the chamber fixed relative to the head, and proximity switches to cut off the supply of pressurised fluid when a selected one of said guides is aligned with said wedge member.

4,635,343

METHOD OF MANUFACTURING GAAS SEMICONDUCTOR DEVICE

Shigeru Kuroda, Hadano, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 9, 1984, Ser. No. 587,967
Claims priority, application Japan, Mar. 14, 1983, 58-042007
Int. Cl.⁴ H01L *21/203, 21/205*
U.S. Cl. 29—571 **46 Claims**



1. A method of manufacturing a GaAs semiconductor device comprising an enhancement-mode GaAs FET having a heterojunction and utilizing a two-dimensional electron gas and a depletion-mode GaAs FET, comprising the steps of:

forming an undoped GaAs layer on a semi-insulating GaAs substrate;

forming an N-type AlGaAs layer on said undoped GaAs layer;

forming a first GaAs layer on said N-type AlGaAs layer;

forming an AlGaAs layer serving as an etching stoppable layer on said first GaAs layer;

forming a second GaAs layer on said etching stoppable AlGaAs layer;

selectively etching said second GaAs layer, said etching stoppable AlGaAs layer, and said first GaAs layer at a position for a gate of the enhancement GaAs FET; and

a further etching step of selectively etching the GaAs of said first GaAs layer remaining at the position for the gate of the enhancement-mode GaAs FET and of said second GaAs layer at a position for a gate of the depletion-mode GaAs FET, the etching being stopped at said N-type AlGaAs layer and said etching stoppable AlGaAs layer, respectively.

4,635,344

METHOD OF LOW ENCROACHMENT OXIDE ISOLATION OF A SEMICONDUCTOR DEVICE

Robert H. Havemann, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 20, 1984, Ser. No. 642,320
Int. Cl.⁴ H01L *21/76*
U.S. Cl. 29—576 W **11 Claims**

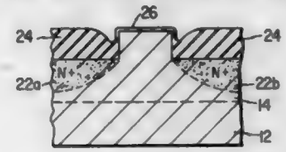
1. A method of isolating a semiconductor device comprising the steps of:

(a) providing a semiconductor body of a first conductivity type,

(b) forming a raised structure having a side wall on said semiconductor body of said first conductivity type,

(c) forming a first layer of oxide over the top and sides of said raised structure, said semiconductor body being exposed adjacent the sides of said raised structure,

(d) forming highly doped areas of said first conductivity



type in the exposed regions of said semiconductor body extending to said raised structure, and

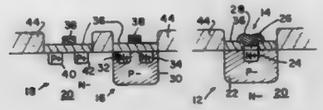
(e) forming a second layer of oxide over said raised structure and over said doped areas at a temperature such that the rate of oxidation over said doped areas greatly exceeds the rate of oxidation over said raised structure in order to form a thick recessed field oxide adjacent said raised structure without encroachment into the active device region.

4,635,345

METHOD OF MAKING AN INTERGRATED VERTICAL NPN AND VERTICAL OXIDE FUSE PROGRAMMABLE MEMORY CELL

Kevin T. Hankins; Mark W. Michael, both of Palm Bay, Fla., and Brian K. Rosier, Jenkintown, Pa., assignors to Harris Corporation, Melbourne, Fla.

Filed Mar. 14, 1985, Ser. No. 711,816
Int. Cl.⁴ H01L *21/20, 21/479*
U.S. Cl. 29—577 C **19 Claims**



1. A method of forming a vertical fuse and PN junction comprising:

forming a mask layer on a first insulative layer on a semiconductor substrate, said substrate having a first region of a first conductivity type;

patterning said mask layer to form at least one opening above said first region;

introducing impurities through said opening to form a second region of a second conductivity type in said first region;

forming an aperture in said first insulative layer corresponding to said opening using said mask layer;

removing said mask layer;

oxidizing said substrate to form a thin oxide fuse region in said aperture; and

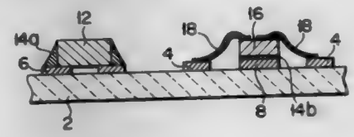
forming a top electrode on said thin oxide fuse region.

4,635,346

METHOD FOR PRODUCING HYBRID INTEGRATED CIRCUIT

Kazuhiro Matsuzaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 8, 1984, Ser. No. 669,364
Claims priority, application Japan, Nov. 11, 1983, 58-210987; Nov. 11, 1983, 58-210988
Int. Cl.⁴ C08L *23/26*
U.S. Cl. 29—577 R **5 Claims**



1. A method for producing a hybrid integrated circuit, comprising the steps of:

applying an adhesive to lead wire connecting conductors and to an electronic part mounting portion of a conductor on an insulating substrate, the adhesive containing a polymer or a copolymer of a substituted or non-substituted styrene dissolved in a solvent consisting essentially of substituted or non-substituted Carbitol acetate, and a silica powder dispersed in the solvent and upon being hardened being capable of withstanding a temperature of molten solder and of being dissolved in a solvent;

adhering an electronic part on the applied adhesive and hardening the adhesive to temporarily fix the electronic part in position;

fixing with solder the temporarily fixed electronic part on the conductor on the insulating substrate; and

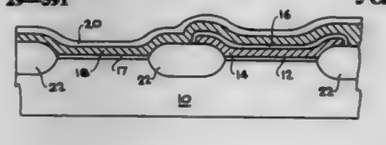
dissolving the hardened adhesive in a solvent and removing the dissolved adhesive.

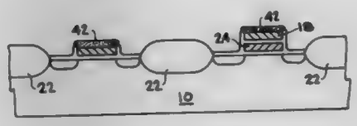
4,635,347

METHOD OF FABRICATING TITANIUM SILICIDE GATE ELECTRODES AND INTERCONNECTIONS

Jih-Chang Lien, and Hsingya A. Wang, both of San Jose, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 29, 1985, Ser. No. 717,370
Int. Cl.⁴ H01L *21/283, 21/88*
U.S. Cl. 29—591 **5 Claims**





1. An improved method of forming metal silicide electrode and interconnection structures on an integrated circuit substrate having a patterned polysilicon layer superposing said substrate and circuit components, characterized by the steps of:

depositing a film of titanium having a thickness in the approximate range of 500 to 1500 Angstroms;

rapidly raising the temperature of said substrate to within the approximate range of 500 to 800 degrees centigrade;

msintaining said temperature for only a period of time suffi-

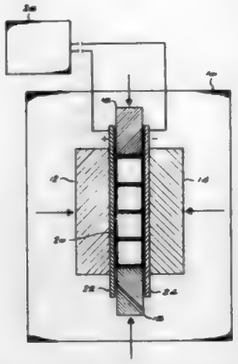
cient for said titanium to react with only said polysilicon, said period of time being within the approximate range of one second to 30 seconds such that said metal and said polysilicon react to form a silicide layer.

4,635,348

MANUFACTURE OF ELECTRICAL COILS

Theodore D. Van Zyl, 3 Villa Gritchen, Jan Cilliers Park, Welkom, South Africa

Filed Oct. 15, 1984, Ser. No. 660,645
Claims priority, application South Africa, Oct. 14, 1983, 83/7661
Int. Cl.[4] H02K *15/12*
U.S. Cl. 29—596 13 Claims



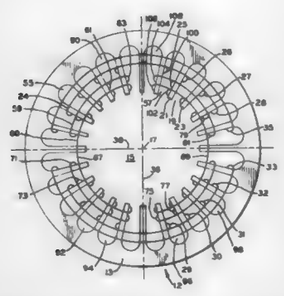
1. A process of preparing electrical coils comprising an array of parallel conductors placed side by side for placement in slots in electrical machines comprising separating the conductors and surrounding the array of conductors with insulation material containing thermosetting resin, applying pressure to hold the conductors together side by side, and radiating the resin with electro magnetic radiation in the radio frequency range to cure the resin.

4,635,349

METHOD OF MAKING SINGLE PHASE MULTI-SPEED MOTOR

Jerry R. Rabe, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 20,182, Mar. 13, 1979, Pat. No. 4,296,344. This application Aug. 10, 1981, Ser. No. 291,509
Int. Cl.[4] H02K *15/085*
U.S. Cl. 29—596 1 Claim



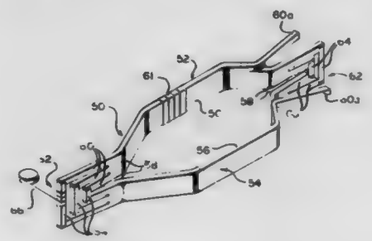
1. A method of manufacturing a two speed motor having an optimized low speed efficiency, wherein the motor includes a magnetic core having a plurality of slots, a main winding, a two pole auxiliary winding, and a four pole auxiliary winding, wherein the windings are particularly adapted for capacitor start, capacitor run energization modes, and wherein the method comprises sequentially placing and positioning coil turn groups of the main and auxiliary windings on the stator core to establish a main winding, and low and high speed auxiliary windings; the steps comprising: placing the winding turns on the main winding coil groups in slots of the core so that the main winding turns are positioned in bottom portions of the slots radially outermost from the bore of the core, and thereby defining polar axes associated with the main winding; developing a four pole auxiliary winding having four coil groups that each have the same number of coils; placing the four pole auxiliary winding coil groups in slots of the core in quadrature relationship with the polar axes of the main winding, and occupying a total number n of the stator slots with turns of the four pole auxiliary winding; developing a two pole auxiliary winding having two coil groups that each have the same number of coils, and wherein the turns of the coil groups thereof are distributed and generally proportioned in accordance with slot areas available for accommodating the two pole auxiliary winding turns; placing the two pole auxiliary winding in quadrature relationship with the main winding and on top of at least some of the turns of the four pole auxiliary winding, and occupying a total number of stator slots with the two pole auxiliary winding that is greater than the number n of slots occupied by the four pole auxiliary winding.

4,635,350

METHOD OR MANUFACTURING ARMATURE WINDING FOR A LARGE TURBINE GENERATOR

Dwight Olsen, Concord, Calif., and Robert L. Wall, Delanson, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1985, Ser. No. 789,183
Int. Cl.[4] H02K *15/06*
U.S. Cl. 29—598 4 Claims



1. A method of winding a magnetizable member of a dynamoelectric machine wherein the member has a cylindrical surface and a plurality of axially extending slots uniformly spaced therein and opening into the cylindrical surface thereof, each slot having upper and lower slot positions, said method including the steps of:

A. successively placing a plurality of multiturn diamond coils on the member with first sides thereof inserted in respective upper slot positions of successive slots and second sides thereof inserted in respective lower slot positions of successive different slots;

B. halting the successive placement of the diamond coils at the point where the first coil sides of initially placed diamond coils in the upper slot positions of a first succession of slots interferes with the insertion into the lower slot positions thereof of the second coil sides of additional diamond coils required to complete the winding process;

C. respectively inserting first conductive bars into the lower slot positions of each of the first succession of slots;

D. respectively inserting second bars into the upper slot positions of a second succession of slots left vacant at the point at which the placement of diamond coils is halted; and

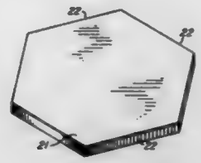
E. electrically joining the terminations of the first bars with the terminations of the second bars to create separate multiturn bar coils and thereby complete the winding process without disturbing the positions of any initially placed diamond coils.

4,635,351

METHOD AND MACHINE FOR PROVIDING ALTERNATOR POLE PIECES

Hubert H. Koch, Arcade, and Edward F. Sergeaunt, Machias, both of N.Y., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 1, 1983, Ser. No. 500,122
Int. Cl.[4] B21D *41/00*; B21J *7/16*
U.S. Cl. 29—598 20 Claims



1. A method for forming an alternator pole piece comprising the steps of:

forming at least one integral, solid, flat plate multi-straight sided polygon perimeter shaped flat plate blank from flat plate sheet stock of magnetic material, then

notching said perimeter straight sides of said polygon blank to form notched portions of said straight sides by laterally simultaneously contacting each of said perimeter straight sides by chisel point shaped tools, and then

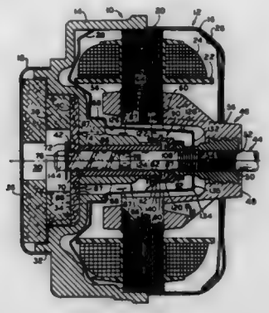
forming said notched polygon blank to create a star shaped perimeter flat plate blank usable in providing an alternator pole piece.

4,635,352

METHOD OF ASSEMBLING A ROTOR ASSEMBLY

Richard F. Uhen, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 584,622, Feb. 29, 1984, Pat. No. 4,565,937. This application Nov. 12, 1985, Ser. No. 796,827
Int. Cl.[4] H02K *15/02*
U.S. Cl. 29—598 3 Claims



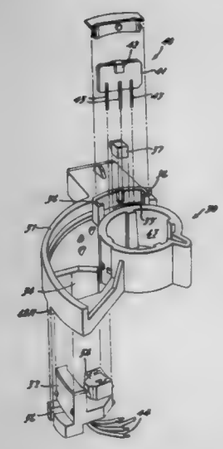
1. A method of assembling a rotor assembly in a dynamoelectric machine comprising: providing a case having a sleeve bearing thereon; providing an oil slinger having a cylindrical cup portion, a central opening, and an annular rim having a trailing edge; providing a rotor including a shaft having a diameter smaller than the slinger central opening and a slinger seat coaxial with the shaft and having a leading edge; placing the cup portion of the slinger over an end portion of the sleeve bearing such that the cup portion surrounds the bearing end portion, there being radial clearance between the bearing end portion and cup portion; placing an inner oil cover over the oil slinger and connecting the oil cover to said case; inserting the rotor shaft through an opening in the oil cover, through the central opening in the oil slinger and into the sleeve bearing; continuing to insert the shaft into the bearing to cause the seat leading edge to contact the oil slinger rim trailing edge and center the oil slinger on the shaft; and then press fitting the seat into the slinger rim.

4,635,353

METHOD FOR POSITIONING TWO SENSOR DEVICES

Henry J. Tamagno, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 30, 1985, Ser. No. 739,344
Int. Cl.[4] H01F *41/00*
U.S. Cl. 29—602 R 7 Claims



1. A method of positioning two Hall sensor devices at a predetermined angular position with respect to each other on a distributor, including the steps of:

mounting a first Hall sensor in a primary carrier;

forming a first alignment means in the primary carrier at the firing point of the first Hall sensor;

mounting a second Hall sensor in a secondary carrier;

forming a second alignment means in the secondary carrier at the firing point of the second Hall sensor;

forming a third alignment means in the primary carrier at a predetermined angle from the first alignment means; and

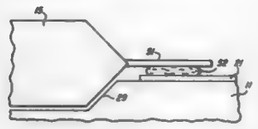
mounting the secondary carrier to the primary carrier so that the second and third alignment means are aligned and the first and second Hall sensors are thus positioned the predetermined angle apart to provide output signals displaced by the predetermined angular position.

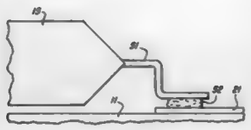
4,635,354

LOW COST ELECTRONIC APPARATUS CONSTRUCTION METHOD

Michael J. Cherchak, and Doyle R. Evans, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 401,053, Jul. 22, 1982, abandoned. This application Feb. 19, 1985, Ser. No. 702,755
Int. Cl.[4] H01H *11/00*
U.S. Cl. 29—622 14 Claims





1. A method for manufacture of an electronic apparatus comprising the steps of:

forming a first case part for said electronic apparatus having a non-conducting interior surface;

forming a conductive interconnection pattern on said non-conducting interior surface, said conductive interconnection pattern having at least one set of connection conductors including a plurality of conductors arranged in proximity about a predetermined region of said non-conducting interior surface and having a plurality of key switch positions, each key switch position having two conductors in proximity;

applying conductive adhesive material to said connection conductors of said set of connection conductors of said interconnection pattern at respective locations thereon in proximity to said predetermined region of said non-conducting interior surface;

disposing an integrated circuit semiconductor device having a plurality of outwardly extending leads within said predetermined region of said non-conducting interior surface with said leads extending outwardly of said predetermined region in spaced relation with said non-conducting interior surface of said first case part on which said conductive interconnection pattern is formed;

aligning the leads of said integrated circuit semiconductor device in registering partially overlapping spaced relationship with said set of connection conductors of said interconnection pattern so as to position the leads of said integrated circuit semiconductor device in respective abutment with the conductive adhesive material on the corresponding connection conductors of said set of connection conductors of said interconnection pattern such that said leads of said integrated circuit semiconductor device are electrically coupled to said set of connection conductors of said interconnection pattern in response to disposing said integrated circuit semiconductor device within said predetermined region of said non-conducting interior surface;

forming a second case part for said electronic apparatus having a plurality of keyholes therein positioned in registration with said plurality of key switch positions of said interconnection pattern;

disposing a key in each of said keyholes of said second case part, each key having a conductive portion for shorting together said two proximate conductors of a corresponding key switch position of said interconnection pattern and having a biasing means for normally preventing such shorting; and

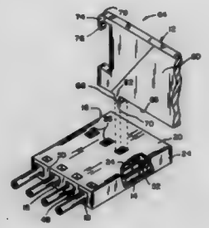
coupling together said first case part and said second case part.

4,635,355

TOOL FOR ELECTRICAL TERMINALS

Donald J. Brinkman, Woodridge, and Russell J. Leonard, Downers Grove, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jan. 6, 1986, Ser. No. 816,527
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—747 4 Claims



1. A manually operable tool for inserting and extracting an electrical terminal into and out of a dielectric connector housing, said housing including a terminal receiving cavity at least partially defined by an outer wall with a window formed therein, said terminal including a body having opposing top and floor walls, a resilient locking lance struck out a predetermined amount and extending at a given angle from said top wall, the lance having a free end in the window and engaging an edge of the window when the terminal is fully inserted into the cavity to prevent withdrawal of the terminal from the housing cavity, the tool comprising:

a unitary stamped body including first and second lance engaging portions;

said first lance engaging portion including a stop surface for externally engaging the housing wall, and a terminal engaging projection extending from the stop surface and receivable in the window to deformably depress the lance toward the terminal floor a predetermined amount to push the lance out of the window and into the terminal receiving cavity so that said lance is spaced with no less than a minimum gap from said floor, whereby when said first lance engaging portion is advanced toward said housing, said stop surface engages said outer housing wall to limit the penetration of said projection into said window to thereby limit the depression of said lance to said predetermined amount; and

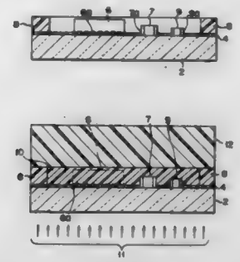
said second lance engaging portion including a hook-like lance reforming member having a tip formed by the joinder of an inner lance engaging surface and an outer floor engaging rocking surface, insertable in said gap, whereby when said tip is inserted in the gap between said deformed lance and said body, and said second body portion of said tool is rocked against said floor, said lance is deflected away from said floor so as to be restored to its original angle and position, so that upon insertion in said housing, said lance will engage said window edge.

4,635,356

METHOD OF MANUFACTURING A CIRCUIT MODULE

Masayuki Ohuchi, Tokyo; Hironi Oodaira, Chigasaki, and Kenichi Yoshida, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 15, 1985, Ser. No. 765,800
Claims priority, application Japan, Dec. 28, 1984, 59-27467; Mar. 26, 1985, 60-61489
Int. Cl.[4] H05K *3/30*
U.S. Cl. 29—841 17 Claims



1. A method of manufacturing a circuit module comprising:

a first step of placing a plurality of terminal-equipped electronic elements at prescribed locations on one surface of a support board such that one surface of each terminal is in contact with the surface of said support board;

a second step of placing the surface of said support board such that it faces a flat surface of a substrate at a prescribed interval, and of injecting an electrically insulative synthetic resin into the interval so that it flows onto the surface of said support board to bury said electronic elements;

a third step of curing said synthetic resin to form a synthetic resin layer, burying said electronic elements, such that one surface of the resin layer contacts the surface of said support board, and the other surface of the resin layer contacts the flat surface of said substrate;

a fourth step of peeling said support board from said electronic elements and said synthetic resin layer to expose the surface of each terminal of each electronic element on the surface of said synthetic resin layer; and

a fifth step of electrically connecting the terminals of said electronic elements.

4,635,357

ELECTROSTATIC RECORDING HEAD, A METHOD FOR MANUFACTURING THE SAME, AND AN APPARATUS FOR PRACTICING THIS METHOD

Teruo Tsutsumi, and Masao Hori, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki K.K., Kawasaki, Japan

Division of Ser. No. 368,089, Apr. 13, 1982, Pat. No. 4,488,161. This application Sep. 28, 1984, Ser. No. 655,891
Claims priority, application Japan, Apr. 15, 1981, 56-55687; Jul. 20, 1981, 56-112096; Jul. 20, 1981, 56-112097; Jul. 29, 1981, 56-117630
Int. Cl.[4] H01K *3/10*; B23P *19/00*
U.S. Cl. 29—850 14 Claims

1. A method for making an electrostatic recording head comprising the steps of:

arranging and soldering each of a plurality of rod-shaped end portions of control electrode units to a flat plate;

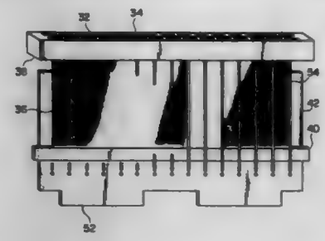
arranging and integrally forming, with a resin, electrode wires to constitute recording electrodes along said control electrode units soldered to said flat plate, thereby forming a resin body; and

cutting through said resin body, said rod-shaped portions of said control electrode units, and said electrode wires in a plane parallel to said flat plate in order to form said control electrodes and said recording electrodes.

4. Apparatus for making an electrostatic recording head comprising:

a rotatable mandrel adapted to carry on its outer circumferential surface flexible printed circuit board of the type including plural electrode wire connecting lands;

electrode wire supplying means operatively associated with said mandrel for continuously supplying an insulated electrode wire to said mandrel along a wire supply path



and for winding said electrode wire around said circumferential surface upon rotation of said mandrel; and

insulation-removing means, located along said wire supply path upstream of said mandrel, for periodically removing portions of insulation from said electrode wire to expose those corresponding portions of said electrode wire which electrically contact said connecting lands when said electrode wire is wound on said mandrel.

4,635,358

METHOD FOR FORMING ELECTRICALLY CONDUCTIVE PATHS THROUGH A DIELECTRIC LAYER

Herbert L. Fritz, Englishtown, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 3, 1985, Ser. No. 688,332
Int. Cl.[4] H01K *3/10*
U.S. Cl. 29—853 9 Claims

1. A process for making multiple electrically conductive paths in a dielectric layer sandwiched between two conductive layers with a series of holes extending through one of the conductive layers and the dielectric layer comprising; providing the holes in the conductive layer and the dielectric layer are of different size with the conductive layer overhanging the holes in the dielectric layer and applying pressure to conductive overhangs by an elastomeric material which contacts the conductive layer and has a dimpled surface.

4,635,359

METHOD OF MANUFACTURING MULTI-TERMINAL ELECTRICAL CONNECTOR

Jacques Noziek, 28 rue Broca, 75005 Paris, France

Filed Dec. 24, 1984, Ser. No. 685,658
Claims priority, application France, Dec. 23, 1983, 83 20665
Int. Cl.[4] H01R *43/20*
U.S. Cl. 29—878 6 Claims

1. A method of manufacturing a multi-contact electrical connector for electrically interconnecting multiple contacts in two electrical circuits, comprising the steps of:

selecting a plurality of wires of a material having an elastic memory and having the desired cross-sectional geometries for mating said wires with said multiple contacts in said electrical circuits to be interconnected through said plurality of wires;

selecting the lengths of said wires to be at least as long as the distance between said electrical circuits over the route said wires will run between said electrical circuits;

arranging the selected wires of selected lengths side by side in a common plane;

preparing a first sheet of insulating material to have a width

greater than the distance between the outside edges of the two outside ones of said plurality of side by side wires and a length at least as great as said selected lengths of said wires;

forming a plurality of apertures at selected positions equally spaced apart along the length of said first sheet;

preparing a second sheet of insulating material to have a width greater than the distance between the outside edges of the two outside ones of said side by side wires and a length at least as great as said selected lengths of said wires;



sandwiching said side by side wires between said first and second sheets, said wires being exposed through said apertures;

transversely cutting through said sandwiched first and second sheets and said wires across two longitudinally separated apertures to form a connector blank with exposed wires at both longitudinal ends thereof; and

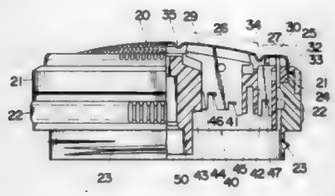
bending the exposed wires so that they will exert a resilient contact force upon said mating with said multiple contacts in said electrical circuits.

4,635,360

CUTTING HEAD FOR AN ELECTRIC SHAVER

Masao Tanahashi; Tetsuo Hamashima, and Humihiro Kumano, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed May 1, 1985, Ser. No. 729,219
Claims priority, application Japan, May 23, 1984, 59-105152
Int. Cl.[4] B26B *19/14*
U.S. Cl. 30—34.2 **5 Claims**



1. A cutting head for an electric shaver comprising:

an outer shearing foil provided with a series of hair entrance slots arranged in a row and spaced from one another by webs; said outer shearing foil being divided into:

(a) a first radial inner section having a plurality of hair entrance apertures for shearing relatively short hair strands and

(b) a second radial outer section having a plurality of hair entrance slots formed as a series of generally radially oriented slots for shearing relatively long hair strands;

an inner cutter assembly including a first radial inner and a second radial outer blade which are separated from each other and mounted on a common assembly base, each blade having a cutting edge elongated in a generally radial direction;

said first inner blade defining a cutting edge which is in hair shearing relation with said hair entrance apertures in the first section of the shearing foil and said second inner blade defining a cutter edge which is in hair shearing relation with said hair entrance slots in the second section of the shearing foil;

means for driving the inner cutter assembly for moving the cutting edges of the first and second inner blades in hair shearing relationship with the rows of the hair entrance slots of the outer shearing foil;

said slots being elongated in the direction generally perpendicular to the movement of the cutting edge and spaced from one another in generally parallel relation with the longitudinal dimension of each slot;

a hair scooping projection extending from the second inner blade in the general direction of the movement of the cutting edge, said hair scooping projection defining a sloping edge which extends downwardly and outwardly from the cutting edge such that the spacing between the sloping edge of the projection and the outer shearing foil is greater toward the distal end of the sloping edge than at the juncture with the cutting edge; the hair scooping projection thus being positioned to straddle across the webs between adjacent slots to prevent the cutting edge from falling into the slots;

said cutting edge of the second inner blade having its longitudinal ends positioned within the length of each slot so that the cutting edge is not in sliding engagement with the portion of the outer shearing foil other than the webs separating the adjacent slots; and,

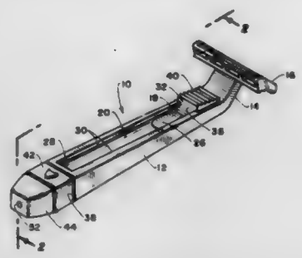
means biasing said first and second inner blades against the first section and the second section respectively of the outer shearing foil, said biasing means being independent of each other.

4,635,361

DISPOSABLE RAZOR

Robert DeMars, 7932 Maestro, Canoga Park, Calif. 91304

Filed Jan. 7, 1985, Ser. No. 742,473
Int. Cl.[4] B26B *21/44*
U.S. Cl. 30—41 **10 Claims**



1. A disposable shaving implement having means defining a shaving head, wherein the improvement comprises:

a handle having a first portion carrying said shaving head suitably to permit said implement to be used as a manually operated razor;

said handle further provided with a longitudinal chamber and adapted to receive a tube of shaving lotion having a dispensing neck, said handle being provided with a channel opening in one side face thereof which communicates with said chamber; said channel opening having longitudinal side edges;

a slidable tube squeezing means mounted in said channel opening and adapted to squeeze lotion from said tube, wherein said slidable tube squeezing means comprises:

(1) a top member having a surface adapted to cooperatively engage a thumb of a user in a pushing or retracting motion,

(2) a downwardly depending bulbous portion located within said chamber and adapted to exert squeezing pressure against said tube of lotion, and

(3) a pair of slot means in respective sides of said tube squeezing means parallel to each other and to the plane defined by said top member, between said top member and said downwardly depending bulbous portion and adapted to cooperatively engage said side edges of said channel opening in slidable fashion; and

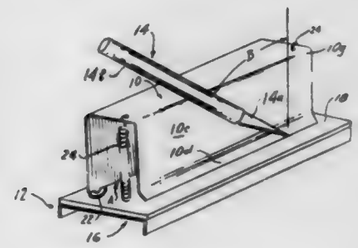
said handle further provided with a second portion at an end opposite said first portion having secured thereto dispensing closure means comprising two parts, a first part adapted to receive said dispensing neck of said tube and a second part rotatable with respect to said first part, said parts being provided with passageways that permit communication between said end of said tube and the end of said dispensing closure when said second part is rotated into one position and which prevent said communication when said second part is rotated into another position.

4,635,362

CUTTING APPARATUS

Barry D. Brown, 4550 Sierra Madre Dr., Reno, Nev. 89502

Continuation of Ser. No. 608,140, May 8, 1984, abandoned. This application Jul. 26, 1985, Ser. No. 759,515
Int. Cl.[4] B26D *7/02*
U.S. Cl. 30—124 **11 Claims**



1. Apparatus for making accurate elongated cuts in a sheet, including a table for supporting a sheet to be cut and an elongated member above said table, and a knife having a knife handle and a knife blade projecting from an end of the knife handle, said blade having a cutting edge at its end and having opposite side faces, said elongated member having an elongated marginal portion constituting means for clamping a sheet against said table and for directly guiding a side face of the knife blade, said table providing a cutting surface that supports a sheet directly opposite to said blade when guided by said elongated marginal portion, and a pair of hinge couples supporting said elongated member on said table for arcuate movement of said elongated marginal portion toward and away from the table about an axis parallel to but spaced from said elongated marginal portion, said hinge couples being mutually spaced apart along said axis and at least a portion of said elongated member between said hinge couples being spaced from the table so as to provide a passage between the hinge couples, over the table and under the elongated member for a sheet to be cut, and spring means acting between said elongated member and said table and disposed out of said passage for biasing said elongated marginal portion toward said table.

4,635,363

HAND OPERATED CUTTING TOOL

David S. Chapin, Raleigh, N.C., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jun. 29, 1984, Ser. No. 626,390
Int. Cl.[4] B26B *13/12, 13/20*
U.S. Cl. 30—257 **25 Claims**



1. A hand operated cutting tool comprising:

(a) a first blade and a second blade, said blades being stantially parallel and pivotally connected at a pivot point, the blades being hereby pivotable into an open position and into closed position defining a plane therebetween, and in a closed position terminating in points substantially defining a line with said pivot point;

(b) a relatively short handle on one of the blades extending upwardly and rearwardly from the line, the short handle including a thumb-receiving means formed in an end thereof opposite the blade, the thumb-receiving means including a central axis diverging from the plane at an angle of greater than 0° and less than 45°, the angle being selected to allow sufficient side pressure to be placed on the cooperating blades in the cutting action, and including means for applying a thumb-induced force for pivoting the blade on the short handle about the pivot point; and

(c) a relatively long handle on the other of the blades extending upwardly and rearwardly at a lesser angle with respect to the line defined by the blade points and the pivot point than the upwardly and rearwardly extending short handle for the substantially vertical alignment of the handles along the area of the plane, the long handle then extending rearwardly and curving slightly downward for receiving the fingers curved thereabout in a line substantially parallel to the line defined by the blade points and the pivot point.

4,635,364

BRAKING ARRANGEMENT FOR A CHAIN SAW

Wilfried Noll, Waiblingen; Konrad Ehmann, Remshalden; Hans P. Stehle, Waiblingen; Wolfgang Dorner, Rottenburg, and Günter Dietzsch, Waiblingen, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 473,880, Mar. 10, 1983, abandoned. This application Apr. 11, 1985, Ser. No. 722,112
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209162
Int. Cl.[4] B27B *17/00*
U.S. Cl. 30—381 **3 Claims**

1. A braking arrangement for a motor-driven chain saw having a housing and a guide bar m ounted on the housing for accommodating a saw chain thereon which is lubricated during operation with lubricating oil, the braking arrangement comprising:

a metallic brake band which forms a first friction partner and has a first friction surface which becomes at least partially coated with a film of said lubricating oil during normal operation of the chain saw;

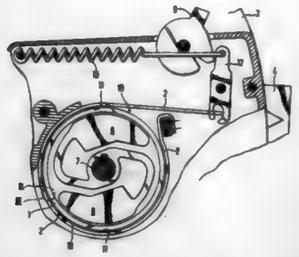
a metallic brake drum which forms a second friction partner and has a second friction surface which too becomes at least partially coated with a film of said lubricationg oil;

brake lever means operatively connected to said brake band and being pivotally mounted on the housing for movement between a ready position whereat said brake band is

disposed in spaced relationship to said brake drum and a released position whereat said brake band is drawn tightly around said brake drum;

a brake spring connected to said brake lever means for resiliently biasing said brake lever means in a direction to cause said brake lever means to pull said brake band tightly about said brake drum when said brake lever means is in said released position;

release means operatively connected to said brake lever means for releasing the same to said released position thereby causing said brake band to be tightly drawn about said brake drum and bringing said friction surfaces into braking engagement with each other;



one of said friction partners being made of steel having a cubic body centered structure and the other friction partner, at least in the region of the friction surface corresponding thereto, including a material which is resistant to conversion to a martensitic structure and said conversion-resistant material being austenitic steel selected from the group consisting of X 5 CrNi 189, X 10 CrNiMoTi 1810, and X 12 CrNi 177 whereby said friction surfaces tightly fuse together during the braking action thereby preventing the films of oil on said friction surfaces from inhibiting the braking action and preventing further oil from reaching said surfaces.

4,635,365

COORDINATE PLOTTER WITH AUTOMATIC PUNCHING DEVICE

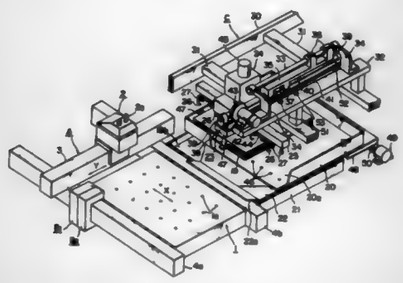
Takeji Hashimoto, Kyoto, and Minoru Murayama, Shiga, both of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Sep. 6, 1984, Ser. No. 647,990

Claims priority, application Japan, Sep. 9, 1983, 58-165118; Sep. 12, 1983, 58-166576

Int. Cl.[4] B65H *17/36*

U.S. Cl. 33—1 M 4 Claims



1. An X-Y coordinate plotter adapted to draw a picture on an individual sheet, comprising:

a table having an upper surface for receiving said sheet thereon, said table being mounted for movement in one of said X-Y coordinate directions, said sheet moving with said table;

an autographic head, said head being directed downwardly from a point above said table, said autographic head being mounted for movement in the other one of said X-Y directions;

at least one automatic punching device having a fixed position, said table and head when in motion moving relatively to said fixed position, said punching device when actuated forming a positioning hole in said sheet at at least one position selected by movement of said table in said one coordinate direction with said sheet moving therewith;

holding means for maintaining said sheet in the same position on the upper surface of said table for said punching and for said drawing, said drawing being accomplished by coordinate motions of said head and table.

4,635,366

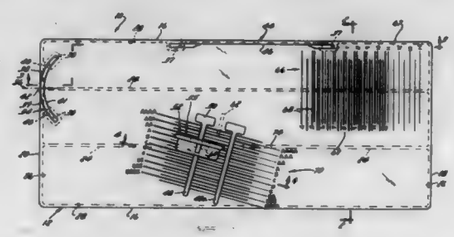
POLYMERIC SHOE SIZER

Scott R. Fohrman, 1123 Linden, Wilmette, Ill. 60091, and Herbert Steinmetz, Rte. 2, Box 340, Elk Mound, Wis. 54739

Filed Dec. 16, 1985, Ser. No. 809,316

Int. Cl.[4] A43D *1/00*

U.S. Cl. 33—3 B 10 Claims



1. An apparatus for measuring the length and width of the feet of adult men and women, each of said feet having a length, a width, a ball, and an outside edge, in order to determine proper shoe size comprising:

a unitary polymeric base comprising a flat horizontal surface, a length, a width, an underside, at least one elongate slot and plurality of support ribs integrally joined to said underside;

means for positioning the heel of the foot to be measured in one location on said base, comprising a vertically-projecting curved member having vertically depending mounting lugs;

stopping means for positioning the ball of the foot to be measured comprising a vertically-projecting stop wall having vertically depending mounting lugs;

mounting means for securing said heel positioning means and said stopping means to said base comprising a plurality of accurately positioned recesses in said horizontal surface of said base and designed to positively, frictionally engage said mounting lugs of said heel positioning and stopping means;

one piece foot width determining means securely, yet slidably mounted into said slot in said base;

men's and women's sizing grids designed to be accurately affixed upon said base to measure a foot of either sex placed in the same location on said base; and

wherein said apparatus is designed to be inexpensively shipped by mail and assembled by an inexperienced purchaser without the use of tools.

4,635,367

METHOD FOR TAKING BODY MEASUREMENT AND APPARATUS FOR PERFORMING THE METHOD AS WELL AS A SYSTEM FOR TAKING BODY MEASUREMENT AND PRODUCING GARMENTS

Thure Vigede, Huddinge, Sweden, assignor to Procs Consulting AB, Huddinge, Sweden

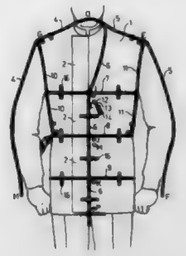
PCT No. PCT/SE83/00227, § 371 Date Feb. 3, 1984, § 102(e) Date Feb. 3, 1984, PCT Pub. No. WO83/04366, PCT Pub. Date Dec. 22, 1983

PCT Filed Jun. 3, 1983, Ser. No. 579,889

Claims priority, application Sweden, Jun. 8, 1982, 8203542

Int. Cl.[4] A41H *1/02*

U.S. Cl. 33—15 16 Claims



1. A method for measuring a body, comprising the steps of:

providing a measuring garment having at least one adjustably attachable measuring tape including electrically detectable means capable of generating an electrical signal in accordance with a position of adjustment of said tape;

adjusting said measuring tape to fit the body part being measured so that said electrically detectable means generates an electrical signal; and

conducting said electrical signal to a central memory and calculating unit for transforming said signal into a pattern dimension.

4,635,368

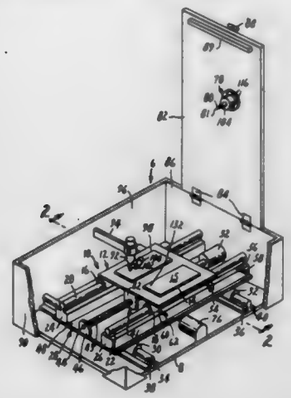
APPARATUS FOR MAKING ELECTRONIC CIRCUIT BOARDS

Michael G. Golden, 13914 Oakgreen Cir., Afton, Minn. 55001

Filed Aug. 10, 1984, Ser. No. 639,591

Int. Cl.[4] B43L *13/10*

U.S. Cl. 33—23.03 4 Claims



1. Apparatus for cutting into the surface of a flat circuit board blank to prepare an electronic circuit board comprising, in combination, (a) a worktable movably mounted on a base and supporting said flat circuit board blank during fabrication and having means for reciprocatively moving said worktable in a first direction and means for moving said worktable in incremental steps in a second direction perpendicular to said first direction, (b) an engraving head secured to said base and having a cutting style positioned to face said circuit board blank and capable of being advanced into a cutting mode or withdrawn into a non-cutting mode in response to an electric signal as said worktable moves in said first and second directions, (c) a photoelectric scanning means positioned to scan an electronic circuit layout and thereby generate an electronic signal corresonding to said electronic circuit layout, and (d) means for controlling the advancement or withdrawal of said cutting style into a cutting mode or a non-cutting mode in response to said electronic signal, in which said means further controls the withdrawal of the cutting style from the cutting mode to the non-cutting mode during the time said worktable travels 25 to 75 micrometers in said first direction.

4,635,369

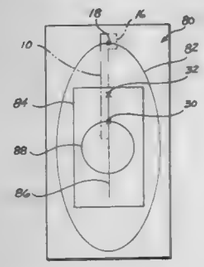
SCRIBING DEVICE AND METHOD

Tommie L. Powell, 2000 NE. 100th St., Seattle, Wash. 98125

Filed Apr. 29, 1986, Ser. No. 857,130

Int. Cl.[4] B43L *13/22*

U.S. Cl. 33—27.11 10 Claims



1. A scribing device, comprising:

a generator having a generally flat upper surface and a groove formed therein, the groove comprising one or more connected segments, each segment being either linear or circular; and

a scribing assembly comprising a body having a lower tracing surface shaped so as to permit the tracing surface to slide over the upper surface of the generator, means for mounting a scribing instrument, and first and second tracers, each tracer including a follower projecting downward from the tracing surface, each of the followers being adapted to slide along the groove.

4,635,370

CALIPER

Bud K. Beaver, Coronado, Calif.

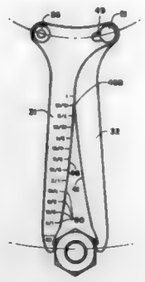
Filed Nov. 19, 1984, Ser. No. 672,710

Int. Cl.[4] G01B *3/16*

U.S. Cl. 33—149 R 13 Claims

1. A caliper comprising two legs, and a coupling means adapted to slidably couple the legs together and adapted to

permit coplanar, opposing rotation of the legs about a single fixed virtual pivot point such that all points on the legs, when



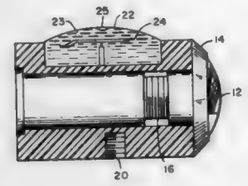
rotated, translate along arcs of concentric circles whose common center is at the single fixed virtual pivot point.

4,635,371

DEVICE TO INDICATE SOLAR EXPOSURE

Michael B. Dalrymple, 24 Dickens Cir., Salinas, Calif. 93901

Continuation of Ser. No. 613,824, May 25, 1984, abandoned.
This application Feb. 18, 1986, Ser. No. 830,565
Int. Cl.[4] G01C *1/00*
U.S. Cl. 33—1 DD 4 Claims



1. A lightweight portable hand-held device for investigating annual solar exposure of a specific site, comprising: a hollow cylindrical body having a first end and a second end and adapted to be held in one hand, and a transparent lens attached to said first end of said body, said lens having arcuate and radial markings indicating the line of travel of the sun at a given latitude for selected dates of the year and for selected times of the day, such that when said site is viewed through said second end of said body and said lens, said arcuate and radial markings are superimposed over the view of said site as seen through said body to thereby provide an indication of the solar exposure at said specific site.

4,635,372

APPARATUS FOR POSITIONING AN ELECTRICAL BOX

Myron Tande, Box 1000, Stanley, N. Dak. 58784

Filed Feb. 6, 1986, Ser. No. 826,609
Int. Cl.[4] B25B *11/00, 1/00*
U.S. Cl. 33—180 R 6 Claims

2. An apparatus for positioning an electrical box in a selected position for mounting on a vertically disposed stud, the electrical box including at least one opening at its upper forward end and at least one opening at its lower forward end, comprising,

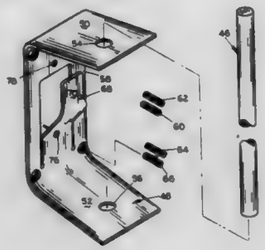
an elongated vertically disposed support means adapted to be positioned outwardly of and at one side of the vertically disposed stud,

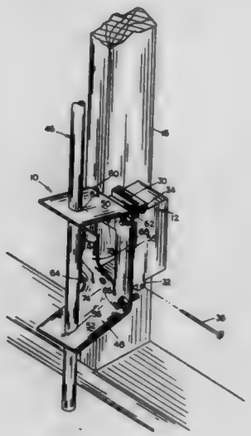
a substantially U-shaped member selectively vertically mounted on said support means comprising upper and lower legs movably mounted on said support means which extend laterally inwardly therefrom towards the stud, and a base portion extending between the inner ends of said legs,

said base portion having a resilient tab portion, having upper and lower ends, joined at its lower end to said base portion,

a first box retaining pin means secured to said base portion extending horizontally inwardly therefrom adapted to be received by said upper opening of said box,

a second box retaining pin means secured to said tab portion, below the upper end thereof, extending inwardly therefrom at an angle less than 90°,





said second box retaining pin means being horizontally disposed when said tab portion is moved, to a first position, relative to said base portion to enable said second box retaining pin means to be received by said lower opening,

said second box retaining pin means frictionally engaging said lower opening, when said tab portion returns to its normal position so that said box is held by said first and second retaining pin means whereby said box

may be positioned adjacent said stud by moving said support means relative thereto.

4,635,373

WAFER CONVEYING APPARATUS WITH ALIGNMENT MECHANISM

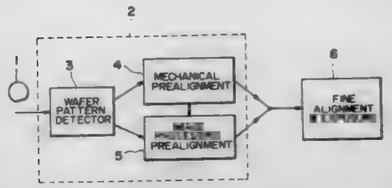
Makoto Miyazaki; Minoru Yomoda, both of Kawasaki, and Takehiko Suzaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 4, 1985, Ser. No. 772,460
Claims priority, application Japan, Sep. 7, 1984, 59-186466; Sep. 7, 1984, 59-186468
Int. Cl.[4] G01B *5/25, 11/27*
U.S. Cl. 33—180 R 8 Claims

1. A wafer pre-alignment apparatus, comprising:

first positioning means for positioning a wafer on the basis of an outer periphery configuration of the wafer;

second positioning means for positioning the wafer on the basis of a pattern of an image formed on the wafer; and



means for operating said apparatus selectively in a first mode wherein only said first positioning means positions the wafer and in a second mode wherein only said second positioning means positions the wafer, or said first positioning means and said second positioning means sequentially position the wafer.

4,635,374

BOW SIGHT BAR

John F. Bradshaw, 14 Garnett Ave., St. Augustine, Fla. 32084

Filed Oct. 11, 1985, Ser. No. 786,532
Int. Cl.[4] F41G *1/00;* F41B *5/00*
U.S. Cl. 33—265 9 Claims



7. A bow sight bar comprising a substantially flat Y-shaped plate having a broad stem portion adapted to be attached to a bow and two widely spaced narrow arm portions, a hinge pin attached to each said arm portions and extending across the space between said arm portions; an L-shaped beam member having two wall sections joined along a backbone with said backbone being pivotally attached to said hinge pin so that either of said wall sections may be positioned to be flush with said Y-shaped plate; a slot in one of said wall sections for adjustable attachment of one or more stationary bow sights thereto; a slot in the other of said wall sections for adjustable attachment of a pendulum bow sight thereto; a stop means attached to said Y-shaped plate for engagement with said L-shaped beam member when either of said wall sections is positioned to be flush with said Y-shaped plate; and clamp means to hold either of said wall sections in the selected position.

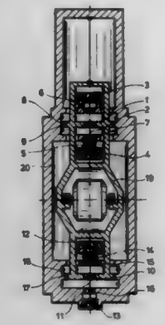
4,635,375

VERTICAL SHAFT SYSTEM FOR GYROSCOPIC THEODOLITES WITH TWO DEGREES OF FREEDOM

András Tarcsafalvi, Budapest, Hungary, assignor to Magyar Optikai Muvek, Budapest, Hungary

Filed Sep. 2, 1983, Ser. No. 528,850
Int. Cl.[4] G01C *19/00*
U.S. Cl. 33—318 2 Claims

1. A vertical shaft system for gyroscopic theodolites with two degrees of freedom, comprising housing, a bearing, a suspended pendulum system carried on said bearing and arranged in said housing for azimuth determination, perforated stones (1,10) arranged in two axial points on the housing, said



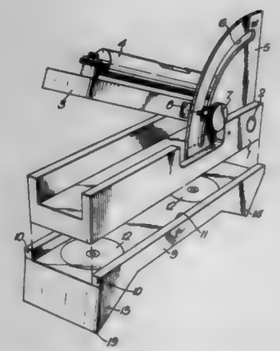
suspended pendulum system comprising wires (2,11) clamped on both ends, tensioning elements (5,14) threaded through said perforated stones for tensioning said wires, and perforated guiding stones (6,7 and 15,16) for aligning the tensioned wires.

4,635,376

ANGLE MEASURING APPARATUS

Andrew R. Fry, Herts, England, assignor to Croafield Electronics Limited, London, England

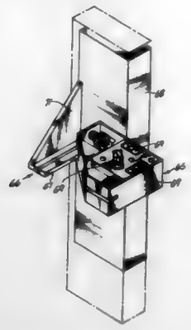
Filed Jan. 23, 1985, Ser. No. 693,942
Claims priority, application United Kingdom, Jan. 23, 1984, 8401662
Int. Cl.[4] G01C *9/28*
U.S. Cl. 33—384 3 Claims



1. An angle measuring apparatus, comprising: an elongate support defining an upper surface and an under surface; said under surface of said support including a pair of spaced downwardly projecting feet (13, 14), each foot tapering towards a single linear edge oriented transverse to a longitudinal axis of said support, said edges being defined in a common plane such that when said apparatus is placed on a cylinder said common plane is substantially parallel with a chord of the cylinder; a horizontal level detecting device (4) pivotally connected (2) to said upper surface of said support such that said horizontal level detecting device defines an angle with said common plane; and means (5–8) for determining said angle between said common plane and said horizontal level detecting device, wherein said support comprises two separable sections, one section (1) providing said upper surface of said support and defining a planar under surface parallel with said common

plane when said sections are assembled, and the other section (9) including said projecting feet, said angle determining means enabling the angle between said horizontal level detecting device and said under surface of said one section to be determined.

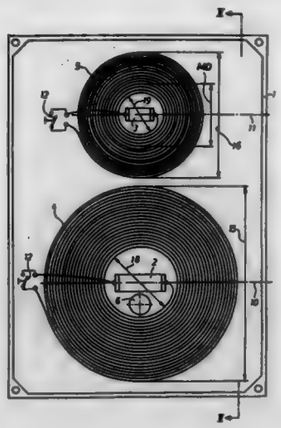
4,635,377
T-SQUARE APPARATUS
Joon Park, 1128 E. Raleigh St., Glendale, Calif. 91205
Filed Apr. 5, 1985, Ser. No. 720,625
Int. Cl.⁴ G01C 9/24
U.S. Cl. 33—451 **9 Claims**



1. A T-square apparatus comprising:
a generally triangular frame having a first generally flat working surface, a second generally flat working surface and a third generally flat working surface oriented at select angles to the first and second working surfaces;
three level vials;
means for mounting the level vials on the frame whereby one level vial is in parallel relation to each working surface;
a measuring blade;
a generally L-shaped angle bar having generally flat first and second walls generally normal to each other, said angle bar being fixedly attached to one end of the measuring blade whereby the plane of the measuring blade is generally normal to the planes of the first and second walls; and
means for slidably mounting the measuring blade on the frame in parallel relation to one of the working surfaces.

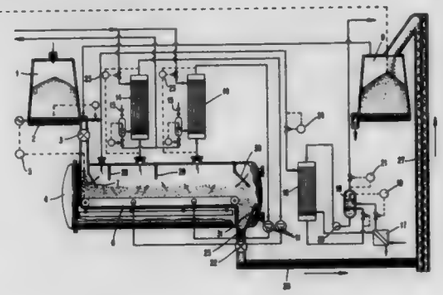
4,635,378
APPARATUS FOR THE DEHUMIDIFYING MASONARY WORKS
Walter Wehrli, Diepoldsau, Switzerland, assignor to Terramundo Ltd., Jersey, Channel Islands
PCT No. PCT/CH84/00082, § 371 Date Oct. 22, 1985, § 102(e) Date Oct. 22, 1985, PCT Pub. No. WO85/03732, PCT Pub. Date Aug. 29, 1985
PCT Filed May 23, 1984, Ser. No. 796,024
Claims priority, application European Pat. Off., Feb. 23, 1984, 84101920.1
Int. Cl.⁴ F26B 23/04
U.S. Cl. 34—1 **10 Claims**

1. Apparatus for the dehumidifying masonary works which comprises capacitors and electrical conductors wound into coils, each of the two poles of a particular capacitor being connected to one end of a particular conductor wound into a coil,
wherein at least a first and a second coil and at least a first and a second capacitor are present, the first capacitor is connected to the first coil and the second capacitor to the second coil, the axes of the coils run parallel to each other and the longitudinal axes of the capacitors cross the axes



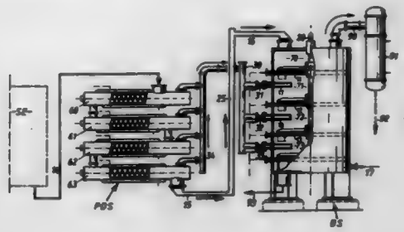
of the coils connected to them, and the coils are different in their outer diameter and their number of windings.

4,635,379
METHOD OF DRYING MATERIAL USING AN INDIRECTLY HEATED SYSTEM
Erik G. Kroneld, Alvägen 5, S-852 43 Sundsvall, Sweden
PCT No. PCT/SE83/00328, § 371 Date May 14, 1984, § 102(e) Date May 14, 1984, PCT Pub. No. WO84/01207, PCT Pub. Date Mar. 29, 1984
PCT Filed Sep. 14, 1983, Ser. No. 610,999
Claims priority, application Sweden, Sep. 15, 1982, 8205276
Int. Cl.⁴ F26B 3/04
U.S. Cl. 34—25 **15 Claims**



1. Method of drying material in one or more steps comprising: feeding an indirectly heated superheated steam to a drier containing a pressurized bed of said material;
passing the superheated steam in transverse flow through the bed; whereby water is driven off from the material to form a new saturated steam;
keeping the material bed at a constant level;
preventing superheated steam from bypassing the bed by means of a sealing device;
distributing the new saturated steam in one or more circulation systems; and
maintaining the pressurized bed of said material in said drier by cell feeders or plug screws.

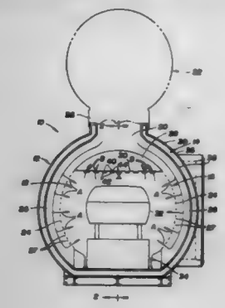
4,635,380
METHOD AND APPARATUS FOR HEAT TREATING FLOWABLE MATERIALS
George E. Anderson, Champlin, Minn., assignor to Crown Iron Works Company, Minneapolis, Minn.
Filed May 29, 1984, Ser. No. 614,554
Int. Cl.⁴ F26B 3/02
U.S. Cl. 34—27 **9 Claims**

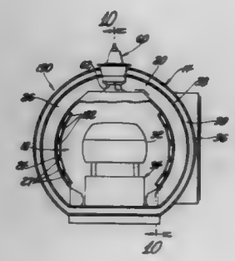


1. A process for treating flowable granular solid materials, having a liquid adhering thereon, to remove said liquid, comprising the steps of:
(a) passing the materials through a pre-desolventizer to heat the materials in order to vaporize and superheat a first portion of the liquid, wherein liquid thereby vaporized and superheated has dust of the granular solid materials entrained therein;
(b) passing the partly desolventized granular solid materials downwardly through vertically spaced compartments of a desolventizer to completely vaporize the remaining liquid adhering on the materials by means of live steam introduced into the lowermost compartment of the desolventizer, the live steam passing upwardly in a directional flow opposite that of the materials on which the liquid adheres, to vaporize a second portion of the liquid during countercurrent passage of said materials and said steam;
(c) condensing a substantial portion of the steam upon the materials and, currently, introducing superheated vapors of the liquid having dust of the granular solid materials entrained therein from the pre-desolventizer into an upper section of the desolventizer below the uppermost compartment, to pass upwardly through the desolventizer in a directional flow opposite that of the solid granular materials on which the liquid adheres, wherein the super heated vapors of the liquid generated in the pre-desolventizer function to further vaporize in the desolventizer additional of the liquid, and wherein dust entrained in the vapors of the liquid generated in the pre-desolventizer is filtered out of the vapors by the granular solid material passing downwardly through the vertically-spaced compartments of the desolventizer;
(d) withdrawing the combined vapors of said liquid vaporized in the pre-desolventizer and the desolventizer from the uppermost compartment of the desolventizer and venting them; and
(e) discharging materials, from which the adhering liquid has been removed, at the lowermost compartment of the desolventizer.

4,635,381
PAINT BAKE OVEN
Gordon F. Hubbert, Plymouth, Mich., assignor to Gladd Industries, Inc., Detroit, Mich.
Continuation-in-part of Ser. No. 393,274, Jun. 29, 1982, abandoned. This application Jan. 9, 1984, Ser. No. 570,071
Int. Cl.⁴ F26B 15/12, 21/00
U.S. Cl. 34—54 **18 Claims**

1. A paint bake oven of a modular construction including a heating module comprising:
an outer insulated housing; an inner housing received within the outer housing and defining a product passage through which products are passed; an upper central supply plenum located above the inner housing within the outer housing; said inner housing having perforated lateral side walls defining a bifurcated gas flow path from the supply plenum to the product passage; a central upper return plenum located above product passage and below the supply plenum; the inner housing having a perforated top wall through which gas flows from the product passage to



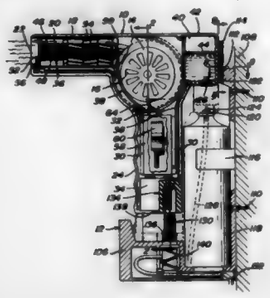


the return plenum, and removable baffles that can be selectively attached to and removed from said perforated lateral side walls to cover and prevent flow through selected groups of said perforations for shutting off or controlling the amount of flow into said product passage from the space between said perforated side walls and said outer housing, and for directing and selectively concentrating the flow through selected portions of said perforated side walls into said product passage.

4,635,382
WIRELESS HAND HELD HOT AIR HAIR DRYER
Serge Bourdeau, 104 Meaney, Kirkland, Quebec, Canada H8T 3B5
Filed Mar. 10, 1986, Ser. No. 838,246
Int. Cl.⁴ A45D 2/00
U.S. Cl. 34—97 **18 Claims**

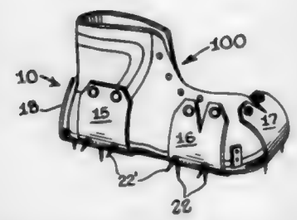
1. A cordless hand held hot air hair dryer comprising:
nozzle means for exhausting air;
a heating chamber disposed proximate said nozzle means;
fuel supply means for storing a vaporizable fuel in a liquid state;
catalytic heating means in fluid flow communication with said fuel supply means and including a catalyst member disposed within said heating chamber for combusting vaporized fuel supplied from said fuel supply means;
battery-powered motor means;
fan means driven by said motor means for passing air through said heating chamber so as to contact said catalyst member, to thereby heat the air prior to exhausting through said nozzle means; and

manually operated control means for controlling the amount of current applied to said motor means and proportionally adjusting the flow of fuel to said heating means to thereby



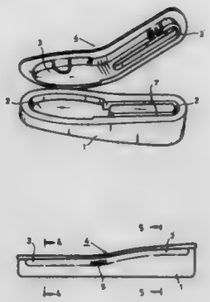
regulate the temperature of said heated air in relation to the amount of air flow exhausted through said nozzle means.

4,635,383
ROOFING CLEAT CONSTRUCTION
Terard L. Free, 13995 E. Utah Cir., Aurora, Colo. 80012
Filed Dec. 13, 1985, Ser. No. 808,754
Int. Cl.[4] A43B *3/16*
U.S. Cl. 36—7.6 1 Claim



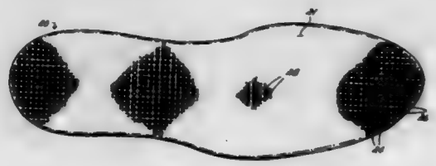
1. A cleat apparatus for releasable attachment to work shoes wherein said cleat apparatus consists of:
a reinforced heel unit and a reinforced toe/sole unit wherein both said heel unit and said toe-sole unit comprise: a generaly flexible transverse member; a generally flexible lateral member; and a generally rigid and relatively thick reinforcing element having a flat bottom and outwardly angle side walls; wherein, said transverse members are operatively connected on one end to the respective reinforcing elements; said lateral members are operatively connected in the middle to the respective reinforcing elements; and the free ends of said lateral and transverse members are each provided with at least one reinforced aperture;
an intermediate connecting unit connecting said heel unit to said toe/sole unit;
a releasable securing means operatively associated with the said reinforced apetures for attaching said cleat apparatus to work shoes; and,
a plurality of spike elements operatively connected to the flat bottoms and angled side walls of said reinforcing elements to provide both vertically oriented downwardly projecting spike elements and outwardly angled downwardly projecting spike elements one both said heel unit and said toe/sole unit; and, rigid shoe engaging elements operatively associated with the top surface of said reinforcing elements, and comprising generally L-shaped brackets.

4,635,384
FOOTWEAR SOLE
Myung H. Huh, 102-1, Kwangan-dong, Nam-ku, and Je S. Jeon, 77-8, Kwangan-dong, Nam-ku, both of Busan-si, Rep. of Korea
Filed May 24, 1984, Ser. No. 613,417
Int. Cl.[4] A43B *13/20*
U.S. Cl. 36—29 8 Claims



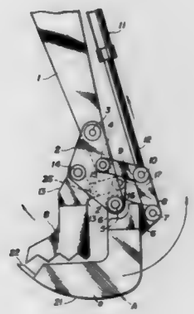
1. A shoe sole, comprising:
an upper sole having an obtusely angled shape; and
a lower sole,
said upper sole containing a forward air pocket and a rearward air pocket, said forward air pocket communicating with said rearward air pocket by a hollow corrugated section, such that said hollow corrugated section expands or contracts depending on pressure applied to said air pockets, said lower sole having formed therein a cavity for receipt of said air pockets of said upper sole therein.

4,635,385
SHOE INSERT
John M. Ogden, Cincinnati, Ohio, assignor to Ogden Inc., Cincinnati, Ohio
Filed Oct. 24, 1985, Ser. No. 790,728
Int. Cl.[4] A43B *13/38*
U.S. Cl. 36—43 12 Claims



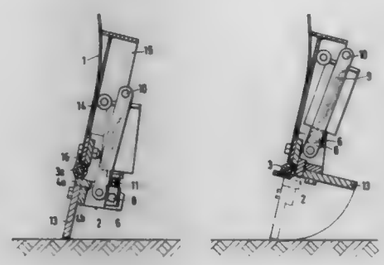
1. An insert for a shoe having an insole comprising:
a thin section of non-absorbent, thermally non-conductive material adapted to overlie at least a portion of the insole of the shoe, said section being deformable to conform to the shape of the insole;
said section being formed with a plurality of apertures to permit the passage of air and moisture from a foot and sock resting atop said section to the insole beneath said section;
said section having an uppermost surface with a coefficient of friction approximately equal to the coefficient of friction of the skin of the foot so as to limit movement of the foot and sock with respect to the insole to reduce the incidence of turf toe while permitting at least some movement of the foot and sock relative to the insole to reduce blistering of the foot.

4,635,386
PAVED ASPHALT STRIPPING AND DIGGING BUCKET APPARATUS
Soichi Kobayasi, Chiba, Japan, assignor to Kabushiki Kaisha SK, Chiba, Japan
Filed Sep. 10, 1985, Ser. No. 774,573
Claims priority, application Japan, Sep. 10, 1984, 59-136981[U]
Int. Cl.[4] E02F *3/76*
U.S. Cl. 37—117.5 4 Claims



1. Digging apparatus comprising:
(a) an arm;
(b) a first bracket mounted on said arm for pivotal movement relative thereto about a first pivot shaft;
(c) a bucket mounted on said first bracket for pivotal movement relative thereto about a second pivot shaft;
(d) a first hydraulic cylinder having a first piston rod;
(e) a first link having a first end and a second end, the first end of said first link being pivotally mounted on said arm and said first bracket for pivotal movement relative thereto about a third pivot shaft and the second end of said first link being pivotally mounted on said first piston rod for pivotal movement relative thereto about a fourth pivot shaft;
(f) a second link having a first end and a second end, the first end of said second link being pivotally mounted on said first piston rod for pivotal movement relative thereto about said fourth pivot shaft and the second end of said second link being pivotally mounted on said bucket for pivotal movement relative thereto about a fifth pivot shaft;
(g) a holding arm mounted on said first bracket for pivotal movement relative thereto about a sixth pivot shaft; and
(h) a third link having a first end and a second end, the first end of said third link being pivotally mounted on said holding arm for pivotal movement relative thereto about a seventh pivot shaft and the second end of said third link being pivotally mounted on said bucket for pivotal movement relative thereto about a seventh pivot shaft,
whereby extension of said first piston rod relative to said first hydraulic cylinder causes said bucket to pivot relative to said arm from a first position to a second position and said holding arm to pivot relative to said first bracket from a first position in which said holding arm extends away from said bucket to a second position in which said holding arm extends into close proximity of said bucket.

4,635,387
SNOWPLOW BLADE WITH SPRING-LOADED EDGE FLAPS
Theodor Hiring, Industriestrasse 4, 7891 Dettighofen, Fed. Rep. of Germany
Filed Jun. 18, 1984, Ser. No. 621,514
Claims priority, application European Pat. Off., Jun. 24, 1983, 83106186.6
Int. Cl.[4] E01H *5/04*
U.S. Cl. 37—232 17 Claims



1. A snowplow having a blade (1) at least two spring flaps (2) being pivoted at the bottom of the blade by hinges, each having a hinge axis disposed approximately in the plane of said blade each spring flap having a wearbar (13) depending therefrom and being retained in its working position by a pre-tensioned reset spring (17), a U-shaped reinforcement rail mounted on the back of said blade, said reset spring (17) being compressive and included within a spring housing (12); and means responsive to the pivoting of said spring flaps to simultaneously compress said spring and displace said spring housing and said spring along said U-shaped reinforcement rail
said spring housing (12) being guided to be moveable longitudinally along said reinforcement rail.

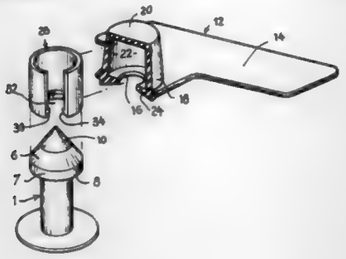
4,635,388
FRAMING HOOP FOR WALL HANGINGS
Janice W. Bussard, 201 N. Fruitport Rd., Spring Lake, Mich. 49456
Filed Jan. 28, 1986, Ser. No. 823,253
Int. Cl.[4] D05C *1/04*
U.S. Cl. 38—102.2 5 Claims



1. An improved framing hoop assembly for wall hangings, comprising, in combination, an outer hoop, an inner hoop for being received in said outer hoop and a take-up mechanism or said inner hoop for snugly fitting said inner hoop against said outer hoop; said outer hoop comprising a circularly closed band and said inner hoop comprising a circularly open band having a gap between opposite ends of said inner hoop, said take-up mechanism bridging said gap, and said take-up mechanism including means for being moved from a retracted position inside the periphery of the inner hoop to an outwardly extended position exterior to the periphery of the outer hoop

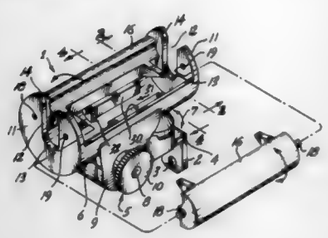
wherein said snug fitting is still being maintained by said takeup mechanism.

4,635,389
EAR TAG FOR MARKING ANIMALS
Gilles Oudelette, Vitre, France, assignor to Societe Nouvelle Rockall France S.A., Vitre, France
Filed Sep. 5, 1985, Ser. No. 773,308
Claims priority, application France, Sep. 7, 1984, 84 13794
Int. Cl.[4] G09F *3/00*
U.S. Cl. 40—301 11 Claims



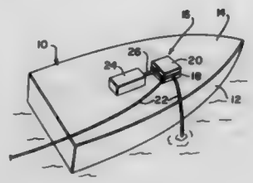
1. An ear tag for marking animals such tag comprising a male part having a stem with a head portion at the end thereof said head portion forming a shoulder extending outwardly of said stem and a female part having an opening through which the stem can locate and a hollow enclosed boss surrounding the opening to receive said head portion when the head portion has been passed through said opening, the area about said opening forming a shoulder which locks the head portion in place, a collar made of material which has a softening temperature higher than that from which the enclosed boss is formed is located within said boss, said collar having an internal rim which abuts against the said shoulder of the female part, the collar being radially expandable to enable said head portion, when engaged through said opening, to pass the internal rim and become located with the collar such as to be retained by the collar within the boss.

4,635,390
FISHING ROD SUPPORT
Haven B. Walters, 12723 22nd Ave. Northeast, Seattle, Wash. 98125
Filed Jun. 6, 1985, Ser. No. 741,984
Int. Cl.[4] A01K *97/10*
U.S. Cl. 43—21.2 12 Claims



1. A support for a fishing rod comprising an elongated housing having two aligned slots spaced apart longitudinally of said housing, extending transversely thereof and opening at the exterior thereof for receiving a section of the rod into said housing with the length of the rod extending longitudinally of said housing, a rotor, means mounting the rotor for swinging about an axis extending longitudinally of said housing but offset from said aligned slots, said rotor having a hook portion and being biased by gravity to an open position in which said hook portion is out of registration with said aligned slots, said rotor further having generally radially projecting leg means extending at least partway across said aligned slots when said rotor is in its open position for engagement by the rod when it is inserted into said slots so as to swing said rotor and move its hook portion into registration with said slots to block movement of the rod out of said slots, said leg means including generally radially projecting leg portions spaced axially of said rotor and generally adjacent to the opposite ends thereof.

4,635,391
FISHING LINE GRIPPING AND RELEASE ASSEMBLY FOR ATTACHMENT TO A FLOATATION MEMBER
Susan E. Early, 2938 Fox Tail Ct., Woodbridge, Va. 22192
Filed Jun. 13, 1985, Ser. No. 744,328
Int. Cl.[4] A01K *91/06*
U.S. Cl. 43—26.1 9 Claims



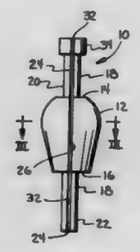
1. A fishing line gripping and release assembly in combination with a floatation member used to transport a fishing line to a remote fishing area of a body of water,

(a) said assembly including opposed members mounted on said floatation member between which an intermediate portion of the fishing line is positioned, said opposed members being of bar shape and arranged for movement into and out of superimposed relation, one of said opposed members being fixed to said floatation member,

(b) said opposed members being urged together by magnetic force to grippingly hold the fishing line therebetween while it is transported by the floatation member to the desired area for fishing, and

(c) remotely controllable means for releasing the fishing line from the opposed members and allowing it to drop into the water, said remotely controllable means being connected to the other of said members for slidably moving the other of said members out of engagement with said one of said members.

4,635,392
FLOAT DEVICE
Clarence L. Wirkus, 13435 N.W. Jay St., Andover, Minn. 55304
Filed Jun. 17, 1985, Ser. No. 745,142
Int. Cl.[4] A01K *93/00*
U.S. Cl. 43—44.9 3 Claims



1. A float device which may be readily and adjustably secured to a line said float device comprising:

(a) a buoyant body having a top surface and a bottom surface;

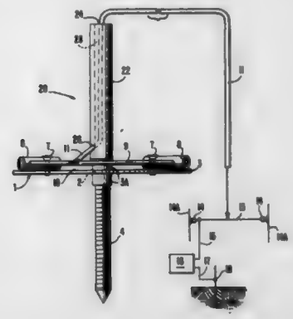
(b) an elongate one piece contiguous guide sleeve positioned centrally and fixed with in and projecting out both ends of the body, said sleeve having an upper end extending outward beyond the body top surface and a bottom end extending outward beyond the body bottom surface, said sleeve having an elongate slot and being C-shaped in section along its entire length;

(c) an elongate one piece contiguous locking key inside of the sleeve, said key being the same general length as the sleeve and having an elongate slot and being C-shaped in section along its entire length, said key being retained in said sleeve by a tight frictional fit inside of and to the sleeve;

(d) a round key handle on a first end of the key, said handle being of larger diameter than the sleeve and of substantially smaller diameter then the buoyant body, said handle being beyond one end of the sleeve and being abutted against an outer end of said sleeve; and

(e) in which both said key and said handle are a solid C-shape in cross-section, the opposed sides of the elongate slot in the key and handle being parallel to each other.

4,635,393
ELECTRIC INSECT KILLER
Harry L. Pfeffer, Sr., Rte. 2 Box 170, Caldwell, Tex. 77836, and Harry L. Pfeffer, Jr., Box 584, Bryon, Tex. 77805
Filed Jun. 17, 1985, Ser. No. 744,941
Int. Cl.[4] A01M *1/22*
U.S. Cl. 43—112 11 Claims



1. An apparatus for electrocuting insects comprising:

a. a flat plate and an insertion shaft for securing the plate to ground and providing an electrical contact to ground;

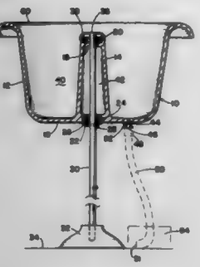
b. a rod located adjacent to the perimeter of said plate in the form of a closed ring concentric with the plate center, said rod being displaced from said plate sufficiently to permit an insect to pass therebetween, a means for electrically connecting said rod to an electrical source;

c. said rod and said plate cooperating to deliver an electrical charge sufficient to kill an insect passing therebetween;

d. an elongated handle, made of insulated material to protect the user, extending from a side of said plate opposite said shaft, wherein said handle and said shaft have a common longitudinal axis and said axis is perpendicular to said plate; and

e. said means for electrically connecting said rod to said source includes a wire having one end electrically connected to said rod, said wire passing through at least a portion of said handle.

4,635,394
BASKET FOR PLANTS
John A. Brown, 2604 Mountain Rd., Bartlesville, Okla. 74003
Continuation of Ser. No. 615,685, Jun. 1, 1984, abandoned, which is a continuation of Ser. No. 429,821, Sep. 30, 1982, abandoned. This application Feb. 21, 1985, Ser. No. 703,462
Int. Cl.[4] A47G *7/00*
U.S. Cl. 47—67 4 Claims



1. A rotatable container for plants and a host material comprising; a self-contained container means for receiving host material and plant directly therein, sufficient host material within the container means to support a plant, centrally disposed housing means extending longitudinally within the container and adapted to be at least partially enclosed within the host material, nonrotatable support means extending through the housing means for supporting the container means from a support structure in a manner consistent with free rotation of the container means about the stationary longitudinal axis of the support means, drain means provided directly in the lower portion of the container means for directing excess water drained directly from the host material and plant during watering thereof to a site completely out of the container, bearing means interposed between the housing means and support means for providing said free rotation for the container means, and sealing means disposed around the outer periphery of the support means and secured to the housing means for precluding leakage of fluid therebetween.

4,635,395
LOUVER ASSEMBLY PARTICULARLY USEFUL FOR AIR-CONDITIONING UNITS OR OTHER LIKE APPLIANCES
Avner Movshovitz, Tel-Aviv, and Joel Shwarzman, Givatayim, both of Israel, assignors to Amcor Ltd., Tel Aviv, Israel
Filed Aug. 1, 1985, Ser. No. 761,594
Claims priority, application Israel, Feb. 4, 1985, 74233
Int. Cl.[4] E05F *17/00*; G05G *9/00*; F24F *13/00*
U.S. Cl. 49—78 19 Claims

1. A louver assembly comprising:

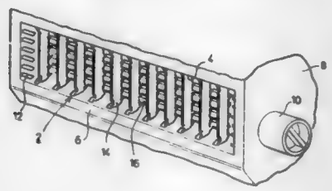
a frame defining an opening;

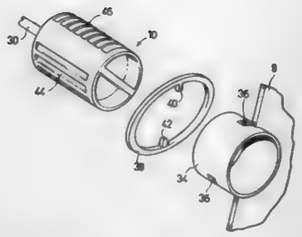
a first group of slats extending along one coordinate axis mounted to said frame within said opening and pivotable about said one coordinate axis;

a second group of slats extending along a second coordinate axis mounted on said first group of slats within said opening and pivotable about said second coordinate axis;

and a manipulatable knob coupled to both said groups of slats such that moving said knob in a direction parallel to

said second coordinate axis pivots said first group of slats about said first coordinate axis, and rotating said knob





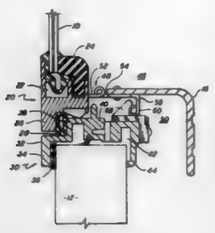
about said second coordinate axis pivots said second group of slats about said second coordinate axis.

4,635,396

BUS WINDOW RELEASE MECHANISM

John C. Ranz, Brewerton, and David T. Ahlgren, Syracuse, both of N.Y., assignors to O. M. Edwards Company, Inc., Syracuse, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,651
Int. Cl.[4] E05B *65/10*
U.S. Cl. 49—141 6 Claims



1. A release mechanism for a vehicle escape sash provided for an elongated vehicle window in an opening provided in a body panel of the vehicle, said window having a sash swingably mounted at an upper side of said opening, said escape sash having a sash subframe fixedly mounted on a lower edge of said body panel opening, a sash rail framing a lower edge of the window and bearing a resilient sealing member for sealably contacting said sash subframe, and a latch assembly for releasably holding said sash rail in place with said resilient sealing member compressed against said sash subframe, said latch assembly including

a keeper having a web secured to said sash subframe and having a keeper flange projecting upwards therefrom, said keeper flange having a rounded head and a generally cylindrical undercut recess defining a latch seat;

a latch member having a sash plate mounted to said sash rail and extending laterally inwards of said sash rail, a latch plate hingedly connected to said sash plate extending laterally inwards of said sash plate and having a depending flange with a generally cylindrical rounded head extending downwardly and generally outwards towards said sash rail, said latch member rounded head making continuous rolling contact with the latch seat of said keeper when the keeper and latch member are latched together; and

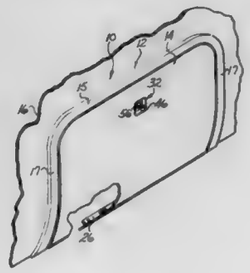
a sash bar mounted to the latch plate of said latch member and extending inwardly of said latch member over the same and said sash subframe and serving as a release handle, said sash bar being lifted to cam the rounded head of the latch member out of said latch seat and over said keeper flange to release the window for emergency egress.

4,635,397

COMBINATION LOCK AND CONCEALED LATCH MECHANISM FOR A DOOR PANEL

Ronald E. Wooten, Moreno Valley, Calif., assignor to Excel Industries, Inc., Elkhart, Ind.

Filed Nov. 12, 1985, Ser. No. 796,927
Int. Cl.[4] E05B *65/06*
U.S. Cl. 49—394 3 Claims



1. In combination, a latch and lock for an access member, said access member including an exterior frame defining an opening and an access panel having front and rear sides and hingedly connected to said frame for movement between an open position spaced outwardly of the frame and a closed opening spanning said frame opening, said latch including a latch part positioned behind said panel and shiftable between a latched position engaging said access member frame to secure the panel in its closed position and an unlatched position to permit the panel to shift into its open position, said latch part including hand engagement means shiftable over said panel rear side and accessible only through said panel opening to shift the latch part into its unlatched position, and biasing means for urging said latch part into its latched position.

4,635,398

WATERTIGHT WINDOW ASSEMBLY

Shunichi Nakamura, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 25, 1985, Ser. No. 715,419
Claims priority, application Japan, Mar. 27, 1984, 59-044717[U]
Int. Cl.[4] E06B *3/32*
U.S. Cl. 49—413 9 Claims

1. A watertight window assembly, comprising:

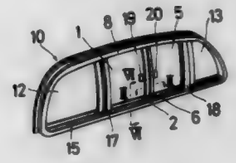
a window frame forming a window opening;

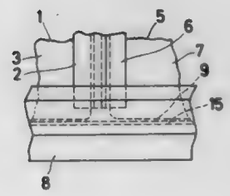
a single guide groove formed in the frame along spaced opposing edges of said opening;

two panes, each having an inner and outer surface, slidably mounted in said groove, said panes being slidable outwardly away from one another to open and inwardly toward one another to close the opening;

a weather strip mounted in the quide groove and abutting on said outer surface of the panes to form a watertight joint between said outer surface and said weather strip;

a frame member mounted on opposing ends of each of the panes, each said frame member having first spaced portions engaging said inner and outer surfaces and extending outwardly a predetermined distance to form an edge spaced from and along each said opposing end, one said frame member having second spaced portions extending inwardly a predetermined distance from the respective opposing end of said panes, another of said frame members having an inwardly extending portion dimensioned to fit between said spaced second portions of said one frame





member, when said panes close the opening, each said frame member extending in a direction substantially perpendicular to said guide groove through the watertight joint between said outer surface and said weatherstrip, each said frame member having an inclined plane surface portion in said joint between said outer surface of the pane and said weather strip, said inclined plane surface portion extending outwardly to said edge of each frame member; and

a watertight member disposed between the spaced extensions of said one frame member for abutting said inwardly extending portion of said other frame member to form a watertight joint when said panes close the opening.

4,635,399

DOOR JAMB SUPPORT

David E. Gehrke, 3202 N. 54th St., Milwaukee, Wis. 53216, and Hans Ewald, N55W14332 Carol Dr., Menomonee Falls, Wis. 53051

Filed Apr. 1, 1985, Ser. No. 718,484
Int. Cl.[4] E06B *3/30*; E04G *23/02*
U.S. Cl. 49—460 12 Claims

1. A door jamb support, comprising:

reinforcing means including a support plate having an opening therethrough and mountable on a door jamb so that said opening is in alignment with a door latch on a door;

a strike plate having an opening therethrough positionable in alignment with the opening in said support plate, said openings are rectangular in shape and the widthwise dimension of said strike plate opening is less than the widthwise dimension of said support plate opening;

adjustment means for adjusting the position of said strike plate on said support plate to vary the location of said strike plate opening with respect to said support plate opening, said adjustment means includes a series of spaced projections on said strike plate above and below said strike plate opening and a corresponding series of spaced indentations on said support plate above and below said support plate opening, and

there are five indentations above said support plate opening and six indentations below said support plate opening, and



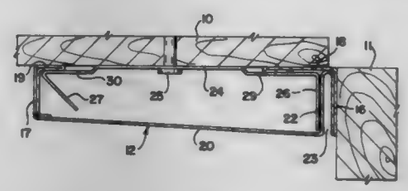
there are two projections above said strike plate opening and three projections below said strike plate opening; and mounting means for mounting said strike plate on said support plate.

4,635,400

OVERHEAD DOOR STOP

Willis Mullet, 3341 Edgewater Dr., Gulf Breeze, Fla. 32561

Filed Jul. 17, 1985, Ser. No. 755,850
Int. Cl.[4] E06B *1/04*
U.S. Cl. 49—504 6 Claims



1. A door stop for sealingly abutting a movable overhead door in closed position, comprising a channel of resilient material having forward and rearward legs and a web connecting said legs, said forward leg adapted to sealingly abut a movable door, the free ends of said legs have inturned flanges for abutting a door jamb, a fastening clip having forward and rearward flanges and a web connecting said flanges, said web adapted to be secured to the door jamb, said clip flanges, detachably interfitting said channel legs, and the rear flange of said clip being acutely angled to allow the inturned flange of said rear channel leg to slide over and resiliently snap behind the web of said clip, said forward leg of said channel being reversely bent to form a transverse open slot thereunder to allow the leg to flex.

4,635,401

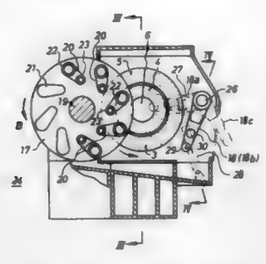
DUPLEX-HEAD SURFACE GRINDER

Takayuki Nakaji, Kawanishi, Japan, assignor to Daisho Seiki Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 528,475, Sep. 1, 1983, abandoned. This application Oct. 1, 1985, Ser. No. 782,152
Int. Cl.[4] B24B *7/16*
U.S. Cl. 51—5 D 1 Claim

1. An opposed, double-spindle type duplex-head surface grinder comprising:

(a) a pair of carriages mounted upon a base;
(b) a pair of grinding heads, each supported upon one of said carriages;
(c) a pair of grinding wheel spindles, each mounted in one of said grinding heads and connected to a power source so as to rotate said spindles about a longitudinal axis, said axes of said spindles lying along a common line;
(d) a pair of disc-shaped grinding wheels, each mounted to an end of one of said grinding wheel spindles so as to oppose each other, said wheel comprising a base disc, an annular large diameter grinding disc having a radially extending flat face perpendicular to said axis of said spindle and mounted to said base disc and a relatively smaller diameter grinding disc having the same composition as said large diameter grinding disc and mounted to said base disc at the center of said base disc, said radially extending flat face of said smaller diameter disc being positioned farther from said base disc than said radially extending flat face of said larger diameter disc.
(e) a rotary workpiece carrier mounted on a shaft parallel to said grinding wheel spindles so as to project a portion of



said rotary work piece carrier between said grinding wheels, said rotary work piece carrier having a plurality of workpiece holders and adapted to interpose said work pieces between said grinding wheels as said shaft is rotated; and
(f) a two-stage dresser arm having a base portion and a tip portion, each of which portions carries a pair of grinding chips mounted to project in opposite directions from said dresser arm and adjustable on said dresser arm so as to accurately control the distance between the opposed chips, the base portion of said dresser are being fixed to a shaft parallel to said grinding wheel spindles so as to interpose said dresser arm between the grinding wheel in a progressive manner and to simultaneously dress four faces of said grinding wheels; wherein a workpiece held in said workpiece holder is inserted between said grinding wheels in a postion such that flat surfaces on opposite sides of two portions of said work piece are simultaneously ground, the two portions having different thicknesses as measured perpendicular to the plane of said work piece carrier.

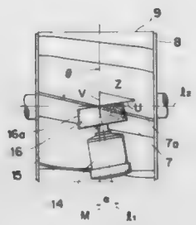
4,635,402

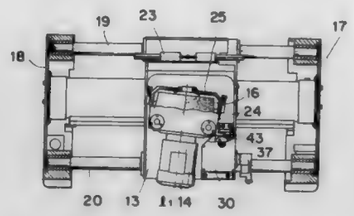
KNIFE ABRASIVE APPARATUS FOR ROTARY DRUM SHAPED CUTTER

Busaburo Sakabe, Yokohama; Kounosuke Hyuga, Oisomachi, and Kazuhito Araki, Hiratsuka, all of Japan, assignors to Japan Tobacco, Inc., Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 705,309
Claims priority, application Japan, Mar. 15, 1984, 59-48217
Int. Cl.⁴ B24B *9/04, 9/00*
U.S. Cl. 51—74 BS **6 Claims**

1. A knife abrasive apparatus for a rotary drum shaped cutter comprising:
a rotary drum and a plurality of knives, each of said knives having a blade edge, said knives spacedly disposed on the outer peripheral surface of said rotary drum at a predetermined helical angle with respect to a virtual cylindrical outer surface which blade edges of said knives will draw;
means for rotating said rotary drum shaped cutter about said first axis of rotation at a first predetermined speed;
an abrasive wheel, having a second axis of rotation, adapted to grind said knife blade edges;
means for rotating said abrasive wheel about said second axis of rotation at a second predetermined speed, said first and second predetermined speeds being set at a predetermined ratio;
movable support means for supporting said abrasive wheel for rotation about said second axis of rotation for grinding engagement with said knife blade edges with said second





axis of rotation declined at a predetermined angle to a vertical plane perpendicular to said first axis of rotation, said first predetermined speed in conjunction with said second predetermined speed and said predetermined angle producing a composite vector composed of a peripheral velocity vector of said rotary drum shaped cutter and a peripheral velocity vector of said abrasive wheel which is parallel to each of said knife blade edges in the longitudinal direction of each of the knives, said movable support means being reciprocally movable in the axial direction of said first axis of rotation;
reciprocation means for moving said movable support means reciprocally in said axial direction of said first axis of rotation.

4,635,403

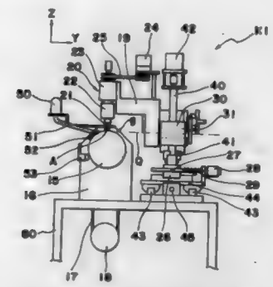
EDGE ROUNDING MACHINE

Masashi Makino, Toyonaka; Kunio Nakada, Suita; Isao Muragishi, Osaka, and Syozi Nishitani, Higashiosaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 12, 1985, Ser. No. 743,970
Int. Cl.⁴ B24B *9/00*
U.S. Cl. 51—94 R **8 Claims**

1. An edge rounding machine for performing edge rounding of an outer portion of a machining face of at least one workpiece, comprising:
a frame;
a cylindrical rotary member rotatably mounted on said frame for rotation about a rotary axis, said rotary member having a grinding face at its outer periphery comprising abrasive means for grinding said workpiece;

at least one holder movably supported on said frame for supporting said workpiece, means to rotate said holder about an axis of rotation which is perpendicular to the machining face of the workpiece;
support means mounted on said frame including means for adjusting said holder in horizontal and vertical directions and pivot means for pivoting said holder about a pivot axis which is perpendicular to a plane containing said rotary axis of said cylindrical rotary member;



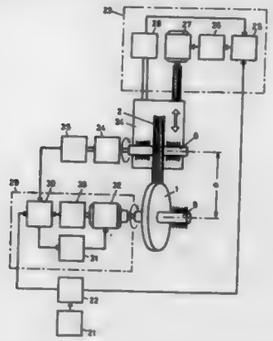
said pivot means for pivoting said holder in a plane which contains said axis of rotation of said holder and is parallel to a plane which contains said rotary axis of said cylindrical rotary member; and
a biasing means connected between said holder and said support means for biasing said holder towards said grinding face of said cylindrical rotary member so as to hold said outer edge portion of said machining face of said workpiece in contact with said grinding face at all times during machining of said workpiece.

4,635,404

APPARATUS FOR MACHINING A SPUR GEAR BY MEANS OF A ROTATING GEARLIKE TOOL

Walter Wirz, Pfaffikon, Switzerland, assignor to Reishauer AG, Wallisellen, Switzerland

Division of Ser. No. 744,657, Jun. 14, 1985, Pat. No. 4,559,744, which is a continuation of Ser. No. 342,960, Jan. 26, 1982, abandoned. This application Oct. 25, 1985, Ser. No. 793,409
Claims priority, application Switzerland, Jan. 27, 1981, 516/81
Int. Cl.⁴ B23F *1/02*
U.S. Cl. 51—105 HB **3 Claims**



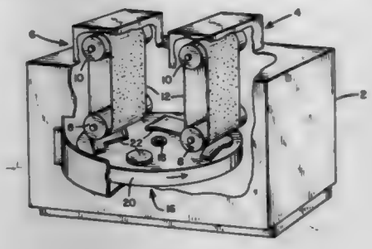
1. An apparatus for grinding the teeth of a rotating cylindrical spur gear workpiece comprising at least one rotatable worm shaped tool, drive means for rotating one of said workpiece and tool, feed means for radially moving said workpiece and tool relatively toward and away from each other, additional means for producing an additional rotational movement of one of said workpiece and tool when the axes of said workpiece and tool are a desired distance apart with the worm shaped tool at full depth relative to the teeth of the workpiece and with the axes of said workpiece and tool crossing each other at an angle smaller than 90° to carry out a machinging operation on said teeth, measuring means for continuously measuring said additional rotational movement during said machining operation to continuously monitor the machining operation and input means for limiting said additional rotational movement upon reaching predetermined teeth dimensions.

4,635,405

CONTINUOUS ARCUATE FEED ASSEMBLY

Lee E. Stump, Brooklyn Park, Minn., assignor to Timesavers, Inc., Minneapolis, Minn.

Continuation of Ser. No. 495,744, May 18, 1983, abandoned. This application Aug. 9, 1985, Ser. No. 763,963
Int. Cl.⁴ B24B *12/12*
U.S. Cl. 51—145 T **1 Claim**



1. An endless abrasive belt grinding assembly comprising:
(a) first and second driven endless abrasive belt grinders, wherein each grinder comprises:
(1) frame means;
(2) a lower driven contact drum and an upper idler drum operatively retained within said frame means to form a working drum pair and with said contact drum being adapted for rotatable motion about the central axis thereof;
(3) an endless abrasive belt having a longitudinal axis and being wrapped about each said working drum pair and arranged for travel along the direction of said longitudinal axis, with said longitudinal belt axis being generally normal to the central axis of the lower contact drum of said working drum pair;
(4) screw-jack means coupled to said frame means and disposed intermediate said contact drum and said idler drum for adjustably positioning said contact drum to establish the grinding plane of said abrasive belt; and
(5) air-filled bladder means operatively and resiliently coupling said contact drum to said frame means for applying a substantially continuous bias force against said contact drum as it engages workpieces passing along said grinding plane thereunder;
(6) a circular rotating table having a centrally disposed axis of rotation, means for rotating said table at a substantially continuous arcuate rate of speed, and with a plurality of work-retaining platens thereon, each platen being disposed on said rotating table in radially spaced relationship to said axis of rotation and being arranged to move along a closed circular path at said substantially continuous rate of speed, and said work-retaining platens being further adapted to receive and support at least one workpiece thereon for arcuately conveying said workpiece on said rotating table along said circular path and immediately beneath the contact roll of each of said working drum pairs within said grinding assemblies to create a working line of contact between said abrasive belt and the surface of said workpiece and

thereby remove a desired amount of material from the thickness of said workpiece; and

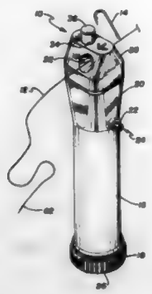
(7) the central axis of rotation of the lower contact drum of each working drum pair being disposed and positioned relative to the surface of said rotating table and to the arcuately moving workpieces secured thereto such that the angular relationship between the contact drum central axis of rotation and the direction of motion of the work-retaining platen at the point where said work retaining platen moves directly beneath said central axis of rotation and along said closed circular path ranges from between about 15 degrees and 60 degrees.

4,635,406

APPARATUS FOR STRIPPING FISH LINE FROM A SPOOL AND SHARPENING FISH HOOKS

James T. Rumbaugh, Spirit Lake, Iowa, assignor to Berkley and Company, Inc., Spirit Lake, Iowa

Filed Sep. 28, 1984, Ser. No. 655,569
Int. Cl.[4] B24B *23/02*; B65H *20/02*
U.S. Cl. 51—181 R 8 Claims



1. A line stripper for removing line from a spool, comprising:

housing means provided with an inlet port and an exit port;

motor means disposed within the housing means;

drive roller means disposed within the housing means and operatively coupled for rotation by the motor means;

idler roller means pivotally mounted within the housing means on an axis parallel to the rotational axis of the drive roller means and operatively biased into engagement with the drive roller means for combined rotation therewith; and wherein the drive roller means and idler roller means are aligned with the inlet and exit ports for engaging and transporting the free end of a line inserted into the inlet port, between the rollers and out the exit port;

said inlet port and said exit port each respectively extending to close proximity to said drive roller and said idler roller with the ends of said inlet and exit ports respectively forming surfaces tangential to said drive roller and idler roller;

an aperture through the housing means for receiving a sharpening means;

sharpening means operatively connected to the motor means within the housing means; and wherein:

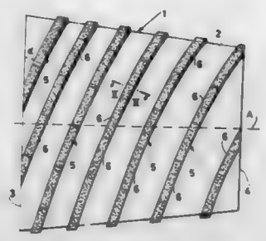
the sharpening means is axially aligned with and projects through the housing means aperture.

4,635,407

TRUNCATED-CONE ROLLER WITH ABRASIVE SURFACE FOR SMOOTHING TOOL WITH RADIAL TRUNCATED-CONE ROLLER

Ernanno Pacini, Viale Boezio, 10, 20145 Milano, Italy

Filed Apr. 5, 1984, Ser. No. 596,949
Claims priority, application Italy, Apr. 27, 1983, 20810 A/83
Int. Cl.[4] B24B *33/00*
U.S. Cl. 51—206 R 7 Claims



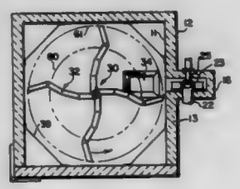
1. A truncated-cone roller with abrasive surface for roughing, smoothing and polishing machines provided with a working tool rotatable about a vertical axis and including truncated-cone abrasive rollers radially disposed with respect to said vertical axis, wherein said abrasive surface consists of at least one variable-pitch continuous helix of abrasive material, said helix having a pitch which varies continuously from a minimum at the outer base to a maximum at the inner base of the roller.

4,635,408

DISCHARGE OF BLASTING MEDIA FROM A TREATING CHAMBER

Thomas W. Burke, Allentown, and David J. Klee, Emmaus, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 445,603, Nov. 30, 1982, Pat. No. 4,524,550.
This application Feb. 22, 1985, Ser. No. 704,678
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—292 3 Claims



1. In the blasting of articles to remove molding flash or coatings therefrom by projecting a high velocity stream of impact media against the articles within a thermally insulated enclosure having an insulated bottom, wherein a mixture comprising the used media and fragments of material removed from said articles by said stream fall upon a plane surface at the bottom of said enclosure, the method of discharging said mixture from said enclosure which comprises:

sweeping said mixture continuously over said surface toward and into an opening in the bottom of said enclosure through adjoining paths defining an inner path and an outer path, the inner path being defined by a central circular area and the outer path being defined by an annulus surrounding said circular area, said annulus having an area substantially equal to that of the circular area, and wherein the mixture within said circular area during such sweeping is caused to move radially outward and the mixture within said annulus is caused to move radially inward during travel toward said opening; and wherein said sweeping is effected by a rotating device having a plurality of sweep arms equally spaced circumferentially from one another, and the rate of said sweeping being controlled by actuating means adjacent the bottom exterior of said enclosure, said actuating means including a circumferentially enveloped rotating member passing upwardly through an opening in the insulated bottom of said enclosure; said rate being substantially that defined by the mathematical formula

$$N = \frac{6.28\ m}{\rho d A n}, \text{ wherein}$$

N=the speed of rotation of said rotating member in radians/second,

m=the flow rate of impact media entering said enclosure in kilograms/second,

n=number of sweep arms,

ρ=bulk density of said media in kilograms/cubic meter,

A=area of the bottom of said enclosure in square meters, and

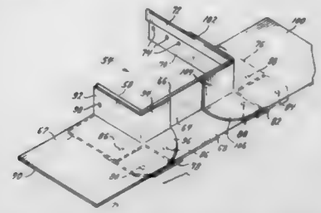
d=depth of media on the bottom of the enclosure in meters.

4,635,409

PLURAL-SECTION PITCH PAN

William J. Vandemore, St. Louis County, Mo., assignor to Lucas Sales Company, Inc., St. Louis, Mo.

Filed Sep. 17, 1985, Ser. No. 776,839
Int. Cl.[4] E04B *1/36*
U.S. Cl. 52—60 12 Claims



1. A plural-section pitch pan that comprises a first pre-fabricated section which has skirting that is smoothly and intimately secured thereto as a integral part thereof, said section and said skirting thereof being movable as a unit into position on a roof adjacent an object that extends upwardly through said roof, said section having a plurality of relatively-stiff walls which are generally vertically directed and horizontally extending and which form a corner and which have interior and exterior faces and lower edges and said skirting overlying and concealing said corner and substantially all of said exterior faces, said section having the skirting thereof projecting outwardly from said lower edges of said walls and outwardly from said object before and after said section is disposed on said roof, said skirting having a periphery which is spaced outwardly from said walls of said section, said skirting having flexible outer portions that are adjacent said periphery and that are readily conformable and readily adherable to said roof, said skirting providing a continuous, corrosion-resistant, water-impervious surface from said periphery of said skirting to said interior faces of said walls, a second pre-fabricated section which has skirting that is smoothly and intimately secured thereto as an integral part thereof, said second section and said skirting thereof being movable as a unit into position on said roof adjacent said object, said second section having a plurality of relatively-stiff walls which are generally vertically directed and horizontally extending and which form a corner and which have interior and exterior faces and lower edges and said skirting overlying and concealing said corner and substantially all of said exterior faces, said second section having the skirting thereof projecting outwardly from said lower edges of said walls and outwardly from said object before and after said second section is disposed on said roof, said skirting on said second section having a periphery which is spaced outwardly from said walls of said second section, said skirting on said second section having flexible outer portions that are adjacent said periphery and that are readily conformable and readily adherable to said roof, said skirting on said second section providing a continuous, corrosion-resistant, water-impervious surface from said periphery of said skirting to said interior faces of said walls of said second section, said sections having portions of said walls thereof engageable with each other to lap and thereby cause said sections to define a filling-confining recess around said object whenever said sections are disposed on said roof adjacent said object, said skirting on said first section having edges which are disposable close to edges of said skirting on said second section whenever said portions of said walls of said sections are in lapping relation, whereby said sections can receive and confine filling around said object and also can be sealed to said roof in substantially water-tight engagement throughout the entire lengths of said peripheries of said skirtings on said sections.

4,635,410

DECORATIVE FABRIC WALL SYSTEM

James F. Chambley, 16018 Inglewood Rd., Bothell, Wash. 98011

Filed Apr. 17, 1985, Ser. No. 723,969
Int. Cl.[4] A47H *23/00*; E04B *1/00*
U.S. Cl. 52—63 25 Claims



1. A decorative fabric wall system, comprising:

(a) a plurality of wall frame members for defining the margin of a predetermined area to be covered by fabric, each member including an adhesive layer on one face, and a magnetic or ferrometalic strip on the other face, the members being interconnectible to define the frame;

(b) a plurality of complementary fabric holding frame members interconnectible to form a stretcher frame for holding the fabric, each member including a ferrometalic or magnetic strip on a rigid body such that the fabric members and the wall members may be magnetically adhered together;

(c) a decorative fabric of an area slightly larger than the predetermined area so that a margin of the fabric can extend around the fabric holding frame members to fully conceal the frame members; and

(d) means for adhering the fabric to the fabric holding frame members with the frame concealed.

4,635,411

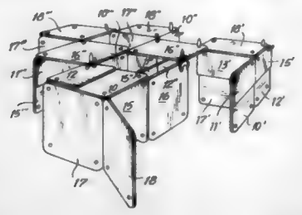
CONSTRUCTION PANEL SYSTEM

Aaron Kurzen, Box 3233, Stony Creek, Conn. 06405

Continuation of Ser. No. 196,208, Oct. 14, 1980, abandoned.
This application Aug. 9, 1983, Ser. No. 503,351
Int. Cl.[4] A63H *33/10*
U.S. Cl. 52—71 2 Claims

1. A construction panel system for the erection of doll and play houses, mazes, etc., comprising a series of a least four similarly shaped panels connected together so that each panel can be rotated with respect to an adjacent panel about adjacent edge portions thereof, at least three of said panels being con-

nected at opposite edges to the adjacent panel by a double hinge of the Jacobs ladder type, at least one of said panels being substantially continuous with respect to an adjacent panel and connected thereto along a creased line forming a single hinge therebetween so that if can be rotated about an axis at right angles to axes to rotation of the double hinge, said last named panel being so constructed that it is collapsible together with the other panels one the respective hinges into a single stack having the area of approximately one panel, a plurality of edges of the various panels, including the edges of the panels with a single hinge connection, containing an opening adapted to receive fastening means for connecting two of the series of panels together, in combination with a fastening and reinforcing means comprising a two-part means, stamped or cut from



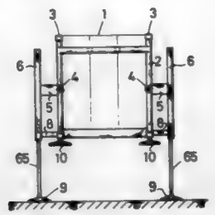
planar, resilient, flexible material, a first part of said two-part means comprising two side fingers extending outwardly from an intermediate portion thereof and a central, longer and oval shaped finger extending outwardly from the intermediate portion between the two side fingers, said central finger being wider at its widest part than the openings in the edges of said panels but being sufficiently resilient and flexible to be forced through such openings, the second part of said fastener being the mirror image of said first part, whereby the edges of two panels can be connected in an abutting relation by forcing the central finger of a first part of the fastening means through one of said openings in a first panel and also forcing the central finger of the second part of the fastener through one of said openings in a second panel to be connected to the first panel.

4,635,412

FOLDING HOUSE TRANSPORTABLE IN THE FORM OF A STACKABLE CONTAINER

Yves M. J. Le Poittevin, 40 Avenue Marceau, Paris 8, France

Filed Jun. 28, 1985, Ser. No. 750,697
Int. Cl.[4] E04B *1/344*
U.S. Cl. 52—79.5 5 Claims



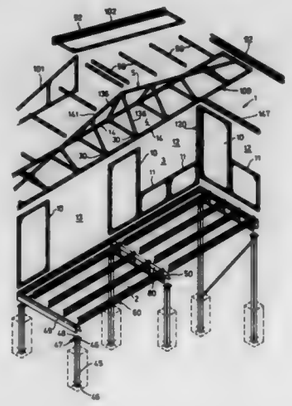
1. A folding house comprising component elements which constitute, in a folded up position of the house, a closed and sealed container in which container are folded up all other component elements of the house, lateral walls of the container in the folded up position of the housing being formed by panels of a floor of the house while an upper wall of the container is formed by panels constituting corbelling walls of the house in the opened out position of the house, the house comprising an axial bay formed by a ladder-girder constituting a longitudinal framework which ensures the stability and the bracing of the opened out house and the rigidity of the container in the folded up position of the house, an end element connected to each end of said ladder-girder raising and opening out means formed by jacks having racks being pivotally mounted on said end elements, and said house comprising roof elements to which said racks are adapted to be connected, two racks being pivotally connected to each end element on opposite sides of each end element and for rotation about a horizontal axis near a middle of each rack, each rack having a first end engaged on said floor with said component elements folded and a stop block near a second end of each rack, each rack being pivotable by about 180° to engage its stop block against an outer edge of said floor with said rack outside said bay and said component elements unfolded.

4,635,413

STRUCTURAL CONNECTORS AND/OR STRUCTURES

Peder U. Hansen, Auckland, New Zealand, and Mark D. Beazley, Nerang, Australia, assignors to Hong Sheet Metal Pte. Limited, Collyer Quay, Singapore

Filed Oct. 4, 1985, Ser. No. 784,386
Claims priority, application Australia, Oct. 11, 1984, PG7590
Int. Cl.[4] E04B *7/04, 7/16;* E04C *1/10*
U.S. Cl. 52—92 15 Claims



1. A panel comprising:
a perimeter frame comprising members having a first inwardly facing channel and an oppositely outwardly facing second channel so that when a pairof panels are positioned in a side-by-side relationship, one of said channels of the perimeter fame of one panel is engageable in the other channel of the perimeter frame of the adjacent panel;
a pair of skins spaced apart by said perimeter frame; and
load distributing connecting members at the corners of said perimeter frame;
each load distributing connecting member comprising a pair of spaced plates joined over a part of the surface of each plate, and at least one of said plates having a tongue member engageable with each adjacent inwardly facing channel.

4,635,414

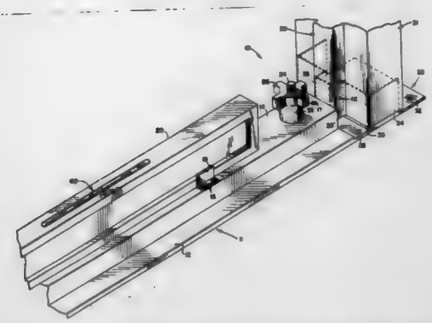
ADJUSTABLE DOOR JAMB LEVELER

Ernest R. Allen, 1131 Vine St., Jonesboro, Ark. 72401

Continuation-in-part of Ser. No. 418,429, Sep. 15, 1982, Pat. No. 4,478,016. This application Oct. 31, 1983, Ser. No. 547,137
The portion of the term of this patent subsequent to Oct. 23, 2001, has been disclaimed.
Int. Cl.[4] E04D *15/00*
U.S. Cl. 52—126.1 15 Claims

1. An adjustable device for leveling a door jamb, comprising:

a longitudinal brace member; a pair of elongated spacer members; means for slidably mounting each spacer member on a respective end portion of said brace member; a plate member secured to each spacer member and extending longitudinally outwardly therefrom, each plate member having a lip portion of relatively thin vertical dimen-



sion at the outer end thereof; and a generally vertical bolt member threadedly received in the outer end portion of each spacer member, said bolt member extending through to the lower surface of said device so as to contact the floor when said device is positioned on the floor while leveling a door jamb.

4,635,415

GLASS PANE GLUED INTO THE FRAME OF AN AUTOMOBILE BODY BY MEANS OF AN ELASTOMERIC POLYMERIZED ADHESIVE

Rolf Schumacher, Sindelfingen; Heinz Faix, Gechingen, and Ulrich Brulnke, Ehningen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jan. 13, 1986, Ser. No. 818,333
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1985, 3501490
Int. Cl.[4] E06B *3/00*
U.S. Cl. 52—127.1 14 Claims



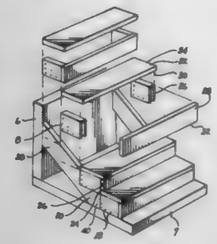
1. A glass pane adhesively secured in the frame of an automobile body by means of an adhesive, said pane carrying on its surface within the adhesive area an electrical conductor strip means provided with electrical connecting means, the adhesive being an irreversibly hardening cross-linked elastomeric adhesive, and the conductor strip means being coated on its side facing the adhesive with a separating layer means made from a thermally fusible material.

4,635,416

METAL CHANNEL APPARATUS AND METHOD FOR FORMING A STAIRWAY

Albert Ayala, 2105 N. Bullmoose, Chandler, Ariz. 85224

Filed Aug. 26, 1985, Ser. No. 769,366
Int. Cl.[4] E04G *13/06;* E04F *11/12*
U.S. Cl. 52—188 1 Claim



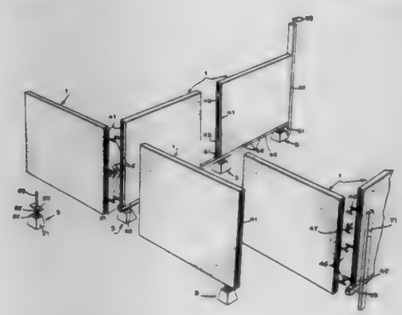
1. A method for forming a stairway by using a series of metal channels, each having a generally u-shaped configuration, comprising the steps of:
diagonally coupling a rectangular beam onto a vertical brace member and a horizontal base member;
placing each of said metal channels thereabove a generally rectangular beam;
fastening each side of said u-shaped metal channel to each side of said rectangular beam;
placing a step thereabove the top portion of a horizontal side joining each of the pair of perpendicular extending sides of said generally u-shaped metal channel;
fastening said step onto said beam with a nail means;
placing a riser thereabove said step abutting the front portion of said metal channel;
fastening said riser onto said step with a nail means;
placing an upper step onto the upper end of said riser;
fastening said upper step onto said riser with a screw means; and thereafter
integrally joining a bottom metal channel having a height smaller than the height of the series of said metal channel, said bottom metal channel has a height equivalent to the height of said riser.

4,635,417

PORTABLE PARTITIONING PANEL

Gilles Larouche, Mont St-Hilaire, Canada, assignor to Societe d'Energie de la Baie James, Montreal, Canada

Filed Aug. 9, 1985, Ser. No. 764,181
Int. Cl.[4] E04B *2/72*
U.S. Cl. 52—239 3 Claims



1. A portable panel for partitioning a building space, said panel comprising:
(a) two wall units both having the same surface area, each

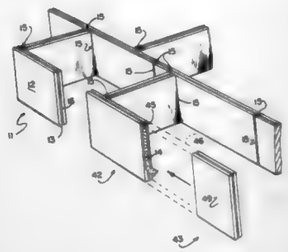
wall unit comprising a board of rigid insulating material fixed onto one side of a frame comprising a pair of external uprights made of wood, said uprights having ends connected by two horizontal planks, said wall units being mounted end to end onto a single piece of cloth with a small space left therebetween and with said boards in contact with said cloth, said piece of cloth being stretched on and fixed to the uprights and the opposite planks of said two wall units on the other sides of their frames, said wall units being closed one against the other with the piece of cloth acting as a hinge, said closing advantageously dissimulating the fixation of the cloth onto the said wall units and thus avoiding the use of a decorative mask, said two wall units being maintained one against the other in closed position by two small plates extending across and fixed to the opposite planks of the frame of said wall units after said opposite planks have been brought one against the other, said opposite planks of the wall units brought one against the other defining the bottom of the panel,

(b) a sound-insulating sheet covered on its both sides with a layer of not-compressed material whose function is to improve the acoustic factor of the whole panel by muffling the sound stopped by the insulating sheet, said insulating sheet and its two covering layers being located inside the panel between the two wall units and

(c) means integral with said wall units for operatively installing the panel in the building space in a removable manner, said installation means comprising at least two passages provided in said frames for receiving a support rod, said passages extending from said opposite planks brought one against the other toward the top of the panel, each of said passage being defined by two other uprights made of wood and fixed parallel to the uprights of the frame of at least one of said units between two vertical planks whose surfaces are parallel to the surfaces of the wall units;

wherein the frame of each unit further comprises a plurality of internal uprights spaced apart from each other between the external uprights, said internal uprights of both of said units being mounted in alternate rows to pinch the insulation sheet and its two covering layers therebetween.

4,635,418
PORTABLE PARTITION WALL SYSTEM
Charles M. Hobgood, P.O. Box 19916, Atlanta, Ga. 30343
Filed Dec. 3, 1984, Ser. No. 677,227
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—239 **7 Claims**



1. A knock-down wall system for joining a panel to a static member, comprising:

a panel comprising:

a core comprising a pair of major surfaces connected by an edge surface, said edge surface defining a groove therein;

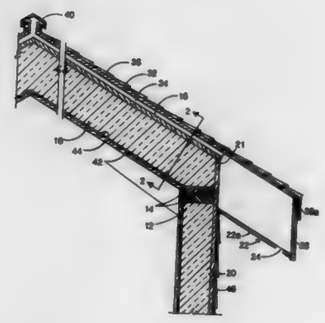
an adhesive binding agent applied to said major surfaces and to said groove; and

loop fabric applied to both said major surfaces and extending from both said major surfaces into said groove, said fabric being adhered to said major surfaces and to said groove by said adhesive binding agent; and

hook fastener tape extending substantially the same length as the length of said groove, said tape being attached to said static member;

said grooved edge surface of said panel being removably joined to said static member solely along said hook fastener tape by interconnection of said hook fastener tape with said loop fabric on both sides of said groove.

4,635,419
VENTED ROOF CONSTRUCTION
Joseph C. Forrest, Box 154, Somerset, Wis. 54025
Continuation-in-part of Ser. No. 494,642, May 16, 1983, abandoned. This application Nov. 20, 1985, Ser. No. 799,801
Int. Cl.[4] E04B *1/70*
U.S. Cl. 52—303 **7 Claims**



1. A vented roof construction including,

an insulated inner roof structure,

an intermediate layer sealingly covering the insulated inner roof structure,

an outer roof sheeting layer spaced outwardly from the intermediate layer and providing vent passage means therebetween,

venting means at the two ends of said passage means to provide vented areas at the ends of the passage means and produce circulation therethrough and remove condensation from the top surface of the intermediate layer,

spacing and supporting means interposed between said two layers to provide support for the outer roof sheeting layer while maintaining the vent passage means therebetween,

wherein said spacing means comprises a plurality of spaced-apart firring strips extending between the proximate end portions of said layers and defining individual passages and said venting means communicating with the ends of said individual passages,

and said firring strips terminating in spaced relation to the ends of said passages providing cross passages to afford communication between adjacent passages, said venting means communicating with the cross passages to eliminate dead air space from the roof structure.

4,635,420
MOTOR VEHICLE GLAZING ASSEMBLY AND METHOD OF MANUFACTURE THEREOF
Michael Batky, Brooklyn, N.Y., assignor to Almac Plastics Inc., Long Island City, N.Y.
Filed Apr. 22, 1985, Ser. No. 726,079
Int. Cl.[4] B29C *65/08*; B60J *1/00*
U.S. Cl. 52—309.1 **17 Claims**

1. A motor vehicle glazing assembly comprising:

a sheet of thermoplastic glazing material; and

a gasket comprising:

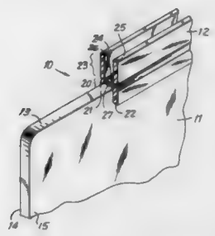
a flexible glazing mating portion,

a flexible vehicle mating portion, and

an ultrasonic welding capable portion adjacent said glazing mating portion; wherein

said thermoplastic glazing material is received in said flexible glazing mating portion such that it contacts said ultrasonic welding capable portion, said thermoplastic glazing material being ultrasonically welded to said ultrasonic welding capable portion.

12. A method of manufacturing a motor vehicle glazing assembly, said method comprising the steps of:



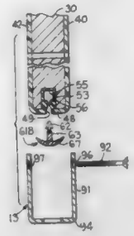
providing a sheet of thermoplastic glazing material;

forming a gasket comprising a flexible glazing mating portion, a flexible vehicle mating portion, and an ultrasonic welding capable portion adjacent said flexible glazing mating portion;

receiving said sheet of thermoplastic glazing material in said flexible glazing mating portion such that it contacts said ultrasonic welding capable portion; and

ultrasonically welding said thermoplastic glazing material to said ultrasonic welding capable portion.

4,635,421
MOLDED DOOR
Phillip J. Newberg, Mattawan, Mich., assignor to Eliason Corporation, Kalamazoo, Mich.
Filed Apr. 17, 1985, Ser. No. 724,233
Int. Cl.[4] E04C *2/34*
U.S. Cl. 52—309.11 **7 Claims**



1. A door construction comprising:

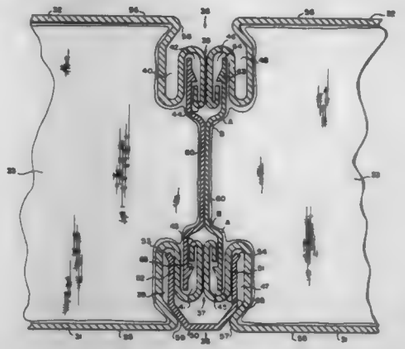
a core having a slot in and extending along a peripheral edge thereof and spaced from the front and rear faces thereof;

substantially rigid front and rear door skins of molded synthetic resin material sheet having a thickness substantially less than that of said core; said door skins each having a shallow tray shape including a peripheral edge flange, the peripheral edge flanges of said front and rear skins being opposed to each other in coplanar fashion and partly overlapping said slot and narrowing the open side thereof;

a gasket retainer extending along said slot and trapped therein by said peripheral edge flanges of said door skin; and

a resilient edge gasket removably retained in said gasket retainer, a window port in the core and spaced inboard of the periphery of the core, said front and rear door skins having face portions adhesively bonded to the front and rear faces of said core respectively, said door skins each having a window opening in registry with said window port, said skins having a bend at the edge of the core window port, said skins having respective ramps extending from said bends, inward toward each other, said ramps converging each at about a 60° angle to the central plane of the core, said ramps meeting adjacent the central plane of said core with face to face engaging flanges adhesively bonded together and defining the boundary of the window opening in said skins, adjacent ramps of said skins lying close inboard of the edge of the core window port, a resilient window gasket of substantially H-cross section having inboard and outboard grooves, said window flanges of said skins being received in said outboard groove, a window pane received in said inboard groove such that said window pane is substantially in the central plane of said door core, said H-cross-section gasket having a total thickness somewhat less than that of said door so as to lie between the planes of the outer surfaces of said door skins and thereby being protected from snagging and the like, said core being entrapped between said window opening ramps and said peripheral edge flanges of said front and rear door skins in directions parallel to the plane of the door.

4,635,422
INTERLOCKING SEAL FOR INSULATED PANELS
William C. Nowack, Twin Lakes, Wis.; Stephen J. Moore, and Kenneth F. Weger, Jr., both of Cary, Ill., assignors to Knaack Manufacturing Company, Crystal Lake, Ill.
Filed Jul. 16, 1984, Ser. No. 631,410
Int. Cl.[4] E04B *2/00*
U.S. Cl. 52—406 **12 Claims**



1. In a series of insulated panel members defined by an inner skin in parallel spaced relationship with an outer skin, an insulation material occupying the space between the inner and outer skins, the improvement comprising in combination

means for sealing the top and bottom of the panel, means for locking adjacent panel members in end-to-end relationship to form a wall of interconnected insulated panels, the locking means comprising means integral with the end flaps of said inner and outer skins for forming a labyrinth having at least one slot opening outwardly away from said insulation and clip means lockingly engageable with the slots of the adjacent panel members, said labyrinth forming means comprising a series of bends along the end flaps of the inner and outer skins, each end flap being bent inwardly at an angle greater than 90° relative to the skin for a short distance to create an undercut slot, and then continuing inwardly at approximately 90° relative to the siin for a short distance more before being bent outwardly 180° to form an outwardly opening first slot, the flap then being bent 180° inwardly to form an inwardly opening

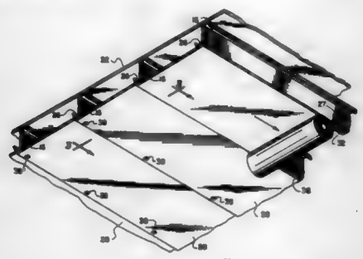
second slot of approximately the same size as the first slot, the flap being bent 180° outwardly and into the second slot to form a lip, and said clip means comprising a U-shaped clip having a pair of legs, the legs sliding into locking engagement with the first slots of abutting panel members, the second slot of each panel member being positioned between the legs of the clip, the legs of the clip extending into the first slots a sufficient distance so that the entire clip is below the surface of the inner and outer skins of the panel member when assembled, a spacer in slidable interlocking relationship with said locking means, the spacer separating and holding the inner and outer skins in parallel spaced relation and to contain the insulation, the spacer having a plurality of slots along its longitudinal axis to expose portions of insulation, the spacer being offset slightly so that when two panel members are locked together the spacer of one panel member is in direct mating relationship with the spacer of the adjacent panel member and the slots of one spacer correspond to the slots of an adjacent spacer to allow the insulation of one panel member to align and contact the insulation of the adjacent panel member which will serve to minimize heat loss through the interconnection.

4,635,423

BUILDING INSULATION AND WALL COVERING SYSTEM AND METHOD

Lonnie R. Ward, P.O. Box 493, Lewisville, Tex. 75067

Filed Oct. 3, 1984, Ser. No. 657,380
Int. Cl.⁴ E04B *1/74, 5/52*
U.S. Cl. 52—746 **19 Claims**



1. A method for covering exposed beam ceilings and walls of a building interior having a plurality of parallel spaced apart metal beams forming a structural support for at least one of said ceiling and wall, said beams each having generally planar flange portions forming an inner distal surface and the space between said distal surface and said outer covering being adapted to be occupied by insulation material, said method comprising the sequential steps of:

applying a substantially continuous coating of liquid adhesive to a predetermined longitudinal length of the distal surface of a first adjacent pair of said beams;

applying a sheet-like panel of a flexible reinforced multilayer covering material over the previously coated distal surfaces of said first beam pair by unrolling said covering material from a supply roll source of said covering material to position said panel in an adhesive adhering relation to said beams; and

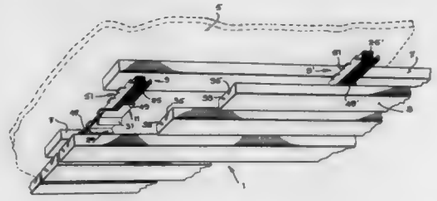
repeating the previous sequential application steps of applying said liquid adhesive and said panel for other adjacent pairs of said beams.

4,635,424

ONE-PIECE FASTENER FOR SECURING A LINING ELEMENT IN A REMOVABLE MANNER ON A CARRYING SURFACE

Rémi Drapeau, Quebec, Canada, assignor to Les Enterprises Manuspec Inc., Quebec, Canada

Filed Nov. 21, 1985, Ser. No. 800,385
Claims priority, application Canada, Nov. 26, 1984, 468433
Int. Cl.⁴ E04B *5/52*
U.S. Cl. 52—480 **9 Claims**



1. A one-piece fastener for adjustably and releasably securing a lining element to a carrying surface to be lined or finished, said fastened comprising a thin plate rectangular in shape having, on one face thereof, two fastening tongues extending obliquely from said one face plate in two opposite directions for insertion into two corresponding oblique grooves provided in the lining element for securing and holding said lining element, said two fastening tongues extending transversely of the longitudinal axis of said rectangular plate over the full width thereof and being inclined toward one another, said thin plate having on the other face thereof, means capable of reversibly locking said plate by simply pressing said plate on and against a rail rigidly fixed to the carrying surface to be lined or finished, said reversibly locking means comprising two pair of teeth disposed and spaced from one another so as to simultaneously lock over two parallel edges forming integral parts of the rail, said pairs being symmetrically disposed one on each side of said rectangular plate so as to allow securing said plate at two points on the same rail, the longitudinal axis of said plate being thus aligned with the rail, wherein said thin rectangular plate integrally projects at either end to form small positioning lugs, said lugs each extending over a half-width only of said plate and being staggered with respect to one another so that each lug may serve as a referenced and as abutment for the precise positioning of an adjacent similar fastener over the same rail.

4,635,425

PORTABLE AND MODULAR DANCE FLOOR

Michel Cova, Villeurbanne, France, assignor to Constructions Metalliques et Carrosseries Caire Claude, Voglans, France

Filed Jul. 9, 1985, Ser. No. 753,244
Claims priority, application France, Jul. 9, 1984, 84 11213
Int. Cl.⁴ E04D *5/52*
U.S. Cl. 52—480 **10 Claims**

1. A portable dance floor for use on a stationary floor surface, the floor being formed of a plurality of like elements each comprising:

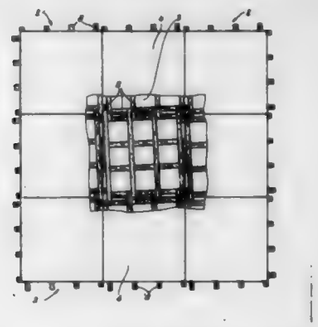
vertically spaced upper and lower similar rectangular panels having straight edges; and

at least an upper and a lowe set of parallel and spaced-apart sticks, the upper set being fixed to the upper panel and to the lower set and the lower set being fixed to the lower panel, the sticks of the upper set being generally perpendicular to those of the lower set, both sets including two edge sticks at and generally parallel to respective opposite edges of the panels,

the floor also comprising

means for laterally connecting the sticks of different elements with the respective upper panels substantially coplanar

each set of sticks being of a predetermined thickness and extending at a small acute angle to the respective edges so that each edge stick has one end immediately juxtaposed



with the respective panel edge and an opposite end spaced inward therefrom by a distance equal generally to its thickness.

4,635,426

DEVICE FOR BRIDGING THE JOINT BETWEEN TWO PARTS OF A ROOF AND METHOD FOR TESTING ITS TIGHTNESS

Ernst Ammann, Baltenswilerstrasse #127, CH8360 Wallenwil, Switzerland

Continuation-in-part of Ser. No. 421,570, Sep. 22, 1982, abandoned. This application Jun. 12, 1984, Ser. No. 619,860
Claims priority, application Switzerland, Oct. 6, 1981, 6410/81
Int. Cl.⁴ E04B *1/62*
U.S. Cl. 52—573 **7 Claims**



1. In a roofing structure, a device for bridging a juncture between two composite parts of said roofing structure in the form of an expansion joint comprising:

two sheet metal side portions providing a gap positioned between said side portions,

a rubber elastic material bridging said gap and equipped with flanges bondingly vulcanized in a waterproof manner to said sheet metal side portion,

said expansion joint element being connected to the roofing structure extending on both sides of said expansion joint,

a narrow separating strip secured to each of said side portions and being arranged between each of said metal side portions and the flanges of said rubber elastic material to interrupt the vulcanized bond between the rubber elastic material and the sheet metal side portions and provide a chamber for pressure testing said vulcanized bond,

the length of said narrow separating strips extending approximately over the full length of said flanges, and

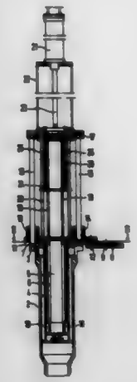
at least one opening conductively leading out of said narrow separating strip to the atmosphere for pressuring said chamber for pressure testing the said vulcanized bond.

4,635,427

METHOD FOR LOADING A CONTAINER WITH RODS OF NUCLEAR REACTOR FUEL ASSEMBLIES CONTAINING NUCLEAR FUEL OR NEUTRON ABSORBER MATERIAL, AND DEVICE FOR PERFORMING THE METHOD

Franz Rohr, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 21, 1983, Ser. No. 553,703
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1982, 3242878
Int. Cl.⁴ B65B *5/00*
U.S. Cl. 53—475 **4 Claims**



1. Method of loading a container with rods of nuclear reactor fuel assemblies having mutually parallel longitudinal axes and containing nuclear fuel or neutron absorption material, which compriaes the steps of loading the container initially with a multiplicity of dummies corresponding to the rods in a given dense packing arrangement, and thereafter inserting the rods in longitudinal direction thereof into the given dense packing arrangement in place of the dummies; wherein the dummy loading step includes inserting a bundle of tubes in the given dense packing arrangement into the container, and the rod inserting step includes inserting the rods respectively into each of the tubes of the tube bundle, partially extending hold-down rods into tubes of the tube bundle and then withdrawing the tube bundle from the container over and onto respective hold-down rods extending into each of the tubes of the tube bundle.

4,635,428

FLATTENED CARDBOARD BOX SUPPLYING APPARATUS

Eijiro Nagao, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

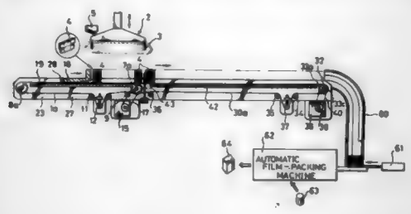
Filed Oct. 8, 1985, Ser. No. 785,566
Claims priority, application Japan, Oct. 12, 1984, 59-212448
Int. Cl.⁴ B65B *35/40*
U.S. Cl. 53—542 **10 Claims**

1. An apparatus for supplying flattened cardboard boxes, comprising:

first conveyor means comprising drive means for selectively moving said conveyor means forwardly and rearwardly, on which said first conveyor a plurality of flattened cardboard boxes is placed in a standing posture in a row, and first retaining means carried by said first conveyor means for retaining said row of flattened cardboard boxes in a standing posture from the rear during forward movement of said first conveyor means, said first retaining means being moved by said first conveyor means between a

forward and rearward position and slidable relative to said first conveyor means;

second conveyor means disposed aligned with and adjacent said first conveyor means so as to form with said first conveyor means a continuous path for the said flattened cardboard boxes, said second conveyor means comprising drive means for selectively driving said second conveyor means forwardly, and second retaining means rigidly secured in the path of said second conveyor means, said second retaining means being designed to move between: (1) an extended position in which said second retaining means cooperates with said first retaining means in its forward position to retain said row of flattened cardboard



boxes in a standing posture from the rear; and (2) a retracted position, and means for driving said second retaining means between said extended and retracted positions;

first detecting means for detecting said forward position of said first retaining means, said drive means for said second retaining means operating to extend said second retaining means responsive to the detection of first retaining means at its forward position by said first detecting means; and

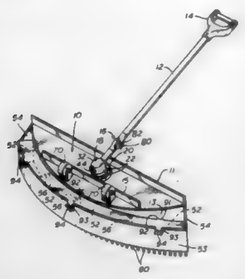
second detecting means for detecting the extended position of said second retaining means, said drive means for said first conveyor means operating to drive said first conveyor means rearwardly responsive to said second detecting means.

4,635,429

WINDROW YARD RAKE

George B. Cornelius, P.O. Box 332, Jefferson, Tex. 75657

Filed Oct. 31, 1985, Ser. No. 793,305
Int. Cl.[4] A01D *7/04*
U.S. Cl. 56—400.18 8 Claims



1. An adjustable windrow rack comprising:

(a) a body of sheet metal or other suitable material, said body comprising a rectangular front member, an arcuate rear member, and a top member, said members defining front, rear and top surfaces, respectively;

(b) a draw bar attached to said top member, said draw bar having a first adjusting means for adjusting said draw bar horizontally and a second adjusting means for adjusting said draw bar vertically; and

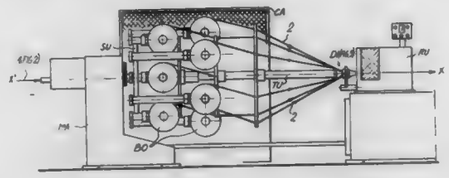
(c) a plurality of tines attached to and extending downward from the bottom of said rear member.

4,635,430

DEVICE FOR DISPENSING OPTICAL FIBERS INTO HELICAL GROOVES OF A RING

Bernard M. Missout; Jean-Pierre Michaux, and Jean-Luc Piova, all of Paris Cedex, France, assignors to Societe Anonyme de Telecommunications and Societe Industrielle de Liaisons Electriques, both of Paris, France

Filed May 29, 1985, Ser. No. 739,062
Claims priority, application France, May 30, 1984, 84 08533
Int. Cl.[4] G02B *6/10, 6/16, 6/04;* H01B *13/02*
U.S. Cl. 57—6 15 Claims



1. A device for dispensing optical fibers in helical peripheral grooves in a cylindrical ring, comprising

(a) a holder containing an axial through bore within which the ring freely runs, said holder including a plurality of conduits arranged along generating lines of a cone coaxial with the ring;

(b) hollow, elongated fiber-guide means slidably mounted in each of said holder conduits, respectively, said fiber-guide means including first fiber-output ends and second fiber-input ends, each of said fiber guide means receiving at least one optical fiber from said fiber-input end to said fiber-output end; and

(c) means connected with said holder and radially slidably linked to said fiber-input ends of fiber-guide means for imparting translational movement to said fiber-guides in said conduits along said generating lines of said cone, respectively, thereby engaging said fiber-output ends of said fiber-guides into the ring grooves to rotatably link said holder with the ring.

4,635,431

MACHINE FOR PRODUCING TWISTED FILAMENTS

Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

PCT No. PCT/DE84/00010, § 371 Date Sep. 20, 1984, § 102(e) Date Sep. 20, 1984, PCT Pub. No. WO84/02932, PCT Pub. Date Aug. 2, 1984
PCT Filed Jan. 18, 1984, Ser. No. 662,288
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 3301811
Int. Cl.[4] D01H *13/00*
U.S. Cl. 57—105 8 Claims

1. A machine for producing a twisted yarn which comprises:

a plurality of spindles arrayed in at least one row and having respective whorls lying in a row;

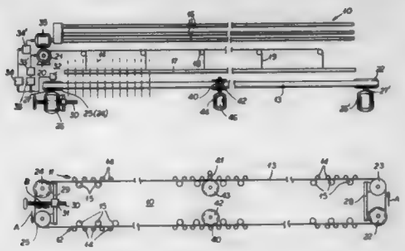
an endless belt peripherally engaging the whorls of said row along a substantially linear stretch of said belt;

respective deflecting pulleys at opposite ends of said row around which said belt passes;

a respective drive motor connected with each of said deflecting pulleys for driving said belt;

a friction roller disposed intermediate said ends of said row and provided with means for causing said friction roller to bear upon said belt so that said belt engages said friction roller without looping of said belt around said friction roller; and

a further motor operatively connected to said friction roller for driving same, one of said whorls being juxtaposed with



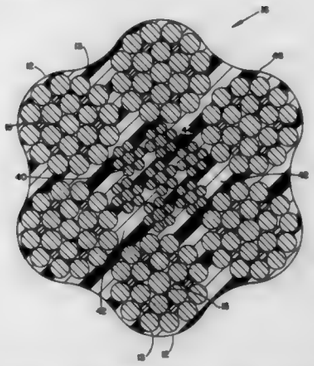
said friction roller across said belt whereby said belt is pressed between said one of said whorls and said friction roller.

4,635,432

METHOD FOR IMPREGNATING AND COATING WIRE ROPE

Claude R. Wheeler, St. Joseph, Mo., assignor to Wire Rope Corporation of America, Inc., St. Joseph, Mo.

Filed Apr. 10, 1985, Ser. No. 721,806
Int. Cl.[4] D07B *1/16, 7/14*
U.S. Cl. 57—221 18 Claims



1. A method for impregnating wire rope wherein the wire rope is drawn through a die for impregnating spaces within the wire rope and coating an outer surface of the wire rope, said method comprising the steps of:

introducing into a die a mixture of at least two reactive components, which when mixed together and sufficiently heated react rapidly and chemically to form a curable liquid polymeric material, the mixture being introduced into the die at a pressure of approximately 20–50 psi and temperature at which rapid reaction between the components does not occur;

passing the wire rope through the die to contact the component mixture;

applying heat to the component mixture in the die while simultaneously contacting the component mixture with the wire rope, the applied heat being sufficient to initiate a rapid reaction of the components upon contacting the wire rope to cause the components to form the liquid polymeric material and impregnate and encapsulate the wire rope; and

curing the polymeric material to form an impregnated, coated wire rope.

15. An impregnated, encapsulated wire rope comprising:

a core;

a plurality of strands laid around said core to form a wire rope having an outer surface and spaces between the core and strands and between adjacent strands; and

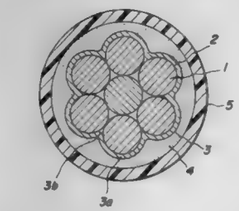
a cured polymeric material filling the spaces and coating the outer surface of the wire rope, the cured polymeric material being formed by the reaction of at least two components which when mixed together and sufficiently heated react chemically and rapidly to form a curable liquid polymeric material that penetrates the spaces and cures in a radially outward direction such that the liquid polymer in the spaces cures before the liquid polymer adjacent the outer surface of the wire rope, the liquid polymeric material providing a cushion around the core and strands to equalize stress within the wire rope and support the strands in positions established during stranding and rope closing.

4,635,433

UNBONDED PC STEEL STRAND

Masamitsu Takei, and Shigeo Shoji, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo and Kawatetsu Wire Products, Tokyo, both of, Japan

Filed Nov. 18, 1985, Ser. No. 799,157
Claims priority, application Japan, Nov. 20, 1984, 59-243459
Int. Cl.[4] D07B *1/16, 1/14*
U.S. Cl. 57—223 2 Claims



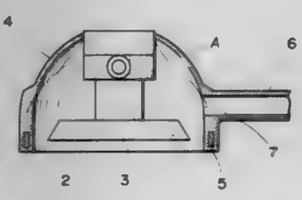
1. An unbonded PC steel strand comprising a PC steel strand composed of a plurality of stranded wires, a zinc plated layer on the outer surface of the PC steel strand, said zinc plated layer having a thickness of 5–100 μm at the wire outer surface portion, and being breakable when the PC steel strand is subjected to the tension applied for posttensioning concrete, said thickness preventing breaking of said layer during manufacture, shipping, handling and storage, a greaselike or other anticorrosive lubricative filler covering the zinc plated layer, and a synthetic resin sheath covering the zinc plated, filler-covered PC steel strand.

4,635,434

PROTECTIVE DEVICE FOR A GRINDER OR THE LIKE

Ken'ichi Suzuki, 1824-3 Sakai, Kashiwa-shi, Chiba-ken, Japan

Filed Mar. 14, 1985, Ser. No. 711,726
Int. Cl.[4] B24B *55/06*
U.S. Cl. 57—273 6 Claims



1. A protective device for a grinder or the like, comprises a cup-shaped guard cover for enclosing a grinding wheel of the grinder, which is provided with a suction port communicating

with a suction pump device and a contractible portion capable of being deformed or contracted so as to reduce the height of the cup-shaped guard cover, said cup-shaped guard covering having its lower end surface placed somewhat lower than or level with the lower surface of said grinding or cutting wheel, and said cup-shaped guard cover being made of elastic material and said contractible portion is formed by reducing the thickness of said guard cover in part at an upper portion thereof, whereby the height of the guard cover is elastically reduced when the guard cover is pressed against a workpiece.

4,635,435

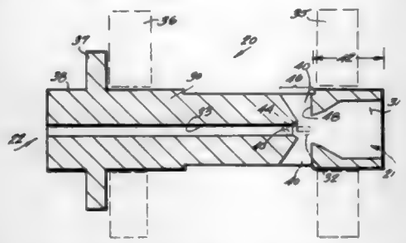
VACUUM SPINNING FROM SLIVER

Elbert F. Morrison, Clarksville, Va.; Danny R. Bradley, Bullock, and D. C. Reece, Oxford, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 677,487, Dec. 3, 1984. This application May 9, 1985, Ser. No. 732,256

Int. Cl.[4] D01H *5/28, 1/12, 1/13;* D02G *1/04*

U.S. Cl. 57—328 **20 Claims**



1. Apparatus for forming yarn comprising: an elongated hollow shaft having a first end and a second end, a through-extending passageway from the first end to the second end, at least a portion of the entire circumference of the shaft being perforated by perforations; means for mounting said shaft for rotation about an axis; means for rotating said shaft about its axis; means for passing textile fibers through the through-extending passageway of said shaft linearly, generally along the axis of rotation thereof, the fibers being fed into the first end thereof; means for applying a vacuum to the exterior of said shaft so that at least some of the fibers or free ends of fibers passing through said shaft will draw toward the shaft perforations and will be caused to rotate with said shaft as said fibers move linearly generally along the axis of rotation; means for withdrawing formed yarn from the second end of said shaft, opposite said first end thereof; and

means provided between the first end and second end of said shaft for allowing free fiber movement so that at least some of the fibers or free ends of fibers adjacent said perforations will rise up and wrap around a core of fibers as the fibers pass through the passageway, said means including means defining a chamber having a larger cross-sectional area than that of said passageway second end, said perforations communicating with said opening.

13. Apparatus for forming yarn comprising: an elongated hollow shaft having a first end and a second end, a through-extending passageway from the first end to the second end, at least a portion of the entire circumference of the shaft being perforated by perforations; means for mounting said shaft for rotation about an axis; means for rotating said shaft about its axis; means for passing textile fibers through the through-extending passageway of said shaft linearly, generally along the axis of rotation thereof, the fibers being fed into the first end thereof; means for applying a vacuum to the exterior of said shaft so that at least some of the fibers or free ends of fibers passing through said shaft will draw toward the shaft perforations and will be caused to rotate with said shaft as said fibers move linearly generally along the axis of rotation; means for withdrawing formed yarn from the second end of said shaft, opposite said first end thereof; and

wherein said perforations have effective cross-sectional areas relative to the effective cross-sectional area of said passageway between said first end and said perforations so that optimum fiber wrapping action is achieved.

4,635,436

SPINNING DEVICE FOR OPEN-END SPINNING CONTAINING EASILY REPLACEABLE NOZZLE BODY

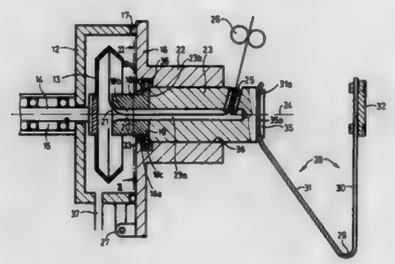
Ludek Malina, Klotes, and Ernst Ott, Flurlingen, both of Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Apr. 21, 1986, Ser. No. 854,068

Claims priority, application Switzerland, Apr. 29, 1985, 01815/85

Int. Cl.[4] D01H *1/135, 7/885*

U.S. Cl. 57—417 **6 Claims**



1. A spinning device for open-end spinning for forming a thread or the like, comprising:

a rotor housing;

a cover provided for said rotor housing;

a spinning rotor located in said rotor housing and serving for forming a thread which is withdrawn from the spinning rotor;

a withdrawal nozzle secured to the cover of the rotor housing;

a nozzle body having an axial direction and coacting with said withdrawal nozzle;

said withdrawal nozzle and said nozzle body abuttingly contacting one another and conjointly forming a withdrawal passage for the thread withdrawn from the spinning rotor;

a receiving socket provided at said cover for insertably receiving therein said nozzle body and enabling movements of said nozzle body in said axial direction of said nozzle body;

said receiving socket determining the position of said nozzle body in radial direction;

said receiving socket being structured to permit insertion and removal of the nozzle body from a front side of the spinning device;

a manually-operable elastic device engaging an end of said nozzle body remote from an end of said nozzle body which abuttingly contacts said withdrawal nozzle; and

said manually-operable elastic device being biased towards said nozzle body in the axial direction thereof and pressing said nozzle body against said withdrawal nozzle.

4,635,437

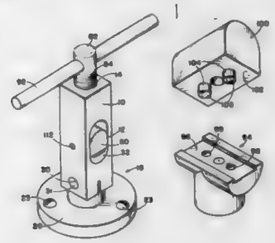
CHAIN PUNCH

Kenny R. Parton, Broken Arrow, Okla., assignor to R. W. Steele, II, Tulsa, Okla.

Division of Ser. No. 630,274, Jul. 12, 1984, Pat. No. 4,581,825. This application Jan. 21, 1986, Ser. No. 819,742

Int. Cl.[4] B21L *9/06*

U.S. Cl. 59—7 **2 Claims**



1. A device for punching holes in a surveyor's chain and in metal pieces used for repairing the chain and for riveting together the punched chain and metal pieces comprising an elongated vertical housing having an elongated vertically oriented opening extending transversely therethrough and defined by a continuous wall, said vertical opening having an upper portion and a lower portion, an upper vertical bore extending from the top of the housing into said upper portion of said opening, the upper portion of said upper vertical bore being threaded, a lower vertical bore extending downwardly from said lower portion of said opening towards the lower end of said housing, a lower rivet block removably received in the lower portion of said opening and having a lower base removably received in the lower vertical bore, said lower rivet block having a flat horizontally extending recess therein whose width is equal to that of the chain to be repaired, said lower rivet block also including a pair of spaced shallow recesses located on said flat recess for receiving the heads of a pair of rivets, an upper rivet block removably received in the upper portion of said opening and in vertically slidable contact with the wall of said opening, said upper rivet block having a lower flat surface and a pair of flaring members projecting downwardly from said flat surface and adapted to flare the upper ends of a pair of rivets supported on said lower rivet block and projecting through a pair of overlapping prepunched metal strips received in said flat recess, an arbor shaft having a threaded portion received in the threaded portion of the upper bore, means for rotating said arbor shaft, the arbor shaft having a lower portion for engaging, upon rotation, the upper end of said upper rivet block for urging the upper rivet block downwardly toward said lower rivet block so as to urge said flaring members against the upper ends of said rivets, whereby, upon continued rotation of said arbor shaft, said flaring members will flare the upper end of said rivets, and means for restraining rotation of the lower end of said housing.

4,635,438

SELF-LOCKING LINK

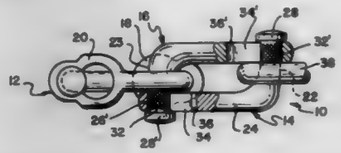
Robert B. Rottinghaus, 4121 S. Canfield Rd., Canfield, Iowa 50648

Filed Mar. 1, 1985, Ser. No. 707,155

Int. Cl.[4] F16G *13/06*

U.S. Cl. 59—84 **15 Claims**

1. A self-locking link comprising first and second generally L-shaped link elements each including first and second elongated sections oriented generally transversely to each other, wherein each of said second sections includes a deformable portion having an aperture including an intermediate portion and tapered at a first end along the length and toward the distal end of said second section and having a notch in a second facing end thereof to facilitate a narrowing and elongation of the tapered aperture upon application of a work load generally parallel to the second sections of the link elements, and wherein each of said first section is dimensioned so as to loosely engage the intermediate portion of said tapered aperture prior to application of a work load generally parallel to the second sections of the link elements and includes an enlarged portion on the distal end thereof adapted for insertion in said aperture and through the second section of the other link



element and wherein the first section of each of the link elements is securely engaged along a respetive intermediate portion thereof by the tapered aperture of the other link element upon the application of a work load across said self-locking link in a direction generally parallel to the second sections of the link elements by the elongation of the tapered aperture of the other link element along the length thereof and resulting narrowing of the aperture.

4,635,439

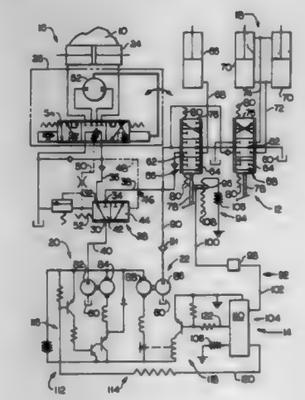
FLUID OPERATED SYSTEM CONTROL

John E. Wible, Painesville, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio

Filed Apr. 11, 1985, Ser. No. 722,236

Int. Cl.[4] B62D *5/07*

U.S. Cl. 60—420 **11 Claims**



1. A control for a work vehicle, comprising:

a fluid operated steering system having a fluid operated steering motor and a steering control valve connected to said steering motor;

a fluid operated implement system having a fluid operated implement motor and an implement control valve connected to said implement motor, said implement control valve having first and second positions and being movable between said positions;

a flow control valve connected to said steering control valve and said implement control valve;

a first pump having a preselected maximum flow delivering capacity and being connected to said flow control valve;

a first variable speed motor drivingly connected to said first pump, said flow control valve being adapted to deliver fluid flow from said first pump to said steering control

valve and said implement control valve on a steering flow priority demand basis;

a second pump having a preselected maximum flow delivering capacity and being connected to said implement control valve, said maximum flow delivering capacity of the first pump being greater in magnitude than said maximum flow delivering capacity of the second pump;

a second single speed motor drivingly connected to said second pump, said second pump being adapted to deliver fluid flow to said implement control valve and in bypass of said steering system;

means for delivering a control signal having a magnitude representative of the relative position of the implement control valve between said first and second positions; and

means for receiving said control signal and increasing the speed of the first motor from a minimum speed towards a maximum speed in response to movement of said implement control valve from said first position toward said second position, simultaneously actuating the second motor and decreasing the speed of the first motor in response to said implement control valve being at a preselected location between said first and second positions, and increasing the speed of said first motor in response to movement of said implement control valve from said preselected location toward said second position.

4,635,440

DUAL CONSUMER HYDRAULIC MECHANISMS

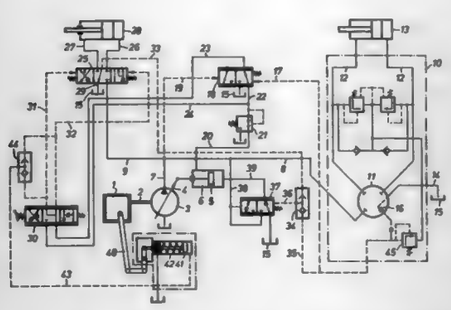
Walter Kropp, Aschaffenburg, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jun. 4, 1984, Ser. No. 617,111

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1983, 3321484

Int. Cl.⁴ F15B *13/02*

U.S. Cl. 60—422 **7 Claims**



1. In a dual consumer hydraulic mechanism having a source of fluid under pressure, a drive means for said source of fluid, and at least two consumers of hydraulic energy including one primary consumer connected to an receiving fluid under pressure from said source of fluid and in which the maximum fluid consumed by said consumers is greater than the maximum fluid delivery from said source of fluid, the improvement comprising a first multiway valve having two control pressure chambers, one acted upon by fluid pressure from said source to said primary consumer, resilient means acting on said multiway valve normally to reduce the volume of said other chamber, the other of said chambers being connected to pressure signal means at said primary consumer which act in conjunction with said resilient means, a second multiway valve having first and second spring loaded control chambers and a feed chamber connected to the other of said at least two consumers, connection means from said feed chamber to said fluid sorce, selecting means between said first and second multiway valves selectively connecting one of said first and second control chamber of said second multiway valve to a first connection of said first multiway valve, a low pressure source of fluid connected to a second connection on said first multiway valve and through said valve to the first connection, said low pressure source being connected also to the other of said first and second control chambers of said second multiway valve by said selecting means whereby said primary consumer receives the full stream required for its operation as a result of the spring and pressure signal acting on the first multiway valve against the fluid pressure flowing to said primary consumer and at the same time the second multiway valve is acted upon by fluid from the low pressure source through the selecting means simultaneously to reduce flow to the other of said at least two consumers from said fluid source.

4,635,441

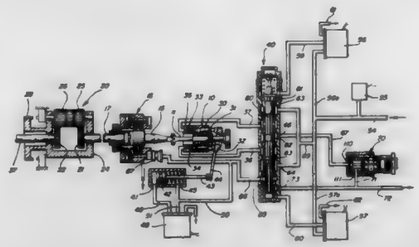
POWER DRIVE UNIT AND CONTROL SYSTEM THEREFOR

Steven J. Ebbing; Robert J. Hermans; John J. Vicari, all of Rockford, and Bruce D. Beneditz, Roscoe, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed May 7, 1985, Ser. No. 731,663

Int. Cl.⁴ F16D *31/02*

U.S. Cl. 60—450 **8 Claims**



1. A hydraulic power drive unit having a variable displacement motor for moving a load under both aiding and opposing load conditions at the maximum speed possible for the load condition with a substantially constant desired rate of fluid flow throug the motor comprising, means for adjusting motor displacement, means for regulating fluid flow from the motor including a flow-regulating valve having a valve member positionable in response to a flow responsive pressure differential, and means responsive to a variation in said desired rate of fluid flow as detected by the flow-regulating means for operating said motor displacement adjusting means including a circuit having a linear variable differential transformer movable by said valve member.

4,635,442

HYDRAULIC MASTER CYLINDER ASSEMBLY

Richard A. Bass, Leamington Spa, England, assignor to Automotive Products plc, Leamington Spa, England

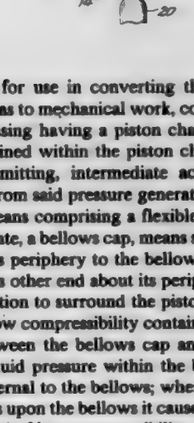
Filed Aug. 16, 1985, Ser. No. 766,269

Claims priority, application United Kingdom, Aug. 29, 1984, 8421130

Int. Cl.⁴ B60T *7/02*

U.S. Cl. 60—594 **21 Claims**

1. A hydraulic master cylinder assembly comprising a hydraulic master cylinder and an actuating mechanism, the hydraulic master cylinder having a body member defining a bore therein and being adapted for attachment to part of a vehicle, a piston slideably supported in the bore, and an input member of the piston for co-operation with part of the actuating mechanism, the actuating mechanism having a driver operated actuating lever and an operative connection to connect the actuating lever to the input member said operative connection including means for altering the travel ratio between the actuating lever and the input member.



4,635,443

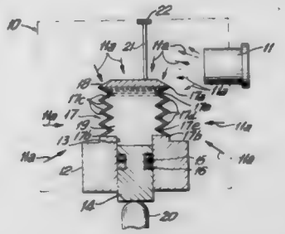
NON-FOULING ACTUATING MECHANISM

Louis Pino, Rego Park, N.Y., assignor to EDO Corporation, College Point, N.Y.

Filed May 10, 1985, Ser. No. 733,220

Int. Cl.⁴ F15B *15/10*; F41F *5/02*

U.S. Cl. 60—628 **12 Claims**



1. Means for use in converting the energy of a pressure generating gas to mechanical work, comprising in combination a piston housing having a piston chamber opening therein; a piston contained within the piston chamber; a closed-system, energy-transmitting, intermediate actuating means isolating said piston from said pressure generating gas; the intermediate actuating means comprising a flexible metal bellows having a low spring rate, a bellows cap, means sealing the bellows at one end about its periphery to the bellows cap, means sealing the bellows at its other end about its periphery to the piston housing at a position to surround the piston chamber opening, and a liquid of low compressibility contained within and filling the bellows between the bellows cap and the piston; said liquid creating a fluid pressure within the bellows equal to the gas pressure external to the bellows; whereby, when sufficient gas pressure acts upon the bellows it causes the bellows to contract and the liquid of low compressibility within the bellows to act against the piston.

4,635,444

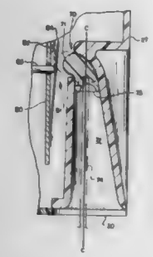
ICE MAKER

Harold S. Mawby, Belding, and Duane H. Harris, Gowen, both of Mich., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Division of Ser. No. 722,135, Apr. 11, 1985. This application Apr. 24, 1986, Ser. No. 855,462

Int. Cl.⁴ F25B *49/00*

U.S. Cl. 62—125 **7 Claims**



1. An automatic ice cube maker for use in the freezer compartment of a domestic refrigerator comprising:

a housing member having a generally open top and bottom defined by a front wall, a rear wall, and a pair of opposed sidewalls;

a compartmented ice tray having a top side constituted by a plurality of ice cube shaped pockets for receiving water to be frozen, the ice tray being horizontally mounted within the walls of the housing for movement between an upright ice making position and an inverted ice dumping position;

an electrically energized drive means connected to the ice tray for moving the ice tray between its upright and inverted positions; and

a control circuit for energizing the drive means, the control circuit including a test switch for initiating energization of the drive means, said rear wall of the housing being hollow, and having a front face, a rear face, a top face, a bottom face and a pair of opposed side faces, the control means being mounted within and being totally enclosed within the hollow rear wall to preclude direct access to the said test switch, the ice maker including a button member composed of electrical insulating material, the button member being slidably mounted in an aperture in one of said faces, said button member having an inner end engageable with the test switch and an outer end accessible to the user, wherein the user can push the outer end of the button member to actuate said test switch.

4,635,445

AIR-CONDITIONER

Nobuo Otsuka, Kamakura; Hideo Igarashi, Fujisawa, and Peter Thompson, Yokohama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1986, Ser. No. 824,589

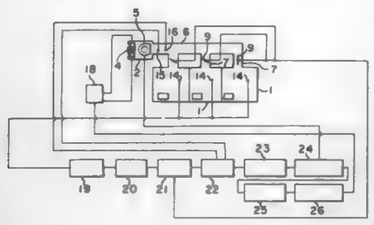
Claims priority, application Japan, Feb. 20, 1985, 60-33724; Feb. 25, 1985, 60-35832; Mar. 12, 1985, 60-50153; Apr. 19, 1985, 60-84962; Apr. 19, 1985, 60-84964; May 14, 1985, 60-104334

Int. Cl.⁴ F24F *7/00*

U.S. Cl. 62—158 **29 Claims**

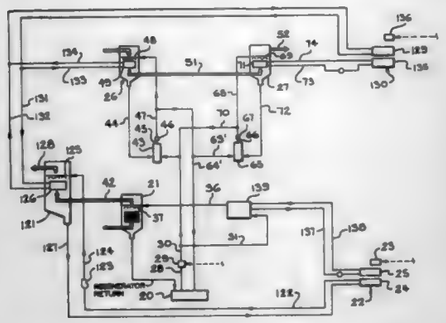
1. An air-conditioner, which comprises in combination: a heat pump; an air blowing fan and air passage ducts for distributing air as heated or cooled by said heat pump to each of rooms to be air-conditioned; air quantity adjusting dampers, each being disposed in a branched duct connected to said air passage duct for each room; heat load measuring means for measuring the heat load in each room based on the condition signals from a room thermostat provided in said each room; damper control quantity determining means for determining the degree of opening of the damper based on the output from

said heat load measuring means; damper control means for controlling the degree of opening of said damper based on the output from said damper control quantity determining means; a pressure detector for detecting a pressure within said air duct after the damper control; a temperature detector for detecting air temperature within said air duct after the damper control; operating condition measuring means for measuring the operating condition of the air-conditioner based on the detection signals from said detectors; air blowing fan revolution determining means for determining the number of revolution of said air blowing fan based on the output from said operating condi-



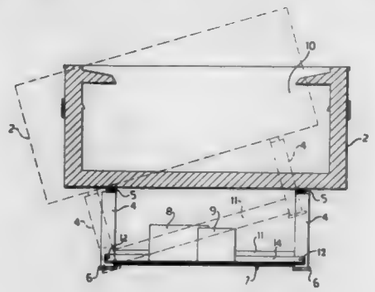
tion measuring means; air blowing fan control means for controlling the number of revolution of the air blowing fan based on the output from said air blowing fan revolution determining means; capacity determining means for determining a value of a temperature of air to be blown based on the output from said heat load measuring means, and then determining the capacity of said heat pump based on the determined temperature value and the output from said operating condition determining means; and capacity control means for controlling the capacity of said heat pump based on the output from said capacity determining means.

4,635,446
DEHUMIDIFICATION APPARATUS
Gershon Meckler, Bethesda, Md., assignor to Camp Dresser & McKee, Boston, Mass.
Continuation of Ser. No. 264,126, May 15, 1981, abandoned, which is a continuation-in-part of Ser. No. 49,592, Jun. 18, 1979, abandoned. This application Aug. 5, 1985, Ser. No. 763,306
Int. Cl.⁴ F25D *21/00*
U.S. Cl. 62—271 **9 Claims**



1. Apparatus for dehumidifying air, said apparatus comprising a receiver for a hygroscopic liquid, a regenerator, a dehumidifier, a heat pump having an energy input section, a heat collecting section and a heat rejection section, and operable, when said energy input section is energized, to transfer heat from said heat collecting section at a given temperature to said heat rejection section at a temperature higher than said given temperature, means for circulating a first stream of a hygroscopic liquid which is capable of being regenerated when indirectly heated by the heat rejection section of said heat pump from said receiver into heat transfer relationship with the heat rejection section of said heat pump and then to said regenerator, means for spraying hygroscopic liquid circulated in the first stream in said regenerator, means for circulating a second stream of hygroscopic liquid from said regenerator to said receiver, means for circulating a third stream of hygroscopic liquid from said receiver to said dehumidifier, means for spraying hygroscopic liquid circulated in the third stream in said dehumidifier, means for circulating a fourth stream of hygroscopic liquid from said dehumidifier to said receiver, means for transferring heat of sorption from the apparatus, means for circulating air to be dehumidified through said dehumidifier in contact with hygroscopic liquid therein, means for removing from said regenerator water vaporized from hygroscopic liquid therein, and means operatively associated with the heat absorbing section of said heat pump and effective to transfer heat thereto from the second stream of hygroscopic liquid.

4,635,447
TILTING COLD CABINET
Giuseppe Casanova, Trichiana, and Ivano De Zolt, Bribano, both of Italy, assignors to Costan S.p.A., Limana, Italy
Filed Mar. 20, 1985, Ser. No. 713,881
Claims priority, application Italy, Mar. 21, 1984, 21304/84[U]
Int. Cl.⁴ A25D *19/00*
U.S. Cl. 62—448 **2 Claims**



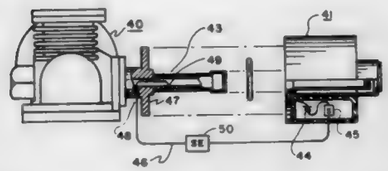
1. A cold cabinet comprising: a refrigerated chest; a tiltable base including a plurality of legs, each fixed at one upper end to a lower portion of the chest for supporting the chest between upright and two tilted positions; a frame pivotally mounted to a lower end of the base; a refrigerator unit mounted on the frame and connected to the chest; removable pivot pin means interconnecting each leg of the base with the frame; pairs of adjacent legs having axially aligned opposed hole means, a lower end and the frame having corresponding holes, said holes for receiving the removable pivot pins therein along opposed parallel pivot axes, said refrigerated chest and base being tiltable about each pivot axis towards one of the tilted positions and in a direction away from the upright position and the refrigerated unit when the pivot pins in the opposite pivot axis are removed, thereby allowing alternate access to the refrigeration unit.

4,635,448
TRAINING AID FOR DETECTOR/COOLER ASSEMBLY
William R. Fournier, Woodbridge, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Dec. 10, 1985, Ser. No. 807,403
Int. Cl.⁴ F25B *19/00*
U.S. Cl. 62—467 **5 Claims**

1. A training apparatus for assemblers of low temperature IR detection systems, comprising:

a male test unit having the same external configuration as an existing IR detector cooler with a cold finger, at least the portion of said unit representing said cold finger having a first electrically conductive surface;

a female test unit having the same external configuration as an existing detector dewar for said cooler, the recess in said dewar for said cold finger having a second electrically conductive surface;

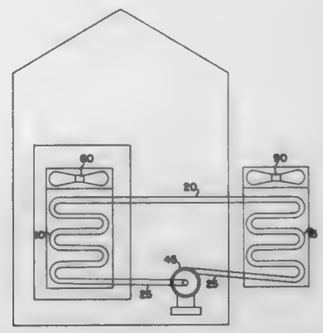


said first and second conductive surfaces including all areas of surfaces of said male and female units which are separated by less than one centimeter when the units are assembled, except for those areas which are in contact;

an electronic signalling device; and

an electric power source, said source and device each being electrically connected to a different one of said first and second surfaces and serially connected to each other, whereby contact between said surfaces activates a warning signal.

4,635,449
SUPPLEMENTAL COOLING DEVICE FOR A REFRIGERATING UNIT
Scott H. Winter, 11 Broadway, and Mark S. Carbone, 107 6th St., both of Verplanck, N.Y. 10596
Filed Mar. 1, 1985, Ser. No. 707,247
Int. Cl.⁴ F25B *1/00*
U.S. Cl. 62—467 **3 Claims**



1. In a refrigerating unit comprising an enclosure and fluid evaporating and condensing means for cooling the air within said enclosure,

the improvement comprising supplemental means for cooling said air within said enclosure, including:

(a) an outdoor coil accessable to the outside ambient air;

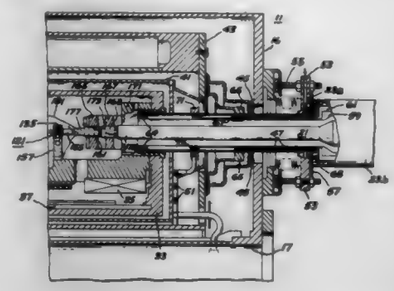
(b) an indoor coil inside the enclosure;

(c) a liquid circulator connected in series between said indoor coil and said outdoor coil and having a liquid circulating pump; and

(d) a working liquid contained within said indoor and outdoor coils and within said liquid circulator;

whereby said working liquid transmits heat from said indoor coil to said outdoor coil when the outside ambient air is cooler than said air within said enclosure.

4,635,450
COMPACT RETRACTABLE CRYOGENIC LEADS
Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Feb. 4, 1986, Ser. No. 826,049
Int. Cl.⁴ F25B *19/00*
U.S. Cl. 62—514 R **8 Claims**



1. Retractable cryogenic lead assembly for a cryostat having an aperture, said retractable lead assembly comprising:

a tube defining a bayonet socket at one end;

means for slidably and rotatably disposing said tube through the cryostat aperture, said tube extending inside and outside said cryostat with said bayonet socket end extending inside;

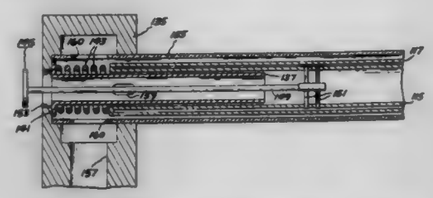
an electrically conductive rod slidably disposed inside said tube;

an electrically conductive terminal post mounted in said cryostat, said post having a transverse pin adapted to be engaged by said bayonet;

means affixed to said tube external to said cryostat for rotating and slidably moving said tube to engage and disengage said socket with said terminal post; and

means external to the cryostat, coupled to said rod and said tube for adjusting the relative displacement between said rod and said tube, so that the rod can be urged against said post after said socket engages said pin.

4,635,451
SPRING LOADED VALVE FOR ADDING CRYOGENIC LIQUID TO A CRYOSTAT
Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Feb. 4, 1986, Ser. No. 826,051
Int. Cl.⁴ F25B *19/00*
U.S. Cl. 62—514 R **2 Claims**



1. A spring loaded valve assembly for use with a cryostat insert for selectively adding cryogenic fluid to the upper and lower portion of a supercoolable vessel, said spring loaded valve assembly comprising:

a cryogenic fill tube for supplying cryogenic fluid;

a spring;

a sleeve having one flanged end and one unflanged end, said unflanged end slidably situated partway inside said fill tube, said spring surrounding said sleeve and being re-

tained on one end by said flanged end of said sleeve and on the other by the end of the fill tube which has a diameter greater than the spring diameter, said sleeve defining a radial extending aperture through the sleeve wall;

a valve having a stem portion and a head portion, the stem portion extending longitudinally through the longitudinal aperture of said sleeve, with the end of the stem secured to the fill tube, the valve head having a diameter larger than the inside diameter of the flanged end of said sleeve;

housing means adapted to be secured inside the upper portion of said supercoolable vessel, aligned with the end of said fill tube, the end of said fill tube slidably situated in said housing, said housing means defining an aperture in line with said fill tube, through which the valve head can pass but the flanged end of said sleeve cannot, said housing means defining a passageway adjacent to said radial sleeve aperture, said passageway adapted to be coupled in flow communication with the lower portion of said supercoolable vessel;

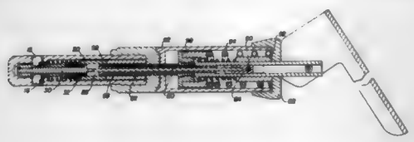
said valve having a first position in which said valve head extends through said housing aperture and said fill tube, covering said radial sleeve aperture allowing cryogenic fluid to flow from said fill tube into the upper portion of the supercoolable vessel; and said valve having a second position in which the valve head closes said housing aperture and said fill tube uncovers said radial sleeve aperture allowing flow communication from said flow tube through said radial sleeve aperture to said housing passageway.

4,635,452

DOUBLE-ACTING BARREL LOCK AND KEY

Anthony J. Agbay, Auburn, Mass., assignor to Olson Manufacturing Company, Holden, Mass.

Filed Jan. 21, 1986, Ser. No. 820,224
Int. Cl.⁴ E05B 67/36
U.S. Cl. 70—34 **9 Claims**



1. In a conventional barrel lock and key, the improvement therein comprising:

(a) Said lock having spring-biased plunger means mounted within a barrel for reciprocal movement between a security forward locking position and a normal rearward unlocking position said plunger means having a camming surface adapted to cam at least two locking balls to their outward locking position when said plunger means is moved forwardly against spring pressure to its security locking position, said plunger means being continuously urged rearwardly by spring pressure to its normal rearward unlocking position in which said camming surface is out of engagement with the locking balls thereby permitting the locking balls to move to their inward unlocking position;

(b) said lock having spring-biased pin means mounted coaxially with said plunger means for reciprocal movement between a forward unlocking position and a normal rearward locking position, said pin means having a small diameter portion permitting the locking balls to move to their inward unlocking position when said pin means is moved forwardly against spring pressure to its unlocking position, said pin means having a large diameter camming surface and being continuously urged rearwardly by spring pressure to its normal locking position in which said camming surface cams the locking balls to their outward locking position;

(c) said pin means moving forwardly to its unlocking position when pushed by a nail-type pick, said plunger means moving simultaneously forward, under spring pressure to its security locking position in which said plunger means relatively large diameter camming surface maintains the locking balls in their outward locking position to prevent unauthorized unlocking of the lock by a nail-type pick; and

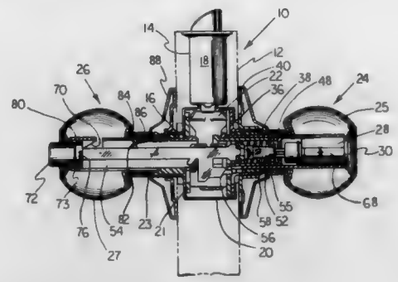
(d) said key having double-acting means for simultaneously maintaining said plunger means in its normal rearward unlocking position and moving said pin means to its forward unlocking position thereby permitting the locking balls to move inwardly to their unlocking position.

4,635,453

LOCK SET

Leroy Hart, Farmington, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 13, 1986, Ser. No. 838,333
Int. Cl.⁴ E05B 55/00; E05C 1/12
U.S. Cl. 70—134 **14 Claims**



1. A lock set for a door comprising:

a housing member;

a latch bolt assembly including a bolt movable between latching and retracted positions;

retractor means supported by said housing member for reciprocal movement relative thereto between latching and retracted positions and connected to said bolt for moving said bolt between its positions upon reciprocal movement thereof;

axially movable and rotatable first drive means extending transverse of the direction of movement of said bolt and engaged with said retractor means for producing reciprocal movement thereof, said first drive means including a locking surface; and

an operating assembly comprising a hand operator having a locking slot formed in an axially extending portion thereof,

locking means disposed within said hand operator including a plug portion rotatable relative thereto,

a non-rotatable sleeve radially sandwiched between said hand operator and said first drive means including a radially movable retainer member aligned with said locking slot and normally extending therethrough for locking said hand operator to said sleeve, the locking surface of said first drive means being radially aligned with said retainer member for maintaining said retainer member within said slot, and

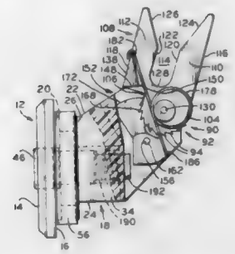
second drive means operatively connected to said rotatable plug and said first drive means with rotation of said plug initially resulting in actuation of said second drive means to move said first drive means axially to displace said locking surface relative to said retainer means.

4,635,454

LATCH GEAR LOCK ASSEMBLY

Alex G. Brown, Greenville, Tenn., assignor to Avis Industrial Corporation, Upland, Ind.

Filed Nov. 19, 1984, Ser. No. 673,117
Int. Cl.⁴ E05B 65/06
U.S. Cl. 70—139 **9 Claims**



1. A latch gear lock device adapted to releasably secure together relatively movable members wherein one of said movable members mounts a keeper, said latch gear lock device comprising:

a base mountable to the other of said movable members;

a latch bolt member having a pivotal mounting means pivotally mounted to said base so as to be selectively movable between an unlatched position and an extreme latched position, and including a pair of spaced apart arms defining therebetween a keeper recess, each of said arms having at its distal end a terminal inner surface inclining towards said keeper recess, said latch bolt member being mounted to said base so that upon movement of the movable members towards one another, the keeper can contact said latch bolt member anywhere alont either one inner surface of said respective arms thereof causing said latch bolt member to pivot correspondingly in either clockwise or counterclockwise direction so as to align the keeper with said keeper recess so that upon further movement of the movable members toward each other the keeper is received in said keeper recess, said latch bolt member including a detate surface and a cam surface;

a latch gear means, pivotally mounted on said base and adjacent said latch bolt member, for governing said latch bolt member movement between the unlatched and extreme latched positions so that they are provided a plurality of intermediate latched positions between the unlatched and extreme latched positions;

a biasing means, connected to said latch bolt member and to said latch gear means, for biasing said latch bolt member to its unlatched position; and

a release means, mounted on said base, for selectively releasing said latch bolt member from any one of the selected latched positions and selectively locking said latch bolt member in any one of the selected latched positions.

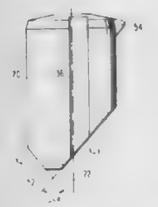
4,635,455

CYLINDER LOCK

Roy N. Oliver, Salem, Va., assignor to Medeco Security Locks, Inc., Salem, Va.

Filed Jul. 19, 1985, Ser. No. 756,791
Int. Cl.⁴ E05B 15/14, 27/04
U.S. Cl. 70—364 A **19 Claims**

1. A cylinder lock of the type having a cylinder shell, a key plug rotatably mounted in the shell, a plurality of chisel point pin tumblers in the key plug at a plurality of tumbler positions, at least one of the pin tumblers capable of reciprocatory and oscillatory movement about its axis, the tumblers being positionable with respect to each other along a shear line to provide one locking function, a fence means, the tumblers capable of oscillatory movement being positionable rotatably about their axis to block or free the fence means to provide a second locking function, the cylinder lock being usable with a proper bitted key having at least one V-shaped cut perpendicularly cut across a longitudinal axis of the key blade and at least one V-shaped cut skew cut across the longitudinal axis of the key blade, with improvements for creating an enormous number of possible key bit changes and master key combinations, the



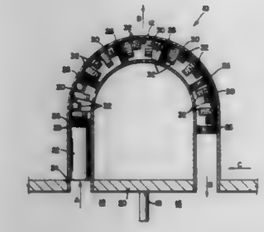
improvements comprising: selectively offsetting the chisel point for selected pin tumblers capable of oscillatory movement either forward or rearward of the tumbler axis, and positioning the V-shaped cuts on the key blade corresponding to such tumbler offset with the apex of the V similarly offset of the axis of the tumbler when the key is inserted into the cylinder lock.

4,635,456

DEVICE FOR SHOT-PEENING INSIDE SURFACE OF U-BEND REGION OF HEAT EXCHANGER TUBING

Douglas G. Harman, Pensacola Beach, and Elbert P. Odor, Tampa, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 24, 1984, Ser. No. 613,674
Int. Cl.⁴ C05B 17/00
U.S. Cl. 72—53 **16 Claims**



1. Apparatus for uniformly imparting compressive stresses to the interior surface portions of a U-bend region of a U-shaped tube so as to counteract any residual tensile stresses developed within said U-shaped tube during the formation of said U-bend region thereof, comprising:

a single high-speed rotary drive motor;

a plurality of serially arranged flexible drive shafts extending substantially throughout the axial length of said U-bend region of said U-shaped tube with one end of a first one of said plurality of serially arranged flexible drive shafts being operatively connected to said single high-speed rotary drive motor;

shot-peening means secured upon most all of said plurality of serially arranged flexible drive shafts for impacting upon said interior surface portions of said U-bend region of said U-shaped tube; and

a plurality of epicyclic gear trains interposed between and operatively connected to said plurality of serially arranged flexible drive shafts for simultaneously causing said plurality of serially arranged flexible drive shafts, and said shot-peening means secured thereon, to slowly orbit about the interior of said U-bend region of said U-shaped tube while said plurality of serially arranged flexible drive

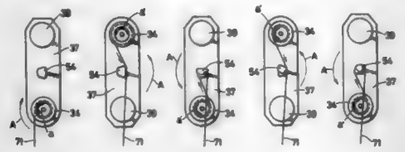
shafts rotate in a high-speed mode about the axes of said plurality of serially arranged flexible drive shafts so as to uniformly impart said compressive stresses to said interior surface portions of said U-bend region of said U-shaped tube.

4,635,457

METHOD OF WINDING DOUBLE-LAYER MOTOR COILS

Takayuki Ishii, and Yuji Yamauchi, both of Chiba, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 10, 1985, Ser. No. 786,076
Claims priority, application Japan, Oct. 25, 1984, 59-225474
Int. Cl.[4] B21D *11/00*; B21C *47/10*; H01F *7/06, 11/04*
U.S. Cl. 72—66 **8 Claims**



1. A method of winding a double-layer coil of a conductor around a bobbin, comprising the steps of:

feeding a continuous conductor to a pulley;

winding a predetermined length of the conductor about the pulley;

arranging the continuous conductor being fed to the pulley adjacent the bobbin at a point along its length;

rotating the bobbin in a first direction at a predetermined rate for winding the conductor thereon starting at said point along the length thereof that is adjacent the bobbin and forming a first layer of the coil around the bobbin; and

simultaneously with winding the conductor on the bobbin revolving the pulley having the predetermined length wound thereon around the bobbin in said first direction at a rate two times the rate of rotation of the bobbin, thereby unwinding the conductor from the pulley and winding it around said bobbin to form a second layer of the coil on the bobbin simultaneously with forming the first layer.

4,635,458

LEVELING APPARATUS

Charles R. Bradlee, Sidney, Ohio, assignor to Monarch Machine Tool Co., New Bremen, Ohio

Filed Apr. 24, 1985, Ser. No. 726,542
Int. Cl.[4] B21D *1/02*
U.S. Cl. 72—165 **12 Claims**

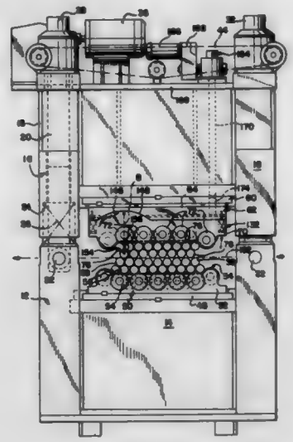
1. A leveling apparatus of the type having first and second sets of work rolls positioned in opposing, nested relation and forming an undulating path therebetween for metal strip material, said path extending longitudinally of said apparatus from entry rolls of said first and second sets at a forward end of said apparatus to rearmost rolls of said first and second sets at a rearward end of said apparatus, means for supporting said first set of work rolls, means for supporting said second set of work rolls, and means for displacing said second set of work rolls toward and away from said first set, wherein the improvement comprises said second support means including:

a back-up block having a rearwardly positioned concave portion extending longitudinally thereof and being superposed to said rearmost work roll of said second set, said back-up block having a center of curvature coinciding with a rotational axis of said rearmost work roll of said second set;

a longitudinally-extending support member having a rearwardly positioned convex portion matingly engaging said concave portion and being superposed to said rearmost work roll of said second set, said support member having a center of curvature coinciding with said rotational axis;

a plurality of back-up rollers supporting said second set of work rolls and extending along said support member; and

means for pivoting said support member relative to said back-up block and about said rotational axis such that said



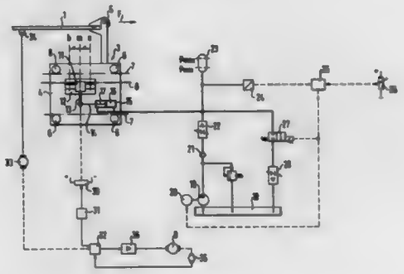
convex portion slides against said concave portion, whereby penetration of said rearmost work roll of said second set relative to said first set of work rolls is unchanged, and penetration of all remaining ones of said second set of work rolls relative to said first set of work rolls is varied increasingly from said rearward end to said forward end.

4,635,459

SYSTEM FOR CONTROLLING A PULLING ASSEMBLY

Friedrich W. Elhaus, Dorfstr. 21, 7761 Moos, Fed. Rep. of Germany

Filed Apr. 8, 1985, Ser. No. 720,966
Int. Cl.[4] B21C *35/02*
U.S. Cl. 72—257 **7 Claims**



1. Apparatus for controlling the operation of a puller assembly (3) operable to withdraw an extruded section (1) from an extruder, comprising

(a) drive means (8,9) for driving said puller assembly in a pulling direction;

(b) speed control means (32) for controlling the speed of operation of said drive means, thereby to control the speed of said puller assembly;

(c) speed sensing means (33) for supplying to said speed control means a reference input signal that is a function of the actual speed of the extruded section; and

(d) means (30) for supplying to said speed control means a disturbance input signal that is a function of the exerted pulling force on the extruded section, said disturbance signal supplying means including

(1) follower means (11,11') arranged intermediate said puller assembly and said drive means, said follower means being influenced by the exerted pulling force on the extruded section;

(2) actuator means (15, 15') acting on said follower means to effect relative displacement between said drive means and said puller assembly; and

(3) displacement detector means (30) for generating said disturbance signal as a function of the relative displacement between said drive means and said puller assembly.

4,635,460

APPARATUS FOR AND METHOD OF THE PLASTIC FORMING OF MATERIALS

Boyan I. Paunov; Teodor A. Balevski, and Bojidar S. Ivanov, all of Sofia, Bulgaria, assignors to Institute Po Metalozmanie I Technologia Na Metalite, Sofia, Bulgaria

Continuation-in-part of Ser. No. 395,281, Jul. 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 149,536, May 14, 1980, abandoned. This application Apr. 29, 1985, Ser. No. 728,266
Claims priority, application Bulgaria, May 14, 1979, 43564
Int. Cl.[4] B21C *26/00*
U.S. Cl. 72—259 **9 Claims**

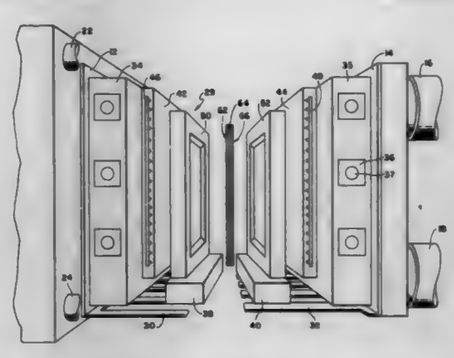
1. In a method for the plastic forming of materials between the dies of a die assembly which has a place for the outflow of the product and which is compressed by the application of a pulsating compressive force applied to the material by a pulsating ram, said die assembly comprising a female die in which the worked material is disposed at the start of its deformation, and a composite male die which enters the female die along its longitudinal axis and compressively engages the material to be formed, the male die being made up of plurality of sections, each section being capable of axial movement in the female die independently of the movement of the other section, a first section of the male die being located nearest to the place of the outflow of the product, the improvement wherein the first section of the male die is rigidly connected to a reciprocating power driven plunger which positively drives the first section against the worked material, and the other sections of the male die are yieldably elastically thrust against the worked material so that during the periods of thrusting against the material in the die assembly by the ram the first section of the male die effects plastic forming of the material in the female die, thus shaping a portion of the product, the other sections of the male die at that time being motionless with respect to the material so that they are additionally elastically stressed, and in the periods wherein the ram reduces its thrust against the material in the die assembly the other sections of the male effect nonsimultaneously plastic forming of the material under the action of the additional stress to which they are elastically subjected in succession beginning with the section located nearest to the first section of the male die and finishing with the section of the male die which is most distant from the first section of the male die.

4,635,461

VERITCAL PRESS

Roger S. Raymond, Redondo Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 22, 1984, Ser. No. 663,635
Int. Cl.[4] B21D *37/16, 37/14*; B21J *9/10, 13/00*
U.S. Cl. 72—342 **21 Claims**



1. An apparatus for sealing tooling about a workpiece, which comprises:

two substantially rigid and vertical rams which oppose each other and are substantially parallel to each other, said rams being in a horizontally spaced relationship;

support means under said tooling and said workpiece for supporting said tooling and said workpiece between said vertical rams; and

pressure means for moving said rams to vary said spaced relationship and clamp said tooling about said workpiece such that said tooling is sealed about said workpiece, said pressure means including a mechanical means for moving one ram and a fluid pressure means for moving the other ram, said one ram movable by said mechanical means having a substantially greater range of horizontal movement than said other ram which is movable by said fluid pressure means.

4,635,462

CORRUGATING DIE SHOE ASSEMBLIES

Gordon H. Bald, Lockport, N.Y., assignor to Diversified Manufacturing Corporation, Lockport, N.Y.

Filed Sep. 26, 1985, Ser. No. 780,647
Int. Cl.[4] B21D *13/02*
U.S. Cl. 72—385 **7 Claims**

1. Upper and lower corrugating die shoe assemblies in combination with press means for moving said corrugating die shoe assemblies between an open loading and unloading position and a closed corrugating position; each of said upper and lower corrugating die shoe assemblies including:

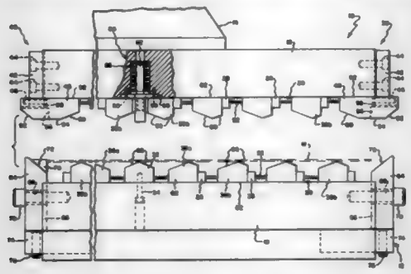
a primary bed member having a bearing surface;

a plurality of individual shiftable corrugating dies;

mounting means carried by said primary bed member for maintaining said plurality of shiftable corrugating dies in juxtapositioned relationship to said bearing surface of the primary bed member for shifting movement towards and away from each other;

a plurality of guide bars fixedly mounted on said bearing surface between said shiftable corrugating dies; and

means to bias said shiftable corrugating dies apart;
one of said upper and lower corrugating die shoe assemblies further including a fixed corrugating die nonshiftably

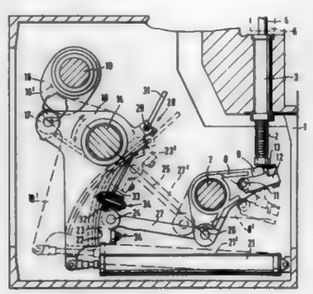


mounted on the bearing surface, the shiftable corrugating dies associated with said one corrugating die shoe assembly extending to either side of said fixed die.

4,635,463
ARRANGEMENT FOR THE EJECTION OF THE SHAPED PARTS OUT OF THE MATRIX OF A DEFORMATION PRESS

Helmut Dumschat, Donzdorf, Fed. Rep. of Germany, assignor to L. Schuler GmbH, Goeppingen, Fed. Rep. of Germany

Filed May 14, 1985, Ser. No. 733,773
Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418508
Int. Cl.[4] B21D *45/02, 45/04*
U.S. Cl. 72—427 **6 Claims**

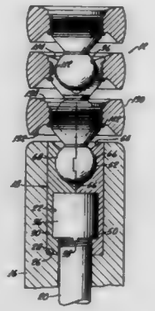


1. An arrangement for ejecting shaped parts out of a matrix means in a deformation press, comprising ejector means movable in the matrix means, drive means for the deformation press, a pivotal drive lever means operatively connected with the drive means of the deformation press and with the ejector means by way of pivotal coupling means, said drive lever means including a guide means in the shape of a circular arc, said pivotal coupling means including a segment adjustable at the drive lever along said guide means by way of an adjusting means and operable to be fixed or released by way of clamping means said guide means having an abutment surface for the abutment of the segment and said segment having a counterabutment surface, said abutment surface and counterabutment surface having differing radii of curvature, the counterabutment surface being made according to a slightly smaller radial dimension than the abutment surface, said clamping means being mounted on the segment and being movable in unison therewith, said clamping means including plural clamping members operable to be fixed at the guide means and arranged spaced from one another to fix the segment at the guide means by deforming the guide means and segment at the abutment and counterabutment surfaces.

4,635,464
TUBE BENDING MANDREL

Samuel B. McGuire, Sr., Carlsbad, and Lee V. Jaderborg, Escondido, both of Calif., assignors to Eaton Leonard Corporation, Carlsbad, Calif.

Filed Sep. 3, 1985, Ser. No. 771,973
Int. Cl.[4] B21D *9/03*
U.S. Cl. 72—466 **18 Claims**

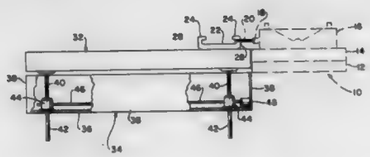


1. A tube-bending mandrel comprising,
a plurality of links, each having a ball end and a socket end, each said link being formed of first and second mating link sections positioned in face-to-face abutment with each other along a parting plane that extends longitudinally from the ball end to the socket end, the socket ends of a mating pair of said links sections having formed thereon continuous external threads having an axis extending longitudinally of the link sections, said threads running around the circumference of the link sections at said socket portion,
the ball end of a first one of said links being positioned within the socket end of an adjacent one of said links, and
an internally-threaded ball segment threaded on said socket end threads, whereby said ball segment holds mating link sections together in assembled relation and restrains relative longitudinal motion of said mating sections.

4,635,465
DIE PULLING APPARATUS

Robert U. Asbelman, Jr., Akron; Michael G. Townsend, Stow, and Mark C. Lawrence, Cuyahoga Falls, all of Ohio, assignors to Karder Machine Co., Akron, Ohio

Filed Oct. 31, 1985, Ser. No. 793,638
Int. Cl.[4] B21D *37/16;* B21J *9/02*
U.S. Cl. 72—448 **11 Claims**

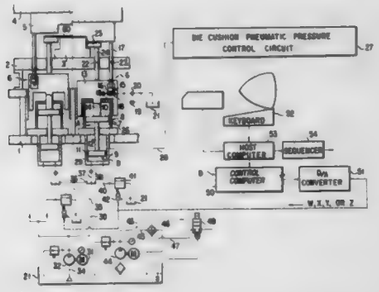


1. Apparatus for changing a die, which is supported on a stationary die supporting member when in use, said apparatus comprising:
(a) die puller means located alongside said stationary die supporting member, said die puller means having a first position in which it is operatively positioned for transfer of a die to or from said stationary die supporting member and a second position in which it is inoperative, said die puller means and said stationary die supporting member having die supporting surfaces which are substantially flush when said die puller means is in its first position;
(b) means associated with said die puller means for moving a die horizontally from said die puller means to said stationary die supporting member or vice versa when said die puller means is in its first position and
(c) means for moving said die puller means between said first position and said second position.

4,635,466
DIE CUSHION APPARATUS FOR USE IN A PRESS MACHINE

Seiji Seki, Kanazawa, and Kiyoji Aoshima, Komatsu, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Apr. 26, 1985, Ser. No. 727,458
Claims priority, application Japan, Apr. 27, 1984, 59-61357[U]
Int. Cl.[4] B21J *9/18*
U.S. Cl. 72—453.13 **1 Claim**



1. A die cushion apparatus for use in a press machine, comprising:
(I) a die cushion mechanism for achieving a die cushioning capability, said die cushion mechanism including a plurality of cylinder devices mounted on a base of a machine body, a plurality of first die cushion pads each mounted on one of said cylinder devices, respectively, and a plurality of cushion pins each interposed between said first die cushion pads and one of a plurality of second cushion pads for contacting an upper die, respectively, each of said cylinder devices comprising:
(a) an upper-side cylinder section,
(b) a lower-side cylinder section connected to said upper-side cylinder section,
(c) a dual piston having a piston rod connected to each of said first die cushion pads and having at opposite sides thereof two piston heads which are connected with each other by a connecting rod and are fitted into said upper-side cylinder section and said lower-side cylinder section, respectively,
(d) a pneumatic pressure chamber defined by said upper-side cylinder section and one of said piston heads and connected to a die cushion pneumatic pressure control circuit, and
(e) a hydraulic pressure chamber defined by said lower-side cylinder section and the other piston head and connected through a check valve to a hydraulic pressure feed circuit;
(II) means for relieving a shock caused at the contact of the upper die and a sheet material to be press-shaped, each of said relieving means comprising:
(a) a cylinder section formed in said first die cushion pad,
(b) a piston fitted into said cylinder section and connected to a pilot pin interposed between said upper die and said first die cushion pad, and
(c) a hydraulic pressure chamber defined by said cylinder section and said piston and connected through a check valve and a choke to a hydraulic tank; and
(III) means for varying the die cushioning capability, each comprising:
(a) an exhaust circuit connected between said hydraulic pressure chamber of said die cushion mechanism and said hydraulic tank,
(b) a relief valve provided in said exhaust circuit and having a preset spring control section, and
(c) relief pressure control means for said relief valve, said relief pressure control means being connected to said preset spring control section and having a computer for control purpose.

4,635,467
CALIBRATION CELL FOR THE CALIBRATION OF GASEOUS OR NON-GASEOUS FLUID CONSTITUENT SENSORS

Jack L. Hoffa, Brea, and Maurice N. Karkar, Costa Mesa, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed May 22, 1985, Ser. No. 736,767
Int. Cl.[4] G01C *25/00*
U.S. Cl. 73—1 G **18 Claims**



1. A reference liquid-containing calibration cell for the calibration of a sensor for measuring a gaseous or non-gaseous constituent parameter of a fluid, comprising a chamber containing a reference liquid, wherein said chamber is sealed to prevent loss of said reference liquid, and wherein said chamber includes:
(a) means for inletting gas into the chamber, the gas-inletting means including a first semi-permeable membrane permeable to a gaseous fluid constituent but impermeable to said reference liquid and non-gaseous reference constituents in the reference liquid;
(b) means for placing a sensor in communication with a reference constituent present in said reference liquid, said means comprising a port sealed by a second semi-permeable membrane permeable to the gaseous fluid constituent but impermeable to said reference liquid and non-gaseous reference constituents present in the reference liquid; and
(c) means for venting gas from the chamber.

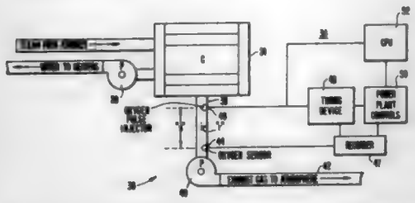
4,635,468
GAS MONITORING METHOD AND DEVICE

William M. Hickam, Churchill Boro, and Warren E. Snider, Elizabeth Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 10, 1985, Ser. No. 743,340
Int. Cl.[4] G01N *31/00*
U.S. Cl. 73—19 **7 Claims**

1. A method for monitoring gas flowing within the exhaust system of a condenser in a steam system, comprising the steps of:
(a) monitoring the gas flowing in the exhaust system;
(b) determining the total gas flow rate and oxygen content of the gas flowing in the exhaust system;
(c) introducing a pulse of oxygen in the exhaust system upstream from the gas monitoring location; and
(d) determining the air inleakage rate in the steam system

and the oxygen content of the air inleakage based on the transit time of the oxygen pulse from the pulse introduc-



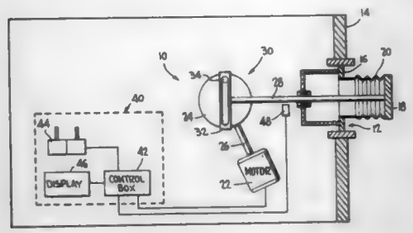
tion location to the gas monitoring location, the total gas flow rate and the oxygen content in the exhaust system.

4,635,469

METHODS AND APPARATUS FOR MEASURING THE TIGHTNESS OF ENCLOSURES

Mark P. Modera, 3815 Brighton Ave., Oakland, Calif. 94602, and Max H. Sherman, 461 Hudson St., Oakland, Calif. 94618

Filed Jan. 21, 1985, Ser. No. 747,556
Int. Cl.[4] G01M *3/26*
U.S. Cl. 73—40 **20 Claims**



1. A method for determining a gas leakage value of an enclosure at a reference pressure which comprises providing apparatus capable of causing an internal volume change for the enclosure, the apparatus including a means for determining instantaneous volume change, and a means for determining instantaneous pressure within the enclosure, operating said apparatus within said enclosure to change the volume thereof; adjusting at least one of the frequency and the displacement to achieve a root mean square pressure in the enclosure approximately equal to the reference pressure, and, at that pressure, determining the leakage of the enclosure from values of the instantaneous volume change and instantaneous pressure values.

4,635,470

APPARATUS AND METHOD FOR PERMEABILITY MEASUREMENT

Bengt Skåller, Sifflo; Kjell Ljungkvist, Gothenburg, and Urban Gren, Mölndal, all of Sweden, assignors to Eur-Control Kalle AB, Sweden

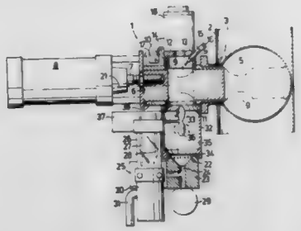
PCT No. PCT/SE84/00177, § 371 Date Jan. 7, 1985, § 102(e) Date Jan. 7, 1985, PCT Pub. No. WO84/04591, PCT Pub. Date Nov. 22, 1984
PCT Filed May 11, 1984, Ser. No. 694,389
Claims priority, application Sweden, May 11, 1983, 8302719
Int. Cl.[4] G01N *11/06*
U.S. Cl. 73—63 **10 Claims**

1. An apparatus for sampling a fibrous suspension and for measuring permeability values of the suspension, the apparatus comprising:

a cylindrical sampling piston housing attachable to a pipe carrying the suspension, at an opening in a wall of the pipe, a concentrically disposed and axially displaceable sampling piston adapted for retrieving a suspension sample from the pipe, the sampling piston having a cylindrically shaped through hole extending at a right angle to a longitudinal direction of the piston, the hole forming a sample chamber which is so disposed that when the sampling piston is in a retracted position inside the housing, the sample chamber is in register with at least one hole, of substantially the same diameter, in a cylindrical surface of the housing, the hole which forms the sample chamber being defined around a longitudinal axis;

a cylindrical casing defining a mixing and dilution chamber and a mixing device disposed in the mixing and dilution chamber, the casing having two opposing openings, of which one of the openings has the same diameter as the hole in the cylindrical surface of the housing and is in register with the hole in the cylindrical surface of the housing;

an end wall member and a screening plate located in an opening in the end wall member, the opening of the end wall member being sealingly connected to the other opening in the casing which is located away from the sampling



piston, the mixing and dilution chamber being defined around a respective longitudinal axis which respective axis is coaxially aligned with the axis of the sample chamber;

a drainage collection duct disposed on the side of the screening plate which faces away from the mixing and dilution chamber and a source of pressurized liquid disposed on the side of the screening plate which is away from the mixing and dilution chamber, the source of pressurized liquid being adapted to provide a stream of flushing liquid which flows through the screening plate into the mixing and dilution chamber and then into the sample chamber generally in a direction along the longitudinal axes of the sample chamber and the mixing and dilution chamber whereby substantially all of the fibrous suspension will be evacuated whenever the source of pressurized liquid is operated in consequence of the alignment of the sample chamber and the mixing and dilution chamber and avoidance of circuitous routes for the flushing liquid.

4,635,471

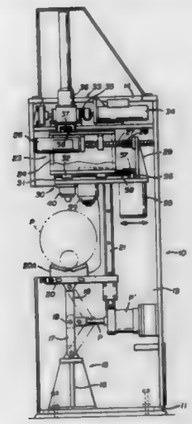
HARDNESS TESTING DEVICE FOR PIPES

D. Brett Rogers, Poland, and Kevin T. Penner, Salem, both of Ohio, assignors to Energy Development Corporation, East Liverpool, Ohio

Filed Jan. 16, 1986, Ser. No. 819,415
Int. Cl.[4] G01N *3/42*
U.S. Cl. 73—81 **8 Claims**

1. A hardness testing device comprises in combination a testing and milling head assembly, means for positioning said testing and milling head assembly in position above a work piece, means for engaging, positioning and supporting a work piece, said testing and milling head assembly comprising a milling head having a drive means, a testing head positioned adjacent said milling head, load cells with in said testing head and means for control of said testing head position, duration,

and relative spacing of both the milling head and testing head with said work piece, communication means in said testing



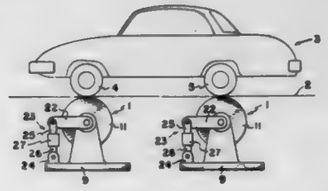
head to said control means, clamping load cells on said testing head in communication with said control means of position.

4,635,472

CHASSIS DYNAMOMETER CONSTRUCTION

George Scourtes, Plymouth, Mich., assignor to The Allen Group Inc., Saginaw, Mich.

Filed Sep. 13, 1984, Ser. No. 650,257
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—117 **21 Claims**



1. A dynamometer construction for use in testing a vehicle having a plurality of spaced ground engaging propulsion devices, said construction comprising a plurality of synchronous, rotary load testing units corresponding in number and spacing to the number and spacing of said propulsion devices; means mounting said load testing units in such positions that one of said units is engageable with a different propulsion device for rotation therewith; adjustable control means for coupling each of said units to a common source of power and selecting a uniform speed at which all of said units rotate; and torque sensing means coupled to each of said units for sensing torque developed thereby.

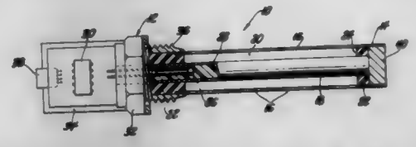
4,635,473

OIL DEGRADATION AND TEMPERATURE MONITOR

Peter A. Hochstein, 2966 River Valley Dr., Troy, Mich. 48098

Filed Nov. 4, 1985, Ser. No. 794,463
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—118.1 **24 Claims**

1. An oil monitor assembly (10) comprising; support means (12) for removable attachment to an oil reservoir, a first electrode (14) extending from said support means (12) to a distal end thereof for immersion in an oil reservoir, a second electrode (18) extending from said support means (12) to a distal end thereof and in spaced relationship (20) to said first electrode (14), electrical insulation means (22) disposed annularly between said first (14) and second (18) electrodes and spacing said second electrode (18) within said first electrode (14) at said distal ends and presenting a surface (24) in a plane facing said support means (12), perforations (16) in said first electrode (14)



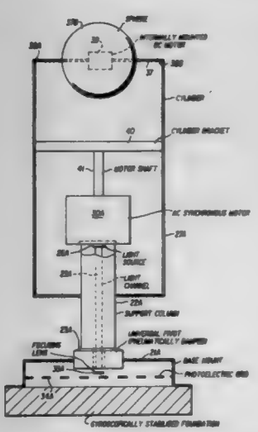
spaced circumferentially thereabout and axially therealong, characterized by at least one of said perforations (16) extending from at least a position radially aligned with the plane of said surface (24) of said insulation means (22) toward said support means (12) to prevent retention of oil within said first electrode (14) on said surface (24).

4,635,474

METHOD AND APPARATUS FOR WIND DIRECTION AND SPEED IN SPATIAL DETERMINATION BY MAGNUS EFFECT

Carl I. R. Blackwood, Fort Washington, Md., assignor to White Scientific Consultants Inc., Arlington, Va.

Filed Feb. 20, 1985, Ser. No. 703,550
Int. Cl.[4] G01W *1/04*
U.S. Cl. 73—189 **16 Claims**



1. A Magnus vane type wind velocity and direction determination apparatus comprising

a first Magnus vane having an external right circular symmetrical shape mounted on a support column with its major axis vertical and rotatable about said vertical axis and supported by a base mount,

an electric motor carried by said support column and being connected through a motor drive shaft to rotate said Magnus vane about its vertical axis,

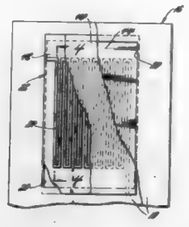
a universal pivot connected between said support column and base mount pivotally supporting said column and Magnus vane above said base mount,

and electromagnetic energy transmitting and receiving means, said electromagnetic transmitting means being supported proximate the top of said support column and said electromagnetic energy receiving means being carried by said base mount.

4,635,475
HOT ELEMENT MASS AIRFLOW SENSOR

Gregory S. Jones, Cape Canaveral, Fla.; William H. Steele, Flushing, and Glenn A. Gurtcheff, Grand Blanc, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 31, 1985, Ser. No. 793,214
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204 3 Claims

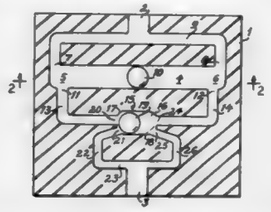


1. A mass airflow sensor having a heated element subject to heat loss by convection and radiation wherein the rate of heat loss by convection is a measure of mass airflow and the rate of heat loss by radiation introduces error into airflow measurement, the heated element including;
- a resistive element positioned in an airstream;
- a circuit for electrically heating the element to a prescribed operating temperature and maintaining heat input at a rate equal to heat loss at the operating temperature, such rate being useful as a measure of mass airflow; and
- means for minimizing the heat loss by radiation comprising a low emissivity coating on the element whereby any error in mass airflow measurement is also minimized.

4,635,476
FLUID FLOW SENSOR

Joel E. Haynes, 18316 Oxnard St., Tarzana, Calif. 91356

Continuation of Ser. No. 589,592, Mar. 14, 1984, abandoned.
This application Oct. 23, 1985, Ser. No. 790,595
Int. Cl.[4] G01F *3/16*
U.S. Cl. 73—249 11 Claims



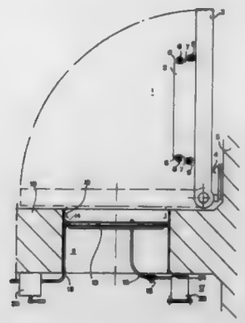
1. A fluid flow sensor for measuring the volumetric flow of a fluid, comprising:
- a housing having a fluid inlet and a fluid outlet;
- a measuring chamber in the housing having opposite first and second ends, each end being connected to both said fluid inlet and said fluid outlet;
- a body in said measuring chamber movable between said opposite ends of said chamber; and
- outlet valve means for alternately controlling the flow of fluid from said first or second end toward said outlet, said valve means being movable between a first position in which said valve means is positioned to cut off said first end of said chamber from said outlet such that fluid in said first end of said chamber urges said body in a first direction towards the end of said chamber, and a second position in which said valve means is positioned to cut off said second end of said chamber from said outlet such that fluid in the second end of said chamber urges said body in the opposite direction towards the first end of said chamber;
- said outlet valve means being shaped and positioned to be moved between said first and second positions solely by the changes in pressure on opposite sides of it resulting from the alternate flow of said fluid from either end of said measuring chamber and to be maintained in a respective one of said first and second positions, during movement of said body in said measuring chamber, solely by the difference in pressure on opposite sides of said outlet valve means developed by the selective flow of fluid from said respective first or second end of said measuring chamber to said outlet, and wherein said outlet valve means comprises:
- a cavity in said housing connected in the flow paths between said first and second ends of said measuring chamber and said fluid outlet;
- an outlet valve member movable in the said cavity between said first position in which the flow path from said measuring chamber first end is cut off from said outlet and the flow path from said measuring chamber second end communicates to said outlet via a portion of said cavity, and said second position in which the flow path from said second end is cut off from said outlet and the flow path from said first end communicates to said outlet via a portion of said cavity; and
- said outlet valve member being arranged in said cavity to move between said first and second positions solely by changes in fluid pressures acting on either side of it when said body moves from one end of said measuring chamber to the other, and wherein:
- said valve cavity has a first inlet port and first outlet port, said first inlet port being connected to said first end of said measuring chamber and said first outlet port being connected to said fluid outlet; and
- a second inlet port and second outlet port, said second inlet port being connected to said second end of said measuring chamber and said second outlet port being connected to said fluid outlet;
- said outlet valve member sealing said first inlet and outlet ports in said first position and sealing said second inlet and outlet ports in said second position;
- the pressures at said first and second outlet ports being less than the pressures at said first and second inlet ports, so that while said body is moving in said first direction in said measuring chamber, the fluid flowing in the flow path including said first inlet port, a portion of said cavity and said first outlet port will exert a pressure on said outlet valve member greater than the pressure exerted thereon by fluid at said second inlet and outlet ports, thereby maintaining said outlet valve member in said first position, and while said body is moving in said second direction in said measuring chamber the fluid flowing in the flow path including said second inlet port, a portion of said cavity and said second outlet port will exert a pressure on said outlet valve member greater than the pressure exerted thereon by fluid at said first and second ports, thereby maintaining said outlet valve member in said second position.

4,635,477
LEAK DETECTOR FOR THE DIKES OF NUCLEAR COOLING PONDS

Andre Simon, Les Bons Villers, Belgium, assignor to Ateliers de Constructions Electriques de Charleroi, Charleroi, Belgium

Filed Mar. 1, 1984, Ser. No. 585,279
Claims priority, application European Pat. Off., Mar. 1, 1984, 83870013.6
Int. Cl.[4] G01F *23/00*
U.S. Cl. 73—290 R 12 Claims

1. An apparatus for monitoring and measuring the leakage of water between adjacent compartments of a water basin, comprising:
- a dike comprising a gate for closing an opening between two adjacent compartments of said water basin;
- a plurality of gaskets extending along a lateral surface of said gate;
- a raised rib extending along a wall of said opening, wherein

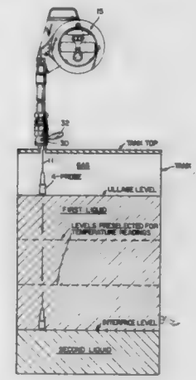


said gaskets, said rib and said wall comprise a free space when said dike is in a closed position;
- means for detecting the level of water in said free space, said means for detecting the level of water in said free space providing a calibration reference volume; and
- said detecting means generating electrical signals providing an indication of the rate of water leakage into said free space.

4,635,478
DEVICE FOR REGISTRATION OF LEVEL, TRANSITION ZONES AND TEMPERATURE

Bjorn R. Hope, Lommedalen, Norway, assignor to Tanksystem A/S, Lysaker, Norway

PCT No. PCT/NO83/00034, § 371 Date May 17, 1984, § 102(e) Date May 17, 1984, PCT Pub. No. WO84/01216, PCT Pub. Date Mar. 29, 1984
PCT Filed Sep. 16, 1983, Ser. No. 616,830
Claims priority, application Norway, Sep. 17, 1982, 823167
Int. Cl.[4] G01F *23/04*
U.S. Cl. 73—292 13 Claims

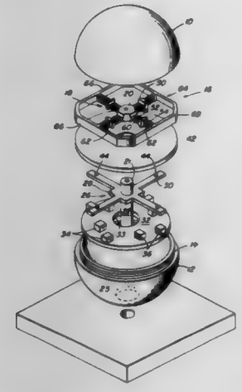


1. Manually operable, portable measuring apparatus for measuring the dielectric constant and loss factor as well as temperature of media contained in a tank to determine the ullage level and the interface level between at least two liquids, said apparatus comprising a combination probe sensitive to the media to be measured, said probe being connected to a tape measure provided with positional read-off indicators and which is supported on a reel, sensing means in the form of a capacitance sensing means and temperature sensing means contained in said probe in approximately the same region of said probe to detect said ullage level and the said interface between at least two liquids of said media by measuring dielectric constant and loss factor as well as the temperature thereof, said sensing means being physically isolated from said media by an electrical insulating material, said tape measure connecting said probe mechanically to said reel, said reel having attached thereto a monitoring unit including electronic signal processing means and electrical conductors attached thereto and extending therefrom through said tape measure to said sensing means in said probe, an insulating mantle covering said tape measure and said conductors therein, said apparatus including a sluice connected to the reel and provided with a quick-coupling in the lower end thereof which is adapted to cooperate with a tank having a pressure different from atmospheric pressure and provided with a ball valve attached to the top portion thereof, and the probe and tape measure are guided internally through said sluice so that the probe may enter said tank by way of said quick coupling and said ball valve, and a combined scrape-off and gas sealing device located in the upper end of said sluice.

4,635,479
FORCE SENSING APPARATUS

John K. Salisbury, Jr., Cambridge, and David L. Brock, Lexington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

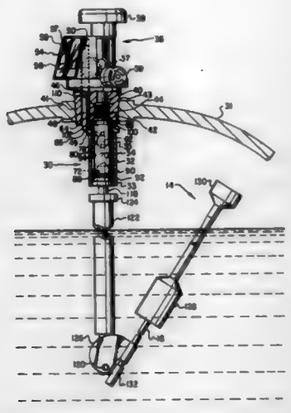
Continuation of Ser. No. 645,495, Aug. 29, 1984, abandoned.
This application Jan. 15, 1986, Ser. No. 819,462
Int. Cl.[4] G01L *5/16*
U.S. Cl. 73—862.04 16 Claims



1. Force sensing apparatus for determining the location, magnitude and direction of a force exerted through a point contact on a three dimensional surface comprising:
- a movable member having a convex surface of known configuration,
- a pedestal,
- a cross having flexible arms fixed to the pedestal,
- a flexible force transmitting member surrounding and attached to each arm, limited portions of the force transmitting member being attached to the movable member, the remainder of the force transmitting member being spaced from the movable member,
- at least one strain gauges secured to each arm of the cross whereby a force applied to the convex surface through a point contact and the resultant moments of that force are transmitted through the flexible force transmitting mem-

ber to the flexible arms resulting in strain measurable by the gauges.

4,635,480
DENSITY COMPENSATING FLOAT
Robert E. Hracir, Dallas, and Herbert G. Ross, Jr., Carrollton, both of Tex., assignors to Rochester Gauges, Inc., Dallas, Tex.
Filed Oct. 15, 1984, Ser. No. 661,039
Int. Cl.[4] G01F *23/76, 23/38*
U.S. Cl. 73—322.5 6 Claims



1. A density compensating float for indicating the quantity of fluid in a tank substantially independent of the density of the fluid, comprising:

a float member which includes at least a portion thereof having predetermined volumetric grading along a dimension thereof, said volumetric grading related to the density variation of said fluid for maintaining said float member in a substantially constant floatation position relative to said tank independent of changes in density for a given quantity of said fluid;

said portion of said float member comprising four discrete volumetric segments positioned along an axis of said float member, said segments including:

a first segment having first and second ends and having a first diameter between said first and second ends thereof;

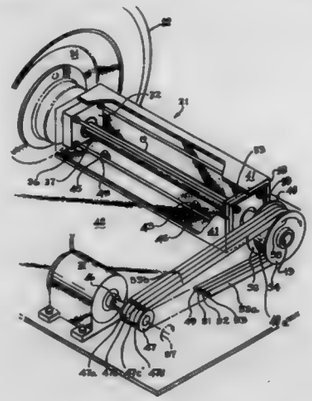
a second segment having first and second ends said first end thereof being connected to said second end of said first segment and having a diameter equal to said first diameter, said second end thereof having a second diameter less than said first diameter;

a third segment having first and second ends, said first end thereof being connected to said second end of said second segment and having a diameter equal to said second diameter, said second end thereof having a third diameter greater than said second diameter and less than said first diameter; and

a fourth segment having first and second ends, said first end thereof being connected to said second end of said third segment and having a diameter equal to said third diameter between said first and second ends thereof; and

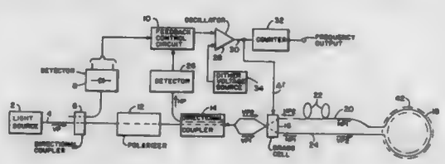
means for supporting said float member in said tank.

4,635,481
LIGHT WEIGHT DYNAMIC WHEEL BALANCING MACHINE
Donald B. Curchod, 1246 Sharon Park Dr., Menlo Park, Calif. 94025
Continuation-in-part of Ser. No. 395,250, Jul. 6, 1982. This application Oct. 3, 1984, Ser. No. 657,432
Int. Cl.[4] G01M *1/22*
U.S. Cl. 73—460 5 Claims



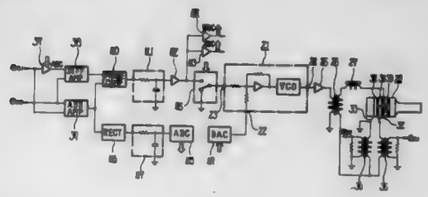
2. A dynamic wheel balancing machine for rotating a wheel and tire assembly, said balancing machine comprising a low mass base formed of sheet material, a drive shaft and bearing means carried by said base for supporting said shaft for rotation, one end of said shaft being disposed and adapted to readily removably receive a wheel and tire assembly to be balanced during rotation with said shaft, a first pulley fixed to rotate with said shaft, a low power drive motor of the order of one-sixth horsepower, a second pulley driven by said motor, means for sensing imbalance signals and attendant system noise during rotation of said wheel, means for mounting said first and second pulleys substantially in a common plane and in predetermined spaced relation to each other, cyclic elastically stretchable lengthwise drive belt means trained about and extending between said first and second pulleys, said belt means being jointless and uniformly integrally continuous therealong, said belt means serving to increase the ratio of the amplitude of said signals to that of attendant noise sensed by said means for sensing imbalance signals to permit reliable detection of signals representative of unbalanced forces at relatively low speed.

4,635,482
SAGNAC PHASE DETECTION PASSIVE LASER ACCELEROMETER
Clifford G. Walker, 915 Weatherly Rd., Huntsville, Ala. 35803
Filed Aug. 5, 1985, Ser. No. 762,233
Int. Cl.[4] G01P *15/08*
U.S. Cl. 73—517 R 12 Claims



10. A phase detection laser accelerometer comprising: a laser for generating a beam of coherent light; a waveguide-to-waveguide directional coupler having first and second, optical, input-output ports and a third, output, port; said first input-output port being coupled to receive said beam of coherent light; optical waveguide means having a refractive index that changes in response to stress, said waveguide means lying substantially in a plane and forming an optical path loop terminating in a Y-coupler junction, said Y-coupler junction having an input-output port coupled to said second input-output port of said directional coupler; said waveguide means having a substantially circular loop portion spaced apart from said waveguide means Y-coupler junction; a polarizer disposed between said laser and said directional coupler first port for vertically polarizing said beam of light; polarization control means disposed in said optical path loop; modulating means adjacent to said polarization control means for modulating polarized laser light in said optical path, said polarization control means being disposed between said directional coupler and said modulating means; optical energy detection means coupled to said third, output, port of said directional coupler for providing an output signal indicative of acceleration stress forces directed perpendicular to the plane of the waveguide means; stress application means disposed on the surface of the circular loop portion of said waveguide means for subjecting the loop portion of said waveguide means optical path to said acceleration stress forces; and feedback means coupled to receive the optical energy detection means output and having an output coupled to said modulating means for controllably modulating the phase of the light frequency traveling in said waveguide means and wherein said polarization control means is disposed for rotating the polarization of light passing therethrough from vertical to horizontal polarization.

4,635,483
DRIVING CONTROL METHOD OF ULTRASONIC TRANSDUCER
Shoji Mishiro, Kawasaki, Japan, assignor to Taga Electric Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 636,629, Aug. 1, 1984, Pat. No. 4,577,500. This application Feb. 18, 1986, Ser. No. 829,930
Claims priority, application Japan, Aug. 5, 1983, 58-143593
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—579 2 Claims



1. A driving control method for an ultrasonic tranducer, comprising the steps of:

measuring the transducer current and determining the transducer current characteristics;

determining the vibratory velocity detecting signal of said transducer based upon said transducer current;

determining the phase characteristic of said vibratory velocity detecting signal with respect to said transducer current;

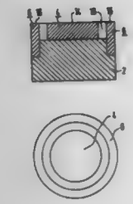
locating a zero cross point based on said phase characteristics;

locating the resonant points of the operation of said transducer based upon said current characteristics;

determining the fundamental resonant point based upon the relationship of the zero cross point of said phase characteristic with respect to the location and current value of said resonant point; and

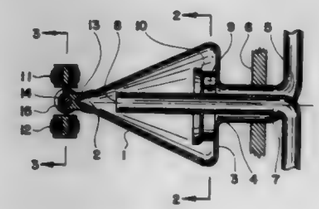
performing a phase lock-loop control oscillation to drive said transducer.

4,635,484
ULTRASONIC TRANSDUCER SYSTEM
Reinhard Lerch, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jun. 6, 1985, Ser. No. 742,157
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422115
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—628 6 Claims



1. An ultrasonic transducer system characterized by at least two ultrasonic transducers (4,6) having different predetermined mid-frequencies, attached to a common support body and having overlapping natural foci, the ultrasonic transducers (4,6) being separately, electrically controllable, the ultrasonic transducer (4) having the highest mid-frequency being equipped with the largest radiating surface area for producing the highest acoustic power output.

4,635,485
PRECESSION FLOW METER
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005
Filed Jun. 24, 1985, Ser. No. 748,183
Int. Cl.[4] G01F *1/80*
U.S. Cl. 73—861.37 20 Claims



1. A device for measuring flow rate comprising in combination:

(a) a flow passage assembly comprising a conical shell with closed converging extremity and capped diverging extremity including a substantially centrally located inlet port disposed through said capped diverging extremity of said conical shell and extending to an inlet tube, and an outlet tube coaxially routed and extending through said inlet port into inside of said conical shell in a substantially coaxial relationship and terminated near said closed converging extremity, wherein flow guide means disposed adjacent to said inlet port for imposing rotating movements on fluid medium entering through said inlet port and guiding said fluid medium toward the wall of said conical shell is included;

(b) means for securing said inlet tube;

(c) means for imposing oscillatory movements on said closed converging extremity of said conical shell in a first direc-

tion substantially perpendicular to the central axis of said conical shell; and

(d) means for measuring vibratory movements of said closed converging extremity of said conical shell in a second direction substantially perpendicualr to the central axis of said conical shell and to said first direction, said vibratory movements being generated by dynamic interaction between rotating motion of fluid in said conical shell and said oscillatory movements of said closed converging extremity of said conical shell.

4,635,486

ELECTROMAGNETIC FLOW METER

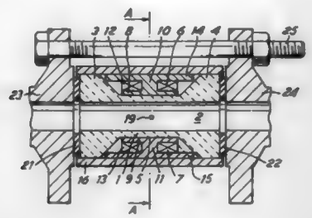
Hans E. Jacobsen; Henning M. Hansen, both of Nordborg; John Nyrup, Sonderborg; Henry Hansen, Graasten, and Konstantin Lasithiotakis, Nordborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed May 24, 1985, Ser. No. 737,462

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1984, 3420963

Int. Cl.⁴ G01F *1/58*

U.S. Cl. 73—861.12 **8 Claims**



1. An electromagnetic flow meter, comprising a measuring tube of an electrically insulating material having a cylindrically shaped section, a magnetic system having two magnetic poles with pole shoes thereto attachable externally to diametrically opposite sides of said measuring tube, said poles including core sections carrying windings connected to said shoes, outer yoke means surrounding said poles, said poles including radially outward plate means connected to said core sections which extend circumferentially beyond said windings to receive stay flux from said pole shoes, and said yoke means having separating gap means associated therewith disposed beyond the magnetic path of said stray flux emanating from either of said pole shoes, said gap means being disposed between said plate means and said poles means.

4,635,487

FLUID SAMPLER

Scott Gowing, Rockville, Md., assignor to The United States of America as represented by the United States Department of Navy, Washington, D.C.

Filed Oct. 29, 1985, Ser. No. 792,374

Int. Cl.⁴ G01N *1/10*

U.S. Cl. 73—864.62 **2 Claims**

1. A fluid sampler for acquiring fluid samples at in situ conditions comprising:

a rigid container having first and second openings in the wall thereof for containment of volumes of sample approximately equal to to the volume of said rigid container;

a bladder to act as a pressure reservoir having a single bladder opening disposed within said rigid container;

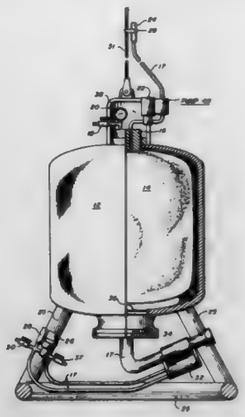
closing means for covering the bladder opening and hermetically sealing the periphery of the bladder opening around the rim of the first opening in the wall of the rigid container, said closing means having two conduits, a first conduit and a second conduit, therethrough through which fluid communication is established between the outside of the rigid container and the inside of the bladder in the absence of an obstruction;

first valve means for controlling fluid flow through the first conduit from outside the rigid container and closing means to inside the bladder;

means for controlling fluid flow through the second conduit from inside the bladder to outside the rigid container and closing means;

second valve means for controlling fluid flow through the second opening in the wall of said rigid container;

fluid-impervious tubing interconnecting the first conduit through said closing means and said first valve means for controlling fluid flow, said fluid-impervious tubing being hermetically sealed at each interconnecting point;



additional fluid-impervious tubing interconnecting the second conduit through said closing means and said means for controlling fluid flow through the second conduit, said fluid-impervious tubing being hermetically sealed at each interconnecting point;

additional fluid-impervious tubing interconnecting the second opening in the wall of said rigid container and said second valve means, said fluid-impervious tubing being hermetically sealed at each interconnecting point;

support means for holding the first valve means, means for controlling fluid flow through the second conduit and second valve means in predetermined positions around said rigid container;

means for remotely controlling said means for controlling fluid flow; and

means for remotely controlling said second valve means.

4,635,488

NONINTRUSIVE BODY FLUID SAMPLERS AND METHODS OF USING SAME

Richard D. Kremer, Keene, N.H., assignor to Schleicher & Schuell, Inc., Keene, N.H.

Filed Dec. 3, 1984, Ser. No. 677,226

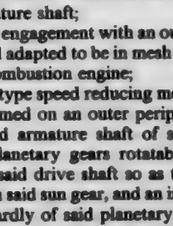
Int. Cl.⁴ G01N *1/12*

U.S. Cl. 73—864.72 **23 Claims**

1. A device for nonintrusively collecting a sample of a fluid such as sweat, tears or saliva, comprising:

(a) a hollow tube having at least one open end; and

(b) a collecting nib secured in said one end of said tube and having an inner extremity facing the interior of the tube and an outer tip projecting beyond said one end of the tube for contact with a fluid to be collected, said nib comprising a solid, nonfibrous, porous, water-wettable body a porosity sufficient for absorption therein of the fluid to be collected, and said nib and said one end of said tube being mutually arranged to permit passage of fluid



between the exterior and the interior of the tube at said one end only through the nib body.

4,635,489

STARTER WITH PLANETARY GEAR TYPE SPEED REDUCING MECHANISM

Tetsuo Imamura, and Yasuaki Yukawa, both of Toyoake, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 24, 1985, Ser. No. 779,684

Claims priority, application Japan, Oct. 30, 1984, 59-229685

Int. Cl.⁴ F02N *15/06*; F16H *1/32, 57/10*

U.S. Cl. 74—7 E **12 Claims**

1. A starter for an internal combustion engine having a ring gear, the starter comprising:

a starter motor having an armature shaft;

a drive shaft extending in coaxial relation to said armature shaft, said drive shaft having a projection extending radially outwardly from an axial end of said drive shaft adjecent said armature shaft;

a pinion in spline engagement with an outer periphery of said drive shaft and adapted to be in mesh with the ring gear of the internal combustion engine;

a planetary gear type speed reducing mechanism comprising a sun gear formed on an outer periphery of an axial end portion of said armature shaft of said starter motor, a plurality of planetary gears rotatably mounted on said projection of said drive shaft so as to be in meshing engagement with said sun gear, and an internal gear disposed radially outwardly of said planetary gears so as to be in meshing engagement with said planetary gears, said planetary gear type speed reducing mechanism being operative to reduce the rotational speed of said armature shaft and transmit the rotation of said armature shaft to said drive shaft through said sun gear, said planetary gears and said internal gear;

a center bracket comprising a cylindrical portion supported through a bearing by an outer periphery of one of said drive shaft and said armature shaft, and a disc-shaped portion extending radially outwardly from an axial end of said cylindrical portion; and

a shock absorber unit comprising a rotary disc disposed around said cylindrical portion of said center bracket so as not to be rotatable, but to be axially movable with respect to said internal gear, spring means disposed around said cylindrical portion of said center bracket to urge said rotary disc against said disc-shaped portion of said center bracket, and fixing means for retaining said rotary disc and said spring means in their respective positions around said cylidrical portion of said center bracket.

4,635,490

PUSH-BUTTON TUNER

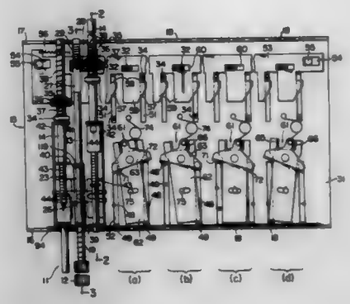
Tamaki Ohashi, Tokyo, Japan, assignor to Nihon Technical Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1984, Ser. No. 660,931

Claims priority, application Japan, Oct. 17, 1983, 58-192680

Int. Cl.⁴ H03J *5/12*

U.S. Cl. 74—10.33 **9 Claims**



1. A push-button tuner comprising: a support, tuning means mounted on said support in a manner so that said tuning means is movable to positions corresponding to tuned frequencies for producing the tuned frequencies, and a plurality of presettable tuning mechanisms for adjusting said tuning means to move selectively to positions respectively corresponding to specific frequencies, in which each of said tuning mechanism comprises:

a rotatable operation member movable between a front non-actuation position and a rear actuation position, said operation member being normally urged to said front non-actuation position, said operation member having a drive rotary body and a push-button provided at an end of said operation member, said push-button defining a rotating knob for effecting rotation of the operation member;

a pair of rotatable tuning members each having a driven rotary body selectively engaged with said drive rotary body to thereby rotate together with said drive rotary body, each of said rotatable tuning members being supported by said support in a manner so that said rotatable tuning member is normally urged to said front non-actuation position while it is movable between said front non-actuation position and said rear actuation position, each of said rotatable tuning members having a longitudinally extending threaded portion and a tuning piece threadedly engaged with said threaded portion, said tuning piece being movable in the frontward and rearward directions in response to the rotation of said tuning member;

an engagement mechanism coacting with said operation member for engaging with said pair of tuning members such that said pair of tuning members are alternately displaced to said rear actuation position relative to said operation position every one reciprocation of said operation member between said front non-actuation position to said rear actuation position;

an enlarging mechanism for enlarging the amount of movement of said operation member toward said rear actuation position and for transmitting the enlarged amount of movement to one of said tuning member which is movable to said rear actuation position;

said tuning means including an actuator plate for engaging with said tuning piece of one of said pair of tuning members which is in said rear actuation portion for adjusting said tuning means; and

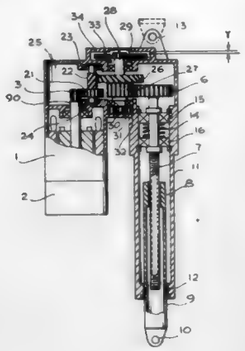
said push-button tuner further comprising locking means including a lock member for holding any one of said tuning members so as to permit the transmission of rotation between said drive rotary body and said driven rotary body when said one tuning member is located in said rear actuation position and for releasing said one tuning member held in said rear actuation position when another tuning member is displaced to said rear actuation position.

4,635,491

FAIL-SAFE MOTOR-DRIVEN CYLINDER FOR LIFTING APPARATUS

Kenji Yamano, and Tetsuo Tamamura, both of Yokkaichi, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 7, 1984, Ser. No. 638,395
Claims priority, application Japan, Aug. 10, 1983, 58-147217
Int. Cl.⁴ F16H *57/10*
U.S. Cl. 74—89.15 **7 Claims**



6. For use with lifting apparatus, a motor-driven cylinder including:

a frame;

a motor supported fixedly in said frame and having a rotatable shaft;

screw means having intermeshed internally and externally threaded members;

torque transmission means coupled between said rotatable shaft and said externally threaded member of said screw means;

said torque transmission means including torque sensing means movable from a first position in the presence of torque transmission between said shaft and said screw means to a second position in the absence of troque transmission between said shaft and said screw means;

braking means carried by said torque sensing means and operative upon the movement of said torque sensing means to said second position to prevent rotation of said internally threaded member in said screw means; and,

load coupling means coupled to said screw means;

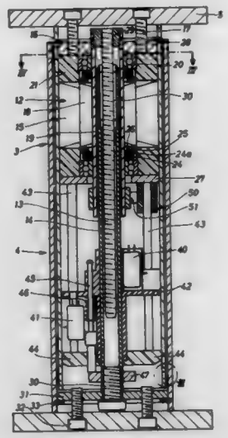
said torque sensing means including first and second intermeshed helical gears coupled between said rotatable shaft of said motor and said screw means, said first and second helical gears, when transmitting torque, producing a force in the direction of said first position of said torque sensing means.

4,635,492

TELESCOPIC ASSEMBLY

Hugo Uebelhart, Liestal, Switzerland, assignor to Magnetic Elektromotoren A.G. Liestal, Liestal, Switzerland

Filed Feb. 19, 1985, Ser. No. 702,617
Claims priority, application Switzerland, Feb. 20, 1984, 814/84
Int. Cl.⁴ F16H *25/20*; F16M *11/00*
U.S. Cl. 74—89.15 **15 Claims**



1. A telescopic assembly comprising

an inner tube substantially closed at one end and open at the other end,

an outer tube substantially closed at one end and open at the other end, said outer tube being movably disposed onto said inner tube,

a motive power source having a rotatable hollow output shaft, said motive power source being disposed within said inner tube and affixed to the closed end thereof to prevent rotation therebetween,

a screwed spindle affixed to said rotatable output shaft at one end, and

a driving tube screwed onto said spindle at one end and affixed to said closed end of the outer tube, whereby rotation of said motor output shaft and said screwed spindle effects reciprocal displacement of said inner tube, said driving tube extends substantially into said hollow output shaft when retracted so that the minimum height of the assembly as well as the length of stroke correspond substantially to the length of said motive power source.

4,635,493

RECIPROCATOR FOR DIE-CASTING MACHINE

Richard A. Buckley, Worthington, Ohio, assignor to Rimrock Corporation, Columbus, Ohio

Filed Apr. 1, 1985, Ser. No. 718,180
Int. Cl.⁴ F16F *21/44*
U.S. Cl. 74—99 R **4 Claims**

1. Apparatus for moving a fluid emission head through operating cycles that include extension and retraction to and from a space within which predetermined operations are to be performed, comprising:

a support assembly;

a crankshaft journaled in said support assembly;

drive means for turning said crankshaft in forward and reverse directions;

a main link having an outer end and an inner end connected for guided movement to said support assembly;

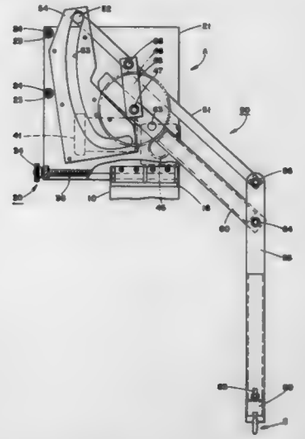
a carrier arm pivotally connected at one end to the outer end of said main link and adapted to carry said fluid emission head at its other end;

a control arm having an inner end rigidly connected to said crankshaft and an outer end pivotally connected intermediate the ends of said carrier arm, said control arm extending generally parallel to said main link;

an intermediate link having one end pivotally connected to said crankshaft and its other end pivotally connected intermediate the ends of said main link, said intermediate link extending generally parallel to said carrier arm;

a guide plate defining a curved slot;

roller means on said inner end of said main link received in and engaging said slot whereby movement of said inner



end conforms to the path defined by said slot to guide said inner end of said main link through a controlled path of travel whereby said fluid emission head is carried through an operating cycle between a retracted position above and laterally offset from the vertical projection of said operating space and an extended position in said work space;

a lever arm having one end fixed to said crankshaft, resilient means connected between the other end of said lever arm and said support assembly whereby said lever arm applies a variable counterbalancing torque to said crankshaft for counterbalancing the torque applied to said crankshaft resulting from the weight of said parallel link assembly and said fluid emission head when said fluid emission head is moved to and from said extended position.

4,635,494

INFINITELY VARIABLE TRANSMISSION AND CONTROL APPARATUS THEREFOR

Emmett D. Conklin, 2937 63rd Ave. S., St. Petersburg, Fla. 33712

Filed Oct. 3, 1983, Ser. No. 538,566
Int. Cl.⁴ F16H *29/08*; B60K *41/12*
U.S. Cl. 74—119 **10 Claims**

1. An infinitely variable transmission comprising:

a driving shaft;

a driven shaft parallel to said driving shaft;

cam means on said driving shaft;

fulcrum means interposed said driving shaft and said driven shaft;

fulcrum moving means selectively operable to move said fulcrum means along a line between said driving shaft and said driven shaft;

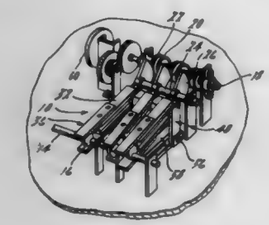
lever means pivotally interconnected with said fulcrum means, said lever means being in the form of a beam and having a first end, a second end, an elongated portion and a pair of spaced apart flanges extending therefrom, said cam means being trapped between said pair of spaced apart flanges, said pair of spaced apart flanges acting as cam follower means;

cam follower means on said first end of said lever means and disposed adjacent said cam means and engaged therewith such that said first end of said lever means is oscillated about said fulcrum means by said cam means upon rotation of said driving shaft;

one-way clutch means mounted to said driven shaft;

gear means mounted to said one-way clutch means;

intermediate shaft means disposed between said driving shaft and said driven shaft and parallel thereto; and



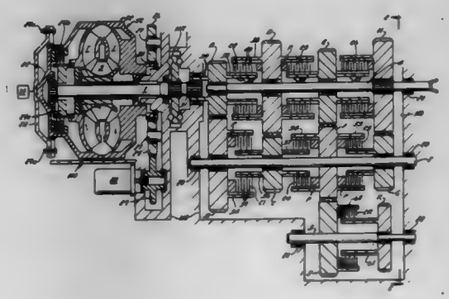
rack means pivotally mounted to said intermediate shaft means, said rack means further being pivotally interconnected with said second end of said lever means and further engaging said gear means such that, upon oscillation of said lever means, said rack means is driven thereby to pivot about said intermediate shaft means to drive said driven shaft through said gear means to rotate in a first predetermined angular direction, the angular speed of said driven shaft being determined by the angular speed of said driving shaft and the location of said fulcrum means.

4,635,495

MULTI-SPEED REVERSIBLE POWER TRANSMISSION

Basil White, Roscoe, Ill., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Oct. 18, 1985, Ser. No. 788,921
Int. Cl.⁴ F16H *3/08*
U.S. Cl. 74—364 **4 Claims**



1. A multi-speed reversible transmission for providing eight forward speeds and four reverse speeds and comprising, a housing, four shafts mounted in said housing and arranged in parallelism,

said shafts including an input shaft and an output shaft which together are in coaxial alignment with one another, a countershaft and a reverse shaft;

said transmission including ten gears and seven hydraulically actuated multiple friction disc type clutches;

said gears including an input driver gear journalled on one end of said output shaft and having a driving connection

with said input shaft, an output driven gear fixed at the other end of said output shaft for rotation therewith, and a 3rd and 4th gear journalled on said output shaft and located axially between said input driver gear and said output driven gear; said gears also including a 5th, 6th, 7th and 8th gear mounted on said countershaft, said 5th, 6th and 8th gear journalled for rotation on said countershaft, and said 7th gear fixed to said countershaft for rotation therewith, said 7th gear located axially between said 6th and 8th gears, said 5th gear being in constant mesh with said input driver gear, said 6th gear being in constant mesh with said 3rd gear, said 7th gear being in constant mesh with said 4th gear, and said 8th gear being in constant mesh with said output driven gear; said gears furthermore including a 9th gear fixed to said reverse shaft and a 10th gear rotatably journalled on said reverse shaft;

said clutches including a 1st clutch located between said 5th gear and said 6th gear so as to form a disengagable driving connection therebetween, a 2nd clutch located between said input driver gear and said 3rd gear, a 3rd clutch located between said 3rd gear and said 4th gear, a 4th clutch located between said 6th gear and said 7th gear, a 5th clutch located between said 7th gear and said 8th gear, a 6th clutch located between said 4th gear and said output driven gear, and a 7th clutch located between said 9th gear and said 10th gear so as to form a disengagable driving connection therebetween for reversing the transmission output,

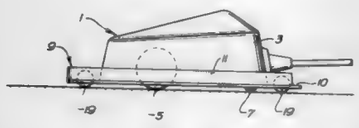
each of said clutches acting to form a driving connection between its respective gears when said clutch is engaged, whereby said clutches can be hydraulically actuated to cause their respective gears to be drivingly connected with another and thereby provide various gear speeds for said transmission.

4,635,496

ATTACHMENT FOR A DISPLAY POSITION INDICATOR

Scott B. McTyre, 9640 Topanga Canyon Pl., Suite H, Chatsworth, Calif. 91311

Filed Apr. 18, 1985, Ser. No. 724,621
Int. Cl.⁴ G05G *9/04*
U.S. Cl. 74—471 XY **6 Claims**



1. A holder for a visual display position indicator, said holder comprising:

a substantially planar base defining a series of apertures wherein said apertures comprise one aperture adapted to allow a transport sphere of said indicator to extend through said holder and come in contact with a supporting surface, and at least two apertures adapted to receive support feet of said indicator but preventing said support feet from making contact with said supporting surface;

side members located along the length of said base and perpendicular thereto for securing said indicator to said holder; and

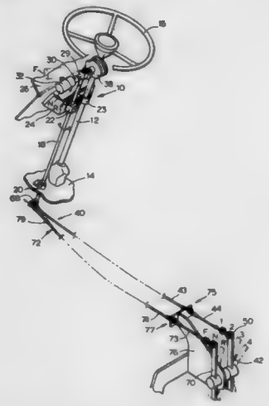
a plurality of rotatable bearing means joined to said base, such that said holder can be readily moved across a supporting surface.

4,635,497

SINGLE LEVER SHIFT

Robert L. Siewert, Benton Harbor, and Edmund K. Varnelis, St. Joseph, both of Mich., assignors to Clark Michigan Company, Cleveland, Ohio

Filed Aug. 26, 1985, Ser. No. 769,120
Int. Cl.⁴ G05G *9/12*
U.S. Cl. 74—473 SW **6 Claims**



1. A single lever shift mechanism for a hydraulically shifted transmission which has a ratio valve with at least two positions and a forward and reverse valve with at least two positions, comprising

a vertically disposed column member,

means supporting said column member on a vehicle so that it can be pivoted about its axis,

a bracket fixed at the upper end of said column member,

said bracket having a laterally facing surface supporting the spindle of a handle mechanism which extends laterally from said column member,

a handle which encircles said spindle and turns about the joint axis of said spindle and said handle,

a pulley secured to said handle confronting said bracket and having a plurality of ratio positions around the periphery of said pulley,

a flexible cable having an outer sheath and inner wire which is movable longitudinally within the sheath,

said sheath being secured to said bracket, and

means for securing one end of said wire to said pulley to move between ratio positions when said handle is turned about its axis.

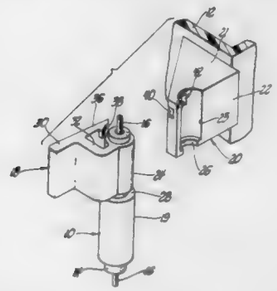
4,635,498

FASTENING DEVICE

Klaus Zimmermann, Loerzweiler, Fed. Rep. of Germany; Michael J. Thomas, and Norman R. Bailey, both of Lockport, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 18, 1985, Ser. No. 724,589
Int. Cl.⁴ F16C *1/10*
U.S. Cl. 74—501 R **3 Claims**

1. A fastening device for fastening a bowden wire or cable sheath and the like to a support, said device comprising a first fastener member adapted to be fixed to the sheath and a second fastener member adapted to be fixed to the support, one of said fastener members having a semi-cylindrical socket, the other of said fastener members having a cylindrical body adapted to engage said socket and be supported thereby for rotary movement, axial retention means on said cylindrical body and socket for preventing relative axial movement therebetween, and detent means on said cylindrical body and socket for self forcibly snap fittingly engaging with each other in a radial direction upon relative rotary movement between said cylindrical body and socket and thereafter yieldingly holding said cylindrical



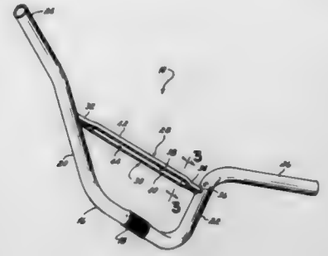
body in said socket and preventing such relative rotary movement therebetween.

4,635,499

BICYCLE HANDLEBAR BRACE

David K. McMurtrey, Maysville, Ky., assignor to Wald Manufacturing Co., Inc., Maysville, Ky.

Filed Jul. 10, 1985, Ser. No. 753,394
Int. Cl.⁴ B62K *21/12*
U.S. Cl. 74—551.1 **5 Claims**



1. In a bicycle handlebar having spaced handlebar arms connected to a transverse bar, the improvement comprising:

a brace having a center portion disposed between opposed end portions, each of said end portions being fixedly secured by weldment means to a handlebar arm;

said center portion and said end portions each having spaced, longitudinally extending legs forming a channel-shaped cross section having an open interior forcing vertically downwardly when said handlebar is mounted upon a bicycle.

4,635,500

EPOXY STEERING WHEEL

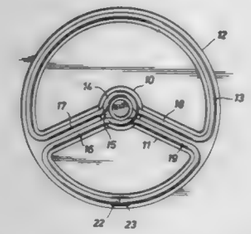
Robert H. Overcashier, Santa Rosa, Calif., and Robert D. Farris, Katy, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 613,499, May 24, 1984, abandoned, which is a division of Ser. No. 448,540, Dec. 10, 1982, Pat. No. 4,473,520. This application Jul. 22, 1985, Ser. No. 757,758
Int. Cl.⁴ B62D *1/04*
U.S. Cl. 74—552 **1 Claim**

1. An automotive steering wheel having a rim and two spokes connecting said rim to a central hub, said steering wheel comprising:

a flexible tubular member sealed at each end, said flexible tubular member being sealed in a partially deflated condition;

a woven tube of fiber-reinforcing material, said tube being positioned to surround said flexible tubular member, a continuous length of said flexible member and tube of fiber-reinforcing material being used to form the steering wheel by placing one end of the flexible member in a first position on the rim, passing it up one spoke around the central hub then back down said one spoke around a remainder of the rim to the second spoke, up said second



spoke around said hub, back down said second spoke and around a remainder of the rim to the first position to join the other end of said flexible member with said one end of said flexible member; and

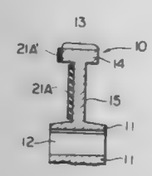
a thermosetting resin, said resin combining with said fiber-reinforcing material to bond the reinforcing into a solid mass.

4,635,501

GEARS WITH DAMPED VIBRATION

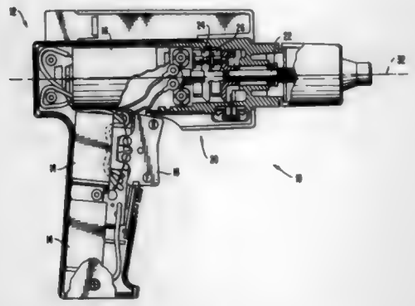
Keiichiro Mizuno; Kazuyoshi Iida, and Kazutomo Murakami, all of Yokohama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 29, 1984, Ser. No. 614,918
Claims priority, application Japan, Aug. 19, 1983, 58-150278
Int. Cl.⁴ F16F *15/10*
U.S. Cl. 74—574 **8 Claims**



1. A rotary element of magnetizable material having a hub and an outer edge disposed radially outwardly of said hub along with a web between said hub and said outer edge, said web having a side face which is disposed in a plane perpendicular to the axis of rotation of said rotary element, a permanent magnet held magnetically onto said side face such that under non-rotating conditions, said magnet is magnetically and fixedly retained and carried on and by said rotary element, said rotary element being adapted to be mounted on a shaft, said magnet being carried by said rotary element free and clear of and spaced from said shaft, said magnet directly contacting and directly abutting said side face free of any intermediate material between said side face and said magnet and providing for relative rotary movement between said magnet and said rotary element as said rotary element is continuously rotated, whereby said relative rotary movement provides dampening of vibration of said rotary element during continuous rotation of said rotary element.

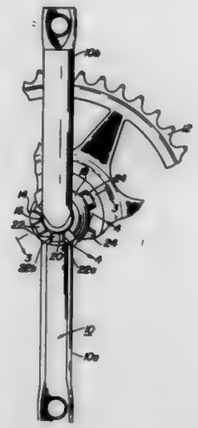
4,635,502
RACHET SYSTEM FOR HAND-HELD TOOL
William A. George, Raleigh, N.C., assignor to Black & Decker Inc., Newark, Del.
Filed Feb. 27, 1985, Ser. No. 706,272
Int. Cl.[4] F16H *1/28*
U.S. Cl. 74—625 23 Claims



1. A hand-held tool comprising:
a housing adapted for being hand-held;
a spindle rotatably mounted in said housing;
means for rotating said spindle in a given direction;
ratchet means for selectively interengaging said housing and said spindle for preventing a substantial degree of relative rotation therebetween in a direction opposite to said given rotational direction while allowing substantially unrestricted relative rotation in said given direction, said ratchet means including
(i) a carrier member fixedly connected to said spindle for rotation therewith, said carrier member including stop means located on the carrier member periphery,
(ii) a stop engaging member having a shaft portion and an arm portion, said arm portion steadfastly fixed to said shaft portion and extending at an angle to said shaft portion, said shaft portion being mounted for rotation in said housing along an axis which is substantially perpendicular to the axis of rotation of said spindle, said arm portion being located within said housing, and said shaft portion extending through said housing to the outside thereof,
wherein said shaft portion is selectively rotatable between a non-engagement angular position where said stop means can by-pass said arm portion during rotation of said spindle, and an engagement angular position where said stop means can engage said arm portion and thereby prevent further spindle rotation in said opposite direction.

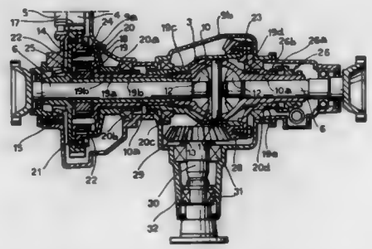
4,635,503
BICYCLE SPROCKET DRIVE ASSEMBLY
Wilfred J. Sharon, Clarksville, Tenn., assignor to Thun, Inc., Clarksville, Tenn.
Filed Apr. 10, 1985, Ser. No. 721,607
Int. Cl.[4] G05G *1/12*
U.S. Cl. 74—594.2 5 Claims

1. A bicycle sprocket drive assembly, comprising:
a crank having crank arms connected by a crank shaft, a collar on said shaft positioned at an end of said shaft to receive the central aperture of a sprocket and a sprocket retaining flange positioned at the outboard end of said collar, said flange having sprocket-engaging splines on its inboard surface extending radially from said collar and being shaped so that they are tapered along their drive faces;
a metal drive sprocket having a central aperture for mounting on said collar and having spline receiving slots formed into its surface by cold working said metal, said slots having tapers matching those of said splines and engaging the full radial extent of said splines; and



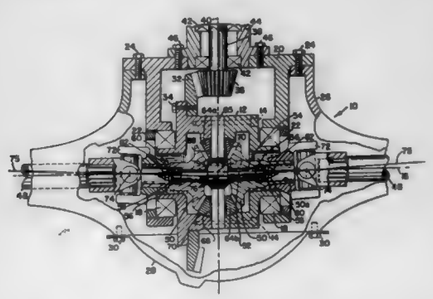
means for maintaining said splines in engagement with said slots during the operation of said crank.

4,635,504
TRANSMISSION SYSTEMS FOR MOTOR VEHICLES WITH FOUR-WHEEL DRIVE
Federico Cordero, and Roberto Faldella, both of Turin, Italy, assignors to Fiat Auto S.p.A., Italy
Filed Jul. 13, 1984, Ser. No. 630,805
Int. Cl.[4] F16H *37/08, 37/06*
U.S. Cl. 74—695 1 Claim



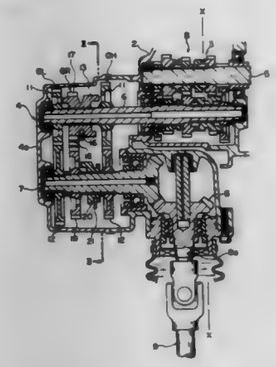
1. A transmission system for a motor vehicle having a front-mounted engine and gear box disposed transversely to the longitudinal axis of the motor vehicle wherein said gear box includes a gear box casing and a driven shaft having an output gear rotatably mounted in said gear box casing, said transmission system comprising an additional casing separate from said gear box casing, connecting means joining said gear box casing to said additional casing, a front differential located in said additional casing and having a cage operatively coupled to said output gear carried by said driven shaft and a pair of half shafts for transmitting torque to front wheels respectively of the motor vehicle, a rear differential for transmitting torque to rear wheels of the motor vehicle, and an intermediate differential constituted by an epicyclic gear train housed within said gear box casing, the epicyclic train including a ring gear driven by said output gear carried by said driven shaft, a sun wheel rigid with said cage of said front differential and a planet carrier carrying a series of planet wheels interposed between said sun wheel and said ring gear, a bell shaped member surrounding said cage in said additional casing, first and second bearing means adjacent said connecting means, said first bearing means rotatably supporting said ring gear and said second bearing means rotatably supporting said bell shaped member in their respective casings, the connecting means being located between both bearing means, said bell shaped member being rigidly coupled to said planet carrier of said intermediate differential, a beveled gear carried by said bell shaped member, a bevel pinion rotatably mounted in said additional casing in meshing engagement with said beveled gear and shaft means kinematically connecting said pinion to said rear differential whereby said intermediate differential divides the torque from said gear box between said front and rear differentials.

4,635,505
AXLE-CONTROLLED DIFFERENTIAL
Archie O. Williamson, 5916 S. Halifax Ave., Edina, Minn. 55424
Filed Jun. 10, 1985, Ser. No. 742,806
Int. Cl.[4] F16H *1/40, 1/44*
U.S. Cl. 74—713 21 Claims



1. In a differential of the type including a driven case supporting a rotatable pinion engaged between opposing bevels for driving respective output shafts, the case and output shafts being rotatable about a common transverse axis, the improvement comprising:
a universal joint coupled between each output shaft and corresponding bevel; and
a control shaft supported for free rotation within said case about the transverse axis, said control shaft including opposite inclined ends defining offset axes extending through the corresponding universal joints and a common focal point positioned a predetermined distance away from the transverse axis;
said bevels being rotatably supported on the ends of said control shaft in fixed predetermined relationship offset from the transverse axis so that the spacing between said bevels varies between a predetermined minimum and maximum in accordance with circumferential position, with said pinion being engaged between said bevels at the maximum spacing therebetween, whereby said bevels enable differential drive but are constrained by said pinion and said control shaft against uncontrolled relative rotation such that one bevel and corresponding output shaft cannot be driven to the exclusion of the other bevel and corresponding output shaft.

4,635,506
GEARBOX ASSEMBLY FOR VEHICLES
Masahiro Imaizumi; Masanori Maruyama, both of Saitama; Takeshi Ishikawa, Tokyo, and Eiji Hosoya, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 14, 1983, Ser. No. 542,290
Claims priority, application Japan, Oct. 15, 1982, 57-179778; Oct. 15, 1982, 57-179779
Int. Cl.[4] F16H *3/02, 5/06, 57/06*
U.S. Cl. 74—745 2 Claims



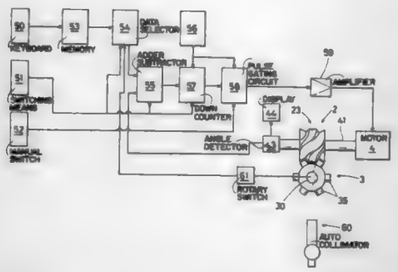
1. A gearbox assembly for a vehicle for transmitting an output of an engine to driving wheels of the vehicle, comprising:
a main gearbox (3) receiving said output and having plural forward gear-shift steps;
a shift lever (14);
a sub gearbox (4) coupled to an output of said main gearbox having at least two relatively high and low speed gear-shift steps (GH, GL) and a reverse transmission system (GR), said two steps and said reverse transmission system being selectively established through switching operation of said shift lever;
wherein said sub gearbox further comprises:
a rotary member (15) connected to said shift lever for selecting one of said steps and said reverse transmission system according to its rotation;
a stopper mechanism (15', 39*b*) engaging said rotary member for preventing said rotary member from rotating to a position where the reverse transmission system is established; and
interlinking means (39, 38) between said stopper mechanism and said main gearbox for releasing said stopper mechanism only when said main gearbox is in neutral or in a low speed gear-shift step;
wherein said stopper mechanism comprises:
a cam (38) rotatable in response to the gear-shift operation of said main gearbox;
a stopper lever (39) one end (39*b*) of which faces the periphery of said cam and the other end (39*a*) facing said rotary member, said stopper lever being pivotally supported at its middle portion; and
a spring (39*c*) urging said stopper level to abut against the periphery of said cam;
wherein a portion of the periphery of said cam, which is rotated so as to oppose the one end of said lever when said main gearbox is in neutral or in a low speed gear-shift, is formed into a small radius portion and the remaining peripheral portion is formed into a large radius portion;
wherein a portion of the periphery of said rotary member which is rotated so as to oppose the other end of said lever when said rotary member rotates to the reverse transmission position is formed into a large radius projection; and
wherein the other end of said lever is swung into or out of

the rotation locus of said projection when the one end of said lever abuts against the large radius portion or the small radius portion respectively of said cam.

4,635,507
ANGULAR INDEXING DEVICE AND METHOD FOR OUTPUT SHAFT

Shigetake Kojima, Nagoya, Japan, assignor to CKD Kabushiki Kaisha, Aichi, Japan

Filed Mar. 25, 1985, Ser. No. 715,879
Claims priority, application Japan, Mar. 28, 1984, 59-44326[U]
Int. Cl.⁴ B23B *29/24*; F16H *1/16*
U.S. Cl. 74—813 C **5 Claims**



1. An angular indexing device for indexing an output shaft successively to a plurality of indexed positions comprising:

a first rotatable body having thereon an outer peripheral cam comprising a ridge wound spirally thereon and having a gentle slope portion having a minute but substantial lead angle other than 0° and steep slope portions having relatively large lead angles and being continuous with said gentle slope portion at opposite ends thereof, said steep slope portions being juxtaposed to each other in parallel relationship,

a second rotatable body connected to said output shaft and having therearound at approximately equal angular intervals a plurality of radially projecting followers positioned for engagement of said cam ridge of said first rotatable member between successive followers,

means for intermittently rotating said first rotatable member through an angle of approximately 360° and thereby rotating said second rotatable body between successive indexed positions, said second rotatable body being rotated at a high speed when said followers are engaged with said steep slope portions of said cam ridge of said first rotatable member and being rotated at a low speed when said followers are engaged with said gentle slope portion, said first rotatable member stopping when said followers are engaged with said gentle slope portion,

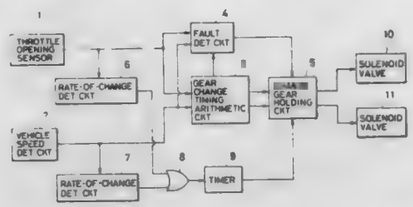
said means for rotating said first rotatable member comprising a pulse motor and circuit means controlling said pulse motor,

said circuit means comprising oscillator means for supplying pulses to said motor to drive said motor, memory means for recording compensatory values of the number of pulses for respective indexing angles between respective indexed positions of said second rotatable body, rotary switch means for detecting the reference indexed position of said second rotatable member, data selector means controlled by said rotary switch means for selecting the compensatory value of the number of pulses for shifting said second rotatable member through the respective indexing angle between respective indexed positions and pulse counting means for counting pulses supplied to said motor and stopping said motor when the compensatory value of the number of pulses for the respective indexing angle has been counted.

4,635,508
SAFETY CONTROL DEVICE FOR AUTOMATIC TRANSMISSION

Takumi Tatsumi, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 618,157
Claims priority, application Japan, Jun. 16, 1983, 58-109398
Int. Cl.⁴ B60K *41/08*; G06F *15/50*
U.S. Cl. 74—866 **5 Claims**



1. A control apparatus for an automatic transmission of a motor vehicle, comprising: means for producing a speed signal representing a speed of said vehicle; means for producing a load signal representing a load of said vehicle; means for producing a signal representing a gear to be engaged by said transmission in response to said speed signal and said load signal; means for detecting the existence of a fault condition in said speed signal and said load signal and producing in response thereto a signal representing a fault condition; means for detecting a rate of change in said speed signal and said load signal for producing a signal representing an excessive rate of change; means for controlling a gear engaged by said transmission in response to a signal applied to an input thereof; and gear change instructing means receiving said signal representing said fault condition, said signal representing said excessive rate of change, and said signal representing said gear to be engaged by said transmission, said gear change instructing means comprising means for applying said signal representing said gear to be engaged by said transmission directly to said input of said means for controlling said gear engaged by said transmission when said signal representing fault condition is in an inactive state and means for applying to said input of said means for controlling said gear engaged by said transmission a first value of said signal representing said gear engaged by said transmission detected at initiation of an active state of said signal representing said excessive rate of change when said signal representing said fault condition is in an active state so as to inhibit changes in said gear engaged by said transmission for a predetermined period of time after the occurrence of said active state of said signal representing said excessive rate of change.

4,635,509
BOTTLE OPENING MACHINE

Masami Nagao, Miwa, and Tadakazu Oosawa, Takasaki, both of Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 452,877, Dec. 27, 1982, abandoned. This application May 20, 1985, Ser. No. 735,865
Claims priority, application Japan, Dec. 28, 1981, 56-214958
Int. Cl.⁴ B67B *7/00*
U.S. Cl. 81—3.2 **9 Claims**

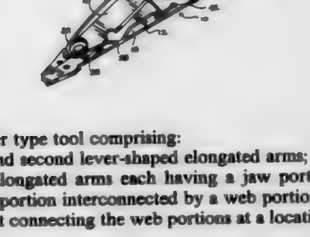
1. A bottle opening machine for removing crown caps from bottle heads of empty bottles contained in bottle cases which are conveyed on a conveyance system one after another in an end-to-end relation, essentially comprising:

a rotary shaft mounted over a path for the bottle cases on a frame structure and extending perpendicular to the flowing direction of the bottle cases;

a plurality of rotary members mounted on the rotary shaft at a space interval corresponding to a distance between two adjoining lines of bottles;

a plurality of cap removing parts disposed circularly around the periphery of each rotary member so that they can be engaged with the respective heads of the bottles in the bottle cases at a predetermined position, each of the cap removing parts including a pawl means adapted to be engaged to the crown caps capped on them; and

synchronizing means for causing each cap removing part to engage with the head of each bottle in each bottle case in a synchronous relationship, the synchronizing means being rotatably provided over the path for the bottle cases and having at least one synchronizing recess which is adapted to be simultaneously engaged with the rear end of the preceding bottle case and the fore end of the following bottle case so that the synchronizing means is rotated under the influence of line pressure transmitted by the conveyance system via the bottle cases, and means for transmitting the rotation of the synchronizing means to the rotary shaft,



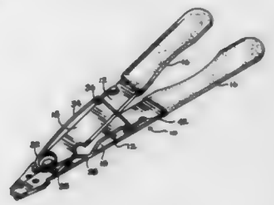
the synchronizing means rotated under the influence of line pressure which is transmitted by the conveyance system and being located with respect to the rotary shaft so that the revolution of the synchronizing means causes the revolution of the rotary shaft,

cap removing operation being carried out by way of engagement of each pawl means to the crown caps in an area where the linear movement track of the bottle heads of the bottles contained in the bottle cases and the circular movement track of the pawl means on the cap removing parts are united with one another in the tangential relation to exert a moment on the caps thereby to remove them from the head of the bottles which moment is caused due to the gradually increased distance by which the circular movement track is parted away from the linear movement track past the aforesaid area as the bottle cases are conveyed further on the conveyance system.

4,635,510
PLIERS

Joe G. Box, Macedonia, Ohio, assignor to Milbar Corporation, Chagrin Falls, Ohio

Filed Oct. 25, 1985, Ser. No. 791,428
Int. Cl.⁴ B25B *7/14*
U.S. Cl. 81—319 **11 Claims**



11. A plier type tool comprising:

(a) first and second lever-shaped elongated arms;

(b) said elongated arms each having a jaw portion and a handle portion interconnected by a web portion;

(c) a pivot connecting the web portions at a location spaced from arm ends for movement of the arms between open and closed positions;

(d) a torsion spring for biasing the tool jaw and handle portions toward the open position;

(e) the spring being located in a plane substantially parallel to and spaced from the elongated arms;

(f) the spring having first and second legs spaced from one another and an interconnection connecting the legs together;

(g) said first spring leg being securely mounted on a surface of the tool handle portion of the first arm, said second spring leg projecting through an aperture in a surface of the tool handle portion of the second arm;

(h) a loop member having a pair of spaced eyes and a connecting bridge;

(i) the spring legs having locking offset portions for selectively engaging said loop member eyes;

(j) one spring leg having a working offset portion positioned for limiting unintended movement from the release position to the locking position;

(k) said loop member eyes being respectively around said torsion spring legs, the loop member being slidable along the spring between locking and release positions for selectively permitting and inhibiting pivoted relative movement of said tool arms;

(l) the tool being movable from the release position to the locking position upon compression of the handle portions against the torsion spring and slidably engaging the loop member eyes with the locking offset portions, the loop member being interposed between the locking offset portions of the spring legs;

(m) said spring legs being adaptably mounted for biasing the locking offset portions against the loop member eyes when the tool is in the locking position;

(n) said loop member and locking offset portions being configured to minimize accidental locking interference during operation of the tool and to avoid disengagement from the tool locking position upon movement or accidental contact with other items during storage of the tool; and

(o) the torsion spring and loop member being positioned for operative engagement in a plane spaced from and parallel to said elongated arms and adapted to avoid interference with additional tool accessories positioned on the tool handle portions.

4,635,511
CUTTER CONTROL APPARATUS

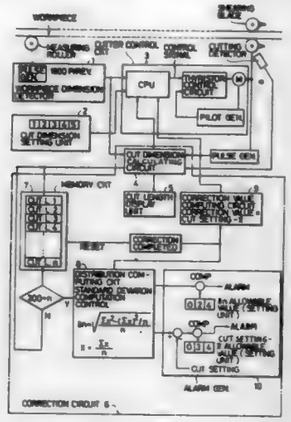
Masanori Shirasu, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 489,292, Apr. 28, 1983, abandoned. This application Nov. 5, 1984, Ser. No. 668,187
Claims priority, application Japan, Apr. 29, 1982, 57-72979
Int. Cl.⁴ B23D *25/12*; B23Q *15/08*
U.S. Cl. 83—71 **7 Claims**

1. In a cutter control apparatus for a cutting machine, said machine being of the type having cutting means for cutting a piece from an object to be cut, cutter control circuit means operable for controlling said cutting means to cut pieces of desired length from said object, first measuring means for measuring the length of a portion of said object and for providing an output, setting means for providing a set output indicating said desired length, said cutter control circuit means being responsive to the outputs of said first measuring means and said setting means for controlling the operation of said cutting means, cut dimension calculating circuit means, coupled to said control circuit means, for calculating the actual cut lengths of pieces cut from said object, and display means, coupled to said cut dimension calculating circuit means, for displaying said actual cut lengths; the improvement comprising:

correction circuit means, coupled to said cutter control circuit means and to said cut dimension calculating circuit means, for automatically correcting said cutter control

circuit means by automatically delivering thereto a cutting position correction signal when the center value of a



distribution of a plurality of said actual cut lengths disagrees with said set output indicating said desired length.

4,635,512

APPARATUS FOR THE CUTTING OF RODS, ESPECIALLY CONCRETE REINFORCING RODS

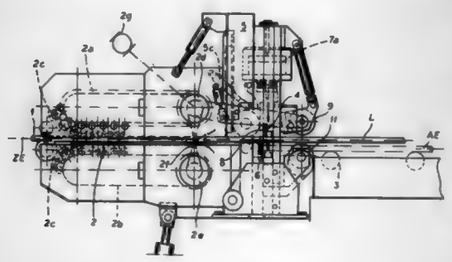
Kurt Wengenroth, Wuppertal, and Siegfried Klaus, Ennepetal, both of Fed. Rep. of Germany, assignors to Carl Ulrich Peddinghaus, Wuppertal-Barmen, Fed. Rep. of Germany

Filed Jan. 25, 1985, Ser. No. 695,123

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1984, 3402567

Int. Cl.⁴ B21D *43/12, 43/28*

U.S. Cl. 83—156 **6 Claims**



1. A rod cutting apparatus comprising:

support means forming a horizontal transport path for rod stock having an upstream side and a downstream side;

a feed conveyor at said upstream side of said support means for advancing said stock along said path in a horizontal feed plane;

a shear on said support means downstream of said feed conveyor comprising a lower blade disposed beneath said feed plane, a vertically displaceable carriage, and a movable blade mounted on said carriage and engageable with said stock for severing same, said movable blade and said carriage having a given cutting stroke;

a discharge conveyor downstream of said shear and having a discharge conveyor plane located below said horizontal feed plane by a distance substantially equal to said stroke;

a support roller mounted on a side of said carriage turned toward said discharge conveyor and, in an upper position of said carriage, lying so that it engages said stock as advanced by said feed conveyor in said feed plane, said stock being engaged from below by said support roller and being substantially tangent to a surface of said support roller so that upon displacement by said carriage through said stroke, stock lying on said support roller is displaced into said discharge conveyor plane; and

a pressing roller mounted on said carriage and displaceable toward and away from said support roller for engaging said stock between said support roller and said pressing roller.

4,635,513

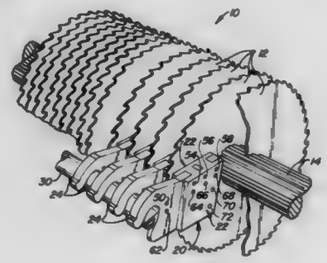
SAW GUIDE OIL SYSTEM

Ronald W. McGeehee, 9049 East Rd., Redwood Valley, Calif. 95470

Filed Jan. 7, 1985, Ser. No. 689,198

Int. Cl.⁴ B27B *11/02*

U.S. Cl. 83—169 **9 Claims**



1. An improved saw guide system for supporting circular saws in a multiple saw assembly, said saw guide system including a guide block between each adjacent pair of blades and on the outside of each end blade, said improvement comprising means integral to each guide block for directing lubricating and cooling fluids onto the proximate saw saw blade in order to lessen friction between and reduce the heat generated by the blade and the guide, including an oil passage network and a water passage network where the two networks are isolated from each other; an external oil source connected to said oil passage network; an external water source connected to said water passage network; and means for selectively directing either oil or water to the fluid directing means.

4,635,514

ELLIPTICAL SHEARING APPARATUS

Alexander Borzym, 7469 Pebble Point Dr., West Bloomfield, Mich. 48033

Filed May 3, 1985, Ser. No. 729,928

Int. Cl.⁴ B26D *3/16*

U.S. Cl. 83—196 **5 Claims**

1. A shearing apparatus comprising:

(A) a fixed die comprising a first shearing ring defining a first die aperture to receive stock to be cut;

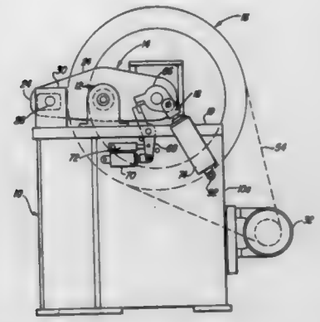
(B) a movable die comprising a second shearing ring defining a second die aperture having a size and shape generally corresponding to that of said first die aperture and having a neutral position in which its center is coaxial with the axis of said first die aperture to allow stock to be cut to be inserted through said first and second die apertures; and

(C) means for moving said movable die in a manner to move said center of said second die aperture in a closed elliptical path passing through said axis and thereby shear the inserted stock at the interface of said fixed immovable dies, said moving means comprising

(1) an arm carrying said second shearing ring at a location intermediate the ends of the arm,

(2) a driven shaft,

(3) an eccentric fixed on said drive shaft and journalled in one end of said arm, and



(4) means mounting the other end of said arm for combined rotary and translatory movement.

4,635,515

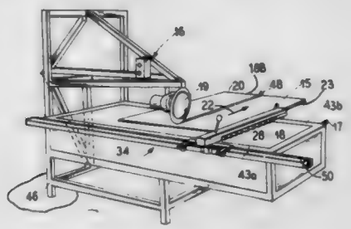
GUIDE FENCE HAVING ROLLERS TO REDUCE FRICTION

James E. Altman, P.O. Box 334, Gray, Ga. 31037

Filed May 29, 1985, Ser. No. 738,828

Int. Cl.⁴ B27B *27/02*

U.S. Cl. 83—438 **5 Claims**



1. An adjustable low friction fence for positioning on a planar working table means for guiding sheet material, said table means having opposing side edge regions, said fence comprising in combination:

(A) an elongated frame means adapted to extend transversely across said table means, said frame means having opposite end portions,

(B) a plurality of roller means extending along at least one side of such frame means, each individual said roller means being

(1) revolvable about an axis generally normal to said table means,

(2) located in adjacent spaced relationship to said table means,

(3) located in adjacent spaced relationship to adjacent ones of said roller means, and

(4) linearly aligned with all other said roller means of said plurality,

(C) adjustable clamping arm means functionally associated with each of said opposite end portions and said clamping arm means including shoe means to reversably engage selected portions of said opposing side edge regions,

(D) interconnection means extending between said clamping arm means including actuation means therefor for adjustably engaging and disengaging said clamping arm means with said opposing side edge portions and further including locking means for holding said clamping arm means in a predetermined clamping configuration,

(E) support means functionally associated with each said opposite end portion for guiding and supporting said frame means over predetermined regions along said opposing side edge portions with which said support means is adapted to make contacting engagement, whereby said fence can be translated on said support means across said working table means,

(F) one of said opposite end portions being adapted to hold and position said actuation means for operator utilization,

(G) guide track means for said support means located along one side of said working table means,

(H) said support means further including slide means for riding said guide track means, and

(I) said clamping arm means further including means for grasping opposing side portions of said guide track means when said clamping arm means is in a locked configuration.

4,635,516

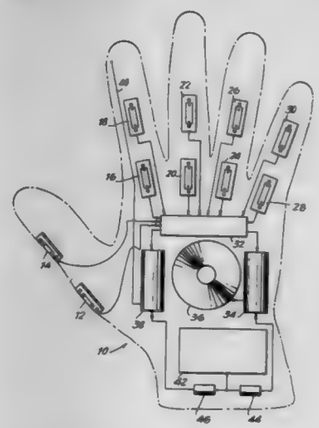
TONE GENERATING GLOVE AND ASSOCIATED SWITCHES

Giancarlo Gianini, Via Giuseppe Mercalli 46, Rome, Italy

Filed Sep. 17, 1984, Ser. No. 651,866

Int. Cl.⁴ G10H *1/00, 5/00*

U.S. Cl. 84—1.01 **6 Claims**



1. A tone generating glove, comprising:

a glove;

a plurality of switches mounted in said glove; and

tone generating means for generating a tone, said tone generating means being mounted in said glove, each of said switches being connected to said tone generating means, said tone generating means generating a tone in response to actuation of one of said switches.

4,635,517

ELECTRIC MUSICAL INSTRUMENT

Yoichi Nagashima; Tatsunori Kondo; Kiyomi Takeuji, and Mineo Kitazura, all of Shizuoka, Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Dec. 10, 1984, Ser. No. 679,758

Claims priority, application Japan, Dec. 10, 1983, 58-233330

Int. Cl.⁴ G10H *1/20, 7/00*

U.S. Cl. 84—1.01 **1 Claim**

1. An electronic musical instrument which is capable of generating note frequencies corresponding to a plurality of kinds of temperaments and a transposition operation, comprising:

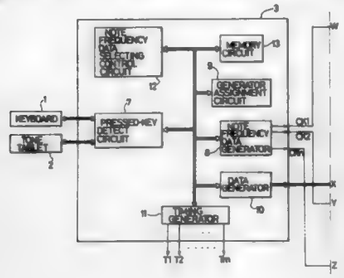
memory means for storing note frequency data correspond-

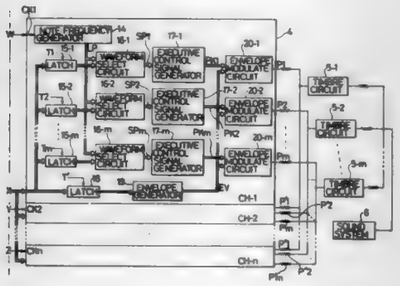
ing to a plurality of temperaments by steps of more than one of each transposition operation;

a note frequency data selecting controller for selecting the note frequency data from the memory means in accordance with a selected one of the temperaments and the transposition operation; and

a musical tone generator for generating, of the basis of the note frequency data selected by the note frequency data selecting controller, a musical waveform of a note frequency corresponding to the selected note frequency data;

the musical tone generator comprising means for generating a master clock frequency and a programmable frequency divider for dividing the master clock frequency, and wherein the note frequency data is frequency dividing





ratio data for the programmable frequency data, the musical tone generator also comprising an adder-accumulator for generating an output pulse when the result of an add-accumulate operation overflows and means for periodically transferring increment data for the add-accumulate operation to the adder-accumulator, and wherein the note frequency data is the increment data for the adder-accumulator;

the memory means comprising optional memory means for storing the note frequency data individually and main memory means incorporated in the electronic musical instrument and connected via transfer means to the optional memory means, the optional memory means being detachable from the electronic musical instrument and portable.

4,635,518

SEGMENTED FRET ELECTRONIC MUSICAL INSTRUMENT

Frank Meno, 365 S. Atlantic Ave., Pittsburgh, Pa. 15224

Filed Aug. 20, 1984, Ser. No. 642,205

Int. Cl.⁴ G10H *3/18*

U.S. Cl. 84—1.16 **18 Claims**

1. An electronic musical instrument comprising:

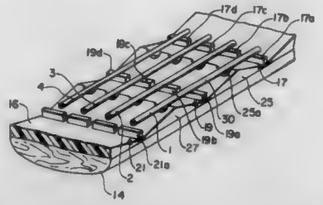
(a) a fingerboard having an electrically insulating upper surface and having a plurality of segmented frets attached across the surface at desired points along its length, each of said frets including a plurality of electrically conducting fret segments, each of said segments electrically insulated from one another;

(b) a plurality of elongated electrically conducting elements, each element disposed adjacent to and associated with a single fret segment of each of the frets;

(c) means for electrically charging said elements;

(d) plural frequency generator means one associated with a fret segment of a first one of frets for each associated conducting element for selectively providing each of said fret segments with an electrical signal of at least one known reference frequency;

(e) Divider means electrically interposed between adjacent fret segments of each associated conducting element along the length of the fingerboard for selectively providing each additional fret segment of each associated conducting element with a signal which has at least one frequency



which is a known fraction of said reference frequencies; and

(f) means for attaching each of said conducting elements to said instrument in spaced relationship with respect to its associated fret segments, whereby displacing an element to contact any fret segment completes an electrical circuit having at least one frequency equal to at least one frequency of the signal provided to such fret segment, displacing said element to contact a fret segment of a difference fret completes a different electrical circuit having at least one different frequency, displacing said element to contact a plurality of fret segments completes a plurality of electrical circuits producing a plurality of frequencies, and simultaneously depressing a plurality of conducting elements simultaneously completes a plurality of electrical circuits each capable of having a plurality of different frequencies.

4,635,519

HYBRID ELECTRONIC MUSICAL INSTRUMENT

Keiichi Sakurai, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1984, Ser. No. 597,169

Claims priority, application Japan, Apr. 15, 1983, 58-65679; Apr. 30, 1983, 58-74916

Int. Cl.⁴ G10H *3/06*

U.S. Cl. 84—1.17 **19 Claims**

1. A hybrid electronic material instrument, comprising:

a first electronic musical instrument including a first keyboard and circuit means for executing a predetermined function according to operation of said first keyboard; and

a second electronic musical instrument without said circuit means;

said second electronic musical instrument including:

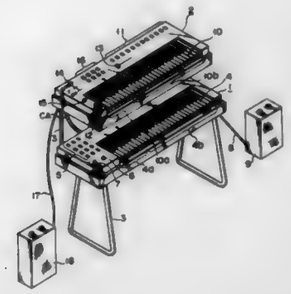
a second keyboard;

means for generating a drive signal by operating a key on said second keyboard for driving said circuit means in said first electronic musical instrument; and

means for supplying said drive signal to said circuit means of said first electronic musical instrument; and

said first electronic musical instrument including:

means for supplying a signal obtained by the execution of said predetermined function by said circuit means accord-



ing to said drive signal, to said second electronic musical instrument.

4,635,520

TONE WAVESHAPE FORMING DEVICE

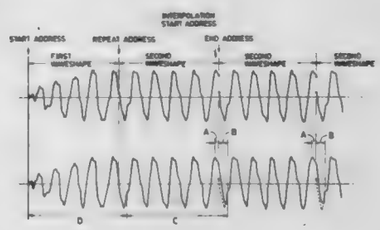
Katoh Mitsumi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 26, 1984, Ser. No. 634,626

Claims priority, application Japan, Jul. 28, 1983, 58-136888

Int. Cl.⁴ G10H *1/02, 1/00*

U.S. Cl. 84—1.26 **18 Claims**



1. A tone waveshape forming device comprising:

waveshape generation means for generating first waveshape data and thereafter generating second waveshape data repetitively, said first waveshape data representing an attack portion of a tone waveshape corresponding to a tone to be produced and said second waveshape data representing a part of said tone waveshape succeeding said attack portion and including plural periods of said tone;

interpolation section designation means for designating an interpolation section of said succeeding part including a first section near the end of said succeeding part and a second section near the beginning of the section of said succeeding part to be repetitively generated next;

interpolation means for producing new waveshape data by performing an interpolation operation based on said second waveshape data during said interpolation section; and

waveshape data outputting means for outputting said first waveshape data and thereafter repetitively outputting said second waveshape data during the section of said succeeding part not designated as an interpolation section, and outputting said new waveshape data during said interpolation section.

4,635,521

ELECTRONIC MUSICAL INSTRUMENT HAVING COVER WITH OPERATION PANEL

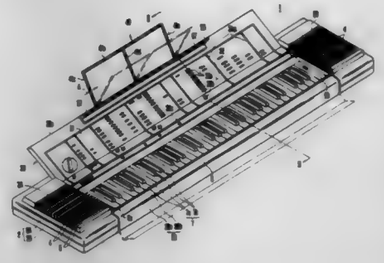
Mario Bellini, Milan, Italy, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 20, 1984, Ser. No. 684,931

Claims priority, application Japan, Jan. 7, 1984, 59-9145[U]; Jan. 26, 1984, 59-8253[U]; Jan. 27, 1984, 59-9144[U]; Jan. 27, 1984, 59-9146[U]; Jan. 27, 1984, 59-9148[U]

Int. Cl.⁴ G10C *3/02*

U.S. Cl. 84—177 **21 Claims**



1. An electronic musical instrument having a cover with an operation panel, comprising:

a music instrument body having a keyboard portion and an electric circuit for generating musical tones; and

a cover pivotally mounted through a pivot structure on said instrument body so as to cover said keyboard portion when said cover is closed, said cover being provided with an operation panel having operating elements required for controlling the electric circuit;

said pivot structure comprising hollow shaft means mounted on one of said cover and said instrument body and bearing means formed in the other thereof to support said shaft means, and cord means inserted in said hollow shaft so as to electrically connect said electric circuit incorporated in said instrument body and said operating elements incorporated in said cover.

4,635,522

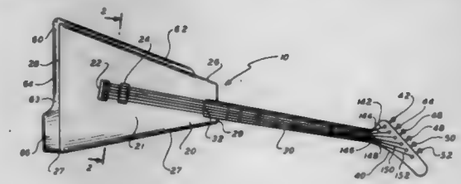
ASYMMETRIC STRINGED INSTRUMENT

Richard Excellente, 1018 Brighton St., Union, N.J. 07083

Filed Mar. 31, 1986, Ser. No. 846,016

Int. Cl.⁴ G10D *1/08*

U.S. Cl. 84—291 **28 Claims**



1. In a stringed instrument comprising a body having a front surface and a rear surface, peripheral edges connecting said front and rear surfaces, a neck extending from one end of said body, and strings tensioned on the body and the neck in a substantially common plane, the improvement comprising

a rigid metallic frame affixed to a portion of said peripheral edges in such a manner that the resultant mass of the side thereof proximal to the strings of highest frequency is greater than that on the other side distal to said strings of highest frequency by between 10% and 40% of the weight

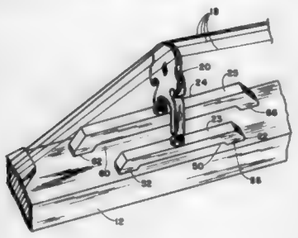
of the instrument prior to said affixation upon the peripheral edges of the instrument.

4,635,523

SPRUCE SPRING BRIDGE SUPPORT FOR STRINGED INSTRUMENT

William Merchant, 39 Christopher St., Apt. 1C, New York, N.Y. 10014

Filed Feb. 3, 1986, Ser. No. 825,253
Int. Cl.[4] G10D *3/04*
U.S. Cl. 84—307 18 Claims



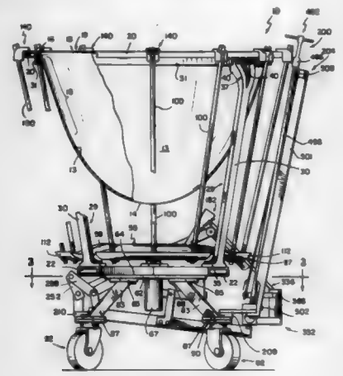
1. In an electric stringed musical instrument of the type having an elongated neck connected to one end of an elongated solid-filled body, the neck having a peg box at an other end, an upstanding bridge mounted laterally across the body, a plurality of tunable strings at transversly spaced locations mounted on the bridge and adjustably attached under tension at their first ends to the peg box and at their second ends to the body, the improvement comprising a plurality of elongated bridge supports extending parallel with respect to the longitudinal axis of the instrument, the bridge supports resting on the body between the body and the bridge, the bridge supports being made of spruce wood, and each of the bridge supports including space forming means for defining an air space intermediate the respective bridge support and the body, and said bridge supports being operable to vibrate within the air space as the strings are played.

4,635,524

KETTLEDRUM

Barbara A. Allen, and Rebecca Kite, both of P.O. Box 1954, Bloomington, Ind. 47402

Filed Jun. 6, 1984, Ser. No. 617,747
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—419 20 Claims



1. A percussion instrument comrising

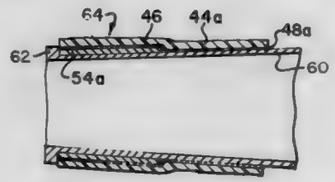
a body member comprising an inner surface which comprises a quartic paraboloid of revolution,
a percussion head carried by the body member,
tensioning rods,
means for operatively coupling the tensioning rods to the percussion head,
a master tensioning member for tensioning the percussion head, the master tensioning member having a central portion, leg portions extending radially outwardly from the central portion, adjacent leg portions defining an opening therebetween, and
means for coupling the tensioning rods to the master tensioning member.

4,635,525

JOINING TOGETHER PARTS OF MUSICAL INSTRUMENTS

Pete Valentine, P.O. Box 6476, Stateline, Nev. 89449

Filed May 30, 1984, Ser. No. 615,900
Int. Cl.[4] G10G *7/00*; G10D *9/02*
U.S. Cl. 84—453 7 Claims



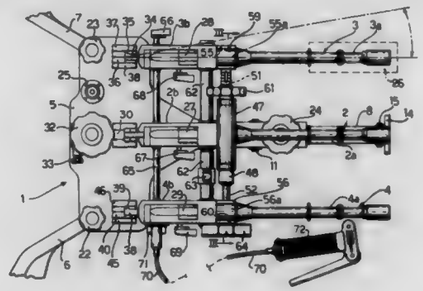
1. In a musical wind instrument having two parts thereof joined together by a male/female joint, the arrangement comprising a gasket around the male component of said joint and said gasket comprising a strip of plastic material in the form of a sleeve surrounding said male component, the ends of said strip being butted together, a layer of adhesive on the surface of said strip forming the inner surface of said sleeve, and a strip of adhesive applied around said male component and adhering thereto, said strip of plastic material overlying said adhesive strip with said adhesive layer adhering to said adhesive strip.

4,635,526

WEAPON FOR LAUNCHING A NUMBER OF GRENADES

Sergio Mottana, Carpenedolo, and Mostura Roberto, Brescia, both of Italy, assignors to Luigi Franchi S.p.A., Brescia, Italy

Filed Apr. 23, 1984, Ser. No. 602,759
Claims priority, application Italy, Oct. 25, 1982, 23278/82[U]
Int. Cl.[4] F41F *21/00*; F41G *1/44, 5/00, 11/00*
U.S. Cl. 89—1.41 6 Claims



1. A weapon for launching a number of grenades simultaneously or otherwise comprising
a plate,

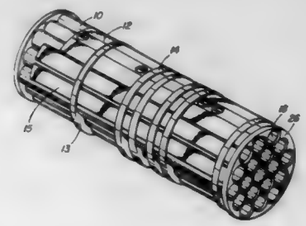
three launching tubes, each one of said tubes including a barrel and a breech,
said launching tubes are made up of a central launching tube and a lateral launching tube on either side of said central launching tube,
means for pivotally connecting each said breech to said plate,
means for elevating said launching tubes, and
means for traversing said launching tubes including means for traversing said lateral launching tubes simultaneouly with a single action,
said traversing means including a telescopic beam member fixed transversely to said breech of said central launching tube and connecting said launching tubes to each other.

4,635,527

COMPACT MOLDED BULKHEAD FOR A TUBE-CLUSTER ROCKET LAUNCHER

Christian J. L. Carrier, and Charles J. Shea, both of Ste-Foy, Canada, assignors to Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Jul. 8, 1985, Ser. No. 752,600
Claims priority, application Canada, Jul. 9, 1984, 458480
Int. Cl.[4] F41F *3/042*
U.S. Cl. 89—1.816 8 Claims



1. A bulkhead for a rocket launcher wherein said rocket launcher includes a plurality of open-ended cylindrical launch tubes secured together in close contacting relation in a cluster with said bulkhead adapted to be attached to an end of said tube cluster; said bulkhead comprising a plate with a plurality of counterbored circular openings in said plate located to align with the open ends of the launch tubes, said counterbored openings each defining a first diameter portion and a second larger diameter portion respectively with said first and second diameters being substantially equal to the inner and outer diameters, respectively, of said launch tubes, such that in use with each launch tube end aligned with and disposed in a respective one of said counterbored bulkhead openings a smooth transition between the interiors of said launch tubes and the bulkhead is provided to prevent rocket-to-bulkhead interference at launch.

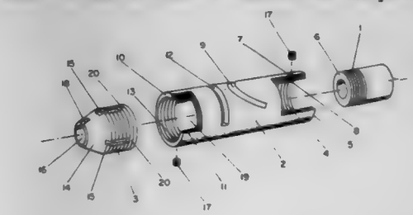
4,635,528

ADJUSTABLE FIREARM STABILIZER

Sidney J. McQueen, Albuquerque, N. Mex., assignor to Continental Technology Corporation and Gerald Goodman, both of Albuquerque, N. Mex.

Continuation-in-part of Ser. No. 560,574, Dec. 12, 1983, abandoned. This application Jun. 28, 1985, Ser. No. 750,074
Int. Cl.[4] F41C *21/18*
U.S. Cl. 89—14.3 4 Claims

1. An adjustable stabilizer for firearms which fire a single projectile from each shell, comprising:
a means for attaching a body of the stabilizer to a muzzle of a firearm, and
the body of the stabilizer being generally hollow and cylindrical in shape having a rear end and a forward end and said body having one or more gas screen ports adjacent to the rear end, and said gas screen ports being slots cut in the top of the body through to the interior of the body to provide a gas communication with the exterior atmosphere, said gas screen ports being cut at a slant from the interior of the body to the exterior of the body toward the front end of the body from the rear end of the body so that gas escaping from inside the body flows toward the exterior front end of the body, and said body having gas vent slots cut perpendicular to the longitudinal axis of the body from the exterior of the body to the interior of the body so as to provide a gas communication from inside the body to the outside of the body, said body being internally threaded at the front end to accept an externally threaded nose cap, and wherein the body has on its front end at the bottom a set screw hole, and
the externally threaded nose cap having a center hole along the longitudinal axis of the bore of the firearm, said center being hole sized to have the same or slightly larger diameter as the bore of the firearm, and the external threads of the nose cap having partial longitudinal recesses, but a portion of the threads being completely circumferential, and wherein a set screw is threaded through the set screw hole in the bottom of the front end of the body and wherein the said set screw is screwed into the partial



recess thereby locking the nose cap into the desired position, and wherein the nose cap has in the forward most surface across the center hole screw driver slots to enable the firer to screw the nose cap in or out of the body, and
wherein the nose cap can be screwed into the body to any desired position thereby covering or closing gas vent slots as desired and forming a chamber within the body wherein the completely circumferential portion of the threads on the nose cap provide a seal for the chamber, and wherein the gases which trail a bullet as it exits the muzzle of a firearm fill the chamber, and wherein the bullet as it passes through the center hole in the nose cap substantially seals said chamber and the pressure therein rises rapidly causing the gases to exit the chamber through the gas screen ports and the exposed gas vent slots causing a force on the body in the direction opposite the direction of gas flow, and wherein the amount of gas flow exiting the gas screen ports and gas vent slots is controlled by the number and size of gas vent slots and gas screen ports left exposed, and
wherein the attaching means enables the body to be attached to the muzzle of a firearm with the gas screen ports and gas vent slots oriented radially around the longitudinal axis of the barrel of the firearm in any desired direction.

4,635,529

SEAL ASSEMBLY

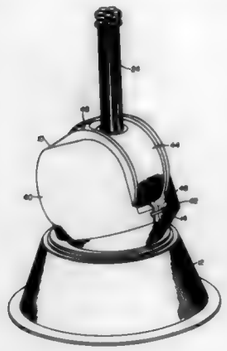
Douglas P. Tassie, St. George, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Dec. 21, 1984, Ser. No. 685,266
Int. Cl.[4] F41H *5/20*
U.S. Cl. 89—36.14 4 Claims

1. A naval gun turret comprising
a first panel,
a second panel,
a third sliding panel, and

a sump having a drain discharging to the exterior of said turret,

said first and second panels mutually interfitted to provide a static seal having a conduit therein discharging to said sump, and



said third panel interfitted with said first and second panels respectively to provide respective dynamic seals therewith, each dynamic seal having a respective conduit therein discharging to said sump.

4,635,530

AUTOMATIC HAND FIREARM WITH RIGIDLY LOCKED BREECH FOR AMMUNITION WITH EXTREMELY HIGH PROJECTILE MOMENTUM

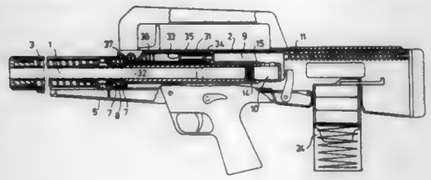
Helmut Weidle, Oberndorf, Fed. Rep. of Germany, assignor to Heckler & Koch GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 552,676, Nov. 17, 1983, abandoned. This application Dec. 4, 1985, Ser. No. 805,401

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1982, 3244315

Int. Cl.[4] F41D *15/04*; F41F *19/06*

U.S. Cl. 89—159 5 Claims



1. In a firearm having a recoil operated shell loading mechanism and including a housing, a barrel slidably received in the housing for movement in a recoil and a counter-recoil direction, a recoil spring, a carrier also slidably received in the housing and cooperating with the breech end of the barrel to define a chamber for a loaded shell, a breech closing spring to urge the carrier in the counter-recoil direction, the improvement to said carrier characterized by a bolt mechanism comprising:

(a) firing pin means provided in said carrier,

(b) a cylindrical breech block plug slidably received in a bore defined by said carrier and said plug defining an axially extending opening for receiving said firing pin means, said plug having a breech end and a recoil end,

(c) locking means provided in part on the breech end of said plug and in part on the breech end of the barrel to normally lock said plug to said barrel,

(d) coupling means between said barrel and carrier to selectively supplement said recoil operated loading mechanism by recoil gas pressure generated as a result of barrel recoil motion due to firing shells of low momentum, and means for disconnecting said coupling means in response to the recoil impulse encountered when shells of high momentum are fired,

(e) camming means provided in part on said plug and in part on said carrier for rotating said plug in response to recoil and counter-recoil motion of the carrier, said plug rotation in the recoil direction causing disengagement of said locking means to release said plug from the barrel, and

(f) said plug being movable axially relative to the carrier and barrel when so disengaged to provide a full recoil movement for said plug and assure proper loading of the a succeeding shell, and to provie for less than full recoil movement of the barrel when the barrel is so disengaged,

(g) whereby positive shell loading and firing is accomplished with shells of both low and high momentum.

4,635,531

HYDRAULICALLY OPERATED IMPACTING DEVICE

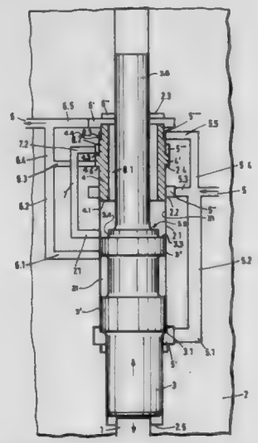
Wilhelm Rode, Darmstadt, Fed. Rep. of Germany, assignor to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 2, 1985, Ser. No. 688,347

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1984, 3400307

Int. Cl.[4] F01L *25/02*

U.S. Cl. 91—303 3 Claims



1. Hydraulically operated impacting device comprising:

a housing having an axial bore;

a differential piston slidably disposed in the bore, and having on one hand an impacting surface and having a piston rod facing away from the impacting surface at the other end of the rod, the differential piston having accordingly a smaller and a larger piston surface;

a sleeve-like valve in the bore circumscribing the piston rod, there being an annular space between the rod and the valve, the valve having a first and second position, the sleeve-like valve having a collar, the collar having an annular surface facing away from the impacting device;

first duct means leading from a pressure source to the bore and being governed by the valve for acting or not acting on the larger one of the two piston surfaces respectively in the first and second positions of the valve;

second duct means leading from said source to said bore for acting on the smaller one of the piston surfaces;

third duct means leading from the bore at a location below the valve to a ring chamber adjacent the valve, the collar of the valve being movable in the ring chamber, said piston having a portion which depending on the position of the piston permits or prevents communication between said annular space and said third duct means to obtain or not obtain pressurization of the ring chamber, increased pressurization of the ring chamber obtains as the rod impacts, pressurization of the ring chamber acting on said annular surface of the collar for shifting the valve from the first to the second position; and

said piston having a first collar annularly biparting the larger piston surface, the first collar entering in parts the annular space during a return stroke of the piston while the remainder of the first collar, an outer part of the biparted larger piston surface, a lower end of the valve, and the bore establish a closed chamber so that upon continuation of the return stroke the piston shifts the valve from the second position into the first position in which the valve opens said first duct means for obtaining a forward and impacting stroke.

4,635,532

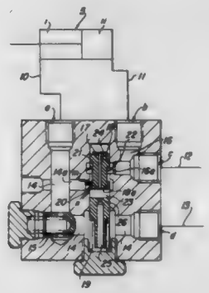
SPEEDUP DEVICE FOR HYDRAULIC CONTROL CIRCUIT SYSTEMS

Masahiro Tanino, and Tomoyuki Higuchi, both of Itami, Japan, assignors to Sanyo Kiki Kabushiki Kaisha, Hyogo, Japan

Continuation-in-part of Ser. No. 182,073, Aug. 28, 1980. This application Oct. 5, 1981, Ser. No. 308,905

Int. Cl.[4] F15B *11/08*

U.S. Cl. 91—436 1 Claim



1. A speedup device, in a double acting hydraulic cylinder having a piston and a piston rod, for increasing a rod advancing speed by transferring oil in a rod-side chamber to a piston-side chamber, comprising:

a first oil passage operatively connected to the rod-side chamber of said cylinder;

a second oil passage operatively connected with the piston-side chamber of said cylinder;

a check valve disposed in said first passage such that the return of oil from rod-side chamber is blocked;

a circulation valve disposed between said check valve and rod-side chamber of said first oil passage and said second oil passage, said circulation valve being movable between a first position where it establishes the communication between said first and second oil passages and a second position where it blocks such communication;

a spring normally biasing said circulation valve to said second position;

a pilot oil passage disposed within said circulation valve, for communicating said first oil passage, between said check valve and the rod-side chamber, with a chamber adjacent said circulation valve, for moving said circulation valve to said first position when the pressure in said first oil passage exceeds a predetermined value; and

a restrictor connecting said pilot oil passage to said first oil passage at a point in said first oil passage, opposite from said rod-side chamber with respect to said check valve, for bypassing said check valve.

4,635,533

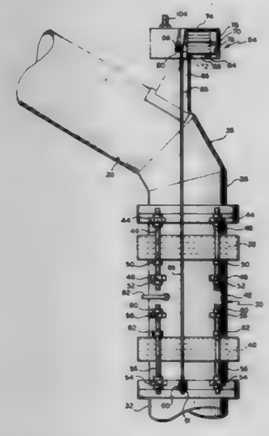
METHOD AND APPARATUS FOR ACCOMMODATING TEMPERATURE AND PRESSURE VARIATIONS IN TUBULAR CONDUITS

James D. Whiteside, II, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 566,465, Dec. 28, 1983, abandoned, which is a division of Ser. No. 366,211, Apr. 7, 1982. This application May 13, 1985, Ser. No. 733,155

Int. Cl.[4] F15B *1/00*

U.S. Cl. 91—471 6 Claims



1. A method of controlling the pressure-induced elongation along a first longitudinal axis of a movable coupling between a first conduit and a second conduit for conveying a pressurized fluid comprising:

sensing at least one of (1) the temperature of said first conduit and (2) the strain on said first conduit, and providing a signal output representative thereof; and

applying a counterthrust force along the longitudinal axis of said movable coupling opposing the pressure-induced elongation of said movable coupling by applying pressurized fluid from a source of the preasurized fluid other than any pressurized fluid within said movable coupling to bellows means located near said movable coupling in response to said signal output, said bellows means having first and second portions connected respectively to said first and second conduits and movable relative to one another along a second longitudinal axis substantially parallel to said first longitudinal axis.

4,635,534

PISTONS, PISTON SHOES AND ROTORS IN PUMPS AND MOTORS

Karl Eickmann, 2420 Ishiki, Hayama-machi, Kanagawa-ken, Japan

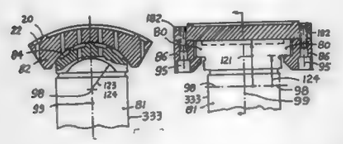
Continuation-in-part of Ser. No. 118,388, Feb. 2, 1980, abandoned, which is a division of Ser. No. 765,221, Feb. 3, 1977, Pat. No. 4,193,336, which is a continuation-in-part of Ser. No. 528,346, Nov. 29, 1974, Pat. No. 4,037,523, which is a continuation-in-part of Ser. No. 372,875, Aug. 18, 1981, abandoned. This application Apr. 23, 1984, Ser. No. 603,051

Int. Cl.[4] F01B *13/06*

U.S. Cl. 91—488 1 Claim

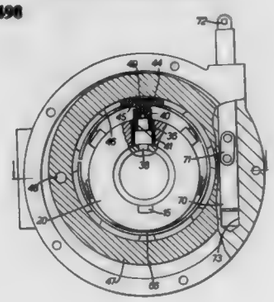
1. A hydraulic device including a housing with a rotor revolvingly borne in said housing and provided with working chambers which are subjected to a displacement member for enlarging and reducing said chambers for the reception and expulsion of a fluid and control means provided in said device for the control of flow of fluid and for the control of the movements of said displacement members,

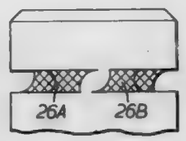
wherein said device includes a piston and a piston shoe, said piston forms a piston head and said piston shoe forms an inner face and an outer face,
wherein said piston head forms a part cylindrical bearing face of a constant first radius around a second axis of normal direction relatively to a first axis longitudinally through said piston,
wherein said inner face forms a hollow part-cylindrical face of a second radius substantially equal to said first radius, whereby said inner face may lay upon said bearing face and is able to pivot thereon,
wherein said outer face of said piston shoe is able to slide along a respective guide face of a piston stroke guide,
wherein said piston head forms retaining faces of third radii around said second axis,
wherein retaining members are fastend to said piston shoe and include holding faces of fourth radii around said second axis substantially equal to said third radii, whereby said holding faces are able to slide along said retaining faces when said piston shoe pivots on said piston head,
whereby said piston and piston shoe are fastened together by said retaining members with said retaining faces and said holding faces of said piston and retaining member,
wherein said piston forms a cylindrical outer face around said first axis,
wherein said piston head forms lateral extensions parallel to said second axis and extending beyond the outer diameter of said piston whereby said part cylindrical bearing face extends along the entirety of said piston head with its lateral extensions and thereby beyond the outer diameter of said piston,



wherein said piston shoe extends laterally beyond said extensions of said piston head to form reception portions for the fastening of said retaining members thereon,
wherein said retaining faces of said piston head are formed on said lateral extensions,
whereby said retaining members are located laterally of said piston head and of said outer diameter of said piston,
wherein passages are extended through said piston to meet passage means which extend through said piston shoe;
wherein fluid pressure balancing pockets are provided in the radial outer face of said piston shoe and fluid pressure pockets are also provided in and through at least one face of the bearing bed whereon the piston shoe pivots on said piston while said passage and said passage means communicate from said cylinder to said fluid pressure pockets;
wherein sealing lands surround and seal said fluid pressure pockets to form with said fluid pressure pockets hydrostatic bearings between the guide face of the piston stroke guide wherealong the radial outer face of the piston shoe slides and between the faces of the bearing bed for the pivotal movement of the piston shoe on the said bearing bed of said piston, and;
wherein the areas of said hydrostatic bearings exceed the cross-sectional area of said piston,
whereby said hydrostatic bearings are of such a large area that the sealing lands and guide portions of the pivot face and of the radial outer slide face of the piston shoe remain at all times loaded with a force per area which never exceeds the pressure per area in the fluid which flows through the cylinders of said device.

4,635,535
HYDRAULIC RADIAL PISTON MACHINES
Christian H. Thoma, St. Clement, and George D. M. Arnold, St. Helier, both of Great Britain, assignors to Unipat AG, Glarus, Switzerland
PCT No. PCT/EP83/00008, § 371 Date Sep. 6, 1983, § 102(e) Date Sep. 6, 1983, PCT Pub. No. WO83/02482, PCT Pub. Date Jul. 21, 1983
PCT Filed Jan. 14, 1983, Ser. No. 536,152
Claims priority, application United Kingdom, Jan. 19, 1982, 8201456
Int. Cl.⁴ F01B *13/06*
U.S. Cl. 91—498 **4 Claims**

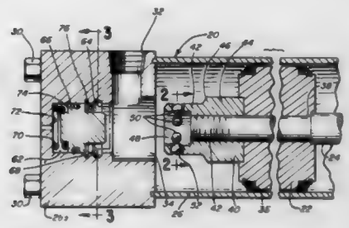




1. A radial piston hydraulic machine comprising a rotary cylinder unit provided with generally radial cylinder bores and mounted to rotate on a stationary ported pintle, a piston movable in each cylinder bore and connected to a sliding slipper engaging a surrounding annular cam track, means for transferring hydraulic fluid to and from the ports of the pintle, the cylinder bores communicating with respective ports within the internal surface of the rotary cylinder unit, arranged to cooperate successively with the ports of the pintle as the cylinder unit rotates, and including a common flexible, resilient, non-continuous guide band surrounding said rotary cylinder unit, and acting resiliently on said slippers in a radial direction in relation to the cam track, the guide band having apertures for the individual slippers and intervening bridges, said band having inturned flanges along opposite edges.

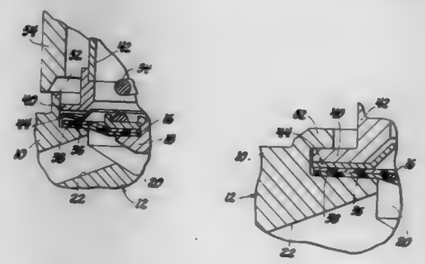
4. A radial piston hydraulic machine comprising a rotary cylinder unit provided with generally radial cylinder bores and mounted to rotate on a fixed ported pintle supported at one end only, a piston movable in each cylinder bore and connected to a sliding slipper engaging a surrounding annular cam track, means for transferring hydraulic fluid to and from the ports of the pintle, the cylinder bores communicating with respective ports within the internal surface of the rotary cylinder unit, arranged to cooperate successively with the ports of the pintle as the cylinder unit rotates, and including a separately formed ported sleeve positioned within the rotary cylinder unit and rotating therewith and having valve ports arranged to communicate with the ports on the pintle and with the cylinders of the rotary unit, the said valve ports in the sleeve and the ports in the pintle being elongate and extended in a circumferential direction, the end profile of each port in the sleeve being narrowed to a point and extending circumferentially and being offset axially in relation to and overlapping an adjacent narrowed extension of an adjacent port in the sleeve.

4,635,536
CYLINDER LOCKING APPARATUS
Ming Liu, Westmont; John F. Bowbin, Elmhurst, both of Ill.; Raymond L. Ghislain, Twin Lakes, Wis., and Stephen K. McDaniel, Glen Ellyn, Ill., assignors to Miller Fluid Power Corporation, Bensenville, Ill.
Continuation of Ser. No. 534,171, Sep. 19, 1983, abandoned. This application May 14, 1985, Ser. No. 734,742
Int. Cl.⁴ F15B *15/26*
U.S. Cl. 92—24 **3 Claims**



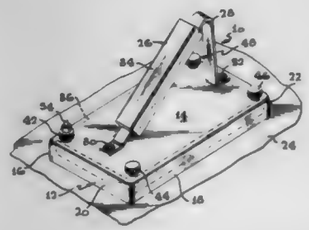
1. Locking apparatus for a piston and cylinder device having a piston disposed on a piston rod and movable in response to fluid pressure toward a head of the device, the head having an axial bore having opposite ends and being coupled to a fluid passage to the interior of the cylinder, comprising:
a locking plunger threaded onto the piston rod for and disposed between the piston and one cylinder head, said locking plunger including a sleeve portion having inner and outer surfaces concentric and circular cylindrical and extending away from the piston toward said cylinder head, locking members mounted in said sleeve portion and movable between a position and a locking position wherein said locking members have portions exposed beyond the outer surface of said sleeve portion;
means forming a circumferential groove extending outwardly in the head from said axial bore;
a locking plug disposed in the axial bore for reciprocation toward and away from the piston, said plug having an outer surface to fit within the inner surface of the plunger sleeve and a tapered nose extending inwardly from said outer surface;
a stop in said head axial bore limiting movement of the locking plug toward the piston, spring means urging the locking plug against the stop, said locking plug tapered nose being axially aligned with and engageable against said locking members as the locking plug and locking plunger telescope one relative to the other, said engaging plug nose and locking members being capable of moving the locking plug against its spring urging to move the locking plunger and locking plug together until said locking members are opposite said circumferential groove so as to ramp up the tapered nose and move radially into the circumferential groove;
said locking members having a size to clear the inner surface of said sleeve when entered into said circumferential groove, so that said locking plug may move its outer surface toward the piston and opposite said locking members to maintain same in the groove holding said piston and rod against further movement.

4,635,537
FUEL PRESSURE REGULATOR
Martin J. Field, Churchville, N.Y., assignor to General Motors Corporation, Detroit, Mich.
Continuation of Ser. No. 622,954, Jun. 21, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 821,031
Int. Cl.⁴ F16J *3/02*
U.S. Cl. 92—98 R **2 Claims**



1. A fuel pressure regulator comprising a pressure regulator base having an annular clamping surface, a pressure regulator diaphragm having an annular sealing region overlying said clamping surface, a cover having an annular flange overlying said sealing region, said base having a rim surrounding and extending axially from said clamping surface, said rim being staked over said flange to cause said flange to clamp said diaphragm sealing region against said base clamping surface, and an annular compression ring disposed between said flange and said diaphragm sealing region, said compression ring being substantially V-shaped in cross-section to define an inner edge spaced from said diaphragm, a circular intermediate area engaging a circular area of said diaphragm sealing region, and an outer edge engaging said flange, said outer edge being axially displaced from said intermediate area in the free state of said compression ring, said compression ring thereby being effective to concentrate the clamping effort of said flange on said circular area of said diaphragm sealing region.

4,635,538
HAMBURGER PRESS
Louis S. Polster, 1017 Fairmount Rd., Burbank, Calif. 91501
Filed Dec. 6, 1984, Ser. No. 678,699
Int. Cl.⁴ A47J *37/06*
U.S. Cl. 99—349 **16 Claims**



1. A press for cooking a food product on a heated griddle, said press having a cooking plate therein for placement on top of the food product positioned on the heated griddle to press the food product against the griddle, said cooking plate having sufficient thermal mass that when said cooking plate is first heated on the griddle substantially to griddle temperature and thereafter placed on the food product, it supplies sufficient heat to the food product to cook substantially the upper half of the food product, said cooking plate being made of aluminum and having a substantially flat bottom surface, said bottom surface

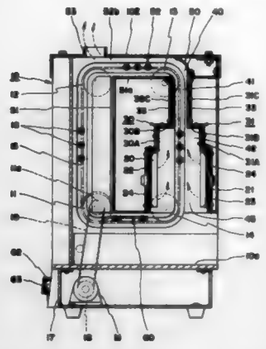
having a substantially smooth finish thereon, said substantially smooth bottom surface having an anodized finish and said bottom surface having a golden brown colored non-stick surface thereon such as is achieved by coating the bottom surface with shortening and heating the bottom surface to about 575 degrees F. for about 20 to 30 minutes so as to minimize sticking of the food product to the bottom surface.

4,635,539

AUTOMATIC SKEWERED FOOD ROASTER

Akira Tanaka, Shizuoka, Japan, assignor to Forming Industry, Inc., Japan

Filed Sep. 23, 1985, Ser. No. 779,048
Claims priority, application Japan, Sep. 21, 1984, 59-198078
Int. Cl.⁴ A47J *37/04*
U.S. Cl. 99—421 H **2 Claims**



1. An automatic skewered food roaster comprising a roaster housing, vertically disposed spaced facing infrared heaters mounted within said housing, a moveable endless chain mounted within said housing and passing between said heaters for transferring spaced skewered food in a clockwise direction and spaced heat reserving plates disposed outside of said heaters within said housing, said heat reserving plates extending above said heaters and defining horizontal sections extending towards each other and vertical sections extending above said horizontal sections to form a path for said endless chain and a chamber serving as a heat storage for reflecting and storing heat ascending from said infrared heaters.

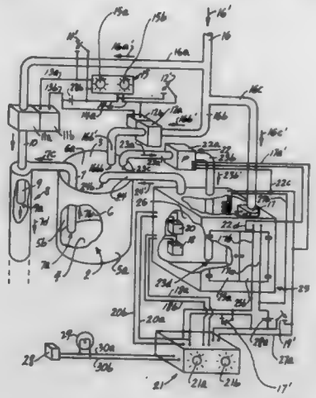
4,635,540

BAKER'S DOUGH PROOFING AND RAISING UNIT

Henry M. Dowds, Woodside, N.Y., assignor to Traulsen & Co., Inc., College Point, N.Y.

Filed May 25, 1982, Ser. No. 381,700
Int. Cl.⁴ A21C *13/00*
U.S. Cl. 99—468 **7 Claims**

1. A baker's dough proofing and raising unit comprising:
(a) dough-proofing apparatus having a portion adapted to contain a mixture of dough and water vapor;
(b) water vapor conditioning means included in a separate portion of said dough-proofing apparatus for controlling the temperature and humidity of water vapor;
(c) water vapor transmission means for transmitting water vapor between said portions of said dough-proofing apparatus;
(d) said water vapor conditioning means comprising water vapor temperature control means responsive to the temperature of water vapor for controlling the heating of water vapor by said water vapor conditioning means to maintain the temperature of water vapor at a predetermined operating temperature for dough proofing;
(e) said water vapor conditioning means further comprising water vapor humidity control means responsive to the humidity of water vapor for controlling the humidity of water vapor to maintain the humidity of water vapor at a predetermined operating humidity for dough-proofing;
(f) vessel means comprising one portion of said dough-proofing apparatus for supporting the dough-proofing process;
(g) solenoid-operated water addition means coupled to said vessel means for adding water to said vessel means;
(h) solenoid-operated vacuum-jet siphon means coupled to



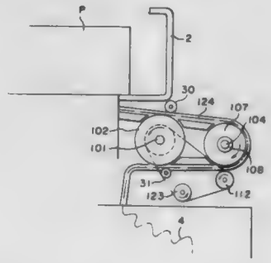
said vessel means as the sole means for extracting water from said vessel means; and
(i) timer means for causing the cleaning of said vessel means after a dough-proofing process is completed by activating said solenoid-operated vacuum-jet siphon means until the water contents of said vessel means are withdrawn from said vessel means, and thereafter activating said solenoid-operated water addition means until water has been added to said vessel means to a predetermined level.

4,635,541

METHOD OF FEEDING AND TIGHTENING A BAND IN A BAND STRAPPING MACHINE AND APPARATUS THEREOF

Yoshiaki Kasuga, Yokohama, Japan, assignor to Nichiro Kogyo Company Ltd., Yokohama, Japan

Filed Sep. 9, 1985, Ser. No. 773,658
Claims priority, application Japan, Dec. 29, 1984, 59-281027
Int. Cl.⁴ B65B *13/22*
U.S. Cl. 100—2 **6 Claims**



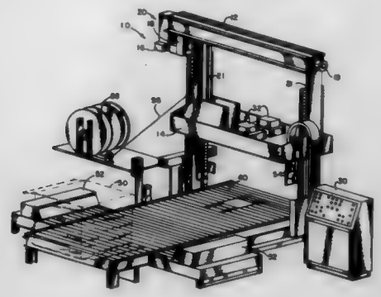
6. A method of feeding and tightening a band in a band strapping machine which comprises feeding a band around a package by bringing a first rocker roller into press-contact with a feed roller rotated at a high speed, performing a primary tightening operation by bringing a second rocker roller driven at a high speed into press-contact with a return roller driven at a lower speed so that said return roller is caused to rotate at a high speed on a return shaft driven at a low speed in accordance with the high speed rotation of said second rocker roller, thereby performing a primary tightening operation, and preforming a secondary tightening operation by engaging said return roller with said return shaft when said band is fitted around a package and a speed of said return roller coincides with the low rotational speed of said return shaft, whereby a rotational force of a low speed and a high torque of said return shaft is transmitted to said return roller in said secondary tightening operation.

4,635,542

METHOD OF COMPRESSING AND STRAPPING ARTICLES

Norman C. Sebelist, Coatesville, and Edward N. Fulton, Exton, both of Pa., assignors to Cyklop International and Emil Hoffman, both of, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 547,425, Oct. 13, 1983, abandoned. This application Feb. 11, 1985, Ser. No. 700,471
Int. Cl.⁴ B30B *15/14*; B65B *13/20*
U.S. Cl. 100—3 **10 Claims**



1. A method for applying strapping and securing articles to be secured together in which said articles: are compressed to a predetermined, measured compression force by pressing down upon them with a platen, the height of which is adjusted relative to an article to be strapped, by means by photocells that measure the height of the articles to be strapped;
said article being held at said predetermined compression force while strapping about the articles is automatically applied and tensioned to a particular force; and
then the compression force is removed after completion of the strapping of said articles.

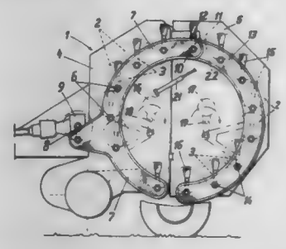
4,635,543

MOBILE LARGE BALING PRESS

Gerhard Clostermeyer, Gütersloh; Werner Könekamp, Herzebrock, and Karlheinz Tooten, Harsewinkel, all of Fed. Rep. of Germany, assignors to Claas Ohg, Harsewinkel, Fed. Rep. of Germany

Filed Mar. 11, 1985, Ser. No. 709,780
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409713
Int. Cl.⁴ B30B *3/00*
U.S. Cl. 100—89 **20 Claims**

1. A mobile large baling press for agricultural products, comprising a plurality of winding elements having axes and driveable in rotation about said axis, two end walls spaced from one another in an axial direction and forming together with said winding elements a pressing chamber, each of said end walls having two parts so that one part of one of said walls and one part of the other of said walls together with the respective winding elements forms one chamber half, whereas the other part of one of said walls and the other part of the other of said walls together with respective winding elements form another chamber half, one of said chamber halves being immovable and the other of said chamber halves being movable relative to said one chamber half for discharging a finished bale; a plurality of shafts each supporting a respective one of said winding elements and having two shaft ends spaced from one another in the axial direction and extending byond said walls; a plurality of cranks each arranged on at least one shaft



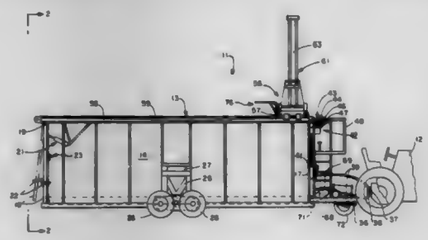
end of said winding elements; at least two driveable connecting members connected with said cranks; and a mass compensating means associated with each of said connecting members and including mass compensating elements arranged so that each of said connecting members is provided with one of said mass compensating elements.

4,635,544

MODULE BUILDER WITH A FLARED TOP AND WITH ATTACHMENTS

Clyde L. Taylor, 1545 Chinowth, Visalia, Calif. 93277

Continuation-in-part of Ser. No. 288,647, Jul. 30, 1981, abandoned. This application Dec. 14, 1983, Ser. No. 540,404
Int. Cl.⁴ B30B *9/30*
U.S. Cl. 100—98 R **23 Claims**



1. In a module builder, a generally rectangular framework having an open top side and having spaced apart side walls and spaced apart front and rear walls, the rear wall being formed by a door movable between open and closed positions, a carriage mounted on said framework for movement longitudinally of the framework between the front and rear walls, a tramper mechanism carried by the carriage and having a tramper mechanism carried by the carriage and having a tramper foot, means for moving said tramper foot vertically within said framework for forming a module from material which is dumped into the framework, and wheels mounted on opposite sides of said framework to permit said module builder to be transported from one location to another, said side walls having upwardly and outwardly flared portions so that imaginary vertical lines depending from the outer upper margins of the side walls clear the outer margins of the wheels on the sides of the rectangular framework.

4,635,545

APPARATUS FOR MARKING MOVING ARTICLES

Edward F. Kubacki, Marengo, and John M. Masciale, Palatine, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Dec. 26, 1984, Ser. No. 685,717
Int. Cl.[4] B41F *17/00*
U.S. Cl. 101—4 **4 Claims**



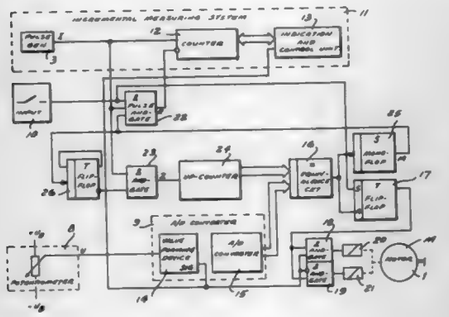
1. In an apparatus for marking an object with a punching or printing die, wherein conveying means are provided for moving said object in a given direction, fixed guide means are mounted on said apparatus for guiding said die for movement transverse to said given direction to contact and mark said object, and means are provided to direct said die toward said object, the improvement wherein said fixed guide means and die are shaped with clearance to permit limited displacement of said die relative to said fixed guide in said given direction, and further comprising means biasing said die in a direction opposite to said given direction, said die being carried by said object through said limited displacement and blurring of said mark is inhibited.

4,635,546

ARRANGEMENT FOR PRINTING MACHINE PLATE CYLINDER ZERO POSITION ADJUSTMENT

Stefan Grossmann, Radebeul, and Erhard Nitzsche, Bohna, both of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Mar. 4, 1986, Ser. No. 836,234
Claims priority, application German Democratic Rep., Mar. 4, 1985, 273755
Int. Cl.[4] B41F *13/14, 33/06*
U.S. Cl. 101—248 **3 Claims**



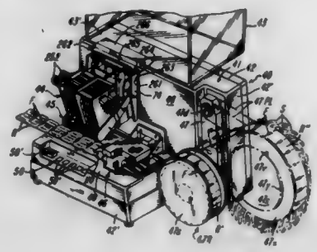
1. An arrangement for controlling the operation of a motor, which has a mechanical output connected by a transmission to a plate cylinder of a printing machine and electrical inputs connected to respective protection devices for the two senses of rotation of the motor, during the adjustment of the plate cylinder to a zero position, comprising potentiometer means for detecting and issuing an electrical signal representative of the instantaneous position of the transmission; an evaluation circuit interposed between said potentiometer means and the protection devices and including and A/D converter unit having an input side connected with the potentiometer means and an output side, at least one equivalence circuit having input means connected to said output side of said A/D converter unit and a signal output, a first flip-flop having one input connected to said signal output of said equivalence circuit, another input and an output, two AND-gates each having two inputs, one connected to said output of said first flip-flop and the other to said output side of said A/D converter unit, and an output connected to an associated one of the protection devices, at least one further AND-gate having input means and an output, at least one up-counter interposed between said output of said further AND-gate and said input means of said equivalence circuit, a monoflop having an input connected to said signal output of said equivalence circuit and an output, a pulse AND-gate having one input connected to said output of said monoflop, another input and an output, and a second flip-flop having an input also connected to said output of said monoflop; an input element for zero position having an output connected to said other input of said first flip-flop; and an incremental measuring system including a pulse generator having an output connected to said other input of said pulse AND-gate and to said input means of said further AND-gate, a counter having an input connected to said output of said pulse generator, a resetting input connected to said output of said pulse AND-gate and output means, and an indication and control device having an input side connected to said output means of said counter and to said output side of said A/D converter unit.

4,635,547

PRINTING APPARATUS

Orville C. Huggins, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 349,498, Feb. 17, 1982, Pat. No. 4,441,425.
This application Feb. 1, 1984, Ser. No. 576,091
Int. Cl.[4] B41F *1/08*
U.S. Cl. 101—292 **8 Claims**



1. Table-top printing apparatus, comprising: a housing including a generally vertical portion and a generally horizontal portion, the vertical portion including a front panel and a rear panel spaced from the front panel, a platen on the top of the horizontal portion, a print head, means mountng the print head on the outside of the front panel for straight line movement into and out of printing cooperation with the platen, a slide, means mounting the slide for reciprocating movement on the top of the horizontal portion, a feed finger carried by the slide for engaging and feeding a web of record members, means for moving the print head and the slide in sequence, the moving means including cam means, means including a pivotally mounted follower lever driven by the cam means for driving the print head, and means driven by the cam means for driving the slide, wherein the cam means and the lever are disposed

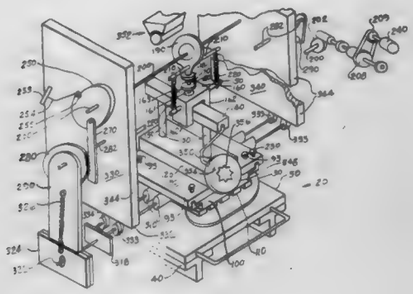
behind the front panel, and the front and rear panels of the vertical portion and the horizontal protion providing a housing for the moving means.

4,635,548

RECIPROCATING PRINTER FOR PATCHES

Arnold H. Peasky, Fairlawn, and James A. Hunt, Lodi, both of N.J., assignors to Patchmaster Corp., West New York, N.J.

Continuation-in-part of Ser. No. 641,873, Aug. 17, 1984, abandoned. This application Oct. 31, 1985, Ser. No. 793,726
Int. Cl.[4] B41F *1/00*
U.S. Cl. 101—319 **7 Claims**



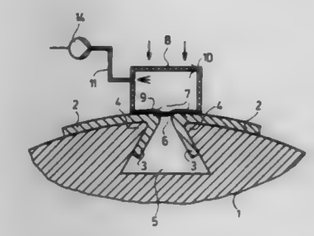
1. Printing apparatus comprising
parallel vertical left and right side plates which face each other;
a first horizontal rotatable shaft extending across the printing apparatus at the upper end thereof and through said left and right side plates to provide left and right ends beyond said left and right side plates, respectively;
a drive motor coupled to said first shaft,
left and right cam disks secured near the left and right ends of said first horizontal shaft to the left and to the right of said left and right side walls, respectively;
a control switch adjacent to and operable with the notch in one of said cam disks;
left and right vertical racks pivotably secured at one end to said left and right cams, respectively;
a second horizontal shaft, positioned vertically below said first shaft, and extending across the printing apparatus and said left and right side plates to provide left and right ends disposed beyond said left and right side plates, respectively;
a left and right pinion gear secured to the left and right ends of said second horizontal shaft and coupled to the left and right racks, respectively;
left and right vertical bars secured at their upper ends to the left and right ends of said second horizontal shaft;
left and right apertured brackets slidably mounted on the left and right vertical bars, respectively, at the lower ends thereof;
a spring coupled between each apertured bracket and its vertical bar to pull the apertured bracket upwardly on the vertical bar;
an inking roller assembly comprising
two horizontal rollers rotatably mounted on inking roller shafts, the ends of said inking roller shafts being secured to a left bracket and a right bracket,
left and right horizontal posts extending from said left and right brackets, respectively, and lying in the apertures in said left and right apertured brackets, respectively, and
left and right starting rollers rotatably mounted on said inking roller shafts and engaging said left and right side plates;
a crank mounted on said first horizontal shaft;
a horizontal upper pin extending to the left and right from said crank;
a vertical shaft depending from said crank;
a U-shaped block slidably mounted on the lower end of said vertical shaft and disposed with its legs generally parallel to the left and right side plates;
a horizontal elongated bar pivotably coupled between the legs of said U-shaped block and oriented front to rear of the printing apparatus;
a horizontal lower pin extending from left to right through said U-shaped bracket and through said elongated bar;
a pair of springs coupled between said upper and lower horizontal pins and tending to pull said U-shaped block and said horizontal elongated bar upwardly;
a pair of vertical posts secured to said elongated bar and depending downwardly therefrom;
means secured to said vertical posts for holding a type chase and printing type in position to perform a printing operation;
said inking rollers being positioned in contact with said last-named means, normally to the rear thereof and out of contact with the printing type;
a support for a sheet to be printed on by said type including a plate support, a resilient sheet, and a sheet to be printed on disposed facing said type; and
an ink pad secured to said elongated bar above said type chase;
all of said parts being so positioned that, at the beginning of a cycle of operation when the motor starts to turn said first shaft and said crank, and before a printing operation is performed, said pair of springs holds said means and said printing type up away from said sheet to be printed on while said inking rollers move from rearwardly of said type across said type to apply ink thereto and forwardly, with said starting rollers riding along the edges of said left and right side plates and causing rotation of said inking rollers, said crank then forcing the parts to which it is coupled including the type chase and type downwardly to contact said sheet to be printed on and printing a message thereon.

4,635,549

METHOD FOR CLOSING THE GAP BETWEEN THE ENDS OF GRAVURE PRINTING PLATES CLAMPED ON FORME CLYINDERS

Gerhard Bleckmann, Lampertheim; John Lynch, Mannheim, and Günter Wallbillich, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 5, 1985, Ser. No. 772,661
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1984, 3433046
Int. Cl.[4] B41C *1/02*; B41F *27/06*
U.S. Cl. 101—401.1 **8 Claims**



1. A method of closing the gap between the end or edge regions of a gravure printing plate clamped on a forme cylinder which comprises: applying a cover element in the form of a hollow body containing a pressure generating and pressure transmitting fluid to the gap, said cover element having a

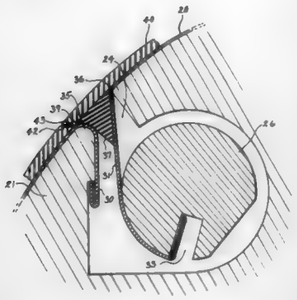
pressure deformable surface at least in the region which lies on the end or edge sections of the plate; exerting pressure on the deformable surface of the cover element by means of said pressure generating and transmitting fluid, whereby the cover element is deformed and assumes the surface contour of the plate in the gap region; filling the resulting gap cavity with a curable filling compound; curing the compound and thereafter removing the cover element.

4,635,550

GAP FILLER BLANKET FOR PRINTING CYLINDER

George B. Brands, Wilmette, Ill., and James R. Carlson, Racine, Wis., assignors to American Roller Company, Bannockburn, Ill.

Filed Mar. 11, 1985, Ser. No. 710,060
Int. Cl.[4] B41F *27/06, 27/12*
U.S. Cl. 101—415.1 3 Claims



1. In a printing cylinder including a core and a blanket, the core having a gap extending laterally along its periphery, means for securing one end of the blanket stationary and a rotatable tensioning bar for attachment to the other end of the blanket to tighten the blanket around the core disposed in the gap, the blanket having an outer layer of elastomeric covering and an inner layer of backing fixed to the covering, the improvement wherein:

the backing is non-extensible and has a first lateral end for attachment to the tensioning bar and a second lateral end for attachment to the second means:

the covering extending over and past the gap, said covering having a pair of opposed lateral edges which angle radially outwardly away from the direction of rotation of the cylinder and overlap; and

a yieldable elastomeric filler portion fixed to the first lateral end and to the portion of the covering which extends over the gap, said filler portion abutting the second lateral end and yielding to fill the gap beneath the covering between the first and second lateral ends as the tensioning bar is rotated to tighten the backing and support the covering over the gap so that the printing cylinder has a substantially continuous circular circumference.

4,635,551

METHOD OF PRINTING HOSIERY

John Croxall, Dadlington, Nr. Nuneaton, England, assignor to Couture Marketing Limited, Leicestershire, England

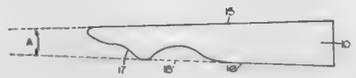
Filed Jul. 1, 1985, Ser. No. 750,866
Claims priority, application United Kingdom, Feb. 20, 1985, 8504345
Int. Cl.[4] B41F *17/38*
U.S. Cl. 101—470 5 Claims

1. A method of printing hosiery, comprising the steps of:

(a) providing a flat form having a pair of side edges which taper towards each other at a predetermined angle, at least one of said side edges being substantially straight;

(b) placing a tubular hose over said flat form such that parts of said tubular hose pass around said side edges of said form;

(c) placing over said tubular hose on said flat form a print carrier having a printed design thereon, said print carrier initially being in the form of a frustoconical tube but being flattened along two opposed fold lines which also taper



towards each other at said predetermined angle, said parts of said tubular hose being engaged between and closely contacted by said fold lines of said print carrier and said side edges of said form; and

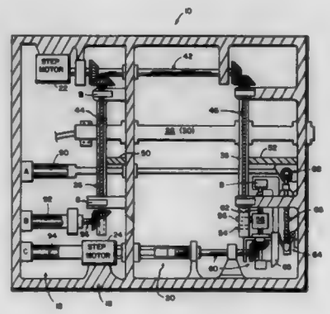
(d) transferring said printed design from said print carrier to said tubular hose.

4,635,552

UNIQUE SIGNAL, SAFE AND ARM DEVICE

Stanley D. Battle, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 15, 1985, Ser. No. 765,764
Int. Cl.[4] F42C *15/40, 15/34, 19/00, 15/06*
U.S. Cl. 102—254 24 Claims



1. A unique signal, safe and arm device, comprising:

a housing;

at least one initiator;

means situated within said housing for containing said initiator, said initiator containing means having a first open end and a second open end;

means positioned adjacent said first open end of said initiator containing means for activating said initiator;

an initiator barrier means interposed between said activating means and said first open end of said initiator containing means for preselectively moving between a first position preventing said activating means from activating said initiator and a second position permitting said activating means to activate said initiator;

means operably interconnected to said initiator barrier means for permitting preselected movement thereof to take place between said first and said second positions, said preselected movement permitting means including a surface having a uniquely designed pattern of preselected configuration therein, means for operably engaging said pattern along the entire configuration thereof and means for positioning said engaging means with respect to said pattern upon the receipt of appropriate preselected signals; and

means operably connected to said initiator barrier means for preselectively moving said initiator barrier means between said first and said second positions upon the receipt of appropriate preselected signals;

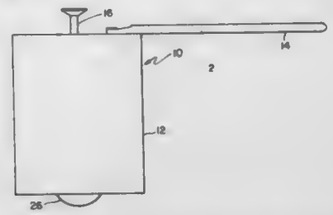
whereby operable engagement of said engaging means along said entire pattern configuration during movement of said initiator barrier means enables said initiator barrier means to move from said first position to said second position in order to effect activation of said initiator by said activating means.

4,635,553

MANEUVERING AIR DISPENSED SUBMUNITION

Thomas A. Kane, Bedford, Mass., assignor to Avco Corporation, Wilmington, Mass.

Filed Oct. 15, 1985, Ser. No. 787,452
Int. Cl.[4] F42B *25/24*
U.S. Cl. 102—384 10 Claims



1. An air dispensed submunition having the capability to perform a lateral maneuver during descent onto a target area, the submunition comprising:

a cannister having an axis and a generally cylindrical shape, said cannister containing a warhead capable of detonation;

means for inducing spin to said cannister about its longitudinal axis;

a wing attached by its one end to the top end of said cannister, the second end of said wing extending outwardly at right angles to the axis of said cannister, the chord of said wing having an angle of attack sufficient to impart a rotation torque to said submunition during descent;

sensor means for detecting targets of opportunity in the search footprint area below said descending submunition, said search footprint field of view being larger than the lethal range of said warhead;

data processor means for generating steering commands from target information gathered by said sensor means;

a means acting on said wing for changing the angle of attack thereof in response to said steering commands for maneuvering said submunition within lethal range of said target; and

signal activation means to generate a detonation command to explode said warhead.

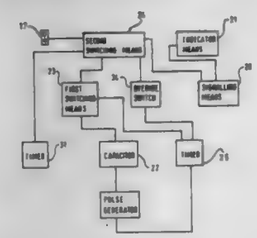
4,635,554

DEMOLITION DEVICE AND METHOD OF PREPARING SAME

Malcolm G. Palmer, Blakedown, United Kingdom, assignor to Compact Energy Limited, Worcestershire, United Kingdom

Filed Dec. 17, 1984, Ser. No. 682,542
Claims priority, application United Kingdom, Dec. 22, 1983, 8334225
Int. Cl.[4] F42B *22/26*
U.S. Cl. 102—416 11 Claims

1. An underwater demolition device comprising holding means for holding the device on a ferrous structure, an explosive charge, a detonator, control means for applying to the detonator at a selected time a firing signal to which the detonator responds by detonating the charge, signalling means which, after arming of the device, is responsive to movement of the device away from a structure with which the device is in contact when armed by providing a movement signal and indicating means distinct from but operatively associated with the signalling means and adapted to provide a visual signal that



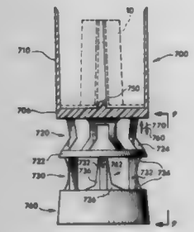
said movement has occurred when the movement signal is applied to the indicating means.

4,635,555

SHOT PATTERN CONTROLLING DEVICE

Bernard L. Ferri, P.O. Box 769, Trinidad, Colo. 81082

Filed Sep. 16, 1985, Ser. No. 776,641
Int. Cl.[4] F42B *7/08*
U.S. Cl. 102—453 4 Claims



1. A device for use in a shotgun cartridge for controlling the opening pattern of said shot as said shot leaves the barrel of said shotgun when said cartridge is fired, said device comprising:

an elongated center support centrally located in said cartridge,

a plurality of equally spaced fins disposed around and integral with said center support for controlling the pattern of opening said inwardly directed shot as said shot leaves said barrel, said fins extending the elongated length of said center support, said fins slightly tapering inwardly from the bottom of said cartridge to the top of said cartridge, each of said fins being substantially rectangular in cross-section and substantially rectangular in shape when viewed from the side,

a circular base connected under said center support and said fins, said circular base having a formed opening centrally disposed therein, and

a wad engaging said circular base for centrally holding said central support and said fins in said wad, said wad comprising:

(a) a first circular region having an upper surface with a formed upstanding nub thereon, press fittingly engaging said formed opening for holding said circular base to said wad, said circular base resting upon the upper surface of said first circular region,

(b) means integral with and located under said first circular region and being further integral with and located above a second circular region for cushioning said shot in said wad to reduce the force of recoil when said shotgun cartridge is fired, said cushioning means being capable of pushing said shot as said shot leaves said barrel, and

(c) means integral with and located below said second circular region and being further integral with and located above a third circular region for bracing said wad as said cartridge is fired.

4,635,556

PENETRATOR SHELL WITH STACKED CORE ELEMENTS

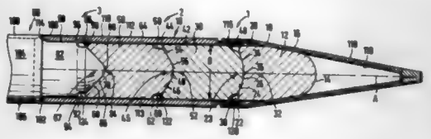
Juergen Boecker, Oberhausen; Hans W. Luther, Kaarst; Peter Wallow, Duesseldorf, and Horst Fritsch, Meerbusch, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 17, 1983, Ser. No. 476,408

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1982, 3209593

Int. Cl.⁴ F42B *11/06*

U.S. Cl. 102—518 **2 Claims**



1. An improved subcaliber fin-stabilized penetrator projectile which has a ballistic hood coaxially mounted on the front end thereof and a plurality of pre-penetrator cores consisting essentially of tungsten alloy and mounted one behind the other in an axial direction behind said ballistic hood, and a main penetrator consisting essentially of tungsten alloy, a cylindrical casing having a smooth external surface being operatively detachably connected to said ballistic hood, said plurality of pre-penetrator cores being operatively mounted partially in said cylindrical casing and partially in said ballistic hood, the improvement comprising in combination

(a) said cylindrical casing axially extends rearwardly from the ballistic hood to a forward region of the main penetrator;

(b) the outer diameter of the main penetrator corresponds to the outer diameter of the cylindrical casing so that the projectile presents a smooth outer cylindrical surface over its entire axial length with the exception of the ballistic hood;

(c) each one of said plurality pre-penetrator cores has the same external diameter and said plurality of pre-penetrator cores are of complementary shape so that the front surface of the rearmost core abuts against the rear mating surface of the next forwardly positioned pre-penetrator core and so on;

(d) the mutually contacting front and rear surfaces of the respective pre-penetrator cores are matingly shaped;

(e) the pre-penetrator cores are detachably joined to each other and the casing by means of detachably mounting said ballistic hood on said casing;

(f) the confronting surfaces of the adjoining cores are complementarily axially convexly and concavely shaped;

(g) the degree of convexity and concavity increases from front to rear with respect to the longitudinal axis of the projectile;

(h) each pair of confronting surfaces of adjoining cores and said casing jointly define an annular space in said casing;

(i) the rear end surface of each pre-penetrator core and the front surface of the corresponding core being rounded off and matingly shaped so that when a pre-penetrator core pivots with respect to the next rearwardly adjoining core the latter core maintains its direction of movement;

(j) the ballistic hood is made of steel and the casing is made of tungsten alloy; and

(k) said casing and ballistic hood maintain the pre-penetrator cores in a play-free operative ready-to-fire condition.

4,635,557

MACHINE FOR WORKS ON A RAILWAY TRACK WITH CONTINUOUS ADVANCE

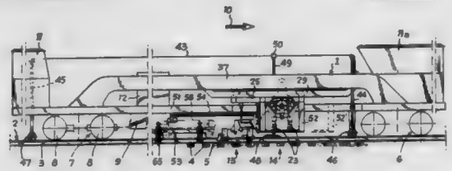
Pierre Mohr, Ligny-en-Barrois, and Gérard Mohr, Forbach, both of France, assignors to Framafer, Boaing-Les-Saint-Avold, France

Filed Mar. 6, 1985, Ser. No. 708,662

Claims priority, application France, Mar. 30, 1984, 84 05085

Int. Cl.⁴ E01B *27/17*

U.S. Cl. 104—7.2 **10 Claims**



1. Continuously advancing machine for works on a railway track, comprising a main chassis and an auxiliary chassis which supports working members such as ballast tamping and track lifting/shifting units, the auxiliary chassis being connected to a mobile carriage which may move in translation along the main chassis under the action of drive means so as to advance, during the works, step by step with respect to the track while the machine progresses continuously, wherein:

said drive means comprises a device for coupling the auxiliary chassis to the mobile carriage adapted to circulate on the track and is provided with means for advance and means for immobilization with respect to the track, this coupling device controlling variations in the distance between the auxiliary chassis and the mobile carriage.

4,635,558

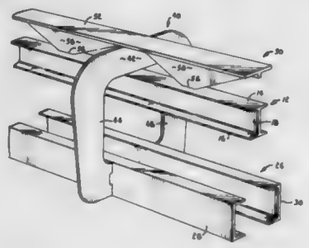
LONG SPAN CONVEYOR TRACK AND HANGER

Robert A. Hoehn, 9230 E. 47th St., Kansas City, Mo. 64133

Filed Sep. 30, 1983, Ser. No. 537,484

Int. Cl.⁴ E01B *25/24*

U.S. Cl. 104—111 **5 Claims**



1. A long span track section for a power and free conveyor comprising the combination of:

a power rail having a continuous upper flange;

a continuous rail cap extending above and along the length of said upper flange of the power rail coextensively therewith, said cap having a continuous top flange uniformly spaced from said power rail and a serrated web depending from said top flange and presenting a plurality of longitudinally spaced stems with interstices therebetween;

means securing the stems of said web to said upper flange of the power rail;

a plurality of yoke plates each having a top portion and a pair of spaced-apart depending legs, the top portion of each yoke plate presenting upper and lower edges and extending through a corresponding interstice transversely of the power rail and cap with the legs thereof extending downwardly on opposite sides of the power rail;

means rigidly securing the top portion of each yoke plate to the top flange of the rail cap and to the upper flange of the power rail at said upper and lower edges respectively;

a free track spaced beneath said power rail, coextensive therewith and secured to the legs of the yoke plates;

a plurality of hanger devices for said rail cap releasably receiving user-selected, longitudinally spaced portions of said continuous top flange located anywhere therealong; and

means for securing said hanger devices to an overhead structure of a building, whereby to suspend the track section therefrom.

4,635,559

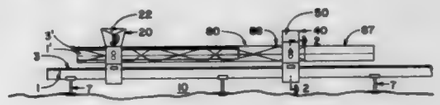
PIPELINE MONORAIL SYSTEM

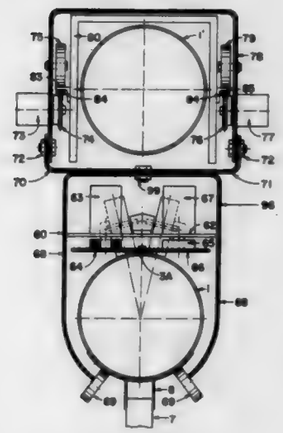
Warren B. Nelson, 3410 Montvue Dr., Meridian, Id. 83642

Filed Mar. 5, 1984, Ser. No. 586,308

Int. Cl.⁴ B61B *13/06*; B66F *11/04*

U.S. Cl. 104—119 **17 Claims**





1. A pipeline monorail system comprising:

a cylindrical pipeline provided with at least one outwardly and radially projecting flange longitudinally extending the length of said pipeline;

means for supporting said pipeline;

at least two carriages supportable by said pipeline, each of said carriages individually supported by said pipeline in front to rear relationship relative to another carriage, and each carriage longitudinally movable a selected distance along said pipeline relative to another carriage, each of said carriages including an upper and lower chassis, said lower chassis of each provided with drive means for engaging one or more flanges of said pipeline for guidance on said pipeline, and said upper chassis provided with a load carrier support frame;

a load carrier carried by and between each of said support frames of said carriages;

pivot means for pivoting said load carrier both horizontally and vertically relative to the lower chassis of each of said carriages whereby said carriages may move at varying vertical angles relative to one another over rises and through troughs and at varying horizontal angles relative to one another around curves; and

power source means for providing power to said drive means of at least one of said carriages for propelling the carriage.

4,635,560

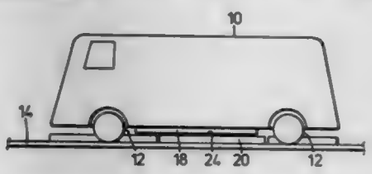
CONTACTLESS POWERING OF LIM VEHICLE ELECTRICAL SYSTEM BY RECOVERY OF LIM SLIP POWER

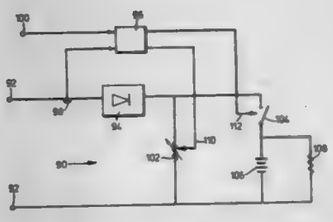
W. John Ballantyne, Kingston, Canada, assignor to Urban Transportation Development Corporation Limited, Toronto, Canada

Filed Jan. 4, 1985, Ser. No. 688,937

Int. Cl.⁴ B60L *1/00*; B61B *13/08*

U.S. Cl. 104—292 **6 Claims**





1. A transportation system including a linear induction motor primary for generation of a moving magnetic field along a path and a vehicle fitted with a linear induction motor secondary so that the vehicle is propelled along the path by the moving magnetic field, the vehicle having an on-board electrical system including lights, fans or other electrical apparatus, the secondary comprising a reaction winding in which current is induced by the moving magnetic field for generation of thrust,

the vehicle including conversion means connected to the winding to convert current induced in the winding into electrical power for operation of the on-board electrical system whereby slip power in the secondary can be converted into electrical power for operation of the on-board electrical system;

and the vehicle also including a slip power recovery unit for controlling the recovery of slip power, said slip power recovery unit including a rectifier, a load resistor, storage means for storing rectified current, and means enabling the output of the rectifier to be connected selectively to one or more of the load resistor, the storage means and the on-board electrical system.

4,635,561

CABIN FOR AN AERIAL CABLEWAY

Francis Tanda, Veyrins, France, assignor to Sigma Plastique and Pomagalski S.A., Fontaine, France

Filed Nov. 14, 1984, Ser. No. 671,211

Claims priority, application France, Dec. 16, 1983, 83 20329

Int. Cl.⁴ B61D *19/00*

U.S. Cl. 105—329.1 **4 Claims**

1. A cabin for an aerial cableway, said cabin having a gener-

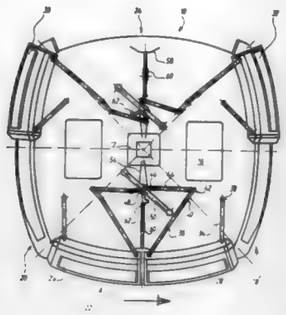
ally parallelepipedical shape in vertical cross-section and comprising:

a floor and a roof,

two lateral walls facing each other, at least one of which has a door opening extending substantially along the whole lateral wall,

two end walls facing each other, the lateral walls and the end walls intersecting at junctions and having substantially the same width to form substantially a square in a horizontal cross section,

a door having two substantially planar identical panels, each panel having a closing edge and an opening edge opposite said closing edge, said closing edges of said panels contact each other when the panels are in a closed position such that said panels cover said door opening, said panels move symmetrically away from each other to effect opening of the door,



a door actuating mechanism having a set of first and second link rods for each panel, a first link rod having an outboard end pivotally mounted adjacent the closing edge of one panel and an opposite inboard end of said first link rod pivotally mounted on a first fixed vertical axis, and a second link rod having an outboard end pivotally mounted adjacant the opening edge of said one panel and an opposite inboard end of said second link rod pivotally mounted on a second vertical fixed axis, said first and second axes being located such that said second axis is arranged closer to said end wall than said first axis so that actuating the link rods guides the panel along a curved travel path around the junction between the end wall and side wall of the cabin, the panel in the open position being disposed close to and in parallel relationship with the end wall and covering about one half of the end wall, the opening edge of said panel being adjacent said junction between end wall and lateral wall.

4,635,562

SIDEWALL ASSEMBLY FOR TOTE BOX

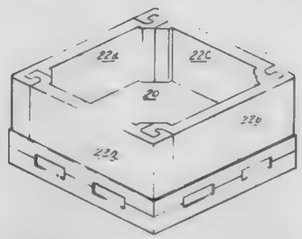
Elmer W. Kreeger, Howell, Mich., assignor to Pinckney Molded Plastics, Inc., Howell, Mich.

Filed Oct. 29, 1984, Ser. No. 666,119

Int. Cl.⁴ B65D *19/44*

U.S. Cl. 108—55.1 **3 Claims**

1. A tote box assembly or the like comprising a pallet including a horizontal rectangular main panel, said main panel having a plurality of rectangular openings therethrough disposed along and adjacent to each side edge thereof, a sidewall extending along each side edge of the main panel and projecting upwardly therefrom, each of said sidewalls having: (a) a plurality of latching leg means projecting downwardly from the lower edge through said openings in said main panel, the leg means having latch teeth engagable with the underside of said main panel to positively prevent vertical withdrawal of the sidewall from said main panel; (b) a first interlocking member at one end of the sidewall defining a vertical slot of generally L-shaped, horizontal cross section extending from the top to the bottom of said sidewall, said first interlocking member including first, second and third webs, said first and said second webs projecting perpendicularly from the inner side of the sidewall in spaced parallel relationship, said first web extending along said one end of said sidewall, and said third web extending perpendicularly from said first web in spaced opposed parallel relationship to said sidewall toward said second web and terminating at a vertical edge spaced from said second web, one of the latching leg means located on the sidewall immediately adjacent to said first interlocking member and projecting downward therefrom, said first interlocking member also having a stabilizing post projecting downward therefrom such that the associated latching leg means are received within a rectangular opening on a first side edge of said main panel immediately below the sidewall and the stabilizing post is received within a rectangular opening on a second side edge of said main panel, perpendicularly adjacent to said first side edge; and (c) a second interlocking member at the respective other end of the sidewall, the second interlocking member having a generally L-shaped horizontal cross section complementary to that of said slot of said first interlocking member and oriented such that the second interlocking member of a



first sidewall extending along a first side edge of said main panel is interlockingly received within the slot of a first interlocking member of a second sidewall extending along a second adjacent side edge of said main panel to lock said first and second sidewalls into a fixed perpendicular relationship to each other and against horizontal movement relative to each other, the second interlocking member having latching leg means located on the sidewall immediately adjacent thereto projecting downwardly therefrom, and a stabilizing post projecting downwardly from the second interlocking member such that the latching leg means are received within a rectangular opening on the first side edge of the main panel immediately below the sidewall and the stabilizing post is received within a rectangular opening on a third side edge perpendicularly adjacent to the first side edge and parallel to the second side edge, the stabilizing post of a second interlocking member of a second side wall and the latching leg means of a first interlocking member of a first side wall adapted to project into the same rectangular opening located on the first side edge while the stabilizing post of a first interlocking member of a first sidewall and the latching leg means of a second interlocking member of a second side wall project into a rectangular opening located on a side edge perpendicular to the first side edge.

4,635,563

ADJUSTABLE SHELVING SYSTEM

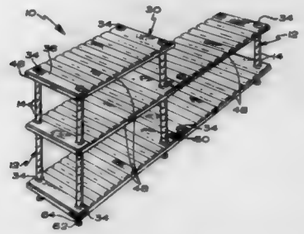
George E. Hand, Excelsior, and Roman A. Kramer, Bloomington, both of Minn., assignors to Interplastic Corporation, Minneapolis, Minn.

Filed Sep. 17, 1984, Ser. No. 650,789

Int. Cl.⁴ A47B *9/00*

U.S. Cl. 108—111 **14 Claims**

1. In a shelf system of the type having a plurality of elongated support posts, the support posts including grooves around their periphery at spaced intervals along the post longitudinal axes, having shelf means and having means for supporting said shelf means on said support posts, said means for supporting cooperating with said support post grooves, the improvement wherein said shelf means comprise generally rectangular shelf members having shelf connecting means mutually engaging each other, and aperture means for receiving said post means and, said aperture means having an enlarged recess means for receiving said means for supporting and said means for supporting means comprising unitary clip means having a first portion substantially surrounding a support post within a support post groove and a second portion configured to nest within said recess means.



4,635,564

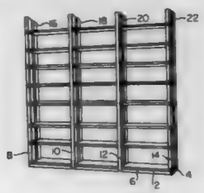
FURNITURE CONSTRUCTION

Stanton E. Baxter, P.O. Box 8986, 3812 Anson La., Virginia Beach, Va. 23450

Filed Sep. 20, 1985, Ser. No. 778,007

Int. Cl.⁴ A47B *3/00*

U.S. Cl. 108—111 **6 Claims**



1. A furniture construction comprising:

(a) a plurality of horizontal, planar, longitudinal support elements each of which has a front edge, a rear edge, a top side, a bottom side, a first end, a second end, a first notch formed in a corner between said first end and rear edge, a second notch formed in a corner between said second end and rear edge and a plurality of notches extending from said rear edge to said front edge and open to said front edge;

(b) a plurality of shelf units having a first shelf unit resting on said side of said support elements and having a front edge, a rear edge, a first end and a second end, said front edge having a plurality of notches extending from said rear edge to said front edge and open to said front edge, said rear edge having a plurality of notches extending from said front edge to said rear edge and open to said rear edge, said first end having a plurality of notches extending from said second end to said first end and open to said first end, and said second end having a plurality of notches extending from said first end to said second end and open to said second end; and

(c) a plurality of vertical, planar, longitudinal support elements each of which has a front edge, a rear edge, a bottom end and a top end, a notch at said bottom end of each of said vertical support elements formed in a corner between said bottom end and said rear edge and a plurality of notches intermediate said bottom end and said top end extending from said front edge to said rear edge and open to said rear edge, four of said vertical support elements having said notches mating with said end notches in said horizontal support elements and said first shelf unit, and a plurality of said vertical support elements having said notches in said rear edges mating with said notches in said front and rear edges in said plurality of shelf units having the same configuration as said first shelf unit.

4,635,565

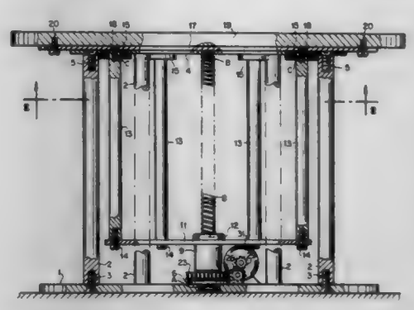
VARIABLE HEIGHT TABLE

Warren D. Novak, Chappaqua, N.Y., assignor to Interquad, Inc., New York, N.Y.

Filed Dec. 11, 1984, Ser. No. 680,440

Int. Cl.⁴ A47B *9/00*

U.S. Cl. 108—147 **11 Claims**



1. A power operated vertically adjustable table comprising:

a lower support cage comprising:

a substantially horizontally positioned lower base member;

a plurality of substantially vertically positioned lower support rods fixedly attached at one end to said lower base member; and

a substantially horizontally positioned lower support member located above said lower base member and fixedly attached to a second end of said plurality of lower support rods;

an upper support cage slidably attached to and interlocked with said lower support cage comprising:

a substantially horizontally positioned upper base member located beneath said lower support member and above said lower base member;

a plurality of substantially vertically positioned upper support rods fixedly attached at one end to said upper base member; and

a substantially horizontally positioned upper support member located above said upper base member and said lower support member and fixedly attached to the second end of said plurality of upper support rods;

a power operated means for changing the vertical position of said upper support cage relative to said lower support cage; and

at least one of said lower support member of said lower support cage and said upper base member of said upper cage being provided with a plurality of holes through each of which slidably pass one of the support rods of the other cage.

4,635,566

FUEL MIXER AND BURNER

Chadwell O'Connor, 2024 Galaxy Dr., Newport Beach, Calif. 92660

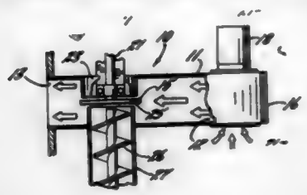
Filed Apr. 9, 1982, Ser. No. 367,039

Int. Cl.⁴ F23K *1/00*; B02C *15/06*

U.S. Cl. 110—106 **5 Claims**

1. A device for mixing fuel for burning comprising, in com-

bination, a chamber having aligned inlet and outlet openings, a disk rotatably mounted in said chamber with a flat circular face in a plane that substantially bisects said openings, means for rapidly rotating said disk, a blower for delivering air at high speeds and volumes to said inlet opening, and means for direct-



ing, combustible fuel perpendicularly against said disk face so that the fuel is particlized, thrown in said plane peripherally in all directions from the disk, intermixed with air from said blower, and blown toward and through said outlet opening, whereby igniting the fuel-air mixture causes a flame to be formed around the disk that is directed out the outlet opening.

4,635,567

MONITORING OF BURNER OPERATION

Josef J. Haftke; Norman G. Worley, both of Sidcup; Colin R. Coleman, Kingston-upon-Thames, and Anne-Marie Warris, London, all of Great Britain, assignors to Babcock Power Limited, London, England

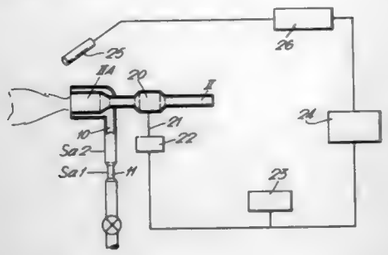
PCT No. PCT/GB85/00037, § 371 Date Sep. 24, 1985, § 102(e) Date Sep. 24, 1985, PCT Pub. No. WO85/03340, PCT Pub. Date Aug. 1, 1985

PCT Filed Jan. 25, 1985, Ser. No. 779,290

Claims priority, application United Kingdom, Jan. 25, 1984, 8401566

Int. Cl.⁴ F23N *5/18*

U.S. Cl. 110—188 **6 Claims**



1. In the operation of a burner connected in parallel with one or more other burners to a splitter to which pulverized fuel is supplied in a stream of primary air, supplying secondary air to each of the burners so that combustion of the fuel supplied by the burner occurs in optimum conditions, deriving a measure of the total air supply to each of the burners, measuring the total supply of fuel to the splitter, and deriving from that and the ratio of the air supplies the amounts of fuel that are supplied to each of the burners.

4,635,568

FURNACE AFTERBURNER

James F. Angelo, II, P.O. Box 55275, Little Rock, Ark. 72225

Filed Mar. 28, 1986, Ser. No. 845,344

Int. Cl.⁴ F23B *5/00*; F23C *9/00*; F23G *7/06*

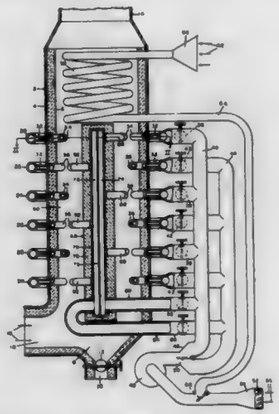
U.S. Cl. 110—214 **9 Claims**

1. An afterburner for the exhaust effluvia of a furnace, which exhaust contains combustible material, said afterburner comprising:

a. an elongated, generally cylindrical combustion chamber having an inlet for said exhaust at or adjacent one end thereof, and an outlet at or adjacent its other end,

b. means operable to induce a draft through said combustion chamber from its inlet to its outlet,

c. a series of air nozzles disposed to direct jets of air into the interior of said combustion chamber, certain of said nozzles being arranged to direct air jets into said combustion



chamber substantially tangentially thereto in a clockwise direction, and the remainder of said nozzles being arranged to direct air jets into said chamber substantially tangentially thereto in a counter-clockwise direction, whereby to induce turbulence within said chamber to intermix said air and said exhaust thoroughly, and

d. means operable to deliver air to said air nozzles.

4,635,569

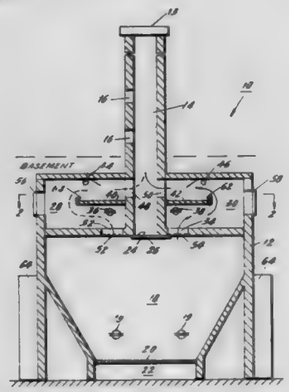
INCINERATOR SYSTEM ARRANGEMENT WITH DUAL SCRUBBING CHAMBERS

Irving Domnitch, 80-15 Forty-First Ave., Elmhurst, N.Y. 11373

Filed Mar. 28, 1986, Ser. No. 845,973

Int. Cl.⁴ F23J *15/00*

U.S. Cl. 110—215 **14 Claims**



1. An incinerator arrangement, comprising:

an incinerator housing located near the lowest point in a building, the housing containing incinerator elements therein;

a chute-flue having a first end in communication with said incinerator housing, a second end at the top of the building for evacuation of combustion gases to the atmosphere

therethrough, and at least one intermediately located waste disposal opening through which waste is dropped into said incinerator housing;

said incinerator elements including:

a main combustion chamber, an opening between said main combustion chamber and said first end of said chute-flue and a flue-damper covering said opening, said flue-damper biased in a closed position and being operable by the weight of waste to admit said waste into said combustion chamber;

a scrubbing chamber located exteriorly along the top of said combustion chamber and having a first opening into said combustion chamber and a second opening into said chute-flue; and

water spraying means in the scrubbing chamber for directing a water spray at said combustion gases to wash particulate matter from said gases before said gases enter said chute-flue whereby said water spraying means which are located adjacent said combustion chamber are protected against freezing and the elements.

4,635,570

ARRANGEMENT FOR VITRIFYING RADIOACTIVE LIQUID WASTE

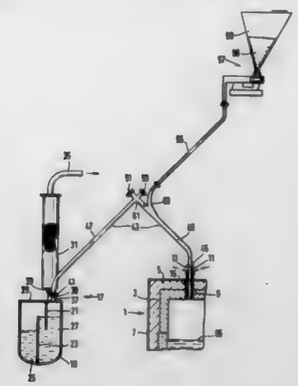
Eckhart Ewest, Balen; Gustav Mertens, and Helmut Straschewski, both of Mol, all of Belgium, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Apr. 22, 1985, Ser. No. 725,391

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415198

Int. Cl.⁴ F23G *7/00*

U.S. Cl. 110—237 **6 Claims**



1. Arrangement for vitrifying highly radioactive liquid waste comprising:

a glass melting furnace for acting upon the liquid waste to be vitrified and wherein an offgas with dust particles entrained therein is generated;

a wet scrubber for washing dust particles from the offgas;

a first conduit length communicating at one end thereof with said glass melting furnace;

a second conduit length communicating at one end thereof with said wet scrubber;

said first and second conduit lengths extending upwardly and being inclined toward each other;

said conduits being interconnected at the respective locations thereof remote from said one ends so as to permit the offgas from said furnace to travel upwardly through said first conduit length along which a portion of said dust particles are deposited and then downwardly to said wet scrubber through said second conduit length along which a further portion of said dust particles are deposited; and,

said first and second conduit lengths being inclined to define respective gradients sufficient to permit said particles to drop into corresponding ones of said furnace and said set scrubber thereby inhibiting the formation of deposits of dust particles in said conduit lengths.

4,635,571

APPARATUS FOR INFRASONICALLY INTENSIFYING A GLOW BED

Mats A. Olsson, Bromma, and Roland Sandström, Skellefteå, both of Sweden, assignors to Inasko, KB, Soedra Brobacken, Sweden

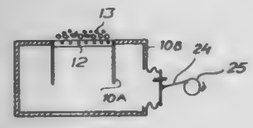
PCT No. PCT/SE84/00408, § 371 Date Jul. 16, 1985, § 102(e) Date Jul. 16, 1985, PCT Pub. No. WO85/02452, PCT Pub. Date Jun. 6, 1985

PCT Filed Nov. 30, 1984, Ser. No. 758,555

Claims priority, application Sweden, Dec. 2, 1983, 8306652

Int. Cl.⁴ F23L *13/00*

U.S. Cl. 110—297 **2 Claims**



1. Apparatus for burning solid fuel as an infrasonically intensified glow bed, comprising a grate for supporting the glow bed, means forming a cavity, and a low frequency sound generator including a reciprocating member, said grate and said reciprocating member forming parts of the walls of said cavity for exposing the glow bed to pulsating combustion air, wherein the dimensions of the cavity are substantially smaller than the wave-length of the low frequency sound generated and that the grate forms the only communication between the cavity and the surrounding air to provide a high and uniform reciprocating flow of combustion air and combustion gas through the glow bed.

4,635,572

DESULFURIZING OF FOSSILE FUELS

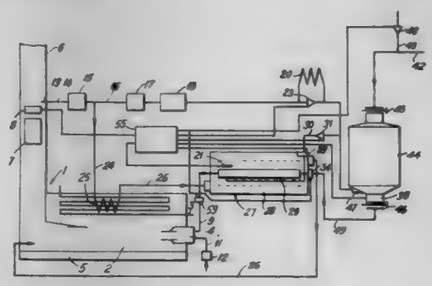
Klaus-Dietrich Nickel, Frankfurt am Main, Fed. Rep. of Germany, assignor to Kaus-Technoplan GmbH, Frankfurt, Fed. Rep. of Germany

Filed Mar. 11, 1985, Ser. No. 710,127

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1984, 3409014; Mar. 13, 1984, 3508650

Int. Cl.⁴ F23B *7/00*

U.S. Cl. 110—343 **28 Claims**



1. A process for attaining flue gases low in SO_x in furnaces operated with finely divided carbon-containing fuels containing sulphur, such as coal, in which process the sulphur contained in the fuel is fused with a finely divided additive, selected from the group consisting of limestone powder

($CaCO_3$), caustic lime powder (CaO) and calcium hydroxide powder ($Ca(OH_2)$) and the desulphurized fuel is subsequently burned in a combustion chamber and the additive particles loaded with the sulphur are sintered and removed with the ash, wherein the improvement comprises preparing the fuel and the additive in separate disintegration processes, mixing the disintegrated fuels with newly prepared additive in an amount corresponding to the sulphur content of the fuel, transporting the fuel-additive mixture in a heated-up inert transport gas under a controllable excess pressure—while maintaining the mixture—to a reactor designed as a leading zone, abruptly dropping the transport gas pressure as the mixture enters the leading zone in a low-oxygen atmosphere of inert gas within an adjustable temperature range above the boiling point of sulphur, adapting the residence time of the mixture and proceeding with a thermodynamic and reaction-kinetic sulphur transfer process, and expelling the sulphur from the fuel in the form of sulphur vapor and gaseous sulphur compounds and the additives are loaded with the sulphur vapour and the gaseous sulphur compounds, and injecting the fuel substantially freed from sulphur into the combustion chamber and burning the fuel at a temperature for sintering the loading of the injected additive particles with the sulphur vapour and the gaseous sulphur compounds.

4,635,573

METHOD FOR DESTROYING REFUSE

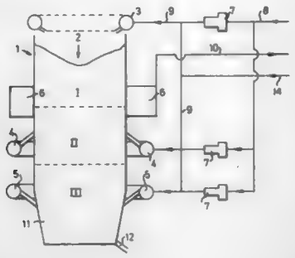
Sven Santén, Hofors, Sweden, assignor to SKF Steel Engineering AB, Hofors, Sweden

Continuation of Ser. No. 542,343, Nov. 17, 1983, abandoned. This application Apr. 5, 1985, Ser. No. 703,096

Claims priority, application Sweden, Mar. 23, 1983, 8301592; Sep. 6, 1983, 8304770

Int. Cl.⁴ F23G *5/00*

U.S. Cl. 110—346 **11 Claims**



1. A method of destroying and vaporizing household waste material, in which the material is fed into the top of a shaft furnace through a feeder and descends through at least three reaction zones, comprising the steps of

(a) feeding the material concurrently with a first blast of hot process gas into the top of said furnace to predry, prevaporize, and partially combust said material in a first, upper zone and produce a first product gas which flows downwardly in said furnace,

(b) subjecting said partially combusted material descending through the furnace to a second blast of hot process gas in a second intermediate zone to dry and vaporize volatile components of said material and produce a second product gas which flows upwardly in said furnace,

(c) combining said first product gas and said second product gas and removing said combined gases from said furnace at a level within said furnace between the first and second zones,

(d) subjecting said material as it continues to descend through the furnace to a third blast of hot process gas in a third lower zone to combust remaining carbon and melt noncombustible material,

each of said hot blasts of process gas supplementing the heat of combustion for maintaining the reactions within the three furnace zones, and the flow rate and the temperatures of the three different process gas blast flows being controlled independently of each other by heating a predetermining quantity of said process gas in at least one plasma generator.

4,635,574

AUTOMATIC SEWING APPARATUS

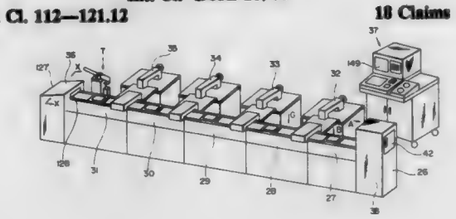
Jiro Fujita, and Iwao Yamane, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

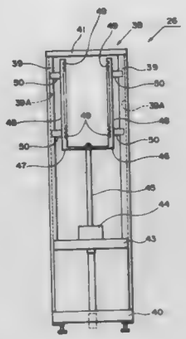
Filed Sep. 25, 1985, Ser. No. 779,901

Claims priority, application Japan, Sep. 28, 1984, 59-203139; Sep. 28, 1984, 59-203140

Int. Cl.⁴ D05B *21/00*

U.S. Cl. 112—121.12 **18 Claims**





1. An automatic sewing apparatus comprising: at least one cassette for positioning and holding materials to be sewn, a plurality of sewing machines each having a table movable according to a program of a sewing pattern, said cassette being selectively mounted on said table, a plurality of first carrier units each for transporting said cassette in a predetermined direction, and a plurality of second carrier units each for transporting said cassette transported by said first carrier unit to a corresponding one of said sewing machines and then for transporting said cassette in a predetermined direction, a plurality of sewing units thereby being formed each including one of said sewing machines, one of said first carrier units and one of said second carrier units, said sewing units being arranged in series, said sewing machines having different programs of sewing patterns, respectively, so that said sewing machines perform different sewing operations on said materials held in said cassette sequentially.

4,635,575

SEWING MACHINE FOR SEWING A RUBBER STRIP TO A TEXTILE FABRIC

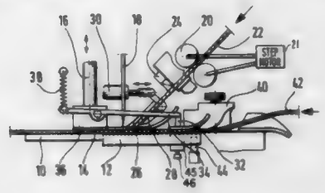
Helmut Schips, Steinacher Str. 340, CH-9327, Tubach, Switzerland

Filed Mar. 20, 1985, Ser. No. 713,988

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1984, 3410181

Int. Cl.⁴ D05B *35/06*

U.S. Cl. 112—121.26 **11 Claims**



1. A sewing machine for sewing a rubber strip to a tubular end section of an item of clothing made from an elastic, textile material while forming an endless, elastic gather, comprising:

a presser foot for pressing the material to be sewn against a support;

a transporter for transporting the material to be sewn;

a feed mechanism which supplies the rubber strip to the presser foot;

a separating device for the rubber strip; and

a brake for acting on the rubber strip located between the feeding mechanism and a point at which the presser foot begins to press the supplied rubber strip against the support, wherein the brake is formed as a friction brake with clamping elements that can be pressed against each other, between which the rubber strip is gripped, wherein, one clamping element is formed as a pivotably mounted compression plate which can be moved against a counter plate which forms the other clamping element, and wherein the brake includes guide elements which laterally guide the rubber strip.

4,635,576

STITCHED WOODWOOL MAT

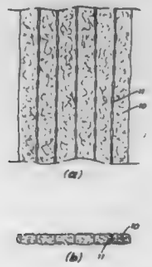
Geoffrey Bowers, Sydney, Australia, assignor to Seasonmakers (Australia) Pty. Limited, Beaconsfield, Australia

Filed Oct. 19, 1984, Ser. No. 662,912

Claims priority, application Australia, Aug. 2, 1984, PG6352

Int. Cl.⁴ B32B *7/08*

U.S. Cl. 112—403 **16 Claims**



1. A soil erosion control blanket comprising a single layer mat of woodwool fibers, wherein some of the fibers interlock with one another, the mat being retained in a coherent structure only by means of a plurality of laterally unconnected longitudinal rows of stitching extending through the mat and interlocking between the fibers.

10. A method of forming a soil erosion control blanket comprising the steps of continuously producing a mat of intertangled woodwool fibers, said mat having a substantially constant cross-sectional area, and passing a single layer of said mat through stitching means to insert a plurality of laterally unconnected longitudinal rows of stitches extending through said mat and interlocking between tthe fibers thereof, said mat thereby being retained in a coherent structure only by means of said unconnected longitudinal rows of stitches.

4,635,577

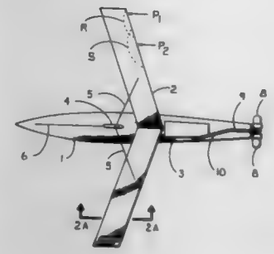
HYDROPLANING WING SAILING CRAFT

Martti J. Palmquist, 1941 Hastings St., Marietta, Ga. 30062

Continuation-in-part of Ser. No. 341,831, Jan. 22, 1982, abandoned. This application Mar. 1, 1984, Ser. No. 585,101

Int. Cl.⁴ B63B *1/24*

U.S. Cl. 114—39 **10 Claims**



1. A hydroplaning winged sailing craft having a hydroplaning wing structure and a sailing rig means for producing a heeling moment and forward thrust to the craft comprising a buoyant hull structure, the hydroplaning wing structure being mounted with a negative dihedral transversely to the longitudinal axis of said hull, the wing structure having a forward sweep thereto toward the bow of the hull structure with respect to the longitudinal axis of the hull, the outermost portions of the wing diverging upwardly with a positive dihedral in a gentle curve from the lateral plane which extends outwardly from the longitudinal axis of the hull, the lowest part of the wing on each side of the craft being above the water-load-line of the craft when the craft is levelled about its longitudinal axis, the wing having a positive angle of incidence to provide hydroplaning lift when the craft moves forward under thrust, means for providing positive control of the helm of the craft's direction of movement, of pitch attitude and of angle of attack of the hydroplaning wing.

4,635,578

DEVICE FOR THE ERECTION OF THE MAST OF A SAILING BOARD

Vinicio Calcabrini, Zona Industriale Enrico Mattei, Via S. Agostino 38/B, and Antonio Ferracuso, Via Gherardacci 76, both of 62019 Recanati (Macerata), Italy

Filed Jan. 4, 1985, Ser. No. 689,087

Claims priority, application Italy, Jan. 20, 1984, 47572 A/84

Int. Cl.⁴ B63B *15/02*

U.S. Cl. 114—39 **2 Claims**

1. A device for the erection of a mast of a sailing board, comprising:

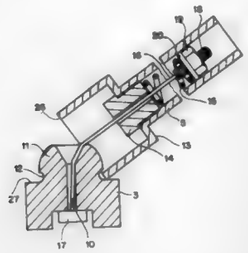
a base member having a vertical passage therethrough, a head in the shape of a spherical sector, a throat at the base of the head, and an annular support surface located adjacent said throat and below said head;

a mast-foot support with an open tubular upper portion and an open tubular lower portion, the lower portion being of a larger diameter than the upper portion and forming an external rest for a mast-foot, said lower portion being adapted for loosely fitting around the head, and abutting on said support surface, of the base member;

a cylindrical plug having a longitudinal through-passage, threadedly engaged internally in the upper portion of the mast-foot support;

a mast-foot slidably and pivotally engaged on the outer surface of the upper portion, and resting on the external rest, of said mast-foot support;

a lid threadedly engaged at the top of said mast-foot support upper portion for locking said mast-foot in place;



and an elastic tie-member unit normally extending vertically between said base member and said mast-foot support, said tie-member unit including a steel rope, a threaded rod fixed to the upper end of said rope, said rope being restrained at its lower end to said base member and being disposed in the vertical passage of said base member and in the longitudinal passage of said plug, a nut screwed on said threaded rod, and a helical compression spring abutting said nut and said plug.

4,635,579

BOOM END PIECE

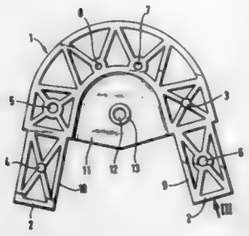
Hannes Marker, Alpspitzstrasse 37, 8100 Garmisch-Partenkirchen, Fed. Rep. of Germany, and Günter Rochelt, Munich, Fed. Rep. of Germany, assignors to Hannes Marker, Garmisch-Partenkirchen, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,499

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 8401467[U]

Int. Cl.⁴ B63H *9/10*; B63B *35/82*

U.S. Cl. 114—97 11 Claims



1. A boom end piece for a sailboard rig, said boom end piece comprising:

two identical monocoque one-half sections of a body, each one-half section having at least approximately the shape of a U or a V, each of said two one-half sections including integral components of two legs, two leg ends, and alignment means for aligning said two one-half sections with each other so that said two leg ends of one one-half section form together with said two leg ends of the other one-half section two pegs for connecting two tubular spars of a boom of a sailboard rig to said boom end piece by a plug joint, said two pegs having a diameter substantially equal to an inner diameter of said tubular spars.

4,635,580

SHELL OF SMALL-SIZED MARINE CRAFT

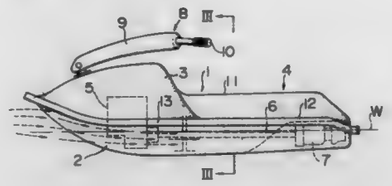
Hiroshi Nisaida, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Jun. 11, 1985, Ser. No. 743,677

Claims priority, application Japan, Jun. 13, 1984, 59-87907[U]

Int. Cl.⁴ B63B *5/24*

U.S. Cl. 114—343 1 Claim



1. A shell of a small-sized marine craft compriaing:

a deck and a hull joined together, said deck having a raised seat on a rear portion thereof and having laterally and longitudinally-extending flat, horizontal, parallel step portions straddling said seat;

means effective upon forward movement of the craft for deflecting water from breaking over the bow and the sides of the craft including:

a flat upper flange projecting outwardly from the deck at the periphery thereof having flat rear portions extending laterally outwardly from and being coplanar with said step portions and extending horizontally lengthwise of the craft, said flat upper flange having forward portions extending laterally from said deck and extending lengthwise of the craft to the bow portion of said shell, said flat flange being wider on both sides of said bow than at other portions of the periphery of the shell;

a flat lower flange projecting outwardly from the hull at the periphery thereof and conforming to said flat upper flange, the outer extremities of said flat upper and lower flanges being bent downwardly;

a sandwich packing between and bonded to said flanges so as to connect said deck and said hull to each other;

said flat upper and lower flanges being inclined upwardly and forwardly at the portion thereof which extends for about one/third of the whole shell length as measured from the bow end of said shell while the rear part of said flat flanges extends substantially horizontally.

4,635,581

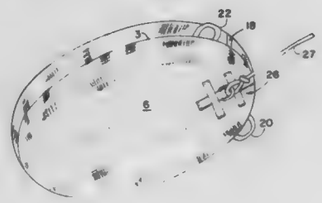
TUBE COVER

Robert S. Scheurer, P.O. Box 539, Wichita Falls, Tex. 76307

Filed Feb. 15, 1985, Ser. No. 702,702

Int. Cl.⁴ B63B *7/08*

U.S. Cl. 114—346 1 Claim



1. An aquatic sport apparatus comprising a nylon cover for an inner tube, the cover comprising,

a bottom member,

a top member overlying the bottom member and having a central opening for receiving an inner tube, the bottom and top members being connected together along mutual peripheral edges to form an enclosure for receiving the inner tube, the enclosure conforming in shape to an outer sidewall of the inner tube,

a reinforced hitch connected to a forward portion of the cover, for attaching a tow rope, the hitch comprising an elongated nylon strap having its entire length overlying the cover and having opposite end portions connected to an outer surface of the cover, first and second outer transverse nylon straps connected to the outer surface of the cover and the elongated strap and being spaced and parallel to each other, first and second inner transverse nylon straps connected to an inner surface of the cover and crossing the elongated strap and underlying the first and second outer transverse straps so as to sandwich the portions of the cover and the elongated strap therebetween, and wherein the inner and outer transverse straps are disposed at right angles to the elongated strap, and a metal ring disposed between the two transverse straps and being connected to and carried by the elongated strap, wherein the metal ring is a D-shaped ring with a flat portion thereof lying in a transverse direction to the elongated strap mounted in a loop formed in a medial portion of the elongated strap which extends outwardly from the outer surface of the cover, said D-shaped ring being secured to said elongated strap by stitching transverse portions of the elongated strap together to form a loop through which the flat portion of the D-shaped ring extends to thereby hold the D-shaped ring in place, whereby towing forces are transmitted through the metal ring, the elongated strap the transverse straps and the cover.

4,635,582

APPARATUS FOR PREVENTING A CAPSIZED BOAT FROM SINKING

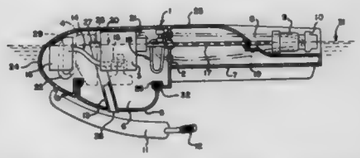
Hiroshi Nishida, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jul. 3, 1985, Ser. No. 752,152

Claims priority, application Japan, Jul. 5, 1984, 59-139395

Int. Cl.⁴ B63B *43/02*; B63H *21/32*

U.S. Cl. 114—360 3 Claims



1. A water craft comprising a hull, a portion of said hull forming an enclosed engine room, an engine having an exhaust system mounted in said engine room, said hull having a water line when overturned in the water and with relatively little water in said room, and said portion of said hull being constructed air-tightly at and above said water line when said craft is overturned, an air inlet duct and an exhaust duct each extending through said hull and into said room, said exhaust system carrying engine exhaust during operation of the engine, said exhaust duct forming part of said exhaust system and having an interior opening located above said water line when said hull is overturned, said air inlet duct having an interior end opening in said room and each of said ducts having an exterior end opening out of said room and below said water line when said hull is overturned, so as to form a trapped air space in said room when said craft is overturned.

4,635,583

TIRE SKID DETECTOR

Geral L. Cox, 8931 Upper DeArmoun Rd., Anchorage, Ak. 99516

Filed Dec. 13, 1985, Ser. No. 808,520

Int. Cl.⁴ B60Q *9/00*

U.S. Cl. 116—28 R 15 Claims



1. A tire rotation detector in combination with a vehicle wheel carrying a tire, said wheel defining a rotary axis and including a radially outermost peripheral edge and a center hub with a central hole therein, said detector comprising a strip including a diametrically extending mounting portion having a pair of legs disposed diametrically apart at opposite ends of said mounting portion, said legs disposed radially inwardly of said peripheral edge and projecting axially outwardly beyond a plane defined by a side wall of the tire and carrying light reflecting means so as to be observable when the detector is viewed in a direction transversely of said rotary axis of said wheel, and releasable fastener means for removably attaching said mounting portion to said central hole.

4,635,584

APPARATUS FOR TINNING PRINTED-CIRCUIT BOARDS

Klaus Obermaier, Bruder-Grimm-Strasse 2d, D-6107 Reinheim-Ueberau, Fed. Rep. of Germany

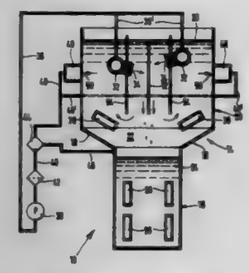
PCT No. PCT/EP84/00341, § 371 Date Jun. 28, 1985, § 102(e) Date Jun. 28, 1985, PCT Pub. No. WO85/01963, PCT Pub. Date May 9, 1985

PCT Filed Oct. 29, 1984, Ser. No. 755,325

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3339887

Int. Cl.⁴ B05C *11/00*, *3/10*

U.S. Cl. 118—64 12 Claims



1. An apparatus for tinning printed-circuit boards, comprising: a first heatable tank portion for molten solder, a second heatable tank portion for thermofor oil, a pump for aspirating thermofor oil from the second tank portion, squirting means including two jet-nozzle tubes with nozzles aimed against one another for squirting thermofor oil aspirated by said pump against opposite flat sides of printed-circuit boards after immersion into the solder, the first and second tank portions being portions of a common treatment tank with a continuous

chamber in which the second tank portion lies above the first tank portion, whereby before and after immersion, the circuit boards to be tinned pass into the solder through the thermofor oil bath, the first tank portion seen at right angles to the opposite flat sides of the circuit boards to be immersed being narrower than the second tank portion, and the second tank portion having a bottom portion merging funnel-wise with the first tank portion.

4,635,585

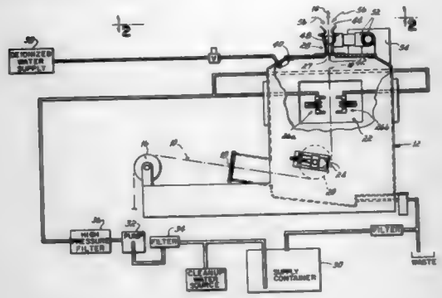
SYSTEM FOR SPRAY COATING SUBSTRATES

Douglas J. Conrad, Lorain; James L. Keunon, Amherst; Lawrence J. Macartney, Lorain, and Donald R. Scharf, Amherst, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Oct. 15, 1985, Ser. No. 787,090

Int. Cl.[4] B05B *15/12*

U.S. Cl. 118—316 **7 Claims**



1. A system for spray coating a substrate with a liquid coating material containing particles of a film-forming material in a liquid vehicle, said system comprising, in combination,

a coater having an inlet and an outlet and including a coating chamber portion for receiving the substrate to be coated, said outlet having a first open end communicating with said chamber and a second open end communicating with the ambient environment, said second end opening being larger than said first end opening,

spray nozzle means in said chamber for dispensing said spray of said liquid coating material onto said substrate,

transport means for moving said substrate into said coater through said inlet, into said coating chamber portion into proximity to said spray nozzle means for coating by said spray nozzle means, and out of said coating chamber through said outlet,

overspray control means for containing and conveying the airborne overspray from said coating chamber, said overspray control means comprising a particle collector for collecting the particles of film-forming material in said overspray, duct means communicating at one end with the interior of said coater outlet and at the other with the ambient environment, conduit means connected to said particle collector and in fluid communication with said duct means, and air flow control means for drawing ambient air through said second open end of said outlet and through said other end of said duct means at a rate such that airborne overspray in said outlet is drawn into said duct means and transported to said particle collector without drawing substantial spray material out of said coating chamber.

4,635,586

SETUP FOR PRODUCING METALLIC COATINGS

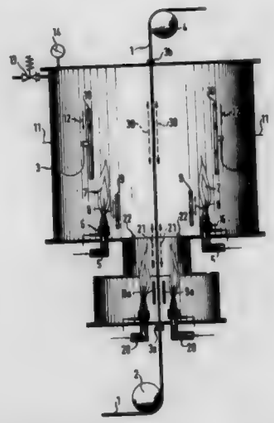
Arnulf Dieser, Dortmund; Hans Kettler, Wissen, and Ulrich Tenhaven, Dortmund, all of Fed. Rep. of Germany, assignors to Hoesch Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Division of Ser. No. 669,310, Nov. 7, 1984, Pat. No. 4,587,135. This application Jan. 10, 1986, Ser. No. 817,881

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340840

Int. Cl.[4] C23C *16/00*

U.S. Cl. 118—718 **7 Claims**



1. Setup for producing high-quality metallic coatings on steel strip (1) characterized by a gas tight chamber (3) which is provided with a centrally-arranged entrance opening (3*a*) for said steel strip which is to be coated and an exit opening (3*b*) for said steel strip which has been coated, gas lines (5) which enter said chamber adjacent said opening, said gas lines inside said chamber being provided with generating devices for generating a thermal plasma of non-oxidizing gas and metal ions of one or several metals or metal alloys, shielding plates (9) which are disposed between said generating devices and said steel strip entering said chamber, electrically-charged depositing plates (10) disposed in the center area of said chamber and in spaced-apart relationship from said steel strip.

4,635,587

METHOD AND APPARATUS FOR DETECTING STANDING HEAT IN CATTLE

John Leonardo, El Nido, Calif., assignor to Cowtronics, Inc., Merced, Calif.

Filed Jun. 6, 1985, Ser. No. 741,838

Int. Cl.[4] A01K *29/00*; A61B *10/00*; G08B *23/00*

U.S. Cl. 119—1 **12 Claims**

1. A self-contained apparatus for detecting the onset of estrus in cattle, including;

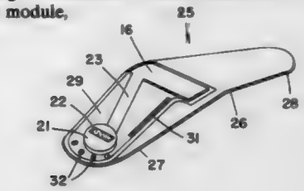
a pressure responsive switch disposed to be actuated by mounting of the cow, timer means connected directly to said switch means for activation thereby in count up fashion, digital readout means connected to said timer means and disposed to display the elapsed time after mounting of the cow, audible and visible signaling means connected directly to said timer means to emit a warning signal in response to activation of said timer means, means for securing said pressure responsive switch, said time means, said readou means, and said signaling means together in closely adjacent fashion to the base of the tail of a cow; said means for securing including means for displaying said elapsed time directly from the apparatus secured to the cow, and said means for securing further including

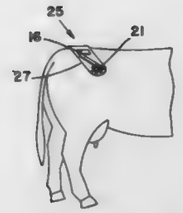
means for emitting said audible and visible warning signals directly from the apparatus secured to the cow.

12. A method for determining the onset and time of onset of estrus in a cow, comprising the steps of:

providing a timer module having a count up timer, digital time display, and audible and visible local signaling devices,

providing a membrane switch connected to actuate said timer module,





securing said membrane switch adjacent to the base of the tail of a cow, with the timer module secured directly adjacent thereto, said membrane switch being disposed to be actuated by mounting of the cow by other cows in response to onset of estrus, said membrane switch connected to activate said timer module to display elapsed time after initial mounting and to activate said local signaling device to emit said audible and visible signals directly from the animal to warn of onset of estrus in the cow.

4,635,588

HEATERS FOR THERMAL ENERGY TRANSFORMATION INSTALLATIONS

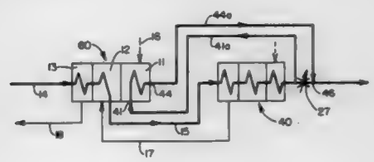
Jules F. R. Ledoux, Nivelles, Belgium, assignor to Hamon-Sobelco S.A., Brussels, Belgium

Filed Nov. 15, 1985, Ser. No. 798,631

Claims priority, application European Pat. Off., Feb. 25, 1985, 85870030.5

Int. Cl.[4] F22B *33/00*

U.S. Cl. 122—1 C **6 Claims**



1. In an installation for the transformation of thermal energy into mechanical energy by causing a condensable fluid to effect a thermodynamic cycle through vapor generating means, vapor heating means, vapor condensing means, and vapor using means, said vapor heating means comprising a first heat exchanger within which are incorporated separate desuperheating, condensation and supercooling zones, each of said zones comprising at least one tube having a wall through which heat is exchanged between a condensable fluid flowing within said tube and a second condensable fluid flowing outside said tube, the improvement which comprises a separate first nest of heat exchange tubes formed in the shape of a triple U in said condensation and supercooling zones within said first heat exchanger and a separate second nest of spirally wound heat exchange tubes in said desuperheating zone within said first heat exchanger, each nest of heat exchange tubes having inlet and outlet ends.

4,635,589

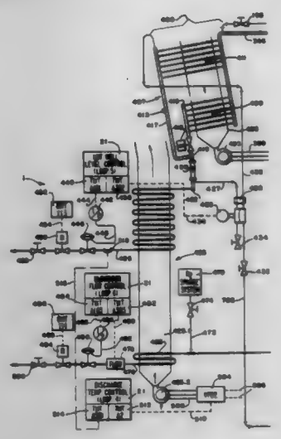
MODEL STEAM GENERATOR HAVING AN IMPROVED FEEDWATER SYSTEM

Robert Draper, Churchill Boro, and Donald G. Lorentz, Irwin, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 31, 1984, Ser. No. 636,449

Int. Cl.[4] F22B *37/48*

U.S. Cl. 122—396 **20 Claims**



1. A model steam generator for monitoring the condition of the heat exchange tubes within a full-scale steam generator which converts feedwater into steam, comprising a boiler vessel, and a feedwater system for supplying feedwater from one of at least two sources to the boiler vessel including a first conduit which is fluidly connected between the boiler vessel and the feedwater of the full-scale steam generator via a first valve, a feedwater reservoir, and a second conduit which is fluidly connected between the boiler vessel and the feedwater reservoir by way of a second valve, so that said feedwater from the full-scale steam generator or the reservoir may be selectively introduced into the model steam generator via said first and second valves, respectively, in order to compare the corrosive effects of different feedwaters.

4,635,590

INTERNAL COMBUSTION ENGINE AND OPERATING CYCLE THEREFOR

Anthony Gerace, 28 Allegheny Ave., #2601, Towson, Md. 21204

Division of Ser. No. 489,549, Apr. 28, 1983, Pat. No. 4,520,765. This application May 22, 1985, Ser. No. 736,818

Int. Cl.[4] F02B *1/12*

U.S. Cl. 123—27 R **22 Claims**

1. An internal combusion engine, comprising:

block means having at least one cylinder formed therein;

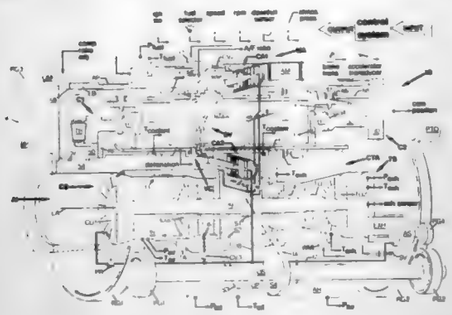
first and second pistons located within said cylinder for controlled reciprocating motion to advance toward one another and retract away from one another;

valve means located within said cylinder between said first and second pistons and operable between an open position

permitting communication between a first chamber defined between the first piston, said cylinder, and said valve means and a second chamber defined between said second piston, said cylinder, and said valve means;

control means connected to said first and second pistons for controlling the reciprocating motion thereof by causing each of said pistons to advance to a predetermined first position adjacent to said valve means and for permitting each of said pistons to retract away their respective first positions to a respective second position;

introducing means for introducing air into said second chamber when said second piston is in a position other than said first-mentioned predetermined position and for introducing an air and fuel mixture of predetermined ratio into said first chamber, said control means operative to cause said first piston to compress said air and fuel in said first chamber to a predetermined pressure less than that which would effect ignition and to cause said second piston to



compress said air in said second chamber to a predetermined pressure that is sufficient to raise the temperature of the so-compressed air to a temperature above the auto-ignition temperature of the compressed air-fuel mixture;

actuator means connected to said valve means for causing said valve means, during the compression of said air in said second chamber and said air and fuel mixture in said first chamber to remain closed, and for opening said valve at a predetermined time to cause the so-compressed air which is at a temperature above the ignition temperature of the air/fuel charge from said second chamber to enter the compressed air and fuel mixture of said first chamber to cause ignition thereof, said pistons retracting in response to the formation of combustion products from said so-ignited air-fuel mixture; and

exhaust means for exhausting the combustion products of said so-ignited air-fuel mixture after substantial retraction of said first and second pistons.

4,635,591

INTERNAL-COMBUSTION ENGINES

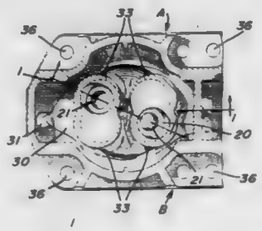
Alexander S. Hledia, 102 Elm Street, Hudson, Quebec, Canada (H0P 1H0)

Continuation-in-part of Ser. No. 659,908, Oct. 11, 1984, abandoned. This application Apr. 11, 1985, Ser. No. 721,891

Int. Cl.[4] F02B *75/00*

U.S. Cl. 123—37 **9 Claims**

1. A cylinder head for a two and four cycle internal combustion engine, the cylinder head having at least one combustion chamber, each combustion chamber provided with at least a pair of spaced apart spark plugs, which ignite during each power stroke, provided in the cylinder head and protruding within the combustion chamber, the cylinder block defining a concavely curved roof for the combustion chamber with a central cone like projection extending downwardly into said combustion chamber, between the spark plugs, adapted to provide directed circulation of gases within the combustion chamber towards the respective spark plugs, and coolant flow channels provided in the cylinder head with a coolant flow



channel defined in the central cone-like projection for cooling the central part of the combustion chamber.

4,635,592

VALVE CONTROL FOR AN INTERNAL COMBUSTION ENGINE

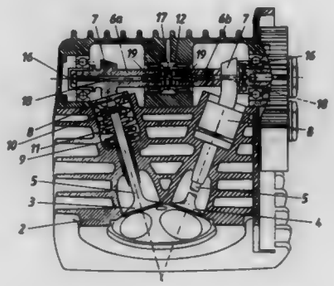
Hermann Weichsler, Klagenfurt, Austria, assignor to Bombardier-Rotax Gesellschaft m.b.H., Gunskirchen, Austria

Filed Mar. 7, 1985, Ser. No. 709,761

Claims priority, application Austria, Mar. 14, 1984, 843/84

Int. Cl.[4] F01L *1/24, 1/26*

U.S. Cl. 123—90.18 **8 Claims**



1. Valve control for an internal combustion engine with at least one cylinder whose cylinder head has at least one pair of valves inclined towards each other and arranged to be radially aligned with respect to the combustion chamber, the valves being operable by a common camshaft by means of conical cams, wherein the improvement comprises bucket type tappets displaceably mounted in the cylinder head between the radially aligned valves and the conically shaped cams.

4,635,593

HYDRAULIC VALVE LIFTER

Hisashi Kodama, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 28, 1985, Ser. No. 717,277

Claims priority, application Japan, Mar. 28, 1984, 59-045462[U]

Int. Cl.[4] F01L *1/24*

U.S. Cl. 123—90.55 **2 Claims**

1. A hydraulic valve lifter for use in a valve train of an internal combustion engine, said lifter comprising:

a first cylindrical body member having an inner cylindrical wall with an inlet port extending therethrough and having a top wall adapted to be disposed in engagement with a cam shaft;

an annular guide sleeve fixed in said body member in spaced relation to said cylindrical wall to define an annular space therebetween;

a second cylindrical body member having a bottom wall

mounted for reciprocation within said annular guide sleeve, said bottom wall adapted to be in contact with a valve stem;

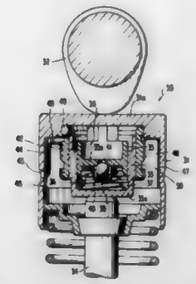
a plunger member mounted for reciprocation within said second body member;

spring means biasing said plunger member towards said top wall;

said plunger member and said second body member defining a pressure chamber;

said plunger member defining a reservoir chamber therein;

first fluid passage means extending between said reservoir chamber and said annular space;



second fluid passage means interconnecting said reservoir chamber and said pressure chamber;

check valve means associated with said fluid passage means for permitting fluid flow only from said reservoir chamber to said pressure chamber;

an annular channel member having an inverted U-shaped cross section secured between said cylindrical wall and said guide sleeve and defining an oil chamber extending between said inlet port and said first fluid passage means wherein said guide sleeve is comprised of a relatively thick member for obtaining rigidity and said annular channel member is made of relatively thin plate material for easy shaping and weight reduction.

4,635,594

METHOD OF APPLYING ELECTRIC CURRENT TO GLOW PLUGS AND DEVICE THEREFOR

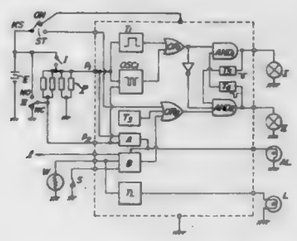
Sadao Ichikawa; Shinichi Yokoi, both of Nagoya; Seishi Yasuhara, and Hiroshi Kondo, both of Yokohama, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya and Nissan Motor Co., Ltd., Yokohama, both of, Japan

Filed Feb. 8, 1985, Ser. No. 699,851

Claims priority, application Japan, Feb. 10, 1984, 59-21587

Int. Cl.[4] F02P *19/02*

U.S. Cl. 123—179 BG **10 Claims**



1. A method for applying electric currents to glow plugs for cylinders of an engine, comprising steps of

electrically connecting a plurality of glow plugs through a switch means in such a manner that the glow plugs can be selectively connected in parallel to each other, connected in serial to each other,

applying electric currents to the parallel-connected glow plugs through said switch means for preheating the glow plugs before cranking of the engine,

applying electric currents to the glow plugs while intermittently switching connection thereof from parallel to serial and vice versa with intervening predetermined time intervals in which no current is applied to the glow plugs between each switching from parallel to serial and vice versa during the cranking of the engine, and

applying electric currents to the serial-connected glow plugs after the engine is started by the cranking.

4,635,595

STARTING METHOD FOR INTERNAL COMBUSTION ENGINE

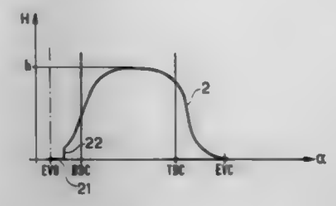
Dieter Grabbe, Hamburg, Fed. Rep. of Germany, assignor to Societe d'Etudes de Machines Thermiques, Saint Denis, France

Filed Jun. 19, 1985, Ser. No. 746,290

Claims priority, application France, Jun. 19, 1984, 84 09583

Int. Cl.[4] F02N *9/04*

U.S. Cl. 123—179 F **3 Claims**



1. A method for starting an internal combustion engine having a crankshaft, at least one working cylinder with a piston connected to the crankshaft for reciprocation between an initial dead center position and a final dead center position in a combustion stroke, the cylinder being equipped with an exhaust valve that opens during normal running of the engine no later than a preselected angle of the crankshaft in advance of the final dead center position of the piston in the combustion stroke and a starting valve connected to a source of compressible starting fluid under pressure, the method comprising:

opening the starting valve to introduce pressurized starting fluid into the cylinder during the combustion stroke in a starting sequence of the engine and temporarily retarding the opening of the exhaust valve beyond said preselected angle of the crankshaft during the starting sequence to improve utilization of the potential energy contained in the pressurized starting fluid.

4,635,596

ASSEMBLY OF PISTON AND CONNECTING ROD IN INTERNAL-COMBUSTION ENGINE

Hideaki Nakano, Akashi, and Tadahiro Ozu, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Aug. 12, 1985, Ser. No. 764,784

Int. Cl.[4] F16J *1/14*

U.S. Cl. 123—197 AB **5 Claims**

1. An assembly of a piston and a connecting rod in an internal-combustion engine comprising:

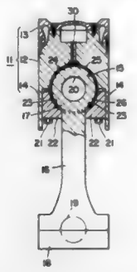
a generally cylindrical piston pin;

a connecting rod integrally formed with and extending from only a lower surface of said piston pin at a point midway between either end of said piston pin;

a piston having a skirt and a crown disposed on an upper surface of said skirt, said skirt having a concave bearing

recess of semicylindrical shape on a lower surface thereof, said recess having a length at least equal so that of said piston pin;

a metal bearing piece of semicylindrical shape disposed in said concave bearing recess across the entire length thereof, an upper half of said piston pin being held in a semicylindrical recess defined by said metal bearing piece;



a pair of spaced metal bearing halves of semicylindrical shape disposed, respectively, over a lower half of said piston pin on either side of said connecting rod;

a pair of bearing caps, each of said bearing caps having a concave bearing recess, each of said bearing caps being fitted over one of said metal bearing halves to pivotally couple said piston pin to said piston; and

bolt means fixedly attaching said pair of bearing caps to said skirt of said piston.

4,635,597

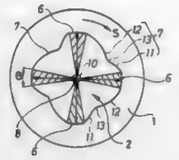
STRUCTURE OF A MAIN COMBUSTION CHAMBER OF A DIESEL ENGINE OF A DIRECT INJECTION TYPE

Ryoichi Ohashi, and Hitoshi Inaba, both of Chayamachi, Japan, assignors to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed Jan. 16, 1985, Ser. No. 691,767

Int. Cl.⁴ F02B *23/06*

U.S. Cl. 123—276 **8 Claims**



1. A structure of a main combustion chamber of a diesel engine of a direct injection type in which a main combustion chamber having a peripheral wall and a bottom wall is formed by a hollow at a top of a piston, above peripheral wall includes a plurality of collision walls and guide walls which are disposed alternately to each other in a circumferential direction of the piston, a fuel injection nozzle having a plurality of nozzle holes is disposed in or at the rear of the combustion chamber, the injection nozzle is designed to radiately spray the fuel only against the collision walls, and the sprayed collided fuel is adapted to flow along the guide walls in one direction while forming a swirl;

characterized in that;

each guide wall includes an upstream portion and a downstream portion with a boundary therebetween with respect to the direction of the swirl, a radial distance from the center of the chamber to the boundary is shorter than a radial distance from the center of the chamber to other portions and each upstream portion has a longer radius of curvature and a circumferential length than each downstream portion so that the inner periphery of the chamber has a pin-wheel-like shape, the upstream portions forms smooth walls along which the fuel after collision flows while forming a film of the fuel, the downstream portions forms walls along which the fuel flows from the boundaries, and the circumferential angle of each collision wall is so determined that the fuel sprayed from the nozzle holes collides only with the collision walls;

each said collision wall does not, in combination with the lower portion of a corresponding said guiding wall, constitute a radial pocket operative to retain a mass of fuel, but comprises a lower portion wall forming a support surface contributing to said swirl in fuel flow.

4,635,598

SWIRL CHAMBER ARRANGEMENT FOR DIESEL ENGINE OR THE LIKE

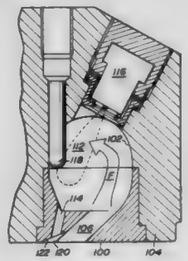
Toshiaki Tanaka, Fujisawa, and Kunihiko Sugihara, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 9, 1986, Ser. No. 817,287

Claims priority, application Japan, Jan. 25, 1986, 60-11025

Int. Cl.⁴ F02B *19/18, 19/10, 19/00, 19/16*

U.S. Cl. 123—293 **4 Claims**



1. In an internal combustion engine

means defining a blind bore;

a piston reciprocatively disposed in said bore in manner to defined a variable volume main combustion chamber, said piston having a crown;

means defining a shaped recess in the crown of said piston;

means defining a fixed volume pre-chamber adjacent the blind end of said bore;

a main transfer passage, said main transfer passage having a first end which communicates with said pre-chamber and a second end which communicates with said main combustion chamber, said main transfer passage and said pre-chamber being arranged so that said main transfer passage introduces an air containing charge compressed in said main combustion chamber during a compression phase of said engine into said pre-chamber in a manner that the charge introduced into said pre-chamber tends to swirl in a predetermined direction therein;

a fuel injector for injecting fuel into said pre-chamber;

an auxiliary transfer passage having a first end which communicates with said pre-chamber and a second end which communicates with said main combustion chamber, said auxiliary transfer passage being oriented with respect to said fuel injector and the direction in which the charge in the pre-chamber swirls so as to permit a fraction of the injected fuel to pass therethrough and enter the main combustion chamber prior combustion of the air-fuel mixture in said pre-chamber, said auxiliary transfer passage being arranged to direct the fuel introduced into the main combustion chamber into said shaped recess formed in the crown of said piston; and

means defining a recess which merges with said second end of said auxiliary transfer, said recess having a wall which is inclined toward said first end of the main transfer passage, said wall deflecting fuel which splashes back up out of the shaped recess in said piston crown into said recess and into a zone through which the flame from said swirl chamber passes during the expansion phase of the engine.

4,635,599

DISTRIBUTOR-TYPE FUEL INJECTION PUMP WITH PRELIMINARY INJECTION CONTROL DEVICE

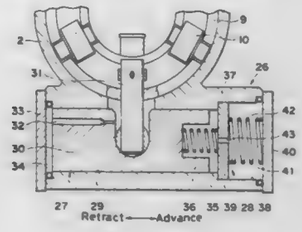
Shigeo Taira, and Toru Ishiboshi, both of Higashi-Matsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

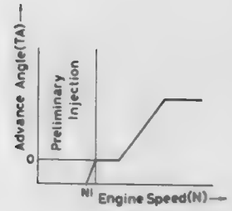
Filed Jun. 13, 1985, Ser. No. 744,265

Claims priority, application Japan, Jun. 15, 1984, 59-123128

Int. Cl.⁴ F02M *59/20;* **F02B** *3/00*

U.S. Cl. 123—300 **9 Claims**





1. A distributor-type fuel injection pump for an internal combustion engine having at least one cylinder, said fuel injection pump comprising:

(a) a housing having a fuel chamber defined therein;

(b) fuel supply means for supplying fuel to said fuel chamber under pressure dependent upon engine r.p.m.;

(c) a barrel mounted within said housing and having a distribution hole communicating with the engine cylinder;

(d) a plunger mounted within said barrel for axial and rotary motion therein and defining jointly with said barrel a pump working chamber communicating with said fuel chamber, said plunger having a main discharge port communicating at one end with said pump working chamber and alignable with said distribution hole for effecting a main fuel injection, and a preliminary discharge port communicating with said pump working chamber and alignable with said distribution hole before the alignment of said main discharge port with said distribution hole, thereby effecting a preliminary fuel injection before said main injection; and

(e) means operatively connected with said plunger and actuatable in response to pressure within said fuel chamber, for controlling fuel injection timing, said control means including a first means, actuatable in response to the pressure within said fuel chamber, for effecting said preliminary fuel injection when the pressure within said fuel chamber is at less than a predetermined value, and a second means, actuatable in response to the pressure within said fuel chamber, for preventing said preliminary fuel injection when the pressure within said fuel chamber is above said predetermined value.

4,635,600

FUEL INJECTION SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINES

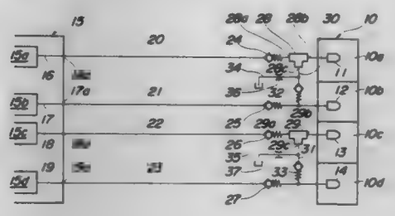
Shigeo Taira, Higashi-matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 24, 1985, Ser. No. 758,551

Claims priority, application Japan, Jul. 30, 1984, 59-160058

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—300 **3 Claims**



1. A fuel injection system for use with an internal combustion engine having a plurality of cylinders, comprising:

a plurality of fuel injections valves mounted, respectively, in said cylinders;

a plurality of fuel pressurizing means;

a plurality of fuel passages each connecting a corresponding one of said fuel pressurizing means with a corresponding one of said fuel injection valves;

a plurality of delivery valves arranged, respectively, across said fuel passages;

a communication passage connecting at both ends thereof a first one of said fuel passages corresponding to one of said cylinders which is to be fired earlier, to a second one of said fuel passages corresponding to another one of said cylinders which is to be fired later, each at a location between one of the fuel injection valves and a corresponding one of the delivery valves associated with said first and second fuel passages;

said delivery valves each having an outlet port, said communication passage being connected at said both ends thereof to said first and second fuel passages each at a location in the vicinity of said outlet port of a corresponding one of said delivery valves;

a selector valve arranged between said first fuel passage and said communication passage for selectively connecting one of said delivery valves across said first one fuel passage with said communication passage in a predetermined low load and low speed region of the engine, said selector valve connecting one of said delivery valves with a corresponding one of said fuel injection valves mounted in said one cylinder to be fired earlier in operating regions of the engine other than said predetermined low load and low speed region;

a one-way valve arranged across said communication passage for allowing fuel to flow in only one direction from said first fuel passage to said second fuel passage; and

a leak passage connecting said communication passage with a zone under a lower pressure at a location upstream of said one-way valve, said leak passage having restriction means arranged therein for adjusting the amount of fuel flowing from said first fuel passage to said second fuel passage.

4,635,601

METHOD OF AND ARRANGEMENT FOR REGULATING THE IDLING ROTATIONAL SPEED OF AN INTERNAL COMBUSTION ENGINE

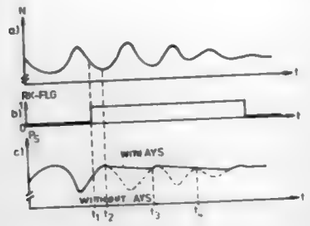
Peter Cornelius, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 3, 1985, Ser. No. 783,758

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 3437324

Int. Cl.⁴ F02D *41/16*; F02M *3/07*

U.S. Cl. 123—339 **6 Claims**



1. A method of regulating the idling rotational speed of an internal combustion engine using a regulating device having at least a proportional regulation region and operative for controlling the position of an adjustment element which controls the amount of intake air supplied to the engine during the idling operation of the latter, comprising the steps of comparing the actual and the desired rotational speeds and issuing an error signal indicative of the comparison result to the regulating device; detecting a jerky operation of the engine by evaluating the frequency and amplitude of rotational speed oscillations; and maintaining a manipulated variable of the proportional regulation region of the regulating device, in response to the detection of the jerky operation, asymmetrically only after an increase in the actual rotational speed, substantially at the respective highest achieved value thereof.

4,635,602

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

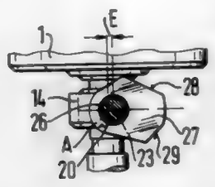
Franz Eheim, deceased, late of Stuttgart, Fed. Rep. of Germany (by Helga Eheim, heir), assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 29, 1985, Ser. No. 759,790

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1984, 3430654

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—357 **1 Claim**



1. A fuel injection pump for internal combustion engines comprising a housing, a pump piston therein arranged to reciprocate in a cylinder, said pump piston adapted to enclose in said cylinder a pump work chamber which communicates constantly with a relief line that discharges into a relief chamber, an annular slide on said pump piston having a control edge which opens and closes said relief line, said annular slide being adjustable relative to said pump piston and actuatable by means of a shaft having an axis, said shaft further being driven at one end by an electromechanical final control element and at another end said shaft being coupled with said annular slide via an eccentrically disposed connecting element and a counterweight positioned on said shaft, said counterweight comprising a disk-like member positioned proximate to said eccentrically disposed connecting element so as to protrude into said relief chamber of said fuel injection pump, said counterweight further having a center of gravity disposed upon a projection along an eccentricity E of the eccentrically disposed connecting element and said counterweight further comprises a position transducer secured to said shaft relative to said electromechanical final control element, whereby said shaft is protected from being loaded by tilting moments occurring during engine operation.

4,635,603

FUEL PRESSURE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

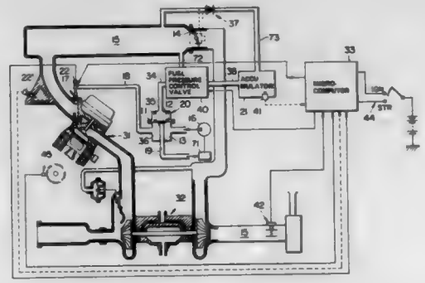
Yoichi Hara, Hiratsuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 3, 1985, Ser. No. 730,094

Claims priority, application Japan, May 8, 1984, 59-67704[U]

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—383 **14 Claims**



1. A system for controlling fuel pressure in a fuel supply system for a fuel injection type internal combustion engine equipped with a supercharger, comprising:

a pressure regulator having a diaphragm separating a reference pressure chamber and a fuel chamber which is in fluid communication with a fuel feed passage for conveying fuel from a fuel pump to at least one fuel injector of the engine, and a fuel return port for draining the fuel from said fuel chamber, said diaphragm being capable of opening and closing said fuel return port in accordance with a pressure difference between both chambers,

normal reference pressure supplying means for introducing an air pressure in an intake air passage of the engine at a position downstream of a throttle valve of the engine in said reference pressure chamber,

high reference pressure supplying means for containing an air pressurized by the supercharger,

a temperature sensor for sensing a temperature of the fuel in the fuel supply system, and

fuel pressure control means for supplying the air pressure of said high reference pressure supplying means to said reference pressure chamber when the temperature sensed by said temperature sensor is equal to or higher than a predetermined value,

wherein said high reference pressure supplying means comprises an accumulator for containing the air pressurized by the supercharger, and said fuel pressure control means comprises a three-way valve having a first position for supplying the pressure from said normal reference pressure supplying means to said reference pressure chamber and a second position for supplying the pressure from said high reference pressure supplying means to said reference pressure chamber, and a control unit producing a control signal to control said valve in accordance with the temperature sensed by said temperature sensor.

4,635,604

ENGINE IGNITION TIMING CONTROL APPARATUS

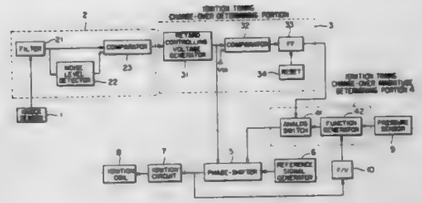
Toshio Iwata, Mitachi; Satoshi Komurasaki, and Atsushi Ueda, both of Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 22, 1985, Ser. No. 704,579

Claims priority, application Japan, Feb. 24, 1984, 59-34573; Feb. 24, 1984, 59-34574

Int. Cl.⁴ F02P *5/15*

U.S. Cl. 123—425 **19 Claims**



1. An ignition timing control apparatus for an internal combustion engine having a reference ignition timing comprising:

a sensing means for sensing vibrations including knocks of said engine;

knock signal deriving means for deriving knock signals from the output of said sensing means and indicating a knock condition of the engine;

means for initially setting the reference ignition timing in accordance with one of a plurality of modes corresponding to different octane ratings of gasoline fuel used in the engine;

an ignition timing change-over determining means for determining from said knock signals derived by said knock signal deriving means whether or not change-over of the reference ignition timing from the initial setting is necessary according to the indicated knock condition and the mode corresponding to the initial setting of the reference ignition timing;

an operating condition sensing means;

a change-over magnitude determining means for correcting the change-over magnitude of the reference ignition timing according to the operating condition of said engine from said condition sensing means and the output of said ignition timing change-over determining means; and

an ignition timing change-over means for changing the reference ignition timing according to the output of said change-over magnitude determining means.

4,635,605

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Werner Faupel, Gerlingen, and Klaus Schmidt, Vaihingen/Enz, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

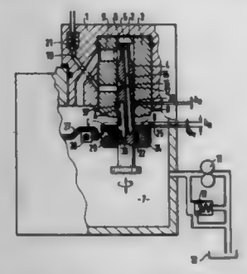
Filed Jun. 3, 1985, Ser. No. 740,139

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3434883

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—449 **15 Claims**

1. A fuel injection pump for internal combustion engines comprising a pump cylinder, a reciprocating pump piston in said pump cylinder which encloses a pump work chamber arranged to communicate continuously with a first relief line, an intake bore for fuel supply to said pump cylinder, a second relief line in the pump piston, the pump piston having a jacket face provided with an inlet (A) and an outlet (C) of said second relief line, a control edge arranged to open and close an outlet (D) of said first relief line at a predetermined point of the pump piston stroke course and arranged to be adjusted in accordance with load and/or rpm to change said predetermined point, the adjustment of said control edge further adjusts the point of the pump piston stroke course at which the outlet of said second relief line is opened wherein beyond a first, fixed stroke of the pump piston, communication is interrupted between the inlet (A) of the second relief line and a connecting opening (B) of a relief line, which leads uninterrupted to said pump work chamber wherein opening of said outlet (C) of said second relief line



is effected at a constant, fixed partial stroke (h_p) of the pump piston prior to said predetermined point of the pump piston stroke course, wherein the predetermined stroke portion (h_e) of said supply stroke is less than the fixed partial stroke (h_p) and further that the predetermined stroke portion is located such that in the upper load range the outlet (C) of the second relief line is in a closed position until after communication between the relief line leading to the pump work chamber and the second relief line has been interrupted, and said inlet (A) of the second relief line, is connected to the first relief line over a predetermined stroke portion (h_e) of the pump piston supply stroke after a portion of the high pressure supply stroke of the pump piston.

4,635,606

FUEL SUPPLY CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES, CAPABLE OF PREVENTING VAPOR LOCK

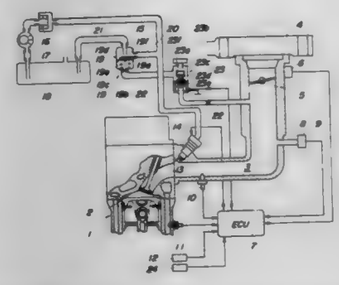
Akihiko Koike, Utsunomiya, and Tadashi Umeda, Asaka, both of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed May 28, 1985, Ser. No. 738,610

Claims priority, application Japan, May 30, 1984, 59-79710[U]

Int. Cl.⁴ F02M *55/02*

U.S. Cl. 123—463 **4 Claims**



1. In a fuel supply control system for an internal combustion engine, having pressure regulating means for regulating the pressure of fuel to a predetermined value, and at least one fuel injection valve for supplying said engine with fuel having

pressure thereof regulated by said pressure regulating means, said system comprising in combination:

a temperature sensor for detecting a temperature value representative of the temperature of fuel being supplied to said at least one fuel injection valve;

fuel pressure modulating means for varying the pressure of fuel being supplied to said at least one fuel injection valve; and

control means for operating said fuel pressure modulating means in response to the temperature value detected by said temperature sensor;

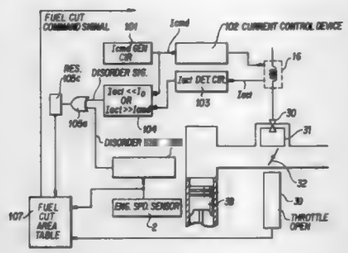
the improvement wherein said control means is disposed to operate said fuel pressure modulating means to increase the pressure of fuel over a period of time dependent on the temperature value detected by said temperature sensor from the time said engine is started, when the temperature value detected by said temperature sensor is higher than a predetermined value at the start of said engine.

4,635,607

APPARATUS FOR CONTROLLING THE SUPPLY OF FUEL TO AN INTERNAL COMBUSTION ENGINE

Akimasa Yasuoka, and Takeo Kiuchi, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1986, Ser. No. 837,924
Claims priority, application Japan, Mar. 11, 1985, 60-46495
Int. Cl.⁴ F02B *3/00*
U.S. Cl. 123—479 **4 Claims**



1. In an apparatus for controlling the supply of fuel to an internal combustion engine having a control valve means for controlling the amount of air to be supplied to an engine piston downstream of a throttle valve, the improvement which comprises:

means for detecting any disorder in the amount of air and outputting a disorder indicating signal;

an engine speed sensor for detecting the rotating speed of the engine;

a throttle opening sensor for detecting the degree of opening of said throttle valve; and

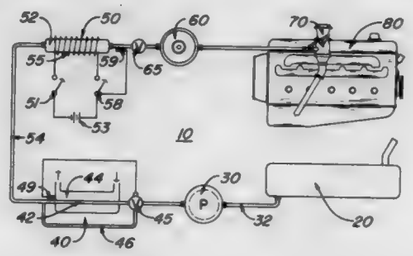
fuel cut means coupled to said disorder detecting means, said engine speed sensor, and said throttle opening sensor, for determining a fuel cut area defined by the degree of throttle opening and the rotating speed of the engine, and for executing fuel cut in response to the disorder indicating signal, when the output of said engine speed sensor and said throttle opening sensor indicate that the engine is operating within the fuel cut area.

4,635,608

ALCOHOL FUEL CONVERSION APPARATUS FOR INTERNAL COMBUSTION ENGINES

Bruce I. Carroll, 4410 Foothill Dr., Boise, Id. 83703

Filed Aug. 28, 1981, Ser. No. 297,215
Int. Cl.⁴ F02M *31/02*
U.S. Cl. 123—557 **12 Claims**



1. Alcohol fuel conversion apparatus for internal combustion engines comprising:

fuel storage means containing an alcohol fuel;

primary heat exchanger means in fluid communication with said fuel storage means for transferring heat to pressurized alcohol contained within said heat exchanger means;

a heat source for heating said heat exchange means;

pressure relief valve means, in closed fluid communication with said primary heat exchange means, operable to release heated pressurized alcohol into an expansion chamber;

converter means, including said expansion chamber, in fluid communication with said pressure relief valve means for receiving the heated pressurized alcohol and for the vaporization of the alcohol;

carburetor means in fluid communication with said converter means for metering and mixing vaporized alcohol with air for proper combustion and for feeding said mixture to an internal combustion engine; and

pump means for pressurized pumping of alcohol from said fuel storage means to said heat exchanger means, converter means, carburetor means, and to the engine.

4,635,609

SYSTEM AND DEVICE FOR EXHAUST GAS RECIRCULATION IN COMBUSTION MACHINE

Jan J. Seppen, Huizen, and Jouke van der Weide, Rijswijk, both of Netherlands, assignors to Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek, Netherlands

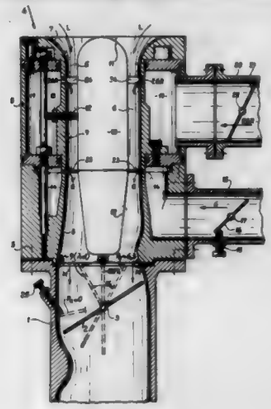
Filed May 10, 1985, Ser. No. 733,509
Claims priority, application Netherlands, May 11, 1984, 8401537
Int. Cl.⁴ F02M *25/06*
U.S. Cl. 123—568 **8 Claims**

4. An internal combustion engine system which uses a gaseous fuel, which mixed with air, is ignited in the combustion chamber of the engine and burnt to deliver power and which is designed for low levels of nitrogen oxides (NO_x) emissions in the exhaust even with mixtures of air/fuel ratios normally characterized by high level of emissions and with relatively high compression ratios for high thermodynamic efficiency at least over the full load portion of the power range comprising:

an internal combustion engine including a main throttle valve;

a fuel/air mixing means located upstream of the main throttle valve including a fuel gas inlet and an exhaust gas inlet; and

means for supplying recirculated exhaust gas relatively free of oxygen to said exhaust gas inlet such that the same full load power output the engine can deliver without exhaust gas recirculation is achieveable with a low level of nitrogen oxides emissions.

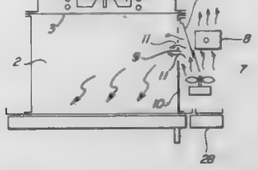


4,635,610

HOT AIR CIRCULATING OVEN RANGE USING SHAPE MEMORY ALLOY

Takao Nakanishi, Takaichi, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 15, 1985, Ser. No. 723,519
Int. Cl.⁴ F24C *15/32*
U.S. Cl. 126—21 A **2 Claims**



1. In a hot air circulating-microwave oven comprising

an oven chamber provided with an aperture,

damper means operative to open and close said aperture, and

fan means operatively associated with said aperture for supplying air through said aperture to the inside of the oven during microwave cooking, the improvement which comprises,

first and second opposite-acting memory shaped alloy springs connected to said damper means, and

electrical current means connected to said first and second springs for energizing one of said springs to open said damper to introduce air into the oven chamber, and the other of said springs to close said damper, said first and second shaped memory alloy springs not being energized at the same time.

4,635,611

ARCHERY QUIVER

Raymond G. Priebe, P.O. Box 691, Grayling, Mich. 49738

Filed Jun. 17, 1985, Ser. No. 745,528
Int. Cl.⁴ F41B *5/06*
U.S. Cl. 124—24 A **6 Claims**

1. An archery device for use with an archery bow comprising:

a quiver,

means for detachably securing said quiver to the bow, said securing means comprising,

a mounting plate,

means for securing said mounting plate to the bow,

one of said bow or said mounting plate having a longitudinally elongated projection with two sides which taper toward each other from one end to the other end of said projection,

the other of said bow or said mounting plate comprising a channel open at at least one end, said channel conforming in shape to said projection so that said projection is longitudinally slidably received through the open end of said channel to a predetermined position in said channel,

and means for detachably locking said quiver to said mounting plate at said predetermined position

wherein said locking means comprises a cam having an outwardly protruding cam surface and pivotally mounted

to said quiver between a locked and an unlocked position, wherein in said locked position said cam surface is received within and engages a recessed abutment surface on said mounting plate, said cam and said recess extending in a direction transverse to the longitudinal axis of said projection so that said cam surface prevents longitudinal sliding of said projection in said channel and wherein in said unlocked position said cam surface disengages from said abutment surface,

wherein said cam comprises a disc having a pivotal axis, said cam surface being formed on one peripheral edge of said disc, and a lever protruding outwardly from an edge of said disc substantially opposed to said cam surface, and

wherein said disc comprises a through slot between said pivotal axis and said cam surface, said cam being dimensioned so that, with said cam in said locked position, said cam surface compresses against said recess and radially compresses said slot.

4,635,612

BARBECUE BURNER DEVICE

Shoichiro Kakuberi, Maebashi, and Hidetomo Okamura, Kumagaya, both of Japan, assignors to Yamani Netsu Kogyo, Gunma, Japan

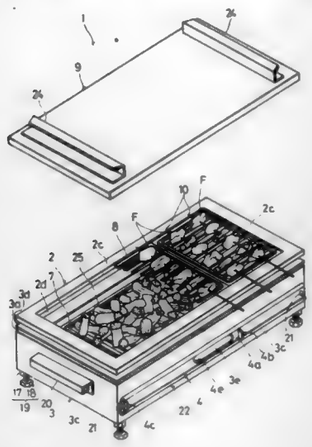
Filed Feb. 15, 1985, Ser. No. 702,260
Claims priority, application Japan, Sep. 10, 1984, 59-189000
Int. Cl.⁴ A47J *37/07*
U.S. Cl. 126—25 R **14 Claims**

1. A barbecue burner device comprising an inner vessel with

a bottom wall and enclosed side walls standing up from the bottom wall and opened at the top thereof for accommodating therein pieces of charcoal, said side walls providing a stepped face on the inside thereof, said inner vessel further having a ventilation hole formed in at least one of said side walls;

an external vessel for receiving therein said inner vessel, said external vessel being formed with enclosed side walls defined by inner and outer faces providing a top and a lower end and being opened at least at the top thereof and having a ventilation hole formed in at least one of said side walls, said ventilation hole being adapted to be in alignment with said ventilation hole of said inner vessel;

support means located in said external vessel between opposite side walls near the lower end thereof to support said inner vessel spaced from the lower end of said external vessel;



positioning means secured to the inner faces of the side walls of said external vessel to position said inner vessel in spaced relation with respect to the side walls of said external vessel;

heat-insulation means provided on the inner face of said side walls of said external vessel;

food carrier means adapted to be placed on said stepped face of said inner vessel; and

ventilation adjusting means arranged on said external vessel, said ventilation adjusting means being manually operated with respect to said ventilation hole of said external vessel to adjust the ventilation of the barbecue burner device, wherein said inner vessel and said external vessel are positioned to provide a heat-insulation space therebetween all around the side walls thereof when said inner vessel is received in said external vessel.

4,635,613

LID SUPPORT FOR CART-MOUNTED OUTDOOR GRILL

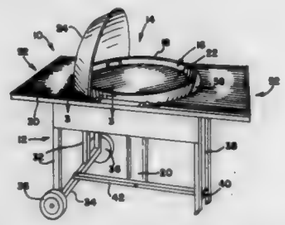
James E. Tucker, Batavia; James C. Stephen, Arlington Heights, and John Beecher, III, Carpentersville, all of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.

Filed Aug. 8, 1985, Ser. No. 763,857

Int. Cl.[4] A47J *37/00*

U.S. Cl. 126—25 R **16 Claims**

1. A portable outdoor grill including a generally hemispherical bowl having an upper peripheral rim and a hemispherical lid having a lower peripheral flange adapted to be received over said rim, a cart for supporting said bowl, said cart including spaced side members and said bowl having extensions extending from the periphery thereof and supported on said side members, clips carried by the respective side members,



said clips having inwardly-directed projections adjacent respective ends for receiving said lower peripheral flange of said lid therebetween so that said lid is supported in a generally upright position by said clips adjacent said bowl.

4,635,614

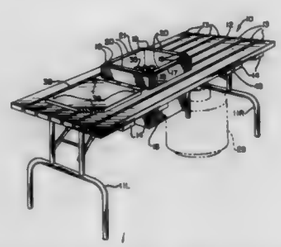
DEEP FAT FRYING POT COOKER HOLDING AND PICNIC TABLE

James L. Segroves, 3025 Chisholm Trail, Garland, Tex. 75042

Filed Jul. 7, 1986, Ser. No. 882,243

Int. Cl.[4] A47J *37/00*

U.S. Cl. 126—41 R **16 Claims**



1. A table mounted pot cooker comprising: a box like rectangular metal enclosure with an open top, four sides and a bottom; a table with opposite end legs and a table top with a rectangular opening sized to receive said box like rectangular metal enclosure; a rectangular frame resting on the table top around said rectangular opening; said rectangular metal enclosure having top flanges extending out over the top of said rectangular frame to support said rectangular metal enclosure extending from above said table top through said table top rectangular opening to below the table top; a gas burner element; a cylindrical gas burner element holder with a bottom supported on the bottom of said box like rectangular metal enclosure; a gas burner element support plate with upward extensions having outwardly extended flanged tops that overlap the top of said cylindrical gas burner element holder to support said gas burner element down in the cylindrical gas burner element holder; inflammable gas line means extended from an inflammable gas container to said gas burner element; grill means resting on the top of said cylindrical gas burner element holder; opening means in said box like rectangular metal enclosure, and opening means in the side of said cylindrical gas burner element holder for flow of inlet air to said gas burner and passage of said inflammable gas line means through from the exterior of said enclosure to said gas burner element.

4,635,615

DEVICE FOR MOUNTING COOKING APPARATUS

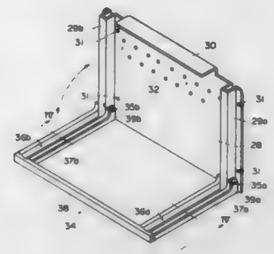
Fumihiko Itoh, Shiga; Tatumi Usagawa; Ryo Sakai, both of Ohtsu, and Yasakao Yamamoto, Shiga, all of Japan, assignors to Sanyo Electric, Osaka, Japan

Filed Nov. 5, 1985, Ser. No. 795,189

Claims priority, application Japan, Apr. 3, 1985, 60-70342

Int. Cl.[4] A21B *1/00*; A47B *67/02*

U.S. Cl. 126—273 A **9 Claims**



1. A device for mounting on a wall a cooking apparatus provided with legs on both the left side and the right side of a bottom surface thereof, comprising:

a wall fixing member to be fixedly mounted on the wall and provided with reinforcing members for improving the rigidity in the upward and downward direction;

a supporting member provided with receiving portions for receiving the legs of said cooking apparatus, supported on said reinforcing members of said wall fixing member being rotatable upwardly and downwardly, and supporting said cooking apparatus under the condition that said support member is positioned horizontally and the legs of said cooking apparatus are received in said receiving portions; and

a stopper member positioned at an upper portion of said wall fixing member for preventing said cooking apparatus from coming off said receiving portions.

4,635,616

FIREPLACE

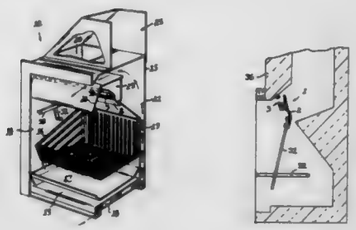
Arthur G. Jones, Johannesburg, South Africa, assignor to Jetmaster (Proprietary) Limited, South Africa

Filed Dec. 12, 1985, Ser. No. 807,978

Claims priority, application South Africa, Oct. 24, 1985, 85/8165

Int. Cl.[4] F23L *3/00*

U.S. Cl. 126—288 **6 Claims**



1. A fireplace having a fire grate and a passage for the flow of combustion gases from the fire grate comprising a base adapted to support the fire grate, side walls extending from said base, a damper in the passage for controlling the flow of combustion gases, said damper carrying a pair of stub shafts provided at opposite ends thereof and located on a common axis, said damper extending between said side walls of the fireplace with each of said stub shafts projecting through a hole in its associated side wall, said damper being displacable about said common axis of said stub shafts, said damper having a handle for causing said displacement, a friction bar associated with said handle mounted on one of said wide walls, said friction bar being adapted for frictionally inhibiting displacement of said handle, said stub shafts being housed in a sleeve secured to said sleeve having a longitudinal slot formed therein, at least one of said stub shafts being capable of axial displacement in said sleeve for readily mounted said damper in and demounting thereof from the fireplace, said one stub shaft carrying a bolt receivable in a threaded bore extending through said stub shaft in a direction normal to its axis, said bolt providing means for locking said stub shaft in an extended position and in a retracted position relative to said sleeve, said bolt passing through said longitudinal slot formed in said sleeve, said one stub shaft being displacable in said sleeve by displacement of said bolt along said slot, said slot having ends serving in cooperation with said bolt to determine the extended and retracted positions of said stub shafts, said damper being formed so that failure of said friction bar to inhibit displacement of said handle will cause said damper to open under its own weight to permit flow of combustion gases through said passage.

4,635,617

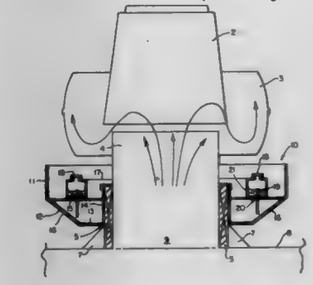
GREASE CATCH BASIN WITH SOLVENT RESERVOIR FOR USE WITH COOKING EXHAUST SYSTEMS

Kenard A. Simonsen, R.R. 1, P.O. Box 116A, Lennox, S. Dak. 57039

Filed May 1, 1985, Ser. No. 729,213

Int. Cl.[4] F24C *15/20*

U.S. Cl. 126—299 E **16 Claims**



11. Apparatus for use in collecting, breaking down and disposing of condensed or precipitated grease from an exhaust system, comprising means forming a grease catch basin, means forming a grease solvent reservoir, means for supporting the solvent reservoir such that gravity flow of solvent from the reservoir to the catch basin can occur, means forming a controlled flow path for gradual flow of solvent from the reservoir into the catch basin, and means for permitting outflow of contents of the catch basin when the contents reach a predetermined level.

4,635,618

SKIN LIFTING DEVICE FOR BODY EXERCISING PURPOSES

Otto J. Munz, deceased late of 600 S. 22nd St., Arlington, Va. 22202, by Gerta H. Munz, executrix

Filed Jan. 19, 1978, Ser. No. 870,731

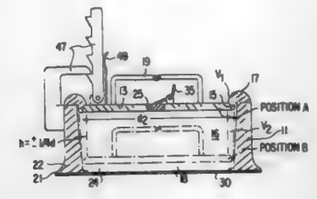
Int. Cl.[4] A61H *1/00*

U.S. Cl. 128—24 R **1 Claim**

1. A suction device comprising:

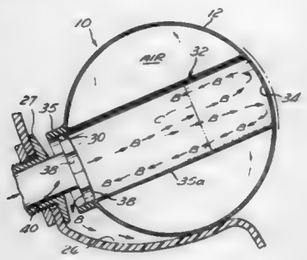
a rigid cylinder having an upper and a lower rim;

a rigid dome;
an elastomeric belt with a peripheral elastomeric swelling integrally connecting the upper rim of said cylinder with the rim of said dome;
the bottom rim of said cylinder in its normal position comprising an elastic cylindrical distal band extending about vertically and an integral elastic bulge extending horizontally therefrom in their respective normal positions;



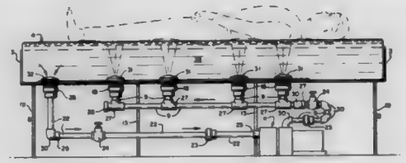
the volumes of said distal band and of said bulge having an elasticity and dynamic strength of recovery permitting their manual upward biased folding over the outer wall of the bottom of the cylinder rim and after air-tight compression of the said cylinder rim against the skin, their springing back into their normal position, while simultaneously stretching the skin adjacent to the cylinder underneath thereof.

4,635,619
WATER MASSAGER MEANS
Harvey E. Diamond, 12953 Woodbridge St., Studio City, Calif. 91604
Filed Jan. 20, 1984, Ser. No. 572,699
Int. Cl.⁴ A61H *23/04*
U.S. Cl. 128—39 **11 Claims**



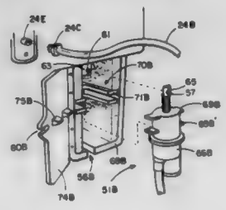
1. A fluid-tight flexibly resilient enclosure for enabling a person's head to be supported thereon and for enabling a vibratory massage to be applied to the person's head, which enclosure is adapted to be inflated and to be supported on a supporting surface, and is further adapted to be connected to a valve-controlled pressurized stream of fluid so as to direct such pressurized fluid stream against the portion thereof on which the person's head is to be supported and so as to remove such fluid from the enclosure at substantially the same rate at which such fluid stream is directed thereinto, to prevent any material fluid buildup, and to generate the vibratory massage, comprising:
(a) an outer enclosing wall, adapted to be inflated, including a lower portion adapted to be supported on the supporting surface, which includes a fluid port formed therein, adapted to be connected to the valve-controlled pressurized stream of fluid, and an upper portion, opposite the lower portion, adapted to project from the supporting surface and to enable the person's head to be supported thereon; and
(b) a hollow inner generally tubular shaped wall, having a through passage, which extends from the fluid port in the lower portion of the outer wall, into the outer wall, so as to direct fluid from the fluid port into the outer wall for impinging directly on the upper portion of the outer wall and for enabling removal of such fluid therethrough to prevent material fluid buildup and to generate the vibratory massage to be applied to the person's head to be supported on the upper portion of the outer wall.

4,635,620
METHOD FOR IMPROVED WATER THERAPY
Dominic A. Ricchio, 6021 56th Ave., Kenosha, Wis. 53142
Continuation-in-part of Ser. No. 371,456, Apr. 23, 1982, abandoned. This application Dec. 8, 1982, Ser. No. 447,763
Int. Cl.⁴ A61H *7/00*
U.S. Cl. 128—64 **9 Claims**



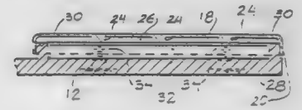
1. A method of water massage comprising the steps of:
supporting an entire person in a reclining position on a top membrane of an enclosure containing a layer of heated water of sufficient standing depth to support the entire person in a floating manner;
drawing the heated water out of the enclosure;
introducing the heated water into an interior of the enclosure as an array of water jets that are laterally spaced apart and aimed upwardly at an underside of the top membrane; and
imparting sufficient pressure to the heated water drawn from the enclosure to drive the water jets through a depth of water to impinge upon the underside of the top membrane on which the person is supported to produce jet pressure massage effects on a plurality of areas of the person, such as shoulders, back and legs and to produce a rippling effect under the person.

4,635,621
LAVAGE SYSTEM WITH REPLACEABLE PUMP
Robert W. Atkinson, Dover, Ohio, assignor to Snyder Laboratories, Inc., Dover, Ohio
Filed Dec. 1, 1982, Ser. No. 445,806
Int. Cl.⁴ A61H *7/00*
U.S. Cl. 128—66 **7 Claims**



1. Medical, dental or therapeutic lavage apparatus comprising:
a motor having a drive member;
a pump housing including a door;
a pump having a pump body and a driven member, said pump body comprising a pump chamber;
a means for coupling said motor drive member with said driven member for movement in unison in a longitudinal direction; and
a means activated by the closing of said door for gripping said pump body and securing it within said pump housing to oppose movement of said pump body in the longitudinal direction;
said means for gripping and securing comprises:
a pair of gripping members, at least one of said members moveable relative to the other member; and
a means for forcing said gripping members to engage at least a portion of said pump body in opposing directions.

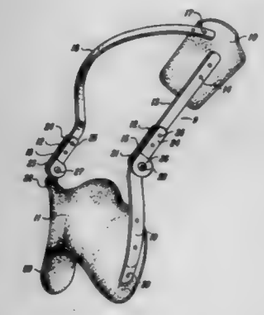
4,635,622
ADJUSTABLE SEAT CUSHION
Ghislain R. Bérubé, 456, rue Principale, Lachute, Quebec, Canada (J8H 1Y3)
Filed Jul. 31, 1984, Ser. No. 636,431
Int. Cl.⁴ A47C *7/02*
U.S. Cl. 128—68 **5 Claims**



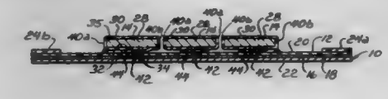
1. An adjustable seat cushion for chiropractic use comprising:
a rigid base member including a generally planar base portion;
first and second substantially coplanar adjacent cushion portions mounted on said base member; and
an adjustment mechanism within said first cushion portion for mounting said first cushion portion on said base member to adjust its elevation above said base member with respect to the elevation of said second cushion, said adjustment mechanism including:
(a) a plate member having downwardly depending side and end flanges to define the perimeter thereof;
(b) a plurality of downwardly depending rib members on said plate member defining a grid pattern within the perimeter of said plate member, said rib members intersecting to define bearing areas for said plate member;
(c) a plurality of upstanding locator elements on said base member cooperating within said side and end flanges to locate said plate member with respect to said base member;
(d) a plurality of upstanding boss members on said rigid base member and positioned below selected bearing areas of said plate member; and
(e) drive means including a rotatable threaded member below the surface of the planar base portion extending through a threaded bore in each said boss member for bearing engagement with corresponding bearing areas for adjustably supporting said plate member on said base member, whereby selective adjustment of said threaded members adjusts the elevation of corresponding portions of said first cushion portion.

4,635,623
BRACE FOR AN ARTICULATING LIMB
George M. Charuest, Montreal-North, and Lawrence P. Coughlin, Pointe Claire, both of Canada, assignors to J. E. Hanger Limited, Montreal, Canada
Filed Nov. 28, 1983, Ser. No. 555,889
Claims priority, application Canada, Oct. 24, 1983, 439564
Int. Cl.⁴ A61F *3/00*
U.S. Cl. 128—80 C **5 Claims**

1. A knee brace for controlling the movement of a knee joint of a wearer having an anterior cruciate deficiency about an axis, comprising a femoral engaging component, means for securing the femoral engaging component to the leg of the wearer above the knee, a proximal lateral femoral bar having a distal end fixed to the femoral engaging component and extending downwardly to a proximal femoral lateral position, a proximal medial femoral bar having a distal end fixed to the femoral engaging component and extending downwardly to a proximal femoral medial position, a tibial engaging component molded to fit the anterior tibial portion of the calf, means for securing the tibial engaging component to the leg of the wearer below the knee, a proximal lateral tibial bar having a distal end fixed to the tibial engaging component and extending upwardly therefrom to a proximal lateral tibial position, a proximal medial tibial bar having a distal end fixed to the tibial engaging component and extending upwardly therefrom to a proximal medial tibial position, a medial joint connecting the proximal ends of the proximal medial femoral bar and the proximal medial tibial bar, a lateral joint connecting the proximal ends of the proximal lateral femoral bar and the proximal lateral tibial bar, and at least one of said joints including an extension stop adapted to limit the extension of the joint beyond the point at which abnormal internal rotation between the distal femur and proximal tibia occurs while otherwise permitting normal extension of the joint to occur, said molded tibial engaging component being adapted to minimize abnormal tibial rotation in conjunction with said extension stop.



4,635,624
WOUND DRESSING
Thomas Gilman, Palatine, Ill., assignor to The Kendall Company, Boston, Mass.
Filed May 15, 1985, Ser. No. 734,301
Int. Cl.⁴ A61L *15/00*
U.S. Cl. 128—156 **19 Claims**



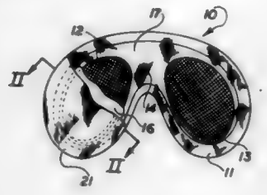
1. A wound dressing, comprising:
a flexible base sheet having adhesive on a front surface thereof, and a back surface;
an absorbent pad; and
a flexible film defining a chamber to receive the pad, with the chamber overlying the back surface of the base sheet, said dressing having opening means extending through the adhesive and base sheet and communicating with the pad inside the chamber.

4,635,625

SURGICAL EYE MASK

Edward Teeple, 641 Ridgefield Ave., Mt. Lebanon, Pa. 15216

Filed Oct. 15, 1984, Ser. No. 661,120
Int. Cl.[4] A61F *13/12*
U.S. Cl. 128—163 3 Claims



1. A laser-beam resistant protective surgical eye mask for use during laser procedures conducted about the face comprising:
   a. a facial mask member configured and sized to cover the eyes and nose bridge of a patient, said member being made of a metal foil;
   b. a pair of eye pads secured on the inner surface of the facial member, said pads being made of moisture absorptive material;
   c. an adhesive portion positioned on the inner surface of the periphery of the facial member for temporarily sealing the facial member to the face of the patient; and
   d. a nonwettable cover member for said mask member having a shape and size substantially the same as the mask member and removably secured to said inner surface by the adhesive portion.

4,635,626

PROSTHETIC STOCKINGS

Max Lerman, 1950 Carla Ridge, Beverly Hills, Calif. 90210

Filed Nov. 16, 1984, Ser. No. 672,408
Int. Cl.[4] A61F *13/00*; B32B *25/00*, *7/02*
U.S. Cl. 128—165 31 Claims



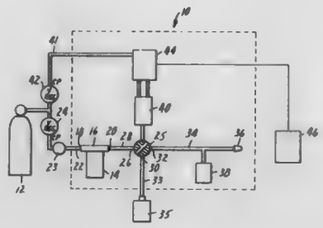
1. A temporary post-operative stump sock comprising a flexible, resilient composite material including a base layer of a flexible, resilient open cell material; a skin-protecting first layer of a soft, flexible porous material overlying and adhered to a first face of the base layer; and a flexible second layer of a protective fabric overlying and adhered to a second face of the base layer, the composite material being cut, overlaid and seamed to form a tubular sock which is open at its top, closed at its bottom and shaped generally to conform to the shape of an amputee's stump, with the skin-protecting first layer on the inside of the sock and the protective second layer on the outside of the sock.

4,635,627

APPARATUS AND METHOD

Vivien W. Gam, Shoreview, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Filed Sep. 13, 1984, Ser. No. 651,040
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—200.14 3 Claims



1. A device for administering a closely controlled dose of an aerosol, comprising:
   means for providing a supply of gas under pressure,
   nebulizing means having a through opening comprising an inlet and an outlet, said inlet being coupled to said supply of gas,
   valve means having an inlet coupled to the outlet of said nebulizing means, first and second outlet openings, and portions relatively moveable between a first portion at which said portions define a through opening coupled between said inlet of said valve means and said first outlet opening and blocking said second outlet opening, and a second position at which said portions define a through opening coupled between said inlet of said valve means and said second outlet opening and blocking said first outlet opening, said portions normally being in said first position,
   exhaust means coupled to said first outlet opening for affording continuous and constant flow of gas through said nebulizing means when said portions are in said first position.
   delivery means coupled to said second outlet opening adapted to be coupled to the breathing passageway of a subject when said portions are in said second position, and
   activating means for moving said portions from said first position to said second position for a predetermined period, after which said activating means returns said portions back to said first position.

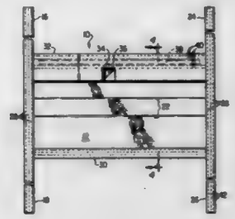
4,635,628

SURGICAL FACE MASK WITH IMPROVED MOISTURE BARRIER

Vance M. Hubbard, and Welton K. Brunson, both of Bedford, Tex., assignors to Tecnol, Inc., Fort Worth, Tex.

Filed Sep. 11, 1985, Ser. No. 775,026
Int. Cl.[4] A62B *7/00*
U.S. Cl. 128—201.17 12 Claims

1. In a surgical face mask of the type having a panel for covering the nose and mouth of a wearer, and means for securing the mask to the wearer's face, the improvement in said mask comprising a barrier strip disposed across the top inside surface of said panel for restricting the permeation of moisture therethrough, said barrier strip comprising a synthetic resin



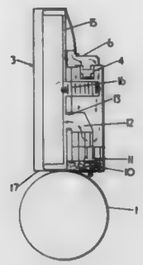
material layer sandwiched between a polyester foam material layer and said panel.

4,635,629

BREATHING APPARATUS

Peter Thorp, Rotherham, and Roger E. W. Manley, Slough, both of England, assignors to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 718,414, Apr. 1, 1985, abandoned, which is a continuation of Ser. No. 476,907, Mar. 18, 1983, abandoned. This application Oct. 4, 1985, Ser. No. 774,714
Claims priority, application United Kingdom, Mar. 26, 1982, 8208915
Int. Cl.[4] A62B *7/08*
U.S. Cl. 128—202.26 11 Claims



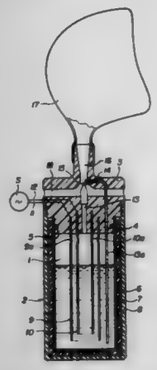
1. A breathing apparatus having a carbon dioxide absorbing-heat generating canister, cooling means of the type having paralell adjacent first and second flow passage means therethrough with a surface adapted to retain a film of evaporable liquid extending in said first passage means and in heat exchange relationship with said second passage means, a breathing bag, breathing gas recirculation means for passing exhausted breathing gases from a user through said carbon dioxide absorbing canister to purify the exhausted gases for inhalation, through said cooling means, through said breathing bag and back to the user, and means for inducing air flow over said cooler means, said means comprising:
   a closed housing having inlet valve means for communicating ambient air to the interior of the housing and outlet valve means for communicating ambient air from within the housing through said second passage means of said cooler means; and
   said breathing bag being disposed within the housing for reciprocating movement, and having inlet means connected with said first passage of said cooler means for filling the breathing bag with replenished breathing gases and outlet means adapted to be connected to a user for emptying the breathing bag of breathing gases;
   said inlet valve means being actuated by a pressure drop within the housing resulting from inward movement of the breathing bag due to emptying;
   said outlet valve means being actuated by a pressure increase within the housing resulting from outward movement of the breathing bag within the housing due to filling, whereby as atmospheric air is pumped over said surface in said first flow passage means of said cooler means, sensible heat and liquid vapor is picked up thus cooling said surface thereby cooling breathing gases passing through said second flow passage means.

4,635,630

APPARATUS FOR HEAT THERAPY BY INHALATION

Dominique Noir, Auboune, and Yves Trouilhet, Vesenaz, both of Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

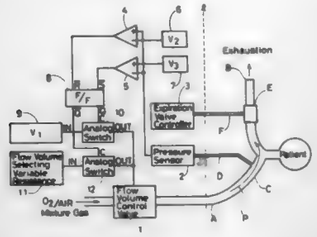
PCT No. PCT/CH84/00168, § 371 Date Jun. 19, 1985, § 102(e) Date Jun. 19, 1985, PCT Pub. No. WO85/01661, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 16, 1984, Ser. No. 750,606
Claims priority, application Switzerland, Oct. 20, 1983, 5708/83
Int. Cl.[4] A61M *15/00*
U.S. Cl. 128—203.26 1 Claim



1. Apparatus for providing heat therapy by inhalation, comprising:
   wall means defining an enclosure for heating at its boiling temperature a quantum of aqueous liquid when contained therein to a level which incompletely fills said enclosure, leaving a headspace of said enclosure unfilled by aqueous liquid above said level;
   a tube having an inlet end and an outlet end, said inlet end of said tube opening into said headspace of said enclosure and said outlet end of said tube being provided with a nozzle;
   a pipe secured to said wall means and having an inlet end and an outlet end, said inlet end of said pipe being adapted to be open to the atmosphere, and said outlet end of said pipe including means adapted to provide from said headspace and from the atmosphere, in use, a hot, moist air mixture for inhalation by a user for providing heat therapy for the user;
   said pipe, intermediate said inlet and said outlet ends thereof having surface means defining a neck of a venturi therein;
   said nozzle of said tube opening into said venturi neck, towards said outlet end of said pipe, so that as pressurized steam issues from said nozzle, atmospheric air will be drawn into said pipe through said inlet end of said pipe and form with said steam at said nozzle a hot, moist air mixture;
   said nozzle and said venturi neck being dimensioned to provide, in use, a hot moist air mixture having a temperature within the range of 38°–50° C.; and
   a second tube secured to said wall means and having an open inlet end disposed below said level in said enclosure and having an open outlet end disposed in said pipe adjacent

said nozzle and being adapted to supply, in use, heated aqueous liquid drawn thereinto from said enclosure to said hot, moist air mixture for inhalation by the user, as droplets having sized in the range of 2–20 μm.

4,635,631
ARTIFICIAL RESPIRATION VENTILATOR OF AIR CONSTANT FLOW
Kazuo Izumi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Oct. 29, 1984, Ser. No. 666,248
Claims priority, application Japan, Nov. 4, 1983, 58-207973
Int. Cl.⁴ A61M *16/00*
U.S. Cl. 128—204.23 **3 Claims**



1. An artificial respiration ventilator for controlling the volume of continuous air flow passing into a patient's lungs comprising:

respiratory circuit means for conducting a continuous air flow from a source to a patient's lungs during inhalation and exhalation phases of a respiratory cycle;

sensing means for sensing a generation of positive and negative airway pressures in the respiratory circuit means caused by inhalation and exhalation efforts;

means for generating a plurality of threshold signals corresponding to predetermined positive and negative airway pressure threshold value

threshold detection means, responsive to said sensing means, for ascertaining when said sensed positive and negative airway pressures exceed said threshold values;

means for generating a plurality of reference input signals corresponding to a plurality of air volume flow rate values;

switching means, responsive to said threshold detection means, for choosing one from a plurality of reference input signals when one of the plurality of threshold values is exceeded; and

air volume flow rate adjusting means, responsive to the output of said switching means, for continuously and instantaneously adjusting the air volume flow rate through the respiratory circuit means in accordance with the reference input value chosen by said switching means such that the continuous air flow through substantially inversely proportioned to the sensed positive and negative airway pressures.

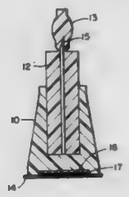
4,635,632
QUICK RELEASE CONNECTOR FOR A SURGICAL DEVICE
Stanley Welber, Palatine, and Nick Lakatos, DesPlaines, both of Ill., assignors to Eder Instrument Co., Princeton, N.J.
Filed Jun., 1984, Ser. No. 617,339
Int. Cl.⁴ A61B *17/36*
U.S. Cl. 128—303.1 **4 Claims**

1. A quick release device for detachably connecting a surgical instrument to a surgical output apparatus such as a laser micromanipulator including a first member, the first member having bushing means extending therefrom and a nut means on the bushing means, means for advancing the nut means axially along the bushing means, pin means rigidly affixed to the first member, means for attaching the first member to the output apparatus; a second member connected to the surgical instrument, the second member having a slot means for receiving the first member pin means for relative pivotal movement between



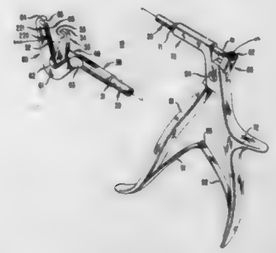
the first and second members, nut receiving means on the second member whereby the surgical instrument may be detachably connected to the output apparatus by advancing the nut means into abutment with the nut receiving means thereby urging the pin and slot means into tight engagement.

4,635,633
COMBINATION STERILE PAD SUPPORT AND LANCET
Douglas R. Hufnagle, 75 Executive Dr., Westerville, Ohio 43081
Filed Dec. 17, 1984, Ser. No. 682,519
Int. Cl.⁴ A61B *17/34*
U.S. Cl. 128—314 **7 Claims**



1. A combination sterile pad support and lancet comprising a member in the shape of the frustum of a cone containing a hollow cylinder extending along the axis of said cone and coaxial therewith, and one end of said cylinder terminating adjacent to, but spaced from, the base of said cone, the opposite end of said cylinder terminating in the top of the frustum of said cone, said cylinder being of a size and shape adapted frictionally to hold a conventional lancet, said lancet being positioned in said cylinder, said member provided with a centrally positioned recess in the base of said member, the depth of said recess being substantially less than the width of said recess, and absorbent pad in said recess containing an antiseptic fluid, said pad having a shape complementary to said recess and substantially filling said recess, said recess being deep enough to hold a quantity of said antiseptic fluid in addition to that antiseptic fluid which saturates said pad, a removable cover on said base completely covering said pad and adapted to cooperate with said recess to prevent said antiseptic from coming in contact with the atmosphere, said cover being separable from said pad whereby said pad will remain in said recess when said cover is removed from said base, a sharp lancet tip extending from the top of said conically-shaped member and a removable cover on said sharp lancet tip.

4,635,634
SURGICAL CLIP APPLICATOR SYSTEM
Manuel V. Santos, 126 Pulaski St., Newark, N.J. 07105
Filed Jul. 12, 1985, Ser. No. 754,651
Int. Cl.⁴ A61B *17/12*
U.S. Cl. 128—325 **5 Claims**



1. A surgical clip applicator system comprising a surgical clip applicator having a front end and a rear end defining a front to rear direction, said surgical clip applicator further comprising:

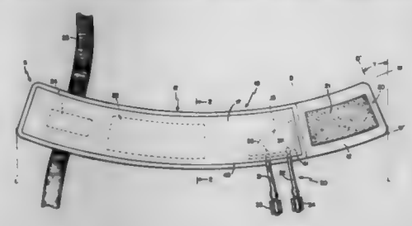
a stationary front jaw member including a rear facing grooved surface, a rear facing cancave notch above said rear facing grooved surface and a rear end;

a rotatable jaw member being located at the rear end of said stationary front jaw member and including a front facing grooved surface and a front facing concave notch above said front facing grooved surface, and rear end; and

actuating means being located at the rear end of said rotatable jaw member and being connected to said rotatable jaw member about a first horizontal axis being common to said actuating means and to said rotatable jaw member for effecting frontward and rearward rotation of said rotatable jaw member about a second horizontal axis being common to said rotatable jaw member and said stationary front jaw member, such that said rear and front facing grooved surfaces approximate each other when said rotational jaw member is rotated from a fully open configuration to a fully closed configuration relative to said stationary front jaw member; wherein said actuating means includes first and second internal members each having front and rear ends, and a third external member having an upper end and a lower end; said rotatable jaw member being connected to said first internal member front end about said first common horizontal axis and wherein said first member front end exhibits longitudinal motion and rotational motion, said front to rear direction being defined as the longitudinal direction; said second internal member front end being connected to said first internal member rear end about third horizontal axis being common to said second internal member and said first internal member wherein said first internal member rear end and said second internal member front end exhibit longitudinal motion; and said second internal member rear end being connected to said third external member upper end about a fourth horizontal axis being common to said second internal member and said third external member wherein said second internal member rear end exhibits only longitudinal motion and said third external member upper end exhibits rotational motion about a fifth horizontal axis.

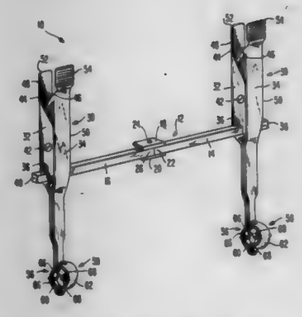
4,635,635
TOURNIQUET CUFF
Cynthia Robinette-Lehman, Larkspur, Colo., assignor to Aspen Laboratories, Inc., Englewood, Colo.
Filed Nov. 29, 1984, Ser. No. 676,321
Int. Cl.⁴ A61B *17/12*
U.S. Cl. 128—327 **6 Claims**

1. An improved tourniquet cuff of the type including an inflatable member, a means for securing said inflatable member around a body part, and a means for facilitating inflation of said inflatable member, said member having a length dimension for wrapping around said body part, a thickness dimension for placement perpendicular to the surface of said body part, and a width dimension for spanning a portion of said body part, said member having a substantially arcuate shape with the radius of the arc passing along said width dimension, at least three layer elements coupled at their ends to define a pair of



cavities, a stiffener in one cavity, said inflatable member being disposed in the other cavity whereby a middle layer element for said three layer elements separates said stiffener from said inflatable member, said inflatable member further comprising a pair of sheets sealingly coupled together within said other cavity to define a first seal for said inflatable member, and said pair of sheets extending from said first seal to also sealingly engage said middle layer element and define a second seal for said inflatable member.

4,635,636
MICROSPIKE SURGICAL APPROXIMATOR
Marc Goldstein, New York, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.
Filed Jun. 18, 1985, Ser. No. 746,166
Int. Cl.⁴ A61B *17/12*
U.S. Cl. 128—334 R **1 Claim**



1. A microspike surgical approximator usable to stabilize ends of a duct or vessel during microsurgical anastomosis of the duct or vessel, said microspike surgical approximator comprising:

a generally rectangular elongated bar foldable intermediate its ends and having a fixed bar segment and a folding bar segment joined together by spaced hinge plates secured to said fixed bar segment and a pivot pin passing through said hinge plates and said folding bar segment;

at least first and second approximating clamps slidably positioned on said bar with one of said clamps being slidably positioned on each of said fixed and folding bar segments, respectively;

each said approximator clamp having a stationary blade which includes a generally rectangular aperture sized to receive one of said fixed and folding bar segments so that

said stationary blade is slidably attached to said bar, and a pivoted blade pivotably attached to said stationary blade, said stationary blade and said pivoted blade of each said approximating clamp being spring biased;

actuating means at first ends of said stationary and pivoted blades of each said approximating clamp, said actuating means being engageable by a user of said approximator to pivot said pivotable blade with respect to said stationary blade;

duct or vessel clamping portions at second ends of said stationary and pivoted blades of each said approximating clamp, said duct or vessel clamping portions including curved jaw segments on each said stationary and pivoted blades, said curved jaw segments cooperating to form an annular duct or vessel receiving aperture; and

a plurality of spaced microspikes on said curved jaw segments of each of said stationary and pivoted blades, said microspikes on said stationary blade being opposite to said microspikes on said pivoted blade, each of said microspikes extending inwardly into said annular duct or vessel receiving aperture, said microspikes being formed on stainless steel with each said microspike having a diameter and a length sized to penetrate only the adventitia of the duct or vessel during microsurgical anostomosis of the duct or vessel with no penetration of the mucosa or endothelium of the duct or vessel.

4,635,637

SURGICAL SUTURE

Saul N. Schreiber, 6525 N. Central Ave., Phoenix, Ariz. 85012

Filed Mar. 29, 1984, Ser. No. 595,330
Int. Cl.[4] A61B 17/04
U.S. Cl. 128—337 4 Claims





1. A surgical suturing system comprising:

a surgical suture having a base member, two substantially parallel shafts upstanding from said base member and having pointed barbs at the ends thereof;

means for positioning and inserting said suture into body tissue; said means for positioning and inserting comprises:

a hollow sleeve member through which said suture can be delivered;

a pusher member sized to fit through the hollow interior of said sleeve member and capable of pushing said suture into said body tissue; and

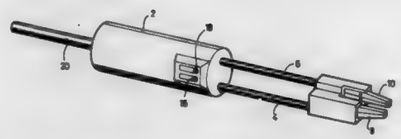
a starter member sized to fit through said sleeve member and comprising a substantially rigid rod having two pointed projections at the end thereof, said projections capable of creating two starter holes in said body tissue into which can be inserted said substantially parallel shafts.

4,635,638

POWER-DRIVEN GRIPPING TOOL PARTICULARLY USEFUL AS A SUTURING DEVICE

David Weintraub, Kibbutz Dvir, and Yaakov Zamir, Kfar Saba, both of Israel, assignors to Galil Advanced Technologies Ltd., Ramat Gan, Israel

Filed Jan. 29, 1985, Ser. No. 696,103
Claims priority, application Israel, Feb. 7, 1984, 70893
Int. Cl.[4] A61B 17/06, 17/04; B23Q 3/08; B25B 1/02
U.S. Cl. 128—340 20 Claims



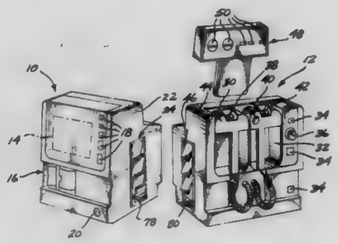
1. A suturing device comprising a handle grippable by the surgeon; a pair of needle holders extending parallel to each other from one end of the handle, and each movable to an extended operative position or to a retracted, inoperative position; each of said needle holders including a pair of gripper members movable to a closed position gripping a needle therebetween, or to an open position releasing the needle; characterized in that said handle further includes a power drive for driving said pair of needle holders to their extended and retracted positions, and for moving said pair of gripper members of each needle holder to their open and closed positions; and control means operable by the surgeon for selectively controlling said power drive.

4,635,639

MODULAR PHYSIOLOGICAL INSTRUMENT

Douglas T. Hakala, Bothell; Joseph M. Bocek, Seattle, and James G. Osborn, Medina, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Filed Jan. 8, 1985, Ser. No. 689,747
Int. Cl.[4] A61N 1/36; A61B 5/04
U.S. Cl. 128—419 D 14 Claims



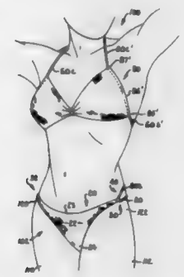
1. A physiological instrument including a first component comprising an ECG monitor and a second component comprising a defibrillator, each component comprising means for permitting an operator to turn the component on and off, the components being adapted for integrated operation wherein information concerning defibrillator operation is transmitted from the defibrillator to the ECG monitor, the defibrillator comprising means for generating a power-on signal when the defibrillator is turned on and means for transmitting the power-on signal to the ECG monitor, and the ECG monitor comprising means for receiving the power-on signal and means responsive to receipt of the power-on signal for turning the ECG monitor on.

4,635,640

LADIES COMPETITION SUIT

Rhonda Sehorn, 4024 S. Lynn, Independence, Mo. 64055

Filed Jun. 10, 1985, Ser. No. 743,101
Int. Cl.[4] A41C 1/06; A41D 5/00
U.S. Cl. 128—438 8 Claims



1. A competition suit for a woman comprising:

a bikini brief having a first panel for covering the front pelvic region of the wearer and a rear panel for covering the posterior region of the wearer, said front and rear panels being connected by a crotch panel therebetween;

a bra member;

means for maintaining said bra on said wearer;

a pair of laterally spaced-apart female fastener elements connected to one of said front or rear panels and positioned on the respective hips of the wearer;

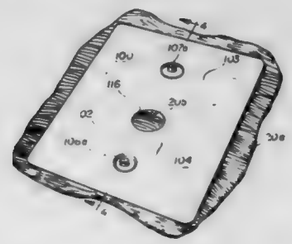
a pair of laterally spaced-apart elongated male fastener elements connected to the other of said front or rear panels and positioned on the respective hips of the wearer, said respective male elements slidable through said male elements for joining said front panel to said rear panel on said regions of said wearer in a user-selectable displacement therebetween, said male elements further joining said brief with said brassiere, said slidable relationship between said elements allowing for displacement of said front and rear panels towards and away from one another in response to various sizes of said pelvic and posterior regions of said wearer.

4,635,641

MULTI-ELEMENT ELECTRODE

Kent C. Hoffman, Cockeysville, Md., assignor to Murray Electronics Associates Limited, Hunt Valley, Md.

Filed Oct. 16, 1985, Ser. No. 788,215
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—639 10 Claims



7. A multi-element electrode for therapeutic or diagnostic applications in medical or veterinary use which may be adhesively affixed to the external body surface of a subject, said electrode comprising:

a plurality of conductive patches for transferring electrical signals to/from the subject;

an adhesive layer extending at least part way about the edges of said conductive patches which are positioned at predetermined relative locations on said layer for holding said conductive patches at predetermined relative locations and in place on the body surface of a subject;

at least one treatment location and access aperture being provided in said adhesive layer at a predetermined location relative to said electrodes which defines the proper location of treatment area and which thus facilitates proper placement over an injury or other treatment site and for access to the site; and

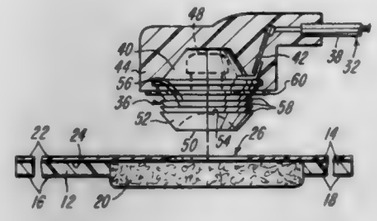
a releasable liner protectively covering the otherwise exposed adhesive surface of said adhesive layer until the liner is removed to permit affixation to said body surface.

4,635,642

MEDICAL ELECTRODE WITH REUSABLE CONDUCTOR

James V. Cartmell; Larry R. Barcham, both of Dayton, and Michael L. Wolf, West Milton, all of Ohio, assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 18, 1985, Ser. No. 756,752
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—639 10 Claims



1. A medical electrode comprising a disposable electrode pad having an electrolyte gel matrix and a socket plate overlying said gel matrix, said socket plate comprising a sheet of plastic having a socket therein overlying said gel matrix, said socket comprising a bore extending through said socket plate; and

a reusabel electrode conductor having a body releasably positioned within said socket to engage said gel matrix, said body having an axis extending through said bore, said body being slightly oversized with respect to said bore and having outer surface portions engaged by the margin of said bore as said body is inserted into said socket, said outer surface portions comprising plural, axially spaced, radially projecting ridges spaced by grooves, whereby said margin is resiliently biased into one of said grooves when said electrode conductor is assembled on said pad.

4,635,643

ASSAY METHOD FOR THE IN VIVO QUANTITATIVE DETERMINATION OF MINERAL CONTENT IN BONE

Charles E. Brown, Hubertus, Wis., assignor to The Medical College of Wisconsin Research Foundation, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 426,147, Sep. 28, 1982, Pat. No. 4,510,450. This application Oct. 31, 1984, Ser. No. 666,961
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—653 6 Claims

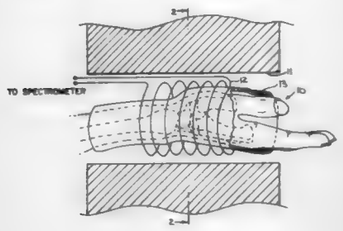
1. A noninvasive in vivo assay of the mineral content of a bone in an animal comprises:

(a) placing the part of the body of the animal containing said bone to be analyzed within the operational range of a receiver coil of a NMR spectrometer;

(b) recording a ^{31}P NMR spectrum of the bone while keeping the bone stationary; and

(c) then comparing the quantitative spectral results obtained in step (b) to the spectral results obtained with a reference

standard containing a known concentration and quantity of a reference compound which responds to ^{31}P NMR



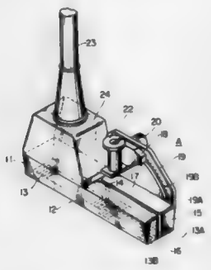
spectroscopy in a manner similar to that of bone mineral but which does not overlap the resonance of bone material.

4,635,644

ULTRASONIC APPLICATOR

Yukihiro Yagata, Kawachinagano, Japan, assignor to Hitachi Medical Corporation, Tokyo, Japan

Filed Mar. 22, 1985, Ser. No. 714,822
Claims priority, application Japan, Jul. 24, 1984, 59-153801
Int. Cl.⁴ A61B *10/00*
U.S. Cl. 128—660 **4 Claims**



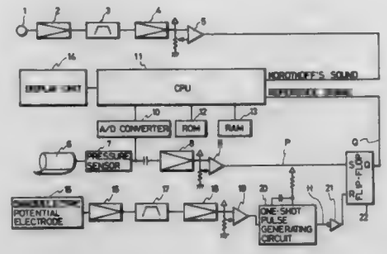
1. An ultrasonic applicator for insertion of a puncturing cannula, comprising an applicator body having a longitudinally extending lower application surface for contacting a living body and a plurality of ultrasonic transducer elements arranged on said lower application surface in parallel to one another in at least one predetermined row in a longitudinal direction of said lower application surface, at least some but no more than one half of said plurality of ultrasonic transducer elements being divided into two halves spaced apart from one another so that the two halves cooperate as a pair to form a single transducer element, said applicator body including means for defining a slot for guiding the puncturing cannula, said slot being formed as a thin parallelpiped like space extending from a center portion of said lower application surface between the two halves of respective pairs forming a single transducer element to an opposite upper surface of said applicator body.

4,635,645

ELECTRONIC SPHYGMOMANOMETER

Toshitaka Fukushima, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Mar. 2, 1984, Ser. No. 585,885
Claims priority, application Japan, Mar. 3, 1983, 58-34887; Mar. 3, 1983, 58-34888; Mar. 3, 1983, 58-34889; Mar. 3, 1983, 58-30883[U]; Mar. 3, 1983, 58-30884[U]
Int. Cl.⁴ A61B *5/04*
U.S. Cl. 128—680 **14 Claims**



1. In an electronic sphygmomanometer including a Korotkoff sound detecting circuit, a cuff pressure detecting circuit having a pressure sensor, an analog-to-digital converter connected to the cuff pressure detecting circuit, reference signal generating means for producing a reference signal relating to a signal based on a pulsatile blood pressure variation within a brachial artery, central processing unit means for receiving a signal relating to an output of the Korotkoff sound detecting circuit, an output of the reference signal generating means and an output of the cuff pressure detecting circuit through the analog-to-digital converter and determining a systolic and a diastolic blood pressure, and display unit means for receiving an output of the central processing unit means and displaying the systolic and diastolic blood pressures, the improvement comprising: cardioelectric potential detecting circuit means having a one-shot pulse generating circuit for detecting a cardioelectric potential and producing a cardioelectric potential synchronizing signal; and the reference signal generating means including memory circuit means for receiving the signal based on a pulsatile blood pressure variation within a brachial artery and the cardioelectric potential synchronizing signal.

4,635,646

PORTABLE APPARATUS FOR MONITORING HEART ACTIVITY

Ascher Gilles, 20bis bd du Général Leclerc, 92200 Neuilly; Jean-Pierre Coustenoble, 11 rue Charcot, 92800 Puteaux, and Jean-Francois Fourrail, La Sauvagère Route de Parinier, 72560 Change, all of France

Filed Oct. 18, 1984, Ser. No. 662,024
Claims priority, application France, Nov. 10, 1983, 83 17874
Int. Cl.⁴ A61B *5/04*
U.S. Cl. 128—696 **13 Claims**

1. A portable apparatus for monitoring heart activity comprising: a case, a first electrode mounted on said case and a second electrode separate from said case wherein said first and second electrodes are for making electrical contact with respective regions of the patient's body to pick up electrical heart signals; attachment means for attaching said apparatus to a patient's body including flexible loop for passing round a part of the patient's body; wherein said case includes electronic processing means for registering said electrical heart signals; electrical connection means connecting said first electrode to said electronic processing means; said loop including electrical conductor means for connecting said second electrode electrically with said electronic processing means; and at least one auxiliary electrode electrically connected to the electronic processing means, fixing means for fixing said auxiliary electrode to the patient's skin, and connection means for connecting said auxiliary electrode with said case wherein said connection means for connecting said auxiliary electrode includes mechanical and electrical couplings for coupling said first electrode to said auxiliary electrode.

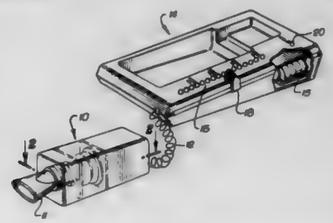


4,635,647

INCENTIVE SPIROMETER EMPLOYING BELLOWS AIR FLOW SENSOR

Pradip V. Choksi, 10935 Yolanda Ave., Northridge, Calif. 91326

Filed Sep. 7, 1984, Ser. No. 648,243
Int. Cl.⁴ A61B *5/08*
U.S. Cl. 128—728 **22 Claims**



1. An incentive spirometer for use by a patient during breathing exercises comprising:
an air flow rate sensor having a mouthpiece and an air flow rate switch coupled to said mouthpiece, said switch having flexible means, which flexes in response to changes in air pressure caused by changes in air flow rate, for activating said switch when the air flow rate through said sensor is within a preselected relatively narrow range corresponding to a desired breathing rate for said patient and for deactivating said switch when the air flow rate through said sensor is not within said range;
timing means coupled to said air flow rate switch for determining the time that said air flow rate switch is activated and providing an output corresponding to said time; and
display means coupled to said timing means for providing a display corresponding to the output of said timing means.

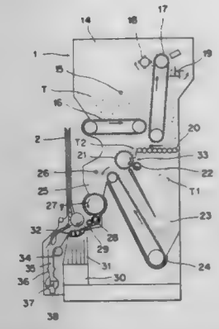
4,635,648

SHREDDED TOBACCO FEEDING APPARATUS FOR CIGARETTE MAKING MACHINE

Yutaka Okumoto, Musashino, Japan, assignor to Japan Tobacco, Inc., Japan

Filed Dec. 28, 1984, Ser. No. 687,273
Claims priority, application Japan, Jan. 6, 1984, 59-341
Int. Cl.⁴ A24C *5/39*
U.S. Cl. 131—109.1 **6 Claims**

1. A shredded tobacco feeding apparatus for a cigarette making machine comprising:
a storage reservoir for temporarily storing shredded tobacco therein;
a feeding means disposed within said reservoir for continuously feeding a predetermined quantity of shredded tobacco from said storage reservoir;
a classifying means disposed beneath for receiving shredded tobacco from said feeding means to classify said shredded tobacco based on required grain length thereof into short shredded tobacco and long shredded tobacco; and
a cutting means disposed adjacent one end of said classifying means for cutting long shredded tobacco classified by said classifying means into a proper length, said long shredded tobacco after being cut with said cutting means being rejoined with the other short shredded tobacco after classification for feeding into a dispersing device.

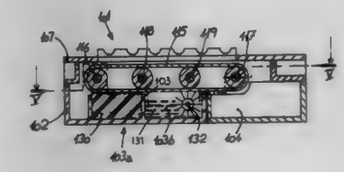


4,635,649

ELECTRICALLY OPERATED SELF-CLEANING ASHTRAY

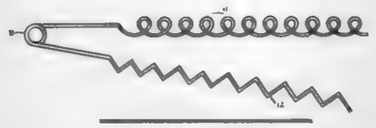
Gastone Zanello, Via Montere le 10, Pordenone; Giovanni Zago, Via N. Aprilis 41, San Quirino, and Giovanni Prataviera, Via Caorle 4, Pordenone, all of Italy

Filed Feb. 6, 1985, Ser. No. 698,727
Claims priority, application Italy, Feb. 14, 1984, 41527 A/84
Int. Cl.⁴ A24F *19/00*
U.S. Cl. 131—237 **13 Claims**



1. A self-cleaning ashtray comprising a box like case, an opening, a spray device, a web, web support means, a collecting bin, drive means, first actuation means and second actuation means, said opening being formed in said box-like case, said web support means being adapted for movably supporting said web in said box-like case, at least a portion of said web being at least temporarily locatable substantially below said opening, said collection bin being located in said box-like case, said web being adapted for transporting material deposited thereon to said collecting bin, said drive means actuatable for causing movement of said web on said web support means at least in a direction extending from below said opening towards said collecting bin, said spray device being accommodated in said box-like case and adapted for being actuated for spraying deodorizing fluid onto said web, said first actuation means and said second actuation means being mounted on said box-like case, said first actuation means being adapted for actuating said spray device, said second actuation means being adapted for actuating said drive means.

4,635,650
PIPE CLEANER
Gilbert W. Lindemann, 1032 W. Iowa Ave., St. Paul, Minn. 55117
Filed Apr. 22, 1985, Ser. No. 726,153
Int. Cl.[4] A24F *9/06*
U.S. Cl. 131—245 1 Claim



1. A device for cleaning tobacco residues from pipes, said device comprising:
a generally hairpin-shaped wire formed into a loop at one end and having two legs, one of which is coiled for the majority of its length and is capable of being used to clean tobacco residues from the bowl of a pipe by using a twisting and rotating motion, and the other of which is kinked for the majority of its length and is capable of being used to clean tobacco residues from the stem of a pipe by using a plunging motion, said legs being capable of being spread apart or pushed together.

4,635,651
PROCESS FOR THE INCLUSION OF A SOLID PARTICULATE COMPONENT INTO AEROSOL FORMULATIONS OF INHALABLE NICOTINE
Allen W. Jacobs, 12534 Oxnard St., #6, North Hollywood, Calif. 91606
Filed Aug. 29, 1980, Ser. No. 182,639
Int. Cl.[4] A24F *47/00*
U.S. Cl. 131—270 1 Claim

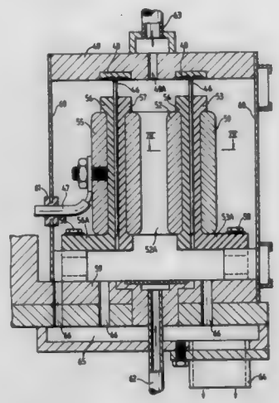


1. A process for the addition of a solid particulate component into a smokeless inhalable aerosol, which comprises the steps of providing a smokeless inhalable aerosol having nicotine as an active component; and introducing a solid particulate component into said smokeless inhalable aerosol with said nicotine being carried by the particulate component, in which the particle size of said solid particulate component is sufficiently fine to negotiate entry and deposition into the alveoli of the lungs and closely matches the optimum size range of non-exhaled smoke particles.

4,635,652
SMOKING COMPOSITION CONTAINING A NOVEL MONOACYLPYRAZINE FLAVORANT
Yoram Houminer; Everett W. Southwick, and David L. Williams, all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.
Filed Feb. 17, 1983, Ser. No. 467,412
Int. Cl.[4] A24B *15/38*
U.S. Cl. 131—278 5 Claims

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco and non-tobacco substitutes, and (2) between about 0.0001 and 2 weight percent, based on the total weight of filler, of 1-pyrazinyl-2,2-dimethyl-1-propanone flavorant.

4,635,653
SPARK PERFORATION OF WEB MATERIAL
Reginald C. Bolt; Derek H. Dyett, and Robert E. Williams, all of High Wycombe, England, assignors to Molins PLC, London, England
Filed May 19, 1983, Ser. No. 495,941
Claims priority, application United Kingdom, May 19, 1982, 8214558
Int. Cl.[4] A24C *5/47*
U.S. Cl. 131—281 22 Claims

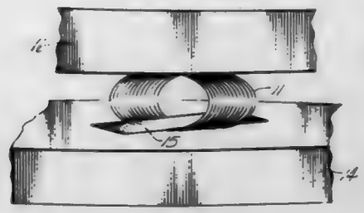


1. A method of producing filter cigarettes with a predetermined dilution factor, comprising perforating a filter attachment web by means of an adjustable perforating device prior to using portions of the web to join filters to cigarettes; measuring the porosity of the perforated web; measuring the dilution of cigarettes assembled with portions of the web; and controlling the perforating device by immediate response to the measured porosity and by progressive response to the dilution of the assembled cigarettes, the perforating device being controlled in response to the measured porosity, and the porosity reference being progressively compensated for changes in cigarette dilution.

4,635,654
METHOD FOR EVALUATING EFFICACY OF A HAIR STYLING PRODUCT
Roger A. Mathews, Newbury Park, and David W. Cassell, Los Angeles, both of Calif., assignors to Redken Laboratories, Inc., Canoga Park, Calif.
Filed Nov. 4, 1985, Ser. No. 794,740
Int. Cl.[4] A45D *7/00*
U.S. Cl. 132—7 24 Claims

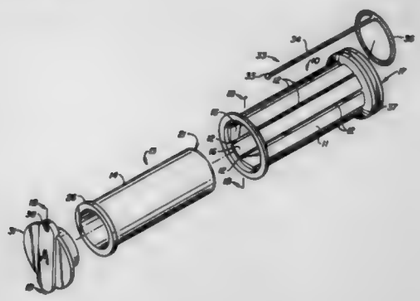
1. A method of evaluating efficacy of a hair styling product comprising:

forming a coiled tress of hair treated with such a hair styling product;
measuring the work of deformation of the coiled treated tress; and



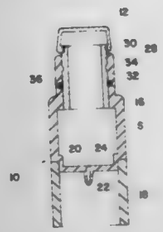
comparing the work of deformation of the coiled treated tress with the work of deformation of a coiled tress treated with water.

4,635,655
HAIR-WAVING ROD
Norman P. Paradise, 14554 Big Basin Way, Saratoga, Calif. 95070
PCT No. PCT/US83/00608, § 371 Date Apr. 16, 1984, § 102(e) Date Apr. 16, 1984, PCT Pub. No. WO83/03529, PCT Pub. Date Oct. 27, 1983
Continuation-in-part of Ser. No. 369,436, Apr. 19, 1982, Pat. No. 4,403,621. This PCT application Apr. 19, 1983, Ser. No. 604,691
Int. Cl.[4] A45D *2/00*
U.S. Cl. 132—40 3 Claims



1. A hair waving rod for use in giving a body wave to hair comprising:
a first member providing an outer wall having a generally cylindrical shape for wrapping strands of hair thereabout;
a second member providing an inner wall, said second member having a closed end and being positionable within said first member;
partitioning means between said inner and outer walls defining a plurality of slender axial passageways uniformly angularly spaced about the region between said walls, said plurality including at least four passageways;
a plurality of axial grooves in said outer wall, each groove permitting flow of fluid from one of said passageways;
means defining a closed end of said first member, said end-defining means having an inlet aperture;
means within the region between said enddefining means and the closed end of said second member for directing flow of fluid from said inlet aperture to said plurality of passageways, whereby hair treatment solution introduced under pressure into said inlet aperture will be uniformly distributed among said passageways and dispensed through said grooves to strands of hair coiled around said outer wall;
said second member and said partitioning means being formed to provide said passageways with a cross-sectional area sufficiently small that hair treatment solution directed to said passageways under pressure from said inlet aperture will flow the entire length of said passageways before being absorbed by said strands of hair; and
attachment means at opposite ends of said hair waving rod for securing thereto a means for retaining the hair in its wrapped configuration.

4,635,656
FINGERNAIL CLEANER COMPRISING FAUCET ATTACHMENT WHICH PROVIDES SHIELDED JET STREAM
Charles G. Daniel, 83 Sunrise Ave., Mill Valley, Calif. 94941
Continuation of Ser. No. 489,027, Apr. 27, 1983, abandoned. This application Jan. 14, 1986, Ser. No. 818,895
Int. Cl.[4] A45D *29/20*
U.S. Cl. 132—75 4 Claims



1. A fingernail cleaner, comprising:
a straight cylindrical housing having a flow passageway therethrough,
said cylindrical housing having open top and bottom ends,
the top end of said housing having attachment means thereat for attaching said cylindrical housing to a water tap such that water flowing out of said tap will flow into the top end of said housing,
a plate positioned across the passageway of said cylindrical housing intermediate said top and bottom ends thereof, said plate being mounted perpendicularly to the axis of said cylindrical housing,
said plate having top and bottom surfaces facing said open top and bottom ends, respectively, of said cylindrical housing,
said plate having an orifice therein,
a nozzle attached to and extending from said bottom surface of said plate and pointing to said open bottom end of said cylindrical housing,
said nozzle being positioned coaxially with said cylindrical housing and extending along the axis of said cylindrical housing from a central portion of said plate,
said nozzle having an orifice therethrough communicating with said orifice in said plate,
said orifice of said nozzle being arranged and shaped so that water forced therethrough from said tap will leave the tip of said nozzle in a high velocity jet stream which will be directed along the axis of said housing and directly at said bottom open end of said housing,
a bottom portion of said cylindrical housing forming a skirt which is positioned coaxially around said nozzle so as to form a shield completely surrounding the sides of said nozzle,
said bottom portion of said cylindrical housing being long enough so that the tip of said nozzle is spaced, in an axial direction, up from said bottom open end of said cylindrical housing so that a user can insert a finger up into said skirt portion and position said tip of said nozzle under the nail

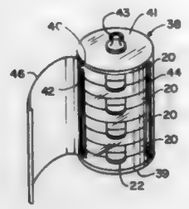
of said finger so that the jet of water leaving said tip of said nozzle will clean the area under said nail and so that said skirt will confine any splashing.

4,635,657

NAIL POLISH DISPENSING SYSTEM

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Filed Jun. 20, 1985, Ser. No. 746,642
Int. Cl.[4] A45D *33/00*
U.S. Cl. 132—83 R **2 Claims**



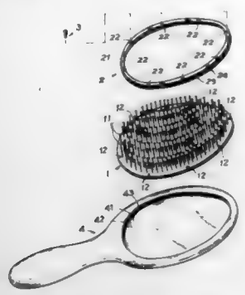
1. A system for preventing accumulation of partially used nail finishing materials, for avoiding use of gummy nail finishing materials and for displaying type and quantity on hand of nail finishing materials used in sets, comprising: a plurality of separate containers, each container proportioned for holding one application of nail finishing materials, a holder proportioned for holding one container on top of another, the plurality of containers containing a said set, a tree having a plurality of arms, each arm proportioned for suspending one holder therefrom, each container being disk-like in shape with interfitting top and bottom; said holder being cylindrical in shape with top and bottom, structure forming an opening longitudinally along one side of the holder for receiving and dispensing a plurality of said containers, the structure forming said opening proportioned for retentively fitting the circumference of each container and causing it to snap through the opening when removed therefrom, a door for closing said opening comprising a flexible arcuate member hinged at one side of the opening, said door having a hook-shaped free end, a first channel at an edge of said opening for engaging and holding closed said door hook-shaped free end, each container having a handle radially protrusive therefrom, and said holder and door proportioned for the door to press on said handles when closed.

4,635,658

MODIFIED FIXING MEANS FOR COMB BRISTLES

Che-Yuan Chang, P.O. Box 10160, Taipei, Taiwan

Filed Nov. 27, 1984, Ser. No. 675,413
Int. Cl.[4] A45D *44/18*
U.S. Cl. 132—85 **2 Claims**



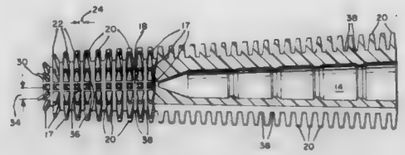
1. A modified fixing means for comb bristles comprising:
a bristle base formed with a plurality of bristles on said base and formed with a first set of several fixing holes along the periphery of said base, said base being made of yielding material for inserting a fixing bolt through each fixing hole;
a fixing frame having an upper rim surface formed with a second set of several fixing holes corresponding to said fixing holes on said bristle base, a side rim edge bent downwards from said upper rim surface and a ratchet extension formed on the lower portion of said side rim edge;
several fixing bolts each assembling said fixing frame and said bristle base; and
a comb body having a recessed back portion, a recessed periphery disposed on the periphery of said recessed back portion and an embedding groove further recessed from said recessed periphery,
the improvement which comprises:
said fixing bolt including a shank portion having the same diameter as that of said fixing hole of said bristle base, a head formed on the top portion of said shank, a round tip formed on the lowest portion of said shank and an inversed truncated cone portion intermediate said shank and said tip, said inversed truncated cone portion expanded upwards to form a shoulder portion whose diameter is slightly larger than that of said shank and larger than said fixing hole on said bristle base, but slightly smaller than the diameter of said fixing hole on said fixing frame, said head having a diameter slightly larger than that of said fixing hole on said fixing frame, whereby said fixing bolt is inserted into both said fixing holes of said fixing frame and said bristle base to assemble said base and said frame together as locked by said inversed truncated cone portion of said bolt, and the combination of said base and said frame is then inserted into said recessed back portion of said comb body to form a comb easily and fastly by engaging said ratchet extension of said fixing frame with said embedding groove of said comb body.

4,635,659

MASCARA APPLICATOR

Walter Spatz, Los Angeles, Calif., assignor to Spatz Laboratories, Inc., Marina Del Ray, Calif.

Filed Jan. 5, 1984, Ser. No. 568,415
Int. Cl.[4] A45D *40/26*
U.S. Cl. 132—88.7 **1 Claim**



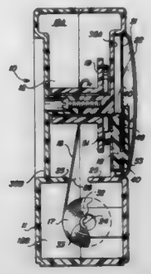
1. A method of manufacturing a mascara applicator comprising:
a. molding the head of an applicator producing a preform core having at least seven axially aligned substantially parallel fluke lines, each said fluke line separated from adjacent fluke lines by an axially aligned channel; and
b. grinding a plurality of outwardly tapered, evenly spaced grooves into said fluke lines, said grooves being substantially perpendicular to the axis of the applicator.

4,635,660

ANIMATED DENTAL FLOSS DISPENSER

Rodney J. Graves, Phoenix, Ariz., assignor to E & J Enterprises, Inc., Phoenix, Ariz.

Filed Nov. 4, 1985, Ser. No. 794,680
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—92 A **8 Claims**



1. An animated dental floss dispenser comprising:
a hollow housing displaying an animated character on one outer surface thereof and having a simulated open mouth showing its teeth,
a slot formed in said surface immediately below the teeth of said character,
a pair of spaced hands having a simulated piece of dental floss extending therebetween mounted in front of said mouth and having a pair of spaced pins mounted thereon to extend through said slot and into said housing,
a cam wheel mounted behind said animated character and in said housing,
cam means mounted on said cam wheel for engaging said pins and moving said pins to cause said hands to move back and forth through an arcuate path in front of said teeth simulating a tooth flossing operation,
said cam means comprising a surface for engaging a piece of floss passing thereover for rotation of said cam means upon predetermined movement of a piece of said floss out of said housing, and
a spool of floss mounted in said housing adjacent said cam means,
said housing having a first aperture extending therethrough, whereby when a piece of the floss from said spool is fed over said surface and through said first aperture and is pulled outwardly of said housing, its movement causes rotation of said cam means and movement of said hands simulating the flossing of the teeth of the animated character.

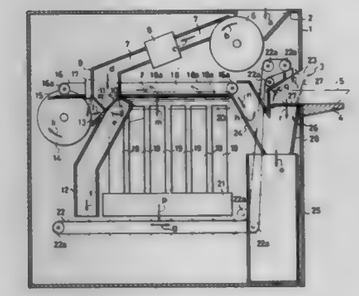
4,635,661

AUTOMATIC COIN DEPOSITING AND PAYING MACHINE

Yoshiaki Uematsu, Numazu, and Hideshi Sentoku, Tokyo, both of Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 510,587, Jul. 5, 1983, abandoned. This application Jan. 3, 1985, Ser. No. 688,546
Claims priority, application Japan, Jul. 9, 1982, 57-119243
Int. Cl.[4] G07D *3/00*
U.S. Cl. 133—3 R **5 Claims**

1. An automatic coin depositing and paying machine, said machine comprising:
a machine body;
an inlet opening defined by said body for receiving coins therethrough;
a first discriminator for discriminating the kinds and genuineness of coins received through said inlet;
storage means for temporarily storing all of the coins received in a single transaction after each of the coins have been discriminated by said first discriminator, said storage means including two shutters for dispensing coins after the coins have been temporarily stored;
a horizontal transfer passage for receiving genuine coins from said storage means through one of said two shutters;
a second discriminator disposed in the path of travel of coins on said horizontal transfer passage for discriminating the kinds of coins;
a plurality of coin storing tubes disposed below and along said horizontal transfer passage for respectively storing coins in accordance with the kinds of coins discriminated by the second discriminator;
a pay-off mechanism for paying off coins one by one from a lower portion of the coin storing tubes;



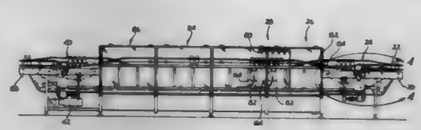
a lift belt for receiving coins paid out from the pay-off mechanism and for transferring the coins in an upward direction;
an exit defined by said body for receiving coins from the lift belt and for passing the coins through said exit;
a safe for receiving coins to be stored when at least one of the coin storing tubes is full of coins;
a recovery hole defined by said body providing a communication path between said safe and said exit; and
a recovery cover mounted on said body for opening and closing said recovery hole, said recovery cover being closed to prevent passage of coins from entering said recovery hole (1) when coins are paid out by said pay-off mechanism and (2) when an improper coin is detected by said first discriminator.

4,635,662

INLINE BOTTLE RINSER WITH QUICK BOTTLE SIZE CHANGEOVER CAPABILITY

Roger W. Tottes, Ventura, Calif., assignor to Industrial Automation Corporation, Goleta, Calif.

Continuation of Ser. No. 445,283, Nov. 29, 1982, abandoned. This application Feb. 11, 1985, Ser. No. 700,408
Int. Cl.[4] B08B *9/00*
U.S. Cl. 134—68 **19 Claims**



1. An inline bottle rinser comprising;
a transport system having a continuous chain defining a transport path having an infeed end, an outfeed end and a rinse region therebetween, said transport system defining a substantially straight path through said rinse region, said chain having a plurality of equally spaced carrier mounting means thereon, each for receiving and supporting a bottle carrier;

a transport system drive means for driving said continuous chain along said transport path;

a plurality of equally spaced first bottle carriers, each for receiving and supporting a bottle therein, each said first bottle carrier being rotatably coupled to one of said carrier mounting means for rotation between bottle upright and bottle inverted positions;

bottle carrier guide means for guiding said first bottle carriers to a bottle upright orientation at the said infeed end of said transport path, a bottle inverted orientation in said rinse region and back to a bottle upright orientation at said outfeed end;

infeed means for feeding bottles into said first bottle carriers at said infeed end;

outfeed means for removing bottles from said first bottle carriers at said outfeed end;

a rotating spray head assembly, said spray head assembly being disposed below said rinse region for rotation as a unitary assembly about the central horizontal axis thereof, and having a plurality of spray heads thereon, each for directing a stream of water substantially radially from said central axis into an inverted bottle spaced from and passing thereabove, whereby a stream of water is directed into each inverted bottle passing thereby;

chain drive means coupled between said transport system and said spray head assembly for driving said spray head assembly from said transport system at a speed proportional to the speed of said transport system, said chain drive means including a first sprocket associated with said transport system and rotating therewith about a horizontal axis, a second sprocket coupled to said spray head assembly, and a drive chain encircling said first and second sprockets, whereby said first sprocket will tension the drive side of the chain between said first and second sprockets to cause rotation of said second sprocket therewith;

adjustment means for adjusting the elevation of said rotating spray head assembly with respect to said transport system, said adjustment means including support means for supporting said spray head assembly to provide controllable movement of said spray head assembly in an arc in a vertical plane, including synchronizing means for varying the drive side length of the chain between said first and second sprockets as said spray head assembly is moved for maintaining synchronization between said spray head assembly rotation and said first bottle carrier movement with respect thereto, whereby elevational adjustments, to allow rinsing bottles of a different height, may be made for said rotating spray head assembly dependent upon the elevation of the openings in the bottles in the rinse region and still continue to direct a stream of water into each inverted bottle passing thereby.

4,635,663

SELF-CONTAINED, SINGLE-USE HOSE AND TUBING CLEANING MODULE

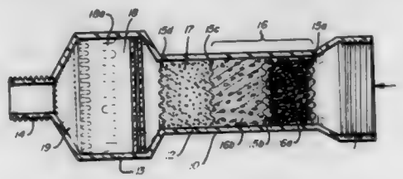
Fred P. Rollins, and James S. Glass, both of Las Cruces, N. Mex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 3, 1985, Ser. No. 783,886
Int. Cl.[4] B08B *3/10*
U.S. Cl. 134—93 **7 Claims**

1. A tube cleaning module comprising:

(a) one substantially cylindrical body containing, in sequence from a water inlet end to a water outlet end, a means for water purification, a detergent dispensing means for tube cleaning and a filtration means;

(b) a first attachment means carried by the water inlet end of the body for attaching the body to a water source; and



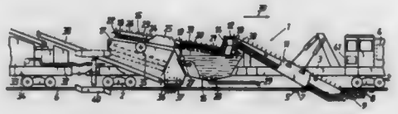
(c) a second attachment means carried by the outlet end of the body for attaching the tube to be cleaned.

4,635,664

MOBILE BALLAST CLEANING MACHINE

Josef Theurer, Vienna, and Friedrich Oellerer, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Oct. 15, 1984, Ser. No. 660,691
Claims priority, application Austria, Jan. 19, 1984, 182/84
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—131 **8 Claims**



1. A mobile machine for cleaning ballast supporting a railroad track, which comprises

(a) an elongated machine frame;

(b) an endless ballast excavating and conveying chain adjustably mounted on the machine frame;

(c) a ballast screening installation arranged to receive the excavated ballast conveyed by the endless chain; and

(d) apparatus for washing the excavated ballast conveyed by the endless chain, the washing apparatus comprising

(1) an elongated conveyor having an input end adjacent the endless ballast excavating and conveying chain and receiving the excavated ballast conveyed by the endless chain and conveying the received ballast in a conveying path to the ballast screening installation,

(2) a water tank mounted on the machine frame below the elongated conveyor, the elongated conveyor extending above the water tank and the screening installation,

(3) a series of nozzles directed towards the conveying path and receiving water from the tank,

(4) drainage means comprising a sieve defining drainage openings for returning the water from the elongated conveyor to the water tank,

(5) a trough having a bottom and an open top, a portion of the bottom of the trough being constituted by the sieve, the nozzles delivering water from the tank into the trough, the entire elongated conveyor being guided in, and through, the trough, the trough and the elongated conveyor extending above the water tank and the ballast screening installation, and the bottom portion of the sieve extending over the water tank,

(6) a storage tank for storing water, and

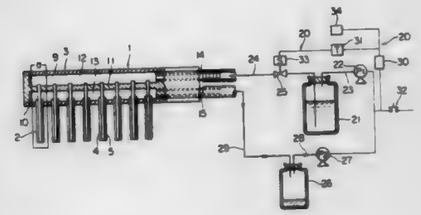
(7) a water delivery conduit arranged to deliver stored water from the storage tank to the water tank whereby the water in the water tank may be maintained at a substantially constant level, the input end of the elongated conveyor being disposed at least partially below the water level.

4,635,665

WASHING APPARATUS

Yuzaburo Namba, Yatabe, and Shigenori Kukisaki, Sayama, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1984, Ser. No. 574,033
Claims priority, application Japan, Feb. 1, 1983, 58-13557[U]
Int. Cl.[4] B08B *9/04*
U.S. Cl. 134—167 R **5 Claims**



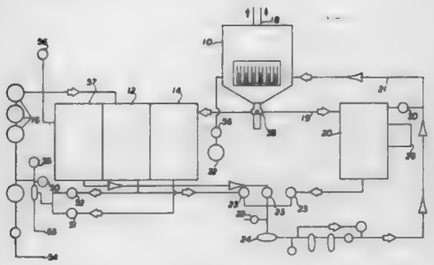
1. In a micro well washing apparatus including at least one pipe assembly having a pouring pipe for pouring a wash liquid into micro wells, a suction pipe for sucking away waste wash liquid from within said micro wells and a holding means for holding at least one pipe assembly, the improvement comprising providing at least one dual-pipe assembly with a pouring pipe disposed inside of a suction pipe and the forward end opening portions of both pipes being in substantially the same plane, said dual pipe assembly being configured such that at least the forward opening portions of both pipes are disposable within a micro well, movement means for controlled vertical movement of said pipe assembly so that said forward opening portions of both pipes are disposable at both the opening of the micro well and near the bottom thereof, and means for simultaneously supplying wash liquid to said pouring pipe and suction to said suction pipe, whereby wash liquid is poured into and sucked from said micro well at positions of the forward opening portions of both pipes which include the position of the opening of the micro well and the position of near the bottom of the micro well.

4,635,666

BATCH CLEANING APPARATUS

Frank E. Daley, 2001 83rd Ave. North #4031, St. Petersburg, Fla. 33702, and Richard H. Wilhelm, P.O. Box 5742, Clearwater, Fla. 33518

Filed Apr. 22, 1985, Ser. No. 725,989
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—172 **11 Claims**



1. An apparatus for cleaning articles, such as printed wiring assemblies, in a batch fashion, comprising:

an action chamber having enclosing walls,

a spray header assembly arranged for vertical movement within said action chamber walls,

guide means for controlling the movement of said spray header assembly,

a plurality of elongated support members mounted in spaced rows on said spray header assembly,

a plurality of spray nozzles arranged in spaced relation on said support members,

a holding device for holding the articles to be cleaned, said holding device arranged to receive and hold the articles vertically in separate spaced rows, the spacing between the rows being sufficient to receive said support members in between the rows of articles to be cleaned so that said spray nozzles can move progressively along the surfaces of the articles,

spray header controlling means for advancing and retracting said spray header inside said action chamber,

said spray header including means for changing the spacing between said support members to allow the cleaning of assemblies having different widths,

apparatus cycling means for operating said apparatus in a washing cycle, a rinsing cycle, a deionizing cycle, and a drying cycle,

a purging means for purging the spray header between cycles to substantially eliminate cross-contamination between the wash, rinse and de-ionizing cycles,

an air distribution header positioned in closely spaced relation to said spray header,

a plurality of elongated support members mounted in spaced rows on said air distribution header,

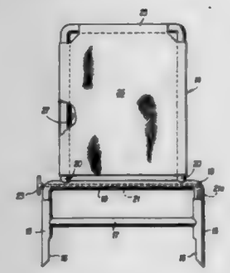
and said support members having a plurality of slots formed therein so that air can be blown therethrough to impinge upon and dry said articles.

4,635,667

SUN PROTECTION CANOPY

James E. Hara, P.O. Box 345, Richmond Hill, Ga. 31324

Filed Mar. 22, 1985, Ser. No. 714,985
Int. Cl.[4] E04H *15/04*; A47C *7/10*; F16B *7/10*; E05C *17/64*
U.S. Cl. 135—90 **7 Claims**



1. A canopy for use with recreational chairs to provide sun protection comprising two leg members of tubular construction, each leg member having a free end and an other end, said free end of each leg member terminating in a U-shaped slot formed by removal of a radial segment of said tubular leg member along a portion of its axial length so as to provide directly opposed concave segments adapted to matingly fit over the tubular frame of a chairback, said leg members being held apart with the leg slots in facing relationship by a connecting member of tubular construction, each of said leg members having connecting means at the other end thereof, said connecting means having a face adapted to rotatably contact an end face of said connecting member, a rod extending through said connecting member and having one end attached to a first leg member, the other rod end extending through the opposite end of the connecting member and through the other leg member, tensioning means attached to the rod end extending through said opposite end of the connecting member whereby tension can be applied to adjust the pressure between the rotatably contacting faces of said legs and said connecting member, a generally U-shaped frame member, the two ends of

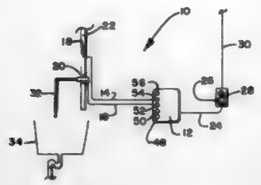
said frame member attached at the ends of said connecting member, said frame member extending outwardly from said connecting member in a generally planar configuration, the said legs held in spaced apart relationship, and said tensioning means being adapted to allow and to stop rotation of said connecting member whereby the canopy frame memer is readily adjustable in position.

4,635,668

AUTOMATIC WATER LINE FREEZE CONTROL

Aaron J. Netter, Box 400, Waite Park, Minn. 56387

Filed Sep. 13, 1985, Ser. No. 775,777
Int. Cl.[4] E03B *7/10*; F16L *55/00*
U.S. Cl. 137—62 **10 Claims**



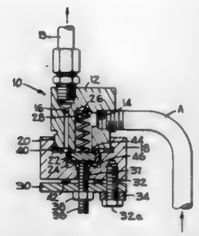
10. Apparatus for automatically controlling flow in a water line to avoid freeze damage, comprising:
a temperature sensor adapted for connection to the water line;
a normally-closed valve adapted for connection to the water line;
timing control means connected to said valve;
a clock connected to said timing control means:
a pluality of latches connected between said temperature sensor and said timing control means, said latches having different predetermined setpoint temperatures ranging between predetermined upper and lower temperatures above freezing;
said timing control means being programmed to open and close said valve periodically for predetermined time intervals between predetermined decreasing time delays in accordance with successive setting of said latches and decreasing temperature of water in the water line; and
indicator means connected to said control circuit means for indicating proximity to freezing of the temperature of water in said water line.

4,635,669

TEMPERATURE RESPONSIVE FLUID CONTROL VALVE

Henry-Albert Thoor, Villeneuve-sur-Yonne, France, assignor to FMC Corporation, Chicago, Ill.

Filed Mar. 6, 1984, Ser. No. 586,616
Claims priority, application France, Mar. 8, 1983, 83 03754
Int. Cl.[4] F16K *17/38*
U.S. Cl. 137—79 **3 Claims**



1. A temperature responsive fluid control valve for opening a pressure relief line in a fluid circuit installation when subjected to dangerous temperature increases, said valve comprising:
(a) an inlet-outlet body having an inlet port, an outlet port, and a chamber for a flow control element biasing means, said chamber having an inlet in communication with said inlet port and an outlet with a first annular lip-type seat for a flow control element;
(b) a seat body releasably secured to the inlet-outlet body and having a flow control element chamber in communication with the biasing means chamber and the outlet port, said seat body also having a bore extending from its exterior to the flow control element chamber;
(c) a second annular lip-type seat in the flow control element chamber, said second lip-type seat surrounding the bore and spaced from and opposed to the first lip-type seat;
(d) a plug-type flow control element supported within the flow control element chamber for movement between its closed position against the first annular lip-type seat and its open position against the second annular lip-type seat;
(e) spring means in the biasing means chamber biasing the flow control element towards the second annular lip-type seat; and
(f) a temperature responsive retention system for releasably holding the flow control element in its closed position against the first annular lip-type seat until the ambient temperature rises to a dangerous level, said system comprising:
(1) a support plate for the flow control element,
(2) a plurality of threaded fastening means extending freely through the support plate into threaded engagement with the seat body to movably secure the support plate thereto;
(3) a washer-like fusible spacer surrounding each fastening means and cooperating therewith to prevent movement of the support plate away from the seat body so long as the ambient temperature is below a predetermined level, and
(4) a screw-like compression element threaded through the support plate and extending freely through the bore in the seat body into the flow control element chamber for holding the flow control element on the first lip-type seat in opposition to the biasing means,
whereby fusion of the fusible spacers facilitates movement of the support plate away from the seat body and the flow control element off of the first lip-type seat towards the second lip-type seat, thereby establishing flow communication between the inlet and outlet ports to permit fluid to flow through the valve.

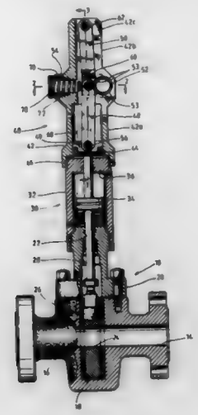
4,635,670

HEAT SENSITIVE VALVE

James E. Kilmoyer, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Dec. 6, 1985, Ser. No. 805,703
Int. Cl.[4] F16K *17/14*
U.S. Cl. 137—75 **11 Claims**

1. A heat sensitive valve comprising
a body having an inlet, an outlet and a valve chamber therebetween with a valve seat in said valve chamber surrounding the opening of one of said inlet and said outlet into said valve chamber,
a valve member movably positioned in said chamber to coact with said seat to open and close flow through said valve,
a bonnet secured to said body and having an opening therethrough,
a valve stem connected to said valve member and extending through said bonnet opening,
means connected to said stem for actuating said valve member to its open and closed positions,
linkage means engaging and supporting the outer end of said valve stem in its innermost position, and
heat responsive means retaining said linkage means in said stem supporting position,
said heat responsive means upon exposure to excessive heat releases said linkage to remove support of said valve stem allowing outward movement thereof to close flow through said valve,
said linkage means in its supporting position extending to an



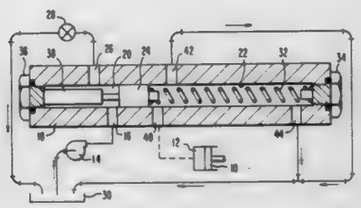
almost straight position and said heat responsive means including
a heat sensitive tube engaging said linkage means with its exterior cylindrical surface to retain said linkage means in its extended position and when subjected to elevated temperatures above a preselected temperature said tube releases said linkage means to allow it to pivot and the valve member to move to its outermost position.

4,635,671

FLOW AND PRESSURE CONTROL VALVE SYSTEM

Herman H. Viegas, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Aug. 14, 1985, Ser. No. 765,737
Int. Cl.[4] F16D *25/14*
U.S. Cl. 137—102 **4 Claims**



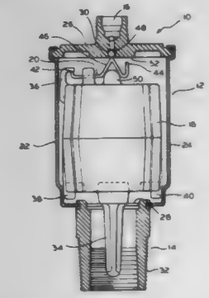
1. A flow and pressure control system for controlling the flow and pressure of the fluid to be selectively supplied to an actuatable device from a positive displacement pump, comprising:
a fluid reservoir from which said pump draws fluid;
control valve means including a body having an axial bore with an axially movable piston therein;
means biasing said piston toward one pressure end portion of said bore;
first and second ports, opening to said bore, in said one pressure end portion;
said pump having its discharge connected to said first port;
means including a two-way valve connecting said second port to said reservoir;
stop means preventing said piston from moving to a position blocking said first and second ports;
third radial port means, opening to said bore, in communication with said actuatable device;
fourth radial port means, opening to said bore, in communication with said reservoir;
said third and fourth port means being located, along the axial length of said bore and relative to the movable path of said piston, such that said third and fourth port means are out of communication with said one pressure end portion of said bore when said piston is in its stop position with said two-way valve open; and
said third and fourth port means further being axially located, relative to each other, such that said third and fourth port means are successively placed in communication with said one pressure end portion as said piston is progressively retracted against said spring with said two-way valve closed, so that said actuating device is first actuated by the fluid pressure and the fluid pressure is then regulated in accordance with the position of said piston relative to said fourth port means.

4,635,672

AIR VENT

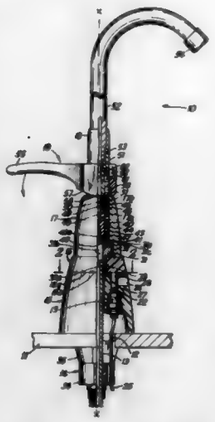
Sol Baker, Indianapolis, Ind., assignor to ITT Corporation, New York, N.Y.

Filed Aug. 22, 1985, Ser. No. 768,453
Int. Cl.[4] F16K *31/18, 33/00*
U.S. Cl. 137—202 **13 Claims**



1. A vent for venting air from a system of the type which conducts fluid under pressure, said vent comprising:
a chamber having sidewalls, a top wall, and an input port arranged to be in fluid communication with said system;
a valve within said chamber top wall, said valve including a ball element;
a float within said chamber, said float being arranged for vertical movement within said chamber responsive to the level of said fluid within said chamber; and
lever means coupled to said float for opening and closing said valve responsive to the vertical position of said float within said chamber, said lever being arranged to pivot about a point on the inner chamber surface of said top wall as said valve is opened and to be disengaged from said top wall after said valve is opened;
said lever further including an inverted-v portion having an apex, said ball element being secured to said lever at said apex; and
said float further including guide means comprising a projection from said float, said projection being in contact with the adjacent inner walls of said inverted-v portion of said lever for guiding said ball element into seating position within said valve.

4,635,673
ACCESSORY FAUCET
Gerald E. Gordos, Wallingford, Conn., assignor to WPM, Inc., Waterbury, Conn.
Filed Mar. 5, 1985, Ser. No. 708,287
Int. Cl.⁴ F16K *31/52, 31/60*
U.S. Cl. 137—216 **20 Claims**

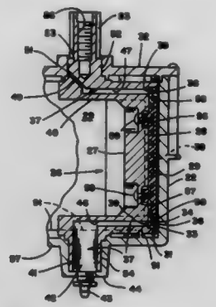


1. An accessory faucet, comprising in combination a threaded pipe conduit for connection to a water inlet; a faucet outlet; a hollow housing positioned between the threaded pipe conduit and the faucet outlet; means connecting the housing to the threaded pipe conduit; valving means within the housing to control water passage from the threaded pipe conduit to the faucet outlet; a handle to operate the valving means; a separable plastic air-gap module slidable over the threaded pipe conduit and positioned below the housing to surround the threaded pipe conduit; said air-gap module having an upper surface, a side wall, and generally vertical brine inlet and outlet passages formed in the plastic for connection at the bottom thereof to a brine tube from a reverse osmosis system and a brine tube to waste respectively, and an air-gap opening to atmosphere formed in the plastic through the side wall along the brine outlet passage, a generally horizontal closed channel connecting the brine inlet and outlet passages at the top of the air-gap module; means overlying the air-gap module and closing off the top openings of the brine inlet and outlet passages from atmosphere, said overlying means and said air-gap module together defining therebetween the generally horizontal closed channel; and, means attachable to the threaded pipe conduit to hold the accessory faucet in assembled condition on a sink lip or the like.

4,635,674
DIVERTER VALVE ASSEMBLY AND METHOD
Peter Bajka, 725 Casita Way, Los Altos, Calif. 94022
Filed Feb. 24, 1986, Ser. No. 832,069
Int. Cl.⁴ F16K *5/22*
U.S. Cl. 137—246.22 **8 Claims**

1. In a diverter valve having a valve housing with a plurality of openings spaced circumferentially about a central axis of said housing, a diverter member mounted in said housing for rotation about said axis and having a radially outwardly extending portion, and a diverter portion substantially mating with the interior surface of said housing proximate said openings and extending circumferentially about said axis a distance sufficient to span across one of said openings upon positioning of said diverter portion in front of said one of said openings, a seal assembly carried by said diverter portion and slidably sealing against fluid flow between said diverter portion and said interior surface, and lubricant passageway means formed in said housing and through said radially outwardly extending portion for the flow of a lubricant therein, said diverter portion includes a removable arcuate retention plate means, wherein the improvement in said diverter valve comprises:

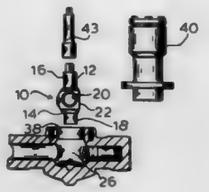
said seal assembly being formed as an endless ring-type flexible seal member mounted to said diverter portion and disposed between and in abutting engagement with said passageway means and said arcuate plate means to slidably engage said interior surface, said flexible seal member being dimensioned to extend around said one of said openings when said diverter portion is positioned in front of said one of said openings, said flexible seal member having



two resiliently displaceable side-by-side endless ribs defining an endless groove therebetween encircling said one of said openings, and

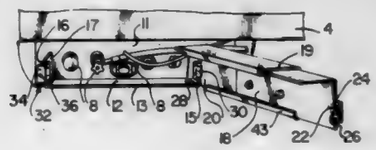
said lubricant passageway means including passageway portions extending through said flexible seal member to said endless groove for the discharge of lubricant between said diverter portion and said interior surface from said endless groove to provide lubrication for easy rotation of said diverter member without the need for diassemble of said diverter valve.

4,635,675
FLAT SIDED BALL VALVE
John F. Walter, North Kingston, R.I., assignor to Crosby Valve & Gage Company, Wrentham, Mass.
Filed Oct. 15, 1981, Ser. No. 311,705
Int. Cl.⁴ F16K *5/06*
U.S. Cl. 137—315 **8 Claims**



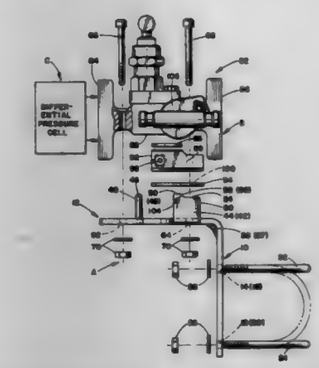
1. A ball valve comprising:
a housing assembly;
a valve chamber defined by said housing assembly;
an opening within said housing assembly providing access to said valve chamber;
a ball member positioned within said valve chamber, said ball member having a bore extending therethrough;
a first conduit in fluid communication with said valve chamber;
a second conduit in fluid communication with said valve chamber;
a detachable member secured to said housing assembly to allow removal of said ball member through said opening when said detachable member is removed from said housing assembly;
seating means within said housing assembly for sealingly engaging said ball member;
means resiliently urging said seating means towards said ball member;
means for rotating said ball member;
said ball member including a first external surface portion capable of sealingly engaging said seating means when positioned adjacent thereto when said ball member is rotated to a first rotational position, thereby preventing flow in a first direction from one of said conduits to the other of said conduits;
said ball member further including a second external surface portion which does not sealingly engage said seating means when positioned adjacent thereto in a second rotational position of said ball member, said ball membe being removable from said chamber without the necessity of retracting said seating means while in said second rotational position;
said ball member capable of being rotated to a third rotational position where said bore establishes fluid communication between said first and second conduits.

4,635,676
PROTECTIVE PROPANE TANK CONTROL HOUSING ASSEMBLY
Edmund W. Reilley, P.O. Box 1538, Kelowna, British Columbia, Canada (V1Y 7V8)
Filed Dec. 2, 1985, Ser. No. 803,250
Int. Cl.⁴ B65D *25/00*
U.S. Cl. 137—354 **13 Claims**



1. A protective motor vehicle propane tank housing assembly, comprising:
(a) an elongated propane fuel tank having a set of controls disposed on the tank and spaced apart in a direction lengthwise thereon;
(b) a casing with an outwardly projecting elongated lower side panel, extending along the tank adjacent the set of controls thereon, and with first and second outwardly projecting opposed end panels, extending laterally on said tank from respective ends of the side panel, the side panel and end panels having coplanar outer side edges defining a side opening of said casing;
(c) a casing cover pivotally connected at a first end to the first end panel, so as to be swingable between a closed position in which said casing cover lies adjacent, and covers, the side opening of said casing, and an open position outwardly pivoted from the closed position, the casing cover having a first flange extending from a second end thereof, and
(d) a second flange extending from the second end panel of said casing, so as to mate with the first flange when said casing cover is closed, and allow a lock to extend between the first and second flanges to lock said casing cover in the closed position.

4,635,677
VALVE MANIFOLD MOUNTING BRACKET
Ray D. Linderman, Streetsboro, and Peter C. Williams, Cleveland Heights, both of Ohio, assignors to Whitey Co., Highland Hts., Ohio
Filed Apr. 24, 1985, Ser. No. 726,417
Int. Cl.⁴ F16L *5/00*
U.S. Cl. 137—356 **11 Claims**



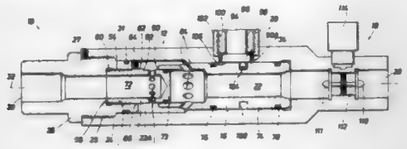
1. A mounting bracket for securely fastening a differential pressure cell and a valve manifold to a support structure, said mounting bracket comprising:
a bracket body defined by first and second generally planar legs disposed in an angularly disposed relationship with each other and being joined at an interface area;
means associated with said first leg for interchangeably securing the mounting bracket to an associated support structure;
plural support members extending substantially normal from the plane of said second leg and defining a support plane supportingly engaging an associated valve manifold at some predetermined distance from said second leg; and,
said plural support members including at least first, second, and third support members, said first support member being disposed at a narrowed width portion of said second leg spaced toward a free terminal end thereof, and said second and third support members being spaced along said second leg intermediate said first support member and said interface area, said second and third members each having a pair of surfaces adapted to accommodate different associated valve manifold configurations, and said support members adapted to receive a steam block therebetween while allowing said supporting engaging relationship between said second leg and said valve manifold as well as associated piping therewith to be continuously maintained.

4,635,678
FLOW CONTROL APPARATUS
Charles P. Peterman, and Julian D. Keithahn, both of Houston, Tex., assignors to Hydril Company, Los Angeles, Calif.
Filed Jan. 16, 1985, Ser. No. 691,995
Int. Cl.⁴ F16K *1/36, 31/528*
U.S. Cl. 137—551 **13 Claims**

1. Flow control apparatus adapted for controlling a flow of fluid in a conduit, comprising:
a valve body having an inlet, an outlet and a flow passage communicating said inlet and outlet, each of said inlet and said outlet having means for connecting with said conduit to form a portion of the conduit, said valve body forming a longitudinal axis with said inlet and said outlet disposed on said longitudinal axis to form a substantially straight portion of the conduit;
a cylindrical seat member fixedly secured in said valve body

for directing flow through said flow passage of said valve body, said cylindrical seat member closed at a first end to form a central flow cavity communicating with said outlet, said cylindrical seat member having a plurality of radially opposed ports formed in said cylindrical seat member at a location spaced from said first end to direct the flow from said inlet radially inwardly through said opposed ports into said central flow cavity to impinge upon the opposed flow to minimize flow erosion of said cylindrical seat member;

a movable flow control sleeve concentrically disposed about said cylindrical seat member and movable longitudinally relative to said seat member to and from a closed position for blocking radially inwardly flow of fluid through said ports and an open position for enabling flow of fluid radially inwardly through said ports;



means for moving said flow control sleeve in said flow passage to and from the flow enabling and the flow blocking positions to regulate the fluid flowing through said flow passage;

sensor means mounted with said valve body for providing an output signal in response to the rate of flow through said flow passage, the signal usable by a flow rate determining system to measure the flow through said flow passage;

said movable flow control sleeve having a plurality of angular bypass openings radially disposed in said sleeve to communicate flow from said inlet to said flow passage adjacent said ports in said cylindrical seat member;

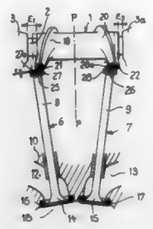
an annular shoulder formed on said sleeve for engaging with said cylindrical seat member to form a second annular seal when said sleeve is moved to the closed position for blocking flow of fluids through said ports, said second seal disposed between said ports and a second end of said cylindrical seat member.

4,635,679

SINGLE ROCKER DEVICE FOR ACTUATING TWO VALVES

Roger Lombard, Noisy-Le-Sec, France, assignor to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly-Sur-Seine, both of, France

Filed Nov. 15, 1985, Ser. No. 798,636
Claims priority, application France, Nov. 19, 1984, 84 17615
Int. Cl.⁴ F01L *1/26*
U.S. Cl. 137—601 **12 Claims**



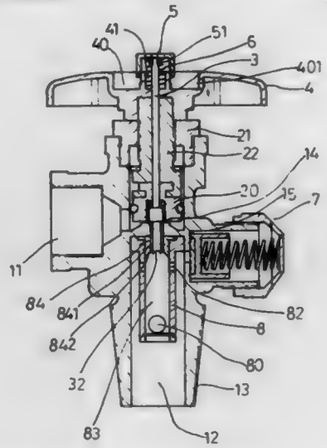
1. A device in combination with for actuating two valves including valve rods having ends, said device comprising a shaft, a rocker pivotally mounted on said shaft and comprising two arms, a boss on each arm cooperative with a respective one of said ends of said rods, each boss and respective rod end defining two cooperative contacting surfaces, one of which cooperative contacting surfaces is curved in the shape of a substantially spherical dome while the other of said cooperative contacting surfaces is planar, the two planar surfaces being inclined and disposed substantially symmetrically relative to a plane perpendicular to said shaft.

4,635,680

SAFETY GAS FLOW REGULATOR

Reuy-Feng Fang, No. 106, Po Ai Road, San Min District, Kaohsiung, Taiwan

Continuation-in-part of Ser. No. 576,309, Feb. 2, 1984. This application Sep. 10, 1985, Ser. No. 774,411
Int. Cl.⁴ F16K *15/00*
U.S. Cl. 137—614.18 **3 Claims**



1. A safety gas flow regulator comprising:

a body portion having an outlet at one side thereof, a vertical passage formed at a lower part thereof and in communication with the outlet, and an externally threaded portion at a lower end thereof;

a first seat formed on top of said body portion;

a second seat formed in said body portion and positioned lower than the outlet of said body portion;

a safety valve engaged with said second seat;

a tubular member which is hollow in structure and has along its length two holes being designed so that their center lines intersect each other at a point;

a sleeve mounted on top of said tubular member and having a hemispherical recess at bottom thereof;

a ball disposed in said tubular member;

a pin mounted at lower part of said tubular member for retaining said ball therein;

an exhaust mechanism engaged with the first seat, said exhaust mechanism having a threaded member connected to top of said body portion, a controlling member threadedly engaged with said threaded member, and a plug connected with a lower end of said controlling member;

a plunger rod extending downwardly through said exhaust mechanism and said sleeve, said plunger rod being provided with screw threads at top end thereof, an enlarged portion at a lower part thereof, and a recess at a lower end thereof;

an oil seal enclosing said plunger rod and disposed on top edge of the enlarged portion thereof;

a turning knob disposed on top of the threaded member of said exhaust mechanism and connected with top of the controlling member of said exhaust mechanism, said turning knob having a neck at center thereof;

a cap threadedly engageable with the neck of said turning knob and top end of said plunger rod; and

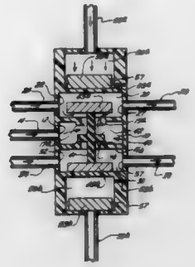
a spring disposed within the neck of said turning knob for urging said cap to move upwards.

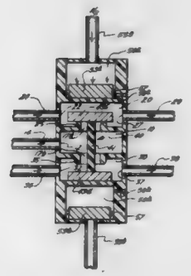
4,635,681

ALTERING FLOW OF GASEOUS SUBSTANCES

Steven I. Boldish, Plano, Tex., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 24, 1985, Ser. No. 779,527
Int. Cl.⁴ F16K *11/044, 11/048, 31/06*
U.S. Cl. 137—625.5 **14 Claims**





1. A system for selectively diverting and merging the continuous flow of one gaseous into the flow of one or the other of two other continuous gaseous steams which comprises:

(a) a first chamber having a gas entry port, and a pair of gas exit ports;

(b) a second chamber adapted to receive gas flowing through one of said exit ports, and additionally having a gas dischage port and a separate gas inlet port to receive another flow of gas;

(c) a third chamber adapted to receive gas flowing through the other of said exit ports, and additionally having a gas discharge port and a separate gas inlet port to receive another flow of gas;

(d) a pair of magnetic discs, one positioned within said second chamber and one positioned within said third chamber, said discs having interposed therebetween a stem traversing said first chamber and extending through, but not blocking, said pair of exit ports, said stem having intermediate its length a transverse port closure valve for sealing off one or the other of said pair of gas exit ports from the interior of said first chamber; and

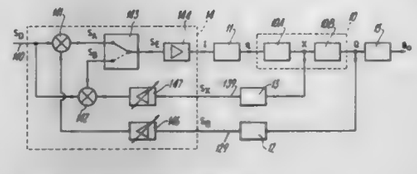
(e) means including a pair of magnets for alternatively magnetically repelling one or the other of said magnetic discs to cause the port closure valve to seal off from the interior of said first chamber the more remote of the gas exit ports.

4,635,682

HYDRAULIC VALVES WITH DUAL FEEDBACK CONTROL

Ronald B. Walters, Wembley, England, assignor to Vickers, Incorporated, Troy, Mich.

Continuation of Ser. No. 508,618, Jun. 28, 1983, abandoned. This application Mar. 14, 1985, Ser. No. 710,956
Claims priority, application United Kingdom, Jul. 2, 1982, 8219280
Int. Cl.⁴ F15B *11/02*
U.S. Cl. 137—625.64 **8 Claims**



1. A valve arrangement comprising

a pilot operated hydraulic spool valve,

means for sensing the position of the spool of the valve and producing an electrical flow feedback signal,

means for producing an electrical position feedback signal, and

means for summing the flow feedback signal and the position feedback signal with an electrical flow demand signal,

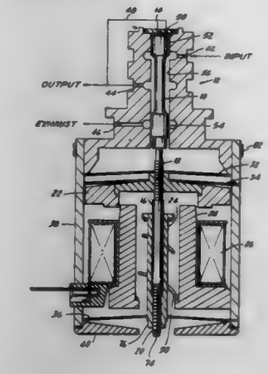
and means for comparing the two summed signals and selecting one of the summed signals as a final demand signal for the valve, the comparing and selecting means being operable normally to apply said flow feedback signal as a control signal for the valve, and operable to apply said position feedback signal as a control signal for the valve if the flow feedback signal indicates less than a predetermined mimimum flow for a given valve opening.

4,635,683

VARIABLE FORCE SOLENOID

Arnold D. Nielsen, Wayne, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 3, 1985, Ser. No. 783,393
Int. Cl.⁴ F16K *31/02;* **F15B** *13/044*
U.S. Cl. 137—625.65 **27 Claims**



1. A solenoid comprising:

coil means for inducing a magnetic flux when supplied with electrical current;

an actuator supported for linear displacement;

first spring means having a positive spring constant for applying to the actuator a force that changes as the dis-

placement of the actuator changes from a reference position;

second spring means having a negative spring constant over the operating range of actuator displacement for applying to the actuator a force that changes in the opposite direction and by substantially the same amount as the change of force of the first spring means as the displacement of the actuator position changes from a reference position; and

a magnetic circuit through which the induced magnetic flux passes tending to displace the actuator in accordance with the magnitude of electrical current supplied to the coil means.

4,635,684

TORSION BAR MOUNTING FOR A PROJECTILE WEAVING MACHINE

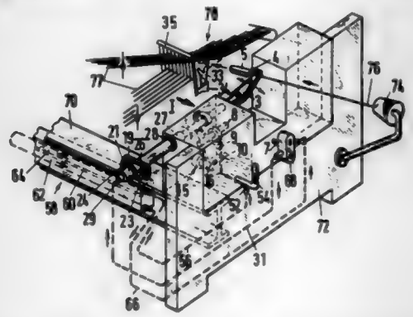
Otto Hintsch, Wallisellen, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Nov. 6, 1985, Ser. No. 795,429

Claims priority, application European Pat. Off., Nov. 13, 1984, 84113679.9

Int. Cl.⁴ D03J *1/00*

U.S. Cl. 139—1 R **16 Claims**



1. In a projectile weaving machine, the combination comprising

a torsion bar for picking a projectile across a shed within the machine;

a mounting for connecting said torsion bar to the machine to permit twisting of said bar about a longitudinal axis thereof during picking of a projectile; and

means for supplying a flow of oil to at least one end zone of said torsion bar at said mounting to flow along said torsion bar.

4,635,685

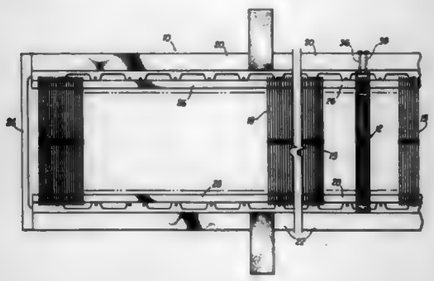
DETACHABLE BIFURCATED CENTER BRACE LOOM HARNESS

Leo L. Chabot, Marietta, Ga., assignor to Ellison, Pioneer Division, Atlanta, Ga.

Filed Apr. 24, 1985, Ser. No. 726,501

Int. Cl.⁴ D03C *9/06*

U.S. Cl. 139—91 **5 Claims**



1. An improved center brace apparatus for a loom harness of the type having upper and lower frame members and corresponding upper and lower supports upon which heddles are mounted comprising:

first and second elongated rod members extending in a spaced apart relationship between the upper and lower frame members forming a slot opening through which warp yarns pass;

a top bar extending between and connecting the top ends of said first and second elongated rod members;

at least one cross bar extending between said first and second elongated rod members wherein said at least one cross bar has a thickness less than that of said elongated rod members to permit heddles to be mounted between said first and second rod member;

a pair of feet connected to and extending inwardly from the bottom ends of said first and second elongated rod members;

a means for mounting said center brace to the loom harness.

4,635,686

METHOD FOR TREATING A WEFT YARN IN A SHUTTLELESS LOOM AND DEVICE FOR EFFECTING THE SAME

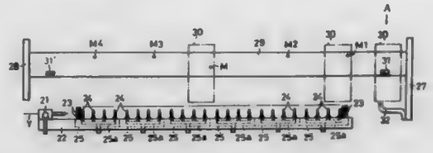
Kazunori Terasaki, Kariya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Oct. 16, 1985, Ser. No. 788,217

Claims priority, application Japan, Oct. 24, 1984, 59-223630; Oct. 24, 1984, 59-223631; Oct. 27, 1984, 59-226491; Nov. 9, 1984, 59-236920

Int. Cl.⁴ D03D *49/00*

U.S. Cl. 139—116 **7 Claims**



1. A method for treating a weft yarn in a shuttleless loom which has been stopped by a stopping signal, which comprises:

returning said shuttleless loom to form an open shed so as to release a weft yarn, which has been woven in a fabric just before the stoppage of said shuttleless loom, from its condition crossed by the warp yarns;

moving a weft yarn treating device, which is normally located at a standby position located at one side of said loom, in a widthwise direction of said shuttleless loom, and stopping said weft yarn treating device at a predetermined position along the width of said woven fabric;

inserting a weft yarn separating member, which is mounted on said weft yarn treating device, into the inside of said open shed from the outside of said open shed, at said predetermined position by rotating said weft yarn separating member, and separating said weft yarn from said woven fabric;

repeating said moving, inserting and separating operations at a plurality of positions along the width of said woven fabric;

further rotating said weft yarn separating member, at a position where said moving, inserting and separating operations last took place, from the inside of said open shed to the outside of said open shed, while a part of said separated weft yarn is engaged with said weft yarn separating member so as to withdraw said separated weft yarn to the outside of said open shed;

holding said withdrawn weft yarn on said weft yarn separating member by a weft yarn holding means, which is mounted on said weft yarn treating device, at the outside of said open shed so as to firmly hold said withdrawn weft yarn; and

removing the remaining part of said weft yarn, which continues to be connected to said part of said separated weft yarn, from the inside of said open shed, by moving said weft yarn treating device in a widthwise direction of said shuttleless loom.

4,635,687

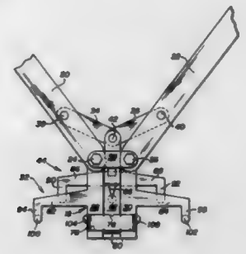
FENCE TOOL FOR WIRE CRIMPING AND WIRE CUTTING

Felix B. Romberg, P.O. Box 218, Holland, Tex. 76534

Filed Mar. 4, 1985, Ser. No. 707,951

Int. Cl.⁴ B21F *1/04*

U.S. Cl. 140—106 **7 Claims**



1. A wire cutting tool comprising;

a frame having a spaced apart pair of longitudinal frame members;

an elongated central member positioned between said frame members for longitudinally sliding operating movements relative thereto;

a wire cutting pair of members of which a first member is secured to each of said frame members and extends between said frame members over the central member;

the second member of said pair of wire cutting members being affixed to said central member;

a pair of operating levers, each pivotally secured at one end to separate ones of said frame members for swinging movements toward and away from each other;

a pair of toggle links pivotally connecting each of said levers with said central member, whereby movement of said levers to a widely spread position separates the pair of wire cutting members so that a wire may be received between them, and subsequent movement of said levers towards each other closes the space between the pair of wire cutting members to cut the wire in two;

wherein said frame members and said central member are substantially coplanar, each of said two longitudinal frame members and said central frame member being wide in a common plane; and

further having a structural member integrally connecting said frame members under said central member and confining said central member slidably between said frame members, adjacent said first wire cutting member beyond said second wire cutting member from where said toggle links are attached to said central member.

4,635,688

METHOD AND APPARATUS FOR MONITORING AND CONTROLLING PRODUCTION LINE FILLING OF RECEPTACLES WITH A PREDETERMINED WEIGHT OF VARIABLE DENSITY MATERIAL

Andre J. J. Graffin, La Ferte Bernard, France, assignor to Etablissements A. Bertaud, Vitrolles, France

Filed Nov. 15, 1984, Ser. No. 671,667

Claims priority, application France, Nov. 18, 1983, 83 18417

Int. Cl.⁴ B67C *3/26*

U.S. Cl. 141—1 **6 Claims**

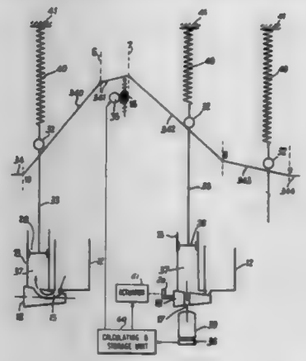
1. A method of filling receptacles (39) with a net reference value weight of a product in a filling installation which includes a rotary carrousel (3) having a plurality of filling stations, said method comprising the steps of:

(a) successively and individually introducing the receptacles on a filling station,

(b) weighing each receptacle while it is still empty,

(c) simultaneously with step (b), filling a corresponding product charging mechanism of a volumetric dispenser (37) including a transfer member (28) for positively moving said product, with an excess weight of product higher than said net reference value weight,

(d) filling each receptacle by continuously moving said transfer member so that product is transferred from said volumetric dispenser into a corresponding receptacle,



(e) simultaneously with step (d), continuously weighing said receptacle and comparing an instantaneous net weight of the product in the receptacle with said net reference value weight,

(f) interrupting said transfer and attendantly halting the movement of the transfer member as soon as the net weight in the receptacle is equal to said net reference value weight such that said excess weight of product remains in said charging mechanism, and

(g) resiliently absorbing lost further motion of the transfer member attendant with the halting thereof.

4,635,689

METHOD AND APPARATUS FOR MONITORING AND CONTROLLING THE FILLING OF RECEPTACLES WITH A DETERMINED WEIGHT OF MATERIAL

Andre J. J. Graffin, La Ferte Bernard, France, assignor to Etablissements A. Bertaud, Vitrolles, France

Filed Nov. 15, 1984, Ser. No. 671,668

Claims priority, application France, Nov. 18, 1983, 83 18418

Int. Cl.⁴ B65B *3/28, 3/32*

U.S. Cl. 141—1 **3 Claims**

1. A method of filling receptacles in a filling installation including a rotary carrousel having a plurality of filling stations, each including a volumetric dispenser having a piston (28) movable into a cylinder (13), said method comprising the steps of:

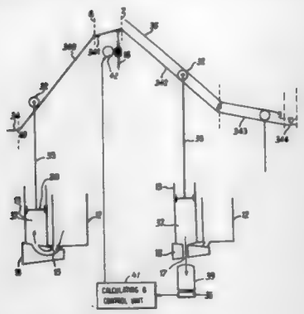
(a) successively and individually introducing the receptacles in a filling station and weighing at least one receptacle placed in a control filling station while said receptacle is still empty,

(b) simultaneously with step (a), filling a corresponding volumetric dispenser (37) having its piston (28) connected to a common adjustable volume control member (34),

(c) filling each receptacle by emptying said corresponding volumetric dispenser into said receptacle,

(d) simultaneously with step c, continuously weighing said receptacle at said control filling station and comparing an actual net weight of product in said receptacle at said control filling station with a reference value weight, and

(e) setting said volume control member according to a difference between said actual net weight of product and said



reference value weight as soon as said volumetric dispenser is empty at said control station.

4,635,690

FILLING VALVE FOR USE IN THE BOTTLING OF LIQUIDS

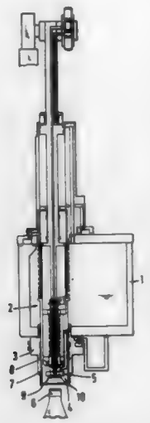
Friedrich Rademacher, Kamen-Südkamen; Siegmar Sindermann, Kamen-Heeren, and Rolf Süshardt, Waltrop, all of Fed. Rep. of Germany, assignors to Holstein und Kappert GmbH, Dortmund, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,517

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446502

Int. Cl.[4] B67C *3/32*

U.S. Cl. 141—39 2 Claims



1. Filling machine for filling liquid into containers including bottles, cans and the like, comprising a vertically displaceable centering member arranged to be moved between a lower position for securing a container in place to be filled and an upper position spaced upwardly from the container, a filling valve located within said centering member, a filling vessel for supplying liquid to the filling valve, a control support block mounted on said vessel and enclosing said centering member, said support block arranged to include valves for carrying out different operations in the container filling operation, wherein the improvement comprises that said support block includes an axially extending vertically arranged guide bushing extending laterally around said centering member and completely enclosing the lower end of said centering member in the upper position of said centering member, a seal within said support block extending transversely of the axial direction of said guide bushing and extending between said guide bushing and said centering member, said centering member having an axially extending section at the lower end thereof displaceable downwardly out of said guide bushing in the lower position of said centering member and said seal being spaced upwardly from said section of said centering member so that in the upper position of said centering member said seal is located upwardly from said section of said centering member.

4,635,691

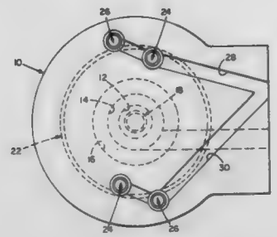
VOLUME RESPONSIVE LIQUID DISCHARGE NOZZLE

Ronald W. Hume, Clearwater, Fla., assignor to Equip-Mark, Inc., Tierre Verde, Fla.

Filed Jul. 15, 1985, Ser. No. 754,981

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—94 8 Claims



1. A beverage dispenser for dispensing beverage into empty cups of different sizes, said different sized cups having different rim diameters, said dispenser comprising

dispensing means for dispensing beverage in first and second volumes corresponding to first and second cup sizes,

receiving means for receiving said cups of different sizes in position for filling said cups with respective volumes of beverage from said dispensing means, said receiving means including a generally horizontal bottom wall with an exposed downwardly directed surface,

said dispensing means including a nozzle for directing said beverage to said cups in filling position under said horizontal bottom wall,

said dispensing means including a source of beverage connected to said nozzle and an on/off beverage flow control mechanism,

a first sensor carried by said bottom wall in position to sense a rim portion of a cup of a first cup size brought into proximity to said first sensor and to activate said dispensing means to dispense said first volume,

a second sensor carried by said bottom wall and spaced from said first sensor in position to sense a rim portion of a cup of a second cup size brought into proximity to said second sensor and to activate said dispensing means to dispense said second volume, and

a guard carried by said bottom wall preventing a rim portion of a cup of said first size from being sensed by said second sensor and a rim portion of a cup of said second cup size from being sensed by said first sensor.

4,635,692

WORKBENCH

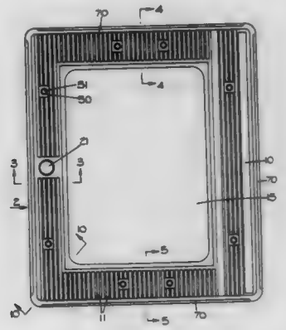
Anthony J. Hulse, Walton; Neville G. Hulse, Rugeley, and Terence Egan, Solihull, all of England, assignors to Meritcraft Ltd., Martindale, England

Filed Dec. 21, 1984, Ser. No. 684,581

Claims priority, application United Kingdom, Dec. 22, 1983, 8334147

Int. Cl.[4] B27C *9/00*; B25N *1/04*

U.S. Cl. 144—286 R 5 Claims



1. A workbench comprising in combination: a first part having a generally planar surface having a through aperture and having a plurality of adaptor plates, each of said adaptor plates being separately shaped to fit closely into said aperture so that the surfaces of said adaptor plates are substantially co-planar with said generally planar support surface; each of said adaptor plates being adapted to receive and locate one or more power tools, and a cooperating means on each said plate and said first part for securing each respective said plate in said aperture;

each of said adaptor plates having clamp bars selectively engageable with baseplates of a plurality of power tools, and means for urging said bars toward said plates and into clamping engagement with the baseplates of the plurality of power tools, said clamp bars each being configured as a channel section wherein one limb of section is forward with cut-outs through which sides of a tool baseplate can pass.

4,635,693

PNEUMATIC TIRE BASE-CAP TREAD

Asahiro Ahagon, Fujisawa; Toshio Kobayashi, Kanagawa; Kazuhiro Yamada, Chigasaki; Seiichi Doi, Hadano, and Makoto Mizawa, Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Nov. 20, 1984, Ser. No. 673,348

Claims priority, application Japan, Nov. 21, 1983, 58-217839

Int. Cl.[4] G60C *11/00, 1/00*

U.S. Cl. 152—209 R 7 Claims

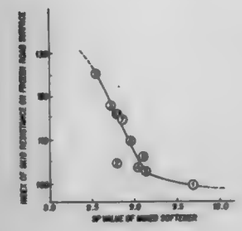
1. A pneumatic tire having a rubber cap tread and a rubber base tread,

said cap tread is made of a rubber comprising per 100 pts. by wt. at least 50 pts. wt. of at least one rubber selected from the group consisting of natural rubber and polyisoprene rubber, 50 pts. wt. max. of polybutadiene rubber containing 20% max. of 1,2-bonding units and 50 pts. wt. max. of styrene-butadiene copolymer rubber containing 30 wt.% max. of bonded styrene with 50 to 100 pts. wt. of carbon black and with a softener in an amount of;

$$1.1X-44<y<1.1X-30,$$

where y is the total amount of the softener in pts. wt.; x is the amount of carbon black in pts. wt.; and said softener having a solubility parameter of from 8.0 to 9.0,

said base tread is made of a rubber comprising per 100 pts. by wt. at least 60 pts. wt. of at least one rubber selected from the group consisting of natural and polyisoprene rubber,



40 pts. wt. max. of polybutadiene rubber containing 20% max. of 1,2-bonding units and 40 pts. wt. max. of styrene-butadiene copolymer rubber containing 30 wt% max. of bonded styrene with 2.6 to 3.6 pts. wt. of sulfur, and

said base tread having a volume fraction of 0.1 to 0.5 relative to total volume of said base tread and said cap tread.

4,635,694

PNEUMATIC RADIAL TIRE TREAD FOR HEAVY LOAD

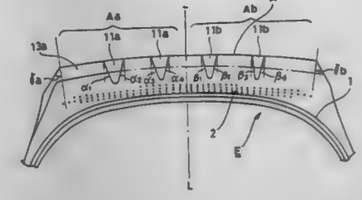
Ichiro Hosokawa, Kanagawa, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1984, Ser. No. 590,441

Claims priority, application Japan, Mar. 25, 1983, 58-48659

Int. Cl.[4] B60C *11/04*

U.S. Cl. 152—209 A 2 Claims



1. A pneumatic radial tire for heavy load wherein a tread design formed on a tread portion is divided into a tread part Ab with larger ground contact area ratio and a tread part Aa with smaller ground contact area ratio with the tread equator plane as a boundary, the ratio Sa/Sb of a ground contact area ratio Sa of said tread part Aa with smaller ground contact area ratio to a ground contact area ratio Sb of said tread part Ab with larger ground contact area ratio is set in a range of 0.71 through 0.89, and set at a smaller ratio from when the tire is new in a range of 0.85 through 1.06 at a time when a depth of each groove constituting said tread design is substantially ½ of initial depth and said tread part Aa with smaller ground contact area ratio is located on an inner side of a vehicle when said tire is mounted thereon.

4,635,695

LOCKING CONFIGURATION FOR A WHEEL RIM FLANGE RETAINING RING

Richard J. Frank, Akron, and Donald H. Smith, Cuyahoga Falls, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

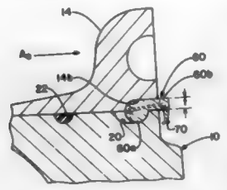
Filed Oct. 31, 1985, Ser. No. 793,352

Int. Cl.[4] B60B *25/18*

U.S. Cl. 152—410 4 Claims

1. In a wheel rim assembly having an inboard tire bead

flange and a separable outboard tire bead flange and a retaining ring having a split defining circumferentially oriented terminal ends, said retaining ring having an inboard facing bulbous portion which extends into an outboard facing flange portion and the bulbous portion is received within an annular groove in the rim to secure the separable tire bead flange on the rim an improved configuration for a locking retaining ring characterized in that each terminal end of the ring has a circumferential extent of both the outboard facing flange and the inboard facing bulbous portions removed forming respective outboard facing and inboard facing wall surfaces and a drilled-through



bore extends through each terminal end in an axial direction of the retaining ring from the outboard facing wall surface to the inboard facing wall surface, said bores having axes in parallel alignment and angularly disposed with respect to a rotational axis of the retaining ring and a steel lockwire is carried within the drilled-through bores and is continuous from one bore to the other about the bulbous portion of the ring, said lockwire having terminal ends which extend outboardly from a respective bore in a terminal end and these are twisted together such as to draw the retaining ring terminal ends together in a predetermined spaced-apart circumferential orientation.

4,635,696

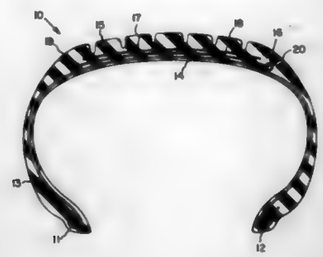
RADIAL TIRES AND A BELT STRUCTURE THEREFOR

Chester J. Gasowski, Uniontown; Ronald L. Loeffler, Akron, both of Ohio; Joseph T. Musteric, Cumberland, Md.; Richard H. Springford, and Robert L. Toth, Jr., both of Stow, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 601,134, Apr. 19, 1984, abandoned, which is a continuation of Ser. No. 434,797, Oct. 18, 1982, abandoned. This application Jan. 14, 1985, Ser. No. 690,910

Int. Cl.[4] B60C *9/20, 9/26*

U.S. Cl. 152—528 **6 Claims**



1. A radial tire comprising a tread portion and an annular belt structure underlying said tread portion, said annular belt structure comprising a pair of radially superposed belt plies and a pair of axially spaced apart edge strips, said edges strips comprising square woven fabric that was embedded in an elastomeric substance prior to the assembly of said edge strips with said belt plies to manufacture said annular belt structure, the square woven fabric of said edge strips having cords extending in a circumferential direction of said tire and cords extending transverse to said circumferential direction, each said edge strip being folded around a respective axial edge of only the radially innermost of said belt plies.

4,635,697

WHEEL AND TIRE ASSEMBLY FOR A VEHICLE

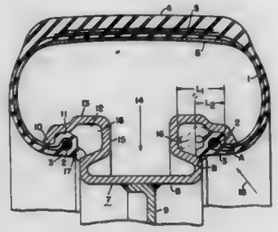
Heinz-Dieter Rach, Garbsen; Hans-Ulrich Klose, Wiedensahl, and Udo Frericks, Langenhagen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Feb. 15, 1985, Ser. No. 701,952

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405363

Int. Cl.[4] B60C *15/024*

U.S. Cl. 152—544 **9 Claims**



1. A wheel and tire assembly for a vehicle, with said wheel having a rigid rim on which can be mounted a pneumatic tire of rubber or rubber-like synthetic material; said tire having a carcass which is anchored in the tire beads by being looped around pull-resistant and compression-resistant bead cores; said rim having essentially radially inwardly extending rim flanges having a mounting space located axially inward of the rim flanges, and next to these and axially inwardly thereof on its radially inner periphery, said rim has seating surfaces for said tire beads; disposed next to each seating surface, and axially inwardly thereof, is a respective deep mounting bed, which is apart of a respective mounting space which is delimited by wall portions of said rim;

the improvement wherein each of said tire beads is provided with a predetermined cross-sectional shape including an integral radially inwardly located and axially extending means which on the one hand, during mounting of said tire on said rim, allows said tire bead to enter into said mounting space axially inward of the rim flanges along with said deep bed, and on the other hand, said means in the operating position of said tire, closes-off said mounting space to protect against rain and wash water penetrating into the mounting space as well as to protect against dirt accumulation in this mounting space without any need for filling and covering rings.

4,635,698

CORD EQUALIZER FOR LOCKING TOGETHER A PLURALITY OF CORDS OF A BLIND ASSEMBLY

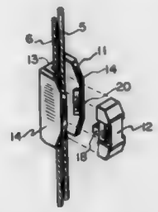
Richard N. Anderson, Owensboro, Ky., assignor to Hunger Douglas, Inc., Maywood, N.J.

Filed Jan. 17, 1985, Ser. No. 692,201

Int. Cl.[4] E06B *9/322*

U.S. Cl. 160—178 C **3 Claims**

1. A core equalizer for locking together a plurality of cords of a blind assembly comprising a main body member having a base portion and two spaced sidewalls connected to said portion adapted to receive a plurality of parallel extending cords there between, a cut out in said base portion, a locking member having a stem and each side wall having a locking barb on an end thereof opposite said base portion, said locking member adapted to be positioned between said side walls to overlie said cords with said stem adapted to force said cords into said cut out to securely lock said cords against the edges of said cut out, and said barb is adapted to snap over and engage an edge of said locking member when said locking member is forced



between said sidewalls to lock said locking member in place on said body member.

4,635,699

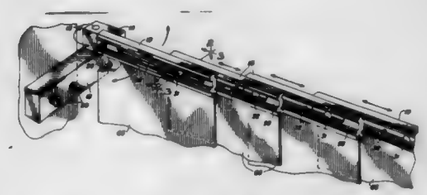
RETRACTABLE SAFETY SHIELD

James C. Kauffman, and Glenn F. Thompson, both of Tucson, Ariz., assignors to Covenant Manufacturing Co., Tucson, Ariz.

Filed Apr. 6, 1984, Ser. No. 597,514

Int. Cl.[4] E05D *15/12*

U.S. Cl. 160—211 **19 Claims**



1. A retractable shield, including in combination:

first and second identical elongated support members slidably overlapping one another for cantilevered telescopic movement relative to one another, at least said second member having an elongated slot therethrough for a substantial portion of its length and extending in the direction of relative movement of said first and second support members;

pin means attached to said first member and passing through the slot in said second member for slidable movement in the slot in said second member to secure said first and second members together;

at least one elongated groove in each of said first and second support members on one surface thereof and extending throughout the entire length thereof, and a mating elongated rib extending from the opposite surface of each of said first and second support members and extending throughout the entire length thereof, the rib in said second support member fitting within the groove in said first support member for slidable overlapping telescopic movement therein, said groove and rib preventing said members from pivoting with respect to one another about said pin means; and

first and second shield members attached to the lower edges of said first and second support members, respectively, and depending therefrom.

4,635,700

SELF-ADJUSTING CANVAS TENSIONING FRAME

Gustav A. Berger, 115 W. 73rd St., New York, N.Y. 10023

Filed Jan. 16, 1984, Ser. No. 571,350

Int. Cl.[4] D06C *3/28*; E06B *3/26*

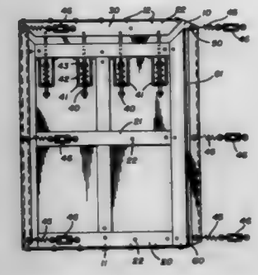
U.S. Cl. 160—374.1 **9 Claims**

1. A canvas tensioning frame structure for maintaining a constant tension and a plane configuration in a canvas sheet stretched upon said frame structure comprising:

(A) a rigid inner structure;

(B) first and second spring means attached to said rigid inner structure with said spring means being constructed so as to permit the magnitude of the tension in each spring means to be set at values desired;

(C) at least one outer structure holding at least a first edge region of the canvas sheet;



(D) said first spring means interconnecting said outer structures and said rigid inner structure and said second spring means interconnecting the canvas and said inner structure and said outer structure;

(E) some of the remaining edge regions of the canvas sheet being slidably arranged over at least a portion of opposed outward facing edges of said rigid inner structure; and a layer of suitable low-friction substance on at least one of said outward facing edges of said inner structure and the remaining edge regions of the canvas sheet.

4,635,701

COMPOSITE METAL ARTICLES

Ian R. Sare, Coromandel Valley; Ian D. Henderson, Glen Osmond; Teunis Heijkoop, Highbury; Michael R. Bosworth, Walkerville; Ronald E. Aspin, Henley Beach, and Brian K. Arnold, Panorama, all of Australia, assignors to Vida-Weld Pty. Limited

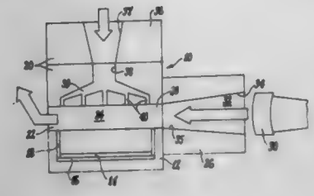
PCT No. PCT/AU84/00123, § 371 Date Feb. 27, 1985, § 102(e) Date Feb. 27, 1985, PCT Pub. No. WO85/00308, PCT Pub. Date Jan. 31, 1985

PCT Filed Jun. 19, 1984, Ser. No. 714,557

Claims priority, application Australia, Jul. 5, 1983, PG0130; Nov. 22, 1983, PG2499; Nov. 22, 1983, PG2500

Int. Cl.[4] B22D *19/00*

U.S. Cl. 164—102 **16 Claims**



1. A method of forming a composite article having first and second metal components, wherein said first component is a ferrous metal and said second component is a ferrous metal or cobalt base alloy comprising the steps of:

(a) applying a flux coating over a substantially oxide-free bond surface of said first component;

(b) preheating said first component in a mould in which said first component is positioned to a preheat temperature of about 350° C. to about 800° C.; and

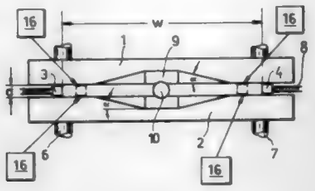
(c) pouring a melt of said second metal to provide said second component, said melt being poured at a superheated temperature and such that said melt flows over said bond surface to thereby displace said flux coating from said bond surface and wet said bond surface, said superheat temperature being substantially in excess of said preheat temperature, whereby said melt raises the temperature of said bond surface to achieve an initial temperature equilibrium between said surface and the melt, and a substantially instantaneous interface temperature therebetween which is at least equal to the liquidus temperature of the melt, such that on solidification of the melt a bond between the components is attained substantially in the absence of fusion of said bond surface.

4,635,702

MOLD FOR CONTINUOUS CASTING OF STEEL STRIP

Manfred Kolakowski, and Hans Streubel, both of Erkrath, Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag AG, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 17, 1984, Ser. No. 682,602
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1984, 3400220
Int. Cl.[4] B22D *7/00*
U.S. Cl. 164—418 **10 Claims**



1. A mold for continuously casting steel strip comprising:
a pair of broad side walls juxtaposed spacedly with one another and formed with upper portions expanding outwardly to provide a downwardly converging funnel-shaped casting area; and
a pair of narrow walls opposing each other and arranged between said broad side walls laterally outwardly of said funnel-shaped casting area, said mold possessing a pair of extension portions, said extension portions being spaces between the narrow walls and the funnel-shaped casting area and the pair of broad side walls, wherein the distance between the narrow walls and the funnel-shaped area is at least equal to the distance between the two broad side walls in the area of the extension portions, said broad side walls being further formed with lower portions extending parallel to one another at a spacing corresponding to the width of an outlet slot of said mold, from said downwardly converging funnel-shaped casting area to said outlet slot.

4,635,703

COOLING PAD FOR USE IN A CONTINUOUS CASTING APPARATUS FOR THE PRODUCTION OF CAST SHEETS

Hakaru Nakato; Nagayasu Bessho; Tsutomu Nozaki; Yasuhiro Habu, all of Chiba, and Tomoaki Kimura, Hitachi, all of Japan, assignors to Kawasaki Steel Corporation, Kobe City and Hitachi, Ltd., Tokyo, both of, Japan

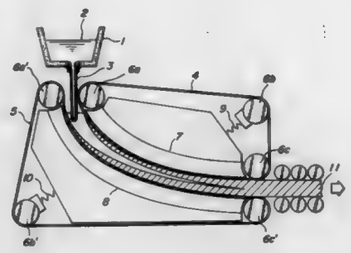
Filed Aug. 6, 1985, Ser. No. 762,965
Int. Cl.[4] B22D *11/124, 11/06*
U.S. Cl. 164—443 **2 Claims**

1. In a continuous casting apparatus for the production of cast sheets comprising a pair of endlessly circulating metal belts oppositely arranged at such a gap to hold molten metal and its cast sheet at both long sides of the cast sheet, a pair of side plates each locaed near the both side edge portions of the belts and brought into intimate contact therewith, and a cooling pad for supplying and discharging a cooling water to the rear surface of the metal belt, the improvement wherein said cooling pad is provided with plural water supply holes and water discharge holes each opening to said metal belt so as to satisfy the following relations:

$0.5 \leqq Ai \leqq 7$

$Ai/Ao \leqq 1.1$ in

$lc \leqq 20$,



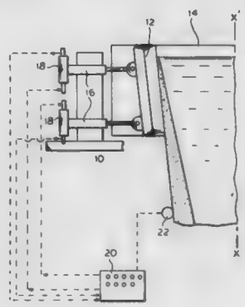
wherein Ai is a sectional area (cm^2) of the water supply hole, Ao is a sectional area (cm^2) of the water discharge hole, n is a parameter depending on the arrangement of the water supply and discharge holes, and lc is a distance (cm) between the centers of the water supply hole and the water discharge hole, said water dischrge holes being disposed around said water supply hole in said cooling pad into a triangular shape at n=0.5, a square shape at n=1 or a hexagonal shape at n=2.

4,635,704

METHOD OF CHANGING THE WIDTH OF A CONTINUOUS METAL CASTING WITHOUT INTERRUPTING THE CASTING PROCESS

Alain Chielens, Mouvaux; Rene Durinck, Villeneuve D'Ascq, and Pierre Werquin, Marcq en Baroeuil, all of France, assignors to Fives-Cail Babcock, Paris, France

Filed Nov. 19, 1984, Ser. No. 672,801
Claims priority, application France, Nov. 23, 1983, 83 18671
Int. Cl.[4] B22D *11/16*
U.S. Cl. 164—452 **10 Claims**



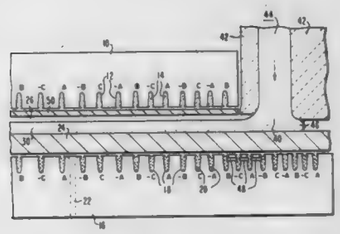
10. A method of changing the width of a continuously cast strand of rectangular cross-section without interrupting the casting process, wherein the strand is cast through a mold defining a cavity of rectangular cross-section with a longitudinal axis and having a small side wall which is displaceable with respect to the said longitudinal axis and is in contact with a small face of the strand, wherein said small side wall of the mold is displaced from an initial position to a final position, wherein a transitional section of the strand having a width which varies from an initial width to a final width is cast during a period of time when said small side wall is displaced from said initial to said final position, and wherein the improvement comprises the steps of:
selecting a predetermined length for said transitional section of the cast strand,
inclining the said small side wall by an angle whose tangent is substantially equal to the slope of the small face of the transitional section of the cast strand by pivoting the said small side wall from said initial position to a first intermediary position about a first axis extending slightly below the mold, the slope being defined between the small face of the transitional section of the cast strand and the plane containing the small faces adjacent the cast strand upstream and downstream thereof,
displacing the said small side wall from said first intermediary position to a second intermediary position by pivoting it about an axis defined approximately by the intersection of planes defined by an inner face of the said small side wall positioned, respectively, in the first and second intermediary positions,
displacing the said small side wall to said final position by pivoting it about a third axis extending approximately at the level of the free surface of the metal being cast in the mold, and
continuously measuring the length of the strand section cast from the beginning of the displacement of the said small side wall in response to the length of the strand section cast from the beginning of the said displacement so that the length of the transitional section of the cast strand equals said predetermined length.

4,635,705

DOUBLE-SIDED ELECTROMAGNETIC PUMP WITH CONTROLLABLE NORMAL FORCE FOR RAPID SOLIDIFICATION OF LIQUID METALS

Stephen B. Kuznetsov, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 14, 1983, Ser. No. 561,426
Int. Cl.[4] B22D *27/02*
U.S. Cl. 164—466 **12 Claims**



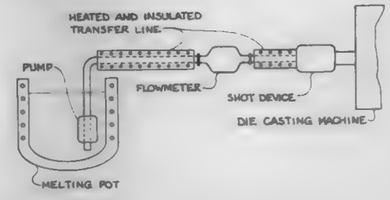
1. A system for casting of liquid metals having an electromagnetic pump comprising:
an upper primary block including a plurality of slots adjacent to one side thereof and a first polyphase winding passing through said upper primary block slots;
a lower primary block including a plurality of slots adjacent to one side thereof and a second polyphase winding passing through said lower primary block slots, said upper and lower primary blocks being positioned to form a gap therebetween;
a movable conductive heat sink disposed within said gap;
means for depositing liquid metal onto said heat sink, whereupon said liquid metal solidifies; and
means for supplying an alternating current to said first and second polyphase windings for controlling the slip of said heat sink and said metal, thereby holding said heat sink and said metal in compression by electromagnetic forces placed on said heat sink and said metal as a result of a traveling electromagnetic wave in said gap produced by said alternating current flowing through said first and second polyphase windings.

4,635,706

MOLTEN METAL HANDLING SYSTEM

Hugh C. Behrens, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 6, 1985, Ser. No. 741,782
Int. Cl.[4] B22D *37/00, 27/02*
U.S. Cl. 164—500 **5 Claims**



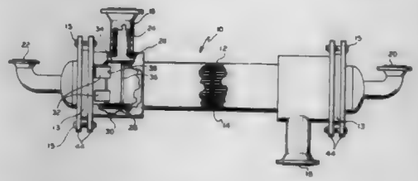
1. A method for delivering molten metal from a molten metal source, a melting or holding pot, to a desired location, including a mold or die, without exposure of the molten metal to the atmosphere, which comprises
(1) pumping said molten metal from said molten metal source employing a pump having no external cooling means employing a conventional mica which has been heat treated to at least the maximum temperature to which the pump will be subjected and operating on the principle of magnetohydrodynamics (MHD) completely immersed in the molten metal source,
(2) transporting the molten metal from the outlet of said pump through a heated conduit or series of heated conduits providing a path for molten metal delivered by the pump to access the desired use location, said conduits being insulated electrically heated tubes non-reactive with the metal being carried.

4,635,707

METHOD FOR VARYING SHELL FLUID FLOW IN SHELL AND TUBE HEAT EXCHANGER

Cecil C. Gentry, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 395,450, Jul. 6, 1982, Pat. No. 4,506,728.
This application Sep. 4, 1984, Ser. No. 646,883
Int. Cl.[4] F28F *27/00, 9/22*
U.S. Cl. 165—1 **6 Claims**



1. A method of using a shell and tube heat exchanger which includes a shell having a first end and a second end and shell ports comprising inlet ports and outlet ports near said first and second ends respectively through which shell side fluid may enter and exit the shell, an inlet annular distributor which surrounds and is in communication with the inlet ports near said first end, an outlet annular distributor which surrounds and communicates with the outlet ports near said second end, an inlet nozzle in communication with the inlet annular distrib-

utor, an outlet nozzle in communication with the outlet annular distributor, a tube bundle enclosed within the shell so as to extend from the first end to the second end of the shell, and a tube sheet affixed to the tube bundle at each end of the shell, said method comprising:

adjusting the effective flow area of at least some of said shell ports by adjusting the position of at least one shell insert which is adapted to at least partially cover said at least some shell ports, said at least one shell insert being adjusted rotationally and longitudinally;

flowing tube side fluid through the tube bundle;

introducing shell side fluid to the inlet nozzle so as to establish a flow of shell side fluid through the inlet annular distributor and then through the inlet ports and into the interior of the shell, the shell side fluid flowing generally axially along the length of the tube bundle to the second end of the shell; and

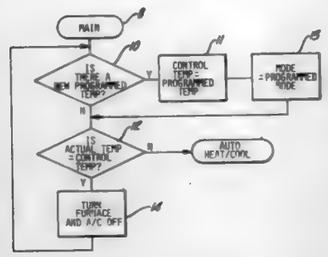
withdrawing shell side fluid from the exchanger through the outlet nozzle after the shell side fluid has passed from the shell and into the outlet annular distributor.

4,635,708

ELECTRONIC THERMOSTAT FOR HEATING AND COOLING SYSTEM

Michael R. Levine, Ann Arbor, Mich., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Apr. 19, 1984, Ser. No. 602,221
Int. Cl.⁴ F23N *5/20*
U.S. Cl. 165—12 **13 Claims**



1. A thermostat for use in a building having means for heating and means for cooling the building, the thermostat being connected to the heating means and the cooling means to selectively control the state of operation of each, the thermostat comprising:

memory means for storing at least one set of time/temperature values representing desired temperature levels at predetermined times;

a clock;

means under control of the clock for outputting a temperature value representing the present desired temperature from the memory means;

means for selecting a control temperature as a function of the present desired temperature;

sensor means for measuring the ambient temperature in the building;

means for comparing the ambient temperature to the control temperature;

means for generating a signal to energize one of said heating means or said cooling means when the ambient temperature is not substantially equal to the control temperature;

timer means adapted to receive the last said signal and to trigger a predetermined time delay; and

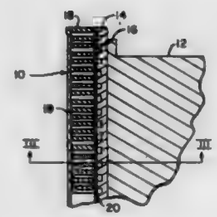
means for inhibiting the energization of the said other of said heating means or said cooling means during the time delay period.

4,635,709

DUAL MODE HEAT EXCHANGER

Frank E. Altor, Catonsville, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 3, 1985, Ser. No. 804,193
Int. Cl.⁴ F28D *15/00*; H01L *23/44*
U.S. Cl. 165—32 **13 Claims**



1. A device for cooling heat dissipating electronic components comprising:

(a) a heat transfer plate thermally coupled to said electronic components for absorbing heat generated by said electronic components;

(b) radiation fins thermally coupled to said heat transfer plate, for radiating heat absorbed by said heat transfer plate from said electronic components to a gaseous medium;

(c) a liquid medium for evaporative cooling of said electronic components; and

(d) a cavity formed to retain said liquid medium operably associated with said heat transfer plate; and

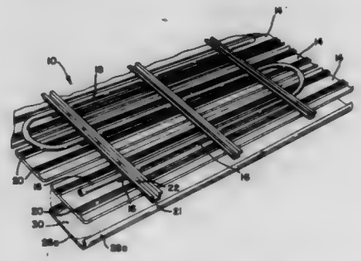
(e) a selectively permeable membrane in contact with said liquid medium which retains said liquid medium within said cavity but permits vapor to leave said cavity in order to encourage evaporative cooling.

4,635,710

LINEAR RADIANT CEILING PANEL

William Shelley, 456 W. Frontage Rd., Northfield, Ill. 60093

Filed Feb. 2, 1984, Ser. No. 576,158
Int. Cl.⁴ F24D *19/02, 19/06*; F28F *1/20*
U.S. Cl. 165—49 **6 Claims**



1. A linear radiant ceiling panel used in a ceiling system for heating and/or cooling an inside room of a building by circulation of a heat transfer fluid through a pipe, the improvement comprising:

an extruded aluminum plate having a longitudinal axis extending the length thereof and also having first, flat surface and having a back with a rounded saddle formed therein and the saddle having means to receive and hold said pipe in heat transfer relationship for heat transfer between said heat transfer fluid and the aluminum plate, and, further, said saddle and pipe of the aluminum plate extending parallel with said longitudinal axis of the aluminum plate;

said extruded plate having up-standing channels forming trough shaped attachment members with up-standing legs on each side of said saddle and said upstanding legs providing gripping means to receive and hold a fastener for attaching the ceiling panel in said ceiling system;

said extruded plate having side edges extending parallel to the longitudinal axis of the plate and located outwardly of the up-standing channels;

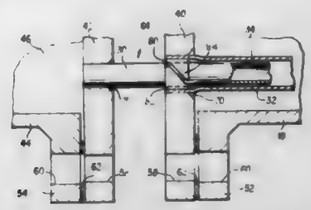
a snap-on flexible, metal linear sheet adapted to extend across the first, flat surface of the extruded plate and along the axis thereof, said linear sheet having contoured edge means providing side margins which snap-on and grip the side edges of the aluminum plate to securely join the linear sheet to the aluminum plate and provide contact between the flexible, metal linear sheet and the first, flat surface of the aluminum plate to thereby allow heat transfer between the extruded aluminum plate and the sheet.

4,635,711

DOUBLE WALL HEAT EXCHANGER

John A. Clark, Jr., East Stroudsburg, Pa., assignor to Harsco Corporation, Wormleysburg, Pa.

Filed Feb. 15, 1985, Ser. No. 702,228
Int. Cl.⁴ F28F *11/00*
U.S. Cl. 165—70 **20 Claims**



12. A heat exchanger comprising an inner tube coaxially disposed within an outer tube so as to define a space therebetween, the inner tube having an end extending beyond an end of the outer tube; first and second spaced plates having apertures therein and defining a chamber therebetween, the end of the inner tube being disposed within the aperture in the first plate and being connected to the first plate and the end of the outer tube being disposed within the aperture of the second plate; and a ferrule disposed over the inner tube and within the outer tube at the end of the outer tube within the aperture of the second plate, the ferrule having a slit therein; and the inner tube, the ferrule and the outer tube all being expanded within the aperture of the second plate such that the outer tube is connected to the second plate and such that said slit in the ferrule is expanded and defines a passageway that connects said chamber with the space between the tubes to vent such space to said chamber.

4,635,712

HEAT EXCHANGER ASSEMBLY FOR A COMPRESSOR

Robert L. Baker, 139 Brompton Rd., Williamsville, N.Y. 14221, and Diane E. Glauber, 65 Little Robin Rd., Amherst, N.Y. 14228

Filed Mar. 28, 1985, Ser. No. 716,866
Int. Cl.⁴ F28F *9/02*
U.S. Cl. 165—82 **6 Claims**

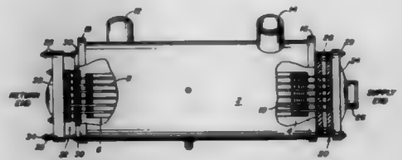
1. A heat exchanger assembly for a compressor comprising:

an elongated shell having first and second flanged ends, a fluid inlet and fluid outlet, said inlet and outlet providing passage of a first fluid into and out of said shell;

a fixed tube sheet assembly positioned adjacent the first flanged end of said shell, said fixed tube sheet assembly having a fixed inner tube sheet sealingly affixed to the first flanged end to close in the first end of the shell space and a fixed outer tube sheet spaced from the fixed inner tube sheet, the fixed inner and outer tube sheets being separated by a plurality of spacers to create a substantially open space therebetween in communication with the exterior of said heat exchanger assembly;

a floating tube sheet assembly positioned adjacent the second flanged end of said shell, said floating tube sheet assembly having a floating inner tube sheet sealingly abutting the second flanged end to close in that end of the shell space and a floating outer tube sheet spaced from the floating inner tube sheet, the floating inner and outer tube sheets being separated by a plurality of spacers to create a substantially open space therebetween in communication with the exterior of said heat exchanger assembly, said floating tube sheet assembly being allowed limited longitudinal movement with respect to the second flanged end of said shell without breaking the sealed abutment between the floating inner tube sheet and said second flanged end;

an elongated tube bundle assembly received within said shell, said bundle assembly having a plurality of elongated



tubes extending generally longitudinally within said bundle assembly and being received through both of the inner and outer tube sheets of said fixed and floating tube sheet assemblies, each of said tubes being affixedly press-fit into the inner and outer tube sheets providing a fixed fluid-tight connection with each of the inner and outer tube sheets of said fixed and floating tube sheets, respectively; and

fixed and floating header assemblies being affixed to the fixed and floating outer tube sheets, respectively, for providing passage of a second fluid to be communicated through the elongated tubes extending through said shell such that if the first fluid within the shell or the second fluid within said tubes and header assemblies leaks by the sealed connections between said tubes and the fixed and floating tube sheet assemblies, the escaping fluid will pass into the open spaces between said fixed and floating tube sheet assemblies, respectively, to be vented exteriorly of said heat exchanger assembly without the possibility of intermixing the first and second fluids within said heat exchanger assembly.

4,635,713

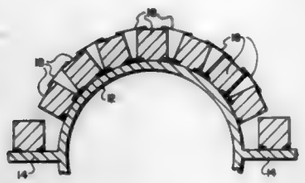
EROSION RESISTANT WATERWALL

Richard C. Johnson, and Leigh B. Egbert, both of Dansville, N.Y., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Division of Ser. No. 550,700, Nov. 10, 1983, Pat. No. 4,554,967.
This application Jul. 1, 1985, Ser. No. 750,612
Int. Cl.⁴ F28F *19/00*
U.S. Cl. 165—134.1 **4 Claims**

1. A waterwall comprising a plurality of water tubes extending in a spaced parallel relationship; a plurality of continuous fins extending between adjacent tubes for the length thereof and connected to the outer surfaces of said tubes for forming a gas-tight structure, one surface of which is exposed directly to erosion-causing particulate material; and a plurality of erosion resistant studs extending around the exposed surface of said structure in a spaced relationship, each stud comprising a rod member, and a weldable member projecting from at end surface of said rod member and welded to said exposed surface of

said structure, the length and diameter of said weldable member being such that, after welding, the melted portion of said

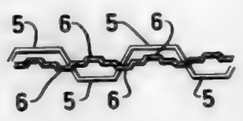


weldable member extends over substantially the entire surface area of said exposed tube surface corresponding to said end surface of said rod member.

4,635,714
PACKING GROOVE IN PLATE MEMBER OF PLATE HEAT EXCHANGER

Christer Almqvist, Täby; Bengt Carlsson, Vargön, and Lars Lindahl, Handen, all of Sweden, assignors to ReHeat AB, Täby, Sweden

Filed Oct. 20, 1982, Ser. No. 435,604
Claims priority, application Sweden, Oct. 21, 1981, 8106221
Int. Cl.[4] F28F *3/10*
U.S. Cl. 165—167 7 Claims



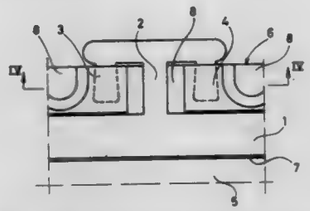
1. A plate for a plate-type heat exchanger, said plate having a fluid inlet opening therethrough and a fluid outlet opening therethrough, said plate having alternate depressions and elevations in one face thereof which form respective elevations and depressions in the opposite surface of the plate, said elevations and depressions forming fluid flow channels on each surface of the plate, the tops of the elevations on each surface lying in a common plane, and said plate having at least one packing groove intersecting said elevations and depressions, said groove having a bottom located in a plane which is intermediate said common planes, said bottom having a plurality of longitudinally spaced apart bars embossed therein, said bars projecting perpendicularly to said intermediate plane with alternate bars projecting in opposite directions away from said intermediate plane so as to form alternate elevations and depressions in said bottom, the tops of the elevations in said bottom lying in essentially a common plane which is between said intermediate plane and the common plane defined by the tops of said channel-forming elevations.

4,635,715
GASKET ARRANGEMENT FOR A PLATE HEAT EXCHANGER

Jarl A. Andersson, Lund, Sweden, assignor to Alfa-Laval Thermal AB, Lund, Sweden

PCT No. PCT/SE84/00215, § 371 Date Jan. 24, 1985, § 102(e) Date Jan. 24, 1985, PCT Pub. No. WO85/00052, PCT Pub. Date Jan. 3, 1985
PCT Filed Jun. 7, 1984, Ser. No. 709,034
Claims priority, application Sweden, Jun. 16, 1983, 8303449
Int. Cl.[4] F28F *3/10*
U.S. Cl. 165—167 8 Claims

1. In the combination of a heat exchange plate having a groove formed on one side thereof and extending along an adjacent edge of the plate, a sealing gasket inserted into the groove, and securing means spaced apart longitudinally of the gasket for holding the gasket in the groove, each said securing means including an integral element made in one piece with the gasket and projecting transversely of said gasket from that side of the gasket which faces said plate edge, said element extending to substantially said plate edge, each securing means also including attached thereto a holding part cooperating with said integral element and having at least one projection lying on the

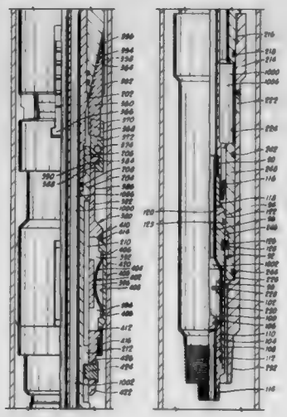


other side of the plate remote from said integral element, the improvement wherein said one projection is directed toward the gasket and is spaced from said integral element in the longitudinal direction of the gasket, said holding part extending around said plate edge and having its said projection engaging said other side of the plate while extending toward the gasket from said plate edge, said integral element lying on said one side of the plate.

4,635,716
GRAVEL PACKER

Gary D. Zunkel, Chickasha, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jul. 19, 1985, Ser. No. 756,886
Int. Cl.[4] E21B *43/04*
U.S. Cl. 166—51 19 Claims



1. A gravel packer for placing a gravel pack in a wellbore about a gravel screen disposed therebelow across a producing formation comprising:
- a gravel packer assembly;
- a packer element disposed on the exterior of said assembly;
- ratchet means in said assembly for releasably locking said packer element in a set mode;
- an intake passage in said assembly for receiving fluid from a tubing string in said well bore and secured to said gravel packer;
- a return passage in said assembly for receiving fluid from the interior of said gravel screen;
- a circulation passage in said assembly extending from the exterior of said gravel packer below said packer element to said intake passage;
- closeable crossover means associated with said assembly to receive fluid from said return passage and guide said received fluid from said return passage to the exterior of said assembly above said packer element;
- first check valve means in said assembly for preventing flow to said gravel screen through said return passage;
- second check valve means in said assembly adapted to selectively permit flow from said return passage to said intake passage in response to a positive pressure differential between said return passage and said intake passage; and
- J-slot means for selectively disconnecting said crossover means from said packer assembly.

4,635,717
METHOD AND APPARATUS FOR OBTAINING SELECTED SAMPLES OF FORMATION FLUIDS

Alfred H. Jageler, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

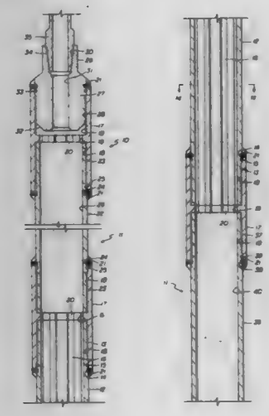
Continuation of Ser. No. 618,613, Jun. 8, 1984, Pat. No. 4,535,843, which is a continuation of Ser. No. 380,689, May 21, 1982, abandoned. This application May 9, 1985, Ser. No. 732,523
The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.
Int. Cl.[4] E21B *49/08*
U.S. Cl. 166—250 13 Claims

1. A method for obtaining formation fluid samples from a borehole, comprising:
- (a) lowering a tool suspended by a wireline into the borehole to a preselected level;
- (b) utilizing a pair of packers carried by the tool to isolate an interval of the borehole by inflating the packers to expand them into sealing contact with the borehole;
- (c) withdrawing fluid from the isolated interval and meauring its resistivity in a first test chamber within the tool;
- (d) when the resistivity measurement becomes constant, indicating that formation fluid uncontaminated by drilling mud components is being withdrawn into the tool, directing the withdrawn fluid into a second test chamber and measuring therein selected physical properties of the fluid;
- (e) determining from the selected property measurements whether it is desired to retain a sample and, if the determination is positive, pumping the fluid to a sample collection chamber associated with the tool;
- (f) deflating the pair of packers to free the tool for vertical movement; and
- (g) retracting the wireline to return the tool and the collected sample to the surface.

4,635,718
CONTINUOUS OBSTRUCTION MONITOR FOR WELL LOGGING TOOLS

Ralph R. Thomas, SR2, Box 6240, Chugiak, Ak. 99567

Filed Jul. 5, 1985, Ser. No. 752,470
Int. Cl.[4] E21B *23/00, 47/00*
U.S. Cl. 166—250 42 Claims



1. Apparatus for continuously monitoring a borehole for obstruction during well logging, comprising
- an elongate tubular outer housing having means at the upper end for connection to a drill string,
- a movable inner member slidably supported inside said outer housing,
- said inner member having means for connection to support a well logging instrument,
- a releasable means retaining said inner member initially in the lower portion of said housing and to release said inner member upon a predetermined upward force thereon,
- said outer housing and inner member having relative movement upon contact of said logging instrument with an obstruction within said borehole with sufficient force to release said inner member from said releasable means thereby causing displacement of a column of drilling fluid within said housing and said drill string for detection at the earth surface, and
- means movable in response to said drilling fluid displace-

ment and having a portion visible at the earth surface to indicate an obstruction.

39. A method of continuously monitoring for obstructions within an earth borehole filled with a drilling fluid while passing a well logging instrument therethrough by a drill string comprising the steps of;

installing an elongate tubular outer housing member to the lower end of a drill string to be transported thereby, said outer housing having a variable volume greater than the volume of an equal length of the drill string transporting it,

enclosing and releasably retaining a movable inner member in said housing and connecting the lower end of said inner member to the upper portion of a well logging instrument, said inner member releasable to move relative to said outer housing upon the logging instrument contacting an obstruction in the borehole,

connecting the logging instrument to equipment at the surface of the borehole for logging operations,

verifying that the borehole is filled with drilling fluid,

lowering the drill string, having the housing installed on its lower end and the logging instrument installed on the movable inner member, into the borehole, and allowing drilling fluid to enter the drill string from the borehole as it is lowered thereinto,

installing means responsive to fluid displacement within the drill string to continuously monitor and communicate changes in the level of the fluid within the drill string, and

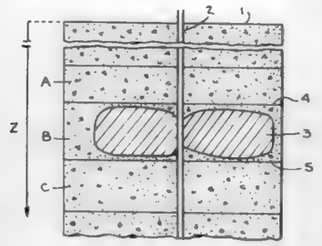
shutting off fluid communication between the drill string and the borehole upon sufficient movement of the inner member relative to the outer housing caused by the logging instrument contacting an obstruction in the borehole, and simultaneouly causing the drilling fluid contained within the drill string to rise and be detected by the means responsive to fluid displacement and thereby indicating that the logging tool has encountered an obstruction.

4,635,719

METHOD FOR HYDRAULIC FRACTURE PROPAGATION IN HYDROCARBON-BEARING FORMATIONS

Mark D. Zoback, 716 Garland Dr., Palo Alto, Calif. 94303, and Cecil B. Raleigh, P.O. Box DD, Palisades, N.Y. 10964

Filed Jan. 24, 1986, Ser. No. 822,051
Int. Cl.⁴ E21B *43/26, 47/06, 49/00*
U.S. Cl. 166—250 **12 Claims**



1. A method of hydraulically fracturing a hydrocarbon-bearing strata in a hydrocarbon producing well comprising:

providing a hydrocarbon-producing well having a hydrocarbon bearing strata, a bounding non-producing strata overlying the hydrocarbon-bearing strata, and a bounding non-producing strata underlying the hydrocarbon-producing strata;

determining the maximum principal compressive stress S_1 for the hydrocarbon-bearing strata, the overlying bounding non-producing strata, and the underlying bounding non-producing strata;

determining the pore fluid pressure P_F for the hydrocarbon-bearing strata, the overlying bounding non-producing strata, and the underlying bounding non-producing strata;

determining the coefficient of friction u for the hydrocarbon-bearing strata, the overlying bounding non-producing strata, and the underlying bounding non-producing strata;

determining the least principal compressive stress S_3 for the hydrocarbon-bearing strata, the overlying bounding non-producing strata, and the underlying bounding non-producing strata using the equation:

$$S_3 = \frac{S_1 - P_F}{[(u^2 + 1)^{\frac{1}{2}} + u]^2} + P_F$$

using the respective determined values of S_1, P_F, and u for said respective determinations of S_3;

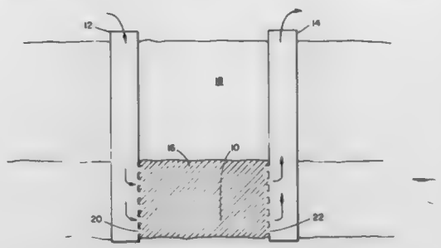
hydraulically fracturing the hydrocarbon-bearing strata with a fracturing pressure selected greater than said determined S_3 for the hydrocarbon-bearing strata and less than the S_3 determined for the overlying bounding non-producing strata and the underlying bounding non-producing strata.

4,635,720

HEAVY OIL RECOVERY PROCESS USING INTERMITTENT STEAMFLOODING

Ju-Nam Chew, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 3, 1986, Ser. No. 816,094
Int. Cl.⁴ E21B *43/30, 43/24*
U.S. Cl. 166—245 **19 Claims**



1. A steam flood method for recovering hydrocarbonaceous fluids from a subterranean, oil-bearing formation containing one or more substantially vertical fractures which formation is penetrated by at least one injection well which communicates via said fracture with at least one production well comprising:

(a) injecting steam into said formation via an injection well until steam, along with hydrocarbonaceous fluids, breaks through at said production well;

(b) shutting in said production well while continuing steam injection into said injection well until the steam pressure near said production well is substantially the same as said pressure at the injection well; and

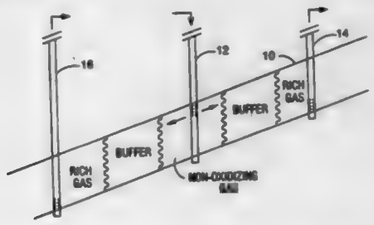
(c) shutting in said injection well and producing hydrocarbonaceous fluids from said production well.

4,635,721

METHOD OF DISPLACING FLUIDS WITHIN A GAS-CONDENSATE RESERVOIR

Miller Sheffield; Robert S. Metcalfe, both of Tulsa, Okla.; James W. Calvin, Cairo, Egypt, and Joseph J. Chaback, Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 566,205, Nov. 29, 1983, Pat. No. 4,548,267. This application Oct. 21, 1985, Ser. No. 789,869
The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.
Int. Cl.⁴ E21B *43/22*
U.S. Cl. 166—268 **12 Claims**



1. A method of displacing reservoir fluids through a subterranean retrograde or gas-condensate reservoir, comprising:

introducing a displacement fluid into the reservoir and displacing it and the reservoir fluids through the reservoir;

wherein the displacement fluid is inherently miscible with the reservoir fluids at the temperature and pressure of the reservoir; and

further wherein the displacement fluid comprises a nonoxidizing gas selected from the group consisting of carbon dioxide, flue gas, nitrogen, residue gas, and mixtures thereof.

4,635,722

METHOD OF INCREASING ENHANCED OIL RECOVERY BY USING A HIGHER SULFONATE PHASE OBTAINED ON POLYMER ADDITION

Joseph T. Carlin, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 1, 1985, Ser. No. 729,452
Int. Cl.⁴ E21B *43/22, 43/40*
U.S. Cl. 166—274 **15 Claims**

1. A process for enhanced hydrocarbon recovery comprising:

dissolving a polymer from the group consisting of polyacrylamides and polysaccharides in a surfactant flood fluid resulting from mixing water, petroleum sulfonate-containing surfactant and solubilizer;

allowing the mixture to separate;

using the fraction with the highest sulfonate content as a surfactant fluid;

forcing said fluid through the formation and recovering said hydrocarbons,

wherein the proportion of the sulfonate-containing surfactant, solubilizer and polymer is about 0.5% to 20.0% of total solute by weight of petroleum sulfonate surfactant, about 0.1% to about 5% by weight of a solubilizer and about 0.1% to 10% by weight of polymer.

4,635,723

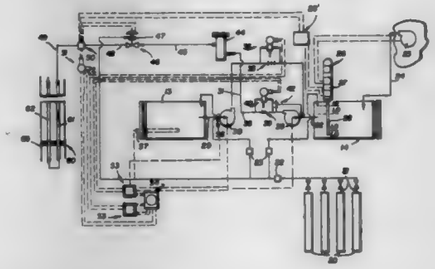
CONTINUOUS INJECTION OF CORROSION-INHIBITING LIQUIDS

Melvin F. Spivey, 304 E. Horner, Atmore, Ala. 36502

Filed Jul. 7, 1983, Ser. No. 511,625
Int. Cl.⁴ E21B *41/02, 43/12, 47/06*
U.S. Cl. 166—250 **19 Claims**

1. A portable system for the continuous injection of corrosion-inhibiting chemical into a production well, comprising: a portable skid; a corrosion-inhibiting chemical tank, and a water tank, mounted on said skid; pump means for pumping any desired amounts and proportions of chemical and water from said tanks for injection into a production well, said pump means mounted on said skid; conduit means operatively interconnecting said pumps and tanks for delivery of corrosion-inhibiting chemical to a production well, said conduit means including an end conduit for operative interconnection to a production well; and control means, mounted on said skid for controlling the operation of said pump means to provide desired amounts and proportions of a mix of corrosion-inhibiting chemical and water to said end conduit.

16. A method for delivering a mix of corrosion-inhibiting chemical and water to a production well utilizing a portable



skid having a chemical tank and water tank mounted thereon, comprising the steps of:

transporting the skid to a single production well site;

operatively interconnecting the chemical and water tanks to an injection tube string, or an annulus associated with a side mandrel, of the production well; and

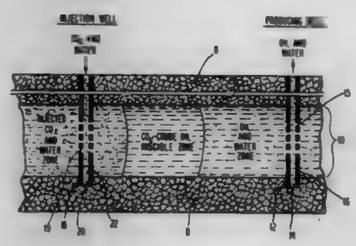
controlling delivery of a mix of corrosion-inhibiting chemical and water from the tanks to the production well so that any desired amounts and proportions of a mix of chemical and water are continuously injected into the well to provide corrosion-inhibiting of a production tube string of said well without interruption of production through said production tube string.

4,635,724

CO_2-ENHANCED HYDROCARBON RECOVERY WITH CORROSION-RESISTANT CEMENT

Roderick A. Bruckdorfer, and Samuel E. Coleman, both of Broken Arrow, Okla., assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Jul. 26, 1985, Ser. No. 759,632
Int. Cl.⁴ E21C *33/14, 41/02*
U.S. Cl. 166—268 **5 Claims**



1. In a system for producing a hydrocarbon fluid from a deposit of said fluid in an underground formation, carbon dioxide and water also being present in said formation, said system including at least one bore hole and a centrally disposed metal tube therein extending from ground level to said underground formation, the improvement consisting of a CO_2-corro-

sion resistant cement surrounding said tube and occupying the annular space between said tube and said formation, said cement comprising a hardened cement slurry comprised of Portland cement and Class C fly ash in a weight proportion of from about 1:2 to 2:1.

4,635,725

METHOD AND APPARATUS FOR GRAVEL PACKING A WELL

Thomas C. Burroughs, 8958 Chatsworth, Houston, Tex. 77024

Filed Dec. 10, 1984, Ser. No. 679,625
Int. Cl.[4] E21B *43/04*
U.S. Cl. 166—278 **13 Claims**



1. In a perforate liner wash-down and gravel packing apparatus for wells comprising,

a perforated liner to be positioned within a well;

means connected to the upper end of the liner for lowering the liner into the well;

a wash pipe of smaller diameter than said liner connected to said lowering means and extending downwardly within said liner in generally concentric relation thereto;

means permitting fluid flow downwardly through the wash pipe into the well for washing the liner down prior to gravel packing and permitting a reverse flow upwardly through the wash pipe during gravel packing; and

means mounting the wash pipe for vertical movement relative to the liner from a lower liner wash-down position to a raised upper gravel pack position, said mounting means being responsive to fluid pressure resulting from a reversal of fluid flow in the wash pipe upon the beginning of gravel packing to raise the wash pipe in the liner to said upper position, thereby to allow direct fluid communication between the lower end of the wash pipe and the inside of the liner during the raised gravel packing position.

12. A method for gravel packing a liner in a production zone of a well comprising the steps of:

mounting a tubular wash pipe within a cross-over structure carrying a concentric perforated tubular liner for movement of the wash pipe relative to the liner between a raised gravel packaging position and a lowered wash-down position;

running within the well the cross-over structure thus formed suspended from a tubing with the cross-over structure having a cross-over tool carrying the perforated tubular liner with the wash pipe therein;

setting said cross-over structure in the well above the production zone with said wash pipe being responsive to fluid pressure resulting from fluid flow down the wash pipe for movement to said lowered position, and responsive to fluid pressure resulting from fluid flow up the wash pipe for movement to said raised position;

providing first and second fluid passages within the cross-over tool with the first fluid passage being in fluid communication with the wash pipe and the second fluid passage being in fluid communication with an outer annulus around the outside of the liner;

providing a fluid flow downwardly through said first passage and said wash pipe with the fluid pressure resulting therefrom effective to move the wash pipe relative to the liner to said lowered wash-down position and to effect movement of the combined liner and wash pipe to a predetermined depth within the well, the fluid flow in said outer annulus and said second fluid passage being in an upward direction; and

then reversing the fluid flow to provide fluid with entrained gravel downward through said second fluid passage and the annulus outside the liner to pack gravel in the annulus about the liner with fluid flow in said wash pipe and said first fluid passage being in an upward direction, the fluid pressure within said liner resulting in the upward movement of said wash pipe relative to said liner to said raised gravel packing position whereby the lower end of the wash pipe is in direct fluid communication with the inside of the liner.

4,635,726

METHOD FOR CONTROLLING LOST CIRCULATION OF DRILLING FLUIDS WITH WATER ABSORBENT POLYMERS

Clarence O. Walker, Richmond, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 28, 1985, Ser. No. 738,000
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—294 **3 Claims**

1. A method of reducing lost circulation of drilling fluids in a borehole penetrating an underground formation, comprising:

injecting a discrete slug of a hydrocarbon fluid into a borehole, said hydrocarbon fluid having dispersed therein about 10 to about 100 pounds of a water absorbent polymer per barrel of hydrocarbon fluid which expands upon absorbing water;

injecting into the borehole a discrete slug of a hydrocarbon fluid after the hydrocarbon fluid and polymer slug;

injecting into the borehole a slug of water after the hydrocarbon fluid slug;

forcing the hydrocarbon fluid and polymer slug into a lost circulation zone;

mixing the water slug with the hydrocarbon fluid and polymer slug to allow the water absorbent polymer to absorb water and expand in the formation closing off the lost circulation zone; and

circulating undesired compounds out of the borehole.

4,635,727

METHOD OF FRACTURING A SUBTERRANEAN FORMATION

James L. Anderson, and Javad Paktinat, both of Arlington, Tex., assignors to Hughes Tool Company, Houston, Tex.

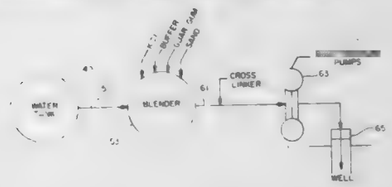
Filed Aug. 12, 1985, Ser. No. 764,819
Int. Cl.[4] E21B *43/26*
U.S. Cl. 166—308 **2 Claims**

1.

A method of fracturing a subterranean formation, comprising the steps of:

preparing a base gel by mixing together an aqueous fluid, a hydratable gelling agent comprising a carboxymethylhydroxypropylguar polymer having a hydroxypropyl molar substitution in the range of 0.1 to 0.4, and having a molecular weight of at least about 100,000, and a sodium discetate buffer capable of adjusting the pH of the base gel;

adding a crosslinking means to the aqueous fluid containing the hydratable gelling agent which allows continued hydration of the gelling agent in the presence of the crosslinking means as the aqueous fluid is being pumped into the well bore and which also serves to crosslink the base gel to form a crosslinked aqueous gel after a predicted time period, the crosslinking means comprising:



a liquid solution containing approximately 75% by volume of a 7% aqueous solution of active zirconium lactate, and 25% by volume of a 30% aqueous solution of aluminum chlorohydrate; and

introducing the resulting crosslinked aqueous gel into the formation at a flow rate and pressure sufficient to fracture the formation.

4,635,728

METHOD AND APPARATUS FOR CONNECTING A TUBULAR ELEMENT TO AN UNDERWATER WELLHEAD

John P. Harrington, Houston, Tex., assignor to Amoco Corporation, Chicago, Ill.

Filed Jul. 30, 1985, Ser. No. 760,700
Int. Cl.[4] E21B *43/013*
U.S. Cl. 166—341 **18 Claims**

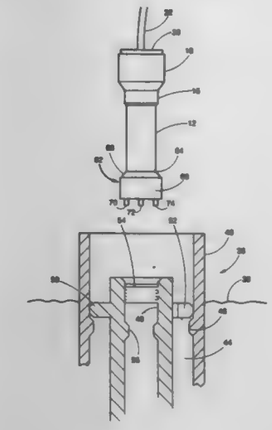
1. Apparatus for connecting a tubular member to an underwater wellhead of the type including a casing pipe having an annular exterior collar which includes flow-by ports, said apparatus comprising:

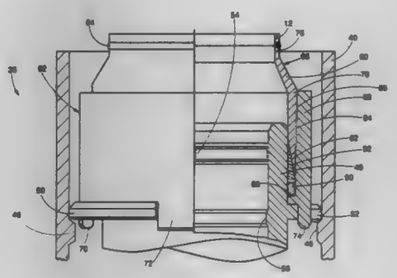
a housing having an upper end and a lower end, the interior diameter of the lower end being of a size sufficient to fit over the wellhead on the upper end of said casing pipe, said wellhead being adapted for connection to said tubular member;

a set of helical threads formed on the radially outer side of said housing;

a substantially tubular nut threadably engaged with said helical threads;

a set of lugs mounted on the lower end of said nut, said lugs being adapted for engagement with said flow-by ports; and





a set of slips mounted on the lower portion of said housing for fixedly engaging the exterior of said casing.

4,635,729

EXTENSIBLE FLAME DEFLECTOR

Tibor Z. Harmathy, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Continuation of Ser. No. 647,403, Sep. 4, 1984, abandoned. This application Jun. 3, 1986, Ser. No. 873,045
Claims priority, application Canada, Sep. 9, 1984, 436406
Int. Cl.[4] A62C *7/00*
U.S. Cl. 169—48 **6 Claims**

1. A building-exterior mountable flame deflecting device comprising:

(a) a casing having an open side and mountable on a building to extend upwardly less than three feet when so mounted;

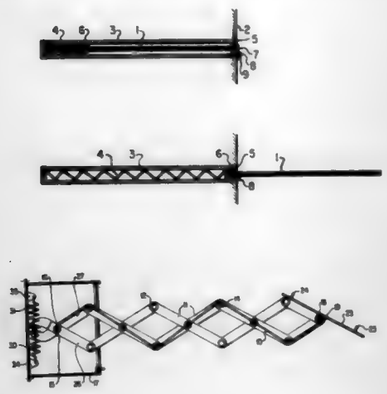
(b) a fire resistant lamina large enough to span a horizonftal width of a window and retained in said casing in a stored, horizontally retracted position and extendable therefrom through the open-side to a substantially horizontal position;

(c) lamina retaining means comprising a closure closing the open side of the casing;

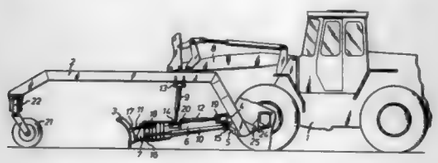
(d) securing means releasably securing the closure in the casing, the securing means being thermally actuated on the occurrence of fire to release the closure and allow the lamina to emerge through the open side of the casing; and,

(e) lamina projecting means enclosed within said casing spring loading the lamina to urge the lamina against the closure when said lamina is stored in the retracted position in the casing and upon thermal actuation of the securing

means to release the closure, urging the lamina to and holding the lamina in, the substantially horizontal, extended position to deflect flames impinging on an underside thereof.

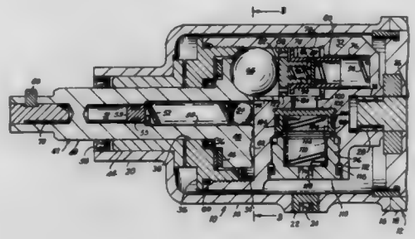


4,635,730
GRADER ATTACHMENT FOR A LOADER
Gunnar Larsson, Skövde, Sweden, assignor to AB Vretens Mekaniska Verkstad, Skövde, Sweden
Filed May 15, 1985, Ser. No. 734,584
Claims priority, application Sweden, May 18, 1984, 8402673
Int. Cl.⁴ E02F *3/76*
U.S. Cl. 172—788 **10 Claims**



1. A grader attachment for a loader or the like having a chassis, which comprises:
an elongated frame having front and rear ends;
at least one pivot wheel connected to the front end of said frame;
a coordinate plate connected to the rear end of said frame for pivotal movement about a generally transverse first axis;
a pivot plate connected to said coordinate plate for pivotal movement about a generally longitudinal axis;
a cross beam extending beneath said frame and between said pivot wheel and said pivot plate;
a pusher boom coupled between said cross beam and said pivot plate;
skewing means for selectively adjusting vertical pivotal positioning of said pusher boom relative to said frame;
first skewing means for selectively adjusting horizontal pivotal positioning of said pusher boom relative to said frame;
a grader blade connected to said cross beam for pivotal movement about a generally transverse second axis;
tilt means for selectively adjusting vertical pivotal positioning of said blade relative to said cross beam;
second slewing means for selectively adjusting horizontal pivotal positioning of said cross beam relative to said pusher boom; and
means for releasably attaching the rear end of said frame at two transversely spaced-apart points to the chassis of said loader.

4,635,731
IMPULSE TOOL
William K. Wallace, Baraeveld, and Kenneth A. McHenry, Clinton, both of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.
Filed Dec. 13, 1984, Ser. No. 680,998
Int. Cl.⁴ B23Q *5/00*
U.S. Cl. 173—12 **16 Claims**

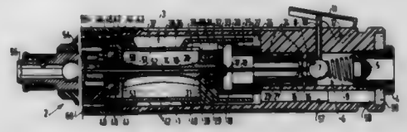


1. A rotary impulse device adapted to be driven by electric or air motor driving means having a rotary drive shaft comprising a generally cylindrical outer casing member affixed at one end to said driving means and carrying bearing means at the opposite end thereof, generally cylindrical rotatable cage means having first and second ends positioned within said outer casing member and drivingly connected at said first end to said rotary drive shaft of said driving means, said cage means filled with hydraulic fluid, a driven impulse member having a head portion disposed within said rotatable cage means and a shaft portion journalled within said outer casing member for rotation with respect thereto and journalled for supporting said second end of said rotatable cage means, said shaft portion of said driven impulse member adapted to carry a work engaging tool at its outer end, cam surface means formed on the head portion of said impulse member, ball means carried in a first bore formed in said cage means, said ball means positioned in said first bore adajcent said cam surface, biasing means adapted to bias said ball means toward said cam surface and means to develop hydraulic pressure in said first bore in response to motion of said ball means within said first bore, hydraulic check valve means communicating between a pressurized region either said first bore and a region outside said first bore adjoining said cam surface means formed on the head portion of said impulse member and said hydraulic check valve means adapted to open whenever the hydraulic pressure developed in said first bore drops below a predetermined pressure and to close whenever the hydraulic pressure developed in said first bore rises above such predetermined pressure, and torque adjusting means communicating with said first bore.

4,635,732
POWER-DRIVEN HAND-HELD TOOL WITH A PNEUMATIC MOTOR
Dieter Gotsch, Grosserlach/Grab; Robert Klenk, Grosserlach-Schönbr.; Otto Hilfner, Murrhardt, and Claus Süss, Maulbronn, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jul. 5, 1984, Ser. No. 627,741
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1983, 3335005
Int. Cl.⁴ B25B *21/00*
U.S. Cl. 173—162 R **6 Claims**

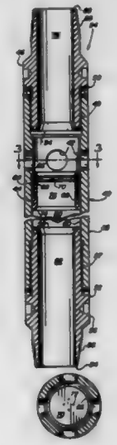
1. A power-driven, hand-held tool, comprising a housing; a pneumatic motor including a stator having a stator tube formed of steel and an annular stator flange made of plastic mounted to

each end of said tube and extending axially, said flanges being connected to said stator tube therefrom by injection molding, and an impeller rotor positioned in said stator tube, said stator and said rotor being arranged so that they form a complete motor assembly; an elastic supporting means carried by the outer peripheral surface of one of said flanges said complete motor assembly being supported in said housing by said elastic



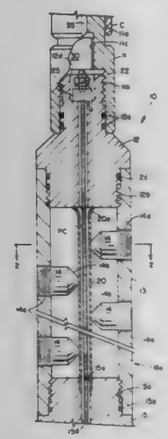
supporting means being positioned between said one flange and the inner peripheral surface of said housing; said housing and said one flange each being provided with a plug connection means formed directly therewith and of one piece with said housing and said one flange, respectively, and engageable with each other, said plug connection means securing said motor assembly in said housing against rotation.

4,635,733
GUN FIRING SYSTEM USING FLUID FILLED PRESSURE BALANCE TUBING
Roy R. Vann, Katy, Tex.; Emmet F. Brieger, Albuquerque, N. Mex.; Flint R. George, Katy; Edward A. Colle, Jr., Houston, both of Tex., and Hilton B. Jones, Albuquerque, N. Mex., assignors to Halliburton Company, Duncan, Okla.
Continuation of Ser. No. 385,707, Jun. 7, 1982, abandoned. This application May 22, 1985, Ser. No. 736,872
Int. Cl.⁴ E21B *43/11*
U.S. Cl. 175—4.56 **43 Claims**



1. In a tool string adapted for use in completing a payzone intersected by a borehole, said tool string including a perforating gun supported by a tubing string, said gun including a firing head at the upper end thereof actuable by a gun firing means run downhole through the tubing string into contact therewith, an apparatus comprising:
a chamber above said gun, said firing head being in communication with said chamber; closure means comprising a piston having a longitudinal passageway extending therethrough received within said chamber and in slidable sealed relationship with the wall thereof, said piston further including frangible disk means closing said passageway, said closure means being disposed proximate the upper end of said chamber and isolating said firing head from the interior of the tubing string thereabove; and
means associated with said gun firing means for penetrating said closure means and thereafter actuating the firing head, firing said gun to perforate the wall of the borehole and intersected payzone.

4,635,734
BOOSTERLESS PERFORATING GUN AND METHOD OF ASSEMBLY
Joseph F. Donovan, Tomball; Gregg W. Stout, Montgomery, and Phillip W. Schmuck, Spring, all of Tex., assignors to Baker Oil Tools, Inc., Houston, Tex.
Filed Jun. 11, 1985, Ser. No. 743,578
Int. Cl.⁴ E21B *43/117*
U.S. Cl. 175—4.6 **13 Claims**



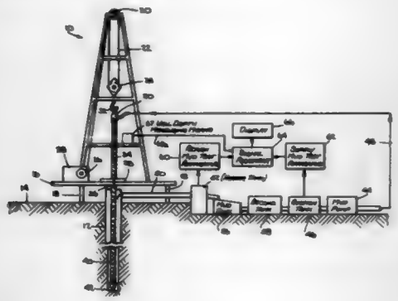
5. A perforating gun for a subterranean well comprising: a plurality of shaped charge containers, each container having a primer containing end; carrier means for mounting said containers in vertically and angularly spaced relation; fusible tube means defining a continuous axial passage adjacent said primer ends of said shaped charge containers; a continuous length of primer cord extending through said continuous axial passage; and means for detonating one end of said primer cord, thereby melting said fusible tube means and firing said shaped charges.

4,635,735
METHOD AND APPARATUS FOR THE CONTINUOUS ANALYSIS OF DRILLING MUD
Donald J. Crownover, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Jul. 6, 1984, Ser. No. 628,683
Int. Cl.⁴ E21B *47/00*; C09K *7/00*
U.S. Cl. 175—48 **56 Claims**

1. In the logging of a well during drilling thereof, the method of producing a logging signal which represents, on a continuous basis, the instantaneous concentration of a given gaseous component in drilling mud as it is being returned from the well, said method comprising the steps of:
continuously subjecting at least a portion of said drilling mud being returned from the well to gas separation to separate gas containing said gaseous component from said portion of the returned mud;
continuously and simultaneously subjecting the separated gas to analysis to produce a gaseous component concentration signal whose value at any instant corresponds to the concentration, at that instant, of said given gaseous component in the separated gas;

producing a continuous mud flow rate signal whose value at each instant corresponds to the rate of flow of drilling mud from which the gas is separated;

producing a continuous gas flow rate signal whose value at each instant corresponds to the rate of flow of gas separated from said drilling mud; and



continuously processing said gaseous component concentration signal, said mud flow rate signal and said gas flow rate signal to provide a continuous logging signal whose value at any instant corresponds to the product of the concentration at that instant of the given gaseous component and the rate of flow at that instant of gas separated from said drilling mud divided by the rate of flow at that instant of the drilling mud.

4,635,736

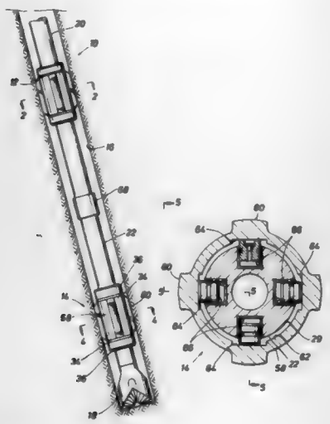
DRILL STEERING APPARATUS

Kirk R. Shirley, 15719 Tumbling Rapids, Houston, Tex. 77084

Filed Nov. 22, 1985, Ser. No. 800,799

Int. Cl.⁴ E12B *7/08*

U.S. Cl. 175—76. **9 Claims**



1. A steering tool comprising

a tubular body having means on each end for connecting into a drill string at a position close to the drill bit,

an upper stabilizer on said tubular body having means coacting between said tubular body and said upper stabilizer to sense the low side of the well bore being drilled,

a lower stabilizer on said tubular body having means coacting between said tubular body and said lower stabilizer to impart a lateral thrust to the tubular body responsive to the sensing of the low side of the well bore by said upper stabilizer,

means adjustably interconnecting said sensing means in said upper stabilizer to said thrust means in said lower stabilizer to provide thrust in a preselected direction to the lower end of said tubular body, and

means for securing each of said stabilizers to said tubular body for rotation therewith and allowing freedom of relative movement between said tubular body and said stabilizers in radial directions.

4,635,737

UNDERCUTTING DRILL

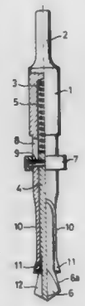
Masaaki Miyanaga, Ashiya, Japan, assignor to Kabushiki Kaishi Miyanaga, Miki, Japan

Filed Mar. 4, 1985, Ser. No. 707,641

Claims priority, application Japan, Mar. 8, 1984, 59-045306; Sep. 7, 1984, 59-136571[U]

Int. Cl.⁴ E21B *10/32*

U.S. Cl. 175—284 **5 Claims**



1. A rotatable drill having forward and rearward ends, said drill comprising a rotatable body having an axially extending bore forming a generally cylindrical wall, said bore being open adjacent said forward end, an axially extending slot formed through said wall, a wedge center slidably mounted within said bore, connecting means fixed to said center and axially slidably engaging said slot so that said body and said center rotate together, said center being spring-urged toward said forward end relative to said body so that said connecting means is normally adjacent one end of said slot, annular means fixed to said connecting means and axially slidable around said body, and thrust means threaded on said body rearwardly of said annular means and engageable with said annular means, whereby the rotation of said thrust means on said body is operable to force said body to retract toward said rearward end relative to said center, said body having a blade adjacent said forward end, a cutting tooth fixed to said blade, said center having guide jaws adjacent said forward end, said jaws extending radially outwardly toward said forward end, whereby as said body moves toward said forward end relative to said center, said blade slides on said jaws and said tooth moves radially.

4,635,738

DRILL BIT

Hans Schillinger, Celle; Klaus Pahlke, Ovelgonne; Siegfried Starke, Grob Ilsede; Heinz-Juergen Panhorst, Nienhagen, and Hans-Eckhard Mengel, Celle, all of Fed. Rep. of Germany, assignors to Norton Christensen, Inc., Salt Lake City, Utah

Filed Apr. 5, 1985, Ser. No. 720,237

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, P3411809

Int. Cl.⁴ E21B *10/00*

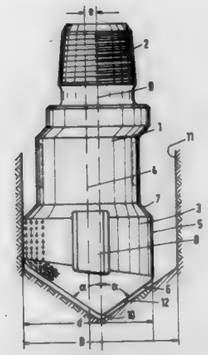
U.S. Cl. 175—398 **1 Claim**

1. A drill bit for drilling bore holes comprising

a connecting spigot for connecting to a drill string, said spigot having a longitudinal axis of rotation,

a cutting head having a longitudinal axis, eccentric of the spigot axis

said cutting head comprising a circumferential face having



an axis which is substantially coincident with the cutting head axis and an end face projecting away from said spigot,

said end face being substantially conical and coaxial with the axis of rotation of said spigot, said conical end face terminating at a point axially opposite said spigot.

4,635,739

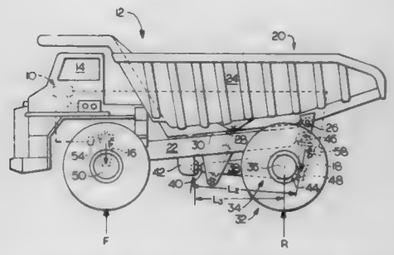
PAYLOAD MONITOR

Donald E. Foley, Peoria Heights; Gregory H. Gipp, Peoria; William G. Schwader, East Peoria; Craig L. Sells, Peoria; James A. Smittkamp, Peoria; Alan L. Stahl, Peoria, and John F. Szentes, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jun. 25, 1985, Ser. No. 749,607

Int. Cl.⁴ G01G *23/18, 19/10, 5/04*

U.S. Cl. 177—45 **13 Claims**



1. An apparatus for measuring and indicating the weight of a payload carried by a work vehicle, the work vehicle having at least one front and rear strut disposed in supporting relation to a load carrying portion of the work vehicle, said apparatus comprising:

means for separately sensing the pressures of said front and rear struts and delivering signals respectively responsive to the magnitude of said front and rear strut pressures;

means for modifying said front and rear strut pressure signals by applying respective unique correction factors thereto, summing the resultant modified signals, and delivering a control signal responsive to the magnitude of the sum of said modified signals;

means for receiving said control signal and delivering an indication of the magnitude of the work vehicle payload in response to the magnitude of said control signal; and

means for recording the magnitude of the control signal as an indication of actual current payload in response to the magnitude of said control signal changing by less than a preselected magnitude during a first preselected duration of time.

4,635,740

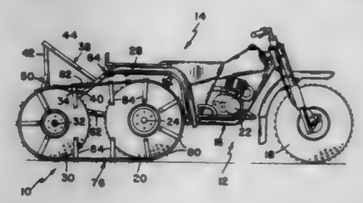
ENDLESS TRACK ATTACHMENT FOR A WHEELED VEHICLE

David W. Krueger, Box 524, and Raymond A. Yerigan, Rte. 3, both of Grantsburg, Wis. 54840

Filed Jan. 31, 1985, Ser. No. 696,734

Int. Cl.⁴ B62D *55/04*

U.S. Cl. 180—9.21 **11 Claims**



1. An endless track attachment for a wheeled vehicle, said vehicle having at least one front wheel and a pair of rear wheels, said attachment comprising:

a frame;

a pair of auxiliary wheels rotatably attached to said frame;

means for attaching said frame to said vehicle, said attaching means including means for shifting a portion of the weight of said vehicle from said rear wheels to said auxiliary wheels and to said front wheel; and

a pair of endless tracks, each of said tracks being entrained about one of said rear wheels and one of said auxiliary wheels.

4,635,741

POWER STEERING APPARATUS

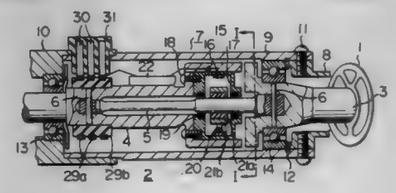
Mitsuharu Morishita; Tadayuki Hara; Shinichi Kohge; Tetsushi Watanabe, all of Himeji, and Yasuki Ikari, Hiroshima, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1985, Ser. No. 770,184

Claims priority, application Japan, Sep. 7, 1984, 59-136424[U]

Int. Cl.⁴ B62D *5/04*

U.S. Cl. 180—79.1 **1 Claim**



1. A power steering apparatus comprising:

a rotatably supported steering shaft having an input section adapted to be driven by a steering wheel, an output section, and a torsion bar which is connected between said input section and said output section and is disposed coaxially therewith;

a potentiometer comprising a generally annular resistive element and a wiper element which is in electrical and sliding contact with said resistive element, one of said elements being secured to said output section and the other of said elements being secured to said torsion bar

such that when said torsion bar is rotated with respect to said output section, said wiper element will move with respect to said resistive element while maintaining electrical contact therewith, and brush means in electrical brushing contact with the element which is on said torsion bar;

a preamplifier on said output section and electrically connected with said brush means and said element which is on said output section;

three slip rings secured to the outer periphery of said output section and electrically connected to said preamplifier for connecting two of the slip rings to said resistive element and the third slip ring to said wiper element; and

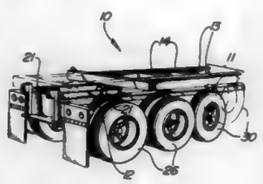
stationary brushes outside said output element which are in sliding electrical contact with said slip rings.

4,635,742

EXTENDABLE CHASSIS

William A. Bertolini, Montague, N.J., assignor to JD-Bertolini Industries, Ltd., Compton, Calif.

Filed Jan. 18, 1985, Ser. No. 692,505
Int. Cl.[4] B62D *53/06*; B62P *1/18*
U.S. Cl. 180—209 **12 Claims**



1. A chassis, comprising:

a main frame; a wheeled underframe generally planar-parallel with respect to the main frame; means connecting the main frame to the underframe for relative movement between a retracted position and an extended position to decrease and increase the length of the chassis, an additional axle including wheels, and supporting means supporting the additional axle for raising the wheels of the additional axle to a position off the ground upon retraction of the chassis and for lowering the wheels of the additional axle to a position on the ground upon extension of the chassis.

4,635,743

VEHICLE FRONT WHEEL ASSIST DRIVE OVERSPEED CONTROL SYSTEM

David C. Riehl, Shelby, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 12, 1984, Ser. No. 599,368
Int. Cl.[4] B60K *25/00*
U.S. Cl. 180—243 **5 Claims**

1. A front wheel drive speed control system for a vehicle having a rear wheel drive and an assisting front wheel drive, coprising:

(a) a hydraulic pump means operably connected by a hydraulic circuit to a hydraulic motor at each driven front wheel to cause rotation of that wheel;

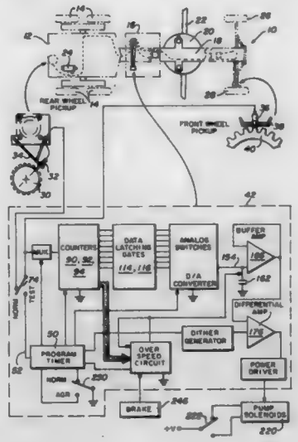
(b) an overrunning clutch assembly interposed between said motor and each associated wheel, engagable to facilitate rotation of said driven front wheel in both forward and reverse directions;

(c) a speed sensing means has main rear wheel drive sensor mounted with a vehicle transmission output to the driven rear wheels thereof operable to provide pulse signals indicative of the speed of rotation of said driven rear wheels;

(d) a driven front wheel sensor mounted with said vehicle and operable to provide pulse signals indicative of the speed of rotation of said driven front wheel;

(e) a comparator means operable to compare the rate of rear wheel pulse signals with a first predetermined rate to produce a front wheel enabling signal when said rear wheel pulse signals are below said first predetermined rate;

(f) a front wheel drive operating circuit means connected to said comparator means to receive said front wheel enabling signal and operable to activate said hydraulic pump means to cause rotation of said front wheel;



(g) said comparator means additionally has means to compare the rate of said front wheel pulse signals with a second predetermined rate to produce a front wheel disabling signal when said rear wheel pulse signal rate has increased above said first predetermined rate and is decreasing therefrom towards said second predetermined rate; and

(h) said front wheel drive operating circuit means being connected to receive said front wheel disabling pulse signal and operable to maintain said hydraulic pump means in a deactivated condition until said rear wheel pulse signals are equal to said second predetermined rate whereupon said hydraulic pump means is activated to resume assisting rotation of said front wheel.

4,635,744

FOUR-WHEEL DRIVE AUTOMOTIVE VEHICLE

Kazuyoshi Hiraiwa, Atsugi, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Mar. 16, 1984, Ser. No. 590,490
Int. Cl.[4] B60K *5/04*
U.S. Cl. 180—249 **9 Claims**

1. A four-wheel drive automotive vehicle comprising:

a front shaft for driving front wheels having first and second divided portions, said first portion of the front shaft driving one of the front wheels and said second portion of the front shaft driving the other front wheel;

a rear shaft for driving rear wheels having first and second divided portions, said first portion of the rear shaft driving one of the rear wheels and said second portion of the rear shaft driving the other rear wheel;

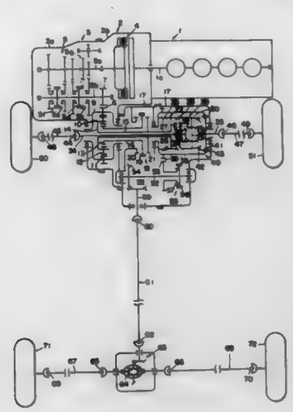
an engine having a crank shaft rotatable about an axis extending in a transverse direction of a vehicle body;

a transmission having a speed change mechanism between an input shaft and a first output shaft each rotatable about an axis extending in a transverse direction of the vehicle body and arranged in parallel with each other, said input shaft driven by said crank shaft;

a final reduction gear driven by said first output shaft and having a second output shaft arranged substantially in a coaxial relationship to one of said front and rear shafts;

a first differential device having at least first and second pinion gears each rotatably supported by a first shaft which extends at a right angle to said one of the front and rear shafts and is driven by said second output shaft to rotate about an axis of rotation of said second output shaft, said first differential device having first and second side gears arranged substantially in a coaxial relationship to said one of the front and rear shafts and facing each other, said first and second pinion gears each positioned between said first and second side gears and each meshing with said first and second side gears in such a manner that the first and second side gears are rotatable at different speeds;

a second differential device having at least third and fourth pinion gears each rotatably supported by a second shaft which extends at a right angle to said one of the front and rear shafts and is driven by said first side gear, said second differential device having third and fourth side gears, said



third side gear rotatable about an axis of rotation of said one of the front and rear shafts and driving said first portion of said one of the front and rear shafts, said fourth side gear rotatable about the axis of rotation of said one of the front and rear shafts and driving said second portion of said one of the front and rear shafts, said third and fourth pinion gears each positioned between said third and fourth side gears and meshing with said third and fourth side gears in such a manner that the third and fourth side gears are rotatable at different speeds;

a first transfer gear which rotates together with said second side gear of the first differential device about an axis of rotation of said second side gear;

a direction change gear device for changing a rotation direction of drive power of the first transfer gear into a different direction at a right angle thereto thereby to drive a third differential device for driving said first and second portions of the other one of the front and rear shafts, said first and second portions of said other one of the front and rear shafts being rotatable at different speeds.

4,635,745

VEHICLE AIR SUSPENSION

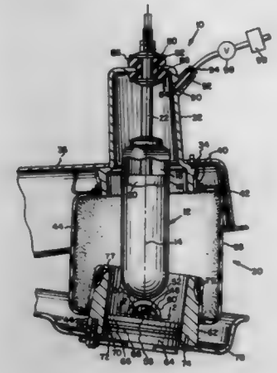
Philip F. Myers, Stow; Roger A. Strickler, and Ivan J. Warmuth, II, both of Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 10, 1986, Ser. No. 827,707
Int. Cl.[4] F16F *9/04*
U.S. Cl. 280—708 **10 Claims**

1. A vehicle air suspension member comprising:

(a) a hydraulic shock absorber with an axis of extension having an outer body containing an oil filled reservoir, a rod operatively positioned within said reservoir for coaxial reciprocal movement along the axis of extension, said rod extending axially outward from said outer body of said shock absorber;

(b) an airspring having an upper retainer with a bore therethrough for receiving therein the rod, said upper retainer being connected to said rod by a resilient mounting means, an airspring piston axially spaced apart from said upper retainer, a flexible, tubular member sealingly connected at



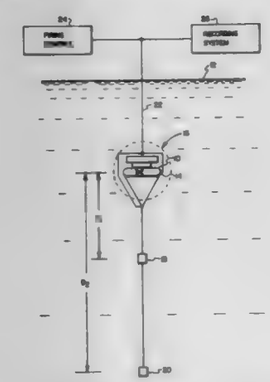
a first end thereof to said airspring piston and at a second end to said upper retainer to form a sealed pneumatic working cavity, and a means for changing pressure within said working cavity, a port connecting said working chamber to said means for changing pressure, said airspring piston being attached to the outer body of said hydraulic shock absorber by a means for pivoting the shock absorber relative to said airspring piston during operation of said air suspension.

4,635,746

TIMING CORRECTION METHODS FOR SEISMIC ENERGY SOURCE OPERATION

James J. Lin, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 11, 1984, Ser. No. 619,099
Int. Cl.[4] G01R *1/38*
U.S. Cl. 181—107 **3 Claims**



1. A method for measuring the effective firing time of a seismic source comprising:

placing first and second seismic detectors in the propagation medium in which the source is positioned at first and

second distances from said source, both said first and second distances being selected to be beyond a non-linear propagation region surrounding said source,

connecting a third detector to said source for providing a time break signal indicating source firing time,

detecting the times of arrivals of energy from said source at said first, second, and third detectors,

using the times of arrivals at said first and second detectors and said first and second distances, calculating the effective firing time of said source, and

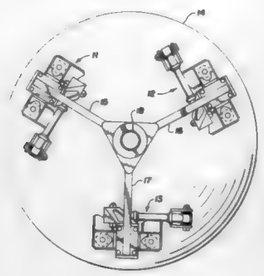
calculating the time difference between the third detector time break signal and the effective firing time determined from said first and second seismic detectors, said time difference being a correction factor.

4,635,747

MARINE SEISMIC VIBRATOR HAVING SUPPORT STRUCTURE INCLUDING VIBRATION ISOLATORS

James M. Bird, Sr., and Jesse M. Lewis, both of Tulsa, Okla., assignors to Industrial Vehicles International, Inc., Tulsa, Okla.

Filed Jun. 28, 1985, Ser. No. 750,329
Int. Cl.⁴ G01V *1/04*; H04R *11/00, 1/02*
U.S. Cl. 181—120 **5 Claims**



1. A marine seismic vibrator for immersion in a body of water to generate variable frequency acoustic sweep frequencies and including an upper housing, means secured to the upper housing for mechanical connection to means at the surface of the water supporting the immersed vibrator, said means secured to said upper housing comprising at least three acoustic isolators equally spaced apart about said upper housing, each of said isolators comprising a pair of spaced mounting pads mechanically secured to said housing, a U-shaped bracket having a base and depending spaced leg portions, the free ends of said leg portions being secured to said spaced mounting pads by way of a low-pass acoustic filter, a rectangular shaped bracket having a base, a top, and a pair of spaced vertical side walls, said rectangular shaped bracket being located between said spaced leg portions of said U-shaped bracket, resilient means mounted to and between said bases of said U-shaped bracket and said rectangular bracket to provide a high-pass acoustic filter, and means mechanically connected to the top of said rectangular bracket for securing all said isolators to a common point at the center of said housing.

4,635,748

SPEAKER CABINET HAVING INTERACTIVE SPEAKERS

Rollie W. Paulson, 6119 9th Ave. South, Gulfport, Fla. 33707

Filed Feb. 18, 1986, Ser. No. 830,358
Int. Cl.⁴ H05K *5/00*
U.S. Cl. 181—145 **3 Claims**

1. A cabinet for speakers of the type used in stereo systems, comprising:

a cabinet member of generally parallelepiped configuration;

a substantially imperforate partition wall member positioned interiorly of said cabinet member in a horizontal plane;

said partition wall member dividing the interior of said cabinet member into an upper compartment and a lower compartment;

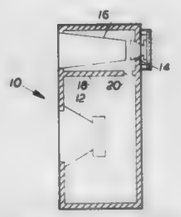
at least one opening formed in said partition wall member to allow sound waves originating in said lower compartment to enter into said upper compartment;

a full range speaker member positioned within said upper compartment;

a low range speaker member positioned within said lower compartment;

a horn member;

said horn member positioned in said upper compartment;



said horn member positioned in spaced apart, axially aligned, non-attached relation to said full range speaker member;

a space defined between said horn member and said full range speaker member by said spaced, non-attached positioning of said full range speaker member and horn member;

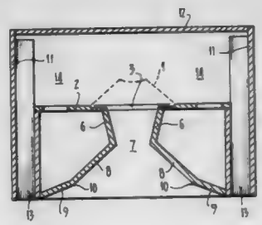
said space being occupied by sound emanating from said full range speaker member and from said low range speaker member when said system is operating so that a mixture of sound from said speaker members enters said horn member to provide a full-bodied sound.

4,635,749

SPEAKER ENCLOSURE

Alan M Tattersall, 179 Corio Street, Shepparton, Victoria, 3630, Australia

PCT No. PCT/AU82/00146, § 371 Date Apr. 29, 1983, § 102(e) Date Apr. 29, 1983, PCT Pub. No. WO83/00977, PCT Pub. Date Mar. 17, 1983
PCT Filed Aug. 31, 1982, Ser. No. 491,338
Claims priority, application Australia, Aug. 31, 1981, PF0534
Int. Cl.⁴ H05K *5/00*
U.S. Cl. 181—152 **10 Claims**



1. A loudspeaker horn which provides an improved horizontal dispersion of sound at frequencies up to 4 KHz, said loudspeaker horn comprising

a generally planar baffle board which has a front face, a rear face and a rectangular opening therethrough; said baffle board, when vertically oriented, defining opposite vertical side edges of said rectangular opening, said opposite side edges defining a width dimension of said rectangular opening,

first generally planar side wall members connected to the front face of said baffle board along the respective opposite side edges of said opening therethrough, said first side wall members extending away from said baffle board and converging towards one another to provide a single rectangular throat having a width dimension which is less than the width dimension of said rectangular opening,

second generally planar side wall members respectively connected to said first side wall members at said throat to extend away from said baffle board while diverging away from one another at a first included angle, and

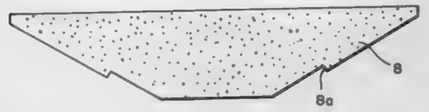
generally planar top and bottom wall members which are respectively connected to said baffle board and to said first and second side wall members.

4,635,750

LOUDSPEAKER DIAPHRAGM

Akihisa Suzuki, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 3, 1985, Ser. No. 740,545
Int. Cl.⁴ G10K *13/00*
U.S. Cl. 381—194 **3 Claims**



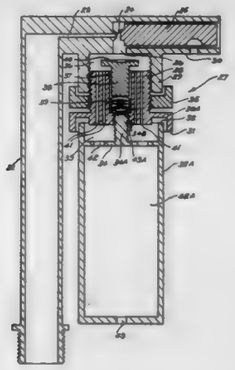
1. A plane-type or cone-type loudspeaker diaphragm with a foam material having an inclined surface formed to shape a frustum of a cone, said cone having an inward step provided therein about the thickness of a bobbin near the middle of the inclined surface such that the bobbin for accurately positioning said diaphragm with respect to a voice coil can be easily attached to said diaphragm correctly.

4,635,751

SILENCER

John S. Howell, 2/13 Willow Place, Port Macquarie, N.S.W. 2444, Australia

PCT No. PCT/AU84/00232, § 371 Date Jul. 12, 1985, § 102(e) Date Jul. 12, 1985, PCT Pub. No. WO85/02241, PCT Pub. Date May 23, 1985
PCT Filed Nov. 9, 1984, Ser. No. 765,327
Claims priority, application Australia, Nov. 17, 1983, PG2429
Int. Cl.⁴ E03D *9/14*
U.S. Cl. 181—234 **6 Claims**



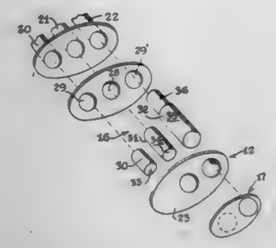
1. A silencer for attachment to a toilet cistern float valve or the like comprising a housing having an inlet and an outlet respectively communicating with an intermediate chamber defined therein, damping means disposed within said chamber for reducing flow noise generated in the valve, a cylinder mounted adjacent said outlet and having an upper edge disposed above the level of said outlet and defining a space thereabout, said cylinder having a bottom opening, and a partition disposed across the interior of said cylinder and defining a cavity directly below said outlet, said partition provided with an aperture, whereby during refilling of the cistern water fills the cavity to a level above said outlet to thereby eliminate any air gap and subsequently spills through said space over said upper edge and down the outside of the cylinder and after cessation of flow through the valve the water in said cavity drains away through said aperture in said partition and said cylinder bottom opening to provide a siphon-breaking air gap below said outlet.

4,635,752

UNIVERSAL MUFFLER CONSTRUCTION ASSEMBLY

Freddie L. Jennings, Rte. 4, Box 95, El Dorado, Ark. 71730

Filed Jan. 29, 1986, Ser. No. 823,846
Int. Cl.⁴ F01N *7/18*
U.S. Cl. 181—241 **6 Claims**



1. A universal muffler construction wherein the basic muffler components may be assembled in a variety of structural relationships to produce different internal and external muffler configurations wherein the basic components comprise a generally cylindrical muffler housing member, a primary exhaust tube array comprising an exhaust inlet tube, an exhaust outlet tube and a reverse flow tube, supported within the housing member by exhaust tube support panels, and wherein the improvement comprises:

a pair of end cap elements provided with a central aperture and an offset aperture wherein the end cap elements are adapted to assume different orientations with respect to the ends of the said muffler housing member; and

an auxiliary exhaust tubing array comprising an exhaust transmittal tube adapted to be received in one of the said apertures in the end cap element, and operatively connected to the exhaust outlet tube in the said primary exhaust tube array.

4,635,753

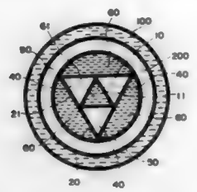
NOISE CONVERTER

Jun Itani, Kobe, Japan, assignor to Ohbayu Kabushiki Kaisha, Osaka, Japan

Filed Jul. 31, 1985, Ser. No. 760,798
Claims priority, application Japan, Jun. 17, 1985, 60-132623
Int. Cl.⁴ F01N *1/10*
U.S. Cl. 181—279 **4 Claims**

1. A noise converter comprising an outer spirally twisted tube having a polygonal cross-section, an inner spirally twisted tube having a polygonal cross-section and disposed within said outer tube, said inner and outer tubes spirallying in the same direction and forming gas conducting spiral passages therebe-

tween, and an outer cylindrical container into which said outer tube with said inner tube therein is inserted for supporting said



outer and inner tubes, a gas inlet at one end of said tubes and a gas outlet at the other end of said tubes.

4,635,754

RESCUE FROM AN AVALANCHE

Peter Aschauer; Michael Aschauer, both of Gräfelfing, and Helmuth Bauer, Malgersdorf, all of Fed. Rep. of Germany, assignors to Firma Peter Aschauer, Gräfelfing, Fed. Rep. of Germany

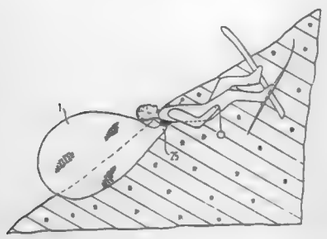
PCT No. PCT/EP83/00262, § 371 Date Jul. 26, 1984, § 102(e) Date Jul. 26, 1984, PCT Pub. No. WO84/01300, PCT Pub. Date Apr. 12, 1984

PCT Filed Oct. 6, 1983, Ser. No. 615,744

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1982, 3237060

Int. Cl.[4] A63B *29/02*

U.S. Cl. 182—3 19 Claims



1. Apparatus for rescuing persons in avalanches, said apparatus comprising a tear-resistant balloon (1) connected through a body-close connection to the wearer; said balloon (1) being inflated, during rescue action, by means of pressure gas so as to keep, like a floating body, its wearer on the surface of the avalanche; said apparatus also comprising a filling apparatus (2) to which one or more pressure gas bottles (3) are directly connected, said filling apparatus (2) being connected to the interior of said balloon through a valve, characterized in

that the balloon (1) with its filling opening grip a collar part (4) of a rigid frame (5) in the interior of which is located said filling apparatus (2), and straps (6) which may be connected to the wearer are attached to the frame (5).

4,635,755

BACKWOUND PRE-STRESSED SPRING MOTOR AND METHOD

John C. Arechaga, Lansdale, Pa., assignor to Ametek, Inc., New York, N.Y.

Filed Jan. 16, 1985, Ser. No. 691,899

Int. Cl.[4] F03G *1/00*

U.S. Cl. 185—45 18 Claims

1. An improved backwound pre-stressed flat spring motor comprising an arbor, a spring retaining means substantially concentric to said arbor, said arbor rotatable relative to said spring restraining means, a pre-stressed flat spring element located in said spring retaining means and having a natural direction of curvature and a first end including an eye portion extending from said first end, and a second end, said first end of said spring element fastened to said arbor with said extending eye portion extending past said arbor and said spring element backwound around said arbor in a direction opposite said



natural direction of curvature and said second end of said spring element engaged in said retaining means whereby said extended eye portion of said spring element is wound and said first end of said spring element is backwound around said arbor in alternating layers.

4,635,756

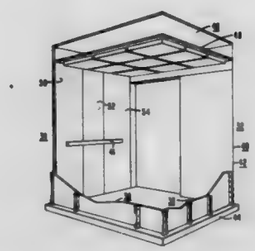
ELEVATOR CAB

Edward F. Sherwood, Gettysburg; Paul L. Baldwin, Franklin Township, Adams County; Karl B. Orndorff, Bonneauville Boro, all of Pa., and Charles M. Dillon, Emmitsburg, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 9, 1985, Ser. No. 753,282

Int. Cl.[4] B66B *9/00*

U.S. Cl. 187—1 R 8 Claims



1. A lightweight elevator cab, comprising:

upstanding side, rear and front wall portions assembled to define an enclosure having inner and outer surfaces and upper and lower edges,

said upstanding front wall portion including a swing return portion, said swing return portion including a stationary return assembly comprising an aluminum channel member, and a pivotable swing panel punched for fixtures, said swing panel having a closed position which cooperates with said channel member to define a wiring duct,

a transom disposed above the swing return, said transom including an L-shaped metallic member mounted on the aluminum channel member of the stationary return assembly, with said L-shaped metallic member being adapted to provide support for a door operator,

at least said side wall portions being formed of aluminum wall panel members having flat major surfaces,

each of said aluminum wall panel members having flanged lateral edges and flanged upper and lower edges, with the flanged lower edge being adapted to be secured to a platform,

means joining the flanged lateral edges of adjacent wall panel members together,

and a canopy attached to the upper edges of the enclosure, said canopy comprising aluminum honeycomb having a plurality of cells, the terminating edges of which lie in first and second flat, parallel planes, and flat aluminum sheet members adhesively bonded to terminating edges of said honeycomb cells, to form flat upper and lower surfaces of the canopy.

4,635,757

MAST ASSEMBLY FOR A FORKLIFT

Takashi Yamagishi, and Masaru Ohsawa, both of Tokyo, Japan, assignors to Komatsu Forklift Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1984, Ser. No. 624,092

Claims priority, application Japan, Jun. 27, 1983, 58-114316

Int. Cl.[4] B66B *9/20*; B66F *9/08*

U.S. Cl. 187—9 E 3 Claims



1. In a mast assembly for a forklift, including prong carrier means disposed on one side of the mast assembly, the combination of:

(a) a pair of upstanding outer masts horizontally spaced from each other, each outer mast comprising a first web oriented at right angles with the plane of the mast assembly, first and second flanges formed on opposite sides of the first web in right angular relationship therewith and extending toward the other outer mast, and a rim bent right angularly from the first flange, disposed farther away from the prong carrier means than the second flange, into parallel spaced relationship with the first web;

(b) a pair of outer rolls rotatably mounted one to each outer mast in the adjacency of the top end thereof for rotation about a horizontal axis parallel to the plane of the mast assembly;

(c) a pair of upstanding inner masts horizontally spaced from each other and disposed inwardly of the outer masts for up and down motion relative to the same, each inner mast comprising a second web oriented at right angles with the plane of the mast assembly, and third and fourth flanges formed on opposite sides of the second web in right angular relationship therewith and extending at least in a direction away from the other inner mast, the second web and the third and fourth flanges of each inner mast defining in combination a space in which the outer roll on one of the outer masts is rotatably engaged;

(d) a pair of inner rolls rotatably mounted one to each inner mast in the adjacency of the bottom end thereof for rotation about a horizontal axis parallel to the plane of the mast assembly, the inner roll on each inner mast being rotatably engaged in a space defined by the first web and rimmed first flange and second flange of one of the outer mast, the rims of the first flanges of the outer masts being effective to bear the axial thrust of the inner rolls when the inner masts are loaded out of the perpendicular in the plane of the mast assembly;

(e) two pairs of carrier rolls rotatably mounted on said prong carrier means for rotation about horizontal axes parallel to the plane of said mast assembly, said prong carrier means being movable up and down relative to said outer and inner masts, each pair of carrier rolls being vertically spaced and horizontally offset from each other, said third and fourth flanges of each inner mast further extending toward the other inner mast in right angular relationship with said second web and defining in combination with said second web another space for receiving one pair of carrier rolls, each pair of carrier rolls making rolling contact with the different ones of said third and fourth flanges of the associated inner mast;

(f) first tie means rigidly interconnecting the pair of inner masts only at the top ends thereof;

(g) second tie means rigidly interconnecting the pair of outer masts at least at the bottom ends thereof;

(h) a pair of linear actuators rigidly mounted upstandingly one to each outer mast, each linear actuator having an output member extending upwardly therefrom;

(i) third tie means rigidly interconnecting the top ends of said output members of said linear actuators;

(j) stop means movable with said output members of said linear actuators into and out of abutting engagement with said second tie means;

(k) a pair of guide rolls rotatably mounted to said third tie means; and

(l) a pair of elongate flexible members extending between the respective outer masts and said prong carrier means via the respective guide rolls.

4,635,758

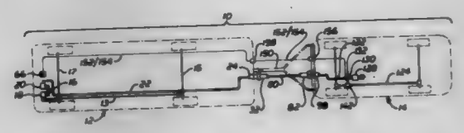
HYDRAULIC CONTROL SYSTEM FOR SIMULTANEOUS APPLICATION OF BRAKES OF TOWING AND TOWED VEHICLES WITH EQUAL INTENSITY

Frank A. Beard, Jr., P.O. Box 5145, Clearwater, Fla. 33518

Continuation-in-part of Ser. No. 746,631, Jun. 19, 1985, abandoned. This application May 22, 1986, Ser. No. 874,188

Int. Cl.[4] B60T *7/20*

U.S. Cl. 188—3 H 7 Claims



1. Hydraulic brake system controlling the simultaneous braking of a towing and towed vehicle comprising:

(a) a brake pedal in the towing vehicle simultaneously activating a first master cylinder controlling front wheel and rear wheel brakes in the towing vehicle and a second master cylinder independent of the first master cylinder controlling fluid pressure through a first brake fluid conduit mounted in the towing vehicle to a first auxiliary brake cylinder mounted on the rear end of the towing vehicle;

(b) the first auxiliary brake cylinder having an adjustable piston in nose to nose contact with a piston in a second auxiliary brake cylinder, the second auxiliary brake cylinder being separated from a third auxiliary brake cylinder by a second brake fluid conduit exterior of the towing and towed vehicles;

(c) a piston in the third auxiliary brake cylinder being in nose to nose contact with a piston in a fourth auxiliary brake cylinder mounted on the front end of the towed vehicle;

(d) the towed vehicle having a three way valve inserted in a fourth brake fluid conduit mounted within the towed vehicle and in fluid contact with a third master brake cylinder mounted in the towed vehicle, the valve having a means for opening or closing the fourth brake fluid line to prevent flow of fluid from the master cylinder in the

towed vehicle to front and rear brake cylinders in the towed vehicle;

(e) a third auxiliary brake fluid conduit in fluid contact with the three way valve at one end and in fluid contact with a brake fluid reservoir in the fourth auxiliary brake cylinder at its other end, the valve having a means controlled by the handle for opening or closing the end of either brake fluid conduit in contact with the valve;

(f) the valve controlling the flow of brake fluid from the third brake fluid conduit to the brake fluid in the fourth brake fluid conduit;

(g) the valve being configured so that when fluid from the third brake fluid conduit is in contact with fluid in the fourth brake fluid conduit, the fluid from the master cylinder in the towed vehicle is prevented from being in contact with the fluid of the fourth brake fluid conduit; whereby when pressure in the brake pedal of the towing vehicle activates the second master cylinder and the third master cylinder in the towed vehicle is not in fluid contact with the fourth brake fluid conduit extending beyond the valve, the fluid pressure in the entire system activates the front and rear brake cylinders in the towed vehicle.

4,635,759

CALIPER BRAKE FOR A BICYCLE

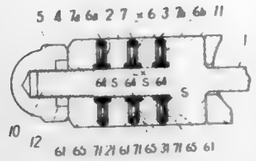
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 16, 1985, Ser. No. 723,905

Claims priority, application Japan, Apr. 24, 1984, 59-60240[U]

Int. Cl.⁴ B62L *1/12*

U.S. Cl. 188—24.22 **10 Claims**



1. A caliper brake for a bicycle, comprising:

(a) a pair of brake arms each having a brake shoe on one end thereof,

(b) a support bolt for supporting said brake arms rotatably relative to each other, said brake arms each having a boss with a through bore by which said brake arms are fitted onto said bolt, said bosses being supported on said bolt adjacent to each other,

(c) a thrust bearing disposed between opposite surfaces of said bosses, and

(d) a sealing means disposed at an outer periphery of said thrust bearing between said opposite surfaces of said bosses,

(e) said thrust bearing comprising (i) a plurality of rolling elements and a retainer holding said rolling elements, such that said rolling elements and said retainer are interposed between said opposite surfaces of said bosses, each of said bosses comprising a recess forming a space on a side thereof which is disposed opposite to said retainer, and (ii) respective washer means disposed in each said recess such that each washer means is disposed opposite to a respective side of said retainer, whereby said respective washer means and said retainer enclose said rolling elements to cooperate with said sealing means to seal said rolling elements.

4,635,760

DISK BRAKE WITH AUTOMATIC ADJUSTMENT

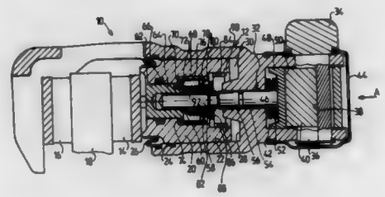
Claude Le Marchand, Domont, and Jean-Louis Gerard, Paris, both of France, assignors to Bendix France, Paris, France

Filed Aug. 8, 1985, Ser. No. 763,727

Claims priority, application France, Sep. 5, 1984, 84 13658; Oct. 31, 1984, 84 16643

Int. Cl.⁴ F16D *65/56*

U.S. Cl. 188—71.9 **12 Claims**



1. A disc brake with automatic adjustment of the type comprising a caliper, a brake actuator carried by the caliper and including an actuator piston having one side exposed to a pressure chamber and movable axially to actuate at least one friction member, a mechanical control acting upon the actuator piston via an automatic adjustment device comprising a screw-and-nut assembly with reversible pitch operable by the actuator piston beyond a predetermined travel of the actuator piston, a annular member movable axially and coupled to the nut for rotation therewith, and a control piston having one end exposed to the pressure chamber and movable axially to cooperate in engagement with the annular member for immobilizing rotationally the annular member when hydraulic pressure in the pressure chamber reaches a predetermined pressure, wherein the actuator piston and the control piston are mounted coaxially one inside the other in direct mutual sealing and sliding engagement.

4,635,761

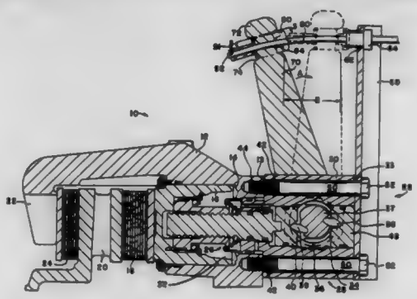
DISC BRAKE PARKING CARTRIDGE RETENTION DEVICE

Roger L. Smith, Niles, Mich., and Daniel L. Bolenbaugh, South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Aug. 30, 1985, Ser. No. 771,869

Int. Cl.⁴ F16D *55/26, 65/14*

U.S. Cl. 188—72.6 **22 Claims**



1. A disc brake having a parking cartridge device, comprising a caliper assembly cooperating with at least one friction pad to engage the friction pad with a rotor, the caliper assembly including a caliper housing with a bore receiving a piston assembly movable within the bore to engage the friction pad with the rotor, a parking cartridge housing having a through opening and secured to the caliper assembly so that said through opening is aligned with said bore, mechanical actuator means disposed in said bore and opening, end plug means disposed at an end of said cartridge housing in order to enclose the through opening, a bracket disposed over the end of said parking cartridge housing, and a plurality of securement devices each attached securely at one end with said caliper and at the other end with said bracket so that the plurality of securement devices and bracket cooperate to secure the parking cartridge housing to the caliper and capture the end plug means within the through opening, the mechanical actuator means developing reaction forces during actuation thereof and the reaction forces transmitted via said end plug means, bracket, and securement devices to the caliper housing.

4,635,762

RAIL VEHICLE SLACK ADJUSTER

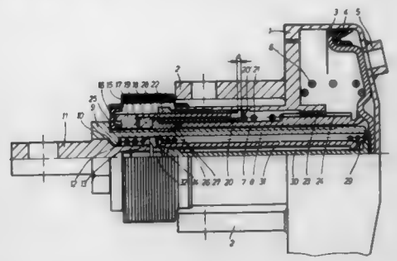
Bo Nilsson, Odengatan, and Lars M. Severinsson, Hishult, both of Sweden, assignors to SAB Nife AB, Landskrona, Sweden

Filed Sep. 6, 1985, Ser. No. 773,248

Claims priority, application Sweden, Sep. 7, 1984, 8404272

Int. Cl.⁴ F16D *65/66*

U.S. Cl. 188—203 **6 Claims**



1. A clearance-sensing slack adjuster for a rail vehicle brake rigging, including a non-rotatable, axially movable, tubular force-introducing part (7, 17) for introducing a force in a braking direction, in a fixed housing (1) a non-rotatable, threaded axially movable spindle (8) arranged coaxially inside the force-introducing part to deliver a brake force from the adjuster, an adjuster nut (26) in non-self-locking engagement with the spindle for engaging the force-introducing part and in the braking direction abutting a bearing (18) bearing against the force-introducing part, and a barrel spring (29), acting in the braking direction between the force-introducing part and the spindle, the adjuster nut forming a clutchable surface of a main clutch (27) surface of the force-introducing part thereby for transmitting brake force, characterized in that a non-rotatable locking sleeve (20), which is axially movable in the braking direction only a distance corresponding to a set control distance (A) under the action of a locking spring (21) supported by the force-introducing part (7, 17), is coaxial with the force-introducing part (7, 17), and the sleeve forms a clutchable surface to engage the adjuster nut (26) thereby forming a control clutch (28), the main clutch (27) selectively coupling braking forces from the force-introducing part to the spindle, and the control clutch (28) controlling the rotation of said adjuster nut (26) when the main clutch (27) is disengaged.

4,635,763

METHOD OF REGULATING THE OPENING SPEED OF BOX IN PASSENGER COMPARTMENT OF CAR

Nobuaki Omata, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

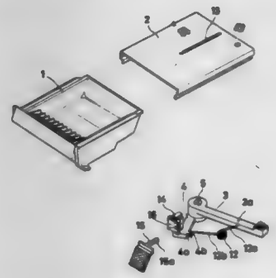
Filed May 20, 1985, Ser. No. 736,207

Claims priority, application Japan, May 26, 1984, 59-105676

Int. Cl.⁴ F16F *9/54*

U.S. Cl. 188—268 **4 Claims**

1. A drawer assembly comprising a fixed base, a drawer, means for slidably mounting said drawer on said base to permit movement of said drawer between closed, retracted position and open, extended position, and drawer opening means operable between said base and said drawer comprising a first arm pivotally mounted adjacent a first end thereof on said base, a second arm pivotally connected adjacent a first end thereof to said drawer, each of said arms having a second end, a pivotal connection between said second ends of said arms and including a chamber fixed relative to one of said arms and containing a viscous fluid and a damping surface fixed relative to the other of said arms and disposed in said chamber engaging said viscous fluid, a spring acting between said arms to move said drawer to open, extended position, and means acting on said arm to retain said drawer in closed, retracted position.



4,635,764

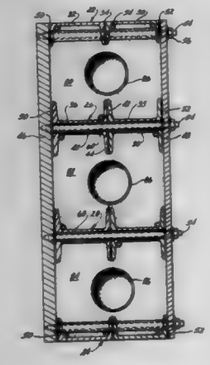
DAMPED REACTION BASE FOR VIBRATION TESTER

William B. Woyski, Whittier; Bruce L. Huntley, Diamond Bar, and Robert C. Tauscher, Hacienda Heights, all of Calif., assignors to Team Corporation, South El Monte, Calif.

Filed May 29, 1984, Ser. No. 614,647

Int. Cl.⁴ F16F *9/30*

U.S. Cl. 188—268 **10 Claims**



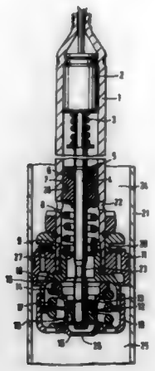
1. A damped structural unit subject to externally induced vibrations, comprising a rigid framework having open spaces, an outer rigid skin secured to the framework and fully enclosing said open spaces in the framework, the framework and outer skin forming a rigid unitary structure of fixed volume, solid particulate matter enclosed in said spaces, and flexible inflatable means immersed in said particulate matter, said means when inflated expending to compress the particulate matter against the surrounding surfaces of the framework and outer skin.

4,635,765

ADJUSTABLE HYDRAULIC DAMPER APPARATUS

Rudolf Schmidt, Eltorf, Fed. Rep. of Germany, assignor to Boge GmbH, Eltorf, Fed. Rep. of Germany

Filed Jun. 29, 1984, Ser. No. 626,313
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1983, 3323405; Sep. 22, 1983, 3334255; Mar. 7, 1984, 3408267
Int. Cl.[4] F16F 9/46
U.S. Cl. 188—299 23 Claims



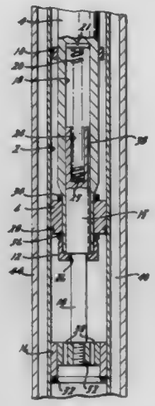
1. In an adjustable hydraulic damper apparatus having a hollow piston rod operably connected to a damping piston means which divides the interior of a cylinder member into first and second halves filled with damping fluid, at least one throttle disposed in said interior of said cylinder member for passing at least a portion of said damping fluid acted upon in operation by said damping piston means, said hollow piston rod including a transverse bore disposed above said damping piston means for the constant passage of said damping fluid therethrough, and an axially displaceable rod disposed within the interior of said hollow piston rod and connected to means for adjusting, the improvement to said damper apparatus wherein: said axially displaceable rod comprises a tension rod and defines in combination with the inner surface of said hollow piston rod an annular gap which functions as a throttle restriction, said axially displaceable rod having an outer surface which defines in the region adjacent the annular gap a recessed portion, which recessed portion provides in combination with said annular gap over a corresponding range of movement of said axially displaceable rod relative to said hollow piston rod, an opening of increased cross-sectional dimension, said adjusting means having electromagnetic means for moving said axially displaceable rod at least axially over said range of movement and wherein a lower portion of said axially displaceable rod adjacent said recessed portion is operably associated with a control piston means which is axially displaceable within a cylindrical inner surface of a valve body disposed within the interior of the cylinder, said valve body being operably associated with the lower portion of said tension rod, said valve body including a control lip which extends around the periphery of said valve body defining therein a constant oil passage in the region thereof which is nearest said damping piston means and wherein said valve body includes, in a base portion thereof, a further oil passage which can be closed by the control piston lower portion of said tension rod, said electromagnetic means being disposed within said hollow piston rod, said electromagnetic means having biasing means for returning said axially displaceable rod to a predetermined position, said biasing means being substantially the sole biasing means disposed to transmit substantial forces to said axially displaceable rod and whereby said axially displaceable rod is at least rapidly axially movable by said electromagnetic means during operation to adjust the damping of said damping apparatus, to provide different damping and be substantially contemporaneously responsive over a range of operationally variable varying piston speeds from low speeds to high speeds of said damping piston means as speeds of said damping piston means vary during operation, thereby compensating for, at least, rapid variations of said piston speeds.

4,635,766

AUTOMOTIVE SUSPENSION STRUT WITH INCREASED STROKE

Thomas R. Street, Jr., Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 14, 1985, Ser. No. 691,260
Int. Cl.[4] F16F 9/36
U.S. Cl. 188—317 10 Claims



1. A suspension strut for a motor vehicle comprising:
a working cylinder;
a piston rod having an upper portion extending from said working cylinder and a lower portion including a lower end within said working cylinder;
a pressure piston fixed upon the lower portion of said piston rod and carried within said working cylinder;
a first piston rod bearing, located at one end of said working cylinder, through which the upper portion of said piston rod extends;
a second piston rod bearing mounted upon slidable means extending from said lower end of said piston rod; and
means for resiliently extending said slidable means and said second piston rod bearing from said lower end of said piston rod in a direction away from said upper portion of said piston rod so that said second piston rod bearing will be allowed to move slidably from a first position abutting said lower end of said piston rod to a second position in which said second piston rod bearing separated from said lower end of said piston rod, whereby the effective bearing span of said strut will be increased by the distance said second piston rod bearing moves relative to said lower end of said piston rod.

4,635,767

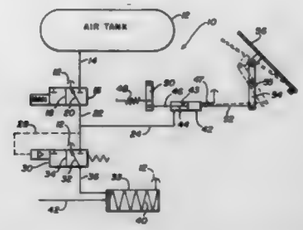
INTERLOCK FOR THE THROTTLE AND PARKING BRAKE OF A VEHICLE

James W. Crane, Farmington, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 18, 1985, Ser. No. 712,937
Int. Cl.[4] B60K 41/20
U.S. Cl. 192—3 M 8 Claims

1. A cable operated throttle for the primary engine of a vehicle having a parking brake interlock for retaining the engine at a predetermined speed until the parking brake is released comprising;
parking brake actuating means;

fluid supply means connected to said parking brake actuating means;
means for controlling the supply of fluid to said parking brake actuating means;
means for retaining the parking brake actuating means in a parking brake engaged position in the absence of fluid supply thereto;
said cable operated throttle including first operating means connected to a vehicle operator control mechanism and second operating means connected to an engine speed control mechanism;



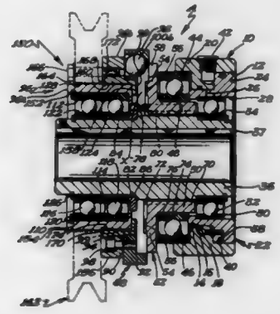
linkage means interposed between the first and second operating means having a first operating mode for effectively connecting said first and second operating means, and a second operating mode for effectively disconnecting said first and second operating means; and
means responsive to the supply of fluid to said parking brake actuating means to place said linkage means in its first operating mode when fluid is supplied to said parking brake actuating means and in said second operating mode when the supply of fluid is discontinued.

4,635,768

CLUTCH HAVING AN OUTPUT WITH BREAK AWAY CONNECTION

James V. Hanks, Robbinsdale, Minn., assignor to Horton Manufacturing Co., Inc., Minneapolis, Minn.

Filed Jan. 22, 1985, Ser. No. 693,190
Int. Cl.[4] F16D 9/00
U.S. Cl. 192—30 W 19 Claims



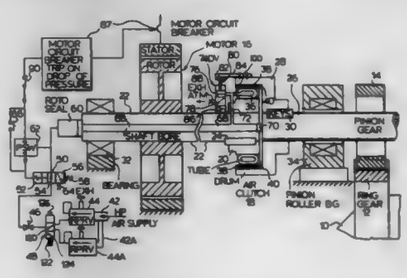
1. Clutch for selectively rotationally interrelating an input and an output in designated driving positions with which the input and output always come to the same degrees of registry for rotation of the output comprising, in combination: a hub for mounting a driven shaft; a drive ring slidably mounted on said hub and rotatable thereby; said drive ring formed with a multiplicity of projection-receiving tapered cavities; said drive ring having teeth formed thereon and radially within said projection-receiving cavities, with said hub and drive ring forming the input of the clutch; a hub portion; at least one bearing, with the hub portion being rotatably mounted by the bearing to the hub of the input; a collar portion; means for forming a break away connection between the hub portion and the collar portion where the same relative rotational position is maintained between the hub portion and the collar portion unless a torque force is applied to the hub portion which is not simultaneously applied to the collar portion in which event relative rotation is allowed between the hub portion and the collar portion; said collar portion including a projection carrier ring having a multiplicity of projections mounted thereon adjacent the periphery thereof for engagement with said cavities of said drive ring; said projection carrier ring having teeth formed thereon radially within said projections for engagement with the teeth of said drive ring, with the collar portion, the hub portion, and the projection carrying ring comprising the output of the clutch; and means for urging said drive ring axially on said hub for engagement of said cavities thereof with said projections of said carrier ring as said teeth of said drive ring engage the teeth of said projection carrier ring to thereby rotate said collar portion carrying said projection carrier ring and under normal operation when the bearings allow relative rotation between the hub of the input and the hub portion of the output, the collar portion and hub portion have the same relative rotational position and under operation when the bearings have failed and seized, relative rotation occurs between the hub portion and the collar portion when the input and output are not rotationally interrelated by the engagement of the teeth of the drive ring and the projection carrier ring.

4,635,769

GEAR PROTECTION SYSTEM FOR GRINDING MILLS

Peter de Hertel Eastcott, Peterborough, Canada, assignor to Canadian General Electric Company Limited, Toronto, Canada

Filed Mar. 7, 1986, Ser. No. 837,269
Int. Cl.[4] F16D 7/02, 43/20
U.S. Cl. 192—0.034 16 Claims



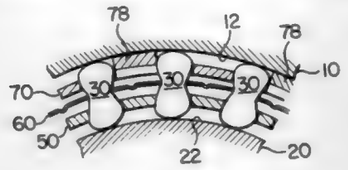
1. A drive gear overload protector for heavily loaded gears, said gears having a design yield strength at which said gears will fail comprising:
a clutch means having a drive side and a driven side interposed between said gears and a driving motor;
means for setting the maximum torque that may be transmitted between said drive and said driven sides of said clutch to a value so that said clutch slips before gears are subjected to a maximum stress less than said gear yield strength;
means for detecting relative movement between said drive and said driven sides of said clutch;
means for releasing said clutch and
said means for detecting operating said means for releasing said clutch when the amount of said relative movement detected by said means for detecting exceed a preset value thereby to prevent undue slippage of said clutch.

4,635,770

ONE-WAY CLUTCH ROLLING MEMBER HOLDER AND ONE-WAY CLUTCH HAVING THE HOLDER

Masao Shoji, Fujisawa; Mikio Uchida, Yamato, and Yoshio Kinoshita, Ayase, all of Japan, assignors to NSK-Warner K.K., Tokyo, Japan

Filed Jan. 9, 1985, Ser. No. 689,948
Claims priority, application Japan, Jan. 31, 1984, 59-10953[U]
Int. Cl.[4] F16D *15/00*
U.S. Cl. 192—41 A 8 Claims



1. A one-way clutch comprising:
(a) an outer race having an annular inner surface;
(b) an inner race having an annular outer surface and disposed coaxially with said outer race;
(c) a plurality of sprags spaced circumferentially at a predetermined interval between said inner surface and said outer surface, and engageable with said inner surface and said outer surface by tilting in a peripheral direction of said surfaces to transmit a torque between said two races; and
(d) a sprag holder for holding said sprags in an annular space between said annular surfaces, said sprag holder including:
(i) two annular band portions for supporting both sides of said sprags with respect to said peripheral direction, between said inner surface and said outer surface; and
(ii) connecting portions for connection said two annular band portions, said connecting portions being positioned between said sprags and supporting the front and the rear of said sprags with respect to said peripheral direction, said connecting portions having friction engagement means frictionally engaged with one of said inner surface and said outer surface;
said friction engagement means having a bearing portion bearing against said one surface, an extending portion extending between one end of said bearing portion and one of said two band portions, and a free end portion provided at another end of said bearing portion;
said bearing portion, said extending portion, and said free end portion being aligned in an axial direction of said annular bands.

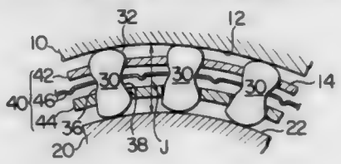
4,635,771

ONE-WAY CLUTCH BEARING

Masao Shoji, Fujisawa; Mikio Uchida, Yamato, and Noboru Kitamura, Fujisawa, all of Japan, assignors to NSK-Warner K. K., Tokyo, Japan

Filed Jan. 9, 1985, Ser. No. 689,949
Claims priority, application Japan, Jan. 21, 1984, 59-9091
Int. Cl.[4] F16D *15/00*
U.S. Cl. 192—41 A 4 Claims

1. A one-way clutch bearing having an outer race having an annular inner surface, an inner race having an annular outer surface corresponding to and concentric with said inner surface, and rolling members disposed in an annular space formed between said inner surface and said outer surface, said rolling members being displaceable within said space into engagement between said inner surface and said outer surface to prevent relative rotation of said inner and outer races in one direction and transmit a torque between said inner and outer races, characterized by holding means including a holding member for holding said rolling members at a displacement position at which said rolling members transmit a predetermined transmission torque, means for decreasing a wedge angle defined by a line extending from the center of said inner race to the point of contact between said rolling member and said inner race and a



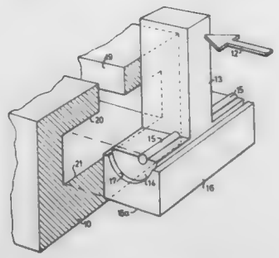
line passing through the points of contact between said rolling member and said inner and outer races before said rolling members arrive at said displacement position, and means for increasing the wedge angle after said wedge angle has been decreased by said means for decreasing the wedge angle.

4,635,772

CLUTCH ARRANGEMENT, PARTICULARLY FOR VARIABLE SPEED GEARS

Gustaf Gadelius, Stockholmsvägen 70, S-18142 Lidingö, Sweden

Filed Dec. 19, 1984, Ser. No. 683,620
Claims priority, application Sweden, Dec. 22, 1983, 8307120
Int. Cl.[4] F16D *41/00, 15/00*
U.S. Cl. 192—45.2 4 Claims



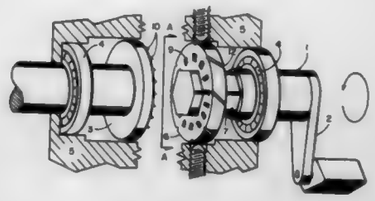
1. A clutch arrangement for coupling together two mechanisms, said arrangement comprising first and second members, said first member comprising: a lever arm; a partially cylindrical section fixed perpendicularly to said lever arm, said partially cylindrical section comprising a substantially planar surface having at least one gripping element fixed to said planar surface and extending parallel to but spaced from the axis of said partially cylindrical section; and a guide element in which said partially cylindrical section may rotate; and said second member comprising: a recess adapted to receive said guide element and a substantially planar gripping surface adapted to cooperate with said gripping element; said first and second members being so dimensioned that, when said first and second elements are coupled, said planar surface of said partially cylindrical section and said planar gripping surface are spaced from and substantially parallel to one another, and said gripping element bears against said gripping surface.

4,635,773

NON-BACKDRIVEABLE FREE WHEELING COUPLING

William R. Llewellin, Denver, Colo., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 22, 1985, Ser. No. 725,689
Int. Cl.[4] F16D *11/04*
U.S. Cl. 192—46 9 Claims



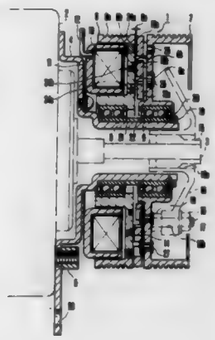
1. A non-backdriveable free wheeling coupling, comprising:
an input member rotatable about a given axis of rotation;
a coupling member mounted on said input member by mounting means, allowing said coupling member to freely slide axially thereof and preventing relative rotation with respect to said input member;
an output member rotatable about the axis of rotation;
shifting means operably associated with said coupling member for causing axial movement of said coupling member along the axis of rotation, toward said output member when said input member is rotated in a first direction about the axis of rotation, and away from said output member when said input member is rotated in the second direction about the axis of rotation, and
engagment means operably associated with said output member and said coupling member for transmitting rotary force from said coupling member to said output member when they are in axially proximal relationship.

4,635,774

ELECTROMAGNETIC COUPLING DEVICE

Yuzo Sekiguchi, and Enjiro Maejima, both of Kiryu, Japan, assignors to Ogura Clutch Co., Ltd., Gunma, Japan

Filed Mar. 26, 1985, Ser. No. 716,059
Claims priority, application Japan, Mar. 28, 1984, 59-58195
Int. Cl.[4] F16D *27/10*
U.S. Cl. 192—52 4 Claims



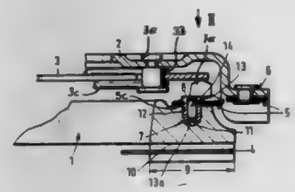
1. An electromagnetic coupling device comprising:
a first annular rotary member rotatable about an axis and serving as a path of a magnetic flux, one axial end of said first rotary member being flat to form a friction surface;
a yoke disposed in an inner space of said first rotary member for accommodating an excitation coil which generates said magnetic flux when energized;
a second annular rotary member disposed coaxially with said first rotary member and adapted to be coupled to rotate together therewith, one axial end of said second rotary member which opposes the axial end of said first rotary member being flat;
a plurality of annular armatures adapted to be fastened to said one axial end of said second rotary member concentrically with said first rotary member and with each other, said armatures being spaced with respect to the axial end of said first rotary member through gaps, respectively, and movable toward and away from said first rotary member;
armature supporting means provided on said one axial end of said secondary rotary member for elastically supporting said armatures in such a manner that said armatures can be sequentially contacted to and sequentially separated from the axial end of said first rotary member in accordance with the energization and the deenergization of said excitation coil, said armature supporting means including a plurality of leaf springs arranged circumferentially and equidistantly on said one axial end of said second annular rotary member, each of said leaf springs being composed of an integral portion fixed to said one axial end of said second rotary member and a plurality of branch portions each having a first end integrated into said integral portion and a free end connected with a corresponding one of said armatures, respectively, said branch portions being curved along the corresponding armatures and having substantially identical widths but different lengths which progressively vary in a discrete manner, so that the spring constants of said branch portions vary progressively in a discrete manner; and
detour magnetic flux adjusting means formed on the axial end of said first rotary member for interfering with the path of the magnetic flux in said first rotary member, said detour magnetic flux adjusting means being constituted by concentrical and annular slots formed in the axial end of the first rotary member and a non-magnetic member filled in the slots, said slots confronting said corresponding armatures and having widths and depths which are in inverse proportion to said spring constants of said branch portions which correspond to said armatures confronting said slots, respectively.

4,635,775

FASTENING DEVICES FOR FRICTION CLUTCHES

Helmut Kohler, Bühlertal, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Baden, Fed. Rep. of Germany

Filed Jun. 29, 1983, Ser. No. 509,171
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224403
Int. Cl.[4] F16D *13/58*
U.S. Cl. 192—70.18 49 Claims



1. In a friction clutch, particularly for use in motor vehicles, the combination of first and second rotary components, said first component being movable axially with reference to said second component; a deformable coupling member having a first portion secured to one of said components and a second

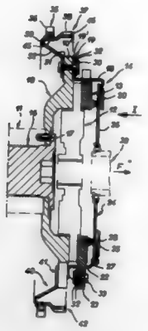
portion provided with an opening and overlying the other of said components, said other component having a surface facing the second portion of said coupling member and a blind bore provided in said surface and in register with said opening, said coupling member having an outer side facing away from said other component; and means for fastening the second portion of said coupling, member to said other component, including a metallic connecting element anchored in the blind bore of said other component and extending through said opening, said connecting element including a deformed portion overlying said outer side in the region of said opening.

4,635,776

CLUTCH HAVING A STARTER RING GEAR AND AN IGNITION TIMING MARK

René Billet, Lamorlaye, and Michel Bacher, Garges-les-Gonesse, both of France, assignors to Valeo, Paris, France

Filed Apr. 29, 1983, Ser. No. 489,802
Claims priority, application France, Apr. 29, 1982, 82 07393
Int. Cl.⁴ F16D *13/58*
U.S. Cl. 192—70.27 **8 Claims**



1. In a clutch for a motor vehicle including a starter ring gear and ignition timing mark means, the improvement comprising a single annular support ring carrying both said starter ring gear and said ignition timing mark means adapted to be fixed relative to a reaction plate for the clutch, said annular support ring comprising an inner peripheral radial portion and an outer peripheral axial portion, and a connecting zone between said radial and axial portions, said axial portion of said support ring comprising two separate axial sections radially offset relative to each other, one of said axial sections carrying said starter ring gear and the other of said axial sections carrying said ignition timing mark means.

4,635,777

CENTRIFUGAL CLUTCH

Hans Nickel, Cottenweiler, and Michael Wissmann, Markgrö ningen, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Apr. 11, 1985, Ser. No. 722,080
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1984, 3414406
Int. Cl.⁴ F16D *43/18, 13/18*
U.S. Cl. 192—75 **21 Claims**

1. A centrifugal clutch for hand-guided, portable, motor-driven apparatus including chain saws or the like, the centrifugal clutch comprising:

a carrier adapted to be rotatably driven by the motor of the apparatus;

a clutch drum disposed in surrounding relationship to said carrier;

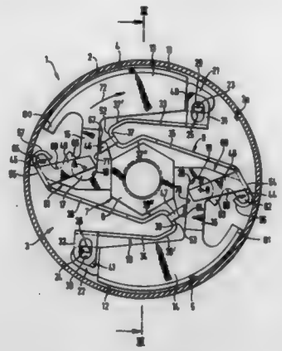
at least two centrifugal weights disposed within said clutch drum and mounted on said carrier;

resilient means for resiliently biasing said weights radially inwardly toward said carrier so as to hold said weights in a rest position whereat said weights are disengaged from said drum up to a first rotational speed of said carrier; and,

pivot connection means for pivotally connecting said weights to said carrier to permit a pivoting movement of said weights into contact engagement with said drum for transmitting torque thereto from said carrier at rotational speeds higher than said first rotational speed;

said resilient means including springs connecting respective ones of said weights to said carrier;

said pivot means comprising two articulated joints corresponding to respective ones of said weights, each one of said articulated joints including mutually engageable joint



parts of which one joint part is insertable into the other joint part;

each of said springs including first holding means for connecting the spring to the centrifugal weight corresponding thereto and second holding means for connecting the spring to the carrier;

said first holding means including: a pin formed on said weight; and, appendage means formed on said spring and having aperture means formed therein, said appendage means being resilient so as to permit elastically deforming the same by pressing said appendage means over said pin thereby causing the latter to engage said aperture means as said appendage means snaps into place over said pin.

4,635,778

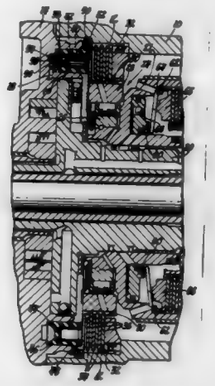
FLUID-OPERATED PISTON

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 13, 1985, Ser. No. 808,607
Int. Cl.⁴ A16D *19/00*
U.S. Cl. 192—85 AA **2 Claims**

1. An improvement in a friction torque transmitting device having a piston slidably disposed in a cylinder and being selectively pressurized therein for controlling the engagement of frictional plates; said improvement comprising: a rigid piston body generally U-shaped in cross section; an elastomeric covering portion bonded on said piston body and incorporating therein a pair of lip seal portions for engaging the cylinder and cooperating therewith to form a fluid tight joint; valve means formed in said bonded portion for permitting air bleed from

said cylinder; a reaction ring bonded to the elastomeric covering; and a spring portion integral with said elastomeric portion



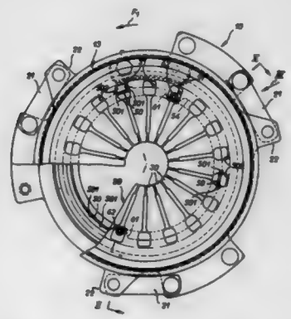
operatively disposed between said piston body and said reaction ring.

4,635,779

CLUTCH COVER ASSEMBLY

Michel Bacher, Domont, and Paolo Rumignani, Neuilly-sur-Seine, both of France, assignors to Valeo, Paris, France

Filed May 23, 1984, Ser. No. 613,191
Claims priority, application France, May 24, 1983, 83 08522
Int. Cl.⁴ F16D *13/44*
U.S. Cl. 192—89 B **17 Claims**



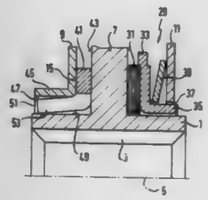
1. Clutch cover assembly comprising a generally annular cover adapted to be attached to a reaction plate, a generally annular pressure plate constrained to rotate with said cover and movable relative to said cover in an axial direction, a generally annular bearing member, elastic clutch release means regularly spaced in the circumferential direction on said pressure plate, said elastic clutch release means being positioned to bear on said cover and, via said bearing member, on said pressure plate, and axial lugs on said bearing member adapted to center said bearing member and said elastic clutch release means relative to one another.

4,635,780

CLUTCH DISC FOR A MOTOR VEHICLE FRICTION CLUTCH

Peter Wiggen, Grafenrheinfeld, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 8, 1984, Ser. No. 669,592
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340896
Int. Cl.⁴ F16D *13/38*
U.S. Cl. 192—106.2 **8 Claims**



1. A clutch disc for a motor vehicle friction clutch comprising:

(a) a hub having a radially protruding hub disc;

(b) two side discs of substantially annular disc form enclosing the hub, which are arranged on axially opposite sides of the hub disc and are firmly connected with one another to form one unit which is rotatable through a limited angle of rotation in relation to the hub disc;

(c) a guide ring having an annular disc part arranged axially between one of the two side discs and the hub disc and determining the axial position of this side disc in relation to the hub, and having a bearing extension part protruding axially towards this side disc from the annular disc part, which part extends into an annular space between this side disc and the hub and guides this side disc radially on the hub;

(d) at least one torsional vibration damper with at least one damping spring which is resiliently stressable in the relative rotation of the side discs and the hub;

(e) at least one friction damper with an axially acting spring which braces the one side disc against the hub disc through the annular disc part of the guide ring; and

(f) clutch friction linings which are connected at least with one of the side discs, said bearing extension part of the guide ring being made radially elastic and being braced with initial radial stress in between the inner circumference of the one side disc and the hub, the bearing extension part is formed by a plurality of radially resilient tongues distributed in the circumferential direction and protruding from the internal circumference of the annular disc part.

4,635,781

PROTECTION APPARATUS

Peter Morellini, P.O. Box 188, Ingham, Queensland 4850, Australia

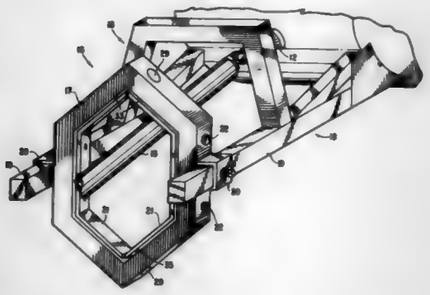
PCT No. PCT/AU84/00025, § 371 Date Oct. 23, 1984, § 102(e) Date Oct. 23, 1984, PCT Pub. No. WO84/03349, PCT Pub. Date Aug. 30, 1984
PCT Filed Feb. 23, 1984, Ser. No. 673,754
Claims priority, application Australia, Feb. 23, 1983, PF8162
Int. Cl.⁴ F16P *7/00*
U.S. Cl. 192—150 **11 Claims**

1. Protection apparatus adapted to be associated with a universal drive shaft of the type extending between a prime mover and an implement to be driven by said prime mover, said implement being adjustable in elevation to cause said shaft to pivot in a generally vertical plane through a range of angles, said protection apparatus including

frame means supported in a fixed attitude relative to said prime mover,

a housing supported on said frame means and surrounding said drive shaft,

actuator means on said housing and adapted to be engaged by said drive shaft when said drive shaft pivots beyond a predetermined angle, and



means associated with said actuator means and operable on engagement of said drive shaft with said actuator means for removing drive from said drive shaft.

4,635,782

SAFETY ARRANGEMENT

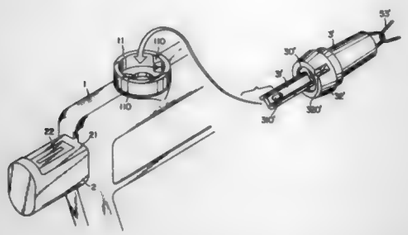
Franz Wiehl, Schraystr. 28, and Horst Sonnendorfer, Kirchenstr. 31, both of 8034 Germering, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 355,536, Mar. 8, 1982, abandoned. This application Jul. 18, 1984, Ser. No. 632,197

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1981, 8121677[U]

Int. Cl.[4] G07F *1/06*

U.S. Cl. 194—212 11 Claims



1. An arrangement for securing orderly positioned shopping carts to each other, comprising a token extractor having a housing positioned on the shopping cart and including a control key element adapted to receive tokens therein and slidably insertable into said housing; an encoding ring adjustably mounted on the shopping cart; a releasing member suspended on the shopping cart and having a position ring adjustably mounted thereon, the releasing member of one cart being insertable into the encoding ring of the neighboring shopping cart to thus reliably connect said one cart to the neighboring one; and means in said housing to lock said releasing member in said housing after it has bean inserted into the encoding ring of the neighboring cart and to simultaneously release said control key element from said housing and to permit a return of a token to a customer, said means also releasing said releasing member from said housing once said control key element with a token inserted therein is pushed into said housing, said releasing member carrying coding means for defining various adjustable positions of said releasing member relative to the encoding ring into which the releasing member is to be inserted.

4,635,783

PERSON-CONVEYING DEVICE

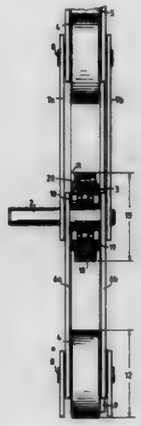
Peter Höfling, Dortmund, Fed. Rep. of Germany, assignor to O&K Orenstein & Koppel Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Mar. 20, 1985, Ser. No. 713,942

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412250

Int. Cl.[4] B66B *23/00*

U.S. Cl. 198—321 8 Claims



1. In a person-conveying device of quiet operating design having a belt comprising tread plates, each tread plate being guided, via a respective driver pin, on a guide rail having a planar travel surface and a lateral guide surface, by transport chains comprising rollers between plates of the transport chains, the improvement wherein

said rollers contact said travel surface,

said rollers comprise load supporting chain rollers and chain-guide rollers,

each of said load supporting chain rollers is mounted on a respective said driver pin,

each of said load supporting chain rollers has a smaller width in the region of said travel surface than said chain-guide rollers whereby a side surface of said load supporting chain rollers is spaced by a distance from said lateral guide surface of the guide rail, and

said chain-guide rollers laterally contact said lateral guide surface.

4,635,784

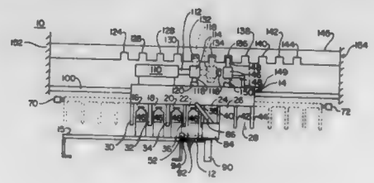
ACCUMULATING MAGAZINE

Ronald D. Bourgeois, 138 Ellison Park, Waltham, Mass. 02154

Filed Oct. 3, 1984, Ser. No. 657,160

Int. Cl.[4] B65G *1/00*

U.S. Cl. 198—347 6 Claims



1. An accumulating magazine for use with a conveyor system comprising:

a planar accumulation surface disposed alongside a conveyor system, said planar accumulation surface being laterally stationary relative to said conveyor system;

a magazine including a plurality of channels generally aligned with and suspended above the conveyor system and said planar accumulation surface;

means for linearly moving said magazine laterally of said conveyor system one channel at a time to move a channel from over said conveyor system to over said planar accumulation surface and to linearly move a channel from over said planar accumulation surface to over said conveyor system;

gate means for controlling flow of product into and out of said conveyor system alongside said planar accumulation surface;

means for indicating when said magazine is full and when it is empty;

means for counting the number of articles on the conveyor system along said planar accumulation surface; and

controller means, responsive to the count of product exceeding one predetermined number and said magazine not being full for actuating said gate means to stop flow of product out of said conveyor system and actuating said means for moving to index said magazine and shift a channel with product from over said conveyor system to over said planar accumulation surface and responsive to the count of product being beneath another predetermined number and said magazine not being empty for actuating said gate means to stop flow of product into said conveyor system and actuating said means for moving to index said magazine and shift a channel with product from over said planar accumulation surface to over said conveyor system.

4,635,785

SORTER CONVEYOR HAVING LATERALLY TILTABLE TRAYS

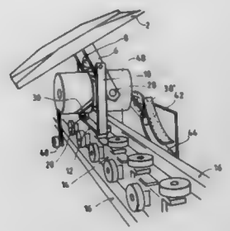
Ole Prydtz, Hjortshoj, Denmark, assignor to Kosan Crisplant A/S, Aarhus, Denmark

Filed Aug. 19, 1985, Ser. No. 767,044

Claims priority, application Denmark, Aug. 20, 1984, 3975/84

Int. Cl.[4] B65G *47/38, 47/94;* B07C *9/00*

U.S. Cl. 198—365 4 Claims



1. A sorter conveyor of the type comprising a preferably endless row of laterally tiltable trays, which are carried forwards on associated carrier means along a conveyor chassis, which in several places is provided with activating means for selective activation of a tilting mechanism for the individual by-passing trays, characterized in that the tilting mechanism for an individual tray comprises a cylinder member which is transversely oriented relative the conveying direction of the tray and is turnable about a substantially horizontal axis which is fixed relative to the carrier means of the tray, said cylinder member being equipped with obliquely extending cam guiding tracks, which cooperate with a cam member mounted track follower, radially spaced from the longitudinally extending tilting axis of the tray, on a carrier part connected to the tray, and the cylinder member having at least at one end an axially projecting pin located radially spaced from the axis of the cylinder member in such a manner that this pin by operatively engaging the said activating means can produce a turning of the cylinder member, whereby the obliquely extending cam guiding track of the cylinder member forces the said cam track follower member to carry out a transverse movement resulting in a lateral tilting of the associated tray.

4,635,786

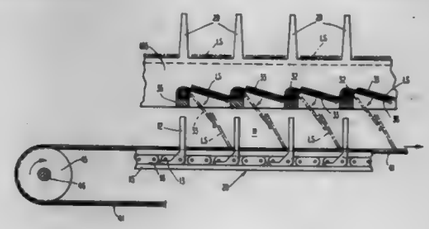
ORIENTATION SECTION OF PACKING APPARATUS

Frank A. Reuda, Hummelstown, Pa., assignor to Hershey Foods Corporation, Hershey, Pa.

Filed Jan. 11, 1985, Ser. No. 690,848

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—424 13 Claims



1. An orientation mechanism for use as a section of an article handling apparatus for handling article strips of a predetermined narrow dimension between opposite edges, said orientation mechanism comprising:

a. a transport conveyor divided into a succession of narrow transverse flights defined by upwardly projecting spaced-apart push fingers;

b. a series of narrow shelves that have at least some portions that are approximately the width of the strips in the narrow direction, the shelves being positioned in a generally horizontal plane above said transport conveyor for receiving and supporting narrow strips;

c. a plurality of pivotal shafts positioned transversely relative to said transport conveyor;

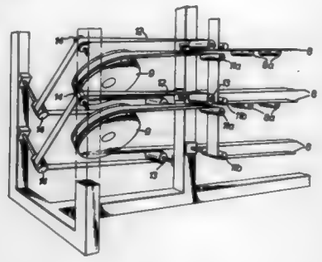
d. means mounting each of said shelves to one of said pivotal shafts;

e. means for pivoting said shafts to tilt said shelves to DOWN positions, thereby to cause strips on said shelves to slide down toward the flights of said transport conveyor;

f. friction belt means positioned below said shelves in the DOWN position of the shelves a distance less than the dimension of the strip in the direction of conveyance on the friction belt means;

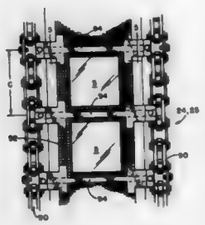
g. drive means for moving said friction belt means in the forward direction of said transport conveyor at a speed greater than that of said conveyor, and together with said shelves comprising means whereby leading edges of said strips from said shelves in DOWN positions come into engagement with said friction belt means while still being engaged by said shelves, for pulling strips forwardly by said friction belt means to the forward limits of said flights, and off said shelves, whereby trailing edges of the strips fall down with the strips falling into horizontal positions in said flights; wherein said shelves are provided with cut-out means in lengthwise alignment with said push fingers to allow passage therethrough of said push fingers.

4,635,787
SORTING MACHINE
Roy C. Thake, Old Coulsdon, England, assignor to The Post Office, London, England
Filed Jan. 25, 1984, Ser. No. 573,615
Claims priority, application United Kingdom, Jan. 25, 1983, 8301973
Int. Cl.[4] B65G *17/26, 37/00*
U.S. Cl. 198—603 9 Claims



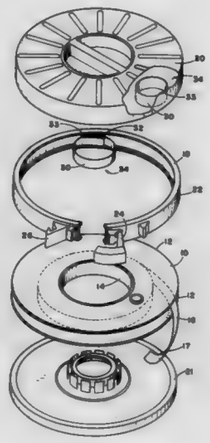
1. A sorting machine for sorting generally flat items, the machine comprising a plurality of sorting destinations arranged in levels and conveying means for conveying the items each to an assigned destination, said conveying means including a plurality of endless flexible tensile elements each extending along the machine, on one side at a respective level, and returning along the other side at the same level and at least one of the elements being provided with transfer pulley means for leading the element from a first level to a position of transfer cooperation with another of said elements at a second level, so as to transfer the items from the element at the first level to said other element and thereby to convey the items through the machine.

4,635,788
CONVEYOR
David I. McDonald, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Jul. 12, 1984, Ser. No. 630,050
Int. Cl.[4] B65G *15/54*
U.S. Cl. 198—848 18 Claims



1. An endless conveyor belt assembly comprising
a pair of spaced apart roller chains each of endless configuration;
a perforate mesh workpiece support coated with a coating selected to be nonadherent to the material intended to be carried and disposed between said chains and coextending therewith; and
a plurality of H-shaped bars each having a crossbar connected between said chains and with the crossbar perpendicular to the conveying direction, and each further having at least two uprights having a length in the conveying direction larger than the width in said conveying direction of said crossbar to form an H-shaped bar and with said mesh supported underneath each pair of bars forming a pocket in the space defined between their crossbars and uprights.

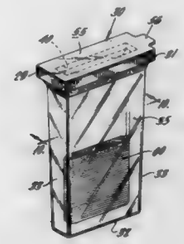
4,635,789
LOCKING MECHANISM FOR MAGNETIC TAPE
Bryan Webb, 5531 S. Newport Ave., Tulsa, Okla. 74105
Filed May 28, 1985, Ser. No. 737,727
Int. Cl.[4] B65D *85/67*
U.S. Cl. 206—53 4 Claims



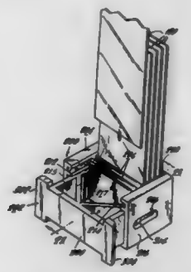
1. A locking mechanism for magnetic tape to be used in conjunction with a closure means for protecting said magnetic tape, said magnetic tape being wound about a central hub of a reel, said reel comprising a pair of spaced circular flanges connected at their centers to said hub; said locking mechanism comprising a flexible plastic strip having a pair of spaced adhesive means attached to the opposite ends of the strip, said strip being bent and joined at its ends by one of said adhesive means to form a small loop, said loop being attached by the other of said adhesive ends to an interior portion of said closure means and whereby attaching said closure means to said reel permits said loop to fit between said flanges and bear against the outer portion of said tape thereby preventing said tape from becoming unwound from said hub.

4,635,790
CONTAINER PACKAGE FOR STAINING A BIOLOGICAL SPECIMEN
Frank W. Jackson, Mechanicsburg, and David Schlossberg, Merion, both of Pa., assignors to Bio-Innovations, Camp Hill, Pa.
Continuation-in-part of Ser. No. 372,591, Apr. 28, 1982, abandoned. This application Feb. 8, 1985, Ser. No. 699,993
Int. Cl.[4] B05C *3/00, 19/02;* B65D *81/24, 85/48*
U.S. Cl. 206—210 16 Claims

1. A disposable container package for applying a staining liquid to a specimen affixed to a specimen zone centrally arranged on one of the opposed faces of a glass slide, said container package comprising:
(a) a generally rectangular body member arranged with its longitudinal axis extending vertically and containing a generally rectangular upwardly-opening cavity for receiving the slide, the cavity having such a height less than the length of the slide as to cause one end of the slide to extend above said body member and the specimen zone to be completely disposed within the cavity when the slide is fully inserted in the cavity, said cavity having a horizontal cross-sectional area no greater than twice the cross-sectional area of the slide and being of a size sufficient to receive only a single slide;
(b) guide means arranged in the cavity for maintaining a spaced relationship between the opposed faces of the inserted slide and the cavity walls;
(c) a quantity of staining liquid partially filling the cavity, the depth of said staining liquid prior to insertion of the slide in the cavity being less than the distance between the upper edge of the specimen zone and the inserted end of the slide, the quantity of said staining liquid being sufficient to raise the level of said liquid when the slide is fully inserted in the cavity to a level sufficient to cover the specimen zone on the slide with a thin film of said staining liquid, thereby staining the specimen affixed thereto; and
(d) a removable seal closing the upward end of the cavity, thereby to contain said staining liquid prior to the use of said container package.

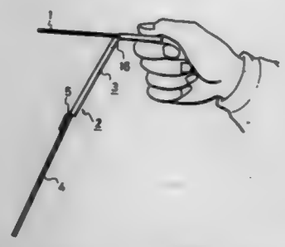


4,635,791
CONTAINER PACKAGE FOR STAINING BIOLOGICAL SPECIMENS
Frank W. Jackson, Mechanicsburg, and David Schlossberg, Merion, both of Pa., assignors to Bio-Innovations, Camp Hill, Pa.
Continuation-in-part of Ser. No. 462,510, Jan. 31, 1983, abandoned, which is a continuation-in-part of Ser. No. 372,591, Apr. 28, 1982, abandoned. This application Feb. 8, 1985, Ser. No. 699,994
Int. Cl.[4] B05C *3/00, 19/02;* B65D *81/24, 85/48*
U.S. Cl. 206—210 11 Claims



1. A container package for staining a plurality of specimens centrally arranged on the respective faces of a plurality of microscope slides, comprising
(a) a slide holder for vertically supporting the slides at their upper ends to define a clamped assembly in which the downwardly extending portions of adjacent slides are in spaced parallel relation;
(b) a generally rectangular body member arranged with its longitudinal axis extending vertically and containing a generally rectangular upwardly-opening cavity for receiving the downwardly extending portions of the slides, the cavity having such a height less than the length of the slides as to cause the upper ends of the slides in said assembly to extend above said body member and the specimens to be completely disposed within the cavity when the downwardly extending portions of the slides are fully inserted in the cavity;
(c) guide means arranged in the corners of the cavity for maintaining a spaced relationship between the opposed outer end faces of the inserted slides and the cavity walls; and
(d) a quantity of staining liquid partially filling the cavity, the depth of said staining liquid prior to insertion of the slides in the cavity being less than the distance between the specimens and the inserted ends of the respective slides;
(e) the slides being supported in sufficiently close relation, and the walls of said cavity conforming sufficiently close to the lower perimeters of the slides, that when the lower portions of the slides are inserted into the bottom of the cavity, the staining liquid rises to a level sufficient to cover the specimens on the respective slides with a thin film of said staining liquid.

4,635,792
DISC PACKAGE
Masaki Yamada, Tokyo; Mitsuru Yokoi, and Kazuhiro Ohki, both of Shizuoka, all of Japan, assignors to CBS/Sony Records Inc., Shizuoka, Japan
Filed Apr. 12, 1985, Ser. No. 722,370
Claims priority, application Japan, Apr. 13, 1984, 59-54529; Sep. 13, 1984, 59-147162
Int. Cl.[4] B65D *85/30*
U.S. Cl. 206—310 11 Claims



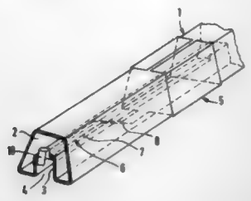
1. A disc package for enclosing a record disc formed with a center hole, said disc package being capable of opening to permit said disc to be withdrawn therefrom for insertion into a disc player and comprising:
a body for accommodating said record disc;
a cover; and
cover hinge means connecting said cover to said body for relative pivoting movement about a first axis;
said body comprising a first part adjacent to said cover hinge means, a second part spaced away from said cover hinge means, body hinge means connecting said first and second body parts for relative pivoting movement about a second axis, a central holding member formed on said first body part for engagement in said center hole of said disc, and a peripheral holding member formed on a side of said second body part remote from said body hinge means for gripping an outer edge of said disc;
whereby said disc package can be moved between a closed position wherein it securely grips, encloses and protects said disc and an open position wherein said disc is free of said cover, of said first body part and of said central holding member and is held only by said second body part, including said peripheral holding member, so that, without being touched by a hand, it is easily inserted into a disc player.

4,635,793
GOLF BAG
Tae G. Kim, Seoul, Rep. of Korea, assignor to Byung D. Yim, Rochester, N.Y.
Filed Mar. 26, 1984, Ser. No. 593,065
Claims priority, application Rep. of Korea, Apr. 14, 1983, 3310
Int. Cl.[4] A63B 55/00
U.S. Cl. 206—315.6 13 Claims



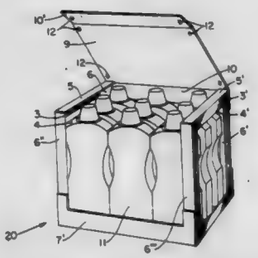
1. A collapsible golf bag having a frame for holding the bag taut which comprises a base disposed in the lower end of the bag, a tubular body disposed in the upper end of the bag, a member extending across the tubular body and connected thereto, said member dividing the bag into golf club receiving compartments, said member having a hole extending in a direction axially of said bag, an opening in said base aligned with said hole, a rigid rod extending through said hole into said base opening, a key protruding laterally from said rod and engageable with the surface of said member facing said base for maintaining said bag upright and taut, and said key being movably disposed in said rod to release said rod from said frame to enable said rod to be removed from said bag and said bag to be collapsed.

4,635,794
IC ROD-MAGAZINE
Alfred Lemmer, Machtilfingerstrasse 24, D-8000 München 70, Fed. Rep. of Germany
Filed Jul. 17, 1984, Ser. No. 631,627
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 8321507; Sep. 15, 1983, 3333374; Oct. 11, 1983, 3336986; European Pat. Off., Jun. 1, 1984, 84106297.9
Int. Cl.[4] B65D 73/02, 83/00, 85/30
U.S. Cl. 206—328 25 Claims



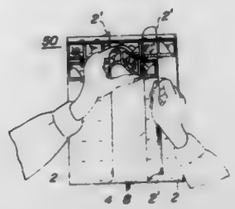
1. An IC rod-magazine comprising an elongated tubular member having an inwardly directed wall protrusion and forming a magazine chamber having a substantially U-shaped interior cross-section, a deflectable spring element having one end mounted on said tubular member and a formation on the other end of said spring element, said formation including a wall section which, in the undeflected position of said spring element, extends across an opening at one end of said magazine chamber to block movement of IC elements from said chamber and in the deflected position of said spring element uncovers said opening to allow exit of IC elements from said chamber, said formation having a further wall section for receiving an externally applied force and causing deflection of said spring element, said spring element being a spring tongue which extends in the longitudinal direction of the rod-magazine through a channel formed by the wall protrusion towards said one end of the rod-magazine, said wall section of said formation comprising a bent-up portion of said spring which is directed towards the opening at said one end of the magazine chamber, said further wall section of said formation being formed on said spring adjacent said bent-up portion, said further wall section being oblique in the direction facing away from said one end of said rod-magazine and in respect of the longitudinal direction of said rod-magazine and cutting the imaginary prolongation of the highest point of the wall protrusion in the undeflected position of said spring tongue so that when pressure is applied between said further wall section and a deflection stop in the longitudinal direction of the magazine, the spring element is caused to deflect.

4,635,795
EASY-OPENABLE SEE-THROUGH CONTAINER
Jos DeFlander, Wespelaar, and Dirk Verdoodt, Mechelen, both of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Aug. 20, 1985, Ser. No. 767,458
Claims priority, application United Kingdom, Oct. 12, 1984, 84 25882
Int. Cl.[4] B65D 5/50, 5/64
U.S. Cl. 206—526 11 Claims



1. A shipping and display container featuring substantially open sidewall panels, said container comprising:
(a) a body portion, said body portion including a bottom panel, front and rear sidewall panels attached to opposite front and rear edges of said bottom panel, right and left sidewall panels attached to opposite right and left edges of said bottom panel, and four reinforcing corner pillars, said front, rear, right and left sidewall panels having substantial open cutout portions to provide see-through windows therein, and said right and left sidewall panels each having a top flap extension hingedly attached to its upper distal edge, said top flap extensions being folded inwardly 90° in a completed container to facilitate support and attachment of a top panel to said body portion; and
(b) a top panel attached to the upper surfaces of said top flap extensions and to the outer surfaces of said reinforcing pillars of said body portion and being easily removable therefrom.

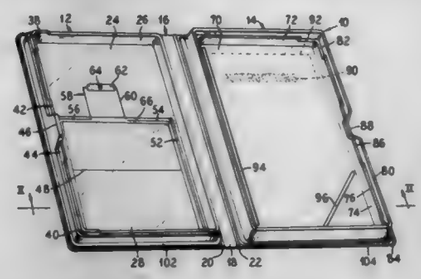
4,635,796
JACKET FOR STRIP FILMS
Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan
Continuation of Ser. No. 686,538, Dec. 26, 1984. This application Feb. 14, 1986, Ser. No. 829,157
Claims priority, application Japan, May 2, 1984, 59-87800; Aug. 21, 1984, 59-172368
Int. Cl.[4] B65D 85/67
U.S. Cl. 206—456 14 Claims



1. A jacket for an elongated, flexible strip having a length and a width, said jacket comprising:
a transparent surface sheet;
a back sheet, said surface sheet being divided into two sections at the central portion thereof to define a right surface sheet section and a left surface sheet section each section having an edge remote from said central portion, a distance between said central portion and each of said remote edges located on a line perpendicular to said central portion being less than the length of said strip; and
a pair of locating means for holding said strip, each of the locating means including at least one portion of each of said right and left sections of said surface sheet bonded to said back sheet, said bonded portions of each section being separated from each other in the width direction of the strip at a distance slightly larger than the width of the strip for preventing sliding of said strip in its width direction and for snugly holding said strip at a predetermined location between said surface sheet and said back sheet and between said locating means, said bonded portions of each section being separated from the central portion of the surface sheet, whereby a close-type pocket for holding a strip therein is formed by said pair of locating means and the right and left surface sheet sections are lifted rightward and leftward respectively from the central portion of the surface sheet to facilitate the insertion of the strip into the close-type pocket.

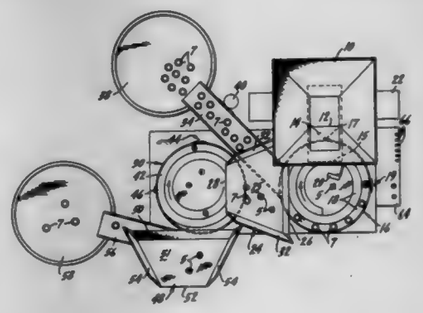
4,635,797
PILFER RESISTANT SOFTWARE PACKAGE
Jack D. Bankier, Northbrook, Ill., assignor to Bankier Companies, Inc., Northbrook, Ill.
Filed Dec. 26, 1985, Ser. No. 813,469
Int. Cl.[4] B65D 73/00
U.S. Cl. 206—472 11 Claims

1. A software package comprising:
a base including a first section, a second section and a hinge between said first and second sections;
a software structure carried on said first section and software-related material carried on said second section;
first pocket means covering said software structure and including a peripheral flange sealed to said first section of said base to define a first storage section, and frangible access means for access to said software structure, said first pocket means further comprising a molded sheet including a pocket shaped to receive said software structure, and said frangible access means comprising a flap defined by frangible scores in said molded sheet and including a bubble in said molded sheet having an aperture therethrough;
second pocket means covering said software related material and including a peripheral flange sealed to said second section of said base to define a second storage section; and



first and second cooperable latch means carried by said first and second storage sections, respectively, for releasably latching said storage sections together with said first and second pocket means pivoted towards one another.

4,635,798
FLASH SORTING APPARATUS
Horst Bruck, Vandalia, Ill., assignor to John Crane-Houdaille, Inc., Morton Grove, Ill.
Filed Sep. 13, 1984, Ser. No. 650,056
Int. Cl.[4] B07C 5/00
U.S. Cl. 209—644 10 Claims



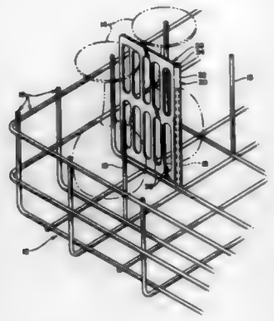
1. A method of sorting a mixture of two sets of solid elements comprising the steps of;
placing the mixture in an open topped container having an upper rim and a track at least a portion of which is disposed below said rim;
causing the mixture to move along the track;
forming the mixture into a single layer; and
passing said layer across an air jet from a blow-off nozzle at said portion of said track disposed below said rim to blow substantially all of one set of said elements off the track and out of the container over said upper rim and to a transfer chute having a first edge positioned above the upper rim of the open topped container.

4,635,799
DISHWARE PROTECTOR
Maureen Penner, 3994 Kitchener St., Burnaby, British Columbia, Canada (V5C 2M3)
Filed May 4, 1984, Ser. No. 606,914
Int. Cl.[4] A47G 19/08
U.S. Cl. 211—41 11 Claims

1. A dishware holding and protecting assembly, comprising:
(a) a rack of an automatic dishwasher, having intermediate dishware stages defined by an array of upstanding post

members to receive individual pieces of dishware during a washing cycle;

(b) a dishware protector disposed within said rack and comprising a polymeric separating member having longitudinal and lateral dimensions at least sufficient to yield means for



preventing collision between adjacent dishware members in said dishwasher and fixture means for pivotally securing said protector to a preselected one of said post members, said fixture means being disposed along said longitudinal dimension.

4,635,800

WALL MOUNTED SKI HOLDER

Gary A. Stempin, 504 11th Street W., Columbia Falls, Mont. 59912

Filed Sep. 23, 1985, Ser. No. 778,854
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—70.5 6 Claims



1. A holding device for skis, comprising, in combination:

a base formed of resiliently deformable material, peripherally defined by longer side edges and shorter top and bottom edges and having means for mechanical attachment to a supporting structure at a spaced distance above a horizontal supporting surface therebelow; and

a holding element defined by severing a substantial portion of the periphery thereof from the medial portion of the base, said holding element having

an unsevered portion at a spaced distance downwardly from the shorter top edge of said base,

an elongate body communicating therefrom and defining in its lower end part

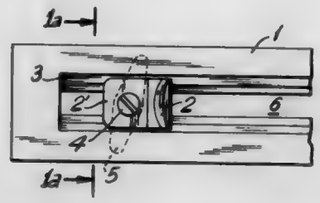
a "T" shaped cross-arm extending laterally a spaced distance from each of the side edges of the base and a spaced distance from the shorter bottom edge of the body, said cross-arm defining, on the side facing the unsevered portion of the holding element, spaced slots to receive the side portions of skis.

4,635,801

DEVICE FOR HOLDING AND STORING ARTICLES

Meir Oren, 149 Salame Road, Tel Aviv, Jaffa, Israel

Continuation of Ser. No. 495,427, May 17, 1983, abandoned.
This application Feb. 13, 1984, Ser. No. 579,659
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—70.6 8 Claims



1. A device for holding and storing articles, such as tools and vendable items exhibited for sale, said device comprising an elongated ruler-like member having a front side and a rear side with an at least laterally enclosed space between the front side and the rear side and including an elongated rail forming the front side and having a front face and a rear face and a pair of laterally spaced elongated edges extending in the elongated direction of said rail, wall means extending from the rear face of said rail and forming the lateral closure of said laterally enclosed space said rail being recessed laterally inwardly from said elongated edges toward the rear side of said ruler-like member and with the recess extending in the elongated direction of said rail, said recess having a base spaced inwardly from said front face and an elongated slot in said base extending in the elongated direction of said rail with said slot being open between said first face and said rear face and having a front face side and a rear face side, said slot opening into said laterally enclosed space, said recess being stepped inwardly from said front face toward the base of said recess with said base forming at least one support surface stepped inwardly from said front face and disposed in substantially parallel relation with said front face, said slot dividing said support surface into a pair of co-extensive partial support surfaces, at least one pair of springy fingers being slidably mounted in said slot for holding an item therebetween, said two fingers in said at least one pair being separate from one another and being separately slidable in said slot along said support surface relative to one another so that an article can be held between said fingers, each said finger having a first end and a second end with a major extension thereof extending from said first end toward the second end and with a bent-off portion extending from said second end and being bent off at a substantially right angle relative to said major extension of said finger at a location spaced from said first end, said bent-off portion being supported on said partial support surfaces and spanning said slot, a co-acting male screw member and female screw member fixing each said finger to said ruler-like member at any desired position along said slot, said male screw member extending through said bent-off portion of said finger and through said slot with one end of said male screw member located on the front face side of said slot and the other end located on the rear face side of said slot in said laterally enclosed space, said female screw member being mounted on said male screw member and being insertable through said slot from said front side so that said female screw member can be displaced within said laterally enclosed space relative to said rear face for securing said male screw member in said slot so that said finger does not slide relative to said partial support surface, and said female screw member is a plate-shaped nut having a first dimension and a second dimension extending approximately normal to said first dimension, said first dimension being greater than the width of said slot and the second dimension being less than the width of said slot so that with the first dimension extending in the elongated direction of said slot said female screw member

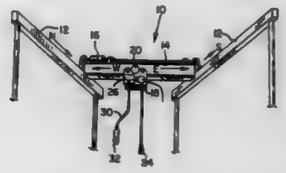
can be inserted through said slot from said front face to said rear face extending into said laterally enclosed space, said wall means comprises a pair of parallel flanges each located along a different one of the elongated edges of said rail and extending generally perpendicularly outwardly from said rear face, said flanges having facing surfaces defining said laterally enclosed spaces and the first dimension of said female screw member being greater than the dimension between the facing surfaces of said flanges.

4,635,802

BRIDGE CRANE CONTROL UNIT

Douglas W. Hylton, 14312 SE. River Rd., Milwaukie, Oreg. 97267

Filed Dec. 27, 1985, Ser. No. 813,689
Int. Cl.[4] B66C 13/40
U.S. Cl. 212—160 11 Claims



1. A control assembly for controlling the operation of a bridge crane of the type including a pair of longitudinal rails, a movable bridge supported on and extending laterally between said rails, a bridge traverse motor for moving the bridge along said longitudinal rails, a hoist carriage movably supported on the bridge, and a hoist carriage traverse motor for moving the hoist carriage laterally along the bridge, the control assembly comprising:

(a) control handle means rotatable about a generally vertical axis for pointing to a direction toward which it is desired to traverse said hoist unit;

(b) a rotary cam;

(c) drive means extending between said control handle means and said rotary cam for rotating said rotary cam in response to rotation of said control handle means;

(d) a plurality of cam followers associated with said rotary cam and located at respective different locations with respect to the rotation thereof; and

(e) a plurality of traverse motor control switches, each operatively controlled by a respective one of said plurality of cam followers, each of said traverse motor control switches being connected for controlling operation of a respective one of said bridge traverse motors and hoist carriage traverse motors of said bridge crane in a predetermined direction.

4,635,803

COMPACT PEDESTAL-MOUNT CRANE

Frank S. Foster, and Gerald P. Berger, both of Cedar Rapids, Iowa, assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 508,973, Jun. 29, 1983, abandoned.
This application Aug. 6, 1985, Ser. No. 763,312
Int. Cl.[4] B66C 23/52
U.S. Cl. 212—192 4 Claims

1. A vertically arranged compact crane assembly for mounting on a pedestal, comprising,

a main frame secured to said pedestal for rotation about a vertical axis and defining a platform of relatively limited surface area for receiving other crane components,

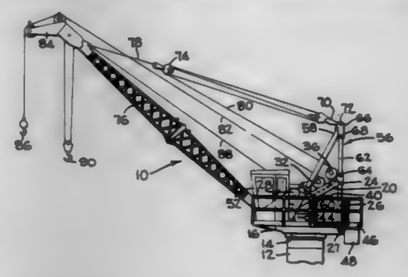
a boom pivotally attached to said platform adjacent an edge thereof and extending outwardly therefrom,

a winch frame including members extending rearwardly and upwardly from the said platform edge and on either side of the platform vertical axis in linear alignment with said boom,

upstanding laterally spaced link members on said platform at the rear edge of said winch frame and connected thereto so as to define a space beneath said winch frame,

winch members mounted on said frame transversely of said link members and above said space, said winches having cables for cooperative association with said boom,

a gantry frame surmounted upon said winch frame and said link members including legs on either side of said winch frame so as to be free of cables extending from said



winches to said boom, said gantry frame being disposed on either side of said platform vertical axis,

an engine mounted on said platform in said space beneath said winch frame, and,

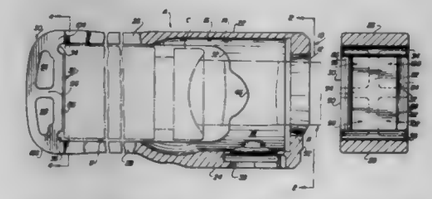
a generally U-shaped catwalk on said platform extending along either side and around the rear edge of said engine, winch frame, winches, and gantry frame, whereby the compact vertical arrangement of said engine, winch frame, winches, and gantry frame on said platform proximate its central axis facilitates access thereto despite platform space limitations.

4,635,804

YOKE FOR RAILWAY CAR COUPLER ASSEMBLY

Richard M. Hanula, 5012 N. Barton Rd., Lyndhurst, Ohio 44124

Filed Apr. 8, 1985, Ser. No. 720,690
Int. Cl.[4] B61G 9/04
U.S. Cl. 213—67 R 8 Claims



1. A yoke for a railway car coupling system, said yoke comprising:

a yoke body including a generally rectangular front portion having a central opening extending longitudinally therethrough with a pair of opposed laterally spaced apart straps extending rearwardly from said front portion and terminating in a bridge portion which connects said straps, said bridge portion including a load bearing pad having a substantially flat load bearing area and relieved portions for prolonging the yoke service life;

said bridge portion including a pair of reinforcing ribs for said load bearing area disposed in a normal relationship to each other, said relieved portions being disposed at upper and lower edges of said load bearing area for preventing the formation of cracks; and

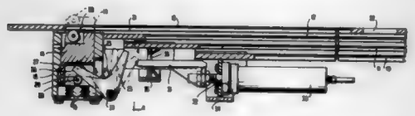
wherein the railway car coupling system comprises a vertical pin-type coupler, and said pad comprises recessed areas along opposed side edges thereof.

4,635,805

CRANE BOOM LOCKING PIN INSERTION INDICATOR AND ACTUATOR MEANS

William R. Mentzer, Shady Grove, Pa., assignor to Kidde, Inc., Saddle Brook, N.J.

Filed Nov. 5, 1981, Ser. No. 318,591
Int. Cl.⁴ B66C *23/04, 13/16, 23/06*
U.S. Cl. 212—230 **6 Claims**



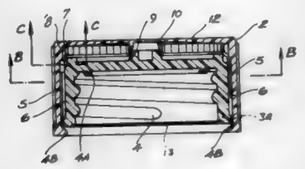
1. In a multi-section telescoping boom for cranes or the like having a base section and a manual fly section requiring locking to the boom section immediately surrounding the manual fly section, wear pad structure for the fly section at the forward end of said boom section, a locking pin for the manual fly section on said boom section, a guide housing for the locking pin depending from and forming a part of said wear pad structure, said locking pin being slidably mounted in said housing, the manual fly section having a pin receiver adapted to move into registry with the locking pin at proper times, spring means mounted in said housing for biasing said locking pin outwardly of said housing into said pin receiver, a bell crank lever pivotally mounted on said housing for retracting said biased locking pin from the pin receiver, power actuator means on said base section including a movable actuator adapted to reach forwardly of the base section and forwardly of at least one intermediate telescoping boom section when the boom section is retracted to engage and operate said bell crank lever, said bell crank lever having a first arm operatively engaged with the biased locking pin internally thereof and a second arm extending into the path of movement of said movable actuator member externally of the locking pin, and a through passage provided in said wear pad structure for allowing the movable actuator member to project forwardly of the wear pad structure to reach and operate the bell crank lever.

4,635,806

SAFETY CAP

Vere A. Williamson, 42 Oxford Street, Strathfield, New South Wales 2135, Australia

Filed Sep. 24, 1985, Ser. No. 779,412
Int. Cl.⁴ B65D *55/02*
U.S. Cl. 215—220 **2 Claims**



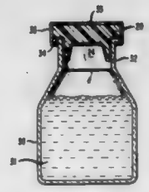
1. A safety cap which includes; an inner closure member provided with a skirt and adapted to removably seal the mouth of a bottle, a cowling having a top panel and fitted over the closure member in such a manner as to be movable between a first position where it is freely rotatable in at least one direction and a second position where it engages said closure member so that subsequent rotation of the cowling serves to remove said closure member, a biasing mechanism adapted to urge the cowling to said first position, said biasing mechanism comprising a conical projection and a split ring located centrally of said cap and between the closure member and cowling, the thickness of said top panel of the cowling being tapered to its minimum thickness towards its center so that said panel more easily deforms as the cowling is depressed onto the closure member to thereby enhance the resilient action of said biasing mechanism, and a series of saw tooth ridges disposed on the lower portion of said skirt of the closure member during the moulding thereof to facilitate the subsequent cutting of threads around the interior of said closure member.

4,635,807

STOPPER FOR STERILE FLUID CONTAINERS

Julius Z. Knapp, Somerset, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 476,075, Mar. 17, 1983, Pat. No. 4,554,125. This application Sep. 3, 1985, Ser. No. 772,220
Int. Cl.⁴ B65D *39/00*
U.S. Cl. 215—247 **7 Claims**



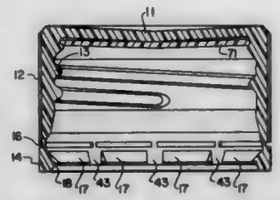
1. A stopper for holding fluid in a container comprising:
(a) a body of vulcanized elastomer having a convex surface and laminated to the convex surface without adhesive,
(b) a thin layer of stretched thermoplastic to form a surface intended to contact the fluid and a side of an opening in the container, said thermoplastic having had an elongation of at least 450% prior to stretching.

4,635,808

PLASTIC CAP

Robert L. Nolan, New York, N.Y., assignor to Maxcap, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 449,783, Dec. 14, 1982, Pat. No. 4,550,843. This application Jan. 22, 1985, Ser. No. 692,908
The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.
Int. Cl.⁴ B65D *41/34*
U.S. Cl. 215—252 **20 Claims**



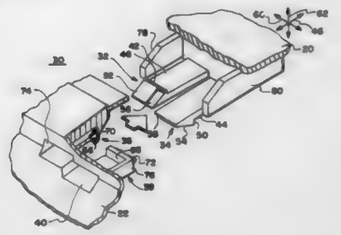
1. A molded plastic cap for use with a bottle having a neck carrying an outwardly extending thread and having an outwardly extending shoulder beneath said thread,
said cap comprising a top wall, an annular sidewall extending down from said top wall and having an inwardly extending thread for cooperation with said neck thread, and an integral antitamper skirt below said side wall and connected thereto,
said skirt having at least a lower portion which, when the cap is fully screwed onto said neck, is at a level below said shoulder, said skirt having also a plurality of circumferentially spaced integral inwardly projecting flaps which are integrally hinged thereto and which as molded project inwardly, the construction and arrangement being such that
(a) when during the operation of screwing said cap onto said neck, said cap moves downward, said flaps are engaged by said shoulder and pushed outward thereby and then, on further downward movement of said cap during said operation, said flaps are moved past said shoulder and
(b) when, during the operation of unscrewing said cap from said neck, said cap moves upward, said flaps engage the lower part of said shoulder and are forced by said engagement downward and outward into abutting relationship with said lower portion of said skirt so that the presence of said flaps decreases the effective internal diameter of said lower portion of said skirt so as to prevent said skirt, while intact, from passing up over said shoulder, said cap having
(i) above the zones where said flaps are integrally attached to said skirt, a first portion having an inner surface toward which said flaps swing during said screwing-on operation and
(ii) below said zones, a second portion having an inner surface against which said flaps abut during said unscrewing operation, said second portion having a diameter less than that of said first portion.

4,635,809

TELEVISION CABINET HAVING SNAP-TOGETHER ASSEMBLY

William J. Bachman, Mt. Laurel, and Franklin R. DiMeo, Woodbury, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 18, 1985, Ser. No. 799,217
Int. Cl.⁴ A47B *81/06*; B65D *6/24, 41/16*; H01R *13/44*
U.S. Cl. 220—4 B **11 Claims**



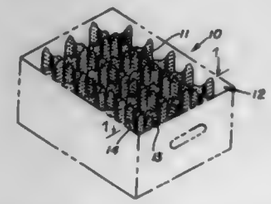
1. A television cabinet comprising:
a pair of cabinet halves defining an enclosure when said halves are inserted into each other along a path;
a pair of oppositely-disposed, relatively flexible latch fingers secured side-by-side to one of said cabinet halves such that said latch fingers are encompassed within said enclosure when said cabinet halves are assembled together; each of said latch fingers having a major surface disposed substantially parallel to said insertion path; each of said latch fingers further having, toward the free end thereof, a protruding edge that extends away from the respective one of said major surfaces and substantially at right angles thereto; said latch fingers being mounted such that said latch fingers are offset with respect to each other in a direction parallel to said major surfaces thereof, and such that said protruding edges are oppositely disposed with respect to said insertion path;
a pair of oppositely-disposed, relatively rigid stops secured side-by-side to the other of said cabinet halves such that said stops are encompassed within the confines of said enclosure when said cabinet halves are assembled together; each of said stops having a protruding edge which is disposed substantially orthogonally to said insertion path; said stops being mounted on said other member such that they engage and deflect said flexible latch fingers in opposite directions as said cabinet halves are assembled together until said protruding edges of said stops capture the respective ones of said protruding edges of said latch fingers to releasably secure said cabinet halves to each other; and
said cabinet enclosure being additionally equipped with a window for providing a limited access to said latch fingers when said cabinet halves are assembled to each other; said limited access window being dimensioned such that entry of human fingers into said window is precluded, while allowing introduction of an implement into said window to cause deflection of said latch fingers in opposite directions in a manner causing disengagement thereof from said stops.

4,635,810

CARDBOARD BOX AND/OR PLASTIC CRATE PARTITION

Benjamin E. Tate, 407 Wedgewood Dr., Erie, Pa. 16505

Filed Nov. 12, 1985, Ser. No. 797,045
Int. Cl.⁴ B65D *5/48*
U.S. Cl. 220—21 **1 Claim**



1. In combination, a cardboard box and/or plastic crate having a bottom and a partition made of thermoplastic material in said crate,
said partition comprising a first partition members and a second partition members,
said first partition members and said second partition members each being substantially identical to the other in configuration,
said first partition members and said second partition members each having a first side and a second side and spaced generally V-shaped convolutions formed in said first sides and in said second sides,
said sides being flattened between said convolutions providing a supporting surface to rest on said bottom,
said partition members each comprising a plate like member having first sides and second sides having spaced pairs of spaced beads extending from said first side toward said second side,
said plate-like members having spaced first slots formed in said plate and extending from a first side, toward a said second side, second slots formed in each said partition and extending from second sides toward said front side and extending from the bottom of each said convolution on one said side to the bottom of each said convolution on the other said side,
said first slots each having a first side, and a second side,
said first sides of each said first slots adjacent said first edge of each said partition member extending inwardly toward said second edge, then at right-angles toward said second edge defining a shoulder,
said first slots having second sides extending from said first edges toward a second side and toward said first end underlying said shoulders, then extending toward said second edge to a position beyond the center part of said partition member toward said second edge and terminating at an inner end,
said first slots in said first partition member receiving said second partition member between the inner ends of said first slots and said second slots,
said shoulder overlying said second partition in said second

slots whereby said shoulders lock said partition members together,

each said pair of said beads being disposed approximately half way between two adjacent said first slots for preventing damage to labels on bottles that may be disposed adjacent said partitions,

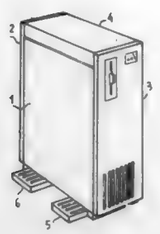
said partition has six spaced rows of relatively large holes extending through said plate-like partition member and disposed between each said pairs of spaced beads.

4,635,811

COMPUTER MODULAR FRAME WITH RETRACTABLE STABILIZERS

Renato Lodi, Rho, Italy, assignor to Honeywell Information Systems Italia, Milan, Italy

Filed Sep. 18, 1985, Ser. No. 777,113
Claims priority, application Italy, Oct. 1, 1984, 22939 A/84
Int. Cl.⁴ B65D *19/00*
U.S. Cl. 220—69 4 Claims



1. Computer modular frame capable of juxtaposition against a wall and/or against other similar frames, comprising:

N retractable feet where N≧3, each of said feet being shaped as a substantially rectangular foot and movably skid-mounted on the bottom of said frame and shiftable in a direction transverse to the longitudinal axis of said frame, two sides of said rectangular foot being parallel to said shifting direction,

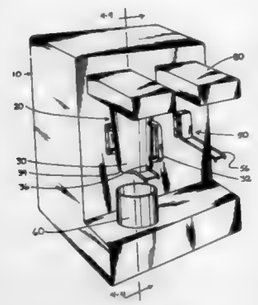
said N feet being serially mounted in juxtaposition, along said longitudinal axis, at least two of said feet in juxtaposition one to the other with each being shiftable in an opposite direction of said shifting direction.

4,635,812

APPARATUS FOR HEATING PASTA AND SAUCE

Martin Mueller, 2545 Lake Shore Dr., Wonder Lake, Ill. 60097

Filed Jun. 21, 1985, Ser. No. 747,321
Int. Cl.⁴ B65D *8/04*
U.S. Cl. 220—70 19 Claims



14. A cup for use with a steaming apparatus to permit rapid heating of food while avoiding contact with said food by said steaming apparatus, said cup having a structure wherein:

a. said cup includes a cup body;

b. a handle is secured to said cup body;

c. said cup body includes a cup base;

d. said cup base includes holder notches to receive holder rods and permit said cup to be tightly held adjacent to a steam circulation housing to provide for efficient steaming of food placed in said cup; and

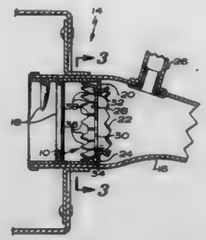
e. said cup has an interior shape for holding said food of a parabolic concave cup bottom.

4,635,813

FILLER NECK INSERT

Marlin W. Peickert, 2 Herron La., St. Paul, Minn. 55112

Filed Nov. 7, 1984, Ser. No. 669,379
Int. Cl.⁴ B65B *39/00*; B65D *25/01*
U.S. Cl. 220—86 R 2 Claims



1. A retrofittable single piece gasoline filler neck restrictor insert for installation into commercial stock automobiles and light trucks for restricting a filler neck having an inlet opening through which a filler nozzle is inserted, or for repairing a damaged or tampered unleaded gas filler tube restrictor, said insert comprising:

a generally circular planar central portion;

an aperture in said central portion sized to accept only an unleaded filler nozzle;

an annular flange integral with said planar central portion and extending at an angle therefrom, a plurality of circumferentially spaced apart slots in a circumferential portion of said flange and extending into the outer portion of said central portion, said circumferential portion of said annular flange enhancing flexing thereof during insertion of said restrictor insert; and

locking means comprising a plurality of fingers extending radially outwardly from said annular flange and at an angle from the plane of said central portion, said fingers facing outwardly when said restrictor insert is inserted into the filler neck, said fingers having pointed ends defining a diameter greater than the inner diameter of the filler neck and being adaptable for engagement with the inner surface of the filler neck for retaining said insert in a filler neck and preventing withdrawal of said insert after insertion.

4,635,814

LINED RECEPTACLES

Allen S. Jones, Lynfield, New Zealand, assignor to Rheem Manufacturing Company, New York, N.Y.

Continuation of Ser. No. 533,001, Sep. 16, 1983, abandoned. This application Feb. 21, 1985, Ser. No. 704,144
Int. Cl.⁴ B65D *25/16*
U.S. Cl. 220—403 3 Claims

1. An improved lined receptacle comprising, in combination:

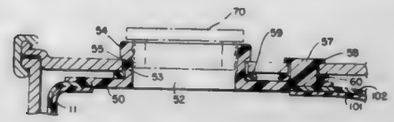
a rigid, enclosed container having a cylindrical side wall, an attached bottom wall, and a top wall, said top wall having an interior side and an exterior side, said top wall defining two opposed pairs of spaced openings, each of said two opposed pairs including a first gland opening and a second gland opening, said top wall further having first and second skirts extending outwardly from said exterior side and enclosing said first and second gland openings, respectively;

a flexible liner adapted to substantially fill said rigid, enclosed container, said liner comprising first and second opposed, overlying, flexible, rectangularly shaped panels of a film material, said panels sealed at the edges thereof and also sealed across the corners to define a bag enclosure;

first and second gland members sealingly attached to said flexible liner, one of said gland members being attached to the first panel and the other gland member being attached to the second panel, said gland members being separated by a seal along an edge of the panels and in an opposed relationship;

said gland members adapted to engage said two opposed pairs of spaced openings by projecting through the first and second gland openings, respectively, whereby said flexible liner is draped between said two opposed pairs of openings along said interior side of said top wall so as to facilitate filling and draining of said improved receptacle;

each of said first and second gland members including a base



sealed to said flexible liner, a spigot extending from said base opposite said flexible liner, and a spout extending from said base opposite said flexible liner;

said spigot of each gland member having a spigot head and a spigot neck so as to snap fit into said first gland opening from said interior side of said top wall and outwardly directed, said first skirt engaging said spigot neck and abutting said spigot head;

said spout of each gland member having a spout head and a spout neck so as to snap fit into said second gland opening from said interior side of said top wall and outwardly directed, said second skirt engaging said spout neck and abutting said spout head, each of said spigots defining means of maintaining a gland member and attached liner in a torque resisting position with the sealed edge of the liner maintained intermediate the gland members and supported between the gland members;

said spout and said base providing a fluid passage between the interior of said flexible liner and said exterior side of said top wall;

seal means for selectively closing said fluid passage; and

release vent means in said top wall for selectively relieving pressure between said rigid, enclosed container and said flexible liner, said vent means centrally located between the pairs of gland openings.

4,635,815

REINFORCED BULK MATERIAL CONTAINER

John M. Grigsby, Marietta, Ga., assignor to North American Container Corp., Mableton, Ga.

Continuation-in-part of Ser. No. 652,673, Sep. 21, 1984, Pat. No. 4,586,627. This application Feb. 28, 1986, Ser. No. 834,899
Int. Cl.⁴ B65D *5/32, 5/56*
U.S. Cl. 220—443 3 Claims

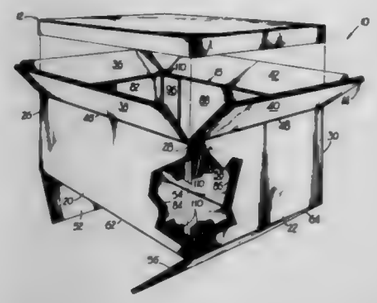
1. A reinforced bulk material container comprising:

a first wall-forming blank scored to provide a series of main panels foldably joined together, said first wall-forming blank being formed of corrugated paperboard having corrugations in a first alignment and defining an inside surface and an outside surface;

a second wall-forming blank scored to provide a series of main panels foldably joined together, said second wall-forming bland being formed of corrugated paperboard having corrugations in said first alignment and defining a front side surface and a back side surface;

a pair of independent support members secured to said back side surface of said second wall-forming blank at the location of each said score, said pair of support members each extending substantially the height of said second wall-forming blank and arranged so as to straddle and be spaced apart from said score;

a filler bonded to each main panel of said second wall-forming blank, said filler being formed of corrugated paperboard having corrugations in an alignment substantially



perpendicular to that of said first alignment and dimensioned so as to extend substantially the width of said main panel between said support members secured thereto and substantially the height of said second wall forming blank;

said backside surface of said second wall-forming blank being laminated to said inside surface of said first wall forming blank so as to provide a unitary container having a series of reinforced side walls foldably joined together;

whereby the interior of said container defined by said front side surface of said second wall-forming blank of paperboard provides a plurality of continuous, protrusion-free inner surfaces foldably joined together at corners such that said container may be collapsed into a flat condition for shipping and easily erected for filling.

4,635,816

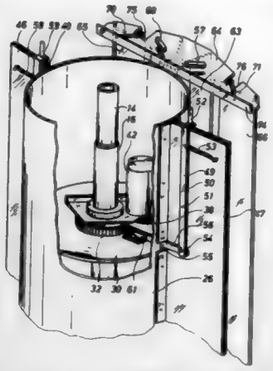
VENDING MACHINE DELIVERING CUPS CONTAINING FRESHLY MADE BEVERAGES

Per W. Mikkelsen, Odense SV, Denmark, assignor to Wittenborgs Automatfabriker A/S, Odense C, Denmark

Filed Jul. 10, 1985, Ser. No. 753,651
Claims priority, application Denmark, Aug. 3, 1984, 3777/84
Int. Cl.⁴ G07F *11/12*
U.S. Cl. 221—11 5 Claims

1. A vending machine for cups containing freshly made beverages and comprising a cup dispenser delivering the cups one by one to a filling device, where the cup dispenser includes a magazine for rows of several succeeding stacks of cups situated on a bottom plate shaped with a delivery opening and driving means for advancing the stacks in the magazine, said delivery opening allowing the front stack of cups to fall downwards by gravity upon the advancing in the magazine so as to position the front stack on top of a delivery mechanism which is placed below the delivery opening and which upon activation is adapted to remove the lowermost cup from the stack and to deliver said cup to the filling device and where the cup dispenser comprises a sensor detecting that the uppermost cup of the front stack positioned on top of the delivery mechanism is flushing with or situated below the bottom plate of the magazine, said sensor furthermore activating said driving means advancing the row of stacks in the magazine and allowing the succeeding stack to fall through the delivery opening,

characterized in that the cup dispenser comprises two magazines for their respective rows of stacks of cups and each including a driving means and a delivery opening with a delivery mechanism and the two magazines having associated chambers for the rows of stacks, and that the two magazines are shaped in such a manner that the associated chambers for the rows of stacks extend coaxially and include delivery openings positioned immediately adjacent one another, and wherein there are inner and outer cylindrical wall surfaces having a



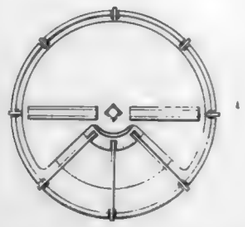
common central axis, the driving means of each magazine comprising a pushing arm projecting radially in the space between the cylindrical wall surfaces and being mounted about the common central axis of the two cylindrical wall surfaces, said pushing arms being driven about said central axis by means of a driving motor associated with each pusher arm, and wherein each driving motor is connected to its associated pushing arm by means of a releasable coupling means which is adapated to engage the driving motor in any position of the pushing arm seen in a direction about its axis of rotation.

4,635,817

ICE CUBE DISPENSER

Urly K. Kostov, 5613 Lexington Ave., #105, Los Angeles, Calif. 90038

Filed Apr. 29, 1985, Ser. No. 728,045
Int. Cl.⁴ G07F *11/00*
U.S. Cl. 221—89 **2 Claims**



1. An apparatus for making ice cubes comprising:
an ice cube tray;
an inner grid core;
an outer grid core comprising sloped sides and a threaded opening at a top of the outer grid core and wider at a bottom of the outer grid core;
dividers positioned in the ice cube tray and upright with respect to the ice cube tray and inserted into the inner and outer grid cores; and
a threaded stud engageable with the threaded opening in the outer grid core.

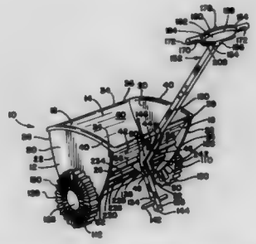
2. The apparatus as claimed in claim 1 further comprising a dispenser lid defining an opening for the ice cube tray for allowing a single ice cube to go through the opening and mountable over the threaded stud for turning the lid in two directions.

4,635,818

SPREADER

Henry P. Glass, Northfield, Ill., assignor to Duraco Products, Inc., Streamwood, Ill.

Filed Nov. 20, 1985, Ser. No. 799,827
Int. Cl.⁴ A01C *17/00*
U.S. Cl. 222—41 **8 Claims**



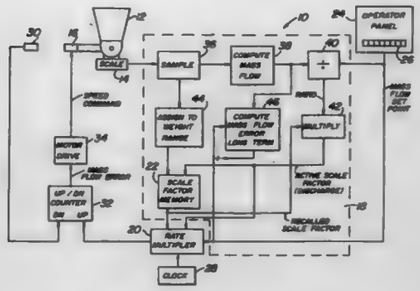
1. A spreader for lawn care related materials, said spreader comprising:
hopper means to hold a supply of said material,
wheels means rotatively attached to said hopper means to allow movement of said spreader over terrain supporting said spreader and movement to an agitator bar in said hopper means to promote a uniform flow of said material through discharge openings in said hopper means,
gate means carried by said hopper means adjacent to said hopper means discharge openings, said gate means slidable between a first open position to uncover said openings and allow said flow of said material therethrough and a second close position with a front member of said gate means covering said openings, an edge of said gate means seating against a front wall of said hopper means, and a bottom flange of said gate means offset from said front wall to form a relief space therebetween to promote sealing of said gate means edge,
handle assembly means for manual operation of said spreader, said handle assembly means including an extension having one end attached to said hopper means and an opposite end to a flow control housing, a handle bar carried by said housing with ends of said handle bar extending outward from said housing, a movable control bar operatively connected to said gate means for direct movement of a said gate means between said open and close positions, a control dial carried by said housing for positioning a stop slidably connected to said housing with said stop interacting with said control bar to selectively regulate said gate means open position, and a spring attached to said extension and said control bar to generate a closing force on said gate means, and
stand means attached to said hopper means with said stand means having a down position to maintain said spreader upright and an up position allowing elevation adjustment of said handle assembly means handle bar during spreader operation.

4,635,819

APPARATUS AND METHOD FOR IMPROVING THE ACCURACY OF A LOSS-IN-WEIGHT FEEDING SYSTEM

David H. Wilson, and James M. Loe, both of Scottsdale, Ariz., assignors to K-Tron International, Inc., Scottsdale, Ariz.

Continuation of Ser. No. 343,143, Jan. 28, 1982, Pat. No. 4,524,886. This application Mar. 19, 1985, Ser. No. 713,749
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.
Int. Cl.⁴ G01G *11/08*
U.S. Cl. 222—58 **16 Claims**



1. A material feeding system comprising:
means for storing a quantity of material;
means for discharging said material from said means for storing during a first period and a second period, said material having an effective density which is dependent on the quantity of material in said storing means;
means for generating a signal representing the effective density of material being discharged during said first period, said signal being different for different effective densities; and
means responsive to the quantity of material in said storing means during said second period and to said signal for controlling said means for discharging during at least a portion of said second period to compensate for change of the effective density of the material being discharged.

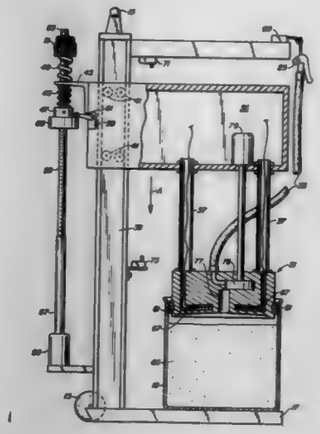
4,635,820

BULK UNLOADER OF SOLIDIFIED THERMOPLASTIC MATERIAL FROM PAILS AND DRUMS

Lee Marshall, Santa Cruz, Calif., assignor to Slautterback Corporation, Monterey, Calif.

Filed Jan. 9, 1986, Ser. No. 818,184
Int. Cl.⁴ G01F *11/00*
U.S. Cl. 222—63 **17 Claims**

1. An apparatus for unloading solidified thermoplastic material such as hot-melt, from a container, comprising,
a movable platen assembly having a first vertical axis of movement, said platen assembly having a platen carriage, said platen carriage supporting a heated platen having a means for pumping melted thermoplastic material from a container,
a vertically movable advancing means for moving said platen assembly, said advancing means having a second vertical axis of movement parallel to the first vertical axis and having a pressure means for urging said platen assembly downwardly and a balance means for urging said platen assembly upwardly, and



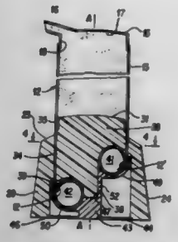
a limiting means for restricting vertical movement of said advancing means relative to vertical movement of said platen carriage to preselected incremental advances.

4,635,821

STANDING TOOTHPASTE DISPENSER

Richard F. Shaffner, 1115 Jefferson Dr., Charlotte, N.C. 28226

Filed Jan. 7, 1985, Ser. No. 742,351
Int. Cl.⁴ B65D *83/00*; B67D *5/42*
U.S. Cl. 222—80 **16 Claims**



1. An apparatus for dispensing paste products comprising a container having cylindrical side walls and upper and lower portions, said cylindrical side walls being defined by a first diameter, nozzle means carried by said upper portion of said container, a dispenser means having a generally central piston means and a base portion, said piston means having side walls which are retained in spaced relationship from said base portion so as to create a generally annular passageway therebetween, at least two spaced cutter means disposed across said passageway and between said piston means and said base portion, said container being mounted over said piston means so that said cylindrical side walls of said container are slidably received in said passageway, so that as said container is urged toward said piston means the paste product will be dispensed from said nozzle means and said cylindrical side walls of said container will pass along said passageway and be severed into strips by said cutter means, a supplemental containment assembly carried within said base portion of said dispenser means, said supplemental containment assembly including at least two generally U-shaped cradle members which are open toward said lower end of said piston means, said piston means being generally cylindrical and having a central axis which extends

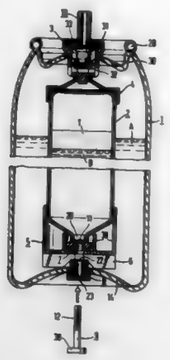
between upper and lower ends, said upper end of said piston means being in vertically spaced relationship above said cutter means, said lower end of said piston means having at least two spaced generally semi-circular grooves therein for guiding said strips of said container, and semi-circular grooves extending generally perpendicular with respect to said axis of said piston means, one of each said cradle members being oriented in opposing relationship with one of said grooves in said piston means and being aligned so as to guide said strips of said container as said strips pass through said passageway whereby said grooves and said cradle means retain said strips therebetween.

4,635,822

APPARATUS FOR PRODUCING AND SPRAYING A MIXTURE CONSISTING OF AT LEAST TWO COMPONENTS, E.G. LIQUIDS, AND A PROPELLANT GAS

Hans J. Klawitter, Munich, Fed. Rep. of Germany, assignor to F.P.D. Future Patents Development Company S.A., Luxembourg

Filed Feb. 6, 1985, Ser. No. 698,800
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1984, 3405065
Int. Cl.[4] B67B *7/24*
U.S. Cl. 222—82 **17 Claims**



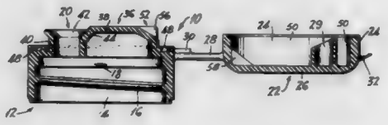
1. An apparatus for producing and spraying a mixture consisting of at least two components, e.g. liquids and a propellant gas, comprising two nested containers for housing the components to be mixed and the propellant gas and a discharge valve which is disposed at the outer container and has a small discharge tube operable from outside to establish fluid communication with the interior of the outer container, wherein the inner container has a desired rupture site at its end remote from the discharge valve, facing the bottom of the outer container, the rupture site being adapted to be broken from outside by a crusher acting through the bottom of the outer container and establishing fluid communication between the inner and outer containers, and wherein the desired rupture site is adapted to be pushed open or broken by a pin-like puncher passed through a closure member arranged in the bottom of the outer container, the puncher including a passage to permit the exit of the components located in the inner container directly into the interior of the outer container, the axial extension of this passage being smaller than the length of the axial passage for the puncher formed in a closure member of the outer container.

4,635,823

DISPENSING CLOSURE CONSTRUCTION

Gene Stull, 5 Oak St., Chester, N.J. 07930

Filed May 9, 1985, Ser. No. 732,065
Int. Cl.[4] B67D *1/16, 3/00*; B65D *5/72*; B23P *11/02*
U.S. Cl. 222—108 **15 Claims**



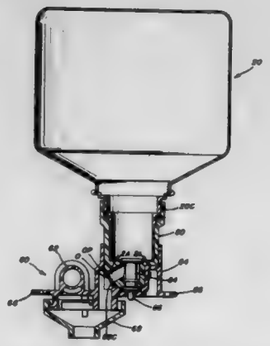
1. A dispensing closure for dispensing liquid product from containers, comprising in combination:
(a) a body having means for securing it to the neck of the container,
(b) said body having an off-center discharge orifice and having a high, domed, segmental-shaped top portion disposed laterally of the orifice and including a transverse top wall,
(c) a sealing cap adapted to fit over and to be mounted on said body, and
(d) a hinge connecting and integral with said body and sealing cap,
(e) said sealing cap having a sealing peg adapted to be received in the discharge orifice of the body when the sealing cap is in a mounted sealing position on the body,
(f) said domed top portion of the body having a sloping barrier wall extending from said transverse top wall obliquely downward to said off-center discharge orifice,
(g) said off-center discharge orifice having a pouring lip all portions of which are disposed substantially below the level of said transverse top wall, thereby minimizing the tendency for liquid to flow from the lip toward the transverse top wall when the closure is tilted from an upright position.

4,635,824

LOW-COST POST-MIX BEVERAGE DISPENSER AND SYRUP SUPPLY SYSTEM THEREFOR

Lorraine E. Gaunt, Marietta; Samuel C. Crosby, Decatur; William J. Saunders, Stone Mountain, and Robert D. Bruffey, Jr., Lilburn, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Sep. 13, 1985, Ser. No. 775,833
Int. Cl.[4] B67D *5/56, 5/06*; B65D *47/20*
U.S. Cl. 222—129.1 **5 Claims**



1. In, a post-mix beverage dispenser system including a predetermined number of cabinet-mounted valve assemblies and associated dispensing nozzles rigidly affixed to a dispenser cabinet, each of said valve assemblies including a soda valve

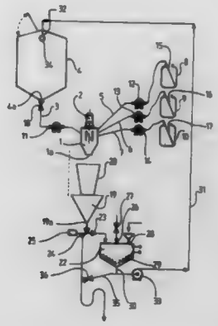
for controlling the flow of carbonated water to said nozzle, the improvement comprising:
(a) a plurality of syrup valve adaptor assemblies of a number in excess of the predetermined number of cabinet-mounted valve assemblies, each said syrup valve adaptor assembly including,
1. a main housing having an open end removably connectable to a discharge spout of a gravity-flow syrup container,
2. a normally-closed syrup valve in the main housing for controlling the flow of syrup from said spout,
3. a syrup outlet conduit connected to said syrup valve, and
4. a flow-rate control orifice plate in said outlet conduit in fluid communication with said syrup valve having a predetermined orifice size compatible with the brix value of a predetermined flavor of syrup,
the orifice size of each valve adaptor assembly being different to be compatible with different brix values of syrup; and
(b) a socket in each said cabinet-mounted valve assembly for removably receiving a selected one of said syrup valve adaptor assemblies to operatively position the syrup outlet conduit with respect to an associated dispensing nozzle.

4,635,825

INSTALLATION FOR AUTOMATICALLY DISPENSING, ON REQUEST, INDIVIDUAL PORTIONS OF DRINKING YOGHURT IN SELECTED FLAVORS

Jacques Tulasne, Paris, France, assignor to Societe de Developpements et d'Innovations des Marches Agricoles, Paris, France

Filed Apr. 3, 1985, Ser. No. 719,426
Claims priority, application France, Apr. 3, 1984, 84 05221
Int. Cl.[4] B67D *5/56*
U.S. Cl. 222—129.1 **11 Claims**



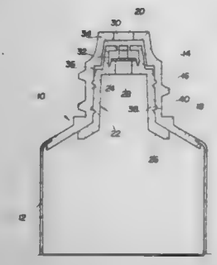
1. An installation for automatically dispensing, upon request, individual portions of drinking yoghurt in selected flavors, said installation comprising:
a store of liquid yoghurt having duct means leading therefrom and yoghurt control means for causing a portion of yoghurt to flow from said store;
at least one flavoring store having respective flavoring duct means leading therefrom and respective flavoring control means for causing a portion of flavoring to flow from said at least one flavoring store;
a static, free flow mixer comprising a body which defines an inside chamber having an inlet terminating therein and connected to the yoghurt store via said duct means and said yoghurt control means, a plurality of inlet ducts connected to respective ones of the at least one flavoring store via respective ones of said flavoring duct means and said flavoring control means, said inside chamber further having a plurality of outlet orifices, wherein said inlet, said inlet ducts and said outlet orifices are arranged so that the yoghurt and flavoring entering the chamber are mixed together before leaving the chamber through one of said outlet orifices;
means for supporting a beaker in a position in which it can receive the yoghurt and flavoring mixture leaving the outlet orifices of said mixer; and
a device for cleaning the installation, said device comprising a wash tank having an outlet connected to said yoghurt store and an inlet connected to the outlet orifices of the mixer, means for supplying said wash tank in a controlled manner with cleaning material, means for pumping said cleaning material from the tank to the yoghurt store, and means for connecting the tank to waste disposal means.

4,635,826

TUBE CONTAINER FOR RECEIVING SEMIFLUID MATERIAL

Yoshiharu Hatakeyama, Tokyo, and Tatsuo Ishikawa, Chiba, both of Japan, assignors to Yoshida Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 551,929, Nov. 15, 1983, abandoned. This application Jan. 16, 1986, Ser. No. 819,492
Claims priority, application Japan, Aug. 23, 1983, 58-129269[U]
Int. Cl.[4] B65D *37/00*
U.S. Cl. 222—147 **3 Claims**



1. A tube container for receiving semifluid material, said container comprising:
a tubular body formed of a synthetic resin material capable of being deformed by the application of exterior pressure and having elasticity for restoring said tubular body to its original shape upon removal of the exterior pressure, said tubular body being open at an upper end thereof, a lower end of said tubular body being sealed after said tubular body is filled with a semifluid material;
a hollow neck portion formed of a synthetic resin material and adapted to be covered by a cap, said neck portion including an outlet provided at a top end thereof and a shoulder, an inner surface of said neck portion being formed with circumferentially extending grooves, and said neck portion being integrally mounted on said upper end of said tubular body at said shoulder; and
a valve member inserted into said neck portion from said lower end of said tubular body before sealing thereof, said valve member including a side wall, a lower open end, an upper end plate, a valve sheet, a stopper means and a flange, said side wall having an outer surface tightly fitting with an inner surface of said neck portion, said outer surface having an upper end tapering inwardly from the portion of the outer surface that tightly fits with the inner surface of the neck portion and further having circumferentially extending protrusions extending into and in engagement with said grooves of said neck portion, said end plate being provided with a passage for communicating the interior of said tubular body with said outlet, said valve sheet being positioned on said end plate and being movable upwardly and downwardly between said end

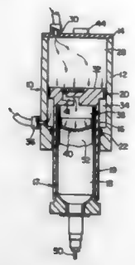
plate and said stopper means, said valve sheet being movable upwardly to open said passage when exterior pressure is applied to said tubular body, and said valve sheet being movable downwardly to close said passage when the pressure to said tubular body is removed, said stopper means comprising a plurality of pawls extending upwardly from an upper surface of said end plate and being circumferentially apart from each other, upper portions of said pawls defining a space of less diameter than that of said valve sheet, and said upper portions of said pawls being located adjacent to said outlet of said neck portion so as to minimize a space therebetween, and said flange being formed at a lower end of said valve member and abutting said shoulder of said neck portion.

4,635,827

SEALANT APPLICATOR FOR RIVET MACHINE

Robert Roedig, Farmingdale, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Feb. 6, 1985, Ser. No. 698,971
Int. Cl.[4] B67D *5/54*
U.S. Cl. 222—160 8 Claims



1. A material applicator comprising:
a piston body enclosing a first piston;
a sleeve mounted within the first piston;
a piston cartridge containing material, the cartridge being removably positioned in the sleeve;
a spring-loaded valve nozzle extending outwardly from the cartridge for depositing a bead of material on a contacted surface;
means for pressurizing a first chamber existing between the first piston and a cap of the body for extending the first piston outwardly from the body thereby causing similar extension of the sleeve and the piston cartridge connected thereto; and
means pressurizing a second chamber existing between the piston cartridge and the first piston for pressurizing the material in the piston cartridge and causing ejection of material upon displacement of the valve nozzle to an open position after nozzle contact with a surface.

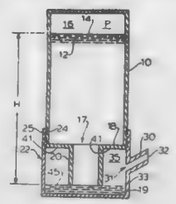
4,635,828

LIQUID CONTAINER DISPENSING CAP STRUCTURE

John G. Kaufman, 858 Condor Drive, Burlington, Ontario, Canada (L7T3A7)

Filed Jun. 27, 1984, Ser. No. 625,363
Int. Cl.[4] B65D *37/00*
U.S. Cl. 222—185 12 Claims

1. A liquid dispenser comprising:
resiliently deformable container means including a main body having at least one side wall extending longitudinally; a transversely extending bottom wall means defining an opening, the opening being the only access into the container means and the wall means having a downwardly facing outer wall surface extending between the opening and said side wall of the main body; and a neck extending longitudinally and downwardly from the opening and having a transverse cross-sectional area substantially smaller than the area of the bottom wall means surrounding the neck, and defining at its lower end an opening;
an inverted cap structure having at least one longitudinally extending side wall, a transversely extending bottom wall below said neck opening, and an outlet in the side wall above said opening;
the cap structure side wall at its upper extremity cooperating with the side wall of the main body to form a liquid tight-seal; and
a temperature compensated air pocket defined by liquid



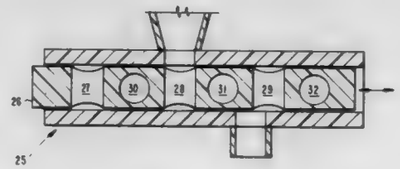
contained in the inverted cap, the outer surface of the neck, the inner surface of the side wall of the cap structure, and said outer wall surface of the bottom wall means whereby in use, temperature driven changes in a volume of air above liquid in the main body of the container means results in movement of the level of the liquid in the cap, the air pocket being proportioned relative to the container means to accommodate such changes in level below the outlet for a pre-selected range of temperatures so that there is no discharge at the outlet caused by such changes in the volume of air above the liquid.

4,635,829

MEASURED VOLUME DISPENSER

Louis W. Brittingham, Jr., 121 Hemlock, Sunnyside, Wash. 98944

Filed May 30, 1985, Ser. No. 739,432
Int. Cl.[4] G01F *11/00, 11/10, 11/28*
U.S. Cl. 222—278 5 Claims



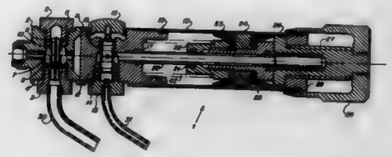
1. A dispensing apparatus for dispensing discrete measured amounts of fluent material, comprising:
a dispenser body defining a horizontal tubular chamber therein of circular cross section and further defining an inlet port communicating with the top of the tubular chamber and an outlet port communicating with the bottom of the tubular chamber, the inlet port and the outlet port being offset with respect to each other along the length of the tubular chamber;
a piston disposed within the tubular chamber and configured for reciprocal linear displacement therein, said piston further being rotatable within said tubular chamber, said piston defining therethrough a vertical measuring hole and a horizontal measuring hole oriented at substantially right angles to the vertical measuring hole, each measuring hole having open ends configured in tight-fitting sliding engagement with the tubular chamber, where there is defined a measuring space of a desired volume bounded by the tubular chamber and the measuring hole, each measuring hole alternately communicating with the inlet port and the outlet port when aligned therewith as said piston is displaced linearly; and
a reservoir communicating with the inlet port;
whereby alternate measuring holes are provided by rotating said piston to align the selected measuring hole with the inlet and outlet ports, and whereby the volume of fluent material dispensed from said reservoir per reciprocation of the piston is determined by the volume of the measuring space.

4,635,830

PORTABLE, SELF-POWERED, ADJUSTABLE HERBICIDE DISPENSING SYSTEM

Michael A. Wehr, Hancock, and Robert L. Sajdak, Chassell, both of Mich., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 29, 1984, Ser. No. 676,147
Int. Cl.[4] G01F *11/06*
U.S. Cl. 222—334 2 Claims



1. A liquid dispensing device comprising:
a. a body;
b. a chamber within said body;
c. a piston slidably mounted within said chamber to form a cavity to the front and to the rear of said piston so that said piston moves in a rearward and a forward direction;
d. a means for biasing said piston in the rearward direction;
e. a nozzle;
f. a fluid pressure means;
g. a pressure releasing means;
h. a valve connected to said front cavity by a first conduit, to said rear cavity by a second conduit, to said nozzle by a third conduit; to said pressure means by a fourth conduit; and to said pressure releasing means by a fifth conduit; said valve having an open and a closed position, wherein said open position connects said first conduit to said third conduit, and said second conduit to said fourth conduit; and wherein said closed position connects said second conduit to said fifth conduit; and
i. a supply of liquid connected by a sixth conduit to said first conduit through a check valve.

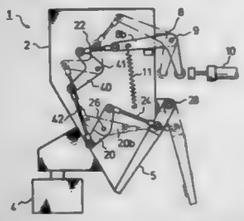
4,635,831

GATE DRIVING DEVICE

Kinjiro Kinoshita, Himeji, Japan, assignor to Yamato Scale Company, Limited, Japan

Continuation-in-part of Ser. No. 537,036, Sep. 29, 1983, Pat. No. 4,522,321. This application Feb. 11, 1985, Ser. No. 700,593
Claims priority, application Japan, Oct. 5, 1982, 57-175457
The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.
Int. Cl.[4] E16K *31/52*
U.S. Cl. 222—504 3 Claims

1. In a hopper having a discharge opening at the bottom, said opening being provided with a flapdoor type gate; a gate driving device comprising a first bell crank having first and second arms and pivoted on a first generally horizontal axis for receiving an original driving force applied to said first arm, a second bell crank having first and second arms and pivoted on a second generally horizontal axis, a third bell crank having first and second arms and pivoted on a third generally horizontal axis, a first connecting rod connecting the second arm of said first bell crank to the first arm of said second bell crank, a second connecting rod connecting the second arm of said third bell crank to said gate, and link means connecting the second arm of said second bell crank to the first arm of said third bell crank; characterized in that the locations and geometries of



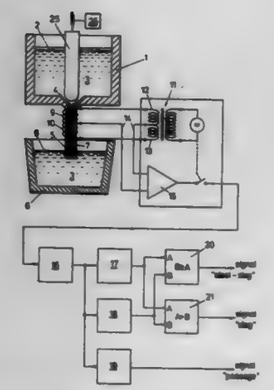
said bell cranks and connecting rods are selected such that, when said gate is closed, the second arm of said first bell crank and said first connecting rod align substantially on a straight line, and that, when said gate is open, the second arm of said third bell crank and said second connecting rod align substantially on another straight line.

4,635,832

METHOD OF, AND AN ARRANGEMENT FOR CASTING METAL MELT

Reinhold Augerer, and Felix Wallner, both of Linz, Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Mar. 25, 1985, Ser. No. 715,270
Claims priority, application Austria, Apr. 5, 1984, 1155/84
Int. Cl.[4] B22D *41/08;* G01N *27/74, 27/90*
U.S. Cl. 222—590 2 Claims



1. A method of casting metal melt from a first metallurgical vessel, in which the metal melt is covered by a slag layer, into a second metallurgical vessel in the form of a casting jet guided through a casting tube provided between said first and said second vessels and covering said casting jet, which method comprises the steps of
inducing magnetic fields in said casting jet by two coils peripherally surrounding said casting tube so as to cause inductivity variations in said two coils on account of eddy currents produced in said casting jet by said magnetic fields,
continuously measuring the difference of said inductivity variations and comparing it to at least one limit value, and
interrupting casting after a rise in the difference of the inductivity variations to above a predetermined limit value within a predetermined time interval and a consecutive drop in the difference of the inductivity variations to below a predetermined limit value within a further predetermined time interval.

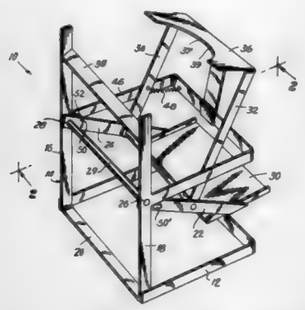
2. In an arrangement for casting metal melt from a first metallurgical vessel, in which the metal melt is covered by a slag layer, into a second metallurgical vessel in the form of a casting jet and of the type including a casting tube directed from said first metallurgical vessel into said second metallurgical vessel, the improvement which comprises two equal coils peripherally surrounding said casting tube and consecutively arranged in the longitudinal direction of said casting tube and connected in series, an A.C. power supply for feeding said two coils so as to induce magnetic fields in said casting jet to cause inductivity variations in said two coils on account of eddy currents produced in said casting jet by said magnetic fields, a Wheatstone bridge adapted to integrate the ends of said two coils and including a bridge diagonal connected between said two coils, a mean value rectifier and a peak value rectifier following said Wheatstone bridge and each including a phase shifting means, said means value rectifier and said peak value rectifier being connected in parallel, a first comparator following said mean value rectifier and a second comparator following said peak value rectifier, said first and said second comparators being connected parallel to said mean value rectifier and said peak value rectifier.

4,635,833

PORTABLE BOOTJACK

Salvatore Scarlata, 101-02 95th Ave., Queens, N.Y. 11416

Filed Nov. 20, 1985, Ser. No. 799,964
Int. Cl.[4] A47J *51/02*
U.S. Cl. 223—116 6 Claims



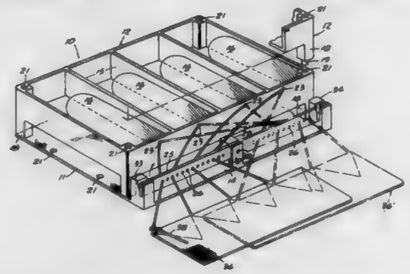
1. A bootjack assembly for facilitating removal of a boot or shoe wherein said assembly comprises
- a base adapted to sit on the floor,
- a vertical frame attached at the front of said base,
- a lateral front gripping bar adapted to bear against the front of the heel of the boot,
- a moveable rear gripping plate conforming to the shape of the rear of the boot moveable against the rear of the boot holding it firmly,
- a pedal plate connected to said moveable rear gripping plate, the latter being urged forwardly against the rear of the boot as the pressure is applied to said pedal plate,
- a first pair of articulated levers hingedly attached at opposite sides of said frame to said pedal plate,
- a second pair of articulated levers hingedly attached to said first pair of articulated levers, said second pair of levers forming said moveable rear gripping plate,
- and said pedal plate being attached to and connected between the lower end of said first pair of articularted levers.

4,635,834

APPARATUS FOR PATTERN CROCHETING

Kathy A. Lindquist, 2095 Avocado Ter., Hacienda Heights, Calif. 91745

Continuation-in-part of Ser. No. 638,853, Aug. 8, 1984, abandoned. This application Dec. 19, 1985, Ser. No. 811,163
Int. Cl.[4] D04B *3/06*; B65H *49/36*
U.S. Cl. 223—107 10 Claims



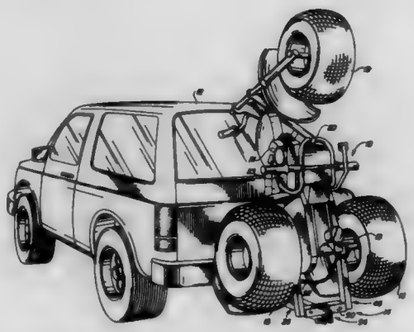
1. An accessory to facilitate crocheting in colored patterns comprising:
- a yarn tender for a plurality of differently colored supplies of yarn including control means for holding the leading end of each yarn supply loosely captive and untensioned; and
- one end of said control means for retaining the leading ends of said yarn strands from becoming entangled being pivotably mounted on said yarn tender and provided with a row of holes through which an individual yarn strand is threadable, said control means being manually invertible either backwardly or forwardly about an axis adjacent one end of said row of holes as each course of stitches is finished, and the crocheting workpiece being invertible in the same direction as said control means.

4,635,835

CARRIER APPARATUS FOR ALL TERRAIN VEHICLE

Daniel L. Cole, 5914 W. Kathleen Rd., Glendale, Ariz. 85306

Filed Dec. 26, 1985, Ser. No. 813,488
Int. Cl.[4] B60R *9/00*
U.S. Cl. 224—42.08 14 Claims



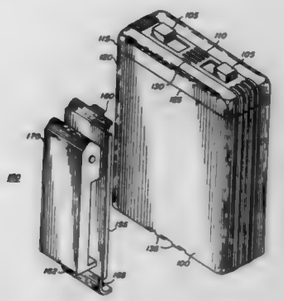
1. A carrier apparatus for carrying an all terrain vehcile on a transport vehicle, said all terrain vehicle having rear axles and a rearwardly extending back bar said transport vehicle being equipped with a trailer hitch receiver, said carrier apparatus comprising:
- (a) an elaongated tongue having a mounting end for attachment to the trailer hitch receiver of the transport vehicle, said tongue extending rearwardly from the transport vehicle when attached to the trailer hitch reciever thereof and having a distal end;
- (b) yolk means pivotably mounted on the distal end of said tongue for supportive attachment to the rear axles of the all terrain vehcile, said yolk means being pivotably movable between a loading position of extending from said tongue in a substantially horizontal plane for attachment to the rear axles of the all terrain vehicle to be loaded and a loaded position wherein said yolk means extends upwardly from said tongue and slopes angularly toward the mounting end thereof so as to support the rear axles of the all terrain vehicle above said tongue when the all terrain vehicle is moved with said yolk means to the loaded position above said tongue; and
- (c) seat means on said tongue intermediate the mounting and distal ends thereof for supportingly receiving the back bar of the all terrain vehicle when it is moved into the loaded position above said tongue.

4,635,836

TWIST-OFF DETACHABLE BELT CLIP ASSEMBLY

Charles W. Mooney, Lake Worth; Robert E. Phipps, Pompano Beach, and William J. Kuznicki, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 559,130, Dec. 7, 1983, abandoned. This application Dec. 17, 1985, Ser. No. 810,109
Int. Cl.[4] A45F *5/00*
U.S. Cl. 224—247 10 Claims



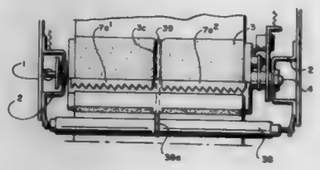
1. A detachable mounting clip assembly for use with a portable, hand-held device having a housing with clip receiving means on the top and bottom surfaces thereof, said clip assembly comprising:
- a base having first and second base members slidable with respect to one another along a longitudinal axis thereof, each of said base members including latch means which, when said base members are in a set position with respect to each other, mate with said top and bottom receiving means respectively to releasable latch said base to the housing;
- a mounting clip operatively affixed to said base member; and
- a rotatable bracket member, operatively connected to the base, said bracket further including means engaging one of said base members for moving apart said slidable base members along said longitudinal axis when said bracket member is rotated to a predetermined position; whereby, said latching means detaches from said receiving means when said bracket is rotated to said predetermined position.

4,635,837

MEANS FOR DISTRIBUTION AND SIMULTANEOUSLY CUTTING BANDS OF ROLLED MATERIAL WITH AT LEAST ONE ROLL OF MATERIAL IN USE

Maurice Granger, 17 rue Marcel Pagnol, 42270 Saint-Priest-en-Jarez, France

Filed Nov. 27, 1984, Ser. No. 675,286
Claims priority, application France, Dec. 6, 1983, 83 19815
Int. Cl.[4] A47K *10/36*; B26F *3/02*
U.S. Cl. 225—96 5 Claims



1. In an apparatus of known type for the simultaneous dispensing and cutting of rolled-up webs of materials, with at least one roll of material in use, of the type in which the roll of material in use, mounted for free rotation on a support, is depressed directly against a drum with anti-skidding surface, so that by mere manual pull on the web of material protruding out from a slot in the housing of the apparatus, a web the length of which is approximately equal to the diameter of the drum will be dispensed and cut automatically by means of a toothed cutting device associated with the drum and projecting out of the drum, so that, when the drum is driven rotatably by pulling the material, the cutting device penetrating the material which is thereby stretched on either side of said cutting device, and the actuated drum returned by associated means to its initial position on completion of the cutting step, and a fresh web of material then protruded out of said slot in the housing of the apparatus, said apparatus being characterized by the improvement;
- in that the apparatus has a toothed cutting blade made of two portions (7*a*1 and 7*a*2) and housed within the drum (3) and each portion slidable transversely to the length of the said web in a common support (7) mounted pivotally (8) in the drum (3) for driving the material (B7) and cooperating with camming means (4c) for the periodic projection of the cutting blade out of the drum for cutting the material, means for providing a spacing between adjacent ends of the two portions of said cutting blade, on the one hand, for the passage therethrough of a belt (39) for transmission of the rotational motion between the drum and a safety roller (38) positioned at the level of said slot for the passage of the dispensed web or webs of material, and to minimize, on the other hand, the width of the uncut portion of the cut-off line of the web which occurs because of the absence of a tooth at the location of said space.

4,635,838

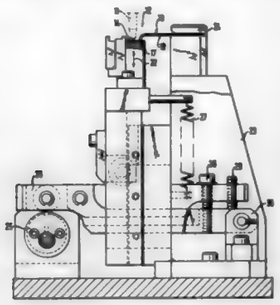
BONDER FOR LEAD FRAMES

Peter Urban, Gärtnerstr. 44, 8208 Kolbermoor, Fed. Rep. of Germany

Continuation of Ser. No. 578,782, Feb. 9, 1984, abandoned. This application Jan. 13, 1986, Ser. No. 818,400
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1984, 8401090[U]
Int. Cl.[4] B23K *37/04*
U.S. Cl. 228—5.5 8 Claims

1. A bonder for lead frames, each including at least two contact surfaces to be bonded, said bonder comprising:
- an ultrasonic bonding head;
- an optical finder for searching the contact surface to be bonded;
- a conveyor for the lead frames; and

a holding means for the lead frames to be bonded, said holding means comprising a clamping bar coordinated with said bonding head and a rubber-like flexible-yielding resilient layer having a thickness of between 0.3 to 1.5 mm as support for the lead frames to be bonded, said layer being coordinated with the said clamping bar and the length of



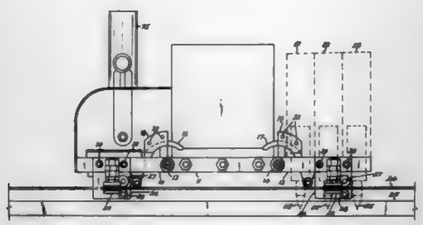
said resilient layer corresponding approximately to the maximum length of the lead frames to be bonded, so that the clamping bar is not to be opened until all contact surfaces of one lead frame have been bonded and so that the optimum location on the contact surface to be bonded next can be determined optically by the optical finder while the preceding contact surface is being bonded.

4,635,839

WELDING CARRIAGE

Clyde M. Slavens, Houston, Tex., assignor to CRC-Evans Pipeline International, Inc., Houston, Tex.

Filed Feb. 17, 1984, Ser. No. 581,504
Int. Cl.[4] B23K *5/08*
U.S. Cl. 228—29 4 Claims



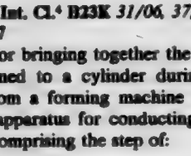
1. Welding carriage, comprising three base plates hinged together end-to-end to be articulated for bending against a convexly curved object, means for fixing said hinged together base plates against movements from a preselected angularity, each end one of such base plates having a set of support wheels at each of its opposite sides for supporting said carriage on a strip track of uniform width which is fixed in a loop uniformly spaced about an object, said track having an inner side facing said object and an outer side facing away from said object, each said set of support wheels including a wheel engaged with the outer side of said track and a wheel engaged with the inner side of said track and a wheel engaged with an edge of said track, said sets of support wheels at one side of said carriage and track being pivotally movable away from the side of said carriage whereby said carriage may be readily installed on and removed from said track, spring means for moving said pivotally movable sets of wheels inwardly and outwardly and for fixing them in their inward and outward positions, one end one of said base plates supporting drive wheel means which extend through an opening through said base plate to engage said track, spring means biasing said drive wheel means toward said track, and crank means for raising said drive wheel means away from said track against said bias of said spring means, said end base plates having auxiliary wheel means adjacent said sets of support wheels at said one side of said carriage to support said end base plates on said track while said sets of support wheels at said one side of said carriage are pivotally moved outwardly.

4,635,840

FORMING METHOD USING AN ELECTROMAGNETICALLY EXPLODED FILAMENT

Matija Cosanovic, 2567 Aanelyn Court, Mississauga, Ontario, Canada (L5C 2Z7)

Continuation-in-part of Ser. No. 422,662, Sep. 24, 1982, abandoned, which is a continuation of Ser. No. 166,064, Jul. 7, 1980, abandoned. This application Jan. 25, 1984, Ser. No. 573,661
Int. Cl.[4] B23K *20/08*
U.S. Cl. 228—107 15 Claims



1. The method of expanding a metal pipe by a controlled amount at an exteriorly inaccessible, predetermined location therealong, which comprises positioning a conductive filament concentrically within the pipe at said predetermined location, the filament being immersed in an energy transfer medium filling the space between the filament and the pipe, and rapidly discharging a predetermined electrical charge through the filament to explode the filament, the explosion of the filament creating a shock wave of predetermined energy that is transmitted through the medium to impinge on said pipe thereby to expand the pipe plastically, the predetermined energy of said shock wave created by the exploding filament being controlled so as to limit the amount of expansion of the pipe without the need for exterior constraints, wherein the dimensions of the filament are small in relation to the diameter of the pipe such that the shock wave has a substantially spherical wave front, the filament occupying a volume whose maximum dimension is not more than about one-eighth the internal diameter of the pipe.

4,635,841

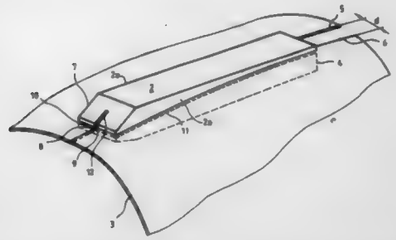
METHOD FOR BRINGING TOGETHER THE EDGES OF A BLANK OF SHEET METAL ROLLED TO A CYLINDER AS WELL AS A GUIDE APPARATUS FOR PERFORMING THE METHOD

Siegfried Frei, Galles, Switzerland, assignor to Cantec, Inc., Fort Worth, Tex.

Filed Dec. 7, 1984, Ser. No. 679,637
Claims priority, application Switzerland, Dec. 21, 1983, 6816/83
Int. Cl.[4] B23K *31/06, 37/04*
U.S. Cl. 228—147 23 Claims

1. A method for bringing together the edges of a blank of sheet metal formed to a cylinder during transport of the formed blank from a forming machine to a joining station having a guide apparatus for conducting the blank into the joining station, comprising the step of:

arcuately curving edges of said blank longitudinally of said blank and toward a longitudinal axis of said cylinder



before said edges enter into mutual contact and before said edges subsequently arrive in said joining station.

4,635,842

PROCESS FOR MANUFACTURING CLAD ALUMINUM-LITHIUM ALLOYS

William R. Mohondro, Dublin, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Jan. 24, 1985, Ser. No. 694,359
Int. Cl.[4] B23K *20/00*
U.S. Cl. 228—175 12 Claims

1. A method for effecting a substantially uniform adhesion of substantially all of the contacting surfaces of a lithium-containing core alloy with a metallic liner material, comprising the steps of:

(a) preparing opposed surfaces of said core alloy and said liner material by removing therefrom substantially all oxide materials;

(b) contacting said prepared surfaces to form a composite and tacking together the leading edges of each of said prepared surfaces;

(c) roll bonding said composite from said leading edges to obtain substantially uniform adhesion along said contacting surfaces while causing at most a 2% reduction of said core alloy, at a temperature of up to about 450° F.; and

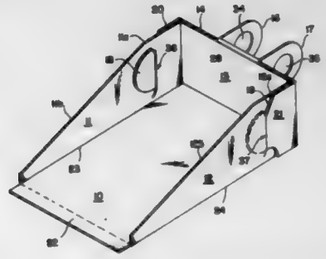
(d) heating said roll bonded composite to form a metallurgical bond between said core alloy and said liner material along substantially all of said contacting surfaces.

4,635,843

DISPOSABLE UTENSIL

Barnard E. Tomlinson, 913 Emma, Walla Walla, Wash. 99362

Filed Nov. 8, 1985, Ser. No. 796,612
Int. Cl.[4] B65D *5/46*
U.S. Cl. 229—52 B 14 Claims



1. A cardboard blank for making a utensil, comprising:

a base panel having a pair of side edges and a rear edge defined by fold lines;

a pair of side panels and a rectangular back panel joined to said side edges and rear edge of the base panel, said back panel having a back edge and a pair of side edges defined by fold lines;

a rectangular handle carrying panel connected to the back panel at the back edge of the back panel and having a back edge and a pair of side edges defined by fold lines;

a rectangular reinforcing panel matching the back panel and connected to the handle carrying panel at the back edge of the latter, said reinforcing panel having side edges defined by fold lines;

a first pair of locking tabs connected to the back panel at the side edges thereof;

a second pair of locking tabs matching said first pair and connected to the reinforcing panel at the side edges thereof;

a pair of handles connected to the handle carrying panel at the side edges thereof, said handles being located between and separated from the back panel and the reinforcing panel; and

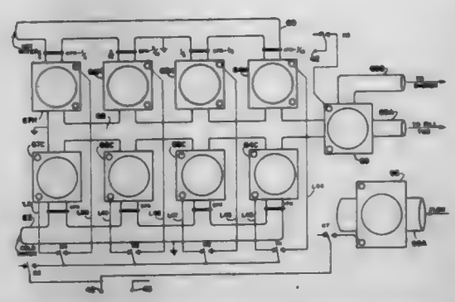
a pair of slots in the side panels for receiving said pairs of locking tabs.

4,635,844

ELECTRONIC CONTROL DEVICE FOR LIQUIDS

John P. Barrett, Sr., 879 Harbor Island, Clearwater, Fla. 33515, and Daniel R. Schulz, Crystal Beach, Fla., assignors to John P. Barrett, Sr., Clearwater, Fla.

Division of Ser. No. 428,921, Sep. 30, 1983, Pat. No. 4,409,694. This application Jul. 5, 1983, Ser. No. 510,730
Int. Cl.[4] G05D *23/185*
U.S. Cl. 236—12.12 4 Claims



1. A device for controlling the temperature of a liquid in a discharge conduit from a hot liquid source and a cold liquid conduit source, comprising in combination:

a first plurality of valves interconnecting the hot liquid conduit to the discharge conduit;

a second plurality of valves interconnecting the cold liquid conduit to the discharge conduit;

first flow restriction means in said first plurality of valves for enabling selective flow rates of hot liquid from the hot liquid conduit to the discharge conduit;

said first flow restriction means comprises a plurality of first ports respectively disposed in liquid flow relation to said first plurality of valves;

said plurality of first ports including a port having a major port area and including a port having an intermediate port area and including a port having a minor port area;

second flow restriction means in said second plurality of valves for enabling selective flow rates of cold liquid from the cold liquid conduit to the discharge conduit;

said second flow restriction means comprises a plurality of second ports respectively disposed in liquid flow relation to said second plurality of valves;

said plurality of second ports including a port having a major port area and including a port having an intermediate port area and including a port having a minor port area;

said intermediate port area and said minor port area having

a combined area being substantially equal to said major port area; and

means for selectively energizing at least one of said plurality of valves for providing the proper temperature of the liquid emanating from the discharge conduit upon mixing the hot and cold liquids flowing through said selectively energized valves and for providing a constant liquid flow rate through the discharge conduit.

4,635,845

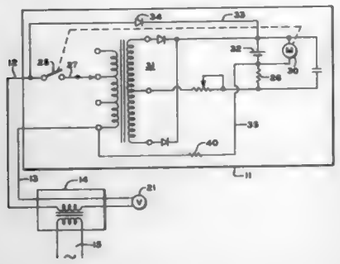
TIME CONTROLLED THERMOSTAT

Arlon D. Kompelien, Richfield, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 944,098, Sep. 20, 1978, abandoned, which is a division of Ser. No. 639,523, Dec. 10, 1975, abandoned. This application Jan. 2, 1980, Ser. No. 108,997

Int. Cl.⁴ F23N *5/20*; H02J *7/00*

U.S. Cl. 236—46 R **3 Claims**



1. In a timer controlled space thermostat for switching a circuit connecting remote space conditioning apparatus with a remote A.C. power source, thermostatic switching means in said circuit, electrically operated timer means for periodically changing the temperature set point of said thermostat, a rechargeable storage battery for operation of said timer means, means for charging said battery when said thermostatic switching means is closed comprising a transformer having a primary winding in said circuit and a secondary winding connected across said battery, and current rectifying means connected in series with said secondary and said battery, and means for charging said battery when said thermostatic switching means is open comprising circuit means connecting a resistor, a diode, and said battery in series across said thermostatic switching means.

4,635,846

INSULATIVE PROTECTIVE DEVICE FOR RAIL FASTENER

Peter L. Todd, Berkeley, Calif., assignor to San Francisco Bay Area Rapid Transit District, Oakland, Calif.

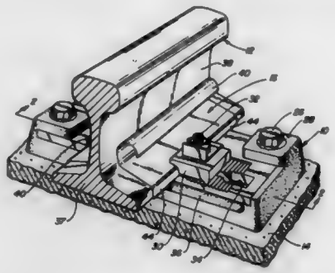
Filed May 20, 1985, Ser. No. 735,630

Int. Cl.⁴ E01B *9/38, 11/54*

U.S. Cl. 238—264 **6 Claims**

1. A rail-support insulating device for electrically insulating a track rail having a head, a web and a base flange from a rail fastener having clips for attaching said fastener to the rail and connected to a support structure, said device comprising:

an insulating membrane of electrically non-conductive sheet material passing beneath the base of the rail and extending beyond each edge of the rail-support fastener in the logitudinal direction of the rail, said membrane being wrapped around the base flange of the rail and beneath the rail clips of said fastener to insulate the rail from the clips and extending up along each side of the rail web in close contact therewith for a distance less than the full height of said rail web and to a point spaced below the rail head, the upper ends of said membrane extending outwardly from the rail web to form dual surface wing-like end portions on either side of the rail web free from contact with the rail head and any fastener structure, said wing-like end portions thereby providing high resistance surface barriers to potential paths of electrical current leakage from the rail to the rail fasteners or its support structure.



4,635,847

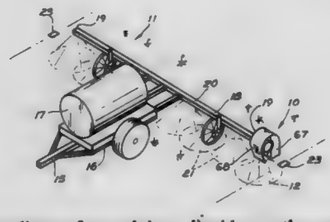
FIELD MARKER AND METHOD

Michael R. Jackson, HC02, Box 11-C, Weippe, Id. 83553

Filed Oct. 29, 1984, Ser. No. 666,174

Int. Cl.⁴ B05B *1/20*

U.S. Cl. 239—1 **19 Claims**



1. A liquid applicator for applying a liquid over the ground and for marking a swath of applied liquid by applying sections of paper tissue interconnected by perforated tear lines, taken from a tissue roll of sections, to the ground surface along an edge of the swath, said applicator comprising:

an elongated applicator boom extending to opposed ends;

means for applying liquid to the ground surface through the boom;

means for attaching the applicator boom to a vehicle for movement therewith;

a marker frame adjacent one end of the applicator boom;

roll mounting means on the frame for mounting a roll of paper tissue;

paper section separating means on the frame for selective actuation to tear successive sections of paper from a paper tissue roll comprised of a length of interconnected sections on the roll mounting means and for dropping the successive sections of paper to the ground.

4,635,848

IRRIGATION ADDITIVE DELIVERY SYSTEM

Charles F. Little, 1188 Lockhaven Way, San Jose, Calif. 95129

Filed Nov. 6, 1985, Ser. No. 795,651

Int. Cl.⁴ B05B *7/30*

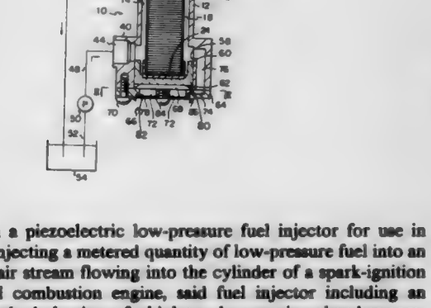
U.S. Cl. 239—10 **20 Claims**

1. A system for delivering controlled amounts of liquid additives to at least one irrigation unit which irrigation unit comprises a water supply, a shut-off valve, an anti-syphon valve seat, water flow means and a sprinkler head, and wherein the delivery system comprises:

(a) an additive bag of flexible construction;

(b) a rigid container, said additive bag received within the rigid container, and said bag and container separately sealed to prevent crossmixing of liquids contained therein, and to permit a differential in pressure to exist between them;

(c) an injection housing, substantially cylindrical, open and threaded at one end, and having a valve seat extension longitudinally disposed through a second end of the housing, said injection housing being connected to the irrigation unit anti-syphon valve seat;



(d) two liquid ports for communication through the curved surfaces of said injection housing;

(e) first fluid flow means for joining said rigid walled container to said first liquid port; and

(f) second fluid flow means for joining said additive bag to said second liquid port.

4,635,849

PIEZOELECTRIC LOW-PRESSURE FUEL INJECTOR

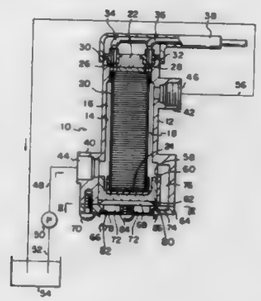
Toshihiko Igashira, Toyokawa; Yasuyuki Sakakibara, Nishio; Seiko Abe, Okazaki; Masahiro Takigawa, Nukata, and Akihiro Izawa, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 30, 1985, Ser. No. 729,144

Claims priority, application Japan, May 3, 1984, 59-89975; Jun. 5, 1984, 59-116259

Int. Cl.⁴ B05B *3/14, 1/30*; F16K *31/08, 15/00*

U.S. Cl. 239—102.2 **17 Claims**



1. In a piezoelectric low-pressure fuel injector for use in spray injecting a metered quantity of low-pressure fuel into an intake air stream flowing into the cylinder of a spark-ignition internal combustion engine, said fuel injector including an injector body having a fuel inlet and a pumping chamber communicated with said fuel inlet and open at an end, a pumping piston received movably in said pumping chamber, a piezoelectric drive housed in said injector body and operatively connected to said piston, and a normally closed output control valve positioned between the pumping chamber and the exterior of the injector body for closing the open end of the pumping chamber and operable to relase fuel therethrough under a predetermined fuel pressure, the improvements wherein said normally closed control valve comprises:

a valve plate secured to said injector body in a face-to-face relationship with and in close proximity with said piston, said valve plate having at least one outlet port extending therethrough in a direction parallel to the direction of movement of said piston in direct fluid communication with said pumping chamber, said valve plate having a valve seat at the exterior side thereof; and

a generally flat thin, resilient disk-shaped closure member held in contact with and cooperating with said valve seat;

said outlet port having an overall cross-sectional flow area sufficient to allow a pressure wave produced in the fuel in said pumping chamber by sudden movement of the piston to propagate therethrough substantially unobstructed to reach said closure member;

said closure member being substantially free from preload in its normally closed state and being sufficiently yieldable to flex away from the cooperating valve seat in response to an initial pressure wave arriving thereon, thereby causing the fuel to be injected into the intake air stream in an amount substantially equal to volumetric displacement of the piston.

4,635,850

SPRAY NOZZLE, PARTICULARLY ADAPTED FOR SPRAY GUNS

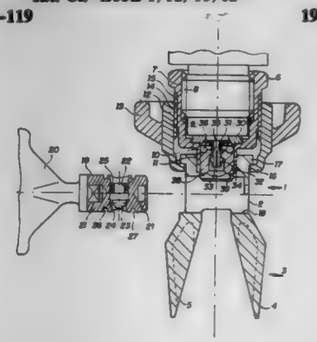
Marcel Leisi, Thonex, Switzerland, assignor to Exit S.A., Switzerland

Filed Apr. 29, 1985, Ser. No. 728,811

Claims priority, application Switzerland, Apr. 27, 1984, 2064/84

Int. Cl.⁴ B05B *1/12, 15/02*

U.S. Cl. 239—119 **19 Claims**



1. A spray nozzle particularly adapted for a spray gun, said nozzle comprising:

a central body, a rotary element placed within said central body; a channel traversing said rotary element, said channel having a spray orifice; a safety tip arranged in the front of said central body; a diffuser on said spray gun, said central body being connected to said diffuser;

a joint assuring tightness between the rotary element and said diffuser of said spray gun; and

a bore in said central body corresponding to the channel of the spray orifice of the rotary element, said joint traversing said bore, said joint having a plurality of ribs; said rotary element having at least one circular groove whose axis corresponds to the axis of rotation of said rotary element and within which a corresponding rib of said joint is introduced, the front part of said joint having a cross-section of a shape corresponding to that of the bore of the central body, so that the joint is guided, positioned and held by said bore.

4,635,851

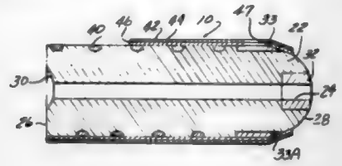
CASTING NOZZLE

Kenneth P. Zecman, Redford, Mich., assignor to Pegasus Industries, Inc., Redford, Mich.

Continuation-in-part of Ser. No. 533,409, Sep. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 483,869, Apr. 11, 1983, abandoned. This application Jul. 13, 1984, Ser. No. 630,731

Int. Cl.⁴ B05B 1/24

U.S. Cl. 239—133 **7 Claims**



1. A casting nozzle for transferring molten metals into a die comprising:

a substantially solid nozzle body formed of a structural metal such as steel, having an inlet out and an outlet end and a through-bore between said ends;

said body having an external surface of area substantially greater than the surface area of said through-bore;

a relatively shallow groove formed in said exterior surface in a pattern which extends both circumferentially and axially of said body, substantially full between said ends but occupying only a portion of said surface area, thereby to define ungrooved land areas over said external surface; and

a high heat conductivity metal such as copper filling said groove substantially flush with said surface to leave said land areas exposed;

said high heat conductivity metal serving as a passive heat transfer distribution path for heat applied locally to a portion of said nozzle body.

4,635,852

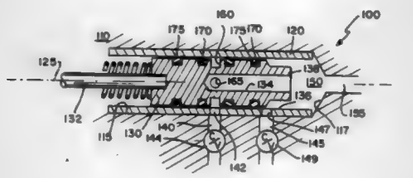
HYDRAULIC VALVE FOR SPRAY GUN

Donald L. Muhlnickel, Jr., Goshen, Ind., assignor to Graves Spray Supply Company, Goshen, Ind.

Filed Jul. 19, 1984, Ser. No. 632,292

Int. Cl.⁴ B05B 7/14

U.S. Cl. 239—414 **12 Claims**



1. A fiberglass spraying apparatus for internally mixing fluid components of fluid fiberglass comprising:

first housing means having a plurality of inlet ports for separately receiving said fluid components and at least one outlet port through which said fluid components exit after mixing;

first valve means, disposed within said housing means, for defining separate concentric fluid passageways for each of said fluid components and simultaneously opening or closing the fluid connection from said plurality of inlet ports into each of their respective concentric fluid passageways; and first mixing chamber means, connected between said concentric fluid passageways and said outlet port, and remote from said inlet ports, for receiving concentric fluid flows of said fluid components and mixing the same.

4,635,853

FUEL INJECTION NOZZLES

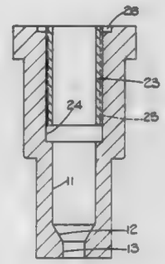
Dorian F. Mowbray, Burnham, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Continuation of Ser. No. 610,030, May 14, 1984, abandoned. This application Jan. 8, 1986, Ser. No. 816,963

Claims priority, application United Kingdom, Jul. 9, 1983, 8318635

Int. Cl.⁴ F02M 61/04

U.S. Cl. 239—533.3 **5 Claims**



1. A fuel injection nozzle for supplying fuel to an internal combustion engine comprising a nozzle body having a bore formed therein, an annular fuel receiving chamber on said body adjacent to one end of said bore for receiving fuel, a seating defined at another end of the bore and a resiliently loaded valve member slidable in the bore and shaped for cooperation with the seating, said valve member being urged into contact with the seating by the resilient loading and being lifted from the seating by the action of fuel under pressure to allow fuel flow from an inlet to an outlet, a sleeve mounted in an elongated recess in the body and fixed to the body in the recess, said bore being defined by said sleeve, the sleeve terminating short of the end of the recess to define between the end of the sleeve and the recess an enlargement, the outer wall of the sleeve and the wall of the recess defining only a single passage through which fuel can flow to said enlargement from said inlet and said passage in part being defined by a helical groove formed in the outer wall of the sleeve, said helical groove having an inlet end overlapping said annular fuel receiving chamber to be directly connected to said fuel receiving chamber and another end directly connected to said enlargement to transfer fuel directly from said fuel receiving chamber to said enlargement and being closed at all other locations for forming the sole fluid connection between said fuel receiving chamber and said enlargement, the fuel under pressure in the enlargement acting upon said valve member to lift the valve member away from the seating.

4,635,854

FUEL INJECTION VALVE FOR INTERNAL COMBUSTION ENGINES

Toru Ishibashi, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 2, 1985, Ser. No. 729,557

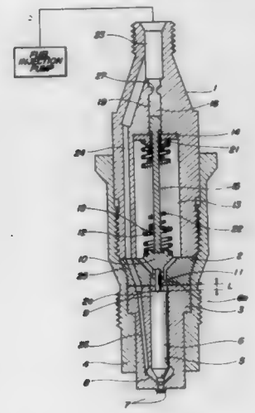
Claims priority, application Japan, May 10, 1984, 59-93243

Int. Cl.⁴ F02M 47/00

U.S. Cl. 239—533.8 **5 Claims**

1. A fuel injection valve for an internal combustion engine, comprising: a nozzle holder having a fuel inlet port formed therein and connected to an injection pipe extending from a fuel injection pump; a nozzle body supported by said nozzle holder and having at least one nozzle hole and a pressure

chamber formed therein at an end thereof remote from said nozzle holder, said pressure chamber being more remote from said injection pipe than said fuel inlet port; fuel passage means formed in said nozzle holder and said nozzle body and extending between said fuel inlet port and said pressure chamber; a nozzle needle mounted within said nozzle body and liftable and returnable to open and close said nozzle hole, respectively, in response to an increase and a decrease in the pressure of fuel supplied into said pressure chamber; nozzle spring means urging said nozzle needle in a direction of closing said nozzle hole; a central plunger disposed in said nozzle holder for displacement in unison with said nozzle needle through a whole lifting stroke thereof, said central plunger having one end remote from said nozzle needle, said one end having an end



face thereof disposed to receive pressure within said injection pipe through said fuel inlet port to thereby impart an urging force to said nozzle needle in said direction of closing said nozzle hole; said nozzle holder having an axial bore formed therein and communicating with said fuel inlet port, said axial bore slidably receiving therein said one end of said central plunger remote from said nozzle needle; and restriction means provided in said axial bore at a location between said fuel inlet port and said one end of said central plunger remote from said nozzle needle above a maximum lifted position of said central plunger, said restriction means at least restricting flowing within said axial bore therefrom into said fuel inlet port as said central plunger lifts in unison with said nozzle needle, whereby said nozzle needle gradually lifts.

4,635,855

METHOD AND APPARATUS FOR RAPIDLY CONTROLLING THE FLOW OF GAS

Birol Kuyel, Hopewell Township, Mercer County, and Paul F. Sinclair, III, Trenton, both of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Apr. 26, 1985, Ser. No. 727,713

Int. Cl.⁴ B05B 1/14

U.S. Cl. 239—551 **2 Claims**

1. Apparatus for rapidly controlling the flow of gas to produce a plurality of gas streams which form the outline of a shell comprising:

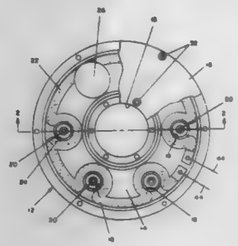
an annular base member having a plurality of spaced plenums therein, each plenum communicating with an orifice through the bottom of the base member;

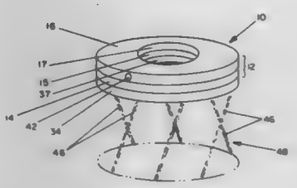
a plate in intimate contact with the bottom of said base member, said plate having an annular channel therein connecting the orifices in said base member to each of a plurality of inclined nozzles passing through said plate;

sealing means, including a conductive disc, disposed within each plenum in said base member for sealing the orifice;

a coverplate overlying the base member, said coverplate having a passageway therein for admitting gas into each of said plenums in said base member; and

means within each plenum in said base member for rapidly





lifting each of said discs simultaneously from their respective orifices to allow gas to pass into the nozzles and be discharged therefrom as inclined gas streams which form a shell.

4,635,856

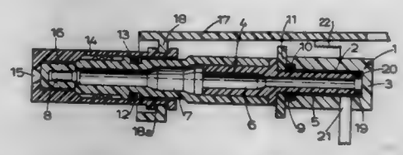
HAND-OPERATED SPRAYERS

William J. Reed, Birmingham, England, assignor to Associated Sprayers Limited, Birmingham, England

Filed Oct. 12, 1984, Ser. No. 660,142

Int. Cl.⁴ B05B 1/30, 1/14; F16K 39/00

U.S. Cl. 239—583 **9 Claims**



1. A hand-operated sprayer comprising a spray head for attachment to a container for liquid and having an inlet for liquid, a discharge nozzle, a bore, and a valve seating at a closed inlet end of said bore, and a manually-operable valve incorporated in said head for controlling the discharge of liquid from said inlet to said discharge nozzle, wherein said valve comprises a spool guided for longitudinal movement in said bore in said head, said spool having a longitudinally extending passage adapted to provide communication between said inlet and said discharge nozzle, and a head defined by the end of said spool remote from said nozzle for making sealing engagement against said valve seating to isolate said inlet from said passage in said spool, said sprayer also including a spring for urging said valve into a closed position in which said head is in sealing engagement with said valve seating, an annular seal of elastomeric material supported in a wall of said bore and surrounding said spool which is guided to slide through said seal, said annular seal providing a seal between said bore and said spool and being adapted to prevent external leakage of liquid from said bore, and a manually-operable member for

moving said valve into an open position against the force in said spring, wherein said inlet comprises a radial port leading to said bore, said port being located in an axial position between said seal and said valve seating, whereby when the valve is in the closed position thereof fluid pressure in the inlet does not urge the spool longitudinally.

4,635,857

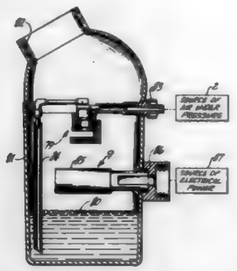
ATOMIZING APPARATUS

Nathaniel Hughes, Palm Springs, Calif., assignor to Vortran Corporation, Culver City, Calif.

Continuation-in-part of Ser. No. 213,843, Dec. 8, 1980, Pat. No. 4,453,542. This application Nov. 28, 1983, Ser. No. 555,703

Int. Cl.⁴ B05B *5/02*; A61M *11/02*

U.S. Cl. 239—690 **15 Claims**



1. Atomizing apparatus comprising:
vortex generating transducer means for at least partially atomizing a fluid and having a gas inlet and an outlet;
a perforated planar member spaced from the outlet of the transducer means;
a tube coupled between the outlet of the transducer means and the perforated member completely closing the space therebetween; and
a drag member spaced from the perforated member and elongated along a central axis parallel to a plane of the perforated member.

4,635,858

METHODS OF OPERATING BALL GRINDING MILLS

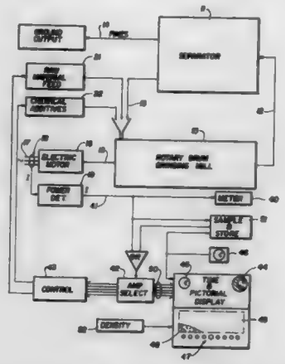
Phillip W. Welch, Houston, Tex., and Lawrence R. Roberts, Acton, Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Jan. 9, 1981, Ser. No. 223,833

Int. Cl.⁴ B02C *25/00*

U.S. Cl. 241—16 **14 Claims**

1. The method of operating and monitoring an electric motor operated rotary drum type mill comprising the steps of,
(a) establishing a desired high operating efficiency condition with a known load of materials operating at a known motor power,
(b) operating the electrical drive motor with a partial mill charge at said established operating condition on an intermediate portion of the motor power curve wherein the motor power decreases and increases with load,
(c) deriving from the electrical power delivered to the motor a motor power signal over a range including the power at positions on either side of said desired operating condition in an intermediate position on said range,
(d) providing control signals responsive to the magnitude of said power signal indicative of the need for corrective action when load conditions are below or above said desired condition, and
(e) providing indications of the mill condition from the power signal magnitude identifying the need for corrective action in the form of pictorial displays showing mill conditions as typical mill interior grinding patterns of media and load flowing through the mill selected to correspond to different magnitudes of the control signals, the displays signifying to operators the corrective action



required to restore the mill load conditions to the desired condition.

4,635,859

FOIL ARRANGEMENT FOR CENTRIFUGAL GRINDER

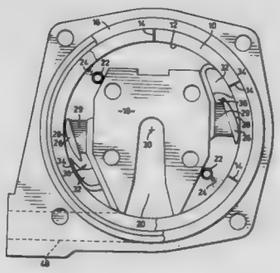
Allan J. Wildey, Brantford, Canada, assignor to AMCA International Limited, Brantford, Canada

Filed May 29, 1985, Ser. No. 739,438

Claims priority, application Canada, May 9, 1985, 481168

Int. Cl.⁴ B02C *19/12*

U.S. Cl. 241—21 **6 Claims**



1. In combination:
a grinding stone having an internal grinding surface in the shape of a surface of revolution,
a rotor within the grinding stone mounted for rotation about the axis of the surface of revolution, the rotor having an axial inlet for material to be ground and pocket means to allow the material to contact the said internal grinding surface,
spray means mounted on the rotor at a location trailing the said pocket means in the sense of rotation, the spray means adapted to spray liquid against the internal grinding surface to make a slurry with ground material,
an element mounted on the rotor at a location trailing the said spray means in the sense of rotation, the element having a rounded outer surface juxtaposed closely with respect to the said internal grinding surface,
a scoop means mounted on the rotor and trailing the said element in the sense of rotation, the scoop means having a leading edge juxtaposed against the said internal grinding surface and defining a pocket for collecting the scooped-up slurry, the scoop means being adapted to conduct the slurry toward the axial ends of the grinding stone,
means defining an outlet for the slurry,
and passage means from the pocket of the scoop means to the said outlet.

4,635,860

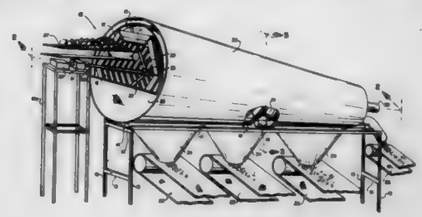
ROTATIVE GRIZZLY FOR OIL SAND SEPARATION

Jan Kruyer, 4643 82nd Avenue, Edmonton, Alberta, Canada (T6B 2L9)

Filed May 24, 1982, Ser. No. 381,425

Int. Cl.⁴ B07B *1/24, 1/58*; B02C *17/00*; C10G *1/00*

U.S. Cl. 241—23 **15 Claims**



1. A grizzly assembly for particle size reduction of agglomerated mineral materials consisting of a mined tar sands mixture composed of particulate solids and viscous liquid hydrocarbon bitumen with or without water comprising:
(a) A rotatable grizzly framework having an entrance at one end and an exit at the opposite end consisting of a series of equidistantly spaced axial baffles, each being interconnected to an adjacent baffle by a series of parallel bars which bars are secured at either end thereof to said adjacent baffles and which are spaced to create apertures between the bars, said baffles extending inwardly toward the framework axis a greater distance than do said parallel spaced bars,
(b) support means for rotatably holding said framework in a near horizontal position such that the framework axis slants downwardly from the entrance end to the exit end,
(c) drive means to rotate said framework in said suport means,
(d) receiving means below said grizzly framework to receive mineral particles falling through the framework apertures,
(e) cover means surrounding said grizzly framework, and
(f) means to introduce heat into the interior of the grizzly framework.

4,635,861

ROLLER MILL

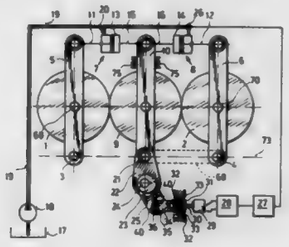
Heinz Resch, Flawil, Switzerland, assignor to Gebruder Buhler AG, Uzwil, Switzerland

Filed Feb. 7, 1985, Ser. No. 699,019

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1984, 3404932

Int. Cl.⁴ B02C *4/32*

U.S. Cl. 241—37 **26 Claims**



1. A roller mill, comprising:
at least first and second milling rollers;
first bearing means defining a first axis of rotation for said first milling roller;
second bearing means defining a second axis of rotation for said second milling roller;
means for supporting opposite ends of at least one of said first and second bearing means for movement so that the axes of rotation of said milling rollers are movable into and out of parallel with each other;
pressure imparting means to press said milling rollers together, said pressure imparting means comprising
fluidic actuating means including piston-cylinder means, a source of pressurized fluid, and
transfer means for said fluid from said source to said piston-cylinder means; and
displacing means for automatically displacing the ends of at least one of said bearing means in opposite directions simultaneously to skew said first and second axes of rotation out of parallel, said displacing means comprising
converter means for converting the pressure exerted by said pressure imparting means into a corresponding stroke of displacement; and
connecting means interconnecting said pressure imparting means and said displacing means to make the amount of skew dependent upon the pressure exerted by said pressure imparting means, said connecting means including pressure transfer means connected to said pressure imparting means to transfer a signal corresponding to the pressure exerted, said pressure transfer means being also connected to said converter means.

4,635,862

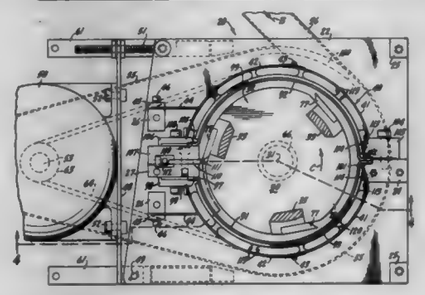
ROTARY COMMINUTOR

G. Allan West, North Kingstown, R.I.; William W. Barnes, Canton, Mass.; Thomas J. Dumaine, North Attleboro, Mass., and Herbert K. Andrews, Northbridge, Mass., assignors to Nelmor Co., Inc., North Uxbridge, Mass.

Filed May 17, 1984, Ser. No. 611,480

Int. Cl.⁴ B02C *23/10*

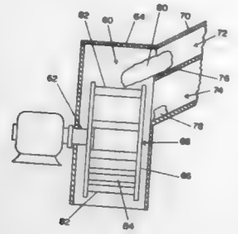
U.S. Cl. 241—51 **26 Claims**



1. A rotary granulator comprising:
a frame including an end frame member and a plurality of parallel spaced side frame members projecting from the end member;
a multi-perforate cylindrical screen mounted on the frame and defining a cylindrical cutting chamber having an axis normal to the end frame member;
a bed knife mounted on the frame and projecting into the cutting chamber;
a rotor, positioned within the cutting chamber, comprising a hub located adjacent the end frame member, a plurality of spaced rotor arms projecting from the hub parallel to the cutting chamber axis but adjacent the periphery of the cutting chamber, and at least one rotor knife mounted on a rotor arm in position to cooperate with the bed knife in cutting stock introduced into the cutting chamber;
a guide and support bearing for the rotor, comprising an annular fixed bearing member mounted on the frame and

an annular rotor bearing member mounted on the ends of the rotor arms opposite the hub, affording an inlet opening with unimpeded axial feed access into the cutting chamber across substantially the full cutting chamber diameter;
and drive means for rotating the rotor.

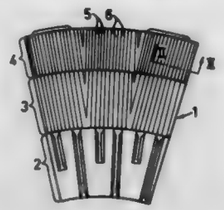
4,635,863
REVERSIBLE, AXIALLY FED, CAGE ROTOR IMPACT BREAKER
Franklin M. McCorkel, Leola, Pa., assignor to Aggregates Equipment, Inc., Leola, Pa.
Filed Jul. 9, 1984, Ser. No. 629,210
Int. Cl.⁴ B02C *13/02, 13/28*
U.S. Cl. 241—188 A **1 Claim**



1. An impact crusher for rocks comprising:
a base structure;
a housing with side walls, a top and end walls, resting upon the base structure;
a feed chute attached to the housing and opening into the interior of the housing so as to feed entering material to the outside of a rotor cage within the housing;
a shaft located within the housing with its axis parallel to the end walls;
a motor attached to and driving the shaft; and
a rotor cage attached to the shaft comprising end plates, at least one of which is attached to the shaft, and which hold a first group of rotor breaker bars with at least one rotor breaker bar radially outward from the shaft and parallel to it to form a cage structure rotated by the shaft;
wherein only a first end plate is attached to the shaft and a second end plate is constructed with a central opening, together forming a rotor cage with access to the interior, and wherein the feed chute is located to deliver material to the interior of the rotor cage through the central opening in the second end plate; and
further including more than one feed chute, wherein one chute delivers material to the interior of the rotor cage and a second chute delivers material external to the rotor cage.

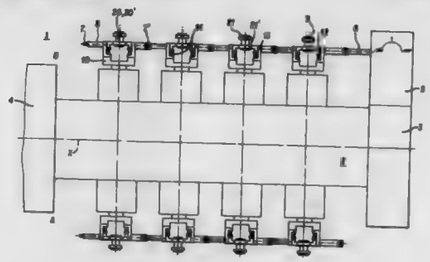
4,635,864
REFINER DISC SEGMENT
Per V. Peterson, Sundsvall; Hans E. Höglund, Matfors, and Alf O. K. Johansson, Sundsvall, all of Sweden, assignors to SCA Development Aktiebolag, Sweden
Continuation of Ser. No. 463,117, Feb. 2, 1983, abandoned. This application Sep. 24, 1985, Ser. No. 779,602
Claims priority, application Sweden, Feb. 3, 1982, 8200614
Int. Cl.⁴ B02C *7/12*
U.S. Cl. 241—251 **12 Claims**

1. An apparatus for refining fibrous material containing cellulose, said apparatus comprising a pair of refining members that are relatively rotatable about a common axis, each refining member having a refining surface that is opposed to the refining surface of the other refining member, each refining surface including an inner end that corresponds to said common axis, and an outer end, wherein said refining surfaces define a zone therebetween that extends radially outwardly relative to said common axis so that fibrous material passes through said zone; and further wherein at least one of said refining surfaces in a predetermined radial portion of said refining surfaces comprises a plurality of raised bars that extend radially outwardly with a plurality of grooves defined between said plurality of raised bars, each of said plurality of raised bars being of a predetermined width B, and each of said plurality of grooves



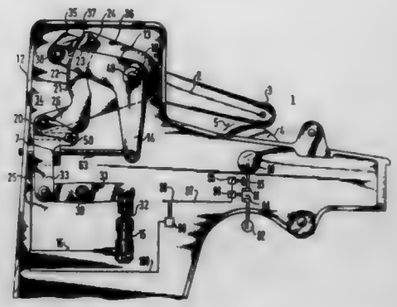
being of a predetermined width S and a predetermined depth D in said predetermined radial portion, such that B-S-D/S+D is greater than 2.7 mm^2 and less than 4.3 mm^2, wherein said predetermined width B is between about 1.0 mm and about 4.0 mm, said predetermined width S is between about 2.0 mm and about 5.0 mm, and said predetermined depth D is between about 1.0 mm and about 7.0 mm.

4,635,865
APPARATUS AND PROCESS FOR WINDING ELECTRICAL COILS
Ernst Arnold, Buchs, Switzerland, assignor to Meteor AG, Ruschlikon, Switzerland
PCT No. PCT/CH83/00133, § 371 Date Aug. 3, 1984, § 102(e) Date Aug. 3, 1984, PCT Pub. No. WO84/02225, PCT Pub. Date Jun. 7, 1984
PCT Filed Nov. 28, 1983, Ser. No. 641,947
Claims priority, application Switzerland, Dec. 3, 1982, 7034/82
Int. Cl.⁴ H01F *41/10*
U.S. Cl. 242—7.03 **2 Claims**



2. In an apparatus for twisting wire ends onto contact pins of electrical coil forms on a coiler machine, comprising a plurality of coil forms, each coil form having axially arranged inner and outer contact pins respectively located on opposite sides thereof, at least two coiler tools having coil holders located at 180° on a rotatable support, at least one wire guide for cooperating with said at least two coiler tools having coil holders;
(a) a swivel shaft connected to the coil holder on each coiler tool, said swivel shaft having one end in the shape of a fork, and the other end in the shape of a driving pin, the forked end and driving pin end having complementary configurations so as to be capable of driving engagement with each other,
(b) a rotating shaft having a driving pin fitting into the fork shaped end of the swivel shaft for driving engagement, and
(c) catches and a compression spring for biasing said catches into engagement with said coil holder for releasably retaining said coil holder in one of three positions.

4,635,866
APPARATUS FOR AUTOMATICALLY LIFTING A CROSS-WOUND BOBBIN FROM ITS DRIVE DRUM
Heinz Kamp, Wegberg, and Rolf Becker, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany
Filed Mar. 4, 1985, Ser. No. 707,699
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 3407766
Int. Cl.⁴ B65H *63/00*
U.S. Cl. 242—36 **8 Claims**

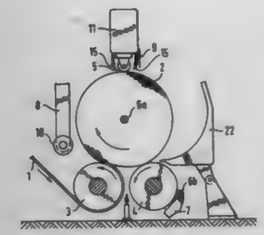


1. In a winding device for cross-wound bobbins, including a winding frame rotatably supporting a bobbin, a drive drum for rotating the bobbin, and a drive for rotating the drive drum, the improvement comprising an apparatus for automatically lifting the bobbin from the drive drum upon the stoppage of the drive, said lifting apparatus including a disconnection device being connected to the drive, means for switching said disconnection device into different switching states for controlling the drive drum, a device for lifting the winding frame being connected to said disconnection drive, means for controling said frame lifting device in dependence on the switching state of said disconnection device, and a coupling having a first coupling element connected to the winding frame, a second coupling element connected to said frame lifting device, and a control element, said frame lifting device including means connected to said control element for separating and joining said coupling elements with said control element.

4,635,867
WEB WINDING METHOD AND APPARATUS
Pauli Kytönen, Riihikallio, Finland, assignor to Oy Wartsila Ab, Helsinki, Finland
Continuation of Ser. No. 601,268, Apr. 17, 1984, abandoned. This application Jun. 28, 1985, Ser. No. 750,040
Claims priority, application Finland, May 3, 1983, 831507
Int. Cl.⁴ B65H *19/26, 18/20, 19/30*
U.S. Cl. 242—56 R **18 Claims**

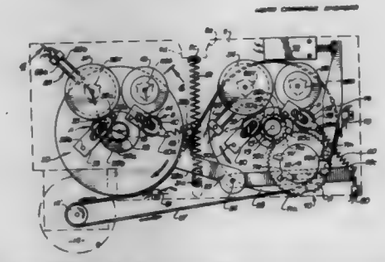
1. A method of winding a web onto a succession of take-up members, comprising:
(a) locating a first take-up member in a web winding position defined between first and second support drums with a leading end of the web gripped between the take-up member and a rider member;
(b) rotating the drums so as to rotate the take-up member and thereby cause the web to be wound onto the take-up member to form a roll thereon while the rider member remains in contact with the roll and, when the roll is finished, withdrawing the rider member from contact with the roll and transferring the roll away from the support drums to a receiving position;
(c) after steb (b), supplying a new take-up member to the web winding position, bringing the rider member into a position in which the web is gripped in a nip defined between the rider member and the new take-up member, and severing the web from the finished roll at a location between the nip and the finished roll, so as to define a new leading end of the web, the new leading end of the web being gripped in the nip between the rider member and the new take-up member, and
(d) repeating steps (b) and (c).

4. Apparatus for winding a web onto a roll take-up member, comprising first and second support drums defining a web winding position therebetween, a rider roll mounted to engage a roll being formed on the take-up member when positioned in the web winding position, a support member supporting the rider roll to permit movement thereof relative to the support



drums, means defining a receiving position for a finished roll, means for transferring the finished roll from the web winding position to the receiving position, and means for supplying a new roll take-up member to the web winding position when the finished roll has been transferred from the web winding position, the support member being movable to bring the rider roll into a position in which it defines a nip with the new roll take-up member in the web winding position and the web is gripped between the rider roll and new roll take-up member, and the apparatus also comprising a cutter member that is stationary relative to the support member and is effective when the finished roll is in the receiving position and the rider roll is in the position in which it defines a nip with the new roll take-up member to contact the web at a location between the nip and the finished roll and sever the web at that location.

4,635,868
END OF REWIND DETECTOR FOR A TELEPHONE ANSWERING DEVICE
Sava Jacobson, 8130 Orion Ave., Van Nuys, Calif. 91406
Division of Ser. No. 554,265, Nov. 22, 1983, Pat. No. 4,584,435. This application Jul. 8, 1985, Ser. No. 742,956
Int. Cl.⁴ G11B *15/22, 15/32*
U.S. Cl. 242—57 **1 Claim**



1. An end of rewind detector in a telphone answering device utilizing at least one tape cassette having a spindle, comprising:
a rotating member rotating with said spindle, said member having intermittent conductivity characteristics,

an electrical feeler mounted for physical contact with said rotating member, and

means for detecting variations in electrical conductivity in a path including said feeler and said rotating member during rotation thereof, termination of said conductivity variation indicating termination of rotation of said spindle, and wherein:

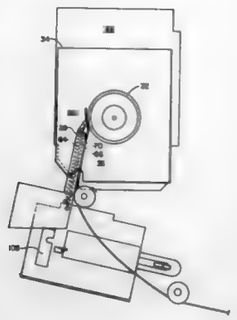
said rotating member comprises a conductive plastic material containing carbon particles.

4,635,869

APPARATUS AND METHOD FOR INITIATING A TAPE WINDING OPERATION

George M. Woodley, Shrewsbury, Mass., assignor to King Instrument Corporation, Westboro, Mass.

Filed Oct. 15, 1985, Ser. No. 787,780
Int. Cl.[4] B65H *75/28*; G03B *1/04*; G11B *15/32*
U.S. Cl. 242—67.1 R 15 Claims



1. An apparatus for initiating a tape winding operation upon a reel that forms part of a tape cartridge, said apparatus comprising:

a tape presentation means for holding the leading end of a tape having a reel-engaging surface, said tape presentation means comprising a tape supporting surface;

means for moving said tape presentation means from a first selected tape-holding position in which said tape supporting-surface is spaced from said reel and a second selected tape-presenting position in which said tape-supporting surface is adjacent said reel;

said tape presentation means having at least one first aperture and at least one second aperture in said tape-supporting surface, with said at least one first aperture being located close to one end of said tape-supporting surface and said at least one second aperture being spaced from said at least one first aperture;

first means for connecting said at least one first aperture to a source of vacuum when said tape presentation means is in said first position and to a source of pressurized air when said tape presentation means is in said second position, said at least one first aperture being located so that a stream of air exiting said at least one first aperture will urge the end of a tape engaged with said tape-supporting surface into contact with said reel; and

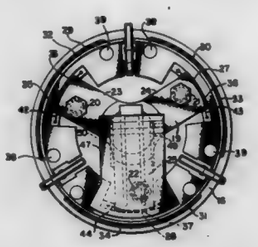
second means for (a) connecting said at least one second aperture to a source of vacuum when said presentation means is in said first position or said second position, and (b) disconnecting said at least one second aperture from said source of vacuum after the leading end of said tape has been urged into contact with said reel by a stream of pressurized air exiting said at least one first aperture.

4,635,870

REEL HUB FOR A MAGNETIC TAPE DRIVE

John C. Owens, Arvada, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Sep. 25, 1984, Ser. No. 654,327
Int. Cl.[4] B65H *18/10, 75/24*; G11B *15/32*
U.S. Cl. 242—68.3 9 Claims



1. In a magnetic tape drive of the type in which magnetic tape is driven between a file reel and a machine reel past a magnetic read/write head, an improved locking hub for a file reel having an annular opening with a circular peripheral surface in the center thereof, said locking hub comprising:

a circular hub frame rotatably mounted on said drive for rotating said file reel, said circular hub frame fitting within the annular opening of said file reel;

an actuator having camming surfaces which lock and unlock said hub as said actuator is moved axially with respect to said frame;

a plurality of arcuate locking members within said frame, said locking members having circumferential surfaces of a friction material, said circumferential surfaces matching the circumferential surface at the center of said file reel;

a cam surface at the center of each of said locking members, said cam surface at the center of each locking member mating with the camming surfaces on said actuator; and

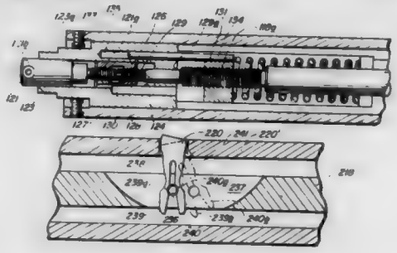
guides extending through said frame and through slots in said arcuate locking members to guide said locking members in a radial movement so that said friction material of the circumferential surfaces of said locking members engage the peripheral surface at the center of said locking hub substantially completely around the periphery thereof.

4,635,871

MANDREL LOCKING MECHANISM

Peter A. Johnson, and William A. Olesen, both of Green Bay, Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.

Filed Sep. 17, 1985, Ser. No. 776,904
Int. Cl.[4] B65H *16/02, 75/18*
U.S. Cl. 242—68.3 6 Claims



1. In a mandrel structure adapted for use in web rewinding operations, an elongated hollow mandrel provided with a plurality of openings in the circumferential wall thereof, means supporting and rotatably driving said mandrel adjacent one end thereof, said mandrel being adapted to receive a core thereon from the other end thereof, spaced apart support members mounted within said mandrel and having aligned bores therethrough lying on the longitudinal axis of the mandrel, a core locking rod, slidably and axially mounted within said bores and being equipped with a plurality of core-locking lugs aligned with said openings and being movable inwardly and outwardly therethrough upon axial movement of said rod relative to said mandrel, said rod adjacent said one end being equipped with adjustable spring stop means, a spring interposed between said stop means and one of said support members, first means accessible from said mandrel one end for adjusting the position of said stop means and thereby the spring pressure urging said rod toward said mandrel one end, and second means accessible from said mandrel one end for adjusting the location of said rod independent of said spring pressure adjustment means.

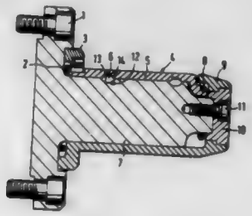
6. A locking lug for a mandrel mountable and replacable through the mandel openings comprising a relatively elongated unitary member having a first end adapted to protrude out of said mandrel and having a generally transverse surface adapted to engage the interior of a core, said member adjacent the other end thereof being bifurcated to provide a pair of spaced apart legs, said legs in confronting portions thereof being equipped with arcuate recesses for engagement with a mandrel rod pin.

4,635,872

DEVICE FOR TENSIONING CORE TUBES

Karl Thievessen, Grevenbroich, Fed. Rep. of Germany, assignor to Jagenberg AG, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 8, 1984, Ser. No. 638,818
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1983, 3329330
Int. Cl.[4] B65H *16/04*
U.S. Cl. 242—72 R 3 Claims



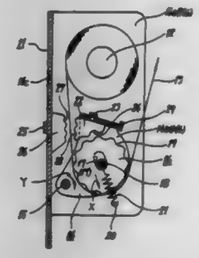
1. In an apparatus for tensioning core tubes, such as for webs of paper or similar materials, and comprising an arbor having circumferential grooves on the surface thereof, a cage disposed on the arbor, a plurality of tensioning segments in the shape of arcs of a hollow cylinder displaceable radially inside the cage and distributed around the arbor, and supports positioned between the arbor and the tensioning segments in the circumferential grooves on the surface of the arbor, wherein the cross section of the arbor is equilateral polygon-like with arcuate sides in the vicinity of the grooves, the improvement wherein each support has one side facing an inner surface of one tensioning segment, wherein the one side of the support is spherical, wherein each circumferential groove has a floor, wherein the inner surface of the tensioning segment has a hemispherical depression into which the spherical one side of the support is inserted, and wherein each support has another side that faces the arbor and has a contact surface that matches the cross-section of the floor of the groove.

4,635,873

SEAT BELT CLAMP

Juichiro Takada, 12-1, 3 Chome, Shinmachi, Setagayaku, Tokyo, Japan

Filed Dec. 16, 1985, Ser. No. 809,493
Claims priority, application Japan, Dec. 24, 1984, 59-194526[U]
Int. Cl.[4] B60R *22/42*
U.S. Cl. 242—107.2 1 Claim



1. A seat belt clamp adapted to be affixed to a portion of a vehicle body along the path of the belt between an emergency locking retractor and a vehicle occupant and including a U-shaped frame having a base portion and spaced-apart side portions, a fixed clamping jaw mounted on the frame base portion, a lever member having two arms, one mounted on each side portion to pivot about a pivot axis that is spaced apart from the fixed clamping jaw, a movable clamping jaw affixed to the lever member at a location such that it is engageable with the fixed clamping jaw upon pivoting of the lever member and having a corrugated cam surface, an operating roll having a corrugated surface and mounted for rotation and for movement relative to the lever member between a clamping position in which the roll surface engages the cam surface of the movable clamping jaw and urges the movable clamping jaw toward the fixed clamping jaw and a release position in which the operating roll can rotate without engaging the movable clamping jaw, and a spring urging the operating roll toward its release position, the belt clamp being adapted to receive the seat belt along a path such that it runs from the retractor, passes between the clamping jaws, turns part way around the operating roll and leads to the vehicle occupant, characterized in that each lever arm has an elongated mounting hole oriented generally orthogonally to the cam surface of the movable clamping jaw, in that the operating roll is mounted on the lever arms by means of shafts received in the mounting holes, and in that the spring is connected between the frame and the operating roll, whereby the spring not only urges the operating roll to the release position but also urges the lever and the movable clamping jaw to the release position away from the fixed clamping jaw and prevents vibrations and noise.

4,635,874

SEAT BELT RETRACTOR

James A. Swindlehurst, Fraser, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1985, Ser. No. 808,082
Int. Cl.[4] B60R *22/38*; B65H *75/48*
U.S. Cl. 242—107.4 B 1 Claim

1. A seat belt retractor comprising:

a frame having spaced apart side walls;

a reel rotatably mounted on the side walls and having toothed plates disposed adjacent the side walls and having a belt wound thereon to a diameter greater than the diameter of teeth of the toothed plates;

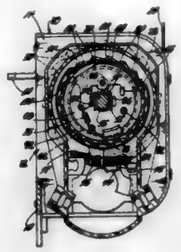
a lock bar extending between the side walls and having a normal rest position spaced away from the toothed plates and being movable to a locking position engaging one of

the teeth subsequent to the unwinding of sufficient belt from the reel to decrease the belt diameter to a diameter less than the diameter of the teeth;

a first clutch member mounted for rotary movement relative the reel and having a normal rest position, said first clutch member having means acting to move the lock bar into the engaged position upon said first clutch member rotation from the rest position in the belt unwinding direction of rotation;

a second clutch member having a plurality of circumferentially spaced inner teeth on the inner periphery thereof and an equal number of circumferentially spaced teeth on the outer periphery thereof;

pawl means carried by the reel and movable to selectively couple the reel with the second clutch member in response to a sensed rate of belt unwinding reel rotation so that the pawl rotates the second clutch member in the unwinding direction of rotation; and



said first clutch member being a split clutch ring encircling the outer periphery of the second clutch member and having spring fingers engaging the outer teeth thereof to friction drive couple the split clutch ring with the second clutch member, said split clutch ring further having an actuating arm extending into actuating proximity with the lock bar whereby the lock bar is moved into engagement with the reel teeth to lock the reel against any further belt unwinding belt reel rotation in the event of occurrence of the sensed rate of belt unwinding reel rotation subsequent to the unwinding of sufficient belt from the reel to decrease the belt diameter to a diameter less than the diameter of the teeth of the toothed plates and the split clutch ring slips on the rotating second clutch member in incremental steps defined by the spacing of the outer teeth of the second clutch member in the event that occurrence of the sensed rate of belt unwinding occurs prior to the unwinding of sufficient belt from the reel to expose the teeth of the toothed plates for engagement by the lock bar.

4,635,875

CABLE PULLING DEVICE

Merrill K. Apple, 863 Linden La., Davis, Calif. 95616

Filed Jan. 19, 1984, Ser. No. 572,009

Int. Cl.[4] B65H *59/18, 57/28;* B66D *1/08*

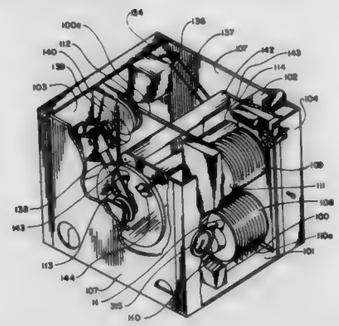
U.S. Cl. 242—155 BW **9 Claims**

1. A device for paying-out and taking-up cable comprising in combination:

a pair of bull wheels adapted to receive cable and pay cable out including a plurality of wraps of cable looped in a figure eight configuration over both bull wheels so as to gain mechanical advantage thereby,

storage means associated with said bull wheels, means for winding cable onto said storage means,

and means for synchronizing rotation rate between said bull wheels and said storage means so that cable wrapped on said storage means is put on or taken off in a uniform manner, wherein said means for winding cable on said storage means includes a sheave disposed adjacent said storage means, means for causing said sheave to move along said storage means in an oscillatory pattern so as to uniformly distribute cable along the length of said storage means, said sheave provided with means to synchronize the oscillatory pattern with said storage means' rotation rate, and a constraint to assure that only one wrap of cable at a time is placed on said storage means along its storage length except at end portions when said sheave changes direction in its oscillatory pattern where two wraps are placed thereon, said constraint including a chain welded to a support plate having a central guide bar, said chain disposed in an oval manner about said guide bar, a sprocket from said sheave



oriented to engage said chain on an inner path thereof whereby when said sprocket engages arcuate sections of said chain on an inner portion thereof only two wraps of cable will be placed on each end of said storage means and said support plate is resiliently carried and constrained by brackets so as to allow vertical motion thereof in response to said sprocket engaging arcuate sections of said chain, said oval chain including first and second horizontally extending linear portions and arcuate end walls.

4,635,876

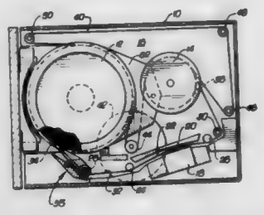
TAPE PICKER AND CLEANER

Randall E. Hoshyk, Costa Mesa; David J. Marley, Santa Ana, and Rodney E. Hoshyk, Fountain Valley, all of Calif., assignors to Rosstream Research Associates, Ltd., Cerritos, Calif.

Filed Apr. 4, 1985, Ser. No. 720,000

Int. Cl.[4] G11B *15/67*

U.S. Cl. 242—195 **11 Claims**



1. A tape picking device for use in a reel-to-reel tape drive, the device comprising:

a pivotally mounted picker body;

a tape guide mounted at the same axis of rotation as the picker body;

a tapered end portion extending from the picker body toward a supply tape pack, the picker body being lightly spring-biased to bias the tapered end portion into contact with the supply tape pack for tape threading;

a tape channel formed within the picker body to direct tape from the tape pack toward the tape guide; and

a tape cleaner bar positioned in the tape channel to engage the tape when under tension after threading, and to thereby lift the tapered end portion of the picker out of contact with the tape pack.

4,635,877

MAGNETIC TAPE CASSETTE

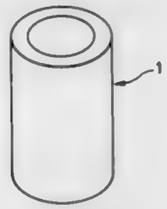
Kengo Oishi, and Masayoshi Moriwaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 1, 1985, Ser. No. 794,035

Claims priority, application Japan, Nov. 2, 1984, 59-230432

Int. Cl.[4] B65H *23/04;* G11B *15/60*

U.S. Cl. 242—197 **6 Claims**



1. In a magnetic tape cassette having magnetic tape guides which are brought into contact with a magnetic tape to guide said tape running, the improvement wherein: said magnetic tape guides are made of a synthetic resin which essentially contains polyoxymethylene having an electrical surface resistivity of 10^3 to 10^9 ohms.

4,635,878

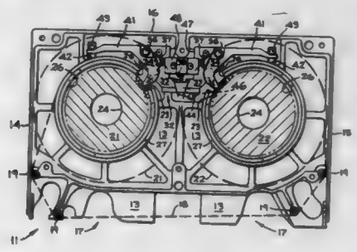
INDEXING MEANS FOR TAPE CASSETTE

Neal A. Didriksen, Portola Valley, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 483,315, Apr. 8, 1983, abandoned. This application May 20, 1985, Ser. No. 736,409

Int. Cl.[4] G03B *1/04;* G11B *15/32*

U.S. Cl. 242—198 **4 Claims**



1. A tape cassette reel-locking and tape tensioning mechanism, comprising:

means mounted in said cassette for securing a tangentially extending portion of said tape;

first reel-engaging means movably mounted in said cassette;

second means movably mounted in said cassette for moving said reel-engaging means in a first non-radial direction for engaging and rotating a reel disposed in the cassette with said extending tape portion tensioned between said reel and said securing means; and

third means movably provided in said cassette and movable with respect to said first reel-engaging means for cooperating with said second means for moving said reel-engaging means in a second radial direction of said reel and away therefrom, so as to have at least a component of movement orthogonal to said first non-radical direction, and so as to produce a compound motion of said first and second means such that said first means moves at the latest concurrently with said second means to release said reel for operation, without moving said reel in the unwinding direction, and without positively causing slack to appear in said tape segment.

4,635,879

TAPE CASSETTE

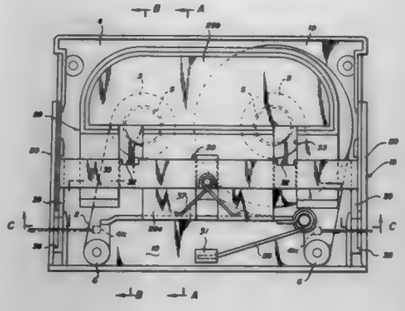
Takashi Sumida, Takatsuki; Sigeo Sasaki, Kyoto; Takao Ketori, Osaka, and Kazuhiro Fujita, Nagaokakyo, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Sep. 11, 1985, Ser. No. 774,888

Claims priority, application Japan, Sep. 12, 1984, 59-191102; Sep. 14, 1984, 59-193155

Int. Cl.[4] G11B *15/32, 23/04*

U.S. Cl. 242—198 **6 Claims**



1. A tape cartridge comprising a case body having a top wall with an opening therein, at least one hub accommodated in the case body for winding a tape, a plate member having a support plate member and a transparent window plate portion attached to said opening from inside of the case body defining a gap g between the support plate member and an inner face of said top wall, and a braking member 21 engageable with said at least one hub to stop rotation of said at least one hub when said tape cartridge is not in use, said braking member being slidably inserted in said gap g.

4,635,880

REMOTE CONTROL SYSTEM FOR A MISSILE

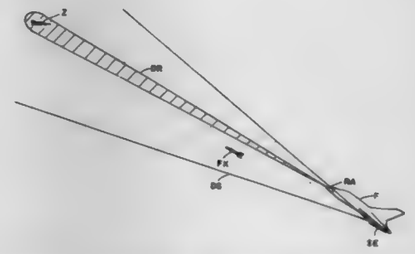
Franz Jehle, Ulm, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs GmbH, Frankfurt, Fed. Rep. of Germany

Filed Feb. 1, 1985, Ser. No. 697,504

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1984, 3403558

Int. Cl.[4] F41G *7/30*

U.S. Cl. 244—3.14 **4 Claims**



1. A remote control system of guiding a missile to a target

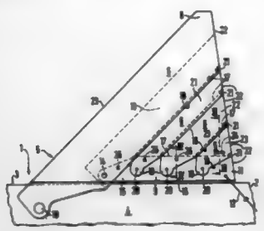
through radio-frequency communication from an aircraft which is equipped with a broadband jamming transmitter, radar with a radar antenna for locating targets, and a predictor for computing a necessary trajectory of the missile from target locating data of the radar characterized in that the broadband jamming transmitter comprises a directional antenna whose directive pattern points substantially in the flight direction on the aircraft and has a very large halfpower width as compared to the pattern of the radar antenna, and that after launching the missile, a control device tunes the jamming transmitter at regular time intervals and in a narrow band to the frequency of radio communication with the missile, while interrupting the transmission of jamming signals if necessary, and transmits to the missile trajectory control instructions.

4,635,881

FOLDABLE WING, ESPECIALLY FOR A PROJECTILE

Bernd Briesack, Heufenfeld, and Peter Kreuzer, Zirndorf-Weiherhof, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Fed. Rep. of Germany

Filed Aug. 9, 1985, Ser. No. 764,314
Int. Cl.⁴ B64C *3/56*
U.S. Cl. 244—49 **13 Claims**



1. A foldable wing, such as for a projectile, including telescopically interengageable fin sections for the erection of an extended wing surface; a nose spar hinged proximate one end by a pivot in a longitudinal groove in the projectile, said nose spar having a chamber opening away from the leading edge thereof located between the wing part surfaces for receiving the interengaged fin sections, said fin sections being profiled in a U-shaped cross-section and said fin sections being of different lengths which progressively shorten towards the trailing end of the projectile, said chamber receiving a root spar which is hinged proximate its front end in the chamber, and the front ends of the fin section straddling the root spar and being hinged along the root spar offset relative to each other.

4,635,882

METHOD AND APPARATUS FOR REDUCING LOW TO MID FREQUENCY INTERIOR NOISE

Gautam SenGupta, Renton, Wash., and Byron R. Spain, Mulvane, Kans., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 206,574, Nov. 14, 1980, abandoned, which is a continuation of Ser. No. 29,705, Apr. 11, 1979, abandoned. This application Apr. 18, 1985, Ser. No. 724,787
Int. Cl.⁴ B64C *1/00*
U.S. Cl. 244—119 **49 Claims**

1. A method of reducing the low to mid frequency interior noise of a reinforced skin structure formed of a skin supported by a plurality of elongate reinforcing components having spaced apart legs oriented such that said spaced apart legs project away from said skin and are free to vibrate, said method comprising the steps of:

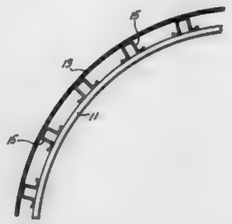
forming said reinforced skin structure such that areas of the skin bounded by said reinforcing components having a higher fundamental frequency than the bending and tuning fork frequency of said elongate reinforcing components with spaced apart legs; and

damping the bending, tuning fork and torsional vibration of said elongate reinforcing components by spanning said spaced apart legs with rigid elements viscoelastically attached to said spaced apart legs.

9. A reinforced skin structure comprising:

a plurality of elongate reinforcing components having spaced apart legs;

a skin mounted on said reinforcing components such that said spaced apart legs of said reinforcing components project away from said skin and are free to vibrate in a



tuning fork manner, said reinforcing components and said skin being formed such that the areas of said skin bounded by said reinforcing components have a higher fundamental frequency than the bending and tuning fork frequency of said reinforcing components;

a plurality of rigid elements positioned so as to span the spaced apart legs of said reinforcing components; and

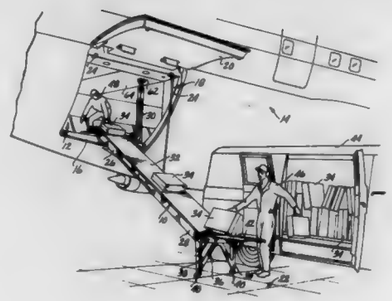
viscoelastic means for attaching the ends of said rigid elements to said spaced apart legs.

4,635,883

AIRCRAFT CARGO LOADER

Herbert E. Hamilton, Edmonds, and Thomas H. Shorey, Mill Creek, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 8, 1985, Ser. No. 763,634
Int. Cl.⁴ B64C *1/22*; B64D *9/00*
U.S. Cl. 244—137 R **18 Claims**



1. An aircraft cargo loader stowable in a folded condition along the inside surface of an aircraft cargo door and deployable through the cargo opening of an aircraft to extend between the aircraft cargo compartment and the surface of the ground, said aircraft cargo loader comprising:

an upper and lower loader section, said upper and lower loader sections each being substantially rectangular in geometry with a first end of said upper loader section being hinged to a first end of said lower loader section to permit said lower loader section to be swung between a folded condition in which said lower loader section is in superposition with said upper loader section and an extended condition in which said lower loader section extends in axial alignment with said upper loader section;

an L-shaped deployment track having a first leg adapted to be temporarily secured to the floor of said cargo compartment in front of said cargo opening when said cargo loader is to be deployed, said L-shaped deployment track having a second leg that is substantially vertical when said first leg is secured to said floor of said cargo compartment; and

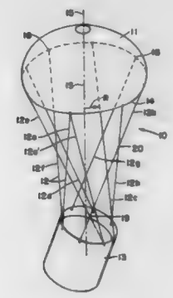
first cargo loader deployment means operatively connected between a second end of said upper loader section and said L-shaped deployment track for selectively positioning said cargo loader in a first position in which said lower loader section is in said folded condition and said second end of said upper loader section is in spaced-apart juxtaposition with said first leg of said L-shaped deployment track and a second position in which said second end of said upper loader section is in spaced-apart juxtaposition with said second leg of said L-shaped deployment track, said first cargo loader deployment means including means for permitting swinging movement of said cargo loader about said second end of said upper loader section to permit said cargo loader to be swung outwardly through said cargo door when said lower loader section is in said folded condition and said cargo loader is in said second position and to permit swinging movement of said cargo loader away from and toward said surface of said ground when said cargo loader is in said first position and said cargo loader is extended through said cargo opening.

4,635,884

ROTATING PARACHUTE

Hubert Nöhren, Hamburg, Fed. Rep. of Germany, assignor to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 673,045
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1983, 3341990
Int. Cl.⁴ B64D *17/24*
U.S. Cl. 244—142 **16 Claims**



1. A rotating parachute, which includes a canopy, a load-carrier for a load being suspended to be transported therewith, and shroud lines for connecting said load-carrier to said canopy comprising;

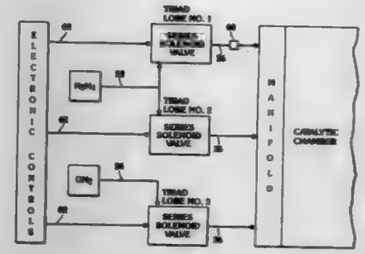
the improvement therewith including means for causing rotation of the parachute and transmitting rotation to cause the load to rotate also wherein said shroud lines are arranged to come in helically between the canopy and the load carrier as offset relative to the central longitudinal axis of said parachute, said shroud lines being arranged collectively subject to interconnection although via helical arrangement of lines bringing together all shroud lines for auto-rotation with the canopy, and furthermore the load being connected helically offset with said shroud lines such that rotation of the parachute is converted also into a rotation of the load.

4,635,885

SPACE MANEUVERING VEHICLE CONTROL THRUSTER

Edward J. Hujsak, La Jolla, Calif., assignor to General Dynamics Corporation/Convair Div., San Diego, Calif.

Filed May 25, 1984, Ser. No. 614,202
Int. Cl.⁴ B64G *1/26*
U.S. Cl. 244—169 **9 Claims**



1. In a maneuvering vehicle, control thrusters for maneuvering the vehicle in space, each of said control thrusters having a catalytic chamber and a thrust outlet and further including,

a valve housing with a plurality of pairs of series valves therein, and

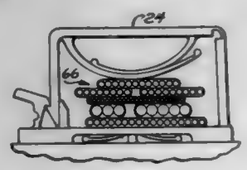
means for controlling said valves of said pairs wherein thrust material introduced into the catalytic chamber from the pairs of series valves is varied in type and amount, at least one of said types being an inert gas so that the control thruster will operate at different thrust levels.

4,635,886

FLAT WIRE CLIP

Donald Santucci, Wheaton, and Phillip W. Denemark, Bloomingdale, both of Ill., assignors to DEK, Inc., St. Charles, Ill.

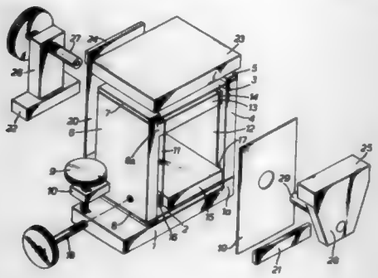
Filed Oct. 18, 1985, Ser. No. 789,079
Int. Cl.⁴ F16L *3/08*
U.S. Cl. 248—73 **4 Claims**



1. A clip for retaining flat wire or ribbon cables on a surface including a base; means for mounting the base to the surface; a strap integrally affixed to the base at a first end of the strap; latch means for attaching a second end of the strap to the base thereby closing the clip and creating a cable retention passage within the region bounded by the strap and base, the strap having a center section oriented in opposed relationship to the base when the clip is closed; means integrally affixed to the strap center section and extending toward the base for biasing wires or cables in the passage against the base, said biasing means including first flexible cantilever means integral to, and extending from, the strap center section substantially along the passage toward the base; second flexible cantilever means integral to, and extending from, the strap center section toward the base to a point proximate the first flexible cantilever means, the distal end of the second cantilever means adapted for sliding engagement along the first cantilever means upon latching of cables in the clip; the cable retention passage being defined as the region between the base and the biasing means whereby

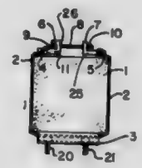
the cantilever means act and coact to urge flat wire or ribbon cables into abutting contact against the base when the clip is closed.

4,635,887
ADJUSTABLE MOUNTINGS
Kenneth F. Hall, and George Chambers, both of Martock, England, assignors to Martock Design Limited, Martock, England
Filed Jul. 5, 1984, Ser. No. 627,830
Int. Cl.⁴ G01B *5/00*
U.S. Cl. 248—179 **2 Claims**



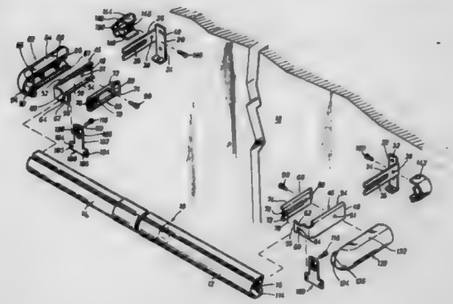
1. A micro-positioner comprising:
a first base,
a first bracket extending from and normal to said first base,
a first pair of spaced flat strip springs extending from said first bracket and extending approximately parallel to said first base,
a second base supported by said first pair of spaced flat strip springs for movement approximately normal to said first pair of spaced flat strip springs,
first adjustment means for moving said second base relative to said first base,
a second bracket extending from and normal to said second base, said second bracket being spaced from said first base and extending towards said first bracket,
an open-ended box-like structure defined by said first bracket, said second base and said first pair of spaced flat strip springs,
a second pair of spaced flat strip springs extending from said second bracket and extending approximately parallel to said second base,
a third base supported by said second pair of spaced flat strip springs within said open-ended box-like structure for movement approximately normal to said second base,
second adjustment means for moving said third base relative to said second base,
a third pair of spaced flat strip springs located outside of and covering the open ends of said open-ended box-like structure,
a platform located outside of said open-ended box-like structure and supported by said third pair of spaced flat strip springs for movement approximately parallel to said third base, and
a third adjustment means for adjusting the position of said platform, said third adjustment means being mounted on said third base and on said platform, and extending through apertures defined by said third pair of spaced flat strip springs and extending into said open-ended box-like structure.

4,635,888
FLEXIBLE BANDING AND INSTRUMENT SUPPORT SYSTEM
Gerald T. Aldridge, and Jerry L. Peters, both of Shelby County, Tenn., assignors to Alumo-Form, Inc., Memphis, Tenn.
Filed Apr. 18, 1984, Ser. No. 601,678
Int. Cl.⁴ A47B *96/06*
U.S. Cl. 248—231 **1 Claim**



1. A flexible banding and instrument support system for use in securing an instrument to a utility pole having a particular width, comprising, flexible banding means provided for substantially surrounding a pole and capable of conforming to its outer surface upon tightening of the system therearound, bracket means held by said flexible band to the pole, said bracket means capable of cooperating with fastening means providing a stable connection of an instrument to the pole, said flexible banding means having a pair of free ends, a pair of connectors cooperating with the band mean ends, and which when adjusted into a tightened position drawing the proximate band ends together for securement of the band, its held bracket means. and any instrument held thereby securely to the pole, said connectors comprising an extruded length of material and each having a base portion, and each having a series of slots therein, a pair of slots in each base portion of a connector and useful for accommodating the insertion of the flexible band end therein, and the other slot disposed for insertion of a bolt means therethrough and which when tightened providing for a contracted drawing of the band ends together for securement of the system to a pole, said bolt means inserting through a slot of each of the connectors and when tightened drawing the bands' ends together and tightening the held bracket means to the supporting pole, each band end as inserting through each pair of slots of a connector having its end also being turned back for disposition beneath their respective connector, and upon tightening of the bolt means the said band ends locate intermediate the connector and the contiguous pole for securely mounting of the bracket means to the said pole, one of said connectors comprising an angle, the other connector comprising a J-clamp, and each of said angle and J-clamp having the aligned slots arranged therethrough, said bolt means securing through the said slots, the J-clamp provided for securement of the bolt means head therein during bolt means tightening, said bracket means having a substantial length equivalent to the width of the pole to which it mounts, said bracket means including a base member disposed for being embraced by the flexible band when tightened upon a utility pole, said base member including a series of integral ribs formed upon the base member corresponding to the entire length of the said bracket mans, said ribs extending from the base member towards the supporting pole and provided for stabilizing the mounting of the bracket means upon the said pole, said bracket means having a pair of walls projecting integrally and outwardly from the base member oppositely from its extending ribs, said walls having inturned edges along their oppositely disposed edges, and forming a space therebetween, for accommodating and holding against turning the head of a fastener useful for securement of an instrument to the supporting pole.

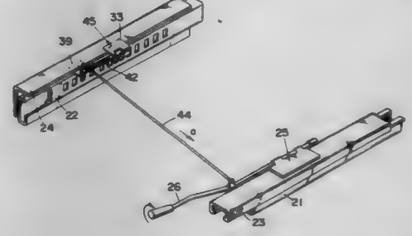
4,635,889
DRAPERY SUPPORT SYSTEM WITH DECORATIVE ROD END SUPPORT STRUCTURE
David E. Bell, Sturgis, and Dennis G. Babbs, Colon, both of Mich., assignors to Cooper Industries, Houston, Tex.
Filed Jun. 20, 1985, Ser. No. 747,159
Int. Cl.⁴ B61L *11/08*
U.S. Cl. 248—265 **15 Claims**



1. A support rod assembly for drapery panels and the like comprising:
an elongated rod member having a predetermined decorative cross-sectional shape;
opposed wall brackets adapted to be mounted on a vertical wall surface or the like in a spaced apart relationship, each of said wall brackets including a substantially horizontally projecting cantilever arm portion;
a bracket member adapted to be supported on each of said wall brackets respectively, said bracket member further including a channel shaped portion having a web and opposed flanges dimensioned to receive said horizontally projecting cantilever portion in a nested relationship and means for securing said bracket member to said elongated rod member;
an inner cover part cooperable with said bracket member for mounting said bracket member on said arm portion of said wall bracket;
an outer cover part having a cross-sectional shape corresponding substantially to the cross-sectional shape of said elongated rod member and having the appearance of a continuation of said elongated rod member extending toward said wall when assembled with said elongated rod member and said bracket member on said wall bracket;
fastener means for securing said bracket member, said inner cover part and said outer cover part in assembly with each other and supported on said wall brackets; and
means for securing said elongated rod member to said bracket member at each end of said elongated rod member for push-on assembly of said elongated rod member together with said bracket members onto and supported by said wall brackets.

4,635,890
LOCK MECHANISM FOR ADJUSTABLE SEAT
Koichi Matsuda, Ebina; Nobuaki Kondo, and Yuji Tanaka, both of Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd. and Ikeda Bussan Co., Ltd., both of, Japan
Filed Oct. 5, 1984, Ser. No. 657,817
Claims priority, application Japan, Oct. 11, 1983, 58-188513
Int. Cl.⁴ F16M *13/00*
U.S. Cl. 248—429 **9 Claims**

1. A seat support mechanism for supporting a seat so that the position of the seat is adjustable back and forth, comprising:
first and second parallel guide rails,
first slide means slidable on said first guide rail in forward and backward directions, and second slide means slidable on said second guide rail in the forward and backward directions, said first and second slide means being adapted to support the seat under the seat so that the seat is slidable along said first and second guide rails in the forward and backward directions,
first lock means which locks said first slide means so that said first slide means is not slidable relative to said first guide rail when said first lock means is in a lock position, and unlocks said first slide means so that said first slide means is slidable relative to said first guide rail when said first lock means is in an unlock position,
second lock means which locks said second slide means so that said slide means is not slidable relative to said second guide rail when said second lock means is in a lock position, and unlocks said second slide means so that said second slide means is slidable relative to said second guide rail when said second lock means is in an unlock position,
an operating bar extending from a rear end to a front end in the forward direction, said rear end of said operating bar

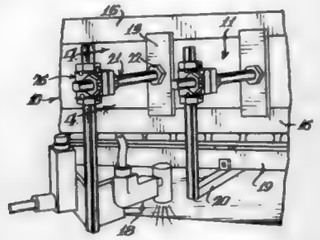


being connected with said first lock means so that said first lock means can be moved to the unlock position with said operating bar, and
motion transmitting means, connected between said operating bar and said second lock means, for transmitting motion from said operating bar to said second lock means so that said second lock means is moved to the unlock position together with said first lock means with said operating bar, said motion transmitting means comprising a wire extending along a line crossing said first and second guide rails, and having a first end connected with said operating bar at an intermediate position between said front and rear ends of said operating bar, and a second end, and link means extending along the longitudinal line of said second guide rail and having a front end connected with said second end of said wire, and a rear end located away from said front end of said link means in the backward direction and connected with said second lock means.

4,635,891
MULTIPLE AXIS LINEARLY ADJUSTABLE SUPPORT
David C. McDonough, 426 S. First St., Dundee, Ill. 60118
Filed Mar. 8, 1984, Ser. No. 587,658
The portion of the term of this patent subsequent to Mar. 11, 2003, has been disclaimed.
Int. Cl.⁴ E04G *3/00*
U.S. Cl. 248—542 **10 Claims**

1. A support for adjustably positioning an implement along at least one axis, comprising: a first threaded rod having a square cross-section with one end thereof adapted to be connected to a fixed supporting structure, a block member having a bore therethrough having a square cross-section slidably receiving and non-rotatable on the threaded rod, a first threaded lock nut threadedly received on the rod and engageable with one side of the block member to axially lock the block member in one direction, a second threaded lock nut threadedly received on the rod and engageable with the other side of the block member to axially lock the block member in the other direction, said block having a second bore therethrough generally transverse to the first bore also having a square cross-section, a second threaded square rod slidably

received in the second bore, third and fourth threaded lock nuts threadedly received on the second rod each engageable with opposite sides of the block member to lock the second rod axially with respect to the block member, at least one of the sides of the first rod having a flat uninterrupted surface extending longitudinally for a substantial length thereof, numerical



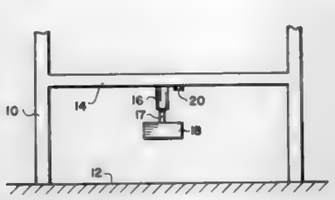
indicia on the flat uninterrupted surface, and edge means on one of the threaded nuts to provide an indicator with the numerical indicia for the position of the block member along the rod, said numerical indicia being calibrated to directly read at said one nut edge means the distance from the fixed supporting structure to the centerline of the second rod.

4,635,892

ACTIVE VIBRATION SUPPRESSOR

E. Bruce Baker, Altamonte Springs, Fla., assignor to Vibrastop, Inc., Altamonte Springs, Fla.

Filed Aug. 19, 1985, Ser. No. 766,796
Int. Cl.⁴ F16M *13/00*
U.S. Cl. 248—550 **21 Claims**



1. A system for suppressing vibrations in an elongate building structure and the like comprising:

a seismic mass;

actuator means attached to said structure and to said seismic mass for moving said mass in a direction at right angles to said elongate structure;

vibration sensor means attached to said structure for producing control signals representative of lateral movement thereof; and

control means connected to said actuator means and said sensor means, said control means responsive to said control signals to cause said actuator means to move said seismic mass in a direction to oppose such movement of said structure.

4,635,893

ADJUSTABLE SUPPORT FOR A COMPUTER SYSTEM

Stephen M. Nelson, 1830 Peace Portal, Blaine, Wash. 98230

Filed Jul. 15, 1985, Ser. No. 755,184
Int. Cl.⁴ A47B *21/00*
U.S. Cl. 248—558 **19 Claims**

1. Apparatus for supporting a computer system, including a video display, computer keyboard and copy materials, from an elevated surface, comprising:

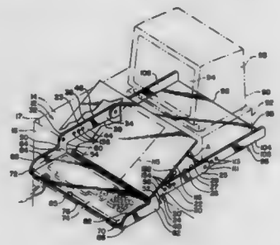
a. a base member, adapted to be supported on said elevated surface, and including first and second elongated upstanding side members, and having a flange portion which extends downwardly below said elevated surface when said base member is supported on said elevated surface;

b. a first planar member, for supporting said keyboard thereon, extending forwardly from said flange portion at a location below said elevated surface;

c. an adjustable member, including a planar portion for supporting said computer video display thereon, and first and second upstanding side members which are connected to said planar portion so that said first and second side members of said adjustable member are located generally adjacent to the respective first and second side members of said base member, said adjustable member being characterized in that said adjustable member

(i) is adapted to be supported on said elevated surface, and

(ii) is engaged to said base member and extends rearwardly therefrom for slidable movement on said elevated surface relative to said base member in a forward direction toward said base member and a rearward direction away from said base member;



d. means for securing said adjustable member to said base member to position said planar portion at selected distances from said first planar member, said securing means including

(i) first fastening means which releasably connect said first side member of said base member to said first side member of said adjustable member, and

(ii) second fastening means which releasably connect said second side member of said base member to said second side member of said adjustable member; and

e. an inclined member, operatively connected to said base member rearward of said first planar member, for supporting said copy material thereon.

4,635,894

MULTI-PURPOSE FURNITURE SWIVEL ASSEMBLY

Gregg J. Sammons, Edina, Minn., assignor to Fournier Accessory Furniture, Inc., Minneapolis, Minn.

Filed Jun. 17, 1985, Ser. No. 745,195
Int. Cl.⁴ F16M *13/00*
U.S. Cl. 248—558 **5 Claims**

1. A multi-purpose swivel assembly for supporting an appliance for swiveling movement with respect to a horizontal tabletop about a vertical appliance swivel axis, the swivel assembly including:

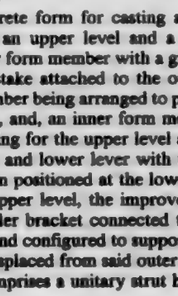
a. a platform positioned in supportive relationship under an appliance;

b. a bearing race base having a circular, annular bearing race track providing a pair of back-to-back bearing races each open to one of first and second sides of the race base, a central hub, and a spider fixedly positioning the race track in concentric relation to the hub about a vertical swivel assembly axis;

c. a bearing assembly including a plurality of bearings and a bearing retainer, the retainer including a plurality of bearing cages each encompassing a central portion of one of the bearings while leaving the top and bottom portions of the bearings exposed, the retainer further including a circular retaining ring integral with each of the cages and supporting the cages in evenly spaced relation to each other around the retainer ring;

d. the bearing assembly being of configuration such that the bearing retainer fits substantially within either of the back-to-back race tracks which is uppermost in a particular configuration with top portions of the bearings extending outwardly farther than the race base;

e. means including the hub to fix the position of the bearing race track with respect to the platform such that the





swivel assembly axis is in coincident relationship with respect to the appliance swivel axis;

f. wherein a deeper first bearing race is open to a first side of the race base and a shallower second bearing race is open to a second side of the race base; and

g. wherein the bearing race base carries support pad means extending outwardly from its second side far enough to support the race base in spaced relation to a horizontal surface when the second side is down but not as far as the tops of the bearings when the race base second side is up and the bearing assembly is positioned in the shallower second bearing race.

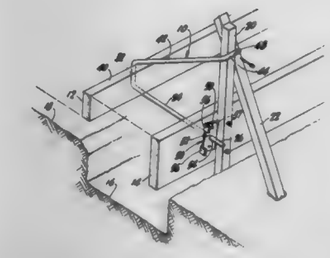
4,635,895

CONCRETE FORM SPREADER BRACKET

Edward C. Johnson, Jr.; Leroy M. Johnson, both of 4987 Vanden Rd., Vacaville, Calif. 95688, and Kevin Jewison, 1309 Phillip Way, Suisun City, Calif. 94585

Filed Apr. 5, 1985, Ser. No. 720,513
Int. Cl.⁴ E01C *19/50*; E04G *13/00*
U.S. Cl. 249—5 **10 Claims**

1. In a concrete form for casting a unitary concrete step structure with an upper level and a lower level, the form having an outer form member with a ground support comprising a vertical stake attached to the outer form member, the outer form member being arranged to provide a wall facing for the upper level, and, an inner form member arranged to provide a riser facing for the upper level and positioned between the upper level and lower lever with the inner form member having a bottom positioned at the lower lever and a top positioned at the upper level, the improvement comprising a removable spreader bracket connected to said supported outer form member and configured to support said inner form member spacially displaced from said outer form member; wherein the bracket comprises a unitary strut having a horizontal segment for supporting the inner form member at the bottom of the inner form member arranged to horizontally pass through the upper level of the step structure at the lower level, a vertical segment connected to the horizontal segment for limiting the spacing of the inner form member from the outer form member, and a diagonal segment connected to the vertical segment for bracing and stabilizing the vertical and horizontal segments, wherein the horizontal segment has an end connected to the supported outer form member and the diagonal segment has an end connected to the vertical stake above the outer form member, and the horizontal and diagonal segments being connected to the vertical segment at opposite ends thereof, whereby on setting of a poured concrete structure, the horizontal segment is detached from the outer form member and tapped through the upper level of the step structure for early removal of the inner form member.

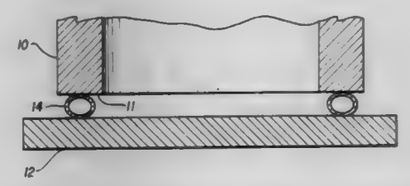


4,635,896

METHOD OF SEALING A JOINT BETWEEN AN INGOT MOLD AND A STOOL AND RESULTING ASSEMBLY

Edwin L. Baker, Box 487, 102 Baker Ave., Scottsville, Tex. 75688

Filed Apr. 4, 1986, Ser. No. 848,222
Int. Cl.⁴ B22D *7/06*
U.S. Cl. 249—135 **8 Claims**



1. In combination, a steel ingot mold having an open bottom with a rim, a stool below said rim for supporting said mold, wherein the improvement consists essentially in a deformable metal tubular sealing means positioned between said open bottom and said stool.

5. A method of sealing a joint between a steel ingot mold having an open bottom with a rim and a stool below said rim for supporting said mold, wherein the improvement consists essentially in applying a deformable metal tubular sealing means between said open bottom and said stool.

4,635,897

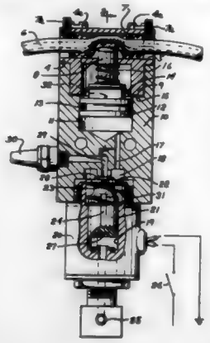
TUBE FLOW SHUT-OFF DEVICE

Ben J. Gallant, Portland, Tex., assignor to Airsonics License Partnership, Corpus Christi, Tex.

Continuation of Ser. No. 537,932, Sep. 30, 1983, abandoned. This application Mar. 29, 1985, Ser. No. 717,585
Int. Cl.⁴ F16L *55/14*
U.S. Cl. 251—5 **7 Claims**

1. A flow shut-off device for a tube formed of collapsible

flexible material, comprising a black having a transverse bore through which said flexible tube continuously extends with portions projecting beyond the ends of the bore, the bore being defined by a wall in the block and the block having an aperture extended through the bore wall at one side of said bore, a sleeve of resilient material surrounding the tube in said bore



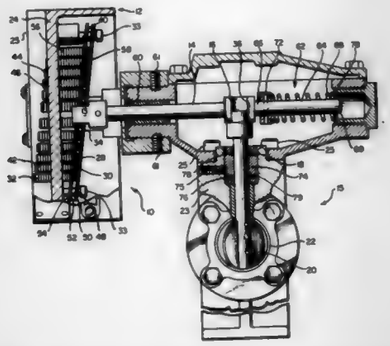
and extending across said aperture, said block, sleeve and tube being relatively shiftably moveable axially of the tube, and a reciprocable plunger mounted for shifting movement through said aperture transversely of the tube and of the surrounding sleeve and providing for closure of the tube by transversely compressing said sleeve and thereby transversely collapsing said tube within said sleeve.

4,635,898

POSITIVE PULLBACK SYNCHRO VALVE ACTUATOR

Jack Rollins; William Coppin, and Thaddeus Karabin, all of Muncie, Ind., assignors to Maxon Corporation, Muncie, Ind.

Filed Jan. 23, 1986, Ser. No. 821,825
Int. Cl.[4] F16K *31/524*
U.S. Cl. 251—229 **24 Claims**



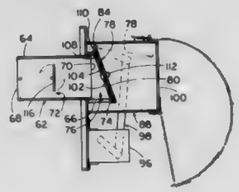
1. An improved positive pullback synchro valve actuator comprising:
- a universal cam assembly having a frame and supporting at least one deformable carrier cam strip means operatively contacted on a first side thereof by the respective ends of a plurality of contour adjustment screws diposed in spaced array therealong, and means for selectively adjusting the depth of said screws to adjust the shape of said deformable carrier cam strip means;
- plunger means disposed for reciprocal movement generally transversely of and operatively connected to said carrier cam strip means for positive, reciprocal, push and pull movement by means of said plunger means being driven by said cam strip means in either longitudinal direction;
- return spring means for urging said plunger means in a return longitudinal direction;
- rotational means including a shaft yoke attached to said plunger means and a rotational valve shaft that is rotationally driven by said shaft yoke, said rotational means attached to and rotationally driven in a first rotational direction by the positive, reciprocal, push and pull movement of said plunger means and said rotational means driven in an opposite rotational direction by said return spring means; and
- butterfly valve means attached to said valve shaft which is directly driven by said rotational means in said rotational directions to open and close said butterfly valve means.

4,635,899

AIR INLET VALVE SUBASSEMBLY WITH REPLACEABLE SEAL

Roger D. Eshleman, Waynesboro, Pa., assignor to Eshland Enterprises, Inc., Greencastle, Pa.

Filed Mar. 25, 1985, Ser. No. 715,847
Int. Cl.[4] F16K *1/18*
U.S. Cl. 251—298 **18 Claims**



1. In a particle fuel burning furnace having a particle fuel holding and combustion chamber and means forming at least one opening in said chamber for entry of air into said chamber for support of combustion of particle fuel therein, an air inlet valve subassembly comprising:
- (a) air inlet means connected to said chamber opening and having a rim forming a valve opening, said air inlet means defining a passageway for communicating air from an external source, through said valve opening, and into said chamber;
- (b) a substantially rigid valve flap mounted adjacent said valve opening formed by said rim of said air inlet means for movement toward and away from said rim between closed and open positions in which said valve opening is closed and opened to the communication of air from said external source, through said passageway, and into said chamber;
- (c) a generally planar, resiliently flexible disk having a periphery and opposite inner and outer sides and being removably mounted to said valve flap such that its outer side faces toward said flap and its opposite, inner side faces toward said valve opening formed by said rim;
- (d) an annular ring of gasket material affixed on said inner side of a portion of said disk located adjacent said periphery thereof and being capable of contacting said rim of said air inlet means for providing an air seal about said valve opening when said valve flap is at its closed position and thereby a substantially air tight seal of said air inlet means passageway, said resiliently flexible disk having a size at least as large as that of said rim defining said valve opening such that said portion of the disk being located adjacent its periphery which mounts said annular ring of gasket material aligns with said rim and disposes said annular ring of gasket material therebetween; and
- (e) means insertable between said valve flap and said portion of said planar disk at said outer side thereof and adjacent said periphery thereof so as to deflect said disk portion

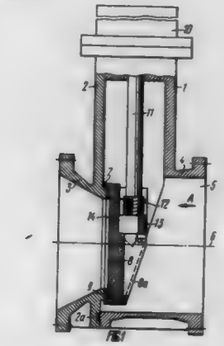
and periphery away from said valve flap and thereby match the contour of said gasket material on said portion of said disk at said inner side thereof with the contour of said rim.

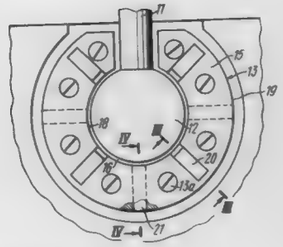
4,635,900

GATE VALVE

Boris F. Bragin, and Felix D. Markuntovich, both of Voroshilovgrad, U.S.S.R., assignors to Voroshilovgradsky Mashinostroitelny Institut, Voroshilovgrad, U.S.S.R.

Filed May 13, 1985, Ser. No. 733,624
Claims priority, application U.S.S.R., May 17, 1984, 3734951
Int. Cl.[4] F16K *3/00*
U.S. Cl. 251—326 **3 Claims**





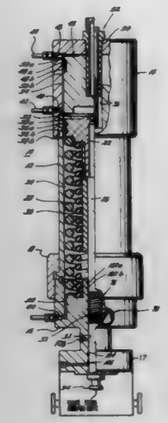
1. A gate valve comprising
- a housing;
- a passage in said housing defined by its walls for admitting a fluid medium carrying solid particles to and discharging from the housing;
- gate means for closing said passage;
- a shaft pivotably connected to said gate means; means for moving said shaft; articulating joint means;
- said gate means connected to said shaft for reciprocating motions through said articulating joint means;
- at least two elements forming said articulating joint means and arranged with a clearance therebetween; a first of said two elements rigidly connected to said shaft and arranged with a clearance relative to said gate means; a second of said two elements is rigidly connected to said gate means;
- a plurality of slots provided in at least one of said two elements for communicating the clearance between said two elements and the clearance between the first of said two elements and said gate with said passage on the side of the escape of the fluid medium from said housing for evacuating solid particles from these clearances.

4,635,901

POSITION INDICATOR FOR VALVES

Richard J. Pond, Nalleworth, England, assignor to Smith International, Inc., Newport Beach, Calif.

Filed Apr. 17, 1984, Ser. No. 601,306
Int. Cl.[4] F16K *31/00*
U.S. Cl. 251—355 **17 Claims**



1. An apparatus for indicating the position of a valve having a reciprocating member arranged for reciprocal motion to open and close the valve, said apparatus comprising:
- a support body including a generally cylindrical indicator bore extending through at least one side thereof along a line oriented generally perpendicular to the line of reciprocal motion of the reciprocating member;
- a shaft rotatably disposed within the indicator bore;
- means on said shaft forming a pinion;
- means connected to the reciprocating member forming a rack, said rack means engaging said pinion means and being disposed for generally linear motion simultaneous and coextensive with motion of the reciprocating member;
- means for sealingly isolating said rack means and said pinion means, said isolating means defining a sealed space isolated from fluids within and without said support body, said sealed space being charged with a fluid medium, surrounding said rack means and said pinion means, for protecting and lubricating said apparatus; and
- indicator means for providing an indication of valve position.

4,635,902

JACK SAFETY DEVICE

Peter Chou, 41, Lane 50, Sy Kang Kuoh, Chung Pu Hsiang, Chiayi Hsien, Taiwan

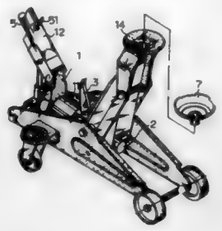
Filed May 13, 1985, Ser. No. 733,503
Int. Cl.[4] B60P *1/48*
U.S. Cl. 254—8 B **3 Claims**

1. A safety device on a jack which has a hydraulic cylinder and a hydraulic stem shaft extending into the hydraulic cylinder, the safety device comprising:
- coupling grooves provided in a row on a horizontal length of the hydraulic stem shaft extending into the hydraulic cylinder;
- a hollow set key lid mounted on a hole forming an entrance to the hydraulic stem shaft in the hydraulic cylinder;
- a spanner positioned on said hollow set key lid and having a bearing surface in camming contact with said hollow set key lid;
- a stop rotation key having one end for abutting in said cou-

pling grooves and another end for pivotal attachment to said spanner

a spring positioned with said hollow set key lid to oppose a withdrawal action of said stop rotation key from said coupling grooves;

said stop rotation key and said spanner connected eccentrically relative to said bearing surface camming contact to cause a lifting of said stop rotation key out of said grooves



upon movement of the opposite end of said spanner from the connection to said key in a direction towards the hydraulic cylinder and a movement of said key into said grooves under action of said spring upon release of said opposite end of said spanner in a direction away from the hydraulic cylinder; and

a propelling stem shaft demountably connected to said spanner and said key with a quick pin sliding in a groove connect and disconnect structure.

4,635,903

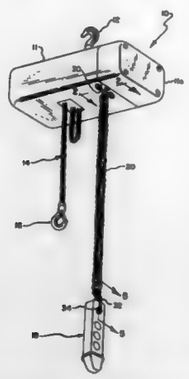
ELECTRIC HOIST PENDANT CONTROL SWITCH ARRANGEMENT

Robert H. Broyden, Bristol, Va.; R. Paul Beaton, North Tonawanda, and Allen E. Eldridge, Tonawanda, both of N.Y., assignors to Columbus McKinnon Corporation, Amherst, N.Y.

Filed Jul. 29, 1985, Ser. No. 760,268

Int. Cl.⁴ A44B *13/00*; B66D *1/12*; F16G *15/00*

U.S. Cl. 254—362 **4 Claims**



1. An electric hoist and pendant switch control system therefor wherein said hoist includes an electric motor housing and means for suspending same at an elevation;

an electric switch control panel;

a flexible strain relief device in the form of a link chain mechanically connected at an upper portion thereof to said motor housing and at a lower portion thereof to said panel for suspending said panel at an elevation below that of said motor housing;

said upper portion of said link chain being connected to said motor housing by a saddle bar passed through a link of said link chain adjacent said upper portion, a clamp plate fixed to said motor housing and screws for removably attaching opposite ends of said saddle bar to said clamp plate;

said lower portion of said link chain being connected to said panel by a hook attached to said panel and removably received within a link of said link chain adjacent said lower portion;

and an electric cord comprising a plurality of conductors electrically connected at each of their ends with terminals in said motor housing and in said panel, respectively;

said conductors being matrixed in an initially uncured but curable elastic material and then helically wound into hollow columnar form and then cured, whereby said cord is of a linear length greater than that of said link chain and at least a portion of said cord tends by way of elastic memory to retain a helically wound columnar form;

said link chain is disposed to extend through the hollow of the helically wound columnar portion of said cord, said link chain being unconnected to said cord throughout the lengths thereof;

whereby said pendant switch control system may be modified to suit different distances required between said motor housing and said control panel by changing the length of said link chain between said motor housing and said control panel while leaving the terminal connections of said conductors undisturbed.

4,635,904

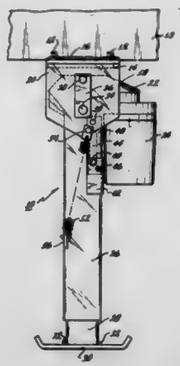
VEHICLE JACK

Reginald P. Whittingham, Orange, Calif., assignor to A & E Systems, Inc., Santa Ana, Calif.

Filed Sep. 17, 1984, Ser. No. 651,306

Int. Cl.⁴ B60S *9/02*

U.S. Cl. 254—425 **20 Claims**



1. A leveling jack for mounting on a vehicle having a frame to have a stowed position with the jack lying substantially horizontal to the frame and having an actuated position with the jack extending vertical to the frame, including,

a pair of telescoping tubular members telescoping between open and closed position,

a ball screw actuator including a ball member and a screw member supported within the tubular members and with one of the tubular members attached to the ball member for producing telecopic movement of one tubular member relative to the other tubular member in accordance with longitudinal movement of the ball member relative to the screw member,

a drive spindle coupled to the screw member for providing rotational movement of the screw member to produce longitudinal movement of the ball member,

a motor for rotation at a particular speed and associated gear train coupled to the drive spindle and with the gear train

providing a substantial reduction of speed of rotation of the drive spindle relative to the speed of rotation of the motor,

an outer housing for mounting on the frame of the vehicle and with the tubular members, ball screw actuator, drive spindle and motor and gear train forming a pivotable portion of the leveling jack pivotable around a first pivot point within the outer housing between the horzontal and vertical positions, and

an arm interconnecting the outer housing and the pivotable portion of the leveling jack and pivotally mounted to the outer housing at a second pivot point off center of the first pivot point and mounted in sliding engagement with the Pivotable portion by a pin and guide slot arrangement to slide relative to the pivotable portion when the tubular members are telescoped to the closed position to provide rotation of the arm around the second pivot point to in turn provide rotation of the pivotable portion of the leveling jack around the first pivot point to guide the pivotable portion of the leveling jack from the vertical position to the horizontal position.

4,635,905

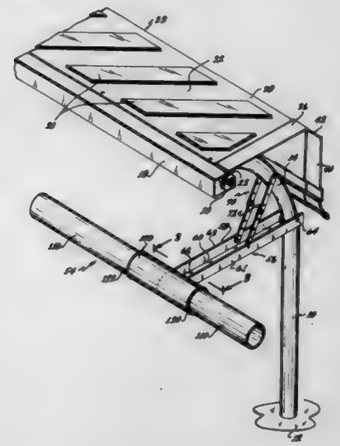
RACETRACK CONVERTIBLE GUARDRAIL

Richard Fontana, 8525 Bella Vista, Alta Loma, Calif. 91701

Filed Sep. 25, 1985, Ser. No. 780,010

Int. Cl.⁴ E04H *17/14*

U.S. Cl. 256—65 **22 Claims**



1. A improved racetrack rail comprising:

a post for placement within the ground:

a first rail for attachment to said post:

a second rail means adapted for connection to said post at a lower operative position from said first rail: and,

pivotal means attached to said post for moving said second rail to a position away from said lower operative position beneath said first rail.

4,635,906

SUSPENSION FOR VEHICLE

Shunichi Buma, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 2, 1985, Ser. No. 783,189

Claims priority, application Japan, Nov. 19, 1984, 59-242266

Int. Cl.⁴ B60G *13/00, 15/00*; F16F *9/00, 11/00*

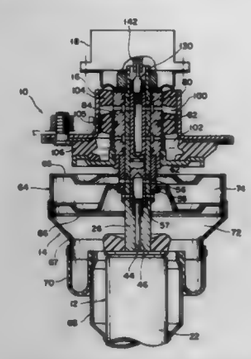
U.S. Cl. 267—8 R **15 Claims**

1. A suspension for a vehicle comprising:

a shock absorber capable of adjusting the damping force for damping vibration given from a wheel;

a bushing interposed between the shock absorber and a car body and capable of adjusting the spring constant and damping force;

an air spring capable of adjusting the spring constant for damping the vibration given from said wheel in cooperation with said shock absorber; and



at least an actuator for adjusting the damping force of said shock absorber, the spring constant and damping force of said bushing and the spring constant of said air spring.

4,635,907

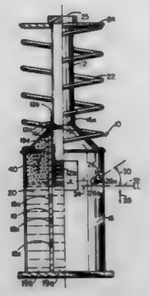
HYDRAULIC BUFFER FOR ELEVATORS

Louis Bialy, Dundas, and Frederick P. Menet, Burlington, both of Canada, assignors to Otis Elevator Company, Farmington, Conn.

Continuation of Ser. No. 512,520, Jul. 11, 1983, abandoned. This application Jan. 21, 1986, Ser. No. 821,216

Int. Cl.⁴ F16F *9/32, 9/36, 9/48*

U.S. Cl. 267—8 R **3 Claims**



1. A hydraulic buffer, for location at the bottom of an elevator shaft to decelerate an elevator car, characterized by:

a container for buffer oil (**16**);

a piston cylinder (**18**) within said container (**16**), said piston cylinder (**18**) defining two fluid chambers (**19*a*, 19*b***) within the container (**16**), one (**19*a***) within the piston cylinder, the second (**19*b***) around the piston cylinder, said piston cylinder (**18**) containing ports (**18*a***) connecting the two chambers (**19*a*, 19*b***);

a piston (**12**) extending through a congruent sleeve (**16*c***) in the top of the container (**16**) into said piston cylinder (**18**), said sleeve (**16*c***) being about the top (**18*c***) of said piston cylinder (**18**), there being a space between the piston and the sleeve allowing air to escape from the interior of the container to the surrounding environment outside said container, said space extending around the piston for the entire length of the sleeve;

the top of the piston cylinder (**18*c***) and the top (**16*d***) of the

container defining a nozzle (19*d*) between the uppermost portion of the second chamber (19*b*) to an area (19c) on top of said piston cylinder (18), that is within the container and directly exposed to the piston (12) and the sleeve (16c), said nozzle providing a volumetric expansion to an oil/air mixture forced therethrough to said area (19c) from the second chamber (19*b*) whereby the oil condenses from said mixture as it passes through the nozzle (19*d*) and air in the mixture escapes through the space (16*b*) between the sleeve (16c) and the piston (12) to aid in maintaining said space free from blockage; and

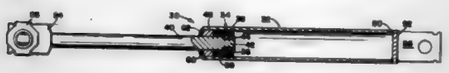
a spring (22) that extends the piston (12) out of the container (16).

4,635,908

PNEUMATIC COUNTERBALANCE

George C. Ludwig, Florence, S.C., assignor to AVM, Inc., Marion, S.C.

Continuation of Ser. No. 122,850, Feb. 20, 1980, abandoned.
This application Sep. 28, 1982, Ser. No. 425,565
Int. Cl.[4] F16F *5/00, 9/00*
U.S. Cl. 267—64.11 6 Claims



1. A pneumatic spring link comprising: a cylinder assembly with a closed end; a piston assembly in said cylinder with a piston shaft extending from the other end of said cylinder, a bushing on said shaft, an annular seal means around said shaft, a piston means with a piston ring, sealing against said cylinder, fixed on the end of said shaft; the other end of said cylinder being crimp shaped to retain said bushing; said seal means providing a static seal against said cylinder, and a dynamic seal around said shaft; said piston means and piston ring providing means enabling metered orifice by-pass flow of gas across said piston in one direction of stroke and a free flow by-pass fluid communication path across said piston means in the other direction of stroke; a predetermined small quantity of oil being contained in said cylinder; said cylinder containing a pre-determined quantity of gas under pressure; said piston means having a spool shaped piston with flanges of less diameter than the I.D. of said cylinder to provide an annular free-flow space between the piston flanges and said cylinder, and at least one of said flanges being deliberately made in a weakened condition as a fail-safe device to deflect and release said piston ring upon contamination clogging of said means providing by-pass flow across said piston, and to thereby permit continued spring function without the metered orifice by-pass flow of gas.

4,635,909

COMBINATION PNEUMATIC SPRING AND SHOCK ABSORBING APPARATUS

Henning Gold, Im Rheinblick 29, 6530 Bingen 1, Fed. Rep. of Germany

Filed Apr. 29, 1985, Ser. No. 728,565
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1984, 8413300[U]
Int. Cl.[4] F16F *9/04, 9/348, 9/36*
U.S. Cl. 267—64.21 12 Claims

1. A combination pneumatic spring and shock absorbing apparatus, comprising:

a substantially cylindrical housing;

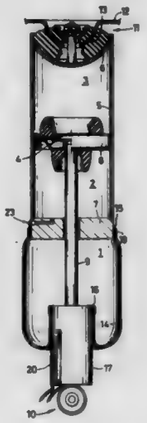
closure means for closing opposite ends of said housing, one of said closure means comprising first mounting means;

piston means coaxially mounted within said housing for sliding movement between said opposite ends and for separating said housing into first and second absorption chambers of respectively increasable and decreasable volumes, said piston means comprising first and second sections each providing an annular surface radially offset from and contric to the other;

a piston rod having a first end section coaxially connected to said piston means and a second end section extending through the other of said closure means and provided with second mounting means;

substantially tubular resilient means having one end connected to said housing adjacent said other closure means and an opposite end connected to said piston rod adjacent said second end section for forming a resilient spring chamber;

throttle means provided within said piston means for permitting limited exchange of pneumatic pressure between said



first and second absorption chambers, said throttle means comprising a plurality of coaxially superposed annular disc members separated by a substantially thin layer of substantially elastic material and biased against each other by the outer marginal portion of one of said disc members engaging one of said annular surfaces and the inner marginal portion of another of said disc members engaging the other of said annular surfaces, whereby said exchange of said pneumatic pressure in one direction between said first and second absorption chambers takes place substantially by way of said outer marginal portion and in the opposite direction substantially by way of said inner marginal portion.

4,635,910

FLUID-FILLED DAMPER DEVICE

Isao Ozawa; Noboru Ito, both of Aichi; Masaaki Takizawa, Shizuoka; Yoshio Ohta, Shizuoka, and Kiyotaru Ijichi, Shizuoka, all of Japan, assignors to Toyoda Gosei Co., Ltd. and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed May 1, 1985, Ser. No. 729,177
Claims priority, application Japan, May 3, 1984, 59-89065
Int. Cl.[4] F16M *5/00*
U.S. Cl. 267—140.1 3 Claims

1. A fluid-filled damper device comprising:

two support members, consisting of a first support member to be coupled to a support element and a second support member to be coupled to a suspended element;

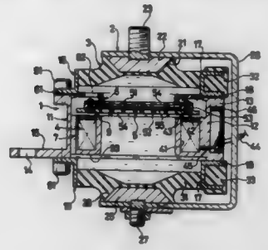
a thick elastic block comprising a deformable, elastic material and having an outer peripheral edge fixed to the first support member and a substantially central portion fixed to the second support member for elastically coupling said first and second support members so as to allow relative movement therebetween in at least one direction wherein a sealed space is formed surrounded by at least said thick elastic block,

an elastic bottom plate for sealing an end of said first support

member which is opposite to the side of said second support member and said first support member wherein a liquid is disposed in said sealed space;

a solenoid arranged at an inner wall of said first support member, said solenoid having a space at a central portion thereof and an attractive/fixing surface substantially perpendicular to said one direction of relative movement;

a plate-shaped partition member interposed between said attractive/fixing surface of said solenoid and said elastic block, and having an outer peripheral edge thereof fixed to an inner peripheral edge of an elastic sheet made of a deformable, elastic material which is fixed at an outer peripheral edge thereof to said first support member, and a movable member movably provided in the interior thereof for a short distance along said one direction of



relative movement, said partition member being movable along said one direction of relative movement by the deformation of said elastic sheet; and

at least one fluid passage formed in a wall portion constituting said first support member, said fluid passage having open ends each of which is opening in said sealed space at each of both side positions of said attraction/fixing surface of said solenoid along said one direction of relative movement, respectively, and imparting flow resistance to the liquid flowing therethrough,

whereby said partition member is adherently held to said attraction/fixing surface of said solenoid against elasticity of said elastic sheet by excitation of said solenoid so as to divide said sealed space into first and second chambers, and wherein said fluid passage communicates between said first and second chambers.

4,635,911

MOTORIZED OVER CENTER CLAMP

Rodger T. Lovrenich, 209 Whispering Sands, Santa Teresa, N. Mex. 88008

Filed Aug. 30, 1985, Ser. No. 771,101
Int. Cl.[4] B23Q *3/02*
U.S. Cl. 269—93 18 Claims

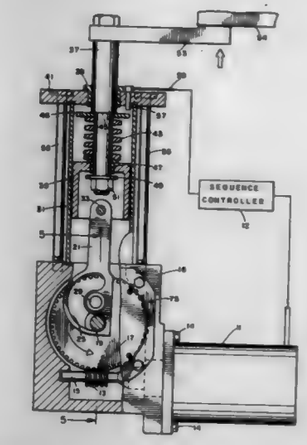
1. A motorized over center clamp, comprising:

motor means;

drive means coupled with said motor means and including over center spring loaded positioning means;

clamping means connected with said spring loaded positioning means for clamping work pieces;

control means connected with said motor means for controlling said motor means and actuating said positioning means to move the clamp means to an over center clamped position and to an unclamped position, said spring loaded positioning means retaining said clamping means in the over center position without the need of external holding power and constructed to accommodate a work piece that is over size; and



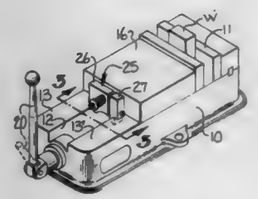
sensing means for sensing the clamping force provided by said clamping means as a function of energy stored in said spring means.

4,635,912

WORK RELEASE STOP FOR A VISE

James E. Donnelly, 930 Malotte La., Gastonia, N.C. 28052

Filed May 17, 1985, Ser. No. 735,140
Int. Cl.[4] B25B *1/00*
U.S. Cl. 269—157 10 Claims



1. In a vise including an elongate base, a fixed jaw at one end of said elongate base, a guideway extending longitudinally along said base and from said fixed jaw to the opposite end thereof, a screw shaft journaled at each end of said base and extending along said guideway, an adjustable jaw supported for longitudinal movement on said base and including a depending guide extending into said guideway and having an internally threaded bore threadably receiving said screw shaft to permit movement of said adjustable jaw forwardly toward and rearwardly away from said fixed jaw and along said screw shaft upon rotation thereof, and handle means connected to said screw shaft for manually imparting rotation thereto, the combination therewith of adjustable stop means supported in said guideway and rearwardly of said adjustable jaw for engaging and limiting rearward movement of said adjustable jaw when releasing a workpiece clamping between said fixed jaw and said adjustable jaw, said adjustable stop means comprising a stop plate including an upper portion extending transversely of and above said guideway, said upper portion of said stop plate including lower shoulder portions on opposite sides thereof, said shoulder portions being supported on portions of said elongate base adjacent opposite sides of said guideway, and gripping jaw portions extending downwardly below said

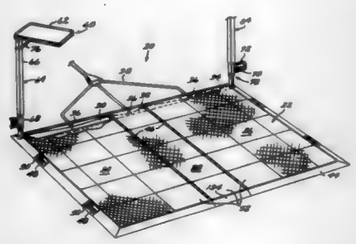
shoulder portions and engageable with respective oppositely facing sides of said guideway, and adjustment means for varying the transverse distance between said gripping jaw portions to maintain said stop plate in a selected longitudinally adjusted position in said guideway, said stop plate being vertically divided to define first and second transversely adjacent parts, a threaded connector joining adjacent upper ends of said first and second parts and being operable to vary the overall width of said stop plate, said adjustment means including an adjustment screw threadably supported in said second part of said stop plate and below said threaded connector and operativley engaging said first part for varying the distance between said lower gripping jaw portions, and wherein said adjustment means includes a bearing ball partially seated in said first part of said stop plate, said bearing ball being in alignment with and engageable by the inner end of said adjusting screw.

4,635,913

PORTABLE SURGICAL DRAINAGE PLATFORM

Michael L. Rothman, 440 St. Michaels Dr., Santa Fe, N. Mex. 87501

Filed Oct. 29, 1985, Ser. No. 792,544
Int. Cl.[4] A61G *13/00*
U.S. Cl. 269—327 18 Claims



1. A portable surgical drainage platform for collecting fluids discarded during surgical operations, said platform comprising:

a central support tray and two outer support trays situated adjacent opposite edges of said central support tray, each of said support trays including a trough at one end, an upper fluid receiving surface having a slight inclination for channeling fluids toward and into said trough, a drain for evacuating fluids from said trough, and means situated below said upper fluid receiving surface for supporting the same;

means for rotatably attaching said outer support trays to said central support tray, said attaching means including overlapping hinges to prevent fluid from leaking between said outer support trays and said central support tray;

means for locking each said outer support tray in a folded position when rotated about said attaching means with respect to said central support tray;

means for damping the downward movement of each said outer support tray when unfolded to align said outer support trays with said central support tray;

a plurality of removable perforated mats, said mats being situated upon said upper fluid receiving surfaces of said support trays to provide a non-slip surface through which fluids may pass; and

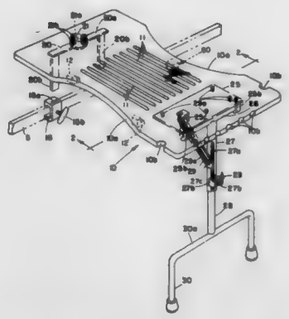
means for moving said platform, said moving means including a plurality of vertically extendable and retractable roller mechanisms situated below said upper fluid receiving surface of said central support tray, a hand lever which can be releasably locked in one of two primary positions, and means for extending or retracting all said roller mechanisms simultaneously in response to the positioning of said hand lever to, respectively, raise or lower said platform.

4,635,914

ORTHOPEDIC ATTACHMENT FOR SURGICAL TABLES

Joseph R. Kabasek, P.O. Box 156, Helotes, Tex. 78023

Continuation-in-part of Ser. No. 567,770, Jan. 3, 1984, abandoned. This application Jan. 23, 1985, Ser. No. 693,999
Int. Cl.[4] A61G *13/00*
U.S. Cl. 269—328 8 Claims



1. An orthopedic attachment for surgical table having a patient-supporting surface and a rigid bar extending along one side of the surfical table parallel to the patient-supporting surface, comprising, in combination: a tray formed of rigid X-ray-transparent material, the tray having top and bottom surfaces, opposed ends, first and second edges connecting said ends, and a medial portion intermediate said first and second edges; means secured to said tray adjacent one end thereof for detachably securing said tray to said rigid bar, said securing means including means for orienting the tray so that said first and second edges project laterally relative to the patient-supporting surface whereby a patient's extremity may be supporting on said tray for surgical operations performed from either edge of said tray and for X-ray pictures of the extremity without moving the extremity; said tray having a plurality of vertical pasages through the medial portion thereof; at least one support lug depending from the bottom of said tray at a location outside of said vertical passages, said support lug being contoured to receive and selectively support either one edge of an X-ray film cartridge or an edge of a fluid-collecting trough; and manually operable latch means positioned on said tray bottom on the opposite side of said vertical passages for said support lug; the latch means having an engaging portion for selectively engaging either another edge of the X-ray film cartridge or the other edge of the trough, whereby either an X-ray film cartridge or a fluid-collecting trough may be selectively clamped between the lug and latch means beneath said tray.

4,635,915

FOLDING CYLINDER FOR A WEB FOLDING APPARATUS

Katsumi Sato, Tokyo, Japan, assignor to Kabushikigaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Filed Nov. 21, 1985, Ser. No. 800,389
Claims priority, application Japan, Apr. 24, 1985, 60-61266[U]
Int. Cl.[4] B42C *1/04*
U.S. Cl. 270—49 3 Claims

1. A folding cylinder for a web folding apparatus comprising:

(a) a folding cylinder,

(b) a cutting cylinder,

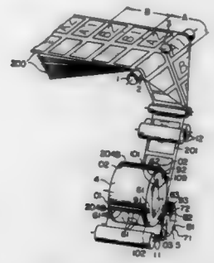
(c) said cylinders rotating in opposite directions relative to each other for receiving a plurality of superposed webs fed between the folding cylinder and the cutting cylinder,

(d) cutting knife receiving members on the folding cylinder,

(e) corresponding cutting knives on the cutting cylinder,

(f) paper pressing members positioned on opposite sides of the cutting knives,

(g) protrusion means disposed on the circumference of the folding cylinder adjacent to and in advance of the cutting



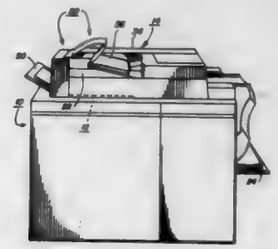
knife receiving members with respect to the direction of rotation thereof, for holding the superposed webs introduced between the folding cylinder and the cutting cylinder, in cooperation with the corresponding paper pressing members provided on the opposite sides of the cutting knives in severing the superposed webs.

4,635,916

DUAL-MODE COPIER DOCUMENT FEEDER AND COMPUTER FORMS WEB RESTACKER

Joseph J. Modugno, and William R. Klimley, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 15, 1985, Ser. No. 787,569
Int. Cl.[4] B65H *1/00*
U.S. Cl. 271—3 4 Claims



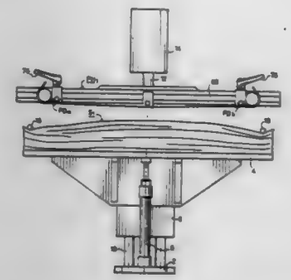
1. In a document feeder for feeding conventional document sheets from a stack thereof in a document feeding tray of the document feeder to the imaging station of a copier, and wherein said document feeding tray has a resettable side guide for the conventional document sheets, the improvement comprising a dual mode document feeder for alternatively fan-fold restacking a fan-fold web document in said same document tray, wherein said document feeding tray is enlarged to accommodate said fan-fold restacking of a fan-fold web document therein, and wherein said side guide is repositionable intermediately of said enlarged document feeding tray, and wherein said side guide has integral fan-fold web end stopping means thereon positioned in the path of a document being restacked in said tray when said side guide is so repositioned, for automatic engagement for fan-fold stacking of a fan-fold web document in said document feeding tray against said fan-fold web end stopping means when fan-fold web is fed into said document feeding tray from said imaging station.

4,635,917

METHOD AND APPARATUS FOR FEEDING SHEETS, PARTICULARLY FABRICS FROM A STACK

Daniel Granot; Ahron Siev, and Freddy Derfler, all of Haifa, Israel, assignors to State of Israel, Ministry of Defense, Rafael Armament, Haifa, Israel

Filed Dec. 5, 1984, Ser. No. 678,585
Claims priority, application Israel, Mar. 2, 1984, 71133
Int. Cl.[4] B65H *3/22, 3/14*
U.S. Cl. 271—9 17 Claims



1. A method of feeding sheets from a stack comprising the steps:

(a) engaging the opposite edges of the upper sheet of the stack by a pair of restrainer members overlying said opposite edges;

(b) bringing a pick-up head into engagement with the upper sheet of the stack between said restrainer members while producing air streams from said pick-up head directed outwardly across the opposite edges of the upper sheet of the stack;

(c) effecting relative displacement between said stack and said restrainer members in one direction such that the stack is spaced below said restrainer members and said air streams cause the opposite edges of the upper sheet of the stack to curl upwardly to clear said restrainer members;

(d) lifting said upper sheet from the stack;

(e) and effecting relative displacement between said stack and said restrainer members in the opposite direction from step (c) such that the opposite edges of the next underlying sheet of the stack are brought into engagement with said restrainer members.

4,635,918

PROCESS AND APPARATUS FOR GRIPPING FLEXIBLE, AND IN PARTICULAR TEXTILE LAYERS, AND A MACHINE FOR GRIPPING AND TRANSFERRING SAID LAYERS

Alain Rouleau, 3 rue Espinasse; Patrick Rouleau, 52, boulevard Carnot, both of 3100 Toulouse, and Jean-Pierre Touret, 21, rue des Rottelets, 31270 Villeneuve Tolosane, all of France

Filed Mar. 15, 1985, Ser. No. 712,197
Claims priority, application France, Mar. 26, 1984, 84 04804
Int. Cl.[4] B65H *3/22*
U.S. Cl. 271—183 36 Claims

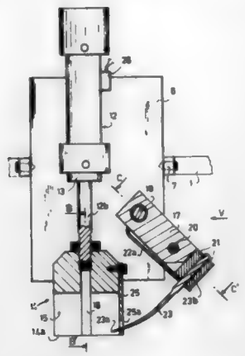
1. A process for gripping one layer or a specified number of layers of a flexible material arranged in a stack of layers for separating said layer(s) (S) from the other layers of the stack (E), said process comprising

moving a contact surface (14*a*) having a clearance (16) above at least one zone of the stack's upper flexible layer (S) until this contact surface makes contact with said layer (S) which remains free at the clearance (16),

moving a needle (23) with respect to said contact surface so that its tipped end (23*a*) moves with respect to said contact surface in sequence first in an intitial segment (Ti) starting at the contact surface and deviating from it in such a manner that the needle enters the flexible layer (S), then in

a reversing segment (Tr) wherein takes place a change in the relative displacement between the needle tip and the contact surface, and lastly in an end segment (Tf) nearing and extending beyond the contact surface and offset from the initial segment so as not to coincide with it,

inplacing the assembly of needle and contact contact surface in a plurality of rapid to-and-fro motions in a direction substantially parallel to the plane of said contact surface



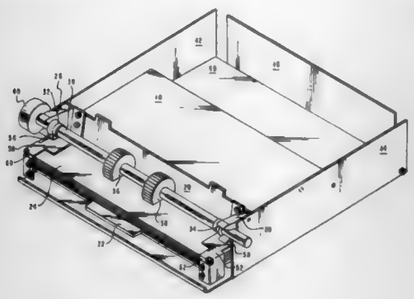
and producing a relative separation motion between the stack (E) and the assembly of needle and contact surface, the motion of the needle (23) being caused in such a manner that during the motion of said tip along the initial segment (Ti) and along the reverse segement (Tr) said needle forces the flexible layer (S) toward the clearance (16) and shapes it into a corrugation in said clearance, the end segment (Tf) of the path passing through said corrugation.

4,635,919

FLOATING DOCUMENT THROAT

Adolph B. Habich, Austin, and Ronald E. Hunt, Georgetown, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1984, Ser. No. 666,791
Int. Cl.⁴ B65H *3/30*
U.S. Cl. 271—22 **3 Claims**



1. Apparatus for providing envelopes one at a time in a reliable manner to a device requiring such envelopes comprising:

a base;

side frame members attached to the base;

a support plate for supporting documents, said support plate being biased away from the base;

a cross piece connected between the side frame members;

leaf spring throat members attached to the cross piece and positioned to form corner restraint means with the support plate;

said throat members being biased in the direction opposite to that of the support plate,

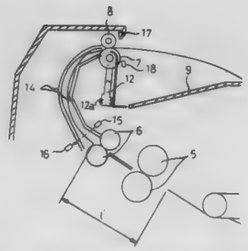
whereby contact with friction feed means of documents supported on the support plate lowers the support plate against the upwardly biased force and permits the throat members to revert to their downward bias for maintaining the throat in alignment with the uppermost document in the stack.

4,635,920

SELECTIVE SHEET LOADING APPARATUS

Yutaka Kodama, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Jul. 22, 1985, Ser. No. 757,625
Claims priority, application Japan, Jul. 20, 1984, 59-149678; Aug. 10, 1984, 59-168679
Int. Cl.⁴ B65H *29/14, 33/06*
U.S. Cl. 271—81 **3 Claims**



1. A sheet selective loading apparatus which make groups a given number of sheets discharged on a sheet stacker from a pair of sheet discharge rollers in an image recording apparatus and selectively loads said groups of sheets alternatively on positions separate from each other one on top of another, wherein

said pair of sheet discharge rollers are held movably in their axial direction between first and second positions a given distance apart from each other,

and comprising

means to move said pair of sheet discharge rollers between said two positions;

first detecting means to detect that the trailing edge of sheets has left sheet-carrying means upstream of said pair of sheet discharge rollers;

second detecting means to detect that the trailing edge of sheets has left said pair of sheet discharge rollers ; and

control means which

when sheets are to be discharged in a normal position on said sheet stacker, is so programmed that said pair of sheet discharge rollers are held at either said first or second position while they receive and discharge the sheets, and

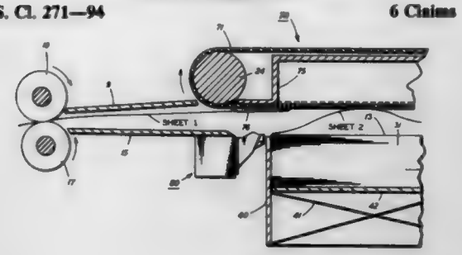
when sheets are to be discharged in another position offset from said normal position, is so programmed that said sheet discharge rollers are held at either said first or second position, said pair of sheet discharge rollers are moved to the other position after said first detecting means has detected the trailing edge of sheets to be discharged at the other position, and are returned to the original position in response to said second detecting means detecting the trailing edge of said sheets and before the leading edge of the following sheet reaches said pair of sheet discharge rollers.

4,635,921

FRONT AIR KNIFE TOP VACUUM CORRUGATION FEEDER

Kendolph A. Thomas, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 6, 1985, Ser. No. 795,580
Int. Cl.⁴ B65H *3/12*
U.S. Cl. 271—94 **6 Claims**



1. A top sheet feeding apparatus especially adapted for feeding downcurled stiff sheets as well as flimsy sheets, comprising a sheet stack support tray, feedhead means including a vacuum plenum chamber positioned over the front of a stack of sheets when sheets are placed in the tray with the vacuum plenum chamber having a negative pressure applied thereto at all times during a feed cycle, said vacuum plenum chamber having a sheet corrugation means mounted in the center of its bottom surface and perforated means mounted in the center of its bottom surface and perforated feed belts associated with said vacuum plenum chamber to transport the sheets acquired by said vacuum plenum chamber in a forward direction out of the stack support tray; and air knife means positioned immediately adjacent the front of said stack of sheets for applying a positive pressure to the sheet stack in order to separate the uppermost sheet from the rest of the stack, said air knife means including fluffer jets, vectored auxiliary fluffer jets and a converging slot jet for increasing the range of sheet weights and stress conditions that can be easily fed through said apparatus.

4,635,922

ENVELOPE FEEDING APPARATUS

Frank Roetter, Westport, and Frank Oeschger, Norwalk, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 29, 1984, Ser. No. 665,870
Int. Cl.⁴ B65H *3/06*
U.S. Cl. 271—119 **4 Claims**

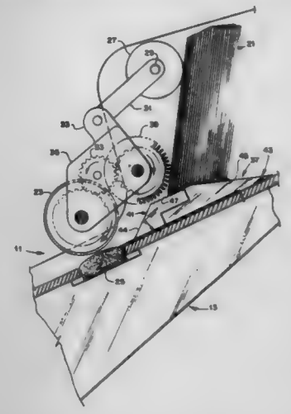
1. An envelope feeding apparatus, comprising:

a hopper having a support deck and a pair of vertical sides extending upwardly from said support deck, said support deck being oriented at an acute angle with respect to a horizontal plane;

a separator roller and a separator stone situated at the lower end of the hopper for feeding envelopes seriatim from said hopper;

a center ramp located upstream of said separator roller and said separator stone, said center ramp having a downstream and an upstream portion, said upstream portion comprising an elongated surface inclined with respect to the hopper support deck, said downstream portion having a knurled surface parallel to the hopper support deck and adjacent the elongated, inclined surface of said upstream portion, and said center ramp extending only a small portion of the distance between the vertical sides of said hopper; and

a center feed roller located above said downstream portion of said center ramp and proximate said separator stone, whereby the lower corners of said envelopes are raised off said support deck when said envelopes are translated along said center ramp and under said feed roller, thereby



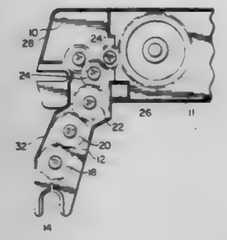
allowing said envelopes to approach said separator roller and said separator stone unskewed.

4,635,923

DEVICE FOR THE FEEDING OF INDIVIDUAL SHEETS TO THE PLATEN OF AN OFFICE MACHINE

Friedhelm Steinhilber, Saline 29, 7210 Rottweil, Fed. Rep. of Germany

Filed Apr. 29, 1985, Ser. No. 727,923
Claims priority, application Fed. Rep. of Germany, May 4, 1984, 3416509
Int. Cl.⁴ B65H *1/00*
U.S. Cl. 271—162 **5 Claims**

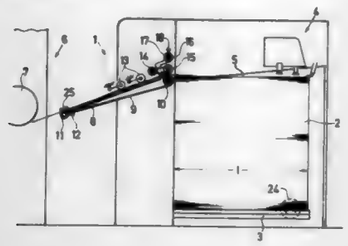


1. A contact section for utilization in conjunction with the sidewall of a sheet-feeding device to facilitate the accommodation of said sheet-feeding device to office machines having platens of different width, including, an attachment portion for permitting securement of said contact section to said sidewall of said sheet-feeding device, a stepwise joggle located intermediate the extremities of said contact section and a lower extremity displaced laterally by said stepwise joggle and disposed parallel to the plane of the sidewall of said sheet-feeding device.

4,635,924
SHEET FEEDER FOR A SHEET-PROCESSING MACHINE

Gerhard Pollich, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Sep. 13, 1985, Ser. No. 775,652
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3433994
Int. Cl.⁴ B65H 7/14
U.S. Cl. 271—227 **7 Claims**



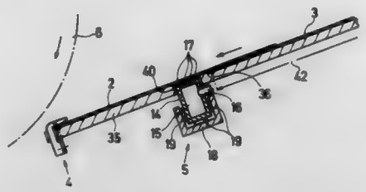
1. Sheet feeder for a sheet-processing machine having a device for automatically aligning a lateral position of a stack of sheets from which respective sheets to be individually separated are detectable by a conveyor device for transporting the sheets in a given transport direction and feedable to the sheet-processing machine, comprising a stack table for carrying the stack of sheets, said stack table being movable transversely to said given transport direction of the sheets, servomotor means for moving said stack table transversely to said given transport direction in response to respective control signals from an actual sheet-position detection device disposed immediately downstream of the sheet stack as viewed in said given transport direction, said detection device having means for detecting the lateral position of the respective sheet just separated from the stack and already fed to the conveyor device, said detecting means comprising optical reflex light barriers for detecting varying degrees of light reflection and transmitting said control signals corresponding thereto, said detection device including two optical reflex light barriers disposed so as to be operatively associated with at least one of the side edges of the respective sheets, said two optical reflex light barriers being positionable independently of one another within a selective distance extending transversely to the respective sheets.

4,635,925
FEEDING DEVICE FOR SHEET PROCESSING MACHINES

Gerhard Pollich, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,502
Claims priority, application Fed. Rep. of Germany, May 12, 1984, 3417764
Int. Cl.⁴ B65H 9/06
U.S. Cl. 271—235 **16 Claims**

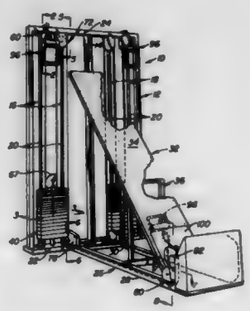
1. Feeding device for a sheet processing machine for stream feeding to the sheet processing machine, in mutually overlapping relationship, equally thick sheets taken singly from a pile of the sheets, in combination with an alignment device for laterally aligning the sheets as they are being fed to the sheet processing machine, the feeding device comprising a feed table having, together with the lateral alignment device, surfaces whereon the stream-fed sheets are supported, at least one section of the surfaces of said feed table and the lateral alignment device being disposed at a different level from that of another section thereof, at least while the sheets are being aligned, the difference in the levels being such that a preceding sheet being aligned at the moment lies flush against a surface section of the lateral alignment device until the preceding sheet is delivered to the sheet processing machine, the latter surface section being at substantially the same level as the upper surface of a leading portion of a next succeeding sheet underlying a trailing portion of the preceding sheet, said feed table, upstream of said lateral alignment device, as viewed in travel direction of the sheets, being disposed lower by approximately the thickness of one sheet than a section of the feed table facing towards the sheet processing machine and containing the lateral alignment device.



4,635,926
WEIGHT LIFTING TYPE EXERCISING DEVICE

Roger E. Minkow, 735 H St., Petaluma, Calif. 94952

Filed Dec. 27, 1983, Ser. No. 565,924
Int. Cl.⁴ A63B 21/06
U.S. Cl. 272—118 **13 Claims**



1. A device for weight training or assisting in exercising body members comprising:

(a) a frame assembly including,

an upright rectangular portion having a top end and a bottom end with a central brace and a pair of guide means, one of said pair of guide means being on each side of said central brace,

a horizontal rectangular portion having a remote end and a fixed end, said fixed end being fixed to said upright rectangular portion at said bottom end of said upright rectangular portion and having outside edges aligned in symmetry with said central brace and said guide means,

a tilted portion having one end fixed to said remote end of said horizontal rectangular portion and the other end fixed to said upright rectangular portion at said central brace at a position between said top end and said bottom end of said upright rectangular portion,

(b) a plurality of separate weight elements slideably positioned on said pair of guide means, said plurality including weight elements of different weight with weight elements of the same weight being positioned on each guide means in the same order, said weight elements having a central guide hole therethrough establishing a vertically aligned set of holes having an axis parallel to said guide means,

each of said weight elements also having a horizontal hole therethrough aligned with said central guide holes, and means engageable with said weight elements at said horizontal holes,

(c) two sets of pulley means and flexible means cooperation with said pulleys, each set of pulley means comprising a plurality of separate but cooperating pulleys, one each of said pulley sets being associated with said guide means and said weight elements at each side of said central brace and at each side of said tilted portion of said frame, said set of flexible means comprising separate flexible means associated with each set of pulley means,

(d) each of said sets of pulleys including,

a first pulley attached to the top end of said upright rectangular portion and on the inside thereof, said first pulley of each set being positioned with respect to said guide means at each side of said central brace,

a second pulley attached to said means engageable with said weight elements at said guide means, said second pulley being in alignment with said first pulley,

a third pulley attached to the top end of said upright rectangular portion and on the inside thereof, said third pulley being positioned with respect to said guide means adjacent to said central brace and at each side thereof, said third pulley being spaced from said first pulley by the diameter of said second pulley,

a fourth pulley attached to the bottom end of said upright rectangular portion of said frame, said fourth pulley being attached on the inside of said upright rectangular portion and positioned with respect to said guide means on said upright rectangular portion, said fourth pulley being aligned with the side of said third pulley closest to said central brace, said fourth pulley being further aligned with respect to an outside edge of said fixed end of said horizontal rectangular portion of said frame,

a fifth pulley attached to said horizontal rectangular portion at said remote end and aligned with respect to an outside edge of said horizontal rectangular portion, said fifth pulley being further attached to said horizontal rectangular portion at the location of attachment between said remote end of said horizontal rectangular portion and said one end of said tilted portion of said frame,

a sixth pulley attached to said frame with respect to said horizontal rectangular portion above said fifth pulley and in alignment with said tilted portion,

(e) said flexible means extending from said first pulley to said sixth pulley and passing through each pulley in order, said flexible means being flexible in lateral movement but not elongatable,

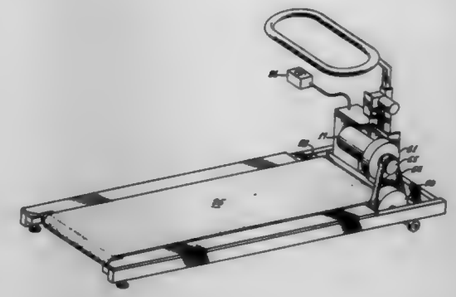
(f) and a pair of stop means associated with each pulley set, one of said stop means being fixed to said flexible means at said first pulley and the other of said stop means being fixed to said flexible means at said sixth pulley, said stop means cooperation with said first and sixth pulley means and said flexible means so as to permit said stop means to be pulled away from said pulleys but not to be pulled through said pulleys,

said device permitting a user to recline on said tilted portion and to grasp either or both of said stop means and to lift said weight elements in adjustable combinations with pulling forces applied to said stop means and transmitted through said flexible means and said pulley means from either the top or the bottom of said frame assembly at said tilted portion.

4,635,927
LOW POWER TREADMILL

Stephen K. Shu, Fountain Valley, Calif., assignor to Del Mar Avionics, Irvine, Calif.

Filed Mar. 4, 1985, Ser. No. 707,816
Int. Cl.⁴ A63B 23/06
U.S. Cl. 272—96 **8 Claims**



1. A treadmill for diagnostic and therapeutic purposes comprising:

an endless belt supported at each end by a cylindrical roller;

a DC motor;

a DC reference voltage;

velocity sensing means responsively coupled to said DC motor for generating a voltage which is proportional to the angular speed of said DC motor;

pulse width control means responsively connected to said velocity sensing means for generating a gating pulse having a duration which is proportional to the difference between the voltage generated by said velocity sensing means and said reference voltage;

means for coupling said DC motor to said endless belt;

power supply means for converting a standard 110 volt 60 cps household power to a unidirectional potential;

switching means having its main terminals series connected between said DC motor and the output of said power supply means and its gating terminal responsively connected to said pulse width control means, for controlling the duration of the DC voltage applied to said DC motor in response to the width of the pulses generated by said pulse width control means

at least one semiconductor switching device;

a choke means having a low DC resistance;

a resistor connected in parallel with said choke means;

means for connecting said switching device in series with the parallel combination of said resistor and said choke means, and;

means for connecting the network comprised of said semiconductor switching device and said choke means and said resistor in parallel with said DC motor, and;

means for actuating said switching device so as to cause said switching device to short circuit said choke means and resistor network across the terminals of said DC motor.

4,635,928
ADJUSTABLE SPEED CONTROL ARRANGEMENT FOR MOTORIZED EXERCISE TREADMILLS

Ralph Ogden, Munster, and Carl J. Johnson, Crown Point, both of Ind., assignors to Ajax Enterprises Corporation, Delavan, Wis.

Filed Apr. 15, 1985, Ser. No. 723,140
Int. Cl.⁴ A63B 23/06
U.S. Cl. 272—69 **10 Claims**

1. In an exercise treadmill including a generally planar slider bed having a head end, a tail end, and a top surfacing extending

substantially between said ends thereof, an endless treadmill belt trained over said slider bed defining an upper belt run overlying said slider bed top surfacing and a lower run passing under said slider bed, and means for driving said belt for movement of said belt upper run from said head end to said tail end of said slider bed, including a head roller journalled in said slider bed adjacent the head end of same over which the belt is trained, said head roller being journalled for rotation about an axis extending transversely of said treadmill belt, an electric drive motor assembly mounted on the slider bed ahead of said head roller for pivotal movement about an axis paralleling that of said head roller, said drive motor assembly including a drive motor driving a drive shaft about an axis paralleling said motor assembly pivot axis and having keyed to same a first drive pulley, with said head roller having keyed to same a second drive pulley, a pulley belt in drive transmitting relation between said pulleys, said head pulley axis and said drive shaft axis being in substantially coplanar relation in a plane paralleling said slider bed, said motor assembly pivot axis being disposed below said plane and between said motor assembly and the cross member,

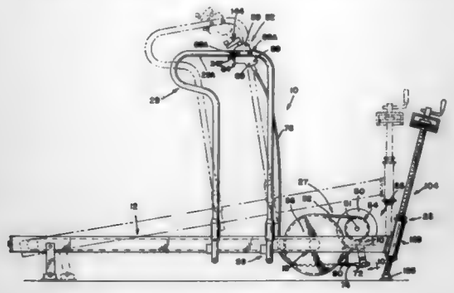
an adjustable speed control arrangement for setting the speed of said movement of said treadmill belt,

said speed control arrangement comprising:

said first drive pulley being a variable speed pulley,

said motor assembly having a depending lever arm extending through and below said motor assembly pivot axis,

a manually actuated speed control mechanism mounted on



the treadmill above the treadmill belt and intermediate said slider bed ends,

said mechanism including a reciprocable member and hand crank means for moving said reciprocable member in opposite directions a predetermined distance,

a cable connected between said lever arm, below said motor assembly pivot axis, and said mechanism reciprocable member,

a flexible cable guide through which said cable extends having one end anchored to said bed adjacent said lever and the other end anchored to said mechanism,

said first drive pulley including spring biasing means for biasing same to the high speed position whereby said pulley belt is tensioned to swing said drive motor assembly about its said pivot axis to maximize the spacing of said lever arm from said head roller axis and said treadmill belt is driven at maximum high speed,

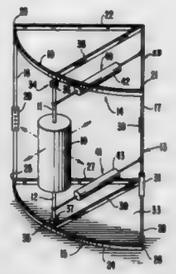
said connection of said cable to said mechanism reciprocable member including means for effecting a pulling action on said cable when said reciprocable member is moved by said hand crank means in one of said opposite directions for speed reduction of said treadmill belt, and means for effecting a lost motion action on said cable when said reciprocable member is moved by said hand crank means in the other of said directions when said motor is deenergized, and for permitting said biasing action of said first drive pulley spring biasing means to bias said cable through said pulley belt and said lever to return said lever arm toward said maximum spacing from said head roller axis for speed increasing of said treadmill belt when said motor is running.

4,635,929

KARATE EXERCISING BAG

Leonard T. Shustack, P.O. Box 63, Walden, N.Y. 12586

Filed May 28, 1985, Ser. No. 738,174
Int. Cl.[4] A63B *69/00*
U.S. Cl. 272—76 4 Claims



1. Apparatus for providing controlled resistance to the movements of Karate comprising:

an exercising bag, for striking or kicking by an exerciser, said exercising bag having an upper pole member and a lower pole member, and

a top mounting frame and a bottom mounting frame, mounted parallel to one another, interconnected and supported by three or more adjustable vertical support members, for vertically supporting said exercising bag, and

adjustable shock absorbers, mounted at right angles to, and interconnected to, said upper pole member and said lower pole member, for providing adjustable resistance to rearward movement imparted to said exercising bag by an exerciser, and

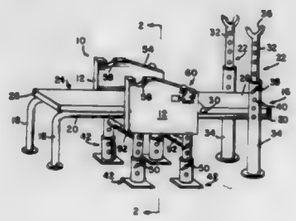
spring-loaded swivels attaching said upper pole member to said top mounting frame and attaching said lower pole member to said bottom mounting frame, for providing resistance to any twisting movement imparted to said exercising bag by an exerciser.

4,635,930

SAFETY BENCH PRESSING APPARATUS

Gary Cormier, 32 S. Central St., Bradford, Mass. 01830

Filed Jul. 26, 1985, Ser. No. 759,334
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 13 Claims



1. A bench press safety apparatus for use with a weight lifting bench having board means of given width and length with anterior and posterior ends for supporting a weight lifter thereupon in at least a generally supine position along the longitudinal length and main bar bell upright support members

located immediately adjacent to said anterior end of said board means, the safety apparatus comprising:

a pair of vertical support members each having an elongated upper surface and a lower surface; and further including;

means associated with the lower surface of said vertical support members for supporting said vertical support members in parallel vertical spaced relationship adjacent opposing longitudinal sides of said board means of said weight lifting bench;

said upper surface of said vertical support members being formed into an inclined portion and a generally horizontal holding portion;

said inclined portion having an upper end and a lower end and being inclined upwardly toward said posterior end of said board means of said weight lifting bench;

said holding portion extending posteriorly of said inclined portion and having means for retaining a bar bell to prevent said bar bell from rolling off said holding portion; and

means for adjustably securing said safety apparatus at a fixed point adjacent said board means and said anterior end of said weight lifting bench;

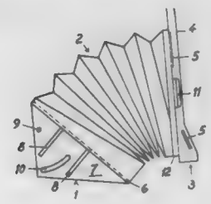
whereby said inclined surfaces is positioned above the chest of said weight lifter for receiving thereupon a falling or otherwise uncontrolled bar bell to prevent such bar bell from impacting upon said weight lifter supine on said board means of said weight lifting bench and allowing said weight lifter to support said barbell from rolling off said inclined surface onto said weight lifter.

4,635,931

APPARATUS FOR ARM AND LEG EXERCISE

Gunilla Brännstam, Blomstervägen 17, S-54141 Skövde, Sweden

Filed Sep. 6, 1984, Ser. No. 647,850
Claims priority, application Sweden, Sep. 13, 1983, 8304902; Feb. 23, 1984, 8400994
Int. Cl.[4] A63B *21/00, 23/04;* A61H *1/02*
U.S. Cl. 272—130 12 Claims



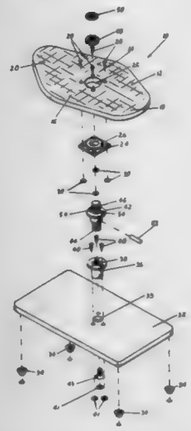
1. A device for use by a person lying on a bed to exercise a limb comprising an attachment (1) for attaching the device to or adjacent the bed in a manner suitable for the intended use of the device, a member (3) for engagement with the limb of the person lying on the bed, a bellows (2) having one end coupled to the attachment and another end coupled to the member for exerting a pressure on the member as the bellows is compressed when the limb is straightened and for exerting a pulling force on the member as the bellows is extended when the limb is subjected to a bending movement, the attachment being moveably mounted relative to a horizontal axis for movement of the attachment and the one end of the bellows coupled thereto to a fixed angular position relative to the position of the member when the bellows is extended so that the limb can be twisted backwards and forwards relative to the horizontal axis in response to limb bending and straightening movements as the bellows is extended and compressed, respectfully.

4,635,932

ANKLE AND LOWER LEG EXERCISER FOR PROPRIOCEPTIVE REHABILITATION

James A. Dewees, Wichita, Kans., assignor to Cerebral Palsy Research Foundation of Kansas, Inc., Wichita, Kans.

Filed Apr. 12, 1985, Ser. No. 722,606
Int. Cl.[4] A63B *23/04*
U.S. Cl. 272—96 3 Claims



1. An ankle and lower leg exerciser, the exerciser comprising:

a base adapted for receipt on a floor, the base including a base flange having a threaded aperture therein;

an oval-shaped foot table having an aperture through the center thereof for receiving a mounting plate attached thereto, the mounting plate having a rubber bushing therein; and

a table flange having an upper post and a lower post, the lower post threadably received in the threaded aperture of the base flange for adjusting the height of the table above the base, the upper post received through the rubber bushing and attached to the mounting plate, the rubber bushing allowing, through its resilience, limited movement of the table against the upper post, the table having a forward or toe portion, a rear or heel portion, a right side portion and a left side or arch portion.

4,635,933

TRAINING APPARATUS

Josef Schnell, Sportweg 9, 8899 Gachenbach, Fed. Rep. of Germany

Continuation of Ser. No. 555,470, Nov. 28, 1983, abandoned.
This application filed Oct. 4, 1985, Ser. No. 785,099
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3244023; Oct. 28, 1983, 3339083
Int. Cl.[4] A63B *21/24*
U.S. Cl. 272—129 8 Claims

1. An exercise machine comprising:

a support;

a first shaft journaled on said support;

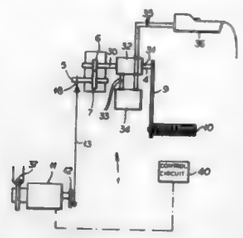
an arm fixed to that first shaft and provided with means engageable by a trainee, whereby said trainee can swing said arm through a predetermined stroke and thereby rotate said shaft;

a transmission on said support having an input connected with said first shaft, an output, and continuous-mesh gearing positively interconnecting said input and output mechanically with a transmission ratio;

a second shaft operatively connected to said output of said transmission for rotation relative to said first shaft at said ratio;

a link articulated to said second shaft at a location offset from an axis thereof; and

means including a reversible variable speed/variable torque electric motor mounted on said support and having a third



shaft on which said link is articulated at a location offset from an axis thereof for resisting rotation of said first shaft and arm on said support with a generally constant force in both rotational senses through the entire stroke of said arm.

4,635,934

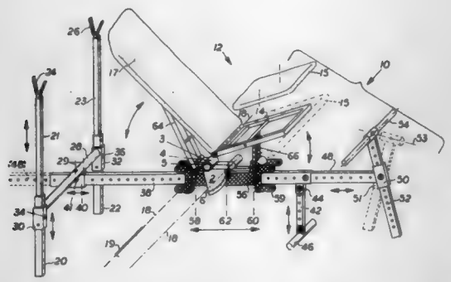
EXERCISE TOWER AND BENCH

Siegfried Roethke, Kieferaweg 19, 3172 Isenbuettel-Tankumsee, Fed. Rep. of Germany

Filed Jul. 29, 1985, Ser. No. 760,049

Int. Cl.⁴ A63B *17/00*

U.S. Cl. 272—144 **26 Claims**



1. An exercise device that includes a bench and a tower which bench and tower maybe interconnected to one another and used as a single exercise device or which may be detached from one another and used as independent exercise devices, comprising:

a bench means;

a tower means;

said bench means including a horizontally disposed elongate central frame member;

a bench carriage means rollably mounted to said central frame member;

a chair means;

said chair means including a back portion and a seat portion hingedly connected together;

said bench carriage means having a first, second and third chair mounting means;

a first rigid link member for removably interconnecting said back portion of said chair means to said first or third chair mounting means;

a second rigid link member for removably interconnecting said seat portion of said chair means to said first or third chair mounting means;

an intersupport device generally triangular in configuration, said intersupport device including a plurality of generally linearly but slightly arcuately arrayed aperture means formed therein between a first and second preselected corner thereof, and a central bore means proximate a third corner of said intersupport device;

a hinge pin means for hingedly interconnecting said back and seat portions of said chair means, said hinge pin means being received by an aperture means adjacent one of said first or second corners of said intersupport device;

said central bore means of said intersupport device being detachably mounted to said first or third chair mounting means;

and said intersupport device being selectively attachable to said second chair mounting means through said aperture means to provide differing angles of adjustment between said back and seat portions of said chair means, including angles of adjustment greater than one hundred eighty degrees.

4,635,935

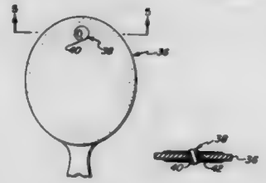
AUDIBLE-PHYSICAL COORDINATION RACKET

Jerome Kane, 1817 S. Ocean Dr., Hallandale, Fla. 33009

Filed Dec. 24, 1984, Ser. No. 685,470

Int. Cl.⁴ A63B *69/40*

U.S. Cl. 273—30 **3 Claims**



1. A practice racket of the type a player swings in a table tennis game comprising:

a handle for grasping said racket;

a head integral with said handle adapted for striking an object of the type used in said game; and

audible tone producing means affixed to said head for producing a tone varying in response to the velocity at which said racket is moved during practice, said audible tone producing means being a whistle fabricated in a spherical shaped casing, said casing being affixed to said head in an opening which conforms to the shape of the surface of said casing, whereby said tone producing means can be angularly adjusted and a person using said racket can practice various strokes to control speed and spin consistency of swing.

4,635,936

INFLATABLE RACKET

James R. Becker, New York, N.Y.; Peter Wehn, Garbsen, Fed. Rep. of Germany, and Peter Rademacher, Hemmingen, Fed. Rep. of Germany, assignors to Anjar Co., New York, N.Y.

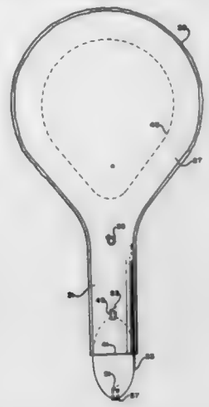
Filed Sep. 20, 1983, Ser. No. 533,991

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1982, 3235897

Int. Cl.⁴ A63B *59/00*

U.S. Cl. 273—67 R **18 Claims**

1. A collapsible and inflatable racket comprising a head and handle portion, said head comprising an inflatable element having a hollow, inflatable, generally toroidal portion having an open area in the central portion thereof and fitted within an exterior envelope forming spaced apart ball striking surfaces covering said open area, and a permanently attached air pump integral and unitary with said racket, and wherein said inflatable element comprises an inflatable handle portion connected to said toroidal portion for inflation therewith, said handle having a base located away from said head portion said pump being located at the base of the handle portion such that said pump, when squeezed, forces air along and inflates the entire



circumference of the racket including the head and handle portions of the racket.

4,635,937

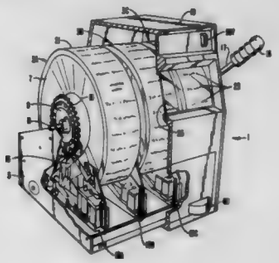
AMUSEMENT MACHINE

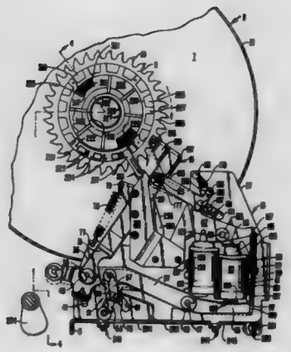
Peter D. Dickinson, and Robert A. Luciano, both of Reno, Nev., assignors to IGT, Reno, Nev.

Filed Oct. 24, 1984, Ser. No. 664,185

Int. Cl.⁴ A63F *5/04*

U.S. Cl. 273—143 R **54 Claims**





4. An amusement machine comprising:

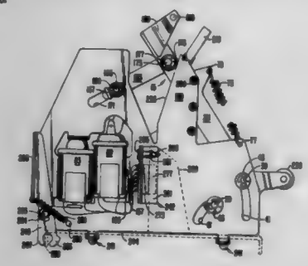
a frame;

a plurality of reels coaxially mounted for rotation in said frame;

a corresponding plurality of discrete modules, each module releasably disposed in said frame adjacent an associated reel;

a corresponding plurality of sprocket means, coaxially mounted with said reels, each mechanically interconnecting an associated reel and module and cooperating with said associated reel for transmitting rotational force thereto;

each said module having means for engaging its associated sprocket means to start and stop the rotation of its associated reel, and



means associated with each of said modules for releasably mounting its module at a designated location in said frame, including:

a slotted track disposed on one of said frame and said module;

a guide post mounted on the other of said frame and module and sized for insertion into the slot of said track; and

resilient means connecting said guide post and track for tensioning said module against said frame.

4,635,938

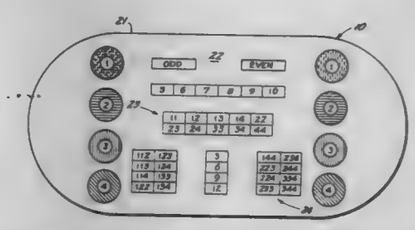
BOARD GAME

Patrick Gray, 13A Hasbrouck Rd., Garnerville, N.Y. 10923

Filed Mar. 24, 1986, Ser. No. 843,251

Int. Cl.⁴ A63F *3/00*

U.S. Cl. 273—274 **2 Claims**



1. A dice game employing two mono-colored dice having four sides, each side being numbered from 1 to 4, and a single third die having four sides, each side having a different color and a single numerical value from 1 to 4, the playing of the game including the steps of:

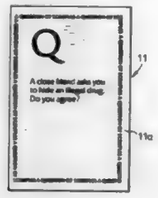
(a) placing initial bets on numerical combinations of 11, 12, 13, 14, 22, 23, 24, 33, 34, and 44;

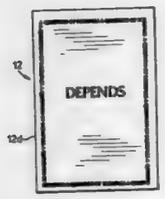
(b) making a first roll of the mono-colored dice to obtain an indicated numerical value corresponding to one of the values recited in the proceeding steps;

(c) placing secondary bets on any of the following conditions and values, including odd/even, hard 3, 6, 9 and 12; the total value of the three dice; the combinations possible from the values of the rolled three dice; and the color and number of the third die;

(d) making a second roll using only the third die; and
(e) rewarding the players in accordance with attained bets.

4,635,939
QUESTION AND ANSWER GAME APPARATUS AND METHOD
Henry Makow, Manitoba, Canada, assignor to Hasbro Canada, Inc., Quebec, Canada
Filed Nov. 4, 1985, Ser. No. 794,701
Int. Cl.[4] A63F 1/00
U.S. Cl. 273—296 **13 Claims**



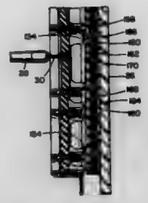


1. Game playing apparatus comprising:
(a) a set of question playing pieces of like shape each having a front and a reverse side, said reverse sides each being of a first like appearance, and said front sides each bearing a legend posing a moral question to which a positive, a negative or an indeterminate answer may be given, each of said question playing pieces bearing a different moral question; and
(b) a set of answer playing pieces of like shape each having a front side and a reverse side, said reverse sides each being of a second like appearance distinctive from said first like appearance and said front sides each bearing a legend indicating an answer from one of the three types of positive, negative and indeterminate, there being a plurality of answer playing pieces bearing answers in each of said three types.

8. Method of playing a game by a plurality of players, comprising:
(a) establishing a set of differing moral questions to each of which a positive, a negative or an indeterminate answer can be given;
(b) randomly selecting an answer from one of the three types, positive, negative and indeterminate, and disclosing the randomly selected answer to a first player;
(c) selecting by said first player (i) one of said questions from the set and (ii) identity of a second player from the plurality of players to whom the selected question is to be posed;
(d) posing to the second player the question selected in step (c);
(e) comparing the second player's answer with the answer randomly selected in step (b);
(f) recording a score for the first player dependent on the outcome of the comparison of step (e); and
(g) repeating steps (b) to (f) for each of the players in turn.

4,635,940
DART BOARD ASSEMBLY FOR AN ELECTRONIC DART GAME
Frederick T. Kelley, Cary, Ill., assignor to William E. McClure, Hoffman Estates, Ill., a part interest
Filed Jun. 26, 1985, Ser. No. 749,584
Int. Cl.[4] F41J 3/00, 5/04
U.S. Cl. 273—347 **14 Claims**

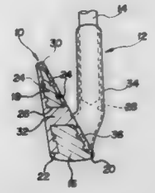




14. A dart board assembly including a plurality of target segments and other components, said plurality of target segments being slidably retained by said other components of said assembly, each target segment being of integral plastic construction and comprising:
a target plate having a great plurality of closely spaced apertures for receiving the shaft of a dart, said target plate having a dart entry side and an inner side spaced from entry side with said apertures extending between said sides; and
at least a pair of spaced legs disposed at the periphery of said plate and extending away from said entry side, each leg terminating in a small protuberance at the free end thereof, with the target segment being open between said legs, said target plate having peripheral corners, each leg being positioned at one of said corners, said segment being pie-shaped, having a proximal peripheral corner and two distal peripheral corners, said segment having a proximal leg and two distal legs, said proximal leg being V-shaped with the protuberance on said proximal leg being disposed remote from the apex of the V.

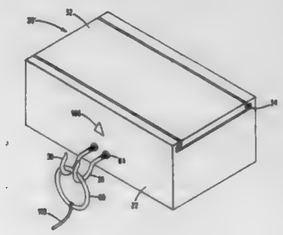
4,635,941
GOLF CLUB HEAD
Minoru Yoneyama, Niigata, Japan, assignor to Yonex Kabushiki Kaisha, Niigata, Japan
Filed Mar. 15, 1985, Ser. No. 712,231
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.
Int. Cl.[4] A63B 53/04
U.S. Cl. 273—78 **2 Claims**

1. A golf club head comprising:
a sole formed of metal material;
an inner head member of metal material formed integrally with said sole, said inner head member extending upwardly from said sole and having a substantially triangular shape in cross section, a lower end of said inner head member having a thickness in a direction of swing of the head smaller than the thickness of said sole to provide front and rear shoulders therebetween;
a hosel for receiving a shaft therein and formed of metal material integrally with said sole and said inner head member, said hosel being integral with said sole and said inner head member at a heel portion of the golf club head;
an outer head member formed of carbon fiber reinforced resin material, said outer head member having a substantially inverted V-shaped cross sectional configuration covering the entirety of said inner head member, lower ends of said outer head member being in close contact with said shoulders with marginal edges of said lower ends being flush with said sole; and



a means for strengthening the joint between said inner and outer head members, said means comprising a hole and a plurality of dimples formed in said inner head member, said hole being formed at substantially a central portion of said inner head member and extending therethrough from front to back thereof, said dimples being formed all around the outer surface of said inner head member, said carbon fiber reinforced resin material of said outer head member filling said hole and being in close fit in said dimples.

4,635,942
RING-A-DING HOOK GAME
John J. Flaherty, Jr., 106 Elm St., Hyannis, Mass. 02601
Filed Jan. 13, 1986, Ser. No. 818,262
Int. Cl.[4] A63B 67/06, 67/10
U.S. Cl. 273—332 **14 Claims**



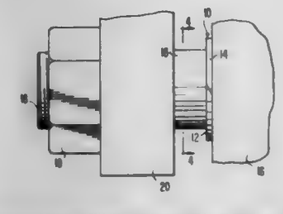
1. A ring game comprising:
a housing forming a hollow enclosure, said housing having opposed front and rear walls;
a pair of electrically conductive hooks projecting outward from said front wall, said hooks being separated from each other by a gap;
an electrical light source and an electrical power source within said housing;
electrical means within said housing for connecting said light source and said electrical power source between said hooks, said electrical means forming with said light source and said electrical power source a circuit when said gap is electrically bridged, whereby said light source is activated;
an opening in said front wall through which light emanates upon activation of said light source;
an electrically conductive ring engageable on said hooks so as to bridge said gap;
means for mounting said housing on a generally vertical surface;
a flexible line having a first end attachable to said ring and a second end suspendible from a horizontal surface a selected distance above and in front of the position of mounting of said housing on said generally vertical surface, whereby said ring may be propelled in an arc towards said hooks to either become engaged on said hooks, or will, in the event said ring fails to engage said hooks, tend to return to the general area from which said ring was propelled.

4,635,943
INDOOR AND OUTDOOR GAME
Larry Lampkin, 22822 Palm Ave., Apt. 28, Grand Terrace, Calif. 92324
Filed Jan. 22, 1986, Ser. No. 820,796
Int. Cl.[4] A63B 67/06
U.S. Cl. 273—402 **1 Claim**



1. An Indoor and Outdoor game comprising:
(a) a stand, said stand comprising a base, a pole secured to said base and extending upwardly therefrom, a target hoop mounted to the top of said pole, and means securing said hoop at a lowermost portion thereof to said pole for adjustably tilting said hoop about a generally horizontal axis, and
(b) a disc for throwing through said hoop.

4,635,944
METHOD FOR PROVIDING A SEAL AROUND A SHAFT AND AGAINST A BEARING HOUSING
Robert C. Sabo, 291 Indian Paint Brush, #3, Casper, Wyo. 82604
Filed Sep. 20, 1984, Ser. No. 652,583
Int. Cl.[4] F16J 15/18, 9/20, 9/28
U.S. Cl. 277—1 **3 Claims**



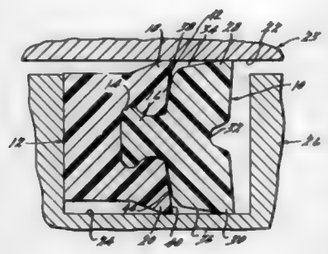
1. A method for providing a seal around a shaft adjacent to the outer surface of a bearing housing extending radially outwardly from said shaft, said method comprising the steps of:
(a) providing an elongated flexible strip having two terminal ends and a length greater than its width; wherein one side of said strip comprises a flat surface;
(b) encircling said shaft with said elongated flexible strip;
(c) adhering said flat surface of said strip to said outer surface of said bearing housing in a manner such that one edge of said strip is in contact with, and conforms to, said shaft, and wherein said terminal ends are in contact with each other.

4,635,945

ANTI-EXTRUSION SEAL WITH PRIMARY AND SECONDARY COMPLEMENTARY ELEMENTS

Gerald H. Bock, Sandy, Utah, assignor to Microdot Inc., Darien, Conn.

Filed Mar. 21, 1986, Ser. No. 842,182
Int. Cl.⁴ F16J *15/22*
U.S. Cl. 277—124 **2 Claims**



1. A composite seal for disposition about a circular element having a central axis, said seal comprising

an annular primary sealing element having a durometer of 60 to 90 on the Shore A Scale,

an annular secondary sealing element having a durometer of 95 to 125 on the Shore A Scale,

said secondary element being of a generally U-shaped radial cross section defined by radially spaced axially extending legs connected by a radially extending bight portion,

the legs of said secondary seal element being normally engageable with said circular element and with the wall of a supporting element, respectively,

the legs on said secondary element having conical axial end faces, respectively, inclined axially and radially toward the bight portion thereof,

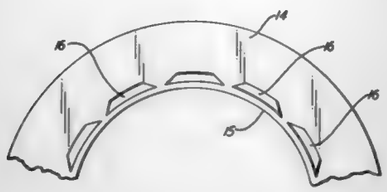
said primary element having a pair of radially spaced lips with axially and radially inclined surfaces complementary to and in juxtaposed relation to the end faces on said secondary element to preclude extrusion of said primary element past the legs of said secondary element.

4,635,946

SEAL WITH SPACED RECESSES

Clive J. Stanley, Tewkesbury, England, assignor to Dowty Seals Limited, Gloucestershire, England

Continuation of Ser. No. 506,298, Jun. 21, 1983, abandoned. This application Dec. 13, 1985, Ser. No. 808,540
Claims priority, application United Kingdom, Jul. 9, 1982, 8220054
Int. Cl.⁴ F16J *15/32*
U.S. Cl. 277—134 **1 Claim**



1. A seal for use as an oil to air seal between two relatively-rotatable parts and devoid of a garter spring including a sealing member of fluorine resin having an air side defined by a substantially continuous surface which terminates in a sealing edge and which has fluid-returning means comprising a plurality of recesses formed therein as circumferentially spaced depressions wholly sunken into said fluorine resin adjacent to and disposed about said edge, each recess being in the form of a quadrilateral with two opposite sides, defining with said air side opposed recess edges, substantially parallel to said edge, one being longer than, and closer to said edge than, the other, and each of the other two sides defining, with said air side opposed recess edges which are inclined at an acute angle to the longer of the two parallel sides, and said sealing edge and said quadrilateral recesses, in use, being engageable with one of the two relatively-rotatable parts to be sealed, said recesses being on the air side of the seal and being displaced from said sealing edge so that at said sealing edge a continuous uninterrupted annular band is formed with its mating relatively rotatable part, the broad base of the quadrilateral being closer to the oil side of the seal than is the narrow side.

4,635,947

UV-CURED AUTOMOTIVE SEAL COMPONENT

Satoyuki Hatayama, Toyoake, Japan, assignor to Tohkai Kogyo Co., Ltd., Aichi, Japan

Filed Jan. 22, 1986, Ser. No. 821,422
Claims priority, application Japan, Jan. 24, 1985, 60-11675
Int. Cl.⁴ F16J *15/10, 15/14*
U.S. Cl. 277—235 A **2 Claims**



1. A seal component, for providing a sliding seal against a pane of window glass, comprising a main body provided with a lubricating coating on at least the surface thereof brought into sliding contact with the window glass, said coating formed by coating said surface with a UV-curing coating material followed by irradiating said coating material with UV rays.

4,635,948

RELEASE COATING FOR GASKETS AND MANUFACTURING METHOD

Hans-Rainer Zerfass; Klaus-Peter Majewski, both of Burscheid, and Franz-Josef Giesen, Odenthal, all of Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Feb. 18, 1986, Ser. No. 830,688
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1985, 3505562
Int. Cl.⁴ F16J *15/10*
U.S. Cl. 277—235 B **13 Claims**

1. A soft material, flat gasket having a release coating adhered thereto prepared by a process comprising:

preparing a release coating composition which is a suspension including:

from 69.5 to 93 parts by weight of an oil having a viscosity in excess of 100 m Pa×s and a fire point in excess of 230° C., which oil is one of a mineral oil, a non-reactive silicone oil, and a mixture thereof;

from 5 to 20 parts by weight of a polytetrafluoroethylene powder having a particle size of less than 5μ;

from 0.5 to 10 parts by weight of an aqueous latex; and

from 0.5 to 2 parts by weight of a wetting agent; and

applying the release coating composition by coating at least a predetermined portion of at least one surface of the soft material, flat gasket therewith.

4,635,949

CYLINDER-HEAD GASKET

Jacques D. H. Lacas, and Dominique H. P. M. Samson, both of Oullins, France, assignors to Societe Anonyme Curty, Rhone, France

Filed Jun. 1, 1981, Ser. No. 268,852
Claims priority, application France, Jun. 2, 1980, 80 12478
Int. Cl.⁴ F16J *15/12*
U.S. Cl. 277—235 B **10 Claims**



1. A cylinder-head gasket comprising:

a sheet formed of a rigid organic and substantially nonthermoplastic material and having a plurality of gas-passage holes having edges and a plurality of liquid-passage holes having edges;

respective elastomeric seal rings secured to said sheet adjacent edges of said liquid-passage holes; and

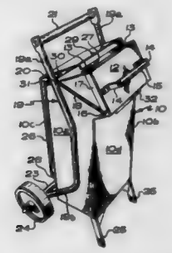
respective metallic rings secured to said edges of said gas-passage holes, each of said liquid-passage holes being surrounded by a thick portion of said sheet at said edges and being separated from the thick portion at an edge of another liquid passage by a region which is thinner than said thick portions.

4,635,950

TRANSPORTABLE HOT FAT CONTAINER

Richard Le Sage, 123 Knollwood Dr., Redwood Falls, Minn. 56283; Eugene N. Reshanov, 1309 Florida Ave. North, Golden Valley, Minn. 55427, and Richard A. Schlemmer, Rte. #3, Box 76, Redwood Falls, Minn. 56238

Filed Sep. 16, 1985, Ser. No. 776,371
Int. Cl.⁴ B62B *1/10*
U.S. Cl. 280—47.26 **20 Claims**



1. A means for safely transporting hot fats, comprising:

(a) a normally upright elongated container having a front side, a back side, and opposite lateral sides;

(b) said front side of said container having a spaced baffle plate associated therewith;

(c) a pair of support legs extending generally downwardly from said container adjacent said back side, and constructed and arranged to provide support to said container while in an upright position;

(d) a transverse axle located adjacent to and outside the vertical confines defined by the front side of said container;

(e) a pair of wheels rotatably mounted one each on each end of said axle;

(f) a pair of axle struts mounted to said container and carrying said axle and said wheels in a cooperative container-supporting relation with said support legs when said container is in its upright position;

(g) an axle handle carried by said axle between said wheels;

(h) a transport handle connected to said container to facilitate transportion of the container upon said wheels;

(i) said container having an inlet port at its upper end constructed and arranged to facilitate the collection of hot fats in said container; and

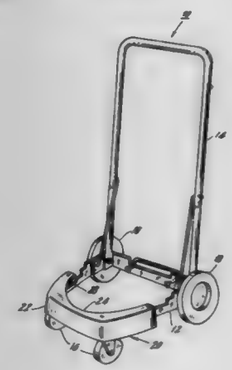
(j) a port covering means mounted to said container to cover said inlet port and being movable between its closed position and open position.

4,635,951

DOLLY BUMPER

Robert C. Berfield, Jersey Shore, and Robert L. Creviing, Jr., Williamsport, both of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.

Filed Jul. 19, 1985, Ser. No. 757,081
Int. Cl.⁴ B62B *3/10*
U.S. Cl. 280—47.34 **17 Claims**



11. A bumper for a cart having a frame for supporting a container, the bumper comprising:

an outer surface portion for being positioned at an outer side of the cart frame for protecting against damage in the event of collision between the cart and another object;

at least one securing element connected to the outer surface portion for securing the bumper to the cart frame, the securing element having a generally horizontal portion with an inner end for being positioned between a section of the cart frame and the container above the section of the cart frame with the inner end at an inner side of the cart frame opposite the outer side; the securing element also having a locking portion for preventing the removal of the bumper when the container is on the frame; and

said outer surface portion having an inner edge for being disposed toward a wall of the container on the frame, the inner edge being shaped to extend generally parallel to the wall of the container.

4,635,952

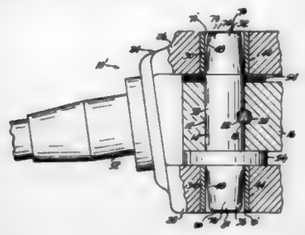
STEERING KNUCKLE AND KINGPIN ASSEMBLY

Joseph E. Smith, Birmingham, Mich., assignor to V. W. Kaiser Engineering, Inc., Millington, Mich.

Filed May 7, 1985, Ser. No. 731,557
Int. Cl.⁴ B62D *7/18*
U.S. Cl. 280—96.1 **18 Claims**

1. In a steering knuckle and kingpin assembly comprising a kingpin, means for fixedly supporting said kingpin, said kingpin having an upper end portion and a lower end portion, a wheel spindle knuckle pivotally mounted relative to said kingpin, said knuckle having an integral upper yoke having a bore disposed around said kingpin upper end portion and an integral lower yoke having a bore disposed around said kingpin lower end portion, a bushing disposed in said bore in said upper yoke, a bushing disposed in said bore in said lower yoke, said kingpin

end portions having a peripheral surface and said bushings having an internal surface defining mutual bearing surfaces, the improvement comprising at least one of said kingpin end portions having a peripheral surface of predetermined shape and an associated bushing having an internal surface of a second



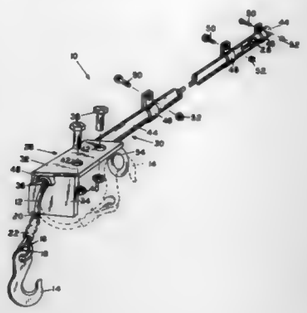
predetermined shape non-conforming with said first predetermined shape, whereby when a load is supported by said steering knuckle and kingpin assembly, said non-conforming shapes cause mutual bearing surface engagement of a relatively large area.

4,635,953

TOW CABLE WITH BRACKET AND STORAGE MEANS

Jesse C. Robertson, and Beverly M. Robertson, both of 395 N. 54th St., Springfield, Oreg. 97478

Filed Aug. 29, 1985, Ser. No. 770,524
Int. Cl.[4] B60D *1/18*
U.S. Cl. 280—480 **1 Claim**



1. A towing device, whereby a towing vehicle may pull a disabled vehicle, which comprises:

(a) a cable, having a first end, a second end, and a diameter, wherein attached to the said first end is a connector means for attachment to a disabled vehicle, and at the said second end there are means attached to significantly increase the said diameter of the said cable;

(b) a cable housing, having a first end and a second end, and being constructed of flexible tubing, of such diameter and length as to contain the said cable and the said second end means for increasing the said diameter of said cable;

(c) a bracket member for attachment to the undercarriage of the towing vehicle, said bracket member having an end plate oriented generally transverse to the longitudinal axis of the vehicle, said end plate of said bracket member having a hole formed therein of such size as to permit free passage of said cable but to deny through passage of the said cable with the said second end means for increasing the diameter of the said cable attached thereto;

(d) said cable housing being securely attached at its said first end to the said bracket so as to be aligned with said hole of said end plate of said bracket, wherein, when assembled, the said first end of said cable, with said connector means attached, extends through the said hole, and the said second end of said cable, with said second end means for increasing the said diameter of said cable attached, remains within the said cable housing;

(e) means for attaching the said cable housing at a plurality of locations between the said first end and the said second end of said cable housing to the said undercarriage of said towing vehicle; and

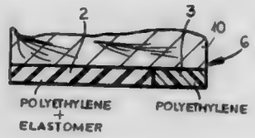
(f) connector receiving means, attached to said bracket, so as to provide for securing said connector means when the said cable is not in use and is stowed in said cable housing.

4,635,954

SKI WITH IMPROVED RUNNING SURFACE

Anton Arnsteiner, Mittersill, Austria, assignor to Blizzard Gesellschaft m.b.H., Salzburg, Austria

Filed May 28, 1985, Ser. No. 738,551
Claims priority, application Austria, May 25, 1984, 1730/84; Apr. 30, 1985, 1293/85
Int. Cl.[4] A63C *5/00*
U.S. Cl. 280—604 **16 Claims**



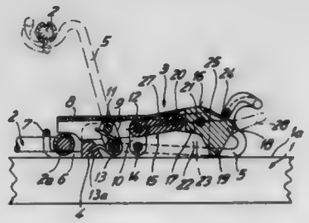
1. A ski comprising front tip and rear end members defining a ski length, said ski including a top surface and a bottom running surface along said ski length, said running surface having a coating which covers a portion of the middle region defined by the length of said ski, and extending substantially across the width thereof said coating consisting essentially of 20 to 80 wt. % of a polyethylene, and from 80 to 20 wt.% of an elastomer, said coating being free of particles and fibers.

4,635,955

DEVICE FOR RELEASABLY HOLDING PARTS OF SKI BINDINGS

Reinhold Zoor, München, Fed. Rep. of Germany, assignor to Heinrich Wunder GmbH & Co. KG, Dachau, Fed. Rep. of Germany

Filed Feb. 8, 1985, Ser. No. 699,926
Int. Cl.[4] A63C *9/084*
U.S. Cl. 280—614 **12 Claims**



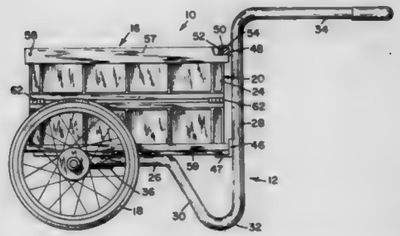
1. A device for releasably holding a movable component of a ski binding, particularly for releasably holding the pivotable boot support of a cross-country ski binding, comprising a retainer; and means for movably mounting said retainer at the upper side of the ski, including guide means for confining said retainer to movements between an operative position, in which the retainer holds the movable component, and an inoperative position along a composite non-circular path a portion at least of which is at least substantially parallel to the upper side of the ski, said guide means comprising mutually inclined first and second links, means for connecting said links to the ski for pivotal movement about fixed axes, and means for pivotally connecting said links to spaced-apart portions of said retainer.

4,638,956

COLLAPSIBLE CART

Roger J. Morrissette, 265 N. Woodstock Rd., Southbridge, Mass. 01550

Filed Mar. 13, 1985, Ser. No. 711,599
Int. Cl.[4] B62B *1/04*
U.S. Cl. 280—652 **5 Claims**



1. Cart comprising:

(a) an elongated longitudinal frame member having a horizontal rear portion, a vertical forward portion, and a freely extending front end which serves as a handle for the cart,

(b) an elongated horizontal cross frame member which is operatively connected to the rear end of the longitudinal frame member and which extends at a right angle to said longitudinal frame member,

(c) a pair of wheels which are rotatably mounted on opposite ends of the cross frame member,

(d) collapsible storage basket located at the rear of the said vertical portion, the basket having a horizontal bottom wall the basket also having vertical side walls whose lower edges are hingedly connected to the bottom wall, each side wall consisting of an upper and a lower portion joined centrally of the wall by a horizontal hinge to permit folding onto the bottom wall, the basket also having rear and front end walls the upper edges of which are hingedly pivoted to the respective ends of the side walls to permit swinging between the side walls, the basket being movable from an expanded state to a collapsed state in which the side walls and the end walls lie in horizontal orientation on the bottom wall,

(e) means for connecting the bottom wall to one of said frame members,

(f) a first bracket which is fixed to the vertical forward portion of said longitudinal frame member for supporting the forward end of the bottom wall, and

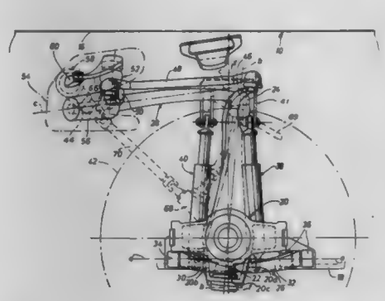
(g) a second basket which is fixed to the vertical forward portion of said longitudinal frame member, said second bracket having a rearwardly extending horizontal portion for freely engaging the top edge of said front wall when said storage basket is moved from the collapsed state to the expanded state and a lip portion which extends downwardly from the rearward end of said horizontal portion for freely engaging a rearward side of said front wall for stabilizing the storage basket when the basket is in the expanded state and preventing relative movement between the storage basket and the longitudinal frame member in a direction rearwardly of said vertical forward portion.

4,635,957

INDEPENDENT WHEEL SUSPENSION FOR A WHEEL OF A VEHICLE

Josef Merkle, Esslingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 14, 1984, Ser. No. 589,318
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1983, 3309152
Int. Cl.[4] B60G *3/00*
U.S. Cl. 280—663 **13 Claims**



1. Independent wheel suspension for a wheel of a vehicle comprising:

a wheel carrier having, at an upper end thereof, a steering linkage lever extending transversely toward the outside over the wheel;

a lower control arm connected at a lower end of said wheel carrier;

a steering tie rod extending in a first generally horizontal direction which is substantially parallel to a longitudinal axis of the vehicle, said steering tie rod having a first end connected to said steering linkage lever and a second end connected to a steering means; and

a rod shaped upper control arm extending in a second generally horizontal direction in substantially side-by-side relation with said steering tie rod, said upper control arm having approximately the same effective length as said steering tie rod, said upper control arm also having a first end connected to said wheel carrier at a point located laterally of and above said steerable wheel between said wheel and a body portion of said vehicle, and said upper control arm having a second end pivotably connected to a bearing member such that said upper control arm is pivotable about an upper bearing axis which extends obliquely from a point of intersection with a transverse vertical plane intersecting said wheel;

said steering tie rod and upper control arm extending in the direction from their respective connection toward the end of the vehicle adjacent the wheel, whereby said suspension arrangement effects a transverse guidance of said wheel while preventing intrinsic steering motions on the wheel in both the longitudinal and transverse direction of said vehicle when responding to driving induced movement of said wheel.

4,635,958

AUTOMOBILE SUSPENSIONS

Kenji Yonemoto, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

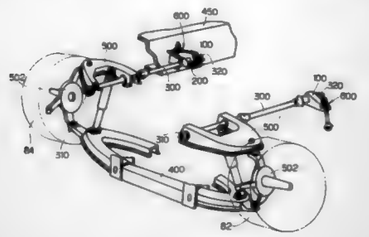
Filed Jul. 16, 1985, Ser. No. 755,442
Claims priority, application Japan, Jul. 18, 1984, 59-10942[U]
Int. Cl.[4] B60G *11/18*
U.S. Cl. 280—664 **13 Claims**

1. An automobile suspension for suspending a wheel on a body member of a vehicle comprising:

a support means including at least two walls and an upward projection, the two walls extending inwardly from the

body member in a lateral direction of the vehicle and having an interval defined therebetween, the projection located between the two walls, each of the two walls having at least one upper recess;

an arm causing a torsion force on a member connected to the wheel, said arm adapted to be mounted slidably on the member in a longitudinal direction of the member, said arm including at least two plates and a cylinder, said cylinder having a plurality of inner grooves, said member including an engagement device which slidably engages with said plurality of inner grooves, whereby said arm is slidable in the longitudinal direction of said member and is not rotatable about said member, the two plates extending in the lateral direction of the vehicle and having a space



defined therebetween, said cylinder penetrating the two plates with both ends of the cylinder projecting outwardly from the two plates, the ends of the cylinder adapted to be mounted on the at least one upper recess of each of the two walls of said support means, the upward projection of said support means adapted to be inserted in a bottom recess which is defined between the two plates and the cylinder, whereby said insertion of said upward projection of said support means in said bottom recess prevents said arm from sliding longitudinally relative to said support means but permits said arm to rotate relative to said support means; and

a securing means for securing opposite edges of the two plates of said arm to said support means.

4,635,959

SHOCK ABSORBER CONTROL SYSTEM

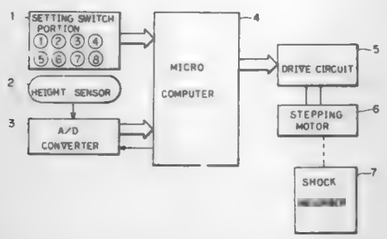
Yoshihisa Nakano, Nagoya; Masatoshi Ohira, Gifu; Manabu Ushida, Aisai; Tomoyuki Miyagawa, Obu, and Toshiya Shimodaira, Toyokashi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 29, 1985, Ser. No. 727,926

Claims priority, application Japan, Apr. 30, 1984, 59-88209

Int. Cl.⁴ B60G *17/08*

U.S. Cl. 280—707 **5 Claims**



1. A shock absorber control system for controlling a dampening force of a shock absorber of a vehicle comprising:

setting means for setting a desired dampening force changeable within a predetermined range;

drive means for driving said shock absorber to change the dampening force of said shock absorber linearly;

control means for controlling said drive means in accordance with said desired dampening force when the setting of said desired dampening force has been changed;

detecting means for detecting an actual dampening force of said shock absorber;

correcting means for correcting the dampening force of said shock absorber by controlling said drive means in accordance with a difference between said desired dampening force and said detected actual dampening force.

4,635,960

CONTROL SYSTEM FOR HYDRAULIC DAMPERS

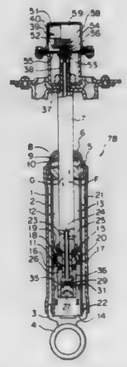
Takashi Shirakuma, Kanagawa, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Oct. 9, 1985, Ser. No. 785,899

Claims priority, application Japan, Oct. 19, 1984, 59-158033; Oct. 19, 1984, 59-158034

Int. Cl.⁴ B60G *11/26*

U.S. Cl. 280—707 **4 Claims**



1. A control system for controlling the damping force of a plurality of hydraulic dampers, each of said dampers including a damping force producing mechanism; a damping force adjustment member for adjusting the effective passage area of an oil passage in the damping force producing mechanism; and an actuator connected to the damping force adjustment member, said system characterized by comprising:

an indicator circuit for indicating the adjusted and en-route conditions of at least one damping force producing mechanism;

an electric power supply circuit for supplying electric power to respective actuators; and

said power supply circuit being provided with an inhibiting circuit for inhibiting the supply of power to an actuator associated with a damping force adjustment member which has already been adjusted, through a part of the power supply circuit associated with a damping force adjustment member which has yet not been adjusted.

4,635,961

AIR-SPRING SUSPENSION

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Feb. 25, 1985, Ser. No. 705,489

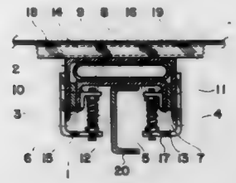
Int. Cl.⁴ B60G *11/26*

U.S. Cl. 280—711 **9 Claims**

1. An air-spring beam suspension system including at least one air-spring suspension beam or pad of elongated construction disposed intermediate a carriage frame supported on wheels and a passenger or cargo holding structure supported by said carriage frame, said air-spring suspension beam or pad comprising in combination:

(a) a first rigid elongated member including a substantially flat base and flanges extending from the boundary of said substantially flat base in a direction substantially perpendicular to a plane including said substantially flat base;

(b) a second rigid elongated member including a substantially flat base disposed adjacent to said first rigid elongated member in a parallel and superimposed relationship, said second rigid elongated member including flanges extending from the boundary of said substantially flat base in a direction substantially perpendicular to a plane including said substantially flat base, wherein said flanges of said second rigid elongated member guided by said flanges



of said first rigid elongated member in a sliding relationship provides a confined space intermediate said first and second rigid elongated members;

(c) a plurality of elastic containers containing compressed air or gas confined within said confined space intermediate said first and second rigid elongated members, said plurality of elastic containers including means for inflating or deflating said elastic containers;

(d) means for limiting the distance of separation between said first and second rigid elongated members; and

(e) means for damping the oscillatory movements of said first and second rigid elongated members relative to one another.

4,635,962

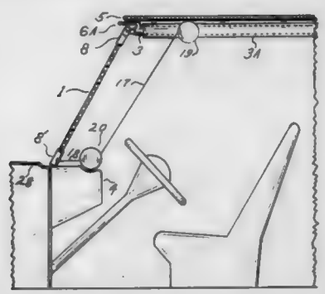
INERTIAL SAFETY SYSTEM FOR CARS

Thomas S. Miyada, P.O. Box 430, Summit, N.J. 07901

Filed Sep. 7, 1984, Ser. No. 648,482

Int. Cl.⁴ B60R *21/02*

U.S. Cl. 280—749 **5 Claims**



1. An inertial safety system for an automotive vehicle designed to prevent occupants of the vehicle's front seat and others from being thrown against or through the vehicle's front windshield when a fast moving vehicle suddenly stops in a collision or accident by providing a combination of a windshield that moves forwardly or upwardly away from the occupants of the front seat and a protective air net, said invention comprising in combination the following coordinating components:

(a) a forward and upward opening windshield having its upper side or frame hinged to supporting bars called arms, its three other sides unattached to, but in contact with, the front frame of the vehicle's body, and its forward and upward moveability and openability especially designed to take advantage of Newton's First Law of Motion and the inertial property of matters, but not for the purpose of ventilation;

(b) two tubes having open ends showing from under the edge of the front section of the vehicle's roof, one on the left and the other on the right side, and having their long side positioned horizontally and made parallel to the longitudinal line of the vehicle and securely installed immediately under said section of the roof;

(c) two rigid strong bars called arms, one on the left top side and the other on the right top side of the vehicle's windshield, each end of each arm safely hinged to its side of the windshield, the other end extending horizontally and slidably inside each of said paired tubes;

(d) a strong helical spring attached to the end of each of the said arms and to the midsection of the vehicle's roof capable of extending when the arm is pulled outward, and contracting when the outward pull is absent, thus permitting each arm to slide outward with the windshield or to slide backward into its normal position;

(e) a rotatable spool having a width approximately equal to that of the windshield, securely held under the vehicle's front roof and positioned parallel to the upper side of the windshield and containing a roll of net;

(f) a roller having a width about equal to that of the said spool and securely installed at approximately the level of the vehicle's dashboard;

(g) a paired openings, one in the left side and the other in the right side of the vehicle's front wall, communicating with the left and the right, respectively, of the bottom side of the windshield;

(h) protective net made of strong artificial cordage, thickly coated or encased in air bubble retaining foam rubber, and having meshes not larger than an infant's head, a width about equal to that of the said spool and the said roller, and possessing a pair of pulling cords, one on its left side and the other on its right side, which are pulled out of the said spool containing the net, pulled under the said roller, passed through the said openings in the front wall, and then securely attached to the left and the right, respectively, of the windshield's bottom side.

4,635,963

SEAT BELT DEVICE

Kazuo Higuchi; Hisakazu Okuhara, both of Tochigi, and Kiichi Sasaki, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 578,589, Feb. 9, 1984, abandoned. This application Apr. 24, 1986, Ser. No. 856,864

Claims priority, application Japan, Feb. 9, 1983, 58-20468

Int. Cl.⁴ B60R *21/10*

U.S. Cl. 280—801 **18 Claims**

1. A seat belt device for a seat of

(a) a seat belt;

(b) a retractor mounted on the inner wall of the vehicle body for winding up said seat belt;

(c) a hanger mounted on the vehicle body and above said retractor;

(d) a lever pivotally connected one end thereof to a part of the vehicle body and swingable in the back-and-forth direction with respect to the vehicle body;

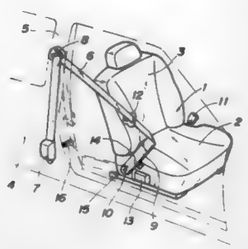
(e) said seat belt having a first end thereof coupled to said retractor, a second end thereof connected to a movable end of said lever, and an intermediate portion thereof loosely inserted through said hanger;

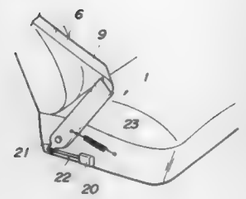
(f) fastener means composed of a tongue plate carried between said second end and said intermediate portion on said seat belt, and a buckle attached on the opposite side of the seat from the lever;

(g) drive means for driving said lever to move between a relatively forward first position and a relatively rearward second position;

(h) said drive means being actuatable in response to opening and closing movement of the door such that said lever is prevented from moving into said first position unless the door is closed and from moving into said second position unless the door is open; and

(i) the arrangement of the lever and seat being such that when said lever is in said first position, said movable end of said lever is located above an upper surface of the seat bottom, substantially forward of the entire front surface of the seat back, and below a straight line passing through a





front end of the upper surface of the seat bottom and an upper end of the front surface of the seat back for positioning at least a substantial proportion of the intermediate portion of the seat belt that extends between the hanger and the lever movable end both above the seat bottom and forward of the front of the seat back, as viewed from a lateral side of the seat, for convenient access to the seat belt and tongue plate by an occupant of the seat for fastening the seat belt by connecting the tongue plate to the buckle.

4,635,964

SEATBELT ASSEMBLY

Nobuyuki Ryu, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed May 30, 1985, Ser. No. 739,174

Claims priority, application Japan, Sep. 28, 1984, 59-146741[U]

Int. Cl.⁴ B60R *21/00*

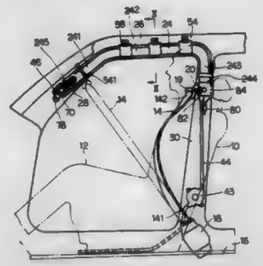
U.S. Cl. 280—804 **23 Claims**

1. A seatbelt assembly for automatically fastening a restraining webbing around an occupant in a vehicle, comprising:

a guide rail having a first and a second end, a longitudinal guide groove running between said first and second ends, an longitudinal wire receiving groove located on said guide rail and a separating wall physically separating the longitudinal guide groove from the longitudinal wire receiving groove thereby preventing the longitudinal guide groove from communicating with the longitudinal wire receiving groove;

a slider which is displaceable along said longitudinal guide groove, said restraining webbing being fastened at one end thereof to said slider;

a detecting means for detecting arrival of the slider at said first end of said guide rail; and



a connecting wire connected to said detecting means, the connecting wire being located within the longitudinal wire receiving groove, whereby said connecting wire is protected by said longitudinal wire receiving groove.

4,635,965

INFORMATION CARRIER IN THE FORM OF A CARD

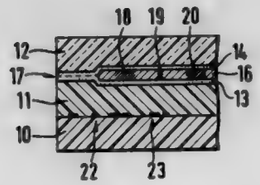
Werner Vogt, Schlieren, Switzerland, assignor to Interlock Sicherheitsysteme, Schlieren, Switzerland

Continuation of Ser. No. 613,841, May 24, 1984, abandoned, which is a division of Ser. No. 399,949, Jul. 20, 1982, Pat. No. 4,464,454. This application Sep. 9, 1985, Ser. No. 773,851

Claims priority, application Switzerland, Jul. 20, 1981, 4753/81

Int. Cl.⁴ B42D *15/00*

U.S. Cl. 283—112 **12 Claims**



1. An information carrier in the form of an identification card, consisting of a multiplicity of plastic layers bonded together in a block, which comprises at least a first covering plastic layer, an adhesive layer on one side of said at least first covering plastic layer, a developed photographic emulsion including multiple types of visible information data secured by a first side onto said one side of said at least first plastic layer by said adhesive, a second carrier plastic layer applied onto a second side of said developed photographic emulsion, all of said layers are bonded together to form said identification card, whereby said emulsion extends to the outer edges of said identification card between said carrier and covering layers having a continuous edge in the vicinity of the edges of the card, said continuous edges being of water repellent quality.

4,635,966

HOSE CONNECTOR

John T. Hermann, Livonia, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Sep. 20, 1985, Ser. No. 778,102

Int. Cl.⁴ F16L *33/00*

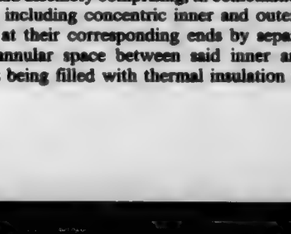
U.S. Cl. 285—3 **3 Claims**

1. A hose connector in the form of a composite assembly to facilitate connecting a bare hose end to a fitting solely by insertion of the hose therein, comprising:

a hose receiving nipple shaped member having an elongated main body portion, the member also having a first end with an enlarged bead portion for first receiving the hose end thereover and for producing limited radially outward expansion of the hose adjacent the bead, the member being axially apertured to form a passage therethrough for transmitting fluid from and to the hose;

a hollow housing encircling the nipple shaped member and defining a generally cylindrically configured interior and with an open end radially spaced from the bead portion to permit insertion of the hose end over and along the nipple shaped member, the housing being supported about the nipple shaped member at an opposite end;

a radially expandable snap ring within the housing having a generally circular shape and an inner diameter relative to the outer diameter of the hose when in a non-expanded configuration so as to exert an inwardly radially constrictive force on the hose, the ring having a radially directed separation forming facing end surfaces which are movable apart in the circumferential direction of the snap ring against the ring's elasticity to a stressed configuration characterized by an enlarged and slightly elliptical inner opening of sufficient dimension relative to the outer hose



surface to facilitate insertion of the hose therethrough while sliding over the main body portion of the nipple shaped member;

a snap ring spacer member supported by the housing and including a portion within the interior of the housing defining a pair of oppositely facing spacing surfaces which are separated sufficiently to maintain the end surfaces of the snap ring apart and, thus, in the stressed configuration with the end surfaces of the snap ring bearing respectively on the end spacing surfaces of the spacing member prior to completion of the hose connection;

the spacer member further including an inwardly extending portion for contact by the hose end to produce axial movement of the spacer member in the housing as the hose is fully inserted over and along the main body of the nipple shaped member;

means on the housing member to block axial movement of the snap ring corresponding to the aforesaid axial movements of the spacer member by insertion of the hose end whereby full insertion of the hose end causes disengagement between the spacer's spacing surfaces and the end surfaces of the snap ring to permit radial contraction of the snap ring about the hose.

4,635,967

INTERNAL SEAL FOR INSULATED STEAM INJECTION CASING ASSEMBLY

Edgar O. Stephenson, Tacoma, Wash., assignor to Kawasaki Thermal Systems, Inc., Tacoma, Wash.

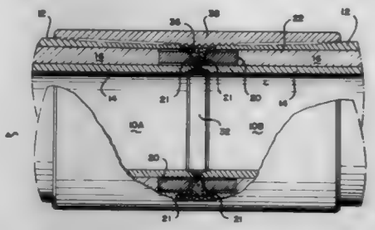
Filed Mar. 29, 1985, Ser. No. 717,559

Int. Cl.⁴ F16L *55/00*

U.S. Cl. 285—45 **8 Claims**

1. An insulated casing assembly for conveying a high temperature fluid, said assembly comprising, in combination, a pair of casings each including concentric inner and outer tubular sections joined at their corresponding ends by separate ring members, the annular space between said inner and outer tubular sections being filled with thermal insulation material,

the interior surfaces of said inner tubular section adjacent its ends being tapered to provide recessed sealing seats and the exterior surfaces of said outer tubular section being threaded adjacent its ends, a sealing ring having a radially outwardly extending rib and flexible oppositely axially extending sealing lips having tapered sealing surfaces, the inner diameter of said sealing ring being substantially equal to the inner diameter of said inner tubular sections, said sealing ring being positioned between adjacent ends of said pair of casings with said rib



extending into the space between adjacent ends of said pair of casings, said sealing surfaces of said lips engaging said sealing seats of said annular tubular sections, and a threaded coupling sleeve engaging said threaded ends of said outer tubular sections and adapted when tightened to force said sealing surfaces of said lips into fluid and thermal sealing relation with said sealing seats, the width of said rib being such that the ends of said casings are out of contact with said rib when said seal is effected between said sealing ring and said casings.

4,635,968

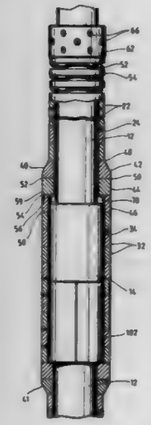
METHOD AND APPARATUS FOR PROTECTING CONSECUTIVE MULTIPLE VARIABLE DIAMETER COUPLINGS

Karl F. Kuhne, Spring, Tex., assignor to Carbide Blast Joints, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 732,703, May 10, 1985. This application Nov. 26, 1985, Ser. No. 802,513

Int. Cl.⁴ F16L *55/00*

U.S. Cl. 285—45 **11 Claims**



6. An apparatus for protecting consecutive multiple protective joints on tubulars, each tubular having a body portion and an increased diameter portion for coupling to another tubular, at least a part of the body and increased diameter portions of each tubular to be included in a zone to be protected, said apparatus comprising:

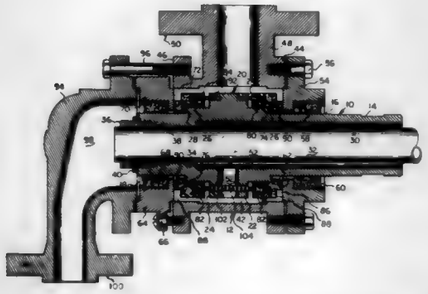
a plurality of protective members including:
a sleeve coaxially located along the body portion of the second tubular, said sleeve forming an extension of the increased diameter portion coaxially located along the body portion of the first tubular;
a plurality of first generally cylindrical annular protective rings coaxially located over the body portion of the first and second tubulars;
a plurality of second generally cylindrical annular protective rings coaxially located over the increased diameter portion of the first tubular and the sleeve; and
first and second transition ring formations, each having first and second faces with an inside and outside diameter at its first face approximately equal to the inside and outside diameter, respectively, of the first protective rings and an outside diameter at its second face approximately equal to the outside diameter of the second protective rings, the first transition ring being coaxially located on the first tubular between the first and second protective rings and near the increased diameter portion and the second transition ring formation being coaxially located on the second tubular between the first and second protective rings and near the sleeve; and
biasing means coaxially located along one of the tubulars and engagable at one end with a retainer coaxially located on the tubular and at the other end with at least one of the protective members to thereby sealingly engage the protective members to form a protective joint over the tubulars.

4,635,969

ROTARY JOINT WITH BALANCED SEALS

Eldon D. Jackson, Three Rivers, Mich., assignor to The Johnson Corporation, Three Rivers, Mich.

Filed May 31, 1985, Ser. No. 739,862
Int. Cl.⁴ F16L *39/04*
U.S. Cl. 285—95 **6 Claims**



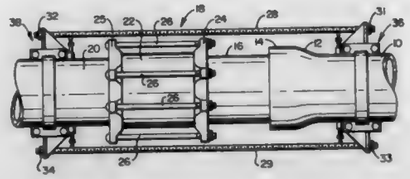
1. A rotary joint for use with a rotary heat exchanger drum particularly suitable for use with a high pressure fluid medium comprising, in combination, an elongated tubular one-piece nipple adapted to be coaxially attached to a drum shaft for rotation therewith about the drum axis of rotation, said nipple including an inner cylindrical end region, an outer cylindrical end region and a central region, said central region being of a greater diameter than the diameter of said end regions and including a central radial flange having opposed, axially spaced radial sides, a cylindrical surface defined upon said central region adjacent each flange side of a diameter greater than that of said nipple end regions, a body having first and second ends and a chamber defined therein intersecting said ends, an inlet defined in said body in communication with said chamber, said nipple central region being located within said chamber and said inner end region being exteriorly located with respect to said body, an annular wear plate mounted upon said body first end, an annular assembly plate mounted upon said body second end, said nipple inner end region extending through said wear plate, said nipple outer end region extending into said assembly plate, inner radial seal faces defined upon said plates within said chamber, axially spaced annular bushings interposed between said wear plate and nipple inner end region and said assembly plate and nipple outer end region, respectively, first and second annular seals sealingly mounted upon said nipple central region for axial displacement thereon and axially spaced from each other, one of said seals being mounted upon each cylindrical surface defined adjacent each flange side whereby said seals are located upon opposite sides of said flange, said first seal sealingly engaging said wear plate seal face and said second seal sealingly engaging said assembly plate seal plate, each of said seals having a radial first pressure face and a radial second pressure face in opposed relation and exposed to the fluid pressure within said chamber, the area of said first pressure faces being slightly larger than the area of said second pressure faces whereby the fluid pressure of said first pressure faces forces said seals toward their associated plate seal face, and an orifice defined in said nipple central region establishing communication between said chamber and the interior of said nipple.

4,635,970

THRUST ROD ANCHOR FOR PIPE JOINT RESTRAINT SYSTEMS

Robert E. Haines, 4699 Chantry Ct., Columbus, Ohio 43220

Continuation-in-part of Ser. No. 540,193, Oct. 7, 1983, abandoned. This application Aug. 20, 1985, Ser. No. 767,414
Int. Cl.⁴ F16L *13/04*
U.S. Cl. 285—114 **22 Claims**



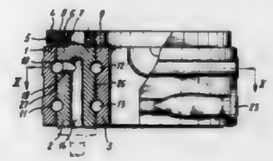
1. A thrust rod anchor for connection to a pipe of given external surface diameter, comprising:
arcuate band means including two arcuate band segments of predetermined width, each having an inwardly disposed surface of diameter substantially corresponding with said pipe external surface diameter and a predetermined circumferential length extending between the ends thereof so as to be mountable in end-to-end configuration around the surface of said pipe;
junction means weldably fixed to each arcuate band segment end and having a joining surface extending outwardly therefrom;
connector means for drawing adjacently disposed joining surfaces of said junction means towards each other to tension said band means about said pipe external surface; and
at least two selectively spaced thrust rod connectors each having a thrust bearing plate rigidly supported by the assemblage of components including said arcuate band means and said junction means by welded connection with at least one said component segment end located at one said arcuate band for restraining forces developed within said thrust rods along a predetermined direction from a remote connection thereof, said plate having an opening formed therein for receiving a said thrust rod spaced a predetermined distance from said pipe external surface when said anchor is mounted thereupon, and each said thrust rod connector including buttress means extending toward said remote connection and rigidly supported by said assemblage for restrainably supporting said thrust bearing plate.

4,635,971

ROTATABLE PIPE COUPLING FOR A PLURALITY OF INCOMING AND A PLURALITY OF OUTGOING PIPES

René Perratone, Menton, and Leendert Poldervaart, La Turbie, both of France, assignors to Single Buoy Moorings Inc., Marly, Switzerland

Filed Sep. 24, 1984, Ser. No. 654,094
Claims priority, application Netherlands, Sep. 23, 1983, 8303278
Int. Cl.⁴ F16L *39/04*
U.S. Cl. 285—134 **5 Claims**



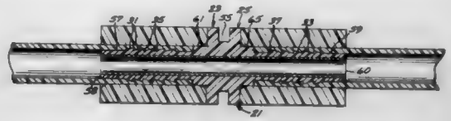
1. A rotatable coupling for a plurality of incoming and outgoing pipes, comprising at least three annular bodies having a common central axis and each having a plurality of pipe connections, at least one of said bodies being rotatable relative to at least one stationary said body about said axis, said bodies being disposed concentrically with respect to one another in a common plane perpendicular to said axis, and means to retain said bodies in said common plane, said bodies being sealingly connected to one another by mutually facing cylindrical surfaces which over their entire axial length have a substantially constant diameter, of which cylindrical surfaces at least one of each pair of facing surfaces is provided with a plurality of recesses forming circumferential channels communicating with incoming and outgoing pipes and sealing rings positioned between said facing surfaces sealingly separating said channels from one another.

4,635,972

PLASTIC PIPE COUPLING APPARATUS AND METHOD OF USING SAME

Robert W. Lyall, Huntington Beach, Calif., assignor to R. W. Lyall & Company, Inc., Santa Fe Springs, Calif.

Filed May 13, 1985, Ser. No. 732,932
Int. Cl.⁴ F16L *47/00*
U.S. Cl. 285—242 **21 Claims**



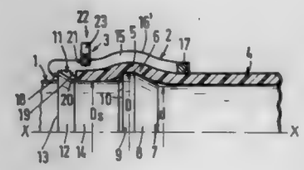
1. A plastic gas pipe coupling system comprising:
at least one plastic pipe having predetermined inside and outside diameters and formed by a wall constructed of relatively rigid plastic material flowable at ambient temperature under a predetermined compressive pressure;
a plastic fitting formed with an annular wall defining a through axial bore and including circular flange means defining at least a first flange member having a compressive tool abutment surface, said circular flange means having at least a first spigot projecting axially therefrom, the outer periphery of said spigot being formed with a minor diameter and a plurality of, axially spaced apart, frusto-conically shaped sealing rings radiating outwardly from said minor diameter to a major diameter, each arranged to taper rearwardly toward said flange member and radially outwardly to form respective conical wedge surfaces and then breaking inwardly to form respective annular stop faces, said wedge surfaces and annular stop faces cooperating, in cross-section, to form saw tooth shaped grooves;
a plastic completion sleeve for telescopical receipt on said pipe to be telescoped into coaxial relationship with said spigot;
said sealing rings being sized to be received telescopically into the extremity of said plastic pipe to wedge the wall of said pipe to a radially expanded configuration, said sleeve being characterized in that it is formed with an interior diameter sufficiently smaller than the exterior diameter of said expanded configuration of said pipe and possesses sufficient tensile strength to cause it, when telescoped along said pipe and onto said expanded configuration of said pipe at ambient temperatures to maintain said interior diameter and thereby press the wall of said pipe radially inwardly under a pressure at least as great as said predetermined compressive pressure to cold flow the plastic of the wall of said pipe radially inwardly into said saw tooth shaped grooves to maintain the wall of said pipe compressed in sealing, coaxial, engagement with said grooves and sealing rings; and
a support tube telescopically received in said bore and cooperating with the wall of said spigot to support such spigot wall against radial inward collapse as said predetermined compressive pressure is applied to said expanded configuration of said pipe pressing it radially inwardly on said spigot.

4,635,973

HOSE COUPLING

Heinz Sauer, Rosenberg, Fed. Rep. of Germany, assignor to Rasmussen GmbH, Maintal, Fed. Rep. of Germany

Filed Jan. 11, 1985, Ser. No. 743,603
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1984, 3424675
Int. Cl.⁴ F16L *33/23*
U.S. Cl. 285—242 **10 Claims**



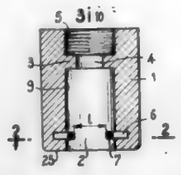
1. A coupling for one terminal portion of a flexible hose whose terminal portion has an end face, comprising a tubular member including an end portion, a second portion, a circumferentially extending external deforming rib for deforming the hose, located between said end and second portions and a second circumferentially extending external rib, said second portion being disposed between said ribs and said second rib having a first flank facing away from said deforming rib and a conical second flank which tapers toward the axis of said tubular member in a direction toward said end portion, said end and second portions and said deforming rib of said tubular member being surrounded by the terminal portion of the hose in the assembled condition of the coupling; a tubular clamping member including a circumferentially complete annular portion surrounding the hose and radially spaced apart from said tubular member in assembled condition of the coupling, and a plurality of elongated substantially axially parallel elastic prongs having first ends integral with said annular portion and free second ends, said prongs being radially external to the terminal portion of the hose and radially outwardly overlying said end and second portions and said deforming rib of said tubular member in assembled condition of the coupling, at least some of said prongs having radially inwardly extending pro-

jections adjacent to said first flank in assembled condition of the coupling and at least some of said prongs further having teeth extending radially inwardly and being adjacent to the end face of the terminal portion of the hose in assembled condition of the coupling, said teeth being outwardly adjacent to the second rib of said tubular member, said clamping member having a composite circumferentially extending recess formed by external sockets provided in said prongs and surrounding the second portion of said tubular member and the terminal portion of the hose in assembled condition of the coupling, the end face of the terminal portion of the hose being disposed between said projections and said recess, as seen in the axial direction of said tubular member, in assembled condition of the coupling; and a compressing ring received in said recess and arranged to press said prongs against the terminal portion of the hose.

4,635,974
RAPIDLY ASSEMBLED AND DISASSEMBLED CONNECTING DEVICE

Grégoire Moussaian, Résidence Les Plantines, 78840 Freneuse, France

Filed Nov. 25, 1983, Ser. No. 555,632
Claims priority, application France, Nov. 25, 1982, 82 19800
Int. Cl.⁴ F16L *37/00*
U.S. Cl. 285—305 1 Claim



1. A connecting device capable of rapid assembly and disassembly, said device comprising:

a female element having a longitudinal axis and including a body having therein a chamber defining a socket, said female element having therein two substantially parallel rectilinear passages located on opposite sides of said chamber, said passages extending entirely through said body of said female element and communicating with the exterior of said body of said female element;

a male element having a spigot complementary in shape to said chamber, said spigot having formed in opposite sides thereof two substantially parallel rectilinear recesses;

said female and male elements being relatively movable axially between a first axial position, whereat said spigot extends into said chamber, and a second axial position, whereat said spigot is withdrawn from said chamber;

said female and male elements being relatively rotatable about said axis when said elements are in said first axial position between a locking position, whereat said recesses are aligned with respective said passage, and a releasing position, whereat said recesses and passages are out of alignment;

a resiliently yieldable retaining member comprising a U-shaped spring member having two branches capable of being resiliently spread apart without permanent deformation, said branches extending into respective said passages and into respective said recesses when said female and male elements are in said locking position, thereby locking said female and male elements in said first axial position, and said branches, upon relative rotation of said female and male elements to said releasing position, being resiliently spread apart to remove said branches from said recesses, thereby enabling axial movement between said female and male elements to said second position;

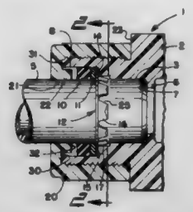
said passages having widths sufficient to permit insertion therethrough of said branches with said branches extending obliquely with respect to each other, and to allow additional spreading apart of said branches over the entire length thereof upon axial movement of said female and male elements from said second axial position to said first axial position; and

second recesses formed in said female element, each said second recess extending between respective adjacent ends of said passages, and said branches having respective opposite end portions deformed to fit in said second recesses when said female and male elements are in said locking position.

4,635,975
QUICK-CONNECT TUBE COUPLING

Lawrence C. Campbell, Berea, Ohio, assignor to Jaco Manufacturing Company, Berea, Ohio

Filed Sep. 25, 1985, Ser. No. 780,076
Int. Cl.⁴ F16L *17/02*
U.S. Cl. 285—340 10 Claims

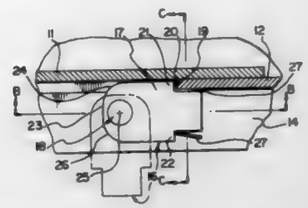


1. A tube coupling comprising a body member having a bore for receiving the end of a tube, a first counterbore adjacent the outer end of said body member having a diameter greater than the diameter of said bore, a second counterbore between said bore and first counterbore having a diameter greater than said bore and less than said first counterbore, a gripper ring contained within said body member, said gripper ring including an annular substantially radially flat outer ring portion received in said first counterbore, said outer ring portion having an inner diameter greater than the outer diameter of the tube and an outer diameter greater than the diameter of said second counterbore and less than the diameter of said first counterbore, and a plurality of gripper ring fingers at the inner diameter of said outer ring portion, said gripper ring fingers extending radially and axially inwardly beyond the axial innermost surface of said outer ring portion into said second counterbore, said gripper ring fingers having axial inner ends which when in an unstressed condition have an inner diameter which is less than the outer diameter of the tube to be inserted therein, and retaining means for retaining said gripper ring in said body member with said gripper ring fingers extending at least part way into said second counterbore, whereby when the tube is inserted into the bore past said gripper ring fingers and a pulling force is applied to the tube, said gripper ring fingers will bite into the tube preventing withdrawal of the tube from said tube coupling, the axial inner ends of said gripper ring fingers having arcuate cutting edges, with corners at the ends of the arcuate length of each of said arcuate cutting edges, said arcuate cutting edges being deformed radially outwardly from said corners toward the center of each of said arcuate cutting edges whereby said corners will bite into the tube first when the tube is inserted into the bore past the gripper ring fingers and a pulling force is applied to the tube.

4,635,976
SLIDING WINDOW LOCK

Jeffrey J. Sigler, 13 Carmichael Court, Kanata, Ontario, Canada (K2K 1K1)

Filed Feb. 15, 1984, Ser. No. 580,342
Int. Cl.⁴ E05C *5/02*
U.S. Cl. 292—57 26 Claims



1. A lock assembly for a sliding closure having a fixed panel (11) and a sliding panel (12) mounted within a frame (13) for sliding movement along a predetermined direction of movement within said frame; said sliding panel (12) movable along said direction between a closed position and an open position with said sliding panel presenting a leading edge (20) generally transverse to said direction of movement; said assembly comprising:

a block (17);

pivot means (18) for pivotally attaching said block (17) to said frame (13) with a pivot axis (25) disposed on a side of said leading edge (20) away from said open position with said pivot axis generally perpendicular to said direction of movement; said block (17) pivotable about said axis between a lock position and an unlocked position;

said block (17) having a lock surface (19) opposing said leading edge (20) when said block (17) is pivoted to said lock position and said sliding panel (12) is in said closed position with said lock surface (19) spaced from said leading edge (20) a distance to present a clearance sized to permit passage of said lock surface (19) through said clearance as said block (17) is pivoted from said lock position to an unlocked position;

anchor means for restraining said block (17) from pivotal movement when said block (17) is in said locked position and comprising cooperating mating elements (31, 32) on said block member and said frame with said elements (31, 32) free to slide relative to one another in a straight path parallel to said pivot axis, said mating elements movable a predetermined stroke between a captured position and a free position with said elements (31, 32) in said free position free to move relative to one another perpendicular to said pivot axis and with said elements (31, 32) in said captured position restrained from movement other than movement in said straight path; and

said pivot means including means for moving said block away from said frame in a path parallel to said straight path a distance greater than said stroke.

4,635,977
DOOR HANDLE DEVICE UNLOCKABLE FROM INDOOR SIDE

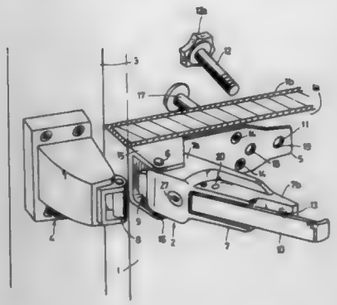
Kouichi Yamada, Yokohama, Japan, assignor to Takigen Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1984, Ser. No. 683,350
Claims priority, application Japan, Jun. 14, 1984, 59-068706[U]
Int. Cl.⁴ E05C *15/02, 5/02*
U.S. Cl. 292—92 6 Claims

1. A door handle device unlockable from an indoor side of a door, the device comprising:

a handle unit (2) fastened to a door, and a latch receiver unit (4) fastened to a wall of a compartment (3), said handle unit (2) consisting of a fixed seat (5) attached to said door, and a movable body (7) connected to said fixed seat by a pivot (6), said movable body being provided with a slidable latch member (9) adapted to engage with and disengage from a latch-receiving member (8) of said latch receiver unit (4);

an operating handle (10) adapted to drive said latch member (9) slidingly in a backward direction against a spring (31);

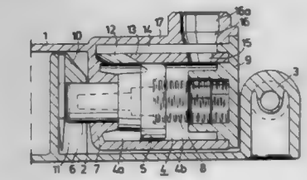


a setting bolt (12) inserted into a through bore (19) provided in said door and engaged with a threaded bore (13) provided in a rear portion of said movable body (7) so as to secure said movable body to said door, said setting bolt having an operating portion (12a) positioned inside of said compartment and adapted to be turned relative to the movable body to remove the setting bolt from the threaded bore and permit opening the door.

4,635,978
LOCKING DEVICE WHICH CAN BE OPENED BY MEANS OF A PRESSURIZED FLUID AND A PRESSURIZED-FLUID NOZZLE THEREFOR

Klas Stoltz, Majgardsvägen 5, S-141 44 Huddinge; Bo Gustavsson, Glikvägen 9, S-141 72 Huddinge, and Kerstin Gustavsson, Vipanvägen 40, S-145 72 Norsborg, all of Sweden

Filed Feb. 14, 1984, Ser. No. 579,956
Claims priority, application Sweden, Feb. 24, 1983, 8301034
Int. Cl.⁴ E05C *1/06;* F01B *31/00*
U.S. Cl. 292—144 3 Claims



1. A locking system including at least one lock and at least one pneumatically operable opening means for said lock; said lock comprising:

a latch bolt having a locked position and an unlocked position,

a cylinder with a cylinder wall and sealed end walls,

a plunger arranged for axial movement within said cylinder and dividing the interior thereof into a first cylinder chamber and a second cylinder chamber, said plunger being connected to said latch bolt,

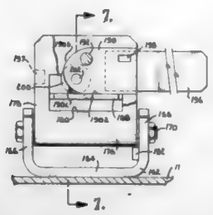
spring means urging said plunger in a direction towards a first terminal position in said cylinder corresponding to said locked position of said latch bolt,

a fore-chamber located externally of said cylinder and separated from the interior thereof by said cylinder wall,

a first through-passing opening provided in said cylinder

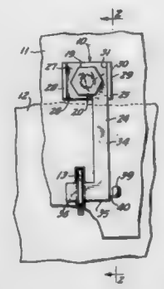
wall between said first cylinder chamber and said fore-chamber, and
a second through-passing opening provided in said cylinder wall between said second cylinder chamber and said fore-chamber, and
a third through-passing opening provide in an external wall of said fore-chamber between said fore-chamber and the surrounding atmosphere, said third through-passing opening being located in alignment with said second through-passing opening in said cylinder wall;
and said opening means comprising:
an elongate nozzle separate from and freely movable relative to said lock,
said nozzle having a first end formed for connection to a source of pressurized gas and a second end manually and removably insertable into said second and third, mutually aligned openings of said lock,
said second end of the nozzle having an external surface including a first annular surface portion locate close to the extremity of said second end of the nozzle and formed to provide a sealing fit in said second opening of the lock when inserted therein, and a second annular surface portion axially spaced from said first annular surface portion and formed to provide a sealing fit in said third opening of the lock when inserted therein,
and said nozzle further having at least one first internal channel extending from said preasurized gas source connection and opening into said external surface of the nozzle between said first and second annular portions, and at least one second internal channel extending from an axial opening at the extremity of said second end of the nozzle and opening into the external surface of the nozzle between said second annular surface portion and said first end of the nozzle.

4,635,979
LATCH DEVICE FOR RAILCAR HATCH COVERS
Orville E. Blume, Buchanan County, Mo., assignor to Aero Transportation Products, Inc., Kansas City, Mo.
Filed Jun. 11, 1984, Ser. No. 619,582
Int. Cl.[4] E05B *65/18*
U.S. Cl. 292—256.5 **2 Claims**



1. A latch device for a railcar hatch cover which closes on a compressible gasket and which has a projecting tongue, said latch device comprising:
a mounting bracket adapted to be mounted on the railcar;
a pair of spaced apart latch plates mounted on said bracket for movement about a generally horizontal hinge axis between an operating position and a storage position, said latch plates presenting an opening located to receive the tongue when the latch cover is closed and said latch plates are moved to the operating position and said latch plates being substantially parallel to one another and being substantially perpendicular to said tongue in the operating position;
a pivotal latch bar mounted on said latch plates for swinging movement between latching and release positions about a pivot axis oriented substantially perpendicular to said hinge axis, said bar having a pair of substantially parallel bar members spaced apart from one another and fitting between said latch plates;
a cam surface on said latch bar confronting the top of the tongues between the latching and release positions of the bar, said cam surface having a high area adjacent a latching surface of said bar to push the tongue down for forcing the cover down on the gasket to compress same beyond a partially compressed condition when said high area confronts the tongue whereby to resist initial movement of the latch bar away from the latching position, said cam surface gradually releasing from the tongue as said bar is swung toward the release position; and
a roller mounted between said bar members for rotation at a location to provide said high area of the cam surface.

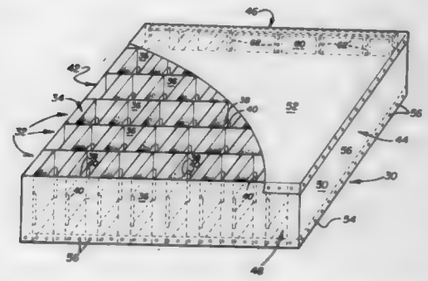
4,635,980
LOCK ASSEMBLY FOR METALLIC COVERS
Paul V. De Luca, Plandome Manor, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.
Filed Nov. 21, 1985, Ser. No. 800,269
Int. Cl.[4] E05C *19/08*
U.S. Cl. 292—281 **2 Claims**



1. An improved lock assembly for use in securing a cover to a housing for telephone apparatus and the like, the housing having a projecting bracket forming a loop opening normally engaged by a padlock hasp or similar locking device, the cover having a slotted opening surrounding said bracket; said lock assembly comprising: a hook element of generally elongated configuration having a planar base member forming first and second ends; said first end having a through bore therein and a pair of flanges laterally extending from the plane of said base member on either side of said bore to form a channel therebetween; said second end having a laterally extending projection in the plane of said base member selectively positionable in said loop opening; a threaded bolt having a polygonal head positioned within said channel, and a threaded shank penetrating said bore in said first end and a through bore in said cover, and a nut threadedly engaging said threaded shank; said polygonal end of said bolt being engageable by a socket tool of corresponding configuration of outer diameter corresponding to the effective width of said channel; said nut, upon tightening preventing removal of said projection of said second end out of said loop opening.

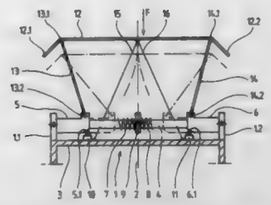
4,635,981
IMPACT ATTENUATING BODY
Warren D. Fritos, Union City, Calif., assignor to Energy Absorption Systems, Inc., Chicago, Ill.
Filed Oct. 29, 1984, Ser. No. 665,721
Int. Cl.[4] B60R *19/02*
U.S. Cl. 293—1 **35 Claims**

1. An impact attenuating body adapted to be engaged by vehicles or other objects moving in generally a selected direction of travel, the impact attenuating body being further adapted for gradually arresting motion of the moving object and dissipating its impact energy, comprising
frame means comprising a plurality of laterally extending, spaced members and forming multiple rows of vertically arranged cells therebetween,
said rows of cells being formed in transverse relation to the travel direction, said cells in each row providing differing effective degrees of shock absorption, including first cells having a higher effective degree of shock absorption and



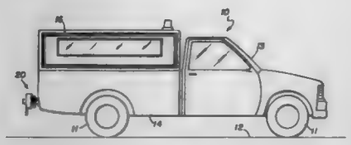
second cells having a lower effective degree of shock absorption whereby movement of the object is arrested as it travels a selected distance after initial engagement with the body, said arrangement and cross-sectional shape of said cells selected such that selected ones of the first cells are situated in front of respective selected ones of the second cells in the travel direction.

4,635,982
COLLISION PROTECTION DEVICE FOR INDUSTRIAL VEHICLES, ESPECIALLY INDUSTRIAL TRUCKS
Hansueli Feldmann, and Max Brändli, both of Safnern, Switzerland, assignors to Invention AG, Hergiswil, Switzerland
Filed Feb. 24, 1986, Ser. No. 832,255
Claims priority, application Switzerland, Mar. 1, 1985, 933/85
Int. Cl.[4] B60R *19/02*; B60T *7/22*
U.S. Cl. 293—2 **6 Claims**



6. A collision protection device for protecting an industrial vehicle having a vehicle chassis, an overall width and a longitudinal axis against collision with an obstacle, comprising:
a displaceable collision protector having a rest position;
a de-energizing means cooperating with said displaceable collision protector;
said displaceable collision protector extending at least over said overall width of said industrial vehicle;
at least one spring means for generating a biasing force;
means enabling said biasing force to retain said moveable collision protector in said rest position;
said de-energizing means being adapted for causing said industrial vehicle to stop when said displaceable collision protector is moved against said biasing force by collision with said obstacle;
said enabling means including two swing arms each having a first end and a second end for mounting said displaceable collision protector on said vehicle chassis;
said two swing arms being oriented in mutually non-parallel relationship in said rest position of said displaceable collision protector;
said first end of each said swing arm being pivotably mounted on said displaceable collision protector;
said enabling means further including two sliding link members;
said second end of each said swing arm being pivotably mounted on a respective sliding link member of said two sliding link members;
a cross-shaft mounted on said vehicle chassis for mounting said at least one spring means and said two sliding link members;
said two sliding link members being subject to the influence of said biasing force and being displaceable on said cross-shaft;
switching cam means for said sliding link members for enabling said two sliding link members to cooperate with said de-energizing means when said two sliding link members are displaced against said biasing force;
two flexible retaining elements arranged on respective sides of said longitudinal axis; and
said displaceable collision protector being connected directly with said vehicle chassis by said two flexible retaining elements.

4,635,983
REAR BUMPER ASSEMBLY FOR CABLE PULLING TRUCK
Donald P. Boland, Downers Grove; William Menz, Villa Olivia, and Glen R. Seimetz, Hanover Park, all of Ill., assignors to Illinois Bell Telephone Company, Chicago, Ill.
Filed Feb. 7, 1986, Ser. No. 827,768
Int. Cl.[4] B60R *19/02*
U.S. Cl. 293—111.1 **20 Claims**



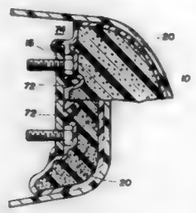
1. A bumper apparatus for a wheeled vehicle carrying a cable pulling system including a winch assembly, said bumper apparatus comprising: a frame fixedly secured to the vehicle, extensible support means carried by said frame and movable with respect thereto between a retracted stowed position and an extended use position projecting away from the vehicle, and mounting means carried by said support means and adapted for supporting engagement with the associated winch assembly in a use configuration.

4,635,984
VEHICLE BUMPER
Norman S. Loren, Warren, and William E. Gordon, Sterling Heights, both of Mich., assignors to Michael Ladney, Grosse Pointe Shores, Mich.
Division of Ser. No. 624,202, Jun. 24, 1984, which is a continuation-in-part of Ser. No. 568,215, Dec. 30, 1983, abandoned. This application Oct. 25, 1985, Ser. No. 791,501
Int. Cl.[4] B60R *19/08*
U.S. Cl. 293—120 **10 Claims**

1. A vehicle bumper, comprising: a fascia having a front portion adapted to receive impact forces and upper and lower flanges extending rearwardly from said portion;
a backing member positioned rearwardly of the front portion of the fascia and extending vertically relative to said upper and lower flanges in spaced relation therebetween,

said member including means for mounting the bumper on the vehicle;

a resiliently compressible plastic foam molded in situ in at least the volume bounded by the backing member and the



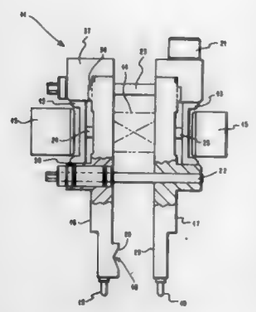
fascia and extending rearwardly through at least one of the spaces between the backing member and the upper and lower flanges, said foam having an integral skin bonded to adjacent surfaces of the backing member and the fascia.

4,635,985

SELF-PIVOTING ROBOTIC GRIPPER TOOL

Paul A. Rooke, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 29, 1984, Ser. No. 614,629
Int. Cl.[4] B25J *15/00*
U.S. Cl. 294—2 2 Claims



1. A robotic gripper tool having a plurality of separately actuable gripping surfaces, each of which is oriented by a self-pivoting action of said robotic gripper tool under gravitational force, comprising:

a first pair of opposed body members, each of said first pair of opposed body members having an aperture along a common axis, wherein said first pair of opposed body members forms a first and a second pair of gripping surfaces, said second pair of gripping surfaces located substantially orthogonal to said first pair of gripping surfaces; and,

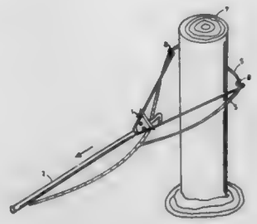
a second pair of opposed body members, the inner surfaces of said second pair abutting the outer surfaces of said first pair of opposed body members, each of said second pair of opposed body members having a shaft fittable into an adjacent aperture in said first pair of opposed members, whereby said first pair of opposed body members is pivotable with respect to said second pair of opposed body members about said common axis.

4,635,986

LINE HANDLING DEVICE

Richard B. Johns, 1306 Lake Joanna Dr., Eustis, Fla. 32726

Filed Dec. 2, 1985, Ser. No. 803,730
Int. Cl.[4] B63B *21/04*
U.S. Cl. 294—19.1 11 Claims



1. A device for holding open a line loop at the end of a boat line and for extending and positioning said loop a substantial distance from the user to encircle an object, comprising:

a substantially V-shaped wire element having releasable line holding means at the two free ends of said V shape;

wire element support means having hinge means at a first end and wire holding means at a second end, said hinge means rotatably holding said wire element at the apex of the V, thereby permitting said wire element to rotate substantially 180° about said hinge from a first, operating position to a second, storage position, said wire holding means for releasably holding the two legs of said wire element apart to maintain the V shape and affixed to said wire element support means in said first operating position, said wire holding means further for releasing said legs of said wire element to permit said wire element to be rotated 180° about said hinge means to a second, storage position;

pole clamping means connected to said wire element support means for clamping said device substantially at the end of a long pole with a major portion of said wire element extending beyond the end of said pole when said device is in said first, operating position, wherein said wire element is for holding the ends of said V together after the legs of said wire element are wrapped around said pole in said second, storage position to facilitate storage and alternate use of said pole, said wire element support means formed by plate means, said wire holding means formed by forming a second end of said plate means substantially orthogonally to the body of said plate means, the sides of said second end being wider than said V-shaped wire element in its relaxed state and of reduced width closer to said body of said plate means to permit said wire holding by the spring tension of said wire element when it is spread apart to fit outside of the outer edges of said second end in said first, operating position.

4,635,987

GOLF BALL RETRIEVING DEVICE

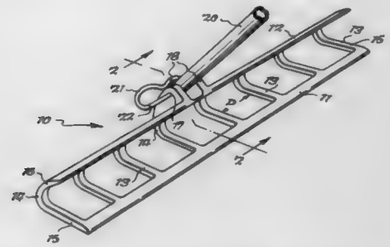
Mervin W. Hurtgam, 3261 Andrews Rd., Ransomville, N.Y. 14131

Filed Aug. 1, 1985, Ser. No. 761,595
Int. Cl.[4] A63B *47/02*
U.S. Cl. 294—19.2 17 Claims

1. A golf ball retrieving device comprising:

an elongated ball retrieval head containing fixed upper and lower stabilizing members, said lower fixed stabilizing member extending the elongated length of the elongated head and providing a generally straight edge for engaging a golf ball;

a plurality of curved tines, spaced apart a distance from about 30% to about 99% of the diameter of a golf ball, extending between said fixed upper and lower stabilizing members, each said tine including a bight portion having a radius of curvature from about 70% to about 150% of the radius of a golf ball, a guiding leg portion extending from the bight portion a distance of greater than about one-half the radius of curvature of the bight portion and fixedly connecting with and not extending beyond said lower



stabilizing member, and means for fixedly connecting said upper stabilizing member to said bight portion;

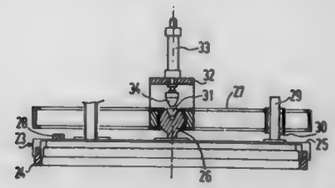
means for connecting an elongated handle to said retrieval head so that the included angle of the guiding legs of said tines relative to the central axis of said handle is less than about 80°.

4,635,988

PROCEDURE AND DEVICE FOR GRIPPING PARCELS

Michel Potters, Jacob Catalaan 15, 4873 GT Etten Leur, Netherlands, and Georges Bancon, 25 BD Joffre, 54000 Nancy, France

Continuation-in-part of Ser. No. 478,495, Mar. 24, 1983, abandoned. This application Nov. 30, 1984, Ser. No. 679,081
Claims priority, application France, Mar. 24, 1982, 82 04975
Int. Cl.[4] B66C *1/02*
U.S. Cl. 294—64.1 11 Claims



1. An apparatus for gripping at least one parcel with low mass/volume ratio covered by a thin wrapping comprising:

at least one handling mechanism including:

(a) a chassis;

(b) at least one gripping part;

(c) a ball joint pivotally connecting said at least one gripping part to said chassis; and

(d) means for locking said ball joint, wherein said ball joint includes a ball fixed to said at least one gripping part, and wherein said means for locking comprises:

(i) a tapered recess in said ball,

(ii) a movable element movable into said recess and having the same shape as said recess, and

(iv) means fixed to said support for moving said movable element into said recess, whereby said ball is rotatably guided and locked relative to said support;

at least one device operatively connected to said handling mechanism for applying pneumatic sunction on part of a surface area of said parcel.

4,635,989

CABLE CLAMPING DEVICE

Paul Tremblay, Point-aux-Trembles, and Georges Tzabanakis, Montreal, both of Canada, assignors to Telsa Recherche & Developpement Inc., Canada

Filed Dec. 18, 1984, Ser. No. 682,768
Int. Cl.[4] F16G *11/10*; B65H *59/00*
U.S. Cl. 294—102.1 10 Claims



1. A device for clamping the stripped end of a cable having a strength member extending centrally of said cable and projecting from said stripped end thereof, and peripherally arranged conductors, comprising:

a body having one end defining a tapered socket;

wedge means cooperatingly engaging said socket and adapted to receive therethrough said projecting strength member;

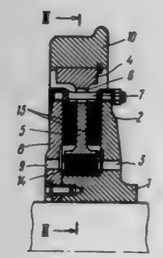
wedge driving means having one end adapted to be mounted at said stripped end of said cable and the opposite end thereof adapted to engage said socket end of said body whereby engagement of said wedge driving means with said body forces said wedge means in said tapered socket for tightening said wedge means on said strength member in order to tightly grip said strength member.

4,635,990

RESILIENT WHEEL OF A RAILWAY CAR

Alexandr L. Golubenko; Viktor P. Turchin; Alexei N. Kouyaev; Igor N. Sukhov; Nikolai N. Kaljuzhny; Arkady S. Filonov; Alexei P. Koropets, all of Voroshilovgrad; Mikhail I. Pisovsky, Omsk; Viktor P. Tkachenko, and Nikolai M. Kramar, both of Voroshilovgrad, all of U.S.S.R., assignors to Voroshilovgradsky Mashinostroitelny Institut, Voroshilovgrad, U.S.S.R.

PCT No. PCT/SU83/00024, § 371 Date Mar. 5, 1984, § 102(e) Date Mar. 5, 1984, PCT Pub. No. WO84/00328, PCT Pub. Date Feb. 2, 1984
PCT Filed Jul. 7, 1983, Ser. No. 596,465
Claims priority, application U.S.S.R., Jul. 7, 1982, 3465559; Jun. 15, 1983, 3600351; Jun. 15, 1983, 3600353; Jun. 15, 1983, 3600352
Int. Cl.[4] B60B *17/00, 9/12*
U.S. Cl. 295—11 6 Claims



1. A resilient wheel of a railway car, said resilient wheel comprising:

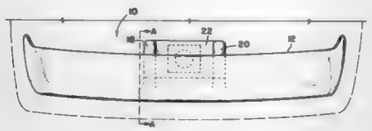
a hub with an annular projection located on an outer surface thereof,

a pressure disk, the hub and the pressure disk being connected by bracing elements,

ventilation ports defined by said annular projection of the hub and said pressure disk,

an inner rim having an annular projection disposed between the hub and the pressure disk,
first resilient elements subject to shearing forces, some of which are reinforced and disposed between side surfaces of the pressure disk and the annular projections of the inner rim and the hub, and
a second resilient element subject to radially directed compressive forces being disposed between the hub and an inner surface of the annular projection of the inner rim,
said second resilient element forming a silent block capable of turning relative to at least one of the annular projection of the inner rim and the hub engageable therewith,
the wheel being independently adjustable for rigidity in the radial and tangential directions,
the ventilation ports of the annular projection of the hub and the pressure disk being located in front of two end faces of the silent block.

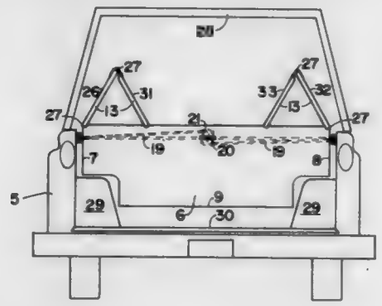
4,635,991
CORVETTE WING
Leroy O. Parno, 5747 E. Admiral Pl., Bldg. C, Tulsa, Okla. 74115
Filed Jun. 21, 1985, Ser. No. 747,455
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—1 S **4 Claims**



1. A rear deck spoiler wing for attaching to the gas cap lid hinge centrally located at the rearward portion of the rear deck of a vehicle, comprising:
(a) an essentially horizontal air foil surface means adapted to remain suspended substantially above the rear deck and gas cap during use and swing upwardly and forwardly during refueling;
(b) a vertical support means operatively attached to essentially the central portion of the underside of said horizontal air foil surface means and adapted to hold said air foil surface means at a fixed distance above the rear deck during use and swing said air foil surface means upwardly and forwardly during refueling; and
(c) a horizontal support lid means attached to the lower end of said vertical support means and operatively attachable to and removable from the original gas cap lid hinges.

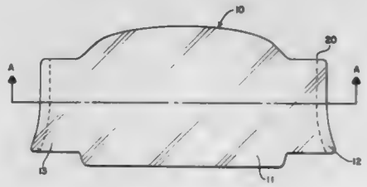
4,635,992
MOVEABLE VEHICULAR STORAGE BOX
Gene Hamilton, 118 Market Ave.; Gale Hawkins, 592 Adams, and Lynn R. Potthast, 103 Skylane Mobile Park, all of Twin Falls, Id. 83301
Filed Oct. 26, 1984, Ser. No. 665,440
Int. Cl.[4] B60P *1/52*
U.S. Cl. 296—37.6 **5 Claims**

1. A storage container for vehicles having a cargo compartment having limited headroom and defined by opposite sloping side walls, a front wall a roof and a floor, said storage container comprising:
(a) Side rail means attached to said opposite side walls in parallel relationship one to the other; and
(b) A front panel, rear panel, left and right side panels and bottom panels of conforming size and shape to define a storage box which can be slid from a storage position in close proximity to the front wall of the cargo compartment to the rear of said cargo compartment; and
(c) Mounting means attached to said storage box and slideably engaged with said side rails; and
(d) A top panel; and
(e) Top panel mounting means for removeable engagement of said top panel with the storage box and for holding said top panel in a position of nonengagement with the sloping



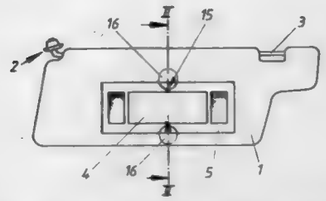
side walls and the roof of the cargo compartment when so removed.

4,635,993
AUTOMOBILE WINDSHIELD COVER
Stanley W. Hooper, 3430 Mauricia Ave., and Charles L. Hooper, 3776 Flora Vista Ave., both of Santa Clara, Calif. 95051
Filed Feb. 1, 1985, Ser. No. 697,177
Int. Cl.[4] B60J *1/20*
U.S. Cl. 296—95 C **11 Claims**



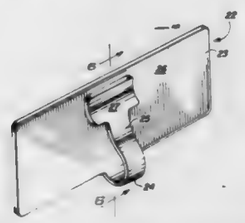
1. A cover for a selected exterior portion of a vehicle, said cover comprising:
a continuous piece of a selected flexible material having:
a central body portion sized and shaped to cover the selected portion of the vehicle to be covered; and
at least two clamping portions disposed to be captured at at least two different sites on the vehicle between two adjacent vehicle portions where at least one of each of the two adjacent vehicle portions is movable for holding the body portion in place on the vehicle, and sized and shaped to be as wide as possible without limiting the size and shape of the central body portion and to fit between said vehicle portions; and
bead means affixed to each clamping portion along its entire width for holding the central body of the cover taut on the vehicle by placement of each bead means in juxtaposed position to the inner surface of the corresponding two adjacent vehicle portions with said bead portions being placed so that the movable vehicle portion comes into contact with the bead means upon closure to stretch the central body portion across the selected portion of the vehicle to be covered, and for preventing the theft of the cover from the vehicle with the bead means being of sufficient size to prevent its being withdrawn from between said two adjacent vehicle portions when said movable vehicle portion is closed with its adjacent vehicle portion.

4,635,994
SUN VISOR, PARTICULARLY FOR AUTOMOTIVE VEHICLES, WITH REVERSIBLE MIRROR
Günter Dietz, Wuppertal, and Manfred Nowak, Solingen, both of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany
Filed Jan. 30, 1985, Ser. No. 696,354
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 34047352
Int. Cl.[4] B60J *3/02*
U.S. Cl. 296—97 H **8 Claims**



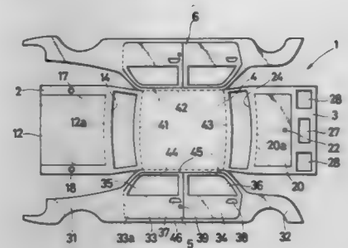
1. A sun visor for automotive vehicles comprising a sun-visor body having a surface for facing into the vehicle; a housing and mirror assembly including a housing for a mirror which is separate from the sun-visor body but is affixed to such body at the surface thereof, and a flipover mirror having a reflective front face and which is supported by the housing; the mirror having a hinge axis generally at an edge thereof for swinging of the mirror around the hinge axis between a position in which the mirror is covered and a position in which the mirror is exposed; lateral guides being defined on a major surface of the housing and extending along such surface; bearing pedestals at least partially disposed in the lateral guides; hinge means for coupling the mirror to the bearing pedestals, the hinge means being effective for maintaining the orientation of the hinge axis relatively constant as the hinge axis travels along the lateral guides; the hinge axis being defined in the bearing pedestals and the hinge axis being displaceably received in and movable along the lateral guides, whereby the housing and mirror assembly may be preassembled without strict dimensioning relative to the sun-visor body and later affixed to the sun-visor body and the mirror is prevented from canting relative to the lateral guides.

4,635,995
DETACHABLY MOUNTED ADD ON SUN VISOR FOR VEHICLES
Fred Mineck, Kingman, Ariz., assignor to Warren F. B. Lindley, Phoenix, Ariz., a part interest
Filed Nov. 4, 1985, Ser. No. 794,473
Int. Cl.[4] B60J *3/02*
U.S. Cl. 296—97 G **1 Claim**



1. An add on sun visor for sliding over an exposed edge of a vehicle mounted conventional sun visor comprising:
an opaque shield in the form of a flat panel, and
a clamp means comprising at least one leg secured at one end to said panel and bent back on itself in a spring biased arrangement toward said panel to form between the other end of said leg and the panel a slot for receiving therein the exposed edge of the conventional sun visor,
said one leg being formed integral with one edge of said panel,
whereby when the edge of the conventional sun visor is inserted in said slot, the add on visor may be adjustably positioned at any one of a plurality of positions along its length.

4,635,996
VEHICLE BODY COVER
Tokuzo Hirose, 13-13, Higashiyamacho, Ashiya-shi, Hyogo-ken, Japan
Filed Jan. 15, 1985, Ser. No. 691,753
Claims priority, application Japan, Oct. 4, 1984, 59-208648
Int. Cl.[4] B62D *39/00*
U.S. Cl. 296—136 **2 Claims**



1. A vehicle body covered with a vehicle body cover which comprises:
a front cover part, a rear cover part, a pair of side cover parts, and a roof cover part:
said front cover part having portions adapted to cover only a hood, an area around a windshield and tops of front fenders of a vehicle body, the portion covering the hood being separated from the portions covering the tops of the fenders by cuts in said front cover part, said front cover part having an un-cut portion corresponding to a position at which the hood is hinged to the car body, said front cover part having a cut-out at a position corresponding to the windshield of the vehicle body and said front cover part having at least one cut-out at a position corresponding to where a rear view mirror is attached to the vehicle body;
said rear cover part having portions adapted to cover an area around a rear window, a trunk lid and a rear end of the vehicle body, the portion covering the trunk lid separated from the rest of said rear cover part by cuts corresponding to three sides of the trunk lid and an un-cut portion corresponding to a position at which the trunk lid is hinged to the vehicle body, said rear cover part having a hole at a position corresponding to a trunk lid lock, a cut-out portion at a position corresponding to the rear window of the vehicle body, a cut-out at a position corresponding to a license plate of the vehicle body and cut-outs at positions corresponding to rear taillights of the vehicle body;
said pair of side cover parts each having a portion adapted to cover a front fender, a portion adapted to cover a front door, a portion adapted to cover a rear door and a portion adapted to cover a rear fender of the vehicle, said portion adapted to cover the front door having an un-cut portion at a position corresponding to a hinged edge of the front door, cuts at positions corresponding to the remainder of

the front door to allow opening and closing of the front door, a cut-out at a position corresponding to a front door window, a cut-out at a position corresponding to a front door handle and a hole at a position corresponding to a front door lock, said portion adapted to cover the rear door having an un-cut portion at a position corresponding to a hinged edge of the rear door, cuts at positions corresponding to the remainder of the rear door to allow opening and closing of the rear door, a cut-out portion at a position correspoonding to a rear door window and a cut-out portion at a position corresponding to a rear door handle;

said roof cover part having respective portions integrally joined to said front cover part, said rear cover part and said pair of side cover parts;

said front cover part, said rear part, said pair of side cover parts and said roof cover part being directly joined to the vehicle body by means of an adhesive; and, said vehicle body cover being coated with teflon.

4,635,997

TRAILER

Joseph C. Holt, Veedersburg, and Russell L. Losh, Rensselaer, both of Ind., assignors to Talbert Manufacturing, Inc., Rensselaer, Ind.

Continuation-in-part of Ser. No. 637,958, Aug. 6, 1984, Pat. No. 4,580,830. This application Jul. 26, 1985, Ser. No. 759,598

Int. Cl.⁴ B62D 27/02

U.S. Cl. 296—182 23 Claims



1. A trailer comprising a forward section including a kingpin for attachment to a fifth wheel of a tractor, a rearward section including a set of wheels for supporting the trailer on the ground, and a middle section extending between the forward and rearward sections and positionable in at least two load-transporting positions at different heights above the ground, and forward and rearward sections each including fixed support elements extending downward adjacent the middle section, each support element having a flange confronting the middle section, the middle section including longitudinal support beams substantially aligned with the support elements of the forward and rearward sections having at each end laterally displaced extensions straddling the support elements of the forward and rearward sections contact means on the ends of the middle section longitudinal support beams for contacting the confronting flange of the support elements of the forward and rearward sections and locking means for securing the middle section at each of the load-transporting positions, the locking means securing the extensions to the support elements.

4,635,998

FOLD-AWAY CHAIR

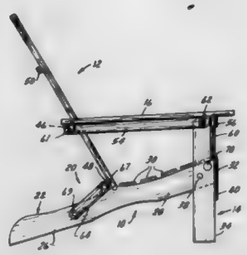
William S. Hickey, Grosse Potate Farms, Mich., assignor to Wilkhorn Wood Products, Detroit, Mich.

Filed Oct. 25, 1985, Ser. No. 791,521

Int. Cl.⁴ A47C 4/00

U.S. Cl. 297—31 1 Claim

1. A fold-away chair adapted to be pivoted from a position of use to a collapsed position, comprising a combined seat bottom and rear leg assembly, a seat back assembly, a front leg assembly, a pair of arm rests, and a lever assembly to facilitate folding, said combined seat bottom and rear leg assembly comprising laterally spaced side rails having front seat bottom portions and rear leg portions, transverse slats connecting the front seat bottom portions of said side rails, a first transverse load-bearing member connecting the front ends of the front seat bottom portions of said side rails, said front leg assembly comprising laterally spaced front legs, first means pivoting said front legs near their midpoints to the front ends of the seat bottom portions of said side rails, a second transverse load-bearing member connecting said front legs beneath said first pivot means, said seat back assembly comprising longitudinal slats connected near their midpoints by an upper transverse bar and connected near their lower ends by a lower transverse bar, each arm rest having an elongated rib secured to the underside thereof and extending lengthwise thereof from a point near the rear end of said arm rest to a point short of the front end thereof, each arm rest having a second rib secured to the underside thereof spaced forwardly of the front end of said elongated rib to define a transverse slot, each front leg having a transverse plate at the upper end thereof, second means pivoting the rear ends of the longitudinal ribs of said arm rests to said upper transverse bar of said seat back assembly and third means pivoting the front ends of said longitudinal ribs to



the upper ends of said respective front legs, said lever assembly comprising a pair of levers, fourth means pivoting one end of said levers to the ends of said lower transverse bar of said seat back assembly, fifth means pivoting the other ends of said levers to the rear leg portions of said side rails between the ends thereof, releasable pins engaging said front legs and the front ends of the seat bottom portions of said rails to lock said chair in its position of use in which, when said chair is supported on a horizontal surface, said front legs are substantially vertical and their transverse plates extend into said transverse slots, said combined seat bottom and rear leg assembly slopes downwardly from front to rear, said first load-bearing member bears upon said second load-bearing member at a point well below said transverse slats of said combined seat bottom and rear leg assembly, and said lower transverse bar of said seat back assembly bears upon the rear leg portions of said side rails, said chair being foldable when said pins are released to a collapsed position in which, when said chair is supported on a horizontal surface, said front legs are substantially horizontal and extend generally parallel to said side rails.

4,635,999

VEHICLE SEATS

Leslie J. Simpson, Amersham, England, assignor to Flight Equipment and Engineering Ltd., Buckinghamshire, England

Filed Oct. 25, 1983, Ser. No. 545,243

Claims priority, application United Kingdom, Oct. 28, 1982, 8230858; Apr. 19, 1983, 8310490

Int. Cl.⁴ A47C 1/02, 1/035

U.S. Cl. 297—88 7 Claims

1. A combined support means and seat, said support means including a first support element defining a first axis and a second support element defining a second axis; and said seat comprising

a bottom part which includes front and rear edges and includes mounting means near said rear edge which is mounted on said first support element such that said seat can be rotated about said first axis between an upright positioning and a reclining positioning,

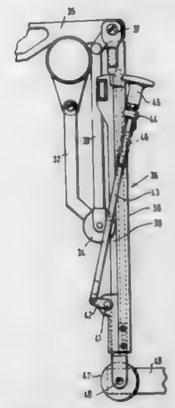
a back support part,

a connecting means connecting said back support part to the rear edge of said bottom part,

securing means securing said bottom part and said back support part in selective rotational positions about said first axis,

a leg support part which includes an upper end that is connected to the bottom part adjacent its front edge to be rotatable relative thereto, and

a linkage system for controlling the orientation of said leg support part relative to said bottom part when said seat rotates about said first axis, wherein said linkage system includes a first link having upper and lower ends and a



second link having upper and lower ends, wherein the upper end of said first link is connected to said bottom part adjacent its front edge so as to be rotatable relative thereto, wherein the upper end of said second link is connected to said second support means so as to be rotatable about said second axis, wherein the bottom ends of said first and second links are connected together to enable said links to rotate relative to one another, and wherein said linkage system also includes abutment means associated with the lower ends of said first and second links for contacting said leg support part and for causing it to rotate forwardly relative to said bottom part when said seat is rotated about said first axis into its reclining positioning.

4,636,000

SIDE SUPPORT DEVICE IN A VEHICLE SEAT

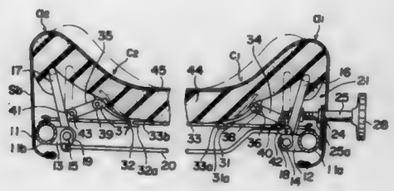
Takaishi Nishino, Akishima, Japan, assignor to Tachikawa Spring Co. Ltd., Tokyo, Japan

Filed Sep. 20, 1985, Ser. No. 778,260

Claims priority, application Japan, Sep. 28, 1984, 59-203377; Sep. 28, 1984, 59-203378

Int. Cl.⁴ A47C 7/14

U.S. Cl. 297—284 2 Claims



1. A side support device for use in a seat having a pair of raised side portions on the right and left sides thereof, comprising:

a seat frame having a pair of lateral bar sections and a pair of support frames respectively journaled to said pair of lateral bar sections, said pair of support frames being each disposed within the respective pair of raised side portions, thereby allowing said pair of support frames to be rotated inwardly and outwardly of said seat;

means for adjustably rotating said pair of support frames so as to adjust the distance between said pair of raised side portions of said seat to thereby support an occupant's body from both sides thereof;

a pad receiving member extended between sides of said seat frame; and

a pair of sub-panels respectively disposed inwardly of said pair of support frames, the arrangement of said pair of sub-panels being such that one end portion of each of said sub-panels are engaged with the pad receiving member while another end portion of each of said pair of sub-panels are connected to said pair of support frames;

whereby, when said rotating means is activated to cause said pair of support frames to rotate in a direction inwardly of said seat, said sub-panels are moved in the same inward direction simultaneously, thereby supporting both sides as well as the occupant's central body portion uniformly.

4,636,001

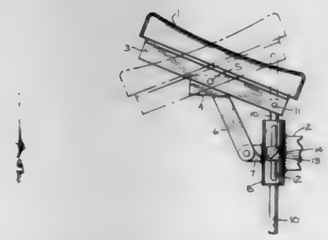
TILTABLE SEAT FOR VEHICLE

Lionel E. Weyenberg, Waupaca, Wis., assignor to Level-Rider Inc., Waupaca, Wis.

Filed Oct. 17, 1985, Ser. No. 788,476

Int. Cl.⁴ A47C 1/00; B60N 1/02

U.S. Cl. 297—314 3 Claims



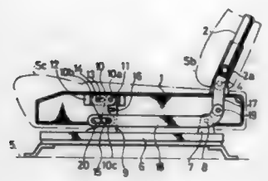
1. A tiltable seat assembly for a vehicle, comprising a frame, a seat, a vertically disposed cylinder fixed to said frame, a seat supporting linkage having one end connected to said cylinder, pivot means for pivotally connecting the opposite end of said linkage to said seat, said pivot means including a pivot axis extending in a fore and aft direction and disposed substantially midway between the sides of said seat, a piston slidable within said cylinder, a piston rod connected to said piston and extending outwardly of the upper end of said cylinder and pivotally connected to the seat adjacent a side edge of said seat, and conduit means interconnecting the end portions of said cylinder on opposite sides of said piston, tilting movement of the seat about said pivot axis caused by the weight of the operator acting to move said piston rod and thereby cause fluid from one end of said cylinder to pass through said conduit means to the opposite end of said cylinder.

4,636,002

VEHICLE SEAT

Takagi Genjiro, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Akishima, Japan

Filed Aug. 1, 1985, Ser. No. 761,525
Claims priority, application Japan, Aug. 28, 1984, 59-178956
Int. Cl.[4] B60N *1/02*; A47C *1/032*
U.S. Cl. 297—319 2 Claims



1. A vehicle seat comprising:

a cushion frame having a pair of brackets fixed at a forward portion thereof such that one of said brackets is disposed at one lateral section of said cushion frame while the other of said brackets is disposed at the other opposed lateral section of said cushion frame, said brackets each being formed with a bore therethrough;

a pair of rear support brackets fixed to a rear end portion of said cushion frame and being adapted for pivotally supporting respective rearward parts of said lateral sections of said cushion frame so that the forward portion of said cushion frame can be raised up and lowered down;

a pair of front support brackets fixed at respective forward parts of said lateral sections of said cushion frame;

a back frame interlocked to the rear end portion of said cushion frame in such a manner as to be rotatable forwardly and rearwardly relative to said cushion frame;

a pair of substantially V-shaped link members each having a first upper end, a central portion and a second lower end formed therewith, the arrangement of said substantially Vshaped link members being such that each of said first upper ends is pivotally connected to one of said pair of front support brackets, each of said central portions has an engagement pin slidably engaged in each of said bores of said brackets of said cushion frame, and each of said second lower ends is so formed as to extend downwardly from each of said substantially V-shaped link members;

a stopper formed on each of said pair of front support brackets, said stopper being adapted to prevent rearward rotation of each of said substantially V-shaped link members;

a rod extending between said pair of substantially V-shaped link members such that both ends of said rod are respectively connected to said second lower ends of said pair of substantially V-shaped link members;

an arm fixed to a lower part of said back frame, said arm extending downwardly and terminating in a free end portion; and

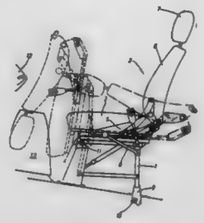
a connecting bar having an elongated bore formed at a forward end portion thereof, said connecting bar extending between said rod and said arm in such a manner that said elongated bore of said connecting bar slidably receives said rod and a rearward end portion of said connecting bar is pivotally connected to said free end portion of said arm.

4,636,003

MOTOR-VEHICLE SEAT WITH BACKREST WHICH CAN BE SWUNG FORWARD OUT OF A POSITION OF USE

Helmut Siebler, Fellbach, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 21, 1985, Ser. No. 714,209
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1984, 3410163
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—336 8 Claims



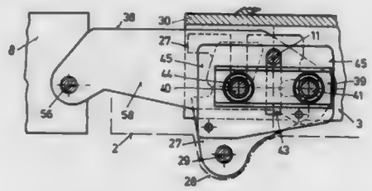
1. A motor-vehicle seat with a backrest which can be swung forward out of the position of use and which is mounted so as to be pivotable forwardly about a lateral pivot on a bracket connected to a seat-cushion frame, there being a guide device by means of which the point of pivoting of the backrest on the bracket is displaced rearwardly relative to the seat cushion frame and in the longitudinal direction of the vehicle via a lever arrangement connected to the backrest, characterized in that the guide device is assigned to the bracket in such a way that the latter is arranged so as to be displaceable relative to the seat-cushion frame, and in that, when the backrest is pivoted out of the position of use, the backrest together with the bracket is moved to the rear via at least one supporting lever articulated on the seat frame and fixed to the backrest.

4,636,004

SEAT MOUNTING FOR CHAIRS, IN PARTICULAR SWIVEL-TYPE DESK CHAIRS

Konrad Neumüller, Gibitzenhof-Street 21, D-8501 Burgthann, Fed. Rep. of Germany

Filed Aug. 13, 1984, Ser. No. 640,437
Claims priority, application European Pat. Off., Aug. 12, 1983, 83108004.9
Int. Cl.[4] A47C *1/027*
U.S. Cl. 297—374 8 Claims



1. In a seat mounting for chairs, especially swivel-type desk chairs, which can be connected to the base of a chair by a post and comprises a bracket which accommodates a cantilevered end of the post, the seat mounting having a channel-shaped base member including a free end, a mounting pin and upwardly pointing flanks in which the bracket is fixedly installed, the seat mounting further having a supporting element for a seat whose angular position with reference to the base member is adjustable and the base member being provided with height

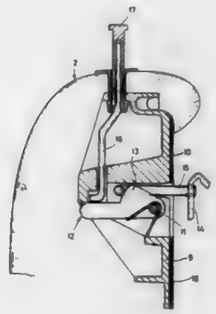
adjusting means and pitch adjusting means having moving parts between the flanks of the base member and manually operated parts outside of the base member, the improvement which consists in that the supporting element is tee-shaped and includes a channel-shaped bearing member and an angular second member, the bearing member having flanks disposed between the flanks of said base member and said supporting element being pivotable relative to said base member about an axis adjacent to the free end of said base member, said base member further including a clamp pivotally attached at it other end for supporting a backrest therein, said clamp having a mounting pin thereon spaced from the pivotal attachment, said bearing member provided with a clamping device having pins and which is disposed between the flanks of the bearing member, said clamping device comprising a spring-loaded bracket member with a manually actuatable crankshaped release lever having a free end and at least two pressure plates which are spaced apart from each other as well as longitudinal and transverse lamination packs between the pressure plates for adjustment of the angular position of the backrest supporting clamp and the height and pitch of the bearing member respectively, the longitudinal lamination pack having holes for the pins of said clamping device at one of its ends and being attached to the mounting pin of said clamp at the other end thereof, the holes for the pins of the clamping device being of sufficient size to allow relative shifting movement between the longitudinal lamination pack and the bearing member, said transverse lamination pack having a first end slidably mounted on the pins of said clamping device and a second end mounted on the pin of said base member, said bracket member having a recessed portion disposed between the pins of said clamping device, connecting said bracket member to said bearing member and receiving the free end of said release lever, and in the provision of springs for biasing said bracket member toward said packs, said springs being mounted on the pins of said clamping device.

4,636,005

SEAT BACK FOR A MOTOR VEHICLE REAR SEAT ASSEMBLY

Richard Bolz, Flörsheim, and Walter P. Trutter, Wiesbaden, both of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 12, 1985, Ser. No. 775,513
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3433996
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—379 2 Claims



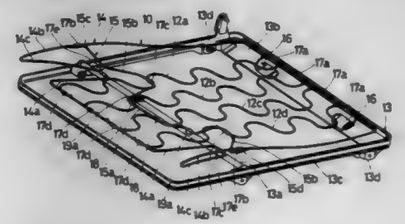
1. A rear seat assembly for an automotive vehicle having body structure and comprising a rear seat cushion, a foldable rear seat back supported for movement between an upright position in which it is latched to an adjacently located locking member carried by the vehicle body structure and a folded position in which its rear panel forms part of the vehicle floor, and a releasable locking mechanism carried by said rear panel of said seat for latching and unlatching said rear seat back to said locking member, the improvement being that said rear seat panel is made from a fiber reinforced plastic material and includes a rear panel portion and a housing formed integral therewith which extends interiorly of the rear seat, said housing including first and second vertically spaced inwardly extending portions each having a generally vertically extending opening for slidably receiving a locking rod and said rear seat panel having a transverse opening adjacent said second inwardly extending portion for receiving said locking member carried by said vehicle body structure, and wherein said housing at its sides pivotally supports a latch bar disposed within said transverse opening which is spring biased into engagement with said locking and unlocking rod and toward a locking position in which a locking projection thereof locks said rear seat back to the latching member on said vehicle body structure when the rear seat back is in its upright position, said latch bar being pivotally movable to a position in which it is unlatched from said latching member in response to movement of said locking and unlocking rod.

4,636,006

SEAT CUSHION STRUCTURE

Kenichi Kazaoka, Nagoya; Hiroshi Okazaki, Toyota, and Yasuhiro Inaba, Handa, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 19, 1985, Ser. No. 713,755
Claims priority, application Japan, Mar. 23, 1984, 59-56992; Mar. 23, 1984, 59-56991
Int. Cl.[4] A47C *7/35*
U.S. Cl. 297—458 11 Claims



1. A seat cushion structure comprising:

a seat cushion foam body having laterally spaced sides;

a cushion frame having longitudinally spaced front and rear edges and laterally spaced side edges, said cushion frame being positioned below said seat cushion foam body;

a support member connecting said side edges intermediate said front and rear edges and spaced a predetermined distance from said front edge;

a border wire having a rear portion extending along the rear edge of said frame and side portions extending along respective side edges of said frame to points above and substantially even with said frame front edge, said border wire having retaining portions extending downwardly and rearwardly from said points to said support member along respective side edges of said frame, said border wire having a support portion extending from said support member upwardly and forwardly toward said front edge of said frame inwardly of said retaining portions;

first means connecting said border wire to said support member at a juncture of said support portion and said retaining portion of said border wire adjacent each of said side edges of said frame, and second means connecting said rear portion of the border wire to said rear edge of the frame;

a plurality of cushion springs, each having front and rear ends, disposed below said foam seat cushion, said springs connected at each said front end to said support portion of said border wire and connected at each said rear end to said rear portion of said border wire, said cushion springs supporting said foam seat cushion; and

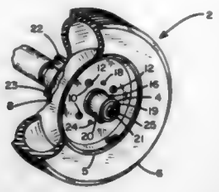
a support spring connected at opposite ends to respective side portions of said border wire at a location on each said side portion rearwardly of said points of said border wire, said support spring being connected intermediate said opposite ends to said support member, and said suport spring being connected also to each of said cushion springs rearwardly of the respective front ends of each said cushion spring.

4,636,007

WHEEL HUB WITH LUBRICATION FITTINGS

Thomas H. Persons, 3200 Quarles Rd., Brooklyn Center, Minn. 55429

Filed Sep. 6, 1985, Ser. No. 773,183
Int. Cl.[4] B60B 27/00
U.S. Cl. 301—105 R 7 Claims



1. Apparatus for lubricating a wheel hub having inner and outer axially spaced apart wheel bearings mounted within a sealed axle receiving cavity of the hub, said wheel bearings rotatively supporting the hub in relation to the axle, and said hub having inner and outer cylindrical hub portions extending orthogonally from opposite sides of a backing plate portion, said outer bearing mounting within said outer cylindrical hub portion and said inner bearing mounting within said inner cylindrical hub portion, comprising:

(a) means mounted to said outer cylindrical hub portion in flow communication with the interior of said hub adjacent an inner surface of said outer wheel bearing for admitting lubricant to surround said outer wheel bearing; and

(b) means accessible from the outer exposed surface of said wheel hub and including a first lubricant conveying channel in part external to the inner and outer cylindrical hub portions in flow communication with the interior of the inner cylindrical hub portion adjacent the inner surface of said inner wheel bearing for admitting a lubricant thereto under pressure to surround said inner wheel bearing.

4,636,008

ANTI-SKID BRAKING CONTROL SYSTEM

Yoshiharu Adachi, Gamagohri; Tadao Saitoh, Nagoya, and Takumi Nishimura, Chiryu, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 15, 1985, Ser. No. 702,306
Claims priority, application Japan, Mar. 26, 1984, 59-059173
Int. Cl.[4] B60T 8/02
U.S. Cl. 303—92 7 Claims

1. An anti-skid braking control system, comprising:

(a) a brake master cylinder;

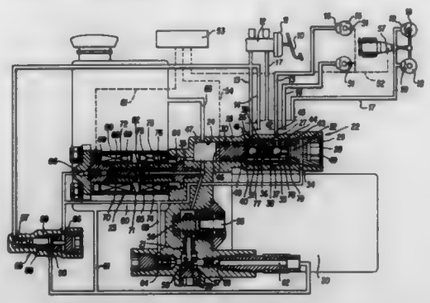
(b) a wheel brake actuating cylinder on a wheel;

(c) a braking fluid pressure circuit interconnecting said brake master cylinder and said wheel brake actuating cylinder for applying a braking fluid pressure from said brake master cylinder to said wheel brake actuating cylinder;

(d) an actuator disposed in said braking fluid preasure circuit for controlling the braking fluid pressure;

(e) a fluid pressure source for generating a power fluid pressure to be supplied to said actuator; and

(f) a power fluid pressure supply and discharge valve for supplying the power fluid pressure to and discharging the power fluid pressure from said actuator dependent on a skidding condition of the wheel wherein said actuator comprises a body having a cylinder with one end closed by a closure member; an inlet port defined in said body and opening into said cylinder; said inlet port being connected through said braking fluid pressure circuit to said brake master cylinder; an outlet port defined in said body and opening into said cylinder; said outlet being connected through said braking fluid pressure circuit to said wheel brake actuating cylinder; a first valve disposed centrally in said cylinder between said inlet and outlet ports for cutting off fluid communication therebetween; a first piston disposed in one side of said cylinder and having



an end on which the power fluid pressure acts and an opposite end exposed in said braking fluid pressure circuit for engaging said first valve, said first piston being responsive to said power fluid pressure for moving said first valve to vary the volume of said braking fluid pressure circuit; a second piston disposed in an opposite side of said cylinder and having an end on which the power fluid pressure acts and actuated by the braking fluid pressure in response to failure of said power fluid pressure; and a second valve for communicating said inlet and outlet ports directly with each other in response to operation of said second piston.

4,636,009

HYDRAULIC PRESSURE CONTROL DEVICE FOR USE IN VEHICLE ANTI-SKID BRAKING SYSTEM

Naohiko Tsuru, Okazaki; Ryoichi Matsuura, Anjo; Hiromi Otsuki, Anjo; Hiroshi Fujinami, Anjo; Shinichi Hori, Anjo; Yoshihisa Nomura, Toyota, and Hiroyuki Oka, Susono, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Mar. 22, 1985, Ser. No. 714,804
Claims priority, application Japan, Mar. 23, 1984, 59-57130
Int. Cl.[4] B60T 8/02
U.S. Cl. 303—93 9 Claims

1. A hydraulic pressure control device in a vehicle anti-skid braking system, comprising:

(a) a brake master cylinder;

(b) a wheel brake actuating cylinder for braking a vehicle wheel;

(c) a master cylinder passage extending from said master cylinder;

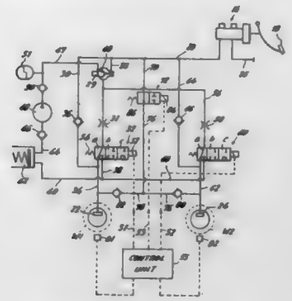
(d) a fluid pressure supply passage connected between said master cylinder passage and said wheel brake actuating cylinder;

(e) wherein a restriction is disposed in said fluid pressure supply passage;

(f) a first directional control valve disposed in said fluid pressure supply passage and having at least pressure-increasing and pressure-decreasing modes, said first directional control valve being normally in said pressure-increasing mode, in which said master cylinder passage is connected to said fluid pressure supply passage;

(g) a fluid pressure return passage connected to said first directional control valve;

(h) a pressure control valve connected to said fluid pressure return passage and said fluid pressure supply passage, said pressure control valve being normally biased to provide fluid communication between said master cylinder passage and said fluid pressure supply passage and being responsive to a fluid pressure buildup in said fluid pressure return passage when said first directional control valve is in said pressure-decreasing mode, for providing fluid communication between said fluid pressure return passage and said fluid pressure supply passage and for shutting off the fluid communication between said master cylinder passage and said fluid pressure supply passage;



(i) a second directional control valve connected between said master cylinder passage and said wheel brake actuating cylinder, said second directional control valve being normally open to provide a bypass passage across said first directional control valve in which said master cylinder passage is connected to said wheel brake actuating cylinder; and

(j) a control unit responsive to a decelerating condition of the vehicle wheel for actuating said first directional control valve into said pressure-decreasing mode and for actuating said second directional control valve to shut off said bypass passage.

4,636,010

ANTISKID APPARATUS FOR VEHICLES

Yoshiharu Adachi, Gamagori; Takumi Nishimura, Chiryu; Tadao Saito, Nagoya; Hirochika Shibata, Kariya; Nobuyasu Nakanishi, Toyota; Akira Shirai, Toyoake, and Noboru Noguchi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Feb. 5, 1986, Ser. No. 826,253
Claims priority, application Japan, Feb. 6, 1985, 60-13427[U]; Mar. 5, 1985, 60-43882; Jun. 6, 1985, 60-123246
Int. Cl.[4] B60T 8/02
U.S. Cl. 303—115 25 Claims

1. An antiskid apparatus for an automotive vehicle having a brake master cylinder and at last one wheel brake cylinder, comprising:

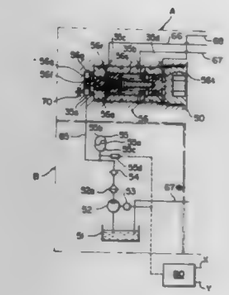
a cut-off valve for selectively cutting a brake line connecting the vehicle brake master cylinder with the wheel brake cylinder into a brake line on the brake master cylinder side and a brake line on the wheel brake cylinder side;

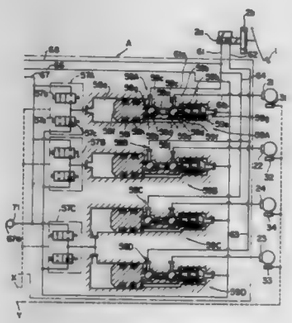
an accumulator for accumulating power hydraulic pressure above a maximum value of brake fluid pressure at which a wheel corresponding to the wheel brake cylinder approaches a state near lock-up;

a hydraulic pressure control piston movable in a first direction by hydraulic pressure in the brake line on the wheel brake cylinder side and movable in an opposite second direction by the power hydraulic pressure from said accumulator to close and open said cut-off valve, respectively, and, moreover, to increase and restore the volume of the brake line on the wheel brake cylinder side, respectively, by such movement in the first and second directions; and

a directional control valve installed in a power hydraulic pressure line connecting said accumulator with a fluid chamber formed on one side of said hydraulic pressure control piston for being supplied with the power hydraulic pressure, said directional control valve operating to discharge the power hydraulic pressure from the fluid chamber when the wheel approaches the lock-up state and to supply the fluid chamber with the power hydraulic pressure under all other conditions; characterized by:

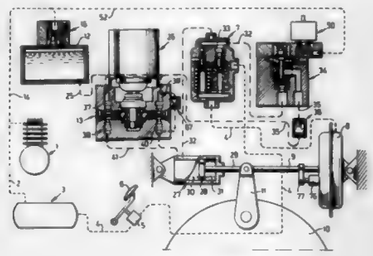
a pressure regulating valve installed in the power hydraulic pressure line connecting said accumulator with said directional control valve;





wherein when the brake master cylinder is actuated for braking, said pressure regulating valve is operable, in dependence upon master cylinder hydraulic pressure delivered by the brake master cylinder, to reduce the power hydraulic pressure supplied by said accumulator to a hydraulic pressure higher, by a predetermined amount, than the master cylinder hydraulic pressure, and to deliver this reduced hydraulic pressure to said directional control valve; and when the brake master cylinder is not actuated, said pressure regulating valve cuts off communication between said accumulator and said directional control valve and brings the hydraulic pressure in the hydraulic pressure line leading to the fluid chamber through said directional control valve to a value not higher than a set value.

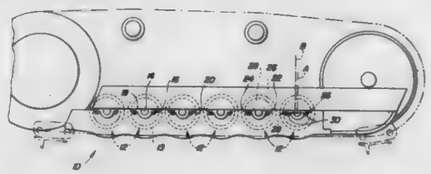
4,636,011
BRAKING FORCE MODULATOR
Folke I. Blomberg, Duvstigen 4, S-181 40 Lindingo, and Jan-Olov M. Holst, Skogsduvevagen 14, S-752 52 Uppsala, both of Sweden
Filed Oct. 31, 1984, Ser. No. 666,649
Claims priority, application Sweden, Oct. 31, 1983, 8305977
Int. Cl.[4] B60T *8/40*
U.S. Cl. 303—115 16 Claims



1. In an apparatus for braking a rotating member and having means for supplying pressurized air, a control valve operatively connected to said air supply means for controlling the supply of pressurized air, a pneumatic braking cylinder operatively connected to said control valve for applying braking force in response to the supply of pressurized air, a brake operatively connected to said pneumatic braking cylinder and operable between an inactive position and an active position for braking rotation of a rotating member in response to the application of braking force, sensor means for signaling the occurrence of excessive rates of retardation of the rotating member, means for supplying pressurized hydraulic fluid, counter pressure hydraulic cylinder means operatively connected with said fluid supply means and with said brake for counteracting the braking force produced by said pneumatic braking cylinder, and modulator valve means operatively connected to said sensor means and to said hydraulic cylinder means for responding to sensor signals and for modulating hydraulic fluid pressure applied to said hydraulic cylinder means and thereby for counteracting braking force applied to said brake upon occurrences of excessive rates of retardation, an improvement in the apparatus which enhances the responsiveness thereof and which comprises means operatively connected to said pneumatic braking cylinder and said modulator valve means for responding to modulated hydraulic fluid pressure indicative of a signaled occurrence of an excessive rate of retardation of the rotating member, said last named means comprising hydraulically operated closing valve means for blocking the supply of pressurized air to said braking cylinder and hydraulically operated discharge valve means for releasing pressurized air from said pneumatic braking cylinder.

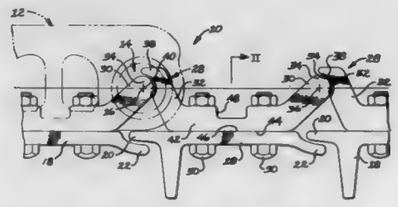
4,636,012
TRACK ROLLER MOUNTING BRACKET
Joseph J. Smith, Dubuque, Iowa, and Dean J. Stillmunkes, East Dubuque, Ill., assignors to Deere & Company, Moline, Ill.
Filed Nov. 23, 1983, Ser. No. 554,518
Int. Cl.[4] B62D *55/14*
U.S. Cl. 305—28 3 Claims

1. In a track roller assembly including first and second brackets fixed to opposite ends of a shaft upon which a track roller is rotatably mounted and said brackets each having first and second mounting flanges located at opposite sides of a center point of the shaft, the improvement, comprising: said first and second mounting flanges respectively containing first and second mounting holes spaced unequally from said center point, whereby the track roller assembly is adapted to be mounted to a track frame in alternate end-for-end reversed



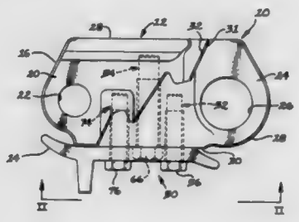
positions for disposing the track roller in alternate positions along the track frame.

4,636,013
TRACK SHOE DEFLECTION LIMITER FOR ENDLESS TRACK ASSEMBLIES
Andrew J. Tonsor, East Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.
Filed Nov. 4, 1985, Ser. No. 794,908
Int. Cl.[4] B62D *55/22*
U.S. Cl. 305—48 7 Claims



6. A track shoe deflection limiter comprising:
a body having a mounting surface, a first arm portion, a second arm portion, and a central mounting portion;
said first arm portion having a convex end having a predetermined first radius of curvature and being located at a first end of said body;
said second arm portion having a concave end having a predetermined second radius of curvature and being located at a second opposite end of said body; and
said second radius of curvature of said second arm portion being slightly larger than said first radius of curvature of said first arm portion.

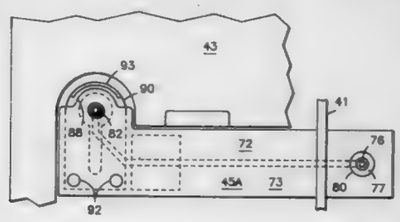
4,636,014
MASTER TRACK CHAIN CONNECTION FOR CRAWLER TRACTORS
Thomas M. Dennison, Peoria, and Blair A. Maust, Dunlap, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Dec. 23, 1985, Ser. No. 812,676
Int. Cl.[4] B62D *55/20*
U.S. Cl. 305—54 8 Claims



1. A master link for an endless track, comprising:

said master link having a mounting surface along one edge thereof for receiving a track shoe, a rail surface along the opposite edge thereof, and a pair of half-links separable along mating interlocking surfaces, said surfaces being oriented in a generally diagonal direction between the mounting surface and the rail surface of the link; and
means for independently securing the track shoe to the master link and for retaining said half-links together, said means including at least a first threaded aperture and a second threaded aperture each entering through said track shoe mounting surface, the first of said threaded apertures being adapted to receive a first bolt for solely fastening the track shoe to the link and the second of said apertures being adapted to receive a second bolt for solely retaining the half-links of the master link together, said second bolt having a head positionable in abutting engagement against the mounting surface of the link and not against the track shoe when said track shoe is positioned on said master link.

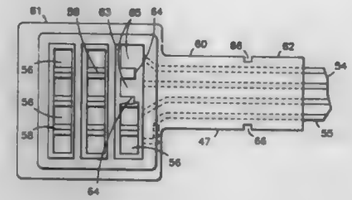
4,636,015
RF CONNECTOR
Alexander P. Ford, Jr., Boca Raton, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 30, 1985, Ser. No. 771,098
Int. Cl.[4] H01R *17/04*
U.S. Cl. 339—14 R 9 Claims



1. A connector for mating with flush coaxial contacts comprising,
a connector housing,
a strip line including opposed ground planes and a conductor running between the ground planes and insulated therefrom, the strip line being of longitudinal configuration with opposed ends and mounted to the housing substantially at one of said ends,
contact means carried by said strip line located adjacent to the other end of said strip line and including a center contact electrically connected to the conductor and extending therefrom and a ground plane contact electrically connected to the ground planes and extending therefrom for engaging said flush coaxial contact, and
biasing means operatively engaging the strip line for biasing said center contact and said ground plane contact into contact with said flush coaxial contacts.

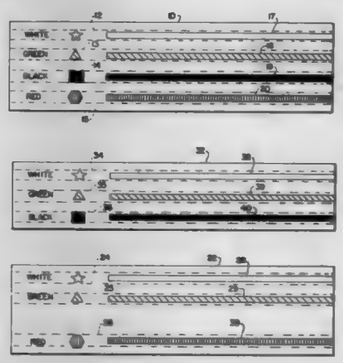
4,636,016
ACCESSORY CONNECTOR
Alexander P. Ford, Jr., Sebastian, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 30, 1985, Ser. No. 771,099
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—17 F 11 Claims

1. An electrical connector comprising:
a connector housing having a first portion and a second portion,
at least one multi-conductor flex circuit extending from said connector second portion and forming a plurality of electrical contacts in said connector housing first poriton, the multi-conductor flex circuit being wrapped about a cylindrical flexible member to form said contacts,
a support member carried by said housing and having a contact carrying portion including at least one slot and a



longitudinal portion extending from said contact carrying portion.
said multi-conductor flex circuit extending through said slot of said support member for supporting said flex circuit at said contacts.

4,636,017
FLAT CONDUCTOR CABLE
William C. Boteler, Bridgeport, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.
Continuation of Ser. No. 616,155, Jun. 1, 1984. This application Aug. 29, 1985, Ser. No. 771,149
The portion of the term of this patent subsequent to Jul. 29, 2003, has been disclaimed.
Int. Cl.[4] H01R *4/24, 11/01*; H01B *7/36*
U.S. Cl. 339—17 F 5 Claims



2. A wiring system comprising
a transition connection device including
a housing;
means in said housing defining an opening for receiving and interconnecting a plurality of flat cables, said means including a reference surface at one side of said opening, and
four electrically conductive members supported in said housing, said members being uniformly, laterally spaced apart;
a cable of a first cable type in said opening, said first cable type having four flat, spaced-apart conductors therein,
said conductors being covered with insulation material and having substantially the same lateral center-to-center spacing as said conductive members,
said first cable having a reference edge adjacent a first one of said conductors and positioned adjacent said surface;
a cable of a second cable type in said opening, said second

cable type having three flat spaced-apart conductors therein,

said conductors being covered by insulation material, the first and second of said conductors having substantially the same lateral center-to-center spacing as said conductive members, the third of said conductors being laterally spaced from the second conductor by twice the center-to-center spacing of said first and second conductors,

said second cable having a reference edge adjacent the first of said conductors and positioned adjacent said surface;

cable of a third cable type having three flat spaced-apart conductors therein,

said conductors being covered with insulation material, said three conductors having substantially the same center-to-center lateral spacing as said cable of said first type,

said cable of said third type having a reference edge adjacent the first of said conductors and positioned at said surface so that said conductors of both said first and second cables similarly spaced from said reference edges are aligned with each other,

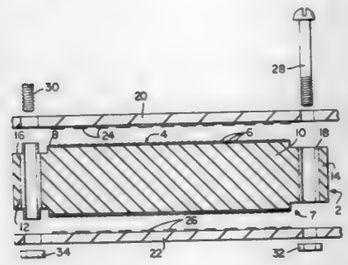
said conductive members extending into and electrically interconnecting aligned ones of said conductors in said cables.

4,636,018

ELASTOMERIC ELECTRICAL CONNECTOR

Donald G. Stillie, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 5, 1985, Ser. No. 741,650
Int. Cl.⁴ H01R *9/09*
U.S. Cl. 339—17 M **18 Claims**



1. An electrical connector for interconnecting circuitry on a substrate to corresponding circuitry, the substrate having conductive elements disposed on one surface thereof as part of the circuitry on the substrate, the connector comprising:

a body formed of an elastomeric material and having an elastomeric cylindrical portion and elastomeric base members formed as an integral continuous section of material with the cylindrical portion, the base members extending outwardly from the ends of the cylindrical portion;

support members extending through each base member, each support member being more rigid than the elastomeric base, each support member having a vertical height less than the undeflected vertical height of the cylindrical body portion; and

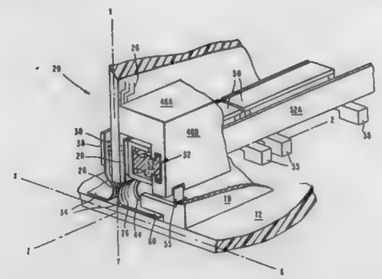
a plurality of conductors disposed on the surface of the cylindrical body portion, each being disposable in registry with the conductive elements on the substrate, whereby the body can be attached to the substrate with the support members comprising means for aligning conductors with corresponding conductive elements, the conductors being urged into contact with the conductive elements upon application of a compressive force applied through the substrate to the elastomeric body, the support members comprising means for limiting the compressive force applied through the substrate to the body.

4,636,019

CONNECTOR MECHANISMS

John B. Gillett, Kingston, and John A. Miraglia, West Hurley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 577,460, Feb. 6, 1984, abandoned. This application Nov. 22, 1985, Ser. No. 801,386
Int. Cl.⁴ H01R *9/09, 13/629*
U.S. Cl. 339—17 M **19 Claims**



1. A zero insertion force connector mechanism releasably electrically interconnecting two structures, each said structures carrying conducting lines, said connector mechanism comprising:

a common actuator means mounted on a second of said two structures so as to have one degree of freedom of movement only relative thereto between a first position and a second position, said common actuator locking said two structures in fixed relationship to each other, when in an engaged juxtaposition;

first contact means electrically connected to said conducting lines on a first of said two structures and fixed relative to said first structure;

a flexible conductive film forming part of said second structure and incorporating at least extensions of said conducting lines thereon;

second contact means electrically connected to said conducting line extensions in said flexible conductive film and being carried by said common actuator means and being capable of independent orthogonal motion with two degrees of freedom relative to said first contact means by movement of said common actuator means, from its first to its second position while said first and second structures are maintained in an engaged juxtaposition.

4,636,020

INSERT FOR AN ELECTRICAL CONNECTOR

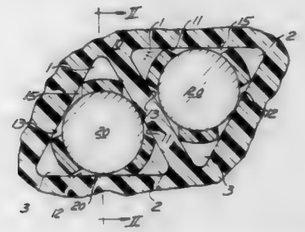
David J. Marsilliton, Afton, N.Y., assignor to Allied Corporation, Morristown, N.J.

Filed May 31, 1983, Ser. No. 499,707
Int. Cl.⁴ H01R *11/00*
U.S. Cl. 339—59 M **8 Claims**

1. An insert for an electrical connector assembly, said insert comprising:

a body of dielectric material having a pair of end faces and at least one triangularly shaped axial passage extending between said end faces; and

a resiliently deflectable finger located in each corner of said triangular passage, each finger disposed between the end faces and extending radially inward and terminating in a free end, the other end of each finger being integral with adjacent walls of said passage.



4,636,021

HIGH DENSITY ZIF CARD EDGE CONNECTOR

Clifford F. Bobb, Carlisle, and Robert F. Cobaugh, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 585,013, Mar. 2, 1984, abandoned, which is a continuation of Ser. No. 394,235, Jul. 1, 1982, abandoned, which is a continuation-in-part of Ser. No. 297,431, Aug. 28, 1981, abandoned. This application Oct. 7, 1985, Ser. No. 785,110
Int. Cl.⁴ H01R *9/09*
U.S. Cl. 339—75 MP **27 Claims**

1. A zero insertion force, card edge connector, adapted to engage the conductive traces on a card inserted in a card receiving slot in the connector, comprising:

a. an elongated lower housing with a base having a plurality of contact receiving passages located on each longitudinal side;

b. an elongated upper housing positioned over the lower housing having a longitudinally extending card receiving slot and cam surfaces facing the slot with said cam surfaces being located at more than one vertical position;

c. cam means positioned between the upper and lower housings for vertically moving the upper housing; and

d. contact elements retained in the passages in the lower housing, each element having a cantilevered portion extending into the upper housing between the slot and cam surfaces with a contact surface facing the slot for engagement with a conductive trace on a card inserted in the slot, and a convex surface positioned adjacent a cam surface on the upper housing for engagement with the cam surface during vertical movement of the upper housing to move the contact surface into engagement with a trace on a card positioned in the slot,

the cantilevered portions of the elements on each side of the slot being longitudinally spaced from each other,

the elements being arranged in opposing pairs whose contact surfaces face one another across the slot, the contact surfaces on adjacent elements along each side of the slot being located at different vertical positions, and the facing contact surfaces on elements located on opposite sides of the slot being located at different vertical positions and further with all elements having contact surfaces at each vertical position having their associated cam surfaces located at one vertical position.

4,636,022

CASSETTE CONNECTOR

Toshimitsu Sonobe, Tokyo, Japan, assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Mar. 11, 1985, Ser. No. 710,334
Int. Cl.⁴ H01R *13/62*
U.S. Cl. 339—75 MP **8 Claims**

1. In combination:

a cassette including a package having two major opposing walls and a bottom wall through which a plurality of electrical terminals are exteriorly accessible; and

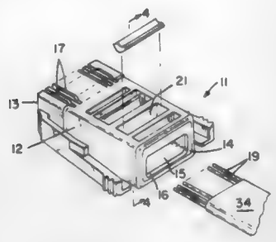
an electrical connector in secured receipt of said cassette, said connector including a housing having a cavity defined by a wider access opening than the bottom portion of said cavity, a plurality of spring contacts disposed in said housing cavity adjacent a bottom surface of said cavity and in electrical engagement with said cassette terminals, and engaging means maintaining said cassette and connector in retentive engagement, said engagement means including cooperative latching means on the cassette and connector housing that permits oblique insertion of said cassette into said housing in a first direction and retains said cassette in said housing in response to rotational movement of said cassette within said cavity, said terminals sliding on said spring contacts during said rotational movement of said cassette, said latching means comprising a ridge portion on said cassette and a recess portion of said housing cavity in receipt of said ridge portion, said cassette having opposing side walls connecting said two major opposing walls, and wherein said ridge portion includes a generally L-shaped projection extending outwardly from at least one of said side walls, a ridge for engagement with said housing within said recess being disposed on said L-shaped projection, said ridge being disposed adjacent the top portion of said L-shaped projection, said recess being sized to accommodate the foot portion of said L-shaped projection during insertion of said cassette into said housing cavity.

4,636,023

ELECTRICAL CONNECTOR WITH STRAIN RELIEF

Billy E. Olsson, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 1, 1985, Ser. No. 718,148
Int. Cl.[4] H01R 13/58
U.S. Cl. 339—103 M 6 Claims



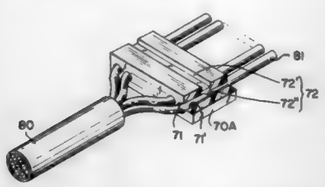
4. A stuffer strip moulded from resilient material with a cable engaging face and a rear face, latching shoulders extending along opposite longitudinal edges of the strip between the faces, the cable engaging face having a pair of cable engaging surfaces extending from the respective edges and tapering symmetrically to an apex extending longitudinally of the strip, a stress relieving groove extending along the cable engaging face on each side of the apex, and the rear face being formed with a longitudinally extending stress relieving recess, the opposite surfaces of the cable being inwardly deformable into a concave configuration by pressing the cable engaging face against a cable with a consequent reduction in the depth of the recess.

4,636,024

ELECTRICAL CONNECTOR

Katsumi Yahata, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1984, Ser. No. 639,182
Claims priority, application Japan, Feb. 23, 1984, 59-24796[U]
Int. Cl.[4] H01R 13/58
U.S. Cl. 339—103 M 3 Claims



1. An electrical connector for a cable including a layer of insulation surrounding a core having a plurality of individual conductors, the ends of said conductors having said insulation layer stripped away, comprising:

a housing including a plurality of grooves for receiving respective ones of a plurality of contacts and for arraying said contacts in a predetermined pattern, said contacts being for connections respectively to said conductor ends, said housing further including a plurality of bores leading to said grooves respectively for receiving respective ones of said conductor ends for arraying said conductors in said pattern and guiding said conductors to said contacts, an inlet cavity for receiving therein and holding said cable with said insulation layer and enclosed conductors, and a central cavity formed between said inlet cavity and said plurality of bores;

an adaptor for insertion in said central cavity, said adaptor having a plurality of insertion holes passing therethrough for receiving and positioning said plurality of conductor ends in a pattern identical with said predetermined contact pattern, the contours and dimensions of said central cavity and adaptor being such that said insertion holes and said bores are in registration with each other when said adaptor is seated in said central cavity, conductor ends extending from said insertion holes of said adaptor entering said bores when said adaptor is being inserted into said central cavity, a portion of said cable including insulation being within said inlet cavity;

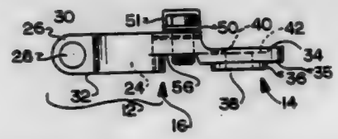
a stamping portion in said adaptor, said adaptor stamping portion being subject to permanent deformation by application of force thereto, said deformed adaptor stamping portion being positioned on said adaptor for pressing against conductors within said insertion holes, said adaptor deformation preventing withdrawal of said conductors from said adaptor.

4,636,025

UNIVERSAL BATTERY TERMINAL CONNECTOR

Robert W. Norris, 1845 State Rte. 303, Streetsboro, Ohio 44241

Filed Feb. 10, 1986, Ser. No. 828,219
Int. Cl.[4] H01R 11/26
U.S. Cl. 339—230 R 11 Claims



1. A universal battery terminal connector for connecting either a top post battery terminal or a side post battery terminal to a battery cable, said connector comprising an elongated electrically conductive body having:

(a) first means for connection to a top post battery terminal;

(b) second means for connection to a side post battery terminal, and

(c) third means for receiving one end of a battery cable and providing an electrical connection therewith.

4,636,026

ELECTRICAL TEST PROBE

James S. Cooney, Attleboro, and Stephen T. Sicard, Norton, both of Mass., assignors to Augat Inc., Mansfield, Mass.

Filed Dec. 20, 1985, Ser. No. 811,707
Int. Cl.[4] H01R 13/15
U.S. Cl. 339—255 R 19 Claims



1. A spring probe comprising:

a first element having an outer contact tip, an inner end and movable along a longitudinal axis;

a second element disposed in a mounting member and having an outer end confronting the inner end of the first element;

one of the elements having a ramp surface;

the other one of the elements having spring means cooperative with the ramp surface, the spring means being movable in a direction transverse to the axis of the first element and operative to bias the first element to a normally outward axial position;

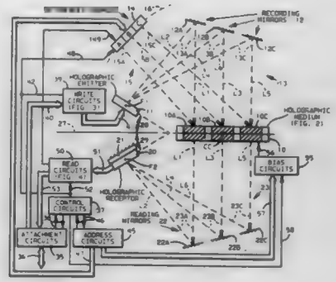
means for electrical connection to the second element.

4,636,027

HOLOGRAPHIC IMAGE PROCESSING SYSTEMS

Roger R. Dube, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 6, 1985, Ser. No. 730,966
Int. Cl.[4] G03H 1/02
U.S. Cl. 350—3.6 8 Claims



1. In an optical processor, in combination:

a planar array of hologram sections disposed along a central axis with each of said hologram sections for containing at least one hologram;

a first array of planar mirrors disposed along a parabolic line and each planar mirror facing a respective one of said hologram sections for reflecting radiation to be transferred to or from the respective hologram sections and disposed with respect to the hologram sections such that the radiation arrives at and leaves the hologram sections orthogonally to said central axis; and

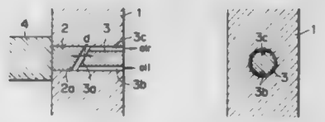
a holographic emitter disposed intermediate said central axis and said parabolic line at about the center of focus for the parabolic line, having an array of photoelements disposed at a predetermined angle with respect to said center line and said array of photoelements facing all of said mirrors in said first array of planar mirrors such that the effective light path lengths between any one of said hologram sections and said holographic emitter are substantially identical.

4,636,028

LIGHT DIVERTING DEVICE

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Nov. 5, 1984, Ser. No. 668,228
Claims priority, application Japan, Nov. 10, 1983, 58-211643; Nov. 16, 1983, 58-215810
Int. Cl.[4] G02B 6/26, 6/42
U.S. Cl. 350—96.15 4 Claims



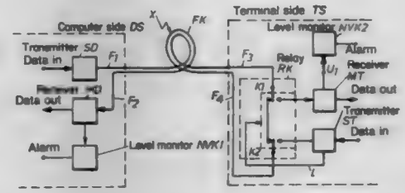
1. A light diverting device, is characterized in that said light diverting device is comprised of a first optical conductor rod, having a through-hole in a radial direction, a second optical conductor rod tightly inserted into the half way point of said through-hole and firmly fixed thereon, the edge surface of said second optical conductor rod in said through-hole being formed on a surface inclined in relation to the direction of said first optical conductor rod's axis, a third optical conductor rod tightly inserted into the remaining portion of said through-hole, the edge surface of said third optical conductor rod in said through-hole being formed so as to be engaged with said inclined surface of said second optical conductor rod, and a fourth optical conductor rod firmly fixed on the outer circumferential surface of said first optical conductor rod so as to cover the inserted portion of said second optical conductor rod, said third optical conductor rod having a couple of grooves formed along the direction of said third optical conductor rod's axis in a symmetrical position in relation to the direction of said first optical conductor rod's axis, and said inclined surface of said third optical conductor rod being fixed leaving a predetermined distance between it and said inclined surface of said second optical conductor rod.

4,636,029

APPARATUS FOR DETECTING TAPPING OF LIGHT ENERGY FROM AN OPTICAL FIBER

Jan U. S. Johansson, Bromma; Gunnar S. Forsberg, Stockholm, and Viesturs J. Vucins, Älta, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jul. 2, 1984, Ser. No. 626,639
Claims priority, application Sweden, Sep. 1, 1983, 8304733
Int. Cl.[4] G02B 6/28
U.S. Cl. 350—96.16 5 Claims



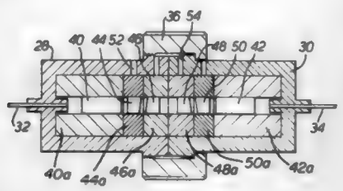
1. In an optical data transmission system having a first-transmitter-receiver with a transmitter for optically transmitting coded information and a receiver for optically receiving coded information, a second transmitter-receiver with a transmitter for optically transmitting coded information and a receiver for optically receiving coded information, fibre optical cable means having a first fibre for connecting the transmitter of the first transmitter-receiver to the second transmitter-receiver and a second cable for connecting the second transmitter-receiver to the receiver of the first transmitter-receiver, apparatus for detecting the tapping of a light energy from the fibre optical cable means comprising a first signal level sensing means in the first transmitter receiver and connected by the receiver thereof for giving an alarm when the level of the received signals falls below a predetermined level, a second signal level sensing means in the second transmitter-receiver for giving an alarm when the level of the received signal falls below a predetermined level, and relay means in the second transmitter-receiver which is in a first state when the second transmitter-receiver is operative and in a second state when the transmitter-receiver is not operative, said relay means including means for feeding signals from the first optical fibre to the receiver of the second transmitter-receiver and for feeding signals from the transmitter of the second transmitter-receiver to the second optical fibre when in the first state and including further means for feeding signals from the first optical fibre to the second optical fibre when in the second state.

4,636,030

OPTICAL ALIGNMENT APPARATUS UTILIZING PRISMATIC ELEMENTS

Andrew C. Carter, Blisworth, and William J. Stewart, Blakesley, both of England, assignors to Plessey Overseas Limited, Ilford, England

Filed Feb. 21, 1984, Ser. No. 582,008
Claims priority, application United Kingdom, Feb. 23, 1983, 8304981; May 7, 1983, 8312650
Int. Cl.[4] G02B 6/32
U.S. Cl. 350—96.18 9 Claims



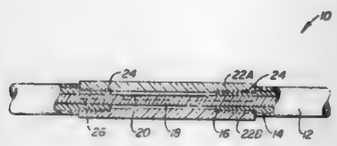
1. An optical connector for accurately aligning an optical fibre with a light emitting source comprising supporting means for supporting the end of the optical fibre and the light emitting source in spaced apart relationship and substantially in alignment, and at least two independent light deflecting members located therebetween with at least one deflecting member having an inclined face, at least one of the light deflecting members being rotatable independently of and relative to the other light deflecting member and substantially on the axis of the optical fibre, whereby the image of the light emitting source can be moved to a position in which it is focussed on the end of the optical fibre.

4,636,031

PROCESS OF TUNING A GRATED OPTICAL FIBER AND THE TUNED OPTICAL FIBER

Donald C. Schmadel, Jr., Kensington, and Jack E. Goodman, Germantown, both of Md., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 28, 1983, Ser. No. 546,610
Int. Cl.[4] G02B 6/34
U.S. Cl. 350—96.19 19 Claims



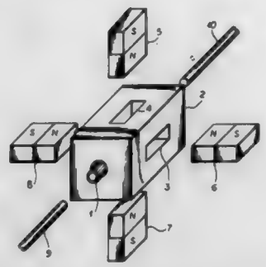
18. A tuned optical fiber having at least one grating capable of reflecting a specified wavelength of light comprising:
an optical fiber containing at least one grating; and
a tube fabricated from two semi-tubular sections around said grating and sealed to an inner sheath of the optical fiber on opposite ends of said grating, wherein said gratings are under a positive tension to reflect light at a predetermined wavelength which is greater than the wavelength of reflectance of the grating initially formed when not under a positive tension.

4,636,032

OPTICAL FIBRE CONNECTOR

Giorgio Grego, Venaria, Italy, assignor to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Nov. 8, 1984, Ser. No. 669,628
Claims priority, application Italy, Nov. 10, 1983, 68173 A/83
Int. Cl.[4] G02B 6/36, 7/26
U.S. Cl. 350—96.20 3 Claims



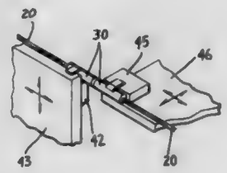
1. A connector for optical fibres, in which fibres end alignment is obtained by the effect of a magnetic field and refractive index matching is accomplished by means of a matching liquid, characterized in that it is composed of a small tube of nonferromagnetic material, with a diameter exceeding that of the fibres, into which the fibre ends are inserted together with a ferromagnetic fluid after covering the end faces with said index-matching liquid, as well as of elements apt to generate a magnetic field with an intensity minimum in correspondence with said small-tube axis and intensity increasing in radial direction.

4,636,033

OPTICAL FIBER SPLICE AND METHODS OF MAKING

Paul F. Gagen, Duluth, Ga., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 14, 1984, Ser. No. 609,769
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 15 Claims



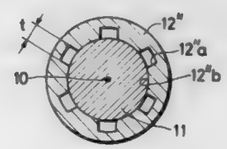
1. An optical fiber splice, which comprises:
a first plug including a passageway which extends between end faces of said plug;
a first optical fiber which comprises a core and a cladding about said core and which is secured in said passageway of said first plug with an end face of the fiber being substantially coplanar with one of the end faces of said first plug;
a second plug including a passageway which extends between end faces of said second plug;
a second optical fiber which comprises a core and a cladding about said core and which is secured in said passageway of said second plug with an end face of the second fiber being substantially coplanar with one of the end faces of said second plug, said one end face of said second plug being adjacent to said one end face of said first plug with the core of said second fiber being aligned substantially axially with the core of said first fiber; and
a cured adhesive material which is interposed between the end faces of said fibers and between said one end face of said first plug and said one end face of said second plug to form a joint therebetween, said adhesive material having an index of refraction which is suitably matched to that of the fiber cores and being effective to hold said plugs and said fibers secured together and the cores maintained in alignment with each other, said splice being formed without any substrate that extends through a plane which is disposed between the end faces of the optical fibers and which is normal to longitudinal axes of the passageways.

4,636,034

OPTICAL CONNECTOR FOR OPTICAL FIBER CABLES

Noritake Kashimura, Ohmiya, and Hiroaki Saitoh, Kawaguchi, both of Japan, assignors to Dai-Ichi Seiko Co., Ltd., Kawaguchi, Japan

Continuation of Ser. No. 443,887, Nov. 23, 1982, abandoned. This application Apr. 4, 1985, Ser. No. 719,046
Claims priority, application Japan, Nov. 30, 1981, 56-190897
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.21 6 Claims



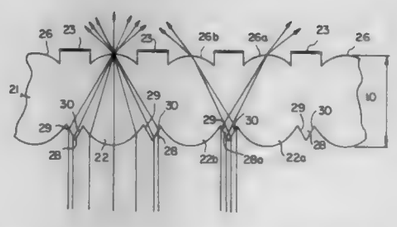
1. An optical connector for optically connecting respective ends of two optical fibers of two respective optical fiber cables, said optical connector comprising:
a first ferrule molded of synthetic resin, this ferrule having two axially opposite ends and being constructed and arranged to receive an end portion of a first optical fiber so that the said respective end thereof is exposed at the axially inner said end of this ferrule and said end portion of the first optical fiber extends longitudinally within this ferrule;
a second ferrule molded of synthetic resin, this ferrule having two axially opposite ends and being constructed and arranged to receive an end portion of a second optical fiber so that the said respective end thereof is exposed at the axially inner said end of this ferrule and said end portion of the second optical fiber extends longitudinally within this ferrule; and
a tubular sleeve molded of synthetic resin, this sleeve being axially open at two opposite ends thereof and being constructed and arranged to have said first and second ferrules slid axially thereinto through respective ones of said opposite ends thereof until said respective ends of said two optical fibers, when said end portions are received in said ferrules as aforesaid are aligned in juxtaposition so that within said optical connector, each of said two optical fibers is positioned to effectively form an optical continuation of the other;
each of said ferrules having external surface means defining a portion of full circumferential extent which is of uniform transverse cross-sectional shape along the length of each such portion;
said sleeve having internal surface means defining a portion of full circumferential extent which is of uniform transverse cross-sectional shape along the length of such portion;
one of said internal surface means portion and said external surface means portions being effectively grooved by at least one groove means formed along the full longitudinal extent of telescopic overlap of said portions when said ferrules are axially slid into said sleeve as aforesaid that air otherwise trapped between said ferrules as said ferrules are being slid into said sleeve escapes axially outwardly of said optical connector via said groove means;
said internal surface means portion and external surface means portion being so sized and shaped relative to one another that frictional resistance to axial sliding of said ferrules into said sleeve as aforesaid is extremely small, so that said sleeve need not be distended as said ferrules are axially slid thereinto.

4,636,035

TRANSPARENT REAR PROJECTION SCREEN

Erik Clausen; Johannes Clausen, both of Gentofte; Holger Jensen, Glostrup, and Finnur Sturlason, Roskilde, all of Denmark, assignors to Scan Screen A/S, Roskilde, Denmark

Filed Nov. 26, 1985, Ser. No. 801,844
Claims priority, application Denmark, Aug. 30, 1985, 3975/85
Int. Cl.[4] G03B 21/60
U.S. Cl. 350—128 9 Claims



1. A transparent rear projection screen of the kind comprising a sheet-shaped Fresnel lens (20) and a picture-forming sheet-shaped screen (21) placed in front of the Fresnel lens, as viewed by the watcher or watchers, the back of which picture-forming screen is provided with backward convex lenses (22) which are situated vertically in the working position of the screen, and the front of which picture-forming screen is provided with masking strips (23) which are also vertical, and strip-shaped sections (26) between these masking strips, which strip-shaped sections are positioned opposite to the backward convex lenses (22), each of these last-mentioned lenses being designed in such a way as to refract the light rays from the Fresnel lens (20) which hit them so that these rays are emitted through the strip-shaped sections (26), characterized in that between every two of the backward convex lenses (22) on the back of the picture-forming screen (21) a vertical intermediate lens (28) is provided comprising two opposite sides (29 and 30) designed in such a way that the light rays coming from the Fresnel lens (20) and which from the rear enter into one side (29) of each intermediate lens (28*a*), are refracted so that they flow generally in the direction towards the strip-shaped section (26*a*) which is situated opposite to the backward convex lens (22*a*) which is adjacent to the other side (30) of the intermediate lens (28*a*) concerned, and that the light rays coming from the Fresnel lens (20) and which from the rear enter into the other side (30) of the intermediate lens (28*a*) concerned are refracted so that they flow generally in the direction towards the strip-shaped section (26*b*) which is situated opposite to the backward convex lens (22*b*) which is adjacent to the said one side (29) of the intermediate lens (28*a*) concerned.

4,636,036

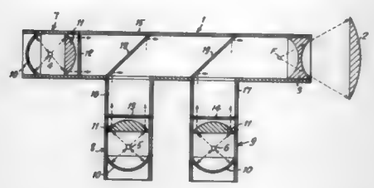
MULTI-COLOR TRAFFIC SIGNAL

Giancarlo Pasquali, Bologna, Italy, assignor to Sasib S.p.A., Bologna, Italy

Filed Sep. 17, 1981, Ser. No. 303,140
Int. Cl.[4] G02B 27/14; B61L 15/00; B60Q 1/26
U.S. Cl. 350—172 3 Claims

1. Multi-color traffic signal in particular for railway line signalling installations, of the type presenting for each color a projector unit (7, 8, 9) comprising a light source (4, 5, 6), an

optical unit (10, 11) and a chromatic filter (12, 13, 14), the projector units being connected to an irradiating output optics (2, 3) by means of an optical channel system (15, 16, 17), and the projector units being controlled so that only one unit produces a light beam at any given time, characterized by the fact that the said optical channel system comprises a main rectilinear channel (15) presenting at one end the irradiating output optics (2, 3) and at the other end a first projector unit (7) in axial alignment with said main channel (15), second and third projector units (8, 9) being housed in transverse channels (16, 17) arranged at 90° with respect to the said main channel (15) and opening thereinto, a first dichroic mirror (18) being arranged in the main channel with an angle of 45°, in correspondence with the outlet of the transverse channel of the second



projector unit, and a second dichroic mirror (19) being arranged in the main channel with an angle of 45° in correspondence with the outlet of the transverse channel of the third projector unit, each said dichroic mirror (18, 19) being spectrophotometrically adjusted with respect to the bands of wave length of the colored lights produced by the said projector units (7, 8, 9), each said dichroic mirror (18, 19) being arranged, at the interior of the optical channel system, in such a manner as to reflect towards the irradiating output optics (2, 3) the colored light beam produced by a projector unit (8, 9) associated thereto, while it permits the passage towards the said irradiating output unit (2, 3) of the colored light beams produced by the remaining projector units (7, 8), and each said projector unit producing a light beam of a respectively different color.

4,636,037

ELECTRONIC DEVICE FOR PROCESSING AND DISPLAYING AN ITEM OF INFORMATION, A METHOD OF ASSEMBLING SAID DEVICE AND A MACHINE FOR CARRYING OUT THE METHOD

Ernst Thomke, Grenchen, and Hans Zaugg, Derendingen, both of Switzerland, assignors to ETA S.A., Fabriques d'Ebauches, Grenchen, Switzerland

Filed Sep. 26, 1984, Ser. No. 654,449

Claims priority, application Switzerland, Oct. 14, 1983, 5610/83

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—334 **18 Claims**

1. An electronic device for processing and displaying an item of information, the device comprising:

three flexible elements each having two faces, said three elements comprising respectively:

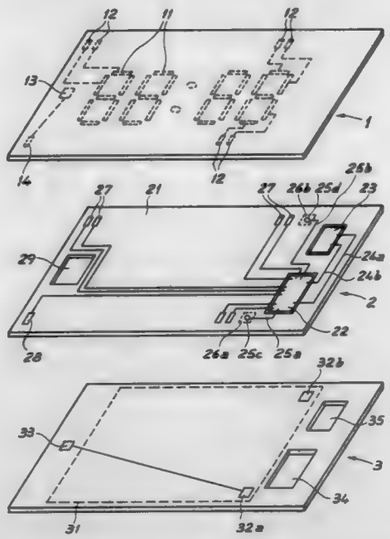
an electronic assembly for processing said information;

a display cell for displaying said information;

and an electrical power source for supplying power to said electronic assembly;

said elements being so disposed that at least one face of each element is disposed facing a face of another element;

means for mechanically connecting said elements together;



and means for electrically connecting said elements together.

4,636,038

ELECTRIC CIRCUIT MEMBER AND LIQUID CRYSTAL DISPLAY DEVICE USING SAID MEMBER

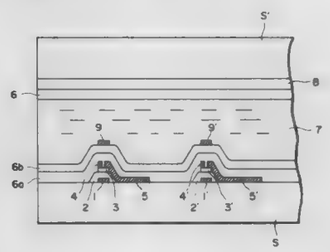
Nobuko Kitahara, Tama; Osamu Takamatsu, Yokohama; Tetsuya Kaneko, Tokyo, and Masao Sugata, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1984, Ser. No. 628,276

Claims priority, application Japan, Jul. 9, 1983, 58-124084; Jul. 12, 1983, 58-126742

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—339 R **30 Claims**



1. An electric circuit member comprising a substrate provided with a thin film transistor array thereon, an inorganic insulating layer formed over said thin film transistor array and an organic insulating layer formed over said inorganic insulating layer.

11. A liquid crystal display device comprising a substrate provided with a thin film transistor array thereon, an inorganic insulating layer formed over said thin film transistor array, an organic insulating layer formed over said inorganic insulating layer and shading means for shading light to which said thin film transistor is sensitive, the surface part of said organic insulating layer in contact with liquid crystal having an orienting property.

4,636,039

NONUNIFORMITY OF FRINGE FIELD CORRECTION FOR ELECTRO-OPTIC DEVICES

William D. Turner, San Marino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 12, 1985, Ser. No. 722,557

Int. Cl.⁴ G02F *1/03*; G01D *15/14*

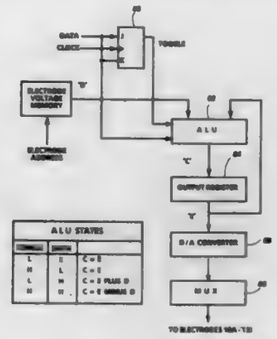
U.S. Cl. 350—356 **1 Claim**

1. In an electro-optic device including an electro-optic element,

a plurality of electrodes intimately coupled to said electro-optic element,

and first means coupled to said electrodes for applying differentially encoded voltages to said electrodes, whereby electric fringe fields are created within said electro-optic element by adjacent pairs of said electrodes;

the improvement comprising second means for storing electric fringe field correction analog voltages for each of said



electrodes, and third means coupled to said first means for receiving said differentially encoded voltages and coupled to said second means for receiving said analog correction voltages for providing that said electric fringe fields created within said electro-optic element by adjacent pairs of said electrodes are of equal strength.

4,636,040

ZOOM LENS SYSTEM

Hisashi Tokumaru, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 17, 1983, Ser. No. 467,433

Claims priority, application Japan, Feb. 19, 1982, 57-026637; May 19, 1982, 57-085279

Int. Cl.⁴ G02B *15/16, 15/177, 15/22*

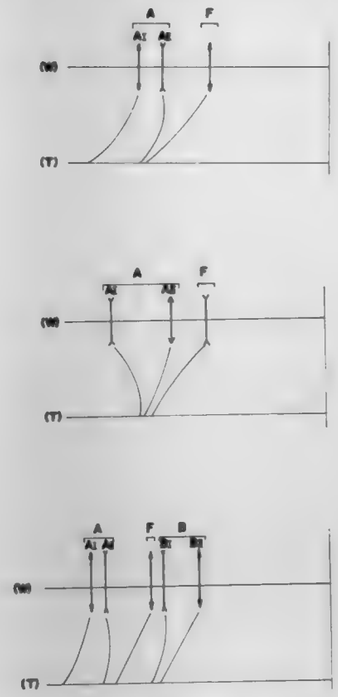
U.S. Cl. 350—427 **15 Claims**

1. A zoom lens system comprising:

a first lens group including at least two sub-groups with a variable air space therebetween, the total focal length of the first lens group being variable in accordance with the change in the variable air space during zooming;

a focusing lens group located at the image side of the first lens group and shiftable along the optical axis for focusing; and

second lens group located at the image side of the focusing lens group including at least two sub-groups with another variable air space therebetween, the total focal length of



the second lens group being variable in accordance with the change in its variable air space during zooming.

4,636,041

APERTURE DEVICE FOR ZOOM LENS

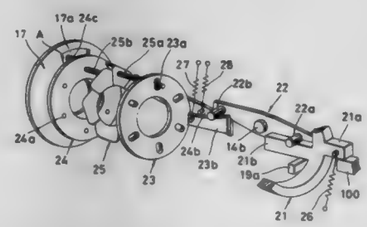
Yoshiro Kotaka; Hideshi Naito, both of Tokyo, and Yoshiharu Shiokawa, Kawasaki, all of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Nov. 27, 1984, Ser. No. 675,309

Claims priority, application Japan, Nov. 30, 1983, 58-226341

Int. Cl.⁴ G02B *15/00*

U.S. Cl. 350—429 **9 Claims**



1. An aperture apparatus for a zoom lens, comprising:

aperture blade means forming an aperture opening;

drive means connected with said aperture blade means, said drive means being operable to drive said aperture blade means to vary said aperture opening, and including first and second rotatable drive members that drive said aperture blade means to vary said aperture opening when there is relative rotation between said first and second drive

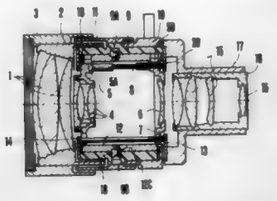
members, the first and second drive members each being rotatable about the optical axis;
moving means having a coupling member that is moved to perform an aperture closing operation;
operating means for operating said drive means in response to movement of said coupling member, the operating means operating said drive means in such a manner that said aperture blade means is not driven while said coupling member is moved by a predetermined amount of movement after the start of said aperture closing operation and said aperture blade means is driven when said coupling member is moved in excess of said predetermined amount of movement, said operating means including first and second connection members operatively connected to said first and second drive members, respectively, and extending along said optical axis, the first and second connection members being coupled to said coupling member, and said first and second drive members each being rotated by the corresponding connection member during said aperture closing operation; and
control means for controlling said operating means for varying said predetermined amount of movement in response to zooming.

4,636,042

MECHANICAL MOUNTING FOR ZOOM LENS

Yoshio Komine, Kanagawa, and Kenichi Kawamoto, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1984, Ser. No. 573,365
Claims priority, application Japan, Jan. 26, 1983, 58-11053
Int. Cl.⁴ G02B *7/04*
U.S. Cl. 350—429 **3 Claims**



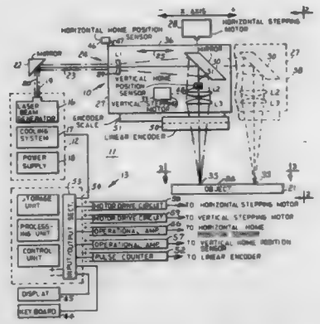
1. A mechanical mounting for a zoom lens defining an optical axis and including a body tube, an optical element and a zoom ring, comprising:
a cam sleeve mounted in operative association with said body tube and having a cam for controlling movement of said optical element for contributing to a zooming function, said cam sleeve being rotatable about said optical axis upon actuation of said zoom ring to move said optical element;
said body tube being made of plastic material and being provided with a groove;
said cam sleeve being made of metallic material and being provided with a groove corresponding to said groove of said body tube; said cam sleeve having both ends made as free ends so as to be able to be displaced in the direction parallel to said optical axis; and
an engagement member which engages with both of said groove of said body tube and said groove of said cam sleeve for regulating deviation in the relative positions in the direction parallel to the optical axis of said body tube and said cam sleeve derived from changes in ambient temperature.

4,636,043

LASER BEAM SCANNING DEVICE AND MARKING SYSTEM

Dennis R. Bellar, Orlando, Fla., assignor to Laser Photonics, Inc., Orlando, Fla.

Filed Mar. 1, 1984, Ser. No. 584,987
Int. Cl.⁴ G02B *26/08*
U.S. Cl. 350—484 **9 Claims**



9. A device for use in scanning a stationary target area with a laser beam and wherein said target area is generally defined by a pair of intersecting and angularly arranged linear axes comprising means for projecting the laser beam along an optical path having a first linear portion which projects in front of the target area and is generally parallel to one of said pair of linear axes, a carriage which is moveable along a first linear path that is parallel to said first linear portion of said optical path, means controllable to move the carriage back and forth along said first linear path, means fixed to the carriage and located in said first linear portion of said optical path for projecting the laser beam toward said target area and along a second linear portion of said optical path, first lens means having an optical axis and being mounted on and moveable with said carriage and located in said optical path for focusing said laser beam on said target area, and a light collimator arranged in said optical path for traversal by said laser beam and being mounted on and moveable with said carriage for expanding said laser beam and delivering collimated light to said first lens means, said light collimator including second lens means arranged to deliver said collimated light to said first lens means and mounted for movement along a path extending laterally of said optical axis, and means mounted on the carriage for moving said second lens means back and forth along said laterally extending path to laterally move the focus of the first lens means generally in parallel with the other of said pair of linear axes.

4,636,044

OPTICAL SYSTEM FOR VIEWING A SCENE

Fernand R. Loy, Sceaux, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,534
Claims priority, application France, May 11, 1983, 83 07911
Int. Cl.⁴ G02B *23/02*
U.S. Cl. 350—539 **2 Claims**

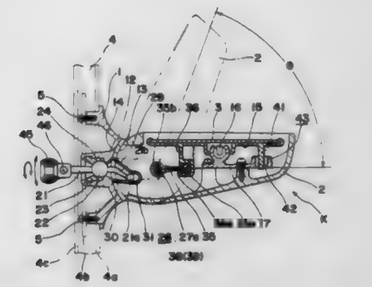
2. An optical system for viewing a scene, said optical system comprising:
a housing having first, second and third portions, the first portion being fixed relative to a first axis, the second portion being rotatable relative to the first portion around the first axis, said second portion having a second axis orthogonal to the first axis, the third portion being rotatable relative to the second portion around the second axis; and
optical elements arranged in the said rotating portions of the housing to form the image of the scene on a receiver in such a manner that the image tilt is always corrected;
characterized in that said optical elements include:
inner and outer objective lenses arranged coaxially on a third axis in an aperture of the said third portion of the housing, said third axis intersecting the second axis; and
a switching mirror arranged at the intersection between the second and third axes, said switching mirror being rotatable relative to the third portion of the housing around the second axis; and
characterized in that:
said inner objective passes light along a path directly onto the switching mirror; and
said optical elements further comprise a system of diverting mirrors for passing light from the outer objective onto the switching mirror along a longer path than the direct path.

4,636,045

MANUAL ADJUSTING DEVICE FOR TILTABLE OUTER MIRROR

Masaru Suzuki, Chiryu, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Aug. 29, 1984, Ser. No. 645,906
Claims priority, application Japan, Sep. 1, 1983, 58-161445; Dec. 7, 1983, 58-189652[U]
Int. Cl.⁴ G02B *5/08, 5/10*
U.S. Cl. 350—606 **18 Claims**



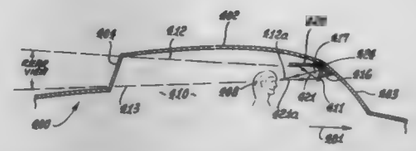
1. A manual adjusting device for a tiltable outer mirror of a motor vehicle including a mirror visor, a mirror member tiltably supported by said mirror visor and a mirror stay formed with a rotary shaft and attached to an outer side face of said motor vehicle such that said mirror visor is pivotally mounted on said mirror stay through said rotary shaft, said manual adjusting device comprising:
a bearing member for supporting said mirror member, which is disposed at a position deviated from an axis of said rotary shaft;
an operating lever which extends from an inside of said motor vehicle into said mirror stay towards said mirror visor and is so supported by said mirror stay as to be movable in two modes;
a coupling member having a shaft portion;
said shaft portion being rotatably and axially movably supported by said rotary shaft coaxially with said rotary shaft;
said shaft portion being rotated by the motion of said operating lever in one of said modes, and axially moved by the motion of said operating lever in the other of said modes;
a detachable engaging means;
a driving arm which is detachably mounted on an end portion of said shaft portion through said detachable engaging means such that said driving arm and said end portion of said shaft portion are disengaged from each other upon application of a predetermined torque to said detachable engaging means; and
an arm holder for supporting said driving arm, which is attached to said mirror member such that a distal end of said driving arm and said arm holder are engaged with each other at an engaging position deviated in the forward direction of said motor vehicle from said bearing member.

4,636,046

SHADE FOR SEGMENTED REAR VIEW MIRROR

C. James Blom, Bakersfield, Calif., assignor to Roxor Corporation, Bakersfield, Calif.

Continuation-in-part of Ser. No. 642,179, Aug. 20, 1984, which is a continuation-in-part of Ser. No. 385,544, Jun. 7, 1982, Pat. No. 4,470,665, which is a division of Ser. No. 233,106, Feb. 10, 1981, Pat. No. 4,368,951. This application Oct. 2, 1984, Ser. No. 656,927
The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.
Int. Cl.⁴ G02B *5/08, 1/10*
U.S. Cl. 350—613 **10 Claims**



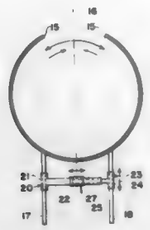
1. In combination with a rear view mirror used in a vehicle and located in the cab behind the windshield, to receive impingement of light rays traveling generally forwardly from the rear, or flank, or flanks of the vehicle, and to reflect said light rays back toward the viewer in the vehicle which is traveling forwardly,
(a) a canopy carried by the vehicle to extend generally rearwardly above the level of the mirror and above the space immediately rearwardly of the mirror, but at or below the vehicle ceiling,
(b) the canopy absorbing light rays impinging thereon, thus to minimize ghost reflection thereform via the mirror toward the eyes of said viewer,
(c) the mirror having individual sectors on a transparent molding and comprising a myriad of metallized layers providing reflecting adjacent surfaces at the back side of the mirror away from the viewer, said surfaces oriented to produce, in the eyes of the viewer, one virtual image, or separate virtual images from separate portions of such molded mirror, said layers having thinned peripheries, there being a network of zones separating the individual reflecting surfaces, improvements,
(d) a material coating the back sides of said zones, and which includes a light absorber,
(e) the coating covering zones between reflecting surfaces and the thinned peripheries of said metallized reflecting layers, whereby undesirable reflections from said zones are substantially reduced.

4,636,047
WRIST WATCH MIRROR ACCESSORY
Ronald N. Green, 1723 W. Monteroso, Phoenix, Ariz. 85015
Filed Mar. 21, 1986, Ser. No. 842,777
Int. Cl.[4] G02B *1/04, 5/08;* B32B *15/08, 7/06*
U.S. Cl. 350—641 11 Claims



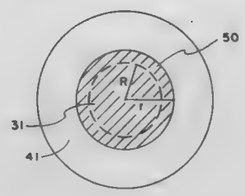
1. An accessory for the back of a wrist watch to effect an emergency mirror comprising:
(A) a thin wafer dimensioned and configured for emplacement on the back surface of a wrist watch, said wafer having a first one of its surfaces mirror finished;
(B) an adhesive coating overlaying a second surface of said wafer; and
(C) a removable paper wafer overlaying said adhesive coating;
whereby said paper wafer may be peeled off said adhesive coating such that said thin wafer may be pressed onto the back of a wrist watch with said mirror finished surface directed outwardly, said thin wafer thereafter remaining secured in place on the wrist watch back by said adhesive coating.

4,636,048
ADJUSTABLE EYEGLASS HOLDER FOR CAPS AND HATS
Boone Jones, P.O. Box 493, Ada, Okla. 74820
Filed Nov. 13, 1984, Ser. No. 671,252
Int. Cl.[4] G02C *3/00*
U.S. Cl. 351—155 4 Claims



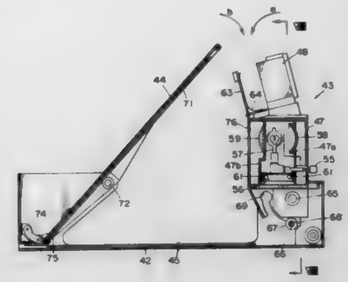
1. An eyeglass holding apparatus which comprises:
(a) a mounting band of adjustable size adapted to be attached to the interior headband of a cap or hat and substantially encircle the head of the wearer, said mounting band having a front extremity adapted to fit over the wearer's forehead, an opposed rear extremity, and a vertical plane of symmetry that bisects said front and rear extremities,
(b) first and second elongated straight rigid holding arms forwardly extending from the front extremity of said mounting band in equally spaced relationship about said vertical plane of symmetry and centered in a plane that perpendicularly intersects said plane of symmetry,
(c) a first T-shaped sleeve comprised of a straight hollow top portion and straight hollow leg portion, said top portion being slideably engaged by said first holding arm, the leg portion being directed toward the opposite holding arm,
(d) a second T-shaped sleeve comprised of a straight hollow top portion slideably engaged by said second holding arm, and a straight leg portion which telescopically inserts within the leg portion of said first sleeve, thereby forming a structural bridge between said holding arms,
(e) a third T-shaped sleeve comprised of a straight hollow top portion slideably engaged by the straight leg portion of said first sleeve and adapted to move horizontally along said structural bridge, and a straight leg portion downwardly oriented with respect to said structural bridge,
(f) vertical adjustment means adapted to telescopically engage the downwardly oriented leg portion of said third sleeve, said adjustment means being of elongated straight construction,
(g) the several slideably and telescopically interengaged members being interactive in a manner to remain in a selected position until forcibly re-positioned,
(h) attachment means positioned adjacent the lowermost extremity of said adjustment means for holding eyeglasses, and
(i) eyeglasses having a frame with nosepiece but devoid of arms intended to engage the ears of the wearer, said eyeglasses being supported adjacent said nosepiece by said attachment means in a disposition below said structural bridge and substantially coplanar therewith.

4,636,049
CONCENTRIC BIFOCAL CONTACT LENS
J. Warren Blaker, New York, N.Y., assignor to University Optical Products Co., Westport, Conn.
Filed Sep. 20, 1983, Ser. No. 534,017
Int. Cl.[4] G02C *7/04*
U.S. Cl. 351—161 1 Claim



1. A bi-focal contact lens for the cornea of an eye, comprising:
a thin circular lens body formed of a single piece of plastic material;
said body having a symmetrically curved rear surface adapted to fit centrally and stably on the corneal surface of the eye;
said body having a near power correction region of circular periphery in the central portion thereof, surrounded by a concentric distance power annular correction region;
the near power central region having an area which is substantially equal to half the pupil area of the eye under average reading light conditions.

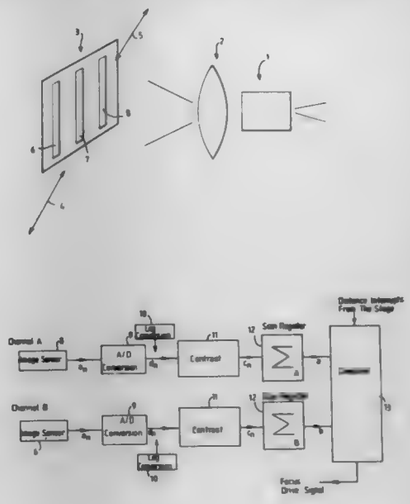
4,636,050
REFLECTION TYPE OVERHEAD PROJECTOR
Susumu Tohata, and Kunio Numata, both of Tokyo, Japan, assignors to Kabushiki Kaisha Gakushu Kenkyusha, Japan
Filed Dec. 20, 1984, Ser. No. 684,043
Claims priority, application Japan, Dec. 26, 1983, 58-204301[U]; Jun. 8, 1984, 59-85423[U]
Int. Cl.[4] G03B *21/06*
U.S. Cl. 353—66 6 Claims



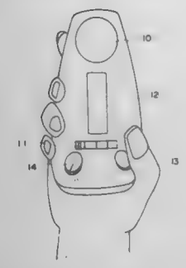
1. A reflection type overhead projector comprising:
a case having a Fresnel concave mirror disposed on a bottom wall thereof with a mirror surface facing upwardly for allowing a transparency to be placed thereon;
light source means disposed at the front of said case;
projecting lens means disposed at the front of said case; and
reflecting mirror means disposed above said Fresnel concave mirror with a reflecting surface capable of facing downwardly and forwardly such that a light beam from said light source means is reflected by said reflecting mirror means into said Fresnel concave mirror and the reflected light beam from said Fresnel concave mirror is then reflected by said reflecting mirror means into said projecting lens means; wherein said case comprises a case body and a plate member forming at least a part of the top wall of said case and pivotably connected to said case body, said reflecting mirror is bonded to the lower surface of said plate member, the front end of said plate member is capable of being lifted up causing the mirror surface of said reflecting mirror to face downwardly forwardly when said projector is used, and a cut-out portion adapted for allowing the hand to be inserted therethrough is defined in the lateral side of said case body.

4,636,051
AUTOMATIC FOCUSSING DEVICE
Geoffrey Shippey, Edinburgh, Scotland, assignor to Shandon Southern Products Limited, Great Britain
Filed Apr. 15, 1985, Ser. No. 723,611
Claims priority, application United Kingdom, Apr. 16, 1984, 8409855
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—402 13 Claims

1. An automatic focussing arrangement, incorporated in a system which an optical image is focussed on to a focus plane, comprising a sensor assembly, located in the region of the focus plane to sense the image, the sensor assembly comprising at least two arrays of sensor devices, one array of sensor devices being in front of the focus plane, and the second array of sensor devices being behind the focus plane, means being provided for effecting relative movement between the image and the sensor assembly, so that the sensor assembly may be sequentially exposed directly to different parts of the image, means being provided for deriving from the first and second array signals representative of the image received by the said sensor devices, and for deriving, from signals generated from the first array when exposed to a predetermined part of the image, and from the second array when exposed to the predetermined part of the image, a focus drive signal to maintain the focus of the arrangement as desired.



4,636,052
AUTOMATIC HAND-HELD PHOTOGRAPHIC LIGHT METERS
John M. Bowsher, Cobham, United Kingdom, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 639,664, Aug. 8, 1984, abandoned. This application Mar. 17, 1986, Ser. No. 840,608
Claims priority, application United Kingdom, Aug. 10, 1983, 8321464
Int. Cl.[4] G03B *7/00;* G08C *19/36;* G01J *1/42*
U.S. Cl. 354—410 1 Claim



1. In a light exposure control system including a camera for photographing a subject, a remote light measuring device and an infrared receiver connected to the camera, said light measuring device comprising:
a light receiving means for receiving light incident at the location of the subject to be photographed and generating a plurality of light quantity signals each signal being representative of a different measurement of said light;
a light emitting means for emitting infrared light;
means including an analogue to digital converter for converting each light quantity signal generated by said light receiving means into an eight bit digital signal representative of the particular light quantity signal; and
means including a microcomputer for driving said light

emitting means to emit modulated infrared light in a series of four bit words carrying data corresponding to said digital signal;

said receiver comprising:

means for receiving the infrared light; and

means for reading the series of four bit word data carried by said infrared light to provide a digital output,

said camera comprising:

means for controlling exposure in accordance with the digital read data including an exposure control processor and a switch control to enable the control processor to receive said digital output from the receiver.

4,636,053

DISTANCE DETECTING DEVICE

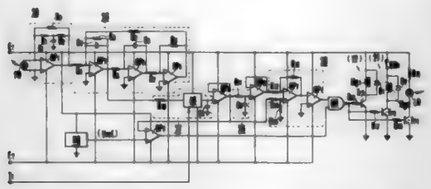
Toshio Sakane; Tetsuya Taguchi, both of Kanagawa; Masahiko Ogawa, Tokyo; Shuichi Tamura, and Tokuichi Tsunekawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha

Division of Ser. No. 13,294, Feb. 21, 1979, Pat. No. 4,291,223. This application Apr. 8, 1980, Ser. No. 138,316

Claims priority, application Japan, Feb. 24, 1978, 53-20659; Jul. 25, 1978, 53-90585

Int. Cl.⁴ G03B *3/00, 1/34;* H01J *40/14*

U.S. Cl. 354—403 **13 Claims**



3. A system for sensing a radiation modulated with a predetermined frequency, comprising:

(A) means for sensing said radiation, said sensing means producing an output signal indicative of the intensity of the received radiation;

(B) circuit means for processing the output signal of said sensing means, said circuit means including an amplifying circuit receiving the output signal of the sensing means, wherein said amplifying circuit comprises:

(1) an operational amplifier having two input terminals and an output terminal and receiving the output of said sensing means;

(2) a series connection of first and second resistors, the first resistor being connected to one of the input terminals of said amplifier and said second resistor being connected to the output terminal of the amplifier;

(3) a capacitor disposed between the connecting point of said first and second resistors and a terminal of a predetermined potential; and

(4) a third resistor connected in parallel with said series connection of said first and second resistors;

(C) wherein R_1, R_2 and R_3 are resistances of said first, second and third resistors, respectively, and the value of R_1 is greater than that of R_2 so as to reduce an increase factor of $(1+R_3/R_1)$ of a noise voltage generating at an inversion input terminal of the operational amplifier due to amplification of a signal of a predetermined frequency band containing said predetermined frequency by the amplifying circuit under a predetermined gain of the amplifying circuit determined by a predetermined value of R_3 and under a predetermined DC elimination ratio of $(R_1+R_2)/R_3$ of the amplifying circuit; and

(D) thereby the noise of the amplifying circuit is reduced but the gain of the amplifying circuit over said predetermined frequency band containing said predetermined frequency remains substantially unchanged as compared to a case where the values of R_1 and R_2 are equal.

4,636,054

PHOTOMETRIC METHOD AND APPARATUS FOR CAMERAS

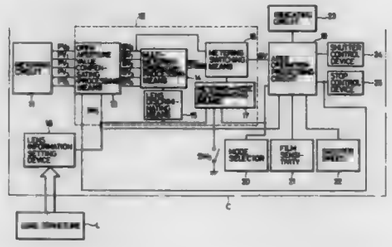
Takashi Soegawa, Kawasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Continuation of Ser. No. 635,844, Jul. 30, 1984, abandoned. This application Jan. 15, 1986, Ser. No. 818,912

Claims priority, application Japan, Aug. 2, 1983, 58-141274

Int. Cl.⁴ G03B *7/08, 7/20, 7/28*

U.S. Cl. 354—432 **12 Claims**



1. A camera in which a first phototaking lens having means producing a stop signal pertinent to a stop and a second phototaking lens having no means producing said stop signal are capable of being attached on and detached from the camera, comprising:

(a) metering means provided with a plurality of light receiving elements and which measures the field through at least a phototaking lens, the light receiving elements each producing a metering output according to the intensity of light received on each of elements;

(b) first detection means which detects the mounting of said first phototaking lens on said camera to produce a first detection signal;

(c) second detection means which detects the mounting of said second phototaking lens on said camera to produce a second detection signal;

(d) determination means determining an amount of exposure and having a first state and a second state, the determination means operating the brightnesses of a plurality of areas where at least two light receiving elements each measures, according to the metering output thereof and said stop signal, to determine the exposure depending on the operated brightnesses of plural areas when the determination means is at the first state, said determination means determining an amount of exposure depending upon the metering output of at least one light receiving element when the determination means is at said second state; and

(e) selection means which causes said determination means to be at said first state in response to said first detection signal and causes said determination means to be at said second state in response to said second detection signal.

4,636,055

CAMERA

Kiyoshi Aiyfuku, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1985, Ser. No. 716,849

Claims priority, application Japan, Mar. 29, 1984, 59-59342; Dec. 28, 1984, 59-276965; Dec. 28, 1984, 59-276966

Int. Cl.⁴ G03B *17/18*

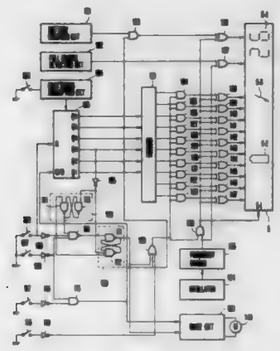
U.S. Cl. 354—465 **23 Claims**

1. A camera comprising,

(A) A display circuit for displaying information necessary for exposing film;

(B) exposure interrupting means for making it substantially impossible for said camera to expose film;

(C) switching means for erasing display of said display circuit in response to the exposure interrupting means becoming operative, and for causing said display circuit to display in response to the operative state of the exposure interrupting means being released; and



(D) intrusion means for causing said display circuit to display necessary information even when said exposure interrupting means has made it substantially impossible for said camera to expose film.

4,636,056

ELECTRICAL POWER SUPPLY CIRCUIT IN A CAMERA

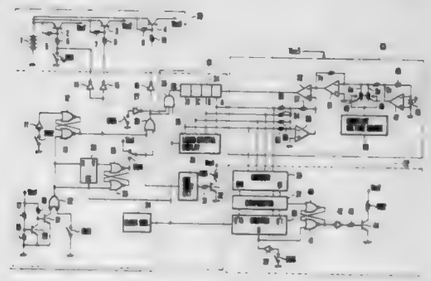
Ryuichi Kobayashi; Akira Akashi, and Masaharu Kawamura, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1984, Ser. No. 657,764

Claims priority, application Japan, Oct. 6, 1983, 58-185893; Oct. 6, 1983, 58-185894; Oct. 6, 1983, 58-185895; Dec. 28, 1983, 58-245901

Int. Cl.⁴ G03B *7/26*

U.S. Cl. 354—484 **17 Claims**



1. A camera provided with an electrical power for supplying electrical power to a light metering circuit, comprising:

(A) a light metering circuit having a photosensitive element with an output and an amplifier for amplifying the output of said photosensitive element with the use of electrical power;

(B) an electrical power source circuit responsive to a signal for supplying electrical power to said light metering circuit;

(C) switching means having a first state and a second state and arranged to be operable manually; and

(D) a control circuit responsive to detection of the fact that said switching means is in the second state for producing said signal, said control circuit producing said signal intermittently in response to detection of the fact that a prescribed period of time has passed with said switching means remaining in the second state.

4,636,057

ELECTROSTATIC COPYING APPARATUS

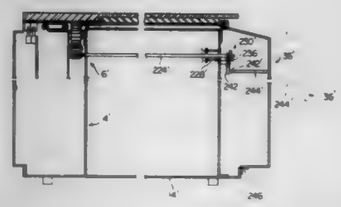
Kazumi Iida, Matsubara; Yosuke Obata, Habikino; Keiichiro Hyodo, Kobe; Kazunori Akiyama, Takatsuki; Tadashi Umeda, Takada, and Keiichi Kishimoto, Nara, all of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Filed Apr. 3, 1984, Ser. No. 596,121

Claims priority, application Japan, Apr. 12, 1983, 58-63051

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 R **7 Claims**



1. An electrostatic copying apparatus of the type comprising a lower supporting frame, an upper supporting frame mounted on the lower supporting frame for pivotal movement between an open position and a closed position, a document placing means having a transparent plate to place a document to be copied, an optical unit and a driving source, either said document placing means or at least a part of the optical unit being reciprocably coupled to the driving source via a power transmission mechanism;

said power transmission mechanism including a rotating power transmission element mounted rotatably on the upper supporting frame and having at least one protrusion or groove formed on its surface,

said apparatus including an automatic locking means comprising a locking member mounted on the upper supporting frame for free movement between a locking position at which it interferes with the protrusion or groove of the rotating power transmission element to hamper the movement of the document placing means or at least a part of the optical unit and a lock cancelling position at which it moves away from the protrusion or groove of the rotating power transmission element, a spring means for elastically biasing the locking member to the locking position and a lock cancelling mechanism operatively connected to the locking member, the lock cancelling mechanism being adapted to be restrained at an operating position, at which it forcibly holds the locking member at the lock cancelling position, by an operation of pivoting the upper supporting frame from the open position to the closed position or an operation to be subsequently performed of moving another member to a closed position, the restraining of the lock cancelling mechanism to the operating position being cancelled by an operation of pivoting the upper supporting frame from the closed position to the open position or by an operation to be performed before it of moving said other member to an open position, and the locking member being adapted to be held at the locking position by the elastic biasing action of the spring means.

4,636,058

EXPOSURE OPTICAL APPARATUS

Yozo Fujii, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 29, 1984, Ser. No. 614,817

Claims priority, application Japan, Jul. 21, 1983, 58-133373; Jul. 21, 1983, 58-133374

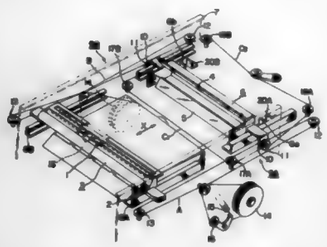
Int. Cl.⁴ G03G *15/04, 15/28*

U.S. Cl. 355—8 **12 Claims**

1. Apparatus for scanning a document comprising:

a frame (7);

a carriage (3,6,17) mounted for reciprocating movement relative to said frame (7) along a center axis (x);
two symmetrical sets (9A,9B) of pulleys disposed on opposite sides of said center axis (X);
each set (9A,9B) of pulleys including pulleys mounted on said frame (7) and on said carriage (3,6);



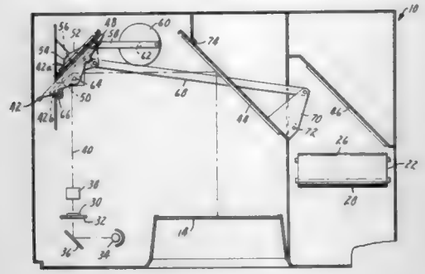
and a single endless common drive wire (C) for driving said two sets (9A,9B) of pulleys and symmetrically arranged with respect to said center axis (X) so that two symmetrical wire portions (A,B) lie on opposite sides of said center axis (X).

4,636,059

MICROFILM READER AND PRINTER

Robert W. Thompson, Pine City, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 25, 1985, Ser. No. 715,682
Int. Cl.⁴ G03G *15/04*; G03B *13/28*
U.S. Cl. 355—5 **10 Claims**



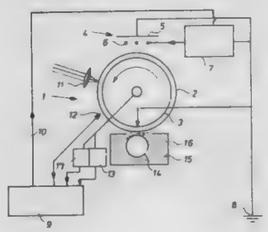
1. A microfilm reader and printer for alternately projecting an image onto a screen for reading and projecting the same image onto a photoreceptor for printing, comprising:
an object plane defined by a surface of a microfilm strip;
a planar rear-projection screen disposed in a plane parallel to said object plane;
a photoreceptor surface defining a plane and disposed parallel to said object plane;
a light source having an optical axis perpendicular to said object plane for projecting light perpendicularly through said object plane defined by said microfilm strip;
a first set of mirrors for folding said light projected perpendicularly through said object plane into a first light path which terminates at said rear-projection screen and which has an optical axis at said screen which is perpendicular to said plane of said rear-projection screen;
a second set of mirrors for folding said light projected perpendicularly through said object plane into a second light path which terminates at said photoreceptor surface and which has an optical axis at said photoreceptor surface which is perpendicular to said plane of said photoreceptor surface;
wherein said first light path and said second light path are equal in length so that said image projected on said rear-projection screen is identical to said image projected on said photoreceptor surface; and
means for selectively directing said light projected through said object plane along either said first light path or said second light path.

4,636,060

ELECTROSTATIC COPYING METHOD INCLUDING COMPENSATION FOR PHOTOCONDUCTOR FATIGUE AND DARK RECOVERY

Lucien A. De Schamphelaere, Edegem; Freddy M. Librecht, Boechout, and Willy G. Verlinden, Edegem, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Feb. 21, 1985, Ser. No. 703,661
Claims priority, application European Pat. Off., Feb. 28, 1984, 84200278.4
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—14 CH **5 Claims**



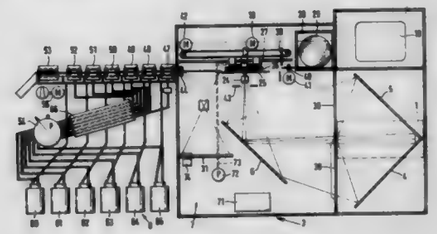
1. In a method of producing toner-developed electrostatic images involving the repetitive performance of a copying cycle comprising the steps of electrostatically charging a photoconductive layer by means of a corona discharge at a determined voltage level, information-wise photo-exposing said charged photoconductive layer to electromagnetic radiation to which it is sensitive, applying electrostatically charged toner particles to said exposed photoconductor to develop the resulting electrostatic charge pattern as a toner image, information-wise transferring the applied toner image to a receptor, and restoring the photoconductive layer to a rest potential preparatory to the next cycle; and after completion of one series of copying cycles, but before the completion of the next series, maintaining said photoconductor in the dark for a randomly varying time period, the improvement wherein:
(i) during the performance of a given series of copying cycles following immediately one after another, the number of performed copying cycles in said series is registered by electronic means as they are performed and an output signal corresponding to said number is generated;
(ii) after the performance of one such series, the period of time that said photoconductor is maintained in the dark before the start of the next series is measured and an output signal corresponding to said time period is generated; and
(iii)the respective output signals (i) and (ii) are applied as input signals to electronic control means which (a) on the basis of an experimentally developed relation establishing the actual charge surface potential of said photoconductor as a function of the number of copying cycles performed in a series, provides a measure of the voltage change on said photoconductor surface resulting from the actual number of cycles in said given series, (b) on the basis of an experimentally developed relation establishing the actual change in surface potential of said photoconductor as a function of the duration of the time period to which said photoconductor is maintained in the dark between said series of cycles, provides a measure of the voltage change in the surface potential of said photoconductor after the elapse of the actual period of time said photoconductor is maintained in the dark, (c) said two measures are combined to generate a control signal of a magnitude indicative of the overall change in surface potential of said photoconductor from the beginning of one series of cycles to the beginning of the next series, and (d) the voltage level of said corona discharge is regulated to a determined level substantially according to the magnitude of said control signal, whereby said corona discharge voltage level is controlled so as at least substantially to compensate for variations in the surface potential of the photoconductive layer resulting from both the number of copy cycles performed in a given series and the duration of the dark maintenance period between that series and the next.

4,636,061

APPARATUS FOR THE AUTOMATIC MICROFILMING OF DOCUMENTS

Eckhard Staude, and Juergen Kaus, both of Woelfersheim, Fed. Rep. of Germany, assignors to Firma Eva Staude, Woelfersheim, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 703,652
Claims priority, application European Pat. Off., Mar. 13, 1984, 84102710.5
Int. Cl.⁴ G03B *27/52*
U.S. Cl. 355—24 **16 Claims**



1. An apparatus for the automatic microfilming of documents of different formats and the development of exposed microfilm sheets in a continuous process, the apparatus including a computer controlled combination of systems, comprising:
(a) means for the automatic insertion and transport of documents through an exposing device from an input of stacked documents of a certain format with a format adjusting device;
(b) an interchangeable lens camera with an exposure and mirror system for the simultaneous imaging of the front and reverse sides of the document and with automatic film transport means;
(c) a second camera having an exposure system for the filming of titles and running identifications;
(d) means for the development of film; and
(e) a central guide and control system with an input keyboard, a monitor and a processor device.

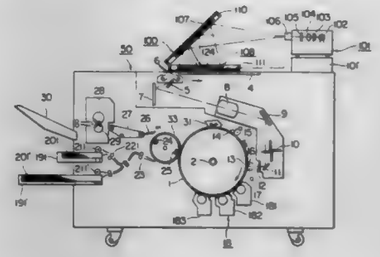
4,636,062

IMAGE FORMING APPARATUS

Akio Ohno, Kawaguchi, and Akiyoshi Torigai, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1984, Ser. No. 602,012
Claims priority, application Japan, Apr. 26, 1983, 58-72122
Int. Cl.⁴ G03B *27/52, 27/70*
U.S. Cl. 355—43 **12 Claims**

1. An image forming apparatus for forming copy images of a reflection original and a transparent original, comprising:
a transparent table for supporting a reflection original thereon;
support means removably mounted on said table and having an opening facing said table;
a condenser lens provided on said support means in facing relation with said opening to condense and guide light from a tansparent original through said opening to said table;
a reflection-type screen disposed on said support means and movable between a first position where said screen interrupts the light from said condenser lens and a second position where said screen does not interrupt the light from said condenser lens;



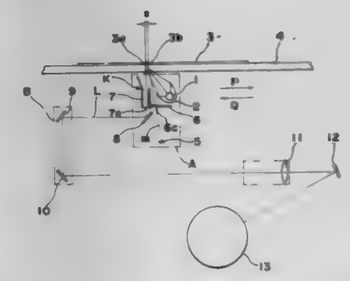
first optical means for projecting an image of the transparent original to said condenser lens on said support means mounted on said table; and
second optical means for projecting when the reflection original is on said table, an image of the reflection original to a photosensitive member and, when said support means is mounted on said table, the image of the transparent original projected to said condenser lens on said support means.

4,636,063

AUTOMATIC EXPOSURE ADJUSTING DEVICE

Yasuhiro Takai, Sakurai; Kenichi Morimoto, Nara; Shigekazu Yoshida, Nara, and Takao Tagawa, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 15, 1985, Ser. No. 734,097
Claims priority, application Japan, May 21, 1984, 59-103192
Int. Cl.⁴ G03B *27/74, 27/80*
U.S. Cl. 355—68 **7 Claims**



1. An automatic exposure adjusting device for use in a variable copying magnification type copying apparatus enabling continuous change of its copying magnification, which controls quantity of light from a light source of said copying apparatus on a real time basis by detecting the photographic density of a scanned portion of a copy face of an original document by the use of a photo detector during the copying operation of said original document, wherein:
said photo detector is provided below and adjacent to said light source; and
a shielding plate is provided below and adjacent to said copy face of said original document and is formed with a slit such that said slit is brought into alignment with an optical

path for subjecting a photosensitive member of said copying apparatus to exposure.

4,636,064

DEVICE FOR THE AUTOMATIC LOADING OF FILM MATERIAL ON A SUCTION PLATE

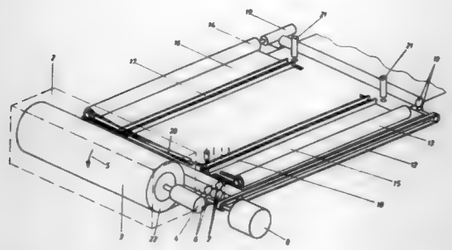
Hans Penza, Preetz; Siegfried Segler, Raisdorf; Karl-Wilhelm Schmuck, Kiel; Dietrich Asbach, Klausdorf, and Eckhard Lindemann, Raisdorf, all of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 703,712

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1984, 3406132; European Pat. Off., Nov. 10, 1984, 84113607.0

Int. Cl.[4] G03B *27/60*

U.S. Cl. 355—73 12 Claims



1. A device for loading and retaining film material on a suction plate, comprising:

first and second pairs of cooperating transport rollers at respective first and second opposite ends of the suction plate;

drive means for driving the first and second roller pairs;

the first pair being positioned to receive a leading edge of the film material and being driven by the drive means so as to slide the film over the suction plate;

the second pair being driven by the drive means and positioned to receive and engage the leading edge of the film material after it passes over the suction plates;

the second roller pair being driven by the drive means more rapidly than the first roller pair such that the film is tensioned between the roller pairs;

respective first and second shade rollers extending substantially along entire respective opposite lateral sides of the suction plate;

each shade roller having a respective flexible sheet material wound thereon ;

each shade roller being positioned and the flexible material wound thereon being dimensioned so that when both flexible materials are unwound a blind is formed which covers the suction plate so as to provide a partial vacuum where the blind covers usction holes not covered by the film;

a leading end of each flexible material having a rail connected therewith such that in the unwound state of the material, the rails abut approximately at a center line of the suction plate so that during loading of the film, all suction holes and the film are covered so as to improve a partial vacuum over the suction plate;

tension means connected to each rail for drawing the rails toward each other; and

shade roller drive means connected to the shade rollers so as to counteract tension applied by the tension means by pulling across in a direction away from the center line.

4,636,065

MOLDED ARTICLE WITH FLEXIBLE HINGE

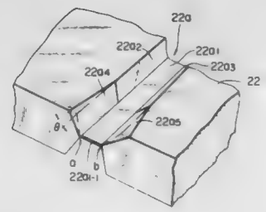
Shinji Kanesaltsu, Ichikawa, and Hiroshi Nitanda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

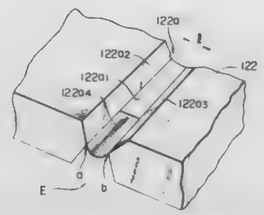
Filed Nov. 14, 1984, Ser. No. 671,460

Claims priority, application Japan, Nov. 25, 1983, 58-222601; Nov. 25, 1983, 58-222632

Int. Cl.[4] G03B *27/62*

U.S. Cl. 355—75 24 Claims





1. An original document cover for an original pressing apparatus, comprising a molded hinge, a flexible portion, having first and second end areas and a pair of solid portions mutually opposed across said flexible portion, said original document cover being foldable at said flexible portion between a first and a second position, said solid portions mutually abutting when said original document cover is folded at said flexible portion into said second position, wherein said solid portions are shaped and arranged so that they do not contact each other at said end areas of said flexible portion.

4,636,066

METHOD OF EXPOSING PHOTOSENSITIVE MATERIAL

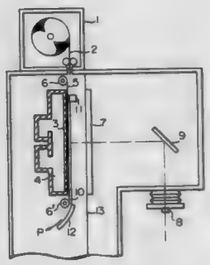
Eiji Kanada; Shigeyoshi Suzuki; Kazunaka Endo, and Kyonosuke Yamamoto, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jan. 3, 1986, Ser. No. 816,053

Claims priority, application Japan, Jan. 14, 1985, 60-5392; Jan. 14, 1985, 60-3841[U]

Int. Cl.[4] G03B *27/32*

U.S. Cl. 355—77 7 Claims



1. A method for exposing in two steps a photosensitive material to an original of a continuous tone image mingled with a line image through a lens of a process camera of the daylight type, which comprises feeding said photosensitive material to an exposure unit disposed in nearly vertical position in said camera and provided with a suction mechanism, setting the sensitive material in place; then, (A) in case of the first step exposure being made to an original of a continuous tone image, (a) moving a contact screen from a position in front of the photosensitive material to establish a close contact with the photosensitive material and exposing the sensitive material imagewise to the continuous tone image, subsequently (b-1) moving the contact screen by the internal shift to the position in front of the sensitive material so that it is out of the exposure region while the sensitive material being remained as such, or (b-2) moving the contact screen internally to a position in front of the sensitive material and then shielding the latter against light in such a manner that the sensitive material can be released of the shield at the time of the second step exposure, the contact screen being absent at least in the exposure region at the time of second step exposure and subsequently (c) exposing the sensitive material to the line image (second step exposure), or (B) in case of the first step exposure being made to the line image, (a') exposing the sensitive material to the line image in the first step, then (b'-1) moving the contact screen, which is in front of the sensitive material and kept outside the exposure region, to establish close contact with the sensitive material while the sensitive material being remained as such, or (b'-2) shielding the sensitive material against light in such a manner that the sensitive material can be released of the shield at the time of bringing the contact screen into close contact with the sensitive material and moving the contact screen from a position in front of the sensitive material to establish a close contact with the photosensitive, and subsequently (c') exposing the sensitive material to the continuous tone image (second step exposure).

4,636,067

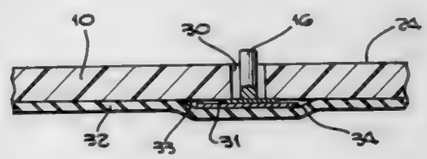
PHOTOGRAPHY PIN BOARD SYSTEM

Chester L. Richards, Sr., 1610 Sheridan Rd., Glendale, Calif. 91296

Filed Jan. 30, 1986, Ser. No. 824,208

Int. Cl.[4] G03B *27/20*

U.S. Cl. 355—91 22 Claims



1. Apparatus for use with a vacuum frame assembly for providing repeatable registration of a photomask and photosensitive plates, the combination comprising:

(a) a substantially rigid pin board of limited flexibility having at least one aligning pin aperture for loosely containing an aligning pin;

(b) at least one aligning pin having a body portion and a capping plate portion of greater surface area than the body portion cross sectional area, said body portion cross sectional area being smaller than said aligning pin aperture and said capping plate area being greater than said aligning pin aperture, said pin being located in said aligning pin aperture of said pin board; and

(c) an elastomeric backing sheet for retaining said aligning pin in said pin aperture, said backing sheet extending over said capping plate and aperture and being fastened to said pin board surface near said aligning pin capping plate, whereby said aligning pin is loosely retained in said aperture by said backing sheet and is capable of axial as well as lateral motion.

4,636,068

CHANGE-OVER SHUTTER FOR LIGHT-WAVE RANGE FINDER

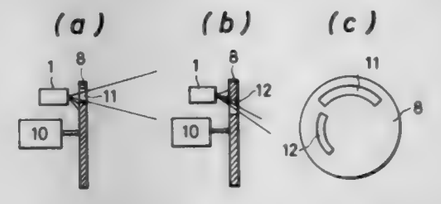
Masaaki Nilhe; Kiyoshi Itoh; Shinichi Suzuki; Takuo Itagaki, and Koji Tsuda, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1983, Ser. No. 486,169

Claims priority, application Japan, Apr. 19, 1982, 57-56738[U]

Int. Cl.[4] G01C *3/08;* G02B *5/22*

U.S. Cl. 356—5 12 Claims



1. A change-over shutter for a light-wave range finder for changing over between measurement light and compensation light, comprising; a shutter body having a plurality of measurement light slits and at least one compensation slit, and a light-quantity reducing member provided in at least one of said measurement light slits.

4,636,069

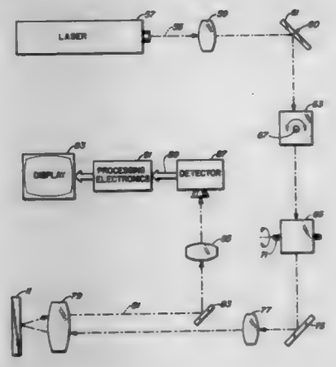
METHOD FOR READING DEFORMATION IMAGES ON ELECTROPHOTOGRAPHIC MEDIA

N. Balasubramanian, Saratoga, Calif., assignor to Matrix Instruments Inc., Orangeburg, N.Y.

Filed Nov. 15, 1984, Ser. No. 672,597

Int. Cl.[4] G01B *11/24;* H04N *3/08*

U.S. Cl. 356—71 10 Claims



1. A method of reading deformation images recorded on electrophotographic media comprising,

scanning a deformation image on an electrophotographic medium with a radiation beam,

detecting the optical slope from a plurality of microscopic regions,

forming an electrical signal representing the surface slope for said plurality of microscopic regions, and

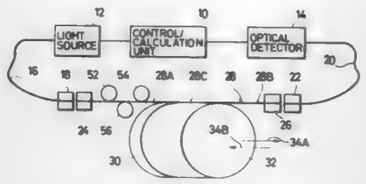
integrating said electrical signal to obtain a signal representing the image intensity at said plurality of microscopic regions.

4,636,070

APPARATUS FOR MEASURING THE CUT-OFF WAVELENGTH OF A SINGLE-MODE OPTICAL FIBER

Takashi Ide, Kanagawa, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 13, 1985, Ser. No. 797,667
Claims priority, application Japan, Nov. 26, 1984, 59-249248
Int. Cl.⁴ G01N *21/84*
U.S. Cl. 356—73.1 **7 Claims**



1. An apparatus for measuring the cut-off wavelength of a single-mode optical fiber by comparing an optical output obtained when a bend having a larger radius-of-curvature is given to the fiber with an optical output obtained when a bend of a small radius-of-curvature is given to the fiber, said apparatus comprising:

a light source connected to one end of the fiber and capable of emitting light having varying wavelengths;

an optical detector connected to the other end of the fiber; and

two fiber bending means that provide the fiber, between said light source and said optical detector, with arched bends having different radii of curvature, including:

(a) first bending means for providing a bend having the larger radius-of-curvature and having two larger radius-of-curvature bend imparting members having arched curved surfaces with the same radius-of-curvature, said members being so arranged that they have two common parallel tangents and that the tangent to a bend at the point where it starts to be applied to the fiber by one of said members is collinear with the tangent to a bend at the point where it starts to be applied to the fiber by the other member, one of said members being fixed whereas the other member is movable in a direction parallel to said tangents, said other member being provided with a tension imparting unit that applies a biasing force in a direction that is parallel to said tangents and which departs from said one member, said members bending said fiber into the form of a taut loop and applying a minimum radius-of-curvature to said fiber equal to the radius of said arched curved surface, the length of that portion of the fiber that is bent, with the radius of said arched curved surface, being equal to the circumference of a single circle having the radius of said arched curved surface; and

(b) second bending means for providing a bend having the smaller radius-of-curvature by pressing an arched curved surface with a small radius-of-curvature against the fiber for providing the necessary amount of bend.

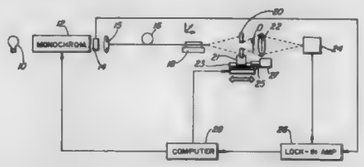
4,636,071

METHOD AND APPARATUS FOR MEASURING SINGLE MODE FIBER MODE FIELD RADIUS

Richard S. Lowe, Kanata, and Constantine Saravanos, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 6, 1985, Ser. No. 797,064
Int. Cl.⁴ G01N *21/84*
U.S. Cl. 356—73.1 **8 Claims**

1. A method for determining the mode field radius 'w', of a single mode optical fiber comprising projecting light of wavelength λ through the optical fiber, positioning a fixed diameter aperture in front of an exit face of the optical fiber in the far field pattern of light emitted therefrom, moving the aperture on the axis of emitted light through a series of acceptance angles θ, measuring the power P passing through the aperture



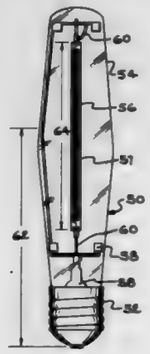
corresponding to said acceptance angles, and obtaining a value of mode field radius in terms of λ, P and θ.

4,636,072

METHOD AND APPARATUS FOR IMPROVED PHOTOMETRIC TESTING OF HIGH INTENSITY DISCHARGE LAMPS AND LUMINAIRES

Theodor G. Yahraus, Crawfordsville, Ind., assignor to National Service Industries, Inc., Atlanta, Ga.

Filed Sep. 6, 1983, Ser. No. 529,376
Int. Cl.⁴ G01J *1/02*
U.S. Cl. 356—121 **2 Claims**



1. An improved method for testing the photometric qualities of luminaires intended for use with a high intensity discharge lamp having a tube enclosing an ionized arc stream, comprising:

(a) selecting a high intensity discharge lamp having an arc tube enclosing an ionized arc stream, said high intensity discharge lamp having a published total lamp lumen rating;

(b) replacing such arc tube with an accurately constructed copy of such arc tube which replaces such ionized arc stream with an incandescent filament while maintaining all other structural and electrial components of said lamp;

(c) measuring the proportional candlepower of said lamp having said incandescent filament, said measurements occuring at the midpoints of standard test angle zones surrounding the light center of said lamp;

(d) repeating such proportional candlepower measurements at dissimilar locations within each of said test angle zones to obtain an average proportional candlepower value for each of said test angle zones;

(e) obtaining the proportional lumen output for each of said test angle zones by multiplying said average proportional candlepower value of each of said test angle zones by a predetermined zonal multiplier for said test angle zones and totalling said proportional lumen output values for said test angle zones, thereby providing a total proportional lumen output for said lamp having said incandescent filament;

(f) obtaining a proportionality constant for said lamp having said incandescent filament by dividing the published rated lumen value for said high intensity discharge lamp by said total proportional lumen output of said lamp having said incandescent filament; and,

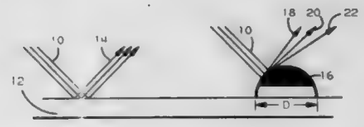
(g) using said proportionality constant to obtain the relative photometric qualities of said actual high intensity discharge lamp as used in a subject luminaire from said proportional photometric qualities of said lamp having said incandescent filament.

4,636,073

UNIVERSAL CALIBRATION STANDARD FOR SURFACE INSPECTION SYSTEMS

Randal R. Williams, Woodbridge, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1984, Ser. No. 666,588
Int. Cl.⁴ G01N *21/88*
U.S. Cl. 356—243 **8 Claims**



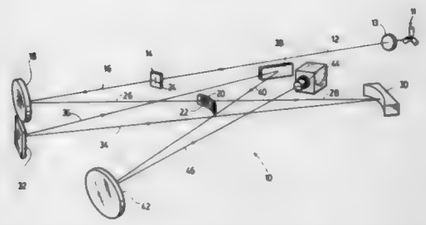
1. A test standard for calibrating an optical wafer surface inspection system, said test standard comprising a plurality of pads bonded to a flat, optically reflective substrate, said plurality of pads being hemispherically shaped and comprised of a layer of solder and at least one other metallic layer selected from the group consisting of titanium, copper, gold, chromium, and nickel, whereby the hemispherical pads simulate particulate contamination on the substrate and the wafer surface inspection system can be calibrated independently of the angles of illumination and detection.

4,636,074

OPTICS SYSTEM FOR EMISSION SPECTROMETER

Gilbert M. Levy, Toronto; Alexander Quaglia, and Robert E. Lazure, both of London, all of Canada, assignors to PRA International Inc., London, Canada

Filed Dec. 6, 1984, Ser. No. 679,080
Int. Cl.⁴ G01J *3/443, 3/18*
U.S. Cl. 356—328 **45 Claims**



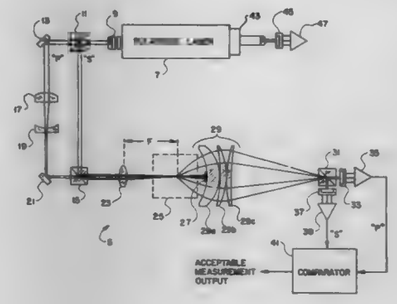
17. Apparatus for analyzing spectral energy emissions from a source comprising first means for dispersing incident spectral energy to form a spectral dispersion, means for simultaneously selecting multiple desired spectral regions from said spectral dispersion and rejecting all other spectral regions, means for collecting together the multiple selected regions, second means for dispersing said collection of multiple selected spectral regions which are present in said spectral energy, and means for organizing such dispersed spectral regions in a detectable spectral energy distribution pattern.

4,636,075

PARTICLE MEASUREMENT UTILIZING ORTHOGONALLY POLARIZED COMPONENTS OF A LASER BEAM

Robert G. Knollenberg, Boulder, Colo., assignor to Particle Measuring Systems, Inc., Boulder, Colo.

Filed Aug. 22, 1984, Ser. No. 643,665
Int. Cl.⁴ G01N *15/14*
U.S. Cl. 356—336 **26 Claims**



1. A particle measuring system, comprising:

beam generating means for generating first and second beams that are orthogonally related to one another;

processing means for receiving said first beam from said beam generating means and modifying one dimension of said first beam relative to the other dimension thereof;

combining means for combining said modified first beam and said second beam to provide a beam combination output;

exposure means for receiving said beam combination output from said combining means and exposing said beam combination to particles to be measured so that portions of said beam combination are scattered by said particles; and

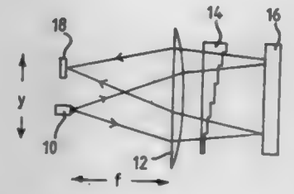
determining means for collecting at least some of said scattered portions of said beam combination and providing therefrom an output indicative of the measurement of said particles.

4,636,076

DISPLACEMENT MEASURING APPARATUS AND METHOD

Robert M. Pettigrew, Cambridgeshire, England, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jul. 30, 1984, Ser. No. 635,453
Claims priority, application United Kingdom, Jul. 30, 1983, 8320629
Int. Cl.⁴ G01B *09/02*
U.S. Cl. 356—356 **18 Claims**



1. Displacement measuring apparatus for measuring relative displacement between two members, comprising an index grating mounted on one member, a reflective scale grating mounted on the other member, a light source for illuminating the index grating and then the scale grating with light so that

an image of the scale grating interacts with the index grating to form an interference image, a lens and at least three detector, each detector located in the focal plane of the lens and operative to detect a respective one of three selected diffraction orders of the interference image, the detectors operative to derive corresponding output signals representative of relative movement between the two members, said output signals differing in phase in consequence of the optical path length of the light from the index grating to the scale grating being different from the optical path length of the light from the scale grating to the index grating by virtue of the light passing through different thicknesses of a material having a refractive index different from the ambient medium, wherein all three of the seleced diffraction orders of light from a selected ray pass from the index grating to the scale grating through a first constant thickness of material, and wherein all three of the selected diffraction orders of light from the selected ray pass from the scale grating to the index grating through a second constant thickness of material different from the first constant thickness, the thickness of the material being measured perpendicular to the plane of the scale grating.

4,636,077

ALIGNING EXPOSURE METHOD

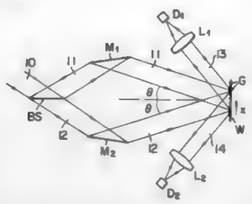
Nobuo Nomura, Kyoto; Koichi Kugimiya, Toyonaka; Takayoshi Matsumura, Hirakata, and Taketoshi Yoneezwa, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 12, 1984, Ser. No. 599,734

Claims priority, application Japan, Apr. 15, 1983, 58-67329; May 31, 1983, 58-97085; Sep. 21, 1983, 58-175636; Sep. 22, 1983, 58-175353; Sep. 22, 1983, 58-175354; Sep. 22, 1983, 58-175355; Sep. 22, 1983, 58-175356

Int. Cl.⁴ G01B *9/02*

U.S. Cl. 356—356 **28 Claims**



20. An aligning method comprising: applying coherent ray beams from two directions to form interference fringe by the mutual interference of the two ray beams; placing a grid in the optic paths of said two ray beams; leading the ray reflected or diffracted by said grid to a photo-detecting means through a slit to measure the intensity of said ray thereby to detect the relative position between said interference fringe and said grid; and aligning said interference fringe with said grid.

4,636,078

MICROSCOPIC DETECTION OF MEMBRANE SURFACE DEFECTS THROUGH INTERFERENCE PATTERNS

T. Charles Podvia, Poway, Calif., assignor to Micromanipulator Microscope Co., Inc., Escondidto, Calif.

Filed Oct. 4, 1983, Ser. No. 539,051

Int. Cl.⁴ G01B *9/04, 9/02*

U.S. Cl. 356—359 **22 Claims**

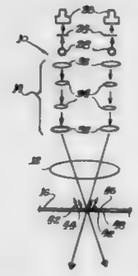
1. An apparatus for inspecting a substantially transarent membrane by reflection when said transparent membrane is backed by an opaque surface, said apparatus comprising:

said transparent membrane having a pair of flat surfaces with a thickness between said pair of flat surfaces of between about 0.5 and about 2.5 microns, said transparent membrane transimtting at least about 50% of incident light at a particular wavelength, and each of said pair of flat surfaces reflecting between about 0.5% and about 5% of the incident light;

a polychromatic light source;

a microscope having an eyepiece and an objective means and defining a light path from said light source through the objective means to said transparent membrane, and back from said transparent membrane, through said objective means, and to the eyepiece;

a filter removably disposed in said light path having a peak transmittance at a particular wavelength with a bandwidth of about 40 nanometers or less;



one of said pair of flat surfaces forming a reference surface and the other one of said pair of flat surfaces forming a measurement surface such that light reflecting off said reference surface and reflecting off said measurement surface to said eyepiece combine to create an observable interference pattern permitting inspection of said transparent membrane for defects, said defects appearing as fringe patterns in regions of change in optical path length; and

said microscope being useful for normal observations of said opeque surface with polychromatic light when said filter is removed from the light path.

4,636,079

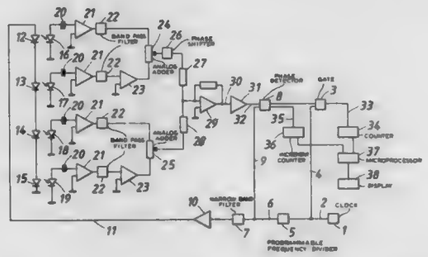
OPTOELECTRONIC METHOD OF MEASURING THE EXTENT OF A MOVEMENT AND OPTOELECTRONIC MEASURING INSTRUMENT FOR CARRYING OUT THE METHOD

Heinz Rieder, Sankt Pantaleon; Max Schwaiger, Ostermiething, and Harald Swatek, Sankt Michael, all of Austria, assignors to RSF Elektronik OHG Rieder & Schwaiger Gesellschaft m.b.H., Tarsdorf, Austria

Filed Nov. 16, 1984, Ser. No. 672,575

Int. Cl.⁴ G01B *11/14*

U.S. Cl. 356—374 **24 Claims**



1. In a method of measuring the extent of a movement, comprising

providing an incremental scale,

providing a scanning unit, which comprises a plurality of scanning gratings, which are spaced apart along said scale and are offset by different fractions of an increment of said scale from adjacent increments of said scale, and a plurality of light receivers associated with respective ones of said gratings,

moving said scanning unit along said scale and at the same time illuminating said light receivers with light which has been projected onto said scale and which is incident on each of said light receivers from the grating associated therewith so that the illumination of each of said light receivers varies in accordance with a sine function that has a spatial frequency related to the pitch of said scale and is displaced in phase from the sine function of the illumination of another of said light receivers,

generating amplitude-modulated electric signals which are at a predetermined carrier frequency and are displaced in phase from each other in response to said illumination as said scanning unit is moved along said scale,

generating a reference signal at said carrier frequency,

combining said amplitude-modulated signals to generate an analog resultant signal which is displaced in phase from said reference signal by a phase displacement that is proportional to the instantaneously scanned fraction of an increment of said scale,

processing said analog resultant signal to generate in dependence on its phase displacement a control signal,

controlling by means of said control signal the counting of clock pulses in a number that depends on said phase displacement, and

counting said clock pulses by a clock counter in a sense which depends on the direction in which said scanning unit is moved along said scale,

the improvement residing in that

said clock pulses are generated at a frequency which is a multiple of said carrier frequency,

a binary carrier frequency signal at said carrier frequency is derived from said clock pulses and used as said reference signal,

an energizing signal having an a.c. component at said carrier frequency is derived from said binary carrier frequency signal and used to generate the light for illuminating said light receivers so that amplitude-modulated signals are generated by said light receivers,

said analog resultant signal is transformed into a binary resultant signal have relative to said reference signal a time lag that is proportional to said phase displacement, and

said binary resultant signal and said reference signal are processed to generate said control signal, said light for illuminating said light receivers being generated by a plurality of light emitters associated with respective ones of said light receivers,

said light emitters being each energized with a respective energizing signal having an a.c. component with said energizing signals being in phase with each other, and

one of said amplitude-modulated signals being displaced 90° in phase before said amplitude-modulated signals are combined to generate said analog resultant signal.

4,636,080

TWO-DIMENSIONAL IMAGING WITH LINE ARRAYS

Martin Feldman, Berkeley Heights, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 7, 1984, Ser. No. 607,956

Int. Cl.⁴ G01B *11/00*

U.S. Cl. 356—401 **1 Claim**

1. In combination in a zone plate alignment system,

means for illuminating a zone plate mark,

a member having a zone plate alignment mark thereon responsive to said illuminating means for forming an image spot a predetermined distance from the surface of said member in an X-Y plane,

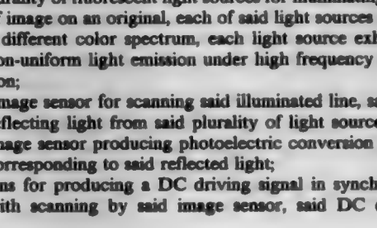
means responsive to light from said image spot for providing first and second beams respectively representative of the X and Y coordinates of said spot,

and means including at least one cylindrical lens and at least one linear array of photodetectors interposed in the path of said beams providing electrical output signals representative of the coordinates of said spot in said X-Y plane,

wherein said last-mentioned means comprises

a polarizing beam splitter interposed in the path of said light for providing first and second beams,

a first quarter-wave plate, a first cylindrical lens and a first mirror interposed in that order in the path of said first beam, said first mirror being positioned to reflect said first beam back through said first lens and said first quarter-wave plate into said beam splitter and towards a second cylindrical lens,



a second quarter-wave plate and a second mirror interposed in that order in the path of said second beam, said first mirror being positioned to reflect said second beam back through said second quarter-wave plate into said beam splitter and towards said second cylindrical lens,

and a single linear array of photodetectors associated with said second lens and positioned to have said first and second beams focused on said array by said second lens,

wherein said array extends parallel to the main longitudinal axis of said second lens and wherein the main longitudinal axis of said first lens is disposed at 45 degrees with respect to the main longitudinal axis of said second lens.

4,636,081

APPARATUS FOR READING COLOR IMAGE

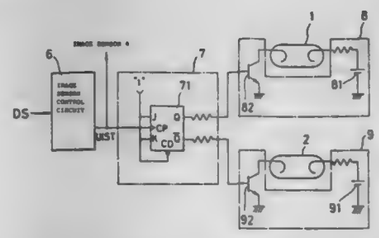
Hiroyuki Saitoh; Masami Kurata, and Takashi Omori, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1984, Ser. No. 641,491

Claims priority, application Japan, Aug. 17, 1983, 58-149911

Int. Cl.⁴ G01J *3/50*

U.S. Cl. 356—402 **9 Claims**



1. An apparatus for reading a color image on an original comprising:

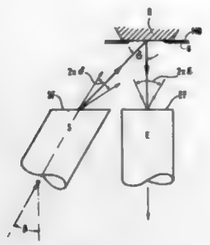
a plurality of fluorescent light sources for illuminating a line of image on an original, each of said light sources having a different color spectrum, each light source exhibiting non-uniform light emission under high frequency excitation;

an image sensor for scanning said illuminated line, said line reflecting light from said plurality of light sources, said image sensor producing photoelectric conversion signals corresponding to said reflected light;

means for producing a DC driving signal in synchronism with scanning by said image sensor, said DC driving

signal eliminating said non-uniformity of said light sources;
means for supplying said DC driving signal to said light sources; and
means for discriminating color images based on said photoelectric conversion signals produced by said image sensor.

4,636,082
FIBER OPTIC REFLECTANCE MEASUREMENT APPARATUS
Jürgen Barry, Munich, Fed. Rep. of Germany, assignor to Compur-Electronic GmbH, Fed. Rep. of Germany
Filed Jul. 1, 1983, Ser. No. 510,460
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1983, 3226371
Int. Cl.⁴ G01N *21/47*
U.S. Cl. 356—446 **12 Claims**



1. In an apparatus for measuring reflectance at a reflecting surface placed in a field of measurement, comprising a transmitted light guide cable made up of a number of light guide fibers for emission of a plurality of discrete beams along a transmitted light cone axis and a received light guide cable made up of a number of light guide fibers for receiving radiation reflected from said field of measurement along a received light cone axis, the light guide fibers of the transmitted and received light guide cables having transmitting and inlet faces respectively, the transmitted and received light cone axes passing through geometrical middle points of the respective transmitting and inlet faces, said transmitting faces of the transmitted light guide fibers and said inlet faces of the received light guide fibers being positioned in planes parallel to the plane of said field of measurement, the transmitted and received light cone axes meeting at a geometrical middle point of the surface to be measured, the transmitting face of the transmitted light guide cable and the inlet face of the received light guide cable having a form the same as the form of the surface to be measured, the transmitted and received light guide cables having aperture angles of less than 15° and 30+ respectively.

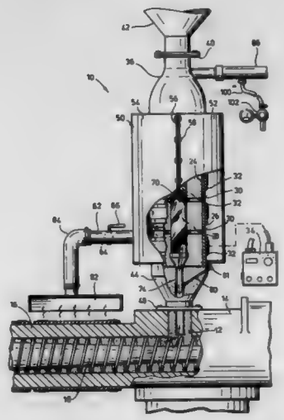
4,636,083
ARRANGEMENT IN CONTAINERS INTENDED TO HOLD PUMPABLE SUBSTANCES AND PROVIDED WITH A PUMP HEREFOR
Bjorn Soderlund, Huddinge, Sweden, assignor to Allman Byggnadsservice AB ABS, Farsta, Sweden
Filed Jun. 11, 1985, Ser. No. 743,619
Claims priority, application Sweden, Jun. 20, 1984, 8403298
Int. Cl.⁴ B28C *7/16*
U.S. Cl. 366—43 **1 Claim**

1. An apparatus for agitating and pumping material such as mortar or a filler which contains a liquid which can separate from the material, the apparatus including a container (1) for holding the material to be agitated and pumped, a pump (2) for pumping material from the container (1), a flexible conduit (3) connected to the output of the pump (2), a reversible motor (9), a rotatable agitator (12) located in the container (1) for agitating the material therein and drivably connected to the reversible motor (9), the reversible motor (9) adapted to drive the pump to pump material from the container into the flexible conduit (3) during a first direction of rotation of the motor (9) and to rotate the agitator in both the first and second directions of the rotation of the motor, a coupling means (17, 18) arranged between the pump (2) and the agitator (12) and including a first coupling element (17) fixed for rotation with the agitator (12) and a second movable coupling element (18) mounted for



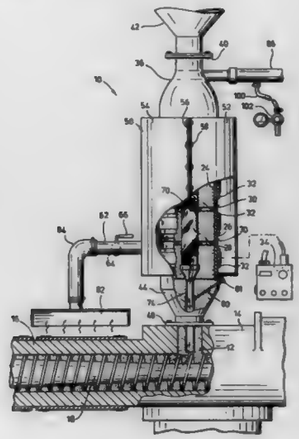
rotation with the pump, and a control means (16) to hold the movable coupling element (18) in engagement with the first coupling element (17) for a selected period of time after the first direction of rotation of the motor (9) is reversed for the purpose of removing some of the material previously pumped into the flexible conduit (3) to relieve pressure in the flexible conduit (3) while continuing to rotate the agitator (12).

4,636,084
REMOVING VOLATILES FROM PLASTIC MATERIALS DELIVERED TO AN EXTRUSION OR INJECTION MOLDING MACHINE
Jaro Kopernicky, Bramalea, Canada, assignor to Mapro Inc., Georgetown, Canada
Filed Mar. 16, 1982, Ser. No. 358,554
Int. Cl.⁴ B28C *7/04*
U.S. Cl. 366—76 **7 Claims**



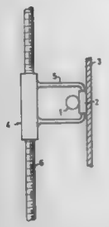
1. A process for removing moisture and other volatiles from a particulate plastic material which is plasticized in a plastic injection molding or extrusion-type machine having a plastic material inlet, a heated barrel and screw, comprising:
(1) feeding the particulate plastic material to a guide means which extends from said material inlet, wherethrough it flows downward into said material inlet and along said heated barrel;
(2) applying a suction to said guide means such that a flow of heated air is drawn from apertures in the sidewalls of said guide means substantially through the downwardly flowing particulate plastic material, to a perforated conduit located substantially axially in said guide means and out of said guide means;
(3) heating and working the particulate plastic material passing along said heated barrel and screw whereby contact with the heated barrel and screw releases volatiles from the plastic material;
(4) withdrawing said released volatiles by action of said suction through said material inlet, said conduit and out of said guide means in said flow of heated air;
whereby a flow of said plastic material which is substantially free of moisture and other volatiles is provided to said plastic molding machine for plasticization.

4,636,085
APPARATUS FOR REMOVING VOLATILES FROM PLASTIC MATERIALS DELIVERED TO AN EXTRUSION OR INJECTION MOLDING MACHINE
Jaro Kopernicky, Bramalea, Canada, assignor to Mapro Inc., Georgetown, Canada
Division of Ser. No. 358,554, Mar. 16, 1982. This application Dec. 27, 1983, Ser. No. 565,462
Int. Cl.⁴ B28C *7/04*
U.S. Cl. 366—76 **8 Claims**



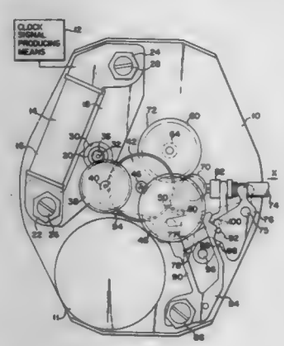
1. An apparatus for removing moisture and other volatiles from a particulate plastic material which is plasticized in a plastics injection molding or extrusion-type machine having a plastics material inlet, a heated barrel and screw, comprising:
(1) guide means extending upwardly from said material inlet for guiding and feeding the particulate plastics material downwardly into said material inlet and along said heated barrel, said guide means having apertures in the sidewalls thereof and heating means for heating air passing therethrough;
(2) perforated conduit means disposed substantially axially in said guide means;
(3) suction means for applying a suction to said perforated conduit means such that a flow of air is heated by said heating means, drawn through said apertures in said guide means, through the downwardly flowing particulate plastics material, through said perforated conduit means and upwardly out of said perforated conduit and out of said guide means;
(4) means for heating and working the particulate plastics materials passing along said heated barrel and screw wherein contact with the heated barrel and screw releases volatiles from the plastics material, and whereby said released volatiles are withdrawn from said barrel by action of said suction means through said material inlet and said perforated conduit and passed out of said perforated conduit and said guide means in the said flow of heated air;
whereby, a flow of said plastics material which is substantially free of moisture and other volatiles is provided to said plastics molding machine for plasticization.

4,636,086
VIBRATOR EQUIPPED WITH FASTENING DEVICE
Lars I. Setterberg, Mjölnartorpsvägen 11, S-182 63 Djursholm, Sweden
Filed Feb. 13, 1985, Ser. No. 701,173
Claims priority, application Sweden, Feb. 15, 1984, 8400815
Int. Cl.⁴ B01F *11/00*
U.S. Cl. 366—114 **2 Claims**



1. Apparatus for vibrating mass materials in molds, forms or vessels including magnetically attractive walls, comprising at least one vibrator mounted on a mold, form or vessel, said vibrator being fastened to a magnet with the aid of which said vibrator is attached to the walls for mounting on the mold, form or vessel, means for carrying out vibration with said vibrator continuously while continuously moving the vibrator along the mold, form or vessel at the same time the mold, form or vessel is being filled with said material, and means continuously maintaining magnetic attraction between said magnet and said walls during said vibration and during movement of the vibrator along the mold.

4,636,087
GEAR TRAIN MECHANISM STOP DEVICE OF TIMEPIECE
Toshiyuki Suzuki, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jan. 24, 1986, Ser. No. 822,018
Claims priority, application Japan, Jan. 29, 1985, 60-9920[U]
Int. Cl.⁴ G04B *17/12, 27/02*
U.S. Cl. 368—185 **20 Claims**



1. A gear train mechanism stop device which is used in a timepiece having clock signal producing means; a rotational movement source for generating a given rotational movement in response to a clock signal produced from said clock signal producing means; time indication hand means having at least hour and minute hands; and a gear train mechanism for trans-

mitting the rotational movement from said rotational movement source to said time indication hand means so as to make said time indication hand means move in a given movement, which is selectively engaged with a specified gear in said gear train mechanism so as to stop rotation of said specified gear, and which is characterized by comprising:

an engaging member movable between an engaged position at which said member is engaged with said specified gear in said gear train mechanism in the axial direction of said specified gear so as to stop rotation of said specified gear, and a disengaged position at which said member is disengaged from said specified gear in said gear train mechanism and allows said specified gear to rotate so as to allow rotational movement transmission from said rotational movement source to said time indication hand means; and

an operation member for selectively moving said engaging member between the engaged and disengaged positions,

wherein said specified gear is made of a synthetic resin.

4,636,088

METHOD AND APPARATUS FOR EVALUATING SURFACE CONDITIONS OF A SAMPLE

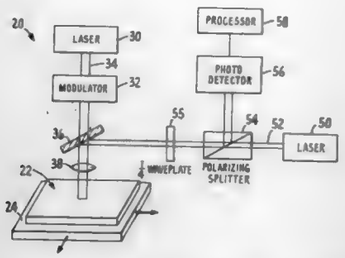
Allan Rosencwaig, Danville, and Walter L. Smith, Livermore, both of Calif., assignors to Therma-Wave, Inc., Fremont, Calif.

Filed May 21, 1984, Ser. No. 612,076

The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

Int. Cl.⁴ G01N *21/41, 25/00*

U.S. Cl. 374—5 **27 Claims**



1. An apparatus for evaluating the surface conditions of a sample by measuring intensity variations of a reflected probe beam resulting from periodic changes in optical reflectivity of the sample induced by localized periodic heating, said apparatus comprising:

means for inducing a localized periodic heating at the surface of the sample;

a probe for emitting a beam of radiation;

means for directing the radiation probe beam within a portion of the area periodically heated by said periodic heating means in a manner such that the radiation probe beam reflects off the surface of the sample;

means for measuring the intensity variations of the reflected radiation probe beam resulting from the periodic changes in optical reflectivity of the sample induced by the periodic heating with the measured intensity changes being independent of changes in diameter or position of the probe beam; and

means for processing the measured intensity variations of the reflected radiation probe beam resulting from the periodic changes in optical reflectivity of the sample to evaluate the surface conditions of the sample surface.

4,636,089

PROCESS AND APPARATUS FOR THE QUENCHING INTENSITY OF LIQUID QUENCHING BATCHS

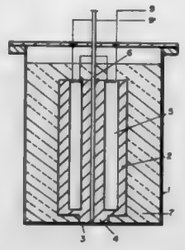
Erwin Schumann, Bruchkobel, Fed. Rep. of Germany, assignor to DeGussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 22, 1984, Ser. No. 612,804

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320055

Int. Cl.⁴ G01N *25/00*

U.S. Cl. 374—45 **13 Claims**



1. A process for measuring a quenching characteristic of a liquid salt utilizing a heat transfer body of the type having a housing surrounding said heat transfer body, said heat transfer body having a plug portion on a surface thereof with said plug portion having a surface area that is substantially less than the surface area of the heat transfer body, said plug portion being in heat engaging relation with a portion of the housing to thereby define a test hot spot on said housing surface, said housing including insulation means isolating said heat transfer body from said housing except in the area of said plug portion engaging said housing, said process including the steps of inserting the portion of the housing containing at least said plug portion into the bath, applying a controlled heating to said heat transfer body to thereby raise the temperature of the hot spot to a constant higher temperature which is from 50 to 700 degrees C. above that of the bath and measuring the heat energy required to maintain the temperature of the test hot spot constant while heat transfer occurs between said test hot spot and said bath, wherein said heat energy serves as a measurement of the quenching characteristic of the bath.

4,636,090

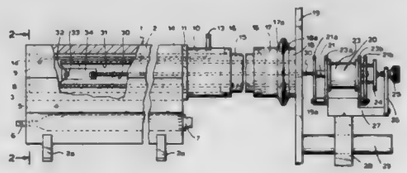
LOW TEMPERATURE DILATOMETER

Thomas A. Baricevac, Bayside, and Kari-Heinz Raffalski, Wheatley Heights, both of N.Y., assignors to Theta Industries, Inc., Port Washington, N.Y.

Filed May 22, 1985, Ser. No. 736,813

Int. Cl.⁴ G01N *25/16, 3/08*; G01K *1/14*

U.S. Cl. 374—56 **11 Claims**



1. Low temperature dilatometer comprising a combination cryostat/furnace, a specimen tube having a closed end that is insertable into said cryostat/furnace, a specimen holder within said specimen tube and a dilation sensor coupled to a ceramic pushrod that is adapted to engage a specimen within said specimen tube,

said cryostat/furnace being an elongated block of metal that has been drilled longitudinally to form a tubular specimen chamber for receiving said specimen within said specimen tube, at least one tubular heating chamber containing an electric resistance heating element and at least one tubular cooling chamber within which a compressed refrigerant is expanded and

said specimen holder comprising a pair of specimen clamping blocks having smooth surfaces adapted to abut opposing sides of an interposed specimen with the ends of said specimen protruding beyond said blocks and spring means for maintaining said blocks in contact with said specimen to slidably grasp and restrain flexing said specimen, said closed end of said specimen tube being internally adapted to abut one said protruding specimen end and said push rod being adapted to abut the other said protruding specimen end and to apply a compressive force to said specimen.

4,636,091

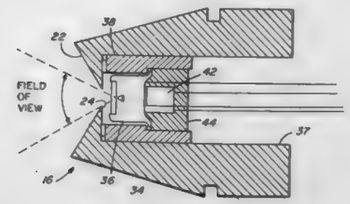
RADIATION DETECTOR HAVING TEMPERATURE READOUT

Francesco Pompei, Wayland, and Shiraz Daya, Franklin, both of Mass., assignors to Exergen Corporation, Natick, Mass.

Filed Jun. 27, 1985, Ser. No. 750,524

Int. Cl.⁴ G01J *5/18*; G01K *1/20*

U.S. Cl. 374—124 **27 Claims**



1. A radiation detector comprising a nosepiece comprised substantially of aluminum, the nosepiece having a cup formed therein and a cup aperture in the cup, there being a radiation sensor positioned within, but thermally insulated from, the nosepiece behind the cup aperture and a temperature compensation sensor mounted in the nosepiece, wherein the cup eliminates the effect of the actual emissivity of the target surface by reflecting emissions from the target surface back to that surface in such a way that the target surface acts as a black body with emissivity of about 1.

4,636,092

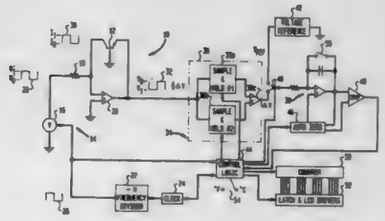
DIODE THERMOMETER

Dennis J. Hegyi, 1512 Morton Ave., Ann Arbor, Mich. 48104

Continuation-in-part of Ser. No. 622,040, Jun. 19, 1984, abandoned. This application Jun. 18, 1985, Ser. No. 746,005

Int. Cl.⁴ G01K *7/16, 7/00*

U.S. Cl. 374—178 **21 Claims**



1. A temperature sensing system comprising:

solid state temperature sensing means having at least one junction for developing a junction voltage thereacross in response to a current conducted through said solid state temperature sensing means, said voltage being at least partially determined by a temperature of said solid state temperature sensing means;

current source means for generating said current conducted through said solid state temperature sensing means, said current being conducted in first and second current levels;

first and second voltage value storage means for storing values of said junction voltage responsive to said first and second current levels, respectively;

integrator means for receiving a signal responsive to said junction voltages stored in said first and second voltage value storage means and for integrating said signal in a first direction to produce at an output of said integrator means an integration signal proportional to a difference between said junction voltages; and

means responsive to said integration signal for providing a temperature signal indicative of the temperature sensed by the temperature sensing means.

4,636,093

METHOD OF MEASURING TEMPERATURES AND PORTABLE RECORDER FOR STORING TEMPERATURE DATA

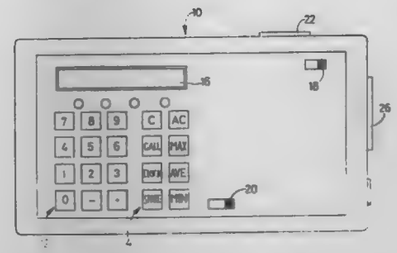
Hiroyasu Nagasaka, Chiryu; Kunio Kamidaira, Nagoya; Hiroshi Iso, and Mitsuo Utsuno, both of Aichi, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Filed Aug. 2, 1985, Ser. No. 761,884

Claims priority, application Japan, Sep. 4, 1984, 59-186115; Sep. 18, 1984, 59-141081[U]; Sep. 21, 1984, 59-199086

Int. Cl.⁴ G01D *15/00*; G01K *5/70*

U.S. Cl. 374—186 **2 Claims**



1. A portable temperature data recorder for storing in a stationary data processing unit temperature data measured by a stationary temperature detector disposed at a measurement location, or by stationary temperature detectors disposed at different measurement locations, comprising:

first connector means coacting with said data processing unit for temporarily connecting the temperature data recorder selectively to said stationary temperature detector at said single measurement location, or to said stationary temperature detectors at said different measurement locations, respectively, and said connector means for connecting the temperature data recorder to said stationary data processing unit; and

memory means in said data processing unit for storing in succession plural sets of temperature data representative of temperatures measured by said stationary temperature detector or detectors, together with corresponding sets of measurement location data representative of said measurement locations, while the temperature data recorder is connected to said stationary temperature detector or detectors through said connector means,

said plural sets of temperature data and the corresponding sets of measurement location data being transferred from said memory means directly into said data processing unit

while the temperature data recorder is connected to the data processing unit through said connector means.

4,636,094

STRAIGHT-SLIDING ROLLER BEARING AND STRAIGHT GUIDE APPARATUS

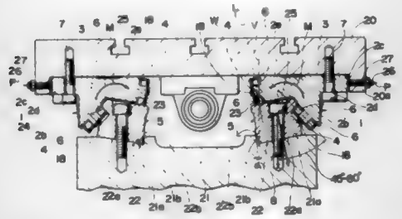
Hiroshi Teramachi, 34-8, Higashitamagawa 2-chome, Setagaya-ku, Tokyo, Japan

Filed Sep. 24, 1985, Ser. No. 779,758

Claims priority, application Japan, Sep. 27, 1984, 59-200377; Oct. 16, 1984, 59-215216; Oct. 16, 1984, 59-215217; Oct. 23, 1984, 59-221231

Int. Cl.⁴ F16C *29/06*

U.S. Cl. 384—44 **12 Claims**



1. A straight-sliding roller bearing comprising

a slide base having a horizontal portion and a vertical portion extending downwardly from one end of said horizontal portion, said horizontal portion having an inwardly directed face and said vertical portion having a downwardly and inwardly directed face, each face having defined thereon a loaded roller rolling face and a non-loaded roller rolling face,

a pair of roller retainers attached to said inwardly directed face of said horizontal portion and said downwardly directed face of said vertical portion of said slide base forming respective endless roller raceways in conjunction with said loaded roller rolling faces and said non-loaded roller rolling faces,

a raceway base having upper and lower rolling faces opposite to the respective loaded roller rolling faces formed on said horizontal portion and said vertical portion of said slide base, and

a number of rollers circulating inside the respective endless roller raceways formed on said horizontal portion and said vertical portion of said slide base in conjunction with said roller retainers for supporting loads together with the respective loaded roller rolling faces on the side of said slide base and the respective rolling faces on the side of said raceway base,

wherein

said slide base is provided with an attaching portion projecting horizontally from said one end of said horizontal portion in the opposite direction to said horizontal portion and having an upper face in the same plane as an upper face of said horizontal portion,

said inwardly directed face being aligned such that a line of load action between said loaded roller rolling face formed on said horizontal portion and the opposed upper rolling face of said raceway base extends at a downward angle,

said downwardly directed is aligned such that a line of load action between said loaded roller rolling face formed on said vertical portion and said opposed lower rolling face of said raceway base extends upwardly and inclines with respect to a line perpendicularly intersecting said same plane, and

means are provided for fixing said slide base to a movable body and for exterting a pushing pressure from the side of said movable body against an upper portion of said slide base in the direction from said attaching portion toward said horizontal portion to adjust the height of said horizontal section upper face and a preload.

4,636,095

HYDRODYNAMIC PLAIN BEARING

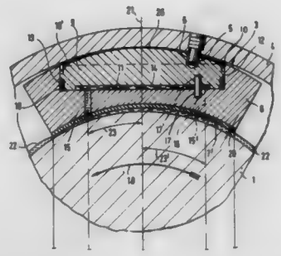
Paul Gerling, Oberhausen, Fed. Rep. of Germany, assignor to Glyco-Metall-Werke Daelen & Loos GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 18, 1985, Ser. No. 756,765

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1984, 3426613; Jun. 20, 1985, 3522037

Int. Cl.⁴ F16C *32/06, 17/03*

U.S. Cl. 384—117 **8 Claims**



1. A plain bearing for supporting a shaft having a cylindrical surface, comprising:

a plurality of members spaced apart from one another and juxtaposed with said shaft for supporting same in said bearing and having at least one adapter segment including an arc-segmental bearing body formed with a curved surface which defines a lubricant gap with the cylindrical surface of said shaft, and reacting means for absorbing the pressure within said lubricant gap and defining with said bearing body a pressure chamber at a radial distance from said lubricant gap, said bearing body being provided with a bearing-body recess, said reacting means including an adapter piston received in said bearing-body recess and provided with a further recess facing said bearing body and defining said chamber;

connecting means for providing a communication between said pressure chamber and said lubricant gap for allowing pressure within said lubricant gap to be diverted to said pressure chamber and to be absorbed by said reacting means;

a housing spaced from said shaft, said piston and said members being braced generally radially against said housing by hydrodynamic pressure in gaps between said members and shaft and between said curved surface and said shaft, said adapter piston being provided with a circumferential flange portion to define an annular space with said bearing body; and

a sealing ring accommodated within said space and abutting against said flange portion.

4,636,096

AUTOLUBRICATING BEARING

Philippe Bonello, Grand-Saconnex, Switzerland, assignor to Sarcem S.A., Meyrin, Switzerland

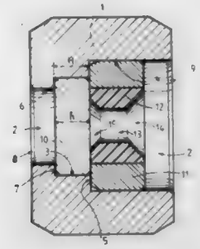
Filed Jul. 17, 1985, Ser. No. 756,090

Claims priority, application Switzerland, Aug. 3, 1984, 03748/84

Int. Cl.⁴ F16C *17/08*

U.S. Cl. 384—243 **4 Claims**

1. Autolubricating bearing, characterized by the fact that it comprises a body provided with a central through passage presenting a first cylindrical surface in which a disc of natural or synthetic hard stone is driven and a second cylindrical surface, of greater diameter than the first one, in which a steel ring is driven which is provided with a central hole having a diameter less than that of the first cylindrical surface and one of the annular faces of which is in contact with one of the faces of the disc of hard stone; by the fact that a cylindrical part of synthetic resin is fixed in the steel ring, this part presenting an



internal medial cylindrical surface adapted to receive a pivot and two conical surfaces widening from said medial cylindrical surface towards the frontal surfaces of this part and by the fact that the frontal internal face of the part of synthetic resin is in contact with the face of the hard stone disc which is itself in contact with the steel ring.

4,636,097

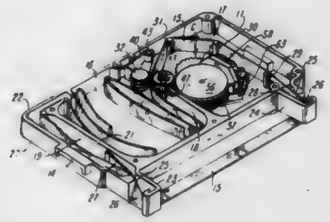
REPLACEABLE INKING CARTRIDGE WITH DEPLETION COUNTER

Donald E. Goubeaux, Miamisburg, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 152,058, May 20, 1980, abandoned. This application Mar. 8, 1982, Ser. No. 356,077

Int. Cl.⁴ B41J *35/28*

U.S. Cl. 400—196.1 **14 Claims**



1. A replaceable inking cartridge, comprising: a cartridge housing, an ink ribbon disposed partly inside the housing but extending outside the housing and adapted to ink printing means, means for advancing the ink ribbon, a counter disposed in the housing, a member disposed in the housing, responsive to the counter, and movable from a first position to a second position for indicating a spent condition of the ink ribbon, wherein the counter includes a rotatable worm wheel having a side surface and a meshing worm gear, the member having a projection for riding on the side surface, a recess in the side surface, the projection being disposed in a path made by the recess as the worm wheel rotates, the member being movable from the first position to the second position upon movement of the projection into the recess when the projection is aligned with the recess, a pawl movably mounted by the housing, and a ratchet coupled to the worm gear and operable by the pawl.

4,636,098

RIBBON DRIVE COUPLING AND CARTRIDGE TILT ARRANGEMENT FOR PRINT LINE VISIBILITY

Edward Arnold Halter; Billy D. Purcell, and Edward E. Toutant, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 5, 1984, Ser. No. 617,422

Int. Cl.⁴ B41J *32/00*

U.S. Cl. 400—208 **11 Claims**



1. A ribbon cartridge and a ribbon cartridge arrangement for use in a printer, typewriter or the like, in which said cartridge is attached to a moveable carrier such that said cartridge is tiltable around an axis parallel to a print line, said arrangement comprising on said carrier a reversible ribbon feed device that in one direction is coupled with a rotatable ribbon drive of said cartridge to feed ribbon from a supply spool to a take-up spool of said cartridge, and that when driven in the other direction for an appropriate amount lifts part of said cartridge such that a ribbon guiding part of said cartridge drops to render said print line visible, characterized in that

(a) a rotatable drive means (7) is provided on a bottom of said cartridge (10) facing said carrier (1),

(b) said rotatable drive means and a rotatable engaging part (5, 17) of said feed device (6) are formed such that together they form a kind of screw driver interconnection,

(c) said interconnection comprising a rotatable blade-like means (5) on one side and a rotatable slot-forming means (12) on the other side,

(d) said screw driver interconnection is operative during ribbon feed (14) from said supply spool to said take-up spool,

(e) ramp means (11) is provided in one (8) of said rotatable drive means and said rotatable engaging part,

(f) said ramp means, upon rotating said ribbon feed device in reverse direction (16), i.e., opposite to the normal ribbon feed direction (14), for said appropriate amount serves to tilt said cartridge such as to make said print line visible.

4,636,099

DOCUMENT HOLDER WITH PREPRINTED LOCATING AID

Ted A. Goldstone, 1423 E. Alameda Ave., Burbank, Calif. 91501

Continuation-in-part of Ser. No. 428,945, Sep. 30, 1982, abandoned. This application Apr. 24, 1985, Ser. No. 726,788

Int. Cl.⁴ B41J *13/12*

U.S. Cl. 400—531 **4 Claims**

1. A reusable document holder for printing on inserted checks and like pliant documents especially adapted for use in a computer printer of friction or pin drive type which feeds the checks through in a given feed direction, which comprises:

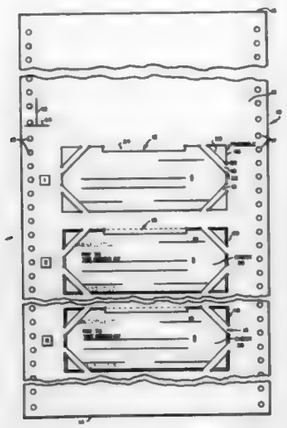
(a) a strong, flexible polyester support film having a thickness ranging from about 0.003 inch (3 mils) to about 0.007 inch (7 mils);

(b) a plurality of vertically spaced attachment areas of predetermined shape on said support film for attachment of different checks of similar shape but that may vary in thickness and rigidity in said respective areas, the spacing of the attachment areas defining successive printing positions;

(c) means provided in said attachment areas for attaching and supporting the checks in said respective areas on said support film, said attaching and supporting means comprising a plurality of essentially diagonally disposed straps, at least one at each of the corners of said attach-

ment areas, said straps formed by cutting said support material for insertion of said check beneath said straps in the respective attachment areas;

(d) a flap provided along the leading edge of each of said attachment areas, said flap formed by slitting said support material, for insertion of the top edge of said check beneath the flap in each of said attachment areas said support film including printed matter thereon corresponding to the pattern of a check in areas other than said straps and said flap, to aid in locating said straps and said flap for insertion of a check in proper position;



(e) aligned tractor feed holes along opposite edges of said plastic support film for receiving the pins of a tractor feed mechanism on said computer printer, for loading and alignment of said support film in said computer printer, and feeding said document holder in the feed direction; and

(f) line-up marks on said document holder prior to the leading attachment area to ensure proper initial loading and alignment of said support film in the computer printer, such that printed entries will properly be positioned on the subsequently printed checks.

4,636,100

PAPER FEED MECHANISM FOR RECORDING APPARATUS

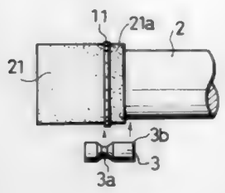
Kyuichi Fujisawa, Tonan, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Oct. 12, 1984, Ser. No. 660,030

Claims priority, application Japan, Oct. 14, 1983, 58-159181[U]

Int. Cl.⁴ B41J *11/14*; G03B *1/24*

U.S. Cl. 400—662 **5 Claims**



1. A paper feed mechanism for use in a recording apparatus, comprising:

(a) a rotatable platen;

(b) a printing unit disposed in confronting relation to said platen and movable axially of said platen for printing on the recording paper against said platen;

(c) a plurality of teeth disposed at each end of said platen and arranged circumferentially of said platen, said teeth having an outer diameter greater than that of said platen;

(d) a resilient member disposed circumferentially, outwardly of and adjacent to said teeth at each end and having an uncompressed diameter of an outer surface thereof greater than that of said platen and equal to or greater than that of said teeth, such that said resilient member can guide a paper wound around said platen without interence from said teeth when said resilient member is in an uncompressed state; and

(e) a paper presser roller disposed in confronting relation to said teeth and resilient member and movable retractably toward said platen for pressing the recording paper against said resilient member such that said outer surface of said resilient member is compressed below the diameter of said teeth to provide said teeth in biting engagement with the recording paper, said paper presser roller having a portion for pressing the recording paper against said resilient member.

4,636,101

LOW-NOISE TYPE IMPACT PRINTER

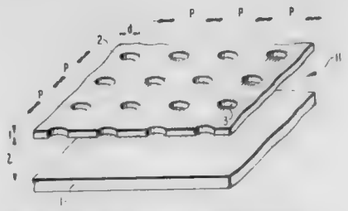
Hiroyuki Matsukura, and Fumio Yamaachi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 1, 1985, Ser. No. 718,302

Claims priority, application Japan, Mar. 30, 1984, 59-62410

Int. Cl.⁴ B41J *29/10, 29/08*

U.S. Cl. 400—690 **1 Claim**



1. A low noise type impact printer, comprising:

an impact printing mechanism;

a frame member for supporting said impact printing mechanism;

covering means for covering said impact printing mechanism and said frame;

means for absorbing noise generated by said impact printing mechanism;

said absorbing means having a resonant frequency corresponding to a fundamental frequency of said noise;

said absorbing means comprising a space formed between said frame member and said cover means at a location below said printing mechanism;

said frame member being provided with an array of through holes; wherein the size of said through holes, the pitch or spacing between said through holes, the thickness of said frame member, and the distance between said frame member and said cover means are selected such that said space is given a resonant frequency corresponding to said fundamental frequency as defined by the following equation:

$$f = Cd/4P \times \sqrt{1/\pi(t + 0.8d)l}$$

wherein:

d is the diameter of one of said holes;

P indicates the pitch or spacing between said holes;

t indicates the thickness of the frame;

l indicates the distance between the upper surface of the cover member and the lower surface of the frame; and

C indicates the speed of sound.

4,636,102

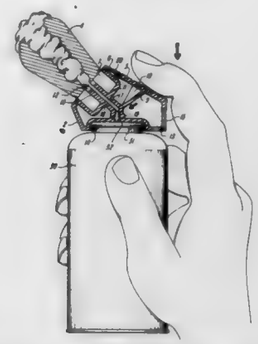
COMBINATION BRUSH AND APPLICATOR UNIT

William J. Drake, Andover, Mass., assignor to Ekard Industries, Boston, Mass.

Filed Oct. 12, 1983, Ser. No. 541,097

Int. Cl.⁴ A46B *11/02*

U.S. Cl. 401—190 **4 Claims**



1. A combination brush and applicator unit for dispensing shaving cream foam from an aerosol can having an outlet pipe displaceable to release said foam and a lip surrounding said pipe for attaching a cap to said can, said unit comprising:

an outer housing comprising

a pair of substantially planar side members,

at least one spacer piece for holding said side members a fixed distance apart in a parallel planar relationship,

a brush,

an activator assembly comprising

a circular well having a side and a bottom,

a tubular nozzle extension mounted perpendicularly in the center of the bottom of said well, said extension communicating with said brush,

a tubular nozzle for conveying said foam from said pipe to said brush, said nozzle being joined to the bottom of said well on the side opposite from said extension and communicating with said extension, said nozzle having a ring-shaped notch cut therein adjacent to the junction of said nozzle with said well,

an activator button wherein said brush and said activator button are at an angle to said pipe, said angle being between 0° and 90°,

a rigid strut for mounting said activator button on said nozzle so that pressure applied to said activator button causes said nozzle to move to displace said pipe, and

a flexible hinge for attaching said activator button to said side of said well, whereby said activator button, said strut, said nozzle and said side and bottom of said well form a hinged parallelogram structure.

4,636,103

LOCKING MECHANISM

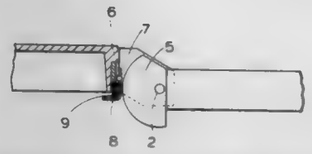
Leslie F. Brown, Ramsgate, United Kingdom, assignor to Instro Precision Ltd., Kent, England

Filed Nov. 19, 1985, Ser. No. 799,728

Int. Cl.⁴ F16C *11/00*; F16D *1/12*

U.S. Cl. 403—92 **1 Claim**

1. A locking mechanism for use with a pair of members which are mutually rotatable about a common pivot, said members being a platfom body and a leg therefor which is adjustable so as to vary the height of the platform body, the locking mechanism comprising a substantially flat surface on one of the members tangential to an opposing convex cylindrical surface on the other member, the cylindrical surface being coaxial with the pivot, said cylindrical surface and said substantially flat surface defining therebetween a gap, and further



including a cylindrical roller mounted within said gap in tangential frictional contact with the opposing surfaces, and means for releasably biasing the roller towards an apex of the gap to thereby prevent rotation of the members in a direction which tends to urge the roller towards the apex, except on release of the biasing means, and to freely permit rotation in the opposite direction.

4,636,104

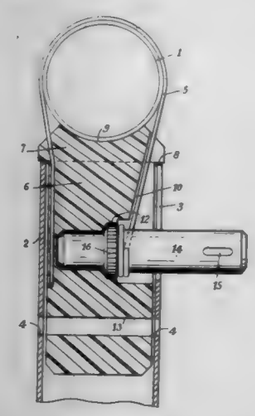
STRUCTURAL FIXING DEVICES FOR FURNITURE

Didier Diuh, Le Vesinet, France, assignor to NIVO S.A., Saint Germain en Laye, France

Filed Mar. 26, 1985, Ser. No. 716,355

Int. Cl.⁴ F16B *7/08*

U.S. Cl. 403—191 **9 Claims**



1. A device for fixing hollow structural sections to assembly elements, comprising, in combination, an end piece fitted into the end of a hollow section, a holding cable surrounding an assembly element and a device for tensioning said cable, said tensioning device being a winding shaft to which is fixed at least one end of said cable and which may move in a cavity between an active position for winding said cable and a passive position in which said shaft is locked in said cavity, said winding shaft comprising a toothed wheel which, when the winding shaft is in the locked position, is locked in a circular serrated housing in the cavity of the end piece.

4,636,105

CORNER PIECE FOR FRAMES

Gert A. Johansson, von Holtens väg 21, S - 443 00 Lerum, Sweden

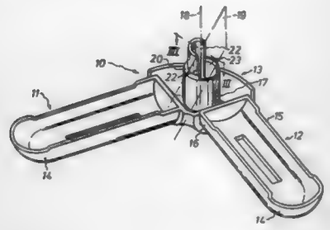
PCT No. PCT/SE84/00087, § 371 Date Jan. 4, 1985, § 102(e) Date Jan. 4, 1985, PCT Pub. No. WO84/04366, PCT Pub. Date Nov. 8, 1984

PCT Filed Mar. 9, 1984, Ser. No. 694,391

Claims priority, application Sweden, May 5, 1983, 8302583

Int. Cl.⁴ F16B *7/00*

U.S. Cl. 403—205 **6 Claims**



1. A corner connection device for joining adjacent tubular frame sides having inner cavities, said corner connection device comprising:

two identical corners parts interconnected to form a corner piece, each of said corner parts comprising

two shank parts perpendicular to each other each including sides sized and shaped to be engaged and received within said inner cavities,

an intermediate part positioned between said perpendicularly positioned shank parts,

a fastening portion extending out of said intermediate part and having first and second planes, said first plane coinciding with and symmetrical about the tubular frame sides, said second plane bisecting the angle between said perpendicular shanks, and being perpendicular to said first plane, said fastening portion further comprising

a cylindrical lug extending at right angles to said first plane and situated in said bisector plane,

a supporting edge located on the axial free end of said cylindrical lug, said support edge lying in said first plane,

a guide pin projecting above said support edge on one side of said bisector plane and projecting above said first plane at right angles thereto, and

a downwardly directed recess below said first plane and on the opposite side of the bisector plane to the guide pin, said recess being shaped complementary to said upwardly projecting guide pin, said fastening portion interconnecting said two corner parts by said guide pin on a first corner part engaging the recess of said fastening portion of an oppositely facing second corner part.

4,636,106

COAXIAL JOINT

Neville Waisbrod, Shimshon, Israel, assignor to Tzora Furniture Industries Ltd., Bet Shemesh, Israel

Filed Oct. 25, 1985, Ser. No. 791,609

Claims priority, application Israel, Oct. 26, 1984, 73328

Int. Cl.⁴ F16B *12/42*; F16D *1/00*

U.S. Cl. 403—228 **20 Claims**

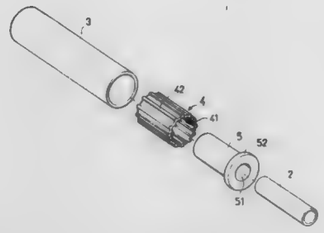
1. A coaxial joint for joining an inner cylindrical member to an outer cylindrical member by means of a bushing disposed therebetween, characterized in that said bushing includes:

an outer sleeve non-rotatably receivable within said outer cylindrical member;

an inner sleeve formed with a central bore for receiving said inner cylindrical member;

a first group of longitudinally-extending, circumferentially-spaced ribs formed between said inner and outer sleeves with each such rib having a width which is substantially smaller than the circumferential spacing between ribs;

and a second group of longitudinally-extending, circumferentially-spaced ribs each also having a width which is substantially smaller than the circumferential spacing between ribs, said second group of ribs being formed in staggered relationship with respect to said first group of ribs on the outer face of said outer sleeve and effective, when forcibly received within said outer cylindrical member, to distort inwardly the portions of said outer sleeve between said first group of ribs and thereby to minimize the distortion of said inner sleeve.



4,636,107

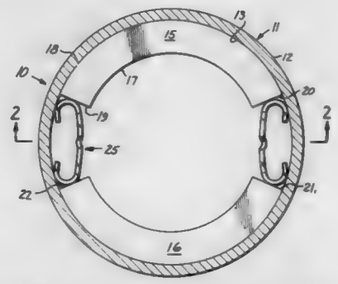
REFORMED IN PLACE RESILIENT RETENTION SPRINGS

William A. Casler, and Phillip E. Saurenman, both of Pasadena, Calif., assignors to Plus Manufacturing Co., Inc., South El Monte, Calif.

Filed Mar. 30, 1982, Ser. No. 363,468

Int. Cl.⁴ B25G *3/00*; F16D *1/00*

U.S. Cl. 403—405.1 **24 Claims**



1. A working spring retainer biasing a separate article to hold it in place against a separate concavely-curved wall in surface to surface contact therewith, said article having an abutment surface facing toward and being contacted by said spring retainer, said spring retainer also bearing against a second abutment surface, and comprising: a metal body having a pair of spaced-apart arms, each arm having a contact surface, whereby spaced-apart portions of each arm make contact with a respective abutment surface, and a bight connecting said arms, the metal of said body providing significant spring loading capacity, and permitting of permanent deformation, some part of said bight, after placement of said spring retainer between said abutment surfaces, having been permanently reformed by stress exerted in such a way as would, absent restraint by said abutment surfaces, enlarge the intrinsic length of said working spring retainer, the angle between said arms closer to said wall thereby being enlarged, and the spring retainer thereby storing additional energy which exerts a springing force against said abutment surfaces, said spring retainer, if removed from restraint, resiliently elongating to an intrinsic length longer than the distance between said abutment surfaces, which distance is greater than the length of said spring prior to said placement.

4,636,108

FLEXIBLE SURFACE MOUNT DELINEATOR

John W. Duckett, P.O. Box 9058, San Rafael, Calif. 94902

Filed Jan. 5, 1984, Ser. No. 617,366

Int. Cl.⁴ E01F *9/00*

U.S. Cl. 404—10 **4 Claims**





1. A surface delineator kit comprising

an elongated and unitary marker entirely composed of a flexible semi-rigid plastic material defining a cylindrical post of uniform circular cross-section and having a circular bottom wall formed on a lower end thereof and an open top defined at an upper end thereof having a diameter corresponding to the diameter of an inner circular surface of said bottom wall,

a first access opening formed centrally through said bottom wall and adapted to receive a fastener therethrough to secure said marker to a surface,

a circular second access opening formed through a side wall of said marker, closely adjacent to said bottom wall and adjacent to said first access opening, adapted to receive a tool therethrough to selectively tighten or release said fastener,

fastening means, including a fastener having a head and an annular washer mounted between said head and the inner circular surface of said bottom wall, for releasably attaching said marker to a stationary mounting surface, said washer substantially conforming to the inner circular surface of said bottom wall and having an outer diameter slightly less than said open top, the inner circular surface of said bottom wall and an inner circular cross-section of said post, but greater than said circular second access opening whereby said washer can only be positioned in said post through the open top thereof and not through said second access opening, and

a mounting plate mounted beneath the bottom wall of said marker and having an outer dimension at least as large as the outer dimension of said bottom wall whereby tightening of said fastener through said circular second access opening will clamp the substantial entirety of said bottom wall between said washer and said mounting plate.

4. A surface mount delineator for mounting on a roadway comprising an elongated traffic marker, said traffic marker being made by the following method steps

forming a cylinder having flat first and second bottom walls formed on opposite ends thereof, and

severing said cylinder entirely about the periphery thereof and along a continuous cut line extending generally longitudinally from a frist end adjacent to said first bottom wall to a second end adjacent to said second bottom wall of said cylinder and along opposite sides thereof to define a substantially identical pair of said traffic markers adapted for mounting on said roadway.

4,636,109

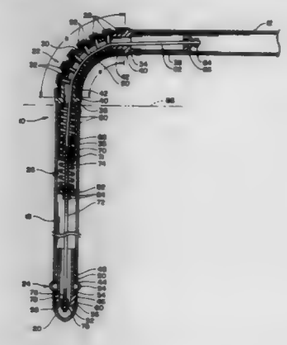
HINGED SLALOM GATE

Eivind Clausen, Bellingham, Wash., and Timothy J. Skaling, Dana Point, Calif., assignors to Allsop, Inc., Bellingham, Wash.

Filed Dec. 21, 1984, Ser. No. 685,135

Int. Cl.⁴ E01F *9/01*

U.S. Cl. 404—10 **16 Claims**



1. A post assembly which is adapted to be inserted into a base material, such as snow, and which can pivot upon encountering an impacting force, while being retained in said base material, said post assembly comprising:

a. a lower support member adapted to be inserted into said base material and withdrawn therefrom, said support member having an upper end and a lower end;

b. a main post member comprising an upper main post portion and a lower connecting portion operatively connected to said base member, said post member having a lengthwise axis, said connecting portion being bendable so as to permit said main post portion to pivot laterally about the connecting portion from a normal upright position to a downward deflected position, said connecting portion being biased to urge said post member to said normal upright position;

c. a retractable anchoring member mounted to said support member, said anchoring member having a retracted position which permits said post assembly to be inserted into,

or withdrawn from, said base material with little force, and an extended position where said anchoring member extends into said base material to resist movement of said support member from said base material;

d. actuating means operatively connected between said anchoring member and said main post member in a manner to be responsive to movement of said main post member so that lateral movement of said post member from the upright position causes said anchoring member to move to the extended position;

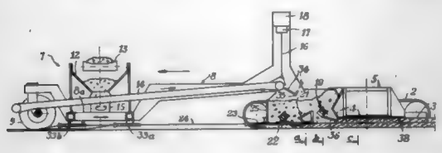
whereby said support member in its upright position can be inserted into or removed from the base material with relative ease, and when said main post portion is deflected under impact loading, said anchoring member moves to said extended position to resist movement of said support member from the base material.

4,636,110

SLIDING FORMWORK MACHINE WITH TWO EXTRUDING PLATES FOR CONSTRUCTING CONTINUOUSLY REINFORCED CONCRETE ROADWAYS

Jean-Pierre Augoyard, Domont, France, assignor to GTM-Entrepose, Nanterre Cedex, France

Filed Nov. 13, 1984, Ser. No. 670,961
Claims priority, application France, Nov. 17, 1983, 83 18284; Sep. 21, 1984, 84 14518
Int. Cl.⁴ E01C *19/18, 19/48, 23/04*
U.S. Cl. 404—100 **20 Claims**



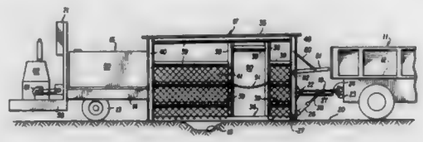
1. A sliding shuttering machine for constructing continuously reinforced concrete roadways or pavements, comprising a main frame provided with transversely spaced ground engaging members allowing it to move over the ground, two lateral shutterings spaced apart transversely and extending longitudinally between the ground engaging members, a main extrusion plate extending transversely between the lateral shutterings and forming therewith a tunnel shaped sliding shuttering for extruding a mass of concrete and molding the same into a thick pavement as the machine moves forward, said main extrusion plate being mounted for vertical movement with respect to the main frame, adjustment means mounted between said main frame and said main extrusion plate for adjusting the vertical position thereof with respect to the ground and, consequently, the thickness of the concrete pavement to a desired value, concrete supply and distribution means disposed in front of the main frame for delivering said mass of concrete on to the ground in front of said main extrusion plate, an additional extrusion plate, extending transversely between the lateral shutterings and being situated at a distance in front of said main extrusion plate for extruding a mass of concrete into a first compact layer of concrete as the machine moves forward, said additional extrusion plate having a lower face which is at a height with respect to the ground which is less than that of the main extrusion plate, first vibrator means mounted in front of said additional extrusion plate, said concrete supply and distribution means being arranged for delivering a mass of concrete also in front of the additional extrusion plate, and a first set of guide elements, space apart transversely, which are mounted under said additional extrusion plate, for guiding continuous longitudinal reinforcements to be placed on top of said first layer and to be ultimately embedded in the concrete pavement.

4,636,111

APPARATUS FOR ROAD REPAIR WORK INCLUDING A PROTECTIVE CAGE

James V. Joyce, Andover, N.Y., assignor to Joyce Pipe Line Company, Andover, N.Y.

Filed Jul. 25, 1985, Ser. No. 758,893
Int. Cl.⁴ E01C *19/16*
U.S. Cl. 404—101 **11 Claims**



1. Apparatus for road repair work, wherein the apparatus is configured to be coupled to and towed by a road repair vehicle, the apparatus comprising:

trailer means for supporting the apparatus and allowing the apparatus to be towed over a roadway by the vehicle, the trailer means including a pair of wheels mounted on a frame about which wheels the apparatus pivots;

the frame including first and second portions wherein the first portion has the pair of wheels mounted on the bottom thereof and a trailer bed for supporting road working equipment;

cage means secured to the first portion, said cage means having front and rear ends, opposed sides and a floor wherein, the front and rear ends have openings therethrough, the rear end opening communicating with the bed portion of the trailer so as to render the equipment thereon accessible to workers in the cage, while the front end of the cage has an opening therethrough whereby material carried by the towing vehicle is accessible to workers within the cage, and

the floor of the cage having front and rear portions spaced by an opening defining a work area, whereby when the road repair apparatus is positioned over the work area, workers standing on the front and rear portions of the floor can work in the opening while being protected from traffic and while having the materials and tools necessary for their work conveniently positioned adjacent to the work area, the floor of the cage extending below the trailer bed and below the bottom of the first portion substantially the same distance that the wheels extend therebelow whereby the apparatus when utilized rests substantially parallel to the road surface but can be conveniently towed by raising the front end of the cage portion.

4,636,112

METHOD OF AND APPARATUS FOR CONTROLLING FLUID LEAKAGE THROUGH SOIL

Avi Raviv, Rehovot, Israel, assignor to Solmat Systems, Ltd., Yavne, Israel

Continuation of Ser. No. 367,886, Apr. 13, 1982, abandoned. This application May 6, 1985, Ser. No. 730,257
Int. Cl.⁴ E02B *3/16;* **F16L** *1/02*
U.S. Cl. 405—176 **13 Claims**

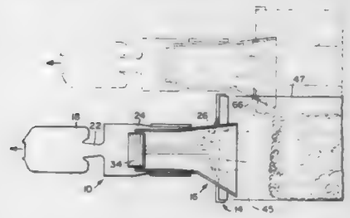
1. A method for controlling fluid leakage through soil in a region comprising:

(a) sequentially passing over the region to dig a plurality of parallel, laterally spaced grooves in the surface;

(b) removing the soil from a groove as it is created;

(c) laying a strip of fluid impermeable sheet material over a groove during each pass, the strip being wider than the width of the groove; and

(d) depositing soil dug from the groove onto the strip such that the latter is covered with soil except along one edge, the other edge of the strip overlying the uncovered edge of an adjacent strip laid down during a previous pass over the region, thereby establishing over the region a first layer of overlapping strips of sheet material covered with soil.

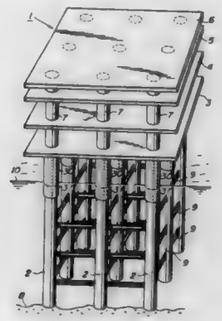


4,636,113

LANDING ADJUSTMENT SYSTEM FOR OFFSHORE STRUCTURES

Kiyohide Terai, 2-23-1, Higashi Nakano, Nakano-ku, Tokyo, Japan

Filed Sep. 26, 1984, Ser. No. 654,785
Claims priority, application Japan, Sep. 27, 1983, 58-178953
Int. Cl.⁴ E02B *17/00*
U.S. Cl. 405—203 **5 Claims**



1. An offshore structure adapted to rest on the bed of a body of water, said structure comprising a platform for receiving a load, a plurality of columns extending downwardly from said platform, said columns having lower end portions adpated to rest on the bed of the body of water, a plurality of tanks connected with said columns, detector means for detecting the amount of force applied by said columns against the bed of the body of water, and control means connected with said detector means for adjusting the bouyancy of said tanks as a function of the amount of force detected by said detector means.

4,636,114

BUOYANCY-SUPPORTED STRUTS FOR OCEAN PLATFORMS

Neville E. Hale, Mississauga, Canada, assignor to Fathom Oceanology Limited, Mississauga, Canada

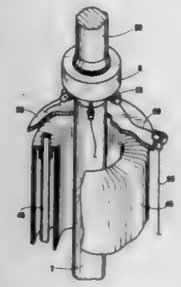
Filed Sep. 18, 1984, Ser. No. 651,842
Claims priority, application Canada, Sep. 23, 1983, 437397
Int. Cl.⁴ E02D *5/74;* **E21B** *7/12;* **E02B** *17/08*
U.S. Cl. 405—224 **15 Claims**

1. Apparatus for transmitting forces between two points that are widely separated vertically in a body of deep water, the apparatus comprising a strut, and buoyancy means for supporting the weight of the strut, characterised by the following structural combination:

(a) the strut is in sections that are fastened end to end, and a section of the strut has a relatively slender form over most of its length, but is relatively bulbous at at least one of its ends;

(b) the buoyancy means comprises a plurality of vertically stacked air canisters, to which air is fed in a cascading fashion from the bottom-most canister upwards;

(c) each canister has a vertical height of less than half the length of a section of the strut, and two or more canisters disposed one above the other are provided for each strut section;



(d) wherein the buoyancy forces from the canisters along the entire length of the strut are transmitted to the strut by cords on all the strut sections, which cords are capable of transmitting only tensile forces;

(e) wherein there are cord attachment points at the at least one bulbous end of each strut section, and the cords extend from cord attachment means provided on each canister to the next lower cord attachment point along the length of the strut; and

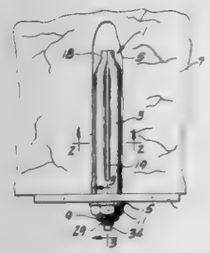
(f) wherein each canister and cord is spaced laterally from the respective strut section where it is disposed along the length of the relatively slender form of that strut section.

4,636,115

EXPANSION BOLT AND MINE ROOF REINFORCEMENT THEREWITH

Robert L. Davis, and Harold D. Keith, both of Rolla, Mo., assignors to The Curators of The University of Missouri, Columbia, Mo.

Filed Nov. 10, 1980, Ser. No. 205,601
Int. Cl.⁴ E21D *21/00*
U.S. Cl. 405—259 **11 Claims**



1. An expansion bolt adapted for insertion in an initial unexpanded condition in a hole drilled in a body in which the bolt is to be anchored, and adapted to be expanded girthwise after being inserted in the hole to anchor it in the hole, said bolt having an elongate hollow shank portion constituted by a relatively thin-walled tubular metal member closed at one end constituting its inner end as inserted in the hole and having a head at its other end constituting its outer end, said head being exteriorly threaded for reception of a nut and extending out of

the hole when the bolt is anchored in the hole, said tubular member, in its unexpanded condition, being of fluted cross section, said tubular member being adapted to hold a fluid under pressure and to expand girthwise under pressure of fluid therein, and said head being constructed for delivery of fluid under pressure into said tubular member whereby, following insertion of the tubular member in a hole, fluid under pressure may be delivered into the tubular member to cause it to expand girthwise into pressure engagement with the body within the hole for anchoring it in the hole, the head having a passage for flow of pressurizing fluid into the tubular member, means associated with the head for pressurizing the fluid held in the tubular member comprising expansible chamber means in the head, said expansible chamber means comprising a plug in threaded engagement with the head in the passage, whereby, on turning the plug to advance it in the passage, pressurizing fluid may be displaced from the passage into the tubular member, the plug having a hole extending therethrough, and wherein the expansion bolt further comprises a valve member retained in said passage in the head movable into and out of engagement with the plug to block and unblock the hole in the plub.

4,636,116

CUTTING TOOL

Hiroshi Shikata, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

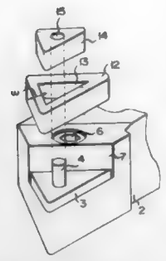
Continuation of Ser. No. 368,438, Apr. 14, 1982, Pat. No. 4,507,023. This application Jan. 25, 1985, Ser. No. 695,003

Claims priority, application Japan, May 30, 1981, 56-83482; Aug. 26, 1981, 56-125197

The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.

Int. Cl.⁴ B23B *27/16*

U.S. Cl. 407—103 **20 Claims**



1. A cutting tool for cutting a workpiece by a relative rotation between the cutting tool and the workpiece, said cutting tool, during use, being fed relative to said workpiece by a prescribed feed amount f per revolution, said cutting tool comprising:

a bit holder, wherein said bit holder is fed in a direction of an axis of rotation; and

a throw-away tip which is formed of superhard metal, which has an outer peripheral surface of prescribed shape, an inner peripheral surface provided concentrically with the outer peripheral surface and defining a hollow part and a predetermined thickness t which is detachably mounted to the bit holder,

wherein a distance ω between the inner peripheral surface of said throw-away tip and the outer peripheral surface thereof is defined within a range satisfying the following formula represented by;

$$f_{max} \leq \omega \leq t$$

where f max is a maximum value for f.

4,636,117

CUTTING TOOL

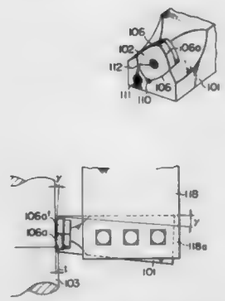
Hiroshi Shikata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 3, 1984, Ser. No. 657,126

Claims priority, application Japan, Apr. 12, 1984, 59-73570

Int. Cl.⁴ B26D *1/00*; B23B *1/00*

U.S. Cl. 407—104 **13 Claims**



1. An oblique edged cutting tool for machining a work, comprising:

(a) a holder having a front end;

(b) an indexable throw-away tip comprising:

(1) a first flat surface facing a work and being substantially tangent to a work surface to be machined;

(2) a second flat surface parallel to said first flat surface;

(3) an outer configuration radially symmetrical about a geometric center of said tip; and

(4) an outer peripheral surface formed by a curved surface projecting outwardly;

(c) means for releasably securing said tip to said front end of said holder, thereby forming a cutting edge on an edge portion of said outer peripheral surface, said cutting edge defining a curved rake face; and

(d) means for positioning said tip at an inclination angle of from about 30° to about 70°, and at a relief angle;

wherein said, inclination angle is defined as an angle formed by (1) a line tangent to a central point of an effective cutting edge portion of said cutting edge and (2) a line normal to a cutting velocity direction of said cutting tool and parallel to said work surface;

wherein said relief angle is defined as an angle formed by (1) a plane coincident with said cutting velocity direction and tangent to said work surface and (2) a line normal to aid line tangent to said central point, said central point forming an apex of said relief angle, said cutting edge thereby being formed as a part of an ellipsoidal curve having a large radius of curvature inclined with respect to said work surface.

9. An oblique edged cutting tool for machining a work, comprising:

(a) a holder having a front end;

(b) an indexable throw-away tip comprising:

(1) a first flat surface facing a work and being substantially tangent to a work surface to be machined;

(2) a second flat surface parallel to said first flat surface;

(3) an outer configuration radially symmetrical about a geometric center of said tip; and

(4) a plurality of outer peripheral flat surfaces;

(c) means for releasably securing said tip to a front end of said holder, thereby forming a cutting edge on an edge portion of one of said outer peripheral surfaces, said cutting edge defining a flat rake face;

(d) means for positioning said tip at an inclination angle of from about 30° to about 70°, and means for positioning said tip at a relief angle;

wherein said inclination angle is defined as an angle formed by (1) a line tangent to a central point of an effective cutting edge portion of said cutting edge and (2) a line normal to a cutting velocity direction of said cutting tool and parallel to said work surface;

wherein said relief angle is defined as an angle formed by (1) a plane coincident with said cutting velocity direction and tangent to said work surface and (2) a line normal to said line tangent to said central point, said central point forming an apex of said relief angle.

4,636,118

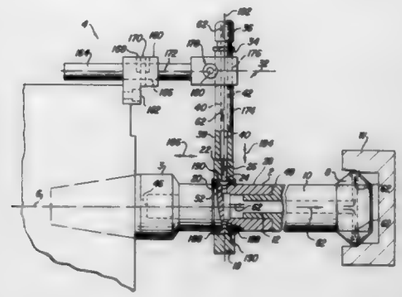
COOLANT SUPPLY EXTENSION MEMBER IN ROTATING CUTTING TOOL

Carl E. Hunt, Milford, Mich., assignor to GTE Valeron Corporation, Troy, Mich.

Filed Dec. 17, 1985, Ser. No. 809,911

Int. Cl.⁴ B23B *27/10, 51/06*

U.S. Cl. 409—136 **8 Claims**



1. A rotatable cylindrical extension member for attachment to a drive spindle of a cutting tool of the type for cutting a workpiece wherein there is relative cutting motion about an axis of rotation between a cutting member mounted upon a tool shank of the type for attachment to said extension member and having an axially extending bore therethrough, and said workpiece, and wherein coolant is supplied from a coolant supply means through a ring bore of a coolant supply ring rotatably mounted upon said extension member and through said bore in said tool shank to said cutting member, said cylindrical extension member comprising a longitudinal axis, a first end for coupling to said drive spindle, a second end for coupling to said tool shank, a coolant inlet means, for alignment with said ring bore, extending inwardly from the peripheral surface of said extension member, for directing said coolant towards said longitudinal axis when said extension member is coupled to said drive spindle and rotated while coolant is being supplied to said inlet means from said ring bore, said inlet means comprising two or more inlet bores each defined by an inlet bore wall extending from said peripheral surface to said longitudinal bore, said inlet bores being equally spaced circumferentially of said peripheral surface and being positioned relative to a centerline, defining an extension member diameter, such that each of said inlet bores is positioned behind said centerline with respect to the direction of intended rotation of said extension member; a coolant outlet at said second end for supplying coolant through said bore of said tool shank to said cutting member; a longitudinal bore defined by a longitudinal bore wall extending from said inlet means to said outlet and about said longitudinal axis; and, means adjacent said inlet bores at said peripheral surface for exerting a positive scooping effect to move coolant along said surface towards said inlet bores so that coolant is drawn from said surface through said inlet bores and towards said longitudinal axis, said exerting means formed such that each of said inlet bores includes a channel partially extending circumferentially about said peripheral surface and having a first end which merges into the respective of said two or more of said inlet bores and a second end spaced from said first end in the direction of intended rotation of said extension member, each channel being scoop-like in configuration and having a leading edge which forms said second end.

4,636,119

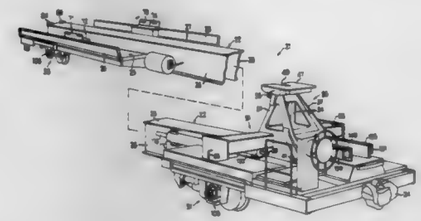
ALL PURPOSE RAILROAD CAR

Boris S. Terlecky, Woodridge, Ill., assignor to Trailer Train Company, Chicago, Ill.

Filed Sep. 24, 1984, Ser. No. 653,821

Int. Cl.⁴ B61D *45/00*

U.S. Cl. 410—54 **36 Claims**



1. An all purpose railroad car for transporting wheeled trailers and containers, said car comprising an elongated frame supported by wheel trucks, combined hitch and bolster means adjacent one end of said frame for selectively receiving and releasably retaining a trailer king pin and one end of a container and means spaced from said combined hitch and bolster means for selectively receiving and supporting the wheels of a wheeled trailer and the other end of a container, and wherein said combined hitch and bolster means is an integral rigid structure with said hitch fixed in spaced relationship to said bolster with both said hitch and said bolster permanently disposed in operative position to respectively receive and retain a trailer king pin and a container.

4,636,120

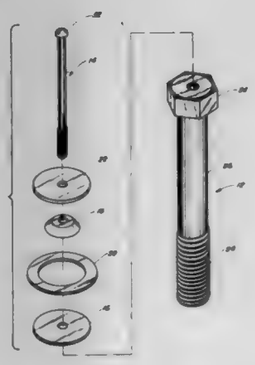
STUD/BOLT LOAD GAUGE

Timothy A. Brandsberg, Goode, and Ronald C. Pillow, Lynchburg, both of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 2, 1986, Ser. No. 869,474

Int. Cl.⁴ F16B *31/02*

U.S. Cl. 411—14 **2 Claims**



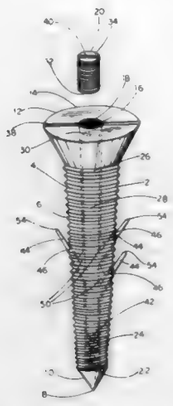
1. A bolt load gauge, comprising:

a. a bolt having a longitudinal bore, said bore being threaded at its lower end;

b. a gauge screw threadably engaged in said longitudinal bore;

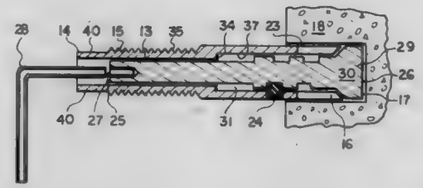
c. a washer stack assembly mounted on said gauge screw comprising:
i. a first flat washer adjacent the head of said bolt;
ii. a spring washer providing an overload gap and being compressible to take up said overload gap;
iii. a second flat washer overlying said first flat washer and having a central bore larger than said first flat washer adapted to receive said spring washer; and
iv. a third flat washer overlying said second flat washer and said spring washer; and
d. said gauge screw being threaded to a depth in said longitudinal bore which provides an underload gap wherein all of said washers are movable.

4,636,121
HOLDING SCREW
Lillias S. Miller, 738 Yates, Romeoville, Ill. 60441
Filed Apr. 22, 1985, Ser. No. 725,619
Int. Cl.[4] F16B *13/04, 39/02*
U.S. Cl. 411—21 **1 Claim**



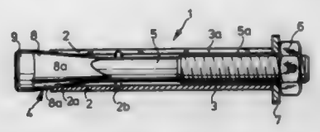
1. A self holding screw comprising an elongated threaded screw shank having a conical side wall, a leading end for entry into a work piece and a trailing engagement end for driving engagement with a screw driving tool, an elongated cavity in said screw shank opening to said trailing engagement end and closed at its opposite end, a retaining member positioned in said cavity for reciprocal movement therein toward said leading end and toward said trailing end, said retaining member including a solid elongated body portion, the cross-sectional configuration of said solid elongated body portion corresponding to the cross-sectional configuration of said elongated cavity, a plurality of integrally formed projecting fingers on said retaining member extending diagonally from said retaining member at an acute angle facing toward said trailing end, aperture means through said conical side wall of said screw shank opening to said elongated cavity in registration with said fingers of said retaining member seated in said elongated cavity for reception of said fingers through said aperture means and movement of said fingers relative to said aperture means wherein said fingers project outwardly beyond the said conical side wall of said screw shank in an extended position and wherein said fingers are withdrawn completely within the circumferential surface and boundary of said screw shank in a retracted position, and reciprocating means to move said retaining member and fingers between said extended and retracted positions, wherein said elongated cavity in said screw shank includes a circular internally threaded portion extending inwardly from said trailing engagement end for a short distance, an externally threaded set screw of short longitudinal dimension to threadedly engage with said internally threaded portion of said cavity and to seat therein, said reciprocating means including a compression spring seated at the opposite end of said elongated cavity, said spring being movable longitudinally between a compressed and a released position, said compression spring requiring mechanical advantage means to compress and having sufficient force when released to move longitudinally toward said released position to force said retaining member toward said trailing engagement end and said fingers outwardly of said aperture means to said extended position thereof for penetration into said work piece, said retaining member extending from abutment against the inner surface of said set screw at one end to abutment against said compression spring at the opposite end, said compression spring being moved to its compressed position by said retaining member when said set screw has been fully seated at the opposite end, said mechanical advantage means including said externally threaded set screw threadedly engaged with said internally threaded portion of said cavity at said trailing engagement end thereof.

4,636,122
JOINING AND MOUNTING DEVICE
James F. Rooney, 54 Poplar Swamp Rd., Bethany, Conn. 06525
Filed Dec. 12, 1985, Ser. No. 808,097
Int. Cl.[4] F16B *13/06*
U.S. Cl. 411—45 **8 Claims**



1. A joining and mounting device for engaging a pre-drilled substrate comprising:
(a) a hollow sleeve of generally circular cylindrical outer contour elongated upon a center axis and having contiguous rearward and forward portions terminating at opposed first and second extremities, respectively, said rearward portion having externally disposed threading and opposed flat sections recessed into said threading, and an axially centered first circular bore beginning at said first extremity and terminating within said forward portion in a shoulder directed outwardly from said axis, said forward portion having an axially centered second circular bore of larger diameter than said first bore and extending between said shoulder and said second extremity, slots in said forward portion parallel to said axis defining at least two outwardly displaceable prongs, and bearing means intruding radially into the sleeve,
(b) an elongated rotatable core member adapted to be disposed within said sleeve, having a helical groove which engages said bearing means, and first and second extremities positioned adjacent the corresponding first and second extremities of the sleeve, said extremities of the core having torque receiving means, said second extremity having a mandrel whose diameter is larger than the diameter of said second bore, whereby
(c) application of torque to said core member from either extremity causes it to travel axially within the sleeve so that the mandrel enters the second extremity of the sleeve with attendant outward displacement of said prongs.

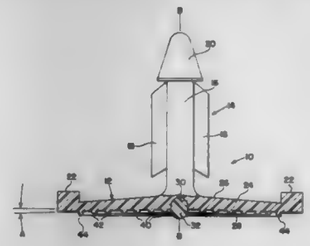
4,636,123
EXPANSION ANCHOR ASSEMBLY
Armin Herb, Peissenberg, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Furstentum, Liechtenstein
Filed Dec. 13, 1984, Ser. No. 681,023
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1983, 3346537
Int. Cl.[4] F16B *13/06*
U.S. Cl. 411—55 **11 Claims**



1. Expansion anchor assembly comprising an axially extending expansion sleeve, an expansion body for radially expanding at least an axially extending part of said expansion sleeve, and an anchor rod connected to said expansion body for axially displacing said expansion body into said expansion sleeve and for attaching a load, said expansion sleeve having a first end and a second end and comprising a plurality of axially extending coextensive slits extending from the first end toward the second end of and dividing said expansion sleeve into a plurality of separate coextensive axially extending expansion sections, each said expansion section having an axially extending radially inner surface and an axially extending radially outer surface, said expansion body having a first end and a second end with said expansion body having a first end and a second end with said second end insertable into the first end of said expansion sleeve so that said expansion body can be displaced axially into said expansion sleeve from the first end toward the second end for radially expanding said expansion sections, said expansion body having a radially outer surface comprised of a plurality of axially extending coextensive expansion surfaces arcuately curved in the direction transverse to the axial direction, said expansion surfaces having axially extending edges with said edges on adjacent said expansion surfaces being being contiguous, and said expansion surfaces tapering outwardly from the axis of said expansion body in the direction from the second ends toward the first end thereof, each said expansion surface being arranged to contact a corresponding said expansion section and an axially extending part of the radially inner surface of said expansion sections commencing at the leading end thereof being concavely arc-shaped transverse to the axial direction of said expansion sleeve and the arc-shape of the axially extending part of the radially inner surface corresponding to the arc-shape of said expansion surfaces on said expansion body, and each of said arc-shaped surfaces on said expansion body has the same radius of curvature along the axial length of said surfaces.

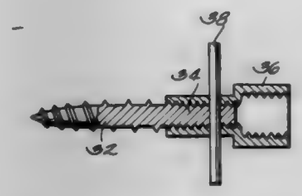
4,636,124
ADHESIVE FRICTION WELD FASTENER
James E. Gugle, Crystal Lake, and Brian R. Peek, Steger, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.
Filed May 6, 1985, Ser. No. 730,416
Int. Cl.[4] F16B *39/02*
U.S. Cl. 411—82 **5 Claims**

1. A one-piece thermoplastic fastener comprising a symmetrically-shaped base member having a friction weld surface, a heat-activated adhesive pellet secured to the center portion of said friction weld surface about the axis of rotation of said base member, and a plurality of deflector segments integrally formed on said friction weld surface at a plurality of radial distances from said axis of rotation, where the shape of said base member and the thickness of said plurality of deflector segments are selected to allow any imaginary straight line emanating from said axis of rotation and passing across the outer marginal edge of each intercepted deflector segment to extend below the radial plane which passes across the outer marginal edge of the innermost deflector segment, said thickness of said plurality of deflector segments being uniform and



said base member being shaped to form said friction weld surface with a slight concave configuration.

4,636,125
MOUNTING DEVICE AND METHOD OF USE
Francis A. Burgard, 12800 W. Cleveland Ave., New Berlin, Wis. 53151
Filed Nov. 29, 1984, Ser. No. 676,482
Int. Cl.[4] F16B *15/00*
U.S. Cl. 411—389 **1 Claim**



1. A mounting device for affixing to a tree or the like a member having a machine threaded mounting stud, said device having an elongated body having an externally threaded wood screw at one end and a blind hole at its other end,
machine threads on the interior of said blind hole, and
handle means fixed to said body to facilitate fixing said body on a tree or the like,
said body having two parts, one part including said wood screw and a threaded end, the other part being an adapter threaded onto said threaded end and including said machine threads,
a cross bore in each of said parts,
said handle means comprising a pin through said cross bores in said parts to retain the parts connected while functioning as a handle.

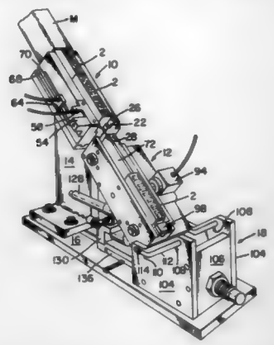
4,636,126
ELECTRICAL CONNECTOR PICKUP STATION
Kenneth L. Spotts, Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 25, 1985, Ser. No. 704,801
Int. Cl.[4] B65G *47/06*
U.S. Cl. 414—126 **11 Claims**

1. An electrical connector pickup station, comprising:
a base;
an escapement assembly mounted on the base and defining an open-ended electrical connector supply channel for slidably receiving elongate electrical connectors arranged in end-to-end relationship, the supply channel being inclined in a vertical plane and thereby having an upper and a lower end;
escapement means movable into and out of said supply chan-

nel to allow a connector at a time to fall from the lower end thereof;

a connector locating assembly defining a connector locating channel for slidably receiving a connector at a time from the supply channel and having a first, open end nearest to the escapement assembly and a second, closed end remote therefrom;

means supporting the locating assembly on the base for translatory and tilting movement between a first position in which the first end of the locating channel is in alignment with, and is proximate to, the lower end of the supply channel and a second position in which said locating channel is substantially horizontal, said supporting means



comprising a cam plate having a cam slot receiving a cam follower on the location assembly, the cam slot having a horizontal first portion nearest to the escapement assembly, merging with a second portion which is upwardly inclined in a direction away from the escapement assembly;

means for actuating the escapement means to allow a connector to fall from the supply channel into the locating channel when the locating assembly is in its first position;

means for driving the locating assembly between its first and its second positions; and

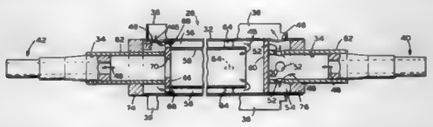
means for releasably retaining the connector in the locating channel during movement of the locating assembly from its first to its second position.

4,636,127

CONVEYING SCREW FOR FURNACE

Francisco Olano, Miami, Fla.; John A. MacDougall, Pittsburgh, and John K. Pargeter, Ellwood City, both of Pa., assignors to The International Metals Reclamation Co., Inc., Ellwood City, Pa.

Filed Apr. 3, 1985, Ser. No. 719,310
Int. Cl.[4] B65G *33/10*
U.S. Cl. 414—158 **5 Claims**



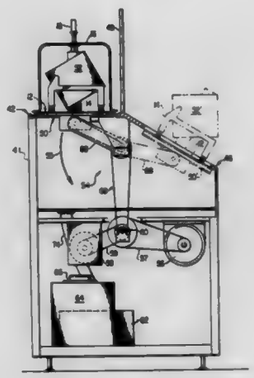
1. In combination with a furnace (10), a fluid cooled conveying screw (26) disposed therein, the conveying screw (26) comprising a proximal end (40), a distal end (42) and a hollow shaft (32) disposed therebetween, a plurality of spaced, continuous, fluid cooled, hollow, helical flights (36) affixed to the exterior of the shaft (32), coolant fluid entrance slots (46) disposed towards the proximal end (40), each coolant fluid entrance slot (46) communicating with an individual flight (36), coolant fluid exit slots (46) disposed towards the distal end (42), each coolant fluid exit slot (46) communicating with an individual flight (36), an inner tube (58) disposed within the shaft (32) communicating with the distal end (42) and partially extending through the shaft (32), and the shaft (32) and the inner tube (58) forming an annular space (56) therebetween wherein fluid flows from the entrance slots (46) through the helical flights (36) and through the exit slots (46) through the annular space (56) and out the distal end (42) of the shaft (32).

4,636,128

SEMICONDUCTOR SLICE CASSETTE TRANSPORT UNIT

Edwin G. Millis, Dallas, Tex.; Thomas C. Bimer, Albuquerque, N. Mex., and Alton D. Lewis, Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 30, 1984, Ser. No. 646,385
Int. Cl.[4] B65G *65/00*
U.S. Cl. 414—217 **16 Claims**



1. An apparatus for transporting semiconductor slice cassettes in a portable carrier between a high contamination area and a low contamination area, said portable carrier having a base carrying the slice cassettes and a cover removably attached to the base, comprising:

a housing having a forward portion disposed in the high contamination area and a rear portion positioned in the low contamination area said rear portion isolated from said forward portion by a barrier wall;

said housing having an interior portion in communication with the high contamination area through a first access opening in said forward portion and with the low contamination area through a second access opening in said rear portion;

the cover of the portable carrier being sealingly receivable over the first access opening to isolate the interior portion of the housing from the high cotamination area;

means for creating a positive pressure within the portable carrier prior to removing of the cover of the portable carrier from the base;

means for creating a negative pressure within the interior of said housing relative to both the high and low contamination areas;

support means disposed within said housing for receiving the base of the portable carrier and operable to be alternately disposed proximate said first access opening and said second access opening to move the base of the portable carrier and the slice cassettes therebetween; and

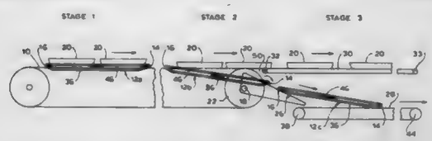
motive force means disposed within said housing for causing said support means and at least a portion of the portable carrier to be moved between said first access opening and said second access opening.

4,636,129

METHOD AND APPARATUS FOR REMOVING BAKERY CARRIER SCREENS FROM CONVEYOR

William E. Lanham, Jr., Stone Mountain, Ga., assignor to Lanham Machinery Company, Inc., Atlanta, Ga.

Filed Jun. 21, 1985, Ser. No. 747,406
Int. Cl.[4] B65G *65/06*
U.S. Cl. 414—417 **8 Claims**



1. A device for removing a longitudinally slotted carrier screen from a bakery product or the like carried thereon comprising, a moving product entrance conveyor means, a product exit conveying means for receiving products from the entrance conveyor means, said entrance conveyor means including means for interdigitating said carrier screen around the end of said entrance conveyor means adjacent said exit conveying means to cause aaid carrier screen to move downwardly away from products remaining on the entrance conveyor means and moving therewith; wherein said interdigitating means of the entrance conveyor means includes a plurality of substantially parallel and spaced apart product entrance conveying means, all of which are substantially in the same plane, said conveying means each having a width less than the longitudinal slot of a carrier screen disposed immediately above them the slotted carrier screen is correctly positioned upon said plurality of product entrance conveying means, with the slots of said screen parallel to and directly above the corresponding product entrance conveying means so that the carrier screen is supported only by its leading edge and its trailing edge, the forwardmost ends of said conveying means being adapted to permit interdigitation of a cooperatively designed longitudinally slotted carrier screen around them.

4,636,130

RAILROAD TRACK TRAILER

John I. Lenertz, Brainerd, Minn.; Dennis J. Tessenske, Eau Claire, Wis., and Ricky J. Ferrari, Crosby, Minn., assignors to Western States Company, Omaha, Nebr.

Filed Oct. 5, 1984, Ser. No. 658,269
Int. Cl.[4] B60P *1/00*
U.S. Cl. 414—500 **9 Claims**



1. A trailer for use in carrying railroad rail sections on a railroad track, including wheel means for permitting movement of the trailer along a railroad track, a trailer bed, said trailer bed being mounted on said wheel means and extending in a fore and aft direction and comprising:

means for clamping a rail section on the trailer with the rail section supported on the trailer bed, said means for clamping including a first adjustable clamp assembly at a leading edge of said trailer bed, and a second adjustable clamp assembly at a trailing edge of said trailer bed; and

means for mounting said first adjustable clamp assembly to the trailer bed for permitting limited transverse movement of a rail section supported on said first clamp assembly with respect to said trailer bed;

a roller mounting assembly at the trailing portion of said trailer bed, said roller mounting assembly comprising at least one roller and at least one pair of support arm means rotatably mounting said roller, means to pivotally mount said support arm means to the underside of the trailing portion of said trailer bed on a first axis, and a cam operator comprising a cam shaft rotatably mounted on the trailer bed on a second axis extending transversely across the trailer bed at the trailing end of the trailer bed, said second axis being generally parallel to the first axis and positioned spaced from the first axis, said cam shaft having cam means thereon to engage and be movable against said arm means to move said arm means from a first position wherein an upper edge of said roller is above the plane of the trailer bed, to a second position wherein the upper edge of said roller is below the trailer bed;

removable end gate means from said trailer, said trailer bed having at least one rack below the plane of said trailer bed and accessible from an end thereof for receiving an end gate means for said trailer after the end gate means has been removed; and

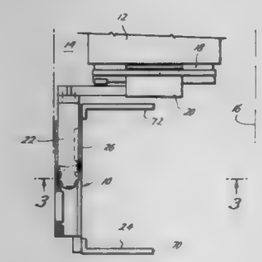
retainer means associated with said cam operator movable to a position wherein said retainer means obstructs one end of the rack to retain said end gate means in the rack when the roller is moved to its second position and wherein said retainer means is moved to a position clearing the end of said rack when said roller is moved to its first position.

4,636,131

SIDE SHIFTER AND NARROW AISLE ATTACHMENT FOR A LIFT TRUCK

Stuart W. Sinclair, Lake Jackson, Tex., assignor to Long Reach Manufacturing Co., Houston, Tex.

Filed Apr. 3, 1985, Ser. No. 719,591
Int. Cl.[4] B66F *9/14*
U.S. Cl. 414—621 **3 Claims**



1. A narrow aisle attachment for use with a lift truck comprising,

a carriage plate adapted to be supported from the lift truck,

side shifter means supported from the carriage plate,

a yoke assembly supported from the side shifter means,

a clamp assembly rotatably supported from the yoke,

means connected to the clamp assembly for rotating the clamp assembly,

means connected to the clamp assembly for opening and closing the clamp assembly,

said side shifter means including,

a single pair of vertically extending movable parallel arms,

a head assembly vertically moving in the carriage plate and pivotally connected to the top ends of each of the parallel arms,

the lower ends of the parallel arms pivotally connected to the yoke,

a hydraulic piston and cylinder assembly pivotally connected between the parallel arms and the head assembly for shifting said arms transversely to the carriage plate, said assembly having a piston/cylinder located on an outward side of each arm,

a dolly assembly including a wheel pivotally connected to each of the arms at points closer to the lower ends than the upper ends of said arms, and

a support track positioned on the carriage plate for sup-

porting the wheel, said track being substantially the width of the carriage plate.

4,636,132

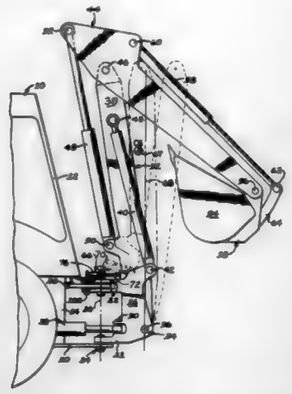
VEHICLE BOOM LOCK

Jeffery W. Menke, Peoria, and Craig W. Riediger, Pekin, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 501,041, Jun. 6, 1983, abandoned. This application May 31, 1985, Ser. No. 739,505

Int. Cl.⁴ B66C *23/00*

U.S. Cl. 414—694 **7 Claims**



1. In a vehicle of the type including a support and an implement carrying swing frame coupled to the support by a first pivot pin apparatus, and an elevatable boom assembly connected to the swing frame by a second pivot pin apparatus, a boom lock comprising:

a coupling joint connected to the swing frame; and

cable assembly means for interlockably engaging the coupling joint upon retracting pivotal movement of the boom assembly generally to be retracted transport position and for subsequently preventing extending pivotal movement of the boom assembly generally from the transport position as a result of said interlocking engagement with the coupling joint, said cable assembly means including a stiff, but deflectable cable solely cantileverably connected to the boom assembly and an enlarged distal end portion.

4,636,133

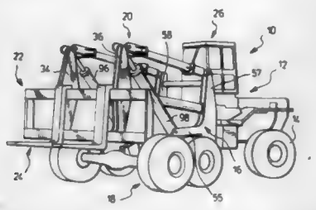
HEAVY LOAD LIFTING APPARATUS

Markus J. Hess, Thornhill, Canada, assignor to Crothers Limited, Concord, Canada

Filed Jan. 23, 1985, Ser. No. 693,982

Int. Cl.⁴ B66F *9/06*

U.S. Cl. 414—715 **9 Claims**



1. A heavy load lifting machine for elevating a heavy object off of and transporting a heavy object along the ground, said machine comprising a motorized mobile vehicle having a structural load-bearing frame, said frame having rigid spaced-apart members, each said member having upright and base members fixed relative to each other, said base members extending forwardly of a corresponding said upright member, a lifting linkage secured to said frame comprising two forwardly extending upper arms of equal length, each of said upper arms having a first end pivotally connected to one of said upright members, two forwardly extending lower arms of equal length, each of said lower arms having a first end pivotally connected to one of said upright members below said first ends of said upper arms, carriage means adapted for carrying a load comprising an upright frame to which a load engaging means is connected, a second end of each of said upper arms being pivotally connected to said carriage means frame and a second end of each of said lower arms being pivotally connected to said carriage means below said upper arm second end, said lower arms converging relative to each other towards said carried means frame to resist sway in said lifting linkage, two hydraulic rams for said lifting linkage, each said ram having a first end pivotally connected to said base member means intermediate said first and second ends of said lower arm and said ram having a second end pivotally connected to said carriage means frame at said pivotal connection of said second end of a respective said upper arm, a hydrualic circuit supplies and removes pressureized hydraulic fluid to and from said lift rams, a gear flow divider included in said hydraulic circuit for said lift rams for equally dividing flow of hydraulic fluid to and from said lift rams to ensure thereby a level lifting and lowering of said lifting linkage.

4,636,134

ARRANGEMENT IN AN INDUSTRIAL ROBOT

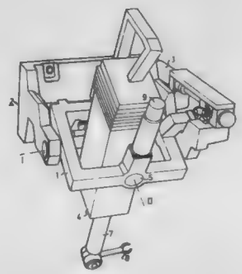
Leif Telldén, Västerås, Sweden, assignor to ASEA AB, Västerås, Sweden

Filed May 10, 1985, Ser. No. 732,722

Claims priority, application Sweden, May 18, 1984, 8402689

Int. Cl.⁴ B25J *1/00*

U.S. Cl. 414—729 **3 Claims**



1. An arrangement for an industrial robot of the type which has two mutually perpendicular swinging axes arranged in accordance with the gimbal-ring type principle, the arrangement comprising a carrier, a frame which is swingably journalled by first journal means on each side of the carrier to provide a first swinging movement about a first swinging axis, a machine part being journalled by two second journal means in the frame for swinging motion about a second swinging axis extending at right angles to the first swinging axis, said machine part supporting a movable unit which is mounted for translatory movement at right angles in relation to the second swinging axis and on which a working device can be mounted, a first motor to provide for said first swinging movement and a second motor to provide for said second swinging movement, and drive means to transfer power from a third motor for moving the movable unit in the gimbal-type movable machine part, the third motor being mounted on the aforesaid swingably journalled frame and connected to one of the second journal means in which the machine part is journalled, said one of the second journal means being journalled for rotation both

to the frame and the machine part, and the drive means including, adjacent the machine part, a pinion rotatable by the third motor, and a rack secured to the movable unit of the machine part which meshes with the pinion and which extends parallel with the direction of movement of said movable unit.

4,636,135

TOOL-HOLDER FOR INDUSTRIAL ROBOT

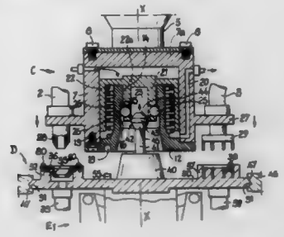
Georges R. Bancon, Vandoeuvre, France, assignor to Societe Syspro, Nancy, France

Filed Mar. 12, 1984, Ser. No. 588,405

Claims priority, application France, Mar. 11, 1983, 83 04059

Int. Cl.⁴ B66C *1/10*

U.S. Cl. 414—730 **14 Claims**



1. A tool holder (B) for gripping and changing tools used by an industrial robot (A), said tool holder including an upstream part (C) for connection to a rotary wrist-joint (5) of a robot arm (1) and at least one downstream part (D) to be fixed to and remain integral with a tool (E1, E2 . . .) at each tool change; said upstream part and each downstream part including cooperating means for the rapid assembly and locking together of said upstream part and a downstream part and for the rapid unlocking and disassembly of a previously assembled and locked together upstream and downstream parts, said cooperating means comprising;

in the upstream part, locking and unlocking means comprised of a double acting jack unit which includes a cylinder portion (7, 71), a piston means (21, 22, 22*a*, 60, 72, 73) for reciprocating along an axis X—X in said cylinder portion between a locking position and an unlocking position and spring means for biasing said piston means into its locking position,

said cylinder portion having an interior lining (10, 10*a*), said lining defining successively from its top to its bottom a generally cylindrical locking bore (14), a first flared slope section in the shape of a truncated cone (15), a generally cylindrical unlocking bore (16) having a diameter greater than that of said locking bore, and a second flared slope section in the shape of a female cone (70),

said piston means comprising a head portion (22*a*, 72), a flange portion extending from said head portion and over a portion of said cylinder portion (7, 71), and a sleeve portion (21, 73) having a central bore with an open lower end and a top end closed by said head portion, said sleeve portion extending below said head portion and coaxial with said cylinder portion (7, 71), said sleeve portion including at least one orifice (24) and at least one ball (25) radially movable in said orifice, said ball having a diameter such that when the orifice of said sleeve portion is in registration with said lining locking bore (14) the ball extends into the central bore of the sleeve to define a locking position and when said sleeve portion is in registration with said lining unlocking bore (16) the ball may be radially withdrawn from said central bore into an unlocking position, and

in the downstream part, a support means (30) fixedly attached to a tool for supporting a tool on said downstream part, a male cone portion (40) extending from said supporting means and cooperating with said femal cone (70) for quickly aligning said downstream part with said upstream part during assembly of said two parts, a stem (41) extending from said male cone, said stem having a double cone locking head (42) at its end opposite its end connected to said male cone, said stem being receivable into said central bore of said sleeve portion (21, 73) when said piston means is in its unlocking position; and

means for forcing said piston means to its unlocking position against the bias of said spring means, said flange portion of said piston means striking said portion of said cylinder portion over which it lies when moved to its unlocking position,

whereby said downstream part can be forced out of engagement with the upstream part by the hammer action realized as the flange portion of the piston means strikes the portion of the cylinder portion over which it lies.

4,636,136

APPARATUS FOR OPENING AND CLOSING A VEHICLE DOOR WHICH IS LOCATED IN A LINE FOR MANUFACTURING A VEHICLE

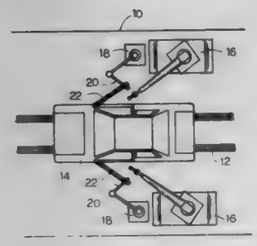
Iwao Nomura, Kasugai; Takayuki Maeyama, Okazaki; Yasuo Tanigawa, and Hirofumi Hasimoto, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 1, 1984, Ser. No. 616,235

Claims priority, application Japan, Jun. 8, 1983, 58-102300

Int. Cl.⁴ B66C *1/00*

U.S. Cl. 414—730 **9 Claims**



1. An apparatus for automatically opening and closing a door of a vehicle body which is transferred through or stopped at a predetermined position by a transport means for conveying the vehicle body in a plant, said apparatus comprising:

a detachable device for controlling the amount of opening of a vehicle door, the device being detachably mounted on the door and including:

a lock member slidably mounted on the detachable device, the lock member being selectively positioned at a first position in which the lock member is in contact with the vehicle body to prevent the door from opening more than a predetermined amount, and a second position in which the lock member is not in contact with the vehicle body to allow the door to open beyond the predetermined amount; and

a biasing means for biasing the lock member toward the first position;

a first engagement member connected to the lock member at one end thereof; and

an actuating device located independently from and cooperating with said detachable device and lock member for selectively forcing the lock member of the detachable device to the second position, the actuating device being located in the vicinity of the transport means and the predetermined position, the actuating device including:

a second engagement member connected to the actuating device at one end thereof, the second engagement member selectively engaging the first engagement member, the second engagement member of said actuating device engaging the first engagement member of said detachable

device and said actuating device forcing the lock member of said detachable device to the second position to open the door more than the predetermined amount, said detachable device preventing the door from being opened more than the predetermined amount when said biasing means forces the lock member of said detachable device to the first position.

4,636,137

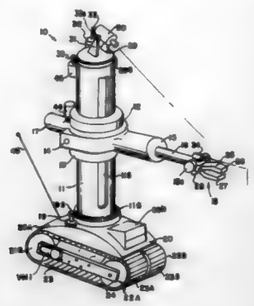
TOOL AND MATERIAL MANIPULATION APPARATUS AND METHOD

Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540

Continuation of Ser. No. 200,347, Oct. 24, 1980, abandoned, which is a continuation of Ser. No. 910,998, May 30, 1978, abandoned, which is a continuation of Ser. No. 753,321, Dec. 20, 1976, abandoned, which is a continuation of Ser. No. 544,832, Jan. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 436,073, Jan. 24, 1974, abandoned. This application Aug. 6, 1984, Ser. No. 638,432

Int. Cl.[4] B25J *9/00*

U.S. Cl. 414—730 **46 Claims**



1. Article manipulation apparatus comprising:

(a) a manipulator including a carriage having transport means adapted to support and guide said carriage on a ground surface,

(b) a manipulator arm assembly supported by said carriage and including a tool head,

(c) first power means for propelling and maneuvering said transport means across said ground surface in an infinite number of directions so as to permit the manipulator to reach different locations and to attain different positions on said surface,

(d) second power means including a plurality of separately operable motors for operating said arm assembly,

(e) first control means for controlling said plurality of motors to cause said arm assembly to execute various maneuvers,

(f) said first control means including input means for receiving command control signals, and

(g) respective closed loop control means for each of said motors connected to said input means,

(h) program control means for generating a plurality of command control signals which are operative for controlling said plurality of motors defining said second power means for causing said arm assembly to execute a programmed maneuver,

(i) said program control means being connected to said input means to permit the signals generated thereby to be applied to said closed loop control means for respective of said motors,

(j) cycle initiating means for initiating operation of said program control means to cause it to generate said command control signals,

(k) remote control means for said manipulator located at a monitor station and including a command control signal generator and a wireless signal transmitter connected to transmit signals generated by said generator by shortwave,

(l) a wireless receiver supported by said manipulator for receiving said shortwave command control signals transmitted thereto by said transmitter, said receiver being connected for selectively controlling operation of said first power means and said motors defining said second power means in accordance with signals received from said transmitter so as to permit said carriage to be remotely controlled in its movement and to remotely control the movement of and predeterminately position said arm assembly and said carriage by applying said command control signals to said closed loop control means for respectively operating said motors,

(m) a first television camera disposed on said manipulator, a second television camera disposed on said tool head and arranged to always have its scanning axis in a direction toward said tool head, motor means for driving said first television camera to scan the area in the immediate vicinity of the manipulator along a plurality of axes which are different than said scanning axis of said second television camera, and a television receiver at said monitor station for signals generated by said cameras whereby movement of said tool head can be viewed by the first and second television cameras to control said manipulator,

(n) said cycle initiating means being operable when said manipulator is predeterminately located for causing said program control means to generate said command control signals and to thereby control the operation of said manipulator to execute a programmed cycle of operation.

4,636,138

INDUSTRIAL ROBOT

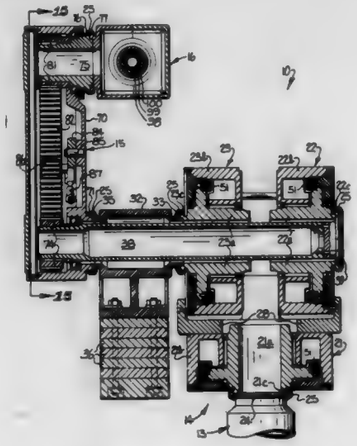
Robert H. Gorman, Clinton, Pa., assignor to American Robot Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 346,222, Feb. 5, 1982, Pat. No. 4,424,473. This application Nov. 19, 1982, Ser. No. 443,156

The portion of the term of this patent subsequent to Jan. 3, 2001, has been disclaimed.

Int. Cl.[4] B66C *23/16*

U.S. Cl. 414—735 **15 Claims**



12. A modular industrial robot characterized by the ability to be configured to serve a variety of applications, and comprising

a first drive unit having a tubular base component and a secondary component concentrically surrounding said base component, with one of said components being rotatable with respect to the other component, said base component including a mounting flange at end thereof,

means releasably connecting said mounting flange of said first drive unit to an external member,

a second drive unit having a tubular base component and a secondary component concentrically surrounding its associated base component, with one of said components of said second drive unit being rotatable with respect to the other component thereof, and with said base component of said second drive unit including a mounting flange at one end thereof, and with the base components and secondary components of said first and second drive units being of substantially identical configuration respectively,

means releasably interconnecting the secondary components of said first and second drive units, and

means releasably connecting said mounting flange of said second drive unit to a second external member, and wherein said external member which is connected to said mounting flange of said first drive unit includes a shaft which extends coaxially through said tubular base component of said second drive unit.

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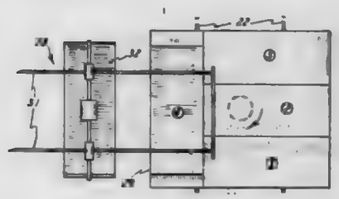
METHOD FOR BUNDLE STACKING

Irving H. Neumann, Somerville; Walter J. Stobb, Pittstown; Robert M. Silva, Milford, and Klaus A. Thumm, Phillipsburg, all of N.J., assignors to Stobb Inc., Clinton, N.J.

Filed Mar. 11, 1985, Ser. No. 710,502

Int. Cl.[4] B65G *57/22, 57/10*

U.S. Cl. 414—786 **4 Claims**



1. A method of stacking elongated bundles of sheets onto a table in an interlocking relationship, and with each of said bundles having a longitudinal axis, comprising the steps of rotatably supporting a table in a horizontal orientation for rotation about a vertical axis and at a first station, positioning a first several said bundles of sheets on said table offset thereon to one side thereof and in side-by-side and parallel axes relationship with the ends of said bundles aligned in a vertical plane, rotating said table about said vertical axis and horizontally moving said table to a second station, positioning an additional one of said bundles of sheets on said table in a position to extend adjacent said vertical plane and across said ends of said first several bundles of sheets at said second station and with said axis of said additional one bundle being transverse to said axes of said first several bundles to thereby form a first layer of bundles of sheets, rotating said table about said vertical axis and horizontally moving said table to a third station, positioning another several bundles of sheets on top of said additional one of said bundles of sheets and on said first several bundles of sheets with said axes of said another several bundles being parallel to said axes of said first several bundles, rotating said table about said vertical axis and horizontally moving said table to a fourth station, and positioning another additional one of said bundles of sheets on top of said first several bundles of sheets and with its said axis transverse to said axes of said first several bundles to thereby form a second layer of bundles of sheets.

4,636,140

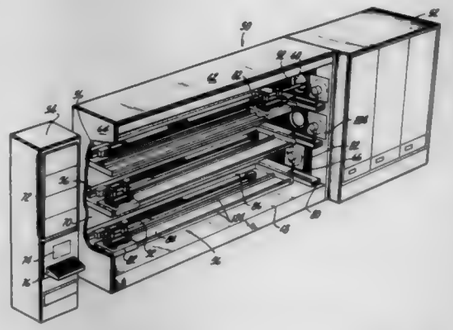
METHOD OF LOADING AND UNLOADING A FURNACE

Robert E. Aldridge, Anaheim; Russell Elloway, Riverside; William O. Fritz, Anaheim; Ralph D. Goff, and Michael J. Herrera, both of Placentia, all of Calif., assignors to Thermco Systems, Inc., Orange, Calif.

Filed Apr. 3, 1985, Ser. No. 719,409

Int. Cl.[4] B65G *25/00*

U.S. Cl. 414—786 **8 Claims**



1. A method of loading and unloading semiconductor wafer boats from a furnace having a processing tube provided with an opening through which the boats are transported, and having a door which is moveable by a control means for sealingly closing the opening when the wafers are being processed, comprising the steps of:

(a) placing at least one of said boats on a support which is moveable by a motor along a path through said opening into and out of said furnace and to any of a plurality of selectable locations along said path;

(b) selecting a first location of said support along said path outside said furnace which is related to a position where said boats are to be placed on and removed from said support respectively before and after the wafers are introduced into said furnace;

(c) moving said support along said path to said first selected location;

(d) generating a first set of data representing said first selected location;

(e) storing said first set of data in a memory;

(f) selecting a location of said support along said path outside said furnace where the support clears the door;

(g) moving said support along said path to said clear-of-door location;

(h) generating a clear-of-door set of data representing the location where the support clears the door;

(i) storing said clear-of-door set of data in a memory;

(j) selecting a second location of said support along said path inside said furnace which is related to a position where said boats are deposited in and picked up from said furnace;

(k) moving said support along said path to said second selected location;

(l) generating a second set of data representing said second selected location;

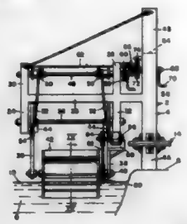
(m) storing said second set of data in said memory;

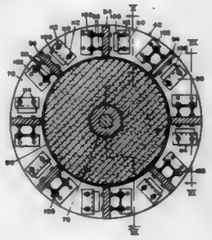
then, after completing steps (a) through (m)

(n) retrieving said first and second sets of data and said clear-of-door set of data from said memory; and

(o) non-manually controlling said motor and said door to effect movement of said support along said path using the data retrieved in step (n), and in a manner to repeatably position said support at either of said first and second selected locations or at said clear-of-door location.

4,636,141
HYDROELECTRIC DEVICE
Raymond Sedlacek, P.O. Box 725, Payette, Id. 83661
Filed Aug. 28, 1985, Ser. No. 770,173
Int. Cl.[4] F03B *7/00*; B63H *1/38*
U.S. Cl. 416—86 9 Claims

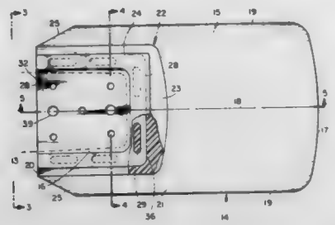




1. A hydroelectric device comprising:
a. a water wheel having radially extending paddle boards at angular intervals about its periphery, each paddle board normally lying in a plane including the axis of the wheel,
b. a supporting structure carrying said water wheel and operable to support it for axial rotation with its lower portion submerged in a moving stream of water, with its axis horizontal and normally transverse to the water current, whereby said water wheel is turned by said water current,
c. an electric generator mounted on said supporting structure and operably driven by rotation of said water wheel, and
d. adjusting means operable to move the respectively opposite ends of each of said paddle boards, at the respectively opposite sides of said wheel, either forwardly or rearwardly, having reference to the direction of current flow, whereby if the current speed at one side of the wheel is greater than at its opposite side, a portion of the water impinging against said paddle boards at the fast-current side of the wheel may be deflected toward the slow-current side of the wheel.

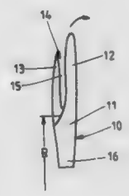
4,636,142
ROTATING FAN APPARATUS
Bernard R. Baranski, Indianapolis, Ind., assignor to Household Manufacturing, Inc., Prospect Heights, Ill.
Filed May 11, 1984, Ser. No. 609,543
Int. Cl.[4] F04D *29/38*
U.S. Cl. 416—210 R 26 Claims

1. A fan apparatus comprising:
a fan spider having a hub portion and a plurality of arms extending outwardly therefrom, each of the arms including a blade attaching surface;
a plurality of individual fan blade assemblies, each of said assemblies including a blade attachment insert and a fan blade, the fan blade being composed of a plastic material attached to and encasing a portion of the insert, the insert including a first portion encased by the fan blade and a second portion having an externally exposed surface, the insert being secured to the fan blade by the encasement of the first portion of the insert by the fan blade, the exposed surface being for securement with the attaching surface of the arm; and
attachment means for attaching each of the fan blade assemblies to a corresponding one of the arms of said fan spider,



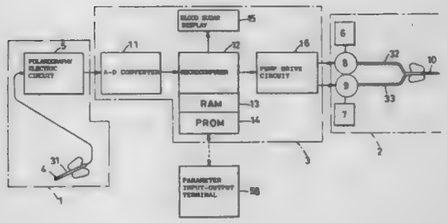
said attachment means being for securing the exposed surface of a blade attachment insert to the blade attaching surface of the corresponding arm to have the fan blade assembly supported by the connection of the insert and the arm.

4,636,143
PROPELLER FOR GASEOUS AND FLUIDIC MEDIA
Otto Zeidler, Lehnbachweg 10, 7410 Metzingen, Fed. Rep. of Germany
Filed Jul. 1, 1985, Ser. No. 750,876
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, 3424010
Int. Cl.[4] F01D *5/14*
U.S. Cl. 416—228 13 Claims



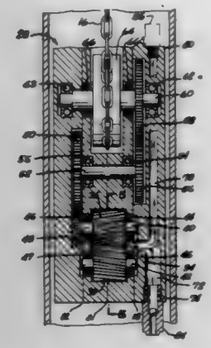
12. A propeller for gaseous or fluidic media, particularly an air propeller, comprising at least one vane having a tip and including at least two complete, individual elongated propeller blades extended at a radial distance from a center of rotation of the propeller, said propeller blades being spaced from each other in the direction transverse to a radial direction of the propeller so as to form a gap therebetween, said vane being formed with an elongated slot constituting said gap and forming said individual propeller blades, said slot starting at a distance from said center and extending to said tip and being of 40 to 50% of the length of a radius of said vane defined between said center and said tip, said slot extending in a cross-section at an acute angle to a chord of a non-divided profile of said vane.

4,636,144
MICRO-FEED PUMP FOR AN ARTIFICIAL PANCREAS
Hiroshi Abe, Nishinomiya; Motoaki Shichiri, Osaka; Ryuzo Kawamori, Kobe; Tasuku Ichob, Suita; Kenji Iwatani, Takatsuki; Mamoru Higuchi, Suita; Kiyotaka Takagi, Kyoto; Norihiko Okamoto, Ikeda, and Toshiyuki Okudaira, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan
Continuation of Ser. No. 704,016, Feb. 21, 1985, abandoned, which is a continuation of Ser. No. 508,910, Jun. 29, 1983, Pat. No. 4,515,584. This application Apr. 3, 1986, Ser. No. 847,114
Claims priority, application Japan, Jul. 6, 1982, 57-118114; Jul. 9, 1982, 57-120078
Int. Cl.[4] F04B *43/12, 21/00*; A61M *5/00*
U.S. Cl. 417—63 1 Claim



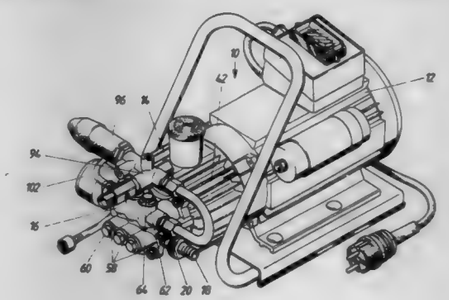
1. A micro-feed pump for an artificial pancreas used for medical care comprising:
a roller holder, which is connected to a motor to be rotated, including a pair of disc-like roller supports opposed to each other and having center portions thereof connected to each other in fixed relation;
a plurality of rollers rotatably mounted near the peripheral portion of said roller holder, the opposite ends of each roller being rotatably supported on said roller supports;
an elastic tube having an intermediate portion reeved around said rollers under tension;
a plurality of flanges provided at opposite ends of said rollers for preventing the elastic tube from zigzagging and slipping off;
a plurality of permanent magnets equidistantly embedded in the outer peripheral portion of one of said roller supports;
a fixed pump housing surrounding said roller holder;
a magnetic sensor mounted on said pump housing;
tubular stoppers fixed to an intermediate portion of said elastic tube at two positions, each tubular stopper having an outer diameter larger than that of said tube; and
two stepped grooves, each of which is open at its opposite ends and partially open on top, are provided in said pump housing, the elastic tube being secured under tension with the use of said two stoppers and said two stepped grooves, each of said stepped grooves having a tube insertion portion with an inner diameter substantially equal to the outer diameter of said tube, and a stopper insertion portion having an inner diameter substantially equal to the outer diameter of said stopper, both of said portions being essentially circular in section, said tube insertion portion being at the end of said stepped groove nearer said roller holder;
wherein two stoppers are each engaged in fitting relation with a different one of said stopper insertion portions and opposite ends of said intermediate portion of said tube are engaged in fitting relation with each of said tube insertion portions.

4,636,145
DOWN-WELL PUMP DEVICE
Thomas W. Donaldson, 2460 Lemon Ave., Signal Hill, Calif. 90806
Filed May 28, 1985, Ser. No. 737,800
Int. Cl.[4] F04B *23/08*
U.S. Cl. 417—199 R 16 Claims



1. A device for pumping fluid from a well comprising:
a pump positioned in the well;
a motor positioned outside of the well;
a driven endless oil-accumulating chain for recovering oil from the well having a loop portion suspended down the well extending between said motor and said pump through which said motor drives said pump;
a fluid inlet and a fluid discharge in fluid communication with said pump.

4,636,146
AXIAL PLUNGER PUMP
Josef Kräuzle, Rudolf-Diesel-Strasse 20, D-7918 Illertissen; Lutz Droitsch, Bussardweg 25, 4800 Bielefeld 12, and Manfred Bauer, Am Märtelbrunnen 15, D-7918 Illertissen, all of Fed. Rep. of Germany
Filed Jun. 4, 1985, Ser. No. 741,319
Int. Cl.[4] F04B *1/12, 27/03*
U.S. Cl. 417—270 4 Claims



1. An axial plunger pump comprising
(a) a wobble plate rotatable around an axis thereof;
(b) a plurality of plungers having longitudinal axes arranged radially and angularly at equal distances around that axis of said wobble plate and engaging a face surface of said wobble plate;
(c) a pumping unit block containing a plurality of pumping units, one for each plunger;
(d) a plurality of pump chambers, one for each pumping unit in the form of a bore, each extending in said pumping unit

block in parallel to each other and perpendicular to a longitudinal axis of each plunger;

(e) inlet and outlet valves correspondingly connected at spaced locations to each of said pump chambers for each of said pumping units, all of said inlet valves being arranged in line and being connected to a common straight inlet duct and all of said outlet valves being arranged in line and being connected to a common straight outlet duct;

(f) a plurality of cylinders, one for each of said plungers for reciprocating movement of those ends of said plungers distant from said wobble plate therein, at least one of said cylinders being connected to its associated pump chamber between its inlet and outlet valves;

(g) said inlet duct passing between said plunger cylinders with part of said cylinders arranged above and below respectively of said axis of said wobble plate.

4,636,147

LUBRICATING-OIL PUMP FOR A MOTOR-DRIVEN APPARATUS

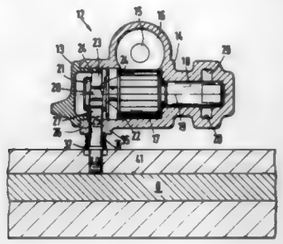
Karl Schweitzer, Waiblingen; Karl Nitschmann, Schorndorf, and Hans Dolata, Waiblingen, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Aug. 2, 1985, Ser. No. 762,104

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1984, 3429656

Int. Cl.⁴ B25F *1/02*; B23Q *11/12*; F04B *49/00*

U.S. Cl. 417—214 **11 Claims**



1. A lubricating-oil pump for a motor-driven apparatus such as a chain saw or the like to supply lubricating oil to a work tool of the apparatus, the lubricating-oil pump comprising:

a pump housing mounted on the apparatus;

pump means mounted in said housing for pumping the lubricating oil to the work tool, said pump means including: a piston having a longitudinal axis and being mounted in said housing so as to be both rotatable about said axis and displaceable along said axis; drive means for rotatably driving said piston to rotate the same about said longitudinal axis thereof; and, reciprocating means for imparting reciprocatory movement to said piston;

interrupt means for selectively interrupting the flow of oil to the work tool, said interrupt means being mounted on said housing for acting directly on said reciprocating means to interrupt said reciprocatory movement thereby stopping the delivery of oil to said work tool, said interrupt means including a control member for coacting with said reciprocating means, said control member being movable between a first position whereat said reciprocating means imparts a reciprocatory movement to said piston and a second position whereat said reciprocatory movement is interrupted and the supply of lubricating oil is stopped;

said reciprocating means including slot-like recess means formed in said piston in surrounding relationship to said longitudinal axis thereof, said slot-like recess means having a peripheral course about said axis so as to cause the mutually adjacent walls thereof to define respective cam surfaces; and,

said interrupt means including a pin-like control member having a flat projection extending therefrom and into said recess means, said pin-like control member being rotatably mounted in said housing for rotational movement between said two positions such that said flat projection is in contact engagement with said cam surfaces when said pin-like control member is in said first position thereby imparting reciprocatory movement to said piston, said flat projection being dimensioned so as to cause the same to remain clear of said cam surfaces when said control member is rotated into said second position so that no reciprocatory movement is imparted to said piston.

4,636,148

VANE TYPE COMPRESSOR WITH VOLUME CONTROL

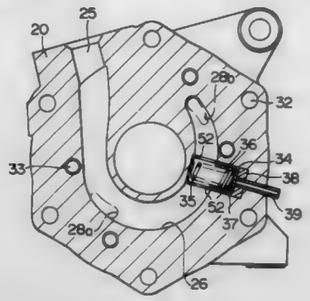
Kunihiko Takao; Kenichi Kawashima; Yozo Nakamura, all of Ibaraki, and Isao Hayase, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 751,592, Jul. 3, 1985, abandoned. This application Mar. 4, 1986, Ser. No. 836,110

Claims priority, application Japan, Jan. 19, 1983, 58-5896

Int. Cl.⁴ F04B *49/02*

U.S. Cl. 417—286 **7 Claims**



1. A vane type compressor comprising:

a cam ring;

a rotor rotatably mounted within said cam ring;

a plurality of vanes mounted in said rotor;

a rear plate and a front plate disposed so as to close opposite ends of said cam ring;

a refrigerant inlet means for said compressor;

each pair of adjacent vanes cooperating with said cam ring and said rotor to define a working chamber;

suction ports formed in said front plate and successively communicatable with the working chambers when said rotor is rotated;

a front cover abutting against said front plate and having formed therein a low pressure passage means in the form of a vortex in the rotational direction of said rotor, said low pressure passage means having an upstream end in communication with said refrigerant inlet means and having a dead end in a downstream end, said suction ports opening to said low pressure passage means for allowing said refrigerant inlet means to communicate with said working chambers through said suction ports; and

valve means mounted in said front cover for controlling in an ON-OFF manner, a portion of said low pressure passage so as to fully open the same to allow said refrigerant inlet means to communicate with said working chambers through said suction ports and so as to fully close said portion of said low pressure passage means to prevent said refrigerant inlet means from communicating with said working chambers through at least one of said suction ports while continuously maintaining said refrigerant inlet means in communication with said working chambers through the remaining at least one suction port.

4,636,149

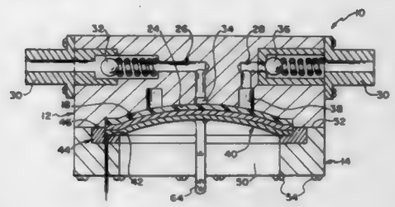
DIFFERENTIAL THERMAL EXPANSION DRIVEN PUMP

David C. Brown, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 733,414, May 13, 1985, abandoned, which is a continuation of Ser. No. 586,213, Mar. 5, 1984, abandoned. This application Apr. 29, 1986, Ser. No. 858,823

Int. Cl.⁴ F04B *17/00*

U.S. Cl. 417—322 **20 Claims**



1. A biomedical pump for use in the measured pumping of a medicament or the like, said pump comprising: a pump body; a pump chamber in said body, said chamber being defined by a first wall formed by said body and an opposed second wall; an inlet passageway through said body, said inlet passageway including an inlet port in communication with said chamber through said first wall; an outlet passageway through said body, said outlet passageway including an outlet port in communication with said chamber through said first wall; a flow inducing diaphragm including a bimetallic member, facing said first wall, and being selectively movable between a first position closely overlying and conforming to said first wall and sealing said ports and a selected second position which is outwardly spaced from said first wall, the side of said diaphragm facing said first wall defining said second wall and defining a selected volumetric interior space within said chamber between said first and second walls; said diaphragm, in said first position, eliminating the selected volumetric interior space of said chamber; said diaphragm bimetallic member being heat responsive for effecting regulated flexure of said diaphragm between said first and second positions in response to heating and cooling of said heat responsive bimetallic member to effect precise pumping of a selected volume of fluid defined by said selected volumetric interior space of said chamber, electrical conductor means coupled to said bimetallic member and extending outwardly therefrom; said bimetallic member being selectively flexible by the control of the input of electrical energy thereto; a support ring engaging said bimetallic member in a heat transfer manner and being capable of conducting heat away from said bimetallic member to expedite cooling of said bimetallic member; and, means connected to said diaphragm and extending out of said pump body for indicating the selected second position of said diaphragm.

4,636,150

LOW POWER ELECTROMAGNETIC PUMP

Theodore J. Falk, Clarence, and Lawrence E. Morris, Bowmansville, both of N.Y., assignors to Greatbatch Enterprises, Inc., Clarence, N.Y.

Continuation-in-part of Ser. No. 496,822, May 23, 1983, Pat. No. 4,568,250, which is a continuation-in-part of Ser. No. 415,657, Sep. 7, 1982, Pat. No. 4,569,641. This application Jun. 5, 1984, Ser. No. 617,486

Int. Cl.⁴ F04B *17/04*

U.S. Cl. 417—417 **20 Claims**

1. An electromagnetic pump comprising:

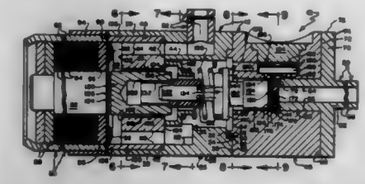
(a) an elongated housing having a longitudinal axis and having an interior fluid containing region including a fluid receiving chamber and a fluid pumping chamber in fluid communication therewith, an inlet in fluid communication with said receiving chamber and an outlet in fluid communication with said pumping chamber;

(b) check valve means operatively associated with said fluid containing region for allowing fluid flow in a direction from said inlet through said outlet and blocking fluid flow in a direction from said outlet through said inlet;

(c) electromagnet means carried by said housing and located external to said fluid containing region;

(d) an armature positioned in said fluid containing region of said housing for movement along said housing longitudinal axis and having a pole portion located for magnetic attraction by said electromagnet means and having a piston portion operatively associated with said fluid receiving and pumping chambers for forcing fluid from said receiving chamber through said outlet; said armature being movably supported in said housing for movement from a rest position through a forward pumping stroke when attracted by said electromagnet means to force fluid from said receiving chamber through said outlet and for movement in an opposite direction through a return stroke back to said rest position;

(e) means defining a magnetic circuit including said electromagnet means and said armature and a gap between said pole portion of said armature and said electromagnet means for moving said armature toward said electromag-



net means to close said gap in response to electrical energization of said electromagnet means;

(f) said check valve means comprising a thin body movably carried by said armature and located in said interior fluid containing region in small clearance relation therewith and between said armature and said inlet, and a conical spring between said valve body and said armature thereby enabling said pump chamber to have dimensions which define a volume not greater than about one and one-half times the stroke volume of the pump which therefore limits the volume of a bubble in the fluid which can be contained in said pump chamber up to a volume of about one and one-half times the stroke volume the pump when said armature is in a rest position so as to enable said pump to operate with bubbles present in the fluid being pumped;

(g) said armature pole portion having a pole face located to define said gap with said electromagnet means; and

(h) said fluid-containing region of said housing and said electromagnet means being in axially spaced relation along said housing longitudinal axis and being separated by barrier means of fluid impervious material having opposite sides, said fluid containing region, inlet, outlet and armature all being located on one side of said barrier means and said electromagnet means being located on the opposite side of said barrier means.

4,636,151

DOWNHOLE PROGRESSIVE CAVITY TYPE DRILLING MOTOR WITH FLEXIBLE CONNECTING ROD

Jay M. Eppink, Spring, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Mar. 13, 1985, Ser. No. 711,322

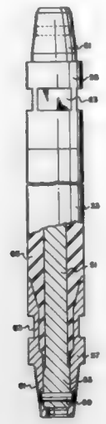
Int. Cl.⁴ F03C *2/00*; F16D *3/04*

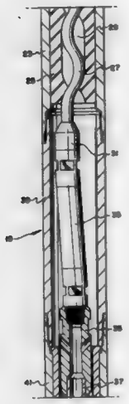
U.S. Cl. 418—48 **5 Claims**

1. A downhole drilling motor, comprising:

a stator of the progressive cavity type;

a rotor, within the stator, wherein the rotor rotates and gyrates in response to fluid flow through the stator;
a housing, connected to the stator;
a shaft concentrically located within the housing and rotatable about the longitudinal axis of the shaft and the housing;
a plurality of bearings between the housing and the shaft;





a flexible rod, extending between the rotor and the shaft, for translating the rotation and gyration of the rotor to the true rotation of the shaft;
an upper threaded connection, nonintegral to, but connected to one end of the rod, for connecting the rod to the rotor; and
a lower threaded connection, nonintegral to, but connected to the other end of the rod, for connecting the rod to the shaft.

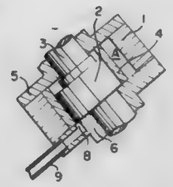
4,636,152

ROTARY COMPRESSOR

Susumu Kawaguchi; Takuho Hirahara; Kazuhiro Nakane, all of Shizuoka, and Sei Ueda, Shimizu, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1985, Ser. No. 760,627
Claims priority, application Japan, Aug. 22, 1984, 59-174562
Int. Cl.⁴ F01C *1/063*
U.S. Cl. 418—54 **3 Claims**

1. A rotary compressor, comprising:
a cylinder having bearing plates at axial ends thereof;
a rotatable crank shaft extending axially through said cylinder, said crank shaft having an eccentric part in said cylinder;
a rolling piston fitted around said eccentric part in said cylinder;
a vane extending from said cylinder to said rolling piston, whereby a variable volume compression chamber is defined by said cylinder, said vane, said bearing plates and said rolling piston;
gas inlet means having an injection opening in at least one of said bearing plates for communication with said compression chamber; and



gas outlet means for discharging compressed gas from said compression chamber,
wherein said eccentric part and said rolling piston are in slide contact with each said at least one bearing plate having said injection opening therein, and wherein each said injection opening is radially positioned on a respective said bearing plate such that said injection opening is closed by both said rolling piston and said eccentric part during a portion of each revolution of said crank shaft.

4,636,153

ROTARY COMPRESSOR WITH BLIND HOLE IN END WALL THAT ALIGNS WITH BACK PRESSURE CHAMBER

Yutaka Ishizaka, and Teruo Nakamura, both of Konan, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Oct. 15, 1984, Ser. No. 660,773
Claims priority, application Japan, Oct. 19, 1983, 58-160916[U]
Int. Cl.⁴ F04C *18/00*
U.S. Cl. 418—90 **2 Claims**



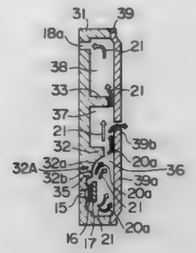
1. In a rotary compressor including a cylindrical housing, and a rotor rotatably disposed in the housing and provided with a plurality of vanes slidably mounted respectively in substantially radial slots which are formed in the rotor, each of the vanes defining a back-pressure chamber at a radially innermost end thereof in cooperation with the rotor and axially opposite ends of the housing, the improvement comprising:
passageway means for communicating a fluid pressure from a source of fluid pressure supply to the back-pressure chamber while the chamber is in a suction stroke range;
means for fluidly isolating the back-pressure chamber from the source of fluid pressure supply while the chamber is in a compression stroke range; and
damper means for damping the fluid pressure in the back-pressure chamber in said compression stroke range;
the damper means comprising a blind hole formed in that surface of an end wall of the housing which faces the rotor, the back-pressure chamber aligning with said blind hole in the compression stroke range.

4,636,154

HORIZONTAL TYPE ROTARY COMPRESSOR

Masahiko Sugiyama, Tochigi; Masatune Sutou, Ota; Mitsuru Murata, Tochigi; Minoru Ooki, Oyama, and Shigetaro Tagawa, Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 3, 1985, Ser. No. 740,818
Claims priority, application Japan, Jun. 4, 1984, 59-112932
Int. Cl.⁴ F01G *21/04*
U.S. Cl. 418—97 **9 Claims**



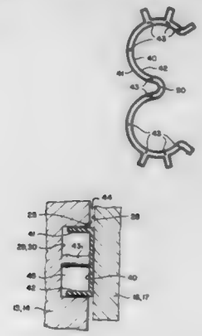
1. A horizontal type rotary compressor comprising a bearing means for rotatably supporting a rotary shaft connecting an electric drive element and a compression element, a planar cover means secured to an end face of said bearing means, a plurality of partitioning walls provided in said bearing in a confronted relationship to said planar cover means, a slant portion formed in a part of one of said partitioning walls for deflecting oil in a direction of the cover means, and small hole means formed in at least one of said planar cover means for enabling a communication between an inside and an outside of said bearing means whereby the deflected oil from the slant portion is discharged through said hole means.

4,636,155

HYDRAULIC SEAL HAVING U-SHAPED GASKET AND A PLURALITY OF PLASTICALLY DEFORMABLE POSTS

David W. Francis, Canfield, Ohio, assignor to Commercial Shearing, Inc., Youngstown, Ohio

Filed Jun. 29, 1984, Ser. No. 626,297
Int. Cl.⁴ F01C *19/08*; F04C *15/00*
U.S. Cl. 418—132 **7 Claims**



1. A hydraulic pressure fluid seal for sealing two adjacent surfaces, one of which surfaces has a groove opening toward the other surfaces, comprising a plastically deformable nonelastic sealing member adapted to fit within said groove and a plurality of spaced nonelastic plastically deformable interference members integrally with the sealing member and extending beyond the sealing member in the direction of the groove depth and each interference member having a section such that it will plastically deform before any of the sealing surfaces of the sealing member are engaged between the other sealing surface and the bottom of the groove.

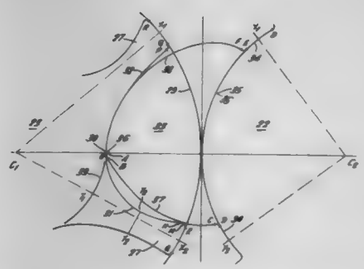
6. In a rotary gear pump or motor having a case, a pair of meshing rotary gears in said case, said gears having axial stub shafts journaled in said case, the improvement comprising a unitary thrust plate for the corresponding ends of the pair of rotary gears adapted to lie between the case and the ends of the gears, said thrust plate being of a metal softer than the gears and having a front face adapted to abut the gear ends and a rear face abutting the case, a pair of spaced openings extending through said thrust plate to receive the gear stub shafts, a pair of connected at least half annular grooves in the rear face spaced from and surrounding each of said openings at least on one side, a groove in the rear face connecting said annular grooves at their closest points, at least one groove in the rear face extending radially from each said annular groove to the periphery of the body generally opposite the groove connecting the at least half annular grooves defining at least two substantially identical areas on opposite sides of the body, a generally U-shaped plastically deformable nonelastomer seal gasket having the contour of the combined grooves on the rear face of the body and fitting sealingly into said grooves with the opening of the U-shaped gasket opening downwardly in the groove and at least one integral nonelastic plastically deformed means within said U-shaped gasket extending out of said gasket and urging said gasket partially out of said grooves into sealing contact with the case.

4,636,156

SCREW ROTOR MACHINES WITH SPECIFIC TOOTH PROFILES

David Hough, Marlow; Sidney J. Morris, Aylesbury, and Anthony D. Barber, Truro, all of England, assignors to Compair Broomwade Limited, High Wycombe, England

Filed May 29, 1985, Ser. No. 738,851
Claims priority, application United Kingdom, May 29, 1984, 8413619
Int. Cl.⁴ F04C *18/16*
U.S. Cl. 418—201 **32 Claims**



1. A pair of intermeshing rotors having helical lands and intervening grooves and being rotatable, in use, within a housing about parallel axes for co-acting engagement to alter the pressure of a working fluid, the grooves of each rotor each having a primary flank and a secondary flank in which at least a first portion of at least one of said flanks of each rotor is a parabolic arc.

4,636,157

TOROIDAL MOTOR OR PUMP

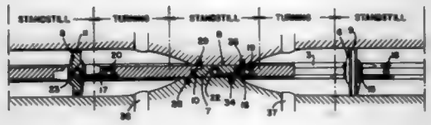
Jelchiamus A. Van der Werff, Onder de Boompjes "Quo Vadis", 3417 ZG Montfoort, Netherlands

Filed Jan. 25, 1985, Ser. No. 694,987

Claims priority, application Netherlands, Jan. 26, 1984, 8400246

Int. Cl.⁴ F03C *4/00*; F04C *18/00*

U.S. Cl. 418—225 **9 Claims**



1. Toroidal motor or pump comprising: a casing defining a toroidal passage; a disc rotor rotatably carried in said casing and extending into said toroidal passage; a plurality of vanes carried on shafts radially rotatably mounted on said rotor and which vanes are able to seal off the toroidal passage; rockers secured to the vane shafts and which during rotation of the motor or pump are carried between a pair of curved discs; said toroidal passage includes a narrowed section in the shape of the cross section of the disc rotor and through which the vanes when in a first position are able to pass; an inlet and an outlet port for a pressure medium and positioned in a section of said casing wherein the vanes are rotatable to a second position; said curved discs spaced from each other to define a cylindrical cam having a first curved track and a second curved track along which the rockers are carried; said rockers including a central cam follower and two side cam followers shaped so that the rockers are able to move through spaces in the disc rotor, said side cam followers engaging said first curved track and said central cam follower engaging said second curved track for pivoting said vanes within said toroidal passage.

4,636,158

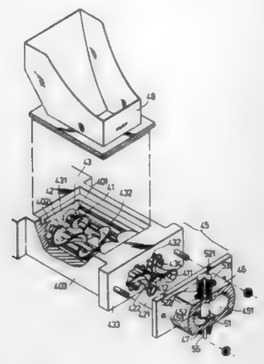
APPARATUS FOR MAKING BUN

Der S. Huang, No. 79, Lane 225, Sec. 1, Chung Hwa Rd., Taichung City, Taiwan

Filed Nov. 14, 1985, Ser. No. 798,013

Int. Cl.⁴ H21C *11/10*

U.S. Cl. 425—133.1 **9 Claims**



1. An apparatus for making buns from dough which is continuously fed through a conduit comprises: a housing having a cavity, an upper inlet opening and a bottom outlet opening communicated with said cavity; a plate member rotatably mounted in said cavity, which has a concentric central opening aligned with said inlet and outlet openings; a plurality of die pieces provided on said circular plate in said cavity, each of said die pieces including an elongate inner portion which is tapered and extends into said central opening of said plate and which has a cutting edge and an arcuate forming face below said plate at the lateral portion of said plate, and an intermediate portion between said inner and outer portions pivoted to the inner top side of said housing; and means for turning said plate counter-clockwise and clockwise intermittently within a certain angle so as to move said die pieces between a first position and a second position, said inner portions of said die pieces extending radially and abutting against each other with said cutting edges to cut and form the dough into a bun when said plate is in the first position, said cutting edges of said inner portions moving away from each other when said plate is in the second position to allow the formed dough to be released from said die pieces.

4,636,159

APPARATUS FOR OBTAINING A PREDETERMINABLE DISTRIBUTION OF WEIGHT IN THE TRANSVERSE DIRECTION OF A PRE-MAT AND/OR MAT

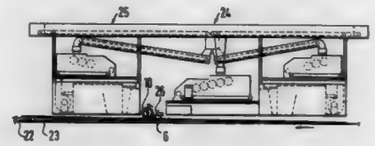
Wolfgang Heller, Bad Pyrmont; Peter Rückert, Springe, and Dieter Wiemann, Barsinghausen, all of Fed. Rep. of Germany, assignors to Bison-Werke Bahre & Greten GmbH & Co. KG, Springe, Fed. Rep. of Germany

Filed Apr. 5, 1985, Ser. No. 720,254

Claims priority, application European Pat. Off., Apr. 16, 1984, 84104310; Apr. 16, 1984, 84104309

Int. Cl.⁴ B29C *43/22*, *43/58*

U.S. Cl. 425—148 **5 Claims**



1. Apparatus for obtaining a predetermined fiber distribution in weight per unit area in the traverse direction of a fiber deposit on a conveyor in the manufacture of particle board, the apparatus comprising: a flat conveyor belt, at least one backwards scraping unit extending across the width of the conveyor, belt, means for measuring the weight per unit area of the fiber deposit across the width of the conveyor belt, said backwards scraping unit being a metering rake which is adjustable to provide different regions of thickness across said width in response to said means for measuring such as to obtain said predetermined fiber distribution the metering rake being divided over the width of the conveyor into individual segments, spacings of said segments above said conveyor being individually adjustable independently of each other, said individual segments also being connected together by couplings for displacement of segment axes as a group.

4,636,160

DEVICE FOR TIGHTENING A COIL ON A CYLINDRICAL BODY

Yasumasa Nagasaka, Aichi, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 739,273, May 30, 1985. This application May 6, 1986, Ser. No. 860,232

Claims priority, application Japan, May 31, 1984, 59-81388[U]; Jul. 3, 1984, 59-100561[U]

Int. Cl.⁴ B29C *45/74*, *47/82*

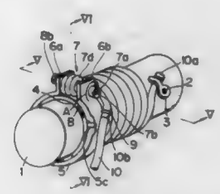
U.S. Cl. 425—190 **12 Claims**

1. A device for fixing a coil on cylindrical body, said coil having a coil portion arranged around the cylindrical body and a first and second end portions, said device comprising:

first anchor means for connecting the first end portion of the coil to the cylindrical body;

a ring member arranged around the cylindrical body at a position axially remote from the first anchor means, said ring member being rotatable with respect to the cylindrical body;

second anchor means arranged on the ring member for connecting a second end portion of the coil to the ring member; and,



means for rotating the ring member about an axis of the cylindrical body so that the second end portion of the coil is circumferentially moved with respect to the cylindrical body whereby the coil portion is tightened around the cylindrical body.

4,636,161

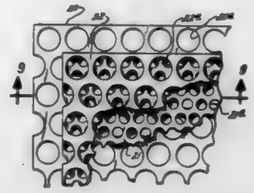
SCREEN FOR SELECTIVELY PERFORATING THERMOPLASTIC FILM

Garland E. Raley, and Dean M. Spear, both of Terre Haute, Ind., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 499,857, Jun. 1, 1983, Pat. No. 4,541,794. This application Apr. 11, 1985, Ser. No. 721,896

Int. Cl.⁴ B29C *59/06*

U.S. Cl. 425—194 **8 Claims**



1. A screen for selectively perforating thermoplastic sheet or film consisting essentially of a cylindrically shaped base pattern screen having a plurality of openings therein arranged in a predetermined pattern, a fine mesh airflow restrictor sheet material mounted over the surface of a portion of said base pattern screen for providing predetermined localized restriction of an airflow through the base pattern screen when a pressure differential is applied to the surface of the base pattern screen and an overlay screen mounted over said airflow restrictor sheet material and secured on said base pattern screen, said airflow restrictor sheet materiel being spunbonded-nonwoven breathable thermally resistant material.

4,636,162

APPARATUS FOR MAKING A TUBULAR SHEATH OF PLASTIC MATERIAL

Michel Pavy, Wattignies, and Alain Genty, Mouvaux, both of France, assignors to Nortene, Lille, France

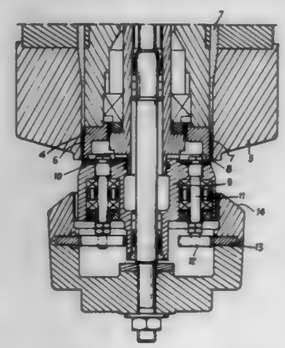
Filed Nov. 13, 1985, Ser. No. 797,497

Claims priority, application France, Nov. 13, 1984, 84 17280

Int. Cl.⁴ B29C *47/00*, *55/26*, *61/08*

U.S. Cl. 425—290 **6 Claims**

1. Apparatus for making, from plastic material, a tubular sheath of the type having solid longitudinal bands of film connected together by longitudinal bands of net, said apparatus comprising, an extrusion nozzle with an annular gap between inner and outer concentric extrusion dies, and which opens into an extrusion annulus from which a tube of plastic material is extruded, means for extruding said tube of plastic material in the form of a tube having spaced apart longitudinally extending bands of predetermined width and of a first thickness, connected together by longitudinally extending bands of a predetermined width and of a second thickness less than the first thickness, toothed wheel means adjacent the extrusion annulus for perforating the bands of said first thickness, without perforating the bands of said second thickness, and expander means downstream of the toothed wheel means for stretching the extruded and perforated tube radially to stretch said perforated bands of said first thickness to form a net structure, and to stretch said bands of said second thickness to form a solid film structure and thereby form a tubular sheath having bands of net connected together by solid film bands of substantial width.



4,636,163

APPARATUS FOR FORMING MATERIAL INTO A BALL

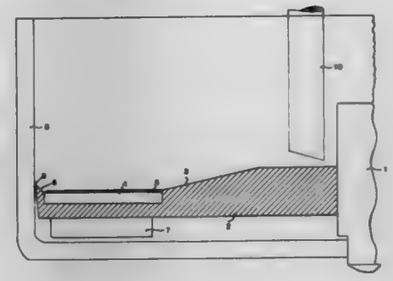
Curt H. Appelgren, Kungsbacka, and Nemo Ivarsson, Enskede, both of Sweden, assignors to Lejus Medical Aktiebolag, Molndal, Sweden

Filed Nov. 20, 1985, Ser. No. 799,980

Claims priority, application Sweden, Nov. 20, 1984, 8405839

Int. Cl.⁴ A21C *11/00*; B29C *43/00*

U.S. Cl. 425—332 **3 Claims**



1. A device for shaping a semi-moist material into spheres without substantially disintegrating and pulverizing the material comprising:

(a) a disc which is rotatable substantially in the horizontal plane and which has an upper side which is arranged to receive the semi-moist material, said upper side of the disc further comprising a waffle patterned surface and an annular smooth surface at the periphery of the disc;

(b) at least two wings on an under side of the disc, said wings being arranged substantially radial to the rotational axis of

the disc and substantially perpendicular to the under side of the disc; and

(c) a cylindrical wall surrounding the disc whereby an annular slot is formed beneath the annular smooth surface of the disc and the cylindrical wall to allow passage of air flow.

4,636,164

MACHINE FOR TRANSFORMING A PIECE OF DOUGH OF GLOBOIDAL FORM INTO A SUBSTANTIALLY CIRCULAR-SHAPED PUFF-PASTRY, WHICH MAY BE PARTICULARLY EMPLOYED FOR PREPARING FOOD-STUFFS OF VARIOUS KINDS

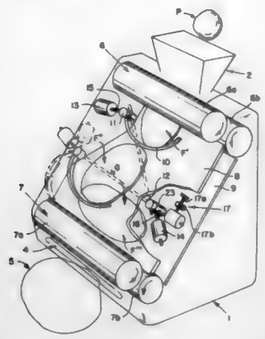
Carlo Bellotto, Via Ugo Foscolo, 1 - Cimpello di Fiume Veneto (Pordenone); Antonio Cimenti, Via Baron, 15 - S. Dona' Di Piave (Venezia), and Ermes Polo, Via G. F. Carli, 2 - Gisis di Aviano (Pordenone), all of Italy

Filed Feb. 26, 1985, Ser. No. 705,803

Claims priority, application Italy, Feb. 27, 1984, 45708 A/84

Int. Cl.⁴ A21C *3/02*; B29C *43/46*

U.S. Cl. 425—337 **4 Claims**



1. A machine for transforming a piece of dough of globoidal form into a substantially circular puff-pastry which may be particularly utilized in the preparation of different foodstuffs, said machine comprising:

a supporting structure on which a first and a second roll train are fixed, each said first and second roll train including pairs of rolls disposed in a horizontal and reciprocally parallel position, wherein the distance between the rolls of each pair of rolls may be regulated and said rolls are reciprocally interconnected in a kinematic manner and driven in rotation by a motor,

said first and second roll trains being arranged respectively at an upper end portion and a lower end portion of an inclined plate which slidably supports pre-manufactured dough which is discharged from the first roll train after a first flattening operation thereby towards the second roll train,

means for receiving said pre-manufactured dough at an outlet of the first roll train and guiding said pre-manufactured dough while it rotates about itself along said inclined plate and for releasing said pre-manufactured dough at the inlet of said second roll train in a position such that said pre-manufactured dough may be subjected thereby to a second flattening operation which is orthogonal to said first flattening operation,

said means comprising a first oscillating arm pivoted at an end portion thereof to a first end portion of a second oscillating arm having a second end portion pivoted at a position between said first and second roll trains,

said first oscillating arm comprising a bar skimming the upper surface of said plate and being slidably guided therealong by said second arm, said bar being movable from a first position, at which said bar is disposed near said first roll train and transversally to the direction of sliding movement of the pre-manufactured dough which is discharged therefrom, to a second position which is determined by the impact of said second oscillating arm against an adjustable stopping element, at which said bar is disposed near said second roll train, and at which, due to the push effect of the pre-manufactured dough and the instantaneous stopping of said second oscillating arm, said bar is rotated about its pivot while contemporaneously causing the pre-manufactured dough to be rotated about itself and then to be released into said second roll train in a position such that the pre-manufactured dough will be rotated by an appropriate angle with respect to the direction of the first flattening operation,

adjustable return means for bringing said first and second oscillating arms back to the respective starting positions thereof, and

adjustable stopping means for limiting the oscillating amplitude of said first and second oscillating arms.

4,636,165

STRIPPER RINGS FOR CAPSULE PINS

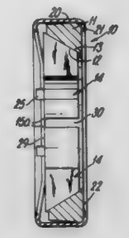
William G. Roast, Basingstoke, England, assignor to Lilly Industries Limited, London, England

Filed Nov. 7, 1985, Ser. No. 795,959

Claims priority, application United Kingdom, Nov. 14, 1984, 8428750

Int. Cl.⁴ B29C *45/17, 47/68*

U.S. Cl. 425—472 **9 Claims**



1. A stripper ring for a capsule-forming pin comprising inner and outer segmental members having cooperable surfaces shaped so that axial movement of the inner member in one sense relative to the outer member causes radially inwards movement of the inner member, and spring means biasing the inner member radially inwards, the inner member defining an inner surface slidable on the pin and having an end face for engaging a capsule section on the pin during movement of the ring on the pin in the opposite sense.

4,636,166

APPARATUS FOR APPLYING LABELS TO BLOW MOLDED ARTICLES

Nelson J. Franks, Toledo, and Casimir W. Nowicki, Sylvania, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 1, 1985, Ser. No. 707,335

Int. Cl.⁴ B65C *9/14*

U.S. Cl. 425—503 **16 Claims**

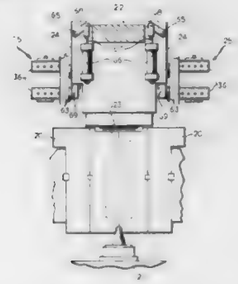
1. In combination with an apparatus for forming hollow plastic articles wherein parisons are blown outwardly into conformity with the cavities of an array of sets of partible mold sections which open and close and are in a predetermined array, an apparatus for handling labels which comprises

a magazine for supporting labels in a stack,

an endless belt transfer conveyor positioned adjacent said magazine,

means for indexing said belt in predetermined distances corresponding to the spaces between the sets of said mold sections of said array of said sets of mold sections,

means for successively removing a label from the magazine and depositing it on the conveyor, such that the labels are arranged in a predetermined array of spaced labels with the spacing between the labels on the endless transfer conveyor corresponding to the spaces between the sets of mold sections, and



means for removing the array of labels simultaneously from said endless transfer conveyor and delivering them between the array of open partible mold sections.

4,636,167

INJECTION MOULDING CLAMPING APPARATUS FOR AN INJECTION MOULDING MACHINE

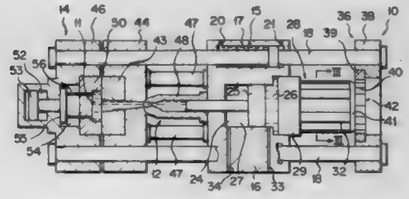
Toru Shibata, Fukushima, Japan, assignor to Tsuois Corporation, Fukushima, Japan

Filed Oct. 7, 1985, Ser. No. 785,163

Claims priority, application Japan, May 4, 1985, 60-95822

Int. Cl.⁴ B29C *45/64, 45/67*

U.S. Cl. 425—589 **10 Claims**



1. A mould clamping apparatus for an injection moulding machine comprising:

a plurality of tie bars having a peripheral surface

a stationary platen mounted to the tie bars, said stationary platen having a back surface and a front surface, said front surface having a stationary mould;

a movable platen also mounted to the tie bars and said movable platen having a movable mould, said movable mould defines, together with the stationary mould, a cavity for a moulding article;

a mould opening/closing means for moving the movable platen to open or close said stationary and movable moulds;

a housing disposed at the back surface of the stationary platen, said housing having an injection cylinder in which an injection piston slides, said injection piston having a peripheral surface; and

a mould clamping means for applying a mould clamping force to said stationary and movable moulds against an injection pressure acting on the injection piston so as to clamp said stationary and movable moulds together,

the mould clamping means including a converting means for converting the injection pressure into the mould clamping force and transmitting the mould clamping force to said stationary and movable moulds, so that a mould clamping process is synchronized with an injection process.

4,636,168

APPARATUS FOR THERMAL AND PNEUMATIC TREATMENT OF GRANULAR SOLIDS

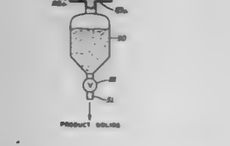
William A. Sandstrom, Chicago; Jitendra G. Patel, Bolingbrook, both of Ill., and John R. Bush, Dunwoody, Ga., assignors to Institute of Gas Technology, Chicago, Ill.

Division of Ser. No. 639,395, Aug. 10, 1984, Pat. No. 4,569,696.

This application Nov. 7, 1985, Ser. No. 796,008

Int. Cl.⁴ F27B *15/00*; B08B *7/04*

U.S. Cl. 432—58 **9 Claims**



1. An apparatus for thermally and pneumatically treating granular solids to remove organic and inorganic materials therefrom comprising:

a reactor vessel capable of confining a freeboard zone, a dilute phase zone and a dense phase zone fluidized bed of said solids upon a bed support plate, said reactor vessel having a removal means for removing oxidizing/fluidizing gas entraining said organic and inorganic materials from said freeboard zone;

granular solids feed means capable of supplying said granular solids to be treated to said dilute phase zone;

heat means capable of maintaining said dense phase at about 1000° to about 2000° F. for thermal oxidation of said organic materials;

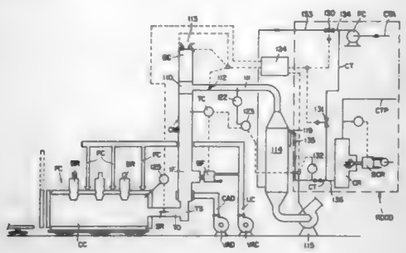
a contiguous pneumatic physical impaction flow conduit having an open upper end in communication with said dense phase zone fluidized bed and an opposite lower end in communication with a product granular solids withdrawal means, said flow conduit having baffle means directing said product granular solids to at least one nozzle and means for introducing pressurized oxidizing/fluidizing gas to said nozzle, each said nozzle being directed toward an impaction target for separation of said inorganic materials; and

means for introducing and distributing oxidizing/fluidizing gas in quantities sufficient for conduct of said thermal oxidation and for maintenance of said fluidized bed in fluidized condition.

4,636,169
UNIT FOR REGENERATING THE HEAT PRODUCED BY EXHAUST GASES IN MOVABLE HEARTH FURNACES USED FOR BAKING OR REBAKING CARBONACEOUS MATERIALS

Jean L. Genevois, Corso Sempione, 3, 20145 Milano; Antonio Lucia, Via Pacinotti, 20/B, 05100 Terni, and Emidio Di Fabio, Via dei Tigli, 6/4, 20020 Arese MI, all of Italy

Filed Jul. 3, 1985, Ser. No. 751,795
Claims priority, application Italy, Jul. 4, 1984, 48495 A/84
Int. Cl.[4] F27B *19/00, 7/00*
U.S. Cl. 432—90 5 Claims



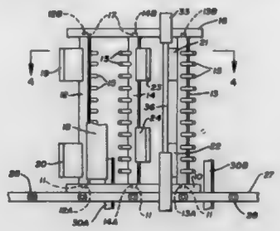
1. A unit for regenerating the heat produced by exhaust gases in a movable hearth furnace used for baking or rebaking carbonaceous materials and for incinerating volatile distillation products contained in said exhaust gases, said movable hearth furnace comprising: a baking chamber having a number of burners and a plurality of combustion air inlets supplied through a single pipe by a first fan placed outside said furnace; a smoke pipe consisting of a first horizontal portion having a gate fitted thereon and a second portion comprising a smoke incinerator comprising means for incinerating of said volatile distillation products provided with a burner; a smokestack placed downstream of said smoke incinerator comprising a thermocouple operatively connected to said burner to control the operation thereof in response to the temperature of smoke passing through said smokestack; and, a dilution air pipe which supplies dilution air supplied by a second fan, also placed outside said furnace, to said smoke incinerator, said unit comprising in combination: a pipe connection consisting of a sleeve fitted in said smokestack and a side pipe having an on-off valve placed therein; a valve comprising two or more sectors placed at the mouth or top of said smokestack, each sector being separately controlled by means of motors; a heat regenerator connected to said side pipe; an exhauster operated by a variable speed motor; a means for controlling the heat to be used for setting a desired differential between the exhaust gas temperature measured by a first thermocouple at an outlet of said smoke incinerator and the exhaust gas temperature measured by a second thermocouple at an inlet of said heat regenerator; a means for using heat regenerated by said heat regenerator to produce a hot fluid; a control means for controlling the condition of said hot fluid; a valve means for controlling the supply of said hot fluid to a pipeline for delivering said hot fluid to various users placed outside said furnace, said pipeline being also provided with an independent means for producing said hot fluid independently of the fluid obtained through said heat regenerator.

4,636,170
KILN FURNITURE SETTER

David Stupka, P.O. Box 73, New Bedford, Pa. 16140

Filed Mar. 13, 1986, Ser. No. 839,186
Int. Cl.[4] F27D *1/12*; F27B *9/26*
U.S. Cl. 432—258 4 Claims

1. An improvement to a kiln furniture support and transport setter, the kiln furniture comprising a base having spaced receptacles therein, a top member having spaced receptacles therein, columns positioned between said receptacles and within said receptacles, a plurality of vertically spaced posts extending from each of said columns for holding and spacing of ceramic ware thereon, the improvement comprising means for rotation of said columns from a ceramic wear support position, said means for rotation comprising activation flaps



positioned on each of said columns in angularly disposed relation to said posts, means for engaging said activation flaps sequentially from column to column, means for ejecting said ceramic ware from said kiln furniture and wherein said kiln furniture is positioned on a conveyor belt.

4,636,171
DENTAL POLISHING TIP

Thomas W. Martin, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 22, 1985, Ser. No. 768,510
Int. Cl.[4] A61C *3/06*
U.S. Cl. 433—134 6 Claims



1. A dental polishing tip adapted for use with a mandrel including a cylindrical working end and a reduced diameter cylindrical driving end coaxial with said working end, said tip comprising:

a body portion having a hollow cylindrical interior of a diameter and length substantially equal to those of said working end; and

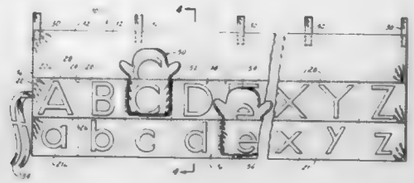
a reduced diameter cylindrical aperture extending from and coaxial with said hollow interior and opening to the exterior surface of said body portion, said aperture having a diameter substantially equal to that of said driving end;

said body portion being sufficiently resilient to enable said aperture to be expanded and forced over said working end and to contract and grip said driving end to retain said tip on said working end.

4,636,172
TEACHING APPARATUS

Barbara A. Fredericks, 2020 Carolina Ave., NE., St. Petersburg, Fla. 33703

Filed Oct. 2, 1985, Ser. No. 783,015
Int. Cl.[4] G09B *1/06*
U.S. Cl. 434—159 3 Claims



1. Teaching apparatus comprising: an elongated flexible support member; a first row of pockets secured to said support member, each of said pockets having a different upper case letter of the alphabet thereon; a second row of pockets secured to said support member, each of said pockets in said second row having a different lower case letter of the alphabet thereon adjacent the corrresponding upper case letter in said first row; a plurality of soft, compressible dolls sized to fit snugly within said pockets, each of said dolls having different upper and lower case letter of the alphabet on opposite sides thereof corresponding to the letters in the first and second rows of pockets; each different letter on said pockets and the corresponding letter on said dolls being made from a unique fabric and color combination so that each letter is distinguishable from the other letters by fabric as well as configuration.

4,636,173
METHOD FOR TEACHING READING

Robert Mossman, Cullen, Sloman, Cantor, Graner, Scott & Rutherford, P.C., 3200 Penobscot Building, Detroit, Mich. 48226

Filed Dec. 12, 1985, Ser. No. 808,329
Int. Cl.[4] G09B *17/00*
U.S. Cl. 434—178 4 Claims

1. In a method for teaching reading of the type characterized by a combined video and oral recording which comprises (1) a visual display of information in the form of alphabetic characters arranged either individually or in groups which are combined to represent words and (2) an audible soundtrack which records spoken pronunciation of such displayed information, the improvement which comprises the steps of:

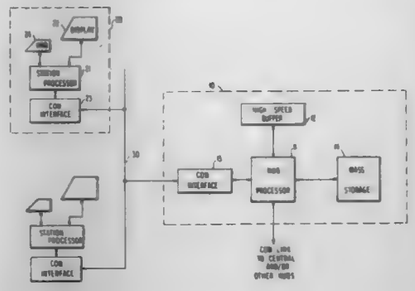
synchronizing the recorded audible pronunciation of each syllable or word with a temporary recorded visible highlighting of such syllable or word as it is pronounced, the highlighting being in the form of a temporary change in the visual characteristics of the pronounced syllable or word,

whereby the viewer can readily follow the reading of the visual display and correlate the sound of the displayed syllable or word with its written representation merely by following the visible highlighting as such highlighting progresses through the visual display.

4,636,174
CLUSTER COMPUTER BASED EDUCATION DELIVERY SYSTEM

David M. Anderson; Donald L. Bitzer, both of Urbana, Ill.; Robert K. Rader, Mt. Kisco, N.Y.; Bruce A. Sherwood, Champaign, Ill., and Paul T. Tucker, Leawood, Kans., assignors to University of Illinois, Urbana, Ill.

Filed Nov. 17, 1983, Ser. No. 552,947
Int. Cl.[4] G09B *7/00*
U.S. Cl. 434—335 8 Claims



1. An interactive instructional multi-processor system for providing instructional programs for execution at one or more processor stations while relieving memory requirements at said processor stations without allowing a perceivable delay to users at said processor stations as a result of paging of instructional program segments, comprising:

a cluster subsystem and a plurality of processor stations interconnected by a high speed multi-access communication subsystem, in which said cluster subsystem comprises:

at least one mass storage device for storing a library of instructional programs averaging at least about 50 kilobytes in length,

high speed buffer means coupled to said mass storage device for simultaneously storing a plurality of instructional programs,

an interface for said speed communication sub-system, and

processor means including a digital processor for managing said mass storage device, said high speed buffer means and said interface, said processor means further including a bus interconnecting said mass storage device, said high speed buffer means, said interface and said digtal processor, said digital processing including controller means for transferring a requested instructional program from said mass storage device to said high speed buffer means and for retaining said instructional program in said high speed buffer means for at least a target time related to the plurality of processor stations coupled to said cluster subsystem,

each of said processor stations comprising:

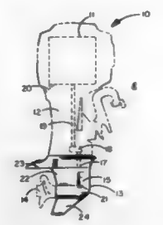
a microprocessor, electronic memory of about 64 Kbytes or less and display controlled by said microprocessor,

an interface for bidirectional communication coupled to and controlled by said microprocessor and coupled to said high speed communication subsystem,

said high speed communication subsystem including means for supporting high speed bidirectional communication between said cluster subsystem and a plurality of said processor stations at a rate of at least one megabit per second,

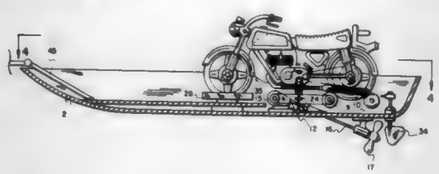
whereby said electronic memory at said microprocessor need not have a capacity to store an entire instructional program, rather a microprocessor can execute one of said instructional programs in segments without noticeable delay in loading an instructional program segment from said high speed buffer means for execution.

4,636,175
WATER INLET FOR OUTBOARD PROPULSION UNIT
Michael E. Fraxell, Neenah, and Michael A. Karls, Hilbert, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.
Filed Nov. 7, 1985, Ser. No. 796,051
Int. Cl.⁴ B63H *21/10*
U.S. Cl. 440—88 **6 Claims**



1. An outboard propulsion unit having a lower portion including a generally vertical streamlined strut, a torpedo gearcase including a at the lower end of said strut for supporting a propeller aft of said gearcase, and a cooling water circulation system, said system including a plurality of inlet ports at different heights in the lateral side wall of said strut, aft of the leading edge of said strut, for supplying water to said water circulation system, each port having a rear wall area exposed directly to the external flow stream for turning flow into said ports, the flow directing area of the exposed rear wall of the uppermost of said ports being greater than the corresponding area of the lowest of said ports.

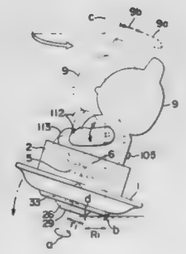
4,636,176
BOAT PROPELLED BY A MOTORCYCLE
Alejandro Capilla, Adolfo Prieto 725-1, México City, Mexico (03100), assignor to Alejandro Capilla, México City, Mexico
Filed Jan. 22, 1985, Ser. No. 693,579
Int. Cl.⁴ B63H *25/00*
U.S. Cl. 441—12 **1 Claim**



1. A boat for use in combination with an engine driven motorcycle having a driven wheel, and a steerable wheel comprising:

a fore roller and an aft roller rotatably mounted on axes which extend transversely of a longitudinal axis of said boat, said rollers being mounted on a frame means which in turn is mounted on the boat, said rollers being in contact with said driven wheel of said motorcycle to transmit the driving force of said wheel to a propulsion means and a cooling means, said propulsion means comprising a gear box means drivingly connected to said fore roller and having an output shaft drivingly connected to a propeller for propelling said boat, said gear box means further comprising shift means for changing the direction of rotation of said output shaft for providing forward and reverse movement of said boat, said shift means comprising a pair of handles mounted to the boat and operably connected to said gearbox, said cooling means comprises a pair or ducted fans drivingly connected to said aft roller and mounted to said boat on respective sides of said motorcycle, and being generally aligned with said engine to effect cooling of said engine, said boat further comprising steering means, said steering means comprising a supporting yoke rotatably mounted to said boat to rotate about a generally vertical axis, said yoke engaging and supporting the steerable wheel of said motorcycle such that the steerable wheel and yoke will rotate together, said yoke being operably connected to a rudder means such that rotation of said steerable wheel and yoke causes rotational movement of said rudder.

4,636,177
PLAYING ANIMAL TOY
Noriyuki Koguchi, Koshigaya, Japan, assignor to Iwaya Corporation, Tokyo, Japan
Filed Feb. 27, 1985, Ser. No. 706,141
Claims priority, application Japan, May 28, 1984, 59-108120
Int. Cl.⁴ A63H *1/00*
U.S. Cl. 446—236 **6 Claims**



1. A playing animal toy comprising:

A. a floor engaging means having a bottom surface area which lies in a single plane for flatwise engagement with an upwardly facing supporting surface and around which there is a peripheral edge;

B. a vessel mounted on said floor engaging means for rotation relative thereto about a substantially upright axis which is spaced radially inwardly from all portions of said peripheral edge, said vessel having a downwardly projecting ridge which surrounds said axis, is larger in diameter than said peripheral edge and is spaced above said single plane;

C. power drive means disposed within said vessel and connected between it and said floor engaging means for effecting relative rotation between the vessel and the floor engaging means about said axis;

D. an animal figure disposed within said vessel and swingable relative thereto in opposite directions substantially transverse to said axis; and

E. tilting means connected with said power drive means and operative during said relative rotation to tilt the floor engaging means sufficiently out of flatwise engagement with said supporting surface and onto said peripheral edge thereof to bring a portion of said ridge into transient engagement with said supporting surface, for thus imparting gyratory swinging motion to the vessel.

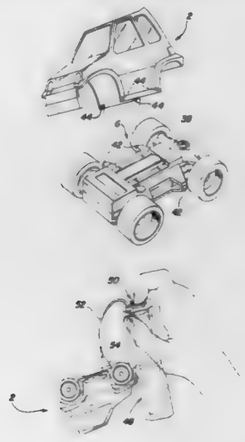
4,636,178
RECHARGEABLE TOY ELECTRIC VEHICLE SET
Nobuo Oda, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jan. 3, 1984, Ser. No. 567,794
Claims priority, application Japan, Feb. 9, 1983, 58-17690[U]; Sep. 14, 1983, 58-170080
Int. Cl.⁴ A63H *29/02*
U.S. Cl. 446—462 **12 Claims**

1. An electric toy vehicle with a rechargeable battery comprising:

a chassis member extending along a longitudinal axis and having an upper and lower portion of approximately the same exterior configurations and having a fore end and rear end positioned at opposite ends of the longitudinal axis;

a front and rear wheel assembly including wheels mounted on the chassis, each wheel being dimensioned with a diameter that is greater than the maximum distance between the upper and lower portions of the chassis member;

a rechargeable battery mounted within the chassis;

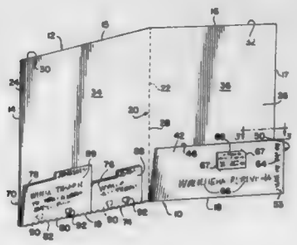


an electric motor mounted within the chassis and electrically connected to the battery;

means for recharging the battery from a source of power; and

at least one removable vehicle body, one of the chassis member and vehicle body having a set of male type connectors and the other having a set of female type receptacles for snap mounting of the vehicle body on the chassis member in a position that interfaces either the upper or lower portion of the chassis member.

4,636,179
FOLDER
Stephan F. Gentile, and Mark A. Gentile, both of Edinburg, Va., assignors to Gentile Brothers Screen Printing, Inc., Edinburg, Va.
Filed May 10, 1985, Ser. No. 732,692
Int. Cl.⁴ B42F *13/00, 19/00*
U.S. Cl. 402—79 **26 Claims**



1. A folder comprising:

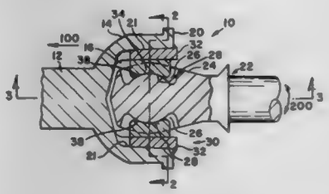
(a) a base sheet defined by a set of outside edges;

(b) a central score region running between a pair of opposed outside edges along which region said base sheet is foldable, whereby said base sheet, when folded at a central fold line which extends along said central score region, has a front side portion and a back side portion, a boundary between said side portions being defined by said central fold line, each side portion including an outside surface which faces the exterior of the folder, when folded, and an inside surface, which faces the interior of the folder, when folded;

(c) said base sheet including a base tab portion on one of said outside edges thereof;

(d) an overlapping sheet on at least one of said inside surfaces, said overlapping sheet extending over one part of said one inside surface to provide a pocket between said overlapping sheet and said one part of said inside surface, said overlapping sheet including an overlapping tab portion, said overlapping tab portion extending over said base tab portion to provide a plural-thickness tab, at least part of said overlapping tab portion being affixed to said base sheet to provide a pocket with at least one closed lateral edge.

4,636,180
UNIVERSAL JOINT WITH STATIONARY SEATS
Dean E. Runkle, LaPorte, Ind., assignor to Allied Corporation, Morristown, N.J.
Continuation of Ser. No. 643,597, Aug. 23, 1984, abandoned.
This application Nov. 12, 1985, Ser. No. 797,757
Int. Cl.⁴ F16D *3/20*; B62D *1/18*
U.S. Cl. 464—120 **5 Claims**

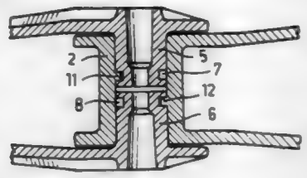


1. A universal joint having first and second members capable of being rotated with their axes angularly disposed relative to one another, consisting of a first head located at an end of the first member, the first head having a cavity with slot openings disposed oppositely from one another along the perimeter of the cavity, the slot openings extending along the longitudinal axis of said first member, a pair of unitary seats each shaped complementary to and received in a respective slot opening so that the unitary seats are disposed stationary relative to the first member, each unitary seat including a projection extending radially inwardly of said cavity and terminating in a curved seat surface, the second member including a second head received within said cavity, said second head including a pair of oppositely disposed recesses having longitudinal axes parallel to the axis of said second member, and each recess having a curved surface complementary to and engaging an associated curved seat surface to permit multi-directional movement therebetween so that said members may be rotated relative to one another, said slot openings comprising generally longitudinal openings in said perimeter and each radially outermost surface of a slot opening being disposed at an angle relative to a longitudinal center line of said first member, each of the outermost surfaces being inclined so that initial placement of a respective unitary seat in a direction along the longitudinal axis of the first member displaces the seat radially inwardly to provide lash-free engagement between said curved surfaces and curved seat surfaces.

4,636,181
CONVEYOR CHAIN

Esko Savolainen, Sorsmäki; Tuomo Laukkarinen, Ruohis; Arto Lehto, Espoo; Erkki Okuman, Helsinki, and Unto Eilamo, Lahti, all of Finland, assignors to Oy Nokia Ab, Helsinki, Finland

PCT No. PCT/FI84/00073, § 371 Date Jun. 6, 1985, § 102(e) Date Jun. 6, 1985, PCT Pub. No. WO85/01783, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 10, 1984, Ser. No. 743,992
Claims priority, application Finland, Oct. 11, 1983, 833694
Int. Cl.⁴ F16G *13/02*
U.S. Cl. 474—207 6 Claims



1. A conveyor chain comprising a plurality of adjacent chain links, each chain link including:

a barrel portion including an inside cylindrical surface having an inside diameter, and first and second spaced apart shoulders extending radially inward from said inside surface;

first and second generally parallel, elongated side arms, each side arm having a first end connected to and extending away from the barrel portion;

a first cylindrical stud extending inward from a second end of the first side arm, having an outside diameter approximately equal to the inside diameter of the barrel portion, and including

(i) a first circumferential recess extending radially inward from an outside surface of the first stud, to receive and hold the first shoulder of the barrel portion of an adjacent chain link, and

(ii) a first axial groove extending inward from the outside surface of the first stud, and extending away from the first circumferential recess along the axis of the first stud, to facilitate sliding the first shoulder of the barrel portion of the adjacent chain link into the first circumferential recess;

a second cylindrical stud extending inward from a second end of the second side arm, having an outside diameter approximately equal to the inside diameter of the barrel portion, and including,

(i) a second circumferential recess extending radially inward from an outside surface of the second stud, to receive and to hold the second shoulder of the barrel portion of the adjacent chain link, and

(ii) a second axial groove extending inward from the outside surface of the second stud, and extending away from the second circumferential recess along the axis of the second stud, to facilitate sliding the second shoulder of the barrel of the adjacent chain link into the second circumferential recess.

4,636,182
FILTER MANUFACTURING METHOD FOR THE PRODUCTION OF PRE-FILTERS TO REMOVE HARMFUL SUBSTANCES IN CIGARETTE SMOKE BY USE OF PINE NEEDLES

Chu Hwan Cho, and Gong In Lee, both of 202-19, Nonhyon-dong, Kangnam-Ku, Seoul, Rep. of Korea

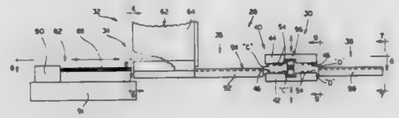
Filed Aug. 2, 1985, Ser. No. 761,808
Int. Cl.⁴ F16H *9/12*
U.S. Cl. 493—39 3 Claims

1. A process for manufacturing a pre-filter for the filteration of harmful substances in cigarette smoke by use of treated pine needles in the filter which comprises applying steam to the needles to remove the odor of pine resin from the needles, drying the pine needles in a shaded lot, crushing the dried needles to form a fine powder, preparing a dough from said fine powder by mixing the powder with water, allowing the dough to dry, granulating the dried dough and formulating a rod shaped pre-filter therefrom.

4,636,183
APPARATUS FOR MAKING GROOVES IN CIGARETTE FILTERS

John H. Sexstone, Anchorage; Everett N. Finn, Louisville; Byron L. Lowe, Prospect, and Ken M. Milliner, Louisville, all of Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Division of Ser. No. 464,277, Feb. 7, 1983, Pat. No. 4,490,982.
This application Aug. 13, 1984, Ser. No. 639,759
Int. Cl.⁴ A24D *3/02*; B31C *13/00*
U.S. Cl. 493—42 12 Claims



1. An apparatus for making grooves in a filter rod comprising:

die means comprising a lower die block adapted for vertical movement and having groove forming means at its upwardly facing surface, an upper die block adapted for vertical movement and having groove forming means at its donwardly facing surface, the downwardly facing surface of the upper die block being disposed in overlaying facing relationship to the upwardly facing surface of the lower die block, the groove forming means of the lower die block and upper die block are adpated to be embedded into a filter rod disposed between the lower and upper die blocks to impress grooves in the filter rod when the lower and upper die blocks are vertically moved toward each other;

means for moving the lower and upper die blocks vertically toward each other in unison;

stripper means for holding the grooved filter rod stationary in the die means as the lower and upper die blocks move away from each other to allow the groove forming means of the lower and upper die blocks to be extracted from the filter rod;

hopper means for storing a plurality of filter rods to be grooved;

dispenser means for receiving ungrooved filter rods from the hopper means, orienting the filter rods for proper feeding of the ungrooved filter rods to the die means, and feeding the ungrooved filter rods to the die means;

feed guide means for transferring the ungrooved filter rods in an aligned manner from the dispenser means to the die means; and,

exit guide means for transferring grooved filter rods away from the die means in an orderly manner to diminish the chances of a jam of grooved filter rods at the exit from the die means.

4,636,184
ARBOR GUIDING APPARATUS

Tomizou Nagata, and Norikuni Miyaoka, both of Tokyo, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

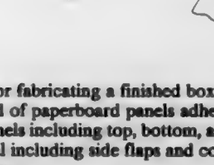
Filed Sep. 10, 1984, Ser. No. 648,732
Claims priority, application Japan, Sep. 13, 1983, 58-167587
Int. Cl.⁴ B31B *1/32*
U.S. Cl. 493—98 10 Claims

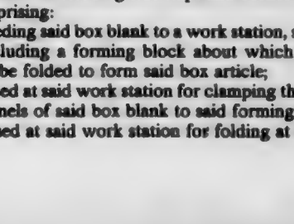
1. An arbor apparatus for forming packing containers comprising double bags of first and second packing sheet materials, said apparatus comprising:

a rotary packing drum;

means for forming first bags with said first sheet material, said first bag forming means including a first row of circumferentially spaced arbors connected to said drum;

means for forming second bags on said first bags with said second sheet material, said second bag forming means including a second row of circumferentially spaced arbors





connected to said drum and axially spaced from said first row of arbors, said arbors of said rotary rows being arranged in tandem;

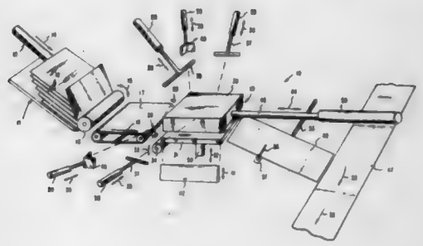
means connected to said drum and to said arbors for guiding said arbors in radial movement with respect to said drum; and,

means connected to said drum and to said arbors for effecting relative axial movement of tandem arbors with respect to said drum rotation of said drum.

4,636,185
APPARATUS FOR FABRICATING A BOX-LIKE ARTICLE

Leewood C. Carter; Robin P. Neary, both of Warren, N.J., and Robert Mulles, North Andover, Mass., assignors to Book Covers Inc., Newark, N.J.

Filed May 7, 1985, Ser. No. 731,355
Int. Cl.⁴ F16H *7/22*
U.S. Cl. 493—127 19 Claims



8. An apparatus for fabricating a finished box article from a box blank comprised of paperboard panels adhered to a backing material, said panels including top, bottom, and side panels, said backing material including side flaps and corner tabs, said apparatus comprising:

means for feeding said box blank to a work station, said work station including a forming block about which said box blank can be folded to form said box article;

means disposed at said work station for clamping the top and bottom panels of said box blank to said forming block;

means disposed at said work station for folding at least two of said side panels of said box blank about said forming block to form a box shape having one open side;

means disposed at said work station for folding, heating and bonding portions of said backing material to said folded side panels to permanently hold said folded side panels in said box shape and to provide said box article with a finished appearance;

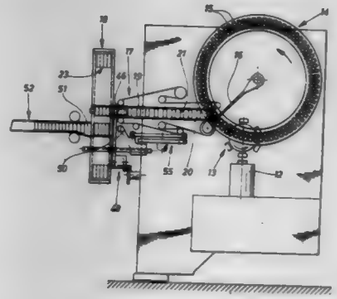
said means for folding, heating and bonding said backing material about said folded side panels including a pair of heated engaging arms for movingly engaging, folding, heating and adhering said corner tabs to said folded side panels; and

means adjacent said forming block for removing said finished box article from said forming block and said work station.

4,636,186
APPARATUS FOR SETTING AND SHAPING GLUED CIGARETTE PACKS

Heinz Focke, and Hans Schönberger, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Dec. 18, 1984, Ser. No. 683,109
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1984, 3400650
Int. Cl.⁴ B31B *3/62*
U.S. Cl. 493—142 13 Claims



1. An apparatus for producing cuboid packs with folding tabs joined by means of gluing, comprising:

first generally circular rotatable drying turret means (14) for receiving cuboid packs immediately after the gluing of the tabs thereof and for temporarily holding the packs in a predetermined cuboid configuration during substantial setting of the glued tabs;

second generally circular intermittently rotatable drying turret means (18), disposed downstream of said first turret means and having a periphery and an axis of rotation, for receiving said packs (10) and temporarily holding said packs during final setting of the glued tabs;

said second drying turret means (18) comprising pockets (22), each comprising means for receiving from said first turret means (14) a group (23) of packs (10) located next to one another in the axial direction of said second drying turret means (18);

feed conveyor means (17), disposed between said first and second turret means and extending in said axial direction of said second drying turret means (18), for sequentially transporting a plurality of packs (10) from said first drying turret means (14) to said second drying turret means (18) and for forming said group (23) from the packs (10) received by one of said pockets (22);

wherein each of said pockets is an axially extending continuous orifice having an exit end and a feed end;

wherein, in the region of a feed station (31) disposed adja-

cent the periphery of said second turret means, there is located at the exit end of the pockets pocket stop means (35) for providing a stop against which abuts the pack group (23) conveyed into a pocket through the feed end thereof, said stop means having a stop projection (36); and further comprising

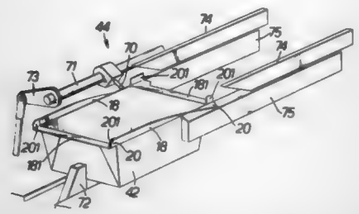
means, associated with said stop means, for moving said stop means outside the rotation path of the second drying turret means (18) during rotation thereof and, during the time when said second drying means (18) is stationary, for moving said stop projection (36) into the exit end of the pocket (22) to provide said stop.

4,636,187

METHODS AND APPARATUS FOR ERECTING TRAY-TYPE CARTONS

John R. Oakley, Swindon, England, assignor to Metal Box, p.l.c., Reading, England

Filed Apr. 22, 1985, Ser. No. 725,642
Claims priority, application United Kir.gdom, May 4, 1984, 8411523
Int. Cl.[4] B31B *1/44, 1/52*
U.S. Cl. 493—134 16 Claims



9. Apparatus for erecting a blank of foldable sheet material into a rectangular tray-type carton having a base formed from a base panel of the blank, a side wall upstanding from the base and formed from four side wall panels, gusset folds secured against the side wall at the corner of the carton and formed from gusset panels by which the side wall panels are joined integrally together, and a continuous peripheral flange outturned from the side wall around the mouth of the carton, the flange being formed from elongate panels carried by the side wall panels and formed at their ends with tabs having surfaces which are secured together in overlapping relation at the corners of the carton by heat-sealing, characterised in that the apparatus comprises:

(a) an intial forming station incorporating means for supporting a blank in a substantially horizontal plane, a punch movable vertically through the plane of the blank, a die disposed below the plane of the blank for cooperating with said punch to fold up said side wall, pivotal fingers arranged adjacent to the plane of the blank, means associated with said pivotal fingers for operating said pivotal fingers prior to folding up said side wall so as to fold up from the plane of the blank those of the tabs which are to be uppermost in the erected carton, the punch being arranged to force the blank in a stroke through the die to form the side wall by folding up the side wall panels in relation to the base panel whilst folding the gusset panels to form the gusset folds, the elongate panels moving with the side wall panels as coplanar extensions thereof with the exception of the said uppermost ones of the tabs, and folding means arranged to be operated on completion of the stroke of the punch to fold outwardly the pair of opposed panels which carry the said uppermost ones of the tabs, whereby said uppermost tabs are disposed with their surfaces which are to be secured to the surfaces of the others of said tabs facing laterally outwardly,

(b) a conveyor arranged to receive the partially erected carton from the initial forming station and to transport it continuously through the remainder of the apparatus in a direction perpendicular to the length of the already folded pair of elongate panels,

(c) folding means disposed adjacent to said conveyor downstream from said initial forming station for folding the other pair of opposed elongate panels outwardly in relation to the side wall so as to form the peripheral flange,

(d) means disposed on both sides of said conveyor for directing hot gas at the said laterally outwardly facing surfaces of said uppermost tabs for activating an adhesive provided thereon, and

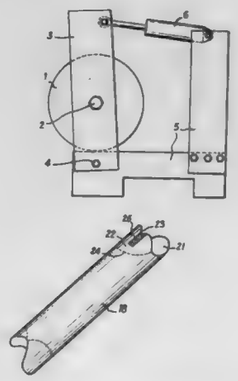
(e) sealing means disposed adjacent to said conveyor downstream from said hot gas directing means for pressing said uppermost tabs into contact with said other tabs in overlapping relationship to bond them together and thus complete the peripheral flange.

4,636,188

PROCESS AND APPARATUS FOR MANUFACTURING CARDBOARD TUBES WITH INCORPORATED CLOSURE

Jean-Marie Bihl, 67 avenue de la Belle Gabrielle, F-94130 Nogent sur Marne, France

Filed Jul. 3, 1985, Ser. No. 751,642
Claims priority, application France, Jul. 6, 1984, 84 10778
Int. Cl.[4] F16H *7/06*
U.S. Cl. 493—157 4 Claims



2. Apparatus for cutting into elements, each provided with a closure system, a rigid cylindrical cardboard tube continuously formed on a spiralling machine having a rotary mandrel, which comprises:

(a) a support for a cutting member, laterally disposed with relation to the rotary mandrel of the spiralling machine on which the tube is formed;

(b) arms pivoted to said support;

(c) a shaft disposed parallel to said mandrel and mounted on said arms pivoted to said support;

(d) control means disposed between said support and said arms for pivoting said arms towards said mandrel; and

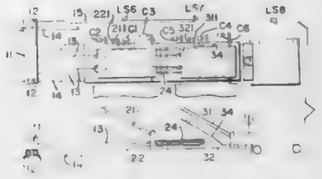
(e) a cylindrical cutting member mounted for free rotation on said shaft, said cutting member presenting on its outer surface a continuous cutting relief having in flat development the shape of a sinusoid, comprising, on each side thereof, two bulges of the same height, arcuate lines of teeth being provided on said outer surface of the cutting member and connecting two successive bulges of said sinusoid disposed on a same side thereof.

4,636,189

MACHINE FOR PLACING A PLASTIC BAG AUTOMATICALLY INTO A LARGER FEEDSTUFF BAG

Yaw H. Chen, 3-3, Ta Chyan, Pu Yuan Tsuen, Yeong Kang Shiang, Tainan Hsien, Taiwan

Continuation-in-part of Ser. No. 548,121, Nov. 2, 1983, abandoned. This application Dec. 24, 1985, Ser. No. 813,133
Int. Cl.[4] B31B *39/04, 39/80*
U.S. Cl. 493—217 2 Claims



1. A machine for putting a lining bag into a main bag by automation, comprising

a rail of a fixed loci;

an activation means, including two push bars, which moves along said rail of fixed loci;

a first stock piling device for a lining bag, said lining bag having a sealed end and an unsealed end, including an upper and lower vacuum tank, said upper vacuum tank being pivotable between a closed and an open position with respect to said lower vacuum tank;

a second stock piling device for a main bag, said main bag having a sealed end and an unsealed end, including an upper and lower vacuum tank, said upper vacuum tank being pivotable between a closed and an open position with respect to said lower vacuum tank,

first delivery means adjacent to said first stock piling device for delivering said lining bag to a surface of said lower vacuum tank of said first stock piling device facing said upper vacuum tank of said first stock piling device,

second delivery means adjacent to said second stock piling device for delivering said main bag to a surface of said lower vacuum tank of said second stock piling device facing said upper vacuum tank of said second stock piling device,

means for opening said lining bag comprising, on each of said upper and lower vacuum tanks, a suction holder on each of said surfaces facing said lower and upper vacuum tanks of said first stock piling device, respectively:

means for opening said main bag comprising, on each of said upper and lower vacuum tanks, respectively, a suction holder on each of said surfaces facing said lower and upper vacuum tanks of said second stock piling device, respectively;

means for creating a vacuum within said upper and lower vacuum tanks of said first and second stock piling devices associated with said tanks, causing said suction holders to develop suction power and hold said lining and main bag, respectively;

means, on each of said stock piling devices, for rupturing the vacuum within said upper and lower vacuum tanks, thereby causing said suction holder to lose suction power and release said lining and main bag, respectively;

said activation means and said first and second stock piling devices being arranged in relation to each other so that said lining bag, when released from said suction holder of said first stock piling device, may be pushed through said unsealed end of said lining bag by said push bars, into the unsealed end of said main bag when said main bag is in an open position on said second stock piling device, thereby forming a lined bag;

a press table adjacent said second stock piling device;

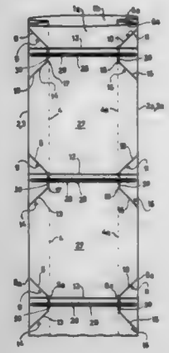
means above said press table for pressing said lined bag down against said press table.

4,636,190

APPARATUS FOR MANUFACTURING A WEB OF PLASTIC BAGS

Kornelis Herder, Goor, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Division of Ser. No. 381,228, May 24, 1982, Pat. No. 4,561,107, which is a continuation of Ser. No. 148,016, May 8, 1980, abandoned. This application Sep. 20, 1985, Ser. No. 778,438
Claims priority, application Netherlands, May 11, 1979, 7903733
Int. Cl.[4] B31B *33/60*
U.S. Cl. 493—196 9 Claims



1. An apparatus for manufacturing a valve free plastic bag (27) with gusset folds formed from a tubular foil, at least comprising a central (4, 4*a*) and two outer longitudinal gusset fold edges (2, 3, 2*a*, 3*a*) which bound a first and second gusset fold part, said bag being open at one end opposite a transverse bottom seal (12) and further comprising:

(a) two first fold part seals (8, 9, 10, 11) at both sides of the bag, which first fold part seals always connect an outer foil layer (1*a*, 1*b*) with an opposite gusset fold part (6*a*, 5*a*; 6,5) said first fold part seals extending in the region between the central (4, 4*a*) and outer longitudinal fold edges (2, 3; 2*a*, 3*a*) in the region of said transverse bottom seal (12) and diverging from the region of said bottom seal (12) to the outer fold edges (2, 2*a*; 3, 3*a*),

(b) second fold part seals (13, 14, 15, 16) at both sides of the bag which second foil part seals always connect an outer foil layer (1*a*, 1*b*) with an opposite gusset fold part (6*a*, 5*a*; 6, 5) said second fold part seals extending in the region between the central (4, 4*a*) and outer longitudinal fold edges (2, 3; 2*a*, 3*a*) at the end of the bag remote from the transverse bottom seal of this bag, said second fold part seals converging from the outer longitudinal fold edges (2, 3; 2*a*, 3*a*) to the open end of said bag (27) wherein least at both sides of the bag an additional seal (30) extends substantially parallel to the fold edges and in the region between inner and outer fold edges and in the region between inner and outer fold edges, said additional seals (30) being at least connected with the second fold part seals (13, 14; 15, 16) and extending from said second fold part seals towards the open end of said bag (27), said apparatus at least comprising:

(1) conveying means for stepwise conveying a tubular plastics foil;

(2) first sealing means for forming said first fold part seals (8, 9; 10, 11);

(3) second sealing means for forming said second fold part seals (13, 14; 15, 16);

(4) transverse sealing means for forming a transverse bottom seal (12);

(5) additional sealing means for forming said additional seals (30) connecting at least said seals with said second sealing means;

cent the periphery of said second turret means, there is located at the exit end of the pockets pocket stop means (35) for providing a stop against which abuts the pack group (23) conveyed into a pocket through the feed end thereof, said stop means having a stop projection (36); and further comprising

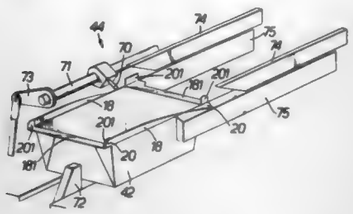
means, associated with said stop means, for moving said stop means outside the rotation path of the second drying turret means (18) during rotation thereof and, during the time when said second drying means (18) is stationary, for moving said stop projection (36) into the exit end of the pocket (22) to provide said stop.

4,636,187

METHODS AND APPARATUS FOR ERECTING TRAY-TYPE CARTONS

John R. Oakley, Swindon, England, assignor to Metal Box, p.l.c., Reading, England

Filed Apr. 22, 1985, Ser. No. 725,642
Claims priority, application United Kingdom, May 4, 1984, 8411523
Int. Cl.[4] B31B *1/44, 1/52*
U.S. Cl. 493—134 16 Claims



9. Apparatus for erecting a blank of foldable sheet material into a rectangular tray-type carton having a base formed from a base panel of the blank, a side wall upstanding from the base and formed from four side wall panels, gusset folds secured against the side wall at the corner of the carton and formed from gusset panels by which the side wall panels are joined integrally together, and a continuous peripheral flange outturned from the side wall around the mouth of the carton, the flange being formed from elongate panels carried by the side wall panels and formed at their ends with tabs having surfaces which are secured together in overlapping relation at the corners of the carton by heat-sealing, characterised in that the apparatus comprises:

(a) an intial forming station incorporating means for supporting a blank in a substantially horizontal plane, a punch movable vertically through the plane of the blank, a die disposed below the plane of the blank for cooperating with said punch to fold up said side wall, pivotal fingers arranged adjacent to the plane of the blank, means associated with said pivotal fingers for operating said pivotal fingers prior to folding up said side wall so as to fold up from the plane of the blank those of the tabs which are to be uppermost in the erected carton, the punch being arranged to force the blank in a stroke through the die to form the side wall by folding up the side wall panels in relation to the base panel whilst folding the gusset panels to form the gusset folds, the elongate panels moving with the side wall panels as coplanar extensions thereof with the exception of the said uppermost ones of the tabs, and folding means arranged to be operated on completion of the stroke of the punch to fold outwardly the pair of opposed panels which carry the said uppermost ones of the tabs, whereby said uppermost tabs are disposed with their surfaces which are to be secured to the surfaces of the others of said tabs facing laterally outwardly,

(b) a conveyor arranged to receive the partially erected carton from the initial forming station and to transport it continuously through the remainder of the apparatus in a direction perpendicular to the length of the already folded pair of elongate panels,

(c) folding means disposed adjacent to said conveyor downstream from said initial forming station for folding the other pair of opposed elongate panels outwardly in relation to the side wall so as to form the peripheral flange,

(d) means disposed on both sides of said conveyor for directing hot gas at the said laterally outwardly facing surfaces of said uppermost tabs for activating an adhesive provided thereon, and

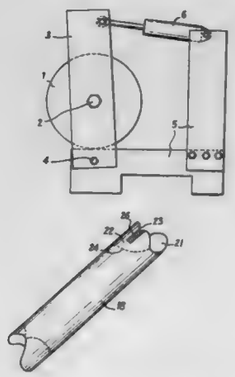
(e) sealing means disposed adjacent to said conveyor downstream from said hot gas directing means for pressing said uppermost tabs into contact with said other tabs in overlapping relationship to bond them together and thus complete the peripheral flange.

4,636,188

PROCESS AND APPARATUS FOR MANUFACTURING CARDBOARD TUBES WITH INCORPORATED CLOSURE

Jean-Marie Bihl, 67 avenue de la Belle Gabrielle, F-94130 Nogent sur Marne, France

Filed Jul. 3, 1985, Ser. No. 751,642
Claims priority, application France, Jul. 6, 1984, 84 10778
Int. Cl.[4] F16H *7/06*
U.S. Cl. 493—157 4 Claims



2. Apparatus for cutting into elements, each provided with a closure system, a rigid cylindrical cardboard tube continuously formed on a spiralling machine having a rotary mandrel, which comprises:

(a) a support for a cutting member, laterally disposed with relation to the rotary mandrel of the spiralling machine on which the tube is formed;

(b) arms pivoted to said support;

(c) a shaft disposed parallel to said mandrel and mounted on said arms pivoted to said support;

(d) control means disposed between said support and said arms for pivoting said arms towards said mandrel; and

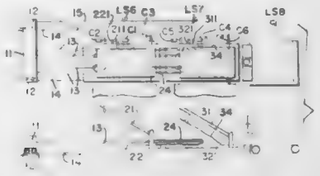
(e) a cylindrical cutting member mounted for free rotation on said shaft, said cutting member presenting on its outer surface a continuous cutting relief having in flat development the shape of a sinusoid, comprising, on each side thereof, two bulges of the same height, arcuate lines of teeth being provided on said outer surface of the cutting member and connecting two successive bulges of said sinusoid disposed on a same side thereof.

4,636,189

MACHINE FOR PLACING A PLASTIC BAG AUTOMATICALLY INTO A LARGER FEEDSTUFF BAG

Yaw H. Chen, 3-3, Ta Chyan, Pu Yuan Tsuen, Yeong Kang Shiang, Tainan Hsien, Taiwan

Continuation-in-part of Ser. No. 548,121, Nov. 2, 1983, abandoned. This application Dec. 24, 1985, Ser. No. 813,133
Int. Cl.[4] B31B *39/04, 39/80*
U.S. Cl. 493—217 2 Claims



1. A machine for putting a lining bag into a main bag by automation, comprising

a rail of a fixed loci;

an activation means, including two push bars, which moves along said rail of fixed loci;

a first stock piling device for a lining bag, said lining bag having a sealed end and an unsealed end, including an upper and lower vacuum tank, said upper vacuum tank being pivotable between a closed and an open position with respect to said lower vacuum tank;

a second stock piling device for a main bag, said main bag having a sealed end and an unsealed end, including an upper and lower vacuum tank, said upper vacuum tank being pivotable between a closed and an open position with respect to said lower vacuum tank,

first delivery means adjacent to said first stock piling device for delivering said lining bag to a surface of said lower vacuum tank of said first stock piling device facing said upper vacuum tank of said first stock piling device,

second delivery means adjacent to said second stock piling device for delivering said main bag to a surface of said lower vacuum tank of said second stock piling device facing said upper vacuum tank of said second stock piling device,

means for opening said lining bag comprising, on each of said upper and lower vacuum tanks, a suction holder on each of said surfaces facing said lower and upper vacuum tanks of said first stock piling device, respectively:

means for opening said main bag comprising, on each of said upper and lower vacuum tanks, respectively, a suction holder on each of said surfaces facing said lower and upper vacuum tanks of said second stock piling device, respectively;

means for creating a vacuum within said upper and lower vacuum tanks of said first and second stock piling devices associated with said tanks, causing said suction holders to develop suction power and hold said lining and main bag, respectively;

means, on each of said stock piling devices, for rupturing the vacuum within said upper and lower vacuum tanks, thereby causing said suction holder to lose suction power and release said lining and main bag, respectively;

said activation means and said first and second stock piling devices being arranged in relation to each other so that said lining bag, when released from said suction holder of said first stock piling device, may be pushed through said unsealed end of said lining bag by said push bars, into the unsealed end of said main bag when said main bag is in an open position on said second stock piling device, thereby forming a lined bag;

a press table adjacent said second stock piling device;

means above said press table for pressing said lined bag down against said press table.

4,636,190

APPARATUS FOR MANUFACTURING A WEB OF PLASTIC BAGS

Kornelis Herder, Goor, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Division of Ser. No. 381,228, May 24, 1982, Pat. No. 4,561,107, which is a continuation of Ser. No. 148,016, May 8, 1980, abandoned. This application Sep. 20, 1985, Ser. No. 778,438
Claims priority, application Netherlands, May 11, 1979, 7903733
Int. Cl.[4] B31B *33/60*
U.S. Cl. 493—196 9 Claims



1. An apparatus for manufacturing a valve free plastic bag (27) with gusset folds formed from a tubular foil, at least comprising a central (4, 4*a*) and two outer longitudinal gusset fold edges (2, 3, 2*a*, 3*a*) which bound a first and second gusset fold part, said bag being open at one end opposite a transverse bottom seal (12) and further comprising:

(a) two first fold part seals (8, 9, 10, 11) at both sides of the bag, which first fold part seals always connect an outer foil layer (1*a*, 1*b*) with an opposite gusset fold part (6*a*, 5*a*; 6,5) said first fold part seals extending in the region between the central (4, 4*a*) and outer longitudinal fold edges (2, 3; 2*a*, 3*a*) in the region of said transverse bottom seal (12) and diverging from the region of said bottom seal (12) to the outer fold edges (2, 2*a*; 3, 3*a*),

(b) second fold part seals (13, 14, 15, 16) at both sides of the bag which second foil part seals always connect an outer foil layer (1*a*, 1*b*) with an opposite gusset fold part (6*a*, 5*a*; 6, 5) said second fold part seals extending in the region between the central (4, 4*a*) and outer longitudinal fold edges (2, 3; 2*a*, 3*a*) at the end of the bag remote from the transverse bottom seal of this bag, said second fold part seals converging from the outer longitudinal fold edges (2, 3; 2*a*, 3*a*) to the open end of said bag (27) wherein least at both sides of the bag an additional seal (30) extends substantially parallel to the fold edges and in the region between inner and outer fold edges and in the region between inner and outer fold edges, said additional seals (30) being at least connected with the second fold part seals (13, 14; 15, 16) and extending from said second fold part seals towards the open end of said bag (27), said apparatus at least comprising:

(1) conveying means for stepwise conveying a tubular plastics foil;

(2) first sealing means for forming said first fold part seals (8, 9; 10, 11);

(3) second sealing means for forming said second fold part seals (13, 14; 15, 16);

(4) transverse sealing means for forming a transverse bottom seal (12);

(5) additional sealing means for forming said additional seals (30) connecting at least said seals with said second sealing means;

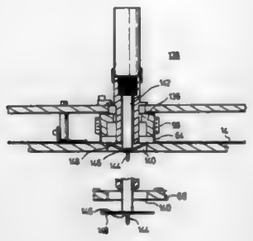
(6) separating means being active during the action of said first respectively second sealing means for forming said first respectively second fold part seals.

4,636,191

PLASTIC BAG HANDLE APERTURE FORMING APPARATUS

David C. Piggott, Burlington, Canada, assignor to PCL Packaging Ltd, Oakville, Canada

Filed Feb. 7, 1984, Ser. No. 577,713
Claims priority, application Canada, Dec. 16, 1983, 443474
Int. Cl.[4] B31B *23/18, 23/86*
U.S. Cl. 493—227 7 Claims



1. In a bag making machine, an apparatus for forming bag handle apertures by cutting coupons from a plastic web material, said apparatus comprising:

at least one aperture cutting means for cutting said web material and ejecting a coupon therefrom, having a peripherally extending aperture cutting blade shaped to cut said bag handle aperture within its cutting periphery, said aperture cutting means including a plunger movable within the cutting periphery of the aperture cutting blade, said plunger including pirecing means on a leading face thereof for positively holding said web material proximate and aperture cutting blade;

support means for supporting said web material and having one aperture for each aperture cutting means located in alignment with said plunger thereof, said support means aperture being sized greater than said plunger and less than the cutting periphery of said aperture cutting blade, means for moving said support means and aperture cutting means relative to one another, operatively associated therewith, to bring said web material into engagement first with said piercing means and then with said aperture cutting blade to first cause said piercing means to pierce said web material and extend into said support means aperture to positively hold said web material proximate said aperture cutting blade and then to cause said aperture cutting blade to cut said coupon from the web material; and

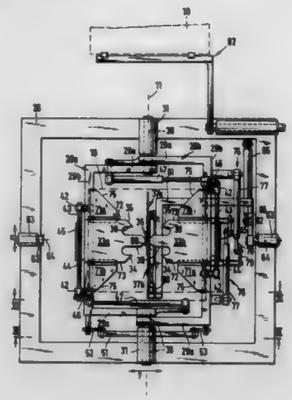
means operatively associated with said aperture cutting means for moving said plunger into and out of said support means aperture when said coupon is cut so as to eject said coupon from said web material upon withdrawal of said plunger from said support means aperture.

4,636,192

APPARATUS FOR FOLDING A FOLDABLE SHEET

Alfred Vogtländer, and Elabeth Vogtländer, both of Waldbröl-Hermesdorf, Fed. Rep. of Germany, assignors to Falk-Verlag fur Landkarten und Stadtplane Gerhard Falk GmbH, Fed. Rep. of Germany

Filed Sep. 3, 1985, Ser. No. 771,694
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434620
Int. Cl.[4] B31F *1/00, 7/00*
U.S. Cl. 493—451 10 Claims



1. An apparatus for folding a sheet, in which alternate inward and outward, rectilinear folds extend from the approximate center point of a surface of the sheet, the outward and the inward folds forming opposed pairs in each case, and the outward folds that extend approximately to the corners of the sheet dividing at a distance from the respective corners to outward edge folds that extend substantially parallel to the edges of the sheet that meet at the corners, and an inward corner fold extends from the point of division to the corner, comprising two flat carriers for the sheet, the carriers being foldable one on top of the other about a folding axis lying in their plane; first folding elements pivotal in a plane passing through the folding axis and bisecting the angle between the flat carriers, about the center point of the sheet that is arranged between the flat carriers; second folding elements, each of which has a fold edge passing through the point of division of the outward edge folds and pivotal about the point of division such that it describes a path on the surface of a truncated cone; and clamps for securing the sheet to the carriers.

4,636,193

DISPOSABLE CENTRIFUGAL BLOOD PROCESSING SYSTEM

Herbert M. Cullis, Silver Spring, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

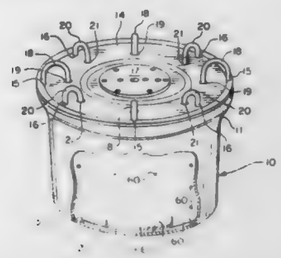
Division of Ser. No. 842,779, Oct. 17, 1977, which is a continuation of Ser. No. 687,290, May 14, 1976, abandoned. This application Jun. 11, 1986, Ser. No. 872,822
Int. Cl.[4] B04B *7/08*
U.S. Cl. 494—45 18 Claims

1. A disposable continuous flow centrifugal separator for use in conjunction with centrifugation apparatus including a rotatably driven casing for separating fractions from a whole fluid, said separator comprising, in combination:

a molded outer shell received within said casing in rotatably-locked relation therewith;

a molded inner shell disposed within said outer shell in spaced relation thereto, said inner and outer shells including wall portions forming between their inner surfaces a separation chamber radially spaced from the axis of rotation of the casing, the wall portion of said outer shell being relatively thin and deformable and resiliently biased toward said inner shell when seated in said casing;

means including a plurality of projections on at least one of said inner surfaces in abutting engagement with the other of said inner surfaces for establishing a predetermined concentricity between said wall portions;



inlet means including an inlet port for supplying whole blood to be processed to said separation chamber; and

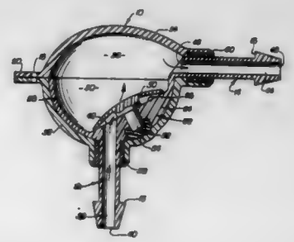
outlet means including a plurality of collection ports communicating with said separation chamber at respective radial distances from said axis of rotation for removing respective separated fractions from said chamber.

4,636,194

BURR-HOLE FLOW CONTROL VALVE

Rudolf R. Schulte; Gary P. East, both of Santa Barbara; Marga M. Bryant, and Alfons Heindl, both of Goleta, all of Calif., assignors to Pudenz-Schulte Medical Research Corp., Santa Barbara, Calif.

Continuation-in-part of Ser. No. 575,165, Jan. 30, 1984, Pat. No. 4,560,375, which is a continuation-in-part of Ser. No. 510,381, Jun. 30, 1983, abandoned, which is a continuation of Ser. No. 208,514, Nov. 20, 1980, abandoned. This application Nov. 8, 1985, Ser. No. 796,299
The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—9 19 Claims



1. A surgically implantable flow control valve positionable upon a burr-hole through a patient's skull for controlling the flow of cerebrospinal fluid from the brain ventricles to another portion of the body, said valve comprising:

a substantially rigid base of unitized construction including a valve supporting portion having a planar surface, an inlet connector integral with said supporting portion, and an outlet connector integral with said supporting portion, said supporting portion being situated within a protective well formed by said base;

an inlet passageway through said base, said inlet passageway originating at an open end of said inlet connector and terminating at an inlet port situated on said planar surface;

a resilient dome substantially overlying said valve supporting portion of said base to form a reservoir chamber therebetween, said dome having an arch-shape and being deformable toward said base by external pressure so that the extent of deformation is limited by contact between said dome and said base;

an outlet passageway through said base, said outlet passageway originating at an outlet port in open communication with said reservoir chamber and terminating at an open end of said outlet connector;

a flow control member including a central support and a resilient membrane, said central support being securely attached to said base and extending therefrom into said reservoir chamber to support said membrane, said membrane being generally arch-shaped and resiliently biased to contact said planar surface generally along the outer edges of said membrane in a manner surrounding said inlet port and forming a releasable seal between said planar surface and the outer edges of said membrane;

an inlet radiopaque marker generally encircling a portion of said inlet connector;

an outlet radiopaque marker generally encircling a portion of said outlet connector; and

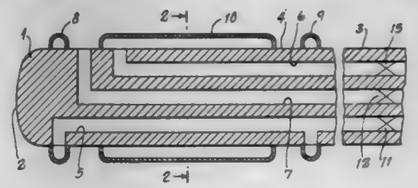
means for indicating the pressure/flow characteristics of said valve, said indicating means being x-ray detectable after implantation of said valve.

4,636,195

METHOD AND APPARATUS FOR REMOVING ARTERIAL CONSTRICTION

Harvey Wolinsky, 186 Riverside Dr., New York, N.Y. 10024

Continuation of Ser. No. 558,703, Dec. 6, 1983, abandoned, which is a continuation of Ser. No. 364,968, Apr. 2, 1982, abandoned. This application Apr. 4, 1985, Ser. No. 720,453
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—53 11 Claims

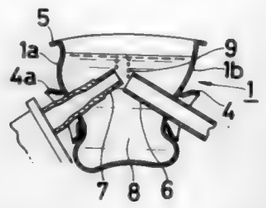


1. A cathether adapted for insertion into an artery for relieving arterial constriction caused by a body of plaque comprising a main catheter body having means including two spaced balloon elements adapted to be positioned adjacent respective proximate and distal ends of the plaque body and expansible against the arterial walls for providing a chamber about said plaque body so as to hold said main catheter body in place, means carried by said main catheter body for delivering a solution into said chamber for solubilizing said plaque body, and means including a third balloon element disposed intermediate said two spaced balloon elements and expansible for forcing said solution into said plaque body while compressing said plaque body.

4,636,196
METHOD FOR PROVIDING A BUBBLELESS CONNECTION BETWEEN FILLING TUBES FOR BLOOD OR THE LIKE AND A CONTAINER USED FOR SAID CONNECTION

Takashi Tsuji, Fujisawa; Shozo Kobayashi, Kawasaki, and Toshio Nagase, Tsukuba, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 562,697
Claims priority, application Japan, Dec. 27, 1982, 57-226936
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—122 6 Claims



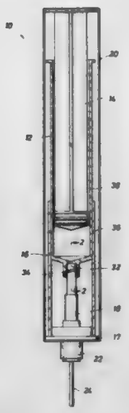
1. A container for connecting filling tubes for blood or the like, comprising:
a container body having an upper opened-portion defining a fluid receiving interior chamber and an external surface;
said container body being formed of a high molecular weight substance that is flexible, elastic, and wholly or partly deformable;
said container body having opposed confronting sidewalls;
each of said opposed confronting sidewalls of said container body having a through-hole of a predetermined dimension through which the end of each of two tubes to be connected are respectively insertable into said container body;
a skirt formed with each of said opposed sidewalls and outwardly projecting from said external surface of said container body defining a flange-like appurtenance surrounding an associated one of said tube insertable through-holes; and
a flange integrally formed along the periphery of said opened-portion of said container body for strengthening said container body.

4,636,197
INTRAVENOUS FLUID INFUSION DEVICE

Ping Chu, 2227 Foreland, Houston, Tex. 77077

Filed Feb. 15, 1985, Ser. No. 702,220
Int. Cl.[4] A61M 37/00
U.S. Cl. 604—131 20 Claims

1. An intravenous fluid infusion device for infusing a fluid into a patient at a controlled flow rate, comprising:
a cylindrical houding unit;
an outlet tubing in fluid communication with said housing unit;
a syringe housing disposed partially within said housing unit;
a syringe plunger disposed at least partially within said syringe housing;
a control unit disposed within said housing unit and providing fluid communication between said syringe housing and said tubing; and
an elastomeric member means extending radially outwards of said housing unit and said syringe housing and further extending from the proximal end of said housing unit to the distal end of said syringe plunger, said elastomeric member means being for providing a longitudinal force of

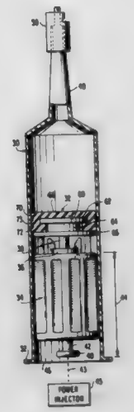


preselected varying magnitude over time between said housing unit and said syringe plunger.

4,636,198
POWER SYRINGE WITH VOLUME REDUCING ADAPTER

John H. Stade, Ferguson, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Nov. 18, 1985, Ser. No. 799,314
Int. Cl.[4] A61M 37/00
U.S. Cl. 604—154 4 Claims

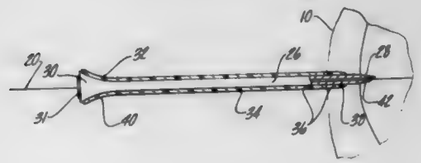


1. A plastic syringe for a power injector comprising:
a syringe barrel having a nozzle at one end and being open at the other end;
a piston slidable within the barrel and having a backer plate and an elastomeric seal cap secured over front and side edge portions of the backer plate for sealing the open end of the barrel and for expressing contents from the barrel through the nozzle upon sliding movement toward the nozzle;
said backer plate having a machine grippable protrusion formed on a rear side of the backer plate for enabling the backer plate to be gripped by piston engaging and driving means of a power injection machine;
said barrel and said piston, when at a machine gripping position in the barrel, designed to hold a first predetermined volume of liquid for injection;
an adapter for being inserted into the open end of the barrel and having means, on a forward end thereof, for engaging the rearside of the backer plate and for gripping the backer plate protrusion; and
said adapter having a machine grippable protrusion formed on a rearside of the backer plate for enabling the backer plate to be gripped by the piston engaging and driving means of the power injection machine, and having a length along the barrel axis selected so that, when the adapter protrusion is in a machine gripping position, the volume defined by the barrel and the piston is a second predetermined volume which is substantially less than the first predetermined volume.

4,636,199
DEVICE FOR INSERTING A CATHETER WITHIN THE INTERCOSTAL SPACE

Lyle D. Victor, 18181 Oakwood Blvd., Dearborn, Mich. 48124

Filed Jul. 9, 1984, Ser. No. 628,792
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—164 2 Claims



1. A surgical kit for draining fluid from the intercostal cavity of a human comprising:
a syringe having a plunger and a hollow needle, said needle being insertable into the intercostal space so that upon retraction of said syringe plunger, a sample of fluid within the intercostal space is withdrawn into the syringe,
an elongated guide wire, one end of said guide wire being insertable through said hollow needle and into said intercostal space and said needle thereafter being removed, an elongated trocar having a pointed end and an outwardly flared portion at its other end, said trocar having a uniform crossectional shape between its pointed end and its outwardly flared portion, said trocar having an axial passageway from said pointed end and to said other end, said passageway being dimensioned to slidably receive the guide wire therethrough,
an elongated hollow catheter, said catheter being open on one end and outwardly flared at its other end, said catheter having a throughbore of uniform shape between its open end and other end, said catheter being dimensioned to receive said trocar therethrough so that the pointed end of the trocar protrudes outwardly from said open end of the catheter,
wherein said catheter throughbore is of a complementary size and shape to said trocar so that with said trocar positioned through said catheter, the catheter snugly fits over the trocar so that substantially the entire periphery of the catheter throughbore is in abutment with the trocar, and
wherein said trocar includes a hand engagement surface at its other end adapted to be pushed and thereby simultaneously move said trocar and said catheter into the intercostal space, said hand engagement surface having an area substantially greater than a crossectional area of a midpoint of said trocar.

4,636,200
INTUBATING DEVICE

Vincent L. Vaillancourt, Livingston, N.J., assignor to Chesebrough-Pond's Inc., Greenwich, Conn.

Filed Sep. 17, 1985, Ser. No. 776,774
Int. Cl.[4] A61M 25/00
U.S. Cl. 604—170 3 Claims



1. An intubating device permitting aspiration of gastric juices to determine proper positioning of the device having a stylet which can be positioned within a human patient without removal of the stylet comprising:
a. a tube connector having connected at one end thereof a flexible feeding tube for conveying liquid nourishment to the patient and having an opening at the other end;
b. a stylet holder having a circular flange portion extending from the stylet holder for hand manipulation of the stylet holder and an opening at one end of the stylet holder for receipt of a supply of liquid nourishment;
c. a hub at the other end of said stylet holder extending from said circular flange;
d. a blind hole in said hub extending from the end of said hub towards said circular flange, said hole being offset from the center of said hub;
e. a fluid passageway extending through said stylet holder;
f. a metal stylet fixedly embedded in said blind hole and extending therefrom and forming a one-piece unit with said hub;
g. said stylet holder and stylet adapted to be positioned in telescoping relationship with said tube connector and said feeding tube with the fluid passageway unobstructed by said stylet;
h. whereby when the intubating device is initially positioned an aspiration process can be accomplished through the unobstructed fluid passageway and after the device is properly positioned liquid nourishment can flow unobstructed through said passageway.

4,636,201
HYPODERMIC SYRINGE HAVING A PROTECTIVE SHEATH COVER

William A. Ambrose, Crystal Lake, and Fernando A. Garcia, Vernon Hills, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Nov. 1, 1985, Ser. No. 793,878
Int. Cl.[4] A61M 5/32
U.S. Cl. 604—192 8 Claims



1. A rigid sheath cover adapted to be placed over a hypodermic syringe needle cover, the sheath cover comprising:
a hollow tubular body having a closed end and an opposing open end;
a plurality of spaced teeth projecting outwardly from the tubular body to form the open end;
the sheath cover being substantially coextensive in length with the length of the needle cover;

a lip on the end of at least two of the teeth projecting inwardly toward the center of the opening in the open end formed by the projecting teeth;

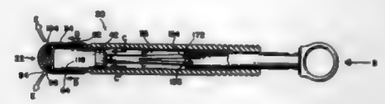
said spaced teeth and lips being adapted to grip the needle cover when the sheath is placed over the needle cover whereby the needle cover is removed together with the sheath when the sheath is removed from the hypodermic syringe and is retained within the sheath when the sheath and needle cover are replaced on the syringe.

4,636,202

MEDICAMENT APPLICATOR WITH PLUNGER ASSEMBLY AND AUTOMATICALLY-OPENABLE CLOSURE THEREFOR

David A. Lowin, Woodside; Richard A. Fayram, Palo Alto, and Andrew J. Bivetto, Los Gatos, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 27, 1984, Ser. No. 635,334
Int. Cl.⁴ A61M *31/00*
U.S. Cl. 604—236 **30 Claims**



1. A telescoping rod assembly for prefilled syringes, medicament applicators and the like, said telescoping rod assembly comprising:

a first rod member comprising:

a first portion having a continuous circumferential surface, and

a second portion comprising two forks extending from said first portion at an angle;

a second rod member slidingly associated with said first rod member; and

engaging means comprising reciprocal protruding and receding portions,

said receding portion of said engaging means being disposed inwardly from an outwardly facing surface of said second portion of said first rod member, and

said protruding portion of said engaging means being disposed on said second rod member;

said forks being adapted to spring outward upon alignment of said protruding portion with said receding portion to lock said engaging means.

4,636,203

EARLOBE TREATMENT APPARATUS

Russell B. Emanis, 219 Countryside Dr., Arlington, Tex. 76014; Don L. Wallace, 2218 Skybark Dr., Arlington, Tex. 76010; Travis W. Wolfe, 614 Hill City Dr., Duncanville, Tex. 75116, and Waverly B. Emanis, 1512 Arbor Town Cir., #517, Arlington, Tex. 76011

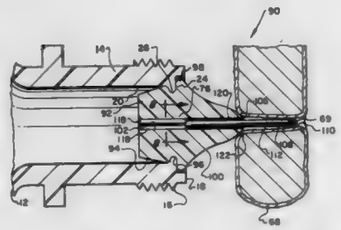
Continuation-in-part of Ser. No. 567,795, Jan. 3, 1984, abandoned. This application May 11, 1984, Ser. No. 609,469
Int. Cl.⁴ A61M *5/185*
U.S. Cl. 604—257 **4 Claims**

1. Apparatus for treating an earlobe which has been pierced to form an ear ornament posthole, said apparatus comprising:

a container having a flexible sidewall responsive to a squeezing action to dispense a liquid cleaning solution from an interior chamber formed by said container;

a plug member closing one end of said container, said plug member having a projection forming a generally conical exterior surface and delimited by an apex and a bore extending through said plug member from said apex and opening into said chamber;

an solid elongated probe member having a generally solid cylindrical shank portion and being supported at one end in said bore in said plug member by means forming a plurality of radially projecting bosses extending in said bore, said probe member having a distal end insertable in said posthole, said probe member including liquid conducting passage means formed between said bosses and said plug member and between said shank portion and said



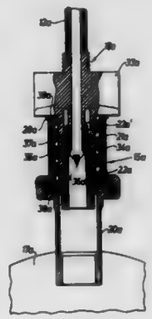
probe member within said bore for dispensing said solution into said posthole when said probe member is inserted therein, said projection being engageable with said earlobe around said posthole to form a seal to prevent leakage of said solution entering said posthole around said probe member.

4,636,204

COUPLING FOR THE CONNECTION OF FLEXIBLE TUBES AND THE LIKE

Kjell H. Christopherson; Tomas Odelius, both of Staffanstorp, Sweden; Friedrich Rosemeier, Hechingen, Fed. Rep. of Germany; Kaj O. Stenberg, Staffanstorp; Tommy E. Svensson, Lund, both of Sweden, and Horst Killmaier, Hechingen-Boll, Fed. Rep. of Germany, assignors to Gambro Lundia AB, Sweden

Continuation of Ser. No. 484,197, Apr. 12, 1983, abandoned. This application Jun. 7, 1985, Ser. No. 742,148
Claims priority, application Sweden, Apr. 13, 1982, 8202290
Int. Cl.⁴ A61M *25/00*
U.S. Cl. 604—283 **39 Claims**



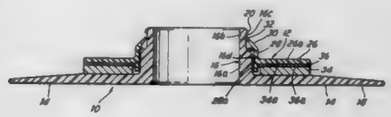
1. A coupling member including a first end, a second end, and a connecting passageway therebetween, said first end of said coupling member being adapted for connection with a mating member connected to a first conduit, and said second end of said coupling member being adapted for connection with a second conduit, whereby said coupling member can be used to couple together said first and second conduits so as to provide for the flow of fluid therebetween, said coupling member comprising an outer substantially cylindrical coupling component which is thermally resistant, and an inner coupling component rigidly affixed to said outer coupling component, said inner coupling component being thinner and more flexible than said outer coupling component and including a substantially cylindrical portion concentrically disposed within said outer coupling component and including an outer surface, an inner surface defining a central passageway, and a penetrable first membrane sealing said central passageway and integral with said cylindrical portion, said cylindrical portion further including a first end corresponding to said first end of said coupling member, and a second end corresponding to said second end of said coupling member, thereby providing an annular space between said outer coupling component and said inner coupling component, with said first end of said inner coupling component being recessed within said first end of said coupling member, whereby said inner coupling component is protected from inadvertent contact thereby, and can withstand autoclaving so that it may be sterilized prior to use and remain substantially sterile thereafter, and said inner coupling component further including a second membrane portion separating said central passageway from said annular space, said second membrane portion being sufficiently thin so that steam can diffuse through said membrane in order to sterilize said annular space between said outer coupling component and said inner coupling component.

4,636,205

OSTOMY BAG MAGNETIC COUPLING

Peter L. Steer, Surrey, England, assignor to Craig Medical Products Limited, Surrey, England

Filed Oct. 11, 1984, Ser. No. 659,936
Claims priority, application United Kingdom, Oct. 13, 1983, 8327469
Int. Cl.⁴ A61F *5/44*
U.S. Cl. 604—338 **6 Claims**



1. A coupling for joining an ostomy bag to a pad or face plate comprising:

a body-side coupling part having a radially extending substantially planar annular surface and a tubular portion which extends away from the body of the wearer, said tubular portion comprising a thicker wall portion connected to a thinner wall portion; and

a bag-side coupling part having a tubular portion which is adapted for mating engagement with and fits over said body-side tubular portion and a radially extending substantially planar annular surface which is held together with said body-side annular surface by a magnetic sheet means providing magnetic forces when said coupling parts are matingly engaged, said bag-side coupling part further comprising a flexible sealing skirt coupled to said bag-side tubular portion and extending inwardly to engage the thinner wall portion of said body-side tubular portion, said thinner wall portion comprising a projection means over which the flexible sealing strip is deflected when the coupling parts are engaged for providing mechanical security against inadvertent disassembly of the coupling parts, whereby a liquid seal is provided.

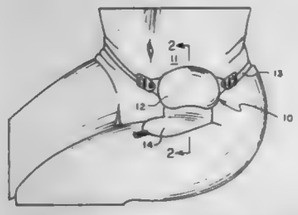
4,636,206

UROSTOMY GUARD

Richard M. Ederati, 92 Rickard Dr., East, Oswego, Ill. 60543, and Henry J. Perez, 353 Sunset Ave., Aurora, Ill. 60506

Filed Jun. 27, 1985, Ser. No. 749,462
Int. Cl.⁴ A61F *5/44*
U.S. Cl. 604—340 **6 Claims**

1. A guard to protect an ostomy pouch of the type including a collection bag connected to a flange, the flange having means for adhesively securing the pouch to the abdomen of an ostomy patient for receiving discharges from the stoma, comprising a unitary body having a generally concave inner surface and a peripheral edge, the body defining a major plane oriented horizontally when the guard is in use and a minor plane oriented at rights angles thereto, the body being substantially symmetrical about the minor plane, a first portion of said peripheral edge defining an arc lying above said major horizontal plane and a pair of lobes lying below said major plane and further defining a vertical plane passing tangentially to inner surface portions of said lobes, a second portion of said



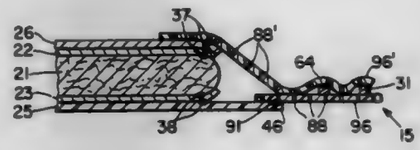
edge defining a second arc curved generally inwardly of said guard toward said major horizontal plane and interconnecting said pair of lobes, said first edge portion configured to define a third arc curving generally outwardly of said vertical plane, whereby when the guard is in use with an ostomy pouch said first portion of said peripheral edge provides a seal with the surface of the abdomen of an ostomy patient, the inner surface of the guard is spaced from the pouch at the connection of the flange to the abdomen and the second portion of the peripheral edge is spaced from the abdomen defining an opening through which a portion of the pouch extends.

4,636,207

DISPOSABLE GARMENT WITH BREATHABLE LEG CUFFS

Kenneth B. Buell, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 441,825, Nov. 15, 1982, abandoned. This application Aug. 11, 1983, Ser. No. 522,438
Int. Cl.⁴ A61F *13/16*
U.S. Cl. 604—370 **3 Claims**



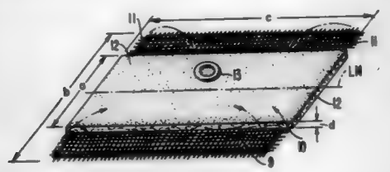
1. A disposable diaper comprising a liquid permeable topsheet, a liquid impermeable backsheet, and an absorbent element interposed therebetween; said diaper having two lateral end margins and two longitudinal side margins; said longitudinal side margins being contoured in that said side margins are non-linear over at least a portion of their respective lengths; said diaper further having two longitudinally extending cuffs adapted to contact the legs of a wearer when said diaper is in use; each of said cuffs comprising at least a portion of one of said longitudinal side margins; each of said cuffs having been rendered elastically contractable by the association therewith of elastic means affixed to said diaper; wherein each of said cuffs is permeable to vapor over at least a portion of its extent, each of said cuffs comprises at least one separate element affixed to said diaper, each of said cuffs comprises at least one portion permeable to vapor and at least one portion impermeable to vapor; and wherein in each cuff at least one portion permeable to vapor is intermediate the distal edge of said cuff and said adsorbent element and at least one portion imperme-

able to vapor is intermediate said portion permeable to vapor and said absorbent element, and the portion permeable to vapor comprises from about 5% to about 75% of said cuff.

4,636,208
SURGICAL SPONGE

Ewald Rath, Geranienstr. 5, 5600 Wuppertal 21, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 699,167
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1984, 3436471; Jan. 12, 1985, 3500842
Int. Cl.[4] A47L *17/08*
U.S. Cl. 604—378 13 Claims

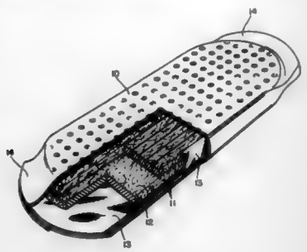


1. A ball-shaped surgical sponge for medical purposes, the surgical sponge comprising a bulbous jacket of at least two superimposed inside and outside lying separate cuts of substantially the same length, of which the outside lying cut is of a gauze material,
the superimposed cuts having their edge portions gathered together to form a constricted tubular neck,
said tubular neck being turned radially inwardly of the jacket and forming a filling core of the sponge,
a rubber ring disposed interiorly of the jacket and contracted onto the inturned neck thereof retaining it in the constricted inturned position,
wherein said inside lying cut consists of a soft flat fleece of high absorbency, whereby the bulbous jacket as well as the filling core are each made up of gauze and of fleece material, and wherein said rubber ring is upholstered at its outer side by the soft fleece material.

4,636,209
SANITARY NAPKIN WITH FLUID TRANSFER LAYER

Frederick O. Lassen, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 472,708, Mar. 7, 1983, abandoned. This application Jul. 12, 1985, Ser. No. 754,804
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—378 3 Claims

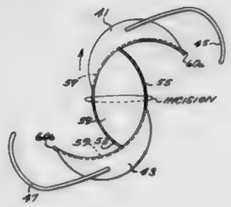


1. A sanitary napkin comprising:
a fluid permeable cover enclosing a multilayer fluid absorbent pad, said cover having a top side and a bottom side, said cover top side being placed adjacent a human body in use,
said multilayer pad having a first layer of absorbent material adjacent said cover top side, and a second layer of absorbent material adjacent said first layer, said napkin having a longitudinal axis,
said first layer formed from a planar web containing between about 60% and 80% by weight thermoplastic functional fibers to prevent capillary collapse of this layer, and at least about 20% by weight of hydrophilic absorbent material to draw fluid through said cover, wherein said planar web has a plane of deposition with fibers oriented in the X and Y direction of the plane of the web, and said first layer is comprised of a plurality of elongated portions cut from said web which are rotated 90° from said plane of deposition so at least some fibers are in the Z direction of said napkin and arranged side-by-side generally along said napkin longitudinal axis to yield said first layer,
said first layer transferring fluid rapidly from said cover into said second layer with minimum fluid absorption until said second layer has exceeded about 50% of its absorbent capacity.

4,636,210
MULTI-PART INTRAOCULAR LENS AND METHOD OF IMPLANTING IT IN AN EYE

Kenneth J. Hoffer, 1407 Georgina Ave., Santa Monica, Calif. 90402

Filed Dec. 9, 1985, Ser. No. 806,542
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6 20 Claims



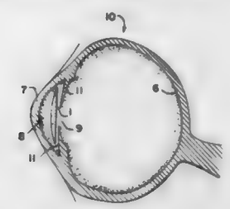
1. An intraocular lens comprising:
a plurality of lens segments; and
lens guiding means for slidably attaching said plurality of lens segments to each other, such that said lens segments are slidable between a retracted orientation, in which said lens segments cooperate to form an optical lens having a first predetermined transverse width, and an extended orientation, in which said lens segments have a second predetermined transverse width, substantially less than the first predetermined transverse width;
wherein when said lens segments are positioned in the extended orientation, they are insertable into an eye through an incision having a length that is less than the first predetermined transverse width of said lens, after which the lens segments can be slid to the retracted orientation for proper positioning within the eye.

4,636,211
BIFOCAL INTRA-OCULAR LENS

J. McHenry Nielsen, 2339 Sunset Point Rd., Clearwater, Fla. 33575, and Wayne G. Miller, 6375 Lane Rd., Sarasota, Fla. 33580

Filed Mar. 13, 1984, Ser. No. 588,926
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6 1 Claim

1. An intra-ocular lens adapted to be implanted in a human eye comprising
a transparent single one-piece lens body, the transparent body having a permanently fixed centrally located, near vision optically powered first portion and a concentrically located, far vision optically powered second portion, the first portion having an average diameter of approximately 2.12 mm and the body having an average diameter of approximately 6 mm, the first portion being optically powered within the range of from +10.00 to +30.00 diopters effective power and the second portion being optically powered within the range of from +10.00 to



+30.00 diopters effective power, the difference in effective power between the first and second portions averaging +2.50 diopters effective power in order to ensure distinction in focus and to provide rapid neuro-transfer between near and far vision.

4,636,212
ULTRAVIOLET RADIATION ABSORBING INTRAOCULAR LENS

Thomas Posin, Walnut, and Daniel D. Lawson, Arcadia, both of Calif., assignors to Optical Radiation Corporation, Azusa, Calif.

Continuation-in-part of Ser. No. 376,666, May 10, 1982, abandoned. This application Mar. 18, 1985, Ser. No. 713,014
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6 6 Claims



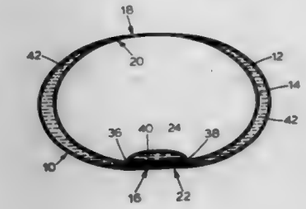
1. A method for forming an intraocular lens comprising the steps of:
(a) co-polymerizing a polymerizable derivative of dihydroxybenzophenone and methyl methacrylate monomer to form a solid ultraviolet radiation absorbing co-polymer additive;
(b) dissolving the ultraviolet radiation absorbing co-polymer additive in methyl methacrylate monomer to thereby form a prepolymer solution;
(c) curing the prepolymer solution in a mold to thereby form an intraocular lens comprising the ultraviolet radiation absorbing co-polymer additive physically trapped within a polymethylmethacrylate polymer matrix.

4,636,213
IMPLANTABLE PROSTHESIS

Anthony I. Pakiam, 3200 University, Des Moines, Iowa 50311

Filed Jan. 24, 1985, Ser. No. 694,651
Int. Cl.[4] A61F *2/12*
U.S. Cl. 623—8 10 Claims

1. A prosthesis for permanent implantation in a body cavity, comprising:
a closed flexible envelope of medical grade elastomer for containing selected materials defining an anterior area for orientation towards the outer skin surface and an opposed posterior area,
a self-sealing valve fixedly disposed on the inner surface of said anterior area and adapted to be pierced by a hypodermic needle after implantation of said prosthesis,
a band of radiopaque material circumscribing said valve so that the precise perimeter of said valve can be delineated by means of X-ray and by means of ultrasound,



a pair of opposed half-shell shaped members of medical grade elastomer disposed within said envelope,
each one of said members secured at one end to the posterior area of said envelope and secured at its other end to a portion of the perimeter of said valve to form a compartment in said envelope in registration with said valve defining the material receiving area of said envelope and further forming respective chambers intermediate said respective members and said envelope, and
a lubricating gel disposed in each chamber.

4,636,214
IMPLANTATION OF ARTICULATING JOINT PROSTHESIS

Charles A. Homsy, 11526 Raintree Cir., Houston, Tex. 77024

Continuation of Ser. No. 476,117, Mar. 17, 1983, abandoned, Continuation-in-part of Ser. No. 369,731, Apr. 19, 1982, abandoned. This application Oct. 17, 1985, Ser. No. 788,421
Int. Cl.[4] A61F *2/28*
U.S. Cl. 623—16 4 Claims



1. A method of surgical orthopedic implantation of an intramedullary prosthesis device having an elongate stem with distal and proximate ends into the medullary canal of a long bone defined by the cortex of a long bone and comprising the steps of:
forming in said medullary canal a stem socket;
sizing the stem socket with an appropriately sized tool to form a socket defined substantially by the inner periphery of compact bone formed by cortical or dense cancellous bone, said stem having transverse sectional dimensions along substantially its entire length which are undersized with respect to adjacent corresponding transverse sectional dimensions of said stem socket;

then injecting bone cement in the completed stem socket; and

finally pushing said stem into said stem socket with said bone cement therein surrounding the stem for its entire length including its distal and proximate ends whereby said cement forms a liner around the outer surface of said stem between the stem and the adjacent compact bone, the transverse sectional dimensions of the liner and stem constituting at least around seventy percent (70%) of the corresponding transverse sectional dimensions of the long bone defined by cortical bone or metaphyseal and epiphyseal segments of said long bone, and at least around ninety percent (90%) of the corresponding transverse sectional dimensions of the long bone defined by cortical bone of the diaphyseal segment of said long bone.

4,636,215

COMBINATION TRAY AND CONDYLAR PROSTHESIS FOR MANDIBULAR RECONSTRUCTION AND THE LIKE

Harry C. Schwartz, Granada Hills, Calif., assignor to REI, Inc., Torrance, Calif.

Filed Jan. 11, 1984, Ser. No. 569,912
Int. Cl.⁴ A61F *2/28*
U.S. Cl. 623—16 **17 Claims**



1. A device for reconstruction of bone, and for osteogenesis, employing cancellous bone chips and marrow, comprising:

a flexible tray, made of a urethane coated plastic material, shaped approximately in the form of the bone to be reconstructed, adapted to hold said cancellous bone chips and marrow, and having openings allowing tissue ingrowth into all portions of the tray; and

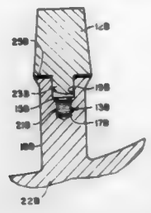
at least one plastic simulated condyle, integrally affixed to one end of said flexible tray.

4,636,216

DENTAL IMPLANT

O. Hilt Tatum, 2299 - 9th Ave. North, St. Petersberg, Fla. 33713

Continuation-in-part of Ser. No. 428,920, Sep. 30, 1982, Pat. No. 4,511,335. This application Mar. 4, 1985, Ser. No. 707,811
The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.
Int. Cl.⁴ A61F *2/28*; A16C *8/00*
U.S. Cl. 623—16 **11 Claims**



1. An endosseous implant for permanent implantation within a groove formed in the posterior alveolar process of the mandible of a patient's mouth, comprising in combination:

a supporting head for supporting a crown portion of an artificial tooth, said supporting head having a substantially horizontal top surface and a base portion;

a stud rigidly connected to and depending from said supporting head;

a constricted neck portion disposed adjacent to said base portion for supporting said supporting head;

said neck portion defining a hole which threadably engages said stud for securing said supporting head relative to said neck portion;

an apertured blade portion disposed adjacent to said neck portion such that said neck portion connects together said supporting head relative to said blade portion;

said blade portion including a lingual face and a buccal face;

said blade portion including a mesial portion and an adjoining distal portion;

said neck portion being disposed adjacent the juncture of said mesial portion with said distal portion;

said mesial portion including a substantially blunt mesial edge;

said distal portion including a distal edge of pointed configurations; and

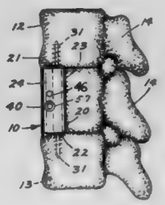
said distal portion defining a curvature which curves laterally away from the longitudinal axis of said mesial portion for conforming to the shape of the mandible of the patient's mouth.

4,636,217

ANTERIOR SPINAL IMPLANT

James W. Ogilvie, Edina, Minn., and Frank R. Ogilvie, Leavenworth, Wash., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Apr. 23, 1985, Ser. No. 726,134
Int. Cl.⁴ A61F *2/44*
U.S. Cl. 623—17 **13 Claims**



1. An implantable prosthesis for replacement of a vertebral bone portion comprising;

a body of size to fit within a void left by removal of a vertebral portion from a spinal column of a patient, said body having a first axis positioned to generally align with the direction of extension of a spinal column in which the body is to be inserted and having generally planar end surfaces transverse to the axis at opposite ends of the body;

at least two bore means in said body, at least one bore means extending in each direction of said axis;

a separate self tapping bone screw in each bore means, said screws being threadably engaged with a portion of the bore means so that each screw will be selectively extended or retracted relative to one of the end surfaces of said body upon rotation of such screw; and

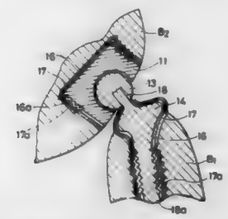
drive means for rotation of each of said screws in its respective bore means, said drive means being positioned to be accessible from a lateral side of the body when the body is placed into a void between two adjacent vertebrae sections, said drive means being actuable to thread the screws through the respective bore means to tap into the bone adjacent opposite end surfaces, to secure the body in place.

4,636,218

ARTIFICIAL ARTICULATION

Isamu Fukuura, and Shigeo Niwa, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Mar. 18, 1983, Ser. No. 476,757
Claims priority, application Japan, Mar. 19, 1982, 57-45372
Int. Cl.⁴ A61F *2/30*
U.S. Cl. 623—18 **17 Claims**



1. A biocompatible artificial articulation prosthesis including an acetabular socket consisting essentially of polycrystal alumina porcelain wherein said socket having formed therein a special inner surface to be pivotally coupled to with a femoral ball member, said femoral member consisting essentially of dense silicon nutride porcelain;

a stem adapted to be inserted into a prepared medullary cavity and being connected to, at one end thereof, said femoral ball member, said stem consisting of partially stabilized zirconia porcelain;

said prosthesis further including a first layer disposed over an outer surface of said stem and an outer surface of said socket and a second layer disposed over said first layer wherein said first layer and second layer consist essentially of oxidized alkaline metal-phosphoric and anhydride frit and calcium phosphate, respectively.

4,636,219

PROSTHESIS DEVICE FABRICATION

Clyde R. Pratt, Somis; Roger G. Carignan; Charles M. Raggio, both of Camarillo, and Chuck P. Wozniek, Oxnard, all of Calif., assignors to Technedica, Inc., Camarillo, Calif.

Filed Dec. 5, 1985, Ser. No. 804,927
Int. Cl.⁴ A61F *1/24*
U.S. Cl. 623—22 **16 Claims**



4. A process for fabricating a biocompatible mesh screen structure for bonding to a prosthetic substrate, the processing comprising:

(a) providing from four to eight layers of a mesh comprising a titanium alloy; and

(b) subjecting the layered structure to a processing temperature below the beta-transformation temperature of said alloy and a pressure of about 1300 to 1500 psi for a period of time of about 12 to 24 min, the heating and pressing being carried out in a furnace maintained at a temperature ranging from about 1600° to 1725° F., depending upon the alloy, said furnace evacuated to provide a vacuum of less than about 10^{-4} torr.

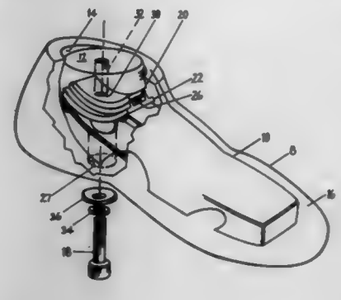
11. Product produced by the process of claim 4.

4,636,220

ADJUSTABLE PROSTHETIC FOOT

Harold R. Ziegelmeyer, Medford, Oreg., assignor to John W. Campbell, Medford, Oreg.

Filed Jan. 14, 1986, Ser. No. 818,768
Int. Cl.⁴ A61F *2/66*
U.S. Cl. 623—53 **4 Claims**



1. In a heel height adjusting arrangement for a prosthetic foot, the combination of

a prosthetic foot having a cavity at the rear end of the foot,

a bolt block disposed in the cavity,

interfitting means for varying the physical position of the bolt block in the cavity whereby the heel height of the prosthetic foot may be varied by the wearer of the foot, and

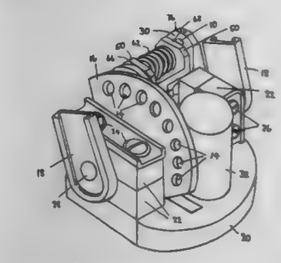
said interfitting means including means for locking the bolt block within the cavity in a determined fixed position when the foot is in use, said locking means comprising interfitting rails and grooves on the prosthetic foot and bolt block respectively, to provide locking engagement between the bolt block and the foot.

4,636,221

ELBOW LOCK MECHANISM

Martin Kemp, Aldershot, England, assignor to Hugh Steeper Limited, London, England

Filed Mar. 12, 1985, Ser. No. 710,917
Claims priority, application United Kingdom, Mar. 16, 1984, 8406928
Int. Cl.⁴ A61F *2/54*
U.S. Cl. 623—59 **5 Claims**



1. An elbow lock mechanism for use in artificial arms, comprising a carriage support and a carriage movable thereon between a first position and a second position, electric drive means including an electric motor and a shaft rotatably sup-

ported in a bearing, a disc capping the shaft, a crank-pin on the disc and a roller on the crank-pin, a transverse recess in the carriage arranged to receive the roller in a snug fashion so that rotation of the shaft by the electric motor causes the carriage to move on the carriage support, a locking bolt mounted for axial movement on the carriage to enter and withdraw from a locking aperture in a bolt-receiving member, and a spring on the carriage to urge the bolt into locking engagement with the bolt-receiving member when the carriage is in the first position and to urge the bolt into a disengaged position with respect to the bolt-receiving member when the carriage is in the second position, the movement of the carriage on the carriage support being in a direction substantially parallel to the longitudinal axis of the locking bolt.

4,636,222

ENZYMATIC UNHAIRING METHOD

Ernst Pfleiderer, Darmstadt-Arheilgen; Tilman Taeger, Griesheim, and Gertrud Wick, Weiterstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jul. 30, 1985, Ser. No. 760,556

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1984, 3429047

Int. Cl.⁴ C14C *1/06*

U.S. Cl. 8—94.16 8 Claims

1. An enzymatic method for the unhairing of hides and skins in the alkaline pH range, which comprises treating soaked hides and skins for a period of 12 to 36 hours at a pH range from 9 to 11, with a proteolytic enzyme having an optimum activity in the pH range of from 2 to 7.5 and then unhairing, said enzyme being used at a proportion from 2 to 10 m U_{H6} per gram of salted or dried hides and skins said enzyme being the sole active unhairing agent.

4,636,223

HEAT TRANSFER PRINTING OF NATURAL SILK SUBSTRATES

Wolfgang Mehl, Geneva, and Albert Amon, Lausanne, both of Switzerland, assignors to Sicpa Holding S.A., Switzerland

Filed Apr. 4, 1985, Ser. No. 719,498

Claims priority, application European Pat. Off., Apr. 12, 1984, 84810182.0

Int. Cl.⁴ B41M *5/02;* D06L *3/12*

U.S. Cl. 8—471 6 Claims

1. A method for the printing of textile materials at least partially consisting of natural silk fibers, by the heat transfer printing process at a temperature selected in the range of from about 170° to about 230° C.in the absence of a vacuum or a carrier gas or both, using a transfer sheet carrying at least one dyestuff to be heat transferred to said textile material, wherein said method comprises impregnating said textile material, prior to said heat transfer printing, with a dry impregnating composition containing an impregnating agent capable of improving the affinity of the said silk fiber to dyestuffs, said impregnating agent being selected from colorless, nitrogen containing, organic substances which are solid below 60° C. and liquid in the temperature range of from about 60° to about 200° C., and which exert in their liquid state but not in their solid state a solvatation power on the dyestuffs used wherein said impregnating agent is selected from ϵ-caprolactam, nicotinamide, isonicotinamide, propylene urea, ethylene urea, glyoxal monourein, urea, 5,5-dimethyl hydantoin, imidazole, 2-methyl imidazole, N-methyl pyrrolidone, N-hydroxy succinic amide, and mixtures thereof.

4,636,224

AMMONIUM LIGNOSULFONATES

Peter Dilling, Isle of Palms, S.C., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 679,901, Dec. 10, 1984, abandoned. This application Oct. 21, 1985, Ser. No. 789,318

Int. Cl.⁴ C09B *62/02, 62/44*

U.S. Cl. 8—547 7 Claims

1. A dyestuff composition comprising a dye and as an additive therein an ammonium salt of a low-electrolyte containing sulfomethylated lignin having about one mole or less sulfonation per 1,000 grams of lignin, an inorganic electrolyte content in an aqueous medium of from about 0.5 to 3.0% by weight based on the dry weight of the lignin, and having a pH value of about 7.0.

4,636,225

DRYING OF GASES WITH MULTI-LAYER ADSORPTION BEDS

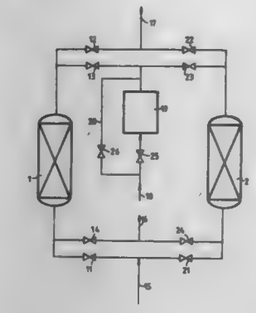
Guenter Klein, Neuried, and Hans-Juergen Wernicke, Geretsried, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Mar. 22, 1985, Ser. No. 714,736

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410815

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—31 18 Claims



1. In a process for drying a gaseous stream wherein the gaseous stream is fed, during an adsorption phase, to the inlet end of an adsorber and, after passing through an adsorption bed, the dried gaseous stream is withdrawn from the outlet end of the adsorber, and wherein, after termination of the adsorption phase, a regenerating gas introduced via the outlet end of the adsorber is passed through the adsorber at a sufficiently elevated temperature to desorb H_2O, and regenerating gas loaded with desorbed steam is withdrawn from the adsorber, said gaseous stream containing at least one compound tending to polymerize under the regenerating conditions of the adsorption process,

the improvement wherein the adsorption bed is subdivided into at least two layers containing differing adsorbents, passing the gaseous stream through a first layer of adsorbent, said first layer selective for the adsorption of water, and then through a second layer of adsorbent also selective for water, the second layer traversed by the gaseous stream consisting essentially of an adsorbent having a lower adsorption capacity for said at least one polymerizible compound than the first layer.

4,636,226

HIGH PRESSURE OXYGEN PRODUCTION SYSTEM

Philip H. Canfora, Norton, Ohio, assignor to VBM Corporation, Louisville, Ky.

Filed Aug. 26, 1985, Ser. No. 769,479

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—68 18 Claims

1. A method of supplying a selected gaseous component at a first relatively high pressure, the method comprising:

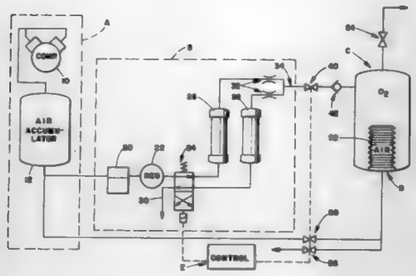
supplying a gaseous mixture at a second, relatively high pressure;

separating the selected gaseous component from the mixture and supplying the separated, selected gaseous component to a separated gas reservoir at a first, relatively low pressure;

after receiving the selected gaseous component in the reservoir, contracting the effective volume of the gaseous reservoir under motive force supplied by the gaseous mixture such that the pressure of the selected gaseous component is increased to the first relatively high pressure;

removing the motive force of the gaseous mixture allowing

the effective volume of the gaseous reservoir to expand and the pressure of the gaseous component therein to decrease such that additional selected gaseous component at the first, relatively low pressure is received therein;

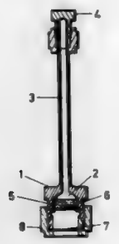


cyclically repeating the effective volume contracting and expanding steps such that the pressure of the selected gaseous component is cyclically increased to the first relatively high pressure.

4,636,227
MONITORING BY ADSORPTION

Candido C. Yin, Llanbradoch, and Graham L. Matthews, Cardiff, both of United Kingdom, assignors to Coal Industry (Patents) Limited, London, England

Filed Dec. 17, 1984, Ser. No. 682,174
Claims priority, application United Kingdom, Jan. 27, 1984, 8400258
Int. Cl.⁴ B01D *53/04*
U.S. Cl. 55—74 **10 Claims**



1. A passive monitor capable of accuracy in measuring $ppm \times 10^{-3}$ concentrations of organic vapours in an atmosphere, comprising a charge of adsorbent contained in an adsorbent holder, said adsorbent holder having a first sampling chamber and a second desorption chamber interconnected and arranged such that the charge of adsorbent may be positioned in the first chamber wherein it is exposed to the atmosphere and adsorbs any organic contaminants and at the end of a predetermined sampling time may be transferred without handling to the second chamber in which the adsorbent may be treated to desorb the organic contaminants so they are removed from the holder for analysis, the first chamber having a larger cross-sectional area than the second chamber.

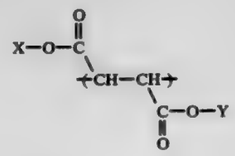
4,636,228
Patent Not Issued For This Number

4,636,229
SELECTIVE GAS SEPARATION MEMBRANE

Hiroyuki Itoi; Ko Sakata, both of Kawasaki, and Hirosuke Imai, Yokohama, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Mar. 14, 1985, Ser. No. 712,001
Claims priority, application Japan, Mar. 26, 1984, 59-56285; Feb. 13, 1985, 60-24507
Int. Cl.⁴ B01D *53/22*
U.S. Cl. 55—158 **16 Claims**

1. A selective gas separation membrane comprising a fumaric diester polymer having a repeating unit represented by the following general formula (1):



(1)

wherein X and Y are each independently an alkyl, cycloalkyl, aryl, trialkylsilylalkyl or siloxane-containing alkyl group.

4,636,230
APPARATUS FOR AIR COMPRESSING AND DUST COLLECTING

Tzeng-Yuan Fan, No. 123, Sec.5, Yen Ping N. Road, Taipei, Taiwan

Filed Dec. 6, 1985, Ser. No. 805,723
Int. Cl.⁴ B01D *47/02*; A47L *9/12*
U.S. Cl. 55—274 **1 Claim**

1. An apparatus for air compressing and dust collecting comprising:

a housing capable of being separated into a pair of half parts, the housing being provided at the top with a handle, a pressure gauge being disposed on the housing and located below the handle;

a front cover being secured to the front end of the housing by means of fastening means, the front cover being furnished with an inlet through which the dust can be sucked into a container disposed in the housing;

a rubber piece being disposed on the inner side of the inlet of the front cover;

a frame having a filter covered thereon being disposed in the front cover;

an annular washer being located between the frame and the front wall of the housing;

a motor provided with a shaft being disposed in the housing;

a hexagonal sleeve being secured to the first end of the shaft;

a first clutch having a hexagonal hole formed on the center thereof being slidably mounted on the hexagonal sleeve, the clutch being provided at one end with a toothed portion and at the other end with a slot;

a sleeve being jointed at one end with a propeller and provided at the other end with a toothed portion which is arranged to mesh in the toothed portion of the first clutch, the sleeve with the propeller disposed therein being loosely mounted on the first end of the shaft so that the shaft of the motor can make free rotation therein;

a supporting frame being secured to the motor with the second end of the shaft passing through the supporting frame, the supporting frame being furnished with a reduction gear;

a gear arranged to mesh in the reduction gear being loosely mounted on the second end of the shaft so that the shaft can make free rotation therein, the gear is provided with a toothed portion;

a hexagonal sleeve being secured to the second end of the shaft;

a second clutch having a hexagonal hole formed on the center thereof being slidably mounted on the hexagonal sleeve, the clutch being furnished at one end with a slot and at the other end with a toothed portion which is arranged to mesh in the toothed portion of the gear;

a cylinder with a piston sealingly received therein being disposed in the housing;

a linking rod being connected at one end to the piston of the cylinder and the other end thereof being connecting to the reduction gear in an eccentric manner whereby when the reduction gear is driven to rotate, the linking rod can drive the piston to move back and forth along the axial direction of the cylinder;

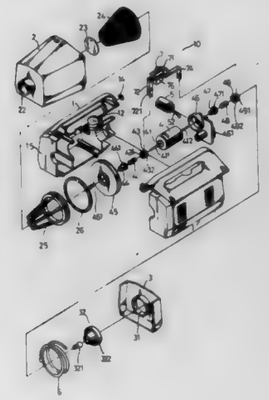
a cover being secured to the cylinder, the cover being provided at the bottom with an inlet which is associated with a check valve and at the top with an outlet which is associated with a check valve, the outlet of the cover being connected through the pressure gauge to a rubber hose which, when unused, can be received in the rear portion of the housing,

a sliding member being disposed in a seat which is disposed in the housing and located above a switch which is arranged to control the motor, a lever being pivotally connected at the upper end to one end of the sliding member, the lower end of the lever being arranged to tightly engage with the slot of the first clutch, a S-shaped member being secured at upper end to the other end of the S-shaped member being arranged to tightly engage with the slot of the second clutch;

a rear cover provided with a central hole being arranged to be secured to the rear end of the housing;

a lamp assembly being disposed on the rear cover to illuminate through the central hole of the rear cover, and

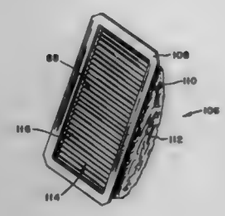
a switch disposed on the rear end of the handle being used to control the lamp assembly.



4,636,231
PANEL AIR FILTER

Donald I. Thornton, Warwick, R.I.; Richard H. Peyton, Berkley, Mass., and James P. O'Shea, East Providence, R.I., assignors to Allied Corporation, Morristown, N.J.

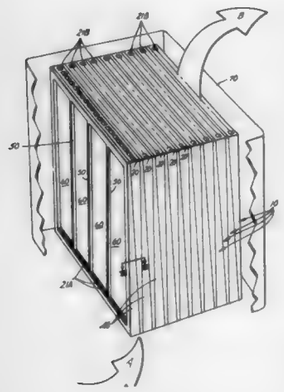
Filed Aug. 15, 1985, Ser. No. 765,783
Int. Cl.⁴ B01D *27/06*
U.S. Cl. 55—318 **14 Claims**



1. Method of forming a fluid filter having first and second filtering media comprising the steps of forming said first filtering media by providing a nonwoven batt comprising a randomly arrayed mixture of thermoplastic material and fibers which are not thermoplastic, forming said second filtering media, cutting said batt into sections of sufficient size to provide an edge portion projecting beyond all sides of the second filtering media, placing said first filtering media on said second filtering media with the edge portion of the first filtering media projecting beyond all edges of the second filtering media, compressing said edge portion of the first filtering media against the edges of said second filtering media while causing said edge portion of the first filtering media to stiffen into a fluid-impermeable support portion for the edges of the second filtering media, and bonding the edges of the second filtering media to the fluid-impermeable support portion to effect a

substantially fluid-impermeable seal therebetween, said step of causing said edge portions to stiffen being effected by heating and compressing said edge portion.

4,636,232
FILTER STACK
David E. McDowell, Grand Rapids, Mich., assignor to Amway Corporation, Ada, Mich.
Filed Dec. 16, 1985, Ser. No. 809,409
Int. Cl.[4] B01D *46/12*
U.S. Cl. 55—350 25 Claims

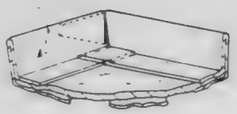


1. A filter stack comprising:
a plurality of frames with a filter medium located between adjacent frames, each frame having opposed first and second sides, there being openings in said frame first sides, said frames being arranged alternatively such that the first side on one frame faces a first direction and the first side on the next adjacent frame faces in the opposite direction, the improvement comprising:
each of said first sides being wider than each of said second sides, said first and second sides being joined by lateral sides which are tapered from a wide end adjacent said first side to a narrower end adjacent said second side whereby said frames are arranged in a stack with said first sides of some of said frames facing a first direction and the first sides of the alternate frames facing in the opposite direction so that air can flow through said openings in said first sides facing in said first direction, through said filter medium between adjacent frames and out said openings in said first sides facing in said opposite direction to thereby maximize the flow of air through said filter stack.

12. A filter stack comprising:
a plurality of frames with a filter medium located between adjacent frames, each frame having opposed first and second sides and lateral sides joining said first and second sides, there being openings in said frame first sides, said frames being arranged alternatively such that the first side on one frame faces a first direction and the first side on the next adjacent frame faces in the opposite direction, the improvement comprising:
each of said frames including a pair of spaced, parallel tongues extending laterally from said first, second and lateral sides of said frame towards the next adjacent frame in said stack, said tongues being located towards the perimeter of each said frame, with one tongue being spaced inwardly from said perimeter farther than the other whereby said filter medium will be held in place between adjacent frames through engagement with said tongues and whereby at least said one tongue will engage said filter medium at all points on said one tongue, even though dimensional tolerances in said filter medium might result in some portions of said other tongue not engaging said filter medium.

22. A filter stack comprising:
a plurality of frames with a filter medium located between adjacent frames, each frame having opposed first and second sides and lateral sides joining said first and second sides, there being openings in said frame first sides, said frames being arranged alternatively such that the first side on one frame faces a first direction and the first side on the next adjacent frame faces in the opposite direction, the improvement comprising:
said stack being firmly held together by a wrap extending around said stack so as to embrace the lateral sides of said frames, but so as not to embrace and cover said first and second sides of said frames, said wrap having approximately the same width as the length of said lateral sides whereby said stack is firmly held together with a relatively even pressure over the entire width of said stack.

4,636,233
FILTER ASSEMBLY
George Lizmore, London, Canada, assignor to Lawson & Jones Limited, Mississauga, Canada
Filed Feb. 16, 1983, Ser. No. 467,067
Int. Cl.[4] B01D *46/10*
U.S. Cl. 55—501 10 Claims



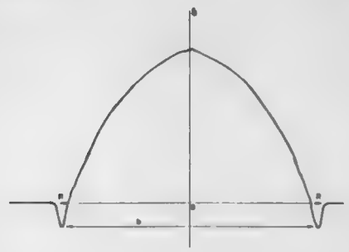
1. A filter assembly comprising a filter element, a planar rectangular support panel which supports said filter element, upstanding, outwardly flared walls extending around the periphery of said support panel, each pair of adjacent walls meeting at a corner and having reinforcing means extending between adjacent walls to interconnect them, and each of said walls being formed from material folded back on itself to provide a pair of contiguous layers of material, with opposed surfaces in contact over a substantial portion of each of said walls, said reinforcing means comprising a first tab extending from a first of said walls between the layers of a second of said walls, and a second tab extending from a second of said walls between the layers of the first of said walls, said first and second tabs being held in retaining engagement with said opposed surface of the respective walls to prevent separation of said walls at said corner.

4,636,234
METHOD AND APPARATUS FOR MAKING NON-CIRCULAR MINERAL FIBERS
Larry J. Huey, and Paul D. Beuther, Both of Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Continuation-in-part of Ser. No. 677,451, Dec. 3, 1984, abandoned. This application Feb. 14, 1986, Ser. No. 830,382
Int. Cl.[4] C03B *37/022*
U.S. Cl. 65—2 34 Claims



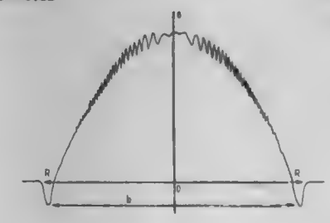
1. The method of making non-circular mineral fibers having a mod ratio greater than about 1.2 comprising discharging molten mineral material having a liquidus greater than about 1200° F. (649° C.) from non-circular orifices to produce molten streams of non-circular cross-section, said non-circular orifices being positioned in a wall of a container for holding a body of molten mineral material and the mineral material in said streams having a low enough initial viscosity that said streams would assume circular cross-sections in the absence of quenching, and quenching said streams to harden them into mineral fibers having a non-circular cross-sectional shape similar to the shape of said orifices before the streams can assume circular cross sections.

4,636,235
METHOD FOR PRODUCING OPTICAL FIBERS
Bertram Glessner, Düsseldorf; Paul Pitsch, Monchen-Gladbach; Peter Heinen, Waldfeucht, and Hartmut Peglow, Willich, all of Fed. Rep. of Germany, assignors to AEG-Telefunken Kabelwerke AG, Rheydt, Monchen-Gladbach, Fed. Rep. of Germany
Filed May 23, 1985, Ser. No. 737,170
Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419835; Dec. 22, 1984, 3447081
Int. Cl.[4] C03B *37/023*
U.S. Cl. 65—3.12 19 Claims



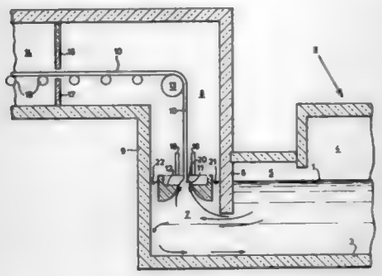
1. An improved process for producing an optical fiber characterized by having essentially no reduction in index of refraction in the center of the optical fiber, comprising:
forming a tubular glass body having a hollow center and at least two concentric layers, at least one interior layer being doped, each layer having an index of refraction different from at least one of said other layers;
applying a partial vacuum to said hollow center of said tubular glass body;
heating said tubular glass body under said partial vacuum until the softening point of said tubular glass body is reached; and
drawing said softened tubular glass body under said partial vacuum into a glass fiber, said partial vacuum being of sufficient magnitude to reduce evaporation of dopant from said interior layer of said tubular glass body, thereby effectively preventing a reduction in index of refraction in the center of the optical fiber.

4,636,236
METHOD FOR PRODUCING A PREFORM FOR DRAWING OPTICAL FIBERS
Bertram Glessner, Düsseldorf; Paul Pitsch, Monchen-Gladbach; Peter Heinen, Waldfeucht, and Hartmut Peglow, Willich, all of Fed. Rep. of Germany, assignors to AEG-Telefunken Kabelwerke AG, Rheydt, Monchen-Gladbach, Fed. Rep. of Germany
Filed May 23, 1985, Ser. No. 737,262
Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419836; Dec. 22, 1984, 3447082
Int. Cl.[4] C03B *37/023*
U.S. Cl. 65—3.12 21 Claims



1. An improved process for making a preform from which optical fibers may be drawn, said preform characterized by having essentially no reduction in index of refraction in the center of an optical fiber drawn from said preform, comprising:
forming a tubular glass body having a hollow center and at least two concentric layers, at least one interior layer being doped, each layer having an index of refraction different from each adjacent layer;
precollapsing said tubular glass body by heating;
applying a partial vacuum to said hollow center of said tubular glass body;
softening at least part of said tubular glass body by heating; and
finally collapsing the softened portions of said tubular glass body under said partial vacuum to form a preform, said partial vacuum selected to effectively eliminate a dip in index of refraction in the center of any glass fiber produced from said preform.

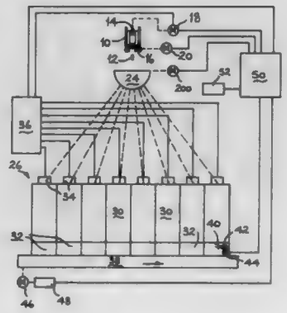
4,636,237
MANUFACTURING DRAWN SHEET GLASS
Adrianus Geppaard, Mol, Belgium, assignor to Glaverbel, Brussels, Belgium
Continuation of Ser. No. 517,208, Jul. 25, 1983, abandoned. This application Apr. 19, 1985, Ser. No. 724,808
Claims priority, application United Kingdom, Jul. 30, 1982, 8221083
Int. Cl.[4] C03B 15/06
U.S. Cl. 65—95 12 Claims



1. In a sheet glass manufacturing process including the steps of: causing molten glass to flow continuously from a glass-melting tank furnace, in which the molten glass is produced, to a drawing tank; drawing molten glass upwardly in the form of a continuous ribbon from the drawing tank; bending the ribbon about a bending roller located above the drawing tank; maintaining at least the major portion of the ribbon out of contact with any solid body between the drawing tank and the bending roller; and passing the ribbon from the bending roller into a horizontal annealing lehr, the improvement wherein the drawing tank is a deep drawing tank in which molten glass is maintained at a depth of at least 1 meter, and said step of drawing comprises partially immersing a refractory device in the form of a one-piece debiteuse provided with a slot in the molten glass in the drawing tank to a sufficient depth for causing molten glass to flow upwardly through the slot under the influence of hydrostatic pressure so as to maintain an onion of glass at the top of the slot from which the ribbon is drawn, wherein the top of said slot is below the level of the surface of molten glass in said drawing tank and said debiteuse further has a rim extending around the periphery of said debiteuse, spaced laterally from said slot, and projecting upwardly from the level of the top of said slot to a height above the level of the surface of the molten glass in the drawing tank, to form a region surrounding the top of said slot which is free of molten glass.

8. A sheet glass manufacturing plant comprising: a glass melting tank furnace for producing molten glass; a drawing tank connected to the furnace to receive a continuous flow of molten glass from the furnace so that the drawing tank is filled with molten glass to a predetermined depth of at least 1 meter; a bending roller disposed above said drawing tank; a horizontal annealing lehr spaced horizontally from said bending roller; and a refractory device in the form of a one-piece debiteuse provided with a slot and a rim extending around the periphery of said debiteuse, spaced laterally from said slot, and projecting upwardly from the top of said slot, said debiteuse being disposed in said drawing tank to be partially immersed in molten glass when said tank is filled with molten glass to said predetermined depth so that the top of said slot is below the level of the surface of molten glass in said drawing tank and said rim projects to a height above the level of the surface of molten glass in the drawing tank; said plant being arranged, said slot being dimensioned, and said refractory device being disposed to be immersed in the molten glass, such that, in operation, molten glass passes through the slot so that an onion of glass is maintained at the top of said slot and said rim forms a region surrounding the top of said slot which is free of molten glass, and molten glass is drawn upwardly in the form of a continuous ribbon from the onion, without at least the major portion of the ribbon contacting any solid body below said bending roller, and the ribbon is bent around said bending roller and passes from said bending roller into said annealing lehr.

4,636,238
CONTROL OF APPARATUS FOR USE IN THE MANUFACTURE OF GLASSWARE ARTICLES
Werner Sidler, Esslingen, Switzerland, assignor to Emhart Industries, Inc., Farmington, Conn.
Filed Oct. 23, 1985, Ser. No. 790,583
Claims priority, application United Kingdom, Oct. 27, 1984, 8427222
Int. Cl.[4] C03B 9/40
U.S. Cl. 65—29 8 Claims



1. A method for controlling glassware manufacture apparatus of the type including a furnace in which raw materials are melted to form molten glass, a forehearth channel through which molten glass flows out of the furnace, a feeder associated with the forehearth and operable to form molten glass from the forehearth into discrete gobs which fall from the feeder, a gob distributor for distributing gobs falling from the feeder to the sections of a glassware forming machine of the individual section type, the gob distributor being electronically programmable to determine which sections of the machine receive gobs and the sequence in which those sections receive gobs, an electronic control system for the glassware forming machine operable to control the timing of the operation of the components of those sections which receive gobs in relationship to one another so that the gobs received by a sections are formed into articles of glassware, and transfer means associated with each section of the machine operable to transfer articles from the section onto an outfeed conveyor, said method comprising the steps of:

determining the available melting capacity of the furnace, weight of the glassware article to be formed, and range of speeds at which such glassware article can be formed,

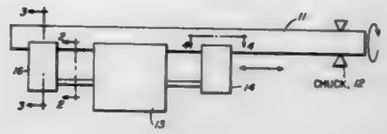
based upon the determined parameters, calculating the number of sections of the glassware forming machine which are to receive gobs, and the speed at which these sections are to be operated,

setting the rate of gob formation of the feeder at intervals required by the calculated parameters,

programming the gob distributor to cause it to operate in accordance with the calculated parameters, and

causing the electronic control system to control the timing of the glasware forming machine according to the calculated parameters.

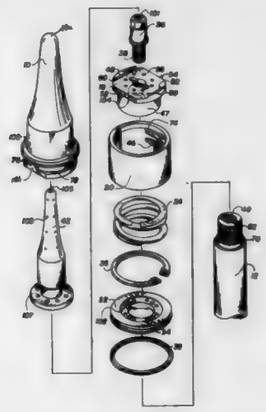
4,636,239
METHOD OF FLUIDIC SUPPORT OF A HEAT SOFTENED GLASS TUBE
James L. Wilson, San Antonio, Fla., and Robert C. Folweiler, Bedford, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Division of Ser. No. 688,226, Jan. 2, 1985. This application Nov. 25, 1985, Ser. No. 785,112
Int. Cl.[4] C03B 19/06
U.S. Cl. 65—109 3 Claims



1. A method of inhibiting bending of a heated, horizontally oriented, cylindrical glass preform comprising

directing fluid in radially inward directions along an axial portion of the lower semicircumference of said preform, wherein the greatest quantity of fluid is directed centrally to the bottom of said cylindrical preform, and diminishing quantities of fluid are directed to said preform about said semicircumference toward the horizontal direction.

4,636,240
PLUNGER ASSEMBLY FOR GLASS CONTAINER MANUFACTURING
Joseph W. Kozora, P.O. Box 559, Valencia, Pa. 16059
Filed Dec. 31, 1984, Ser. No. 687,594
Int. Cl.[4] C03B 9/00
U.S. Cl. 65—229 13 Claims



1. A plunger assembly for use in a glass forming machine comprising:

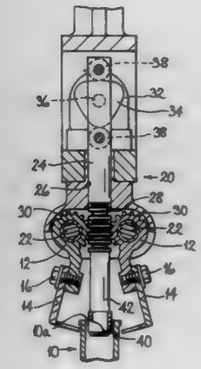
a plunger having a nose end and a base end;

a plunger support member having a piston-engaging end and a face end for registration with the base end of the plunger;

a sleeve, disposed about the support member, having integral means engaging the plunger base end;

biasing means, disposed between the sleeve and the support member, for exerting a pushing force therebetween to hold the integral means of the sleeve in firm contact with the plunger base end and thereby retain the plunger in operative position wherein the integral means of the sleeve comprises oppositely disposed shoulders projecting inwardly to the face end of the support member, and the plunger base end has oppositely laterally projecting flanges rotatively engaged between the shoulders and the face end.

4,636,241
TAKE-OUT MECHANISM FOR REMOVING CONTAINERS FROM A MOULD OF A GLASSWARE FORMING MACHINE
Hermann H. Nebelung, Zarich, Switzerland, assignor to Emhart Industries, Inc., Farmington, Conn.
Continuation of Ser. No. 666,695, Oct. 31, 1984, abandoned. This application Mar. 14, 1986, Ser. No. 840,983
Claims priority, application United Kingdom, Nov. 16, 1983, 83305575
Int. Cl.[4] C03B 9/44
U.S. Cl. 65—260 1 Claim



1. A take-out mechanism operable to remove containers from the mould of a glassware forming machine, the mechanism comprising a carrier, two gripper member supports pivotably mounted on said carrier for movement about a horizontal axis toward and away from each other, a gripper member mounted on each of said gripper member supports, an operating rod mounted on said carrier for longitudinal movement in a vertical direction, means on said carrier for moving said operating rod upwardly and downwardly, means interconnecting said operating rod and said gripper member supports so that when the operating rod is moved downwardly the gripper member supports are moved away from each other and when said operating rod is moved upwardly, said gripper member supports are moved toward each other, said lower portion of said operating rod having a centering member thereon which when said operating rod moves downwardly, extends into the neck portion of a container and when said operating rod moves upwardly is withdrawn from the neck portion of the container.

4,636,242
SULFUR-BASED ENCAPSULANTS FOR FERTILIZERS
Richard J. Timmons, Marysville, Ohio, assignor to The O. M. Scott and Sons Company, Marysville, Ohio
Filed Apr. 7, 1986, Ser. No. 849,153
Int. Cl.[4] C05C 9/00
U.S. Cl. 71—28 20 Claims

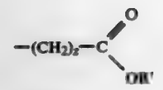
1. In a slow release particulate fertilizer product wherein the fertilizer particles are encapsulated with a sulfur coating:

the improvement in which the sulfur coating is substantially crystalline and contains in admixture therewith from 0.05 to 2% (by weight of the coating) of at least one organosulfur compound of the formula:

$$R—S_n—R$$

wherein R is selected from the group consisting of a nor-

mal or branched alkyl group of from C_8H_{17} to $C_{12}H_{25}$ and an alkyl carboxylic group of the formula:



wherein z is 1 or 2 and R' is selected from the group consisting of H and a normal or branched alkyl group of from CH_3 to $C_{12}H_{25}$ and n is 3 to 5, said aforesaid compound or compounds being the sole organosulfur compound or compounds in said admixture.

4,636,243

BENZAMIDES, COMPOSITIONS AND AGRICULTURAL METHOD

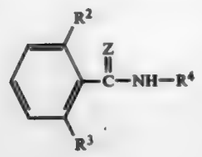
Kenneth W. Burow, Jr., Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 510,699, Jul. 5, 1983, Pat. No. 4,515,625, which is a division of Ser. No. 302,323, Sep. 14, 1981, Pat. No. 4,416,683, which is a continuation-in-part of Ser. No. 187,675, Sep. 16, 1980, abandoned. This application Dec. 24, 1984, Ser. No. 685,922

Int. Cl.⁴ A01N *43/80*

U.S. Cl. 71—88 **18 Claims**

1. A herbicidal composition comprising a herbicidally effective amount of a benzamide of the formula



wherein:

Z is oxygen or sulfur;

R^2 is C_1–C_4 alkylthio or C_1–C_4 alkoxy;

R^3 is C_1–C_4 alkylthio, or C_1–C_4 alkoxy;

R^4 is an aryl group selected from

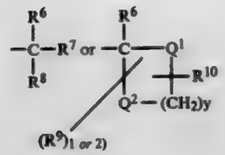


in which:

R is hydrogen or C_1–C_4 alkyl;

X is O;

R^5 is

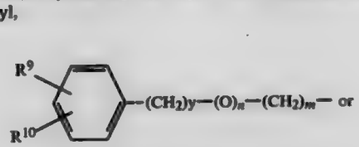


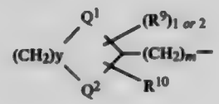
wherein:

R^6 is hydrogen, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_1–C_6 alkoxy or C_1–C_6 alkylthio;

y is an integer from 0 to 5;

R^7 and R^8 independently are hydrogen, C_1–C_{13} alkyl, halo-C_1–C_{13} alkyl, C_2–C_{13} alkenyl, C_2–C_{13} alkynyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, C_1–C_4 alkoxy-C_1–C_6 alkyl, C_1–C_4 alkylthio-C_1–C_6 alkyl, C_2–C_4 alkanoyloxy-C_1–C_6 alkyl,





wherein:

m is an integer from 0 to 4;

n is zero or 1;

R^9 and R^{10} independently are hydrogen, halogen, C_1–C_4 alkyl, or C_2–C_4 alkenyl; Q^1 and Q^2 independently are CH_2; and the agronomically acceptable salts thereof, admixed with an agronomically-acceptable carrier, diluent, or adjuvant therefor.

4,636,244

HALOACYL AND THIOHALOACYL ARYL-SUBSTITUTED OXAZOLIDINES AND THIAZOLIDINES - HERBICIDAL ANTIDOTES

Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Co., Westport, Conn.

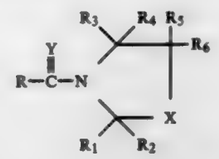
Division of Ser. No. 492,271, May 6, 1983, Pat. No. 4,483,706, which is a division of Ser. No. 317,957, Nov. 4, 1981, Pat. No. 4,400,200, which is a division of Ser. No. 840,973, Oct. 11, 1977, Pat. No. 4,322,240, which is a division of Ser. No. 627,986, Nov. 3, 1975, Pat. No. 4,072,688, which is a continuation-in-part of Ser. No. 550,069, Feb. 14, 1975, abandoned. This application Jul. 12, 1984, Ser. No. 630,171

Int. Cl.⁴ A01N *43/78, 43/76*

U.S. Cl. 71—90 **105 Claims**

1. An herbicidal composition comprising an active haloacetanilide herbicidal compound and a non-phytotoxic

antidotally effective amount of an antidote therefore corresponding to the formula



wherein X and Y are independently oxygen or sulfur; R is haloalkyl having 1 to 6 carbon atoms, inclusive or chloroalkenyl having 2 to 4 carbon atoms, inclusive; R_1 is hydrogen, lower alkyl having 1 to 4 carbon atoms, inclusive, phenyl, naphthyl, substituted phenyl wherein said substituents are monofluoro, mono- or di-chloro, nitro, methyl, methoxy, or hydroxyl; R_2 is hydrogen or lower alkyl having 1 to 4 carbon atoms, inclusive; R_3 is hydrogen, hydroxymethyl, N-methylcarbamoyloxymethyl or dichloroacetoxymethyl; R_4 is hydrogen, lower alkyl having 1 to 4 carbon atoms, inclusive; R_5 is hydrogen, lower alkyl having 1 to 4 carbon atoms, inclusive or phenyl; and R_6 is hydrogen, provided that at least one of R_1 or R_5 is phenyl, substituted phenyl or naphthyl; said antidote being antidotally active with said acetanilide herbicide compounds and wherein said compound is present in an amount between about 0.0001 to about 30 parts by weight of antidote per each part by weight of herbicide.

4,636,245

HERBICIDAL TETRAHYDROTHIOPYRAN-2,4-DIONE DERIVATIVES, COMPOSITIONS, AND METHOD OF USE THEREFOR

Heinz-Jürgen Wroblowsky, Langenfeld; Jörg Stetter, Wuppertal; Ludwig Ese, Leverkusen; Robert R. Schmidt, Bergisch-Gladbach, and Hans-Joachim Santel, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

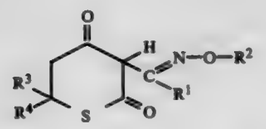
Filed May 23, 1985, Ser. No. 737,292

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 3421351

Int. Cl.⁴ A01N *43/18*; C07D *335/02, 409/12*

U.S. Cl. 71—90 **11 Claims**

1. A substituted tetrahydrothiopyran-2,4-dione of the formula



in which

R^1 is hydrogen, alkyl, alkenyl, alkinyl, alkoxyalkyl, alkylthioalkyl or halogenoalkyl, each of which has up to 8 carbon atoms in the individual alkyl or alkenyl or alkinyl parts and, where relevant, up to 9 identical or different halogen atoms, or is cycloalkyl having 3 to 7 carbon atoms, phenyl, or phenyl substituted by halogen, cyano, nitro and alkyl, alkoxy, alkylthio and/or halogenoalkyl, each of which has up to 4 carbon atoms and, where relevant, up to 9 identical or different halogen atoms,

R^2 is alkyl, alkenyl, alkinyl, alkoxyalkyl, alkylthioalkyl, halogenoalkyl or halogenoalkenyl, each of which has up to 8 carbon atoms in the individual alkyl or alkenyl or alkinyl parts and, where relevant, up to 9 identical or different halogen atoms, or is alkoxycarbonylalkyl or alkoximinoalkyl, each of which has up to 4 carbon atoms in the individual alkyl parts, or is phenylalkyl which has up to 4 carbon atoms in the straight-chain or branched alkyl part and is unsubstituted or substituted in the phenyl part by those substituents mentioned in the case of R^1, or is



wherein X is oxygen or sulphur, each of which is bonded via an alkylene bridge having 1 to 4 carbon atoms and is unsubstituted or substituted by halogen, lower alkyl and-/or lower halogenoalkyl, and

R^3 and R^4 each independently is hydrogen, or alkyl, alkoxyalkyl or alkylthioalkyl, each of which has up to 8 carbon atoms in the individual alkyl parts, or is cycloalkyl having 3 to 7 carbon atoms, or is phenyl, phenylalkyl or phenoxyalkyl, each of which is unsubstituted or substituted by those substituents mentioned in the case of R^1 and, where relevant, has 1 to 4 carbon atoms in the alkyl part,

or a metal salt thereof.

10. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a compound or salt according to claim 1.

4,636,246

HETEROCYCLIC DIHALOACETAMIDES, AND HERBICIDES WHICH CONTAIN ACETANILIDES AS HERBICIDAL ACTIVE INGREDIENTS AND THE DIHALOACETAMIDES AS ANTAGONISTIC AGENTS

Peter Plath, Ludwigshafen; Wolfgang Rohr, Wachenheim; Volker Schwendemann, Wiesenbach, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

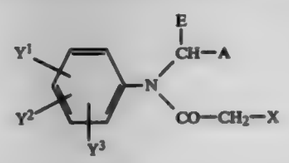
Division of Ser. No. 376,744, May 10, 1982, Pat. No. 4,521,604. This application Dec. 31, 1984, Ser. No. 687,734

Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119077

Int. Cl.⁴ A01N *43/62*; C07D *241/08*

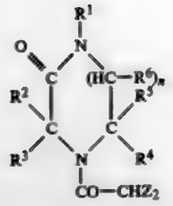
U.S. Cl. 71—92 **6 Claims**

1. A herbicidal composition containing, as herbicidal active ingredient, an acetanilide of the formula



(II)

where Y^1 is hydrogen or straight-chain or branched alkyl or alkoxy of not more than 5 carbon atoms and Y^2 and Y^3 are hydrogen, halogen or straight-chain or branched alkyl or alkoxy of not more than 5 carbon atoms, and Y^1 and Y^2 together are alkylene of not more than 6 carbon atoms which is linked in the ortho-position and is unsubstituted or substituted by straight-chain or branched alkyl of not more than 4 carbon atoms, X is chlorine or bromine, A is alkoxy or alkoxyalkyl of not more than 4 carbon atoms, or is, pyrazolyl which may be monosubstituted or polysubstituted by halogen or phenyl, or by alkyl, alkoxy, alkylthio or perfluoroalky, each of not more than 4 carbon atoms, or by cyano, carboxyl or alkoxycarbonyl where alkoxy is of not more than 4 carbon atoms, and E is hydrogen or methyl, and as antagonistic agent, a heterocyclic dihaloacetamide of the formula



(I)

where R^1 is hydrogen or alkyl of 1 to 4 carbon atoms, R^2 is hydrogen or methyl, R^3 is hydrogen or alkyl of 1 to 3 carbon atoms, R^4 is hydrogen, alkyl of 1 to 4 carbon atoms or cyclohexyl, R^5 is hydrogen or methyl, R^6 is hydrogen or methyl, Z is chlorine or bromine and n is 1, or where R^2 together with R^3 is pentamethylene or where R^5 together with R^6 is tetramethylene.

4,636,247

HETEROCYCLIC COMPOUNDS

John M. Clough, Buckinghamshire; Timothy Lewis, Berkshire, and Michael B. Gravestock, Cheshire, all of England, assignors to Imperial Chemical Industries PLC, London, England

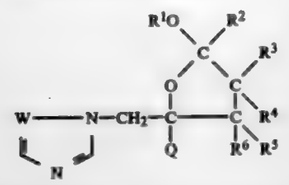
Filed Feb. 8, 1984, Ser. No. 578,033

Claims priority, application United Kingdom, Mar. 9, 1983, 8306512

Int. Cl.[4] C07D 405/06; A01N 43/00, 43/653

U.S. Cl. 71—92 7 Claims

1. A compound having the formula (I):



(I)

and stereoisomers thereof, wherein W is CH or N; Q is C_{1-6} alkyl, phenyl or benzyl, or phenyl or benzyl substituted with halogen, C_{1-6} haloalkyl, C_{1-6} alkyl, C_{1-6} alkoxy, phenyl, benzyl or phenoxy, R^1 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, alkylcarbonyl having one to seven carbon atoms in the alkyl moiety, C_{1-4} alkoxycarbonyl, C_{1-4} alkoxyalkyl, ethoxycarbonylmethyl, 1-propenyloxymethyl, 2,4-dichlorobenzyloxyethyl, 4-nitrophenylcarbonyl, C_{1-6} hydroxyalkyl, phenyl or benzyl, or phenyl or benzyl substituted with halogen, C_{1-6} haloalkyl, C_{1-6} alkyl, C_{1-6} alkoxy, phenyl, benzyl or phenoxy; R^2, R^3, R^4, R^5 and R^6, which may be the same or different, H, C_{1-6} alkyl or C_{3-6} cycloalkyl, phenyl or benzyl; and acid salts and metal complexes thereof.

5. A fungicidal, or plant growth regulating composition comprising an effective amount of a compound of general formula (I) as defined in claim 1 or a salt or complex thereof, and a carrier or diluent.

4,636,248

METHOD FOR PRODUCTION OF DIELECTRIC POWDER

Yasuyuki Ogata, and Yoshinori Shinohara, both of Saitama, Japan, assignors to Mitsubishi Mining & Cement Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1985, Ser. No. 786,766

Claims priority, application Japan, May 30, 1985, 60-117473

Int. Cl.[4] B22F 9/16

U.S. Cl. 75—0.5 AA 9 Claims

1. A method for the production of a dielectric powder consisting of a solid solution of compounds selected at least one each from the two groups (a) and (b) of compounds indicated below: (a) Compounds of the ABO_3 pervoskite structure and (b) Compounds of the $A'(B'_{\frac{1}{2}}B''_{\frac{1}{2}})O_3$, $A'(B'_{\frac{1}{3}}B''_{\frac{1}{3}})O_3$, or $A'(B'_{\frac{1}{4}}B''_{\frac{1}{4}})O_3$ valency-compensating pervoskite structure,

wherein A and A′ each denotes a divalent metal, B a tetravalent metal, B′ a divalent metal or a trivalent metal, and B″ a pentavalent metal or a hexavalent metal,

said dielectric powders having a chemical composition represented by the following general formula:

$$[ABO_3]_{1-x}[A'(B'_{1-y}B''_y)O_3]_x \quad (I)$$

wherein x and y satisfy $0<x<1$ and $0<y<1$ respectively

said method comprising

dissolving and mixing metal alkoxides having a purity of at 99.9 mol% in at least one organic solvent in proportion such that proportions of the metallic elements of the metal alkoxides conform to the proportions of the metallic elements in said general formula (I);

adding water or steam at a temperature of 0°–200° C. mixture to the solution thereby to hydrolyze the metal alkoxides whereupon the hydrolyzed mixture of metal alkoxides precipitates; and

separating the precipitate from the liquid and drying the precipitate to obtain said dielectric powder.

4,636,249

TREATMENT OF MOLTEN METAL

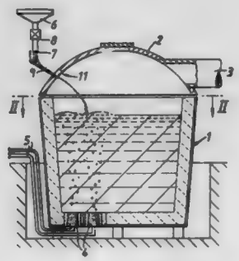
Arthur Laycock, Doncaster; Michael J. Harris, Rotherham, and Mark A. Broxholme, Sheffield, all of England, assignors to British Steel Corporation, London, England

Filed Dec. 23, 1985, Ser. No. 811,994

Claims priority, application United Kingdom, Dec. 28, 1984, 8432748; Jan. 9, 1985, 8500535

Int. Cl.[4] C21C 7/02

U.S. Cl. 75—53 7 Claims



1. A method of introducing into a bath of molten metal contained in a vessel an additional constituent, which method comprises the steps of connecting a plurality of gas flow passageways located in at least one of bottom and side walls of the vessel to supplies of gas under pressure, causing gas under pressure to be introduced simultaneously through the passageways to produce individual gas flows which pass upwardly through the metal bath to create areas of turbulence the boundaries of which interact partially to produce on the surface of the metal bath a relatively quiescent region with respect to immediately adjacent regions, and introducing into this relatively quiescent region a required quantity of the additional constituent.

4,636,250

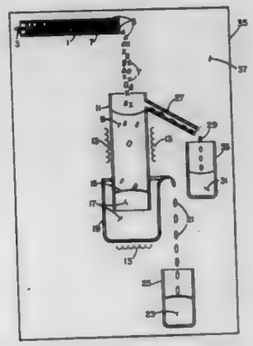
RECOVERY OF URANIUM ALLOY

Guy R. B. Elliott, 133 La Senda Rd., Los Alamos, N. Mex. 87544

Filed Mar. 15, 1985, Ser. No. 712,375

Int. Cl.[4] C22B 60/02

U.S. Cl. 75—84.1 A 5 Claims



1. A method of recovery of uranium alloy from a mixture of uranium alloy with magnesium fluoride comprising:

(a) pretreating uranium fluoride with magnesium at 400°–1250° C. to form a pretreated mixture of uranium and magnesium fluoride,

(b) introducing said pretreated mixture into a molten-salt bath floating on a molten-uranium-alloy trap,

(c) allowing said bath to transfer heat to said pretreated mixture to cause the said magnesium fluoride to dissolve into said molten-salt bath and said uranium alloy to be molten,

(d) allowing molten uranium alloy from said pretreated mixture in said bath to separate from said bath into said trap,

(e) discharging separated molten-uranium alloy from said trap, and

(f) discharging non-alloy components of said pretreated mixture along with excess molten salt from said bath.

4,636,251

MATERIALS FOR ELECTRICAL CONTACT

Issa S. Mahmoud, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 17, 1986, Ser. No. 853,111

Int. Cl.[4] B22F 1/00

U.S. Cl. 75—246 7 Claims

1. An alloy comprising a blend of

(a) nickel within the range from about 80–93%;

(b) palladium within the range from about 2–20%; and

(c) beryllium within the range from about 1–2%; all by weight.

4,636,252

METHOD OF MANUFACTURING A HIGH TOUGHNESS CERMET FOR USE IN CUTTING TOOLS

Hironori Yoshimura, and Jhunichi Toyama, both of Tokyo, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1984, Ser. No. 609,892

Claims priority, application Japan, May 20, 1983, 58-88699

Int. Cl.[4] C22C 29/04

U.S. Cl. 75—238 15 Claims

1. A method of manufacturing a cermet having high toughness for use in cutting tools, comprising the steps of:

(a) preparing a mixed powder consisting essentially of:

titanium nitride, from 25 to 50 percent by weight;

titanium carbide, from 10 to 30 percent by weight;

at least one compound selected from the group consisting of tantalum carbide, niobium carbide, and zirconium carbide, from 5 to 25 percent by weight;

tungsten carbide, from 10 to 25 percent by weight; and

at least one metal selected from the group consisting of Co and Ni, from 7.5 to 25 percent by weight;

(b) compressing said mixed powder into a green compact; and

(c) sintering said green compact in a nitrogen atmosphere under a pressure within a range from 0.1 to 100 torr, and at a temperature within a range from 1400° to 1550° C.

4,636,253

DIAMOND SINTERED BODY FOR TOOLS AND METHOD OF MANUFACTURING SAME

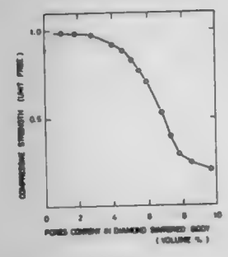
Tetsuo Nakai, and Shuji Yazu, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 26, 1985, Ser. No. 769,609

Claims priority, application Japan, Sep. 8, 1984, 59-188492; Oct. 26, 1984, 59-226574; Nov. 21, 1984, 59-246565

Int. Cl.[4] C22C 29/02

U.S. Cl. 75—239 33 Claims



1. A diamond sintered body for tools, having a diamond content in excess of 95 percent and not more than 99 percent by volume, and a residue including at least one of a metal or a carbide selected from groups IVa, Va and VIa of the periodic table, and an iron group metal of 0.1 to 3 percent by volume in total, and pores at least 0.5 percent and not more than 5 percent by volume.

4,636,254

SILVER-GLASS PASTE FOR ATTACHMENT OF SILICON DIE TO CERAMIC SUBSTRATE

Frank D. Husson, Jr., and Kathleen E. Walter, both of San Diego, Calif., assignors to Quantum Materials, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 758,671, Jul. 23, 1985, abandoned. This application Mar. 10, 1986, Ser. No. 837,543

Int. Cl.[4] C03C 3/10

U.S. Cl. 106—1.14 10 Claims



1. A paste for attaching a silicon die to a ceramic substrate, the paste consisting of:

32.69% silver flake having an apparent density of 32.6 to 39.2 gm/cubic inch and a tap density of 3.5 to 3.85 gm/cc and a mesh size of approximately 100;

32.69% silver flake having an apparent density of 25.6 to 26.3 gm/cubic inch, a tap density of 3.1 to 3.3 gm/cc and a mesh size of approximately 200;

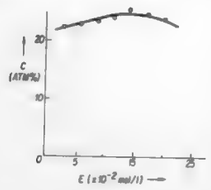
2.62% monovalent silver oxide particles;
17% lead borate glass frit;
1.5% isobutyl methacrylate; and
13.5% organic solvent.

4,636,255

ELECTROLESS PLATING BATH FOR FORMING A NICKEL ALLOY COATING HAVING A HIGH PHOSPHORUS CONTENT

Jou Tsuda, 43, Yashiki, Kitanajima Charu-cho, Ama-gun, Japan, and Masami Ishii, Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Jou Tsuda, Ama, both of, Japan

Filed May 22, 1985, Ser. No. 736,859
Claims priority, application Japan, May 24, 1984, 59-105877
Int. Cl.⁴ C23C *18/36*
U.S. Cl. 106—1.22 **9 Claims**



1. An electroless plating bath for forming a nickel-phosphorus alloy coating having a high phosphorus content of 15 to 25 atom %, said bath containing nickel ions, hypophosphite as a reducing agent for said nickel ions, a pH adjustor, a pH buffering agent, a nickel ion sequestering agent, a small amount of a stress reducing agent and tri(alkali metal) N-(2-hydroxyethyl) ethylenediamine-N, N', N'-triacetate as a first phosphorus deposition promotor in water.

4,636,256

CORROSION INHIBITING SYSTEM CONTAINING ALKOXYLATED AMINES

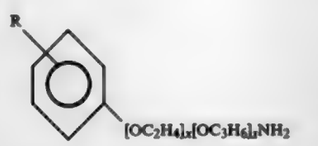
Frederick W. Valone, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 2, 1985, Ser. No. 751,156
Int. Cl.⁴ C04B *9/02*; C07C *93/06*
U.S. Cl. 106—14.15 **35 Claims**

1. A water-dispersible corrosion inhibiting solution comprising:

water; and

about 2 ppm to about 1% by volume of an ethoxylated, propoxylated alkylphenol amine in a solvent, said amine represented by the formula



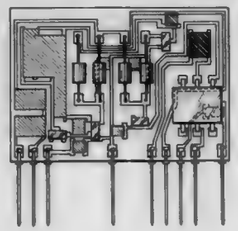
wherein R is an alkyl group containing about 5 to about 12 carbon atoms, x equals about 3 to about 15, and z equals about 2 to about 10.

4,636,257

SILK SCREEN PRINTING PASTE WITH LEAD GLASS WHICH IS TO BE FIRED IN A NON-OXIDIZING ATMOSPHERE

Hugues Baudry, Varennes-Jarcy; Marc A. Monseraye, Saint-Maur-des-Fosses, and Claude Morhaim, Paris, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 14, 1982, Ser. No. 388,385
Claims priority, application France, Jun. 19, 1981, 81 12123
Int. Cl.⁴ C09D *11/00*
U.S. Cl. 106—19 **5 Claims**



1. In a silk screen printing paste for use in a thick-film technique which paste is fired in a non-oxidizing atmosphere and which paste comprises a mixture of a passive vitreous component as a permanent binder, an active component and a temporary organic binder, the improvement wherein said paste also comprises one or more lead oxide(s) having a degree of oxidation higher than 2 in a total quantity below 20% by volume.

4,636,258

INK FOR THERMAL TRANSFER PRINTING

Seiichi Hayashi; Katsumori Takei; Takahiro Usui; Yoshitaka Yamaguchi, and Makoto Taniguchi, all of Nagano, Japan, assignors to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1985, Ser. No. 767,581
Claims priority, application Japan, Aug. 21, 1984, 59-173845; Dec. 25, 1984, 59-279302; Jan. 24, 1985, 60-11340; Jan. 24, 1985, 60-11341
Int. Cl.⁴ C09D *11/12*
U.S. Cl. 106—31 **25 Claims**

1. An ink composition for thermal transfer printing comprising a masterbatch, said masterbatch including between about 65 to 85 parts by weight of a copolymer of at least one of styrene and another α-olefin and at least one of maleic anhydride and a dialkyl maleate, and said masterbatch further including between about 10 to 35 parts by weight of a colorant dispersed in the copolymer, the masterbatch present in an amount between about 30 to 50 weight percent based on the total weight of the composition, the balance of the composition being comprised of wax.

4,636,259

SOYBEAN PROTEIN FILM

Joichi Hasaoka, Kawanishi, Japan, assignor to Yoshihara Oil Mill, Ltd., Osaka, Japan

Filed Dec. 17, 1984, Ser. No. 682,761
Claims priority, application Japan, Dec. 17, 1983, 58-238285
Int. Cl.⁴ B32B *7/02*; C08L *89/00*
U.S. Cl. 106—122 **5 Claims**

1. A soybean protein film useful in preparing food products, wherein said film contains air bubbles, has a thickness of 0.05–1 mm and a density of 0.1–0.8 g/cm^3, and is prepared by sheeting a solution or suspension containing air bubbles and 5–20 weight % of soybean protein, and drying the resultant sheet at from room temperature to 120° C.

4,636,260

METHOD OF MAKING A SEALING GLASS SUSPENSION

William F. Ely, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 26, 1985, Ser. No. 759,352
Int. Cl.⁴ C08L *1/18, 1/08*
U.S. Cl. 106—198 **9 Claims**

1. In a method of preparing a sealing glass suspension including a finely divided sealing glass, a gelling agent including a titanate coupling agent, and a vehicle, the improvement whereby all of the solid ingredients of the suspension are brought together in predetermined proportions and intimately mixed together prior to being exposed to the vehicle.

4,636,261

DRY LAKE SYSTEM

Richard F. Heinze, 248 White Oak Ridge Rd., Bridgewater, N.J. 08807

Filed Oct. 24, 1984, Ser. No. 664,319
Int. Cl.⁴ C08D *17/02*; C04B *14/00*
U.S. Cl. 106—289 **14 Claims**

1. A storage stable composition capable of use in color coating or internal coloring of products, comprising a dry mixture of pigment selected from the group consisting of carmine, a D&C lake, or an FD&C lake, and additionally 0.005 to 5.0 percent, at least partly in the salt form, of an organic compound containing one to four carboxylic acid groups or a salt of phosphoric acid.

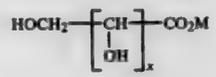
4,636,262

ADDITIVE FOR GREEN MOLDING SAND

Edgar H. Reed, P.O. Box 164, Leesburg, N.J. 08327

Filed Mar. 11, 1986, Ser. No. 838,363
Int. Cl.⁴ B28B *7/34*
U.S. Cl. 106—38.3 **14 Claims**

1. An improved foundry green molding sand composition comprising molding sand, clay and water, wherein the improvement comprises the presence, in said composition in amounts and proportions sufficient to impart improved green sand properties to said composition an alkanoate salt of magnesium and/or lithium and an alkali metal salt of carboxyhexose or carboxyheptose of the formula



wherein x=4 or 5 and M is an alkali metal salt.

4,636,263

METHOD AND APPARATUS FOR SEPARATING THE PITH FROM THE FIBROUS COMPONENT OF SWEET SORGHUM, SUGAR CANE AND THE LIKE

John S. Cundiff, Blacksburg, Va., assignor to Applied Science Associates, Inc., Fairfield, Va.

Filed Jun. 3, 1985, Ser. No. 740,425
Int. Cl.⁴ C13D *1/00*
U.S. Cl. 127—42 **7 Claims**

1. A method of separating the pith from the bast of sweet sorghum stalks comprising conveying a mat of stalks in one direction longitudinally of the stalk axes while holding the mat of stalks down on a support surface, flailing the stalks across their path of movement and across their longitudinal axes while the stalks are moving between nodes of the stalks thereby transforming the pith of the stalks into a hail of pith particles while simultaneously producing fibre strings of, gradually increasing length from the sheaths of the stalks, the fibre strings remaining attached to the sheaths of the stalks, separating the fibre strings from the stalks at the nodes while the production of the hail of pith particles continues, and then separating the pith particles from the fibre strings.

4,636,264

AUTODEPOSITION POST-BATH RINSE PROCESS

Lutz Schellenberg, Cologne; Matthias Hamacher, Huerth-Gleuel, both of Fed. Rep. of Germany, and Ronald Broadbent, Ardsley, Pa., assignors to Gerhard Collardin GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 26, 1985, Ser. No. 802,635
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1985, 3500443
Int. Cl.⁴ C23F *7/00*; B05D *7/16*
U.S. Cl. 148—6.2 **16 Claims**

1. In a process for autodeposition coating wherein a metal substrate is contacted with an autodeposition bath containing a latex sufficiently long for the resin in said latex to be autodeposited in an uncured state, said uncured resin is then rinsed with an anticorrosive property enhancing substance, and said rinsed uncured resin coating is then cured, the improvement of employing a two-stage rinse by:

contacting said uncured resin with a first rinse comprising at least one readily water soluble strontium, barium, lead, nickel, ferric, cupric or zinc nonchromate salt in an aqueous solution having a pH of about 4.5 to 8.5, for a time long enough and at a salt concentration high enough, for a precursor anticorrosive effective amount of said at least one salt to be incorporated within said uncured resin; and then

contacting said first rinsed resin with a second rinse comprising an aqueous solution of a water soluble chromate, chromic acid, or chromic acid and partially reduced chromic acid, for a time long enough, and in a concentration high enough, to convert an anticorrosive effective amount of said percursor salt to its corresponding chromate salt in situ.

4,636,265

AUTODEPOSITION POST-BATH RINSE

Herbert Fischer, Duesseldorf; Karl H. Stritzke, Langenfeld; Roland Morlock, Bergheim, all of Fed. Rep. of Germany; Thomas C. Jones, Melrose Park, and Joseph C. Donovan, Drexel Hill, both of Pa., assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 26, 1985, Ser. No. 802,643
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1984, 3442985
Int. Cl.⁴ C23F *7/00*; B05D *7/16, 3/10*
U.S. Cl. 148—6.15 R **18 Claims**

1. A method for improving the anticorrosive properties of a resin autodeposited on a clean metal substrate comprising sequentially:

contacting said substrate with an autodeposition bath containing said resin in latex form and an autodeposition activator, until an uncured resin of desired thickness is autodeposited:

removing said uncured-resin coated substrate from said contact and post-rinsing said uncured-resin with a water or water and acid solution containing at least an anticorrosive effective amount of a composition consisting essentially of:

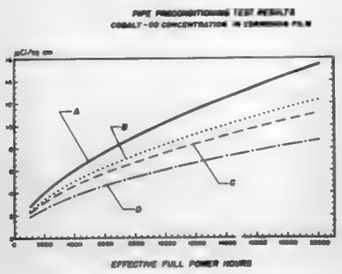
(a) at least one cupric, calcium, zinc, strontium, cadmium, ferric or cobalt dichromate readily water soluble salt; or

(b) at least one metal hypophosphite readily water soluble salt; or

(c) at least one metal dihydrogenphosphate readily water soluble salt in admixture with either (a) or (b); and

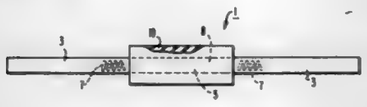
curing said rinsed uncured-resin.

4,636,266
REACTOR PIPE TREATMENT
Roger H. Amy, Santa Clara, Calif., assignor to Radiological & Chemical Technology, Inc., San Jose, Calif.
Filed Jun. 6, 1984, Ser. No. 617,635
Int. Cl.[4] C23C 8/14
U.S. Cl. 148—6.35 25 Claims



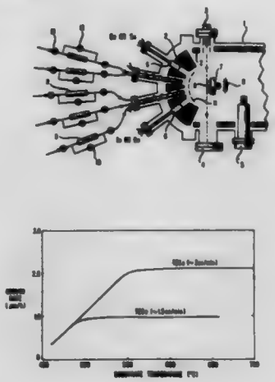
1. A method of retarding buildup of radioactive materials on a water exposed stainless steel surface of a pipe which forms a part of a water system of a light water nuclear reactor, comprising:
exposing the water exposed surface of the pipe to a gaseous oxygen source which includes oxygen while preventing contact of said water exposed surface with liquid water at a temperature which falls in a range from about 150° C. to no greater than 450° C. for at least about five hours; and
using said pipe as a portion of the water system of the light water nuclear reactor.

4,636,267
VACUUM ANNEALING OF ZIRCONIUM BASED ARTICLES
William A. Jacobson, Burrell Township, Indiana County, and Richard L. Briggs, Hempfield Township, Westmoreland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Aug. 2, 1985, Ser. No. 762,093
Int. Cl.[4] C22F 1/00
U.S. Cl. 148—133 6 Claims



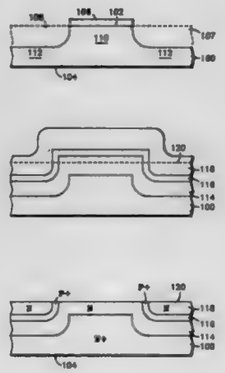
1. A method of annealing comprising the steps of:
obtaining a bundle of zirconium base alloy tubes;
placing said bundle into the cold zone of a vacuum furnace;
evacuating said cold zone and maintaining a hot zone to said furnace at a desired annealing temperature between about 820° and about 1450° F.;
moving said bundle through an energized induction coil and into the hot zone of said furnace;
heating said bundle with said energized induction coil as said bundle moves through said energized induction coil, and whereby a central tube in said bundle is heated to a temperature between about 500° F. and said desired annealing temperature, while the tubes on the periphery of said bundle are heated to a maximum temperature which is less than 50° F. above the desired annealing temperature.

4,636,268
CHEMICAL BEAM DEPOSITION METHOD UTILIZING ALKYL COMPOUNDS IN A CARRIER GAS
Won-Tien Tsang, New Providence, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Nov. 30, 1984, Ser. No. 676,658
Int. Cl.[4] H01L 21/203, 21/205
U.S. Cl. 148—175 11 Claims



1. Method for making a device, said method comprising epitaxially depositing a layer of a semiconductor material on a substrate,
said method comprising a step of exposing said substrate to a beam comprising at least one species of molecules of an alkyl compound comprising a constituent of said material, said substrate being heated in a high-vacuum environment, and
said molecules being admitted to the vicinity of said substrate in a carrier gas.

4,636,269
EPITAXIALLY ISOLATED SEMICONDUCTOR DEVICE PROCESS UTILIZING ETCH AND REFILL TECHNIQUE
Bernard W. Boland, Scottsdale, Ariz., assignor to Motorola Inc., Schaumberg, Ill.
Continuation-in-part of Ser. No. 553,326, Nov. 18, 1983, Pat. No. 4,609,413. This application Jul. 2, 1985, Ser. No. 750,969
Int. Cl.[4] H01L 21/205, 21/76
U.S. Cl. 148—175 8 Claims



1. A process for manufacturing electrically isolated semiconductor device structures comprising the steps of: providing a semiconductor substrate having a surface; selectively etching

portions of said surface to form etched regions and unetched regions; epitaxially forming first, second and third layers overlying said etched and unetched regions; and shaping back said epitaxial layer to form a substantially planar surface and to expose a portion of said first layer overlying said unetched region.

4,636,270
INTERNAL OXIDIZED AG-SN SYSTEM ALLOY CONTACT MATERIALS
Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo K.K., Tokyo, Japan
Filed Sep. 23, 1985, Ser. No. 779,066
Int. Cl.[4] C22C 5/06
U.S. Cl. 148—431 3 Claims

1. Internal oxidized Ag-Sn system alloy electrical contact materials, which are made by the complete internal oxidation of an alloy comprising 0.5–12 weight % of Sn, and 0.5–15 weight % of In or 0.01–less than 1.5 weight % of Bi, to which alloy may be added one or more metallic elements selected from a group consisting of 0.1–5 weight % of Cd, 0.1–2 weight % of Zn, 0.1–2 weight % of Sb, 0.01–2 weight % of Pb, and 0.1–less than 2 weight % of In, and which alloy is characterized by having adjacent a first surface thereof a first area in which metal oxides are segregated, having adjacent the opposite surface thereof a third area comprising the forwardmost area of the internal oxidation along its progressive direction and constituting the contact surface of said alloy, and a second area interposed between said first and third areas and being depleted of said metal oxides, said contact surface having finer internally oxidized structures than said first and second areas.

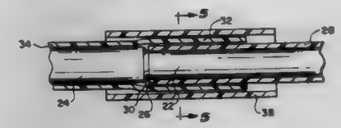
4,636,271
FORMING A WIRE MARKER SLEEVE
Paul J. Gandolfo, Parsippany, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.
Filed Feb. 8, 1985, Ser. No. 699,775
Int. Cl.[4] B29C 53/20; B32B 31/02
U.S. Cl. 156—73.1 16 Claims



8. A method of forming a wire identification sleeve comprising the steps of:
providing an elongate hollow member having a first wall portion and an opposed second wall portion; and
flattening a central portion of said hollow member intermediate the ends thereof by releasably bonding said first wall portion to said second wall portion.

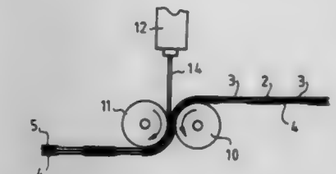
4,636,272
PROCESS FOR THERMALLY BONDING PLASTIC TUBES
Gary T. Riggs, West Palm Beach, Fla., assignor to Cordis Corporation, Miami, Fla.
Filed Feb. 19, 1985, Ser. No. 702,945
Int. Cl.[4] B29C 65/02
U.S. Cl. 156—158 25 Claims

1. A process for thermally bonding together first and second tubings made of a plastic material with a bond area having a narrow width; said process comprising the steps of:
providing a stepped mandrel wire having a small diameter portion the outer diameter of which corresponds to the inner diameter of the first plastic tubing to be utilized, a larger diameter portion having an outer diameter which corresponds generally to the outer diameter of the first plastic tubing, and a shoulder separating the stepped portions;
feeding one end of the first plastic tubing over the small diameter portion of the mandrel wire;
feeding the end of the second plastic tubing over the larger diameter portion of the mandrel wire to a position where it overlaps the end of the first plastic tubing fed onto the small diameter portion of the mandrel wire from a direction opposite that in which the first plastic tubing was fed over the mandrel wire;
feeding a section of shrink tubing having an inner diameter sufficient to be received over the second plastic tubing to



a position where the overlapped first and second tubings are centrally located within the section of shrink tubing;
placing the plastic tubing assembly comprising the mandrel wire, one end of the first plastic tubing, one end of the second plastic tubing, and the shrink tubing into a specially configured preheated die assembly including chill blocks;
heating a narrow circumferential portion of the assembly to cause the shrink tubing section to shrink and force the second tubing against the first tubing which is being melted by the heating to thermally bond the plastic tubings together;
allowing the heated bonded tubings to cool;
and after cooling, removing the shrink tubing and mandrel wire.

4,636,273
PROCESS FOR MANUFACTURING COVERS FOR CONTAINERS OPENED BY PEELING OFF THE COVER
Daniel J. Wolfersperger, Selestat, France, assignor to Societe Alsacienne D-Aluminium, Saint Julien en Genevois, France
Filed Aug. 22, 1984, Ser. No. 643,270
Claims priority, application France, Aug. 24, 1983, 83 13639
Int. Cl.[4] B32B 31/18
U.S. Cl. 156—244.11 15 Claims



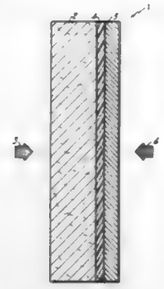
1. A process for manufacturing covers for containers which are opened by peeling off the cover, comprising the steps of forming a series of holes in a strip of material, applying a first continuous coating to one of the faces of the perforated strip, said first coating being at least partially separable from the strip by peeling off said coating, applying a second continuous coating to the other face of the perforated strip so that a portion of said second coating adheres to a corresponding portion of the first coating through said holes, the length and width of each of said coatings substantially corresponding to that of said strip, and cutting out the multi-layer sheet thus formed to form a series of covers, each having one hole.

4,636,274

METHOD OF MAKING CIRCULATING ELECTROLYTE ELECTROCHEMICAL CELL HAVING GAS DEPOLARIZED CATHODE WITH HYDROPHOBIC BARRIER LAYER

Gary A. Gruver, South Windsor, and Harold R. Kunz, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 686,178, Dec. 24, 1984, Pat. No. 4,564,427.
This application Sep. 13, 1985, Ser. No. 775,925
Int. Cl.[4] B32B *27/06*; C25B *11/06*
U.S. Cl. 156—279 1 Claim



1. A method of making a gas depolarized cathode particularly adapted for use in a circulating electrolyte electrochemical cell comprising:

(a) forming a carbonized fiber ribbed porous substrate;

(b) press-molding a self-supporting layer of a fluorocarbon polymer that contains carbon particles;

(c) applying a layer of an oxygen reducing catalyst on one side of the fluorocarbon polymer layer; and

(d) bonding the uncoated side of the fluorocarbon polymer layer to the porous substrate;

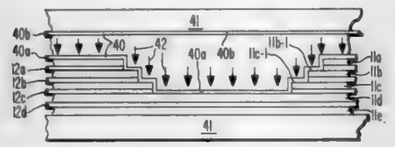
resulting in substantially no electrolyte leakage through the cathode when the electrolyte pressure is up to three pounds per square inch above ambient.

4,636,275

ELASTIC BLADDER METHOD OF FABRICATING AN INTEGRATED CIRCUIT PACKAGE HAVING BONDING PADS IN A STEPPED CAVITY

Ronald A. Norell, Carlsbad, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 21, 1986, Ser. No. 819,994
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—289 14 Claims



1. A method of fabricating an integrated circuit package including the steps of:

assembling a stack which is comprised of a plurality of thin flat epoxy-glass layers, adhesive layers between the epoxy-glass layers, a staircase-shaped cavity which extends from an outer epoxy-glass layer to an internal epoxy-glass layer and goes parallel along a portion of the flat surface of said internal epoxy-glass layer and then penetrates through it, and conductors on said internal epoxy-glass layer including bonding pads on the flat surface portion;

covering said one outer epoxy-glass layer and said cavity with an elastic bladder; and

laminating said stack by forcing a fluid against said elastic bladder at a temperature and pressure which causes the bladder to stretch and push against all the surfaces of said cavity and thereby dam said adhesive from flowing onto said bonding pads.

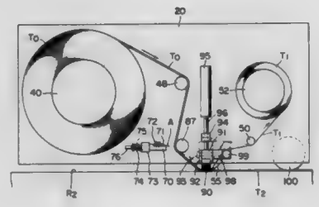
3. A method according to claim 1 wherein said elastic bladder has a surface that resists sticking to said epoxy-glass and said adhesive.

4,636,276

AUTOMATIC ADHESIVE DOUBLE COATED TAPE APPLYING DEVICE

Yoshiki Nozaka, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 621,527, Jun. 18, 1984, abandoned. This application Nov. 4, 1985, Ser. No. 794,571
Claims priority, application Japan, Jun. 20, 1983, 58-110666
Int. Cl.[4] B31F *5/06*; B65H *21/00*
U.S. Cl. 156—353 14 Claims



1. A device for automatically applying an adhesive double coated tape to a desired material comprising:

a base assembly constituting an essential structure of the adhesive double coated tape applying device;

means for supporting said base assembly to be movable in a direction toward or away from said desired material; and

means for shifting said supporting means together with said assembly in a direction such that said base assembly is moved along the surface of said desired material, said base assembly comprising:

a frame member connected to said supporting means;

means mounted on said frame member for feeding and holding a roll mounted on a rotating shaft thereof around which a composite tape consisting of an adhesive double coated tape and a support tape laminated thereto to be separable therefrom is wound so as to feed said composite tape;

means mounted on said frame member for guiding and feeding only said support tape separated from said composite tape;

means for pressing said adhesive double coated tape separated from said composite tape against said desired material so that the adhesive exposed surface of said adhesive double coated tape is linearly bonded under pressure of said pressing means onto the surface of said desired material between said composite tape feeding means and said separated support tape guide means when said base assembly approaches closely said desired material, said pressing means being supported by said base assembly to be movable relative thereto;

means located between said composite tape feeding means and said pressing means for cutting only said adhesive double coated tape of said composite tape without cutting said support tape to be separated therefrom after said adhesive double coated tape with the adhesive exposed surface has been applied on said desired material by a length determined by the movement of said base assembly along the surface of said desired material, said cutting means comprising a cutter knife, a cutter knife support member movably supported by said base assembly, means for moving said cutter knife support member, and a cutter knife receiving member supported by said frame member around which said composite tape passes through a position opposite to the front end of said cutter knife;

means for braking the rotation of said rotating shaft of said composite tape feeding means after said adhesive double coated tape has been cut by the cutting means;

means disposed on said frame member for detecting an end surface of said desired material to control travelling of said base assembly;

means for operating said braking means so that when the cut portion of said composite tape reaches the central portion of said pressing means, said braking means is operated by a timer operated in connection with the cutting operation of said cutting means thereby to stop the feeding of said adhesive double coated tape; and

means for actuating and guiding said pressing means in operative relation to said cutting means and detecting means so that the adhesive double coated tape of a desired length can be applied on the desired material,

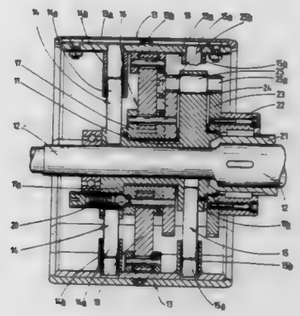
said means for guiding and feeding said support tape cut and separated from said composite tape comprising at least one movable guide roller which is disposed to be movable together with said pressing means and around which said separated support tape is wound, a winding reel rotatably mounted on a rotating shaft supported by said frame member, and a stationary guide roller located between said movable guide roller and said winding reel at such a position that a length of said separated support tape stretched between said movable guide roller and said stationary guide roller is equal before and after the pressing movement of said pressing means.

4,636,277

TIRE BUILDING DRUM

Michael E. Owen, Tettenhall, United Kingdom, and Mark S. Byerley, Greenback, Tenn., assignors to Wyko Equipment Limited, Dudley, England

Filed Feb. 5, 1985, Ser. No. 698,536
Claims priority, application United Kingdom, Feb. 8, 1984, 8403351
Int. Cl.[4] B29D *30/26*
U.S. Cl. 156—417 19 Claims



1. A radial collapse tire building drum comprising:

a hub;

a plurality of axially extending cylindrical body segments disposed around the hub;

first radial support means at one axial end of the hub and including a radially extending support adjacent one axial end of each of the segments;

second radial support means at the other axial end of said hub and including a radially extending support adjacent the other axial end of each of the segments;

a collapsing mechanism within the drum and disposed between said first and second radial support means, said collapsing mechanism being selectively operable either to move said segments radially outwardly with respect to said hub to form a cylindrical body concentric with said hub, or to move said segments radially inwardly towards said hub to collapse the cylindrical body of the drum;

a main drive shaft secured to said hub and having its axis co-extensive with the hub axis;

a hollow shaft through which said main drive shaft extends; and

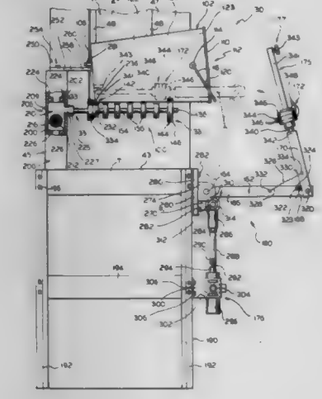
a drive transmission gear train extending between circumferentially adjacent, radially extending supports of said first radial support means to provide a drive connection between said hollow shaft and said collapsing mechanism for transmitting rotational movement of said hollow shaft relative to the main shaft to operate said collapsing mechanism.

4,636,278

APPARATUS FOR LABELING NESTING TYPE BUCKETS

John G. Wesley, Oak Brook, Ill., assignor to Labelette Company, Forest Park, Ill.

Filed Dec. 20, 1985, Ser. No. 811,373
Int. Cl.[4] B65C *3/12*, *9/06*, *9/30*
U.S. Cl. 156—446 10 Claims



1. In a labeling machine for applying labels to individual round open top containers of the nesting type, said machine including a label supply hopper, a glue applying station, and a labeling station including a pair of support rollers upon which the container to be labeled may be supported and rotated, and means for feeding labels longitudinally thereof along a predetermined feed path from the hopper through the glue applying station to a label applying relation position with the container external side wall surface at the labeling station, said glue applying station including means for applying glue to the underside of the label when received from the label supply station, and said feeding means including one of said support rollers being in overlying relation to said feed path and a label feed guide mounted below said one support roller and including a guide surface concentric with the periphery of said one support roller and disposed to direct the leading end of a label to be applied to the container external side wall surface at a predetermined outfeed angle,

the improvement wherein:

said support rollers include means for disposing the container external side wall surface adjacent said one roller in substantially flush relation with the out feed angle of the labels from the label feed guide when the container is received on said support rollers,

said disposing means comprising an indexing roller seat mounted on each said roller adjacent one end of said rollers in concentric relation thereto and rotatable therewith for receiving the rim of the container at the closed end of same,

said disposing means further comprising a disc mounted on the other roller adjacent the other end of same and proportioned in external diameter relative to the amount of circumferential wrap the label to be applied to the container external side wall surface is to have on the container external side wall surface, on which disc the container external side wall surface is to ride adjacent the container open end, whereby said container external side wall surface is disposed in said substantially flush relation and including:

means for releasably holding the container against said support rollers from inside the container and comprising a hold down arm including roller means for hold down engagement of the container inside side wall surface against said support rollers while the container is being labeled, and means for retracting said hold down arm from within said container to release same for removal from said support rollers after labeling of the container.

4,636,279

TAPE SPLICING MECHANISM

Scott J. Morgan, 45 King Street, Broseley, Shropshire TF12 5NA, England

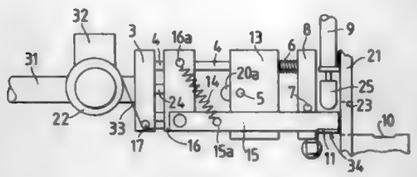
PCT No. PCT/GB82/00011, § 371 Date Sep. 20, 1982, § 102(e) Date Sep. 20, 1982, PCT Pub. No. WO82/02613, PCT Pub. Date Aug. 5, 1982

Continuation of Ser. No. 425,097, Sep. 20, 1982, abandoned. This PCT application Jan. 18, 1982, Ser. No. 695,404

Claims priority, application United Kingdom, Jan. 20, 1981, 8101661

Int. Cl.⁴ B31F 5/06

U.S. Cl. 156—506 8 Claims



1. In a tape splicing mechanism for joining two free end portions of tape to be joined in abutting end-to-end relationship at a joining station by applying an element of adhesive splicing tape from a source of supply thereof over said two free end portions of said tape to be joined at said joining station, improved means for feeding and cutting to length and controlling the position of the adhesive splicing tape, said means comprising

a linearly reciprocable splicing tape advancing means for drawing a standing length of said splicing tape from said source of supply thereof, with said standing length extending transversely of the length of said two free end portions of tape to be joined at said joining station and closely adjacent the plane defined thereby,

splicing tape severing means operating to sever an end portion of said splicing tape at the end of said standing length thereof,

splicing tape severed end retaining means for retaining by suction said severed end portion of splicing tape severed by the operation of said splicing tape severing means in substantially the same plane as that in which said standing length of splicing tape lies,

means for displacing said severed end retaining means linearly towards and away from said joining station in a direction generally parallel to said standing length of said splicing tape whereby to transfer said severed end portion of splicing tape to said joining station by moving it parallel to the plane defined by said two free end portions of tape to be joined, and

applicator pressing means for applying said severed end portion of splicing tape onto said abutting free end portions of said tape to be joined by pressing splicing tape severed end retaining means carrying said severed end portion of splicing tape onto said free end portions of said tape to be joined to join said free end portions together,

said means for displacing said splicing tape severed end retaining means also acting to displace said splicing tape advancing means a different distance than said splicing tape severed end retaining means.

4,636,280

METHOD FOR THE PRETREATMENT OF A SUBSTRATE FOR ION IMPLANTATION

Ryusuke Nakai; Toshihiko Takebe, both of Osaka, and Hajime Yamazaki, Ischara, all of Japan, assignors to Sumitomo Electric Ind., Ltd., Osaka and Nippon Telegraph & Telephone Public Corp., Tokyo, both of, Japan

Filed Aug. 21, 1984, Ser. No. 643,034

Claims priority, application Japan, Aug. 23, 1983, 58-154265

Int. Cl.⁴ C30B 1/02

U.S. Cl. 156—603 7 Claims



1. A method for the pretreatment of a semiconductor substrate, which comprises annealing a substrate consisting of a material selected from the Group III–V compounds containing impurities therein at a high temperature for a long period of time sufficient to uniformly distribute the impurities throughout the substrate and then quenching the substrate to freeze the impurities in a uniform state throughout the substrate before IC processing.

4,636,281

PROCESS FOR THE AUTOPOSITIONING OF A LOCAL FIELD OXIDE WITH RESPECT TO AN INSULATING TRENCH

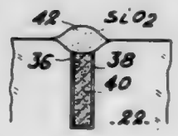
Francois Buiguez, Saint Egieve, and Joël Hartmann, Claix, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 13, 1985, Ser. No. 744,339

Claims priority, application France, Jun. 14, 1984, 84 09315

Int. Cl.⁴ H01L 21/306; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—643 17 Claims



1. A process for self-positioning a local field oxide with respect to an insulating trench formed in a silicon substrate, comprising the successive steps of:

(a) forming at least one first insulating material coating on the substrate surface;

(b) forming a second insulating material coating on said first coating;

(c) anisotropically etching the first and second insulating material coatings until the region of the substrate in which the trench is to be formed is exposed;

(d) forming insulating spacers on the etched flanks of the first and second insulating material coatings;

(e) anisotropically said region of the substrate in order to produce the trench, the second etched insulating material coating and the spacers acting as a mask for said etching;

(f) eliminating the second etched insulating material coating and the spacers;

(g) forming insulating edges in the trench;

(h) filling the trench with a polycrystalline silicon;

(i) producing the local field oxide with a thermal oxidation of said polycrystalline silicon, the first etched insulating material coating acting as a mask for said thermal oxidation; and

(j) eliminating the first etched insulating material coating.

4,636,282

METHOD FOR ETCHING COPPER AND COMPOSITION USEFUL THEREIN

Kwee C. Wong, Orange County, Calif., assignor to Great Lakes Chemical Corporation, West Lafayette, Ind.

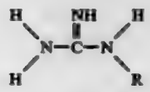
Filed Jun. 20, 1985, Ser. No. 747,037

Int. Cl.⁴ C23F 1/02; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—659.1 29 Claims



12. A process for etching copper, comprising contacting the surface of a copper article with an etching composition at a temperature of at least about 120° F., said etching composition comprising between about 8% and about 12% by weight sulfuric acid, at least about 0.5 moles hydrogen peroxide per mole sulfuric acid, and between about 0.004 and about 0.02 moles per mole sulfuric acid of an additive corresponding to the formula



where R is selected from a group consisting of hydrogen and an amino group corresponding to the formula:



where R^1 and R^2 are independently selected from the group consisting of hydrogen and formyl.

4,636,283

APPARATUS FOR THE DISTILLATION OF FRESH WATER FROM SEA WATER

Gamal E. D. Nasser, Puchheim, Fed. Rep. of Germany, assignor to D.V.T. Buro fur Anwendung Deutscher Verfahrenstechnik H. Morsy, Duesseldorf, Fed. Rep. of Germany

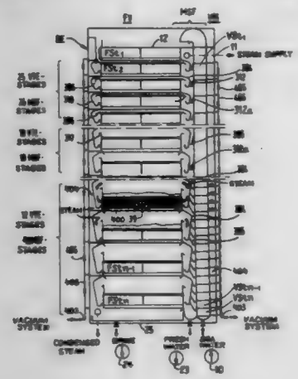
Division of Ser. No. 496,709, May 20, 1983, abandoned. This application Mar. 6, 1984, Ser. No. 586,662

Claims priority, application Fed. Rep. of Germany, May 24, 1982, 3219386; Oct. 27, 1982, 3239816

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.⁴ B01D 3/06, 1/26; C02F 1/06

U.S. Cl. 202—173 15 Claims



1. Apparatus for the distillation of fresh water from seat water comprising a generally vertically extending falling film evaporator comprising a vertical tube evaporator formed of a multiplicity of vertical tube evaporator stages with said evaporator stages spaced apart in the vertical direction and including an uppermost stage, a lowermost stage and a multiplicity of vertically spaced stages therebetween, means for supplying preheated seat water to the uppermost stage of said vertical tube evaporator so that the seat water flows downwardly through said stages, each of said vertical tube evaporator stages of said vertical tube evaporator comprises upwardly extending stamped heat exchanger plates having opposite vertically extending planes with shaped reinforcing projections stamped out of the opposite planes of said plates with the projections forming shaped recesses on the opposite sides of said plates from said reinforcing projections, said projections and recesses arranged in a grid-like manner in both directions of said plates, a first pair of said plates arranged with said projections aligned in opposed relation with said projections extending in the opposite direction combining to form tubes extending in the vertical direction of said plates, the recesses in said plates aligned vertically with said projections forming said tubes defining cross connections between said tubes for providing a pressure balancing effect, another said plate on each side of said first pair with said projections of the another said plate offset transversely of the vertical direction relative to said projections in said first pair and the another said plate and the adjacent one of said plates of said first pair defining therebetween slot-like ducts extending transversely of said tubes, in said vertical tube evaporator said tubes are arranged for the downward flow therethrough of the preheated seat water and said slot-like ducts are arranged for the flow therethrough of a steam component for vaporizing the sea water flowing through said vertical tubes so that the flow through said vertical tubes is generally horizontal, and the upper ends of said plates forming said tubes are spaced apart forming an inlet to each of said vertical tube evaporator stages, a loosely arranged horizontally extending distributor tube located in each said inlet extending for the horizontal length of said inlet across the

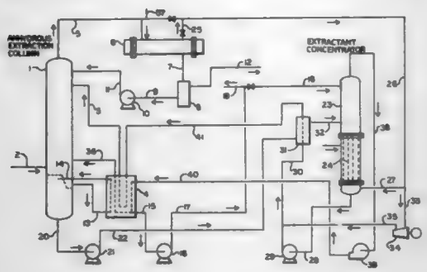
upper ends of said plates and said rod forming a weir-like member for uniformly distributing the downwardly flowing seat water into said tubular ducts in each said vertical tube evaporator stage.

4,636,284

PROCESS FOR THE SEPARATION OF WATER FROM A WATER-CONTAINING MIXTURE OR AZEOTROPE WITH AN EXTRACTANT, AND FOR THE SEPARATION OF WATER FROM SAID EXTRACTANT

John C. English, 300 Morris, Longview, Tex. 75602; John A. Ondrey, 4600 Paluxy, Tyler, Tex. 75703, and Jason M. Voyce, Rte. 21, Box 296, Tyler, Tex. 75709

Filed May 18, 1984, Ser. No. 611,906
Int. Cl.[4] B01D *3/40*
U.S. Cl. 203—18 11 Claims



1. In a process for the extraction, in an anhydrous extraction column, of water from a water-containing product by countercurrent contact of a vaporous stream of the water-containing product with a liquid extractant to remove water from said water-containing product, the extractant retaining water removed from the water-containing product while recovering a vaporous stream of said product from which water has been removed,

and water is removed from the water-containing extractant in an extractant concentrator associated with said anhydrous extraction column,

the improvement comprising,

boiling the water-containing extractant in a first heat exchanger associated with said extraction column, which is heated with water vapor from the water removed from the extractant to provide reboil for the extraction column,

transporting the extractant from the anhydrous extraction column to a second heat exchanger associated with an extractant concentrator, heating and removing a major portion of the water from said extractant within said second heat exchanger which is heated by hot dried extractant produced in said extractant concentrator, this leaving residual water in said extractant, and then removing the residual water from the extractant while countercurrently contacting said heated extractant within said extractant concentrator with at least a portion of said vaporous stream of said product from which water has been removed, and then

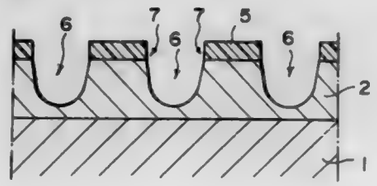
transporting said product used to remove residual water from said extractant to said first heat exchanger and therein condensing a portion of this vapor product stream to supply heat to the extraction column.

4,636,285

METHOD OF MANUFACTURING WEAR RESISTANT SLIDING MEMBER

Kouji Tarumoto; Jun Miyata; Koji Yagi, and Satoshi Nanba, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed May 28, 1985, Ser. No. 738,433
Claims priority, application Japan, May 29, 1984, 59-110465
Int. Cl.[4] C25D *5/48*; C25F *3/14*; C23C *14/34*
U.S. Cl. 204—38.5 6 Claims



1. A method of manufacturing a sliding member having a number of oil retaining pores comprising the steps of forming a hard plating layer, having a surface hardness not less than Hv 700, on a metal base,

forming a masking resist film on the hard plating layer by exposure to light and development,

forming a number of oil-retaining pores in the hard plating layer by effecting electrolytic etching at a current density of 50 to 600 A/dm^2, an edge portion of each of said oil-retaining pores having a shoulder angle not less than 100 degrees,

dissolving said masking resist film and removing the same,

and forming a hard ceramic film, having a surface hardness not less than Hv 1000, on the hard plating layer by vapor phase plating.

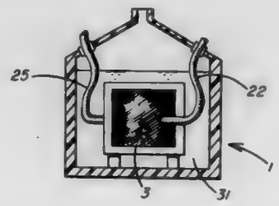
6. A method of manufacturing a sliding member as defined in claim 1 in which said sliding member is a rotor housing for a rotary piston engine.

4,636,286

ELECTRO ORGANIC METHOD

Norman R. DeLue, Akron, and Stanley R. Pickens, Wadsworth, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 25, 1983, Ser. No. 478,928
Int. Cl.[4] C25C *1/00*
U.S. Cl. 204—59 R 5 Claims



1. In a method of electrolyzing a non-aqueous medium in an electrolytic cell having an anode, a cathode, and solid electrolyte means, the anode in contact with one surface of the solid electrolyte means, the cathode in contact with the opposite surface of the solid electrolyte means, and the anode-solid electrolyte means-cathode dividing the electrolytic cell into anode and cathode compartments, which method comprises providing a non-aqueous medium containing an organic reactant in contact with one of said anode and cathode, and externally imposing an electrical potential across the anode and

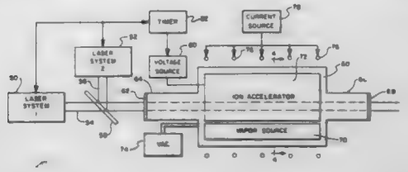
cathode whereby to evolve anhydrous product at an electrode and transport ionic species across the solid electrolyte means, the improvement wherein said solid electrolyte means contains entrapped, mobile, ion transport means provided by an ionizable liquid or polar ionic organic moieties within the solid electrolyte means.

4,636,287

FREQUENCY SWEPT LASER SYSTEM FOR ISOTOPE EXCITATION

Charles T. Pike, Lexington; Horace W. Furumoto, Wellesley, both of Mass., and Lawrence A. Levin, Beer Sheva, Israel, assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Continuation of Ser. No. 184,123, Sep. 4, 1980, abandoned, which is a division of Ser. No. 958,623, Nov. 8, 1978, Pat. No. 4,257,013, which is a division of Ser. No. 483,077, Jun. 25, 1974, Pat. No. 4,156,144, which is a continuation of Ser. No. 465,264, Apr. 29, 1979, abandoned. This application Oct. 28, 1983, Ser. No. 546,633
Int. Cl.[4] B01D *59/00*
U.S. Cl. 204—157.15 5 Claims



1. A method of exciting elemental uranium particles containing at least a selected isotope and at least an undesired isotope, said selected isotope having an absorption band of a spectral width broadened into degenerate states resulting from an unwanted environmental effect, with laser radiation of a frequency band which corresponds to a portion of said spectral width comprising the steps of:

providing a hot vaporous environment of said elemental uranium particles with said broadened spectral width;

generating said laser radiation having said frequency band;

sweeping said laser radiation across said absorption band whereby the frequency band of said laser radiation is caused to provide a spectral match with substantially all of said broadened spectral width without corresponding absorption for the undesired isotope to selectively excite said selected isotope wherein said sweeping is performed at a controlled rate of sweep;

separating said selected isotope from others of said particles following selective excitation of said isotope.

4,636,288

ELECTRODIALYTIC CONVERSION OF MULTIVALENT METAL SALTS

Daniel J. Vaughan, 36 Paxon Dr., Wilmington, Del. 19803

Continuation-in-part of Ser. No. 568,897, Jan. 6, 1984, abandoned. This application Oct. 26, 1984, Ser. No. 665,052
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—182.4 24 Claims

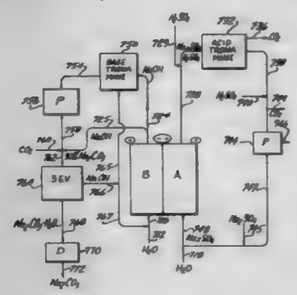
1. A process for the electrodialytic conversion of salts or multivalent metal cations in an aqueous solution as an anolyte into the acid of the salt anion or a halogen if the salt anion is a halide, said aqueous anolyte solution being selected from solutions of said salts and solutions of said salts and salts of monovalent cations, which comprises electrotransporting at least multivalent metal cations from said aqueous anolyte solution through a cation permeable membrane into another aqueous solution containing (a) a soluble salt of an acid which acid in a one normal solution would have a pH no greater than three and forms a water soluble salt of said multivalent metal cation and (b) an agent capable of reacting selectively with said multivalent metal cations to form ionically immobile substances selected from precipitates, complexes and chelates of said multivalent metal cations.

4,636,289

SOLUTION MINING OF SODIUM MINERALS WITH ACIDS GENERATED BY ELECTRODIALYTIC WATER SPLITTING

Krishnamurthy N. Mani, Deaville, and Frederick P. Chlanda, Rockaway, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 2, 1983, Ser. No. 490,945
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—182.4 13 Claims



1. A process for converting basic sodium material into a liquid comprising aqueous hydrogen ions and a liquid comprising aqueous sodium base which comprises:

(a) contacting basic sodium material with a liquid comprising aqueous hydrogen ions for a time sufficient to produce a reaction liquid comprising aqueous sodium ions and being substantially free of $CO_3^=$ values;

(b) introducing the reaction liquid and a liquid comprising water into separate compartments of an electrodialytic water splitter;

(c) passing direct current through said electrodialytic water splitter to produce a reaction liquid product comprising aqueous hydrogen ions and a liquid product comprising an aqueous sodium base;

(d) withdrawing reaction liquid product from the electrodialytic water splitter; and

(e) supplying at least a portion of the withdrawn reaction liquid product for contact with the basic sodium material.

4,636,290

LIQUID-LIQUID EXCHANGERS AND PROCESS OF USING

Louis Betinel, Pierrelatte; Laurent Martin, Bourg St Andeol, and Thierry Dujardin, Viviers, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 13, 1984, Ser. No. 620,180
Claims priority, application France, Jun. 22, 1983, 83 10021
Int. Cl.[4] B03C *5/00*, *5/02*
U.S. Cl. 204—186 10 Claims

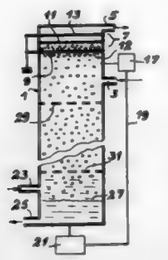
9. A process for removal of entrained droplets of a dispersed phase in a continuous phase, which comprises:

providing a column; said column having connected thereto a dispersed phase inlet and outlet and a continous phase inlet and outlet;

connecting said dispersed phase inlet to a source of a dispersed phase; said column having a perforated electrocoalescer which comprises at least two electrodes, one of which is connected to ground while another is live, said electrodes being positioned perpendicularly to the axis of said column such that when said dispersed phase is flow-

ing in counterflow manner relative to said continuous phase, small droplets of the dispersed phase are coalesced to form larger droplets which are able to move in a direction away from said continuous phase outlet and then reach a part of said exchanger positioned between the dispersed phase inlet and the continuous phase inlet, thereby diminishing entrainment of said dispersed phase by said continous phase;

introducing a continuous phase into said column by way of said continous phase inlet;



introducing a dispersed phase into said column in a counterflow manner to said continuous phase by way of said dispersed phase inlet;

drawing off said dispersed phase by way of said dispersed phase outlet;

passing substantially all of said continuous phase through said electrocoalescer with removal of entrained droplets of said dispersed phase; and

drawing off by way of said continuous phase outlet a coalesced phase.

4,636,291

DIAPHRAGM FOR ALKALINE ELECTROLYSIS AND PROCESS FOR MANUFACTURE OF DIAPHRAGM

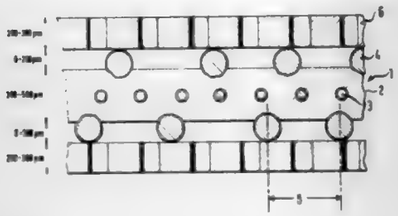
Jiri Divisek, and Peter Malinowski, both of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Jul. 1, 1985, Ser. No. 750,858

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1984, 3424203

Int. Cl.[4] C25B *11/03*

U.S. Cl. 204—283 20 Claims



1. An electrically isolating diaphragm for use between at least two contacting electrodes for alkaline electrolysis, said diaphragm comprising:

a fine-pored predominantly ceramic layer-like structure having at least one fine-pored side surface;

said ceramic structure having a plurality of protuberances projecting outwardly by a predetermined dimension from said at least one fine-pored side surface of said ceramic structure;

said predetermined dimension defining a spacing between said at least one fine-pored side surface and one of said contacting electrodes; and

said protuberances comprising a plurality of coarse grains of known dimensional size partially embedded in said at least one fine-pored side surface of said ceramic structure.

4,636,292

ELECTRODE FOR ELECTROCHEMICAL MEASUREMENTS IN AQUEOUS SOLUTIONS OF HIGH TEMPERATURES

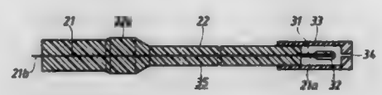
Peter Fejes, and Eva Halldén, both of Västerås, Sweden, assignors to AB Asea-Atom, Västeras, Sweden

Filed May 1, 1985, Ser. No. 729,426

Claims priority, application Sweden, May 3, 1984, 8402387

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—406 10 Claims



1. In a nuclear reactor which includes a flow circuit for carrying a high temperature aqueous solution and a means for making electrochemical measurements of the high temperature aqueous solution which flows through said flow circuit, said means including an autoclave and an electrode which is extendable into said autoclave, the improvement wherein said electrode comprises (1) a platinum-group metal conductor which has a first end portion positionable within said autoclave to contact the aqueous solution flowing therethrough, a middle portion and a second end portion positionable outside said autoclave for connection to an electrical measuring means, and (2) an insulating casing which has been isostatically pressed around said middle portion of said conductor to be in tight contact therewith, said casing being composed of sintered-together particles of a material selected from the group consisting of aluminium oxide, zirconium oxide and stabilized zirconium dioxide, said casing having a density of at least 95% of the theoretical density of the material thereof.

4,636,293

INTERNALLY HEATED OXYGEN SENSOR, PARTICULARLY FOR USE WITH INTERNAL COMBUSTION ENGINES

Kurt Bayha, Oberriexingen, and Helmut Weyl, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 25, 1985, Ser. No. 715,656

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1984, 3423590

Int. Cl.[4] G01N *27/58*

U.S. Cl. 204—428 7 Claims

1. Internally heated oxygen sensor, particularly to determine the oxygen content in exhaust gases from a combustion process, especially from an internal combustion engine, having

a tubular oxygen-ion-conductive body (26);

a first electrode (28) secured to an outer surface of the tubular body;

a housing (11) retaining said tubular body in a predetermined position, projecting from the housing;

a heater element (35) located within the tubular body and having an inner end projecting from the tubular body inside the housing, and an outer end located in the vicinity of the projecting end of the tubular body; and

means for retaining the heater element in position in the housing, and within the tubular body,

wherein, in accordance with the invention,

the heater element (35) comprises

a plate-like substrate (36) of insulating material having a dimension at the inner end which is wider than the dimension of the projecting end; and

two electrical connection tracks (37/2) located on the plate-like substrate, and being positioned thereon to have a greater distance from each other at a location adjacent the inner end than in the region of the plate-like substrate which is located within the tubular body (26), the connection tracks leading to electrical heating conductors (37/1), said connection tracks and said heating conductors being formed as surface conductive tracks on the substrate (36).

4,636,294

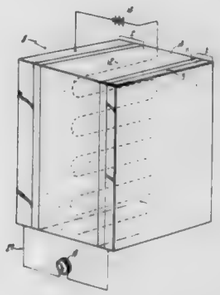
APPARATUS FOR DETECTING AND MEASURING HYDROGEN SULFIDE GAS IN THE PRESENCE OF CARBON MONOXIDE

Robert L. Novack, Evans City, and Beth A. Tomasovic, New Kensington, both of Pa., assignors to Bacharach, Inc., Pittsburgh, Pa.

Filed Sep. 20, 1985, Ser. No. 777,988

Int. Cl.[4] G01N *27/54*

U.S. Cl. 204—432 2 Claims



1. An apparatus for the detection and measurement of hydrogen sulfide gas in an object gas comprising

(a) an anode having an electrically conductive substrate with a gold oxide catalyst dispersed thereon,

(b) a cathode having an electrically conductive substrate having a cathodic catalyst dispersed thereon wherein the anode and cathode are in electrical contact with one another,

(c) an electrolyte dispersed between, and in contact with, the anode and the cathode,

(d) a reference electrode in contact with the electrolyte and the anode,

(e) a means for supplying and maintaining an electrical potential from about 0 to about 300 mv, between said anode and said reference electrode; and

(f) a means for measuring the current flow from said anode to said cathode which current is a measure of the concentration of the hydrogen sulfide.

4,636,295

METHOD FOR THE RECOVERY OF LITHIUM FROM SOLUTIONS BY ELECTRODIALYSIS

Donald L. Ball, Castlegar, and Daniel A. D. Boateng, Montrose, both of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Nov. 19, 1985, Ser. No. 799,701

Int. Cl.[4] C25B *1/16, 9/00;* B01D *13/00*

U.S. Cl. 204—182.4 27 Claims

1. A method for the recovery of lithium from brines containing monovalent cations including lithium, multivalent cations including magnesium and monovalent and multivalent anions which method comprises the steps of subjecting brine to electrodialysis; feeding brine to diluate cells of an electrodialysis unit comprising a multiplicity of alternating monopolar cationic permselective membranes and monopolar anionic permselective membranes, said membranes defining alternating diluate and concentrate cells, an anode compartment and a cathode compartment, an anode positioned in the anode compartment and a cathode positioned in the cathode compartment; applying an electrical current between the anode and the cathode at a value such that the value of the corresponding current density is in the range of about 10 to 500 A/m^2; maintaining the temperature in the unit in the range of about 0° to 60° C.; maintaining the pH of the brine fed to the electrodialysis at a value of less than about 7; passing flows of solutions through the diluate and concentrate cells at a linear velocity sufficient to maintain turbulent flow in said cells; removing a lithium-depleted diluate from the diluate cells; withdrawing a lithium-enriched concentrate from the concentrate cells, said concentrate containing magnesium and lithium in a weight ratio of about 5:1 or less; and recovering lithium from withdrawn concentrate.

4,636,296

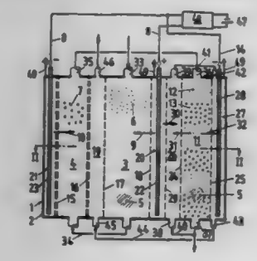
PROCESS AND APPARATUS FOR TREATMENT OF FLUIDS, PARTICULARLY DESALINIZATION OF AQUEOUS SOLUTIONS

Gerhard Kunz, Ruhrstrasse 111, D-5628 Heiligenhaus, Fed. Rep. of Germany

Filed Jan. 23, 1985, Ser. No. 693,948

Int. Cl.[4] B01D *13/02*

U.S. Cl. 204—182.5 46 Claims



1. A process for demineralizing an aqueous liquid containing salts, comprising:

successively passing the liquid through alternating separate layers of at least one means for exchanging cations and at least one means for exchanging anions to obtain a substantially demineralized liquid, said means for exchanging cations containing labile hydrogen ions and said means for exchanging anions containing labile hydroxyl ions;

applying electric energy between an anode and a cathode across the direction of the flow of the liquid and through said layered means, whereby cations and anions disassociated from the salts are transferred in opposite directions out of said layers and toward the cathode and anode, respectively; and

flushing said cations and said anions.

4,636,297

METHOD FOR PREVENTING COKING IN HYDROCARBON TREATMENT PROCESS

Hiroshi Uchiyama, Chiba, and Yukinori Matsui, Yokkaichi, both of Japan, assignors to Hakuto Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1985, Ser. No. 764,879

Claims priority, application Japan, Aug. 16, 1984, 59-169941; Jan. 10, 1985, 60-1428

Int. Cl.[4] C10G *9/16*

U.S. Cl. 208—48 AA 15 Claims

1. A method for suppressing coking in equipment used in a hydrocarbon treatment process wherein a hydrocarbon is

treated at a temperature of from about 250° to about 950° C. to produce at least one of petroleum products, petrochemical products and their intermediate products, the method comprising supplying to at least a portion of said equipment susceptible to coking, an effective amount of a coking inhibitor containing, as an active component, at least one compound selected from the group consisting of N,N-diethylthiourea, N,N-dibutylthiourea, N,N-dilaurylthiourea, tetramethylthiuram monosulfide, tetramethylthiuram disulfide, tetraethylthiuram disulfide, and tetrabutylthiuram disulfide.

4,636,298

REFORMING PROCESS

Waldeen C. Buss, Kensington, and Thomas R. Hughes, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 519,157, Aug. 1, 1983, abandoned, which is a continuation-in-part of Ser. No. 420,540, Sep. 20, 1982, abandoned, which is a continuation-in-part of Ser. No. 344,570, Feb. 1, 1982, abandoned, and a continuation-in-part of Ser. No. 344,572, Feb. 1, 1982, Pat. No. 4,435,283. This application Dec. 7, 1984, Ser. No. 679,161

Int. Cl.⁴ C10G *35/06*

U.S. Cl. 208—65 **25 Claims**

1. A reforming process comprising:

(a) contacting a hydrocarbon feed with a first reforming catalyst at conditions which favor reforming to form a product stream, wherein said first reforming catalyst is bifunctional and comprises a metallic oxide support which contains acidic sites having disposed therein a Group VIII metal; and

(b) contacting said product stream with a second reforming catalyst at conditions which favor reforming, wherein said second reforming catalyst is a monofunctional, non-acidic catalyst comprising a large-pore zeolite containing at least one Group VIII metal, and an alkaline element selected from the group consisting of calcium, barium and strontium.

4,636,299

PROCESS FOR THE MANUFACTURE OF LUBRICATING OILS

Eugene E. Unmuth, Naperville; John A. Mahoney, Glen Ellyn, and Ralph J. Bertolacini, Naperville, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 24, 1984, Ser. No. 686,076

Int. Cl.⁴ C10G *67/04*

U.S. Cl. 208—87 **10 Claims**

1. A process for reducing the pour point of a hydrocarbon feedstock containing nitrogen and sulfur-containing compounds which comprises:

passing the hydrocarbon feedstock to a solvent extraction zone wherein N-methyl-2-pyrrolidone is used to extract a portion of the aromatic compounds contained in the hydrocarbon and thereby form an extraction zone raffinate;

passing at least a portion of the extraction zone raffinate to a hydrotreating zone wherein hydrogen is contacted with the extraction zone raffinate in the presence of a hydrotreating catalyst at hydrotreating conditions wherein a substantial portion of the nitrogen and sulfur-containing compounds are converted to hydrogen sulfide and ammonia to form a hydrotreating zone effluent;

passing at least a portion of the effluent from the hydrotreating zone to a stripping zone wherein hydrogen sulfide and ammonia are removed from the hydrotreating zone effluent to form a stripping zone effluent; and

passing at least a portion of the stripping zone effluent to a dewaxing zone wherein hydrogen is contacted with the stripping zone effluent at catalytic dewaxing conditions in the presence of a catalyst composition comprising a shape selective molecular sieve component and a hydrogenation component selected from the group consisting of Group VIB and Group VIII metals.

4,636,300

INTEGRATED GAS-PHASE HYDROGENATION PROCESS USING HEAT RECOVERED FROM SUMP-PHASE HYDROGENATION FOR TEMPERATURE REGULATION

Eckard Wolowski, Mülheim, and Frank Mirtsch, Bottrop, both of Fed. Rep. of Germany, assignors to Ruhrkohle Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Sep. 13, 1985, Ser. No. 775,920

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, 34336257

Int. Cl.⁴ C10G *1/00, 1/06*

U.S. Cl. 208—400 **16 Claims**

1. In a sump-phase hydrogenation process having gas-phase hydrogenation, a method of regulating the temperature of carbonaceous input material being inputted to said hydrogenation process, said method of regulating comprising:

extracting heat from a head output product from a sump-phase hydrogenator;

heating said carbonaceous input material being inputted to said hydrogenation process through indirect heat exchange with at least a portion of said heat extracted from said sump-phase hydrogenator;

adjusting heat transfer from said heat extracted from said sump-phase hydrogenator to produce temperatures in a predetermined range by selectively by-passing any further remaining portion of said heat extracted from said sump-phase hydrogenator, wherein the further portion so by-passed is selected to compensate for a reduction in heat transfer efficiency in the heating of said carbonaceous input material;

extracting additional heat from an output of a gas-phase reactor; and

heating said carbonaceous input material with said additional heat extracted from said output of said gas-phase reactor

whereby heat generated in different portions of said sump-phase hydrogenation process is used to heat said carbonaceous input material substantially to a start up temperature of reaction.

4,636,301

DUSTING FLOUR RECYCLING SYSTEM

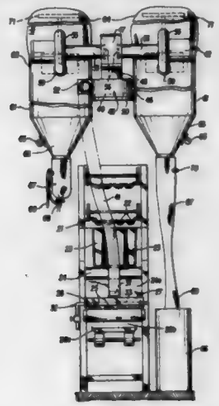
William D. Laramore, P.O. Drawer 1977, Thomasville, Ga. 31792

Filed Oct. 9, 1985, Ser. No. 785,670

Int. Cl.⁴ B04C *9/00*

U.S. Cl. 209—31 **16 Claims**

11. A flour recycling system comprising a compressed air and vacuum head adapted to be placed over a bakery product conveyor line to remove flour from all external surfaces of bakery product units, a remotely located vacuum assembly and means to support said assembly, an elongated flexible hose interconnecting said assembly and said compressed air and vacuum head, said assembly comprising a pair of reclaimed flour tanks, a pair of independently operated blowers having outlet means connected into said tanks, a separator unit having an inlet connected with said elongated flexible hose and having a pair of outlets, a pair of sifter screens across said outlets of the separator unit, and a pair of pipes connected between the outlets the separator unit and inlets of said blowers, the arrangement being such that one blower associated with one tank can be stopped and that tank can be vacuum cleaned by



the operation of the blower associated with the other tank while the system continues to operate.

4,636,302

SEPARATOR

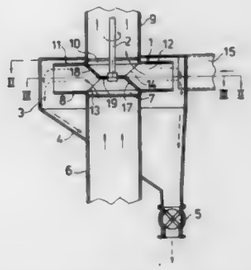
Jan Folsbeg, Copenhagen, Denmark, assignor to F. L. Smidth & Co. A/S, Denmark

Filed May 15, 1985, Ser. No. 734,451

Claims priority, application United Kingdom, Jun. 14, 1984, 8415190

Int. Cl.⁴ B07B *7/083*

U.S. Cl. 209—144 **5 Claims**



1. In a separator for sorting granular material suspended in a conveying gas into a fine fraction and a coarse fraction, said separator comprising a rotor with substantially radial vanes defining interspaces therebetween, connection means for connecting said vanes to a shaft support means, upper and lower annular plates mounted to the top and bottom, respectively, of said vanes and further defining a top and bottom of each interspace, and a cylindrical housing encasing said rotor and defining a gap between said housing and said rotor, said separator further comprising an axial inlet duct leading to an inlet end of said rotor for the supply of unsorted material and an axial outlet duct leading from an opposite outlet end of said rotor for discharging said separated fine fraction, said connection means and one of said plates defining inlet openings and flap means for permitting the supply of unsorted material and conveying gas to pass from said inlet duct into some of said interspaces while preventing the unsorted material and said conveying gas from passing to the rest of the interspaces, said connection means and the other of said plates defining outlet openings and flap means for permitted the fine fraction and conveying gas to pass from said rest of said interspaces to the outlet duct while preventing said fine fraction and conveying gas from passing into said some of said interspaces, said connection means being connected to said upper and lower plates such that the only axial conveying of said conveying gas and granular material from the inlet duct to the outlet duct is via a plurality of flow paths.

4,636,303

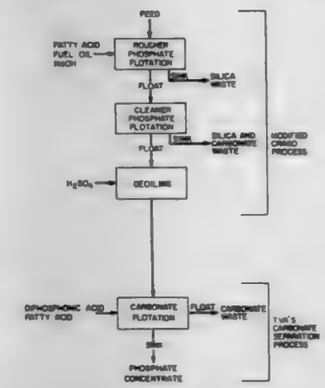
BENEFICIATION OF DOLOMITIC PHOSPHATE ORES

Shuang-chii Haieh, Florence, Ala., assignor to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed Oct. 7, 1985, Ser. No. 785,310

Int. Cl.⁴ B01D *3/14*

U.S. Cl. 209—167 **10 Claims**



1. An ore beneficiation process which comprises the steps of:

(a) subjecting, within a pH ranging from about 8.0 to about 11 as rougher phosphate flotation feed a phosphate ore of size fraction minus 16-mesh plus 10 micron containing coarse, weathered dolomite impurities and containing greater than about 1 percent MgO, to a rougher phosphate flotation step in the presence of from about 0.3 kg to about 2 kg of fatty acid and in amounts ranging upwards to about 4 kg of fuel oil per ton of said flotation feed, said coarse, weathered dolomite being of particle size about plus 48-mesh or about plus 65-mesh;

(b) collecting substantially the phosphate values along with only minor amounts of both silica and dolomite impurities as phosphate rougher concentrate from the float and rejecting substantial amounts of the silica waste in the sink of step (a) supra;

(c) subjecting said phosphate rougher concentrate collected in step (b) supra to at least one cleaner flotation step to thereby reject substantial amounts of said coarse, weathered dolomite and only minor amounts of silica in the sink thereof and recovering in the float therefrom phosphate cleaner concentrate, said at least one cleaner flotation step having aqueous media without additional floating agents added thereto and utilizing as reagent therein substantial amounts of residual fatty acid and fuel oil remaining in the float from step (b) supra;

(d) removing the fatty acid and fuel oil from said phosphate cleaner concentrate recovered in the float from step (c) supra by subjecting said concentrate to a deoiling step in the presence of from about 0.2 kg to about 2 kg of H_2SO_4 per ton of feed thereto;

(e) subjecting the resulting deoiled phosphate concentrate from step (d) supra to a carbonate flotation step in the presence of from about 0.03 kg to about 0.4 kg of alkyl diphosphonic acid per ton of feed, and from about 0.1 kg to about 2 kg fatty acid per ton of feed added thereto;

(f) removing the resulting separated dolomite from the float of step (e) supra; and

(g) recovering as product the resulting phosphate values in the sink from step (e) supra;

4,636,304

DRUM SCREENING MACHINE

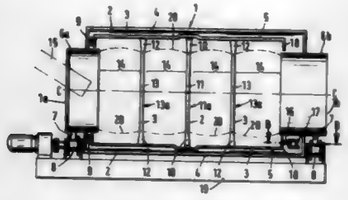
Kurt Hoppe, Hilden, Fed. Rep. of Germany, assignor to Hein, Lehmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 22, 1985, Ser. No. 715,193

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412174

Int. Cl.⁴ B07B *1/26, 1/28*

U.S. Cl. 209—287 **6 Claims**



1. A screening machine comprising:
- a screening drum defining an axis comprising first and second longitudinal support members;
- means for axially elastically connecting said first and second longitudinal support members;
- an elongated annular screen made of elastic material inside of said drum;
- means for circumferentially connecting said screen to said first support member;
- means for circumferentially connecting said screen to said second support member;
- means for vibrating said second support member in an axial direction;
- means connected to and not permitting axial motion of said first support member, for rotation said drum and screen therein.

4,636,305

APPARATUS FOR CLEANING GRITS

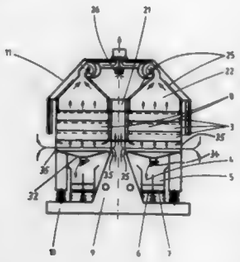
Roman Mueller, Niederuzwil, Switzerland, assignor to Gebrueder Buehler AG, Switzerland

Filed Mar. 21, 1985, Ser. No. 714,717

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1984, 3410573

Int. Cl.⁴ B07B *4/08, 1/28*

U.S. Cl. 209—312 **21 Claims**



1. In an apparatus for cleaning grits, said apparatus being of the type having a plurality of superimposed screen layers mounted for reciprocating vibratory motion, a feed inflow inlet and a screen discharge outlet at the opposite end along the length of said apparatus, collecting means for collecting the screenings, a suction collecting channel coupled to a source of vacuum, an air distribution chamber coupled to said channel and communicating with said screen layers so as to provide air circulation therethrough, and means for adjusting said air circulation, the improvement comprising:
- the apparatus being constructed of a stationary component adapted to be supported on a supporting surface and a moveable component mounted for reciprocating motion with respect to said stationary component;
- said stationary component comprising at least one stand with a generally I-shaped cross-section, said stand having a stand top in the form of an inverted channel extending along said apparatus, said channel defining said air distribution chamber, said stand also having a stand base spaced from said top and an upright intermediate support portion interconnecting said top and base and being substantially narrower than either thereof;
- the screen layers being constructed as dust boxes disposed on either side of said support portion between said top and said base, said dust boxes defining part of said moveable component; and
- air inlet means disposed below said dust boxes at the laterally outermost extreme thereof.

4,636,306

FLUID FILTERING SYSTEMS

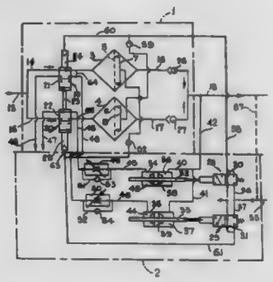
Paul Radmall, Stonehouse, England, assignor to Dowty Mining Equipment Limited, Tewkesbury, England

Filed Jul. 23, 1985, Ser. No. 758,473

Claims priority, application United Kingdom, Jul. 27, 1984, 8419271; Jun. 1, 1985, 8513862

Int. Cl.⁴ B01D *27/12*

U.S. Cl. 210—108 **4 Claims**



1. A fluid filtering system including at least two filter units so arranged in parallel that flow of fluid from a source to a point of usage can take place by way of only one said filter unit at a time, each other filter unit then being out of service, said system also including means for sensing the degree of contamination of whichever one of said filter units is in service so that when the degree of contamination is such that the said one filter unit is no longer in a suitable condition for further filtering service, said means including means for causing the bypassing of that filter unit and the bringing of another filter unit into service, said system further including jet-type back-flushing means which is automatically operable upon its filter unit when so by-passed to effect cleaning of the filter element of that unit, by jet back-flushing in the direction opposite to normal filtering flow therethrough, said back-flushing means being so subjected to the pressure differential subsisting between the unit in service and the unit out of service as to cause that back-flushing means to traverse with respect to its said filter element, and timing means for automatically controlling the period of time during which the jet back-flushing operation is permitted to continue.

4,636,307

HOLLOW-FIBER FILTERING MODULE AND WATER PURIFICATION DEVICE UTILIZING IT

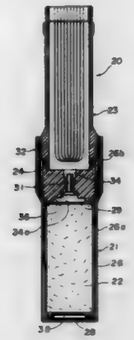
Michio Inoue, Kasugai, and Kazuto Kawashima, Nagoya, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1984, Ser. No. 650,540

Claims priority, application Japan, Sep. 16, 1983, 58-143520[U]; Jul. 17, 1984, 59-107172[U]

Int. Cl.⁴ B01D *19/00, 13/01*

U.S. Cl. 210—188 **5 Claims**



1. A water purification unit comprising a cartridge including:
- (a) a hollow-fiber filtering module comprising (i) a casing having an open end, (ii) a bundle of hollow fibers mounted within said casing, each of said hollow fibers having an open end, part of said hollow fibers being made of a microporous membrane having a portion of a hydrophobic nature, and the other hollow fibers being hydrophilic microporous membranes, and (iii) a fastening member sealingly joining said open ends of said hollow fibers to said open end of said casing in sealing relation thereto, said open ends of said hollow fibers opening to the exterior of said casing; and
- (b) an absorbent module comprising a tubular body containing a particulate absorbent and connected to said casing of said filtering module in coaxial relation thereto, said tubular body having an inlet at one end for introducing water to be treated thereinto and another end connected to said casing of said filtering module; and
- (c) a check valve having a valve body, fitted in said cartridge between said filtering module and said absorbent module, said valve body including a flow passageway communicating said absorbent module with said filtering module and having a smallest-diameter portion, and a valve element engageable with said smallest-diameter portion of said flow passageway and having means for preventing the water from flowing to said absorbent module from said filtering module, an enlarged bore being formed in an end of said valve body disposed adjacent to said absorbent module, and said enlarged bore being in communication with said flow passageway and being at least twice the diameter of said smallest-diameter portion of said flow passageway, and a filter member covering said enlarged bore on the side thereof adjacent said absorbent module.

5. A water purification device comprising:
- (a) a container having at its lower portion an inlet for a water to be treated and an outlet for the water at its upper portion;
- (b) an absorbent module accommodated within said container and comprising a tubular body containing activated carbon, said absorbent module having an outlet and having an inlet which is disposed at a level higher than said inlet of said container and in communication therewith, said tubular body having a central recess; and
- (c) a hollow-fiber filtering module comprising (i) a casing having an upper open end and an inlet in communication with said outlet of said absorbent module, (ii) a bundle of hollow fibers mounted within said casing, each of said hollow fibers having an open end, part of said hollow fibers being made of a microporous membrane having a portion of a hydrophobic nature, and the other hollow fibers being hydrophilic microporous membranes; and (iii) a fastening member sealingly joining said open ends of said hollow fibers to said open end of said casing in sealing relation thereto, said open ends of said hollow fibers opening to the exterior of said casing, said upper open end of said casing being sealingly connected to said outlet of said container, said casing of said filtering module being sealingly fitted in said central recess, wherein said absorbent module is spaced from said container to leave an annular space therebetween, said absorbent module inlet being positioned at a top thereof and above said activated carbon, a portion of said container above said absorbent module inlet being sealed and defining an air chamber, said air chamber and a top of said absorbent module separating water in said annular space from said activated carbon when a flow of water to be treated is stopped, whereby diffusion of chlorine from said water in said annular space into said activated carbon is prevented.

4,636,308

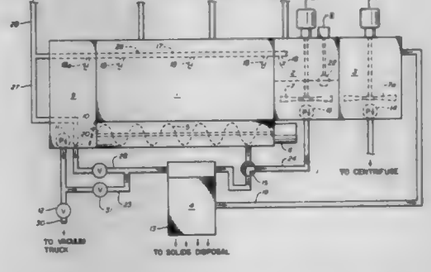
METHOD AND APPARATUS FOR RECLAIMING DRILLING FLUIDS FROM UNDESIRABLE SOLIDS IN A DRILLING OPERATION

Don D. Summers, P.O. Box 42808X, Houston, Tex. 77242

Filed Jun. 13, 1985, Ser. No. 744,412

Int. Cl.⁴ B01D *36/04*

U.S. Cl. 210—195.1 **13 Claims**



1. An apparatus for reclaiming valuable drilling fluids from the undesirable refuse discharged from a primary drilling fluid-solids separator drilling operation comprising, in combination:
- (a) a Vee-bottom bin for collecting the coarse undesirable solids-liquids fluids mixture from said primary separator constructed such that said coarse mixture will flow by gravity to the bottom of said bin;
- (b) a rectangular vessel for collecting the fine undesirable solids-drilling fluid mixture from said primary separation, said rectangular vessel including a electrically driven agitator for keeping said fine solids in a uniform suspension in said drilling fluid;
- (c) a high speed shaker screen with 150–200 mesh screen for separating valuable drilling fluids from said undesirable solids;
- (d) a second vessel for collecting said valuable drilling fluid including an electrically driven agitator for keeping said valuable drilling fluid uniform;
- (e) a first lowhead pump for conveying said coarse mixture from said Vee-bottom bin to said high speed filter;
- (f) a sump for holding said first lowhead pump located at one end of said Vee-bottom bin;
- (g) electrically driven screw conveyor means located adja-

cent to and longitudinally along the bottom of said bin for continuously propelling said coarse mixture from said bin into said sump;

(h) a second lowhead pump for conveying said fine mixture from said first rectangular vessel to said separation means; and,

(i) a conduit between said high speed shaker screen and said second rectangular vessel to allow said valuable drilling fluid to flow by gravity from said high speed shaker to said second rectangular vessel.

4,636,309

TRANSFER MEMBRANE APPARATUS

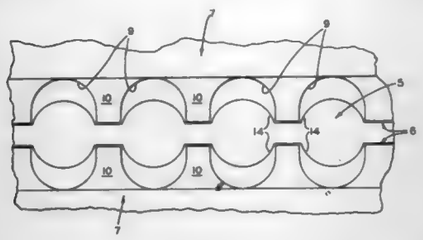
Brian J. Bellhouse, The Lodge, North Street, Islip, Oxfordshire OX5 2SQ, United Kingdom

PCT No. PCT/GB83/00324, § 371 Date Jun. 29, 1984, § 102(e) Date Jun. 29, 1984, PCT Pub. No. WO84/02275, PCT Pub. Date Jun. 21, 1984

PCT Filed Dec. 7, 1983, Ser. No. 629,838

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—321.3 **5 Claims**



1. A membrane assembly, for use in mass or heat transfer apparatus, the assembly comprising a pair of generally parallel plates (7) spaced apart with a profiled surface of one plate facing a similarly profiled surface of the other plate; and a pair of sheets of transfer membrane material (6) closely spaced, throughout substantially their whole area, face to face between the plates with each sheet supported by and partially nesting in the profiled surface of the adjacent plate, to provide between the membranes a first conduit (5) for a first fluid and, between each sheet and the adjacent plate a second conduit for a second fluid; each sheet presenting in its surface facing the other sheet a regular close packed array of permanent dimple-like depressions (14), each facing and substantially aligned with a similar depression in the other sheet, whereby, in use, when the one fluid is passed through the first conduit (5) with a pulsatile flow, vortex mixing occurs in the depressions, the profiled surface of each of said plates comprising depressions in alignment with the depressions in the respective sheet partially nesting therein, and grooves (10) interconnecting adjacent said depressions in the plate, said grooves forming spaces between the respective sheet and plate profiled surface.

4,636,310

TRANSFER MEMBRANE APPARATUS

Brian J. Bellhouse, The Lodge, North St., Islip, Oxfordshire, Great Britain (OX5 2SQ)

PCT No. PCT/GB83/00325, § 371 Date Jun. 29, 1984, § 102(e) Date Jun. 29, 1984, PCT Pub. No. WO84/02276, PCT Pub. Date Jun. 21, 1984

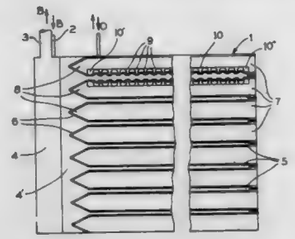
PCT Filed Dec. 7, 1983, Ser. No. 629,837

Claims priority, application United Kingdom, Dec. 7, 1982, 8234893; Dec. 7, 1982, 8234892

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—321.3 **12 Claims**

1. Transfer membrane apparatus incorporating a plurality of parallel channels, each channel comprising a first conduit (5) for a first fluid formed between two closely spaced transfer membranes (6) with the outer face of each membrane supported against a profiled plate (7) such that second conduits for a second fluid are provided one on each side of the first conduit (5) between a respective membrane (6) and supporting plate (7), the supporting plates (7) being mounted spaced apart in a stack with the double membranes between each adjacent pair of plates, the transfer membranes (6) which are supported against opposite faces of each plate being provided as parts of a continuous web (6) of transfer membrane material which is folded around the front edge of the respective plates (7); and inlet and outlet manifolds for the first fluid being provided alongside one another across the front of the stack, characterised in that each first conduit (5) is sealed along a narrow zone (16) extending from a point midway along the front of the stack



towards, but short of, the rear of the stack, whereby each first conduit (5) is substantially U-shaped, extending from one side of the front of the stack towards and across the rear of the stack and back to the other side of the front of the stack; and in that the folds (11) of transfer membrane material (6) extending around the front edges of the plates (7) provide a faired entry for the first fluid from the inlet manifold (4) into each first conduit (5) and a faired exit for the first fluid from each first conduit (5) into the outlet manifold (4); the entry and exit together extend across the full width of the conduit; and the inlet and outlet manifolds together extend across the full width of the conduits and are spaced from the front edges of said plates and membrane material extending therearound.

4,636,311

MULTIPLE FILTERS WITH FLOW-REVERSING ROTARY VALVE SET

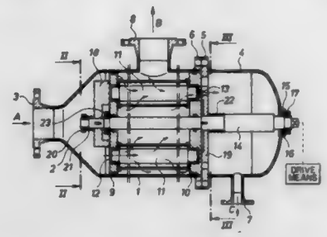
Wolfgang Litzenburger, Barbarossastr. 1, D-6733 Hassloch/Pfalz, Fed. Rep. of Germany

Filed Oct. 21, 1982, Ser. No. 435,673

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1981, 3141900

Int. Cl.⁴ B01D *29/26*

U.S. Cl. 210—323.2 **5 Claims**



1. In a filter of the type having a housing, first and second spaced separation plates dividing the housing into an inlet end with an opening to receive liquid to be filtered, a filter section between the plates and an outlet end which receives dirty liquid, a plurality of openings in each separation plate, and a plurality of hollow, generally tubular filter elements extending

between the plates and aligned with the openings therethrough, the improvement comprising

first and second rotary slide valve members associated respectively with the first and second separator plates, said first valve member being a solid member located at said inlet end,

means for interconnecting said first and second valve members together for rotation with each other;

means for selectively rotating said first and second valve members to any one of a plurality of positions in each of which said first valve member closes a predetermined number N of openings in said first plate to which inlet ends of N of said filter elements are connected and at the same time said second valve member closes a predetermined number M of openings in said second plate to which the other ends of M of said filter elements are connected, wherein N is less than M and wherein the sum N+M equals the total number of filter elements.

4,636,312

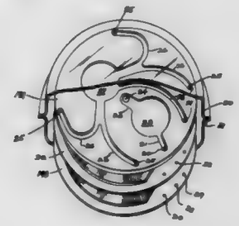
PLASMAPHERESIS FILTRATION MODULE HAVING IMPROVED END PLATE

Frank M. Willis, Wenonah, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 16, 1982, Ser. No. 349,369

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—416.1 **24 Claims**



1. In a membrane filter module for carrying out a continuous plasmapheresis under reciprocatory pulse blood flow conditions whereby blood is conducted in a forward direction over a first surface of each of a plurality of membranes having cell retaining pores, while maintaining a net positive transmembrane pressure difference, the forward conducting of blood is terminated and the blood is conducted in a reverse direction over said surface, the volume of blood flowed in the reverse direction being less than the volume flowed in the forward direction, the transmembrane pressure difference being reduced during the forward and the reverse blood flow conducting periods, and the forward and reverse conducting steps being repeated and plasma being collected from a second surface of each of the membranes, said membrane filter module comprising:

(a) first and second opposing module housing end plates having therebetween at least one blood flow region and at least one plasma flow region, there being a blood inlet port connected to the blood flow region; a blood collection channel, around the blood flow region, connected to a plasma-depleted blood outlet port; and a plasma collection channel around the plasma flow region connected to a plasma outlet port;

(b) a plasma-side support within each plasma flow region; and

(c) a membrane, having cell-retaining pores, between each plasma flow region and blood flow region, and a blood flow path over the membrane,

the improvement whereby the module comprises (a) a module housing plate which is an end plate of the module and which has blood inlet and outlet reciprocatory pulse cavities; and (b) a sealing envelope which encloses the module and which forms a flexible diaphragm over the cavities of the end plate.

4,636,313

FLEXIBLE FILTER DISPOSED WITHIN FLEXIBLE CONDUCTOR

Vincent L. Vaillancourt, 14 Bunyan Dr., Livingston, N.J. 07039

Filed Feb. 3, 1984, Ser. No. 576,864

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—436 **22 Claims**



2. In an IV delivery system a device in which a flexible tubular filter membrane is disposed within a flexible IV conductor tubing which includes a vent, said conductor tubing capable of being formed into a bend of less than one inch radius without collapsing the wall of said flexible tubing and with said tubing having a wall of sufficient thickness and composition so as to prevent collapse when the conductor tubing is empty, this device including:

(a) a length of flexible conductor tubing having a substantially constant configuration;

(b) a length of flexible tubular filter membrane which is bacteria retentive and sized so that the outer diameter of said tubular filter membrane is smaller than the inner diameter of said IV conductor tubing and with the IV conductor tubing enclosing said tubular filter membrane, and between this tubular filter and IV conductor tubing there is sufficient space for fluid flow, said flexible tubular filter membrane being hydrophilic so as to pass fluid absent the passage of air or gas;

(c) a second filter providing vent means and of hydrophobic material and operatively connected to that space between the flexible tubular filter and the interior of the flexible connector tubing, this second filter and vent means secured in a housing so as to protect this second filter from penetration damage and dislocation, location, this second filter disposed so that air or gas from said space between the IV conductor and the inner flexible filter is required to pass only through said second hydrophobic filter;

(d) a closure means at one end of the flexible tubular filter membrane and configured and disposed to exclude fluid flow from the tubular conductor tubing to the interior of the flexible tubular filter membrane except through the sidewall portion of said filter membrane;

(e) a closure connector at the other end of this flexible tubular filter membrane, this closure connection providing a fluid flow path from the interior of the flexible tubular filter membrane to external means, and

(f) a tubular conductor associated with said connector, with said connector having means providing a tubular connecting portion which is tightly connected to said tubular filter membrane and with said connecting portion being at-

tached so as to inhibit any fluid flow through transverse portions of the filter membrane at said connecting portion.

4,636,314

POLYMER BLENDED MEMBRANES

Allyson J. Beuhler, Indian Head Park, and Anthony J. Polak, Lake Zurich, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Mar. 16, 1984, Ser. No. 590,294
The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—500.25 **29 Claims**

1. A thin film membrane comprising a single phase blend of: (1) from 1% to 70% by weight of a heteropoly acid or salts thereof having the generic formula:

$$A_m[X_xY_yO_z]\cdot nH_2O,$$

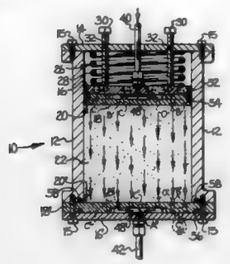
in which X is selected from the group consisting of boron, aluminum, gallium, silicon, germanium, tin, phosphorus, arsenic, antimony, bismuth, selenium, tellurium, iodine, and metals of the first, second, third, and fourth transitional metal series of the Periodic Table, where Y is dissimilar from X and is selected from at least one metal of the first, second, third, and fourth transitional metal series of the Periodic Table, where A is selected from the group consisting of hydrogen, ammonium, sodium, potassium, lithium, rubidium, cesium, beryllium, magnesium, calcium, strontium and barium, where m is an integer of from about 1 to 10, where y is an integer of from 6 to 12 based on x being equal to 1, where z is an integer of from 30 to 80, and where n is an integer of from 3 to 100 and, (2) from 99% to 30% by weight of a polymer compatible with said compound selected from the group consisting of poly(vinyl alcohol), poly(vinyl fluoride), polyethylene oxide, polyethyleneimine, polyacrylic acid, polyethylene glycol, cellulose acetate, polyvinylmethylethyl ether and phenol formaldehyde resins, said blend containing a multiplicity of electrically conductive particles forming a portion of said membrane, the particles being of a size sufficient so that portions of the surfaces of each of said particles are coexistent with or extend beyond each opposing surface of said membrane.

4,636,315

FLUID SEPARATOR APPARATUS AND METHOD

Crowley C. Alles, Jr., Durham, N.C., assignor to Research Triangle Institute, Research Triangle Park, N.C.

Division of Ser. No. 448,201, Dec. 9, 1982, Pat. No. 4,537,217. This application Aug. 23, 1985, Ser. No. 768,862
Int. Cl.⁴ B01D *15/08, 53/04, 53/18*
U.S. Cl. 210—656 **7 Claims**



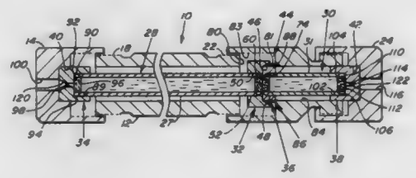
1. A fluid separation apparatus comprising;
a column-forming body structure defining an input end and an output end;
a separation-type packing material in said body structure;
a pair of fluid distributors enclosing said packing within said body structure and each having a distribution surface in intimate contact with the packing, said pair comprising a first fluid distributor at the input end of said apparatus for uniformly distributing fluid to the packing and a second distributor at the output end of said apparatus for receiving a uniform distribution of fluid from the packing, each said distributor comprising:
a distributor body defining first and second opposed exterior portions;
said first exterior portion including a fluid port;
said second exterior portion defining a distribution surface having a plurality of distribution openings so spaced as to be uniformly distributed over the surface area thereof;
means defined by interconnecting fluid passages in said distributor body, said means extending through said distributor body for providing communication between said fluid port and each of said distribution openings, and such that the fluid flow path between said fluid port and each of said distribution openings is of substantially uniform length and has similar geometric flow resistance characteristics so as to provide substantially the same resistance to flow therealong, said interconnecting fluid passages comprising a first set of passages that communicate directly to the fluid port and a second set of passages connecting the first set to the distribution openings;
said distributors being so positioned that fluid entering the fluid port of the first distributor is uniformly distributed to the packing through the distribution openings of the first distributor, and fluid having passed through the packing is uniformly withdrawn through the distribution openings of the second distributor for flowing out of the apparatus via the second distributor fluid port.

4,636,316

DISPOSABLE COLUMN CARTRIDGE

John Harris, Oakland; Nelson Cooke, Concord, and Kristine Olsen, Richmond, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 690,564, Jan. 11, 1985, abandoned. This application Sep. 4, 1985, Ser. No. 773,501
Int. Cl.⁴ B01D *15/08*
U.S. Cl. 210—656 **9 Claims**



1. A liquid chromatography cartridge column system comprising:
an analytical column having an analytical column bore;
a precolumn having a precolumn bore;
a holder body having a bore therein;
a first end cap mounted upon a first end of the analytical column;
a second end cap mounted upon a first end of the precolumn, the second end cap having a portion formed to abut the end of the first end cap, so that the analytical column and the precolumn are axially aligned and abutting each other to form a fluid flow path between the analytical column bore and the precolumn bore;
a ferrule positioned around the second end cap;
means for compressing an end of the ferrule against the first end cap; and
means for urging the precolumn and the first end cap toward the end of the holder body.

4,636,317

RECYCLING OF METALWORKING FLUIDS

Elliott W. Lewis, San Marino, Calif., assignor to Fluid Recycling Services, Inc., Santa Ana, Calif.

Filed Jul. 16, 1985, Ser. No. 755,439
Int. Cl.⁴ B01D *33/02;* **C02F** *1/32*
U.S. Cl. 210—748 **5 Claims**

1. A process for the recycling of used and contaminated metalworking fluids, both oil-based and water-based, said process employing a mobile recycling equipment capable of being moved into close proximity to the sources of said fluids, said equipment comprising the following elements:
(a) pumping means able to accomodate either a predominately water-based or a predominately oil-based fluid stream for pumping the contaminated fluids from storage sites through appropriate piping and valving means:
(b) solid separation means selected from hydrocylones and filters of appropriate capacities for eliminating excess solid loadings from the contaminated fluids;
(c) sterilization means selected from flash pasteurizers and irradiation devices inserted at an advantageous point in the piping means for destroying microorganisms within the contaminated fluids;
(d) centrifugal means selected from manually cleaned and self-cleaning high speed disk bowl centrifuges, said centrifugal means including a multiplicity of differently sized ring dams for adjusting a separation line within the centrifuge to accommodate the different concentrations of oil and water which may exist within contaminated fluids, said centrifugal means being used for separating contaminated fluids into an oil stream, an aqueous stream, and a solid residue, said pumping means solid separation means, sterilization means and centrifugal means being fluidly interconnected;
(e) mobile means for transporting said equipment from one site to another;
said process comprising:
positioning the mobile equipment in proximity to the contaminated metalworking fluid storage sites;
pumping the contaminated metalworking fluid from the storage sites to the solid separation means;
removing metal fines and suspended solids from said metalworking fluid in said separation means;
subjecting the solid depleted metalworking fluid to said sterilization means;
passing the sterilized metalworking fluid to the centrifugal means thereby recovering a recycled metalworking fluid.

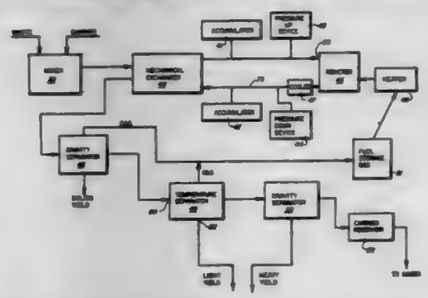
4,636,318

CHEMICAL REFORMER

David L. Baker, 100 S. Home Ave., Oak Park, Ill. 60302

Continuation of Ser. No. 622,708, Jun. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 560,520, Dec. 12, 1983, abandoned. This application Oct. 16, 1984, Ser. No. 661,342
Int. Cl.⁴ C10B *57/04;* **C02F** *11/10*
U.S. Cl. 210—766 **21 Claims**

1. The process of producing liquid oils from organic waste materials, which comprises: mixing an oil-based carrier with organic waste material selected from the group consisting of organic garbage, raw sewage, sewage sludge and waste paper, said waste material containing at least about 10 weight percent water, the amount of oil-based carrier present being sufficient to permit the mixture to be a more readily flowable material than the corresponding waste material free of oil carrier, and



pyrolyzing said flowable material at elevated temperature and pressure to produce said liquid oils.

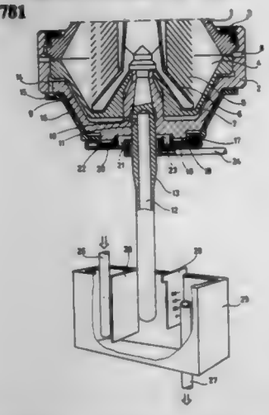
17. The process of producing liquid oils from organic waste materials selected from the group consisting of organic garbage, raw sewage, sewage sludge, and waste paper, which comprises:
mixing an oil-based carrier with organic waste material, said waste material containing at least about 10 weight percent water, the amount of oil-based carrier present being sufficient to permit the mixture to be more readily flowable material than the corresponding waste material free of oil carrier, pyrolysing said flowable material at a temperature of 700° to 950° F. and a pressure of 700 to 2,500 p.s.i. to produce said liquid oils, and thereafter passing said heated, substantially continuous stream through heat exchange means to recover heat and to transfer it to an upstream portion of said substantially continuous stream.

4,636,319

MAINTAINING CLOSING-LIQUID LEVEL IN CENTRIFUGES, FOR OPERATING SLIDE VALVES

Klaus Stroucken, Rosnäge, Sweden, assignor to Alfa-Laval Separation AB, Tumba, Sweden

Filed Jun. 7, 1985, Ser. No. 742,453
Claims priority, application Sweden, Jun. 15, 1984, 8403227
Int. Cl.⁴ B04B *11/00, 7/08*
U.S. Cl. 210—781 **4 Claims**



1. In the operation of a centrifugal separator having a rotor mounted on a vertical drive shaft for rotation about an axis, said shaft having a channel extending axially from the lower end of the shaft to the rotor, said rotor containing a control valve operable by a fluid pressure, the method which comprises maintaining the lower end of the shaft in a liquid body, rotating the rotor through said shaft to cause liquid from said body to flow upward in said channel along its surrounding wall and thence radially outward to a location where the liquid applies its pressure to said valve, the liquid in said channel

forming an annulus with a cylindrical inner surface, flowing the liquid from said body into the channel by way of an orifice located at said lower end of the shaft and having a surrounding edge spaced a shorter distance from said axis than is said surrounding wall, and maintaining said cylindrical surface at substantially said shorter distance from said axis throughout the liquid flow from said orifice to the point where the liquid undergoes said radially outward flow.

4,636,320

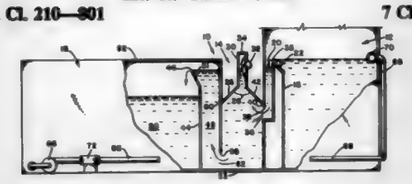
PROCESS FOR REMOVAL OF SURFACE FILMS FROM NON-ABSORBENT ARTICLES

Francis J. Figiel, Boonton, and Harry F. Osterman, Westfield, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 395,210, Jul. 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 220,206, Dec. 24, 1980, abandoned. This application Mar. 19, 1984, Ser. No. 589,865

Int. Cl.[4] B01D *17/028*

U.S. Cl. 210—801 **7 Claims**



1. A process for separating a less dense hydrophilic liquid that is introduced into a continuously circulating relatively more dense organic liquid which is used to remove said less dense hydrophilic liquid from a surface of a non-absorbent article, which comprises:

a. immersing a non-absorbent article, having thereon a less dense surface film, into an article treating tank containing a more dense liquid having a density greater than that of water and in which water is soluble in the more dense liquid in amounts between about 0.01% and 1.0% by weight;

b. contacting the non-absorbent article with the more dense liquid according to step (a) and thereby removing from the article a hydrophilic aqueous surface film containing dispersed substance and comprising a less dense liquid which is separated by said more dense liquid;

c. flowing the more dense liquid containing the less dense liquid of step (b) by overflow into a separator chamber at an intermediate height in said separator chamber below where the less dense liquid is removed from the separator chamber and permitting this mixture of less dense liquid and the more dense liquid to separate into an upper layer and a lower layer in said separating chamber;

d. continuously withdrawing from an upper part of said separator chamber, the upper layer of less dense liquid which collects in an upper separation zone of said separator chamber;

e. continuously transferring the more dense liquid, which is collected as the lower layer in said separator chamber and is removed from said separator chamber at a level below said intermediate height where the more dense liquid containing the less dense liquid enters the separator chamber, through a channel having a cross-sectional area greater than a second cross-sectional area provided for the flow to the said separator chamber by step "c", to avoid pressure build-up, to a holding chamber;

f. recirculating the more dense liquid which is substantially free of the less dense liquid from the holding chamber to the article treating tank of step (a) at a rate sufficient to replace a quantity of more dense liquid used to remove the less dense liquid from the surface of the non-absorbent article; and

g. removing the non-absorbent article from the article treating tank.

4,636,321

WATER SOLUBLE LUBRICANT

Egbert M. Kipp, Devon, Pa.; Thomas E. Kirk, Henrico County, and Barry L. Riddle, Richmond, both of Va., assignors to Reynolds Metals Company, Richmond, Va.

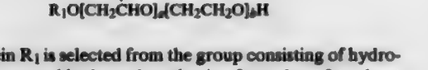
Continuation-in-part of Ser. No. 782,011, Sep. 30, 1985, abandoned. This application Jan. 27, 1986, Ser. No. 822,462

Int. Cl.[4] C10M *173/00*

U.S. Cl. 252—49.3 **12 Claims**

1. A water soluble metal working lubricant concentrate consisting essentially of:

(a) From about 10 to about 60 percent by weight of a polyalkylene glycol polymer having the formula



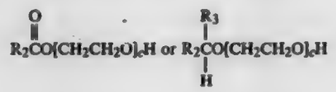
$$R_1O[CH_2CHO]_a[CH_2CH_2O]_bH$$

CH_3

wherein R_1 is selected from the group consisting of hydrogen, normal hydrocarbons having from about 2 to about 20 carbon atoms, polyhydroxy substituted hydrocarbons having from about 2 to about 10 carbon atoms, aryl hydrocarbons having from about 6 to about 20 carbon atoms and alkyaryl hydrocarbons having from about 7 to about 30 carbon atoms;

and wherein a may range between about 0 and about 75, b may range between about 1 and about 100 and b is greater than or equal to a;

(b) from about 1 to about 25 percent by weight of an ethoxylated carboxylic acid or alcohol having the formula

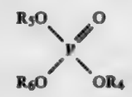


$$R_2CO(CH_2CH_2O)_cH \text{ or } R_2CO(CH_2CH_2O)_cH$$

R_3, H

wherein R_2 and R_3 each are selected from the group consisting of hydrogen, normal hydrocarbons having from about 2 to about 20 carbon atoms, polyhydroxy substituted hydrocarbons having from about 2 to about 10 carbon atoms, aryl hydrocarbons having from about 6 to about 20 carbon atoms and alkyl aryl hydrocarbons having from about 7 to about 30 carbon atoms, but R_2 and R_3 need not be identical to R_1 or to each other; and wherein c may range between about 1 and about 100;

(c) from about 1 to about 25 percent by weight of a complex organic phosphate ester having the formula



wherein R_4 is selected from the group consisting of hydrogen or mono-, di- or triethanolamine;

wherein R_5 is a polyoxyalkylated alcohol wherein the alcohol portion is derived from a member of the group consisting of saturated and unsaturated alkyl radicals having about 1 to about 20 carbon atoms, aryl radicals, and alkylaryl radicals wherein the alkyl substituent comprises from about 1 to about 20 carbon atoms and is saturated or unsaturated, and wherein the polyoxyalkylated portion of R_5 is derived from ethylene oxide, propylene oxide, a polyhydroxy substituted alkanol having from about 2 to about 10 carbon atoms, or a combination of these, wherein the number of monomeric units of any single type is from about 1 to about 100;

and wherein R_6 is defined as is R_4 or as is R_5 above, but need not be identical to either, so long as it can be described as is one or the other;

(d) from about 1 to about 20 percent by weight of an alkanolamine, such as mono-, di- or triethanolamine; and

(e) from about 0 to about 65 percent by weight water.

4,636,322

LUBRICATING OIL DISPERSANT AND VITON SEAL ADDITIVES

Theodore E. Nalesnik, Beacon, N.Y., assignor to Texaco Inc., White Plains, N.Y.

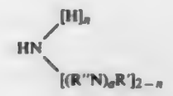
Filed Nov. 4, 1985, Ser. No. 795,023

Int. Cl.[4] C10M *107/44, 145/20, 149/16*

U.S. Cl. 252—51.5 A **17 Claims**

17. A lubricating oil composition comprising a major portion of a lubricating oil and minor dispersant amount of a reaction product prepared by the process which comprises:

(a) reacting an alkenyl succinic acid anhydride with a polyamine



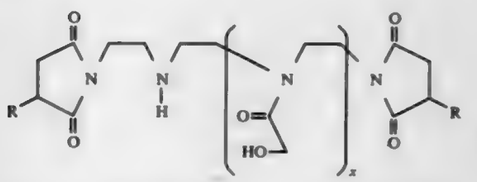
$$HN\begin{matrix}[H]_n \\ [(R''N)_aR']_{2-n}\end{matrix}$$

where R′ is H or a hydrocarbon selected from the group consisting of alkyl, aralkyl, cycloalkyl, aryl, alkaryl, alkenyl and alkynyl group; R″ is a hydrocarbon selected from the same group as R′ except that R″ contains one less H; a is an integer of about 3 to about 8 and n is 0 or 1, to form a bis-alkenyl succinimide

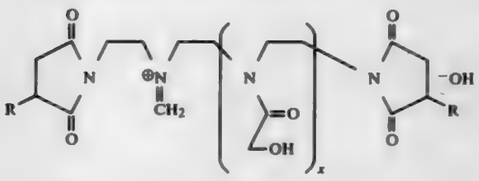


where R is polyisobutylene and x is an integer of 1 to 6;

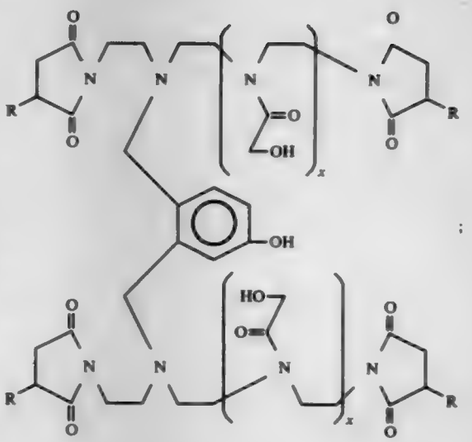
(b) acylating said bis-alkenyl-succinimide with a carboxylic acid to form a partially glycolated bis-alkenyl succinimide



(c) adding an excess of formaldehyde to said partially glycolated bis-alkenyl succinimide to form an iminium salt of the glycolated bis-alkenyl succinimide



(d) adding a phenol to said iminium salt, thereby forming a Mannich base phenol coupled glycamide bis-alkenyl succinimide



and

(e) recovering said acylated Mannich phenol coupled glycamide bis-alkenyl succinimide.

4,636,323

LUBRICATING OIL COMPOSITION FOR METAL ROLLING

Yoshio Makino; Takeshi Nagai, and Shingo Yamazaki, all of Hyogo, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1984, Ser. No. 674,896

Claims priority, application Japan, Nov. 24, 1983, 58-219358

Int. Cl.[4] C10M *105/08*

U.S. Cl. 252—51.5 R **8 Claims**

1. A lubricating oil composition for metal rolling comprising

(a) an oily component comprising one or more of fats and oils, mineral oils, and fatty acid esters, and

(b) a dispersant comprising one or more of salts of fatty acid esters of polyethyleneimine/epoxy compound adducts wherein said salts are salts resulting from neutralization with phosphoric acid, boric acid, or acid phosphoric ester, and wherein the weight ratio of the oily component (a) to the dispersant (b) is from 85/15 to 99.95/0.05.

4,636,324

ANTI-ICING COMPOSITIONS

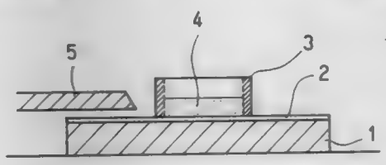
Heihachi Murase, Kanagawa, and Kiyoshi Nanishi, Hiratsuka, both of Japan, assignors to Kansai Paint Company, Ltd., Japan

Filed Mar. 18, 1985, Ser. No. 712,724

Claims priority, application Japan, Mar. 30, 1984, 59-63706; Apr. 23, 1984, 59-82640

Int. Cl.[4] C09K *3/18;* **C09D** *5/20*

U.S. Cl. 252—70 **6 Claims**



1. A composition for use in preventing the formation of ice comprising:

(A) 40 to 99.6% by weight of organopolysiloxane resin comprising recurring structural units of the formula

$$RnSi(OR')_mO_{\frac{4-n-m}{2}}$$

wherein R represents hydrogen atom or monovalent organic group attached to the silicon atom by a carbon-silicon bond, R' represents hydrogen atom, C_1–C_{20} alkyl group, acyl group, aryl group, oxime residue, n and m are each 0, 1, 2 or 3 and n plus m is an integer of 1 to 3,

(B) 0.2 to 30% by weight of alkali metal compound represented by the formula

$$M_a^{\oplus}X^{\ominus}$$

wherein M represents alkali metal selected from Li, Na and K, X represents inorganic or organic acid group and a is an integer of 1 to 4, and

(C) 0.2 to 30% by weight of liquid paraffin and/or solid paraffin.

4,636,325

HEAT EXCHANGE FLUID PARTICULARLY FOR CLOSED LOOP SOLAR ENERGY COLLECTING SYSTEMS

Jay S. Greene, Accokeek, Md., assignor to Environmental Security Incorporated, Lancaster, Pa.

Filed Apr. 15, 1985, Ser. No. 723,451

Int. Cl.⁴ C09K *5/00*

U.S. Cl. 252—75 **15 Claims**

7. A method of effecting heat exchange between a surrounding environment and a heat exchange liquid flowing in a closed path, comprising the step of passing a heat exchange liquid comprising a non-combustible, non-toxic, biodegradable liquid having a heat absorption capacity in the range between about 40,000 BTUs per pound–one million BTUs per pound in the closed path in heat exchange relationship with the surrounding environment wherein the heat exchange liquid comprises: a linear alkylbenzene sulfonate, non-ionic detergent and lauric superamide detergent mixture; a dark coloring agent; and a means for increasing the heat absorption capacity and boiling temperature of the detergent mixture.

4,636,326

THICKENER COMPOSITIONS FOR WATER-BASED HYDRAULIC AND METALWORKING FLUID COMPOSITIONS

Paul M. Hernandez, Lake County, Ill., and Curtis R. Petersen, Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Dec. 12, 1984, Ser. No. 680,710

Int. Cl.⁴ C09K *5/00*

U.S. Cl. 252—77 **18 Claims**

1. A thickener composition comprising:

(1) at least one water-soluble, thermoplastic, organic polymer having a weight average molecular weight of at least about 10,000 which comprises hydrophobic segments, each containing at least one monovalent hydrophobic group covalently bonded to the polymer, wherein the polymer has an amount of hydrophobe bunching comprising at least two monovalent hydrophobic groups per hydrophobic segment, sufficient to provide for enhanced thickening of aqueous solutions containing the polymer, and

(2) at least one water-soluble polyester which comprises, the condensation product of

(a) a polyoxyalkylene glycol having a molecular weight of from about 400 to about 1000; and

(b) the addition product of

(1) a dimer fatty acid; and

(2) from about 0.4 to about 0.8 equivalents of maleic anhydride for each equivalent of the dimer fatty acid wherein about 2.1 to about 3.2 equivalents of the glycol are used for each equivalent of the addition product.

4,636,327

AQUEOUS ACID COMPOSITION AND METHOD OF USE

Wayne W. Frenier, Tulsa County, Okla., and David A. Wilson, Brazoria County, Tex., assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Continuation of Ser. No. 526,723, Aug. 26, 1983, abandoned, which is a division of Ser. No. 213,280, Dec. 5, 1980, Pat. No. 4,430,128. This application May 1, 1985, Ser. No. 728,448

Int. Cl.⁴ C23F *11/14*

U.S. Cl. 252—87 **9 Claims**

1. An aqueous acid composition which can remove iron oxide scale from ferrous metal surfaces, the composition having a pH of between about 1 and about 3, and comprising (a) hydroxyethylethylenediaminetriacetic acid (HEDTA) dissolved therein in an amount of at least about 1% by weight of the composition, and (b) a compatible acid corrosion inhibitor.

4,636,328

MULTI FUNCTIONAL LAUNDRY PRODUCT AND EMPLOYMENT OF SAME DURING FABRIC LAUNDERING

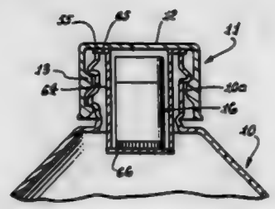
Brian P. Flynn, Lakewood; Deborah S. Winetzky, Torrance, and George D. Evans, Tustin, all of Calif., assignors to Purex Corporation, Lakewood, Calif.

Division of Ser. No. 597,127, Apr. 5, 1984, Pat. No. 4,563,186. This application Jan. 7, 1985, Ser. No. 689,293

The portion of the term of this patent subsequent to Oct. 7, 2003, has been disclaimed.

Int. Cl.⁴ B65D *51/28, 79/00, 81/32;* **G11D** *17/04*

U.S. Cl. 252—90 **23 Claims**



1. In combination

(a) a first openable container containing a detergent composition fo use in home laundering of fabrics,

(b) a dispensing container containing a fabric prespotter composition in solid or semi-solid stick form, and forming a fitment,

(c) the fitment carried by the first container to be readily detachable at least in part for dispensing the prespotter composition onto fabric as at the time of fabric laundering,

(d) the first container being a bottle having a removable cap, the bottle having a neck onto which the cap is attached,

(e) there being a receptacle received into said neck and having a flange supported by an upper rim of said neck, the cap retaining the receptacle in position in said neck,

(f) the fitment confined and loosely received into the receptacle to substantially fill same, vertically, and including a sub-container containing the prespotter composition, and a removable sub-container cap, and including manipulable means associated with the sub-container for effecting progressive dispensing of the prespotter composition after removal of the sub-container cap,

(g) the fitment being accessible after removal of the cap from the bottle, and the detergent composition in the bottle being accessible after removal of said receptacle from the bottle neck as by elevation of said flange.

4,636,329

SHAMPOO COMPOSITIONS COMPRISING QUATERNARY IMIDAZOLINIUM COMPOUND AND ALKYLAMIDO BETAINE HAVING LOW PH RANGE

Christian Steuri, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 735,709, May 17, 1985, abandoned, which is a continuation of Ser. No. 506,917, Jun. 22, 1983, abandoned. This application Jan. 13, 1986, Ser No. 818,994

Int. Cl.⁴ A61K *7/06;* **C11D** *3/26, 7/32, 1/90*

U.S. Cl. 252—106 **10 Claims**

1. A shampoo composition comprising:

(a) from about 1% to about 2% of a quaternary ammonium compound;

(b) from about 10% to about 18% of a higher alkylamido betaine; and

(c) the remainder water;

wherein the pH of said composition is in the range of from about 2.0 to about 3.4 being maintained within said range by means of a buffering agent.

4,636,330

PERFUME DEPOSITING DETERGENTS CONTAINING PERFUME IN A PARTICULATE MATRIX OF A CATIONIC COMPOUND

James B. Melville, Merseyside, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 239,837, Mar. 2, 1981, abandoned. This application Jan. 25, 1985, Ser. No. 694,896

Claims priority, application United Kingdom, Mar. 11, 1980, 8008239

Int. Cl.⁴ C11D *1/65, 1/86, 3/50, 17/06*

U.S. Cl. 252—174.11 **2 Claims**

1. A method of depositing perfume on a fabric surface, comprising contacting the surface with an aqueous composition comprising an effective amount for cleaning of an anionic detergent active material and from about 0.005 g/liter to about 0.3 g/liter, based on the volume of the aqueous composition, of particles having an average size of from about 0.1 to about 2,000 microns, said particles comprising a matrix material and a perfume, characterized in that said particles are an intimate mixture comprising:

(a) from about 0.5% to about 50% by weight of a perfume component;

(b) from about 22% to about 99.5% by weight of a cationic component; and optionally

(c) from about 0% to about 16.6% by weight of a nonionic component;

the ratio by weight of the cationic to the nonionic component, when present, being at least 5:1;

and wherein the fabric is dried by line drying.

2. A method of depositing perfume on a fabric surface, comprising contacting the surface with an aqueous composition comprising an effective amount for cleaning of an anionic detergent active material and from about 0.005 g/liter to about 0.3 g/liter, based on the volume of the aqueous composition, of particles having an average size of from about 0.1 to about 2,000 microns, said particles comprising a matrix material and a perfume, characterized in that said particles are an intimate mixture comprising:

(a) from about 0.5% to about 50% by weight of a perfume component;

(b) from about 22% to about 99.5% by weight of a cationic component; and optionally

(c) from about 0% to about 16.6% by weight of a nonionic component;

the ratio by weight of the cationic component to the nonionic component ranging from about 6:1 to about 12:1;

and wherein the fabric is dried by line drying.

4,636,331

POLYMERIC COMPOSITE HEATING ELEMENT

Junichi Sako, Osaka, and Toshiharu Yagi, Hyogo, both of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed Jul. 10, 1985, Ser. No. 753,564

Claims priority, application Japan, Jul. 10, 1984, 59-143688

Int. Cl.⁴ H10B *1/06*

U.S. Cl. 252—511 **3 Claims**

1. A polymeric composite heating element comprising a composition containing (1) a copolymer of 30–85 mole % of vinylidene fluoride, 15–70 mole % of trifluoroethylene and 0.5–15 mole % of a further copolymerizable monomer selected from the group consisting of vinyl fluoride, tetrafluoroethylene, chlorotrifluoroethylene and hexafluoropropylene, and (2) 3–35% by weight of electrically conductive carbon based on the weight of said copolymer.

4,636,332

THICK FILM CONDUCTOR COMPOSITION

William A. Craig, Bedfordshire, England, and Barry E. Taylor, Youngstown, N.Y., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 1, 1985, Ser. No. 794,946

Int. Cl.⁴ H01B *1/06*

U.S. Cl. 252—514 **13 Claims**

1. A thick film conductor composition comprising an admixture of finely divided particles of

A. 60–99% wt. of noble metal, noble metal alloy or mixtures thereof,

B. 40–1% wt. inorganic binder consisting essentially of finely divided particles of

(1) 100 parts of a glass corresponding to the formula $Bi_4Si_{3-x}Ge_xO_{12}$, wherein x=0–3 having dissolved therein 0–20 pph PbO, basis glass, (2) (2) 0–100 pph Bi_2O_3, basis glass and PbO, and (3) 4–100 pph ZnO, basis glass and PbO,

C. A glass bleed-out inhibitor selected from

(1) 0.2–10% wt., basis solids, of finely divided particles of a pyrochlore-related oxide corresponding to the formula $(M_xM_{2-x'})M''_2O_{7-z}$ wherein M is different than M and is selected from at least one of Pb, Bi, Cd, Cu, Ir, Ag, Y, rare earth metals having atomic numbers of 57–71 and mixtures thereof, M' is selected from Pb, Bi and mixtures thereof, M'' is selected from Ru, Ir, Rh and mixtures thereof, x=0–0.5, and z=0–1;

(2) 2–10% wt., basis solids, of a resinate of a metal selected from (a) the noble metals Ru, Rh, Re, Ir, Pt and mixtures thereof, and (b) the non-noble metals Mg, Si, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Zr, Nb, Ba, Ce, Ta, W and mixtures thereof, and mixtures of (1) and (2), all of components A through C being dispersed in

D. an organic medium.

4,636,333

ALKOXY-SUBSTITUTED POLYHYDROINDAN CARBOXALDEHYDES

Mark A. Sprecker, Sea Bright; William L. Schreiber, Jackson; Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean; Manfred H. Vock, Locust; Patrick Whelan, Matawan, and Marie R. Hanna, Hazlet, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 712,164, Mar. 15, 1985, which is a continuation-in-part of Ser. No. 528,568, Sep. 1, 1983, Pat. No. 4,541,949. This application Mar. 7, 1986, Ser. No. 837,386

Int. Cl.⁴ A61K *7/46*

U.S. Cl. 252—522 R **6 Claims**

1. A mixture of polyhydroindan carboxaldehydes defined according to the structure:



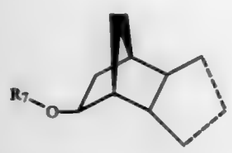
wherein R_7 represents a moiety selected from the group consisting of methyl and isopropyl prepared according to the process of reacting bicyclopentadiene having the structure:



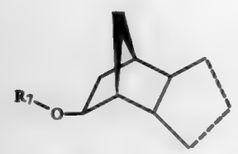
with an anhydrous alkanol having the structure:

R_7—OH

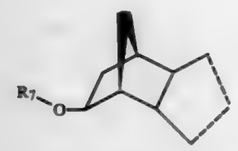
in the presence of a Lewis acid catalyst at reflux conditions for a period of time in order to effect substantially complete conversion to a mixture of compounds defined according to the structure:



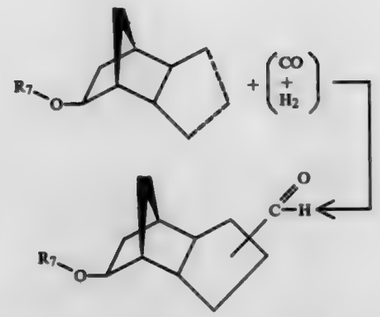
wherein the mixture in each of the compounds one of the dashed lines represents a carbon-carbon double bond and the other of the dashed lines represents a carbon-carbon single bond; then fractionally distilling the resulting reaction product in order to recover the said mixture of compounds defined according to the structure:



and then reacting the resulting mixture having the structure:



with carbon monoxide and hydrogen in the presence of an "oxo" reaction catalyst according to the reaction:



at a temperature of between 150° C. and 300° C.; at a pressure of between 20 and 250 atmospheres; with a ratio of partial pressure of carbon monoxide:partial pressure of hydrogen being from 0.1:1 up to 1:0.1.

2. A process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of intimately admixing with a perfume composition base, a cologne base or a perfumed article base, an aroma augmenting or enanching quantity of the composition of matter defined according to claim 1.

4,636,334

PRODUCTION OF AMMONIA SYNTHESIS GAS

Geoffrey F. Skinner, Kimblewick; Wieslaw M. Kowal, Sunnyview, and Stephen D. Linton, Pangbourne, all of England, assignors to Foster Wheeler USA Corporation, Livingston, N.J.

Filed Aug. 9, 1985, Ser. No. 764,194

Claims priority, application United Kingdom, Aug. 14, 1984, 8420644

Int. Cl.⁴ C01B *3/02, 3/50, 3/52*

U.S. Cl. 252—377 **16 Claims**

1. A process for the production of gaseous feed for the synthesis of ammonia from a raw synthesis gas stream comprising hydrogen, nitrogen and carbon monoxide having a molar ratio of hydrogen: nitrogen of less than 3:1, said process comprising:

(a) subjecting a first portion of said raw synthesis gas stream to methanation to convert carbon monoxide contained therein to methane;

(b) cooling and partially condensing the product of step (a);

(c) cooling and partially condensing a second portion of said raw synthesis gas stream;

(d) washing uncondensed product from step (c) with condensate from step (b); and

(e) recovering washed gas from step (d) and uncondensed gas from step (b) for use as said gaseous feed for ammonia synthesis.

4,636,335

METHOD OF DISPOSING RADIOACTIVE ION EXCHANGE RESIN

Fumio Kawamura; Masami Matsuda; Yoshiyuki Aoyama; Koichi Chino, and Mamoru Mizumoto, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 559,084

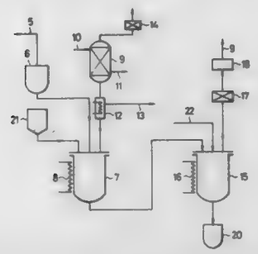
Claims priority, application Japan, Dec. 10, 1982, 57-215577

Int. Cl.⁴ G21F *9/16, 9/32*

U.S. Cl. 252—629 **16 Claims**

1. A method for processing spent radioactive ion exchange resin formed in a nuclear power plant comprising the steps of:

(a) heating the spent ion exchange resin to thermally decompose the ion exchange groups of said ion exchange resin at low temperatures of not more than 350° C. to form exhaust gas containing decomposition products of said ion exchange groups and a residue containing the polymer matrix of said ion exchange resin; and then



(b) heating the residue to thermally decompose the polymer matrix of said ion exchange resin at high temperatures above 350° C. to form exhaust gas containing decomposition products of said polymer matrix and a residue containing radioactive components.

4,636,336

PROCESS FOR DRYING A CHELATING AGENT

Richard L. Gay, Canoga Park, and LeRoy F. Grantham, Calabasas, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 2, 1984, Ser. No. 667,784

Int. Cl.⁴ G21F *9/08, 9/14;* F23G *5/12*

U.S. Cl. 252—632 **8 Claims**

1. A process for reducing the volume of a low-level radioactive liquid waste containing an organic amine chelating agent comprising:

burning a fuel and an oxygen-containing gas to produce a hot gas stream having a temperature in excess of the thermal decomposition temperature of the chelating agent;

introducing the hot gas stream into a spray drying zone;

introducing a finely atomized spray of said liquid waste into said spray drying zone and into intimate contact with said hot gas stream;

controlling the proportions of said hot gas stream and said liquid waste to rapidly evaporate water from said liquid waste and cool said hot gas to a temperature below the decomposition temperature of said chelating agent in a time of less than six seconds to produce (a) a dry, flowable powder product including said chelating agent, and (b) a product gas substantially free of any gaseous products of said chelating agent and volatile fission products of the radioactive constituents of said liquid waste; and

separating said powder product from said product gas.

4,636,337

APPARATUS FOR RAPID CARBONATION

Ashis S. Gupta, Marietta; J. Tony Camp, Loganville, both of Ga., assignor to the Coca-Cola Company, Atlanta, Ga.

Filed Jun. 15, 1983, Ser. No. 504,633

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—64.3 **20 Claims**

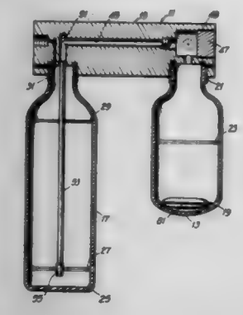
1. An apparatus for carbonating a predetermined measure of liquid comprising:

a source of carbon dioxide under pressure;

a container of predetermined volume larger than the volume of the measure of liquid thereby defining a headspace when the measure of liquid is placed in the container;

means for fluidly coupling said source with the bottom of said container to enable the flow of carbon dioxide through the liquid; and

a bleed line coupled to the headspace of said volume for continuously bleeding the gases in the headspace to the atmosphere during the flow of carbon dioxide through the liquid without loss of the liquid through the bleed line to the atmosphere while maintaining a pressure in the headspace within a desired range; whereby a continuous flow



of carbon dioxide through the liquid can be assured and whereby an effective amount of carbonation can be achieved in a relatively short amount of time.

4,636,338

MOLDING TORIC CONTACT LENSES USING A DIRECTED STREAM OF GAS

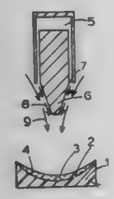
Charles W. Neefe, 811 Scurry St. P.O. Box 429, Big Spring, Tex. 79720

Filed Jan. 11, 1985, Ser. No. 690,943

The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.

Int. Cl.⁴ B29D *11/00*

U.S. Cl. 264—2.1 **15 Claims**



3. A method of molding a contact lens having a convex surface molded against a rotating concave lens mold and a toric concave lens surface shaped by a stream of compressed gas released through a gas nozzle extending across the lens and positioned over the lens center and rotating and synchronized with the rotating concave lens mold and the released gas is directed at the liquid lens monomer and the gas pressure displaces the rotating liquid lens monomer to form the concave toric liquid surface and allowing the rotating liquid lens monomer to polymerize and form a solid toric contact lens.

4,636,339

METHOD FOR IN-PROCESS MULTI-ELEMENT ANALYSIS OF MOLTEN METAL AND OTHER LIQUID MATERIALS

George B. Kenney, Medfield, Mass., assignor to Metallurgical Instruments, Inc., Lexington, Mass.

Division of Ser. No. 522,913, Aug. 12, 1983, Pat. No. 4,578,022.

This application Aug. 22, 1985, Ser. No. 768,493

Int. Cl.⁴ B22F *9/08*

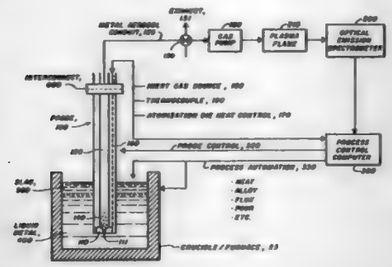
U.S. Cl. 264—12 **4 Claims**

1. A method for performing continuous in-process generation of an aerosol powder for analysis thereof comprising the steps of:

immersing in a melt a portion of an apparatus including an atomization die having an orifice suitable for aspiration

along a flow axis, such orifice being in a size range at and immediately above the size which is just sufficient to permit both continuous generation of said powder by aspiration of the melt therethrough and in-process analysis of said powder, and having in at least one direction perpendicular to the flow axis a dimension less than approximately five millimeters;

aspirating the melt through the orifice so as to generate said powder by atomization;



conducting the powder to a remote location for analysis thereof via a gaseous transport medium;

raising the temperature of said portion of the apparatus in the melt so as to melt accumulated accretions therein;

ejecting the melted accretions from said portion of the apparatus so as to prepare the apparatus for a further period of powder generation.

4,636,340

METHOD OF PRODUCING CROSSLINKED POLYETHYLENE STRETCHED FILM

Yasushi Itaba, Tokyo; Tadao Yoshino, Saitama; Yutaka Yoshifuji, Saitama; Keichiro Saito, Saitama, and Jyoichi Tabuchi, Saitama, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 682,864
Claims priority, application Japan, Jan. 23, 1984, 59-8418
Int. Cl.[4] B29C *35/08, 55/12*
U.S. Cl. 264—22 **7 Claims**

1. A method for producing high clarity oriented polyethylene film which comprises

(a) crosslinking opposite surfaces of a sheet of polyethylene having a density greater than 0.935 and containing from 0.02 to 1 parts by weight per 100 parts by weight of said polyethylene of a particulate inorganic compound selected from the group consisting of zeolite, silica, alumina, and bentonite, having an average particle size less than 20 microns, said crosslinking produces gel fractions in opposite outer layer portions of the sheet of between 20% and 70% and a gel fraction in a middle layer portion of the sheet of between 0 and 5%,

(b) heating and stretching the crosslinked sheet under conditions to orient the polyethylene molecules thereby producing an oriented film.

4,636,341

METHOD FOR HANDLING AND COOLING INJECTION MOLDED POLYMERIC ARTICLES

Jackie D. Murley, Big Spring, Tex., assignor to Co-Ex Pipe Company, Inc., Big Spring, Tex.

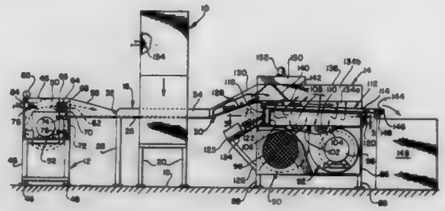
Division of Ser. No. 515,296, Jul. 19, 1983, Pat. No. 4,527,970.
This application Mar. 4, 1985, Ser. No. 707,851
Int. Cl.[4] B29C *45/72*
U.S. Cl. 264—37 **12 Claims**

1. A method for reducing the cycle time required to produce injection molded polymeric articles, said method comprising the steps of:

a. Injecting a plasticized polymeric resin into each mold cavity in an injection molding machine to form a molded polymeric article;

b. Partially cooling each molded polymeric article within said mold cavity;

c. Ejecting each partially cooled molded polymeric article from said mold cavity onto a receiving means;



d. Pneumatically transporting each partially cooled molded polymeric article from said receiving means onto a vibratory pneumatic cooling means and

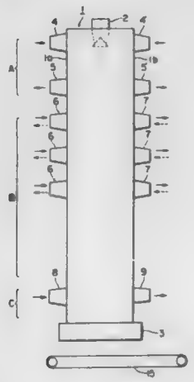
e. Further cooling each molded polymeric article while on said vibratory pneumatic cooling means so as to prevent deformation or sticking of said polymeric article during subsequent handling or storage.

4,636,342

METHOD FOR CONTINUOUSLY MANUFACTURING NON-FIRED PELLETS

Tsuneo Miyashita, Yokohama; Hideyuki Yoshikoshi, Hino; Hiroaki Nishio, Yokohama, and Osamu Takeuchi, Kawasaki, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1984, Ser. No. 578,858
Claims priority, application Japan, Feb. 28, 1983, 58-30978
Int. Cl.[4] C04B *40/00*
U.S. Cl. 264—82 **6 Claims**



1. A method for continuously manufacturing non-fired pellets, which comprises:

mixing a carbonating binder and water with raw materials which comprise at least one of (i) iron ore fines, (ii) nonferrous ore fines and (iii) dust mainly containing oxides of iron or non-ferrous metal, to form a mixture;

forming said mixture into green pellets having a water content of from over 7 to 20% by weight;

continuously supplying said green pellets into a vertical type reactor comprising a predrying zone, a carbonating zone following said pre-drying zone and a drying zone following said carbonating zone;

continuously passing said green pellets through said predrying zone, said carbonating zone and said drying zone sequentially in this order;

blowing a predrying gas having a relative humidity of up to 70% and a temperature within the range of from 40° to 250° C. into said predrying zone to predry the green pellets in said zone until the water content of the green pellets in said zone falls within the range of from 1 to 7% by weight;

blowing a carbonating gas into said carbonating zone to contact said green pellets and to carbonate said carbonating binder contained in the green pellets, said carbonating gas comprising carbon dioxide gas of from 5 to 95 vol. % and saturated steam of from 5 to 95 vol. % and having a temperature of from 30° to 98° C. whereby contact of said carbonating gas with the green pellets results in heat transfer from said carbonating gas to said green pellets, said heat transfer being compensated for by condensation heat which is generated by condensation of at least part of said saturated steam contained in said carbonating gas, thereby promoting carbonation of said carbonating binder contained in the green pellets; and

blowing a drying gas at a temperature within the range of from 100° to 300° C. into said drying zone to dry the green pellets in said zone, thereby hardening the green pellets in said zone to continuously manufacture non-fired pellets.

4,636,343

PROCESS FOR THE PREPARATION OF INSECT REPELLING/KILLING FILM

Ichiro Shibanai, 10-6-312, Akasaka 6-chome, Minato-ku, Tokyo, Japan

Filed Sep. 9, 1985, Ser. No. 774,197
Claims priority, application Japan, Sep. 10, 1984, 59-188212
Int. Cl.[4] B29C *59/02*
U.S. Cl. 264—118 **12 Claims**

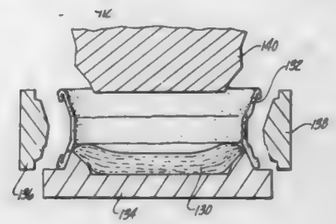
1. A process for the preparation of insect repelling/killing film, which comprises forming a clathrate compound of fenitrothion with either cyclodextrin or a starch decomposition product containing cyclodextrin, granulating said clathrate compound into dry powder, melt-mixing said dry powder with a synthetic resin material in a weight ratio ranging from 0.1 to 50%, molding said mixture into pellets, and molding said pellets in the form of a film.

4,636,344

METHOD OF MOLDING FIBER REINFORCED COMPOSITE WHEEL

Malcolm K. McDougall, Sterling Heights, Mich., assignor to The Budd Company, Troy, Mich.

Filed Nov. 21, 1984, Ser. No. 673,903
Int. Cl.[4] B32B *1/10*
U.S. Cl. 264—102 **9 Claims**



1. A method of constructing a fiber-reinforced composite wheel having integral rim and disc portions, said method comprising the steps of:

(a) forming a disc charge with reinforcing fiber segments predominantly oriented in a radially outwardly extending direction;

(b) forming an annular rim charge from a plurality of radially disposed substantially distinct layers, alternate layers having directional fibers extending in essentially transverse directions, with the inner and outermost layers having fibers extending essentially parallel to the wheel axis, said rim charge defining a pair of separated bead retaining flanges and wherein said inner and outermost layers are joined adjacent said bead retaining flanges whereby said fibers of said inner and outermost layers are in substantially parallel interrelation;

(c) placing the disc and rim charges in a mold;

(d) compression molding the rim and disc charge to form an integral fiber-reinforced composite wheel wherein the fibers of said disc charge which join said fibers of said innermost layer of said rim are oriented in substantially parallel interrelation; and

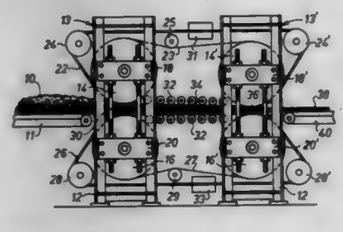
(e) removing the wheel from the mold.

4,636,345

METHOD OF ROLLING A PLASTICALLY DEFORMABLE MATERIAL

Hans E. W. Jensen, Stovring, and Johan C. Gregersen, Soborg, both of Denmark, assignors to Dansk Eternit-Fabrik A/S, Aalborg, Denmark

Continuation of Ser. No. 389,101, Jun. 16, 1982, abandoned.
This application Jan. 8, 1984, Ser. No. 618,753
Claims priority, application Denmark, Jun. 16, 1981, 1955/81
Int. Cl.[4] B28B *3/12*
U.S. Cl. 264—122 **20 Claims**



1. A method of rolling a plastically deformable material, viz., a material which behaves as a single phase which is deformed plastically when subjected to deformation forces, which comprises:

(a) compounding a plastically deformable composite material comprising the following constituents:

(A) inorganic solid particles of a material selected from the group consisting of hydraulic cement, fly ash, and mixtures thereof, said particles having a size of from 0.5 to 100 μm;

(B) silica particles having a size of from 50 Å to 0.5 μm and being at least one order of magnitude smaller than the cement/fly ash particles A; a surface-active dispersing system; and water;

the amount of the particles A constituting from B 40% to 70% by weight of the composite material and substantially corresponding to dense packing thereof with the particles B being homogeneously arranged in the voids between the cement/fly ash particles A, the amount of water constituting from 7–20% by weight of the composite material and substantially corresponding to the amount necessary to fill the voids between the solid particles of the composite material, and the dispersing system being present in an amount sufficient to impart to the composite material a plastic consistency in a stress field of up to 200 kg/cm^2;

(b) introducing the composite material into a wedge-like space defined between oppositely arranged surface parts, at least one of said parts being gas-permeable and substantially impervious to said material; and

(c) moving said surface parts so as to entrain the material towards and through the throat or gorge of said space,

the composite material retaining substantially all of its original water content after steps (b) and (c) and continuing to behave as a one-phase plastically deformable material.

4,636,346

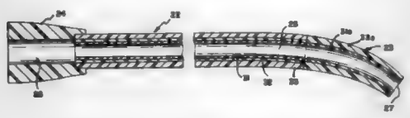
PREPARING GUIDING CATHETER

Jeffrey G. Gold, Miami; Gyan S. Pande, Miramar, and Kevin Smith, Miami, all of Fla., assignors to Cordis Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 587,382, Mar. 8, 1984, Pat. No. 4,596,563, which is a continuation-in-part of Ser. No. 587,557, Mar. 8, 1984, which is a continuation-in-part of Ser. No. 502,526, Jun. 9, 1983, abandoned. This application Feb. 6, 1985, Ser. No. 698,561

Int. Cl.[4] B29C *47/06, 63/22*

U.S. Cl. 264—139 7 Claims



1. A method of making a guiding catheter having a distal end adapted to be formed into curved configurations and passed through branching blood vessels and having a longitudinal lumen therethrough for receiving an intravascular catheter and the like, the method comprising:

forming a continuous and uninterrupted longitudinal lubricious interior sheath coating onto a mandrel;

extruding a generally rigid intermediate sheath radially over the lubricious interior sheath;

coating a generally flexible outer sheath radially over the generally rigid intermediate sheath;

removing a distal end axial length of said generally flexible outer sheath;

removing a distal end axial length of said generally rigid intermediate sheath and thereby exposing a distal end axial length of said lubricious interior sheath; and

securing a length of generally flexible outer sheath onto and over said exposed distal end axial length of the continuous and uninterrupted longitudinal lubricious interior sheath to thereby form a two-layered atraumatic distal end tip portion that is an axial length of generally flexible outer sheath secured onto the exposed distal end axial length of the continuous lubricious interior sheath.

4. A fuseless method of making a guiding catheter having a distal end adapted to be formed into curved configurations and passed through branching blood vessels and having a longitudinal lumen therethrough for receiving an intravascular catheter and the like, the method comprising:

coating a continuous and uninterrupted longitudinal lubricious interior sheath coating onto a mandrel;

extruding a longitudinal axially gapped generally rigid intermediate sheath radially over the lubricious interior sheath coating, wherein said extruding step includes providing a longitudinal axial gap and a longitudinal axial length of the generally rigid intermediate sheath, said longitudinal axial gap exposing an axial length of the lubricious interior sheath coating; and

extruding a generally flexible outer sheath coating radially over the longitudinal axially gapped generally rigid intermediate sheath and the continuous and uninterrupted interior sheath, said extruding step laying down a continuous and uninterrupted flexible polymer elongated sheath over said longitudinal axial gap to form a two-layered atraumatic distal end tip that is an axial length of generally flexible outer sheath radially positioned over the exposed length of the lubricious interior sheath coating, and the continuous and uninterrupted flexible polymer elongated sheath laid down by said extruding step is continuously laid down over said longitudinal axial length of the generally rigid intermediate sheath to form a tubular body integral with said atraumatic distal end tip without fusing said atraumatic distal end tip to said tubular body.

4,636,347

METHOD OF MAKING A FASTENER

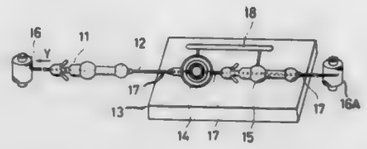
Masumi Kato, Nagoya, Japan, assignor to Tomka Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1984, Ser. No. 617,463

Claims priority, application Japan, Jun. 15, 1983, 58-105733

Int. Cl.[4] B29C *45/14*

U.S. Cl. 264—251 54 Claims



1. A method of producing a fastener comprising a female member having a longituidinal opening, a male member insertable and lockable into the opening of said female member, and a string member connecting together said female member and said male member with a distance therebetween, wherein the longitudinal axis of said string member is perpendicular to the longitudinal axis of the opening in said female member, said method comprising the steps of:

A. placing a string through a female-member forming mold, said female-member forming mold comprising an upper mold portion and a lower mold portion, said lower mold portion having splittable segments, in such a manner that said string extends across the mold cavity defined btween said upper and lower mold portions when assembled, and then joining said upper mold portion and said lower mold portion together;

B. thereafter raising one of said splittable segments of said lower mold portion to cut said string to provide a through-bore in the opening of the female member to be formed;

C. then, while maintaining said one of said splittable mold segments in the raised position, charging a molten thermoplastic resin into said mold cavity thereby molding the female member of the fastener, and then releasing the formed female member out of the mold by moving the upper mold portion away from the lower mold portion and further raising said raised one of said splittable mold segments of the lower mold portion;

D. placing the string through a male-member forming mold disposed adjacent to said female-member forming mold, the male-member forming mold comprising an upper mold piece and a lower mold piece, the string being disposed so as to extend across the mold cavity defined between said upper and lower mold pieces when assembled; then joining said upper mold piece and said lower mold piece together, followed by charging molten thermoplastic resin into said mold cavity, thereby forming a male member engageable with the female member formed through the above steps A to C, and thereafter releasing the formed male member by separating said upper mold piece and lower mold piece of said male-member forming mold;

E. thereafter, taking-up a first portion of the string on a roll, then operating a next cycle of molding of the female member and the male member on the string by the above steps A to D, and repeating this operation cycle to produce a length of the string having a number of pairs of the female member and the male member forming in series thereon; and

F. thereafter, cutting said length of the string between each adjacent pair of female member and male member.

4,636,348

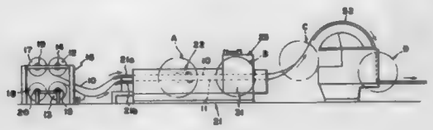
SYSTEM FOR THERMOFORMING ARTICLES SUCH AS PICNIC PLATES IN A PAIR OF SIMULTANEOUSLY FED, CONTINUOUS THERMOPLASTIC WEBS WHICH SUBSEQUENTLY MOVE INTO NESTED RELATION, AND THEN DUALLY TRIMMING THE NESTED ARTICLES FROM THE WEBS

Robert C. Whiteside, Harrison, Mich., assignor to John Brown Inc., Beaverton, Mich.

Filed Feb. 19, 1985, Ser. No. 702,638

Int. Cl.[4] B29C *51/10, 51/20*

U.S. Cl. 264—544 16 Claims



1. In an improved synthetic plastic article production system for producing products such as picnic plates at increased rates; a frame; a mold station supported thereby and incorporating an intermediate mold having projecting male mold parts on one side and directly opposite, recessed female mold cavities on its opposite side of the same configuration; a first movable end mold on the side of the intermediate mold having the male mold parts and having recessed female mold cavities aligned and dimensioned to mate therewith; a second movable end mold on the side of the intermediate mold having the recessed female mold cavities and having projecting male mold parts aligned and dimensionsed to mate therewith; mechanism for advancing a pair of heated, moldable synthetic plastic webs in unison to move moldable sections thereof to opposite sides of the intermediate mold, and for later removing them in unison from the mold station; drive mechanism for moving each of said first and second end molds toward the intermediate mold and conforming said portions of the webs to the female cavities and male parts of the intermediate mold, and for separating said first and second movable end molds from the intermediate mold; mechanism for converging said webs toward one another after they have been removed from the mold station to nest the products formed in the two webs; and trim mechanism including a relatively movable punch and trim die assembly operable for severing the nested products from the nested webs simultaneously with a single punching stroke.

10. A method of producing generally concavo-convex synthetic plastic containers and like articles, such as picnic plates, in apparatus comprising: a mold station having a stationary intermediate mold with projecting male mold parts on one side and directly opposite recessed female mold cavities in alignment therewith on the other; a first movable mold, on the side of the intermediate mold having the male mold parts, provided with recessed mating female mold cavities of substantially the same dimensions as the said cavities in the intermediate mold; a second mold on the other side of the intermediate mold having aligned projecting male mold parts mating with the cavities in the intermediate mold; mechanism for supplying a pair of heated, moldable synthetic plastic webs in unison on opposite sides of the intermediate mold and for later removing them in unison from the mold station; drive mechanism for moving each of said first and second movable molds toward the intermediate mold and molding the articles, and for separating said first and second movable molds from the intermediate mold; and a punch and severing die; the steps of:

moving heated sections of the webs in unison to opposite sides of the intermediate mold when the said first and second movable molds are separated therefrom; moving the first and second movable molds to the intermediate mold to thermoform conforming products in both of the webs; moving the first and second movable molds away from the intermediate mold and indexing the webs in unison to remove the products formed from the mold station, converging the webs toward one another to nest the aligned articles formed in the respective webs in pairs; and punching pairs of the nested articles from the webs in a single relative movement of the punch and severing die.

4,636,349

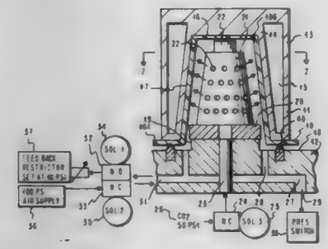
PROCESS FOR MANUFACTURING THERMOPLASTIC CONTAINERS

Don N. MacLaughlin, Midland, Mich., assignor to Couden Technology, Inc., Dallas, Tex.

Filed Aug. 22, 1985, Ser. No. 768,300

Int. Cl.[4] B29C *35/16, 51/10, 51/42*

U.S. Cl. 264—549 9 Claims



1. A process for forming hollow articles from a thermoplastic polymer sheet material, said process comprising:

heating said polymer material to a forming temperature wherein said material is softened sufficiently to allow forming and yet prevent substantial flow of the material from gravity;

clamping said heated material between a ported mold plug and a jacketed mold cavity;

moving said mold plug into said mold cavity, thereby stretching said heated material into said cavity;

releasing said clamping during said plug moving step and evacuating a substantial portion of the air trapped between said material and said mold cavity;

injecting a pressurized forming gas such as compressed air through flow means around said mold plug to further expand said material substantially completely into said mold cavity; and,

thereafter discontinuing said injecting step and flowing coolant through said jacketed mold cavity while injecting a cooling fluid through said ported mold plug against said heated material while simultaneously purging said pressurized gas from the area between said mold plug and said expanded material through said flow means.

4,636,350

PROCESS FOR THE CONTROL AND SHUTDOWN OF A GAS-COOLED REACTOR

Wolfgang Presser, Schwetzingen, and Cornelis von Charzewski, Edingen-Neckarhausen, both of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 327,076, Dec. 3, 1961, abandoned. This application Sep. 10, 1984, Ser. No. 648,627

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1960, 3047961

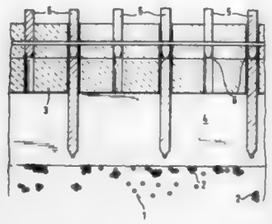
Int. Cl.[4] G21C *7/06*

U.S. Cl. 376—226 5 Claims

1. A process for alternate operational control, scram, and shutdown of a gas-cooled high-temperature nuclear reactor having a bed of spherical fuel elements, cooling gas flowing through said bed from top to bottom, the fuel elements achieving a desired final burn-up after a signal passage through the bed, said reactor also having a roof reflector, side reflector, and bottom reflector defining a reactor housing containing said

bed, said roof reflector and a top surface of said bed defining therebetween a cavity within said reactor housing said reactor also having a plurality of absorber rods insertable from respective first positions in said roof reflector to respective second positions at a predetermined depth in said cavity and further to respective third positions at a predetermined depth in said bed, comprising the step of:

inserting only rods comprising a predetermined number of said plurality of said absorber rods into said respective second positons a predetermined distance into said cavity when effecting operational control of power output, said predetermined number being less than the number of absorber rods in said plurality of absorber rods, the remainder of said plurality of absorber rods being maintained in said respective first positions in said roof reflector;



exchanging each of said predetermined number of absorber rods in said respective second position with a respective absorber rod from said remainder by moving said each absorber rod from its second position to its first position and moving said respective absorber rod from its first position to its second position when said each absorber rod originally in its second positon has absorbed a predetermined amount of radiation;

inserting said predetermined number of rods in said respective second positions into said respective third positions at a predetermined depth in said bed to effect a temporary scram as required; and

inserting all of said plurality of absorber rods into said respective third positions to effect a long-term shutdown of said reactor as required.

4,636,351

ARRANGEMENT FOR RECEIVING AND METHOD FOR HANDLING SPENT NUCLEAR REACTOR FUEL RODS

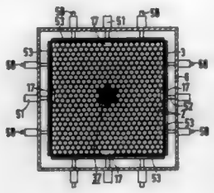
Franz Rohr, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 20, 1984, Ser. No. 602,395

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 332007; 08011983, Aug. 1, 1983, 831075684; European Pat. Off., Aug. 1, 1983, 831075684

Int. Cl.[4] G21C *19/00*

U.S. Cl. 376—272 15 Claims



1. A packing assembly for arranging in a densely packed array spent nuclear reactor fuel rods upon removal thereof from a nuclear fuel assembly in a nuclear power plant, said packing assembly comprising:

a transport and storage container having a first jacket part, a first bottom part detachably connected to said jacket part at one end thereof and a top part removably mounted to said jacket part at an end thereof opposite said bottom part, said jacket part having a length substantially equal to the length of the fuel rods and a cross-sectional area substantially equal to the area of the densely packed array of fuel rods;

a dense-packing container **81** including a second jacket part of larger dimensions that said first jacket part, a second bottom part fixed to said second jacket part at one end thereof and an outwardly extending connecting flange at an end of said second jacket part opposite said second bottom part, at least said first jacket part of said transport and storage container being insertable into said dense-packing container **81** upon a loading of spent fuel rods thereinto and upon a lateral shifting of the fuel rods from a first geometric array into a seond geometric array more densely packed than said first geometric array;

coupling means at least partially mounted to said second bottom part and engageable with said first bottom part and said first jacket part for alternately coupling and decoupling said first bottom part to said first jacket part;

guide means, removably insertable into said dense-packing container **81** prior to a loading of fuel rods thereinto, for guiding the fuel rods into positions in said first geometric array during the loading of said rods into said dense-packing container **81**, said second jacket part having inside dimensions larger than outside dimensions of said guide means;

first clamping means including pressure bars shiftably mounted to said second jacket part on an inner side thereof in the region of said second bottom part for engaging and temporarily securing said first bottom part to said dense-packing container **81**;

second clamping means, mounted to said second jacket part at a plurality of longitudinally spaced positions along an inner side of said second jacket part and inwardly shiftable at each of said spaced positions independently of the other spaced positions, for engaging said fuel rods in said dense-packing container **81** and shifting said fuel rods transversely to a longitudinal axis of said second jacket part from said first geometric array to said second geometric array upon removal of said guide means from said dense-packing container **81** after a loading of said fuel rods into said dense-packing container **81**.

4,636,352

NUCLEAR FUEL ROD WITH BURNABLE PLATE AND PELLET-CLAD INTERACTION FIX

Raymond F. Boyle, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1984, Ser. No. 578,336

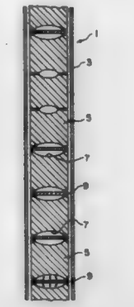
Int. Cl.[4] G21C *3/00*

U.S. Cl. 376—419 16 Claims

1. In a nuclear fuel rod comprising a metallic tubular cladding containing a plurality of nuclear fuel pellets, said pellets containing enriched uranium-235, the improvement comprising:

a plurality of ceramic wafers, each wafer comprising

a sintered mixture of gadolinium oxide and uranium dioxide, said uranium oxide having no more uranium-235 than is present in natural uranium dioxide, wherein each of said plurality of wafers is axially disposed between a major portion of adjacent said nuclear fuel pellets, whereby said wafers freeze out volatile fission products



produced by said nuclear fuel and prevent interaction of said fission products with said metallic tubing cladding.

4,636,353

NOVEL NEODYMIUM/IRON ALLOYS

Francoise Seon, Montreuil, and Bernard Boudot, Paris, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Continuation of Ser. No. 627,829, Jul. 5, 1984, abandoned. This application Jun. 18, 1985, Ser. No. 745,828

Claims priority, application France, Jul. 5, 1983, 83 11139; Sep. 9, 1983, 83 14392

Int. Cl.[4] C22C *28/00*

U.S. Cl. 420—416 8 Claims

1. A neodymium-based metal alloy which comprises from about 70 to 95% by weight of metallic neodymium and from about 5 to 30% by weight of metallic iron.

4,636,354

PROCESS AND ALLOY OF GALVANIZATION OF TEMPERED STEEL CONTAINING SILICON, AND GALVANIZED OBJECT

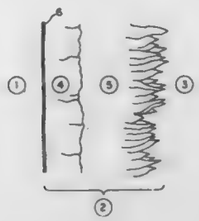
Jean-Louis Caillerie, Montigny-Le-Bretonneux; Remy Decaens, Maurepas, and Armand Limare, Aubigny-Au-Bac, all of France, assignors to Societe Anonyme Dite Societe Miniere et Metallurgique de Penarroya, Paris, France

Division of Ser. No. 491,810, May 5, 1983, abandoned. This application Mar. 22, 1984, Ser. No. 592,347

Claims priority, application France, May 5, 1982, 82 07772

Int. Cl.[4] C22C *18/00*

U.S. Cl. 420—514 4 Claims



1. Alloy for galvanization and tempering of objects of steel having a concentration of silicon lower than 0.45% by weight, characterized by the fact that said alloy consists essentially of zinc, 0.5 to 1.5% by weight of lead, and 0.005 to 0.2% by weight of germanium and the balance zinc.

4,636,355

METHOD FOR MANUFACTURE OF HIGHLY DUCTILE MATERIAL

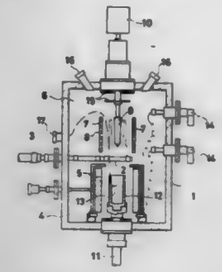
Kiyoshi Ichikawa, Yatabemachi, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Nov. 14, 1985, Ser. No. 797,905

Claims priority, application Japan, Nov. 14, 1984, 59-239978

Int. Cl.[4] C22C *1/00*

U.S. Cl. 420—590 3 Claims



1. A method for the manufacture of a highly ductile material, which comprises melting an alloy material in a crucible held under a vacuum, inserting a stirring bar in the molten alloy material in said crucible and while cooling said molten alloy material rotating said stirring bar at a speed of less than 1,000 rpm, causing the stirring bar to be rotated at a high speed of more than 2,000 rpm after said molten alloy material has reached the temperature for starting solidification, and continuing said rotation of said stirring bar at more than 2,000 rpm until immediately before completion of the solidification.

4,636,356

ALUMINUM BRAZING ALLOY

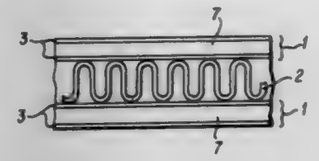
Shosuke Iwasaki, Hyogo; Tetsuo Abiko, Shimanchi; Michiki Hagiwara, and Keizo Nanba, both of Aichi, all of Japan, assignors to Sumitomo Precision Products Co., Ltd., Amagasaki, Japan

Filed Mar. 29, 1985, Ser. No. 717,677

Claims priority, application Japan, Mar. 30, 1984, 59-64385

Int. Cl.[4] C22C *21/02*

U.S. Cl. 420—532 3 Claims



1. An aluminum brazing alloy, consisting essentially of Si from 9.8–11.7%, Fe 0.02 to 0.15%, Cu from 0.01–0.03%, Mn at about 0.01%, Mg from 0.01–1.56%, Cr from 0.02–0.03%, Zn at about 0.01%, Ti at about 0.01%, and the balance aluminum, all on a weight basis as a percentage of the total.

4,636,357

ALUMINUM ALLOYS

Christopher J. Peel, Fleet; Brian Evans, Church Crookham; Samuel J. Harris, Nottingham; Brian Noble, Derby, and Keith Dinsdale, Nottingham, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB83/00229, § 371 Date Jun. 4, 1984, § 102(e) Date Jun. 4, 1984, PCT Pub. No. WO84/01391, PCT Pub. Date Apr. 12, 1984

PCT Filed Sep. 19, 1983, Ser. No. 617,997

Claims priority, application United Kingdom, Oct. 5, 1982, 8228429

Int. Cl.[4] C22C *21/10*

U.S. Cl. 420—532 11 Claims

1. An aluminum alloy consisting essentially of the composition expressed below in weight percent

lithium	2.0 to 3.0
magnesium	0.5 to 4.0
zinc	2.0 to 5.0
copper	0 to 2.0
zirconium	0 to 0.2
manganese	0 to 0.5
nickel	0 to 0.5
chromium	0 to 0.4
aluminum	balance

and wherein the alloy contains at least one of the group consisting of zirconium, manganese, nickel and chromium.

4,636,358

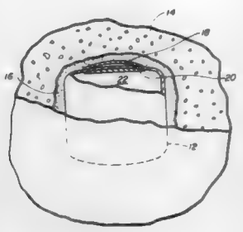
CONCRETIZATION OF HIGH LEVEL RADIOACTIVE SOURCE IN MARINE SEDIMENT

Herbert V. Weiss, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 4, 1985, Ser. No. 698,199

Int. Cl.[4] C23F *15/00*

U.S. Cl. 422—6 1 Claim



1. A method of forming a concretized coating which encapsulates a canister of heat producing materials and provides protection against corrosion by seawater when said canister is placed in an ocean floor-sediment environment, said method comprising the steps:

selecting a location on the ocean floor at such a depth that the proximate seawater thereat would be capable of reaching a temperature of at least 110° C. when in contact with the canister of heat producing materials and wherein seawater within the pores of the ocean floor sediment thereat contains sufficient amounts of calcium and sulfate to form, at said temperature, an anhydrite layer around the canister;

placing said canister into the ocean floor sediment at said location; and

storing said canister at said location for at least one month thereby allowing heat from said canister to raise the temperature of the seawater in the pores of the sediment proximate to said canister to at least 110° C. wherein anhydrite precipitates from the proximate seawater and forms a concretized layer on the exterior surfaces of said canister.

4,636,359

METHOD FOR INHIBITING CORROSION OF ZINC USING BIS-TRIAZOLES

Josef Penninger, Hilden, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

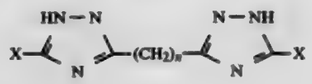
Filed Oct. 16, 1984, Ser. No. 661,536

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1983, 3338952

Int. Cl.[4] C23F *11/06, 11/16, 11/14*

U.S. Cl. 422—13 19 Claims

1. A method of inhibitng the corrosion of zinc by an aqueous system comprising adding to said system a corrosion inhibitive effective amount of at least one compound, or at least one water soluble salt thereof, having the formula



wherein:

X is NH_2 or SH, and

n is 0 to 10.

4,636,360

AUTOMATIC ANALYZING APPARATUS

Masahiko Sakurada; Sugio Manabe, both of Tokyo; Hideaki Okamura, Kawasaki City, and Nagahiro Gocho, Tokyo, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

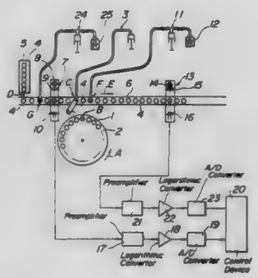
Division of Ser. No. 246,055, Mar. 20, 1981, Pat. No. 4,536,369. This application Jun. 6, 1985, Ser. No. 741,840

Claims priority, application Japan, Mar. 21, 1980, 55-36480

The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.

Int. Cl.[4] G01N *35/02*

U.S. Cl. 422—65 7 Claims



1. An automatic analyzing apparatus comprising:

means for transferring a reaction vessel along a given traveling path;

means for distributing a dilute liquid into the reaction vessel, said dilute liquid distributing means being arranged on the traveling path at a dilute liquid distribution position;

means for distributing a sample into the reaction vessel, said sample distributing means being arranged on the traveling path at a sample distribution position which is downstream with respect to said dilute liquid distribution position;

means for distributing a reagent into the reaction vessel, said reagent distributing means being arranged on the traveling path at a reagent distribution position which is downstream with respect to said dilute liquid distribution position;

a first photometric unit arranged on the traveling path at a position between the dilute liquid distribution position and one of said sample distribution and reagent distribution positions for measuring an absorption degree of the reaction vessel and the liquid contained therein;

a second photometric unit arranged on the traveling path at a downstream position with respect to said sample distribution position and said reagent distribution position for measuring an absorption degree of the reaction liquid through the reaction vessel;

means for correcting the absorption degree of the reaction liquid on the basis of the absorption degree measured at the first photometric unit for the respective reaction vessel to derive a corrected absorption degree of the reaction liquid alone;

means arranged on the traveling path at an upstream position with respect to said reagent distribution position for supplying new reaction vessels onto the reaction vessel transferring means; and

means arranged on the traveling path at a downstream position with respect to the second photometric unit for removing the reaction vessels containing the reaction liquids from the traveling path.

4,636,361

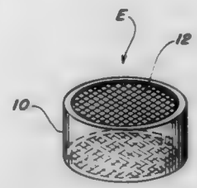
DEVICE FOR SEPARATING LIQUID FRACTIONS

Miklós Mariás, 2 Eötvös St., Budapest H-1067, Hungary, and Donald L. Weber, 6 Paul Place Ct., Florissant, Mo. 63031

Filed Nov. 18, 1985, Ser. No. 798,952

Int. Cl.[4] B01L *3/14;* B04B *5/02*

U.S. Cl. 422—101 2 Claims



2. A process for separating liquid fractions in density gradient centrifugation, using a device comprising a functional element, the surface of which is formed partly by a net through which the free streaming of the materials in a liquid medium can occur and partly by a continuous surface, the continuous and net surface parts of said element enclosing a space, the net having a structure which ensures that the liquid fraction entrapped in the space of the element is removable from the liquid medium by removing the element itself and a plurality of said functional elements being placed above each other in a centrifuge tube so that their net surfaces, being parallel to each other, are facing each other, said net surfaces either contacting each other or being separated by a spaced by application of a spacer element, said process comprising carrying out the centrifugation procedure resulting in fractionation of the sample using said centrifuge tube supplied with the functional elements, and then separating the specific liquid fractions entrapped in the inner spaces of the functional elements by removing said elements one by one from the common housing tube and taking out the liquid contents of said elements.

4,636,362

APPARATUS FOR THE CONTINUOUS TREATMENT OF FRAGMENTED FUEL ELEMENTS

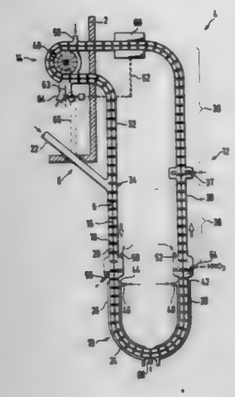
Peter Leister, Waldbronn, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft, Fed. Rep. of Germany

Filed Jun. 26, 1984, Ser. No. 624,612

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1983, 3324020; Dec. 24, 1983, 3347008

Int. Cl.[4] B01D *11/02;* B08B *3/08*

U.S. Cl. 422—105 21 Claims



1. In an apparatus for continuous treatment of fragmented radioactive fuel elements consisting of comminuted cans and fuel comprising a continuous conveyor which is at least enclosed by and arranged to move through a dissolving unit, a washing unit, a drying unit, and a discharge unit, disposed successively along the length of the conveyor, the improvement comprising

(a) a U-shaped hollow member as the enclosing dissolving unit,

(b) a feeding unit for discharging said elements onto said continuous conveyor at a point upstream of said dissolving unit, and

(c) means for advancing said conveyor through said U-shaped hollow member, and said washing, drying, and discharge units.

4,636,363

APPARATUS AND METHOD FOR CONDITIONING RADIOACTIVE WASTES FOR ULTIMATE STORAGE

Gerhard Kratz, Rodgau; Siegfried Meininger, Offenbach; Eckhard Fischer, Ramstadt, and Dietmar Bege, Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim am Ruhr, Fed. Rep. of Germany

Filed Dec. 7, 1983, Ser. No. 558,797

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245443

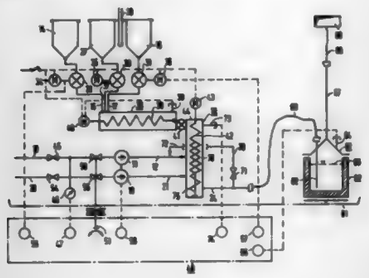
Int. Cl.[4] G21F *9/04, 9/16, 9/20*

U.S. Cl. 422—159 6 Claims

1. Installation for conditioning radioactive wastes with a binding agent to form a wastes/binding agent mixture for ultimate storage comprising, a premixer in which a binding agent and flowable wastes are mixed, a tank for the flowable wastes connected through a throughput measuring device to the premixer, a silo for the binding agent connected through a throughput measuring device to the premixer, a receiver main tank for liquid wastes connected to a throughput measuring device to a throughput-mixer downstream from the entrance of the premixer mixture into the throughput-mixer, for mixing the liquid wastes with the mixture containing the binding agent discharged from the premixer, a discharge transport downstream from the throughput-mixer for filling barrels with con-

ditioned radioactive wastes from the throughput-mixer for ultimate storage; the combination therewith of

(a) said throughput-mixer having a vertical throughput direction,



(b) said premixer arranged at the upper end of the throughput-mixer and provided with a movable member, and that

(c) movable parts of the throughput-mixer which are subject to wear are less than 700 mm long and less than 500 mm wide.

4,636,364

APPARATUS FOR PRODUCING A STREAM OF AEROSOL

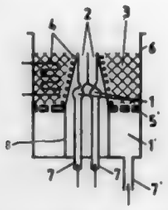
Arthur Geyer; Max Kuial, both of Ulm; Eugen Pfeiffer, Staig; Helmut Roese, Ulm, and Werner Klein, Neu Ulm, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

Filed May 3, 1985, Ser. No. 730,244

Claims priority, application Fed. Rep. of Germany, May 11, 1984, 3417438

Int. Cl.⁴ B01F *5/02*; B05B *7/22*

U.S. Cl. 422—162 **8 Claims**



1. In apparatus for producing a directed aerosol stream from gaseous and/or vapor phase reactants, including means for conveying the reactants to a reaction site where the reactants undergo a flame free chemical reaction to produce an aerosol composition, and means for causing the aerosol composition to flow from the reaction site and for immediately surrounding the aerosol composition with a moving, essentially aerosol free gas and/or vapor stream to form a directed aerosol stream enveloped in the aerosol free stream, the improvement wherein said means for conveying comprise: a distributor for receiving at least one of the reactants; at least one discharge element connected to said distributor for conveying the at least one reactant substantially vertically upwardly to said reaction site; and means including a mass of heat resistant filler material in said element for giving said element a flow resistance which is higher than that of said distributor.

4,636,365

REACTOR FOR CATALYTICALLY INDUCED OR PROMOTED REACTIONS

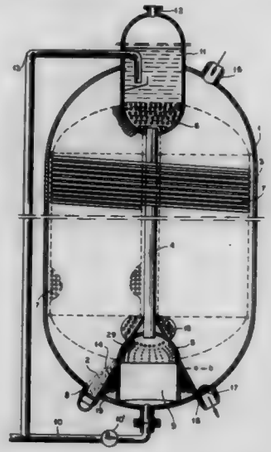
Heinz Link, Zell, and Karl-Heinz Schrenker, Tittmoning, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 438,808, Nov. 3, 1982, abandoned. This application Nov. 26, 1984, Ser. No. 674,731

Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3217066

Int. Cl.⁴ B01J *8/02*; F28D *7/02*; F28F *9/02*

U.S. Cl. 422—201 **9 Claims**



1. A reactor for catalytic reactions comprising:

a vessel having a wall, an upper portion, a lower portion, an upright axis and defining a space for receiving catalyst particles, said vessel provided with means for introducing reactants into said space and means for removing a reaction product from said space;

a mass of catalyst particles in said space;

a helical tube bundle of generally annular configuration extending through said space and said mass for passing a fluid through the tubes of said tube bundle for indirect heat exchange with said catalyst particles, said tube bundle having interstices between adjacent tubes and said interstices containing said catalyst particles;

an upper tube sheet positioned within said upper portion of said vessel, said upper tube sheet having an upright cylindrical portion and a hemispherical portion located beneath said cylindrical portion, said hemispherical portion being convex with respect to said space, said upper tube sheet communicating with the tubes of said tube bundle through openings located only within said hemispherical portion of said upper tube sheet, said upper tube sheet thereby forming an upper manifold for said tube bundle;

a lower tube sheet positioned within said lower portion of said vessel, said lower tube sheet having an upright cylindrical portion and a hemispherical portion located above said cylindrical portion of said lower tube sheet, said hemispherical portion of said lower tube sheet being convex with respect to said space and being provided with openings which communicate with the tubes of said tube bundle thereby forming a lower manifold for said tube bundle, said openings of said lower tube sheet being oriented in equally spaced rows radiating from the apex of said hemispherical portion of said lower tube sheet, said rows diverging downwardly from the apex of said hemispherical portion of said lower tube sheet whereby the spacing between said rows increases as said rows radiate downwardly from the apex of said hemispherical portion of said lower tubesheet, said tube bundle having an inner diameter which is less than the diameter of the cylindrical portion of either of said tube sheets, said tube bundle having an outer diameter which is greater than the diameter of the cylindrical portion of either of said tube sheets, said tubes of said tube bundle being connected to each of the tube sheets substantially perpendicular to the hemispherical portions thereof;

outlet means within said vessel at a position below said hemispherical portion of said lower tube sheet for removing catalyst particles from said space;

and means for circulating a heat exchange fluid through the tubes of said tube bundle.

4,636,366

DEVICE FOR STERILIZNG HOLDERS CONTAINING PRODUCTS

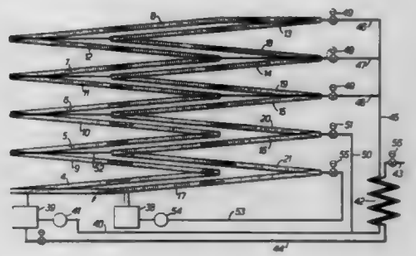
Hermann J. Langen, Berkel Enschot, Netherlands, assignor to Machinefabriek Lan B.V., Tilberg, Netherlands

Filed Jul. 17, 1981, Ser. No. 283,922

Claims priority, application Netherlands, Jul. 19, 1980, 8004172; Mar. 3, 1981, 8101368

Int. Cl.⁴ A61L *2/00*; A23L *3/04*

U.S. Cl. 422—297 **13 Claims**



1. A device for sterilizing holders containing products with the aid of a heated liquid comprising:

an elongate hollow channel;

endless conveyor means for conveying the holders through said channel; and

duct means for supplying a pressurized heated liquid into the channel at a feeding point located between end portions of said channel wherein said conveyor means further comprises a plurality of blades fixed thereto at regular intervals;

said blades closing almost the entirety of a cross-section of the hollow channel throughout the length of said channel, such that during sterilizing operation the pressure of the liquid will progressively decrease from said feeding point to said end portions of said channel.

4,636,367

REMOVAL OF RADIUM FROM AQUEOUS LIQUIDS

Peter M. Huck, 11720 - 37B Avenue, Edmonton, Alberta, Canada (T6J OK4); Robert C. Andrews, 46 Fletcher Place, Regina, Saskatchewan, Canada (S4V OA3), and William B. Anderson, 1114-8510, 111th Street, Edmonton, Alberta, Canada (T6G 1H7)

Filed Oct. 24, 1983, Ser. No. 544,946

Int. Cl.⁴ C01G *56/00*; C22B *60/02*

U.S. Cl. 423—12 **8 Claims**

1. In a process for separating radium-226 from an aqueous liquid by adding a precipitant to the liquid, the improvement that comprises passing the liquid, including the precipitant, upwardly through a particulate bed to assist co-precipitation and removal of the radium-226 from the liquid, adding the precipitant to the liquid in the vicinity of an upstream end of the particulate bed to form a mixture, and imparting a sufficient flow rate to the mixture to fluidize the bed.

4,636,368

STABILIZED ACIDIC AQUEOUS SOLUTIONS CONTAINING HYDROGEN PEROXIDE AND METALLIC IONS AND PROCESSES

Christian Prulus, Saint Cyr au Mont D'Or, France, assignor to Atochem, France

Filed Apr. 17, 1985, Ser. No. 723,970

Claims priority, application France, May 4, 1984, 84 07174

Int. Cl.⁴ C01B *15/02*; C01G *43/01*

U.S. Cl. 423—16 **6 Claims**

1. A stabilized acidic aqueous composition comprising hydrogen peroxide, metallic ions, and 3-amino-1,2,4-triazine, said triazine being present in an amount sufficient to improve the stability of said composition against decomposition of said peroxide.

4,636,369

ESSENTIALLY COMPLETE RECOVERY OF URANIUM, YTTRIUM, THORIUM AND RARE EARTH VALUES FROM PHOSPHATE ROCK DURING WET-PROCESS PRODUCTION OF PHOSPHORIC ACID THEREFROM

Jean Fava, Pessac; André Lambert, Puiseux, and Jean-Paul Tognet, La Rochelle, all of France, assignors to Rhone-Poulenc Chimie de Base, Courbevoie, France

Filed Nov. 10, 1983, Ser. No. 550,627

Claims priority, application France, Nov. 10, 1982, 82 18910

Int. Cl.⁴ C01G *43/00*

U.S. Cl. 423—20 **11 Claims**

1. A process for the improved recovery of uranium, yttrium, thorium and rare earth values contained in a phosphate rock having a relatively low aluminum and iron content, during the wet-process preparation of phosphoric acid therefrom, comprising the step of acidulating said phosphate rock and adding a predetermined amount of aluminum ion, iron ion or a combination thereof sufficient to result in an amount of aluminum, expressed as Al_2O_3, and/or amount of iron, expressed as Fe_2O_3, of about 0.8 percent to 1.5 percent by weight with respect to the amount of phosphate rock acidulated, said predetermined amount added being sufficient to improve the recovery of said uranium, yttrium, thorium and rare earth values from the phosphate rock in the phosphoric acid solution thus produced.

4,636,370

NON-CATALYTIC METHOD FOR REDUCING THE CONCENTRATION OF NO IN COMBUSTION EFFLUENTS BY INJECTION OF AMMONIA AT TEMPERATURES FROM ABOUT 975 DEGREES K. TO 1300 DEGREES K.

Anthony M. Dean, Hampton; Anthony J. DeGregorio, Flemington; James E. Hardy, Lebanon; Boyd E. Hurst, Long Valley, and Richard K. Lyon, Pittstown, all of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 550,398, Nov. 10, 1983, Pat. No. 4,507,269. This application Mar. 22, 1985, Ser. No. 715,119

The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.

Int. Cl.⁴ C01B *21/00*; B01J *8/00*

U.S. Cl. 423—235 **6 Claims**

1. A process for reducing NO concentration of a combustion effluent containing NO and at least 0.1 volume percent oxygen when at least a portion of the combustion effluent is at a temperature within the range of about 975° K. to about 1300° K. which process comprises injecting ammonia in an amount and at a location determined by the solution of a set of simultaneous equations derived from the kinetic model:

Rate constant K = exp (−E/(1.98)T)			
REACTION	A	n	E
$NH_3 + O = NH_2 + H_2$	.246E + 14	0.0	17071.

-continued

Rate constant K = exp (−E/(1.98)T)			
REACTION	A	n	E
$NH_3 + O = NH_2 + OH$	.150E + 13	0.0	6040.
$NH_3 + OH = NH_2 + H_2O$	.326E + 13	0.0	2120.
$HNO + M = NO + H + M$	.186E + 17	0.0	48680.
$HNO + OH = NO + H_2O$	.360E + 14	0.0	0.
$NH_2 + HNO = NH_3 + NO$	.175E + 15	0.0	1000.
$NH_2 + NO = NNH + OH$	.610E + 20	−2.46	1866.
$NH_2 + O_2 = HNO + OH$	.510E + 16	0.0	30000.
$NNH + NH_2 = N_2 + NH_3$	.100E + 14	0.0	0.
$NH_2 + O = NH + OH$	.170E + 14	0.0	1000.
$NH_2 + OH = NH + H_2O$	.549E + 11	0.68	1290.
$NH_2 + H = NH + H_2$	.500E + 12	0.5	2000.
$NH + O_2 = NHO + O$	.300E + 14	0.0	3400.
$H_2 + OH = H_2O + H$	.220E + 14	0.0	5150.
$H + O_2 = OH + O$	.220E + 15	0.0	16800.
$O + H_2 = OH + H$	.180E + 11	1.0	8900.
$H + HO_2 = OH + OH$	.250E + 15	0.0	1900.
$O + HO_2 = O_2 + OH$	.480E + 15	0.0	1000.
$OH + HO_2 = H_2O + O_2$	.500E + 14	0.0	1000.
$OH + OH = O + H_2O$	.630E + 13	0.0	1090.
$HO_2 + NO = NO_2 + OH$	.343E + 13	0.0	−260.
$H + NO_2 = NO + OH$	.350E + 15	0.0	1500.
$O + NO_2 = NO + O_2$	.100E + 14	0.0	600.
$H + O_2 + M = HO_2 + M$ $H_2O/21$**	.150E + 16	0.0	−995.
$NNH + M = N_2 + H + M$	.200E + 15	0.0	30000.
$NO_2 + M = NO + O + M$	.110E + 17	0.0	66000.
$NH_3 + M = NH_2 + H + M$	.480E + 17	0.0	93929.
$O + O + M = O_2 + M$	.138E + 19	−1.0	340.
$NH_2 + NO = N_2 + H_2O$	.910E + 20	−2.46	1866.
$NNH + OH = N_2 + H_2O$	.300E + 14	0.0	0.
$NNH + NO = N_2 + HNO$	.906E + 12	0.0	0.

**i.e. A = 21 × .15E + 16 for H_2O as "third body".

4,636,372

ALUMINUM FLUOROPHOSPHATES MADE FROM IMPURE PHOSPHORIC ACIDS AND CONVERSION THEREOF TO ALKALIMETAL PHOSPHATES

Elie Chemtob, Claremont, and Gary L. Beer, Simi Valley, both of Calif., assignors to Occidental Chemical Agricultural Products, Inc., Los Angeles, Calif.

Filed Mar. 7, 1985, Ser. No. 709,166

The portion of the term of this patent subsequent to Mar. 19, 2002, has been disclaimed.

Int. Cl.⁴ C01B *7/19, 25/16*

U.S. Cl. 423—312 **21 Claims**

1. A process for producing HF and alkali metal phosphates and for removing aluminum and fluorine from impure aqueous phosphoric acid analyzing, in weight percent, no more than about 45% P_2O_5, in the range of from about 2% to about 4% Al_2O_3 and from about 1% to about 2% F, said process comprising:

(a) aging said impure aqueous phosphoric acid at an elevated temperature for sufficient time to permit the formation of solid precipitate comprising a fluoroaluminum phosphate, said elevated temperature being between 25° C. and the boiling temperature of said impure aqueous phosphoric acid;

(b) separating said solid precipitate from the aged phosphoric acid, thereby removing at least a portion of the aluminum and fluorine from the impure, aqueous phosphoric acid;

(c) thermally decomposing said separated solid precipitate without treating with other reactants to evolve HF and produce a second solid;

(d) recovering said evolved HF; and

(e) contacting said second solid with an alkali metal hydroxide to produce an alkali metal phosphate.

4,636,371

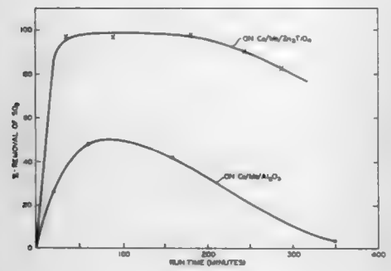
REMOVAL OF SULFUR OXIDES FROM FLUID STREAMS

Floyd E. Farha, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 9, 1985, Ser. No. 773,964

Int. Cl.⁴ B01J *8/00;* **C01B** *17/00, 17/16, 17/02*

U.S. Cl. 423—244 **17 Claims**



1. A process for removing a sulfur oxide from a gaseous stream containing a sulfur oxide comprising the step of contacting said gaseous stream in the presence of a hydrogen donor with a catalyst composition comprising zinc titanate and at least one promoter selected from the group consisting of vanadium, chromium, cobalt, nickel, molybdenum, tungsten, rhenium, platinum, palladium, rhodium, ruthenium and compounds thereof, wherein said sulfur oxide is converted to hydrogen sulfide and said hydrogen sulfide is absorbed by said catalyst composition.

4,636,373

SYNTHESIS OF CRYSTALLINE SILICATE ZSM-12 USING DIBENZYLDIMETHYLAMMONIUM CATIONS AND THE PRODUCT PRODUCED

Mae K. Rubin, Bala Cynwyd, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 624,562, Jun. 26, 1984, abandoned. This application Aug. 30, 1985, Ser. No. 770,941

Int. Cl.⁴ C01B *33/28*

U.S. Cl. 423—328 **13 Claims**

1. A method for synthesizing a crystalline silicate ZSM-12 exhibiting a characteristic X-ray diffraction pattern as shown in Table 1 of the specification, which comprises (i) preparing a mixture capable of forming said crystalline silicate, said mixture containing sources of alkali metal cations, dibenzyldimethylammonium cations, an oxide of silicon and water and having a composition, in terms of mole ratios, within the following ranges:

added Al_2O_3/SiO_2	0
H_2O/SiO_2	5–50
OH^-/SiO_2	0.03–0.4
M/SiO_2	0.03–0.4
R/SiO_2	0.05–1.0

wherein M is said alkali metal cation and R is said dibenzyldimethylammonium cation, (ii) maintaining the mixture at a temperature of from about 80° C. to about 180° C. until crystals of the crystalline silicate are formed and (iii) recovering the crystalline silicate ZSM-12 from step (ii) said recovered crystalline silicate containing alkali metal and dibenzyldimethylammonium cations.

13. Dibenzyldimethylammonium-containing ZSM-12.

4,636,374

METHOD FOR MANUFACTURING ALUMINUM OXYNITRIDE REFRACTORY

Susumu Kurihara, Shimizu; Tadashi Seki, Tokyo; Hiroshi Awata, and Hitoshi Kadowaki, both of Shimizu, all of Japan, assignors to Nikkei Kako Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1985, Ser. No. 791,355

Claims priority, application Japan, Oct. 26, 1984, 59-224046

Int. Cl.⁴ C01B *21/20;* **C04B** *35/58*

U.S. Cl. 423—385 **3 Claims**

1. A method for the manufacture of an aluminum oxynitride refractory, characterized by mixing alumina with aluminum dross and electrically fusing the resultant mixture in an electric furnace.

4,636,375

PROCESS FOR PRODUCING FURNACE BLACKS OF VARIABLE CARBON BLACK STRUCTURE

Lothar Rothbühr, Hürth-Hermülheim, and Gerhard Kühner, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 203,843, Nov. 4, 1980, abandoned. This application Dec. 20, 1982, Ser. No. 451,303

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1979, 2944855

Int. Cl.⁴ C01B *31/02;* **C09C** *1/48*

U.S. Cl. 423—450 **4 Claims**

1. A process for controlling the structure of carbon black in the production of furnace blacks of lowered carbon black structure comprising

burning a fuel with air without oxygen enrichment in a combustion chamber of a furnace black reactor thereby producing hot exhaust gases,

preheating reaction air introduced into the combustion chamber to a temperature in the range of 400° to 1200° C.,

spraying carbon black raw material into said hot exhaust gases at a location downstream from the point of introduction of the fuel and

completing the reaction further downstream by injecting water and cooling, whereby for the achievement of high yields and large raw material through-puts, a low ratio of combustion air:carbon black raw material is selected,

removing from the exhaust gases wholly or 80 to 90% of the carbon black that is produced by the process and recycling at least 5% by volume of the exhaust gases to the combustion chamber without requiring removal of hydrogen and carbon monoxide, the recycled gas being employed at a temperature of 100° to 1200° C. thereby lowering the carbon black structure as measured by the absorption of dibutylphthalate, the structure of the carbon black being controlled by the volume of the recycled gas.

4,636,376

SULFATE REMOVAL FROM ALKALI METAL CHLORATE SOLUTIONS

Bernard A. Maloney, Canal Fulton, and John E. Carbaugh, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 30, 1985, Ser. No. 781,176

Int. Cl.⁴ C01B *11/14*

U.S. Cl. 423—475 **18 Claims**

1. A process of removing sulfate from aqueous alkali metal chlorate solutions comprising:

(a) mixing a chromate and sulfate-containing aqueous alkali metal chlorate solution having a pH in the range from about 2.0 to about 6.0 with a calcium-containing material for a time and at a temperature sufficient to form a sulfate-containing precipitate, the precipitate being predominantly glauberite; and

(b) separating the sulfate-containing precipitate from the solution.

2. The process of claim 1 wherein the sulfate-containing precipitate is substantially chromium-free.

4,636,377

INTEGRATED SCRUBBING OF SO_2 AND PRODUCTION OF SULFUR

Michael Heisel, Pullach; Freimut Marold, Neubiberg, and Gerhard Linde, Gruenwald, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 2, 1985, Ser. No. 762,072

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1984, 3428548

Int. Cl.⁴ C01B *17/02*

U.S. Cl. 423—575 **24 Claims**

1. A process for the production of elemental sulfur from SO_2, comprising the steps of: dissolving the SO_2 in a regenerable physical solvent, contacting resultant solution with a reducing agent to convert the SO_2 to sulfur, separating the resultant sulfur from the solution, passing a minor portion of said resultant solution from the separating step to a regeneration stage to remove water and sulfur from said minor portion, combining resulting regenerated minor portion with remaining solvent from said separating step, and scrubbing a raw SO_2-containing gas with said combined solution thereby dissolving said SO_2, wherein the concentration of sulfur is maintained at saturation or above saturation during said reacting step and after said separating step, and the concentration of sulfur in the solvent is maintained at a level close to or below saturation during the scrubbing step and in downstream zones leading to the contacting step.

4,636,378

METHOD OF PREPARATION OF PEROVSKITE-TYPE COMPOUNDS

Ricardo C. Pastor, Manhattan Beach, and Florentino V. Lee, Culver City, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 11, 1985, Ser. No. 743,717

Int. Cl.⁴ C01G *23/00*

U.S. Cl. 423—598 **12 Claims**

9. A method of producing barium titanate comprising the steps of:

(a) reacting titanium iso-butoxide with at least a stoichiometric amount of aqueous barium hydroxide;

(b) heating the reaction mixture to an initial temperature of 100° C.–250° C. at 1–40 atmospheres of pressure to form a reaction product;

(c) cooling the reaction product to a temperature of below 40° C. and thereafter heating it to approximately 40° C. to 60° C.;

(d) treating the reaction product with hydrochloric acid until a pH of 1–2 is attained;

(e) dialyzing the reaction product into a dialyzate and tenate;

(f) recovering the tenate and washing it with methylalcohol; and

(g) drying the remaining residue.

4,636,379

PROCESS FOR PRODUCING CALCIUM HYDROXIDE

Heinz Bestek, Velbert; Werner Ewald, Wulfrath; Hans-Peter Hennecke, Wuppertal; Alfred Roeder, Duisburg, and Friedrich Schmitz, Wulfrath, all of Fed. Rep. of Germany, assignors to Rheinische Kalksteinwerke GmbH, Wulfrath, Fed. Rep. of Germany

Filed Sep. 5, 1985, Ser. No. 772,773

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, 3433228

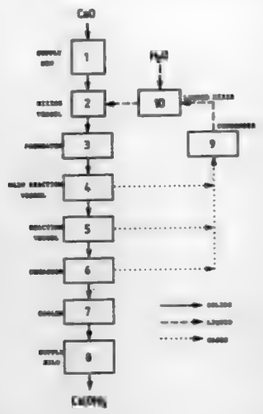
Int. Cl.⁴ C01F *11/02*

U.S. Cl. 423—640 **11 Claims**

1. A process for producing dry calcium hydroxide by slaking finely divided or ground, softly burnt lime, where the lime is

intensively and homogeneously mixed with a slaking liquid consisting of water and a reaction-retarding, organic solvent, comprising the steps of:

mixing the slaking liquid consisting of 30 to 50 parts by volume water and 70 to 50 parts by volume of organic solvent with the lime at a temperature below 45° C. in a mixing vessel;



transferring the reaction mixture to a main reaction vessel for reacting where the mixture is heated by a heating device to a temperature of from 50° to 70° C.; and

transferring the mixture to a final reaction vessel for final reacting whereby calcium hydroxide is formed;

the ratio between lime and slaking liquid in the mixing vessel being such that a final reaction temperature of from 85° to 110° C. is reached in said final reaction vessel.

4,636,380

NOVEL PHYSIOLOGIC CHEMICAL METHOD OF LABELING PROTEIN SUBSTANCES WITH THE RADIONUCLIDES OF INDIUM

Dennis W. Wong, 2853 Sunnyglen Rd., Torrance, Calif. 90505

Filed Apr. 23, 1984, Ser. No. 602,923

Int. Cl.⁴ A61K *43/00, 49/00*

U.S. Cl. 424—1.1 **36 Claims**

1. A method of labeling mammalian plasma proteins with the radionuclides of Indium at physiologic pH 6–8 condition which comprises the sequential steps of:

a. mixing a solution of stannous salt with an aqueous solution of sodium citrate at room temperature for 1–5 minutes;

b. reacting the (Sn)citrate chemical species of step (a) with a radioactive solution of $InCl_3$ at room temperature for 1–5 minutes;

c. raising the pH of the radioactive mixture of step (b) to 7.4 with a sufficient amount of dilute alkaline solution;

d. heating the neutralized radioactive admixture of step (c) at 120° C. for 15 minutes and allow it to cool to room temperature for 5–10 minutes;

e. binding of the radionuclide to the protein ligand by adding an aqueous protein solution desired to be labeled to the neutralized radioactive admixture of step (d) and incubating the radioactive protein admixture at 37° for 30 minutes.

4,636,381

COATED UBIDECARENONE-CONTAINING LIPOSOME

Masahiro Takada; Teruaki Yuzurihe; Koichi Katayama, all of Iwaki, and Junzo Sunamoto, Nagasaki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed May 19, 1983, Ser. No. 497,255

Claims priority, application Japan, May 19, 1982, 57-82993

Int. Cl.⁴ A61K *9/10, 9/52*

U.S. Cl. 424—38 **2 Claims**

1. A coated ubidecarenone-containing liposome which comprises a ubidecarenone-containing liposome and a polysaccharide fatty acid ester coating on the surface of a membrane of said liposome effective to speed the transfer of Ubidecarenone from the blood to a target organ, wherein the membrane of said liposome is composed of, per mole of ubidecarenone, 1–10 moles of cholesterol and 10–30 moles of at least one compound selected from the group consisting of phosphatidyl choline, phosphatidyl ethanolamine, phosphatidyl serine, sphingomyelin, dicetylphosphoric acid, stearylamine, phosphatidyl glycerol, phosphatidic acid and phosphatidyl inositol; the fatty acid component of said polysaccharide fatty acid ester is selected from the group consisting of lauric acid, myristic acid, palmitic acid and stearic acid; the substitution degree of the fatty acid component of said polysaccharide fatty acid ester is 0.5 to 5; and the polysaccharide component has a molecular weight of more than 40,000 and is at least one member selected from the group consisting of dextran, amylopectin, pullulan, dextran sulfuric acid, chiotic acid and pullulan sulfuric acid.

4,636,382

MORPHOLINO COMPOUNDS AND COMPOSITIONS

Sven E. H. Heraeustam; Nils A. Nilsson, and Lars-Olof Willard, all of Malmo, Sweden, assignors to AB Ferrosan, Malmo, Sweden

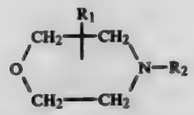
Division of Ser. No. 480,399, Mar. 30, 1983, which is a continuation-in-part of Ser. No. 245,441, Mar. 19, 1981, abandoned. This application Feb. 14, 1985, Ser. No. 701,427

Claims priority, application Sweden, Mar. 21, 1980, 8002218

Int. Cl.⁴ A61K *7/22;* **C07D** *265/30*

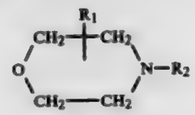
U.S. Cl. 424—54 **17 Claims**

1. Morpholino compounds of the general formula:



wherein R_1 is a straight or branched alkyl group containing 8 to 10 carbon atoms at the 2- or 3-position of the morpholino ring, and R_2 is a straight or branched alkyl group containing 2 to 6 carbon atoms terminating with a hydroxy group, the sum of the carbon atoms in the groups R_1 and R_2 being 12 to 16, and pharmaceutically acceptable salts thereof.

16. Composition for treatment of the oral cavity and especially the surfaces of the teeth comprising a compound of the general formula



wherein R_1 is a straight or branched alkyl group containing 8 to 10 carbon atoms at the 2- or 3-position of the morpholino ring, and R_2 is a straight or branched alkyl group containing 2 to 6 carbon atoms terminating with a hydroxy group, the sum of the carbon atoms in the groups R_1 and R_2 being 12 to 16, or a pharmaceutically acceptable salt thereof carried in tooth pastes, chewable tablets, mouth washes, or chewing gums.

4,636,383

INTERFERON-CYCLARADINE COMBINATION

Tattanahali L. Nagabhushan, Parsippany; George H. Miller, Montville, both of N.J.; Jerome Schwartz, New York, N.Y., and Michael R. Ostrander, Glen Ridge, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Aug. 29, 1984, Ser. No. 645,370

Int. Cl.⁴ A61K *45/02;* **C12P** *21/00*

U.S. Cl. 424—85 **18 Claims**

1. A pharmaceutical composition comprising an antiviral effective amount of a combination of (+)-cyclaradine or an equivalent amount of the 5'-methoxyacetate ester or 5'-ethoxypropionate ester, or a pharmaceutically acceptable salt thereof, and interferon in a pharmaceutically acceptable carrier.

4,636,384

METHOD FOR TREATING DISORDERS OF THE VASCULAR AND PULMONARY SYSTEMS

Ralph J. Stolle, Oregonia, Ohio, and Lee R. Beck, Birmingham, Ala., assignors to Stolle Research & Development Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 384,625, Jun. 3, 1982, abandoned. This application Oct. 27, 1983, Ser. No. 546,162

Int. Cl.⁴ A61K *39/40, 35/20*

U.S. Cl. 424—87 **13 Claims**

1. A method of lowering lipid blood stream levels in an animal which comprises:

administering to said animal milk collected from a bovid being maintained in a hyperimmune state against a mixture of antigens comprising *Staphylococcus aureus; Staphylococcus epidermidis; Streptococcus pyogenes,* A. Type 1; *Streptococcus pyogenes,* A. Type 3; *Streptococcus pyogenes,* A. Type 5; *Streptococcus pyogenes,* A. Type 3; *Streptococcus pyogenes,* A. Type 12; *Streptococcus pyogenes,* A. Type 14; *Streptococcus pyogenes,* A. Type 18; *Streptococcus pyogenes,* A. Type 22; *Aerobacter aerogenes; Escherichia coli; Salmonella enteritidis; Pseudomonas aeruginosa; Klebsiella pneumoniae; Salmonella typhimurium; Haemophilus influenzae; Streptococcus viridans; Proteus vulgaris; Shigella dysenteriae;* Streptococcus, Group B; *Diplococcus pneumoniae; Streptococcus mutans;* and *Corynebacterium Acne,* Types 1 and 2, in an amount and for a time sufficient to produce said lowering effect.

4,636,385

VACCINE, METHOD FOR ITS PREPARATION, AND USE THEREOF IN VACCINATING HUMANS AGAINST ROTAVIRUS INFECTION

Stanley A. Plotkin, Philadelphia, and H. Fred Clark, Wynnwood, both of Pa., assignors to The Wistar Institute of Anatomy & Biology, Philadelphia, Pa.

Filed Feb. 15, 1985, Ser. No. 702,041

Int. Cl.⁴ A61K *39/15, 39/225, 39/42*

U.S. Cl. 424—89 **17 Claims**

1. A method of producing a live rotavirus vaccine against bovine and human rotaviruses, including human serotype 3, which comprises inoculating onto monkey kidney cell culture a strain of live bovine rotavirus which does not hemagglutinate primate red blood cells, gives at least about 20 fold higher titers when neutralized with antiserum therefor as compared to heterologus bovine and primate rotaviruses, and has a migration pattern for its RNA genome segments when determined by PAGE substantially as shown by lane WC3 in FIG. 1, to prepare a seed batch of said virus strain serially passaging virus from said seed batch on cells of the cell line CV-1 (ATCC CCL 70), subjecting said passaged virus to plaque purification on cells of the cell line MA-104, further passaging said plaque-purified virus on cells of the cell line CV-1 (ATCC CCL 70), and harvesting the resulting vaccine from disrupted cells obtained from said last passage, the total number of passages being from about 5 to about 25 and being such that when administered to humans the vaccine is immunogenic without causing disease.

4,636,386

MYCOLOGICAL METHOD FOR CONTROLLING ITALIAN THISTLE GROWTH

Gary L. Anderson, Oakland, and Steven E. Lindow, Berkeley, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 22, 1984, Ser. No. 643,214

Int. Cl.⁴ A01N *63/00;* **C12N** *1/00;* **C12R** *1/645*

U.S. Cl. 424—93 **3 Claims**

1. A method for inhibiting the growth of Italian thistle which comprises applying to a field containing thistle at about or prior to the cotyledon stage an amount of Alternaria sp. having A.T.C.C. Accession No. 20723 effective to inhibit the growth of the Italian thistle.

4,636,387

ANESTHETIC POLYORGANOPHOSPHAZENES

Harry R. Allcock; Paul E. Austin, and Thomas X. Neenan, all of State College, Pa., assignors to Research Corporation, Tucson, Ariz.

Division of Ser. No. 390,345, Jun. 21, 1982, Pat. No. 4,495,174. This application Sep. 21, 1984, Ser. No. 708,907

Int. Cl.⁴ C08G *79/02, 79/04;* **A61K** *9/58*

U.S. Cl. 514—89 **10 Claims**

1. A long-acting, local anesthetic, consisting of a polymeric phosphazene backbone, and an organic radical having local anesthetic activity and an amino functional group on the ring of said radical through which said radical is covalently attached to said phosphazene backgone by a phosphorous-nitrogen signal bond, said organic radical being selected from the group consisting of 2-amino-3-picoline, benoxinate, naepaine and phenacaine.

6. A long-acting local anesthetic medicament, comprising a local anesthetic effective amount of a compound of claim 1 in admixture with a pharmaceutically acceptable carrier.

4,636,388

PREPARING PROTEIN FOR HYDROLYSIS AND PRODUCT

Chifa F. Lin, Irvington, and Chang R. Lee, Yonkers, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 562,023, Dec. 14, 1983, abandoned, which is a continuation of Ser. No. 350,845, Feb. 22, 1982, abandoned. This application Dec. 19, 1984, Ser. No. 683,339

Int. Cl.⁴ A23J *3/00*

U.S. Cl. 426—7 **36 Claims**

1. A process which comprises:

(a) heating a dispersion of a gelable proteinaceous material wherein the solids content of said dispersion ranges from about 12% to about 40% by weight and the protein content of said dispersion ranges from about 9% to about 30% by weight to a temperature for a period of time and under conditions sufficient to form a gel having a gel strength of at least 100 grams;

(b) washing the gel in particulate form in sufficient liquid and for a period of time sufficient to allow a portion of the non-proteinaceous material entrained in the gel to diffuse from the gel into the surrounding liquid; and

(c) separating the liquid, the protein product of Steps (a), (b) and (c) being adapted for enzymatic hydrolysis.

13. The process as recited in claim 1 which further includes the step of enzymatically hydrolyzing the protein adapted for enzymatic hydrolysis with fungal protease and pancreatin.

4,636,389

BREWING AND DISTILLING

Roger Statham, Lymm, and John F. Taylor, Hale, both of England, assignors to Edward Billington & Son Limited, Liverpool, England

Filed Aug. 22, 1984, Ser. No. 643,361

Claims priority, application United Kingdom, Sep. 2, 1983, 8323656

Int. Cl.⁴ C12C *11/04, 9/00*

U.S. Cl. 426—11 **12 Claims**

1. In a process for producing a fermented product from a mash containing malt and a brewing adjunct, the improvement consisting of using as the brewing adjunct an extruded starch product which has been passed through an extruder cooker to attain a temperature in the extruder of from 60° C. through 180° C. at a moisture content of from 12% through 30% by weight and under a pressure of at least 3 bars.

4,636,390

PROCESS FOR PRODUCING PROTEIN ALIMENTS AND VARIOUS BY PRODUCTS FROM CEREALS

Emile Segard, and Philippe Mouceaux, both of Compiegne, France, assignors to Chambre Regionale d'Agriculture de Picardie, Amiens, France

Filed Feb. 9, 1984, Ser. No. 578,644

Claims priority, application France, Feb. 22, 1983, 83 02813

Int. Cl.⁴ A23J *1/12;* **C12P** *19/14*

U.S. Cl. 426—18 **16 Claims**

1. A process for producing protein-containing aliments from cereals, comprising the following steps:

(a) grinding cereals and soaking the ground product in water;

(b) separating the soaked ground product obtained in step (a) into a sediment containing substantially insoluble materials and starch A and a suspension containing at least 60% of the initially present nitrogenous materials;

(c) isolating from the suspension in step (b) an insoluble fraction containing at least 60% of the proteins intially present and a remaining floating fraction;

(d) mixing the sediment obtained in step (b) with the remaining floating fraction of step (c) to obtain a suspension containing at least 90% of the initial starch;

(e) hydrolyzing the starch contained in the suspension of step (d) by addition of thermostable amylase;

(f) separating, and collecting from the hydrolysis of step (e) a remaining floating hydrolysate and an insoluble fraction;

(g) fermentating a mixture comprising the insoluble fraction of step (f), water and yeast, whereby such mixture becomes protein enriched; and

(h) separating the fermented mixture of step (g) into a recycling effluent and a sediment containing a first protein-containing aliment.

4,636,391

APPARATUS AND METHOD OF FORMING A STERILE PRODUCT PACKAGE

Brian R. Pike, Carlsbad, Calif., assignor to Patrick J. Furlong, Carlsbad, Calif.

Filed Aug. 22, 1985, Ser. No. 768,348

Int. Cl.⁴ B65B *55/10, 9/24*

U.S. Cl. 426—106 **15 Claims**

9. A method of providing and filling portions of a sterilized plastic film tube with a sterile product, said method comprising the steps of extruding a plastic film tube at a temperature sufficient to ensure sterility of both inner and outer surfaces of the plastic film tube, supplying a sterile gas to the plastic film tube as it is being formed at a pressure at least as great to maintain the shape of the plastic film tube, supplying a sterile product through the sterile gas into the plastic film tube as the plastic film tube is being formed, and sealing off and separating filled plastic film tube portions.

4,636,392

APPLE CASE FOR USE IN PRESERVING APPLES

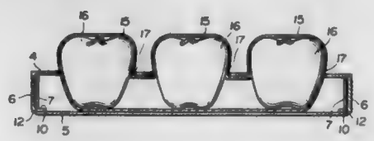
Kitayama Toshitsugu, Kuroishi, Japan, assignor to Kyoei Co., Ltd., Japan

Division of Ser. No. 734,908, May 16, 1985. This application Jan. 30, 1986, Ser. No. 824,170

Claims priority, application Japan, May 21, 1984, 59-101898; Jul. 25, 1984, 59-113277[U]

Int. Cl.⁴ B65B *25/04;* **B65D** *77/04*

U.S. Cl. 426—110 **4 Claims**



1. A package containing apples, said package comprising a case and a sealed resilient bag containing said apples, said case comprising a front plate, a rear plate aligned with said front plate and connected to said front plate by side walls; said front plate having a plurality of spaced openings of a size sufficient to allow said apples to go through, and said sealed resilient bag containing said apples being positioned in said case such that the sealed bag rests on the rear plate and said front plates depresses the bag between the apples towards the rear plate with resilient deformation such that each apple disposed in said bag partly projects from one of said openings respectively and is stationarily supported in said bag by the resilient deformation of the bag.

4,636,393

METHOD OF PROCESSING MEAT FOR INCLUSION IN HIGH ACID TYPE FOODS AND PRODUCT THEREOF

Donald J. Lynch, Haverford, Pa., and Raymond P. Shivers, Gibbstown, N.J., assignors to Campbell Soup Company, Camden, N.J.

Filed Nov. 28, 1984, Ser. No. 675,852

Int. Cl.⁴ A23L *1/317*

U.S. Cl. 426—276 **20 Claims**

1. A process for preparing acidified meat agglomerates to be included in a heat treated, though unsterilized, acidic liquid food product comprising:

(a) grinding meat in the presence of added protein-solubilizing salt to produce a meat paste;

(b) extruding discrete agglomerates of the meat paste into a hot aqueous protein denaturing bath so as to coagulate at least the surface proteins of said discrete agglomerates, said agglomerates comprising particles having a size within the range of about 0.25 to about 1.25 inch; and

(c) soaking the surface-coagulated agglomerates in a hot aqueous bath containing an edible acid for a time sufficient to permeate the agglomerates with the acid and reduce the pH of said agglomerates to less than about 4.6, said acid bath containing a sufficient concentration of acid for reducing the pH of said agglomerates to less than about 4.6.

4,636,394

METHOD AND COMPOSITIONS FOR CHILLPROOFING BEVERAGES

Wen-Pin Hsu, Woodhaven, N.Y., assignor to J. E. Siebel Sons' Company, Inc., Chicago, Ill. and PQ Corporation, Valley Forge, Pa.

Filed Apr. 16, 1984, Ser. No. 600,508

Int. Cl.⁴ C12H *1/02*

U.S. Cl. 426—330.4 **18 Claims**

1. A method for chillproofing beer by removing chill haze precursors therefrom, comprising contacting beer with both a first amorphous silica and a second amorphous silica for a period of time sufficient to effect sorption by said silicas of chill haze precursors, and thereafter separating said silicas from the beer, said first amorphous silica having a moisture content of at least about 30% by weight and having a surface area in the range of from about 300 to about 800 m^2/g, a pore volume of from about 0.9 to about 1.8 ml/g, an average pore diameter of from about 30 to about 1200 Å, and an average particle size of less than about 40 microns; said second amorphous silica having a moisture content of less than 30% by weight and having a surface area in the range of from about 200 to about 700 m^2/g, a pore volume of from about 1.0 to about 1.6 ml/g, an average pore diameter of from about 50 to about 300 Å, and an average particle size of less than about 20 microns; wherein the weight ratio of the amount of said second amorphous silica with which the beer is contacted to the amount of said first amorphous silica with which the beer is contacted is in the range of from about 1:7 to 1:1.

4,636,395

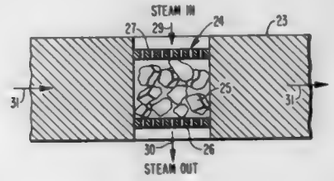
METHOD FOR HEAT TREATING FOOD

Albert H. Robinson, Jr., Plymouth Meeting, and Walter W. Egee, deceased, late of Wallingford, both of Pa. (by Elizabeth J. Egee, executrix), assignors to Campbell Soup Company, Camden, N.J.

Continuation-in-part of Ser. No. 435,242, Oct. 19, 1982, abandoned. This application Jun. 18, 1985, Ser. No. 745,956

Int. Cl.⁴ A23L *3/18*

U.S. Cl. 426—511 **18 Claims**



1. A continuous method of heat treating discrete pieces of fresh foods without significantly affecting their organoleptic properties comprising the steps of:

(a) filling individual confined treatment zones provided in a conveyor with said discrete food pieces, said discrete food pieces having a largest dimension of about two inches, said confined treatment zones retain separate, finite portions of essentially immobile discrete food pieces while permitting fluids to flow therethrough;

(b) conveying said confined treatment zones through a thermal processing zone comprising a heating zone and a cooling zone;

(c) passing said confined treatment zones through said heating zone and flowing a heating fluid through said confined treatment zones to rapidly heat by direct contact the entire mass of food pieces therein to an elevated temperature of at least 165° F. in less than 10 minutes without significantly degrading the texture, structure, taste and color of the fresh food pieces;

(d) thereafter passing said confined treatment zones through said cooling zone and flowing a cooling fluid through said confined treatment zones to rapidly cool by direct contact the previously heated food pieces to near ambient temperature within 10 minutes after said food pieces reach said elevated temperature in step (c); and

(e) discharging said near ambient temperature discrete food pieces from said confined treatment zones into containers under purified conditions.

4,636,396

FOODSTUFF WITH L-AMINODICARBOXYLIC ACID GEM-DIAMINES

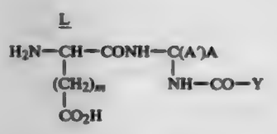
Paul R. Zanno, Nanuet; Ronald E. Barnett, Suffern, and Glenn M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 723,599, Apr. 15, 1985. This application Mar. 21, 1986, Ser. No. 842,565

Int. Cl.⁴ A23L *1/236*

U.S. Cl. 426—548 **7 Claims**

1. A composition comprising a foodstuff composition and a sweetening effective amount of a compound represented by the formula:



wherein

A is CO_2R where R is alkyl containing 1–3 carbon atoms,

A′ is hydrogen or alkyl containing 1–3 carbon atoms;

Y is $—(CHR_2)_n—R_1$ or $—CHR_3R_4$;

R_1 is cycloalkyl, cycloalkenyl, lower alkyl substituted cycloalkyl or cycloalkenyl, bicycloalkyl, bicycloalkenyl or tricycloalkyl containing up to 10 ring carbon atoms and up to a total of 12 carbon atoms;

R_2 is H or alkyl containing 1–4 carbon atoms;

R_3 and R_4 are each cycloalkyl containing 3–4 ring carbon atoms;

n=0 or 1; and

m=0 or 1;

and food-acceptable salts thereof.

4,636,397

PROCESS FOR MAKING AN IMPROVED INSTANT FILLING MIX

Catherine A. Brown, Port Hope, and Jean L. Eng, Oshawa, both of Canada, assignors to General Foods Inc., Don Mills, Canada

Filed Nov. 27, 1985, Ser. No. 802,544

Int. Cl.⁴ A23L *1/187*

U.S. Cl. 426—579 **12 Claims**

1. A method for making an improved instant filling comprising the steps of:

(a) mixing a liquid hydrogenated or partially hydrogenated edible oil with about 40 to about 100 percent by weight of the total natural carbohydrate sweetener solid particles to be used, to provide a substantially uniformly oil-coated natural carbohydrate sweetener product;

(b) dry mixing the remaining natural carbohydrate sweetener solid particles, a rapid hydratable cold water swelling starch, malto-dextrin having a dextrose equivalent between about 5 to about 20 and a flavor with the product of step (a) for a period of time sufficient to obtain a substantially uniform mix of the total ingredients of steps (a) and (b) to provide a flowable powder wherein the weight percentage of ingredients, based on the total composition, comprising:

Natural Carbohydrate Sweeteners: about 55 to about 80%

Rapid Hydratable cold water swelling Granular Starch: about 16 to about 20%

Malto-dextrin: about 5 to about 15%

Edible Oil: about 4 to about 6%

Flavor: in amounts below about 1%

Edible Food Acid: 0 to about 5%.

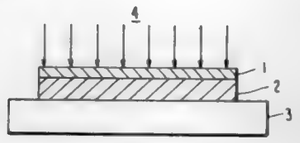
4,636,398
PROCESS FOR PRODUCTION OF STERILIZED PACKED TOFU
Masaru Matsuura, Noda, Japan, assignor to Kikkoman Corporation, Noda, Japan
Filed Jan. 2, 1985, Ser. No. 688,418
Claims priority, application Japan, Jan. 13, 1984, 59-3530
The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.
Int. Cl.[4] A23J 3/00; A23L 1/20
U.S. Cl. 426—634 5 Claims

1. A process for the production of sterilized packed tofu, which comprises soaking either whole or dehulled soybeans in water at a temperature of 40° C. to 60° C. for a period of time sufficient to remove at least 45% of the soluble saccharide content of the soybeans, grinding at a temperature of 40° C. to 50° C. the resulting soaked soybeans with water in an amount of 2 to 6 times the weight of the soybeans, heating the resulting soybean slurry and filtering to obtain a soybean milk, admixing the soybean milk with a coagulant, filling the resulting mixture in a container, then sealing tightly the filled container, and heating the sealed container at a temperature and for a period of time sufficient to effect simultaneously sterilization and coagulation of the soybean milk thereby making a sterilized packed tofu.

4,636,399
REMOVAL OF ANIONS FROM VEGETABLE MATERIAL
Tuan Nguyen, Renens; Pierre Hirsbrunner, Corseaux, and Hans Weymuth, La Tour-de-Peilz, all of Switzerland, assignors to Nestec S. A., Vevey, Switzerland
Filed Jun. 7, 1984, Ser. No. 618,388
Int. Cl.[4] A23L 1/212, 1/20
U.S. Cl. 426—629 10 Claims

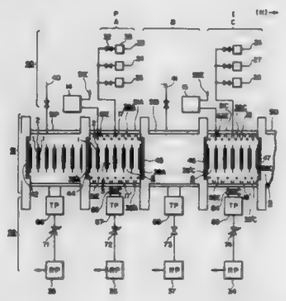
1. A process for removing nitrate and nitrite ions from an edible plant material containing such ions comprising combining the plant material and from 0.05% to 5% by weight of a food-acceptable ferrous salt, based upon the weight of the plant material, and an aqueous acid medium having a pH no greater than 3 at a temperature of at least 70° C. for a period of time sufficient to remove nitrate and nitrite ions from the plant material.

4,636,400
METHOD OF TREATING SILICON NITRIDE FILM FORMED BY PLASMA DEPOSITION
Tadashi Nishioka; Hiroshi Koyama, and Yoji Mashiko, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 9, 1985, Ser. No. 773,918
Claims priority, application Japan, Sep. 7, 1984, 59-188424
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—39 3 Claims



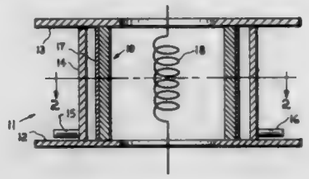
1. A method of treating a silicon nitride film formed by plasma deposition and deposited on a substrate, which comprises: (1) irradiating said silicon nitride film, and (2) heating said silicon nitride film during said irradiating.

4,636,401
APPARATUS FOR CHEMICAL VAPOR DEPOSITION AND METHOD OF FILM DEPOSITION USING SUCH DEPOSITION
Shunpei Yamazaki; Mamoru Tashiro, and Minoru Miyazaki, all of Tokyo, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Japan
Filed Feb. 14, 1985, Ser. No. 701,738
Claims priority, application Japan, Feb. 15, 1984, 59-26594
Int. Cl.[4] C23C 13/08
U.S. Cl. 427—39 15 Claims



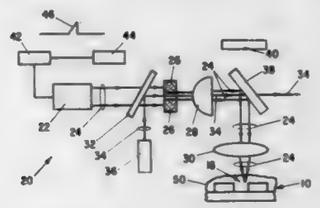
1. An apparatus for conducting chemical vapour deposition under reduced pressure, comprising:
a means for feeding reactive gases;
a reaction vessel for depositing a layer from said reactive gases by application of thermal energy, light energy or electrical energy, singly or in combination;
an exhaust means for exhausting unnecessary reactive gases and/or unnecessary reaction products from said reaction vessel by maintaining the pressure in said reaction vessel in a range of 0.01 to 10 TORR, including a turbo-molecular pump interposed between said reaction vessel and a roughing vacuum pump such as a rotary oil pump.

4,636,402
METHOD OF COATING HOLLOW MASSIVE OBJECTS WITH PLASTISOLS AND ORGANOSOL
Eustathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Feb. 13, 1986, Ser. No. 828,977
Int. Cl.[4] B05D 3/14
U.S. Cl. 427—49 7 Claims



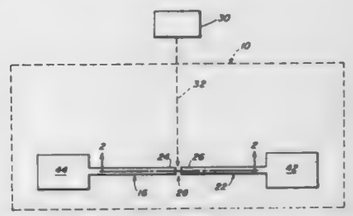
1. A process for coating a hollow object with a plastisol or organosol coating composition containing a solvent wherein
the hollow object is coated on the outside with the composition,
the object is heated internally so that the object itself reaches temperatures for curing the coating before or not later than the outer layers of the coating, and
an atmosphere of latent solvent is maintained in contact with the coated surface of the object during curing.

4,636,403
METHOD OF REPAIRING A DEFECTIVE PHOTOMASK
Georgia J. Fisanick, Warren Township, Somerset County; Michal E. Gross, Summit, and Gary L. Wolk, Ewing Township, Mercer County, all of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights and Bell Telephone Laboratories, Murray Hill, both of, N.J.
Filed Apr. 29, 1985, Ser. No. 728,551
Int. Cl.[4] B05D 3/06; B32B 35/00
U.S. Cl. 427—53.1 15 Claims



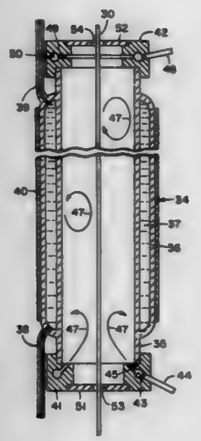
1. A method of depositing metal on a substrate, comprising the steps of
(a) applying a metal-organic compound to a substrate;
(b) exposing the metal-organic compound to light radiation; and
(c) ramping the power level of the light radiation delivered to the metal-organic compound to cause said compound to decompose to volatile components and a metal film which is adherent to the substrate.

4,636,404
METHOD AND APPARATUS FOR FORMING LOW RESISTANCE LATERAL LINKS IN A SEMICONDUCTOR DEVICE
Jack I. Raffel; John A. Yasaitis, both of Lexington, and Glenn H. Chapman, Bedford, all of Mass., assignors to Mass. Institute of Technology, Cambridge, Mass.
Division of Ser. No. 389,385, Jun. 17, 1982, abandoned. This application Sep. 17, 1984, Ser. No. 651,230
Int. Cl.[4] B05D 3/06, 5/12; B23K 9/00
U.S. Cl. 427—53.1 9 Claims



1. A method for forming a conductive link in a semiconductor device comprising the steps of
forming at least a first and a second single layer conductor, said first and second conductors being insulated from each other and having a planar gap therebetween and
directing a low power laser source at a surface area of said device, including said gap, for forming a conductive bridge across said gap and connecting said first and second conductors.
2. The method of claim 1 further comprising the initial steps of
forming an electrically insulating layer on a substrate surface of said device, and
forming an electrically insulating semiconductor layer in an overlying relationship to said electrically insulating layer, said conductors having an overlying relationship to said semiconductor layer.

4,636,405
CURING APPARATUS FOR COATED FIBER
Thomas O. Measeh, Big Flats, and Dale R. Powers, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Dec. 24, 1985, Ser. No. 813,575
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—54.1 9 Claims

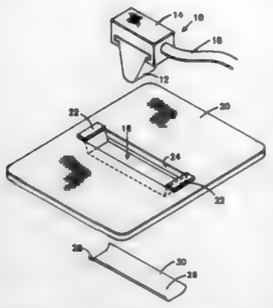


1. An apparatus for curing a coating applied to a fiber being drawn along a given axis, said apparatus comprising
an elongated ultraviolet energy-generating lamp mounted parallel to said given axis,
means for focusing said ultraviolet energy onto said given axis whereby a coating on a fiber drawn along said given axis becomes cured,
a jacket surrounding said given axis, said jacket compriaing inner and outer cylinders that are transparent to ultraviolet energy, and
means for flowing through said jacket a fluid which absorbs infrared energy.
7. In a method for coating a fiber and thereafter curing said coated fiber, said curing step being characterized in that it comprises
passing said coated fiber through an elongated jacket formed of inner and outer cylinders that are transparent to ultraviolet light,
flowing between said cylinders a fluid that is transparent to ultraviolet energy but absorbs a major portion of the infrared energy incident thereon
radiating ultraviolet and infrared energy toward said jacket whereby a major portion of said infrared energy is filtered and a major portion of said ultraviolet energy is transmitted to said coated fiber.

4,636,406
METHOD AND APPARATUS FOR DISPENSING SOLDER PASTE
John L. Leicht, Hawthorn Woods, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 31, 1984, Ser. No. 687,886
Int. Cl.[4] H05K 3/12, 3/34
U.S. Cl. 427—96 11 Claims

1. A method of dispensing solder paste onto a surface in a predetermined pattern, said method comprising:
providing a solder paste dispenser head coupled to a solder paste supply, said head having a dispensing opening therein through which said solder paste can be extruded;
providing a stencil assembly having a predetermined pattern and raised sides and ends;

applying said dispenser head to said stenciled pattern and moving said head across said stenciled pattern while extruding said solder paste from said head onto said stenciled pattern with said raised sides and ends on said stencil assembly containing the movement of said dispenser head



and thereby selectively controlling the application of said solder paste; and

removing said head and said stenciled pattern from said surface forming said predetermined solder paste pattern on said surface.

4,636,407

SURFACE-TREATED TIRE CURING BLADDER, TREATMENT COMPOSITION THEREFORE AND METHOD FOR CURING TIRES

Louis F. Comper, and Robert F. Scheiderich, both of Danville, Va., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 651,649, Sep. 17, 1984, Pat. No. 4,533,305, which is a continuation of Ser. No. 440,127, Nov. 8, 1982, abandoned, which is a continuation of Ser. No. 208,612, Nov. 20, 1980, Pat. No. 4,359,340. This application Aug. 6, 1985, Ser. No. 762,986

Int. Cl.⁴ B44D *1/20*

U.S. Cl. 427—133 **2 Claims**

1. A method of treating a cured rubber, expandable toroidal shaped, pneumatic tire cure bladder for a pneumatic or semi-pneumatic tire which comprises coating the outer, exposed surface of the bladder, optionally in about 80 to about 150 percent of its tire cure expanded position with a composition and drying said composition, wherein said composition comprises an aqueous mixture of the product of the mixture of

(A) about 20 to about 40 parts by weight hydroxyl capped polydimethylsiloxane characterized by having a viscosity in the range of about 12 million to about 28 million centistokes at 25° C.;

(B) about 35 to about 70 parts by weight of at least one silane selected from (i) a methyl hydrogen silane, characterized by having a viscosity in the range of about 20 to about 40 centistokes at 25° C., (ii) dimethyl hydrogen silane characterized by having a viscosity in the range of about 80 to about 120 centistokes at 25° C., (iii) methyl trimethoxy silane;

(C) optionally, about 3 to about 12 parts by weight of a metal salt of an organic acid selected from at least one of zinc, magnesium, manganese and cobalt as acetates, stearates, propionates, glutionates and octoates thereof; and

(D) about 10 to about 25 parts by weight surfactant.

4,636,408

ULTRAVIOLET RADIATION STABILIZED POLYMER COMPOSITIONS

Blair T. Anthony, and Daniel R. Olson, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 575,244, Jan. 30, 1984, abandoned. This application Jul. 22, 1985, Ser. No. 757,699

Int. Cl.⁴ B05D *5/00, 7/00;* C08J *7/06*

U.S. Cl. 427—160 **5 Claims**

1. A method for imparting improved ultraviolet radiation stability to an article comprising a member selected from the group of resins consisting of polystyrene resins, acrylonitrile-butadiene-styrene resins, and polyphenylene ether resins which comprises contacting the surface of the article with a stabilizer composition comprising a hindered amine light stabilizer and ultraviolet radiation absorber compound in nonaggressive liquid carrier at a temperature sufficient to effectively impregnate the surface of the article with the hindered amine light stabilizer and the ultraviolet radiation absorber.

4,636,409

RECORDING MEDIUM

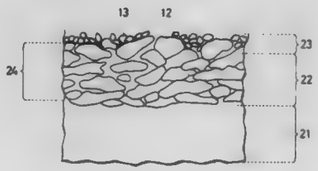
Ryuichi Arai, and Shigeo Toganoh, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1984, Ser. No. 650,177

Claims priority, application Japan, Sep. 19, 1983, 58-171377; Sep. 19, 1983, 58-171378

Int. Cl.⁴ B41M *5/00*

U.S. Cl. 427—256 **17 Claims**



12. A method of ink-jet recording comprising the steps of:

providing an ink-jet recording medium comprising a layer of fibrous material having filler particles bound thereto providing at the surface of the recording medium a recording surface layer containing a mixture of said filler particles and said fibrous material, wherein said layer of fibrous material comprises a base layer underlying said recording surface layer; and

depositing ink on said medium.

4,636,410

RECORDING METHOD

Takashi Akiya, Yokohama; Shigeo Toganoh, Tokyo, and Ryuichi Arai, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1985, Ser. No. 767,362

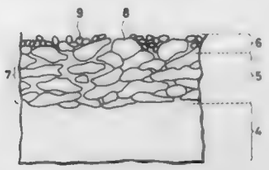
Claims priority, application Japan, Aug. 29, 1984, 59-181508; Aug. 29, 1984, 59-181509; Aug. 29, 1984, 59-181510; Aug. 29, 1984, 59-181511; Aug. 29, 1984, 59-181512; Aug. 29, 1984, 59-181513

Int. Cl.⁴ B41M *5/00*

U.S. Cl. 427—261 **13 Claims**

1. A method of ink-jet recording comprising the steps of:

providing an ink-jet recording medium comprising a layer of fibrous material having filler particles bound thereto providing at the surface of the recording medium a recording surface layer containing a mixture of said filler particles and said fibrous material, wherein said layer of fibrous material comprises a base layer underlying said recording surface layer; and



depositing ink on said medium, said ink having a surface tension of about 30 to 60 dyne/cm at 20° C.

4,636,411

PROCESS FOR TREATING GLASS CONTAINERS WITH A PROTECTIVE VARNISH, AND PROTECTING VARNISH USED

Jean G. Dubois, "En Bagatelle", and Michel Hesling, Rue Raymond Dorey, both of 71700 Tournus, France

Filed Mar. 14, 1985, Ser. No. 711,855

Int. Cl.⁴ C08K *3/20;* B05D *3/02*

U.S. Cl. 427—314 **18 Claims**

1. Process for treating glass containers, wherein there is applied to the surface of the said containers, heated to a temperature of 80° to 150° C., an aqueous composition comprising:

(a) a chemically drying binding agent consisting of an emulsifiable liquid or solid epoxy resin and either a water-soluble polyaminoamide resin having an amine index from 150 to 250, or an organosoluble solid amine adduct, or a mixture of the two, and

(b) an aqueous physically drying binding agent consisting of a cationic emulsion containing an acrylic polymer or a polyurethane.

4,636,412

ENEMA BAG

Peter W. Field, Concord, Australia, assignor to Field Group Research Pty. Ltd., New South Wales, Australia

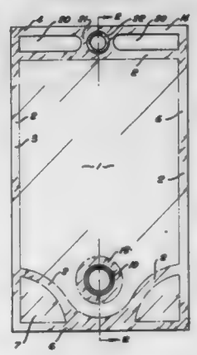
Continuation of PCT AU84/00060, April 13, 1984, published as WO84/04037, Oct. 25, 1984

Filed Dec. 12, 1984, Ser. No. 680,808

Claims priority, application Australia, Apr. 13, 1983, PF8885

Int. Cl.⁴ A61F *7/04;* B65D *30/08*

U.S. Cl. 428—35 **10 Claims**



1. A container suitable for handling and storage of a liquid and adapted to facilitate transfer to or from a patient of the liquid during a medical procedure said container comprising:

a transparent or translucent composite flexible wall or walls;

port means for communication with the interior of the container;

the composite wall including an innermost layer which is substantially inert towards the liquid and which is heat sealed with the port means;

a first non-innermost layer selected from the group consisting of polyvinylidene chloride, high density polyethylene, polyvinyl chloride and polypropylene;

and a second non-innermost layer differing from the first, and selected from the group consisting of nylon, high density polyethylene, and polypropylene, said layers being selected so that the composite has an impact resistance (as measured by ASTM D 1909-75 method A) in excess of 1.2 kg. and has a moisture transpiration rate of less than 7.7 g./m²/24 hours when measured at 37.8° C. and 90% RH.

4,636,413

CORNER GLASS BLOCK

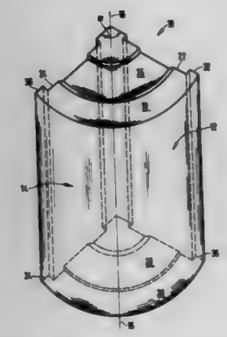
Bernd Wittmann, Montabaur, and Eberhard Haya, Dernbach, both of Fed. Rep. of Germany, assignors to Westerwald AG für Silikatindustrie, Fed. Rep. of Germany

Filed Dec. 11, 1985, Ser. No. 807,505

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 8437071

Int. Cl.⁴ E04C *1/42*

U.S. Cl. 428—33 **4 Claims**



1. A glass block having two side faces forming at least approximately the shape of a sector of a circular cylinder and containing the axis of the cylinder, both side faces being formed with a recess, the side faces terminating in end faces, each recess extending vertically between the end faces of the glass block for receiving mortar or the like, the side faces interrupting edges of the end faces which are formed with recesses adapted to receive reinforcing members.

4,636,414

LAMINATED BITUMINOUS ROOFING MEMBRANE

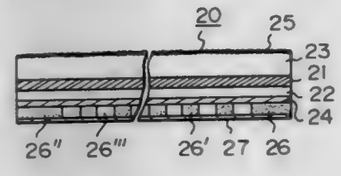
Eiichi Tajima, and Kaname Yamamoto, both of Tokyo, Japan, assignors to Tajima Roofing Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1984, Ser. No. 646,668

Claims priority, application Japan, Sep. 12, 1983, 58-166749

Int. Cl.⁴ B32B *3/00, 11/00*

U.S. Cl. 428—40 **12 Claims**



1. A laminated bituminous roofing membrane comprising:

(i) a fibrous sheet;
(ii) a first bituminous layer laminated on one surface of the fibrous sheet, said bituminous layer being composed of bitumen or a bituminous mixture;
(iii) a synthetic resin sheet or film laminated on the other surface, opposite to the surface laminated to the fibrous sheet, of the first bituminous layer;
(iv) a second bituminous layer laminated on the other surface of the fibrous sheet, said second bituminous layer being composed of bitumen or a bituminous mixture; and
(v) a mineral aggregate layer deposited on the opposite surface of the second bituminous layer.

4,636,415

PRECIPITATED SILICA INSULATION

Robert W. Barito, and Kenneth L. Downs, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Feb. 8, 1985, Ser. No. 699,930
Int. Cl.[4] B32B *1/02, 1/10, 9/00*
U.S. Cl. 428—68 21 Claims

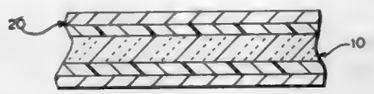
1. A slab of board-like material for use as thermal insulation comprising:
a. finely divided silica material formed by the interaction of an alkaline water glass and a mineral acid to precipitate silica, followed by a drying action to form a dried, finely divided silica; and
b. a gas and water-tight envelope containing said dried, finely divided silica.

4,636,416

SHAPED MICROPOROUS THERMAL INSULATION BODY WITH SHEATHING AND PROCESS FOR MAKING SAME

Günter Krstel; Günter Stohr, both of Durach-Bechen, and Franz Schreiner, Sulzberg, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed May 14, 1985, Ser. No. 734,034
Claims priority, application Fed. Rep. of Germany, May 18, 1964, 3418637
Int. Cl.[4] B32B *1/00, 3/00, 3/26*
U.S. Cl. 428—69 16 Claims



1. A thermal insulation body for use at temperatures ranging from approximately −50 to 200° C., comprising:
a pressed microporous thermal insulation material encased in a sheathing and evacuated to a partial air pressure of 20 mbar or less.

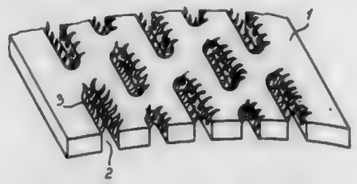
4,636,417

FIBROUS RETICULAR SHEET MATERIAL

Ole-Bendt Rasmussen, Forchwaldstrasse 23, Walchwil/Zug CH-6318, Switzerland

Continuation of Ser. No. 428,803, Sep. 30, 1982, abandoned, which is a division of Ser. No. 284,685, Jul. 20, 1981, Pat. No. 4,377,544, which is a continuation of Ser. No. 179,708, Aug. 20, 1980, abandoned, which is a continuation of Ser. No. 7,713, Jan. 30, 1979, abandoned, which is a continuation of Ser. No. 841,480, Oct. 12, 1977, abandoned, which is a continuation of Ser. No. 639,007, Dec. 9, 1975, abandoned. This application Feb. 19, 1985, Ser. No. 701,809
Int. Cl.[4] B05D *5/12;* B44D *1/20*
U.S. Cl. 428—91 4 Claims

1. Textile-like reticular product compriaing a perforated plastic film wherein said perforations extend through said film and are arranged in a predetermined pattern, and projecting exteriorly from one surface of said film multitudinous filaments or threads of the same plastic as said film and having base ends merging integrally with the side margins of each of said perforations with a length greater than any dimension of the corresponding perforation, the regions of said film side intervening between said margins of said perforations being at least substantially free of said filaments or threads.

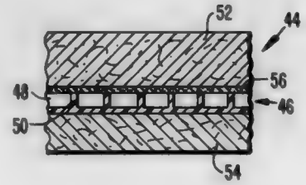


4,636,418

CLOTH-LIKE COMPOSITE LAMINATE AND A METHOD OF MAKING

Gregory J. Kennard, Shelburne, N.H., and Cedric A. Dunkerly, II, Appleton, Wis., assignors to James River Corporation, Richmond, Va.

Filed May 17, 1984, Ser. No. 611,151
Int. Cl.[4] B32B *5/12*
U.S. Cl. 428—110 30 Claims



1. A method of making a cloth-like composite laminate comprising the steps of:
(a) air laying a continuous layer of three-dimensional cellulosic fibers onto one side of a layer of nonwoven material;
(b) applying to the continuous layer of three-dimensional cellulosic fibers and the nonwoven material layer a latex adhesive containing a wetting agent; and
(c) drying the latex adhesive and wetting agent to bond the layer of cellulosic fiber to the non-woven material layer to form a cloth-like composite laminate having substantially all of a continuous layer of three-dimensional cellulosic fibers bound to one side of the nonwoven material layer.

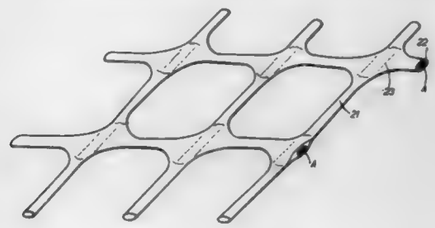
4,636,419

NET AND METHOD OF PRODUCING SAME

Willy B. Madsen; Finn H. Jensen, both of Copenhagen Valby; Ole B. Rasmussen, Birkerod, all of Denmark; Guy Goldstein, Colmar, and Yves R. Rassin-Moynier, Wettolsheim, both of France, assignors to Beghin-Say International, Inc., Lakeland, Fla.

Continuation of Ser. No. 388,124, Aug. 13, 1973, abandoned. This application Aug. 2, 1977, Ser. No. 821,079
Int. Cl.[4] B32B *3/10*
U.S. Cl. 428—131 15 Claims

1. A net composed of (a) a substantially equispaced parallel array of distinct longitudinal flat ribbon-like continuous filaments of a first polymeric material, and (b) a substantially equispaced parallel array of distinct individual transverse strands of at least one second polymeric material having a melting point lower than said first polymeric material disposed in crossing relation to said longitudinal filaments and defining zones of intersection between the respective filaments and strands of said two arrays, said filaments extending bodily through transverse strands in said zones of intersection with their flat faces generally parallel to the plane of the net so that a section of each longitudinal filament at each such zone is entirely embedded within said second polymeric material, said distinct transverse strands being arranged in said array in a predetermined generally uniform relationship relative to said continuous filaments and to each other with a generally uniform separation between adjacent pairs thereof.

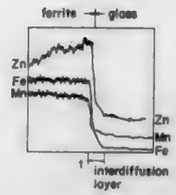


4,636,420

GROOVED MAGNETIC SUBSTRATES AND METHOD FOR PRODUCING THE SAME

Toshiaki Wada, Takatsuki; Junichi Nakaoka, Amagasaki, and Takayuki Segano, Osaka, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Filed May 4, 1984, Ser. No. 607,137
Claims priority, application Japan, May 4, 1983, 58-78676
Int. Cl.[4] G11B *5/42*
U.S. Cl. 428—156 10 Claims



1. A grooved magnetic substrate for thin film magnetic heads, which has therein at least one groove filled with glass, the number of pores in the filled glass having a size of one micron or larger being no more than one per cubic millimeter, and an interdiffusion layer between said substrate and said glass, said interdiffusion layer having a thickness of no more than 5 microns.

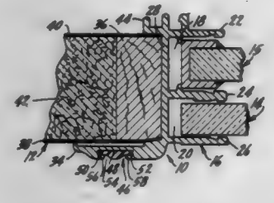
4,636,421

FRAME WITH DECORATIVE TRIM STRIP

Robert Hotovy, South Bend, Ind., assignor to Creation Windows, Inc., Elkhart, Ind.

Filed Feb. 27, 1986, Ser. No. 833,969
Int. Cl.[4] B32B *3/02, 7/04*
U.S. Cl. 428—156 14 Claims

1. An elongated assembly for forming a frame comprising:
an elongated metal member having a uniform transverse cross-sectional shape, said cross-sectional shape including an elongated slot, said slot having a predetermined width and a predetermined height, said predetermined width being greater than said predetermined height, the top of said slot having an opening therein of a predetermined width which is less than the predetermined width of said slot; and
an elongated trim strip with a uniform transverse cross-section, said cross-section having a width less than predetermined width of said slot, but greater than the predetermined width of said opening, a thicker central section and thinner end sections on either side of said central section, said thinner end sections having heights less than the predetermined height of said slot, said center section having a height greater than the predetermined height of said slot, such that it extends into said opening in the top of said slot, a portion of the surface of said trim strip being exposed in said opening, said exposed portion of the surface of said trim strip and adjacent outer surfaces of said metal member forming the top of said slot having different appearances, such that the exposed portion of the surface of said trim strip provides a decorative accent strip with respect to the adjacent outer surfaces metal member.

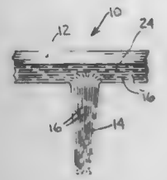


4,636,422

COMPOSITE FIBER REINFORCED MOLDED STRUCTURE FOR DIMPLE CONTROL

Charles E. Harris, Bellevue, Wash., and Robert K. Tolley, Benton, Kans., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 26, 1985, Ser. No. 759,154
Int. Cl.[4] B32B *5/16, 1/04*
U.S. Cl. 428—174 3 Claims



1. A composite fiber-reinforced molded structure, the structure comprising:
an outside member of fabric embedded in an uncured resin, said outside member further including a precured, resin-impregnated fabric embedded therein, both aid fabrics including high modulus, high strength fibers; and
an internal stiffener integrally formed with said outside member and extending outwardly therefrom, said stiffener including high modulus, high strength fibers embedded in an uncured resin.

4,636,423

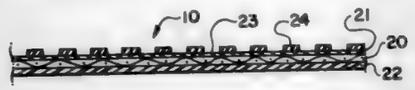
DOCK SHELTER FABRIC

James S. Reid, Concord, N.C., assignor to Graniteville Company, Graniteville, S.C.

Continuation-in-part of Ser. No. 694,788, Jan. 25, 1985, abandoned. This application Sep. 30, 1985, Ser. No. 781,521
Int. Cl.[4] B32B *3/00, 27/14*
U.S. Cl. 428—196 39 Claims

1. A dock shelter fabric comprising a core fabric formed from synthetic fibers, a base coat of polymeric material extend-

ing continuously over at least the one surface of the core fabric intended to be exposed to abrasion, and a second polymeric coating of abrasion resistant polymeric material fused in a



discontinuous pattern to the continuous surface of the base coat; whereby the discontinuous coating resists abrasion without sacrificing flexibility of the fabric.

4,636,424

MOISTURE-PERMEABLE WATERPROOF LAMINATED FABRIC AND PROCESS FOR PRODUCING THE SAME

Kunio Amemiya, Hirakata; Mikihiko Tanaka, Daito; Kenichi Kanemaru, and Kiyoshi Nakagawa, both of Uji, all of Japan, assignors to Unitika Ltd., Japan

Filed Jan. 7, 1985, Ser. No. 689,322

Claims priority, application Japan, Jan. 23, 1984, 59-10853; Feb. 17, 1984, 59-29232; Aug. 31, 1984, 59-183277; Aug. 31, 1984, 59-183278; Sep. 7, 1984, 59-188435; Sep. 13, 1984, 59-191932

Int. Cl.[4] B32B *5/18, 5/22, 7/14, 27/40*

U.S. Cl. 428—198 35 Claims

1. A moisture-permeable waterproof laminated fabric comprising a water-repellent base fabric and porous film means provided on one surface of the base fabric, the porous film means being formed of a synthetic polymer composed chiefly of a polyamino acid urethane resin, the porous film means having numerous fine pores provided by microcells continuous in the direction of its thickness.

9. A laminated fabric as defined in claim 1 wherein the porous film means comprises a single porous film bonded to the base fabric by an adhesive layer which is discrete two-dimensionally.

10. A laminated fabric as defined in claim 9 wherein the adhesive layer comprises a plurality of adhesive spots.

4,636,425

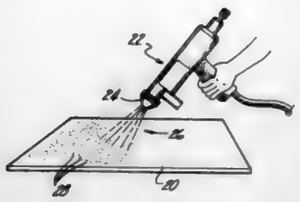
URETHANE BONDING METHOD AND LAMINATE

Malcolm C. Johnson, Lapeer, and Theodore O. Stolz, Pontiac, both of Mich., assignors to Foamseal, Inc., Oxford, Mich.

Filed Jun. 10, 1985, Ser. No. 742,821

Int. Cl.[4] B32B *7/14, 3/12*

U.S. Cl. 428—198 13 Claims



1. A method of bonding two elements in surface-to-surface contact, wherein at least one of the element surfaces is relatively porous, comprising the following steps:

(a) spraying under pressure a fine mist of a two component foamable liquid polyurethane on one of said element surfaces forming discrete dispersed generally spaced small droplets of liquid foamable polyurethane on said one element surface;

(b) allowing said polyurethane droplets to foam and expand in discrete foam pods to between 20 and 60% of full cure, the spacing between said droplets being sufficient to permit said pods to expand and skin prior to fully contacting adjacent pods, forming said discrete urethane foam pods; and

(c) applying a second element surface and completing the cure of said polyurethane pods.

4,636,426

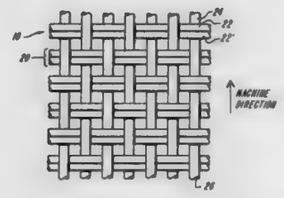
PAPERMAKER'S FABRIC WITH YARNS HAVING MULTIPLE PARALLEL MONOFILAMENT STRANDS

Thomas B. Fleischer, Raleigh, N.C., assignor to Huyck Corporation, Wake Forest, N.C.

Filed Jan. 4, 1985, Ser. No. 688,900

Int. Cl.[4] D03D *3/00*

U.S. Cl. 428—224 20 Claims



1. A yarn for use in a papermaker's forming fabric comprising at least two monofilament strands arranged to be in a side by side parallel relationship said monofilament strands being made from a synthetic polymer, said strands being treated with a polymer material to secure said parallel strands of said yarn together along the entire length of said strands.

4,636,427

ADHESIVE TAPE AND PROCESS FOR PREPARATION THEREOF

Shoji Ohno, and Sigeru Sugada, both of Uozu, Japan, assignors to Toyama Industry Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1985, Ser. No. 726,415

Claims priority, application Japan, Nov. 13, 1984, 59-239273

Int. Cl.[4] B32B *7/00*

U.S. Cl. 428—246 11 Claims



1. An adhesive tape comprising (1) a fabric base in which the warp and filling are made of thermoplastic yarns, the denier of the warp yarns being lower than that of the filling yarns and the number of warp yarns per inch being larger than the number of filling yarns per inch; (2) a first thermoplastic layer which is laminated on the surface of said fabric base in such manner that the thermoplastic is embedded in the spaces of said fabric base to firmly weld the yarns of said fabric base with the thermoplastic; (3) a second thermoplastic layer which is laminated on at least one of the surfaces of (1) and (2); and a pressure-sensitive adheaive which is applied to at least one of the surfaces of said structure of (1), (2) and (3).

4,636,428

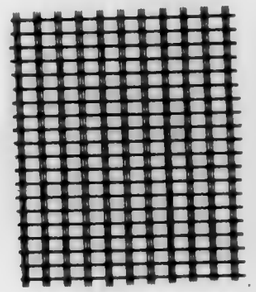
WEFT INSERTED WARP KNIT FENCING PRODUCT

Jeffrey W. Bruner, Greensboro, and Delbert A. Davis, Kernersville, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Apr. 22, 1986, Ser. No. 854,606

Int. Cl.[4] B32B *7/00*

U.S. Cl. 428—254 7 Claims



1. A weather-resistant knitted fabric constructions knitted in a predetermined width from yarns of a tough, elastic, synthetic polymeric material into an open pattern in which from about 40% to about 80% of this product surface is open to the passage of air and particles there through, the closed portion of the pattern providing resistance to the passage of air and particulants there through and causing particulates to deposit and accumulate in the area adjacent the fencing product, the product consisting essentially of:

a plurality of laid in warp yarns disposed in the machine direction and spaced apart from each other.

a plurality of weft inserted yarns arranged in bundles of at least two and disposed perpendicular to the machine direction, each bundle of weft inserted yarns spaced apart from the adjacent bundle of bundles,

a pair of knitting warp yarns for each laid in warp yarn, the knitting warp yarns knitted in the machine direction around the underlying laid in warp and weft yarns, the knitting warp yarns securing the weft inserted yarns to the laid in warp yarns.

the fabric construction having a relatively thin elastomeric, weather-resistant coating substantially evenly adhered to the surface of and impregnated into each of said strands thereby encapsulating and adhering said strands to each other to rigidify and support the knit product, and to render the product capable of withstanding sustained periods of direct sunlight, the relative thickness of said coating being not greater than the diameter of each of the yarns.

4,636,429

DUSTING CLOTH

Charles J. Morell, Atlanta, and Mark D. Strickland, Roswell, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 13, 1986, Ser. No. 818,435

Int. Cl.[4] B32B *27/12*

U.S. Cl. 428—288 8 Claims

1. A dusting cloth comprising a non-woven polypropylene web treated with from about 0.1% to 5.0% by weight of polypropylene glycol having molecular weights between 400 and 1000.

4,636,430

COMPOSITE MATERIAL CONSISTING OF POROUS MATERIALS AND ELECTRICALLY CONDUCTIVE POLYMERS

Helmut Moehwald, Heidelberg, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 12, 1986, Ser. No. 838,783

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1985, 3510036

Int. Cl.[4] C25B *3/02*

U.S. Cl. 428—304.4 5 Claims

1. A composite material consisting of a porous material and electrically conductive polymers, wherein the surfaces of the pores are first coated with a layer of an electrically conductive polymer obtained by treating the monomers with an oxidizing agent, and a layer of an electrically conductive polymer obtained by anodic oxidation of the monomers is applied on top of this.

4,636,431

POLYMERS CONTAINING RESORCINOL MONOBENZOATE

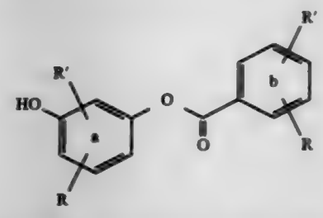
Michael DeBergalis, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 469,689, Feb. 25, 1983, Pat. No. 4,522,971. This application Jan. 22, 1985, Ser. No. 693,254

Int. Cl.[4] B32B *5/16*

U.S. Cl. 428—327 2 Claims

1. A substrate coated with a cured coating of a polymer comprising a polymeric moiety reacted with resorcinol monobenzoate or a derivative containing resorcinol monobenzoate, said moiety being bound to the hydroxyl group on the resorcinol monobenzoate through a linking group, wherein the polymer contains, by weight, 12.5–80% resorcinol monobenzoate, the balance being said moiety, said linking group including at least one group selected from the group consisting of ether, carbonate, and urethane groups and ester groups containing at least two carbon atoms, said derivative fitting the structure



wherein R and R' are hydrogen or alkyl or alkoxy groups containing 1–14 carbon atoms, and wherein there is at least one unsubstituted position on the a ring ortho to the carbonyl groups.

4,636,432

PRESSURE SENSITIVE-ADHESIVE TAPES OR SHEETS

Tomishi Shibano, Tama; Itsuo Kimura, and Sachio Maruchi, both of Tokyo, all of Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

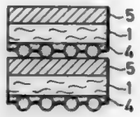
Filed Feb. 4, 1985, Ser. No. 697,915

Int. Cl.[4] B32B *5/16*; C09J *7/02*

U.S. Cl. 428—327 4 Claims

1. A pressure-sensitive adhesive tape or sheet comprising a paper substrate, a release layer provided on at least one side of said substrate and comprising modified starch and/or starch, and a pressure-sensitive adhesive mass layer provided on the

substrate side opposite to said release layer and containing elastomeric polymer microspheres, said pressure-sensitive



adhesive tape or sheet having an adhesion of no more than 150 g/cm.

4,636,433

MAGNETIC POWDERS FOR MAGNETIC RECORDING MEDIA AND MAGNETIC RECORDING MEDIA EMPLOYING SAID MAGNETIC POWDER THEREIN

Osamu Kubo; Tutomu Nomura, both of Yokohama; Tadashi Ido, Ebina, and Hirotaka Yokoyama, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 5, 1985, Ser. No. 795,130
Claims priority, application Japan, Nov. 30, 1984, 59-251564
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—328 **12 Claims**

1. A magnetic powder for magnetic recording media, comprising a magnetoplumbite type hexagonal crystalline system ferrite represented by the formula:

$$A_{1-x}M_xFe_{12-y}Q_yO_{19}$$

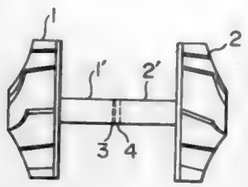
wherein A represents at least one of the elements selected from the group of Ba, Sr, Ca and Pb; Q represents at least one of the elements selected from the group of Ti, Co, Ni, Mn, Cu, Zn, In, Ge, Nb, Zr and Sb; M represents at least one of the rare earth elements selected from the group of Ce, Pr, Nd, Pm, Sm and Eu; X represents an atomic ratio of M; and Y represents an atomic ratio of Q and ranges in value from about 1 to 2.2, said magnetic powder having a mean particle size of 0.01 to 0.3 μm and a coercive force of 200 to 2000 Oe.

4,636,434

CERAMIC COMPOSITE ARTICLE

Hisanori Okamura, Ibaraki; Hiroi Akiyama, Hitachi; Mutuo Kamoshita, Katsuta, and Kunio Miyazaki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 7, 1984, Ser. No. 679,534
Claims priority, application Japan, Dec. 9, 1983, 58-231392
Int. Cl.[4] B32B *9/00*; C09J *1/00*; F02C *1/00*
U.S. Cl. 428—328 **37 Claims**



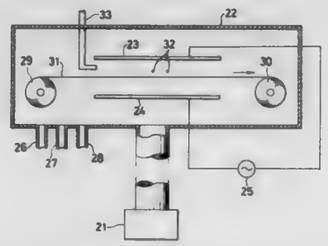
1. A ceramic composite article which comprises ceramic elements joined together with carbon which has been diffused and penetrated into the ceramic elements from the decomposition of an organic substance applied to at least one joining surface of the ceramic elements, the organic substance being selected from the group consisting of phenol resin, Polyimide resin, polyvinylidine fluoride resin, cellulose acetate resin, epoxy resin, polyester resin, polybutyl acrylate resin, vinyl acetate resin and polyvinyl chloride resin, and the thickness of any carbon film at an interface between the joining surfaces is not more than 10 μm.

4,636,435

POLYMERIC THIN FILM, PROCESS FOR PRODUCING THE SAME AND PRODUCTS CONTAINING SAID THIN FILM

Kenji Yanagihara; Mituo Kimura, both of Yokohama, and Masahiro Niinomi, Machida, all of Japan, assignors to Japan Synthetic Rubber Company Limited, Tokyo and Fuji Photo Film Company Limited, Minami-ashigara, both of, Japan

Filed Sep. 28, 1984, Ser. No. 655,428
Int. Cl.[4] G11B *5/72*
U.S. Cl. 428—336 **19 Claims**



1. A process for preparing a polymeric thin film having a thickness of not less than 10 Å and having a Vicker's hardness of at least 1,000 on the surface of substrate placed in reaction zone by providing a gas containing at least one monomeric compound selected from the group consisting of halogenated alkanes (A), alkanes (B), hydrogen (C) and halogens (D) in accordance with any of the combinations set forth as follows:

(1) only A;
(2) A and B;
(3) A and C;
(4) A and D;
(5) A, B and C;
(6) A, B and D;
(7) A, C and D;
(8) A, B, C and D;
(9) B and D; or
(10) B, C and D,

for plasma polymerization, wherein the atomic ratio of halogen/hydrogen in said gas is 0.1 to 5, the flow rate of said gas flowing into the reactor in which said plasma polymerization is carried out is from 0.1 to 100 cc (STP)/min. per 100 liter of inner volume of the reactor and the electron temperature of the plasma in the reaction zone for plasma polymerization is at least 6,000° K. and lower than 30,000° K.

12. An amorphous polymeric thin film having a thickness of not less than 10 Å and having a Vicker's hardness of at least 1,000 formed on a substrate, consisting essentially of carbon (C), hydrogen (H), halogen (X) and oxygen (O) at an atomic ratio of these elements represented by the formula:

$$C_{1.0}H_{0.005-0.2}X_{0.005-0.2}O_{0.005-0.3}$$

and having a ratio of the number of hydrogen atoms bonded to carbon atoms having a double bond

to the number of hydrogen atoms bonded to carbon atoms having only single bonds



of 0 to 0.1 and a density of 1.6 to 3.5 g/cm^3.

4,636,436

TEXTILE FIBERS BASED ON MODIFIED OLEFINIC POLYMERS

Luciano Clementini, and Pier P. Camprincoli, both of Terni, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Dec. 20, 1983, Ser. No. 563,588
Claims priority, application Italy, Dec. 22, 1982, 24902 A/82
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—364 **8 Claims**

1. Fibers and films comprising the reaction product of (1) a crystalline olefin homopolymer or copolymer modified with an unsaturated carboxylic acid and (2) a compound reactive with the carboxylic groups and selected from the group consisting of polyamides, polyamines, polyoxyethylene alcohols of the general formula

$$R—O(CH_2CH_2O)_nH$$

and polyoxyethylene amines of the formula

$$R—N[(CH_2CH_2O)_nH]_2$$

in which general formulae R is an alkyl radical containing 1 to 18 carbon atoms and n is an integer ranging from 1 to 50.

4,636,437

GLASS FIBER SIZE AND IMPREGNANT COMPOSITIONS

Donald J. Algrim, Columbus; Doan R. Vermilion; Donald J. Hammond, both of Newark, and Richard M. Haines, Warsaw, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 5, 1984, Ser. No. 668,112
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—391 **11 Claims**

1. A glass fiber having a thin coating on the surfaces thereof, said coating being a dried resin residue of a coating composition comprising an aqueous solution consisting essentially of (a) the hydrolysis product of a copolymer of a vinyl aromatic monomer and maleic anhydride, (b) from about 0.3 to about 1%, by weight of said composition of an organo silane glass fiber anchoring agent and (c) from about 0.2 to about 0.4% by weight of said composition, of a film-forming water-soluble pyrrolidone-containing polymer, the amount of (c) being sufficient to form a protective film over the glass fiber to prevent fraying while retaining rewettability of said fiber by latex impregnant solution subsequently applied thereto.

4,636,438

MASKING FILMS

Andrew Hudson, Witney, and Norman J. Staunfield, Deal, both of England, assignors to Autotype International Limited, Wantage, England

Filed Jun. 5, 1985, Ser. No. 741,645
Int. Cl.[4] B32B *27/08, 27/36*
U.S. Cl. 428—412 **14 Claims**

1. A masking film comprising a stable transparent base carrying a masking layer in the form of a dyed coating of a transparent plastics material wherein the masking layer comprises a vinyl chloride-vinyl acetate copolymer and an aromatic polyester-based polyurethane and is coated directly onto the transparent base, the masking layer adhering to but being peelable from the base.

2. A masking film according to claim 1, wherein the masking layer contains one or more matting agents and/or one or more antistatic agents.

4,636,439

NON-GLARE COATED GLASS

J. Shannon Breisinger, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 718,755, Apr. 1, 1985, Pat. No. 4,578,100. This application Dec. 16, 1985, Ser. No. 809,644
Int. Cl.[4] C03C *17/44*
U.S. Cl. 428—428 **14 Claims**

1. A non-glare glass article comprising:
a. a glass substrate; and
b. on at least one surface of said glass substrate an alkali silicate coating treated with a compound which removes excess alkali from the coating, said compound selected from the group consisting of acids and salts of weak acids.

4,636,440

NOVEL PROCESS FOR COATING SUBSTRATES WITH GLASS-LIKE FILMS AND COATED SUBSTRATES

Sivananda S. Jada, Englewood, Colo., assignor to Manville Corporation, Denver, Colo.

Filed Oct. 28, 1985, Ser. No. 791,845
Int. Cl.[4] B32B *9/04*
U.S. Cl. 428—446 **11 Claims**

1. An improved process for coating and drying a substrate with a glass-like film comprising in order the steps of:
(a) applying to the substrate an aqueous alcoholic solution containing a polymeric network of partially hydrolyzed silicon alkoxides;
(b) applying to the thus coated substrate an additional coating of at least one aqueous compound selected from the group consisting of: (i) a quaternary ammonium hydroxide of the general formula NR_4OH wherein each R independently represents hydrogen or a C_1 to C_{10} alkyl group and (ii) an alkanol amine of the general formula H_2NR^1OH wherein R^1 represents a C_1–C_{10} alkylene group, whereby the surface of the coated substrate resulting from 1(a) is uniformly coated with said aqueous compound; and
(c) drying the resulting coated substrate of 1(b) at room temperature for a period of time not to exceed about 6 hours.

9. A dried, coated substrate prepared by the process of claim 1 and having a fire resistance meeting the requirements of ASTM E 119-83.

4,636,441

SEMI-FINISHED PRODUCTS FOR THE MANUFACTURE OF PRINTED CIRCUIT BOARDS

Kirker Sirinyan, Bergisch Gladbach; Gerhard D. Wolf, Dormagen; Ulrich von Gizycki, and Rudolf Merten, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 7, 1985, Ser. No. 785,175
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1984, 3436971
Int. Cl.[4] B32B *9/04*
U.S. Cl. 428—447 **9 Claims**

1. A semi-finished product for the manufacture of printed circuit boards, consisting essentially of a base carrier and a metal complex compound applied thereto and having an activating effect on electroless metallisation, wherein in said complex compound, the ligand and the ion or molecule to be complexed show a mutual "host/guest interaction".

4,636,442
LAMINATED STRUCTURES OF POLYETHYLENE TEREPHTHALATE AND ELASTOMERIC COPOLYESTERETHERS

Randy S. Beavers; Finley E. McFarlane; Harry R. Musser, and Freddie A. Shepherd, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 11, 1985, Ser. No. 786,433
Int. Cl.[4] B32B *27/08, 27/36*
U.S. Cl. 428—480 10 Claims

1. A shaped article comprising a poly(ethylene terephthalate) layer and a layer comprising an elastomeric polyesterether positioned in contact with said poly(ethylene terephthalate) layer, said polyesterether having an I.V. of about 0.8–1.5, a melting point above about 150° C. and being the reaction product of
(a) 100 mol % of at least one aromatic or cycloaliphatic dicarboxylic acid having from 8 to 12 carbon atoms,
(b) about 75–96 mol % of an aliphatic or cycloaliphatic glycol having 2 to 13 carbon atoms, and
(c) about 25–4 mol % of polyether glycol having 2–4 carbon atoms between ether units and a molecular weight of about 200–3000.

4,636,443
DECORATIVE LAMINATES AND METHOD OF PRODUCING SAME

Richard F. Jaisle, Batesville, Ind.; Henry C. Mollmann; Martha J. Albers, both of Cincinnati, Ohio, and James H. Burgess, Loveland, Ohio, assignors to Formica Corporation, Cincinnati, Ohio

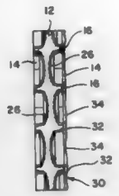
Filed Nov. 23, 1984, Ser. No. 674,219
Int. Cl.[4] B32B *27/10*
U.S. Cl. 428—481 9 Claims

1. A heat and pressure consolidated laminate with superior edge crazing properties comprising:
(1) a core comprising a plurality of polymerized polyester resin impregnated paper sheets, and,
(2) one or more polymerized melamine/formaldehyde resin impregnated decor outer sheet(s) bonded thereto
wherein said core sheet(s) are impregnated with a polymerized colorless polyester resin which has a molecular weight ranging from about 1–4 million.

4,636,444
THERMAL PANEL

Lucio Lombardozzi, 22-16 35th Street, Astoria, N.Y. 11105

Filed Dec. 18, 1985, Ser. No. 810,362
Int. Cl.[4] B32B *3/12, 3/24*
U.S. Cl. 428—596 12 Claims

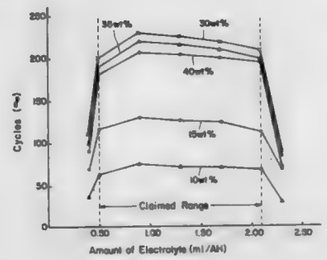


1. An improved thermal panel construction, comprising a lamina of low thermal conductivity having a multiplicity of contiguous polygonal recesses on at least one of the exposed surfaces thereof,
each of said polygonal recesses having a concave base surface of thermally radiant reflective character whose focal point is located above the upper marginal edges of said polygonal recesses.

4,636,445
METAL/HYDROGEN ALKALINE STORAGE BATTERY

Masaru Yamano; Takashi Sakai; Nobuhiro Furukawa, all of Hirakata; Shuzo Murakami, Ibaraki, and Takanao Matsumoto, Nishinomiya, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 677,677, Nov. 30, 1984, abandoned. This application Mar. 17, 1986, Ser. No. 841,058
Claims priority, application Japan, Aug. 10, 1984, 59-167993; Aug. 10, 1984, 59-167994; Aug. 17, 1984, 59-172086; Sep. 6, 1984, 59-186878; Oct. 18, 1984, 59-219937; Oct. 18, 1984, 59-219938
Int. Cl.[4] H07M *2/12*
U.S. Cl. 429—53 9 Claims



1. A metal/hydrogen alkaline storage battery which comprises:
a positive electrode comprising a metal oxide,
a negative electrode comprising a hydrogen-storage alloy,
a separator interposed between said positive electrode and said negative electrode and impregnated with an alkaline electrolyte, wherein said electrolyte is a 15 to 35 wt.% alkaline solution and the amount of said electrolyte is controlled to 0.50 to 2.10 ml per AH of the theoretical capacity of said negative electrode, and
a battery casing for housing said positive and negative electrodes and said separator, wherein said battery casing comprises valve means having a valve which acts under pressure ranging from an equilibrium pressure in adsorption of hydrogen by said negative electrode to about 20 kg/cm^2, thereby maintaining the internal pressure of the battery below about 20 kg/cm^2.

4,636,446
STOPPER STRUCTURE FOR STORAGE BATTERY CONTAINER

Yung-Lin Lee, Chia I, Taiwan, assignor to Cheng Kwang Storage Battery Co., Ltd., Taiwan

Filed Nov. 15, 1985, Ser. No. 798,290
Int. Cl.[4] H01M *2/12*
U.S. Cl. 429—54 1 Claim

1. An improved stopper for a storage battery containing comprising:
(a) a rectangular-shaped open trough provided with an internal longitudinal slot and a plurality of spaced holders;
(b) a plurality of stopper structures, each stopper structure being engageable with a spaced holder;
(c) each stopper structure being defined by a hollow cylindrical-shaped body having disposed therein:
i. a porous plastic body permeable only to gas,
ii. a spiral-shaped body provided with notches at both ends for directing gas in a circular direction from the container towards the porous plastic body, and
iii. a flexible rubber pad spaced from the porous plastic body and defining a space therebetween, the pad including a protrusion engageable against the porous plastic body for supporting the pad thereon, whereby gas evolved from the battery and trapped within the space causes the periphery of the pad to curve outwardly when the pressure of the gas reaches a given level,

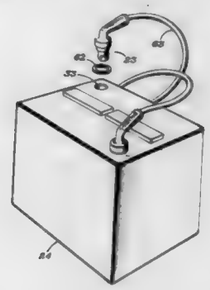


thereby causing the gas to vent from the space and along the slot to the exterior of the stopper.

4,636,447
BATTERY TERMINAL AND CONNECTOR

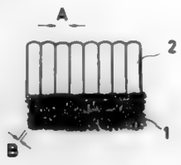
Roland D. Tate, P.O. Box 127, Bellevue, Tex. 76228

Filed Apr. 18, 1983, Ser. No. 485,871
Int. Cl.[4] H01M *2/30*
U.S. Cl. 429—121 4 Claims



1. A battery terminal and connector, comprising:
a terminal member for a battery having an aperture formed therein,
said aperture having a round closed end and a portion defined by a cylindrical shaped wall portion extending away from said round closed end to an open end,
said cylindrical shaped wall portion having a given radius relative to a central axis of said aperture,
an arcuate shaped wall means located between said closed end and said open end and spaced from said closed end and from said open end,
said arcuate shaped wall means having a radius relative to the central axis of said aperture which is less than said given radius such that said arcuate shaped wall means extends radially inward from said cylindrical shaped wall portion and defines a shoulder facing said closed end,
the arc of said arcuate shaped wall means being less than a full circle and extending from a first end portion to a second end portion,
said aperture between said first and second end portions and opposite said arcuate shaped wall means being defined by an arcuate shaped wall which is an extension of a portion of said cylindrical shaped wall portion and which has a radius relative to said central axis which is equal to that of said given radius,
a connector having a first end adapted to be connected to a flexible lead and a male member adapted to be located in said aperture and secured therein by turning said connector and hence said male member relative to said terminal member,
said male member having a first arcuate shaped portion at a free end opposite said first end of said connector with an arc less than that of a circle and greater than the arc of said arcuate shaped wall means of said aperture of said terminal member,
said first arcuate shaped portion of said male member having a radius relative to a central axis of said male member which is less than the radius of said arcuate shaped wall means of said aperture of said terminal member,
said male member having a second arcuate shaped portion at said free end with a radius relative to its central axis which is greater than the radius of said arcuate shaped wall means of said aperture of said terminal member and less than the radius of said cylindrical shaped wall portion of said aperture of said terminal member,
the arc of said second arcuate shaped portion of said male member extending from a first end portion to a second end portion,
said male member having a shoulder on said second arcuate shaped portion which faces towards said first end of said connector and away from said free end of said male member,
said shoulder on said second arcuate shaped portion of said male member extending from its first end portion gradually away from said free end to its second end portion,
said male member having a cylindrical portion near said first end of said connector opposite said free end,
said cylindrical portion of said male member being spaced from said second arcuate shaped portion of said male member,
said cylindrical portion of said male member extending radially outward of said first arcuate shaped portion of said male member,
a connecting portion extending from said cylindrical portion of said male member to said second end portion of said second arcuate shaped portion of said male member,
said connecting portion extending radially outward of said first arcuate shaped portion of said male member,
said cylindrical portion of said male member having a radius relative to the central axis of said male member which is greater than the radius of said arcuate shaped wall means of said aperture of said terminal member and less than the radius of said cylindrical shaped wall portion of said aperture of said terminal member,
said connecting portion having a radius relative to the central axis of said male member which is less than the radius of said cylindrical shaped wall portion of said aperture of said terminal member,
the distance between said shoulder of said second arcuate shaped portion of said male member at its first end portion and said free end of said male member being less than the distance between said shoulder of said arcuate shaped wall means of said aperture at its first end portion and said closed end of said aperture in said terminal member whereby said male member including at least a portion of its cylindrical portion may be inserted into said aperture of said terminal member and rotated relative to said terminal member to wedge said second arcuate shaped portion of said male member between said shoulder of said arcuate shaped wall means and said closed end of said aperture of said terminal member to secure said male member in said aperture of said terminal member.

4,636,448
MAGNETIC RECORDING MEDIUM
Haruyuki Morita; Jiro Yoshinari, and Kazumasa Fukuda, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Jan. 16, 1985, Ser. No. 691,883
Claims priority, application Japan, Jan. 26, 1984, 59-10998
Int. Cl.[4] B21C *37/00*
U.S. Cl. 428—607 6 Claims



1. A magnetic recording medium comprising a non-magnetic substrate and a magnetic thin film formed on the surface thereof said magnetic film comprising two layers, an upper layer having an average grain diameter A and a lower layer having an average grain diameter B, wherein the lower layer is contiguous to said upper layer and closer to the non-magnetic substrate, and the average grain diameter B of the lower layer is less than one half of the average grain diameter A of said upper layer.

4,636,449
ELECTROSTATIC PRINTING PROCESS
Emery J. Gorondy, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 392,788, Jun. 28, 1982, abandoned. This application Dec. 2, 1983, Ser. No. 557,275
Int. Cl.[4] G03G *19/00*
U.S. Cl. 430—39 7 Claims



1. A process for producing a colored image on a substrate comprising the steps of forming a latent magnetic image in a magnetic imaging member, decorating the latent magnetic image with nonconductive magnetic toner, transferring the magnetic toner to a conductive member to form a nonconductive toner image fused to said conductive member, electrostatically charging the nonconductive toner image, decorating the charged nonconductive toner image with electrostatic colored toner comprising a resin and a colorant, transferring the resulting electrostatic colored toner image to a substrate.

4,636,450
PHOTOCONDUCTIVE MEMBER HAVING AMORPHOUS SILICON MATRIX WITH OXYGEN AND IMPURITY CONTAINING REGIONS
Kyosuke Ogawa, Tokyo; Shigeru Shirai, Yamato; Junichiro Kanbe, Yokohama; Keishi Saitoh, Tokyo; Yoichi Osato, Yokohama, and Teruo Misumi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 706,891, Feb. 27, 1985, abandoned, which is a continuation of Ser. No. 460,919, Jan. 25, 1983, abandoned. This application Feb. 18, 1986, Ser. No. 830,483
Claims priority, application Japan, Feb. 1, 1982, 57-14551; Feb. 1, 1982, 57-14552; Feb. 3, 1982, 57-16173; Feb. 3, 1982, 57-16174; Feb. 8, 1982, 57-18420; Feb. 9, 1982, 57-20239; Feb. 10, 1982, 57-20990; Feb. 10, 1982, 59-20991; Mar. 2, 1982, 57-33504; Mar. 3, 1982, 57-33291; Mar. 3, 1982, 57-33292; Mar. 3, 1982, 57-33293; Mar. 3, 1982, 57-33294; Mar. 4, 1982, 57-34207; Mar. 4, 1982, 57-34208; Mar. 4, 1982, 57-34209
Int. Cl.[4] G03G *5/082*
U.S. Cl. 430—84 37 Claims

1. A photoconductive member comprising a support for a photoconductive member and an amorphous layer exhibiting photoconductivity and comprising an amorphous material comprising silicon atoms as a matrix and at least one member selected from the group consisting of hydrogen atoms and halogen atoms as a constituting atom, characterized in that the amorphous layer has a first layer region containing oxygen atoms and a second layer region containing an atom of Group III or an atom of Group V of the Periodic Table and existing interiorly at the support side, and the first layer region and the second layer region share in common at least a portion of said mutual region, and there is the relation:

$$t_B/(T+t_B) \leq 0.4$$

where t_B is the thickness of the second layer region and T is a difference between the thickness of the amorphous layer and the thickness of the second layer region t_B.

4,636,451
PRESSURE-FIXABLE TONER MATERIAL AND METHOD OF MAKING SAME
Josef Matkin, Malvern, and Richard J. Treleaven, Toorak Gardens, both of Australia, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 13, 1986, Ser. No. 829,011
Int. Cl.[4] G03G *9/08*
U.S. Cl. 430—109 19 Claims

1. Method of preparing spherical toner particles comprising:
(1) admixing a colorant, a pressure-fixable material, an isocyanate, and a matrix-forming co-reactant to form a mixture,
(2) emulsifying said mixture in an aqueous medium containing a non-reactive emulsifying agent to provide a dispersion of spheres of said mixture,
(3) hydrolyzing a first portion of the isocyanate near the surface of said spheres by contact with water in the aqueous medium to initiate formation of polyurea (a) at the surface of said spheres as a thin, substantially continuous layer and (b) in the interiors of said spheres as a continuum for some distance beneath the surfaces of said spheres, said continuum being a polyurea matrix, and reacting a second portion of the isocyanate within said spheres with said matrix-forming co-reactant to form additional matrix material in the interiors of said spheres,
(4) removing said emulsifying agent from the dispersion, and
(5) removing the water from the dispersion to obtain dry, spherical toner particles.

4,636,452
METHOD FOR PRODUCING LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY
Akira Furukawa; Takao Senga, and Shigeyoshi Suzuki, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 546,955, Oct. 31, 1983, abandoned. This application Sep. 11, 1984, Ser. No. 649,411
Claims priority, application Japan, Nov. 4, 1982, 57-194223; Mar. 29, 1983, 58-54534; May 18, 1983, 58-86957; Jun. 10, 1983, 58-103953; Apr. 24, 1984, 59-82623
Int. Cl.[4] G03G *9/12*
U.S. Cl. 430—112 12 Claims

1. A method for producing a resin dispersion type electrophotographic liquid developer containing resin particles dispersed in a high insulation resistance hydrocarbon medium which comprises polymerizing, in the presence of a first polymer dissolved in said medium which is soluble in said medium and has a polar functional group having adsorptivity to a second polymer, also dissolved in said medium a monomer having a polar functional group having adsorptivity to said first polymer to produce the second polymer which is low in solubility in said medium and is substantially particle.

4,636,453
PHOTOPOLYMER FILMS CONTAINING MICROENCAPSULATED SENSITOMETRIC ADJUVANTS
Dalen E. Keys, and William J. Nebe, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 1, 1985, Ser. No. 782,424
Int. Cl.[4] G03C *1/68*; G03F *7/16*
U.S. Cl. 430—138 23 Claims

1. In a photopolymerizable element comprising a support bearing, in order, a layer of a photopolymerizable composition, and a protective layer, the improvement wherein dispersed in the photopolymerizable layer are pressure rupturable microcapsules consisting essentially of outer walls resistant to solvent for the photopolymerizable layer surrounding at least one active component for the photopolymerizable composition which improves the speed and/or physical properties of the photopolymerizable composition.

4,636,454
METHOD POR THE PREPARATION OF A PATTERNED PHOTORESIST LAYER AND A PHOTORESIST COMPOSITION THEREFOR
Teruo Fujimoto; Takeo Kazama; Minoru Takamizawa, and Akira Yamamoto, all of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Jul. 10, 1985, Ser. No. 753,604
Claims priority, application Japan, Jul. 18, 1984, 59-148778
Int. Cl.[4] G03C *1/52, 1/71, 5/16*; C08F *30/08*
U.S. Cl. 430—197 6 Claims

1. A negative-working photoresist composition which comprises, as the polymeric constituent thereof:
a polymeric compound which is a product of the styrenic polymerization of a vinylphenyl substituted-vinyl dimethyl silane compound represented by the general formula

$$CH_2{=}CH{-}C_6H_4{-}SiMe_2{-}CR^1{=}CR^2R^3,$$

in which Me is a methyl group and R^1, R^2 and R^3 are each a hydrogen atom, methyl group or ethyl group, at least one of the R^1, R^2 and R^3 being not a hydrogen atom.

3. The negative-working photoresist composition as claimed in claim 1 which further comprises an organic solvent dissolving the polymeric compound therein.

4. The negative-working photoresist composition as claimed in claim 3 which further comprises a photosensitizer.

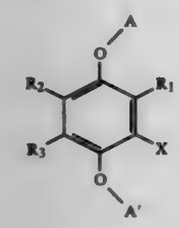
5. The negative-working photoresist composition as claimed in claim 4 wherein the photosensitizer is 2,6-di(4-azidobenzylidene) cyclohexanone.

4,636,455
HEAT DEVELOPEMENT DYE-TRANSFER PROCESS USING CROSSLINKED BINDERS WITH DYE MORDANTS
Toshiaki Aono; Koichi Nakamura; Takeshi Shibata, and Taku Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Nov. 22, 1985, Ser. No. 801,183
Claims priority, application Japan, Nov. 30, 1984, 59-253730
Int. Cl.[4] G03C *5/54, 1/40*
U.S. Cl. 430—203 9 Claims

1. A process which comprises exposing and developing a light-sensitive silver halide material comprising a dye-providing substance capable of forming or releasing a diffusible hydrophilic dye wherein a diffusible dye is transferred to a dye fixing material including the steps of:
(a) applying water to a dye fixing material comprising a support having thereon at least a mordant and a binder,
(b) contacting said dye fixing material with said light-sensitive silver halide material, and
(c) heating said contacted materials to transfer a dye from said light-sensitive silver halide material to said dye fixing material,
wherein said binder contains a cross-linked hydrophilic polymer and a non-cross-linked hydrophilic polymer and the amount of said water applied to said dye fixing material is not more than that required to maximally swell the layer coated on said dye fixing material, wherein said non-cross-linked hydrophilic polymer is a polymer which is not cross-linked by a cross-linking agent used in said cross-linked hydrophilic polymer as present in said binder.

4,636,456
PROCESS FOR FORMING A PHOTOGRAPHIC IMAGE
Toshiro Takahashi, and Koki Nakamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed May 7, 1985, Ser. No. 731,249
Claims priority, application Japan, May 7, 1984, 59-90435
Int. Cl.[4] G03C *5/24*
U.S. Cl. 430—266 13 Claims

1. A process for forming a photographic image, comprising:
(1) imagewise exposing a silver halide photographic light-sensitive material including at least one silver halide emulsion layer and containing in at least said emulsion layer or other hydrophilic layer a compound represented by formula (I)



(I)

wherein:
A and A' each represents a hydrogen atom or an alkalihydrolyzable group;
R_1, R_2, and R_3 each represents a hydrogen atom or group capable of substituting a hydrogen atom on the hydroquinone nucleus, or R_2 and R_3, A and R_1, or A and R_2 together form a ring, wherein said ring is a 5–6 membered ring; and
X represents a group which shows a development-inhibiting effect after being released, and

(2) photographically developing the resulting imagewise exposed silver halide photographic light-sensitive material, using a lithographic developer, wherein a polyalkylene oxide compound is employed in said silver halide photographic light-sensitive material, or said lithographic developer or both.

4,636,457

PROCESS FOR FORMING DIRECT POSITIVE IMAGES, DIRECT POSITIVE SILVER HALIDE ELEMENTS, COMPOSITIONS AND COMPOUNDS AS CHARACTERISTICS FEATURE OF SUCH PROCESSES AND ELEMENTS

Luigi Valbusa, Savona; Enzo Coraluppi, Carcare Savona; Andrea Quaglia, and Mario Tavella, both of Savona, all of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 15, 1985, Ser. No. 755,292
Claims priority, application Italy, Jul. 20, 1984, 21991 A/84
Int. Cl.[4] G03C *5/24*
U.S. Cl. 430—267 18 Claims

1. An internal latent image silver halide photographic emulsion having in contact therewith developer autoxidation promoter agents comprising compounds having at least one 1,2,4-triazolyl-5-amino-azomethine group, the carbon atom and the nitrogen atom of said azomethine being a part of a nitrogen-containing heterocyclic nucleus.

4,636,458

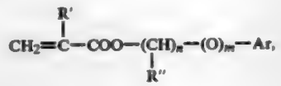
STORAGE DISK MADE OF PARA-METHYL STYRENE

Franz Wenzel, Darmstadt; Peter J. Arndt, Seeheim-Jugenhe, and Werner Siol, Darmstadt-Ebers, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 661,868, Oct. 16, 1984, abandoned, which is a division of Ser. No. 562,706, Dec. 19, 1983, abandoned. This application Dec. 2, 1985, Ser. No. 803,512
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1982, 3248607-4
Int. Cl.[4] G03C *1/76*
U.S. Cl. 430—270 9 Claims

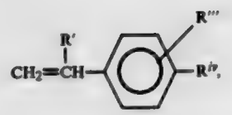
1. A storage disk for optically readable information, said disk including a layer of a transparent polymer wherein optically readable information has been entered for storage in a surface of said polymer layer by casting, molding, injection molding, or extruding said polymer, said polymer having low absorptive capacity for water, a molecular weight greater than 50,000 and less than 10^6, whereby the polymer exhibits low birefringence such that the difference in the optical pattern of a light beam passing through said layer is less than 100 nanometers, said polymer consisting of:

(A) 10 to 100 percent by weight of para-methylstyrene,
(B) 0 to 50 percent by weight of at least one monomer of the formula



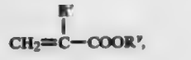
wherein
R′ is hydrogen or methyl,
R″ is hydrogen or alkyl having from 1 to 7 carbon atoms,
Ar is phenyl or phenyl substituted with alkyl having from 1 to 4 carbon atoms
n is an integer from 0 to 6, and
m is 0 or 1, but wherein m and n must not both be 1 and, if n is 0, then m must also be 0,

(C) 0 to 20 percent by weight of at least one compound of the formula



wherein
R′ is hydrogen or methyl,
R‴ is hydrogen or alkyl having from 1 to 4 carbon atoms, and
R^{iv} is hydrogen or alkyl having from 2 to 4 carbon atoms;

(D) 0 to 8 weight percent of methyl methacrylate;
(E) 0 to 50 weight percent of at least one monomer of the formula



wherein
R′ is hydrogen or methyl and
R′ is linear or branched hydrocarbon having from 1 to 20 carbon atoms, or is cyclic, nonaromatic hydrocarbon having at least 5 ring carbon atoms and up to 12 carbon atoms, but wherein R′ and R′ must not both be methyl;

(F) 0 to 30 weight percent of further different copolymerizable comonomers whose solubility does not exceed 50 g of monomer per liter of water at 25° C., whereby the comonomers are selected from the group consisting of α-olefins, halogen containing olefins, esters of unsatured dicarboxylic acids and vinyl esters of saturated carboxylic acids having three to eight carbon atoms in the acid portion, and
(G) 0 to 10 weight percent of still further different copolymerizable monomers which enhance polymer cohesion and are selected from the group consisting of acrylonitrile and methacrylonitrile and crosslinking monomers having in the molecule more than one group capable of polymerizing under free radical polymerizing conditions, the sum of all monomers (A) through (G) in each case being 100 percent.

4,636,459

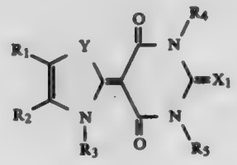
PHOTOPOLYMERIZABLE COMPOSITIONS

Kouichi Kawamura; Yoshimasa Aotani; Akira Umehara, and Seiji Horie, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 6, 1986, Ser. No. 836,942
Claims priority, application Japan, Mar. 6, 1985, 60-44027; Mar. 6, 1985, 60-44029; Mar. 7, 1985, 60-45531; Mar. 7, 1985, 60-45532
Int. Cl.[4] G03C *1/68*
U.S. Cl. 430—288 10 Claims

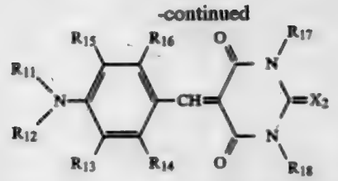
1. A photopolymerizable composition containing an addition polymerizable compound having at least one ethylenically unsaturated double bond and a photopolymerization initiator, wherein the photopolymerizable composition contains at least one compound represented by following general formula (I) or (II) as the photopolymerization initiator:

(I)



-continued

(II)



wherein, R_1, R_2, R_3, R_4, and R_5 each represents a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an allyl group or a substituted allyl group, said R_1 and R_2 may combine with each other to form a ring together with the carbon atoms to which they are bonded; Y represents —O—, —S—, —Se—, —$C(CH_3)_2$— or —CH=CH—; X_1 represents an oxygen atom or a sulfur atom; R_{11}, R_{12}, R_{17}, and R_{18} each represents a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an allyl group, or a substituted allyl group; R_{13}, R_{14}, R_{15}, and R_{16} each represents a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, a halogen atom, a carboalkoxy group, or an alkoxy group; said R_{11} and R_{15}, said R_{12} and R_{13}, said R_{15} and R_{16}, and said R_{13} and R_{14} each may combine with each other to form a ring together with the carbon atoms to which they are bonded; and X_2 represents an oxygen atom or a sulfur atom.

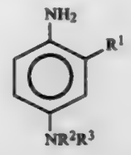
4,636,460

PHOTOGRAPHIC RECORDING MATERIAL AND PROCESS FOR THE PRODUCTION OF PHOTOGRAPHIC IMAGES

Heinz Meckl, Bergisch Gladbach; Helmut Kampfer, Cologne, and Helmut Hikseler, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 11, 1985, Ser. No. 743,634
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3422917
Int. Cl.[4] G03C *5/24, 1/06, 1/48*
U.S. Cl. 430—442 3 Claims

1. Light-sensitive photographic recording material for the production of photographic images by development in an aqueous bath, which material contains at least one silver halide layer and contains a color developer compound of the formula



wherein
R^1 represents hydrogen or C_1–C_4 alkyl C_1 to C_4 alkoxy or methylsulfonamido C_1 to C_4 alkyl group;
R^2 represents a C_1–C_4 alkyl group; and
R^3 represents a C_1 to C_4 alkyl group unsubstituted or terminally substituted with a hydroxyl, methylsulfonamido or methoxy group or a salt thereof
in at least one layer, characterised in that an alkali metal disulphite is contained in at least one layer.

4,636,461

PHOTOGRAPHIC RECORDING MATERIAL

Manfred Becker; Reinhart Matejec, both of Leverkusen, and Lothar Endres, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 31, 1985, Ser. No. 696,901
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1984, 3404854
Int. Cl.[4] G03C *1/34, 1/02*
U.S. Cl. 430—567 7 Claims

1. Colour photographic recording material comprising a support layer, a DIR compound in at least one layer, at least one silver halide emulsion layer, which contains at least one iodide-containing silver halide emulsion comprising substantially silver halide grains having zones of differing halide compositions wherein in the grains:

(a) at least three zones differing in halide compositions are arranged in succession from the surface of the grain to the centre of the grain and the local iodide content assumes a maximum at least in one position which is not on the surface and not at the centre;
(b) the difference between the iodide content of the zone having the highest iodide content and the iodide content of the zone of lowest iodide content situated further away from the grain centre is at least 6 mol-%;
(c) the proportion of the zones in which the iodide content assumes a maximum amounts to from 10 to 60 mol-%; and
(d) at least 50% of the crystals are cubes or tetradecahedrons;

and wherein the percentage of the silver iodide content is based on the silver halide content in the zones referred to.

4,636,462

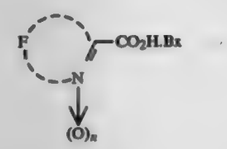
HEAT-DEVELOPABLE PHOTOSENSITIVE MATERIAL

Ken Kawata; Yoshiharu Yabuki; Kozo Sato, and Hiroyuki Hirai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

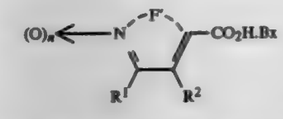
Filed Aug. 26, 1985, Ser. No. 769,288
Claims priority, application Japan, Aug. 24, 1984, 59-176402
Int. Cl.[4] G03C *1/02*
U.S. Cl. 430—617 9 Claims

1. A heat-developable photosensitive material which comprises a light-sensitive material and a compound as a base precursor of the general formula:

(I)



(II)



wherein F and F′ each represents an atomic group necessary for the formation of a 5- or 6-membered ring which may have condensed rings therewith; n represents an integer of 0 or 1; R^1 and R^2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a hydroxyl group, a cyano group, or a substituted or unsubstituted alkyl group, cycloalkyl group, alkenyl group, alkynyl group, aryl group, heterocyclic group, aralkyl group, alkoxy group, aryloxy group, acylamino group, acyloxy group, acyl group, carbamoyl group, sulfamoyl group, sulfamoylamino group, ureido group, alkylsulfonyl group, arylsulfonyl group, alkylsulfonylamino group, arylsulfonylamino group, alkoxycarbonyl group or alkoxycar-

bonylamino group, —CO_2H.B wherein B is as defined herein or —CO_2M; and R^1 and R^2 may be combined and form a ring, M is an alkali metal or H.Bx in which B represents an organic base; and x represents an integer of 1 when B is a monoacidic base and represents ½ when B is a diacidic base.

4,636,463

ANTIBODIES TO HUMAN INTERLEUKIN-2 INDUCED BY SYNTHETIC POLYPEPTIDES

Amnon Altman, San Diego; Argyrios N. Theofilopoulos, La Jolla; Richard A. Lerner, La Jolla, and Frank J. Dixon, La Jolla, all of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed Apr. 5, 1984, Ser. No. 597,179
Int. Cl.⁴ C07C *103/52;* **G01N** *33/531, 33/535*
U.S. Cl. 435—7 **32 Claims**

1. A synthetic polypeptide containing about 6 to about 40 amino acid residues having an amino acid residue sequence that substantially corresponds to an amino acid residue sequence of interleukin-2 that is selected from the group consisting of:
(a) the interleukin-2 protein from about position 18 to about position 32 from the amino-terminus thereof,
(b) the interleukin-2 protein from about position 79 to about position 92 from the amino-terminus thereof,
(c) the interleukin-2 protein from about position 111 to about position 125 from the amino-terminus thereof, and
(d) the interleukin-2 protein from about position 139 to about position 153 from the amino-terminus thereof;
said synthetic polypeptide having the capacity alone, as a polymer or as a conjugate of said polypeptide bound to a carrier, when injected into a host in an effective amount and in a physiologically tolerable diluent of inducing the production of antibodies to interleukin-2.

10. An inoculum comprising an effective amount of synthetic polypeptide containing about 6 to about 40 amino acid residues having an amino acid residue sequence that immunologically corresponds substantially to an amino acid residue sequence of interleukin-2 that is selected from the group consisting of:
(a) the interleukin-2 protein from about position 18 to about position 32 from the amino-terminus thereof,
(b) the interleukin-2 protein from about position 79 to about position 92 from the amino-terminus thereof,
(c) the interleukin-2 protein from about position 111 to about position 125 from the amino-terminus thereof, and
(d) the interleukin-2 protein from about position 139 to about position 153 from the amino-terminus thereof;
and a physiologically tolerable diluent, said inoculum, when introduced into a host, being capable of inducing the production of antibodies in the host that immunoreact with interleukin-2.

20. Antibodies raised in an animal host to a synthetic polypeptide containing about 6 to about 40 amino acid sequence that immunologically corresponds substantially to an amino acid residue sequence of interleukin-2 that is selected from the group selected from:
(a) the interleukin-2 protein from about position 18 to about position 32 from the amino-terminus thereof,
(b) the interleukin-2 protein from about position 79 to about position 92 from the amino-terminus thereof,
(c) the interleukin-2 protein from about position 111 to about 125 from the amino-terminus thereof, and
(d) the interleukin-2 protein from about position 139 to about position 153 from the amino terminus thereof;
said antibodies having the capacity to immunoreact with interleukin-2.

22. A diagnostic system for assaying for the presence of interleukin-2 comprising in biochemically active form antibodies raised in an animal host to a synthetic polypeptide containing about 6 to about 40 amino acid residues having an amino acid residue sequence that immunologically coresponds to at least a portion of interleukin-2 that is selected from the group consisting of:
(a) the interleukin-2 protein from about positions 18 to about 32 from the amino-terminus thereof,
(b) the interleukin-2 protein from about position 79 to about position 92 from the amino-terminus thereof,
(c) the interleukin-2 protein from about position 111 to about position 125 from the amino-terminus thereof, and
(d) the interleukin-2 protein from about position 139 to about position 153 from the amino terminus thereof;
said antibodies immunoreacting with an admixed sample to be assayed that contains interleukin-2 to form an immunoreactant with interleukin-2, the presence of said immunoreactant being signalled by an indicating means.

27. A method for assaying for the presence of an antigenic determinant of interleukin-2 in a sample comprising:
(a) providing an anti-polypeptide antibody to a synthetic polypeptide of claim 1;
(b) admixing a predetermined amount of said anti-polypeptide antibody with a predetermined amount of sample to be assayed for the presence of the antigenic determinant to which the anti-polypeptide antibody binds;
(c) maintaining that admixture for a period of time sufficient for said anti-polypeptide antibody to bind to the antigenic determinant present in the admixed sample; and
(d) determining the amount of binding between said anti-polypeptide antibody and said antigenic determinant of interleukin-2.

4,636,464

PYRANOSE OXIDASE, METHOD OF MAKING AND METHOD OF USE

Toru Nakanishi, Atsugi, and Yozo Machida, Yokohama, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 474,310, Mar. 11, 1983, abandoned. This application Aug. 12, 1985, Ser. No. 764,960
Int. Cl.⁴ C12Q *1/54;* **C12N** *9/04*
U.S. Cl. 435—14 **16 Claims**

1. Pyranose oxidase derived from a microorganism belonging to the genus Coriolus, Daedaleopsis or Gloeophyllum and exhibiting a strong specific activity only on glucose and low activity on sorbose and xylose.

2. A process for producing pyranose oxidase defined in claim 1 which comprises culturing a microorganism belonging to the genus Coriolus, Daedaleopsis or Gloeophyllum which is capable of producing the enzyme in a nutrient medium until enzymatic activity is detected in the culture liquor and thereafter recovering the enzyme therefrom.

6. A method for the determination of the substrate for pyranose oxidase in a sample which comprises oxidizing the substrate with pyranose oxidase defined in claim 1, in the presence of oxygen and determining the amount of the reaction product or the amount of oxygen consumed by said reaction.

4,636,465

METHOD AND COMPOSITION FOR DETERMINATION OF GLYCEROL

Nobuya Itoh, Suzuka, and Kuniyoshi Matsunaga, Ichinomiya, both of Japan, assignors to Amano Pharmaceutical Co., Ltd., Nagoya, Japan

Filed Apr. 17, 1984, Ser. No. 601,252
Claims priority, application Japan, Apr. 21, 1983, 58-70730
Int. Cl.⁴ C12Q *1/48, 1/44, 1/32*
U.S. Cl. 435—15 **12 Claims**

1. A method for enzymatic determination of glycerol, which comprises:
incubating
(a) a glycerol-containing sample;
(b) a glycerol dehydrogenase;
(c) a pyridine nucleotide coenzyme;
(d) a dihydroxyacetone kinase in an amount sufficient to convert into dihydroxacetone phosphate and D-glyceraldehyde phosphate the dihydroxyacetone and D-glyceraldehyde produced by the action of glycerol dehydrogenase on the glycerol in said sample;
(e) a phosphate donor; and
(f) a divalent metal cation;
determining the amount of resulting reduced pyridine nucleotide coenzyme; and
determining the amount of glycerol from the amount of resulting reducted pyridine nucleotide coenzyme.

4,636,466

PHENYLALANINE AMMONIA LYASE-PRODUCING MICROBIAL CELLS

Jeffrey C. McGuire, Frederick; John P. Montgomery, Clarksburg, and Huei-Hsuing Yang, Olney, all of Md., assignors to Genex Corporation, Gaithersburg, Md.

Filed Oct. 31, 1983, Ser. No. 547,129
Int. Cl.⁴ C12P *13/22;* **C12N** *15/00, 9/88, 1/16;* **C12R** *1/645*
U.S. Cl. 435—108 **17 Claims**

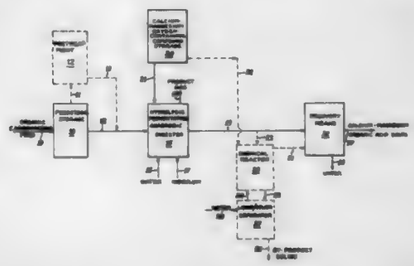
1. A method for producing phenylalanine ammonia-lyase which comprises cultivating under PAL-producing conditions a PAL-microbial strain in a nutrient medium containing assimilable sources of carbon, nitrogen and essential minerals and growth factors; wherein the PAL-producing microbial strain is a microorganism which has been isolated by mutation followed by selection for the ability to grow on a minimal essential medium containing, as substantially the sole carbon source, L-tyrosine.

4,636,467

MIXED MICROBIAL FERMENTATION OF CARBONACEOUS MATTER TO ROAD DE-ICER

David P. Claysoweth, St. Charles, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Filed Feb. 1, 1985, Ser. No. 697,253
Int. Cl.⁴ C12P *7/54, 7/40, 39/00;* **C12R** *1/145*
U.S. Cl. 435—140 **20 Claims**



1. A process for production of mixed calcium-magnesium organic acid salts useful for de-icing, said process comprising:
adding organic carbonaceous solids to a hydrolysis-fermentation anaerobic digester;
conducting anaerobic hydrolysis-fermentation of said carbonaceous solids by a biologically active mixture of hydrolysis-fermentation anaerobes comprising primarily acid-forming bacteria while suppressing growth of methanogenic bacteria in said digester to promote the production of fermentation acid products;
adding calcium-magnesium oxygen containing compound to said digester in a quantity sufficient to maintain said digester pH at about 4 to about 7 and to react said calcium-magnesium oxygen containing compound with substantially all said fermentation acid products to form a mixture of calcium-magnesium organic acid salts; and
recovering said calcium-magnesium organic acid salts in solid form.

4,636,468

LIPOLYTIC ENZYME DERIVED FROM A ASPERGILLUS MICROORGANISM HAVING AN ACCELERATING EFFECT ON CHEESE FLAVOR DEVELOPMENT

Michael V. Arbige, Bensalem, and Clifford E. Neubeck, Hatboro, both of Pa., assignors to Genencor, Inc., South San Francisco, Calif.

Filed Jun. 25, 1984, Ser. No. 623,931
Int. Cl.⁴ C12N *9/20, 1/14;* **C12R** *1/66;* **A23C** *9/12*
U.S. Cl. 435—198 **3 Claims**

1. A biologically pure culture of a variant of Aspergillus species known as ATCC No. 20719 which produces a lipolytic enzyme having a tricaprylin to tributyrin hydrolysis ratio greater than 0.75.

4,636,469

ISOLATION OF HEPATITIS A VIRUS STRAIN HM-175

Richard J. Daemer; Stephen M. Feinstone, both of Washington, D.C.; Ian D. Gust, Fairfield, Australia, and Robert H. Purcell, Boyds, Md., assignors to The United States of America as represented by the Secretary of the Department of Health & Human Services, Washington, D.C.

Continuation of Ser. No. 366,165, Apr. 7, 1982, Pat. No. 4,532,215. This application Dec. 26, 1984, Ser. No. 686,524
Int. Cl.⁴ C12N *7/08;* **A61K** *39/12*
U.S. Cl. 435—237 **3 Claims**

1. A method for the direct isolation of HAV strain HM-175 taken from stool samples of humans with acute hepatitis A virus, propagating the virus in a suitable substrate, and serially passaging said virus to form an agent for a vaccine without interposition of a mammalian model.

4,636,470

RESOLUTION OF RACEMATES OF AMINO ACIDS

Mark W. Empie, Pleasantville, N.Y., assignor to Stauffer Chemical Company, Dobbs Ferry, N.Y.

Filed Aug. 17, 1984, Ser. No. 641,887
Int. Cl.⁴ C07P *41/00*
U.S. Cl. 435—280 **20 Claims**

1. A process for resolving a racemate of optically active amino acids substituted at the carbonyl position and wherein the alpha amino acid nitrogen is underivatized comprising:
(a) preparing a two phase system of a racemate of an amino acid substituted at the carbonyl position wherein the alpha amino acid nitrogen is underivatized by dissolving in a substantially water immiscible organic material which is a solvent for said amino acid racemate, but not for the corresponding unsubstituted amino acids, adding water to form an aqueous phase wherein the racemate dissolved in the aqueous phase is in equilibrium with the racemate in the organic phase a majority of the racemate being dissolved in the substantially water immiscible organic solvent phase;
(b) selectively hydrolyzing with an enzyme one of the optical isomers of the amino acid racemate in the aqueous phase to the corresponding amino acid; and
(c) recovering the amino acid.

4,636,471

BIOCHEMICAL METHOD FOR PREPARATION OF OPTICALLY ACTIVE CARNITINE *ENTEROBACTER* SP. Y-219-B

Usao Nakamura, Sakai; Makoto Takao, Kobe; Etsuko Ueno, Itami, and Kichitaro Kawaguchi, Nara, all of Japan, assignors to Hamari Chemicals Ltd., Osaka, Japan

Filed Apr. 5, 1984, Ser. No. 597,233
Claims priority, application Japan, Apr. 5, 1983, 58-60412
Int. Cl.⁴ C07P *41/00*
U.S. Cl. 435—280 **7 Claims**

1. A process for preparing L-carnitine which comprises contacting apocarnitine with water in the presence of hydrase,

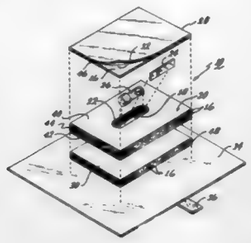
said hydrase being produced by Enterobacter sp. Y-239-b or the mutant thereof and which is capable of hydrating apocarnitine, in an aqueous medium having a pH of 4–10 at a temperature of 20°–60° C.; and recovering L-carnitine from the aqueous medium.

4,636,472

DISPOSABLE STERILIZATION BIOLOGICAL TEST PACK

Loran H. Bruso, Ontario, Calif., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 16, 1985, Ser. No. 735,226
Int. Cl.⁴ C12M *1/34*
U.S. Cl. 435—287 **20 Claims**



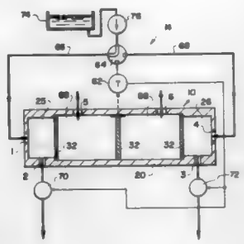
1. A disposble pack for testing the efficacy of a sterilization process comprises:
- a plurality of gas permeable porous sheets, each of said sheets being cut to form a hole therethrough and stacked to form a base pad having a top surface, a bottom surface, an edge therebetween and a cavity established by the alignment of said holes for receiving a sterilization indicator therein;
- a top pad having an edge and disposed against said top surface with its edge substantially flush with said edge of said base pad;
- a porous bottom pad having an edge and disposed against said bottom surface with its edge substantially flush with said edge of said base pad; and
- a gas impermeable layer disposed against said top pad to substantially direct the passage of gas into and out of said pack through said edges of said top pad, said middle pad and said bottom pad and through said bottom pad.

4,636,473

MEMBRANE AND STATIC MIXER-MODERATED BIOREACTOR WITH ANTI-FOULING DEVICE

Clement Kleinstreuer, Troy, N.Y., assignor to Rensselaer Polytechnic Institute, Troy, N.Y.

Filed Oct. 6, 1983, Ser. No. 539,566
Int. Cl.⁴ C12M *1/36, 1/34, 1/12, 1/02*
U.S. Cl. 435—289 **5 Claims**



1. A bioreactor apparatus comprising:
- a housing defining a closed space and having a longitudinal axis;
- first and second spaced-apart microporous membranes fixed in said space and dividing said space into a first chamber on one side of one of said first and second membranes, a second chamber on one side of the other of said first and second membranes, and a third chamber between opposite sides of said one and other first and second membranes, said longitudinal axis of said housing extending through said first membranes and through said first, second and third chambers;
- said housing including a first port communicating with said first chamber and a second port communicating with said second chamber;
- a third microporous membrane extending in said third chamber dividing said third chamber into two sections, said third microporous membrane having opposite sides facing said opposite sides of said one and other first and second membranes, said first and second membranes and said third membrane extending radially in said housing with respect to said longitudinal axis thereof;
- a perforated cylinder disposed in each of said two two sections, each perforated cylinder having a cylindrical portion with an axis parallel to said longitudinal axis of said housing and being spaced radially inwardly from said housing, each cylindrical portion having a cover at one end thereof engaged with said third membrane and a radially outwardly extending flange at an opposite end thereof engaged with one of said first and second membranes, said cover and flange of each perforated cylinder being without perforations and said perforated cylindrical portion of each perforated cylinder functioning to agitate contents of said two sections of said third chamber;
- a first line for carrying a fluid to said first chamber connected to said first port;
- a second line for carrying fluid to said second chamber connected to said second port;
- valve means connected to said first and second lines for selectively supplying fluid to said first and second lines;
- pump means connected to said valve means for pumping fluid through said valve means to one of said first and second lines; and
- control means connected to said valve means for activating said valve means to alternately and selectively supply fluid to one of said first and second lines and then to the other of said first and second lines in response to a selected time interval whereby flow of fluid through said first, second and third chambers alternates in a direction to avoid fouling of said one and opposite sides of each of said first and second microporous membranes.

4,636,474

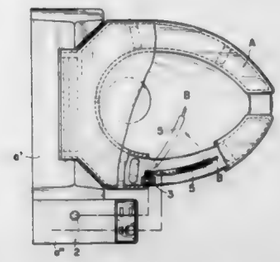
TOILET APPARATUS

Kenji Ogura, Chigasaki, and Takeshi Yamazaki, Tokyo, both of Japan, assignors to Toto Ltd., Fukuoka, Japan

Filed Jan. 24, 1984, Ser. No. 573,315
Claims priority, application Japan, Jan. 25, 1983, 58-11032; Jan. 25, 1983, 58-11033; Oct. 14, 1983, 58-192694; Nov. 30, 1983, 58-225154
Int. Cl.⁴ C12M *1/34*
U.S. Cl. 435—291 **32 Claims**

1. A toilet apparatus comprising a detecting sensor for detecting constituents contained in the excrements of a user of said toilet apparatus, an arm to which said sensor is connected, operating means for turning said arm with respect to a toilet bowl within which said apparatus is adapted to be positioned, said arm being connected to a rotary solenoid positioned below the seat of said toilet bowl, a mechanical switch comprising means for activating said solenoid and means for turning said arm into said toilet bowl to contact said sensor with said excrement, and an indicator which is electrically connected to said sensor, said indicator comprising means for analyzing and evaluating the health of said toilet user in response to the constituents which are detected in the excrements by said sensor.

2. A toilet apparatus comprising means for detecting constituents in the excrements of a user and means for activating said detecting means, said detecting means comprising a detecting



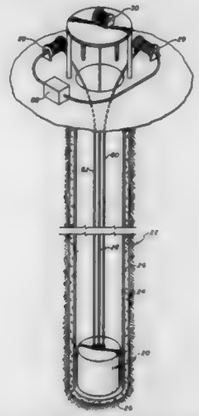
sensor and said activating means comprising means for activating said detecting sensor in response to detection of the presence of a user seated on said toilet apparatus.

4,636,475

APPARATUS AND METHOD FOR MONITORING STORED MATERIAL

William E. Price, 16252 Candelwood, Houston, Tex. 77642; Louie A. Galloway, III, 410 Elmwood Dr., Lafayette, La. 70503; Charles B. Lowrey, Rte. 1, Box K-78, Beaumont, Tex. 77706, and Donald R. Lewis, 9219 Lasater, San Antonio, Tex. 78250

Division of Ser. No. 296,429, Aug. 26, 1981, Pat. No. 4,521,372. This application Jan. 22, 1985, Ser. No. 693,611
The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.
Int. Cl.⁴ G01N *31/00*
U.S. Cl. 436—3 **36 Claims**



1. A storage system for the monitored storage of non-radioactive hazardous material comprising
- a first container for containing non-radioactive hazardous material;
- a second container for containing said first container;
- means for circulating a monitoring fluid in a closed loop of fluid flow through a cavity between said first container and said second container when said first container is contained within said second container, said closed loop of fluid flow through said cavity covering substantially the entire exterior surface of said first container;
- means located within said closed loop of fluid flow for monitoring said monitoring fluid to detect leakage of said non-radioactive hazardous material from said first container;
- means for monitoring said monitoring fluid to detect when the volume of said monitoring fluid in said closed loop of fluid flow is not within a predetermined range of volumes; and
- means for monitoring said monitoring fluid to detect when the rate of flow of said monitoring fluid is not within a predetermined range of rates of flow.

4,636,476

PRESERVING AGENT AND METHOD OF USE THEREOF

Keith D. Brunt, East Bridgford, and Frederick R. Higton, West Bridgford, both of England, assignors to The Boots Company Plc, England

Continuation of Ser. No. 537,718, Dec. 2, 1983, abandoned. This application Apr. 15, 1985, Ser. No. 723,013
Claims priority, application United Kingdom, Dec. 14, 1982, 8235596
Int. Cl.⁴ G01N *33/04*
U.S. Cl. 436—23 **11 Claims**

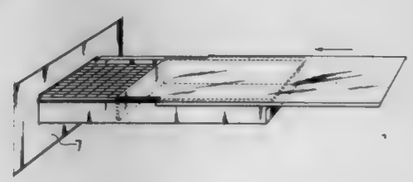
1. A tablet for use in the preservation of milk samples for analysis comprising bronopol and a water-soluble solid carboxylic acid, the amount of the carboxylic acid being within the range of 0.002 to 0.035 milli-equivalents per milligram of bronopol.

4,636,477

PROCEDURE FOR LOADING CUVETTE PACKAGES INTO AN INSTRUMENT, AND CUVETTE PACKAGE

Pekka Rönka, and Raimo Vaintola, both of Espoo, Finland, assignors to Kone Oy, Helsinki, Finland

Filed Dec. 28, 1984, Ser. No. 699,572
Claims priority, application Finland, Dec. 30, 1983, 834882
Int. Cl.⁴ G01N *35/02*; B01L *3/14*
U.S. Cl. 436—48 **9 Claims**



1. A procedure for loading into an instrument cuvettes intended for chemical analysis and/or handling of liquids, said cuvettes being arranged in at least one row in a shipping package having a detachable cover and being loaded in a forward direction into an input aperture of the instrument directly from the shipping package, comprising:
- transferring the cuvettes into the instrument by pushing the cuvettes in the package from behind with the detachable cover of the package, the cover being provided with a separate pushing member which, when the cover is contiguous with the package, forms one end of the package.

4,636,478

MONOCLONAL ANTIBODIES RECOGNIZING L-THYROXINE

Gary R. Siebert, Raleigh, N.C., and Jean Armstrong, Bogota, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jul. 16, 1984, Ser. No. 631,048
Int. Cl.⁴ G01N *33/577, 33/543*
U.S. Cl. 436—500 **7 Claims**

1. A method for the radioimmunoassay of thyroxine comprising:
- (a) affixing to a solid phase particular mouse monoclonal antibodies produced by hybridoma cell lines designated as

ATCC HB 8499 and ATCC HB 8500, said antibodies being specific for thyroxine and having a cross reactivity to triiodothyronine of no more than 0.12%;

(b) reacting said monoclonal antibodies with a composition comprising thyroxine and a predetermined amount of radiolabeled thyroxine to cause binding therebetween;

(c) separating said solid phase from unreacted thyroxine and radiolabeled thyroxine;

(d) determining the amount of radiolabeled thyroxine bound on said solid phase;

(e) repeating steps (a) to (d) with a plurality of other compositions comprising predetermined and different amounts of thyroxine;

(f) repeating steps (a) to (d) with a composition comprising an unknown amount of thyroxine; and

(g) determining said unknown amount of thyroxine by ascertaining which of said solid phases reacted with a predetermined amount of thyroxine has the same amount of bound radiolabeled thyroxine as said solid phase reacted with said unknown amount of thyroxine.

4,636,479

ENHANCED AGGLUTINATION METHOD AND KIT

Francis J. Martin, San Francisco, and Viola T. Kung, Menlo Park, both of Calif., assignors to Cooper-Lipotech, Inc., Menlo Park, Calif.

Filed Apr. 20, 1983, Ser. No. 486,793

Int. Cl.⁴ G01N *33/546, 33/555*

U.S. Cl. 436—533 **24 Claims**

1. An enhanced agglutination assay method for determination of a multivalent analyte in a weakly positive analyte-containing sample, said method comprising:

providing an unagglutinated suspension of (a) agglutinatinable particles between about 1 and 20 microns in diameter and having surface-bound anti-analyte molecules effective to produce particle agglutination in the presence of such analyte, and (b) liposomes having surface-bound analyte-binding protein molecules, at an average surface concentration of at least about 15 analyte-binding molecules per liposome, these molecules being effective to bind the analyte concurrently with analyte binding to a particle-bound anti-analyte molecule.

adding such analyte-containing sample to the suspension, and

by said adding, producing a degree of particle agglutination which is at least 1–2 grades greater, on a 1–4 grade scale, than that which would be produced by adding the anaylte sample to a suspension of the particles in the absence of the liposomes.

12. An enhanced agglutination assay kit for determination of a multivalent analyte in a weakly positive analyte-containing sample, comprising:

an unagglutinated suspension of (a) agglutinatinable particles between about 1 to 20 microns in size, and having surface-bound anti-analyte molecules adapted to promote particle agglutination in the presence of the analyte, and (b) liposomes having surface-bound analyte-binding molecules, at an average concentration of at least about 15 analyte-binding molecules per liposome, these molecules being effective to bind the analyte concurrently with analyte binding to a particle-bound anti-analyte molecule.

said liposomes being present in an amount effective to produce a degree of particle agglutination, when such analyte sample is added to the suspension, which is at least 1–2 grades greater, on a 1–4 grade scale, than that which would be produced by adding the analyte to a suspension of the particles in the absence of the liposomes.

4,636,480

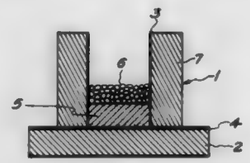
COMPOSITE BY INFILTRATION

William B. Hillig, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 692,468, Jan. 18, 1985, abandoned. This application Jul. 29, 1985, Ser. No. 759,815

Int. Cl.⁴ C04B *35/50, 35/56, 35/58*

U.S. Cl. 501—87 **25 Claims**



1. A polycrystalline composite comprised of a ceramic member in an amount ranging from about 5% by volume to about 70% by volume of the composite and a fluoride-containing member in amount from about 30% by volume to about 95% by volume of the composite, said composite having a porosity of less than about 10% by volume of said composite, said ceramic member being selected from the group consisting of boron carbide, hafnium carbide, hafnium nitride, niobium carbide, niobium nitride, silicon carbide, tantalum carbide, tantalum nitride, titanium carbide, titanium nitride, vanadium carbide, vanadium nitride, zirconium carbide and zirconium nitride, said fluoride-containing member being selected from the group consisting of barium fluoride, calcium fluoride, magnesium fluoride, strontium fluoride, cerium fluoride, dysprosium fluoride, gadolinium fluoride, lanthanum fluoride, samarium fluoride, yttrium fluoride and a mixture of at least about 10% by volume of said fluoride and a metal oxide wherein said mixture of said fluoride and metal oxide has a liquidus temperature ranging from above 1000° C. to below about 1500° C.

21. A polycrystalline composite comprised of silicon nitride in an amount ranging from about 5% by volume to about 70% by volume of the composite and a fluoride-containing member ranging in amount from about 30% by volume to about 95% by volume of the composite, said composite having a porosity of less than about 10% by volume of said composite, said silicon nitride being particulate in form and/or in the form of filaments, said fluoride-containing member being selected from the group consisting of barium fluoride, calcium fluoride, magnesium fluoride, strontium fluoride, cerium fluoride, dysprosium fluoride, gadolinium fluoride, lanthanum fluoride, samarium fluoride, yttrium fluoride and a mixture of at least about 10% by volume of said fluoride and a metal oxide wherein said mixture of said fluoride and metal oxide has a liquidus temperature ranging from above 1000° C. to below about 1500° C.

4,636,481

ZRB_2 COMPOSITE SINTERED MATERIAL

Otojiro Kida, and Yutaka Segawa, both of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jul. 3, 1985, Ser. No. 751,528

Claims priority, application Japan, Jul. 10, 1984, 59-141401; Sep. 4, 1984, 59-183636; Sep. 14, 1984, 59-191816; Sep. 18, 1984, 59-193969

Int. Cl.⁴ C04B *35/58;* **B24D** *3/16*

U.S. Cl. 501—96 **18 Claims**

1. A ZrB_2 composite sintered material consisting essentially of at least 1% by weight of SiC, at least 1% by weight of B_4C, and an additive selected from the group consisting of at most 15% by weight of TiC, at most 35% by weight of TiN, and at most 40% by weight of AlN, wherein the total of SiC, B_4C and said additive is at most 60% by weight when TiC and AlN is employed as said additive, and 50% by weight when TiN is employed as said additive, the rest being substantially ZrB_2, provided that the total amount of SiC and B_4C is from 2 to 50% by weight and in the total amount of SiC and B_4C, SiC constitutes from 10 to 60% by weight, and B_4C constitutes from 90 to 40% by weight.

4,636,482

NOVEL ZEOLITE CATALYST AND METHOD OF PREPARING

Hideo Okado; Hiroshi Shoji, both of Ibaraki; Haruo Takaya, Abiko; Kichinari Kawamura, Tsuchiura, and Yasuyoshi Yamazaki, Ibaraki, all of Japan, assignors to Director-General of Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 553,257, Nov. 18, 1983, Pat. No. 4,544,793. This application May 20, 1985, Ser. No. 735,981

Claims priority, application Japan, May 23, 1984, 59-105530

Int. Cl.⁴ B01J *29/06*

U.S. Cl. 502—60 **17 Claims**

1. A zeolite material obtained by modifying a crystalline aluminosilicate, said aluminosilicate having the following empirical formula:

$$xM_2O.yM'O.Al_2O_3.zSiO_2.nH_2O$$

wherein M is an exchangeable cation selected from the group consisting of alkali metals, hydrogen and mixtures thereof, M' is an alkaline earth metal selected from the group consisting of calcium, strontium and barium, x is between 0 and 1.5, y is between 1.2 and 40, z is betwen 70 and 3000 and n is between 0 and 40 and wherein x+y is at least 1.2, said modifying being by incorporation of a calcium, strontium or barium compound.

11. A method of preparing a zeolite material, comprising the steps of:

providing a crystalline aluminosilicate having the following empirical formula:

$$xM_2O.yM'O.Al_2O_3.zSiO_2.nH_2O$$

wherein M is an exchangeable cation selected from the group consisting of alkali metals, hydrogen and mixtures thereof, M' is an alkaline earth metal, x is between 0 and 1.5, y is between 0.2 and 40, z is between 50 and 3000 and n is between 0 and 40 and wherein x+y is at least 1.2; and

modifying the crystalline aluminosilicate by commingling the crystalline aluminosilicate with fine particulates of an alkaline earth metal compound.

4,636,483

PHOSPHORUS CONTAINING ALUMINA CATALYST FOR THE PRODUCTION OF AROMATICS

Solveg S. Kjell, Euless, Tex.; Tai-Hsiang Chao, Mount Prospect, Ill.; Nancy J. Flint, Wonder Lake, Ill., and Arthur A. Fountitzis, Des Plaines, Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 9, 1985, Ser. No. 806,984

Int. Cl.⁴ B01J *29/06*

U.S. Cl. 502—61 **15 Claims**

1. A catalytic composition for the dehydrocyclodimerization of C_2–C_5 aliphatic hydrocarbons comprising phosphorus containing alumina, a gallium component, and crystalline aluminosilicate zeolite having a silica to alumina ratio of at least 12.

4,636,484

METHOD FOR THE PREPARATION OF CATALYST COMPOSITION FOR USE IN CRACKING HYDROCARBONS

Yoichi Nishimura, Yokohama; Masamitsu Ogata, and Takasori Ida, both of Kitakyusyu, all of Japan, assignors to Catalysts & Chemicals Industries Co., Ltd., Tokyo, Japan

PCT No. PCT/JP83/00312, § 371 Date May 15, 1985, § 102(e) Date May 15, 1985, PCT Pub. No. WO85/01225, PCT Pub. Date Mar. 28, 1985

PCT Filed Sep. 22, 1983, Ser. No. 741,670

Int. Cl.⁴ B01J *29/06*

U.S. Cl. 502—65 **7 Claims**

1. A method for preparing a catalyst composition for cracking hydrocarbons, which consists essentially of:

spray drying an aqueous slurry containing

(i) flash calcined alumina particles which have been prepared by contacting aluminum hydroxide which has been made by the Bayer process, with hot air having a temperature in the range of 350° to 700° C., for 5 seconds or less,

(ii) kaolin,

(iii) a precursor of a siliceous inorganic oxide matrix, and

(iv) a crystalline aluminosilicate zeolite,

to obtain catalyst particles consisting essentially of from 10 to 30 wt.% of said flash-calcined alumina, from 30 to 55 wt.% of said kaolin, from 3 to 40 wt.% of said crystalline aluminosilicate zeolite and the balance is said siliceous inorganic oxide matrix.

6. A method according to claim 1 in which said zeolite is rare earth exchange zeolite Y or hydrogen exchanged zeolite Y.

4,636,485

FILTER COMPRISING A CATALYST ON A SUBSTRATE FOR PURIFICATION OF AIR

Carl-Ernst van der Smissen, Lubeck, Fed. Rep. of Germany, assignor to Drägerwerk AG, Fed. Rep. of Germany

Filed Feb. 13, 1985, Ser. No. 701,102

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1984, 3405100

Int. Cl.⁴ B01J *21/04, 21/08, 21/18*

U.S. Cl. 502—66 **2 Claims**

1. A filter for filtering air comprising a granulated porous substrate selected from the group consisting of activated charcoal, activated alumina, silica gel and zeolite, said substrate supporting a layer of an oxide of a metal selected from the group consisting of zinc, copper, cobalt, nickel, silver and manganese, on which is deposited at platinum group catalyst selected from the group consisting of platinum, palladium, rhodium and ruthenium, and including a metal chromic acid salt as part of the deposit on said substrate.

4,636,486

POLYMERIZATION CATALYSTS

Adolfo Mayr; Ermanno Susa; Antonio Leccese, all of Ferrara; Velmore Davoli, Reggio Emilia, and Ettore Giachetti, Milan, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Division of Ser. No. 152,531, May 22, 1980, Pat. No. 4,544,717, which is a continuation of Ser. No. 543,795, Jan. 24, 1975, abandoned, which is a continuation of Ser. No. 350,525, Apr. 12, 1973, abandoned, which is a continuation of Ser. No. 47,550, Jun. 18, 1970, abandoned. This application Jul. 30, 1985, Ser. No. 760,539

Claims priority, application Italy, Jun. 20, 1969, 18462 A/69; Jun. 27, 1969, 18823 A/69

The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

Int. Cl.⁴ C08F *4/64*

U.S. Cl. 502—121 **18 Claims**

1. Polymerization catalysts prepared by mixing

(A) a catalyst-forming component which is a hydride or organo-metallic compound of a metal belonging to Groups I to III of the Mendelyeev Periodic Table with

(B) a supported catalyst-forming component which is the product obtained by contacting (1) an addition compound of di-, tri-, or tetravalent titanium selected from the group consisting of the halides, oxyhalides and alcoholates containing at least one molecule of an electron-donor bound to at least one Ti atom, or such a di-, tri-, or tetravalent titanium compound and a electron-donor compound, with (2) a support comprising an activated anhydrous magnesiunm dichloride characterized in that, in its X-raya powder spectrum, the diffraction line appearing at a lattice distance (d) of 2.56 Å, and which is most intense in the X-rays powder spectrum of the normal $MgCl_2$ is less intense and in its place a broadened halo appears at a lattice distance within the range of (d)=2.56 to 2.95 Å.

4,636,487

PROCESS FOR THE PREPARATION OF PROMOTED CATALYSTS

Stephen L. Parrott; Simon G. Kukes, and Howard F. Efner, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 16, 1985, Ser. No. 776,305
Int. Cl.[4] B01J *31/00, 21/02, 27/188, 27/19*
U.S. Cl. 502—168 **54 Claims**

1. A process for preparing a promoted catalyst comprising the steps of:

impregnating a catalyst support comprising a refractory material selected from the group consisting of alumina, silica and silica-alumina with a promoter comprising one or more dissolved metal compounds, wherein said metal compounds comprise metals selected from Group IB, Group VIB, Group VIIB or Group VIII of the Periodic Table;

drying the impregnated catalyst support;

treating the dried, impregnated catalyst support with a mercaptoalcohol, thereby forming a metal hydroxymercaptide; and

drying the treated catalyst support to produce said promoted catalyst.

4,636,488

NOVEL MOTOR FUEL ALKYLATION CATALYST AND PROCESS FOR THE USE THEREOF

Tamotsu Imai, Mount Prospect, and Joseph A. Kocal, Gurnee, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 12, 1985, Ser. No. 764,707
Int. Cl.[4] B01J *31/02*
U.S. Cl. 502—172 **2 Claims**

1. A catalyst for the alkylation of an isoparaffin with an olefin acting agent consisting essentially of an anhydrous, nonalcoholic mixture of from about 5 to 15 wt. % methyl tert-butyl ether and from about 85 to 95 wt. % hydrofluoric acid.

4,636,489

MODIFIED PROTEASE INHIBITORS, PROCESS FOR THEIR PREPARATION, AND PHARMACEUTICAL COMPOSITIONS PREPARED THEREFROM

Ursula Seemüller; Johannes Dodt, both of Munich, and Hans Fritz, Hohenbrunn, all of Fed. Rep. of Germany, assignors to Plantorganwerk KG, Bad Zwischenahn, Fed. Rep. of Germany and Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 6, 1984, Ser. No. 628,355
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1983, 3324534
Int. Cl.[4] A61K *37/64;* **C07K** *7/10*
U.S. Cl. 514—12 **14 Claims**

1. A peptide having the primary structure of eglin B or C which is shortened by 2–6 amino acids units at the N-terminus.

4,636,490

NOVEL PEPTIDIC DERIVATIVES INHIBITING GASTRIC SECRETION, PROCESS FOR PREPARING THEM AND DRUGS CONTAINING THEM

Jean Martinez, Caux; Jean-Pierre Bali, Saint-Gely du Fesc; Bertrand Castro, Perols, all of France; Dino Nisato, Pavia, Italy, and Henri Demarne, Montpellier, France, assignors to Sanofi and Centre National de la Recherche Scientifique, both of Paris, France

Filed Apr. 6, 1984, Ser. No. 597,427
Claims priority, application France, Apr. 20, 1983, 83 06492
Int. Cl.[4] A61K *37/43;* **C07K** *7/06*
U.S. Cl. 514—15 **15 Claims**

1. Peptides of general formula:

R—A—Gly—Trp—B—Asp—NH_2 (I)

in which:

Asp NH_2 represents the amide in α position of the aspartic acid of formula:

R represents hydrogen, a protector group of the terminal amine function which is t.butyloxy carbonyl (BOC), benzyloxy carbonyl (Z), or lower alkanoyl,

A designates:

either tyrosine, tyrosine-O-sulfate, threonine or methionine;

or a dipeptide selected from: —Ala—TYR—, —TYR—Thr—, —TYR

Met—, TYR designates tyrosine or tyrosine-O-sulfate;

or a tripeptide selected from: —Glu—Ala—TYR—, Asp—TYR—Thr—, —Asp—TYR—Met—;

or a tetrapeptide selected from: —Glu—Glu—Ala—TYR—, —Gln—Asp—TYR—Thr—, —Arg—Asp—TYR—Met—;

or a pentapeptide selected from: —Glu—Glu—Glu—Ala—TYR—, —Pyr—Gln—Asp—TYR—Thr—, —Asp—Arg—Asp—TYR—Met—;

B designates methionine, leucine or norleucine.

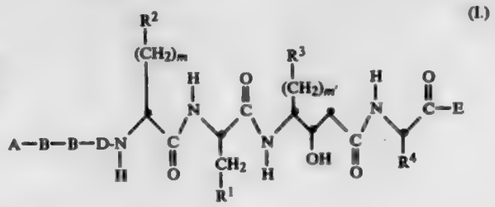
4,636,491

RENIN INHIBITORY PEPTIDES HAVING IMPROVED SOLUBILITY

Mark G. Bock, Hatfield; Robert M. DiPardo, Lansdale; Joshua S. Boger, Bryn Mawr; Ben E. Evans, Lansdale, and Roger Freidinger, Hatfield, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 27, 1984, Ser. No. 593,754
Int. Cl.[4] A61K *37/64;* **C07K** *5/02, 7/02*
U.S. Cl. 514—16 **4 Claims**

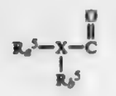
1. A peptide of the formula:



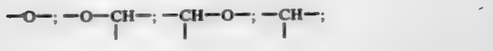
(I.)

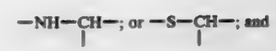
wherein:

A is hydrogen or



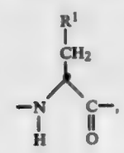
where X is —O—;





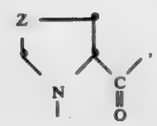
R_a^5 and R_b^5 may be the same or different and are hydrogen; Y—$(CH_2)_p$— or Y—$(CH_2)_{p'}$—CH=CH—$(CH_2)_{p''}$, where Y is C_{1-4} alkyl; hydrogen; aryl; C_{3-7}cycloalkyl; or C_{3-7}cycloalkyl or aryl substituted with up to five members independently selected from the group consisting of C_{1-4}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and halo; p is 0 to 5; and p' and p'' are independently 0 to 2; except that where X is —O—, only one of R_a^5 or R_b^5 is present;

B is absent; glycyl; sarcosyl; or



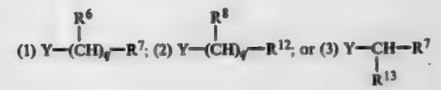
where R^1 has the same meaning as set out further below;

D is absent; or



where Z is —$(CH_2)_p$— and p is 1 or 2; or —S—;

E is



where

Y is —NH— or —O—;

q is 1–5;

q' is 0–5;

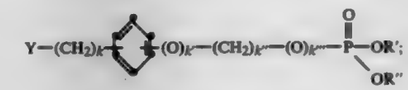
R^6 is hydrogen; hydroxy; $N(R)_2$, where R may be the same or different and is hydrogen or C_{1-4}alkyl; guanidyl; or $N^{\oplus}(R)_3A^{\ominus}$, where R is as defined above, and A^- is a counterion; provided that at least one R^6 is not hydrogen;

R^7 is C_{1-4}alkyl; C_{3-7}cycloalkyl; aryl; aryl substituted with up to three members independently selected from the group consisting of C_{1-6}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, amino, mono- or di-C_{1-4}alkylamino, amino-C_{1-4}alkyl, mono-, di-, or tri-C_{1-4}alkylamino-C_{1-4}alkyl, halo, carboxy, carboxy ester or amide, carboxy-C_{1-4}alkoxy, carboxy-C_{1-4}alkoxy ester or amide, α-aminocarboxy-C_{1-4}alkyl, α-aminocarboxy-C_{1-4}alkyl ester or amide, carboxy-C_{1-4}alkyl, carboxy-C_{1-4}alkyl ester or amide, guanidyl, and guanidyl-C_{1-4}alkyl; carboxy, ester or amide; sulfo; heterocyclic; or heterocyclic substituted with up to five members independently selected from the group consisting of C_{1-6}alkyl, hydroxy, trifluoromethyl, C_{1-4}alkoxy, halo, aryl, aryl C_{1-4}alkyl, amino, and mono- or di-C_{1-4}alkylamino;

R^8 is hydrogen; or carboxy, ester, or amide;

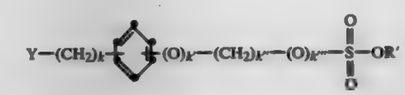
R^{12} is carboxy, ester or amide; sulfo; or aryl substituted with up to three members selected from the group consisting of amino-C_{1-4}alkyl, mono-, di-, or tri-C_{1-4}alkylamino-C_{1-4}alkyl, halo, carboxy, carboxy ester or amide, carboxy-C_{1-4}alkoxy, carboxy-C_{1-4}alkoxy ester or amide, α-aminocarboxy-C_{1-4}alkyl, α-aminocarboxy-C_{1-4}alkyl, carboxy-C_{1-4}alkyl ester or amide, carboxy-C_{1-4}alkyl ester or amide, guanidyl, and guanidyl-C_{1-4}alkyl; and

R^{13} is carboxy, ester, or amide; or



(4)

or



(5)

where

Y is —NH— or —O—;

k is 0–4;

k' is 0 or 1;

k'' is 0–4;

k''' is 0 or 1;

R' is hydrogen or C_{1-4}alkyl; and

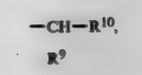
R'' is hydrogen or C_{1-4}alkyl;

R^1 is hydrogen; C_{1-4}alkyl; hydroxy C_{1-4}alkyl; aryl; aryl substituted with up to three members selected from the group consisting of C_{1-4}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and halo; indolyl; 4-imidazolyl; amino C_{2-4}alkyl; guanidyl C_{2-3}alkyl; or methylthiomethyl;

R^2 is hydrogen; C_{1-4}alkyl; aryl; aryl substituted with up to three members selected from the group consisting of C_{1-4}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and halo; or indolyl;

R^3 is C_{3-6}alkyl; C_{3-7}cycloalkyl; aryl; or C_{3-7}cycloalkyl or aryl substituted with up to three members selected from the group consisting of C_{1-4}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and halo;

R^4 is hydrogen; or



10 where R^{10} is hydrogen; C_{1-4}alkyl; hydroxy; or C_{3-7}cycloalkyl; and R^9 is hydrogen; C_{1-4}alkyl; aryl; aryl C_{1-4}alkyl; aryl C_{1-4}alkyl or aryl where the aryl portion is substituted with up to three members selected from the group consisting of C_{1-4}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and halo; or indolyl;

m is 1 to 4;

m' is 1 to 4; and

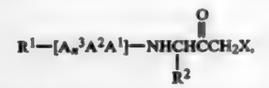
wherein all of the asymmetric carbon atoms have an S configuration, except for those in the A, B, D, and E substituents, which may have an S or R configuration; and a pharmaceutically acceptable salt thereof.

4,636,492
INHIBITION OF VIRAL PROTEASE ACTIVITY BY PEPTIDE HALOMETHYL KETONES

Charles A. Kettner, and Bruce D. Korant, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

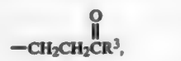
Filed Aug. 29, 1984, Ser. No. 645,426
Int. Cl.[4] A61K *37/02*; C07K *5/06, 5/08, 5/10*
U.S. Cl. 514—18 26 Claims

1. A process for treating picornavirus infection in a mammal, comprising administering to a mammal an effective antiviral amount of a compound of the formula



(I)

or a physiologically acceptable salt thereof, wherein
A^1 is an amino acid residue selected from the group consisting of Ala, Val, Leu, Ile, Phe, Tyr, Gly, Pro, Ser, and Thr;
A^2 is an amino acid residue selected from the group consisting of Ala, Val, Leu, Ile, and Gly;
A^3 is an amino acid residue selected from the group consisting of Ala, Val, Leu, Ile, Phe, Tyr, and Gly;
R^1 is an N-terminal protecting group; and
R^2 is methyl, isopropyl, isobutyl, 4-hydroxybenzyl, or



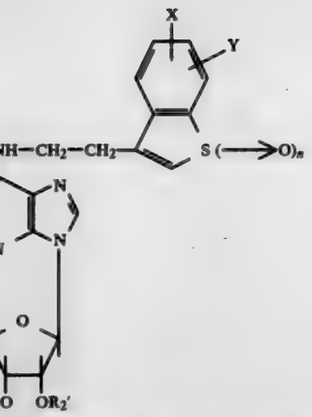
wherein
R^3 is amino, methoxy, ethoxyl, benzyloxy, or alkyl of 1 to 6 carbon atoms;
X is Cl or Br; and
n is 0 or 1; with the proviso that both A^3 and A^1 are not simultaneously Ala.

4,636,493
BENZOTHIEN-3-YL ADENOSINE; BENZOTHIEN-3-YL ADENOSINE, S-OXIDE; AND BENZOTHIEN-3-YL, S,S-DIOXIDE ADENOSINE COMPOUNDS

William Patt, Chelsea, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 695,022, Jan. 25, 1985, Pat. No. 4,600,707. This application Apr. 18, 1986, Ser. No. 853,581
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—46 12 Claims

1. A method of treating hypertension in a mannal suffering therefrom, which comprises administering to such mammals an antihypertensive effective amount of a compound of the formula



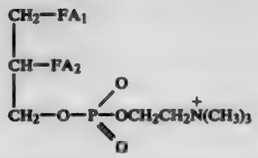
wherein is — or =, n is 0–2, inclusive, X and Y are each independently H, hydroxy, lower alkoxy, lower alkyl, amino, mono-lower alkylamino, di-lower alkylamino, nitro, or halogen; R_2 is H, halogen, or amino; R_2', R_3', and R_5' are independently H, lower alkanoyl, benzoyl, or benzoyl substituted by lower alkyl, lower alkoxy, halogen, or when taken together, R_2' and R_3' may be 2',3'-lower alkylidene; or pharmaceutically acceptable acid addition salts thereof; in unit dosage form.

4,636,494
PROCESS AND COMPOSITION FOR TREATING DISORDERS BY ADMINISTERING AMPHETAMINE AND CHOLINE

John H. Growdon, Brookline, and Richard J. Wurtman, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 229,812, Jan. 30, 1981, Pat. No. 4,346,085, which is a continuation-in-part of Ser. No. 126,124, Feb. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 88,227, Oct. 25, 1979, abandoned, which is a continuation of Ser. No. 847,967, Nov. 2, 1977, abandoned. This application Mar. 17, 1982, Ser. No. 358,938
Int. Cl.[4] A61K *31/55, 31/415, 31/515, 31/685*
U.S. Cl. 514—78 13 Claims

1. A composition of matter comprising (a) a drug which, when administered to a human causes side effects associated with inadequate release of brain acetylcholine, said drug being selected from the group consisting of and phenytoin, phenobarbital and diazepam and (b) an amount of a compound effective to raise the bloodstream choline level of a patient to between about 10 and 50 nanomoles/ml and to release adequate amounts of brain acetylcholine selected from the group consisting of choline, a salt of choline, lysolecithin, an acyglycerophosphocholine having the formula:



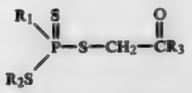
wherein FA_1 and FA_2 can be the same or different and are fatty acid residues having from 6–26 carbon atoms, glycerophosphatidyl choline and mixtures thereof.

4,636,495
S-PHENYLACETONYL TRITHIOPHOSPHONATE INSECTICIDES

Charles G. Chavdarian, Martinez, Calif., and Alexandra B. Shortt, Houston, Tex., assignors to Stauffer Chemical Company, Westport, Conn.

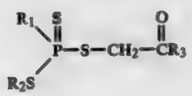
Filed Apr. 22, 1985, Ser. No. 725,717
Int. Cl.[4] A01N *57/06*; C07F *9/40*
U.S. Cl. 514—125 14 Claims

1. A compound having the formula:



in which R_1 is methyl or ethyl; R_2 is C_1–C_6 alkyl; and R_3 is phenyl or halo-substituted phenyl.

9. A method of controlling insects comprising applying to said insecg or to a locus at which control is desired an insecticidally effective amount of a compound having the formula



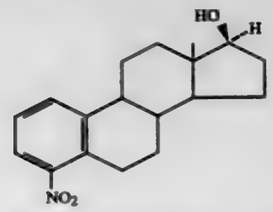
in which R_1 is metyl or ethyl; R_2 is C_1–C_6 alkyl; and R_3 is phenyl or halo-substituted phenyl.

4,636,496
COMPOSITIONS INHIBITING MURINE MXT DUCTAL CARCINOMA

Samuel C. Brooks, Orchard Lake, and Jerome P. Horwitz, Oak Park, both of Mich., assignors to Wayne State University, Detroit, Mich.

Continuation-in-part of Ser. No. 741,125, Jun. 4, 1985, which is a continuation of Ser. No. 591,500, Mar. 20, 1984, Pat. No. 4,568,673. This application Jan. 28, 1986, Ser. No. 823,273
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—182 7 Claims

1. A method for inhibiting the growth of MXT murine ductal carcinoma comprising administering to mice being treated a compound of the formula



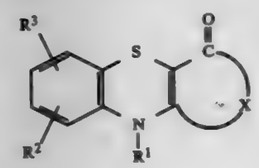
in admixture with a pharmacologically and physiologically acceptable carrier, in an amount sufficient to inhibit the growth of the ductal carcinoma.

4,636,497
ANTI-THROMBOTIC PHARMACEUTICAL COMPOSITIONS COMPRISING TRICYCLO-4H-1,4-BENZOTHIAZINE DERIVATIVES AND METHOD OF USE THEREFOR

Ekkehard Niemers, Wuppertal; Rudi Grötzmann, Solingen; Mithat Mardin, Wuppertal, all of Fed. Rep. of Germany; Wolf-Dieter Busse, West Haven, Conn., and Horst Meyer, Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 517,081, Jul. 22, 1983, abandoned. This application Aug. 29, 1985, Ser. No. 770,895
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1982, 3229122
Int. Cl.[4] A61K *31/38*; C07D *279/10, 513/04*
U.S. Cl. 514—215 2 Claims

1. A pharmaceutical composition comprising, as an active ingredient an anti-thrombotic-effective amount of a fused 4H-1,4-benzothiazine of the formula



I

wherein
R^1 represents hydrogen or C_1–C_8-alkyl,
R^2 and R^3 represent hydrogen, C_1–C_8-alkyl, halogen, nitro, cyano, C_1–C_8-alkylsulphonyl, phenylsulfonyl, hydroxyl, C_1–C_8-alkoxy or carboxylic acid acyloxy and R^2 and R^3 can be identical or different, with the proviso that R^2 and R^3 do not denote bromine, or R^2 and R^3 do not both denote hydrogen, and
X represents alkylene (having 2 to 4 C atoms) which is unsubstituted or substituted by C_1–C_8-alkyl, C_1–C_8-alkoxy, phenyl, fluorine or C_1–C_8-alkoxycarbonyl, and wherein a methylene group of the alkylene bridge is replaced by O, S, SO_2, SO, NH or N-alkyl and an inert pharmaceutical carrier.

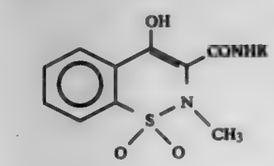
2. A method for treating thromboses in warm-blooded animals which comprises administering to the said animals an anti-thrombotic effective amount of an active ingredient according to claim 1 either alone or in admixture with a diluent or in the form of a medicament.

4,636,498
FORMULATION OF ANTIINFLAMMATORY DRUGS

John L. LaMattina, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 659,752, Oct. 11, 1984, abandoned. This application Aug. 15, 1985, Ser. No. 765,415
The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.
Int. Cl.[4] A61K *31/54, 31/425*
U.S. Cl. 514—222 20 Claims

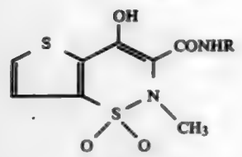
1. A method for the oral treatment of inflammation in man which comprises, in addition to treatment with an antiinflammatory amount of an oxicam having the formula



(I)

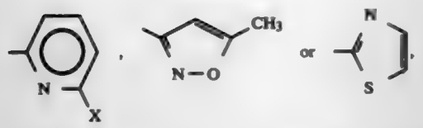
or

-continued



(II)

wherein R is



and X is hydrogen, chloro or methyl; or a pharmaceutically acceptable salt thereof; treatment with a gastric anti-irritation and ulcer-inhibiting amount of a compound selected from the group consisting of:

2-guanidino-4-(4-imidazolyl)thiazole;
2-guanidino-4-(2-methyl-4-imidazolyl)thiazole;
2-(N-benzyl-N'-guanidino)-4-(2-methyl-4-imidazolyl)-thiazole;
2-(N-pentyl-N'-guanidino)-4-(2-methyl-4-imidazolyl)-thiazole;
2-guanidino-4-[2-(hexylamino)-4-imidazolyl]thiazole; and the pharmaceutically acceptable salts thereof.

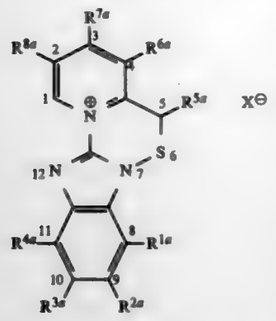
4,636,499

SULPHENAMIDES

Arne E. Brändström, Gothenburg; Per L. Lindberg, Askim, and Björn Wallmark, Mölnlycke, all of Sweden, assignors to Aktiebolaget Hassle, Molndal, Sweden

Filed May 30, 1985, Ser. No. 739,425
Claims priority, application Sweden, Jun. 13, 1984, 8403179
Int. Cl.[4] C07D *513/04, 513/12;* A61K *31/54*
U.S. Cl. 514—222 **18 Claims**

1. A compound of the formula IIIa



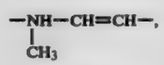
IIIa

wherein R^{1a}, R^{2a}, R^{3a} and R^{4a} are the same or different and are hydrogen, and alkyl, alkoxy, optionally completely or predominantly substituted by fluorine or chlorine, halogen, CN, $-CF_3$, $-NO_2$, —COR, or —COOR an aryl group having up to 10 carbon atoms, an aryloxy group having up to 10 carbon atoms, or arylalkoxy group having up to 10 carbon atoms in the aryl group and 1 to 5 carbon atoms in the alkloxy group, or adjacent groups R^{1a}, R^{2a}, R^{3a} and R^{4a} together with the adjacent carbon atoms in the benzimidazole ring form a 5-, 6- or 7-membered monocyclic ring or a 9-, 10- or 11-membered bicyclic ring, which rings may be saturated or unsaturated and may contain 0–3 heteroatoms selected from N and O and which rings may be optionally substituted with 1–4 substituents selected from alkyl groups with 1–3 carbon atoms, halogen alkylene radicals containing 4–5 carbon atoms giving spiro compounds, or two or four of these substituents together form one or two oxy groups



whereby if R^{1a}, R^{2a}, R^{3a} and R^{4a} together with the adjacent carbon atoms in the benzimidazole ring form two rings they may be condensed with each other,

R^{5a} is hydrogen or an alkyl group,
R^{6a} is hydrogen or an alkyl group or R^{5a} and R^{6a} are joined together to form an alkylene chain,
R^{7a} is hydrogen, alkyl, alkoxy, alkenyloxy, or an alkynyloxy group,
R^{8a} is hydrogen or an alkyl group, or R^{6a} and R^{7a}, or R^{7a} and R^{8a} together with the adjacent carbon atoms in the pyridinium ring form a ring wherein the part constituted by R^{6a} and R^{7a} or R^{7a} and R^{8a} is —CH=CH—CH=CH—, $-O-(CH_2)_p-$, $-CH_2(CH_2)_p-O-CH=CH-$,



—N—CH=CH—, or $-S-(CH_2)_p-$, wherein p is 2, 3 or 4 and the O, S and N atoms always are attached to position 3 and compound 3a in the compound IIIa,

R is an alkyl group, a cycloalkyl group, an aryl group having up to ten carbon atoms or an arylalkyl group having up to ten carbon atoms in the aryl group and one to seven carbon atoms in the alkyl group, and

X^- is a pharmaceutically acceptable anion.

12. A pharmaceutical preparation for the treatment of inflammatory diseases of the gastrointestinal tract comprising a compound according to claim 1 and the pharmaceutically acceptable carrier therefor, the concentration of said compound in said pharmaceutical composition being sufficient that the preparation is therapeutically effective to treat inflammatory diseases of the gastrointestinal tract in man or animal when administered thereto in an effective dosage form.

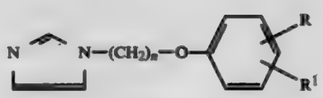
4,636,500

N-(PHENOXYALKYL)IMIDAZOLES AS SELECTIVE INHIBITORS OF THE THROMBOXANE SYNTHETASE ENZYME AND PHARMACEUTICAL COMPOSITIONS THEREOF

Peter E. Cross, Canterbury, and Roger P. Dickinson, Dover, both of England, assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 95,755, Nov. 19, 1979, Pat. No. 4,602,016.
This application Mar. 21, 1985, Ser. No. 714,422
Claims priority, application United Kingdom, Dec. 13, 1978, 48367/78
Int. Cl.[4] A61K *31/535;* C07D *233/60*
U.S. Cl. 514—234 **11 Claims**

1. A compound of the formula



(I)

or the pharmaceutically acceptable acid addition salt thereof, wherein:

R is $OCH_2CO_2R^2$, CH_2CONHR^3, OCH_2CONHR^3, $CH_2CON(R^4)_2$, $OCH_2CON(R^4)_2$, tetrazolyl, CH_2-tetrazolyl or OCH_2-tetrazolyl;

R^1 is H, C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen;

R^2 is H or C_1–C_4 alkyl;

R^3 is H, C_1–C_4 alkyl, C_1–C_4 alkanoyl, C_1–C_4 alkylsulphonyl, CN, benzoyl or benzenesulphonyl, or a monosubstituted benzoyl or benzenesulfonyl, the monosubstituent being C_1–C_4 alkyl, C_1–C_4 alkoxy, CF_3 or halogen;

each R^4 is C_1–C_4 alkyl or the two R^4 groups together with the nitrogen atom to which they are attached form a pyrrolidino, piperidino or morpholino group;

and n is 2 or 3.

10. A pharmaceutical composition for use as an inhibitor of thromboxane synthetase enzyme, comprising an effective amount of a compound of claim 1 or a pharmaceutically acceptable acid addition salt thereof together with a pharmaceutically acceptable diluent or carrier.

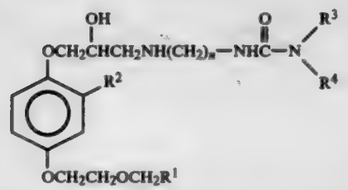
4,636,501

PARA-SUBSTITUTED 3-PHENOXY-1-CARBONYLAMINO-ALKYLAMINO-PROPANOL COMPOUNDS, BETA RECEPTOR BLOCKING COMPOSITIONS AND USE

Bill B. R. Gustafsson, Bollebygd; Sven A. Hedberg, Gråbo, and Bo T. Lundgren, Frillesås, all of Sweden, assignors to Aktiebolaget Hassle, Molndal, Sweden

Continuation of Ser. No. 621,147, Jun. 18, 1984, abandoned, which is a continuation of Ser. No. 482,266, Apr. 5, 1983, abandoned, which is a continuation-in-part of Ser. No. 450,006, Dec. 15, 1982, abandoned. This application Jul. 22, 1985, Ser. No. 757,763
Claims priority, application Sweden, Dec. 17, 1981, 8107574
Int. Cl.[1] A61K *31/17, 31/535;* C07C *127/19;* C07D *295/20*
U.S. Cl. 514—235 **18 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, in which formula

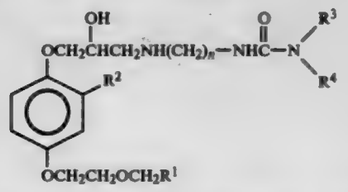
R^1 is H, a straight or branched alkyl group containing 1–5 carbon atoms, a cycloalkyl group containing 3–6 carbon atoms, or a cycloalkylalkyl group containing 4–6 carbon atoms;

R^2 is H;

n is 2, 3, or 4; and

R^3 and R^4 together with the adjacent nitrogen atom form a morpholino group.

9. A pharmaceutical preparation comprising an amount of compound effective to block the cardiac adrenergic beta-receptor, which compound has the formula



or a pharmaceutically acceptable salt thereof, wherein

R^1 is a straight or branched alkyl group containing 1–5 carbon atoms, or a cycloalkylalkyl group containing 4–6 carbon atoms;

R^2 is H

R^3 and R^4 together with adjacent nitrogen atom form a morpholino group; and

a pharmaceutically acceptable carrier therefor.

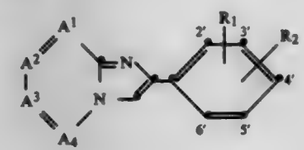
4,636,502

METHODS OF PRODUCING A POSITIVE INOTROPIC EFFECT OR VASODILATION BY ADMINISTRATION OF 3-PHENYL IMIDAZO PYRIMIDINES AND PYRAZINES

Wayne A. Spitzer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 606,806, May 3, 1984, Pat. No. 4,537,889, which is a division of Ser. No. 453,565, Dec. 27, 1982, abandoned. This application May 17, 1985, Ser. No. 734,984
Int. Cl.[4] A61K *31/505, 31/495, 31/53;* C07D *471/02*
U.S. Cl. 514—249 **14 Claims**

1. A method of producing a positive inotropic effect or causing vasodilation in a mammal, which comprises the administration to such mammal an effective amount of a compound of the formula



and their pharmaceutically acceptable salts, wherein one of A_1, A_2, and A_3 *is N, and the remaining* A_1, A_2, A_3, and A_4 are each CH; and each of R_1 and R_2 is independently C_1–C_4 alkyl, C_1–C_4 alkoxy, allyloxy, benzyloxy, (C_1–C_4 alkyl)thio, (C_1–C_4 alkyl)-sulfinyl, (C_1–C_4 alkyl)sulfonyl, hydroxy, halo, cyano, nitro, mono- or di-(C_1–C_4 alkyl)amino, trifluoromethyl, or Z-Q-substituted C_1–C_4 alkoxy, wherein Q is oxygen, sulfur, sulfinyl, sulfonyl, or a bond, and Z is C_1–C_4 alkyl, phenyl or phenyl substituted with halo, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, nitro, amino, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, or C_1–C_4 alkylsulfonyl.

4,636,503

DUST-FREE QUINOXALINE 1,4-DI-N-OXIDES

Hans W. Hammen, Solingen, and Herbert Voege, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 2, 1984, Ser. No. 667,652
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340931
Int. Cl.[4] A61K *31/50*
U.S. Cl. 514—249 **4 Claims**

1. A process for the preparation of a dust-free animal growth-promoting quinoxaline 1,4-di-N-oxide comprising

(a) adjusting the water content of the quinoxaline 1,4-di-N-oxide to about 5–15% by weight, and

(b) adding thereto a water-binding flow-regulating agent in an amount approximately equal to the water content.

4,636,504

6-(ACYLAMINOARYL)-3(2H)-PYRIDAZINONE DERIVATIVES AND THEIR USE

Phillip A. Reasy, Hillsdale, N.J.; Marco Thyes, Ludwigshafen, Fed. Rep. of Germany; Albrecht Franke, Wachenheim, Fed. Rep. of Germany; Horst Koenig, Ludwigshafen, Fed. Rep. of Germany; Hans Dieter Lehmann, Hirschberg, Fed. Rep. of Germany; Josef Gries, Wachenheim, Fed. Rep. of Germany; Ludwig Friedrich Bruchi, Fed. Rep. of Germany, and Dieter Lenke, Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

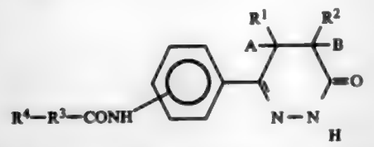
Filed Jan. 17, 1984, Ser. No. 571,675

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 33020213

Int. Cl.⁴ C07D *237/06*; A61K *31/50*

U.S. Cl. 514—252 **13 Claims**

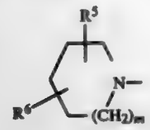
1. A 6-(alkanoylaminoaryl)-3(2H)-pyridazinone derivative of the formula I



(I)

wherein the substituents on the phenylene radical are para to one another, A and B are each hydrogen or together form a bond, R^1 is hydrogen or methyl, R^2 is hydrogen or, where A and B are each hydrogen R^1 and R^2 together form a C_1–C_2-alkylene radical, R^3 is a straight-chain C_1–C_4-alkylene group which can be substituted by C_1–C_3-alkyl group or by two methyl groups, and R^4 is

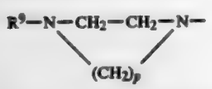
(b) a group of the formula II



(II)

where the broken line can be an additional bond, R^5 is C_1–C_4-alkyl which is unsubstituted or substituted by phenyl, or phenyl which is unsubstituted or substituted by 1 or 2 halogen atoms, or is a group of the formula R^7R^8N, where R^7 is hydrogen or phenyl, and R^8 is C_1–C_4-acyl or benzoyl, or R^7 and R^8, together with the nitrogen atom, form a benzimidazol-2-on-1-yl group, R^6 is C_1–C_4-alkyl, hydroxyl, C_1–C_4-acyl, (C_1–C_5-alkoxy)-carbonyl or cyano, or R^5 and R^6 together form a C_1–C_4-alkylene chain, and m is 0, 1 or 2, or

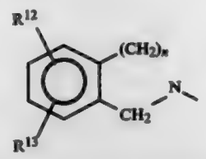
(c) a group of the formula III



(III)

where R^9 is a C_1–C_3-hydrocarbon radical which may be substituted by phenyl or a C_3–C_6-cycloalkyl (in which case a C_5–C_6-cycloalkyl group can be benzofused) or C_6–C_{10}-aryl which can contain 1 to 3 C_1–C_4-alkyl, C_1–C_4-alkoxy, trifluoromethyl, nitro, hydroxyl, C_1–C_4-acyl, carboxyl, (C_1–C_5-alkoxy)-carbonyl, amido, N-(C_1–C_4-alkyl)amido, N,N-di-(C_1–C_4-alkyl)amido, tri(C_1–C_4-alkyl)-silyl, cyano, amino, C_1–C_4-alkylamino, di-(C_1–C_4-alkyl)amino, C_1–C_4-alkanoyl amino groups and/or halogen atoms; a C_6–C_{10}-aroyl group which is unsubstituted or substituted by 1 to 3 C_1–C_4-alkyl, C_1–C_4-alkoxy, trifluoromethyl, nitro, hydroxyl, C_1–C_4-alkanoyl, carboxyl, C_1–C_5-alkoxy-carbonyl, N,N-di-(C_1–C_4-alkyl)-amido, cyano, di-(C_1–C_4-alkyl)-amino groups and/or halogen atoms; or a hetaroyl group having 5 to 6 ring members, which can contain 1 to 3 hetero atoms and may be benzofused; a C_3–C_{12}-cycloalkyl, C_1–C_8-acyl or (C_1–C_5-alkoxy)-carbonyl group or a C_6–C_{10}-aryl radical which is unsubstituted or monosubstituted, disubstituted or trisubstituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, hydroxyl, trifluoromethyl, C_1–C_4-acyl, carboxyl, (C_1–C_5-alkoxy)-carbonyl, cyano, nitro, amino, C_1–C_4-alkylamino, di-C_1–C_4-alkylamino, arylamino or C_1–C_4-acylamino; or a 5-membered or 6-membered hetaryl radical which may be benzofused, contains 1 to 3 nitrogen atoms and may or may not contain an oxygen atom or sulfur atom, and p is 2 or 3, or

(e) a group of the formula V



(V)

where R^{12} and R^{13} are each hydrogen, halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy, and n is 1, 2, or 3.

4,636,505

AMIDE DERIVATIVES

Howard Tucker, Macclesfield, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England

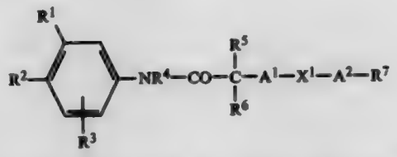
Filed Jul. 15, 1983, Ser. No. 514,332

Claims priority, application United Kingdom, Jul. 23, 1982, 8221421

Int. Cl.⁴ A61K *31/505, 31/275, 31/16*

U.S. Cl. 514—256 **9 Claims**

1. An acylanilide of the formula:



wherein R^1 is cyano, nitro, fluoro, chloro, bromo or iodo, or alkyl, alkoxy, alkanoyl, alkylthio, alkylsulphinyl, alkylsulphonyl or perfluoroalkyl each of up to 4 carbon atoms;
wherein R^2 is cyano, nitro, fluoro, chloro, bromo or iodo, or alkanoyl, alkylthio, alkylsulphinyl, alkysulphonyl or perfluoroalkyl, each of up to 4 carbon atoms;
wherein R^3 is hydrogen or halogen;
wherein R^4 is hydrogen or alkyl or up to 4 carbon atoms;
wherein R^5 is hydroxy or alkoxy or acyloxy each of up to 15 carbon atoms;
wherein R^6 is alkyl or halogenoalkyl of up to 4 carbon atoms;
wherein A^1 is alkylene of up to 6 carbon atoms;
wherein A^2 is a direct link or alkylene of up to 6 carbon atoms;
wherein X^1 is sulphur, sulphinyl or sulphonyl (—SO_2—);
wherein R^7 is alkyl, alkenyl, hydroxyalkyl or cycloalkyl each of up to 6 carbon atoms, or R^7 is phenyl which bears one or two substituents selected from hydrogen, halogen, nitro, and cyano, and alkyl, alkoxy, alkanoyl, alkylthio, alkylsulphinyl, alkylsulphonyl and perfluoroalkyl; or R^7 is naphthyl; or R^7 is 5- or 6-membered saturated or unsaturated heterocyclic which contains one, two or three heteroatoms selected from oxygen, nitrogen and sulphur, which heterocyclic may be a single ring or may be fused to a benzo-ring, and which heterocyclic is unsubstituted or bears one or two halogen or alkyl of up to 4 carbon atoms substituents.

9. A method for producing an antiandrogenic effect in a warm-blooded animal in need of such treatment which comprises administering to said animal an effective amount of acylanilide claimed in claim 1.

4,636,506

7-HETEROCYCLIC-1,4-DIHYDROQUINOLONES

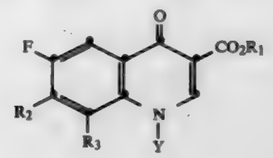
Paul J. Gilligan, New Haven; Paul R. McGairk, Gales Ferry, both of Conn., and Michael J. Witty, Dover, Great Britain, assignors to Pfizer, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 679,147, Dec. 6, 1984, abandoned. This application Apr. 4, 1985, Ser. No. 719,663

Int. Cl.⁴ A61K *31/47*; C07D *215/18*

U.S. Cl. 514—256 **12 Claims**

1. A compound selected from those of the formula:



wherein
R_1 is hydrogen, a pharmaceutically acceptable cation or alkyl of 1 to 3 carbon atoms;
Y is selected from the group consisting of alkyl and haloalkyl of 1 to 3 carbon atoms, allyl, vinyl, cyclopropyl, hydroxyethyl, phenyl, 4-hydroxyphenyl and 4-fluorophenyl;
R_2 is 3-pyridyl or 4-pyridyl which may be substituted by one or two substituents selected from the group consisting of fluoro, chloro, hydroxy, alkoxy of 1 to 4 carbon atoms, amino, dialkylamino of 2 to 8 carbon atoms, hydroxyalkyl of 1 to 6 carbon atoms, aminoalkyl of 1 to 6 carbon atoms; 5-pyrimidyl, or 6-quinolyl, and
R_3 is fluoro;
and the acid addition salts thereof when R_1 is hydrogen.

10. A method for treating a host affected by bacterial disease which comprises administering to said host an antibacterially effective amount of a compound as claimed in claim 1.

4,636,507

HOST DEFENSE MECHANISM ENHANCEMENT

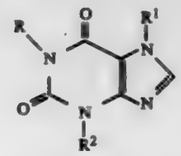
Donald L. Kreutzer, Avon, Conn.; William J. Novick, Jr., Lebanon, N.J., and Michael P. Sheetz, Avon, Conn., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Apr. 30, 1984, Ser. No. 605,085

Int. Cl.⁴ A61K *31/52*

U.S. Cl. 514—263 **53 Claims**

1. A method of enhancing host defense mechanisms against trauma which comprises administering to a host in need of defense mechanisms enhancement against trauma a defense mechanisms enhancing against trauma effective amount of a compound of the formula



wherein R and R^1 are the same or different and are lower alkyl,

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4,636,508

5-PYRIMIDINECARBOXYAMIDES AND TREATMENT OF LEUKEMIA THEREWITH

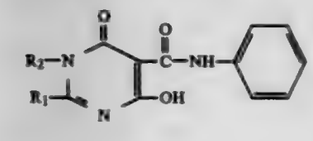
Arthur D. Brewer, Puslinch, Canada, and John A. Mirsteill, Watertown, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn. and Uniroyal Ltd., Don Mills, Canada

Filed Apr. 22, 1985, Ser. No. 725,736

Int. Cl.⁴ A61K *31/515, 31/505*; C07D *239/52, 239/60*

U.S. Cl. 514—274 **6 Claims**

1. A method for inducing the regression of leukemia in a host, which comprises treating the host with an effective amount of a compound of the formula:



wherein
R_1 is an alkoxy group having from one to four carbon atoms;
R_2 is hydrogen or a carbohydrate residue selected from the group consisting of furanosyl, pyranosyl, glucopyranosyl or galactopyranosyl groups, their deoxy derivatives, and hydroxyalkoxyalkyl and polyhydroxyalkyl groups having from 2–12 carbon atoms in each of the alkoxy and alkyl moieties thereof; and
the pharmaceutically acceptable addition salts thereof.

4,636,509

SUBSTITUTED PYRIMIDIN-2-ONES, THE SALTS THEREOF, PROCESSES FOR THEIR PREPARATION, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND A METHOD THEREFOR

Gordon H. Phillipps, Wembley, and Christopher Williamson, Cobham, both of United Kingdom, assignors to Glaxo Group Limited, England

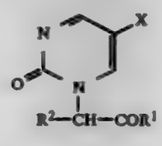
Continuation of Ser. No. 283,645, Jul. 15, 1981, abandoned. This application May 27, 1983, Ser. No. 498,723

Claims priority, application United Kingdom, Jul. 15, 1980, 8023063

Int. Cl.⁴ A61K *31/505*; C07D *239/36*

U.S. Cl. 514—274 **12 Claims**

1. Compounds of the general formula



(I)

wherein
X represents a halogen atom or a trifluoromethyl group;

R^1 represents a C_{6-10} carbocyclic aromatic group optionally substituted by one or two substituents selected from halogen atoms, hydroxyl, alkoxy having from 1 to 6 carbon atoms, aralkoxy having from 7 to 10 carbon atoms, amino, amino substituted with one or two alkyl groups having from 1–6 carbon atoms, aralkyl groups having from 7–10 carbon atoms, phenyl groups, alkanoyl groups in which the alkyl moiety has from 1–6 carbon atoms, haloalkanoyl groups in which the alkyl moiety has from 1–6 carbon atoms or benzoyl groups, cyclic imido groups derived from dibasic alkanoic acids having from 1–6 carbon atoms in the alkyl moiety, from aralkanoic acids having from 7–10 carbon atoms in the aralkyl moiety or from benzene dicarboxylic acids, $—S(O)_nR^a$ (in which n is 0, 1 or 2 and R^a is lower alkyl), nitro, cyano, carboxyl, alkoxycarbonyl having 1–6 carbon atoms in the alkyl moiety, carboxamido, C_{1-4} alkyl, phenyl and methylenedioxy groups, which methylenedioxy group may carry alkyl substituents or, a perfluorinated alkyl group; and

R^2 represents a hydrogen atom or a lower alkyl C_{7-16} aralkyl or C_{6-10} aryl group or the group COR^{1a} (in which R^{1a} is as defined for R^1, R^1 and R^{1a} being the same or different); and the physiologically compatible salts thereof.

12. In a method of combined therapy for combating abnormal cell proliferation in a host which comprises administering to said host an amount of a metaphase arrest agent sufficient to cause the division cycle of cells within said host to be arrested in the metaphase, the improvement comprising using as said metaphase arrest agent a compound of formula I as defined in claim 1 or a physiologically compatible salt thereof.

4,636,510

4-PHENYL-TETRAHYDRO-FURANO-PYRIDINES AND ANTI-DEPRESSANT PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Claus Schneider, Ingelheim am Rhein; Gerhard Walther, Bingen; Karl-Heinz Weber, Gau-Algesheim; Wolf D. Bechtel, Appenheim, and Karin Böke-Kuhn, Gau-Algesheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

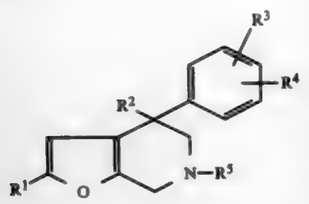
Filed Apr. 19, 1984, Ser. No. 601,910

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1983, 3315157

Int. Cl.⁴ A61K *31/44;* **C07D** *491/048*

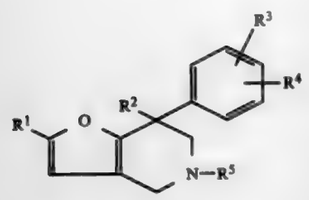
U.S. Cl. 514—302 **10 Claims**

1. A compound of the formula



(I)

or



(II)

wherein

R^1 represents hydrogen, fluorine, chlorine, bromine, an alkyl group having from 1 to 4 carbon atoms, a hydroxyalkyl group having 1 or 2 carbon atoms, an alkoxyalkyl group wherein each alkyl group may have 1 or 2 carbon atoms, a pyrrolidinomethyl group, or a dialkylaminomethyl group wherein each alkyl group may have 1 or 2 carbon atoms;

R^2 represents hydrogen, hydroxyl, methoxy, or ethoxy;

R^3 and R^4, which may be the same or different, each represent hydrogen, fluorine, chlorine, bromine, methyl, ethyl, hydroxyl, methoxy, acetoxy, or benzyloxy or R^3 and R^4 together with the phenyl ring form a 3,4-benzodioxanyl group;

R^5 represents hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a benzyl or o-chlorobenzyl group,

with the proviso that in Formula II R^2 represents hydrogen and R^1 does not represent hydroxyalkyl, or a pharmaceutically acceptable acid addition salt thereof.

10. A method of treating depressive states of various origins which comprises administering to a warm-blooded host in need of such treatment an anti-depressively effective amount of one or more compounds of claim 1 in conjunction with conventional excipients and/or carriers.

4,636,511

DERIVATIVES OF 3-AMINOPROPANE-1,2-DIOL

Franz Ostermayer, and Markus Zimmermann, both of Riehen, Switzerland, assignors to Ciba-Geigy AG, Ardsley, N.Y.

Continuation of Ser. No. 378,165, May 14, 1982, Pat. No. 4,497,813, which is a continuation-in-part of Ser. No. 255,414, Apr. 20, 1981, abandoned, which is a continuation-in-part of Ser. No. 181,581, Aug. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 122,640, Feb. 19, 1980, abandoned. This application Dec. 28, 1984, Ser. No. 687,093

The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.

Int. Cl.⁴ C07C *103/26;* **A61K** *31/605*

U.S. Cl. 514—311 **7 Claims**

1. A compound selected from the group consisting of 1-(2-(3-carbamoyl-4-hydroxyphenoxy)-ethylamino)-3-(2-(pyrrol-1-yl)-phenozy-propan-2-ol, 1-(4-acetamidophenoxy)-3-(2-(3-carbamoyl-4-hydroxyphenoxy)-ethylamino)-propan-2-ol, N-(4-(2-hydroxy-3-(3-carbamoyl-4-hydroxyphenoxy)-ethylamino)-propoxy)phenyl)-N',N'-dimethyl urea, and 5-(3-(2-(4-carbamoyl-3-hydroxyphenoxy)-1-methylethylamino)-2-hydroxy-propoxy)-3,4-dihydro-2-(1H)-quinolinone, or a pharmaceutically acceptable non-toxic acid addition salt thereof.

4,636,512

ANTI-INFLAMMATORY 2-SUBSTITUTED-4-HYDROXY-3-QUINOLINE CARBOXAMIDES

Francois Clémence; Odile Le Martret, both of Paris, and Francoise Delevalleé, Fontenay-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

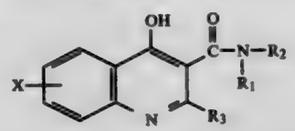
Filed Jun. 25, 1985, Ser. No. 748,743

Claims priority, application France, Jun. 25, 1984, 84 09960

Int. Cl.⁴ A61K *31/47;* **C07D** *215/22*

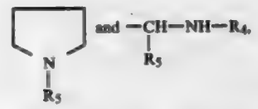
U.S. Cl. 514—312 **18 Claims**

1. A compound selected from the group consisting of racemates or optically active forms of the formula



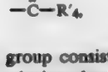
I

wherein X is in the 5-, 6-, 7- or 8-position and is selected from the group consisting of hydrogen, halogen, alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 4 carbon atoms, CF_3—, CF_3S— and CF_3O—, R_1 is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, R_2 is selected from the group consisting of (a) thiazolyl, 4,5-dihydrothiazolyl, pyridinyl, oxazolyl, isoxazolyl, imidazolyl, pyrimidyl and tetrazolyl, each optionally substituted with alkyl of 1 to 4 carbon atoms and (b) phenyl optionally substituted with at least one member of the group consisting of hydroxy, alkyl and alkoxy of 1 to 4 carbon atoms, CF_3—, $—NO_2$ and halogen, R_3 is selected from the group consisting of 2-pyrrolidinyl of the formula

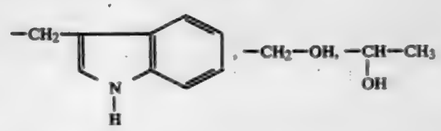


and $—CH—NH—R_4$, R_5

R_4 is selected from the group consisting of hydrogen, —COOA and A is selected from the group consisting of alkyl of 1 to 5 carbon atoms, aryl of 6 to 10 carbon atoms and aralkyl of 7 to 12 carbon atoms and



R_4' is selected from the group consisting of alkyl of 1 to 5 carbon atoms optionally substituted with amino or protected amino, aryl of 6 to 10 carbon atoms and aralkyl of 7 to 12 carbon atoms, R_5 is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, aryl of 6 to 10 carbon atoms, aralkyl of 7 to 12 carbon atoms, p-hydroxy-benzyl, 1H-indol-3-yl methyl of the formula



and $—CH_2SH$, the last three being optionally protected by a blocking group and their non-toxic, pharmaceutically acceptable acid addition salts.

13. A method of relieving pain and inflammation in warm-blooded animals comprising administering to warm-blooded animals an analgesically and anti-inflammatorily effective amount of at least one compound of claim 1.

4,636,513

ISOXAZOLE DERIVATIVES AND MEDICAMENTS CONTAINING THESE COMPOUNDS

Friedrich-Johannes Kümmerer, Hochheim am Main, and Rudolf Schleyerbach, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

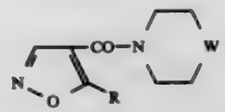
Filed Feb. 15, 1985, Ser. No. 702,312

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405727

Int. Cl.⁴ A61K *31/445;* **C07D** *413/06*

U.S. Cl. 514—326 **9 Claims**

1. A compound of the formula I,



(I)

in which

R represents hydrogen, alkyl having up to 4 carbon atoms or haloalkyl having up to 2 carbon atoms and

W represents a direct bond, CH_2, $CH—CH_3$, $CH—C_2H_5$, CHOH, O or S.

5. A pharmaceutical composition for use in the treatment of pains or fever or both, containing an effective amount of a compound of the formula I as claimed in claim 1.

4,636,514

ARYL(ARYLOXY OR ARYLTHIO)AZOLOMETHANES

Richard B. Rogers, Concord, and Maria P. Herrero, Berkeley, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 407,852, Aug. 13, 1982, abandoned. This application Sep. 24, 1984, Ser. No. 653,399

Int. Cl.⁴ C07D *401/06;* **A61K** *31/415*

U.S. Cl. 514—340 **4 Claims**

1. A compound corresponding to the formula



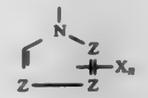
wherein

R represents hydrogen, phenyl or phenyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^1 represents pyridyl or pyridyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^2 represents phenyl or phenyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^3 represents a 5-membered N-heterocyclic ring of the formula



wherein

each Z independently represents —CH or N and at least one of Z is N;

X is C_1–C_4 alkyl, Br, Cl, F or I and

n represents an integer of from 0 to 3 and

Y is oxygen or sulfur.

4,636,515

NON-CLASSICAL TOPICAL TREATMENT FOR GLAUCOMA

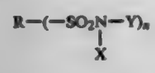
Charles F. Barfknecht, and Ronald D. Schoenwald, both of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Division of Ser. No. 464,061, Feb. 4, 1983, Pat. No. 4,483,864. This application Jun. 25, 1984, Ser. No. 624,250

Int. Cl.⁴ A61K *31/41, 31/425, 31/18*

U.S. Cl. 514—363 **6 Claims**

1. A topical composition for eye drop treatment of glaucoma, comprising a small but intraocular eye pressure lowering effective amount of a non-classical carbonic anhydrase inhibitor of the formula:



wherein R is selected from the group consisting of 2-acylamino-1,3,4 thiadiazole-5-, 2-acylamino-2-methyl-1,3,4-thiadiazole-5, and dichlorophenyl-1,3,-di-; and X is selected

from the group of hydrogen and hydroxyl, and Y is selected from the group of C_1 to C_6 alkyl and hydrogen, and if either X or Y is hydrogen the other is not hydrogen and n a whole integer and is either 1 or 2; and, from about 0.1% by weight to about 0.10% by weight of a wetting agent;

from about 0.004% by weight to about 0.02% by weight of an anti-bacterial agent; and

an isotonic inert, non-irritating and nontoxic topical opthalmic carrier having a pH within the range of from about 4.0 to about 8.0.

4,636,516

3,5-DI-TERT-BUTYL-4-HYDROXYPHENYL-SUBSTITUTED HETEROCYCLIC COMPOUNDS

Kazuo Kubo, Saitama; Yuzuo Izumura; Shuichi Sakamoto, both of Tokyo, and Hiroshige Honma, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

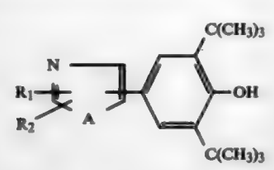
Filed Feb. 11, 1982, Ser. No. 347,982

Claims priority, application Japan, Feb. 19, 1981, 56-23515; Apr. 21, 1981, 56-59990; Oct. 2, 1981, 56-157010

Int. Cl.⁴ C07D *233/42, 277/36;* A61K *31/415, 31/425*

U.S. Cl. 514—365 **16 Claims**

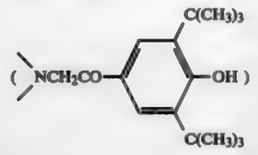
1. A 3,5-di-tert-butyl-4-hydroxyphenyl-substituted heterocyclic compound represented by the formula



wherein R_1 and R_2, which may be the same or different, each represents a hydrogen atom, a lower alkyl group, a phenyl or naphthyl lower alkyl group, a phenyl group, a naphthyl group, a lower alkoxy-substituted phenyl or naphthyl group, or the group shown by —O—Z,



or —NH—Z wherein Z represents a hydrogen atom, a lower alkyl group, a carboxy lower alkyl group, a lower alkoxycarbonyl lower alkyl group, a phenyl or naphthyl lower alkyl group, a phenyl group, or a naphthyl group and n represents 0, 1, or 2; and A represents an oxygen atom, a sulfur atom, an imino group, a lower alkylimino group, or a 3,5-di-tert-butyl-4-hydroxyphenacylimino group



and salts thereof.

4,636,517

3-TOLYLTHIO-4-AMINO-4,5-DIHYDRO ISOXAZOLE AS ANTHELMINTIC

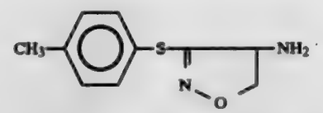
Jing-Jong Lu, and Herbert L. Wehrmeister, both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Oct. 18, 1985, Ser. No. 788,934

Int. Cl.⁴ A61K *31/42;* C07D *261/04*

U.S. Cl. 514—380 **7 Claims**

1. An anthelmintic compound of the formula:



3. A method of treating mammals and fowl which are infested with parasitic worms which comprises administering orally the anthelmintic compound 3-tolylthio-4-amino-4-5-dihydroisoxazole to said infested animals.

4,636,518

IMIDAZOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS

Peter J. Fellner, Marlow; Mun F. Lai, Maidenhead, and Thakorbhai P. Patel, High Wycombe, all of England, assignors to G. D. Searle & Co., Skokie, Ill.

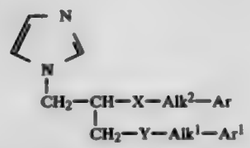
Continuation of Ser. No. 606,808, May 3, 1984, abandoned, which is a continuation of Ser. No. 363,180, Mar. 29, 1982, abandoned. This application Jun. 20, 1985, Ser. No. 746,684, abandoned.

Claims priority, application United Kingdom, Apr. 13, 1981, 8111614

Int. Cl.⁴ A61K *31/415;* C07D *405/12*

U.S. Cl. 514—397 **7 Claims**

1. A compound of the formula



wherein

Ar is substituted phenyl having at least one substituent selected from the class comprising lower alkoxy, alkylenedioxy, carboxy and carboxyalkyl; and

Ar^1 is phenyl or substituted phenyl having at least one substituent selected from the class comprising halogen, lower alkyl, lower alkoxy, alkylenedioxy, aralkoxy, aryloxy, trihalomethyl, carboxy, carboxyalkyl, cyano, carboxamido, di-loweralkylamino, nitro and lower alkyl sulphonyl;

Alk^1 and Alk^2 are independently an alkylene group containing from 1 to 8 carbon atoms which may be substituted with one or more alkyl groups;

X and Y are independently —O—, —NH— or —S—;

with the provisio that at least one of Ar and Ar^1 is phenyl substituted with alkylenedioxy

and acid addition salts thereof.

6. A pharmaceutical composition comprising a compound of claim 1 and a non-toxic pharmaceutically acceptable carrier.

4,636,519

KETENE S,S-ACETAL DERIVATIVE, A PROCESS FOR MANUFACTURING THEREOF AND A METHOD FOR CURING MYCOSIS BY ADMINISTERING IT

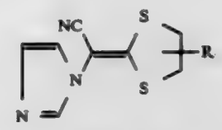
Akira Seo, Yamatotakada; Hideo Kanno, Ibaraki; Nobu Hasegawa, Nishinomiya; Yukio Miyagi, Osaka; Akira Nishimura, Kawachinagano; Shigeo Kosaka, Habikino; Tetsuo Ohmi, Kawachinagano; Yukimi Munechika, Hashimoto; Matazaemon Uchida, Kawachinagano, and Kenichi Ikeda, Chiba, all of Japan, assignors to Nihon Nohyaku Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1985, Ser. No. 786,123

Int. Cl.⁴ A61K *31/415, 31/44;* C07D *403/00, 401/00*

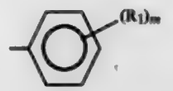
U.S. Cl. 514—397 **12 Claims**

1. A ketene S,S-acetal derivative represented by the general formula (I):



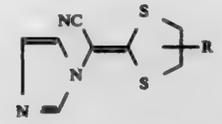
(I)

wherein R represents a hydrogen atom; an alkyl group having 1 to 8 carbon atoms; a cycloalkyl group having 3 to 6 carbon atoms; a methylene group; a lower alkenyl group; a lower Alkyl gronp substituted by a halogen atom, a cyano group, a lower alkoxyl group, a lower alkylthio group, a carbamoyl group, a lower alkanoyl group, or an alkenoyloxy groups; a plenyl group represented by



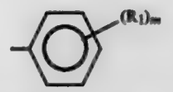
(in which R_1 represents a hydrogen atom, a halogen atom, a straight or branched chain lower alkyl group, a lower alkoxyl group with which may be substituted by one or more halogen atoms, a phenoxy group or a methylenedioxy group, and m represents an integer of 1 to 3); a benzyl group; a methylenedioxybenzyl group; a phenoxyalkyl group; a phenoxyalkyl group substituted by a halogen atom; a naphthyl group; a pyridyl group or a pyridyl group substituted by a lower alkyl group.

8. A process for producing a ketene S,S-acetal derivative represented by the general formula (I):



(I)

wherein R_1 represents a hydrogen atom; an alkyl group having 1 to 8 carbon atom; a cycloalkyl group having 3 to 6 carbon atoms; a methylene group; a lower alkenyl groups; a lower alkyl group substituted by a halogen atom, a cyano group, a lower alkoxyl group, a lower alkylthio group, a carbamoyl group, a lower alkanoyl group, or an alkenoyloxy group; a phenyl group represented by



(in which R_1 represents a hydrogen atom, a halogen atom, a straight or branched chain lower alkyl group, a lower alkoxyl group which may be substituted by one or more halogen atoms, a phenoxy group or a methylenedioxy group, and m represents an integer of 1 to 3); a benzyl group; a methylenedioxybenzyl group; a phenoxyalkyl group; a phenoxyalkyl group substituted by a halogen atom; a naphthyl group; a pyridyl group or a pyridyl group substituted by a lower alkyl group, which comprises reacting 1-cyanomethylimidazole represented by the structural formula (II):



(II)

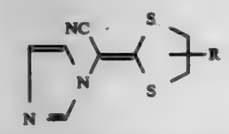
with carbon disulfide in the presence of a base, and then reacting the reaction product with a compound represented by the general formula (III):



(III)

wherein R is as defined above, and X represents a halogen atom, a mesyloxy or a tosyloxy group.

9. A method for curing mycosis which comprises administering a pharmaceutical preparation containing a pharmaceutically effective amount of a ketene S,S-acetal derivative represented by the general formula (I):



(I)

wherein R represents a hydrogen atom; an alkyl group having 1 to 8 carbon atoms; a cycloalkyl group having 3 to 6 carbon atoms; a methylene group; a lower alkenyl group; a lower alkyl group substituted by a halogen atom; a cyano group; a lower alkoxyl group, a lower alkylthio group, a carbamoyl group, a lower alkanoyl group, or an alkenoyloxy group; a phenyl group represented by



(in which R_1 represents a hydrogen atom, a halogen atom, a straight or branched chain lower alkyl group, a lower alkoxyl group which may be substituted by one or more halogen atoms, a phenoxy group or a methylenedioxy group, and m represents an integer of 1 to 3); a benzyl group, a methylenedioxybenzyl group; a phenoxyalkyl group; a phenoxyalkyl group substituted by a halogen atom; a naphthyl group; a pyridyl group or a pyridyl group substituted by a lower alkyl group.

4,636,520

ANTIFUNGAL COMPOSITION EMPLOYING PYRROLNITRIN IN COMBINATION WITH AN IMIDAZOLE COMPOUND

Sunanori Unio, Kawanishi; Toshiaki Kamimura, Ibaraki; Takuro Kamishita, Takatsuki, and Yasuhiro Mise, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd. and Toko Yakuhin Kogyo Co., Ltd., both of Osaka, Japan

Filed Jul. 3, 1985, Ser. No. 751,560

Claims priority, application United Kingdom, Jul. 16, 1984, 8418057; Nov. 26, 1984, 8429832

Int. Cl.⁴ A61K *31/40, 31/415*

U.S. Cl. 514—399 **22 Claims**

1. An antifungal composition which contains, as active in-

gredients 1 part of 3-(2-nitro-3-chlorophenyl)-4-chloropyrrole and 1 part of an antimycotic imidazole compound selected from the group consisting of clotrimazole, miconazole, econazole and oxyconazole.

4,636,521

3 AMINO ALKYL INDOLES FOR USE IN TREATING MIGRAINE

Ian H. Coates, Hertford; Keith Mills, Ware; Colin F. Webb, Royston; Michael D. Dowle, and David E. Bays, both of Ware, all of United Kingdom, assignors to Glaxo Group Limited, London, England

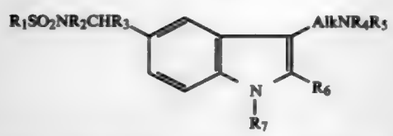
Continuation of Ser. No. 404,872, Aug. 3, 1982, which is a continuation of Ser. No. 292,022, Aug. 11, 1981. This application Jun. 29, 1984, Ser. No. 626,383

Claims priority, application United Kingdom, Aug. 12, 1980, 8026288

Int. Cl.[4] A61K *31/40*; C07D *209/14*

U.S. Cl. 514—415 **13 Claims**

1. A compound of the formula I:



(I)

wherein R_1 represents a C_{1-6} alkyl, C_{5-7} cycloalkyl, aryl or ara C_{1-4} alkyl group; R_2, R_3, R_4, R_6 and R_7, which may be the same or different, each represents a hydrogen atom or a C_{1-3} alkyl group; R_5 represents a hydrogen atom or a C_{1-6} alkyl, C_{5-7} cycloalkyl, C_{3-6} alkenyl or ara C_{1-4} alkyl group; or R_4 and R_5 together form an aralkylidene group or R_4 and R_5 together with the nitrogen atom to which they are attached form a saturated monocyclic 5- to 7-membered ring; Alk represents an alkylene chain containing two or three carbon atoms which may be unsubstituted or substituted by not more than two C_{1-3} alkyl groups; aryl, alone or as part of a group means phenyl which may be optionally substituted with one or more substitutes selected from the group consisting of C_{1-3} alkyl, C_{1-3} alkoxy and halogen atoms; and physiologically acceptable salts and solvates thereof.

4,636,522

ACYLAMINOALKANOYL URETHANES OR THIOURETHANES

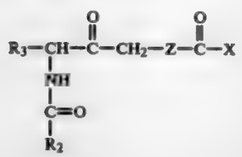
Eric M. Gordon, Pennington, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 22, 1985, Ser. No. 715,217

Int. Cl.[4] C07D *207/04*; A61K *31/40, 31/34, 31/38*

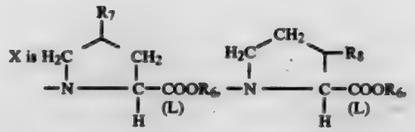
U.S. Cl. 514—423 **9 Claims**

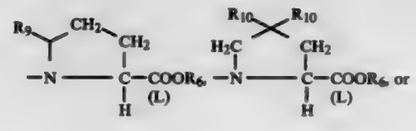
1. A compound of the formula

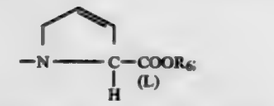


including a pharmaceutically acceptable salt thereof wherein:

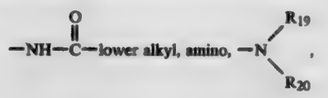
Z is oxygen or sulfur;

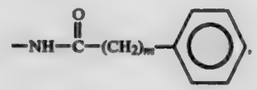


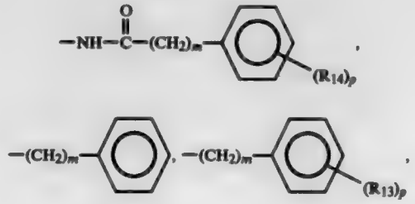


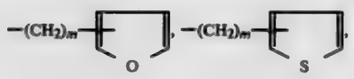


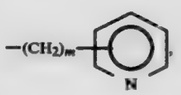
R_7 is hydrogen, lower alkyl, halogen, hydroxy,



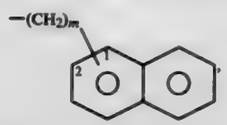




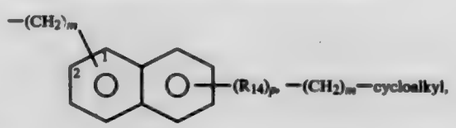




a 1- or 2-naphthyl or the formula

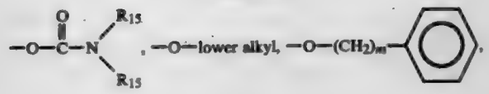


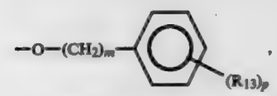
a substituted 1- or 2-naphthyl of the formula



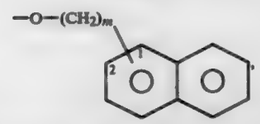
$-(CH_2)_m$—cycloalkyl,

-continued

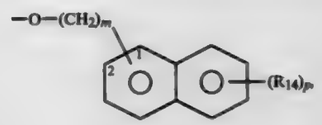


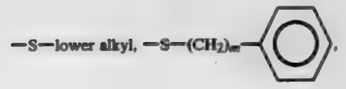


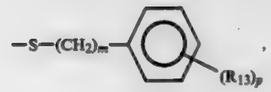
a 1- or 2-naphthyloxy of the formula



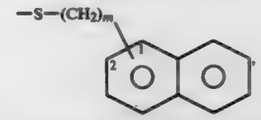
a substituted 1- or 2-naphthyloxy of the formula



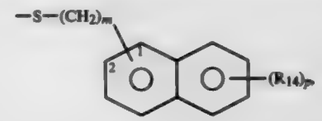


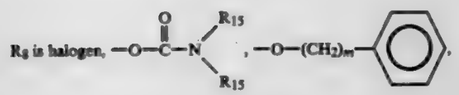


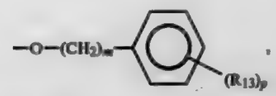
a 1- or 2-naphthylthio of the formula



or a substituted 1- or 2-naphthylthio of the formula

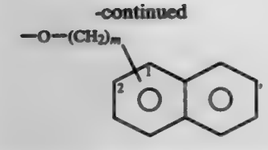


R_8 is halogen, 

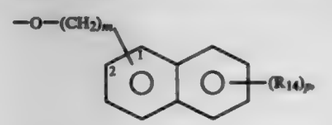


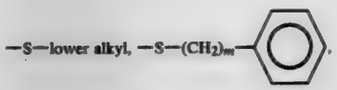
—O—lower alkyl, a 1- or 2-naphthyloxy of the formula

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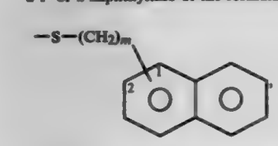


a substituted 1- or 2-naphthyloxy of the formula

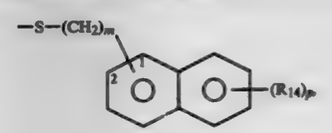


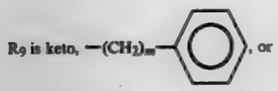


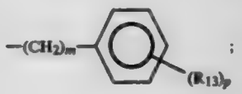
a 1- or 2-naphthylthio of the formula



or a substituted 1- or 2-naphthylthio of the formula



R_9 is keto,  , or

 ;

R_{10} is halogen or —Y—R_{16};

R_{13} is lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;

R_{14} is lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl or hydroxy;

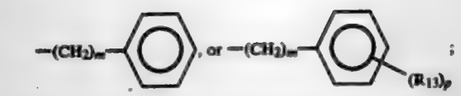
m is zero, one, two, three, or four;

p is one, two or three provided that p is more than one only if R_{13} or R_{14} is methyl, methoxy, chloro, or fluoro;

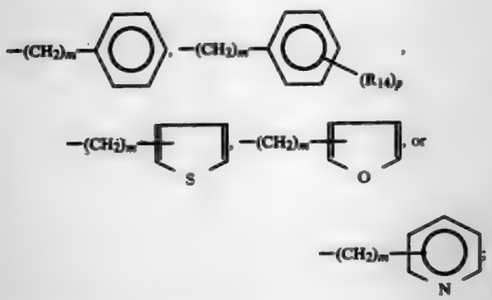
R_{15} is hydrogen or lower alkyl of 1 to 4 carbons;

Y is oxygen or sulfur;

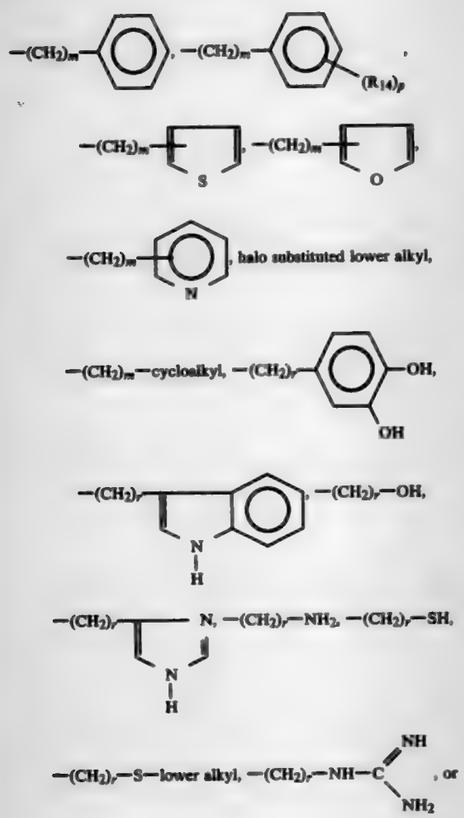
R_{16} is lower alkyl of 1 to 4 carbons,



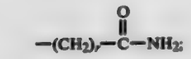
R_{19} is lower alkyl, benzyl or phenethyl;
R_{20} is hydrogen, lower alkyl, benzyl or phenethyl;
R_2 is



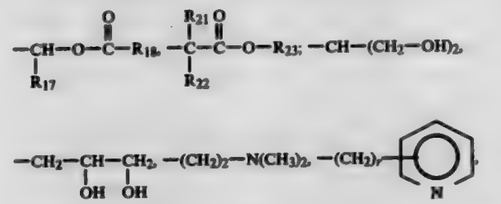
R_3 is hydrogen, lower alkyl,



-continued



r is an integer from 1 to 4;
R_6 is hydrogen, lower alkyl, benzyl, benzhydryl,



or pharmaceutically acceptable salt ion;

R_{17} is hydrogen, lower alkyl, cycloalkyl, or phenyl;
R_{18} is hydrogen, lower alkyl, lower alkoxy or phenyl;
R_{21} and R_{22} are independently selected from hydrogen and lower alkyl; and
R_{23} is lower alkyl.

8. A pharmaceutical composition useful for treating hypertension comprising a pharmaceutically acceptable carrier and a hypotensively effective amount of a compound of the formula

wherein Z, X, R_2 and R_3 are as defined in claim 1.

9. The method of treating hypertension in a mammalian host which comprises administering a hypotensively effective amount of the composition of claim 8.

4,636,523

INSECTICIDAL UREA SUBSTITUTED 2,3-DIHYDRO-BENZOFURAN AND BENZOTHIOPHENE DERIVATIVES, COMPOSITIONS, AND METHOD OF USE THEREOF

Ernest L. Plummer, Yardley, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jan. 7, 1986, Ser. No. 816,661
Int. Cl.[4] A01N *43/10, 43/12*; C07D *307/78, 333/52*
U.S. Cl. 514—443 11 Claims

1. A compound of the formula:

in which A and B are both hydrogen or halogen, or one of A and B is hydrogen, and the other of A and B is halogen; Z and W are independently O or S; the substituted benzofuranyl or benzothienyl group is attached at position 5 or 6; R is halogen; m is 0 to 3, R′ is F or CF_3, with the proviso that only one of R′ may be CF_3.

10. An insecticidal composition comprising an insecticidally effective amount of a compound of claim 1 in admixture with a compatible agricultural carrier, diluent, or adjuvant.

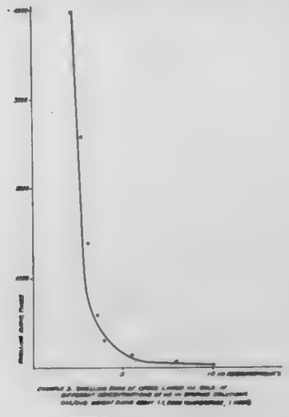
11. A method for controlling insects by applying an insecticidally effective amount of a compound of claim 1 to the locus where control is desired.

4,636,524

CROSS-LINKED GELS OF HYALURONIC ACID AND PRODUCTS CONTAINING SUCH GELS

Endre A. Balazs, Riverdale, N.Y., and Adolf Leshchiner, Fairview, N.J., assignors to Biomatrix, Inc., Ridgefield, N.J.

Division of Ser. No. 678,895, Dec. 6, 1984, Pat. No. 4,582,865.
This application Mar. 8, 1985, Ser. No. 709,977
Int. Cl.[4] C08F *8/00*
U.S. Cl. 514—781 1 Claim



1. A delivery system for a substance having biological or pharmacological activity, said system comprising a molecular cage formed of a cross-linked gel of hyaluronic acid or a mixed cross-linked gel of hyaluronic acid and at least one other hydrophilic polymer co-polymerizable therewith and having dispersed therein a substance having biological or pharmacological activity and which is capable of being diffused therefrom in a controlled manner.

4,636,525

POLYGLYCEROL COMPOUNDS AND COSMETIC PRODUCTS CONTAINING THE SAME

Michio Ochiai, and Hiromichi Segitani, both of Kanagawa, Japan, assignors to Pola Chemical Industries, Inc., Japan

Division of Ser. No. 750,231, Jun. 28, 1985, Pat. No. 4,595,537.
This application Mar. 12, 1986, Ser. No. 838,614
Claims priority, application Japan, Apr. 13, 1982, 57-61264
Int. Cl.[4] A61K *7/48, 7/00*
U.S. Cl. 514—786 1 Claim

1. In a hydrophilic cosmetic cream or lotion product containing an emulsifier or solubilizer, the improvement wherein the emulsifier or solubilizer comprises at least one or two or more of polyglycerol compounds expressed by following formula (I) or (II):

$$R_1O(X_1)_{m1}—Y_1—_{n1}H \quad (I)$$

wherein R_1 is a straight-chain or branched saturated or unsaturated aliphatic alcohol residue having carbon atoms of 8–36, X_1 is $CH_3CH_2CH_2O$ and/or $CH_3CH_2CH_2CH_2O$, Y_1 is a glycerol group, X_1 and Y_1 are randomly arranged, m_1 equals 3–60, and n_1 equals 4–60, or

$$R_2COO(X_2)_{m2}—Y_2—_{n2}H \quad (II)$$

wherein R_2 is a straigh-chain or branched, saturated or unsaturated fatty acid residue having carbon atoms of 7–35, X_2 is $CH_2CH_2CH_2O$ and/or $CH_2CH_2CH_2CH_2O$, Y_2 is a glycerol group, X_2 and Y_2 are randomly arranged, m_2 equals 3–60, and n_2 equals 4–60.

4,636,526

COMPOSITES OF UNSINTERED CALCIUM PHOSPHATES AND SYNTHETIC BIODEGRADABLE POLYMERS USEFUL AS HARD TISSUE PROSTHETICS

Linneaus C. Dorman, Midland, Mich., and Paul A. Meyers, Dublin, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 19, 1985, Ser. No. 702,998
Int. Cl.[4] C08J *9/26, 9/28*
U.S. Cl. 521—61 9 Claims

1. A composite material comprising from about 25 to about 75 percent by weight of an unsintered calcium phosphate biomaterial and about 75 to about 25 percent by weight of synthetic biodegradable polymer selected from the group consisting of a polyester of glycolic acid, a polyester of lactic acid, polyhydroxy-butyrate, an α-amino acid polymer and mixtures thereof, said composite material also containing from about 5 to about 30 percent by weight of a pore-forming agent (based on the total weight of the composite material plus the pore-forming agent).

4,636,527

METHOD FOR THE PREPARATION OF STYRENE POLYMER FOAM AND FOAM PREPARED THEREBY

Kyung W. Suh, Granville, and John M. Kennedy, Wheelersburg, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 722,877, Apr. 12, 1985, abandoned. This application Mar. 31, 1986, Ser. No. 846,408
Int. Cl.[4] C08J *9/12, 9/14*
U.S. Cl. 521—79 7 Claims

1. A process for the preparation of an alkenyl aromatic thermoplastic resinous elongate foam body having a machine direction and a transverse direction, the body defining a plurality of closed noninterconnecting gas-containing primary cells therein, the steps of the method comprising heat plastifying an alkenyl aromatic synthetic resinous material, adding to the heat plastifying synthetic resinous material a volatile fluid foaming agent to provide a foaming agent resinous polymer mixture under a pressure sufficiently high that foaming is prevented, mixing the fluid foaming agent with the plastified resin to form a blowable resinous mixture, reducing the temperature of the mixture to a temperature such that when pressure is removed therefrom, a foam of desirable quality is obtained, reducing the pressure on the mixture to thereby cause the mixture to form a foam of desired quality, the improvement which comprises employing a blowing agent mixture of from about 3–45 weight percent of carbon dioxide, from 5–97 weight percent ethyl chloride and from about 0–90 weight percent of a fluorocarbon member selected from the group consisting of dichlorodifluoromethane, 1-chloro-1,1-difluoroethane and mixtures thereof, the blowing agent mixture being utilized at a level of about 3–18 parts per 100 parts of resinous material.

4,636,528

FOAMING OF UNSATURATED POLYESTER RESIN AT ELEVATED TEMPERATURES

Ernest R. Kamens, Tonawanda, and John P. Cassoni, Grand Island, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 780,475, Sep. 26, 1985. This application May 21, 1986, Ser. No. 865,877
Int. Cl.[4] C08J *9/10*
U.S. Cl. 521—95 12 Claims

1. A foamable and crosslinkable composition consisting essentially of an admixture of

(a) an unsaturated polyester resin including an unsaturated monomer,

(b) a free radical initiator selected from the group of dialkyl peroxides, peroxyketals, peroxyesters, monoperoxycarbonates, and aliphatic azos and which initiator is activated at temperatures from about 100° to about 400° F., and

(c) a compound selected from a t-alkylhydrazinium salt, a carbonylhydrazine or a mixture thereof.

4,636,529

POLYURETHANE FOAMS FROM ISOCYANATE, POLYESTER POLYOL AND CHLORODIFLUOROMETHANE

Richard M. Crooker, Fogelsville, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed May 13, 1985, Ser. No. 733,024
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—131 **15 Claims**

1. A process for the manufacture of a polyurethane foam which comprises

(a) forming within a mixing zone a reaction mixture containing:

(i) an organic isocyanate,

(ii) an organic polyol that includes an aromatic polyester polyol in an amount of at least 1.0 percent by weight of the reaction mixture, and

(iii) an inert blowing agent comprising (1) from 0.7 to 14 weight percent of the reaction mixture of $CHClF_2$ and (2) from 0.8 weight percent of the reaction mixture up to the solubility limit in the reaction mixture of a second blowing agent selected from the group comprising CCl_3F, CCl_2F_2, $C_2Cl_3F_3$, CH_3CClF_2, $C_2Cl_2F_4$ or mixtures thereof;

(b) discharging the mixture from the mixing zone to provide: (1) expansion of the inert blowing agent, (2) reaction of the isocyanate and the polyol in an exothermic reaction, and (3) further expansion of the inert blowing agent by heat from the exothermic reaction to form a foamed reaction product; and

(c) allowing the foamed reaction product to cure to provide the polyurethane foam.

4,636,530

ISOCYANATE TERMINATED QUASI-PREPOLYMERS USEFUL FOR PREPARING URETHANE-GROUP-CONTAINING POLYISOCYANURATE FOAMS HAVING LOW FRIABILITY

Thirumurti Narayan, Grosse Ile, Mich., assignor to BASF Corporation, Wyandotte, Mich.

Filed Nov. 25, 1985, Ser. No. 801,334
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—159 **13 Claims**

1. An isocyanate-group terminated quasi-prepolymer prepared by the process of reacting an organic polyisocyanate with a polyester polyol which is derived from DMT process residue by transesterification with a low molecular weight aliphatic diol.

4,636,531

PROCESS FOR THE PREPARATION OF OPTIONALLY CELLULAR POLYURETHANE POLYUREA MOLDED PARTS WITH IMPROVED DEMOLDING CHARACTERISTICS

Hans U. Schmidt, Ludwigshafen, and Frank Werner, Neustadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 13, 1985, Ser. No. 700,633
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405680
Int. Cl.[4] C08G *18/14, 18/32*; B29C *67/22*
U.S. Cl. 521—163 **21 Claims**

1. In a process for the one-shot preparation of a cellular, microcellular, or non-cellular polyurethane polyurea polymer by reaction injection molding wherein said polymer is formed through the reaction of an isocyanate, a polyol and a chain extender, in the presence of suitable catalysts and optionally, blowing agents, additives, and auxiliaries, the improvement comprising selecting a chain extender containing in excess of 70 percent by weight relative to the total chain extender weight, of an aromatic diamine component comprising

(a) from 80 to 50 percent by weight of at least one sterically hindered primary aromatic diamine whose amino groups are sterically hindered with respect to reaction with polyisocyanates by the presence of at least one alkyl substituent in the ortho position of each amino group, and

(b) from 20 to 50 percent by weight of a reactive aromatic diamine selected from the group consisting of unsubstituted, primary aromatic diamines, substituted primary aromatic diamines, and mixtures thereof, wherein the amino groups of said diamines do not exhibit any reduced reactivity with respect to polyisocyanates as a result of electrophilic substituents and/or steric hindrance,

wherein the foregoing percents by weight are based on the total weight of mixture of (a) and (b).

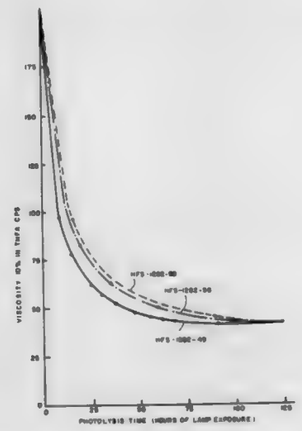
21. A polymer prepared by the process of claim 1.

4,636,532

METHOD FOR PREPARING POLYGLUTARIMIDE HAVING A LOWER MOLECULAR WEIGHT AND A LOW POLYDISPERSITY

Harold F. Sandford, Natick, Mass., assignor to Shipley Company Inc., Newton, Mass.

Filed Oct. 11, 1985, Ser. No. 786,531
Int. Cl.[4] C08F *8/00*
U.S. Cl. 522—3 **7 Claims**



1. A method for reducing the molecular weight of a polyglutarimide polymer having a molecular weight of 50,000 or higher, wherein the method comprises:

(a) dissolving the polyglutarimide in a solvent which is transparent to ultraviolet radiation;

(b) exposing the polyglutarimide solution to ultraviolet radiation for a sufficient time to reduce the molecular weight of the polyglutarimide; and

(c) re-isolating the resin by precipitating the resin in an organic solution.

7. The method of claim 1, wherein the resin solution is illuminated by the ultraviolet light for approximately 10 hours while stirring.

4,636,533

PHOTOPOLYMERIZABLE ADHESION PROMOTING DENTAL COMPOSITION

Ralf Janda, Bad Homburg, and Bernhard Eppinger, Wehrheim, both of Fed. Rep. of Germany, assignors to Kulzer & Co. GmbH, Wehrheim, Fed. Rep. of Germany

Filed Mar. 21, 1985, Ser. No. 714,480
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414164
Int. Cl.[4] C08F *130/02, 230/02, 2/50*; C08K *5/07*
U.S. Cl. 522—14 **8 Claims**

1. An adhesion promoting dental composition for use together with a photopolymerizable dental sealing composition consisting essentially of

a solution of (1) 10 to 30% by weight of tetramethacryloyloxyethyl pyrophosphate and a (ii) photopolymerization catalyst comprising camphor quinone and an amine, in acetone.

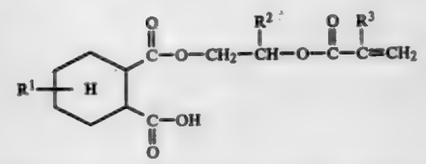
4,636,534

PHOTOPOLYMERIZABLE COMPOSITION

Kazuyoshi Nawata, Onoda; Masahito Katayama, and Minoru Yokoshima, both of Yamaguchi, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

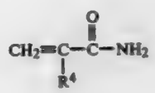
Filed Oct. 29, 1985, Ser. No. 792,736
Claims priority, application Japan, Oct. 30, 1984, 59-226928
Int. Cl.[4] C08F *2/50, 271/02, 220/40*
U.S. Cl. 522—116 **8 Claims**

1. A photopolymerizable composition comprising poly-N-vinylpyrrolidone (A), a compound (B) represented by the formula (I):



(I)

wherein each of R^1, R^2 and R^3 represents a hydrogen atom or a methyl group, an acid amide (C) represented by the formula (II):



(II)

wherein R^4 represents a hydrogen atom or a methyl group and a monomeric compound (D) having an acryloyl group or a methacryloyl group in the molecule thereof selected from the group consisting of carbitol acrylate, carbitol methacrylate, 2-hydroxypropyl methacrylate, 2-hydroxyethyl acrylate, 2-hydroxyethyl methacrylate and phenoxyethyl methacrylate, as well as optionally a photopolymerization-initiator (E).

4,636,535

CURABLE EPOXY RESIN COMPOSITIONS

David W. Wang, Vestal, N.Y.; Jeanne L. Courter, Stamford, and Dalip K. Kohli, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 518,872, Aug. 1, 1983, abandoned. This application Jan. 16, 1985, Ser. No. 691,993
Int. Cl.[4] C08K *3/34, 3/04, 3/02*; C08L *61/00*
U.S. Cl. 523—204 **36 Claims**

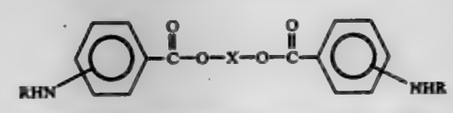
1. A fiber resin matrix composition comprising:

(a) non-siliceous reinforcing filaments, and

(b) a heat-curable epoxy resin composition comprising:

(i) an epoxy prepolymer or combination of prepolymers having more than one epoxide group per molecule, and

(ii) an amount effective to promote cure of an amine-functional curing agent or combination of curing agents selected from those of the formula:



wherein R is hydrogen or methyl and X is a divalent non-aromatic organic hydrocarbon, non-aromatic hetero-interrupted hydrocarbon, or non-aromatic halo- or alkyl-substituted hydrocarbon radical, wherein the structure of X is characterized by conferring on composites comprised of said fiber resin matrix composition improved interlaminar toughness and residual compression strength after impact, while maintaining compression strength under hot/wet conditions.

4,636,536

ELECTROMAGNETIC INTERFERENCE-SHIELDING, FLAME-RETARDANT ABS RESIN COMPOSITION

Sumio Kamiyo, Toyohashi, and Mitsuto Yoshihiro, Yokohama, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1985, Ser. No. 776,803
Claims priority, application Japan, Sep. 20, 1984, 59-197690
Int. Cl.[4] C08K *7/00, 3/08*; G21F *1/10*; G21K *1/10*
U.S. Cl. 523—137 **6 Claims**

1. An electromagnetic interference-shielding, flame-retardant ABS resin composition comprising a blend of a flame-retardant ABS resin (A) with 5 to 20% by weight of stainless steel fibers (B) having an average diameter of 3 to 50 μm and an average fiber length of 3 to 50 mm and with 4 to 30% by weight of glass fibers (C) having an aspect ratio of at least 50 and an average diameter of at least 5 μm, wherein the total amount of the components (A), (B), and (C) is 100% by weight.

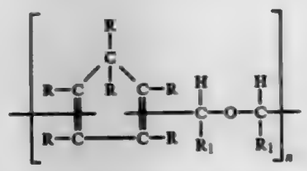
4,636,537

COMPOSITION, METHOD FOR PREPARING AND USE THEREOF

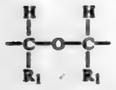
Bruce A. Gruber, Delaware; Heimo J. Langer, and William R. Dunnavant, both of Franklin, all of Ohio, assignors to Ashland Oil, Inc., Russell, Ky.

Continuation-in-part of Ser. No. 575,254, Jan. 30, 1984, Pat. No. 4,529,771, which is a continuation-in-part of Ser. No. 524,050, Aug. 16, 1983, Pat. No. 4,483,961, which is a continuation-in-part of Ser. No. 300,786, Sep. 10, 1981, Pat. No. 4,412,088. This application Apr. 12, 1985, Ser. No. 722,498
Int. Cl.[4] C08G *16/02*; C08L *61/00*; C08K *3/34*
U.S. Cl. 523—139 **33 Claims**

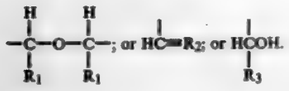
1. Polymeric cyclopentadiene derivative having recurring units of the Formula I or isomers thereof, or mixtures thereof:



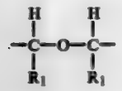
wherein each R, other than the R group(s) which act as the



linkage between adjacent recurring units of said Formula I, individually, is hydrogen, methyl,



each R_1, individually, is hydrogen or an alkyl group having 1–4 carbon atoms; R_2 is methylene or ethylidene; R_3 is hydrogen or methyl or ethyl; provided that at least 2 of the R groups on different carbon atoms is



when n is greater than 2 and that at least three of said R groups is hydrogen and wherein n is at least 2.

28. A molding composition which comprises a major amount of aggregate and an effective bonding amount up to about 40% by weight of the aggregate of the composition of claim 1 and a curing agent.

4,636,538

INTUMESCENT MATERIAL

Tessa Malcolm-Brown, Cambridge, England, assignor to Dixon International Limited, Cambridge, England

Filed Aug. 23, 1984, Ser. No. 644,110

Claims priority, application United Kingdom, Aug. 23, 1983, 8322643; Dec. 15, 1983, 8333462

Int. Cl.⁴ C08K *3/34*

U.S. Cl. 523—179 **15 Claims**

1. An intumescent material which comprises the following components:

(a) one or more organic polyhydroxy compounds in a carbonific effective amount;

(b) one or more organic polyamido compounds in free and/or combined form in a spumific effective amount;

(c) an ammonium phosphate in sufficient amounts to act as an activator for the carbonific effective compounds;

(d) an amino resin binder; and

(e) sodium silicate, said sodium silicate being present in an amount ranging from 3.0 to 12.7% by weight of the total composition but being present in at least 8.9% by weight of the ammonium phosphate activator;

the paste from which said material is prepared having a pH not exceeding 6.2, and wherein, when heated, intumescence in said material occurs in two stages, a first stage at relatively low temperatures, and a second stage at higher temperatures, the intumescent characteristics of the material not being adversely affected by aging or by prolonged exposure to high concentrations of carbon dioxide or atmospheric moisture.

4,636,539

INSTANT ADHESIVE COMPOSITION UTILIZING CALIXARENE ACCELERATORS

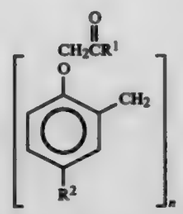
Stephen J. Harris, Dublin; M. Anthony McKervey, Bishopstown; David P. Melody, Castlenock; John Woods, Stillorgan, and John M. Rooney, Kildare, all of Ireland, assignors to Loctite (Ireland) Limited, Dublin, Ireland

Division of Ser. No. 673,621, Nov. 21, 1984, Pat. No. 4,556,700, which is a continuation-in-part of Ser. No. 575,257, Jan. 30, 1984, abandoned. This application Sep. 16, 1985, Ser. No. 776,536

Int. Cl.⁴ C08F *220/34*

U.S. Cl. 523—214 **9 Claims**

1. In a cyanoacrylate adhesive composition, the improvement comprising that the composition includes a thickener in an amount of about 20% or less by weight of the composition and an accelerator compound in a conventional amount, the thickener selected from the group consisting of poly(methyl methacrylate); methacrylate type copolymers; acrylic rubbers; polyvinyl acetate; poly(α-cyanoacrylate); and fumed silica fillers treated with polydialkylsiloxanes or trialkylsilanes and the accelerator being a calixarene compound stable to cyanoacrylate monomers represented by the formula:



where R^1 is alkyl, alkoxy, substituted alkyl or substituted alkoxy; R^2 is H or alkyl; and n=4, 6 or 8.

4,636,540

PURIFICATION OF POLYMER SOLUTIONS

David R. Warfel, Exton, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 8, 1985, Ser. No. 752,751

Int. Cl.⁴ C08J *3/08*

U.S. Cl. 523—310 **12 Claims**

1. A method of purifying a vinyl aromatic macromonomer prepared by anionic polymerization in an organic diluent in the presence of a lithium initiator and termination with a polymerizable, halogen-containing terminating agent, said method comprising

(a) contacting the macromonomer solution resulitng from the polymerization and termination, with an adsorbent selected from an alkaline earth metal silicate, an ion exchange resin, and a mixture of said silicate and resin, to form a liquid phase and a solid phase,

(b) separating the solid phase from the liquid phase, and

(c) isolating the macromonomer from the liquid phase.

4,636,541

WATER-DISPERSIBLE CATIONIC VINYLIZED EPOXY RESINS

Michael G. Stevens, Worthington, Ohio, and Rhetta Q. Davis, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 28, 1985, Ser. No. 717,195

Int. Cl.⁴ C09D *3/58, 3/56, 3/52, 5/02*

U.S. Cl. 523—404 **16 Claims**

1. A water-compatible composition comprising at least one vinyl ester resin comprising at least one terminal olefinically unsaturated group and at least one terminal pyridinium group covalently bonded through the pyridinium nitrogen atom.

4,636,542

IMIDE FUNCTIONAL POLYPHENOLS; THERMOSETTABLE COMPOSITIONS CONTAINING SAME AND CURED PRODUCTS THEREFROM

Robert E. Hefner, Jr., and Mary N. White, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

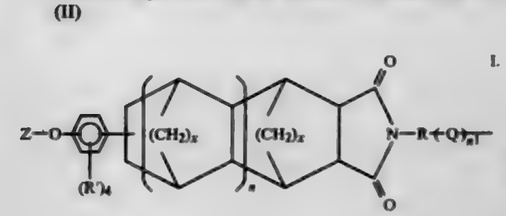
Division of Ser. No. 679,529, Dec. 7, 1984, Pat. No. 4,555,563. This application Sep. 9, 1985, Ser. No. 773,895

Int. Cl.⁴ C08G *59/26*

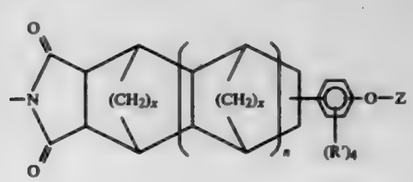
U.S. Cl. 523—466 **13 Claims**

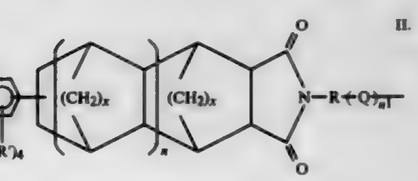
1. A curable composition comprising

(A) any one or a combination of any two or more of the materials represented by the following formulas (I) and (II)

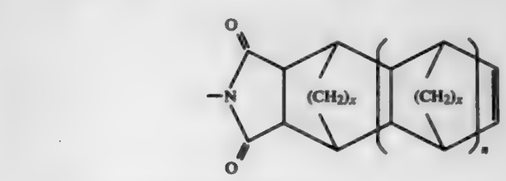


I.

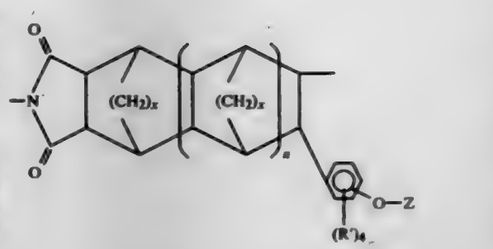


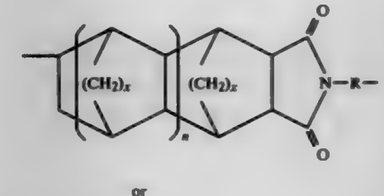


II.

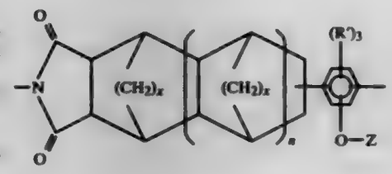


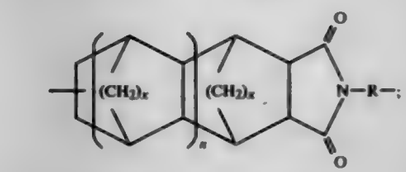
wherein each Q is independently



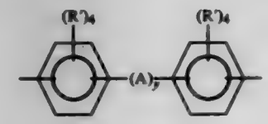


or

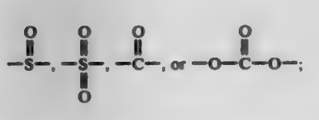




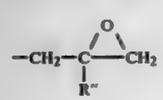
each R is independently a hydrocarbyl group having from 1 to about 10 carbon atoms, or a



group; each A is independently a divalent hydrocarbyl group having from 1 to about 10, carbon atoms, —S—, —S—S—, —O—,



each R′ is independently hydrogen, chlorine, bromine, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 3 carbon atoms; each R″ is hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms; Z is a group represented by the formula



wherein R'' is hydrogen or a hydrocarbyl group having from 1 to about 4 carbon atoms; each x has a value of zero or 1; each y has a value of zero or 1; each n independently has an average value from zero to about 20, and n^1 has a value from zero to about 10;

(B) a curing quantity of at least one curing agent therefor.

4,636,543

PROTECTIVE COATING COMPOSITION

Bob G. Helton, 4013 N. Star Rd., Garland, Tex. 75040

Filed Oct. 18, 1985, Ser. No. 789,759

Int. Cl.[4] C08K *5/01, 5/15*

U.S. Cl. 524—109 **22 Claims**

1. A protective coating solution composition comprising: a mixture of non-volatile materials in the range of 15% to 35% by weight and volatile materials in the range of 65% to 85% by weight; with the non-volatile portion containing Vinyl Chloride resin in the range of 40% to 70% thereof, a release agent in the range of 5% to 15% thereof, and a plasticizer primarily of epoxidized vegetable oil in the range of 20% to 45% thereof; with the volatile portion including Ketone in the 25% to 100% range thereof, and aromatics in the 0% to 75% thereof; and wherein said release agent is a saturated vegetable oil.

4,636,544

FLAME RETARDED POLYESTER MOLDING COMPOSITION WITH IMPROVED ELECTRICAL PERFORMANCE

Leonard R. Hepp, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Feb. 25, 1985, Ser. No. 705,446

Int. Cl.[4] C08K *3/22;* **C08L** *67/02, 69/00*

U.S. Cl. 524—411 **7 Claims**

1. A flame retarded poly(1,4-butylene terephthalate) resin molding composition having an improved comparative tracking index consisting essentially of:

(a) poly(1,4-butylene terephthalate) resin;

(b) a flame retarding amount of halogenated aromatic flame retardant;

(c) an effective amount of antimony compound synergist; and

(d) an effective amount of titanium dioxide powder to raise the comparative tracking index of said molding composition, said effective amount being from about 3.5 to about 6.5 parts by weight of said titanium dioxide powder for each 85 parts by weight of said poly (1,4-butylene terephthalate) resin and said halogenated aromatic flame retardant.

4,636,545

AQUEOUS DISPERSIONS OF GRAFT POLYMERS OR COPOLYMERS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE AS HYDROPHOBIZING AND OLEOPHOBIZING AGENTS FOR TEXTILES

Joachim König; Carlhans Süling, both of Odenthal, and Klaus Nachtkamp, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 19, 1985, Ser. No. 703,011

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407362

Int. Cl.[4] C08F *2/20, 283/00;* **C08L** *51/08*

U.S. Cl. 524—457 **6 Claims**

1. An oleophobizing and hydrophobizing agent for textiles, natural and synthetic fibers, carpets, papers and leather comprising an aqueous dispersion of graft polymers or graft copolymers prepared by polyermizing or copolymerizing an ethylenically unsaturated monomer or a mixture of ethylenically unsaturated monomers in the presence of an aqueous dispersion consisting essentially of a non-thermosetting polyurethane, wherein the ethylenically unsaturated monomer is an ethylenically unsaturated perfluoroalkyl monomer having a molecular weight above 367 and wherein said mixture of ethylenically unsaturated monomers is a mixture of said perfluoroalkyl monomer with at least one ethylenically unsaturated monomer which is free from perfluoroalkyl groups in a ratio by weight of perfluoroalkyl monomers to monomers free from perfluoroalkyl groups of at least 3:2.

4,636,546

PROCESS FOR PREPARING MODIFIED POLYMER EMULSION ADHESIVES

Yen-Yau H. Chao, Harleysville, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 594,515, Mar. 29, 1984, abandoned. This application Sep. 30, 1985, Ser. No. 781,583

Int. Cl.[4] C08L *33/10, 33/08, 33/02*

U.S. Cl. 524—507 **10 Claims**

1. A process for preparing an improved coating or adhesive composition comprising (1) first mixing an aqueous dispersion of addition polymer polymerized from ethylenically unsaturated monomers, wherein the addition polymer contains greater than 0.001% active hydrogen and substantially no polyurethane functional moieties, with about 0.05% to about 10% of at least one isocyanate selected from the difunctional and multi-functional isocyanates to form a polymer-isocyanate adduct mixture; and (2) subsequently adding to said polymer-isocyanate adduct mixture from about 0.1% to about 50% of an aqueous dispersion of polyurethane polymer, all percentages being on a total dry weight basis, and wherein the active hydrogen content of the addition polymer is derived from an active hydrogen functional monomer selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid and acryloxypropionic acid.

4,636,547

SINTERABLE, FINELY PARTICULAR MOLDING COMPOSITION BASED ON VINYL CHLORIDE POLYMERS

Manfred Engelmann; Helmut Kraus, both of Burgkirchen, and Otto Plewan, Neuötting, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 19, 1985, Ser. No. 756,970

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1984, 3426929

Int. Cl.[4] C08L *27/06, 51/00*

U.S. Cl. 524—523 **10 Claims**

1. A sinterable, finely particulate molding composition which consists essentially of a mixture of at least two polymers based on vinyl chloride and at least one surfactant, in which each of the polymers has a K value of 55 to 90 and the mixture of polymers has an average particle size of 10 to 50 μm, a bulk density of 400 to 700 g/dm^3 and a particle size distribution of 99 to 30% by weight, relative to the mixture, <33 μm, 1 to 60% by weight, relative to the mixture, from 33 to 63 μm, 0 to 9% by weight, relative to the mixture, from 63 to 125 μm and 0 to 1% by weight, relative to the mixture, <125 μm, wherein the mixture contains

(I) 95 to 10% by weight, relative to the mixture, of a sinterable copolymer prepared by suspension polymerization in an aqueous phase and in which the polymer component consists essentially of:

(a) 89 to 70% by weight of polymerized units of vinyl chloride,

(b) 10.4 to 29.4% by weight of polyermized units of at least one alkyl acrylate having 3 to 10 carbon atoms in the alkyl group,

(c) 0.3 to 2.5% by weight of polymerized units of ethylene and

(d) 0.3 to 11% by weight of polymerized units of vinyl acetate, subject to the proviso that the amount of (d) is at least 3/7 of the amount of (c) and the sum of the amounts of (b) plus (c) plus (d) is 10 to 30% by weight, wherein said components (c) and (d) can be present as an ethylene/vinyl acetate copolymer onto which components (a) and (b) fan be grafted;

(ii) 5 to 90% by weight, relative to the mixture, of at least one sinterable polymer in which the polymer consists essentially of:

(α) 100 to 95% by weight of polymerized units of vinyl chloride,

(β) 0 to 5% by weight of polyermized units of ethylene and

(γ) 0 to 5% by weight of polymerized units of vinyl acetate, subject to the proviso that the amount of (γ) is at least 3/7 of (β) and that the amount of (β) plus (γ) is 0 to 5% by weight of the polymer component; and also

(III) 0.05 to 5% by weight, relative to the mixture, of at least one water-soluble surfactant, subject ot the proviso that the amounts of I plus II plus III add up to 100% by weight of mixture said mixture providing a molding composition from which sintered plates having improved bending angles can be obtained.

4,636,548

BINDERS FOR AQUEOUS PRIMERS FOR WOOD PAINTS

Herlbert Kossmann, Ludwigshafen; Lothar Matthaei, Weisenheim; Gregor Ley, Wattenheim; Eckehardt Wistuba, Bad Durkheim, and Savas Wulgaris, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 21, 1986, Ser. No. 820,003

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1985, 3502944

Int. Cl.[4] C08K *3/22*

U.S. Cl. 524—524 **1 Claim**

1. A binder for aqueous primers for wood paints, which consists of

(A) from 50 to 95% by weight, based on the weight of the primer, of an aqueous dispersion of a vinyl polymer having a particle size of from 0.03 to 0.5 μm and a minimum film-forming temperature of from 0° to 50° C., the said dispersion being stable to polyvalent ions, and

(B) from 5 to 50% by weight, based on the weight of the primer, of a water-soluble polymeric zinc amine complex of a copolymer which has a K value of from 8 to 40 and consists of

(a) from 20 to 60% by weight, based on the weight of the copolymer, of an α,β-monoethylenically unsaturated mono- and/or dicarboxylic acid of 3 to 5 carbon atoms and

(b) from 40 to 80% by weight, based on the weight of the copolymer, of styrene and/or one or more alkyl (meth-)acrylates, where alkyl is of 1 to 8 carbon atoms, the copolymer being reacted with from 2 to 6 moles, based on the carboxyl groups of the copolymer, of ammonia and from 0.8 to 1.2 equivalents of a zinc compound per carboxyl group of the copolymer.

4,636,549

TETRAFLUOROETHYLENE COPOLYMERS

Subhash V. Gangal, and Satish C. Malhotra, both of Parkersburg, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 663,466, Oct. 18, 1984, abandoned, which is a continuation-in-part of Ser. No. 489,305, Apr. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 449,499, Dec. 13, 1982, abandoned. This application May 31, 1985, Ser. No. 739,860

Int. Cl.[4] C08K *3/20*

U.S. Cl. 524—546 **1 Claim**

1. An aqueous dispersion comprising particles of a tetrafluoroethylene polymer consisting essentially of polymerized units of tetrafluoroethylene and less than 0.5 percent by weight of total polymer weight of one copolymerizable monomer of the formula $CF_3(CF_2)_3CH{=}CH_2$ present in an amount which does not cause the melt viscosity to be less than about 1×10^8 PaS at 380° C., wherein the units of said copolymerizable monomer are located in the interior of the polymer particle, wherein said particles had been prepared by polymerization comprising the step of stopping the addition of said copolymerizable monomer at least 5%, based on 100% monomer to polymer conversion, before the end of the polymerization, dispersed in an aqueous liquid.

4,636,550

VULCANIZABLE 2-SEC.AMINO-4,6-DIMERCAPTO-S-TRIAZINE CONTAINING HALOGEN RUBBER MIXTURES

Siegfried Wolff, Bornheim-Merten; Werner Schwarze, Frankfurt, and Heinz Grewatta, Cologne, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany

Filed Jul. 17, 1985, Ser. No. 756,087

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1984, 3430442

Int. Cl.[4] C08K *3/36, 3/04*

U.S. Cl. 524—552 **27 Claims**

1. A vulcanizable halogen containing rubber mixture containing a 2 sec.amino-4,6-dimercapto-s-triazine and also containing 10-100 parts per 100 parts of rubber of a silicatic filler and 0 to 40 parts per hundred parts of rubber of carbon black, the silicatic filler always being present in a preponderant amount when carbon black is present.

4,636,551

COATING MATERIAL

Takuji Okaya, Nagaokakyo; Yoshinari Tanaka; Kiyoshi Yonezu, both of Kurashiki; Akimasa Aoyama, and Takeshi Moritani, both of Kurashiki, all of Japan, assignors to Kuraray Co, Ltd., Kurashiki, Japan

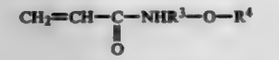
Filed May 29, 1985, Ser. No. 738,831

Claims priority, application Japan, Jun. 8, 1984, 59-118767

Int. Cl.[4] C08F *16/06*

U.S. Cl. 525—60 **3 Claims**

1. A saponification product of a modified ethylene-vinyl acetate copolymer which comprises vinyl acetate, ethylene and a cross-linkable olefinically unsaturated monomer having the formula:



in which R^3 is C_1–C_5 alkylene, and R^4 is C_1–C_{40} saturated branched or unbranched alkyl, said saponification product having a degree of saponification of the vinyl acetate component of at least 95%, an ethylene content of from 20 to 55 mole %, a content of olefinically unsaturated monomer of from 0.0005 to 5 mole %, and an intrinsic viscosity not greater than 0.7 dl/g measured at 20° C. using phenol containing 15 wt % of water as a solvent.

4,636,552

NOVEL SILICONE/POLYLACTONE GRAFT COPOLYMER

Michel Gay, Lyons, and Claude Millet, Saint-Priest, both of France, assignors to Rhone-Poulenc Recherches, Courbevoie, France

Filed May 30, 1985, Ser. No. 739,195

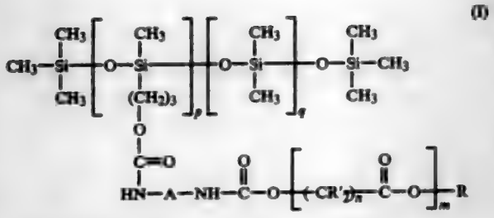
Claims priority, application France, May 30, 1984, 84 08510

Int. Cl.[4] C08G *77/42;* **C08L** *83/10*

U.S. Cl. 525—63 **17 Claims**

1. Graft copolymers having the average general formula:

(I)



in which p is an integer or decimal ranging from 1.5 to 6, q is an integer or decimal ranging from 0 to 20, A is a divalent hydrocarbon having from 2 to 20 carbon atoms, n is an integer ranging from 3 to 12, m is an integer ranging from 2 to 25, the radicals R', which may be identical or different, are each hydrogen or C_1–C_4 alkyl, and R is a hydrocarbon having up to 24 carbon atoms.

4,636,553

THERMOPLASTIC RESIN COMPOSITION

Takayuki Katto; Yasunosa Komatsu, and Zenya Shiiki, all of Fukushima, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1984, Ser. No. 618,662

Claims priority, application Japan, Jun. 14, 1983, 58-106098

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.⁴ C08L *51/06, 55/02, 69/00*

U.S. Cl. 525—67 10 Claims

1. A thermoplastic resin composition comprising:

5 to 85% by weight of a copolymer (A) prepared by copolymerizing 40 to 85% by weight of a monomer mixture of 2-isopropenylnaphthalene and α-methylstyrene, the proportion of 2-isopropenylnaphthalene being 5 to 70% by weight based on the total weight of 2-isopropenylnaphthalene and α-methylstyrene, 7.5 to 35% by weight of acrylonitrile, and 0 to 40% by weight of a vinyl monomer copolymerizable other than α-methylstyrene, acrylonitrile or 2-isopropenylnaphthalene with the foregoing monomers;

1 to 40% by weight of a graft copolymer (B) prepared by emulsion polymerizing 15 to 50 parts by weight of

a graft monomer component consisting essentially of from 0 to 100% by weight of a methacrylic acid alkyl ester, an acrylic acid alkyl ester or mixtures thereof, from 0 to 85% by weight of an aromatic vinyl compound, and from 0 to 40% by weight of a vinyl cyanide compound in the presence of

50 to 85 parts by weight of a butadiene-containing rubber as the rubber component, provided that the sum of the graft component and rubber component is 100 parts by weight; and

10 to 90% by weight of a polycarbonate (C).

4,636,554

PROCESS FOR PRODUCING A CHLOROMETHYLATED POLYMER

Akira Tada, Yokohama; Takamitsu Morita, Kita-Kyushu; Takeshi Terase, Kita-Kyushu, and Yoshihiro Kusumoto, Kita-Kyushu, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Dec. 13, 1984, Ser. No. 681,102

Claims priority, application Japan, Dec. 26, 1983, 58-248852; Jan. 30, 1984, 59-14674

Int. Cl.⁴ C08F *8/18*

U.S. Cl. 525—359.3 9 Claims

1. A process for producing a chloromethylated polymer by reacting styrene polymer particles with chloromethyl methyl ether in the presence of a catalyst, characterized in that hydrogen chloride is added to the reaction product mixture in an amount of from 0.5 to 10 molar times relative to the chloromethyl methyl ether remaining in said reaction product mixture, followed by distillation to recover a distillate mixture containing chloromethyl methyl ether.

4,636,555

PETROLEUM RESINS AND THEIR PRODUCTION

Quoc Laviah, Brussels; Jacques Lechat, Overijse, both of Belgium; Morris L. Evans, Baton Rouge, La., and Andre Lepert, Allouville Bellefosse, France, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 20, 1985, Ser. No. 778,600

Claims priority, application United Kingdom, Sep. 21, 1984, 8423919

Int. Cl.⁴ C08F *4/14*

U.S. Cl. 526—290 5 Claims

1. A process for the production of petroleum tackifier resins comprising copolymerising using a Friedel Crafts catalyst a mixture consisting essentially of:

(i) 70 to 95 wt.% of a C_5 olefins and/or diolefins and/or C_6 olefins and/or diolefins or a mixture of C_5 and C_6 olefins and/or diolefins feed and

(ii) from 5 to 30 wt.% of para-methyl styrene; and forming a tackifier resin having a softening point of about 75° to 115° C. and a molecular weight Mn by GPC of about 500 to 1,500.

4,636,556

HEAT-HARDENING REACTION RESIN MIXTURE FOR IMPREGNATING INSULATION OF ELECTRICAL EQUIPMENT AND FOR THE MANUFACTURE OF MOLDING MATERIALS WITH AND WITHOUT INSERTS

Walter Ihlein, Berlin, and Wolfgang Rogler, Mohrendorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 10, 1985, Ser. No. 774,310

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1984, 3434270

Int. Cl.⁴ C08G *18/18, 18/30, 18/58;* C08F *283/04*

U.S. Cl. 528—53 10 Claims

1. A heat-hardenable reaction resin mixture for impregnating insulation on electric equipment comprising a polyisocyanate, a polyepoxy resin, at least one olefinically unsaturated compound having no active hydrogen atoms, and an accelerator comprising an addition complex of a tertiary amine and boron trichloride having general formula

$$BCl_3.NR_1R_2R_3$$

where R_1, R_2 and R_3 are the same or different aliphatic, aromatic, heterocyclic or aryl-aliphatic radicals.

4,636,557

PROCESS FOR THE PREPARATION OF AROMATIC POLYETHERS WITH MIXTURE OF CARBONATE CATALYSTS

Hellmuth Deckers, Ingelheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 21, 1984, Ser. No. 673,857

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342433

Int. Cl.⁴ C08G *65/38, 65/40*

U.S. Cl. 528—126 8 Claims

1. Process of preparing aromatic polyethers which comprises condensing diphenols and activated aromatic dihalogen compounds; polynuclear activated halogenophenols; or polynuclear activated halogenophenols, together with mixtures of dihydric phenols and activated aromatic dihalogen compounds, the molar ratio between diphenol and dihalogen being about 0.9 to 1.1:1

in the presence of a condensation agent of at least one carbonate selected from the group consisting of lithium and alkaline earth metal carbonate, and

at least one carbonate selected from the group consisting of sodium, potassium, rubidium and cesium carbonate,

the condensation agent being in an amount of at least one mol of metal atoms per mol of hydroxyl.

4,636,558

POLYMER FROM BICYCLIC AMIDE ACETAL-EPOXIDE MONOMER AND DICARBOXYLIC ACID ANHYDRIDE

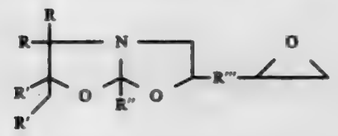
Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Dec. 16, 1985, Ser. No. 809,600

Int. Cl.⁴ C08G *83/00*

U.S. Cl. 528—363 12 Claims

1. The process for preparing a thermoset polymer comprising copolymerizing a monomer having the formula



wherein R, R' and R'' independently represent hydrogen, an alkyl group having from 1 to 20 carbon atoms, an aryl group having from 6 to 12 carbon atoms, an alkaryl group having from 7 to 20 carbon atoms and R''' represents an alkylene group having from 1 to 20 carbon atoms, an arylene group having from 6 to 20 carbon atoms, an arylene group having from 7 to 20 carbon atoms, an alkylene ether group having from 1 to 50 carbon atoms or an arylene ether group having from 6 to 50 carbon atoms with a dicarboxylic acid anhydride.

4,636,559

BIS(CYCLIC CARBONATES), PRECURSORS THEREOF, AND POLYCARBONATE COMPOSITIONS CONTAINING THEM

Niles R. Rosenquist, Evansville, Ind., and Thomas L. Evans, Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

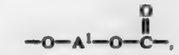
Filed Jun. 12, 1985, Ser. No. 744,074

Int. Cl.⁴ C08G *63/62*

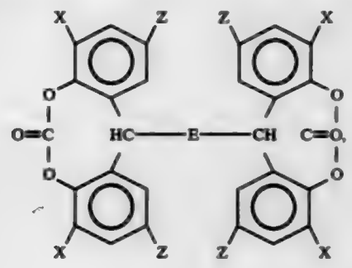
U.S. Cl. 528—370 21 Claims

1. A composition comprising a major proportion of (A) at least one cyclic polycarbonate oligomer having a plurality of structural units of the formula

(V)



wherein A^1 is a divalent aromatic radical, and a minor proportion of (B) at least one bis(cyclic carbonate) having the formula



wherein:

E is an alkylene radical containing from 2 to about 12 carbon atoms;

each X is independently hydrogen or lower alkyl; and

each Z is independently lower alkyl.

4,636,560

AMINO THIOL PEPTIDES

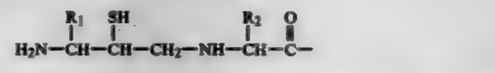
Jollie D. Godfrey, Jr., Trenton; Eric M. Gordon, Pennington, and Norma G. Delaney, Princeton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 16, 1984, Ser. No. 672,044

Int. Cl.⁴ C07K *5/506, 5/508*

U.S. Cl. 530—331 6 Claims

1. A compound having the formula



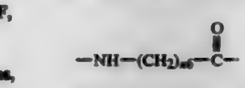
$$-(A_1)_{n1}-(A_2)_{n2}-(A_3)_{n3}-(A_4)_{n4}-(A_5)_{n5}-R_3,$$

and pharmaceutically acceptable salts thereof, wherein

R_1 and R_2 are each independently hydrogen, alkyl, carboxyalkyl, halo substituted alkyl, hydroxyalkyl, aminoalkyl, mercaptoalkyl, alkylthioalkyl, (cycloalkyl)alkyl, (heteroaryl)alkyl, arylalkyl, carbamoylalkyl, guanidinylalkyl, or heteroaryl;

R_3 is hydroxy, alkoxy, (substituted alkyl)oxy, arylalkoxy, (heteroaryl)alkoxy, or $-NY_1Y_2$, wherein Y_1 and Y_2 are each independently hydrogen, alkyl, aryl, or arylalkyl, or Y_1 is hydrogen and Y_2 is substituted alkyl or (heteroaryl)alkyl;

A_1 is glycyl, alanyl, leucyl, phenylalanyl, arginyl, sarcosyl, seryl, asparagyl, lysyl, glutamyl, histidyl, tryptophyl, cysteinyl, methionyl, threonyl, tyrosyl, leucyl, valyl, aspartyl, prolyl, norleucyl, norvalyl, or



wherein n_6 is an integer of 2 to 15;

A_2, A_3, A_4 and A_5 each is independently glycyl, alanyl, leucyl, phenylalanyl, arginyl, sarcosyl, seryl, asparagyl, lysyl, glutamyl, histidyl, tryptophyl, cysteinyl, methionyl, threonyl, tyrosyl, leucyl, valyl, aspartyl, prolyl, norleucyl, or norvalyl; and

n_1, n_2, n_3, n_4 and n_5 each is independently 0 or 1.

4,636,561

SPIROINDOLINENAPHTHOXADINE PHOTOCHROMIC COMPOUNDS

Masahiro Hosoda, Kyoto, Japan, assignor to Unitika Ltd., Kyoto, Japan

Filed Dec. 5, 1985, Ser. No. 804,951

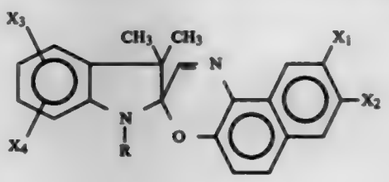
Claims priority, application Japan, Dec. 11, 1984, 59-261306; Mar. 7, 1985, 60-45387

Int. Cl.⁴ C07D *498/10*

U.S. Cl. 544—71 5 Claims

1. A photochromic compound represented by formula (I):

(I)



wherein one of X_1 and X_2 represents a hydroxyl group, and the other of X_1 and X_2 represents a hydrogen atom; X_3 and X_4 each represents a hydrogen atom, a lower alkyl group having from 1 to 3 carbon atoms, a lower alkoxy group having from 1 to 3 carbon atoms, a halogen atom, a nitro group or a cyano group; and R represents a straight chain alkyl group having from 1 to 30 carbon atoms.

4,636,562

PROCESS FOR PREPARING 6-HALO-2-CHLOROQUINOXALINE

Richard F. Davis, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 375,977, May 7, 1982, abandoned. This application Nov. 1, 1984, Ser. No. 667,467

Int. Cl.⁴ C07D *241/44*; C07B *1/00*

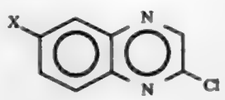
U.S. Cl. 544—354 **10 Claims**

1. A process for preparing a 6-halo-2-quinoxalinol compound of the formula:



wherein X is F, Cl, or Br, comprising reacting 6-halo-2-hydroxyquinoxaline-4-oxide with hydrogen in the presence of a transition element metal catalyst selected from the group consisting of platinum, rhodium, nickel, ruthenium, cobalt, and copper in an aqueous solution containing at least three equivalents of alkali metal hydroxide thereby producing the 6-halo-2-quinoxalinol compound.

6. A process for preparing a 2-chloro-6-haloquinoxaline compound of the formula:



wherein

X is F, Cl or Br, comprising: (a) reacting 4-halo-2-nitroaniline with diketene in the presence of a non-nucleophilic amine catalyst to produce 4-halo-2-nitroacetoacetanilide; (b) forming a reaction mixture comprising the 4-halo-2-nitroacetoacetanilide in an aqueous solution containing at least 4 equivalents of alkali metal hydroxide to produce 6-halo-2-hydroxyquinoxaline-4-oxide followed by dilution of the reaction mixture to yield in step (c) an alkali metal hydroxide concentration of about 2% to about 10% by weight; (c) reacting said reaction mixture with hydrogen in the presence of a transition element metal catalyst selected from the group consisting of platinum, rhodium, nickel, ruthenium, cobalt, and copper in aqueous alkali metal hydroxide solvent, thereby producing 6-halo-2-quinoxalinol; and (d) contacting the 6-halo-2-quinoxalinol with an acid chloride, thereby producing said 2-chloro-6-haloquinoxaline compound.

4,636,563

ANTIPSYCHOTIC γ-CARBOLINES

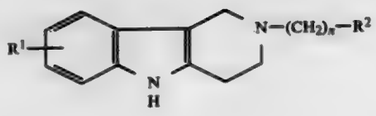
Magid A. Abou-Gharbia, Wilmington, Del., assignor to American Home Products Corporation, New York, N.Y.

Filed Sep. 16, 1985, Ser. No. 776,180

Int. Cl.⁴ C07D *471/04, 401/02, 241/36*

U.S. Cl. 546—87 **15 Claims**

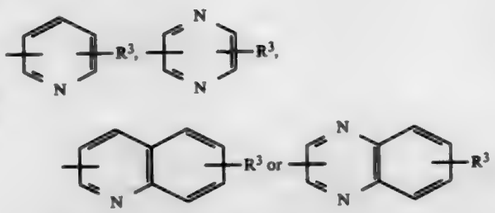
1. A compound of the formula:



in which

R^1 is hydrogen, halogen, hydroxy or alkyl of 1 to 6 carbon atoms;

R^2 is



where R^3 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, $—CO_2R^4$ where R^4 is alkyl of 1 to 4 carbon atoms, halogen, cyano or nitro; and

n is one of the integers 2, 3, 4, 5 or 6;

or a pharmaceutically acceptable salt thereof.

4,636,564

5-CYANOPYRIDINE-2-DIAZOHYDROXIDE, BASIC SALTS AND METHODS FOR PRODUCTION AND USE

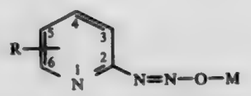
David C. Baker, Tuscaloosa, Ala., assignor to Board of Trustees of the University of Alabama, University, Ala.

Filed Nov. 13, 1984, Ser. No. 670,203

Int. Cl.⁴ C07D *213/85, 213/76*; A61K *31/44*

U.S. Cl. 546—289 **5 Claims**

1. A salt of 5-cyanopyridine-2-diazohydroxide having the formula



where R is a 5-CN group and M is one equivalent of an alkali metal or one-half equivalent of an alkaline earth metal.

4,636,565

PREPARATION OF 2,3-DICHLORO-5-TRICHLOROMETHYLPYRIDINE

John A. Werner, Menlo Park; Charles A. Wilson, Pittsburg, both of Calif., and Craig E. Mixan, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 467,710, Feb. 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 343,055, Jan. 27, 1982, which is a division of Ser. No. 243,166, Mar. 12, 1981, Pat. No. 4,331,811. This application Mar. 13, 1985, Ser. No. 711,543

Int. Cl.⁴ C07D *213/26*

U.S. Cl. 546—345 **6 Claims**

1. In a process for preparing 2,3-dichloro-5-trichloromethylpyridine by contacting 2-chloro-5-trichloromethylpyridine in the liquid state with chlorine in the presence of a catalyst at a temperature of 70° to 250° C., and at a pressure of from atmospheric pressure to 200 psig, the improvement comprising employing an effective amount of a catalyst selected from the group consisting of tungsten hexachloride, molybdenum pentachloride, tungsten oxytetrachloride, molybdenum oxytetrachloride and ruthenium chloride, whereby 2,3-dichloro-5-trichloromethylpyridine is obtained in a yield of at least 70 percent of final product.

4,636,566

PROCESS FOR PREPARING D-(+)-BIOTIN AND INTERMEDIATES THEREFOR

Wolfgang Holick, Grenzach-Wyhlen, Fed. Rep. of Germany, and Horst Pauling, Bottmingen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

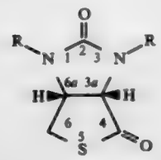
Filed Feb. 26, 1985, Ser. No. 705,775

Claims priority, application Switzerland, Mar. 9, 1984, 1171/84

Int. Cl.⁴ C07D *495/04*

U.S. Cl. 548—303 **3 Claims**

1. A process for manufacturing D-(+)-biotin which process comprises reacting a thiolactone of the formula:



I

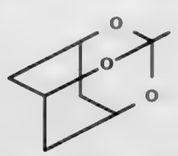
wherein

R is benzyl, with a Grignard compound of the formula:

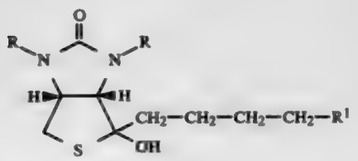
$$X—Mg—CH_2—CH_2—CH_2—CH_2—R^1$$

II

wherein X is halogen, and R^1 is



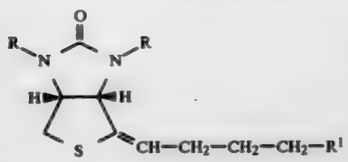
to obtain a compound of the formula



III

wherein

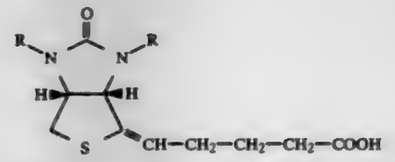
R and R^1 are as above and dehydrating the compound of formula III to form a compound of the formula:



IV

wherein

R and R^1 are as above and cleaving cis-1,3,5-cyclohexanetriol from the compound of formula IV to form the compound of the formula:



V

wherein

R is as above and converting the compound of formula V to D-(+)-biotin by hydrogenation of the double bond and cleavage of the protecting groups on the nitrogen atoms.

4,636,567

4-SUBSTITUTED-2-AZETIDINONE COMPOUND

Toshinari Tamura, Tokyo; Hidenori Iwamoto; Makoto Yoshida, both of Saitama, and Minoru Yamamoto, Kanagawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

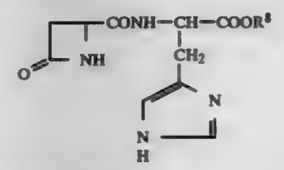
Division of Ser. No. 592,866, Mar. 23, 1984. This application Oct. 7, 1985, Ser. No. 785,169

Claims priority, application Japan, Mar. 25, 1983, 58-48989; Nov. 25, 1983, 58-221469; Nov. 25, 1983, 58-221470

Int. Cl.⁴ C07D *403/12*

U.S. Cl. 548—336 **1 Claim**

1. A 4-substituted-2-azetidinone compound represented by general formula (VII)



(VII)

wherein R^8 represents a hydrogen atom, a lower alkyl, a phenyl lower alkyl or a naphthylmethyl group or a salt thereof.

4,636,568

AMINOETHER COMPOUNDS

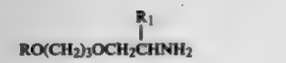
Myron S. Simon, West Newton, and David P. Waller, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 27, 1984, Ser. No. 644,911

Int. Cl.⁴ C07D *335/00*; C07C *93/08, 93/04*

U.S. Cl. 549—13 **6 Claims**

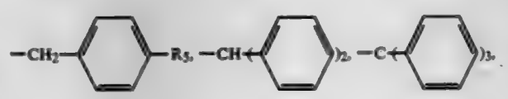
1. A compound represented by the formula



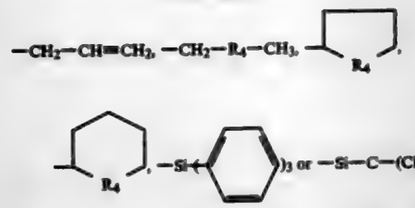
or the formula



wherein R is



-continued



R_1 is hydrogen, alkyl having from 1 to 6 carbon atoms, benzyl or phenethyl; R_2 and R_3 are alkyl having from 1 to 6 carbon atoms; or R_2 and R_3 together represent the carbon atoms necessary to form, with the oxygen atoms to which they are bonded and >CH—, a five or six member saturated heterocyclic moiety; R_4 is —O— or —S—; and R_5 is hydrogen, —O—CH_3, —NO_2, halogen or —CN.

4,636,569

PHARMACEUTICAL COMPOSITIONS CONTAINING COMPOUNDS WITH A FLAVANONE SKELETON, PROCESS FOR THE PREPARATION OF THE SAID COMPOUND AND NOVEL COMPOUNDS OBTAINED

Ezio Bombardelli; Bruno Gabetta, and Maria J. Magistretti, all of Milan, Italy, assignors to Inversi Della Beffa S.p.A., Milan, Italy

Filed Mar. 6, 1984, Ser. No. 587,684
Claims priority, application Italy, Mar. 10, 1983, 19993 A/83
Int. Cl.[4] C07D *311/04*
U.S. Cl. 549—403 1 Claim

1. A method of treatment of a patient in need of a mucoregulating agent, comprising administering to such patient a mucoregulating amount of 6,8-dimethyl-5,7,3',4'-tetrahydroxyflavanone.

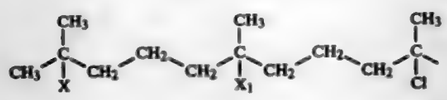
4,636,570

TOCOPHEROL DERIVATIVES USEFUL IN THE SYNTHESIS OF VITAMIN E AND THEIR PREPARATION

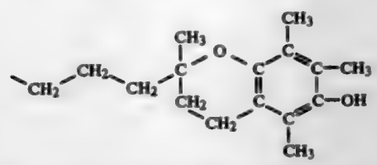
Pierre Chabardes, Sainte Foy les Lyon, and Michel Malhomme, Charriere Blanche, both of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Filed Sep. 19, 1985, Ser. No. 777,846
Claims priority, application France, Sep. 20, 1984, 84 14426; Mar. 15, 1985, 85 03843
Int. Cl.[4] C07D *311/72*
U.S. Cl. 549—408 5 Claims

1. A tocopherol derivative of the formula:



(I)



in which X and X_1, which may be identical or different, each represent hydrogen or chlorine, or the acetate thereof.

4,636,571

4-CARBALKOXY-2-ETHYL-2,3-DIHYDROFURANS

Eugene G. Harris, West Chester, and Richard G. Fayter, Jr., Fairfield, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 503,974, Jun. 13, 1983, Pat. No. 4,515,978. This application Apr. 23, 1985, Ser. No. 726,220
Int. Cl.[4] C07D *307/02*
U.S. Cl. 549—484 8 Claims

1. 4-Carbethoxy-2-ethyl-5-methyl-2,3-dihydrofuran.
2. 4-Carbomethoxy-2-ethyl-5-methyl-2,3-dihydrofuran.
3. 4-Carbethoxy-2-ethyl-2,5-dimethyl-2,3-dihydrofuran.
4. 4-Carbomethoxy-2-ethyl-2,5-dimethyl-2,3-dihydrofuran.
5. 4-Carboethoxy-5-methyl-2-propyl-2,3-dihydrofuran.

4,636,572

PERMEABILITY CONTRAST CORRECTION EMPLOYING PROPIONATE-SEQUESTERED CHROMIUM(III) PREPARED BY NITRITE/DICHROMATE REDOX

Paul S. Hudson, and Tod K. Shioyama, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 11, 1985, Ser. No. 710,733
Int. Cl.[4] C07F *11/00*
U.S. Cl. 556—2 19 Claims

1. A method of producing a stabilized chromium(III) propionate solution which comprises the steps of:

(a) admixing a propionic acid source selected from propionic acid and propionic anhydride with water thereby forming an aqueous solution of propionic acid containing 50 to 70 weight percent propionic acid;

(b) adding to said aqueous propionic acid a chromium(VI) source selected from the group consisting of chromium(VI) oxide and alkali metal and ammonium dichromates and chromates thereby forming a solution of said chromium(VI) source in said aqueous propionic acid employing a molar ratio of at least about 4:1 propionic acid:chromium and

(c) adding to said solution of chromium(VI) source in aqueous propionic acid a nitrite source employing sufficient nitrite source selected from the group consisting of alkali metal and ammonium nitrites to effectively reduce chromium(VI) to chromium(III) allowing sufficient time at sufficient temperature to produce a clear green solution of stabilized chromium(III) propionate; and

(d) adding to said stabilized chromium(III) propionate solution an additional acid selected from the group consisting of propionic acid, hydrochloric acid, acetic acid and acetic anhydride to adjust total acidity to at least about an 11:1 molar ratio of acid:chromium.

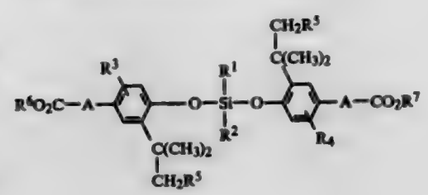
4,636,573

HINDERED SILICON ESTER STABILIZERS

Stephen D. Pastor, Yonkers, and John D. Spivack, Spring Valley, both of N.Y.

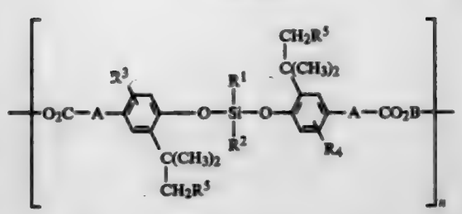
Filed Sep. 9, 1985, Ser. No. 773,962
Int. Cl.[4] C07F *7/08, 7/18*
U.S. Cl. 556—441 13 Claims

1. A compound of the formulae I and II



(I)

-continued



(II)

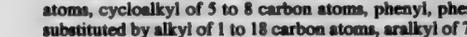
wherein

R^1R^2, R^3, R^4 and R^5 are independently hydrogen, alkyl of 1 to 18 carbon atoms cycloalkyl of 5 to 8 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 18 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 12 carbon atoms,

R^6 and R^7 are independently alkyl having 1 to 30 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 18 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 12 carbon atoms;

A is a direct bond, a methylene or an ethylene radical,

B is an alkanediyl radical of 2 to 10 carbon atoms, the radical of formula $—CH_2CH_2—S—CH_2CH_2—$ or of the formula III



(III),

wherein m is an integer from 1 to 4, B also denotes a phenylene radical or a biphenylene radical interrupted by an oxygen or a sulfur atom or by the group of formula $—C(CH_3)_2—$; and

n is an integer from 2 to 100.

4,636,574

PROCESS FOR PREPARING ARYLISOTHIOCYANATES

Kju H. Shin, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 4, 1985, Ser. No. 794,855
Int. Cl.[4] C07C *161/04*
U.S. Cl. 558—18 7 Claims

1. A process which comprises reacting a primary arylamine with carbon disulfide in the presence of a tertiary amine so as to prepare an arylisothiocyanate.

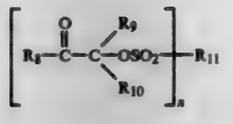
4,636,575

MASKED CURING CATALYST FOR ACID-CURABLE COMPOSITIONS

Rudolf Kirchmayr, Aesch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 455,173, Jan. 3, 1984, Pat. No. 4,510,290. This application Dec. 17, 1984, Ser. No. 682,451
Claims priority, application Switzerland, Jan. 11, 1982, 123/82; Aug. 31, 1982, 5174/82
Int. Cl.[4] C07C *143/68*
U.S. Cl. 558—58 6 Claims

1. A compound of the formula X



(X)

in which n is the number 1 or 2 and R_9 is phenyl or naphthyl which is substituted by C_2–C_{12}—alkyl, C_2–C_4—alkoxy, phenoxy, tolyloxy, phenylthio, tolylthio, C_1–C_8—alkylthio, —SCH_2—CH_2OH, C_1–C_4—alkylsulfonyl, phenylsulfonyl, C_1–C_4—alkylamino, C_2–C_4—dialkylamino, phenyl—CONH—, C_1–C_4—alkyl—CONH— or benzoyl, or R_9 is also anthryl, phenanthryl, thienyl, pyridyl, furyl, indolyl or tetrahydronaphthyl, R_9 is C_2–C_8—alkyl or C_1–C_8—alkyl which is substituted by —OH, —Cl, C_1–C_4—alkoxy, —CN, C_2–C_5—alkoxycarbonyl, phenyl, chlorophenyl, C_7–C_{10}—alkylphenyl or C_7–C_{10}—alkoxyphenyl, R_{10} is as defined above for R_9 and is also phenyl which is substituted by —Cl, C_1–C_4—alkyl, C_1–C_4—alkoxy or C_1–C_4—alkylthio, C_4–C_8—alkoxycarbonyl, —CN, C_1–C_4—alkyl—NHCO—, phenyl—NHCO— or —$CONH_2$ or R_9 and R_{10}, together with the carbon atom to which they are attached, form a C_4–C_6—cycloalkyl ring, and, if n=1, R_{11} is C_2–C_{18}—alkyl, phenyl which is substituted by C_2–C_{12}—alkyl, C_2–C_4—alkoxy, C_1–C_4—alkyl—CONH—, phenyl—CONH— or benzoyl, naphthyl which is unsubstituted or is substituted by halogen, C_1–C_{12}—alkyl or C_1–C_4—alkoxy, C_5–C_6—cycloalkyl, C_7–C_9—aralkyl, camphoryl, —CF_3, —CCl_3, —F or —NH_2, and, if n=2, R_{11} is a —$(CH_2)_m$— group in which m is the number 2 to 8, or R_{11} is phenylene or naphthylene which is unsubstituted or is substituted by C_1–C_{12}—alkyl.

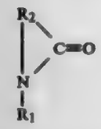
4,636,576

CYCLIC AMIDE ADDITIVES FOR ORGANIC CARBONATE PROCESS

Ajit K. Bhattacharya, Hopewell Junction, and John T. Nolan, Jr., Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 30, 1985, Ser. No. 781,172
Int. Cl.[4] C07C *68/00*
U.S. Cl. 558—277 11 Claims

1. A method of preparing dimethyl carbonate which comprises reacting methanol (CH_3OH) with carbon monoxide (CO) and oxygen (O_2) in the presence of a catalyst system containing as a catalyst cupric methoxychloride [Cu(OMe)Cl], and as an additive for the catalyst, a cyclic amide of the formula



wherein R_1 is H or a (C_1–C_8) alkyl group and R_2 is a (C_3–C_8) alkylene group.

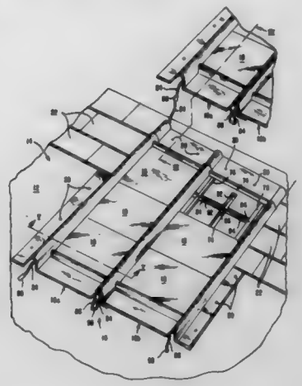
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4,636,577

SOLAR PANEL MODULE AND SUPPORT THEREFOR

Joseph Peterpaul, West Orange, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Aug. 29, 1983, Ser. No. 527,439
Int. Cl.[4] H01L *35/00*
U.S. Cl. 136—206 8 Claims



1. A solar panel module for mounting to a surface of a roof or the like comprising:

a solar panel having an upper surface for receiving incident solar radiation, an opposed under surface and conductive means electrically connected thereto;

an elongate frame including a generally flat rectangular base having a support surface for supporting the under surface of said solar panel;

means removably sealably securing said solar panel under surface to said frame support surface;

raceway means on said frame for concealed passage of electrical wires electrically connected to said conductive means of said solar panel;

means for interlocking said frames for forming an assembly of solar panel modules;

means for attaching said frame to said roof surface,

said raceway means being defined by first and second upstanding continuous walls extending longitudinally adjacent opposing laterally spaced edges of said solar panel, said first and second walls defining first and second channels, respectively for concealed receipt of electrical wires, said laterally spaced walls being differently configured so as to provide said means for interlocking said frames along their longitudinal extents, said first longitudinally extending wall of a module adapted to be relatively overlapped with said second differently configured longitudinally extending wall of another similar module,

said interlocking means including means for interlocking a frame to another frame along their lateral extents, said lateral extent interlocking means defined by different configurations of the first and second walls at the spaced longitudinal ends of said frame, whereby the first and second walls at one longitudinal end of a module are insertable into the respective channels defined by said first and second walls at the other end of another similar module.

4,636,578

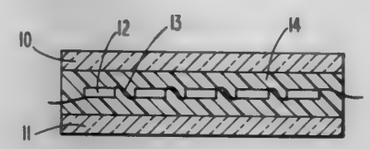
PHOTOCELL ASSEMBLY

Stewart C. Feinberg, Exton, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 11, 1985, Ser. No. 722,085
Int. Cl.[4] H01L *25/02, 25/04*
U.S. Cl. 136—251 11 Claims

1. A photocell assembly comprising first and second sheets in spaced apart, laminar arrangement, said first sheet being transparent and light transmissive, said sheets defining a cavity therebetween, said cavity containing one or more photocells encapsulated within a thermoplastic polymeric pottant comprising a graft copolymer of

(a) 50–90 wt. %, based on graft copolymer, of at least one addition polymerizable backbone monomer having a T_g of less than 0° C.,



(b) 0–10 wt. %, based on graft copolymer, of at least one addition polymerizable backbone monomer having a T_g of 50°–150° C., and

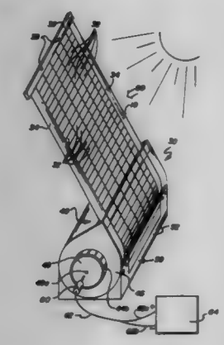
(c) 10–50 wt. %, based on graft copolymer, of a macromonomer comprising poly (vinyl aromatic) of number average molecular weight of 3,000–50,000 and having an addition polymerizable end group, said macromonomer having a T_g of at least 30° C.

4,634,579

RETRACTABLE POWER SUPPLY

Joseph J. Hanak, Birmingham; James Young, West Bloomfield; Bert Kuypers, Lake Orion, and Richard Blieden, Bloomfield Hills, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 18, 1985, Ser. No. 712,838
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—245 16 Claims



1. A retractable power supply comprising:

a thin, flexible, lightweight, large area solar cell for converting incident light energy into electrical energy;

a base member for storing the solar cell, said solar cell rollably secured to said base member;

a thin, rollable, elongated, tape-like, rigidifying spring strip affixed to the solar cell and oriented generally perpendicular to the base member, said strip having a curved cross-sectional shape taken in a direction transverse to the longitudinal direction thereof when the solar cell is deployed from the base member, and of a generally planar cross-section in said transverse direction when the solar cell is rollably secured, said strip operative to rigidify the deployed solar cell; and,

terminal means for withdrawing electrical energy from the power supply.

4,636,580
STATIC CONVERTER MODULE WITH MOUNTING LUGS

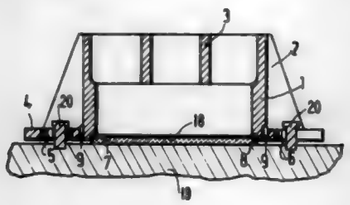
Arno Neidig, Plankstadt; Bernd Leukel, Weinheim, and Hubert Hettmann, Hockenheim, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Division of Ser. No. 585,991, Mar. 5, 1984, abandoned. This application Nov. 8, 1985, Ser. No. 800,082

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, 3307704

Int. Cl.⁴ H05K 7/20

U.S. Cl. 174—52 PE 3 Claims



1. A module for a static converter, comprising a housing including:

a top part in the form of a frame being open at the bottom and top defining lateral surfaces, a lower edge and an interior, and mounting lugs formed on said lateral surfaces at a given height, said mounting lugs having mounting holes formed therein for receiving means for mounting the module on a heat sink; and

a bottom part in the form of a ceramic plate having a lower surface disposed entirely on the heat sink when mounted, said ceramic plate being at least partially disposed in a peripheral indentation formed in said lower edge in said interior of said frame substantially at said given height; and

means for preventing a mechanical stress field from being transmitted directly from the mounting means to said ceramic plate when mounted, said transmission prevention means being in the form of slits separate from said peripheral indentation and said mounting holes, each of said slits being formed in a respective one of said mounting lugs substantially parallel to a respective one of said lateral surfaces between a respective one of said lateral surfaces and a respective one of said mounting holes.

4,636,581
SEALED FLEXIBLE PRINTED WIRING FEEDTHROUGH APPARATUS

Thomas A. Roche, Tempe, and Robert E. Edminster, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 24, 1985, Ser. No. 747,749

Int. Cl.⁴ H01B 17/30

U.S. Cl. 174—152 R 13 Claims

1. An electrical feedthrough apparatus comprising:

a flexible printed wiring cable having two conductors wherein said two conductors extend through a first insulated section of said cable, a first exposed section of said cable, and a second insulated section of said cable, the first exposed section being between the first and second insulated sections, said cable having a second exposed section and a third insulated section, the second exposed section being between the second and third insulated sections; and

a molded object of electrical insulating material surrounding a portion of the first insulated section of said cable, the entire first exposed section of said cable, the entire second insulated section, the entire second exposed section, and a portion of the third insulated section of said cable.

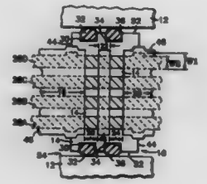
8. A method of routing a plurality of insulated electrical conductors through an opening in a housing wall, the method comprising the steps of:

supplying a flexible printed wiring cable containing a plurality of insulated conductors;

exposing the conductors in a first section of the cable so that the first section resides between two insulated sections of the cable;

exposing the conductors in a second section of the flexible printed wiring cable so that the second section resides between two insulated sections of the cable;





molding an object electrical insulating material around and between each of the exposed conductors in the first and the second sections;

forming a first channel in the periphery of the object;

inserting a first O-ring in the first channel; and

clamping the object into the opening in the housing wall so that the O-ring contacts the housing wall throughout an outer surface of the O-ring.

4,636,582
SIGNAL INPUT SHEET HAVING A CONDUCTIVE SHIELD LAYER

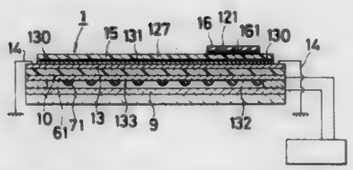
Masafumi Moriwaki; Shigeaki Sano, both of Hachioji, and Eiichi Tanaka, Koganei, all of Japan, assignors to Toppan Moore Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1984, Ser. No. 645,441

Claims priority, application Japan, Aug. 31, 1983, 58-160035

Int. Cl.⁴ G08C 21/00

U.S. Cl. 178—18 3 Claims



1. In a sheet-like input device wherein a conductive layer and a resistance layer are arranged in an isolated state up and down, one layer of said conductive layer and said resistance layer which is at least positioned as an upper layer side is formed from a flexible sheet layer, and writing pressure points of the conductive layer and resistance layer contact according to writing preasure from a sheet surface whereby a varisble electric circuit is formed to obtain a position signal, a signal input sheet characterized in that a conductive shield layer is provided on the upper surface of said layer positioned as an upper layer side through an insulating layer, said shield layer being connected to an earth.

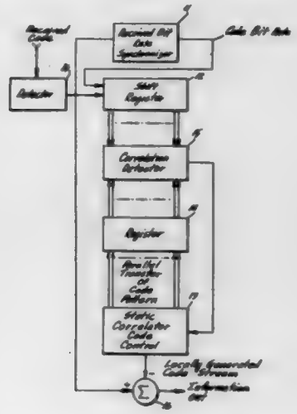
4,636,583
SYNCHRONIZATION OF LONG CODES OF BOUNDED TIME UNCERTAINTY

Frederick W. Bidell, Grand Island; Harold C. Kluever, Williamsville, both of N.Y., and Roger R. Reed, Arlington, Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 24, 1970, Ser. No. 48,780

Int. Cl.⁴ H04L 9/00, 7/00

U.S. Cl. 178—22.17 3 Claims



1. In a communications network having a plurality of terminals each adapted to receive coded information signals, the improvement comprising means for synchronizing a locally generated code with a received code, said synchronizing means comprising:

means for detecting said received code,

means for correlating said received code with said locally generated code,

means for generating a correlation signal when said codes are correlated,

means for generating said locally generated code in time synchronization with said received code in response to said correlation signal,

said correlating means compriting search means for searching a period of bounded time uncertainty to determine the timing of said locally generated code, said search means comprising means for storing said received code, register means for storing blocks of said locally generated code related to said period of bounded time uncertainty, correlation detector means for generating said correlation signal when said received code and a block of said locally generated code attain a predetermined level of correlation,

a master code generator for generating a master code,

a precessing delay line for storing said master code in a compressed time domain,

an address counter for providing an address to each master code bit period in said compressed time domain,

an address storage register for storing a preset address related to said bounded time uncertainty,

a coincidence detector for providing a readout pulse to said precessing delay line when the information in said address counter is coincident with the information in said address storage register, and

a reclocking flipflop for reclocking information readout of said precessing delay line in real time to produce said locally generated code.

4,636,584
SIGNALING PROTOCOL CHANNEL UNIT

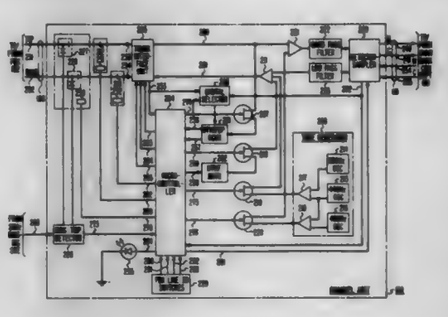
Mark S. Binkerd, Warrenville, and William C. Sand, St. Charles, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 546,336, Oct. 28, 1983. This application Dec. 19, 1983, Ser. No. 563,193

The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.

Int. Cl.⁴ H04J 3/22; H04M 7/10

U.S. Cl. 379—340 31 Claims



31. A channel unit for interfacing different signaling protocols utilized on carrier channel and terminal unit lines comprising:

control means responsive to a first set of electrical interface signals indicative of a state in a first signaling protocol of a call when on said terminal unit line for generating a control signal and

transmit converter means for converting said control signal to a second set of electrical interface signals for said call when on said carrier channel line to assume a state in a second signaling protocol different from said first signaling protocol corresponding to said state in said first signaling protocol of said call when on said terminal unit line.

4,636,585
TELEPHONE INSTALLATIONS

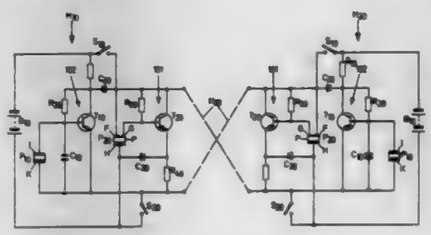
Horst Brandstätter, Zirndorf, Fed. Rep. of Germany, assignor to Geobra Brandstätter GmbH & Co. KG, Fed. Rep. of Germany

Filed Jul. 5, 1984, Ser. No. 627,805

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1983, 3324690; Nov. 15, 1983, 3341251

Int. Cl.⁴ H04M 5/12, 9/00

U.S. Cl. 379—167 6 Claims



1. A telephone installation having two talk-listen stations each comprising talking and listening means housed in a common receiver case, first switch means being provided, at said

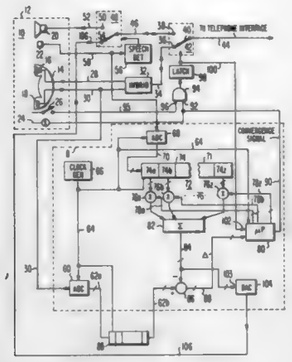
receiver case, said first switch means being in a first switching position when the receiver case is resting and in a second switching position when the receiver case is lifted wherein the listening means comprises an electroacoustic piezoelectric device having metallic electrodes arranged on either side of a piezoelectric material plate, one electrode being subdivided into two partial electrodes not interconnected in direct current-like manner, an oscillator arrangement being provided between the partial electrodes and the other electrode which produces a ringing signal in one switching position of said first switch means and in the other switching position, one of the partial electrodes and the said other electrode forming the actual listening means, the other partial electrode being disconnected.

4,636,586

SPEAKERPHONE WITH ADAPTIVE CANCELLATION OF ROOM ECHOES

Leonard N. Schiff, Lawrenceville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 20, 1985, Ser. No. 778,314
Int. Cl.[4] H04B *15/00*
U.S. Cl. 379—390 **10 Claims**



1. A method for reducing the effect of room resonances on the quality of sound transmitted over a speakerphone including a loudspeaker-microphone pair and a handset transmitter-receiver pair, comprising the steps of:

speaking into said transmitter of said handset at a location in said room so that a clean audio signal is generated by said transmitter which is unaffected by said room resonances, and a corresponding audio signal is generated by said microphone which is affected by said room resonances;

delaying said corresponding audio signal to produce a plurality of incrementally delayed samples of said corresponding audio signal;

multiplying each of said incrementally delayed samples of said corresponding audio signal by one of a plurality of multipliers to produce a plurality of multiplied signals;

summing together said multiplied signals to produce a sum signal;

subtracting said sum signal from said clean audio signal to produce a difference signal;

adjusting each of said plurality of multipliers so as to reduce said difference signal towards zero, whereby said sum signal approximates said clean signal;

fixing the values of each of said plurality of multipliers to produce fixed multipliers which multiply said incrementally delayed samples of said corresponding audio signal, whereby said sum signals is said corresponding audio signal corrected for said room resonances;

ceasing speech into said transmitter of said handset after said fixing step;

speaking towards said microphone after said ceasing step; and

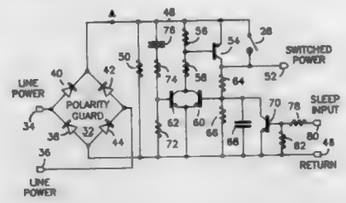
utilizing said sum signal as the output of said speakerphone.

4,636,587

ELECTRONIC SWITCH FOR DIGITAL TELEPHONE

Glen J. Zoerner, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 16, 1985, Ser. No. 776,314
Int. Cl.[4] H04M *1/00, 19/00*
U.S. Cl. 379—377 **8 Claims**



1. An electronic switch for supplying power to a digital telephone which consumes substantially no power in the idle mode and includes a hookswitch, comprising:

first input means coupled to receive a source of power;

an output terminal for supplying power to said telephone;

second input means coupled to receive a disabling signal for deactivating said electronic switch;

first switching means coupled to said first input means for momentarily turning on in response to an input signal;

second switching means coupled to said first switching means and to said output terminal for turning on when said first switching means turns on and supplying power to said output terminal; and

third switching means coupled to said second switching means, to said hookswitch, and to said second input means for

(a) turning on when said second switching means turns on to maintain said second switching means on after said first switching means turns off, and

(b) turning on when said hookswitch is closed causing said second switching means to turn on and supply power to said output terminal, said third switching means remaining on after said hookswitch is again opened,

said third switching means turning off when said disabling signal is received causing said second switching means to turn off.

4,636,588

ELECTRIC SOURCE CIRCUIT FOR TELEPHONE SETS

Yasunobu Nakayama, Musashino, and Yasuji Sato, Hachioji, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 27, 1985, Ser. No. 706,283
Claims priority, application Japan, Feb. 29, 1984, 59-38140; Feb. 29, 1984, 59-38141; Apr. 4, 1984, 59-66865
Int. Cl.[4] H04M *19/00*
U.S. Cl. 379—362 **10 Claims**

1. A source circuit for a telephone set for generating an office line voltage comprising:

a dial pulse transmitting circuit;

control circuit means, incldng a control unit and a memory, for controlling a dial pulse transmission operation and a talking operation;

a back-up battery;

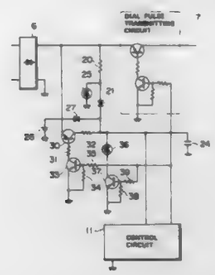
first diode means for deriving said office line voltage at times of talking;

second diode means for deriving said office ling voltage via said dial pulse transmitting circuit at times of initial line connection and dial pulse transmission, output voltage of said first and second diode means being connected to provide a combined output voltage;

third diode means for deriving an output voltage from said back-up battery;

a smoothing capacitor receiving outputs of said first, second and third diode means and smoothing said combined output voltage of said first and second diode means;

first voltage limiting circuit means, connected to an input of said first diode means, for preventing said combined output voltage from exceeding a predetermined voltage level;



second voltage limiting circuit means, connected to an input of said second iode means for preventing said combined output voltage from exceeding said predetermined voltage level; and

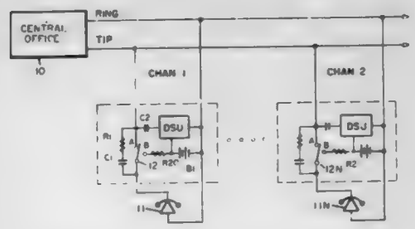
means for supplying said smoothed combined output voltage to said control circuit means, said smoothed combined output voltage acting as a source voltage for said control circuit means.

4,636,589

IN-LINE TELEPHONE INTERCOM SYSTEM

Peter Lee, Monterey Park, Calif., assignor to American Phone Products, Anaheim, Calif.

Filed Feb. 4, 1985, Ser. No. 697,787
Int. Cl.[4] H04M *1/72*
U.S. Cl. 379—159 **14 Claims**



1. A telephone control system for use with an existing single line, two-conductor telephone line system including Tip and Ring lines comprising,

interconnecting means for connecting a telephone instrument to said telephone line system,

detection and signalling apparatus (DSA) connected between said Tip and Ring lines and to said interconnection means to selectively detect or supply a control signal along said telephone line system via said interconnecting means,

source means connected to said interconnection means and to said DSA in order to supply power thereto,

said interconnection means includes first switch means connected in series between said telephone instrument and the Tip line of said telephone line system,

said interconnection means further includes an RC circuit connected across said first switch means to provide a continuous circuit path from said Tip line to said telephone instrument which exhibits high impedance to low frequency signals supplied to said interconnection means via said telephone line system, and

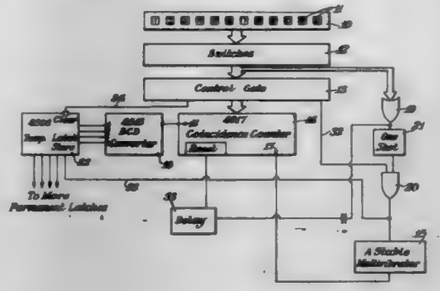
a hold circuit connected to said interconnection means in order to maintain a call condition at said telephone line system relative to said telephone instrument.

4,636,590

METHOD AND APPARATUS FOR CONVERTING FREQUENCY SIGNALS REPRESENTING CHARACTERS TO BINARY CODE

John P. Cairns, Wilmington, Del., assignor to Computer Security Corporation, Wilmington, Del.

Filed Dec. 31, 1984, Ser. No. 688,014
Int. Cl.[4] H04M *1/26*
U.S. Cl. 379—386 **1 Claim**



1. A system for converting selected characters to binary code data, comprising

a plurality of means for producing signals of selected audio frequencies,

a plurality of NOR gates,

means connecting pairs of said frequency producing means to the NOR gates for transmitting to selected NOR gates pairs of frequency signals and producing a positive output signal from a NOR gate upon coincidence of a pair of frequency signals,

wherein the output signals from the NOR gate represent selected code characters

a plurality of channels consisting of a NAND gate, an AND gate and an OR gate connected in series, said channels representing code characters,

means transmitting the output signal representing a code character from each NOR gate to the channel representing the code character to produce an activating pulse from the channel,

a coincidence counter having output pins each output pin corresponding to a code character,

means connecting the channels to the corresponding coded output pins of the coincidence counter,

a clock means for providing clock pulses,

means for transmitting the activating pulse to the clock means to activate the clock pulses

means in said coincidence counter for applying positive pulses successively to the channels connected at the output pins,

a coded counter for producing successively code characters at terminals of the coded counter,

means for providing clock pulses synchronously to increment the coincidence counter and the coded counter to produce simultaneously a positive pulse at a coded output terminal of the coincidence counter and the corresponding code character in the output of the code counter, and remove from the channel which activates the clock the activating pulse to discontinue the incrementation and

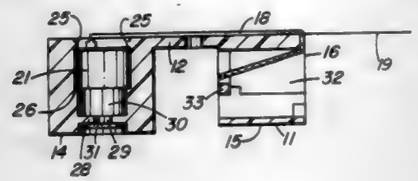
produce at the output terminals of the coded counter the code character represented by the activating channel.

4,636,591

INTEGRAL TRANSMITTER AND MODULAR JACK ASSEMBLY FOR A TELEPHONE SET

Gerd Kuhfus; Charles R. S. Walker, both of London, and Anthony H. J. Robinson, Richmond Hill, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jan. 22, 1985, Ser. No. 693,293
Int. Cl.[4] H04M *1/03, 1/04*
U.S. Cl. 381—159 10 Claims



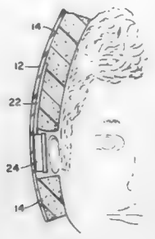
1. An integral transmitter and modular jack assembly, for a telephone set, comprising:
- a housing having a cylindrical bore having a central axis;
- a transmitter positioned in said bore, said transmitter having a front end and a back end surface;
- a modular jack extending laterally from said housing, the jack having a rectangular bore having an axis entending normal to said central axis of said cylindrical bore;
- said modular jack having a back surface extending in a plane parallel to said back end surface of said transmitter;
- a web extending between said housing and said modular jack, said web being co-planar with said back surface of said jack and a back surface of said housing;
- spring contact members extending down into said rectangular bore from said back surface of said modular jack;
- contact members on said back end surface of said transmitter; and
- a circuit pattern on said web and connected to said spring contact members and to said contact members on said transmitter.

4,636,592

SPEAKER MOUNTING FOR LINED HELMET

Anthony W. Scott, Oberlin, Ohio, assignor to Helmet Sound, Inc., Oberlin, Ohio

Filed Dec. 3, 1984, Ser. No. 677,750
Int. Cl.[4] H04M *1/05*
U.S. Cl. 381—187 7 Claims



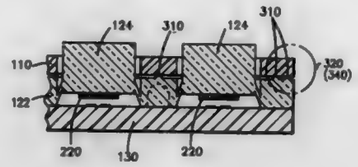
1. An apparatus for mounting a speaker in a helmet having a curved outer shell and a lining, said apparatus comprising a blade and means for securing at least one speaker to the blade, said blade having length and elasticity such that when the blade is inserted between the outer shell and the lining of a lined helmet the curvature of the outer shell will cause the blade to be stressed sufficiently to hold said speaker securing means away from the ear of a wearer of the helmet.

4,636,593

LIGHT CONDUCTING, ELASTOMERIC MEMBRANE KEYPAD

Carl V. Novak, Pell Lake, Wis., and Ronald R. Browne, Des Plaines, Ill., assignors to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 711,425, Mar. 13, 1985, abandoned.
This application Apr. 17, 1986, Ser. No. 854,730
Int. Cl.[4] H01H *3/12*
U.S. Cl. 200—5 A 23 Claims



21. A keypad assembly, comprising:
- a housing having a predetermined shape;
- a flexible circuit board disposed in said housing and having pairs of contacts and at least one light source, said circuit board adapted to conform to the shape of said housing; and
- keypad means disposed between said housing and said circuit board and including:
  - translucent sheet means comprised of an elastomer, having a top surface and a bottom surface and a predetermined thickness for conductng light from the light source, and said sheet means further having a plurality of cavities and having a plurality of protruding keys each having a top surface and a bottom surface, each key attached by a relatively thin suport leg portion to the bottom surface of said sheet means substantially at the periphery of the bottom surface of the key, and each key further having a portion extending below the top surface of said sheet means for directly receiving conducted light therefrom; and
  - a plurality of electrically conductive means each disposed on the bottom surface of a corresonding key and opposite to a corresponding pair of contacts for producing electrical signal continuity therebetween when the key is activated.

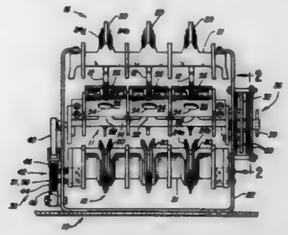
4,636,594

SWITCH WITH AUXILIARY BIASING MECHANISM

Janak R. Patel, Indian Head Park, and John S. Schaffer, Tinley Park, both of Ill., assignors to G & W Electric Company, Blue Island, Ill.

Filed Sep. 24, 1985, Ser. No. 779,564
Int. Cl.[4] H01H *21/54*
U.S. Cl. 200—15 6 Claims

1. An electric power distribution switch having at least one closed position and at least one open position, comprising:
- a frame including a pair of side walls;
- a rocker arm supported by said side walls and rotatable between a first predetermined position, corresponding to an open position of said switch and a second predetermined position corresponding to a first closed position of said switch;
- a plurality of movable contacts fixed on said rocker arm for rotation therewith;
- a first set of fixed contacts for engaging said movable contacts in said first closed position;
- an operator connected to said rocker arm comprising spring means for storing potential energy, and manually rotatable input means for effecting discharge of said potential energy by application of torque to said rocker arm to effect rotation thereof; and
- auxiliary biasing means connected to said rocker arm and cooperative with said operator to assist said operator in rotating said rocker arm from said first predetermined position to said second predetermined position to shift said switch from open to closed position, and oppose said operator in rotating said rocker arm from said second predetermined position to said first predetermined position to shift said switch from closed to open position,
- said auxiliary biasing means being effective to apply torque to said rocker arm, said torque applied by said auxiliary biasing means being variable as a function of rocker arm position, said operator being capable of applying torque greater in magnitude than and opposite in direction to that applied by said auxiliary biasing means when said rocker arm is in said second predetermined position.

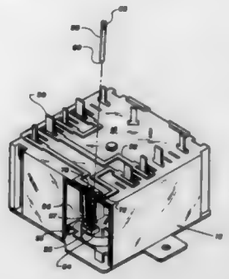


4,636,595

TIMER AND MOTOR ASSEMBLY

Steven W. Smock, Indianapolis, and James W. Richmond, Carmel, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Oct. 15, 1985, Ser. No. 787,536
Int. Cl.[4] H01H *43/00*; H02K *11/00*
U.S. Cl. 200—38 R 3 Claims



1. A timer and motor assembly comprising a housing providing a single compartment, a motor assembly carried within said single compartment, cam means carried within said single compartment, coupling means coupling said motor assembly to said cam means and carried within said single compartment, switch means carried within said single compartment and operated by said cam means, electrical terminals electrically coupled to said switch means and extending outside said housing, electrical bussing bars carried on an outer surface of said housing and electrically connected to said electrical terminals, and electrical bussing pins extending from said motor assembly outside said housing and electrically connected to said bussing bars.

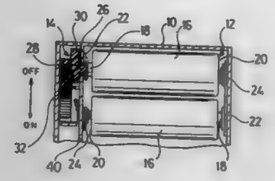
2. A timer and motor assembly according to claim 1 wherein said electrical bussing bars carried on an outer surface of said housing electrically connect selected ones of said electrical terminals.

4,636,596

POWER SWITCH FOR A BATTERY

Mitsuo Takada, Tokyo, Japan, assignor to Nikko Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1985, Ser. No. 774,741
Int. Cl.[4] H01H *3/16*; F21V *23/04*
U.S. Cl. 200—52 R 5 Claims



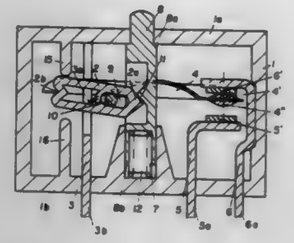
1. A power switch for a battery which is adapted to be used with a battery-receiving chamber having room for receiving at least one battery, said chamber having at least first and second opposed outer walls and an intermediate wall located between said opposed walls, a first electrical contact positioned on said intermediate wall, said first contact being electrically connected to an anode of a battery when said battery is inserted into said chamber, and a second electrical contact which is in electrical and resilient contact with a cathode of said battery when said battery is inserted into said chamber, wherein said first contact has an aperture located along a central portion of said contact, said aperture being aligned with a similar aperture in said intermediate wall, said device further comprising a switching mechanism which includes an insulative operating element, said operating element having a protuberance which is moved through said aligned apertures in an axial fashion relative to said anode of said battery for selectively moving said battery anode towards and away from said first contact.

4,636,597

ELECTRICAL SNAP SWITCH

Edgar Mesche, Laedenscheid, Fed. Rep. of Germany, assignor to Leopold Kostal GmbH & Co., KG, Fed. Rep. of Germany

Filed May 30, 1985, Ser. No. 739,149
Int. Cl.[4] H01H *5/00*
U.S. Cl. 200—68.1 4 Claims



1. An electrical snap switch comprising in combination a substantially rectangularly-shaped switch operating (2), a sliding control member, and a switch spring assembly; said switch operating member having a wedge-shaped relief segment formed on one end of the segment, said switch operating member having an other end oscillatably mounted longitudinally between abutment members such that the other end upon operation of said switch operating member engages one of said abutment members, said switch operating member having an

elongated slot for pivotally mounting said switch operating member on an axis, said switch operating member being acted upon by said switch spring assembly and being in communication with contact means to enable said switch operating member to connect in at least one of its end positions at least one pair of fixed contact members to each other, said sliding control member (8) being acted upon by a return spring, disposed between said switch operating member and said fixed contact members, and being movable approximately normal to the longitudinal extension of the snap switch operating member to act upon the switch spring assembly, said sliding control member having formed thereon a wedge-shaped relief segment for interaction with said wedge-shaped relief segment of the switch operating member which is axially displaceably mounted about its pivot axis, said switch spring assembly characterized by a one-piece elongated metal element (4) which serves the dual purpose to act as contact means and to function as a switch spring device, said metal element (4) having a pull section (4a) engaging said other end of the snap switch operating member (2) and a push section (4b) for engaging a fixed contact member (3), said metal element (4) being adapted to make contact by means of at least one of the plated contacts (4', 4") provided on its free end with at least one fixed contact member (5, 6).

4,636,598

PRESSURE SWITCH WITH NON-CONDUCTIVE HOUSING AND AXIALLY SPACED TERMINALS

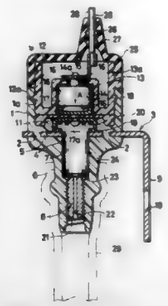
Masaru Suzuki, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Oct. 19, 1984, Ser. No. 662,890

Claims priority, application Japan, Oct. 21, 1983, 58-197965; Oct. 24, 1983, 58-164188[U]; Oct. 24, 1983, 58-164189[U]

Int. Cl.⁴ H01H *35/34*

U.S. Cl. 200—83 N **10 Claims**



1. A pressure switch comprising:

a non-conductive switch housing including a rigid body integrally molded from a synthetic resin material and having an aperture;

first terminal means including a metal support with a part thereof embedded in said body, said part having means for integration with said body when said body is molded, said support having an attachment portion outside said body;

a pressure reponsive member provided inside of said body for receiving a pressure from a pressure source through said body aperture and for being displaced toward said support in response to the pressure received;

second terminal means in said body and including a lead member extending out of said housing, said pressure responsive member being positioned between said support and said lead member;

a fixed contact disposed in said housing and electrically connected to a predetermined one of said first and second terminal means; and

a movable contact carried by said pressure responsive member, electrically connected to the other of said first and second terminal means, and arranged to become in contact with and separate from said fixed contact in response to the displacement of said pressure responsive member, a rigid insulator positioned within said housing and attached to said body, said insulator together with said body defining a rigid non-conductive subhousing within which are disposed said fixed contact and said movable contact.

4,636,599

HIGH-VOLTAGE SWITCH

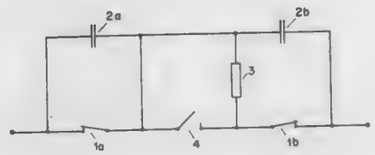
Walter Bischofberger, Niederwenigen; Heinz Eichholzer, Thalwil; Werner Graber, Ennetbaden and Jiri Talir, Baden, all of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Switzerland

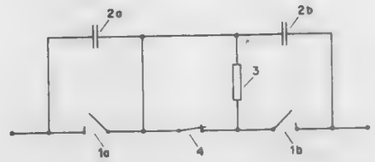
Filed Jan. 30, 1985, Ser. No. 696,266

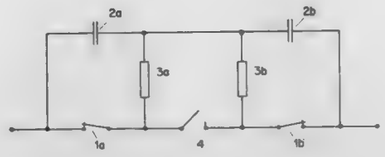
Claims priority, application Switzerland, Feb. 23, 1984, 884/84

Int. Cl.⁴ H01H *33/16*

U.S. Cl. 200—144 AP **9 Claims**







1. A high-voltage circuit breaker, comprising:

a first main switching unit and a second main switching unit, each of the switching units comprising a respective contact arrangement which can be opened or closed;

at least one closing resistor connected in parallel to at least one auxiliary switching unit to form a parallel circuit, said at least one auxiliary switching unit comprising a respective contact arrangement which can assume an opened or closed position, said parallel circuit being disposed in series circuit relationship between said first and said second main switching units;

drive means including a drive and a switching drive mechanism that are so structured that said drive actuates, in common, said contact arrangements of said first and second main switching units and of said auxiliary switching unit; and

means, comprised in said switching drive mechanism, for closing said respective contact arrangement of said at least one auxiliary switching unit in delayed relationship to the closing of said contact arrangement of said main switching units during a power turn-on procedure, and for opening said respective contact arrangement of said auxiliary switching unit in delayed relationship to the opening of said respective contact arrangement of said main switching units, during a power turn-off procedure.

4,636,600

VACUUM SWITCH PROVIDED WITH HORSESHOE-SHAPED ELEMENTS FOR GENERATING AN AXIAL MAGNETIC FIELD

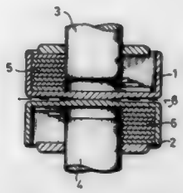
Joseph H. F. G. Lipperts, Hengelo, Netherlands, assignor to Holec Systemen Componenten B.V., Hengelo, Netherlands

Filed Mar. 18, 1985, Ser. No. 712,737

Claims priority, application Netherlands, Mar. 19, 1984, 8400873

Int. Cl.⁴ H01H *33/66*

U.S. Cl. 200—144 B **10 Claims**



1. Electrical vacuum switch provided with two contacts of electrically conductive material which can be moved towards and away from each other, mounted on the ends of a fixed or movable contact rod respectively of electrically conductive material, with a laminated horseshoe-shaped ferromagnetic element being fitted around each contact rod, as a result of which because of the position a magnetic circuit is formed around the contact rod, which circuit consists of a section of low magnetic resistance and a section of a high magnetic resistance, the circular base of the U-shaped inner cavity of the horseshoe-shaped elements being adjacent to the associated contact rod and the elements being offset through 180° with respect to each other, so that the internal magnetic fields generated in the horseshoe-shaped elements when current passes through the switch, to the extent that the section with high magnetic resistance is approached, are mainly oriented axially between the two horseshoe-shaped elements, wherein the horseshoe-shaped elements are so designed that their magnetic resistance to the internal magnetic field increases in going from the U-shaped base section to the section with high magnetic resistance.

4,636,601

PUSH-PUSH SWITCH

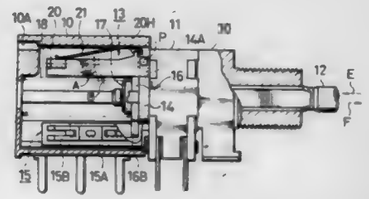
Osamu Tanabe, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Apr. 17, 1985, Ser. No. 724,185

Claims priority, application Japan, Apr. 20, 1984, 59-58308[U]

Int. Cl.⁴ H01H *3/00*

U.S. Cl. 200—153 J **1 Claim**



1. In a push-push switch of the type comprising an operation shaft reciprocatingly movable in an opening in a housing, switch contact means mounted to the operation shaft, a member mounted on the operation shaft having a projection extending transverse to the direction of reciprocation of the operation shaft, and a heart shaped cam mounted in the housing and adapted to be engaged by the projection of the member on the operation shaft for selectively locking the shaft at a certain position when the shaft is pushed inwardly in the housing,

the improvement comprising:

said heart shaped cam mounted pivotally to said housing at a pivot end thereof toward said opening in said housing with a free end thereof remote from said opening, said cam having a cam path oriented substantially in a plane, and

a substantially planar spring body having one hook piece at one end thereof for attachment to an inner surface of said housing and a second hook piece at another end thereof for attachment to said heart shaped cam adjacent said pivot end thereof such that said spring body is secured substantially parallel to the plane of said cam, and further having a spring portion extending at an angle from the plane of said spring body for exerting a biasing pressure to bias the free end of said heart shaped cam toward said operation shaft.

4,636,602

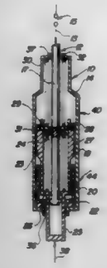
LINEAR OPERATING MECHANISM FOR ELECTRICAL SWITCHES

Walter J. Hall, Evanston; Chester H. Lin, Skokie; Joel A. Ramos, Chicago, and Edward J. Rogers, Chicago, all of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Apr. 10, 1985, Ser. No. 721,617

Int. Cl.⁴ H01H *3/00*

U.S. Cl. 200—153 SC **56 Claims**



1. A linear operating mechanism for an electrical switch, the operating mechanism being capable of immediately reopening the switch after its closure the operating mechanism comprising:

a housing;

a carriage movable along a linear path between first and second positions;

an operating member to effect opening and closing of a switch and being movable between first and second positions along a path parallel to or coincident with the path of said carriage;

a closing spring disposed about said operating member, said closing spring acting between said carriage and said operating member;

an opening spring disposed about an axis parallel to or coincident with said closing spring and acting between said housing and said carriage;

operating member latch means for selectively latching said operating member against movement in a switch-closing direction;

carriage latch means for selectively latching said carriage in said second position; and

means responsive to movement of said carriage from said

second position to said first position for moving said operating member from said second position to said first position,

said carriage being moved from said first position to said second position to charge said opening spring and said closing spring with operating energy while said operating member is latched by said operating member latch means in said first position corresponding to the switch-open position, said carriage being latched by said carriage latch means when said carriage reaches said second positon, subsequent release of said operating member by said operating member latch means causing said operating member to move from said first position to said second position corresponding to the switch closed position, subsequent release of said carriage by said carriage latch means causing said carriage to move from said second position to said first position, said moving means comprising means carried by said carriage for engaging and acting against said operating member, said moving means further comprising means carried by said operating member for engagement by said carriage-engaging means, said operating-member engagement means comprising a widened portion of said operating member, said carriage comprising a hollow portion with defined walls, a portion of said operating member being disposed within said hollow portion, said carriage engaging means comprising a section of reduced cross-sectional opening with respect to said hollow portion.

4,636,603

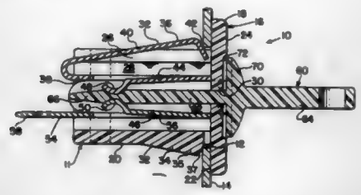
TWO-POSITION ELECTRICAL SWITCH ASSEMBLY

Frank V. Pliml, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 677,444, Dec. 3, 1984, abandoned. This application Mar. 3, 1986, Ser. No. 835,624

Int. Cl.⁴ H01H *27/04*

U.S. Cl. 200—296 **5 Claims**



1. A two position four piece switch assembly for mounting in an aperture of a metal panel, comprising an electrically non-conducting body having a head portion and a shank portion, said head portion having a panel contacting surface and an outer exposed surface with a central opening formed through said head portion between the two surfaces, said shank portion integrally formed with said head portion and extending transversely away from said panel contacting surface, a longitudinal bore formed through said shank portion along the axis of said central opening of said head portion, said shank having an opening along its length extending through to said bore whose inner side walls adjacent said opening have a first and second channel formed therein parallel to said opening for snap engagement with a first and second electrical conducting member respectively, said first electrical conducting member having a base and an integrally formed outwardly projecting electrical conducting spring biased finger on one side thereof with an integrally formed spring arm member on its other side which when affixed to said first channel normally protrudes through said shank opening with its free end disposed adjacent said head portion to maintain electrical contact with said panel as well as providing a means for resiliently mounting said switch assembly, said second electrical conducting member having a base and an integrally formed outwardly projecting electrical conducting spring biased finger on one side thereof and an integrally formed terminal portion extending outwardly from said base in a direction perpendicular to said finger which when affixed to said second channel normally protrudes out of said bore of said shank away from said head portion, said fingers being disposed within said longitudinal bore with their free ends normally biased together along said bore axis, and a removable switch actuating means for separating said pair of spring-biased fingers comprising an electrically non-conducting rod portion of a cross-section smaller than said central opening and a handle portion, whereby the insertion of said rod portion through said central opening causes the separation of said spring-biased fingers to open the electrical conducting path between said first and second electrical conducting members.

4,636,604

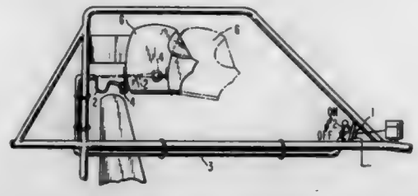
EMERGENCY IGNITION SHUTOFF SYSTEM

Lee R. Gomes, Jr., 4634 E. Dakota, Fresno, Calif. 93726

Filed Aug. 23, 1985, Ser. No. 768,684

Int. Cl.⁴ H01H *17/14*

U.S. Cl. 200—331 **1 Claim**



1. An emergency shut-off mechanism for a racing car having a roll bar framework forming a driver's cage, comprising, in combination, a toggle switch wired in series with an ignition switch of said car, said toggle switch being mounted on a dashboard of said car, one end of a flexible cord being connected to said toggle switch, an "L"-shaped conduit affixed to said driver's cage through which said cord slidably extends, a snap hook affixed to an opposite end of said cord, a ring affixed to a rear portion of a driver's helmet for detachable attachment to said snap hook; said conduit extending from said dashboard to a position rearward of a driver's seat and of said helmet; whereby sufficient movement of the helmet pulls the cord, thereby actuating the switch and shutting off the car.

4,636,605

MODE STIRRING TURNTABLE FOR MICROWAVE OVEN

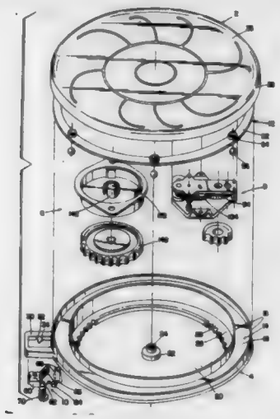
Peter M. Bereza; Richard D. Dilyard; William A. Pena, and Howard J. Vaeth, all of Wooster, Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Jul. 17, 1985, Ser. No. 755,761

Int. Cl.⁴ H05B *6/74*; A47B *85/00*

U.S. Cl. 219—10.55 F **28 Claims**

1. In a turntable of the type comprising a stationary base, a platform mounted to rotate about a central vertical axis of the base, and a motor assembly for moving said platform, the improvement comprising:



said motor assembly being mounted to rotate about said base central axis.

4,636,606

METHOD AND APPARATUS FOR PRODUCING A REACTOR SPACING GRID BY PULSE LASER WELDING

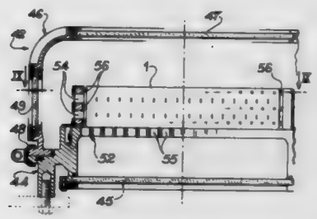
Bernard Chastanet, Boissy-sous-Saint Yon; Claude Decailloz, Palaiseau; Solange Dournel, Evry, and Marcel Masson, Le Mesnil Saint-Denis, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 2, 1983, Ser. No. 471,317

Claims priority, application France, Mar. 3, 1982, 82 03521

Int. Cl.⁴ B23K *26/00*

U.S. Cl. 219—121 LC **16 Claims**



1. A method for producing by pulse laser welding a structural component of a nuclear reactor, welding being carried out by means of a laser source emitting a pulse laser beam having a given wavelength, said component comprising at least a first plate provided with at least one slot into which a second plate is inserted, thus defining an intersection line of the plates and forming a crosspiece, said crosspiece having two ends and defining four dihedral angles, each of said plates having two ends, said method comprising:

securing said component inside a tight enclosure under a controlled atmosphere, said enclosure having at least one wall which is transparent to said wavelength, said laser source being placed outside said enclosure, and said enclosure being movable with respect to said laser source

placing said enclosure so that said laser beam traverses said transparent wall perpendicular thereto before impinging on said component, and

fixing said cross-piece by a single weld spot made at each of its ends.

4,636,607

METHOD OF ENHANCING AN ICE-BREAKING OPERATION

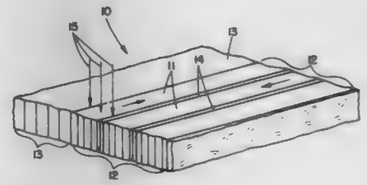
Axel Hayd, Munich; Peter Meinke, Starnberg; Martin Maurer, Munich, and Joachim Schwarz, Grosshesselohe, all of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed May 13, 1985, Ser. No. 733,620

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418535; Sep. 15, 1984, 3433961

Int. Cl.⁴ B23K *27/00*

U.S. Cl. 219—121 LM **5 Claims**



1. A method of breaking large areas of ice, particularly in the ocean, comprising:

(a) selecting a radiation beam frequency to excite the intermolecular and intramolecular frequency of oscillation in the ice to be broken;

(b) irradiating at least a portion of the ice to be broken with a radiation beam having said selected frequency,

(c) preparing the ice for breaking by irradiating said ice in a predefined breakage pattern forming at least one zone of irradiation, the mechanical properties of the ice being modified on the surface of the ice within said at least one irradiation zone thereby reducing the energy needed to break the ice; and

(d) breaking the prepared portion of the ice.

4,636,608

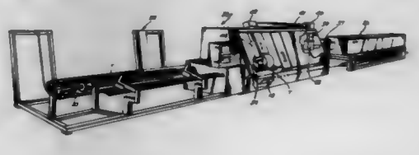
LASER CONTOUR CUT DOOR BEAMS

Gunther H. Palentyn, Grand Blanc; James R. Dehlinger, Ada, and Donald R. Rigsby, Jenison, all of Mich., assignors to Benteler Corporation, Grand Rapids, Mich.

Filed Nov. 15, 1985, Ser. No. 798,299

Int. Cl.⁴ B23K *26/00*

U.S. Cl. 219—121 LN **3 Claims**



1. A method of forming a contour cut impact door beam for an automobile, comprising the steps of:

positioning a structural cylindrical tube on an operative axis coincident with the axis of said tube;

orienting a cutting laser offset from said operative axis with its beam aimed toward said operative axis;

actuating said cutting laser; causing advancement between said tube and said beam rotationally about said operative axis while simultaneously causing advancement between said tube and said beam linearly in one direction along said operative axis to form a curvilinear diagonal edge surface, all portions of which are on radii relative to said axis;

arresting said linear advancement while continuing rotational advancement to form an arcuate terminus in the wall of said tube; and

causing linear advancement between said tube and said beam in the opposite direction while continuing rotational advancement to form a second diagonal edge surface which is in mirror image to said first diagonal edge, all portions being on radii relative to said axis.

4,636,609

PROCESS FOR JOINING DIFFERENT KINDS OF SYNTHETIC RESINS

Hideo Nakamata, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Apr. 4, 1985, Ser. No. 720,282
Claims priority, application Japan, Apr. 10, 1984, 59-72256
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 LD **20 Claims**



1. A process for joining an article of a first kind of synthetic resin to an article of a second kind of synthetic resin comprising the steps of:

providing a first article of a first kind of synthetic resin which can store up the heat of a laser beam;

setting a second article of a second kind of synthetic resin on said first article, a first contact surface of said first article being in contact with a second contact surface of said second article, said second kind of synthetic resin being able to transmit said laser beam; and

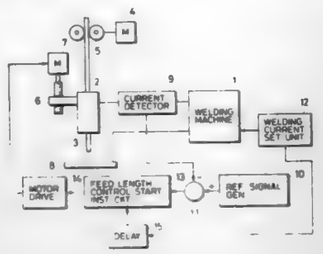
exposing an outer surface of said second article to said laser beam, whereupon said second article will transmit said laser beam to said first article, which will store up the heat of the laser beam so that the first contact surface of said first article and the second contact surface of said second article are melted thereby, and the first contact surface of said first article is joined to the second contact surface of said second article.

4,636,610

FEED LENGTH CONTROL DEVICE FOR CONSUMABLE ELECTRODE WELDING OPERATIONS

Kazuhiko Kamo, Hyogo; Hiroshi Suwahara, and Ryuji Nakane, both of Aichi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Mitsubishi Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 18, 1985, Ser. No. 789,257
Claims priority, application Japan, Oct. 18, 1984, 59-219249
Int. Cl.⁴ B23K *9/12*
U.S. Cl. 219—124.02 **4 Claims**



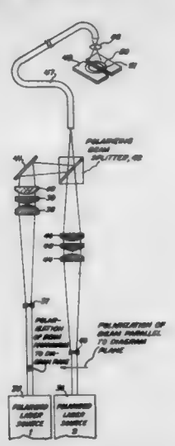
1. In a feed length control device for use in a consumable electrode welding system including means (1) for genrating a welding current in the form of a pulse signal having peak current periods alternating with base current periods, means (9) coupled to an output of the generating means for detecting the welding current, means (10) for supplying a reference signal, means (11) for comparing an output of the detecting means with the reference signal, bi-directional drive means (6, 7) for moving a welding torch (2) vertically relative to a workpiece (8), and feed length control means (13) responsive to an output of the comparing means for energizing the drive means during base current periods of the welding current to maintain a constant separation between the workpiece and an electrode and thus a constant average welding current as the electrode is consumed, the improvement comprising: means (15) for delaying an output from said feed length control means for a predetermined period of time from the start of each base current period.

4,636,611

QUIESCENT CIRCLE AND ARC GENERATOR

Carl M. Penney, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,591
Int. Cl.⁴ B23K *9/12*
U.S. Cl. 219—124.34 **3 Claims**



1. A quiescent circular light pattern generator comprising:

sources of collimated incident light beams;

stationary optical systems to separately generate quiescent uniformly illuminated light circles of different radii, each system comprised of a circular priam to deviate the repsective incident beam by the prism effect and a focusing lens; and

means to combine said light circles and project a concentric circle pattern onto a target surface;

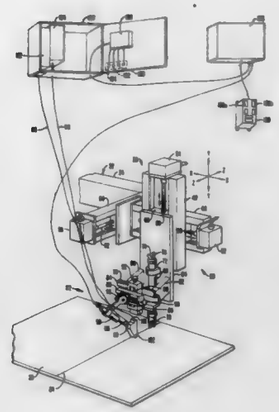
wherein said sources comprise lasers and said target surface is the entrance of a coherent fiber optic bundle by which said concentric circle pattern is transferred to a vision-guided arc welding torch for use in tracking a joint in a workpiece.

4,636,612

OPTICAL TRACKING DEVICE

Richard A. Cullen, San Diego, Calif., assignor to Cyclomatic Industries, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 486,536, Apr. 19, 1983. This application Apr. 6, 1984, Ser. No. 597,460
Int. Cl.⁴ B23K *9/12*
U.S. Cl. 219—124.34 **23 Claims**



11. An apparatus for tracking a boundary on a surface where work is to be performed using an instrument wherein the boundary and the portion of the surface adjacent to the boundary are illuminated, and wherein the reflectivity of the surface changes at the boundary, said apparatus comprising:

means for sensing the light reflected from an elongated portion of the surface defining a window so that when the sensing means is moved over the surface, said sensing means will receive consecutively light reflected from a sequence of windows it passes over, said sensing means generating a set of electrical signals indicative of the intensity of light reflected from locations along the length of the window, so that when a portion of the boundary is in the window, the set of electrical signals will indicate the difference in light reflectivity at the boundary and the locations in the window where the changes in reflectivity occur, said sensing means connected to the instrument for guiding the instrument;

processing and control means for deriving secondary sets of signals from sets of signals provided by the sensing means indicative of optically detectable characteristics of the boundary, wherein said processing and control means is capable of recording a secondary set of signals as a template when the window includes and intersects a selected portion of the boundary, and is capable of comparing the template set of signals to a sequence of secondary sets of signals derived from signals provided by the sensing means when it is moved over the surface to determine whether the window intersects the boundary during such movement of the sensing means; and

means for sensing the distance between the instrument and the surface and for controlling such distance.

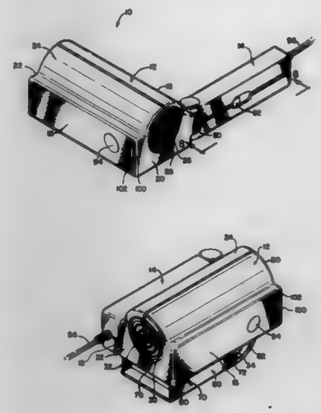
12. The apparatus of claim 11, wherein the distance sensing and controlling means is an arc voltage control system.

4,636,613

COMBINATION DRYER AND IRON

Anne J. de la Morandiere, 200 East 72nd St., Apt. 3E, New York, N.Y. 10021; Peter W. Bressler, Philadelphia, Pa.; Peter D. Byar, Willingboro, N.J., and Edward A. Spector, Philadelphia, Pa., assignors to Anne J. de la Morandiere, New York, N.Y.

Filed Apr. 10, 1985, Ser. No. 721,619
Int. Cl.⁴ H05B *1/00*; D06F *75/00*; A45D *20/12*; F24H *3/04*
U.S. Cl. 219—249 **10 Claims**



1. A combination dryer and iron comprising:

a housing having air inlet means and air outlet means;

blower means within the housing for creating an air flow through the housing by drawing air into the housing through the air inlet means and exhausting air from the housing through the air outlet means;

heater means within the housing for heating the air flowing through the housing;

a permanent, non-removable iron assembly including a sole plate forming a portion of a wall of the housing and having an exposed generally flat ironing surface for utilization as an iron, the sole plate being disposed in the path of the heated air exhausted from the housing through the air outlet means; and

diverter means within the housing and selectively movable between a first, dryer position in which substantially all of the heated air flowing through the housing and exhausted through the air outlet means is diverted from contact with the sole plate and a second, iron position in which a substantial portion of the heated air flowing through the housing and exhausted through the air outlet means is diverted into contact with at least a portion of the sole plate for impingement heating of the sole plate and means for retaining said diverted means in either said first position or said second position.

4,636,614

SELF-CONTROL TYPE GLOW PLUG

Tsuneo Itoh, and Shinichi Yokoi, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

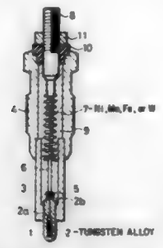
Filed Jun. 8, 1984, Ser. No. 618,875
Claims priority, application Japan, Jun. 13, 1983, 58-104199
Int. Cl.⁴ H05B *3/00*; F02P *19/02*; F23Q *7/22*
U.S. Cl. 219—270 **15 Claims**

1. A self-control type glow plug for use in an engine, the plug comprising:

means including a shell member for mounting said glow plug to the engine;

heat generating means comprised of a sintered ceramic body and a heating wire embedded therein, said heating wire

having terminal ends located outside said ceramic body for establishing electrical connections, said ceramic body being connected to extend from said shell member, and said heating wire consisting essentially of a tungsten alloy having a temperature resistance coefficient at 1000° C. no greater than four times that at room temperature; and



a current control resistor electrically connected in series with said heating wire of said heat generating means for controlling the temperature of said heat generating means, said resistor comprising a wire having a positive temperature resistance coefficient at 1000° C. no less than five times that at room temperature,

wherein said heating wire consists essentially of tungsten alloyed with 2 to 50 wt % rhenium.

4,636,615

ELECTRICAL RESISTANCE HEATING ELEMENT HAVING A BIMETALLIC PROTECTIVE SWITCH

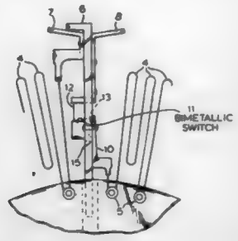
Gustav Petz, Nuremberg, Fed. Rep. of Germany, assignor to Petz Elektro GmbH, Hauslech, Fed. Rep. of Germany

Filed Oct. 24, 1984, Ser. No. 664,476

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1984, 3409495

Int. Cl.⁴ H05B *1/02, 3/00*; F24H *3/04*

U.S. Cl. 219—363 **2 Claims**



1. In an electrical radiator, particularly for fan-forced heaters, comprising a resistance heating element in the form of a coil winding disposed on an insulating element adapted to be connected to the housing of the fan-forced heater, the coil winding of the resistance heating element being secured to the insulating element by means of clamping elements and freely extending therefrom, and a bimetallic switch in series with the resistance heating element serving as a heat protective switch, the bimetallic switch being disposed on an electrically insulated connector bar connected to the insulating element and carrying two electrical connectors for the coil winding, wherein one end of the coil winding is secured on one side of the bar to a first metallic bracket rigid with the bar and connected to a first connector, said first bracket being remote from the insulating element, and the other end of the coil winding being secured to a second metallic bracket rigid with the bar and disposed on the other side of the bar near the insulating element, said bimetallic switch being electrically connected between said second bracket and said second connector, the improvement comprising the bimetallic switch being located on the side of the connector bar facing the end of the coil winding which is connected to the insulating element and secured to the first bracket remote from the insulating element.

4,636,616

ELECTRICALLY HEATED RADIATOR WITH HEAT ACCUMULATING PROPERTIES

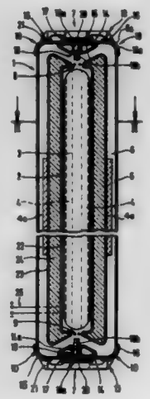
Karl G. H. Elg, Loremborgsgatan 3A, 217 61 Malmö, Sweden

Filed Jul. 18, 1984, Ser. No. 632,108

Claims priority, application Sweden, Jul. 19, 1983, 8304035

Int. Cl.⁴ H05B *1/02*; F24H *7/02*

U.S. Cl. 219—365 **9 Claims**



1. An electrically heated radiator with heat-accumulating properties, comprising:

a heat-insulated container (1) having an inner space (2) with at least one heat accumulation vessel (3) therein, and at least one electrical heating element (4) for heating said at least one heat accumulation vessel (3);

a jacket (5) surrounding the container so that an air gap (6) is formed around the container (1);

a regulator (7) responsive to the ambient temperature of the radiator, for opening at least one passage (8, 9) in the container for establishing heat flow communication between the inner space of the container (1) and the air gap (6) and at least one passage 10 in said jacket for establishing heat flow communication between the air gap (6) and the surroundings of the radiator;

wherein the regulator (7) is adapted first to open at least one passage (8, 9) between the inner space (2) of the container (1) and the air gap (6) in response to the ambient temperature of the radiator having substantially fallen to a first level, and second to open also at least one passage (10) between the air gap (6) and the surroundings of the radiator in response to ambient temperature of the radiator having fallen to a second level lower than said first level; and

wherein the regulator (7) comprises at least one thermostat device (12) which by displacing at least one mechanism (13) moves at least one valve means (14) in relation to a valve seat (15) on the container (1) to successively open the passages (8, 9) between the inner space (2) of the container (1) and the air gap (6), and further move one or more dampers (16) along an outer side of the jacket (5) to successively open at least one passage (10) disposed in the jacket between the air gap (6) and the surroundings of the radiator.

4,636,617

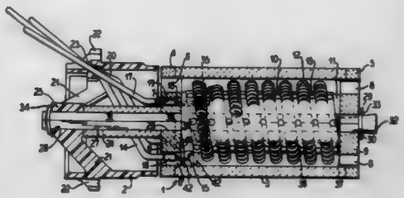
HEATING COIL ASSEMBLY FOR A HEAVY DUTY HOT AIR BLOWER

Walter J. Petersen, Eden Prairie; John M. Svendsen, New Hope, both of Minn., and Verne J. Morand, Desert Hot Springs, Calif., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Aug. 8, 1984, Ser. No. 639,371

Int. Cl.⁴ H05B *3/00*; F24H *3/04*; H01C *3/20*

U.S. Cl. 219—375 **25 Claims**



1. A heating coil assembly for use in a heavy duty hot air blower comprising:

an axially elongated ceramic core;

a heating coil helically wound on said core and having a plurality of electrical leads;

an axially elongated hollow ceramic sleeve surrounding and spaced from said core and coil and defining an axial air flow passage between said sleeve and said core about said coil;

a pair of ceramic end caps having a plurality of radial vanes defining axial apertures aligned with said air flow passage disposed at opposite ends of said core and coil forming in combination with said sleeve a ceramic insulating shell completely surrounding said core and coil, at least one of said leads extending through said apertures in one of said end caps;

an annular support element disposed adjacent said one of said end caps and receiving said leads;

each of said core, said end caps and said annular support element having a centrally disposed non-circular bore therein; and

a retainer having a non-circular crossection corresponding to the cross-section of said bore extending through said core, said end caps and said annular support element for simultaneously axially and radially fixing and restraining said core, said end caps and said annular support element.

4,636,618

ELECTRIC FRYER

Jean-Marie Jenicot, Rue de Mellery,19 B, B-5862 Gentinne, Belgium

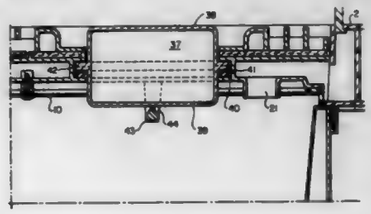
PCT No. PCT/BE84/00005, § 371 Date Oct. 30, 1984, § 102(e) Date Oct. 30, 1984, PCT Pub. No. WO84/03427, PCT Pub. Date Sep. 13, 1984

PCT Filed Mar. 2, 1984, Ser. No. 674,955

Claims priority, application Belgium, Mar. 4, 1983, 0/210258

Int. Cl.⁴ F27D *11/00*; A47J *27/00*

U.S. Cl. 219—441 **8 Claims**



1. An electric fryer comprising a cooking chamber having an open top; and electric heating element associated with said cooking chamber, said heating element being operatively connected to an electric circuit whereby said cooking chamber can be heated; a filtering lid adapted to fit on said cooking chamber so as to close said open top provided with an external annulus, said filtering lid comprising a lower condensation wall and an upper condensation wall defining therebetween a condensation chamber; a reflector situated between said lower condensation wall and said cooking chamber; means providing communication between the cooking chamber and the condensation chamber; filter means carried by the upper condensation wall providing communication between the condensation chamber and the exterior of said filtering lid; and means for discharging towards the exterior of said filtering lid water of condensation collected in the condensation chamber.

4,636,619

HEATER CONTROL DEVICE

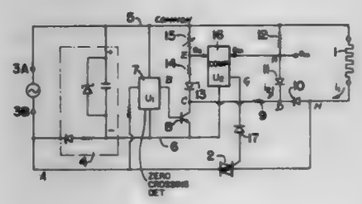
Hideo Sugimori, 12-2 Kozu Shimokubota, Ohara Hokcho, Saikacho, Sakyoku, Kyoto-fu, Japan

Continuation of Ser. No. 499,428, May 31, 1983, abandoned. This application Jun. 14, 1985, Ser. No. 744,886

Claims priority, application Japan, May 31, 1982, 57-093304; May 31, 1982, 57-093305

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—497 **1 Claim**



1. A heater control device in which a heater element to be temperature-controlled doubles as a temperature sensor, said heater element being supplied from an AC power source through an AC power switching element except when said heater element is acting as said temperature sensor, said heater control device comprising:

a zero-crossing detector means for generating a pulse signal each time an instantaneous absolute voltage value of said AC power source becomes smaller than a predetermined value, said pulse signal causing said heater element to act as said temperature sensor;

a DC power source for supplying current for operating said heater control and for providing a temperature sensing circuit voltage to said heater element when said element is being utilized as a temperature sensor;

a DC current switching element for providing a sensing excitation voltage in accordance with said pulse signal generated by said zero-crossing detector means;

a circuit means connected to said heater element and responsive to said sensing excitation voltage for providing a reference voltage corresponding to a predetermined control temperature value, and for sensing a temperature sensing signal which corresponds to an exciting sensing voltage from said heater element when said element is being utilized as a temperature sensor;

a comparator means for comparing said temperature sensing signal with said reference voltage;

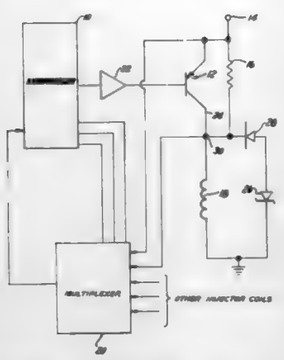
wherein said AC power switching element is operated by said comparator means in accordance with the polarity of the difference between said temperature sensing signal and said reference voltage;

wherein said circuit means is a bridge circuit which comprises:

a variable voltage-divider circuit for generating said reference voltage in one leg of said bridge circuit;

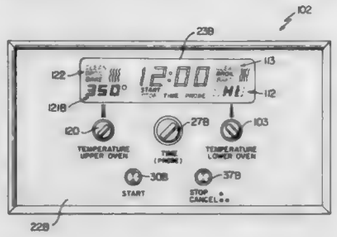
a resistor connected in series with a load impedance, said load impedance, connected in parallel with said heater element, wherein said resistor, said load impedance and said heater element constitute another leg of said bridge circuit;
and a means for preventing an AC voltage from said AC power source to be imposed on said reference voltage and on said temperature sensing signal;
and wherein said preventing means comprises:
a first diode connected in series between said resistor and said heater element, an anode of said first diode being connected to a connecting point of said heater element and said AC power switching element;
a second diode connected in series between said resistor and said load impedance, an anode of said second diode being connected to said load impedance;
a third diode connected in series between said DC current switching element and said variable voltage-divider circuit, a cathode of said third diode being connected to said DC current switching element;
and wherein said temperature sensing signal is generated at a connecting point between said load impedance and said second diode.

4,636,620
TEMPERATURE COMPENSATION INJECTOR CONTROL SYSTEM
Danny O. Wright, Grafton, Va., and Michael A. Pauwels, Birmingham, Mich., assignors to Allied Corporation, Morris Township, N.J.
Filed Sep. 13, 1985, Ser. No. 775,852
Int. Cl.⁴ H05B *1/02*; F02M *51/00*
U.S. Cl. 219—501 **3 Claims**



1. A temperature compensation injector control system having a source of electric power, a microprocessor having input/output ports for receiving and sending control signals and stored control laws for generating injector control signals having a pulse width for operating the injectors, power switch means responsive to the injector control signals for switching the electric power and at least one injector coil electrically connected in circuit with the power switch means and responsive to the switched electric power for injecting fuel the improvement comprising:
bypass resistance means electrically connected in parallel with the power switch means and to the at least one injector coil for supplying a leakage current to the at least one injector coil;
multiplexing means electrically connected to the at least one injector coil and the microprocessor and controlled by control signals from the microprocessor for receiving voltage signals from the injector coil and operative in response to the control signals for transmitting digital signals representing said voltage signals to the microprocessor; and
calculating means in the microprocessor means responsive to said digital signals from said multiplexing means and the source of electric power for generating signals adjusting the pulse width of the injector control signals according to the resistance value of the injector coil and the source of electric power.

4,636,621
ELECTRICALLY OPERATED APPLIANCE CONTROLS AND METHODS OF MAKING THE SAME
Grant J. McGeorge, Spring Lake, Mich., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Dec. 24, 1984, Ser. No. 685,775
Int. Cl.⁴ H05B *1/02*
U.S. Cl. 219—506 **11 Claims**

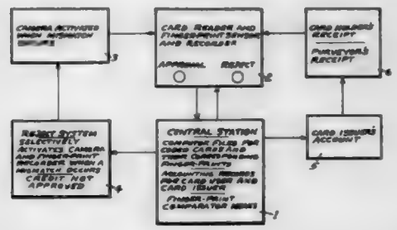


1. In an electrically operated appliance control comprising an electrically operated device for providing two different functions of said device, an electrically operated visual display unit, and a manually operated selector means electrically interconnected to said device and said unit for selecting a desired function of said device and for setting said device to provide that selected function in a desired set manner thereof as being indicated on said display unit by such operation of said selector means, said selector means having a manually operated start actuator which when actuated will cause said device to begin to produce the selected function thereof and in that selected set manner thereof, the improvement wherein said selector means comprises a manually operated movable selector member which when moved in one direction a certain amount from an off position thereof to a first position thereof selects one of said functions and then sets said device to provide that selected function in a desired manner as being indicated on said display unit as said selector member is being further moved in said one direction from said first position thereof and which when moved in the other direction a certain amount from said off position thereof to a second position thereof selects the other of said functions and then sets said device to provide that selected function in a desired manner as being indicated on said display unit as said selector member is being further moved in said other direction from said second position thereof.

4,636,622
CARD USER IDENTIFICATION SYSTEM
Clement P. Clark, 70 Pauges Rd., Holden, Mass. 01520
Filed May 6, 1985, Ser. No. 730,944
Int. Cl.⁴ G06K *5/00*
U.S. Cl. 235—380 **6 Claims**

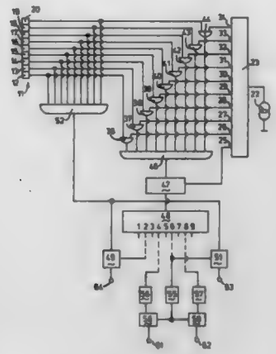
1. A means for reading coded indicia on a card and for scanning a card user's fingerprint for a comparison with the file record of the authorized card holder's fingerprint comprising a card reader means in combination with a fingerprint exposure device that includes an instantaneous fingerprint scanner, remotely disposed comparator means for comparing the scanned fingerprint with said file record fingerprint of the authorized card holder, means for transmitting signals between said reading and scanning means and said comparator means, means

activated by the fingerprint comparator to indicate at the card reader means when a proper fingerprint match occurs, and other means activated by the fingerprint comparator to otherwise indicate that an unauthorized user is standing at the card



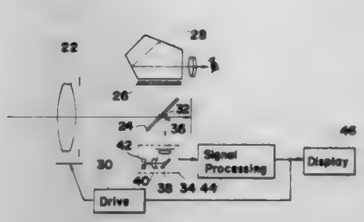
reader means, which other means is also operative to activate means adapted to make a permanent record of the fingerprint that is exposed to the scanner when the comparator indicates a mismatch of the scanned fingerprint with the recorded fingerprint occurs.

4,636,623
APPARATUS FOR READING A LINE MARKING
Hans Martin, Thalwil, Switzerland, assignor to Esshart Industries, Inc., Farmington, Conn.
Filed Sep. 7, 1984, Ser. No. 648,229
Claims priority, application Switzerland, Sep. 12, 1983, 4945/83
Int. Cl.⁴ G06K *7/00*
U.S. Cl. 235—436 **14 Claims**



1. Apparatus for reading a line marking fixed to a carrier, the marking comprising a succession of line-like elements of at least two different lengths which are arranged substantially parallel to one another, the apparatus operating in conjunction with an optical apparatus which displays the line-like elements in turn on a reading surface as the marking carrier is moved transversely to the direction in which the elements extend, the reading surface being divided into a plurality of sectors each of which is associated with an optoelectronic transducer which, when illuminated, produces an electrical output signal, wherein the apparatus comprises an electronic circuit comprising
a plurality of AND-gates each having two inputs, a first of the inputs being connected to an associated one of the optoelectronic transducers of the reading surface,
a pulse generator
scanner means receiving pulses from said pulse generator for transmitting the pulses in turn to each second input of the AND-gates,
a first OR-gate having a plurality of inputs, wherein each input of the first OR-gate is connected to the output of one of the AND-gates,
a counter having a counting input which is connected to the output of the first OR-gate and a resetting input which is connected to an output of the scanner means,
a decoder coupled to the output of the counter and having a plurality of outputs, wherein a numerical value is associated with each output and, in each read-out, a signal appears at the output whose associated numerical value corresponds to the number of the optoelectronic transducers which are illuminated,
a first counter having an input connected to one of the outputs of the decoder which decoder output corresponds to an accurate measurement of one of the line lengths,
second and third counters having respective inputs connected to other outputs of the decoder, one of which is associated with a specific greater value count and the other of which is associated with a specific smaller value count than the aforementioned output, and
two comparators, one input of each comparator being connected to the output of the first counter and the other inputs of the comparators being respectively connected to the outputs of the second and third counters, whereby the comparators indicate a marking-reading error signal based on the comparison of said second and third counter outputs to the first counter output.

4,636,624
FOCUS DETECTING DEVICE FOR USE WITH CAMERAS
Tokuji Ishida, Daito, and Masataka Hamada, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jan. 10, 1984, Ser. No. 570,012
Claims priority, application Japan, Jan. 10, 1983, 58-2622; Jun. 23, 1983, 58-113936
Int. Cl.⁴ G01J *1/20*
U.S. Cl. 250—201 **27 Claims**



1. A focus detecting device for a camera having an objective lens with an optical axis, comprising:
optical means for receiving light from an object which has passed through said objective lens at two portions of said objective lens distant from the optical axis of said objective lens, to form first and second object images in such a manner that the distance between said first and second object images in a direction perpendicular to said optical axis varies with the focus condition of an object image formed by said objective lens on its predetermined focal plane equivalent to a film exposure plane;
first and second line sensors disposed to receive said first and second object images for generating first and second image signals corresponding to the light intensity distributions of said first and second object images on said first and second line sensors, respectively, each of said line sensors having a plurality of picture element and said first and second image signals being the collective of picture element outputs of said first and second line sensors, respectively;
signal dividing means for dividing said picture element outputs of said first line sensor into a plurality of blocks such that the number of the picture element outputs belonging

to each of said blocks is smaller than the number of said picture element outputs of said second line sensor;

correlation calculating means for calculating correlations represented by an equation

$$Hi(j) = \sum_{k=1}^{m} |L_{k+ni} - R_{k+j-1}|$$

wherein L_{k+ni} represents the (k+ni)-th picture element output of said first line sensor, R_{k+j-1} represents the (k+j−1)-th picture element output of said second line sensor, j represents the number of shifts, mi represents a number inherent to the i-th block, and ni represents a number inherent to the i-th block and varying with the value of i;

best correlation finding means for finding a best correlation having a minimum value among the correlations Hi(j) for each of said blocks;

image distance calculating means for determining which of the best correlations found by said best correlation finding means is smallest and calculating the distance between said first and second images on said first and second line sensors in accordance with the number of shifts j which provides the best correlation; and

defocus amount calculating means for calculating the amount of defocus of said object image with respect to said predetermined focal plane in accordance with the distance calculated by said distance calculating means.

4,636,625

METHOD AND DEVICE FOR DETECTING FOCAL POINT

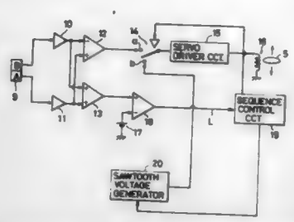
Masumi Emoto; Masanobu Nishimiya, and Hiroyuki Kiguchi, all of Kanagawa, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 5, 1985, Ser. No. 772,756

Claims priority, application Japan, Sep. 6, 1984, 59-186962; Dec. 27, 1984, 59-281755

Int. Cl.⁴ G01J *1/20*; G11B *7/12*

U.S. Cl. 250—201 **3 Claims**



2. A device for detecting the focal point in an optical pickup wherein a laser beam is converged by an objective lens as a small spot on an optical information storage medium, said device comprising:

(a) a detector having a plurality of light detecting areas for detecting less than half of a laser beam reflected from said optical information storage medium through said objective lens;

(b) first means for detecting when said objective lens enters a focusing range in response to a sum signal indicative of the sum of output signals from said light detecting areas of said detector; and

(c) second means operable upon detection by said first means for positionally adjusting said objective lens with respect to said optical information storage medium so that a difference signal indicative of the difference between the output signals from said light detecting areas will be eliminated.

4,636,626

APPARATUS FOR ALIGNING MASK AND WAFER USED IN SEMICONDUCTOR CIRCUIT ELEMENT FABRICATION

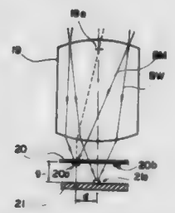
Junji Hazama; Kisya Kato, both of Kawasaki; Akikazu Tanimoto, Yokohama, and Hisao Izawa, Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 12, 1984, Ser. No. 570,189

Claims priority, application Japan, Jan. 14, 1983, 58-3316; Jan. 18, 1983, 58-5183; Jan. 18, 1983, 58-5184

Int. Cl.⁴ G01J *1/20*

U.S. Cl. 250—201 **25 Claims**



1. An apparatus for adjusting a gap between a first flat sheet and a second flat sheet which are disposed in parallel with a plane, at least a localized area of said first flat sheet transmitting light, said apparatus comprising:

light beam radiating means for radiating toward said light transmission area of said first flat sheet first and second light beams so as to be respectively imaged at positions separated by a first predetermined distance in a direction intersecting said plane and a second predetermined distance in a direction of said plane, said second light beam being passed through said first flat sheet at a position different from the imaging position of said first light beam;

means for relatively moving the imaging positions of said first and second light beams and said first and second flat sheets in the direction of optical axes of said first and second light beams; and

detecting means for generating a first detection signal when the imaging position of said first light beam substantially coincides with said first flat sheet and for generating a second detection signal when the imaging position of said second light beam substantially coincides with said second flat sheet.

4,636,627

FOCUS DETECTING APPARATUS

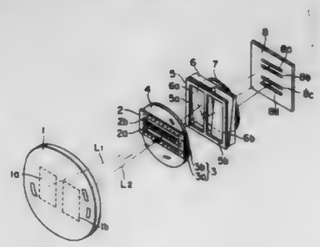
Susumu Matsumura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1984, Ser. No. 569,994

Claims priority, application Japan, Jan. 17, 1983, 58-5630; Jan. 17, 1983, 58-5632; Apr. 21, 1983, 58-70565

Int. Cl.⁴ G01J *1/20*

U.S. Cl. 250—201 **9 Claims**



1. A focus detecting apparatus for detecting the focus condition of an objective lens, comprising:

(a) light intercepting means having a plurality of openings such that a stream of light passes from said objective lens through each opening, said light intercepting means disposed near a predetermined imaging plane of said objective lens;

(b) imaging means for forming a plurality of images on the basis of each of the light streams passing through the openings of said light intercepting means;

(c) filter means for causing an optical characteristic of the light streams passing through the openings of said light intercepting means to differ from one another; and

(d) sensing means for sensing the images formed by said imaging means.

4,636,628

OPTICALLY RECORDED DATA READING APPARATUS WITH INCLINATION CONTROLLER

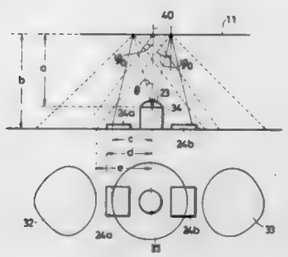
Yoshiyuki Tsukai, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 23, 1985, Ser. No. 694,195

Claims priority, application Japan, Jan. 23, 1984, 59-7434[U]

Int. Cl.⁴ G01J *1/20*; G11B *5/09*

U.S. Cl. 250—201 **8 Claims**



1. In an optical recorded data reading apparatus having a servo system for maintaining the optical axis of a recorded data reading light beam perpendicular to the recording surface of a recording medium, said servo system including inclination controlling means for detecting a deviation of an angle between said optical axis and said recording surface from 90° to control said angle according to the deviation thus detected, the improvement wherein said inclination controlling means comprises: light-emitting means for emitting a light beam towards said recording surface; and light-detecting means receiving said light beam reflected from said recording surface, said light-emitting means and said light-detecting means being positioned so that, of diffracted light beams reflected from said recording surface, substantially only a zeroeth-order diffracted light beam is applied to said light-detecting means.

4,636,629

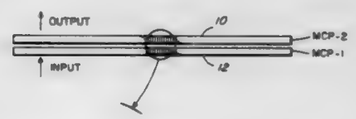
IMAGE-STORAGE MICROCHANNEL DEVICE WITH GATING MEANS FOR SELECTIVE ION FEEDBACK

Christopher H. Toeswill, Sturbridge, Mass., assignor to Galileo Electro-Optics Corp., Sturbridge, Mass.

Filed Apr. 2, 1985, Ser. No. 718,954

Int. Cl.⁴ H01J *31/50*

U.S. Cl. 250—213 VT **10 Claims**



1. A device to write and store traces and image which comprises:

a first microchannel plate,

a second microchannel plate,

said plates having channels in series, and

gating means to selectively affect feedback of ions from one said plate to the other said plate.

4,636,630

PHOTOELECTRIC TYPE DISPLACEMENT DETECTION APPARATUS

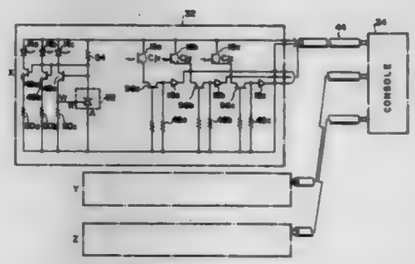
Ryo Nagai, Kanagawa, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1984, Ser. No. 681,225

Claims priority, application Japan, Dec. 16, 1983, 58-237552; Mar. 12, 1984, 59-047553

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—214 R **3 Claims**



1. A photoelectric type displacement detecting apparatus for detecting relative displacement between members movable relative to each other comprising optical lattice means, light emitting means for irradiating said optical lattice means with a detecting light, a light receiving means for receiving a light from said optical lattice means, and a detection circuit for generating an output signal indicative of relative displacement between said members being moved relative to each other in accordance with an output from said light receiving means, said apparatus being characterized in that said light emitting means is connected with a power supply through a collector-emitter path of a transistor and a resistor to form a light emitting circuit, said light emitting circuit being connected to a constant-voltage circuit including a shunt regulator, a cathode/input terminal of said shunt regulator being connected to a base of said transistor with a constant-voltage terminal of said shunt regulator being connected with the emitter of said transistor and that said light receiving means includes a phototransistor cascade-connected to an emitter of a grounded-base transistor, the collector of said grounded-base transistor being grounded through a load resistor and also connected to the detection circuit so that said output signal indicative of relative displacement will be detected at the collector terminal of said grounded-base transistor by the detection circuit, whereby the frequency characteristic of said photo-transistor depends on the input impedance of said grounded-base transistor to maintain the current supplied to said light emitting means constant and to improve the frequency response in said detection apparatus.

4,636,631

PHOTOCONDUCTING DETECTOR IN OPTICAL IMMERSION

Yves Carpentier, Savigny s/Orge, and André Gauthier, Paris, both of France, assignors to Societe Anonyme de Telecommunications, France

Filed Apr. 3, 1984, Ser. No. 596,390

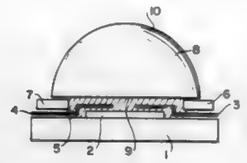
Claims priority, application France, Apr. 8, 1983, 83 05801

Int. Cl.⁴ H01J *3/14*

U.S. Cl. 250—216 **2 Claims**

1. A photoconductive detector in optical immersion, semi-

tive to infrared radiation, comprising a lens, the front surface of which is convex and transparent to infrared radiation, a wafer of semi-conductor material of one of the two types of conductivity N and P on the rear side of the lens, contacts engaging



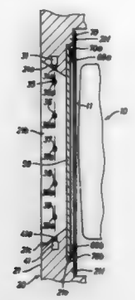
the semi-conductor wafer and, between the lens and the wafer, a layer of a bonding agent for bonding the lens and the wafer, the bonding layer being a layer of a photosensitive resin that is transparent to infrared radiation and chemically inert.

4,636,632

PHOTOELECTRIC INPUT APPARATUS FOR DISPLAY SYSTEM

Noriyoshi Ando, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 17, 1985, Ser. No. 777,075
Claims priority, application Japan, Sep. 17, 1984, 59-194389
Int. Cl.⁴ G01V *9/04*
U.S. Cl. 250—221 **3 Claims**



1. A photoelectric touch input apparatus for a display device such as a cathod ray tube, a liquid crystal display panel or the like, comprising:

a housing having a frame adapted to be placed in front of the display surface of said display device and defining an opening therein;

a plurality of light-emitting elements mounted on said frame in a row along one side of said opening to produce a plurality of light beams in parallel spaced relationship in a common plane;

a plurality of photosensitive elements mounted on said frame in a row along the opposite side of said opening and aligned with said light-emitting elements to receive the light beams;

a transparent flat plate arranged between the display surface of said display device and said light beams and resiliently supported on said frame to be moved toward the display surface by pressure of an object such as an operator's finger touched thereto;

means associated with said photosensitive elements to produce a first output signal indicative of the position of said object when it interrupts one of the light beams;

switch means mounted on said frame and associated with said transparent flat plate to produce a second output signal therefrom in response to movement of said flat plate toward the display surface; and

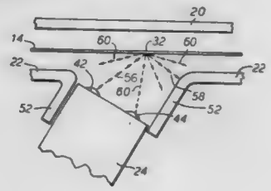
control means responsive to the first and second output signals to produce a control signal for switching over an indication or picture on the display surface of said display device to another indication or picture defined by the first output signal.

4,636,633

DOCUMENT SENSING APPARATUS THAT DETECTS NON-SPECULAR REFLECTED LIGHT

Stephen J. Roger, Livingston; John D. Bryant, Whitburn, and Philip Wong, Kettering, all of Wales, assignors to Burroughs Corporation, Detroit, Mich.

Filed May 18, 1984, Ser. No. 611,575
Claims priority, application United Kingdom, Dec. 10, 1983, 8333022
Int. Cl.⁴ G01N *9/04*; G06M *7/00*; H01J *40/14*
U.S. Cl. 250—223 R **28 Claims**



1. An apparatus for sensing the presence of a document stopped in a track in a stop-and-display station, said stop-and-display station including a first transparent wall wherethrough the document can be viewed and a second wall for supporting the document against said first wall, said apparatus comprising:

a light source in said second wall for projecting a beam of light, intensity-modulated with a predetermined frequency of modulation, at a predetermined angle of incidence onto a document intermediate between said first and second walls;

a photosensor, also in said second wall, positioned to intercept light from said beam scattered by the document without intercepting light from said beam specularly reflected by the document, said photosensor being operable to provide an output signal representative of the instant intensity of light incident thereon;

a band-pass filter coupled to receive as input said output signal from said photosensor and operable to provide as output those components of its input lying within a predetermined range of said predetermined frequency; and

a threshold detector, coupled to receive said output of said band-pass filter, and operable to provide output, indicative of a document being intermediate said first and second walls at each cycle of said output of said band-pass filter exceeding a predetermined amplitude.

4,636,634

APPARATUS WITH INTELLIGENT BINS INDICATING THE PRESENCE AND IDENTITY OF STORED CODED ARTICLES

James G. Harper, and Louis G. Bailey, both of Dallas, Tex., assignors to Veeco Integrated Automation, Inc., Dallas, Tex.

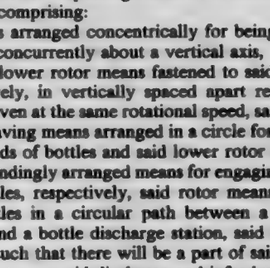
Filed Aug. 28, 1984, Ser. No. 645,162
Int. Cl.⁴ G01N *9/04*
U.S. Cl. 250—223 R **17 Claims**

1. An apparatus for storing and identifying coded articles placed therein, said code being a visually perceptible bar code and providing an indication of the identity of said articles, said apparatus comprising:

at least one bin which is adapted to store the coded articles;

presence detecting means disposed in each said at least one bin for detecting the presence of said coded article in said at least one bin;

code reading means disposed in each said at least one bin for reading the bar code disposed on the coded article; and



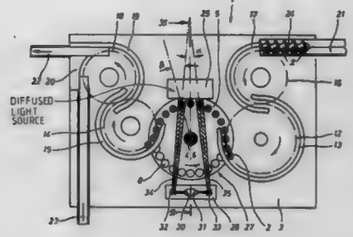
circuit means coupled to said presence detecting means and said code reading means for providing an indication of the identity and presence of the coded article in said at least one bin.

4,636,635

INSPECTION MACHINE FOR BOTTLES

Hermann Krönseder, Postfach 1230, D-8402 Neutraubling, Fed. Rep. of Germany

Filed Feb. 15, 1985, Ser. No. 702,242
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407386
Int. Cl.⁴ B07C *5/342*; G01N *21/00*
U.S. Cl. 250—223 B **12 Claims**



1. A machine for inspecting bottles for contaminants, flaws and the like, comprising:

shaft means arranged concentrically for being driven rotationally concurrently about a vertical axis,

upper and lower rotor means fastened to said shaft means, respectively, in vertically spaced apart relationship for being driven at the same rotational speed, said upper rotor means having means arranged in a circle for engaging the upper ends of bottles and said lower rotor means having correspondingly arranged means for engaging the bases of said bottles, respectively, said rotor means transporting said bottles in a circular path between a bottle infeed station and a bottle discharge station, said stations being located such that there will be a part of said path free of bottles between said discharge and infeed stations,

radiation source means located radially outwardly of the circular path in which the bottles travel on said rotor means between said infeed and discharge stations, said source means being constructed and arranged to project two beams of radiation having substantially the height of a bottle across said path through at least one bottle, said beams diverging from each other so as to pass said shaft means on opposite sides of said shaft means toward the part of said circular path that is across the rotor means from said source means and is free of bottles, and

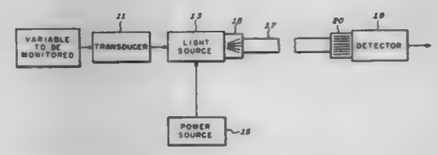
photoresponsive scanning means arranged in alignment with said part of the circular path that is free of bottles to receive said beams, said scanning means responding to said beams being modulated by flaws, contaminants and the like in said bottle by producing a signal indicative thereof.

4,636,636

MICROWATT BATTERY POWERED OPTICAL SENSOR

Donald H. McMahon, Carlisle, and Richard A. Soref, Newton Centre, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 13, 1984, Ser. No. 630,568
Int. Cl.⁴ G02F *1/00*
U.S. Cl. 250—227 **6 Claims**



1. An optical sensor system comprising:

transducer means for converting vairables for measurement to electrical signals;

transmission line means for optical signal propagation therealong;

detector means, having an optical intensity dynamic range and an optical shot noise intensity level, coupled to one end of said transmission line means for receiving and detecting optical signals; and

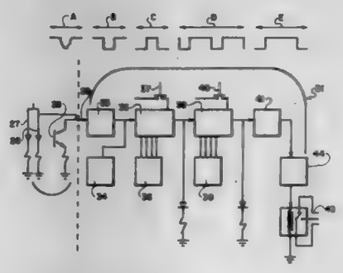
conversion means coupled between said transducer means and an end opposite said one end of said transmission line means for converting electrical signals from said transudcer means to optical signals for propagation along said transmission line means to said detector means, said conversion means operated about a bias level which establishes at said detector means an optical signal bias that is at an intensity level which exceeds said optical shot noise intensity level by said optical intensity dynamic range.

4,636,637

METHOD AND APPARATUS FOR DETECTING MOTION THROUGH A TRANSPARENT ENCLOSURE, WITH SPURIOUS INFORMATION DETECTING AND COMPENSATING MEANS

James Van Orsdel, 1917 Commonwealth Ave., Charlotte, N.C. 28205

Filed Oct. 24, 1985, Ser. No. 791,100
Int. Cl.⁴ G01D *5/34*
U.S. Cl. 250—231 SE **15 Claims**



1. An electro-optical encoder of the type used for reading utility meters which include a rotating meter disk having a calibration mark thereon, said encoder comprising at least one light source for directing light onto the circumferential periph-

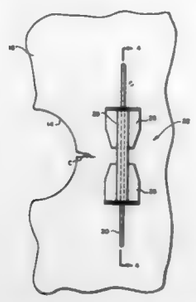
ery of the rotating meter disk; at least one sensor for receiving information reflected from the meter disk in pulse form upon sensing the calibration mark; a compensation circuit operatively connected to said sensor for detecting spurious information reflected from the meter disk and compensating for the spurious information to produce an accurate signal reflecting metered product usage for delivery to a final output, said compensation circuit comprising; a counter operatively connected to said sensor for being set to an integer corresponding to an empirically determined number of pulses sensed by the sensor during a single rotation of the meter disk, wherein at least one of such pulses is genuine and the remainder spurious, said counter having means for counting down to "one" and then transmitting downstream a single pulse representing one revolution of the meter disk, and means for then resetting the counting circuit to the integer and repeating the counting down function during each successive rotation of said meter disk.

4,636,638

REMOTE OPTICAL CRACK SENSING SYSTEM INCLUDING FIBEROPTICS

Shih L. Huang, Southampton; Arthur Scotese, Audubon; Mark Libeskind, Cornwells Heights, and Lee W. Gause, Warminster, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 12, 1984, Ser. No. 660,349
Int. Cl.[4] G01D *5/34*; G01B *11/16*; G01L *1/24*
U.S. Cl. 250—231 R 2 Claims



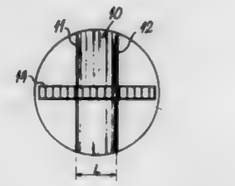
1. Apparatus for detecting cracks which originate from a stress raiser in a structural material, comprising in combination:
a length of optical fiber having two ends;
means for injecting light into one of said ends;
strain responsive means coupled to said fiber and attched to the structural material in close proximity to the stress raiser such that cracks originating therefrom cause tensile forces which will break said fiber in tension, said strain responsive means consisting of two non-contiguous rigid members bonded by their lower surfaces to the structural material to form a gap between said members and a graphite epoxy composite having lower strain than said fiber by which said fiber is attached to said members, said composite spanning said gap; and
light responsive means optically coupled to the other of said ends for detecting breakage of said fiber.

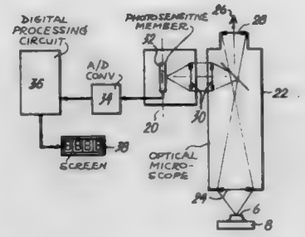
4,636,639

DEVICE FOR THE OPTICAL MEASUREMENT OF THE EDGE TO EDGE DIMENSION OF AN OBJECT

Michel E. Guillaume, Les Bletieres-Les Adrets, 38190 Brignoud, and Nicole Noelly, 61 Bd J. Vallier, 38100 Grenoble, both of France

Filed Jul. 26, 1984, Ser. No. 634,542
Claims priority, application France, Jul. 26, 1983, 83 12328
Int. Cl.[4] G01B *11/02*, *11/08*
U.S. Cl. 250—560 3 Claims





1. A device for measuring an edge to edge dimension of an object, said device incorporating optical means forming a magnified image of the object in an image plane, the image clearly and distinctly showing the two edges of the object, a photosensitive member constituted by a sequence of photosensitive elements arranged in the image plane and oriented in a direction perpendicular to the edges of the image, said photosensitive member supplying a series of analog electrical signals having an amplitude which is a function of the light intensity received by each of the various elements constituting said photosensitive member, said device also comprising an analog-digital converter having an input connected to said photosensitive member and an output supplying a series of digital signals and a digital processing circuit connected to the output of said analog-digital converter and performing a discrete Fourier transformation of the signal formed by the series of digital signals, the transformation leading to a distribution of Fourier components comprising a first minimum having a value N and successive minima spaced from each other by the value N, said processing circuit being able to determine the value N and deduce from the value N the sought dimension L by the relation $L=X/N$, in which X is a parameter defined by calibration.

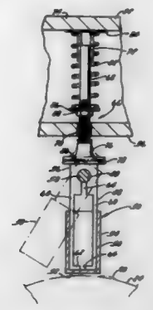
4,636,640

CORONA DISCHARGE ELECTRODE ASSEMBLY

Joseph R. Majewski, South Milwaukee, Wis., assignor to Pillar Corporation, Milwaukee, Wis.

Filed Jul. 1, 1983, Ser. No. 510,120
Int. Cl.[4] G03G *15/00*
U.S. Cl. 250—324 10 Claims

1. A corona discharge device comprising
a frame,
a first elongate rod mounted on said frame,
a first electrode assembly mounted on said frame,
a second electrode assembly mounted on said rod in a fixed relation with respect to said first electrode assembly,
said second electrode assembly having one or more electrodes each including an electrically conductive member having one end located in a spaced relation to said first electrode assembly and an aperture on the other end for mounting on said rod, a ceramic element enclosing said one end of said conductive member
said conductive member including resilient means for frictionally retaining said ceramic element on the end of said member,



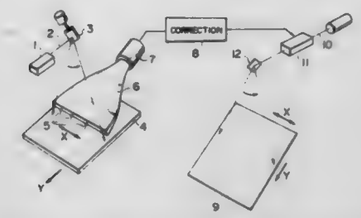
plunger means mounted on said frame to resiliently engage each electrode and resiliently hold each electrode in an orientation generally radial relative to said rod, such that said electrodes may pivot on said rod if engaged by material passing around said first electrode assembly,
and power source means operatively connected to said first electrode assembly and the said conductive member to produce a corona discharge in the space between said first electrode assembly and said ceramic element.

4,636,641

RADIATION IMAGE READ-OUT METHOD AND APPARATUS

Nobufumi Mori; Kenji Takahashi, and Kazuo Horikawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 5, 1983, Ser. No. 558,241
Claims priority, application Japan, Dec. 8, 1982, 57-215318
Int. Cl.[4] G03G *5/16*; H05B *33/00*
U.S. Cl. 250—327.2 6 Claims



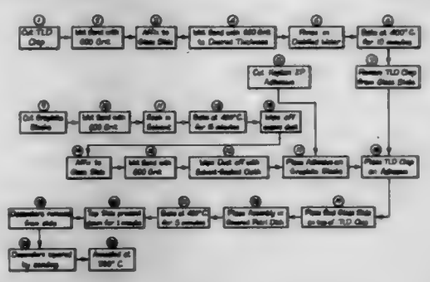
4. A radiation image read-out apparatus including a stimulating ray emitting means for emitting stimulating rays to a stimulable phosphor sheet carrying a radiation image stored therein, a means for moving said stimulable phosphor sheet, and a light detecting means for photoelectrically detecting light emitted from said stimulable phosphor sheet in proportion to the radiation energy stored therein upon exposure thereof to said stimulating rays, thereby to obtain sequential electric signals of respective picture elements of the radiation image, wherein the improvement comprises a means for electrically eliminating the interference among said electric signals of the respective picture elements, which is caused by the light emission response characteristics of the stimulable phosphor of said stimulable phosphor sheet to the stimulation, by adding a weighted differentiated value of said sequential electric signals of respective picture elements to said sequential electric signals of respective picture elements.

4,636,642

THIN THERMOLUMINESCENT DOSIMETER AND METHOD OF MAKING SAME

Gale G. Simons, Manhattan, Kans., and Timothy M. DeBey, Albuquerque, N. Mex., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Filed Feb. 13, 1984, Ser. No. 579,388
Int. Cl.[4] G01T *1/11*
U.S. Cl. 250—337 26 Claims



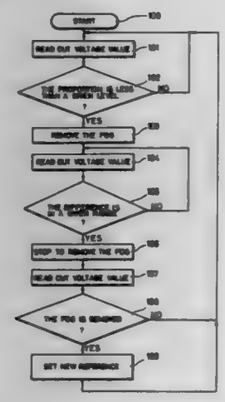
1. A radiation dosimeter comprising an essentially pure, self-sustaining, solid body of thermoluminescent material of substantially constant density and having a thickness of less than about 0.15 millimeters and a volume of at least about 0.0125 mm^3.

4,636,643

FOG DETECTING APPARATUS FOR USE IN VEHICLE

Kanehito Nakamura, Oobe; Kazuma Matsui, Toyohashi; Takashi Kurahashi, Aichi, and Hiroshi Ishikawa, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 25, 1984, Ser. No. 634,360
Claims priority, application Japan, Jul. 25, 1983, 58-136374; Jul. 25, 1983, 58-136375; Jul. 25, 1983, 58-136376; Jul. 25, 1983, 58-138417
Int. Cl.[4] G01N *21/55*; B60L *1/02*
U.S. Cl. 250—338 5 Claims



1. A fog detecting apparatus for use in a vehicle, comprising:
(a) means for emitting an infrared beam such that the emitted infrared beam is directed to a predetermined portion of a windshield of said vehicle, said infrared-emitting means being actuated in response to a signal applied thereto from an emitting control circuit;

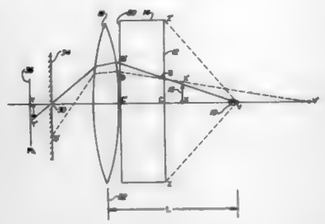
(b) means for receiving an infrared beam reflected at said predetermined portion, said infrared-receiving means producing an electrical signal corresponding to an intensity of an infrared beam reaching said infrared-receiving means after a reflection;
(c) means for detecting a fog on said windshield by comparing said electrical signal from said infrared-receiving means with a predetermined reference value and issuing a command signal indicative of the removal of the fog in response to the detection of the fog;
(d) first decision means for deciding that the fluctuation of said electrical signal is stably kept within a first predetermined range, after the removal of the fog performed in response to said command signal;
(e) second decision means for deciding that the deviation between said electrical signal and said predetermined reference value remains within a second predetermined range, after the decision of stability of the fluctuation; and
(f) means for updating said predetermined reference value with a value of said electrical signal at the time that a decision is made by said second decision means.

4,636,644

ANTI-PARALLAX SCINTILLATOR SYSTEM FOR USE WITH PENETRATING IONIZING RADIATION

Jeffrey A. Stokes, San Diego, Calif., assignor to IRT Corporation, San Diego, Calif.

Filed May 1, 1984, Ser. No. 605,877
Int. Cl.⁴ G01T *1/20*
U.S. Cl. 250—368 **19 Claims**



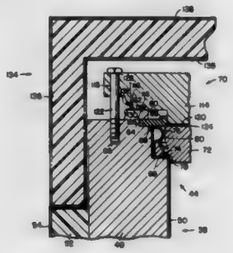
1. A scintillator imaging system for imaging penetrating ionizing radiation from a source, comprising:
scintillation means for providing light having a predetermined range of wave lengths in response to the radiation, said scintillation means having an irradiated surface, said source being sized and disposed to provide no more than a preselected minimum unsharpness and to radiate said surface conically, the vertex of the radiation flux cone defining an equivalent point source of radiation radiating said surface;
imaging means for focussing said light from said scintillation means, said imaging means providing a focus point, said point source and said focus point being optically conjugate with each other respect to said imaging means;
aperture means for defining an aperture at said focus point for transmitting the focussed light; and
viewing means having an inherent best spatial resolution for receiving and intensifying the transmitted light, and for displaying an image responsive to said transmitted light, said aperture being sized with respect to said range of wave lengths to minimize diffraction degradation of said viewing means while also minimizing defocussing resulting from finite aperture size.

4,636,645

CLOSURE SYSTEM FOR A SPENT FUEL STORAGE CASK

Boyd A. Kessinger, Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 31, 1984, Ser. No. 666,944
Int. Cl.⁴ G21F *5/00*
U.S. Cl. 250—506.1 **15 Claims**



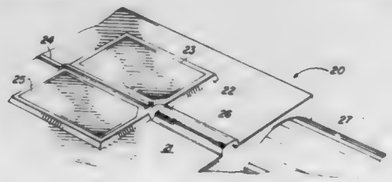
1. A closure system for temporarily sealing a cask base element having a mouth region with first and second steps and for permitting said cask base element to be permanently sealed, said closure system comprising:
a primary cover having a bottom side with a first peripheral region configured for placement on said first step and having a top side with a second peripheral region, an upwardly open annular recess being provided in said primary cover at said secondary peripheral region;
first means disposed between said first peripheral region and said first step for creating a mechanical seal to seal said cask base element at least temporarily;
a generally band-shaped element which is disposed in said annular recess and which has first and second edges and a curved cross section, the first edge being sealingly affixed to said primary cover and the second edge being sealingly affixed to said cask base element only if said cask base element is to be permanently sealed;
a secondary cover having a bottom side with a peripheral region configured for placement on said second step; and
second means disposed between the peripheral region of said secondary cover and said second step for creating an additional mechanical seal to seal said cask base element at least temporarily.

4,636,646

OPFET PHOTODETECTOR

Davis H. Hartman, Tempe, and Fred V. Richard, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 21, 1984, Ser. No. 653,121
Int. Cl.⁴ G02B *27/00*
U.S. Cl. 250—551 **5 Claims**



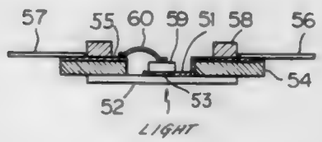
1. An OPFET photodetector comprising:
a substrate;
optical detecting MESFET for detecting an optical signal, said optical detecting MESFET being mounted on said substrate so as to present an edge perpendicular thereto, said optical detecting MESFET comprising:
a gate being mounted on said substrate and having a first edge perpendicular to said substrate and coupled to said optical transmitting means;
a drain being mounted on said substrate juxtaposed to and to one side of said gate; and
a source being mounted on said substrate juxtaposed to and to a side of said gate opposite said drain; and
optical transmitting means for transmitting an optical signal, said optical transmitting means being optically coupled to the edge of said optical detecting means for selectively utilizing a high frequency response characteristic of said OPFET and minimizing the generation of low frequency components of a response of said OPFET.

4,636,647

PACKAGE FOR OPTICAL ELEMENT

Hideaki Nishizawa, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 15, 1984, Ser. No. 610,414
Claims priority, application Japan, May 31, 1983, 58-97628
Int. Cl.⁴ G02B *27/00*
U.S. Cl. 250—551 **3 Claims**



1. A package for an optical element which receives or emits light, comprising:
a transparent sapphire glass substrate;
a first ceramic peripheral member being bonded on top of the substrate;
an electrode pad including a window formed therein on top of the substrate and extending across the first peripheral member; and
a second ceramic ring-shaped peripheral member overlapping with and bonded on top of said first peripheral member so as to surround the optical element;
wherein said optical element is bonded on top of the electrode pad and is extended over the window of the electrode pad;
whereby light is received into and emitted from the optical element through the transparent substrate and the window of the electrode pad.

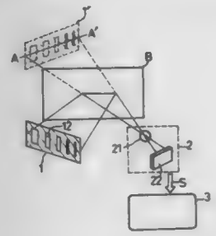
4,636,648

COATING QUALITY MEASURING DEVICE

Tsuneyuki Egami, Gamagori; Tsutomu Saito, Okazaki; Mitosi Ando, Nishio; Ryuzou Hori; Takashi Kamo, both of Toyota, and Kazusori Yoshida, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Sep. 19, 1985, Ser. No. 777,680
Claims priority, application Japan, Sep. 20, 1984, 59-197706
Int. Cl.⁴ G01V *9/04*
U.S. Cl. 250—571 **6 Claims**

1. A coating quality measuring device for measuring the coating quality of a coated surface, comprising:
a pattern plate disposed opposite the coated surface to be measured; said pattern plate being provided with a plurality of strip pattern portions having different pattern widths, which are arranged on a surface of said pattern plate opposite the coated surface at intervals, each of said strip pattern portions having lightness different from that of a ground portion of said pattern plate;
an image-pickup means for image-forming a reflected image of said pattern plate, which is reflected on the coated surface; scanning the formed reflected image along a line extending in a width direction of each pattern portion and successively generating an output signal having a signal level corresponding to the lightness of each portion on the scanned line; and



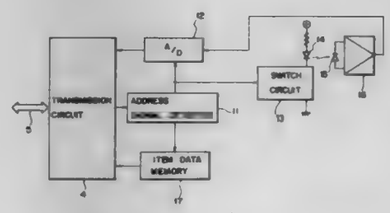
a computing means for calculating the difference between the peak value of the signal level of the output signal corresponding to each of said strip pattern portions in the reflected image and the signal level of the output signal corresponding to the ground portion and detecting the pattern width of said strip pattern portion wherein the calculated difference reaches a predetermined value, thereby to obtain the coating quality of the coated surface.

4,636,649

PHOTOELECTRIC SMOKE SENSOR TERMINAL

Tetsuo Kimura, Tokyo; Seiichi Tanaka, Chiba, and Takashi Suzuki, Tokyo, all of Japan, assignors to Nittan Company, Limited, Tokyo, Japan

Continuation of Ser. No. 542,258, Oct. 14, 1983. This application Feb. 26, 1986, Ser. No. 833,577
Claims priority, application Japan, Oct. 22, 1982, 57-158799[U]
Int. Cl.⁴ G08B *17/10, 26/00*
U.S. Cl. 250—574 **5 Claims**



1. A photoelectric smoke sensor terminal for use with a main control unit which addresses the terminal via a transmission line, comprising:
photoelectric smoke sensing means utilizing light-emitting means and a corresponding light-receiving means for converting light to an analog electrical signal responsive to the presence of smoke;
an amplifier means connected to said light-receiving means for amplifying the analog electrical signal from said light-receiving means;
an A/D converter means for converting the amplified analog electrical signal from said photoelectric smoke sensing means to a digital signal;
an address signal detector means connected to said A/D converter means for detecting whether or not an address assigned to and stored at the photoelectric smoke sensor

terminal coincides with an address represented by an address signal contained in a series of address signals received from the main control unit and for supplying a coincidence signal indicative of the coincidence of the stored and received addresses to said A/D converter means so as to activate the same for output of the digital signal created when said light-emitting means is operated;

a transmission means connected to said A/D converter means and said address signal detector means for transmitting the digital signal indicating an operation state of said photoelectric smoke sensing means onto the transmission line when it is received in response to the coincidence signal from said address signal detector means and for receiving the address signal from the main unit and supplying the address signal to said address signal detector means; and

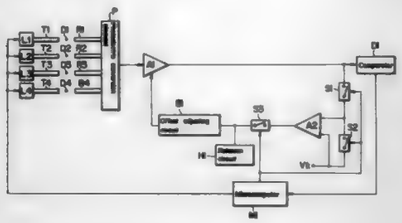
a switch circuit means connected to said light-emitting means and controlled by an output of said address signal detector means for operating said light-emitting means and creating said analog signal converted to a digital signal only in response to the coincidence signal, whereby power drain supplied to the sensor terminal is minimized.

4,636,650

OPTICAL IMAGE READER FOR READING AN IMAGE ON A GIVEN MANUSCRIPT

Yujiro Ishikawa, Toyoda, Japan, assignor to Brother Industries, Ltd., Nagoya, Japan

Filed Aug. 28, 1984, Ser. No. 645,042
Claims priority, application Japan, Aug. 31, 1983, 58-160111
Int. Cl.⁴ H04N *1/032*
U.S. Cl. 250—578 **5 Claims**



1. An optical image reader for reading an image on a manuscript comprising:

a reader head including a light source for directing light to said manuscript during a read cycle, said source being deactivated during an idle cycle and a photoelectric conversion element for generating a signal corresponding to the light reflected by said manuscript, said reader head being movable with respect to said manuscript;

DC amplifying means for amplifying said signal;

error amplifying means for comparing said output voltage with a preselected reference voltage during the idle cycle and for generating differential signals;

retaining means for temporarily retaining said differential signals; and

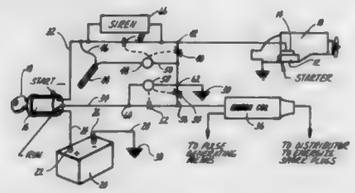
offset adjusting means for adjusting an offset of said DC amplifying means during the read cycle in accordance with said differential signals retained by said retaining means.

4,636,651

VEHICLE ANTI-THEFT SYSTEM WITH PRESSURE SENSITIVE SENSOR

Woodson B. Kilgore, 31827 Maine, Livonia, Mich. 48150

Continuation-in-part of Ser. No. 418,719, Sep. 16, 1982, abandoned. This application Feb. 1, 1985, Ser. No. 697,162
Int. Cl.⁴ B60R *25/04*
U.S. Cl. 307—10 AT **1 Claim**



1. In a motor vehicle having an engine, a vehicle frame, electrical starter means operable to turn said engine, the starter means having a pair of electrical terminals, the combination comprising:

an ignition key switch;

a key receivable in the key switch and movable to a start position;

a battery for providing a source of electrical energy, the battery having a first pole and a second pole;

first conductor means electrically grounding the first battery pole to the vehicle frame;

second conductor means electrically connecting the second battery pole to the ignition key switch;

third conductor means electrically grounding a first of the pair of starter means terminals to the vehicle frame;

fourth conductor means operable to ground the second of the pair of starter means terminals to the vehicle frame;

means for electrically connecting the ignition key switch to the starter means including:

a first normally-open relay contact connected between the ignition key switch and the starter means;

a first normally-closed relay contact disposed in the fourth conductor means;

first relay coil means electrically connected to both the first normally-open relay contact and the first normally-closed relay contact such that both of the terminals of the starter means are grounded to the vehicle frame at such times as the first normally-closed relay contact is closed;

a manually-operated tape switch which makes an electrical connection only when a pressure is continuously applied thereto, and which opens such connection when such pressure is removed, the tape switch being located in a selected position in the vehicle, and being electrically connected between the ignition key switch and the first relay coil means to energize the first relay coil means such that the first normally-closed relay contact is opened, and the first normally-open relay contact is closed when said pressure is applied to the tape switch, and the first normally-closed relay contact is closed and the first normally-open relay contact is opened when said pressure is removed from the tape switch;

whereby the starter means may be energized only when the ignition key is disposed in the start position in the ignition key switch and said pressure is continuously applied to the tape switch; and

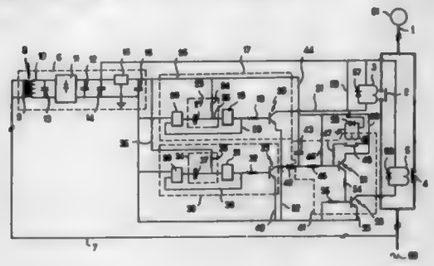
including siren means electrically connected between the ignition key switch and the starter means such that the siren means is electrically energized when said pressure has not been applied to the manually-operated switch but the ignition key has been disposed in the start position in the ignition key switch.

4,636,652

ELECTRIC CIRCUIT CONTROL DEVICE

Marc Raes, Lamorlaye, France, assignor to Compagnie Industrielle des Telecommunications Cit-alcatel, France

Filed Jan. 19, 1985, Ser. No. 746,424
Claims priority, application France, Jan. 20, 1984, 84 09673
Int. Cl.⁴ H01H *43/06*
U.S. Cl. 307—141 **5 Claims**



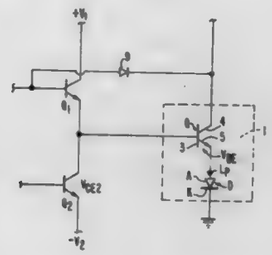
1. Electric circuit control device comprising a first, normally open, controlled switch connected in the electric circuit, a second, normally closed, controlled switch shunted with the first controlled switch, means for supplying power to the control device, said means connected in the electric circuit upstream from said first and second controlled switches, first time delay control means connected to said first controlled switch, second time delay control means connected to said second controlled switch and memory means connected to said second controlled switch, the time delay of the first control means being at most equal to the time delay of the second control means.

4,636,653

HIGH VOLTAGE SEMI-CONDUCTOR SWITCHING APPARATUS AND METHOD

Poh S. Hsu, 1010 Massachusetts Ave., Cambridge, Mass. 02138

Continuation of Ser. No. 389,238, Jun. 17, 1982, abandoned. This application Feb. 26, 1985, Ser. No. 705,846
Int. Cl.⁴ H03K *17/60, 17/72*
U.S. Cl. 307—253 **18 Claims**



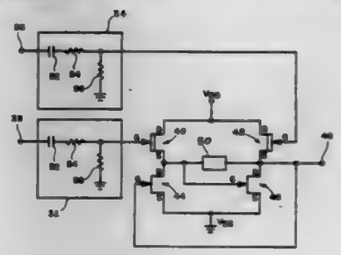
1. High voltage, high current switching apparatus comprising, in combination: a high voltage, high current switching transistor having a base, an emitter and a collector and which is susceptible to reverse biased secondary breakdown when a reverse bias is applied between the base and emitter to turn off said transistor; base drive means for applying a forward bias voltage between the base and emitter of said transistor to turn on said transistor and for applying a high reverse bias voltage with fast rise time between the base and emitter of said transistor to turn off said transistor; and high current diode means connected between ground and the emitter of said transistor with such a polarity as to permit normal forward current flow through said transistor when said transistor is in an ON state; said high reverse bias voltage applied by said base drive means being sufficient to maintain said diode means in a reverse biased state during turn off of said transistor and thereby to prevent current flow between the collector and emitter of said transistor and force reverse base current in said transistor to a level at least equal to that of collector current in said transistor during turn off of said transistor, whereby reverse biased secondary breakdown of said transistor at turn off by said drive means is eliminated.

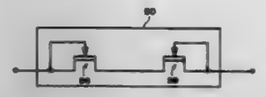
4,636,654

GAAS DIFFERENTIAL LINE RECEIVER WITH POSITIVE FEEDBACK

Lawrence E. Lach, Chicago, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Oct. 7, 1985, Ser. No. 784,983
Int. Cl.⁴ H03K *3/356*; H04B *1/24*; H04L *25/08*
U.S. Cl. 307—260 **11 Claims**





1. A MESFET differential line receiver circuit comprising:

first and second receiver means for receiving first and second differential input signal voltages;

a pair of load element means each connected between a first voltage supply terminal and a respective load element means output

for transforming said received signal voltages into corresponding signal currents to provide pull up at said load element means outputs and connected to said first and second receiver means, respectively;

a pair of driver element means each connected between a respective one of said pair of load element means outputs and a second voltage supply terminal for outputting a predetermined signal representation of said first and second differential input signal voltages at one of said load element means outputs;

positive feedback means for increasing the gain of said pair of driver element means and connected to said pair of driver element means as regenerative feedback connections; and

at least two depletion transistors operatively connected in a back to back configuration

between the respective driver and load element means connections for reducing hysteresis switching to said pair of driver element means.

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CIRCUIT IN WHICH OUTPUT CIRCUIT AND OPERATIONAL AMPLIFIER EQUIPPED INPUT CIRCUIT ARE ELECTRICALLY ISOLATED

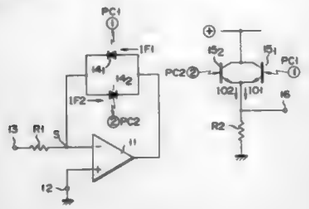
Katsumi Nagano, Shimonoseki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 6, 1984, Ser. No. 668,832

Claims priority, application Japan, Nov. 11, 1983, 58-211876; Dec. 27, 1983, 58-246342

Int. Cl.⁴ H03K *5/00, 3/42*

U.S. Cl. 307—261 **3 Claims**



1. A full wave rectifier circuit comprising:
an input terminal of the rectifier circuit;
an output terminal of the rectifier circuit;
an operational amplifier having first and second input terminals and an output terminal, said first input terminal of said amplifier being connected to a first power source potential, and said second input terminal of said amplifier being connected to an AC input signal;
a feedback circuit connected between said output terminal of said amplifier and said second input terminal thereof for feeding an output signal of said amplifier back to said second input terminal thereof, said feedback circuit comprising first and second electrophoto converting elements, said first and second electrophoto converting elements being connected in parallel to each other between said output terminal of said amplifier and said second input terminal thereof, said first electrophoto converting element being connected between said output terminal of said amplifier and said second input terminal thereof so that an electric current flows through said first electrophoto converting element from said output terminal of said amplifier to said second input terminal thereof, and said second electrophoto converting element being connected between said output terminal of said amplifier and said second input terminal thereof so that an electric current flows through said second electrophoto converting element from said second input terminal of said amplifier to said output terminal thereof;
first and second photoelectro converting elements being connected in parallel to each other between a second power source potential and said output terminal of the rectifier circuit, said first photoelectro converting element being optically connected to said first electrophoto converting element and said second photoelectro converting element being optically connected to said second electrophoto converting element; and
a load element connected between said output terminal of the rectifier circuit and said first power source potential.

4,636,656

CIRCUIT FOR SELECTIVELY EXTENDING A CYCLE OF A CLOCK SIGNAL

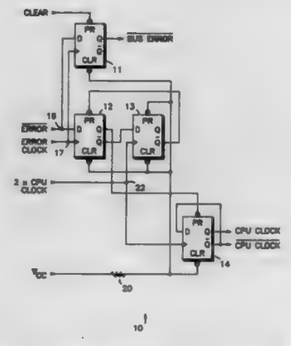
Ralph E. Snowden, and Robert D. Whitley, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 21, 1984, Ser. No. 612,212

Int. Cl.⁴ H03K *3/017, 5/04;* **G06F** *15/00*

U.S. Cl. 307—267 **8 Claims**

1. A circuit for providing a clock signal and selectively extending a cycle of the clock signal during a predetermined time period established by a first control signal and in response to a second control signal, comprising:
first latch means having a first input for receiving the first control signal, a second input for receiving the second control signal a first output for providing an active state suspend signal in response to the receipt of the first control signal when the second control signal is in a predetermined logic state, a second output for providing a complement of the active state suspend signal, and a preset terminal for receiving a set signal which releases the suspend signal from the active state in response thereto;
second latch means having a first input coupled to the second output of the first latch means, a second input coupled to a terminal for receiving a modified clock signal having



a predetermined multiple frequency of the clock signal, and an output coupled to the preset terminal of the first latch means for providing the set signal, said second latch means selectively providing the set signal in response to both the complement of the active state suspend signal and the modified clock signal; and
third latch means having a first input for receiving the modified clock signal, a second input coupled to a first output thereof, a second output for providing the clock signal in response to the receipt of the modified clock signal, and a preset terminal coupled to the first output of the first latch means for setting the first and second outputs of the third latch means in response to the active state suspend signal thereby selectively extending a cycle of the clock signal.

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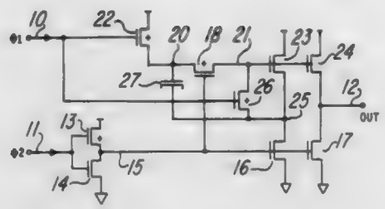
HIGH SPEED CMOS CLOCK GENERATOR

Chitranjan Reddy, Sugar Land, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 29, 1984, Ser. No. 645,578

Int. Cl.⁴ H03K *19/096, 19/01, 17/04, 4/58*

U.S. Cl. 307—269 **6 Claims**



1. A clock circuit comprising:
first and second clock voltages each switching between zero in a precharge cycle and to a supply voltage in an active cycle,
an inverter having a pair of inverter transistors with source-to-drain paths connected in series between a voltage supply and ground, the gates of said transistors being coupled to said second clock voltage, the juncture of said transistors providing a first control node,
first and second pairs of output transistors, the source-to-drain paths of the first pair being separately connected between ground and a second control node and an output node, respectively, the gates of the first pair of output transistors connected in common to said first control node, the source-to-drain paths of the second pair being separately connected between said supply and said second control node and said output node, respectively, the gates of the second pair of transistors connected in common to a driver node,
a first transistor having its source-to-drain path connected between said supply and a charge node; a second transistor having its source-to-drain path connected between said charge node and said driver node; a third transistor having its source-to-drain path connected between said driver node and said second control node; the gates of said first and third transistors being connected to said first clock voltage; the gate of said second transistor being connected to said first control node;
and a capacitor connected between said second control node and said charge node.

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SAMPLE AND HOLD CIRCUIT

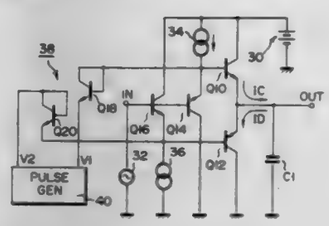
Yasuhiro Sugimoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 6, 1984, Ser. No. 668,841

Claims priority, application Japan, Nov. 11, 1983, 58-211879

Int. Cl.⁴ H03K *17/04;* **G11C** *27/02*

U.S. Cl. 307—353 **6 Claims**



1. A sample and hold circuit comprising:
input and output terminals;
first and second power source terminals;
capacitive means connected between said output terminal and said second power source terminal;
a first transistor of one conductivity type which has a collector connected to said first power source terminal and an emitter connected to said output terminal;
a second transistor of the opposite conductivity type which has an emitter connected to said output terminal and a collector connected to said second power source terminal;
a third transistor of the opposite conductivity type which has a base connected to said input terminal, a collector connected to said second power source terminal and an emitter connected to a base of said first transistor;
a fourth transistor of the one conductivity type which has a base connected to said input terminal, a collector connected to said first power source terminal and an emitter connected to a base of said second transistor;
a first constant current source connected between said first power source terminal and the emitter of said third transistor;
a second constant current source connected between said second power source terminal and the emitter of said fourth transistor; and
a driving control circuit including mode setting means for selectively setting sampling and holding modes and current control means to inhibit flow of the respective base currents of said first and second transistors in the holding mode and to permit flow of the respective base currents of said first and second transistors in the sampling mode.

4,636,658

VOLTAGE DETECTING DEVICE

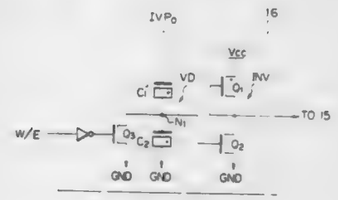
Hideki Arakawa, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 25, 1985, Ser. No. 704,995

Claims priority, application Japan, Feb. 28, 1984, 59-035115

Int. Cl.⁴ H03K *5/153*

U.S. Cl. 307—350 **7 Claims**



1. A voltage detecting device comprising:
first terminal means to which a detected voltage is to be applied;
second terminal means;
a voltage dividing circuit comprising:
a first capacitor linked between said first terminal means and a common node and
a second capacitor linked between the common node and said second terminal means;
switching means linked between the common node and said second terminal means;
a first means, connected to the common node, for generating an output signal, when the potential at the common node reaches a predetermined value; and
a second means, connected to said switching means, for turning on said switching means when said detected voltage is not applied to said first terminal means.

4,636,660

FAIL-SAFE "AND" GATE USING CAPACITOR DISCHARGE THROUGH A TRANSFORMER

Andrés Gelabert, Margency, France, assignor to Jeumont-Schneider Corporation, Puteaux, France

Filed Oct. 24, 1984, Ser. No. 664,344

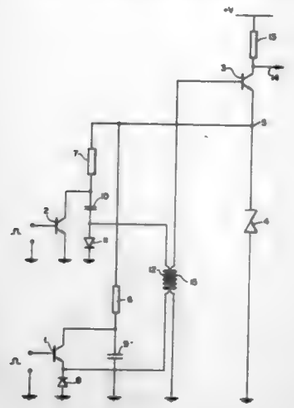
Claims priority, application France, Oct. 26, 1983, 83 17041

Int. Cl.⁴ H03K *19/007*

U.S. Cl. 307—442 **3 Claims**

1. A fail-safe "AND" logic circuit, comprising a first transistor and a second transistor, the respective bases of which constitute two inputs of said circuit to which pulses can be applied and the respective collectors of which each being connected to a point of reference voltage through a resistance, and a third transistor having its base connected to a first terminal of a d.c. voltage supply through a secondary winding of a transformer having a transforming ratio less than unity, its collector connected to a second terminal of said d.c. voltage supply through a resistance, and its emitter connected to said point of reference voltage, said first transistor having its emit-

ter connected through a first diode to said first terminal of said d.c. supply and its collector connected through a first capacitor to that terminal, said second transistor having its emitter connected to said first terminal of said d.c. supply and its collector connected to that terminal through a series circuit



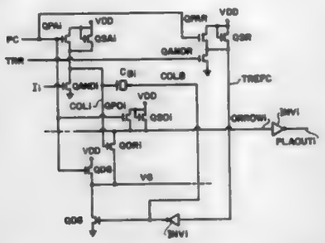
including a second capacitor and a second diode in series, a junction of said second capacitor and said second diode being connected to a junction of the emitter of said first transistor and said first diode through a primary winding of said transformer.

4,636,661

RATIOLESS FET PROGRAMMABLE LOGIC ARRAY

Syed T. Mahmud, Los Gatos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Dec. 21, 1984, Ser. No. 684,638
Int. Cl.[4] H03K *19/177, 19/094, 19/003*
U.S. Cl. 307—468 8 Claims



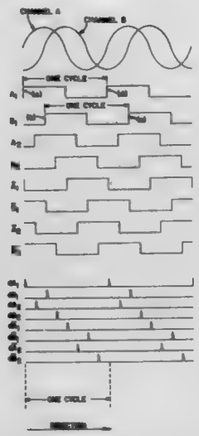
1. A logic array including a plurality of FETs connected in sets to perform AND functions and OR functions, each FET having a gate and first and second conducting regions, the gates of said AND FETs serving as inputs for said logic array, a separate column conductor for each AND set connecting together one of the conducting regions of each FET in its associated and set, a separate row conductor for each OR set connecting together the first conducting region of each FET in its associated OR set, a common conductor connecting together second conducting regions of all FETs performing an OR function, precharging means precharging said column conductors, said row conductors and said common conductor, and selection means selecting a particular combination of one or more AND sets for operation in conjunction with the operation of one or more OR sets in accordance with a particular function it is desired that the array perform, said selection means connected to said common conductor including delay means delaying the operation of all said one or more OR sets associated with a particular function until said selected one or more AND sets associated with that function have all operated.

4,636,662

METHOD AND MEANS FOR INCREASING THE FREQUENCY OF UPDATE OF DIRECTION INFORMATION CONTAINED IN TWO SINE WAVES IN QUADRATURE

Robert S. Landin, Northfield, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Nov. 14, 1984, Ser. No. 671,318
Int. Cl.[4] H03K *1/12;* H03L *7/00*
U.S. Cl. 307—512 6 Claims



1. A method of increasing the frequency of update of direction information embedded in two, essentially identical, alternating current signals, essentially sinusoidal in waveform, and which are in quadrature, comprising:

(a) generating eight, on-off, electrical signals, essentially rectangular in waveform, from said two alternating current signals, said eight electrical signals being displaced by intervals of 45°;

(b) differentiating said eight electrical signals, to produce eight electrical pulse trains, the pulses in a train representing the positive-going transitions in the electrical signal of which the derivative was taken; and

(c) combining said eight pulse trains and said eight electrical signals in pairs, such that when a pulse train and its paired electrical signal are each at a high level, a direction will be uniquely indicated;

wherein direction information is updated eight times during each full cycle of each of said two alternating current signals.

4. A device for increasing the frequency of update of direction information embedded in two, essentially identical, alternating current signals, essentially sinusoidal in waveform, and which are in quadrature, comprising:

(a) generating means for generating eight, on-off, electrical signals, essentially rectangular in waveform, from said two alternating current signals, said eight electrical signals being displaced by intervals of 45°;

(b) differentiating means connected to said generating means for differentiating said eight electrical signals, to produce eight electrical pulse trains, the pulses in a train representing the positive-going transitions in the signal of which the derivative was taken; and

(c) combining means connected to said generating and differentiating means for combining said eight pulse trains and said eight electrical signals in pairs, such that when a pulse train and its paired electrical signal are each at a high level, a direction will be uniquely indicated;

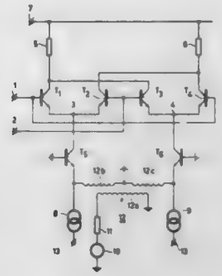
wherein direction information is updated eight times during each full cycle of each of said two alternating current signals.

4,636,663

DOUBLE-BALANCED MIXER CIRCUIT

Abraham Jongepier, and Wolfdietrich G. Kasperkovitz, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 3, 1984, Ser. No. 627,594
Claims priority, application Netherlands, Jul. 8, 1983, 8302438
Int. Cl.[4] G06G *7/00;* H03B *19/00*
U.S. Cl. 307—529 3 Claims



1. A double-balanced mixer circuit comprising a first differential pair of first and second transistors whose emitters are connected to a common first emitter terminal, a second differential pair of third and fourth transistors whose emitters are connected to a common second emitter terminal, the bases of the first and the fourth transistor and the bases of the second and the third transistor being coupled to a common first and a common second base terminal respectively, between which base terminals a mixing signal may be applied, and a voltage-current converter having an input for receiving an input signal and having first and second outputs which are coupled to the first and the second emitter terminal respectively, characterized in that the voltage-current converter comprises a balanced, common-base circuit comprising a fifth and a sixth transistor, whose bases are earthed for signal current, whose collectors are coupled to the first and the second emitter terminals respectively and whose emitters are coupled to a common power-supply terminal via respective current-supply elements, which emitters constitute the input of the voltage-current converter.

4,636,664

CURRENT SINKING RESPONSIVE MOS SENSE AMPLIFIER

Donald G. Craycraft, Spring Valley, and Giao N. Pham, Centerville, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Division of Ser. No. 456,938, Jan. 10, 1983. This application Feb. 25, 1985, Ser. No. 705,298
Int. Cl.[4] H03K *5/24;* G11C *7/06*
U.S. Cl. 307—530 3 Claims

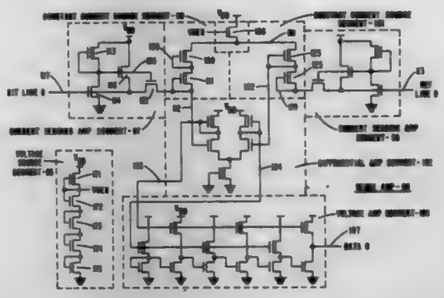
1. A sensing amplifier responsive to the difference in current sinking capacity between an input line and a reference line, comprising:

means for generating a first constant current to a first reference node;

means for generating a second constant current to a second reference node;

a first pass FET conductively connected between said input line and said first reference node, and having its gate electrode biased in inverse proportion to the potential on said input line;

a second pass FET conductively connected between said reference line and said second reference node, and having its gate electrode biased in inverse proportion to the potential on said reference line; and



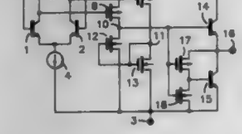
means for detecting a difference in the current sinking capacity between said input line and said reference line.

4,636,665

BIMOS MEMORY SENSE AMPLIFIER

Kevin L. McLaughlin, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 2, 1985, Ser. No. 803,279
Int. Cl.[4] H03K *5/24;* G11C *7/06*
U.S. Cl. 307—530 3 Claims



1. A circuit comprising:

a first supply voltage terminal;

a second supply voltage terminal;

first and second input terminals;

an output terminal;

a first bipolar transistor coupled between said first supply voltage terminal and said output terminal;

a second bipolar transistor coupled between said output terminal and said second supply voltage terminal;

a pair of differentially connected bipolar transistors coupled between said first and second supply voltage terminals and having their bases coupled to said first and second input terminals for receiving a first and a second input signal, respectively, and having their collectors coupled for providing a first and a second output, respectively;

first means coupled between said first and second supply voltage terminals and coupled to said pair of differentially connected transistors and said first bipolar transistor for providing a voltage for biasing said first bipolar transistor, said first means providing a high impedance to said pair of differentially connected transistors, said first means comprising:

a first P-channel MOS transistor having a source coupled to said first supply voltage terminal, a gate coupled to a collector of one of said pair of differentially connected transistors, and a drain coupled to the base of said first bipolar transistor;

a second P-channel MOS transistor having a source coupled to said first supply voltage terminal and a gate

coupled to a collector of the other of said pair of differentially connected transistors;

a first N-channel MOS transistor having a drain coupled to said base of said first bipolar transistor and a source coupled to said second supply voltage terminal; and

a second N-channel MOS transistor having a drain and a gate coupled to a gate of said first N-channel transistor and to a drain of said second P-channel MOS transistor and a source coupled to said second supply voltage terminal; and

second means coupled between said output terminal and said second supply voltage terminal and coupled to said first means and said second bipolar transistor for biasing said second bipolar transistor.

4,636,666

HETEROPOLAR MAGNET

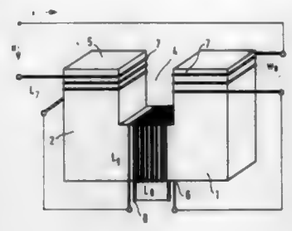
Juergen Meiss, Baldham, Fed. Rep. of Germany, assignor to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,817

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411895

Int. Cl.⁴ H02K *41/00*

U.S. Cl. 310—13 **5 Claims**



1. An excitation arrangement for an elongate stator drive, which includes an elongate stator, having combined propelling and carrying forces, comprising: at least one heteropolar magnet including a plurality of channels therein extending at right angles to the direction to the elongate stator; electromagnetic coils disposed in said channels, said coils subdivided into individual coils connected in series and wound on said magnet such that the magnetic fields generated upon energization thereof add and support one another, said magnet comprising a magnet yoke and a pair of magnet poles at respective ends of said yoke, one of said individual coils wound on said yoke and two of said individual coils wound on respective ones of said magnet poles; and at least one short-circuit coil tightly coupled to at least one of said individual coils.

4,636,667

EXCITATION ARRANGEMENT FOR A LONG STATOR DRIVE

Gerhard Holzinger, Munich; Jürgen Meins, Baldham, and Luitpold Miller, Ottobrunn, all of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Jan. 31, 1985, Ser. No. 697,048

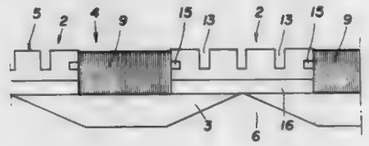
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1984, 3410119

Int. Cl.⁴ H02K *41/00*

U.S. Cl. 310—13 **10 Claims**

1. An excitation arrangement for a rapid transit long stator drive which provides both propulsive and portative forces, comprising:

an elongate magnet member including a first surface constituting a pole plane, a second surface opposite said first surface, a plurality of spaced apart first channels extending from said first surface into and transversely of the length of said magnet member to define poles therebetween, and at least one second channel extending parallel to and between adjacent ones of said first channels and into said magnet member from said second surface thereby reducing the weight of said magnet member; and



a plurality of magnetic coils, each of said coils electrically insulated and wound in tight contact with one another and with the walls of the first channels with the windings extending transversely through and completely filling the first channels.

4,636,668

COMPACT-SIZED PERMANENT MAGNET TYPE STEPPING MOTOR

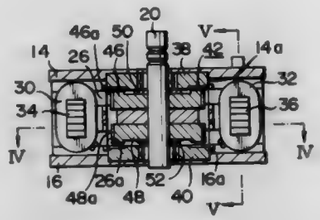
Akira Nikaido, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jul. 5, 1984, Ser. No. 627,885

Claims priority, application Japan, Jul. 4, 1983, 58-103727[U]; Jul. 4, 1983, 58-103728[U]

Int. Cl.⁴ H02K *27/26*

U.S. Cl. 310—49 R **7 Claims**



1. A compact-sized stepping motor wherein said stepping motor includes:

a laminated stator assembly fixed in an upper and a lower housing and provided on the inner periphery thereof with a plurality of stator poles, said laminated stator assembly comprising a plurality of thin magnetic plates laminated to a nonmagnetic core plate and four slits extending only through the magnetic plates and dividing said magnetic plates into four equal portions, adjacent ones of said four slits being angularly separated by 90 degrees:

stator coils magnetically connected to said laminated stator assembly;

a rotor having a plurality of rotor poles opposed to said stator poles, having assembled therein a permanent magnet and rotatably supported between the upper and the lower housings; and

the upper and the lower housing each provided with a disc-shaped locating shoulder engageable with the inner peripheries of the stator poles of the laminated stator assembly whereby the center-alignment between said stator and the rotor is carried out by said locating shoulders.

4,636,669

TERMINATION ASSEMBLY FOR ELECTRIC FANS

Larry E. Plunkett, and William M. Gresho, both of Danville, Ill., assignors to MSL Industries, Inc., Oakbrook, Ill.

Filed Oct. 29, 1984, Ser. No. 665,769

Int. Cl.⁴ H02K *5/24*; F01D *9/04*; F04D *29/54*

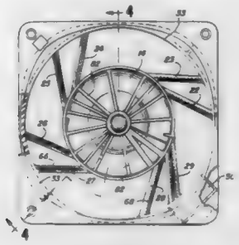
U.S. Cl. 310—51 **15 Claims**

1. In an electric motor housing, a peripheral frame member,

a central motor mounting member carrying an electric motor, and strut members connecting and supporting said frame member and motor mounting member, the improvement comprising, in combination:

said peripheral frame member defining a receptacle defining an open mouth for receiving terminal block assembly means in sliding relation thereto, said receptacle also defining a lateral aperture for access to said terminal block;

at least one of said strut members defining a longitudinal



channel communicating at one end with said open mouth and at its other end with means for access to said electric motor, electric wire means connecting said electric motor and terminal block assembly and occupying said longitudinal channel, said strut members being positioned in a plurality of pairs, the strut members of each pair being positioned closer to each other than to the strut members of other pairs, the strut member which defines the longitudinal channel, and the other strut member of its pair, being both approximately equally larger in their transverse dimensions relative to the other strut members.

4,636,670

CONTROL GEAR FOR A DYNAMO CONNECTED TO A HUB

Olof Källström, Mölnlycke, Sweden, assignor to Ingvar Nilsson Mekaniska AB, Mölnlycke, Sweden

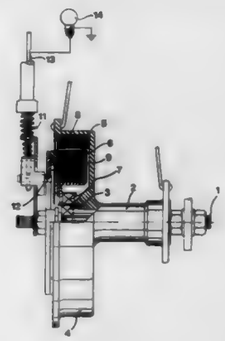
PCT No. PCT/SE84/00168, § 371 Date Jan. 2, 1985, § 102(e) Date Jan. 2, 1985, PCT Pub. No. WO84/04285, PCT Pub. Date Nov. 8, 1984

PCT Filed May 4, 1984, Ser. No. 694,456

Claims priority, application Sweden, May 4, 1983, 8302545

Int. Cl.⁴ B69J *5/12*; H02K *7/112*

U.S. Cl. 310—67 A **5 Claims**



1. A control device for a dynamo connected to a hub particularly a wheel hub and which dynamo is of the type incorporating stator and armature rotating with the hub and being arranged radially relative to each other and where the armature can be prevented from rotation by means of a locking device, and where a current collector is arranged to lead off current generated during arresting of the armature, characterized thereby, that the control device incorporates a connecting wire which is attached to said locking device, said locking device including a contact pin which is radially movable in a track located adjacent to the hub and which pin moves to current transmitting and rotation locking engagement with a current collector fixed to said armature, the connecting wire being made from an electrically conductive material and acting as a current conductor, which is fed with generated current via the current collector and the contact pin.

4,636,671

MAGNETO GENERATOR FOR INTERNAL COMBUSTION ENGINE

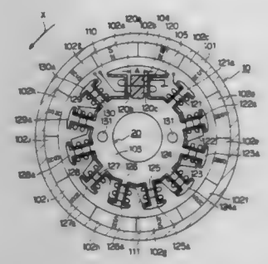
Kanechiyo Terada, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 11, 1984, Ser. No. 680,512

Claims priority, application Japan, Dec. 23, 1983, 58-243369; Jan. 25, 1984, 59-12529; Apr. 23, 1984, 59-82759; Aug. 1, 1984, 59-163098

Int. Cl.⁴ H02K *7/02*

U.S. Cl. 310—74 **15 Claims**



1. A magneto generator for an internal combustion engine comprising;

a cup-shaped flywheel made of magnetic material and driven by an engine, said flywheel having a circular side wall;

a plurality of magnets fixed to an inner peripheral surface of said circular side wall and circumferentially arranged at equal intervals, each of said magnets being magnetized in a radial direction and the same polarity appearing at one portion of inner peripheral surfaces of said circumferentially arranged magnets so that at least two magnets having the same polarity are arranged adjacently, while S-pole and N-pole appear alternately at the remaining portion of inner peripheral surfaces of said circumferentially arranged magnets;

a stator core arranged within said flywheel and having at least one radially outwardly extending large pole core and a plurality of radially outwardly extending small pole cores, each pole core being a T-shape and having at its forward end a circumferentially extending pole piece to face to the inner peripheral surfaces of said magnets, said small pole cores being arranged circumferentially at equal intervals and said at least one large pole core being equally spaced from the adjacent small pole cores, a circumferential width of pole pieces of said small pole cores being smaller than that of each of said magnets while a circumferential width of the pole pieces of said at least one large pole core being larger than that of each of said magnets so that said pole piece of said at least one large pole core faces to at least two adjacent magnets at the same time; and

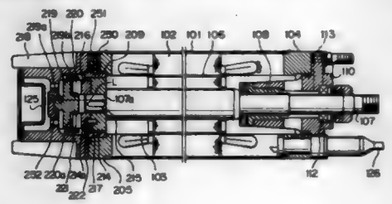
a coil wound around said at least one large pole core for producing a single pair of positive and negative halfwave voltages for each revolution of said flywheel.

4,636,672

SUBMERSIBLE MOTOR

Minoru Iwata, and Kozo Matake, both of Kanagawa, Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,300
Claims priority, application Japan, Mar. 5, 1984, 59-31543[U]
Int. Cl.[4] H02K *5/12*
U.S. Cl. 310—87 2 Claims



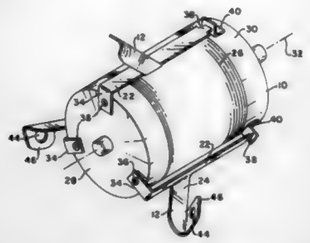
1. A submersible motor having a motor shaft extending outwardly at one end in the axial direction thereof for transmitting torque to a submersible apparatus to be driven by the motor, and a thrust housing at the opposite end of said motor, a thrust bearing means encased in said thrust housing for bearing the thrust load through said shaft, said thrust bearing means having a thrust disk secured to said shaft at the opposite end of said motor, a radial metal bearing surrounding the periphery of said thrust disk and within which said thrust disk is journalled for rotation in radial bearing relationship with said radial metal bearing, and the surface of said thrust disk facing toward said opposite end having an axially extending recess opening out of said thrust disk toward said opposite end, and thrust bearing elements in said recess between said thrust disk and said thrust housing for bearing the thrust load on said shaft.

4,636,673

FLEXIBLE MOUNTING SYSTEM FOR ELECTRIC MOTORS

George M. McDonald, Liberty Township, Hardin County, Ohio, assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed May 24, 1985, Ser. No. 737,746
Int. Cl.[4] H02K *5/00*
U.S. Cl. 310—91 13 Claims



7. A method of mounting an electric motor to a support structure comprising the steps of:

rigidly attaching a first end of each of a plurality of generally planar, longitudinally extending portions of a plurality of mounting arms to a first plurality of points on a first end bell of an electric motor;

inserting a tab on a second end of each of said longitudinally extending portions of said mounting arms into each of a plurality of tab receptacles, wherein said tab receptacles are fixed with respect to a second plurality of points on a second end bell of said electric motor and wherein each of said second plurality of points is longitudinally spaced along the surface of said electric motor with respect to corresponding ones of said first plurality of points, such that each of said longitudinally extending portions extends between said first and second end bells of said electric motor; and

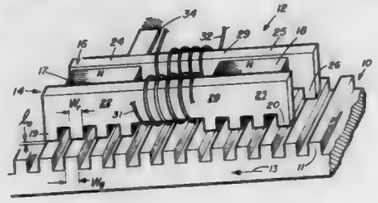
attaching a first end of each of a plurality of generally planar, radially extending portions of said mounting arms to a support structure, wherein a second end of each of said generally planar, radially extending portions is attached to an intermediate section of one of said longitudinally extending portions, said intermediate section lying between said end bells in a longitudinal direction.

4,636,674

LINEAR FLUX SWITCH ALTERNATOR

Arnold D. Peterson, Bainbridge, N.Y., assignor to Allied Corporation, Morristown, N.J.

Filed Jul. 19, 1985, Ser. No. 756,897
Int. Cl.[4] H02K *21/38*
U.S. Cl. 310—155 14 Claims



1. A linear flux switch alternator comprising

first and second elongated magnetic pole pieces,

each of said pole pieces having at least one dependent tooth formed transversely to the length of said pole piece at the opposite end portions thereof and having a medial portion joining said end portions;

means for mounting said pole pieces adjacent the periphery of a moving toothed machine gear with said pole pieces parallel to one another and spaced apart transversely, the length of said pole pieces being aligned with the direction of motion of said machine gear and within the plane of motion of said machine gear, said pole piece teeth being closely spaced from the tips of the teeth of said machine gear;

a first magnet positioned between the like end portions of said pole pieces, the direction of magnetization of said magnet being transverse to said pole pieces;

the medial portion of each said pole piece being of such length that when a tooth at one end portion of said pole piece overlies the tip of a tooth on said gear, a tooth on the opposite end of said one pole piece overlies a space between teeth of said gear;

said pole pieces being displaced longitudinally relative to one another so that when a tooth at one end of one said pole piece overlies the tip of a gear tooth, a tooth at the like end of the other of said pole pieces overlies a space between teeth of said gear; and

a first conductor coil wound on the medial portion of one of said pole pieces.

4,636,675

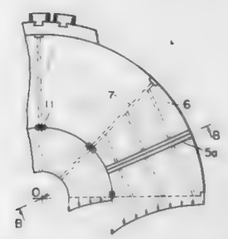
ROTOR SPIDER FOR ROTARY ELECTRIC MACHINE

Kengo Takahashi, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 6, 1985, Ser. No. 698,817
Claims priority, application Japan, Feb. 7, 1984, 59-21232
Int. Cl.[4] H02K *1/30*
U.S. Cl. 310—157 2 Claims

1. In a rotor spider for a rotary electric machine having an upper disk and a lower disk which in combination connect together a shaft and a yoke,

an improvement comprising said upper and lower disks being each divided into an inner disk and an outer disk, said inner disk being constituted by an integral body, and



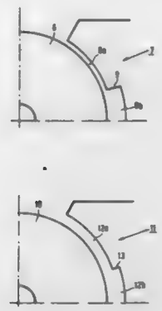
said outer disk being radially divided into a plurality of pieces which are integrally connected together by flanges.

4,636,676

SINGLE-PHASE SYNCHRONOUS MOTOR WITH TWO-POLE PERMANENT-MAGNET ROTOR

Leo Bertram, Stolberg; Gerhard Diefenbach, Aachen, both of Fed. Rep. of Germany, and Hugo Scheumann, Schaesberg, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 22, 1985, Ser. No. 693,703
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1984, 3403041
Int. Cl.[4] H02K *21/08*
U.S. Cl. 310—162 11 Claims



1. A single-phase synchronous motor comprising a two-pole permanent-magnet rotor of a high energy magnetic material having a remanence B_r, a specific density ρ, a rotor diameter d, a resulting detent torque of an amplitude M_{k1}, and a mass moment of inertia J; said rotor having a characteristic constant of

$$C = \frac{B_r}{\sqrt{\rho}}, \text{ where } C \text{ is greater than } 6.0 \frac{mT}{\sqrt{Kg/m^3}};$$

a natural frequency ω_o,
where

$$\omega_o = \sqrt{\frac{2\,M_{k1}}{J}};$$

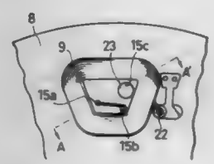
and a supply voltage frequency ω_e; such that in a low-amplitude freely oscillating system comprising said rotor and a load, the improvement therein comprising determining the values for said amplitude of said detent torque M_{k1} and mass moment of inertia J of said synchronous motor so that said natural frequency ω_o is unequal to said voltage supply frequency ω_e to limit the value of voltages at which oscillations of said rotor can occur which prevents the starting of said motor.

4,636,677

DRIVE COIL WIRING STRUCTURE FOR BRUSHLESS MOTOR

Yukihiko Yasuhara, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Aug. 19, 1985, Ser. No. 767,184
Claims priority, application Japan, Aug. 17, 1984, 59-124676[U]
Int. Cl.[4] H02K *3/46*
U.S. Cl. 310—194 2 Claims



1. In a brushless motor comprising a stator portion having a stator yoke on which a plurality of drive coils are mounted on one side thereof and a circuit wired substrate mounted on the other side of said stator yoke, and a rotor portion opposed to said stator portion having a rotor yoke on which a ring-like rotor magnet is mounted, said rotor portion being arranged to be rotated by interaction between a current flowing in said drive coils and magnetic flux generated from said rotor magnet,

an improved drive coil structure comprising:

coil holders formed on said stator yoke through outsert molding for respectively positioning said drive coils on said stator yoke;

a protrusion respectively formed on each of said coil holders on an end surface thereof facing said rotor magnet for preventing the drive coil from coming loose; and

a through hole formed in each coil holder in the vicinity of said protrusion, one end of said drive coil being wound around said protrusion by a half turn and passed through said through hole in said coil holder and the other end of said drive coil being passed through another through hole formed in said stator yoke for connection to said wired substrate.

4,636,678

COMPENSATION OF ACOUSTIC WAVE DEVICES

Arthur Ballato, Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 1, 1985, Ser. No. 707,346
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—313 R 7 Claims

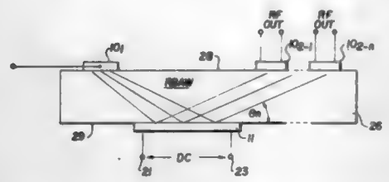
1. A method of altering the effective elastic constants in piezoelectric acoustic wave devices, comprising the steps of:

launching acoustic wave signals from input interdigital transducer means located on a first surface of a body of piezoelectric material;

receiving said acoustic wave signals by output interdigital transducer means located on said first surface of said body of piezoelectric material; and

applying an elastic-constant-altering signal to interdigital transducer means located on a second surface of said body of piezoelectric material whereby the relatively large electric field concentrations at the edges of the finger

elements constituting said transducer means operates to magnify the electroacoustic effect and thus alter the



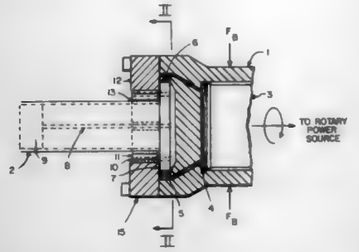
acoustic velocity of acoustic waves propagating between said input and output interdigital transducers.

4,636,679

PIEZOELECTRICALLY DRIVEN FAST RESPONSE HIGH-TORQUE CLUTCH UNIT

Bryan L. Glett, Bellefontaine, Ohio, and Mark A. Murphy, South Bend, Ind., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 15, 1986, Ser. No. 818,923
Int. Cl.⁴ H01L *41/08*
U.S. Cl. 310—328 **4 Claims**



1. A fast response high-torque clutch system which couples a driving shaft, which is rotating at high speeds, with a driven shaft, said fast response high-torque clutch system comprising:
- a passive clutch which is connected to the driven shaft and engages the driven shaft with the driving shaft when said passive clutch is rotated;
- a piezoelectric stack which is housed in said driving shaft, said piezoelectric stack extending with a fast response when receiving an engagement signal and retracting when said engagement signal is removed; and
- a means for activating said passive clutch, said activating means being connected to said piezoelectric stack and rotating said passive clutch in response to said engagement signal, said activating means thereby enabling said driving shaft to be engaged by said passive clutch at a high torque with the driven shaft at high speeds with a fast response.

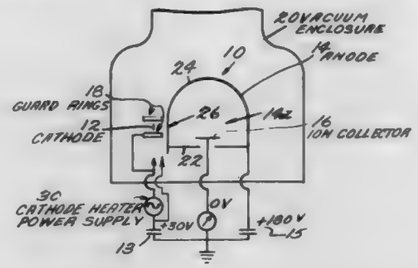
4,636,680

VACUUM GAUGE

Daniel G. Bills; Paul C. Arnold; Stephen L. Dodgen, and Craig B. Van Cleve, all of Boulder, Colo., assignors to Granville-Phillips Company, Boulder, Colo.

Filed May 24, 1983, Ser. No. 497,581
Int. Cl.⁴ A47B *5/00*
U.S. Cl. 313—7 **44 Claims**

1. In an ionization gauge of the type including a source of electrons having an electron emitting surface, an accelerating electrode for accelerating said electrons through a volume generally defined by said accelerating electrode, and a collector electrode, disposed in said volume, for collecting ions formed by interaction between said electrons and gas within said volume, the improvement wherein:
- said accelerating electrode comprises a substantially closed anode having an internal cavity to precisely define said volume, and an aperture disposed to admit substantially all of said electrons from said source into said closed anode volume; and



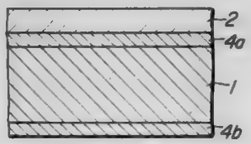
- electric field producing means for providing with respect to each of said electrons in said volume substantially the same electrostatic field at corresponding points in the respective trajectories of the electrons;
- whereby the sensitivity of said ionization gauge is substantially independent of variations in the electron emission pattern over the electron emitting surface of said electron source.

4,636,681

DIRECTLY HEATED CATHODE

Akira Misumi, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 928,733, Jul. 27, 1978, abandoned. This application Dec. 24, 1980, Ser. No. 219,941
Int. Cl.⁴ H01J *1/14, 19/06*; H01K *1/04*
U.S. Cl. 313—346 R **16 Claims**



1. A directly heated cathode comprising:
- a base formed of a nickel base alloy containing tungsten; and
- a coating of an oxide of an alkaline earth metal which emits electrons, said coating being applied to a first surface of said base;

wherein the improvement comprises:
- said nickel base alloy which forms said base being a nickel base alloy containing 20–30% tungsten and small amounts of reducing agents; and
- at least two layers formed by plating or electrophoresis and formed of a metal selected from the group consisting of, platinum and rhodium, an alloy of said metal or an alloy containing said metal as its principal component, one of said at least two layers being formed directly on said first surface of said base to which said coating of said oxide is applied, the layers, of the at least two layers, formed on the first surface having said coating of said oxide formed directly thereon, and at least one other layer of said at least two layers being formed on a second surface of said base which is opposite said first surface, said layers formed on the first surface and said at least one other layer each having a thickness of 0.1 to 2.0 μm, whereby said layers

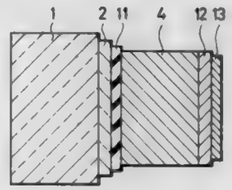
formed on the first surface act to inhibit formation of a tungsten base intermediate product and said layers formed on the first surface and the at least one other layer formed on the second surface of the base act to prevent deformation of the cathode.

4,636,682

IMAGE PICKUP TUBE

Chushirou Kusano, Tokorozawa; Sachio Ishioka, Toshima; Yoshinori Imamura, Hachioji; Yukio Takasaki, Hachioji; Hirofumi Ogawa, Hachioji; Tatsuo Makishima, Hachioji, and Tadaaki Hirai, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 5, 1983, Ser. No. 491,921
Claims priority, application Japan, May 10, 1982, 57-76736
Int. Cl.⁴ H01J *31/00*
U.S. Cl. 313—386 **19 Claims**



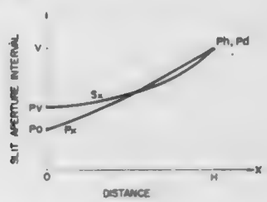
11. An image pickup tube including
- means including a cathode for producing a primary electron beam;
- a target to be scanned on one side by said primary electron beam, including a light transmissive insulating substrate, a transparent conductive layer formed on said light transmissive insulating substrate, a photoconductor layer which is essentially made of amorphous silicon containing hydrogen and which is formed on said transparent conductive layer, and a layer disposed on said photoconductor layer facing said balancing mesh electrode for emitting secondary electrons with a secondary electron emission ratio greater than one in response to bombardment by primary electrons of said primary electron beam;
- a balancing mesh electrode for collecting secondary electrons emitted from said one side of said target; and
- means for biasing the light incidence side of said photoconductor layer negatively with respect to the electron beam incidence side of said photoconductor layer.

4,636,683

COLOR CATHODE-RAY TUBE HAVING SHADOW MASK WITH VARIABLE SIZED APERTURES

Kiyoshi Tokita, and Michio Nakamura, both of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 9, 1984, Ser. No. 588,108
Claims priority, application Japan, Mar. 10, 1983, 58-38218
Int. Cl.⁴ H01J *29/07*
U.S. Cl. 313—403 **6 Claims**



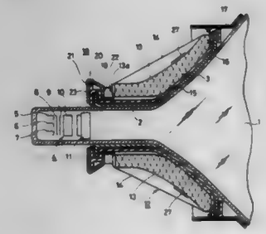
1. A color cathode-ray tube having a tube axis, a horizontal axis and a vertical axis, these being perpendicular to one another, comprising:
- a face plate having an inner surface;
- a phosphor screen formed on the inner surface of the face plate and including a plurality of groups of red, green and blue phosphor stripes, said phosphor stripes extending across the horizontal axis and being spaced apart therealong;
- means for emitting electron beams toward the phosphor screen, said emitting means including electron guns arranged along the horizontal axis; and
- a shadow mask including a curved plate portion facing the inner surface of the face plate and having a plurality of slit apertures allowing passage of electron beams therethrough, the center-to-center interval Px between adjacent slit apertures along the horizontal axis being increased as a first function along the horizontal axis from the center of the shadow mask to the periphery thereof, the center-to-center interval Sx between adjacent slit apertures in peripheral regions remotest from the horizontal axis being increased as a second function different from the first function along the horizontal axis from the center of the shadow mask to the periphery of the shadow mask, the slit aperture intervals Px and Sx in the central region between the center of the shadow mask and the peripheral region furthest from the vertical axis being substantially equal.

4,636,684

COLOR TELEVISION DISPLAY APPARATUS HAVING IMPROVED CONVERGENCE OF ELECTRON BEAMS

Yutaka Yokota, Amagasaki, and Hiroshi Shimasaki, Osaka, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Oct. 5, 1984, Ser. No. 658,257
Claims priority, application Japan, Oct. 7, 1983, 58-156213[U]
Int. Cl.⁴ H01J *29/46*; H01F *3/12*
U.S. Cl. 313—412 **8 Claims**



1. In a color television display apparatus comprising:
- a color cathode ray tube integrally structured by a neck region at the back, a display screen at the top and an intermediate funnel region connecting said neck region and said display screen;
- an electron gun apparatus disposed within said neck region of said cathode ray tube, having means for producing three horizontal in-line electron beams and a magnetically-permeable focusing electrode for focusing the beams;
- a deflection yoke disposed about said neck region and said funnel region of said cathode ray tube, including a core and vertical deflection coils toroidally-wound about said core, said coils producing a deflection magnetic field having deflection magnetic flux located within the interior of said yoke for effecting deflection of said beams in a vertical direction and leakage flux located external to said yoke; and
- magnetically-permeable means disposed adjacent to said yoke, for channeling a portion of said leakage flux beyond

the rear of said yoke to the vicinity of the beam exit end of said electron gun apparatus for forming a barrel-shaped magnetic field at said exit end for interaction with said electron beams; the improvement wherein

said magnetically-permeable means comprises first, second and third portions,

said first portion being positioned adjacent to the rear end surface of said core, extending toward the center axis of said neck region in a direction perpendicular to said center axis, for receiving leakage flux produced mainly in said rear end surface of said core,

said second portion extending backward from the outer end of said first portion, for transmitting backward the flux received by said first portion, and

said third portion being connected to the rear end of said second portion, extending toward the center axis of said neck region in a direction perpendicular to said center axis, and being positioned corresponding to the beam exit end of said electron gun apparatus, said third portion functioning to emit said flux transmitted through said second portion to said beam exit end.

4,636,685

MAGNETIC ARC SPREADING FLUORESCENT LAMP WITH PROTECTIVE ENVELOPE

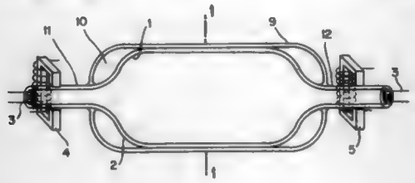
S. Merrill Skeist, Glen Head, and Leo Gross, Bayside, both of N.Y., assignors to Spellman High Voltage Electronics Corp., Plainview, N.Y.

Filed Sep. 30, 1983, Ser. No. 537,588

The portion of the term of this patent subsequent to Jan. 19, 1999, has been disclaimed.

Int. Cl.[4] H01J *1/62*

U.S. Cl. 313—493 7 Claims



1. An arc discharge lamp having magnetic arc spreading means for spreading the arc discharge of said lamp, comprising an inner lamp envelope of flattened oval or elliptical cross-section, an outer clear, transparent protective envelope of circular cross-section, surrounding and enclosing said inner lamp envelope; the space defined between said inner lamp envelope and said protective envelope being at least partially evacuated; and said inner lamp envelope containing two electrodes for forming an arc and being coated with a luminescent fluorescent phosphor on the interior wall thereof; whereby the low gas pressure in said space between said envelopes prevents atmospheric pressure from weakening said inner lamp envelope or causing crack propagation in regions of strain.

4,636,686

LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP PROVIDED WITH AN AMALGAM FORMING ALLOY

Wubbe Vriens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

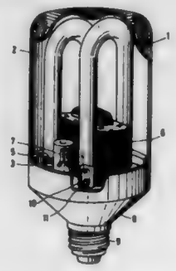
Filed Feb. 26, 1985, Ser. No. 705,931

Claims priority, application Netherlands, Mar. 9, 1984, 8400756

Int. Cl.[4] H01J *61/20*

U.S. Cl. 313—565 5 Claims

1. A low-pressure mercury vapor discharge lamp comprising a discharge vessel which is sealed in a vacuum-tight manner and in which during operation of said lamp a discharge is present; and said discharge vessel contains a small quantity of



an alloy which forms with mercury an amalgam, characterized in that the alloy is composed of bismuth, lead and silver.

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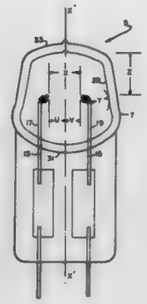
ELECTRODE ALIGNMENT AND CAPSULE DESIGN FOR SINGLE-ENDED LOW WATTAGE METAL HALIDE LAMPS

William M. Keeffe, Rockport; W. Calvin Gungle, Danvers; Harold L. Rothwell, Jr., Rowely, and Zeya K. Krasko, Danvers, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Mar. 27, 1984, Ser. No. 593,789

Int. Cl.[4] H01J *61/04, 61/20, 61/30*

U.S. Cl. 313—620 4 Claims



1. A single-ended low-wattage metal-halide arc discharge lamp comprising:

an isothermal arc chamber having an outer diameter and an inner wall with a dome seal portion and a press seal portion;

a fill gas disposed within said arc chamber which includes mercury, a halide, and a starting gas;

a pair of electrical conductors sealed into and passing through one end of said arc chamber to provide a pair of electrodes therein, said arc discharge lamp characterized by the improvement wherein said pair of electrodes have an inner end spacing of a distance to provide a substantially uniform current for lamps in the range of about 35 to 150 watts and wherein said electrode inner end spacing varies in accordance with the following:

$$X = 1.74\times10^{-5}W^3 - 3.3\times10^{-3}W^2 + 0.267W - 3.32$$

where:

X=electrode spacing in millimeters, and

W=lamp wattage.

4,636,688

GYROTRON DEVICE

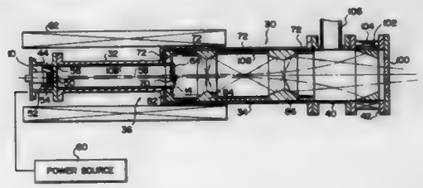
Yasuyuki Ito, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 28, 1984, Ser. No. 655,466

Claims priority, application Japan, Sep. 30, 1983, 58-180199; Mar. 19, 1984, 59-51110; Mar. 19, 1984, 59-51111; Mar. 19, 1984, 59-51112; Mar. 19, 1984, 59-51113; Jun. 13, 1984, 59-119876

Int. Cl.[4] H01S *25/00*

U.S. Cl. 315—4 14 Claims



1. A gyrotron device comprising:

a housing having a longitudinal axis;

electron gun means located at one end portion of said housing to emit at least one electron beam along the longitudinal axis;

means for applying a magnetic field to the electron beam emitted from said electron gun means;

resonator means arranged in said housing said resonator means including at least one ring-shaped resonator mirror which quasi-optically reflects and resonates those electromagnetic waves caused when the electron beam passes along the magnetic lines of force generated by said magnetic field applying means, said resonator mirror being arranged coaxial with the axis of said housing, and having an annular reflecting surface which is a portion of surface of revolution of an arc around the axis of the resonator mirror, and a plurality of slots provided in the annular reflecting surface, to pass the electromagnetic waves; and

transmitting means located in said housing and serving to optically reflect and transmit the electromagnetic waves resonated by said resonator means to emit them from said housing, said transmitting means including a plurality of annular reflecting mirrors which are disposed in said housing at predetermined intervals in the direction of the longitudinal axis and are coaxial with the longitudinal axis.

4,636,689

MICROWAVE PROPAGATION MODE TRANSFORMER

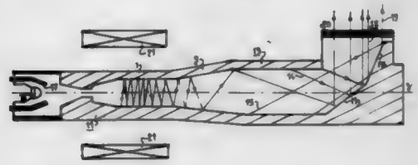
Georges Mourier, Le Port Marly, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 14, 1984, Ser. No. 589,565

Claims priority, application France, Mar. 18, 1983, 8304484

Int. Cl.[4] H01J *25/00*

U.S. Cl. 315—4 2 Claims



1. A gyrotron which includes means forming an electron beam along a beam axis, a circular cavity into which the beam is projected for interacting with electromagnetic wave energy and creating oscillating wave energy in the cavity, an output wave guide essentially rectangular in cross section in which the electric field is parallel to the major wall of the guide, and an intermediate mode conversion means having one end coupled to the cavity and the other end coupled to the output wave guide comprising a transforming wave guide essentially elliptic in cross section whose eccentricity varies from about zero at said one end to about one at said other end and having a pair of mirrors oppositely disposed along the axis of the beam with openings therebetween, a pair of beam collectors oppositely disposed along the axis of beam at said openings, and means for directing the electron beam after it has traversed the cavity through said openings onto said collector means.

4,636,690

SPARK PLUG FOR AN INTERNAL COMBUSTION ENGINE, HAVING A PILOT BREAKDOWN GAP

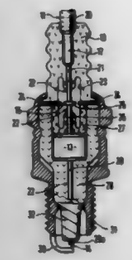
Werner Herden, Gerlingen, and Boye Saggau, Schorndorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 13, 1984, Ser. No. 649,989

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1983, 3333891

Int. Cl.[4] H01J *7/44, 13/46, 19/78*

U.S. Cl. 315—58 9 Claims



1. Spark plug, with post-breakdown-phase spark gap current suppression, for an internal combustion engine, including

a metallic housing (31);

a spark gap (14) having a ground or chassis electrode (30) galvanically connected to the metallic housing and a center electrode (29,29*a*),

a capacitor (13) dischargeable over the spark gap, and

a pilot breakdown gap (15) controlling discharge of the capacitor (13), and

means for suppressing current flow between said spark gap electrodes (29,29*a*; 30) after a breakdown phase of each spark across said spark gap,

wherein, in accordance with the invention,

said means for suppressing current flow comprises

a shunt circuit having an inductive component (17) therein, the spark gap (14), the capacitor (13), the pilot breakdown gap (15) and the shunt circuit forming a composite unitary spark plug structure; and

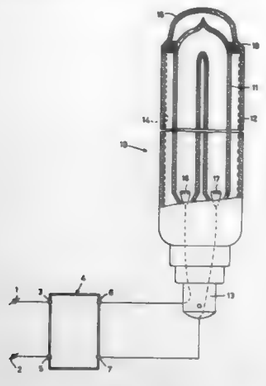
wherein the inductive component has an electrical galvanic connection with the metallic housing (31) and hence with the ground or chassis electrode (30), and further with the center electrode (29,29*a*) to provide effectively an electrical short circuit across the spark gap (14) for current flow through said shunt circuit after breakdown of the spark gap and during an arc and glow phase of the spark at the spark gap (14).

4,636,691

ARRANGEMENT INCLUDING A METAL VAPOR DISCHARGE TUBE PROVIDED WITH AT LEAST TWO INTERNAL ELECTRODES

Rolf E. de Man; Jan de Ridder; Leo M. Sprengers, and Jozef I. C. Peeters, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1983, Ser. No. 562,340
Claims priority, application Netherlands, Dec. 29, 1982, 8205026
Int. Cl.[4] H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—209 R 15 Claims



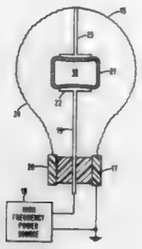
1. An arrangement comprising a metal vapour discharge tube, provided with at least two internal electrodes, and a frequency converter for supplying the discharge tube with alternating current through said electrodes, the interior of the discharge tube containing sodium, characterized in that the discharge tube comprises a low-pressure sodium vapour discharge tube containing a rare gas and in that the output frequency of the frequency converter is at least 80 kHz.

4,636,692

MERCURY-FREE DISCHARGE LAMP

Walter P. Lapatovich, Hudson, Mass., and George R. Gibbs, Nesconset, N.Y., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 4, 1984, Ser. No. 647,081
Int. Cl.[4] H05B *41/16, 41/24*
U.S. Cl. 315—248 10 Claims



1. A mercury free molecular vapor discharge lamp comprising:

a vessel having walls defining a discharge chamber;

a mercury free filling of aluminum tribromide vapor at a pressure of about 0.2 to 20 torr and one or more inert gases in said chamber; and

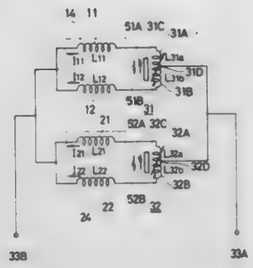
means for causing an electrical discharge through said filling whereupon said filling emits ultraviolet and visible light.

4,636,693

DEFLECTION YOKE HAVING A FUNCTION FOR ADJUSTING DEFLECTION FIELD

Sadayoshi Sarata, Yokohama, Japan, assignor to Denki Onkyo Company Limited, Tokyo, Japan

Filed Aug. 9, 1985, Ser. No. 764,035
Claims priority, application Japan, Aug. 11, 1984, 59-168478; Aug. 11, 1984, 59-168479
Int. Cl.[4] H01J *29/70, 29/76*
U.S. Cl. 315—368 4 Claims



1. A deflection yoke for use in a color television cathode-ray tube having three electron guns provided in an in-line arrangement, comprising

(a) a deflection core,

(b) a pair of vertical deflection coils,

(c) an upper horizontal deflection coil having a first and a second horizontal coil section, and

a lower horizontal deflection coil having a third and a fourth horizontal coil section, each of said coil sections being formed and wound independently of one another, wherein an x-axis and a y-axis, perpendicular to the axis of the cathode-ray tube, form a cartesian coordinate system having 4 quadrants, such that said upper horizontal deflection coil is positioned in the upper 2 quadrants, and said lower horizontal deflection coil is positioned in the lower 2 quadrants,

each of said horizontal coil sections having two windings which extend along a neck of said cathode-ray tube, each coil section having a distinct and specific coil distribution, such that

(1) a first quadrant includes one of said windings from said first horizontal coil section, and one of said windings from said second horizontal coil section,

(2) a second quadrant includes another one of said windings from said first horizontal coil section and another one of said windings from said second horizontal coil section, said second quadrant being adjacent said first quadrant, said first and second quadrants comprising said upper 2 quadrants,

(3) said third quadrant includes one of said windings from said third horizontal coil section, and one of said windings from said fourth horizontal coil section, said third quadrant being adjacent said first quadrant,

(4) said fourth quadrant includes another one of said windings from said third horizontal coil section, and another one of said windings from said fourth horizontal coil section, said fourth quadrant being adjacent said second and third quadrants, and

wherein, one winding in each quadrant has a dispersed conductor distribution, while the other winding in each quadrant has concentrated conductor distribution, and

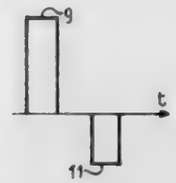
(d) a current regulating means which is connected across said two horizontal coil sections to provide differential variation of a quantity of horizontal deflection current to be supplied to said two horizontal coil sections.

4,636,694

PROCESS AND APPARATUS FOR THE RAPID ADJUSTMENT OF THE STATIC CONVERGENCE AND PURITY IN A TELEVISION TUBE, BY USING A PERMANENT MAGNET

Cesare De Paolis, Rome; Guiseppe Giannantonio, Anagni, and Claude Pons, Rome, all of Italy, assignors to Videocolor, Montrouge, France

Continuation of Ser. No. 603,025, Apr. 23, 1984. This application Oct. 30, 1985, Ser. No. 792,247
Claims priority, application France, Apr. 26, 1983, 83 06833
Int. Cl.[4] H01J *29/70, 29/76*
U.S. Cl. 315—368 7 Claims



1. Process for adjusting the static convergence and purity of a color television tube of the perforated or shadow mask type which comprises the steps of:

applying to the terminals of at least one coil a first single current impulse thus inducing, on a magnetic member surrounding a neck of the tube, remanent induction of a value higher than that necessary to make the adjustment; and

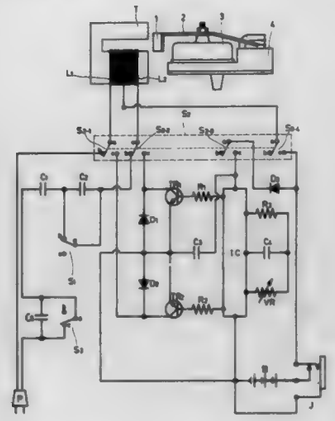
further applying a second single current impulse, to the coil terminals, in an opposite direction to reduce the remanent induction of said magnetic member, whereby substantially complete demagnetization to a preselected value for the static convergence and purity adjustments is effected.

4,636,695

AC/DC ELECTRO-MAGNETIC DEVICE FOR AERATION PUMP IN FISH GLOBE OR THE LIKE

Shan F. Tsai, 2nd Fl., No. 20, Alley 7, Lane 23, Nanking E. Rd., Sec. 5, Taipei, Taiwan

Filed Mar. 4, 1985, Ser. No. 708,085
Int. Cl.[4] H02K *33/12*
U.S. Cl. 318—124 15 Claims



1. An AC/DC electromagnetic device for controlling an aeration pump for use in a fish tank or the like, the aeration pump having a vibrator member and having a magnetic member thereon, said device comprising:

an electromagnet including a loading coil, for exerting magnetic forces on the magnetic member so as to vibrate the vibrator member upon excitation of said coil by an alternating current;

DC power connecting means for electrically connecting said device to a source of DC power;

oscillating signal generating means, connected to said DC power connecting means, for generating an oscillating signal;

means, including a drive circuit, for driving current through said coil with said oscillating signal;

a switching means for selectively electrically connecting said coil to a source of AC power or to said drive circuit; and

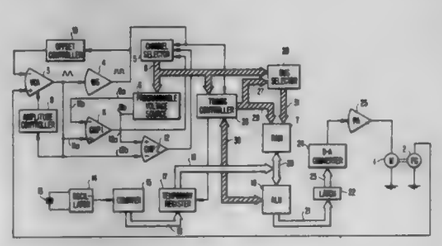
first voltage dropping means for controlling the amplitude of a voltage supplied to said coil through said AC power connecting means.

4,636,696

SERVO SYSTEM

Hiroshi Minakuchi, Shiga; Tadashi Kanthira, Osaka, and Yoshiaki Igarashi, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 9, 1985, Ser. No. 785,900
Claims priority, application Japan, Oct. 12, 1984, 59-214544
Int. Cl.[4] H02P *5/00*
U.S. Cl. 318—327 9 Claims



1. A servo system for controlling moving speed of a moving body comprising:

discriminating means for measuring a period of an AC signal which contains a speed information of said moving body, setting at least two reference points within a half period of said AC signal, and generating an error information corresponding to a deviation value from a desired value at each reference point; and

drive means for driving said moving body in accordance with said error information.

4,636,697

COPYING APPARATUS EQUIPPED WITH BRUSHLESS DC MOTOR

Norihide Kuaikawa, Yao, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 6, 1985, Ser. No. 709,065
Claims priority, application Japan, Mar. 15, 1984, 59-50723
Int. Cl.[4] H02K *29/06*
U.S. Cl. 318—436 5 Claims

1. A copying apparatus comprising:

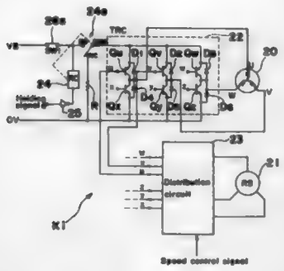
a lower housing unit;

an upper housing unit pivotably mounted to said lower housing unit at a common fulcrum point for facilitating opening of said copying apparatus to perform maintenance operations thereon, said upper housing unit having located therein a movable member selected from a group consisting of a light source, an optical mirror system and photoreceptor means;

a brushless DC motor operatively connected to said movable member to facilitate the driving thereof, said DC motor including a stator coil and a rotor;

means for locking said DC motor in a stable position upon pivoting of said upper housing unit from said lower housing unit, said means for locking including,

displacement detection means for detecting the separation of said upper and lower housing units by an external force, said displacement detection means including an



interlocking switch, said displacement detection means developing a housing open signal when said upper housing unit is pivotably moved from said lower housing unit, and

control circuit means, responsive to said housing open signal developed by said displacement detection means for applying a rotor lock current to the stator coil of said DC motor to prevent the movement of said movable member caused by the opening of said apparatus by inhibiting rotation of said DC motor.

4,636,698

AUTOMATIC DEVICE FOR ACTUATION OF COMPONENTS TO CLEAN A MOTOR VEHICLE WINDOW

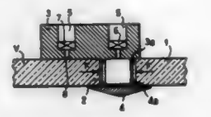
Jacques Leclercq, Roisel, France, assignor to Saint-Gobain Vitrage, Aubervilliers Cedex, France

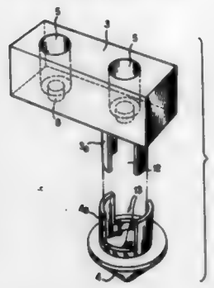
Filed Sep. 24, 1985, Ser. No. 779,407

Claims priority, application France, Oct. 4, 1984, 84 15249

Int. Cl.⁴ B60S *1/08*

U.S. Cl. 318—443 **13 Claims**





1. An automatic device for actuating elements for cleaning motor vehicle glass, comprising two photosensitive elements placed on the glass to be cleaned so that they are influenced by the light going through said glass, the first photosensitive element being positioned ro receive light directly through the glass, the second photosensitive element being isolated from any direct light transmitted through the glass and influenced only by the light transmitted through the inside of said glas, said device further comprising an electronic circuit to receive and compare the responses of said photosensitive elements and means to control the cleaning compoents automatically when the difference in response of said photosensitive elements exceeds a certain threshold.

4,636,699

INDUSTRIAL ROBOT CONTROL SYSTEM

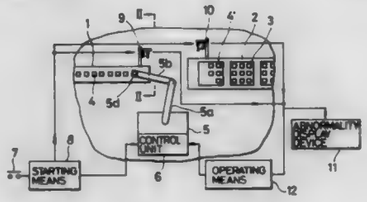
Hisao Kato, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1985, Ser. No. 780,741

Claims priority, application Japan, Sep. 27, 1984, 59-202624

Int. Cl.⁴ G05B *19/42*

U.S. Cl. 318—568 **2 Claims**



1. A movement accuracy verification system for an industrial robot (5) having controlled arm means (5*a*, 5*b*) adapted to execute movements between first and second spaced positions, comprising:

(a) first and second detecting means (9, 10) respectively disposed proximate said first and second positions, each detecting means comprising three detectors (92, 93, 94) having mutually orthogonal, axially displaceable sensing rods whose axes converge at a common point,

(b) a contact member (5*d*) mounted to and projecting outwardly from an end of the robot arm means proximate a controllable work implement (5*c*),

(c) means for successively moving the end of the arm means to the first and second detecting means in response to a start instruction such that, under normal operating conditions, the contact member engages and axially displaces all of the sensing rods of each detecting means within a predetermined range and the detecting means generate respective output signals in response to such displacements, and

(d) means for inhibiting program controlled working movements of the robot arm means in the absence of an output signal from either one of the detecting means.

4,636,700

POSITION SERVO SYSTEM

Peter G. Moore, Edinburgh, and John D. Davidson, Lothian, both of Scotland, assignors to Ferranti, plc, Cheshire, England

Filed Oct. 12, 1984, Ser. No. 660,312

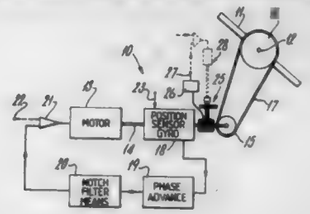
Claims priority, application United Kingdom, Oct. 13, 1983, 8327514

Int. Cl.⁴ G05B *5/01*

U.S. Cl. 318—611 **4 Claims**

1. A belt driven position servo system including a drive motor rigidly coupled to a primary driven member, a secondary driven member coupled to the primary driven member by a flexible drive belt to be positioned thereby and an electrical feedback control loop between a sensor of the position of the primary driven member and the drive motor including notch

filter means operable to attenuate signals in the feedback control loop in a frequency band, displaced from a response band



of the servo system, including the resonant frequency of along axis vibrations of the drive belt.

4,636,701

SYSTEM FOR CONTROLLING ROTATION OF ROTARY MECHANISM IN Z-TYPE PROPULSION APPARATUS

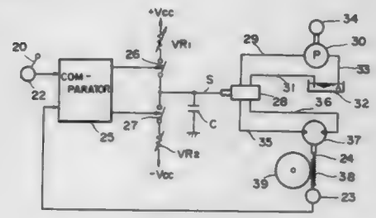
Masanori Kodera, Chigasaki; Yasuo Aizawa, Hiratsuka, and Kohji Ichijo, Tokyo, all of Japan, assignors to Niigata Engineering Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,517

Claims priority, application Japan, Apr. 12, 1983, 58-54440[U]; May 9, 1983, 58-68852[U]

Int. Cl.⁴ G05B *1/06*

U.S. Cl. 318—635 **7 Claims**



1. A system for controlling the rotation of a rotary mechanism in a Z-type propulsion apparatus comprising:

(a) means for generating a command signal;

(b) means for detecting a feedback signal relating to the rotation of said rotary mechanism;

(c) means for generating a control signal whose signal level is varied at a predetermined inclination when signal levels of said command signal and feedback signal differ from each other, and said control signal generating means comprises (i) a comparator for comparing the signal level of said command and feedback signals with each other to generate one of the first and second energizing signals, said first energizing signal being generated when the signal level of said command signal is greater than that of said feedback signal, said second energizing signal being generated when the signal level of said command signal is less than that of said feedback signal, (ii) a first integrator circuit having a first resistor and a capacitor serially connected to each other, (iii) a second integrator circuit having a second resistor and said capacitor serially connected to each other, (iv) first switch means in response to said first energizing signal for applying a positive voltage to said first integrator circuit, and (v) second switch means in response to said second energizing signal for applying a negative voltage to said second integrator circuit, whereby said control signal appears across said capacitor; and

(d) drive means for rotating said rotary mechanism in accordance with the signal level of said control signal.

4,636,702

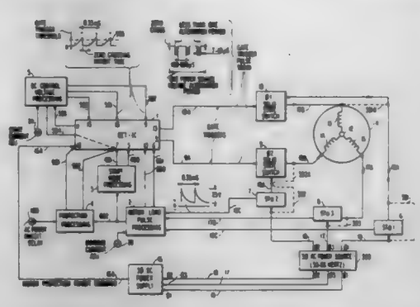
ENERGY ECONOMIZER CONTROLLED-CURRENT START AND PROTECTION FOR INDUCTION MOTORS

Rhey W. Hedges, Fort Lauderdale, Fla., assignor to Louis W. Parker, Fort Lauderdale, Fla.

Filed Aug. 9, 1984, Ser. No. 639,098

Int. Cl.⁴ H02P *5/40*

U.S. Cl. 318—729 **10 Claims**



1. A power control system comprising an AC induction motor having a rotor and a stator winding, a sine wave power supply for energizing said stator winding to effect rotation of the rotor, a motor current demodulator coupled to the stator winding for monitoring operating efficiency-related parameters of the inrush current to the stator winding each time the current in the stator winding increases from zero, the motor current demodulator including a sample transformer operative to generate a voltage pulse output control signal whose characteristics are at least in part dependent upon the efficiency-related inrush current parameters, the motor current demodulator also including a control circuit responsive to said voltage pulse output control signal for controlling the energization which is supplied by said power supply to the stator winding by varying the portion of each sine wave which is coupled to the stator winding from the power supply, manually settable means for selecting a maximum value of motor starting torque during a start mode of operation, said manually settable means being rendered operative in response to said voltage pulse output control signal, means responsive to said voltage pulse output control signal for deactivating said control circuit during said start mode, means controlled by said manually settable means for limiting the maximum current which is supplied to said stator winding from said power supply during said start mode to assure that the motor torque does not exceed said selected maximum value of motor torque during said start mode, and means responsive to said voltage pulse output control signal as the motor speed reaches near synchronous speed for rendering said control circuit operative thereby to switch said power control system from said start mode into a run mode.

4,636,703

CHARGING APPARATUS

Syoichi Tokya, and Minoru Takahashi, both of Hyogo, Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Aug. 30, 1985, Ser. No. 771,296

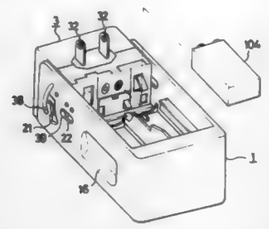
Claims priority, application Japan, Sep. 3, 1984, 59-133713[U]; Jun. 7, 1985, 60-86502[U]; Jun. 13, 1985, 60-89321[U]

Int. Cl.⁴ H02J *7/00*; H01M *10/46*

U.S. Cl. 320—2 **13 Claims**

1. A charging apparatus comprising a generally U-shaped, cell-accommodation frame structure including an end plate having contact strips for connection with cells; a pair of arm plates extending substantially orthogonally from the both ends respectively of said end plate, each arm plate including a free

end, the frame structure including a free end opening defined between the free ends of the arm plates; a power supply casing having a power supply plug on one surface and cell-connection contact strips on another surface, said power supply casing being mounted in the free end opening of cell-accommodation frame structure so as to be rotatable and movable relative to said cell-accommodation frame structure along the longitudinal direction of said arm plates so that cells have different lengths can be easily loaded to be charged; and cooperating



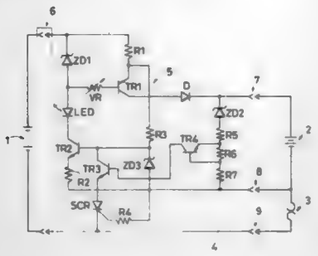
first and second means for effecting relative rotation and longitudinal movement of the power supply casing and the frame structure, the first means being provided on the arms of the frame structure and the second means being provided on the power supply casing, the frame structure and the power supply casing defining an adjustable cell accommodation space, wherein the cell accommodation space is adjustable to accommodate cells of different sizes by adjusting the relative rotation and longitudinal movement of the power supply casing and the frame structure.

4,636,704

BATTERY CHARGING CIRCUIT

Shinichi Nakai, Hiroshima, Japan, assignor to Ryobi Limited, Hiroshima, Japan

Filed Jul. 9, 1985, Ser. No. 753,256
Claims priority, application Japan, Jul. 9, 1984, 59-103966[U]
Int. Cl.[4] H02J 7/04
U.S. Cl. 320—35 4 Claims



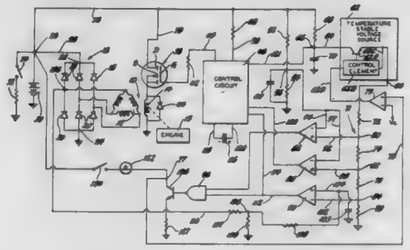
1. A circuit for charging a battery, comprising:
a constant-circuit for controlling current to the battery;
means for generating a charge completion signal upon completion of the charge of the battery;
means responsive to the battery voltage when it reaches a predetermined point for generating a control signal;
a switching element having a pair of output terminals and an input terminal, said switching element input terminal being connected to said responsive means and establishing a low-impedance path across said switching element input terminals upon generation of said control signal;
a silicon-controlled rectifier comprising a pair of output terminals connected in series with said switching element output terminals, said silicon-controlled rectifier having an input terminal connected to said charge-completion signal generating means and establishing a low-impedance path across said silicon-controlled rectifier output terminals upon generation of said charge completion signal and maintaining a low-impedance path across said silicon-controlled rectifier output terminals while said low impedance path is established across said switching element output terminals; and
said switching and said silicon-controlled rectifier being coupled to said constant-current circuit and causing said constant-current to interrupt charging current to the battery whenever a low-impedance path is present across the series combination of said switching element output terminals and silicon-controlled rectifier output terminals;
whereby charging current to the battery remains off even after said charge completion signal is deactivated at times when said control signal is being generated.

4,636,705

SWITCHING CIRCUIT UTILIZING A FIELD EFFECT TRANSISTOR

William E. Bowman, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 13, 1986, Ser. No. 817,986
Int. Cl.[4] H02J 7/14; H03K 17/687
U.S. Cl. 322—28 15 Claims



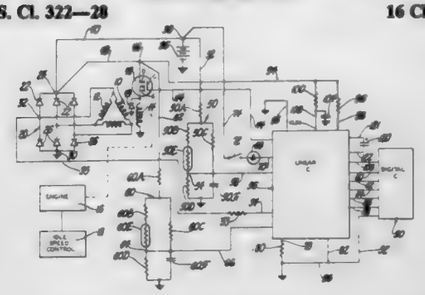
1. A switching circuit for connecting and disconnecting a voltage source and an electrical load comprising, a direct voltage source having positive and negative terminals, an N-channel field effect transistor having a gate, a drain and a source, means connecting said drain to the positive terminal of said voltage source, an electrical load connected between said source of said transistor and said negative terminal, a capacitor, a charge circuit for charging said capacitor, a discharge circuit for discharging said capacitor, means responsive to the voltage across said capacitor attaining a predetermined charge voltage when said capacitor is charging for disabling said charge circuit while substantially simultaneously enabling said discharge circuit to cause said capacitor to begin to discharge, means responsive to said capacitor attaining said predetermined voltage for causing the voltage of said voltage source and the voltage attained by said capacitor to be added in series to provide a gate bias voltage that is substantially the sum of the voltage of said voltage source and the voltage attained by said capacitor and for applying said gate bias voltage to said gate to thereby provide a gate bias voltage that is high enough to bias said transistor conductive between its drain and source, means for sensing said gate bias voltage as said capacitor discharges and for causing said charge circuit to be re-enabled to recharge said capacitor when said gate bias voltage decreases to a predetermined value due to discharge of said capacitor, said predetermined value of gate bias voltage being high enough to maintain said transistor biased conductive, and control means comprising a switching means for at times connecting said gate to said negative terminal to thereby cause said transistor to be biased nonconductive, said switching means when nonconductive permitting said transistor to be biased conductive.

4,636,706

GENERATOR VOLTAGE REGULATING SYSTEM

William E. Bowman; Richard J. Voss, both of Kokomo, and Thomas E. Kirk, Anderson, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 12, 1985, Ser. No. 775,172
Int. Cl.[4] H02J 7/14
U.S. Cl. 322—28 16 Claims



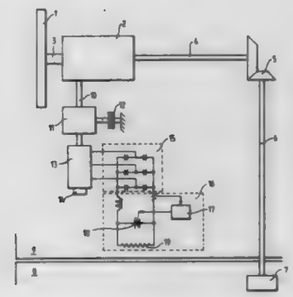
1. The method of regulating the output voltage of a generator that has a field winding and an output winding, the steps comprising, sensing the magnitude of the output voltage of said output winding, comparing the sensed voltage with a reference voltage, incrementing a counter when the sensed voltage is lower than the reference voltage and decrementing the counter when sensed voltage is higher than the reference voltage, repeatedly sampling the magnitude of the count in the counter at a predetermined frequency, energizing said field winding each time the counter is sampled with a voltage pulse the pulse width of which is a function of the magnitude of the count in the counter at the time that the counter is sampled and during the time that the sensed voltage is lower than the reference voltage, and maintaining said field winding deenergized when said sensed voltage is higher than said reference voltage while at the same time decrementing said counter.

4,636,707

POWER GENERATING EQUIPMENT

Hilton Law, Leicester, England, assignor to The English Electric Company Limited, England

Filed Aug. 19, 1985, Ser. No. 767,197
Claims priority, application United Kingdom, Aug. 20, 1984, 8421103
Int. Cl.[4] H02P 9/00
U.S. Cl. 322—35 10 Claims



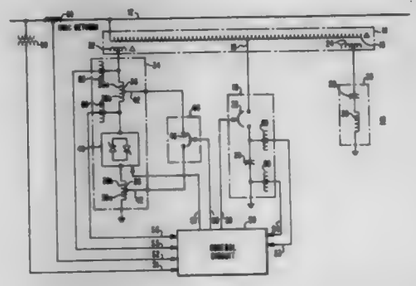
1. An alternating current electrical power generating system comprising: a main electrical generator, a prime mover whose speed or torque could vary in use drivably coupled to the main electrical generator, a differential drive unit having an output shaft coupled to the main electrical generator and two inputs, a synchronous generator having an output, and a thyristor controlled variable load, one input of the differential drive unit being coupled to the prime mover, and the other input of the differential drive unit being coupled to the synchronous generator, the output of the synchronous generator being connected to the thyristor controlled variable load.

4,636,708

STATIC VAR GENERATOR

Ian A. Whyte, Churchill, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 5, 1985, Ser. No. 741,426
Int. Cl.[4] G05F 1/70
U.S. Cl. 323—210 18 Claims

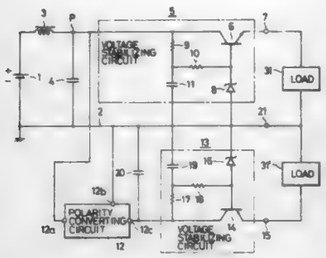


1. A static VAR generator for providing reactive power compensation to an n-phase AC network subject to transient surge current, comprising:
a capacitor bank for each phase comprising at least one capacitor in combination with mechanical switching means for switching the capacitor bank into the AC network when actuated;
a reactor for each phase with a tap for dividing the reactor into a first segment and a second segment;
a thyristor array electrically connected in series with each reactor and operable in a phase controlled mode for switching the reactor into the AC network when actuated;
mechanically switched shunt circuit means having an impedance lower than that of the thyristor array and electrically connected in parallel with each thyristor array and the second segment of said reactor, the shunt circuit means operable between an open position and a closed position when actuated, the shunt circuit means when closed forming a low impedance path around the thyristor array for dividing the transient surge current between the shunt circuit means and the thyristor array such that the second segment provides voltage and current for operation of the thyristor array in the phase controlled mode without exceeding the current rating thereof during the occurrence of transient surge currents; and
control circuit means for determining the reactive power requirements of the AC network with the combination of the thyristor array and reactor and the combination of the mechanical switching means and the capacitor bank being responsive thereto for providing the reactive power so determined, the control means further detecting transient surge current and actuating the shunt circuit means in response thereto.

4,636,709
REGULATED DC POWER SUPPLY

Mitsuo Ohsawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 25, 1984, Ser. No. 634,290
Claims priority, application Japan, Jul. 29, 1983, 58-139044; Jul. 30, 1983, 58-140403
Int. Cl.[4] G05F 1/20
U.S. Cl. 323—267 18 Claims



1. A power supply for supplying DC voltages of opposite polarity, comprising:

a DC voltage source having a first terminal at which a first DC voltage is provided and a second terminal connected to a common line;

first voltage stabilizing means connected between said first terminal of said voltage source and a first power-source, voltage-supply output terminal for stabilizing said first DC voltage at said first output terminal;

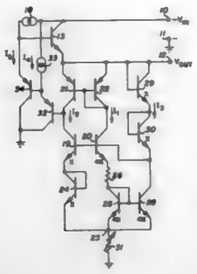
polarity converting means connected to said first teriminal of said voltage source and to said common line and including a switching means controlled by a pulse-width modulation signal generator for supplying at an output terminal a second DC voltage of substantially the same absolute value and of opposite polarity as said first DC voltage; and

second voltage stabilizing means connected between said output terminal of said polarity converting means and a second power-source, voltage-supply output terminal for stabilizing said second DC voltage at said second output terminal, whereby positive and negative DC voltages of substantially equal absolute value and of opposite polarity are respectively provided between said first and second power-source, voltage-supply output terminals and said common line.

4,636,710
STACKED BANDGAP VOLTAGE REFERENCE

Silvo Stanojevic, 641 Clauser Dr., Milpitas, Calif. 95035

Filed Oct. 15, 1985, Ser. No. 787,194
Int. Cl.[4] G05F 1/575
U.S. Cl. 323—280 5 Claims



1. A voltage reference circuit having a reference node and first and second supply rails connectable to a source of operating power, said circuit comprising:

first and second transistor means having their bases coupled together and operated so that said first transistor has a higher emitter current density thereby developing a ΔV_{BE} between said first and second transistor means;

third transistor means diode connected and coupled between the emitter of said first transistor and a first circuit node;

fourth transistor means diode connected and coupled in series with a first resistor between the emitter of said second transistor and said first circuit node whereby twice ΔV_{BE} appears across said first resistor;

first current mirror means coupled between the collectors of said first and second transistor means and said reference node whereby said collector of said first transistor provides a single ended load output node;

amplifier means, coupled between said first supply rail and said reference node, and responsive to the potential of said load output node for forcing said reference node to operate about one diode higher than the potential at said load output node;

fifth transistor means having its base-emitter circuit coupled across said fourth transistor means to form a second current mirror therewith and a collector connected to said bases of said first and second transistors;

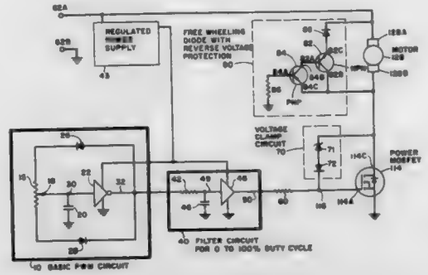
sixth and seventh transistor means diode connected and coupled to forward conduct between said reference node and said collector of said fifth transistor means; and

a second resistor coupled between said first circuit node and said second supply rail, said second resistor having a value that when conducting the currents flowing in said first, second and fifth transistors at about 300° K. produces a potential that is slightly higher than the combined drops across said first transistor emitter electrodes in series with said third, sixth and seventh transistors to produce a reference voltage on the order of five volts.

4,636,711
PULSE WIDTH MODULATION CONTROL CIRCUIT WITH A VARIABLE ZERO TO ONE HUNDRED PERCENT DUTY CYCLE

William P. Freymuth, Tulsa, Okla., assignor to Airborne Electronics, Inc., Plano, Tex.

Continuation of Ser. No. 677,754, Dec. 4, 1984, abandoned. This application Mar. 7, 1986, Ser. No. 838,426
Int. Cl.[4] G05F 1/56
U.S. Cl. 323—282 12 Claims



1. In an apparatus for controlling the average current through a load means by means of a pulse width modulated signal to an electronic switch means in series with said load means;

the improvement in constant period oscillator and pulse width modulator comprising:

(a) a source of selected voltage;

(b) Schmitt trigger and inverter (STAI) means;

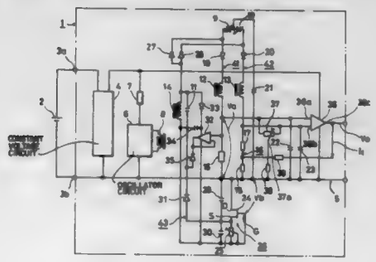
(c) resistance means with a first of its two ends connected to the output of said STAI through a first diode, having its anode connected to said output; the second of said two ends connected to said output through a second diode, having its cathode connected to said output;

(d) an intermediate point between said two ends connected to the input of said STAI; and a first capacitor connected between said input and ground.

4,636,712
REDUCED POWER DISPLACEMENT CONVERTING DEVICE USING VARIABLE CAPACITANCE INPUT

Keiichiro Tago, Kanagawa, Japan, assignor to Fuji Electric Company, Ltd., Kawasaki, Japan

Filed Feb. 27, 1985, Ser. No. 706,093
Claims priority, application Japan, Feb. 28, 1984, 59-28125[U]; Mar. 13, 1984, 59-35730[U]
Int. Cl.[4] G01L 9/12
U.S. Cl. 323—349 14 Claims



1. A displacement coverting device for converting mechanical movement of a sensor or actuator mechanism to a corresponding output signal, comprising:

a source of DC voltage

means for producing an AC voltage from said DC voltage;

a first capacitor;

a second capacitor having a varable capacitance corresponding to the mechanical movement of the mechanism;

a first current circuit connected to said producing means and to said first capacitor for producing a first current proportional to the capacitance of said first capacitor;

a second current circuit connected to said producing means and to said second capacitor for producing a second current proportional to the capacitance of said second capacitor;

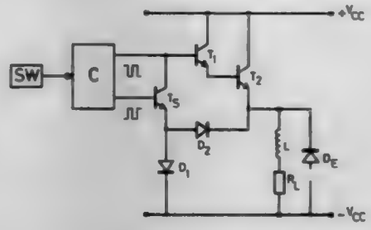
amplifier means having a first input terminal for receiving a first signal corresponding to the magnitude of said first current, a second input terminal for receiving a second signal corresponding to the magnitude of said second current, and an output terminal, said amplifier means for comparing said first signal to said second signal and for generating the output signal having a magnitude corresponding to the mechanical movement of the mechanism; and

means coupled to said amplifier means and to said first and second capacitors, for preventing stray capacitances associated with said first and second capacitors from affecting the output signal, said preventing means including a third capacitor and a buffer amplifier.

4,636,713
MONOLITHICALLY INTEGRATABLE CONTROL CIRCUIT FOR SWITCHING INDUCTIVE LOADS COMPRISING A DARLINGTON-TYPE FINAL STAGE

Fabrizio Stefani, Cardano al Campo, Italy, assignor to SGS-ATES Componenti Elettronici S.p.A., Italy

Filed Dec. 20, 1984, Ser. No. 683,808
Claims priority, application Italy, Dec. 20, 1983, 24252 A/83
Int. Cl.[4] H03K 17/60
U.S. Cl. 323—350 13 Claims



3. A switching circuit for switching current through an inductive load impedance in response to a first switching signal and a second switching signal comprising:

a Darlington circuit output stage coupled to said inductive load, said first switching signal coupled to an input terminal of said Darlington output stage;

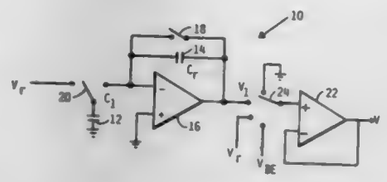
a control transistor having a first terminal coupled to said Darlington output stage input terminal, a control terminal of said control transistor coupled to said second signal; and

a first diode coupled between said inductive load impedance and a second terminal of said control transistor.

4,636,714
CAPACITIVE TRANSDUCER AND METHOD

Henry V. Allen, Fremont, Calif., assignor to Wystron, Inc., Fremont, Calif.

Filed Jan. 18, 1984, Ser. No. 572,204
Int. Cl.[4] G01R 27/26
U.S. Cl. 324—60 CD 17 Claims



1. A capacitive transducer for measuring the difference between at least one parameter of a first medium and at least one parameter of a second medium to which said transducer is exposed, said transducer comprising:

a source of reference potential;

a first capacitor having a capacitance which varies as a function of said parameter of said first medium;

a second capacitor having a capacitance which varies as a function of said parameter of said second medium;

means for selectively charging said first capacitor and said second capacitor to obtain a charge on each said capacitor determined by its instantaneous capacitance and said reference potential;

a third capacitor having a fixed, reference capacitance; and

means for transferring substantially all of said charge on said first capacitor to said third capacitor and for transferring substantially all of said charge on said second capacitor

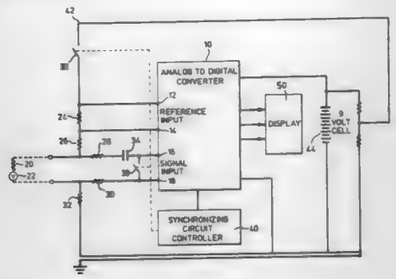
with a polarity opposite from said charge on said first capacitor to said third capacitor, said third capacitor developing a voltage as a function of the difference between said capacitance of said first capacitor and said second capacitor when said charge is transferred thereto.

4,636,715

DIGITAL DISPLAY OHMMETER

Jerzy Borkowicz, Ottawa, Canada, assignor to C-I-L Inc., North York, Canada

Filed Jul. 8, 1985, Ser. No. 752,846
Claims priority, application Canada, Aug. 13, 1984, 460884
Int. Cl.⁴ G01R *27/00*
U.S. Cl. 324—62 **4 Claims**



1. In an apparatus for measuring the continuity and resistance of an electric wire blasting network of the type where a constant current is passed through the network and a reference resistor; and the voltages across the reference resistor and the network are measured and compared to derive the resistance of the blasting circuits; the apparatus including a converter for sensing the measured voltages and converting their values to display resistance of the blasting network directly, the improvement of means for compensating for the effect of voltages due to galvanic currents associated with the blasting network comprising:

a reference resistor;

a storage capacitor for voltage due to galvanic currents associated with the blasting network;

an input terminal for supplying a test voltage;

terminals for connection to the electric wire blasting network;

switch means operable between two positions, the first position being one wherein said storage capacitor is connectible only to said blasting network to assume a charge proportional to the voltage across the blasting network due to galvanic currents in the location of the blasting network and the second one being one in which said input terminal is connectible to said blasting network through said reference resistor, and in which said reference resistor, blasting network, and voltage storage capacitor are connectible to said converter;

synchronizing means for cyclically moving said switch means between said first and said second positions at a frequency at which the voltage applied to the storage condenser is substantially constant; and

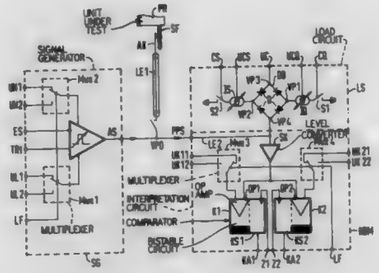
the time constant of said storage capacitor being adapted to fully charge when said switch means is in said first position.

4,636,716

DEVICE FOR TESTING UNITS CONTAINING ELECTRICAL CIRCUITS

Klaus Welzhofer, Graefelfing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 6, 1984, Ser. No. 597,720
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1983, 3312687
Int. Cl.⁴ G01R *15/12, 31/22*
U.S. Cl. 324—73 R **7 Claims**



1. An arrangement for testing units which contain electrical circuits and which provide test signals having voltage levels at an output terminal, comprising:

a load circuit connected to the output terminal and operable to provide a predetermined load current, said load circuit comprising switches and a pair of connectible and disconnectible constant current sources connected to said switches and responsive to the operation thereof to also alternately function as current sinks for providing a variable current for loading a unit under test;

an interpretation circuit connected to the output terminal, said interpretation circuit including at least one comparator operable to compare a test signals to a variable reference signal at a predetermined time;

said load circuit further comprising a diode bridge including four junctions, said constant current sources connected to first and second diagonally disposed junctions of said bridge, said bridge comprising diodes poled in the same direction between said first and second junctions, a third junction connected to receive a control voltage, and a fourth junction connected to the output terminal; and

said interpretation circuit further comprising a level converter connected to the output terminal for converting the voltage level of the unit under test into a voltage signal suitable for said comparator.

4,636,717

VECTOR NETWORK ANALYZER WITH INTEGRAL PROCESSOR

David D. Sharrit; Robert G. Dildine, both of Santa Rosa; Mark D. Roos, San Carlos, and John T. Barr, IV, Santa Rosa, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 9, 1984, Ser. No. 569,051
Int. Cl.⁴ G01R *23/16*
U.S. Cl. 324—77 B **4 Claims**

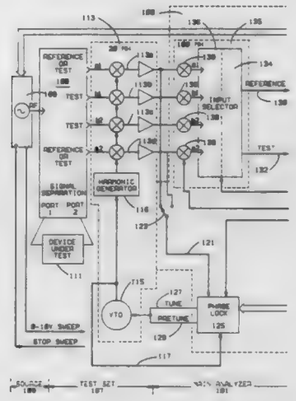
1. An RF network analyzer comprising:

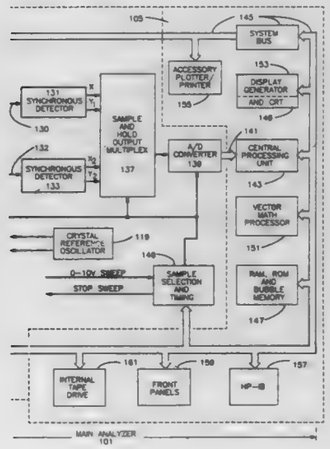
a pair of synchronous detectors having a plurality of output terminals:

sample and hold means coupled to the plurality of detector output terminals for sampling and holding signals from the pair of synchronous detectors, the sample and hold means having a plurality of sample and hold output terminals to provide sample and hold output signals:

a multiplexor coupled to the plurality of sample and hold output terminals to combine the sample and hold output signals, the multiplexor having a multiplexor output terminal to provide multiplexor output signals:

analog to digital converter means for digitizing the multiplexor output signals:





the synchronous detectors, sample and hold means, multiplexor, and analog to digital converter means connected together as an IF string: and

calibration means for digitally calibrating the complex gain and offset of the IF string.

4,636,718

ACOUSTO-OPTICAL SPECTRUM ANALYZER WITH EXPANDED FREQUENCY RESOLUTION

Joseph H. Labrum, West Jordan, and Allen D. Wilcox, Bountiful, both of Utah, assignors to Sperry Corporation, Blue Bell, Pa.

Filed Jul. 20, 1984, Ser. No. 632,728
Int. Cl.⁴ G01R *23/165, 23/17*
U.S. Cl. 324—77 K **14 Claims**

1. An acousto-optical spectrum analyzer comprising,

first source means for providing an electromagnetic wave,

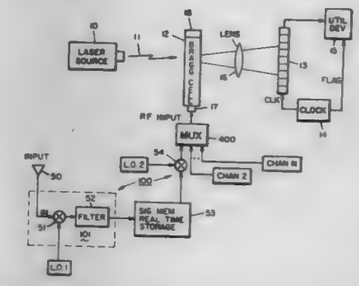
acousto-optic cell means for operating on said electromagnetic wave, optical means disposed intermediate said acousto-optic cell and said detector means to operate on focusing of said electromagnetic wave,

dectector means for detecting said electromagnetic wave after operation thereon by said acousto-optic cell,

bandwidth expansion means connected to said acousto-optic cell to control the operation thereof,

said bandwidth expansion means including storage means capable of a rate of read-out which is higher than the rate of read-in,

first oscillator means,



first mixer means for combining the signal from said first oscillator means and the output signal from said storage means to produce a control signal to be applied to said acousto-optic cell means,

second source means for providing an R.F. input signal,

second oscillator means, and

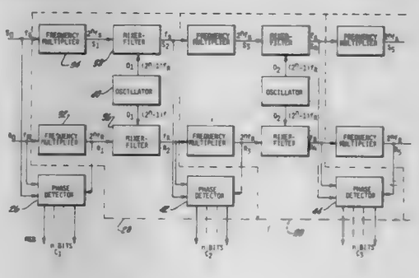
second mixer means for combining the signal from said second source means and the signal from said second oscillator means to produce an input signal to be stored in said storage means.

4,636,719

APPARATUS FOR EXTENDED PRECISION PHASE MEASUREMENT

David M. Zak, Ann Arbor, and Vernon L. Larrowe, Ypsilanti, both of Mich., assignors to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Nov. 1, 1984, Ser. No. 667,355
Int. Cl.⁴ G01R *25/00*
U.S. Cl. 324—83 D **7 Claims**



1. In an apparatus for measuring the phase difference between a first and second signal, the improvement comprising:

means for increasing the precision of measurement of the phase difference between the signals including

first phase detector means for measuring the phase difference between the signals to a precision of n bits,

first and second frequency multiplier means for multiplying the frequency and phase of the first and second signals respectively by a factor of 2^m to form third and fourth signals respectively,

first and second heterodyning means for heterodyning each of the third and fourth signals to produce fifth and sixth

signals, the fifth and sixth signals each having a frequency equal to the first and second signals, and

second phase detector means for measuring the phase difference between the fifth and sixth signals to a precision of m bits,

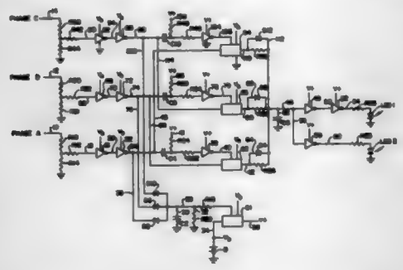
whereby the m bit value obtained from the second phase detector means contributes m bits of additional accuracy to the n bit value obtained from the first phase detector means, thereby yielding a phase difference measurement with n+m bits of accuracy.

4,636,720

PHASE DETECTOR

Aaron V. Farr, Logan, Utah, assignor to Abex Corporation, Boston, Mass.

Filed Nov. 30, 1984, Ser. No. 676,690
Int. Cl.[4] G01R *25/00*
U.S. Cl. 324—86 6 Claims



1. A phase detector for monitoring a first phase line, a second phase line and a third phase line for a three-phase line power input in which each phase has a positive polarity region and a negative polarity region occurring in a given sequence which comprises:

first, second and third cross-over detecting means for deriving respective first, second and third activator signals in the presence of the transition of the first, second and third respective phases between said regions;

first, second and third activators having activator inputs connected to said first, second and third cross-over detecting means respectively, having line phase inputs connected to the next adjacent phase lines of said given sequence, and having activator ouputs;

said first, second and third activators alternatively having a first line phase condition at their line phase inputs corresponding with the presence of the next adjacent phase of said given sequence thereof or a second line phase condition at their inputs corresponding with the absence of the next adjacent phase of said given sequence thereof;

said first, second and third activators being actuable in response to said first, second and third activator signals to provide first, second and third activator output signals at their respective outputs corresponding to the line phase condition at the first, second and third respective line phase inputs thereof; and

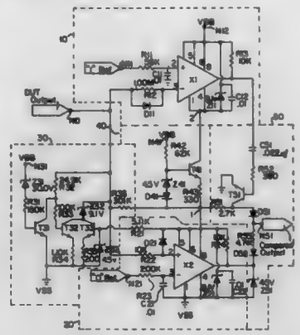
first perceptible indicating means connected to said first, second and third activator outputs which is activated when all of said first, second and third respective activator outputs have said first line phase condition.

4,636,721

METHOD AND STRUCTURE FOR TESTING HIGH VOLTAGE CIRCUITS

Robert G. Howell, Chubbuck, and Tomas G. Fisher, Pocatello, both of Id., assignors to American Microsystems, Inc., Santa Clara, Calif.

Filed Jul. 13, 1984, Ser. No. 630,542
Int. Cl.[4] G01R *19/14*
U.S. Cl. 324—133 16 Claims



1. A circuit for generating a low voltage output signal showing the state of a potentially high voltage input signal, comprising

a first terminal for receiving a first supply voltage;

a second terminal for receiving a second supply voltage;

an input terminal for receiving an input signal to be tested;

a third terminal for receiving a logical 1 reference voltage;

a fourth terminal for receiving a logical 0 reference voltage; and

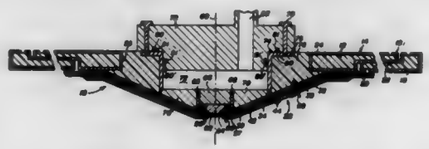
an output terminal for providing an output signal capable of having a first state when said input signal is greater than said logical 1 reference voltage, a second state when said input signal is less than said logical 0 reference voltage, and a third state when said input signal is between said 1 and 0 reference voltages.

4,636,722

HIGH DENSITY PROBE-HEAD WITH ISOLATED AND SHIELDED TRANSMISSION LINES

Frank J. Ardezzone, Santa Clara, Calif., assignor to Probe-Rite, Inc., San Jose, Calif.

Filed May 21, 1984, Ser. No. 612,440
Int. Cl.[4] G01R *1/06, 31/02*
U.S. Cl. 324—158 P 22 Claims



1. A test probe-head assembly comprising:

a planar support member provided with a plurality of signal terminals and having a central opening;

a probe assembly including a plurality of electrically conductive probe arms mounted on the support member and extending into said central opening with each probe arm electrically connected to one of said signal terminals, a terminal end of each probe arm being adapted to provide a probe-point, and a nonconductive flexible film layer, in abutting and adhering contact with the probe arms, mechanically connected to the planar support member and extending into and across said central opening;

a central flexible member mounted on the upper surface of the probe assembly and covering said probe points to allow minor deflection of each individual probe-point to compensate for minor variations in probe-point length and the height of probe pads of a device to be tested;

a central rigid member located above and in abutting contact with the central flexible member and a portion of the upper surface of the probe assembly adjacent thereto, to prevent the deformation of the flexible member and to keep said probe-points approximately co-planar; and

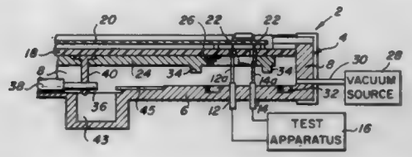
an intermediate flexible member mounted above and in abutting contact with a portion of the probe assembly, intermediate and connected to the central rigid member and the support member, to allow for major deflection of said probe-points, the central flexible member, and the central rigid member.

4,636,723

TESTING DEVICE FOR PRINTED CIRCUIT BOARDS

Harry S. Coffin, 1801 Linden Way, King of Prussia, Pa. 19406

Filed Mar. 21, 1986, Ser. No. 842,599
Int. Cl.[4] G01R *31/02, 1/06*
U.S. Cl. 324—158 F 6 Claims



1. Apparatus for functional and in-circuit testing of printed circuit boards, comprising

(a) a fixed housing including a bottom wall and a plurality of side walls arranged normal to and connected with said bottom wall to define an open chamber, said bottom wall containing at least first and second openings, and an upper surface of said housing bottom wall containing a plurality of recesses;

(b) a generally planar support platform slidably connected with said housing for supporting a circuit board to be tested, said platform being arranged parallel to and spaced from said housing bottom wall and extending between said side walls to close said chamber, said platform containing at least first and second openings aligned with said first and second bottom wall openings, respectively;

(c) means for displacing said platform relative to said housing bottom wall between first, second and third positions, the spacing between said platform and said housing bottom wall decreasing between said first, second and third positions;

(d) a stop plate arranged within said chamber adjacent a lower surface of said platform and displaceable therewith, said stop plate containing an enlarged opening aligned generally with said housing bottom wall and platform openings, the lower surface of said stop plate including a plurality of projections corresponding with said bottom wall recesses;

(e) first and second test pin means extending through said bottom wall first and second openings into said chamber and aligned with said stop plate enlarged opening and said platform first and second openings, respectively, at least said first test pin means including a spring-biased terminal, said first test pin terminal normally extending a first distance into said chamber and said second test pin terminal normally extending a second distance into said chamber, said second distance being less than said first distance; and

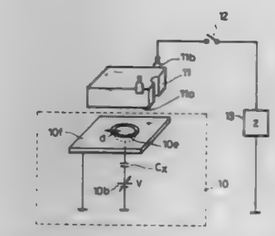
(f) means for displacing said stop plate laterally within said chamber between a first position wherein said projections are out of alignment with said bottom wall recesses and a second position wherein said projections are aligned with said recesses, whereby when said platform and said stop plate are in said first positions, respectively, said first and second pin terminals are spaced from the circuit board, and when said platform displacing means are energized to displace said platform toward said bottom wall, said stop plate projections engage said bottom wall upper surface to arrest displacement of said platform in said platform second position wherein said first test pin terminal contacts the circuit board for functional testing, and when said stop plate displacing means are energized to displace said stop plate to its second position, said projections enter said recesses and said platform is displaced to its third position wherein said stop plate lower surface engages said bottom wall upper surface, and further wherein said first and second test pin terminals contact the circuit board for in-circuit testing thereof.

4,636,724

METHOD AND APPARATUS FOR EXAMINING ELECTROSTATIC DISCHARGE DAMAGE TO SEMICONDUCTOR DEVICES

Yasuhiro Fukuda, and Ikuo Sagusawa, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 653,921
Claims priority, application Japan, Sep. 30, 1984, 58-180838
Int. Cl.[4] G01R *31/26*
U.S. Cl. 324—158 R 3 Claims



2. In apparatus for examining the susceptibility of a semiconductor device having a dielectric package and an input or output pin, to damage by discharge of electrostatic charge on the package of said device, the apparatus including

charging means connected between a surface of the package of the device and a reference potential, for electrically charging said package;

switch means having one terminal connected to the input or output pin of said device; and

load impedance means connected between the other terminal of said switch means and said reference potential,

wherein said switch means is closed to discharge the charge on the package with the charging of the package continued, the improvement comprising:

said charging means comprises a metal plate disposed in contact with a major surface of said package over substantially a whole area thereof, a capacitor having a capacitance corresponding to a distributed capacitance between said major surface and said reference potential and having one end connected to said metal plate, and a direct current voltage supply connected between the other end of said capacitor and said reference potential; and

wherein said direct current voltage supply includes means for providing a variable output voltage.

4,636,725

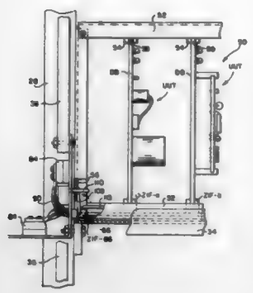
ELECTRONIC BURN-IN SYSTEM

Anthony Santomango, West Peabody, and Nicholas N. Hatheway, Jr., Newbury, both of Mass., assignors to Artronics Corporation, Danvers, Mass.

Division of Ser. No. 336,781, Jan. 4, 1982, Pat. No. 4,542,341. This application Apr. 2, 1985, Ser. No. 718,938

Int. Cl.⁴ G01R *31/28, 31/02*

U.S. Cl. 324—158 F **1 Claim**



1. A system for performing electronic burn-in testing of two or more modules comprising a rack, a removable tray on the rack, a removable daughter board receivable in the tray, and a source of a plurality of specific test voltages of predetermined amounts,

the rack having support means for receiving and releasably supporting at least one removable tray, at least one power interface assembly on the rack for connecting the rack to the source of the plurality of test voltages, a plurality of releaseable electric connectors on the interface assembly for connection to the removable tray,

the tray having a mother board including a plurality of conductive paths for conducting one of the specific voltages in each path, each path being connected to a contact that is engageable with one of the releasable connectors on the interface assembly, means on the mother board circuit for receiving and releasably supporting a removable daughter board, a plurality of releaseable connectors on the mother board each connected to a conductive path to support a plurality of specific voltages to the daughter board, the daughter board having a plurality of contacts each engageable with one of the releaseable electric contacts on the mother board,

the daughter board having means for mounting two or more different modules, each module being connected to a conductive path to one or more contacts on the daughter board to receive the specific test voltages in the conductive path in the mother board to which the contacts on the daughter board are connected,

signal means on the daughter board to indicate the presence of test voltage across the module,

signal means on the daughter board to indicate the presence of voltage generated from the module or the daughter board,

and means to electrically connect and disconnect the rack and the tray automatically upon the tray being moved into and out of the rack.

4,636,726

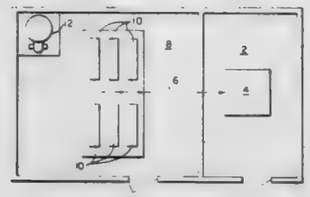
ELECTRONIC BURN-IN SYSTEM

Anthony Santomango, West Peabody, and Nicholas N. Hatheway, Jr., Newbury, both of Mass., assignors to Artronics Corporation, Danvers, Mass.

Division of Ser. No. 336,781, Jan. 4, 1982, Pat. No. 4,542,341. This application Apr. 2, 1985, Ser. No. 718,939

Int. Cl.⁴ G01R *31/02, 31/28*

U.S. Cl. 324—158 F **3 Claims**



1. A system for performing electronic burn in testing of a module comprising:

a rack, a removable tray on the rack, a removable daughter board receivable in the tray and a source of a plurality of specific voltages of predetermined amounts,

the rack having support means for receiving and releasably supporting at least one removable tray, at least one power interface assembly on the rack for connecting the rack to the source of the plurality test voltages, a plurality of releasable electric connectors on the interface assembly for connection to the removable tray,

the tray having a mother board circuit including a plurality of conductive paths for conducting a specific voltage, each path connected to a contact that is engageable with one of the releasable connectors on the interface assembly,

means on the mother board for receiving and releasably supporting a removable daughter board, a plurality of releasable connectors on the mother board each connected to a conductive path to supply a specific voltage to the daughter board,

the daughter board having a plurality of contacts, each engageable with one of the releasable electric contacts on the mother board,

the module being mounted on the daughter board and wired to at least one of the contacts on the daughter board to receive the specific test voltage in the conductive path in the mother board to which the contact is connected,

the daughter board having signal means to indicate the presence of test voltage across the module,

the daughter board having means to indicate the presence of voltage generated from the module or the daughter board,

and means to electrically connect and disconnect the rack and the tray automatically upon the tray being moved into and out of the rack.

4,636,727

METHOD AND APPARATUS FOR DETECTING THE LOCATION OF DEFECTS IN TUBULAR SECTIONS MOVING PAST A WELL HEAD

John E. Kahil; Marvin Milewitz; James E. Bradfield, and Clive C. Lam, all of Houston, Tex., assignors to PA Incorporated, Houston, Tex.

Filed Apr. 11, 1984, Ser. No. 599,229

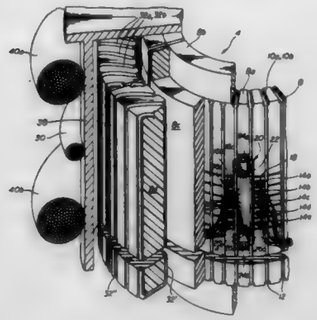
Int. Cl.⁴ G01R *33/12*; G01N *27/82*

U.S. Cl. 324—227 **27 Claims**

7. Apparatus for determining the extent of defects in a tubular string, formed from a series of tubular sections interconnected by end couplings wherein the cross-sectional area at the end couplings is greater than the cross-sectional area of the tubular sections intermediate the ends thereof, used in a subterranean oil or gas well, as a function of the position of the tubular string within the well, as the tubular sections travel relative to the well head, the apparatus comprising:

means for determining the existence of defects on each tubular section as the tubular string travels relative to the well head;

means for detecting the presence of an end coupling at the well head by discriminating between tubular sections intermediate the ends thereof and the end couplings of greater cross-sectional area;



means for detecting the direction of movement of each end coupling relative to the well head; and

means for determining the location of defects in the tubing string relative to an end coupling at one end of a tubular section, whereby the location of defects on the tubular string can be determined by counting the end couplings traveling past the well head.

4,636,728

OFFSET GRADIENT FIELDS IN NUCLEAR MAGNETIC RESONANCE IMAGING SYSTEMS

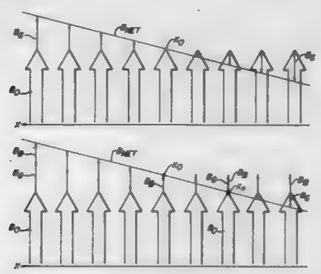
Russell A. Compton, Chesterland; Waldo S. Hinshaw, and David M. Kramer, both of Cleveland Heights, all of Ohio, assignors to Technicare Corporation, Solon, Ohio

Filed Jun. 18, 1984, Ser. No. 621,396

Claims priority, application United Kingdom, Aug. 5, 1983, 8321236

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—309 **13 Claims**



1. In a nuclear magnetic resonance imaging system, including a magnet for developing a main magnetic field, apparatus for producing a magnetic field gradient comprising:

first coil means for producing, when energized by a first current, a first gradient magnetic field which varies in a first direction within a region of said main magnetic field;

second coil means for producing, when energized by a second current, a second gradient magnetic field which varies in a second direction orthogonal to said first direction within a region of said main magnetic field;

third coil means for producing, when energized by a third current, a third gradient magnetic field which varies in a third direction orthogonal to said first and second directions within a region of said main magnetic field;

said gradient magnetic fields defining a reference point of gradient field intensity within said region; and

bias coil means for producing a substantially uniform offset in the magnetic field intensity within said region, said bias coil means being energized by a bias current which is a combination of said first, second and third energizing currents.

4,636,729

GRADIENT COIL SYSTEM FOR A NUCLEAR SPIN TOMOGRAPHY INSTALLATION

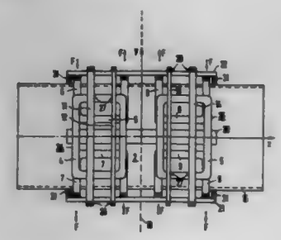
Arnolf Maurer, Bubenreuth, and Horst Siebold, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 29, 1985, Ser. No. 696,104

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1984, 3406053

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—318 **20 Claims**



1. In a gradient coil system for a nuclear spin tomagraphy installation which encloses a hollow cylindrical support body, the cylinder axis of which extends in the z direction of an orthogonal x-y-z coordinate system with the origin of the coordinates in the center of an imaging region, in which direction the magnetic field B_z of a base field magnet comprising several field coils is also oriented, which gradient coil system contains, for generating a z field gradient which is largely constant in the imaging region at least two ring-shaped G_z individual coils arranged at least approximately symmetrically to the x-y plane extending through the center of the imaging region, and further contains at least one set each of pairs of saddle-shaped G_x and G_y individual coils which are arranged at least approximately symmetrically with respect to said x-y plane and which are provided for generating x and y field gradients which are largely constant in the imaging region, the improvement comprising:

(a) the prefabricated saddle-shaped G_x and G_y gradient coils on each side of the x-y plane being rigidly connected to each other to form a self-supporting partial basket;

(b) several longitudinal support elements of non-magnetic insulating material extending in the z direction to which the prefabricated ring-shaped G_z gradient coils are fastened and to which the partial baskets which are formed on both sides of the x-y symmetry plane are fastened to form a common self-supporting coil basket; and

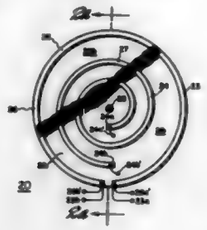
(c) insulating elastic support elements attaching the coil basket to the hollow cylindrical support body.

4,636,730

NMR SPECTROSCOPY BODY PROBES WITH AT LEAST ONE SURFACE COIL

Paul A. Bottomley, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 16, 1984, Ser. No. 641,540
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—318 25 Claims



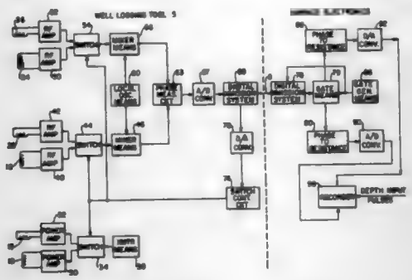
1. An antenna probe for use with an NMR system, comprising:
an insulative substrate having at least initially planar opposed first and second surfaces arranged to be positioned respectively nearest to and furthest from an adjacent exterior surface of an object to be investigated;
at least one surface coil antenna, each having at least one turn of a single conductive member connected only between first and second coil ends, fabricated initially as, and reconfigurable to, a planar coil of one of substantially circular and substantially spiral shape in the plane of, and adjacent to, said second substrate surface; each surface coil antenna providing a spatially non-uniform magnetic field when a single radio-frequency current flows therethrough;
means fabricated adjacent to said first surface for substantially attentuating the radio-frequency electric field of any signal radiated by said at least one surface coil antenna; and
at least one means for separately connecting to said first and second coil ends of each different one of said at least one surface coil antenna, to allow each surface coil antenna to provide a single radio-frequency signal, received from said object, to said system or to radiate a single radio-frequency signal, received from said system, to said object.

4,636,731

PROPAGATION ANISOTROPIC WELL LOGGING SYSTEM AND METHOD

Kerry D. Savage; Percy T. Cox, and Hans J. Paap, all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 31, 1984, Ser. No. 688,106
Int. Cl.[4] G01V 3/30
U.S. Cl. 324—338 22 Claims



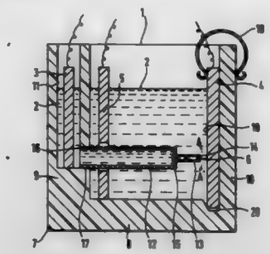
1. Apparatus for determining the anisotropy of an earth formation by measuring both vertical and horizontal resistivity of the formation in the vicinity of a borehole traversing the earth formation comprising:
first transmitter means located in the borehole and spatially arranged with the earth formation in a first predetermined manner for transmitting electromagnetic energy into the earth formation at a frequency within a frequency range from 0.5 MHz to 4 MHz,
second transmitter means located in the borehole and spatially arranged with the earth formation in a second predetermined manner for transmitting electromagnetic energy into the earth formation at a frequency within a frequency from 0.5 MHz to 4 MHz,
first receiving means spatially arranged with the earth formation in the first predetermined manner and spaced a first predetermined distance from the first transmitter means for receiving electromagnetic energy from the earth formation and providing a corresponding signal,
second receiving means spatially arranged with the earth formation in the first predetermined manner and spaced a second predetermined distance from the first receiving means for receiving electromagnetic energy from the earth formation and providing a corresponding signal,
third respective means spatially arranged with the earth formation in the second predetermined manner and spaced the first predetermined distance from the second transmitter means for receiving electromagnetic energy and providing a corresponding signal,
fourth receiving means spatially arranged with the earth formation in the second predetermined manner and spaced a predetermined distance from the third receiving means for receiving electromagnetic energy and providing a corresponding signal,
control means connected to the first and second transmitter means for causing the first and second transmitter means to alternately transmit the electromagnetic energy into the earth formation and for providing a control signal, and
means connected to the first, second, third and fourth receiving means and to the control means for providing one output signal representative of the vertical resistance of the earth formation and a second output signal representative of the horizontal resistance of the earth formation in accordance with the signals from all the receiving means and the control signal from the control means.

4,636,732

APPARATUS FOR MEASURING ELECTRICAL POTENTIAL IN A CELL

Peter M. Willis, Oxfordshire, Great Britain, assignor to Johnson Matthey Public Limited Company, London, England

Filed Jul. 12, 1983, Ser. No. 512,993
Claims priority, application United Kingdom, Jul. 28, 1982, 8221814
Int. Cl.[4] G01N 27/42
U.S. Cl. 324—425 8 Claims



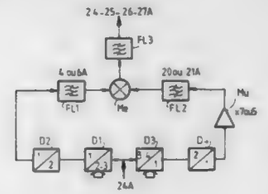
1. A cell containing electrolyte, wherein the cell comprises:
a sample electrode;
a reference electrode spaced from the sample electrode;
a counter electrode, arranged intermediate the sample electrode and the reference electrode, said reference electrode measuring electrical potential a predetermined distance from the sample electrode;
accommodation means for the reference electrode;
a first narrow conduit enclosed by electrically non-conductive material, said first conduit having a first end which is open to entry by electrolyte and a second end which is in communication with the accommodation means for the reference electrode;
a second conduit defined by electrically non-conducting material as an intermediate support means for mounting the first conduit near the second end thereof with an external fluid-tight fit, said second conduit being broader than the first conduit;
location means for the sample electrode;
a support for the location means, wherein there are means fixed relative to the support for the location means, so that the sample electrode is disposed a predetermined distance from the first end of the first conduit.

4,636,733

QUATERNARY FREQUENCY SYNTHESIZER

Roger Charboonier, Meudon Bellevue, and Jöel Remy, Paris, both of France, assignors to Adret Electronique, France

Filed Dec. 27, 1984, Ser. No. 686,856
Claims priority, application France, Feb. 22, 1984, 84 02667
Int. Cl.[4] H03B 19/00
U.S. Cl. 328—14 9 Claims



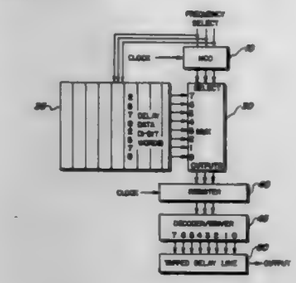
1. A frequency synthesizer comprising:
i. generator means for generating a standard frequency which is a multiple of a predetermined frequency step;
ii. first and second frequency dividers respectively having first and second inputs connected in parallel to the said generator means and each having first and second programmable ratios of division, said first and second frequency divider respectively having first and second outputs and respectively producing first and second and fourth and fifth further frequencies;
iii. first and second band-pass filter means having first and second respective inputs and frequency converter means respectively connecting said first and second outputs of the frequency dividers to the first and second inputs of the band-pass filter means which are respectively adapted for transmitting the first and second and third and fourth further frequencies, said first and second filter means respectively having first and second outputs, and
iv. mixer means having first and second inputs respectively connected to the first and second outputs of the filter means, said mixer means having an output and
v. third band-pass filter means connected to the output of the inner means,
vi. the third filter means being adapted for transmitting fifth, sixth, seventh and eighth further frequencies in arithmetic progression, the first, second, third and fourth further frequencies being so predetermined that the said fifth, sixth, seventh and eighth frequencies will be obtained at the output of the mixer means and the frequency converter means have a fixed factor of frequency conversion.

4,636,734

LOW SPURIOUS NUMERICALLY CONTROLLED OSCILLATOR APPARATUS AND METHOD

Thad J. Genrich, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 510,504, Jul. 5, 1983, abandoned. This application May 9, 1986, Ser. No. 862,193
Int. Cl.[4] H01L 7/00; H03K 5/159
U.S. Cl. 328—55 8 Claims



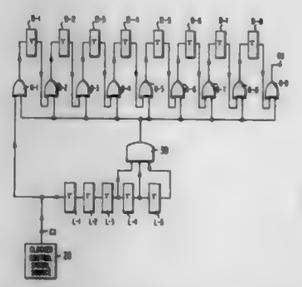
1. Low spurious numerically controlled oscillator apparatus comprising:
a numerically controlled oscillator having a clock input, a frequency select input and an output, the output having an output signal thereon at a selected frequency defined by a signal on the frequency select input and with a periodically irregular duty cycle for at least some frequency select inputs; and
radio frequency (RF) signal generating means coupled to the output of said numerically controlled oscillator for utilizing signals thereon to generate a digital signal having a generally 50% duty-cycle and the same selected frequency as the output signal of said nuemrically controlled oscillator.

4,636,735

DURATION-SENSITIVE DIGITAL SIGNAL STRETCHER

Robert A. Wargo, Ringoes, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 18, 1985, Ser. No. 724,644
Int. Cl.[4] H03K 5/153
U.S. Cl. 328—58 5 Claims



1. A duration-sensitive signal stretcher, for use with a clocked source of control information signals exhibiting one or the other of two alternative signal levels comprising:
delay means having a plurality of successive signal takeoff points; the amount of delay between successive ones of said takeoff points being the same; the input of said delay means being responsive to the output of said signal source;
a plurality of signal paths, each connected to a respectively different one of said signal takeoff points;

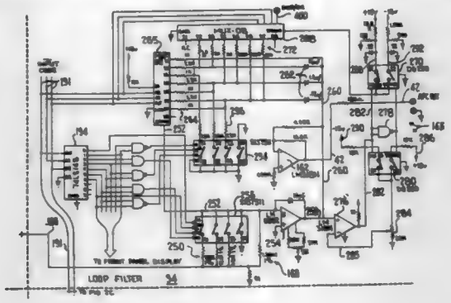
an "and" gate having a plurality of inputs equal in number to said plurality of signal paths, each of said signal paths terminating at a respectively different one of said plurality of inputs of said "and" gate;
a plurality of delay devices, each imparting the same predetermined amount of delay;
a succession of two-input "or" gates, with one input of each rendered responsive to the output of said "and" gate; with the output of each of said succession of "or" gates, with the exception of the last of said succession, being coupled via a respective one of said plurality of delay devices to the other input of the next succeeding one of said succession of "or" gates; and with the output of said last of said succession of "or" gates coupled to a control signal output terminal; and
means for supplying to the other of said inputs of the first of said succession of two-input "or" gates a signal appearing at the output of said "and" gate;
wherein the sum of the delays imparted by said plurality of delay devices exceeds the amount of delay between the first and last of said sucessive signal takeoff points.

4,636,736

VARIABLE PHASE SIGNAL DEMODULATOR

Donald J. Woodworth, and Gregory A. Magin, both of Ocala, Fla., assignors to Microdyne Corporation, Ocala, Fla.

Continuation of Ser. No. 311,114, Oct. 13, 1981, abandoned. This application Jul. 26, 1984, Ser. No. 634,642
Int. Cl.[4] H03D *1/04*; H02L *7/12*
U.S. Cl. 329—50 15 Claims



1. In a system for detecting information from sources transmitting the information over different bandwidths, a phase locked loop for locking a local oscillator at the same frequency as an information bearing carrier signal, having side bands comprising
a phase detector receiving the carrier signal and a reference signal at the frequency of said local oscillator to produce an output signal indicative of the phase difference between the carrier and the reference signals,
an integrator receiving the output signal from said phase detector,
said integratr including active and passive elements for establishing the time constant of said integrator,
means for changing the time constant of said integrator to select the bandwidth of the system to conform to the bandwidth of the information,
means for varying the frequency of the local oscillator as a function of the output signal from said integrator to minimize the phase difference between the carrier and the reference signal,
means applying the integrator output signal to said means for varying,
means for detecting a loss of the carrier signal, and producing a further signal indicating any of such loss of signal, and
means responsive to said further signal, and including said active and passive elements for sweeping the frequency of said local oscillator through prescribed limits upon detection of a loss of carrier signal.

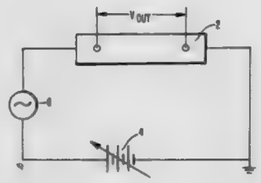
11. A synchronous AM detector comprising
means for generating a local reference signal,
an information containing carrier signal having the same frequency as and in phase quadrature with the reference signal,
a double balanced mixer,
means for applying said signals to said doublebalanced mixer to produce an output signal,
means for eliminating a d.c. component of said output signal of a value indicating phase quadrature of the signals,
a low-pass filter receiving the output signal from said means for eliminating, said filter having an upper frequency limit generally equal to the maximum modulated frequency of the carrier, and
means responsive to an output signal from said lowpass filter to maintain the carrier signal applied to said double-balanced mixer at a substantially constant level.

4,636,737

FREQUENCY MODULATOR AND DEMODULATOR USING MATERIAL HAVING SLIDING CHARGE DENSITY WAVES

Sabyasachi Bhattacharya, Somerville; Aaron N. Bloch, Bridgewater, and James P. Stokes, Flemington, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 634,823, Jul. 26, 1984, Pat. No. 4,580,110. This application Jul. 8, 1985, Ser. No. 752,521
Int. Cl.[4] H03D *3/00*
U.S. Cl. 329—110 5 Claims



1. A method for frequency demodulating a signal comprising:
(a) imposing a direct current voltage across a material which displays sliding of a charge density wave such that said voltage induces a current in the material having direct current and alternating current components wherein said alternating current has a frequency ω_0 which depends on the direct current component, said frequency ω_0 being the same as the carrier frequency of the signal to be demodulated;
(b) applying the signal voltage to be demodulated across said material in series with said direct current voltage; and
(c) obtaining a frequency demodulated signal from said material.

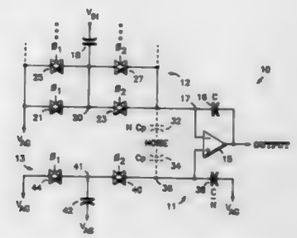
4,636,738

PARASITIC COMPENSATED SWITCHED CAPACITOR INTEGRATOR

Alan L. Westwick, Austin, and Roger A. Whatley, Georgetown, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 3, 1986, Ser. No. 825,373
Int. Cl.[4] H03F *1/08*
U.S. Cl. 330—9 5 Claims

1. In a parasitic compensated switched capacitor integrator for integrating a single input voltage comprising:
a differential amplifier with first and second inputs and an output, for providing an output signal proportional to a differential between first and second input voltage potentials coupled to the first and second inputs, respectively;
feedback capacitance means coupled between the first input and the output of the differential amplifier means and having a first predetermined capacitive value;
switched input capacitance means having an input capacitor with a first electrode coupled to a first voltage terminal and a second electrode;
first switching means coupled to the second electrode of the switched input capacitance means for alternately coupling the input capacitance means between the first input of the differential amplifier and a second voltage terminal, the improvement comprising:



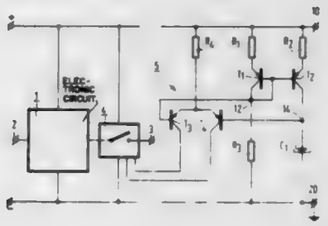
charge compensation means connected between the second input of the differential amplifier and said second voltage terminal, said charge compensation means having a second capacitive value substantially equal to (1/N)th of the first capacitive value, where N is an integer;
discharge means coupled between the second voltage terminal and the charge compensation means, for selectively discharging the charge compensation means; and
second switching means coupled to the first switching means, said second switching means performing substantially the same function as the first switching means and increasing the parasitic capacitance coupled to the first input of the differential amplifier substantially N times.

4,636,739

CIRCUIT FOR REDUCING THE OCCURRENCE OF SPURIOUS SIGNALS ON AN OUTPUT OF AN ELECTRONIC CIRCUIT WHEN THE CIRCUIT POWER SUPPLY IS SWITCHED ON AND OFF

Else C. Dijkmans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 20, 1985, Ser. No. 799,876
Claims priority, application Netherlands, Dec. 17, 1984, 8403820
Int. Cl.[4] H03F *1/00*
U.S. Cl. 330—51 4 Claims



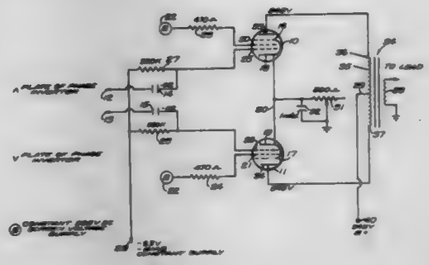
1. A circuit for reducing the occurrence of spurious signals on an electronic circuit during energization and de-energization of a power supply comprising:
a switching device for opening and closing a path from said electronic circuit;
a control circuit for operating said switching device including:
a capacitor connected to one terminal of said power supply;
a current mirror circuit having an input current path and an output current path, said output current path being serially connected with said capacitor and a remaining terminal of said power supply for charging said capacitor, said input current path connected in series with a first resistor and said power supply terminals; and
first and second differentially connected transistors having common emitter connections connected through a common current element to said remaining power supply terminal, a base of said second transistor being connected to a junction formed by said capacitor and output current path, a base of said first transistor being connected to a junction formed by said first resistor, said input current path and an input of said current mirror circuit, at least one of said transistors having a collector connected to operate said switching device.

4,636,740

CONTROL CIRCUIT FOR VARYING POWER OUTPUT OF PUSH-PULL TUBE AMPLIFIERS

Dennis L. Kager, 217 Regina St., Iselin, N.J. 08830

Continuation of Ser. No. 602,735, Apr. 23, 1984. This application Jul. 7, 1986, Ser. No. 883,282
Int. Cl.[4] H03F *3/28*; G10H *3/00*
U.S. Cl. 330—123 8 Claims



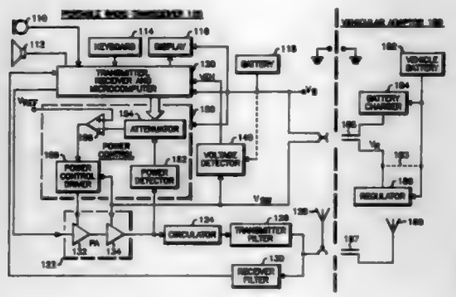
1. An output stage for a power amplifier comprising:
a first vacuum tube comprised of a first plate, a first cathode and a first control grid, said first vacuum tube driving a load through said first plate,
a second vacuum tube comprised of a second plate, a second cathode and a second control grid, said second vacuum tube driving said load through said second plate,
means for biasing said first and second control grids with a negative fixed voltage, and
a variable impedance, responsive to manual adjustment, for selecting the output power of said first and second vacuum tubes, said variable impedance for varying, independently of input or output signals or circuit biasing, the potential at said first cathode of the first vacuum tube and said second cathode of the second vacuum tube between ground and a predetermined voltage level above said ground, and thereby, the conductivity of said first and second vacuum tubes so that any level of output power within a specified range can be selected by said manual adjustment and the tone of an audio signal supplied to said power amplifier can be selectively modified.

4,636,741

MULTI-LEVEL POWER AMPLIFYING CIRCUITRY FOR PORTABLE RADIO TRANSCEIVERS

James E. Mitzlaff, Carpentersville, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 1, 1985, Ser. No. 794,026
Int. Cl.[4] H03F *3/189*
U.S. Cl. 330—127 28 Claims



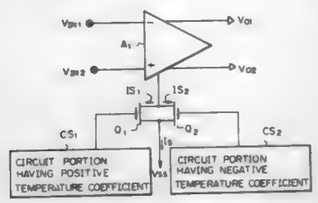
1. Power amplifying circuitry for a radio frequency (RF) signal from a radio transmitter, said power amplifying circuitry comprising:
- means for amplifying the RF signal to produce an output RF signal;
- means for applying to said amplifying means one of first and second supply voltages from separate first and second voltage sources, respectively, said second supply voltage having a magnitude greater than the magnitude of said first supply voltage;
- means coupled to said applying means for selecting one of a first set of levels when said first supply voltage is applied to said amplifying means and one of a second set of levels when said second supply voltage is applied to said amplifying means, said second set of levels including at least one level of greater magnitude than the magnitude of any level of said first set of levels; and
- means coupled to said selecting means and amplifying means for maintaining the output RF signal at said selected one of said first or second sets of levels.

4,636,742

CONSTANT-CURRENT SOURCE CIRCUIT AND DIFFERENTIAL AMPLIFIER USING THE SAME

Atsushi Oritani, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 29, 1984, Ser. No. 665,877
Claims priority, application Japan, Oct. 27, 1983, 58-200045
Int. Cl.[4] H03F *1/30*
U.S. Cl. 330—256 6 Claims



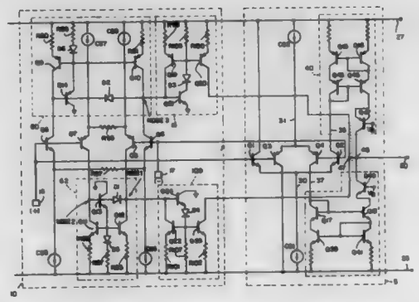
2. A differential amplifier comprising:
- a constant-current source circuit means including
  - a first transistor constant-current circuit means having an output current with a positive temperature coefficient resulting from temperature characteristics of a threshold voltage of the transistors therein,
- a second transistor constant-current circuit means having an output current with a negative temperature coefficient resulting from temperature characteristics of a threshold voltage of the transistors therein, and
- a current synthesizing circuit means connected to said first and second transistor constant-current circuit means and arranged to synthesize output currents of said means in a selected ratio to provide a constant-current source having an output current with a desired temperature coefficient determined by said selected ratio and;
- a pair of differential transistors each having a signal input terminal, a signal output terminal connected to a high-voltage power terminal through a load element, and a third terminal commonly connected to a low-voltage power terminal through said constant-current source circuit.

4,636,743

FRONT END STAGE OF AN OPERATIONAL AMPLIFIER

Gerald M. Cotreau, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 1, 1985, Ser. No. 782,690
Int. Cl.[4] H03F *3/68*
U.S. Cl. 330—295 13 Claims



1. In an amplifier circuit having an input and an output stage, said circuit comprising:
- a small signal amplification means in said input stage for providing an output current in response to a differential input voltage;
- a large signal amplification means connected electrically in parallel in said input stage with said small signal amplification means for providing additional slew current only when the differential input voltage to the parallel circuit reaches a specified value; and
- summing means coupled between the outputs of said small signal amplification means and said large signal amplification means for providing a combined output current to said output stage for said amplifier circuit.

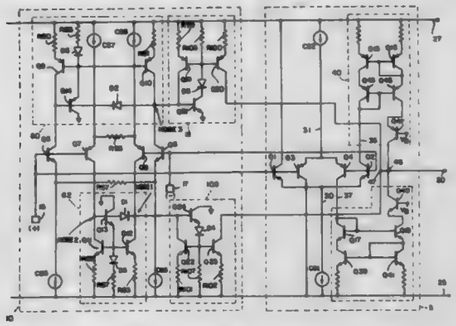
4,636,744

FRONT END OF AN OPERATIONAL AMPLIFIER

Ken R. King, and Celimo P. Hernandez, both of Palm Bay, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Oct. 1, 1985, Ser. No. 782,689
Int. Cl.[4] H03F *3/68*
U.S. Cl. 330—295 19 Claims

1. In an amplifier circuit having an input stage and an output stage, said amplifier circuit comprising:
- a small signal amplification means in said input stage for providing an output current in response to a differential input voltage;
- a large signal amplification means in said input stage connected electrically in parallel with said small signal amplification means for providing additional slew current, wherein said large signal amplification means includes an input means connected to an active load means connected to a high gain current mirror means for providing control over when the additional slew current will be added to the output of said small signal amplification means such that slew current is provided only when said input differential voltage is at least a predetermined value; and
- summing means coupled between the outputs of said small signal amplification means and said large signal amplification means for providing a combined output current to said output stage for said amplifier circuit.

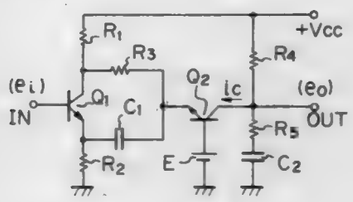


4,636,745

SIGNAL WAVEFORM EQUALIZING CIRCUITRY

Ryuichi Naito, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 26, 1984, Ser. No. 674,666
Claims priority, application Japan, Nov. 24, 1983, 58-221227
Int. Cl.[4] H03F *3/191*
U.S. Cl. 330—304 4 Claims



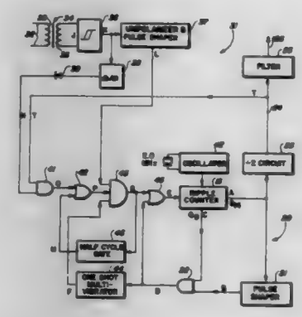
1. A signal waveform equalizing circuit having an overall transfer function which is a multiplication of transfer functions expressed by (1+AS) and (1−BS) respectively (A, B are constants, and S is equal to jω wherein ω is an angular frequency) and a transfer function having an integration function, comprising:
- a first network having the transfer function of (1−BS), which includes a first transistor having a first base for receiving an input signal, a first collector, and a first emitter, a resistor connected to said first collector, a capacitor connected to said first emitter, and a second transistor of common base circuit configuration having a second emitter for receiving signals supplied through both said resistor and said capacitor; and
- a second network made up of passive elements having the transfer function of a multiplication of the transfer function (1+AS) and the transfer function having the integration function, wherein said first and second networks are serially connected.

4,636,746

FREQUENCY LOCK SYSTEM

Francis J. Stiffler, 171 S. Main St., Natick, Mass. 01760

Filed Aug. 26, 1985, Ser. No. 769,471
Int. Cl.[4] H03L *7/08*
U.S. Cl. 331—1 A 20 Claims



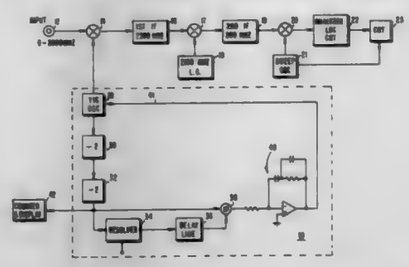
1. A frequency lock system comprising:
- oscillator means providing a switching output voltage that switches between fixed periods in each of first and second states at a given frequency;
- reference means providing a variable reference voltage that periodically varies from and returns to a given voltage level at a predetermined frequency less than ½ said given frequency;
- reference lock means providing a reference pulse of finite width in response to occurrence of said given voltage level;
- oscillator lock means providing a control pulse of finite width a certain period after switching of said output from said first to said second state; and
- reset means for resetting said oscillator means to initiate a new said fixed period thereof at said second state in response to temporal coincidence of said reference and control pulses.

4,636,747

SYSTEM AND METHOD FOR WIDEBAND, CONTINUOUS TUNING OF AN OSCILLATOR

Harold N. Selim, Wichita, Kans., assignor to IFR, Inc., Wichita, Kans.

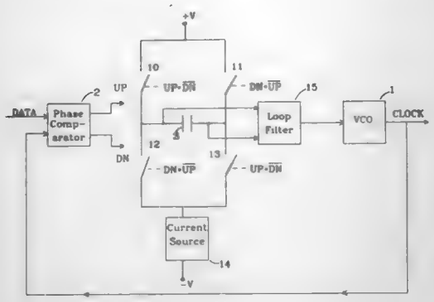
Filed Mar. 11, 1985, Ser. No. 710,309
Int. Cl.[4] H03L *7/02*
U.S. Cl. 331—1 R 16 Claims



1. A system for continuous tuning of an oscillator over its entire operating range by control of a variable phase shift network in a feedback loop around the oscillator, said system providing high-resolution, wideband tuning without discontinuities or loss of phase lock, said system comprising:

(a) an electrically tunable oscillator, said oscillator having a tuning input and an output;
(b) an integrator coupled to said tuning input;
(c) a phase detector, said phase detector having a first input coupled to said oscillator output, an output coupled to said integrator, and a second input; and
(d) a phase shift network coupled between said oscillator output and said second input of said phase detector, said phase shift network including a delay line and phase shift means connected in series with said delay line for providing continuously variable phase shift over a range greater than 360°,
whereby continuous adjustment of said phase shift means enables continuous tuning of said oscillator over its entire operating range.

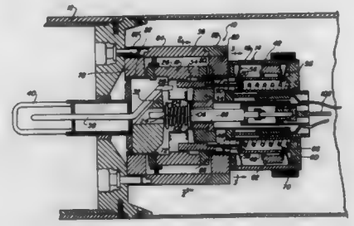
4,636,748
CHARGE PUMP FOR USE IN A PHASE-LOCKED LOOP
Paul W. Latham, II, Marlboro, Mass., assignor to Data General Corporation, Westborough, Mass.
Filed Jan. 26, 1985, Ser. No. 749,156
Int. Cl.⁴ H03L 7/00
U.S. Cl. 331—17 **10 Claims**



1. A charge pump responsive to first and second commands for effecting in a current integrating means a change in voltage proportional to a difference in duration between the first and second commands, the charge pump comprising:
a current source for producing a source current;
a first switching means responsive to the first command for passing the source current through the integrating means in a first direction; and
a second switching means responsive to the second command for passing the source current through the integrating means in a second direction opposite to the first direction.

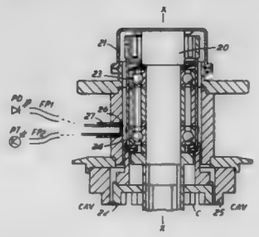
4,636,749
PULSED MAGNETRON TUBE HAVING IMPROVED ELECTRON EMITTER ASSEMBLY
Geoffrey Thornber, Aptos, Calif., assignor to Brunswick Corporation, Skokie, Ill.
Continuation-in-part of Ser. No. 548,203, Nov. 2, 1983, abandoned, which is a continuation-in-part of Ser. No. 362,893, Apr. 19, 1982, abandoned, which is a division of Ser. No. 66,226, Aug. 13, 1979, Pat. No. 4,331,935. This application Aug. 7, 1985, Ser. No. 763,397
Int. Cl.⁴ H01J 25/50
U.S. Cl. 331—90 **2 Claims**

1. A pulsed magnetron tube comprising:
rigid hermetic housing means;
a cathode assembly disposed along the center axis of said housing means; said cathode assembly comprising a directly heated, tightly wound, machined, helical element having a rectangular cross section, said helical element being constructed from 82% dense porous tungsten impregnated with an emissive material comprising a mixture of barium and calcium aluminates;
an anode assembly disposed within said housing means;
means for generating an electromagnetic field at said anode assembly;
means disposed within said housing means for defining the frequency of said electromagnetic field;
tuning means mounted within said housing means for linear



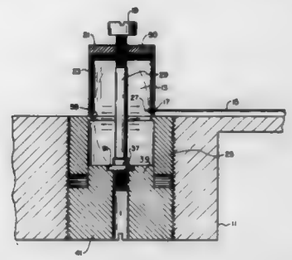
movement to selectively vary said frequency in an oscillatory manner; said tuning means being concentric with said cathode assembly and mounted at the same end of said magnetron tube as said cathode assembly; and
power means disposed exterior to said housing means for exciting said tuning means;
whereby said cathode assembly presents a substantially cylindrical emitting surface having a maximum emitting area and maximum emitting efficiency.

4,636,750
MAGNETRON WITH FREQUENCY SENSOR ARRANGEMENT
Melvin G. England, Sunbury-upon-Thames, England, assignor to Thorn Emi Varian Limited, Hayes, England
Filed Feb. 14, 1986, Ser. No. 829,156
Claims priority, application United Kingdom, Feb. 19, 1985, 8504219
Int. Cl.⁴ H03B 9/10; H01J 25/50
U.S. Cl. 331—90 **7 Claims**



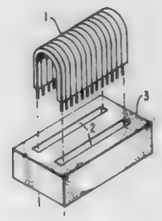
1. A magnetron including a rotatable tuning member and a sensing arrangement, responsive to rotation of the tuning member to provide an indication of the instantaneous magnetron frequency, said sensing arrangement comprising a plurality of markings provided on the tuning member and spaced apart about the axis of rotation thereof,
a detector responsive to movement of the markings past a fixed reference position as the tuning member rotates to generate respective first electrical pulses,
a dividing circuit arranged to divide the period between successive ones of said first electrical pulses into a plurality of sub-periods and to generate respective second electrical pulses,
and an output circuit responsive to said second electrical pulses to generate an electrical output signal related to the instantaneous magnetron frequency.

4,636,751
COAXIAL CAVITY GUNN OSCILLATOR USING PROBE COUPLED MICROSTRIP
Robert E. Horn, Middletown, N.J., and Harold Jacobs, deceased, late of West Long Branch, N.J. (by Lydia S. Jacobs, executrix), assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Dec. 10, 1984, Ser. No. 679,972
Int. Cl.⁴ H03B 7/06
U.S. Cl. 331—96 **3 Claims**



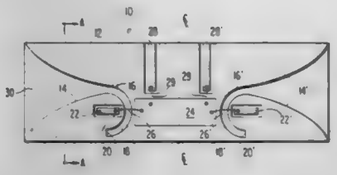
1. A millimeter-wave oscillator apparatus comprising, in combination,
a housing having a variable volume resonating cavity generally cylindrical in shape with an access slot in a cylindrical cavity wall thereof located centrally of the longitudinal dimension of the cavity;
a solid state mechanically tunable element adjustably movable in said housing capable of producing a waveform energy output of a frequency relative to its position in said resonating cavity;
a microstrip transmission line juxtaposed to said resonating cavity;
a probe connected to and extending from said transmission line, through said slot and into said cavity; and
position adjustment means on said mechanically tunable element operably accessible exteriorly of said housing.

4,636,752
NOISE FILTER
Yasuaki Saito, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan
Filed Jun. 10, 1985, Ser. No. 742,968
Claims priority, application Japan, Jun. 8, 1984, 59-85981[U]
Int. Cl.⁴ H03H 7/09
U.S. Cl. 333—12 **3 Claims**



1. A noise filter device, comprising:
a plurality of side-by-side flat cable segments bent in the shape of a U, each cable segment having a lead terminal at opposite free ends thereof so as to define first and second groups of parallel lead terminals, the first and second groups being respectively defined on opposite sides of the U;
a magnetic core having formed therein a first slit and a second slit parallel to said first slit, extending from one side of said core to another side of said core, said cable segments extending through said first slit and said second slit such that said first group of lead terminals project outwardly of said one side of said core from said first slit and said second group of lead terminals project outwardly of said one side from said second slit; and
a casing at least partially surrounding said core, having a bottom located along said one side of said core, said casing having a plurality of individually spaced apart bores of predetermined spacing, respectively guiding each of said lead terminals in spaced relation outwardly of said bottom.

4,636,753
GENERAL TECHNIQUE FOR THE INTEGRATION OF MIC/MMIC'S WITH WAVEGUIDES
Bernard D. Geller, Rockville, and Amir I. Zaghloul, Bethesda, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.
Filed May 15, 1984, Ser. No. 610,537
Int. Cl.⁴ H01P 5/107
U.S. Cl. 333—26 **14 Claims**



1. A microwave transition device for coupling a waveguide and a microwave integrated circuit, said transition device being located within said waveguide for alignment with an electric field having microwave energy, said device comprising: a dielectric substrate having a metallized surface on only one side thereof; a unilateral finline formed in said metallized surface at an end portion of said substrate; a slotline formed adjacent to said finline on said metallized surface and connected to said finline at one end thereof; and a balun positioned proximate to said slotline, said microwave integrated circuit being attached to said metallized surface and connected to said balun, wherein said balun comprises a portion of said slotline equal in length to ¼ of the wavelength of the electric field and a wire bond, passing over said portion of said slotline, and connected at one end to said microwave integrated circuit and at an opposite end to said metallized surface.

4,636,754
HIGH PERFORMANCE INTERDIGITATED COUPLER WITH ADDITIONAL JUMPER WIRE
Adolph Presser, Kendall Park, and Stewart M. Perlow, Marlboro, both of N.J., assignors to RCA Corporation, Princeton, N.J.
Filed Oct. 31, 1984, Ser. No. 666,722
Int. Cl.⁴ H01P 5/18
U.S. Cl. 333—116 **8 Claims**

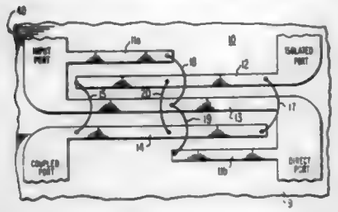
1. In a microstrip interdigitated microwave coupler having an input port, a direct port, a coupled port and an isolated port of the type in which:
said input and coupled ports are at a first longitudinal end of said coupler and said isolated and direct ports are at a second longitudinal end of said coupler,
said input port is diagonally opposite said direct port and is connected thereto by:
a first conductive path including a first conductive strip which extends from said input port, a second conductive strip which extends from said direct port, and a first conductive jumper which interconnects the ends of said first

and second strips which are remote from said ports, said first and second strips having a combined length which is substantially ½ wavelength at a design frequency, and by

a third conductive strip which is substantially ½ wavelength long between said input port and said direct port at said design frequency and to which said first jumper also connects,

said coupled port is diagonally opposite said isolated port and is connected thereto by a second conductive path including:

a fourth conductive strip extending from said isolated port and disposed between said first and third strips,



a fifth conductive strip extending from said coupled port and disposed between said second and third conductive strips,

a second conductive jumper connecting said fourth and fifth conductive stripe near said first end of said coupler, and

a third conductive jumper connecting said fourth and fifth conductive strips near said second end of said coupler,

each of said fourth and fifth conductive strips being substantially ½ wavelength long at said design frequency,

the improvement comprising:

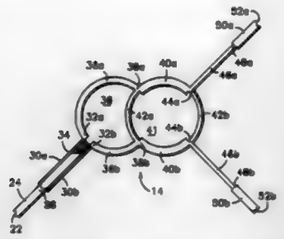
a fourth conductive jumper connecting said fourth and fifth strips at substantially the same longitudinal distance from said input port as said first conductive jumper connects to said first and second strips.

4,636,755

HIGH-RATIO, ISOLATED MICROWAVE BRANCH COUPLER WITH POWER DIVIDER, PHASE SHIFTERS, AND QUADRATURE HYBRID

Terry L. Gibbs, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 26, 1984, Ser. No. 634,855
Int. Cl.[4] H01P *5/12*
U.S. Cl. 333—116 7 Claims



1. A microwave coupler for converting an input signal into first and second equal-phase output signals having a predetermined power ratio between the output signals, said coupler comprising:

means for splitting the input signal into a first intermediate signal at a first port thereof and a second intermediate signal at a second port thereof wherein each of the first and second intermediate signals exhibits a phase and a power level equal to a phase and a power level, respectively, exhibited by the other of the first and second intermediate signals;

means for attenuating out-of-phase components of the first and second intermediate signals, said attenuating means having first and second ports coupled to the first and second ports, respectively, of said splitting means;

a microstrip phase shifter having a first conductive strip with first and second ports and a second conductive strip with third and fourth ports, the first and third ports of said phase shifter being coupled to the first and second ports, respectively, of said splitting means, and the first and second strips of said phase shifter having a difference in length which approximately equals:

$\lambda/4-(\lambda/\pi)\arctan(\sqrt{P_r})$, wherein λ represents the wavelength of the input signal, and P_r represents the predetermined power ratio between the output signals; and

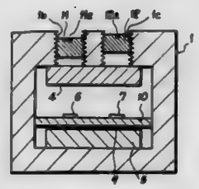
a quadrature hybrid having a first port coupled to the second port of said phase shifter, a second port coupled to the fourth port of said phase shifter, a third port for producing the first output signal, and a fourth port for producing the second output signal.

4,636,756

APPARATUS FOR VARYING THE MAGNETIC FIELD FOR A MAGNETIC RESONANCE ELEMENT

Seigo Ito, Tokyo, and Yoshikazu Murakami, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 27, 1985, Ser. No. 769,896
Claims priority, application Japan, Aug. 30, 1984, 59-180941
Int. Cl.[4] H01P *1/218, 1/203*
U.S. Cl. 333—202 3 Claims



1. A magnetic apparatus comprising a magnetic yoke having a gapped portion therein, a magnet mounted on said magnetic yoke and forming a substantially uniform magnetic filed in said gapped portion, a plurality of magnetic resonance elements located in said magnetic field formed by said magnet, and adjusting means for independently varying the magnetic reluctance to selected values between said magnetic yoke and said magnet for each of said magnetic resonance elements and said adjusting means mounted at positions opposing each of said magnetic resonance elements.

4,636,757

MICROSTRIP/SLOTLINE FREQUENCY HALVER

Robert G. Harrison, and Grigorios A. Kalivas, both of Ottawa, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

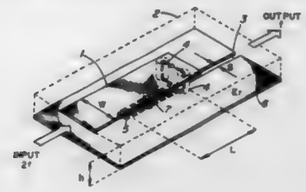
Filed Sep. 5, 1985, Ser. No. 772,910
Claims priority, application Canada, Mar. 7, 1985, 476019
Int. Cl.[4] H01P *1/20*
U.S. Cl. 333—218 14 Claims

1. A broadband microstrip/slotline microwave frequency divider comprising:

(a) a dielectric substrate, bearing upon its first surface a microstrip line open-circulated at one end and upon its second surface a ground plane in which is formed a slotline short-circuited at one end;

(b) a region of said substrate wherein said microstrip line and said slotline overlap each other thereby defining an overlap region;

(c) an even number of matched microwave varactor diodes, each of said diodes having a first terminal and a second terminal, said diodes being symmetrically and operatively disposed in such a way that the first terminal of each of said diodes is connected to said microstrip line and the second terminal of each of said diodes is connected to said ground plane near an edge of said slotline, the combination of the nonlinear reactances of said varactor diodes



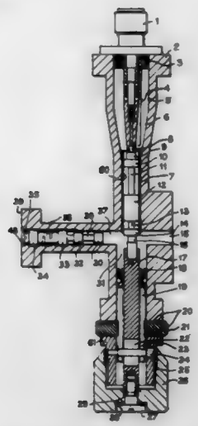
and said overlap region forming a parametric subharmonic resonator wherein the nonlinear charge-voltage characteristics of the varactor diodes mediates the transfer of energy from an input signal at frequency 2f entering via said microstrip line to an output signal at frequency f exiting via said slotline.

4,636,758

FREQUENCY MULTIPLIER FOR MILLIMETER WAVES HAVING MEANS FOR ADJUSTING HARMONIC FREQUENCY

Isaac Mettoudi, Levallois Perret, France, assignor to Alcatel Thomson Faisceaux Hertziens, Levallois Perret, France

Filed Jan. 16, 1985, Ser. No. 692,051
Claims priority, application France, Jan. 27, 1984, 84 01288
Int. Cl.[4] H03B *19/00*
U.S. Cl. 333—218 4 Claims



1. A frequency multiplier for millimeter waves comprising:

a coaxial input, having a central conductor connection an an outer conductor connection, for receiving an incident signal, the frequency of which is to be multiplied;

a low-pass filter of the impedance transformer type for filtering and impedance matching, having a filter input and a filter output, said filter input being coupled to said coaxial input and having a pass-band exceeding said frequency to be multiplied and less than a predetermined maximum value of multiplied frequency;

a rectangular waveguide having a pair of greater sides and a pair of lesser sides and having a first end constituting an output of said multiplier and a second end at least partially closed by a short-circuiting piston;

a cylindrical cavity located in a first one of said greater sides of said wave guide, having a cylindrical wall and having an axis perpendicular to said greater wave guide sides, said axis lying in a median plane of said wave guide parallel to said lesser sides thereof;

a semiconductor diode located on said axis;

an elongate diode carrier for said diode coaxially disposed within said cavity and to which one terminal of said diode is connected, said diode having a second terminal connected with said filter output connection of said impedance transforming low-pass filter, said filter output connecting being seated in an orifice centered on said axis and provided in a second one of said greater wave guide sides;

means for setting said diode carrier in an adjustable position on said axis, said setting means including a rotary control for adjusting said position along said axis;

means for preventing said diode carrier from rotating about said axis during operation of said rotary position control

an annular piston coaxially located between said diode carrier and the cylindrical wall of said cavity and slidably mounted for displacement in axial direction for tuning said cavity at a desired multiple of said incident signal frequency, said diode carrier having a cylindrical outer surface over a length of said carrier leading away from said diode for accommodating a sliding movement of said annular piston, said annular piston being provided with means for preventing rotation of said piston about said axis and means for adjusting the position of said piston in the axial direction, and having at its extremity nearer to said wave guide, inner and outer flexible crowns split in radial planes by slots to assure circumferential distribution of sliding contact pressure, said inner flexible crown providing for axially sliding contact with said diode carrier and said outer crown providing for axially sliding contact with said cavity wall and

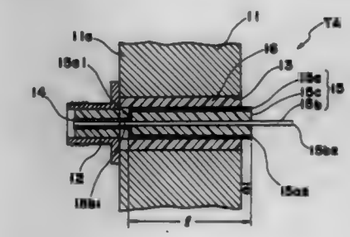
a lengthwise-elastic connecting device for connecting said center conductor connection of said coaxial input to said filter input regardless of any axial adjustment of the position of said diode while maintaining substantially constant impedance for microwave transmission along its length, said connecting device incorporating a bellows for length variation, being at least partly hollow and having therewithin a helical spring urging length extension of said device.

4,636,759

ELECTRICAL TRAP CONSTRUCTION

Youhei Ishikawa, Kyoto; Tadahiro Yorita, Kanazawa, and Sadao Yamashita, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 21, 1985, Ser. No. 714,380
Claims priority, application Japan, Mar. 30, 1984, 59-47254[U]; Apr. 13, 1984, 59-55160[U]; Aug. 9, 1984, 59-122461[U]
Int. Cl.[4] H01P *7/04, 1/202, 5/00*
U.S. Cl. 333—223 16 Claims

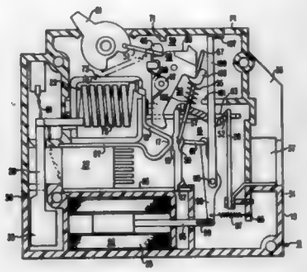


1. An electrical signal trap device for trapping signals having a selected frequency, comprising:

(a) a connector having a body adapted for attachment to a

panel or the like and core pin means mounted within said connector body and insulated therefrom; and
(b) cable means including an outer conductor, a core conductor, and a dielectric member provided between said outer conductor and said core conductor,
(c) said outer conductor and said core conductor of said cable means being conductively connected to said core pin means of said connector, and
(d) a portion of said outer conductor projecting clear of said panel so as to be trimmable for changing said selected frequency.

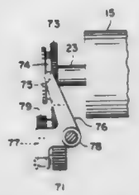
4,636,760
LOW VOLTAGE CIRCUIT BREAKER WITH REMOTE SWITCHING FUNCTION
Anthony Lee, Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Apr. 10, 1985, Ser. No. 721,620
Int. Cl.⁴ H01H *75/00, 77/00, 83/00*
U.S. Cl. 335—14 **7 Claims**



1. A circuit breaker for use in remote load energy management systems, comprising:
an insulating housing having line and load terminals;
separable contact means including a stationary contact and a movable contact member disposed in the housing to form a circuit breaker path between the terminals;
manual actuating means within the housing for operating the circuit breaker and including an operating lever for opening and closing the contacts;
electromagnetic means including a plunger for opening the movable contact and energizable by an electric current from a source remote from the circuit breaker;
the electromagnetic means including connector means between the electromagnetic means and the movable contact;
the electromagnetic means including recoil means for retracting the plunger upon deenergization of the electromagnetic means;
the operating lever being positioned to prevent closing of the contacts upon deenergization when the manual actuating means is in an open-contact position;
the movable contact comprising a first lever pivotally mounted for movement between open and closed positions of the stationary contact; and
the connector means including a second lever connected between the plunger and the first lever.

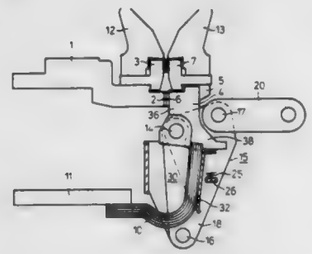
4,636,761
HIGH RELIABILITY SOLENOID SWITCH
Peter J. Caruso, Wayne, and Robert R. Townsend, Towaco, both of N.J., assignors to Allied Corporation, Morristown, N.J.
Continuation-in-part of Ser. No. 526,850, Aug. 26, 1980, Pat. No. 4,502,030. This application Dec. 21, 1984, Ser. No. 684,832
Int. Cl.⁴ H01H *51/08*
U.S. Cl. 335—140 **14 Claims**

1. Switching assembly having at at least one make-or-break connection, which is switchable between a first status and a second status in response to electrical signals, characterized by:
(a) switch operator means;
(b) a slideable contact carrier, the status of the make-or-break connection being controlled by a reciprocal movement of the contact carrier, the contact carrier being connected to the switch operator means so that a force from the switch operator means biases the contact carrier to effect said movement;



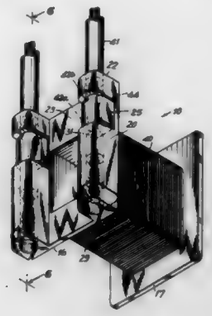
(c) the contact carrier having at least one shorting bar to establish said make-or-break connection, the shorting bar having a circular cross-section;
(d) a ratcheting mechanism connected to the contact carrier and responsive to the reciprocal movement of the contact carrier; and
(e) the ratcheting means including means to cause the contact carrier to be rotated by a predetermined amount for each complete reciprocal movement of the contact carrier.

4,636,762
CONTACT ASSEMBLY HAVING A CURRENT-DEPENDENT FORCE INCREASING THE CONTACT FORCE
Ulrich Marquardt, and Ralf Seebold, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany
Filed Aug. 28, 1985, Ser. No. 770,534
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1984, 3432086
Int. Cl.⁴ H01H *3/00*
U.S. Cl. 335—195 **10 Claims**



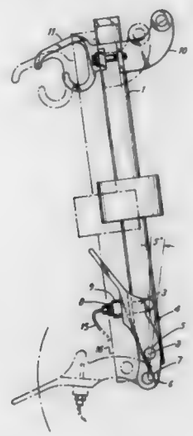
1. A contact assembly for an electrical circuit breaker, comprising: a contact lever, a linkage, a fixed bearing, an articulate lever support which can be swivelled by the linkage around the fixed bearing for on- and off switching, a contact spring mounted between the contact lever and the lever support wherein a circuit-generated current-dependent force is conducted into the contact lever increasing its contact force, and a pressure lever adapted to conduct the current-dependent force into the contact lever, said pressure lever being swivel-mounted onto the lever support independently of the contact lever so that it increases the contact force only in conjunction with the contact lever.

4,636,763
BOBBIN WITH STRAIN RELIEF
Elmer J. Nabstedt, Montvale, N.J., and Raymond H. Van Wagener, Darien, Conn., assignors to Universal Manufacturing Corporation, N.J.
Filed Mar. 12, 1985, Ser. No. 710,982
Int. Cl.⁴ H01C *15/10, 41/04*
U.S. Cl. 336—192 **20 Claims**



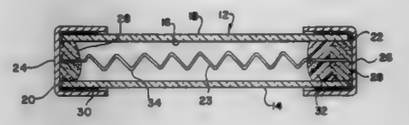
1. A bobin and winding for use in an inductive device, comprising a core surrounded by a coil of wire; strain relief means attached to said core, said strain relief means comprising a first section and a second section spaced from said first section, locking means fitting in the space between said first and second sections, said first and second sections having colinear bores forming passageways through which a lead wire passes, said locking means being movable with respect to said lead wire and a surface between said first and second sections for both (1) engaging the lead wire, and (2) setting the portion of the lead wire it engages off of the colinear axis of the passageways.

4,636,764
AUTOMATIC SECTIONALIZER
Geoffrey R. Mee, Kegworth, and Philip Rosen, West Bridgford, both of England, assignors to Brush Fusegear Limited, Leicestershire, England
Filed Jul. 18, 1985, Ser. No. 756,173
Claims priority, application United Kingdom, Jul. 18, 1984, 8418342
Int. Cl.⁴ H01H *71/10, 71/20*
U.S. Cl. 337—169 **9 Claims**



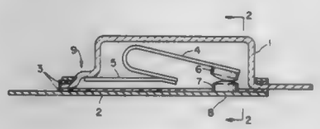
1. An automatic sectionaliser comprising a carrier tube, a toggle having a pivotal mount, a pivotal connection between said toggle and said carrier tube with said toggle supporting said carrier tube for movement between a loaded position and an isolating position, the relationship between said pivotal mount and said pivotal connection being one wherein said carrier tube is held in an over-center position when in said loaded position, and an actuator carried by said toggle for effecting relative pivoting between said toggle and said carrier tube and to cause said carrier tube to be displaced from said loaded position towards said isolating position, said actuator including an actuator body and a pin normally lying within said actuator body, and actuator means within said actuator body operable on said pin to eject said pin from said actuator body with said pin being operable on said carrier body.

4,636,765
FUSE WITH CORRUGATED FILAMENT
David J. Krueger, Arlington Heights, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.
Filed Mar. 1, 1985, Ser. No. 705,901
Int. Cl.⁴ H01H *85/38, 85/04*
U.S. Cl. 337—273 **9 Claims**



1. A fuse comprising an outer tube of insulating material having an inner and an outer wall surface and forming a fuse housing, a pair of conductive fuse terminals at opposite axial ends of and secured to said tube, a meltable fuse element disposed within and extending substantially completely between the ends of said fuse housing, each fuse element end being eletrically and physically directly connected with the adjacent fuse terminal by solder or the like which does not form a seal at the end of the housing involved, and a body including a plug of initially solid, arc-quenching material in said housing which extends along and seals a limited axial extent of said housing to one side of the portion of the fuse wire where the fuse element is expected to blow, the other side of the housing interior remaining unsealed to serve a pressure relief function, said arc-quenching material evaporating under fuse blowing conditions to substantially fill the portions of the housing interior where an arc can develop with an arc-quenching vapor of such material.

4,636,766
MINIATURIZED CIRCUIT BREAKER
Douglas C. Carbone, Wells, and Philip J. Dennis, Cumberland, both of Me., assignors to GTE Products Corporation, Stamford, Conn.
Continuation of Ser. No. 533,184, Sep. 19, 1983, Pat. No. 4,521,760. This application Feb. 19, 1985, Ser. No. 703,064
Int. Cl.⁴ H01H *37/12*
U.S. Cl. 337—368 **1 Claim**



1. In a circuit breaker comprising a two piece metal enclosure, the two metal pieces thereof being electrical terminals and being insulated from each other, one of the metal pieces being a base and the other being a cover, the cover having a

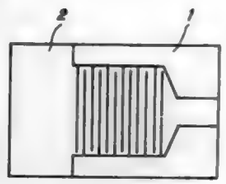
step at one end thereof, the step having an outer edge; and a PMB bimetal disposed within the enclosure, the PMB bimetal comprising a cantilever section and U shaped segment, the U shaped segment having a short leg and a long leg, one end of the cantilever section being fastened to the step, and the other end of the cantilever section being fastened to the short leg of the U shaped segment, and a contact fastened to the long leg of the U shaped segment for making electrical contact with a fixed contact fastened to the base, the method of decreasing the opening time of the circuit breaker by applying pressure to the outer edge of the step by means of a probe in order to slightly deform the metal cover and rock the PMB bimetal.

4,636,767

MIXED SEMICONDUCTOR FILM DEVICE FOR MONITORING GASES

William R. Barger, Fort Washington; Neldon L. Jarvis, Joppa, both of Md.; Arthur W. Snow, Alexandria, and Henry Wohltjen, Burke, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 21, 1985, Ser. No. 768,004
Int. Cl.[4] G01N *27/04*; H01C *13/00*
U.S. Cl. 338—34 7 Claims



1. A device for detecting vapors comprising:
a substrate;
electrodes placed upon the substrate; and
an ordered, semiconductive film, placed such that electricity may flow from one electrode to another through the film;
wherein the film contains stearyl alcohol as a first component of substituted phthalocyanine in which the substituents are connected to the phthalocyanine ring with ether linkages; and
wherein the film further contains a second component which promotes the formation of Langmuir-Blodgett films.

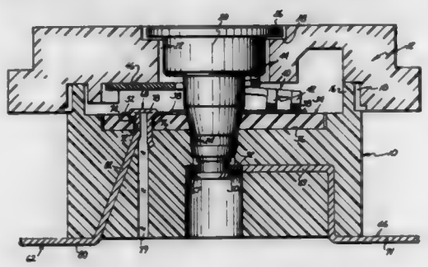
4,636,768

COMPRESSION CONNECTION FOR POTENTIOMETER LEADS

Donald R. Hagen, Brooklyn Center, Minn., assignor to Resistance Technology, Inc., Minneapolis, Minn.

Filed Oct. 4, 1985, Ser. No. 784,331
Int. Cl.[4] H01C *1/012*
U.S. Cl. 338—312 4 Claims

1. A variable resistor assembly comprising:
a molded insulating base;
a plate of insulating material disposed on said base, the plate having a resistance element thereon and an aperture through the plate adjacent the resistance element;
a sliding contact in conductive engagement with the resistance element;
means for moving the sliding contact with respect to the resistance element; and
a terminal element having first and second end portions and an intermediate portion integral with the end portions, the intermediate portion being molded into the molded base, the first end portion of the terminal element extending outwardly from the insulating base for connection to another circuit element, and the second end portion extending through the aperture in the plate and including two spaced-apart segments within the aperture and an intermediate segment, said end portion being compressed to distort the spaced-apart segments into conductive engagement with the resistance element and to force the two spaced-apart segments outwardly into engagement with the wall of the aperture.

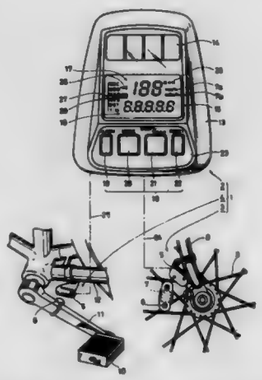


4,636,769

DATA DISPLAY UNIT FOR A BICYCLE

Seidaharu Tsuyama, Osaka, Japan, assignor to Tsuyama Mfg. Co., Ltd., Japan

Filed Jan. 18, 1985, Ser. No. 692,847
Claims priority, application Japan, Jan. 20, 1984, 59-6734[U]
Int. Cl.[4] G01P *3/48*, *3/54*; B62J *3/00*, *6/00*
U.S. Cl. 340—134 7 Claims



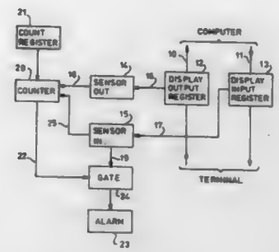
1. A running data display unit for a bicycle, comprising:
wheel revolution detecting means located in association with a wheel of a bicycle in a manner in which no load is applied to said wheel, said wheel revolution detecting means providing pulses signal according to the number of revolutions of said wheel;
running data calculating means coupled to said revolution detecting means, by which running data including the running speed, the running distance, the average speed, and the maximum speed of a bicycle are calculated based on said pulses signal provided from said revolution detecting means;
running data calculation start and stop selecting means coupled to said running data calculating means for starting or stopping the calculation of running data by said running data calculating means;
liquid crystal display means coupled to said running data calculating means for selectively displaying the running data calculated by said running data calculating means, a pulse mark for representing application of pulse signal adapted to be displayed on said liquid crystal display means,
pulse mark display winking means coupled to said running data calculating means and said liquid crystal means, by which selection is made to turn on and off the light in said pulse mark alternately upon receipt of said pulse signal by said running data calculating means, and
power supply means for applying energy to said running data display unit.

4,636,770

DISPLAY TERMINAL

Paul H. Jackson, Winchester, United Kingdom, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1984, Ser. No. 586,608
Claims priority, application European Pat. Off., Mar. 31, 1983, 83301869.0
Int. Cl.[4] G08S *1/00*
U.S. Cl. 340—309.4 3 Claims



1. In a display terminal coupled to a computer and including a plurality of devices for interactive communication with the computer, said devices including means for signalling a user interrupt to said computer, an apparatus for signalling to the user when the computer responds to a user interrupt, the apparatus comprising a timer arranged to measure a specified period of time, means triggered by the generation of an interrupt to cause the timer to begin measurement of the said specified period of time, and means triggered by a computer response to the interrupt to provide an audible signal only when the period of time between the generation of the interrupt and the computer response exceeds the specified period of time measured by the timer.

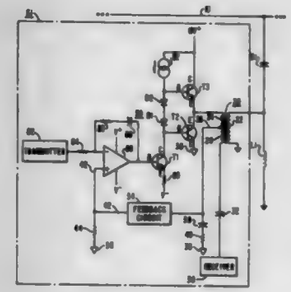
4,636,771

POWER LINE COMMUNICATIONS TERMINAL AND INTERFACE CIRCUIT ASSOCIATED THEREWITH

Garrold W. Ochs, Nokesville, Va., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 10, 1984, Ser. No. 680,211
Int. Cl.[4] H04M *11/04*, *11/08*
U.S. Cl. 340—310 CP 10 Claims

1. A power line interface circuit coupled between a power line and a communications terminal for providing high bridging impedance to communication signals present on said power line without impeding substantially the transmission and reception communication signals of said terminal, said interface circuit comprising:
means for coupling communication signals between said power line and said communications terminal;
means for measuring the communication signals present on said power line from said coupling means; and
means governed by said measured communication signals to generate matched signals, representative of said measured communication signals, which are applied to said coupling means to effect high bridging impedance to said communication signals present on said power line without impeding



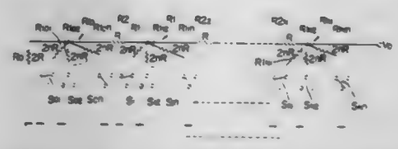
substantially the transmission and reception communication signals of said terminal.

4,636,772

MULTIPLE FUNCTION TYPE D/A CONVERTER

Soichiro Yamaga, Kawasaki, Japan, assignor to Riken Denshi Co. Ltd., Kawasaki, Japan

Filed May 22, 1985, Ser. No. 737,022
Claims priority, application Japan, Jan. 17, 1985, 60-4961
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 DA 1 Claim



1. A multiple function type D/A converter comprising a terminating resistor having a resistance value 2R of which one terminal is connected to ground; a series resistance circuit consisting of a plurality of resistors equal in number to N, each having a resistance value R, connected in series between an output voltage terminal and the other terminal of said terminating resistor, said series circuit including N+1 number of resistor connecting points between each adjacent pair of N resistors and the terminating resistor and the adjacent N resistor; branching in parallel from said series circuit N+1 number of groups of n number of parallel resistors, each having a resistance value 2nR, the n resistors of each such group being all connected on one side to the same resistor connecting point with different groups thereof connected to different connecting points along such series circuit, the n resistors of each such group being individually switchable on the other side alternately between ground and a reference voltage by means of corresponding groups of switching circuits under the control of applied digital signals, N and n each being an integer at least equal to 2.

4,636,773

BINARILY WEIGHTED PULSE WIDTH DIGITAL-TO-ANALOG CONVERTER

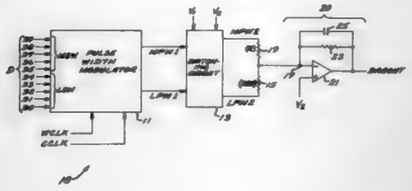
Dan E. Lewis, Mission Viejo, and James L. Gunderson, Laguna Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 25, 1985, Ser. No. 801,539
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 DA 13 Claims

1. A digital-to-analog converter for converting a digital input signal having parallel words, each word including a sign bit and N magnitude bits which include multi-bit groups of

weighted significance, and which is provided at an input word rate of W Hz, comprising:

pulse generating means responsive to the sign bit and to a first and a second multi-bit group of the N magnitude bits for providing (a) a first pulse modulated signal having pulse widths and levels as a function of the sign bit and the value of the first multi-bit group and (b) a second pulse modulated signal having pulse widths and levels as a function of the sign bit and the value of the second multi-bit group, said first pulse modulated signal including a first predetermined pulse for a first value of the sign bit or a



second predetermined pulse for a second value of the sign bit;

means for weighting said first and second pulse modulated signals as a function of the relative weighted significance of the first and second multi-bit groups; and

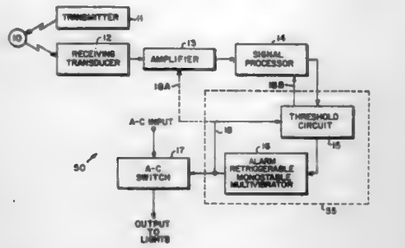
means for summing and filtering said weighted signals to provide an analog output signal which as a result of said first and second predetermined pulses includes distinct outputs for (a) an input word having said first sign bit value and magnitude bits that are all 0's and (b) an input word having said second sign bit and magnitude bits that are all 0's.

4,636,774

VARIABLE SENSITIVITY MOTION DETECTOR

Aaron A. Galvin, Lexington; James B. Edson, Concord, and John K. Guscott, Lynnfield, all of Mass., assignors to American District Telegraph Company, New York, N.Y.

Filed Nov. 8, 1983, Ser. No. 549,987
Int. Cl.[4] G08B *13/00*; G10K *11/00*
U.S. Cl. 340—565 **9 Claims**



8. A motion detection system for providing an output signal in response to detection of entry and continued motion in an area under surveillance, said system comprising:

a single sensor for providing sensor signals in response to sensed motion in the area;

a first circuit selectively providing a higher threshold level and a lower threshold level, and operative at the higher threshold level to detect sensor signals exceeding the higher threshold level and representing initial entry motion in the area, and operative at the lower threshold level to detect sensor signals exceeding the lower threshold level and representing continued motion in the area;

a second circuit operative in response to signals from the first circuit for providing an output signal;

the first circuit being operative in response to the output signal from the second circuit to reduce the threshold level to the lower level and in the absence of the output signal to provide the upper threshold level;

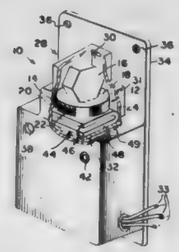
the second circuit being operative to provide the output signal for so long as signals are received from the first circuit and for a predetermined period of time thereafter.

4,636,775

SENSOR FOR AN ALARM SYSTEM

James P. Burgess, Camarillo; John C. Echols, Ventura, and Thomas A. Walker, Summerland, both of Calif., assignors to Essex-Tec Corporation, Carpinteria, Calif.

Filed Apr. 12, 1984, Ser. No. 599,720
Int. Cl.[4] G08B *13/00*
U.S. Cl. 340—566 **16 Claims**



1. A sensor for initiating operation of an alarm for signaling unauthorized interference with an object, said sensor comprising:

piezoelectric material operable in response to vibration thereof to generate a voltage;

deflectable substrate means supporting said piezoelectric means, said substrate means having a flat, upper surface;

a sensing mass carried by said flat, upper surface of said substrate means for movements relative thereto in each of three orthogonal planes, said sensing mass having a flat face, for seating on said flat upper surface, which flat face has an area substantially smaller than the area of the largest horizontal cross section of said sensing mass;

whereby the weight of said sensing mass upon said upper surface is concentrated thereon under the smaller area of said flat face;

said sensing mass being operable to deflect said substrate and vibrate said piezoelectric means in response to relative movement between said sensing mass and said substrate means in any of said planes;

voltage sensitive means for coupling said piezoelectric material to an alarm circuit for energizing the latter in response to the generation of a voltage of predetermined threshold value by said piezoelectric means; and

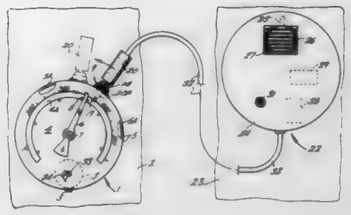
a housing having walls defining a chamber in which said sensing mass is accommodated, said chamber having a size larger than that of said mass thereby enabling said mass to move relative to said substrate means, said chamber having a size which prevents extreme motion of said mass relative to said substrate means, thereby ensuring that the rest position of said sensing mass is in operative relationship with said substrate means.

4,636,776

ALARM SYSTEM FOR SPACE HEATING APPLIANCES

Roger M. Leaming, 2309 Don St., Springfield, Oreg. 97477

Filed Apr. 15, 1985, Ser. No. 723,333
Int. Cl.[4] G08B *17/06*
U.S. Cl. 340—594 **2 Claims**



1. An alarm system for signaling the presence of excessive surface temperatures in a fuel burning appliance, said system comprising,

a sensor assembly including a housing having an annular outer wall, a bimetallic coil having a radially outwardly turned end segment, a terminal assembly adjustably mounted on the housing outer wall and including a set point marker and a contact for location in a path of travel of said end segment of the coil and contactible by said coil end segment and through which an electrical circuit is established upon expansion of the coil during an increase in the surface temperature of the appliance, a pointer rotatably mounted on the housing and including a plate defining an opening through which said coil end segment passes in an unrestricted manner for imparting movement to the pointer without obstructing coil expansion,

a signal generator unit including a second housing for remote disposition from the sensor assembly, a signal generator, a power source, and

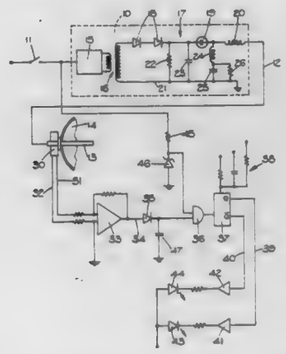
conductor means in circuit with said terminal assembly and said signal generator unit to activate the signal generator upon closure of the terminal assembly contact.

4,636,777

MONITORING ARRANGEMENT FOR A GAS TURBINE SPARK IGNITION SYSTEM

Robert C. Sherritt, Bulkington, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed May 2, 1984, Ser. No. 606,241
Claims priority, application United Kingdom, May 11, 1983, 8312965
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—635 **7 Claims**



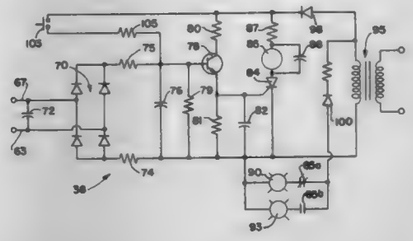
1. An arrangement for monitoring operation of a spark ignition system in which the spark discharge current oscillates at a known frequency to determine when that system is operating properly, said arrangement comprising a sonic transducer for acoustic coupling to a spark igniter in said system, said sonic transducer producing a transducer signal for all acoustic signals detected thereby, a detecting circuit having output signal generating means for providing an output signal in response only to transducer signals from said transducer at frequencies substantially equal to that of said discharge current, said detecting circuit including a bandpass filter connected to said sonic transducer to receive said transducer signals therefrom and which activates said output signal generating means to generate said output signal only for transducer signals from said sonic transducer which are within a frequency range corresponding to that of said discharge current, and indicating means connected to said detecting circuit and responsive to said output signal from said detecting circuit, means for providing a first signal when an energizing voltage is applied to said spark ignition system, and gating means for providing a second signal to said indicating means only in the presence of said first signal and of a signal from said bandpass filter.

4,636,778

BRUSH WEAR MONITOR

William M. Corkran, University Heights; Herbert A. Koeth, Mentor-on-the-Lake, and L. James Pugsley, Rocky River, all of Ohio, assignors to Reliance Electric Company, Cleveland, Ohio

Filed Oct. 3, 1983, Ser. No. 538,181
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—648 **3 Claims**



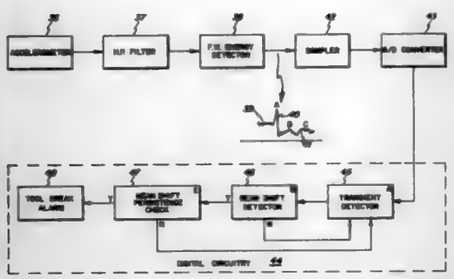
1. A system for monitoring brush wear in dynamoelectric machines comprising a brush having sensor means for providing electrical signals indicating a predetermined amount of brush wear, power supply means separate from said electrical signals from said sensor means, first indicator means, first switch means for connecting said first indicator means to said power supply means in the absence of a signal from said sensor means, second indicator means, second switch means for maintaining said second indicator means disconnected from said power supply means in the absence of a signal from said sensor means, means responsive to a signal from said sensor means for actuating said first and second switch means, and means connected to said power supply means for providing a signal to said signal responsive means to simulate the receipt of a signal from said sensor means to test the operation of said first and second indicator means, said first and second switch means and said signal responsive means.

4,636,779

ACOUSTIC DETECTION OF TOOL BREAK EVENTS IN MACHINE TOOL OPERATIONS

Charles E. Thomas, Scotia; William S. Yerazunis, Troy; Joseph W. Erkes, Albany, and Minyoung Lee, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 24, 1984, Ser. No. 664,189
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.
Int. Cl.⁴ G08B 21/00
U.S. Cl. 340—680 **10 Claims**



1. A machine tool monitor for detecting cutting tool break events while machining a workpiece comprising:

a broadband vibration sensor which generates an electrical signal representing vibrations at the tool-workpiece interface;

analog signal processing means including a high-pass filter to attenuate lower frequency machinery noise, and a full wave energy detector to rectify and low-pass filter said signal;

means for sampling the unipolar output signal of said analog processing means and converting each sample to digital form; and

digital circuitry comprising means for comparing every sample with the running mean signal level of a given number of previous samples to detect the presence of a positive-going signal transient that may indicate a tool break event, means for comparing the mean signal level after and before said transient to detect a shift in mean level and a substantial change in background cutting noise, and means for generating a tool break alarm when the shift in mean level persists for a preselected period.

4,636,780

ACOUSTIC MONITORING OF CUTTING CONDITIONS TO DETECT TOOL BREAK EVENTS

Charles E. Thomas, Scotia; Minyoung Lee, Schenectady; James F. Bedard, Schenectady, and Steven R. Hayashi, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 24, 1984, Ser. No. 664,188
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.
Int. Cl.⁴ G08B 21/00
U.S. Cl. 340—680 **12 Claims**

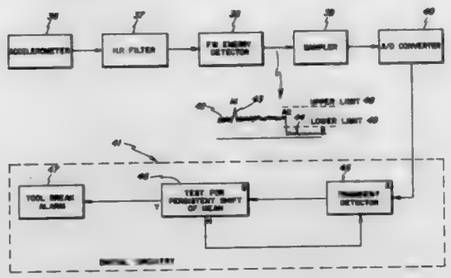
1. A system for detecting cutting tool break events while machining a workpiece comprising:

a broadband vibration sensor which generates an electrical signal representing vibrations at the tool-workpiece interface;

an analog preprocessor including means to discriminate against lower frequency machinery noise and to detect the signal energy in an acoustic frequency band below 100 KHz;

means for sampling the unipolar output signal of said analog preprocessor and converting each sample to a digital value; and

digital pattern recognition circuitry to detect changes in cutting conditions due to tool break events that can cause damage, comprising means for calculating the running mean signal level of a selected number of samples, means for comparing each sample with the running mean to



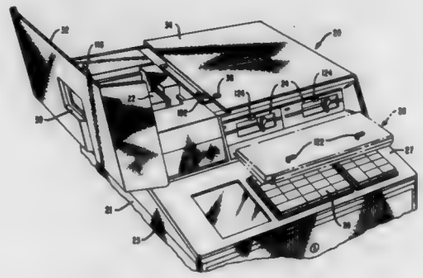
search for an abrupt transient increase or decrease in sample signal level resulting from a substantial change in cutting noise, and means for comparing the mean signal level after detection of an abrupt change with that before detection and generating a tool break alarm when the shift in mean and change in cutting noise persists for a minimum confirmation period.

4,636,781

HOUSING FOR DATA TERMINAL DEVICE

David C. Wills; Donald E. Landis, and Dale R. Lyons, all of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Jan. 27, 1985, Ser. No. 749,358
Int. Cl.⁴ G05G 1/00
U.S. Cl. 340—700 **19 Claims**



1. A processing terminal including a printer, a keyboard and a disk drive memory unit comprising:

a housing structure having a first portion enclosing the printer and the disk drive memory unit and a second portion enclosing the keyboard, said first portion including a movable cover member covering the top of the printer when in a closed position;

a display member movably coupled to the second portion of the housing structure adjacent the front side of the disk drive memory unit for movement between a viewing and open position, said display member covering the front side of the disk drive memory unit when in a viewing position;

and locking means engaging said cover member and said display member to lock said cover member when the cover member is in a closed position and said display member when the display member is in a viewing position, said locking means adapted to be moved through a first predetermined distance releasing said cover member for movement to a position exposing the printer and through a second predetermined distance releasing said display member to a position exposing the front side of the disk drive memory unit.

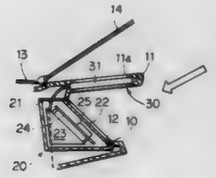
4,636,782

DISPLAY ARRANGEMENT FOR A VEHICLE

Kouzi Nakamura, Toyota; Akio Honda, Nukata; Kazuo Inukai, and Yoshito Ito, both of Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 22, 1984, Ser. No. 592,086
Claims priority, application Japan, Mar. 25, 1983, 58-50809
Int. Cl.⁴ G09G 3/02
U.S. Cl. 340—705 **20 Claims**





1. A display arrangement for a vehicle having a windshield glass, an instrument panel provided below said windshield glass and in front of a driver's seat, and a hood for said instrument panel extending between said windshield glass and said instrument panel toward said driver's seat, said display arrangement comprising:

a display device provided in said hood for displaying in a substantially downward direction information arranged in a first pattern indicative of a first condition of said vehicle, said first pattern extending in substantially the same direction as said display device extends from said instrument panel, said display device including means for providing substantially downward directed light in said first pattern; and

a mirror panel provided in said instrument panel at an acute angle relative to said display device, said mirror panel reflecting light from said display device toward said driver's seat, in such a manner that a virtual image of said first pattern is formed in perspective behind said mirror panel.

4,636,783

DEVICE FOR GIVING A PATTERN A ROTATION OF AN INTEGRAL MULTIPLE OF 90° WITH THE PATTERN READ FROM A MEMORY ON A BLOCK BY BLOCK BASIS

Takao Omachi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

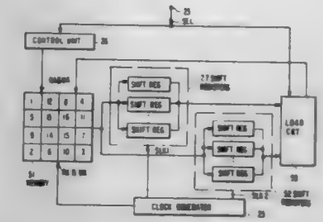
Filed Mar. 16, 1983, Ser. No. 475,982
Claims priority, application Japan, Mar. 17, 1982, 57-41879
Int. Cl.⁴ G09G 1/06
U.S. Cl. 340—727 **1 Claim**

1. A device for rotation of an original pattern by a preselected number of integral multiples of 90° in order to provide a rotated pattern, said device comprising:

memory means for storing said original pattern, said original pattern being divided into blocks, each block consisting of N N-bit words, where N is representative of a predetermined natural number, said memory means also being for storing said rotated pattern;

first reading means for successively reading said blocks out of said memory, word by word, in order to produce sequences of N words, each sequence comprising a read-out block, said first reading means thereby creating a vacant block in said memory means as the N words of a block are read out;

first and second shift register means for alternately storing said read-out blocks;



second reading means for alternately reading out one of said first and said second shift register means in sequences of N bits to successively produce write-in blocks, each comprising N N-bit words;

loading means for successively writing each of said write-in blocks into a respective one of said vacant blocks which is determined by said rotation of the original pattern;

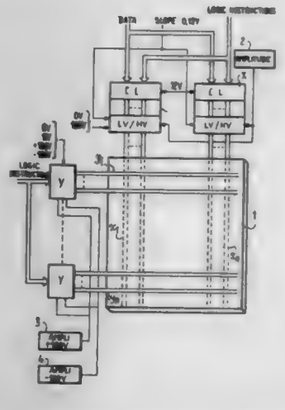
control means for generating read addresses for said readout block and writing addresses for said write-in block and performing a read-out operation in said first reading means and a write-in operation in said loading means at the same address by a read-modify-write cycle.

4,636,784

PROCESS FOR THE CONTROL OF AN ALTERNATING CURRENT PLASMA PANEL AND APPARATUS FOR PERFORMING THE SAME

Louis Delgrange, and Francoise Vialettes, both of St. Egreve, France, assignors to Thomson-CSF, Paris, France

Filed May 24, 1984, Ser. No. 613,904
Claims priority, application France, Jun. 3, 1983, 83 09289
Int. Cl.⁴ G09G 3/28
U.S. Cl. 340—771 **9 Claims**



1. A process, for the control of an alternating current plasma panel operating, selectively, in one of a superimposing mode and a replacement mode, said process permitting the applica-

tion of specific control signals, namely writing signals, erase signals, and maintenance signals, between two electrodes belonging to first and second orthogonal electrode systems and a gaseous space located at the intersection of the two electrodes belonging respectively to different ones of said systems, said two electrodes and said gaseous space therebetween together defining a cell of the panel, comprising the steps of:

applying a selecting signal to an electrode of said first system;

addressing on the second system at least one group of electrodes with at least one electrode to be activated;

selecting the addressed electrodes as a function of the selected operating mode and of an instruction, selected from an erase instruction and a writing instruction, in such a way that when in the superimposing mode the electrodes to be activated are selected no matter what the instruction and when in the replacement mode the electrodes to be activated are selected during a writing instruction and the complementary electrodes of the electrodes to be activated are selected during an erase instruction;

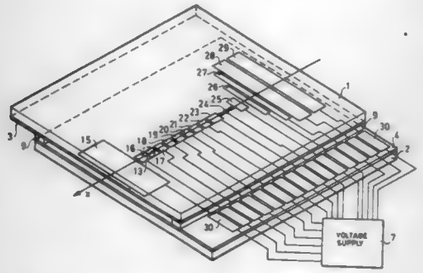
applying, to the electrodes so selected, voltages such that a writing, in the case of a writing instruction, and an erasure in the case of an erasure instruction, is carried out on the cells located at the intersection of two selected electrodes, the other cells being maintained in their initial state.

4,636,785

INDICATOR DEVICE WITH ELECTRIC CONTROL OF DISPLACEMENT OF A FLUID

Jean-Pierre Le Pesant, Gif Sur Yvette, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 22, 1984, Ser. No. 592,282
Claims priority, application France, Mar. 23, 1983, 83 04745
Int. Cl.[4] G09G *3/20*
U.S. Cl. 340—753 19 Claims



1. A device providing electric control of displacement of a fluid which performs a display function, wherein said device comprises two confinement plates which define two internal faces and which are a small distance from each other to form a first volume which is shared by at least two immiscible fluids having different dielectric permittivities, a first fluid having a globular structure and a second volume and immersed in the second fluid, an electric generator connected to a plurality of electrode pairs where the electrodes of each pair are disposed opposite each other on the internal faces of said confinement plates, for inducing an electric field gradient so as to cause one of the two fluids having a higher permittivity to converge toward those regions of said first volume which are subjected to said electric field,

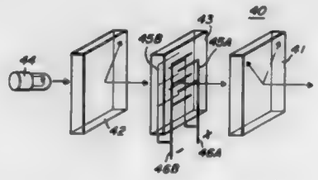
wherein at least two of said electrode pairs constrict said second volume of said first fluid for the purpose of splitting said fluid, said electrode pairs being adapted to cooperate with said electric generator for splitting said second volume.

4,636,786

ELECTROOPTIC CERAMIC DISPLAY AND METHOD FOR MAKING SAME

Gene H. Haertling, Albuquerque, N. Mex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 20, 1982, Ser. No. 450,889
Int. Cl.[4] G09G *3/16*
U.S. Cl. 340—783 7 Claims



1. An electrooptic ceramic display comprising:

a first and second polarizer;

a uniaxial transparent ferroelectric ceramic plate having first and second parallel major surfaces, said first and second surfaces disposed contiguous to said first and second polarizers, respectively;

means for inducing first and second electric fields on the first and second surfaces of said plate, respectively, said first and second fields having the same polarity orientation and occupying opposing areas on said first and second surface, said inducing means capable of selectively inducing said first and second fields at a plurality of perdetermined areas on said first and second surfaces; and

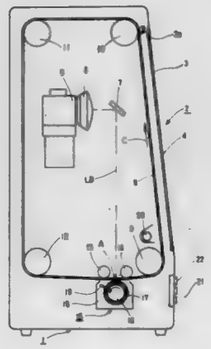
a reflector disposed adjacent said first polarizer on a side of the first polarizer opposite said plate.

4,636,787

IMAGE DISPLAY APPARATUS

Hirotoshi Kishi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1983, Ser. No. 512,709
Claims priority, application Japan, Jul. 19, 1982, 57-125391; Jul. 19, 1982, 57-125392
Int. Cl.[4] G09G *3/26*
U.S. Cl. 340—792 9 Claims



1. An image display apparatus comprising:

a casing;

an image bearing web in the form of an endless belt movable in said casing, said web including a layer sensitive to light or heat;

a plurality of support members for movably supporting said image bearing web;

drive means for moving said image bearing web along said support members;

image formation means for forming visible images, each being spaced apart a predetermined distance on said image bearing web; and

a display station having a predetermined area for allowing observation of said visible image on said image bearing web;

means for detecting a predetermined position of said image bearing web and for actuating said drive means to correct the positional relation between said image bearing web and said image formation means;

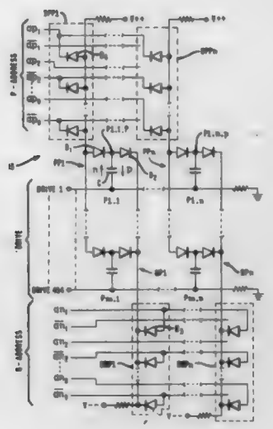
wherein the full length of said image bearing web, measured along said image bearing web, is substantially equal to an integer times the length of a section of said image bearing web which is required to form one discrete image and said full length is long enough to carry the image to said display station to display it thereat.

4,636,788

FIELD EFFECT DISPLAY SYSTEM USING DRIVE CIRCUITS

Johan O. Hilbrink, Cincinnati, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 19, 1984, Ser. No. 572,105
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—804 6 Claims



1. A display system comprising:

an array of display means, each of said display means including a field effect picture element having first and second inputs and a diode array coupled to said first input;

control means for selectively generating first, second and third signals;

drive decoder means coupled to said second inputs of said field effect picture elements and being selectively responsive to said third signals for applying enabling signals to selected ones of said field effect picture elements to selectively enable said selected ones of said field effect picture elements during each of first and second modes of operation; and

diode decoder means coupled to said diode arrays and being responsive to said first signals for selectively enabling said selectively enabled picture elements to be turned on by being electrically charged in a first direction through their respective associated said diode arrays during said first mode of operation and to said second signals for selectively enabling said selectively enabled picture elements to be turned on by being electrically charged in a second direction through their respective associated diode arrays during said second mode of operation;

each said diode array comprising first and second diodes coupled between said first terminal and said diode decoding means;

said array of display means comprising m rows and n columns of display means;

said diode decoder means comprising a plurality of first diode decoders respectively coupled to said n columns of display means and being adapted to receive said first signals, each of said first diode decoders being operative to supply a first voltage to each of said first diodes in said diode arrays in its associated column when its column address is contained in said first signals in said first mode of operation; and a plurality of second diode decoders respectively coupled to said n columns of display means and being adapted to receive said second signals, each of said second diode decoders being operative to supply a second voltage to each of said second diodes in said diode arrays in its associated column when its column address is contained in said second signals in said second mode of operation; and

said drive decoder means comprising m drive circuits respectively coupled to said m rows of display means, said drive decoder means being responsive to each third signal for enabling a selected one of said drive circuits to supply to all of said second inputs in its associated row of display means said first enabling signals during said first mode of operation and said second enabling signals during said second mode of operation;

each selected said picture element either being responsive to the application of said first voltage to its associated first diode and the application of said first enabling signal to its associated said second input for electrically charging in said first direction to produce a first electrical field across said picture element to turn said picture element on or being responsive to the application of said second voltage to its associated second diode and the application of said second enabling signal to its associated said second input for charging in said second direction to provide a second electrical field across said picture element to turn said picture element on.

4,636,789

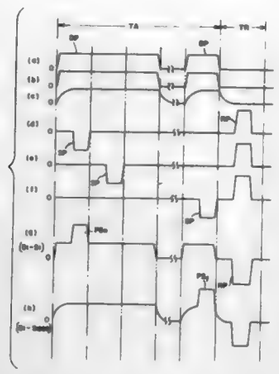
METHOD FOR DRIVING A MATRIX TYPE DISPLAY

Hisashi Yamaguchi, Atsugi; Kazuhiro Takahara, Kawasaki; Hiroyuki Gondoh, Kawasaki; Toyoshi Kawada, Kawasaki, and Shizuo Andoh, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 20, 1983, Ser. No. 533,986
Claims priority, application Japan, Sep. 21, 1982, 57-165461; Jun. 10, 1983, 58-103869
Int. Cl.[4] G09G *3/30*
U.S. Cl. 340—805 16 Claims

1. A method for driving a matrix display panel having opposing scanning and data electrodes defining intersection points thereof, each of said scanning electrodes having a first resistance value and each of said data electrodes having a second resistence value, wherein a respective display cell is defined at each said intersection point of said opposing electrodes, said method comprising applying a selection voltage in a first addressing period, via respective ones of said scanning and data electrodes, across at least one selected one of said display cells corresponding to a first one of said scanning electrodes, for causing an electro-optical display effect across each said selected display cell of said first scanning electrode, and similarly applying said selection voltage across selected display cells of successive other ones of said scanning electrodes in respective subsequent addressing periods, in a predetermined order of said scanning electrodes, wherein each said selection voltage is provided to have a waveform that rises in two stages, the first stage having a first rising part for changing to a predetermined value the relative potential of the one of the two opposing electrodes of each said selected display cell of the respective addressing period which has the larger of said first and second resistance values prior to the rising of the

second stage, and the second stage having a second rising part which is applied uniformly across all of said display cells of at least the scanning line of the respective addressing period and



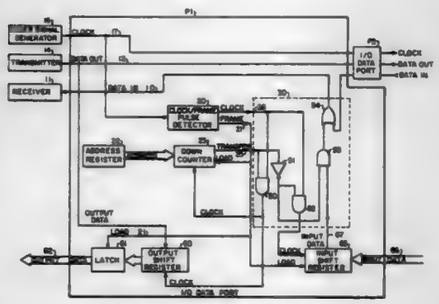
which is combined with said first rising part to uniformly provide said electro-optical display effect in each said selected display cell in the respective addressing period, irrespective of its position along each said scanning and data electrode.

4,636,790

ADDRESSABLE PORT TELEMETRY SYSTEM

Anthony E. Diamond, San Diego, Calif., assignor to Teleplex Corporation, San Diego, Calif.

Filed Dec. 15, 1983, Ser. No. 561,567
Int. Cl.[4] H04Q *9/00*
U.S. Cl. 340—825.52 6 Claims



1. A telemetry system for transferring input data signals from a plurality of serially-connected input data ports to a receiver, said system comprising

a plurality of input data ports;

an input data line serially-connecting the data ports to the receiver for carrying the input data signals from the ports to the receiver; and

a clock signal generator for generating clock pulses and frame pulses for common system timing, where each frame pulse defines a frame of clock pulses;

wherein each data port comprises

an address circuit for determining when that port is enabled to transfer input data signals onto the input data line, wherein the address circuit comprises

a frame pulse detector connected to the clock line for providing a frame detect signal to a clock pulse counter in response to each frame pulse;

an address register for storing a preselected count that determines when the port is enabled to transfer data onto the input data line;

a clock pulse counter for counting clock pulses beginning with each frame detect signal and coupled to the address register for providing a transfer signal when said clock pulse count equals the stored preselected count; and

a transfer control circuit coupled to the clock pulse counter for enabling the input data signals to be transferred onto the input data line to merge with input data signals transferred onto the input data line from the other ports when the transfer signal is provided by the clock pulse counter; and

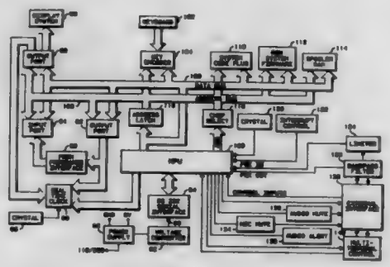
an input shift register that responds to each frame detect signal by loading input data signals for transfer onto the input data line, wherein the input shift register is connected to the transfer control circuit and provides the input data signals to the transfer control circuit in response to subsequent clock signals during each frame only after the transfer signal is provided by the clock pulse counter.

4,636,791

DATA SIGNALLING SYSTEM

Timothy M. Burke, Fort Worth; Scott W. Noble, Bedford, both of Tex.; Thomas A. Freeberg, Arlington Heights, and Jay R. Krebs, Crystal Lake, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 402,682, Jul. 28, 1982, Pat. No. 4,590,473.
This application Mar. 6, 1986, Ser. No. 836,898
Int. Cl.[4] H04Q *9/00*; H04B *7/00*
U.S. Cl. 340—825.52 9 Claims



1. In a register modelled communications system communicating data between a primary station and a plurality of register modelled remote stations, each register modelled remote station having a predetermined station address and adapted to transceive data signals including at least a command data packet containing at least an operation code, an argument and a remote station address, said register modelled remote stations each comprising:

first register means for storing a remote station address;

generating means for generating a command data packet containing at least an operation code, an argument and said remote station address;

means for transmitting said generated command packet to the primary station;

means for receiving a command data packet from the primary station;

second register means for receiving the operation code and argument of said received command data packet;

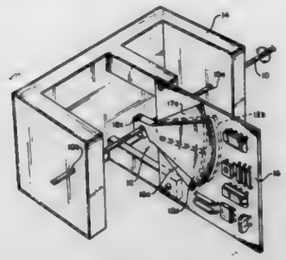
means for executing the operation code from said received command data packet in cooperation with said argument.

4,636,792

CAPACITIVE ANGULAR POSITION TRANSDUCER

Christopher A. Watson, Upland, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Jul. 2, 1984, Ser. No. 626,803
Int. Cl.[4] G08C *19/10*
U.S. Cl. 340—870.37 14 Claims



1. A capacitive transducer for sensing the angular position of a shaft within a limited angle on each side of a midposition comprising

a vane having a capacitor clamped perpendicular to said shaft and disposed symmetrically with respect to said midposition,

a printed circuit board mounted perpendicular to the axis of said shaft adjacent to said capacitor plate of said vane, said printed circuit board having

a first capacitor plate and a second capacitor plate positioned on said printed circuit board and disposed symmetrically with respect to said midposition, and

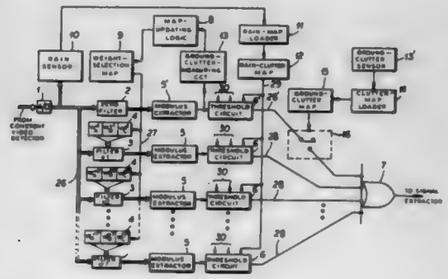
circuit means on said circuit board, having its circuit ground conductor connected to said vane capacitor plate for producing a position signal proportional to the capacitance of said vane capacitor plate over said plate on said circuit board.

4,636,793

ADAPTIVE MTD DIGITAL PROCESSOR FOR SURVEILLANCE RADAR

Egidio D'Addio, Naples; Gaspare Galati, and Ennio Giaccari, both of Rome, all of Italy, assignors to Selenia - Industrie Elettroniche Associate S.p.A., Rome, Italy

Filed Jul. 16, 1984, Ser. No. 631,037
Claims priority, application Italy, Jul. 15, 1983, 48701 A/83
Int. Cl.[4] G01S *13/52*
U.S. Cl. 342—162 7 Claims



1. In a surveillance radar provided with a coherent video detector and with a signal extractor,

the combination therewith of a digital MTD processor inserted between said video detector and said signal extractor, said processor comprising:

an analog/digital converter connected to said video detector;

a multiplicity of Doppler filters with inputs connected in parallel to said converter;

evaluation means disposed between said filters and said signal extractor;

environment-responsive sensing means for registering clutter distribution for the area surveyed by the radar; and

modification means controlled by said sensing means for varying the characteristics of said filters in accordance with clutter conditions prevailing in different regions of the surveyed area, said modification means comprising a plurality of selectors respectively associated with said filters for loading same with one of several stored sets of predetermined weights depending on clutter density, said sensing means including a clutter map controlling said selectors, said filters including a zero filter, said sensing means comprising ground-clutter-measuring means connected to the output of said zero filter for updating said clutter map, wherein said sets include sets of weights being three sets W_A, W_B, W_C stored in every selector, set W_A pertaining to regions of no ground clutter, set W_B pertaining to regions of light to moderate ground clutter, set W_C pertaining to regions of heavy ground clutter.

4,636,794

PHOTO-CONDUCTIVE ELEMENT OPERATIVE IN THE MICROWAVE REGION AND A LIGHT-STEERABLE ANTENNA ARRAY INCORPORATING THE PHOTO-CONDUCTIVE ELEMENT

Vincent P. McGinn, 1952 N. Oak La., State College, Pa. 16803

Filed Jul. 26, 1984, Ser. No. 634,593
Int. Cl.[4] H01Q *3/30*; H01L *31/08*; H01P *7/06*
U.S. Cl. 342—368 15 Claims

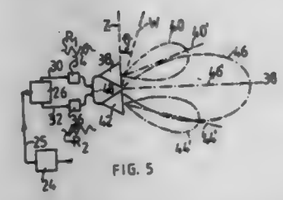


FIG. 5

11. In a steerable microwave antenna array having directional characteristics, and including at least two antenna elements spaced from one another by a predetermined distance, each antenna element defining a controllable directional radiation pattern of a selectable intensity, and having an axis of maximum radiation intensity, said directional characteristics being derived from the superposition of said radiation patterns, said axes subtending a predetermined angle therebetween, the improvement comprising

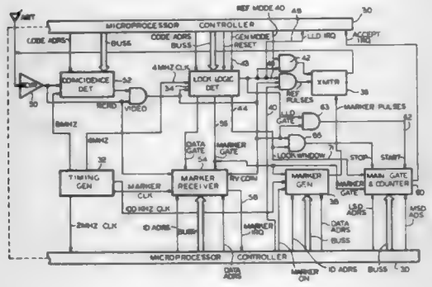
feed means connected to each antenna element, each including a photo-conductive element for a selected frequency in the microwave region, so that, upon said photoconductive elements being impinged with a selected intensity of light, respectively, said directional characteristics are changed in dependence of at least the difference in the intensity of light impinging on said photo-conductive elements, respectively.

4,636,795

RADIO RANGING, NAVIGATION, AND LOCATION SYSTEM WITH CORRECTION FOR SYSTEMATIC ERRORS

Paul K. Dano, Euless, Tex., assignor to Del Norte Technology, Inc., Euless, Tex.

Filed Apr. 18, 1985, Ser. No. 724,393
Int. Cl.[4] G01S 1/24
U.S. Cl. 342—387 18 Claims



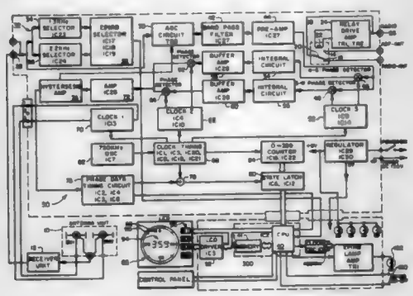
1. A radio ranging and navigation system comprising a plurality of stations at known geographical locations, an unlimited number of mobile receiver stations at independent locations, means in each of said known stations for enabing it to operate in a reference mode or a wing repeating mode, means for systematically shifting the modes of operation throughout said known stations, means responsive to a detection of signals sent after each of said shifting of said modes for detecting apparent distances between stations, means responsive to variations in said apparent distances for calculating systematic errors, and means responsive to said systematic errors for correcting said apparent distances to become true differential time measurements.

4,636,796

RADIO DIRECTION FINDING SYSTEM

Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan

Filed Jun. 15, 1984, Ser. No. 621,031
Int. Cl.[4] G01S 5/04
U.S. Cl. 342—443 15 Claims



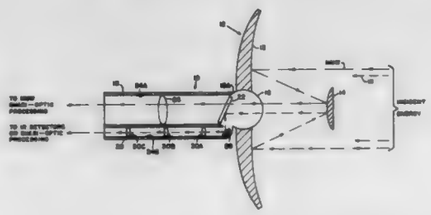
1. A radio direction finding system for receiving radio signals and for determining the direction of the source of received radio signals at the time of transmission thereof by determining the direction of arrival of said radio signals at the location of said system, comprising: means for receiving a radio signal; direction determining means coupled to said receiving means for developing a direction signal corresponding to the direction of arrival of a radio signal received by said receiving means relative to a predetermined reference direction and to the location of said receiving means; memory means having a capacity for storing direction data corresponding to the directions of arrival of a plurality of received radio signals; said memory means being responsive to predetermined control signals for storing direction data corresponding to each of a plurality of directions of arrival of received radio signals for later display and for selecting and producing for display previously stored data corresponding to any one of said directions of arrival of a received radio signal; and control circuit means coupled intermediate said direction determining means and said memory means for producing both said control signals and said direction data corresponding to each said direction signal for storage by said memory means.

4,636,797

DUAL MODE DICHROIC ANTENNA/APERTURE

James A. Saffold; Augustus H. Green, Jr., and Ronald C. Passmore, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 4, 1985, Ser. No. 708,123
Int. Cl.[4] H01Q 21/28, 19/18
U.S. Cl. 343—725 6 Claims



1. A dual mode antenna/aperture system comprising: a first elongated tubular member having first and second terminal ends, a second elongated tubular member having first and second terminal ends and disposed parallel with and adjacent to said first tubular member, respective first ends having a common edge joined together and respective second ends having a common edge joined together, a beam splitter disposed in said first end of said first tubular member and a reflecting mirror disposed in said first end of said second tubular member, both said beam splitter and said reflecting mirror being responsive to a predetermined wavelength of electromagnetic radiation for reflecting said radiation through said second tubular member, and said beam splitter being transparent to a second electromagnetic radiation wavelength for passing said second wavelength therethrough into said first tubular member.

4,636,798

MICROWAVE LENS FOR BEAM BROADENING WITH ANTENNA FEEDS

John M. Seavey, Cohasset, Mass., assignor to Seavey Engineering Associates, Inc., Cohasset, Mass.

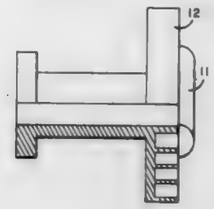
Filed May 29, 1984, Ser. No. 614,515
Int. Cl.[4] H01Q 19/06
U.S. Cl. 343—753 7 Claims

1. Apparatus for broadening the radiation pattern of a waveguide horn comprising,

a circular waveguide horn formed with a circular aperture,

a dielectric lens having rotational symmetry and shaped in the form of a torus cut in half,

said lens being formed of low-loss dielectric material,



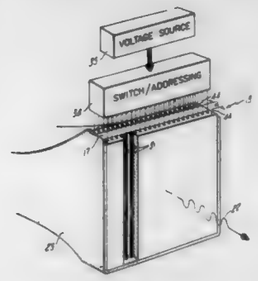
said lens being located over and coaxial with said circular aperture of said circular waveguide horn.

4,636,799

POLED DOMAIN BEAM SCANNER

Frederick Kubick, Redding, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 3, 1985, Ser. No. 730,400
Int. Cl.[4] H01Q 3/00, 15/02, 15/08
U.S. Cl. 343—754 5 Claims



1. A millimeter wavelength scanner in the path of millimeter wavelength radiation for modifying the direction of a beam of millimeter wavelength radiation passing therethrough and comprising a block of ferroelectric material with parallel input and output sides with respect to the path of said millimeter wavelength radiation and said block of ferroelectric material including first and second matching layers on respectively said input and output sides;

characterized in that said block of ferroelectric material is monolithic and in that said millimeter wavelength scanner further comprises electrode means for progressively varying the distribution of domain orientations in at least a single predetermined zone of said block of ferroelectric material,

said electrode means being generally perpendicular to the direction of propagation of said millimeter wavelength radiation and said electrode means further including first and second corresponding pluralities of independently addressable parallel wires, each of said wires and said first and second pluralities thereof being parallel to each other, each of said predetermined zones including corresponding pluralities of adjacent ones of said parallel wires on opposite sides of said block of ferroelectric material, the wires on one end of each of said zones acting in groups of at least two oppositely disposed wires subject to a predetermined pulsed voltage difference therebetween for establishing a first poling direction in said block of ferroelectric material which coincides generally with the direction of propagation of said millimeter wavelength radiation,

the wires on the opposite end of each of said zones acting in groups of at least four wires including two wires on one side of said block and corresponding two wires on the other side of said block of ferroelectric material, the two wires of the group of four on the first side of the block being subject to a predetermined potential difference aligned in a direction generally transverse to the direction of propagation, and the corresponding two wires on the other side being subject to the same potential difference, thereby establishing a second poling direction in said block of ferroelectric material which is transverse to the direction of said millimeter wavelength radiation, and

the intermediate wires of each zone cooperating in diagonal groups of at least two wires, one of the two intermediate wires being on one side of said block of ferroelectric material and the other of said intermediate wires being on the opposite side thereof, said at least two intermediate wires being subject to a predetermined voltage difference therebetween to establish a range of intermediate poling directions for the intermediate regions of each zone, which progressively range from said first poling direction along the general direction of said beam of millimeter wavelength radiation to said second poling direction orthogonal thereto,

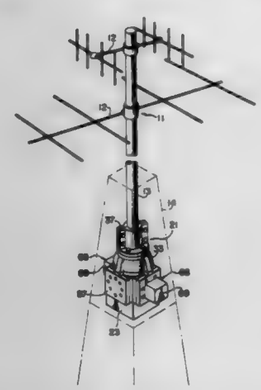
whereby a distribution of progressively varying domain orientations in selected zones of said block of ferroelectric material is established in order to steer said beam of millimeter wavelength radiation.

4,636,800

APPARATUS FOR ROTATING AND DRIVING ANTENNA DEVICE

Yoshiaki Kasiwade, Kawasaki, Japan, assignor to Kabushiki Kaisha Daiwa Industry, Tokyo, Japan

Filed Nov. 28, 1983, Ser. No. 555,380
Int. Cl.[4] H01Q 3/02
U.S. Cl. 343—766 11 Claims



1. An apparatus for angularly displacing an antenna device comprising: a main housing having about its circumference a plurality of circumferentially spaced-apart openings; a displaceable body mounted to undergo angular displacement on the main housing and having means for mounting thereon an antenna device during use of the apparatus; an input gear rotatably supported within the main housing and having gear teeth disposed about the periphery thereof, the input gear being positioned so that the gear teeth thereof are proximate the main housing openings; first gear means disposed within the main housing and operative in response to rotation of the input gear to effect angular displacement of the displaceable body; and a plurality of driving units detachably mounted on the main housing at respective ones of the main housing openings and each operative when detachably mounted on the main housing to effect rotational driving of the input gear in the same direction, each driving unit having a unit housing having

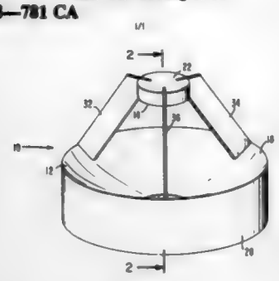
an opening, means detachably mounting the unit housing on the main housing with the unit housing opening facing the main housing opening, second gear means supported within the unit housing and releasably engageable with the input gear to effect rotational driving thereof in response to driving of the second gear means, and driving means supported within the unit housing for driving the second gear means; whereby the driving torque for rotationally driving the input gear can be selectively varied in dependence on the number of driving units detachably mounted on the main housing.

4,636,801

MULTIPLE REFLECTOR SYSTEM WITH DIELECTRIC SUPPORT WEBS AND FOAM BODY

Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 18, 1983, Ser. No. 486,143
Int. Cl.[4] H01Q *1/12*
U.S. Cl. 343—781 CA 6 Claims



1. An antenna structure comprising:

a primary reflector having a reflective surface which is shaped as a surface of revolution about an axis, said axis being the axis of said primary reflector, said reflector surface being supported on a foam body, and having an opening through said primary reflector and said foam body on said axis;

a subreflector having a reflective surface which is a surface of revolution about a second axis, with said two axes positioned substantially colinear, said subreflector positioned with respect to said opening in said primary reflector such that radiation reflects on both said primary reflector and said subreflector;

at least three slots in each of said primary reflector and said subreflector, said slots lying substantially on planes passing through said axis of said primary reflector, with respective ones of said slots in said subreflector lying on the same plane through said primary reflector axis as respective ones of said slots in said primary reflector, said slots in said primary reflector extending into said foam body;

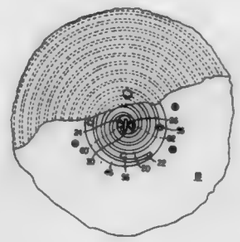
a plurality of support webs of low loss dielectric material between said reflectors for maintaining said subreflector at a substantially fixed distance away from said primary reflector and for maintaining said axes so that they lie substantially together, said support webs being of substantial width in a direction normal to said axes and substantially thin in a direction circumferential to said axes, and having a width to thickness ratio between about 7 and about 100, the thickness of said webs being on the order of between 0.001 and 0.007 times the aperture diameter where the diameter of said primary reflector is the aperture diameter of said antenna, said support webs being mounted in said slots.

4,636,802

ELECTRICAL CONNECTOR FOR SPIRAL ANTENNA AND RESISTIVE/CAPACITIVE CONTACT THEREFOR

William J. Middleton, Jr., Richardson, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Oct. 29, 1984, Ser. No. 665,634
Int. Cl.[4] H01Q *1/36*
U.S. Cl. 343—895 17 Claims



1. An electrical connector for connecting one or more conductors disposed on a stripline to a spiral antenna having one or more dipole conductors disposed on a substrate, the antenna including a housing having a base and a sidewall for supporting the substrate, comprising:

a center post having first and second ends, and a cylindrical aperture, the substrate secured to the first end of the center post, the second end thereof secured to the base of said housing;

a stripline contact snubber supported in an end of the cylindrical aperture adjacent the substrate for receiving said stripline; and

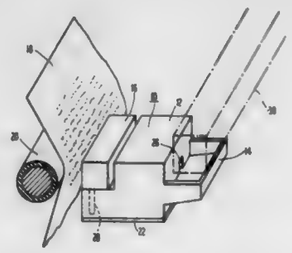
one or more resistive/capacitive contacts, each of said contacts having a first portion and a second portion extending from said first portion, the second portion compressed between said contact snubber and one of said dipole conductors and in abutting relation therewith for ensuring RF continuity between said stripline and said spiral antenna.

4,636,803

SYSTEM TO LINEARLY SUPPLY PHASE CHANGE INK JET

Arthur Mikalsen, Carmel, N.Y., assignor to Exxon Printing Systems, Inc., Brookfield, Conn.

Filed Oct. 16, 1984, Ser. No. 661,922
Int. Cl.[4] G01D *9/00, 15/16*
U.S. Cl. 346—1.1 34 Claims



1. A method of supplying ink to a hot melt ink jet apparatus comprising an ink jet, means for moving said jet in a predetermined substantially linear direction and a heated ink reservoir coupled to said jet, said method comprising the following steps:

aligning a series of solid-state ink members in an elongated array extending along said direction above said reservoir;

advancing each of said members along a path extending through said elongated array to a discharge location at one end of said path;

dropping said members into said reservoir;

melting said solid-state ink members in said reservoir; and

jetting the melted ink from said jet.

4,636,804

RECORDING MEDIUM COMPRISING A MICROPOROUS POLYMER EXHIBITING ENHANCED SIGNAL TO NOISE RATIO

James E. Kuder, Fanwood, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jan. 11, 1985, Ser. No. 690,703
Int. Cl.[4] G01D *15/14*
U.S. Cl. 346—1.1 25 Claims

1. An optical recording medium for the recording of information comprising:

(i) an opaque microporous polymer layer coated with a polymeric layer, the pores of the microporous polymer having an effective pore size less than 500 Angstroms, and wherein the microporous layer collapses upon transmission of heat thereto, and

(ii) an energy-absorbing material situated with regard to the microporous polymer so as to be able to transmit heat thereto, and which upon irradiation with a light source transmits thermal energy to the microporous polymer layer to cause a collapse in the microporous structure of said microporous polymer layer in those areas irradiated.

24. A method of recording information in a thin film by irradiating the film with a laser beam in accordance with said information to form an information track in the film, the improvement which comprises said film being comprised of:

(i) an opaque microporous polymer layer coated with a polymeric layer, the pores of the microporous polymer having an effective more size less than 500 Angstroms, and

(ii) an energy absorbing layer deposited on one side of said microporous polymer layer, which upon irradiation heats up sufficiently to cause a collapse in the microporous structure of the polymer layer in those areas irradiated to thereby form an information track in the polymer layer of transparent regions.

4,636,805

RECORD-BEARING MEMBER AND INK-JET RECORDING METHOD BY USE THEREOF

Shigeo Togasaki; Ryuichi Arai, both of Tokyo, and Mamoru Sakaki, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1985, Ser. No. 711,385
Claims priority, application Japan, Mar. 23, 1984, 59-54524; Mar. 23, 1984, 59-54525; Apr. 18, 1984, 59-76557; May 21, 1984, 59-100679; May 21, 1984, 59-100680; Jun. 12, 1984, 59-119097; Jun. 27, 1984, 59-130944; Jul. 19, 1984, 59-148660; Jul. 19, 1984, 59-148661
Int. Cl.[4] G01D *15/34;* B32B *5/16*
U.S. Cl. 346—1.1 17 Claims

1. A record-bearing member having a linear transmission factor of at least 2%, comprising a substrate and an ink receiving layer provided on said substrate, said ink receiving layer consisting essentially of a material selected from the group, consisting of a partially saponified polyvinyl alcohol with a saponification degree of at least about 70 mole %, a cation-modified product of polyvinyl alcohol and hydroxyethylcellulose applied to said substrate in a solvent, said ink receiving layer being capable of fixing ink within 3 minutes at 20° C. and 65% RH when the ink is deposited onto the surface of said ink receiving layer at a proportion of about 0.7 μl per unit area (cm^2) of said ink receiving layer.

4,636,806

RECORDING MEDIUM

Hisao Watarai, Copo Shoen 203, 5-1-13, Yagiyamaminami, Sendai-shi, Miyagi; Masahiro Tanaka, 3-9-24, Kagitori, Sendai-shi, Miyagi; Shuji Masuda, 27-8, Ejiri Aza Miyamoto, Kitajimamachi, Itano-gun, Tokushima; Kenji Suzuki, 11-12-12, Shogen, Izumi-shi, Miyagi, and Tsuyoshi Matsumoto, 3-8-22, Kamisugi, Sendai-shi, Miyagi, all of Japan, assignors to Research Development Corporation of Japan, Tokyo; Hisao Watarai, Sendai; Masahiro Tanaka, Sendai; Shuji Masuda, Tokushima; Kenji Suzuki, Izumi and Tsuyoshi Matsumoto, Sendai, all of, Japan

Filed Mar. 29, 1985, Ser. No. 717,754
Claims priority, application Japan, Mar. 30, 1984, 59-061157
Int. Cl.[4] G11B *7/24*
U.S. Cl. 346—1.1 13 Claims

1. A heat-sensitive and laser light-sensitive recording medium comprised of a reactively-sputtered coating upon a substrate, said coating consisting essentially of an amorphous or metastable lead oxide composition having the formula

$$PbL_xO_z$$

wherein L is at least one element selected from the group consisting of Fe, Co and Ni,

$$0<x\leq 1.5$$

$$1\leq z\leq 4.25$$

said lead oxide composition being convertible to a stable state and simultaneously the light transmittance and/or electrical resistance of said lead oxide composition are changed, by application of heat or laser light to said recording medium.

4. A method of recording information, comprising applying to the recording medium as claimed in claim 1, a heat and/or laser light pattern indicative of encoded information to convert said medium from its amorphous or metastable state to a stable state and thereby record the encoded information on the medium.

4,636,807

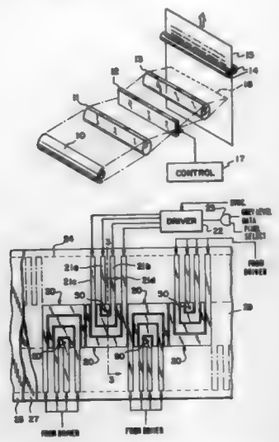
APPARATUS AND METHOD FOR LIGHT VALUE GRAY SCALE RECORDING

Donald L. Head, Springboro, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 14, 1986, Ser. No. 839,402
Int. Cl.[4] G01D *15/14;* G02F *1/03;* H04N *1/21*
U.S. Cl. 346—1.1 10 Claims

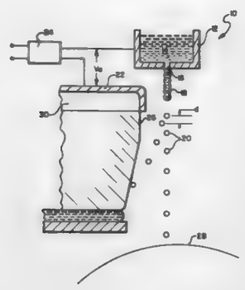
6. A light gate for use with a light beam comprising a layer of electrooptically responsive material, a transparent common electrode on one face thereof and a plurality of groups of transparent active electrodes on the face opposite said one

face; each of said groups being positioned for selective blocking of an associated region of said light beam and comprising a



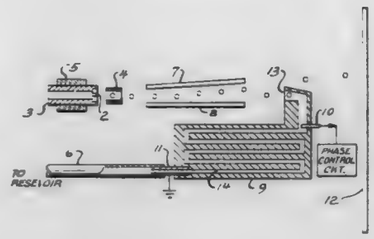
plurality of active electrodes configured for at least partially encompassing a common interior point.

4,636,808
CONTINUOUS INK JET PRINTER
Denver A. Herron, Dayton, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 9, 1985, Ser. No. 773,497
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **4 Claims**



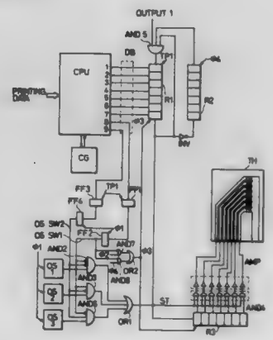
4. A print head for a continuous multijet ink jet printer, comprising:
- means for forming a plurality of ink jets arranged in a line, each ink jet defining an ink filament separating into drops at a drop separation point;
- a corresponding plurality of planar electrodes located adjacent the drop separation points of the respective ink jet filaments for charging and deflecting ink drops;
- a drop catcher having a vertical drop catching face extending generally parallel with the ink jet filaments, said drop catching face being located below said planar electrodes; and
- an ink gutter located at the bottom of said drop catching face, whereby ink drops deflected onto said drop catching face by said planar electrodes flow down said face into said gutter.

4,636,809
INK CATCHER AND DROP CHARGE SENSING DEVICE
Frank Eremity, Hanover Park, Ill., assignor to Videojet Systems International, Inc., Elk Grove Village, Ill.
Filed Oct. 21, 1985, Ser. No. 789,951
Int. Cl.[4] G01D *18/00*
U.S. Cl. 346—75 **8 Claims**



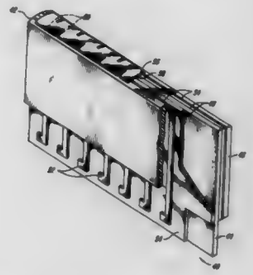
6. In a drop marking system employing electrically conductive ink drops to mark a recording medium and having an ink return system to collect and reuse drops which are not directed onto said medium, said return system including an ink catcher and means for sensing the charges on drops received by the catcher, the improvement comprising:
- (a) said catcher being formed from electrically insulating material having a convoluted passage formed therein, an entry end of said passage being disposed to receive ink drops directed thereat to permit entry into said passage, an exit end of said passage permitting egress therefrom, said passage defining an ink flow path of substantially greater length than the distance between the entry and exit ends;
- (b) the means for sensing the drop charges including at least one electrode associated with the passage.

4,636,810
THERMAL PRINTER
Osamu Asakura, Tokyo; Mineo Nozaki, Kawasaki; Masasumi Nagashima, Kanagawa, and Yoshio Uchikata, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 21, 1983, Ser. No. 487,086
Claims priority, application Japan, Apr. 28, 1982, 57-72366; Apr. 28, 1982, 57-72371
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **10 Claims**



1. A thermal printer for printing an image on a printing sheet, comprising:
- a thermal head having a plurality of heating elements;
- pulse supply means for supplying print pulses to said thermal head such that said heating elements heat in accordance with information to be printed, wherein said pulse supply means is capable of executing a first pulse supply in which only a main pulse is supplied to said thermal head within a dot print timing, and a second pulse supply in which a main pulse and a subsidiary pulse shorter in width than said main pulse are supplied within the dot print timing while spaced in time from each other, and wherein said space between the main and the subsidiary pulses is provided for data processing; and
- control means for controlling said pulse supply means in such a manner as to supply, as the first print pulse in a serial print operation, a print pulse longer in width than succeeding print pulses in said serial print operation, and wherein said control means control said pulse supply means in such a manner as to select one of said first pulse supply and said second pulse supply in accordance with data to be printed.

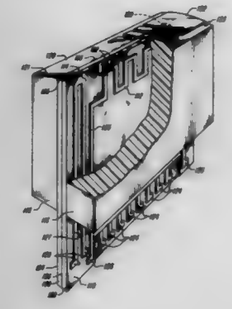
4,636,811
THERMAL PRINT HEAD
Joseph J. Bakewell, Boxford, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.
Filed Oct. 24, 1985, Ser. No. 790,828
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **6 Claims**



1. A thermal print head comprising:
- a first sheet of dielectric material, having front and rear surfaces and a top edge, and having a first plurality of electrodes on the front surface thereof, each electrode having an end terminating at said top edge of said first sheet, each electrode also having a contact area;
- a conductive ground sheet having first and second surfaces, said first surface being in engagement with said rear surface of said first dielectric sheet, said conductive ground sheet also having an upper edge which is parallel to the top edge of said first sheet, both said top edge of said first sheet and said upper edge of said conductive ground sheet being in the same curved plane; and
- a layer of resistive material in electrical contact with said electrode ends and with said upper edge of said conductive ground sheet, sections of said layer serving as printing elements when electrically heated.

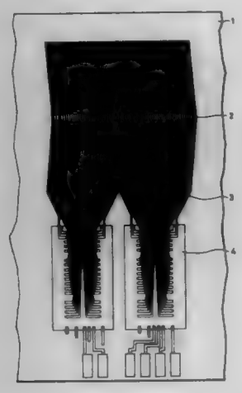
4,636,812
THERMAL PRINT HEAD TEMPERATURE CONTROL
Joseph J. Bakewell, Boxford, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.
Filed Oct. 24, 1985, Ser. No. 790,836
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **7 Claims**

1. A thermal print head comprising:
- a first sheet of dielectric material having a plurality of electrodes on a first surface thereof, each electrode having an end terminating at a common edge of the sheet, the electrode ends being regularly spaced along the length of the edge, and each of the electrodes having a contact area, said first sheet of dielectric material also having a plurality of electrodes on a second surface thereof, each electrode having an end terminating at the common edge of the sheet, the electrode ends being regularly spaced along the length of the edge, and each of the electrodes having a contact area;
- a second sheet of dielectric material having on a surface thereof an electrical heating element and a heat sensor, said heat sensor being located at an edge of said second sheet, and said heating element being located adjacent to the edge of said second sheet at which said heat sensor is located;



said first and second sheets being disposed in laminar engagement, with the heating element and heat sensor of said second sheet being contiguous with the electrode ends of the first and second surfaces of said first sheet; and
- a resistive material interconnecting the contiguous electrode ends along the contiguous edges of the first and second surfaces.

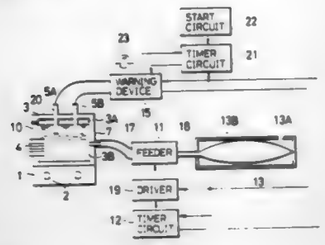
4,636,813
THERMAL PRINT HEAD
Kazuyoshi Mego; Shigetoshi Hiratsuka, and Eiichi Hara, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 28, 1985, Ser. No. 792,280
Claims priority, application Japan, Oct. 29, 1984, 59-225931
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **10 Claims**



1. A thermal print head comprising a first substrate, heating resistors provided on the first substrate, driver element means for driving the heating resistors, the driving element means including a second substrate of a predetermined width and having connecting terminals on one surface thereof, and lead wires for connecting the heating resistors and the connnecting terminals of the driver element means, the lead wires being arranged on the first substrate so that the driver element means is mounted thereover, the lead wires extending from the heat-

ing resistors at one portion of the first substrate to another portion of the first substrate for the mounting of the driver element means thereat, the lead wires being arranged so as to lie within the width of the second substrate of the driver element means upon approaching the driver element means so as to enable the driver element means to be mounted thereon.

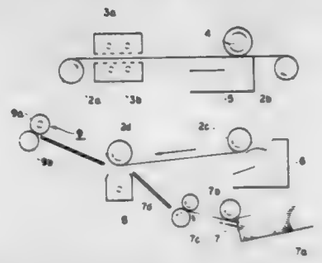
4,636,814
PRINTING APPARATUS
Koji Terasawa, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 635,516, Jul. 30, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 820,925
Claims priority, application Japan, Aug. 2, 1983, 58-140590; Dec. 15, 1983, 58-235052; Dec. 15, 1983, 58-235053; Dec. 15, 1983, 58-235054; Dec. 15, 1983, 58-235055
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R 8 Claims



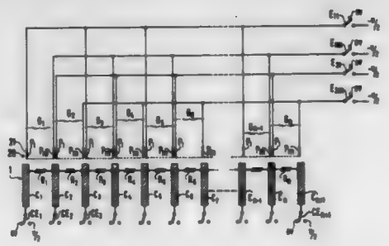
1. A printing apparatus comprising:
first ink storage means for storing ink;
printing means for printing by attaching on a printing medium droplets of the ink stored in said first ink storage means;
second ink storage means, detachably mounted on said printing apparatus, for storing ink;
feeding means adapted to be energized for feeding the ink in said second ink storage means to said first storage means;
sensing means for sensing the level of the ink in said first ink storage means and providing a sensing signal when the ink reaches a predetermined level as said feeding means is feeding ink to said first storage means;
timer means for timing a first predetermined interval initiated in response to the sensing signal and a second predetermined interval initiated with the energization of said feeding means, which second predetermined interval expires before the first predetermined interval if the first predetermined interval is being timed; and
control means for controlling the energization and de-energization of said feeding means such that (a) said feeding means is energized if the level in said first ink storage means is below the predetermined level or in response to the initial mounting of said second ink storage means on said printing apparatus and (b) said feeding means is de-energized at the expiration of the first predetermined interval if the first predetermined interval is being timed and at the end of the second predetermined interval if the first predetermined interval is not being timed.

4,636,815
ELECTROSTATIC RECORDING APPARATUS
Kazuhiro Yuasa, Zama, Japan, assignor to Ricoh Company Ltd., Japan
Filed Oct. 5, 1984, Ser. No. 658,198
Claims priority, application Japan, Oct. 5, 1983, 58-185123
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—153.1 8 Claims

1. A recording apparatus comprising:
a recoding medium of dielectric material supported to advance along a predetermined path, said recording medium having a first surface and a second surface which is opposite of said first surface;
charging means for uniformly charging both sides of said recording medium opposite in polarity;
a thermal printhead disposed to oppose said first surface of said recording medium for applying a heat pattern defined by image information to said recording medium thereby causing at least the uniform charge on said second surface selectively discharged in accordance with the heat pattern thus applied to define an electrostatic latent image on said recording medium; and
developing means for developing said latent image on said recording medium by applying a developer to said second surface of said recording medium thereby forming a developed image on said second surface of said recording medium.

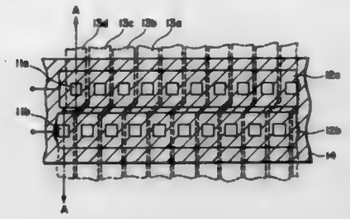


4,636,816
ELECTROSTATIC PRINT HEAD
Patrice Playe, Houilles, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France
Filed May 4, 1984, Ser. No. 607,039
Claims priority, application France, May 9, 1983, 83 07685
Int. Cl.[4] G01D *15/06*
U.S. Cl. 346—155 8 Claims



1. An electrostatic print heat comprising at least one row of individual electrodes disposed at a regular pitch and organized in n groups of electrodes per row, the said groups of electrodes being themselves organized in successive sets of at least two groups each, and the electrodes which are in the same positions within different groups in the same set being interconnected, wherein the head further comprises a counter-electrode disposed facing the electrodes over at least the length of said row, and constituted by resistive material having n+1 conductive tracks in contact therewith disposed at regular intervals substantially equat to the pitch of the groups of electrodes along a row, with a predetermined gap between adjacent conductive tracks defining n intertrack resistive portions each of which is disposed opposite one of the groups of electrodes and is attributed thereto for selecting that group from the other groups, with at least one electrode in each group of electrodes being directly opposite each resistive portion, the said resistive portions forming n electrical resistances which are substantially identical, and connected in series, and for which the said tracks constitute electrical access connections to the end terminals of the two end resistances and to the points between the resistances.

4,636,817
IMAGE FORMING APPARATUS WITH SHUTTER ARRAY ELEMENT
Yuichi Masaki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 3, 1984, Ser. No. 677,499
Int. Cl.[4] G01D *15/14*
U.S. Cl. 346—160 19 Claims



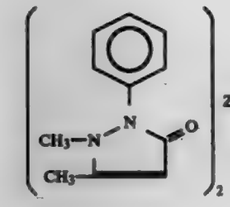
1. An image forming apparatus comprising a light source, a photosensitive member, and a liquid crystal-shutter array device disposed so as to receive and modulate light rays from the light source and illuminate the photosensitive member with the modulated light rays; said liquid crystal-shutter array device comprising:
two rows of transparent elongated electrodes;
a plurality of transparent signal electrodes disposed oppositely spaced from and intersecting with the elongated row electrodes so as to provide two rows of shutter apertures at respective intersections, said two rows of shutter apertures being arranged in a mutually staggered fashion, the distance between an adjacent pair of the shutter apertures in each row being 1.22 to 2.0 times the length of one shutter aperture in the row in the direction of the extension of the row of shutters;
a liquid crystal disposed between the elongated row electrodes and the plurality of signal electrodes; and
a metallic film coating the two elongated row electrodes except for the portions forming the shutter apertures.

4,636,818
CARBONLESS SYSTEM INCLUDING SOLVENT-ONLY MICROCAPSULES
Richard J. Jerabek, Grand Island, N.Y., assignor to Moore Business Forms, Inc. Grand Island, N.Y.
Filed Jun. 5, 1985, Ser. No. 742,113
Int. Cl.[4] B41M *5/16, 5/22*
U.S. Cl. 346—213 6 Claims

1. In a carbonless copying system having a recording substrate, first and second mark-forming components capable of reacting with each other to produce a colored reaction product, and microcapsules having generally continuous walls encapsulating a first fill material, the first fill material comprising a solution or suspension containing the first mark-forming component, the improvement in combination therewith comprising,
microcapsules having generally continuous walls encapsulating a second fill material, the second fill material consisting of solvent capable of dissolving either the first or the second mark-forming component or both, the microcapsules encapsulating the first fill material, the microcapsules encapsulating the second fill material, and the second mark-forming component being arranged in juxtaposed pressure-sensitive contact with respect to one another such that the application of marking pressure upon the carbonless system causes a colored marked to form on the recording substrate.

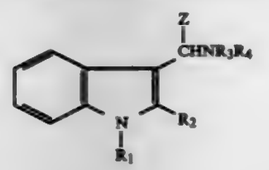
4,636,819
THERMOSENSITIVE RECORDING MATERIAL
Masanaka Nagamoto, Shizuoka; Norio Kurita, Numazu, and Keishi Tsukiyachi, Shizuoka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Jan. 27, 1986, Ser. No. 823,001
Claims priority, application Japan, Feb. 1, 1985, 60-018010
Int. Cl.[4] B41M *5/18*
U.S. Cl. 346—216 14 Claims

1. A thermosensitive recording material comprising a support member, a thermosensitive coloring layer formed on said support material, comprising a binder agent, a colorless or light-colored leuco dye, a zinc thiocyanate antipyrine complex having the following formula, which serves as a color developer capable of inducing color formation in said leuco dye upon application of heat thereto, and a protective layer consisting essentially of a water-soluble resin for protecting the thermosensitive coloring layer:

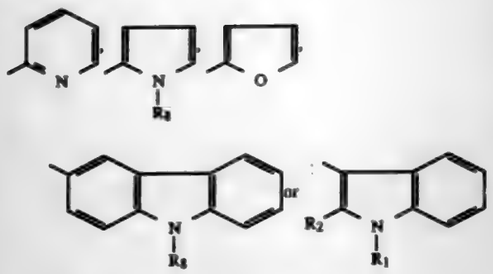


4,636,820
COMPOSITIONS, PROCESS AND SYSTEMS
Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to The Hilton-Davis Chemical, Cincinnati, Ohio
Division of Ser. No. 473,760, Mar. 9, 1983, Pat. No. 4,515,959, which is a division of Ser. No. 341,951, Jan. 22, 1982, Pat. No. 4,398,030, which is a division of Ser. No. 127,650, Mar. 6, 1980, Pat. No. 4,341,402. This application Jan. 17, 1985, Ser. No. 692,093
Int. Cl.[4] B41M *5/16, 5/18, 5/22*
U.S. Cl. 346—224 5 Claims

1. A compound having the formula

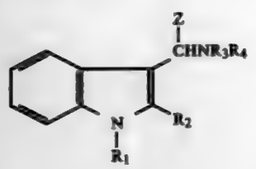


wherein:
R_1 is hydrogen or lower-alkyl;
R_2 is hydrogen, lower-alkyl or phenyl;
R_3 is hydrogen or lower-alkyl;
R_4 is hydrogen, lower-alkyl, benzyl, di-lower-alkylamino-lower-alkyl, tri-lower-alkylammonium-lower-alkyl, phenyl, phenyl substituted with 1 or 2 halo, lower-alkyl or lower-alkoxy groups, or NR_3R_4 is pyrrolidino, piperidino, hexamethyleneimino or morpholino; and
Z is a substituent having the formula



wherein R_3 is hydrogen or lower-alkyl.

4. A pressure-sensitive carbonless duplicating system or thermal marking system containing a support sheet coated with a color-forming substance comprising a compound having the formula



wherein

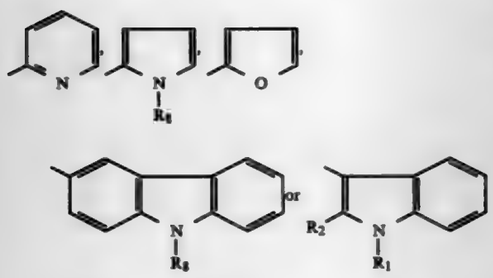
R_1 is hydrogen or lower-alkyl;

R_2 is hydrogen, lower-alkyl or phenyl;

R_3 is hydrogen or lower-alkyl;

R_4 is hydrogen, lower-alkyl, benzyl, di-lower-alkylamino-lower-alkyl, tri-lower-alkylammonium-lower-alkyl, phenyl, phenyl substituted with 1 or 2 halo, lower-alkyl or lower-alkoxy groups, or NR_3R_4 is pyrrolidino, piperidino, hexamethyleneimino or morpholino; and

Z is a substituent having the formula



wherein R_3 is hydrogen or lower-alkyl.

4,636,821

SURFACE-EMITTING SEMICONDUCTOR ELEMENTS

Tomoo Yanase, and Hiroyoshi Ranga, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 21, 1984, Ser. No. 581,749

Claims priority, application Japan, Feb. 21, 1983, 58-27177; Feb. 21, 1983, 58-27178; Feb. 22, 1983, 58-27998; Mar. 30, 1983, 58-54120; Apr. 8, 1983, 58-61722

Int. Cl.[4] H01L *33/00*

U.S. Cl. 357—17 15 Claims

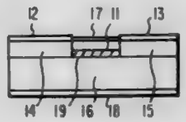
1. A surface-emitting semiconductor light emitting element comprising:

a semi-insulating semiconductor substrate;

a light emitting region, formed over said semi-insulating semiconductor substrate, and including at least one active layer which emits light when impressed with a bias voltage;

a first semiconductor region of a first conductivity type adjoining, in the direction of the thickness of said active layer, a side face of said light emitting region and formed over said semi-insulating semiconductor substrate, said first semiconductor region having a wider bandgap than that of said active layer;

a second semiconductor region of a second conductivity type adjoining, in the direction of the thickness of said active layer, another side face of said light emitting region opposite to said side face and formed over said semi-



insulating semiconductor substrate, said second semiconductor region having a wider bandgap than that of said active layer;

a semi-insulating semiconductor region adjoining, in the direction of the thickness of said active layer, the remaining portion of said light emitting region and separating said first semiconductor region from said second semiconductor region, said semi-insulating semiconductor region having a wider bandgap than that of said active layer;

a first electrode formed over said first semiconductor region; and

a second electrode formed over said second semiconductor region.

4,636,822

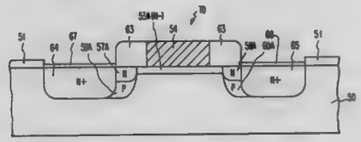
GAAS SHORT CHANNEL LIGHTLY DOPED DRAIN MESFET STRUCTURE AND FABRICATION

Christopher F. Codella, Fishkill, and Seiki Ogura, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 27, 1984, Ser. No. 644,830

Int. Cl.[4] H01L *29/80, 29/48*

U.S. Cl. 357—22 14 Claims



1. A self-aligned metal-semiconductor field effect transistor (MESFET) comprising a semiconductor material having contiguous first conductivity type source, source extension, gate, drain extension and drain areas, the source and drain areas being of an equal, relatively large depth and high doping concentration, said gate area being of a relatively small depth and low uniform doping concentration, said source extension and drain extension being of an equal depth intermediate to said large and small depths and of an equal doping concentration intermediate to said high and low doping concentrations and a conductive gate electrode overlying said gate area, said electrode having a pair of submicron-wide insulative sidewall spacers one on each side thereof, said spacers each having a first portion directly abutting said sides of the gate electrode, said source extension and said drain extension being spaced from the edge of the gate by substantially equal amounts and said source and drain being spaced from the edge of said gate

electrode by substantially the width of the corresponding said spacer.

4,636,823

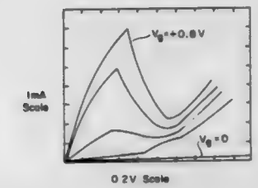
VERTICAL SCHOTTKY BARRIER GATE FIELD-EFFECT TRANSISTOR IN GAAS/GAALAS

Shlomo Margalit, Pasadena; Amnon Yariv, San Marino, and Zeev Rav-Noy, Los Angeles, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jun. 5, 1984, Ser. No. 617,495

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.3 10 Claims



1. A vertical field-effect transistor comprised of epitaxial layers of III–V semiconductor material including a drain layer grown more than one micron thick, a channel layer, and a source layer grown more than one micron thick, with said channel layer grown between said source and drain layers to a controlled submicron thickness for high transconductance of the transistor, and have exposed a cross sectional surface through said channel layer,and further including source and drain contacts for respective one of said source and drain layers, and means for providing a depletion layer of a Schottky barrier gate on the exposed cross sectional surface of said submicron channel layer.

4,636,824

VOLTAGE-CONTROLLED TYPE SEMICONDUCTOR SWITCHING DEVICE

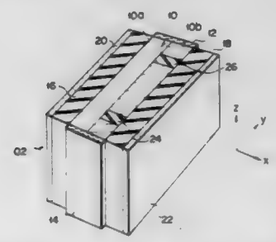
Toshiaki Ikoma, 6-4-16, Honkomagome, Bunkyo-ku, Tokyo; Hajime Maeda, Tokyo; Hisayoshi Yanai, Tokyo; Ryo Dang, Tokyo, and Naoyuki Shigyo, Yokohama, all of Japan, assignors to Toshiaki Ikoma, Tokyo and Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, both of, Japan

Filed Apr. 7, 1986, Ser. No. 850,065

Claims priority, application Japan, Dec. 28, 1982, 57-231419; Dec. 28, 1982, 57-231420

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.14 15 Claims



1. A semiconductor switching device which selectively switches between a current conduction state and a current cut-off state in order to perform an ON/OFF switching operation, said device comprising:

(a) a semiconductor layer having a length and main surfaces and side surfaces, said semiconductor layer comprising,

a first semiconductive layer section serving as a current channel region for allowing majority carriers of said semiconductor layer to flow therethrough in a lateral direction, and

a second semiconductive layer section, formed laterally along the length of said semiconductor layer and is in contact with said first semiconductor layer section, wherein said second semiconductor layer section serves as a nonconductive carrier-storage region which temporarily stores the carriers flowing in said first semiconductor layer section, said second semiconductive layer section comprising an insulative layed component buried in said second layer section, for forming potential barriers high enough to prevent the lateral movement of the stored carriers through said second semiconductive layer section;

(b) terminal electrodes provided on said side surfaces of said semiconductor layer, said terminal electrodes serving as source and drain electrodes of said device; and

(c) a pair of conductive layers for sandwiching said semiconductive layer at the main surfaces thereof and being electrically insulated from said first and second semiconductive layer sections, said conductive layers serving as control electrodes for (1) receiving a control voltage signal whose voltage level changes between a first and a second level, and for (2) creating, in said semiconductor layer along the lateral direction, an electric field, which causes the carriers to move in the direction of the thickness of said semiconductive layer to be stored in said second semiconductive layer section, when the control voltage signal has said first level, thereby causing said switching device to be turned off, and for (3) releasing the stored carriers toward said first semiconductive layer section to thereby cause said switching device to be turned on when the voltage has the second voltage level.

4,636,825

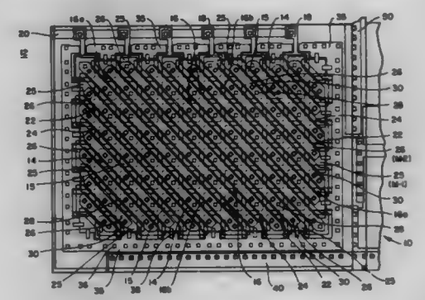
DISTRIBUTED FIELD EFFECT TRANSISTOR STRUCTURE

Martin J. Baynes, Cape Elizabeth, Me., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

Filed Oct. 4, 1985, Ser. No. 784,810

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.14 14 Claims



1. An improved metal oxide semiconductor (MOS) field effect transistor (FET) comprising a single transistor in a distributed structure having source, drain, and gate elements distributed in an array for fabrication on integrated circuit chips, said array comprising a plurality of spaced apart alternating source and drain areas of semiconductor material of first polarity, said source and drain areas being formed in semiconductor material of second polarity and distributed in a checkerboard pattern so that each drain area is surrounded on the sides by spaced apart source areas, a first grid of conductive gate paths overlapping adjacent source and drain areas, said gate paths being dielectrically isolated from the source and drain areas by an insulating layer thereby providing a plurality of

FET areas across the array, said gate paths of the first grid being electrically coupled together to provide a single gate element distributed across the array, and a second grid of electrically conducting source and drain lead lines dielectrically isolated from the first grid by an insulating layer, said second grid comprising source lead lines electrically coupled to each other and to the source areas of the array to provide a single source element distributed across the array and drain lead lines electrically coupled to each other and to the drain areas of the array to provide a single drain element distributed across the array thereby parallel coupling the FET areas across the array, the improvement characterized in that:

said array comprises source and drain areas (14, 15) arranged in horizontal and vertical rows;

said first grid (16) comprises a grid of intersecting horizontal and vertical gate paths (16*a*, 16*b*) overlapping adjacent source and drain areas (14, 15) thereby decreasing the channel length and channel resistance of the FET areas said horizontal and vertical gate paths (16*a*, 16*b*) intersecting orthogonally and being electrically coupled at the intersections so that the first grid (16) comprises a single distributed gate element of the single transistor distributed structure (10) with a common gate lead (20); and

said second grid comprises a grid of parallel diagonal alternating source lead lines (22) and drain lead lines (24), said second grid being formed by a first metal layer (25) comprising lower level diagonal lead lines, and a second metal layer (26) comprising upper level diagonal lead lines formed over at least a major portion of the lower level diagonal lead lines of the first metal layer, said first and second metal layers being separated by a dielectric layer with electrical contacts (30) through the dielectric layer between the first and second metal layers along the lower level and upper level diagonal lead lines to reduce current density and resistance in the source and drain lead lines (22, 24) without increasing the width of said lead lines;

said first metal layer (25) extending beyond the ends of either one of said source and drain lead lines (22, 24) and being electrically coupled to provide a first common lead line (40) for one of said source and drain lead lines and said second metal layer (26) extending beyond the ends of the other of said source and drain lead lines and being electrically coupled to provide a second common lead line (50) for the other of said source and drain lead lines.

4,636,826

CHARGE COUPLED DEVICES HAVING NARROW COPLANAR SILICON ELECTRODES

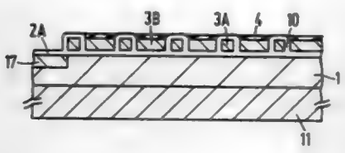
Jan W. Slotboom; Henricus G. R. Maas; Johannes A. Appels, and Francois M. Klaassen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 657,631, Oct. 4, 1984, Pat. No. 4,574,468. This application Nov. 27, 1985, Ser. No. 802,499

Claims priority, application Netherlands, Jan. 25, 1984, 8400234

Int. Cl.[4] H01L *29/78, 29/04*

U.S. Cl. 357—24 **4 Claims**



1. A semiconductor device characterized in that the device is a field effect device having a plurality of adjacent gate electrodes in the form of narrow coplanar silicon strips which are formed from a single silicon layer and alternately belong to a first group covered by silicon oxide and to a second group covered by an insulating layer comprising silicon nitride, the gate electrodes being separated from each other by the silicon oxide covering the first group and the gate electrodes of the second group being formed by separating originally pair-wise coherent silicon strips, wherein the gate electrodes are contacted via contact windows and the contact windows of the gate electrodes of the second group in the direction of the charge transport are bounded by the silicon oxide covering the gate electrodes of the first group.

4,636,827

SEMICONDUCTOR DEVICE RESPONSIVE TO IONS

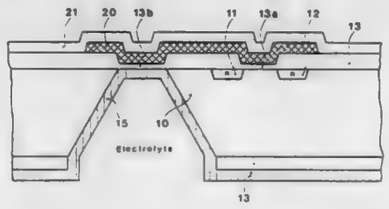
Felix Rudolf, Cortaillod (NE), Switzerland, assignor to Fondation Suisse de Recherche en Microtechnique, Neuchatel, Switzerland

Continuation of Ser. No. 399,846, Jul. 19, 1982, abandoned. This application Sep. 20, 1985, Ser. No. 777,876

Claims priority, application France, Jul. 24, 1981, 81 14501

Int. Cl.[4] H01L *49/02, 29/78, 29/66, 29/06*

U.S. Cl. 357—25 **8 Claims**



1. A semiconductor device for selective response to the ions of a solution to which it is exposed, said device comprising:

a substrate having first and second surfaces;

a responsive layer positioned in a recessed area in a first region of said substrate on said first surface of said substrate; and

a field effect transistor positioned in a second region of said substrate separate from said first region and including a source region, a channel region and a drain region formed on said second surface of said substrate, and a gate separated from said source, channel and drain regions by an insulating layer to form said field effect transistor;

said gate being electrically floating and laterally extending from said field effect transistor in said second region to said first region in such a manner that it is capacitively coupled to said responsive layer in said first region and separated therefrom so as to minimize ion migration between said solution and said gate, said first region being spaced apart from said second region.

4,636,828

OPTICAL IMMERSED TYPE PHOTOVOLTAIC DETECTOR

Thierry Piganeau, Paris, France, assignor to Societe Anonyme de Telecommunications, France

Filed Apr. 3, 1984, Ser. No. 596,389

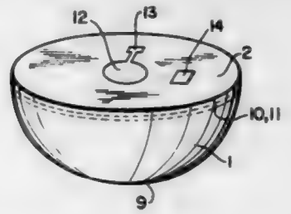
Claims priority, application France, Apr. 8, 1983, 83 05800

Int. Cl.[4] H01L *27/14;* **B23K** *1/19, 35/36*

U.S. Cl. 357—30 **4 Claims**

1. In an optically immersed photovoltaic detector sensitive to infrared radiation, the improvement comprising a substrate transparent to infrared radiation, a wafer of semiconducting material of a first type of conductivity on one side of said substrate; said wafer having on the side opposite said substrate at least one zone of a second type of conductivity forming, with said material of said first type, a PN junction; said substrate, on the side opposite said wafer, being machined in the

form of a lens, and a bonding agent transparent to infrared radiation and constituting a solvent of said substrate and of said



wafer is interposed between and bonding said substrate and said wafer.

4,636,829

PHOTODETECTOR INTEGRATED CIRCUIT

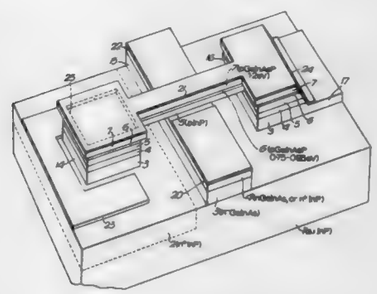
John C. Greenwood, Harlow, and George H. B. Thompson, Sawbridgeworth, both of England, assignors to ITT Industries, Inc., New York, N.Y.

Filed Aug. 16, 1984, Ser. No. 641,881

Claims priority, application United Kingdom, Aug. 18, 1983, 8322236

Int. Cl.[4] H01L *27/14, 31/00*

U.S. Cl. 357—30 **30 Claims**



1. A photodetector integrated circuit comprising:

a field effect transistor including and a PIN photodiode connected to the gate contact of said field effect transistor;

said field effect transistor being constructed as a rib like structure formed on a semiconductor substrate, said rib structure comprising semiconductive layers including a buffer layer and a channel layer with said gate contact formed between the source and drain contacts of said field effect transistor on said channel layer;

said PIN photodiode being also constructed from said semiconductive layers and including a pair of contacts, said semiconductive layers of said PIN photodiode and said contacts of said PIN photodiode being spaced apart from said rib like structure of said field effect transistor on said substrate; and

said contacts of said PIN photodiode being spaced apart by a greater distance than the spacing of said gate from said source and drain and said channel layer of said field effect transistor to provide said PIN photodiode with a capacitance per unit area that is small compared with the gate capacitance of said field effect transistor per unit area of said gate.

4,636,830

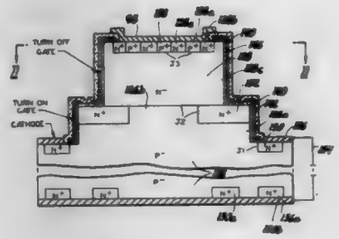
INSULATED GATE-CONTROLLED THYRISTOR HAVING SHORTED ANODE

Jayant K. Baliga, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 617,106, Jun. 4, 1984. This application Nov. 2, 1984, Ser. No. 667,827

Int. Cl.[4] H01L *29/72, 29/78, 29/08, 29/06*

U.S. Cl. 357—38 **4 Claims**



1. A gate-controlled thyristor that not only has an IGFET for turn-on but also an IGFET and a variable resistance effect for turn-off, the thyristor comprising:

a semiconductor body containing integrated bipolar PNP and NPN transistors that form a thyristor;

the PNP transistor collector region having a portion overlapped, in a direction parallel to the direction of electron current flow in the PNP transistor collector region, by a region of opposite conductivity type semiconductive material that is of higher conductivity than the NPN transistor collector region and the overlapped portion of the PNP transistor collector region, for producing a PN junction space charge region effect that restricts electron flow through the PNP transistor collector region;

an insulated gate electrode on said body, extending from emitter to collector regions of the NPN transistor, so as to form an integral enhancement type n-channel IGFET electrically in parallel with the NPN transistor emitter and collector regions;

an electrode that is not only on the PNP transistor emitter region but also on a higher conductivity portion of the NPN transistor collector region, for simultaneously applying the same electrical potential to both the emitter region of the PNP transistor and the collector region of the NPN transistor;

an electrode on the NPN transistor emitter region, for applying a second electrical potential thereto that is lower than the electrical potential applied to the PNP transistor emitter region; and

means for providing an electrical potential, that approaches the electrical potential applied to the PNP transistor emitter region, to said opposite conductivity type region that overlaps the PNP transistor collector region, effective to produce a space charge region in the overlapped portion of the PNP transistor collector region that will inhibit electron current flow therethrough;

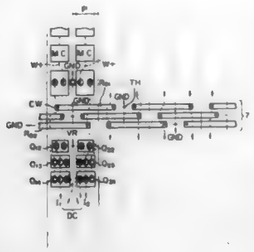
whereby, after the aforesaid electrode potentials are applied to said electrodes, an electrical potential that is higher than the NPN transistor emitter potential can be applied to the gate electrode of the IGFET to turn on the thyristor, and thereafter an electrical potential that approaches that applied to the PNP transistor emitter-NPN transistor collector electrode can be provided to the opposite conductivity type region that overlaps the PNP transistor collector region to turn off the thyristor.

4,636,831

SEMICONDUCTOR DEVICE

Chikai Ono, Kawasaki, and Yoshinori Okajima, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 26, 1983, Ser. No. 517,256
Claims priority, application Japan, Aug. 2, 1982, 57-133781
Int. Cl.⁴ H01L *27/10*
U.S. Cl. 357—45 3 Claims



1. A semiconductor device comprising:

a plurality of circuit block regions including memory cell array block regions and peripheral circuit block regions, said memory cell block regions and said peripheral circuit block regions respectively connected to form circuit block region pairs arranged successively in a first direction and having a width P measured in the first direction; and

a plurality of resistors arranged between and connected to said memory cell array block regions and said peripheral block regions of said circuit block region pairs, each of said plurality of resistors extending in a substantially linear manner in said first direction along the width of said circuit block region pairs and having a contact window provided at each end, said plurality of resistors formed close together and parallel to each other, and set up in the form of n (n is an integer greater than or equal to two) stages arranged in a second direction perpendicular to said first direction, each of said plurality of resistors having a length L determined by a relationship $(n-1)P<L<nP$,

said resistors on each of said stages being shifted from each other in said first direction by an amount rP (r is an integer in a range of $1 \leqq r \leqq (n-1)$).

4,636,832

SEMICONDUCTOR DEVICE WITH AN IMPROVED BONDING SECTION

Masahiro Abe, Yokohama; Masaharu Aoyama, Fujisawa; Takashi Ajima, Kamakura, and Toshio Yonezawa, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 517,412, Jul. 26, 1983, abandoned. This application Mar. 4, 1986, Ser. No. 837,663
Claims priority, application Japan, Jul. 27, 1982, 57-129563
Int. Cl.⁴ H01L *23/14, 21/60*
U.S. Cl. 357—68 4 Claims

1. A semiconductor device with a bonding section comprising:

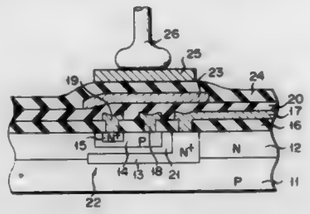
a semiconductor substrate having a plurality of semiconductor elements therein;

a first insulating layer formed on at least one of said semiconductor elements;

means for lessening stress during bonding including a silicon layer formed on said at least one of said semiconductor elements with said first insulating layer interposed therebetween;

a second insulating layer formed on said silicon layer, said silicon layer being interposed between said first and second insulating layers so as to be floating; and

a bonding pad formed on said silicon layer with said second insulating layer interposed therebetween, the surface area of said bonding pad being substantially equal to that of said silicon layer; whereby, when a lead line is bonded to



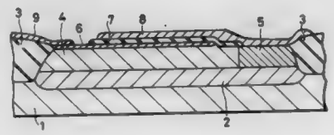
said bonding pad, said silicon layer lessens stress caused by the bonding.

4,636,833

SEMICONDUCTOR DEVICE

Yasushiro Nishioka, Hachioji; Noriyuki Homma, Kokubunji; Noriyuki Sakuma, and Kiichiro Mukai, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 590,870
Claims priority, application Japan, Mar. 18, 1983, 58-44179
Int. Cl.⁴ H01L *23/48, 27/04*
U.S. Cl. 357—71 24 Claims



1. A semiconductor bipolar memory device comprising:

a first semiconductor layer; and

a first electrode, a dielectric film and a second electrode comprised of metal silicide formed on said first semiconductor layer with said second electrode being adjacent to said first semiconductor layer, said dielectric film being formed on said second electrode and said first electrode being formed on said dielectric film so that said first semiconductor layer and said second electrode from a Schottky barrier diode and said first electrode, said dielectric film and said second electrode from a capacitor on said diode, wherein a metal film is interposed between said second electrode and said dielectric film.

4,636,834

SUBMICRON FET STRUCTURE AND METHOD OF MAKING

Joseph F. Shepard, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 560,624, Dec. 12, 1983. This application Jul. 15, 1985, Ser. No. 755,027
Int. Cl.⁴ H01L *29/78, 27/10*
U.S. Cl. 357—23.3 8 Claims

1. An integrated circuit field effect transistor structure comprising:

a semiconductor body with a surface region;

a first insulator layer disposed over said surface region;

a substantially horizontal conductive layer disposed over said first insulator layer and having a plurality of different patterns formed therein;

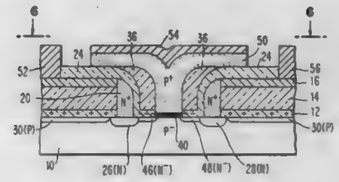
a trench opening in said conductive layer and said first insulator layer down to said semiconductor body and having substantially vertical sidewalls;

a pair of vertical conformal conductive sidewall layers disposed conformally only on one set of opposite vertical sidewalls of said trench and not electrically connected and containing a dopant with a first conductivity type therein suitable for outdiffusion, said vertical conformal conductive sidewall layers being in electrical contact with different patterns in said substantially horizontal conductive layer;

a source region formed in said semiconductor substrate substantially only directly below one of said vertical conformal conductive sidewall layers and having a dopant with said first conductivity type;

a drain region formed in said semiconductor substrate substantially only directly below the other of said vertical conformal conductive sidewall layers and having a dopant with said first conductivity type;

a second substantially vertical insulator layer disposed conformally on said vertical conformal conductive sidewall layers, and a second horizontal insulator layer disposed conformally in said trench opening, with said second



horizontal insulator layer having therein a dopant of said first conductivity type suitable for outdiffusion;

a pair of third substantially vertical conformal insulator sidewall layers disposed conformally only on said second substantially vertical insulator layer down to said second horizontal insulator layer;

a channel opening down to said semiconductor body in said second horizontal insulator layer in said trench opening and between said pair of third substantially vertical conformal insulator sidewall layers;

a doped region disposed in said semiconductor body substantially only below each of said third substantially vertical conformal insulator sidewall layers, with said doped regions having a dopant of first conductivity type but with a lower doping concentration than the doping in said source and drain regions;

a gate dielectric disposed in said channel opening;

a gate electrode disposed on said gate dielectric; and

electrical ohmic contacts connected to said patterns in said substantially horizontal conductive layer.

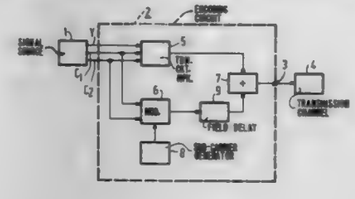
4,636,835

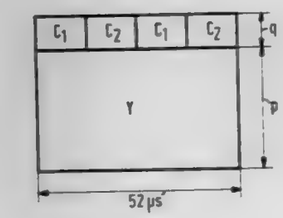
COLOR TELEVISION TRANSMISSION OR DATA STORAGE SYSTEM HAVING TIME-DIVISION MULTIPLEX ENCODING AND DATA GENERATOR AND RECEIVER SUITABLE THEREFOR

Sing L. Tan, and Louis P. M. Schreurs, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 7, 1984, Ser. No. 669,280
Claims priority, application Netherlands, Nov. 22, 1983, 8304007
Int. Cl.⁴ H04N *11/08*
U.S. Cl. 358—12 9 Claims

1. A color television transmission system having time-division multiplex encoding, the system comprising a data generator, at least one data receiver, and a transmission channel arranged between the generator and the receiver, the data generator comprising a signal source for producing signals containing luminance, chrominance, synchronizing and identification information, and an encoding circuit for supplying, from an output, a time-division multiplex encoded signal for transmission via the transmission channel, this time-division multiplex encoded signal comprising, during a number of p line periods of a field period, non-compressed luminance information and, during a number of q line periods of a field period, different from said p line periods, time-compressed chrominance information associated with said luminance information, the number p+q being less than the number of m line periods forming a field period, the data receiver comprising a decoding circuit coupled to said transmission channel and suitable for





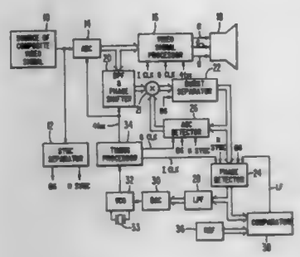
supplying signals containing at least luminance and chrominance information which largely corresponds to the data produced by the signal source in the data generator, characterized in that the encoding circuit is such that it supplies a signal in which the chrominance information, supplied during said q line periods, is also added to the luminance information during said p line periods in accordance with the PAL-, NTSC or SECAM color television standards.

4,636,836

PHASE LOCKED LOOP SYSTEM FOR PROVIDING A PHASE SHIFTED OUTPUT SIGNAL

Steven A. Steckler, Clark, and Alvin R. Balaban, Lebanon, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 3, 1984, Ser. No. 677,524
Int. Cl.⁴ H04N *9/45*
U.S. Cl. 358—19 22 Claims



1. In an electronic signal processing system including a source of reference signal which has a component at a predetermined frequency and phase, a phase locked loop comprising:

signal filtering means coupled to said source for attenuating

components of said reference signal having undesirable frequencies relative to the component at said predetermined frequency and for shifting the phase of said reference signal to provide a signal having a predetermined phase relationship with respect to said reference signal;

means for generating an oscillatory signal having a control input terminal and being responsive to signals applied to said control input terminal for varying the frequency of said oscillatory signal;

phase detecting means coupled to said filtering means and to said signal generating means for developing a correction signal representing the difference in phase between the signal provided by said filtering means and said oscillatory signal; and

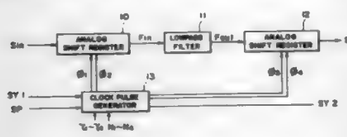
means for coupling said correction signal to the control input terminal of said signal generating means.

4,636,837

TIME BASE CONVERSION APPARATUS

Yuichi Sato, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1983, Ser. No. 487,920
Claims priority, application Japan, Apr. 28, 1982, 57-72370
Int. Cl.⁴ H04N *9/491*
U.S. Cl. 358—21 R **29 Claims**



1. A time base conversion apparatus comprising:

a first time base conversion circuit for subjecting an input signal to a time base conversion;

a filter for filtering an output signal from said first time base conversion circuit; and

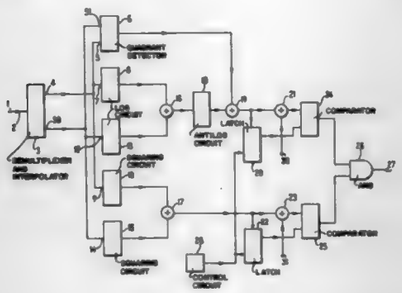
a second time base conversion circuit for subjecting an output signal from said filter to a time base conversion.

4,636,838

GENERATING A CHROMA KEYING SIGNAL

Ian S. Cosh, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 22, 1985, Ser. No. 725,445
Claims priority, application United Kingdom, Apr. 26, 1984, 8410708
Int. Cl.⁴ H04N *9/75*
U.S. Cl. 358—22 **13 Claims**



1. A method of generating a chroma keying signal comprising the steps of:

(a) continuously determining the value of $\tan^{-1}(R-Y)/(B-Y)$, where $(R-Y)$ and $(B-Y)$ are colour difference signals;

(b) continuously determining the value of $(R-Y)^2+(B-Y)^2$;

(c) comparing the determined value of $\tan^{-1}(R-Y)/(B-Y)$ with a pre-selected value thereof;

(d) comparing the determined value of $(R-Y)^2+(B-Y)^2$ with a pre-selected value thereof; and

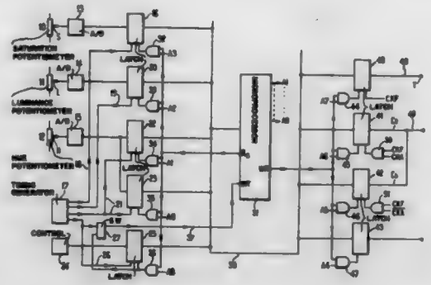
(e) generating a keying signal when the determined value of $\tan^{-1}(R-Y)/(B-Y)$ is substantially equal to the pre-selected value thereof and the determined value of $(R-Y)^2+(B-Y)^2$ is greater than the preselected value.

4,636,839

METHOD OF AND APPARATUS FOR GENERATING COLOR MATTE SIGNALS

David J. Cole, and Ian S. Cosh, both of Cambridge, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 22, 1985, Ser. No. 725,466
Claims priority, application United Kingdom, Apr. 26, 1984, 8410705
Int. Cl.⁴ H04N *9/74*
U.S. Cl. 358—22 **6 Claims**



1. A method of generating colour matte signals comprising the steps of:

inputting hue, saturation, and luminance values; and calculating R, G and B colour component values from the hue, saturation and luminance values;

characterised in that the method further comprises the steps of calculating luminance (Y), and colour difference (Cr and Cb) component values from the calculated R, G and B values; and outputting the calculated Y, Cr, and Cb values; wherein the hue value is formed in two parts, the first of which defines one of six segments formed by dividing each side of the colour triangle in half and the second of which define intermediate values within the segment and the step of calculating the R, G and B values comprises the further steps of:

calculating three colour components from the saturation, luminance and the second part of the hue value;

and assigning the three colour components to registers for holding R, G and B values in dependence on the segment defined by the first part of the hue value.

4,636,840

ADAPTIVE LUMINANCE-CHROMINANCE SEPARATION APPARATUS

David L. McNeely, Indianapolis, and Russell T. Fling, Fishers, both of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 9, 1984, Ser. No. 638,993
Int. Cl.⁴ H04N *9/78*
U.S. Cl. 358—31 **19 Claims**

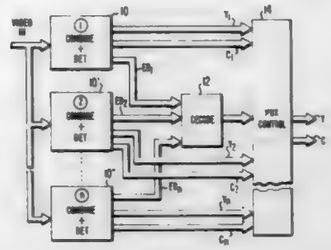
1. Video signal processing apparatus for separating luminance and chrominance signal therefrom including a source of a plurality of video signals respectively displaced in time from each other by integral horizontal line intervals, comprising:

detector means coupled to said source, for generating respective estimation signals developed from sums of cross differences of samples from pairs of said plurality of video signals;

a decoder coupled to said detector means and responsive thereto for generating a control signal indicating which of the respective estimation signals has the smallest value;

means for combining video signals from at least two horizontal lines for producing at least one of said separated luminance and chrominance components; and

a multiplexor coupled to said source and said decoder and responsive to said control signal, for selectively applying video signals from said source to said means for combining video signals, the signals applied to said combining means corresponding to signals which produced the estimation signal having the smallest value.

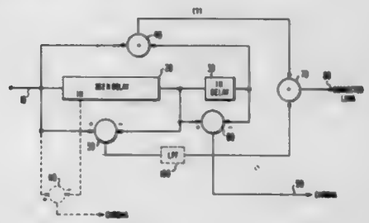


4,636,841

FIELD COMB FOR LUMINANCE SEPARATION OF NTSC SIGNALS

Warren H. Moles, Flemington, and Robert A. Dischert, Burlington Township, Burlington County both of N.J., assignors to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 615,544, May 31, 1984, abandoned. This application May 22, 1985, Ser. No. 736,968
Int. Cl.⁴ H04N *9/64*
U.S. Cl. 358—31 **13 Claims**



1. Apparatus for separating luminance signal from composite video signal including chrominance and luminance signal components, comprising:

an input terminal for applying composite video signal;

signal delaying means having an input port coupled to said input terminal and having first and second output taps at which signals delayed by substantially one field period and one horizontal line period less than said substantially one field period are provided;

first signal combining means having first and second input ports coupled to said input terminal and said first tap respectively for additively combining signals applied thereto;

second signal combining means having first and second input ports coupled to said input terminal and said second tap for subtractively combining signals applied thereto; and

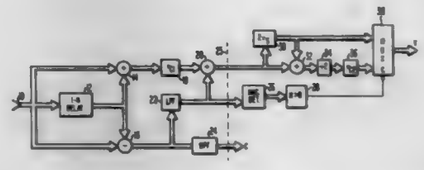
third signal combining means having first and second input ports respectively coupled to said first and second signal combining means for additively combining signals produced thereby, and having an output port at which said luminance signal is produced.

4,636,842

COMB FILTER "HANGING DOT" ELIMINATOR

Werner N. Hartmeier, Geroldswil, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 29, 1984, Ser. No. 676,095
Int. Cl.⁴ H04N *9/64*
U.S. Cl. 358—31 **1 Claim**



1. A comb filter system for separating a luminance signal component from composite video signal including a chrominance signal modulating a subcarrier, comprising:

a source of said composite video signal;

delay means having an input coupled to said source and having an output terminal, for providing composite video signal delayed by an integral number of horizontal line intervals;

first signal combining means, having an output terminal, and having respective input terminals coupled to said source and the output terminal of said delay means, for combining composite video signal and delayed composite video signal to produce a comb filtered luminance signal;

second signal combining means having an output terminal, and having respective input terminals coupled to said source and the output terminal of said delay means, for combining composite video signal and delayed composite video signal to produce a comb filtered chrominance signal including luminance vertical detail information;

filter means having an input terminal coupled to the output terminal of said second signal combining means, and having an output terminal for substantially attenuating signals in the band of frequencies normally occupied by said chrominance signal;

third signal combining means having an output terminal and having respective input terminals coupled to the output terminals of said first combining means and said filter means respectively for providing comb filtered luminance signal with vertical detail substantially restored;

detection means having an input terminal coupled to said output terminal of said filter means, for generating control signals when the magnitude of signal from said filter means exceeds a predetermined magnitude;

further delay means having an output terminal and having an input terminal coupled to the output terminal of said third signal combining means, for delaying signal by one-half period of the chrominance subcarrier;

fourth signal combining means having an output terminal and having respective input terminals coupled to the output terminals of said third combining means and said further delay means for additively combining signals applied to its input terminals;

multiplexing means having a control input terminal coupled to said detection means, having a first signal input terminal coupled to said further delay means, having a second signal input terminal coupled to the output terminal of said fourth signal combining means, and having an output terminal, wherein said multiplexing means couples signal from its first signal input terminal to its output terminal in the absence of said control signals and couples signal from

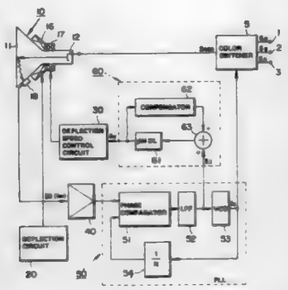
its second input terminal to its output terminal on the occurrence of said control signals.

4,636,843

DEFLECTION CONTROL APPARATUS FOR A BEAM INDEX COLOR TELEVISION RECEIVER

Takashi Hoosoo, Kanagawa, and Akira Tohyama, Chigasaki, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 16, 1984, Ser. No. 671,955
Claims priority, application Japan, Nov. 21, 1983, 58-219255
Int. Cl.[4] H04N *9/24*; H01J *29/74, 29/76, 29/56*
U.S. Cl. 358—67 4 Claims



1. Deflection control apparatus for a beam index color television receiver of the type including a cathode ray tube adapted to display a video picture in response to a received color television signal, said cathode ray tube having index stripes disposed to be scanned by a single electron beam of said cathode ray tube, detecting means for detecting when individual index stripes are scanned by said beam to produce an index signal having a frequency varying from a predetermined frequency when the scanning speed of said beam varies, phase-locked loop means including oscillating means for generating an oscillating signal whose frequency is synchronzied with said index signal and comparing means for comparing said index signal to said oscillating signal to produce an error signal as a function of the phase difference therebetween and to adjust the frequency of said oscillating signal in accordance with said error signal to have a predetermined relationship to the frequency of said index signal, and switching means responsive to said oscillating signal for switching color information signals which are used to modulate said beam, said deflection control apparatus comprising:

deflection control means for controlling the horizontal deflection of said beam; and

compensator means for delaying said error signal for a predetermined time and providing a respective delayed error signal;

said delayed error signal being supplied to said deflection control means to cause the same to generate a control signal to correct the scanning speed of said beam so as to thereby maintain a substantially constant scanning speed thereof; and

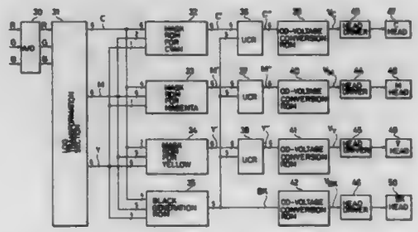
said predetermined time being such that the elapsed time from the detection of the scanning of one of said index stripes to the time of generation of said control signal in accordance therewith equals one horizontal line period.

4,636,844

METHOD OF PROCESSING A COLOR IMAGE SIGNAL

Takashi Sasaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 704,932
Claims priority, application Japan, Feb. 29, 1984, 59-38340
Int. Cl.[4] H04N *1/387*
U.S. Cl. 358—80 8 Claims



4. A method of producing a black signal, comprising the steps of:

obtaining three digital color signals, each signal consisting of a plurality of bits;

selecting a number of bits from each of said three digital color signal; and

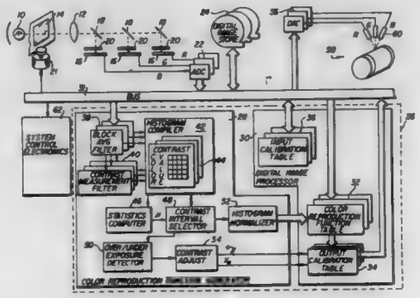
obtaining a black signal from signals represented by the selected number of bits.

4,636,845

DIGITAL IMAGE PROCESSING METHOD FOR OVER AND UNDER EXPOSED PHOTOGRAPHIC IMAGES

James S. Alkofer, Hamlin, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 6, 1985, Ser. No. 730,625
Int. Cl.[4] G03F *3/08*; H04N *1/46, 1/40*; G03B *27/80*
U.S. Cl. 358—80 5 Claims



1. A method for processing a digital image employing a tone reproduction function generated by normalizing a sample of tone values from the digital image, said tone reproduction function relating tone values in the digital image to values of a standard variate, and being applied to the tone values of said digital image to produce processed tone values, characterized by the steps of:

testing the sample of tone values for skewness; and

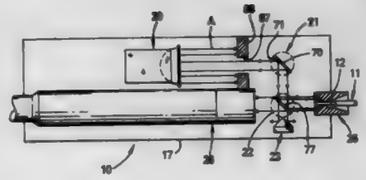
if the absolute value of the skewness of the sample exceeds a predetermined value, applying an exposure bias to the processed tone values in an amount equal to the value of the standard variate computed for the mean of the sample of tone values minus the value of the standard variate computed for the mode of the sample of tone values.

4,636,846

OPTICAL SCANNING APPARATUS FOR INDICIA IMPRINTED ABOUT A CYLINDRICAL AXIS

Richard A. Villarreal, Kennewick, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 6, 1985, Ser. No. 795,604
Int. Cl.[4] G06K *9/00*
U.S. Cl. 358—100 11 Claims



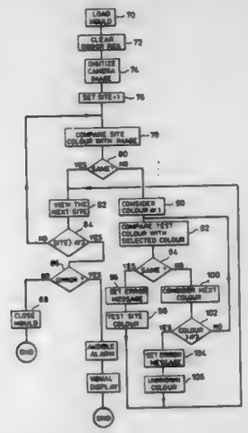
1. An apparatus for optically scanning indicia imprinted about a cylindrical surface of an article comprising: a frame, a camera mounted on said frame, a light source for emitting a collimated light beam, a beam splitter mounted on said frame, means mounted on said frame for diffusing a portion of said light beam and reflecting a portion thereof onto said beam splitter, said beam splitter directing said light beam onto said cylindrical surface of said article for illuminating the indicia imprinted thereon, and means including a metallic mirror surface for reflecting an image from said imprinted cylindrical surface for transmission through said beam splitter to said camera.

4,636,847

TEST APPARATUS

Hugo Magi, Unionville; Arthur J. Boes, and Jerry R. Weese, both of Toronto, all of Canada, assignors to Cabletest International Inc., Markham, Canada

Filed Nov. 29, 1985, Ser. No. 802,912
Int. Cl.[4] H04N *7/18*; G06K *9/00*
U.S. Cl. 358—101 5 Claims



1. Apparatus for use with a machine used to perform an operation on ends of cables, each of the cables having a plurality of wires coded individually in differently coloured insulation, and each of the wires being intended for location at discrete sites in the machine prior to the operation, the apparatus comprising;

a colour responsive camera focused to create an electronic image of the coloured insulations when the wires are on the sites and in place for the operation;

memory means containing first information corresponding to the colours and locations of the insulations when these insulations are positioned correctly in the machine;

comparator means receiving the electronic image and converting the image into second information including means comparing the first and second informations to create a first signal indicating that the informations correspond; and

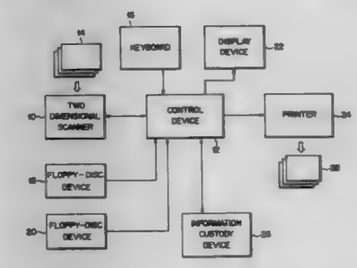
means coupled to the machine to render the machine inoperable in the absence of said signal and to permit normal operator use of the moulding machine on receiving said signal.

4,636,848

DOCUMENT INFORMATION FILING SYSTEM WITH A SINGLE DISPLAY DEVICE

Kazuhiko Yamamoto, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 316,483, Oct. 29, 1981, abandoned.
This application Feb. 23, 1984, Ser. No. 582,851
Claims priority, application Japan, Oct. 31, 1980, 55-153265; Oct. 31, 1980, 55-153267
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—102 14 Claims



1. A document filing system comprising:

optical scanning means for scanning a plurality of documents randomly input thereto to produce document picture information;

means for receiving and associating with each document a retrieval character code which is determined as a function of classification parameters, each retrieval code including a predetermined parameters, each retrieval code including a predetermined number of subcodes;

memory means for storing a plurality of pieces of said document picture information and a plurality of retrieval codes corresponding thereto, each retrieval code including a predetermined number of subcodes;

a display device having a display screen bisected into a first display region for exclusively displaying retrieval code data and a second display region for exclusively displaying the document picture image;

retrieval code input means, manually operable by an operator, for specifying at least a portion of the retrieval character code; and

retrieval controller means for, when a retrieval code is at least partially specified by an operator designating one or more subcodes thereof, (a) extracting from said memory means all of those retrieval codes which include the specified subcodes as a part thereof and the corresponding pieces of document picture information, in accordance with a predetermined algorithm, (b) causing said display device to exclusively display a list of the extracted retrieval codes on said first display region ot allow the operator to select a desired document while seeing the retrieval code list, said retrieval controller means, when the operator inputs the remaining subcode or subcodes through said input means to specify a certain document, causing said display device to display a picture informa-

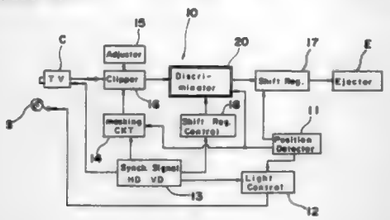
tion of the specified document on the second display region and to continuously display said retrieval code list on the first display region, whereby, after referring to the presently displayed document picture image, the operator may select another document from those satisfying the operator's earlier partial specification based on the retrieval codes continuously displayed on said first display region, thereby facilitating the operator to find his finally desired document whose picture information will be displayed on the second display region of said display device.

4,636,849

APPARATUS FOR INSPECTING SOLID DRUGS AND A METHOD THEREFOR

Yasutaro Wada, Suita, and Takashi Ohtsuki, Kawabe, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 16, 1984, Ser. No. 672,388
Claims priority, application Japan, Nov. 26, 1983, 58-222711
Int. Cl.⁴ H04N 7/18
U.S. Cl. 358—106 **2 Claims**



1. An apparatus for detecting the presence of foreign matter of a plurality of solid drug items by scanning a surface of each solid drug item with a television camera and generating a pulse signal when a level of a video signal output from said camera exceeds a predetermined value, said apparatus comprising: a shift register for temporarily storing a pulse signal generated for each respective address of a scan line of said television camera and for sequentially outputting said stored pulse signal during a next scan; an OR means for receiving both an output from said shift register at a particular address and an output thereof at a next address adjacent said particular address; an AND means for receiving both an output from said OR means and an output from said shift register at an address corresponding to said particular address but at a next scan line scanned by said camera; a counting means for counting pulse signals which are output from said AND means, and a means for generating a detection signal indicative of the detection of foreign matter when said counting means has counted up a number of pulse signals which is greater than a predetermined value, whereby a pulse signal corresponding to adjacent addresses along one scan line and also between the same addresses of two adjacent scan lines are counted by said counting means so that foreign matter of a length and width corresponding to the output thereof can be detected.

4,636,850

APPARATUS AND METHOD FOR ENHANCEMENT OF VIDEO IMAGES

Michael E. Stewart, Redwood City, Calif., assignor to Adac Laboratories, Inc., San Jose, Calif.

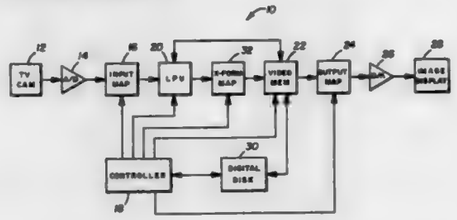
Filed Sep. 7, 1984, Ser. No. 648,459
Int. Cl.⁴ H04N 5/32
U.S. Cl. 358—111 **22 Claims**

1. An apparatus for enhancing video images of a subject comprising:

means for obtaining a first image of said subject, and for subsequently obtaining a second image of said subject;

means for subtracting one of said first image and said second image from the other of said first image and said second image to obtain an intermediate difference image;

transformation mapping means for increasing the intensity of said difference image by applying a monotonically increasing pixel to pixel intensity transformation to said difference image; and



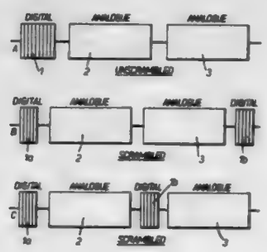
means for adding said increased intensity difference image to one of said first image and said second image to obtain a resultant image wherein the difference is between said first image and said second image are highlight in said resultant image when displayed on a video monitor.

4,636,851

SIGNAL CODING FOR SECURE TRANSMISSION

Gordon M. Drury, Whitechurch; Arthur G. Mason, Andover; Nicolas K. Lodge, Salisbury, and Barry A. Flannaghan, Alresford, all of England, assignors to Independent Broadcasting Authority, London, England

PCT No. PCT/GB83/00121, § 371 Date Dec. 12, 1983, § 102(e) Date Dec. 12, 1983, PCT Pub. No. WO83/03942, PCT Pub. Date Nov. 10, 1983
PCT Filed Apr. 25, 1983, Ser. No. 568,199
Claims priority, application United Kingdom, Apr. 23, 1982, 8211826
Int. Cl.⁴ H04N 7/167
U.S. Cl. 358—119 **5 Claims**



1. A method of processing a signal representing a line of a television picture, comprising the steps of

(a) generating a sampled signal;

(b) dividing the sampled signal into blocks of information;

(c) loading said blocks of information in a first order into a plurality of stores whose total capacity is sufficient to store information representing one line; and

(d) reading out said blocks of information in said stores in a second order different from the first order with the information within one of said blocks when read out being in the same order as when written into a store; thereby to provide an encrypted signal;

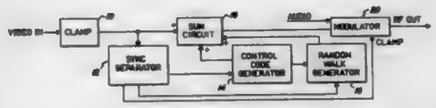
(e) said sampled signal generation comprising the step of processing an input signal to provide multiplexed signals representing digital information, sampled analog chrominance information, and sampled analog luminance information for the complete line, said sample signal division being arranged to divide one of said multiplexed signals into a plurality of portions altering the position in the line of at least one of said portions.

4,636,852

SCRAMBLING AND DESCRAMBLING OF TELEVISION SIGNALS FOR SUBSCRIPTION TV

James O. Farmer, Doraville, Ga., assignor to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Jan. 26, 1984, Ser. No. 574,211
Int. Cl.⁴ H04N 7/167
U.S. Cl. 358—120 **24 Claims**



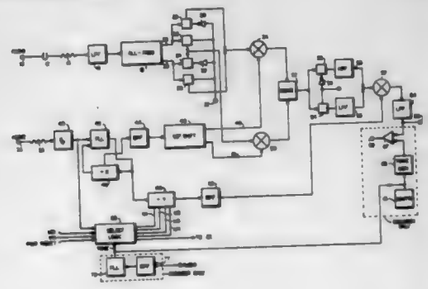
1. A system for scrambling and descrambling TV signals which comprises means for generating a first signal in synchronous relationshp with the TV signals which varies pseudorandomly in amplitude, means for combining said first signal with said TV signal to provide a scrambled TV signal for transmission, means for generating a second signal having the same pseudorandom amplitude variation and synchronous relationship with said TV signal as said first signal, and means for combining said second signal with said scrambled TV signal to descramble said TV signal for reception.

4,636,853

DYNAMIC AUDIO SCRAMBLING SYSTEM

Ronald L. Forbes, and John A. Lund, both of McHenry, Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 21, 1983, Ser. No. 564,973
Int. Cl.⁴ H04N 7/167; H04M 1/70
U.S. Cl. 358—121 **7 Claims**



5. An audio decoder in a television signal decoder system for decoding a single sideband scrambled audio signal that has been dynamically scrambled in a plurality of modes, with a different offset frequency defining each mode, in response to a plurality of control signals comprising:

means for generating corresponding offset frequencies;

logic means for determining the scrambling modes from said control signals and selecting the offset frequencies corresponding thereto;

means generating a data signal for determining a first scrambling mode;

means generating a vertical interval signal for determining when a change in scrambling mode from said first scrambling mode has occurred;

means generating a video inversion signal for determining whether the change in scrambling mode is from said first scrambling mode to a second scrambling mode or whether the change is from said first scrambling mode to a third scrambling mode; and

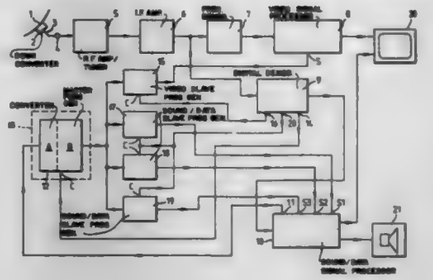
means for selectively applying said offset frequencies to descramble said audio signal.

4,636,854

TRANSMISSION SYSTEM

Gerald O. Crowther, Sutton, and Arthur G. Mason, Hampshire, both of England, assignors to U.S. Philips Corporation, New York, N.Y. and Independent Broadcasting Authority, London, England

Filed Jun. 20, 1984, Ser. No. 622,503
Claims priority, application United Kingdom, Jun. 20, 1983, 8316751
Int. Cl.⁴ H04N 7/167, 7/16; H04K 7/100
U.S. Cl. 358—123 **21 Claims**



1. A television transmission system in which the video components of a transmitted television signal are scrambled to allow only for their authorized reception, a video scrambling key being provided for the line-by-line scrambling or descrambling of said video components, said video scrambling key comprising a first pulse signal, having a first pseudo random configuration, generated at a first rate which corresponds to that of the line frequency, the first pulse signal being periodically set, in response to control data having a rate which is low compared with that of the line frequency, to a particular pulse configuration, which first pulse signal thereafter is stepped in accordance with its random configuration, characterized in that said television signal additionally contains digitally modulated sound or data components which are packet multiplexed such that individual packets represent a sound or a data component, said packets being time-division-multiplexed within periods allotted in said television signal, one of said sound/data components being scrambled to allow only for authorized reception, a packet scrambling key being provided for the packets of the sound/data component which is to be scrambled or de-scrambled, said packet scrambling key comprising a second pulse signal, having a second pseudo random configuration, generated at a second rate corresponding to the rate at which said packets appear either prior to or after multiplexing or demultiplexing, the second pulse signal being periodically set, in response to said control data, to a particular pulse configuration, which second pulse signal thereafter is stepped in accordance with its random configuration.

4,636,855

SCRAMBLED TELEVISION SIGNAL RECEIVER SYSTEM

Takashi Okada, Yokohama; Takao Mogi, Tokyo, and Shinjiro Mino, Yachiyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

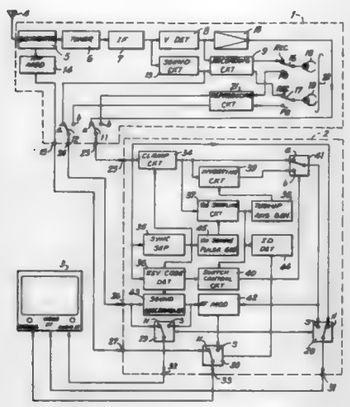
Filed Mar. 1, 1984, Ser. No. 585,174
Claims priority, application Japan, Mar. 9, 1983, 58-38766
Int. Cl.⁴ H04N 7/167
U.S. Cl. 358—124 **4 Claims**

1. Apparatus for viewing a television signal having video

and audio components which may be received in scrambled condition or in standard condition, comprising:

video tape recorder means for recording said television signal as received and for reproducing the recorded television signal, said video tape recorder means having a first video output terminal, a first audio output terminal and a first RF output terminal;

decoder means for descrambling the reproduced television signal when the latter has been received in said scrambled condition to generate a descrambled television signal which is in said standard condition, said decoder means including a first video input terminal, a first audio input terminal and a first RF input terminal adapted for connection to said first video output terminal, said first audio output terminal and said first RF output terminal, respectively, of said video tape recorder means, video descrambling means for descrambling scrambled video signals supplied from said first video input terminal and having an output, audio descrambling means for descrambling scrambled audio signals supplied from said frist audio



input terminal and having an output, detecting means for detecting when the recorded television signal is in said scrambled condition in said video and audio components and generating a control signal in response thereto, RF modualtor means supplied with said outputs of said video descrambling means and said audio descrambling means and producing an RF television signal as an output, a second video output terminal, a second audio output terminal and a second RF output terminal, and a plurality of switching means for automatically and selectively connecting said second video, audio and RF output terminals of said decoder means to said first video, audio and RF input terminals thereof, respectively, or to said outputs of said video descrambling means, said audio descrambling means and said RF modulator means, respectively; and

monitor means for displaying the television signal in said standard condition, said monitor means having a second video input terminal, a second audio input terminal and a second RF input terminal respectively adapted for connection to said second video, audio and RF output terminals, respectively, of said decoder means.

4,636,856

ARRANGEMENT FOR TWO-DIMENSIONAL DPCM CODING

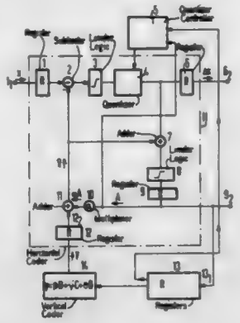
Alexander Starck, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 17, 1984, Ser. No. 641,727

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1983, 3331426

Int. Cl.⁴ H04N *7/13*

U.S. Cl. 358—135 **9 Claims**



1. In an arrangement for two-dimensional differential pulse code modulation of digital picture element signal values, and of the type in which a controlled quantizer receives and quantizes differential pulse code modulation values, which are the difference between the digital picture signal values and assessed values (x), and in which the most recently calculated digital picture signal value (A) prior to the signal value (x) being processed and adjoining calculated picture element signal values (B,C,D) above and on each side of the recently calculated picture element signal value (x) being processed are delayed in delay means and used for calculating the assessed values (x), the improvement therein comprising:

a quantizer controller connected to the delay means to receive the calculated picture signal values (A,B,C,D) and connected to and operable to control the quantizer, said quantizer controller comprising a plurality of serially-connected registers for receiving and storing the adjoining calculated signal values (B,C,D);

comparison means connected to said plurality of registers and operable to compare the amplitudes represented by the adjoining calculated picture element signal values (B,C,D) with one another and to produce respective first control signals (C11, C12, C13), representing the differences between the amplitudes;

extrema selection control means connected to said comparison means and operable in response to said first control signals to select and produce second control signals (S1,S2) selecting the extrema values (E), (F) of the amplitudes of the calculated picture element signal values (B, C, D);

first multiplex means connected to said plurality of registers and to said extrema selection control means and operable in response to said second control signals to through-connect the extrema values (E), (F);

substraction means connected to said first multiplex means for receiving the extrema values (E), (F) and connected to the delay means for receiving the most recently calculated picture element signal value (A), and operable to produce the difference values (A−F), (A−E) and (F−E) along with operational sign bits;

a difference selection control connected to said subtraction means for receiving said operational sign bits and responsive thereto to produce third control signals for defining the maximum difference value (MD);

second multiplex means connected to said subtraction means and to said difference selection control and responsive to said third control signals to through-connect the maximum difference value (MD) of the difference values (A−F), (A−E) or (F−E); and

threshold logic means connected between said multiplex means and the quantizer to control the quantizer.

4,636,857

SCANNING LINE INTERPOLATION CIRCUIT FOR TELEVISION SIGNAL

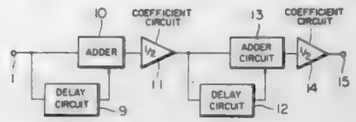
Masahiko Achiha, Iruma, and Kazuo Ishikura, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 8, 1985, Ser. No. 689,804

Claims priority, application Japan, Feb. 8, 1984, 59-19920

Int. Cl.⁴ H04N *11/06, 7/04, 7/01*

U.S. Cl. 358—140 **5 Claims**



1. A scanning line interpolation circuit for a television signal comprising:

input means for receiving an interlaced television signal;

output means for producing an interpolated television signal with a line rate two times of that of the interlaced television signal; and

a spatio-temporal filter and a time compression circuit connected in cascade between said input means and said output means, the total frequency characteristic of said spatio-temporal filter and said time compression circuit being such a characteristic that the response characteristic becomes zero at a vertical frequency and a time frequency which coincide with an interlace scanning frequency in a vertical and time frequency domain, said spatio-temporal filter including a first circuit for adding a signal of a scanning line in a current field of a current input television signal from said input means and a signal of a scanning line one field before of the current television signal and located directly above the position of the first-mentioned scanning line in said current field, and a second circuit for adding the signal of the scanning line in said current field and a signal of a scanning line one field before of the current television signal and located directly below the position of the first-mentioned scanning line in said current field, and in which said time compression circuit is arranged for storing the respective outputs of said first and second circuit, for reading out alternatively the stored output signals of said first and second circuits every scanning line at a speed two times as high as a horizontal scanning period of said interlaced television signal, and for applying the alternately read-out signals to said output means.

4,636,858

EXTRACTING DIGITAL DATA FROM A BUS AND MULTIPLEXING IT WITH A VIDEO SIGNAL

Duane O. Hagge, Huber Heights, Ohio, and James E. Barnes, Fort Wayne, Ind., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 30, 1984, Ser. No. 666,511

Int. Cl.⁴ H04N *7/087, 7/04*

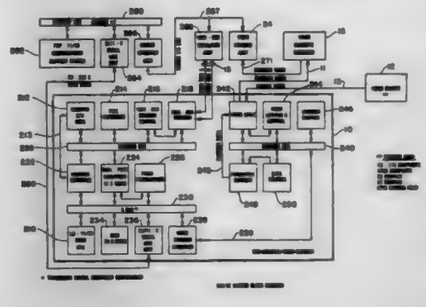
U.S. Cl. 358—147 **5 Claims**

1. Apparatus for monitoring a data bus, selecting data from the bus, encoding the data, and multiplexing the encoded data with a video signal from a separate video source; the data bus being a device addressable multiplex serial digital data bus having a plurality of devices coupled thereto, each device having a unique device address field included in messages which it sends via the data bus; said apparatus comprising:

apparatus bus means having coupled thereto CPU means, programmable memory means, random access memory means, bus decoder means, and video encoder means, the bus decoder means being also coupled to said data bus;

wherein the video encoder means comprises video logic means coupled between said video source and a video output, the video logic means being also coupled to the apparatus bus means;

wherein the apparatus includes means for performing actual data acquisition from the data bus as a passive function



with programmable data selection under control of the CPU means, using the device address fields, the bus decoder means including means for receiving data from the data bus and performing preprocessing of messages, means to time-tag data messages, and to assemble data messages into a message block buffer;

wherein the video encoder means includes means for synchronizing an internal video timing generator to the video signal from the video source, and means for receiving selected data messages from the message block buffer, means for formatting and encoding the messages as encoded data signals, and insertion of encoded data signals into the video signal for output to said video output.

4,636,859

DIDON DIGITAL DEMODULATOR

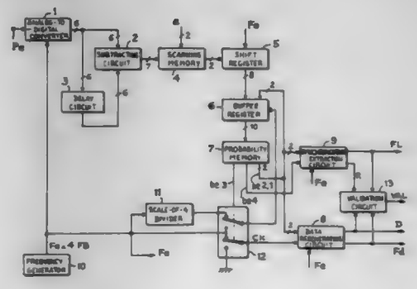
Jean Vernhet, Cesson Sevigne, and Tristan de Cosnanoa, Betton, both of France, assignors to Thomson CSF, Paris, France

Filed Mar. 5, 1985, Ser. No. 708,815

Claims priority, application France, Mar. 9, 1984, 84 03636

Int. Cl.⁴ H04N *7/093;* H03K *9/00*

U.S. Cl. 358—147 **7 Claims**



1. A DIDON digital demodulator comprising:

analog-to-digital conversion means for (a) receiving a DIDON television video signal having a progressive variation and (b) delivering successive inter-sample sig-

nals at the frequency n×FB, n being a positive whole number at least equal to 4 and FB being a binary frequency of the DIDON signal, said successive inter-sample signals being representative of the progressive variation of said video signal from one sampling period to the next;

identifying means for (a) identifying as a function of pre-established criteria configurations of n successive inter-sample signals which are probable configurations representative of a DIDON signal and (b) delivering (b1) auxiliary signals which indicate whether or not a configuration is identified as being representative of a DIDON signal, (b2) configuration signals which correspond to low-high "+" and high-low "−" transitions, and to high and low stable states of the DIDON signal; and

data-regenerating means for receiving the configuration signals and regenerating a data signal and a clock signal when the configurations corresponding to said configuration signals are probable configurations representative of a DIDON signal.

4,636,860

PICTURE DISPLAY DEVICE COMPRISING A NOISE DETECTOR

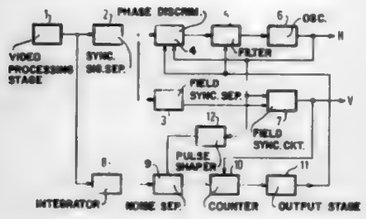
Peter A. Duijkers, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 9, 1984, Ser. No. 639,164

Claims priority, application Netherlands, Aug. 26, 1983, 8302984

Int. Cl.⁴ H04N 5/04

U.S. Cl. 358—148 **11 Claims**



1. A picture display device comprising

a video processing stage for supplying an incoming video signal containing at least a composite synchronizing signal;

a synchronizing signal separating stage connected to the video processing stage for separating the composite synchronizing signal from the incoming video signal;

a line synchronizing circuit coupled to the synchronizing signal separating stage for generating a line reference signal which is substantially synchronous with a line synchronizing signal present in the composite synchronizing signal;

a pulse shaper coupled to the line synchronizing circuit for producing a sampling pulse from said line reference signal, said sampling pulse occurring during a period of said line synchronizing signal and having a duration shorter than that of said line synchronizing signal; and

a noise detector having a noise separating stage coupled to said video processing stage and said pulse shaper for detecting noise present in said incoming video signal during the occurrence of said sampling pulse, and an output stage coupled to said noise separating stage for generating a change signal in dependence on said detected noise, wherein said noise separating stage comprises means for differentiating the incoming video signal applied thereto forming a noise signal, and means for amplifying the noise signal.

4,636,861

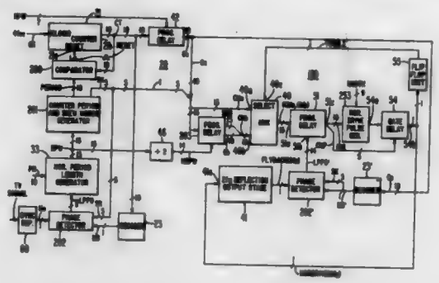
TWO-LOOP LINE DEFLECTION SYSTEM

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 1, 1985, Ser. No. 718,300

Int. Cl.⁴ H04N 5/04

U.S. Cl. 358—158 **16 Claims**



12. A deflection apparatus responsive to a line synchronizing input signal for generating a deflection output signal that forms corresponding deflection cycles in a deflection circuit during a given period of said input signal such that the frequency of said deflection cycles is higher than that of said input signal, said apparatus comprising:

a phase-lock-loop circuit responsive to said line synchronizing input signal for generating in said given period thereof a periodic signal at a frequency that is related to the frequency of said input signal;

a line output stage of said line deflection circuit responsive to said output signal for generating said higher frequency deflection cycles and for developing a deflection cycle indicative signal at said higher frequency that contains phase information of said higher frequency deflection cycles; and

a phase-control-loop having a phase detector that generates a control signal in accordance with said higher frequency deflection cycle indicative signal and in accordance with said periodic signal, said phase-control-loop being responsive to said periodic signal for generating said output signal that forms said deflection cycles at the frequency that is higher than that of said input signal and in a phase that is determined in accordance with said control signal of said phase detector.

4,636,862

SYSTEM FOR DETECTING VECTOR OF MOTION OF MOVING OBJECTS ON PICTURE

Yoshinori Hatori, Kawasaki, and Masahide Kaneko, Yokohama, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

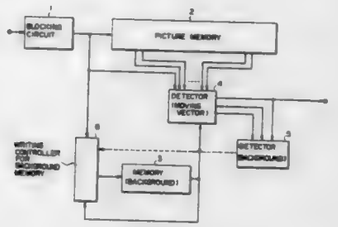
Filed Feb. 7, 1985, Ser. No. 699,001

Claims priority, application Japan, Feb. 13, 1984, 59-24700

Int. Cl.⁴ H04N 5/21

U.S. Cl. 358—166 **2 Claims**

1. A system for detecting the vector of motion of a moving object on a picture, comprising: a blocking circuit for blocking picture signals from the picture by steps of m picture elements x n lines (where m and n are integers greater than one); a picture memory connected to said blocking circuit for storing the picture signals of at least one frame or more in units of blocks; a background memory for storing, in units of blocks, background picture signals representing the background in the picture; a moving vector detector connected to said blocking circuit and said picture memory for selecting one block having the highest degree of similarity to a current input block on a current input frame in the picture signals from a block lying, at the same position as the current input block on said current input frame in the picture signals, on a picture of the immediately preceding frame read out of the picture memory, an adjoining block and a block lying, at the same position as the current input block, on the background stored in the background memory and for detecting the vector from one block selectred by the moving vector detector to the current input block and a distance between said one block and the current



input block on the picture; and a background detector connected to said moving vector detector for updating by the current input block, a block stored in correspondence to the current input block in the background memory when the position of said one block selected on the picture, its location in the picture memory or the background memory and said degree of similarity coincide with a predetermined condition.

4,636,863

NOISE REDUCTION CIRCUIT

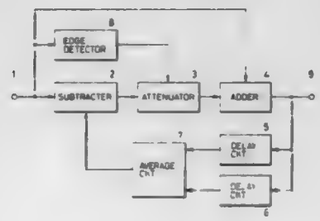
Kazuhiro Kaizaki, Yokohama; Sadao Kubota, Yokohama; Hiroshi Harada, Yokohama, and Shigeo Matsuura, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 17, 1985, Ser. No. 776,876

Claims priority, application Japan, Sep. 21, 1984, 59-196648

Int. Cl.⁴ H04N 5/21

U.S. Cl. 358—167 **3 Claims**



1. A noise reduction circuit comprising:

a plurality of delay circuits for delaying an output video signal for different delay times respectively;

an average circuit for averaging the outputs of the delay circuits;

a subtraction circuit for subtracting the output of the average circuit from an input video signal;

an attenuation circuit having an attenuation factor for attenuating the output of the subtraction circuit;

an addition circuit for adding the output of the attenuation circuit to the input video signal; and

an edge detection circuit for detecting the existence of an edge of a pattern in the input video signal;

the attenuation factor of the attenuation circuit being controlled by the output of the edge detection circuit.

4,636,864

TELEVISION RECEIVER COMPRISING A CIRCUIT FOR SEQUENTIALLY TUNING THE RECEIVER TO DIFFERENT FREQUENCIES

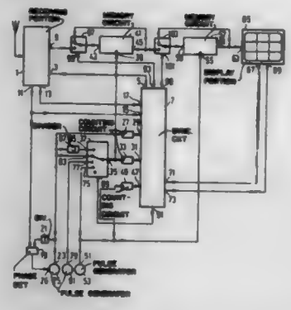
Marcellinus J. J. C. Annegarn, and Petrus W. G. Welles, both of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Jul. 15, 1983, Ser. No. 514,132

Claims priority, application Netherlands, Aug. 23, 1982, 8203282

Int. Cl.⁴ H04N 5/262, 5/445

U.S. Cl. 358—191.1 **2 Claims**



1. A television receiver comprising display means and a circuit for sequentially tuning the receiver to different frequencies and for displaying on said display means a composite picture comprising a group of sub-pictures which correspond to pictures derived from transmissions sequentially received at said different frequencies, the receiver comprising a first memory circuit for selectively storing information corresponding to said group of sub-pictures, characterized in that the receiver further comprises a second memory circuit selectively coupled to said first memory circuit for receiving from the first memory circuit said information corresponding to said group of sub-pictures, and for repeatedly providing said information to said display means for display as said composite picture, whereby while said second memory circuit is repeatedly providing said information, said first memory circuit is storing new information corresponding to a new group of sub-pictures, thereby enabling on display the simultaneous changing of the picture content of the sub-pictures in the composite picture.

4,636,865

SOLID STATE IMAGE SENSOR

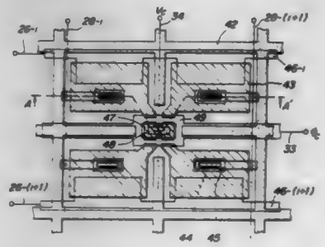
Masaharu Imai, Ina, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1985, Ser. No. 720,805

Claims priority, application Japan, Apr. 27, 1984, 59-85903

Int. Cl.⁴ H04N 3/12

U.S. Cl. 358—213 **10 Claims**



1. A solid state image sensor comprising:

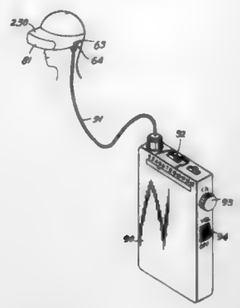
a plurality of row lines;
a plurality of column lines;
a plurality of pixels, each pixel comprising a normally-on type static induction transistor having gate, source and drain and a control transistor having a source-drain passage connected to said gate of said static induction transistor, said gate storing photocarriers induced by incident light, said static induction transistors and control transistors of pixels being formed on a same substrate and being arranged at cross points of the row and column lines;
means for scanning the pixels to readout an image signal by selectively making conductive the static induction transistors; and
means for selectively making conductive one or more control transistors of pixels which are not selected by the scanning means, and for discharging through the source-drain passages of the respective control transistors of non-selected pixels excess amounts of stored photocarriers over a pinch-off voltage of the static induction transistors of said non-selected pixels;
wherein adjacent four pixels are formed symmetrically with respect to a center region whereby first sources and drains of four control transistors of said four pixels are constituted by a common region formed in said center region and each of the others of sources and drains of four control transistors are formed integrally with each of the gates of respective static induction transistors of each of said four pixels.

4,636,866

PERSONAL LIQUID CRYSTAL IMAGE DISPLAY

Noboru Hattori, Shiojiri, Japan, assignor to Seiko Epson K.K., Japan

Filed Dec. 22, 1983, Ser. No. 564,521
Claims priority, application Japan, Dec. 24, 1982, 57-232547
Int. Cl.⁴ H04N *5/74, 13/04*
U.S. Cl. 358—236 **16 Claims**



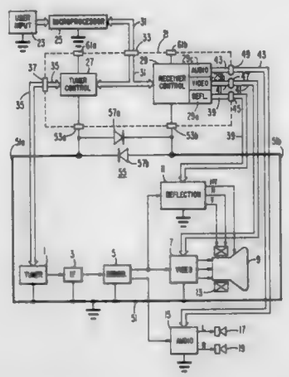
1. A liquid crystal image display device to be worn on a user's head, comprising:
holding means for holding elements of the display adapted to surround the eyes of the user and be worn on the user's head and formed with at least one opening to permit incident light to enter the holding means in the region in front of the user's eyes;
at least one light-transmission-type liquid crystal display panel disposed in the holding member along the line of sight of said at least one opening for displaying an image;
lens means disposed in the holding means along the line of sight between said liquid crystal display panel and the user's eyes for enlarging the size of said image displayed on the display panel; and
signal means coupled to the display panel for generating liquid crystal drive signals for driving said liquid crystal display panel, said display panel being positioned a distance from the lens means which is within the focal length of said lens means.

4,636,867

GROUNDING ARRANGEMENT USEFUL IN A DISPLAY APPARATUS

William J. Testin, Marion County, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 30, 1985, Ser. No. 792,788
Int. Cl.⁴ H04N *5/44*
U.S. Cl. 358—245 **8 Claims**



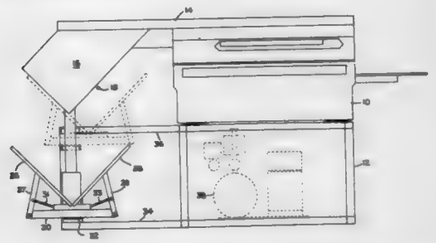
1. A display system comprising a picture tube, a deflection unit for generating magnetic fields for deflecting electron beams produced by said picture tube and first and second processing means for processing first and second signals with respect to a reference potential under the control of first and second control signals generated by a control unit with respect to said reference potential, and further comprising:
a reference potential bus for distributing said reference potential distributed around said deflection unit;
first and second interconnected control means within said control unit for generating said first and second control signals, respectively;
each of said first processing means, said second processing means, said first control means and said second control means having a respective reference potential input connected to respective connection points along said reference potential bus; and
bi-directional gating means connected between said reference potential inputs of said first and second control means for normally electrically separating said respective connection points for non-conduction therebetween to prevent said reference potential bus distributed around said deflection unit from conducting currents induced in response to magnetic fields produced by said deflection unit and for selectively electrically connecting said respective connection points for conduction therebetween when a voltage of a first plurality between said respective connection points exceeds a first predetermined magnitude and when a voltage of a second polarity, opposite said first polarity, between said respective connection points exceeds a second predetermined threshold to prevent an excessively high voltage of unpredictable polarity due to a high energy discharge associated with said picture tube from being developed across said respective connection points.

4,636,868

COPIERS

Brian R. Malyon, Feltham, England, assignor to The British Library Board, London, England

Filed Dec. 17, 1984, Ser. No. 682,158
Claims priority, application United Kingdom, Dec. 24, 1983, 8334479
Int. Cl.⁴ H04N *1/04*
U.S. Cl. 358—285 **9 Claims**



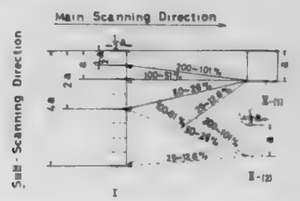
1. A document carrier for a document copier, comprising a trough-shaped support adapted to support a work having plural edge connected pages (a book) and to present a page to an inclined window in a scanner housing, the carrier comprising:
(1) a pair of separate plates normally positioned approximately at right angles and defining a trough;
(2) a platform on which the two plates are mounted;
(3) arms extending to the rear of the plates on the outside of the trough, said arms being, pivotally attached to the platform; and
(4) spring means acting on the said plates to cause said arms to urge the plates towards the normal trough-shaped configuration.

4,636,869

METHOD AND SYSTEM FOR RECORDING IMAGES IN VARIOUS MAGNIFICATION RATIOS

Kunio Tomohisa, Kyoto; Kiyoshi Maeda, Takatsuki, and Koji Yao, Otsu, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Oct. 27, 1983, Ser. No. 546,046
Claims priority, application Japan, Jan. 18, 1983, 58-7096; Jan. 27, 1983, 58-12545
Int. Cl.⁴ H04N *1/04, 1/46*
U.S. Cl. 358—287 **13 Claims**



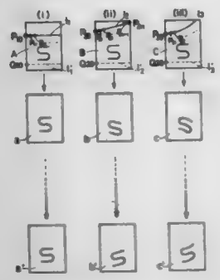
1. A method for performing magnification conversion in an image reproducing system, in which image data obtained by scanning an original picture in main and sub-scanning directions are written into a plurality of memory locations identified by a plurality of addresses and the image data are used for driving a recording beam in order to record a reproduction image, comprising the steps of:
(a) varying a feeding pitch of an input scanning beam in the sub-scanning direction in steps according to a specified magnification ratio;
(b) reading the image data from the memory locations;
(c) skipping or overlapping some of the addresses of the memory locations according to the specified magnification ratio; and
(d) varying the size of the input scanning beam in steps at least in the sub-scanning direction according to the specified magnification ratio.

4,636,870

METHOD AND SYSTEM FOR RECORDING TRANSFORMED IMAGES

Susumu Yamada, Osaka, and Mitsuhiko Yamada, Kyoto, both of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Dec. 6, 1983, Ser. No. 558,871
Claims priority, application Japan, Mar. 8, 1983, 58-038821
Int. Cl.⁴ H04N *1/17, 1/40, 1/06, 1/10*
U.S. Cl. 358—288 **27 Claims**



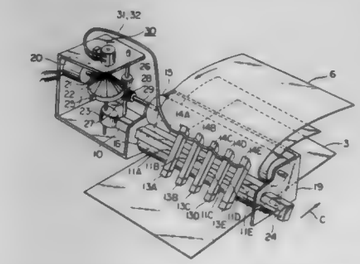
1. A method for recording a transformed image by using an image reproducing system in which image data obtained from an original picture are once written into a memory and then read to be used for driving a recording beam comprising steps of:
(a) individually computing scanning start point or start and stop points for each scanning line on an original picture in advance of an actual scanning process according to a specified transformation condition being set up on a computer module; and
(b) writing image data into a memory according to said transformation condition.

4,636,871

COPYING MACHINE

Takato Oi, Tokyo, Japan, assignor to Fumiaki Nukada, Japan

Filed Feb. 22, 1985, Ser. No. 704,647
Claims priority, application Japan, Feb. 22, 1984, 59-32148
Int. Cl.⁴ H04N *1/04, 1/21, 1/23*; G01D *15/16*
U.S. Cl. 358—296 **2 Claims**



1. A copying machine for reading a subject copy by dividing said subject copy into a plurality of picture elements, and at the same time, printing a copy of said subject copy on a copying paper sheet comprising:

a reading element array consisting of a plurality of reading elements for reading said subject copy, arranged at equal spacings in a straight line,

a printing element array consisting a plurality of printing elements for printing a copy of said subject copy based on image information from said reading elements, arranged at equal spacings in a straight line in the same direction as the direction of arrangement of said reading elements,

a first means for reciprocating said reading element array and said printing element array in the direction of arrangement thereof,

a second means for moving said copying paper sheet in the direction virtually normal to the direction of said reciprocating movement with respect to said printing element array, and

a third means for causing the relative movement between said reading element array and said subject copy in the direction virtually normal to the direction of said reciprocating movement,

said first means having a slide bar, to which said reading elements and said printing elements are provided in a one-to-one correspondence via a mounting member; said first means having a first driving means for reciprocating said slide means,

said second means comprising a paper feeding roller having a rotating shaft parallel to the direction of said reciprocating movement of said reading element array and said printing element array, and a second driving means for rotating said paper feeding roller; said printing element array being disposed in close vicinity to the rotating surface of said paper roller,

said third means comprising a travelling roller having a rotating shaft parallel to the direction of said reciprocating movement of said reading element array and said printing element array and being adapted to make contact with said paper feeding roller so as to be caused to rotate by the rotation of said paper feeding roller; said travelling roller being adapted to cause said copying machine to travel over aid subject copy placed on a plane, and said reading element array being disposed in close vicinity to said subject copy,

said first driving means having an eccentric cam; a half turn of said eccentric cam causing said slide bar to move in one direction and another half turn of said eccentric cam causing to said slide bar in the direction opposite to said one direction, and that said second driving means causes said paper feeding roller to slightly rotate as said slide bar is moved in said one direction,

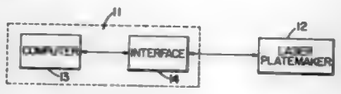
a gear mechanism connecting said first driving means and said second driving means is provided; said gea mechanism interlocking the rotation of said eccentric cam and the rotation of said paper feeding roller.

4,636,872

LASER IMAGING SYSTEM AND METHOD FOR IMPOSING PAGES FOR PRINTING

Robert J. Prichard, Anaheim, Calif., assignor to Gerber Scientific Instrument Company, Tustin, Calif.

Continuation of Ser. No. 618,589, Jun. 8, 1984, abandoned. This application Dec. 2, 1985, Ser. No. 803,788
Int. Cl.[4] H04N *1/21, 1/23*; G01D *9/42*
U.S. Cl. 358—296 **12 Claims**



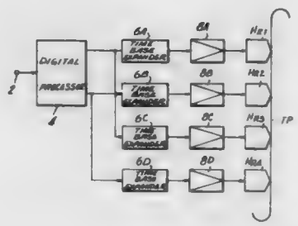
1. In a system for imaging a plurality of printed pages on an output medium in positions and orientations corresponding to an imposition format: means for scanning a first area of the output medium with a laser beam to form an image of one of the pages in the first area, and means for scanning a second area of the output medium with a laser beam to form an image of a second one of the pages in the second area, said first and second areas being positioned toward opposite ends of the output medium, and said means for scanning the areas including means for advancing the beam to a central position between the ends of the output medium, means for scanning the output medium in raster fashion between the central position and one end of the medium to form the image of the first page, means for returning the beam to the central position, and means for scanning the output medium in raster fashion between the central position and the opposite end of the medium to form the image of the second page.

4,636,873

METHOD AND APPARATUS FOR RECORDING AND REPRODUCING AN INFORMATION SIGNAL WITH A LARGER TAPE WRAPPING ANGLE

Takeo Eguchi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 486,812, Apr. 20, 1983, abandoned. This application Nov. 15, 1985, Ser. No. 798,711
Claims priority, application Japan, Apr. 23, 1982, 57-69426
Int. Cl.[4] G11B *5/00, 5/02, 15/14*
U.S. Cl. 360—8 **14 Claims**



1. Apparatus for recording two channels of information signals in a plurality of tracks on a flexible medium, comprising:

drum means engageable with said flexible record medium;

tape guide means positioned adjacent to said drum means and engageable with said flexible record medium;

said drum means and said tape guide means cooperating to train said flexible record medium about said drum means through an arc subtending an angle within the range of 180° to 240°;

time base expansion means for expanding the time base of said information signals to produce time base expanded information signals; and

two pairs of transducer means for recording said time base expanded information signals in said plurality of tracks on said flexible record medium; wherein:

the transducer means of each of said pairs are adjacent to each other, said pairs of transducer means are equally spaced from one another by an angle of 180°, one transducer means of each of said pairs records one of said channels and has a magnetic gap which assumes a first azimuth angle with respect to said tracks and the other transducer means of each of said pairs records the other of said channels and has a magnetic gap which assumes a second, different azimuth angle with respect to said tracks; and

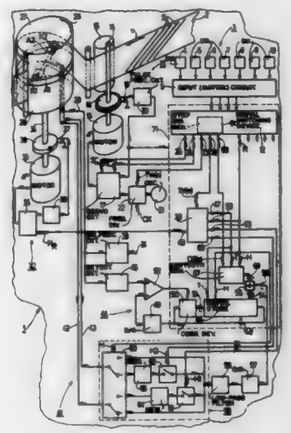
said time base expansion means expands the time base of said information signals so that the Nyquist frequency thereof is multiplied by a factor less than 1.0 but not less than 0.75.

4,636,874

SYSTEM FOR REPRODUCING INFORMATION SIGNALS ON A MAGNETIC TAPE WHICH INCREMENTALLY ADJUSTS, IN A PLURALITY OF STEPS THE SPEED OF THE MAGNETIC TAPE AND THE POSITIONING AND ROTATIONAL SPEED OF THE MAGNETIC HEAD UPON A CHANGE OF MODE

Abraham Hoogendoorn, and Franz Kschar, both of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 9, 1984, Ser. No. 587,790
Claims priority, application Austria, Mar. 15, 1983, 909/83
Int. Cl.[4] H04N *5/782*; G11B *21/10*
U.S. Cl. 360—10.2 **16 Claims**



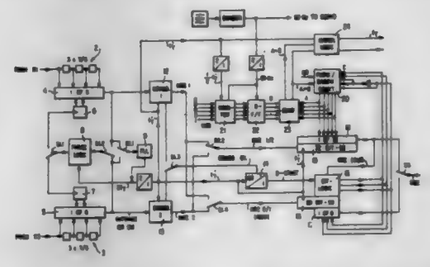
1. A system for reproducing information signals recorded on a magnetic tape in parallel adjacent tracks which extend obliquely relative to the longitudinal direction of said tape, in different modes of operation with different predetermined speeds of the magnetic tape, said system comprising a tape drive device, having a control input, for driving the magnetic tape at different speeds; at least one magnetic head; a head drive device, for rotating said magnetic head causing said magnetic head to consecutively scan said tracks; and a tracking servo system for causing said magnetic head to accurately scan said tracks, said tracking servo system including an electromechanical positioning device for adjusting the position of said magnetic head in a direction transverse to said tracks, a control circuit for generating a tracking signal for said electromechanical positioning device, and a variable-waveform sawtooth generator, having a control input, for generating a sawtooth waveform for said electromechanical positioning device to correct for tracking errors due to the speed of reproduction being different from the speed at which said tracks were recorded; said system further comprising a mode selection device with which an operator may select any of said modes of operation, and a switching device coupled to said mode selection device for applying, respectively, a first control signal (TW) to the control input of said tape drive device for controlling the speed of said magnetic tape, and a second control signal (DS) to the control input of said variable-waveform generator for controlling the amplitude and frequency of said sawtooth waveform, said first and second control signals being co-related so that at any speed of the magnetic tape corresponding to a particular value of said first control signal, a respective particular value of said second control signal adjusts said tracking servo system to cause said magnetic head to accurately scan said tracks, said switching device generating different respective values of said first and second control signals depending upon which of said modes is selected by the operator; characterized in that said switching device comprises a stepping signal generator activated by a change from a first mode to a second mode in said mode selection device, said stepping signal generator causing at least said first and second control signals to change incrementally, in a plurality of respective steps, from respective first values, corresponding to said first mode, to respective second values, corresponding to said second mode, said incremental changing of said first and second control signals being synchronous and said steps being respectively sized to maintain said co-relationship between said first and second control signals, whereby upon initiation of a mode change in said mode selection device, each incremental change in said first and second control signals does not exceed the dynamic responses of said tape drive device and said tracking servo system so that the quality of a picture on display is not degraded during a change from one mode of operation to another mode.

4,636,875

PLAYBACK DEVICE FOR A DIGITAL SIGNAL RECORDED BY A PLURALITY OF HEADS

Werner Scholz, Gehrden, Fed. Rep. of Germany, assignor to Telefunken Fernseh- und Rundfunk GmbH, Hanover, Fed. Rep. of Germany

Filed Dec. 27, 1983, Ser. No. 565,437
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1982, 3248163
Int. Cl.[4] H04N *5/95*; G11B *20/22*
U.S. Cl. 360—26 **22 Claims**



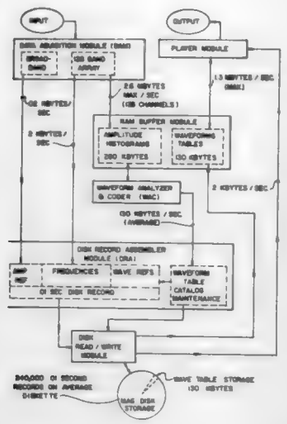
1. In a playback device for an uninterrupted digital signal recorded on a carrier by a plurality of heads in time successive, overlapping tracks, said playback device including a pair of playback heads for reading the recorded digital signal in adjacent tracks, and circuit means responsive to the output signals from both of said heads during the period of overlap for providing a control signal for changing the one of said heads which is to provide the output signal for the playback device to the head associated with the new track; the improvement wherein said means for providing a control signal includes: circuit means for matching the phase of the bit clock pulses of the digital signals in the overlap region of two adjacent tracks; circuit means for matching the bit patterns in said overlap region such that error-free switching takes place between the tracks; and circuit means for providing compensation for overlap errors by increasing or reducing the number of bit clock pulses between two head changes.

4,636,876

AUDIO DIGITAL RECORDING AND PLAYBACK SYSTEM

David M. Schwartz, Denver, Colo., assignor to CompuSonics Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 486,561, Apr. 19, 1983, Pat. No. 4,472,747. This application Sep. 17, 1984, Ser. No. 651,111
The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.
Int. Cl.[4] G11B *5/00*; G10L *5/02*
U.S. Cl. 360—32 26 Claims



1. A microcomputer recording system for recording analog signals in digital data form comprising:

converting means for converting an analog signal into at least three digital data streams, wherein the first of said digital data streams is a reference signal representative of the amplitude of a preselected range of frequencies in a relatively broad band width, and wherein the second of said data streams is produced by filtering the analog signal to produce a data stream indicative of a plurality of discrete frequencies encompassed by the bandwidth represented by said first data stream; and wherein the third of said digital data streams is a reference signal representative of the amplitude of the analog signal for each of said plurality of discrete frequencies;

sampling means for producing a sequential stream of digital data samples in each of said digital data streams,

selection means for selecting a predetermined portion of the digital data samples produced by said sampling means in each digital data stream;

means for separately storing each of said predetermined portions of said digital data samples;

means for comparing said predetermined portion of said first reference data stream containing amplitude data with said predetermined portion of said second reference data stream containing frequency data to produce frequency spectrogram data representative of the frequency and amplitude of the original analog signal;

means for transforming said predetermined portion of said digital data samples selected from said third data stream into data representative of a time versus amplitude histogram for each discreet frequency;

means for providing selected waveform parameters;

means for comparing said histogram data with said selected waveform parameters and producing addressable waveform data representative of the waveform of the original analog signal;

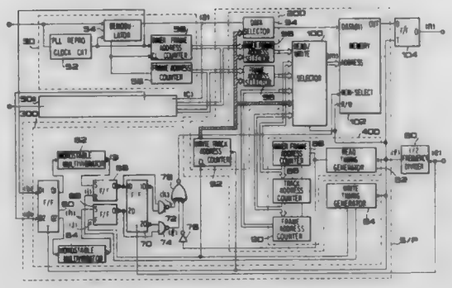
means for sequentially assembling and storing said frequency spectrogram data and said amplitude reference data of said first data stream and said addressable waveform data for subsequent use.

4,636,877

APPARATUS FOR REPRODUCING MULTIPLE TRACK DIGITAL SIGNALS AND INCLUDING TIMING CONTROL OF READ/WRITE OPERATIONS

Kihei Ido, Kyoto, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP84/00242, § 371 Date Nov. 7, 1984, § 102(e) Date Nov. 7, 1984, PCT Pub. No. WO84/04622, PCT Pub. Date Nov. 22, 1984
PCT Filed May 15, 1984, Ser. No. 674,926
Claims priority, application Japan, May 16, 1983, 85409/84
Int. Cl.[4] G11B *5/02, 5/09*
U.S. Cl. 360—51 1 Claim



1. A digital signal reproducing apparatus for multiple-track signals comprising:

N demodulation means for demodulating N parallel track signals into N corresponding binary track signals wherein N is an integer greater than 1;

each of said N demodulation means including clock recovery means responsive to the respective track signal for generating a transmission clock signal of frequency fc in phase with its corresponding binary data signal, and further including input data address counting means responsive to sync signals in the respective track signal and responsive to the respective transmission clock signal for generating respective successive input data address signals;

system clock means for producing a reference clock signal of frequency ANfc wherein A is a rational number equal to or larger than 1, and each cycle of the reference clock signal defines a read phase and a write phase;

a single memory unit having a plurality of address inputs, a data input, a data output, a chip select input, and a read/-write select input connected to the system clock means for being driven into read and write modes in correspondence with the read and write phases of the reference clock signal;

write selection means including (1) write track counting means connected to the system clock means for generating N successive write track addresses on write track address outputs therein in synchronism with successive cycles of the reference clock signal, (2) data selection means operated by the write track address outputs for successively applying the binary track signals from the respective N demodulation means to the data input of the memory unit, and (3) write data address selection means operated by the write track address outputs for successively applying the input data address signals from the respective N demodulation means to write data address outputs thereof;

read address selection means connected to the system clock means and including read track counting means and read data address counting means for generating successive read address signals on read address outputs thereof in synchronism with successive cycles of the reference clock signal;

read/write address selection means operated by the system clock means for alternately connecting first inputs from the read address outputs of the read address selection means and second inputs from the write data address outputs and the write track address outputs of the write selection means to the address inputs of the memory input in synchronism with the read and write phases of the reference clock signal;

write timing set up means including write timing means connected to the system clock means for generating successive spaced write timing pulses on N outputs thereof in synchronism with write phases of the reference clock signal, and further including N enablement means having inputs connected to the respective clock recovery means of the N demodulation means and to the respective N outputs of the write timing means for producing respective memory chip selection pulses upon coincidence of ordinary data signals in the corresponding demodulation means with the corresponding write timing pulses;

read timing means connected to the system clock means for generating successive read timing pulses in synchronism with the read phases of the reference clock signal; and

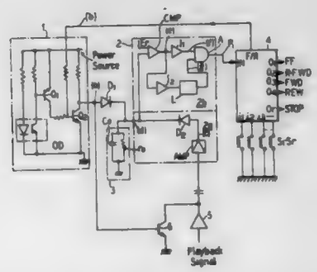
OR means for applying the chip selection pulses and the read timing pulses to the chip select input of the memory unit generating on the data output thereof a series digital data signal corresponding to the N parallel track signals.

4,636,878

COMBINED DETECTOR CIRCUIT FOR DETECTING A TAPE END OR UNRECORDED AREA OF A TAPE

Kazuo Murayama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 14, 1985, Ser. No. 711,753
Claims priority, application Japan, Mar. 15, 1984, 59-48195
Int. Cl.[4] G11B *15/18, 27/22*
U.S. Cl. 360—71 1 Claim



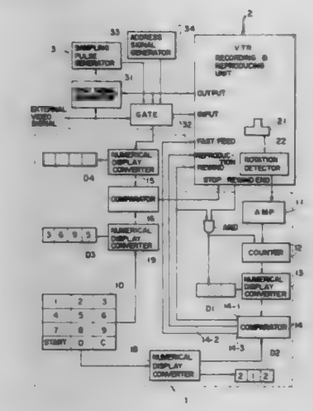
1. A tape reproducing apparatus of automatic reversing type comprising an optical sensor for detecting and producing different output signals from the magnetic coated portion of the tape and the leader of the tape, a first circuit connected to said sensor and generating a first output signal which changes from one state to another state only when the end of the coated portion of tape is detected by the sensor in a forward mode of apparatus, a circuit means including a rectifying circuit receiving a playback signal and detecting a non-recorded area in said tape, a second detecting circuit for generating a second output signal which changes from one state to another state only when a non-recorded area of the tape is detected in a fast-forward or fast-rewind mode of apparatus by said circuit means and an integration circuit which includes a capacitor and resistor which have a predetermined time constant, a switching circuit means responsive to the modes of the apparatus and selectively supplying one of said first or second output signals to said integration circuit such that the capacitor of said integration circuit is discharged and charged at the same time constant.

4,636,879

VTR SYSTEM

Fujiaki Narita, Amagasaki, and Sumio Tanaka, Itami, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jul. 6, 1984, Ser. No. 628,385
Claims priority, application Japan, Jul. 6, 1983, 58-123664; Sep. 2, 1983, 58-162402; Sep. 8, 1983, 58-166303
Int. Cl.[4] G11B *15/18*
U.S. Cl. 360—72.2 6 Claims



1. A magnetic recording and reproducing system comprising:

address generating means for generating a desired address which is comprised of an appropriate number of digits, forming a first part and a second part, and which indicates a location of a recording medium;

first detecting means provided in a means for moving said recording medium for detecting an approximate location of said recording medium based on an amount of movement of said recording medium;

second detecting means for detecting a first part of a recorded address recorded on said recording medium;

first comparing means for comparing the second part of said desired address set by said address generating means with a value detected by said first detecting means, said first comparing means supplying a first coincidence signal when said second part of said desired address agrees with said value detected by said first detecting means;

second comparing means for comparing the first part of said desired address set by said address generating means with a value detected by said second detecting means, said second comparing means supplying a second coincidence signal when said first part of said desired address agrees with said value detected by said second detecting means; and

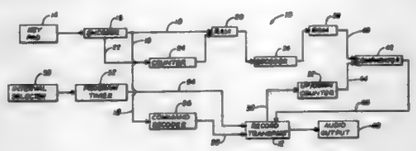
control means for controlling the movement of said recording medium such that said recording medium is moved at a first speed until said first coincidence signal is supplied from said first comparing means and said recording medium is moved at a second speed, which is different from said first speed, until said second coincidence signal is supplied from said second comparing means.

4,636,880

PROGRAMMABLE ANNUNCIATOR

Lawrence R. Debell, Bethany, Okla., assignor to Phi Technologies, Inc., Oklahoma City, Okla.

Filed Jun. 29, 1984, Ser. No. 626,117
Int. Cl.[4] G11B *15/18*
U.S. Cl. 360—72.3 31 Claims





10. Program apparatus for use in controlling a tape transport and record for recording and playback of preselected messages at specific time intervals, comprising:

input means for recording selected messages on said record at a plurality of designated message positions;

means generating a reel turns count output for each such message position on said record;

read only memory means for storing reel turns count data for each message position;

random access memory means storing message position data and address data for each such reel turns count data stored in said read only memory;

comparator means receiving input of reel turns count output from said means generating for comparison with selected reel turns count output data from said read only memory to index said tape transport to selected message positions; and

means actuating said tape transport to reproduce selected message positions of said record.

21. In a programmed annunciator apparatus wherein prerecorded messages are selectively played back, a cassette tape record, comprising:

a plurality of successive tape intervals of preselected duration each separately locatable in said programmed annunciator apparatus;

a message portion of said tape interval having a preselected message recorded thereon; and

a search portion of said tape interval having a first portion with no recording followed by a second portion having a duration of cue-up synchronizing tone of selected frequency recorded thereon, said first portion being of sufficient tape duration to allow for message indexing delays.

4,636,881

TALKING BOOK WITH AN INFRARED DETECTOR USED TO DETECT PAGE TURNING

Paul E. Brefka, Southboro, and Klaus R. Pichler, Princeton, both of Mass., assignors to James T. Shaw, Sagaponack, N.Y.

Filed Sep. 10, 1984, Ser. No. 648,731
Int. Cl.[4] G11B *15/48, 5/06*
U.S. Cl. 360—74.1 9 Claims

8. Apparatus for providing recorded audible messages related to material being observed on sensible sheets comprising,

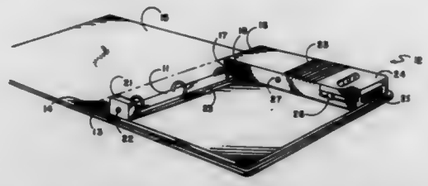
means for detachably securing said sensible sheets,

playback means for audibly reproducing sound messages recorded on a recording medium,

means for supporting said playback means and said means for detachably securing said sensible sheets in fixed relationship,

said means for detachably securing allowing easily turning said sheets as in a book to allow said sheets to exchange places between a left pile of sheets and a right pile of sheets and having means for guiding said sheets over a predetermined turning path when moving between left and right piles,

switching means in fixed relationship to said playback means and said means for detachably securing for providing at least a start signal in response to movement of a sensible



sheet from one of said piles to the other pile without producing any movement of the switching means,

means responsive to said start signal for activating said playback means to produce audible sound associated with a sheet,

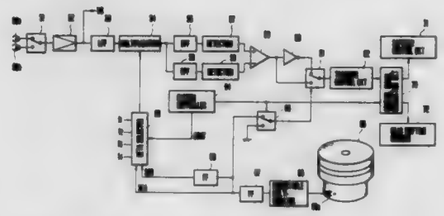
and means for supporting said switching means in noncontacting relationship with said sheets.

4,636,882

HEAD TRACKING APPARATUS

Hiroo Edakubo, Tokyo; Nobutoshi Takayama, and Hiroyuki Takimoto, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 576,029
Claims priority, application Japan, Feb. 1, 1983, 58-15679
Int. Cl.[4] G11B *21/02, 21/10*
U.S. Cl. 360—77 20 Claims



1. A video signal reproducing apparatus arranged to reproduce a composite signal which includes a video signal and four kinds of pilot signals of different frequencies from many recording tracks formed on a recording medium, comprising:

(a) a reproducing head arranged to trace said recording medium;

(b) generation means for selectively generating four kinds of reference signals of different frequencies;

(c) forming means for forming a tracking error signal by using said reference signal generated by said generation means and said pilot signals reproduced by the reproducing head;

(d) switch-over means for shifting an operating mode of the apparatus between a first mode in which said reproducing head traces said recording track at intervals of 4n+3 tracks and a second mode in which the head traces the recording track at intervals of 4n+1 track (n being an integer); and

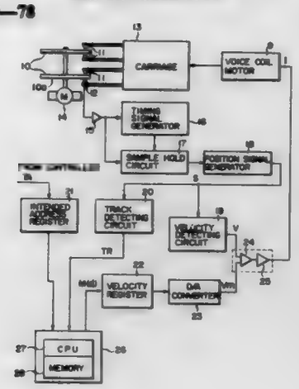
(e) inversion control means for controlling an inversion of the tracking error signal according to the operating mode.

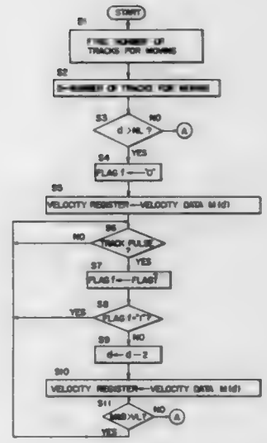
4,636,883

MAGNETIC HEAD CONTROL APPARATUS

Yasuichi Hashimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 19, 1984, Ser. No. 662,627
Claims priority, application Japan, Oct. 21, 1983, 58-197073
Int. Cl.[4] G11B *5/35*
U.S. Cl. 360—78 4 Claims





1. A magnetic head control apparatus comprising:

position signal generating means adapted for driving, with a carriage drive motor, a carriage on which is mounted a magnetic head, said carriage being located in a magnetic disc apparatus for positioning said magnetic head on a specified track of a magnetic disc, said position signal generating means outputting a position signal indicating a position of said magnetic head relative to said magnetic disc;

velocity detection means, which, based on the position signal output by said position signal generatin means, outputs a velocity signal corresponding to the seeking velocity of said magnetic head relative to said magnetic disc;

track detection means, which, based on the position signal output by said position signal generating means, outputs a track pulse for each track on said magnetic disc that is passed by said magnetic head;

target distance calculating means, which, based on the track pulse output by said target detection means, calculates the distance to the target track from the present position of said magnetic head;

comparing means for comparing the preset limit value and the target distance of said magnetic head calculated by said target distance calculating means;

target velocity generating means for generating a target velocity signal corresponding to the target distance, said generating being performed at the timing of a pulse obtained by frequency dividing the track pulse by a predetermined value when the target distance calculated by the target distance calculating means is greater than the preset limit, and being performed at the timing of the track pulse when the target distance calculated by the target distance calculating means is smaller than said preset limit;

error signal generating means for finding the velocity difference between the velocity signal output by said velocity signal generating means and the target velocity signal output by said target velocity generating means; and

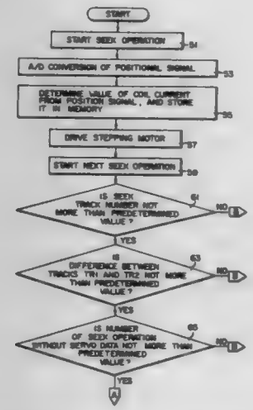
drive control means, which, based on the difference signal output by said error signal generating means, controls the drive of said carriage drive motor.

4,636,884

HEAD POSITIONING CONTROL SYSTEM IN MAGNETIC DISK DEVICE OF INDEX SERVO SYSTEM

Masakatsu Hattori, and Masao Fujiki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 21, 1985, Ser. No. 800,317
Claims priority, application Japan, Nov. 30, 1984, 59-253021
Int. Cl.[4] G11B *5/55*
U.S. Cl. 360—78 6 Claims



1. A magnetic head control system in a magnetic disk device of an index servo system, comprising:

a magnetic recording medium in which predetermined index servo data is prerecorded;

a stepping motor for driving said magnetic head in order to position said magnetic head on a target track on said magnetic recording medium;

drive signal generating means for generating both a positioning coil current value in accordance with the index servo data, and a step pulse, of said stepping motor, determined in accordance with a seek operation of said magnetic head;

memory means for storing the positioning coil current value generated by the drive signal generating means;

first drive control means for driving, when at least a seek distance is shorter than a preset distance in the magnetic head's seek operation, the stepping motor in a non-servo data mode in which the positioning coil current value

stored in the memory means and step pulses generated by the drive signal generating means are not used; and

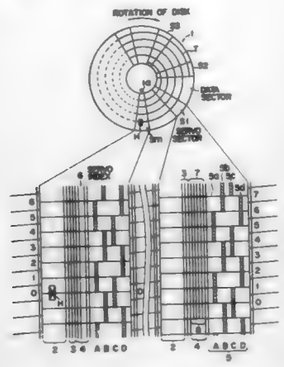
second drive control means for driving, when the number of seek operations in the non-servo data mode by the first drive control means exceeds a predetermined number of magnetic head's seek operations, the stepping motor in a servo mode in which both step pulses and coil current values generated by the drive signal generating means are used.

4,636,885

SERVO SYSTEM FOR A MAGNETIC DISK MEMORY HAVING SPIRAL TRACKS

Takehito Yamada, Yokohama, and Toshihiro Sugaya, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 12, 1985, Ser. No. 807,998
Claims priority, application Japan, Dec. 18, 1984, 59-267172
Int. Cl.[4] G11B *5/55, 5/56*
U.S. Cl. 360—78 6 Claims



1. A disk adapted for writing and reading information through a read/write head, comprising:

a plurality of data sectors each having spiral data tracks and first to m-th servo sectors each having spiral servo tracks and located between adjacent data sectors, said spiral data tracks in said data sectors and said spiral servo tracks in said servo sectors having a substantially equal track pitch, and said spiral servo tracks in each of said servo sectors being displaced from said data tracks in an adjacent data sector by half the track pitch;

a servo index zone formed in association with said m-th servo sector of said disk for providing a reference position on said disk; and

predetermined servo patterns formed in each of said servo sectors in the radial direction of said disk and adapted for positioning said head on said disk, said servo patterns each having a period which is an integral multiple of the pitch of said servo tracks, phases of said servo patterns with respect to said servo tracks in said servo sectors being sequentially displaced, from said first servo sector to said m-th servo sector, substantially by a value obtained by dividing the servo track pitch by the number m of said servo sectors.

4,636,886

ROTARY HEAD RECORDING SYSTEM

Theodore A. Schwarz, Bloomington, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

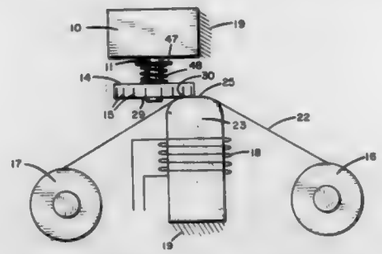
Filed Aug. 2, 1984, Ser. No. 636,932
Int. Cl.[4] G11B *5/027*
U.S. Cl. 360—84 8 Claims

1. In a recording system for use with a vertical format single layer flexible magnetic recording medium having first and second sides, an improved data transcription head assembly of the rotating type, including:

(a) an auxiliary pole having its tip adjacent the first side of the medium;

(b) a winding around the auxiliary pole;

(c) a pole carrier having an end face and a periphery whose intersection with the end face is a circle, said pole carrier mounted for rotation about an axis centered on and perpendicular to the circle of intersection, and positioned to place at least an arc of the circle of intersection in substantially contacting relationship along its length across the second side of the medium;



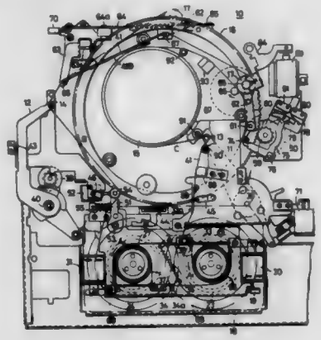
(d) at least two main poles mounted on the pole carrier, each main pole having its transcribing tip coincident with the circle of intersection such that for each revolution of the pole carrier, each transcribing tip is directed toward and sweeps across the medium along the arc of the circle of intersection in substantially contacting relationship with the medium and adjacent to the auxiliary pole tip, thereby allowing data transcription, wherein at least one pole has a pole tip area of preselected size in substantially contacting relationship with the medium, and another pole has a pole tip area of size relatively smaller in length and width as compared to the first main pole tip.

4,636,887

TAPE LOADING AND TENSIONING DEVICE FOR A RECORDING AND/OR REPRODUCING APPARATUS

Hiroshi Kato, Chigasaki, and Hiromitsu Kubota, Kawasaki, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 24, 1983, Ser. No. 545,081
Claims priority, application Japan, Nov. 1, 1982, 57-192259
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—85 6 Claims



1. A tape loading and tensioning device for a recording and/or reproducing apparatus, said tape loading and tensioning device comprising:

tape loading means for drawing out a tape from a tape cassette which has a supply reel and a take-up reel, and for loading said tape unto a predetermined tape path in which said tape is wrapped around a predetermined angular range on a peripheral surface of a guide drum;

first braking means for braking a supply reel disc which rotates said supply reel;

second braking means for braking a take-up reel disc which rotates said take-up reel;

first tension control means for controlling a tension in the tape which is drawn out from said supply reel;

second tension control means for controlling a tension in the tape which is drawn out from said take-up reel;

detecting means for detecting an arrival of said tape loading means at an intermediate position; and

control means for making one of said first and second braking means operative and the other of said first and second braking means inoperative during a first half of an operation stage in which said tape is wrapped around the periphery of said guide drum, and for subsequently making said one of said first and second braking means inoperative during a latter half of the operation stage, and for making both of said first and second tension control means operative during the latter half of the operation stage, said first half of the operation stage continuing until said detecting means detects the arrival of said tape loading means at said intermediate position, said latter half of the operation stage starting from an end of said first half of the operation stage and continuing until the tape loading operation is completed,

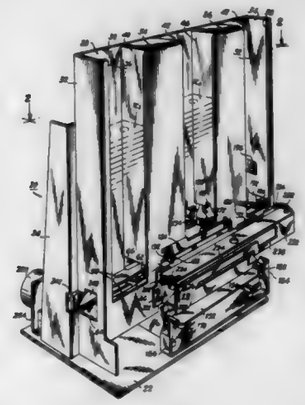
said tape loading means drawing out the tape from only one of said supply and take-up reels which is in correspondence with said other braking means which is made inoperative, during said first half of the operation stage.

4,636,888

CHANGER APPARATUS WITH MOVABLE MEANS FOR WITHDRAWING RECORDING MEDIA FROM AN INPUT HOPPER TO A RECORDING DECK TO AN OUTPUT HOPPER

Philip L. Sidebottom, Fairfield, Conn., assignor to Dictaphone Corporation, Rye, N.Y.

Filed Jul. 9, 1984, Ser. No. 629,212
Int. Cl.[4] G11B *15/68*
U.S. Cl. 360—92 16 Claims



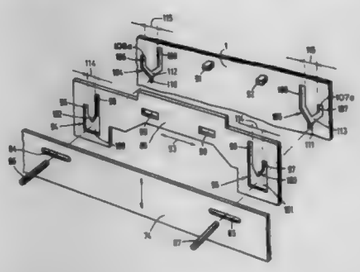
1. Changer apparatus of the type having an input hopper for storing a plurality of recording media and a spaced apart output hopper for storing recording media that have had messages recorded thereon by a recording deck and comprising pusher means for pushing a recording medium out of said input hopper; elevator means disposed beneath said output hopper for receiving the recording medium pushed from said input hopper and for lowering same onto said recording deck for the recording of a message thereon, said elevator means being further operable to lift the recording medium from said recording deck into said output hopper; rotable cam means coupled to said pusher means for reciprocatingly driving said pusher means to push a recording medium out of said input hopper to said elevator means, said cam means having a cam surface operable to drive said elevator means while said pusher means is driven, and cam follower means coupled to said elevator means and driven by the cam surface of said cam means for vertically driving said elevator means to lift one recording medium from said recording deck into said output hopper and then to receive the next recording medium pushed from said input hopper by said pusher means and then to lower that recording medium onto said recording deck.

4,636,889

MAGNETIC-TAPE CASSETTE APPARATUS WITH REVERSING TAPE DIRECTION

Armin Deutsch, and Heinrich M. Ruyten, both of Wetzlar, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1984, Ser. No. 593,798
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312134; Netherlands, Apr. 11, 1983, 8301265
Int. Cl.[4] G11B *5/008, 15/28, 15/44*
U.S. Cl. 360—96.2 10 Claims



1. A magnetic-tape-cassette apparatus comprising:

a frame,

a pivotable head-mounting plate,

at least one magnetic head and two pressure rollers mounted on said plate, and

means for transporting a magnetic tape, contained within a cassette which has been inserted in the apparatus, in a selected one of two opposite directions of tape transport past said at least one head, said means comprising first and second capstans disposed substantially parallel to each other and defining a capstan connecting line; said two pressure rollers being each associated with a respective capstan, arranged such that a controlled pivoting movement of the plate towards said line positions a selected one of said rollers, responsive to the direction of pivoting, against the respective capstan, thereby defining the direction of tape transport,

characterized by comprising a guide slot system having first and second slot portions, each portion including a respective guide slot having a guide slot branch, each said branch having a respective stop edge; and a guide pin system having first and second portions each including a respective pin, each pin engaging and being guided in a respective guide slot; one of said systems being arranged on said frame, with the first and second portions of said one system being disposed, with respect to the direction of tape transport, to respective first and second sides of said magnetic head; the other of said systems being arranged on the head mounting plate, with the first and second portions of said other system being disposed respectively,

with respect to the direction of tape transport, to said first and second sides of the magnetic head; and

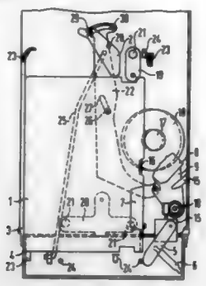
means, responsive to one of said pins being in the respective guide slot branch at the beginning of a cycle of movement of the head-mounting plate away from said line and back toward said line, for causing relative movement between said guide slot system and said guide pin system in a direction parallel to the direction of tape transport, during said cycle, such that upon subsequent movement of the plate towards said line during said cycle the other of said pins undergoes relative movement in its respective guide slot branch to abut the stop edge, said edge blocking further relative travel of said other pin; and as a result of the blocking of relative travel, further movement of said plate towards said line causes pivoting of said plate such that the pressure roller associated with the other side of the magnetic head moves towards its respective capstan and controls the tape transport in the other direction.

4,636,890

MAGNETIC TAPE RECORDER

Guttorm Rudi, Fjellhamar, and Jan-Erik Dilling, Oslo, both of Norway, assignors to Tandberg Data A/S, Oslo, Norway

Filed Mar. 8, 1984, Ser. No. 587,579
Claims priority, application Fed. Rep. of Germany, May 16, 1983, 3317720
Int. Cl.[4] G11B *5/54, 21/12*
U.S. Cl. 360—96.5 13 Claims



1. A magnetic tape transducer system for use with a cassette containing a tape and having a drive opening and a tape scanning location protected by a pivotable dust cover at a front end, and first and second lateral ends substantially perpendicular to the front end, comprising:

an insertion channel means for receiving the cassette first lateral end leading, the insertion channel means having a back end adjacent the inserted first lateral end when the cassette is fully inserted and a front side parallel to an insertion direction of the cassette;

a drive means positioned at said front side of the insertion channel means for interaction with the cassette drive opening;

a magnetic head also at said front side and positioned to interact with the scanning location of the cassette;

manually activatable cassette insertion means for inserting a partially inserted cassette into a final position in the insertion channel means;

means coupled to the insertion means for pivoting the pivotable cassette dust cover from a closed position to an open position as the cassette is inserted into the insertion channel means;

a connecting means having a first end connected to the insertion means and an opposite end connected to a swivel means;

a lever means connected to the swivel means;

pivotable magnetic head carrier means mounting the magnetic head and being connected to the lever means; and

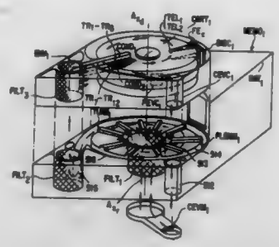
said connecting means, swivel means, and lever means together forming means for simultaneously pivoting the magnetic head into operative position simultaneously as the insertion means is inserting the cassette into its final position and the dust cover is pivoting open, the magnetic head pivoting into the operative position behind the dust cover with precise definitional movement.

4,636,891

MAGNETIC DISC CARTRIDGE WITH VENTILATING STRUCTURE

Guy Barski, Paris, France, assignor to CII Honeywell Bull, France

Filed Feb. 1, 1983, Ser. No. 462,910
Claims priority, application France, Feb. 11, 1982, 82 02207
Int. Cl.[4] G11B *25/04, 23/02*
U.S. Cl. 360—97 12 Claims



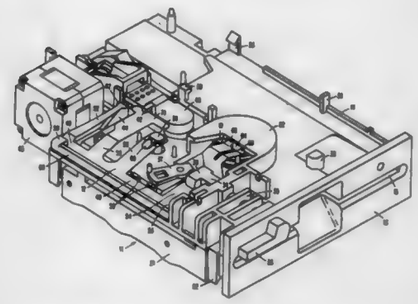
1. In combination, a magnetic disc cartridge having a disc including a rotation axis; a housing for the cartridge, the housing including: transducer head means positioned above a portion of the magnetic disc where data are recorded when the cartridge is in the housing, a platter having a rotation axis coincident with the disc rotation axis when the cartridge is in the housing; a recirculating gas flow path extending from the housing into the cartridge past the heads, thence out of the cartridge and back to the housing; the gas flow path including a first filter in the housing, the flow path through the first filter being coaxial with the disc rotation axis into a plenum in the housing, the plenum including a plate having a rotation axis coincident with the disc axis, the disc when rotated about the axis thereof inducing an outwardly directed gas flow from the first filter into a first passage, the first passage being at a radial position beyond the edges of the platter and disc, the first passage being aligned with a second passage in the cartridge when the cartridge is in the housing so gas flowing into the first passage flows into the second passage, filter means in at least one of said passages, the gas flow path in the cartridge including: means for feeding gas flowing through the second passage to the portion of the disc where data are recorded and an orifice positioned beyond the edge of the disc, the gas feeding means and the orifice being positioned so that gas flows out of the second passage in a spiral path past the head means, thence to the orifice, and a first conduit through which the gas flowing into the orifice flows; the gas flow path in the housing including a second conduit positioned to receive gas flowing in the first conduit and for supplying the gas flowing in the first conduit to the first filter when the cartridge is in the housing.

4,636,892

FLEXIBLE DISK DRIVE OPTIMIZED FOR AUTOMATED MANUFACTURE

William J. Frichauf, Thornton; Donovan M. Janssen; Alan J. Kirton, both of Boulder; Robert M. Murphy, Longmont, and Leroy Rose, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 5, 1984, Ser. No. 628,044
Int. Cl.[4] G11B *5/012*
U.S. Cl. 360—97 20 Claims



1. A flexible disk drive having functional element grouping, said disk drive comprising:

a first frame member;

a first functional element group including a first plurality of elements for loading and unloading a disk into said disk drive, said first plurality of elements being mounted on said first frame member;

a second frame member;

a second functional element group including a second plurality of elements for reading and writing on a disk when loaded in said disk drive, said second plurality of elements being mounted on said second frame member; and

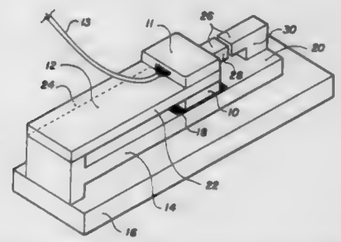
cooperating coarse registration and fastening means on said first and second frame members for releasably securing said frame members together whereby said second plurality of elements can thereafter read and write on a disk loaded into said disk drive by said first plurality of elements.

4,636,893

PIEZOELECTRIC DRIVEN MASS STORAGE

Richard J. McClure, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 6, 1985, Ser. No. 773,394
Int. Cl.[4] G11B *5/00*
U.S. Cl. 360—101 4 Claims



1. Apparatus for the magnetic recording and playback of digital information, comprising:

a. a magnetic transducer comprising a planar array of magnetic cores arranged in rows and columns,

b. means for supporting a magnetic medium comprised of a planar surface of magnetic material, said means for supporting being cooperative with said magnetic transducer for the recording and playback of said information on and from said medium, and

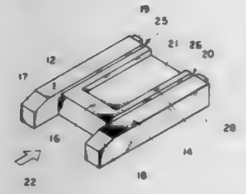
c. piezoelectric displacement means for cyclically effecting the movement of said array of magnetic cores relative to said means for supporting, wherein said cores contact substantially all of said magnetic medium surface for the purpose of recording and playback of said information.

4,636,894

RECORDING HEAD SLIDER ASSEMBLY

Frank S. C. Mo, Cupertino, Calif., assignor to Censtor Corp., San Jose, Calif.

Filed Mar. 12, 1984, Ser. No. 588,235
Int. Cl.[4] G11B *17/32*
U.S. Cl. 360—103 6 Claims



1. A device for supporting a transducer over a recording medium surface on an air bearing generated by an air flow caused by the motion of the medium surface past the transducer, said device comprising:

a slider having a surface including an air bearing region extending generally parallel to said medium surface to create a positive pressure region therebetween tending to support said slider over said medium surface,

said slider also including in said surface a recessed zone for creating a negative pressure region between the slider and medium surface tending to pull said slider towards said medium surface,

said slider also having formed therein a buffer pad and groove combination extending between and separating said positive and negative pressure regions for containing the negative pressure and for creating an ambient pressure region within said groove, and

said buffer pad is sufficiently narrow as to preclude a significant positive pressure region between said buffer pad and said recording medium surface, in contrast to said positive pressure region created by said air bearing region, so that said buffer pad produces little or no air bearing effect.

4,636,895

TAPE HEAD APPARATUS FOR A CASSETTE TAPE RECORDER

Seiji Tomita, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki, Kawasaki, Japan

Division of Ser. No. 383,216, May 28, 1982, Pat. No. 4,532,565.
This application Feb. 13, 1985, Ser. No. 701,239
Claims priority, application Japan, May 29, 1981, 56-82104
Int. Cl.[4] G11B *5/54*
U.S. Cl. 360—105 3 Claims

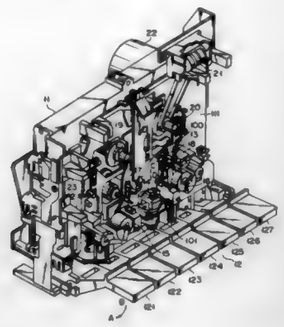
1. A cassette tape recorder for use with a tape cassette, comprising:

a record/play head and an erase head disposed in parallel with a tape running direction so that the tape running direction is substantially parallel to a plane containing said record/play head and said erase head, both of said heads being arranged so as to be capable of simultaneous insertion into at least one head insertion hole of the tape cassette when the cassette is positioned in a cassette housing portion of the tape recorder, a first surface of the record/play head being curved in a direction so that the tape can

travel across the curved portion and including a tape abutting surface which is adapted to contact the tape, said erase head including a tape-abutting surface which is positioned: (1) in a lower position than a highest portion of the tape-abutting surface of the record/play head, so that said highest portion of said tape abutting surface of said record/play head is nearer to the tape cassette than is said tape-abutting surface of said erase head, and (2) in a higher position than a tangential line to a first portion of the tape-abutting surface of the record/play head which is located closest to the erase head;

first and second tape guide means for guiding the tape so that the tape faces said at least one head insertion hole and the tape is disposed between said heads and said guide means, the tape being extended between said first and second guide means; and

head support means for supporting the record/play head and the erase head, and for allowing the two heads to be inserted into said at least one head insertion hole of the



tape cassette and to be movable among first, second and third positions including: (1) a first position with the tape being pushed by the record/play head and the erase head so as to be curved with two ends of the curve being defined by the first and second tape guide means, and a portion of the tape contacting said heads being curved upwards in the direction of curvature of said record/play head, (2) only the record/play head and not said erase head being brought into contact with the tape in said second position, and (3) the tape positioned between said first and second tape guide portions and away from the record/play head and the erase head in said third position, wherein, when the head support is in the first position, the record/play head abuts the tape against a tape pad which is within the tape cassette so that the tape is biased against the tape-abutting surface of the record/play head and, when the head support is in the second position, the tape is run at a high speed so as to reproduce the recorded information at a high speed.

4,636,896

DISK RECORDING AND PLAYBACK APPARATUS HAVING MAGNETIC HEAD SEPARATION DEVICE

Makito Takikawa, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jun. 13, 1984, Ser. No. 620,012

Claims priority, application Japan, Jun. 13, 1983, 58-89073[U]

Int. Cl.⁴ G11B *17/02, 21/12, 21/22*

U.S. Cl. 360—105 **4 Claims**

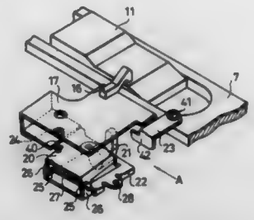
1. A disk recording and playback apparatus comprising:

(a) a housing base including means defining a path for insertion of a magnetic disk into said apparatus;

(b) a movable frame above said housing base having a closure member extending from said apparatus, said disk insertion path being defined between said movable frame and said housing base, said frame being movable by said closure member toward and away from said disk insertion path;

(c) a magnetic head supported on a carriage swingably mounted on said housing base and movable toward and away from said disk insertion path, said carriage having an arm with one end fixed to said carriage and the other end extending therefrom, and when said frame is moved toward said disk insertion path, said magnetic head on said carriage is displaceable by means of said arm between a first position in which it is separated from said disk insertion path and a second position in which it is placed proximate said disk insertion path so as to make operative contact with a magnetic disk inserted in said path;

(d) a cam body rotatably mounted on said housing base and having a tongue rotatably urged by biasing means into said disk insertion path, said tongue being movable out of said disk insertion path by engagement of a leading edge of an inserted magnetic disk with said tongue;



(e) a bail arrangement including a movable plate pivotally mounted to a base plate secured on said housing base, said movable plate being ruged by biasing means toward said base plate; and

(f) said cam body having a cam which is disposed between said movable and said base plates so as to move said movable plate apart from said base plate when said cam body is rotated by its biasing means to place said tongue in said disk insertion path, said movable plate engaging said other end of said arm connected to said carriage for displacing said magnetic head to said first position separated from said disk insertion path when said tongue of said cam body is in said disk insertion path;

(g) whereby said magnetic head can be held separated from said disk insertion path when a magnetic disk has not been inserted in said disk insertion path even though said closure member has been operated to move said frame toward said disk insertion path.

4,636,897

PERPENDICULAR MAGNETIC RECORDING AND REPRODUCING THIN FILM HEAD

Hitoshi Nakamura, Ohme; Kazuo Shiiki, Tsukui; Isamu Yuito, Sendai; Yoshihiro Shiroishi, Hachioji; Hideo Fujiwara, Tokorozawa; Kiminari Shinagawa, Tsukui, and Akemi Iijima, Kitatsuru, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 6, 1983, Ser. No. 539,386

Claims priority, application Japan, Oct. 15, 1982, 57-179854

Int. Cl.⁴ G11B *5/23, 5/235, 5/147, 5/187*

U.S. Cl. 360—119 **11 Claims**

1. A perpendicular magnetic recording and reproducing thin film head, comprising:

a nonmagnetic substrate as a bottom member, having an upper surface;

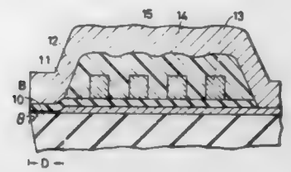
a lower magnetic layer which is formed on said non-magnetic substrate on the upper surface of the nonmagnetic substrate;

a first insulator layer formed on said lower magnetic layer;

a coil conductor layer formed on said first insulator layer;

a second insulator layer which overlies said first insulator layer and said coil conductor layer so as to bury said coil conductor layer therein;

and an upper magnetic layer which is formed on said second insulator layer; which is formed on said first insulator layer at the end facing the recording medium so as to form a magnetic gap between the upper and lower magnetic layers; and which is formed on said lower magnetic layer at the other end, said lower magnetic layer having a thick-



ness smaller than that of the upper magnetic layer, said lower magnetic layer and said upper magnetic layer functioning respectively as a main magnetic pole and an auxiliary magnetic pole of the thin film head; and wherein an angle defined between a surface of said substrate facing to a magnetic recording medium and said upper surface of said substrate is less than 90°, whereby a gap between the magnetic recording medium and the main magnetic pole during operation is reduced.

4,636,898

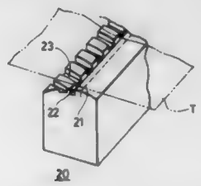
MULTICHANNEL MAGNETIC HEAD

Masaki Suzuki, deceased, late of Kanagawa, Japan (by Yumiko Suzuki, legal representative), and Goro Akashi, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 19, 1985, Ser. No. 756,616

Int. Cl.⁴ G11B *5/22*

U.S. Cl. 360—122 **9 Claims**



1. A multichannel magnetic head for simultaneously performing recording/reproducing on multiple tracks on a magnetic tape and having a tape-contact surface and a plurality or recording/reproducing gaps located on said surface, the improvement wherein a plurality of parallel grooves, inclined with respect to a direction of running of said magnetic tape, are provided at least on said tape-contact surface of said head at a tape-entrance side thereof.

4,636,899

METHOD AND MAGNETIC HEAD ASSEMBLY FOR RECORDING AND REPRODUCING CONTROL SIGNALS

Fumiaki Yamada, Tokyo, Japan, assignor to Nakamichi Corporation, Kodaira, Japan

Filed Jun. 22, 1983, Ser. No. 506,575

Claims priority, application Japan, Aug. 6, 1982, 57-136998; Aug. 11, 1982, 57-139591; Aug. 11, 1982, 57-139592

Int. Cl.⁴ G11B *5/20*

U.S. Cl. 360—123 **7 Claims**

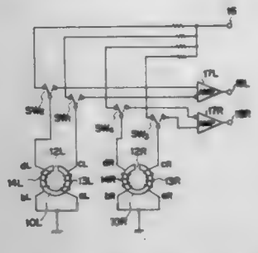
1. A magnetic head assembly for recording a control signal in a control track between information tracks of a magnetic recording medium and reproducing therefrom, comprising:

cores having respective working gaps to record information signals in said information tracks with a magnetizing direction parallel to the moving direction of said magnetic recording medium and to reproduce therefrom, each core having a right-hand portion and a left-hand portion;

respective coils wound on said cores, the winding direction of a said coil on one core being counter to the winding direction of a said coil on another core, said coils each having right-hand and left-hand portions respectively corresponding to said right-hand and left-hand portions of the corresponding core;

spacer means interposed between said cores for opposition to said control track;

means responsive to the control signal for magnetizing said cores with polarities opposite to each other and therewith



for recording said control signal in said control track with a magnetized direction perpendicular to that of said information signal, said means for magnetizing including means for supplying drive currents, corresponding to the control signal to be recorded, to said coils in a manner that current directions in left-hand and right-hand portions of each coil are opposite to each other and therewith current directions around said left-hand and right-hand portions of each core are opposite to each other;

means for reproducing a control signal for magnetic field components parallel to the magnetizing direction of said information signals among magnetic field components formed by said recorded control signal, said reproducing means including said working gaps and further including means connecting the left-hand and right-hand portions of a said coil for current flow in the same direction therethrough and therewith for picking up a signal across said coil generated by the corresponding working gap.

4,636,900

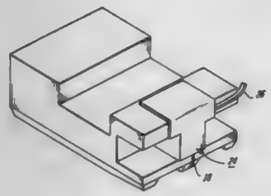
ARRANGEMENT FOR THE ELIMINATION OF CROSSTALK BETWEEN DATA AND SERVO HEADS

Chenshi J. Tung, LaCanada, and John Mansueto, Torrance, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 30, 1983, Ser. No. 537,622

Int. Cl.⁴ G11B *5/17*

U.S. Cl. 360—124 **4 Claims**



1. A disk drive comprising a disk having an upper and lower surface on which is recorded servo information and data on the

upper surface, and an arm assembly located above said disk, said arm assembly comprising:

a read/write data head for reading data from and writing data onto a data portion of said disk,

a composite servo head positioned on said arm to read servo information from a servo portion of the disk surface comprising a slider body with a ferrite core mounted on said body, said ferrite core having a bottom facing the upper surface of said disk, said core having a coil mounting portion for supporting, a coil wound on said core, a two-dimensional mumetal sheet which is cut and bent to form an envelope which surrounds only the top, two sides, and trailing end of the coil and portions of said ferrite core to shield said core and coil to minimize noise picked up by said servo coil from the data head, and

a mumetal plate shield between said data head and electrical cable which passes over said data head to connect said servo head with said disk drive.

4,636,901

THIN FILM MAGNETIC HEAD HAVING MAGNETIC LAYERS OF DIFFERENT THICKNESS AND MANUFACTURING METHOD THEREFOR

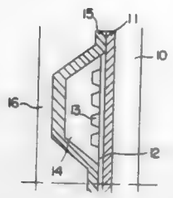
Masaki Ohara, Odawara, and Makoto Saito, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 3, 1983, Ser. No. 463,656

Claims priority, application Japan, Feb. 5, 1982, 57-16220

Int. Cl.⁴ G11B *5/147, 5/127, 5/23*

U.S. Cl. 360—126 **7 Claims**



1. A thin film magnetic head for performing recording and reading operations to a magnetic recording medium, comprising a substrate, a substantially planar first magnetic layer formed on said substrate and having one end facing toward said recording medium, a conductor coil formed above said first magnetic layer, and a second magnetic layer formed over said conductor coil and said first magnetic layer, said second magnetic layer being spaced from said first magnetic layer to define a magnetic gap at one end facing toward said recording medium and being magnetically shorted to said first magnetic layer at an other end opposite to said one end, said second magnetic layer having a first side portion facing toward said recording medium and a second side portion opposite to said first side portion, both of said first and second side portions being constituted by inclined portions, and said second magnetic layer at least at said one end positioned in opposition to said first magnetic layer with the magnetic gap being interposed therebetween being 1.2 to 1.4 times as thick as said first magnetic layer.

4,636,902

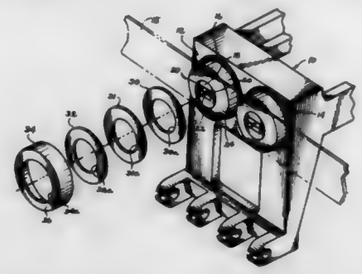
CROSSTALK SHIELDING ASSEMBLY FOR ADDITION TO ONE HEAD OF A DUAL MAGNETIC HEAD ASSEMBLY

Warren L. Dalziel, Monte Sereno; Charles Flanigan, San Jose; Donald V. Daniels, Santa Cruz; John S. Lee, San Jose, and James Johnston, Morgan Hill, all of Calif., assignors to Microtek Storage Corporation, San Jose, Calif.

Filed Jul. 9, 1984, Ser. No. 629,122

Int. Cl.⁴ G11B *5/11, 5/22*

U.S. Cl. 360—128 **9 Claims**



1. An apparatus for effecting data recording and reproducing in relation to a movable magnetic medium, the apparatus including:

a pair of identical, magnetic read/write head assemblies, each assembly including means defining a read/write gap;

means for supporting the head assemblies in spaced-apart relationship along the direction of motion of the magnetic medium; and

magnetic shielding mounted on one of the heads, said shielding circumscribing the gap-defining means and including a substantially non-magnetic, electrically conductive shield element sandwiched between a pair of high magnetic permeability elements;

the electrically conductive shield element being copper and the high magnetic permeability elements being made of mu-metal, the shield elements being stacked washers with their holes aligned and through which holes the gap-defining means projects for data transfer relationship with said magnetic medium.

4,636,903

SAFETY DEVICE FOR TAPE CASSETTES FOR POSITIONALLY CORRECT INSERTION OF THE TAPE CASSETTE INTO AN ACCEPTANCE DEVICE

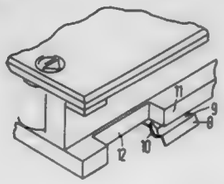
Guttorm Rudi, Fjellhamar, Norway, assignor to Tandberg Data A/S, Oslo, Norway

Filed Jul. 23, 1984, Ser. No. 633,596

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1983, 3331187

Int. Cl.⁴ G11B *23/02, 5/008, 15/00, 17/00*

U.S. Cl. 360—132 **3 Claims**



1. A safety device for tape cassette players for assuring positionally correct insertion of a tape cassette into an acceptance device, comprising the combination of:

a tongue-shaped spring element secured at one end in an acceptance device with a second end being free;

an oblique ramp edge disposed on said free end of said spring element in an insertion channel of said acceptance device and at a distance from a back stop region, said ramp edge being displaceable via a front edge of a tape cassette out of said insertion channel and against a spring power of said spring element;

a stop piece engageable behind said ramp edge and securely connected to and laterally adjacent said ramp edge on said free end of said spring element;

said spring element, ramp edge and stop piece all being fabricated from a one-piece punch part;

said tape cassette having a recess at said front edge, with said recess being disposed on said front edge to be in alignment with said stop piece;

whereby upon positionally correct insertion of said tape cassette into said acceptance device, said stop piece first slides into said recess and, upon continued insertion of said cassette, said front edge displaces said stop piece out of said insertion channel via said ramp edge.

4,636,904

HERMETICALLY SEALED MAGNETIC DISK CARTRIDGE

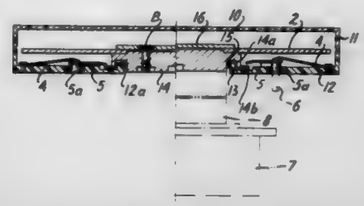
Takeshi Matsuno, Narashino, Japan, assignor to Seiko Seiki Kabushiki Kaisha, Chiba, Japan

Filed Sep. 20, 1984, Ser. No. 652,821

Claims priority, application Japan, Sep. 20, 1983, 58-173378

Int. Cl.⁴ G11B *23/02*

U.S. Cl. 360—133 **3 Claims**



1. A magnetic disk cartridge comprising: a plastic cartridge case having top and bottom walls and having an opening in the bottom wall defined by an upwardly extending tapered wall portion; a magnetic disk disposed within the cartridge case; a disk hub rotatably disposed within the cartridge case opening, the disk hub being displaceable upwardly and downwardly relative to the cartridge case, means connecting the magnetic disk to the disk hub to undergo movement therewith; spring means for resiliently urging the disk hub downwardly toward the bottom wall of the cartridge case; and a plastic ring attached to and encircling the disk hub, the plastic ring being configured to frictionally engage with and wedge against the tapered wall portion when the disk hub is urged downwardly by the spring means during non-use of the magnetic disk cartridge to thereby hermetically seal the opening and to disengage from the tapered wall portion when the disk hub is displaced upwardly relative to the cartridge case during use of the magnetic disk cartridge to thereby permit rotation of the disk hub and magnetic disk within the cartridge case.

4,636,905

VOLTAGE MONITORING SYSTEM FOR AN ELECTRIC POWER SOURCE OF A DISC DRIVE

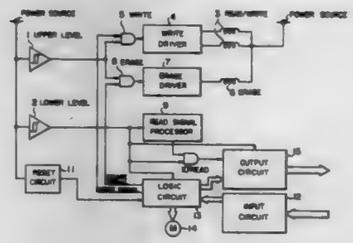
Atsutaka Morimoto, Kanagawa, and Shoji Takahashi, Saitama, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 791,895

Claims priority, application Japan, Oct. 31, 1984, 59-228396

Int. Cl.⁴ G11B *19/04*

U.S. Cl. 360—137 **3 Claims**



1. Voltage monitoring system for an electric power source of a floppy disk drive wherein said disk drive includes a write means, read means, head feeding means and motor driving means, said system comprising;

an upper level voltage detector having two predetermined reference levels to obtain a hysteresis characteristic defined with a upper set level and a upper reset level which is higher than the upper set level, and firstly comparing the voltage of the electric power source in a decreasing state with the upper set level in order to turn off a write operation, and further secondly comparing the voltage in an increasing state with the upper reset level in order to enable the write operation,

a lower level voltage detector having two predetermined reference levels being established as lower than the reference values in the upper level voltage detector to obtain a hysteresis characteristic defined with a lower set level and a lower reset level which is higher than the lower set level, and firstly comparing the voltage in a decreasing state with the lower set level in order to turn off a read operation, head feeding operation and motor driving function, and further secondly comparing the voltage in an increasing state with the lower reset level in order to enable the read, head feeding operations and motor driving function.

4,636,906

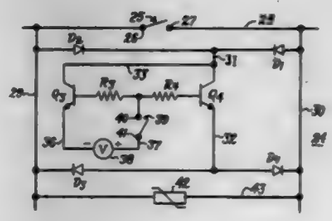
SOLID STATE CIRCUIT INTERRUPTION EMPLOYING A STORED CHARGE POWER TRANSISTOR

Thomas E. Anderson, Highland Heights, Ohio, and Edward K. Howell, Simsbury, Conn., assignors to General Electric Company, New York, N.Y.

Filed Apr. 24, 1985, Ser. No. 726,546

Int. Cl.⁴ H01H *9/30*

U.S. Cl. 361—13 **8 Claims**



1. A circuit interrupter comprising:

a power transistor connected across a pair of separable

contacts within an AC protected circuit for transferring circuit current away from said contacts when said contacts first becomes separated;

power supply means connected to a base on said power transistor through a switch and to a collector on said power transistor through a control transistor for providing stored charge to said power transistor base-collector junction when said switch and said contacts are closed to thereby allow said power transistor to turn on when said contacts and said switch are opened to allow said power transistor to turn off as soon as said stored charge is depleted; and

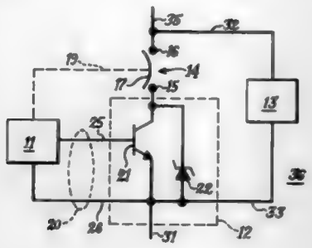
voltage dependent means connected across said power transistor for transferring said circuit current away from said power transistor when said power transistor has turned off.

4,636,907

ARCLESS CIRCUIT INTERRUPTER

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jul. 11, 1985, Ser. No. 753,832
Int. Cl.⁴ H01H 9/42
U.S. Cl. 361—13 **22 Claims**



1. A circuit interrupter comprising:

a pair of separable contacts connected in series within an electric circuit;

first and second circuit means connected within said electric circuit for preventing arc formation between said contacts upon separation;

said second circuit means connected in series with said contacts for causing a circuit current to transfer to said first circuit means prior to separating said contacts;

said first circuit means connected across the series combination of said contacts and said second circuit for conducting circuit current away from said contacts for a predetermined period of time before interrupting said circuit current; and

operating means for separating said contacts while said first circuit means is conducting said circuit current.

4,636,908

THIN-FILM DIELECTRIC AND PROCESS FOR ITS PRODUCTION

Toshio Yoshihara, Machida, and Ichiro Kikuchi, Yokohama, both of Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

PCT No. PCT/JP84/00027, § 371 Date Oct. 1, 1984, § 102(e) Date Oct. 1, 1984, PCT Pub. No. WO84/03003, PCT Pub. Date Aug. 2, 1984
PCT Filed Jan. 31, 1984, Ser. No. 662,295
Claims priority, application Japan, Jan. 31, 1983, 58-13869; May 31, 1983, 58-94840
Int. Cl.⁴ H01G 4/10; C04B 35/46
U.S. Cl. 361—321 **2 Claims**

1. A thin-film dielectric comprising two or more layers of a thin-film of a dielectric formed on a substrate, wherein the composition of said dielectric consists of lead titanate zirconate containing third components represented by the formula $Pb(Ti_xZr_y)_s(M'_tM''_t)_rO_3$

wherein,

M' is Mg and M'' is Nb, or

M' is Ni and M'' is Nb

x and y represent figures satisfying the following relations;

x is 0.3 to 0.55,

y is 0.45 to 0.7, and

$x+y=1$,

s and t represent figures satisfying the following relation;

$s+t=1$, and

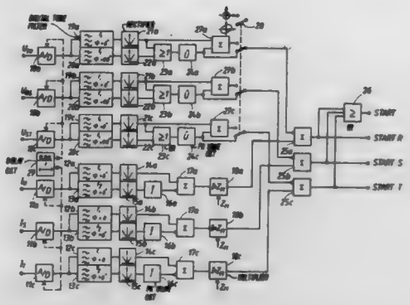
$t \leq 0.6$.

4,636,909

DIGITAL IMPEDANCE RELAY

Nils Brandt, Västerås, Sweden, assignor to Asea Aktiebolag, Västerås, Sweden

Filed Jan. 30, 1985, Ser. No. 696,634
Claims priority, application Sweden, Feb. 1, 1984, 8400499
Int. Cl.⁴ H02H 3/26
U.S. Cl. 361—80 **6 Claims**



1. A protection device of the impedance measuring type for a multiphase system, comprising:

A/D conversion means for generating digital pulse trains representative of the respective phase voltages and currents within said system at least at one measuring point;

voltage circuit means responsive to the voltage digital pulse train for each phase of said system and including means for producing signals representative of the instantaneous value of each of said voltage pulse trains, means for generating a digital mean value corresponding to the mean value of each phase voltage, and summator means for determining the difference between said digital mean value and the instantaneous value of each said phase voltage;

current circuit means responsive to each current digital train for each phase of the system and including means for generating signals respectively representing the fundamental and second harmonic frequencies of said phase current, means for determining the peak value of said second harmonic frequency signal, first summator means for determining the difference between said peak value and said fundamental frequency signal to produce a difference signal, means for multiplying said difference signal by a representative model impedance to produce a difference voltage output; and

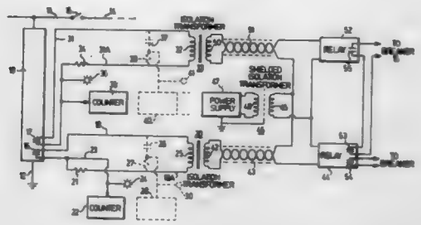
second summator means for determining the difference between the difference voltage outputs of said voltage circuit and said current circuit for each phase of the system to generate relay control signals for each phase of said system.

4,636,910

VARISTOR OVERVOLTAGE PROTECTION SYSTEM WITH TEMPERATURE SYSTEMS

Philip Chadwick, Peterborough, Canada, assignor to Canadian General Electric Company Limited, Toronto, Canada

Filed Apr. 30, 1985, Ser. No. 729,065
Claims priority, application Canada, Apr. 11, 1985, 478909
Int. Cl.⁴ H02H 5/04
U.S. Cl. 361—103 **11 Claims**



1. A protection system for protecting zinc oxide varistors in combination with a system having a plurality of zinc oxide varistors connected between a bus and a source of reference potential to protect the bus from overvoltages, each said varistor having a safety tripping temperature and a higher thermal runaway temperature, said protection system comprising

at least a first temperature sensor mounted to one of said varistors,

first circuit means connected to said first temperature sensor and responsive to said safety tripping temperature being sensed to provide a first signal,

a first circuit breaker connected to said bus having a closed position providing a predetermined voltage on said bus and an open position providing a reduced voltage on said bus,

a first relay connected to said first circuit means and to said first circuit breaker and responsive to said first signal from said first circuit means to operate said first circuit breaker to said open position and reduce voltage on said bus,

a second temperature sensor mounted to one of said varistors,

second circuit means connected to said second temperature sensor and responsive to a protective thermal runaway temperature being sensed to provide a second signal, said protective thermal runaway temperature being less than said thermal runaway temperature,

a second circuit breaker connected to said bus and having a closed position providing said predetermined voltage on said bus and an open position removing all voltage from said bus,

a second relay connected to said circuit means and to said circuit and responsive to said second signal from said second circuit means to operate said second circuit breaker to said open position to remove all voltage from said bus.

4,636,911

RESONANT DEGAUSSING FOR A VIDEO DISPLAY SYSTEM

Walter Truskalo, Titusville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 30, 1984, Ser. No. 676,813
Int. Cl.⁴ H04N 9/29
U.S. Cl. 361—150 **7 Claims**

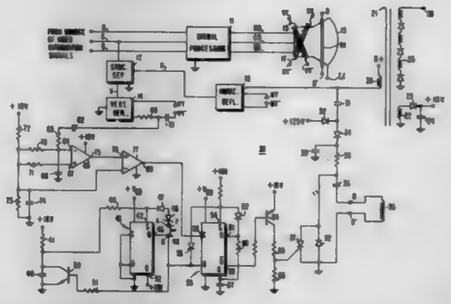
1. A degaussing circuit for a video display apparatus comprising:

a source of voltage;

energy storage means coupled to said source of voltage;

a degaussing coil coupled to said energy storage means to form a first resonant circuit current loop having a first resonant frequency;

inductance means coupled to said degaussing coil to form a second resonant circuit current loop having a second resonant frequency; and



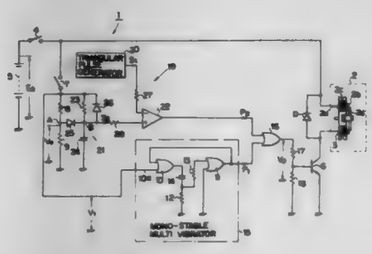
means for discharging said energy storage means through said degaussing coil and said inductance means to provide degaussing of said video display apparatus.

4,636,912

CIRCUIT FOR CONTROLLING SOLENOID CLUTCH

Yoshio Ohtani, Higashimatsuyama, Japan, assignor to Diesel Kiki Company, Ltd., Japan

Filed Jan. 11, 1985, Ser. No. 690,745
Claims priority, application Japan, Jan. 12, 1984, 59-2638; Jan. 12, 1984, 59-2639
Int. Cl.⁴ H01F 7/18
U.S. Cl. 361—154 **9 Claims**



1. A circuit for controlling a solenoid clutch which includes an electromagnet and has an input side rotating member and an associated output side rotating member to be engaged with the input side rotating member, the input side rotating member and the output side rotating member being separated by a gap when the solenoid clutch is in the completely disengaged state, said circuit comprising:

a first means for producing at least one command signal for commanding the start of the engagement of said solenoid clutch; and

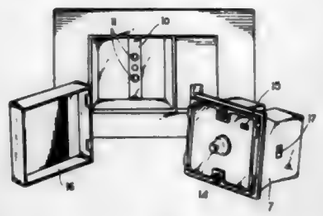
a second means responsive to said command signal for providing an exciting current for said electromagnet whose level is changed in such a way that the width of the gap is first reduced to zero and then the slip rate of said solenoid clutch is gradually changed from 1 to 0.

4,636,913
TEMPERATURE COMPENSATED CAPACITOR
Christopher I. Mobbs, and J. David Rhodes, both of Shipley, United Kingdom, assignors to Filtronic Components Limited, Shipley, United Kingdom
Division of Ser. No. 605,383, Apr. 30, 1984, Pat. No. 4,581,795.
This application Nov. 15, 1985, Ser. No. 798,740
Int. Cl.⁴ H01H 47/18
U.S. Cl. 361—182 9 Claims



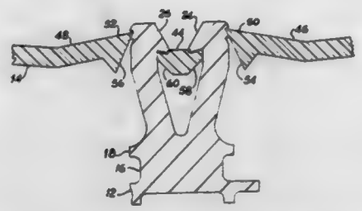
1. A filter circuit for producing a desired frequency response including a plurality of circuit sections connected together so as to form a ladder network, said circuit sections each comprising a combination of impedances including inductive impedances and capacitative impedances, said capacitative impedance including a capacitative device comprising at least two capacitors formed respectively from at least two different dielectric materials chosen such that one of said materials, if used alone, would cause an increase on capacitance with temperature, and the other material, if used alone, would cause a decrease in capacitance with temperature, the materials and dimensions of the said capacitors being structured such that, the capacitance of one decreases and the capacitance of the other increases, one of said dielectric materials comprising PTFE fibers and the other of said dielectric materials comprising a ceramic material.

4,636,914
OUTLET BOX WITH REMOVABLE SELF-CONTAINED DEVICE
Andrea Belli, Brescia, Italy, assignor to AVE S.p.A., Italy
Filed Nov. 28, 1984, Ser. No. 675,944
Int. Cl.⁴ H01H 9/02
U.S. Cl. 361—331 6 Claims



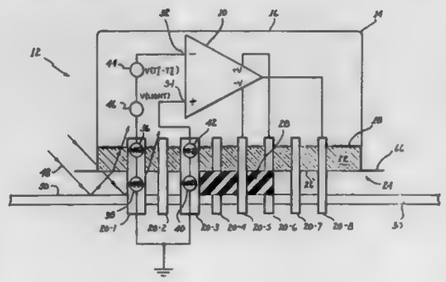
1. An electrical device comprising an outlet box having a front window, a plurality of snap holding means around said window for holding a plurality of structures in said window, a box-like body extending in said window and engaged with at least one of said snap holding means for holding said body in said window, said box-like body defining an inner space accessible through said window, a permanent electrical accessory extending in said window and engaged with one of said snap-holding means adjacent said box-like body, said snap-holding means engaged with said permanent accessory being separate from said snap-holding means engaged with said body, said body including a plurality of electrical connecting openings in said space for receiving electrical jacks, a portable supplementary electrical device inserted into said space of said body, said supplementary device having a plurality of electrical jacks each engaged in one of said electrical connecting openings of said body, said supplementary device substantially filling said space of said body and being positioned adjacent said permanent accessory.

4,636,915
FASTENER HAVING DUAL TEETH
Norman P. Perkins, Duluth; Roger D. Lake, Stone Mountain, and Steven A. Kaufman, Decatur, all of Ga., assignors to Siemens Energy & Automation, Inc., Atlanta, Ga.
Filed Aug. 20, 1985, Ser. No. 767,644
Int. Cl.⁴ H02B 1/14
U.S. Cl. 361—355 11 Claims



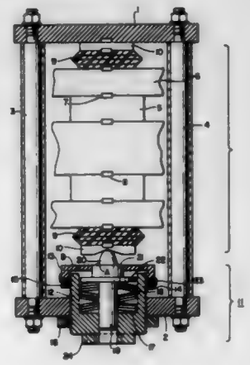
1. A fastener assembly having dual teeth, comprising:
a base with an upstanding stab having a single first tooth having a top surface and a bottom surface and positioned on one side of the stab and at least one second tooth having a top surface and a bottom surface and positioned on the opposite side of the stab; and
a cover defining an opening receiving the stab with the teeth thereon, said cover having a bar adjacent the opening and a flap extending into the opening opposite the bar, said bar sliding along the top surface of the first tooth during assembly and urging the first tooth and stab in a direction toward the flap until the bar engages the bottom surface of the first tooth, the flap being pivotally moved towards and from the base and automatically moving from the base during assembly as the first tooth and stab are urged toward the flap, the flap engaging the second tooth when assembled inhibiting separation of the base and cover.

4,636,916
APPARATUS FOR MINIMIZING OPTICALLY AND THERMALLY INDUCED NOISE IN PRECISION ELECTRONIC COMPONENTS
Rodney T. Burt, and Robert M. Stitt, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.
Continuation of Ser. No. 597,027, Apr. 5, 1984, abandoned. This application May 24, 1985, Ser. No. 738,530
Int. Cl.⁴ H05K 7/20
U.S. Cl. 361—386 6 Claims



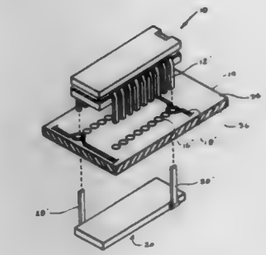
1. Apparatus for minimizing unpredictable noise for precision solid state electronic devices comprising:
at least one solid state electronic device having a planar base bottom surface and a plurality of leads extending from said planar base bottom surface;
a supporting substrate having a planar top surface located beneath said solid state electronic device, said solid state electronic device mounted on said planar surface of said supporting substrate and providing a space between said planar base bottom surface of said solid state electronic device and said top surface of said supporting substrate;
heat diffuser means, said heat diffuser means comprises
heat sink portion having a large thermal mass relative to that of said solid state electronic device in direct contact with a substantial portion of said solid state electronic device for maintaining a temperature within said solid state electronic device substantially constant and also for transferring heat by radiation and convection to a surrounding environment,
a positioning means for positioning said planar base bottom surface of solid state electronic device at a predetermined height above and substantially parallel to said planar top surface of said supporting substrate, and
a skirt portion of said heat diffuser means, said skirt portion extending beneath said planar base bottom surface of said solid state electronic device toward said planar top surface of said supporting substrate, said skirt portion of said heat diffuser means having a thickness and a planar bottom surface, said planar bottom surface of said skirt portion of said heat diffuser means being substantially flush with said planar top surface of said supporting substrate, said thickness of said skirt portion of said heat sink substantially eliminating reflected or direct light from contacting said leads and said planar base bottom surface of said solid state electronic device to minimize noise and also to minimize temperature differentials between said leads and said planar base bottom surface of said solid state electronic device and said supporting substrate, said heat diffuser means being a single integral unit, said heat diffuser means having a single slit to facilitate insertion of said heat diffuser means onto said solid state electronic device, said slit in said heat diffuser means tranversing from said planar bottom of said heat diffuser means to the top of said heat diffuser means, said heat diffuser means being of a single piece construction.

4,636,917
PRECALIBRATED ELEMENT FOR SECURING AND LOCKING SEMICONDUCTORS AND HEAT SINKS ARRANGED IN ALTERNATING ROWS
Robert Jouanny, Montreuil Sous Bois, France, assignor to Jeumont-Schneider Corporation, Puteaux, France
Filed Aug. 13, 1984, Ser. No. 640,394
Claims priority, application France, Aug. 19, 1983, 83.13475
Int. Cl.⁴ H05K 7/20
U.S. Cl. 361—388 22 Claims



7. A clamping element in accordance with claim 5, wherein an end of said cylindrical member opposite said cap has a portion for cooperation with a wrench.

4,636,918
DECOUPLED INTEGRATED CIRCUIT PACKAGE
Raymond C. Jadoia, Scottsdale, Ariz., assignor to Rogers Corporation, Rogers, Conn.
Continuation-in-part of Ser. No. 403,408, Jul. 30, 1982, Pat. No. 4,502,101. This application Dec. 19, 1984, Ser. No. 683,344
Int. Cl.⁴ H05K 1/18
U.S. Cl. 361—405 4 Claims



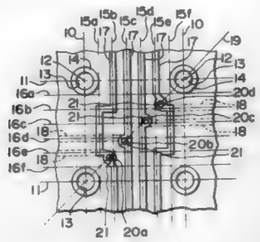
1. An electronic subassembly comprising:
an integrated circuit package, said circuit package having a plurality of pins extending outwardly therefrom in the same direction, said integrated circuit package including a pair of power supply pins, said circuit package having a first surface;
a circuit board, said circuit board having spaced holes receiving said circuit package pins, said circuit board having opposed surfaces, said first surface of said integrated circuit package facing one of said opposed surfaces of said circuit board, a pair of specially displaced of said holes defining power supply sockets, said integrated circuit package power supply pins being received in said power supply sockets; and
decoupling capacitor means, said decoupling capacitor means being mounted on the other of said opposed surfaces of said board and in alignment with said first surface of said circuit package, said capacitor means comprising:
a flat rectangular ceramic body having a pair of opposed surfaces;
a metalized coating on each of said pair of opposed surfaces of said ceramic body;
an insulating film encapsulating said ceramic body and metalized surfaces, said metalized coatings having conductors extending through said insulating film;
said conductors being received in said board power supply sockets along with said power supply pins of said integrated circuit package, said conductors extending outwardly and downwardly from points located adjacent opposite sides of said body.

4,636,919
MULTILAYER PRINTED CIRCUIT BOARD
Sakae Itakura, Ayase, and Osamu Morikawa, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 12, 1986, Ser. No. 828,717
Claims priority, application Japan, Mar. 20, 1985, 60-54260; Mar. 27, 1985, 60-60566
Int. Cl.⁴ H05K 1/14
U.S. Cl. 361—414 20 Claims

1. A multilayer printed circuit board comprising:
part terminal insertion holes and part terminal insertion lands formed at intersecting points between a first plurality of main reference grid lines extending in one direction and a second plurality of main reference grid lines extending in the other direction perpendicular to said one direction;
at least two signal layers, one of said signal layers being constituted by first signal lines disposed on a plurality of ones of first subsidiary grid lines drawn parallelly with said first main reference grid lines on positions obtained by

equidistantly dividing each gap between adjacent ones of said first main reference grid lines into n portions, the other one of said signal layers being constituted by second signal lines disposed on a plurality of ones of second subsidiary grid lines drawn parallelly with said second main reference grid lines on positions obtained by equidistantly dividing each gap between adjacent ones of said second main reference grid lines into n portions;

via holes formed at positions displaced from intersecting points between said first and second signal lines, each of



said via holes having a diameter smaller than that of each of said part terminal insertion holes and said part terminal insertion land, each of said via holes being exclusively used for connecting said first and second signal lines; and

an inner layer pattern for an earthing layer or a power supply layer, said inner layer pattern provided with clearance holes formed in positions corresponding to positions of said part terminal insertion holes and said via holes, said inner layer pattern being continued all over an entire region of a substrate except said portions of said clearance holes.

4,636,920

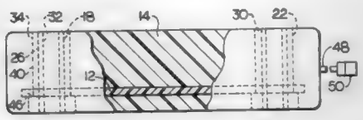
PRINTED CIRCUIT BOARD MOUNTING APPARATUS

James G. Cook, Hanna City, and Gary H. Knapp, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 5, 1985, Ser. No. 773,290

Int. Cl.[4] H05K *7/02*

U.S. Cl. 361—420 **5 Claims**



1. An environmentally protected printed circuit board, said printed circuit board having a plurality of openings of a preselected diameter extending therethrough, comprising:

a plurality of standoffs each having a first and second tubular member, said first tubular member having a first outer periphery including an outer diameter of a preselected magnitude and being of a generally rigid construction, said second tubular member having an inner diameter at least as small as the first tubular member outer diameter, and a second outer periphery including first and second outer diameters respectively less than and greater than the diameter of said circuit board openings, said second tubular member being disposed about the outer periphery of said first tubular member, formed of rubber, and bonded to said first tubular member, said plurality of standoffs extending through said plurality of printed circuit board openings and supporting said circuit board on said second outer periphery intermediate said first and second outer diameters; and

a potted member disposed in enveloping relation to said printed circuit board and adhering in sealing relation with said second tubular member.

4,636,921

DEVICE FOR MOUNTING A LIGHT UNIT ON AN AUTOMOBILE BODY

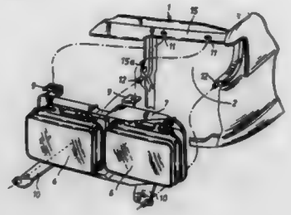
Johannes Vollrath, Neckarsulm, Fed. Rep. of Germany, assignor to Audi AG, Ingolstadt, Fed. Rep. of Germany

Filed May 8, 1985, Ser. No. 731,964

Claims priority, application Fed. Rep. of Germany, May 9, 1984, 3417041

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 362—61 **7 Claims**





1. A method of mounting a light unit on an automobile body, said light unit having a housing connected to the automobile body, comprising the steps of:

a. providing the housing with undercut hollow spaces;

b. providing the automobile body with means having anchoring protrusions;

c. joining the housing and the automobile body with the anchoring protrusions extending into the hollow spaces; and

d. filling said hollow spaces with a hardenable flexible plastic material so that the anchoring protrusions are embedded therein.

4,636,922

LAMP MOUNTING STRUCTURE FOR SMALL SIZED VEHICLE

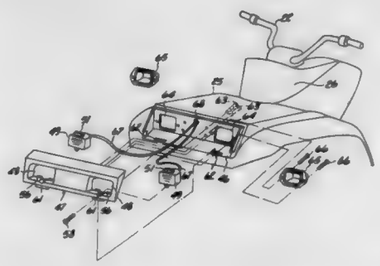
Hiroshi Takimoto, Shizuoka, and Takumi Fukui, Iwata, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jul. 29, 1985, Ser. No. 759,947

Claims priority, application Japan, Jul. 31, 1984, 59-160600

Int. Cl.[4] F21V *33/00*

U.S. Cl. 362—72 **12 Claims**



1. A lamp mounting arrangement for an off the road vehicle

having a frame, a relatively flexible body assembly mounted on said frame and defining an opening, a light supporting frame positioned within said body assembly opening and supported by and reinforcing said body assembly, said light supporting frame being rigidly fixed to said body assembly, said light supporting frame being substantially more rigid than said body assembly, and means for mounting a light within said light supporting frame.

4,636,923

HEADLAMP FOR VEHICLE

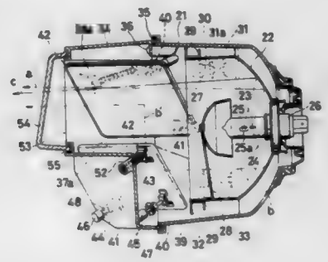
Hiroo Oyama, Sagamihara, and Tadeshi Kouchi, Fuchu, both of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1985, Ser. No. 759,652

Claims priority, application Japan, Aug. 3, 1984, 59-163733; Nov. 13, 1984, 59-172185[U]; May 16, 1985, 60-104823

Int. Cl.[4] B60Q *1/04*

U.S. Cl. 362—80 **20 Claims**



1. A vehicle lamp, comprising:

a housing having a front portion and a rear portion; a paraboloidal reflector at said rear portion of said housing;

a laterally extending slender rectangular shaped front lens located at said front portion of said housing and facing in substantially the same direction as said paraboloidal reflector at least a major portion of said front lens lying on one side of a horizontal plane;

a lamp located so that the position of a filament thereof is at or near the focus of said paraboloidal reflector, whereby light produced by said lamp is reflected by said paraboloidal reflector in substantially the axial direction of said paraboloidal reflector;

at least two first reflecting plate members mounted in said housing so as to reflect right and left side portions of a portion of the light reflected by said paraboloidal reflector in an oblique upper or lower direction; said first reflecting plate members positioned so as to reflect light from a side of said horizontal plane opposite said one side and

at least two second reflecting plate members positioned in parallel to respective first reflecting plate members, said at least two second reflecting plate members reflecting the light reflected from a corresponding first reflecting plate member in a direction substantially parallel to the light reflected by said paraboloidal reflector and in the same direction as said light reflected by said paraboloidal reflector;

a portion of the light reflected by said paraboloidal reflector and not reflected by said reflecting plate members being passed directly to said front lens; and

said laterally extending slender rectangular shaped front lens being located in front of said paraboloidal reflector and in front of said first and second reflecting plate members for directly receiving a portion of said light reflected from said paraboloidal reflector, and for receiving the reflected right and left side portions of light from said second reflecting plate members, thereby providing a substantially uniform rectangular light beam having a high light utilization rate.

4,636,924

ASSEMBLY WITH A LAMP TO BE EMBEDDED HAVING A MEMBER THAT CAN BE ENGAGED IN THE EMBEDDING SEAT AND FORMING THE HOUSING FOR THE LAMP

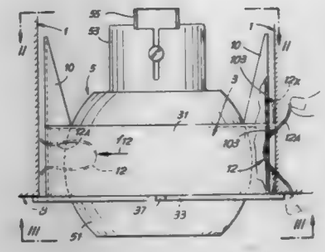
Giampaolo Targetti, Florence, Italy, assignor to Targetti Sankey S.p.A., Florence, Italy

Filed Sep. 5, 1985, Ser. No. 772,777

Claims priority, application Italy, Sep. 18, 1984, 11823/84[U]

Int. Cl.[4] F21V *21/04*

U.S. Cl. 362—277 **4 Claims**



1. An assembly to be mounted in a seat for receiving a lamp comprising in combination an annular member with a cylindrical wall provided with upper and lower flanges,

said lower flange being configured to engage the mouth of said seat upon mounting of said assembly therein,

within said annular member an elastic housing for yieldably supporting a spherical lamp in a plurality of orientations

attached to said annular member a plurality of appendages rising therefrom toward the interior of said seat,

said appendages being of U-shaped cross section with intermediate ladder-shaped clefts, at least two of which are arranged for receiving a V-shaped spring,

said spring being positioned, configured and dimensioned to frictionally secure said assembly in said seat.

4,636,925

FRAMING PROJECTOR FOR USE IN A TRACK LIGHTING SYSTEM

Paul Kristofek, Hickory Hills, Ill., assignor to Cooper Industries, Houston, Tex.

Filed Mar. 18, 1985, Ser. No. 714,010

Int. Cl.[4] H01G *5/00*

U.S. Cl. 362—277 **7 Claims**

1. A framing projector for use in a track lighting system comprising:

a hollow housing having an open front end and an open rear end;

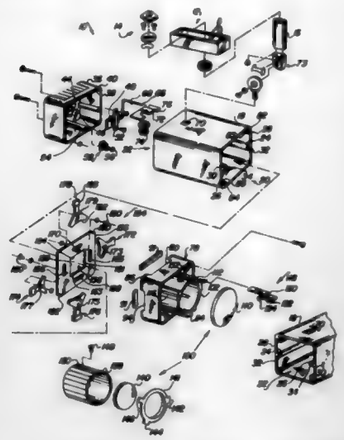
a read end-cap removably mounted to the rear end of said housing;

a light socket mounted to an inner surface of said rear end-cap;

a front end-cap removably mounted to said front end of said housing, said front end-cap including a transverse wall spanning across said front end of said housing and having an aperture therein coaxial with said hollow housing, said front end-cap having a substantially cylindrical extension protruding forwardly from said transverse wall coaxial with said aperture therein, said front end-cap further including two pairs of opposing cut-out portions at equally spaced apart locations on the periphery of said transverse wall defining two pairs of opposing openings into said hollow housing at said open front end thereof when said front end-cap is affixed to said housing;

an optical effects element defining an adjustable framing shutter assembly mounted at said open front end of said housing including a flat plate removably mounted to an inner surface of said transverse wall including a shutter

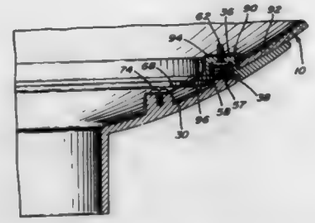
aperture therein, said shutter aperture being coaxial with said aperture in said transverse wall;
slot means located in said flat plate at a predetermined distance from the marginal peripheral edge of said shutter aperture;
two pairs of opposing substantially coplanar shutter blades, each one of said shutter blades having a leading edge protruding substantially across said shutter aperture;
each one of said shutter blades provided with an elongated opening intersecting said slot means in said plate;
each one of said shutter blades further including an adjustment arm extending through a respective one of said openings into said housing defined by said cut-out portions in said front end-cap;



pin means extending through each of said elongated openings in each of said shutter blades and said slot means in said plate providing for independent pivotable movement of each of said blades around said pin means through an angle defined by the length of said cut-out portions and simultaneous rectilinear movement of each of said blades over the length of said intersecting slot and elongated opening;
a first lens fixedly mounted within said front end-cap extension coaxial with said aperture in said transverse wall;
a cylindrical focusing member mounted around said extension for axial slidable movement; and
a second lens fixedly mounted at a front end of said focusing member, said first lens and said lens cooperating to condense and focus the light pattern which emerges from said optical effect element.

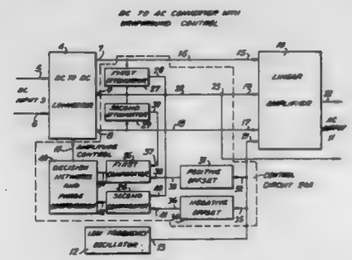
4,636,926
ASSEMBLY FOR MOUNTING A LIGHT FIXTURE TO A SUPPORT STRUCTURE
Jacques Roberge, 5650 Trudeau Street, St-Hyacinthe (Québec), Canada
Filed Feb. 26, 1985, Ser. No. 705,692
Int. Cl.[4] F21V *17/06*
U.S. Cl. 362—353 13 Claims

1. An assembly for mounting a light controlling device such as a diffuser or the like to a support structure, comprising:
a base member for connection to said support structure; an annular member for connection to said light controlling device; first engaging means mounted on said base member; said engaging means mounted on said annular member; said first and second engaging means being overlappingly interengageable through a relative rotational sliding motion between said annular member and said base member, said first and second engaging means each comprising a blade made of resilient material and including a portion thereof having a configuration that enables overlapping portions of each said first and second engaging means to be locked into an overlapping interengagement;
sealing means between said annular member and said base member, pressure being exerted on said sealing means by said first and second resilient engaging means when interengaged, said blade portions having opposite edges and



corners shaped so as to facilitate initial sliding engagement between said two overlapping portions;
stop means being provided on the inner rim of said annular member and located adjacent to said second engaging means, one of said edges of said first engaging means contacting said stop means to thereby prevent said rotational sliding motion from going beyond said overlapping interengagement.

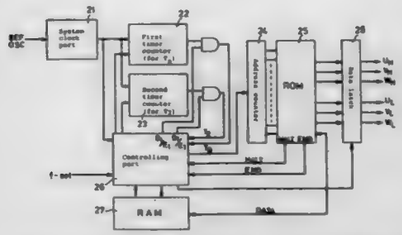
4,636,927
DC TO AC CONVERTER
Earl C. Rhyne, Millis, Mass., and Lewis Illingworth, Exeter, N.H., assignors to Fiskars Electronics Corporation, Cupertino, Calif.
Filed Apr. 26, 1985, Ser. No. 727,884
Int. Cl.[4] H02M *7/00*
U.S. Cl. 363—15 14 Claims



1. In a DC to AC converter for converting power from a DC source to an AC amplifier having an output voltage and having DC to DC converter means having inputs connected to said DC source, said DC to DC converter having a plurality of output DC terminals for positive, negative and common, respectively, and having an additional input for converting DC input power to positive and negative DC voltage at said output DC terminals with voltages greater than the peak values of the AC output voltage, a low frequency signal generator having an output for generating an output waveform at its output, said AC amplifier being a linear amplifier having positive, negative and common inputs connected to the corresponding output DC terminals of said DC to DC converter means via positive, negative and common supply lines, respectively, an additional input connected to the output of said signal generator and an output whereby the AC output voltage varies with the output waveform of said signal generator, said AC output voltage

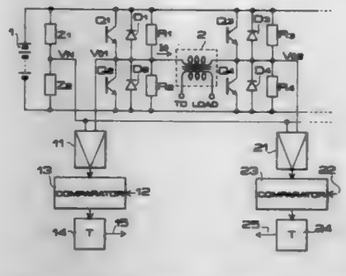
being provided at the output of said amplifier and a common point in the common supply line,
control means connected to the output DC terminals of said DC to DC converter means and between the output of said signal generator and the additional input of said DC to DC converter means for controlling the output voltage of said DC to DC converter means to provide a voltage which is less than the maximum voltage available from said DC to DC converter, but greater than the instantaneous voltage required at the output of said AC amplifier linear amplifier, thereby assuring high overall efficiency and a high quality output waveform.

4,636,928
INVERTER-DRIVE CONTROLLING APPARATUS
Takashi Deguchi; Masahiro Kadono, and Shinji Naka, all of Kusatsu, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Sep. 27, 1984, Ser. No. 655,228
Claims priority, application Japan, Sep. 30, 1983, 58-183382
Int. Cl.[4] H02P *5/40*; H02M *5/458*
U.S. Cl. 363—41 9 Claims



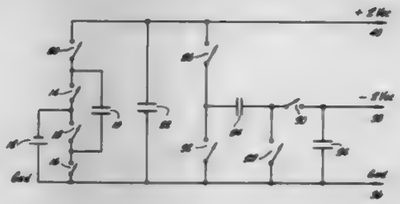
1. An inverter-drive controlling apparatus comprising:
read only memory means for storing data including a carrier number, data number and data contents;
frquency determining means for determining a carrier period of one portion of an output wave on the basis of said carrier number stored in said read only memory means;
first timer means for outputting a value representing the carrier period determined by said frequency determining means;
voltage determining means for determining a voltage corresponding to a predetermined frequency to voltage characteristic and responsive to said carrier period determined by said frequency determining means;
region determining means for determining a ratio of a data region to a HALT region in said carrier period, so that said ratio is such to obtain said voltage determined by said voltage determining means when said carrier period is pulse-width demodulated;
second timer means for outputting at least one data unit timer time period in said data region determined by said region determining means;
waveform data processing means for supplying said stored data contents in a predetermined order to said data region predetermined by said region determining means, each item of data contents being supplied during one of said data unit timer time periods determined by said second timer means; and
HALT region processing means for comparing an end of said carrier period outputted by said first timer means with an end of said data unit timers outputted by said second timer means, and for outputting a signal representing the length of the HALT region, represented by the difference between said end of said data unit timers and said end of said carrier period, to said waveform data processing means, when the end of said data unit timers occurs sooner than that of said carrier period.

4,636,929
ABNORMAL STATE DETECTING CIRCUIT OF INVERTER
Tooru Nakamura, and Shigenori Higashino, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 29, 1986, Ser. No. 823,955
Claims priority, application Japan, Mar. 19, 1985, 60-57344
Int. Cl.[4] H02H *7/122*
U.S. Cl. 363—56 2 Claims



1. An abnormal state detecting circuit of an inverter, wherein an inverter circuit is composed of arms of at least one pair, connected between positive and negative lines of a DC power source and turned on or off alternately, said detecting circuit comprising:
means for comparing the neutral potential of the pair of arms with the neutral potential of the DC power source; and
means for discriminating the abnormal state of the switching operation of the arms if the comparison result becomes less than a prescribed value.

4,636,930
INTEGRATED DUAL CHARGE PUMP POWER SUPPLY AND RS-232 TRANSMITTER/RECEIVER
David Bingham, San Jose, and Charles M. Allen, Sunnyvale, both of Calif., assignors to Maxim Integrated Products, Inc., Sunnyvale, Calif.
Filed Oct. 1, 1985, Ser. No. 782,953
Int. Cl.[4] H02M *7/25*
U.S. Cl. 363—60 4 Claims



1. A circuit, integrable on a single piece of semiconductor substrate material, for providing a bipolar voltage output at substantially double the voltage of a unipolar voltage input source, including:
first and second voltage input terminals,
first and second positive transfer capacitor connection terminals,
a first set of MOS semiconductor switches for selectively connecting said first voltage input terminal to said first and second positive transfer capacitor connection terminal and said second voltage input terminal to said second positive transfer capacitor connection terminal,
first and second positive reservoir capacitor connection terminals,
a second set of MOS semiconductor switches for selectively

connecting said first voltage input terminal to said second positive transfer capacitor connection terminal and for selectively connecting said second voltage input terminal to said first positive reservoir capacitor connection terminal and said first positive transfer capacitor connection terminal to said second positive reservoir capacitor connection terminal,

first and second negative transfer capacitor connection terminals,

a third set of MOS semiconductor switches for selectively connecting said first positive reservoir capacitor connection terminal to said first negative transfer capacitor connection terminal and said second positive reservoir capacitor connection terminal to said second negative transfer capacitor connection terminal,

first and second negative reservoir capacitor connection terminals, said first negative reservoir capacitor connection terminal connected to said first positive reservoir capacitor connection terminal,

a fourth set of MOS semiconductor switches for selectively connecting said first negative transfer capacitor connection terminal to said second negative reservoir capacitor connection terminal and said second negative transfer capacitor connection terminal to said first negative reservoir capacitor connection terminal,

selection circuitry for selectively activating said first, second, third and fourth sets of MOS semiconductor switches,

means for clamping said second positive reservoir capacitor terminal to a voltage approximately equal to the voltage appearing on said first voltage input terminal,

means for clamping said second negative reservoir capacitor to a voltage approximately equal to the voltage appearing on said second voltage input terminal,

means for inhibiting latch-up of forward biased four layer devices created as a result of layout of said circuit on a single piece of semiconductor substrate material.

4,636,931

PHOTOVOLTAIC POWER CONTROL SYSTEM

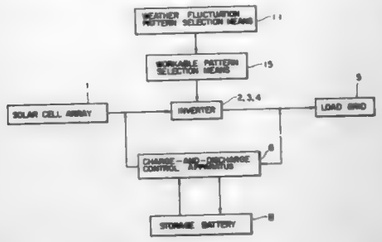
Masahide Takahashi; Seiichi Sekai; Osamu Masada; Masaru Ukawa, and Hamao Onishi, all of Kagawa, Japan, assignors to Shikoku Denryoku Kabushiki Kaisha, Takamatsu and Shikoku Keisoku Kogyo Kabushiki Kaisha, Nakatado, both of, Japan

Filed Jan. 31, 1986, Ser. No. 824,856

Claims priority, application Japan, Jun. 28, 1985, 60-140633; Dec. 9, 1985, 60-277673

Int. Cl.⁴ H02J *7/10*

U.S. Cl. 363—71 **3 Claims**



1. A photovoltaic power control system equipped with at least one inverter for inverting an output of a solar cell array to AC power, and having charge- and discharge control means for charging a surplus portion with respect to the power for expected use of the output of said solar cell array to a storage battery and discharging shortage portion with respect to the power for expected use of the output of said solar cell array from said storage battery by detecting the surplus or shortage produced between the output of said solar cell array and AC power for expected use inverted by said inverter, the improvement comprising:

weather fluctuation pattern selection means for selecting one weather pattern out of various kinds of weather patterns preset based on weather information at a time point when the weather is forecasted on the day when the power is generated by said solar cell array; and

workable pattern selection means for selecting one actuation pattern of the inverter corresponding to the weather pattern selected by said weather fluctuation pattern selection means out of various actuation patterns of the inverter preset corresponding to said weather pattern.

4,636,932

DV/DT PROTECTION CIRCUIT DEVICE FOR AN AC-DC CONVERTER APPARATUS

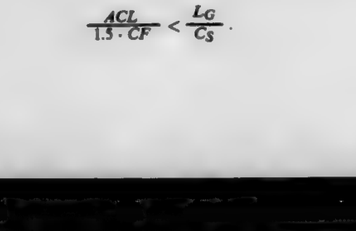
Toshiaki Kurosawa; Seiya Shima, both of Katsuta; Takaki Ando, Naka; Hiromi Inabe, Katsuta; Hajime Nakashima, Hitachi, and Toshimke Mine, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Ibaraki, both of, Japan

Filed Mar. 11, 1985, Ser. No. 710,237

Claims priority, application Japan, Mar. 14, 1984, 59-47069

Int. Cl.⁴ H02H *7/125*

U.S. Cl. 363—54 **2 Claims**



1. A dv/dt protection circuit device for an AC-DC converter apparatus comprising:

controllable switching means having a current cut-off function which conducts and interrupts current from a power source to a load and refluxes the load current while the current is interrupted by a full-wave bridge rectifier circuit having a plurality of arms;

each arm of said bridge rectifier circuit connecting a reactor for suppressing a rate of change of a power source line voltage of said bridge rectifier circuit at the switching time of said switching means;

a condenser for absorbing an overvoltage generated at an inductance on the side of said power source, said condenser being connected to the side of said power source connected to said bridge rectifier circuit; and

means for absorbing an overvoltage including a series circuit consisting of a condenser for absorbing an overvoltage which is generated by said reactor at said switching time of said switching means and a resistance, and a diode which is parallel to said resistance, said absorbing means being connected in parallel to said switching means;

wherein the following condition is satisfied when the inductance of one phase of said power source is ACL, the capacity of said condenser for absorbing said overvoltage is CF, an inductance of said reactor which is inserted into each arm of said bridge rectifier circuit is L_G, and the capacity of said condenser of said absorbing means for absorbing said overvoltage which is connected to said controllable switching means is C_S:

$$\frac{ACL}{1.5 \cdot CF} < \frac{L_G}{C_S}.$$

4,636,933

POWER CONTROL CIRCUIT WITH DIGITAL PULSE WIDTH CONTROL

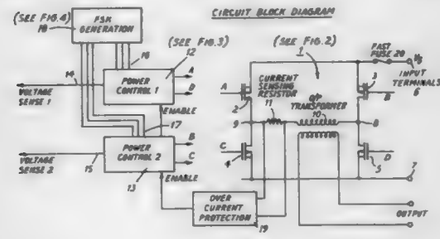
David W. Cowen, Corsham, United Kingdom, assignor to Westinghouse Brake and Signal Company Limited, Chippenham, United Kingdom

Filed Jul. 19, 1985, Ser. No. 757,219

Claims priority, application United Kingdom, Jul. 30, 1984, 8419373

Int. Cl.⁴ H02M *7/529*

U.S. Cl. 363—98 **7 Claims**



1. A power control circuit comprising a bridge of controllable switching elements, a voltage supply connected to the bridge input terminals, an output circuit connected to the bridge output terminals, a pulse width modulated control means providing two anti-phase control signals, a first of the control signals being connected with the control terminals of a first pair of diagonally opposite bridge switching elements and a second pair of the control signals being connected with the control terminals of a second pair of diagonally opposite bridge switching elements, voltage sensing means responsive to the bridge voltage supply level and operatively connected to the pulse width modulated control means to determine the pulse widths of the control signals to maintain the output power delivered from the bridge at a constant level, said voltage sensing means comprising an analog to digital converter connected with a voltage threshold circuit arranged to provide a zero reference level for the analog to digital converter at a level slightly less than the lower limit of the supply voltage.

4,636,934

WELL VALVE CONTROL SYSTEM

Kenneth L. Schwendemann, Lewisville, Tex.; Oliver W. McCracken, Pauls Valley, Okla.; Cary G. Mosdon, Carrollton, and Larry C. Wortham, Garland, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed May 21, 1984, Ser. No. 612,409

Int. Cl.⁴ G06F *11/08, 15/46;* **G05D** *7/06*

U.S. Cl. 364—132 **23 Claims**

6. A system for controlling well testing through an upper and lower test string with a subsea test tree connected therebetween and latch means to release the upper test string from the subsea test tree comprising:

a. first and second selectively programmable microprocessor means;

b. means for storing system operating limits in each microporcessor means;

c. means for chaning the operating limits in response to changes in well conditions;

d. means for communicating operating fluid preasure to the subsurface test tree and the latch means;

e. solenoid pilot valves controlling the flow of the operating fluid pressure to the subsea test tree and the latch means;

f. the first microprocessor means located at a central control console;

g. the second microporcessor means located near the solenoid valves;

h. means for transmitting signals between the first and second microporcessor means and validating the accuracy of the signals; and

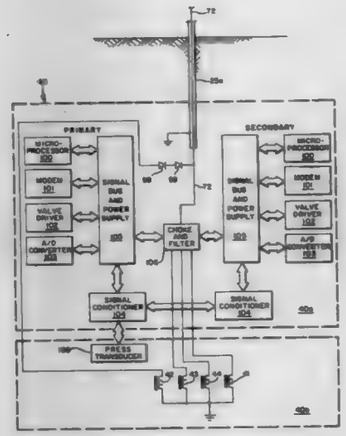
i. electronic circuits to control operation of the solenoid valves in response to validated signals.

21. An electronic circuit electrically connected to and controlling the operation of solenoid valves remotely located from a central control console comprising:

a. selectively programmable microprocessors and their associated memory to receive modem signals from the control console;

b. the microprocessors and solenoid valves located adjacent to each other;

c. the microprocessors transmitting commands received from the central control console back to the console for validation;



d. peripheral interface adapter means;

e. a solenoid decoder connected between the peripheral interface adapter means and the solenoid valves;

f. signal bus means interconnecting the microprocessors with the peripheral interface adapter means to permit data flow therebetween and to enable the microprocessors to control the solenoid valves based on validated signals;

g. means for receiving both a DC voltage signal and the modem signal from the central control console;

h. means for bypassing the microprocessors to send the DC voltage signal directly to a selected solenoid valve; and

i. the selected solenoid valve responding only to a reversal in polarity of the DC voltage signal supplied thereto.

4,636,935

POWER CONTROL SYSTEM

Stanley A. Tscherneako, Long Beach; Lawrence A. Crane, Irvine, and Jay Boyce, Anaheim, all of Calif., assignors to Loyola Controls, Inc., Orange, Calif.

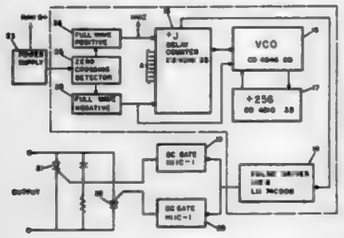
Filed Nov. 7, 1984, Ser. No. 669,805

Int. Cl.⁴ G06F *13/00*

U.S. Cl. 364—140 **15 Claims**

1. A power control system, comprising; input command signal receiving means from a process system; means for converting the command signal to input command digital signal pulses; means for converting the digital input command signals to output digital turn-on command signals; a high frequency clock for subdividing an input power signal into 2^n discrete pulses; a phase delay counter for receiving the discrete pulses and the digital turn-on command signals, the phase delay counter providing a delayed pulse synchronized to a supply

line frequency to generate a discrete pulse signal and synchronized with the digital turn-on command signal; and, an output



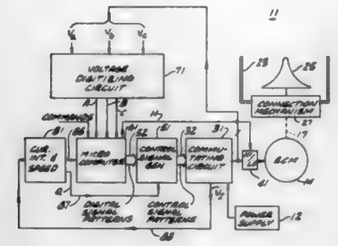
firing circuit actuated by the phase delay counter upon receipt of a turn-on command signal.

4,636,936

CONTROL SYSTEM FOR AN ELECTRONICALLY COMMUTATED MOTOR

John H. Boyd, Jr., Holland, Mich., and Alexander Muller, Ellisville, Mo., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 602,163, Apr. 19, 1984, Pat. No. 4,540,921.
This application Mar. 12, 1985, Ser. No. 710,899
Int. Cl.[4] G05B *13/02*; H02K *29/00, 23/00*; H02P *1/18*
U.S. Cl. 364—148 24 Claims



1. A control system for an electronically commutated motor including a stationary assembly having a plurality of winding stages adapted to be selectively commutated, and rotatable means associated with the stationary assembly in selective magnetic coupling relation with the winding stages, and means for commutating the winding stages by selectively supplying power thereto in response to a pattern of control signals leaving at least one of the winding stages unpowered at any one time while the other winding stages are powered, the control system comprising:

means coupled to the winding stages for digitizing the voltages across the winding stages;

means responsive to successive patterns of digital signals for generating successive patterns of the control signals for the commutating means; and

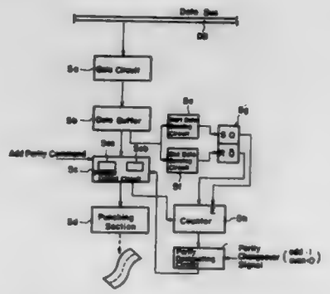
a digital computer operating under stored program control, said computer having inputs for the digitized voltages, said computer having memory elements for storing data representing at least one preselected sequence of the patterns of the digital signals and for storing data, corresponding to each pattern of the digital signals, identifying the respective input for the digitized voltage for the at least one unpowered winding stage, said computer successively producing one of the patterns of the digital signals, sensing only the digitized voltage at the identified input corresponding to the one pattern and producing the following pattern in sequence after at least one predetermined logic level of the digitized voltage at the identified input has occurred.

4,636,937

DATA INPUT/OUTPUT UNIT

Hajime Kishi, Hino; Masaki Seki, Sagamni, and Yutaka Mizuno, Hachioji, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP83/00357, § 371 Date Sep. 28, 1984, § 102(e) Date Sep. 28, 1984, PCT Pub. No. WO84/01646, PCT Pub. Date Apr. 26, 1984
PCT Filed Oct. 14, 1983, Ser. No. 651,996
Claims priority, application Japan, Oct. 16, 1982, 57-181826
Int. Cl.[4] G06K *1/02*
U.S. Cl. 364—191 3 Claims



2. A data input/output unit operatively connectable to a host computer, comprising:

a tape puncher; and

means, operatively connected to said tape puncher and connectable to the host computer, for adding or erasing a parity code in a data block to be punched on a tape, said means for adding or erasing the parity code comprising:

a data buffer operatively connectable to the host computer;

a start data sensing circuit, operatively connected to said data buffer, for sensing the start of the data block;

an end data sensing circuit, operatively connected to said data buffer, for sensing the end of the data block;

a puncher control circuit, operatively connected to said data buffer and said tape puncher, for passing the data block therethrough;

a counter, operatively connected to said puncher control circuit and said start and end data sensing circuits, for counting character codes sent to said tape puncher; and

a parity designating circuit, operatively connected to said counter and said puncher control circuit, for outputting a parity signal in dependence upon the character code count; and

said puncher control circuit adding a parity code to the data block in dependence upon the parity signal or removing a parity code when the end of the data block is sensed.

4,636,938

METHOD AND APPARATUS FOR PRODUCING NUMERICAL CONTROL PROGRAMS

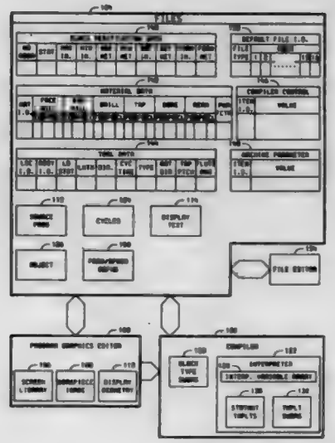
Peter F. Broome, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Aug. 31, 1984, Ser. No. 646,651
Int. Cl.[4] G05B *19/18*
U.S. Cl. 364—191 22 Claims

1. A method for creating and revising programs for a numerically controlled machine, the numerically controlled machine having movable members responding to control signals produced by a numerical control in response to machine control

instructions blocks, the machine and control effecting relative motion between a workpiece and tool to perform machining operations on the workpiece, the method comprising the steps of:

a. producing generalized data block signals representing sets of alphanumeric words, each generalized data block having one block type word defining the block type and at least one data word defining a data value associated with the block type, the generalized data block selectably describing a workpiece material, a workpiece surface, work-



piece features, and machining operations, wherein the data type of each data word is designated by an alphabetic character and the data definition of each alphabetic character is determined by the block type word; and

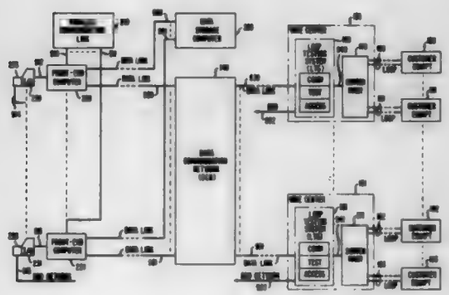
b. producing machine control instruction block signals in response to the generalized data block signals, the machine control instruction block signals representing sets of alphanumeric words describing machine member motion, the machine control instruction block signals conforming to the form and format required by the machine control.

4,636,939

PARALLEL BUS PROTOCOL

Neal R. Fildes, Morristown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 16, 1982, Ser. No. 399,171
Int. Cl.[4] G06F *13/38*
U.S. Cl. 364—200 8 Claims
MICROFICHE APPENDIX INCLUDED
(16 Microfiche, 923 Pages)



1. A method for returning the accept-reject status of a message transmitted from a controller to a listener over a parallel-oriented bus, said method comprising the steps of

computing a check word in said listener based on the contents of said message,

comparing said check word to check information conveyed in said message to establish said status,

providing a check value representative of said status for entry into a poll register of said listener,

setting a service request flag in said poll register to signal said controller to schedule a polling operation,

transferring the contents of said poll register to said controller by a scheduled data transfer, and

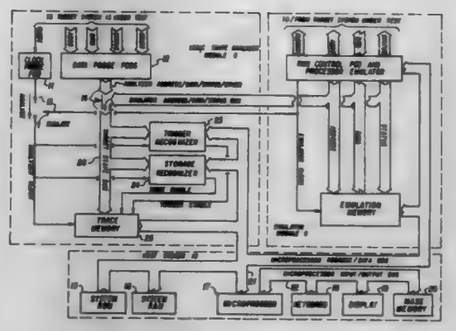
parsing said transferred poll register to determine said status from said check value.

4,636,940

LOGIC ANALYZER USING SOURCE PROGRAM OR OTHER USER DEFINED SYMBOLS IN THE TRACE SPECIFICATION AND THE TRACE LISTING

Bryce S. Goodwin, Jr., Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 481,010, Mar. 31, 1983, abandoned.
This application Dec. 20, 1985, Ser. No. 814,013
Int. Cl.[4] G06F *11/34*
U.S. Cl. 364—200 12 Claims



1. A logic state analyzer for producing a symbolically annotated trace listing of selected logic states occurring during a target system's execution of a relocated machine code object program that was produced from a source program incorporating symbolic labels, and was linked and loaded, the logic state analyzer comprising:

correspondence means, coupled to files associated with the linking and loading of the machine code object program, for producing a table of correspondence between symbolic labels used in the source program and corresponding absolute addresses within the relocated machine code object program that occur as states in the target system;

trace specification means, coupled to the correspondence means, for specifying in terms of the symbolic labels a condition to be met by a logic state occurring in the target system in order for that logic state to be included in the selected trace;

logic state acquisition means, coupled to the trace specification means, for coupling to the target system and acquiring the values of logic states that occur therein and satisfy the condition specified by the trace specification means;

memory means, coupled to the logic state acquisition means, for storing numerically the values of the logic states acquired by the logic state acquisition means;

conversion means, coupled to the correspondence means and to the memory means, for converting from numerical values into their associated symbolic labels those acquired logic state values stored in the memory means which have

associated symbolic labels in the table of correspondence produced by the correspondence means; and

output means coupled to the conversion means for producing an indication of the numerical values and symbolic labels of the logic states included in the trace.

4,636,941

METHOD AND APPARATUS FOR ANALYSIS OF MICROPROCESSOR OPERATION

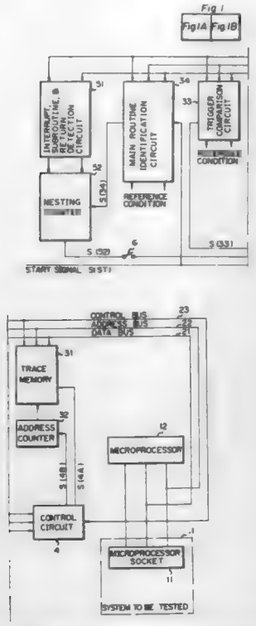
Shouichi Suko, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Japan

Filed May 22, 1984, Ser. No. 612,911

Claims priority, application Japan, May 24, 1983, 58-90079; May 24, 1983, 58-90080

Int. Cl.⁴ G06F *11/30*

U.S. Cl. 364—200 **3 Claims**



1. A device for analyzing the operation of a microprocessor in a system to be tested comprising:

a main routine identification circuit for generating a main routine identification signal when a predetermined reference condition for a main routine and signals on data, address and control buses of said microprocessor in a system to be tested are coincident;

an interrupt subroutine and return detection circuit for detecting an execution of an interrupt, a subroutine call and a return instruction out of the data, address and control buses, and for generating an interrupt subroutine detection signal and a return from interrupt or subroutine signal;

a nesting counter for generating a memory prohibition signal upon receipt of said interrupt subroutine detection signal or upon receipt of said return from interrupt or subroutine signal after receipt of said main routine identification signal;

a trigger comparison circuit for generating a trigger signal when a predetermined reference condition for a termination and signals on the data, address and control buses are coincident;

a trace memory for storing the signal on the data, address and control buses of instruction execution processes;

an address counter for designating addresses of said trace memory; and

a control circuit for generating a write pulse for said trace memory and a clock signal for said address counter until receiving the trigger signal by inputting a signal on the control bus of said microprocessor and the memory prohibition signal, whereby signals on the data, address and control buses in instruction execution processes other than interrupt routine processes and subroutine processes are stored into said trace memory.

4,636,942

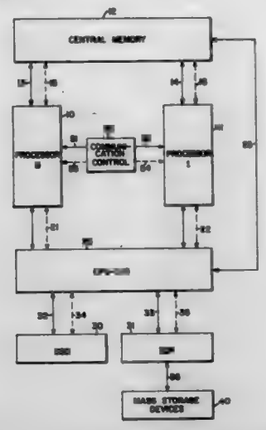
COMPUTER VECTOR MULTIPROCESSING CONTROL

Steve S. Chen; Alan J. Schiffleger, both of Chippewa Falls, Wis.; Eugene R. Somdahl, St. Paul, Minn., and Lee Higbie, Arlington Heights, Ill., assignors to Cray Research, Inc., Chippewa Falls, Wis.

Filed Apr. 25, 1983, Ser. No. 488,082

Int. Cl.⁴ G06F *13/00*

U.S. Cl. 364—200 **27 Claims**



9. The system according to claim 8 wherein said operating system means includes means for reserving one of said clusters for its exclusive use.

4,636,943

ENHANCED CPU MICROBRANCHING ARCHITECTURE

Robert W. Horst, Cupertino, and Richard L. Harris, San Jose, both of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Continuation of Ser. No. 537,886, Sep. 29, 1981, Pat. No. 4,571,673. This application Sep. 10, 1985, Ser. No. 774,564

The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.

Int. Cl.⁴ G06F *9/22*

U.S. Cl. 364—200 **8 Claims**

2. In a central processing unit for use in data processing systems wherein a microinstruction causes operands to be processed by executing microinstructions in a multilevel time sequence pipeline, apparatus for performing microbranching, including:

first sensing means for determining that a selected one of a plurality of first test conditions, sensed during a first rank of microcode execution and signifying that a first microbranch type should be taken, has been met;

second sensing means for determining that a selected one of a plurality of second test conditions sensed during a second rank of microcode execution, and signifying that a second microbranch type should be taken, has been met, said second rank of microcode execution occurring later in time than said first rank of microcode execution;

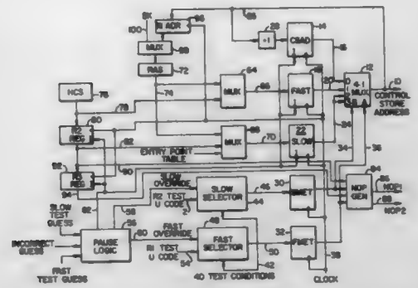
first indicator means, responsive to said first sensing means, for assuming a first state if said selected test condition has been met and by assuming a second state if said selected test condition has not been met;

second indicator means, responsive to said second sensing means for assuming a first state if said selected test condition has been met and by assuming a second state if said selected test condition has not been met;

first register means for holding first data representative of the address of the next microinstruction to be executed if microbranching is not performed;

second register means for holding second data representative of the address of the next microinstruction to be executed if a microbranch of said first type is performed;

third register means for holding third data representative of the address of the next microinstruction to be executed if a microbranch of said second type is performed;



first selection means, responsive to said first and second indicating means, for selecting as the address of the next microinstruction to be executed

(a) the contents of said first register means if neither of said selected first and second test conditions have been met,

(b) the contents of said second register means if said selected first test condition has been met, and said selected second test condition has not been met,

(c) the contents of said third register means if said selected second test condition has been met.

4,636,944

MULTI-LEVEL PRIORITY MICRO-INTERRUPT CONTROLLER

James E. Hodge, Middletown, N.J., assignor to Concurrent Computer Corporation, Holmdel, N.J.

Filed Jan. 17, 1984, Ser. No. 571,607

Int. Cl.⁴ G06F *9/46*

U.S. Cl. 364—200 **4 Claims**

1. A multi-level priority micro-interrupt controller for handling a plurality of interrupt signals input at a plurality of levels of priority, wherein only one interrupt signal for each level of priority may be active at any moment, which comprises:

a sequencer comprising:

(a) incrementer means, in response to a clock signal, for producing successive control store addresses at a sequencer output, by incrementing a first control store address to produce a successive control store address at the sequencer output, said incrementer means being inhibited from incrementing in response to a vector signal,

(b) means, in response to an interrupt-store signal and a further control store address, for storing the next successive control store address in a push down stack and for providing the further control store address to the incrementor means, and

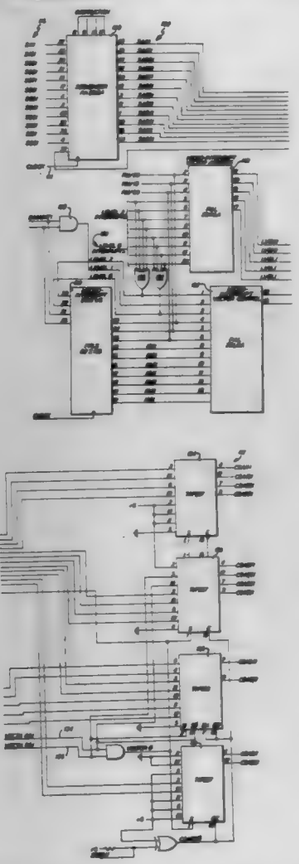
(c) means, in response to an interrrupt-done signal, for removing an address from the top of the push down stack and producing it at the sequencer output;

means, responsive to said plurality of input interrupt signals, for producing an interrupt-handle signal for each priority level;

means, responsive to said interrupt-handle signals, for producing an interrupt-queued signal for each interrupt signal input while an input interrupt signal of higher priority is being handled and an interrupt-status signal for each input interrupt signal being handled;

a vector address generator, responsive to said plurality of input interrupt signals, for producing a first at least part of a control store address of a subroutine for handling an input interrupt signal for the input interrupt signal having the highest level of priority of those input;

a vector control, responsive to said interrupt-handle signals, said interrupt-status signals and said interrupt-queued signals, for producing a second at least part of a control store address of a subroutine for handling an input interrupt signal for the input interrupt signal having the highest level of priority of those input and which have not yet been handled when no input interrupt signal of higher priority is being handled;



means, responsive to said second at least part of a control store address, for producing the vector signal;

multiplexor means, responsive to the sequencer output, the first and second at least part of a control store address, and the vector signal, for producing as controller output, the sequencer output when the vector signal has a first value or a control store address formed in response to the first and second at least part of a control store address when the vector signal has a second value;

means for applying the interrupt-store signal and the control store address of a subroutine for handling an input interrupt signal, as a further control store address, to the sequencer; and

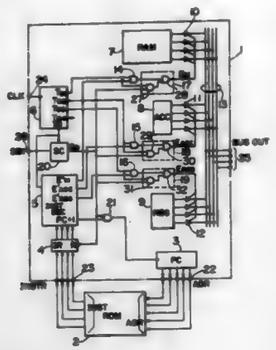
means for applying the interrupt-done signal to the sequencer after the input interrupt signal has been handled.

4,636,945

MICROPROCESSOR

Koji Tanagawa, and Isao Ohashi, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1983, Ser. No. 506,195
Claims priority, application Japan, Jan. 23, 1982, 57-106768
Int. Cl.[4] G06F *9/30*
U.S. Cl. 364—200 1 Claim



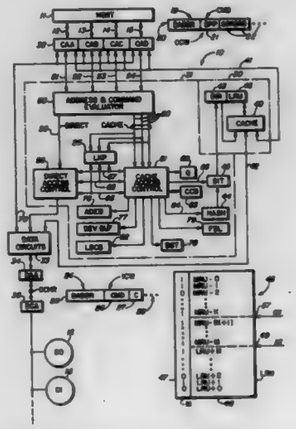
1. In a microprocessor comprising:
a data bus line;
a register operatively connected to said data bus line via a plurality of first output gates, said register temporarily storing data therein;
an accumulator operatively connected to said data bus line via a plurality of second output gates, said accumulator storing data therein;
a random access memory operatively connected to said data bus line via a plurality of third output gates, said random access memory storing data therein;
a timing signal generator means operatively connected to said pluralities of first and second and third output gates for controlling the operation thereof in response to clock signals input to said timing signal generator;
an instruction decoder operatively connected to said pluralities of first and second and third output gates for controlling the operation thereof;
a program counter operatively connected to said instruction decoder for providing an address output which is incremented by a signal from said instruction decoder;
an external read only memory operatively connected to said program counter for receiving said address output therefrom and generating an instruction output in response thereto;
an instruction register operatively connected to said external read only memory for receiving said instruction output therefrom and generating an instruction signal which is input to said instruction decoder, said instruction decoder providing outputs for controlling said pluralities of first and second and third output gates and said program counter in response to said output of said instruction register and a timing signal output from said timing signal generator;
the improvement comprising:
a synchronizing circuit operatively connected to said timing signal generator for producing a control signal which is synchronous with a timing signal from said timing signal generator when an external checking signal is inputted thereto;
and first and second and third gate circuits respectively operatively connected between said plurality of first and second and third output gates and said instruction decoder and timing signal generator and controlled by said control signal so as to selectively inhibit said pluralities of first and second and third output gates in response to said control signal;
and a second gate circuit operatively connected between said instruction decoder and program counter for inhibiting incrementing of said program counter by a signal from said instruction decoder;
wherein said microprocessor operates normally in the absence of said external checking signal and selectively outputs data stored in said register and accumulator and random access memory to said data bus in response to timing signals output from said timing signal generator when said external checking signal is present.

4,636,946

METHOD AND APPARATUS FOR GROUPING ASYNCHRONOUS RECORDING OPERATIONS

Michael H. Hartung, and Gerald E. Tayler, County of Pima, both of Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 24, 1982, Ser. No. 351,835
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 15 Claims



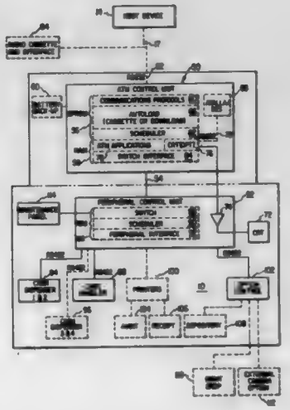
1. In a peripheral data storage system having host connection means for connecting the data storage system to a host processor and having a cache and a backing store, means for transferring data signals between said cache store and said backing store, said cache and backing store each having a plurality of addressable data storage areas for storing data, directory means connected to the cache store for enabling the addressing of the cache store areas using backing store addresses;
the improvement comprising:
first means for maintaining a control list having an entry for each allocated one of said addressable data storage areas in said cache storing data allocated from said backing store, each said entry including a first indicator indicating that data stored in said area associated with said entry has been modified from the corresponding data stored in said backing store, and a second indicator, indicating a relationship of data stored in said area associated with said entry to other data stored in said cache;
first scan means coupled to said first means for scanning a first portion of said control list to identify a first one of said addressable data storage areas in said cache store storing modified data;
second scan means coupled to said first means and to said first scan means for scanning said control list from said first one of said addressable data storage areas in said first portion of said control list through a second portion of said control list to identify further ones of said addressable data storage areas in said cache having a predetermined relationship to data stored in said first one of said addressable data storage areas; and
means coupled to said means for transferring data signals between said cache and said backing store and to said first and second scan means to link addressable data storage areas in cache identified as having said predetermined relationship as data to be transferred as a group of data blocks from said cache to said backing store.

4,636,947

ATM TASK SCHEDULING SYSTEM FOR SIMULTANEOUS PERIPHERAL DEVICE TRANSACTIONS PROCESSING

Stephen W. Ward, Bedford, Tex., assignor to Docutel/Olivetti Corporation, Irving, Tex.

Filed Mar. 14, 1984, Ser. No. 589,571
Int. Cl.[4] G06F *15/30, 9/00*
U.S. Cl. 364—200 16 Claims



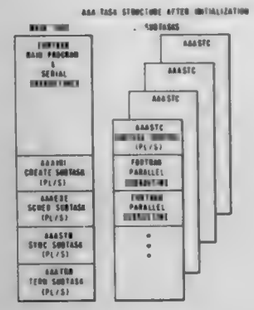
1. Apparatus for controlling the completion of tasks used to control the operation of an automated teller machine (ATM), the ATM connected to a host processing device, comprising:
a plurality of peripheral devices interconnected as a part of the ATM, each of the peripheral devices including means for formatting transaction sequence event messages to initiate ATM transaction events using the peripheral devices;
ATM control means connected between said ATM and said host processing device for scheduling ATM transaction events such that the peripheral devices perform at least two ATM transaction events simultaneously in real-time, the ATM control means including a first task scheduling control means for controlling the completion of tasks initiated by said ATM control means on a prioritized basis; and
interface control means connected to said ATM control means and the plurality of peripheral devices for receiving and processing the transaction sequence event messages to initiate simultaneous real-time performance of the ATM transaction events by the peripheral devices, the interface control means including a second task scheduling means for controlling the completion of tasks initiated by said interface control means on a non-prioritized basis.

4,636,948

METHOD FOR CONTROLLING EXECUTION OF APPLICATION PROGRAMS WRITTEN IN HIGH LEVEL PROGRAM LANGUAGE

Joseph M. Gdaniec, Hyde Park; Richard J. Sahulka, Woodstock, and David B. Sell, Monroe, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 30, 1985, Ser. No. 696,278
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—300 5 Claims



1. A method for executing a program written in an application program language on a multiprocessor data processing system in a Multiple Instruction/Multiple Data (MIMD) environment including the steps of: initializing an MIMD environment in a data processing system by a call to an initialization routine from an application program; maintaining said environment until all independently executable portions of said application program have been executed; scheduling execution of a plurality of tasks representing independently executable portions of said application program; synchronizing execution and completion of said plurality of tasks until all said tasks has completed execution; terminating said MIMD environment on completion of all said tasks.

4,636,949

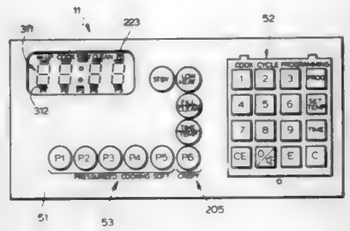
METHOD AND APPARATUS FOR CONTROLLING COOKING CYCLES IN A COOKING SYSTEM

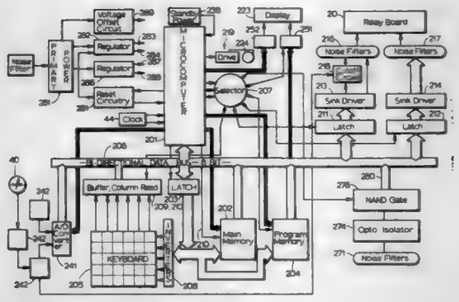
Charles R. Longabaugh, Hazleton, Ind., assignor to AMF Incorporated, White Plains, N.Y.

Filed Mar. 7, 1984, Ser. No. 587,004
Int. Cl.[4] G06F *15/20;* G05B *11/01;* A47J *27/62;* F27D *11/00*
U.S. Cl. 364—400 17 Claims

1. A cooking system including cooking means for cooking a food product and control means for controlling the cooking of said food product by said cooking means, said control means including means for cooking said food product pursuant to a particular cooking cycle, said cooking cycle being defined by a plurality of time/temperature setpoints each of which specify that the cooking temperature be at a particular value at a particular time during the cooking cycle, characterized in that said control means (201) further includes means for inserting an

alternate time/temperature set point into said cooking cycle for replacing the setpoints in said cooking cycle which have a





time or a temperature value that is greater than that of said alternate setpoint.

4,636,950

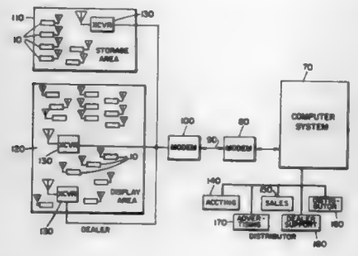
INVENTORY MANAGEMENT SYSTEM USING TRANSPONDERS ASSOCIATED WITH SPECIFIC PRODUCTS

Robert L. Caswell, 207 Laurelwood Ave., Placentia, Calif. 92670, and C. David Bass, 17806 Joshua Cir., Fountain Valley, Calif. 92708

Continuation of Ser. No. 429,546, Sep. 30, 1982, abandoned. This application Aug. 28, 1985, Ser. No. 770,070

Int. Cl.[4] G06F *15/24, 3/04*

U.S. Cl. 364—403 **3 Claims**



1. In combination,

signal producing means uniquely associated with a specific product,

said signal producing means including storage means for storing an encoded identification of said specific product,

said signal producing means operative to produce a signal representative of said encoded identification only in response to the application of an interrogatory signal which is related to said encoded identification of said specific product,

signal transmitting means which is disconnected from said signal producing means and arranged to produce said interrogatory signal to activate said signal producing means,

said signal transmitting means and said signal producing means communicate by means of radio frequency signals which are transmitted through the atmosphere,

said signal transmitting means is selectively alterable to produce interrogatory signals of different coded variations,

said signal producing means and said signal transmitting means each include respective antenna means,

said signal transmitting means comprises a signal transceiver which produces said interrogatory signal to activate said signal producing means and further produces a responsive signal in response to said signal produced by said signal producing means when activated,

switch means for altering said interrogatory signal code,

computer means connected to selectively activate said signal transmitting means and to be responsive to said signal representative of said encoded identification produced by said signal producing means,

said signal transmitting means includes a telephone link means for carrying said interrogatory signal from said computer means and for carrying said responsive signal to said computer means,

directional signal detectors for selectively detecting signals from said signal producing means.

4,636,951

POKER MACHINE COMMUNICATION SYSTEM

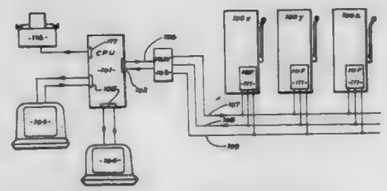
Neville G. Harlick, Sydney, Australia, assignor to Ainsworth Nominees Pty. Ltd., Rosebery, Australia

Filed Apr. 30, 1984, Ser. No. 605,409

Claims priority, application Australia, May 2, 1983, PF9129

Int. Cl.[4] G06F *15/28;* A63B *71/00, 67/00;* A63F *1/00*

U.S. Cl. 364—412 **3 Claims**



1. An apparatus for distributing information to gaming machines for individual game machine control of machine operation depending upon credit available, comprising in combination:

a plurality of gaming machines adapted for independent operation with respect to one another;

central means for recording and storing credit information;

a communication means for individual ones of said plurality of gaming machines and transmitting conformation between said central means for storing and recording credit information;

individual ones of said plurality of gaming machines each having a local means for recording and storing credit information;

each said local means being capable of storing a plurality of credit balances, and of establishing credit, cancelling credit, and transferring credit information to a selected one of said individual ones of said plurality of gaming machines according to instructions from said central means;

individual ones of said plurality of gaming machines each having a control means for enabling operation of the respective gaming machine;

each said control means having a means for interrogating said local means, said control means selectively enabling operation of said respective gaming machine in response to information received regarding credit;

said respective control means enabling operation of said respective gaming machine when a particular credit balance is at least equal to a predetermined amount;

said individual ones of said plurality of gaming machines each having respective transmitter means and receiver means for communicating with said communication means;

each said respective local means being interrogable and adjustable in response to commands from said central means;

said individual ones of said plurality of gaming machines each having respective game cycles; each of said individual ones of said plurality of gaming machines being capable of enabling at least a plurality of gaming cycles without communicating with said central means depending upon the particular credit balance recorded by said respective local means;

whereby each of said individual ones of said plurality of gaming machines are operable through a plurality of gaming cycles without interrogating said central means for each gaming cycle;

said local means debiting the particular credit balance for each gaming cycle, the amount of debit being a wager;

said local means being capable of transmitting particular credit balances to said central means when interrogated by said central means.

4,636,952

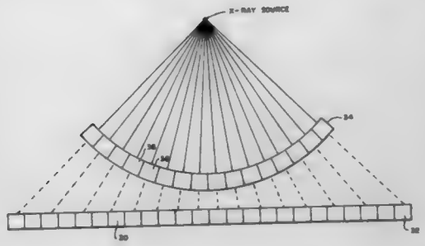
METHOD AND APPARATUS FOR BACK PROJECTION IMAGE RECONSTRUCTION USING VIRTUAL EQUI-SPACED DETECTOR ARRAY

Carl R. Crawford, Milwaukee, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Dec. 3, 1984, Ser. No. 677,560

Int. Cl.[4] G06F *15/42*

U.S. Cl. 364—414 **12 Claims**



1. In a tomographic system using a fan beam radiation source and a curved equi-angular detector array for detecting attenuated radiation, an improved method of image reconstruction comprising the steps of

mapping unfiltered signals of attenuated radiation from said curved equi-angular detector array into signals for a virtual equi-spaced planar detector array,

filtering said signals for a virtual equi-spaced planar detector, and

reconstructing an image based on said filtered signals for said virtual array.

4,636,953

X-RAY IMAGE CORRECTION APPARATUS

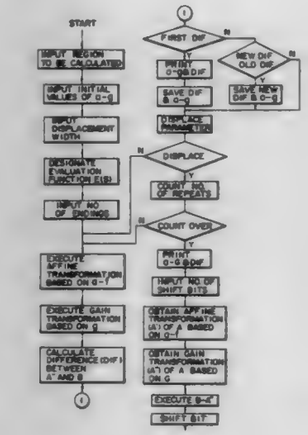
Satoshi Kageyama, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 4, 1984, Ser. No. 607,277

Claims priority, application Japan, May 10, 1983, 58-81411

Int. Cl.[4] H04N *5/32*

U.S. Cl. 364—414 **9 Claims**



1. An X-ray image-correction apparatus comprising:

first memory means for storing a first X-ray image signal corresponding to a first X-ray image of a subject;

second memory means for storing a second X-ray image signal corresponding to a second X-ray image taken later than said first X-ray image;

address means for outputting address signals used for reading out image signals from said first and second memory means;

subtraction means for performing subtraction processing between the first and second X-ray image signals read out from said first and second memory means;

interest area specifying means for specifying at least one interest area in the X-ray image corresponding to the subtraction-processed image signals;

calculating means for calculating a position correction value for each of a plurality of sections obtained by dividing the interest area, to obtain a plurality of position correction values corresponding to a plurality of sections;

selecting means for selecting at least the position correction value appearing most frequently among the position correction values; and

correcting means for determining the actual correction value from at least the selected position correction value and controlling said address means to correct the address signals designating said first and second memory means by the actual correction value

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4,636,954

X-RAY DIAGNOSTIC APPARATUS COMPRISING X-RAY INTENSITY AND DIAPHRAGM VALUE CONTROLS

Kenichi Komatsu, Ootawara, and Senzo Fujii, Tochigi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 23, 1983, Ser. No. 565,225

Claims priority, application Japan, Dec. 27, 1982, 57-226975

Int. Cl.[4] H04N *5/32*

U.S. Cl. 364—414 **5 Claims**

1. An X-ray diagnostic apparatus comprising:

an X-ray source for transmitting first and second doses of X-rays through an object during first and second irradia-

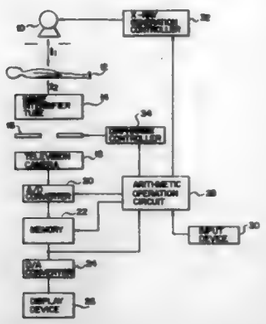
tion periods, respectively, said second dose being larger than said first dose;

means for converting the X-ray images of said object produced during said irradiation periods to optical images;

video means for receiving said optical images from the converting means through a light-transmitting diaphragm and converting the received optical images to video signals representing said optical images as a plurality of digital picture elements, said video signals reaching a fixed level of saturation when the intensity of said received optical image exceeds a certain value;

means for detecting the maximum picture element value of the video signal produced by said video means during said first irradiation period;

arithmetic operation means for calculating a value representing the light transmitting characteristic of said diaphragm for use during said second irradiation period, said arithmetic operation means functioning initially to calculate a permeability value by calculating the water equivalent



thickness value t for the portion of said object corresponding to the picture element having the maximum intensity value, said permeability value representing the X-ray permeability of said object at an area corresponding to the picture element having the maximum picture element value detected during said first irradiation period, and thereafter functioning to calculate from the dosage parameters of the X-ray source during said second irradiation period and said permeability value, a diaphragm output value representing the light transmitting capacity of said diaphragm required to equate the intensity level of the maximum intensity picture element generated during said second irradiation period to the approximate saturation level of said video means; and

means for setting the light emitting capacity of said diaphragm to said diaphragm output value during said second irradiation period, whereby the optical image transmitted by said diaphragm during said second period is matched to the dynamic range of said video means.

4,636,955

METHOD FOR ESTABLISHING CONTINUITY BETWEEN CONTIGUOUS DATA SETS

Merrill S. Ginsberg, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 1, 1984, Ser. No. 605,754
Int. Cl.⁴ G06F *15/32*
U.S. Cl. 364—420 **2 Claims**

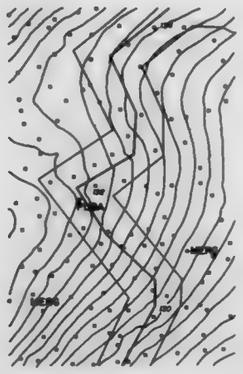
2. A method for establishing continuity between two contiguous sets of data having a variable bias there between comprising the steps of:

receiving a first set of data and a second set of data, each set comprising a plurality of data points having a predetermined value;

selecting a portion of said data points of said first set and a contiguous portion of said data points of said second set to provide an artificial overlap zone;

determining a different set of grid data for said overlap zone having a plurality of data points, each of said data points having a value equal to the difference of grids derived from said portion and said contiguous portion;

fitting a relatively higher order orthogonal polymonial to said difference gridded set for said overlap zone;



altering one of said first set of data and said second set of data by said relatively higher order polymonial

or by an orthogonal polynominal of lower order derived from said relatively higher order polynomial, with said polynomial computed over the entire area occupied by the data set to be altered; and

displaying said altered sets of data with said unaltered set of data.

4,636,956

METHOD AND DEVICE FOR OPTIMIZATION OF SEISMIC DATA

Serge Vassiler, Saint-Gaudens; Robert Garotta, Chatenay-Malabry; André Lozes, and Jean C. Vidal, both of Saint-Gaudens, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie and Compagnie Generale de Geophysique, Massy, both of, France

Filed Mar. 20, 1984, Ser. No. 591,571
Claims priority, application France, Mar. 23, 1983, 83 04740
Int. Cl.⁴ G01V *1/20, 1/36*
U.S. Cl. 364—421 **24 Claims**

1. A method of optimization of seismic data during exploration of a medium, comprising:

emitting from at least a first transmission source a first series of first long signals having alternating polarities and containing a predetermined frequency spectrum;

emitting at the same instant, from at least one second transmission source which is separate and distinct from the first source a second series of second signals having a constant polarity and having energy levels different from the energy levels of said first signals;

receiving and recording both series of signals after propagation through the medium to be explored;

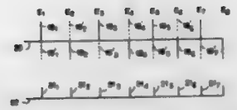
grouping into pairs recorded signals of said first series having opposite polarities;

grouping into pairs recorded signals of said second series having the same polarity as each other and corresponding in transmission time, respectively, to signals in pairs of said first group;

adding the pairs of said first group;

adding the pairs of said second group; and





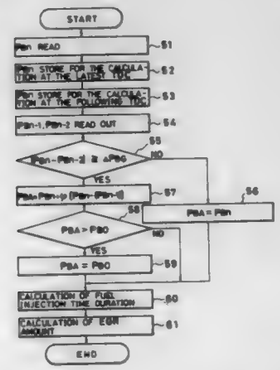
cross correlating the sums produced by each addition with the signal emitted by the corresponding transmission source.

4,636,957

METHOD FOR CONTROLLING OPERATING STATE OF AN INTERNAL COMBUSTION ENGINE WITH AN OVERSHOOT PREVENTING FUNCTION

Yutaka Otobe, Shiki, and Noriyuki Kishi, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 21, 1984, Ser. No. 622,822
Claims priority, application Japan, Jun. 22, 1983, 58-113589
Int. Cl.⁴ F02M *51/00*
U.S. Cl. 364—431.07 **5 Claims**



1. A method for controlling an operating state of an internal combustion engine having an intake air passage with a throttle valve, comprising:

detection step for detecting a pressure in the intake air passage of the engine downstream of the throttle valve and producing a pressure signal;

calculation step for calculating a difference between a latest sampled value of said pressure signal and a preceding sampled value of said pressure signal, and adding a value corresponding to said difference to said latest sampled value to produce a corrected pressure value; and

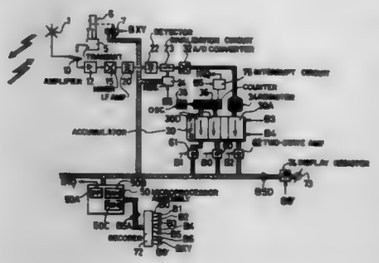
controlling step for controlling an amount of fuel to be supplied to the engine on the basis of said corrected pressure value, wherein said corrected pressure value is made equal to a predetermined value when said corrected pressure value becomes greater than said predetermined value.

4,636,958

ARRANGEMENT FOR RECEIVING TACAN SIGNALS

Serge Hethuin, Meudon, and Guy F. M. Marin, Boulogne, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 6, 1983, Ser. No. 539,583
Claims priority, application France, Oct. 6, 1982, 82 16739
Int. Cl.⁴ G06F *15/50*
U.S. Cl. 364—451 **5 Claims**



1. Apparatus for installation in an aircraft for receiving signals of the TACAN type transmitted by a beacon and producing a display of the TACAN bearing angle TAC of the aircraft with respect to such beacon, whereby the aircraft can be navigated in accordance with the displayed bearing angle TAC; such apparatus deriving the TACAN bearing angle TAC in accordance with

$$TAC=(\phi 135/9)+(k\cdot 40°)$$

where k ($0 \leqq k < 9$) is such that

$$|TAC-\phi 15| \leqq 20°$$

and the values $\phi 15$ and $\phi 135$ are defined by received signals which are in the form of pulses whose amplitude y(t) as a function of the time "t" is given by

$$y(t)=a \sin(\omega t+\phi 15)+b \sin(9\omega t+\phi 135)+c+n(t)$$

where a, b, c and ω are constants and n(t) is a noise component; such apparatus comprising:

accumulator means for accumulating a number N of the received pulses correlated with their times of arrival "t";

storing means for storing data representing a matrix M given by

$$M=\begin{vmatrix} M_{1,1} & M_{1,2} & M_{1,3} & M_{1,4} & M_{1,5} \\ M_{2,1} & M_{2,2} & M_{2,3} & M_{2,4} & M_{2,5} \\ M_{3,1} & M_{3,2} & M_{3,3} & M_{3,4} & M_{3,5} \\ M_{4,1} & M_{4,2} & M_{4,3} & M_{4,4} & M_{4,5} \\ M_{5,1} & M_{5,2} & M_{5,3} & M_{5,4} & M_{5,5} \end{vmatrix}$$

where

$$M_{1,1}=N \quad M_{2,2}=\sum_{i=1}^{N}\sin^2\omega t i \quad M_{3,3}=\sum_{i=1}^{N}\cos^2\omega t i$$

$$M_{4,4}=\sum_{i=1}^{N}\sin^2\omega t i \quad M_{5,5}=\sum_{i=1}^{N}\cos^2\omega t i$$

$$M_{1,2}=M_{2,1}=\sum_{i=1}^{N}\sin\omega t i \quad M_{1,3}=M_{3,1}=\sum_{i=1}^{N}\cos\omega t i$$

-continued

$$M_{1,4} = M_{4,1} = \sum_{i=1}^{N} \sin\omega' ti \quad M_{1,5} = M_{5,1} = \sum_{i=1}^{N} \cos\omega' ti$$

$$M_{2,3} = M_{3,2} = \sum_{i=1}^{N} \sin\omega ti \cdot \cos\omega ti$$

$$M_{2,4} = M_{4,2} = \sum_{i=1}^{N} \sin\omega ti \cdot \sin\omega' ti$$

$$M_{2,5} = M_{5,2} = \sum_{i=1}^{N} \sin\omega ti \cdot \cos\omega' ti$$

$$M_{3,4} = M_{4,3} = \sum_{i=1}^{N} \cos\omega ti \cdot \sin\omega' ti$$

$$M_{3,5} = M_{5,3} = \sum_{i=1}^{N} \cos\omega ti \cdot \cos\omega' ti$$

$$M_{4,5} = M_{5,4} = \sum_{i=1}^{N} \sin\omega ti \cdot \cos\omega' ti$$

where $\omega' = 9\omega$;

such storing means further storing data representing a column vector Z given by

$$Z = \begin{vmatrix} \sum_{i=1}^{N} y(ti) \\ \sum_{i=1}^{N} y(ti)\sin\omega ti \\ \sum_{i=1}^{N} y(ti)\cos\omega ti \\ \sum_{i=1}^{N} y(ti)\sin\omega' ti \\ \sum_{i=1}^{N} y(ti)\cos\omega' ti \end{vmatrix}$$

calculating means for calculating a column vector X from M and Z given by

$$X = \begin{vmatrix} x1 \\ x2 \\ x3 \\ x4 \\ x5 \end{vmatrix} = \begin{vmatrix} c \\ a\cos\phi 15 \\ a\sin\phi 15 \\ b\cos\phi 135 \\ b\sin\phi 135 \end{vmatrix} = M^{-1} \cdot Z$$

such calculating means determining the angles $\phi 15$ and $\phi 135$ in accordance with the relationships

$$\phi 15 = \text{arctg } x3/x2$$

$$\phi 135 = \text{arctg } x5/x4$$

and determining the TACAN angle TAC from $\phi 15$ and $\phi 135$;

said storing means and said calculating means being comprised in a microprocessor assembly which further comprises a read-only memory which stores intercept programs for controlling operation of said calculating means to determine the TACAN angle TAC;

said microprocessor assembly having an input for receiving interrupt signals which cause said calculating means to execute the intercept programs stored in said read-only memory, and further comprising an interrupt circuit for generating such interrupt signals and supplying them to the interrupt input of the microprocessor assembly, whereby said calculating means executes such intercept programs to determine the TACAN angle TAC;

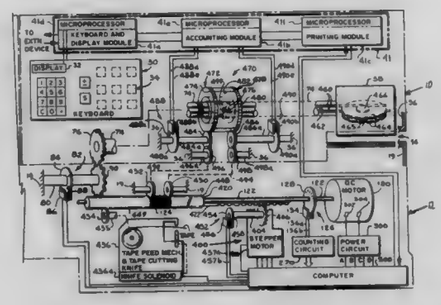
and means controlled by said calculating means for displaying the bearing of said aircraft relative to said beacon in accordance with the calculated TACAN angle TAC.

4,636,959

MICROPROCESSOR CONTROLLED D.C. MOTOR FOR CONTROLLING A POSTAGE METER

Edilberto I. Salazar, Brookfield, and Wallace Kirschner, Trumbull, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 4, 1984, Ser. No. 657,651
Int. Cl.[4] G06F *15/20*; H02P *5/06*; H02K *37/00*
U.S. Cl. 364—464 26 Claims



1. In combination with a postage meter including a plurality of loads, a source of supply of motive power for driving the respective loads and means for selectively coupling the source of motive power to the respective loads, an improvement comprising:

(a) the motive power source including a d.c. motor having an output shaft adapted to be selectively coupled to the respective loads;

(b) means for sensing angular displacement of the motor output shaft;

(c) a microprocessor comprising

i clock means for generating successive sampling time periods,

ii means for providing first counts respectively representative of successive desired angular displacements of the motor output shaft during successive sampling time periods,

iii means responsive to the sensing means for providing second counts respectively representative of actual angular displacements of the motor output shaft during successive sampling time periods, and

iv means for compensating for the difference between the first and second counts during each successive sampling time period and generating a pulse width modulated control signal for controlling the d.c. motor, the motor control signal causing the actual angular displacement of the motor output shaft to substantially match the desired angular displacement of the motor output shaft during successive sampling time periods; and

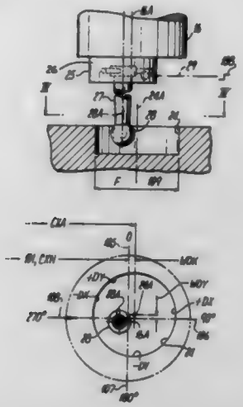
(d) signal amplifying means for operably coupling the motor control signal to the d.c. motor.

4,636,960

METHOD OF OPERATING A MACHINE TOOL WITH A SENSING PROBE IN ORDER TO GATHER POSITIONAL DATA FOR THE CALCULATION OF TOOL OFFSET PARAMETERS

David R. McMurtry, Wotton-under-Edge, England, assignor to Renishaw Electrical Limited, Wotton-under-Edge, England

Continuation of Ser. No. 421,491, Sep. 16, 1982, Pat. No. 4,542,467. This application Jul. 25, 1985, Ser. No. 758,808
Int. Cl.[4] G06F *15/00*
U.S. Cl. 364—474 11 Claims



1. In a machine tool comprising a spindle for driving a rotary cutting tool, the spindle having an axis of rotation, means for rotating the spindle through predetermined angles of rotation, a table for support of a workpiece thereon, the table being movable relative to the spindle transversely to the spindle axis, a surface-sensing probe mounted on the spindle, means for generating a probe signal at the instant of said probe being brought into a sensing relationship with a surface defined on said table, the signal occurring when the spindle axis has a distance, defining a probe offset, from the surface being sensed, said probe offset being liable to be different for different radii about the spindle axis, means responsive to the occurrence of a said probe signal for producing an output defining the position of the spindle axis relative to the primary datum which is fixed in relation to the table, and computer adapted to store information defining the position of the spindle axis relative to the primary datum and adapted to read said output; the method of determining the position of the spindle axis in relation to surfaces to be machined on a said workpiece comprising the steps of:

a. providing on the table a datum means defined by two test surfaces (−DX, +DX) spaced apart in a given direction (X) and having therebetween a mid-point defining a secondary datum (24A) of known relation to said surface to be machined, said mid-point having an actual position (CA) which may differ from a demanded position (CN) of the spindle axis, by an error defining a work offset (WO), said demanded position being stored in the computer,

b. operating the machine to bring the probe into sensing relationship with the first test surface and produce a first said output (A1),

c. operating the machine to bring the probe into sensing relationship with the second test surface and produce a second said output (A2),

d. between two operations (b) and (c) above, operating the machine to rotate the spindle through 180 degrees thereby to ensure that said probe offset is the same for both said sensing relationships,

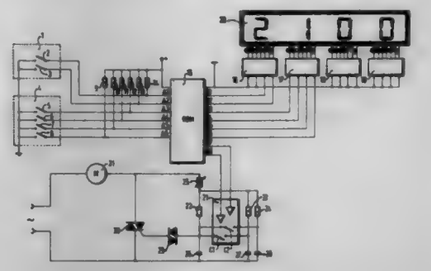
f. operating the computer to read said outputs (A1, A2) and determine the value WO=CN−(A1+A2)/2 defining said error at least in said direction (X).

4,636,961

CONTROL DEVICE FOR A HAND-OPERATED ELECTRIC POWER TOOL

Hans-Peter Bauer, Rutesheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,572
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1983, 3329971
Int. Cl.[4] G06F *15/46*; H02P *7/28*
U.S. Cl. 364—474 8 Claims



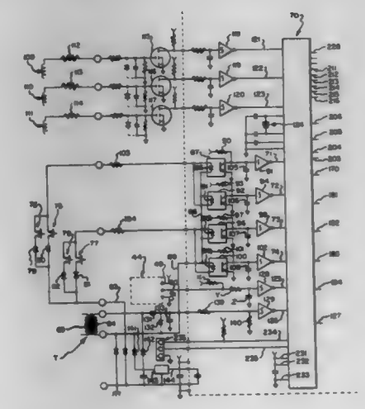
1. A hand-operated electric power tool comprising means for controlling the operation of the tool; a device for storing binary control words each including a first group of bits for controlling a predetermined mode of operation of said tool and a second group of bits indicative of a rotary speed preset for a particular mode of operation; said storing device having addressing inputs for receiving a selected binary address word and data outputs for outputting a stored control word assigned to a selected address word; a data input device connected in parallel to said addressing inputs to apply a selected word thereto; a data display device connected in parallel to one part of said data outputs pertaining to said second group of bits to display a preset rotary speed value; and said means for controlling the operation of the tool being connected to another part of said data outputs pertaining to said first group of bits.

4,636,962

MICROPROCESSOR-CONTROLLED HOIST SYSTEM

Robert H. Broyden, Williamsville; Douglas E. Schenk, Tonawanda, and Raymond A. Newman, Cheektowaga, all of N.Y., assignors to Columbus McKinnon Corporation, Amherst, N.Y.

Filed May 24, 1983, Ser. No. 497,723
Int. Cl.[4] G06F *15/20*; B66D *1/48*
U.S. Cl. 364—478 33 Claims



29. In a load-handling hoist system, the combination of a

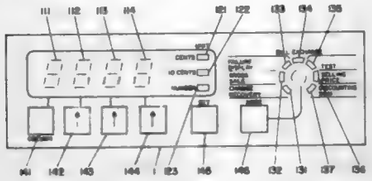
hoist having a reversible electric motor and brake means for normally holding a load stationary when the motor is not energized; an operator's station comprising a pendant having individual control means for respectively commanding said motor to raise a load, for commanding said motor to lower a load, and for initiating a sequence of brake means release operations to lower a load in incremental steps; and microprocessor means responsive to operation of said individual control means for effecting energization of said motor to raise a load, for effecting energization of said motor to lower a load, and for effecting intermittent release of said brake means to lower a load in said incremental steps.

4,636,963

CONTROL SYSTEM FOR AN AUTOMATIC VENDING MACHINE

Yo Nakajima; Yoshihisa Nakajima, and Yoshio Ushijima, all of Nagano, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 537,285, Sep. 29, 1983, abandoned. This application Mar. 7, 1986, Ser. No. 838,411
Claims priority, application Japan, Sep. 29, 1982, 57-170666
Int. Cl.[4] G07D *1/06*; G07F *11/00*
U.S. Cl. 364—479 **1 Claim**



1. A control device for an automatic vending machine for a plurality of different commodities wherein a common display is used for displaying parameter values relating to each of a plurality of machine operating and display modes, comprising:

an operation panel disposed on a front face of a coin mechanism and provided with data display means having a plurality of digits, mode display means for indicating which operating and display mode the machine is in, a column switch, a data advance switch for each of said plurality of digits, a setting switch, and a mode selection switch;

a price memory for storing a selling price for each of said plurality of commodities;

an amount-sold memory for storing an amount sold for each of said plurality of commodities;

mode selection control means for selecting the mode of operation of the machine and of the data display means between at least an ordinary selling mode, a price setting (selling price) mode, a change recovery mode, and an amount-sold (gross sale) display mode, by automatically cycling through said modes in sequence in response to actuations of said mode selection switch, and further including timer means for returning the machine to the ordinary selling mode in response to the mode selection switch not being actuated for a predetermined time period;

mode display control means for causing said mode display means to indicate the present operational mode of the machine and of the data display means as selected by said mode selection control means;

price setting control means for designating, in said price setting mode, one of said plurality of commodities by automatically cycling through said commodities incrementally in response to actuations of said column switch so as to cause said data display means to display information indicating the identity of the designated commodity and the associated selling price of said commodity stored in said price memory, and to cause each digit of the price display to advance incrementally substantially one unit at a time in response to each actuation of said data switch associated with said digit, and to further cause said price memory for the designated commodity to store the displayed price when said setting switch is operated;

change recovery control means for designating, in said change recovery mode, one of a plurality of change cylinders which store respective different denominations of coins so as to cause said data display means to display the identity of a designated change cylinder and to discharge all of the coins in the designated change cylinder when said setting switch is operated;

amount-sold display control means for designating, in said amount-sold display mode, one of said plurality of commodities by automatically cycling through said commodities incrementally in response to actuations of said column switch so as to cause said data display means to display information indicating the identity of the designated commodity and the amount-sold of said associated commodity stored in said amount-sold memory; and

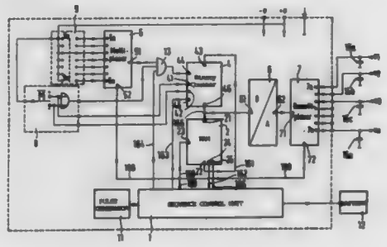
selling control means for performing, in said ordinary selling mode, a selling operation of a commodity selected by a customer in response to deposit of coins in said coin mechanism at least equal to the selling price of said selected commodity stored in said price memory and causing said amount-sold memory to update the amount sold of said selected commodity in said selling operation.

4,636,964

METHOD AND SYSTEM FOR GENERATING AND ADJUSTING A PREDETERMINED QUANTITY OF MUTUALLY INDEPENDENT DIRECT CURRENT VOLTAGES

Hanno Jacobs, Langenfeld; Ulrich Opara, Erftstadt-Köttingen, and Franz Selleschy, Solingen, all of Fed. Rep. of Germany, assignors to Krautkramer-Branson, Inc., Lewistown, Pa.

Filed Apr. 20, 1983, Ser. No. 486,718
Claims priority, application Fed. Rep. of Germany, May 4, 1962, 3216547
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—483 **7 Claims**



4. A system for generating and adjusting a predetermined quantity of mutually independent direct current voltages by converting corresponding digital values stored in a read-write memory using a digital-to-analog converter comprising:

read-write memory means for storing data corresponding to each of said predetermined quantity of voltages;

counting means;

address means coupled to said memory means and said counting means for reading from said memory means said stored data associated with one of said predetermined quantity of voltages and providing a signal to said counting means for presetting said counting means with a count commensurate with said stored data;

selector switch means for selecting one of said predetermined quantity of voltages to be adjusted;

set switch means for selecting the direction of counting of said counting means;

control means coupled to said selector switch means, said set switch means and said counting means for causing when said selector switch means selects said predetermined voltage and said set switch means selects the direction of counting, said counting means to count in said selected direction for providing a changed count;

said address means causing said changed count to be written into said memory means corresponding to said predetermined voltage;

voltage generating and adjusting means, including a digital-to-analog converter, coupled to said counting means for converting said changed count into an adjusted direct current voltage, and

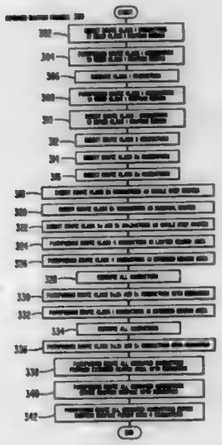
sequencing means coupled to said memory means, said address means, said control means and said voltage generating and adjusting means for sequentially providing adjusted direct current voltages for each of said quantity of mutually independent direct current voltages until each of said voltages is adjusted to its respective required value.

4,636,965

ROUTING METHOD IN COMPUTER-AIDED-CUSTOMIZATION OF UNIVERSAL ARRAYS AND RESULTING INTEGRATED CIRCUIT

David C. Smith, Williamstown, and Richard Noto, Maple Shade, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed May 10, 1984, Ser. No. 608,772
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—491 **18 Claims**



1. In a method of routing conductors during the conversion of a universal array into a custom IC where said universal array includes:

a plurality of basic circuit units each having connection pins;

said basic circuit units being disposed in parallel rows, in fixed, pre-placed locations, within an overall basic-unit-row region of said array;

wiring roadbeds within said basic-unit-row region which space said parallel rows apart, each of said wiring roadbeds including:

a plurality of ranks of fixed conductive tunnels in which each of the tunnels extends perpendicular to the length of said parallel rows,

a plurality of wiring lanes, each of which comprises a group of said tunnels which are aligned with each other and perpendicular to said rows;

a plurality of wiring channels disposed over each of said tunnel ranks, each of said wiring channels extending parallel to said rows;

said universal array having a fixed, pre-fabricated structure up to the level of said wiring channels and the conductors to be routed by said method being at the level of said wiring channels whereby all of the conductors defined by said routing process must fit within the pre-defined structure of said array;

said method being one which executes both a direct routing process and a pathfinding process for routing conductors to interconnect various ones of said basic unit connection pins to provide said IC, and in which a conductor is referred to as a class 1 conductor if it connects two pins on the same basic unit row, the improvement comprising the steps of:

(A) executing said direct routing process for each of said class 1 conductors while restricting permissible routes to those routes which are entirely within a first routing region limited to an area spanning said basic unit row to which said class 1 conductor is to connect and out to and including the first rank of tunnels on either side of said basic unit row; and then

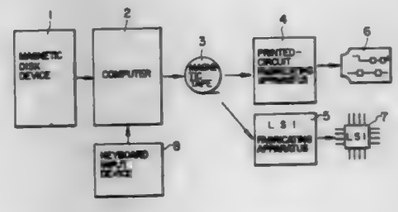
(B) executing said pathfinding routing process for said class 1 conductors which remain unrouted while restricting permissible routes to those routes which are entirely within said first routing region, said pathfinding step being executed prior to any direct routing of said class 1 conductors outside of said first routing region.

4,636,966

METHOD OF ARRANGING LOGIC CIRCUIT DEVICES ON LOGIC CIRCUIT BOARD

Norio Yamada; Hayashi Kajitani; Kyoji Chiba, and Mitsugu Edagawa, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1984, Ser. No. 578,211
Claims priority, application Japan, Feb. 22, 1983, 58-28376
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—491 **4 Claims**



1. A method of arranging logic circuit devices on a circuit board on the basis of a logic data defining the logic circuit devices and signal lines for connecting the logic circuit devices to each other comprising the steps of:

(a) allotting to said signal lines, degrees of expediting signal propagation through the signal lines;

(b) arranging the logic circuit devices connected with the signal line to which the highest degree is allotted, on the circuit board;

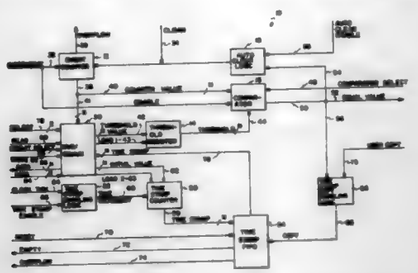
(c) arranging the logic circuit devices connected with the signal line to which the second highest degree is allotted, on the circuit board; and

(d) repeating the step (c) till the step (c) is completed for the logic circuit devices connected with the signal line to which the lowest degree is allotted.

4,636,967
MONITOR CIRCUIT

Devesh Bhatt, Shoreview, and Michael O. Schroeder, St. Anthony, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 24, 1983, Ser. No. 545,312
Int. Cl.[4] G06M 1/28, 3/02; G07C 3/10
U.S. Cl. 364—550 4 Claims



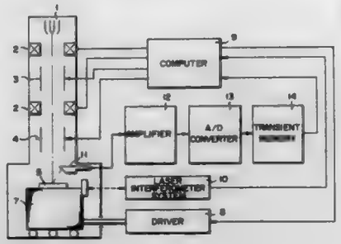
1. An electrical device for monitoring a monitored device, wherein the occurrence of selected events in said monitored device generates event digital signals and wherein a control device generates digital clock signals, comprising:
- first means for counting said event digital signals so that the current value of said first counting means is an event count;
- means for selectively altering a threshold value;
- means for storing said threshold value;
- means for comparing said stored threshold value to said event count and for generating an equal value digital signal when said event count equals said threshold value;
- second means for counting said digital clock signals so that the current count of said second counting means corresponds to a time interval;
- means for setting said second counting means to a predetermined value when said first counting means is at an initial value;
- means for recording said current count of said digital clock signals in response to a record signal;
- means for resetting said event count to said initial value upon the occurrence of said record signal; and
- means for storing a plurality of said current counts of said digital clock signals, one of said current counts of said digital clock signals being stored each time said record signal occurs.

4,636,968
METHOD OF POSITIONING A BEAM TO A SPECIFIC PORTION OF A SEMICONDUCTOR WAFER

Miaso Gotou, Kawasaki, and Hirotsugu Wada, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 28, 1984, Ser. No. 625,545
Claims priority, application Japan, Jun. 30, 1983, 58-119335
Int. Cl.[4] G01B 11/27; G01N 23/223; G06F 15/60
U.S. Cl. 364—559 10 Claims

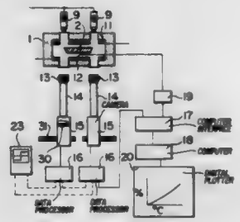
1. A method of positioning a beam to a specific portion of a semiconductor wafer having a plurality of positioning marks formed thereon to treat the wafer, comprising the steps of:
- a first step of detecting the positions of at least two predetermined positioning marks by radiating a beam thereto, calculating a first position of each of said plurality of position marks from the detected positions of said at least two predetermined marks and detecting an actual position of each of said plurality of position marks by radiating the beam thereto;
- a second step of determining if each of selected ones of said marks satisfies predetermined conditions;
- a third step of using the actual position of those of said selected marks which satisfy the predetermined conditions as the reference position to position the beam to a specified portion of the wafer; and
- a fourth step of providing for each of those of said selected marks which do not satisify the predetermined conditions a second position wherein said second position is calculated from the positions of marks around each of those of said selected marks which do not satisify the predetermined conditions whereby said second position is used as the reference position in order to position the beam to the specific portion of the wafer.



4,636,969
APPARATUS FOR AUTOMATIC MEASURING THERMAL DIMENSIONAL CHANGE

Hiroshi Kyoden, Okayama; Yasuhiro Endo, Bizen; Teiichi Fujiwara; Toshisada Mimura, both of Okayama; Kihachiro Nishikawa, and Shoichi Nishizawa, both of Yokohama, all of Japan, assignors to Shinagawa Refractories Co., Ltd. and Matsushita Electric Industrial Co., Ltd., both of, Japan

Continuation-in-part of Ser. No. 636,263, Jul. 31, 1984, abandoned. This application Sep. 17, 1985, Ser. No. 776,920
Claims priority, application Japan, Aug. 15, 1983, 58-147966; Jun. 22, 1984, 59-127526
Int. Cl.[4] G01B 11/02
U.S. Cl. 364—560 5 Claims

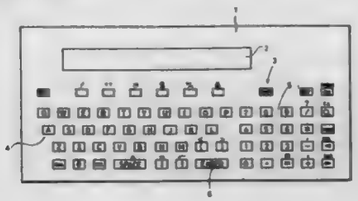


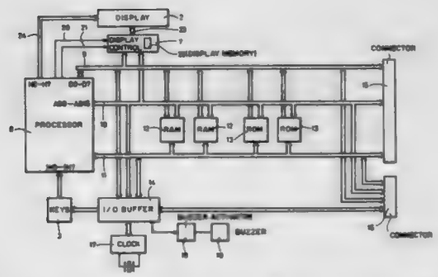
1. An apparatus for automatic measuring thermal dimensional change from the room temperature to 2,000° C., comprising means for supporting a specimen of the material to be tested and heating said specimen, measuring means for measuring the dimensional change of the specimen during heating of said specimen, said measuring means having a photo diode linear array and a telescopic lens for forming an image of the heated specimen, means for illuminating the specimen from the opposite side of the photo diode linear array, said illuminating means having an electric lamp and a condensor lens, the radiation characteristic curve of said lamp being different from that of the heated specimen, means for separating the light-forming image from the light radiated from said heated specimen, said separating means having a light filter and a neutral density filter between said specimen and and said lens and means for processing and calculating a video signal from signals from the photo diode linear array having a predetermined pitch, said photo diode linear array having the image processing unit interpolating the pixel pitch to increase measuring accuracy.

4,636,970
PERSONAL TYPE COMPUTER WITH EXECUTION OF PROGRAMS IN ROM AND RAM

Masaaki Morino, Kyoto; Yoshiyuki Fujikawa; Isamu Haneda, both of Nara, and Tetsuo Myoi, Kyoto, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 442,373, Nov. 17, 1982, abandoned. This application Oct. 7, 1985, Ser. No. 783,819
Claims priority, application Japan, Nov. 24, 1981, 56-189002
Int. Cl.[4] G06F 9/00
U.S. Cl. 364—706 1 Claim



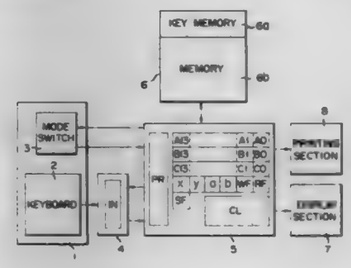


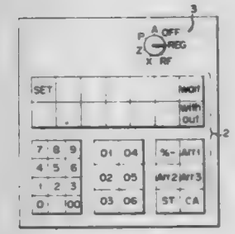
1. A programmable desk top calculator or personal computer comprising:
- a key input device;
- internal Random Access Memory means for reading and writing information input by said key input device;
- internal Read Only Memory means for storing information;
- external Read Only Memory means for storing program information, including,
  - an area for storing machine language program information, and
  - an area for storing high level language program information;
- said internal Random Access Memory means including,
  - an area for storing written program information,
  - an area for storing written data information, and
  - an area for storing address information including,
    - pointer means for storing address information containing,
    - an address of said external Read Only Memory means,
    - an address of said area for storing said high level language information in said external Read Only Memory means,
    - an address of said area for storing written program information,
    - an address of said area for storing written data information, and
    - an address of a line of program information to be executed, and
- means for directly executing programs stored in said external Read Only Memory means without being loaded into said internal Random Access Memory means, by reading the respective addresses of said external Read Only Memory means and said area for storing high level language program information from said internal Random Access Memory means.

4,636,971
DATA PROCESSING DEVICE WITH SPECIFIABLE PROGRAM ORDER

Tetsuo Ootsuka, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 432,999, Oct. 6, 1982, abandoned. This application Jul. 23, 1985, Ser. No. 757,771
Claims priority, application Japan, Oct. 14, 1981, 56-164506
Int. Cl.[4] G06F 3/00
U.S. Cl. 364—709 4 Claims





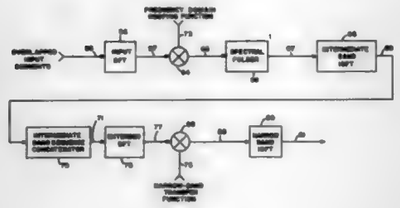
1. A non-programmable type data processing calculator apparatus, comprising:
- a keyboard including an arrangement key and and keys adapted to generate key codes;
- program memory means including a ROM for storing programs each of which corresponds to a different one of the key codes generated by said keys;
- key code memory means for storing a plurality of sequences of key codes, and for generating in response to operation of said arrangement key the stored key codes in the order in which they have been entered in said key code memory means after operation of the keys in a desired sequence;
- said keyboard further including means for selecting an operation mode for writing key codes in said key code memory means, one after another, as the corresponding keys of said keyboard are operated; and
- a central processing unit coupled to said keyboard, said program memory means and said key code memory means for executing the program corresponding to a generated one of said key codes and read from said program memory means when the corresponding one of the keys is operated, and, responsive to operation of said arrangement key for causing said key code memory means to generate the plurality of key codes stored in said key code memory means wherein said program memory means reads out each of the programs corresponding to the key codes, and said central processing unit executes the corresponding programs in the desired sequence.

4,636,972

METHOD AND APPARATUS FOR DIGITAL FILTERING

Robert P. Boland, Wilmington, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 25, 1983, Ser. No. 555,261
Int. Cl.[4] G06F *15/31*
U.S. Cl. 364—724 12 Claims



1. A narrow-band filter for band limiting an input sample train representing an input signal sampled at an input sampling rate, the apparatus comprising:

A. means for performing a discrete Fourier transformation on each of a plurality of successive overlapped input segments from the input sample train to generate a discrete input Fourier transform, each input segment covering a predetermined input-segment time duration shorter than the impulse response of the narrow-band filter;

B. means for multiplying the values of the input Fourier transform by corresponding values of a frequency-domain roofing function to generate an intermediate discrete Fourier transform, the frequency-domain roofing function including the pass band of the narrow-band filter and being band limited to a roofing band whose width is less than that of the bandwidth of the input signal, the inverse transform of the frequency-domain roofing function having a duration shorter than that of the input segments;

C. means for generating from the intermediate transform an intermediate-band discrete time-domain sequence equivalent to the result of resampling the inverse Fourier transform of the intermediate transform at a resampling rate that is lower than the input sampling rate but high enough to extract substantially all the information contained in the roofing band;

D. means for concatenating the intermediate-band discrete time-domain sequence with intermediate-band discrete time-domain sequences generated from previous input segments to produce an extended intermediate-band discrete time-domain sequence that covers a time duration greater than that of the impulse response of the narrow-band filter, the extended intermediate-band sequence thereby containing all of the information within the narrow band but consisting of fewer sample points than a portion of the input sample train of equal duration;

E. means for performing a discrete Fourier transformation on the extended intermediate-band sequence to produce an extended intermediate-band transform; and

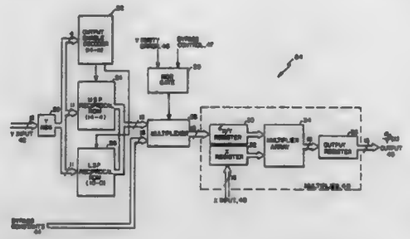
F. means for multiplying the values of the extended intermediate-band transform by corresponding values of the transfer function of the narrow-band filter to generate a narrow-band transform which indicates the frequency content of the input signal within the bandwidth of the narrow-band filter.

4,636,973

VERNIER ADDRESSING APPARATUS

Robert H. Cantwell, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jul. 21, 1982, Ser. No. 400,330
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—764 30 Claims



1. In combination:

register means for storing a first input data word comprising a plurality of vernier address scales for reducing memory storage requirements;

ROM means for storing numerical values with increased accuracy, the quantization of said numerical values being determined by the bit length of a digital word stored in said ROM means, said ROM means having a first portion coupled to a first portion of said plurality of vernier address scales and a second different portion coupled to a second portion of said plurality of vernier address scales; and

ROM decoding means for selecting an output from a portion of said ROM means, said portion being addressed by one of said vernier address scales.

4,636,974

METHOD AND APPARATUS FOR TRANSFERRING DATA BETWEEN OPERATIONALLY-JUXTAPOSED MEMORIES AND KNOWLEDGE-RETRIEVING SYSTEMS UTILIZING SAME

Arthur F. Griffin, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 4, 1983, Ser. No. 538,853
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—900 25 Claims



1. A method for exchanging data between first and second memories, with each memory having a plurality of individually-accessible memory portions, the method comprising the steps of:

(A) in each of said memories, sequentially accessing each of a predetermined plurality of said memory portions, with this sequential accessing thereby establishing in each memory a presently-accessed portion and a plurality of subsequently-accessed portions;

(B) for each accessed portion in each of the respective memories, pair-wise comparing the data-item contents of the presently-accessed portion of the first memory with the data-item contents of the presently-associated portion of the second memory; and

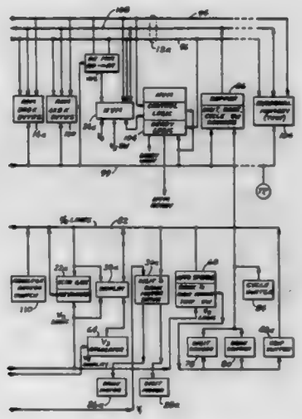
(C) upon detection of a match condition between a given pair of compared data items, diagonally exchanging the data item from the presently-accessed portion of the second memory with the data item from a predetermined one of the subsequently-accessed portions in the first memory.

4,636,975

CONTROLLING FIRMWARE BRANCH POINTS IN AN ELECTRONIC POSTAGE METER

John H. Soderberg, Stratford, and Edward C. Duwel, Trumbull, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 8, 1982, Ser. No. 447,925
Int. Cl.[4] G06F *15/21*
U.S. Cl. 364—900 9 Claims



1. Apparatus for controlling the firmware branch points in an electronic postage meter comprising:

ROM means for storing a program for the electronic postage meter, said program including at least one firmware branch point wherein a different part of the program for meter operation is accessed in accordance with each branch from the branch point;

non-volatile memory means having addresses therein for storage of information;

said non-volatile memory means having at least one specified address wherein for storing a selectable data bit;

said data bit corresponding to selection of a particular active branch of the program at said firmware branch point; and

means interconnecting said ROM means and said non-volatile memory means for providing communication therebetween to control the firmware branch point to cause access to the branch of the program selected in accordance with the data bit present in said non-volatile memory means.

4,636,976

BIT SHIFTING APPARATUS

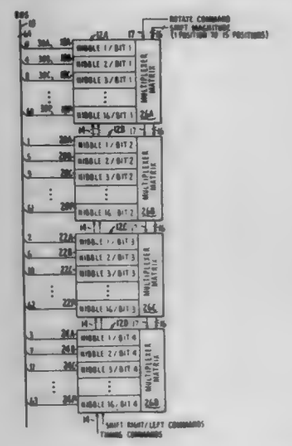
Nabil Takla, San Jose, Calif., assignor to Data General Corporation, Westboro, Mass.

Filed Sep. 28, 1984, Ser. No. 655,959
Int. Cl.[4] G06F *7/00*
U.S. Cl. 364—900 10 Claims

1. An apparatus for shifting the position of data bits which are arranged in an ordered sequence of M positions, in accordance with shift magnitude commands and shift direction commands, wherein each data bit in the sequence is provided from a different one of a plurality of signal lines in a bus, comprising M stages which communicate with one another and which each define a position, and futher wherein a stage N includes

multiplexer means responsive to the shift magnitude commands and having a common-node port and a plurality of controlled ports, wherein ones of the controlled ports are enabled in response to the shift magnitude commands, for directing data presented at the enabled controlled ports to the common-node port and for directing data presented at the common-node port to the enabled controlled ports; and

shift control means responsive to the shift direction commands, having a first port which is coupled to the common-node port of the multiplexer means and having a second port which is coupled to a selected controlled port of the multiplexer means in the N+1st stage, and coupled to one of the plurality of signal lines in the bus, for temporarily storing a data bit and for controlling the direction of propagation of the data bit between the first and second ports;



wherein the multiplexer means in the Nth stage have M−N controlled ports and further wherein the first controlled port of said multiplexer means is coupled to the second port of the shift control means in the N+1st stage, and the jth controlled port of the multiplexer means in the Nth stage is coupled to the j+1st controlled port of the multiplexer means in the N−1st stage, the jth controlled ports of each stage being enabled in common, where N=1, 2, . . . , M, and j=2, 3, . . . , M−N, so that the data bits are provided to the bus shifted in position by a magnitude determined by the shift magnitude command and a direction determined by the shift direction commmands.

4,636,977

LANGUAGE TRANSLATOR WITH KEYS FOR MARKING AND RECALLING SELECTED STORED WORDS

Yutaka Ikemoto, Nara, and Ken Sawada, Ikoma, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 25, 1984, Ser. No. 573,644
Claims priority, application Japan, Jan. 31, 1983, 58-15747
Int. Cl.[4] G06F *15/38*
U.S. Cl. 364—900 5 Claims

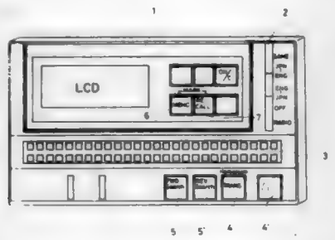
1. An electronic translator comprising:

primary memory means for storing data associated with source words of a first language and equivalent words of a second language, said equivalent words corresponding in meaning to respective source words;

input key means for inputting a desired entry word into said translator;

processor means responsive to said input key means for locating a said source word corresponding to said desired

entry word and recalling its corresponding equivalent word;
output means, responsive to the processor for outputting said equivalent word in response to the input of said desired entry word into said translator;
mark memory means for storing a subset of the data associated with said source words and said equivalent words;
mark key means for individually marking source words and equivalent words to be stored in said mark memory means;



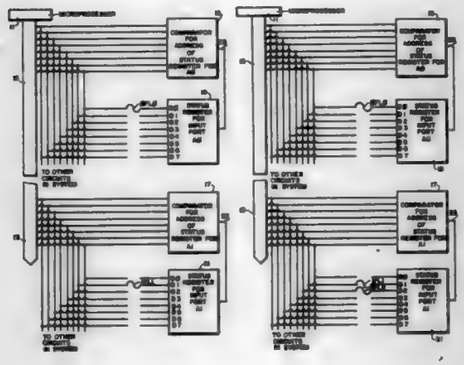
recall key means for individually outputting said marked words from said mark memory means in sequential order; and
announcement means for monitoring said sequential outputting of said marked words by said recall key means and indicating when all of said marked words have been outputted from said mark memory means by said recall key means.

4,636,978

PROGRAMMABLE STATUS REGISTER ARRANGEMENT

Joseph T. Bellavance, and William J. Price, both of San Jose, Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Jun. 13, 1984, Ser. No. 620,197
Int. Cl.[4] G06F *9/02*; G11C *5/06*
U.S. Cl. 364—900 **7 Claims**



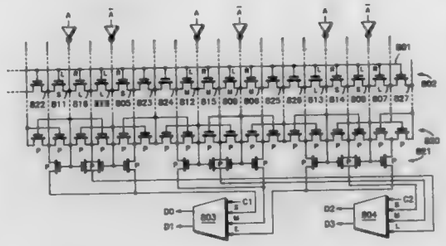
1. A status register arrangement including a bus having a plurality of conductors, a plurality of status registers each generating status signals and each having a plurality of output circuit means for carrying their associated register's status signals and programming means for connecting at least certain of said output circuit means of each status register to said conductors, said programming means comprising fusible link means connected between each said certain output circuit means of each status register and an associated and separate conductor for programming said status register arrangement by destroying selected ones of said fusible link means and leaving selected ones of said certain output circuit means of different status registers connected to different conductors such that a plurality of said status registers can transmit their status signals simultaneously on said bus on different conductors.

4,636,979

ORIENTATION OF REFERENCE CELLS IN A MEMORY

William J. Donoghue, Round Rock, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 2, 1984, Ser. No. 667,943
Int. Cl.[4] G11C *17/00*
U.S. Cl. 365—104 **12 Claims**



1. A memory, comprising:
a first transistor memory cell having a first orientation, programmable to one of at least two states, and providing an output;
a second transistor memory cell having a second orientation, programmable to one of the at least two states, and providing an output;
a first reference transistor having the first orientation, programmed to a first reference state, and providing an output;
a second reference transistor having the second orientation, programmed to the first reference state, and providing an output;
first sense amplifier means, coupled to the first transistor memory cell and the first reference transistor, for providing an output indicative of the state of the first transistor memory cell; and
second sense amplifier means, coupled to the second transistor memory cell and the second reference transistor, for providing an output indicative of the state of the second transistor memory cell.

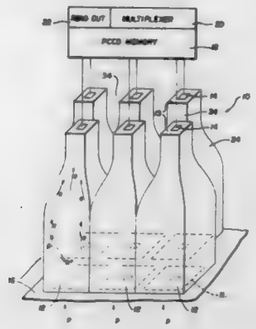
4,636,980

THREE DIMENSIONAL OPTICAL RECEIVER HAVING PROGRAMMABLE GAIN CONTROL

Nathan Bluzer, Silver Spring, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 25, 1984, Ser. No. 634,339
Int. Cl.[4] G11C *11/42*
U.S. Cl. 365—106 **11 Claims**

1. A monolithic three dimensional imaging receiver having a plurality of contiguous sensor cells whereby image detecton positions of adjacent ones of the sensor units are exposed to incident radiation and produce photogenerated electrons to form a composite image detection area for said receiver, each of said sensor cells comprising:
a plurality of radiation detectors having a radiation receiving face and an electron delivery face;
a plurality of programmable gain stages, each coupled to one of the plurality of detectors at the radiation receiving face;
a plurality of charge collectors, each coupled to the electron delivery face of one of said plurality of detectors and being a smaller relative size than the detectors whereby interstices are formed therebetween;
a buffer memory coupled to each of said collectors via said interstices;



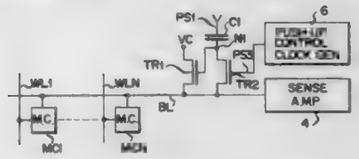
and biasing means for channeling the photogenerated electrons in the detector toward said relatively smaller collectors.

4,636,981

SEMICONDUCTOR MEMORY DEVICE HAVING A VOLTAGE PUSH-UP CIRCUIT

Mitsugi Ogura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 15, 1983, Ser. No. 514,107
Claims priority, application Japan, Jul. 19, 1982, 57-125338
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—203 **4 Claims**



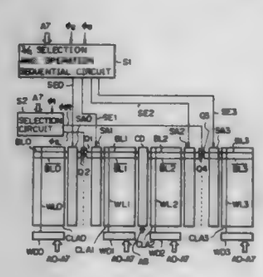
1. A semiconductor memory device comprising:
(A) a plurality of charge storage type memory cells;
(B) a plurality of word lines connected to said plurality of charge storage type memory cells to selectively activate at least one of said plurality of charge storage type memory cells;
(C) at least one bit line connected to said plurality of charge storage type memory cells to transfer memory data;
(D) sense amplifying means for detecting the memory data on said at least one bit line; and
(E) voltage push-up means connected to said at least one bit line for setting a potential on said at least one bit line to an end potential level over a power supply voltage level to increase a charge stored in any of said plurality of charge storage type memory cells said voltage push-up means including
(a) a first MOS transistor with a current path connected at one end to said at least one bit line and connected at another end to receive a voltage equal to the power supply voltage level, said first MOS transistor being operative to set said at least one bit line to a first potential level substantially equal to said power supply voltage level at times when said first MOS transistor is conductive,
(b) a capacitor connected at one end to receive a first signal applied after the memory data having a predetermined logic level is detected by said sense amplifying means, said first signal having a potential level substantially equal to said power supply voltage level, said capacitor connected at another end to render said first MOS transistor conductive upon application of said first signal,
(c) push-up control clock generating circuit means for generating a second potential level higher than said end potential level, and
(d) a second MOS transistor with a current path connected at one end to said another end of said capacitor and to a gate of said first MOS transistor and at another end to said at least one bit line and with a gate connected to, and rendered conductive in response to said second potential level for setting the potential on said at least one bit line to said end potential level at times when said first MOS transistor and said second MOS transistor are both conductive at the same time.

4,636,982

SEMICONDUCTOR MEMORY DEVICE

Yoshihiro Takemae, Tokyo; Tomio Nakano, Kawasaki, and Kimiaki Sato, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 1, 1985, Ser. No. 729,200
Claims priority, application Japan, May 4, 1984, 59-88331
Int. Cl.[4] G11C *7/00, 11/24*
U.S. Cl. 365—149 **13 Claims**



1. A semiconductor memory device comprising:
at least two groups each including a plurality of memory cell array blocks;
each of said memory cell array blocks including a plurality of bit line pairs, a plurality of word lines, and a plurality of memory cells each being connected between respective ones of said bit line pairs and word lines;
switching means connected between respective bit line pairs of adjoining pairs of said memory cell array blocks of each said group, for selectively splitting and connecting said respective bit line pairs of said adjoining pairs of memory cell array blocks of the respective group;
column decoder means operatively connected to the bit line pairs of a first of said memory cell array blocks of each said group, for selecting a bit line pair therefrom to read data from a selected memory cell in the respective group;
a word decoder for simultaneously selecting one of said word lines in one of said memory cell array blocks in a first one of said groups and one of said word lines in one of said memory cell array blocks in a second of said groups, in such a way that the distance between a first respective part of said column decoder means and the memory cell array block with the respective selected word line of said first group is different from the distance between a second respective part of said column decoder means and the memory cell array block with the selected word line of said second group; and
a switching control circuit for controlling said switching means so as to selectively connect the bit line pairs of each said memory cell array block having said selected word line that has the greater value of said distance and in

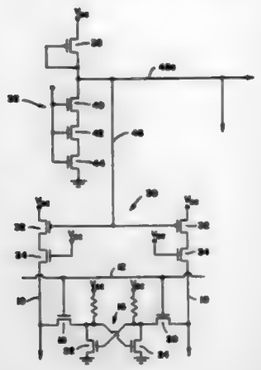
another of the memory cell array blocks of the same group that is located between said memory cell array block of said greater value of said distance and said column decoder.

4,636,983

MEMORY ARRAY BIASING CIRCUIT FOR HIGH SPEED CMOS DEVICE

Kenneth E. Young, Newark, and Bruce L. Bateman, San Jose, both of Calif., assignors to Cypress Semiconductor Corp., San Jose, Calif.

Filed Dec. 20, 1984, Ser. No. 683,062
Int. Cl.[4] G11C 11/40
U.S. Cl. 365—181 6 Claims



1. In a CMOS integrated circuit device, a memory array and control circuitry therefor comprising:
a plurality of pairs of columns;
a plurality of word lines;
a plurality of multi-transistor memory cells, each cell including a pair of cross-coupled N-channel transistors and being at an intersection of and connected to a pair of columns and to one said word line; bias means connected to one end of each said column, said bias means including a P-channel transistor and an N-channel transistor connected source/drain in series between a supply voltage input and one said column, each said bias means serving to limit the current drain to the threshold level of said P-channel transistor as the column for the particular bias means is pulled toward ground; and
a voltage reference circuit connected to said supply voltage input and having an output connected to the gates of said P-channel transistors for each said pair of bias means connected to a pair of columns, said reference circuit providing compensation means for reducing the effects of process variations between elements of said device.

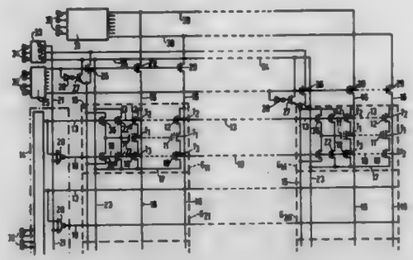
4,636,984

SEMICONDUCTOR DEVICE HAVING NON-VOLATILE STORAGE TRANSISTORS

Hans R. Neukomm, Thalwil, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 9, 1984, Ser. No. 578,442
Claims priority, application Netherlands, Feb. 10, 1983, 8300497
Int. Cl.[4] G11C 11/40; H01L 29/78
U.S. Cl. 365—182 12 Claims

1. A semiconductor device comprising a matrix of storage cells which are arranged in rows and columns, and a common access line for each row, each storage cell comprising a non-volatile storage transistor and a first access transistor connected in series therewith, the storage transistor having an insulated control electrode and the first access transistor having an insulated gate electrode, the gate electrodes of the first access transistors of a row of storage cells being connected to the common access line for this row, a decoder for driving the access line, the access lines being connected to said decoder for driving the access lines with selection signals, whereby the first access transistors of a selected row of storage cells are conducting and the first access transistors of the remaining rows of storage cells are non-conducting, each row of storage cells comprising at least two groups of storage cells, in each of these groups the insulated control electrodes being connected to each other and by means of a switch controllable by said common access line to a control line common to a column of groups, and each storage cell at one end of a series arrangement being connected to a first conductor common to a column of storage cells and at the other end of the series arrangement being coupled to a second conductor common to at least a column of storage cells, characterized in that in each of the



storage cells in the series arrangement between the first and second conductors there is provided a second access transistor having an insulated gate electrode, the gate electrodes of the second access transistors of a row of storage cells being connected to a second access line common to this row, the decoder comprising means by which during erasing and writing in each row the first and second access lines are driven with signals complementary to each other and during reading at least in a selected row the first and second access lines are driven with signals substantially equal to each other, while in each group of storage cells the insulated control electrodes are connected by means of a switch controllable with the second common access line to a selected potential such that the potential differences occurring across the storage transistor can be limited to values which are substantially not greater than the values which can occur across the storage transistor in the reading condition.

4,636,985

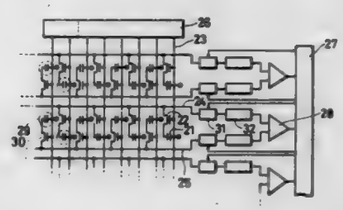
SEMICONDUCTOR MEMORY HAVING CHARGE TRANSFER DEVICE VOLTAGE AMPLIFIER

Masakazu Aoki, Tokorozawa; Yoshinobu Nakagome, Hachioji; Masaki Horiguchi, Kokubunji; Toshifumi Ozaki, Hachioji; Katsuhiro Shimohigashi, Ohmiomi-Musashimurayama, and Shinichi Ikenaga, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 7, 1984, Ser. No. 648,361
Claims priority, application Japan, Sep. 7, 1983, 58-163215; Sep. 7, 1983, 58-163216
Int. Cl.[4] G11C 7/00
U.S. Cl. 365—189 33 Claims

1. A semiconductor device comprising a memory array which includes a plurality of memory cells storing charge carriers as information data, address means for selecting at least one of the memory cells, data lines which are coupled to the memory cells to transfer the charge carriers as the information data therethrough, means for writing the information data into the memory cells coupled to said data lines, and means for reading out the information data from the memory cells coupled to said data lines; said reading-out means being comprised

of a reset gate transistor coupled to said data line, a charge transfer portion coupled to said data lines, a precharge gate transistor at an output end of said charge transfer portion, and a sense amplifier coupled to said output end; said charge transfer portion including at least two charge transfer gates and a driving gate disposed between the two charge transfer gates; wherein a terminal of said reset gate transistor is coupled to



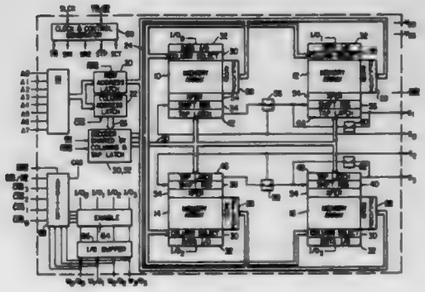
means for applying a voltage which is lower when electrons are used as the charge carriers or higher when holes are used as the charge carriers, than a magnitude obtained by subtracting a threshold voltage of the charge transfer gate on a data line side of said charge transfer gates from a highest value of a voltage that is applied to said charge transfer gate on a data line side.

4,636,986

SEPARATELY ADDRESSABLE MEMORY ARRAYS IN A MULTIPLE ARRAY SEMICONDUCTOR CHIP

Raymond Pinkham, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 22, 1985, Ser. No. 693,421
Int. Cl.[4] G11C 7/00
U.S. Cl. 365—195 40 Claims



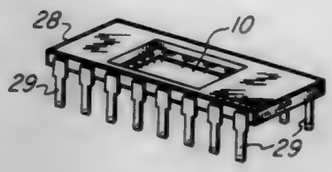
1. A semiconductor memory, comprising:
a plurality of memory arrays each having an equal number of memory elements arranged in rows and columns;
common decode means for receiving a row address and a column address and selecting one of the memory elements in each said arrays responsive to said row address and to said column address, each of said selected memory elements having a common row and column location;
input/output means associated with each of said arrays for transferring data to said selected memory elements or extracting data from said selected memory elements; and
inhibiting means for inhibiting transfer of data to selected ones of said arrays and subsequent storage in the associated one of said selected memory elements such that data is not transferrd to said selected memory elements associated with the inhibited ones of said arrays by said output means.

4,636,987

SEMICONDUCTOR DYNAMIC MEMORY DEVICE WITH MULTIPLEXED SENSE AMPLIFIER AND WRITE-ACTIVATED ACTIVE LOADS

Roger D. Norwood, Sugar Land, Tex., and Chitranjan Reddy, Sunnyvale, Calif., assignors to Texas Instruments, Dallas, Tex.

Filed Aug. 29, 1984, Ser. No. 645,581
Int. Cl.[4] G11C 7/02
U.S. Cl. 365—208 12 Claims



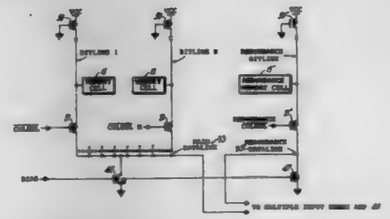
5. A dynamic semiconductor memory device comprising:
an array of rows and columns of memory cells, with all cells in each row connected to a row line and all cells in each column connected to a column line, each column line split into two column line halves.
a plurality of differential sense amplifiers, each sense amplifier having two inputs connected to the column line halves for a column:
a pair of active pull-up load circuits for each sense amplifier, each said load circuit connected to one of the column line halves for said column;
timing means to activate said load circuits at a first time during a read-write cycle, to deactivate said load circuits for a second time following said first time, then to activate said load circuits again at a third time after said second time during said read-write cycle.

4,636,988

CMOS MEMORY ARRANGEMENT WITH REDUCED DATA LINE COMPACITANCE

Hiep V. Tran, Carrollton, Tex., assignor to Thomson Components-Mostek Corporation, Carrollton, Tex.

Filed Jan. 7, 1985, Ser. No. 689,254
Int. Cl.[4] G11C 7/00
U.S. Cl. 365—208 1 Claim



1. A CMOS memory arrangement comprising (FIG. 7)
a sense amplifier having more than two inputs (40'),
a plurality of output datalines (33, 33', 33") connected to respective inputs of said sense amplifier (40');
means (55, 56–60) setting each of said datalines (33,33',33") to a predetermined bias level;
a plurality of bitlines (19,20,N) each connected to a predetermined number of memory cells (13); and
a plurality of MOS transistors (30, 30") each pulling a respective bitline (19,20,N) to a power supply potential (Vcc),
each of said bitlines (19,20,N) having a respective controllable pass transistor (31,31',31") between its associated memory cells (13) and its output dataline (33,33',33"), each

series connection of a bitline, a pass transistor, and a dataline defining one of a plurality of parallel signal paths, some of said signal paths being relatively slower than others, wherein, in order to decrease capacitance in slower signal paths and thereby increase operating speed of said CMOS memory,

each of a selected number of said datalines (33) is coupled through respective pass transistors (31) to a first predetermined number (N) of said bitlines;

and

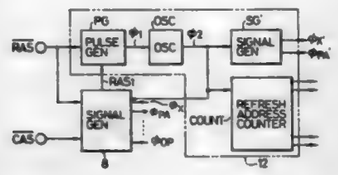
at least one of said datalines (33″), forming part of one of said slower signal paths, is coupled through at least one other pass transistor (31″) to a second, lesser number of said bitlines than said first predetermined number.

4,636,989

DYNAMIC MOS RANDOM ACCESS MEMORY

Kunihiko Ikuzaki, Hinode, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 473,866, Mar. 10, 1983, Pat. No. 4,549,284. This application Sep. 3, 1985, Ser. No. 771,899
Claims priority, application Japan, Mar. 10, 1982, 57-36422
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—222 **3 Claims**



1. A dynamic random access memory formed as an integrated circuit on a single semiconductor substrate which includes memory cells that need to be periodically refreshed, and means for accessing a memory cell in response to an address strobe signal, said dynamic random access memory having a refreshing means for generating at least one refresh pulse without the need for an external terminal being provided for receiving a refresh control signal, said refreshing means comprising:

detecting means receiving said address strobe signal and for generating a detecting signal when said address strobe signal is set at a predetermined level longer than a predetermined period of time;

a pulse generator which generates said at least one refresh pulse in response to said detecting signal; and

an address counter which forms refresh address data by counting the number of refresh pulses,

wherein refresh timing of the memory cells specified by said address counter is determined by said at least one refresh pulse so that refresh of the memory cells specified by said address counter is accomplished during a period when said address strobe signal is set at said predetermined level.

4,636,990

THREE STATE SELECT CIRCUIT FOR USE IN A DATA PROCESSING SYSTEM OR THE LIKE

Carl U. Buscaglia, Clinton Corners, N.Y., and Lawrence E. Knepper, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1985, Ser. No. 739,785
Int. Cl.⁴ G11C *8/00, 7/00*
U.S. Cl. 365—230 **3 Claims**

2. A three state cascoded current switch emitter follower select circuit for providing a differential output or an output inhibited state, said select circuit comprising:

first through sixth transistors, each of said first through sixth transistors having an emitter, base and collector;

a first resistor serially connected between said collector of said first transistor and a source of potential;

a second resistor serially connected between said collector of said second transistor and said source of potential;

a third resistor connected across the base collector junction of said third transistor;

a fourth resistor connected across the base collector junction of said fourth transistor;

a first connection means connecting in common said collector of said third transistor, said collector of said fourth transistor and said first potential source;

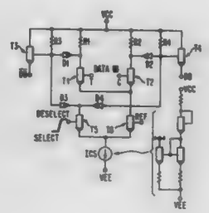
second connection means connecting in common said emitter of said first transistor, said emitter of said second transistor and said collector of said sixth transistor;

third connection means connecting in common said emitter of said fifth transistor, said emitter of said sixth transistor and a constant current source;

a first Schottky barrier diode having an anode connected to said base of said third transistor and a cathode connected to said collector of said first transistor;

a second Schottky barrier diode having an anode connected to said base of said fourth transistor and a cathode connected to said collector of said second transistor;

a third Schottky barrier diode having an anode connected to



said base of said third transistor and a cathode connected to said collector of said fifth transistor;

a fourth Schottky barrier diode having an anode connected to said base of said fourth transistor and a cathode connected to said collector of said fifth transistor;

input circuit means for receiving a true/complement manifestation of a binary bit, said input circuit means comprising a (true) input terminal connected to said base of said first transistor, and a (complement) input terminal connected to said base of said second transistor;

a control terminal for receiving a select/deselect signal, said control terminal being connected to said base of said fifth transistor;

said base of said sixth transistor connected to a source of reference potential;

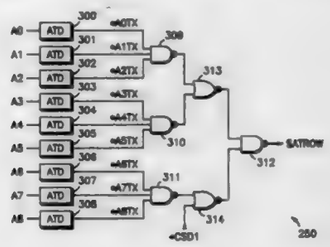
output circuit means for providing a true/complement manifestation of a binary bit, said output circuit means comprising a (true) output terminal connected to said emitter of said fourth transistor and a (complement) output terminal connected to said emitter of said third transistor, whereby when a select signal is impressed on said control terminal said output binary bit electrically manifested by said output circuit means will bear a fixed relationship to the input binary bit impressed on said input circuit means, and when a deselect signal is impressed on said control terminal said output circuit means will assume said output inhibited state.

4,636,991

SUMMATION OF ADDRESS TRANSITION SIGNALS

Stephen T. Flannagan, and Paul A. Reed, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 16, 1985, Ser. No. 766,616
Int. Cl.⁴ G11C *8/00*
U.S. Cl. 365—230 **12 Claims**



1. In a memory having a plurality of address transition detectors each for detecting a transition of a corresponding address signal and having an output for providing an output signal in response to such detection, a circuit for providing a transition pulse when one or more of the address transition detectors provides an output pulse, comprising:

a first plurality of logic gates having inputs coupled to the outputs of the address transition detectors, each logic gate having inputs coupled to a corresponding subset of the address transition detector outputs and having an output for providing a first intermediate transition signal in response to at least one of the address transition detectors in the corresponding subset providing an output signal;

a second plurality of logic gates having inputs coupled to the outputs of the first plurality of logic gates, each of the logic gates of the second plurality of logic gates having a plurality of inputs coupled to the outputs of a corresponding subset of the first plurality of logic gates and providing a second intermediate transition signal in response to at least one of the first plurality of logic gates providing a first intermediate transition signal; and

an output logic gate having inputs coupled to the outputs of the second plurality of logic gates and having an output for providing a summation address transition signal in response to one or more of the second intermediate address transition signals second plurality of logic gates providing a second intermediate address transition signal.

4,636,992

DEVICE FOR SUPPLYING ELECTRIC POWER TO ELECTRONIC APPARATUSES OF AN ACOUSTIC WAVE RECEIVING ASSEMBLY OF GREAT LENGTH

Jacques Cretin, Le Chesnay; Claude Beauducel, Henouville; Jean Rudaz, Noisy S/Ecoles, and Pierre Gonzales, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison and Compagnie Generale de Geophysique, Massy, both of, France

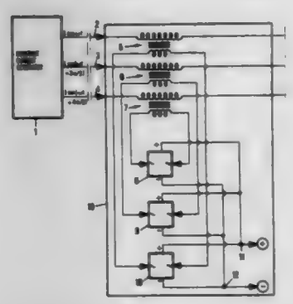
Filed Jul. 30, 1982, Ser. No. 404,102
Claims priority, application France, Jul. 31, 1981, 81 15085
Int. Cl.⁴ G01V *1/38, 1/22*
U.S. Cl. 367—20 **2 Claims**

1. A device for supplying D.C. current to a plurality of remote acquisition devices located in a seismic streamer wherein data from the remote acquisition devices is transmitted to a central recording assembly located at the beginning end of the streamer, the device comprising:

a current generator for generating first, second and third A.C. currents out of phase with one another on three output lines;

three conducting sheaths extending within the seismic streamer, each of the three output lines being connected to one of the conducting sheath;

D.C. power assemblies at locations remote from the beginning of the streamer for providing D.C. current to the acquisition apparatuses, each D.C. power assembly being connected to one acquisition apparatus; each D.C. power assembly comprising three transformers each having a primary winding and a secondary winding with the primary windings being conducted in the three conducting sheaths, the primary windings fed through the same conducting sheath being serially connected; each power assembly further having three rectifier bridges with inputs



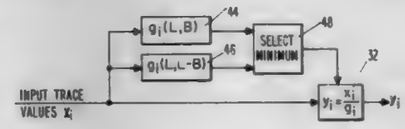
for A.C. current and positive and negative outputs, the secondary winding of each transformer being connected across the A.C. inputs of one of the rectifying bridges, the positive outputs of the three rectifier bridges being connected to a positive terminal and the negative outputs of the three rectifier bridges being connected to a negative terminal to provide each D.C. power assembly with a D.C. output, the D.C. output of each D.C. power assembly being applied to a seismic acquisition apparatus.

4,636,993

AUTOMATIC GAIN CONTROL FOR SEISMIC DATA

Edward M. Lumley, Garland, and Bonita F. Bowman, Arlington, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 5, 1984, Ser. No. 658,256
Int. Cl.⁴ G01V *1/36*
U.S. Cl. 367—65 **4 Claims**



1. The method of applying automatic gain control to seismic data in the form of a series of samples, comprising the steps:

selecting a window length for automatic gain control processing, said window length comprising a plurality of said samples, and

for each respective one of said samples,

calculating the average of the absolute values of the amplitudes of the ones of said samples in a first window of said data, said first window having said length and being disposed in a first time relationship to a respective one sample whereby said sample is within said window and is offset above the center of said window;

calculating the average of the absolute values of the amplitudes of the ones of said samples in a second window of said data, said second window having said length and being disposed in a second time relationship to said respective one sample whereby said respective one sample is within said window and is offset below the center of said window;

selecting the minimum of said average amplitude values as a gain control factor to be applied to said respective one sample; and

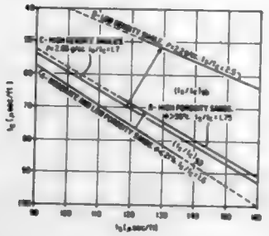
dividing said respective one sample by said gain control factor, to apply automatic gain control to said respective one sample.

4,636,994

METHOD OF DETERMINING SHEAR WAVE TRAVEL TIME IN SUBSURFACE FORMATIONS

Walter H. Fertl, and Elton Frost, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 22, 1983, Ser. No. 534,879
Int. Cl.[4] G01V *1/28, 1/40*
U.S. Cl. 367—75 13 Claims



10. A method for determining an acoustic shear wave travel time for earth formations having mixed lithologies, comprising the steps of:

measuring the porosity of the earth formations having mixed lithologies;

measuring the volume of shale of said earth formations having mixed lithologies;

measuring the acoustic compressional wave travel time of said earth formations having mixed lithologies;

measuring a radioactive characteristic of said earth formations having mixed lithologies;

determining a first shear/compressional travel time ratio in response to said porosity measurement;

determining a second shear/compressional travel time ratio in response to said radioactive characteristic measurement;

determining a third shear/compressional travel time ratio as a function of said first and second shear/compressional travel time ratios and said shale volume measurement; and

determining the shear wave travel time for said earth formations having mixed lithologies in response to said third shear/compressional travel time ratio and said compressional wave travel time measurement.

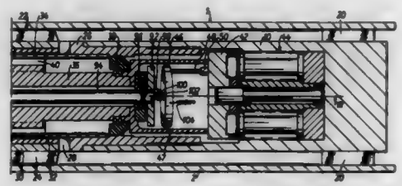
4,636,995

MUD PRESSURE CONTROL SYSTEM

Michael K. Russell, and Anthony W. Russell, both of Cheltenham, England, assignors to NL Sperry-Sun, Inc., Stafford, Tex.

Continuation of Ser. No. 295,431, Aug. 24, 1981, abandoned.
This application Aug. 9, 1985, Ser. No. 764,167
Claims priority, application United Kingdom, Aug. 27, 1980, 8027727; Nov. 20, 1980, 8037213
Int. Cl.[4] G01V *1/40;* E21C *7/08*
U.S. Cl. 367—85 10 Claims

1. A down-hole signal transmitter for a mud-pulse telemetry system, comprising a flow constrictor defining a throttle orifice for the mud passing along a drill string, a throttling member displaceable as a whole towards and away from the throttle orifice to vary the throughflow cross-section of the throttle orifice, a turbogenerator for supplying a measuring instrument and arranged to be driven by the mud flow passing along the drill string, and control means for controlling displacement of the throttling member towards and away from the throttle orifice to modulate the mud pressure, wherein the control means is coupled to the rotor of the turbogenerator and is adapted to displace the throttling member in one direction when the electrical load of the turbogenerator is such that the torque required to drive the rotor exceeds the maximum torque



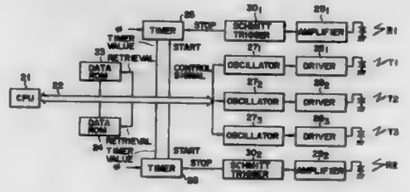
available for driving the rotor, and to displace the throttling member in the opposite direction when the electrical load of the generator is such that the torque required to drive the rotor does not exceed the maximum torque available for driving the rotor.

4,636,996

ULTRASONIC OBSTACLE LOCATION APPARATUS AND METHOD

Akio Tsuji, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed May 9, 1985, Ser. No. 732,559
Claims priority, application Japan, May 25, 1984, 59-106098
Int. Cl.[4] G01S *15/46*
U.S. Cl. 367—93 12 Claims



1. An obstacle detection and location apparatus, comprising:

ultrasonic wave radiating means including a plurality of ultrasonic transducers arranged collectively to transmit an ultrasonic wave into a predetermined sensing area;

memory means for storing preset position data corresponding to coordinates in said predetermined sensing area, in association with time value data corresponding to each of said transducers;

ultrasonic wave receiving means for receiving at least at two points a wave reflected by an obstacle upon operation of each of said transducers of said ultrasonic wave radiating means;

measuring means for measuring a time between the operation of each of said transducers and reception of the wave reflected by the obstacle at each point of said receiving means; and

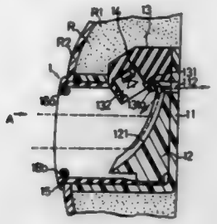
position detecting means for retrieving data from the memory means on the basis of time values measured by the measuring means, and for determining a position of the obstacle within the sensing area.

4,636,997

ULTRASONIC TRANSDUCER

Keiichiro Toyama, Nishio; Masao Kodera, Okazaki, and Kunihiko Sasaki, Nukata, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 31, 1985, Ser. No. 697,006
Claims priority, application Japan, Feb. 17, 1984, 59-29333
Int. Cl.[4] H04R *1/20*
U.S. Cl. 367—140 10 Claims



1. An ultrasonic transducer comprising:

a housing having an open end and a closed end and an axis running therebetween;

ultrasonic vibrator means, provided within said housing, for emitting and receiving ultrasonic waves;

reflecting means, provided within said housing, for reflecting emitted ultrasonic waves toward said open end and reflecting received ultrasonic waves toward said ultrasonic vibrator; and

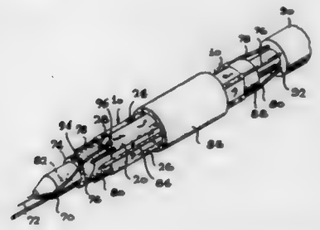
projecting member means, provided on an inner wall of said housing, for dispersing and cancelling ultrasonic waves entering said housing at predetermined angles with respect to the axis of said housing, said projecting member being disposed at least along said open end of said housing and having a smoothly curved cross-section along the axis of said housing.

4,636,998

ELONGATED RETAINING AND ELECTROMAGNETIC SHIELDING MEMBER FOR A TOWED UNDERWATER ACOUSTIC ARRAY

Paul L. Greene, La Crescenta, and James Appling, Canoga Park, both of Calif., assignors to Allied Corporation, Morristown, N.J.

Filed Apr. 18, 1984, Ser. No. 601,414
The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.
Int. Cl.[4] H04R *1/44*
U.S. Cl. 367—154 6 Claims



1. An elongated retaining and electromagnetic shielding member for use in a towed underwater acoustic array including a plurality of hydrophones and circuit modules interconnected by electrical conducting wires, a sheath of plastic foam material surrounding said hydrophones and said circuit modules, a hose-like jacket of durable plastic material surrounding and containing said sheath, a plurality of strength members contained in said hose-like jacket, and connector members at each end of said array to which said strength members and said electrical wires are attached,

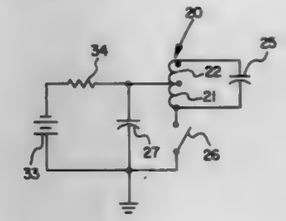
characterized in that said retaining and electromagnetic shielding member is interposed between said sheath and said jacket and comprises a cylindrical tube of electrically conductive synthetic fabric, said fabric being longitudinally stitched or seamed at a plurality of locations to provide a structure with a large center tube and a plurality of spaced parallel peripheral tubes of small diameter each of which receives one of said strength members, and an electrical conductor attached to said fabric for connection to a low voltage source.

4,636,999

MAGNETOSTRICTIVE PULSE GENERATOR

Edward A. Lynn, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Jan. 30, 1985, Ser. No. 509,566
Int. Cl.[4] H04R *15/00*
U.S. Cl. 367—156 14 Claims



1. An acoustic generator, comprising:

a magnetostrictive transducer including a core of magnetostrictive material, a first winding wound on said core, and a second winding on said core attached to and wound as the continuation of said first winding;

a switch in series with said first winding of said transducer;

a first capacitor in parallel with the series combination of said switch and said first winding of said transducer;

a second capacitor in parallel with said first and second windings of said transducer; and

a power supply to charge said first capacitor when said switch is open;

whereby when said switch is closed, the charge on said first capacitor discharges through said first winding to induce a voltage in said scond winding which charges said second capacitor until said transducer reaches saturation, causing said second capacitor to discharge through said first and said second windings to drive said transducer further into saturation thereby causing said transducer to physically deform and produce an acoustic signal.

4,637,000

DEPTH TRANSDUCER PROTECTIVE ASSEMBLY

Ben B. Thigpen; E. Eugene Crump, both of Houston; Otis A. Johnston, League City, all of Tex.; Nathaniel K. McPeek, Anchorage, Ak., and William O. McNeel, Houston, Tex., assignors to Western Geophysical Co. of America, Houston, Tex.

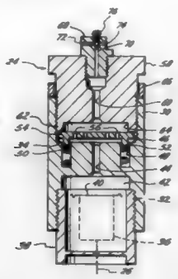
Filed Jan. 21, 1985, Ser. No. 747,270
Int. Cl.[4] H04R *1/02, 17/00;* G01L *7/00*
U.S. Cl. 367—172 7 Claims

4. A ruggedized depth transducer that operates by detecting relatively long-term variations in ambient pressure in the presence of large-amplitude, short-term pressure impulses comprising:

(a) a ruggedized container,

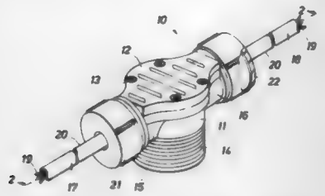
(b) a first plurality of passes, having differing pressure coe-

ducting characteristics, from the exterior to a chamber in the interior of said container,



(c) a pressure transducer in fluid communication with said chamber, and
(d) a check valve between said chamber and said transducer.

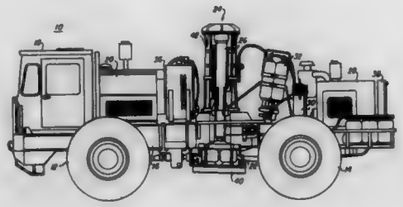
4,637,001
PLUG-IN GEOPHONE CASE
Ira R. Ansoot, 2610 Primrose, Houston, Tex. 77210
Filed Nov. 30, 1984, Ser. No. 676,642
Int. Cl.[4] H04R *1/02*; G01V *1/16*
U.S. Cl. 367—177 **15 Claims**



1. Geophone apparatus comprising: a body having an open top and a cavity that receives a seismic detector having positive and negative terminals; receptacle means on opposite sides of said body for use in plugging said case into prefabricated lengths of leader cable; a first set of three connector pins molded in said body adjacent said cavity, one end of each of said pins of said first set projecting into one of said receptacle means and the other ends thereof projecting into a recess formed in said body adjacent one of said terminals; a second set of three connector pins molded in said body adjacent said cavity, one end of each on said pins of said second set projecting into the other of said receptacle means and the other ends thereof projecting into a recess formed in said body adjacent the other of said terminals; a cover plate for closing the open top of said body; and means for sealingly connecting a connector plug in each of said receptacle means.

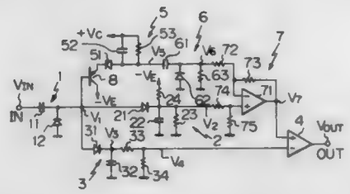
4,637,002
SEISMIC SOURCE VIBRATOR HAVING SELF TUNING CONTROLLER
John J. Sallas, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Mar. 5, 1984, Ser. No. 586,156
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—190 **24 Claims**

1. A seismic source vibrator, including means for providing a desired output signal, comprising:
(a) at least one pad for imparting acoustic energy into the earth;
(b) hydraulic system means, including valve means for selectively introducing pressurized hydraulic fluid into the hydraulic system means, to cause the application of reciprocating forces to the pad;
(c) valve sensor means, connected to the valve means, for sensing the status of the valve means and for providing an electrical valve indicia signal representative thereof;
(d) valve model means, structured to simulate the valve means and having n states accessible, the valve model means having an input, and an output for providing an estimated output signal;
(e) valve comparison means for comparing the valve indicia signal with the estimated output signal and for providing a resultant valve error signal;
(f) valve model gain adjusting means, connected to receive the valve error signal and to adjust the n states in a known



ratio in dependence on the instantaneous amplitude of the valve error signal, to cause the estimated output signal to approach the valve indicia signal in instantaneous amplitude;
(g) valve state feedback means connected to receive the adjusted n states plus inaccessible state (n+) and the valve indicia signal, to weight each n and n+ state in a known ratio and to sum the weighted states; and
(h) input comparison means for receiving and comparing the weighted sum and the desired output signal for providing a difference signal therefrom, and for applying the difference signal to the input of the valve means and to the input of the valve model means to cause the estimated output signal to approach the desired output signal in instantaneous amplitude, thereby providing self tuning control.

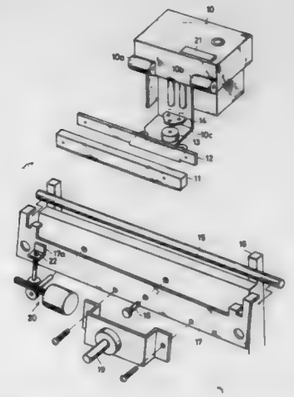
4,637,003
AMPLITUDE MODULATED HIGH FREQUENCY SIGNAL DETECTION DEVICE
Fumihiko Yokogawa, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Dec. 19, 1984, Ser. No. 683,393
Claims priority, application Japan, Dec. 20, 1983, 58-241240
Int. Cl.[4] G11B *21/10*; H03K *5/153*
U.S. Cl. 369—32 **2 Claims**



1. A high frequency signal detection device to be used in an information playback system for playing back information from a record medium having a plurality of record tracks by means of a pickup, comprising:
a first positive peak hold circuit responsive to a high frequency input signal from the pickup, for holding positive peaks of the high frequency input signal and having a first predetermined time constant;

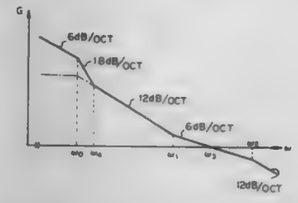
a second positive peak hold circuit responsive to said high frequency input signal, for holding positive peaks for the high frequency input signal and having a second predetermined time constant which is greater than said first predetermined time constant;
a negative peak hold circuit responsive to the high frequency input signal, for holding negative peaks of the high frequency input signal;
a difference circuit connected to said first positive peak hold circuit and said negative peak hold circuit, and for generating a difference signal between an output signal of said first positive peak hold circuit and an output signal of said negative peak hold circuit; and
a comparator circuit connected to said difference circuit and said second positive peak hold circuit for comparing said difference signal with a signal corresponding to a peak hold output signal of said second positive peak hold circuit, and producing a comparator output signal as a detection signal of the high frequency input signal.

4,637,004
OPTICAL DATA READING DEVICE
Yoshitsugu Araki, and Taichi Akiba, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Mar. 22, 1985, Ser. No. 715,155
Claims priority, application Japan, Mar. 24, 1984, 59-42153[U]
Int. Cl.[4] G11B *7/095*
U.S. Cl. 369—44 **5 Claims**



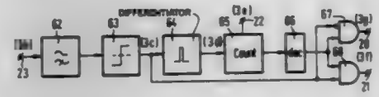
1. An optical data reading device comprising means for supporting and rotating a disk; an optical pick-up head which reads data by focusing light, in use, onto a data track of the disk and detecting the light reflected from the data track; a carrier for supporting the head; means for moving the head to and fro along the carrier radially of the disk; and means for tilting the carrier about an axis extending perpendicularly to an axial plane of the disk containing the radial direction of movement of the head; whereby variation in the spacing of the head from the disk owing to warp of the disk may be at least partially compensated.

4,637,005
FOCUS SERVO DEVICE OF A SYSTEM FOR READING OUT RECORDED INFORMATION
Ryuichi Naito; Minoru Kosaka, and Katsumi Kawamura, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jul. 22, 1983, Ser. No. 516,372
Claims priority, application Japan, Jul. 24, 1982, 57-129136
Int. Cl.[4] G11B *7/08*; G11J *1/20*
U.S. Cl. 369—45 **3 Claims**



1. A focus servo device to be used in a system for optically reading out information recorded on a recording medium comprising:
pickup means for picking-up said information recorded on said recording medium, including a movably disposed object lens for applying a read out light beam on a surface of said recording medium;
a focus actuator for adjusting the position of said object lens with respect to the surface of said recording medium, said focus actuator including a resilient support member for applying a biasing force against said object lens, and an electromagnetic actuator for moving said object lens against the biasing force of said resilient support member;
focus error signal generating means for generating a focus error signal from an output signal of said pickup means;
a driving current generating means for generating a driving current to be applied to said electromagnetic actuator in response to said focus error signal, said driving current generating means further including an operational amplifier means having a negative feedback loop that blocks a direct current;
said driving current generator means, said focus error signal generating means, said focus actuator, and said pickup means define a focus servo loop having a loop gain characteristic in which the loop gain of said focus servo loop increases as the angular frequency of the movement of said object lens decreases below a resonant angular frequency of said focus actuator whereby cancelling a static deviation of said focus actuator in response to a negligibly small amount of said focus error signal.

4,637,006
APPARATUS FOR PRODUCING DIGITAL INFORMATION FROM A TRANSMISSION MEDIUM
Martinus P. M. Bierhoff, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 9, 1984, Ser. No. 578,460
Claims priority, application Netherlands, Oct. 17, 1983, 8303563
Int. Cl.[4] H04N *5/76*
U.S. Cl. 369—59 **8 Claims**



1. An apparatus for reproducing digital information from an

optically readable record carrier having a track of optically detectable areas alternating with intermediate areas, comprising:

oscillator means for generating a clock signal;

means for reading digital information from said track and furnishing readout signals corresponding thereto;

means for generating a decision level;

means for comparing said readout signals with said decision level to regenerate a recorded digital signal, said apparatus further comprising:

means for sampling the amplitude of said readout signals on each side of first instants in time at which said readout signals intersect said decision level in a first of two possible directions of signal amplitude changes, said sampling occurring in phase-synchronism with the clock signal; and

means for generating a first signal which is a measure of the difference in amplitude between the decision level and an interpolated level of the samples on each of said sides of said first instants in time.

4,637,007

TOY HAVING A MELODY-MAKING MECHANISM OF A SOUND-DETECTION TYPE

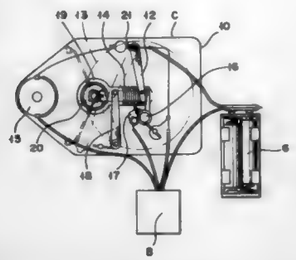
Koichi Sakurai, 316-77, Oaza-kozenji, Oramachi, Ora-gun, Gunma-ken, Japan

Filed Mar. 12, 1985, Ser. No. 712,403

Claims priority, application Japan, Jul. 20, 1984, 59-100949[U]

Int. Cl.[4] A63H *3/33*; G11B *31/00, 19/00*

U.S. Cl. 369—67 1 Claim



1. A doll toy of the type wherein, upon detection of a sound, a melody will be played, said doll toy having a body containing: a sound detecting means, said means generating an electric signal upon detection of sound; an amplifying means comprising a transistor amplifier circuit for amplifying said electric signal from said sound detecting means; a switching circuit to which said amplified signal is applied to create a voltage between outputs of said switching circuit; a melody-making mechanism having a turntable disc player driven by a small electric motor on which a small sound disc is placed, a needle-supporting arm pivoted at its one end, a spring which returns the arm to an original position after the disc is played, and a motor switch associated with said switching circuit for activating said electric motor, said motor switch being opened by return movement of said supporting arm, wherein said melody-making mechanism is electrically connected to the output terminals of the switching circuit, said switching circuit further comprising six resistors R4, R5, R6, R7, R8 and R9 respectively, and three transistors Q2, Q3 and Q4 respectively, a diode D and a capacitor C2, wherein one side of resistor R4 receives said amplified signal and the other side of resistor R4 is connected to both the base of transistor Q2 and one side of resistor R7, the emitter of transistor Q2 being connected to the negative terminal of a dry cell battery, the collector of transistor Q2 being connected to one side of both resistor R5 and R6, the other side of resistor R5 being connected to the positive terminal of the dry cell battery and the other side of resistor R6 being connected to the base of transistor Q3, the emitter of transistor Q3 being connected to the positive terminal of the dry cell battery, the collector of transistor Q3 being connected to one side of resistor R8, one side of resistor R9 and the positive side of capacitor C2, the negative side of capacitor C2 being connected to the other side of resistor R7, the diode being connected in a forward direction between the negative terminal of the dry cell battery and a contact between resistor R7 and the negative side of capacitor C2, the other side of resistor R8 being connected to the negative terminal, the other side of resistor R9 being connected to the base of transistor Q4, the emitter of transistor Q4 being connected to the negative terminal, the collector of transistor Q4 being connected to the input of said melody-making mechanism such that the emitter and the collector of transistor Q4 comprise said outputs of said switching circuit and said resistor R7 and said capacitor C2 comprise a resistance-capacitor circuit; such that, in operation said sound-detecting means, upon detection of a sound operates through said amplifier circuit and said switching circuit to actuate said melody-making mechanism until said capacitor is charged, whereupon said switching circuit no longer actuates said melody-making mechanism, said melody-making mechanism continuing to operate until the end of said disc is reached; said dry cell battery providing power for operation of said amplifier circuit, detecting means, switching circuit and melody-making mechanism.

4,637,008

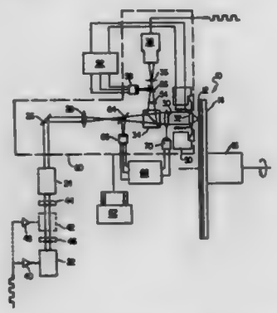
OPTICAL ERASABLE DISK MEMORY SYSTEM UTILIZING DURATION MODULATED LASER SWITCHING

Dayton D. Eden, Dallas, Tex., assignor to LTV Aerospace and Defense, Dallas, Tex.

Filed Apr. 12, 1984, Ser. No. 599,470

Int. Cl.[4] G11B *7/00, 7/22*

U.S. Cl. 369—100 11 Claims



1. An erasable optical read/write data storage system comprising:

a storage medium comprising:

a planar substrate having a first coefficient of thermal expansion; and

a thin film of phase change material disposed on said planar substrate, said phase change material having a second coefficient of thermal expansion and exhibiting an optically discernible phase change from a first phase to a second phase at any portion thereof subjected to a temperature in excess of a selected threshold temperature at a particular stress and from said second phase to said first phase at any portion thereof subjected to a stress in excess of a selected threshold stress at a particular temperature;

means for generating a collimated laser beam of selected power and duration and means for focusing said laser beam on selected portions of said thin film of phase change material;

said means for generating a collimated laser beam of a selected power and duration selects a first duration for increasing the temperature at a selected portion of said thin film of phase change material to a temperature in excess of said selected threshold temperature and for increasing the temperature of said planar substrate for placing said selected portion of said thin film in said first phase;

said means for generating a collimated laser beam of a selected power and duration selects a second duration less than said first duration for heating and expanding said selected portion of said thin film of phase change material without heating said planar substrate whereby said thin film of phase change material will expand thereby increasing the stress at said selected portion for changing the phase of said selected portion from said first phase to said second phase; and

said means for generating a collimated laser beam of a selected power and duration selects said first duration for heating said selected portion of said thin film and said planar substrate for changing the phase of said selected portion from said second phase back to said first phase.

4,637,009

GROUNDING CIRCUIT FOR PICKUP CARTRIDGE MOVING COIL

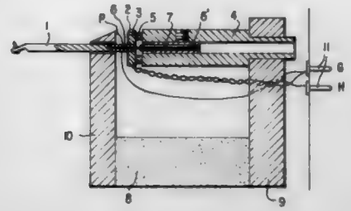
Hiroyoshi Nakatsuka, Mitaka, Japan, assignor to Namiki Precision Jewel Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1984, Ser. No. 645,775

Claims priority, application Japan, Apr. 27, 1983, 59-62392[U]

Int. Cl.[4] H04R *9/12*; G11B *3/46*

U.S. Cl. 369—147 2 Claims



1. In a pickup cartridge of the moving coil type including a non-symmetrical magnetic circuit having, in series, (a) an armature with which the coil is associated, (b) a pole piece, (c) a rear yoke for supporting said pole piece, (d) a magnet, and (e) a front yoke where a gap is disposed between the pole piece and the front yoke to effect said non-symmetrical magnetic circuit and where the armature is disposed in the gap, the improvement of grounding said magnetic circuit at a ground substantially removed from the armature in said series magnetic circuit, said grounding point being at least as far removed from the armature as the surface of the front yoke where the position of said ground point with respect to said armature is determined in the direction extending from the armature through the pole piece, rear yoke, the magnet, and the front yoke in the foregoing order and then back to the armature.

4,637,010

DISC CLAMP DEVICE

Masao Okita, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Apr. 2, 1985, Ser. No. 718,900

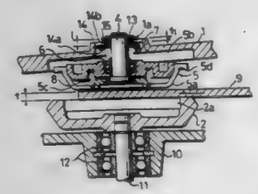
Claims priority, application Japan, Apr. 2, 1984, 59-48292[U]

Int. Cl.[4] A63D *7/00*; G11B *3/62*

U.S. Cl. 369—270 4 Claims

1. In a disc clamp device of the type having a turntable, a hub frame downwardly movable with respect to the turntable, a clamp member mounted on a hub shaft which has one end carried on the hub frame, and a spring provided on the hub shaft between the hub frame and the clamp member, the spring providing a biasing force against the clamp member when the hub is moved downwardly toward the turntable to clamp a disc between the clamp member and the turntable,

the improvement comprising means for mounting the clamp member to the hub frame such that the clamp member has a freedom of angular movement relative to the hub frame when it is above the turntable, said mounting means including the hub frame having a bore of a larger diameter than the hub shaft, a stop member provided on the one end of the hub shaft, the hub shaft being disposed in said bore



of the hub frame and being carried by said stop member abutting the hub frame from one side of said bore, a spring rest on the hub shaft on the other side of said bore in the hub frame at a position spaced downwardly from a lower surface of the hub frame so as to leave a spacing between said spring rest and said lower surface of the hub frame when the hub frame is in an elevated position above the turntable, and the spring having one end carried in said spring rest, said spacing and larger diameter bore providing said freedom of angular movement to the clamp member relative to the hub frame.

4,637,011

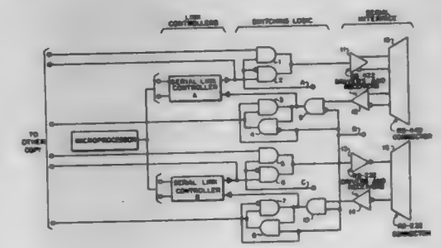
FAULT TOLERANT DUAL PORT SERIAL LINK CONTROLLER

Edwin P. Crabbe, Jr., Peoria, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 23, 1985, Ser. No. 812,552

Int. Cl.[4] H04Q *11/04*; G06F *11/20*

U.S. Cl. 370—24 17 Claims



1. In a data transmission system, a fault tolerant multiple port serial link controller arrangement connected to first and second copies of transmission equipment, said fault tolerant serial link controller arrangement comprising:

first printed wiring card means including:

first link interface means connected to said first copy of said transmission equipment, said first link interface means being operated to transmit and receive data of a first type between said first copy transmission equipment and said serial link controller arrangement;

first switching means connected to said first link interface means and being operated to selectively control said transmission and reception of said first type of data from first link interface means to said serial link controller arrangement;

first duplex controller means for converting said first type of data to parallel data; and

first processor means connected to said first duplex controller means and being operated to receive and to transmit said parallel data;

second printed wiring card means including:

second link interface means connected to said second copy of said transmission equipment, said second link interface means being operated to transmit and receive data of said first type between said second copy transmission equipment and said serial link controller arrangement;

second switching means connected to said second link interface means and being operated to selectively control said transmission and reception of said first type of data from second link interface means to said serial link controller arrangement;

second controller means connected to said second switching means and being operated to transmit and receive said first type of data from said second switching means and being operated to convert said first type of data to said parallel data;

second processor means connected to said second controller means and being operated to receive, to transmit and to store said parallel data; and

second duplex controller means connected to said second processor means and being operated to receive said parallel data;

said multiple port serial link controller arrangement further including:

first strapping means connected between said first switching means and said second switching means, said first strapping means being operated to transmit said first type of data from said second switching means, through said first switching means to said first duplex controller means;

said first duplex controller means being operated in response to said first type of data from said second switching means to convert said first type of data to said parallel data and to transmit said data to said first processor means;

second strapping means connected between said first switching means and said second switching means, said second strapping means being operated to transmit said first type of data from said first switching means, through said second switching means to said second duplex controller means;

said second duplex controller means being operated in response to said first type of data from said first switching to convert said first tye of data to said parallel data and to transmit said parallel data to said second processor means;

third strapping means connected between said second duplex controller means and said first switching means, said third strapping means being operated to transmit said first type of data from said second duplex controller means to said first switching means; and

said second duplex controller being operated to convert said parallel data to said first type of data for transmission through said first copy of transmission equipment.

4,637,012

FLEXIBLE DUPLEX DUAL PORT SERIAL LINK CONTROLLER

Edwin P. Crabbe, Jr., Peoria, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 23, 1985, Ser. No. 812,553

Int. Cl.⁴ H04Q *11/04*; G06F *11/20*

U.S. Cl. 370—24 **23 Claims**

1. In a data transmission system, a multiple port serial link controller arrangement connected to first and second copies of transmission equipment, said serial link controller arrangement comprising:

first printed wiring card means including:

first link interface means connected to said first copy of said transmission equipment, said first link interface means being operated to transmit and receive data of a first type transmitted between said first copy transmission equipment and said serial link controller arrangement;

first switching means connected to said first link interface means and being operated to selectively control said transmission and reception of said first type of data between said first link interface means and said serial link controller arrangement;

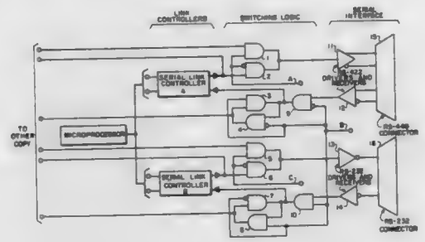
first controller means connected to said first switching means and being operated to transmit and receive said first type of data from said first switching means and being operated to convert said first type of data to parallel data;

first processor means connected to said first controller means and being operated to receive, to transmit and to store said parallel data; and

first duplex controller means connected to said first processor means and being operated to receive said parallel data;

second printed wiring card means including:

second link interface means connected to said second copy of said transmission equipment, said second link interface means being operated to transmit and receive data of said first type transmitted between said second copy transmission equipment and said serial link controller arrangement;



second switching means connected to said second link interface means and being operated to selectively control said transmission and reception of said first type of data between said second link interface means and said serial link controller arrangement;

second controller means connected to said second switching means and being operated to transmit and receive said first type of data from said second switching means and being operated to convert said first type of data to parallel data;

second processor means connected to said second controller means and being operated to receive, to transmit and to store said parallel data; and

second duplex controller means connected to said second processor means and being operated to receive said parallel data;

said serial link controller arrangement further including:

first strapping means connected between said first switching means and said second switching means, said first strapping means being operated to transmit said first type of data from said first switching means, through said second switching means to said second duplex controller means;

said second duplex controller means being operated in response to said first type of data from said first copy of said transmission equipment to convert said first type of data to said parallel data and to transmit said parallel data to said first processor means;

second strapping means connected between said first switching means and said second switching means, said second strapping means being operated to transmit said first type of data from said second switching means, through said first switching means to said first duplex controller means; and

said first duplex controller means being operated in response to said first type of data from said second copy of said transmission equipment to convert said first type of data to said parallel data and to transmit said parallel data to said second processor means.

4,637,013

TOKEN EXCHANGE DATA TRANSMISSION SYSTEM HAVING SYSTEM CONFIGURATION DISCRIMINATION

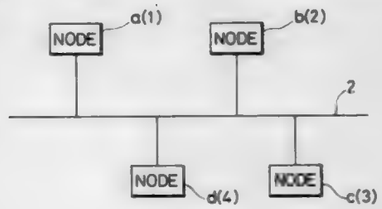
Yasuo Nakamura, Fuchu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

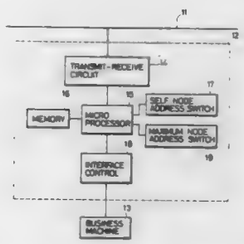
Filed Jun. 28, 1984, Ser. No. 625,823

Claims priority, application Japan, Jul. 5, 1983, 58-121056; Jul. 5, 1983, 58-121057; Jul. 5, 1983, 58-121058; Oct. 5, 1983, 58-185084; Oct. 5, 1983, 58-185085

Int. Cl.⁴ H04J *3/02, 3/16*

U.S. Cl. 370—85 **30 Claims**





1. A data transmission system including a plurality of nodes connected to each other through a transmission line, wherein only a node to which a communication right has been assigned is permitted to perform data transmission between that node and another node of the remaining plurality of nodes, wherein each of said plurality of nodes comprises:

means for retrieving another node of said plurality of nodes to which the communication right is to be assigned;

means for storing information representative of said another node retrieved by said retrieving means;

means for assigning the communication right to said another node according to the information stored in said means for storing; and

means for varying an execution frequency of the node retrieving operation of said retrieving means in accordance with operating conditions of said plurality of nodes.

4,637,014

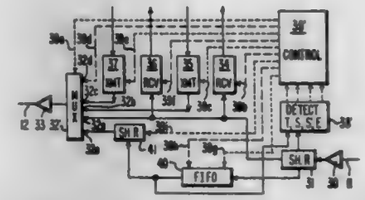
METHOD OF INSERTING AND REMOVING ISOCHRONOUS DATA INTO A SEQUENCE OF NONISOCHRONOUS DATA CHARACTERS WITHOUT SLOT ALLOCATION ON A COMPUTER NETWORK

John L. Bell, Escondido; David L. Isaman, San Diego, and Fazil I. Osman, Escondido, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 17, 1984, Ser. No. 581,351

Int. Cl.⁴ H04J *3/26*

U.S. Cl. 370—89 **13 Claims**



1. A method of transmitting isochronous and nonisochronous data in a computer network in which multiple stations have respective input and output ports that are serially coupled together to form a loop; said method including the steps of:

transmitting said nonisochronous data from a first station of said network and passing it through the remaining stations;

periodically inserting into said nonisochronous data, from a second station of said network, a lead control character followed by a trail control character and circulating said control characters twice around said network;

increasing, in any station of said network that has isochronous data to send, the distance between said lead and trail control characters and sending said isochronous data immediately before the trail control character as it passes through the station;

subsequently decreasing the distance between said lead and trail control characters in each station of said network that performs the sending step by removing, from immediately behind the first lead control character to enter the station after the sending step begins, the same number of characters that it sent before the trail control character.

4,637,015

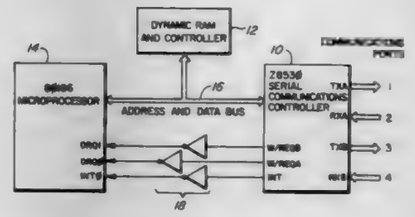
PACKET TRANSMISSION AND RECEPTION VIA A SHARED DMA CHANNEL

Kenneth A. Bobey, Edmonton, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 29, 1985, Ser. No. 760,007

Int. Cl.⁴ H04J *3/24, 3/02*

U.S. Cl. 370—94 **7 Claims**



1. A method of transmitting and receiving packets of data using a bit oriented protocol via respective transmit and receive communications ports which share a direct memory access (DMA) channel for the packets, comprising the steps of:

for the transmission of each packet, transmitting an abort signal via the transmit port, and transmitting the packet

via the transmit port when the DMA channel is free after at least a predetermined time following transmission of the abort signal; and

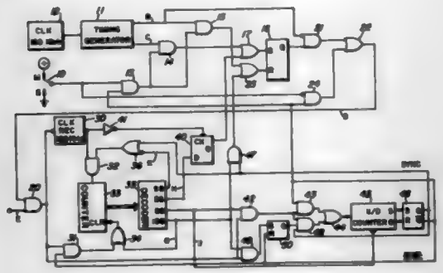
reserving the DMA channel for reception of a packet via the receive port in response to reception of the abort signal via the receive port.

4,637,016

FRAME SYNCHRONIZATION CIRCUIT FOR DIGITAL TRANSMISSION SYSTEM

Carmine A. Ciancibello, Nepean, and Dennis W. Mitchler, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 9, 1985, Ser. No. 732,115
Int. Cl.[4] H04J 3/06
U.S. Cl. 370—100 3 Claims



1. A digital transmission system having a master station and a slave station each including transmitting and receiving means for alternately transmitting and receiving bursts of digital signals of fixed length at fixed frame intervals over a single transmission path, each burst including initial and final synchronization bits at the beginning and ending respectively of each burst; and

means for establishing frame synchronization,

characterized by:

in the receiving means at the master station, gating means responsive to the absence of frame synchronization for passing bits of the received signal immediately preceding the transmission of each burst to the means for establishing frame synchronization, the bits of the received signal including the final synchronization bit and excluding at least the initial synchronization bit; the gating means also being responsive to the presence of frame synchronization for passing only signals received during a window period which is substantially coextensive with that of said bursts, to the means for establishing frame synchronization; and

control means responsive to the final synchronization bit of one burst for initiating said window period substantially concurrent with the anticipated reception of the initial bit of the succeeding burst.

4,637,017

MONITORING OF INPUT BACKOFF IN TIME DIVISION MULTIPLE ACCESS COMMUNICATION SATELLITES

Francois T. Assal, Bethesda; Arnold L. Berman, and Jazaki R. Potukuchi, both of Kensington, all of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed May 21, 1984, Ser. No. 612,496
Int. Cl.[4] H04J 3/06, 15/00, 1/16, 3/14
U.S. Cl. 370—104 10 Claims

1. In a communication system of the type having a remote amplifier for receiving, power amplifying and retransmitting signals transmitted thereto, a method of measuring carrier input power to said remote amplifier when the latter is used in a time division multiple access format wherein transmission bursts include at least a guard time of no carrier transmission, a carrier recovery time of unmodulated carrier, and a clock recovery time of the carrier modulated by a clock signal, said carrier and clock recovery times being a preamble, said method comprising the steps of:

transmitting to said amplifier a pilot signal different in frequency from said carrier but within the bandwidth of said amplifier, said pilot signal arriving at said amplifier at least during said guard time and said preamble;



measuring the power level of the pilot signal output by the amplifier during the guard time;

measuring the power level of the pilot signal output by the amplifier during the preamble;

comparing the two said measurements of the pilot signal, the difference being a pilot level suppression;

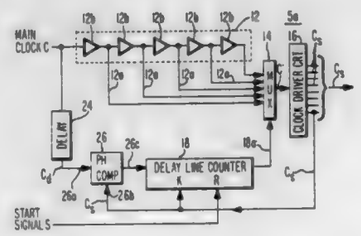
relating the pilot level suppression to the carrier input power according to a known relation.

4,637,018

AUTOMATIC SIGNAL DELAY ADJUSTMENT METHOD

Laurence P. Flora, Covina, and Michael A. McCullough, Pasadena, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 29, 1984, Ser. No. 645,934
Int. Cl.[4] H03K 3/06; G01R 15/12
U.S. Cl. 371—1 15 Claims



1. A method for automatically providing a desired propagation delay between an input signal and an output signal produced by an electrical circuit in response thereto, said method comprising the steps of:

producing in response to said input signal a plurality of delayed signals having different delays relative to said input signal;

selecting one of said delayed signals for application to said circuit;

comparing the time relationship between a first signal derived from said output signal and a second signal derived from said input signal for determining whether the propagation delay provided by a selected delayed signal is substantially equal to said desired propagation delay;

automatically selecting a different delayed signal if the propagation delay provided by a currently selected delayed signal is determined not to be substantially equal to said desired propagation delay;

repeating the steps of comparing and automatically selecting until a currently selected delayed signal is determined to provide substantially said desired propagation delay; and

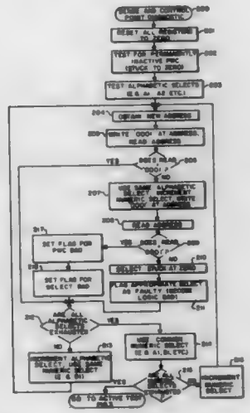
preventing selection of a different delayed signal when the currently selected delayed signal is determined to provide a propagation delay which is substantially equal to said desired propagation delay.

4,637,019

DIAGNOSTIC METHOD FOR ADDRESSING ARRANGEMENT VERIFICATION

Antonio Rahimzad, Glendale, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Oct. 15, 1984, Ser. No. 661,010
Int. Cl.[4] G06F 11/00
U.S. Cl. 371—16 12 Claims



1. In a processing system including a processor, a plurality of printed wiring cards (PWCs) having a plurality of sense points or control points, an addressing arrangement for selectively enabling said PWCs and a data bus connecting said processor to each said PWC, a diagnostic method for validating the integrity of said addressing arrangement comprising the steps of:

first selecting a first address having first and second components corresponding to a first particular PWC to be validated;

first testing said first address with a predefined data word to produce a first valid or an invalid condition;

second selecting a second address in response to an invalid condition of said first testing, said second address having the same first component and a second component which is incremented, said second address corresponding to a second PWC;

second testing said second address with said predefined data word to produce a second valid or an invalid condition;

first indicating a fault of said first address component in response to said second invalid condition;

second indicating a fault of said second PWC and of said second address component for said first invalid condition and said second valid condition;

first iterating said steps of first and second testing, first and second selecting and first and second indicating with an address having said first component incremented by one for each said step of first iterating for each said first address component and;

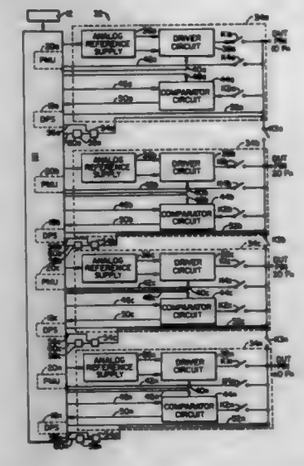
second iterating said step of first iterating with an address having said second component incremented by one for each said step of second iterating for each said second address component.

4,637,020

METHOD AND APPARATUS FOR MONITORING AUTOMATED TESTING OF ELECTRONIC CIRCUITS

John Schinabeck, Pleasanton, Calif., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

Continuation-in-part of Ser. No. 518,499, Aug. 1, 1983, abandoned. This application May 17, 1984, Ser. No. 611,449
Int. Cl.[4] G01R 31/28
U.S. Cl. 371—20 11 Claims



1. A method for continuously applying and monitoring a test bias signal at a node of a device under test including digitally programmed source means having a preselected programmed voltage-current characteristic defined by not-to-exceed voltage rail and current rail levels for supplying a test bias signal to the node, comparison means connected to the node, and means for latching the output signal produced by the comparison means, the method comprising the steps of:

connecting the test bias signal to the node;

continuously comparing the voltage applied to the node with the preselected programmed voltage rail level;

providing an indication of the relative magnitude of the voltage applied to the node with respect to the voltage rail level;

setting first latching means when the voltage applied to the node reaches the voltage rail level;

continuously comparing the current at the node with the preselected programmed current rail level;

providing an indication of the relative magnitude of the current at the node with respect to the current rail level; and

setting second latching means when the current at the node reaches the current rail level.

4,637,021

MULTIPLE PASS ERROR CORRECTION

David N. Shenton, Monroeville, Pa., assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 28, 1983, Ser. No. 536,666
Int. Cl.[4] G06F 11/10
U.S. Cl. 371—37 34 Claims

1. A method for the detection and correction of errors in encoded digital data arranged in data bytes and encoded according to a BCH code, the method comprising the steps of:

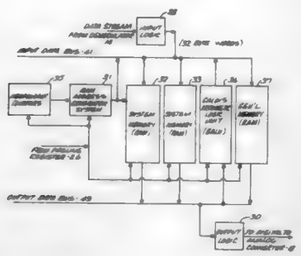
(a) for each data byte in a block of the encoded digital data, forming the product in a Galois field of a first said data byte and of a first power of a root of the primitive polynomial used in forming the encoded digital data of the block;

(b) adding in a Galois field the product formed in the previous step to another said data byte of the block of the

encoded digital data to form a sum and forming the product in a Galois field of the sum and the first power of the root of the primitive polynomial;

(c) repeating the step (b) for all of the rest of the data bytes in the encoded digital data of the block to form a first representation of the number of errors, of the location of the errors and of the nature of the errors in the encoded digital data of the block;

(d) repeating the steps (a), (b) and (c) for a plurality of other powers of the root of the primitive polynomial in order to obtain plural representations of the number, of the location, and of the nature, of errors in the encoded digital data of the block;



(e) determining the number of errors in the encoded digital data of the block using the first representation and the plural representations formed in the steps (c) and (d);

(f) locating the errors determined in the step (e) in the encoded digital data of the block using the representations formed in the steps (c) and (d); and

(g) correcting errors in the encoded digital data of the block located in the step (f) using the representations calculated in the steps (c) and (d).

4,637,022

INTERNALLY REGISTER-MODELLED, SERIALLY-BUSSED RADIO SYSTEM

Timothy M. Burke; Paul F. Smith, both of Ft. Worth, and Eric R. Schorman, Bedford, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 21, 1984, Ser. No. 684,631
Int. Cl.[4] G06F *11/10*; H04B *7/00*
U.S. Cl. 371—37 **9 Claims**

8. A register-modelled radio system having a plurality of interdependent radio processors comprising:

a plurality of register-modelled addressable processor means for determining or altering the virtual state of said processor according to parametric data passed to it and

communication means, comprising a serial bus, interconnecting said register-modelled processor means, for communicating between said addressable register-modelled processor means,

a communications protocol for passing said parametric data to or from said addressable register-modelled processor means, comprising an information packet, further comprising:

an address

an operation code, further comprising:

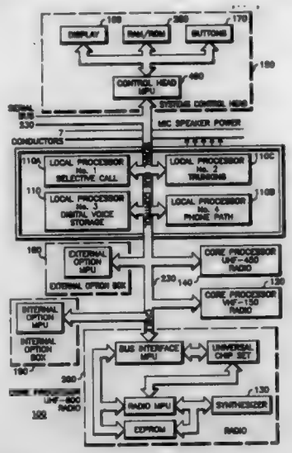
a primitive operation code chosen from the group of primitive operation codes: reset, read, write, bit set, bit clear, acknowledge, and negative acknowledge,

optional data, and

error detection data, further comprising:

a cyclical redundancy check packet,

whereby the virtual state of said processor may be determined or altered by, respectively, communicating parametric data from or to said addressable register-modelled processor means.

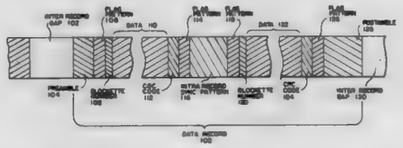


4,637,023

DIGITAL DATA ERROR CORRECTION METHOD AND APPARATUS

David M. Lounsbury, Boston, and Alexander J. Stevenson, Framingham, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Feb. 14, 1983, Ser. No. 466,333
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—38 **43 Claims**



1. Apparatus for serially recording a digital data record on magnetic tape, said apparatus comprising:

a plurality of memory means,

means responsive to said data record for storing portions of said data record into at least two of said memory means,

means for assigning said portion of said data record stored in each of said memory means a unique sequential number, said number being stored in said memory means along with the assigned information, and

means responsive to said stored information for recording the data record portion stored in each of said memory means serially on said tape in a sequential order specified by the assigned numbers, said recording means comprising a counter for producing a count signal and means responsive to said count signal for recording on said tape the portion of said data record assigned a number equal to said count signal,

means responsive to a data record portion recorded on said tape for generating read data signals,

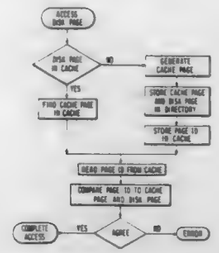
means responsive to said read data signals for detecting a recording error therein, said detecting means comprising means responsive to said data signals for generating a valid signal when said data has been properly recorded on said tape and means responsive to said valid signal for incrementing said counter.

4,637,024

REDUNDANT PAGE IDENTIFICATION FOR A CATALOGUED MEMORY

Jerry D. Dixon, Boca Raton; Robert H. Farrell, Coral Springs; Gerald A. Marazas, Boca Raton; Andrew B. McNeill, Jr., Deerfield Beach, and Gerald U. Merckel, Delray, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 2, 1984, Ser. No. 667,520
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—67 **9 Claims**



1. A method of detecting addressing errors in a memory catalogued by a directory, said memory divided into a plurality of blocks for the storage of data information, said information addressed by a first address, said block addressed by a second address, said directory providing the correspondence between said first address and said second address, comprising the steps of:

storing in a first portion of one of said blocks, addressed by said second address, data addressed by said first address;

storing in a second portion of said one of said blocks addressing information derived from said first and second addresses;

initiating an access to data in said catalogued memory according to said first address;

converting said first address to said second address according to said directory;

reading said second portion addressed by said second address; and

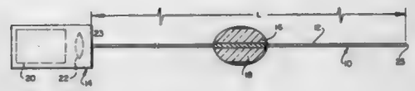
comparing said read second portion with said first and second addresses used for said converting and reading steps.

4,637,025

SUPER RADIANT LIGHT SOURCE

Elias Snitzer, Wellesley, and Shaoul Ezekiel, Medford, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 22, 1984, Ser. No. 663,345
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—1 **24 Claims**



1. A light source comprising:

an optical waveguide having a core and cladding and including active material positioned to overlap propagating modes of the waveguide, said material absorbing light of at least one wavelength and emitting light of at least one other wavelength; and

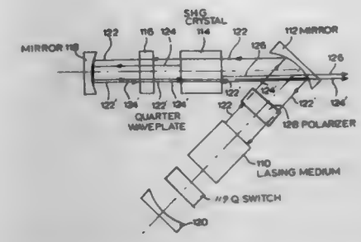
means for directing pump light energy from a source providing said one wavelength into said waveguide at an input location for absorption by said material, the intensity of the directed light being sufficient to cause an amplified spontaneous emission by said material from an output location of said waveguide.

4,637,026

FREQUENCY DOUBLING A Q-SWITCHED LASER BEAM BY USING INTRACAVITY TYPE II PHASE MATCHING

Kuo-Ching Liu, Setauket, N.Y., assignor to Quantronix Corporation, Smithtown, N.Y.

Continuation-in-part of Ser. No. 724,089, Apr. 17, 1985. This application Oct. 29, 1985, Ser. No. 792,474
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—22 **12 Claims**



1. A Q-switched frequency-doubled laser comprising:

first and second mirrors forming an optical cavity therebetween;

a laser active medium disposed within said cavity for generating a fundamental beam at a preselected fundamental frequency and having a linear polarization which can be resolved into two orthogonal components;

a crystal for generating via Type II phase-matching a linearly polarized second harmonic beam in response to said fundamental beam, said crystal having an ordinary and an extraordinary axis, said orthogonal components of said fundamental beam being oriented along said axes, said crystal further generating a differential phase delay between said orthogonal components;

a Q-switch for Q-switching the output of the laser active medium; and

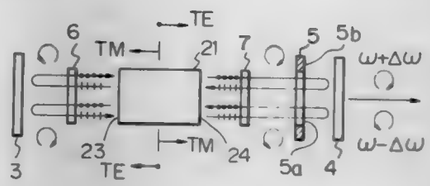
means for eliminating on the return trip through said crystal said differential delay to produce a frequency doubled output beam.

4,637,027

LASER LIGHT SOURCE DEVICE

Masataka Shiratsuki; Hirochika Nakajima, both of Kawasaki; Yasuo Furukawa, Zama, and Takefumi Inagaki, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 26, 1984, Ser. No. 654,628
Claims priority, application Japan, Sep. 26, 1983, 58-177233; Sep. 26, 1983, 58-177227
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—27 **10 Claims**



1. A laser light source device comprising:

a laser having a first end plane and a second end plane, and

an external resonator including first and second reflection planes spaced, respectively, from said first and second end planes;

a Faraday rotator positioned between said first end plane and said first reflection plane; and

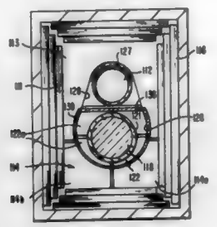
means associated with said Faraday rotator for producing a magnetic field therein, said magnetic field causing an effect such that light of clockwise circular polarization and light of counter-clockwise circular polarization will be differently affected upon passage through said Faraday rotator, thereby producing from said laser light source device two light outputs, one of each polarization and having different oscillation frequencies determined by the strength of said magnetic field applied to said Faraday rotator.

4,637,028

CONDUCTIVELY COOLED LASER ROD

Oshor Kohen, Culver City, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 2, 1984, Ser. No. 636,891
Int. Cl.[4] H09S *3/04*
U.S. Cl. 372—34 18 Claims



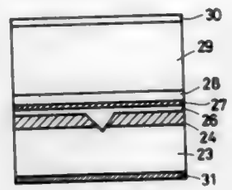
1. In a laser pump cavity having a source of laser pumping energy, a laser rod, a thermally conductive support therefor, and a cooling system for removing heat from the support, the improvement including a cushion thermally coupling said support to said laser rod and comprising a deformable elastic material which is capable of absorbing differential movements between said rod and said support in response to thermal changes therein, to minimize any mechanical and thermal stresses otherwise exerted on said laser rod.

4,637,029

SEMICONDUCTOR LASER

Toshiro Hayakawa, Nara; Nobuyuki Miyauchi, Tenri; Seiki Yano, Kashihara, and Takahiro Suyama, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 24, 1984, Ser. No. 633,990
Claims priority, application Japan, Jul. 29, 1983, 58-140756
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 7 Claims



1. A GaAlAs semiconductor laser element having a predetermined thickness comprising:

a $Ga_{1-v}Al_vAs$ substrate layer having a first surface and a second surface;

a current blocking layer formed on said second surface $Ga_{1-v}Al_vAs$ substrate layer;

A V-shaped groove formed in said current blocking layer;

a first $Ga_{1-y}Al_yAs$ cladding layer formed on said current blocking layer;

a $Ga_{1-x}Al_xAs$ active layer formed on said first $GA_{1-y}Al_yAs$ cladding layer;

a second $Ga_{1-z}Al_zAs$ cladding layer formed on said $Ga_{1-x}Al_xAs$ active layer; and

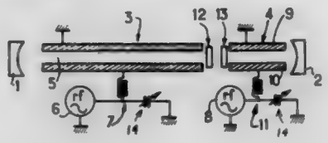
a $Ga_{1-w}Al_wAs$ cap layer having a bottom surface and a top surface, said bottom surface disposed on said second $Ga_{1-z}Al_zAs$ claddying layer, wherein the AlAs mole fraction z, x and w of said substrate layer, active layer and cap layer, respectively, satisfy the following relations: $0<v<1$, $0<y<1$, $0<z<x<1$, and $0<w<w<x<1$.

4,637,030

SWITCHING LASER

Thierry R. Midavaine, and Michel M. Ouhayoun, both of Paris, France, assignors to SAT, Paris, France

Filed Dec. 4, 1984, Ser. No. 678,028
Claims priority, application France, Dec. 15, 1983, 83 20097
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—82 5 Claims



1. A switching laser comprising, in a single cavity, a cell of an amplification gas and a cell of an absorption gas, means for exciting the amplification gas and means for exciting the absorption gas, said means for exciting the absorption gas comprising a low power radio frequency AC voltage source pulsed at a predetermined rate so as to interrupt absorption in said laser such that laser emission becomes continuous at said predetermined rate.

4,637,031

APPARATUS FOR THE GENERATION OF LASER RADIATION

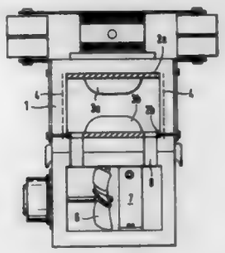
Karl Gürs, Eschborn, and Erich Hansen, Bad Soden, both of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt, Fed. Rep. of Germany

PCT No. PCT/EP83/00285, § 371 Date Jul. 11, 1984, § 102(e) Date Jul. 11, 1984, PCT Pub. No. WO84/02039, PCT Pub. Date May 24, 1984
PCT Filed Nov. 1, 1983, Ser. No. 629,781
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242085
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—86 20 Claims

1. An apparatus for the generation of laser radiation consisting essentially of

a discharge chamber made from an insulating material, said discharge chamber having two opposite walls and two lateral walls made from an insulating material which enclose an interior space containing an optical resonator, said opposite walls being provided with metal coatings on which two discharge electrodes are mounted, said discharge chamber being provided with conducting structures which are insulated from the interior space and extend between said two discharge electrodes on both sides thereof and between the levels of the metal coatings in said opposite walls, whereby by means of said discharge

electrodes and conducting structures a gas discharge can be produced transverse to the optical resonator initiated by UV preionization arising from a corona discharge characterized in that the conducting structures are arranged on or within both the lateral walls of the discharge chamber and are insulated from the interior space by said



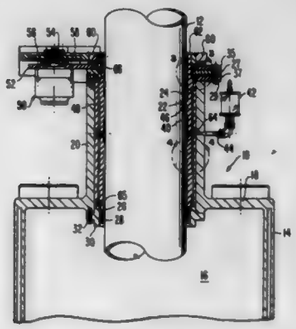
lateral walls of the discharge chamber and wherein a gas circulation and cooling system are disposes in a chamber arranged adjacent to one of said opposite walls said opposite wall adjacent to the chamber containing the gas circulation and cooling system being provided with openings through which the laser gas flows.

4,637,032

ROTARY SEAL FOR MOVABLE SHAFT TO ELIMINATE BREAKAWAY FRICTION

Richard E. Whitman, Ukiah, Calif., assignor to Retech, Inc., Ukiah, Calif.

Filed Dec. 18, 1984, Ser. No. 682,861
Int. Cl.[4] H05B *7/10*
U.S. Cl. 373—69 22 Claims



1. In apparatus having a shaft movable with respect to a chamber having a fixed member, a rotary seal assembly comprising:

a normally vertical sleeve having first seal means on the inner surface thereof at spaced locations thereon for engagement at said locations with the outer surface of the shaft, and second seal means on the outer surface of the sleeve for engagement with a surface adapted to be fixed with respect to the member;

bearing means coupled with the sleeve at the upper and lower ends thereof for shiftably mounting the sleeve on said support for movement relative to the member and the shaft to allow the sleeve to move relative to the shaft as the shaft moves relative to said fixed member; and

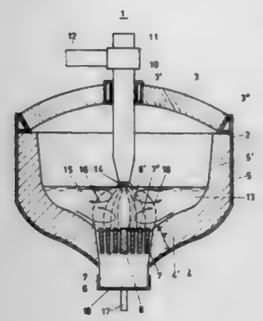
means carried by said mounting means and coupled with the sleeve for shifting the sleeve relative to the member and the shaft.

4,637,033

BOTTOM ELECTRODE FOR A DIRECT CURRENT ARC FURNACE

Karl Bühler, Nussbaumen, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jan. 24, 1985, Ser. No. 694,301
Claims priority, application Switzerland, Jan. 31, 1984, 445/84
Int. Cl.[4] H05B *7/02*
U.S. Cl. 373—72 19 Claims



1. A direct current electric arc furnace for melting metals, comprising:

a furnace crucible having a base including a hearth surface;

a top electrode;

a bottom electrode having a top surface extending into said crucible through said hearth surface; and

means for forming an arc between said top and bottom electrodes, whereby an electromagnetic field is formed around said bottom electrode,

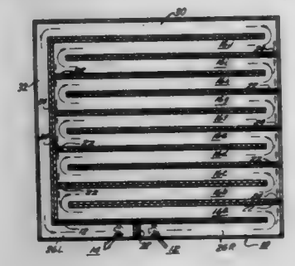
wherein said top surface of said bottom electrode comprises at least one metallic component and at least one non-metallic component, said metallic and non-metallic components being complementary in shape and elongate with lengths parallel to said electromagnetic field being greater than widths thereof transverse to said field.

4,637,034

COOLING PANEL FOR ELECTRIC ARC FURNACE

Ignacio J. Grageda, Puebla, Mexico, assignor to Hylsa, S.A., Monterrey, Mexico

Filed Apr. 19, 1984, Ser. No. 601,987
Int. Cl.[4] E27D *1/12*
U.S. Cl. 373—76 24 Claims



1. Cooling panel for a furnace used in a metallurgical process, the panel comprising inlet means for supplying a cooling liquid; outlet means for withdrawing said cooling liquid; and enclosure means for coupling said inlet means to said outlet means for defining a tortuous liquid flow path which causes said cooling liquid to flow past essentially all portions of the

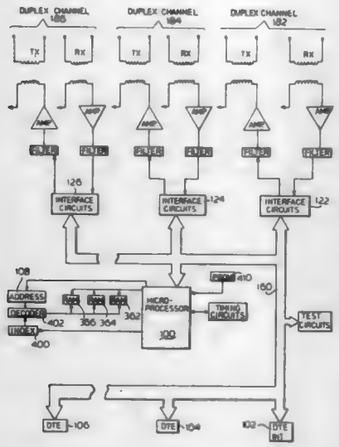
interior face of said panel by passing seriatim through an array of side-by-side passages underlying said interior face, said tortuous flow path having a number of abrupt changes in direction and a shape resulting in potential dead zones at said abrupt changes in direction relative to the main flow through said path, and means for permitting a minor amount of said cooling liquid to flow along alternative liquid paths each into a respective dead zone from an adjacent passage such that at least in the central portion of said panel each successive occurrence of said dead zones are sufficiently reduced to prevent hot spots capable of causing burn out.

4,637,035

DIGITAL MODEM FOR MULTIPLE TELEPHONE CIRCUITS

William L. Betts, St. Petersburg, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Feb. 16, 1984, Ser. No. 580,672
Int. Cl.[4] H04B 3/06
U.S. Cl. 375—8 **6 Claims**



1. A modem for exchanging data signals between a plurality of local data terminals and remote data terminals over individual data channels, each channel connecting said modem to one of said remote terminals comprising:

a plurality of terminal interfacing modules for receiving binary signals from said local data terminals, each module being connected to a corresponding local data terminal;

a single microprocessor means for receiving said binary signals from said terminal interfacing means, said microprocessor means being provided to convert said binary signals into corresponding time-sampled transmit digitized signals; and

a plurality of line interfacing modules, each line interfacing module being connected to one of said channels, said line interfacing modules being provided for converting said transmit digitized signals to transmit analog signals for transmission over said channels;

said plurality of line interfacing modules being further provided for receiving analog signals from said channels and converting them into received digitized signals;

said microprocessor being programmed to adaptively equalize said received digitized signals and to convert the equalized signals into received binary signals;

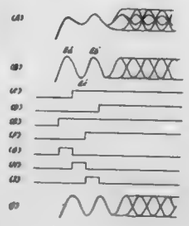
said plurality of terminal interfacing modules being further provided for transmitting said received binary signals to said local data terminals.

4,637,036

CIRCUIT ARRANGEMENT FOR A DATA ACQUISITION CIRCUIT OF A PCM PROCESSOR AND A METHOD FOR IMPROVING WAVEFORM OF PCM SIGNAL EYE PATTERN

Harukuni Koberi, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed May 18, 1984, Ser. No. 612,014
Claims priority, application Japan, May 20, 1983, 58-88719
Int. Cl.[4] H04B 1/12
U.S. Cl. 375—76 **9 Claims**



5. A circuit arrangement for a data acquisition circuit of a PCM processor responsive to a PCM signal of a predetermined format and having a 1010 synchronizing signal and a digital signal both arranged in series of data blocks so that each 1010 synchronizing signal is followed by a corresponding data block, said circuit arrangement comprising:

(a) first means responsive to bits of said 1010 synchronizing signal of said PCM signal for producing timing signals;

(b) second means responsive to said timing signals for detecting positive and/or negative peak levels bf bits of only said 1010 synchronizing signal of said PCM signal;

(c) third means responsive to said second means for producing a control signal representative of detected peak levels of said 1010 synchronizing signal; and

(d) a frequency response control means responsive to said control signal for changing the frequency response to said PCM signal such that the frequency response to said PCM signal is controlled by said control signal which is produced using the peak levels of said 1010 synchronizing signal which immediately precedes each of said data blocks

wherein said frequency response control means includes means for changing the frequency response of said PCM processor to said PCM signal as a function of said detected peak levels.

4,637,037

BIPHASE SIGNAL RECEIVER

Philip Chao, Skokie, Ill., assignor to AT&T Teletype Corporation, Skokie, Ill.

Filed Aug. 29, 1984, Ser. No. 645,367
Int. Cl.[4] H03D 3/02
U.S. Cl. 375—87 **13 Claims**

1. A circuit for decoding a biphase signal comprising:

a plurality of first storage means connected in parallel, for storing

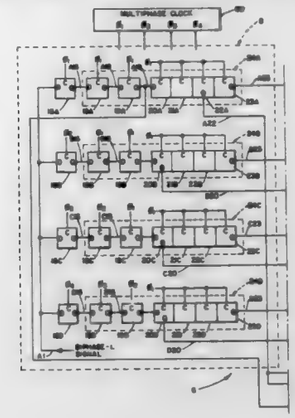
a plurality of shift registers (24 A–D), each shift registers connected to a respective output of said storage means for receiving the stored samples

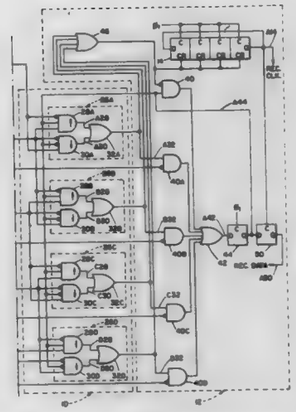
and thereafter advancing each sample therethrough;

a plurality of generating means (A32–D32) Respective to a level transition between said

samples outputted from said plurality of shift registers and a previously stored biphase signal level (A44) for generating a control signal wherein said control signal is generated from one of the said plurality of generating means (A32–D32);

second means (44) responsive to said control signal (A32–D32) for storing a sample of the level of the biphase signal fed into one of said shift registers (24 A–D), wherein said sample to be stored occurred prior to the sample for which said control signal was generated; and





means (14) for generating a recovered clock signal synchronized with said control signal (A32–D32).

4,637,038

HIGH SPEED COUNTER

David H. Boyle, Manassas, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1985, Ser. No. 728,964
Int. Cl.[4] H03K 23/60, 23/62
U.S. Cl. 377—117 **8 Claims**

1. In an M-bit binary counter having M sequentially ascending binary value stages, the first stage being the lowest significant bit, a subsequent value decoder in a N+1st stage (where N is an integer and 0<N<M), comprising:

a first AND gate having a first input connected to a system input to be counted and a second input, and having an output;

said first AND gate being a natural threshold FET device having its gate connected to said system input and its source-drain path connected between said second input and said output thereof;

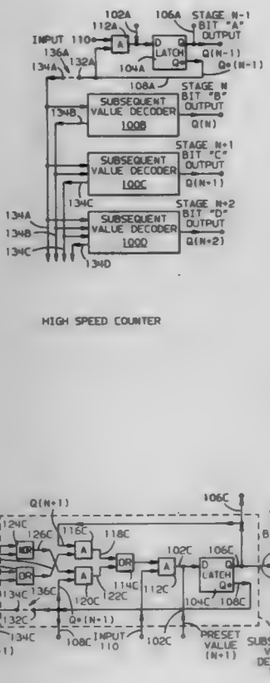
a latch having an input connected to said output of said first AND gate and having a true output Q(N+1) and a complementary output Q*(N+1), for storing the current binary state of said N+1st stage;

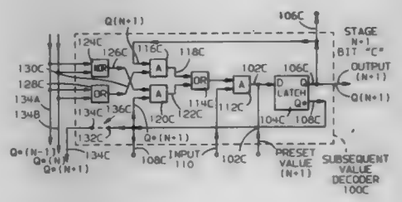
a second AND gate having a first input connected to said true output Q(N+1) of said latch and a second input, and having an output connected to said second input of said first AND gate;

said second AND gate being a natural threshold FET device having its gate connected to said true output Q(N+1) of said latch and its source-drain path connected between said second input and said output thereof;

a third AND gate having a first input connected to said complementary output Q*(N+1) of said latch and a second input and having an output connected to said second input of said first AND gate;

said third AND gate being a natural threshold FET device having its gate connected to said complementary output



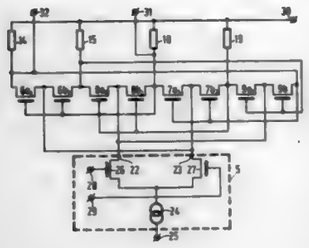


a NOR gate having its output connected to said second input of said third AND gate, and having a plurality of N inputs, each respectively connected to the complementary output Q*(i) of a corresponding ith latch similar to said latch in said N+1st stage, in each of N lower order ones of said stages;

an OR gate having its output connected to said second input of said second AND gate, and having a plurality of N inputs, each respectively connected to the complementary output Q*(i) of said corresponding ith latch similar to said latch in said N+1st stage, in each of said N lower order ones of said stages;

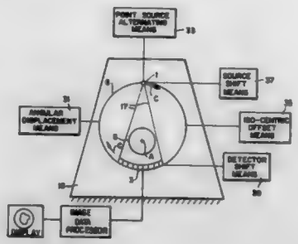
whereby the effect of lower order carry bits on higher order stages can be quickly decoded with a minimum of signal delay.

4,637,039
FREQUENCY DIVIDER CIRCUIT ARRANGEMENT
Cornelis M. Huizer, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.
Filed Feb. 7, 1985, Ser. No. 698,990
Claims priority, application United Kingdom, Feb. 24, 1984, 8404884
Int. Cl.[4] H03K *23/60*
U.S. Cl. 377—121 2 Claims



1. A frequency divider circuit arrangement comprising 2n subcircuits inter-coupled to form a cyclic arrangement, where n is a positive integer, and switchable current source means, each subcircuit comprising first, second, third and fourth transistor structures each having a control electrode, an output electrode and a common electrode, in each subcircuit the output electrode of the first structure being provided with a load impedance and being coupled to the control electrodes of the second and fourth structures, the output electrode of the second structure being provided with a load impedance and being coupled to the control electrodes of the first and third structures, and the common electrodes of all four structures being connected to a common point, the inter-couplings between said subcircuits comprising, for each of said subcircuits except one, a coupling from the output electrode of the third structure of the relevant subcircuit to the output electrode of the first structure of the next subcircuit in the cyclic arrangement and a coupling from the output electrode of the fourth structure of the relevant subcircuit to the output electrode of the second structure of the next subcircuit in the cyclic arrangement, and for the other one of said subcircuits a coupling from the output electrode of the fourth structure of the relevant subcircuit to the output electrode of the first structure of the next subcircuit in the cyclic arrangement and a coupling from the output electrode of the third structure of the relevant subcircuit to the output electrode of the second structure of the next subcircuit in the cyclic arrangement, said switchable current source means having first and second outputs and being constructed to supply current therest alternately in response to the application of an input signal to said switchable current source means, the said common points of the successive said subcircuits in the cyclic arrangement being constituted by alternate ones of said first and second outputs and an output electrode of a said first structure being coupled to an output of said circuit arrangement, characterized in that each said transistor structure is an insulated gate field-effect transistor structure, said control, output and common electrodes being gate, drain and source electrodes respectively of the relevant structures.

4,637,040
PLURAL SOURCE COMPUTERIZED TOMOGRAPHY DEVICE WITH IMPROVED RESOLUTION
A. Robert Solval, Brookline, Mass., and David Freundlich, Haifa, Israel, assignors to Elscint, Ltd., Haifa, Israel
Continuation of Ser. No. 518,121, Jul. 28, 1983. This application Jan. 14, 1986, Ser. No. 818,892
Int. Cl.[4] G01N *23/06*
U.S. Cl. 378—9 34 Claims

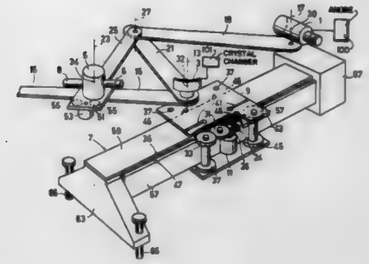


1. An apparatus for providing a tomographic image of a body with sampling data from said body obtained using penetrating radiation such as X-ray radiation said apparatus comprising:
(a) a source of said penetrating radiation for transmitting radiation through a said body, said source including at least said two distinct point sources of said radiation each providing beams of said radiation;
(b) detector means coupled to said source for detecting said radiation emitted from all of said at least two distinct point sources after passage of the radiation through the body, said detector means comprising a plurality of individual detectors arrayed within said beams;
(c) a rotatable gantry on which said source and said detector means are mounted;
(d) means for angularly displacing said gantry for causing the radiation emitted by said source to traverse a plurality of paths through the body and to be detected by said detector means to provide said sampling data;
(e) means for causing said at least two distinct point sources of radiation to alternately emit radiation during said angular displacements to increase said sampling data density by providing data at intervals of no more than one half the pitch of said arrayed individual detectors to thereby provide at least two samples per beam; and
(f) means for processing detected radiation having the increased sampling data density to provide increased spatial resolution in the tomographic images.

4,637,041
KINEMATIC X-RAY ANALYSES APPARATUS
Peter Brinkgreve, Waalre, and Diederik C. Koningsberger, Eersel, both of Netherlands, assignors to Technische Hogeschool Eindhoven, Eindhoven, Netherlands
Filed Mar. 12, 1984, Ser. No. 588,280
Claims priority, application Netherlands, Mar. 15, 1983, 8300927
Int. Cl.[4] G01N *23/20, 23/207;* G21K *1/06*
U.S. Cl. 378—71 14 Claims

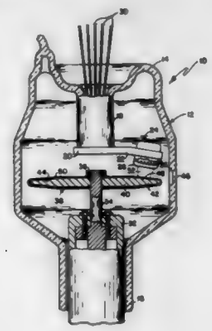
1. An X-ray analysis apparatus, comprising an X-ray source, a sample holder, a crystal holder, an X-ray detection device, and moving means for displacing an orienting said crystal holder and said detection device with respect to one another relative to said X-ray source
wherein said moving means comprises
a main guide,
a main slide displaceable along said main guide, said crystal holder being movable with said main slide,
a detector guide rotatably connected with said main slide,

a detection slide displaceable along said detector guide, said detection device being mounted on said detection slide,
a first arm rotatably connected between an axis of rotation of said X-ray source relative to an end of said main guide and a common central axis,
a second arm rotatably connected between said main slide at said crystal holder and said common central axis, and



a third arm rotatably connected between said detection slide and said common central axis,
wherein said main slide includes a first drive motor means for displacing said main slide along said main guide, said drive motor means including a friction clutch and a pretensioned roller structure contacting guide surfaces of said main guide, said roller structure being coupled by said friction clutch to said motor means.

4,637,042
X-RAY TUBE TARGET HAVING ELECTRON PERVIOUS COATING OF HEAT ABSORBENT MATERIAL ON X-RAY EMISSIVE SURFACE
Martin Braun, San Jose, Calif., assignor to The Machlett Laboratories, Incorporated, Stamford, Conn.
Continuation of Ser. No. 141,526, Apr. 18, 1980, abandoned, which is a continuation of Ser. No. 962,444, Nov. 20, 1978, abandoned. This application Oct. 5, 1981, Ser. No. 308,879
Int. Cl.[4] H01J *35/08*
U.S. Cl. 378—143 10 Claims



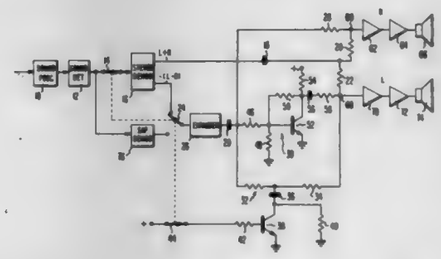
1. An X-ray tube target including:
a body having focal spot surface portion made of X-ray emissive material comprised of one or more elements having respective atomic numbers greater than forty; and
a heat absorbent coating of electron pervious material on the focal spot surface portion and consisting of one or more elements having respective atomic numbers no greater than thirty.

4,637,043
X-RAY SHEET FILM CASSETTE FOR APPLICATION TO ANGULAR BODY PARTS
Walter Bauer, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Jan. 7, 1985, Ser. No. 689,557
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401577
Int. Cl.[4] G03B *42/04*
U.S. Cl. 378—188 8 Claims



1. An X-ray sheet film cassette for taking pictures of a part of patient's body which forms an angle with another body part, comprising a receptacle in the form of a flat quadrangular prism for receiving an X-ray sheet film, the receptacle having a bottom wall, side walls and a cover: said bottom wall supporting said sheet film on its inner surface while its outer surface being engageable with the part of the patient's body; one of said side walls being reduced in thickness relative to the remaining walls and having a flat outer surface engageable with the other part of patient's body; a hinge mount secured to upper part of said one side wall and to an edge of said cover to turn the cover between an open and a closed position, said hinge projecting above the inner surface of a lower part of said one side wall; a resilient pressure means arranged on the inner surface of said cover and having a leading edge portion engaging during the turning movement of said cover said sheet film and displacing the same into abutment against said lower part of said one side wall and in the closed position of said cover, said pressure means holding said sheet film on said bottom wall.

4,637,044
PHASE SELECTABLE CIRCUIT FOR USE IN A STEREO DEMODULATOR
Abraham E. Rindal, Largo, Fla., assignor to RCA Corporation, Princeton, N.J.
Filed Apr. 16, 1984, Ser. No. 600,881
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—4 14 Claims



9. Apparatus for coupling a signal between an input and an output with a selected one of first and second opposite phases comprising:
a first path conveying said signal between said input and said output with a first magnitude and with a first polarity; and
a second path coupled in parallel with said first path and

including switch means for determining that in a first position of said switch means said second path conveys substantially no signal between said input and said output and in a second position of said switch means said second path conveys said signal between said input and said output with a magnitude greater than said first magnitude and with a second polarity opposite to said first polarity.

4,637,045

SPEECH RECOGNITION SYSTEM FOR AN AUTOMOTIVE VEHICLE

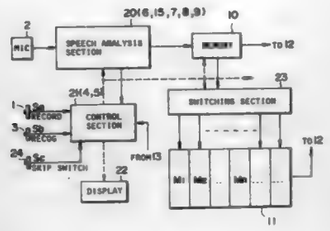
Kazunori Noso, Yokosuka; Norimasa Kishi, Yokohama, and Toru Futami, Yokosuka, all of Japan, assignors to Nissan Motor Company, Japan

Continuation of Ser. No. 428,231, Sep. 29, 1982, abandoned. This application Dec. 17, 1985, Ser. No. 809,882

Claims priority, application Japan, Oct. 22, 1981, 56-167948

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—43 **13 Claims**



1. A speech recognition system for an automotive vehicle for activating vehicle actuators in response to predetermined spoken instructions supplied to the system vin a microphone, which comprises:

(a) a manually controlled record switch for deriving a record signal when activated;

(b) a manually controlled recognition switch for deriving a recognition signal when activated;

(c) a speech recognizer for sequentially recording a plurality of reference spoken instructions whenever one reference spoken instruction is supplied to the system through the microphone while said record switch is activated, a memory having a storage area for each spoken instruction, means for shifting access to each storage area for each spoken instruction has been recorded in the storage area provided therefore, means for activating a plurality of vehicle actuators sequentially whenever one recognition spoken instruction is supplied to the system via the microphone while said recognition switch is activated and when the spoken instruction to be recognized is similar to the reference spoken instruction; and

(d) means for deriving skip instruction signal and for coupling the skip instruction signal to the speech recognizer to shift access from a currently accessed storage area for recording a current reference spoken instruction to a succeeding storage area for recording a succeeding reference spoken instruction even when the current reference spoken instruction is not supplied to the system through the microphone.

4,637,046

SPEECH ANALYSIS SYSTEM

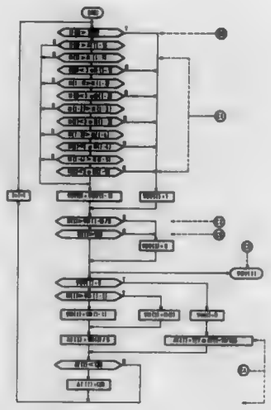
Robert J. Sluijter, and Hendrik J. Kotmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 21, 1983, Ser. No. 487,389

Claims priority, application European Pat. Off., Apr. 27, 1982, 82200501.3

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—49 **2 Claims**



1. In a speech analysis system comprising means for converting an input analog speech signal into a digital speech signal, means for storing segments of said digital speech signal, means for transforming each segment into a sequence of spectrum components, which means comprise means for performing a discrete Fourier transformation, whereby a series of amplitude spectrum each consisting of a sequence of spectrum components is produced, a bistable indicator settable to indicate a period of voiced speech and resettable to indicate a period of unvoiced speech or the absence of speech, and programmable computing means programmed to carry out the process including the steps of:

determining for each segment (number I) the peak value (M(I)) of the spectrum components of the relevant amplitude spectrum in a low frequency band of about 200–800 Hz,

determining, if said indicator is set, for each segment and a number of preceding segments the maximum value (VM(I)) of the peak values M(n), with n=I, I−1, . . . I+1−m, in which m is such that between segments I and I+1−m there is no change in the state of the indicator,

determining for each segment an adaptive threshold (AT(I)) by setting AT(I) equal to a fraction of the maximum value VM(I) if said indicator is set and by setting AT(I) equal to a fraction of AT(I−1) if said indicator is reset,

setting the bistable indicator if the peak values M(n) with n=I, I−1, . . . I+1−k, wherein k is a predetermined number, increase monotonically for increasing values of n, by more than a given factor and M(I) exceeds the adaptive threshold AT(I−1), and

resetting the bistable indicator if the peak value M(I) is smaller than a given fraction of the maximum value VM(I−1) or is smaller than a predetermined threshold.

4,637,047

LEVEL INDICATION APPARATUS FOR DIGITALLY ENCODED AUDIO SIGNAL DATA

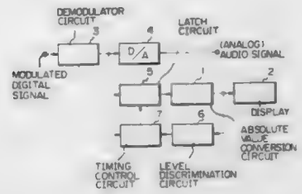
Nobuo Haino, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 30, 1984, Ser. No. 666,306

Claims priority, application Japan, Nov. 1, 1983, 58-169559[U]

Int. Cl.⁴ H04R *29/00*

U.S. Cl. 381—58 **4 Claims**



1. A level indication apparatus for indicating the level of digitally encoded audio data, comprising:

latch circuit means for latching the bits of said digitally encoded audio data, to produce output signals corresponding respectively in logic level to said bits;

level discrimination means coupled to said latch circuit means output signals for producing output signals indicative of the level of said digitally encoded audio data;

timing control circuit means coupled to said latch circuit means for implementing repetitive latching operations thereof, and responsive to said level discrimination means output signals for controlling the period of said latching operations in accordance with the level of said digitally encoded audio data; and

display means comprising a plurality of electro-optical display elements, each controlled by a corresponding one of said latch circuit means output signals such as to be selectively set into first and second display states in accordance with the logic level of said corresponding latch circuit means output signal.

4,637,048

METHODS AND APPARATUS FOR REDUCING NOISE BY CANCELLATION

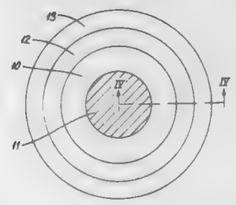
Malcolm A. Swinbanks, Pentlands Close, England, assignor to National Research Development Corp., London, England

Filed Mar. 5, 1985, Ser. No. 708,812

Claims priority, application United Kingdom, Mar. 7, 1984, 8405914

Int. Cl.⁴ G10K *11/16*

U.S. Cl. 381—71 **18 Claims**



1. Apparatus for reducing noise from a noise source which can be regarded as comprising, two spaced apart noise sources substantially in phase or in antiphase and of equal amplitude at respective frequencies, at which noise reduction is required, the apparatus comprising first generating means for generating sounds at first locations on the line joining the sources adjacent to the sources but not between them, and second generating means for generating sounds at second locations on the line, adjacent to the first locations but not between them, the sounds generated at each of the first locations and each of the second locations at the said frequencies being, in operation, substantially twice the amplitude of, and substantially of equal amplitude to, respectively, sound from each of the noise sources, and having a phase relationship which tends to cancel and reinforce, respectively, sound from the adjacent noise source.

4,637,049

CAR-MOUNTED AUDIO SYSTEM

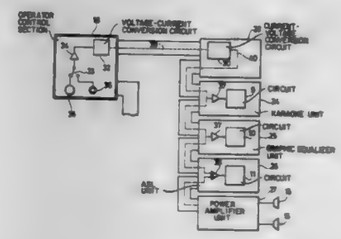
Yoshiro Kanagi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 10, 1985, Ser. No. 721,704

Claims priority, application Japan, Apr. 11, 1984, 59-53033[U]

Int. Cl.⁴ H04Q *5/00*

U.S. Cl. 381—86 **4 Claims**



1. A car-mounted audio system comprising:

a central control console including an operator control section, a display section and a mechanical drive section;

a plurality of audio signal processing units at separate locations connected to said central control console,

a single microphone and a single microphone amplifier mounted at said central control console said microphone adapted to detect running noise, pink noise and an audio signal and generating an output signal in response to such detection;

buffer amplifier means provided at each of said audio signal processing units for buffering signals received from said central control console; and

microphone signal bus means interconnecting said microphone amplifier at said central control console to said buffer amplifier means for supplying said output signal from said microphone in common to said plurality of audio signal processing units.

4,637,050

METHOD AND APPARATUS FOR SUPPRESSING INTERFERENCE IN A SIGNAL, IN PARTICULAR AN AUDIO SIGNAL

Fred Schradis, Mörikestr. 4, Reutlingen 1, Fed. Rep. of Germany (D-7410)

PCT No. PCT/DE84/00285, § 371 Date Oct. 18, 1985, § 102(e) Date Oct. 18, 1985, PCT Pub. No. WO85/03160, PCT Pub. Date Jul. 18, 1985

PCT Filed Dec. 31, 1984, Ser. No. 776,021

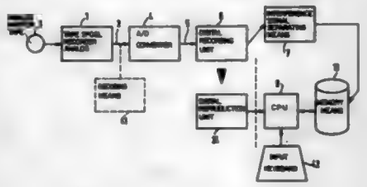
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1984, 3400103

Int. Cl.⁴ G11B *20/24*

U.S. Cl. 381—94 **22 Claims**

1. Method for suppressing interference in an original signal, in particular an audio signal, comprising a useful signal component and an interference signal component, characterized in that the original signal is digitally recorded with a sampling frequency corresponding at least to the essential information content of its useful signal component, that the interference signal component is detected and its level stored as reference interference signal with a sampling frequency corresponding at

least to a level change rate of the interference signal component under the control of a computer in phase synchronism with the recorded digitized signal, and that the recorded digi-



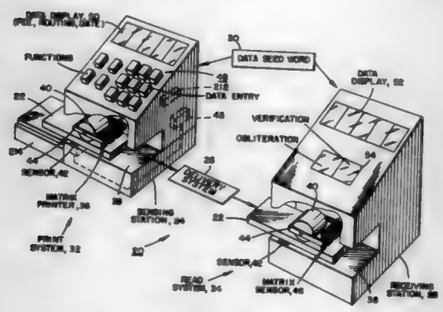
tized signal is processed with a speed independent of its recording speed and its interference signal component compensated under computer control in dependence upon the stored reference interference signal.

4,637,051

SYSTEM HAVING A CHARACTER GENERATOR FOR PRINTING ENCRYPTED MESSAGES

John I. Clark, Milford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 18, 1983, Ser. No. 515,073
Int. Cl.⁴ G06H 9/00
U.S. Cl. 382—1 **49 Claims**



1. In a device for printing marks of value, the device including printing means for printing alphanumeric indicia and means for control of the printing means for imprinting alphanumeric indicia representing a value, a system for verifying the validity of the imprinted indicia of value comprising:

means for adjusting the control means to modify at least a portion of a determined viaible characteristic of at least one alphanumeric character of the alphanumeric indicia in a predetermined manner without changing the identity of the character, said modification representing a function of the value represented by at least another character of the indicia, and means responsive to the adjusting means for causing the printing means to print the modified indicia, the modified indicia being an indication of validity of the indicia.

4,637,052

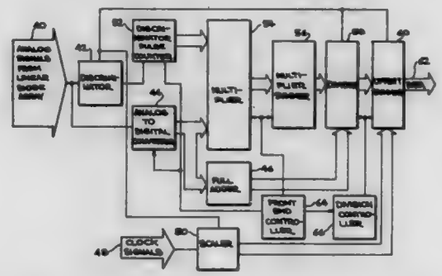
METHOD AND APPARATUS FOR ENHANCING MICROCHANNEL PLATE DATA

Robert S. Thoe, Livermore, Calif., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Oct. 24, 1983, Ser. No. 544,930
Int. Cl.⁴ G06K 9/00
U.S. Cl. 382—1 **5 Claims**

1. In a spectroscopic system for measuring an energy distribution of an emission from a continuously emitting source, which includes a collimator for collimating said emmission, a dispersive element for spatially resolving said emission by energy into a spectral particle distribution, an assemblage of one or more series employed microchannel plates disposed so that the particular location at which any said spectral particle hits the first said microchannel plate is determined by the energy of said spectral particle, a phosphor layer associated with said assemblage of microchannel plates for producing photons when struck by electrons generated by said assemblage of microchannel plates when hit by said spectral particles, a fiber-optics element for conducting said photons to a linear diode array with said linear diode array providing N channels of information that remain activated by said photons for only a limited and very short period of time with said channels consecutively numbered 1, 2, . . . , n, . . . , N and with each nth said channel containing an analog signal amplitude A_n and with all non-zero A_n values that are caused by a single said spectral particle occupying sequential and adjacent channels with no zero values therebetween, a first source providing a sequence of analog signals representative of said signal amplitudes A_n, and a second source providing a sequence of digital clock signals representative of said channel numbers n, an apparatus for determining the centroid channel locations $\Sigma nA_n/\Sigma A_n$ indicative of said energy distribution and combining said centroid channel locations into a distribution that is accurately indicative of the energy distribution of the emission from said continuously emitting source, said apparatus comprising:

means for sequentially interrogating said N channels at a very rapid scan rate and detecting non-zero A_n values;



means operative during each scan for generating a digital signal representative of p, the value of n immediately preceding that whereat A_n takes its first non-zero value;

means operative during each scan for converting said analog A_n signals to digital A_n signals;

means operative during each scan for joining said digital A_n signals to produce a digital signal representing ΣA_n;

means operative during each scan for making digital signals representative of 1, 2, . . . , m where m is the number of times that said detecting means detects a non-zero A_n value;

means operative during each scan for pairwise multiplying said digital 1, 2, . . . , m signals with said digital A_n signals to produce digital signals representing $1\ A_{p+1}, 2\ A_{p+2}, \ldots, m\ A_{p+m}$;

means operative during each scan for summing said digital $1\ A_{p+1}, 2\ A_{p+2}, \ldots, m\ A_{p+m}$ signals to produce a digital signal representing $\Sigma nA_n - p\Sigma A_n$;

means operative during each scan for rapidly dividing said digital $\Sigma nA_n - p\Sigma A_n$ signal by said digital ΣA_n signal to produce a digital signal representing $(\Sigma nA_n/\Sigma A_n) - p$;

means operative during each scan for adding said $(\Sigma nA_n/\Sigma A_n) - p$ signal to said p signal to produce a digital signal representing one of said centroid channel locations $\Sigma nA_n/\Sigma A_n$; and

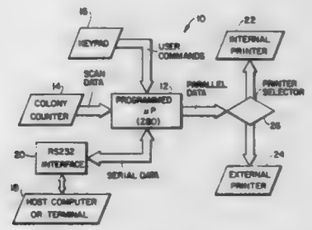
means for processing said digital signals, individually representing said centroid channel locations, made during many scans, into a measured distribution accurately indicative of the energy distribution of the emission from said continuously emitting source.

4,637,053

COMPUTER ASSISTED BIOLOGICAL ASSAY SYSTEM

Samuel Schalkowsky, Chevy Chase, Md., assignor to Spiral System Instruments, Inc., Bethesda, Md.

Filed May 3, 1984, Ser. No. 606,886
Int. Cl.⁴ G06K 9/00; C12Q 1/18
U.S. Cl. 382—6 **16 Claims**



1. In a system for counting the number of colonies in a segment of an area by scanning the area with a scanning spot, a method for determining the number of counts missed because of colony overlap to produce a corrected count indicative of the actual number of colonies in the segment comprising:

(a) scanning the segment with the scanning spot to determine a number of distinct colonies within the segment;

(b) determining the average diameter of the scanned colonies; and

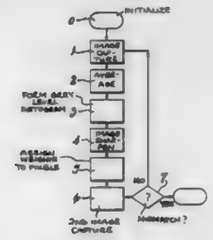
(c) calculating the corrected count of colonies within the segment as a function of the sensed number of distinct colonies, the computed average diameter and segment geometry.

4,637,054

INSPECTING ARTICLES

Abdullah Hashim, Leicester, Fed. Rep. of Germany, assignor to Kearney & Trecker Marwin Limited, Brighton, England

Filed Aug. 1, 1984, Ser. No. 636,498
Claims priority, application United Kingdom, Nov. 23, 1983, 8331248
Int. Cl.⁴ G06K 9/20
U.S. Cl. 382—8 **11 Claims**



1. A method for comparing the condition of an article at different times before and after subjecting the article to some operation, comprising the steps of

(a) forming a first image of the article before the said operation,

(b) storing said first image,

(c) forming a second image of the article after the said operation,

(d) predetermining what differences between said first and second images would be significant if detected, and

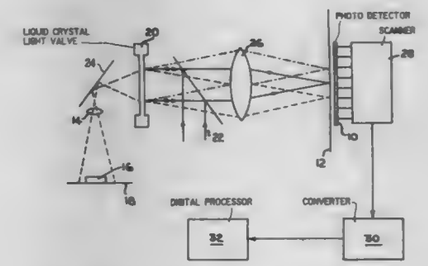
(e) comparing said stored first and said second images automatically to detect such significant differences.

4,637,055

ADAPTIVE PATTERN RECOGNITION

Peter J. Taylor, Cambridge, England, assignor to PA Consulting Services Limited, London, England

Filed May 25, 1984, Ser. No. 614,149
Claims priority, application United Kingdom, May 27, 1983, 8314778
Int. Cl.⁴ G06K 9/00
U.S. Cl. 382—31 **20 Claims**



1. An optical inspection system for analyzing the object content of a field of view comprising:

an optical system adapted to produce either from the said object content or an image thereof, a diffraction pattern;

a light level detection means on which the diffraction pattern is focussed for producing electrical signals corresponding to the light intensity at different points within the pattern;

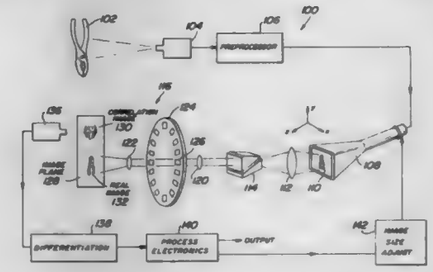
electrical circuit means response to said electrical signals comprising means for storing a plurality of different reference signal patterns and comparison means for comparing the electrical signals from the light level detection means produced from a subsequent field of view with each of the stored reference signal patterns to facilitate the identification of the subsequent signal pattern.

4,637,056

OPTICAL CORRELATOR USING ELECTRONIC IMAGE PREPROCESSING

Rand C. Sherman, Upper Arlington, and Daniel R. Grieser, Columbus, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Oct. 13, 1983, Ser. No. 541,407
Int. Cl.⁴ G06H 9/76
U.S. Cl. 382—31 **16 Claims**



1. Apparatus for incoherent optical correlation of a two-dimensional function, comprising:

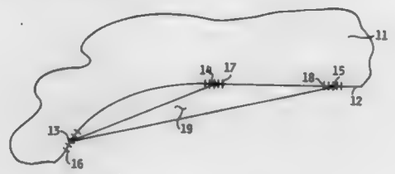
(a) means for generating a first electronic signal representative of said function;
(b) means for electronically performing at least one mathematical operation on said first electronic signal to derive a second electronic signal;
(c) means for electrically converting said second electronic signal into a two-dimensional spatially and temporally incoherent visual image, said two-dimensional visual image having an associated mathematical image function;
(d) imaging means for producing a secondary image of said two-dimensional visual image in an image plane, said second image likewise being spatially and temporally incoherent;
(e) means for generating an optical correlation function having
(i) first and second lens means arranged with their respective optical axes substantially in alignment, said first lens means being spaced apart from said imaging means such that said image plane and the focal plane of said first lens means coincide, the object of said first lens means being said two-dimensional spatially and temporally incoherent image, and
(ii) match optical filter means located between said first and second lens means, said filter means having a random phase distribution and a predetermined transfer function whose amplitude is the square root of the amplitude of said image function;
(f) optical detecting means located on the side of said second lens means opposite said filter means and at the image plane of said second lens means for detecting the optical correlation function generated by said first and second lens means and said filter means and generating a third electronic signal representative of said optical correlation function; and
(g) electronic analyzer means for analyzing said third electronic signal to determine the amplitude and position of the peak of the optical correlation function.

4,637,057
ROTATION OF DIGITAL IMAGES
Darius Kamsteeg, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jul. 30, 1984, Ser. No. 635,869
Int. Cl.[4] G06K 9/32
U.S. Cl. 382—46 4 Claims



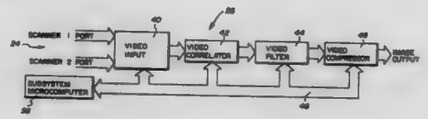
1. A method of rotating a digital image defined by a matrix of pixels A×B an angle ϕ where tangent $\phi = h/A$ wherein h is a number such that both A and B are divisable by h including the steps of:
a. Dividing the image into blocks of size a×b where $a = A/h$ and $b = B/h$;
b. Denote by i and j the columns and rows of a particular block with $0 \leq ij < A/h$;
c. Displace the (i, j) block by i pixels in the vertical direction and by j pixels in the horizontal direction; wherein the improvement comprises the steps of:
d. Scaling down the original image by a factor proportioned to cosine ϕ; and
e. Making each block in the original image at least one pixel wider to overlap with a neighbor block.

4,637,058
LOCATION OF OBJECTS WITHOUT USE OF SALIENT FEATURES
Joseph Ross, Fort Salonga, and Richard Schmidt, Huntington, both of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.
Filed Sep. 12, 1984, Ser. No. 649,687
Int. Cl.[4] G06K 9/20, 9/52
U.S. Cl. 382—48 2 Claims



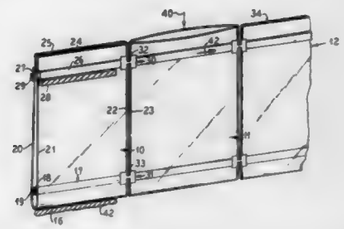
2. A method for uniquely locating an object based on the asymmetric properties of its surface comprising the steps of: selecting a master object similar to the object whose location is to be determined; defining quantitatively the master object by data points or by equations representative of the surface relative to a frame of reference; determining the number of points and locations upon said master object that form a unique location template with adequate sensitivity to positional error; measuring points on the object to be located, said points being in relative locations for providing a unique location template; and fitting the measured points to the master object surface as described by said quantitative definition step to establish the location of the object.

4,637,059
VIDEO FILTER FOR VIDEO FORMAT UNIT
Richard K. Habitzreiter, Dallas; Robert V. Pinney, Jr., Fort Worth, and Tony C. Thomas, Flower Mound, all of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.
Filed Aug. 13, 1984, Ser. No. 640,346
Int. Cl.[4] G06K 9/00
U.S. Cl. 382—54 3 Claims



1. A video filter for use in an image processing system having a video input, a video correlator, and a video compressor, comprising:
means for receiving two cells of video data from the video correlator at one time;
means for widening said two cells of received video data into four cells of data comprising black cells and white cells; and
means for filtering said four cells of data by determining whether there is a minimum density of said black cells or said white cells.

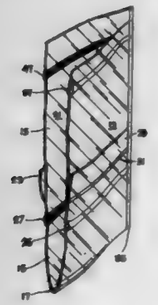
4,637,060
ZIPPER-LOCK BAG CHAIN ADAPTER FOR AUTOMATIC LOADING AND HEAT SEAL CLOSING
Steven Ausnit, New York, N.Y., assignor to Minigrip, Orangeburg, N.Y.
Continuation of Ser. No. 520,838, Aug. 5, 1983. This application Aug. 5, 1985, Ser. No. 762,811
Int. Cl.[4] B65D 30/00
U.S. Cl. 383—37 15 Claims



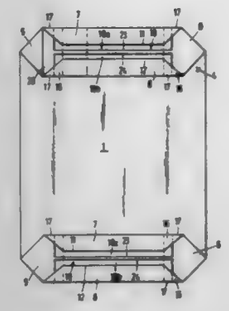
1. A chain of reclosable plastic bags comprising in combination:
a series of bags of extruded plastic material having front and rear walls and upper and lower ends, with reclosable pressure interlocking rib and groove elements on confronting faces at said lower end which will form the bag top when the bag is disassociated from the chain;
seams forming side edges of the bags with the bag walls being unattached along said upper end so that each bag may be filled by inserting contents between said edges;
a stiffening rib extruded integrally with said plastic material and projecting outwardly on each of said walls and extending in parallel relation adjacent to said unattached edges;
each of said ribs being of such a size and shape that they will cooperate to act as guides and supporting means during a bag filling operation;
said ribs being aligned along the bag chain but being discontinuous from one another at said seams;
each of said ribs providing a downwardly facing shoulder along its lower side for supporting and guiding the associated bag along upwardly facing shoulder means associated with means for filling the bags;
and interconnecting means in the form of a frangible link separably interconnecting adjacent bags at the location of said side seams and being aligned with the ribs, said link transmitting forces so that the tension on the rib is transmitted between adjacent bags.

4,637,061
SPECIMEN, SAMPLE COLLECTION AND TRANSPORT CONTAINER
J. Richard Riese, 1098 Queen Ann Dr., San Jose, Calif. 95129
Filed Dec. 20, 1985, Ser. No. 811,698
Int. Cl.[4] B65D 27/08, 33/24
U.S. Cl. 383—38 13 Claims

1. A unitary specimen, sample collection and transport container comprising,
a flexible rectangular bag having a fluid-tight bottom and having first and second generally parallel side walls, said side walls having joined side edges and free upper edges, said free upper edges defining an entrance to said bag, said walls each having an inner surface and an outer surface,
a leak-proof, repeatedly reclosable entrance fastener having a pair of linear mating portions, said mating portins fixed to opposed upper edges of said first and second walls to selectively seal said entrance, and
at least one leak-proof, repeatedly reclosable interior fastener disposed between the upper edges and said bottom, each interior fastener having a linear first mating portion and a linear second mating portion, said linear portions parallel to the linear mating portions of the entrance fastener, each first mating portion fixed to an inner surface of a wall, each second mating portion fixed to an inner surface of a wall opposite a first mating portion, said interior fasteners combining with said entrance fastener to define a plurality of selectively sealable chambers.



4,637,062
PLASTIC BAG ASSEMBLY INCLUDING A CONDUIT MEMBER
Josef Poppe, Tecklenburg, Fed. Rep. of Germany, assignor to Bischof und Klein GmbH & Co., Fed. Rep. of Germany
Filed Dec. 21, 1984, Ser. No. 684,666
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1983, 8337443[U]
Int. Cl.[4] B65D 30/24
U.S. Cl. 383—54 9 Claims



1. A plastic valve bag comprising:
a bag tube closed at both ends by a bottom closure and a top closure, said closures each comprising opposite pairs of corner flaps and side flaps, an inner closure sheet and an outer cover sheet, said top closure additionally comprising a valve member disposed on one of said corner flaps, a width of each of said side flaps measured transversely of said closures having less than half a width of said closures; said inner closure sheet having a width exceeding a transverse dimension of closures which is comprised of the width of each of said closures and the added widths of said two side flaps thereof; said pairs of corner flaps and side flaps, said inner closure sheet, said outer cover sheet and said valve member being bonded to said closures by adhesive coatings of a tacky contact adhesive type, said adhesive coatings being disposed peripherally along edges of said bag tube at both ends thereof and on an inner side of said cover sheet, said inner closure sheet itself being kept free of any adhesive coating and being bonded in each of said closures by part of said peripherally-disposed bag

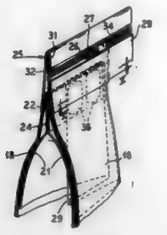
tube adhesive coating and said cover sheet adhesive coating.

4,637,063

RECLOSABLE BAG WITH SEALED LAMINATED LINER AND METHOD

Brian P. Sullivan, Shelbyville; Larry T. Dennis, Greenwood, and Robert A. Ferrell, Shelbyville, all of Ind., assignors to KCL Corporation, Shelbyville, Ind.

Filed Mar. 4, 1985, Ser. No. 707,594
Int. Cl.[4] B65D *33/16*
U.S. Cl. 383—61 **26 Claims**



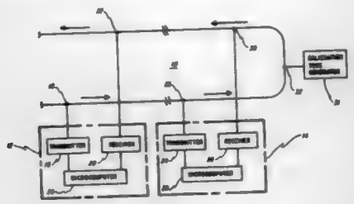
1. A bag structure, comprising:
a bag body having a top with an opening for access into the bag;
a liner on the inside of said bag body and having a closed top within the bag body top providing a primary closure for the bag and which must be opened for access to contents within the bag;
a secondary closure comprising reclosable fastener means carried by said bag body top above said primary closure for selectively opening and closing said top opening; and
said bag body comprising a plurality of paper plys and said liner comprising a plastic film complementary to an inner ply of the bag body and attached to said inner ply at a bottom end of said bag body, and free from said inner ply at said bag top.

4,637,064

LOCAL AREA NETWORK EQUALIZATION SYSTEM AND METHOD

Richard D. Roberts, and William D. Walker, both of Palm Bay, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Apr. 10, 1985, Ser. No. 721,974
Int. Cl.[4] H04B *1/54, 17/00*
U.S. Cl. 455—67 **28 Claims**



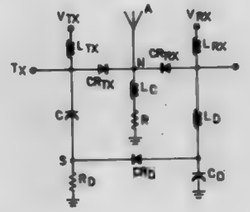
1. In a communications network including a plurality of gain-adjustable transmitters, a plurality of gain-adjustable receivers, and a communications medium, wherein each one of said plurality of gain-adjustable transmitters is associated with one of said plurality of gain-adjustable receivers and wherein the plurality of transmitters and receivers communicate with each other via the communications medium, said communications network comprising:
means for providing a calibration signal at a common point of the communications medium;
means responsive to said calibration signal for adjusting the gain of at least one of the plurality of receivers as a function of a preselected characteristic of said calibration signal;
means for enabling the transmitter associated with said at least one receiver to transmit a test signal to said at least one receiver via said common point; and
means in said at least one receiver for receiving said test signal and for adjusting the gain of said transmitter associated with said at least one receiver as a function of a preselected characteristic of said test signal received by said at least one receiver.

4,637,065

BROADBAND SOLID STATE ANTENNA SWITCH

John S. Ruppel, North Richland Hills, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 607,531, May 7, 1984, abandoned. This application Apr. 14, 1986, Ser. No. 851,992
Int. Cl.[4] H04B *1/48*
U.S. Cl. 455—78 **10 Claims**



1. A broadband solid state RF switch circuit for electrically coupling a common signal path alternately to a transmitter and to a receiver and having a high power handling capability while utilizing relatively low supply voltage, the RF switch circuit comprising in combination:
first selective conducting means for electrically coupling a first signal energy path to said common signal path and controlled by a first biasing voltage;
second selective conducting means for electrically coupling a second signal energy path to said common signal path in alternate fashion to said first selective conducting means and controlled by a second biasing voltage; and
strong RF signal detecting means electrically coupled to said second selective conducting means for providing a reverse bias voltage electrically coupled back to said first selective conducting means,
said strong RF signal detecting means adaptively tracking the magnitude of said strong RF signal at said second selective conducting means to supply adequate, variable, reverse bias voltage thereto, thereby ensuring that said first selective conducting means remains switched off to enhance the power handling capability thereof.

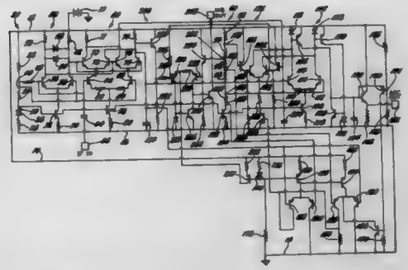
4,637,066

NOISE BLANKING SIGNAL GENERATOR FOR AM RADIO

Richard A. Kennedy, and Fredrick A. Aldridge, both of Russiaville, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 2, 1985, Ser. No. 751,207
Int. Cl.[4] H04B *1/10*
U.S. Cl. 455—223 **4 Claims**

1. A noise blanking signal generator for an AM radio receiver, comprising, in combination:
a product detector adapted to receive an IF signal modulated by an AF signal and synchronously detect the AF signal;
a first low pass filter adapted to derive from the product detector a filtered voltage indicating the average IF signal strength;
a second low pass filter adapted to derive from the product detector an AF signal voltage;
a reference voltage generating circuit ratiometrically related to the product detector through a common DC power supply and effective to generate a reference voltage substantially equal to the filtered voltage in the absence of an IF signal;
a voltage divider comprising a pair of resistors connected in series across the outputs of the first and second low pass filters and having an output at the junction of the resistors,



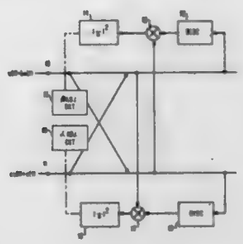
the resistors being of such ratio as to generate at the voltage divider output, for a predetermined modulation index of the IF signal modulated by the AF signal, a voltage equal to the reference voltage;
a comparator effective to compare the voltage at the output of the voltage divider with the reference voltage and generate a noise blanking signal when the former exceeds the latter; and
offset means effective to bias the comparator to not generate the noise blanking signal when the voltage at the output of the voltage generator does not exceed the reference voltage.

4,637,067

BOOTSTRAPPING CROSS-POLARIZATION CANCELER WITH A NOISE-BLANKING LIMITER

Michael L. Steinberger, Colts Neck, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 27, 1985, Ser. No. 749,297
Int. Cl.[4] H04B *1/10*
U.S. Cl. 455—295 **7 Claims**



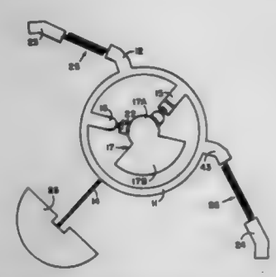
1. A cross-polarization canceler comprising:
a first and a second rail (10, 11) capable of propagating a first and a second signal, respectively, between a respective first and second input terminal and a first and second output terminal, each of said first and second signals including a first and second orthogonally polarized signal, respectively, and a cross-polarized component of the respective second and first orthogonally polarized signal;
a first and a second cross-over path interconnecting the first and second rail and the second and first rail, respectively;
a noise-blanking limiter (12 or 16) disposed to receive a signal propagating in the first rail at a point after the interconnections of the first and second cross-over paths for discriminating between the first orthogonally-polarized signal and the cross-polarized component of the second orthogonally-polarized signal;
a first correlation detector means (13 or 17) responsive to the output signal of the noise-blanking limiter and the signal propagating on the second rail for providing an output signal representative of the correlation measurement between each of the two signals;
a second correlation detector means (17 or 13) responsive to the first and second signals propagating on the first and second rail for providing a correlation measurement between the two signals; and
processing means (15, 19, 57, 115) disposed in the first and second cross-over paths and responsive to the correlation measurements from the first and second correlation means for providing a separate output signal in the first and second cross-over path which when combined with the signal propagating in the second and first rail, respectively, will substantially reduce any cross-polarization component forming part of the first and second signals.

4,637,068

RING HYBRID MIXING

Ian Crossley, Andover; Daniel Donoghue, Tewksbury; Steven Mittleman, Framingham, and Seth Nash, Boston, all of Mass., assignors to Alpha Industries, Inc., Woburn, Mass.

Filed Feb. 8, 1985, Ser. No. 699,918
Int. Cl.[4] H04B *1/26*
U.S. Cl. 455—327 **5 Claims**



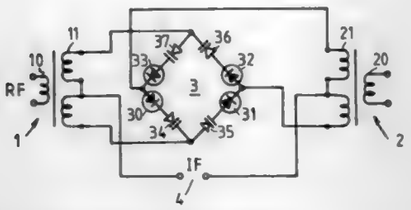
1. In a hybrid ring mixer having on an insulating substrate a conducting loop and conductors spaced along the loop extending outward therefrom comprising ports, the improvement comprising,
at least one conducting portion extending radially inward of said conducting loop defining a mixer diode port,
a central conductor on said substrate inside said loop,
and a semiconductor device connected between said central conductor and said conducting portions extending inward,
wherein said conducting loop and conductors are mounted upon a front side of said insulating substrate formed with a via opening and having its back side conductively coated including the region around said via opening to establish conductive contact between the conductor on said back side and said central conductor.

4,637,069

DOUBLY BALANCED DIODE MIXER COMPRISING A RING MODULATOR EACH LEG OF WHICH COMPRISES A HIGH SPEED CONVENTIONAL DIODE IN SERIES WITH AT LEAST ONE DIODE OF THE "VARACTOR" KIND

Roger Charbonnier, Meudon Bellevue, France, assignor to Adret Electronique, France

Filed Mar. 21, 1985, Ser. No. 714,401
Claims priority, application France, Mar. 26, 1984, 84 04634
Int. Cl.[4] H04B *1/26*
U.S. Cl. 455—330 **9 Claims**



1. A double balanced mixer comprising:

i—a four leg ring modulator having four identical rectifying legs with each leg comprising a high speed diode connected in series with at least an additional diode different from said high speed diode and having an intrinsic resistance of the same order of magnitude as that of a perfect junction and with an accumulated charge of at least several nanocoulombs; the respective high speed diodes and additional diodes of the respective legs being arranged in a common current flow direction around the four leg ring modulator and four ring modulator terminals being each positioned between two of the said legs;

ii—a first signal input transformer having a primary winding and a balanced center tapped secondary winding with opposite terminals connected to a first opposite pair of said ring modulator terminals;

iii—a second signal input transformer having a primary winding and a balanced center tapped secondary winding with opposite terminals connected to a second opposite pair of said ring modulator terminals; and

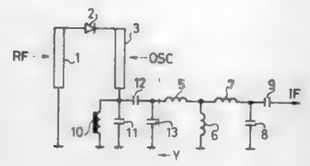
iv—a pair of output terminals connected to the respective center tappings of the secondary winding of the respective first and second input transformers.

4,637,070

UHF MIXING CIRCUIT HAVING π CONFIGURED IMPEDANCE CONVERTER

Shigetoshi Matsuta, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Aug. 11, 1983, Ser. No. 522,470
Claims priority, application Japan, Aug. 12, 1982, 57-123037[U]
Int. Cl.[4] H03H *11/28*
U.S. Cl. 455—331 **4 Claims**



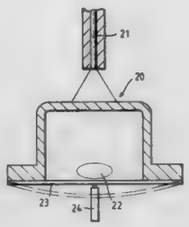
1. In a UHF mixing circuit having a diode mixer providing an output to the input of a double-tuned filter circuit, the improvement comprising a π-type impedance converter consisting of capacitors connected in π-shaped configuration coupled between the output of said diode mixer and the input to said double-tuned filter circuit.

4,637,071

OPTICAL ACTUATOR

Gillies D. Pitt, Saffron Walden; David N. Batchelder, London; Roger E. Jones, Little Shelford, and Rosamund C. Neat, London, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 28, 1984, Ser. No. 675,677
Claims priority, application United Kingdom, Nov. 30, 1983, 8331952
Int. Cl.[4] H04B *9/00*; F16K *31/00, 31/18*
U.S. Cl. 455—603 **4 Claims**



1. A remotely-controlled actuator, which includes:

an input connection formed by an optical fiber over which optical power is received when the actuator is in use;

a cell aligned with said optical fiber and having a heat absorbent surface adjacent said optical fiber so that said surface is heated in response to light energy received via said optical fiber falling on said surface, said cell further having a diaphragm forming a wall thereof which closes the cell;

a volatile liquid within said cell which evaporates upon said surface being heated to cause said diaphragm to bulge outwardly in a first direction, said diaphragm being returnable to its initial position by moving in a second direction when said evaporated liquid cools down; and

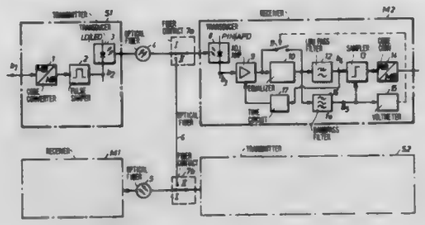
a rod fixed to the outer surface of said diaphragm which moves in said first direction when said diaphragm bulges in said first direction and in said second direction when said diaphragm returns to said initial position in said second direction.

4,637,072

METHOD OF MEASURING THE DISPERSION OF A TRANSMITTING OPTICAL FIBRE

Berg, Hellström, Farsta, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Nov. 8, 1984, Ser. No. 669,765
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—607 **3 Claims**



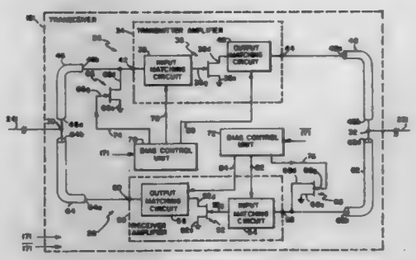
1. In an optical data transmission system having two terminals wherein a transmitter in a first terminal is connected by an optical fibre to a receiver of a second terminal and a transmitter in the second terminal is connected by another optical fibre to a receiver in the first terminal and data is transmitted between the terminals as light signals representing digital information coded according to a binary line code under control of a system clock signal of a given frequency, whereby the light signals have a frequency spectrum containing a discrete frequency component for the system clock frequency, the method of measuring the mode dispersion of at least one of the optical fibres comprising the steps of, during the transmission of light signals representing clocked digital information coded according to the binary code from the transmitter in the first terminal to the receiver in the second terminal, measuring the magnitude (A_1) of the discrete frequency component for the system clock signal in said light signals, transmitting other light signals representing clocked digital information coded according to the binary code from the transmitter in the second terminal to the receiver in the second terminal, during the transmission of said other light signals measuring the magnitude (A_2) of the discrete frequency component for the system clock signal in said other light signals, and utilizing the ratio of said magnitudes (A_2) and (A_1) to obtain the mode dispersion factor for at least the optical fibre connecting the transmitter in the first terminal to the receiver in the second terminal.

4,637,073

TRANSMIT/RECEIVE SWITCH

John R. Selin, Stow, and Donald N. Jensen, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 25, 1984, Ser. No. 624,490
Int. Cl.[4] H04B *1/44*; H01P *1/10*; H03G *9/00*
U.S. Cl. 455—78 **24 Claims**



1. In combination:

means for amplifying an applied signal and operating with a relatively high output impedance when power is applied thereto, such means being inhibited from amplifying the applied signal when power is removed therefrom;

means, responsive to a control signal, for switchably applying power to the amplifying means during a first operating mode and removing power from the amplifying means during a second operating mode to switch the relatively high output impedance of such amplifying means to a relatively low output impedance; and

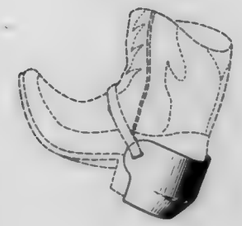
means for coupling the amplified signal to an output port during the first operating mode, and for transforming the relatively low output impedance to a relatively high impedance at the output port during the second operating mode.

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DESIGNS

JANUARY 13, 1987

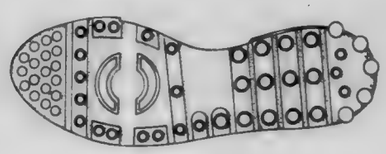
287,660
BOOT HEEL PROTECTOR
James R. Strickland, 4125 S. 570 E., 16L, Salt Lake City, Utah 84107
Filed Jun. 5, 1984, Ser. No. 617,484
Term of patent 14 years
U.S. Cl. D2—277



287,661
ATHLETIC SHOE SOLE
Raymond F. Tonkel, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., Chesterfield, Mo.
Filed Jun. 8, 1984, Ser. No. 618,914
Term of patent 14 years
U.S. Cl. D2—320



287,662
CLEATED SOLE FOR ATHLETIC SHOE
Raymond F. Tonkel, Maryland Heights, Mo., assignor to Kangaroos U.S.A., Inc., Chesterfield, Mo.
Filed Jun. 12, 1984, Ser. No. 619,930
Term of patent 14 years
U.S. Cl. D2—320



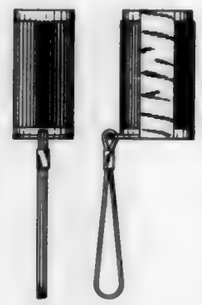
287,663
SHOE SOLE
Lin Yung-Mao, Taichung City, Taiwan, assignor to Autry Industries, Inc., Dallas, Tex.
Filed Jul. 9, 1984, Ser. No. 629,001
Term of patent 14 years
U.S. Cl. D2—320



287,664
FASHION ACCESSORY BELT
Susan Sherwood, and Terry Bonadonna, both of 127 Norwood Ave., Northport, N.Y. 11768
Filed Apr. 16, 1984, Ser. No. 601,040
Term of patent 14 years
U.S. Cl. D2—627

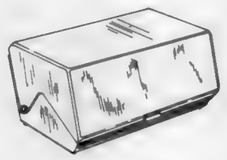


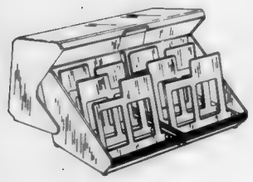
287,665
UMBRELLA HANDLE
Ann S. Cala, Cincinnati, Ohio, assignor to 'totes', incorporated, Loveland, Ohio
Filed Nov. 5, 1984, Ser. No. 668,207
Claims priority, application Taiwan, Mar. 6, 1985, 74301063
Term of patent 14 years
U.S. Cl. D3—12



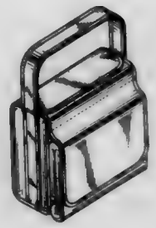


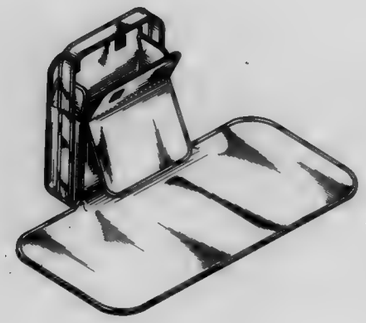
287,666
STORAGE AND DISPLAY CONTAINER FOR FLOPPY DISKETTES
Jerry M. Long, Pleasanton, and James A. Womack, Los Gatos, both of Calif., assignors to Innovative Concepts, Inc., San Jose, Calif.
Filed May 18, 1984, Ser. No. 611,843
Term of patent 14 years
U.S. Cl. D3—35



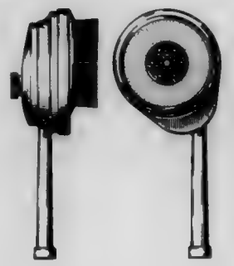


287,667
TOTE BAG
Janet F. Cathcart, 2210 Wilshire Blvd., #314, Santa Monica, Calif. 90403, and Kathleen Ingersoll, 2002 E. 20th St., Santa Ana, Calif. 92701
Filed Jul. 2, 1984, Ser. No. 626,975
Term of patent 14 years
U.S. Cl. D3—42

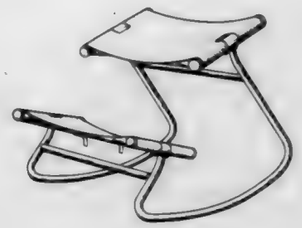




287,668
WATER-POWERED BRUSH
David P. Keddie, Brookfield, and Gordon D. Kelly, Elm Grove, both of Wis., assignors to Hempe Manufacturing Co., New Berlin, Wis.
Filed Aug. 27, 1984, Ser. No. 644,577
Term of patent 14 years
U.S. Cl. D4—115



287,669
CHAIR
Peter Opsvik, Högtunveien 12, Asker, Norway (1370)
Filed Apr. 2, 1984, Ser. No. 595,987
Term of patent 14 years
U.S. Cl. D6—330



287,670
CHILD'S SAFETY SEAT FOR AN AUTOMOBILE
Kenzou Kasai, Osaka, Japan, assignor to Aprica Kasai Kabushikikaisha, Osaka, Japan
Filed Jun. 18, 1984, Ser. No. 621,804
Claims priority, application Japan, Mar. 8, 1984, 59-9187
Term of patent 14 years
U.S. Cl. D6—333



287,671
HANGING CHAIR
Oliver R. Bock, P.O. Box 257, San Geronimo, Calif. 94963
Filed Jul. 27, 1984, Ser. No. 635,124
Term of patent 14 years
U.S. Cl. D6—347



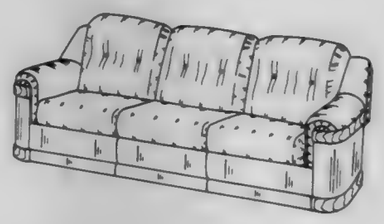
287,672
CHAIR
Steven Holl, New York, N.Y., assignor to Pace Collection Inc., Long Island City, N.Y.
Filed Sep. 14, 1984, Ser. No. 650,795
Term of patent 14 years
U.S. Cl. D6—370



287,673
CHAIR
Caspar C. Verschuren, Rijen, Netherlands, assignor to Industrial Mouldings, B.V., Rijen, Netherlands
Filed Feb. 29, 1984, Ser. No. 584,753
Claims priority, application Benelux, Sep. 8, 1983, 58214-00
Term of patent 14 years
U.S. Cl. D6—379



287,674
SEAT
Deborah L. Nelson, P.O. Box 299, High Point, N.C. 27261
Filed Jun. 20, 1983, Ser. No. 505,500
Term of patent 14 years
U.S. Cl. D6—381



287,675
CABINET ENCLOSURE FOR CENTRAL OFFICE TELEPHONE EQUIPMENT
George M. Jande, Wheaton, Ill., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.
Filed Dec. 24, 1984, Ser. No. 685,416
Term of patent 14 years
U.S. Cl. D6—432



287,676
FILE CABINET
Andreas Christen, Zurich, Switzerland, assignor to H.W. Zarnuhle AG, Richterswil, Switzerland
Filed Nov. 9, 1984, Ser. No. 669,951
Claims priority, application Hague, Jun. 1, 1984, 74101
Term of patent 14 years
U.S. Cl. D6—446



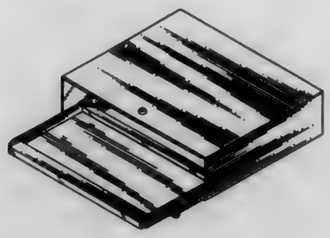




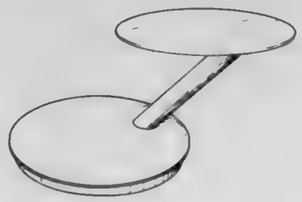
287,677
TABLE
Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.
Filed Aug. 10, 1984, Ser. No. 639,785
Term of patent 14 years
U.S. Cl. D6—449



287,678
COMPUTER STAND WITH SLIDING KEYBOARD SHELF
David O. Hatcher, Eggertsville, and Walter N. Fudala, Cheektowaga, both of N.Y., assignors to Posting Equipment Corporation, Buffalo, N.Y.
Continuation-in-part of Ser. No. 599,985, Apr. 12, 1984, abandoned. This application Aug. 2, 1984, Ser. No. 636,930
Term of patent 14 years
U.S. Cl. D6—474



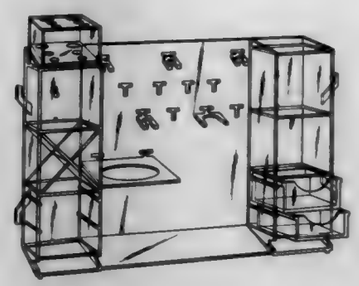
287,679
TABLE
Paul R. Evans, New Hope, Pa., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Apr. 10, 1984, Ser. No. 598,824
Term of patent 14 years
U.S. Cl. D6—483



287,680
SERVING TABLE
Kenneth W. Loungren, R.R. 1, Box 604F, Robin Hollow Rd., West Greenwich, R.I. 02816
Filed Jul. 31, 1984, Ser. No. 636,607
Term of patent 14 years
U.S. Cl. D6—485

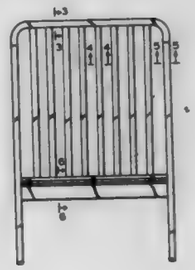


287,682
ORGANIZER CABINET FOR MEN'S TOILETRY ITEMS
Howard Sussman, 3101 NW. 25th Ave., Pompano Beach, Fla. 33060
Filed Apr. 10, 1984, Ser. No. 598,723
Term of patent 14 years
U.S. Cl. D6—524





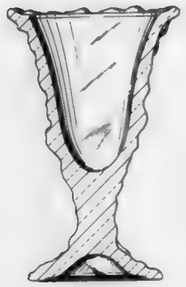
287,681
CRIB FOOTBOARD
Merlin A. Brunner, New London, and Harvey J. Draheim, Weyauwega, both of Wis., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Apr. 23, 1984, Ser. No. 602,998
Term of patent 14 years
U.S. Cl. D6—505



287,683
DECAL FOR A PLATE OR SIMILAR ARTICLE
Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Dec. 23, 1983, Ser. No. 564,895
Term of patent 14 years
U.S. Cl. D7—39

287,684
DESSERT DISH OR SIMILAR ARTICLE
Wayne Hastad, Tiburon, Calif., assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Dec. 5, 1983, Ser. No. 557,891
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1983, URA1139/83
Term of patent 14 years
U.S. Cl. D7—22

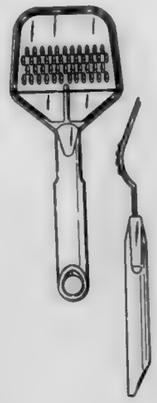




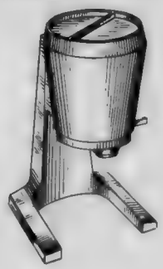


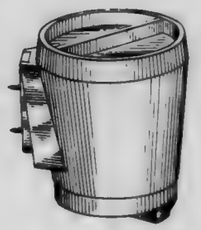


287,685
FOOD PROCESSING DEVICE
Jan Jonsson, Hantverksvägen 8, S-184 00 Åkersberga, and Ernst A. O. Strömberg, Wittstockagatan 3B, S-115 24 Stockholm, both of Sweden
Filed Apr. 24, 1984, Ser. No. 603,418
Claims priority, application Sweden, Nov. 1, 1983, 83-2836
Term of patent 14 years
U.S. Cl. D7—47



287,686
COFFEE DISPENSER
Robert W. Larson, 3032 S. Euclid Ave., Berwyn, Ill. 60402; Edward C. Schwass, 2350 Waterfall, Hanover Park, Ill. 60103, and Gary W. Larson, 3032 S. Euclid Ave., Berwyn, Ill. 60402
Filed Jul. 19, 1984, Ser. No. 632,414
Term of patent 14 years
U.S. Cl. D7—76



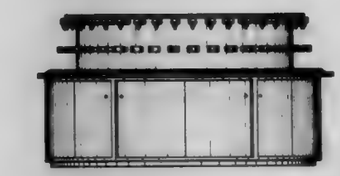


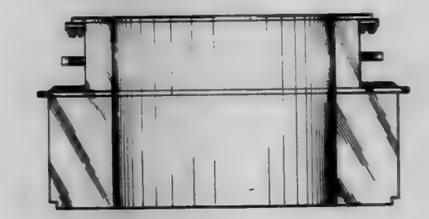
287,687
ARTICLE OF FLATWARE
Horst Schultz, Frankfurt, Fed. Rep. of Germany, assignor to AMC International Alfa Metalcraft Corporation AG, Rotkreuz, Switzerland
Filed Apr. 5, 1983, Ser. No. 482,348
Claims priority, application Switzerland, Oct. 6, 1982, DM/001 866
Term of patent 14 years
U.S. Cl. D7—150



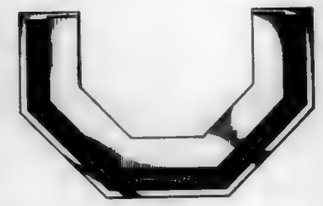
287,688
COMBINED MULTIPLE LIQUID DISPENSER AND CABINET
George H. Mortimer, Provo, Utah, assignor to Carb-A-Drink International, Inc., Salt Lake City, Utah
Filed Jul. 23, 1984, Ser. No. 633,418
Term of patent 14 years
U.S. Cl. D7—307

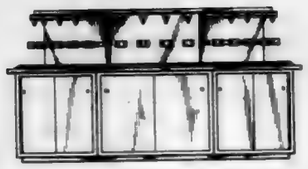






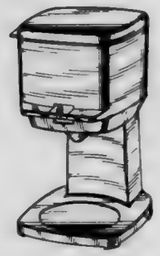
287,689
COMBINED MULTIPLE LIQUID DISPENSER AND CABINET
George H. Mortimer, Provo, Utah, assignor to Carb-A-Drink International, Inc., Salt Lake City, Utah
Filed Jul. 23, 1984, Ser. No. 633,181
Term of patent 14 years
U.S. Cl. D7—307



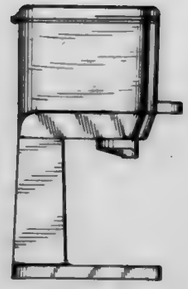




287,690
LIQUID HEATER AND DISPENSER FOR BEVERAGES OR THE LIKE
Norman A. Steinkamp, LaGrange Park, Ill., assignor to John Zink Company, Tulsa, Okla.
Filed Jul. 24, 1984, Ser. No. 634,233
Term of patent 14 years
U.S. Cl. D7—309



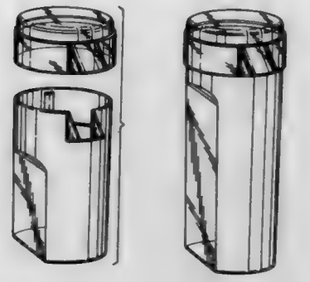




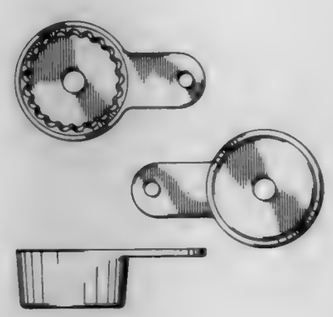
287,691
COVERED PITCHER OR THE LIKE
Rino Conti, Stoughton, Mass., and Jody A. Trivison, Wooster, Ohio, assignors to Dart Industries Inc., Northbrook, Ill.
Filed Feb. 10, 1984, Ser. No. 579,070
Term of patent 14 years
U.S. Cl. D7—317



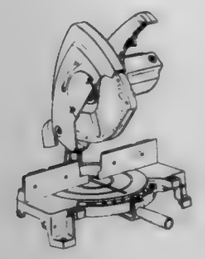




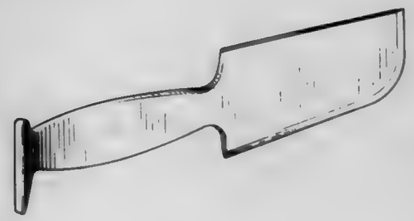
287,693
COMBINED BOTTLE CAP AND LIFT TAB OPENER
Raymond C. Janiszeski, 5326 W. Maui La., Glendale, Ariz. 85306
Filed Jun. 28, 1984, Ser. No. 625,702
Term of patent 14 years
U.S. Cl. D8—40



287,694
MITRE SAW
Kokichi Miyamoto, Fukuyama, Japan, assignor to Ryobi Limited, Hiroshima, Japan
Filed Jan. 26, 1984, Ser. No. 574,291
Term of patent 14 years
U.S. Cl. D8—66



287,692
PAINT STRIPPING TOOL
Michael I. D. Brailsford, Dorton Hill House, Chilton, Near Aylesbury, United Kingdom
Filed Feb. 24, 1984, Ser. No. 583,245
Term of patent 14 years
U.S. Cl. D8—16



287,695
RATCHET SCREWDRIVER
Arnold R. Abril, 332 E. South St., Rialto, Calif. 92376
Filed May 17, 1984, Ser. No. 611,487
Term of patent 14 years
U.S. Cl. D8—82

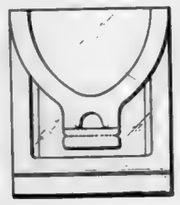


287,696
SEEDER BOX HINGE
Dean Russell, Box 402, Hoopeston, Ill. 60942
Filed Mar. 7, 1984, Ser. No. 587,077
Term of patent 14 years
U.S. Cl. D8—329

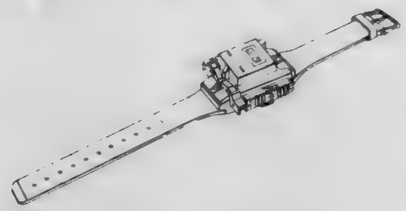




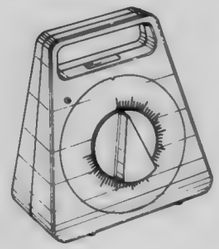
287,697
DISPLAY BOX
Andre Bernatchez, Kirkland; Ronald Brault, St-Gabriel, and Leonard Brzezinski, Montreal, all of Canada, assignors to Lawson & Jones Ltd., Missauga, Canada
Filed Jul. 9, 1984, Ser. No. 629,243
Term of patent 14 years
U.S. Cl. D9—416



287,698
TOY ROBOT WATCH
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Dec. 12, 1984, Ser. No. 680,907
Claims priority, application Japan, Nov. 19, 1984, 59-47260
Term of patent 14 years
U.S. Cl. D10—35



287,699
TIMER
Paul E. Morris, Northbrook, Ill., assignor to Pelouze Scale Co., Evanston, Ill.
Filed Jun. 13, 1984, Ser. No. 620,332
Term of patent 14 years
U.S. Cl. D10—40

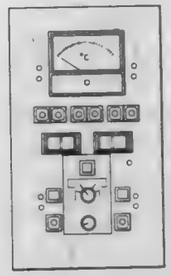


287,700
FILM BADGE FOR MONITORING RADIATION EXPOSURE
Robert Pollock, Aurora, Ill.; Douglas Pattos; David Sharbaugh, both of Irvine, and John Goodin, Long Beach, all of Calif., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.
Filed Feb. 28, 1983, Ser. No. 469,110
Term of patent 14 years
U.S. Cl. D10—47

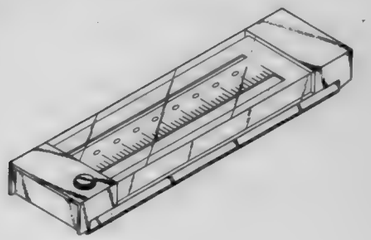




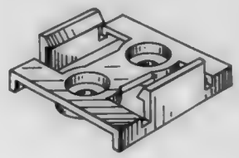
287,701
ELECTRONIC TEMPERATURE MONITOR
Joseph F. Foster, Fairport, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.
Filed Jun. 27, 1984, Ser. No. 625,103
Term of patent 14 years
U.S. Cl. D10—49



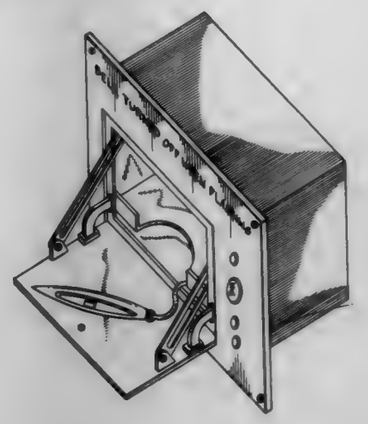
287,702
TEMPERATURE MEASUREMENT HOUSING
Niels Klagenberg, Hørsholm, and Bjørn C. Christensen, Copenhagen, both of Denmark, assignors to ISS Clorius International a.s., Skovlunde, Denmark
Filed Mar. 23, 1984, Ser. No. 592,922
Term of patent 14 years
U.S. Cl. D10—60

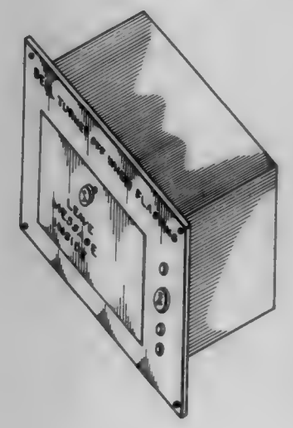


287,703
MOUNTING CLIP FOR FLOWMETERS
Duane M. Koboe, LaPorte, Ind., assignor to Dwyer Instruments, Inc., Michigan City, Ind.
Filed Jun. 20, 1984, Ser. No. 622,483
Term of patent 14 years
U.S. Cl. D10—103

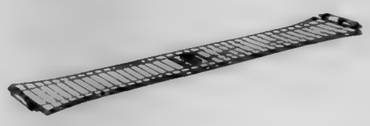


287,704
COMBINED HOUSING FOR DOORBELL SWITCH, SIGNAL SYSTEM AND MESSAGE CABINET
Gary T. Wheeler, 5514 Briarwood Forest, Houston, Tex. 77088
Filed Nov. 7, 1983, Ser. No. 549,386
Term of patent 14 years
U.S. Cl. D10—116

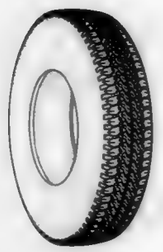




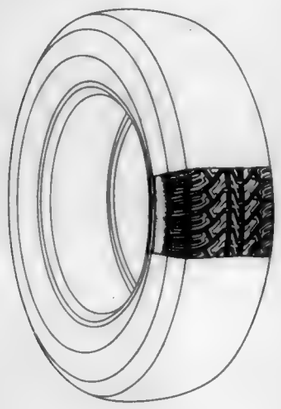
287,705
WATCHBAND
Jean G. Maimoud, Saint Jorioz, France, assignor to S. T. DuPont, Paris, France
Filed Jul. 16, 1984, Ser. No. 631,028
Claims priority, application France, Jan. 17, 1984, 840177
Term of patent 14 years
U.S. Cl. D11—3



287,706
AUTOMOBILE TIRE
Akihiro Takeuchi, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Oct. 4, 1984, Ser. No. 657,672
Claims priority, application Japan, Aug. 29, 1984, 59-36128
Term of patent 14 years
U.S. Cl. D12—146



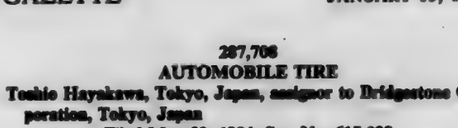
287,707
TIRE
Michael W. Cain, Simpsonville, S.C., assignor to Michelin Recherche et Technique S.A., Basel, Switzerland
Filed Nov. 15, 1984, Ser. No. 672,101
Term of patent 14 years
U.S. Cl. D12—147



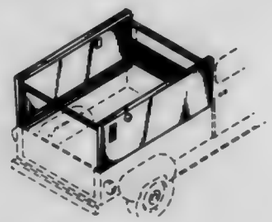
287,708
AUTOMOBILE TIRE
Toshio Hayakawa, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan
Filed May 30, 1984, Ser. No. 615,200
Claims priority, application Japan, Nov. 30, 1983, 58-51633
Term of patent 14 years
U.S. Cl. D12—147



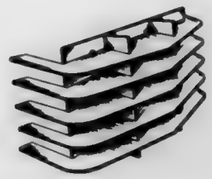
287,709
VEHICLE WINDSHIELD WIPER UNIT
Peter Mower, Twickenham, and Peter C. Pethers, Winkfield, both of England, assignors to Trico Products Corporation, Buffalo, N.Y.
Filed Jan. 30, 1984, Ser. No. 575,068
Claims priority, application United Kingdom, Aug. 2, 1983, 83-1014424
Term of patent 14 years
U.S. Cl. D12—155



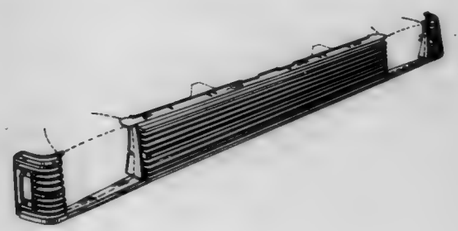
287,710
COVER UNIT FOR THE BED OF A PICKUP TRUCK
David O. Pino, 3234 Taft Ct., Wheatridge, Colo. 80033
Filed Sep. 17, 1984, Ser. No. 651,239
Term of patent 14 years
U.S. Cl. D12—156



287,711
SPORTS CAR GRILLE
John L. Stevens, 107 Winona Ave., Haverhill, Mass. 01830
Filed Sep. 10, 1984, Ser. No. 649,125
Term of patent 14 years
U.S. Cl. D12—163



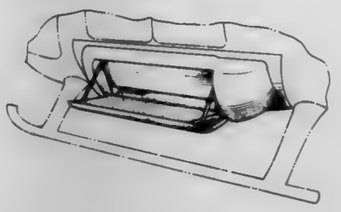
287,712
AUTOMOBILE GRILL
Toshiyuki Shimazaki, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Continuation of Ser. No. 483,297, Apr. 8, 1983, abandoned. This application Sep. 13, 1985, Ser. No. 775,658
Term of patent 14 years
U.S. Cl. D12—163



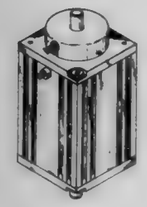
287,713
AERODYNAMIC SPOILER FOR ATTACHMENT TO AN AUTOMOBILE
Björn E. A. Eavall, Vänersborg, Sweden, and Giorgetto Giugiaro, Turin, Italy, assignors to Saab-Scania Aktiebolag, Trollhattan, Sweden
Filed Apr. 24, 1984, Ser. No. 603,945
Claims priority, application Sweden, Oct. 26, 1983, 83-2778
Term of patent 14 years
U.S. Cl. D12—181



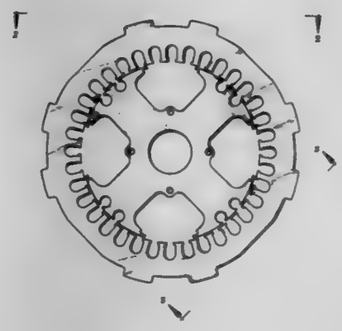
287,714
POWER STEP FOR AN AIRCRAFT
Keith T. Short, Bedford, Tex., assignor to Power Steps, Kennedale, Tex.
Filed Nov. 13, 1984, Ser. No. 670,569
Term of patent 14 years
U.S. Cl. D12—345



287,715
DIRECT CURRENT ELECTRIC MOTORS
Charles A. Pittman, III, King of Prussia, and Howard Hendricks, Harleysville, both of Pa., assignors to Penn Engineering & Manufacturing Corp., Danboro, Pa.
Filed Apr. 15, 1983, Ser. No. 485,318
Term of patent 14 years
U.S. Cl. D13—1



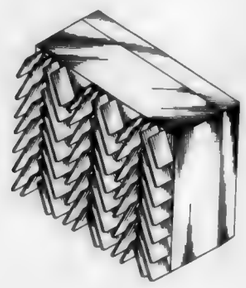
287,716
COMBINED ROTOR AND STATOR LAMINATION
Steven J. Iverson, Woodbury, Minn., assignor to Onan Corporation, Minneapolis, Minn.
Filed Sep. 1, 1983, Ser. No. 528,597
Term of patent 14 years
U.S. Cl. D13—1



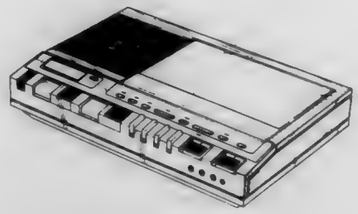
287,717
FRONT FOR AN INSTRUMENT PANEL FOR A CONTROLLER
David S. Farwell, Fairport; David V. Powers; Steven A. Mazelli, both of Rochester, all of N.Y., and Jagadisan Krishnamurthy, Mountain View, Calif., assignors to Combustion Engineering, Inc., Windsor, Conn.
Filed Feb. 29, 1984, Ser. No. 584,684
Term of patent 14 years
U.S. Cl. D13—35



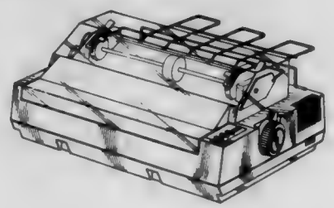
287,718
CASING FOR AN ELECTRONIC AC SPEED CONTROL UNIT
Jorgen J. Moeller, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark
Division of Ser. No. 741,735, Jun. 5, 1985, Pat. No. Des. 284,076, which is a division of Ser. No. 464,055, Feb. 4, 1983, Pat. No. Des. 281,969. This application Dec. 9, 1985, Ser. No. 806,538
Term of patent 14 years
U.S. Cl. D13—40



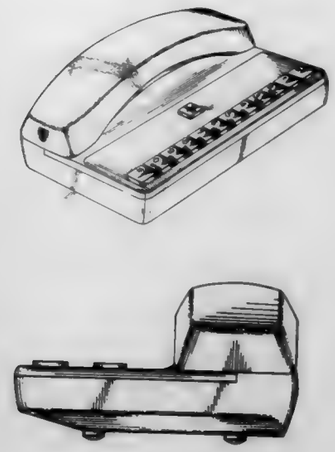
287,719
TELEPHONE ANSWERING MACHINE
Noriaki Kaku, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 19, 1984, Ser. No. 590,605
Claims priority, application Japan, Sep. 29, 1983, 58-42479
Term of patent 14 years
U.S. Cl. D14—4



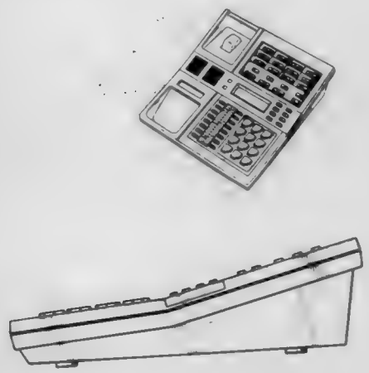
287,720
PRINTER
Hideji Takemasa, Tokyo, Japan, assignor to NEC Home Electronics, Osaka, Japan
Filed Nov. 16, 1984, Ser. No. 672,436
Claims priority, application Japan, Aug. 18, 1984, 59-34679
Term of patent 14 years
U.S. Cl. D14—111



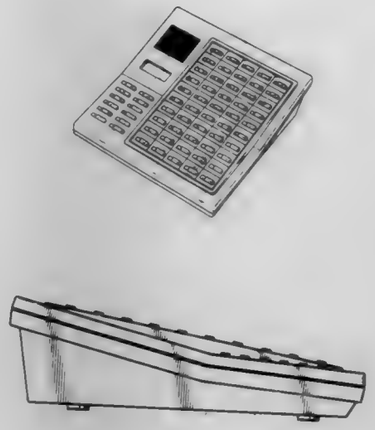
287,721
HANDSET AND TELEPHONE STAND UNIT
George Perkins, Burbank, Calif., assignor to Telequest, Inc., Burbank, Calif.
Filed Nov. 23, 1984, Ser. No. 674,246
Term of patent 14 years
U.S. Cl. D14—53



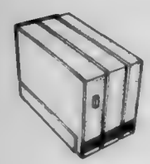
287,722
TELEPHONE STAND
Shigeaki Kido, Tokyo, Japan, assignor to Meisei Electric Co., Ltd., Tokyo, Japan
Filed Jan. 7, 1985, Ser. No. 689,177
Claims priority, application Japan, Jul. 28, 1984, 59-31976; Nov. 21, 1984, 59-47925
Term of patent 14 years
U.S. Cl. D14—62



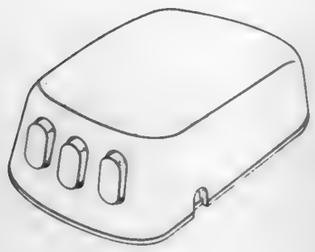
287,723
TELEPHONE STAND FOR DIRECT STATION SELECTION
Shigeaki Kido, Tokyo, Japan, assignor to Meisei Electric Co., Ltd., Tokyo, Japan
Filed Jan. 7, 1985, Ser. No. 689,178
Claims priority, application Japan, Aug. 9, 1984, 59-33760; Sep. 19, 1934, 59-38791
Term of patent 14 years
U.S. Cl. D14—62



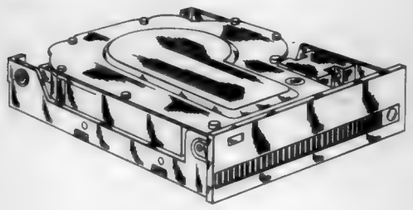
287,724
MODULAR COMPUTER SYSTEM
Leroy B. Keely, Portola Valley; Diab E. Freige, Los Altos, and Michael J. Nuttall, Palo Alto, all of Calif., assignors to Convergent Technologies, Inc., San Jose, Calif.
Filed May 9, 1984, Ser. No. 608,604
Term of patent 14 years
U.S. Cl. D14—100



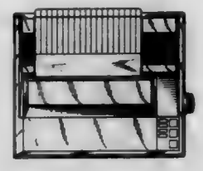
287,725
CURSOR CONTROL FOR DISPLAY SYSTEM
Masao Yoshihama, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Apr. 16, 1984, Ser. No. 601,017
Claims priority, application Japan, Oct. 15, 1983, 58-044853
Term of patent 14 years
U.S. Cl. D14—107

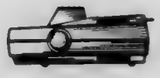


287,726
DISC DRIVE ASSEMBLY
Masafumi Itoh, Tokyo; Sigeru Hasegawa, Kodaira; Haruki Takita, Hachiohji, and Kouji Suzuki, Tokorozawa, all of Japan, assignors to Teac Corporation, Tokyo, Japan
Filed Apr. 10, 1984, Ser. No. 598,810
Claims priority, application Japan, Oct. 15, 1983, 58-44785
Term of patent 14 years
U.S. Cl. D14—109

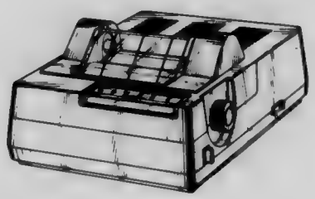


287,727
ELECTRONIC PRINTER
Masaki Kurihara, Suwa, Japan, assignor to Seiko Epson Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 24, 1984, Ser. No. 653,799
Claims priority, application Japan, Mar. 22, 1984, 59-11055
Term of patent 14 years
U.S. Cl. D14—111

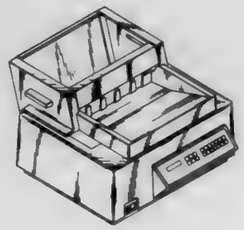




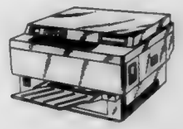
287,728
PRINTER FOR ELECTRONIC COMPUTERS
Kunio Hara, Chiba, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 20, 1984, Ser. No. 652,657
Claims priority, application Japan, Mar. 23, 1984, 59-10979
Term of patent 14 years
U.S. Cl. D14—111



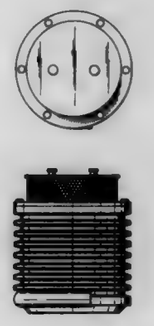
287,729
PRINTER WITH AUTOMATIC SHEET FEEDER
Thomas E. Pangburn, Charlotte, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 18, 1984, Ser. No. 683,097
Term of patent 14 years
U.S. Cl. D14—111



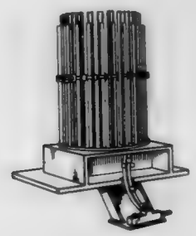
287,730
LASER BEAM PRINTER
Tatuo Kojima, Asaka, and Takashi Yomo, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 9, 1984, Ser. No. 598,268
Claims priority, application Japan, Oct. 12, 1983, 58-44423
Term of patent 14 years
U.S. Cl. D14—111



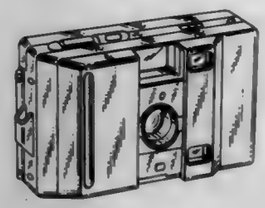
287,731
TURBINE HOUSING
Jack E. Muck, Garfield Heights, Ohio, assignor to Accu-Spray, Inc., Bedford Heights, Ohio
Continuation-in-part of Ser. No. 544,218, Oct. 21, 1983, Pat. No. 4,565,488. This application May 4, 1984, Ser. No. 606,950
Term of patent 14 years
U.S. Cl. D15—1



287,732
CAROUSEL COMPONENT FEEDER
Ravindra S. David, Don Mills, and Alfred H. Allen, Brampton, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Feb. 13, 1984, Ser. No. 579,477
Term of patent 14 years
U.S. Cl. D15—199



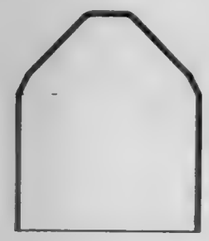
287,733
CAMERA
Nobuhiro Ago, Yokohama; Masayuki Iimura, Kodaira, and Tatso Yamada, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 25, 1984, Ser. No. 624,019
Claims priority, application Japan, Dec. 26, 1983, 58-56536
Term of patent 14 years
U.S. Cl. D16—5



287,734
TYPEWRITER
Yoshihisa Ooie, and Masakazu Sagiyama, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Sep. 25, 1984, Ser. No. 654,758
Claims priority, application Japan, Mar. 28, 1984, 59-12686
Term of patent 14 years
U.S. Cl. D18—1



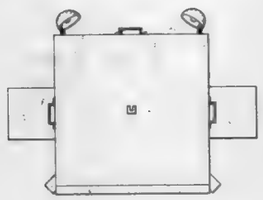
287,735
ENVELOPE
Timothy J. Leyland, London, England, assignor to Camden Graphics Limited, London, England
Filed May 7, 1984, Ser. No. 609,704
Claims priority, application United Kingdom, Feb. 2, 1984, 1017644; Feb. 2, 1984, 1017645
Term of patent 14 years
U.S. Cl. D19—3



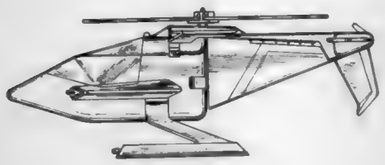
287,736
BALL POINT PEN
Walter Henkels, Helnnderweg 1, D-5142 Hückelhoven, Fed. Rep. of Germany
Filed Apr. 20, 1984, Ser. No. 602,530
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1984, MR 149
Term of patent 14 years
U.S. Cl. D19—49



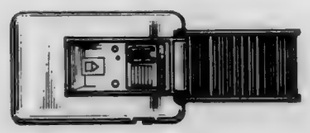
287,737
PORTABLE DART BOARD BACKBOARD
Glen K. Wallace, 13585 Portofino Dr., Del Mar, Calif. 92014
Filed May 2, 1983, Ser. No. 490,869
Term of patent 14 years
U.S. Cl. D21—6



287,738
TOY HELICOPTER
Howard N. Bollinger; Robert K. Allen; Nick H. Langdon, all of Cincinnati; Stephen M. Toth, Loveland, all of Ohio, and W. Grey Williams, Covington, Ky., assignors to Kenner Parker Toys Inc., Beverly, Mass.
Filed Feb. 6, 1985, Ser. No. 698,975
Term of patent 14 years
U.S. Cl. D21—90



287,739
TOY COMMUNICATOR
William George, Sausalito, Calif., assignor to Paramount Pictures Corporation, New York, N.Y.
Filed Nov. 29, 1984, Ser. No. 676,454
Term of patent 14 years
U.S. Cl. D21—111



287,740
TOY TREE HOUSE
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Continuation-in-part of Ser. No. 564,678, Dec. 23, 1983, abandoned. This application Oct. 16, 1985, Ser. No. 788,192
Term of patent 14 years
U.S. Cl. D21—115



287,741
TOY LAP DESK
Beverly W. Taylor, Hermann, Mo., assignor to Handi-Pac, Inc., Hermann, Mo.
Filed Feb. 15, 1984, Ser. No. 580,565
Term of patent 14 years
U.S. Cl. D21—121



287,742
DOLL
Paul W. Bardwell; F. Carolyn Bardwell, both of 2208 Woodsong Trail, Arlington, Tex. 76016, and Irene Corey, 4147 Herschel, Dallas, Tex. 75219
Filed May 24, 1984, Ser. No. 613,851
Term of patent 14 years
U.S. Cl. D21—156



287,743
STUFFED DOLL TOY
Erma O. Dion, 706 Pike #509, Seattle, Wash. 98101
Filed Sep. 4, 1984, Ser. No. 647,187
Term of patent 14 years
U.S. Cl. D21—166



287,744
STUFFED DOLL
Sheri Robinette, East Providence, R.I., assignor to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Jan. 11, 1984, Ser. No. 619,381
Term of patent 14 years
U.S. Cl. D21—167



287,745
DOLL
Nancy Davis, 24320 Wood, St. Clair Shores, Mich. 48080
Filed Apr. 16, 1984, Ser. No. 600,901
Term of patent 14 years
U.S. Cl. D21—174



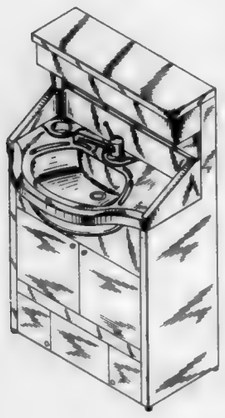
287,746
SNOW SKI
Charles A. Whittaker, 532 Grant St., Niles, Ohio 44446
Filed Sep. 10, 1984, Ser. No. 648,971
Term of patent 14 years
U.S. Cl. D21—229



287,747
FAUCET SPOUT
Charles D. Miller; Bernard O. Daniels, and William C. McKeone, all of Kansas City, Mo., assignors to Broadway Industries, Inc., Kansas City, Mo.
Filed Sep. 4, 1984, Ser. No. 646,836
Term of patent 14 years
U.S. Cl. D23—32



287,748
SINK MODULE
Ned Landau, Westport, Conn.; Dennis Leffler, Charlotte, and Dan Truette, Pineville, both of N.C., assignors to Pelton and Crane Company, Charlotte, N.C.
Filed Mar. 1, 1984, Ser. No. 584,680
Term of patent 14 years
U.S. Cl. D23—59



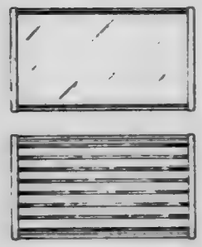
287,749
TRAVELLING CARRIER FOR HEATING ELEMENTS IN A PAINT SPRAY BOOTH
Hans-Erik Nilsson, Hosila, and Åke Carlsson, Trollhättan, both of Sweden, assignors to Infrarodteknik AB, Vänersborg, Sweden
Filed Feb. 28, 1984, Ser. No. 585,224
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1983, URA 1024-83
Term of patent 14 years
U.S. Cl. D23—77



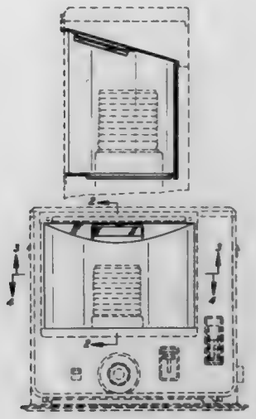
287,750
ELECTRIC HEATER
Ilkka Hämäläinen, Helsinki, Finland, assignor to Rakennusvalmiste Oy, Finland
Filed Apr. 24, 1984, Ser. No. 603,447
Claims priority, application Finland, Nov. 1, 1983, 960/83
Term of patent 14 years
U.S. Cl. D23—93



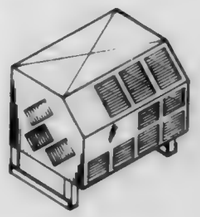
287,751
ELECTRIC HEATER
Ilkka Hämäläinen, Helsinki, Finland, assignor to Rakennusvalmiste Oy, Finland
Filed Apr. 24, 1984, Ser. No. 603,446
Claims priority, application Finland, Nov. 1, 1983, 959/83
Term of patent 14 years
U.S. Cl. D23—110



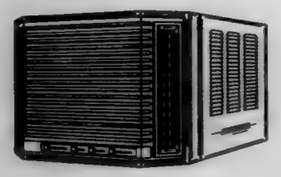
287,752
HEATING CHAMBER FOR A PORTABLE HEATER
Nobuyuki Kojima; Yoichi Sekigawa, and Makoto Kobiyama, all of Niigata, Japan, assignors to Toshiba Heating Appliances Co., Ltd., Kano, Japan
Filed Mar. 7, 1984, Ser. No. 586,987
Claims priority, application Japan, Oct. 31, 1983, 58-169050[U]; Nov. 2, 1983, 58-170310[U]
Term of patent 14 years
U.S. Cl. D23—127



287,753
AIR COOLED REFRIGERATION CONDENSER
Roland A. Ares, St. Charles, and Dennis R. Maechler, St. Louis, both of Mo., assignors to Hussmann Corporation, Bridgeton, Mo.
Filed Oct. 5, 1984, Ser. No. 658,370
The portion of the term of this patent subsequent to Dec. 16, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—139



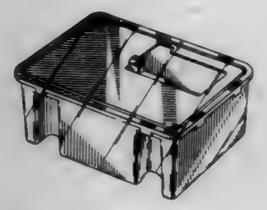
287,754
AIR CONDITIONER
Masao Miyake, and Nobuo Takeishi, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Dec. 24, 1984, Ser. No. 685,748
Claims priority, application Japan, Aug. 6, 1984, 59-33376
Term of patent 14 years
U.S. Cl. D23—141



287,755
ULTRASONIC HUMIDIFIER
Tetsuo Imai, Nagano, and Toshio Yamazaki, Kosboku, both of Japan, assignors to Maruyama Industrial Co., Ltd., Nagano, Japan
Filed Dec. 31, 1984, Ser. No. 687,756
Term of patent 14 years
U.S. Cl. D23—146



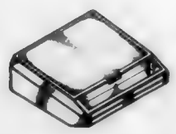
287,756
DISPOSABLE RECEPTACLE FOR A NEEDLE AND SYRINGE DESTRUCTOR
Michael J. Szablak, Stephens City, and Glen E. Tomblin, Winchester, both of Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Mar. 1, 1984, Ser. No. 585,306
Term of patent 14 years
U.S. Cl. D24—99

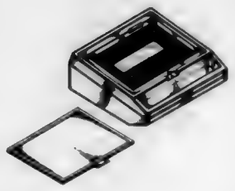


287,757
CERAMMING FURNACE
Ronald C. Webb, Red Lion, Pa., assignor to Dentsply Research & Development Corp., Milford, Del.
Filed Feb. 21, 1984, Ser. No. 582,017
Term of patent 14 years
U.S. Cl. D24—8

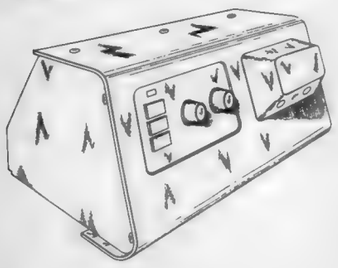


287,758
PORTABLE DEFIBRILLATOR
Steven A. Chenault, Marysville, and Stephen T. Vincent, Redmond, both of Wash., assignors to Physio-Control Corporation, Redmond, Wash.
Filed Mar. 8, 1984, Ser. No. 587,597
Term of patent 14 years
U.S. Cl. D24—17

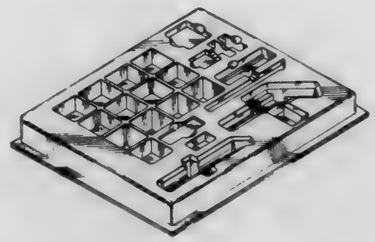




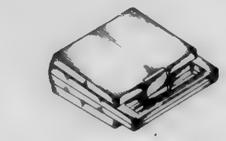
287,759
AMALGAMATOR
Dan Koonts, Charlotte, and Dan Truette, Pineville, both of N.C., assignors to Pelton & Crane Company, Charlotte, N.C.
Filed Dec. 19, 1983, Ser. No. 564,851
Term of patent 14 years
U.S. Cl. D24—10

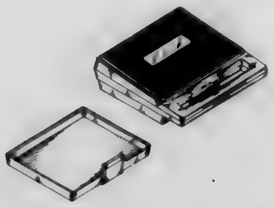


287,760
DENTAL TRAY
John J. Diacko, Jr., 50 Laura Rd., Hamden, Conn. 06514
Filed Mar. 5, 1984, Ser. No. 586,181
Term of patent 14 years
U.S. Cl. D24—10

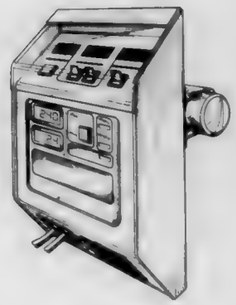


287,761
PORTABLE DEFIBRILLATOR
Neil G. McIlvaine, Seattle; Stephen T. Vincent, Redmond; Randal M. Schmidt, Kirkland, and Daniel Yerkovich, Seattle, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.
Filed Jan. 22, 1986, Ser. No. 821,337
Term of patent 14 years
U.S. Cl. D24—17

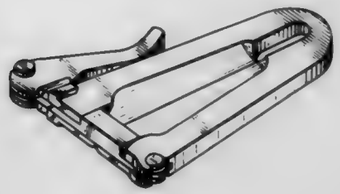




287,762
MEDICAL TOURNIQUET CONTROL CASE
William L. McCune, Denver, Colo., assignor to Aspen Laboratories, Inc., Englewood, Colo.
Filed Jan. 20, 1983, Ser. No. 459,444
Term of patent 14 years
U.S. Cl. D24—23



287,763
CIRCUMCISION CLAMP
Amir Porat, and Michael Porat, both of 4 Hirschenberg Street, Tel-Aviv, Israel
Filed Feb. 21, 1984, Ser. No. 581,607
Claims priority, application Israel, Aug. 22, 1983, 9603
Term of patent 14 years
U.S. Cl. D24—27



287,764
HEARING AID
Christian Topholm, Varlose, Denmark, assignor to Topholm & Westerman I/S, Varlose, Denmark
Filed Nov. 10, 1983, Ser. No. 550,542
Claims priority, application Denmark, Jun. 17, 1983, 1983/595
The portion of the term of this patent subsequent to Dec. 16, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—35





287,765
HEARING AID
Christian Topholm, Varlose, Denmark, assignor to Topholm & Westerman I/S, Varlose, Denmark
Filed Nov. 10, 1983, Ser. No. 550,543
Claims priority, application Denmark, Jun. 17, 1983, 1983/596
The portion of the term of this patent subsequent to Dec. 16, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—35





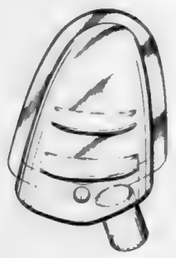
287,766
BABY BOTTLE OR SIMILAR ARTICLE
William Simmons, 8302 Gunwood Cir., Westminster, Calif. 92683
Filed Feb. 17, 1984, Ser. No. 581,308
Term of patent 14 years
U.S. Cl. D24—47



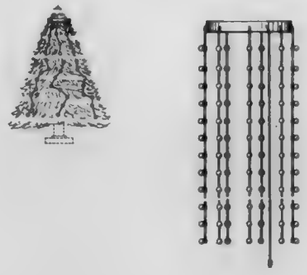
287,767
BABY BOTTLE OR SIMILAR ARTICLE
William Simmons, 8302 Gunwood Cir., Westminster, Calif. 92683
Filed Feb. 17, 1984, Ser. No. 581,306
Term of patent 14 years
U.S. Cl. D24—47



287,768
COLOSTOMY IRRIGATION UNIT
Harold A. Knackstedt, 101½ E. Center St., P.O. Box 529, Inman, Kans. 67546
Filed Feb. 23, 1984, Ser. No. 582,809
Term of patent 14 years
U.S. Cl. D24—56



287,769
CHRISTMAS TREE HALO DECORATION
Lolita P. Davis, 11340 S. Wentworth, Chicago, Ill. 60628
Filed Feb. 2, 1984, Ser. No. 576,145
Term of patent 14 years
U.S. Cl. D26—25



287,770
FLAT-BACK HEXAGONAL AQUARIUM STAND
Debra Brownlee, 2339-84th St., SE., Caledonia, Mich. 49316, and Timothy Van Zegeren, Caledonia, Mich., assignors to Debra Brownlee, Caledonia, Mich.
Filed Aug. 30, 1984, Ser. No. 646,009
Term of patent 14 years
U.S. Cl. D30—8



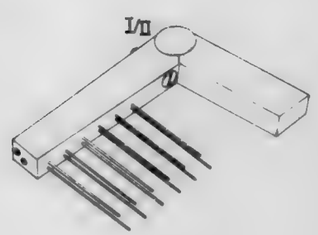
287,771
HORSE FEEDER
David K. Kimble, 6843 W. Country Gables, Peoria, Ariz. 85345
Filed Nov. 19, 1984, Ser. No. 672,498
Term of patent 14 years
U.S. Cl. D30—13



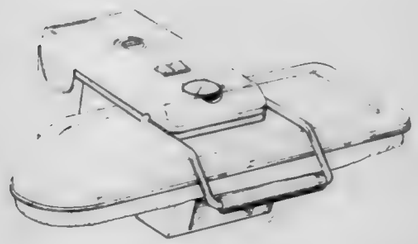
287,772
PET DISH OR THE LIKE
Billy S. Stewart, 2102 Old Cherry Point Rd., New Bern, N.C. 28560
Filed Mar. 22, 1984, Ser. No. 592,477
Term of patent 14 years
U.S. Cl. D30—16



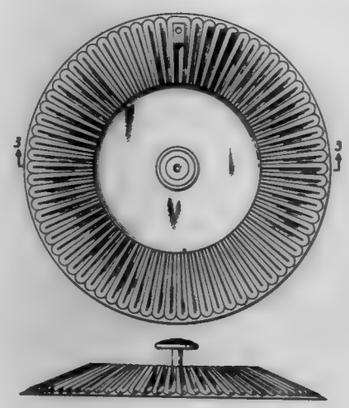
287,773
WASHING DEVICE FOR TEST TUBES
Leif Kruse, Hørsholm, Denmark, assignor to A/S Nunc, Roskilde, Denmark
Filed Nov. 28, 1983, Ser. No. 555,630
Term of patent 14 years
U.S. Cl. D32—1



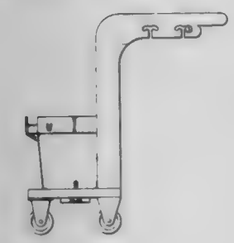
287,774
IRONING PRESS
Marco Primati, Milan, Italy, assignor to Stabilimento Industriale Singer SRL, Monza, Italy
Filed Nov. 13, 1984, Ser. No. 671,108
Term of patent 14 years
U.S. Cl. D32—9



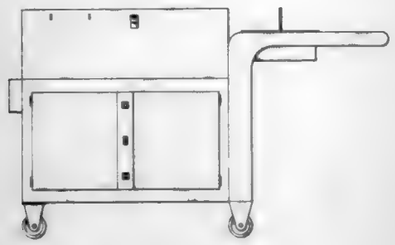
287,775
DUST PAN
Glenn L. Sloane, 8511 La Tuna Canyon Rd., Sun Valley, Calif. 91352
Filed Jan. 3, 1985, Ser. No. 688,691
Term of patent 14 years
U.S. Cl. D32—74



287,776
CART FOR TRANSPORTING WASH BUCKET AND ACCESSORIES
Lowell L. Heilwig, R.R. #4, Box 326, Excelsior Springs, Mo. 64024, and Beverly J. Rapp, Rte. 2, Weston, Mo. 64098
Filed Dec. 21, 1984, Ser. No. 684,953
Term of patent 14 years
U.S. Cl. D34—21

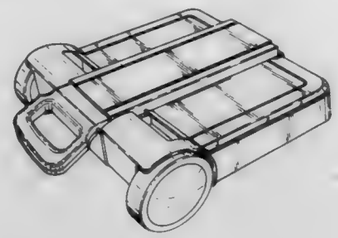


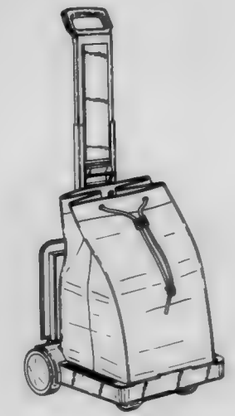
287,777
GARDENERS CART
Lowell L. Hallwig, R.R. #4, Box 326, Excelsior Springs, Mo. 64024, and Beverly J. Rapp, Rte. 2, Weston, Mo. 64098
Filed Dec. 21, 1984, Ser. No. 684,954
Term of patent 14 years
U.S. Cl. D34—20

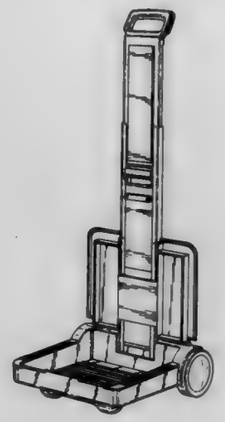


287,778
COMBINED YOKE AND LIFTING APPARATUS
Ingemar Svensson, Långavallagatan 13, S-424 57 Angered, Sweden
Filed Sep. 6, 1983, Ser. No. 529,712
Claims priority, application Sweden, Mar. 3, 1983, 83-0589; May 3, 1983, 83-1252
Term of patent 14 years
U.S. Cl. D34—28

287,779
CONVERTIBLE LUGGAGE/SHOPPING CART
Hans E. Slany, Esslingen, Fed. Rep. of Germany, assignor to Leifheit International AG, Nassau, Fed. Rep. of Germany
Filed Jun. 27, 1984, Ser. No. 625,387
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1983, 6 MR 1281
Term of patent 14 years
U.S. Cl. D34—25







LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF JANUARY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & E Systems, Inc.: *See*—
Whittingham, Reginald P., 4,635,904, Cl. 254-425.000.
A. O. Smith Corporation: *See*—
McDonald, George M., 4,636,673, Cl. 310-91.000.
AB Asea-Atom: *See*—
Fejes, Peter; and Hallden, Eva, 4,636,292, Cl. 204-404.000.
AB Ferrosan: *See*—
Hernestam, Sven E. H.; Nilsson, Nils A.; and Willard, Lars-Olof, 4,636,382, Cl. 424-54.000.
AB Vretens Mekaniska Verkstad: *See*—
Larsson, Gunnar, 4,635,730, Cl. 172-788.000.
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, to Fujisawa Pharmaceutical Co., Ltd. Micro-feed pump for an artificial pancreas. 4,636,144, Cl. 417-63.000.
Abe, Masahiro; Aoyama, Masaharu; Ajima, Takashi; and Yonezawa, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device with an improved bonding section. 4,636,832, Cl. 357-68.000.
Abe, Seiko: *See*—
Igashira, Toshihiko; Sakakibara, Yasuyuki; Abe, Seiko; Takigawa, Masahiro; and Izawa, Akihiro, 4,635,849, Cl. 239-102.200.
Abex Corporation: *See*—
Farr, Aaron V., 4,636,720, Cl. 324-86.000.
Abiko, Tetsuo: *See*—
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Abou-Gharbia, Magid A., to American Home Products Corporation. Antipsychotic γ-carbolines. 4,636,563, Cl. 546-87.000.
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Adac Laboratories, Inc.: *See*—
Stewart, Michael E., 4,636,850, Cl. 358-111.000.
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Ades, Adrian R.; and Schmidt, George S., to General Electric Company. Turbine rotor heating, disassembly, handling and reassembly method and apparatus. 4,635,336, Cl. 29-252.000.
Adret Electronique: *See*—
Charbonnier, Roger; and Remy, Joel, 4,636,733, Cl. 328-14.000.
Charbonnier, Roger, 4,637,069, Cl. 455-330.000.
Advanced Micro Devices, Inc.: *See*—
Lien, Jih-Chang; and Wang, Hsingya A., 4,635,347, Cl. 29-591.000.
AEG-Telefunken Kabelwerke AG, Rheydt: *See*—
Glessner, Bertram; Pitsch, Paul; Heinen, Peter; and Peglow, Hartmut, 4,636,235, Cl. 65-3.120.
Glessner, Bertram; Pitsch, Paul; Heinen, Peter; and Peglow, Hartmut, 4,636,236, Cl. 65-3.120.
Aero Transportation Products, Inc.: *See*—
Blume, Orville E., 4,635,979, Cl. 292-256.500.
Agbay, Anthony J., to Olson Manufacturing Company. Double-acting barrel lock and key. 4,635,452, Cl. 70-34.000.
Agency of Industrial Science & Technology: *See*—
Ichikawa, Kiyoshi, 4,636,355, Cl. 420-590.000.
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Bauer, Walter, 4,637,043, Cl. 378-188.000.
Agfa Gevaert Aktiengesellschaft: *See*—
Becker, Manfred; Matejec, Reinhart; and Endres, Lothar, 4,636,461, Cl. 430-567.000.
Meckl, Heinz; Kampfer, Helmut; and Haseler, Helmut, 4,636,460, Cl. 430-442.000.
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De Schamphelaere, Lucien A.; Librecht, Freddy M.; and Verlinden, Willy G., 4,636,060, Cl. 355-14.0CH.
Aggregates Equipment, Inc.: *See*—
McCorkel, Franklin M., 4,635,863, Cl. 241-188.00A.
Ahagon, Asahiro; Kobayashi, Toshio; Yamada, Kazuhiro; Doi, Seiichi; and Misawa, Makoto, to Yokohama Rubber Co., Ltd., The. Pneumatic tire base-cap tread. 4,635,693, Cl. 152-209.00R.
Ahlgren, David T.: *See*—
Ranz, John C.; and Ahlgren, David T., 4,635,396, Cl. 49-141.000.
Ainsworth Nominees Pty. Ltd.: *See*—
Harlick, Neville G., 4,636,951, Cl. 364-412.000.
Air Products and Chemicals, Inc.: *See*—
Burke, Thomas W.; and Klee, David J., 4,635,408, Cl. 51-292.000.
Airborne Electronics, Inc.: *See*—
Freymuth, William P., 4,636,711, Cl. 323-282.000.
Airsonics License Partnership: *See*—
Gallant, Ben J., 4,635,897, Cl. 251-5.000.
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Kazaoka, Kenichi; Okazaki, Hiroshi; and Inaba, Yasuhisa, 4,636,006, Cl. 297-458.000.
Kodama, Hisashi, 4,635,593, Cl. 123-90.550.
Nakamura, Shunichi, 4,635,398, Cl. 49-413.000.
Tsuda, Jou; and Ishii, Masami, 4,636,255, Cl. 106-1.220.
Aizawa, Yasuo: *See*—
Kodera, Masanori; Aizawa, Yasuo; and Ichijo, Kohji, 4,636,701, Cl. 318-625.000.
Ajax Enterprises Corporation: *See*—
Ogden, Ralph; and Johnson, Carl J., 4,635,928, Cl. 272-69.000.
Ajima, Takashi: *See*—
Abe, Masahiro; Aoyama, Masaharu; Ajima, Takashi; and Yonezawa, Toshio, 4,636,832, Cl. 357-68.000.
Akashi, Akira: *See*—
Kobayashi, Ryuichi; Akashi, Akira; and Kawamura, Masaharu, 4,636,056, Cl. 354-484.000.
Akashi, Goro: *See*—
Suzuki, Masaki, deceased; and Akashi, Goro, 4,636,898, Cl. 360-122.000.
Akiba, Taichi: *See*—
Araki, Yoshitsugu; and Akiba, Taichi, 4,637,004, Cl. 369-44.000.
Akiya, Takashi; Toganoh, Shigeo; and Arai, Ryuichi, to Canon Kabushiki Kaisha. Recording method. 4,636,410, Cl. 427-261.000.
Akiyama, Hiroei: *See*—
Okamura, Hisanori; Akiyama, Hiroei; Kamoshita, Mutuo; and Miyazaki, Kunio, 4,636,434, Cl. 428-328.000.
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Iida, Kazumi; Ohata, Yosuke; Hyodo, Keiichiro; Akiyama, Kazunori; Umeda, Tadashi; and Kishimoto, Keiichi, 4,636,057, Cl. 355-3.00R.
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Brandstrom, Arne E.; Lindberg, Per L.; and Wallmark, Bjorn, 4,636,499, Cl. 514-222.000.
Gustafsson, Bill B. R.; Hedberg, Sven A.; and Lundgren, Bo T., 4,636,501, Cl. 514-235.000.
Albers, Martha J.: *See*—
Jaisle, Richard F.; Mollmann, Henry C.; Albers, Martha J.; and Burgess, James H., 4,636,443, Cl. 428-481.000.
Alcatel Thomson Faisceaux Herziens: *See*—
Mettoudi, Isaac, 4,636,758, Cl. 333-218.000.
Aldridge, Fredrick A.: *See*—
Kennedy, Richard A.; and Aldridge, Fredrick A., 4,637,066, Cl. 455-223.000.
Aldridge, Gerald T.; and Peters, Jerry L., to Aluma-Form, Inc. Flexible banding and instrument support system. 4,635,888, Cl. 248-231.000.
Aldridge, Robert E.; Elloway, Russell; Fritz, William O.; Goff, Ralph D.; and Herrera, Michael J., to Thermco Systems, Inc. Method of loading and unloading a furnace. 4,636,140, Cl. 414-786.000.
Alfa-Laval Separation AB: *See*—
Stroucken, Klaus, 4,636,319, Cl. 210-781.000.
Alfa-Laval Thermal AB: *See*—
Andersson, Jarl A., 4,635,715, Cl. 165-167.000.
Algrim, Donald J.; Vermilion, Donn R.; Hammond, Donald J.; and Haines, Richard M., to Owens-Corning Fiberglas Corporation. Glass fiber size and impregnant compositions. 4,636,437, Cl. 428-391.000.
Alkofer, James S., to Eastman Kodak Company. Digital image processing method for over and under exposed photographic images. 4,636,845, Cl. 358-80.000.
Allcock, Harry R.; Austin, Paul E.; and Neenan, Thomas X., to Research Corporation. Anesthetic polyorganophosphazenes. 4,636,387, Cl. 514-89.000.
Allen, Barbara A.; and Kite, Rebecca. Kettledrum. 4,635,524, Cl. 84-419.000.
Allen, Charles M.: *See*—
Bingham, David; and Allen, Charles M., 4,636,930, Cl. 363-60.000.
Allen, Crowley C., Jr., to Research Triangle Institute. Fluid separator apparatus and method. 4,636,315, Cl. 210-656.000.
Allen, Ernest R. Adjustable door jamb leveler. 4,635,414, Cl. 52-126.100.
Allen Group Inc., The: *See*—
Scourtes, George, 4,635,472, Cl. 73-117.000.
Allen, Henry V., to Wystron, Inc. Capacitive transducer and method. 4,636,714, Cl. 324-60.0CD.

Allied Corporation: *See*—
Caruso, Peter J.; and Townsend, Robert R., 4,636,761, Cl. 335-140.000.
Figiel, Francis J.; and Osterman, Harry F., 4,636,320, Cl. 210-801.000.
Greene, Paul L.; and Appling, James, 4,636,998, Cl. 367-154.000.
Mani, Krishnamurthy N.; and Chlanda, Frederick P., 4,636,289, Cl. 204-182.400.
Marmillion, David J., 4,636,020, Cl. 339-59.00M.
Peterson, Arnold D., 4,636,674, Cl. 310-155.000.
Runkle, Dean E., 4,636,180, Cl. 464-120.000.
Smith, Roger L.; and Bolenbaugh, Daniel L., 4,635,761, Cl. 188-72.000.
Thornton, Donald I.; Peyton, Richard H.; and O'Shea, James P., 4,636,231, Cl. 55-318.000.
Wright, Danny O.; and Pauwels, Michael A., 4,636,620, Cl. 219-501.000.

Allman Byggnadsservice AB ABS: *See*—
Soderlund, Bjorn, 4,636,083, Cl. 366-43.000.

Allsop, Inc.: *See*—
Clausen, Elvind; and Skaling, Timothy J., 4,636,109, Cl. 404-10.000.

Almac Plastics Inc.: *See*—
Batky, Michael, 4,635,420, Cl. 52-309.100.

Almqvist, Christer; Carlsson, Bengt; and Lindahl, Lars, to ReHeat AB. Packing groove in plate member of plate heat exchanger. 4,635,714, Cl. 165-167.000.

Alpha Industries, Inc.: *See*—
Crossley, Ian; Donoghue, Daniel; Mittleman, Steven; and Nash, Seth, 4,637,068, Cl. 455-327.000.

Alps Electric Co., Ltd.: *See*—
Fujisawa, Kyuichi, 4,636,100, Cl. 400-662.000.
Matsuta, Shigetoshi, 4,637,070, Cl. 455-331.000.
Okita, Masao, 4,637,010, Cl. 369-270.000.
Takikawa, Makito, 4,636,896, Cl. 360-105.000.
Tanabe, Osamu, 4,636,601, Cl. 200-153.00J.
Yasuhara, Yukihiko, 4,636,677, Cl. 310-194.000.

Altman, Amnon; Theofilopoulos, Argyrios N.; Lerner, Richard A.; and Dixon, Frank J., to Scripps Clinic and Research Foundation. Antibodies to human interleukin-2 induced by synthetic polypeptides. 4,636,463, Cl. 435-7.000.

Altman, James E. Guide fence having rollers to reduce friction. 4,635,515, Cl. 83-438.000.

Altoz, Frank E., to United States of America, Air Force. Dual mode heat exchanger. 4,635,709, Cl. 165-32.000.

Aluma-Form, Inc.: *See*—
Aldridge, Gerald T.; and Peters, Jerry L., 4,635,888, Cl. 248-231.000.

Alyfuku, Kiyoshi, to Canon Kabushiki Kaisha. Camera. 4,636,055, Cl. 354-465.000.

Amano Pharmaceutical Co., Ltd.: *See*—
Itoh, Nobuya; and Matsunaga, Kuniyoshi, 4,636,465, Cl. 435-15.000.

Ambrose, William A.; and Garcia, Fernando A., to American Hospital Supply Corporation. Hypodermic syringe having a protective sheath cover. 4,636,201, Cl. 604-192.000.

AMCA International Limited: *See*—
Wildey, Allan J., 4,635,859, Cl. 241-21.000.

Amcor Ltd.: *See*—
Movshovitz, Avner; and Shwarzman, Joel, 4,635,395, Cl. 49-78.000.

Amemiya, Kunio; Tanaka, Mikihiko; Kamemaru, Kenichi; and Nakagawa, Kiyoshi, to Unitika Ltd. Moisture-permeable waterproof laminated fabric and process for producing the same. 4,636,424, Cl. 428-198.000.

American Can Company: *See*—
Kubacki, Edward F.; and Masciale, John M., 4,635,545, Cl. 101-4.000.

American Cyanamid Company: *See*—
Wang, David W.; Courter, Jeanne L.; and Kohli, Dalip K., 4,636,535, Cl. 523-204.000.

American District Telegraph Company: *See*—
Galvin, Aaron A.; Edson, James B.; and Guscott, John K., 4,636,774, Cl. 340-565.000.

American Home Products Corporation: *See*—
Abou-Gharbia, Magid A., 4,636,563, Cl. 546-87.000.

American Hospital Supply Corporation: *See*—
Ambrose, William A.; and Garcia, Fernando A., 4,636,201, Cl. 604-192.000.
Cartmell, James V.; Burcham, Larry R.; and Wolf, Michael L., 4,635,642, Cl. 128-639.000.
Hoffa, Jack L.; and Karkar, Maurice N., 4,635,467, Cl. 73-1.00G.

American Microsystems, Inc.: *See*—
Howell, Robert G.; and Fisher, Tomas G., 4,636,721, Cl. 324-133.000.

American Phone Products: *See*—
Lee, Peter, 4,636,589, Cl. 379-159.000.

American Robot Corporation: *See*—
Gorman, Robert H., 4,636,138, Cl. 414-735.000.

American Roller Company: *See*—
Brands, George B.; and Carlson, James R., 4,635,550, Cl. 101-415.100.

Ametek, Inc.: *See*—
Arechaga, John C., 4,635,755, Cl. 185-45.000.

AMF Incorporated: *See*—
Longabaugh, Charles R., 4,636,949, Cl. 364-400.000.

Ammann, Ernst. Device for bridging the joint between two parts of a roof and method for testing its tightness. 4,635,426, Cl. 52-573.000.

Amoco Corporation: *See*—
Harrington, John P., 4,635,728, Cl. 166-341.000.
Jageler, Alfred H., 4,635,717, Cl. 166-250.000.
Sheffield, Miller; Metcalfe, Robert S.; Calvin, James W.; and Chaback, Joseph J., 4,635,721, Cl. 166-268.000.

Amon, Albert: *See*—
Mehl, Wolfgang; and Amon, Albert, 4,636,223, Cl. 8-471.000.

AMP Incorporated: *See*—
Bobb, Clifford F.; and Cobaugh, Robert F., 4,636,021, Cl. 339-75.00MP.
Olsson, Billy E., 4,636,023, Cl. 339-103.00M.
Spotts, Kenneth L., 4,636,126, Cl. 414-126.000.
Stillie, Donald G., 4,636,018, Cl. 339-17.00M.

Ampex Corporation: *See*—
Didriksen, Neal A., 4,635,878, Cl. 242-198.000.

Amway Corporation: *See*—
McDowell, David E., 4,636,232, Cl. 55-350.000.

Andersen, David M.; Bitzer, Donald L.; Rader, Robert K.; Sherwood, Bruce A.; and Tucker, Paul T., to University of Illinois. Cluster computer based education delivery system. 4,636,174, Cl. 434-335.000.

Anderson, Gary L.; and Lindow, Steven E., to University of California, The Regents of the. Mycological method for controlling italian thistle growth. 4,636,386, Cl. 424-93.000.

Anderson, George E., to Crown Iron Works Company. Method and apparatus for heat treating flowable materials. 4,635,380, Cl. 34-27.000.

Anderson, James L.; and Paktinat, Javad, to Hughes Tool Company. Method of fracturing a subterranean formation. 4,635,727, Cl. 166-308.000.

Anderson, Richard N., to Hunger Douglas, Inc. Cord equalizer for locking together a plurality of cords of a blind assembly. 4,635,698, Cl. 160-178.00C.

Anderson, Thomas E.; and Howell, Edward K., to General Electric Company. Solid state circuit interruption employing a stored charge power transistor. 4,636,906, Cl. 361-13.000.

Anderson, William B.: *See*—
Huck, Peter M.; Andrews, Robert C.; and Anderson, William B., 4,636,367, Cl. 423-12.000.

Andersson, Jarl A., to Alfa-Laval Thermal AB. Gasket arrangement for a plate heat exchanger. 4,635,715, Cl. 165-167.000.

Ando, Mitosi: *See*—
Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,636,648, Cl. 250-571.000.

Ando, Noriyoshi, to Nippondenso Co., Ltd. Photoelectric input apparatus for display system. 4,636,632, Cl. 250-221.000.

Ando, Takeki: *See*—
Kurosawa, Toshiaki; Shima, Seiya; Ando, Takeki; Inaba, Hiromi; Nakashima, Hajime; and Mine, Toshisuke, 4,636,932, Cl. 363-54.000.

Andoh, Shizuo: *See*—
Yamaguchi, Hisashi; Takahara, Kazuhiro; Gondoh, Hiroyuki; Kawada, Toyoshi; and Andoh, Shizuo, 4,636,789, Cl. 340-805.000.

Andreas Stihl: *See*—
Nickel, Hans; and Wissmann, Michael, 4,635,777, Cl. 192-75.000.
Noll, Wilfried; Ehmann, Konrad; Stehle, Hans P.; Dorner, Wolfgang; and Dietzsch, Gunter, 4,635,364, Cl. 30-381.000.
Schweitzer, Karl; Nitschmann, Karl; and Dolata, Hans, 4,636,147, Cl. 417-214.000.

Andrews, Herbert K.: *See*—
West, G. Allan; Barnes, William W.; Dumaine, Thomas J.; and Andrews, Herbert K., 4,635,862, Cl. 241-51.000.

Andrews, Robert C.: *See*—
Huck, Peter M.; Andrews, Robert C.; and Anderson, William B., 4,636,367, Cl. 423-12.000.

Angelo, James F., II. Furnace afterburner. 4,635,568, Cl. 110-214.000.

Angerer, Reinhold; and Wallner, Felix, to Voest-Alpine Aktiengesellschaft. Method of, and an arrangement for casting metal melt. 4,635,832, Cl. 222-590.000.

Anjar Co.: *See*—
Becker, James R.; Wehn, Peter; and Rademacher, Peter, 4,635,936, Cl. 273-67.00R.

Annegarn, Marcellinus J. J. C.; and Welles, Petrus W. G., to U. S. Philips Corporation. Television receiver comprising a circuit for sequentially tuning the receiver to different frequencies. 4,636,864, Cl. 358-191.100.

Annoot, Ira R. Plug-in geophone case. 4,637,001, Cl. 367-177.000.

Anstalt, Almopa: *See*—
Sulser, Henry, 4,635,301, Cl. 2-69.000.

Anthony, Blair T.; and Olson, Daniel R., to General Electric Company. Ultraviolet radiation stabilized polymer compositions. 4,636,408, Cl. 427-160.000.

Aoki, Masakazu; Nakagome, Yoshinobu; Horiguchi, Masahi; Ozaki, Toshifumi; Shimohigashi, Katsuhiro; and Ikenaga, Shinichi, to Hitachi, Ltd. Semiconductor memory having charge transfer device voltage amplifier. 4,636,985, Cl. 365-189.000.

Aono, Toshiaki; Nakamura, Koichi; Shibata, Takeshi; and Nakamura, Taku, to Fuji Photo Film Co., Ltd. Heat developement dye-transfer process using crosslinked binders with dye mordants. 4,636,455, Cl. 430-201.000.

Aoshima, Kiyoji: *See*—
Seki, Seiji; and Aoshima, Kiyoji, 4,635,466, Cl. 72-453.130.

Aotani, Yoshimasa: *See*—
Kawamura, Kouichi; Aotani, Yoshimasa; Umehara, Akira; and Horie, Seiji, 4,636,459, Cl. 430-288.000.

Aoyama, Akimasa: *See*—
Okaya, Takuji; Tanaka, Yoshinari; Yonezu, Kiyoshi; Aoyama, Akimasa; and Moritani, Takeshi, 4,636,551, Cl. 525-60.000.

Aoyama, Masaharu: *See*—
Abe, Masahiro; Aoyama, Masaharu; Ajima, Takashi; and Yonezawa, Toshio, 4,636,832, Cl. 357-68.000.

Aoyama, Yoshiyuki: *See*—
Kawamura, Fumio; Matsuda, Masami; Aoyama, Yoshiyuki; Chino, Koichi; and Mizumoto, Mamoru, 4,636,335, Cl. 252-629.000.

Appelgren, Curt H.; and Ivarsson, Nemo, to Lejus Medical Aktiebolag. Apparatus for forming material into a ball. 4,636,163, Cl. 425-332.000.

Appels, Johannes A.: *See*—
Slotboom, Jan W.; Maas, Henricus G. R.; Appels, Johannes A.; and Klaassen, Francois M., 4,636,826, Cl. 357-24.000.

Apple, Merrill K. Cable pulling device. 4,635,875, Cl. 242-155.0BW.

Applied Science Associates, Inc.: *See*—
Cundiff, John S., 4,636,263, Cl. 127-42.000.

Appling, James: *See*—
Greene, Paul L.; and Appling, James, 4,636,998, Cl. 367-154.000.

Arai, Ryuichi; and Toganoh, Shigeo, to Canon Kabushiki Kaisha. Recording medium. 4,636,409, Cl. 427-256.000.

Arai, Ryuichi: *See*—
Akiya, Takashi; Toganoh, Shigeo; and Arai, Ryuichi, 4,636,410, Cl. 427-261.000.
Toganoh, Shigeo; Arai, Ryuichi; and Sakaki, Mamoru, 4,636,805, Cl. 346-1.100.

Arakawa, Hideki, to Fujitsu Limited. Voltage detecting device. 4,636,658, Cl. 307-350.000.

Araki, Kazuhito: *See*—
Sakabe, Busaburo; Hyuga, Kounosuke; and Araki, Kazuhito, 4,635,402, Cl. 51-74.0BS.

Araki, Yoshitsugu; and Akiba, Taichi, to Pioneer Electronic Corporation. Optical data reading device. 4,637,004, Cl. 369-44.000.

Arana, Jorge E.: *See*—
Villavicencio, Eduardo J.; and Arana, Jorge E., 4,635,322, Cl. 19-66.00R.

Arbige, Michael V.; and Neubeck, Clifford E., to Genencor, Inc. Lipolytic enzyme derived from a aspergillus microorganism having an accelerating effect on cheese flavor development. 4,636,468, Cl. 435-198.000.

Ardezzone, Frank J., to Probe-Rite, Inc. High density probe-head with isolated and shielded transmission lines. 4,636,722, Cl. 324-158.00P.

Arechaga, John C., to Ametek, Inc. Backwound pre-stressed spring motor and method. 4,635,755, Cl. 185-45.000.

Armstrong, Jean: *See*—
Siebert, Gary R.; and Armstrong, Jean, 4,636,478, Cl. 436-500.000.

Arndt, Peter J.: *See*—
Wenzel, Franz; Arndt, Peter J.; and Siol, Werner, 4,636,458, Cl. 430-270.000.

Arnold, Brian K.: *See*—
Sare, Ian R.; Henderson, Ian D.; Heijkoop, Teunis; Bosworth, Michael R.; Aspin, Ronald E.; and Arnold, Brian K., 4,635,701, Cl. 164-102.000.

Arnold, Ernst, to Meteor AG. Apparatus and process for winding electrical coils. 4,635,865, Cl. 242-7.030.

Arnold, George D. M.: *See*—
Thoma, Christian H.; and Arnold, George D. M., 4,635,535, Cl. 91-491.000.

Arnold, Paul C.: *See*—
Bills, Daniel G.; Arnold, Paul C.; Dodgen, Stephen L.; and Van Cleve, Craig B., 4,636,680, Cl. 313-7.000.

Arnold, Rose L.: *See*—
Willey, Donald E., 4,635,306, Cl. 5-431.000.

Arnsteiner, Anton, to Blizzard Gesellschaft m.b.H. Ski with improved running surface. 4,635,954, Cl. 280-604.000.

Artronics Corporation: *See*—
Santomango, Anthony; and Hatheway, Nicholas N., Jr., 4,636,725, Cl. 324-158.00F.
Santomango, Anthony; and Hatheway, Nicholas N., Jr., 4,636,726, Cl. 324-158.00F.

Asahi Glass Company Ltd.: *See*—
Kida, Otojiro; and Segawa, Yutaka, 4,636,481, Cl. 501-96.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Niiho, Masaaki; Itoh, Kiyoshi; Suzuki, Shinichi; Itagaki, Takao; and Tsuda, Koji, 4,636,068, Cl. 356-5.000.

Asakura, Osamu; Nozaki, Mineo; Nagashima, Masasumi; and Uchikata, Yoshio, to Canon Kabushiki Kaisha. Thermal printer. 4,636,810, Cl. 346-76.0PH.

Asay, Roger H., to Radiological & Chemical Technology, Inc. Reactor pipe treatment. 4,636,266, Cl. 148-6.350.

Asbach, Dietrich: *See*—
Penza, Hans; Segler, Siegfried; Schmuck, Karl-Wilhelm; Asbach, Dietrich; and Lindemann, Eckhard, 4,636,064, Cl. 355-73.000.

Aschauer, Michael: *See*—
Aschauer, Peter; Aschauer, Michael; and Bauer, Helmuth, 4,635,754, Cl. 182-3.000.

Aschauer, Peter; Aschauer, Michael; and Bauer, Helmuth, to Peter Aschauer, Firma. Rescue from an avalanche. 4,635,754, Cl. 182-3.000.

ASEA AB: *See*—
Tellden, Leif, 4,636,134, Cl. 414-729.000.

Asea Aktiebolag: *See*—
Brandt, Nils, 4,636,909, Cl. 361-80.000.

Ashelman, Robert U., Jr.; Townsend, Michael G.; and Lawrence, Mark C., to Karder Machine Co. Die pulling apparatus. 4,635,465, Cl. 72-448.000.

Ashland Oil, Inc.: *See*—
Goel, Anil B., 4,636,558, Cl. 528-363.000.
Gruber, Bruce A.; Langer, Heimo J.; and Dunnuyant, William R., 4,636,537, Cl. 523-139.000.

Aspen Laboratories, Inc.: *See*—
Robinette-Lehman, Cynthia, 4,635,635, Cl. 128-327.000.

Aspin, Ronald E.: *See*—
Sare, Ian R.; Henderson, Ian D.; Heijkoop, Teunis; Bosworth, Michael R.; Aspin, Ronald E.; and Arnold, Brian K., 4,635,701, Cl. 164-102.000.

Assal, Francois T.; Berman, Arnold L.; and Potukuchi, Janaki R., to Communications Satellite Corporation. Monitoring of input backoff in time division multiple access communication satellites. 4,637,017, Cl. 370-104.000.

Associated Sprayers Limited: *See*—
Reed, William J., 4,635,856, Cl. 239-583.000.

AT&T Bell Laboratories: *See*—
Binkard, Mark S.; and Sand, William C., 4,636,584, Cl. 379-240.000.
Feldman, Martin, 4,636,080, Cl. 356-401.000.
Fildes, Neal R., 4,636,939, Cl. 364-200.000.
Gagen, Paul F., 4,636,033, Cl. 350-96.210.
Stemberger, Michael L., 4,637,067, Cl. 455-295.000.
Tsang, Won-Tien, 4,636,268, Cl. 148-175.000.

AT&T Technologies, Inc.: *See*—
Fisanick, Georgia J.; Gross, Michal B.; and Wolk, Gary L., 4,636,403, Cl. 427-53.100.
Kuyel, Birol; and Sinclair, Paul F., III, 4,635,855, Cl. 239-551.000.

AT&T Teletype Corporation: *See*—
Chao, Philip, 4,637,037, Cl. 375-87.000.

Ateliers de Constructions Electriques de Charleroi: *See*—
Simon, Andre, 4,635,477, Cl. 73-290.00R.

Atkinson, Robert W., to Snyder Laboratories, Inc. Lavage system with replaceable pump. 4,635,621, Cl. 128-66.000.

Atlantic Richfield Company: *See*—
Feinberg, Stewart C., 4,636,578, Cl. 136-251.000.
Lin, James J., 4,635,746, Cl. 181-107.000.
Warfel, David R., 4,636,540, Cl. 523-310.000.

Atochem: *See*—
Pralus, Christian, 4,636,368, Cl. 423-16.000.

Audi AG: *See*—
Vollrath, Johannes, 4,636,921, Cl. 362-61.000.

Augat Inc.: *See*—
Cooney, James S.; and Sicard, Stephen T., 4,636,026, Cl. 339-255.00R.

Augoyard, Jean-Pierre, to GTM-Entrepose. Sliding formwork machine with two extruding plates for constructing continuouly reinforced concrete roadways. 4,636,110, Cl. 404-100.000.

Ausnit, Steven, to Minigrip. Zipper-lock bag chain adapter for automatic loading and heat seal closing. 4,637,060, Cl. 383-37.000.

Austin, Paul E.: *See*—
Allcock, Harry R.; Austin, Paul E.; and Neenan, Thomas X., 4,636,387, Cl. 514-89.000.

Autoflug GmbH: *See*—
Nohren, Hubert, 4,635,884, Cl. 244-142.000.

Automobiles Citroen: *See*—
Lombard, Roger, 4,635,679, Cl. 137-601.000.

Automobiles Peugeot: *See*—
Lombard, Roger, 4,635,679, Cl. 137-601.000.

Automotive Products plc: *See*—
Bass, Richard A., 4,635,442, Cl. 60-594.000.

Autotype International Limited: *See*—
Hudson, Andrew; and Stansfield, Norman J., 4,636,438, Cl. 428-412.000.

Avco Corporation: *See*—
Kane, Thomas A., 4,635,553, Cl. 102-384.000.

AVE S.p.A.: *See*—
Belli, Andrea, 4,636,914, Cl. 361-331.000.

Avis Industrial Corporation: *See*—
Brown, Alex G., 4,635,454, Cl. 70-139.000.

AVM, Inc.: *See*—
Ludwig, George C., 4,635,908, Cl. 267-64.110.

Awata, Hiroshi: *See*—
Kurihara, Susumu; Seki, Tadashi; Awata, Hiroshi; and Kadowaki, Hitoshi, 4,636,374, Cl. 423-385.000.

Ayala, Albert. Metal channel apparatus and method for forming a stairway. 4,635,416, Cl. 52-188.000.

Babbs, Dennis G.: *See*—
Bell, David E.; and Babbs, Dennis G., 4,635,889, Cl. 248-265.000.

Babcock Power Limited: *See*—
Haftke, Jozef J.; Worley, Norman G.; Coleman, Colin R.; and Warris, Anne-Marie, 4,635,567, Cl. 110-188.000.

Babcock & Wilcox Company, The: *See*—
Brandsberg, Timothy A.; and Pillow, Ronald C., 4,636,120, Cl. 411-14.000.
Finch, Curtis L., 4,638,333, Cl. 29-157.400.

Bacharach, Inc.: *See*—
Novack, Robert L.; and Tomasovic, Beth A., 4,636,294, Cl. 204-432.000.

Bacher, Michel; and Rumignani, Paolo, to Valeo. Clutch cover assembly. 4,635,779, Cl. 192-89.00B.

Bacher, Michel: *See*—
Billet, Rene ; and Bacher, Michel, 4,635,776, Cl. 192-70.270.

Buchman, William J.; and DiMeo, Franklin R., to RCA Corporation. Television cabinet having snap-together assembly. 4,635,809, Cl. 220-4.00B.

Bailey, Louis G.: *See—*
Harper, James G.; and Bailey, Louis G., 4,636,634, Cl. 250-223.00R.

Bailey, Norman R.: *See—*
Zimmermann, Klaus; Thomas, Michael J.; and Bailey, Norman R., 4,635,498, Cl. 74-501.00R.

Bajka, Peter. Diverter valve assembly and method. 4,635,674, Cl. 137-246.220.

Baker, David C., to University of Alabama, Board of Trustees of the. 5-cyanopyridine-2-diazohydroxide, basic salts and methods for production and use. 4,636,564, Cl. 546-289.000.

Baker, David L. Chemical reformer. 4,636,318, Cl. 210-766.000.

Baker, E. Bruce, to Vibrastop, Inc. Active vibration suppressor. 4,635,892, Cl. 248-550.000.

Baker, Edwin L. Method of sealing a joint between an ingot mold and a stool and resulting assembly. 4,635,896, Cl. 249-135.000.

Baker Oil Tools, Inc.: *See—*
Donovan, Joseph F.; Stout, Gregg W.; and Schmuck, Phillip W., 4,635,734, Cl. 175-4.600.

Baker, Robert L.; and Glauber, Diane E. Heat exchanger assembly for a compressor. 4,635,712, Cl. 165-82.000.

Baker, Sol, to ITT Corporation. Air vent. 4,635,672, Cl. 137-202.000.

Bakewell, Joseph J., to Dynamics Research Corporation. Thermal print head. 4,636,811, Cl. 346-76.0PH.

Bakewell, Joseph J., to Dynamics Research Corporation. Thermal print head temperature control. 4,636,812, Cl. 346-76.0PH.

Balaban, Alvin R.: *See—*
Steckler, Steven A.; and Balaban, Alvin R., 4,636,836, Cl. 358-19.000.

Balasubramanian, N., to Matrix Instruments Inc. Method for reading deformation images on electrophotographic media. 4,636,069, Cl. 356-71.000.

Balazs, Endre A.; and Leshchiner, Adolf, to Biomatrix, Inc. Cross-linked gels of hyaluronic acid and products containing such gels. 4,636,524, Cl. 514-781.000.

Bald, Gordon H., to Diversified Manufacturing Corporation. Corrugating die shoe assemblies. 4,635,462, Cl. 72-385.000.

Balding, Victor H., to Beaver Machine Tool Sales Limited. Plano-milling machine. 4,635,342, Cl. 29-568.000.

Baldwin, Paul L.: *See—*
Sherwood, Edward F.; Baldwin, Paul L.; Orndorff, Karl B.; and Dillon, Charles M., 4,635,756, Cl. 187-1.00R.

Balevski, Teodor A.: *See—*
Paunov, Boyan I.; Balevski, Teodor A.; and Ivanov, Bojidar S., 4,635,460, Cl. 72-259.000.

Bali, Jean-Pierre: *See—*
Martinez, Jean; Bali, Jean-Pierre; Castro, Bertrand; Nisato, Dino; and Demarne, Henri, 4,636,490, Cl. 514-15.000.

Ball, Donald L.; and Boateng, Daniel A. D., to Cominco Ltd. Method for the recovery of lithium from solutions by electrodialysis. 4,636,295, Cl. 204-182.400.

Ballantyne, W. John, to Urban Transportation Development Corporation Limited. Contactless powering of LIM vehicle electrical system by recovery of LIM slip power. 4,635,560, Cl. 104-292.000.

Ballato, Arthur, to United States of America, Army. Compensation of acoustic wave devices. 4,636,678, Cl. 310-313.00R.

Bancon, Georges: *See—*
Potters, Michel; and Bancon, Georges, 4,635,988, Cl. 294-64.100.

Bancon, Georges R., to Societe Syspro. Tool-holder for industrial robot. 4,636,135, Cl. 414-730.000.

Bankier Companies, Inc.: *See—*
Bankier, Jack D., 4,635,797, Cl. 206-472.000.

Bankier, Jack D., to Bankier Companies, Inc. Pilfer resistant software package. 4,635,797, Cl. 206-472.000.

Baranski, Bernard R., to Household Manufacturing, Inc. Rotating fan apparatus. 4,636,142, Cl. 416-210.00R.

Barber, Anthony D.: *See—*
Hough, David; Morris, Sidney J.; and Barber, Anthony D., 4,636,156, Cl. 418-201.000.

Barfknecht, Charles F.; and Schoenwald, Ronald D., to University of Iowa Research Foundation. Non-classical topical treatment for glaucoma. 4,636,515, Cl. 514-363.000.

Barger, William R.; Jarvis, Neldon L.; Snow, Arthur W.; and Wohltjen, Henry, to United States of America, Navy. Mixed semiconductor film device for monitoring gases. 4,636,767, Cl. 338-34.000.

Baricevac, Thomas A.; and Raffalski, Karl-Heinz, to Theta Industries, Inc. Low temperature dilatometer. 4,636,090, Cl. 374-56.000.

Barito, Robert W.; and Downs, Kenneth L., to General Electric Company. Precipitated silica insulation. 4,636,415, Cl. 428-68.000.

Barnes, James E.: *See—*
Hague, Duane O.; and Barnes, James E., 4,636,858, Cl. 358-147.000.

Barnes, William W.: *See—*
West, G. Allan; Barnes, William W.; Dumaine, Thomas J.; and Andrews, Herbert K., 4,635,862, Cl. 241-51.000.

Barnett, Ronald E.: *See—*
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,636,396, Cl. 426-548.000.

Barr, John T., IV: *See—*
Sharrit, David D.; Dildine, Robert G.; Roos, Mark D.; and Barr, John T., IV, 4,636,717, Cl. 324-77.00B.

Barrett, John P., Sr.; and Schulz, Daniel R., to Barrett, John P., Sr. Electronic control device for liquids. 4,635,844, Cl. 236-12.120.

Barry, Jurgen, to Compur-Electronic GmbH. Fiber optic reflectance measurement apparatus. 4,636,082, Cl. 356-446.000.

Baraki, Guy, to CII Honeywell Bull. Magnetic disc cartridge with ventilating structure. 4,636,891, Cl. 360-97.000.

BASF Aktiengesellschaft: *See—*
Bleckmann, Gerhard; Lynch, John; and Wallbillich, Gunter, 4,635,549, Cl. 101-401.100.
Kossmann, Heribert; Matthaei, Lothar; Ley, Gregor; Wistuba, Eckehardt; and Wulgaris, Savas, 4,636,548, Cl. 524-524.000.
Moehwald, Helmut, 4,636,430, Cl. 428-304.400.
Plath, Peter; Rohr, Wolfgang; Schwendemann, Volker; and Wuerzer, Bruno, 4,636,246, Cl. 71-92.000.
Rossy, Phillip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Friedrich, Ludwig; and Lenke, Dieter, 4,636,504, Cl. 514-252.000.
Schmidt, Hans U.; and Werner, Frank, 4,636,531, Cl. 521-163.000.

BASF Corporation: *See—*
Narayan, Thirumurti, 4,636,530, Cl. 521-159.000.

Bass, C. David: *See—*
Caswell, Robert L.; and Bass, C. David, 4,636,950, Cl. 364-403.000.

Bass, Richard A., to Automotive Products plc. Hydraulic master cylinder assembly. 4,635,442, Cl. 60-594.000.

Batchelder, David N.: *See—*
Pitt, Gillies D.; Batchelder, David N.; Jones, Roger E.; and Neat, Rosamund C., 4,637,071, Cl. 455-603.000.

Bateman, Bruce L.: *See—*
Young, Kenneth E.; and Bateman, Bruce L., 4,636,983, Cl. 365-181.000.

Batky, Michael, to Almac Plastics Inc. Motor vehicle glazing assembly and method of manufacture thereof. 4,635,420, Cl. 52-309.100.

Battelle Development Corporation: *See—*
Sherman, Rand C.; and Grieser, Daniel R., 4,637,056, Cl. 382-31.000.

Battelle-Institut e.V.: *See—*
Gurs, Karl; and Hansen, Erich, 4,637,031, Cl. 372-86.000.

Battelle Memorial Institute: *See—*
Noir, Dominique; and Trouilhet, Yves, 4,635,630, Cl. 128-203.260.

Battle, Stanley D., to United States of America, Air Force. Unique signal, safe and arm device. 4,635,552, Cl. 102-254.000.

Baudry, Hugues; Monneraye, Marc A.; and Morhaim, Claude, to U.S. Philips Corporation. Silk screen printing paste with lead glass which is to be fired in a non-oxidizing atmosphere. 4,636,257, Cl. 106-19.000.

Bauer, Hans-Peter, to Robert Bosch GmbH. Control device for a hand-operated electric power tool. 4,636,961, Cl. 364-474.000.

Bauer, Helmuth: *See—*
Aschauer, Peter; Aschauer, Michael; and Bauer, Helmuth, 4,635,754, Cl. 182-3.000.

Bauer, Manfred: *See—*
Kranzle, Josef; Droitsch, Lutz; and Bauer, Manfred, 4,636,146, Cl. 417-270.000.

Bauer, Walter, to AGFA-Gevaert AG. X-ray sheet film cassette for application to angular body parts. 4,637,043, Cl. 378-188.000.

Baxter, Stanton E. Furniture construction. 4,635,564, Cl. 108-111.000.

Baxter Travenol Laboratories, Inc.: *See—*
Cullis, Herbert M., 4,636,193, Cl. 494-45.000.

Bayer Aktiengesellschaft: *See—*
Hammen, Hans W.; and Voege, Herbert, 4,636,503, Cl. 514-249.000.
Konig, Joachim; Suling, Carlhans; and Nachtkamp, Klaus, 4,636,545, Cl. 524-457.000.
Niemers, Ekkehard; Grutzmann, Rudi; Mardin, Mithat; Busse, Wolf-Dieter; and Meyer, Horst, 4,636,497, Cl. 514-215.000.
Sirinyan, Kirkor; Wolf, Gerhard D.; von Gizycki, Ulrich; and Merten, Rudolf, 4,636,441, Cl. 428-447.000.
Wroblowsky, Heinz-Jurgen; Stetter, Jorg; Eue, Ludwig; Schmidt, Robert R.; and Santel, Hans-Joachim, 4,636,245, Cl. 71-90.000.

Bayha, Kurt; and Weyl, Helmut, to Robert Bosch GmbH. Internally heated oxygen sensor, particularly for use with internal combustion engines. 4,636,293, Cl. 204-428.000.

Baynes, Martin J., to Fairchild Semiconductor Corporation. Distributed field effect transistor structure. 4,636,825, Cl. 357-23.140.

Bays, David E.: *See—*
Coates, Ian H.; Mills, Keith; Webb, Colin F.; Dowle, Michael D.; and Bays, David E., 4,636,521, Cl. 514-415.000.

BBC Brown, Boveri & Company Limited: *See—*
Buhler, Karl, 4,637,033, Cl. 373-72.000.
Talir, Jiri, 4,636,599, Cl. 200-144.0AP.

Beard, Frank A., Jr. Hydraulic control system for simultaneous application of brakes of towing and towed vehicles with equal intensity. 4,635,758, Cl. 188-3.00H.

Beauducel, Claude: *See—*
Cretin, Jacques; Beauducel, Claude; Rudaz, Jean; and Gonzalez, Pierre, 4,636,992, Cl. 367-20.000.

Beaver, Bud K. Caliper. 4,635,370, Cl. 33-149.00R.

Beaver Machine Tool Sales Limited: *See—*
Balding, Victor H., 4,635,342, Cl. 29-568.000.

Beavers, Randy S.; McFarlane, Finley E.; Musser, Harry R.; and Shepherd, Freddie A., to Eastman Kodak Company. Laminated structures of polyethylene terephthalate and elastomeric copolyesterethers. 4,636,442, Cl. 428-480.000.

Beazley, Mark D.: *See—*
Hansen, Peder U.; and Beazley, Mark D., 4,635,413, Cl. 52-92.000.

Bechtel, Wolf D.: *See—*
Schneider, Claus; Walther, Gerhard; Weber, Karl-Heinz; Bechtel, Wolf D.; and Boke-Kuhn, Karin, 4,636,510, Cl. 514-302.000.

Beck, Gerald H., to Microdot Inc. Anti-extrusion seal with primary and secondary complementary elements. 4,635,945, Cl. 277-124.000.

Beck, Lee R.: *See—*
Stolle, Ralph J.; and Beck, Lee R., 4,636,384, Cl. 424-87.000.

Becker, James R.; Wehn, Peter; and Rademacher, Peter, to Anjar Co. Inflatable racket. 4,635,936, Cl. 273-67.00R.

Becker, Manfred; Matejec, Reinhart; and Endres, Lothar, to Agfa Gevaert Aktiengesellschaft. Photographic recording material. 4,636,461, Cl. 430-567.000.

Becker, Rolf: *See—*
Kamp, Heinz; and Becker, Rolf, 4,635,866, Cl. 242-36.000.

Beckman Instruments, Inc.: *See—*
Harris, John; Cooke, Nelson; and Olsen, Kristine, 4,636,316, Cl. 210-656.000.

Becton, Dickinson and Company: *See—*
Siebert, Gary R.; and Armstrong, Jean, 4,636,478, Cl. 436-500.000.

Bedard, James F.: *See—*
Thomas, Charles E.; Lee, Minyoung; Bedard, James F.; and Hayashi, Steven R., 4,636,780, Cl. 340-680.000.

Beecher, John, III: *See—*
Tucker, James E.; Stephen, James C.; and Beecher, John, III, 4,635,613, Cl. 126-25.00R.

Beer, Gary L.: *See—*
Chemtob, Elie; and Beer, Gary L., 4,636,372, Cl. 423-312.000.

Bege, Dietmar: *See—*
Kratz, Gerhard; Meininger, Siegfried; Fischer, Eckhard; and Bege, Dietmar, 4,636,363, Cl. 422-159.000.

Beghin-Say International, Inc.: *See—*
Madsen, Willy B.; Jensen, Finn H.; Rasmussen, Ole B.; Goldstein, Guy; and Russin-Moynier, Yves R., 4,636,419, Cl. 428-131.000.

Behrens, Hugh C., to Dow Chemical Company, The. Molten metal handling system. 4,635,706, Cl. 164-500.000.

Bell, David E.; and Babbs, Dennis G., to Cooper Industries. Drapery support system with decorative rod end support structure. 4,635,889, Cl. 248-265.000.

Bell, John L.; Isaman, David L.; and Osman, Fazil I., to Burroughs Corporation. Method of inserting and removing isochronous data into a sequence of nonisochronous data characters without slot allocation on a computer network. 4,637,014, Cl. 370-89.000.

Bell Telephone Laboratories: *See—*
Fisanick, Georgia J.; Gross, Michal E.; and Wolk, Gary L., 4,636,403, Cl. 427-53.100.

Bellar, Dennis R., to Laser Photonics, Inc. Laser beam scanning device and marking system. 4,636,043, Cl. 350-484.000.

Bellavance, Joseph T.; and Price, William J., to Signetics Corporation. Programmable status register arrangement. 4,636,978, Cl. 364-900.000.

Bellhouse, Brian J. Transfer membrane apparatus. 4,636,309, Cl. 210-321.300.

Bellhouse, Brian J. Transfer membrane apparatus. 4,636,310, Cl. 210-321.300.

Belli, Andrea, to AVE S.p.A. Outlet box with removable self-contained device. 4,636,914, Cl. 361-331.000.

Bellini, Mario, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument having cover with operation panel. 4,635,521, Cl. 84-177.000.

Bellotto, Carlo; Cimenti, Antonio; and Polo, Ermes. Machine for transforming a piece of dough of globoidal form into a substantially circular-shaped puff-pastry, which may be particularly employed for preparing food-stuffs of various kinds. 4,636,164, Cl. 425-337.000.

Bendix France: *See—*
Le Marchand, Claude; and Gerard, Jean-Louis, 4,635,760, Cl. 188-71.900.

Beneditz, Bruce D.: *See—*
Ebbing, Steven J.; Hermans, Robert J.; Vicari, John J.; and Beneditz, Bruce D., 4,635,441, Cl. 60-450.000.

Benteler Corporation: *See—*
Palentyn, Gunther H.; Dehlinger, James R.; and Rigsby, Donald R., 4,636,608, Cl. 219-121.0LN.

Benton, R. Paul: *See—*
Broyden, Robert H.; Benton, R. Paul; and Eldridge, Allen E., 4,635,903, Cl. 254-362.000.

Berend, Peter M.; Dilyard, Richard D.; Pesa, William A.; and Vaeth, Howard J., to Rubbermaid Incorporated. Mode stirring turntable for microwave oven. 4,636,605, Cl. 219-10.55F.

Berfield, Robert C.; and Crevling, Robert L., Jr., to Shop-Vac Corporation. Dolly bumper. 4,635,951, Cl. 280-47.340.

Berger, Gerald P.: *See—*
Foster, Frank S.; and Berger, Gerald P., 4,635,803, Cl. 212-192.000.

Berger, Gustav A. Self-adjusting canvas tensioning frame. 4,635,700, Cl. 160-374.100.

Berkley and Company, Inc.: *See—*
Rumbaugh, James T., 4,635,406, Cl. 51-181.00R.

Berman, Arnold L.: *See—*
Assal, Francois T.; Berman, Arnold L.; and Potukuchi, Janaki R., 4,637,017, Cl. 370-104.000.

Bertolacini, Ralph J.: *See—*
Unmuth, Eugene E.; Mahoney, John A.; and Bertolacini, Ralph J., 4,636,299, Cl. 208-87.000.

Bertolini, William A., to JD-Bertolini Industries, Ltd. Extendable chassis. 4,635,742, Cl. 180-209.000.

Bertram, Leo; Diefenbach, Gerhard; and Schemmann, Hugo, to U.S. Philips Corporation. Single-phase synchronous motor with two-pole permanent-magnet rotor. 4,636,676, Cl. 310-162.000.

Berube, Ghislain R. Adjustable seat cushion. 4,635,622, Cl. 128-68.000.

Bessho, Nagayasu: *See—*
Nakato, Hakaru; Bessho, Nagayasu; Nozaki, Tsutomu; Habu, Yasuhiro; and Kimura, Tomoaki, 4,635,703, Cl. 164-443.000.

Bestek, Heinz; Ewald, Werner; Hennecke, Hans-Peter; Roeder, Alfred; and Schmitz, Friedrich, to Rheinische Kalksteinwerke GmbH. Process for producing calcium hydroxide. 4,636,379, Cl. 423-640.000.

Bethuel, Louis; Martin, Laurent; and Dujardin, Thierry, to Commissariat a l'Energie Atomique. Liquid-liquid exchangers and process of using. 4,636,290, Cl. 204-186.000.

Betts, William L., to Paradyne Corporation. Digital modem for multiple telephone circuits. 4,637,035, Cl. 375-8.000.

Beuhler, Allyson J.; and Polak, Anthony J., to UOP Inc. Polymer blended membranes. 4,636,314, Cl. 210-500.250.

Beuther, Paul D.: *See—*
Huey, Larry J.; and Beuther, Paul D., 4,636,234, Cl. 65-2.000.

Bhagat, Jayant K., to General Motors Corporation. Insulated gate-controlled thyristor having shorted anode. 4,636,830, Cl. 357-38.000.

Bhatt, Devesh; and Schroeder, Michael O., to Honeywell Inc. Monitor circuit. 4,636,967, Cl. 364-550.000.

Bhattacharya, Ajit K.; and Nolan, John T., Jr., to Texaco Inc. Cyclic amide additives for organic carbonate process. 4,636,576, Cl. 558-277.000.

Bhattacharya, Sabyasachi; Bloch, Aaron N.; and Stokes, James P., to Exxon Research and Engineering Company. Frequency modulator and demodulator using material having sliding charge density waves. 4,636,737, Cl. 329-110.000.

Bialy, Louis; and Menet, Frederick P., to Otis Elevator Company. Hydraulic buffer for elevators. 4,635,907, Cl. 267-8.00R.

Bidell, Frederick W.; Kluever, Harold C.; and Reed, Roger R., to United States of America, Navy. Synchronization of long codes of bounded time uncertainty. 4,636,583, Cl. 178-22.170.

Bierhoff, Martinus P. M., to U.S. Philips Corporation. Apparatus for producing digital information from a transmission medium. 4,637,006, Cl. 369-59.000.

Bihl, Jean-Marie. Process and apparatus for manufacturing cardboard tubes with incorporated closure. 4,636,188, Cl. 493-157.000.

Billet, Rene ; and Becher, Michel, to Valeo. Clutch having a starter ring gear and an ignition timing mark. 4,635,776, Cl. 192-70.270.

Bills, Daniel G.; Arnold, Paul C.; Dodgen, Stephen L.; and Van Cleve, Craig B., to Granville-Phillips Company. Vacuum gauge. 4,636,680, Cl. 313-7.000.

Bimer, Thomas C.: *See—*
Millis, Edwin G.; Bimer, Thomas C.; and Lewis, Alton D., 4,636,128, Cl. 414-217.000.

Bingham, David; and Allen, Charles M., to Maxim Integrated Products, Inc. Integrated dual charge pump power supply and RS-232 transmitter/receiver. 4,636,930, Cl. 363-60.000.

Binkard, Mark S.; and Sand, William C., to AT&T Bell Laboratories. Signaling protocol channel unit. 4,636.584, Cl. 379-240.000.

Bio-Innovations: *See—*
Jackson, Frank W.; and Schlossberg, David, 4,635,790, Cl. 206-210.000.
Jackson, Frank W.; and Schlossberg, David, 4,635,791, Cl. 206-210.000.

Biomatrix, Inc.: *See—*
Balazs, Endre A.; and Leshchiner, Adolf, 4,636,524, Cl. 514-781.000.

Bird, James M., Sr.; and Lewis, Jesse M., to Industrial Vehicles International, Inc. Marine seismic vibrator having support structure including vibration isolators. 4,635,747, Cl. 181-120.000.

Bischof und Klein GmbH & Co.: *See—*
Poppe, Josef, 4,637,062, Cl. 383-54.000.

Bison-Werke Bahre & Greten GmbH & Co. KG: *See—*
Heller, Wolfgang; Ruckert, Peter; and Wiemann, Dieter, 4,636,159, Cl. 425-148.000.

Bitzer, Donald L.: *See—*
Andersen, David M.; Bitzer, Donald L.; Rader, Robert K.; Sherwood, Bruce A.; and Tucker, Paul T., 4,636,174, Cl. 434-335.000.

Bivetto, Andrew J.: *See—*
Lowin, David A.; Fayram, Richard A.; and Bivetto, Andrew J., 4,636,202, Cl. 604-236.000.

Black & Decker Inc.: *See—*
George, William A., 4,635,502, Cl. 74-625.000.

Blackwood, Carl I. R., to White Scientific Consultants Inc. Method and apparatus for wind direction and speed in spatial determination by magnus effect. 4,635,474, Cl. 73-189.000.

Blaker, J. Warren, to University Optical Products Co. Concentric bifocal contact lens. 4,636,049, Cl. 351-161.000.

Bleckmann, Gerhard; Lynch, John; and Wallbillich, Gunter, to BASF Aktiengesellschaft. Method for closing the gap between the ends of gravure printing plates clamped on forme clyinders. 4,635,549, Cl. 101-401.100.

Blieden, Richard: *See—*
Hanak, Joseph J.; Young, James; Kuypers, Bert; and Blieden, Richard, 4,636,579, Cl. 136-245.000.

Blizzard Gesellschaft m.b.H.: *See—*
Arnsteiner, Anton, 4,635,954, Cl. 280-604.000.

Bloch, Aaron N.: *See—*
Bhattacharya, Sabyasachi; Bloch, Aaron N.; and Stokes, James P., 4,636,737, Cl. 329-110.000.

Blom, C. James, to Roxor Corporation. Shade for segmented rear view mirror. 4,636,046, Cl. 350-613.000.

Blomberg, Folke I.; and Holst, Jan-Olov M. Braking force modulator. 4,636,011, Cl. 303-115.000.

Blume, Orville E., to Aero Transportation Products, Inc. Latch device for railcar hatch covers. 4,635,979, Cl. 292-256.500.

Bluzer, Nathan, to Westinghouse Electric Corp. Three dimensional optical receiver having programmable gain control. 4,636,980, Cl. 343-106.000.

Boss, Arthur J.: *See*—
Magi, Hugo; Boss, Arthur J.; and Waese, Jerry R., 4,636,847, Cl. 358-101.000.

Boateng, Daniel A. D.: *See*—
Ball, Donald L.; and Boateng, Daniel A. D., 4,636,295, Cl. 204-182.400.

Bobb, Clifford F.; and Cobaugh, Robert F., to AMP Incorporated. High density ZIF card edge connector. 4,636,021, Cl. 339-75.0MP.

Bobey, Kenneth A., to Northern Telecom Limited. Packet transmission and reception via a shared DMA channel. 4,637,015, Cl. 370-94.000.

Bocek, Joseph M.: *See*—
Hakala, Douglas T.; Bocek, Joseph M.; and Osborn, James G., 4,635,639, Cl. 128-419.00D.

Bock, Mark G.; DiPardo, Robert M.; Boger, Joshua S.; Evans, Ben E.; and Freidinger, Roger, to Merck & Co., Inc. Renin inhibitory peptides having improved solubility. 4,636,491, Cl. 514-16.000.

Boden, Richard M.: *See*—
Sprecker, Mark A.; Schreiber, William L.; Fujioka, Futoshi; Boden, Richard M.; Vock, Manfred H.; Whelan, Patrick; and Hanna, Marie R., 4,636,333, Cl. 252-522.00R.

Boecker, Juergen; Luther, Hans W.; Wallow, Peter; and Fritsch, Horst, to Rheinmetall GmbH. Penetrator shell with stacked core elements. 4,635,556, Cl. 102-518.000.

Boehringer Ingelheim KG: *See*—
Schneider, Claus; Walther, Gerhard; Weber, Karl-Heinz; Bechtel, Wolf D.; and Boke-Kuhn, Karin, 4,636,510, Cl. 514-302.000.

Boeing Company, The: *See*—
Hamilton, Herbert E.; and Shorey, Thomas H., 4,635,883, Cl. 244-137.00R.
Harris, Charles E.; and Tolley, Robert K., 4,636,422, Cl. 428-174.000.
SenGupta, Gautam; and Spain, Byron R., 4,635,882, Cl. 244-119.000.

Boge GmbH: *See*—
Schmidt, Rudolf, 4,635,765, Cl. 188-299.000.

Boger, Joshua S.: *See*—
Bock, Mark G.; DiPardo, Robert M.; Boger, Joshua S.; Evans, Ben E.; and Freidinger, Roger, 4,636,491, Cl. 514-16.000.

Boke-Kuhn, Karin: *See*—
Schneider, Claus; Walther, Gerhard; Weber, Karl-Heinz; Bechtel, Wolf D.; and Boke-Kuhn, Karin, 4,636,510, Cl. 514-302.000.

Boland, Bernard W., to Motorola Inc. Epitaxially isolated semiconductor device process utilizing etch and refill technique. 4,636,269, Cl. 148-175.000.

Boland, Donald P.; Menz, William; and Seimetz, Glen R., to Illinois Bell Telephone Company. Rear bumper assembly for cable pulling truck. 4,635,983, Cl. 293-111.100.

Boland, Robert P., to Sanders Associates, Inc. Method and apparatus for digital filtering. 4,636,972, Cl. 364-724.000.

Boldish, Steven I., to Ethyl Corporation. Altering flow of gaseous substances. 4,635,681, Cl. 137-625.500.

Bolenbaugh, Daniel L.: *See*—
Smith, Roger L.; and Bolenbaugh, Daniel L., 4,635,761, Cl. 188-72.900.

Bolt, Reginald C.; Dyett, Derek H.; and Williams, Robert E., to Molins PLC. Spark perforation of web material. 4,635,653, Cl. 131-281.000.

Bolz, Richard; and Trutter, Walter P., to General Motors Corporation. Seat back for a motor vehicle rear seat assembly. 4,636,005, Cl. 297-379.000.

Bombardelli, Ezio; Gabetta, Bruno; and Magistretti, Maria J., to Inverni Della Beffa S.p.A. Pharmaceutical compositions containing compounds with a flavanone skeleton, process for the preparation of the said compound and novel compounds obtained. 4,636,569, Cl. 549-403.000.

Bombardier-Rotax Gesellschaft m.b.H.: *See*—
Weichsler, Hermann, 4,635,592, Cl. 123-90.180.

Bonello, Philippe, to Sarcem S.A. Autolubricating bearing. 4,636,096, Cl. 384-243.000.

Book Covers Inc.: *See*—
Carter, Leewood C.; Neary, Robin P.; and Mullen, Robert, 4,636,185, Cl. 493-127.000.

Boots Company Plc, The: *See*—
Brunt, Keith D.; and Higton, Frederick R., 4,636,476, Cl. 436-23.000.

Borkowicz, Jerzy, to C-I-L Inc. Digital display ohmmeter. 4,636,715, Cl. 324-62.000.

Borzym, Alexander. Elliptical shearing apparatus. 4,635,514, Cl. 83-156.000.

Bosworth, Michael R.: *See*—
Sare, Ian R.; Henderson, Ian D.; Heijkoop, Teunis; Bosworth, Michael R.; Aspin, Ronald E.; and Arnold, Brian K., 4,635,701, Cl. 164-102.000.

Boteler, William C., to Harvey Hubbell Incorporated. Flat conductor cable. 4,636,017, Cl. 339-17.00F.

Bottomley, Paul A., to General Electric Company. NMR spectroscopy body probes with at least one surface coil. 4,636,730, Cl. 324-318.000.

Boudot, Bernard: *See*—
Seon, Francoise; and Boudot, Bernard, 4,636,353, Cl. 420-416.000.

Bourdeau, Serge. Wireless hand held hot air hair dryer. 4,635,382, Cl. 34-97.000.

Bourgeois, Ronald D. Accumulating magazine. 4,635,784, Cl. 198-347.000.

Bowbin, John F.: *See*—
Liu, Ming; Bowbin, John F.; Ghislain, Raymond L.; and McDaniel, Stephen K., 4,635,536, Cl. 92-24.000.

Bowers, Geoffrey, to Seasonmakers (Australia) Pty. Limited. Stitched woodwool mat. 4,635,576, Cl. 112-403.000.

Bowman, Bonita F.: *See*—
Lumley, Edward M.; and Bowman, Bonita F., 4,636,993, Cl. 367-63.000.

Bowman, William E., to General Motors Corporation. Switching circuit utilizing a field effect transistor. 4,636,705, Cl. 322-28.000.

Bowman, William E.; Voss, Richard J.; and Kirk, Thomas E., to General Motors Corporation. Generator voltage regulating system. 4,636,706, Cl. 322-28.000.

Bowsher, John M., to Minolta Camera Kabushiki Kaisha. Automatic hand-held photographic light meters. 4,636,052, Cl. 354-410.000.

Box, Joe G., to Milbar Corporation. Pliers. 4,635,510, Cl. 81-319.000.

Boyce, Jay: *See*—
Tschernenko, Stanley A.; Crane, Lawrence A.; and Boyce, Jay, 4,636,935, Cl. 364-140.000.

Boyd, John H., Jr.; and Muller, Alexander, to General Electric Company. Control system for an electronically commutated motor. 4,636,936, Cl. 364-148.000.

Boyle, David H., to International Business Machines Corporation. High speed counter. 4,637,038, Cl. 377-117.000.

Boyle, Raymond F., to Westinghouse Electric Corp. Nuclear fuel rod with burnable plate and pellet-clad interaction fix. 4,636,352, Cl. 376-419.000.

Bradfield, James E.: *See*—
Kahil, John E.; Milewits, Marvin; Bradfield, James E.; and Lam, Clive C., 4,636,727, Cl. 324-227.000.

Bradlee, Charles R., to Monarch Machine Tool Co. Leveling apparatus. 4,635,458, Cl. 72-165.000.

Bradley, Danny R.: *See*—
Morrison, Elbert F.; Bradley, Danny R.; and Reece, D. C., 4,635,435, Cl. 57-328.000.

Bradshaw, John F. Bow sight bar. 4,635,374, Cl. 33-265.000.

Braeger, Horst; and Johannesson, Orn, to Nordischer Maschinenbau Rud. Baader GmbH & Co KG. Apparatus for decapitating fish. 4,635,318, Cl. 17-63.000.

Bragin, Boris F.; and Markuntovich, Felix D., to Voroshilovgradsky Mashinostroitelny Institut. Gate valve. 4,635,900, Cl. 251-326.000.

Brandli, Max: *See*—
Feldmann, Hansueli; and Brandli, Max, 4,635,982, Cl. 293-2.000.

Brands, George B.; and Carlson, James R., to American Roller Company. Gap filler blanket for printing cylinder. 4,635,550, Cl. 101-415.100.

Brandsberg, Timothy A.; and Pillow, Ronald C., to Babcock & Wilcox Company, The. Stud/bolt load gauge. 4,636,120, Cl. 411-14.000.

Brandstatter, Horst, to Geobra Brandstatter GmbH & Co. KG. Telephone installations. 4,636,585, Cl. 379-167.000.

Brandstrom, Arne E.; Lindberg, Per L.; and Wallmark, Bjorn, to Aktiebolaget Hassle. Sulphenamides. 4,636,499, Cl. 514-222.000.

Brandt, Nils, to Asea Aktiebolag. Digital impedance relay. 4,636,909, Cl. 361-80.000.

Branmstam, Gunilla. Apparatus for arm and leg exercise. 4,635,931, Cl. 272-130.000.

Braun, Martin, to Machlett Laboratories, Incorporated, The. X-ray tube target having electron pervious coating of heat absorbent material on X-ray emissive surface. 4,637,042, Cl. 378-143.000.

Brefka, Paul E.; and Pichler, Klaus R., to Shaw, James T. Talking book with an infrared detector used to detect page turning. 4,636,881, Cl. 360-74.100.

Breininger, J. Shannon, to PPG Industries, Inc. Non-glare coated glass. 4,636,439, Cl. 428-428.000.

Bressler, Peter W.: *See*—
de la Morandiere, Anne J.; Bressler, Peter W.; Byar, Peter D.; and Spector, Edward A., 4,636,613, Cl. 219-249.000.

Brewer, Arthur D.; and Minatelli, John A., to Uniroyal Chemical Company, Inc.; and Uniroyal Ltd. 5-pyrimidinecarboxyamides and treatment of leukemia therewith. 4,636,508, Cl. 514-274.000.

Bridgestone Corporation: *See*—
Mizuno, Keiichiro; Iida, Kazuyoshi; and Murakami, Kazutomo, 4,635,501, Cl. 74-574.000.

Brieger, Emmet F.: *See*—
Vann, Roy R.; Brieger, Emmet F.; George, Flint R.; Colle, Edward A., Jr.; and Jones, Hilton B., 4,635,733, Cl. 175-4.560.

Brieseck, Bernd; and Kreuzer, Peter, to Diehl GmbH & Co. Foldable wing, especially for a projectile. 4,635,881, Cl. 244-49.000.

Briggs, Richard L.: *See*—
Jacobsen, William A.; and Briggs, Richard L., 4,636,267, Cl. 148-133.000.

Brinkgreve, Peter; and Koningsberger, Diederik C., to Technische Hogeschool Eindhoven. Kinematic X-ray analyses apparatus. 4,637,041, Cl. 378-71.000.

Brinkman, Donald J.; and Leonard, Russell J., to Molex Incorporated. Tool for electrical terminals. 4,635,355, Cl. 29-747.000.

British Library Board, The: *See*—
Malyon, Brian R., 4,636,868, Cl. 358-285.000.

British Steel Corporation: *See*—
Laycock, Arthur; Harris, Michael J.; and Broxholme, Mark A., 4,636,249, Cl. 75-53.000.

Brittingham, Louis W., Jr. Measured volume dispenser. 4,635,829, Cl. 222-278.000.

Broadbent, Ronald: *See*—
Schellenberg, Lutz; Hamacher, Matthias; and Broadbent, Ronald, 4,636,264, Cl. 148-6.200.

Brock, David L.: *See*—
Salisbury, John K., Jr.; and Brock, David L., 4,635,479, Cl. 73-862.040.

Brooks, Samuel C.; and Horwitz, Jerome P., to Wayne State University. Compositions inhibiting murine MXT ductal carcinoma. 4,636,496, Cl. 514-182.000.

Broome, Peter F., to Cincinnati Milacron Inc. Method and apparatus for producing numerical control programs. 4,636,938, Cl. 364-191.000.

Brother Industries, Ltd.: *See*—
Ishikawa, Yujiro, 4,636,650, Cl. 250-578.000.

Brown, Alex G., to Avis Industrial Corporation. Latch gear lock assembly. 4,635,454, Cl. 70-139.000.

Brown, Barry D. Cutting apparatus. 4,635,362, Cl. 30-124.000.

Brown, Boveri & Cie AG: *See*—
Neidig, Arno; Leukel, Bernd; and Hettmann, Hubert, 4,636,580, Cl. 174-52.0PE.

Brown, Catherine A.; and Eng, Jean L., to General Foods Inc. Process for making an improved instant filling mix. 4,636,397, Cl. 426-579.000.

Brown, Charles E., to Medical College of Wisconsin Research Foundation, Inc., The. Assay method for the in vivo quantitative determination of mineral content in bone. 4,635,643, Cl. 128-653.000.

Brown, David C., to Cordis Corporation. Differential thermal expansion driven pump. 4,636,149, Cl. 417-322.000.

Brown, John A. Basket for plants. 4,635,394, Cl. 47-67.000.

Brown, Leslie F., to Instro Precision Ltd. Locking mechanism. 4,636,103, Cl. 403-92.000.

Brown, Trevor J.; and Phillips, James E., to General Motors Corporation. Apparatus for attaching a flexible annular member to a rigid member. 4,635,335, Cl. 29-235.000.

Brown & Williamson Tobacco Corporation: *See*—
Sexstone, John H.; Finn, Everett N.; Lowe, Byron L.; and Milliner, Ken M., 4,636,183, Cl. 493-42.000.

Browne, Ronald R.: *See*—
Novak, Carl V.; and Browne, Ronald R., 4,636,593, Cl. 200-5.00A.

Broxholme, Mark A.: *See*—
Laycock, Arthur; Harris, Michael J.; and Broxholme, Mark A., 4,636,249, Cl. 75-53.000.

Broyden, Robert H.; Benton, R. Paul; and Eldridge, Allen E., to Columbus McKinnon Corporation. Electric hoist pendant control switch arrangement. 4,635,903, Cl. 254-362.000.

Broyden, Robert H.; Schenk, Douglas E.; and Newman, Raymond A., to Columbus McKinnon Corporation. Microprocessor-controlled hoist system. 4,636,962, Cl. 364-478.000.

Bruck, Horst, to John Crane-Houdaille, Inc. Flash sorting apparatus. 4,635,798, Cl. 209-644.000.

Bruckdorfer, Roderick A.; and Coleman, Samuel E., to Dowell Schlumberger Incorporated. CO_2-enhanced hydrocarbon recovery with corrosion-resistant cement. 4,635,724, Cl. 166-268.000.

Bruffey, Robert D., Jr.: *See*—
Gaunt, Loraine E.; Crosby, Samuel C.; Saunders, William J.; and Bruffey, Robert D., Jr., 4,635,824, Cl. 222-129.100.

Bruhnke, Ulrich: *See*—
Schumacher, Rolf; Faix, Heinz; and Bruhnke, Ulrich, 4,635,415, Cl. 52-127.100.

Bruner, Jeffrey W.; and Davis, Delbert A., to Burlington Industries, Inc. Weft inserted warp knit fencing product. 4,636,428, Cl. 428-254.000.

Brunson, Welton K.: *See*—
Hubbard, Vance M.; and Brunson, Welton K., 4,635,628, Cl. 128-201.170.

Brunswick Corporation: *See*—
Frazzell, Michael E.; and Karls, Michael A., 4,636,175, Cl. 440-88.000.
Thornber, Geoffrey, 4,636,749, Cl. 331-90.000.

Brunt, Keith D.; and Higton, Frederick R., to Boots Company Plc, The. Preserving agent and method of use thereof. 4,636,476, Cl. 436-23.000.

Brush Fusegear Limited: *See*—
Mee, Geoffrey R.; and Rosen, Philip, 4,636,764, Cl. 337-169.000.

Bruso, Loran H., to Warner-Lambert Company. Disposable sterilization biological test pack. 4,636,472, Cl. 435-287.000.

Bryant, John D.: *See*—
Roger, Stephen J.; Bryant, John D.; and Wong, Philip, 4,636,633, Cl. 250-223.00R.

Bryant, Marga M.: *See*—
Schulte, Rudolf R.; East, Gary P.; Bryant, Marga M.; and Heindl, Alfons, 4,636,194, Cl. 604-9.000.

Buckley, Richard A., to Rimrock Corporation. Reciprocator for die-casting machine. 4,635,493, Cl. 74-99.00R.

Budd Company, The: *See*—
McDougall, Malcolm K., 4,636,344, Cl. 264-102.000.

Buell, Kenneth B., to Procter & Gamble Company, The. Disposable garment with breathable leg cuffs. 4,636,207, Cl. 604-370.000.

Buhler, Karl, to BBC Brown, Boveri & Company Limited. Bottom electrode for a direct current arc furnace. 4,637,033, Cl. 373-72.000.

Buignez, Francois; and Hartmann, Joel, to Commissariat a l'Energie Atomique. Process for the autopositioning of a local field oxide with respect to an insulating trench. 4,636,281, Cl. 156-643.000.

Buma, Shuuichi, to Toyota Jidosha Kabushiki Kaisha. Suspension for vehicle. 4,635,906, Cl. 267-8.00R.

Burcham, Larry R.: *See*—
Cartmell, James V.; Burcham, Larry R.; and Wolf, Michael L., 4,635,642, Cl. 128-639.000.

Burgard, Francis A. Mounting device and method of use. 4,636,125, Cl. 411-389.000.

Burgess, James H.: *See*—
Jaisle, Richard F.; Mollmann, Henry C.; Albers, Martha J.; and Burgess, James H., 4,636,443, Cl. 428-481.000.

Burgess, James P.; Echols, John C.; and Walker, Thomas A., to Essex-Tec Corporation. Sensor for an alarm system. 4,636,775, Cl. 340-566.000.

Burke, Thomas W.; and Klee, David J., to Air Products and Chemicals, Inc. Discharge of blasting media from a treating chamber. 4,635,408, Cl. 51-292.000.

Burke, Timothy M.; Noble, Scott W.; Freeburg, Thomas A.; and Krebs, Jay R., to Motorola, Inc. Data signalling system. 4,636,791, Cl. 340-825.520.

Burke, Timothy M.; Smith, Paul F.; and Schorman, Eric R., to Motorola, Inc. Internally register-modelled, serially-bussed radio system. 4,637,022, Cl. 371-37.000.

Burlington Industries, Inc.: *See*—
Bruner, Jeffrey W.; and Davis, Delbert A., 4,636,428, Cl. 428-254.000.
Morrison, Elbert F.; Bradley, Danny R.; and Reece, D. C., 4,635,435, Cl. 57-328.000.

Burow, Kenneth W., Jr., to Eli Lilly and Company. Benzamides, compositions and agricultural method. 4,636,243, Cl. 71-88.000.

Burr-Brown Corporation: *See*—
Burt, Rodney T.; and Stitt, Robert M., 4,636,916, Cl. 361-386.000.

Burroughs Corporation: *See*—
Bell, John L.; Isaman, David L.; and Osman, Fazil I., 4,637,014, Cl. 370-89.000.
Flora, Laurence P.; and McCullough, Michael A., 4,637,018, Cl. 371-1.000.
Norell, Ronald A., 4,636,275, Cl. 156-289.000.
Roger, Stephen J.; Bryant, John D.; and Wong, Philip, 4,636,633, Cl. 250-223.00B.

Burroughs, Thomas C. Method and apparatus for gravel packing a well. 4,635,725, Cl. 166-278.000.

Burt, Rodney T.; and Stitt, Robert M., to Burr-Brown Corporation. Apparatus for minimizing optically and thermally induced noise in precision electronic components. 4,636,916, Cl. 361-386.000.

Buscaglia, Carl U.; and Knepper, Lawrence E., to International Business Machines Corporation. Three state select circuit for use in a data processing system or the like. 4,636,990, Cl. 365-230.000.

Bush, John R.: *See*—
Sandstrom, William A.; Patel, Jitendra G.; and Bush, John R., 4,636,168, Cl. 432-58.000.

Buss, Waldeen C.; and Hughes, Thomas R., to Chevron Research Company. Reforming process. 4,636,298, Cl. 208-65.000.

Bussard, Janice W. Framing hoop for wall hangings. 4,635,388, Cl. 38-102.200.

Busse, Wolf-Dieter: *See*—
Niemers, Ekkehard; Grutzmann, Rudi; Mardin, Mithat; Busse, Wolf-Dieter; and Meyer, Horst, 4,636,497, Cl. 514-215.000.

Byar, Peter D.: *See*—
de la Morandiere, Anne J.; Bressler, Peter W.; Byar, Peter D.; and Spector, Edward A., 4,636,613, Cl. 219-249.000.

Byerley, Mark S.: *See*—
Owen, Michael E.; and Byerley, Mark S., 4,636,277, Cl. 156-417.000.

Byers, William L. Apparatus for cleaning containers. 4,635,312, Cl. 15-71.000.

C-I-L Inc.: *See*—
Borkowicz, Jerzy, 4,636,715, Cl. 324-62.000.

Cabletest International Inc.: *See*—
Magi, Hugo; Boss, Arthur J.; and Waese, Jerry R., 4,636,847, Cl. 358-101.000.

Caillerie, Jean-Louis; Decaens, Remy; and Limare, Armand, to Societe Anonyme Dite Societe Miniere et Metallurgique de Penarroya. Process and alloy of galvanization of tempered steel containing silicon, and galvanized object. 4,636,354, Cl. 420-514.000.

Cairns, John P., to Computer Security Corporation. Method and apparatus for converting frequency signals representing characters to binary code. 4,636,590, Cl. 379-386.000.

Calcabrini, Vinicio; and Ferruccio, Antonio. Device for the erection of the mast of a sailing board. 4,635,578, Cl. 114-39.000.

California Institute of Technology: *See*—
Margalit, Shlomo; Yariv, Amnon; and Rav-Noy, Zeev, 4,636,823, Cl. 357-23.300.

Calvin, James W.: *See*—
Sheffield, Miller; Metcalfe, Robert S.; Calvin, James W.; and Chaback, Joseph J., 4,635,721, Cl. 166-268.000.

Cameron Iron Works, Inc.: *See*—
Kilmoyer, James E., 4,635,670, Cl. 137-75.000.

Camp Dresser & McKee: *See*—
Meckler, Gershon, 4,635,446, Cl. 62-271.000.

Campbell, John W.: *See*—
Ziegelmeyer, Harold R., 4,636,220, Cl. 623-53.000.

Campbell, Lawrence C., to Jaco Manufacturing Company. Quick-connect tube coupling. 4,635,975, Cl. 285-340.000.

Campbell Soup Company: *See*—
Lynch, Donald J.; and Shivers, Raymond P., 4,636,393, Cl. 426-276.000.
Robinson, Albert H., Jr.; and Egee, Walter W., deceased, 4,636,395, Cl. 426-511.000.

Camprincoli, Pier P.: *See*—
Clementini, Luciano; and Camprincoli, Pier P., 4,636,436, Cl. 428-364.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Harrison, Robert G.; and Kalivas, Grigorios A., 4,636,757, Cl. 333-218.000.

Canadian General Electric Company Limited: *See*—
Chadwick, Philip, 4,636,910, Cl. 361-103.000.
de Hertel Eastcott, Peter, 4,635,769, Cl. 192-0.034.

Canadian Patents and Development Limited: *See*—
Harmathy, Tibor Z., 4,635,729, Cl. 169-48.000.

Canfora, Philip H., to VBM Corporation. High pressure oxygen production system. 4,636,226, Cl. 55-68.000.

Cannell, David W.: *See*—
Mathews, Roger A.; and Cannell, David W., 4,635,654, Cl. 132-7.000.

Canon Kabushiki Kaisha: *See*—
Akiya, Takashi; Toganoh, Shigeo; and Arai, Ryuichi, 4,636,410, Cl. 427-261.000.
Aiyfuku, Kiyoshi, 4,636,055, Cl. 354-465.000.
Arai, Ryuichi; and Toganoh, Shigeo, 4,636,409, Cl. 427-256.000.
Asakura, Osamu; Nozaki, Mineo; Nagashima, Masasumi; and Uchikata, Yoshio, 4,636,810, Cl. 346-76.0PH.
Edakubo, Hiroo; Takayama, Nobutoshi; and Takimoto, Hiroyuki, 4,636,882, Cl. 360-77.000.
Kanemitsu, Shinji; and Nitanda, Hiroshi, 4,636,065, Cl. 355-75.000.
Kishi, Hirotoshi, 4,636,787, Cl. 340-792.000.
Kitahara, Nobuko; Takamatsu, Osamu; Kaneko, Tetsuya; and Sugata, Masao, 4,636,038, Cl. 350-339.00R.
Kobayashi, Ryuichi; Akashi, Akira; and Kawamura, Masaharu, 4,636,056, Cl. 354-484.000.
Komine, Yoshio; and Kawamoto, Kenichi, 4,636,042, Cl. 350-429.000.
Masaki, Yuichi, 4,636,817, Cl. 346-160.000.
Matsumura, Susumu, 4,636,627, Cl. 250-201.000.
Miyazaki, Makoto; Yomoda, Minoru; and Suzuki, Takehiko, 4,635,373, Cl. 33-180.00R.
Nakamura, Yasuo, 4,637,013, Cl. 370-85.000.
Ogawa, Kyosuke; Shirai, Shigeru; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,636,450, Cl. 430-84.000.
Ohno, Akio; and Torigai, Akiyoshi, 4,636,062, Cl. 355-43.000.
Sakane, Toshio; Taguchi, Tetsuya; Ogawa, Masahiko; Tamura, Shuichi; and Tsunekawa, Tokuichi, 4,636,053, Cl. 354-403.000.
Sasaki, Takashi, 4,636,844, Cl. 358-80.000.
Sato, Yuichi, 4,636,837, Cl. 358-21.00R.
Terasawa, Koji, 4,636,814, Cl. 346-140.00R.
Toganoh, Shigeo; Arai, Ryuichi; and Sakaki, Mamoru, 4,636,805, Cl. 346-1.100.

Cantec, Inc.: *See*—
Frei, Siegfried, 4,635,841, Cl. 228-147.000.

Cantwell, Robert H., to Raytheon Company. Vernier addressing apparatus. 4,636,973, Cl. 364-764.000.

Capilla, Alejandro. Boat propelled by a motorcycle. 4,636,176, Cl. 441-12.000.

Carbaugh, John E.: *See*—
Maloney, Bernard A.; and Carbaugh, John E., 4,636,376, Cl. 423-475.000.

Carbide Blast Joints, Inc.: *See*—
Kuhne, Karl F., 4,635,968, Cl. 285-45.000.

Carbone, Douglas C.; and Dennis, Philip J., to GTE Products Corporation. Miniaturized circuit breaker. 4,636,766, Cl. 337-368.000.

Carbone, Mark S.: *See*—
Winter, Scott H.; and Carbone, Mark S., 4,635,449, Cl. 62-467.000.

Carignan, Roger G.: *See*—
Pratt, Clyde R.; Carignan, Roger G.; Raggio, Charles M.; and Woznick, Chuck P., 4,636,219, Cl. 623-22.000.

Carlin, Joseph T., to Texaco Inc. Method of increasing enhanced oil recovery by using a higher sulfonate phase obtained on polymer addition. 4,635,722, Cl. 166-274.000.

Carlson, James R.: *See*—
Brands, George B.; and Carlson, James R., 4,635,550, Cl. 101-415.100.

Carlsson, Bengt: *See*—
Almqvist, Christer; Carlsson, Bengt; and Lindahl, Lars, 4,635,714, Cl. 165-167.000.

Carpentier, Yves; and Gauthier, Andre , to Societe Anonyme de Telecommunications. Photoconducting detector in optical immersion. 4,636,631, Cl. 250-216.000.

Carrier, Christian J. L.; and Shea, Charles J., to Minister of National Defence of Her Majesty's Canadian Government. Compact molded bulkhead for a tube-cluster rocket launcher. 4,635,527, Cl. 89-1.816.

Carroll, Bruce I. Alcohol fuel conversion apparatus for internal combustion engines. 4,635,608, Cl. 123-557.000.

Carter, Andrew C.; and Stewart, William J., to Plessey Overseas Limited. Optical alignment apparatus utilizing prismatic elements. 4,636,030, Cl. 350-96.180.

Carter, Leewood C.; Neary, Robin P.; and Mullen, Robert, to Book Covers Inc. Apparatus for fabricating a box-like article. 4,636,185, Cl. 493-127.000.

Cartmell, James V.; Burcham, Larry R.; and Wolf, Michael L., to American Hospital Supply Corporation. Modical electrode with reusable conductor. 4,635,642, Cl. 128-639.000.

Caruso, Peter J.; and Townsend, Robert R., to Allied Corporation. High reliability solenoid switch. 4,636,761, Cl. 335-140.000.

Casanova, Giuseppe; and De Zolt, Ivano, to Costan S.p.A. Tilting cold cabinet. 4,635,447, Cl. 62-448.000.

Cascade Industries, Inc.: *See*—
Zikmanis, Harija; Prezlock, James; and Lahaski, Paul, 4,635,304, Cl. 4-506.000.

Casio Computer Co., Ltd.: *See*—
Ootsuka, Tetsuo, 4,636,971, Cl. 364-709.000.
Sakurai, Keiichi, 4,635,519, Cl. 84-1.170.
Suzuki, Toshiyuki, 4,636,087, Cl. 368-185.000.
Tsuji, Akio, 4,636,996, Cl. 367-93.000.

Casler, William A.; and Saureaman, Phillip E., to Plus Manufacturing Co., Inc. Reformed in place resilient retention springs. 4,636,107, Cl. 401-405.100.

Cassoni, John P.: *See*—
Kamena, Ernest R.; and Cassoni, John P., 4,636,528, Cl. 521-95.000.

Castro, Bertrand: *See*—
Martinez, Jean; Bali, Jean-Pierre; Castro, Bertrand; Nisato, Dino; and Demarne, Henri, 4,636,490, Cl. 514-15.000.

Caswell, Robert L.; and Bess, C. David. Inventory management system using transponders associated with specific products. 4,636,950, Cl. 364-403.000.

Catalysts & Chemicals Industries Co., Ltd.: *See*—
Nishimura, Yoichi; Ogata, Masamitsu; and Ida, Takanori, 4,636,484, Cl. 502-65.000.

Caterpillar Inc.: *See*—
Cook, James G.; and Knapp, Gary H., 4,636,920, Cl. 361-420.000.
Dennison, Thomas M.; and Maust, Blair A., 4,636,014, Cl. 305-54.000.
Foley, Donald E.; Gipp, Gregory H.; Schwader, William G.; Sells, Craig L.; Smittkamp, James A.; Stahl, Alan L.; and Szentes, John F., 4,635,739, Cl. 177-45.000.
Menke, Jeffery W.; and Riediger, Craig W., 4,636,132, Cl. 414-694.000.
Tonsor, Andrew J., 4,636,013, Cl. 305-48.000.

Caterpillar Industrial Inc.: *See*—
Wible, John E., 4,635,439, Cl. 60-420.000.

CBS/Sony Records Inc.: *See*—
Yamada, Masaki; Yokoi, Mitsuru; and Oishi, Kazuhiro, 4,635,792, Cl. 206-310.000.

Cederwall, Philip J.; and Glezer, Boris, to Solar Turbines Incorporated. Sealed telescopic joint and method of assembly. 4,635,332, Cl. 29-156.80R.

Celanese Corporation: *See*—
Kuder, James E., 4,636,804, Cl. 346-1.100.

Cenanovic, Matija. Forming method using an electromagnetically exploded filament. 4,635,840, Cl. 228-107.000.

Censtor Corp.: *See*—
Mo, Frank S. C., 4,636,894, Cl. 360-103.000.

Centre National de la Recherche Scientifique: *See*—
Martinez, Jean; Bali, Jean-Pierre; Castro, Bertrand; Nisato, Dino; and Demarne, Henri, 4,636,490, Cl. 514-15.000.

Cerebral Palsy Research Foundation of Kansas, Inc.: *See*—
Dewees, James A., 4,635,932, Cl. 272-96.000.

Chaback, Joseph J.: *See*—
Sheffield, Miller; Metcalfe, Robert S.; Calvin, James W.; and Chaback, Joseph J., 4,635,721, Cl. 166-268.000.

Chabardes, Pierre; and Mulhauser, Michel, to Rhone-Poulenc Sante. Tocopherol derivatives useful in the synthesis of vitamin E and their preparation. 4,636,570, Cl. 549-408.000.

Chabot, Leo L., to Ellison, Pioneer Division. Detachable bifurcated center brace loom harness. 4,635,685, Cl. 139-91.000.

Chadwick, Philip, to Canadian General Electric Company Limited. Varistor overvoltage protection system with temperature systems. 4,636,910, Cl. 361-103.000.

Chambers, George: *See*—
Hall, Kenneth F.; and Chambers, George, 4,635,887, Cl. 248-179.000.

Chambre Regionale d'Agriculture de Picardie: *See*—
Segard, Emile; and Monceaux, Philippe, 4,636,390, Cl. 426-18.000.

Chang, Che-Yuan. Modified fixing means for comb bristles. 4,635,658, Cl. 132-85.000.

Chao, Philip, to AT&T Teletype Corporation. Biphase signal receiver. 4,637,037, Cl. 375-87.000.

Chao, Tai-Hsiang: *See*—
Kjell, Solveg S.; Chao, Tai-Hsiang; Flint, Nancy J.; and Foutsitzis, Arthur A., 4,636,483, Cl. 502-61.000.

Chao, Yen-Yau H., to Rohm and Haas Company. Process for preparing modified polymer emulsion adhesives. 4,636,546, Cl. 524-507.000.

Chapin, David S., to Cooper Industries, Inc. Hand operated cutting tool. 4,635,363, Cl. 30-257.000.

Chapman, Glenn H.: *See*—
Raffel, Jack I.; Yassitis, John A.; and Chapman, Glenn H., 4,636,404, Cl. 427-53.100.

Charbonnier, Roger; and Remy, Joel, to Adret Electronique. Quaternary frequency synthesizer. 4,636,733, Cl. 328-14.000.

Charbonnier, Roger, to Adret Electronique. Doubly balanced diode mixer comprising a ring modulator each leg of which comprises a high speed conventional diode in series with at least one diode of the "varactor" kind. 4,637,069, Cl. 455-330.000.

Charuest, George M.; and Coughlin, Lawrence P., to J. E. Hanger Limited. Brace for an articulating limb. 4,635,623, Cl. 128-80.00C.

Chastanet, Bernard; Decailloz, Claude; Dournel, Solange; and Manson, Marcel, to Commissariat a l'Energie Atomique. Method and apparatus for producing a reactor spacing grid by pulse laser welding. 4,636,606, Cl. 219-121.0LC.

Chavdarian, Charles G.; and Shortt, Alexandra B., to Stauffer Chemical Company. S-phenylacetonyl trithiophosphonate insecticides. 4,636,495, Cl. 514-125.000.

Chemtob, Elie; and Beer, Gary L., to Occidental Chemical Agricultural Products, Inc. Aluminum fluorophosphates made from impure phosphoric acids and conversion thereof to alkalimetal phosphates. 4,636,372, Cl. 423-312.000.

Chen, Steve S.; Schiffleger, Alan J.; Somdahl, Eugene R.; and Higbie, Lee, to Cray Research, Inc. Computer vector multiprocessing control. 4,636,942, Cl. 364-200.000.

Chen, Yaw H. Machine for placing a plastic bag automatically into a larger feedstuff bag. 4,636,189, Cl. 493-217.000.

Cheng Kwang Storage Battery Co., Ltd.: *See*—
Lee, Yung-Lin, 4,636,446, Cl. 429-54.000.

Chesebrough-Pond's Inc.: *See*—
Vaillancourt, Vincent L., 4,636,200, Cl. 604-170.000.

Chevron Research Company: *See*—
Buss, Waldeen C.; and Hughes, Thomas R., 4,636,298, Cl. 208-45.000.
Schmadel, Donald C., Jr.; and Goodman, Jack E., 4,636,031, Cl. 350-96.190.

Chew, Ju-Nam, to Mobil Oil Corporation. Heavy oil recovery process using intermittent steamflooding. 4,635,720, Cl. 166-245.000.

Chiba, Kyoji: *See*—
Yamada, Norio; Kajitani, Hayashi; Chiba, Kyoji; and Edagawa, Mitsugu, 4,636,966, Cl. 364-491.000.

Chicago Pneumatic Tool Company: *See*—
Wallace, William K.; and McHenry, Kenneth A., 4,635,731, Cl. 173-12.000.

Chielens, Alain; Durinck, Rene; and Werquin, Pierre, to Fives-Cail Babcock. Method of changing the width of a continuous metal casting without interrupting the casting process. 4,635,704, Cl. 164-452.000.

Chino, Koichi: *See*—
Kawamura, Fumio; Matsuda, Masami; Aoyama, Yoshiyuki; Chino, Koichi; and Mizumoto, Mamoru, 4,636,335, Cl. 252-629.000.

Chlanda, Frederick P.: *See*—
Mani, Krishnamurthy N.; and Chlanda, Frederick P., 4,636,289, Cl. 204-182.400.

Cho, Chu Hwan; and Lee, Gong In. Filter manufacturing method for the production of pre-filters to remove harmful subetances in cigarette smoke by use of pine needles. 4,636,182, Cl. 493-39.000.

Choksi, Pradip V. Incentive spirometer employing bellows air flow sensor. 4,635,647, Cl. 128-728.000.

Chou, Peter. Jack safety device. 4,635,902, Cl. 254-8.00B.

Christopherson, Kjell H.; Odelius, Tomas; Rosemeier, Friedrich; Stenberg, Kaj O.; Svensson, Tommy E.; and Killmaier, Horst, to Gambro Lundia AB. Coupling for the connection of flexible tubes and the like. 4,636,204, Cl. 604-283.000.

Chrobak, Michael J.; and Evans, Doyle R., to Texas Instruments Incorporated. Low cost electronic apparatus construction method. 4,635,354, Cl. 29-622.000.

Chrysler Motors Corporation: *See*—
Hermann, John T., 4,635,966, Cl. 285-3.000.

Chu, Ping. Intravenous fluid infusion device. 4,636,197, Cl. 604-131.000.

Chugai Denki Kogyo K.K.: *See*—
Shibata, Akira, 4,636,270, Cl. 148-431.000.

Chumbley, James F. Decorative fabric wall system. 4,635,410, Cl. 52-63.000.

Chynoweth, David P., to Institute of Gas Technology. Mixed microbial fermentation of carbonaceous matter to road de-icer. 4,636,467, Cl. 435-140.000.

Ciancibello, Carmine A.; and Mitchler, Dennis W., to Northern Telecom Limited. Frame synchronization circuit for digital transmission system. 4,637,016, Cl. 370-100.000.

Ciba-Geigy AG: *See*—
Ostermayer, Franz; and Zimmermann, Markus, 4,636,511, Cl. 514-311.000.

Ciba-Geigy Corporation: *See*—
Kirchmayr, Rudolf, 4,636,575, Cl. 558-58.000.
Seemuller, Ursula; Dodt, Johannes; and Fritz, Hans, 4,636,489, Cl. 514-12.000.

CII Honeywell Bull: *See*—
Barski, Guy, 4,636,891, Cl. 360-97.000.

Cimenti, Antonio: *See*—
Bellotto, Carlo; Cimenti, Antonio; and Polo, Ermes, 4,636,164, Cl. 425-337.000.

Cincinnati Milacron Inc.: *See*—
Broome, Peter F., 4,636,938, Cl. 364-191.000.
McDonald, David L., 4,635,788, Cl. 198-848.000.

Citizen Watch Co., Ltd.: *See*—
Morimoto, Atsutaka; and Takahashi, Shoji, 4,636,905, Cl. 360-137.000.
Nikaido, Akira, 4,636,668, Cl. 310-49.00R.

CKD Kabushiki Kaisha: *See*—
Kojima, Shigetake, 4,635,507, Cl. 74-813.00C.

Claas Ohg: *See*—
Clostermeyer, Gerhard; Konekamp, Werner; and Tooten, Karlheinz, 4,635,543, Cl. 100-89.000.

Clark, Clement P. Card user identification system. 4,636,622, Cl. 235-380.000.

Clark, H. Fred: *See*—
Plotkin, Stanley A.; and Clark, H. Fred, 4,636,385, Cl. 424-89.000.

Clark, John A., Jr., to Harsco Corporation. Double wall heat exchanger. 4,635,711, Cl. 165-70.000.

Clark, John L., to Pitney Bowes Inc. System having a character generator for printing encrypted messages. 4,637,051, Cl. 382-1.000.

Clark Michigan Company: *See*—
Siewert, Robert L.; and Varnelis, Edmund K., 4,635,497, Cl. 74-473.0SW.

Clausen, Eivind; and Skaling, Timothy J., to Allsop, Inc. Hinged slalom gate. 4,636,109, Cl. 404-10.000.

Clausen, Erik; Clausen, Johannes; Jensen, Holger; and Sturlason, Finnur, to Scan Screen A/S. Transparent rear projection screen. 4,636,035, Cl. 350-128.000.

Clausen, Johannes: *See*—
Clausen, Erik; Clausen, Johannes; Jensen, Holger; and Sturlason, Finnur, 4,636,035, Cl. 350-128.000.

Clemence, Francois; Le Martret, Odile; and Delevallee, Francoise, to Roussel Uclaf. Anti-inflammatory 2-substituted-4-hydroxy-3-quinoline carboxamides. 4,636,512, Cl. 514-312.000.

Clementini, Luciano; and Camprincoli, Pier P., to Montedison S.p.A. Textile fibers based on modified olefinic polymers. 4,636,436, Cl. 428-364.000.

Clostermeyer, Gerhard; Konekamp, Werner; and Tooten, Karlheinz, to Claas Ohg. Mobile large baling press. 4,635,543, Cl. 100-89.000.

Clough, John M.; Lewiz, Timothy; and Gravestock, Michael B., to Imperial Chemical Industries PLC. Heterocyclic compounds. 4,636,247, Cl. 71-92.000.

Co-Ex Pipe Company, Inc.: *See*—
Murley, Jackie D., 4,636,341, Cl. 264-37.000.

Coal Industry (Patents) Limited: *See*—
Thorp, Peter; and Manley, Roger E. W., 4,635,629, Cl. 128-202.260.
Yin, Candido C.; and Matthews, Graham L., 4,636,227, Cl. 55-74.000.

Coates, Ian H.; Mills, Keith; Webb, Colin F.; Dowle, Michael D.; and Bays, David E., to Glaxo Group Limited. 3 amino alkyl indoles for use in treating migraine. 4,636,521, Cl. 514-415.000.

Cobaugh, Robert F.: *See*—
Bobb, Clifford F.; and Cobaugh, Robert F., 4,636,021, Cl. 339-75.0MP.

Coca-Cola Company, The: *See*—
Gaunt, Loraine E.; Crosby, Samuel C.; Saunders, William J.; and Bruffey, Robert D., Jr., 4,635,824, Cl. 222-129.100.
Gupta, Ashis S., 4,636,337, Cl. 261-64.300.

Codella, Christopher F.; and Ogura, Seiki, to International Business Machines Corporation. GaAs short channel lightly doped drain MESFET structure and fabrication. 4,636,822, Cl. 357-22.000.

Coffin, Harry S. Testing device for printed circuit boards. 4,636,723, Cl. 324-158.00F.

Cole, Daniel L. Carrier apparatus for all terrain vehicle. 4,635,835, Cl. 224-42.080.

Cole, David J.; and Cosh, Ian S., to U.S. Philips Corporation. Method of and apparatus for generating color matte signals. 4,636,839, Cl. 358-22.000.

Coleman, Colin R.: *See*—
Haftke, Jozef J.; Worley, Norman G.; Coleman, Colin R.; and Warris, Anne-Marie, 4,635,567, Cl. 110-188.000.

Coleman, Samuel E.: *See*—
Bruckdorfer, Roderick A.; and Coleman, Samuel E., 4,635,724, Cl. 166-268.000.

Colle, Edward A., Jr.: *See*—
Vann, Roy R.; Brieger, Emmet F.; George, Flint R.; Colle, Edward A., Jr.; and Jones, Hilton B., 4,635,733, Cl. 175-4.560.

Columbus McKinnon Corporation: *See*—
Broyden, Robert H.; Benton, R. Paul; and Eldridge, Allen E., 4,635,903, Cl. 254-362.000.
Broyden, Robert H.; Schenk, Douglas E.; and Newman, Raymond A., 4,636,962, Cl. 364-478.000.

Cominco Ltd.: *See*—
Ball, Donald L.; and Boateng, Daniel A. D., 4,636,295, Cl. 204-182.400.

Commercial Shearing, Inc.: *See*—
Francis, David W., 4,636,155, Cl. 418-132.000.

Commissariat a l'Energie Atomique: *See*—
Bethuel, Louis; Martin, Laurent; and Dujardin, Thierry, 4,636,290, Cl. 204-186.000.
Buiguez, Francois; and Hartmann, Joel, 4,636,281, Cl. 156-643.000.
Chastanet, Bernard; Decailloz, Claude; Dournel, Solange; and Manson, Marcel, 4,636,606, Cl. 219-121.0LC.

Communications Satellite Corporation: *See*—
Assal, Francois T.; Berman, Arnold L.; and Potukuchi, Janaki R., 4,637,017, Cl. 370-104.000.
Geller, Bernard D.; and Zaghloul, Amir I., 4,636,753, Cl. 333-26.000.

Compact Energy Limited: *See*—
Palmer, Malcolm G., 4,635,554, Cl. 102-416.000.

Compagnie Generale de Geophysique: *See*—
Cretin, Jacques; Beauducel, Claude; Rudaz, Jean; and Gonzalez, Pierre, 4,636,992, Cl. 367-20.000.
Vannier, Serge; Garotta, Robert; Lozes, Andre ; and Vidal, Jean C., 4,636,956, Cl. 364-421.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Playe, Patrice, 4,636,816, Cl. 346-155.000.

Compagnie Industrielle des Telecommunications Citalcatel: *See*—
Raes, Marc, 4,636,652, Cl. 307-141.000.

Compair Broomwade Limited: *See*—
Hough, David; Morris, Sidney J.; and Barber, Anthony D., 4,636,156, Cl. 418-201.000.

Comper, Louis F.; and Scheiderich, Robert F., to Goodyear Tire & Rubber Company, The. Surface-treated tire curing bladder, treatment composition therefore and method for curing tires. 4,636,407, Cl. 427-133.000.

Compton, Russell A.; Hinshaw, Waldo S.; and Kramer, David M., to Technicare Corporation. Offset gradient fields in nuclear magnetic resonance imaging systems. 4,636,728, Cl. 324-309.000.

Compur-Electronic GmbH: *See*—
Barry, Jurgen, 4,636,082, Cl. 356-446.000.

CompuSonics Corporation: *See*—
Schwartz, David M., 4,636,876, Cl. 360-32.000.
Computer Security Corporation: *See*—
Cairns, John P., 4,636,590, Cl. 379-386.000.
Concurrent Computer Corporation: *See*—
Hodge, James E., 4,636,944, Cl. 364-200.000.
Conklin, Emmett D. Infinitely variable transmission and control apparatus therefor. 4,635,494, Cl. 74-119.000.
Conrad, Douglas J.; Kennon, James L.; Macartney, Lawrence J.; and Scharf, Donald R., to Nordson Corporation. System for spray coating substrates. 4,635,585, Cl. 118-316.000.
Constructions Metalliques et Carrosseries Caire Claude: *See*—
Cova, Michel, 4,635,425, Cl. 52-480.000.
Continental Gummi-Werke Aktiengesellschaft: *See*—
Rach, Heinz-Dieter; Klose, Hans-Ulrich; and Frerichs, Udo, 4,635,697, Cl. 152-544.000.
Continental Technology Corporation: *See*—
McQueen, Sidney J., 4,635,528, Cl. 89-14.300.
Cook, James G.; and Knapp, Gary H., to Caterpillar Inc. Printed circuit board mounting apparatus. 4,636,920, Cl. 361-420.000.
Coolze, Nelson: *See*—
Harris, John; Cooke, Nelson; and Olsen, Kristine, 4,636,316, Cl. 210-656.000.
Cooney, James S.; and Sicard, Stephen T., to Augat Inc. Electrical test probe. 4,636,026, Cl. 339-255.00R.
Cooper Industries: *See*—
Bell, David E.; and Babbs, Dennis G., 4,635,889, Cl. 248-265.000.
Kristofek, Paul, 4,636,925, Cl. 362-277.000.
Cooper Industries, Inc.: *See*—
Chapin, David S., 4,635,363, Cl. 30-257.000.
Cooper-Lipotech, Inc.: *See*—
Martin, Francis J.; and Kung, Viola T., 4,636,479, Cl. 436-533.000.
Coppin, William: *See*—
Rollins, Jack; Coppin, William; and Karabin, Thaddeus, 4,635,898, Cl. 251-229.000.
Coraluppi, Enzo: *See*—
Valbusa, Luigi; Coraluppi, Enzo; Quaglia, Andrea; and Tavella, Mario, 4,636,457, Cl. 430-267.000.
Cordero, Federico; and Faldella, Roberto, to Fiat Auto S.p.A. Transmission systems for motor vehicles with four-wheel drive. 4,635,504, Cl. 74-695.000.
Cordis Corporation: *See*—
Brown, David C., 4,636,149, Cl. 417-322.000.
Gold, Jeffrey G.; Pande, Gyan S.; and Smith, Kevin, 4,636,346, Cl. 264-139.000.
Riggs, Gary T., 4,636,272, Cl. 156-158.000.
Corkran, William M.; Koeth, Herbert A.; and Pugsley, L. James, to Reliance Electric Company. Brush wear monitor. 4,636,778, Cl. 340-648.000.
Cormier, Gary. Safety bench pressing apparatus. 4,635,930, Cl. 272-123.000.
Cornelius, George B. Windrow yard rake. 4,635,429, Cl. 56-400.180.
Cornelius, Peter, to Robert Bosch GmbH. Method of and arrangement for regulating the idling rotational speed of an internal combustion engine. 4,635,601, Cl. 123-339.000.
Cornell Research Foundation, Inc.: *See*—
Goldstein, Marc, 4,635,636, Cl. 128-334.00R.
Corning Glass Works: *See*—
Ely, William F., 4,636,260, Cl. 106-198.000.
Mensah, Thomas O.; and Powers, Dale R., 4,636,405, Cl. 427-54.100.
Cosden Technology, Inc.: *See*—
MacLaughlin, Don N., 4,636,349, Cl. 264-549.000.
Cosh, Ian S., to U.S. Philips Corporation. Generating a chroma keying signal. 4,636,838, Cl. 358-22.000.
Cosh, Ian S.: *See*—
Cole, David J.; and Cosh, Ian S., 4,636,839, Cl. 358-22.000.
Costan S.p.A.: *See*—
Casanova, Giuseppe; and De Zolt, Ivano, 4,635,447, Cl. 62-448.000.
Cotreau, Gerald M., to Harris Corporation. Front end stage of an operational amplifier. 4,636,743, Cl. 330-295.000.
Coughlin, Lawrence P.: *See*—
Charuest, George M.; and Coughlin, Lawrence P., 4,635,623, Cl. 128-80.00C.
Courter, Jeanne L.: *See*—
Wang, David W.; Courter, Jeanne L.; and Kohli, Dalip K., 4,636,535, Cl. 523-204.000.
Coustenoble, Jean-Pierre: *See*—
Gilles, Ascher; Coustenoble, Jean-Pierre; and Fournial, Jean-Francois, 4,635,646, Cl. 128-696.000.
Couture Marketing Limited: *See*—
Croxall, John, 4,635,551, Cl. 101-470.000.
Cova, Michel, to Constructions Metalliques et Carrosseries Caire Claude. Portable and modular dance floor. 4,635,425, Cl. 52-480.000.
Covenant Manufacturing Co.: *See*—
Kauffman, James C.; and Thompson, Glenn F., 4,635,699, Cl. 160-211.000.
Cowen, David W., to Westinghouse Brake and Signal Company Limited. Power control circuit with digital pulse width control. 4,636,933, Cl. 363-98.000.
Cowtronics, Inc.: *See*—
Leonardo, John, 4,635,587, Cl. 119-1.000.
Cox, Geral L. Tire skid detector. 4,635,583, Cl. 116-28.00R.
Cox, Percy T.: *See*—
Savage, Kerry D.; Cox, Percy T.; and Paap, Hans J., 4,636,731, Cl. 324-338.000.
Crabbe, Edwin P., Jr., to GTE Communication Systems Corporation. Fault tolerant dual port serial link controller. 4,637,011, Cl. 370-24.000.
Crabbe, Edwin P., Jr., to GTE Communication Systems Corporation. Flexible duplex dual port serial link controller. 4,637,012, Cl. 370-24.000.
Craig Medical Products Limited: *See*—
Steer, Peter L., 4,636,205, Cl. 604-338.000.
Craig, William A.; and Taylor, Barry E., to Du Pont de Nemours, E. I., and Company. Thick film conductor composition. 4,636,332, Cl. 252-514.000.
Crane, James W., to Dresser Industries, Inc. Interlock for the throttle and parking brake of a vehicle. 4,635,767, Cl. 192-3.00M.
Crane, Lawrence A.: *See*—
Tachernenko, Stanley A.; Crane, Lawrence A.; and Boyce, Jay, 4,636,935, Cl. 364-140.000.
Crawford, Carl R., to General Electric Company. Method and apparatus for back projection image reconstruction using virtual equi-spaced detector array. 4,636,952, Cl. 364-414.000.
Cray Research, Inc.: *See*—
Chen, Steve S.; Schiffleger, Alan J.; Somdahl, Eugene R.; and Higbie, Lee, 4,636,942, Cl. 364-200.000.
Craycraft, Donald G.; and Pham, Giao N., to NCR Corporation. Current sinking responsive MOS sense amplifier. 4,636,664, Cl. 307-530.000.
CRC-Evans Pipeline International, Inc.: *See*—
Slavens, Clyde M., 4,635,839, Cl. 228-29.000.
Creation Windows, Inc.: *See*—
Hotovy, Robert, 4,636,421, Cl. 428-156.000.
Cretin, Jacques; Beauducel, Claude; Rudaz, Jean; and Gonzalez, Pierre, to Institut Francais du Petrole; and Compagnie Generale de Geophysique. Device for supplying electric power to electronic apparatuses of an acoustic wave receiving assembly of great length. 4,636,992, Cl. 367-20.000.
Crevling, Robert L., Jr.: *See*—
Berfield, Robert C.; and Crevling, Robert L., Jr., 4,635,951, Cl. 280-47.340.
Crooker, Richard M., to Pennwalt Corporation. Polyurethane foams from isocyanate, polyester polyol and chlorodifluoromethane. 4,636,529, Cl. 521-131.000.
Crosby, Samuel C.: *See*—
Gaunt, Loraine E.; Crosby, Samuel C.; Saunders, William J.; and Bruffey, Robert D., Jr., 4,635,824, Cl. 222-129.100.
Crosby Valve & Gage Company: *See*—
Walter, John F., 4,635,675, Cl. 137-315.000.
Crosfield Electronics Limited: *See*—
Fry, Andrew R., 4,635,376, Cl. 33-384.000.
Cross, Peter E.; and Dickinson, Roger P., to Pfizer Inc. N-(phenoxyalkyl)imidazoles as selective inhibitors of the thromboxane synthetase enzyme and pharmaceutical compositions thereof. 4,636,500, Cl. 514-234.000.
Crossley, Ian; Donoghue, Daniel; Mittleman, Steven; and Nash, Seth, to Alpha Industries, Inc. Ring hybrid mixing. 4,637,068, Cl. 455-327.000.
Crothers Limited: *See*—
Hess, Markus J., 4,636,133, Cl. 414-715.000.
Crown Iron Works Company: *See*—
Anderson, George E., 4,635,380, Cl. 34-27.000.
Crownover, Donald J., to Schlumberger Technology Corporation. Method and apparatus for the continuous analysis of drilling mud. 4,635,735, Cl. 175-48.000.
Crowther, Gerald O.; and Mason, Arthur G., to U.S. Philips Corporation; and Independent Broadcasting Authority. Transmission system. 4,636,854, Cl. 358-123.000.
Croxall, John, to Couture Marketing Limited. Method of printing hosiery. 4,635,551, Cl. 101-470.000.
Crump, E. Eugene: *See*—
Thigpen, Ben B.; Crump, E. Eugene; Johnston, Otis A.; McPeek, Nathaniel K.; and McNeel, William O., 4,637,000, Cl. 367-172.000.
CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Grego, Giorgio, 4,636,032, Cl. 350-96.200.
Cullen, Richard A., to Cyclomatic Industries, Inc. Optical tracking device. 4,636,612, Cl. 219-124.340.
Cullis, Herbert M., to Baxter Travenol Laboratories, Inc. Disposable centrifugal blood processing system. 4,636,193, Cl. 494-45.000.
Cundiff, John S., to Applied Science Associates, Inc. Method and apparatus for separating the pith from the fibrous component of sweet sorghum, sugar cane and the like. 4,636,263, Cl. 127-42.000.
Curchod, Donald B. Light weight dynamic wheel balancing machine. 4,635,481, Cl. 73-460.000.
Cyclomatic Industries, Inc.: *See*—
Cullen, Richard A., 4,636,612, Cl. 219-124.340.
Cyklop International: *See*—
Sebelist, Norman C.; and Fulton, Edward N., 4,635,542, Cl. 100-1.000.
Cypress Semiconductor Corp.: *See*—
Young, Kenneth E.; and Bateman, Bruce L., 4,636,983, Cl. 365-181.000.
D.V.T. Buro fur Anwendung Deutscher Verfahrenstechnik H. Morsy: *See*—
Nasser, Gamal E. D., 4,636,283, Cl. 202-173.000.
D'Addio, Egidio; Galati, Gaspare; and Giaccari, Ennio, to Selenia - Industrie Elettroniche Associate S.p.A. Adaptive MTD digital processor for surveillance radar. 4,636,793, Cl. 342-162.000.
Daemer, Richard J.; Feinstone, Stephen M.; Gust, Ian D.; and Purcell, Robert H., to United States of America, Health & Human Services.

Isolation of hepatitis A virus strain HM-175. 4,636,469, Cl. 435-237.000.
Dai-Ichi Seiko Co., Ltd.: *See*—
Kashimura, Noritake; and Saitoh, Hiroaki, 4,636,034, Cl. 350-96.210.
Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Nozaka, Yoshiki, 4,636,276, Cl. 156-353.000.
Daido Tokushuko Kabushiki Kaisha: *See*—
Nagasaka, Hiroyasu; Kamidaira, Kunio; Ino, Hiroshi; and Utsuno, Mitsuo, 4,636,093, Cl. 374-186.000.
Daikin Industries, Ltd.: *See*—
Sako, Junichi; and Yagi, Toshiharu, 4,636,331, Cl. 252-511.000.
Daimler-Benz Aktiengesellschaft: *See*—
Merkle, Josef, 4,635,957, Cl. 280-663.000.
Schumacher, Rolf; Faix, Heinz; and Bruhnke, Ulrich, 4,635,415, Cl. 52-127.100.
Siebler, Helmut, 4,636,003, Cl. 297-336.000.
Dainippon Screen Mfg. Co., Ltd.: *See*—
Tomohisa, Kunio; Maeda, Kiyoshi; and Yao, Koji, 4,636,869, Cl. 358-287.000.
Yamada, Susumu; and Yamada, Mitsuhiko, 4,636,870, Cl. 358-288.000.
Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Hashimoto, Takeji; and Murayama, Minoru, 4,635,365, Cl. 33-1.00M.
Daisho Seiki Kabushiki Kaisha: *See*—
Nakaji, Takayuki, 4,635,401, Cl. 51-5.00D.
Daley, Frank E.; and Wilhelm, Richard H. Batch cleaning apparatus. 4,635,666, Cl. 134-172.000.
Dalrymple, Michael B. Device to indicate solar exposure. 4,635,371, Cl. 33-1.0DD.
Dalziel, Warren L.; Flanigan, Charles; Daniels, Donald V.; Lee, John S.; and Johnston, James, to Microtek Storage Corporation. Crosstalk shielding assembly for addition to one head of a dual magnetic head assembly. 4,636,902, Cl. 360-128.000.
Danfoss A/S: *See*—
Jacobsen, Hans E.; Hansen, Henning M.; Nyrup, John; Hansen, Henry; and Lassithiotakis, Konstantin, 4,635,486, Cl. 73-861.120.
Dang, Ryo: *See*—
Ikoma, Toshiaki; Maeda, Hajime; Yanai, Hisayoshi; Dang, Ryo; and Shigyo, Naoyuki, 4,636,824, Cl. 357-23.140.
Daniel, Charles G. Fingernail cleaner comprising faucet attachment which provides shielded jet stream. 4,635,656, Cl. 132-75.000.
Daniels, Donald V.: *See*—
Dalziel, Warren L.; Flanigan, Charles; Daniels, Donald V.; Lee, John S.; and Johnston, James, 4,636,902, Cl. 360-128.000.
Dano, Paul K., to Del Norte Technology, Inc. Radio ranging, navigation, and location system with correction for systematic errors. 4,636,795, Cl. 342-387.000.
Dansk Eternit-Fabrik A/S: *See*—
Jensen, Hans E. W.; and Gregersen, Johan C., 4,636,345, Cl. 264-122.000.
Data General Corporation: *See*—
Latham, Paul W., II, 4,636,748, Cl. 331-17.000.
Takla, Nabil, 4,636,976, Cl. 364-900.000.
Davidson, John D.: *See*—
Moore, Peter G.; and Davidson, John D., 4,636,700, Cl. 318-611.000.
Davis, Delbert A.: *See*—
Bruner, Jeffrey W.; and Davis, Delbert A., 4,636,428, Cl. 428-254.000.
Davis, Rhetta Q.: *See*—
Stevens, Michael G.; and Davis, Rhetta Q., 4,636,541, Cl. 523-404.000.
Davis, Richard F., to Du Pont de Nemours, E. I., and Company. Process for preparing 6-halo-2-chloroquinoxaline. 4,636,562, Cl. 544-354.000.
Davis, Robert L.; and Keith, Harold D., to University of Missouri, The Curators of The. Expansion bolt and mine roof reinforcement therewith. 4,636,115, Cl. 405-259.000.
Davoli, Velmore: *See*—
Mayr, Adolfo; Susa, Ermanno; Leccese, Antonio; Davoli, Velmore; and Gischetti, Ettore, 4,636,486, Cl. 502-121.000.
Daya, Shiraz: *See*—
Pompei, Francesco; and Daya, Shiraz, 4,636,091, Cl. 374-124.000.
de la Morandiere, Anne J.; Bressler, Peter W.; Byar, Peter D.; and Spector, Edward A., to de la Morandiere, Anne J. Combination dryer and iron. 4,636,613, Cl. 219-249.000.
Dean, Anthony M.; DeGregoria, Anthony J.; Hardy, James E.; Hurst, Boyd E.; and Lyon, Richard K., to Exxon Research & Engineering Company. Non-catalytic method for reducing the concentration of NO in combustion effluents by injection of ammonia at temperatures from about 975 degrees K. to 1300 degrees K. 4,636,370, Cl. 423-235.000.
Debell, Lawrence R., to Phi Technologies, Inc. Programmable annunciator. 4,636,880, Cl. 360-72.300.
DeBergalis, Michael, to Du Pont de Nemours, E. I., and Company. Polymers containing resorcinol monobenzoate. 4,636,431, Cl. 428-327.000.
DeBey, Timothy M.: *See*—
Simons, Gale G.; and DeBey, Timothy M., 4,636,642, Cl. 250-337.000.
Decaens, Remy: *See*—
Caillerie, Jean-Louis; Decaens, Remy; and Limare, Armand, 4,636,354, Cl. 420-514.000.
Decailloz, Claude: *See*—
Chastanet, Bernard; Decailloz, Claude; Dournel, Solange; and Masson, Marcel, 4,636,606, Cl. 219-121.0LC.
Deckers, Hellmuth, to Hoechst Aktiengesellschaft. Process for the preparation of aromatic polyethers with mixture of carbonate catalysts. 4,636,557, Cl. 528-126.000.
de Cousnon, Tristan: *See*—
Vernhet, Jean; and de Cousnon, Tristan, 4,636,859, Cl. 358-147.000.
Deere & Company: *See*—
Smith, Joseph J.; and Stillmunkes, Dean J., 4,636,012, Cl. 305-28.000.
DeFlander, Jos; and Verdoodt, Dirk, to Procter & Gamble Company, The. Easy-openable see-through container. 4,635,795, Cl. 206-526.000.
DeGregoria, Anthony J.: *See*—
Dean, Anthony M.; DeGregoria, Anthony J.; Hardy, James E.; Hurst, Boyd E.; and Lyon, Richard K., 4,636,370, Cl. 423-235.000.
Deguchi, Takashi; Kadono, Masahiro; and Naka, Shinji, to Matsushita Electric Industrial Co., Ltd. Inverter-drive controlling apparatus. 4,636,928, Cl. 363-41.000.
Degussa AG: *See*—
Wolff, Siegfried; Schwarze, Werner; and Grewatta, Heinz, 4,636,550, Cl. 524-552.000.
Degussa Aktiengesellschaft: *See*—
Rothbuhr, Lothar; and Kuhner, Gerhard, 4,636,375, Cl. 423-480.000.
Schumann, Erwin, 4,636,089, Cl. 374-45.000.
de Hertel Eastcott, Peter, to Canadian General Electric Company Limited. Gear protection system for grinding mills. 4,635,769, Cl. 192-0.034.
Dehlinger, James R.: *See*—
Palentyn, Gunther H.; Dehlinger, James R.; and Rigsby, Donald R., 4,636,608, Cl. 219-121.0LN.
DEK, Inc.: *See*—
Santucci, Donald; and Desemark, Phillip W., 4,635,886, Cl. 248-73.000.
Del Mar Avionics: *See*—
Shu, Stephen K., 4,635,927, Cl. 272-96.000.
Del Norte Technology, Inc.: *See*—
Dano, Paul K., 4,636,795, Cl. 342-387.000.
Delaney, Norma G.: *See*—
Godfrey, Jollie D., Jr.; Gordon, Eric M.; and Delaney, Norma G., 4,636,560, Cl. 530-331.000.
Delevallee, Francoise: *See*—
Clemence, Francois; Le Martret, Odile; and Delevallee, Francoise, 4,636,512, Cl. 514-312.000.
Delgrange, Louis; and Vialettes, Francoise, to Thomson-CSF. Process for the control of an alternating current plasma panel and apparatus for performing the same. 4,636,784, Cl. 340-771.000.
De Luca, Paul V., to Porta Systems Corp. Lock assembly for metallic covers. 4,635,980, Cl. 292-281.000.
DeLue, Norman R.; and Pickens, Stanley R., to PPG Industries, Inc. Electro organic method. 4,636,286, Cl. 204-59.00R.
de Man, Rolf E.; de Ridder, Jan; Sprengers, Leo M.; and Peeters, Josef I. C., to U.S. Philips Corporation. Arrangement including a metal vapor discharge tube provided with at least two internal electrodes. 4,636,691, Cl. 315-209.00R.
Demarne, Henri: *See*—
Martinez, Jean; Bali, Jean-Pierre; Castro, Bertrand; Ninato, Dino; and Demarne, Henri, 4,636,490, Cl. 514-15.000.
DeMars, Robert. Disposable razor. 4,635,361, Cl. 30-41.000.
Denemark, Phillip W.: *See*—
Santucci, Donald; and Denemark, Phillip W., 4,635,886, Cl. 248-73.000.
Denki Onkyo Company Limited: *See*—
Saruta, Sadayoshi, 4,636,693, Cl. 315-368.000.
Dennis, Larry T.: *See*—
Sullivan, Brian P.; Dennis, Larry T.; and Ferrell, Robert A., 4,637,063, Cl. 383-61.000.
Dennis, Philip J.: *See*—
Carbone, Douglas C.; and Dennis, Philip J., 4,636,766, Cl. 337-368.000.
Dennison, Thomas M.; and Maust, Blair A., to Caterpillar Inc. Master track chain connection for crawler tractors. 4,636,014, Cl. 305-54.000.
De Paolis, Cesare; Giannantonio, Guiseppe; and Pona, Claude, to Videocolor. Process and apparatus for the rapid adjustment of the static convergence and purity in a television tube, by using a permanent magnet. 4,636,694, Cl. 315-368.000.
Derfler, Freddy: *See*—
Granot, Daniel; Siev, Ahron; and Derfler, Freddy, 4,635,917, Cl. 271-9.000.
de Ridder, Jan: *See*—
de Man, Rolf E.; de Ridder, Jan; Sprengers, Leo M.; and Peeters, Jozef I. C., 4,636,691, Cl. 315-209.00R.
De Schamphelaere, Lucien A.; Librecht, Freddy M.; and Verlinden, Willy G., to Agfa-Gevaert N.V. Electrostatic copying method including compensation for photoconductor fatigue and dark recovery. 4,636,060, Cl. 355-14.0CH.
Deutsch, Armin; and Ruyten, Hearicus M., to U.S. Philips Corporation. Magnetic-tape cassette apparatus with reversing tape direction. 4,636,889, Cl. 360-96.200.
Deutsche Gesellschaft: *See*—
Leister, Peter, 4,636,362, Cl. 422-105.000.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Ewest, Eckhart; Mertens, Gustav; and Strauchewski, Helmut, 4,635,570, Cl. 110-237.000.

Dewees, James A., to Cerebral Palsy Research Foundation of Kansas, Inc. Ankle and lower leg exerciser for proprioceptive rehabilitation. 4,635,932, Cl. 272-96.000.

De Zolt, Ivano: *See—*
Casanova, Giuseppe; and De Zolt, Ivano, 4,635,447, Cl. 62-448.000.

Diamond, Anthony E., to Teleplex Corporation. Addressable port telemetry system. 4,636,790, Cl. 340-825.520.

Diamond, Harvey E. Water massager means. 4,635,619, Cl. 128-39.000.

Diaz, Eusebio A. Automatic transmission rebuilding tool. 4,635,334, Cl. 29-226.000.

Dickinson, Peter D.; and Luciano, Robert A., to IGT. Amusement machine. 4,635,937, Cl. 273-143.00R.

Dickinson, Roger P.: *See—*
Cross, Peter E.; and Dickinson, Roger P., 4,636,500, Cl. 514-234.000.

Dictaphone Corporation: *See—*
Sidebottom, Philip L., 4,636,888, Cl. 360-92.000.

Didriksen, Neal A., to Ampex Corporation. Indexing means for tape cassette. 4,635,878, Cl. 242-198.000.

Diefenbach, Gerhard: *See—*
Bertram, Leo; Diefenbach, Gerhard; and Schemmann, Hugo, 4,636,676, Cl. 310-162.000.

Diehl GmbH & Co.: *See—*
Brieseck, Bernd; and Kreuzer, Peter, 4,635,881, Cl. 244-49.000.

Diener, Arnulf; Kettler, Hans; and Tenhaven, Ulrich, to Hoesch Aktiengesellschaft. Setup for producing metallic coatings. 4,635,586, Cl. 118-718.000.

Diesel Kiki Co., Ltd.: *See—*
Ishibashi, Toru, 4,635,854, Cl. 239-533.800.
Ishizuka, Yutaka; and Nakamura, Teruo, 4,636,153, Cl. 418-80.000.
Ohtani, Yoshio, 4,636,912, Cl. 361-154.000.
Taira, Shigeo; and Ishibashi, Toru, 4,635,599, Cl. 123-300.000.
Taira, Shigeo, 4,635,600, Cl. 123-300.000.

Dietz, Gunter; and Nowak, Manfred, to Gebr. Happich GmbH. Sun visor, particularly for automotive vehicles, with reversible mirror. 4,635,994, Cl. 296-97.00H.

Dietzsch, Gunter: *See—*
Noll, Wilfried; Ehmann, Konrad; Stehle, Hans P.; Dorner, Wolfgang; and Dietzsch, Gunter, 4,635,364, Cl. 30-381.000.

Di Fabio, Emidio: *See—*
Genevois, Jean L.; Lucia, Antonio; and Di Fabio, Emidio, 4,636,169, Cl. 432-90.000.

Dijkmans, Eise C., to U.S. Philips Corporation. Circuit for reducing the occurrence of spurious signals on an output of an electronic circuit when the circuit power supply is switched on and off. 4,636,739, Cl. 330-51.000.

Dildine, Robert G.: *See—*
Sharrit, David D.; Dildine, Robert G.; Roos, Mark D.; and Barr, John T., IV, 4,636,717, Cl. 324-77.00B.

Dilling, Jan-Erik: *See—*
Rudi, Guttorm; and Dilling, Jan-Erik, 4,636,890, Cl. 360-96.500.

Dilling, Peter, to Westvaco Corporation. Ammonium lignosulfonates. 4,636,224, Cl. 8-547.000.

Dillon, Charles M.: *See—*
Sherwood, Edward F.; Baldwin, Paul L.; Orndorff, Karl B.; and Dillon, Charles M., 4,635,756, Cl. 187-1.00R.

Dilyard, Richard D.: *See—*
Berend, Peter M.; Dilyard, Richard D.; Pesa, William A.; and Vaeth, Howard J., 4,636,605, Cl. 219-10.55F.

DiMeo, Franklin R.: *See—*
Bachman, William J.; and DiMeo, Franklin R., 4,635,809, Cl. 220-4.00B.

Dinh, Didier, to NIVO S.A. Structural fixing devices for furniture. 4,636,104, Cl. 403-191.000.

Dinsdale, Keith: *See—*
Peel, Christopher J.; Evans, Brian; Harris, Samuel J.; Noble, Brian; and Dinsdale, Keith, 4,636,357, Cl. 420-532.000.

DiPardo, Robert M.: *See—*
Bock, Mark G.; DiPardo, Robert M.; Boger, Joshua S.; Evans, Ben E.; and Freidinger, Roger, 4,636,491, Cl. 514-16.000.

Director-General of Agency of Industrial Science & Technology: *See—*
Okado, Hideo; Shoji, Hiroshi; Takaya, Haruo; Kawamura, Kichinari; and Yamazaki, Yasuyoshi, 4,636,482, Cl. 502-60.000.

Dischert, Robert A.: *See—*
Moles, Warren H.; and Dischert, Robert A., 4,636,841, Cl. 358-31.000.

Diversified Manufacturing Corporation: *See—*
Bald, Gordon H., 4,635,462, Cl. 72-385.000.

Divisek, Jiri; and Malinowski, Peter, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Diaphragm for alkaline electrolysis and process for manufacture of diaphragm. 4,636,291, Cl. 204-283.000.

Dixon, Frank J.: *See—*
Altman, Amnon; Theofilopoulos, Argyrios N.; Lerner, Richard A.; and Dixon, Frank J., 4,636,463, Cl. 435-7.000.

Dixon International Limited: *See—*
Malcolm-Brown, Tessa, 4,636,538, Cl. 523-179.000.

Dixon, Jerry D.; Farrell, Robert H.; Marazas, Gerald A.; McNeill, Andrew B., Jr.; and Merckel, Gerald U., to International Business Machines Corporation. Redundant page identification for a catalogued memory. 4,637,024, Cl. 371-67.000.

Dr. Ing. Rudolf Hell GmbH: *See—*
Penza, Hans; Segler, Siegfried; Schmuck, Karl-Wilhelm; Asbach, Dietrich; and Lindemann, Eckhard, 4,636,064, Cl. 355-73.000.

Dr. Johannes Heidenhain GmbH: *See—*
Pettigrew, Robert M., 4,636,076, Cl. 356-356.000.

Docutel/Olivetti Corporation: *See—*
Ward, Stephen W., 4,636,947, Cl. 364-200.000.

Dodgen, Stephen L.: *See—*
Bills, Daniel G.; Arnold, Paul C.; Dodgen, Stephen L.; and Van Cleve, Craig B., 4,636,680, Cl. 313-7.000.

Dodt, Johannes: *See—*
Seemuller, Ursula; Dodt, Johannes; and Fritz, Hans, 4,636,489, Cl. 514-12.000.

Doi, Seiichi: *See—*
Ahagon, Asahiro; Kobayashi, Toshio; Yamada, Kazuhiro; Doi, Seiichi; and Misawa, Makoto, 4,635,693, Cl. 152-209.00R.

Dolan, John E. Toilet bowl cleaner dispenser. 4,635,302, Cl. 4-228.000.

Dolata, Hans: *See—*
Schweitzer, Karl; Nitschmann, Karl; and Dolata, Hans, 4,636,147, Cl. 417-214.000.

Dominion Tool and Die Company: *See—*
Kozlowski, Chester P.; and Lawson, Lawrence J., 4,635,339, Cl. 29-526.00R.

Domnitch, Irving. Incinerator system arrangement with dual scrubbing chambers. 4,635,569, Cl. 110-215.000.

Donaldson, Thomas W. Down-well pump device. 4,636,145, Cl. 417-199.00R.

Donnelly, James E. Work release stop for a vise. 4,635,912, Cl. 269-157.000.

Donoghue, Daniel: *See—*
Crossley, Ian; Donoghue, Daniel; Mittleman, Steven; and Nash, Seth, 4,637,068, Cl. 455-327.000.

Donoghue, William J., to Motorola, Inc. Orientation of reference cells in a memory. 4,636,979, Cl. 365-104.000.

Donovan, Joseph C.: *See—*
Fischer, Herbert; Stritzke, Karl H.; Morlock, Roland; Jones, Thomas C.; and Donovan, Joseph C., 4,636,265, Cl. 148-6.15R.

Donovan, Joseph F.; Stout, Gregg W.; and Schmuck, Phillip W., to Baker Oil Tools, Inc. Boosterless perforating gun and method of assembly. 4,635,734, Cl. 175-4.600.

Dorman, Linneaus C.; and Meyers, Paul A., to Dow Chemical Company, The. Composites of unsintered calcium phosphates and synthetic biodegradable polymers useful as hard tissue prosthetics. 4,636,526, Cl. 521-61.000.

Dorner, Wolfgang: *See—*
Noll, Wilfried; Ehmann, Konrad; Stehle, Hans P.; Dorner, Wolfgang; and Dietzsch, Gunter, 4,635,364, Cl. 30-381.000.

Dournel, Solange: *See—*
Chastanet, Bernard; Decailloz, Claude; Dournel, Solange; and Manson, Marcel, 4,636,606, Cl. 219-121.0LC.

Dow Chemical Company, The: *See—*
Behrens, Hugh C., 4,635,706, Cl. 164-500.000.
Dorman, Linneaus C.; and Meyers, Paul A., 4,636,526, Cl. 521-61.000.
Hefner, Robert E., Jr.; and White, Mary N., 4,636,542, Cl. 521-466.000.
Rogers, Richard B.; and Herrero, Maria P., 4,636,514, Cl. 514-340.000.
Stevens, Michael G.; and Davis, Rhetta Q., 4,636,541, Cl. 521-404.000.
Suh, Kyung W.; and Kennedy, John M., 4,636,527, Cl. 521-79.000.
Werner, John A.; Wilson, Charles A.; and Mixan, Craig E., 4,636,565, Cl. 546-345.000.

Dowda, Henry M., to Traulsen & Co., Inc. Baker's dough proofing and raising unit. 4,635,540, Cl. 99-468.000.

Dowell Schlumberger Incorporated: *See—*
Bruckdorfer, Roderick A.; and Coleman, Samuel E., 4,635,724, Cl. 166-268.000.
Frenier, Wayne W.; and Wilson, David A., 4,636,327, Cl. 252-87.000.

Dowle, Michael D.: *See—*
Coates, Ian H.; Mills, Keith; Webb, Colin F.; Dowle, Michael D.; and Bays, David E., 4,636,521, Cl. 514-415.000.

Downs, Kenneth L.: *See—*
Barito, Robert W.; and Downs, Kenneth L., 4,636,415, Cl. 428-68.000.

Dowty Mining Equipment Limited: *See—*
Radmall, Paul, 4,636,306, Cl. 210-108.000.

Dowty Seals Limited: *See—*
Stanley, Clive J., 4,635,946, Cl. 277-134.000.

Dragerwerk AG: *See—*
van der Smissen, Carl-Ernst, 4,636,485, Cl. 502-66.000.

Drake, William J., to Ekard Industries. Combination brush and applicator unit. 4,636,102, Cl. 401-190.000.

Drapeau, Remi, to Les Enterprises Manuspec Inc. One-piece fastener for securing a lining element in a removable manner on a carrying surface. 4,635,424, Cl. 52-480.000.

Draper, Robert; and Lorentz, Donald G., to Westinghouse Electric Corp. Model steam generator having an improved feedwater system. 4,635,589, Cl. 122-396.000.

Dresser Industries, Inc.: *See—*
Crane, James W., 4,635,767, Cl. 192-3.00M.
Fertl, Walter H.; and Frost, Elton, 4,636,994, Cl. 367-75.000.
Riehl, David C., 4,635,743, Cl. 180-243.000.

Droitsch, Lutz: *See—*
Kranzle, Josef; Droitsch, Lutz; and Bauer, Manfred, 4,636,146, Cl. 417-270.000.

Drury, Gordon M.; Mason, Arthur G.; Lodge, Nicolas K.; and Flanaghan, Barry A., to Independent Broadcasting Authority. Signal coding for secure transmission. 4,636,851, Cl. 358-119.000.

Dube, Roger R., to International Business Machines Corporation. Holographic image processing systems. 4,636,027, Cl. 350-3.600.

Dubois, Jean G.; and Hesling, Michel. Process for treating glass containers with a protective varnish, and protecting varnish used. 4,636,411, Cl. 427-314.000.

Duckett, John W. Flexible surface mount delineator. 4,636,108, Cl. 404-10.000.

Duijkers, Peter A., to U.S. Philips Corporation. Picture display device comprising a noise detector. 4,636,860, Cl. 358-148.000.

Dujardin, Thierry: *See—*
Bethuel, Louis; Martin, Laurent; and Dujardin, Thierry, 4,636,290, Cl. 204-186.000.

Dumaine, Thomas J.: *See—*
West, G. Allan; Barnes, William W.; Dumaine, Thomas J.; and Andrews, Herbert K., 4,635,862, Cl. 241-51.000.

Dumschat, Helmut, to L. Schuler GmbH. Arrangement for the ejection of the shaped parts out of the matrix of a deformation press. 4,635,463, Cl. 72-427.000.

Dunkerly, Cedric A., II: *See—*
Kennard, Gregory J.; and Dunkerly, Cedric A., II, 4,636,418, Cl. 428-110.000.

Dunnayant, William R.: *See—*
Gruber, Bruce A.; Langer, Heimo J.; and Dunnayant, William R., 4,636,537, Cl. 523-139.000.

Du Pont de Nemours, E. I., and Company: *See—*
Craig, William A.; and Taylor, Barry E., 4,636,332, Cl. 252-514.000.
Davis, Richard F., 4,636,562, Cl. 544-354.000.
DeBergalis, Michael, 4,636,431, Cl. 428-327.000.
Fritz, Herbert L., 4,635,358, Cl. 29-853.000.
Gangal, Subhash V.; and Malhotra, Satish C., 4,636,549, Cl. 524-546.000.
Gorondy, Emery J., 4,636,449, Cl. 430-39.000.
Kettner, Charles A.; and Korant, Bruce D., 4,636,492, Cl. 514-18.000.
Keys, Dalen E.; and Nebe, William J., 4,636,453, Cl. 430-138.000.
Vassiliou, Eustathios, 4,636,402, Cl. 427-49.000.
Willis, Frank M., 4,636,312, Cl. 210-416.100.

Dupper, Walter; Emberger, Roland; Hack, Kurt; Lattner, Manfred; Nickolay, Helmut; Riedel, Karl; and Schollhammer, Richard, to Zinser Textilmaschinen GmbH. Spinning machines and the like with signal or indicator devices. 4,635,321, Cl. 19-0.250.

Duraco Products, Inc.: *See—*
Glass, Henry P., 4,635,818, Cl. 222-41.000.

Durinck, Rene: *See—*
Chielens, Alain; Durinck, Rene; and Werquin, Pierre, 4,635,704, Cl. 164-452.000.

Duwel, Edward C.: *See—*
Soderberg, John H.; and Duwel, Edward C., 4,636,975, Cl. 364-900.000.

Dyett, Derek H.: *See—*
Bolt, Reginald C.; Dyett, Derek H.; and Williams, Robert E., 4,635,653, Cl. 131-281.000.

Dynamics Research Corporation: *See—*
Bakewell, Joseph J., 4,636,811, Cl. 346-76.0PH.
Bakewell, Joseph J., 4,636,812, Cl. 346-76.0PH.

E & J Enterprises, Inc.: *See—*
Graves, Rodney J., 4,635,660, Cl. 132-92.00A.

E. R. Squibb & Sons, Inc.: *See—*
Godfrey, Jollie D., Jr.; Gordon, Eric M.; and Delaney, Norma G., 4,636,560, Cl. 530-331.000.
Gordon, Eric M., 4,636,522, Cl. 514-423.000.

E-Systems, Inc.: *See—*
Middleton, William J., Jr., 4,636,802, Cl. 343-895.000.

Early, Susan E. Fishing line gripping and release assembly for attachment to a floatation member. 4,635,391, Cl. 43-26.100.

East, Gary P.: *See—*
Schulte, Rudolf R.; East, Gary P.; Bryant, Marga M.; and Heindl, Alfons, 4,636,194, Cl. 604-9.000.

Eastman Kodak Company: *See—*
Alkofer, James S., 4,636,845, Cl. 358-80.000.
Beavers, Randy S.; McFarlane, Finley E.; Musser, Harry R.; and Shepherd, Freddie A., 4,636,442, Cl. 428-480.000.
Herron, Denver A., 4,636,808, Cl. 346-75.000.
McClure, Richard J., 4,636,893, Cl. 360-101.000.

Eaton Leonard Corporation: *See—*
McGuire, Samuel B., Sr.; and Jaderborg, Lee V., 4,635,464, Cl. 72-466.000.

Ebara Corporation: *See—*
Iwata, Minoru; and Matake, Kozo, 4,636,672, Cl. 310-87.000.

Ebbing, Steven J.; Hermans, Robert J.; Vicari, John J.; and Beneditz, Bruce D., to Sundstrand Corporation. Power drive unit and control system therefor. 4,635,441, Cl. 60-450.000.

Echols, John C.: *See—*
Burgess, James P.; Echols, John C.; and Walker, Thomas A., 4,636,775, Cl. 340-566.000.

Edagawa, Mitsugu: *See—*
Yamada, Norio; Kajitani, Hayashi; Chiba, Kyoji; and Edagawa, Mitsugu, 4,636,966, Cl. 364-491.000.

Edakubo, Hiroo; Takayama, Nobutoshi; and Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Head tracking apparatus. 4,636,882, Cl. 360-77.000.

Eden, Dayton D., to LTV Aerospace and Defense. Optical erasable disk memory system utilizing duration modulated laser switching. 4,637,008, Cl. 369-100.000.

Eder Instrument Co.: *See—*
Welber, Stanley; and Lakatos, Nick, 4,635,632, Cl. 128-303.100.

Ederati, Richard M.; and Perez, Henry J. Urostomy guard. 4,636,206, Cl. 604-340.000.

Edminster, Robert E.: *See—*
Roche, Thomas A.; and Edminster, Robert E., 4,636,581, Cl. 174-152.00R.

EDO Corporation: *See—*
Pino, Louis, 4,635,443, Cl. 60-628.000.

Edson, James B.: *See—*
Galvin, Aaron A.; Edson, James B.; and Guscott, John K., 4,636,774, Cl. 340-565.000.

Edward Billington & Son Limited: *See—*
Statham, Roger; and Taylor, John F., 4,636,389, Cl. 426-11.000.

Efner, Howard F.: *See—*
Parrott, Stephen L.; Kukes, Simon G.; and Efner, Howard F., 4,636,487, Cl. 502-168.000.

Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Coating quality measuring device. 4,636,648, Cl. 250-571.000.

Egan, Terence: *See—*
Hulse, Anthony J.; Hulse, Neville G.; and Egan, Terence, 4,635,692, Cl. 144-286.00R.

Egbert, Leigh B.: *See—*
Johnson, Richard C.; and Egbert, Leigh B., 4,635,713, Cl. 165-134.100.

Egee, Elizabeth J., executrix: *See—*
Robinson, Albert H., Jr.; and Egee, Walter W., deceased, 4,636,395, Cl. 426-511.000.

Egee, Walter W., deceased: *See—*
Robinson, Albert H., Jr.; and Egee, Walter W., deceased, 4,636,395, Cl. 426-511.000.

Egerer, Josef, to Staedtler & Uhl. Drawhead for drawing equipment for drawing woolen fleece or the like. 4,635,323, Cl. 19-129.00R.

Eguchi, Takeo, to Sony Corporation. Method and apparatus for recording and reproducing an information signal with a larger tape wrapping angle. 4,636,873, Cl. 360-8.000.

Eheim, Franz, deceased (by Eheim, Helga, heir), to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,635,602, Cl. 123-357.000.

Eheim, Helga, heir: *See—*
Eheim, Franz, deceased, 4,635,602, Cl. 123-357.000.

Ehmann, Konrad: *See—*
Noll, Wilfried; Ehmann, Konrad; Stehle, Hans P.; Dorner, Wolfgang; and Dietzsch, Gunter, 4,635,364, Cl. 30-381.000.

Eickmann, Karl. Pistons, piston shoes and rotors in pumps and motors. 4,635,534, Cl. 91-488.000.

Eilamo, Unto: *See—*
Savolainen, Esko; Laukkarinen, Tuomo; Lehto, Arto; Oksman, Erkki; and Eilamo, Unto, 4,636,181, Cl. 474-207.000.

Eisai Co., Ltd.: *See—*
Namba, Yuzuburo; and Kukisaki, Shigenari, 4,635,665, Cl. 134-167.00R.
Takada, Masahiro; Yuzuriha, Teruaki; Katayama, Kouichi; and Sunamoto, Junzo, 4,636,381, Cl. 424-38.000.

Ekard Industries: *See—*
Drake, William J., 4,636,102, Cl. 401-190.000.

Eldridge, Allen E.: *See—*
Broyden, Robert H.; Benton, R. Paul; and Eldridge, Allen E., 4,635,903, Cl. 254-362.000.

Elevator GmbH: *See—*
Kahkipuro, Matti; and Hakkinen, Pekka, 4,635,320, Cl. 187-29.00R.

Elg, Karl G. H. Electrically heated radiator with heat accumulating properties. 4,636,616, Cl. 219-365.000.

Elhaus, Friedrich W. System for controlling a pulling assembly. 4,635,459, Cl. 72-257.000.

Eli Lilly and Company: *See—*
Burow, Kenneth W., Jr., 4,636,243, Cl. 71-88.000.
Spitzer, Wayne A., 4,636,502, Cl. 514-249.000.

Eliason Corporation: *See—*
Newberg, Phillip J., 4,635,421, Cl. 52-309.110.

Elliott, Guy R. B. Recovery of uranium alloy. 4,636,250, Cl. 75-84.10A.

Ellison, Pioneer Division: *See—*
Chabot, Leo L., 4,635,685, Cl. 139-91.000.

Elloway, Russell: *See—*
Aldridge, Robert E.; Elloway, Russell; Fritz, William O.; Goff, Ralph D.; and Herrera, Michael J., 4,636,140, Cl. 414-786.000.

Elscint, Ltd.: *See—*
Sohval, A. Robert; and Freundlich, David, 4,637,040, Cl. 378-9.000.

Ely, William F., to Corning Glass Works. Method of making a sealing glass suspension. 4,636,260, Cl. 106-198.000.

Emanis, Russell B.; Wallace, Don L.; Wolfe, Travis W.; and Emanis, Waverly B. Earlobe treatment apparatus. 4,636,203, Cl. 604-257.000.

Emanis, Waverly B.: *See—*
Emanis, Russell B.; Wallace, Don L.; Wolfe, Travis W.; and Emanis, Waverly B., 4,636,203, Cl. 604-257.000.

Emberger, Roland: *See—*
Dupper, Walter; Emberger, Roland; Hack, Kurt; Lattner, Manfred; Nickolay, Helmut; Riedel, Karl; and Schollhammer, Richard, 4,635,321, Cl. 19-0.250.

Emhart Industries, Inc.: *See—*
Hart, Leroy, 4,635,453, Cl. 70-134.000.
Martin, Hans, 4,636,623, Cl. 235-436.000.
Nebelung, Hermann H., 4,636,241, Cl. 65-260.000.
Sidler, Werner, 4,636,238, Cl. 65-29.000.
Smock, Steven W.; and Richmond, James W., 4,636,595, Cl. 200-10.00R.

Emoto, Masami; Nishimiya, Masanobu; and Kiguchi, Hiroyuki, to Ricoh Company, Ltd. Method and device for detecting focal point. 4,636,625, Cl. 250-201.000.

Empie, Mark W., to Stauffer Chemical Company. Resolution of racemates of amino acids. 4,636,470, Cl. 435-280.000.

Endo, Kazunaka: *See—*
Kanada, Eiji; Suzuki, Shigeyoshi; Endo, Kazunaka; and Yamamoto, Kyonosuke, 4,636,066, Cl. 355-77.000.

Endo, Yasuhiro: *See—*
Kyoden, Hiroshi; Endo, Yasuhiro; Fujiwara, Teiichi; Mimura, Toshisada; Nishikawa, Kihachiro; and Nishizawa, Shoichi, 4,636,969, Cl. 364-560.000.

Endres, Lothar: *See—*
Becker, Manfred; Matejec, Reinhart; and Endres, Lothar, 4,636,461, Cl. 430-567.000.

Energy Absorption Systems, Inc.: *See—*
Friton, Warren D., 4,635,981, Cl. 293-1.000.

Energy Conversion Devices, Inc.: *See—*
Hanak, Joseph J.; Young, James; Kuypers, Bert; and Blieden, Richard, 4,636,579, Cl. 136-245.000.

Energy Development Corporation: *See—*
Rogers, D. Brett; and Penner, Kevin T., 4,635,471, Cl. 73-81.000.

Eng, Jean L.: *See—*
Brown, Catherine A.; and Eng, Jean L., 4,636,397, Cl. 426-579.000.

Engelmann, Manfred; Kraus, Helmut; and Plewan, Otto, to Hoechst Aktiengesellschaft. Sinterable, finely particular molding composition based on vinyl chloride polymers. 4,636,547, Cl. 524-523.000.

England, Melvin G., to Thorn Emi Varian Limited. Magnetron with frequency sensor arrangement. 4,636,750, Cl. 331-90.000.

English Electric Company Limited, The: *See—*
Law, Hilton, 4,636,707, Cl. 322-35.000.

English, John C.; Ondrey, John A.; and Voyce, Jason M. Process for the separation of water from a water-containing mixture or azeotrope with an extractant, and for the separation of water from said extractant. 4,636,284, Cl. 203-18.000.

Environmental Research Institute of Michigan: *See—*
Zuk, David M.; and Larrowe, Vernon L., 4,636,719, Cl. 324-83.00D.

Environmental Security Incorporated: *See—*
Greene, Jay S., 4,636,325, Cl. 252-75.000.

Eppinger, Bernhard: *See—*
Janda, Ralf; and Eppinger, Bernhard, 4,636,533, Cl. 522-14.000.

Eppink, Jay M., to Hughes Tool Company. Downhole progressive cavity type drilling motor with flexible connecting rod. 4,636,151, Cl. 418-48.000.

Equip-Mark, Inc.: *See—*
Hume, Ronald W., 4,635,691, Cl. 141-94.000.

Eremity, Frank, to Videojet Systems International, Inc. Ink catcher and drop charge sensing device. 4,636,809, Cl. 346-75.000.

Erkes, Joseph W.: *See—*
Thomas, Charles E.; Yerazunis, William S.; Erkes, Joseph W.; and Lee, Minyoung, 4,636,779, Cl. 340-680.000.

Eshland Enterprises, Inc.: *See—*
Eshleman, Roger D., 4,635,899, Cl. 251-298.000.

Eshleman, Roger D., to Eshland Enterprises, Inc. Air inlet valve subassembly with replaceable seal. 4,635,899, Cl. 251-298.000.

Essex-Tec Corporation: *See—*
Burgess, James P.; Echols, John C.; and Walker, Thomas A., 4,636,775, Cl. 340-566.000.

ETA S.A., Fabriques d'Ebauches: *See—*
Thomke, Ernst; and Zaugg, Hans, 4,636,037, Cl. 350-334.000.

Etablissements A. Bertaud: *See—*
Graffin, Andre J. J., 4,635,688, Cl. 141-1.000.
Graffin, Andre J. J., 4,635,689, Cl. 141-1.000.

Ethyl Corporation: *See—*
Boldish, Steven I., 4,635,681, Cl. 137-625.500.
Raley, Garland E.; and Spear, Dean M., 4,636,161, Cl. 425-194.000.
Shin, Kju H., 4,636,574, Cl. 558-18.000.

Eue, Ludwig: *See—*
Wroblowsky, Heinz-Jurgen; Stetter, Jorg; Eue, Ludwig; Schmidt, Robert R.; and Santel, Hans-Joachim, 4,636,245, Cl. 71-90.000.

Eur-Control Kalle AB: *See—*
Skallen, Bengt; Ljungkvist, Kjell; and Gren, Urban, 4,635,470, Cl. 73-63.000.

Eva Staude, Firma: *See—*
Staude, Eckhard; and Kaus, Juergen, 4,636,061, Cl. 355-24.000.

Evans, Ben E.: *See—*
Bock, Mark G.; DiPardo, Robert M.; Boger, Joshua S.; Evans, Ben E.; and Freidinger, Roger, 4,636,491, Cl. 514-16.000.

Evans, Brian: *See—*
Peel, Christopher J.; Evans, Brian; Harris, Samuel J.; Noble, Brian; and Dinsdale, Keith, 4,636,357, Cl. 420-532.000.

Evans, Doyle R.: *See—*
Chrobak, Michael J.; and Evans, Doyle R., 4,635,354, Cl. 29-622.000.

Evans, George D.: *See—*
Flynn, Brian P.; Winetzky, Deborah S.; and Evans, George D., 4,636,328, Cl. 252-90.000.

Evans, Morris L.: *See—*
Luvinh, Quoc; Lechat, Jacques; Evans, Morris L.; and Lepert, Andre, 4,636,555, Cl. 526-290.000.

Evans, Thomas L.: *See—*
Rosenquist, Niles R.; and Evans, Thomas L., 4,636,559, Cl. 528-370.000.

Ewald, Hans: *See—*
Gehrke, David E.; and Ewald, Hans, 4,635,399, Cl. 49-460.000.

Ewald, Werner: *See—*
Bestek, Heinz; Ewald, Werner; Hennecke, Hans-Peter; Roeder, Alfred; and Schmitz, Friedrich, 4,636,379, Cl. 423-640.000.

Ewest, Eckhart; Mertens, Gustav; and Straschewski, Helmut, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Arrangement for vitrifying radioactive liquid waste. 4,635,570, Cl. 110-237.000.

Excel Industries, Inc.: *See—*
Wooten, Ronald E., 4,635,397, Cl. 49-394.000.

Excellente, Richard. Asymmetric stringed instrument. 4,635,522, Cl. 84-291.000.

Exergen Corporation: *See—*
Pompei, Francesco; and Daya, Shiraz, 4,636,091, Cl. 374-124.000.

Exit S.A.: *See—*
Leisi, Marcel, 4,635,850, Cl. 239-119.000.

Exxon Printing Systems, Inc.: *See—*
Mikalsen, Arthur, 4,636,803, Cl. 346-1.100.

Exxon Research and Engineering Company: *See—*
Bhattacharya, Sabyasachi; Bloch, Aaron N.; and Stokes, James P., 4,636,737, Cl. 329-110.000.
Dean, Anthony M.; DeGregoria, Anthony J.; Hardy, James E.; Hurst, Boyd E.; and Lyon, Richard K., 4,636,370, Cl. 423-235.000.
Luvinh, Quoc; Lechat, Jacques; Evans, Morris L.; and Lepert, Andre, 4,636,555, Cl. 526-290.000.

Ezekiel, Shaoul: *See—*
Snitzer, Elias; and Ezekiel, Shaoul, 4,637,025, Cl. 372-1.000.

F. L. Smidth & Co. A/S: *See—*
Folsbeg, Jan, 4,636,302, Cl. 209-144.000.

F.P.D. Future Patents Development Company S.A.: *See—*
Klawitter, Hans J., 4,635,822, Cl. 222-82.000.

Fairchild Semiconductor Corporation: *See—*
Baynes, Martin J., 4,636,825, Cl. 357-23.140.
Schinabeck, John, 4,637,020, Cl. 371-20.000.

Faix, Heinz: *See—*
Schumacher, Rolf; Faix, Heinz; and Bruhnke, Ulrich, 4,635,415, Cl. 52-127.100.

Faldella, Roberto: *See—*
Cordero, Federico; and Faldella, Roberto, 4,635,504, Cl. 74-695.000.

Falk, Theodore J.; and Morris, Lawrence E., to Greatbatch Enterprises, Inc. Low power electromagnetic pump. 4,636,150, Cl. 417-417.000.

Falk-Verlag fur Landkarten und Stadtplane Gerhard Falk GmbH: *See—*
Vogtlander, Alfred; and Vogtlander, Elsbeth, 4,636,192, Cl. 493-451.000.

Fan, Tzeng-Yuan. Apparatus for air compressing and dust collecting. 4,636,230, Cl. 55-274.000.

Fang, Reuy-Feng. Safety gas flow regulator. 4,635,680, Cl. 137-614.180.

Fanuc Ltd.: *See—*
Kishi, Hajimu; Seki, Masaki; and Mizuno, Yutaka, 4,636,937, Cl. 364-191.000.

Farha, Floyd E., Jr., to Phillips Petroleum Company. Removal of sulfur oxides from fluid streams. 4,636,371, Cl. 423-244.000.

Farmer, James O., to Scientific-Atlanta, Inc. Scrambling and descrambling of television signals for subscription TV. 4,636,852, Cl. 358-120.000.

Farr, Aaron V., to Abex Corporation. Phase detector. 4,636,720, Cl. 324-86.000.

Farrell, Robert H.: *See—*
Dixon, Jerry D.; Farrell, Robert H.; Marazas, Gerald A.; McNeill, Andrew B., Jr.; and Merckel, Gerald U., 4,637,024, Cl. 371-67.000.

Farris, Robert D.: *See—*
Overcashier, Robert H.; and Farris, Robert D., 4,635,500, Cl. 74-552.000.

Fassler, Friebert; Kigyos, Frank; and Slaughter, Bobby L., to North American Philips Corporation. Brush with self retaining bristles. 4,635,313, Cl. 15-193.000.

Fathom Oceanology Limited: *See—*
Hale, Neville E., 4,636,114, Cl. 405-224.000.

Faupel, Werner; and Schmidt, Klaus, to Robert Boach GmbH. Fuel injection pump for internal combustion engines. 4,635,605, Cl. 123-449.000.

Fava, Jean; Lambert, Andre ; and Tognet, Jean-Paul, to Rhone-Poulenc Chimie de Base. Essentially complete recovery of uranium, yttrium, thorium and rare earth values from phosphate rock during wet-process production of phosphoric acid therefrom. 4,636,369, Cl. 423-20.000.

Fayram, Richard A.: *See—*
Lowin, David A.; Fayram, Richard A.; and Bivetto, Andrew J., 4,636,202, Cl. 604-236.000.

Fayter, Richard G., Jr.: *See—*
Harris, Eugene G.; and Fayter, Richard G., Jr., 4,636,571, Cl. 549-484.000.

Feinberg, Stewart C., to Atlantic Richfield Company. Photocell assembly. 4,636,578, Cl. 136-251.000.

Feinstone, Stephen M.: *See—*
Daemer, Richard J.; Feinstone, Stephen M.; Gust, Ian D.; and Purcell, Robert H., 4,636,469, Cl. 435-237.000.

Fejes, Peter; and Halilden, Eva, to AB Asea-Atom. Electrode for electrochemical measurements in aqueous solutions of high temperatures. 4,636,292, Cl. 204-404.000.

Feldman, Martin, to AT&T Bell Laboratories. Two-dimensional imaging with line arrays. 4,636,080, Cl. 356-401.000.

Feldmann, Hansueli; and Brandli, Max, to Invention AG. Collision protection device for industrial vehicles, especially industrial trucks. 4,635,982, Cl. 293-2.000.

Fellner, Peter J.; Lai, Mun F.; and Patel, Thakorbhai P., to G. D. Searle & Co. Imidazole derivatives and pharmaceutical compositions. 4,636,518, Cl. 514-397.000.

Ferranti, plc: *See—*
Moore, Peter G.; and Davidson, John D., 4,636,700, Cl. 318-611.000.

Ferrari, Ricky J.: *See—*
Lenertz, John L.; Tesenske, Dennis J.; and Ferrari, Ricky J., 4,636,130, Cl. 414-500.000.

Ferrell, Robert A.: *See—*
Sullivan, Brian P.; Dennis, Larry T.; and Ferrell, Robert A., 4,637,063, Cl. 383-61.000.

Ferri, Bernard L. Shot pattern controlling device. 4,635,555, Cl. 102-453.000.

Ferruccio, Antonio: *See—*
Calcabrini, Vinicio; and Ferruccio, Antonio, 4,635,578, Cl. 114-39.000.

Fertl, Walter H.; and Frost, Elton, to Dresser Industries, Inc. Method of determining shear wave travel time in subsurface formations. 4,636,994, Cl. 367-75.000.

Fiat Auto S.p.A.: *See—*
Cordero, Federico; and Faldella, Roberto, 4,635,504, Cl. 74-695.000.

Fichtel & Sachs AG: *See—*
Wiggen, Peter, 4,635,780, Cl. 192-106.200.

Field Group Research Pty. Ltd.: *See—*
Field, Peter W., 4,636,412, Cl. 428-35.000.

Field, Martin J., to General Motors Corporation. Fuel pressure regulator. 4,635,537, Cl. 92-98.00R.

Field, Peter W., to Field Group Research Pty. Ltd. Enema bag. 4,636,412, Cl. 428-35.000.

Figiel, Francis J.; and Osterman, Harry F., to Allied Corporation. Process for removal of surface films from non-absorbent articles. 4,636,320, Cl. 210-801.000.

Fildes, Neal R., to AT&T Bell Laboratories. Parallel bus protocol. 4,636,939, Cl. 364-200.000.

Filonov, Arkady S.: *See—*
Golubenko, Alexandr L.; Turchin, Viktor P.; Konyaev, Alexei N.; Sukhov, Igor N.; Kaljuzhny, Nikolai N.; Filonov, Arkady S.; Koropets, Alexei P.; Pinovsky, Mikhail I.; Tkachenko, Viktor P.; and Kramar, Nikolai M., 4,635,990, Cl. 295-11.000.

Filtronic Components Limited: *See—*
Mobbs, Christopher I.; and Rhodes, J. David, 4,636,913, Cl. 361-182.000.

Finch, Curtis L., to Babcock & Wilcox Company, The. Tube expanding method. 4,635,333, Cl. 29-157.400.

Finn, Everett N.: *See—*
Sexstone, John H.; Finn, Everett N.; Lowe, Byron L.; and Milliner, Ken M., 4,636,183, Cl. 493-42.000.

Fisanick, Georgia J.; Gross, Michal E.; and Wolk, Gary L., to AT&T Technologies, Inc.; and Bell Telephone Laboratories. Method of repairing a defective photomask. 4,636,403, Cl. 427-53.100.

Fischer, Eckhard: *See—*
Kratz, Gerhard; Meininger, Siegfried; Fischer, Eckhard; and Bege, Dietmar, 4,636,363, Cl. 422-159.000.

Fischer, Herbert; Stritzke, Karl H.; Morlock, Roland; Jones, Thomas C.; and Donovan, Joseph C., to Henkel Kommanditgesellschaft auf Aktien. Autodeposition post-bath rinse. 4,636,265, Cl. 148-6.15R.

Fisher, Tomas G.: *See—*
Howell, Robert G.; and Fisher, Tomas G., 4,636,721, Cl. 324-133.000.

Fiskars Electronics Corporation: *See—*
Rhyne, Earl C.; and Illingworth, Lewis, 4,636,927, Cl. 363-15.000.

Fives-Cail Babcock: *See—*
Chielens, Alain; Durinck, Rene; and Werquin, Pierre, 4,635,704, Cl. 164-452.000.

Flaherty, John J., Jr. Ring-a-ding hook game. 4,635,942, Cl. 273-332.000.

Flanigan, Charles: *See—*
Dalziel, Warren L.; Flanigan, Charles; Daniels, Donald V.; Lee, John S.; and Johnston, James, 4,636,902, Cl. 360-128.000.

Flannagan, Stephen T.; and Reed, Paul A., to Motorola, Inc. Summation of address transition signals. 4,636,991, Cl. 365-230.000.

Flannaghan, Barry A.: *See—*
Drury, Gordon M.; Mason, Arthur G.; Lodge, Nicolas K.; and Flannaghan, Barry A., 4,636,851, Cl. 358-119.000.

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Plummer, Ernest L., 4,636,523, Cl. 514-443.000.
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Street, Thomas R., Jr., 4,635,766, Cl. 188-317.000.
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Johnson, Richard C.; and Egbert, Leigh B., 4,635,713, Cl. 165-134.100.

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Skinner, Geoffrey F.; Kowal, Wieslaw M.; and Linton, Stephen D., 4,636,334, Cl. 252-377.000.

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Tago, Keiichiro, 4,636,712, Cl. 323-349.000.
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Mori, Nobufumi; Takahashi, Kenji; and Horikawa, Kazuo, 4,636,641, Cl. 250-327.200.
Nagao, Eijiro, 4,635,428, Cl. 53-542.000.
Oishi, Kengo; and Moriwaki, Masayoshi, 4,635,877, Cl. 242-197.000.
Suzuki, Masaki, deceased; and Akashi, Goro, 4,636,898, Cl. 360-122.000.
Takahashi, Toshiro; and Nakamura, Koki, 4,636,456, Cl. 430-266.000.
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Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,636,144, Cl. 417-63.000.
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Shirasaki, Masataka; Nakajima, Hirochika; Furukawa, Yasuo; and Inagaki, Takefumi, 4,637,027, Cl. 372-27.000.
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Jones, Gregory S.; Steele, William H.; and Gurtcheff, Glenn A., 4,635,475, Cl. 73-204.000.
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Geppaard, Adrianus, to Glaverbel. Manufacturing drawn sheet glass. 4,636,237, Cl. 65-95.000.
Gerace, Anthony. Internal combustion engine and operating cycle therefor. 4,635,590, Cl. 123-27.00R.
Gerard, Jean-Louis: *See*—
Le Marchand, Claude; and Gerard, Jean-Louis, 4,635,760, Cl. 188-71.900.
Gerber Scientific Instrument Company: *See*—
Prichard, Robert J., 4,636,872, Cl. 358-296.000.
Gerdes, Gerald E., to WPM, Inc. Accessory faucet. 4,635,673, Cl. 137-216.000.
Gerhard Collardin GmbH: *See*—
Schellenberg, Lutz; Hamacher, Matthias; and Broadbent, Ronald, 4,636,264, Cl. 148-6.200.
Gerling, Paul, to Glyco-Metall-Werke Daelen & Loos GmbH. Hydrodynamic plain bearing. 4,636,095, Cl. 384-117.000.
Geyer, Arthur; Kuisl, Max; Pfeiffer, Eugen; Roese, Helmut; and Klein, Werner, to Licentia Patent-Verwaltungs-GmbH. Apparatus for producing a stream of aerosol. 4,636,364, Cl. 422-162.000.
Ghislain, Raymond L.: *See*—
Liu, Ming; Bowbin, John F.; Ghislain, Raymond L.; and McDaniel, Stephen K., 4,635,536, Cl. 92-24.000.
Giaccari, Ennio: *See*—
D'Addio, Egidio; Galati, Gaspare; and Giaccari, Ennio, 4,636,793, Cl. 342-162.000.
Giachetti, Ettore: *See*—
Mayr, Adolfo; Susa, Ermanno; Leccese, Antonio; Davoli, Velmore; and Giachetti, Ettore, 4,636,486, Cl. 502-121.000.
Giannantonio, Guiseppe: *See*—
De Paolis, Cesare; Giannantonio, Guiseppe; and Pons, Claude, 4,636,694, Cl. 315-368.000.
Giannini, Giancarlo. Tone generating glove and associated switches. 4,635,516, Cl. 84-1.010.
Gibbs, George R.: *See*—
Lapatovich, Walter P.; and Gibbs, George R., 4,636,692, Cl. 315-248.000.
Gibbs, Terry L., to Motorola, Inc. High-ratio, isolated microwave branch coupler with power divider, phase shifters, and quadrature hybrid. 4,636,755, Cl. 333-116.000.
Giesen, Franz-Josef: *See*—
Zerfass, Hans-Rainer; Majewski, Klaus-Peter; and Giesen, Franz-Josef, 4,635,948, Cl. 277-235.00B.
Gilles, Ascher; Coustenoble, Jean-Pierre; and Fournial, Jean-Francois. Portable apparatus for monitoring heart activity. 4,635,646, Cl. 128-696.000.

Gillett, John B.; and Miraglia, John A., to International Business Machines Corporation. Connector mechanisms. 4,636,019, Cl. 339-17.00M.

Gilligan, Paul J.; McGuirk, Paul R.; and Witty, Michael J., to Pfizer, Inc. 7-heterocyclic-1,4-dihydroquinolones. 4,636,506, Cl. 514-256.000.

Gilman, Thomas, to Kendall Company, The. Wound dressing. 4,635,624, Cl. 128-156.000.

Ginsberg, Merrill S., to Mobil Oil Corporation. Method for establishing continuity between contiguous data sets. 4,636,955, Cl. 364-420.000.

Gipp, Gregory H.: *See*—
Foley, Donald E.; Gipp, Gregory H.; Schwader, William G.; Sells, Craig L.; Smittkamp, James A.; Stahl, Alan L.; and Szentes, John F., 4,635,739, Cl. 177-45.000.

Gladd Industries, Inc.: *See*—
Hubbert, Gordon F., 4,635,381, Cl. 34-54.000.

Glass, Henry P., to Duraco Products, Inc. Spreader. 4,635,818, Cl. 222-41.000.

Glass, James S.: *See*—
Rollins, Fred P.; and Glass, James S., 4,635,663, Cl. 134-93.000.

Glauber, Diane E.: *See*—
Baker, Robert L.; and Glauber, Diane E., 4,635,712, Cl. 165-82.000.

Glaverbel: *See*—
Geppaard, Adrianus, 4,636,237, Cl. 65-95.000.

Glaxo Group Limited: *See*—
Coates, Ian H.; Mills, Keith; Webb, Colin F.; Dowle, Michael D.; and Bays, David E., 4,636,521, Cl. 514-415.000.
Phillipps, Gordon H.; and Williamson, Christopher, 4,636,509, Cl. 514-274.000.

Glessner, Bertram; Pitsch, Paul; Heinen, Peter; and Peglow, Hartmut, to AEG-Telefunken Kabelwerke AG, Rheydt. Method for producing optical fibers. 4,636,235, Cl. 65-3.120.

Glessner, Bertram; Pitsch, Paul; Heinen, Peter; and Peglow, Hartmut, to AEG-Telefunken Kabelwerke AG, Rheydt. Method for producing a preform for drawing optical fibers. 4,636,236, Cl. 65-3.120.

Gletl, Bryan L.; and Murphy, Mark A., to United States of America, Air Force. Piezoelectrically driven fast response high-torque clutch unit. 4,636,679, Cl. 310-328.000.

Glezer, Boris: *See*—
Cederwall, Philip J.; and Glezer, Boris, 4,635,332, Cl. 29-156.80R.

Glyco-Metall-Werke Daelen & Loos GmbH: *See*—
Gerling, Paul, 4,636,095, Cl. 384-117.000.

Gocho, Nagahiro: *See*—
Sakurada, Masahiko; Manabe, Sugio; Okamura, Hideaki; and Gocho, Nagahiro, 4,636,360, Cl. 422-65.000.

Godfrey, Jollie D., Jr.; Gordon, Eric M.; and Delaney, Norma G., to E. R. Squibb & Sons, Inc. Amino thiol peptides. 4,636,560, Cl. 530-331.000.

Goel, Anil B., to Ashland Oil, Inc. Polymer from bicyclic amide acetal-epoxide monomer and dicarboxylic acid anhydride. 4,636,558, Cl. 528-363.000.

Goetze AG: *See*—
Zerfass, Hans-Rainer; Majewski, Klaus-Peter; and Giesen, Franz-Josef, 4,635,948, Cl. 277-235.00B.

Goff, Ralph D.: *See*—
Aldridge, Robert E.; Elloway, Russell; Fritz, William O.; Goff, Ralph D.; and Herrera, Michael J., 4,636,140, Cl. 414-786.000.

Gold, Henning. Combination pneumatic spring and shock absorbing apparatus. 4,635,909, Cl. 267-64.210.

Gold, Jeffrey G.; Pande, Gyan S.; and Smith, Kevin, to Cordis Corporation. Preparing guiding catheter. 4,636,346, Cl. 264-139.000.

Golden, Michael G. Apparatus for making electronic circuit boards. 4,635,368, Cl. 33-23.030.

Goldstein, Guy: *See*—
Madsen, Willy B.; Jensen, Finn H.; Rasmussen, Ole B.; Goldstein, Guy; and Russin-Moynier, Yves R., 4,636,419, Cl. 428-131.000.

Goldstein, Marc, to Cornell Research Foundation, Inc. Microspike surgical approximator. 4,635,636, Cl. 128-334.00R.

Goldstone, Ted A. Document holder with preprinted locating aid. 4,636,099, Cl. 400-531.000.

Golubenko, Alexandr L.; Turchin, Viktor P.; Konyaev, Alexei N.; Sukhov, Igor N.; Kaljuzhny, Nikolai N.; Filonov, Arkady S.; Koropets, Alexei P.; Pinovsky, Mikhail I.; Tkachenko, Viktor P.; and Kramar, Nikolai M., to Voroshilovgradsky Mashinostroiteiny Institut. Resilient wheel of a railway car. 4,635,990, Cl. 295-11.000.

Gomes, Les R., Jr. Emergency ignition shutoff system. 4,636,604, Cl. 200-331.000.

Gondoh, Hiroyuki: *See*—
Yamaguchi, Hisashi; Takahara, Kazuhiro; Gondoh, Hiroyuki; Kawada, Toyoshi; and Andoh, Shizuo, 4,636,789, Cl. 340-805.000.

Gonzalez, Pierre: *See*—
Cretin, Jacques; Beauducel, Claude; Rudaz, Jean; and Gonzalez, Pierre, 4,636,992, Cl. 367-20.000.

Goodman, Gerald: *See*—
McQueen, Sidney J., 4,635,528, Cl. 89-14.300.

Goodman, Jack E.: *See*—
Schmadel, Donald C., Jr.; and Goodman, Jack E., 4,636,031, Cl. 350-96.190.

Goodwin, Bryce S., Jr., to Hewlett-Packard Company. Logic analyzer using source program or other user defined symbols in the trace specification and the trace listing. 4,636,940, Cl. 364-200.000.

Goodyear Aerospace Corporation: *See*—
Frank, Richard J.; and Smith, Donald H., 4,635,695, Cl. 152-410.000.

Goodyear Tire & Rubber Company, The: *See*—
Comper, Louis F.; and Scheiderich, Robert F., 4,636,407, Cl. 427-133.000.
Gasowski, Chester J.; Loeffler, Ronald L.; Musteric, Joseph T.; Springford, Richard H.; and Toth, Robert L., Jr., 4,635,696, Cl. 152-528.000.
Myers, Philip F.; Strickler, Roger A.; and Warmuth, Ivan J., II, 4,635,745, Cl. 280-708.000.

Gordon, Eric M., to E. R. Squibb & Sons, Inc. Acylaminoalkanoyl urethanes or thiourethanes. 4,636,522, Cl. 514-423.000.

Gordon, Eric M.: *See*—
Godfrey, Jollie D., Jr.; Gordon, Eric M.; and Delaney, Norma G., 4,636,560, Cl. 530-331.000.

Gordon, William E.: *See*—
Loren, Norman S.; and Gordon, William E., 4,635,984, Cl. 293-120.000.

Gorman, Robert H., to American Robot Corporation. Industrial robot. 4,636,138, Cl. 414-735.000.

Gorondy, Emery J., to Du Pont de Nemours, E. I., and Company. Electrostatic printing process. 4,636,449, Cl. 430-39.000.

Gotou, Mineo; and Wada, Hirotsugu, to Kabushiki Kaisha Toshiba. Method of positioning a beam to a specific portion of a semiconductor wafer. 4,636,968, Cl. 364-559.000.

Gotsch, Dieter; Klenk, Robert; Hafner, Otto; and Suss, Claus, to Robert Bosch GmbH. Power-driven hand-held tool with a pneumatic motor. 4,635,732, Cl. 173-162.00R.

Goubeaux, Donald E., to Monarch Marking Systems, Inc. Replaceable inking cartridge with depletion counter. 4,636,097, Cl. 400-196.100.

Gould Inc.: *See*—
Lach, Lawrence E., 4,636,654, Cl. 307-260.000.

Gowing, Scott, to United States of America, Navy. Fluid sampler. 4,635,487, Cl. 73-864.620.

Grabbe, Dieter, to Societe d'Etudes de Machines Thermiques. Starting method for internal combustion engine. 4,635,595, Cl. 123-179.00F.

Graffin, Andre J. J., to Etablissements A. Bertaud. Method and apparatus for monitoring and controlling production line filling of receptacles with a predetermined weight of variable density material. 4,635,688, Cl. 141-1.000.

Graffin, Andre J. J., to Etablissements A. Bertaud. Method and apparatus for monitoring and controlling the filling of receptacles with a determined weight of material. 4,635,689, Cl. 141-1.000.

Grageda, Ignacio J., to Hylsa, S.A. Cooling panel for electric arc furnace. 4,637,034, Cl. 373-76.000.

Granger, Maurice. Means for distribution and simultaneously cutting bands of rolled material with at least one roll of material in use. 4,635,837, Cl. 225-96.000.

Graniteville Company: *See*—
Reid, James S., 4,636,423, Cl. 428-196.000.

Granot, Daniel; Siev, Ahron; and Derfler, Freddy, to State of Israel, Ministry of Defense, Rafael Armament. Method and apparatus for feeding sheets, particularly fabrics from a stack. 4,635,917, Cl. 271-9.000.

Grantham, LeRoy F.: *See*—
Gay, Richard L.; and Grantham, LeRoy F., 4,636,336, Cl. 252-632.000.

Granville-Phillips Company: *See*—
Bills, Daniel G.; Arnold, Paul C.; Dodgen, Stephen L.; and Van Cleve, Craig B., 4,636,680, Cl. 313-7.000.

Graves, Rodney J., to E & J Enterprises, Inc. Animated dental floss dispenser. 4,635,660, Cl. 132-92.00A.

Graves Spray Supply Company: *See*—
Muhlnickel, Donald L., Jr., 4,635,852, Cl. 239-414.000.

Gravestock, Michael B.: *See*—
Clough, John M.; Lewis, Timothy; and Gravestock, Michael B., 4,636,247, Cl. 71-92.000.

Gray, Patrick. Board game. 4,635,938, Cl. 273-274.000.

Great Lakes Chemical Corporation: *See*—
Wong, Kwee C., 4,636,282, Cl. 156-659.100.

Greatbatch Enterprises, Inc.: *See*—
Falk, Theodore J.; and Morris, Lawrence E., 4,636,150, Cl. 417-417.000.

Green, Augustus H., Jr.: *See*—
Saffold, James A.; Green, Augustus H., Jr.; and Passmore, Ronald C., 4,636,797, Cl. 343-725.000.

Green, Ronald N. Wrist watch mirror accessory. 4,636,047, Cl. 350-641.000.

Greene, Jay S., to Environmental Security Incorporated. Heat exchange fluid particularly for closed loop solar energy collecting systems. 4,636,325, Cl. 252-75.000.

Greene, Paul L.; and Appling, James, to Allied Corporation. Elongated retaining and electromagnetic shielding member for a towed underwater acoustic array. 4,636,998, Cl. 367-154.000.

Greenwood, John C.; and Thompson, George H. B., to ITT Industries, Inc. Photodetector integrated circuit. 4,636,829, Cl. 357-30.000.

Gregersen, Johan C.: *See*—
Jensen, Hans E. W.; and Gregersen, Johan C., 4,636,345, Cl. 264-122.000.

Grego, Giorgio, to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A. Optical fibre connector. 4,636,032, Cl. 350-96.200.

Gregoire, Moussaian. Rapidly assembled and disassembled connecting device. 4,635,974, Cl. 285-305.000.

Gren, Urban: *See*—
Skallen, Bengt; Ljungkvist, Kjell; and Gren, Urban, 4,635,470, Cl. 73-63.000.

Gresho, William M.: *See*—
Plunkett, Larry E.; and Gresho, William M., 4,636,669, Cl. 310-51.000.

Grewatta, Heinz: *See*—
Wolff, Siegfried; Schwartze, Werner; and Grewatta, Heinz, 4,636,550, Cl. 524-552.000.

Gries, Josef: *See*—
Rosy, Phillip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Friedrich, Ludwig; and Lenke, Dieter, 4,636,504, Cl. 514-252.000.

Grieser, Daniel R.: *See*—
Sherman, Raad C.; and Grieser, Daniel R., 4,637,056, Cl. 382-31.000.

Griffin, Arthur F., to Hughes Aircraft Company. Method and apparatus for transferring data between operationally-juxtaposed memories and knowledge-retrieving systems utilizing same. 4,636,974, Cl. 364-900.000.

Grigsby, John M., to North American Container Corp. Reinforced bulk material container. 4,635,815, Cl. 220-443.000.

Gross, Leo: *See*—
Skeist, S. Merrill; and Gross, Leo, 4,636,685, Cl. 313-493.000.

Gross, Michal E.: *See*—
Fisanick, Georgia J.; Gross, Michal E.; and Wolk, Gary L., 4,636,403, Cl. 427-53.100.

Grossmann, Stefan; and Nitzsche, Erhard, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Arrangement for printing machine plate cylinder zero position adjustment. 4,635,546, Cl. 101-248.000.

Grover, Todd C. Waterbed. 4,635,307, Cl. 5-451.000.

Growdon, John H.; and Wurtman, Richard J., to Massachusetts Institute of Technology. Process and composition for treating disorders by administering amphetamine and choline. 4,636,494, Cl. 514-78.000.

Gruber, Bruce A.; Langer, Heimo J.; and Dunnayant, William R., to Ashland Oil, Inc. Composition, method for preparing and use thereof. 4,636,537, Cl. 523-139.000.

Grumman Aerospace Corporation: *See*—
Roedig, Robert, 4,635,827, Cl. 222-160.000.

Grutzmann, Rudi: *See*—
Niemers, Ekkehard; Grutzmann, Rudi; Mardin, Mithat; Busse, Wolf-Dieter; and Meyer, Horst, 4,636,497, Cl. 514-215.000.

Gruver, Gary A.; and Kunz, Harold R., to United Technologies Corporation. Method of making circulating electrolyte electrochemical cell having gas depolarized cathode with hydrophobic barrier layer. 4,636,274, Cl. 156-279.000.

GTE Communication Systems Corporation: *See*—
Crabbe, Edwin P., Jr., 4,637,011, Cl. 370-24.000.
Crabbe, Edwin P., Jr., 4,637,012, Cl. 370-24.000.
Rahimzad, Antonio, 4,637,019, Cl. 371-16.000.

GTE Laboratories Incorporated: *See*—
Lapatovich, Walter P.; and Gibbs, George R., 4,636,692, Cl. 315-248.000.
Wilson, James L.; and Folweiler, Robert C., 4,636,239, Cl. 65-109.000.

GTE Products Corporation: *See*—
Carbone, Douglas C.; and Dennis, Philip J., 4,636,766, Cl. 337-344.000.
Keeffe, William M.; Gungle, W. Calvin; Rothwell, Harold L., Jr.; and Krasko, Zeya K., 4,636,687, Cl. 313-620.000.

GTE Valeron Corporation: *See*—
Hunt, Carl E., 4,636,118, Cl. 409-136.000.

GTM-Entrepose: *See*—
Augoyard, Jean-Pierre, 4,636,110, Cl. 404-100.000.

Gugle, James E.; and Peek, Brian R., to Illinois Tool Works Inc. Adhesive friction weld fastener. 4,636,124, Cl. 411-82.000.

Guillaume, Michel E.; and Noailly, Nicole. Device for the optical measurement of the edge to edge dimension of an object. 4,636,639, Cl. 250-560.000.

Gundersen, James L.: *See*—
Lewis, Dan E.; and Gundersen, James L., 4,636,773, Cl. 340-347.0DA.

Gungle, W. Calvin: *See*—
Keeffe, William M.; Gungle, W. Calvin; Rothwell, Harold L., Jr.; and Krasko, Zeya K., 4,636,687, Cl. 313-620.000.

Gupta, Ashis S., to Coca-Cola Company, The. Apparatus for rapid carbonation. 4,636,337, Cl. 261-64.300.

Gura, Karl; and Hansen, Erich, to Battelle-Institut e.V. Apparatus for the generation of laser radiation. 4,637,031, Cl. 372-86.000.

Gurtcheff, Glenn A.: *See*—
Jones, Gregory S.; Steele, William H.; and Gurtcheff, Glenn A., 4,635,475, Cl. 73-204.000.

Guscott, John K.: *See*—
Galvin, Aaron A.; Edson, James B.; and Guscott, John K., 4,636,774, Cl. 340-565.000.

Gust, Ian D.: *See*—
Daemer, Richard J.; Feinstone, Stephen M.; Gust, Ian D.; and Purcell, Robert H., 4,636,469, Cl. 435-237.000.

Gustafsson, Bill B. R.; Hedberg, Sven A.; and Lundgren, Bo T., to Aktiebolaget Hassle. Para-substituted 3-phenoxy-1-carbonylaminoalkylamino-propanol compounds, beta receptor blocking compositions and use. 4,636,501, Cl. 514-235.000.

Gustavsson, Bo: *See*—
Stoltz, Klas; Gustavsson, Bo; and Gustavsson, Kerstin, 4,635,978, Cl. 292-144.000.

Gustavsson, Kerstin: *See*—
Stoltz, Klas; Gustavsson, Bo; and Gustavsson, Kerstin, 4,635,978, Cl. 292-144.000.

Habich, Adolph B.; and Hunt, Ronald E., to International Business Machines Corporation. Floating document throat. 4,635,919, Cl. 271-22.000.

Habitzreiter, Richard K.; Pinney, Robert V., Jr.; and Thomas, Tony C., to Recognition Equipment Incorporated. Video filter for video format unit. 4,637,059, Cl. 382-54.000.

Habu, Yasuhiro: *See*—
Nakato, Hakaru; Bessho, Nagayasu; Nozaki, Tsutomu; Habu, Yasuhiro; and Kimura, Tomoaki, 4,635,703, Cl. 164-443.000.

Hack, Kurt: *See*—
Dupper, Walter; Emberger, Roland; Hack, Kurt; Lattner, Manfred; Nickolay, Helmut; Riedel, Karl; and Schollhammer, Richard, 4,635,321, Cl. 19-0.250.

Haertling, Gene H., to Motorola, Inc. Electrooptic ceramic display and method for making same. 4,636,786, Cl. 340-783.000.

Hafner, Otto: *See*—
Gotsch, Dieter; Klenk, Robert; Hafner, Otto; and Suss, Claus, 4,635,732, Cl. 173-162.00R.

Haftke, Jozef J.; Worley, Norman G.; Coleman, Colin R.; and Warris, Anne-Marie, to Babcock Power Limited. Monitoring of burner operation. 4,635,567, Cl. 110-188.000.

Hagen, Donald R., to Resistance Technology, Inc. Compression connection for potentiometer leads. 4,636,768, Cl. 338-312.000.

Hagiwara, Michiki: *See*—
Iwasaki, Shosuke; Abiko, Tetsuo; Hagiwara, Michiki; and Nanba, Keizo, 4,636,356, Cl. 420-532.000.

Hague, Duane O.; and Barnes, James E., to United States of America, Air Force. Extracting digital data from a bus and multiplexing it with a video signal. 4,636,858, Cl. 358-147.000.

Haines, Richard M.: *See*—
Algrim, Donald J.; Vermilion, Donn R.; Hammond, Donald J.; and Haines, Richard M., 4,636,437, Cl. 428-391.000.

Haines, Robert E. Thrust rod anchor for pipe joint restraint systems. 4,635,970, Cl. 285-114.000.

Haino, Nobuo, to Pioneer Electronic Corporation. Level indication apparatus for digitally encoded audio signal data. 4,637,047, Cl. 381-31.000.

Hakala, Douglas T.; Bocek, Joseph M.; and Osborn, James G., to Physio-Control Corporation. Modular physiological instrument. 4,635,639, Cl. 128-419.00D.

Hakkinen, Pekka: *See*—
Kahkipuro, Matti; and Hakkinen, Pekka, 4,635,320, Cl. 187-29.00R.

Hakuto Chemical Co., Ltd.: *See*—
Uchiyama, Hiroshi; and Matsui, Yukinori, 4,636,297, Cl. 208-48.0AA.

Hale, Neville E., to Fathom Oceanology Limited. Buoyancy-supported struts for ocean platforms. 4,636,114, Cl. 405-224.000.

Hall, Kenneth F.; and Chambers, George, to Martock Design Limited. Adjustable mountings. 4,635,887, Cl. 248-179.000.

Hall, Walter J.; Lin, Chester H.; Ramos, Joel A.; and Rogers, Edward J., to S&C Electric Company. Linear operating mechanism for electrical switches. 4,636,602, Cl. 200-153.0SC.

Hallden, Eva: *See*—
Fejes, Peter; and Hallden, Eva, 4,636,292, Cl. 204-404.000.

Halliburton Company: *See*—
Vann, Roy R.; Brieger, Emmet F.; George, Flint R.; Colle, Edward A., Jr.; and Jones, Hilton B., 4,635,733, Cl. 175-4.560.
Zunkel, Gary D., 4,635,716, Cl. 166-51.000.

Halter, Edward Arnold; Purcell, Billy D.; and Toutant, Edward E., to International Business Machines Corporation. Ribbon drive coupling and cartridge tilt arrangement for print line visibility. 4,636,098, Cl. 400-208.000.

Hamacher, Matthias: *See*—
Schellenberg, Lutz; Hamacher, Matthias; and Broadbent, Ronald, 4,636,264, Cl. 148-6.200.

Hamada, Masataka: *See*—
Ishida, Tokuji; and Hamada, Masataka, 4,636,624, Cl. 250-201.000.

Hamari Chemicals Ltd.: *See*—
Nakamura, Usao; Takao, Makoto; Ueno, Etsuko; and Kawaguchi, Kichitaro, 4,636,471, Cl. 435-280.000.

Hamashima, Tetsuo: *See*—
Tanahashi, Masao; Hamashima, Tetsuo; and Kumano, Humihiro, 4,635,360, Cl. 30-34.200.

Hamilton, Gene; Hawkins, Gale; and Potthast, Lynn R. Moveable vehicular storage box. 4,635,992, Cl. 296-37.600.

Hamilton, Herbert E.; and Shorey, Thomas H., to Boeing Company, The. Aircraft cargo loader. 4,635,883, Cl. 244-137.00R.

Hammen, Hans W.; and Voege, Herbert, to Bayer Aktiengesellschaft. Dust-free quinoxaline 1,4-di-N-oxides. 4,636,503, Cl. 514-249.000.

Hammond, Donald J.: *See*—
Algrim, Donald J.; Vermilion, Donn R.; Hammond, Donald J.; and Haines, Richard M., 4,636,437, Cl. 428-391.000.

Hamon-Sobelco S.A.: *See*—
Ledoux, Jules F. R., 4,635,588, Cl. 122-1.00C.

Hanak, Joseph J.; Young, James; Kuypers, Bert; and Blieden, Richard, to Energy Conversion Devices, Inc. Retractable power supply. 4,636,579, Cl. 136-245.000.

Hanaoka, Joichi, to Yoshihara Oil Mill, Ltd. Soybean protein film. 4,636,259, Cl. 106-122.000.

Hand, George E.; and Kramer, Roman A., to Interplastic Corporation. Adjustable shelving system. 4,635,563, Cl. 108-111.000.

Haneda, Isamu: *See*—
Morino, Masuaki; Fujikawa, Yoshiyuki; Haneda, Isamu; and Myoi, Tetsuo, 4,636,970, Cl. 364-706.000.

Hankins, Kevin T.; Michael, Mark W.; and Rosier, Brian K., to Harris Corporation. Method of making an intergrated vertical NPN and

vertical oxide fuse programmable memory cell. 4,635,345, Cl. 29-577.00C.

Hanka, James V., to Horton Manufacturing Co., Inc. Clutch having an output with break away connection. 4,635,768, Cl. 192-30.00W.

Hanna, Marie R.: *See—*
Sprecker, Mark A.; Schreiber, William L.; Fujioka, Futoshi; Boden, Richard M.; Vock, Manfred H.; Whelan, Patrick; and Hanna, Marie R., 4,636,333, Cl. 252-522.00R.

Hansen, Erich: *See—*
Gurs, Karl; and Hansen, Erich, 4,637,031, Cl. 372-86.000.

Hansen, Henning M.: *See—*
Jacobsen, Hans E.; Hansen, Henning M.; Nyrup, John; Hansen, Henry; and Lassithiotakis, Konstantin, 4,635,486, Cl. 73-861.120.

Hansen, Henry: *See—*
Jacobsen, Hans E.; Hansen, Henning M.; Nyrup, John; Hansen, Henry; and Lassithiotakis, Konstantin, 4,635,486, Cl. 73-861.120.

Hansen, Peder U.; and Beazley, Mark D., to Hoag Sheet Metal Pte. Limited. Structural connectors and/or structures. 4,635,413, Cl. 52-92.000.

Hanula, Richard M. Yoke for railway car coupler assembly. 4,635,804, Cl. 213-67.00R.

Hara, Eiichi: *See—*
Mego, Kazuyoshi; Hiratsuka, Shigetoshi; and Hara, Eiichi, 4,636,813, Cl. 346-76.0PH.

Hara, Tadayuki: *See—*
Morishita, Mitsuharu; Hara, Tadayuki; Kohge, Shinichi; Watanabe, Tetsushi; and Ikari, Yasuki, 4,635,741, Cl. 180-79.100.

Hara, Yoichi, to Nissan Motor Co., Ltd. Fuel pressure control system for internal combustion engine. 4,635,603, Cl. 123-383.000.

Harada, Hiroshi: *See—*
Kaizaki, Kazuhiro; Kubota, Sadao; Harada, Hiroshi; and Matsuura, Shigeo, 4,636,863, Cl. 358-167.000.

Hardy, James E.: *See—*
Dean, Anthony M.; DeGregoria, Anthony J.; Hardy, James E.; Hurst, Boyd E.; and Lyon, Richard K., 4,636,370, Cl. 423-235.000.

Haring, Theodor. Snowplow blade with spring-loaded edge flaps. 4,635,387, Cl. 37-232.000.

Harlick, Neville G., to Ainsworth Nominees Pty. Ltd. Poker machine communication system. 4,636,951, Cl. 364-412.000.

Harman, Douglas G.; and Odor, Elbert P., to Westinghouse Electric Corp. Device for shot-peening inside surface of U-bend region of heat exchanger tubing. 4,635,456, Cl. 72-53.000.

Harmathy, Tibor Z., to Canadian Patents and Development Limited. Extensible flame deflector. 4,635,729, Cl. 169-48.000.

Hara, James E. Sun protection canopy. 4,635,667, Cl. 135-90.000.

Harper, James G.; and Bailey, Louis G., to Veeco Integrated Automation, Inc. Apparatus with intelligent bins indicating the presence and identity of stored coded articles. 4,636,634, Cl. 250-223.00R.

Harrington, John P., to Amoco Corporation. Method and apparatus for connecting a tubular element to an underwater wellhead. 4,635,728, Cl. 166-341.000.

Harris, Charles E.; and Tolley, Robert K., to Boeing Company, The. Composite fiber reinforced molded structure for dimple control. 4,636,422, Cl. 428-174.000.

Harris Corporation: *See—*
Cotreau, Gerald M., 4,636,743, Cl. 330-295.000.
Hankins, Kevin T.; Michael, Mark W.; and Rosier, Brian K., 4,635,345, Cl. 29-577.00C.
King, Ken R.; and Hernandez, Celimo P., 4,636,744, Cl. 330-295.000.
Roberts, Richard D.; and Walker, William D., 4,637,064, Cl. 455-67.000.

Harris, Duane H.: *See—*
Mawby, Harold S.; and Harris, Duane H., 4,635,444, Cl. 62-125.000.

Harris, Eugene G.; and Fayter, Richard G., Jr., to National Distillers and Chemical Corporation. 4-carbalkoxy-2-ethyl-2,3-dihydrofurans. 4,636,571, Cl. 549-484.000.

Harris, John; Cooke, Nelson; and Olsen, Kristine, to Beckman Instruments, Inc. Disposable column cartridge. 4,636,316, Cl. 210-656.000.

Harris, Michael J.: *See—*
Laycock, Arthur; Harris, Michael J.; and Broxholme, Mark A., 4,636,249, Cl. 75-53.000.

Harris, Richard L.: *See—*
Horst, Robert W.; and Harris, Richard L., 4,636,943, Cl. 364-200.000.

Harris, Samuel J.: *See—*
Peel, Christopher J.; Evans, Brian; Harris, Samuel J.; Noble, Brian; and Dinsdale, Keith, 4,636,357, Cl. 420-532.000.

Harris, Stephen J.; McKervey, M. Anthony; Melody, David P.; Woods, John; and Rooney, John M., to Loctite (Ireland) Limited. Instant adhesive composition utilizing calixarene accelerators. 4,636,539, Cl. 523-214.000.

Harrison, Robert G.; and Kalivas, Grigorios A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Microstrip/slotline frequency halver. 4,636,757, Cl. 333-218.000.

Harsco Corporation: *See—*
Clark, John A., Jr., 4,635,711, Cl. 165-70.000.

Hart, Leroy, to Emhart Industries, Inc. Lock set. 4,635,453, Cl. 70-134.000.

Hartman, Davis H.; and Richard, Fred V., to Motorola, Inc. OPFET photodetector. 4,636,646, Cl. 250-551.000.

Hartmann, Joel: *See—*
Buiguez, Francois; and Hartmann, Joel, 4,636,281, Cl. 156-643.000.

Hartmeier, Werner N., to RCA Corporation. Comb filter "hanging dot" eliminator. 4,636,842, Cl. 358-31.000.

Hartung, Michael H.; and Tayler, Gerald E., to International Business Machines Corporation. Method and apparatus for grouping asynchronous recording operations. 4,636,946, Cl. 364-200.000.

Harvey Hubbell Incorporated: *See—*
Boteler, William C., 4,636,017, Cl. 339-17.00F.

Hasbro Canada, Inc.: *See—*
Makow, Henry, 4,635,939, Cl. 273-296.000.

Hasegawa, Nobu: *See—*
Seo, Akira; Kanno, Hideo; Hasegawa, Nobu; Miyagi, Yukio; Nishimura, Akira; Konaka, Shigeo; Ohmi, Tetsuto; Munechika, Yukimi; Uchida, Matazaemon; and Ikeda, Kenichi, 4,636,519, Cl. 514-397.000.

Haseler, Helmut: *See—*
Meckl, Heinz; Kampfer, Helmut; and Haseler, Helmut, 4,636,460, Cl. 430-442.000.

Hashim, Abdullah, to Kearney & Trecker Marwin Limited. Inspecting articles. 4,637,054, Cl. 382-8.000.

Hashimoto, Takeji; and Murayama, Minoru, to Dainippon Screen Seizo Kabushiki Kaisha. Coordinate plotter with automatic punching device. 4,635,365, Cl. 33-1.00M.

Hashimoto, Yasuichi, to Kabushiki Kaisha Toshiba. Magnetic head control apparatus. 4,636,883, Cl. 360-78.000.

Hasimoto, Hirofumi: *See—*
Nomura, Iwao; Masuyama, Takayuki; Tanigawa, Yasuo; and Hasimoto, Hirofumi, 4,636,136, Cl. 414-730.000.

Hatakeyama, Yoshiharu; and Ishikawa, Tatsuo, to Yoshida Industry Co., Ltd. Tube container for receiving semifluid material. 4,635,826, Cl. 222-147.000.

Hatayama, Satoyuki, to Tohkai Kogyo Co., Ltd. UV-cured automotive seal component. 4,635,947, Cl. 277-235.00A.

Hatheway, Nicholas N., Jr.: *See—*
Santomango, Anthony; and Hatheway, Nicholas N., Jr., 4,636,725, Cl. 324-158.00F.
Santomango, Anthony; and Hatheway, Nicholas N., Jr., 4,636,726, Cl. 324-158.00F.

Hatori, Yoshinori; and Kaneko, Masahide, to Kokusai Denshin Denwa Kabushiki Kaisha. System for detecting vector of motion of moving objects on picture. 4,636,862, Cl. 358-166.000.

Hattori, Masakatsu; and Fujiki, Masao, to Kabushiki Kaisha Toshiba. Head positioning control system in magnetic disk device of index servo system. 4,636,884, Cl. 360-78.000.

Hattori, Noboru, to Seiko Epson K.K. Personal liquid crystal image display. 4,636,866, Cl. 358-236.000.

Havemann, Robert H., to Texas Instruments Incorporated. Method of low encroachment oxide isolation of a semiconductor device. 4,635,344, Cl. 29-576.00W.

Hawkins, Gale: *See—*
Hamilton, Gene; Hawkins, Gale; and Potthast, Lynn R., 4,635,992, Cl. 296-37.600.

Hayakawa, Toshiro; Miyauchi, Nobuyuki; Yano, Seiki; and Suyama, Takahiro, to Sharp Kabushiki Kaisha. Semiconductor laser. 4,637,029, Cl. 372-45.000.

Hayase, Isao: *See—*
Takao, Kunihiko; Kawashima, Kenichi; Nakamura, Yozo; and Hayase, Isao, 4,636,148, Cl. 417-286.000.

Hayashi, Seiichi; Takei, Katsumori; Usui, Takahiro; Yamaguchi, Yoshitaka; and Taniguchi, Makoto, to Seiko Epson Kabushiki Kaisha. Ink for thermal transfer printing. 4,636,258, Cl. 106-31.000.

Hayashi, Steven R.: *See—*
Thomas, Charles E.; Lee, Minyoung; Bedard, James F.; and Hayashi, Steven R., 4,636,780, Cl. 340-680.000.

Hayd, Axel; Meinke, Peter; Maurer, Martin; and Schwarz, Joachim, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method of enhancing an ice-breaking operation. 4,636,607, Cl. 219-121.0LM.

Hayn, Eberhard: *See—*
Wittmann, Bernd; and Hayn, Eberhard, 4,636,413, Cl. 428-33.000.

Haynes, Joel E. Fluid flow sensor. 4,635,476, Cl. 73-249.000.

Hazama, Junji; Kato, Kinya; Tanimoto, Akikazu; and Izawa, Hisao, to Nippon Kogaku K.K. Apparatus for aligning mask and wafer used in semiconductor circuit element fabrication. 4,636,626, Cl. 250-201.000.

Head, Donald L., to Mead Corporation, The. Apparatus and method for light value gray scale recording. 4,636,807, Cl. 346-1.100.

Heckler & Koch GmbH: *See—*
Weidle, Helmut, 4,635,530, Cl. 89-159.000.

Hedberg, Sven A.: *See—*
Gustafsson, Bill B. R.; Hedberg, Sven A.; and Lundgren, Bo T., 4,636,501, Cl. 514-235.000.

Hedges, Rhey W., to Parker, Louis W. Energy economizer controlled-current start and protection for induction motors. 4,636,702, Cl. 318-729.000.

Hefner, Robert E., Jr.; and White, Mary N., to Dow Chemical Company, The. Imide functional polyphenols; thermosettable compositions containing same and cured products therefrom. 4,636,542, Cl. 523-466.000.

Hegyi, Dennis J. Diode thermometer. 4,636,092, Cl. 374-178.000.

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Pollich, Gerhard, 4,635,924, Cl. 271-227.000.
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Heijkoop, Teunis: *See—*
Sare, Ian R.; Henderson, Ian D.; Heijkoop, Teunis; Bosworth, Michael R.; Aspin, Ronald E.; and Arnold, Brian K., 4,635,701, Cl. 164-102.000.

Hein, Lehmann AG: *See—*
Hoppe, Kurt, 4,636,304, Cl. 209-287.000.

Heindl, Alfons: *See—*
Schulte, Rudolf R.; East, Gary P.; Bryant, Marga M.; and Heindl, Alfons, 4,636,194, Cl. 604-9.000.

Heinen, Peter: *See—*
Glessner, Bertram; Pitsch, Paul; Heinen, Peter; and Peglow, Hartmut, 4,636,235, Cl. 65-3.120.
Glessner, Bertram; Pitsch, Paul; Heinen, Peter; and Peglow, Hartmut, 4,636,236, Cl. 65-3.120.

Heinrich Wunder GmbH & Co. KG: *See—*
Zoor, Reinhold, 4,635,955, Cl. 280-614.000.

Heinze, Richard F. Dry lake system. 4,636,261, Cl. 106-289.000.

Heisel, Michael; Marold, Freimut; and Linde, Gerhard, to Linde Aktiengesellschaft. Integrated scrubbing of SO_2 and production of sulfur. 4,636,377, Cl. 423-575.000.

Helderman, J. Frank. Method for removable anchor apparatus. 4,635,337, Cl. 29-432.000.

Heller, Wolfgang; Ruckert, Peter; and Wiemann, Dieter, to Bisoe-Werke Bahre & Greten GmbH & Co. KG. Apparatus for obtaining a predeterminable distribution of weight in the transverse direction of a pre-mat and/or mat. 4,636,159, Cl. 425-148.000.

Hellstrom, Bengt, to Telefonaktiebolaget LM Ericsson. Method of measuring the dispersion of a transmitting optical fibre. 4,637,072, Cl. 455-607.000.

Helmet Sound, Inc.: *See—*
Scott, Anthony W., 4,636,592, Cl. 381-187.000.

Helmke, Richard W., to United States of America, Army. Military tactical bridge system, method and foldable modules. 4,635,311, Cl. 14-2.400.

Helton, Bob G. Protective coating composition. 4,636,543, Cl. 524-109.000.

Henderson, Ian D.: *See—*
Sare, Ian R.; Henderson, Ian D.; Heijkoop, Teunis; Bosworth, Michael R.; Aspin, Ronald E.; and Arnold, Brian K., 4,635,701, Cl. 164-102.000.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Fischer, Herbert; Stritzke, Karl H.; Morlock, Roland; Jones, Thomas C.; and Donovan, Joseph C., 4,636,265, Cl. 148-6.15R.
Penninger, Josef, 4,636,359, Cl. 422-13.000.

Hennecke, Hans-Peter: *See—*
Bestek, Heinz; Ewald, Werner; Hennecke, Hans-Peter; Roeder, Alfred; and Schmitz, Friedrich, 4,636,379, Cl. 423-640.000.

Hepp, Leonard R., to General Electric Company. Flame retarded polyester molding composition with improved electrical performance. 4,636,544, Cl. 524-411.000.

Herb, Armin, to Hilti Aktiengesellschaft. Expansion anchor assembly. 4,636,123, Cl. 411-55.000.

Herden, Werner; and Saggau, Boye, to Robert Bosch GmbH. Spark plug for an internal combustion engine, having a pilot breakdown gap. 4,636,690, Cl. 315-58.000.

Herder, Kornelis, to Wavin B.V. Apparatus for manufacturing a web of plastic bags. 4,636,190, Cl. 493-196.000.

Hermann, John T., to Chrysler Motors Corporation. Hose connector. 4,635,966, Cl. 285-3.000.

Hermans, Robert J.: *See—*
Ebbing, Steven J.; Hermans, Robert J.; Vicari, John J.; and Beneditz, Bruce D., 4,635,441, Cl. 60-450.000.

Hernandez, Celimo P.: *See—*
King, Ken R.; and Hernandez, Celimo P., 4,636,744, Cl. 330-295.000.

Hernandez, Paul M.; and Petersen, Curtis R., to S. C. Johnson & Son, Inc. Thickener compositions for water-based hydraulic and metal-working fluid compositions. 4,636,326, Cl. 252-77.000.

Hernestam, Sven E. H.; Nilsson, Nils A.; and Willard, Lars-Olof, to AB Ferrosan. Morpholino compounds and compositions. 4,636,382, Cl. 424-54.000.

Herrera, Michael J.: *See—*
Aldridge, Robert E.; Elloway, Russell; Fritz, William O.; Goff, Ralph D.; and Herrera, Michael J., 4,636,140, Cl. 414-786.000.

Herrero, Maria P.: *See—*
Rogers, Richard B.; and Herrero, Maria P., 4,636,514, Cl. 514-340.000.

Herron, Denver A., to Eastman Kodak Company. Continuous ink jet printer. 4,636,808, Cl. 346-75.000.

Hershey Foods Corporation: *See—*
Renda, Frank A., 4,635,786, Cl. 198-424.000.

Healing, Michel: *See—*
Dubois, Jean G.; and Healing, Michel, 4,636,411, Cl. 427-314.000.

Hess, Markus J., to Crothers Limited. Heavy load lifting apparatus. 4,636,133, Cl. 414-715.000.

Hethuin, Serge; and Marin, Guy F. M., to U.S. Philips Corporation. Arrangement for receiving TACAN signals. 4,636,958, Cl. 364-451.000.

Hettmann, Hubert: *See—*
Neidig, Arno; Leukel, Bernd; and Hettmann, Hubert, 4,636,580, Cl. 174-52.0PE.

Hewlett-Packard Company: *See—*
Goodwin, Bryce S., Jr., 4,636,940, Cl. 364-200.000.
Sharrit, David D.; Dildine, Robert G.; Roos, Mark D.; and Barr, John T., IV, 4,636,717, Cl. 324-77.00B.

Hickam, William M.; and Snider, Warren E., to Westinghouse Electric Corp. Gas monitoring method and device. 4,635,468, Cl. 73-19.000.

Hickey, William S., to Willsboro Wood Products. Fold-away chair. 4,635,998, Cl. 297-31.000.

Higashino, Shigenori: *See—*
Nakamura, Tooru; and Higashino, Shigenori, 4,636,929, Cl. 363-56.000.

Higbie, Lee: *See—*
Chen, Steve S.; Schiffleger, Alan J.; Somdahl, Eugene R.; and Higbie, Lee, 4,636,942, Cl. 364-200.000.

Higton, Frederick R.: *See—*
Brunt, Keith D.; and Higton, Frederick R., 4,636,476, Cl. 436-23.000.

Higuchi, Kazuo; Okuhara, Hisakazu; and Sasaki, Kiichi, to Honda Giken Kogyo Kabushiki Kaisha. Seat belt device. 4,635,963, Cl. 280-801.000.

Higuchi, Mamoru: *See—*
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,636,144, Cl. 417-63.000.

Higuchi, Tomoyuki: *See—*
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Hilbrink, Johan O., to NCR Corporation. Field effect display system using drive circuits. 4,636,788, Cl. 340-804.000.

Hillig, William B., to General Electric Company. Composite by infiltration. 4,636,480, Cl. 501-87.000.

Hilti Aktiengesellschaft: *See—*
Herb, Armin, 4,636,123, Cl. 411-55.000.

Hilton-Davis Chemical, The: *See—*
Schmidt, Paul J.; and Hung, William M., 4,636,820, Cl. 346-224.000.

Hinshaw, Waldo S.: *See—*
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Hintsch, Otto, to Sulzer Brothers Ltd. Torsion bar mounting for a projectile weaving machine. 4,635,684, Cl. 139-1.00R.

Hirahara, Takuho: *See—*
Kawaguchi, Susumu; Hirahara, Takuho; Nakane, Kazuhiro; and Ueda, Sei, 4,636,152, Cl. 418-54.000.

Hirai, Hiroyuki: *See—*
Kawata, Ken; Yabuki, Yoshiharu; Sato, Kozo; and Hirai, Hiroyuki, 4,636,462, Cl. 430-617.000.

Hirai, Tadaaki: *See—*
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Hiraiwa, Kazuyoshi, to Nissan Motor Company, Limited. Four-wheel drive automotive vehicle. 4,635,744, Cl. 180-249.000.

Hiratsuka, Shigetoshi: *See—*
Mego, Kazuyoshi; Hiratsuka, Shigetoshi; and Hara, Eiichi, 4,636,813, Cl. 346-76.0PH.

Hirose Electric Co., Ltd.: *See—*
Yahata, Katsumi, 4,636,024, Cl. 339-103.00M.

Hirose, Tokuzo. Vehicle body cover. 4,635,996, Cl. 296-136.000.

Hirsbrunner, Pierre: *See—*
Nguyen, Tuan; Hirsbrunner, Pierre; and Weymuth, Hans, 4,636,399, Cl. 426-629.000.

Hitachi Engineering Co., Ltd.: *See—*
Kurosawa, Toshiaki; Shima, Seiya; Ando, Takeki; Inaba, Hiromi; Nakashima, Hajime; and Mine, Toshisuke, 4,636,932, Cl. 363-54.000.

Hitachi, Ltd.: *See—*
Achiha, Masahiko; and Ishikura, Kazuo, 4,636,857, Cl. 358-140.000.
Aoki, Masakazu; Nakagome, Yoshinobu; Horiguchi, Masahi; Ozaki, Toshifumi; Shimohigashi, Katsuhiro; and Ikenaga, Shinichi, 4,636,985, Cl. 365-189.000.
Ikuzaki, Kunihiko, 4,636,989, Cl. 365-222.000.
Itakura, Sakae; and Morikawa, Osamu, 4,636,919, Cl. 361-414.000.
Kaizaki, Kazuhiro; Kubota, Sadao; Harada, Hiroshi; and Matsuura, Shigeo, 4,636,863, Cl. 358-167.000.
Kawamura, Fumio; Matsuda, Masami; Aoyama, Yoshiyuki; Chino, Koichi; and Mizumoto, Mamoru, 4,636,335, Cl. 252-629.000.
Kurosawa, Toshiaki; Shima, Seiya; Ando, Takeki; Inaba, Hiromi; Nakashima, Hajime; and Mine, Toshisuke, 4,636,932, Cl. 363-54.000.
Kusano, Chushirou; Ishioka, Sachio; Imamura, Yoshinori; Takasaki, Yukio; Ogawa, Hirofumi; Makishima, Tatsuo; and Hirai, Tadaaki, 4,636,682, Cl. 313-386.000.
Mego, Kazuyoshi; Hiratsuka, Shigetoshi; and Hara, Eiichi, 4,636,813, Cl. 346-76.0PH.
Misumi, Akira, 4,636,681, Cl. 313-346.00R.
Nakamura, Hitoshi; Shiiki, Kasuo; Yuito, Isamu; Shiroishi, Yoshihiro; Fujiwara, Hideo; Shinagawa, Kiminari; and Iijima, Akemi, 4,636,897, Cl. 360-119.000.
Nakato, Hakaru; Bessho, Nagayasu; Nozaki, Tsutomu; Habu, Yasuhiro; and Kimura, Tomoaki, 4,635,703, Cl. 164-443.000.
Nishioka, Yasushiro; Homma, Noriyuki; Sakuma, Noriyuki; and Mukai, Kiichiro, 4,636,833, Cl. 357-71.000.
Ohura, Masaki; and Saito, Makoto, 4,636,901, Cl. 360-126.000.
Okamura, Hisanori; Akiyama, Hiroshi; Kamoshita, Mutuo; and Miyazaki, Kunio, 4,636,434, Cl. 428-328.000.
Sugiyama, Masahiko; Sutou, Masatune; Murata, Mitsuru; Ooki, Minoru; and Tagawa, Shigetaro, 4,636,154, Cl. 418-97.000.
Takahashi, Kengo, 4,636,675, Cl. 310-157.000.
Takao, Kunihiko; Kawashima, Kenichi; Nakamura, Yozo; and Hayase, Isao, 4,636,148, Cl. 417-286.000.
Yamada, Norio; Kajitani, Hayashi; Chiba, Kyoji; and Edagawa, Mitsugu, 4,636,966, Cl. 364-491.000.

Hitachi Maxell, Ltd.: *See—*
Sumida, Takashi; Sasaki, Sigeo; Ketori, Takao; and Fujita, Kazuhiro, 4,635,879, Cl. 242-198.000.

Hitachi Medical Corporation: *See—*
Yagata, Yukihiro, 4,635,644, Cl. 128-660.000.

Hledin, Alexander S. Internal-combustion engines. 4,635,591, Cl. 123-37.000.

Hobgood, Charles M. Portable partition wall system. 4,635,418, Cl. 52-239.000.

Hochstein, Peter A. Oil degradation and temperature monitor. 4,635,473, Cl. 73-118.100.

Hochtemperatur-Reaktorbau GmbH: *See—*
Presser, Wolfgang; and von Charzewski, Cornelia, 4,636,350, Cl. 376-226.000.

Hodge, James E., to Concurrent Computer Corporation. Multi-level priority micro-interrupt controller. 4,636,944, Cl. 364-200.000.

Hoechst Aktiengesellschaft: *See—*
Deckers, Hellmuth, 4,636,557, Cl. 528-126.000.
Engelmann, Manfred; Kraus, Helmut; and Plewan, Otto, 4,636,547, Cl. 524-523.000.
Kammerer, Friedrich-Johannes; and Schleyerbach, Rudolf, 4,636,513, Cl. 514-326.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See—*
Kreutzer, Donald L.; Novick, William J., Jr.; and Sheetz, Michael P., 4,636,507, Cl. 514-263.000.

Hoehn, Robert A. Long span conveyor track and hanger. 4,635,558, Cl. 104-111.000.

Hoerkens, Reiner. Slide fastener. 4,635,324, Cl. 24-413.000.

Hoesch Aktiengesellschaft: *See—*
Diener, Arnulf; Kettler, Hans; and Tenhaven, Ulrich, 4,635,586, Cl. 118-718.000.

Hoffa, Jack L.; and Karkar, Maurice N., to American Hospital Supply Corporation. Calibration cell for the calibration of gaseous or non-gaseous fluid constituent sensors. 4,635,467, Cl. 73-1.00G.

Hoffer, Kenneth J. Multi-part intraocular lens and method of implanting it in an eye. 4,636,210, Cl. 623-6.000.

Hoffman, Emil: *See—*
Sebelist, Norman C.; and Fulton, Edward N., 4,635,542, Cl. 100-3.000.

Hoffman, Kent C., to Murray Electronics Associates Limited. Multi-element electrode. 4,635,641, Cl. 128-639.000.

Hoffmann-La Roche Inc.: *See—*
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Hofling, Peter, to O&K Orenstein & Koppel Aktiengesellschaft. Person-conveying device. 4,635,783, Cl. 198-321.000.

Hoglund, Hans E.: *See—*
Peterson, Per V.; Hoglund, Hans E.; and Johansson, Alf O. K., 4,635,864, Cl. 241-251.000.

Holec Systemen Componenten B.V.: *See—*
Lipperts, Joseph H. F. G., 4,636,600, Cl. 200-144.00B.

Holick, Wolfgang; and Pauling, Horst, to Hoffmann-La Roche Inc. Process for preparing D-(+)-biotin and intermediates therefor. 4,636,566, Cl. 548-303.000.

Holst, Jan-Olov M.: *See—*
Blomberg, Folke I.; and Holst, Jan-Olov M., 4,636,011, Cl. 303-115.000.

Holstein und Kappert GmbH: *See—*
Rademacher, Friedrich; Sindermann, Siegmar; and Sushardt, Rolf, 4,635,690, Cl. 141-39.000.

Holt, Joseph C.; and Losh, Russell L., to Talbert Manufacturing, Inc. Trailer. 4,635,997, Cl. 296-182.000.

Holy, Franz; and Steiner, Karl, to Maschinenfabrik Heid Aktiengesellschaft. Tool holder assembly for machine tools. 4,635,329, Cl. 29-27.00C.

Holzinger, Gerhard; Meins, Jurgen; and Miller, Luitpold, to Thyssen Industrie AG. Excitation arrangement for a long stator drive. 4,636,667, Cl. 310-13.000.

Homma, Hiroshige: *See—*
Kubo, Kazuo; Isomura, Yasuo; Sakamoto, Shuichi; and Homma, Hiroshige, 4,636,516, Cl. 514-365.000.

Homma, Noriyuki: *See—*
Nishioka, Yasushiro; Homma, Noriyuki; Sakuma, Noriyuki; and Mukai, Kiichiro, 4,636,833, Cl. 357-71.000.

Homsy, Charles A. Implantation of articulating joint prosthesis. 4,636,214, Cl. 623-16.000.

Honda, Akio: *See—*
Nakamura, Kenzi; Honda, Akio; Inukai, Kazuo; and Ito, Yoshito, 4,636,782, Cl. 340-705.000.

Honda Giken Kogyo K.K.: *See—*
Koike, Akihiko; and Umeda, Tadashi, 4,635,606, Cl. 123-463.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Higuchi, Kazuo; Okuhara, Hisakazu; and Sasaki, Kiichi, 4,635,963, Cl. 280-801.000.
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Horst, Robert W.; and Harris, Richard L., to Tandem Computers Incorporated. Enhanced CPU microbranching architecture. 4,636,943, Cl. 364-200.000.

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Ishikura, Kazuo: *See—*
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Ishioka, Sachio: *See—*
Kusano, Chushirou; Ishioka, Sachio; Imamura, Yoshinori; Takasaki, Yukio; Ogawa, Hirofumi; Makishima, Tatsuo; and Hirai, Tadaaki, 4,636,682, Cl. 313-386.000.

Ishizuka, Yutaka; and Nakamura, Teruo, to Diesel Kiki Company, Ltd. Rotary compressor with blind hole in end wall that aligns with back pressure chamber. 4,636,153, Cl. 418-80.000.

Isomura, Yasuo: *See—*
Kubo, Kazuo; Isomura, Yasuo; Sakamoto, Shuichi; and Homma, Hiroshige, 4,636,516, Cl. 514-365.000.

Itaba, Yasushi; Yoshino, Tadao; Yoshifuji, Yutaka; Saito, Keichiro; and Tabuchi, Jyoichi, to Toa Nenryo Kogyo Kabushiki Kaisha. Method of producing crosslinked polyethylene stretched film. 4,636,340, Cl. 264-22.000.

Itagaki, Takuo: *See—*
Niiho, Masaaki; Itoh, Kiyoshi; Suzuki, Shinichi; Itagaki, Takuo; and Tsuda, Koji, 4,636,068, Cl. 356-5.000.

Itakura, Sakae; and Morikawa, Osamu, to Hitachi, Ltd. Multilayer printed circuit board. 4,636,919, Cl. 361-414.000.

Itani, Jun, to Ohhatsu Kabushiki Kaisha. Noise converter. 4,635,753, Cl. 181-279.000.

Ito, Noboru: *See—*
Ozawa, Isao; Ito, Noboru; Takizawa, Masaaki; Ohta, Yoshio; and Ijichi, Kiyoteru, 4,635,910, Cl. 267-140.100.

Ito, Seigo; and Murakami, Yoshikazu, to Sony Corporation. Apparatus for varying the magnetic field for a magnetic resonance element. 4,636,756, Cl. 333-202.000.

Ito, Yasuyuki, to Kabushiki Kaisha Toshiba. Gyrotron device. 4,636,688, Cl. 315-4.000.

Ito, Yoshito: *See—*
Nakamura, Kenzi; Honda, Akio; Inukai, Kazuo; and Ito, Yoshito, 4,636,782, Cl. 340-705.000.

Itoh, Fumihiko; Usagawa, Tatumi; Sakai, Ryo; and Yamamoto, Yasukao, to Sanyo Electric. Device for mounting cooking apparatus. 4,635,615, Cl. 126-273.00A.

Itoh, Hiroyuki; Sakata, Ko; and Imai, Hirosuke, to Nippon Oil Company, Limited. Selective gas separation membrane. 4,636,229, Cl. 55-158.000.

Itoh, Kiyoshi: *See—*
Niiho, Masaaki; Itoh, Kiyoshi; Suzuki, Shinichi; Itagaki, Takuo; and Tsuda, Koji, 4,636,068, Cl. 356-5.000.

Itoh, Nobuya; and Matsunaga, Kuniyoshi, to Amano Pharmaceutical Co., Ltd. Method and composition for determination of glycerol. 4,636,465, Cl. 435-15.000.

Itoh, Tsuneo; and Yokoi, Shinichi, to NGK Spark Plug Co., Ltd. Self-control type glow plug. 4,636,614, Cl. 219-270.000.

ITT Corporation: *See—*
Baker, Sol, 4,635,672, Cl. 137-202.000.

Peckman, Robert; and Karbassiyoon, Kamran, 4,635,314, Cl. 15-304.000.
Watson, Christopher A., 4,636,792, Cl. 340-870.370.

ITT Industries, Inc.: *See—*
Greenwood, John C.; and Thompson, George H. B., 4,636,829, Cl. 357-30.000.

Ivanov, Bojidar S.: *See—*
Paunov, Boyan I.; Balevski, Teodor A.; and Ivanov, Bojidar S., 4,635,460, Cl. 72-259.000.

Ivarsson, Nemo: *See—*
Appelgren, Curt H.; and Ivarsson, Nemo, 4,636,163, Cl. 425-332.000.

Iwamoto, Hidenori: *See—*
Tamura, Toshinari; Iwamoto, Hidenori; Yoshida, Makoto; and Yamamoto, Minoru, 4,636,567, Cl. 548-336.000.

Iwasaki, Shosuke; Abiko, Tetsuo; Hagiwara, Michiki; and Nanba, Keizo, to Sumitomo Precision Products Co., Ltd. Aluminum brazing alloy. 4,636,356, Cl. 420-532.000.

Iwata, Minoru; and Matake, Kozo, to Ebara Corporation. Submersible motor. 4,636,672, Cl. 310-87.000.

Iwata, Toshio; Komurasaki, Satoshi; and Ueda, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Engine ignition timing control apparatus. 4,635,604, Cl. 123-425.000.

Iwatani, Kenji: *See—*
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,636,144, Cl. 417-63.000.

Iwatsu Electric Co., Ltd.: *See—*
Suko, Shouichi, 4,636,941, Cl. 364-200.000.

Iwaya Corporation: *See—*
Koguchi, Noriyuki, 4,636,177, Cl. 446-236.000.

Izawa, Akihiro: *See—*
Igashira, Toshihiko; Sakakibara, Yasuyuki; Abe, Seiko; Takigawa, Masahiro; and Izawa, Akihiro, 4,635,849, Cl. 239-102.200.

Izawa, Hisao: *See—*
Hazama, Junji; Kato, Kinya; Tanimoto, Akikazu; and Izawa, Hisao, 4,636,626, Cl. 250-201.000.

Izumi, Kazuo, to Sharp Kabushiki Kaisha. Artificial respiration ventilator of air constant flow. 4,635,631, Cl. 128-204.230.

J. E. Hanger Limited: *See—*
Charuest, George M.; and Coughlin, Lawrence P., 4,635,623, Cl. 128-80.00C.

J. E. Siebel Sons' Company, Inc.: *See—*
Hsu, Wen-Pin, 4,636,394, Cl. 426-330.400.

Jackson, Eldon D., to Johnson Corporation, The. Rotary joint with balanced seals. 4,635,969, Cl. 285-95.000.

Jackson, Frank W.; and Schlossberg, David, to Bio-Innovations. Container package for staining a biological specimen. 4,635,790, Cl. 206-210.000.

Jackson, Frank W.; and Schlossberg, David, to Bio-Innovations. Container package for staining biological specimens. 4,635,791, Cl. 206-210.000.

Jackson, Michael R. Field marker and method. 4,635,847, Cl. 239-1.000.

Jackson, Paul H., to International Business Machines Corporation. Display terminal. 4,636,770, Cl. 340-309.400.

Jaco Manufacturing Company: *See—*
Campbell, Lawrence C., 4,635,975, Cl. 285-340.000.

Jacobs, Allen W. Process for the inclusion of a solid particulate component into aerosol formulations of inhalable nicotine. 4,635,651, Cl. 131-270.000.

Jacobs, Hanno; Opara, Ulrich; and Selleschy, Franz, to Krautkramer-Branson, Inc. Method and system for generating and adjusting a predetermined quantity of mutually independent direct current voltages. 4,636,964, Cl. 364-483.000.

Jacobs, Harold, deceased: *See—*
Horn, Robert E.; and Jacobs, Harold, deceased, 4,636,751, Cl. 331-96.000.

Jacobs, Lydia S., executrix: *See—*
Horn, Robert E.; and Jacobs, Harold, deceased, 4,636,751, Cl. 331-96.000.

Jacobsen, Hans E.; Hansen, Henning M.; Nyrup, John; Hansen, Henry; and Lassithiotakis, Konstantin, to Danfoss A/S. Electromagnetic flow meter. 4,635,486, Cl. 73-861.120.

Jacobsen, William A.; and Briggs, Richard L., to Westinghouse Electric Corp. Vacuum annealing of zirconium based articles. 4,636,267, Cl. 148-133.000.

Jacobson, Sava. End of rewind detector for a telephone answering device. 4,635,868, Cl. 242-57.000.

Jada, Sivananda S., to Manville Corporation. Novel process for coating substrates with glass-like films and coated substrates. 4,636,440, Cl. 428-446.000.

Jaderborg, Lee V.: *See—*
McGuire, Samuel B., Sr.; and Jaderborg, Lee V., 4,635,464, Cl. 72-466.000.

Jageler, Alfred H., to Amoco Corporation. Method and apparatus for obtaining selected samples of formation fluids. 4,635,717, Cl. 166-250.000.

Jagenberg AG: *See—*
Thievessen, Karl, 4,635,872, Cl. 242-72.00R.

Jaisle, Richard F.; Mollmann, Henry C.; Albers, Martha J.; and Burgess, James H., to Formica Corporation. Decorative laminates and method of producing same. 4,636,443, Cl. 428-481.000.

James River Corporation: *See—*
Kennard, Gregory J.; and Dunkerly, Cedric A., II, 4,636,418, Cl. 428-110.000.

Janda, Ralf; and Eppinger, Bernhard, to Kulzer & Co. GmbH. Photopolymerizable adhesion promoting dental composition. 4,636,533, Cl. 522-14.000.

Janssen, Donovan M.: *See—*
Friehauf, William J.; Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, 4,636,892, Cl. 360-97.000.

Japan Synthetic Rubber Company Limited: *See—*
Yanagihara, Kenji; Kimura, Mituo; and Niinomi, Masahiro, 4,636,435, Cl. 428-336.000.

Japan Tobacco Inc.: *See—*
Nagata, Tomizo; and Miyaoka, Norikuni, 4,636,184, Cl. 493-98.000.
Okumoto, Yutaka, 4,635,648, Cl. 131-109.100.
Sakabe, Busaburo; Hyuga, Kounosuke; and Araki, Kazuhito, 4,635,402, Cl. 51-74.0BS.

Jarvis, Neldon L.: *See—*
Barger, William R.; Jarvis, Neldon L.; Snow, Arthur W.; and Wohltjen, Henry, 4,636,767, Cl. 338-34.000.

JD-Bertolini Industries, Ltd.: *See—*
Bertolini, William A., 4,635,742, Cl. 180-209.000.

Jehle, Franz, to Licentia Patent-Verusaltunga GmbH. Remote control system for a missile. 4,635,880, Cl. 244-3.140.

Jenicot, Jean-Marie. Electric fryer. 4,636,618, Cl. 219-441.000.

Jenninga, Freddie L. Universal muffler construction assembly. 4,635,752, Cl. 181-241.000.

Jensen, Finn H.: *See—*
Madsen, Willy B.; Jensen, Finn H.; Rasmussen, Ole B.; Goldstein, Guy; and Russin-Moynier, Yves R., 4,636,419, Cl. 428-131.000.

Jensen, Hans E. W.; and Gregersen, Johan C., to Dansk Eternit-Fabrik A/S. Method of rolling a plastically deformable material. 4,636,345, Cl. 264-122.000.

Jensen, Holger: *See—*
Clausen, Erik; Clausen, Johannes; Jensen, Holger; and Sturluson, Finnur, 4,636,035, Cl. 350-128.000.

Jeon, Je S.: *See—*
Huh, Myung H.; and Jeon, Je S., 4,635,384, Cl. 36-29.000.

Jerabek, Richard J., to Moore Business Forms. Carbonless system including solvent-only microcapsules. 4,636,818, Cl. 346-213.000.

Jersey Nuclear-Avco Isotopes, Inc.: *See—*
Pike, Charles T.; Furumoto, Horace W.; and Levin, Lawrence A., 4,636,287, Cl. 204-157.150.

Jessen, Donald N.: *See—*
Selin, John R.; and Jessen, Donald N., 4,637,073, Cl. 455-78.000.

Jetmaster (Proprietary) Limited: *See—*
Jones, Arthur G., 4,635,616, Cl. 126-288.000.

Jeumont-Schneider Corporation: *See—*
Gelabert, Andres, 4,636,660, Cl. 307-442.000.
Jouanny, Robert, 4,636,917, Cl. 361-388.000.

Jewison, Kevin: *See—*
Johnson, Edward C., Jr.; Johnson, Leroy M.; and Jewison, Kevin, 4,635,895, Cl. 249-5.000.

Jodoin, Raymond C., to Rogers Corporation. Decoupled integrated circuit package. 4,636,918, Cl. 361-405.000.

Johannesson, Orn: *See—*
Braeger, Horst; and Johannesson, Orn, 4,635,318, Cl. 17-63.000.

Johansson, Alf O. K.: *See—*
Peterson, Per V.; Hoglund, Hans E.; and Johansson, Alf O. K., 4,635,864, Cl. 241-251.000.

Johansson, Gert A. Corner piece for frames. 4,636,105, Cl. 403-205.000.

Johansson, Jan U. S.; Forsberg, Gunnar S.; and Vucins, Viesturs J., to Telefonaktiebolaget LM Ericsson. Apparatus for detecting tapping of light energy from an optical fiber. 4,636,029, Cl. 350-96.160.

John Brown Inc.: *See—*
Whiteside, Robert C., 4,636,348, Cl. 264-544.000.

John Crane-Houdaille, Inc.: *See—*
Bruck, Horst, 4,635,798, Cl. 209-644.000.

Johns, Richard B. Line handling device. 4,635,986, Cl. 294-19.100.

Johnson, Carl J.: *See—*
Ogden, Ralph; and Johnson, Carl J., 4,635,928, Cl. 272-69.000.

Johnson Corporation, The: *See—*
Jackson, Eldon D., 4,635,969, Cl. 285-95.000.

Johnson, Edward C., Jr.; Johnson, Leroy M.; and Jewison, Kevin. Concrete form spreader bracket. 4,635,895, Cl. 249-5.000.

Johnson, Leroy M.: *See—*
Johnson, Edward C., Jr.; Johnson, Leroy M.; and Jewison, Kevin, 4,635,895, Cl. 249-5.000.

Johnson, Malcolm C.; and Stolz, Theodore O., to Foamseal, Inc. Urethane bonding method and laminate. 4,636,425, Cl. 428-198.000.

Johnson Matthey Public Limited Company: *See—*
Willis, Peter M., 4,636,732, Cl. 324-425.000.

Johnson, Peter A.; and Olesen, William A., to Paper Converting Machine Company. Mandrel locking mechanism. 4,635,871, Cl. 242-68.300.

Johnson, Richard C.; and Egbert, Leigh B., to Foster Wheeler Energy Corporation. Erosion resistant waterwall. 4,635,713, Cl. 165-134.100.

Johnston, James: *See—*
Dalziel, Warren L.; Flanigan, Charles; Daniels, Donald V.; Lee, John S.; and Johnston, James, 4,636,902, Cl. 360-128.000.

Johnston, Otis A.: *See—*
Thigpen, Ben B.; Crump, E. Eugene; Johnston, Otis A.; McPeek, Nathaniel K.; and McNeel, William O., 4,637,000, Cl. 367-172.000.

Jones, Allen S., to Rheem Manufacturing Company. Lined receptacles. 4,635,814, Cl. 220-403.000.

Jones, Arthur G., to Jetmaster (Proprietary) Limited. Fireplace. 4,635,616, Cl. 126-288.000.

Jones, Boone. Adjustable eyeglass holder for caps and hats. 4,636,048, Cl. 351-155.000.

Jones, Gregory S.; Steele, William H.; and Gurtcheff, Glenn A., to General Motors Corporation. Hot element mass airflow sensor. 4,635,475, Cl. 73-204.000.

Jones, Hilton B.: *See*—
Vann, Roy R.; Brieger, Emmet F.; George, Flint R.; Colle, Edward A., Jr.; and Jones, Hilton B., 4,635,733, Cl. 175-4.560.

Jones, Roger E.: *See*—
Pitt, Gillies D.; Batchelder, David N.; Jones, Roger E.; and Nest, Rosamund C., 4,637,071, Cl. 455-603.000.

Jones, Thomas C.: *See*—
Fischer, Herbert; Stritzke, Karl H.; Morlock, Roland; Jones, Thomas C.; and Donovan, Joseph C., 4,636,265, Cl. 148-6.15R.

Jongepier, Abraham; and Kasperkovitz, Wolfdietrich G., to U.S. Philips Corporation. Double-balanced mixer circuit. 4,636,663, Cl. 307-529.000.

Jousany, Robert, to Jeumont-Schneider Corporation. Precalibrated element for securing and locking semiconductors and heat sinks arranged in alternating rows. 4,636,917, Cl. 361-388.000.

Joyce, James V., to Joyce Pipe Line Company. Apparatus for road repair work including a protective cage. 4,636,111, Cl. 404-101.000.

Joyce Pipe Line Company: *See*—
Joyce, James V., 4,636,111, Cl. 404-101.000.

K-Tron International, Inc.: *See*—
Wilson, David H.; and Loe, James M., 4,635,819, Cl. 222-58.000.

Kabanek, Joseph R. Orthopedic attachment for surgical tables. 4,635,914, Cl. 269-328.000.

Kabushiki Kaisha Daiwa Industry: *See*—
Kasiwade, Yoshiaki, 4,636,800, Cl. 343-766.000.

Kabushiki Kaisha Gakushu Kenkyusha: *See*—
Tohata, Susumu; and Numata, Kunio, 4,636,050, Cl. 353-66.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; and Kitamura, Mineo, 4,635,517, Cl. 84-1.010.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Seki, Seiji; and Aoshima, Kiyoji, 4,635,466, Cl. 72-453.130.

Kabushiki Kaisha SK: *See*—
Kobayasi, Soichi, 4,635,386, Cl. 37-117.500.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Suzuki, Masaru, 4,636,045, Cl. 350-606.000.
Suzuki, Masaru, 4,636,598, Cl. 200-83.00N.

Kabushiki Kaisha Toshiba: *See*—
Gotou, Mineo; and Wada, Hirotsugu, 4,636,968, Cl. 364-559.000.
Hashimoto, Yasuichi, 4,636,883, Cl. 360-78.000.
Hattori, Masakatsu; and Fujiki, Masao, 4,636,884, Cl. 360-78.000.
Ito, Yasuyuki, 4,636,688, Cl. 315-4.000.
Kageyama, Satoshi, 4,636,953, Cl. 364-414.000.
Kubo, Osamu; Nomura, Tutomu; Ido, Tadashi; and Yokoyama, Hirotaka, 4,636,433, Cl. 428-328.000.
Matsuzaki, Kazuhiro, 4,635,346, Cl. 29-577.00R.
Nagano, Katsumi, 4,636,655, Cl. 307-261.000.
Nakayama, Yasunobu; and Sato, Yasuji, 4,636,588, Cl. 379-362.000.
Ohuchi, Masayuki; Oodaira, Hiroshi; and Yoshida, Kenichi, 4,635,356, Cl. 29-841.000.
Shikata, Hiroshi, 4,636,117, Cl. 407-104.000.
Sugimoto, Yasuhiro, 4,636,659, Cl. 307-353.000.
Yamada, Takehito; and Sugaya, Toshihiro, 4,636,885, Cl. 360-78.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Terasaki, Kazunori, 4,635,686, Cl. 139-116.000.

Kabushiki Kaisha Miyanaga: *See*—
Miyanaga, Masaaki, 4,635,737, Cl. 175-284.000.

Kabushikigaisha Tokyo Kikai Seisakusho: *See*—
Sato, Katsumi, 4,635,915, Cl. 270-49.000.

Kadono, Masahiro: *See*—
Deguchi, Takashi; Kadono, Masahiro; and Naka, Shinji, 4,636,928, Cl. 363-41.000.

Kadowaki, Hitoshi: *See*—
Kurihara, Susumu; Seki, Tadashi; Awata, Hiroshi; and Kadowaki, Hitoshi, 4,636,374, Cl. 423-385.000.

Kager, Dennis L. Control circuit for varying power output of push-pull tube amplifiers. 4,636,740, Cl. 330-123.000.

Kageyama, Satoshi, to Kabushiki Kaisha Toshiba. X-ray image correction apparatus. 4,636,953, Cl. 364-414.000.

Kahan, Osher, to Hughes Aircraft Company. Conductively cooled laser rod. 4,637,028, Cl. 372-34.000.

Kahil, John E.; Milewits, Marvin; Bradfield, James E.; and Lam, Clive C., to PA Incorporated. Method and apparatus for detecting the location of defects in tubular sections moving past a well head. 4,636,727, Cl. 324-227.000.

Kahkipuro, Matti; and Hakkinen, Pekka, to Elevator GmbH. Floor selector for lift. 4,635,320, Cl. 187-29.00R.

Kaiser Aluminum & Chemical Corporation: *See*—
Mohondro, William R., 4,635,842, Cl. 228-175.000.

Kaizaki, Kazuhiro; Kubota, Sadao; Harada, Hiroshi; and Matsuura, Shigeo, to Hitachi, Ltd. Noise reduction circuit. 4,636,863, Cl. 358-167.000.

Kajitani, Hayashi: *See*—
Yamada, Norio; Kajitani, Hayashi; Chiba, Kyoji; and Edagawa, Mitsugu, 4,636,966, Cl. 364-491.000.

Kakubari, Shoichiro; and Okamura, Hidetomo, to Yamani Netsu Kogyo. Barbecue burner device. 4,635,612, Cl. 126-25.00R.

Kalivas, Grigorios A.: *See*—
Harrison, Robert G.; and Kalivas, Grigorios A., 4,636,757, Cl. 333-218.000.

Kaljuzhny, Nikolai N.: *See*—
Golubenko, Alexandr L.; Turchin, Viktor P.; Konyaev, Alexei N.; Sukhov, Igor N.; Kaljuzhny, Nikolai N.; Filonov, Arkady S.; Koropets, Alexei P.; Pinovsky, Mikhail I.; Tkachenko, Viktor P.; and Kramar, Nikolai M., 4,635,990, Cl. 295-11.000.

Kallstrom, Olof, to Ingvar Nilsson Mekaniska AB. Control gear for a dynamo connected to a hub. 4,636,670, Cl. 310-67.00A.

Kamemaru, Kenichi: *See*—
Amemiya, Kunio; Tanaka, Mikihiko; Kamemaru, Kenichi; and Nakagawa, Kiyoshi, 4,636,424, Cl. 428-198.000.

Kamens, Ernest R.; and Cassoni, John P., to Pennwalt Corporation. Foaming of unsaturated polyester resin at elevated temperatures. 4,636,528, Cl. 521-95.000.

Kamidaira, Kunio: *See*—
Nagasaka, Hiroyasu; Kamidaira, Kunio; Ino, Hiroshi; and Utsuno, Mitsuo, 4,636,093, Cl. 374-186.000.

Kamimura, Toshiaki: *See*—
Umio, Suminori; Kamimura, Toshiaki; Kamishita, Takuzo; and Mine, Yasuhiro, 4,636,520, Cl. 514-399.000.

Kamishita, Takuzo: *See*—
Umio, Suminori; Kamimura, Toshiaki; Kamishita, Takuzo; and Mine, Yasuhiro, 4,636,520, Cl. 514-399.000.

Kamiyo, Sumio; and Yoshihiro, Mitsuto, to Mitsubishi Rayon Co., Ltd. Electromagnetic interference-shielding, flame-retardant ABS resin composition. 4,636,536, Cl. 523-137.000.

Kammerer, Friedrich-Johannes; and Schleyerbach, Rudolf, to Hoechst Aktiengesellschaft. Isoxazole derivatives and medicaments containing these compounds. 4,636,513, Cl. 514-326.000.

Kamo, Kazuhiko; Suwahara, Hiroshi; and Nakane, Ryuji, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Jukogyo Kabushiki Kaisha. Feed length control device for consumable electrode welding operations. 4,636,610, Cl. 219-124.020.

Kamo, Takashi: *See*—
Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,636,648, Cl. 250-571.000.

Kamoshita, Mutuo: *See*—
Okamura, Hisanori; Akiyama, Hiroshi; Kamoshita, Mutuo; and Miyazaki, Kunio, 4,636,434, Cl. 428-328.000.

Kamp, Heinz; and Becker, Rolf, to W. Schlafhorst & Co. Apparatus for automatically lifting a cross-wound bobbin from its drive drum. 4,635,866, Cl. 242-36.000.

Kampfer, Helmut: *See*—
Meckl, Heinz; Kampfer, Helmut; and Haseler, Helmut, 4,636,460, Cl. 430-442.000.

Kanada, Eiji; Suzuki, Shigeyoshi; Endo, Kazunaka; and Yamamoto, Kyonosuke, to Mitsubishi Paper Mills, Ltd. Method of exposing photosensitive material. 4,636,066, Cl. 355-77.000.

Kanbe, Junichiro: *See*—
Ogawa, Kyosuke; Shirai, Shigeru; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,636,450, Cl. 430-84.000.

Kane, Jerome. Audible-physical coordination racket. 4,635,935, Cl. 273-30.000.

Kane, Thomas A., to Avco Corporation. Maneuvering air dispensed submunition. 4,635,553, Cl. 102-384.000.

Kaneko, Masahide: *See*—
Hatori, Yoshinori; and Kaneko, Masahide, 4,636,862, Cl. 358-166.000.

Kaneko, Tetsuya: *See*—
Kitahara, Nobuko; Takamatsu, Osamu; Kaneko, Tetsuya; and Sugata, Masao, 4,636,038, Cl. 350-339.00R.

Kanemitsu, Shinji; and Nitanda, Hiroshi, to Canon Kabushiki Kaisha. Molded article with flexible hinge. 4,636,065, Cl. 355-75.000.

Kanno, Hideo: *See*—
Seo, Akira; Kanno, Hideo; Hasegawa, Nobu; Miyagi, Yukio; Nishimura, Akira; Konaka, Shigeo; Ohmi, Tetsuto; Munechika, Yukimi; Uchida, Matazaemon; and Ikeda, Kenichi, 4,636,519, Cl. 514-397.000.

Kansai Paint Company, Ltd.: *See*—
Murase, Heihachi; and Nanishi, Kiyoshi, 4,636,324, Cl. 252-70.000.

Kansas State University Research Foundation: *See*—
Simons, Gale G.; and DeBey, Timothy M., 4,636,642, Cl. 250-337.000.

Karabin, Thaddeus: *See*—
Rollins, Jack; Coppin, William; and Karabin, Thaddeus, 4,635,898, Cl. 251-229.000.

Karbassiyoon, Kamran: *See*—
Peckman, Robert; and Karbassiyoon, Kamran, 4,635,314, Cl. 15-104.000.

Karder Machine Co.: *See*—
Ashelman, Robert U., Jr.; Townsend, Michael G.; and Lawrence, Mark C., 4,635,465, Cl. 72-448.000.

Karkar, Maurice N.: *See*—
Hoffa, Jack L.; and Karkar, Maurice N., 4,635,467, Cl. 73-1.00G.

Karls, Michael A.: *See*—
Frazzell, Michael E.; and Karls, Michael A., 4,636,175, Cl. 440-88.000.

Kass-Technoplan GmbH: *See*—
Nickel, Klaus-Dietrich, 4,635,572, Cl. 110-343.000.

Kashimura, Noritake; and Saitoh, Hiroaki, to Dai-Ichi Seiko Co., Ltd. Optical connector for optical fiber cables. 4,636,034, Cl. 350-96.210.

Kasiwade, Yoshiaki, to Kabushiki Kaisha Daiwa Industry. Apparatus for rotating and driving antenna device. 4,636,800, Cl. 343-766.000.

Kasperkovitz, Wolfdietrich G.: *See*—
Jongepier, Abraham; and Kasperkovitz, Wolfdietrich G., 4,636,663, Cl. 307-529.000.

Kasuga, Yoshiaki, to Nichiro Kogyo Company Ltd. Method of feeding and tightening a band in a band strapping machine and apparatus thereof. 4,635,541, Cl. 100-2.000.

Katayama, Kouichi: *See*—
Takada, Masahiro; Yuzuriha, Teruaki; Katayama, Kouichi; and Sunamoto, Junzo, 4,636,381, Cl. 424-38.000.

Katayama, Masahito: *See*—
Nawata, Kazuyoshi; Katayama, Masahito; and Yokoshima, Minoru, 4,636,534, Cl. 522-116.000.

Kato, Hiroshi; and Kubota, Hiromitsu, to Victor Company of Japan, Ltd. Tape loading and tensioning device for a recording and/or reproducing apparatus. 4,636,887, Cl. 360-85.000.

Kato, Hisao, to Mitsubishi Denki Kabushiki Kaisha. Industrial robot control system. 4,636,699, Cl. 318-568.000.

Kato, Kinya: *See*—
Hazama, Junji; Kato, Kinya; Tanimoto, Akikazu; and Izawa, Hisao, 4,636,626, Cl. 250-201.000.

Kato, Masami, to Toska Co., Ltd. Method of making a fastener. 4,636,347, Cl. 264-251.000.

Katto, Takayuki; Komatsu, Yasumasa; and Shiiki, Zenya, to Kureha Kagaku Kogyo Kabushiki Kaisha. Thermoplastic resin composition. 4,636,553, Cl. 525-67.000.

Kauffman, James C.; and Thompson, Glenn F., to Covenant Manufacturing Co. Retractable safety shield. 4,635,699, Cl. 160-211.000.

Kaufman, John G. Liquid container dispensing cap structure. 4,635,828, Cl. 222-185.000.

Kaufman, Steven A.: *See*—
Perkins, Norman P.; Luke, Roger D.; and Kaufman, Steven A., 4,636,915, Cl. 361-355.000.

Kaus, Juergen: *See*—
Staude, Eckhard; and Kaus, Juergen, 4,636,061, Cl. 355-24.000.

Kawada, Toyoshi: *See*—
Yamaguchi, Hisashi; Takahara, Kazuhiro; Gondoh, Hiroyuki; Kawada, Toyoshi; and Andoh, Shizuo, 4,636,789, Cl. 340-805.000.

Kawaguchi, Kichitaro: *See*—
Nakamura, Usao; Takao, Makoto; Ueno, Etsuko; and Kawaguchi, Kichitaro, 4,636,471, Cl. 435-280.000.

Kawaguchi, Susumu; Hirahara, Takuho; Nakane, Kazuhiro; and Ueda, Sei, to Mitsubishi Denki Kabushiki Kaisha. Rotary compressor. 4,636,152, Cl. 418-54.000.

Kawamori, Ryuzo: *See*—
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,636,144, Cl. 417-63.000.

Kawamoto, Kenichi: *See*—
Komine, Yoshio; and Kawamoto, Kenichi, 4,636,042, Cl. 350-429.000.

Kawamura, Fumio; Matsuda, Masami; Aoyama, Yoshiyuki; Chino, Koichi; and Mizumoto, Mamoru, to Hitachi, Ltd. Method of disposing radioactive ion exchange resin. 4,636,335, Cl. 252-629.000.

Kawamura, Katsumi: *See*—
Naito, Ryuichi; Kosaka, Minoru; and Kawamura, Katsumi, 4,637,005, Cl. 369-45.000.

Kawamura, Kichinari: *See*—
Okado, Hideo; Shoji, Hiroshi; Takaya, Haruo; Kawamura, Kichinari; and Yamazaki, Yasuyoshi, 4,636,482, Cl. 502-60.000.

Kawamura, Kouichi; Aotani, Yoshimasa; Umehara, Akira; and Horie, Seiji, to Fuji Photo Film Co., Ltd. Photopolymerizable compositions. 4,636,459, Cl. 430-288.000.

Kawamura, Masaharu: *See*—
Kobayashi, Ryuichi; Akashi, Akira; and Kawamura, Masaharu, 4,636,056, Cl. 354-484.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nakano, Hideaki; and Ozu, Tadahiro, 4,635,596, Cl. 123-197.0AB.
Nishida, Hiroshi, 4,635,580, Cl. 114-343.000.
Nishida, Hiroshi, 4,635,582, Cl. 114-360.000.

Kawasaki Steel Corporation: *See*—
Nakato, Hakaru; Bessho, Nagayasu; Nozaki, Tsutomu; Habu, Yasuhiro; and Kimura, Tomoaki, 4,635,703, Cl. 164-443.000.
Takei, Masamitsu; and Shoji, Shigeo, 4,635,433, Cl. 57-223.000.

Kawasaki Thermal Systems, Inc.: *See*—
Stephenson, Edgar O., 4,635,967, Cl. 285-45.000.

Kawashima, Kazuto: *See*—
Inoue, Michio; and Kawashima, Kazuto, 4,636,307, Cl. 210-188.000.

Kawashima, Kenichi: *See*—
Takao, Kunihiko; Kawashima, Kenichi; Nakamura, Yozo; and Hayase, Isao, 4,636,148, Cl. 417-286.000.

Kawata, Ken; Yabuki, Yoshiharu; Sato, Kozo; and Hirai, Hiroyuki, to Fuji Photo Film Co., Ltd. Heat-developable photosensitive material. 4,636,462, Cl. 430-617.000.

Kawatetsu Wire Products: *See*—
Takei, Masamitsu; and Shoji, Shigeo, 4,635,433, Cl. 57-223.000.

Kazama, Takeo: *See*—
Fujimoto, Teruo; Kazama, Takeo; Takamizawa, Minoru; and Yamamoto, Akira, 4,636,454, Cl. 430-197.000.

Kazaoka, Kenichi; Okazaki, Hiroshi; and Inaba, Yasuhisa, to Aisin Seiki Kabushiki Kaisha. Seat cushion structure. 4,636,006, Cl. 297-458.000.

KCL Corporation: *See*—
Sullivan, Brian P.; Dennis, Larry T.; and Ferrell, Robert A., 4,637,063, Cl. 383-61.000.

Kearney & Trecker Marwin Limited: *See*—
Hashim, Abdullah, 4,637,054, Cl. 382-8.000.

Keeffe, William M.; Gungle, W. Calvin; Rothwell, Harold L., Jr.; and Krasko, Zeya K., to GTE Products Corporation. Electrode alignment and capsule design for single-ended low wattage metal halide lamps. 4,636,687, Cl. 313-620.000.

Keith, Harold D.: *See*—
Davis, Robert L.; and Keith, Harold D., 4,636,115, Cl. 405-259.000.

Keithahn, Julian D.: *See*—
Peterman, Charles P.; and Keithahn, Julian D., 4,635,678, Cl. 137-551.000.

Kelley, Frederick T., to McClure, William E., a part interest. Dart board assembly for an electronic dart game. 4,635,940, Cl. 273-347.000.

Kemp, Martin, to Hugh Steeper Limited. Elbow lock mechanism. 4,636,221, Cl. 623-59.000.

Kendall Company, The: *See*—
Gilman, Thomas, 4,635,624, Cl. 128-156.000.

Kendall, James W., to Huck Manufacturing Co. System for producing two separate sets of fasteners. 4,635,310, Cl. 10-27.00R.

Kennard, Gregory J.; and Dunkerly, Cedric A., II, to James River Corporation. Cloth-like composite laminate and a method of making. 4,636,418, Cl. 428-110.000.

Kennedy, John M.: *See*—
Suh, Kyung W.; and Kennedy, John M., 4,636,527, Cl. 521-79.000.

Kennedy, Richard A.; and Aldridge, Fredrick A., to General Motors Corporation. Noise blanking signal generator for AM radio. 4,637,066, Cl. 455-223.000.

Kenney, George B., to Metallurgical Instruments, Inc. Method for in-process multi-element analysis of molten metal and other liquid materials. 4,636,339, Cl. 264-12.000.

Kennon, James L.: *See*—
Conrad, Douglas J.; Kennon, James L.; Macartney, Lawrence J.; and Scharf, Donald R., 4,635,585, Cl. 118-316.000.

Kermisch, Dorian, to Xerox Corporation. Rotation of digital images. 4,637,057, Cl. 382-46.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Divisek, Jiri; and Malinowski, Peter, 4,636,291, Cl. 204-283.000.

Kessinger, Boyd A., to Westinghouse Electric Corp. Closure system for a spent fuel storage cask. 4,636,645, Cl. 250-506.100.

Ketori, Takao: *See*—
Sumida, Takashi; Sasaki, Sigeo; Ketori, Takao; and Fujita, Kazuhiro, 4,635,879, Cl. 242-198.000.

Kettler, Hans: *See*—
Diener, Arnulf; Kettler, Hans; and Tenhaven, Ulrich, 4,635,586, Cl. 118-718.000.

Kettner, Charles A.; and Korant, Bruce D., to Du Pont de Nemours, E. I., and Company. Inhibition of viral protease activity by peptide halomethyl ketones. 4,636,492, Cl. 514-18.000.

Keys, Dalen E.; and Nebe, William J., to Du Pont de Nemours, E. I., and Company. Photopolymer films containing microencapsulated sensitometric adjuvants. 4,636,453, Cl. 430-138.000.

Keystone Engineering: *See*—
Fritz, Conrad M., 4,635,330, Cl. 29-148.40A.

Kida, Otojiro; and Segawa, Yutaka, to Asahi Glass Company Ltd. ZrB_2 composite sintered material. 4,636,481, Cl. 501-96.000.

Kidde, Inc.: *See*—
Mentzer, William R., 4,635,805, Cl. 212-230.000.

Kiguchi, Hiroyuki: *See*—
Emoto, Masami; Nishimiya, Masanobu; and Kiguchi, Hiroyuki, 4,636,625, Cl. 250-201.000.

Kigyos, Frank: *See*—
Fassler, Friebert; Kigyos, Frank; and Slaughter, Bobby L., 4,635,313, Cl. 15-193.000.

Kikkoman Corporation: *See*—
Matsuura, Masaru, 4,636,398, Cl. 426-634.000.

Kikuchi, Ichiro: *See*—
Yoshihara, Toshio; and Kikuchi, Ichiro, 4,636,908, Cl. 361-321.000.

Kilgore, Woodson B. Vehicle anti-theft system with pressure sensitive sensor. 4,636,651, Cl. 307-10.0AT.

Killmaier, Horst: *See*—
Christopherson, Kjell H.; Odelius, Tomas; Roesmeier, Friedrich; Stenberg, Kaj O.; Svensson, Tommy E.; and Killmaier, Horst, 4,636,204, Cl. 604-283.000.

Kilmoyer, James E., to Cameron Iron Works, Inc. Heat sensitive valve. 4,635,670, Cl. 137-75.000.

Kim, Tae G., to Yim, Byung D. Golf bag. 4,635,793, Cl. 206-315.600.

Kimberly-Clark Corporation: *See*—
Lassen, Frederich O., 4,636,209, Cl. 604-378.000.
Morell, Charles J.; and Strickland, Mark D., 4,636,429, Cl. 428-288.000.

Kimura, Itsuo: *See*—
Shibano, Tomishi; Kimura, Itsuo; and Maruchi, Sachio, 4,636,432, Cl. 428-327.000.

Kimura, Mituo: *See*—
Yanagihara, Kenji; Kimura, Mituo; and Niinomi, Masahiro, 4,636,435, Cl. 428-336.000.

Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takashi, to Nittan Company, Limited. Photoelectric smoke sensor terminal. 4,636,649, Cl. 250-574.000.

Kimura, Tomoaki: *See*—
Nakato, Hakaru; Bessho, Nagayasu; Nozaki, Tsutomu; Habu, Yasuhiro; and Kimura, Tomoaki, 4,635,703, Cl. 164-443.000.

King Instrument Corporation: *See*—
Woodley, George M., 4,635,869, Cl. 242-67.10R.

King, Ken R.; and Hernandez, Celimo P., to Harris Corporation. Front end of an operational amplifier. 4,636,744, Cl. 330-295.000.

Kinoshita, Kinjiro, to Yamato Scale Company, Limited. Gate driving device. 4,635,831, Cl. 222-504.000.

Kinoshita, Yoshio: *See*—
Shoji, Masao; Uchida, Mikio; and Kinoshita, Yoshio, 4,635,770, Cl. 192-41.00A.

Kipp, Egbert M.; Kirk, Thomas E.; and Riddle, Barry L., to Reynolds Metals Company. Water soluble lubricant. 4,636,321, Cl. 252-49.300.

Kirchmayr, Rudolf, to Ciba-Geigy Corporation. Masked curing catalyst for acid-curable compositions. 4,636,575, Cl. 558-58.000.

Kirin Beer Kabushiki Kaisha: *See*—
Nagao, Masami; and Oosawa, Tadakazu, 4,635,509, Cl. 81-3.200.

Kirk, Thomas E.: *See*—
Bowman, William E.; Voss, Richard J.; and Kirk, Thomas E., 4,636,706, Cl. 322-28.000.
Kipp, Egbert M.; Kirk, Thomas E.; and Riddle, Barry L., 4,636,321, Cl. 252-49.300.

Kirschner, Wallace: *See*—
Salazar, Edilberto I.; and Kirschner, Wallace, 4,636,959, Cl. 364-464.000.

Kirton, Alan J.: *See*—
Friehauf, William J.; Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, 4,636,892, Cl. 360-97.000.

Kishi, Hajimu; Seki, Masaki; and Mizuno, Yutaka, to Fanuc Ltd. Data input/output unit. 4,636,937, Cl. 364-191.000.

Kishi, Hirotoshi, to Canon Kabushiki Kaisha. Image display apparatus. 4,636,787, Cl. 340-792.000.

Kishi, Norimasa: *See*—
Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, 4,637,045, Cl. 381-43.000.

Kishi, Noriyuki: *See*—
Otobe, Yutaka; and Kishi, Noriyuki, 4,636,957, Cl. 364-431.070.

Kishimoto, Keiichi: *See*—
Iida, Kazumi; Ohata, Yosuke; Hyodo, Keiichiro; Akiyama, Kazunori; Umeda, Tadashi; and Kishimoto, Keiichi, 4,636,057, Cl. 355-3.00R.

Kitagawa Industries Co., Ltd.: *See*—
Yagi, Masaru, 4,635,325, Cl. 24-453.000.
Yagi, Masaru, 4,635,326, Cl. 24-453.000.

Kitahara, Nobuko; Takamatsu, Osamu; Kaneko, Tetsuya; and Sugata, Masao, to Canon Kabushiki Kaisha. Electric circuit member and liquid crystal display device using said member. 4,636,038, Cl. 350-339.00R.

Kitamura, Mineo: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; and Kitamura, Mineo, 4,635,517, Cl. 84-1.010.

Kitamura, Noboru: *See*—
Shoji, Masao; Uchida, Mikio; and Kitamura, Noboru, 4,635,771, Cl. 192-41.00A.

Kite, Rebecca: *See*—
Allen, Barbara A.; and Kite, Rebecca, 4,635,524, Cl. 84-419.000.

Kiuchi, Takeo: *See*—
Yasuoka, Akimasa; and Kiuchi, Takeo, 4,635,607, Cl. 123-479.000.

Kjell, Solveg S.; Chao, Tai-Hsiang; Flint, Nancy J.; and Foutsitzis, Arthur A., to UOP Inc. Phosphorus containing alumina catalyst for the production of aromatics. 4,636,483, Cl. 502-61.000.

Klaassen, Francois M.: *See*—
Slotboom, Jan W.; Maas, Henricus G. R.; Appels, Johannes A.; and Klaassen, Francois M., 4,636,826, Cl. 357-24.000.

Klaus, Siegfried: *See*—
Wengenroth, Kurt; and Klaus, Siegfried, 4,635,512, Cl. 83-156.000.

Klawitter, Hans J., to F.P.D. Future Patents Development Company S.A. Apparatus for producing and spraying a mixture consisting of at least two components, e.g. liquids, and a propellant gas. 4,635,822, Cl. 222-82.000.

Klee, David J.: *See*—
Burke, Thomas W.; and Klee, David J., 4,635,408, Cl. 51-292.000.

Klein, Guenter; and Wernicke, Hans-Juergen, to Linde Aktiengesellschaft. Drying of gases with multi-layer adsorption beds. 4,636,225, Cl. 55-31.000.

Klein, Werner: *See*—
Geyer, Arthur; Kuisl, Max; Pfeiffer, Eugen; Roese, Helmut; and Klein, Werner, 4,636,364, Cl. 422-162.000.

Kleinstreuer, Clement, to Rensselaer Polytechnic Institute. Membrane and static mixer-moderated bioreactor with anti-fouling device. 4,636,473, Cl. 435-289.000.

Klenk, Robert: *See*—
Gotsch, Dieter; Klenk, Robert; Hafner, Otto; and Suss, Claus, 4,635,732, Cl. 173-162.00R.

Klimley, William R.: *See*—
Modugno, Joseph J.; and Klimley, William R., 4,635,916, Cl. 271-3.000.

Klose, Hans-Ulrich: *See*—
Rach, Heinz-Dieter; Klose, Hans-Ulrich; and Frerichs, Udo, 4,635,697, Cl. 152-544.000.

Kluever, Harold C.: *See*—
Bidell, Frederick W.; Kluever, Harold C.; and Reed, Roger R., 4,636,583, Cl. 178-22.170.

Knaack Manufacturing Company: *See*—
Nowack, William C.; Moore, Stephen J.; and Weger, Kenneth F., Jr., 4,635,422, Cl. 52-406.000.

Knapp, Gary H.: *See*—
Cook, James G.; and Knapp, Gary H., 4,636,920, Cl. 361-420.000.

Knapp, Julius Z., to Schering Corporation. Stopper for sterile fluid containers. 4,635,807, Cl. 215-247.000.

Knepper, Lawrence E.: *See*—
Buscaglia, Carl U.; and Knepper, Lawrence E., 4,636,990, Cl. 365-230.000.

Knollenberg, Robert G., to Particle Measuring Systems, Inc. Particle measurement utilizing orthogonally polarized components of a laser beam. 4,636,075, Cl. 356-336.000.

Kobari, Harukuni, to Victor Company of Japan, Limited. Circuit arrangement for a data acquisition circuit of a PCM processor and a method for improving waveform of PCM signal eye pattern. 4,637,036, Cl. 375-76.000.

Kobayashi, Ryuichi; Akashi, Akira; and Kawamura, Masaharu, to Canon Kabushiki Kaisha. Electrical power supply circuit in a camera. 4,636,056, Cl. 354-484.000.

Kobayashi, Shozo: *See*—
Tsuji, Takashi; Kobayashi, Shozo; and Nagase, Toshio, 4,636,196, Cl. 604-122.000.

Kobayashi, Toshio: *See*—
Ahagon, Asahiro; Kobayashi, Toshio; Yamada, Kazuhiro; Doi, Seiichi; and Misawa, Makoto, 4,635,693, Cl. 152-209.00R.

Kobayasi, Soichi, to Kabushiki Kaisha SK. Paved asphalt stripping and digging bucket apparatus. 4,635,386, Cl. 37-117.500.

Kocal, Joseph A.: *See*—
Imai, Tamotsu; and Kocal, Joseph A., 4,636,488, Cl. 502-172.000.

Koch, Hubert H.; and Sargeaunt, Edward F., to Motorola, Inc. Method and machine for providing alternator pole pieces. 4,635,351, Cl. 29-598.000.

Kodama, Hisashi, to Aisin Seiki Kabushiki Kaisha. Hydraulic valve lifter. 4,635,593, Cl. 123-90.550.

Kodama, Yutaka, to Ricoh Company, Ltd. Selective sheet loading apparatus. 4,635,920, Cl. 271-81.000.

Kodera, Masanori; Aizawa, Yasuo; and Ichijo, Kohji, to Niigata Engineering Co., Ltd. System for controlling rotation of rotary mechanism in Z-type propulsion apparatus. 4,636,701, Cl. 318-635.000.

Kodera, Masao: *See*—
Toyama, Keiichiro; Kodera, Masao; and Sasaki, Kunihiko, 4,636,997, Cl. 367-140.000.

Koenig, Horst: *See*—
Rossy, Phillip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Friedrich, Ludwig; and Lenke, Dieter, 4,636,504, Cl. 514-252.000.

Koeth, Herbert A.: *See*—
Corkran, William M.; Koeth, Herbert A.; and Pugsley, L. James, 4,636,778, Cl. 340-648.000.

Koguchi, Noriyuki, to Iwaya Corporation. Playing animal toy. 4,636,177, Cl. 446-236.000.

Kohge, Shinichi: *See*—
Morishita, Mitsuharu; Hara, Tadayuki; Kohge, Shinichi; Watanabe, Tetsushi; and Ikari, Yasuki, 4,635,741, Cl. 180-79.100.

Kohler, Helmut, to Luk Lamellen und Kupplungsbau GmbH. Fastening devices for friction clutches. 4,635,775, Cl. 192-70.180.

Kohli, Dalip K.: *See*—
Wang, David W.; Courter, Jeanne L.; and Kohli, Dalip K., 4,636,535, Cl. 523-204.000.

Koike, Akihiko; and Umeda, Tadashi, to Honda Giken Kogyo K.K. Fuel supply control system for internal combustion engines, capable of preventing vapor lock. 4,635,606, Cl. 123-463.000.

Kojima, Shigetake, to CKD Kabushiki Kaisha. Angular indexing device and method for output shaft. 4,635,507, Cl. 74-813.00C.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Hatori, Yoshinori; and Kaneko, Masahide, 4,636,862, Cl. 358-166.000.

Kolakowski, Manfred; and Streubel, Hans, to SMS Schloemann-Siemag AG. Mold for continuous casting of steel strip. 4,635,702, Cl. 164-411.000.

Komatsu Forklift Kabushiki Kaisha: *See*—
Yamagishi, Takashi; and Ohsawa, Masaru, 4,635,757, Cl. 187-9.00E.

Komatsu, Kenichi; and Fujii, Senzo, to Tokyo Shibaura Denki Kabushiki Kaisha. X-ray diagnostic apparatus comprising X-ray intensity and diaphragm value controls. 4,636,954, Cl. 364-414.000.

Komatsu, Yasumasa: *See*—
Katto, Takayuki; Komatsu, Yasumasa; and Shiiki, Zenya, 4,636,553, Cl. 525-67.000.

Komine, Yoshio; and Kawamoto, Kenichi, to Canon Kabushiki Kaisha. Mechanical mounting for zoom lens. 4,636,042, Cl. 350-429.000.

Kompelien, Arlon D., to Honeywell Inc. Time controlled thermostat. 4,635,845, Cl. 236-46.00R.

Komurasaki, Satoshi: *See*—
Iwata, Toshio; Komurasaki, Satoshi; and Ueda, Atsushi, 4,635,604, Cl. 123-425.000.

Konaka, Shigeo: *See*—
Seo, Akira; Kanno, Hideo; Hasegawa, Nobu; Miyagi, Yukio; Nishimura, Akira; Konaka, Shigeo; Ohmi, Tetsuto; Munechika, Yukimi; Uchida, Matazaemon; and Ikeda, Kenichi, 4,636,519, Cl. 514-397.000.

Kondo, Hiroshi: *See*—
Ichikawa, Sadao; Yokoi, Shinichi; Yasuhara, Seishi; and Kondo, Hiroshi, 4,635,594, Cl. 123-179.0BG.

Kondo, Nobuaki: *See*—
Matsuda, Koichi; Kondo, Nobuaki; and Tanaka, Yuji, 4,635,890, Cl. 248-429.000.

Kondo, Tatsunori: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; and Kitamura, Mineo, 4,635,517, Cl. 84-1.010.

Kone Oy: *See*—
Ronka, Pekka; and Vaintola, Raimo, 4,636,477, Cl. 436-48.000.

Konekamp, Werner: *See*—
Clostermeyer, Gerhard; Konekamp, Werner; and Tooten, Karlheinz, 4,635,543, Cl. 100-89.000.

Konig, Joachim; Suling, Carlhans; and Nachtkamp, Klaus, to Bayer Aktiengesellschaft. Aqueous dispersions of graft polymers or copolymers, a process for their production and their use as hydrophobizing and oleophobizing agents for textiles. 4,636,545, Cl. 524-457.000.

Koningsberger, Diederik C.: *See*—
Brinkgreve, Peter; and Koningsberger, Diederik C., 4,637,041, Cl. 378-71.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fujii, Yozo, 4,636,058, Cl. 355-8.000.

Konyaev, Alexei N.: *See*—
Golubenko, Alexandr L.; Turchin, Viktor P.; Konyaev, Alexei N.; Sukhov, Igor N.; Kaljuzhny, Nikolai N.; Filonov, Arkady S.; Koropets, Alexei P.; Pinovsky, Mikhail I.; Tkachenko, Viktor P.; and Kramar, Nikolai M., 4,635,990, Cl. 295-11.000.

Kopernicky, Jaro, to Mapro Inc. Removing volatiles from plastic materials delivered to an extrusion or injection molding machine. 4,636,084, Cl. 366-76.000.

Kopernicky, Jaro, to Mapro Inc. Apparatus for removing volatiles from plastic materials delivered to an extrusion or injection molding machine. 4,636,085, Cl. 366-76.000.

Korant, Bruce D.: *See*—
Kettner, Charles A.; and Korant, Bruce D., 4,636,492, Cl. 514-18.000.

Koropets, Alexei P.: *See*—
Golubenko, Alexandr L.; Turchin, Viktor P.; Konyaev, Alexei N.; Sukhov, Igor N.; Kaljuzhny, Nikolai N.; Filonov, Arkady S.; Koropets, Alexei P.; Pinovsky, Mikhail I.; Tkachenko, Viktor P.; and Kramar, Nikolai M., 4,635,990, Cl. 295-11.000.

Kosaka, Minoru: *See*—
Naito, Ryuichi; Kosaka, Minoru; and Kawamura, Katsumi, 4,637,005, Cl. 369-45.000.

Kosan Crisplant A/S: *See*—
Prydtz, Ole, 4,635,785, Cl. 198-365.000.

Kosmann, Heribert; Matthaei, Lothar; Ley, Gregor; Wistuba, Eckehardt; and Wulgaris, Savas, to BASF Aktiengesellschaft. Binders for aqueous primers for wood paints. 4,636,548, Cl. 524-524.000.

Kostov, Uriy K. Ice cube dispenser. 4,635,817, Cl. 221-89.000.

Kotaka, Yoshiro; Naito, Hideshi; and Shiokama, Yoshiharu, to Nippon Kogaku K. K. Aperture device for zoom lens. 4,636,041, Cl. 350-429.000.

Kotmans, Hendrik J.: *See*—
Sluijter, Robert J.; and Kotmans, Hendrik J., 4,637,046, Cl. 381-49.000.

Kouchi, Tadashi: *See*—
Oyama, Hiroo; and Kouchi, Tadashi, 4,636,923, Cl. 362-80.000.

Kowal, Wieslaw M.: *See*—
Skinner, Geoffrey F.; Kowal, Wieslaw M.; and Linton, Stephen D., 4,636,334, Cl. 252-377.000.

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Nishioka, Tadashi; Koyama, Hiroshi; and Mashiko, Yoji, 4,636,400, Cl. 427-39.000.

Kozak, Burton. Upright converter for portable vacuum. 4,635,315, Cl. 15-329.000.

Kozlowski, Chester P.; and Lawson, Lawrence J., to Dominion Tool and Die Company. Automated wheel decking assembling. 4,635,339, Cl. 29-526.00R.

Kozora, Joseph W. Plunger assembly for glass container manufacturing. 4,636,240, Cl. 65-229.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Kratz, Gerhard; Meininger, Siegfried; Fischer, Eckhard; and Bege, Dietmar, 4,636,363, Cl. 422-159.000.

Kramar, Nikolai M.: *See*—
Golubenko, Alexandr L.; Turchin, Viktor P.; Konyaev, Alexei N.; Sukhov, Igor N.; Kaljuzhny, Nikolai N.; Filonov, Arkady S.; Koropets, Alexei P.; Pinovsky, Mikhail I.; Tkachenko, Viktor P.; and Kramar, Nikolai M., 4,635,990, Cl. 295-11.000.

Kramer, David M.: *See*—
Compton, Russell A.; Hinshaw, Waldo S.; and Kramer, David M., 4,636,728, Cl. 324-309.000.

Kramer, Roman A.: *See*—
Hand, George E.; and Kramer, Roman A., 4,635,563, Cl. 108-111.000.

Kranzle, Josef; Droitsch, Lutz; and Bauer, Manfred. Axial plunger pump. 4,636,146, Cl. 417-270.000.

Krasko, Zeya K.: *See*—
Keeffe, William M.; Gungle, W. Calvin; Rothwell, Harold L., Jr.; and Krasko, Zeya K., 4,636,687, Cl. 313-620.000.

Kratel, Gunter; Stohr, Gunter; and Schreiner, Franz, to Wacker-Chemie GmbH. Shaped microporous thermal insulation body with sheathing and process for making same. 4,636,416, Cl. 428-69.000.

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Kraus, Helmut: *See*—
Engelmann, Manfred; Kraus, Helmut; and Plewan, Otto, 4,636,547, Cl. 524-523.000.

Krautkramer-Branson, Inc.: *See*—
Jacobs, Hanno; Opara, Ulrich; and Selleschy, Franz, 4,636,964, Cl. 364-483.000.

Krebs, Jay R.: *See*—
Burke, Timothy M.; Noble, Scott W.; Freeburg, Thomas A.; and Krebs, Jay R., 4,636,791, Cl. 340-825.520.

Kreeger, Elsmer W., to Pinckney Molded Plastics, Inc. Sidewall assembly for tote box. 4,635,562, Cl. 108-55.100.

Kremer, Richard D., to Schleicher & Schuell, Inc. Nonintrusive body fluid samplers and methods of using same. 4,635,488, Cl. 73-864.720.

Kreutzer, Donald L.; Novick, William J., Jr.; and Sheetz, Michael P., to Hoechst-Roussel Pharmaceuticals Inc. Host defense mechanism enhancement. 4,636,507, Cl. 514-263.000.

Kreuzer, Peter: *See*—
Brieseck, Bernd; and Kreuzer, Peter, 4,635,881, Cl. 244-49.000.

Kristofek, Paul, to Cooper Industries. Framing projector for use in a track lighting system. 4,636,925, Cl. 362-277.000.

Kroneld, Erik G. Method of drymg material using an indirectly heated system. 4,635,379, Cl. 34-25.000.

Kronseder, Hermann. Inspection machine for bottles. 4,636,635, Cl. 250-223.00B.

Kropp, Walter, to Linde Aktiengesellschaft. Dual consumer hydraulic mechanisms. 4,635,440, Cl. 60-422.000.

Krueger, David J., to Littelfuse, Inc. Fuse with corrugated filament. 4,636,765, Cl. 337-273.000.

Krueger, David W.; and Yerigan, Raymond A. Endless track attachment for a wheeled vehicle. 4,635,740, Cl. 180-9.210.

Kruyer, Jan. Rotative grizzly for oil sand separation. 4,635,860, Cl. 241-23.000.

Kubacki, Edward F.; and Masciale, John M., to American Can Company. Apparatus for marking moving articles. 4,635,545, Cl. 101-4.000.

Kubick, Frederick, to United Technologies Corporation. Poled domain beam scanner. 4,636,799, Cl. 343-754.000.

Kubo, Kazuo; Isomura, Yasuo; Sakamoto, Shuichi; and Homma, Hiroshige, to Yamanouchi Pharmaceutical Co., Ltd. 3,5-di-tert-butyl-4-hydroxyphenyl-substituted heterocyclic compounds. 4,636,516, Cl. 514-365.000.

Kubo, Osamu; Nomura, Tutomu; Ido, Tadashi; and Yokoyama, Hirotaka, to Kabushiki Kaisha Toshiba. Magnetic powders for magnetic recording media and magnetic recording media employing said magnetic powder therein. 4,636,433, Cl. 428-328.000.

Kubota, Hiromitsu: *See*—
Kato, Hiroshi; and Kubota, Hiromitsu, 4,636,887, Cl. 360-85.000.

Kubota, Sadao: *See*—
Kaizaki, Kazuhiro; Kubota, Sadao; Harada, Hiroshi; and Matsuura, Shigeo, 4,636,863, Cl. 358-167.000.

Kuchar, Franz: *See*—
Hoogendoorn, Abraham; and Kuchar, Franz, 4,636,874, Cl. 360-10.200.

Kuder, James E., to Celanese Corporation. Recording medium comprising a microporous polymer exhibiting enhanced signal to noise ratio. 4,636,804, Cl. 346-1.100.

Kugimiya, Koichi: *See*—
Nomura, Noboru; Kugimiya, Koichi; Matsumura, Takayoshi; and Yonezawa, Taketoshi, 4,636,077, Cl. 356-356.000.

Kuhfus, Gerd; Walker, Charles R. S.; and Robinson, Anthony H. J., to Northern Telecom Limited. Integral transmitter and modular jack assembly for a telephone set. 4,636,591, Cl. 381-159.000.

Kuhne, Karl F., to Carbide Blast Joints, Inc. Method and apparatus for protecting consecutive multiple variable diameter couplings. 4,635,968, Cl. 285-45.000.

Kuhner, Gerhard: *See*—
Rothbuhr, Lothar; and Kuhner, Gerhard, 4,636,375, Cl. 423-450.000.

Kuisl, Max: *See*—
Geyer, Arthur; Kuisl, Max; Pfeiffer, Eugen; Roese, Helmut; and Klein, Werner, 4,636,364, Cl. 422-162.000.

Kukes, Simon G.: *See*—
Parrott, Stephen L.; Kukes, Simon G.; and Efner, Howard F., 4,636,487, Cl. 502-168.000.

Kukisaki, Shigenari: *See*—
Namba, Yuzaburo; and Kukisaki, Shigenari, 4,635,665, Cl. 134-167.00R.

Kulzer & Co. GmbH: *See*—
Janda, Ralf; and Eppinger, Bernhard, 4,636,533, Cl. 522-14.000.

Kumano, Humihiro: *See*—
Tanahashi, Masao; Hamashima, Tetsuo; and Kumano, Humihiro, 4,635,360, Cl. 30-34.200.

Kung, Viola T.: *See*—
Martin, Francis J.; and Kung, Viola T., 4,636,479, Cl. 436-533.000.

Kunihira, Tadashi: *See*—
Minakuchi, Hiroshi; Kunihira, Tadashi; and Igarashi, Yoshiaki, 4,636,696, Cl. 318-327.000.

Kunikawa, Norihide, to Sharp Kabushiki Kaisha. Copying apparatus equipped with brushless DC motor. 4,636,697, Cl. 318-436.000.

Kunugi, Yoshiro, to Pioneer Electronic Corporation. Car-mounted audio system. 4,637,049, Cl. 381-86.000.

Kunz, Gerhard. Process and apparatus for treatment of fluids, particularly desalinization of aqueous solutions. 4,636,296, Cl. 204-182.500.

Kunz, Harold R.: *See*—
Gruver, Gary A.; and Kunz, Harold R., 4,636,274, Cl. 156-279.000.

Kurahashi, Takashi: *See*—
Nakamura, Kanehito; Matsui, Kazuma; Kurahashi, Takashi; and Ishikawa, Hiroshi, 4,636,643, Cl. 250-338.000.

Kuraray Co, Ltd.: *See*—
Okaya, Takuji; Tanaka, Yoshinari; Yonezu, Kiyoshi; Aoyama, Akimasa; and Moritani, Takeshi, 4,636,551, Cl. 525-60.000.

Kurata, Masami: *See*—
Saitoh, Hiroyuki; Kurata, Masami; and Omori, Takashi, 4,636,081, Cl. 356-402.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Katto, Takayuki; Komatsu, Yasumasa; and Shiiki, Zenya, 4,636,553, Cl. 525-67.000.

Kurihara, Susumu; Seki, Tadashi; Awata, Hiroshi; and Kadowaki, Hitoshi, to Nikkei Kako Kabushiki Kaisha. Method for manufacturing aluminum oxynitride refractory. 4,636,374, Cl. 423-385.000.

Kurisu, Norio: *See*—
Nagamoto, Masana'ka; Kurisu, Norio; and Taniguchi, Keishi, 4,636,819, Cl. 346-216.000.

Kuroda, Shigeru, to Fujitsu Limited. Method of manufacturing GaAs semiconductor device. 4,635,343, Cl. 29-571.000.

Kurosawa, Toshiaki; Shima, Seiya; Ando, Takeki; Inaba, Hiromi; Nakashime, Hajime; and Mine, Toshisuke, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. dv/dt Protection circuit device for an AC-DC converter apparatus. 4,636,932, Cl. 363-54.000.

Kurzes, Aaron. Construction panel system. 4,635,411, Cl. 52-71.000.

Kusano, Chushirou; Ishioka, Sachio; Imamura, Yoshinori; Takasaki, Yukio; Ogawa, Hirofumi; Makishima, Tatsuo; and Hirai, Tadaaki, to Hitachi, Ltd. Image pickup tube. 4,636,682, Cl. 313-386.000.

Kusumoto, Yoshihiro: *See*—
Tada, Akira; Morita, Takamitsu; Teraue, Takeshi; and Kusumoto, Yoshihiro, 4,636,554, Cl. 525-359.300.

Kuyel, Birol; and Sinclair, Paul F., III, to AT&T Technologies, Inc. Method and apparatus for rapidly controlling the flow of gas. 4,635,855, Cl. 239-551.000.

Kuypers, Bert: *See*—
Hanak, Joseph J.; Young, James; Kuypers, Bert; and Blieden, Richard, 4,636,579, Cl. 136-245.000.

Kuznetsov, Stephen B., to Westinghouse Electric Corp. Double-sided electromagnetic pump with controllable normal force for rapid solidification of liquid metals. 4,635,705, Cl. 164-466.000.

Kuznicki, William J.: *See*—
Mooney, Charles W.; Phipps, Robert E.; and Kuznicki, William J., 4,635,836, Cl. 224-247.000.

Kyoden, Hiroshi; Endo, Yasuhiro; Fujiwara, Teiichi; Mimura, Toshisada; Nishikawa, Kihachiro; and Nishizawa, Shoichi, to Shinagawa Refractories Co., Ltd.; and Matsushita Electric Industrial Co., Ltd. Apparatus for automatic measuring thermal dimensional change. 4,636,969, Cl. 364-560.000.

Kyoei Co., Ltd.: *See*—
Toshitsugu, Kitayama, 4,636,392, Cl. 426-110.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Nakanishi, Toru; and Machida, Yozo, 4,636,464, Cl. 435-14.000.

Kytonen, Pauli, to Oy Wartsila Ab. Web winding method and apparatus. 4,635,867, Cl. 242-56.00R.

L. Schuler GmbH: *See*—
Dumschat, Helmut, 4,635,463, Cl. 72-427.000.

Labelette Company: *See*—
Wesley, John G., 4,636,278, Cl. 156-446.000.

Labrum, Joseph H.; and Wilcox, Allen D., to Sperry Corporation. Acousto-optical spectrum analyzer with expanded frequency resolution. 4,636,718, Cl. 324-77.00K.

Lach, Lawrence E., to Gould Inc. GaAs differential line receiver with positive feedback. 4,636,654, Cl. 307-260.000.

Ladney, Michael: *See*—
Loren, Norman S.; and Gordon, William E., 4,635,984, Cl. 293-120.000.

Lahaski, Paul: *See*—
Zikmanis, Harijs; Prezlock, James; and Lahaski, Paul, 4,635,304, Cl. 4-506.000.

Lai, Mun F.: *See*—
Fellner, Peter J.; Lai, Mun F.; and Patel, Thakorbhai P., 4,636,518, Cl. 514-397.000.

Lakatos, Nick: *See*—
Welber, Stanley; and Lakatos, Nick, 4,635,632, Cl. 128-303.100.

Lam, Clive C.: *See*—
Kahil, John E.; Milewits, Marvin; Bradfield, James E.; and Lam, Clive C., 4,636,727, Cl. 324-227.000.

LaMattina, John L., to Pfizer Inc. Formulation of antiinflammatory drugs. 4,636,498, Cl. 514-222.000.

Lambert, Andre : *See*—
Fava, Jean; Lambert, Andre ; and Tognet, Jean-Paul, 4,636,369, Cl. 423-20.000.

Landis, Donald E.: *See*—
Wills, David C.; Landis, Donald E.; and Lyons, Dale R., 4,636,781, Cl. 340-700.000.

Langen, Hermann J., to Machinefabriek Lan B.V. Device for sterilizng holders containing products. 4,636,366, Cl. 422-297.000.

Langer, Heimo J.: *See*—
Gruber, Bruce A.; Langer, Heimo J.; and Dunnayant, William R., 4,636,537, Cl. 523-139.000.

Lanham Machinery Company, Inc.: *See*—
Lanham, William E., Jr., 4,636,129, Cl. 414-417.000.

Lanham, William E., Jr., to Lanham Machinery Company, Inc. Method and apparatus for removing bakery carrier screens from conveyor. 4,636,129, Cl. 414-417.000.

Lapatovich, Walter P.; and Gibbs, George R., to GTE Laboratories Incorporated. Mercury-free discharge lamp. 4,636,692, Cl. 315-248.000.

Laramore, William D. Dusting flour recycling system. 4,636,301, Cl. 209-31.000.

Larouche, Gilles, to Societe d'Energie de la Baie James. Portable partitioning panel. 4,635,417, Cl. 52-239.000.

Larrowe, Vernon L.: *See*—
Zuk, David M.; and Larrowe, Vernon L., 4,636,719, Cl. 324-83.00D.

Larsen, Peter L. Multiple use hand tool. 4,635,309, Cl. 7-158.000.

Larsson, Gunnar, to AB Vretens Mekaniska Verkstad. Grader attachment for a loader. 4,635,730, Cl. 172-788.000.

Laser Photonics, Inc.: *See*—
Bellar, Dennis R., 4,636,043, Cl. 350-484.000.

Laskaris, Evangelos T., to General Electric Company. Compact retractable cryogenic leads. 4,635,450, Cl. 62-514.00R.

Laskaris, Evangelos T., to General Electric Company. Spring loaded valve for adding cryogenic liquid to a cryostat. 4,635,451, Cl. 62-514.00R.

Lassen, Frederich O., to Kimberly-Clark Corporation. Sanitary napkin with fluid transfer layer. 4,636,209, Cl. 604-378.000.

Lassithiotakis, Konstantin: *See*—
Jacobsen, Hans E.; Hansen, Henning M.; Nyrup, John; Hansen, Henry; and Lassithiotakis, Konstantin, 4,635,486, Cl. 73-861.120.

Latham, Paul W., II, to Data General Corporation. Charge pump for use in a phase-locked loop. 4,636,748, Cl. 331-17.000.

Lattner, Manfred: *See*—
Dupper, Walter; Emberger, Roland; Hack, Kurt; Lattner, Manfred; Nickolay, Helmut; Riedel, Karl; and Schollhammer, Richard, 4,635,321, Cl. 19-0.250.

Laukkarinen, Tuomo: *See*—
Savolainen, Esko; Laukkarinen, Tuomo; Lehto, Arto; Oksman, Erkki; and Eilamo, Unto, 4,636,181, Cl. 474-207.000.

Laurel Bank Machine Co., Ltd.: *See*—
Uematsu, Yoshiaki; and Sentoku, Hideshi, 4,635,661, Cl. 133-3.00R.

Law, Hilton, to English Electric Company Limited, The. Power generating equipment. 4,636,707, Cl. 322-35.000.

Lawrence, Mark C.: *See*—
Ashelman, Robert U., Jr.; Townsend, Michael G.; and Lawrence, Mark C., 4,635,465, Cl. 72-448.000.

Lawson, Daniel D.: *See*—
Posin, Thomas; and Lawson, Daniel D., 4,636,212, Cl. 623-6.000.

Lawson & Jones Limited: *See*—
Lizmore, George, 4,636,233, Cl. 55-501.000.

Lawson, Lawrence J.: *See*—
Kozlowski, Chester P.; and Lawson, Lawrence J., 4,635,339, Cl. 29-526.00R.

Laycock, Arthur; Harris, Michael J.; and Broxholme, Mark A., to British Steel Corporation. Treatment of molten metal. 4,636,249, Cl. 75-53.000.

Lazure, Robert E.: *See*—
Levy, Gilbert M.; Quaglia, Alexander; and Lazure, Robert E., 4,636,074, Cl. 356-328.000.

Leaming, Roger M. Alarm system for space heating appliances. 4,636,776, Cl. 340-594.000.

Leccese, Antonio: *See*—
Mayr, Adolfo; Susa, Ermanno; Leccese, Antonio; Davoli, Velmore; and Giachetti, Ettore, 4,636,486, Cl. 502-121.000.

Lechat, Jacques: *See*—
Luvinh, Quoc; Lechat, Jacques; Evans, Morris L.; and Lepert, Andre, 4,636,555, Cl. 526-290.000.

Leclercq, Jacques, to Saint-Gobain Vitiage. Automatic device for actuation of components to clean a motor vehicle window. 4,636,698, Cl. 318-443.000.

Lederman, Frederick E., to General Motors Corporation. Fluid-operated piston. 4,635,778, Cl. 192-85.0AA.

Ledoux, Jules F. R., to Hamon-Sobelco S.A. Heaters for thermal energy transformation installations. 4,635,588, Cl. 122-1.00C.

Lee, Anthony, to Westinghouse Electric Corp. Low voltage circuit breaker with remote switching function. 4,636,760, Cl. 335-14.000.

Lee, Chang R.: *See*—
Lin, Chifa F.; and Lee, Chang R., 4,636,388, Cl. 426-7.000.

Lee, Florentino V.: *See*—
Pastor, Ricardo C.; and Lee, Florentino V., 4,636,378, Cl. 423-598.000.

Lee, Gong In: *See*—
Cho, Chu Hwan; and Lee, Gong In, 4,636,182, Cl. 493-39.000.

Lee, John S.: *See*—
Dalziel, Warren L.; Flanigan, Charles; Daniels, Donald V.; Lee, John S.; and Johnston, James, 4,636,902, Cl. 360-128.000.

Lee, Minyoung: *See*—
Thomas, Charles E.; Yerazunis, William S.; Erkes, Joseph W.; and Lee, Minyoung, 4,636,779, Cl. 340-680.000.
Thomas, Charles E.; Lee, Minyoung; Bedard, James F.; and Hayashi, Steven R., 4,636,780, Cl. 340-680.000.

Lee, Peter, to American Phone Products. In-line telephone intercom system. 4,636,589, Cl. 379-159.000.

Lee, Yung-Lin, to Cheng Kwang Storage Battery Co., Ltd. Stopper structure for storage battery container. 4,636,446, Cl. 429-54.000.

Lehmann, Hans D.: *See*—
Rosey, Phillip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Friedrich, Ludwig; and Lenke, Dieter, 4,636,504, Cl. 514-252.000.

Lehto, Arto: *See*—
Savolainen, Esko; Laukkarinen, Tuomo; Lehto, Arto; Oksman, Erkki; and Eilamo, Unto, 4,636,181, Cl. 474-207.000.

Leicht, John L., to Motorola, Inc. Method and apparatus for dispensing solder paste. 4,636,406, Cl. 427-96.000.

Leisi, Marcel, to Exit S.A. Spray nozzle, particularly adapted for spray guns. 4,635,850, Cl. 239-119.000.

Leister, Peter, to Deutsche Gesellschaft. Apparatus for the continuous treatment of fragmented fuel elements. 4,636,362, Cl. 422-105.000.

Lejus Medical Aktiebolag: *See*—
Appelgren, Curt H.; and Ivarsson, Nemo, 4,636,163, Cl. 425-332.000.

Le Marchand, Claude; and Gerard, Jean-Louis, to Bendix France. Disk brake with automatic adjustment. 4,635,760, Cl. 188-71.900.

Le Martret, Odile: *See*—
Clemence, Francois; Le Martret, Odile; and Delevallee, Francoise, 4,636,512, Cl. 514-312.000.

Lemelson, Jerome H. Tool and material manipulation apparatus and method. 4,636,137, Cl. 414-730.000.

Lemmer, Alfred. IC rod-magazine. 4,635,794, Cl. 206-328.000.

Lenertz, John I.; Tessenske, Dennis J.; and Ferrari, Ricky J., to Western States Company. Railroad track trailer. 4,636,130, Cl. 414-500.000.

Lenke, Dieter: *See*—
Rosey, Phillip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Friedrich, Ludwig; and Lenke, Dieter, 4,636,504, Cl. 514-252.000.

Leonard, Russell J.: *See*—
Brinkman, Donald J.; and Leonard, Russell J., 4,635,355, Cl. 29-747.000.

Leonardo, John, to Cowtronics, Inc. Method and apparatus for detecting standing heat in cattle. 4,635,587, Cl. 119-1.000.

Leopold Kostal GmbH & Co., KG: *See*—
Menche, Edgar, 4,636,597, Cl. 200-68.100.

Lepert, Andre: *See*—
Luvinh, Quoc; Lechat, Jacques; Evans, Morris L.; and Lepert, Andre, 4,636,555, Cl. 526-290.000.

Le Pesant, Jean-Pierre, to Thomson-CSF. Indicator device with electric control of displacement of a fluid. 4,636,785, Cl. 340-753.000.

Le Poittevin, Yves M. J. Folding house transportable in the form of a stackable container. 4,635,412, Cl. 52-79.500.

Lerch, Reinhard, to Siemens Aktiengesellschaft. Ultrasonic transducer system. 4,635,484, Cl. 73-628.000.

Lerman, Max. Prosthetic stockings. 4,635,626, Cl. 128-165.000.

Lerner, Richard A.: *See*—
Altman, Amnon; Theofilopoulos, Argyrios N.; Lerner, Richard A.; and Dixon, Frank J., 4,636,463, Cl. 435-7.000.

Les Enterprises Manuspec Inc.: *See*—
Drapeau, Remi, 4,635,424, Cl. 52-480.000.

Le Sage, Richard; Reshanov, Eugene N.; and Schlemmer, Richard A. Transportable hot fat container. 4,635,950, Cl. 280-47.260.

Leshchiner, Adolf: *See*—
Balazs, Endre A.; and Leshchiner, Adolf, 4,636,524, Cl. 514-781.000.

Leukel, Bernd: *See*—
Neidig, Arno; Leukel, Bernd; and Hettmann, Hubert, 4,636,580, Cl. 174-52.0PE.

Level-Rider Inc.: *See*—
Weyenberg, Lionel E., 4,636,001, Cl. 297-314.000.

Lever Brothers Company: *See*—
Melville, James B., 4,636,330, Cl. 252-174.110.

Levin, Lawrence A.: *See*—
Pike, Charles T.; Furumoto, Horace W.; and Levin, Lawrence A., 4,636,287, Cl. 204-157.150.

Levine, Michael R., to Honeywell, Inc. Electronic thermostat for heating and cooling system. 4,635,708, Cl. 165-12.000.

Levy, Gilbert M.; Quaglia, Alexander; and Lazure, Robert E., to PRA International Inc. Optics system for emission spectrometer. 4,636,074, Cl. 356-328.000.

Lew, Hyok S. Precession flow meter. 4,635,485, Cl. 73-861.370.

Lew, Hyok S. Air-spring suspension. 4,635,961, Cl. 280-711.000.

Lewis, Alton D.: *See*—
Millis, Edwin G.; Bimer, Thomas C.; and Lewis, Alton D., 4,636,128, Cl. 414-217.000.

Lewis, Dan E.; and Gundersen, James L., to Hughes Aircraft Company. Binarily weighted pulse width digital-to-analog converter. 4,636,773, Cl. 340-347.0DA.

Lewis, Donald R.: *See*—
Price, William E.; Galloway, Louie A., III; Lowrey, Charles B.; and Lewis, Donald R., 4,636,475, Cl. 436-3.000.

Lewis, Elliott W., to Fluid Recycling Services, Inc. Recycling of metalworking fluids. 4,636,317, Cl. 210-748.000.

Lewis, Jesse M.: *See*—
Bird, James M., Sr.; and Lewis, Jesse M., 4,635,747, Cl. 181-120.000.

Lewis, Timothy: *See*—
Clough, John M.; Lewis, Timothy; and Gravestock, Michael B., 4,636,247, Cl. 71-92.000.

Ley, Gregor: *See*—
Kossmann, Heribert; Matthaei, Lothar; Ley, Gregor; Wistuba, Eckehardt; and Wulgaris, Savas, 4,636,548, Cl. 524-524.000.

Libeskind, Mark: *See*—
Huang, Shih L.; Scotese, Arthur; Libeskind, Mark; and Gause, Lee W., 4,636,638, Cl. 250-231.00R.

Librecht, Freddy M.: *See*—
De Schamphelaere, Lucien A.; Librecht, Freddy M.; and Verlinden, Willy G., 4,636,060, Cl. 355-14.0CH.

Licentia Patent-Verusaltungs GmbH: *See*—
Jehle, Franz, 4,635,880, Cl. 244-3.140.

Licentia Patent-Verwaltungs-GmbH: *See*—
Geyer, Arthur; Kuisl, Max; Pfeiffer, Eugen; Roese, Helmut; and Klein, Werner, 4,636,364, Cl. 422-162.000.

Lien, Jih-Chang; and Wang, Hsingya A., to Advanced Micro Devices, Inc. Method of fabricating titanium silicide gate electrodes and interconnections. 4,635,347, Cl. 29-591.000.

Lilly Industries Limited: *See*—
Roast, William G., 4,636,165, Cl. 425-472.000.

Limare, Armand: *See*—
Caillerie, Jean-Louis; Decaens, Remy; and Limare, Armand, 4,636,354, Cl. 420-514.000.

Lin, Chester H.: *See*—
Hall, Walter J.; Lin, Chester H.; Ramos, Joel A.; and Rogers, Edward J., 4,636,602, Cl. 200-153.0SC.

Lin, Chifa F.; and Lee, Chang R., to Stauffer Chemical Company. Preparing protein for hydrolysis and product. 4,636,388, Cl. 426-7.000.

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Lindahl, Lars: *See*—
Almqvist, Christer; Carlsson, Bengt; and Lindahl, Lars, 4,635,714, Cl. 165-167.000.

Lindberg, Per L.: *See*—
Brandstrom, Arne E.; Lindberg, Per L.; and Wallmark, Bjorn, 4,636,499, Cl. 514-222.000.

Linde Aktiengesellschaft: *See*—
Heisel, Michael; Marold, Freimut; and Linde, Gerhard, 4,636,377, Cl. 423-575.000.
Klein, Guenter; and Wernicke, Hans-Juergen, 4,636,225, Cl. 55-31.000.
Kropp, Walter, 4,635,440, Cl. 60-422.000.
Link, Heinz; and Schrenker, Karl-Heinz, 4,636,365, Cl. 422-201.000.

Linde, Gerhard: *See*—
Heisel, Michael; Marold, Freimut; and Linde, Gerhard, 4,636,377, Cl. 423-575.000.

Lindemann, Eckhard: *See*—
Penza, Hans; Segler, Siegfried; Schmuck, Karl-Wilhelm; Asbach, Dietrich; and Lindemann, Eckhard, 4,636,064, Cl. 355-73.000.

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Linderman, Ray D.; and Williams, Peter C., to Whitey Co. Valve manifold mounting bracket. 4,635,677, Cl. 137-356.000.

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Anderson, Gary L.; and Lindow, Steven E., 4,636,386, Cl. 424-93.000.

Lindquist, Kathy A. Apparatus for pattern crocheting. 4,635,834, Cl. 223-107.000.

Lindsley, Warren F. B.: *See*—
Mineck, Fred, 4,635,995, Cl. 296-97.00G.

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Linton, Stephen D.: *See*—
Skinner, Geoffrey F.; Kowal, Wieslaw M.; and Linton, Stephen D., 4,636,334, Cl. 252-377.000.

Lipperts, Joseph H. F. G., to Holec Systemen Componenten B.V. Vacuum switch provided with horseshoe-shaped elements for generating an axial magnetic field. 4,636,600, Cl. 200-144.00B.

Littelfuse, Inc.: *See*—
Krueger, David J., 4,636,765, Cl. 337-273.000.

Little, Charles F. Irrigation additive delivery system. 4,635,848, Cl. 239-10.000.

Litzenburger, Wolfgang. Multiple filters with flow-reversing rotary valve set. 4,636,311, Cl. 210-323.200.

Liu, Kuo-Ching, to Quantronix Corporation. Frequency doubling a Q-switched laser beam by using intracavity Type II phase matching. 4,637,026, Cl. 372-22.000.

Liu, Ming; Bowbin, John F.; Ghislain, Raymond L.; and McDaniel, Stephen K., to Miller Fluid Power Corporation. Cylinder locking apparatus. 4,635,536, Cl. 92-24.000.

Lizmore, George, to Lawson & Jones Limited. Filter assembly. 4,636,233, Cl. 55-501.000.

Ljungkvist, Kjell: *See*—
Skallen, Bengt; Ljungkvist, Kjell; and Gren, Urban, 4,635,470, Cl. 73-63.000.

Llewellin, William R., to United States of America, National Aeronautics and Space Administration. Non-backdriveable free wheeling coupling. 4,635,773, Cl. 192-46.000.

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Harris, Stephen J.; McKervey, M. Anthony; Melody, David P.; Woods, John; and Rooney, John M., 4,636,539, Cl. 523-214.000.

Lodge, Nicolas K.: *See*—
Drury, Gordon M.; Mason, Arthur G.; Lodge, Nicolas K.; and Flannaghan, Barry A., 4,636,851, Cl. 358-119.000.

Lodi, Renato, to Honeywell Information Systems Italia. Computer modular frame with retractable stabilizers. 4,635,811, Cl. 220-69.000.

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Wilson, David H.; and Loe, James M., 4,635,819, Cl. 222-58.000.

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Lombard, Roger, to Automobiles Peugeot; and Automobiles Citroen. Single rocker device for actuating two valves. 4,635,679, Cl. 137-601.000.

Lombardozzi, Lucio. Thermal panel. 4,636,444, Cl. 428-596.000.

Long Reach Manufacturing Co.: *See*—
Sinclair, Stuart W., 4,636,131, Cl. 414-621.000.

Longabaugh, Charles R., to AMF Incorporated. Method and apparatus for controlling cooking cycles in a cooking system. 4,636,949, Cl. 364-400.000.

Loren, Norman S.; and Gordon, William E., to Ladney, Michael. Vehicle bumper. 4,635,984, Cl. 293-120.000.

Lorentz, Donald G.: *See—*
Draper, Robert; and Lorentz, Donald G., 4,635,589, Cl. 122-396.000.

Losh, Russell L.: *See—*
Holt, Joseph C.; and Losh, Russell L., 4,635,997, Cl. 296-182.000.

Lounsbury, David M.; and Stevenson, Alexander J., to Prime Computer, Inc. Digital data error correction method and apparatus. 4,637,023, Cl. 371-38.000.

Lovresich, Rodger T. Motorized over center clamp. 4,635,911, Cl. 269-93.000.

Lowe, Byron L.: *See—*
Sexstone, John H.; Finn, Everett N.; Lowe, Byron L.; and Milliner, Ken M., 4,636,183, Cl. 493-42.000.

Lowe, Richard S.; and Saravanos, Constantine, to Northern Telecom Limited. Method and apparatus for measuring single mode fiber mode field radius. 4,636,071, Cl. 356-73.100.

Lowin, David A.; Fayram, Richard A.; and Bivetto, Andrew J., to Syntex (U.S.A.) Inc. Medicament applicator with plunger assembly and automatically-openable closure therefor. 4,636,202, Cl. 604-236.000.

Lowrey, Charles B.: *See—*
Price, William E.; Galloway, Louie A., III; Lowrey, Charles B.; and Lewis, Donald R., 4,636,475, Cl. 436-3.000.

Loy, Fernand R., to U.S. Philips Corporation. Optical system for viewing a scene. 4,636,044, Cl. 350-539.000.

Loyola Controls, Inc.: *See—*
Tachernenko, Stanley A.; Crane, Lawrence A.; and Boyce, Jay, 4,636,935, Cl. 364-140.000.

Lozes, Andre : *See—*
Vannier, Serge; Garotta, Robert; Lozes, Andre ; and Vidal, Jean C., 4,636,956, Cl. 364-421.000.

LTV Aerospace and Defense: *See—*
Eden, Dayton D., 4,637,008, Cl. 369-100.000.

La, Jing-Jong; and Wehrmeister, Herbert L., to International Minerals & Chemical Corp. 3-tolylthio-4-amino-4,5-dihydro isoxazole as anthelmintic. 4,636,517, Cl. 514-380.000.

Lucas Industries Public Limited Company: *See—*
Mowbray, Dorian F., 4,635,853, Cl. 239-533.300.
Skerritt, Robert C., 4,636,777, Cl. 340-635.000.

Lucas, Jacques D. H.; and Samson, Dominique H. P. M., to Societe Anonyme Curty. Cylinder-head gasket. 4,635,949, Cl. 277-235.00B.

Lucas Sales Company, Inc.: *See—*
Vandemore, William J., 4,635,409, Cl. 52-60.000.

Lucia, Antonio: *See—*
Genevois, Jean L.; Lucia, Antonio; and Di Fabio, Emidio, 4,636,169, Cl. 432-90.000.

Luciano, Robert A.: *See—*
Dickinson, Peter D.; and Luciano, Robert A., 4,635,937, Cl. 273-143.00R.

Ludwig, George C., to AVM, Inc. Pneumatic counterbalance. 4,635,908, Cl. 267-64.110.

Luigi Franchi S.p.A.: *See—*
Mottana, Sergio; and Roberto, Mostura, 4,635,526, Cl. 89-1.410.

Luk Lamellen und Kupplungsbau GmbH: *See—*
Kohler, Helmut, 4,635,775, Cl. 192-70.180.

Luke, Roger D.: *See—*
Perkins, Norman P.; Luke, Roger D.; and Kaufman, Steven A., 4,636,915, Cl. 361-355.000.

Lumley, Edward M.; and Bowman, Bonita F., to Mobil Oil Corporation. Automatic gain control for seismic data. 4,636,993, Cl. 367-65.000.

Lumpkin, Larry. Indoor and outdoor game. 4,635,943, Cl. 273-402.000.

Lund, John A.: *See—*
Forbes, Ronald L.; and Lund, John A., 4,636,853, Cl. 358-121.000.

Lundgren, Bo T.: *See—*
Gustafsson, Bill B. R.; Hedberg, Sven A.; and Lundgren, Bo T., 4,636,501, Cl. 514-235.000.

Lundin, Robert S., to Superior Electric Company, The. Method and means for increasing the frequency of update of direction information contained in two sine waves in quadrature. 4,636,662, Cl. 307-512.000.

Luther, Hans W.: *See—*
Boecker, Juergen; Luther, Hans W.; Wallow, Peter; and Fritsch, Horst, 4,635,556, Cl. 102-518.000.

Luvinh, Quoc; Lechat, Jacques; Evans, Morris L.; and Lepert, Andre, to Exxon Research & Engineering Co. Petroleum resins and their production. 4,636,555, Cl. 526-290.000.

Lyall, Robert W., to R. W. Lyall & Company, Inc. Plastic pipe coupling apparatus and method of using same. 4,635,972, Cl. 285-242.000.

Lygas, Edward A., to NL Industries, Inc. Magnetostrictive pulse generator. 4,636,999, Cl. 367-156.000.

Lynch, Donald J.; and Shivers, Raymond P., to Campbell Soup Company. Method of processing meat for inclusion in high acid type foods and product thereof. 4,636,393, Cl. 426-276.000.

Lynch, John: *See—*
Bleckmann, Gerhard; Lynch, John; and Wallbillich, Gunter, 4,635,549, Cl. 101-401.100.

Lyon, Richard K.: *See—*
Dean, Anthony M.; DeGregoris, Anthony J.; Hardy, James E.; Hurst, Boyd E.; and Lyon, Richard K., 4,636,370, Cl. 423-235.000.

Lyons, Dale R.: *See—*
Wills, David C.; Landis, Donald E.; and Lyons, Dale R., 4,636,781, Cl. 340-700.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Hayd, Axel; Meinke, Peter; Maurer, Martin; and Schwarz, Joachim, 4,636,607, Cl. 219-121.0LM.

Maas, Henricus G. R.: *See—*
Slotboom, Jan W.; Maas, Henricus G. R.; Appels, Johannes A.; and Klaassen, Francois M., 4,636,826, Cl. 357-24.000.

Macartney, Lawrence J.: *See—*
Conrad, Douglas J.; Kennon, James L.; Macartney, Lawrence J.; and Scharf, Donald R., 4,635,585, Cl. 118-316.000.

MacDougall, John A.: *See—*
Olano, Francisco; MacDougall, John A.; and Pargeter, John K., 4,636,127, Cl. 414-158.000.

Machida, Yozo: *See—*
Nakanishi, Toru; and Machida, Yozo, 4,636,464, Cl. 435-14.000.

Machinefabriek Lan B.V.: *See—*
Langen, Hermann J., 4,636,366, Cl. 422-297.000.

Machlett Laboratories, Incorporated, The: *See—*
Braun, Martin, 4,637,042, Cl. 378-143.000.

MacLaughlin, Don N., to Coeden Technology, Inc. Process for manufacturing thermoplastic containers. 4,636,349, Cl. 264-549.000.

Madsen, Willy B.; Jensen, Finn H.; Rasmussen, Ole B.; Goldstein, Guy; and Russin-Moynier, Yves R., to Beghin-Say International, Inc. Net and method of producing same. 4,636,419, Cl. 428-131.000.

Maeda, Hajime: *See—*
Ikoma, Toshiaki; Maeda, Hajime; Yanai, Hisayoshi; Dang, Ryo; and Shigyo, Naoyuki, 4,636,824, Cl. 357-23.140.

Maeda, Kiyoshi: *See—*
Tomohisa, Kunio; Maeda, Kiyoshi; and Yao, Koji, 4,636,869, Cl. 358-287.000.

Maejima, Enjiro: *See—*
Sekiguchi, Yuzo; and Maejima, Enjiro, 4,635,774, Cl. 192-52.000.

Maggio, Charles F.; and Spombiantti, Angelina M. Method of using a bed sheet stay. 4,635,308, Cl. 5-508.000.

Magi, Hugo; Boas, Arthur J.; and Waese, Jerry R., to Cabletest International Inc. Test apparatus. 4,636,847, Cl. 358-101.000.

Magin, Gregory A.: *See—*
Woodworth, Donald J.; and Magin, Gregory A., 4,636,736, Cl. 329-50.000.

Magistretti, Maria J.: *See—*
Bombardelli, Ezio; Gabetta, Bruno; and Magistretti, Maria J., 4,636,569, Cl. 549-403.000.

Magnetic Elektromotoren A.G. Liestal: *See—*
Uebelhart, Hugo, 4,635,492, Cl. 74-89.150.

Magnetic Peripherals Inc.: *See—*
Schwarz, Theodore A., 4,636,886, Cl. 360-84.000.

Magyar Optikai Muvek: *See—*
Tarcsafalvi, Andras, 4,635,375, Cl. 33-318.000.

Mahmoud, Issa S., to International Business Machines Corporation. Materials for electrical contact. 4,636,251, Cl. 75-246.000.

Mahmud, Syed T., to Signetics Corporation. Ratioless FET programmable logic array. 4,636,661, Cl. 307-468.000.

Mahoney, John A.: *See—*
Unmuth, Eugene E.; Mahoney, John A.; and Bertolacini, Ralph J., 4,636,299, Cl. 208-87.000.

Majewski, Joseph R., to Pillar Corporation. Corona discharge electrode assembly. 4,636,640, Cl. 250-324.000.

Majewski, Klaus-Peter: *See—*
Zerfass, Hans-Rainer; Majewski, Klaus-Peter; and Giesen, Franz-Josef, 4,635,948, Cl. 277-235.00B.

Makino, Masashi; Nakada, Kunio; Muragishi, Isao; and Nishitani, Syozi, to Matsushita Electric Industrial Co., Ltd. Edge rounding machine. 4,635,403, Cl. 51-94.00R.

Makino, Yoshio; Nagai, Takeshi; and Yamazaki, Shingo, to Nippon Oil and Fats Co., Ltd. Lubricating oil composition for metal rolling. 4,636,323, Cl. 252-51.50R.

Makishima, Tatsuo: *See—*
Kusano, Chushirou; Ishioka, Sachio; Imamura, Yoshinori; Takasaki, Yukio; Ogawa, Hirofumi; Makishima, Tatsuo; and Hirai, Tadaaki, 4,636,682, Cl. 313-386.000.

Makow, Henry, to Hasbro Canada, Inc. Question and answer game apparatus and method. 4,635,939, Cl. 273-296.000.

Malcolm-Brown, Tessa, to Dixon International Limited. Intumescent material. 4,636,538, Cl. 523-179.000.

Malhotra, Satish C.: *See—*
Gangal, Subhash V.; and Malhotra, Satish C., 4,636,549, Cl. 524-546.000.

Malina, Ludek; and Ott, Ernst, to Rieter Machine Works Limited. Spinning device for open-end spinning containing easily replaceable nozzle body. 4,635,436, Cl. 57-417.000.

Malinowski, Peter: *See—*
Divisek, Jiri; and Malinowski, Peter, 4,636,291, Cl. 204-283.000.

Mallinckrodt, Inc.: *See—*
Stade, John H., 4,636,198, Cl. 604-154.000.

Maloney, Bernard A.; and Carbaugh, John E., to PPG Industries, Inc. Sulfate removal from alkali metal chlorate solutions. 4,636,376, Cl. 423-475.000.

Malyon, Brian R., to British Library Board, The. Copiers. 4,636,868, Cl. 358-285.000.

Manabe, Sugio: *See—*
Sakurada, Masahiko; Manabe, Sugio; Okamura, Hideaki; and Gocho, Nagahiro, 4,636,360, Cl. 422-65.000.

Mani, Krishnamurthy N.; and Chlanda, Frederick P., to Allied Corporation. Solution mining of sodium minerals with acids generated by electrodialytic water splitting. 4,636,289, Cl. 204-182.400.

Manley, Roger E. W.: *See—*
Thorp, Peter; and Manley, Roger E. W., 4,635,629, Cl. 128-202.260.

Mannesmann AG: *See—*
Rode, Wilhelm, 4,635,531, Cl. 91-303.000.

Manson, Marcel: *See—*
Chastanet, Bernard; Decailloz, Claude; Dournel, Solange; and Manson, Marcel, 4,636,606, Cl. 219-121.0LC.

Mansueto, John: *See—*
Tung, Chenshi J.; and Mansueto, John, 4,636,900, Cl. 360-124.000.

Manville Corporation: *See—*
Jada, Sivananda S., 4,636,440, Cl. 428-446.000.

Mapro Inc.: *See—*
Kopernicky, Jaro, 4,636,084, Cl. 366-76.000.
Kopernicky, Jaro, 4,636,085, Cl. 366-76.000.

Marazas, Gerald A.: *See—*
Dixon, Jerry D.; Farrell, Robert H.; Marazas, Gerald A.; McNeill, Andrew B., Jr.; and Merckel, Gerald U., 4,637,024, Cl. 371-67.000.

Mardin, Mithat: *See—*
Niemers, Ekkehard; Grutzmann, Rudi; Mardin, Mithat; Busse, Wolf-Dieter; and Meyer, Horst, 4,636,497, Cl. 514-215.000.

Margalit, Shlomo; Yariv, Amnon; and Rav-Noy, Zeev, to California Institute of Technology. Vertical Schottky barrier gate field-effect transistor in GaAs/GaAlAs. 4,636,823, Cl. 357-23.300.

Marian, Miklos; and Weber, Donald L. Device for separating liquid fractions. 4,636,361, Cl. 422-101.000.

Marin, Guy F. M.: *See—*
Hethuin, Serge; and Marin, Guy F. M., 4,636,958, Cl. 364-451.000.

Marker, Hannes; and Rochelt, Gunter, to Marker, Hannes. Boom end piece. 4,635,579, Cl. 114-97.000.

Markuntovich, Felix D.: *See—*
Bragin, Boris F.; and Markuntovich, Felix D., 4,635,900, Cl. 251-326.000.

Marley, David J.: *See—*
Hosilyk, Randall E.; Marley, David J.; and Hosilyk, Rodney E., 4,635,876, Cl. 242-195.000.

Marmillion, David J., to Allied Corporation. Insert for an electrical connector. 4,636,020, Cl. 339-59.00M.

Marold, Freimut: *See—*
Heisel, Michael; Marold, Freimut; and Linde, Gerhard, 4,636,377, Cl. 423-575.000.

Marquardt, Ulrich; and Seebold, Ralf, to Siemens Aktiengesellschaft. Contact assembly having a current-dependent force increasing the contact force. 4,636,762, Cl. 335-195.000.

Marshall, Lee, to Slautterback Corporation. Bulk unloader of solidified thermoplastic material from pails and drums. 4,635,820, Cl. 222-63.000.

Martin, Francis J.; and Kung, Viola T., to Cooper-Lipotech, Inc. Enhanced agglutination method and kit. 4,636,479, Cl. 436-533.000.

Martin, Hans, to Emhart Industries, Inc. Apparatus for reading a line marking. 4,636,623, Cl. 235-436.000.

Martin, Laurent: *See—*
Bethuel, Louis; Martin, Laurent; and Dujardin, Thierry, 4,636,290, Cl. 204-186.000.

Martin Marietta Corporation: *See—*
Staudinger, Frank X., 4,635,341, Cl. 29-566.300.

Martin, Thomas W., to Minnesota Mining and Manufacturing Company. Dental polishing tip. 4,636,171, Cl. 433-134.000.

Martinez, Jean; Bali, Jean-Pierre; Castro, Bertrand; Nisato, Dino; and Demarne, Henri, to Sanofi; and Centre National de la Recherche Scientifique. Novel peptidic derivatives inhibiting gastric secretion, process for preparing them and drugs containing them. 4,636,490, Cl. 514-15.000.

Martock Design Limited: *See—*
Hall, Kenneth F.; and Chambers, George, 4,635,887, Cl. 248-179.000.

Maruchi, Sachio: *See—*
Shibano, Tomishi; Kimura, Itsuo; and Maruchi, Sachio, 4,636,432, Cl. 428-327.000.

Masada, Osamu: *See—*
Takahashi, Masahide; Sakai, Seiichi; Masada, Osamu; Ukawa, Masaru; and Onishi, Hamao, 4,636,931, Cl. 363-71.000.

Masaki, Yuichi, to Canon Kabushiki Kaisha. Image forming apparatus with shutter array element. 4,636,817, Cl. 346-160.000.

Maschinenfabrik Heid Aktiengesellschaft: *See—*
Holy, Franz; and Steiner, Karl, 4,635,329, Cl. 29-27.00C.

Masciale, John M.: *See—*
Kubacki, Edward F.; and Masciale, John M., 4,635,545, Cl. 101-4.000.

Mashiko, Yoji: *See—*
Nishioka, Tadashi; Koyama, Hiroshi; and Mashiko, Yoji, 4,636,400, Cl. 427-39.000.

Mason, Arthur G.: *See—*
Crowther, Gerald O.; and Mason, Arthur G., 4,636,854, Cl. 358-123.000.
Drury, Gordon M.; Mason, Arthur G.; Lodge, Nicolas K.; and Flannaghan, Barry A., 4,636,851, Cl. 358-119.000.

Mass. Institute of Technology: *See—*
Raffel, Jack I.; Yasaitis, John A.; and Chapman, Glenn H., 4,636,404, Cl. 427-53.100.

Massachusetts Institute of Technology: *See—*
Growdon, John H.; and Wurtman, Richard J., 4,636,494, Cl. 514-78.000.
Salisbury, John K., Jr.; and Brock, David L., 4,635,479, Cl. 73-862.040.

Masuda, Shuji: *See—*
Watarai, Hisao; Tanaka, Masahiro; Masuda, Shuji; Suzuki, Kenji; and Masumoto, Tsuyoshi, 4,636,806, Cl. 346-1.100.

Masumoto, Tsuyoshi: *See—*
Watarai, Hisao; Tanaka, Masahiro; Masuda, Shuji; Suzuki, Kenji; and Masumoto, Tsuyoshi, 4,636,806, Cl. 346-1.100.

Masumura, Masanori: *See—*
Imaizumi, Masahiro; Masumura, Masanori; Ishikawa, Takeshi; and Hosoya, Eiji, 4,635,506, Cl. 74-745.000.

Masuyama, Takayuki: *See—*
Nomura, Iwao; Masuyama, Takayuki; Tanigawa, Yasuo; and Hasimoto, Hirofumi, 4,636,136, Cl. 414-730.000.

Matake, Kozo: *See—*
Iwata, Minoru; and Matake, Kozo, 4,636,672, Cl. 310-87.000.

Matejec, Reinhart: *See—*
Becker, Manfred; Matejec, Reinhart; and Endres, Lothar, 4,636,461, Cl. 430-567.000.

Mathews, Roger A.; and Cannell, David W., to Redken Laboratories, Inc. Method for evaluating efficacy of a hair styling product. 4,635,654, Cl. 132-7.000.

Matkin, Josef; and Treleaven, Richard J., to Minnesota Mining and Manufacturing Company. Pressure-fixable toner material and method of making same. 4,636,451, Cl. 430-109.000.

Matrix Instruments Inc.: *See—*
Balasubramanian, N., 4,636,069, Cl. 356-71.000.

Matsuda, Koichi; Kondo, Nobuaki; and Tanaka, Yuji, to Nissan Motor Co., Ltd.; and Ikeda Bussan Co., Ltd. Lock mechanism for adjustable seat. 4,635,890, Cl. 248-429.000.

Matsuda, Masami: *See—*
Kawamura, Fumio; Matsuda, Masami; Aoyama, Yoshiyuki; Chino, Koichi; and Mizumoto, Mamoru, 4,636,335, Cl. 252-629.000.

Matsui, Kazuma: *See—*
Nakamura, Kanehito; Matsui, Kazuma; Kurahashi, Takashi; and Ishikawa, Hiroshi, 4,636,643, Cl. 250-338.000.

Matsui, Yukinori: *See—*
Uchiyama, Hiroshi; and Matsui, Yukinori, 4,636,297, Cl. 208-48.0AA.

Matsukura, Hiroyuki; and Yamauchi, Fumio, to NEC Corporation. Low-noise type impact printer. 4,636,101, Cl. 400-690.000.

Matsumoto, Takanao: *See—*
Yamano, Masaru; Sakai, Takashi; Furukawa, Nobuhiro; Murakami, Shuzo; and Matsumoto, Takanao, 4,636,445, Cl. 429-53.000.

Matsumura, Susumu, to Canon Kabushiki Kaisha. Focus detecting apparatus. 4,636,627, Cl. 250-201.000.

Matsumura, Takayoshi: *See—*
Nomura, Noboru; Kugimiya, Koichi; Matsumura, Takayoshi; and Yonezawa, Taketoshi, 4,636,077, Cl. 356-356.000.

Matsunaga, Kuniyoshi: *See—*
Itoh, Nobuya; and Matsunaga, Kuniyoshi, 4,636,465, Cl. 435-15.000.

Matsuno, Takeshi, to Seiko Seiki Kabushiki Kaisha. Hermetically sealed magnetic disk cartridge. 4,636,904, Cl. 360-133.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Deguchi, Takashi; Kadono, Masahiro; and Naka, Shinji, 4,636,928, Cl. 363-41.000.
Kyoden, Hiroshi; Endo, Yasuhiro; Fujiwara, Teiichi; Mimura, Toshisada; Nishikawa, Kihachiro; and Nishizawa, Shoichi, 4,636,969, Cl. 364-560.000.
Makino, Masashi; Nakada, Kunio; Muragishi, Isao; and Nishitani, Syozi, 4,635,403, Cl. 51-94.00R.
Minakuchi, Hiroshi; Kunihira, Tadashi; and Igarashi, Yoshiaki, 4,636,696, Cl. 318-327.000.
Nomura, Noboru; Kugimiya, Koichi; Matsumura, Takayoshi; and Yonezawa, Taketoshi, 4,636,077, Cl. 356-356.000.

Matsushita Electric Works, Ltd.: *See—*
Tanahashi, Masao; Hamashima, Tetsuo; and Kumano, Humihiro, 4,635,360, Cl. 30-34.200.

Matsuta, Shigetoshi, to Alps Electric Co., Ltd. UHF mixing circuit having π configured impedance converter. 4,637,070, Cl. 455-331.000.

Matsuura, Masaru, to Kikkoman Corporation. Process for production of sterilized packed tofu. 4,636,398, Cl. 426-634.000.

Matsuura, Ryoichi: *See—*
Tsuru, Naohiko; Matsuura, Ryoichi; Otsuki, Hiromi; Fujinami, Hiroshi; Hori, Shinichi; Nomura, Yoshihisa; and Oka, Hiroyuki, 4,636,009, Cl. 303-93.000.

Matsuura, Shigeo: *See—*
Kaizaki, Kazuhiro; Kubota, Sadao; Harada, Hiroshi; and Matsuura, Shigeo, 4,636,863, Cl. 358-167.000.

Matsuzaki, Kazuhiro, to Kabushiki Kaisha Toshiba. Method for producing hybrid integrated circuit. 4,635,346, Cl. 29-577.00R.

Matthaei, Lothar: *See—*
Kossmann, Heribert; Matthaei, Lothar; Ley, Gregor; Wistuba, Eckehardt; and Wulgaris, Savas, 4,636,548, Cl. 524-524.000.

Matthews, Graham L.: *See—*
Yin, Candido C.; and Matthews, Graham L., 4,636,227, Cl. 55-74.000.

Maurer, Arnolf; and Siebold, Horst, to Siemens Aktiengesellschaft. Gradient coil system for a nuclear spin tomography installation. 4,636,729, Cl. 324-318.000.

Maurer, Martin: *See—*
Hayd, Axel; Meinke, Peter; Maurer, Martin; and Schwarz, Joachim, 4,636,607, Cl. 219-121.0LM.

Maust, Blair A.: *See—*
Dennison, Thomas M.; and Maust, Blair A., 4,636,014, Cl. 303-54.000.

Mawby, Harold S.; and Harris, Duane H., to White Consolidated Industries, Inc. Ice maker. 4,635,444, Cl. 62-125.000.
Maxcap, Inc.: *See*—
Nolan, Robert L., 4,635,808, Cl. 215-252.000.
Maxim Integrated Products, Inc.: *See*—
Bingham, David; and Allen, Charles M., 4,636,930, Cl. 363-60.000.
Maxon Corporation: *See*—
Rollins, Jack; Coppin, William; and Karabin, Thaddeus, 4,635,898, Cl. 251-229.000.
Mayr, Adolfo; Susa, Ermanno; Leccese, Antonio; Davoli, Velmore; and Giachetti, Ettore, to Montecatini Edison S.p.A. Polymerization catalysts. 4,636,486, Cl. 502-121.000.
Mazda Motor Corporation: *See*—
Tarumoto, Kouji; Miyata, Jun; Yagii, Koji; and Nanba, Satoshi, 4,636,285, Cl. 204-38.500.
McClure, Richard J., to Eastman Kodak Company. Piezoelectric driven mass storage. 4,636,893, Cl. 360-101.000.
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Kelley, Frederick T., 4,635,940, Cl. 273-347.000.
McCorkel, Franklin M., to Aggregates Equipment, Inc. Reversible, axially fed, cage rotor impact breaker. 4,635,863, Cl. 241-188.00A.
McCracken, Oliver W.: *See*—
Schwendemann, Kenneth L.; McCracken, Oliver W.; Mondon, Cary G.; and Wortham, Larry C., 4,636,934, Cl. 364-132.000.
McCullough, Michael A.: *See*—
Flora, Laurence P.; and McCullough, Michael A., 4,637,018, Cl. 371-1.000.
McDaniel, Stephen K.: *See*—
Liu, Ming; Bowbin, John F.; Ghislain, Raymond L.; and McDaniel, Stephen K., 4,635,536, Cl. 92-24.000.
McDonald, David L, to Cincinnati Milacron Inc. Conveyor. 4,635,788, Cl. 198-848.000.
McDonald, George M., to A. O. Smith Corporation. Flexible mounting system for electric motors. 4,636,673, Cl. 310-91.000.
McDonough, David C. Multiple axis linearly adjustable support. 4,635,891, Cl. 248-542.000.
McDougall, Malcolm K., to Budd Company, The. Method of molding fiber reinforced composite wheel. 4,636,344, Cl. 264-102.000.
McDowell, David E., to Amway Corporation. Filter stack. 4,636,232, Cl. 55-350.000.
McFarlane, Finley E.: *See*—
Beavers, Randy S.; McFarlane, Finley E.; Musser, Harry R.; and Shepherd, Freddie A., 4,636,442, Cl. 428-480.000.
McGeehee, Ronald W. Saw guide oil system. 4,635,513, Cl. 83-169.000.
McGeorge, Gram J., to Robertshaw Controls Company. Electrically operated appliance controls and methods of making the same. 4,636,621, Cl. 219-506.000.
McGinn, Vincent P. Photo-conductive element operative in the microwave region and a light-steerable antenna array incorporating the photo-conductive element. 4,636,794, Cl. 342-368.000.
McGuire, Jeffrey C.; Montgomery, John P.; and Yang, Huei-Hsuing, to Genex Corporation. Phenylalanine ammonia lyase-producing microbial cells. 4,636,466, Cl. 435-108.000.
McGuire, Samuel B., Sr.; and Jaderborg, Lee V., to Eaton Leonard Corporation. Tube bending mandrel. 4,635,464, Cl. 72-466.000.
McGuirk, Paul R.: *See*—
Gilligan, Paul J.; McGuirk, Paul R.; and Witty, Michael J., 4,636,506, Cl. 514-256.000.
McHenry, Kenneth A.: *See*—
Wallace, William K.; and McHenry, Kenneth A., 4,635,731, Cl. 173-12.000.
McKervey, M. Anthony: *See*—
Harris, Stephen J.; McKervey, M. Anthony; Melody, David P.; Woods, John; and Rooney, John M., 4,636,539, Cl. 523-214.000.
McLaughlin, Kevin L., to Motorola, Inc. BIMOS memory sense amplifier. 4,636,665, Cl. 307-530.000.
McMahon, Donald H.; and Soref, Richard A., to Sperry Corporation. Microwatt battery powered optical sensor. 4,636,636, Cl. 250-227.000.
McMurtrey, David K., to Wald Manufacturing Co., Inc. Bicycle handlebar brace. 4,635,499, Cl. 74-551.100.
McMurtry, David R., to Renishaw Electrical Limited. Method of operating a machine tool with a sensing probe in order to gather positional data for the calculation of tool offset parameters. 4,636,960, Cl. 364-474.000.
McNeel, William O.: *See*—
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McNeely, David L.; and Fling, Russell T., to RCA Corporation. Adaptive luminance-chrominance separation apparatus. 4,636,840, Cl. 358-31.000.
McNeill, Andrew B., Jr.: *See*—
Dixon, Jerry D.; Farrell, Robert H.; Marazas, Gerald A.; McNeill, Andrew B., Jr.; and Merckel, Gerald U., 4,637,024, Cl. 371-67.000.
McPeek, Nathaniel K.: *See*—
Thigpen, Ben B.; Crump, E. Eugene; Johnston, Otis A.; McPeek, Nathaniel K.; and McNeel, William O., 4,637,000, Cl. 367-172.000.
McQueen, Sidney J., to Continental Technology Corporation; and Goodman, Gerald. Adjustable firearm stabilizer. 4,635,528, Cl. 89-14.300.
McTyre, Scott B. Attachment for a display position indicator. 4,635,496, Cl. 74-471.0XY.
Mead Corporation, The: *See*—
Head, Donald L., 4,636,807, Cl. 346-1.100.
Meckl, Heinz; Kampfer, Helmut; and Haseler, Helmut, to Agfa Gevaert Aktiengeselischaft. Photographic recording material and process for the production of photographic images. 4,636,460, Cl. 430-442.000.
Meckler, Gershon, to Camp Dresser & McKee. Dehumidification apparatus. 4,635,446, Cl. 62-271.000.
Medeco Security Locks, Inc.: *See*—
Oliver, Roy N., 4,635,455, Cl. 70-364.00A.
Medical College of Wisconsin Research Foundation, Inc., The: *See*—
Brown, Charles E., 4,635,643, Cl. 128-653.000.
Mee, Geoffrey R.; and Rosen, Philip, to Brush Fusegear Limited. Automatic sectionalizer. 4,636,764, Cl. 337-169.000.
Mego, Kazuyoshi; Hiratsuka, Shigetoshi; and Hara, Eiichi, to Hitachi, Ltd. Thermal print head. 4,636,813, Cl. 346-76.0PH.
Mehl, Wolfgang; and Amon, Albert, to Sicpa Holding S.A. Heat transfer printing of natural silk substrates. 4,636,223, Cl. 8-471.000.
Meininger, Siegfried: *See*—
Kratz, Gerhard; Meininger, Siegfried; Fischer, Eckhard; and Bege, Dietmar, 4,636,363, Cl. 422-159.000.
Meinke, Peter: *See*—
Hayd, Axel; Meinke, Peter; Maurer, Martin; and Schwarz, Joachim, 4,636,607, Cl. 219-121.0LM.
Meins, Juergen, to Thyssen Industrie AG. Heteropolar magnet. 4,636,666, Cl. 310-13.000.
Meins, Jurgen: *See*—
Holzinger, Gerhard; Meins, Jurgen; and Miller, Luitpold, 4,636,667, Cl. 310-13.000.
Melody, David P.: *See*—
Harris, Stephen J.; McKervey, M. Anthony; Melody, David P.; Woods, John; and Rooney, John M., 4,636,539, Cl. 523-214.000.
Melville, James B., to Lever Brothers Company. Perfume depositing detergents containing perfume in a particulate matrix of a cationic compound. 4,636,330, Cl. 252-174.110.
Menche, Edgar, to Leopold Kostal GmbH & Co., KG. Electrical snap switch. 4,636,597, Cl. 200-68.100.
Menet, Frederick P.: *See*—
Bialy, Louis; and Menet, Frederick P., 4,635,907, Cl. 267-8.00R.
Mengel, Hans-Eckhard: *See*—
Schillinger, Hans; Pahlke, Klaus; Starke, Siegfried; Panhorst, Heinz-Juergen; and Mengel, Hans-Eckhard, 4,635,738, Cl. 175-398.000.
Menke, Jeffery W.; and Riediger, Craig W., to Caterpillar Inc. Vehicle boom lock. 4,636,132, Cl. 414-694.000.
Meno, Frank. Segmented fret electronic musical instrument. 4,635,518, Cl. 84-1.160.
Mensah, Thomas O.; and Powers, Dale R., to Corning Glass Works. Curing apparatus for coated fiber. 4,636,405, Cl. 427-54.100.
Mentzer, William R., to Kidde, Inc. Crane boom locking pin insertion indicator and actuator means. 4,635,805, Cl. 212-230.000.
Menz, William: *See*—
Boland, Donald P.; Menz, William; and Seimetz, Glen R., 4,635,983, Cl. 293-111.100.
Merchant, William. Spruce spring bridge support for stringed instrument. 4,635,523, Cl. 84-307.000.
Merck & Co., Inc.: *See*—
Bock, Mark G.; DiPardo, Robert M.; Boger, Joshua S.; Evans, Ben E.; and Freidinger, Roger, 4,636,491, Cl. 514-16.000.
Merckel, Gerald U.: *See*—
Dixon, Jerry D.; Farrell, Robert H.; Marazas, Gerald A.; McNeill, Andrew B., Jr.; and Merckel, Gerald U., 4,637,024, Cl. 371-67.000.
Meritcraft Ltd.: *See*—
Hulse, Anthony J.; Hulse, Neville G.; and Egan, Terence, 4,635,692, Cl. 144-286.00R.
Merkle, Josef, to Daimler-Benz Aktiengesellschaft. Independent wheel suspension for a wheel of a vehicle. 4,635,957, Cl. 280-663.000.
Merten, Rudolf: *See*—
Sirinyan, Kirkor; Wolf, Gerhard D.; von Gizycki, Ulrich; and Merten, Rudolf, 4,636,441, Cl. 428-447.000.
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Metal Box, p.l.c.: *See*—
Oakley, John R., 4,636,187, Cl. 493-134.000.
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Kenney, George B., 4,636,339, Cl. 264-12.000.
Metcalfe, Robert S.: *See*—
Sheffield, Miller; Metcalfe, Robert S.; Calvin, James W.; and Chaback, Joseph J., 4,635,721, Cl. 166-268.000.
Meteor AG: *See*—
Arnold, Ernst, 4,635,865, Cl. 242-7.030.
Mettoudi, Isaac, to Alcatel Thomson Faisceaux Herziens. Frequency multiplier for millimeter waves having means for adjusting harmonic frequency. 4,636,758, Cl. 333-218.000.
Meyer, Horst: *See*—
Niemers, Ekkehard; Grutzmann, Rudi; Mardin, Mithat; Busse, Wolf-Dieter; and Meyer, Horst, 4,636,497, Cl. 514-215.000.
Meyers, Paul A.: *See*—
Dorman, Linneaus C.; and Meyers, Paul A., 4,636,526, Cl. 521-61.000.
Michael, Mark W.: *See*—
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Michaux, Jean-Pierre: *See*—
Missout, Bernard M.; Michaux, Jean-Pierre; and Piova, Jean-Luc, 4,635,430, Cl. 57-6.000.
Microdot Inc.: *See*—
Beck, Gerald H., 4,635,945, Cl. 277-124.000.
Microdyne Corporation: *See*—
Woodworth, Donald J.; and Magin, Gregory A., 4,636,736, Cl. 329-50.000.
Micromanipulator Microscope Co., Inc.: *See*—
Podvin, T. Charles, 4,636,078, Cl. 356-359.000.
Microtek Storage Corporation: *See*—
Dalziel, Warren L.; Flanigan, Charles; Daniels, Donald V.; Lee, John S.; and Johnston, James, 4,636,902, Cl. 360-128.000.
Midavaine, Thierry R.; and Ouhayoun, Michel M., to SAT. Switching laser. 4,637,030, Cl. 372-82.000.
Middleton, William J., Jr., to E-Systems, Inc. Electrical connector for spiral antenna and resistive/capacitive contact therefor. 4,636,802, Cl. 343-895.000.
Mikalsen, Arthur, to Exxon Printing Systems, Inc. System to linearly supply phase change ink jet. 4,636,803, Cl. 346-1.100.
Mikkelsen, Per W., to Wittenborgs Automatfabriker A/S. Vending machine delivering cups containing freshly made beverages. 4,635,816, Cl. 221-11.000.
Milbar Corporation: *See*—
Box, Joe G., 4,635,510, Cl. 81-319.000.
Milewits, Marvin: *See*—
Kahil, John E.; Milewits, Marvin; Bradfield, James E.; and Lam, Clive C., 4,636,727, Cl. 324-227.000.
Miller Fluid Power Corporation: *See*—
Liu, Ming; Bowbin, John F.; Ghislain, Raymond L.; and McDaniel, Stephen K., 4,635,536, Cl. 92-24.000.
Miller, George H.: *See*—
Nagabhushan, Tattanahali L.; Miller, George H.; Schwartz, Jerome; and Ostrander, Michael R., 4,636,383, Cl. 424-85.000.
Miller, Lillias S. Holding screw. 4,636,121, Cl. 411-21.000.
Miller, Luitpold: *See*—
Holzinger, Gerhard; Meins, Jurgen; and Miller, Luitpold, 4,636,667, Cl. 310-13.000.
Miller, Wayne G.: *See*—
Nielsen, J. McHenry; and Miller, Wayne G., 4,636,211, Cl. 623-6.000.
Millet, Claude: *See*—
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Milliner, Ken M.: *See*—
Sexstone, John H.; Finn, Everett N.; Lowe, Byron L.; and Milliner, Ken M., 4,636,183, Cl. 493-42.000.
Millis, Edwin G.; Bimer, Thomas C.; and Lewis, Alton D., to Texas Instruments Incorporated. Semiconductor slice cassette transport unit. 4,636,128, Cl. 414-217.000.
Mills, Keith: *See*—
Coates, Ian H.; Mills, Keith; Webb, Colin F.; Dowle, Michael D.; and Baya, David E., 4,636,521, Cl. 514-415.000.
Mimura, Toshisada: *See*—
Kyoden, Hiroshi; Endo, Yasuhiro; Fujiwara, Teiichi; Mimura, Toshisada; Nishikawa, Kihachiro; and Nishizawa, Shoichi, 4,636,969, Cl. 364-560.000.
Minakuchi, Hiroshi; Kunihira, Tadashi; and Igarashi, Yoshiaki, to Matsushita Electric Industrial Co., Ltd. Servo system. 4,636,696, Cl. 318-327.000.
Minatelli, John A.: *See*—
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Mine, Toshisuke: *See*—
Kuroswa, Toshiaki; Shima, Seiya; Ando, Takeki; Inaba, Hiromi; Nakashima, Hajime; and Mine, Toshisuke, 4,636,932, Cl. 363-54.000.
Mine, Yasuhiro: *See*—
Umio, Suminori; Kamimura, Toshiaki; Kamishita, Takuzo; and Mine, Yasuhiro, 4,636,520, Cl. 514-399.000.
Mineck, Fred, to Lindsley, Warren F. B., a part interest. Detachably mounted add on sun visor for vehicles. 4,635,995, Cl. 296-97.00G.
Minigrip: *See*—
Ausnit, Steven, 4,637,060, Cl. 383-37.000.
Minister of National Defence of Her Majesty's Canadian Government: *See*—
Carrier, Christian J. L.; and Shea, Charles J., 4,635,527, Cl. 89-1.816.
Ministry of International Trade & Industry: *See*—
Ichikawa, Kiyoshi, 4,636,355, Cl. 420-590.000.
Minkow, Roger E. Weight lifting type exercising device. 4,635,926, Cl. 272-118.000.
Minnesota Mining and Manufacturing Company: *See*—
Martin, Thomas W., 4,636,171, Cl. 433-134.000.
Matkin, Josef; and Treleaven, Richard J., 4,636,451, Cl. 430-109.000.
Thompson, Robert W., 4,636,059, Cl. 355-5.000.
Valbusa, Luigi; Coraluppi, Enzo; Quaglia, Andrea; and Tavella, Mario, 4,636,457, Cl. 430-267.000.
Mino, Shinjiro: *See*—
Okada, Takashi; Mogi, Takao; and Mino, Shinjiro, 4,636,855, Cl. 358-124.000.
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Bowsher, John M., 4,636,052, Cl. 354-410.000.
Ishida, Tokuji; and Hamada, Masataka, 4,636,624, Cl. 250-201.000.
Tokumaru, Hisashi, 4,636,040, Cl. 350-427.000.
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Mirtach, Frank: *See*—
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Misawa, Makoto: *See*—
Ahagon, Asahiro; Kobayashi, Toshio; Yamada, Kazuhiro; Doi, Seiichi; and Misawa, Makoto, 4,635,693, Cl. 152-209.00R.
Mishiro, Shoji, to Taga Electric Co., Ltd. Driving control method of ultrasonic transducer. 4,635,483, Cl. 73-579.000.
Missout, Bernard M.; Michaux, Jean-Pierre; and Piova, Jean-Luc, to Societe Anonyme de Telecommunications; and Societe Industrielle de Liaisons Electriques. Device for dispensing optical fibers into helical grooves of a ring. 4,635,430, Cl. 57-6.000.
Misumi, Akira, to Hitachi, Ltd. Directly heated cathode. 4,636,681, Cl. 313-346.00R.
Misumi, Teruo: *See*—
Ogawa, Kyosuke; Shirai, Shigeru; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,636,450, Cl. 430-84.000.
Mita Industrial Co. Ltd.: *See*—
Iida, Kazumi; Ohata, Yosuke; Hyodo, Keiichiro; Akiyama, Kazunori; Umeda, Tadashi; and Kishimoto, Keiichi, 4,636,057, Cl. 355-3.00R.
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Mitsubishi Chemical Industries Ltd.: *See*—
Tada, Akira; Morita, Takamitsu; Teraue, Takeshi; and Kusumoto, Yoshihiro, 4,636,554, Cl. 525-359.300.
Mitsubishi Denki K.K.: *See*—
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Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujita, Jiro; and Yamane, Iwao, 4,635,574, Cl. 112-121.120.
Ido, Kihei, 4,636,877, Cl. 360-51.000.
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Kamo, Kazuhiko; Suwahara, Hiroshi; and Nakane, Ryuji, 4,636,610, Cl. 219-124.020.
Kato, Hisao, 4,636,699, Cl. 318-568.000.
Kawaguchi, Susumu; Hirahara, Takuho; Nakane, Kazuhiro; and Ueda, Sei, 4,636,152, Cl. 418-54.000.
Morishita, Mitsuharu; Hara, Tadayuki; Kohge, Shinichi; Watanabe, Tetsushi; and Ikari, Yasuki, 4,635,741, Cl. 180-79.100.
Nakamura, Tooru; and Higashino, Shigenori, 4,636,929, Cl. 363-36.000.
Nishioka, Tadashi; Koyama, Hiroshi; and Mashiko, Yoji, 4,636,400, Cl. 427-39.000.
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Kamo, Kazuhiko; Suwahara, Hiroshi; and Nakane, Ryuji, 4,636,610, Cl. 219-124.020.
Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Yoshimura, Hironori; and Toyama, Jhunichi, 4,636,252, Cl. 75-238.000.
Mitsubishi Mining & Cement Co., Ltd.: *See*—
Ogata, Yasuyuki; and Shinohara, Yoshinori, 4,636,248, Cl. 75-0.5AA.
Mitsubishi Paper Mills. Ltd.: *See*—
Furukawa, Akira; Senga, Takao; and Suzuki, Shigeyoshi, 4,636,452, Cl. 430-112.000.
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Mitsubishi Rayon Co., Ltd.: *See*—
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Kamiyo, Sumio; and Yoshihiro, Mitsuto, 4,636,536, Cl. 523-137.000.
Mitsumi, Katoh, to Nippon Gakki Seizo Kabushiki Kaisha. Tone waveshape forming device. 4,635,520, Cl. 84-1.260.
Mittleman, Steven: *See*—
Crossley, Ian; Donoghue, Daniel; Mittleman, Steven; and Nash, Seth, 4,637,068, Cl. 455-327.000.
Mitutoyo Mfg. Co., Ltd.: *See*—
Nagai, Ryo, 4,636,630, Cl. 250-214.00R.
Mitzlaff, James E., to Motorola, Inc. Multi-level power amplifying circuitry for portable radio transceivers. 4,636,741, Cl. 330-127.000.
Mixan, Craig E.: *See*—
Werner, John A.; Wilson, Charles A.; and Mixan, Craig E., 4,636,565, Cl. 546-345.000.
Miyada, Thomas S. Inertial safety system for cars. 4,635,962, Cl. 280-749.000.
Miyagawa, Tomoyuki: *See*—
Nakano, Yoshihisa; Ohira, Masatoshi; Ushida, Manabu; Miyagawa, Tomoyuki; and Shimodaira, Toshiya, 4,635,959, Cl. 280-707.000.
Miyagi, Yukio: *See*—
Seo, Akira; Kanno, Hideo; Hasegawa, Nobu; Miyagi, Yukio; Nishimura, Akira; Konaka, Shigeo; Ohmi, Tetsuto; Munechika, Yukimi; Uchida, Matazaemon; and Ikeda, Kenichi, 4,636,519, Cl. 514-397.000.
Miyanaga, Masaaki, to Kabushiki Kaishi Miyanaga. Undercutting drill. 4,635,737, Cl. 175-284.000.
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Nagata, Tomizoe; and Miyaoka, Norikuni, 4,636,184, Cl. 493-98.000.
Miyashita, Tsuneo; Yoshikoshi, Hideyuki; Nishio, Hiroaki; and Takeuchi, Osamu, to Nippon Kokan Kabushiki Kaisha. Method for continuously manufacturing non-fired pellets. 4,636,342, Cl. 264-82.000.

Miyata, Jun: *See—*
Tarumoto, Kouji; Miyata, Jun; Yagii, Koji; and Nanba, Satoshi, 4,636,285, Cl. 204-38.500.
Miyauchi, Nobuyuki: *See—*
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Miyazaki, Kunio: *See—*
Okamura, Hisanori; Akiyama, Hirosi; Kamoshita, Mutuo; and Miyazaki, Kunio, 4,636,434, Cl. 428-328.000.
Miyazaki, Makoto; Yomoda, Minoru; and Suzuki, Takehiko, to Canon Kabushiki Kaisha. Wafer conveying apparatus with alignment mechanism. 4,635,373, Cl. 33-180.00R.
Miyazaki, Minoru: *See—*
Yamazaki, Shunpei; Tashiro, Mamoru; and Miyazaki, Minoru, 4,636,401, Cl. 427-39.000.
Mizumoto, Mamoru: *See—*
Kawamura, Fumio; Matsuda, Masami; Aoyama, Yoshiyuki; Chino, Koichi; and Mizumoto, Mamoru, 4,636,335, Cl. 252-629.000.
Mizuno, Keiichiro; Iida, Kazuyoshi; and Murakami, Kazutomo, to Bridgestone Corporation. Gears with damped vibration. 4,635,501, Cl. 74-574.000.
Mizuno, Yutaka: *See—*
Kishi, Hajimu; Seki, Masaki; and Mizuno, Yutaka, 4,636,937, Cl. 364-191.000.
Mo, Frank S. C., to Censtor Corp. Recording head slider assembly. 4,636,894, Cl. 360-103.000.
Mobbs, Christopher I.; and Rhodes, J. David, to Filtronic Components Limited. Temperature compensated capacitor. 4,636,913, Cl. 361-182.000.
Mobil Oil Corporation: *See—*
Chew, Ju-Nam, 4,635,720, Cl. 166-245.000.
Ginsburg, Merrill S., 4,636,955, Cl. 364-420.000.
Lumley, Edward M.; and Bowman, Bonita F., 4,636,993, Cl. 367-65.000.
Rubin, Mae K., 4,636,373, Cl. 423-328.000.
Modera, Mark P.; and Sherman, Max H. Methods and apparatus for measuring the tightness of enclosures. 4,635,469, Cl. 73-40.000.
Modugno, Joseph J.; and Klimley, William R., to Xerox Corporation. Dual-mode copier document feeder and computer forms web restacker. 4,635,916, Cl. 271-3.000.
Moehwald, Helmut, to BASF Aktiengesellschaft. Composite material consisting of porous materials and electrically conductive polymers. 4,636,430, Cl. 428-304.400.
Mogi, Takao: *See—*
Okada, Takashi; Mogi, Takao; and Mino, Shinjiro, 4,636,855, Cl. 358-124.000.
Mohondro, William R., to Kaiser Aluminum & Chemical Corporation. Process for manufacturing clad aluminum-lithium alloys. 4,635,842, Cl. 228-175.000.
Mohr, Gerard: *See—*
Mohr, Pierre; and Mohr, Gerard, 4,635,557, Cl. 104-7.200.
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Moles, Warren H.; and Dischert, Robert A., to RCA Corporation. Field comb for luminance separation of NTSC signals. 4,636,841, Cl. 358-31.000.
Molex Incorporated: *See—*
Brinkman, Donald J.; and Leonard, Russell J., 4,635,355, Cl. 29-747.000.
Molins PLC: *See—*
Bolt, Reginald C.; Dyett, Derek H.; and Williams, Robert E., 4,635,653, Cl. 131-281.000.
Mollmann, Henry C.: *See—*
Jaisle, Richard F.; Mollmann, Henry C.; Albers, Martha J.; and Burgess, James H., 4,636,443, Cl. 428-481.000.
Monarch Machine Tool Co.: *See—*
Bradlee, Charles R., 4,635,458, Cl. 72-165.000.
Monarch Marking Systems, Inc.: *See—*
Goubeaux, Donald E., 4,636,097, Cl. 400-196.100.
Huggins, Orville C., 4,635,547, Cl. 101-292.000.
Monceaux, Philippe: *See—*
Segard, Emile; and Monceaux, Philippe, 4,636,390, Cl. 426-18.000.
Mondon, Cary G.: *See—*
Schwendemann, Kenneth L.; McCracken, Oliver W.; Mondon, Cary G.; and Wortham, Larry C., 4,636,934, Cl. 364-132.000.
Monneraye, Marc A.: *See—*
Baudry, Hugues; Monneraye, Marc A.; and Morhaim, Claude, 4,636,257, Cl. 106-19.000.
Montecatini Edison S.p.A.: *See—*
Mayr, Adolfo; Susa, Ermanno; Leccese, Antonio; Davoli, Velmore; and Giachetti, Ettore, 4,636,486, Cl. 502-121.000.
Montedison S.p.A.: *See—*
Clementini, Luciano; and Camprincoli, Pier P., 4,636,436, Cl. 428-364.000.
Montgomery, John P.: *See—*
McGuire, Jeffrey C.; Montgomery, John P.; and Yang, Huei-Hsuing, 4,636,466, Cl. 435-108.000.
Mooney, Charles W.; Phipps, Robert E.; and Kuznicki, William J., to Motorola, Inc. Twist-off detachable belt clip assembly. 4,635,836, Cl. 224-247.000.
Moore Business Forms: *See—*
Jerabek, Richard J., 4,636,818, Cl. 346-213.000.
Moore, Peter G.; and Davidson, John D., to Ferranti, plc. Position servo system. 4,636,700, Cl. 318-611.000.
Moore, Stephen J.: *See—*
Nowack, William C.; Moore, Stephen J.; and Weger, Kenneth F., Jr., 4,635,422, Cl. 52-406.000.
Morand, Verne J.: *See—*
Petersen, Walter J.; Svendsen, John M.; and Morand, Verne J., 4,636,617, Cl. 219-375.000.
Morell, Charles J.; and Strickland, Mark D., to Kimberly-Clark Corporation. Dusting cloth. 4,636,429, Cl. 428-288.000.
Morellini, Peter. Protection apparatus. 4,635,781, Cl. 192-150.000.
Morgan, Scott J. Tape splicing mechanism. 4,636,279, Cl. 156-506.000.
Morhaim, Claude: *See—*
Baudry, Hugues; Monneraye, Marc A.; and Morhaim, Claude, 4,636,257, Cl. 106-19.000.
Mori, Kei. Light diverting device. 4,636,028, Cl. 350-96.150.
Mori, Nobufumi; Takahashi, Kenji; and Horikawa, Kazuo, to Fuji Photo Film Co., Ltd. Radiation image read-out method and apparatus. 4,636,641, Cl. 250-327.200.
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Itakura, Sakae; and Morikawa, Osamu, 4,636,919, Cl. 361-414.000.
Morimoto, Atsutaka; and Takahashi, Shoji, to Citizen Watch Co., Ltd. Voltage monitoring system for an electric power source of a disc drive. 4,636,905, Cl. 360-137.000.
Morimoto, Kenichi: *See—*
Takai, Yasuhiro; Morimoto, Kenichi; Yoshida, Shigekazu; and Tagawa, Takao, 4,636,063, Cl. 355-68.000.
Morino, Masuaki; Fujikawa, Yoshiyuki; Haneda, Isamu; and Myoi, Tetsuo, to Sharp Kabushiki Kaisha. Personal type computer with execution of programs in ROM and RAM. 4,636,970, Cl. 364-706.000.
Morishita, Mitsuharu; Hara, Tadayuki; Kohge, Shinichi; Watanabe, Tetsushi; and Ikari, Yasuki, to Mitsubishi Denki Kabushiki Kaisha. Power steering apparatus. 4,635,741, Cl. 180-79.100.
Morita, Haruyuki; Yoshinari, Jiro; and Fukuda, Kazumasa, to TDK Corporation. Magnetic recording medium. 4,636,448, Cl. 428-607.000.
Morita, Takamitsu: *See—*
Tada, Akira; Morita, Takamitsu; Teraue, Takeshi; and Kusumoto, Yoshihiro, 4,636,554, Cl. 525-359.300.
Moritani, Takeshi: *See—*
Okaya, Takuji; Tanaka, Yoshinari; Yonezu, Kiyoshi; Aoyama, Akimasa; and Moritani, Takeshi, 4,636,551, Cl. 525-60.000.
Moriwaki, Masafumi; Sano, Shigeaki; and Tanaka, Eiichi, to Toppan Moore Co., Ltd. Signal input sheet having a conductive shield layer. 4,636,582, Cl. 178-18.000.
Moriwaki, Masayoshi: *See—*
Oishi, Kengo; and Moriwaki, Masayoshi, 4,635,877, Cl. 242-197.000.
Morlock, Roland: *See—*
Fischer, Herbert; Stritzke, Karl H.; Morlock, Roland; Jones, Thomas C.; and Donovan, Joseph C., 4,636,265, Cl. 148-6.15R.
Morris, Lawrence E.: *See—*
Falk, Theodore J.; and Morris, Lawrence E., 4,636,150, Cl. 417-417.000.
Morris, Sidney J.: *See—*
Hough, David; Morris, Sidney J.; and Barber, Anthony D., 4,636,156, Cl. 418-201.000.
Morrison, Elbert F.; Bradley, Danny R.; and Reece, D. C., to Burlington Industries, Inc. Vacuum spinning from sliver. 4,635,435, Cl. 57-328.000.
Morrissette, Roger J. Collapsible cart. 4,635,956, Cl. 280-652.000.
Mosaman, Robert. Method for teaching reading. 4,636,173, Cl. 434-178.000.
Motorola Inc.: *See—*
Boland, Bernard W., 4,636,269, Cl. 148-175.000.
Burke, Timothy M.; Noble, Scott W.; Freeburg, Thomas A.; and Krebs, Jay R., 4,636,791, Cl. 340-825.520.
Burke, Timothy M.; Smith, Paul F.; and Schorman, Eric R., 4,637,022, Cl. 371-37.000.
Donoghue, William J., 4,636,979, Cl. 365-104.000.
Flannagan, Stephen T.; and Reed, Paul A., 4,636,991, Cl. 365-230.000.
Ford, Alexander P., Jr., 4,636,015, Cl. 339-14.00R.
Ford, Alexander P., Jr., 4,636,016, Cl. 339-17.00F.
Genrich, Thad J., 4,636,734, Cl. 328-55.000.
Gibbs, Terry L., 4,636,755, Cl. 333-116.000.
Haertling, Gene H., 4,636,786, Cl. 340-783.000.
Hartman, Davis H.; and Richard, Fred V., 4,636,646, Cl. 250-551.000.
Koch, Hubert H.; and Sargeaunt, Edward F., 4,635,351, Cl. 29-591.000.
Leicht, John L., 4,636,406, Cl. 427-96.000.
McLaughlin, Kevin L., 4,636,665, Cl. 307-530.000.
Mitzlaff, James E., 4,636,741, Cl. 330-127.000.
Mooney, Charles W.; Phipps, Robert E.; and Kuznicki, William J., 4,635,836, Cl. 224-247.000.
Novak, Carl V.; and Browne, Ronald R., 4,636,593, Cl. 200-5.00A.
Roche, Thomas A.; and Edminster, Robert E., 4,636,581, Cl. 174-152.00R.
Ruppel, John S., 4,637,065, Cl. 455-78.000.
Snowden, Ralph E.; and Whitley, Robert D., 4,636,656, Cl. 307-267.000.
Westwick, Alan L.; and Whatley, Roger A., 4,636,738, Cl. 330-9.000.
Zoerner, Glen J., 4,636,587, Cl. 379-377.000.
Mottana, Sergio; and Roberto, Mostura, to Luigi Franchi S.p.A. Weapon for launching a number of grenades. 4,635,526, Cl. 89-1.410.

Mourier, Georges, to Thomson-CSF. Microwave propagation mode transformer. 4,636,689, Cl. 315-4.000.
Movshovitz, Avner; and Shwarzman, Joel, to Amcor Ltd. Louver assembly particularly useful for air-conditioning units or other like appliances. 4,635,395, Cl. 49-78.000.
Mowbray, Dorian F., to Lucas Industries Public Limited Company. Fuel injection nozzles. 4,635,853, Cl. 239-533.300.
MSL Industries, Inc.: *See—*
Plunkett, Larry E.; and Gresho, William M., 4,636,669, Cl. 310-51.000.
Mueller, Martin. Apparatus for heating pasta and sauce. 4,635,812, Cl. 220-70.000.
Mueller, Roman, to Gebrueder Buehler AG. Apparatus for cleaning grits. 4,636,305, Cl. 209-312.000.
Muhlnickel, Donald L., Jr., to Graves Spray Supply Company. Hydraulic valve for spray gun. 4,635,852, Cl. 239-414.000.
Mukai, Kiichiro: *See—*
Nishioka, Yasushiro; Homma, Noriyuki; Sakuma, Noriyuki; and Mukai, Kiichiro, 4,636,833, Cl. 357-71.000.
Mulhauser, Michel: *See—*
Chabardes, Pierre; and Mulhauser, Michel, 4,636,570, Cl. 549-408.000.
Mullen, Robert: *See—*
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Muller, Alexander: *See—*
Boyd, John H., Jr.; and Muller, Alexander, 4,636,936, Cl. 364-148.000.
Mullet, Willis. Overhead door stop. 4,635,400, Cl. 49-504.000.
Munechika, Yukimi: *See—*
Seo, Akira; Kanno, Hideo; Hasegawa, Nobu; Miyagi, Yukio; Nishimura, Akira; Konaka, Shigeo; Ohmi, Tetsuto; Munechika, Yukimi; Uchida, Matazaemon; and Ikeda, Kenichi, 4,636,519, Cl. 514-397.000.
Munz, Otto J. Skin lifting device for body exercising purposes. 4,635,618, Cl. 128-24.00R.
Muragishi, Isao: *See—*
Makino, Masashi; Nakada, Kunio; Muragishi, Isao; and Nishitani, Syozi, 4,635,403, Cl. 51-94.00R.
Murakami, Kazutomo: *See—*
Mizuno, Keiichiro; Iida, Kazuyoshi; and Murakami, Kazutomo, 4,635,501, Cl. 74-574.000.
Murakami, Shuzo: *See—*
Yamano, Masaru; Sakai, Takashi; Furukawa, Nobuhiro; Murakami, Shuzo; and Matsumoto, Takanao, 4,636,445, Cl. 429-53.000.
Murakami, Yoshikazu: *See—*
Ito, Seigo; and Murakami, Yoshikazu, 4,636,756, Cl. 333-202.000.
Murase, Heihachi; and Nanishi, Kiyoshi, to Kansai Paint Company, Ltd. Anti-icing compositions. 4,636,324, Cl. 252-70.000.
Murata Manufacturing Co., Ltd.: *See—*
Ishikawa, Youhei; Yorita, Tadahiro; and Yamashita, Sadao, 4,636,759, Cl. 333-223.000.
Saito, Yasuaki, 4,636,752, Cl. 333-12.000.
Murata, Mitsuru: *See—*
Sugiyama, Masahiko; Sutou, Masatune; Murata, Mitsuru; Ooki, Minoru; and Tagawa, Shigetaro, 4,636,154, Cl. 418-97.000.
Murayama, Kazuo, to Sony Corporation. Combined detector circuit for detecting a tape end or unrecorded area of a tape. 4,636,878, Cl. 360-71.000.
Murayama, Minoru: *See—*
Hashimoto, Takeji; and Murayama, Minoru, 4,635,365, Cl. 33-1.00M.
Murley, Jackie D., to Co-Ex Pipe Company, Inc. Method for handling and cooling injection molded polymeric articles. 4,636,341, Cl. 264-37.000.
Murphy, Mark A.: *See—*
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Murphy, Robert M.: *See—*
Friehauf, William J.; Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, 4,636,892, Cl. 360-97.000.
Murray Electronics Associates Limited: *See—*
Hoffman, Kent C., 4,635,641, Cl. 128-639.000.
Musser, Harry R.: *See—*
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Musteric, Joseph T.: *See—*
Gasowski, Chester J.; Loeffler, Ronald L.; Musteric, Joseph T.; Springford, Richard H.; and Toth, Robert L., Jr., 4,635,696, Cl. 152-528.000.
Myer, Jon H., to Hughes Aircraft Company. Multiple reflector system with dielectric support webs and foam body. 4,636,801, Cl. 343-781.0CA.
Myers, Philip F.; Strickler, Roger A.; and Warmuth, Ivan J., II, to Goodyear Tire & Rubber Company, The. Vehicle air suspension. 4,635,745, Cl. 280-708.000.
Myoi, Tetsuo: *See—*
Morino, Masuaki; Fujikawa, Yoshiyuki; Haneda, Isamu; and Myoi, Tetsuo, 4,636,970, Cl. 364-706.000.
Nabstedt, Elmer J.; and Van Wagener, Raymond H., to Universal Manufacturing Corporation. Bobbin with strain relief. 4,636,763, Cl. 336-192.000.
Nachtkamp, Klaus: *See—*
Konig, Joachim; Suling, Carlhans; and Nachtkamp, Klaus, 4,636,545, Cl. 524-457.000.
Nagabhushan, Tattanahali L.; Miller, George H.; Schwartz, Jerome; and Ostrander, Michael R., to Schering Corporation. Interferon-cyclaradine combination. 4,636,383, Cl. 424-85.000.
Nagai, Ryo, to Mitutoyo Mfg. Co., Ltd. Photoelectric type displacement detection apparatus. 4,636,630, Cl. 250-214.00R.
Nagai, Takeshi: *See—*
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Nagamoto, Masanaka; Kurisu, Norio; and Taniguchi, Keishi, to Ricoh Company, Ltd. Thermosensitive recording material. 4,636,819, Cl. 346-216.000.
Nagano, Katsumi, to Kabushiki Kaisha Toshiba. Circuit in which output circuit and operational amplifier equipped input circuit are electrically isolated. 4,636,655, Cl. 307-261.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Caliper brake for a bicycle. 4,635,759, Cl. 188-24.220.
Nagao, Eijiro, to Fuji Photo Film Co., Ltd. Flattened cardboard box supplying apparatus. 4,635,428, Cl. 53-542.000.
Nagao, Masami; and Oosawa, Tadakazu, to Kirin Beer Kabushiki Kaisha. Bottle opening machine. 4,635,509, Cl. 81-3.200.
Nagasaka, Hiroyasu; Kamidaira, Kunio; Ino, Hiroshi; and Utsuno, Mitsuo, to Daido Tokushuko Kabushiki Kaisha. Method of measuring temperatures and portable recorder for storing temperature data. 4,636,093, Cl. 374-186.000.
Nagasaka, Yasumasa, to Toyota Jidosha Kabushiki Kaisha. Device for tightening a coil on a cylindrical body. 4,636,160, Cl. 425-190.000.
Nagase, Toshio: *See—*
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Nagashima, Masasumi: *See—*
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Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; and Kitamura, Mineo, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electric musical instrument. 4,635,517, Cl. 84-1.010.
Nagata, Tomizou; and Miyaoka, Norikuni, to Japan Tobacco Inc. Arbor guiding apparatus. 4,636,184, Cl. 493-98.000.
Naito, Hideshi: *See—*
Kotaka, Yoshiro; Naito, Hideshi; and Shiokama, Yoshiharu, 4,636,041, Cl. 350-429.000.
Naito, Ryuichi, to Pioneer Electronic Corporation. Signal waveform equalizing circuitry. 4,636,745, Cl. 330-304.000.
Naito, Ryuichi; Kosaka, Minoru; and Kawamura, Katsumi, to Pioneer Electronic Corporation. Focus servo device of a system for reading out recorded information. 4,637,005, Cl. 369-45.000.
Naka, Shinji: *See—*
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Nakada, Kunio: *See—*
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Nakagawa, Kiyoshi: *See—*
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Nakagome, Yoshinobu: *See—*
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Nakai, Ryusuke; Takebe, Toshihiko; and Yamazaki, Hajime, to Sumitomo Electric Ind., Ltd.; and Nippon Telegraph & Telephone Public Corp. Method for the pretreatment of a substrate for ion implantation. 4,636,280, Cl. 156-603.000.
Nakai, Shinichi, to Ryobi Limited. Battery charging circuit. 4,636,704, Cl. 320-35.000.
Nakai, Tetsuo; and Yazu, Shuji, to Sumitomo Electric Industries, Ltd. Diamond sintered body for tools and method of manufacturing same. 4,636,253, Cl. 75-239.000.
Nakaji, Takayuki, to Daisho Seiki Kabushiki Kaisha. Duplex-head surface grinder. 4,635,401, Cl. 51-5.00D.
Nakajima, Hirochika: *See—*
Shirasaki, Masataka; Nakajima, Hirochika; Furukawa, Yasuo; and Inagaki, Takefumi, 4,637,027, Cl. 372-27.000.
Nakajima, Yo; Nakajima, Yoshihisa; and Ushijima, Yoshio, to Fuji Electric Co., Ltd. Control system for an automatic vending machine. 4,636,963, Cl. 364-479.000.
Nakajima, Yoshihisa: *See—*
Nakajima, Yo; Nakajima, Yoshihisa; and Ushijima, Yoshio, 4,636,963, Cl. 364-479.000.
Nakamata, Hideo, to Toyota Jidosha Kabushiki Kaisha. Process for joining different kinds of synthetic resins. 4,636,609, Cl. 219-121.0LD.
Nakamichi Corporation: *See—*
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Nakamura, Hitoshi; Shiiki, Kasuo; Yuito, Isamu; Shiroishi, Yoshihiro; Fujiwara, Hideo; Shinagawa, Kiminari; and Iijima, Akemi, to Hitachi, Ltd. Perpendicular magnetic recording and reproducing thin film head. 4,636,897, Cl. 360-119.000.
Nakamura, Kanehito; Matsui, Kazuma; Kurahashi, Takashi; and Ishikawa, Hiroshi, to Nippondenso Co., Ltd. Fog detecting apparatus for use in vehicle. 4,636,643, Cl. 250-338.000.
Nakamura, Kenzi; Honda, Akio; Inukai, Kazuo; and Ito, Yoshito, to Nippondenso Co., Ltd. Display arrangement for a vehicle. 4,636,782, Cl. 340-705.000.
Nakamura, Koichi: *See—*
Aono, Toshiaki; Nakamura, Koichi; Shibata, Takeshi; and Nakamura, Taku, 4,636,455, Cl. 430-203.000.

Nakamura, Koki: *See*—
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Nakamura, Michio: *See*—
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Nakamura, Shunichi, to Aisin Seiki Kabushiki Kaisha. Watertight window assembly. 4,635,398, Cl. 49-413.000.

Nakamura, Taku: *See*—
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Nakamura, Teruo: *See*—
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Nakamura, Tooru; and Higashino, Shigenori, to Mitsubishi Denki Kabushiki Kaisha. Abnormal state detecting circuit of inverter. 4,636,929, Cl. 363-56.000.

Nakamura, Usao; Takao, Makoto; Ueno, Etsuko; and Kawaguchi, Kichitaro, to Hamari Chemicals Ltd. Biochemical method for preparation of optically active carnitine *Enterobacter* sp. Y-239-b. 4,636,471, Cl. 435-280.000.

Nakamura, Yasuo, to Canon Kabushiki Kaisha. Token exchange data transmission system having system configuration discrimination. 4,637,013, Cl. 370-85.000.

Nakamura, Yozo: *See*—
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Nakane, Kazuhiro: *See*—
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Nakane, Ryuji: *See*—
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Nakanishi, Nobuyasu: *See*—
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Nakanishi, Takao, to Sharp Kabushiki Kaisha. Hot air circulating oven range using shape memory alloy. 4,635,610, Cl. 126-21.00A.

Nakanishi, Toru; and Machida, Yozo, to Kyowa Hakko Kogyo Co., Ltd. Pyranose oxidase, method of making and method of use. 4,636,464, Cl. 435-14.000.

Nakano, Hideaki; and Ozu, Tadahiro, to Kawasaki Jukogyo Kabushiki Kaisha. Assembly of piston and connecting rod in internal-combustion engine. 4,635,596, Cl. 123-197.0AB.

Nakano, Tomio: *See*—
Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, 4,636,982, Cl. 365-149.000.

Nakano, Yoshihisa; Ohira, Masatoshi; Ushida, Manabu; Miyagawa, Tomoyuki; and Shimodaira, Toshiya, to Nippondenco Co., Ltd. Shock absorber control system. 4,635,959, Cl. 280-707.000.

Nakaoka, Junichi: *See*—
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Nakashima, Hajime: *See*—
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Nakato, Hakaru; Besaho, Nagayasu; Nozaki, Tsutomu; Habu, Yasuhiro; and Kimura, Tomoaki, to Kawasaki Steel Corporation; and Hitachi, Ltd. Cooling pad for use in a continuous casting apparatus for the production of cast sheets. 4,635,703, Cl. 164-443.000.

Nakatsuka, Hisayoshi, to Namiki Precision Jewel Co., Ltd. Grounding circuit for pickup cartridge moving coil. 4,637,009, Cl. 369-147.000.

Nakayama, Yasunobu; and Sato, Yasuji, to Kabushiki Kaisha Toshiba. Electric source circuit for telephone sets. 4,636,588, Cl. 379-362.000.

Nalesnik, Theodore E., to Texaco Inc. Lubricating oil dispersant and viton seal additives. 4,636,322, Cl. 252-51.50A.

Namba, Yuzaburo; and Kukisaki, Shigenari, to Eisai Co., Ltd. Washing apparatus. 4,635,665, Cl. 134-167.00R.

Namiki Precision Jewel Co., Ltd.: *See*—
Nakatsuka, Hisayoshi, 4,637,009, Cl. 369-147.000.

Nanba, Keizo: *See*—
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Nanba, Satoshi: *See*—
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Nanishi, Kiyoshi: *See*—
Murase, Heihachi; and Nanishi, Kiyoshi, 4,636,324, Cl. 252-70.000.

Narayan, Thirumurti, to BASF Corporation. Isocyanate terminated quasi-prepolymers useful for preparing urethane-group-containing polyisocyanurate foams having low friability. 4,636,530, Cl. 521-159.000.

Narita, Fujiaki; and Tanaka, Sumio, to Ricoh Company, Ltd. VTR system. 4,636,879, Cl. 360-72.200.

Nash, Seth: *See*—
Crossley, Ian; Donoghue, Daniel; Mittleman, Steven; and Nash, Seth, 4,637,068, Cl. 455-327.000.

Nasser, Gamal E. D., to D.V.T. Buro fur Anwendung Deutscher Verfahrenstechnik H. Morsy. Apparatus for the distillation of fresh water from sea water. 4,636,283, Cl. 202-173.000.

National Distillers and Chemical Corporation: *See*—
Harris, Eugene G.; and Fayter, Richard G., Jr., 4,636,571, Cl. 549-484.000.

National Research Development Corp.: *See*—
Swinbanks, Malcolm A., 4,637,048, Cl. 381-71.000.

National Service Industries, Inc.: *See*—
Yahraus, Theodor G., 4,636,072, Cl. 356-121.000.

Nawata, Kazuyoshi; Katayama, Masahito; and Yokoshima, Minoru, to Nippon Kayaku Kabushiki Kaisha. Photopolymerizable composition. 4,636,534, Cl. 522-116.000.

NCR Corporation: *See*—
Craycraft, Donald G.; and Pham, Giao N., 4,636,664, Cl. 307-530.000.
Hilbrink, Johan O., 4,636,788, Cl. 340-804.000.
Wills, David C.; Landis, Donald E.; and Lyons, Dale R., 4,636,781, Cl. 340-700.000.

Neary, Robin P.: *See*—
Carter, Leewood C.; Neary, Robin P.; and Mullen, Robert, 4,636,185, Cl. 493-127.000.

Neat, Rosamund C.: *See*—
Pitt, Gillies D.; Batchelder, David N.; Jones, Roger E.; and Neat, Rosamund C., 4,637,071, Cl. 455-603.000.

Nebe, William J.: *See*—
Keys, Dalen E.; and Nebe, William J., 4,636,453, Cl. 430-138.000.

Nebelung, Hermann H., to Emhart Industries, Inc. Take-out mechanism for removing containers from a mould of a glassware forming machine. 4,636,241, Cl. 65-260.000.

NEC Corporation: *See*—
Matsukura, Hiroyuki; and Yamauchi, Fumio, 4,636,101, Cl. 400-690.000.
Omachi, Takao, 4,636,783, Cl. 340-727.000.
Yanase, Tomoo; and Rangu, Hiroyoshi, 4,636,821, Cl. 357-17.000.

Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek: *See*—
Seppen, Jan J.; and van der Weide, Jouke, 4,635,609, Cl. 123-368.000.

Neefe, Charles W. Molding toric contact lenses using a directed stream of gas. 4,636,338, Cl. 264-2.100.

Neenan, Thomas X.: *See*—
Allcock, Harry R.; Austin, Paul E.; and Neenan, Thomas X., 4,636,387, Cl. 514-89.000.

Neidig, Arno; Leukel, Bernd; and Hettmann, Hubert, to Brown, Boveri & Cie AG. Static converter module with mounting lugs. 4,636,580, Cl. 174-52.0PE.

Nelmor Co., Inc.: *See*—
West, G. Allan; Barnes, William W.; Dumaine, Thomas J.; and Andrews, Herbert K., 4,635,862, Cl. 241-51.000.

Nelson, Stephen M. Adjustable support for a computer system. 4,635,893, Cl. 248-558.000.

Nelson, Warren B. Pipeline monorail system. 4,635,559, Cl. 104-119.000.

Nestec S. A.: *See*—
Nguyen, Tuan; Hirsbrunner, Pierre; and Weymuth, Hans, 4,636,399, Cl. 426-629.000.

Netter, Aaron J. Automatic water line freeze control. 4,635,668, Cl. 137-62.000.

Netznik, Frederick P. Quick disconnect locking coupler. 4,635,327, Cl. 24-653.000.

Neubeck, Clifford E.: *See*—
Arbige, Michael V.; and Neubeck, Clifford E., 4,636,468, Cl. 435-198.000.

Neukomm, Hans R., to U.S. Philips Corporation. Semiconductor device having non-volatile storage transistors. 4,636,984, Cl. 365-182.000.

Neumann, Irving H.; Stobb, Walter J.; Silva, Robert M.; and Thumm, Klaus A., to Stobb Inc. Method for bundle stacking. 4,636,139, Cl. 414-786.000.

Neumuller, Konrad. Seat mounting for chairs, in particular swivel-type desk chairs. 4,636,004, Cl. 297-374.000.

Newberg, Phillip J., to Eliason Corporation. Molded door. 4,635,421, Cl. 52-309.110.

Newman, Raymond A.: *See*—
Broyden, Robert H.; Schenk, Douglas E.; and Newman, Raymond A., 4,636,962, Cl. 364-478.000.

NGK Spark Plug Co., Ltd.: *See*—
Fukuura, Isamu; and Niwa, Shigeo, 4,636,218, Cl. 623-18.000.
Ichikawa, Sadao; Yokoi, Shinichi; Yasuhara, Seishi; and Kondo, Hiroshi, 4,635,594, Cl. 123-179.0BG.
Itoh, Tsuneo; and Yokoi, Shinichi, 4,636,614, Cl. 219-270.000.

Nguyen, Tuan; Hirsbrunner, Pierre; and Weymuth, Hans, to Nestec S. A. Removal of anions from vegetable material. 4,636,399, Cl. 426-429.000.

Nichiro Kogyo Company Ltd.: *See*—
Kasuga, Yoshiaki, 4,635,541, Cl. 100-2.000.

Nickel, Hans; and Wissmann, Michael, to Andreas Stihl. Centrifugal clutch. 4,635,777, Cl. 192-75.000.

Nickel, Klaus-Dietrich, to Kass-Technoplan GmbH. Desulfurizing of fossile fuels. 4,635,572, Cl. 110-343.000.

Nickolay, Helmut: *See*—
Dupper, Walter; Emberger, Roland; Hack, Kurt; Lattner, Manfred; Nickolay, Helmut; Riedel, Karl; and Schollhammer, Richard, 4,635,321, Cl. 19-0.250.

Nielsen, Arnold D., to Ford Motor Company. Variable force solenoid. 4,635,683, Cl. 137-625.650.

Nielsen, J. McHenry; and Miller, Wayne G. Bifocal intra-ocular lens. 4,636,211, Cl. 623-6.000.

Niemers, Ekkehard; Grutzmann, Rudi; Mardin, Mithat; Busse, Wolf-Dieter; and Meyer, Horst, to Bayer Aktiengesellschaft. Anti-thrombotic pharmaceutical compositions comprising tricyclo-4H-1,4-benzothiazine derivatives and method of use therefor. 4,636,497, Cl. 514-215.000.

Nifco Inc.: *See*—
Omata, Nobuaki, 4,635,763, Cl. 188-268.000.

Nihon Nohyaku Co., Ltd.: *See*—
Seo, Akira; Kanno, Hideo; Hasegawa, Nobu; Miyagi, Yukio; Nishimura, Akira; Konaka, Shigeo; Ohmi, Tetsuto; Munechika, Yukimi; Uchida, Matazaemon; and Ikeda, Kenichi, 4,636,519, Cl. 514-397.000.

Nihon Technical Kabushiki Kaisha: *See*—
Ohashi, Tamaki, 4,635,490, Cl. 74-10.330.

Niigata Engineering Co., Ltd.: *See*—
Kodera, Masanori; Aizawa, Yasuo; and Ichijo, Kohji, 4,636,701, Cl. 318-633.000.

Niiho, Masaaki; Itoh, Kiyoshi; Suzuki, Shinichi; Itagaki, Takuo; and Tsuda, Koji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Changeover shutter for light-wave range finder. 4,636,068, Cl. 356-5.000.

Niinomi, Masahiro: *See*—
Yanagihara, Kenji; Kimura, Mitsuo; and Niinomi, Masahiro, 4,636,435, Cl. 428-336.000.

Nikaido, Akira, to Citizen Watch Co., Ltd. Compact-sized permanent magnet type stepping motor. 4,636,668, Cl. 310-49.00R.

Nikkei Kako Kabushiki Kaisha: *See*—
Kurihara, Susumu; Seki, Tadashi; Awata, Hiroshi; and Kadowaki, Hitoshi, 4,636,374, Cl. 423-385.000.

Nikko Co., Ltd.: *See*—
Takada, Mitsuo, 4,636,596, Cl. 200-52.00R.

Nilsson, Bo; and Severinsson, Lars M., to SAB Nife AB. Rail vehicle slack adjuster. 4,635,762, Cl. 188-203.000.

Nilsson, Nils A.: *See*—
Hernestam, Sven E. H.; Nilsson, Nils A.; and Willard, Lars-Olof, 4,636,382, Cl. 424-54.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Bellini, Mario, 4,635,521, Cl. 84-177.000.
Mitsumi, Katoh, 4,635,520, Cl. 84-1.260.

Nippon Kayaku Kabushiki Kaisha: *See*—
Nawata, Kazuyoshi; Katayama, Masahito; and Yokoshima, Minoru, 4,636,534, Cl. 522-116.000.

Nippon Kogaku K. K.: *See*—
Kotaka, Yoshiro; Naito, Hideshi; and Shiokama, Yoshiharu, 4,636,041, Cl. 350-429.000.
Saegusa, Takashi, 4,636,054, Cl. 354-432.000.

Nippon Kogaku K.K.: *See*—
Hazama, Junji; Kato, Kinya; Tanimoto, Akikazu; and Izawa, Hisao, 4,636,626, Cl. 250-201.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Miyashita, Tsuneo; Yoshikoshi, Hideyuki; Nishio, Hiroaki; and Takeuchi, Osamu, 4,636,342, Cl. 264-82.000.

Nippon Oil Company, Limited: *See*—
Itoh, Hiroyuki; Sakata, Ko; and Imai, Hirosuke, 4,636,229, Cl. 55-158.000.

Nippon Oil and Fats Co., Ltd.: *See*—
Makino, Yoshio; Nagai, Takeshi; and Yamazaki, Shingo, 4,636,323, Cl. 252-51.50R.

Nippon Soda Co., Ltd.: *See*—
Yoshihara, Toshio; and Kikuchi, Ichiro, 4,636,908, Cl. 361-321.000.

Nippon Soken, Inc.: *See*—
Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,636,648, Cl. 250-571.000.
Igashira, Toshihiko; Sakakibara, Yasuyuki; Abe, Seiko; Takigawa, Masahiro; and Izawa, Akihiro, 4,635,849, Cl. 239-102.200.
Toyama, Keiichiro; Kodera, Masao; and Sasaki, Kunihiko, 4,636,997, Cl. 367-140.000.

Nippon Telegraph & Telephone Public Corp.: *See*—
Nakai, Ryusuke; Takebe, Toshihiko; and Yamazaki, Hajime, 4,636,280, Cl. 156-603.000.

Nippon Zeon Co., Ltd.: *See*—
Tsuji, Takashi; Kobayashi, Shozo; and Nagase, Toshio, 4,636,196, Cl. 604-122.000.

Nippondenco Co., Ltd.: *See*—
Nakano, Yoshihisa; Ohira, Masatoshi; Ushida, Manabu; Miyagawa, Tomoyuki; and Shimodaira, Toshiya, 4,635,959, Cl. 280-707.000.

Nippondenso Co., Ltd.: *See*—
Ando, Noriyoshi, 4,636,632, Cl. 250-221.000.
Imamura, Tetsuo; and Yukawa, Yasuaki, 4,635,489, Cl. 74-7.00E.
Nakamura, Kanehito; Matsui, Kazuma; Kurahashi, Takashi; and Ishikawa, Hiroshi, 4,636,643, Cl. 250-338.000.
Nakamura, Kenzi; Honda, Akio; Inukai, Kazuo; and Ito, Yoshito, 4,636,782, Cl. 340-705.000.
Terada, Kanechiyo, 4,636,671, Cl. 310-74.000.
Tsuru, Naohiko; Matsuura, Ryoichi; Otsuki, Hiromi; Fujinami, Hiroshi; Hori, Shinichi; Nomura, Yoshihisa; and Oka, Hiroyuki, 4,636,009, Cl. 303-93.000.

Nisato, Dino: *See*—
Martinez, Jean; Bali, Jean-Pierre; Castro, Bertrand; Nisato, Dino; and Demarne, Henri, 4,636,490, Cl. 514-15.000.

Nishida, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Shell of small-sized marine craft. 4,635,580, Cl. 114-343.000.

Nishida, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Apparatus for preventing a capsized boat from sinking. 4,635,582, Cl. 114-360.000.

Nishikawa, Kihachiro: *See*—
Kyodea, Hiroshi; Endo, Yasuhiro; Fujiwara, Teiichi; Mimura, Toshisada; Nishikawa, Kihachiro; and Nishizawa, Shoichi, 4,636,969, Cl. 364-560.000.

Nishimiya, Masanobu: *See*—
Emoto, Masami; Nishimiya, Masanobu; and Kigachi, Hiroyuki, 4,636,625, Cl. 250-201.000.

Nishimura, Akira: *See*—
Seo, Akira; Kanno, Hideo; Hasegawa, Nobu; Miyagi, Yukio; Nishimura, Akira; Konaka, Shigeo; Ohmi, Tetsuto; Munechika, Yukimi; Uchida, Matazaemon; and Ikeda, Kenichi, 4,636,519, Cl. 514-397.000.

Nishimura, Takumi: *See*—
Adachi, Yoshiharu; Saitoh, Tadao; and Nishimura, Takumi, 4,636,008, Cl. 303-92.000.
Adachi, Yoshiharu; Nishimura, Takumi; Saito, Tadao; Shibata, Hirochika; Nakanishi, Nobuyasu; Shirai, Akira; and Noguchi, Noboru, 4,636,010, Cl. 303-115.000.

Nishimura, Yoichi; Ogata, Masamitsu; and Ida, Takanori, to Catalysts & Chemicals Industries Co., Ltd. Method for the preparation of catalyst composition for use in cracking hydrocarbons. 4,636,484, Cl. 502-65.000.

Nishino, Takaishi, to Tachikawa Spring Co. Ltd. Side support device in a vehicle seat. 4,636,000, Cl. 297-284.000.

Nishio, Hiroaki: *See*—
Miyashita, Tsuneo; Yoshikoshi, Hideyuki; Nishio, Hiroaki; and Takeuchi, Osamu, 4,636,342, Cl. 264-82.000.

Nishioka, Tadashi; Koyama, Hiroshi; and Mashiko, Yoji, to Mitsubishi Denki Kabushiki Kaisha. Method of treating silicon nitride film formed by plasma deposition. 4,636,400, Cl. 427-39.000.

Nishioka, Yasushiro; Homma, Noriyuki; Sakuma, Noriyuki; and Mukai, Kiichiro, to Hitachi, Ltd. Semiconductor device. 4,636,833, Cl. 357-71.000.

Nishitani, Syozi: *See*—
Makino, Masashi; Nakada, Kunio; Muragishi, Isao; and Nishitani, Syozi, 4,635,403, Cl. 51-94.00R.

Nishizawa, Hideaki, to Sumitomo Electric Industries, Ltd. Package for optical element. 4,636,647, Cl. 250-551.000.

Nishizawa, Shoichi: *See*—
Kyoden, Hiroshi; Endo, Yasuhiro; Fujiwara, Teiichi; Mimura, Toshisada; Nishikawa, Kihachiro; and Nishizawa, Shoichi, 4,636,969, Cl. 364-560.000.

Nissan Motor Company: *See*—
Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, 4,637,045, Cl. 371-43.000.

Nissan Motor Co., Ltd.: *See*—
Hara, Yoichi, 4,635,603, Cl. 123-383.000.
Hiraiwa, Kazuyoshi, 4,635,744, Cl. 180-249.000.
Ichikawa, Sadao; Yokoi, Shinichi; Yasuhara, Seishi; and Kondo, Hiroshi, 4,635,594, Cl. 123-179.0BG.
Matsuda, Koichi; Kondo, Nobuaki; and Tanaka, Yuji, 4,635,890, Cl. 248-429.000.
Tanaka, Toshiaki; and Sugihara, Kunihiko, 4,635,598, Cl. 123-293.000.

Nitanda, Hiroshi: *See*—
Kanemitsu, Shinji; and Nitanda, Hiroshi, 4,636,065, Cl. 355-75.000.

Nitschmann, Karl: *See*—
Schweitzer, Karl; Nitschmann, Karl; and Dolata, Hans, 4,636,147, Cl. 417-214.000.

Nittan Company, Limited: *See*—
Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takashi, 4,636,649, Cl. 250-574.000.

Nitzsche, Erhard: *See*—
Grossmann, Stefan; and Nitzsche, Erhard, 4,635,546, Cl. 101-248.000.

NIVO S.A.: *See*—
Dinh, Didier, 4,636,104, Cl. 403-191.000.

Niwa, Shigeo: *See*—
Fukuura, Isamu; and Niwa, Shigeo, 4,636,218, Cl. 623-18.000.

NL Industries, Inc.: *See*—
Lygas, Edward A., 4,636,999, Cl. 367-156.000.

NL Sperry-Sun, Inc.: *See*—
Russell, Michael K.; and Russell, Anthony W., 4,636,995, Cl. 367-85.000.

Noailly, Nicole: *See*—
Guillaume, Michel E.; and Noailly, Nicole, 4,636,639, Cl. 250-560.000.

Noble, Brian: *See*—
Peel, Christopher J.; Evans, Brian; Harris, Samuel J.; Noble, Brian; and Dinsdale, Keith, 4,636,357, Cl. 420-532.000.

Noble, Scott W.: *See*—
Burke, Timothy M.; Noble, Scott W.; Freeburg, Thomas A.; and Krebs, Jay R., 4,636,791, Cl. 340-825.520.

Noguchi, Noboru: *See*—
Adachi, Yoshiharu; Nishimura, Takumi; Saito, Tadao; Shibata, Hirochika; Nakanishi, Nobuyasu; Shirai, Akira; and Noguchi, Noboru, 4,636,010, Cl. 303-115.000.

Nohren, Hubert, to Autoflug GmbH. Rotating parachute. 4,635,884, Cl. 244-142.000.

Noir, Dominique; and Trouilhet, Yves, to Battelle Memorial Institute. Apparatus for heat therapy by inhalation. 4,635,630, Cl. 128-203.260.

Nolan, John T., Jr.: *See*—
Bhattacharya, Ajit K.; and Nolan, John T., Jr., 4,636,576, Cl. 528-277.000.

Nolan, Robert L., to Maxcap, Inc. Plastic cap. 4,635,808, Cl. 215-252.000.

Noll, Wilfried; Ehmann, Konrad; Stehle, Hans P.; Dorner, Wolfgang; and Dietzsch, Gunter, to Andreas Stihl. Braking arrangement for a chain saw. 4,635,364, Cl. 30-381.000.

Nomura, Iwao; Masuyama, Takayuki; Tanigawa, Yasuo; and Hasimoto, Hirofumi, to Toyota Jidosha Kabushiki Kaisha. Apparatus for opening and closing a vehicle door which is located in a line for manufacturing a vehicle. 4,636,136, Cl. 414-730.000.

Nomura, Noboru; Kugimiya, Koichi; Matsumura, Takayoshi; and Yonezawa, Taketoshi, to Matsushita Electric Industrial Co., Ltd. Aligning exposure method. 4,636,077, Cl. 356-356.000.

Nomura, Tutomu: *See*—
Kubo, Osamu; Nomura, Tutomu; Ido, Tadashi; and Yokoyama, Hirotaka, 4,636,433, Cl. 428-328.000.

Nomura, Yoshihisa: *See*—
Tsuru, Naohiko; Matsuura, Ryoichi; Otsuki, Hiromi; Fujinami, Hiroshi; Hori, Shinichi; Nomura, Yoshihisa; and Oka, Hiroyuki, 4,636,009, Cl. 303-93.000.

Nordischer Maschinenbau Rud. Baader GmbH & Co KG: *See*—
Braeger, Horst; and Johannesson, Orn, 4,635,318, Cl. 17-63.000.

Nordson Corporation: *See*—
Conrad, Douglas J.; Kennon, James L.; Macartney, Lawrence J.; and Scharf, Donald R., 4,635,585, Cl. 118-316.000.

Norell, Ronald A., to Burroughs Corporation. Elastic bladder method of fabricating an integrated circuit package having bonding pads in a stepped cavity. 4,636,275, Cl. 156-289.000.

Norris, Robert W. Universal battery terminal connector. 4,636,025, Cl. 339-230.00R.

Nortene: *See*—
Pavy, Michel; and Genty, Alain, 4,636,162, Cl. 425-290.000.

North American Container Corp.: *See*—
Grigsby, John M., 4,635,815, Cl. 220-443.000.

North American Philips Corporation: *See*—
Fassler, Friebert; Kigyos, Frank; and Slaughter, Bobby L., 4,635,313, Cl. 15-193.000.

Northern Telecom Limited: *See*—
Bobey, Kenneth A., 4,637,015, Cl. 370-94.000.
Ciancibello, Carmine A.; and Mitchler, Dennis W., 4,637,016, Cl. 370-100.000.
Kuhfus, Gerd; Walker, Charles R. S.; and Robinson, Anthony H. J., 4,636,591, Cl. 381-159.000.
Lowe, Richard S.; and Saravanos, Constantine, 4,636,071, Cl. 356-73.100.

Norton Christensen, Inc.: *See*—
Schillinger, Hans; Pahlke, Klaus; Starke, Siegfried; Panhorst, Heinz-Juergen; and Mengel, Hans-Eckhard, 4,635,738, Cl. 175-398.000.

Norwood, Roger D.; and Reddy, Chitranjan, to Texas Instruments. Semiconductor dynamic memory device with multiplexed sense amplifier and write-activated active loads. 4,636,987, Cl. 365-208.000.

Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, to Nissan Motor Company. Speech recognition system for an automotive vehicle. 4,637,045, Cl. 381-43.000.

Noto, Richard: *See*—
Smith, David C.; and Noto, Richard, 4,636,965, Cl. 364-491.000.

Novack, Robert L.; and Tomasovic, Beth A., to Bacharach, Inc. Apparatus for detecting and measuring hydrogen sulfide gas in the presence of carbon monoxide. 4,636,294, Cl. 204-432.000.

Novak, Carl V.; and Browne, Ronald R., to Motorola Inc. Light conducting, elastomeric membrane keypad. 4,636,593, Cl. 200-5.00A.

Novak, Warren D., to Interquad, Inc. Variable height table. 4,635,565, Cl. 108-147.000.

Novick, William J., Jr.: *See*—
Kreutzer, Donald L.; Novick, William J., Jr.; and Sheetz, Michael P., 4,636,507, Cl. 514-263.000.

Nowack, William C.; Moore, Stephen J.; and Weger, Kenneth F., Jr., to Knaack Manufacturing Company. Interlocking seal for insulated panels. 4,635,422, Cl. 52-406.000.

Nowak, Manfred: *See*—
Dietz, Gunter; and Nowak, Manfred, 4,635,994, Cl. 296-97.00H.

Nowicki, Casimir W.: *See*—
Franks, Nelson J.; and Nowicki, Casimir W., 4,636,166, Cl. 425-503.000.

Nozaka, Yoshiki, to Dai Nippon Insatsu Kabushiki Kaisha. Automatic adhesive double coated tape applying device. 4,636,276, Cl. 156-353.000.

Nozaki, Mineo: *See*—
Asakura, Osamu; Nozaki, Mineo; Nagashima, Masasumi; and Uchikata, Yoshio, 4,636,810, Cl. 346-76.0PH.

Nozaki, Tsutomu: *See*—
Nakato, Hakaru; Bessho, Nagayasu; Nozaki, Tsutomu; Habu, Yasuhiro; and Kimura, Tomoaki, 4,635,703, Cl. 164-443.000.

Nozick, Jacques. Method of manufacturing multi-terminal electrical connector. 4,635,359, Cl. 29-878.000.

NSK-Warner K. K.: *See*—
Shoji, Masao; Uchida, Mikio; and Kitamura, Noboru, 4,635,771, Cl. 192-41.00A.

NSK-Warner K.K.: *See*—
Shoji, Masao; Uchida, Mikio; and Kinoshita, Yoshio, 4,635,770, Cl. 192-41.00A.

Nukada, Fumiaki: *See*—
Oi, Takato, 4,636,871, Cl. 358-296.000.

Numata, Kunio: *See*—
Tohata, Susumu; and Numata, Kunio, 4,636,050, Cl. 353-66.000.

Nyrup, John: *See*—
Jacobsen, Hans E.; Hansen, Henning M.; Nyrup, John; Hansen, Henry; and Lassithiotakis, Konstantin, 4,635,486, Cl. 73-861.120.

O&K Orenstein & Koppel Aktiengesellschaft: *See*—
Hofling, Peter, 4,635,783, Cl. 198-321.000.

O. M. Edwards Company, Inc.: *See*—
Ranz, John C.; and Ahlgren, David T., 4,635,396, Cl. 49-141.000.

O. M. Scott and Sons Company, The: *See*—
Timmons, Richard J., 4,636,242, Cl. 71-28.000.

Oakley, John R., to Metal Box, p.l.c. Methods and apparatus for erecting tray-type cartons. 4,636,187, Cl. 493-134.000.

Obermann, Klaus. Apparatus for tinning printed-circuit boards. 4,635,584, Cl. 118-64.000.

Occidental Chemical Agricultural Products, Inc.: *See*—
Chemtob, Elie; and Beer, Gary L., 4,636,372, Cl. 423-312.000.

Ochisi, Michio; and Sagitani, Hiromichi, to Pola Chemical Industries, Inc. Polyglycerol compounds and cometic products containing the same. 4,636,525, Cl. 514-786.000.

Ochs, Garrold W., to Westinghouse Electric Corp. Power line communications terminal and interface circuit associated therewith. 4,636,771, Cl. 340-310.0CP.

O'Connor, Chadwell. Fuel mixer and burner. 4,635,566, Cl. 110-106.000.

Oda, Nobuo, to Takara Co., Ltd. Rechargeable toy electric vehicle set. 4,636,178, Cl. 446-462.000.

Odelius, Tomas: *See*—
Christopherson, Kjell H.; Odelius, Tomas; Rosemeier, Friedrich; Stenberg, Kaj O.; Svensson, Tommy E.; and Killmaier, Horst, 4,636,204, Cl. 604-283.000.

Odor, Elbert P.: *See*—
Harman, Douglas G.; and Odor, Elbert P., 4,635,456, Cl. 72-53.000.

Oellerer, Friedrich: *See*—
Theurer, Josef; and Oellerer, Friedrich, 4,635,664, Cl. 134-131.000.

Oeschger, Frank: *See*—
Roetter, Frank; and Oeschger, Frank, 4,635,922, Cl. 271-119.000.

Ogata, Masamitsu: *See*—
Nishimura, Yoichi; Ogata, Masamitsu; and Ida, Takanori, 4,636,484, Cl. 502-65.000.

Ogata, Yasuyuki; and Shinohara, Yoshinori, to Mitsubishi Mining & Cement Co., Ltd. Method for production of dielectric powder. 4,636,248, Cl. 75-0.5AA.

Ogawa, Hirofumi: *See*—
Kusano, Chushirou; Ishioka, Sachio; Imamura, Yoshinori; Takasaki, Yukio; Ogawa, Hirofumi; Makishima, Tatsuo; and Hirai, Tadaaki, 4,636,682, Cl. 313-386.000.

Ogawa, Kyosuke; Shirai, Shigeru; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, to Canon Kabushiki Kaisha. Photoconductive member having amorphous silicon matrix with oxygen and impurity containing regions. 4,636,450, Cl. 430-84.000.

Ogawa, Masahiko: *See*—
Sakane, Toshio; Taguchi, Tetsuya; Ogawa, Masahiko; Tamura, Shuichi; and Tsunekawa, Tokuichi, 4,636,053, Cl. 354-403.000.

Ogden Inc.: *See*—
Ogden, John M., 4,635,385, Cl. 36-43.000.

Ogden, John M., to Ogden Inc. Shoe insert. 4,635,385, Cl. 36-43.000.

Ogden, Ralph; and Johnson, Carl J., to Ajax Enterprises Corporation. Adjustable speed control arrangement for motorized exercise treadmills. 4,635,928, Cl. 272-69.000.

Ogilvie, Frank R.: *See*—
Ogilvie, James W.; and Ogilvie, Frank R., 4,636,217, Cl. 623-17.000.

Ogilvie, James W.; and Ogilvie, Frank R., to University of Minnesota, Regents of the. Anterior spinal implant. 4,636,217, Cl. 623-17.000.

Ogura Clutch Co., Ltd.: *See*—
Sekiguchi, Yuzo; and Maejima, Enjiro, 4,635,774, Cl. 192-52.000.

Ogura, Kenji; and Yamazaki, Takeshi, to Toto Ltd. Toilet apparatus. 4,636,474, Cl. 435-291.000.

Ogura, Mitsugi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device having a voltage push-up circuit. 4,636,981, Cl. 365-203.000.

Ogura, Seiki: *See*—
Codella, Christopher F.; and Ogura, Seiki, 4,636,822, Cl. 357-22.000.

Ohashi, Isao: *See*—
Tanagawa, Koji; and Ohashi, Isao, 4,636,945, Cl. 364-200.000.

Ohashi, Ryoichi; and Inaba, Hitoshi, to Yanmar Diesel Engine Co., Ltd. Structure of a main combustion chamber of a diesel engine of a direct injection type. 4,635,597, Cl. 123-276.000.

Ohashi, Tamaki, to Nihon Technical Kabushiki Kaisha. Push-button tuner. 4,635,490, Cl. 74-10.330.

Ohata, Yosuke: *See*—
Iida, Kazumi; Ohata, Yosuke; Hyodo, Keiichiro; Akiyama, Kazunori; Umeda, Tadashi; and Kishimoto, Keiichi, 4,636,057, Cl. 355-3.00R.

Ohhatsu Kabushiki Kaisha: *See*—
Itani, Jun, 4,635,753, Cl. 181-279.000.

Ohira, Masatoshi: *See*—
Nakano, Yoshihisa; Ohira, Masatoshi; Ushida, Manabu; Miyagawa, Tomoyuki; and Shimodaira, Toshiya, 4,635,959, Cl. 280-707.000.

Ohmi, Tetsuto: *See*—
Seo, Akira; Kanno, Hideo; Hasegawa, Nobu; Miyagi, Yukio; Nishimura, Akira; Konaka, Shigeo; Ohmi, Tetsuto; Munechika, Yukimi; Uchida, Matazaemon; and Ikeda, Kenichi, 4,636,519, Cl. 514-397.000.

Ohno, Akio; and Torigai, Akiyoshi, to Canon Kabushiki Kaisha. Image forming apparatus. 4,636,062, Cl. 355-43.000.

Ohno, Shoji; and Sugada, Sigeru, to Toyama Industry Co., Ltd. Adhesive tape and process for preparation thereof. 4,636,427, Cl. 428-246.000.

Ohsawa, Masaru: *See*—
Yamagishi, Takashi; and Ohsawa, Masaru, 4,635,757, Cl. 187-9.00E.

Ohsawa, Mitsuo, to Sony Corporation. Regulated DC power supply. 4,636,709, Cl. 323-267.000.

Ohta, Yoshio: *See*—
Ozawa, Isao; Ito, Noboru; Takizawa, Masaki; Ohta, Yoshio; and Ijichi, Kiyoteru, 4,635,910, Cl. 267-140.100.

Ohtani, Yoshio, to Diesel Kiki Company, Ltd. Circuit for controlling solenoid clutch. 4,636,912, Cl. 361-154.000.

Ohtsuki, Takashi: *See*—
Wada, Yasutaro; and Ohtsuki, Takashi, 4,636,849, Cl. 358-106.000.

Ohuchi, Masayuki; Oodaira, Hirosi; and Yoshida, Kenichi, to Kabushiki Kaisha Toshiba. Method of manufacturing a circuit module. 4,635,356, Cl. 29-841.000.

Ohura, Masaki; and Saito, Makoto, to Hitachi, Ltd. Thin film magnetic head having magnetic layers of different thickness and manufacturing method therefor. 4,636,901, Cl. 360-126.000.

Oi, Takato, to Nukada, Fumiaki. Copying machine. 4,636,871, Cl. 358-296.000.

Oishi, Kazuhiro: *See*—
Yamada, Masaki; Yokoi, Mitsuru; and Oishi, Kazuhiro, 4,635,792, Cl. 206-310.000.

Oishi, Kengo; and Moriwaki, Masayoshi, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 4,635,877, Cl. 242-197.000.

Oka, Hiroyuki: *See*—
Tsuru, Naohiko; Matsuura, Ryoichi; Otsuki, Hiromi; Fujinami, Hiroshi; Hori, Shinichi; Nomura, Yoshihisa; and Oka, Hiroyuki, 4,636,009, Cl. 303-93.000.

Okada, Takashi; Mogi, Takao; and Mino, Shinjiro, to Sony Corporation. Scrambled television signal receiver system. 4,636,855, Cl. 358-124.000.

Okado, Hideo; Shoji, Hiroshi; Takaya, Haruo; Kawamura, Kichinari; and Yamazaki, Yasuyoshi, to Director-General of Agency of Industrial Science & Technology. Novel zeolite catalyst and method of preparing. 4,636,482, Cl. 502-60.000.

Okajima, Yoshimori: *See*—
Ono, Chikai; and Okajima, Yoshinori, 4,636,831, Cl. 357-45.000.

Okamoto, Norihiko: *See*—
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,636,144, Cl. 417-63.000.

Okamura, Hideaki: *See*—
Sakurada, Masahiko; Manabe, Sugio; Okamura, Hideaki; and Gocho, Nagahiro, 4,636,360, Cl. 422-65.000.

Okamura, Hidetomo: *See*—
Kakubari, Shoichiro; and Okamura, Hidetomo, 4,635,612, Cl. 126-25.00R.

Okamura, Hisanori; Akiyama, Hirosi; Kamoshita, Mutuo; and Miyazaki, Kunio, to Hitachi, Ltd. Ceramic composite article. 4,636,434, Cl. 428-328.000.

Okaya, Takuji; Tanaka, Yoshinari; Yonezu, Kiyoshi; Aoyama, Akimasa; and Moritani, Takeshi, to Kuraray Co, Ltd. Coating material. 4,636,551, Cl. 525-60.000.

Okazaki, Hiroshi: *See*—
Kazaoka, Kenichi; Okazaki, Hiroshi; and Inaba, Yasuhisa, 4,636,006, Cl. 297-458.000.

Oki Electric Industry Co., Ltd.: *See*—
Fukuda, Yasuhiro; and Suganuma, Ikuo, 4,636,724, Cl. 324-158.00R.
Tanagawa, Koji; and Ohashi, Isao, 4,636,945, Cl. 364-200.000.

Okita, Masao, to Alps Electric Co., Ltd. Disc clamp device. 4,637,010, Cl. 369-270.000.

Oksman, Erkki: *See*—
Savolainen, Esko; Laukkarinen, Tuomo; Lehto, Arto; Oksman, Erkki; and Eilamo, Unto, 4,636,181, Cl. 474-207.000.

Okudaira, Toshiyuki: *See*—
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,636,144, Cl. 417-63.000.

Okuhara, Hisakazu: *See*—
Higuchi, Kazuo; Okuhara, Hisakazu; and Sasaki, Kiichi, 4,635,963, Cl. 280-801.000.

Okumoto, Yutaka, to Japan Tobacco, Inc. Shredded tobacco feeding apparatus for cigarette making machine. 4,635,648, Cl. 131-109.100.

Olano, Francisco; MacDougall, John A.; and Pargeter, John K., to International Metals Reclamation Co., Inc., The. Conveying screw for furnace. 4,636,127, Cl. 414-158.000.

Olesen, William A.: *See*—
Johnson, Peter A.; and Olesen, William A., 4,635,871, Cl. 242-68.300.

Oliver, Roy N., to Medeco Security Locks, Inc. Cylinder lock. 4,635,455, Cl. 70-364.00A.

Olsen, Dwight; and Wall, Robert L., to General Electric Company. Method or manufacturing armature winding for a large turbine generator. 4,635,350, Cl. 29-598.000.

Olsen, Kristine: *See*—
Harris, John; Cooke, Nelson; and Olsen, Kristine, 4,636,316, Cl. 210-656.000.

Olson, Daniel R.: *See*—
Anthony, Blair T.; and Olson, Daniel R., 4,636,408, Cl. 427-160.000.

Olson Manufacturing Company: *See*—
Agbay, Anthony J., 4,635,452, Cl. 70-34.000.

Olson, Billy E., to AMP Incorporated. Electrical connector with strain relief. 4,636,023, Cl. 339-103.00M.

Olsson, Mats A.; and Sandstrom, Roland, to Insako, KB. Apparatus for infrasonically intensifying a glow bed. 4,635,571, Cl. 110-297.000.

Olympus Optical Co., Ltd.: *See*—
Imai, Masaharu, 4,636,865, Cl. 358-213.000.
Sakurada, Masahiko; Manabe, Sugio; Okamura, Hideaki; and Gocho, Nagahiro, 4,636,360, Cl. 422-65.000.

Omachi, Takao, to NEC Corporation. Device for giving a pattern a rotation of an integral multiple of 90° with the pattern read from a memory on a block by block basis. 4,636,783, Cl. 340-727.000.

Omata, Nobuaki, to Nifco Inc. Method of regulating the opening speed of box in passenger compartment of car. 4,635,763, Cl. 188-268.000.

Omori, Takashi: *See*—
Saitoh, Hiroyuki; Kurata, Masami; and Omori, Takashi, 4,636,081, Cl. 356-402.000.

Ondrey, John A.: *See*—
English, John C.; Ondrey, John A.; and Voyce, Jason M., 4,636,284, Cl. 203-18.000.

Onishi, Hamao: *See*—
Takahashi, Masahide; Sakai, Seiichi; Masada, Osamu; Ukawa, Masaru; and Onishi, Hamao, 4,636,931, Cl. 363-71.000.

Ono, Chikai; and Okajima, Yoshinori, to Fujitsu Limited. Semiconductor device. 4,636,831, Cl. 357-45.000.

Oodaira, Hirosi: *See*—
Ohuchi, Masayuki; Oodaira, Hirosi; and Yoshida, Kenichi, 4,635,356, Cl. 29-841.000.

Ooki, Minoru: *See*—
Sugiyama, Masahiko; Sutou, Masatmue; Murata, Mitsuru; Ooki, Minoru; and Tagawa, Shigetaro, 4,636,154, Cl. 418-97.000.

Oosawa, Tadakazu: *See*—
Nagao, Masami; and Oosawa, Tadakazu, 4,635,509, Cl. 81-3.200.

Ootsuka, Tetsuo, to Casio Computer Co., Ltd. Data processing device with specifiable program order. 4,636,971, Cl. 364-709.000.

Opara, Ulrich: *See*—
Jacobs, Hanno; Opara, Ulrich; and Selleschy, Franz, 4,636,964, Cl. 364-483.000.

Optical Radiation Corporation: *See*—
Posin, Thomas; and Lawson, Daniel D., 4,636,212, Cl. 623-6.000.

Oren, Meir. Device for holding and storing articles. 4,635,801, Cl. 211-70.600.

Oritani, Atsushi, to Fujitsu Limited. Constant-current source circuit and differential amplifier using the same. 4,636,742, Cl. 330-256.000.

Orndorff, Karl B.: *See*—
Sherwood, Edward F.; Baldwin, Paul L.; Orndorff, Karl B.; and Dillon, Charles M., 4,635,756, Cl. 187-1.00R.

Osato, Yoichi: *See*—
Ogawa, Kyosuke; Shirai, Shigeru; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,636,450, Cl. 430-84.000.

Osborn, James G.: *See*—
Hakala, Douglas T.; Bocek, Joseph M.; and Osborn, James G., 4,635,639, Cl. 128-419.00D.

O'Shea, James P.: *See*—
Thornton, Donald I.; Peyton, Richard H.; and O'Shea, James P., 4,636,231, Cl. 55-318.000.

Osman, Fazil I.: *See*—
Bell, John L.; Isaman, David L.; and Osman, Fazil I., 4,637,014, Cl. 370-89.000.

Osterman, Harry F.: *See*—
Figiel, Francis J.; and Osterman, Harry F., 4,636,320, Cl. 210-801.000.

Ostermayer, Franz; and Zimmermann, Markus, to Ciba-Geigy AG. Derivatives of 3-aminopropane-1,2-diol. 4,636,511, Cl. 514-311.000.

Ostrander, Michael R.: *See*—
Nagabhushan, Tattanahali L.; Miller, George H.; Schwartz, Jerome; and Ostrander, Michael R., 4,636,383, Cl. 424-85.000.

Otis Elevator Company: *See*—
Bialy, Louis; and Menet, Frederick P., 4,635,907, Cl. 267-8.00R.

Otis Engineering Corporation: *See*—
Schwendemann, Kenneth L.; McCracken, Oliver W.; Mondon, Cary G.; and Wortham, Larry C., 4,636,934, Cl. 364-132.000.

Otobe, Yutaka; and Kishi, Noriyuki, to Honda Giken Kogyo Kabushiki Kaisha. Method for controlling operating state of an internal combustion engine with an overshoot preventing function. 4,636,957, Cl. 364-431.070.

Otsuka, Nobuo; Igarashi, Hideo; and Thompson, Peter, to Mitsubishi Denki Kabushiki Kaisha. Air-conditioner. 4,635,445, Cl. 62-158.000.

Otsuki, Hiromi: *See*—
Tsuru, Naohiko; Matsuura, Ryoichi; Otsuki, Hiromi; Fujinami, Hiroshi; Hori, Shinichi; Nomura, Yoshihisa; and Oka, Hiroyuki, 4,636,009, Cl. 303-93.000.

Ott, Ernst: *See*—
Malina, Ludek; and Ott, Ernst, 4,635,436, Cl. 57-417.000.

Oudelette, Gilles, to Societe Nouvelle Rockall France S.A. Ear tag for marking animals. 4,635,389, Cl. 40-301.000.

Ouhayoun, Michel M.: *See*—
Midavaine, Thierry R.; and Ouhayoun, Michel M., 4,637,030, Cl. 372-82.000.

Overcashier, Robert H.; and Farris, Robert D., to Shell Oil Company. Epoxy steering wheel. 4,635,500, Cl. 74-552.000.

Owen, Michael E.; and Byerley, Mark S., to Wyko Equipment Limited. Tire building drum. 4,636,277, Cl. 156-417.000.

Owens-Corning Fiberglas Corporation: *See*—
Algrim, Donald J.; Vermilion, Donn R.; Hammond, Donald J.; and Haines, Richard M., 4,636,437, Cl. 428-391.000.
Huey, Larry J.; and Beuther, Paul D., 4,636,234, Cl. 65-2.000.

Owens-Illinois, Inc.: *See*—
Franks, Nelson J.; and Nowicki, Casimir W., 4,636,166, Cl. 425-503.000.

Owens, John C., to Storage Technology Corporation. Rell hub for a magnetic tape drive. 4,635,870, Cl. 242-68.300.
Oy Nokia Ab: *See*—
Savolainen, Esko; Laukkarinen, Tuomo; Lehto, Arto; Okaman, Erkki; and Eilamo, Unto, 4,636,181, Cl. 474-207.000.
Oy Wartsila Ab: *See*—
Kytonen, Pauli, 4,635,867, Cl. 242-56.00R.
Oyama, Hiroo; and Kouchi, Tadashi, to Stanley Electric Co., Ltd. Headlamp for vehicle. 4,636,923, Cl. 362-80.000.
Ozaki, Toshifumi: *See*—
Aoki, Masakazu; Nakagome, Yoshinobu; Horiguchi, Masahi; Ozaki, Toshifumi; Shimohigashi, Katsuhiro; and Ikenaga, Shinichi, 4,636,985, Cl. 365-189.000.
Ozawa, Isao; Ito, Noboru; Takizawa, Masaaki; Ohta, Yoshio; and Ijichi, Kiyotaru, to Toyoda Gosei Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Fluid-filled damper device. 4,635,910, Cl. 267-140.100.
Ozeki, Jiro, to Slidex Corporation. Jacket for strip films. 4,635,796, Cl. 206-456.000.
Ozu, Tadahiro: *See*—
Nakano, Hideaki; and Ozu, Tadahiro, 4,635,596, Cl. 123-197.0AB.
PA Consulting Services Limited: *See*—
Taylor, Peter J., 4,637,055, Cl. 382-31.000.
PA Incorporated: *See*—
Kahil, John E.; Milewits, Marvin; Bradfield, James E.; and Lam, Clive C., 4,636,727, Cl. 324-227.000.
Paap, Hans J.: *See*—
Savage, Kerry D.; Cox, Percy T.; and Paap, Hans J., 4,636,731, Cl. 324-318.000.
Pacini, Ermanno. Truncated-cone roller with abrasive surface for smoothing tool with radial truncated-cone roller. 4,635,407, Cl. 51-206.00R.
Pahlke, Klaus: *See*—
Schillinger, Hans; Pahlke, Klaus; Starke, Siegfried; Panhorst, Heinz-Juergen; and Mengel, Hans-Eckhard, 4,635,738, Cl. 175-398.000.
Pakiam, Anthony I. Implantable prosthesis. 4,636,213, Cl. 623-8.000.
Paktinat, Javad: *See*—
Anderson, James L.; and Paktinat, Javad, 4,635,727, Cl. 166-308.000.
Palentyn, Gunther H.; Dehlinger, James R.; and Rigsby, Donald R., to Benteler Corporation. Laser contour cut door beams. 4,636,608, Cl. 219-121.0LN.
Palmer, Lennart. Device for exchangeable attachment of tools on an industrial robot. 4,635,328, Cl. 29-26.00A.
Palmer, Malcolm G., to Compact Energy Limited. Demolition device and method of preparing same. 4,635,554, Cl. 102-416.000.
Palmquist, Martti J. Hydroplaning wing sailing craft. 4,635,577, Cl. 114-39.000.
Pande, Gyan S.: *See*—
Gold, Jeffrey G.; Pande, Gyan S.; and Smith, Kevin, 4,636,346, Cl. 264-139.000.
Panhorst, Heinz-Juergen: *See*—
Schillinger, Hans; Pahlke, Klaus; Starke, Siegfried; Panhorst, Heinz-Juergen; and Mengel, Hans-Eckhard, 4,635,738, Cl. 175-398.000.
Paper Converting Machine Company: *See*—
Johnson, Peter A.; and Olesen, William A., 4,635,871, Cl. 242-68.300.
Paradise, Norman P. Hair-waving rod. 4,635,655, Cl. 132-40.000.
Paradyne Corporation: *See*—
Betts, William L., 4,637,035, Cl. 375-8.000.
Pargeter, John K.: *See*—
Olano, Francisco; MacDougall, John A.; and Pargeter, John K., 4,636,127, Cl. 414-158.000.
Park, Joon. T-square apparatus. 4,635,377, Cl. 33-451.000.
Parker, Louis W.: *See*—
Hedges, Rhey W., 4,636,702, Cl. 318-729.000.
Parno, Leroy O. Corvette wing. 4,635,991, Cl. 296-1.00S.
Parrott, Stephen L.; Kukes. Simon G.; and Efner, Howard F., to Phillips Petroleum Company. Process for the preparation of promoted catalysts. 4,636,487, Cl. 502-168.000.
Particle Measuring Systems, Inc.: *See*—
Knollenberg, Robert G., 4,636,075, Cl. 356-336.000.
Parton, Kenny R., to Steele, R. W., II. Chain punch. 4,635,437, Cl. 59-7.000.
Pasquali, Giancarlo, to Sasib S.p.A. Multi-color traffic signal. 4,636,036, Cl. 350-172.000.
Passmore, Ronald C.: *See*—
Saffold, James A.; Green, Augustus H., Jr.; and Passmore, Ronald C., 4,636,797, Cl. 343-725.000.
Pastor, Ricardo C.; and Lee, Florentino V., to Hughes Aircraft Company. Method of preparation of perovskite-type compounds. 4,636,378, Cl. 423-598.000.
Pastor, Stephen D.; and Spivack, John D. Hindered silicon ester stabilizers. 4,636,573, Cl. 556-441.000.
Patchmaster Corp.: *See*—
Pensky, Arnold H.; and Hunt, James A., 4,635,548, Cl. 101-319.000.
Patel, Janak R.; and Schaffer, John S., to G & W Electric Company. Switch with auxiliary biasing mechanism. 4,636,594, Cl. 200-15.000.
Patel, Jitendra G.: *See*—
Sandstrom, William A.; Patel, Jitendra G.; and Bush, John R., 4,636,168, Cl. 432-58.000.
Patel, Thakorbhai P.: *See*—
Feilner, Peter J.; Lai, Mun F.; and Patel, Thakorbhai P., 4,636,518, Cl. 514-397.000.
Patt, William, to Warner-Lambert Company. Benzothien-3-yl adenosine; benzothien-3-yl adenosine, S-oxide; and benzothien-3-yl, S,S-dioxide adenosine compounds. 4,636,493, Cl. 514-46.000.
Pauling, Horst: *See*—
Holick, Wolfgang; and Pauling, Horst, 4,636,566, Cl. 548-303.000.
Paulson, Rollie W. Speaker cabinet having interactive speakers. 4,635,748, Cl. 181-145.000.
Paunov, Boyan I.; Balevski, Teodor A.; and Ivanov, Bojidar S., to Institute Po Metaloznanie I Technologia Na Metalite. Apparatus for and method of the plastic forming of materials. 4,635,460, Cl. 72-239.000.
Pauwels, Michael A.: *See*—
Wright, Danny O.; and Pauwels, Michael A., 4,636,620, Cl. 219-501.000.
Pavy, Michel; and Genty, Alain, to Nortene. Apparatus for making a tubular sheath of plastic material. 4,636,162, Cl. 425-290.000.
PCL Packaging Ltd: *See*—
Piggott, David C., 4,636,191, Cl. 493-227.000.
Peckman, Robert; and Karbassiyoon, Kamran, to ITT Corporation. Arrangement for removing glass soot from an exhaust tube during optical preform fabrication. 4,635,314, Cl. 15-304.000.
Peddinghaus, Carl Ulrich: *See*—
Wengenroth, Kurt; and Klaus, Siegfried, 4,635,512, Cl. 83-156.000.
Peek, Brian R.: *See*—
Gugle, James E.; and Peek, Brian R., 4,636,124, Cl. 411-82.000.
Peel, Christopher J.; Evans, Brian; Harris, Samuel J.; Noble, Brian; and Dinsdale, Keith, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Aluminum alloys. 4,636,357, Cl. 420-532.000.
Peeters, Jozef I. C.: *See*—
de Man, Rolf E.; de Ridder, Jan; Sprengers, Leo M.; and Peeters, Jozef I. C., 4,636,691, Cl. 315-209.00R.
Pegasus Industries, Inc.: *See*—
Zecman, Kenneth P., 4,635,851, Cl. 239-133.000.
Peglow, Hartmut: *See*—
Giessner, Bertram; Pitsch, Paul; Heinen, Peter; and Peglow, Hartmut, 4,636,235, Cl. 65-3.120.
Giessner, Bertram; Pitsch, Paul; Heinen, Peter; and Peglow, Hartmut, 4,636,236, Cl. 65-3.120.
Peickert, Marlin W. Filler neck insert. 4,635,813, Cl. 220-86.00R.
Penner, Kevin T.: *See*—
Rogers, D. Brett; and Penner, Kevin T., 4,635,471, Cl. 73-81.000.
Penner, Maureen. Dishware protector. 4,635,799, Cl. 211-41.000.
Penney, Carl M., to General Electric Company. Quiescent circle and arc generator. 4,636,611, Cl. 219-124.340.
Penninger, Josef, to Henkel Kommanditgesellschaft auf Aktien. Method for inhibiting corrosion of zinc using bis-triazoles. 4,636,359, Cl. 422-13.000.
Pennwalt Corporation: *See*—
Crooker, Richard M., 4,636,529, Cl. 521-131.000.
Kamens, Ernest R.; and Cassoni, John P., 4,636,528, Cl. 521-95.000.
Pensky, Arnold H.; and Hunt, James A., to Patchmaster Corp. Reciprocating printer for patches. 4,635,548, Cl. 101-319.000.
Penza, Hans; Segler, Siegfried; Schmuck, Karl-Wilhelm; Asbach, Dietrich; and Lindemann, Eckhard, to Dr. Ing. Rudolf Hell GmbH. Device for the automatic loading of film material on a suction plate. 4,636,064, Cl. 355-73.000.
Perez, Henry J.: *See*—
Ederati, Richard M.; and Perez, Henry J., 4,636,206, Cl. 604-140.000.
Perkins, Norman P.; Luke, Roger D.; and Kaufman, Steven A., to Siemens Energy & Automation, Inc. Fastener having dual teeth. 4,636,915, Cl. 361-355.000.
Perlow, Stewart M.: *See*—
Presser, Adolph; and Perlow, Stewart M., 4,636,754, Cl. 333-116.000.
Perratone, Rene ; and Poldervaart, Leendert, to Single Buoy Moorings Inc. Rotatable pipe coupling for a plurality of incoming and a plurality of outgoing pipes. 4,635,971, Cl. 285-134.000.
Persons, Thomas H. Wheel hub with lubrication fittings. 4,636,007, Cl. 301-105.00R.
Pesa, William A.: *See*—
Berend, Peter M.; Dilyard, Richard D.; Pesa, William A.; and Vaeth, Howard J., 4,636,605, Cl. 219-10.55F.
Peter Aschauer, Firma: *See*—
Aschauer, Peter; Aschauer, Michael; and Bauer, Helmuth, 4,635,754, Cl. 182-3.000.
Peterman, Charles P.; and Keithahn, Julian D., to Hydril Company. Flow control apparatus. 4,635,678, Cl. 137-551.000.
Peterpaul, Joseph, to Thomas & Betts Corporation. Solar panel module and support therefor. 4,636,577, Cl. 136-206.000.
Peters, Jerry L.: *See*—
Aldridge, Gerald T.; and Peters, Jerry L., 4,635,888, Cl. 248-231.000.
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Hernandez, Paul M.; and Petersen, Curtis R., 4,636,326, Cl. 252-77.000.
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Pichler, Klaus R.: *See*—
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Plotkin, Stanley A.; and Clark, H. Fred, to Wistar Institute of Anatomy & Biology, The. Vaccine, method for its preparation, and use thereof in vaccinating humans against rotavirus infection. 4,636,385, Cl. 424-89.000.
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Raffel, Jack I.; Yasaitis, John A.; and Chapman, Glenn H., to Mass. Institute of Technology. Method and apparatus for forming low resistance lateral links in a semiconductor device. 4,636,404, Cl. 427-53.100.
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Chabardes, Pierre; and Mulhauser, Michel, 4,636,570, Cl. 549-408.000.
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Seon, Francoise; and Boudot, Bernard, 4,636,353, Cl. 420-416.000.
Rhyne, Earl C.; and Illingworth, Lewis, to Fiskars Electronics Corporation. DC to AC converter. 4,636,927, Cl. 363-15.000.
Ricchio, Dominic A. Method for improved water therapy. 4,635,620, Cl. 128-64.000.
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Hartman, Davis H.; and Richard, Fred V., 4,636,646, Cl. 250-551.000.
Richards, Chester L., Sr. Photography pin board system. 4,636,067, Cl. 355-91.000.
Richmond, James W.: *See*—
Smock, Steven W.; and Richmond, James W., 4,636,595, Cl. 200-11.00R.
Ricoh Company, Ltd.: *See*—
Emoto, Masami; Nishimiya, Masanobu; and Kiguchi, Hiroyuki, 4,636,625, Cl. 250-201.000.
Kodama, Yutaka, 4,635,920, Cl. 271-81.000.
Nagamoto, Masanaka; Kurisu, Norio; and Taniguchi, Keishi, 4,636,819, Cl. 346-216.000.
Narita, Fujiaki; and Tanaka, Sumio, 4,636,879, Cl. 360-72.200.
Yuasa, Kazuhiro, 4,636,815, Cl. 346-153.100.
Riddle, Barry L.: *See*—
Kipp, Egbert M.; Kirk, Thomas E.; and Riddle, Barry L., 4,636,321, Cl. 252-49.300.
Riedel, Karl: *See*—
Dupper, Walter; Emberger, Roland; Hack, Kurt; Lattner, Manfred; Nickolay, Helmut; Riedel, Karl; and Schollhammer, Richard, 4,635,321, Cl. 19-0.250.
Rieder, Heinz; Schwaiger, Max; and Swatek, Harald, to RSF Elektronik OHG Rieder & Schwaiger Gesellschaft m.b.H. Optoelectronic method of measuring the extent of a movement and optoelectronic measuring instrument for carrying out the method. 4,636,079, Cl. 356-374.000.
Riediger, Craig W.: *See*—
Menke, Jeffery W.; and Riediger, Craig W., 4,636,132, Cl. 414-694.000.
Riehl, David C., to Dresser Industries, Inc. Vehicle front wheel assist drive overspeed control system. 4,635,743, Cl. 180-243.000.
Riese, J. Richard. Specimen, sample collection and transport container. 4,637,061, Cl. 383-38.000.
Rieter Machine Works Limited: *See*—
Malina, Ludek; and Ott, Ernst, 4,635,436, Cl. 57-417.000.
Riggs, Gary T., to Cordis Corporation. Process for thermally bonding plastic tubes. 4,636,272, Cl. 156-158.000.
Rigsby, Donald R.: *See*—
Palentyn, Gunther H.; Dehlinger, James R.; and Rigsby, Donald R., 4,636,608, Cl. 219-121.0LN.
Riken Denshi Co. Ltd.: *See*—
Yasunaga, Soichiro, 4,636,772, Cl. 340-347.0DA.
Riker Laboratories, Inc.: *See*—
Gam, Vivien W., 4,635,627, Cl. 128-200.140.
Rimrock Corporation: *See*—
Buckley, Richard A., 4,635,493, Cl. 74-99.00R.
Rindal, Abraham E., to RCA Corporation. Phase selectable circuit for use in a stereo demodulator. 4,637,044, Cl. 381-4.000.
Roost, William G., to Lilly Industries Limited. Stripper rings for capsule pins. 4,636,165, Cl. 425-472.000.
Roberge, Jacques. Assembly for mounting a light fixture to a support structure. 4,636,92o, Cl. 362-353.000.
Robert Bosch GmbH: *See*—
Bauer, Hans-Peter, 4,636,961, Cl. 364-474.000.
Bayha, Kurt; and Weyl, Helmut, 4,636,293, Cl. 204-428.000.
Cornelius, Peter, 4,635,601, Cl. 123-339.000.
Eheim, Franz, deceased, 4,635,602, Cl. 123-357.000.
Faupel, Werner; and Schmidt, Klaus, 4,635,605, Cl. 123-449.000.
Gotsch, Dieter; Klenk, Robert; Hafner, Otto; and Suss, Claus, 4,635,732, Cl. 173-162.00R.
Herden, Werner; and Saggau, Boye, 4,636,690, Cl. 315-58.000.
Roberto, Mostura: *See*—
Mottana, Sergio; and Roberto, Mostura, 4,635,526, Cl. 89-1.410.
Roberts, Lawrence R.: *See*—
Welch, Phillip W.; and Roberts, Lawrence R., 4,635,858, Cl. 241-16.000.
Roberts, Richard D.; and Walker, William D., to Harris Corporation. Local area network equalization system and method. 4,637,064, Cl. 455-67.000.
Robertshaw Controls Company: *See*—
McGeorge, Gram J., 4,636,621, Cl. 219-506.000.
Robertson, Beverly M.: *See*—
Robertson, Jesse C.; and Robertson, Beverly M., 4,635,953, Cl. 280-480.000.
Robertson, Jesse C.; and Robertson, Beverly M. Tow cable with bracket and storage means. 4,635,953, Cl. 280-480.000.
Robinette-Lehman, Cynthia, to Aspen Laboratories, Inc. Tourniquet cuff. 4,635,635, Cl. 128-327.000.
Robinson, Albert H., Jr.; and Egee, Walter W., deceased (by Egee. Elizabeth J., executrix), to Campbell Soup Company. Method for heat treating food. 4,636,395, Cl. 426-511.000.
Robinson, Anthony H. J.: *See*—
Kuhfus, Gerd; Walker, Charles R. S.; and Robinson, Anthony H. J., 4,636,591, Cl. 381-159.000.
Robotic Vision Systems, Inc.: *See*—
Ross, Joseph; and Schmidt, Richard, 4,637,058, Cl. 382-48.000.
Roche, Thomas A.; and Edminster, Robert E., to Motorola, Inc. Sealed flexible printed wiring feedthrough apparatus. 4,636,581, Cl. 174-152.00R.
Rochelt, Gunter: *See*—
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Rochester Gauges, Inc.: *See*—
Hrncir, Robert E.; and Ross, Herbert G., Jr., 4,635,480, Cl. 73-322.500.
Rockwell International Corporation: *See*—
Gay, Richard L.; and Grantham, LeRoy F., 4,636,336, Cl. 252-632.000.
Raymond, Roger S., 4,635,461, Cl. 72-342.000.
Rode, Wilhelm, to Mannesmann AG. Hydraulically operated impacting device. 4,635,531, Cl. 91-303.000.
Roeder, Alfred: *See*—
Bestek, Heinz; Ewald, Werner; Hennecke, Hans-Peter; Roeder, Alfred; and Schmitz, Friedrich, 4,636,379, Cl. 423-640.000.
Roedig, Robert, to Grumman Aerospace Corporation. Sealant applicator for rivet machine. 4,635,827, Cl. 222-160.000.
Roese, Helmut: *See*—
Geyer, Arthur; Kuisl, Max; Pfeiffer, Eugen; Roese, Helmut; and Klein, Werner, 4,636,364, Cl. 422-162.000.
Roethke, Siegfried. Exercise tower and bench. 4,635,934, Cl. 272-144.000.
Roetter, Frank; and Oeschger, Frank, to Pitney Bowes Inc. Envelope feeding apparatus. 4,635,922, Cl. 271-119.000.

Roger, Stephen J.; Bryant, John D.; and Wong, Philip, to Burroughs Corporation. Document sensing apparatus that detects non-specular reflected light. 4,636,633, Cl. 250-223.00R.
Rogers Corporation: *See*—
Jodoin, Raymond C., 4,636,918, Cl. 361-405.000.
Rogers, D. Brett; and Penner, Kevin T., to Energy Development Corporation. Hardness testing device for pipes. 4,635,471, Cl. 73-81.000.
Rogers, Edward J.: *See*—
Hall, Walter J.; Lin, Chester H.; Ramos, Joel A.; and Rogers, Edward J., 4,636,602, Cl. 200-153.0SC.
Rogers, Richard B.; and Herrero, Maria P., to Dow Chemical Company, The. Aryl(aryloxy or arylthio)azolomethanes. 4,636,514, Cl. 514-340.000.
Rogler, Wolfgang: *See*—
Ihlein, Walter; and Rogler, Wolfgang, 4,636,556, Cl. 528-53.000.
Rohm GmbH: *See*—
Pfleiderer, Ernst; Taeger, Tilman; and Wick, Gertrud, 4,636,222, Cl. 8-94.160.
Wenzel, Franz; Arndt, Peter J.; and Siol, Werner, 4,636,458, Cl. 430-270.000.
Rohm and Haas Company: *See*—
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Rohr, Franz, to Siemens Aktiengesellschaft. Method for loading a container with rods of nuclear reactor fuel assemblies containing nuclear fuel or neutron absorber material, and device for performing the method. 4,635,427, Cl. 53-475.000.
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Rohr, Wolfgang: *See*—
Plath, Peter; Rohr, Wolfgang; Schwendemann, Volker; and Wuerzer, Bruno, 4,636,246, Cl. 71-92.000.
Rollins, Fred P.; and Glass, James S., to United States of America, National Aeronautics and Space Administration. Self-contained, single-use hose and tubing cleaning module. 4,635,663, Cl. 134-93.000.
Rollins, Jack; Coppin, William; and Karabin, Thaddeus, to Mazon Corporation. Positive pullback synchro valve actuator. 4,635,898, Cl. 251-229.000.
Romberg, Felix B. Fence tool for wire crimping and wire cutting. 4,635,687, Cl. 140-106.000.
Ronka, Pekka; and Vaintola, Raimo, to Kone Oy. Procedure for loading cuvette packages into an instrument, and cuvette package. 4,636,477, Cl. 436-48.000.
Rooke, Paul A., to International Business Machines Corporation. Self-pivoting robotic gripper tool. 4,635,985, Cl. 294-2.000.
Rooney, James F. Joining and mounting device. 4,636,122, Cl. 411-45.000.
Rooney, John M.: *See*—
Harris, Stephen J.; McKervey, M. Anthony; Melody, David P.; Woods, John; and Rooney, John M., 4,636,539, Cl. 523-214.000.
Roos, Mark D.: *See*—
Sharrit, David D.; Dildine, Robert G.; Roos, Mark D.; and Barr, John T., IV, 4,636,717, Cl. 324-77.00B.
Rose, Leroy: *See*—
Friehauf, William J.; Janssen, Donovan M.; Kirton, Alan J.; Murphy, Robert M.; and Rose, Leroy, 4,636,892, Cl. 360-97.000.
Rosemeier, Friedrich: *See*—
Christopherson, Kjell H.; Odelius, Tomas; Rosemeier, Friedrich; Stenberg, Kaj O.; Svensson, Tommy E.; and Killmaier, Horst, 4,636,204, Cl. 604-283.000.
Rosen, Philip: *See*—
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Rosencwaig, Allan; and Smith, Walter L., to Therma-Wave, Inc. Method and apparatus for evaluating surface conditions of a sample. 4,636,088, Cl. 374-5.000.
Rosenquist, Niles R.; and Evans, Thomas L., to General Electric Company. Bis(cyclic carbonates), precursors thereof, and polycarbonate compositions containing them. 4,636,559, Cl. 528-370.000.
Rosier, Brian K.: *See*—
Hankins, Kevin T.; Michael, Mark W.; and Rosier, Brian K., 4,635,345, Cl. 29-577.00C.
Ross, Herbert G., Jr.: *See*—
Hrncir, Robert E.; and Ross, Herbert G., Jr., 4,635,480, Cl. 73-322.500.
Ross, Joseph; and Schmidt, Richard, to Robotic Vision Systems, Inc. Location of objects without use of salient features. 4,637,058, Cl. 382-48.000.
Rosstream Research Associates, Ltd.: *See*—
Hosilyk, Randall E.; Marley, David J.; and Hosilyk, Rodney E., 4,635,876, Cl. 242-195.000.
Rosny, Phillip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Friedrich, Ludwig; and Lenke, Dieter, to BASF Aktiengesellschaft. 6-(acylaminoaryl)-3(2H)-pyridazinone derivatives and their use. 4,636,504, Cl. 514-252.000.
Rothbuhr, Lothar; and Kuhner, Gerhard, to Degussa Aktiengesellschaft. Process for producing furnace blacks of variable carbon black structure. 4,636,375, Cl. 423-450.000.
Rothman, Michael L. Portable surgical drainage platform. 4,635,913, Cl. 269-327.000.
Rothwell, Harold L., Jr.: *See*—
Keeffe, William M.; Gungle, W. Calvin; Rothwell, Harold L., Jr.; and Krasko, Zeya K., 4,636,687, Cl. 313-620.000.
Rottinghaus, Robert B. Self-locking link. 4,635,438, Cl. 59-84.000.
Rouleau, Alain; Rouleau, Patrick; and Touret, Jean-Pierre. Process and apparatus for gripping flexible, and in particular textile layers, and a machine for gripping and transferring said layers. 4,635,918, Cl. 271-183.000.
Rouleau, Patrick: *See*—
Rouleau, Alain; Rouleau, Patrick; and Touret, Jean-Pierre, 4,635,918, Cl. 271-183.000.
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Roy, Glenn M.: *See*—
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RSF Elektronik OHG Rieder & Schwaiger Gesellschaft m.b.H.: *See*—
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Rubbermaid Incorporated: *See*—
Berend, Peter M.; Dilyard, Richard D.; Pess, William A.; and Vaeth, Howard J., 4,636,605, Cl. 219-10.55F.
Rubin, Mae K., to Mobil Oil Corporation. Synthesis of crystalline silicate ZSM-12 using dibenzyldimethylammonium cations and the product produced. 4,636,373, Cl. 423-328.000.
Ruckert, Peter: *See*—
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Rudaz, Jean: *See*—
Cretin, Jacques; Beauducel, Claude; Rudaz, Jean; and Gonzalez, Pierre, 4,636,992, Cl. 367-20.000.
Rudi, Guttorm; and Dilling, Jan-Erik, to Tandberg Data A/S. Magnetic tape recorder. 4,636,890, Cl. 360-96.500.
Rudi, Guttorm, to Tandberg Data A/S. Safety device for tape cassettes for positionally correct insertion of the tape cassette into an acceptance device. 4,636,903, Cl. 360-132.000.
Rudolf, Felix, to Fondation Suisse de Recherche en Microtechnique. Semiconductor device responsive to ions. 4,636,827, Cl. 357-25.000.
Ruhrkohle Aktiengesellschaft: *See*—
Wolowski, Eckard; and Mirtsch, Frank, 4,636,300, Cl. 208-400.000.
Rumbaugh, James T., to Berkley and Company, Inc. Apparatus for stripping fish line from a spool and sharpening fish hooks. 4,635,406, Cl. 51-181.00R.
Rumignani, Paolo: *See*—
Bacher, Michel; and Rumignani, Paolo, 4,635,779, Cl. 192-89.00B.
Runkle, Dean E., to Allied Corporation. Universal joint with stationary seats. 4,636,180, Cl. 464-120.000.
Ruppel, John S., to Motorola, Inc. Broadband solid state antenna switch. 4,637,065, Cl. 455-78.000.
Russell, Anthony W.: *See*—
Russell, Michael K.; and Russell, Anthony W., 4,636,995, Cl. 367-85.000.
Russell, Michael K.; and Russell, Anthony W., to NL Sperry-Sun, Inc. Mud pressure control system. 4,636,995, Cl. 367-85.000.
Russin-Moynier, Yves R.: *See*—
Madsen, Willy B.; Jensen, Finn H.; Rasmussen, Ole B.; Goldstein, Guy; and Russin-Moynier, Yves R., 4,636,419, Cl. 428-131.000.
Ruyten, Henricus M.: *See*—
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Ryobi Limited: *See*—
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Ryu, Nobuyuki, to Toyota Jidosha Kabushiki Kaisha. Seatbelt assembly. 4,635,964, Cl. 280-804.000.
S&C Electric Company: *See*—
Hall, Walter J.; Lin, Chester H.; Ramos, Joel A.; and Rogers, Edward J., 4,636,602, Cl. 200-153.0SC.
S. C. Johnson & Son, Inc.: *See*—
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SAB Nife AB: *See*—
Nilsson, Bo; and Severinsson, Lars M., 4,635,762, Cl. 188-203.000.
Sabo, Robert C. Method for providing a seal around a shaft and against a bearing housing. 4,635,944, Cl. 277-1.000.
Saegusa, Takashi, to Nippon Kogaku K. K. Photometric method and apparatus for cameras. 4,636,054, Cl. 354-432.000.
Saffold, James A.; Green, Augustus H., Jr.; and Passmore, Ronald C., to United States of America, Army. Dual mode dichroic antenna/aperture. 4,636,797, Cl. 343-725.000.
Saggau, Boye: *See*—
Herden, Werner; and Saggau, Boye, 4,636,690, Cl. 315-58.000.
Sagitani, Hiromichi: *See*—
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Sahulka, Richard J.: *See*—
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Saint-Gobain Vitiage: *See*—
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Saito, Keichiro: *See*—
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Saito, Makoto: *See*—
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Saito, Tadao: *See*—
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Saito, Tsutomu: *See*—
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Saito, Yasuaki, to Murata Manufacturing Co., Ltd. Noise filter. 4,636,752, Cl. 333-12.000.
Saitoh, Hiroaki: *See*—
Kashimura, Noritake; and Saitoh, Hiroaki, 4,636,034, Cl. 350-96.210.
Saitoh, Hiroyuki; Kurata, Masami; and Omori, Takashi, to Fuji Xerox Co., Ltd. Apparatus for reading color image. 4,636,081, Cl. 356-402.000.
Saitoh, Keishi: *See*—
Ogawa, Kyosuke; Shirai, Shigeru; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,636,450, Cl. 430-84.000.
Saitoh, Tadao: *See*—
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Sajdak, Robert L.: *See*—
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Sakabe, Busaburo; Hyuga, Kounosuke; and Araki, Kazuhito, to Japan Tobacco, Inc. Knife abrasive apparatus for rotary drum shaped cutter. 4,635,402, Cl. 51-74.0BS.
Sakai, Ryo: *See*—
Itoh, Fumihiko; Usagawa, Tatumi; Sakai, Ryo; and Yamamoto, Yasakao, 4,635,615, Cl. 126-273.00A.
Sakai, Seiichi: *See*—
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Sakane, Toshio; Taguchi, Tetsuya; Ogawa, Masahiko; Tamura, Shuichi; and Tsunekawa, Tokuichi, to Canon Kabushiki Kaisha. Distance detecting device. 4,636,053, Cl. 354-403.000.
Sakata, Ko: *See*—
Itoh, Hiroyuki; Sakata, Ko; and Imai, Hirosuke, 4,636,229, Cl. 55-158.000.
Sako, Junichi; and Yagi, Toshiharu, to Daikin Industries, Ltd. Polymeric composite heating element. 4,636,331, Cl. 252-511.000.
Sakuma, Noriyuki: *See*—
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Sakurada, Masahiko; Manabe, Sugio; Okamura, Hideaki; and Gocho, Nagahiro, to Olympus Optical Company Limited. Automatic analyzing apparatus. 4,636,360, Cl. 422-65.000.
Sakurai, Keiichi, to Casio Computer Co., Ltd. Hybrid electronic musical instrument. 4,635,519, Cl. 84-1.170.
Sakurai, Koichi. Toy having a melody-making mechanism of a sound-detection type. 4,637,007, Cl. 369-67.000.
Salazar, Edilberto I.; and Kirschner, Wallace, to Pitney Bowes Inc. Microprocessor controlled d.c. motor for controlling a postage meter. 4,636,959, Cl. 364-464.000.
Salisbury, John K., Jr.; and Brock, David L., to Massachusetts Institute of Technology. Force sensing apparatus. 4,635,479, Cl. 73-862.040.
Sallas, John J., to Texas Instruments Incorporated. Seismic source vibrator having self tuning controller. 4,637,002, Cl. 367-190.000.
Sammons, Gregg J., to Fournier Accessory Furniture, Inc. Multi-purpose furniture swivel assembly. 4,635,894, Cl. 248-558.000.
Samson, Dominique H. P. M.: *See*—
Lucas, Jacques D. H.; and Samson, Dominique H. P. M., 4,635,949, Cl. 277-235.00B.
San Francisco Bay Area Rapid Transit District: *See*—
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Sand, William C.: *See*—
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Sandford, Harold F., to Shipley Company Inc. Method for preparing polyglutarimide having a lower molecular weight and a low polydispersity. 4,636,532, Cl. 522-3.000.
Sandstrom, Roland: *See*—
Olsson, Mats A.; and Sandstrom, Roland, 4,635,571, Cl. 110-297.000.
Sandstrom, William A.; Patel, Jitendra G.; and Bush, John R., to Institute of Gas Technology. Apparatus for thermal and pneumatic treatment of granular solids. 4,636,168, Cl. 432-58.000.
Sano, Shigeaki: *See*—
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Santel, Hans-Joachim: *See*—
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Santen, Sven, to SKF Steel Engineering AB. Method for destroying refuse. 4,635,573, Cl. 110-346.000.
Santomango, Anthony; and Hatheway, Nicholas N., Jr., to Artronics Corporation. Electronic burn-in system. 4,636,725, Cl. 324-158.00F.
Santomango, Anthony; and Hatheway, Nicholas N., Jr., to Artronics Corporation. Electronic burn-in system. 4,636,726, Cl. 324-158.00F.
Santos, Manuel V. Surgical clip applicator system. 4,635,634, Cl. 128-325.000.
Santucci, Donald; and Denemark, Phillip W., to DEK, Inc. Flat wire clip. 4,635,886, Cl. 248-73.000.
Sanyo Electric: *See*—
Itoh, Fumihiko; Usagawa, Tatumi; Sakai, Ryo; and Yamamoto, Yasakao, 4,635,615, Cl. 126-273.00A.
Sanyo Electric Co., Ltd.: *See*—
Tohya, Syoichi; and Takahashi, Minoru, 4,636,703, Cl. 320-2.000.
Yamano, Masaru; Sakai, Takashi; Furukawa, Nobuhiro; Murakami, Shuzo; and Matsumoto, Takanao, 4,636,445, Cl. 429-53.000.
Yokota, Yutaka; and Shimasaki, Hiroshi, 4,636,684, Cl. 313-412.000.
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Tanino, Masahiro; and Higuchi, Tomoyuki, 4,635,532, Cl. 91-456.000.
Sanyo-Kokusaku Pulp Co., Ltd.: *See*—
Shibano, Tomishi; Kimura, Itsuo; and Maruchi, Sachio, 4,636,432, Cl. 428-327.000.
Saravanos, Constantine: *See*—
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Sarcem S.A.: *See*—
Bonello, Philippe, 4,636,096, Cl. 384-243.000.
Sare, Ian R.; Henderson, Ian D.; Heijkoop, Teunis; Bosworth, Michael R.; Aspin, Ronald E.; and Arnold, Brian K., to Vida-Weld Pty. Limited. Composite metal articles. 4,635,701, Cl. 164-102.000.
Sargeaunt, Edward F.: *See*—
Koch, Hubert H.; and Sargeaunt, Edward F., 4,635,351, Cl. 29-598.000.
Saruta, Sadayoshi, to Denki Onkyo Company Limited. Deflection yoke having a function for adjusting deflection field. 4,636,693, Cl. 315-368.000.
Sasaki, Kiichi: *See*—
Higuchi, Kazuo; Okuhara, Hisakazu; and Sasaki, Kiichi, 4,635,963, Cl. 280-801.000.
Sasaki, Kunihiko: *See*—
Toyama, Keiichiro; Kodera, Masao; and Sasaki, Kunihiko, 4,636,997, Cl. 367-140.000.
Sasaki, Sigeo: *See*—
Sumida, Takashi; Sasaki, Sigeo; Ketori, Takao; and Fujita, Kazuhiro, 4,635,879, Cl. 242-198.000.
Sasaki, Takashi, to Canon Kabushiki Kaisha. Method of processing a color image signal. 4,636,844, Cl. 358-80.000.
Sasib S.p.A.: *See*—
Pasquali, Giancarlo, 4,636,036, Cl. 350-172.000.
SAT: *See*—
Midavaine, Thierry R.; and Ouhayoun, Michel M., 4,637,030, Cl. 372-82.000.
Sato, Katsumi, to Kabushikigaisha Tokyo Kikai Seisakusho. Folding cylinder for a web folding apparatus. 4,635,915, Cl. 270-49.000.
Sato, Kimiaki: *See*—
Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, 4,636,982, Cl. 365-149.000.
Sato, Kozo: *See*—
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Sato, Yasuji: *See*—
Nakayama, Yasunobu; and Sato, Yasuji, 4,636,588, Cl. 379-362.000.
Sato, Yuichi, to Canon Kabushiki Kaisha. Time base conversion apparatus. 4,636,837, Cl. 358-21.00R.
Sauer, Heinz, to Rasmussen GmbH. Hose coupling. 4,635,973, Cl. 285-242.000.
Saunders, William J.: *See*—
Gaunt, Lorraine E.; Crosby, Samuel C.; Saunders, William J.; and Bruffey, Robert D., Jr., 4,635,824, Cl. 222-129.100.
Saurenman, Phillip E.: *See*—
Casler, William A.; and Saurenman, Phillip E., 4,636,107, Cl. 401-405.100.
Savage, Kerry D.; Cox, Percy T.; and Paap, Hans J., to Texaco Inc. Propagation anisotropic well logging system and method. 4,636,731, Cl. 324-338.000.
Savolainen, Esko; Laukkarinen, Tuomo; Lehto, Arto; Oksman, Erkki; and Eilamo, Unto, to Oy Nokia Ab. Conveyor chain. 4,636,181, Cl. 474-207.000.
Sawada, Ken: *See*—
Ikemoto, Yutaka; and Sawada, Ken, 4,636,977, Cl. 364-900.000.
SCA Development Aktiebolag: *See*—
Peterson, Per V.; Hoglund, Hans E.; and Johansson, Alf O. K., 4,635,864, Cl. 241-251.000.
Scan Screen A/S: *See*—
Clausen, Erik; Clausen, Johannes; Jensen, Holger; and Stefnisson, Finnur, 4,636,035, Cl. 350-128.000.
Scarlata, Salvatore. Portable bootjack. 4,635,833, Cl. 223-116.000.
Schaffer, John S.: *See*—
Patel, Janak R.; and Schaffer, John S., 4,636,594, Cl. 200-15.000.
Schalkowsky, Samuel, to Spiral System Instruments, Inc. Computer assisted biological assay system. 4,637,053, Cl. 382-6.000.
Scharf, Donald R.: *See*—
Conrad, Douglas J.; Kennon, James L.; Macartney, Lawrence J.; and Scharf, Donald R., 4,635,585, Cl. 118-316.000.

Scheiderich, Robert F.: *See—*
Comper, Louis F.; and Scheiderich, Robert F., 4,636,407, Cl. 427-133.000.
Schellenberg, Lutz; Hamacher, Matthias; and Broadbent, Ronald, to Gerhard Collardin GmbH. Autodeposition post-bath rinse process. 4,636,264, Cl. 148-6.200.
Schemmann, Hugo: *See—*
Bertram, Leo; Diefenbach, Gerhard; and Schemmann, Hugo, 4,636,676, Cl. 310-162.000.
Schenk, Douglas E.: *See—*
Broyden, Robert H.; Schenk, Douglas E.; and Newman, Raymond A., 4,636,962, Cl. 364-478.000.
Schering Corporation: *See—*
Knapp, Julius Z., 4,635,807, Cl. 215-247.000.
Nagabhushan, Tattanahali L.; Miller, George H.; Schwartz, Jerome; and Ostrander, Michael R., 4,636,383, Cl. 424-85.000.
Scheurer, Robert S. Tube cover. 4,635,581, Cl. 114-346.000.
Schiff, Leonard N., to RCA Corporation. Speakerphone with adaptive cancellation of room echoes. 4,636,586, Cl. 379-390.000.
Schiffleger, Alan J.: *See—*
Chen, Steve S.; Schiffleger, Alan J.; Somdahl, Eugene R.; and Higbie, Lee, 4,636,942, Cl. 364-200.000.
Schillinger, Hans; Pahlke, Klaus; Starke, Siegfried; Panhorst, Heinz-Juergen; and Mengel, Hans-Eckhard, to Norton Christensen, Inc. Drill bit. 4,635,738, Cl. 175-398.000.
Schinabeck, John, to Fairchild Semiconductor Corporation. Method and apparatus for monitoring automated testing of electronic circuits. 4,637,020, Cl. 371-20.000.
Schips, Helmut. Sewing machine for sewing a rubber strip to a textile fabric. 4,635,575, Cl. 112-121.260.
Schleicher & Schuell, Inc.: *See—*
Kremer, Richard D., 4,635,488, Cl. 73-864.720.
Schlemmer, Richard A.: *See—*
Le Sage, Richard; Reshanov, Eugene N.; and Schlemmer, Richard A., 4,635,950, Cl. 280-47.260.
Schleyerbach, Rudolf: *See—*
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Schlossberg, David: *See—*
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Jackson, Frank W.; and Schlossberg, David, 4,635,791, Cl. 206-210.000.
Schlumberger Technology Corporation: *See—*
Crownover, Donald J., 4,635,735, Cl. 175-48.000.
Schmadel, Donald C., Jr.; and Goodman, Jack E., to Chevron Research Company. Process of tuning a grated optical fiber and the tuned optical fiber. 4,636,031, Cl. 350-96.190.
Schmidt, George S.: *See—*
Ades, Adrian R.; and Schmidt, George S., 4,635,336, Cl. 29-252.000.
Schmidt, Hans U.; and Werner, Frank, to BASF Aktiengesellschaft. Process for the preparation of optionally cellular polyurethane polyurea molded parts with improved demolding characteristics. 4,636,531, Cl. 521-163.000.
Schmidt, Klaus: *See—*
Faupel, Werner; and Schmidt, Klaus, 4,635,605, Cl. 123-449.000.
Schmidt, Paul J.; and Hung, William M., to Hilton-Davis Chemical, The. Compositions, process and systems. 4,636,820, Cl. 346-224.000.
Schmidt, Richard: *See—*
Ross, Joseph; and Schmidt, Richard, 4,637,058, Cl. 382-48.000.
Schmidt, Robert R.: *See—*
Wroblowsky, Heinz-Jurgen; Stetter, Jorg; Eue, Ludwig; Schmidt, Robert R.; and Santel, Hans-Joachim, 4,636,245, Cl. 71-90.000.
Schmidt, Rudolf, to Boge GmbH. Adjustable hydraulic damper apparatus. 4,635,765, Cl. 188-299.000.
Schmitz, Friedrich: *See—*
Bestek, Heinz; Ewald, Werner; Hennecke, Hans-Peter; Roeder, Alfred; and Schmitz, Friedrich, 4,636,379, Cl. 423-640.000.
Schmuck, Karl-Wilhelm: *See—*
Penza, Hans; Segler, Siegfried; Schmuck, Karl-Wilhelm; Asbach, Dietrich; and Lindemann, Eckhard, 4,636,064, Cl. 355-73.000.
Schmuck, Phillip W.: *See—*
Donovan, Joseph F.; Stout, Gregg W.; and Schmuck, Phillip W., 4,635,734, Cl. 175-4.600.
Schneider, Claus; Walther, Gerhard; Weber, Karl-Heinz; Bechtel, Wolf D.; and Boke-Kuhn, Karin, to Boehringer Ingelheim KG. 4-phenyltetrahydro-furano-pyridines and anti-depressant pharmaceutical compositions containing same. 4,636,510, Cl. 514-302.000.
Schnell, Josef. Training apparatus. 4,635,933, Cl. 272-129.000.
Schoenwald, Ronald D.: *See—*
Barfknecht, Charles F.; and Schoenwald, Ronald D., 4,636 515, Cl. 514-363.000.
Schollhammer, Richard: *See—*
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Scholz, Werner, to Telefunken Fernseh- und Rundfunk GmbH. Playback device for a digital signal recorded by a plurality of heads. 4,636,875, Cl. 360-26.000.
Schonberger, Hans: *See—*
Focke, Heinz; and Schonberger, Hans, 4,636,186, Cl. 493-142.000.
Schorman, Eric R.: *See—*
Burke, Timothy M.; Smith, Paul F.; and Schorman, Eric R., 4,637,022, Cl. 371-37.000.
Schradin, Fred. Method and apparatus for suppressing interference in a signal, in particular an audio signal. 4,637,050, Cl. 381-94.000.
Schreiber, Saul N. Surgical suture. 4,635,637, Cl. 128-337.000.
Schreiber, William L.: *See—*
Sprecker, Mark A.; Schreiber, William L.; Fujioka, Futoshi; Boden, Richard M.; Vock, Manfred H.; Whelan, Patrick; and Hanna, Marie R., 4,636,333, Cl. 252-522.00R.
Schreiner, Franz: *See—*
Kratel, Gunter; Stoiz, Gunter; and Schreiner, Franz, 4,636,416, Cl. 428-69.000.
Schrenker, Karl-Heinz: *See—*
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Schreurs, Louis P. M.: *See—*
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Schroeder, Michael O.: *See—*
Bhatt, Devesh; and Schroeder, Michael O., 4,636,967, Cl. 364-550.000.
Schulte, Rudolf R.; East, Gary P.; Bryant, Marga M.; and Heindl, Alfons, to Pudenz-Schulte Medical Research Corp. Burr-hole flow control valve. 4,636,194, Cl. 604-9.000.
Schulz, Daniel R.: *See—*
Barrett, John P., Sr.; and Schulz, Daniel R., 4,635,844, Cl. 236-12.120.
Schumacher, Rolf; Faix, Heinz; and Bruhnke, Ulrich, to Daimler-Benz Aktiengesellschaft. Glass pane glued into the frame of an automobile body by means of an elastomeric polymerized adhesive. 4,635,415, Cl. 52-127.100.
Schumann, Erwin, to DeGussa Aktiengesellschaft. Process and apparatus for the quenching intensity of liquid quenching batchs. 4,636,089, Cl. 374-45.000.
Schwader, William G.: *See—*
Foley, Donald E.; Gipp, Gregory H.; Schwader, William G.; Sells, Craig L.; Smittkamp, James A.; Stahl, Alan L.; and Szentes, John F., 4,635,739, Cl. 177-45.000.
Schwaiger, Max: *See—*
Rieder, Heinz; Schwaiger, Max; and Swatek, Harald, 4,636,079, Cl. 356-374.000.
Schwartz, David M., to CompuSonics Corporation. Audio digital recording and playback system. 4,636,876, Cl. 360-32.000.
Schwartz, Harry C., to REI, Inc. Combination tray and condylar prosthesis for mandibular reconstruction and the like. 4,636,215, Cl. 623-16.000.
Schwartz, Jerome: *See—*
Nagabhushan, Tattanahali L.; Miller, George H.; Schwartz, Jerome; and Ostrander, Michael R., 4,636,383, Cl. 424-85.000.
Schwarz, Joachim: *See—*
Hayd, Axel; Meinke, Peter; Maurer, Martin; and Schwarz, Joachim, 4,636,607, Cl. 219-121.0LM.
Schwarz, Theodore A., to Magnetic Peripherals Inc. Rotary head recording system. 4,636,886, Cl. 360-84.000.
Schwarze, Werner: *See—*
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Schweitzer, Karl; Nitschmann, Karl; and Dolata, Hans, to Andreas Stihl. Lubricating-oil pump for a motor-driven apparatus. 4,636,147, Cl. 417-214.000.
Schwendemann, Kenneth L.; McCracken, Oliver W.; Mondon, Cary G.; and Wortham, Larry C., to Otis Engineering Corporation. Well valve control system. 4,636,934, Cl. 364-132.000.
Schwendemann, Volker: *See—*
Plath, Peter; Rohr, Wolfgang; Schwendemann, Volker; and Wuerzer, Bruno, 4,636,246, Cl. 71-92.000.
Scientific-Atlanta, Inc.: *See—*
Farmer, James O., 4,636,852, Cl. 358-120.000.
Scotese, Arthur: *See—*
Huang, Shih L.; Scotese, Arthur; Libeskind, Mark; and Gause, Lee W., 4,636,638, Cl. 250-231.00R.
Scott, Anthony W., to Helmet Sound, Inc. Speaker mounting for lined helmet. 4,636,592, Cl. 381-187.000.
Scourtes, George, to Allen Group Inc., The. Chassis dynamometer construction. 4,635,472, Cl. 73-117.000.
Scripps Clinic and Research Foundation: *See—*
Altman, Amnon; Theofilopoulos, Argyrios N.; Lerner, Richard A.; and Dixon, Frank J., 4,636,463, Cl. 435-7.000.
Seasonmakers (Australia) Pty. Limited: *See—*
Bowers, Geoffrey, 4,635,576, Cl. 112-403.000.
Seavey Engineering Associates, Inc.: *See—*
Seavey, John M., 4,636,798, Cl. 343-753.000.
Seavey, John M., to Seavey Engineering Associates, Inc. Microwave lens for beam broadening with antenna feeds. 4,636,798, Cl. 343-753.000.
Sebelist, Norman C.; and Fulton, Edward N., to Cyklop International; and Hoffman, Emil. Method of compressing and strapping articles. 4,635,542, Cl. 100-3.000.
Sedlacek, Raymond. Hydroelectric device. 4,636,141, Cl. 416-86.000.
Seebold, Ralf: *See—*
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Seemuller, Ursula; Dodt, Johannes; and Fritz, Hans, to Plantorganwerk KG; and Ciba-Geigy Corporation. Modified protease inhibitors, process for their preparation, and pharmaceutical compositions prepared therefrom. 4,636,489, Cl. 514-12.000.
Segard, Emile; and Monceaux, Philippe, to Chambre Regionale d'Agriculture de Picardie. Process for producing protein aliments and various by products from cereals. 4,636,390, Cl. 426-18.000.

Segawa, Yutaka: *See—*
Kida, Otojiro; and Segawa, Yutaka, 4,636,481, Cl. 501-96.000.
Segler, Siegfried: *See—*
Penza, Hans; Segler, Siegfried; Schmuck, Karl-Wilhelm; Asbach, Dietrich; and Lindemann, Eckhard, 4,636,064, Cl. 355-73.000.
Segroves, James L. Deep fat frying pot cooker holding and picnic table. 4,635,614, Cl. 126-41.00R.
Sehorn, Rhonda. Ladies competition suit. 4,635,640, Cl. 128-438.000.
Seiko Epson K.K.: *See—*
Hattori, Noboru, 4,636,866, Cl. 358-236.000.
Seiko Epson Kabushiki Kaisha: *See—*
Hayashi, Seiichi; Takei, Katsumori; Usui, Takahiro; Yamaguchi, Yoshitaka; and Taniguchi, Makoto, 4,636,258, Cl. 106-31.000.
Seiko Instruments & Electronics Ltd.: *See—*
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Seiko Seiki Kabushiki Kaisha: *See—*
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Seimetz, Glen R.: *See—*
Boland, Donald P.; Menz, William; and Seimetz, Glen R., 4,635,983, Cl. 293-111.100.
Seki, Masaki: *See—*
Kishi, Hajimu; Seki, Masaki; and Mizuno, Yutaka, 4,636,937, Cl. 364-191.000.
Seki, Seiji; and Aoshima, Kiyoji, to Kabushiki Kaisha Komatsu Seisakusho. Die cushion apparatus for use in a press machine. 4,635,466, Cl. 72-453.130.
Seki, Tadashi: *See—*
Kurihara, Susumu; Seki, Tadashi; Awata, Hiroshi; and Kadowaki, Hitoshi, 4,636,374, Cl. 423-385.000.
Sekiguchi, Yuzo; and Maejima, Enjiro, to Ogura Clutch Co., Ltd. Electromagnetic coupling device. 4,635,774, Cl. 192-52.000.
Selenia - Industrie Elettroniche Associate S.p.A.: *See—*
D'Addio, Egidio; Galati, Gaspare; and Giaccari, Ennio, 4,636,793, Cl. 342-162.000.
Selim, Harold N., to IFR, Inc. System and method for wideband, continuous tuning of an oscillator. 4,636,747, Cl. 331-1.00R.
Selin, John R.; and Jessen, Donald N., to Raytheon Company. Transmit/receive switch. 4,637,073, Cl. 455-78.000.
Selleschy, Franz: *See—*
Jacobs, Hanno; Opara, Ulrich; and Selleschy, Franz, 4,636,964, Cl. 364-483.000.
Sells, Craig L.: *See—*
Foley, Donald E.; Gipp, Gregory H.; Schwader, William G.; Sells, Craig L.; Smittkamp, James A.; Stahl, Alan L.; and Szentes, John F., 4,635,739, Cl. 177-45.000.
Semiconductor Energy Laboratory Co., Ltd.: *See—*
Yamazaki, Shunpei; Tashiro, Mamoru; and Miyazaki, Minoru, 4,636,401, Cl. 427-39.000.
Senga, Takao: *See—*
Furukawa, Akira; Senga, Takao; and Suzuki, Shigeyoshi, 4,636,452, Cl. 430-112.000.
SenGupta, Gautam; and Spain, Byron R., to Boeing Company, The. Method and apparatus for reducing low to mid frequency interior noise. 4,635,882, Cl. 244-119.000.
Sentoku, Hideshi: *See—*
Uematsu, Yoshiaki; and Sentoku, Hideshi, 4,635,661, Cl. 133-3.00R.
Seo, Akira; Kanno, Hideo; Hasegawa, Nobu; Miyagi, Yukio; Nishimura, Akira; Konaka, Shigeo; Ohmi, Tetsuto; Munechika, Yukimi; Uchida, Matazaemon; and Ikeda, Kenichi, to Nihon Nohyaku Co., Ltd. Ketene S,S-acetal derivative, a process for manufacturing thereof and a method for curing mycosis by administering it. 4,636,519, Cl. 514-397.000.
Seon, Francoise; and Boudot, Bernard, to Rhone-Poulenc Specialites Chimiques. Novel neodymium/iron alloys. 4,636,353, Cl. 420-416.000.
Seppen, Jan J.; and van der Weide, Jouke, to Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek. System and device for exhaust gas recirculation in combustion machine. 4,635,609, Cl. 123-568.000.
Setterberg, Lars I. Vibrator equipped with fastening device. 4,636,086, Cl. 366-114.000.
Severinsson, Lars M.: *See—*
Nilsson, Bo; and Severinsson, Lars M., 4,635,762, Cl. 188-203.000.
Sexstone, John H.; Finn, Everett N.; Lowe, Byron L.; and Milliner, Ken M., to Brown & Williamson Tobacco Corporation. Apparatus for making grooves in cigarette filters. 4,636,183, Cl. 493-42.000.
SGS-ATES Componenti Elettronici S.p.A.: *See—*
Stefani, Fabrizio, 4,636,713, Cl. 323-350.000.
Shaffner, Richard F. Standing toothpaste dispenser. 4,635,821, Cl. 222-80.000.
Shandon Southern Products Limited: *See—*
Shippey, Geoffrey, 4,636,051, Cl. 354-402.000.
Sharon, Wilfred J., to Thun, Inc. Bicycle sprocket drive assembly. 4,635,503, Cl. 74-594.200.
Sharp Kabushiki Kaisha: *See—*
Hayakawa, Toshiro; Miyauchi, Nobuyuki; Yano, Seiki; and Suyama, Takahiro, 4,637,029, Cl. 372-45.000.
Ikemoto, Yutaka; and Sawada, Ken, 4,636,977, Cl. 364-900.000.
Izumi, Kazuo, 4,635,631, Cl. 128-204.230.
Kunikawa, Norihide, 4,636,697, Cl. 318-436.000.
Morino, Masuaki; Fujikawa, Yoshiyuki; Haneda, Isamu; and Myoi, Tetsuo, 4,636,970, Cl. 364-706.000.
Nakanishi, Takao, 4,635,610, Cl. 126-21.00A.
Suzuki, Akihisa, 4,635,750, Cl. 381-194.000.
Takai, Yasuhiro; Morimoto, Kenichi; Yoshida, Shigekazu; and Tagawa, Takao, 4,636,063, Cl. 355-68.000.
Sharrit, David D.; Dildine, Robert G.; Roos, Mark D.; and Barr, John T., IV, to Hewlett-Packard Company. Vector network analyzer with integral processor. 4,636,717, Cl. 324-77.00B.
Shaw, James T.: *See—*
Brefka, Paul E.; and Pichler, Klaus R., 4,636,881, Cl. 360-74.100.
Shea, Charles J.: *See—*
Carrier, Christian J. L.; and Shea, Charles J., 4,635,527, Cl. 89-1.816.
Sheetz, Michael P.: *See—*
Kreutzer, Donald L.; Novick, William J., Jr.; and Sheetz, Michael P., 4,636,507, Cl. 514-263.000.
Sheffield, Miller; Metcalfe, Robert S.; Calvin, James W.; and Chaback, Joseph J., to Amoco Corporation. Method of displacing fluids within a gas-condensate reservoir. 4,635,721, Cl. 166-268.000.
Shell Oil Company: *See—*
Overcashier, Robert H.; and Farris, Robert D., 4,635,500, Cl. 74-552.000.
Shelley, William. Linear radiant ceiling panel. 4,635,710, Cl. 165-49.000.
Shenton, David N., to Pioneer Electronic Corporation. Multiple pass error correction. 4,637,021, Cl. 371-37.000.
Shepard, Joseph F., to International Business Machines Corporation. Submicron FET structure and method of making. 4,636,834, Cl. 357-23.300.
Shepherd, Freddie A.: *See—*
Beavers, Randy S.; McFarlane, Finley E.; Musser, Harry R.; and Shepherd, Freddie A., 4,636,442, Cl. 428-480.000.
Sherman, Max H.: *See—*
Modera, Mark P.; and Sherman, Max H., 4,635,469, Cl. 73-40.000.
Sherman, Rand C.; and Grieser, Daniel R., to Battelle Development Corporation. Optical correlator using electronic image preprocessing. 4,637,056, Cl. 382-31.000.
Sherwood, Bruce A.: *See—*
Andersen, David M.; Bitzer, Donald L.; Rader, Robert K.; Sherwood, Bruce A.; and Tucker, Paul T., 4,636,174, Cl. 434-335.000.
Sherwood, Edward F.; Baldwin, Paul L.; Orndorff, Karl B.; and Dillon, Charles M., to Westinghouse Electric Corp. Elevator cab. 4,635,756, Cl. 187-1.00R.
Shibanai, Ichiro. Process for the preparation of insect repelling/killing film. 4,636,343, Cl. 264-118.000.
Shibano, Tomishi; Kimura, Itsuo; and Maruchi, Sachio, to Sanyo-Kokusaku Pulp Co., Ltd. Pressure sensitive-adhesive tapes or sheets. 4,636,432, Cl. 428-327.000.
Shibata, Akira, to Chugai Denki Kogyo K.K. Internal oxidized Ag-Sn system alloy contact materials. 4,636,270, Cl. 148-431.000.
Shibata, Hirochika: *See—*
Adachi, Yoshiharu; Nishimura, Takumi; Saito, Tadao; Shibata, Hirochika; Nakanishi, Nobuyasu; Shirai, Akira; and Noguchi, Noboru, 4,636,010, Cl. 303-115.000.
Shibata, Takeshi: *See—*
Aono, Toshiaki; Nakamura, Koichi; Shibata, Takeshi; and Nakamura, Taku, 4,636,455, Cl. 430-203.000.
Shibata, Toru, to Tsuois Corporation. Injection moulding clamping apparatus for an injection moulding machine. 4,636,167, Cl. 425-589.000.
Shichiri, Motoaki: *See—*
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,636,144, Cl. 417-63.000.
Shigyo, Naoyuki: *See—*
Ikoma, Toshiaki; Maeda, Hajime; Yanai, Hisayoshi; Dang, Ryo; and Shigyo, Naoyuki, 4,636,824, Cl. 357-23.140.
Shih, Peng. Foldable toilet-seat for children. 4,635,303, Cl. 4-254.000.
Shiiki, Kasuo: *See—*
Nakamura, Hitoshi; Shiiki, Kasuo; Yuito, Isamu; Shiroishi, Yoshihiro; Fujiwara, Hideo; Shinagawa, Kiminari; and Iijima, Akemi, 4,636,897, Cl. 360-119.000.
Shiiki, Zenya: *See—*
Katto, Takayuki; Komatsu, Yasumasa; and Shiiki, Zenya, 4,636,553, Cl. 525-67.000.
Shikata, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Cutting tool. 4,636,116, Cl. 407-103.000.
Shikata, Hiroshi, to Kabushiki Kaisha Toshiba. Cutting tool. 4,636,117, Cl. 407-104.000.
Shikoku Denryoku Kabushiki Kaisha: *See—*
Takahashi, Masahide; Sakai, Seiichi; Masada, Osamu; Ukawa, Masaru; and Onishi, Hamao, 4,636,931, Cl. 363-71.000.
Shikoku Keisoku Kogyo Kabushiki Kaisha: *See—*
Takahashi, Masahide; Sakai, Seiichi; Masada, Osamu; Ukawa, Masaru; and Onishi, Hamao, 4,636,931, Cl. 363-71.000.
Shima, Seiya: *See—*
Kurosawa, Toshiaki; Shima, Seiya; Ando, Takeki; Inaba, Hiromi; Nakashima, Hajime; and Mine, Toshisuke, 4,636,932, Cl. 363-54.000.
Shimano Industrial Company Limited: *See—*
Nagano, Masashi, 4,635,759, Cl. 188-24.220.
Shimasaki, Hiroshi: *See—*
Yokota, Yutaka; and Shimasaki, Hiroshi, 4,636,684, Cl. 313-412.000.
Shimodaira, Toshiya: *See—*
Nakano, Yoshihisa; Ohira, Masatoshi; Ushida, Manabu; Miyagawa, Tomoyuki; and Shimodaira, Toshiya, 4,635,959, Cl. 280-707.000.
Shimohigashi, Katsuhiro: *See—*
Aoki, Masakazu; Nakagome, Yoshinobu; Horiguchi, Masahi; Ozaki, Toshifumi; Shimohigashi, Katsuhiro; and Ikenaga, Shinichi, 4,636,985, Cl. 365-189.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Fujimoto, Teruo; Kazama, Takeo; Takamizawa, Minoru; and Yamamoto, Akira, 4,636,454, Cl. 430-197.000.
Shin, Kju H., to Ethyl Corporation. Process for preparing arylisothiocyanates. 4,636,574, Cl. 558-18.000.
Shinagawa, Kiminari: *See*—
Nakamura, Hitoshi; Shiiki, Kasuo; Yuito, Isamu; Shiroishi, Yoshihiro; Fujiwara, Hideo; Shinagawa, Kiminari; and Iijima, Akemi, 4,636,897, Cl. 360-119.000.
Shinagawa Refractories Co., Ltd.: *See*—
Kyoden, Hiroshi; Endo, Yasuhiro; Fujiwara, Teiichi; Mimura, Toshisada; Nishikawa, Kihachiro; and Nishizawa, Shoichi, 4,636,969, Cl. 364-560.000.
Shinohara, Yoshinori: *See*—
Ogata, Yasuyuki; and Shinohara, Yoshinori, 4,636,248, Cl. 75-0.5AA.
Shiokama, Yoshiharu: *See*—
Kotaka, Yoshiro; Naito, Hideshi; and Shiokama, Yoshiharu, 4,636,041, Cl. 350-429.000.
Shioyama, Tod K.: *See*—
Hudson, Paul S.; and Shioyama, Tod K., 4,636,572, Cl. 556-2.000.
Shipley Company Inc.: *See*—
Sandford, Harold F., 4,636,532, Cl. 522-3.000.
Shippey, Geoffrey, to Shandon Southern Products Limited. Automatic focussing device. 4,636,051, Cl. 354-402.000.
Shirai, Akira: *See*—
Adachi, Yoshiharu; Nishimura, Takumi; Saito, Tadao; Shibata, Hirochika; Nakanishi, Nobuyasu; Shirai, Akira; and Noguchi, Noboru, 4,636,010, Cl. 303-115.000.
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Ogawa, Kyosuke; Shirai, Shigeru; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,636,450, Cl. 430-84.000.
Shirakuma, Takashi, to Tokico Ltd. Control system for hydraulic dampers. 4,635,960, Cl. 280-707.000.
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Shirley, Kirk R. Drill steering apparatus. 4,635,736, Cl. 175-76.000.
Shiroishi, Yoshihiro: *See*—
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Shivers, Raymond P.: *See*—
Lynch, Donald J.; and Shivers, Raymond P., 4,636,393, Cl. 426-276.000.
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Okado, Hideo; Shoji, Hiroshi; Takaya, Haruo; Kawamura, Kichinari; and Yamazaki, Yasuyoshi, 4,636,482, Cl. 502-60.000.
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Takei, Masamitsu; and Shoji, Shigeo, 4,635,433, Cl. 57-223.000.
Shop-Vac Corporation: *See*—
Berfield, Robert C.; and Crevling, Robert L., Jr., 4,635,951, Cl. 280-47.340.
Shorey, Thomas H.: *See*—
Hamilton, Herbert E.; and Shorey, Thomas H., 4,635,883, Cl. 244-137.00R.
Shortt, Alexandra B.: *See*—
Chavdarian, Charles G.; and Shortt, Alexandra B., 4,636,495, Cl. 514-125.000.
Shu, Stephen K., to Del Mar Avionics. Low power treadmill. 4,635,927, Cl. 272-96.000.
Shustack, Leonard T. Karate exercising bag. 4,635,929, Cl. 272-76.000.
Shwarzman, Joel: *See*—
Movshovitz, Avner; and Shwarzman, Joel, 4,635,395, Cl. 49-78.000.
Sicard, Stephen T.: *See*—
Cooney, James S.; and Sicard, Stephen T., 4,636,026, Cl. 339-255.00R.
Sicpa Holding S.A.: *See*—
Mehl, Wolfgang; and Amon, Albert, 4,636,223, Cl. 8-471.000.
Sidebottom, Philip L., to Dictaphone Corporation. Changer apparatus with movable means for withdrawing recording media from an input hopper to a recording deck to an output hopper. 4,636,888, Cl. 360-92.000.
Sidler, Werner, to Emhart Industries, Inc. Control of apparatus for use in the manufacture of glassware articles. 4,636,238, Cl. 65-29.000.
Siebert, Gary R.; and Armstrong, Jean, to Becton, Dickinson and Company. Monoclonal antibodies recognizing L-thyroxine. 4,636,478, Cl. 436-500.000.
Siebler, Helmut, to Daimler-Benz Aktiengesellschaft. Motor-vehicle seat with backrest which can be swung forward out of a position of use. 4,636,003, Cl. 297-336.000.
Siebold, Horst: *See*—
Maurer, Arnolf; and Siebold, Horst, 4,636,729, Cl. 324-318.000.
Siemens Aktiengesellschaft: *See*—
Ihlein, Walter; and Rogler, Wolfgang, 4,636,556, Cl. 528-53.000.
Lerch, Reinhard, 4,635,484, Cl. 73-628.000.
Marquardt, Ulrich; and Seebold, Ralf, 4,636,762, Cl. 335-195.000.
Maurer, Arnolf; and Siebold, Horst, 4,636,729, Cl. 324-318.000.
Rohr, Franz, 4,635,427, Cl. 53-475.000.
Rohr, Franz, 4,636,351, Cl. 376-272.000.
Starck, Alexander, 4,636,856, Cl. 358-135.000.
Welzhofer, Klaus, 4,636,716, Cl. 324-73.00R.
Siemens Energy & Automation, Inc.: *See*—
Perkins, Norman P.; Luke, Roger D.; and Kaufman, Steven A., 4,636,915, Cl. 361-355.000.
Siev, Ahron: *See*—
Granot, Daniel; Siev, Ahron; and Derfler, Freddy, 4,635,917, Cl. 271-9.000.
Siewert, Robert L.; and Varnelis, Edmund K., to Clark Michigan Company. Single lever shift. 4,635,497, Cl. 74-473.0SW.
Sigler, Jeffrey J. Sliding window lock. 4,635,976, Cl. 292-57.000.
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Tauzin, Francia, 4,635,561, Cl. 105-329.100.
Signetics Corporation: *See*—
Bellavance, Joseph T.; and Price, William J., 4,636,978, Cl. 364-900.000.
Mahmud, Syed T., 4,636,661, Cl. 307-468.000.
Silva, Robert M.: *See*—
Neumann, Irving H.; Stobb, Walter J.; Silva, Robert M.; and Thumm, Klaus A., 4,636,139, Cl. 414-786.000.
Simon, Andre, to Ateliers de Constructions Electriques de Charleroi. Leak detector for the dikes of nuclear cooling ponds. 4,635,477, Cl. 73-290.00R.
Simon, Myron S.; and Waller, David P., to Polaroid Corporation. Aminoether compounds. 4,636,568, Cl. 549-13.000.
Simons, Gale G.; and DeBey, Timothy M., to Kansas State University Research Foundation. Thin thermoluminescent dosimeter and method of making same. 4,636,642, Cl. 250-337.000.
Simonsen, Kenard A. Grease catch basin with solvent reservoir for use with cooking exhaust systems. 4,635,617, Cl. 126-299.00E.
Simpson, Leslie J., to Flight Equipment and Engineering Ltd. Vehicle seats. 4,635,999, Cl. 297-88.000.
Sinclair, Paul F., III: *See*—
Kuyel, Birol; and Sinclair, Paul F., III, 4,635,855, Cl. 239-551.000.
Sinclair, Stuart W., to Long Reach Manufacturing Co. Side shifter and narrow aisle attachment for a lift truck. 4,636,131, Cl. 414-621.000.
Sindermann, Siegmar: *See*—
Rademacher, Friedrich; Sindermann, Siegmar; and Sushardt, Rolf, 4,635,690, Cl. 141-39.000.
Single Buoy Moorings Inc.: *See*—
Perratone, Rene ; and Poldervaart, Leendert, 4,635,971, Cl. 285-134.000.
Siol, Werner: *See*—
Wenzel, Franz; Arndt, Peter J.; and Siol, Werner, 4,636,458, Cl. 430-270.000.
Sirinyan, Kirkor; Wolf, Gerhard D.; von Gizycki, Ulrich; and Merten, Rudolf, to Bayer Aktiengesellschaft. Semi-finished products for the manufacture of printed circuit boards. 4,636,441, Cl. 428-447.000.
Skaling, Timothy J.: *See*—
Clausen, Eivind; and Skaling, Timothy J., 4,636,109, Cl. 404-10.000.
Skallen, Bengt; Ljungkvist, Kjell; and Gren, Urban, to Eur-Control Kalle AB. Apparatus and method for permeability measurement. 4,635,470, Cl. 73-63.000.
Skeist, S. Merrill; and Gross, Leo, to Spellman High Voltage Electronics Corp. Magnetic arc spreading fluorescent lamp with protective envelope. 4,636,685, Cl. 313-493.000.
Skerritt, Robert C., to Lucas Industries Public Limited Company. Monitoring arrangement for a gas turbine spark ignition system. 4,636,777, Cl. 340-635.000.
SKF Kugellagerfabriken GmbH: *See*—
Walter, Lothar; and Reith, Walter, 4,635,331, Cl. 29-148.40R.
SKF Steel Engineering AB: *See*—
Santen, Sven, 4,635,573, Cl. 110-346.000.
Skinner, Geoffrey F.; Kowal, Wieslaw M.; and Linton, Stephen D., to Foster Wheeler USA Corporation. Production of ammonia synthesis gas. 4,636,334, Cl. 252-377.000.
Slaughter, Bobby L.: *See*—
Fasaler, Friebert; Kigyos, Frank; and Slaughter, Bobby L., 4,635,313, Cl. 15-193.000.
Slautterback Corporation: *See*—
Marshall, Lee, 4,635,820, Cl. 222-63.000.
Slavens, Clyde M., to CRC-Evans Pipeline International, Inc. Welding carriage. 4,635,839, Cl. 228-29.000.
Slidex Corporation: *See*—
Ozeki, Jiro, 4,635,796, Cl. 206-456.000.
Slotboom, Jan W.; Maas, Henricus G. R.; Appels, Johannes A.; and Klaassen, Francois M., to U.S. Philips Corporation. Charge coupled devices having narrow coplanar silicon electrodes. 4,636,826, Cl. 357-24.000.
Sluijter, Robert J.; and Kotmans, Hendrik J., to U.S. Philips Corporation. Speech analysis system. 4,637,046, Cl. 381-49.000.
Smith, David C.; and Noto, Richard, to RCA Corporation. Routing method in computer-aided-customization of universal arrays and resulting integrated circuit. 4,636,965, Cl. 364-491.000.
Smith, Donald H.: *See*—
Frank, Richard J.; and Smith, Donald H., 4,635,695, Cl. 152-410.000.
Smith International, Inc.: *See*—
Pond, Richard J., 4,635,901, Cl. 251-355.000.
Smith, Joseph E., to V. W. Kaiser Engineering, Inc. Steering knuckle and kingpin assembly. 4,635,952, Cl. 280-96.100.
Smith, Joseph J.; and Stillmunkes, Dean J., to Deere & Company. Track roller mounting bracket. 4,636,012, Cl. 305-28.000.

Smith, Kevin: *See*—
Gold, Jeffrey G.; Pande, Gyan S.; and Smith, Kevin, 4,636,346, Cl. 264-139.000.
Smith, Paul F.: *See*—
Burke, Timothy M.; Smith, Paul F.; and Schorman, Eric R., 4,637,022, Cl. 371-37.000.
Smith, Roger L.; and Bolenbaugh, Daniel L., to Allied Corporation. Disc brake parking cartridge retention device. 4,635,761, Cl. 188-72.600.
Smith, Walter L.: *See*—
Rosencwaig, Allan; and Smith, Walter L., 4,636,088, Cl. 374-5.000.
Smittkamp, James A.: *See*—
Foley, Donald E.; Gipp, Gregory H.; Schwader, William G.; Sells, Craig L.; Smittkamp, James A.; Stahl, Alan L.; and Szentes, John F., 4,635,739, Cl. 177-45.000.
Smock, Steven W.; and Richmond, James W., to Emhart Industries, Inc. Timer and motor assembly. 4,636,595, Cl. 200-38.00R.
SMS Schloemann-Siemag AG: *See*—
Kolakowski, Manfred; and Streubel, Hans, 4,635,702, Cl. 164-418.000.
Snider, Warren E.: *See*—
Hickam, William M.; and Snider, Warren E., 4,635,468, Cl. 73-19.000.
Snitzer, Elias; and Ezekiel, Shaoul, to Polaroid Corporation. Super radiant light source. 4,637,025, Cl. 372-1.000.
Snow, Arthur W.: *See*—
Barger, William R.; Jarvis, Neldon L.; Snow, Arthur W.; and Wohltjen, Henry, 4,636,767, Cl. 338-34.000.
Snowden, Ralph E.; and Whitley, Robert D., to Motorola, Inc. Circuit for selectively extending a cycle of a clock signal. 4,636,656, Cl. 307-267.000.
Snyder Laboratories, Inc.: *See*—
Atkinson, Robert W., 4,635,621, Cl. 128-66.000.
Societe Alsacienne D-Aluminium: *See*—
Wolfersperger, Daniel J., 4,636,273, Cl. 156-244.110.
Societe Anonyme Curty: *See*—
Lucas, Jacques D. H.; and Samson, Dominique H. P. M., 4,635,949, Cl. 277-235.00B.
Societe Anonyme de Telecommunications: *See*—
Carpentier, Yves; and Gauthier, Andre , 4,636,631, Cl. 250-216.000.
Missout, Bernard M.; Michaux, Jean-Pierre; and Piova, Jean-Luc, 4,635,430, Cl. 57-6.000.
Piganeau, Thierry, 4,636,828, Cl. 357-30.000.
Societe Anonyme Dite Societe Miniere et Metallurgique de Penarroya: *See*—
Caillerie, Jean-Louis; Decaens, Remy; and Limare, Armand, 4,636,354, Cl. 420-514.000.
Societe de Developpements et d'Innovations des Marches Agricoles: *See*—
Tulasne, Jacques, 4,635,825, Cl. 222-129.100.
Societe d'Energie de la Baie James: *See*—
Larouche, Gilles, 4,635,417, Cl. 52-239.000.
Societe d'Etudes de Machines Thermiques: *See*—
Grabbe, Dieter, 4,635,595, Cl. 123-179.00F.
Societe Industrielle de Liaisons Electriques: *See*—
Missout, Bernard M.; Michaux, Jean-Pierre; and Piova, Jean-Luc, 4,635,430, Cl. 57-6.000.
Societe Nationale Elf Aquitaine (Production): *See*—
Vannier, Serge; Garotta, Robert; Lozes, Andre ; and Vidal, Jean C., 4,636,956, Cl. 364-421.000.
Societe Nouvelle Rockall France S.A.: *See*—
Oudelette, Gilles, 4,635,389, Cl. 40-301.000.
Societe Syspro: *See*—
Bancon, Georges R., 4,636,135, Cl. 414-730.000.
Soderberg, John H.; and Duwel, Edward C., to Pitney Bowes Inc. Controlling firmware branch points in an electronic postage meter. 4,636,975, Cl. 364-900.000.
Soderlund, Bjorn, to Allman Byggnadsservice AB ABS. Arrangement in containers intended to hold pumpable substances and provided with a pump herefor. 4,636,083, Cl. 366-43.000.
Sohval, A. Robert; and Freundlich, David, to Elscint, Ltd. Plural source computerized tomography device with improved resolution. 4,637,040, Cl. 378-9.000.
Solar Turbines Incorporated: *See*—
Cederwall, Philip J.; and Glezer, Boris, 4,635,332, Cl. 29-156.80R.
Soll, David B.: *See*—
Gdaniec, Joseph M.; Sahulka, Richard J.; and Soll, David B., 4,636,948, Cl. 364-300.000.
Solmat Systems, Ltd.: *See*—
Raviv, Avi, 4,636,112, Cl. 405-176.000.
Somdahl, Eugene R.: *See*—
Chen, Steve S.; Schiffleger, Alan J.; Somdahl, Eugene R.; and Higbie, Lee, 4,636,942, Cl. 364-200.000.
Sonnendorfer, Horst: *See*—
Wieth, Franz; and Sonnendorfer, Horst, 4,635,782, Cl. 194-212.000.
Sonobe, Toshimitsu, to Thomas & Betts Corporation. Cassette connector. 4,636,022, Cl. 339-75.0MP.
Sony Corporation: *See*—
Eguchi, Takeo, 4,636,873, Cl. 360-8.000.
Hosono, Takashi; and Tohyama, Akira, 4,636,843, Cl. 358-67.000.
Ishii, Takayuki; and Yamauchi, Yuji, 4,635,457, Cl. 72-66.000.
Ito, Seigo; and Murakami, Yoshikazu, 4,636,756, Cl. 333-202.000.
Murayama, Kazuo, 4,636,878, Cl. 360-71.000.
Ohsawa, Mitsuo, 4,636,709, Cl. 323-267.000.
Okada, Takashi; Mogi, Takao; and Mino, Shinjiro, 4,636,855, Cl. 358-124.000.
Soref, Richard A.: *See*—
McMahon, Donald H.; and Soref, Richard A., 4,636,636, Cl. 250-227.000.
Southwick, Everett W.: *See*—
Houminer, Yoram; Southwick, Everett W.; and Williams, David L., 4,635,652, Cl. 131-278.000.
Spain, Byron R.: *See*—
SenGupta, Gautam; and Spain, Byron R., 4,635,882, Cl. 244-119.000.
Spatz Laboratories, Inc.: *See*—
Spatz, Walter, 4,635,659, Cl. 132-88.700.
Spatz, Walter, to Spatz Laboratories, Inc. Mascara applicator. 4,635,659, Cl. 132-88.700.
Spear, Dean M.: *See*—
Raley, Garland E.; and Spear, Dean M., 4,636,161, Cl. 425-194.000.
Spector, Edward A.: *See*—
de la Morandiere, Anne J.; Bressler, Peter W.; Byar, Peter D.; and Spector, Edward A., 4,636,613, Cl. 219-249.000.
Spellman High Voltage Electronics Corp.: *See*—
Skeist, S. Merrill; and Gross, Leo, 4,636,685, Cl. 313-493.000.
Sperry Corporation: *See*—
Labrum, Joseph H.; and Wilcox, Allen D., 4,636,718, Cl. 324-77.00K.
McMahon, Donald H.; and Soref, Richard A., 4,636,636, Cl. 250-227.000.
Spiral System Instruments, Inc.: *See*—
Schalkowsky, Samuel, 4,637,053, Cl. 382-6.000.
Spitzer, Wayne A., to Eli Lilly and Company. Methods of producing a positive inotropic effect or vasodilation by administration of 2-phenyl imidazo pyrimidines and pyrazines. 4,636,502, Cl. 514-249.000.
Spivack, John D.: *See*—
Pastor, Stephen D.; and Spivack, John D., 4,636,573, Cl. 556-441.000.
Spivey, Melvin F. Continuous injection of corrosion-inhibiting liquids. 4,635,723, Cl. 166-250.000.
Spombiantti, Angelina M.: *See*—
Maggio, Charles F.; and Spombiantti, Angelina M., 4,635,308, Cl. 5.508.000.
Spotts, Kenneth L., to AMP Incorporated. Electrical connector pickup station. 4,636,126, Cl. 414-126.000.
Sprecker, Mark A.; Schreiber, William L.; Fujioka, Futoshi; Boden, Richard M.; Vock, Manfred H.; Whelan, Patrick; and Hanna, Marie R., to International Flavors & Fragrances Inc. Alkoxy-substituted polyhydroindan carboxaldehydes. 4,636,333, Cl. 252-522.00R.
Sprengers, Leo M.: *See*—
de Man, Rolf E.; de Ridder, Jan; Sprengers, Leo M.; and Peeters, Jozef I. C., 4,636,691, Cl. 315-209.00R.
Springford, Richard H.: *See*—
Gasowski, Chester J.; Loeffler, Ronald L.; Musteric, Joseph T.; Springford, Richard H.; and Toth, Robert L., Jr., 4,635,696, Cl. 152-528.000.
Stade, John H., to Mallinckrodt, Inc. Power syringe with volume reducing adapter. 4,636,198, Cl. 604-154.000.
Staedtler & Uhl: *See*—
Egerer, Josef, 4,635,323, Cl. 19-129.00R.
Stahl, Alan L.: *See*—
Foley, Donald E.; Gipp, Gregory H.; Schwader, William G.; Sells, Craig L.; Smittkamp, James A.; Stahl, Alan L.; and Szentes, John F., 4,635,739, Cl. 177-45.000.
Standard Oil Company (Indiana): *See*—
Unmuth, Eugene E.; Mahoney, John A.; and Bertolacini, Ralph J., 4,636,299, Cl. 208-87.000.
Stanford, Sheila A. Nail polish dispensing system. 4,635,657, Cl. 132-83.00R.
Stanley, Clive J., to Dowty Seals Limited. Seal with spaced recesses. 4,635,946, Cl. 277-134.000.
Stanley Electric Co., Ltd.: *See*—
Oyama, Hiroo; and Kouchi, Tadashi, 4,636,923, Cl. 362-80.000.
Stanley, Thomas R.: *See*—
Towne, Clinton G.; and Stanley, Thomas R., 4,635,316, Cl. 17-1.00R.
Stanojevic, Silvo. Stacked bandgap voltage reference. 4,636,710, Cl. 323-280.000.
Stansfield, Norman J.: *See*—
Hudson, Andrew; and Stansfield, Norman J., 4,636,438, Cl. 428-412.000.
Starck, Alexander, to Siemens Aktiengesellschaft. Arrangement for two-dimensional DPCM coding. 4,636,856, Cl. 358-135.000.
Starke, Siegfried: *See*—
Schillinger, Hans; Pahlke, Klaus; Starke, Siegfried; Panhorst, Heinz-Juergen; and Mengel, Hans-Eckhard, 4,635,738, Cl. 175-394.000.
State of Israel, Ministry of Defense, Rafael Armament: *See*—
Granot, Daniel; Siev, Ahron; and Derfler, Freddy, 4,635,917, Cl. 271-9.000.
Statham, Roger; and Taylor, John F., to Edward Billington & Son Limited. Brewing and distilling. 4,636,389, Cl. 426-11.000.
Staude, Eckhard; and Kaus, Juergen, to Eva Staude, Firma. Apparatus for the automatic microfilming of documents. 4,636,061, Cl. 355-24.000.
Staudinger, Frank X., to Martin Marietta Corporation. Variable center distance insertion device. 4,635,341, Cl. 29-566.300.
Stauffer Chemical Company: *See*—
Chavdarian, Charles G.; and Shortt, Alexandra B., 4,636,495, Cl. 514-125.000.
Empie, Mark W., 4,636,470, Cl. 435-280.000.

Lin, Chifa F.; and Lee, Chang R., 4,636,388, Cl. 426-7.000.
Teach, Eugene G., 4,636,244, Cl. 71-90.000.

Steckler, Steven A.; and Balaban, Alvin R., to RCA Corporation. Phase locked loop system for providing a phase shifted output signal. 4,636,836, Cl. 358-19.000.

Steele, R. W., II: *See*—
Parton, Kenny R., 4,635,437, Cl. 59-7.000.

Steele, William H.: *See*—
Jones, Gregory S.; Steele, William H.; and Gurtcheff, Glenn A., 4,635,475, Cl. 73-204.000.

Steer, Peter L., to Craig Medical Products Limited. Ostomy bag magnetic coupling. 4,636,205, Cl. 604-338.000.

Stefani, Fabrizio, to SGS-ATES Componenti Elettronici S.p.A. Monolithically integratable control circuit for switching inductive loads comprising a Darlington-type final stage. 4,636,713, Cl. 323-350.000.

Stehle, Hans P.: *See*—
Noll, Wilfried; Ehmann, Konrad; Stehle, Hans P.; Dorner, Wolfgang; and Dietzsch, Gunter, 4,635,364, Cl. 30-381.000.

Steinberger, Michael L., to AT&T Bell Laboratories. Bootstrapping cross-polarization canceler with a noise-blanking limiter. 4,637,067, Cl. 455-295.000.

Steiner, Karl: *See*—
Holy, Franz; and Steiner, Karl, 4,635,329, Cl. 29-27.00C.

Steinhilber, Friedhelm. Device for the feeding of individual sheets to the platen of an office machine. 4,635,923, Cl. 271-162.000.

Steinmetz, Herbert: *See*—
Fohrman, Scott R.; and Steinmetz, Herbert, 4,635,366, Cl. 33-3.00B.

Stempin, Gary A. Wall mounted ski holder. 4,635,800, Cl. 211-70.500.

Stenberg, Kaj O.: *See*—
Christopherson, Kjell H.; Odelius, Tomas; Rosemeier, Friedrich; Stenberg, Kaj O.; Svensson, Tommy E.; and Killmaier, Horst, 4,636,204, Cl. 604-283.000.

Stephen, James C.: *See*—
Tucker, James E.; Stephen, James C.; and Beecher, John, III, 4,635,613, Cl. 126-25.00R.

Stephenson, Edgar O., to Kawasaki Thermal Systems, Inc. Internal seal for insulated steam injection casing assembly. 4,635,967, Cl. 285-45.000.

Stetter, Jorg: *See*—
Wroblowsky, Heinz-Jurgen; Stetter, Jorg; Eue, Ludwig; Schmidt, Robert R.; and Santel, Hans-Joachim, 4,636,245, Cl. 71-90.000.

Steuri, Christian, to Procter & Gamble Company, The. Shampoo compositions comprising quaternary imidazolinium compound and alkylamido betaine having low pH range. 4,636,329, Cl. 252-106.000.

Stevens, Michael G.; and Davis, Rhetta Q., to Dow Chemical Company, The. Water-dispersible cationic vinylized epoxy resins. 4,636,541, Cl. 523-404.000.

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Lounsbury, David M.; and Stevenson, Alexander J., 4,637,023, Cl. 371-38.000.

Stewart, Michael E., to Adac Laboratories, Inc. Apparatus and method for enhancement of video images. 4,636,850, Cl. 358-111.000.

Stewart, William J.: *See*—
Carter, Andrew C.; and Stewart, William J., 4,636,030, Cl. 350-96.180.

Stifter, Francis J. Frequency lock system. 4,636,746, Cl. 331-1.00A.

Stillie, Donald G., to AMP Incorporated. Elastomeric electrical connector. 4,636,018, Cl. 339-17.00M.

Stillmunkes, Dean J.: *See*—
Smith, Joseph J.; and Stillmunkes, Dean J., 4,636,012, Cl. 305-28.000.

Stitt, Robert M.: *See*—
Burt, Rodney T.; and Stitt, Robert M., 4,636,916, Cl. 361-386.000.

Stobb Inc.: *See*—
Neumann, Irving H.; Stobb, Walter J.; Silva, Robert M.; and Thumm, Klaus A., 4,636,139, Cl. 414-786.000.

Stobb, Walter J.: *See*—
Neumann, Irving H.; Stobb, Walter J.; Silva, Robert M.; and Thumm, Klaus A., 4,636,139, Cl. 414-786.000.

Stohr, Gunter: *See*—
Kratel, Gunter; Stohr, Gunter; and Schreiner, Franz, 4,636,416, Cl. 428-89.000.

Stokes, James P.: *See*—
Bhattacharya, Sabyasachi; Bloch, Aaron N.; and Stokes, James P., 4,636,737, Cl. 329-110.000.

Stokes, Jeffrey A., to IRT Corporation. Anti-parallax scintillator system for use with penetrating ionizing radiation. 4,636,644, Cl. 250-368.000.

Stolle, Ralph J.; and Beck, Lee R., to Stolle Research & Development Corporation. Method for treating disorders of the vascular and pulmonary systems. 4,636,384, Cl. 424-87.000.

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Stolle, Ralph J.; and Beck, Lee R., 4,636,384, Cl. 424-87.000.

Stoltz, Klas; Gustavsson, Bo; and Gustavsson, Kerstin. Locking device which can be opened by means of a pressurized fluid and a pressurized-fluid nozzle therefor. 4,635,978, Cl. 292-144.000.

Stolz, Theodore O.: *See*—
Johnson, Malcolm C.; and Stolz, Theodore O., 4,636,425, Cl. 428-198.000.

Storage Technology Corporation: *See*—
Owens, John C., 4,635,870, Cl. 242-68.300.

Stork PMT B. V.: *See*—
van der Eerden, Henricus F. J. M., 4,635,317, Cl. 17-11.000.

Stout, Gregg W.: *See*—
Donovan, Joseph F.; Stout, Gregg W.; and Schmuck, Phillip W., 4,635,734, Cl. 175-4.600.

Straschewski, Helmut: *See*—
Ewest, Eckhart; Mertens, Gustav; and Straschewski, Helmut, 4,635,570, Cl. 110-237.000.

Street, Thomas R., Jr., to Ford Motor Company. Automotive suspension strut with increased stroke. 4,635,766, Cl. 188-317.000.

Streubel, Hans: *See*—
Kolakowski, Manfred; and Streubel, Hans, 4,635,702, Cl. 164-418.000.

Strickland, Mark D.: *See*—
Morell, Charles J.; and Strickland, Mark D., 4,636,429, Cl. 428-288.000.

Strickler, Roger A.: *See*—
Myers, Philip F.; Strickler, Roger A.; and Warmuth, Ivan J., II, 4,635,745, Cl. 280-708.000.

Stritzke, Karl H.: *See*—
Fischer, Herbert; Stritzke, Karl H.; Morlock, Roland; Jones, Thomas C.; and Donovan, Joseph C., 4,636,265, Cl. 148-6.15R.

Stroucken, Klaus, to Alfa-Laval Separation AB. Maintaining closing-liquid level in centrifuges, for operating slide valves. 4,636,319, Cl. 210-781.000.

Stull, Gene. Dispensing closure construction. 4,635,823, Cl. 222-108.000.

Stump, Lee E., to Timesavers, Inc. Continuous arcuate feed assembly. 4,635,405, Cl. 51-145.00T.

Stupka, David. Kiln furniture setter. 4,636,170, Cl. 432-258.000.

Sturluson, Finnur: *See*—
Clausen, Erik; Clausen, Johannes; Jensen, Holger; and Sturluson, Finnur, 4,636,035, Cl. 350-128.000.

Sugada, Sigeru: *See*—
Ohno, Shoji; and Sugada, Sigeru, 4,636,427, Cl. 428-246.000.

Sugano, Takayuki: *See*—
Wada, Toshiaki; Nakaoka, Junichi; and Sugano, Takayuki, 4,636,420, Cl. 428-156.000.

Suganuma, Ikuo: *See*—
Fukuda, Yasuhiro; and Suganuma, Ikuo, 4,636,724, Cl. 324-158.00R.

Sugata, Masao: *See*—
Kitahara, Nobuko; Takamatsu, Osamu; Kaneko, Tetsuya; and Sugata, Masao, 4,636,038, Cl. 350-339.00R.

Sugaya, Toshihiro: *See*—
Yamada, Takehito; and Sugaya, Toshihiro, 4,636,885, Cl. 360-78.000.

Sugihara, Kunihiko: *See*—
Tanaka, Toshiaki; and Sugihara, Kunihiko, 4,635,598, Cl. 123-293.000.

Sugimori, Hideo. Heater control device. 4,636,619, Cl. 219-497.000.

Sugimoto, Yasuhiro, to Kabushiki Kaisha Toshiba. Sample and hold circuit. 4,636,659, Cl. 307-353.000.

Sugiyama, Masahiko; Sutou, Masatune; Murata, Mitsuru; Ooki, Minoru; and Tagawa, Shigetaro, to Hitachi, Ltd. Horizontal type rotary compressor. 4,636,154, Cl. 418-97.000.

Suh, Kyung W.; and Kennedy, John M., to Dow Chemical Company, The. Method for the preparation of styrene polymer foam and foam prepared thereby. 4,636,527, Cl. 521-79.000.

Sukhov, Igor N.: *See*—
Golubenko, Alexandr L.; Turchin, Viktor P.; Konyaev, Alexei N.; Sukhov, Igor N.; Kaljuzhny, Nikolai N.; Filonov, Arkady S.; Koropets, Alexei P.; Pinovsky, Mikhail I.; Tkachenko, Viktor P.; and Kramar, Nikolai M., 4,635,990, Cl. 295-11.000.

Suko, Shouichi, to Iwatsu Electric Co., Ltd. Method and apparatus for analysis of . icroprocesseor operation. 4,636,941, Cl. 364-200.000.

Suling, Carlhans: *See*—
Konig, Joachim; Suling, Carlhans; and Nachtkamp, Klaus, 4,636,545, Cl. 524-457.000.

Sullivan, Brian P.; Dennis, Larry T.; and Ferrell, Robert A., to KCL Corporation. Reclosable bag with sealed laminated liner and method. 4,637,063, Cl. 383-61.000.

Sulser, Henry, to Anstalt, Almopa. Upper body garment construction. 4,635,301, Cl. 2-69.000.

Sulzer Brothers Ltd.: *See*—
Hintsch, Otto, 4,635,684, Cl. 139-1.00R.

Sumida, Takashi; Sasaki, Sigeo; Ketori, Takao; and Fujita, Kazuhiro, to Hitachi Maxell, Ltd. Tape cassette. 4,635,879, Cl. 242-198.000.

Sumitomo Electric Ind., Ltd.: *See*—
Nakai, Ryusuke; Takebe, Toshihiko; and Yamazaki, Hajime, 4,636,280, Cl. 156-603.000.

Sumitomo Electric Industries, Ltd.: *See*—
Ide, Takashi, 4,636,070, Cl. 356-73.100.
Nakai, Tetsuo; and Yazu, Shuji, 4,636,253, Cl. 75-239.000.
Nishizawa, Hideaki, 4,636,647, Cl. 250-551.000.

Sumitomo Precision Products Co., Ltd.: *See*—
Iwasaki, Shosuke; Abiko, Tetsuo; Hagiwara, Michiki; and Nanba, Keizo, 4,636,356, Cl. 420-532.000.

Sumitomo Special Metals Co., Ltd.: *See*—
Wada, Toshiaki; Nakaoka, Junichi; and Sugano, Takayuki, 4,636,420, Cl. 428-156.000.

Summers, Don D. Method and apparatus for reclaiming drilling fluids from undesirable solids in a drilling operation. 4,636,308, Cl. 210-195.100.

Sunamoto, Junzo: *See*—
Takada, Masahiro; Yuzuriha, Teruaki; Katayama, Kouichi; and Sunamoto, Junzo, 4,636,381, Cl. 424-38.000.

Sundstrand Corporation: *See*—
Ebbing, Steven J.; Hermann, Robert J.; Vicari, John J.; and Benedittz, Bruce D., 4,635,441, Cl. 60-450.000.

Superior Electric Company, The: *See*—
Lundin, Robert S., 4,636,662, Cl. 307-512.000.

Susa, Ermanno: *See*—
Mayr, Adolfo; Susa, Ermanno; Leccese, Antonio; Davoli, Velmore; and Giachetti, Ettore, 4,636,486, Cl. 502-121.000.

Sushardt, Rolf: *See*—
Rademacher, Friedrich; Sindermann, Siegmar; and Sushardt, Rolf, 4,635,690, Cl. 141-39.000.

Suss, Claus: *See*—
Gotsch, Dieter; Klenk, Robert; Hafner, Otto; and Suss, Claus, 4,635,732, Cl. 173-162.00R.

Sutou, Masatune: *See*—
Sugiyama, Masahiko; Sutou, Masatune; Murata, Mitsuru; Ooki, Minoru; and Tagawa, Shigetaro, 4,636,154, Cl. 418-97.000.

Suwahara, Hiroshi: *See*—
Kamo, Kazuhiko; Suwahara, Hiroshi; and Nakane, Ryuji, 4,636,610, Cl. 219-124.020.

Suyama, Takahiro: *See*—
Hayakawa, Toshiro; Miyauchi, Nobuyuki; Yano, Seiki; and Suyama, Takahiro, 4,637,029, Cl. 372-45.000.

Suzuki, Akihisa, to Sharp Kabushiki Kaisha. Loudspeaker diaphragm. 4,635,750, Cl. 381-194.000.

Suzuki, Ken'ichi. Protective device for a grinder or the like. 4,635,434, Cl. 57-273.000.

Suzuki, Kenji: *See*—
Watarai, Hisao; Tanaka, Masahiro; Masuda, Shuji; Suzuki, Kenji; and Matsumoto, Tsuyoshi, 4,636,806, Cl. 346-1.100.

Suzuki, Masaki, deceased (by Suzuki, Yumiko, legal representative); and Akashi, Goro, to Fuji Photo Film Co., Ltd. Multichannel magnetic head. 4,636,898, Cl. 360-122.000.

Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Manual adjusting device for tiltable outer mirror. 4,636,045, Cl. 350-606.000.

Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Pressure switch with non-conductive housing and axially spaced terminals. 4,636,598, Cl. 200-83.00N.

Suzuki, Shigeyoshi: *See*—
Furukawa, Akira; Senga, Takao; and Suzuki, Shigeyoshi, 4,636,452, Cl. 430-112.000.
Kanada, Eiji; Suzuki, Shigeyoshi; Endo, Kazunaka; and Yamamoto, Kyonosuke, 4,636,066, Cl. 355-77.000.

Suzuki, Shinichi: *See*—
Niiho, Masaaki; Itoh, Kiyoshi; Suzuki, Shinichi; Itagaki, Takuo; and Tsuda, Koji, 4,636,068, Cl. 356-5.000.

Suzuki, Takashi: *See*—
Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takashi, 4,636,649, Cl. 250-574.000.

Suzuki, Takehiko: *See*—
Miyazaki, Makoto; Yomoda, Minoru; and Suzuki, Takehiko, 4,635,373, Cl. 33-180.00R.

Suzuki, Toshiyuki, to Casio Computer Co., Ltd. Gear train mechanism stop device of timepiece. 4,636,087, Cl. 368-185.000.

Suzuki, Yumiko, legal representative: *See*—
Suzuki, Masaki, deceased; and Akashi, Goro, 4,636,898, Cl. 360-122.000.

Svendsen, John M.: *See*—
Petersen, Walter J.; Svendsen, John M.; and Morand, Verne J., 4,636,617, Cl. 219-375.000.

Svensson, Tommy E.: *See*—
Christopherson, Kjell H.; Odelius, Tomas; Rosemeier, Friedrich; Stenberg, Kaj O.; Svensson, Tommy E.; and Killmaier, Horst, 4,636,204, Cl. 604-283.000.

Swatek, Harald: *See*—
Rieder, Heinz; Schwaiger, Max; and Swatek, Harald, 4,636,079, Cl. 356-374.000.

Swinbanks, Malcolm A., to National Research Development Corp. Methods and apparatus for reducing noise by cancellation. 4,637,048, Cl. 381-71.000.

Swindlehurst, James A., to General Motors Corporation. Seat belt retractor. 4,635,874, Cl. 242-107.40B.

Syntex (U.S.A.) Inc.: *See*—
Lowin, David A.; Fayram, Richard A.; and Bivetto, Andrew J., 4,636,202, Cl. 604-236.000.

Szentes, John F.: *See*—
Foley, Donald E.; Gippi, Gregory H.; Schwader, William G.; Sells, Craig L.; Smittkamp, James A.; Stahl, Alan L.; and Szentes, John F., 4,635,739, Cl. 177-45.000.

Tabuchi, Jyoichi: *See*—
Itaba, Yasushi; Yoshino, Tadao; Yoshifuji, Yutaka; Saito, Keichiro; and Tabuchi, Jyoichi, 4,636,340, Cl. 264-22.000.

Tachikawa Spring Co., Ltd.: *See*—
Genjiro, Takagi, 4,636,002, Cl. 297-319.000.
Nishino, Takaishi, 4,636,000, Cl. 297-284.000.

Tada, Akira; Morita, Takamitsu; Teraue, Takeshi; and Kusumoto, Yoshihiro, to Mitsubishi Chemical Industries Ltd. Process for producing a chloromethylated polymer. 4,636,554, Cl. 525-359.300.

Taeger, Tilman: *See*—
Pfleiderer, Ernst; Taeger, Tilman; and Wick, Gertrud, 4,636,222, Cl. 8-94.160.

Taga Electric Co., Ltd.: *See*—
Mishiro, Shoji, 4,635,483, Cl. 73-579.000.

Tagawa, Shigetaro: *See*—
Sugiyama, Masahiko; Sutou, Masatune; Murata, Mitsuru; Ooki, Minoru; and Tagawa, Shigetaro, 4,636,154, Cl. 418-97.000.

Tagawa, Takao: *See*—
Takai, Yasuhiro; Morimoto, Kenichi; Yoshida, Shigekazu; and Tagawa, Takao, 4,636,063, Cl. 355-68.000.

Tago, Keiichiro, to Fuji Electric Company, Ltd. Reduced power displacement converting device using variable capacitance input. 4,636,712, Cl. 323-349.000.

Taguchi, Tetsuya: *See*—
Sakane, Toshio; Taguchi, Tetsuya; Ogawa, Masahiko; Tamura, Shuichi; and Tsunekawa, Tokuichi, 4,636,053, Cl. 354-403.000.

Taira, Shigeo; and Ishibashi, Toru, to Diesel Kiki Co., Ltd. Distributor-type fuel injection pump with preliminary injection control device. 4,635,599, Cl. 123-300.000.

Taira, Shigeo, to Diesel Kiki Co., Ltd. Fuel injection system for multi-cylinder internal combustion engines. 4,635,600, Cl. 123-300.000.

Tajima, Eiichi; and Yamamoto, Kaname, to Tajima Roofing Co., Ltd. Laminated bituminous roofing membrane. 4,636,414, Cl. 428-40.000.

Tajima Roofing Co., Ltd.: *See*—
Tajima, Eiichi; and Yamamoto, Kaname, 4,636,414, Cl. 428-40.000.

Takada, Juichiro. Seat belt clamp. 4,635,873, Cl. 242-107.200.

Takada, Masahiro; Yuzuriha, Teruaki; Katayama, Kouichi; and Sunamoto, Junzo, to Eisai Co., Ltd. Coated ubidecarenone-containing liposome. 4,636,381, Cl. 424-38.000.

Takada, Mitsuo, to Nikko Co., Ltd. Power switch for a battery. 4,636,596, Cl. 200-52.00R.

Takagi, Kiyotaka: *See*—
Abe, Hiroshi; Shichiri, Motoaki; Kawamori, Ryuzo; Ichoh, Tasuku; Iwatani, Kenji; Higuchi, Mamoru; Takagi, Kiyotaka; Okamoto, Norihiko; and Okudaira, Toshiyuki, 4,636,144, Cl. 417-63.000.

Takahara, Kazuhiro: *See*—
Yamaguchi, Hitashi; Takahara, Kazuhiro; Gondoh, Hiroyuki; Kawada, Toyoshi; and Andoh, Shizuo, 4,636,789, Cl. 340-805.000.

Takahashi, Kengo, to Hitachi, Ltd. Rotor spider for rotary electric machine. 4,636,675, Cl. 310-157.000.

Takahashi, Kenji: *See*—
Mori, Nobufumi; Takahashi, Kenji; and Horikawa, Kazuo, 4,636,641, Cl. 250-327.200.

Takahashi, Masahide; Sakai, Seiichi; Masada, Osamu; Ukawa, Masaru; and Onishi, Hamao, to Shikoku Denryoku Kabushiki Kaisha; and Shikoku Keisoku Kogyo Kabushiki Kaisha. Photovoltaic power control system. 4,636,931, Cl. 363-71.000.

Takahashi, Minoru: *See*—
Tohya, Syoichi; and Takahashi, Minoru, 4,636,703, Cl. 320-2.000.

Takahashi, Shoji: *See*—
Morimoto, Atsutaka; and Takahashi, Shoji, 4,636,905, Cl. 360-137.000.

Takahashi, Toshiro; and Nakamura, Koki, to Fuji Photo Film Co., Ltd. Process for forming a photographic image. 4,636,456, Cl. 430-266.000.

Takai, Yasuhiro; Morimoto, Kenichi; Yoshida, Shigekazu; and Tagawa, Takao, to Sharp Kabushiki Kaisha. Automatic exposure adjusting device. 4,636,063, Cl. 355-68.000.

Takamatsu, Osamu: *See*—
Kitahara, Nobuko; Takamatsu, Osamu; Kaneko, Tetsuya; and Sugata, Masao, 4,636,038, Cl. 350-339.00R.

Takamizawa, Minoru: *See*—
Fujimoto, Teruo; Kazama, Takeo; Takamizawa, Minoru; and Yamamoto, Akira, 4,636,454, Cl. 430-197.000.

Takao, Kunihiko; Kawashima, Kenichi; Nakamura, Yozo; and Hayase, Isao, to Hitachi, Ltd. Vane type compressor with volume control. 4,636,148, Cl. 417-286.000.

Takao, Makoto: *See*—
Nakamura, Usao; Takao, Makoto; Ueno, Etsuko; and Kawaguchi, Kichitaro, 4,636,471, Cl. 435-280.000.

Takara Co., Ltd.: *See*—
Oda, Nobuo, 4,636,178, Cl. 446-462.000.

Takasaki, Yukio: *See*—
Kusano, Chushiro; Ishioka, Sachio; Imamura, Yoshinori; Takasaki, Yukio; Ogawa, Hirofumi; Makishima, Tatsuo; and Hirai, Tadaaki, 4,636,682, Cl. 313-386.000.

Takauji, Kiyomi: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; and Kitamura, Mineo, 4,635,517, Cl. 84-1.010.

Takaya, Haruo: *See*—
Okado, Hideo; Shoji, Hiroshi; Takaya, Haruo; Kawamura, Kichinari; and Yamazaki, Yasuyoshi, 4,636,482, Cl. 502-60.000.

Takayama, Nobutoshi: *See*—
Edakubo, Hiroo; Takayama, Nobutoshi; and Takimoto, Hiroyuki, 4,636,882, Cl. 360-77.000.

Takebe, Toshihiko: *See*—
Nakai, Ryusuke; Takebe, Toshihiko; and Yamazaki, Hajime, 4,636,280, Cl. 156-603.000.

Takeda Chemical Industries, Ltd.: *See*—
Wada, Yasutaro; and Ohtsuki, Takashi, 4,636,849, Cl. 358-106.000.

Takei, Katsumori: *See*—
Hayashi, Seiichi; Takei, Katsumori; Usui, Takahiro; Yamaguchi, Yoshitaka; and Taniguchi, Makoto, 4,636,258, Cl. 106-31.000.

Takei, Masamitsu; and Shoji, Shigeo, to Kawasaki Steel Corporation; and Kawatetsu Wire Products. Unbonded PC steel strand. 4,635,433, Cl. 57-223.000.

Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, to Fujitsu Limited. Semiconductor memory device. 4,636,982, Cl. 365-149.000.

Takeuchi, Osamu: *See*—
Miyashita, Tsuneo; Yoshikoshi, Hideyuki; Nishio, Hiroaki; and Takeuchi, Osamu, 4,636,342, Cl. 264-82.000.

Takigawa, Masahiro: *See*—
Igashira, Toshihiko; Sakakibara, Yasuyuki; Abe, Seiko; Takigawa, Masahiro; and Izawa, Akihiro, 4,635,849, Cl. 239-102.200.

Takigen Manufacturing Co., Ltd.: *See*—
Yamada, Kenichi, 4,635,977, Cl. 292-92.000.

Takikawa, Makito, to Alps Electric Co., Ltd. Disk recording and playback apparatus having magnetic head separation device. 4,636,896, Cl. 360-105.000.

Takimoto, Hiroshi; and Fukui, Takumi, to Yamaha Hatsudoki Kabushiki Kaisha. Lamp mounting structure for small sized vehicle. 4,636,922, Cl. 362-72.000.

Takimoto, Hiroyuki: *See*—
Edakubo, Hiroo; Takayama, Nobutoshi; and Takimoto, Hiroyuki, 4,636,882, Cl. 360-77.000.

Takizawa, Masaaki: *See*—
Ozawa, Isao; Ito, Noboru; Takizawa, Masaaki; Ohta, Yoshio; and Ijichi, Kiyoteru, 4,635,910, Cl. 267-140.100.

Takla, Nabil, to Data General Corporation. Bit shifting apparatus. 4,636,976, Cl. 364-900.000.

Talbert Manufacturing, Inc.: *See*—
Holt, Joseph C.; and Losh, Russell L., 4,635,997, Cl. 296-182.000.

Talir, Jiri, to BBC Brown, Boveri & Company, Ltd. High-voltage switch. 4,636,599, Cl. 200-144.0AP.

Tamagne, Henry J., to Ford Motor Company. Method for positioning two sensor devices. 4,635,353, Cl. 29-602.00R.

Tamamura, Tetsuo: *See*—
Yamano, Kenji; and Tamamura, Tetsuo, 4,635,491, Cl. 74-89.150.

Tamura, Shuichi: *See*—
Sakane, Toshio; Taguchi, Tetsuya; Ogawa, Masahiko; Tamura, Shuichi; and Tsunekawa, Tokuichi, 4,636,053, Cl. 354-403.000.

Tamura, Toshinari; Iwamoto, Hidenori; Yoshida, Makoto; and Yamamoto, Minoru, to Yamanouchi Pharmaceutical Co., Ltd. 4-substituted-2-azetidinone compound. 4,636,567, Cl. 548-336.000.

Tan, Sing L.; and Schreurs, Louis P. M., to U.S. Philips Corporation. Color television transmission or data storage system having time-division multiplex encoding and data generator and receiver suitable therefor. 4,636,835, Cl. 358-12.000.

Tanabe, Osamu, to Alps Electric Co., Ltd. Push-push switch. 4,636,601, Cl. 200-153.00J.

Tanagawa, Koji; and Ohashi, Isao, to Oki Electric Industry Co., Ltd. Microprocessor. 4,636,945, Cl. 364-200.000.

Tanahashi, Masao; Hamashima, Tetsuo; and Kumano, Humihiro, to Matsushita Electric Works, Ltd. Cutting head for an electric shaver. 4,635,360, Cl. 30-34.200.

Tanaka, Akira, to Forming Industry, Inc. Automatic skewered food roaster. 4,635,539, Cl. 99-421.00H.

Tanaka, Eiichi: *See*—
Moriwaki, Masafumi; Sano, Shigeaki; and Tanaka, Eiichi, 4,636,582, Cl. 178-18.000.

Tanaka, Masahiro: *See*—
Watarai, Hisao; Tanaka, Masahiro; Masuda, Shuji; Suzuki, Kenji; and Masumoto, Tsuyoshi, 4,636,806, Cl. 346-1.100.

Tanaka, Mikihiko: *See*—
Amemiya, Kunio; Tanaka, Mikihiko; Kamemaru, Kenichi; and Nakagawa, Kiyoshi, 4,636,424, Cl. 428-198.000.

Tanaka, Seiichi: *See*—
Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takashi, 4,636,649, Cl. 250-574.000.

Tanaka, Sumio: *See*—
Narita, Fujiaki; and Tanaka, Sumio, 4,636,879, Cl. 360-72.200.

Tanaka, Toshiaki; and Sugihara, Kunihiko, to Nissan Motor Co., Ltd. Swirl chamber arrangement for diesel engine or the like. 4,635,598, Cl. 123-293.000.

Tanaka, Yoshinari: *See*—
Okaya, Takuji; Tanaka, Yoshinari; Yonezu, Kiyoshi; Aoyama, Akimasa; and Moritani, Takeshi, 4,636,551, Cl. 525-60.000.

Tanaka, Yuji: *See*—
Matsuda, Koichi; Kondo, Nobuaki; and Tanaka, Yuji, 4,635,890, Cl. 248-429.000.

Tandberg Data A/S: *See*—
Rudi, Guttorm; and Dilling, Jan-Erik, 4,636,890, Cl. 360-96.500.
Rudi, Guttorm, 4,636,903, Cl. 360-132.000.

Tande, Myron. Apparatus for positioning an electrical box. 4,635,372, Cl. 33-180.00R.

Tandem Computers Incorporated: *See*—
Horst, Robert W.; and Harris, Richard L., 4,636,943, Cl. 364-200.000.

Tanigawa, Yasuo: *See*—
Nomura, Iwao; Masuyama, Takayuki; Tanigawa, Yasuo; and Hasimoto, Hirofumi, 4,636,136, Cl. 414-730.000.

Taniguchi, Keishi: *See*—
Nagamoto, Masanaka; Kurisu, Norio; and Taniguchi, Keishi, 4,636,819, Cl. 346-216.000.

Taniguchi, Makoto: *See*—
Hayashi, Seiichi; Takei, Katsumori; Usui, Takahiro; Yamaguchi, Yoshitaka; and Taniguchi, Makoto, 4,636,258, Cl. 106-31.000.

Tanimoto, Akikazu: *See*—
Hazama, Junji; Kato, Kinya; Tanimoto, Akikazu; and Izawa, Hisao, 4,636,626, Cl. 250-201.000.

Tanino, Masahiro; and Higuchi, Tomoyuki, to Sanyo Kiki Kabushiki Kaisha. Speedup device for hydraulic control circuit systems. 4,635,532, Cl. 91-436.000.

Tanksystem A/S: *See*—
Hope, Bjorn R., 4,635,478, Cl. 73-292.000.

Tarcsafalvi, Andras, to Magyar Optikai Muvek. Vertical shaft system for gyroscopic theodolites with two degrees of freedom. 4,635,375, Cl. 33-318.000.

Targetti, Giampaolo, to Targetti Sankey S.p.A. Assembly with a lamp to be embedded having a member that can be engaged in the embedding seat and forming the housing for the lamp. 4,636,924, Cl. 362-277.000.

Targetti Sankey S.p.A.: *See*—
Targetti, Giampaolo, 4,636,924, Cl. 362-277.000.

Tarumoto, Kouji; Miyata, Jun; Yagii, Koji; and Nanba, Satoshi, to Mazda Motor Corporation. Method of manufacturing wear resistant sliding member. 4,636,285, Cl. 204-38.500.

Tashiro, Mamoru: *See*—
Yamazaki, Shunpei; Tashiro, Mamoru; and Miyazaki, Minoru, 4,636,401, Cl. 427-39.000.

Tassie, Douglas P., to General Electric Company. Seal assembly. 4,635,529, Cl. 89-36.140.

Tate, Benjamin E. Cardboard box and/or plastic crate partition. 4,635,810, Cl. 220-21.000.

Tate, Roland D. Battery terminal and connector. 4,636,447, Cl. 429-121.000.

Tatsumi, Takumi, to Mitsubishi Denki K.K. Safety control device for automatic transmission. 4,635,508, Cl. 74-866.000.

Tattersall, Alan M. Speaker enclosure. 4,635,749, Cl. 181-152.000.

Tatum, O. Hilt. Dental implant. 4,636,216, Cl. 623-16.000.

Tauscher, Robert C.: *See*—
Woyski, William B.; Huntley, Bruce L.; and Tauscher, Robert C., 4,635,764, Cl. 188-268.000.

Tauzin, Francis, to Sigma Plastique and Pomagalski S.A. Cabin for an aerial cableway. 4,635,561, Cl. 105-329.100.

Tavella, Mario: *See*—
Valbusa, Luigi; Coraluppi, Enzo; Quaglia, Andrea; and Tavella, Mario, 4,636,457, Cl. 430-267.000.

Tayler, Gerald E.: *See*—
Hartung, Michael H.; and Tayler, Gerald E., 4,636,946, Cl. 364-200.000.

Taylor, Barry E.: *See*—
Craig, William A.; and Taylor, Barry E., 4,636,332, Cl. 252-514.000.

Taylor, Clyde L. Module builder with a flared top and with attachments. 4,635,544, Cl. 100-98.00R.

Taylor, John F.: *See*—
Statham, Roger; and Taylor, John F., 4,636,389, Cl. 426-11.000.

Taylor, Peter J., to PA Consulting Services Limited. Adaptive pattern recognition. 4,637,055, Cl. 382-31.000.

TDK Corporation: *See*—
Morita, Haruyuki; Yoshinari, Jiro; and Fukuda, Kazumasa, 4,636,448, Cl. 428-607.000.

Teach, Eugene G., to Stauffer Chemical Co. Haloacyl and thiohaloacyl aryl-substituted oxazolidines and thiazolidines - herbicidal antidotes. 4,636,244, Cl. 71-90.000.

Team Corporation: *See*—
Woyski, William B.; Huntley, Bruce L.; and Tauscher, Robert C., 4,635,764, Cl. 188-268.000.

Techmedica, Inc.: *See*—
Pratt, Clyde R.; Carignan, Roger G.; Raggio, Charles M.; and Woznick, Chuck P., 4,636,219, Cl. 623-22.000.

Technicare Corporation: *See*—
Compton, Russell A.; Hinshaw, Waldo S.; and Kramer, David M., 4,636,728, Cl. 324-309.000.

Technische Hogeschool Eindhoven: *See*—
Brinkgreve, Peter; and Koningsberger, Diederik C., 4,637,041, Cl. 378-71.000.

Tecnol, Inc.: *See*—
Hubbard, Vance M.; and Brunson, Welton K., 4,635,628, Cl. 128-201.170.

Teepak, Inc.: *See*—
Towne, Clinton G.; and Stanley, Thomas R., 4,635,316, Cl. 17-1.00R.

Teeple, Edward. Surgical eye mask. 4,635,625, Cl. 128-163.000.

Tekna Recherche & Developpement Inc.: *See*—
Tremblay, Paul; and Tzabanakis, Georges, 4,635,989, Cl. 294-102.100.

Telefonaktiebolaget LM Ericsson: *See*—
Hellstrom, Bengt, 4,637,072, Cl. 455-607.000.
Johansson, Jan U. S.; Forsberg, Gunnar S.; and Vucins, Viesturs J., 4,636,029, Cl. 350-96.160.

Telefunken Fernseh- und Rundfunk GmbH: *See*—
Scholz, Werner, 4,636,875, Cl. 360-26.000.

Teleplex Corporation: *See*—
Diamond, Anthony E., 4,636,790, Cl. 340-825.520.

Tellden, Leif, to ASEA AB. Arrangement in an industrial robot. 4,636,134, Cl. 414-729.000.

Tenhaven, Ulrich: *See*—
Diener, Arnulf; Kettler, Hans; and Tenhaven, Ulrich, 4,635,586, Cl. 118-718.000.

Tennessee Valley Authority: *See*—
Hsieh, Shuang-shii, 4,636,303, Cl. 209-167.000.

Terada, Kanechiyo, to Nippondenso Co., Ltd. Magneto generator for internal combustion engine. 4,636,671, Cl. 310-74.000.

Terai, Kiyohide. Landing adjustment system for offshore structures. 4,636,113, Cl. 405-203.000.

Teramachi, Hiroshi. Straight-sliding roller bearing and straight guide apparatus. 4,636,094, Cl. 384-44.000.

Terasaki, Kazunori, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method for treating a weft yarn in a shuttleless loom and device for effecting the same. 4,635,686, Cl. 139-116.000.

Terasawa, Koji, to Canon Kabushiki Kaisha. Printing apparatus. 4,636,814, Cl. 346-140.00R.

Terase, Takeshi: *See*—
Tada, Akira; Morita, Takamitsu; Terase, Takeshi; and Kusumoto, Yoshihiro, 4,636,554, Cl. 525-359.300.

Terlecky, Boris S., to Trailer Train Company. All purpose railroad car. 4,636,119, Cl. 410-54.000.

Terramundo Ltd.: *See*—
Wehrli, Walter, 4,635,378, Cl. 34-1.000.

Tesaenske, Dennis J.: *See*—
Lenertz, John I.; Tesaenske, Dennis J.; and Ferrari, Ricky J., 4,636,130, Cl. 414-500.000.

Testin, William J., to RCA Corporation. Grounding arrangement useful in a display apparatus. 4,636,867, Cl. 358-245.000.

Texaco Inc.: *See*—
Bhattacharya, Ajit K.; and Nolan, John T., Jr., 4,636,576, Cl. 558-277.000.
Carlin, Joseph T., 4,635,722, Cl. 166-274.000.
Nalesnik, Theodore E., 4,636,322, Cl. 252-51.50A.
Savage, Kerry D.; Cox, Percy T.; and Paap, Hans J., 4,636,731, Cl. 324-338.000.
Valone, Frederick W., 4,636,256, Cl. 106-14.150.
Walker, Clarence O., 4,635,726, Cl. 166-294.000.

Texas Instruments: *See*—
Norwood, Roger D.; and Reddy, Chitranjan, 4,636,987, Cl. 365-208.000.

Texas Instruments Incorporated: *See*—
Chrobak, Michael J.; and Evans, Doyle R., 4,635,354, Cl. 29-622.000.
Havemann, Robert H., 4,635,344, Cl. 29-576.00W.
Millis, Edwin G.; Bimer, Thomas C.; and Lewis, Alton D., 4,636,128, Cl. 414-217.000.
Pinkham, Raymond, 4,636,986, Cl. 365-195.000.
Reddy, Chitranjan, 4,636,657, Cl. 307-269.000.
Sallas, John J., 4,637,002, Cl. 367-190.000.

Thake, Roy C., to Post Office, The. Sorting machine. 4,635,787, Cl. 198-603.000.

Theofilopoulos, Argyrios N.: *See*—
Altman, Amnon; Theofilopoulos, Argyrios N.; Lerner, Richard A.; and Dixon, Frank J., 4,636,463, Cl. 435-7.000.

Therma-Wave, Inc.: *See*—
Rosencwaig, Allan; and Smith, Walter L., 4,636,088, Cl. 374-5.000.

Thermco Systems, Inc.: *See*—
Aldridge, Robert E.; Elloway, Russell; Fritz, William O.; Goff, Ralph D.; and Herrera, Michael J., 4,636,140, Cl. 414-786.000.

Thermo King Corporation: *See*—
Viegas, Herman H., 4,635,671, Cl. 137-102.000.

Theta Industries, Inc.: *See*—
Baricevac, Thomas A.; and Raffalski, Karl-Heinz, 4,636,090, Cl. 374-56.000.

Theurer, Josef; and Oellerer, Friedrich, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile ballast cleaning machine. 4,635,664, Cl. 134-131.000.

Thievessen, Karl, to Jagenberg AG. Device for tensioning core tubes. 4,635,872, Cl. 242-72.00R.

Thigpen, Ben B.; Crump, E. Eugene; Johnston, Otis A.; McPeek, Nathaniel K.; and McNeel, William O., to Western Geophysical Co. of America. Depth transducer protective assembly. 4,637,000, Cl. 367-172.000.

Thoe, Robert S., to United States of America, Energy. Method and apparatus for enhancing microchannel plate data. 4,637,052, Cl. 382-1.000.

Thoma, Christian H.; and Arnold, George D. M., to Unipat AG. Hydraulic radial piston machines. 4,635,535, Cl. 91-498.000.

Thomas & Betts Corporation: *See*—
Gandolfo, Paul J., 4,636,271, Cl. 156-73.100.
Peterpaul, Joseph, 4,636,577, Cl. 136-206.000.
Sonobe, Toshimitsu, 4,636,022, Cl. 339-75.0MP.

Thomas, Charles E.; Yerazunis, William S.; Erkes, Joseph W.; and Lee, Minyoung, to General Electric Company. Acoustic detection of tool break events in machine tool operations. 4,636,779, Cl. 340-680.000.

Thomas, Charles E.; Lee, Minyoung; Bedard, James F.; and Hayashi, Steven R., to General Electric Company. Acoustic monitoring of cutting conditions to detect tool break events. 4,636,780, Cl. 340-680.000.

Thomas, Kendolph A., to Xerox Corporation. Front air knife top vacuum corrugation feeder. 4,635,921, Cl. 271-94.000.

Thomas, Michael J.: *See*—
Zimmermann, Klaus; Thomas, Michael J.; and Bailey, Norman R., 4,635,498, Cl. 74-501.00R.

Thomas, Ralph R. Continuous obstruction monitor for well logging tools. 4,635,718, Cl. 166-250.000.

Thomas, Tony C.: *See*—
Habitzreiter, Richard K.; Pinney, Robert V., Jr.; and Thomas, Tony C., 4,637,059, Cl. 382-54.000.

Thomke, Ernst; and Zaugg, Hans, to ETA S.A., Fabriques d'Ebauches. Electronic device for processing and displaying an item of information, a method of assembling said device and a machine for carrying out the method. 4,636,037, Cl. 350-334.000.

Thompson, George H. B.: *See*—
Greenwood, John C.; and Thompson, George H. B., 4,636,829, Cl. 357-30.000.

Thompson, Glenn F.: *See*—
Kauffman, James C.; and Thompson, Glenn F., 4,635,699, Cl. 160-211.000.

Thompson, Peter: *See*—
Otsuka, Nobuo; Igarashi, Hideo; and Thompson, Peter, 4,635,445, Cl. 62-158.000.

Thompson, Robert W., to Minnesota Mining and Manufacturing Company. Microfilm reader and printer. 4,636,059, Cl. 355-9.000.

Thomson Components-Mostek Corporation: *See*—
Tran, Hiep V., 4,636,988, Cl. 365-208.000.

Thomson-CSF: *See*—
Delgrange, Louis; and Vialettes, Francoise, 4,636,784, Cl. 340-771.000.
Le Pesant, Jean-Pierre, 4,636,785, Cl. 340-753.000.
Mourier, Georges, 4,636,689, Cl. 315-4.000.
Vernhet, Jean; and de Coussnon, Tristan, 4,636,859, Cl. 358-147.000.

Thoor, Henry-Albert, to FMC Corporation. Temperature responsive fluid control valve. 4,635,669, Cl. 137-79.000.

Thorn Emi Varian Limited: *See*—
England, Melvin G., 4,636,750, Cl. 331-90.000.

Thornber, Geoffrey, to Brunswick Corporation. Pulsed magnetron tube having improved electron emitter assembly. 4,636,749, Cl. 331-90.000.

Thornton, Donald I.; Peyton, Richard H.; and O'Shea, James P., to Allied Corporation. Panel air filter. 4,636,231, Cl. 55-318.000.

Thorp, Peter; and Manley, Roger E. W., to Coal Industry (Patents) Limited. Breathing apparatus. 4,635,629, Cl. 128-202.260.

Thumm, Klaus A.: *See*—
Neumann, Irving H.; Stobb, Walter J.; Silva, Robert M.; and Thumm, Klaus A., 4,636,139, Cl. 414-786.000.

Thun, Inc.: *See*—
Sharon, Wilfred J., 4,635,503, Cl. 74-594.200.

Thyes, Marco: *See*—
Roesy, Phillip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Friedrich, Ludwig; and Lenke, Dieter, 4,636,504, Cl. 514-252.000.

Thyssen Industrie AG: *See*—
Holzinger, Gerhard; Mems, Jurgen; and Miller, Luitpold, 4,636,667, Cl. 310-13.000.
Mems, Juergen, 4,636,666, Cl. 310-13.000.

Timesavers, Inc.: *See*—
Stump, Lee E., 4,635,405, Cl. 51-145.00T.

Timmons, Richard J., to O. M. Scott and Sons Company, The. Sulfur-based encapsulants for fertilizers. 4,636,242, Cl. 71-28.000.

Tkachenko, Viktor P.: *See*—
Golubenko, Alexandr L.; Turchin, Viktor P.; Kouyaev, Alexei N.; Sukhov, Igor N.; Kaljuzhny, Nikolai N.; Filonov, Arkady S.; Koropets, Alexei P.; Pinovsky, Mikhail I.; Tkachenko, Viktor P.; and Kramar, Nikolai M., 4,635,990, Cl. 295-11.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Itaba, Yasushi; Yoshino, Tadao; Yoshifuji, Yutaka; Saito, Keichiro; and Tabuchi, Jyoichi, 4,636,340, Cl. 264-22.000.

Todd, Peter L., to San Francisco Bay Area Rapid Transit District. Insulative protective device for rail fastener. 4,635,846, Cl. 238-264.000.

Toganoh, Shigeo; Arai, Ryuichi; and Sakaki, Mamoru, to Canon Kabushiki Kaisha. Record-bearing member and ink-jet recording method by use thereof. 4,636,805, Cl. 346-1.100.

Toganoh, Shigeo: *See*—
Akiya, Takashi; Toganoh, Shigeo; and Arai, Ryuichi, 4,636,410, Cl. 427-261.000.
Arai, Ryuichi; and Toganoh, Shigeo, 4,636,409, Cl. 427-256.000.

Tognet, Jean-Paul: *See*—
Fava, Jean; Lambert, Andre; and Tognet, Jean-Paul, 4,636,369, Cl. 423-20.000.

Tohata, Susumu; and Numata, Kunio, to Kabushiki Kaisha Gakushu Kenkyusha. Reflection type overhead projector. 4,636,050, Cl. 353-66.000.

Tohkai Kogyo Co., Ltd.: *See*—
Hatayama, Satoyuki, 4,635,947, Cl. 277-235.00A.

Tohya, Syoichi; and Takahashi, Minoru, to Sanyo Electric Co., Ltd. Charging apparatus. 4,636,703, Cl. 320-2.000.

Tohyama, Akira: *See*—
Hosono, Takashi; and Tohyama, Akira, 4,636,843, Cl. 358-67.000.

Tokico Ltd.: *See*—
Shirakuma, Takashi, 4,635,960, Cl. 280-707.000.

Tokita, Kiyoshi; and Nakamura, Michio, to Tokyo Shibaura Denki Kabushiki Kaisha. Color cathode-ray tube having shadow mask with variable sized apertures. 4,636,683, Cl. 313-403.000.

Toko Yakuhin Kogyo Co., Ltd.: *See*—
Umio, Suminori; Kamimura, Toshiaki; Kamishita, Takuzo; and Mine, Yasuhiro, 4,636,520, Cl. 514-399.000.

Tokumaru, Hisashi, to Minolta Camera Kabushiki Kaisha. Zoom lens system. 4,636,040, Cl. 350-427.000.

Tokyo Shibaura Denki Kabushiki: *See*—
Tomita, Seiji, 4,636,895, Cl. 360-105.000.
Tsutsumi, Teruo; and Hori, Masao, 4,635,357, Cl. 29-850.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Abe, Masahiro; Aoyama, Masaharu; Ajima, Takashi; and Yonezawa, Toshio, 4,636,832, Cl. 357-68.000.
Ikoma, Toshiaki; Maeda, Hajime; Yanai, Hisayoshi; Dang, Ryo; and Shigyo, Naoyuki, 4,636,824, Cl. 357-23.140.
Komatsu, Kenichi; and Fujii, Senzo, 4,636,954, Cl. 364-414.000.
Ogura, Mitsugi, 4,636,981, Cl. 365-203.000.
Shikata, Hiroshi, 4,636,116, Cl. 407-103.000.

Tokita, Kiyoshi; and Nakamura, Michio, 4,636,683, Cl. 313-403.000.
Yamamoto, Kazuhiko, 4,636,848, Cl. 358-102.000.
Tolley, Robert K.: *See—*
Harris, Charles E.; and Tolley, Robert K., 4,636,422, Cl. 428-174.000.
Tomasovic, Beth A.: *See—*
Novack, Robert L.; and Tomasovic, Beth A., 4,636,294, Cl. 204-432.000.
Tomita, Seiji, to Tokyo Shibaura Denki Kabushiki. Tape head apparatus for a cassette tape recorder. 4,636,895, Cl. 360-105.000.
Tomlinson, Barnard E. Disposable utensil. 4,635,843, Cl. 229-52.00B.
Tomohisa, Kunio; Maeda, Kiyoshi; and Yao, Koji, to Dainippon Screen Mfg. Co., Ltd. Method and system for recording images in various magnification ratios. 4,636,869, Cl. 358-287.000.
Tonsor, Andrew J., to Caterpillar Inc. Track shoe deflection limiter for endless track assemblies. 4,636,013, Cl. 305-48.000.
Tooten, Karlheinz: *See—*
Clostermeyer, Gerhard; Konekamp, Werner; and Tooten, Karlheinz, 4,635,543, Cl. 100-89.000.
Toppan Moore Co., Ltd.: *See—*
Moriwaki, Masafumi; Sano, Shigeaki; and Tanaka, Eiichi, 4,636,582, Cl. 178-18.000.
Torigai, Akiyoshi: *See—*
Ohno, Akio; and Torigai, Akiyoshi, 4,636,062, Cl. 355-43.000.
Toshitsugu, Kitayama, to Kyoei Co., Ltd. Apple case for use in preserving apples. 4,636,392, Cl. 426-110.000.
Toska Co., Ltd.: *See—*
Kato, Masami, 4,636,347, Cl. 264-251.000.
Tosswill, Christopher H., to Galileo Electro-Optics Corp. Image-storage microchannel device with gating means for selective ion feedback. 4,636,629, Cl. 250-213.0VT.
Toth, Robert L., Jr.: *See—*
Gasowski, Chester J.; Loeffler, Ronald L.; Musteric, Joseph T.; Springford, Richard H.; and Toth, Robert L., Jr., 4,635,696, Cl. 152-528.000.
Toto Ltd.: *See—*
Ogura, Kenji; and Yamazaki, Takeshi, 4,636,474, Cl. 435-291.000.
Totten, Roger W., to Industrial Automation Corporation. Inline bottle rinser with quick bottle size changeover capability. 4,635,662, Cl. 134-68.000.
Touret, Jean-Pierre: *See—*
Rouleau, Alain; Rouleau, Patrick; and Touret, Jean-Pierre, 4,635,918, Cl. 271-183.000.
Toutant, Edward E.: *See—*
Halter, Edward Arnold; Purcell, Billy D.; and Toutant, Edward E., 4,636,098, Cl. 400-208.000.
Towne, Clinton G.; and Stanley, Thomas R., to Teepak, Inc. Methods and apparatus for perforating food casing film and casing produced thereby. 4,635,316, Cl. 17-1.00R.
Townsend, Michael G.: *See—*
Ashelman, Robert U., Jr.; Townsend, Michael G.; and Lawrence, Mark C., 4,635,465, Cl. 72-448.000.
Townsend, Robert R.: *See—*
Caruso, Peter J.; and Townsend, Robert R., 4,636,761, Cl. 335-140.000.
Toyama Industry Co., Ltd.: *See—*
Ohno, Shoji; and Sugada, Sigeru, 4,636,427, Cl. 428-246.000.
Toyama, Jhunichi: *See—*
Yoshimura, Hironori; and Toyama, Jhunichi, 4,636,252, Cl. 75-238.000.
Toyama, Keiichiro; Kodera, Masao; and Sasaki, Kunihiko, to Nippon Soken, Inc. Ultrasonic transducer. 4,636,997, Cl. 367-140.000.
Toyoda Gosei Co., Ltd.: *See—*
Ozawa, Isao; Ito, Noboru; Takizawa, Masaaki; Ohta, Yoshio; and Ijichi, Kiyoteru, 4,635,910, Cl. 267-140.100.
Toyota Jidosha Kabushiki Kaisha: *See—*
Adachi, Yoshiharu; Nishimura, Takumi; Saito, Tadao; Shibata, Hirochika; Nakanishi, Nobuyasu; Shirai, Akira; and Noguchi, Noboru, 4,636,010, Cl. 303-115.000.
Buma, Shuuichi, 4,635,906, Cl. 267-8.00R.
Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,636,648, Cl. 250-571.000.
Nagasaka, Yasumasa, 4,636,160, Cl. 425-190.000.
Nakamata, Hideo, 4,636,609, Cl. 219-121.0LD.
Nomura, Iwao; Masuyama, Takayuki; Tanigawa, Yasuo; and Hasimoto, Hirofumi, 4,636,136, Cl. 414-730.000.
Ozawa, Isao; Ito, Noboru; Takizawa, Masaaki; Ohta, Yoshio; and Ijichi, Kiyoteru, 4,635,910, Cl. 267-140.100.
Ryu, Nobuyuki, 4,635,964, Cl. 280-804.000.
Tsuru, Naohiko; Matsuura, Ryoichi; Otsuki, Hiromi; Fujinami, Hiroshi; Hori, Shinichi; Nomura, Yoshihisa; and Oka, Hiroyuki, 4,636,009, Cl. 303-93.000.
Yonemoto, Kenji, 4,635,958, Cl. 280-664.000.
Trailer Train Company: *See—*
Terlecky, Boris S., 4,636,119, Cl. 410-54.000.
Tran, Hiep V., to Thomson Components-Mostek Corporation. CMOS memory arrangement with reduced data line compacitance. 4,636,988, Cl. 365-208.000.
Traulsen & Co., Inc.: *See—*
Dowds, Henry M., 4,635,540, Cl. 99-468.000.
Treleaven, Richard J.: *See—*
Matkin, Josef; and Treleaven, Richard J., 4,636,451, Cl. 430-109.000.
Tremblay, Paul; and Tzabanakis, Georges, to Tekna Recherche & Developpement Inc. Cable clamping device. 4,635,989, Cl. 294-102.100.
Trouilhet, Yves: *See—*
Noir, Dominique; and Trouilhet, Yves, 4,635,630, Cl. 128-203.260.
Truskalo, Walter, to RCA Corporation. Resonant degaussing for a video display system. 4,636,911, Cl. 361-150.000.
Trutter, Walter P.: *See—*
Bolz, Richard; and Trutter, Walter P., 4,636,005, Cl. 297-379.000.
Tsai, Shan F. AC/DC electro-magnetic device for aeration pump in fish globe or the like. 4,636,695, Cl. 318-124.000.
Tsang, Won-Tien, to AT&T Bell Laboratories. Chemical beam deposition method utilizing alkyl compounds in a carrier gas. 4,636,268, Cl. 148-175.000.
Tschernenko, Stanley A.; Crane, Lawrence A.; and Boyce, Jay, to Loyola Controls, Inc. Power control system. 4,636,935, Cl. 364-140.000.
Tsuda, Jou; and Ishii, Masami, to Aisin Seiki Kabushiki Kaisha; and Tsuda, Jou. Electroless plating bath for forming a nickel alloy coating having a high phosphorus content. 4,636,255, Cl. 106-1.220.
Tsuda, Koji: *See—*
Niiho, Masaaki; Itoh, Kiyoshi; Suzuki, Shinichi; Itagaki, Takuo; and Tsuda, Koji, 4,636,068, Cl. 356-5.000.
Tsuji, Akio, to Casio Computer Co., Ltd. Ultrasonic obstacle location apparatus and method. 4,636,996, Cl. 367-93.000.
Tsuji, Takashi; Kobayashi, Shozo; and Nagase, Toshio, to Nippon Zeon Co., Ltd. Method for providing a bubbleless connection between filling tubes for blood or the like and a container used for said connection. 4,636,196, Cl. 604-122.000.
Tsukai, Yoshiyuki, to Pioneer Electronic Corporation. Optically recorded data reading apparatus with inclination controller. 4,636,628, Cl. 250-201.000.
Tsunekawa, Tokuichi: *See—*
Sakane, Toshio; Taguchi, Tetsuya; Ogawa, Masahiko; Tamura, Shuichi; and Tsunekawa, Tokuichi, 4,636,053, Cl. 354-403.000.
Tsuois Corporation: *See—*
Shibata, Toru, 4,636,167, Cl. 425-589.000.
Tsuru, Naohiko; Matsuura, Ryoichi; Otsuki, Hiromi; Fujinami, Hiroshi; Hori, Shinichi; Nomura, Yoshihisa; and Oka, Hiroyuki, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Hydraulic pressure control device for use in vehicle anti-skid braking system. 4,636,009, Cl. 303-93.000.
Tsutsumi, Teruo; and Hori, Masao, to Tokyo Shibaura Denki K.K. Electrostatic recording head, a method for manufacturing the same, and an apparatus for practicing this method. 4,635,357, Cl. 29-150.000.
Tsuyama Mfg. Co., Ltd.: *See—*
Tsuyama, Sadaharu, 4,636,769, Cl. 340-134.000.
Tsuyama, Sadaharu, to Tsuyama Mfg. Co., Ltd. Data display unit for a bicycle. 4,636,769, Cl. 340-134.000.
Tucker, Howard, to Imperial Chemical Industries PLC. Amide derivatives. 4,636,505, Cl. 514-256.000.
Tucker, James E.; Stephen, James C.; and Beecher, John, III, to Weber-Stephen Products Co. Lid support for cart-mounted outdoor grill. 4,635,613, Cl. 126-25.00R.
Tucker, Paul T.: *See—*
Andersen, David M.; Bitzer, Donald L.; Rader, Robert K.; Sherwood, Bruce A.; and Tucker, Paul T., 4,636,174, Cl. 434-335.000.
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White, Basil, 4,635,495, Cl. 74-364.000.
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Seo, Akira; Kanno, Hideo; Hasegawa, Nobu; Miyagi, Yukio; Nishimura, Akira; Konaka, Shigeo; Ohmi, Tetsuto; Munechika, Yukimi; Uchida, Matazaemon; and Ikeda, Kenichi, 4,636,519, Cl. 514-397.000.
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Hague, Duane O.; and Barnes, James E., 4,636,858, Cl. 358-147.000.
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Helmke, Richard W., 4,635,311, Cl. 14-2.400.
Horn, Robert E.; and Jacobs, Harold, deceased, 4,636,751, Cl. 331-96.000.
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Gowing, Scott, 4,635,487, Cl. 73-864.620.
Huang, Shih L.; Scotese, Arthur; Libeskind, Mark; and Gause, Lee W., 4,636,638, Cl. 250-231.00R.
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Bierhoff, Martinus P. M., 4,637,006, Cl. 369-59.000.
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Duijkers, Peter A., 4,636,860, Cl. 358-148.000.
Hethuin, Serge; and Maria, Guy F. M., 4,636,958, Cl. 364-451.000.
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Loy, Fernand R., 4,636,044, Cl. 350-539.000.
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Slotboom, Jan W.; Maas, Henricus G. R.; Appels, Johannes A.; and Klaassen, Francois M., 4,636,826, Cl. 357-24.000.
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University of Illinois: *See—*
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University of Minnesota, Regents of the: *See—*
Ogilvie, James W.; and Ogilvie, Frank R., 4,636,217, Cl. 623-17.000.
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Davis, Robert L.; and Keith, Harold D., 4,636,115, Cl. 405-259.000.
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Unmuth, Eugene E.; Mahoney, John A.; and Bertolacini, Ralph J., to Standard Oil Company (Indiana). Process for the manufacture of lubricating oils. 4,636,299, Cl. 208-87.000.
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Imai, Tamotsu; and Kocal, Joseph A., 4,636,488, Cl. 502-172.000.
Kjell, Solveg S.; Chao, Tai-Hsiang; Flint, Nancy J.; and Foutsitzis, Arthur A., 4,636,483, Cl. 502-61.000.
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Ballantyne, W. John, 4,635,560, Cl. 104-292.000.
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Ushida, Manabu: *See—*
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Usui, Takahiro: *See—*
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Vaillancourt, Vincent L., to Chesebrough-Pond's Inc. Intubating device. 4,636,200, Cl. 604-170.000.
Vaillancourt, Vincent L. Flexible filter disposed within flexible conductor. 4,636,313, Cl. 210-436.000.
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Valbusa, Luigi; Coraluppi, Enzo; Quaglia, Andrea; and Tavella, Mario, to Minnesota Mining and Manufacturing Company. Process for forming direct positive images, direct positive silver halide elements, compositions and compounds as characteristics feature of such processes and elements. 4,636,457, Cl. 430-267.000.
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Billet, Rene ; and Bacher, Michel, 4,635,776, Cl. 192-70.270.
Valone, Frederick W., to Texaco Inc. Corrosion inhibiting system containing alkoxylated amines. 4,636,256, Cl. 106-14.150.

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Vandemore, William J., to Lucas Sales Company, Inc. Plural-section pitch pan. 4,635,409, Cl. 52-60.000.
van der Smissen, Carl-Ernst, to Dragerwerk AG. Filter comprising a catalyst on a substrate for purification of air. 4,636,485, Cl. 502-66.000.
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Van der Werff, Jeichienus A. Toroidal motor or pump. 4,636,157, Cl. 418-225.000.
Vann, Roy R.; Brieger, Emmet F.; George, Flint R.; Colle, Edward A., Jr.; and Jones, Hilton B., to Halliburton Company. Gun firing system using fluid filled pressure balance tubing. 4,635,733, Cl. 175-4.560.
Vannier, Serge; Garotta, Robert; Lozes, Andre ; and Vidal, Jean C., to Societe Nationale Elf Aquitaine (Production); and Compagnie Generale de Geophysique. Method and device for optimization of seismic data. 4,636,956, Cl. 364-421.000.
Van Orsdel, James. Method and apparatus for detecting motion through a transparent enclosure, with spurious information detecting and compensating means. 4,636,637, Cl. 250-231.0SE.
Van Wagener, Raymond H.: *See*—
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Van Zyl, Theodore D. Manufacture of electrical coils. 4,635,348, Cl. 29-596.000.
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Vassiliou, Eustathios, to Du Pont de Nemours, E. I., and Company. Method of coating hollow massive objects with plastisols and organosol. 4,636,402, Cl. 427-49.000.
Vaughan, Daniel J. Electrodialytic conversion of multivalent metal salts. 4,636,288, Cl. 204-182.400.
VBM Corporation: *See*—
Canfora, Philip H., 4,636,226, Cl. 55-68.000.
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Grossmann, Stefan; and Nitzsche, Erhard, 4,635,546, Cl. 101-248.000.
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Vermilion, Donn R.: *See*—
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Vernhet, Jean; and de Cousmon, Tristan, to Thomson CSF. Didon digital demodulator. 4,636,859, Cl. 358-147.000.
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Vibrastop, Inc.: *See*—
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Ebbing, Steven J.; Hermans, Robert J.; Vicari, John J.; and Benedittz, Bruce D., 4,635,441, Cl. 60-450.000.
Vickers, Incorporated: *See*—
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Victor Company of Japan, Ltd.: *See*—
Kato, Hiroshi; and Kubota, Hiromitsu, 4,636,887, Cl. 360-85.000.
Kobari, Harukuni, 4,637,036, Cl. 375-76.000.
Victor, Lyle D. Device for inserting a catheter within the intercostal space. 4,636,199, Cl. 604-164.000.
Vida-Weld Pty. Limited: *See*—
Sare, Ian R.; Henderson, Ian D.; Heijkoop, Teunis; Bosworth, Michael R.; Aspin, Ronald E.; and Arnold, Brian K., 4,635,701, Cl. 164-102.000.
Vidal, Jean C.: *See*—
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Videojet Systems International, Inc.: *See*—
Eremity, Frank, 4,636,809, Cl. 346-75.000.
Viegas, Herman H., to Thermo King Corporation. Flow and pressure control valve system. 4,635,671, Cl. 137-102.000.
Vigede, Thure, to Proca Consulting AB. Method for taking body measurement and apparatus for performing the method as well as a system for taking body measurement and producing garments. 4,635,367, Cl. 33-15.000.
Villarreal, Richard A., to United States of America, Energy. Optical scanning apparatus for indicia imprinted about a cylindrical axis. 4,636,846, Cl. 358-100.000.
Villavicencio, Eduardo J.; and Arana, Jorge E., to Process Evaluation and Development Corp. Fiber washer. 4,635,322, Cl. 19-66.00R.
Vock, Manfred H.: *See*—
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Vogtlander, Alfred; and Vogtlander, Elsbeth, to Falk-Verlag fur Landkarten und Stadtplane Gerhard Falk GmbH. Apperatus for folding a foldable sheet. 4,636,192, Cl. 493-451.000.
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Golubenko, Alexandr L.; Turchin, Viktor P.; Konyaev, Alexei N.; Sukhov, Igor N.; Kaljuzhny, Nikolai N.; Filonov, Arkady S.; Koropets, Alexei P.; Pinovsky, Mikhail I.; Tkachenko, Viktor P.; and Kramar, Nikolai M., 4,635,990, Cl. 295-11.000.
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Vrieze, Wubbe, to U.S. Philips Corporation. Low-pressure mercury vapor discharge lamp provided with an amalgam forming alloy. 4,636,686, Cl. 313-565.000.
Vucins, Viesturs J.: *See*—
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W. R. Grace & Co.: *See*—
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W. Schlafhorst & Co.: *See*—
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Wada, Toshiaki; Nakaoka, Junichi; and Sugano, Takayuki, to Sumitomo Special Metals Co., Ltd. Grooved magnetic substrates and method for producing the same. 4,636,420, Cl. 428-156.000.
Wada, Yasutaro; and Ohtsuki, Takashi, to Takeda Chemical Industries, Ltd. Apparatus for inspecting solid drugs and a method therefor. 4,636,849, Cl. 358-106.000.
Waese, Jerry R.: *See*—
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Wagner Spray Tech Corporation: *See*—
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Waisbrod, Neville, to Tzora Furniture Industries Ltd. Coaxial joint. 4,636,106, Cl. 403-228.000.
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McMurtrey, David K., 4,635,499, Cl. 74-551.100.
Walker, Charles R. S.: *See*—
Kuhfus, Gerd; Walker, Charles R. S.; and Robinson, Anthony H. J., 4,636,591, Cl. 381-159.000.
Walker, Clarence O., to Texaco Inc. Method for controlling lost circulation of drilling fluids with water absorbent polymers. 4,635,726, Cl. 166-294.000.
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Wall, Robert L.: *See*—
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Wallace, William K.; and McHenry, Kenneth A., to Chicago Pneumatic Tool Company. Impulse tool. 4,635,731, Cl. 173-12.000.
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Waller, David P.: *See*—
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Walsh, William H. Method and apparatus for assembling an automatic and disposable pencil. 4,635,338, Cl. 29-436.000.
Walter, John F., to Crosby Valve & Gage Company. Flat sided ball valve. 4,635,675, Cl. 137-315.000.
Walter, Kathleen E.: *See*—
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Walters, Haven B. Fishing rod support. 4,635,390, Cl. 43-21.200.
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Whyte, Ian A., to Westinghouse Electric Corp. Static VAR generator. 4,636,708, Cl. 323-210.000.
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Yamano, Masaru; Sakai, Takashi; Furukawa, Nobuhiro; Murakami, Shuzo; and Matsumoto, Takanao, to Sanyo Electric Co., Ltd. Metal/-hydrogen alkaline storage battery. 4,636,445, Cl. 429-53.000.
Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Kubo, Kazuo; Isomura, Yasuo; Sakamoto, Shuichi; and Homma, Hiroshige, 4,636,516, Cl. 514-365.000.
Tamura, Toshinari; Iwamoto, Hidenori; Yoshida, Makoto; and Yamamoto, Minoru, 4,636,567, Cl. 548-336.000.
Yamashita, Sadao: *See*—
Ishikawa, Youhei; Yorita, Tadahiro; and Yamashita, Sadao, 4,636,759, Cl. 333-223.000.
Yamato Scale Company, Limited: *See*—
Kinoshita, Kinjiro, 4,635,831, Cl. 222-504.000.
Yamauchi, Fumio: *See*—
Matsukura, Hiroyuki; and Yamauchi, Fumio, 4,636,101, Cl. 400-590.000.
Yamauchi, Yuji: *See*—
Ishii, Takayuki; and Yamauchi, Yuji, 4,635,457, Cl. 72-66.000.
Yamazaki, Hajime: *See*—
Nakai, Ryusuke; Takebe, Toshihiko; and Yamazaki, Hajime, 4,636,280, Cl. 156-603.000.
Yamazaki, Shingo: *See*—
Makino, Yoshio; Nagai, Takeshi; and Yamazaki, Shingo, 4,636,323, Cl. 252-51.50R.
Yamazaki, Shunpei; Tashiro, Mamoru; and Miyazaki, Minoru, to Semiconductor Energy Laboratory Co., Ltd. Apparatus for chemical vapor deposition and method of film deposition using such deposition. 4,636,401, Cl. 427-39.000.
Yamazaki, Takeshi: *See*—
Ogura, Kenji; and Yamazaki, Takeshi, 4,636,474, Cl. 435-291.000.
Yamazaki, Yasuyoshi: *See*—
Okado, Hideo; Shoji, Hiroshi; Takaya, Haruo; Kawamura, Kichinari; and Yamazaki, Yasuyoshi, 4,636,482, Cl. 502-60.000.
Yanagihara, Kenji; Kimura, Mituo; and Niinomi, Masahiro, to Japan Synthetic Rubber Company Limited; and Fuji Photo Film Company Limited. Polymeric thin film, process for producing the same and products containing said thin film. 4,636,435, Cl. 428-336.000.
Yanai, Hisayoshi: *See*—
Ikoma, Toshiaki; Maeda, Hajime; Yanai, Hisayoshi; Dang, Ryo; and Shigyo, Naoyuki, 4,636,824, Cl. 357-23.140.
Yanase, Tomoo; and Rangu, Hiroyoshi, to NEC Corporation. Surface-emitting semiconductor elements. 4,636,821, Cl. 357-17.000.
Yang, Huei-Hsuing: *See*—
McGuire, Jeffrey C.; Montgomery, John P.; and Yang, Huei-Hsuing, 4,636,466, Cl. 435-108.000.
Yanmar Diesel Engine Co., Ltd.: *See*—
Ohashi, Ryoichi; and Inaba, Hitoshi, 4,635,597, Cl. 123-276.000.
Yano, Seiki: *See*—
Hayakawa, Toshiro; Miyauchi, Nobuyuki; Yano, Seiki; and Suyama, Takahiro, 4,637,029, Cl. 372-45.000.
Yao, Koji: *See*—
Tomohisa, Kunio; Maeda, Kiyoshi; and Yao, Koji, 4,636,869, Cl. 358-287.000.
Yariv, Amnon: *See*—
Margalit, Shlomo; Yariv, Amnon; and Rav-Noy, Zeev, 4,636,823, Cl. 357-23.300.
Yasaitis, John A.: *See*—
Raffel, Jack I.; Yasaitis, John A.; and Chapman, Glenn H., 4,636,404, Cl. 427-53.100.
Yasuhara, Seishi: *See*—
Ichikawa, Sadao; Yokoi, Shinichi; Yasuhara, Seishi; and Kondo, Hiroshi, 4,635,594, Cl. 123-179.0BG.
Yasuhara, Yukihiko, to Alps Electric Co., Ltd. Drive coil wiring structure for brushless motor. 4,636,677, Cl. 310-194.000.
Yasunaga, Soichiro, to Riken Denshi Co. Ltd. Multiple function type D/A converter. 4,636,772, Cl. 340-347.0DA.
Yasuoka, Akimasa; and Kiuchi, Takeo, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for controlling the supply of fuel to an internal combustion engine. 4,635,607, Cl. 123-479.000.
Yazu, Shuji: *See*—
Nakai, Tetsuo; and Yazu, Shuji, 4,636,253, Cl. 75-239.000.
Yerazunis, William S.: *See*—
Thomas, Charles E.; Yerazunis, William S.; Erkes, Joseph W.; and Lee, Minyoung, 4,636,779, Cl. 340-680.000.
Yerigan, Raymond A.: *See*—
Krueger, David W.; and Yerigan, Raymond A., 4,635,740, Cl. 180-9.210
Yim, Byung D.: *See*—
Kim, Tae G., 4,635,793, Cl. 206-315.600.
Yin, Candido C.; and Matthews, Graham L., to Coal Industry (Patents) Limited. Monitoring by adsorption. 4,636,227, Cl. 55-74.000.
Yokogawa, Fumihiko, to Pioneer Electronic Corporation. Amplitude modulated high frequency signal detection device. 4,637,003, Cl. 369-32.000.
Yokohama Rubber Co., Ltd., The: *See*—
Ahagon, Asahiro; Kobayashi, Toshio; Yamada, Kazuhiro; Doi, Seiichi; and Misawa, Makoto, 4,635,693, Cl. 152-209.00R.
Hosokawa, Ichiro, 4,635,694, Cl. 152-209.00A.
Yokoi, Mitsuru: *See*—
Yamada, Masaki; Yokoi, Mitsuru; and Oishi, Kazuhiro, 4,635,792, Cl. 206-310.000.
Yokoi, Shinichi: *See*—
Ichikawa, Sadao; Yokoi, Shinichi; Yasuhara, Seishi; and Kondo, Hiroshi, 4,635,594, Cl. 123-179.0BG.
Itoh, Tsuneo; and Yokoi, Shinichi, 4,636,614, Cl. 219-270.000.
Yokoshima, Minoru: *See*—
Nawata, Kazuyoshi; Katayama, Masahito; and Yokoshima, Minoru, 4,636,534, Cl. 522-116.000.
Yokota, Yutaka; and Shimasaki, Hiroshi, to Sanyo Electric Co., Ltd. Color television display apparatus having improved convergence of electron beams. 4,636,684, Cl. 313-412.000.

Yokoyama, Hirotaka: *See*—
Kubo, Osamu; Nomura, Tutomu; Ido, Tadashi; and Yokoyama, Hirotaka, 4,636,433, Cl. 428-328.000.
Yomoda, Minoru: *See*—
Miyazaki, Makoto; Yomoda, Minoru; and Suzuki, Takehiko, 4,635,373, Cl. 33-180.00R.
Yonemoto, Kenji, to Toyota Jidosha Kabushiki Kaisha. Automobile suspensions. 4,635,958, Cl. 280-664.000.
Yonex Kabushiki Kaisha: *See*—
Yoneyama, Minoru, 4,635,941, Cl. 273-78.000.
Yoneyama, Minoru, to Yonex Kabushiki Kaisha. Golf club head. 4,635,941, Cl. 273-78.000.
Yonezawa, Taketoshi: *See*—
Nomura, Noboru; Kugimiya, Koichi; Matsumura, Takayoshi; and Yonezawa, Taketoshi, 4,636,077, Cl. 356-356.000.
Yonezawa, Toshio: *See*—
Abe, Masahiro; Aoyama, Masaharu; Ajima, Takashi; and Yonezawa, Toshio, 4,636,832, Cl. 357-68.000.
Yonezu, Kiyoshi: *See*—
Okaya, Takuji; Tanaka, Yoshinari; Yonezu, Kiyoshi; Aoyama, Akimasa; and Moritani, Takeshi, 4,636,551, Cl. 525-60.000.
Yorita, Tadahiro: *See*—
Ishikawa, Youhei; Yorita, Tadahiro; and Yamashita, Sadao, 4,636,759, Cl. 333-223.000.
Yoshida Industry Co., Ltd.: *See*—
Hatakeyama, Yoshiharu; and Ishikawa, Tatsuo, 4,635,826, Cl. 222-147.000.
Yoshida, Kazunori: *See*—
Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,636,648, Cl. 250-571.000.
Yoshida, Kenichi: *See*—
Ohuchi, Masayuki; Oodaira, Hirosi; and Yoshida, Kenichi, 4,635,356, Cl. 29-841.000.
Yoshida, Makoto: *See*—
Tamura, Toshinari; Iwamoto, Hidenori; Yoshida, Makoto; and Yamamoto, Minoru, 4,636,567, Cl. 548-336.000.
Yoshida, Shigekazu: *See*—
Takai, Yasuhiro; Morimoto, Kenichi; Yoshida, Shigekazu; and Tagawa, Takao, 4,636,063, Cl. 355-68.000.
Yoshifuji, Yutaka: *See*—
Itaba, Yasushi; Yoshino, Tadao; Yoshifuji, Yutaka; Saito, Keichiro; and Tabuchi, Jyoichi, 4,636,340, Cl. 264-22.000.
Yoshihara Oil Mill, Ltd.: *See*—
Hanaoka, Joichi, 4,636,259, Cl. 106-122.000.
Yoshihara, Toshio; and Kikuchi, Ichiro, to Nippon Soda Co., Ltd. Thin-film dielectric and process for its production. 4,636,908, Cl. 361-321.000.
Yoshihiro, Mitsuto: *See*—
Kamiyo, Sumio; and Yoshihiro, Mitsuto, 4,636,536, Cl. 523-137.000.
Yoshikoshi, Hideyuki: *See*—
Miyashita, Tsuneo; Yoshikoshi, Hideyuki; Nishio, Hiroaki; and Takeuchi, Osamu, 4,636,342, Cl. 264-82.000.
Yoshimura, Hironori; and Toyama, Jhunichi, to Mitsubishi Kinzoku Kabushiki Kaisha. Method of manufacturing a high toughness cermet for use in cutting tools. 4,636,252, Cl. 75-238.000.
Yoshinari, Jiro: *See*—
Morita, Haruyuki; Yoshinari, Jiro; and Fukuda, Kazumasa, 4,636,448, Cl. 428-607.000.
Yoshino, Tadao: *See*—
Itaba, Yasushi; Yoshino, Tadao; Yoshifuji, Yutaka; Saito, Keichiro; and Tabuchi, Jyoichi, 4,636,340, Cl. 264-22.000.
Young, James: *See*—
Hanak, Joseph J.; Young, James; Kuypers, Bert; and Blieden, Richard, 4,636,579, Cl. 136-245.000.
Young, Kenneth E.; and Bateman, Bruce L., to Cypress Semiconductor Corp. Memory array biasing circuit for high speed CMOS device. 4,636,983, Cl. 365-181.000.
Yuasa, Kazuhiro, to Ricoh Company Ltd. Electrostatic recording apparatus. 4,636,815, Cl. 346-153.100.
Yuito, Isamu: *See*—
Nakamura, Hitoshi; Shiiki, Kasuo; Yuito, Isamu; Shiroishi, Yoshihiro; Fujiwara, Hideo; Shinagawa, Kiminari; and Iijima, Akemi, 4,636,897, Cl. 360-119.000.
Yukawa, Yasuaki: *See*—
Imamura, Tetsuo; and Yukawa, Yasuaki, 4,635,489, Cl. 74-7.00E.
Yuzuriha, Teruaki: *See*—
Takada, Masahiro; Yuzuriha, Teruaki; Katayama, Kouichi; and Sunamoto, Junzo, 4,636,381, Cl. 424-38.000.
Zaghloul, Amir I.: *See*—
Geller, Bernard D.; and Zaghloul, Amir I., 4,636,753, Cl. 333-24.000.
Zago, Giovanni: *See*—
Zanello, Gastone; Zago, Giovanni; and Prataviera, Giovanni, 4,635,649, Cl. 131-237.000.
Zamir, Yaakov: *See*—
Weintraub, David; and Zamir, Yaakov, 4,635,638, Cl. 128-340.000.
Zanello, Gastone; Zago, Giovanni; and Prataviera, Giovanni. Electrically operated self-cleaning ashtray. 4,635,649, Cl. 131-237.000.
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glean M., to General Foods Corporation. Foodstuff with L-aminodicarboxylic acid gem-diamines. 4,636,396, Cl. 426-548.000.
Zaugg, Hans: *See*—
Thomke, Ernst; and Zaugg, Hans, 4,636,037, Cl. 350-334.000.
Zecman, Kenneth P., to Pegasus Industries, Inc. Casting nozzle. 4,635,851, Cl. 239-133.000.
Zeides, Otto. Propeller for gaseous and fluidic media. 4,636,143, Cl. 416-223.000.
Zenith Electronics Corporation: *See*—
Forbes, Ronald L.; and Lund, John A., 4,636,853, Cl. 358-121.000.
Zerfass, Hans-Rainer; Majewski, Klaus-Peter; and Giesen, Franz-Josef, to Goetze AG. Release coating for gaskets and manufacturing method. 4,635,948, Cl. 277-235.00B.
Ziegelmeyer, Harold R., to Campbell, John W. Adjustable prosthetic foot. 4,636,220, Cl. 623-53.000.
Zikmanis, Harijs; Prezlock, James; and Lahaski, Paul, to Cascade Industries, Inc. Wall system for swimming pools. 4,635,304, Cl. 4-506.000.
Zimmermann, Klaus; Thomas, Michael J.; and Bailey, Norman R., to General Motors Corporation. Fastening device. 4,635,498, Cl. 74-501.00R.
Zimmermann, Markus: *See*—
Ostermayer, Franz; and Zimmermann, Markus, 4,636,511, Cl. 514-311.000.
Zinser Textilmaschinen GmbH: *See*—
Dupper, Walter; Emberger, Roland; Hack, Kurt; Lattner, Manfred; Nickolay, Helmut; Riedel, Karl; and Schollhammer, Richard, 4,635,321, Cl. 19-0.250.
Wolf, Horst, 4,635,431, Cl. 57-105.000.
Zoback, Mark D.; and Raleigh, Cecil B. Method for hydraulic fracture propagation in hydrocarbon-bearing formations. 4,635,719, Cl. 166-250.000.
Zoerner, Glen J., to Motorola, Inc. Electronic switch for digital telephone. 4,636,587, Cl. 379-377.000.
Zoor, Reinhold, to Heinrich Wander GmbH & Co. KG. Device for releasably holding parts of ski bindings. 4,635,955, Cl. 280-614.000.
Zuk, David M.; and Larrowe, Vernon L., to Environmental Research Institute of Michigan. Apparatus for extended precision phase measurement. 4,636,719, Cl. 324-83.00D.
Zunkel, Gary D., to Halliburton Company. Gravel packer. 4,635,716, Cl. 166-51.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF JANUARY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bradley, John J.: *See*—
Fulk, James B.; McKeefry, Jerry L.; Schuning, George F.; and Bradley, John J., Re. 32,331, Cl. 493-399.000.
Fulk, James B.; McKeefry, Jerry L.; Schuning, George F.; and Bradley, John J., to Paper Converting Machine Company. Method and apparatus for correcting stack lean in a zig-zag folded web. Re. 32,331, Cl. 493-199.000.
McKeefry, Jerry L.: *See*—
Fulk, James B.; McKeefry, Jerry L.; Schuning, George F.; and Bradley, John J., Re. 32,331, Cl. 493-399.000.
Miyakawa, Seiichi; Tatsumi, Susumu; and Sakamoto, Koji, to Ricoh Co., Ltd. Method of maintaining the correct conditions of an electrophotographically duplicated image. Re. 32,330, Cl. 355-14.00D.
Opex Corporation: *See*—
Russell, Robert J., Re. 32,328, Cl. 53-381.00R.
Paper Converting Machine Company: *See*—
Fulk, James B.; McKeefry, Jerry L.; Schuning, George F.; and Bradley, John J., Re. 32,331, Cl. 493-399.000.
Paszner, Laszlo. Method of adhering mineral deposit in wood fragment surfaces. Re. 32,329, Cl. 264-108.000.
Ricoh Co., Ltd.: *See*—
Miyakawa, Seiichi; Tatsumi, Susumu; and Sakamoto, Koji, Re. 32,330, Cl. 355-14.00D.
Russell, Robert J., to Opex Corporation. Mail extracting and sorting desk. Re. 32,328, Cl. 53-381.00R.
Sakamoto, Koji: *See*—
Miyakawa, Seiichi; Tatsumi, Susumu; and Sakamoto, Koji, Re. 32,330, Cl. 355-14.00D.
Schuning, George F.: *See*—
Fulk, James B.; McKeefry, Jerry L.; Schuning, George F.; and Bradley, John J., Re. 32,331, Cl. 493-399.000.
Tatsumi, Susumu: *See*—
Miyakawa, Seiichi; Tatsumi, Susumu; and Sakamoto, Koji, Re. 32,330, Cl. 355-14.00D.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Armstrong, John H. G., to Volumatic Ltd. Containers for banknotes and the like. B1 3,854,655, 1-13-87, Cl. 232-4.00R.
Brown, Delmont D.; and Rizza, Michael C., to D. S. Brown Company, The. Expansion joint sealing structures. B1 4,290,713, 1-13-87, Cl. 404-69.000.
D. S. Brown Company, The: *See*—
Brown, Delmont D.; and Rizza, Michael C., B1 4,290,713, Cl. 404-69.000.
Institut Francais du Petrole: *See*—
Wittrisch, Christian, B1 4,457,370, Cl. 166-250.000.
Rizza, Michael C.: *See*—
Brown, Delmont D.; and Rizza, Michael C., B1 4,290,713, Cl. 404-69.000.
Volumatic Ltd.: *See*—
Armstrong, John H. G., B1 3,854,655, Cl. 232-4.00R.
Wittrisch, Christian, to Institut Francais du Petrole. Method and device for effecting, by means of specialized tools, such operations as measurements in highly inclined to the vertical or horizontal well portions. B1 4,457,370, 1-13-87, Cl. 166-250.000.

LIST OF DESIGN PATENTEES

A/S Nunc: *See*—
Kruse, Leif, 287,773, Cl. D32-1.000.
Abril, Arnold R. Ratchet screwdriver. 287,695, 1-13-87, Cl. D8-82.000.
Accu-Spray, Inc.: *See*—
Muck, Jack E., 287,731, Cl. D15-1.000.
Ago, Nobuhiro; Iimura, Masayuki; and Yamada, Tateo, to Canon Kabushiki Kaisha. Camera. 287,733, 1-13-87, Cl. D16-5.000.
Allen, Alfred H.: *See*—
David, Ravindra S.; and Allen, Alfred H., 287,732, Cl. D15-199.000.
Allen, Robert K.: *See*—
Bollinger, Howard N.; Allen, Robert K.; Langdon, Nick H.; Toth, Stephen M.; and Williams, W. Grey, 287,738, Cl. D21-90.000.
AMC International Alfa Metalcraft Corporation AG: *See*—
Schultz, Horst, 287,687, Cl. D7-150.000.
Anchor Hocking Corporation: *See*—
Husted, Wayne, 287,684, Cl. D7-22.000.
Aprica Kassai Kabushikikaisha: *See*—
Kassai, Kenzoe, 287,670, Cl. D6-333.000.
Ares, Roland A.; and Maechler, Dennis R., to Hussmann Corporation. Air cooled refrigeration condenser. 287,753, 1-13-87, Cl. D23-139.000.
Aspen Laboratories, Inc.: *See*—
McCune, William L., 287,762, Cl. D24-23.000.
Autry Industries, Inc.: *See*—
Yung-Mao, Lin, 287,663, Cl. D2-320.000.
Bardwell, F. Carolyn: *See*—
Bardwell, Paul W.; Bardwell, F. Carolyn; and Corey, Irene, 287,742, Cl. D21-156.000.
Bardwell, Paul W.; Bardwell, F. Carolyn; and Corey, Irene. Doll. 287,742, 1-13-87, Cl. D21-156.000.
Bernatchez, Andre; Brault, Ronald; and Brzezinski, Leonard, to Lawson & Jones Ltd. Display box. 287,697, 1-13-87, Cl. D9-416.000.
Bock, Oliver R. Hanging chair. 287,671, 1-13-87, Cl. D6-347.000.
Bollinger, Howard N.; Allen, Robert K.; Langdon, Nick H.; Toth, Stephen M.; and Williams, W. Grey, to Kenner Parker Toys Inc. Toy helicopter. 287,738, 1-13-87, Cl. D21-90.000.
Bonadonna, Terry: *See*—
Sherwood, Susan; and Bonadonna, Terry, 287,664, Cl. D2-627.000.
Brailsford, Michael I. D. Paint stripping tool. 287,692, 1-13-87, Cl. D8-16.000.
Brault, Ronald: *See*—
Bernatchez, Andre; Brault, Ronald; and Brzezinski, Leonard, 287,697, Cl. D9-416.000.
Bridgestone Corporation: *See*—
Hayakawa, Toshio, 287,708, Cl. D12-147.000.
Broadway Industries, Inc.: *See*—
Miller, Charles D.; Daniels, Bernard O.; and McKeone, William C., 287,747, Cl. D23-32.000.
Brownlee, Debra; and Van Zegeren, Timothy, to Brownlee, Debra. Flat-back hexagonal aquarium stand. 287,770, 1-13-87, Cl. D30-8.000.
Brunner, Merlin A.; and Draheim, Harvey J., to Simmons Universal Corporation. Crib footboard. 287,681, 1-13-87, Cl. D6-505.000.

Brzezinski, Leonard: *See—*
Bernatchez, Andre; Brault, Ronald; and Brzezinski, Leonard, 287,697, Cl. D9-416.000.
Bycraft, John T.: *See—*
Pomeroy, Charles; and Bycraft, John T., 287,677, Cl. D6-449.000.
Cain, Ann S., to 'totes', incorporated. Umbrella handle. 287,665, 1-13-87, Cl. D3-12.000.
Cain, Michael W., to Michelin Recherche et Technique S.A. Tire. 287,707, 1-13-87, Cl. D12-147.000.
Camden Graphics Limited: *See—*
Leyland, Timothy J., 287,735, Cl. D19-3.000.
Canon Kabushiki Kaisha: *See—*
Ago, Nobuhiro; Iimura, Masayuki; and Yamada, Tateo, 287,733, Cl. D16-5.000.
Kojima, Tatsuo; and Yomo, Takashi, 287,730, Cl. D14-111.000.
Carb-A-Drink International, Inc.: *See—*
Mortimer, George H., 287,688, Cl. D7-307.000.
Mortimer, George H., 287,689, Cl. D7-307.000.
Carlsson, Ake: *See—*
Nilsson, Hans-Erik; and Carlsson, Ake, 287,749, Cl. D23-77.000.
Cathcart, Janet F.; and Ingersoll, Kathleen. Tote bag. 287,667, 1-13-87, Cl. D3-42.000.
Chennault, Steven A.; and Vincent, Stephen T., to Physio-Control Corporation. Portable defibrillator. 287,758, 1-13-87, Cl. D24-17.000.
Christen, Andreas, to H.W. Zurmuhle AG. File cabinet. 287,676, 1-13-87, Cl. D6-446.000.
Christensen, Bjorn C.: *See—*
Klagenberg, Niels; and Christensen, Bjorn C., 287,702, Cl. D10-60.000.
Combustion Engineering, Inc.: *See—*
Farwell, David S.; Powers, David V.; Maselli, Steven A.; and Krishnamurthy, Jagadisan, 287,717, Cl. D13-35.000.
Conti, Rino; and Trivison, Jody A., to Dart Industries Inc. Covered pitcher or the like. 287,691, 1-13-87, Cl. D7-317.000.
Convergent Technologies, Inc.: *See—*
Keely, Leroy B.; Freige, Diab E.; and Nuttall, Michael J., 287,724, Cl. D14-100.000.
Corey, Irene: *See—*
Bardwell, Paul W.; Bardwell, F. Carolyn; and Corey, Irene, 287,742, Cl. D21-156.000.
Danfoss A/S: *See—*
Moeller, Jorgen J., 287,718, Cl. D13-40.000.
Daniels, Bernard O.: *See—*
Miller, Charles D.; Daniels, Bernard O.; and McKeone, William C., 287,747, Cl. D23-32.000.
Dart Industries Inc.: *See—*
Conti, Rino; and Trivison, Jody A., 287,691, Cl. D7-317.000.
David, Ravindra S.; and Allen, Alfred H., to Northern Telecom Limited. Carousel component feeder. 287,732, 1-13-87, Cl. D15-199.000.
Davis, Lolita P. Christmas tree halo decoration. 287,769, 1-13-87, Cl. D26-25.000.
Davis, Nancy. Doll. 287,745, 1-13-87, Cl. D21-174.000.
Dentsply Research & Development Corp.: *See—*
Webb, Ronald C., 287,757, Cl. D24-8.000.
Design Institute America, Inc.: *See—*
Evans, Paul R., 287,679, Cl. D6-483.000.
Dion, Erma O. Stuffed doll toy. 287,743, 1-13-87, Cl. D21-166.000.
Discko, John J., Jr. Dental tray. 287,760, 1-13-87, Cl. D24-10.000.
Draheim, Harvey J.: *See—*
Brunner, Merlin A.; and Draheim, Harvey J., 287,681, Cl. D6-505.000.
Dwyer Instruments, Inc.: *See—*
Kobos, Duane M., 287,703, Cl. D10-103.000.
Envall, Bjorn E. A.; and Giugiaro, Giorgetto, to Saab-Scania Aktiebolag. Aerodynamic spoiler for attachment to an automobile. 287,713, 1-13-87, Cl. D12-181.000.
Evans, Paul R., to Design Institute America, Inc. Table. 287,679, 1-13-87, Cl. D6-483.000.
Farwell, David S.; Powers, David V.; Maselli, Steven A.; and Krishnamurthy, Jagadisan, to Combustion Engineering, Inc. Front for an instrument panel for a controller. 287,717, 1-13-87, Cl. D13-35.000.
Foster, Joseph F., to Qualitrol Corporation. Electronic temperature monitor. 287,701, 1-13-87, Cl. D10-49.000.
Freige, Diab E.: *See—*
Keely, Leroy B.; Freige, Diab E.; and Nuttall, Michael J., 287,724, Cl. D14-100.000.
Fudala, Walter N.: *See—*
Hatcher, David O.; and Fudala, Walter N., 287,678, Cl. D6-474.000.
George, William. Toy communicator. 287,739, 1-13-87, Cl. D21-111.000.
Giugiaro, Giorgetto: *See—*
Envall, Bjorn E. A.; and Giugiaro, Giorgetto, 287,713, Cl. D12-181.000.
Goodin, John: *See—*
Pollock, Robert; Patton, Douglas; Sharbaugh, David; and Goodin, John, 287,700, Cl. D10-47.000.
GTE Communication Systems Corporation: *See—*
Janda, George M., 287,675, Cl. D6-432.000.
H.W. Zurmuhle AG: *See—*
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Hatcher, David O.; and Fudala, Walter N., to Posting Equipment Corporation. Computer stand with sliding keyboard shelf. 287,678, 1-13-87, Cl. D6-474.000.
Hayakawa, Toshio, to Bridgestone Corporation. Automobile tire. 287,708, 1-13-87, Cl. D12-147.000.
Hellwig, Lowell L.; and Rapp, Beverly J. Cart for transporting wash bucket and accessories. 287,776, 1-13-87, Cl. D34-21.000.
Hellwig, Lowell L.; and Rapp, Beverly J. Gardeners cart. 287,777, 1-13-87, Cl. D34-20.000.
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Hendricks, Howard: *See—*
Pittman, Charles A., III; and Hendricks, Howard, 287,715, Cl. D13-1.000.
Henkels, Walter. Ball point pen. 287,736, 1-13-87, Cl. D19-49.000.
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Hussmann Corporation: *See—*
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Imai, Tetuo; and Yamazaki, Toshio, to Maruyama Industrial Co., Ltd. Ultrasonic humidifier. 287,755, 1-13-87, Cl. D23-146.000.
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Itoh, Masafumi; Hasegawa, Sigeru; Takita, Haruki; and Suzuki, Kouji, to Teac Corporation. Disc drive assembly. 287,726, 1-13-87, Cl. D14-109.000.
Iverson, Steven J., to Onan Corporation. Combined rotor and stator lamination. 287,716, 1-13-87, Cl. D13-1.000.
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Janda, George M., to GTE Communication Systems Corporation. Cabinet enclosure for central office telephone equipment. 287,675, 1-13-87, Cl. D6-432.000.
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Tonkel, Raymond F., 287,662, Cl. D2-320.000.
Kassai, Kenzou, to Aprica Kassai Kabushikikaisha. Child's safety seat for an automobile. 287,670, 1-13-87, Cl. D6-333.000.
Keddie, David P.; and Kelly, Gordon D., to Hempe Manufacturing Co. Water-powered brush. 287,668, 1-13-87, Cl. D4-115.000.
Keely, Leroy B.; Freige, Diab E.; and Nuttall, Michael J., to Convergent Technologies, Inc. Modular computer system. 287,724, 1-13-87, Cl. D14-100.000.
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Kido, Shigeaki, to Meisei Electric Co., Ltd. Telephone stand. 287,722, 1-13-87, Cl. D14-62.000.
Kido, Shigeaki, to Meisei Electric Co., Ltd. Telephone stand for direct station selection. 287,723, 1-13-87, Cl. D14-62.000.
Kimble, David K. Horse feeder. 287,771, 1-13-87, Cl. D30-13.000.
Klagenberg, Niels; and Christensen, Bjorn C., to ISS Clorius International a.s. Temperature measurement housing. 287,702, 1-13-87, Cl. D10-60.000.
Knackstedt, Harold A. Colostomy irrigation unit. 287,768, 1-13-87, Cl. D24-56.000.

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Kobos, Duane M., to Dwyer Instruments, Inc. Mounting clip for flowmeters. 287,703, 1-13-87, Cl. D10-103.000.
Kojima, Nobuyuki; Sekigawa, Youichi; and Kobiyama, Makoto, to Toshiba Heating Appliances Co., Ltd. Heating chamber for a portable heater. 287,752, 1-13-87, Cl. D23-127.000.
Kojima, Tatsuo; and Yomo, Takashi, to Canon Kabushiki Kaisha. Laser beam printer. 287,730, 1-13-87, Cl. D14-111.000.
Koonts, Dan; and Truette, Dan, to Pelton & Crane Company. Amalgamator. 287,759, 1-13-87, Cl. D24-10.000.
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Kruse, Leif, to A/S Nunc. Washing device for test tubes. 287,773, 1-13-87, Cl. D32-1.000.
Kurihara, Masaki, to Seiko Epson Kabushiki Kaisha. Electronic printer. 287,727, 1-13-87, Cl. D14-111.000.
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Bollinger, Howard N.; Allen, Robert K.; Langdon, Nick H.; Toth, Stephen M.; and Williams, W. Grey, 287,738, Cl. D21-90.000.
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Long, Jerry M.; and Womack, James A., to Innovative Concepts, Inc. Storage and display container for floppy diskettes. 287,666, 1-13-87, Cl. D3-35.000.
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McIlvaine, Neil G.; Vincent, Stephen T.; Schmidt, Randal M.; and Yerkovich, Daniel, to Physio-Control Corporation. Portable defibrillator. 287,761, 1-13-87, Cl. D24-17.000.
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Miller, Charles D.; Daniels, Bernard O.; and McKeone, William C., to Broadway Industries, Inc. Faucet spout. 287,747, 1-13-87, Cl. D23-32.000.
Miyake, Masao; and Takaishi, Nobuo, to Sharp Corporation. Air conditioner. 287,754, 1-13-87, Cl. D23-141.000.
Miyamoto, Kohichi, to Ryobi Limited. Mitre saw. 287,694, 1-13-87, Cl. D8-66.000.
Moeller, Jorgen J., to Danfoss A/S. Casing for an electronic AC speed control unit. 287,718, 1-13-87, Cl. D13-40.000.
Morris, Paul E., to Pelouze Scale Co. Timer. 287,699, 1-13-87, Cl. D10-40.000.
Mortimer, George H., to Carb-A-Drink International, Inc. Combined multiple liquid dispenser and cabinet. 287,688, 1-13-87, Cl. D7-307.000.
Mortimer, George H., to Carb-A-Drink International, Inc. Combined multiple liquid dispenser and cabinet. 287,689, 1-13-87, Cl. D7-307.000.
Mower, Peter; and Pethers, Peter C., to Trico Products Corporation. Vehicle windshield wiper unit. 287,709, 1-13-87, Cl. D12-155.000.
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Nilsson, Hans-Erik; and Carlsson, Ake, to Infrarodteknik AB. Travelling carrier for heating elements in a paint spray booth. 287,749, 1-13-87, Cl. D23-77.000.
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Orenstein, Henry. Toy tree house. 287,740, 1-13-87, Cl. D21-115.000.
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Pino, David O. Cover unit for the bed of a pickup truck. 287,710, 1-13-87, Cl. D12-156.000.
Pittman, Charles A., III; and Hendricks, Howard, to Penn Engineering & Manufacturing Corp. Direct current electric motors. 287,715, 1-13-87, Cl. D13-1.000.
Pollock, Robert; Patton, Douglas; Sharbaugh, David; and Goodin, John, to Siemens Gammasonics, Inc. Film badge for monitoring radiation exposure. 287,700, 1-13-87, Cl. D10-47.000.
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Shimazaki, Toshiyuki, to Nissan Motor Co., Ltd. Automobile grill. 287,712, 1-13-87, Cl. D12-163.000.
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Simmons, William. Baby bottle or similar article. 287,767, 1-13-87, Cl. D24-47.000.
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Stevens, John L. Sports car grille. 287,711, 1-13-87, Cl. D12-163.000.
Stewart, Billy S. Pet dish or the like. 287,772, 1-13-87, Cl. D30-16.000.
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Topholm, Christian, to Topholm & Westermann I/S. Hearing aid. 287,764, 1-13-87, Cl. D24-35.000.
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Wheeler, Gary T. Combined housing for doorbell switch, signal system and message cabinet. 287,704, 1-13-87, Cl. D10-116.000.
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Yomo, Takashi: *See*—
Kojima, Tatsuo; and Yomo, Takashi, 287,730, Cl. D14-111.000.
Yoshihama, Manzo, to Ricoh Company, Ltd. Cursor control for display system. 287,725, 1-13-87, Cl. D14-107.000.
Yung-Mao, Lin, to Autry Industries, Inc. Shoe sole. 287,663, 1-13-87, Cl. D2-320.000.

LIST OF PLANT PATENTEES

Burks, Joe J., to Co-Operative Rose Growers, Inc. Rose plant named Burstar. 5,853, 1-13-87, Cl. 20.000.
Co-Operative Rose Growers, Inc.: *See*—
Burks, Joe J., 5,853, Cl. 20.000.
Garabedian, John M. Grape vine. 5,856, 1-13-87, Cl. 47.000.
Laver, Keith G., to Nor'East Miniature Roses, Inc. Rose plant named Lavblue. 5,851, 1-13-87, Cl. 10.000.
Mander, George. Rose plant—Canadian White Star. 5,852, 1-13-87, Cl. 14.000.
McGredy, Samuel D. Rose plant named 'Macangeli'. 5,849, 1-13-87, Cl. 8.000.
McGredy, Samuel D. Rose plant. 5,850, 1-13-87, Cl. 8.000.
Nor'East Miniature Roses, Inc.: *See*—
Laver, Keith G., 5,851, Cl. 10.000.
Weeks, O. L. Rose plant named Corpus Christi. 5,854, 1-13-87, Cl. 20.001.
Weeks, O. L. Rose plant named Ink Spots. 5,855, 1-13-87, Cl. 20.000.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 13, 1987

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 1
16 4,635,300
69 4,635,301

CLASS 4
228 4,635,302
254 4,635,303
506 4,635,304

CLASS 5
99 R 4,635,305
431 4,635,306
451 4,635,307
508 4,635,308

CLASS 7
158 4,635,309

CLASS 8
94.16 4,636,222
471 4,636,223
547 4,636,224

CLASS 10
27 R 4,635,310

CLASS 14
2.4 4,635,311

CLASS 15
71 4,635,312
193 4,635,313
304 4,635,314
329 4,635,315

CLASS 17
1 R 4,635,316
11 4,635,317
63 4,635,318
68 4,635,319

CLASS 19
0.25 4,635,321
66 R 4,635,322
129 R 4,635,323

CLASS 24
413 4,635,324
453 4,635,325
4,635,326
653 4,635,327

CLASS 29
26 A 4,635,328
27 C 4,635,329
148.4 A 4,635,330
148.4 R 4,635,331
156.8 R 4,635,332
157.4 4,635,333
226 4,635,334
235 4,635,335
252 4,635,336
432 4,635,337
436 4,635,338
526 R 4,635,339
558 4,635,340
566.3 4,635,341
568 4,635,342
571 4,635,343
576 W 4,635,344
577 C 4,635,345
577 R 4,635,346
591 4,635,347
596 4,635,348
4,635,349
598 4,635,350
4,635,351
4,635,352
602 R 4,635,353
622 4,635,354
747 4,635,355
841 4,635,356
850 4,635,357
853 4,635,358
878 4,635,359

CLASS 30
34.2 4,635,360
41 4,635,361
124 4,635,362
257 4,635,363
381 4,635,364

CLASS 33
1 DD 4,635,371
1 M 4,635,365
1 B 4,635,366
15 4,635,367
23.03 4,635,368
27.11 4,635,369
149 R 4,635,370
180 R 4,635,372
4,635,373
265 4,635,374
318 4,635,375
384 4,635,376
451 4,635,377

CLASS 34
1 4,635,378
25 4,635,379
27 4,635,380
56 4,635,381
97 4,635,382

CLASS 36
7.6 4,635,383
29 4,635,384
43 4,635,385

CLASS 37
117.5 4,635,386
232 4,635,387

CLASS 38
102.2 4,635,388

CLASS 40
301 4,635,389

CLASS 43
21.2 4,635,390
26.1 4,635,391
44.9 4,635,392
112 4,635,393

CLASS 47
67 4,635,394

CLASS 49
78 4,635,395
141 4,635,396
194 4,635,397
413 4,635,398
460 4,635,399
504 4,635,400

CLASS 51
5 D 4,635,401
74 B5 4,635,402
94 R 4,635,403
109 HB 4,635,404
145 T 4,635,405
181 R 4,635,406
206 R 4,635,407
292 4,635,408

CLASS 52
50 4,635,409
63 4,635,410
71 4,635,411
79.5 4,635,412
92 4,635,413
126.1 4,635,414
127.1 4,635,415
188 4,635,416
239 4,635,417
4,635,418
303 4,635,419
309.1 4,635,420
309.11 4,635,421
406 4,635,422
486 4,635,424
4,635,425
573 4,635,426
746 4,635,423

CLASS 53
381 R Re.32,328
475 4,635,427
543 4,635,428

CLASS 58
31 4,636,225
68 4,636,226
74 4,636,227
158 4,636,229
274 4,636,230
318 4,636,231
350 4,636,232
501 4,636,233

CLASS 56
408.18 4,635,429

CLASS 57
6 4,635,430
105 4,635,431
221 4,635,432
223 4,635,433
273 4,635,434
328 4,635,435
417 4,635,436

CLASS 59
7 4,635,437
84 4,635,438

CLASS 60
420 4,635,439
422 4,635,440
450 4,635,441
594 4,635,442
628 4,635,443

CLASS 62
125 4,635,444
138 4,635,445
271 4,635,446
448 4,635,447
467 4,635,448
4,635,449
514 R 4,635,450
4,635,451

CLASS 65
2 4,636,234
3.12 4,636,235
4,636,236
29 4,636,238
95 4,636,237
109 4,636,239
229 4,636,240
260 4,636,241

CLASS 70
34 4,635,452
134 4,635,453
139 4,635,454
364 A 4,635,455

CLASS 71
28 4,636,242
88 4,636,243
90 4,636,244
4,636,245
92 4,636,246
4,636,247

CLASS 72
53 4,635,456
86 4,635,457
165 4,635,458
257 4,635,459
259 4,635,460
342 4,635,461
385 4,635,462
427 4,635,463
448 4,635,465
453.13 4,635,466
466 4,635,464

CLASS 73
1 G 4,635,467
19 4,635,468
40 4,635,469
63 4,635,470
81 4,635,471
117 4,635,472
118.1 4,635,473
189 4,635,474
204 4,635,475
249 4,635,476
290 R 4,635,477
292 4,635,478
322.5 4,635,480
460 4,635,481
517 R 4,635,482
579 4,635,483
628 4,635,484
861.12 4,635,486
861.37 4,635,485
862.04 4,635,479
864.62 4,635,487
864.72 4,635,488

CLASS 74
7 E 4,635,489
10.31 4,635,490
89.15 4,635,491
4,635,492
99 R 4,635,493
119 4,635,494
364 4,635,495
471 XY 4,635,496
473 SW 4,635,497
501 R 4,635,498
551.1 4,635,499
552 4,635,500
574 4,635,501
594.2 4,635,503
625 4,635,502
695 4,635,504
713 4,635,505
745 4,635,506
813 C 4,635,507
866 4,635,508

CLASS 75
0.5 AA 4,636,248
53 4,636,249
84.1 A 4,636,250
238 4,636,252
239 4,636,253
246 4,636,251

CLASS 81
3.2 4,635,509
319 4,635,510

CLASS 83
71 4,635,511
156 4,635,512
169 4,635,513
196 4,635,514
438 4,635,515

CLASS 84
1.01 4,635,516
4,635,517
1.16 4,635,518
1.17 4,635,519
1.26 4,635,520
177 4,635,521
291 4,635,522
307 4,635,523
419 4,635,524
453 4,635,525

CLASS 89
1.41 4,635,526
1.816 4,635,527
14.3 4,635,528
36.14 4,635,529
159 4,635,530

CLASS 91
303 4,635,531
436 4,635,532
471 4,635,533
488 4,635,534
498 4,635,535

CLASS 92
24 4,635,536
98 R 4,635,537

CLASS 99
349 4,635,538
421 H 4,635,539
468 4,635,540

CLASS 100
2 4,635,541
3 4,635,542
89 4,635,543
98 R 4,635,544

CLASS 101
4 4,635,545
248 4,635,546
292 4,635,547
319 4,635,548
401.1 4,635,549
415.1 4,635,550
470 4,635,551

CLASS 102
254 4,635,552
184 4,635,553
416 4,635,554
453 4,635,555
518 4,635,556

CLASS 104
7.2 4,635,557
111 4,635,558
119 4,635,559
292 4,635,560

CLASS 108
329.1 4,635,561

CLASS 106
1.14 4,636,254
1.22 4,636,255
14.15 4,636,256
19 4,636,257
31 4,636,258
38.3 4,636,262
122 4,636,259
198 4,636,260
289 4,636,261

CLASS 108
55.1 4,635,562
111 4,635,563
4,635,564
147 4,635,565

CLASS 110
106 4,635,566
188 4,635,567
214 4,635,568
215 4,635,569
237 4,635,570
297 4,635,571
343 4,635,572
346 4,635,573

CLASS 112
121.12 4,635,574
121.26 4,635,575
403 4,635,576

CLASS 114
19 4,635,577
4,635,578
97 4,635,579
343 4,635,580
346 4,635,581
360 4,635,582

CLASS 116
28 R 4,635,583

CLASS 118
64 4,635,584
316 4,635,585
718 4,635,586

CLASS 119
1 4,635,587

CLASS 122
1 C 4,635,588
396 4,635,589

CLASS 123
27 R 4,635,590
37 4,635,591
90.11 4,635,592
90.55 4,635,593
179 BQ 4,635,594
179 F 4,636,595
197 AB 4,635,596
276 4,635,597
293 4,635,598
300 4,635,599
4,635,600
319 4,635,601
357 4,635,602
383 4,635,603
428 4,635,604
449 4,635,605
463 4,635,606
479 4,635,607
527 4,635,608
568 4,635,609

CLASS 124
24 A 4,635,611

CLASS 126
21 A 4,635,610
28 R 4,635,612
4,635,613
41 R 4,635,614
273 A 4,635,615
288 4,635,616
299 E 4,635,617

CLASS 127
42 4,636,263

CLASS 128
24 R 4,635,618
39 4,635,619
64 4,635,620
66 4,635,621
68 4,635,622
80 C 4,635,623
156 4,635,624
163 4,635,625
165 4,635,626
200.14 4,635,627
201.17 4,635,628
202.26 4,635,629
203.26 4,635,630
204.23 4,635,631
303.1 4,635,632
314 4,635,633
325 4,635,634
327 4,635,635
334 R 4,635,636
337 4,635,637
340 4,635,638
419 D 4,635,639
438 4,635,640
639 4,635,641
4,635,642
4,635,643
660 4,635,644
680 4,635,645
696 4,635,646
728 4,635,647

CLASS 131
109.1 4,635,648
237 4,635,649
245 4,635,650
270 4,635,651
278 4,635,652
281 4,635,653

CLASS 132
7 4,635,654
40 4,635,655
75 4,635,656
83 R 4,635,657
85 4,635,658
88.7 4,635,659
92 A 4,635,660

CLASS 133
3 R 4,635,661

CLASS 134
68 4,635,662
93 4,635,663
131 4,635,664
167 R 4,635,665
172 4,635,666

CLASS 135
90 4,635,667

CLASS 136
206 4,636,577
243 4,636,579
251 4,636,578

CLASS 137
62 4,635,668
75 4,635,670
79 4,635,669
102 4,635,671
202 4,635,672
216 4,635,673
246.22 4,635,674
315 4,635,675
354 4,635,676
356 4,635,677
551 4,635,678
601 4,635,679
616.18 4,635,680

625.5 4,635,681
625.64 4,635,682
625.65 4,635,683

CLASS 139

1 R 4,635,684
91 4,635,685
116 4,635,686

CLASS 140

106 4,635,687

CLASS 141

1 4,635,688
4,635,689
39 4,635,690
94 4,635,691

CLASS 144

286 R 4,635,692

CLASS 148

6.15 R 4,636,265
8.2 4,636,264
6.35 4,636,266
133 4,636,267
175 4,636,268
4,636,269
431 4,636,270

CLASS 152

209 A 4,635,694
209 R 4,635,693
410 4,635,695
528 4,635,696
544 4,635,697

CLASS 156

73.1 4,636,271
158 4,636,272
244.11 4,636,273
279 4,636,274
289 4,636,275
353 4,636,276
417 4,636,277
446 4,636,278
506 4,636,279
603 4,636,280
643 4,636,281
639.1 4,636,282

CLASS 160

178 C 4,635,698
211 4,635,699
374.1 4,635,700

CLASS 164

102 4,635,701
418 4,635,702
443 4,635,703
452 4,635,704
466 4,635,705
500 4,635,706

CLASS 165

1 4,635,707
12 4,635,708
32 4,635,709
49 4,635,710
70 4,635,711
82 4,635,712
134.1 4,635,713
167 4,635,714
4,635,715

CLASS 166

51 4,635,716
245 4,635,720
250 4,635,717
4,635,718
4,635,719
4,635,723
B1 4,457,370
268 4,635,721
4,635,724
274 4,635,722
278 4,635,725
294 4,635 726
308 4,635,727
341 4,635,728

CLASS 169

48 4,635,729

CLASS 172

788 4,635,730

CLASS 173

12 4,635,731
162 R 4,635,732

CLASS 174

52 PE 4,636,580
152 R 4,636,581

CLASS 175

4.56 4,635,733
4.6 4,635,734
48 4,635,735
76 4,635,736
284 4,635,737
398 4,635,738

CLASS 177

45 4,635,739

CLASS 178

18 4,636,582
22.17 4,636,583

CLASS 180

9.21 4,635,740
79.1 4,635,741
209 4,635,742
243 4,635,743
249 4,635,744

CLASS 181

107 4,635,746
120 4,635,747
145 4,635,748
152 4,635,749
234 4,635,751
241 4,635,752
279 4,635,753

CLASS 182

3 4,635,754

CLASS 185

45 4,635,755

CLASS 187

1 R 4,635,756
9 E 4,635,757
29 R 4,635,320

CLASS 188

3 H 4,635,758
24.22 4,635,759
71.9 4,635,760
72.6 4,635,761
4,635,762
4,635,763
4,635,764
4,635,765
317 4,635,766

CLASS 192

4,635,769
3 M 4,635,767
30 W 4,635,768
41 A 4,635,770
4,635,771
45.2 4,635,772
4,635,773
52 4,635,774
70.18 4,635,775
70.27 4,635,776
75 4,635,777
85 AA 4,635,778
89 B 4,635,779
106.2 4,635,780
150 4,635,781

CLASS 194

212 4,635,782

CLASS 198

321 4,635,783
347 4,635,784
365 4,635,785
424 4,635,786
603 4,635,787
848 4,635,788

CLASS 200

5 A 4,636,593
15 4,636,594
38 R 4,636,595
52 R 4,636,596
68.1 4,636,597
83 N 4,636,598
144 AP 4,636,599
144 B 4,636,600
153 J 4,636,601
153 SC 4,636,602
296 4,636,603
331 4,636,604

CLASS 202

173 4,636,283

CLASS 203

18 4,636,284

CLASS 204

38.5 4,636,285
59 R 4,636,286
157.15 4,636,287
182.4 4,636,288
4,636,289
4,636,295
182.5 4,636,296
186 4,636,290
283 4,636,291
404 4,636,292
428 4,636,293
432 4,636,294

CLASS 206

83 4,635,789
210 4,635,790
4,635,791
310 4,635,792
315.6 4,635,793
328 4,635,794
456 4,635,796
472 4,635,797
526 4,635,795

CLASS 208

48 AA 4,636,297
65 4,636,298
87 4,636,299
400 4,636,300

CLASS 209

31 4,636,301
144 4,636,302
167 4,636,303
287 4,636,304
312 4,636,305
644 4,635,798

CLASS 210

108 4,636,306
188 4,636,307
195.1 4,636,308
321.3 4,636,309
4,636,310
323.2 4,636,311
416.1 4,636,312
436 4,636,313
500.25 4,636,314
636 4,636,315
4,636,316
748 4,636,317
766 4,636,318
781 4,636,319
801 4,636,320

CLASS 211

41 4,635,799
70.5 4,635,800
70.6 4,635,801

CLASS 212

160 4,635,802
192 4,635,803
280 4,635,805

CLASS 213

67 R 4,635,804

CLASS 215

220 4,635,806
247 4,635,807
252 4,635,808

CLASS 219

10.55 F 4,636,605
121 LC 4,636,606
121 LD 4,636,609
121 LM 4,636,607
121 LN 4,636,608
124.02 4,636,610
124.34 4,636,611
4,636,612
249 4,636,613
270 4,636,614
363 4,636,615
365 4,636,616
375 4,636,617
441 4,636,618
497 4,636,619
501 4,636,620
506 4,636,621

CLASS 220

4 B 4,635,809
21 4,635,810
69 4,635,811
70 4,635,812
86 R 4,635,813
403 4,635,814
443 4,635,815

CLASS 221

11 4,635,816
89 4,635,817

CLASS 222

41 4,635,818
58 4,635,819
63 4,635,820
80 4,635,821
82 4,635,822
108 4,635,823
129.1 4,635,824
4,635,825
4,635,826
147 4,635,827
160 4,635,828
185 4,635,829
278 4,635,830
504 4,635,831
590 4,635,832

CLASS 123

107 4,635,834
116 4,635,833

CLASS 224

42.08 4,635,835
247 4,635,836

CLASS 128

96 4,635,837

CLASS 228

5.5 4,635,838
29 4,635,839
107 4,635,840
147 4,635,841
175 4,635,842

CLASS 229

52 B 4,635,843

CLASS 232

4 R B1 3,854,655

CLASS 235

380 4,636,622
436 4,636,623

CLASS 236

12.12 4,635,844
46 R 4,635,845

CLASS 238

264 4,635,846

CLASS 239

1 4,635,847
10 4,635,848
102.2 4,635,849
119 4,635,850
133 4,635,851
414 4,635,852
533.3 4,635,853
533.8 4,635,854
551 4,635,855
583 4,635,856
690 4,635,857

CLASS 241

16 4,635,858
21 4,635,859
23 4,635,860
37 4,635,861
51 4,635,862
188 A 4,635,863
251 4,635,864

CLASS 242

7.03 4,635,865
36 4,635,866
36 R 4,635,867
57 4,635,868
67.1 R 4,635,869
68.3 4,635,870
4,635,871
72 R 4,635,872
107.2 4,635,873
107.4 B 4,635,874
155 BW 4,635,875
195 4,635,876
197 4,635,877
198 4,635,878
4,635,879

CLASS 244

3.14 4,635,880
49 4,635,881
119 4,635,882
137 R 4,635,883
142 4,635,884
169 4,635,885

CLASS 248

73 4,635,886
179 4,635,887
231 4,635,888
265 4,635,889
429 4,635,890
542 4,635,891
550 4,635,892
558 4,635,893
4,635,894

CLASS 249

5 4,635,895
135 4,635,896

CLASS 250

201 4,636,624
4,636,625
4,636,626
4,636,627
4,636,628
213 VT 4,636,629
214 R 4,636,630
216 4,636,631
221 4,636,632
223 B 4,636,635
223 R 4,636,633
4,636,634
227 4,636,636
231 R 4,636,638
231 SE 4,636,637
324 4,636,640
327.2 4,636,641
337 4,636,642
338 4,636,643
368 4,636,644
906.1 4,636,645
551 4,636,646
4,636,647
580 4,636,639
571 4,636,648
574 4,636,649
578 4,636,650

CLASS 251

5 4,635,897
229 4,635,898
298 4,635,899
326 4,635,900
355 4,635,901

CLASS 252

49.3 4,636,321
51.5 A 4,636,322
51.5 R 4,636,323
70 4,636,324
75 4,636,325
77 4,636,326
87 4,636,327
90 4,636,328
106 4,636,329
174.11 4,636,330
377 4,636,334
511 4,636,331
514 4,636,332
522 R 4,636,333
629 4,636,335
632 4,636,336

CLASS 254

8 B 4,635,902
362 4,635,903
425 4,635,904

CLASS 256

65 4,635,905

CLASS 261

64.3 4,636,337

CLASS 264

2.1 4,636,338
12 4,636,339
22 4,636,340
37 4,636,341
82 4,636,342
102 4,636,344
108 Re.32,329
118 4,636,343
122 4,636,345
139 4,636,346
251 4,636,347
544 4,636,348
549 4,636,349

CLASS 267

8 R 4,635,906
4,635,907
64.11 4,635,908
64.21 4,635,909
140.1 4,635,910

CLASS 269

93 4,635,911
157 4,635,912
327 4,635,913
328 4,635,914

CLASS 270

49 4,635,915

CLASS 271

3 4,635,916
9 4,635,917
22 4,635,919
81 4,635,920
94 4,635,921
119 4,635,922
182 4,635,923
183 4,635,918
227 4,635,924
235 4,635,925

CLASS 272

69 4,635,928
76 4,635,929
96 4,635,927
4,635,932
4,635,926
118 4,635,930
123 4,635,933
130 4,635,931
144 4,635,934

CLASS 273

30 4,635,935
67 R 4,635,936
78 4,635,941
143 R 4,635,937
274 4,635,938
296 4,635,939
332 4,635,942
347 4,635,940
402 4,635,943

CLASS 277

1 4,635,944
124 4,635,945
134 4,635,946
235 A 4,635,947
235 B 4,635,948
4,635,949

CLASS 280

47.26 4,635,950
47.34 4,635,951
96.1 4,635,952
480 4,635,953
494 4,635,954
614 4,635,955
652 4,635,956
663 4,635,957
664 4,635,958
707 4,635,959
4,635,960
708 4,635,745
711 4,635,961
749 4,635,962
801 4,635,963
804 4,635,964

CLASS 283

112 4,635,965

CLASS 284

3 4,635,966
45 4,635,967
4,635,968
95 4,635,969
114 4,635,970
134 4,635,971
242 4,635,972
4,635,973
105 4,635,974
140 4,635,975

CLASS 292

57 4,635,976
92 4,635,977
144 4,635,978
256.5 4,635,979
281 4,635,980

CLASS 293

1 4,635,981
2 4,635,982
111.1 4,635,983
120 4,635,984

CLASS 294

2 4,635,985
19.1 4,635,986
19.2 4,635,987
64.1 4,635,988
102.1 4,635,989

CLASS 295

11 4,635,990

CLASS 296

1 S 4,635,991
37.6 4,635,992
95 C 4,635,993
97 G 4,635,995
97 H 4,635,994
136 4,635,996
182 4,635,997

CLASS 297

31 4,635,998
88 4,635,999
284 4,636,000
314 4,636,001
319 4,636,002
336 4,636,003
374 4,636,004
379 4,636,005
458 4,636,006

CLASS 301

105 R 4,636,007

CLASS 303

92 4,636,008
93 4,636,009
115 4,636,010
4,636,011

CLASS 305

28 4,636,012
48 4,636,013
54 4,636,014

CLASS 307

10 AT 4,636,651
141 4,636,652
253 4,636,653
260 4,636,654
261 4,636,655
267 4,636,656
289 4,636,657
350 4,636,658
353 4,636,659
442 4,636,660
468 4,636,661
512 4,636,662
529 4,636,663
550 4,636,664
4,636,665

CLASS 310

13 4,636,666
4,636,667
49 R 4,636,668
81 4,636,669
67 A 4,636,670
74 4,636,671
87 4,636,672
91 4,636,673
155 4,636,674
157 4,636,675
162 4,636,676
194 4,636,677
313 R 4,636,678
328 4,636,679

CLASS 313

7 4,636,680
346 R 4,636,681
388 4,636,682
403 4,636,683
412 4,636,684
493 4,636,685
503 4,636,686
620 4,636,687

CLASS 315

4 4,636,688
4,636,689
58 4,636,690
209 R 4,636,691
248 4,636,692
308 4,636,693
4,636,694

CLASS 318

124 4,636,695
327 4,636,696
436 4,636,697
443 4,636,698
568 4,636,699
611 4,636,700
635 4,636,701
729 4,636,702

CLASS 320

2 4,636,703
35 4,636,704

CLASS 322

28 4,636,705
4,636,706
35 4,636,707

CLASS 323

210 4,636,708
267 4,636,709
280 4,636,710
282 4,636,711
349 4,636,712
350 4,636,713

CLASS 324

60 CD 4,636,714
62 4,636,715
73 R 4,636,716
77 B 4,636,717
77 K 4,636,718
83 D 4,636,719
86 4,636,720
133 4,636,721
158 F 4,636,723
4,636,725
4,636,726
158 P 4,636,722
158 R 4,636,724
227 4,636,727
309 4,636,728
318 4,636,729
4,636,730
338 4,636,731
423 4,636,732

CLASS 328

14 4,636,733
55 4,636,734
58 4,636,735

CLASS 329

50 4,636,736
110 4,636,737

CLASS 330

8 4,636,738
51 4,636,739
123 4,636,740
127 4,636,741
256 4,636,742
295 4,636,743
4,636,744
304 4,636,745

CLASS 331

1 A 4,636,746
1 R 4,636,747
17 4,636,748
90 4,636,749
4,636,750
96 4,636,751

CLASS 333

12 4,636,752
26 4,636,753
116 4,636,754
4,636,755
202 4,636,756
218 4,636,757
4,636,758
223 4,636,759

CLASS 335

14 4,636,760
140 4,636,761
195 4,636,762

CLASS 336

192 4,636,763

CLASS 337

189 4,636,764
273 4,636,765
368 4,636,766

CLASS 338

34 4,636,767
312 4,636,768

CLASS 339

14 R 4,636,015
17 F 4,636,016
4,636,017
17 M 4,636,018
4,636,019
59 M 4,636,020
75 MP 4,636,021
4,636,022
103 M 4,636,023
4,636,024
130 R 4,636,025
255 R 4,636,026

CLASS 340

134 4,636,769
309.4 4,636,770
310 CP 4,636,771
347 DA 4,636,772
4,636,773
565 4,636,774
586 4,636,775
594 4,636,776
635 4,636,777
648 4,636,778
680 4,636,779
4,636,780
700 4,636,781
705 4,636,782
727 4,636,783
753 4,636,785
771 4,636,784
783 4,636,786
792 4,636,787
804 4,636,788
805 4,636,789
825.52 4,636,790
4,636,791
870.37 4,636,792

CLASS 342

162 4,636,793
368 4,636,794
387 4,636,795
443 4,636,796

CLASS 343

725 4,636,797
753 4,636,798
754 4,636,799
766 4,636,800
781 CA 4,636,801
895 4,636,802

CLASS 346

1.1 4,636,803
4,636,804
4,636,805
4,636,806
4,636,807
75 4,636,808
4,636,809
76 PH 4,636,810
4,636,811
4,636,812
4,636,813
140 R 4,636,814
153.1 4,636,815
155 4,636,816
180 4,636,817
213 4,636,818
216 4,636,819
224 4,636,820

CLASS 350

3.6 4,636,027
96.15 4,636,028
96.16 4,636,029
96.18 4,636,030
96.19 4,636,031
96.20 4,636,032
96.21 4,636,033
4,636,034
128 4,636,035
172 4,636,036
334 4,636,037
339 R 4,636,038
356 4,636,039
427 4,636,040
429 4,636,041
4,636,042
484 4,636,043
539 4,636,044
606 4,636,045
613 4,636,046
641 4,636,047

CLASS 351

155 4,636,048
161 4,636,049

CLASS 353

66 4,636,050

CLASS 354

402 4,636,051
403 4,636,053
410 4,636,052
432 4,636,054
465 4,636,055
484 4,636,056

CLASS 355

3 R 4,636,057
5 4,636,059
8 4,636,058
14 CH 4,636,060
14 D Re.32,330
24 4,636,061
43 4,636,062
68 4,636,063
73 4,636,064
75 4,636,065
77 4,636,066
91 4,636,067

CLASS 356

5 4,636,068
71 4,636,069
73.1 4,636,070
4,636,071
121 4,636,072
243 4,636,073
328 4,636,074
336 4,636,075
356 4,636,076
4,636,077
359 4,636,078
374 4,636,079
401 4,636,080
402 4,636,081
446 4,636,082

CLASS 357

17 4,636,821
22 4,636,822
23.14 4,636,824
4,636,825
23.3 4,636,823
4,636,834
24 4,636,826
25 4,636,827
30 4,636,828
4,636,829
18 4,636,830
45 4,636,831
68 4,636,832
71 4,636,833

CLASS 358

12 4,636,835
19 4,636,836
21 R 4,636,837
22 4,636,838
31 4,636,839
4,636,840
4,636,841
100 4,636,842
67 4,636,843
80 4,636,844
4,636,845
100 4,636,846
101 4,636,847
102 4,636,848
106 4,636,849
111 4,636,850
119 4,636,851
120 4,636,852
121 4,636,853
123 4,636,854
124 4,636,855
135 4,636,856
140 4,636,857
147 4,636,858
4,636,859
148 4,636,860
158 4,636,861
166 4,636,862
167 4,636,863
191.1 4,636,864
213 4,636,865
216 4,636,866
245 4,636,867
285 4,636,868
287 4,636,869
288 4,636,870
296 4,636,871
4,636,872

CLASS 360

8 4,636,873
10.2 4,636,874
26 4,636,875
32 4,636,876
51 4,636,877
71 4,636,878
72.2 4,636,879
72.3 4,636,880
74.1 4,636,881
77 4,636,882
78 4,636,883
4,636,884
4,636,885
84 4,636,886
85 4,636,887
92 4,636,888
96.2 4,636,889
96.3 4,636,890
97 4,636,891
4,636,892
101 4,636,893
103 4,636,894
105 4,636,895
4,636,896
119 4,636,897
122 4,636,898
123 4,636,899
124 4,636,900
126 4,636,901
128 4,636,902
132 4,636,903
133 4,636,904
137 4,636,905

CLASS 361

4,636,906
4,636,907
80 4,636,909
103 4,636,910
150 4,636,911
154 4,636,912
182 4,636,913
321 4,636,914
331 4,636,915
355 4,636,916
366 4,636,917
385 4,636,918
414 4,636,919
420 4,636,920

CLASS 363

61 4,636,921
72 4,636,922
80 4,636,923
277 4,636,924
4,636,925
353 4,636,926

CLASS 363

15 4,636,927
41 4,636,928
54 4,636,932
56 4,636,929
60 4,636,930
71 4,636,931
98 4,636,933

CLASS 364

132 4,636,934
140 4,636,935
148 4,636,936
191 4,636,937
4,636,938
100 4,636,939
4,636,940
4,636,941
4,636,942
4,636,943
4,636,944
4,636,945
4,636,946
4,636,947
301 4,636,948
400 4,636,949
403 4,636,950
412 4,636,951
414 4,636,952
4,636,953
4,636,954
420 4,636,955
421 4,636,956
431.07 4,636,957
451 4,636,958
464 4,636,959
474 4,636,960
4,636,961
478 4,636,962
479 4,636,963
483 4,636,964
491 4,636,965
4,636,966
550 4,636,967
559 4,636,968
560 4,636,969
706 4,636,970
709 4,636,971
724 4,636,972
764 4,636,973
900 4,636,974
4,636,975
4,636,976
4,636,977
4,636,978

CLASS 340

104 4,636,979
106 4,636,980
149 4,636,982
181 4,636,983
182 4,636,984
189 4,636,985
195 4,636,986
203 4,636,981
208 4,636,987
4,636,988
222 4,636,989
230 4,636,990
4,636,991

CLASS 366

43 4,636,083
76 4,636,084
4,636,085
114 4,636,086

CLASS 367

20 4,636,992
65 4,636,993
75 4,636,994
85 4,636,995
93 4,636,996
140 4,636,997
154 4,636,998
156 4,636,999
172 4,637,000
177 4,637,001
190 4,637,002

CLASS 368

185 4,636,087

CLASS 369

32 4,637,003
44 4,637,004
45 4,637,005
89 4,637,006
67 4,637,007
100 4,637,008
147 4,637,009
270 4,637,010

CLASS 370

24 4,637,011
4,637,012
88 4,637,013
89 4,637,014
94 4,637,015
110 4,637,016
104 4,637,017

CLASS 371

1 4,637,018
16 4,637,019
20 4,637,020
37 4,637,021
4,637,022
38 4,637,023
87 4,637,024

CLASS 372

1 4,637,025
22 4,637,026
27 4,637,027
34 4,637,028
45 4,637,029
82 4,637,030
86 4,637,031

CLASS 373

69 4,637,032
72 4,637,033
76 4,637,034

CLASS 374

5 4,636,088
45 4,636,089
56 4,636,090
124 4,636,091
178 4,636,092
186 4,636,093

CLASS 375

8 4,637,035
76 4,637,036
87 4,637,037

CLASS 376

226 4,636,350
272 4,636,351
419 4,636,352

CLASS 377

117 4,637,038
121 4,637,039

CLASS 378

9 4,637,040
71 4,637,041
143 4,637,042
188 4,637,043

CLASS 379

159 4,636,589
167 4,636,585
240 4,636,584
362 4,636,588
377 4,636,587
386 4,636,590
390 4,636,586

CLASS 381

4 4,637,044
43 4,637,045
49 4,637,046
58 4,637,047
71 4,637,048
86 4,637,049
94 4,637,050
159 4,636,591
187 4,636,592
194 4,635,750

CLASS 382

1 4,637,051
4,637,052
6 4,637,053
8 4,637,054
31 4,637,055
4,637,056
46 4,637,057
48 4,637,058
54 4,637,059

CLASS 383

37 4,637,060
38 4,637,061
54 4,637,062
61 4,637,063

CLASS 384

44 4,636,094
117 4,636,095
243 4,636,096

CLASS 400

196.1 4,636,097
208 4,636,098
531 4,636,099
662 4,636,100
690 4,636,101

CLASS 401

190 4,636,102

CLASS 402

79 4,636,179

CLASS 403

92 4,636,103
191 4,636,104
205 4,636,105
228 4,636,106
405.1 4,636,107

CLASS 404

10 4,636,108
4,636,109
69 B1 4,290,713
100 4,636,110
101 4,636,111

CLASS 405

176 4,636,112
203 4,636,113
224 4,636,114
259 4,636,115

CLASS 407

103 4,636,116
104 4,636,117

CLASS 409

136 4,636,118

CLASS 410

54 4,636,119

CLASS 411

14 4,636,120
21 4,636,121
45 4,636,122
55 4,636,123
82 4,636,124
389 4,636,125

CLASS 414

126 4,636,126
158 4,636,127
217 4,636,128
417 4,636,129
500 4,636,130
621 4,636,131
694 4,636,132
715 4,636,133
729 4,636,134
730 4,636,135
4,636,136
4,636,137
735 4,636,138
786 4,636,139
4,636,140

CLASS 416

86 4,636,141
210 R 4,636,142
228 4,636,143

CLASS 417

63 4,636,144
199 R 4,636,145
214 4,636,147
270 4,636,146
286 4,636,148
322 4,636,149
417 4,636,150

CLASS 418

48 4,636,151
54 4,636,152
80 4,636,153
97 4,636,154
132 4,636,155
201 4,636,156
225 4,636,157

CLASS 420

416 4,636,353
514 4,636,354
532 4,636,356
4,636,357
590 4,636,355

CLASS 422

6 4,636,358
13 4,636,359
65 4,636,360
101 4,636,361
105 4,636,362
159 4,636,363
162 4,636,364
201 4,636,365
297 4,636,366

CLASS 423

12 4,636,367
16 4,636,368
20 4,636,369
235 4,636,370
244 4,636,371
312 4,636,372
328 4,636,373
345 4,636,374
450 4,636,375
475 4,636,376
575 4,636,377
598 4,636,378
640 4,636,379

CLASS 424

1.1 4,636,380
38 4,636,381
54 4,636,382
85 4,636,383
87 4,636,384
89 4,636,385
93 4,636,386

CLASS 425

133.1 4,636,158
148 4,636,159
190 4,636,160
194 4,636,161
290 4,636,162
332 4,636,163
337 4,636,164
472 4,636,165
503 4,636,166
589 4,636,167

CLASS 426

7 4,636,388
11 4,636,389
18 4,636,390
106 4,636,391
110 4,636,392
276 4,636,393
330.4 4,636,394
511 4,636,395
548 4,636,396
579 4,636,397
629 4,636,399
634 4,636,398

CLASS 427

39 4,636,400
4,636,401
89 4,636,402
53.1 4,636,403
4,636,404
54.1 4,636,405
96 4,636,406
133 4,636,407
160 4,636,408
256 4,636,409
261 4,636,410
314 4,636,411

CLASS 428

33 4,636,413
35 4,636,412
80 4,636,414
88 4,636,415
89 4,636,416
91 4,636,417
110 4,636,418
131 4,636,419
156 4,636,420
4,636,421
174 4,636,422
196 4,636,423
198 4,636,424
4,636,425
224 4,636,426
246 4,636,427
254 4,636,428
288 4,636,429
304.4 4,636,430
327 4,636,431
4,636,432
328 4,636,433
4,636,434
336 4,636,435
364 4,636,436
391 4,636,437
412 4,636,438
428 4,636,439
446 4,636,440
447 4,636,441
480 4,636,442
481 4,636,443
596 4,636,444
607 4,636,448

CLASS 429

53 4,636,445
54 4,636,446
121 4,636,447

CLASS 430

39 4,636,449
84 4,636,450
109 4,636,451
112 4,636,452
138 4,636,453
197 4,636,454
203 4,636,455
266 4,636,456
267 4,636,457
270 4,636,458
288 4,636,459
442 4,636,460
567 4,636,461
617 4,636,462

CLASS 432

58 4,636,168
90 4,636,169
258 4,636,170

CLASS 433

134 4,636,171

CLASS 434

159 4,636,172
178 4,636,173
335 4,636,174

CLASS 435

7 4,636,463
14 4,636,464
15 4,636,465
108 4,636,466
160 4,636,467
198 4,636,468
237 4,636,469
280 4,636,470
4,636,471
287 4,636,472
289 4,636,473
291 4,636,474

CLASS 436

3 4,636,475
23 4,636,476
48 4,636,477
500 4,636,478
533 4,636,479

CLASS 488

88 4,636,175

CLASS 441

12 4,636,176

CLASS 446

236 4,636,177
462 4,636,178

CLASS 455

67 4,637,064
78 4,637,065
4,637,073
223 4,637,066
295 4,637,067
327 4,637,068
330 4,637,069
331 4,637,070
603 4,637,071
607 4,637,072

CLASS 464

120 4,636,180

CLASS 474

207 4,636,181

CLASS 493

39 4,636,182
42 4,636,183
98 4,636,184
127 4,636,185
134 4,636,187
142 4,636,186
157 4,636,188
196 4,636,190
217 4,636,189
227 4,636,191
Re.32,331
451 4,636,192

CLASS 494

45 4,636,193

CLASS 501

87 4,636,480
96 4,636,481

CLASS 502

60 4,636,482
61 4,636,483
65 4,636,484
66 4,636,485
121 4,636,486
168 4,636,487
172 4,636,488

CLASS 514

12 4,636,489
15 4,636,490
16 4,636,491
18 4,636,492
46 4,636,493
78 4,636,494
89 4,636,387
125 4,636,495
182 4,636,496
215 4,636,497
222 4,636,498
4,636,499
234 4,636,500
235 4,636,501
249 4,636,502
4,636,503
252 4,636,504
256 4,636,505
4,636,506
263 4,636,507
274 4,636,508
4,636,509
302 4,636,510
311 4,636,511
312 4,636,512
326 4,636,513
340 4,636,514
363 4,636,515
365 4,636,516
380 4,636,517
397 4,636,518
4,636,519
399 4,636,520
415 4,636,521
423 4,636,522
443 4,636,523
781 4,636,524
786 4,636,525

CLASS 521

61 4,636,526
79 4,636,527
95 4,636,528
131 4,636,529
159 4,636,530
163 4,636,531

CLASS 522

3 4,636,532
14 4,636,533
116 4,636,534

CLASS 523

137 4,636,536
139 4,636,537
179 4,636,538
204 4,636,535
214 4,636,539
310 4,636,540
404 4,636,541
466 4,636,542

CLASS 524

109 4,636,543
411 4,636,544
457 4,636,545
507 4,636,546
523 4,636,547
524 4,636,548
546 4,636,549
552 4,636,550

CLASS 525

60 4,636,551
63 4,636,552
67 4,636,553
359.3 4,636,554

CLASS 526

290 4,636,555

CLASS 528

53 4,636,556
126 4,636,557
363 4,636,558
370 4,636,559

CLASS 530

331 4,636,560

CLASS 544

71 4,636,561
354 4,636,562

CLASS 546

87 4,636,563
289 4,636,564
345 4,636,565

CLASS 548

303 4,636,566
336 4,636,567

CLASS 549

13 4,636,568
403 4,636,569
408 4,636,570
484 4,636,571

CLASS 556

2 4,636,572
441 4,636,573

CLASS 558

18 4,636,574
58 4,636,575
277 4,636,576

CLASS 604

9 4,636,194
53 4,636,195
122 4,636,196
131 4,636,197
154 4,636,198
164 4,636,199
170 4,636,200
192 4,636,201
236 4,636,202
257 4,636,203
283 4,636,204
338 4,636,205
340 4,636,206
370 4,636,207
378 4,636,208
4,636,209

CLASS 623

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49 : 287,688
287,689
51 : 287,756
53 : 287,743
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55 : 287,668
287,681

PLANT PATENTS

06 : 5,855	5,856	48 : 5,853			

U.S. GOVERNMENT PRINTING OFFICE : O—1987

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
January 20, 1987 Volume 1074 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
All cases:	1015.00
International fees	
Basic fee (first 30 pages):	430.00
Basic Supplemental fee (for each page over 30):	8.00
Designation fee for the first 10 national or regional offices:	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Sept. 30, 1986.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Jan. 17, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,425,667 through 4,426,738
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 2, 1986 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,356,573	06/219,858	11/2/82
4,356,576	06/265,587	11/2/82
4,356,582	06/264,285	11/2/82
4,356,586	06/253,774	11/2/82
4,356,593	06/308,986	11/2/82
4,356,617	06/244,505	11/2/82
4,356,630	06/261,253	11/2/82
4,356,633	06/286,774	11/2/82
4,356,635	06/219,989	11/2/82
4,356,650	06/278,059	11/2/82
4,356,652	06/269,535	11/2/82
4,356,658	06/233,551	11/2/82
4,356,659	06/255,229	11/2/82
4,356,661	06/221,970	11/2/82
4,356,665	06/264,077	11/2/82
4,356,669	06/314,308	11/2/82
4,356,699	06/226,827	11/2/82
4,356,709	06/239,390	11/2/82
4,356,720	06/231,206	11/2/82
4,356,721	06/218,235	11/2/82
4,356,788	06/258,128	11/2/82
4,356,791	06/255,262	11/2/82
4,356,809	06/269,118	11/2/82
4,356,810	06/234,660	11/2/82
4,356,812	06/340,998	11/2/82
4,356,839	06/301,461	11/2/82
4,356,843	06/338,911	11/2/82
4,356,855	06/282,944	11/2/82
4,356,883	06/303,758	11/2/82
4,356,885	06/294,441	11/2/82
4,356,908	06/242,872	11/2/82
4,356,915	06/310,298	11/2/82
4,356,927	06/302,195	11/2/82
4,356,928	06/275,719	11/2/82
4,356,929	06/226,789	11/2/82
4,356,932	06/275,701	11/2/82
4,356,934	06/243,617	11/2/82
4,356,943	06/325,022	11/2/82
4,356,944	06/241,262	11/2/82
4,356,951	06/268,711	11/2/82
4,356,977	06/235,451	11/2/82
4,356,987	06/257,926	11/2/82
4,356,995	06/291,082	11/2/82
4,357,002	06/292,406	11/2/82
4,357,043	06/217,696	11/2/82
4,357,076	06/217,420	11/2/82
4,357,082	06/220,525	11/2/82
4,357,086	06/287,792	11/2/82
4,357,095	06/228,374	11/2/82
4,357,096	06/241,302	11/2/82
4,357,118	06/239,617	11/2/82
4,357,122	06/217,247	11/2/82
4,357,170	06/288,650	11/2/82
4,357,171	06/232,998	11/2/82
4,357,175	06/281,455	11/2/82
4,357,176	06/236,982	11/2/82
4,357,177	06/254,946	11/2/82
4,357,180	06/228,425	11/2/82
4,357,185	06/265,300	11/2/82
4,357,192	06/232,447	11/2/82
4,357,198	06/293,071	11/2/82
4,357,205	06/298,596	11/2/82
4,357,226	06/215,938	11/2/82
4,357,231	06/267,200	11/2/82
4,357,269	06/241,521	11/2/82
4,357,278	06/252,841	11/2/82
4,357,294	06/229,874	11/2/82
4,357,296	06/228,276	11/2/82
4,357,309	06/240,158	11/2/82
4,357,347	06/326,895	11/2/82
4,357,365	06/247,902	11/2/82
4,357,428	06/333,898	11/2/82
4,357,429	06/359,917	11/2/82
4,357,439	06/295,045	11/2/82
4,357,457	06/339,123	11/2/82
4,357,474	06/242,081	11/2/82
4,357,480	06/242,488	11/2/82
4,357,495	06/232,913	11/2/82
4,357,503	06/219,378	11/2/82
4,357,504	06/219,880	11/2/82
4,357,506	06/248,431	11/2/82
4,357,518	06/293,416	11/2/82
4,357,539	06/225,329	11/2/82
4,357,547	06/237,322	11/2/82
4,357,551	06/244,096	11/2/82
4,357,615	06/233,078	11/2/82
4,357,623	06/257,167	11/2/82
4,357,624	06/246,014	11/2/82
4,357,642	06/278,097	11/2/82
4,357,645	06/263,153	11/2/82
4,357,688	06/300,875	11/2/82
4,357,694	06/274,802	11/2/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,846,254, Re. S.N. 854,063, Filed Apr. 17, 1986, Cl. 203/11, INTERFACE ENHANCEMENT APPLIED TO EVAPORATION OF LIQUIDS, Hugo H. Sephton, Owner of Record: *Inventor,* Attorney or Agent: M. Henry Heines, Ex. Gp.: 113

4,259,676, Re. S.N. 933,751, Filed Nov. 21, 1986, Cl. 346/76PH, THERMAL PRINT HEAD, Peter C. Salmon, et al., Owner of Record: *Santek, Inc., Los Altos, Calif.,* Attorney or Agent: W. Robert Spensley, et al., Ex. Gp.: 216

4,487,468, Re. S.N. 933,009, Filed Nov. 20, 1986, Cl. 339/75MP, CARD EDGE CONNECTOR LOCKING DEVICE, James L. Fedder, et al., Owner of Record: *AMP, Inc., Harrisburg, Pa.,* Attorney or Agent: Jay L. Seitchik, et al., Ex. Gp.: 322

4,523,585, Re. S.N. 828,453, Filed Feb. 11, 1986, Cl. 128/80C, ANATOMIC BRACE FRACTURE FOR THE KNEE, Steve R. Lamb, et al., Owner of Record: *Orthopedic Systems, Inc., Hayward, Calif.,* Attorney or Agent: Theodore J. Bielen, Jr., et al., Ex. Gp.: 336

4,583,797, Re. S.N. 933,560, Filed Nov. 18, 1986, Cl. 339/6R, ROTATABLE ELECTRICAL CONNECTOR FOR COILED TELEPHONE CORD, Anthony R. Engelmore, et al., Owner of Record: *Inventor,* Attorney or Agent: Joseph W. Berenato, III, et al., Ex. Gp.: 322

4,607,069, Re. S.N. 934,459, Filed Nov. 24, 1986, Cl. 523/400, CURABLE COMPOSITIONS BASED ON EPOXY RESINS, Helmut Tesch, et al., Owner of Record: *BASF Aktiengesellschaft, Ludwigshafen, Federal Republic of Germany,* Attorney or Agent: Herbert B. Keil, et al., Ex. Gp.: 155

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Travelcare, Inc., assignee of Senior Vacations, Unlimited, Inc., Aurora, Ohio, Reg. Nos. 916,914, and 1,209,034 for the marks "TRAVEL CARE AND DESIGN", and "TRAVEL CARE", respectively, Canc. No. 15,434.

Yankee Doodle House, Inc., assignee, by mesne assignment, of Yankee Doodle House, Inc., Elmhurst, Ill., Reg. No. 868,272, for the mark "YANKEE DOODLE DANDY AND DESIGN", Canc. No. 15,682.

Yankee Doodle House, Inc., assignee, by mesne assignment, of Yankee Doodle House, Inc., Elmhurst, Ill., Reg. No. 981,345, for the mark "YANKEE DOODLE DANDY AND DESIGN", Canc. No. 15,683.

Apco Oil Corp., assignee of Anderson-Prichard Oil Corp., Oklahoma City, Okla., Reg. No. 528,276, for the mark "INKOL", Canc. No. 15,777.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Department of Commerce
Patent and Trademark Office
Disposition of British Abridgements
1855–1972

The U.S. Patent and Trademark Office (PTO) is offering to any interested party one set of classified British Abridgements, 1855–1972. These documents are stored at a warehouse in the Springfield, Va. area. There are five skids of documents with approximately 20 boxes per skid. The Manager of the PTO Scientific Library must be contacted within two weeks of publication of this notice. This set is being offered on a first come, first served basis. After verification by the Manager of this transaction, the interested party must arrange for the removal of these documents from storage at his/her own expense within 30 days. Inquiries should be directed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Manager, Scientific Library [(703)–557–2955].

Dec. 19, 1986.

DONALD J. QUIGG,
Assistant Secretary and
Commissioner of Patents
and Trademarks.

Survey of Registered Practitioners in Patent Cases

Pursuant to 37 CFR 10.11(b), a survey letter was mailed on Nov. 18, 1986 from the Office of Enrollment and Discipline (OED) to all practitioners in patent cases whose last names begin with A through D. Enclosed with the letter is a data sheet which must be completed and returned to OED as soon as possible. All data sheets returned to OED will be acknowledged. Failure by a practitioner to submit a completed data sheet within the time period specified in the survey letter will result in the practitioner being removed from the register in accordance with 37 CFR 10.11(b).

If your last name begins with A through D and you have not received a data sheet or if you returned the data sheet to OED and you did not receive an acknowledgement within three (3) months after returning the data sheet to OED, please contact Patricia M. Jordan at (703) 557–1728.

Dec. 2, 1986.

CAMERON WEIFFENBACH,
Director, Office of
Enrollment and Discipline.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 20, 1987

Re. 31,450	4,577,777	4,598,836	4,610,759
Re. 32,263	4,578,458	4,598,881	4,611,789
D. 285,808	4,580,219	4,599,064	4,611,996
4,072,759	4,585,304	4,599,088	4,612,901
4,427,556	4,586,608	4,599,260	4,613,324
4,427,894	4,586,844	4,601,764	4,613,365
4,449,534	4,586,880	4,602,941	4,613,501
4,488,201	4,587,996	4,603,231	4,614,407
4,491,797	4,588,719	4,603,664	4,614,595
4,499,102	4,589,034	4,603,817	4,614,854
4,508,980	4,589,053	4,604,248	4,614,935
4,530,891	4,589,399	4,604,287	4,615,067
4,534,970	4,591,107	4,604,737	4,615,300
4,535,180	4,592,054	4,605,244	4,615,403
4,543,761	4,592,072	4,605,790	4,615,979
4,545,718	4,592,753	4,606,603	4,617,074
4,548,886	4,593,992	4,606,879	4,617,327
4,551,580	4,594,000	4,606,982	4,617,719
4,554,231	4,594,130	4,607,333	4,618,290
4,564,444	4,595,151	4,607,606	4,618,822
4,566,930	4,595,394	4,607,637	4,618,944
4,569,035	4,596,858	4,607,667	4,619,328
4,572,316	4,597,085	4,607,975	4,620,472
4,572,659	4,597,195	4,608,705	4,620,515
4,572,912	4,597,806	4,609,242	
4,572,920	4,598,708	4,610,690	
4,573,061	4,598,748	4,610,727	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Connecticut	New Haven: Science Park Library	(203) 786-5000
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 6, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	8-15-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-29-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-15-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-25-85
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-19-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	7-03-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	6-22-84
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	11-06-84
DESIGN, GROUP 290—K. L. CAGE, Director	6-13-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	8-29-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	7-09-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during December 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,480,966 to 3,487,469, inclusive

Plant Patents ..... Numbers 2,945 to 2,958 inclusive

REEXAMINATIONS

JANUARY 20, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,032,296 (621st)

ELECTROLYTIC CONDUCTIVITY DETECTOR SYSTEM

Randall C. Hall, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

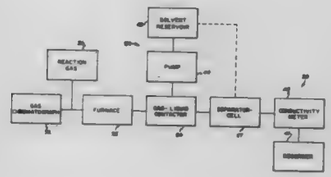
Reexamination Request No. 90/000,828, Jul. 30, 1985.

Reexamination Certificate for Patent No. 4,032,296, issued Jun. 28, 1977, Ser. No. 648,517, Jan. 12, 1976.

Division of Ser. No. 425,116, Dec. 17, 1973, Pat. No. 3,934,193.

Int. Cl.[4] G01N *27/08, 30/64, 31/12*

U.S. Cl. 422—89



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 8–10 are cancelled.

Claims 1 and 11 are determined to be patentable as amended.

Claims 2–7, dependent on an amended claim, are determined to be patentable.

New **claims 12–21** are added and determined to be patentable.

1. An electrolytic conductivity detector for gas chromatography, said detector comprising:

compound supply means for providing as an output therefrom compounds to be tested in the form of eluant gases;

forming means for receiving said eluant gases from said compound supply means and forming therefrom conductivity supporting inorganic gaseous molecules;

solvent supply means for supplying an aqueous or organic solvent;

contactor means for mixing substantially immediately upon contact gaseous molecules received from said forming means with said solvent from said solvent supply means to form a mixture thereof;

separator means for receiving said mixture from said contactor means and substantially immediately separating said mixture into liquid and gas phases; and

measuring means for receiving said liquid phase from said separator means and measuring the conductivity of said liquid phase[.];

said separator means including an axial bore adapted to permit the liquid phase to flow along its wall with the gas phase flowing as a core; and

said measuring means being located along the bore so as to measure the liquid phase conductivity as the gas phase continues to flow through the bore.

B1 4,039,304 (622nd)

METHOD OF REMOVING SO_2 AND/OR OTHER ACID COMPONENTS FROM WASTE GASES

Horst Bechthold, Erftstadt-Friesheim, and Paul Bottger, Bensberg-Refrath, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft, Grevenbroich, Fed. Rep. of Germany

Reexamination Request No. 90/000,893, Nov. 1, 1985.

Reexamination Certificate for Patent No. 4,039,304, issued Aug. 2, 1977, Ser. No. 591,624, Jun. 30, 1975.

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1974, 2431130; Apr. 25, 1975, 2518386

Int. Cl.[4] B01D *53/14;* **B03C** *1/00;* **C01B** *17/00*

U.S. Cl. 55—10



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1—3, 10 and 11 were previously disclaimed.

Claims 4–9 and 12–14 are cancelled.

[1. A continuous process for removing pollutants from waste gases which pollutants are present in the gas in the form of acid components, the said process comprising

1. introducing the waste gas into an evaporator tower where the gas is mixed with an aqueous solution of a salt of said acid component;
2. heat-vaporizing the resulting mixture in said evaporator so as to form salt crystals from said salt solution and withdrawing said salt crystals from the gas substantially without said pollutants and solids from the gas;
3. passing the gas through a separation device to remove the formed crystals together with solids, initially present in the gas prior to passing the gas to an absorption tower;
4. then passing the now substantially dry gas including residual salt crystal to said absorption tower, introducing an alkaline absorbent into the tower, the absorbent being a liquid or forming a liquid in the tower and being adapted to form salts with said acid component of the gas in the form of an aqueous concentrated solution of the salt and to dissolve residual salt crystals present in said gas and introducing fresh water to the extent necessary to form and maintain the liquid absorbent and aqueous salt solution;
5. continuously circulating the formed salt solution out of and into the absorption tower;
6. while continuously withdrawing a controlled amount of said salt solution and recycling said amount into the evaporator tower for said gas-solids separation step and
7. discharging the pollutant-free gas from the absorption tower.]

B1 4,056,375 (623rd)
GAS FILTER ELEMENT
Wolfgang Ringel, Morlenbach; Peter Rutsch, Abtsteinach; Rolf Schneider, Weinheim, and Edgar Kohl, Abtsteinach, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany
Reexamination Request No. 90/001,035, Jun. 19, 1986.
Reexamination Certificate for Patent No. 4,056,375, issued Nov. 1, 1977, Ser. No. 720,327, Sep. 3, 1976.
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1975, 2541331
Int. Cl.[4] B01D *46/02, 29/10*
U.S. Cl. 55—381

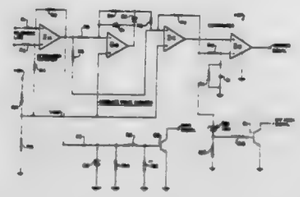


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–9 is confirmed.

1. A gas filter element comprising a holding frame and at least one self-supporting wedge-shaped filter pocket each having its wide end open and secured to said frame, each filter pocket comprising a pair of substantially symmetrical pocket halves formed of fusible fibers and welded to one another along the wedge edge and centrally along the opposite wedge end faces and at least one laminar spacing element disposed within the pocket and extending from adjacent the open end toward the wedge edge, the spacing element being welded to the opposite inclined wedge faces, the filter pocket being rendered self-supporting by the welding of the pocket halves to one another and the welding of the spacing element to the pocket.

B1 4,451,707 (624th)
RING DETECTOR AND TELEPHONE LINE MONITORING SYSTEM FOR TELEPHONE ANSWERING INSTRUMENT
Bradford E. Hanscom, Downey, Calif., assignor to Fortel Corp., Compton, Calif.
Reexamination Request No. 90/000,954, Feb. 7, 1986.
Reexamination Certificate for Patent No. 4,451,707, issued May 29, 1984, Ser. No. 517,005, Jul. 25, 1983.
Continuation-in-part of Ser. No. 381,185, May 24, 1982, abandoned.
Int. Cl.[4] H04M *1/64*
U.S. Cl. 179—84 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–7 is confirmed.

Claim 9 is cancelled.

Claim 8 is determined to be patentable as amended.

Claims 10–12, dependent on an amended claim, are determined to be patentable.

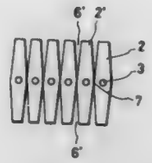
8. A monitoring system for controlling the operation of a telephone answering system, said monitoring system responding to direct current voltage differentials on the telephone line independent of the actual direct current voltage level of the telephone line, said monitoring system including in combination: input circuitry connected to the telephone line, *said input circuitry including circuit means for producing an output voltage representative of the actual direct current voltage level of the telephone line,* and output circuitry connected to said input circuitry [and], *said output circuitry including a comparator having a first input terminal connected to the output of said input circuitry and having a second input terminal, and self-biasing circuitry connected to the second input terminal of said comparator to bias said second input terminal to a voltage representing a predetermined percentage of the voltage applied to said first input terminal, said system being* responsive to said direct current voltage differentials on said telephone line occurring after the telephone answering system has been activated by a ring signal received over the telephone line to produce an output signal when said *direct current* voltage differentials exceed a predetermined minimum value so as to cause the telephone answering system to return to [its original] *the* condition *it was in* before the receipt of the ring signal.

REISSUES

JANUARY 20, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,332
CLUSTER TYPE TAG PIN ASSEMBLY
Masami Kato, Nagoya, Japan, assignor to Toeka Co., Ltd., Tokyo, Japan
Original No. 4,417,656, dated Nov. 29, 1983, Ser. No. 254,755, Apr. 16, 1981. Continuation of Ser. No. 619,962, Jun. 6, 1984, abandoned. Application for reissue Oct. 3, 1985, Ser. No. 783,266
Claims priority, application Japan, Sep. 11, 1980, 55-125275
Int. Cl.[4] A44B *9/00*; B65D *85/24*; G09F *3/12*
U.S. Cl. 206—346 **11 Claims**

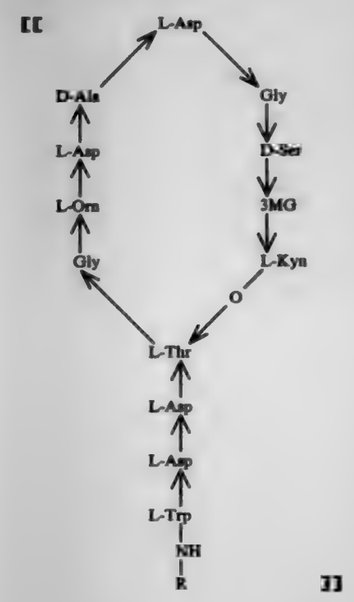


1. A cluster type tag-pin assembly comprising a plurality of tag pins, each said tag pin having a head portion, a cross bar and a filament portion which joins said head portion to said cross bar, each said cross bar including a connecting neck which extends therefrom in a direction opposite to said filament portion, said tag pins being connected through their respective connecting necks to a connecting bar at substantially right angles to said connecting neck to form an assembly of joined tag pins, said assembly of tag pins being integrally formed from a synthetic resin into a comb-like assembly as a whole, each said cross bar having opposing expanded portions defining apeces formed on opposite central parts of each side face thereof, adjacent expanded portions of said cross bars being connected to each other through said apeces of their respective expanded portions whereby all cross bars in the tag pin assembly are arranged in a sheet-like form, said expanded portions being separated when a shearing force is applied thereto, adjacent head portions of said tag pins being spaced with a gap smaller than the thickness of the head portion.

11. A cluster type tag-pin assembly comprising a plurality of tag pins, each said tag pin consisting only of a head portion, a cross bar and a filament portion which joins said head portion to said cross bar, said assembly of tag pins being integrally formed from a synthetic resin into a comb-like assembly as a whole, each said head portion having opposing side faces and side edges, each said side face having an expanded portion defining an apex formed on a central portion thereof which tapers towards the side edges of said head portion, each said cross bar having opposing sides and having an expanded portion defining an apex formed in a central part on each side thereof, each side face of each said head portion extending in a plane parallel to the plane in which each said cross bar extends, each head portion being connected to adjacent head portions only through said apeces of their respective expanded portions and each cross bar being connected to adjacent cross bars only through said apeces of their respective expanded portions wherein all head portions and all cross bars in the tag pin assembly are arranged in a sheet-like form, the taper of said apex on said side faces of said head portions being sufficiently small such that adjacent side faces immediately contact one another adjacent said side edges thereof when forced together to prevent substantial sway of said assembly, said apeces on said sides of said cross bars being sufficiently small such that adjacent cross bars immediately contact one another at the ends thereof when forced together to further prevent substantial sway of said assembly, said joined head portions and joined cross bars being separated when a shearing force is applied thereto.

Re. 32,333
A-21978 ANTIBIOTICS AND PROCESS FOR THEIR PRODUCTION
Robert L. Hamill, Greenwood, and Marvin M. Hoehn, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Reissued No. Re. 31,396, dated Sep. 27, 1983, Ser. No. 399,655, Jul. 19, 1982.
Original No. 4,208,403, dated Jun. 17, 1980, Ser. No. 951,695, Oct. 16, 1978. Application for reissue Sep. 26, 1985, Ser. No. 780,516
Int. Cl.[4] C12D *9/14*; C07C *103/52*; A61K *37/00*
U.S. Cl. 530—321 **11 Claims**

11. The A-21978C antibiotic complex, which is produced by submerged aerobic cultivation of Streptomyces roseosporus NRRL 11379 or an A-21978C-producing mutant thereof; and which comprises factors C_0, C_1, C_2, C_3, C_4 and C_5, which have the following structural formula:



Re. 32,334

MOLDING RESINS

Edward J. Deyrup, Northeast, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 4,352,904, dated Oct. 5, 1982, Ser. No. 631, Jan. 5, 1979. Continuation of Ser. No. 496,938, May 23, 1983, abandoned, which is a continuation-in-part of Ser. No. 882,219, Feb. 28, 1978, abandoned. Application for reissue Mar. 11, 1986, Ser. No. 839,455

Int. Cl.[4] C08K 5/12

U.S. Cl. 524—292 17 Claims

13. A molding composition which provides articles having smooth, glossy surfaces on release from a mold consisting essentially of:

A. polyethylene terephthalate having an inherent viscosity of at least about 0.4;

B. between about 10 and about 60 percent by weight reinforcing or filling material;

C. at least one salt selected from the sodium and potassium salts of hydrocarbon carboxylic acids containing between about 7 and 25 carbon atoms, and the sodium and potassium salts of a carboxyl containing organic polymer, said salt present in an amount sufficient to provide a $\Delta H_f/\Delta H_c$ ratio of less than 0.25 to a mixture of components A, B and C;

D. at least one compound present in an amount sufficient to provide a Tpk at least 4° C. lower than the Tpk of a mixture of components A, B and C, said compound being selected from

(a) organic esters selected from the product of an aromatic carboxylic acid of 7–11 carbon atoms containing at least 1 carboxyl group per aromatic nucleus which is attached directly to said nucleus, and an alcohol selected from those of the formula $(HOCH_2\rightarrow_x R'$ wherein x is 1, 2 or 3 and R' is a hydrocarbon radical of 2–15 carbon atoms or those of the formula $HO\text{-}(R''O\text{-})_y R'''$ wherein y is a cardinal number between 1 and 15, R'' is a hydrocarbon radical of 2–15 carbon atoms, and R''' is —H or a hydrocarbon radical of 2–20 carbon atoms.

(b) organic ketones of the formula

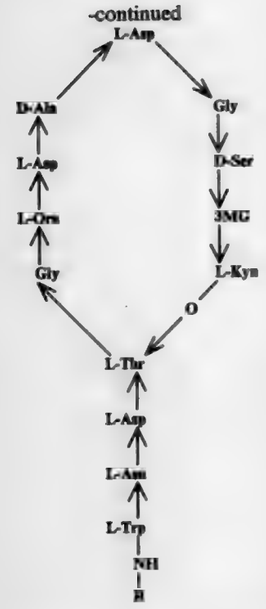


(c) organic sulfones of the formula RSOOR,
(d) organic sulfoxides of the formula R_2SO
(e) organic nitriles of the formula RCN,
(f) organic amides of the formula



wherein in formulas (b) through (f) each R can be the same as, or different from, any other R and is a hydrocarbyl group of 1–25 carbon atoms, while in the formula in (f) R' is hydrogen or a hydrocarbyl group of 1–25 carbon atoms.

-continued



wherein 3MG represents L-threo-3-methylglutamic acid, and R represents a specific fatty acid moiety as follows: 8-methyldecanoyl (C_1), C_{10}-methylundecanoyl (C_2), 10-methyldodecanoyl (C_3), C_{10}-alkanoyl (C_0), C_{12}-alkanoyl (C_4), and [C_{13}-alkanoyl] *C_{12}-alkanoyl C_5*).

PLANT PATENTS

GRANTED JANUARY 20, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,857

ROSE PLANT—BENJEN

Frank A. Benardella, Old Tappen, N.J., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed May 28, 1985, Ser. No. 737,735

Int. Cl.[4] A01H 5/00

U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by neyron rose colored flowers of varying pink tonality and pale yellow petal reverse that hold color well through development and aging.

5,858

ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761

Filed Feb. 4, 1985, Ser. No. 698,222

Int. Cl.[4] A01H 5/00

U.S. Cl. Plt.—11 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described, characterized particularly by rose purple flowers of good form and size borne one to a stem on an attractive, vigorous plant and having a general silvery lavender tonality from a distance.

5,859

ROSE PLANT JACLOPI

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed May 3, 1985, Ser. No. 730,153

Int. Cl.[4] A01H 5/00

U.S. Cl. Plt.—18 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its rose pink buds and blooms on long, heavily prickled stems, little fragrance, long pointed leaflets.

5,860

ROSE PLANT JACALE

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed May 3, 1985, Ser. No. 730,152

Int. Cl.[4] A01H 5/00

U.S. Cl. Plt.—22 1 Claim

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its compact, upright plant habit, large blooms of light pink, white and pale yellow blend, distinct fragrance and relatively large, mildew resistant, foliage.

5,861

HEBE PLANT NAMED LAVENDER LACE

Louis E. Gavello, Richmond, Calif., assignor to Naka Nurseries, Inc., Fremont, Calif.

Filed Mar. 18, 1985, Ser. No. 712,624

Int. Cl.[4] A01H 5/00

U.S. Cl. Plt.—54 1 Claim

1. A new and distinct variety of Hebe (Veronica) plant substantially as illustrated and described, characterized as to novelty by floret color conversion from Campanula blue to white.

5,862

RAPHIOLEPIS INDICA CV. MONTO

Bill Ponto, Vista, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed May 14, 1985, Ser. No. 733,891

Int. Cl.[4] A01H 5/00

U.S. Cl. Plt.—54 1 Claim

1. A new and distinct selection of Raphiolepis as substantially shown and described herein, that is characterized by large glossy bright green leaves; brown tomentum covering the new foliage and large single pink flowers fading to pure white with red filaments.

5,863

SPATHYPHYLLUM PLANT "JEANENE"

Edward B. Caldwell, 199 Townsend house Rd., Brooksville, Fla. 33512

Filed Jun. 20, 1985, Ser. No. 746,850

Int. Cl.[4] A01H 5/00

U.S. Cl. Plt.—88 1 Claim

1. A new and distinct variety of spathyphyllum plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of overall good winter color with greenish yellow upper surface of new leaves to greenish yellow surface of more mature leaves, good keeping qualities, the thick elliptic leaves being resistant to bruising with deep undulations as well as to cool weather chloroplast degradation, the plant as a whole being erect, with stiff petioles.

PATENTS

GRANTED JAN. 20, 1987

ERRATA

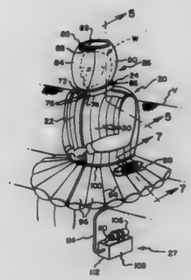
For CLASS	See PATENT NO.
106-261	4,637,464
420-073	4,637,843
427-297	4,637,952
379-145	4,638,121
379-124	4,638,122
379-229	4,638,123
381-068	4,638,125
379-427	4,638,126
333-001	4,638,267

PATENTS

GRANTED JANUARY 20, 1987

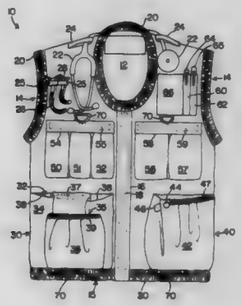
GENERAL AND MECHANICAL

4,637,074
PROTECTIVE GARMENT
Syde A. Taheri, 268 Dan Troy, Williamsville, N.Y. 14221
Filed Mar. 17, 1986, Ser. No. 840,053
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—2 **24 Claims**



1. A protective garment comprising:
means defining a vest for substantially covering the torso of a wearer, said vest having a front, a back, two opposite sides, a neck portion and a waist portion;
a collar member attached to said vest neck portion and of such size so as to closely encircle and substantially cover the wearer's neck when the garment is operatively worn;
envelope-defining means defining an inflatable envelope connected to said collar member which, when uninflated, is maintained in a relatively compact condition adjacent said collar member and which, when operatively inflated, provides a cushioned protective sleeve which substantially and closely encircles and covers the front, back and sides of the head of the wearer and which substantially braces the wearer's neck in alignment with the torso and
means operatively associated with said envelope-defining means for inflating said envelope upon the occurrence of a predetermined event.

4,637,075
EMERGENCY MEDICAL SERVICES SYSTEM
Louis A. Ingrisano; Stephen H. Moon, both of Mount Desert, and Lawrence J. English, Manset, all of Me., assignors to Med-Vest Inc., Mt. Desert, Me.
Filed Apr. 7, 1986, Ser. No. 849,013
Int. Cl.[4] A41D *1/04*
U.S. Cl. 2—94 **20 Claims**

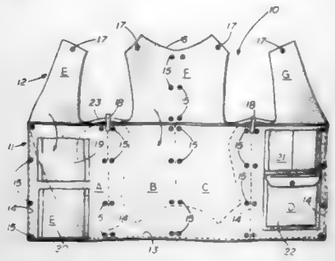


1. An emergency medical system (EMS) system for delivering primary care emergency treatment and EMS equipment and supplies by EMS personnel comprising:
a personnel vest constructed and organized for carrying EMS equipment and supplies in a wearable and accessible arrangement, said vest being formed with a neck, two armholes and a waist opening, and an overlapping placket at the center front of the vest extending between the neck and waist openings, said placket being formed with closure means;
quick release support loops at the shoulders of the vest for securing the ends of a stethoscope and for carrying a stethoscope around the back of the neck and on the shoulders of EMS personnel wearing the vest;
said vest comprising a plurality of outside pockets arranged on the front left and right sides of the vest with first and second large outside pockets across the front bottom left and right sides respectively of the vest for carrying bulkier EMS equipment and supplies at lower center of gravity and a plurality of intermediate size pockets across the center left and right sides of the front of the vest for carrying intermediate and smaller size EMS equipment and supplies;
at least one of said large outside pockets across the bottom front left and right sides of the vest comprising a compound pocket having a large inner pocket formed by a first pocket cover panel across the bottom of one side of the vest and an outer pocket formed by a second pocket cover panel over at least a portion of the first pocket cover panel, said large inner pocket being formed with quick release closure means across at least a portion of the top of the first pocket cover panel;
said intermediate size pockets across the center of the right and left sides of the vest being formed with quick release closure flap means over the tops of the intermediate size pockets;
small upper pockets formed on at least one side of the right and left sides of the front top of the vest at least one of said upper pockets having narrow elongate configuration for retaining elongate objects for ready access;
loop holding means formed on at least one side of the top front of the vest for holding airway means;
and a first extra-large pocket formed across the outside back of the vest comprising an extra-large pocket cover panel secured along the top and bottom across the back of the vest, said extra-large pocket being openable and accessible on the sides and formed with quick release closure means along the sides and with tabs for pulling open the sides for storing and accessing a large multi-trauma dressing pad.

20. An emergency medical response (EMS) system for delivering primary care emergency treatment and EMS equipment and supplies by EMS personnel comprising:
a personnel vest coinstructed and organized for carrying EMS equipment and supplies in a wearable and accessible arrangement, said vest being formed with a neck, two armholes and a waist opening, and an overlapping placket at the center front of the vest extending between the neck and waist openings, said placket being formed with quick release closure means for rapidly opening the vest;
quick release support loops at the shoulders of the vest for securing the ends of a stethoscope and for carrying a stethoscope around the back of the neck and on the shoulders of EMS personnel wearing the vest;
said vest comprising a plurality of outside pockets arranged on the front left and right sides of the vest with first and second large outside pockets across the front bottom left and right sides respectively of the vest for carrying bulkier EMS equipment and supplies at lower center of gravity and a plurality of intermediate size pockets across the center left and right sides of the front of the vest for

carrying intermediate and smaller size EMS equipment and supplies;
small upper pockets formed on at least one side of the right and left sides of the front top of the vest at least one of said upper pockets having narrow elongate configuration for retaining elongate objects for ready access;
loop holding means formed on at least one side of the top front of the vest for holding airway means;
and a first extra-large pocket formed across the outside back of the vest comprising an extra-large pocket cover panel secured along the top and bottom across the back of the vest, said extra-large pocket being openable and accessible on the sides and formed with quick release closure means along the sides and with tabs for pulling open the sides for storing and accessing a large multi-trauma dressing pad.

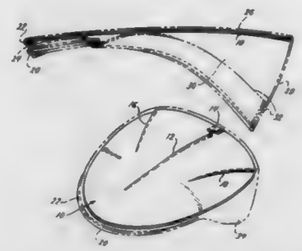
4,637,076
CONVERTIBLE VEST-BAG
Evangeline Tartt, 4916 Imperial, Bellaire, Tex. 77401, and Sandra Webber, P.O. Box 161, Farmington, Me. 04938
Filed Jul. 16, 1985, Ser. No. 755,340
Int. Cl.[4] A41D *1/04, 15/00*; A45C *9/00*
U.S. Cl. 2—102 **18 Claims**



1. A vest-bag which is convertible between a vest garment configuration and a bag configuration comprising:
a unit of material having a lower portion sectioned into laterally contiguous panels and an upper portion divided into a central back panel and a pair of side panels,
said lower portion formed of a multi-ply material wherein each of said contiguous panels forms a pocket with a top opening at the intersection of the upper and lower portions,
said lower portion adapted to be secured in a folded condition with said contigious panels folded one upon another,
said upper portion extending upwardly from the lower portion forming a vest bodice for wearing said vest-bag in a vest garment configuration and foldable over said lower portion to form a bag configuration capable of being supported on the shoulder,
said contiguous panels forming said open ended pockets in the vest garment configuration and defining purse-like divider panels in the folded condition.

4,637,077
FORM-RETAINING INSERT FOR CAPS
Edward W. Henschel, 13966 Meursalt La., Chesterfield, Mo. 63017
Continuation-in-part of Ser. No. 718,632, Apr. 1, 1985, abandoned. This application Mar. 7, 1986, Ser. No. 837,349
Int. Cl.[4] A42C *5/00*; D06C *29/00*
U.S. Cl. 2—185 B **20 Claims**

1. A form-maintaining insert for a cap which comprises a generally flat sheet of form-retaining material that has a front portion which is generally similar to the front portion of the crown of said cap and which is insertable within the front portion of said cap to underlie and to confront said front portion of said crown in face-to-face relation and that has a rear portion which is generally similar to the rear portion of said crown of said cap and which is insertable within the rear portion of said cap to underlie and to confront said rear portion of said crown in face-to-face relation, said front portion of said sheet having a curved periphery, said rear portion of said sheet having a periphery which is, at least in part, curved, said sheet having a severance line therein which extends forwardly from the rear edge of said rear portion into said front portion to define left and right areas for said rear portion which have confronting edges, said left and right areas being bowable to enable the confronting edge on one of said areas to lap over the confronting edge of the other of said areas with a consequent



reduction in the effective width of said rear portion of said insert, said insert resisting the bowing of said left and right areas of said rear portion thereof and developing restorative forces which cause said left and right areas of said rear portion to apply outwardly-directed forces to said cap, adjacent the sides of said crown, that will develop tensile forces in said crown which will resist wrinkling or creasing of said crown, said periphery of said rear portion of said sheet providing a fold-line about which the rear wall of said cap can be folded inwardly and adjacent a confronting surface of said sheet to reduce the space occupied by said cap to a desired value.

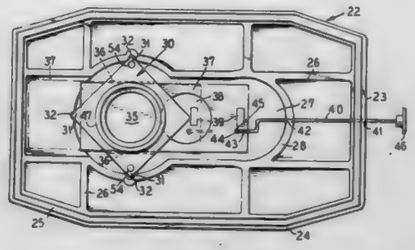
4,637,078
UNDERGARMENT FOR HANDICAPPED
Patricia C. Southwell, 3901 Leland St., San Diego, Calif. 92106
Filed May 17, 1985, Ser. No. 735,130
Int. Cl.[4] A41B *9/04*
U.S. Cl. 2—408 **1 Claim**



1. An undergarment of the panties type for the handicapped, said garment comprising:
a plurality of panels of soft pliable fabric secured together for forming an undergarment for covering the human anatomy at the juncture of the legs with the truck, and having means defining a waist opening and a pair of leg openings, said plurality of panels comprising a front panel terminating at a lower edge above the crotch;
first hook and loop fastening means secured to and extending along said lower edge;
a back panel secured to said front panel for forming a tube portion for receiving the trunk and defining said waist opening;
a releasable lower panel connected to said back panel across the crotch area and up the front and terminating at a

forward edge, said lower panel having a waterproof portion for extending across the crotch area;
second hook and loop fastening means secured to and extending along said forward edge for releasable securement to said first hook and loop fastening means at the lower edge of the front panel for covering the crotch area and for providing easy access to the crotch area of anatomy;
a pair of straps each extending along each side of the lower edge of said front panel for defining a respective leg opening, said leg openings being substantially at the juncture of the wearer's legs and trunk in the worn position and connected at opposite ends to said back panel; and
an additional inner panel extending over the crotch area and connected on opposite sides to said straps and at the top and bottom edges to said front and back panels respectively, said inner panel having a centrally disposed, access opening provided with a finished surrounding edge.

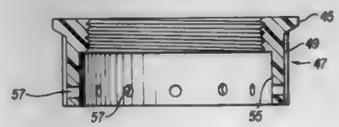
4,637,079
BACKFLOW PREVENTING ATTACHMENT FOR TOILETS
Robert R. Hodge, 3505 Burr St., Gary, Ind. 46408
Filed May 9, 1985, Ser. No. 732,412
Int. Cl.[4] E03D *11/00*
U.S. Cl. 4—427 **2 Claims**

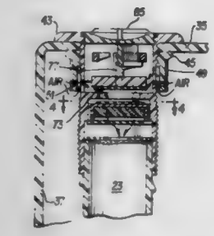


1. A backflow preventing valve for mounting on the top of a soil pipe flange by bolts bottomed in the soil pipe flange which comprises a housing overlying the soil pipe flange having a bore therethrough registering with the soil pipe and bolt holes receiving bolts extending from the flange, a valve plate with top and bottom faces mounted in said housing across said bore and slidable longitudinally in the housing, said valve plate having an aperture selectively aligned with and displaced from the bore to open and close the bore, O-rings mounted in said housing around said bore sealingly engaging the top and bottom faces of said valve plate in all positions of the plate, and a pull rod pivoted on the valve plate in offset relation to the longitudinal axis thereof effecting relative rotation of at least one O-ring and the valve plate to break the plate away from the O-rings as the rod is pulled to slide the plate between open and closed positions thereby preventing damage to the O-rings.

4,637,080
AIR VOLUME CONTROL
Charles H. Hutchinson, 5420 90th St., Lubbock, Tex. 79424
Filed Dec. 19, 1985, Ser. No. 816,318
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—542 **20 Claims**

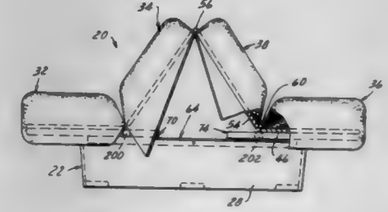
1. An air volume control for use with a flowing water line to control the quantity of air sucked by venturi action into said flowing water line; said air volume control comprising control valve means, valve seat means, float valve means; said control valve means having an open position and a closed position, said control valve means in its said open position being free from engagement with said valve seat means to thereby allow air to be sucked into said flowing water line, said control valve means in its said closed position being in leakproof positive seating and sealing engagement with said valve seat means to prevent air from being sucked into said flowing water line, said float valve means being responsive to reverse flow of water or





back pressure of air to automatically close said valve seat means by leakproof positive seating and sealing engagement of said float valve means with said valve seat means.

4,637,081
FOLD-DOWN SEAT CONSTRUCTION
Richard N. Clark, Farmington Hills, Mich., assignor to Tocia Company, Inc., Mich.
Filed Jul. 22, 1985, Ser. No. 757,330
Int. Cl.[4] A47C *17/06*
U.S. Cl. 5—18 R **10 Claims**



1. In an articulated back-to-back fold-down chair seat and slide-rail track construction having a pair of back-to-back chairs, each with a bottom board and backboard hinged at their mating ends and articulated at the upper abutment of the backs to operate between a full upright position, a fold-down couch position of the backs and seats and intermediate inclined positions therebetween, and wherein each of the seats are mounted on associated pairs of slides which telescopically engage associated first and second track rails affixed in laterally spaced apart relation to opposite sides of a chair platform support, the improvement wherein said rails each comprise an aluminum extrusion having in cross section an upright web integral with a T-head at its upper end and a pair of horizontally opposed flanges projecting oppositely from said web approximately midway between the upper and lower edges of said rail, and wherein said slides each comprise an aluminum extrusion having in cross section an upright web portion with a seat mounting flange integral with its upper edge and protruding horizontally therefrom upon which the seat bottom boards are mounted and a rail gripping flange protruding from said web in the opposite direction from said seat mounting flange and spaced horizontally therebelow, the underside of said gripping flange being adapted to slideably ride on the upper surface of

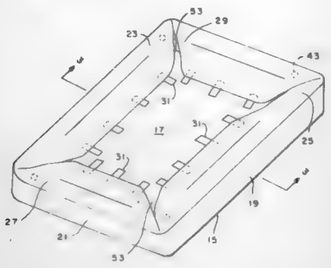
the rail T-head in telescopic assembly of said slide and rail, said outer edge of said gripping flange having a dependent flange and inturned end adapted to wrap around and embrace the associated outer edge of said T-head of the rail, said slide also having vertically spaced flanges protruding from one side of said web adapted to slideably abut the adjacent side of said rail web between said T-head and said mid-flange thereof.

4,637,082

WATERBED WITH REMOVABLE SIDE CUSHIONS

Jerry Moore, and Dennis W. Yanglin, both of Cloverdale, Calif., assignors to New World Manufacturing, Inc., Cloverdale, Calif.

Filed Mar. 26, 1985, Ser. No. 716,155
Int. Cl.⁴ A47C *27/10*
U.S. Cl. 5—452 **7 Claims**



1. A waterbed comprising a water impermeable liner having a rectangular bottom portion, generally upright rectilinear peripheral portions extending from the edges of the bottom portion and extensions of said peripheral portions extending inwardly toward the center of said bottom portion, means for attaching said extensions to said bottom portion to thereby form a plurality of slings each having its loop portion parallel to one side of said rectangular bottom portion, adjacent edges of the extensions being separated from each other to provide an opening, a resilient cushion disposed in each of said slings thereby forming a rectangular peripheral support and a water bag positioned on said rectangular bottom portion within said rectangular peripheral support and overlying said means for attaching said extensions, each of said extensions defining a first linear path from the upper surfaces of the respectively enclosed cushion to the means for attaching when said water bag is empty of water and a second longer linear path from the upper surface of the respectively enclosed cushion to the means for attaching when said water bag is filled with water whereby, when said water bag is filled with water, downward pressure on said extensions tends to urge said resilient cushions inwardly.

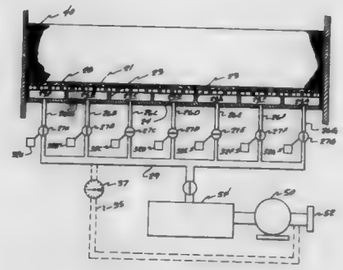
4,637,083

FLUIDIZED PATIENT SUPPORT APPARATUS

Vernon L. Goodwin, Charlotte, N.C., assignor to Support Systems International, Inc., Charleston, S.C.

Filed Mar. 13, 1985, Ser. No. 711,246
Int. Cl.⁴ A47C *27/08*
U.S. Cl. 5—453 **22 Claims**

1. An improved patient support structure comprising:
(a) an open top container means;
(b) a mass of granular material received within said container means;
(c) means for supporting said granular material within said container means, said support means being porous to fluid pressure and impervious to passage of granular material;
(d) means for generating fluid pressure beneath said support means for fluidizing said granular material above said support means;
(e) means for sequentially directing at least a portion of said fluid under pressure, said means for sequentially directing being located beneath predetermined portions of said support means for fluidizing granular material thereabove; and



(f) flexible means atop said granular material for receipt of a patient thereon.

4,637,084

CRIMPING AND CUTTING TOOL

Michael D. Wood, 2301 - 139th Ave., N.W., Anoka, Minn. 55303

Continuation-in-part of Ser. No. 193,534, Jan. 3, 1980, abandoned. This application Dec. 6, 1984, Ser. No. 678,968
Int. Cl.⁴ B25F *1/00*
U.S. Cl. 7—134 **25 Claims**



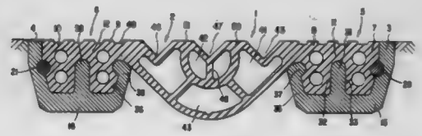
1. A connector crimping and wire cutting tool useable for connection of a ferrule type connector to an electrically conductive wire, comprising: a first lever member having a first head and an elongated first handle, said first head having a first crimping jaw positioned at substantially a right angle relative to the first handle, and a first wire cutting jaw positioned at substantially a right angle relative to the first handle and opposite the first crimping jaw; a second lever member with a second head and an elongated second handle extending from the second head, said second head having a second crimping jaw positioned at substantially a right angle relative to the second handle, and a second wire cutting jaw positioned at substantially a right angle relative to the second handle and opposite the second crimping jaw; pivot means pivotally assembling the first and second lever members with the first and second handles positioned for rotational movement toward one another to a closed position and away from one another to an open position with corresponding rotational movement of the first and second crimping jaws toward and away from one another between closed and open positions, and corresponding rotational movement of the first and second cutting jaws toward and away from one another between closed and open positions to cut wire, said pivot means being located below said crimping and cutting jaws of the first lever member whereby the lever arm of the first cutting jaw is longer than the lever arm of the second cutting jaw; said first crimping jaw having alternating teeth and arcuate recesses in facing relationship to the second crimping jaw, said second crimping jaw having alternating teeth and arcuate recesses in facing relationship to the first crimping jaw, said teeth of the first and second crimping jaws having concave curved sides and being progressively shorter in length from the inside tooth to the outside tooth with respect to the pivot means, and said recesses of the first and second crimping jaws being progressively smaller in curvature from the inside recess to the outside recess with respect to the pivot means; said teeth and recesses of the crimping jaws so positioned that in the closed position teeth of the first crimping jaw occupy the space defined by the arcuate recesses of the second crimping jaw, and teeth of the second crimping jaw occupy spaces defined by the arcuate recesses of the first crimping jaw whereby a tooth of one jaw and a corresponding arcuate recess of the opposite jaw are useable to crimp the ferrule of an electrical connector.

4,637,085

JOINT SPANNING CONSTRUCTION FOR BRIDGES OR SIMILAR STRUCTURES

Alfred Hartkorn, Kolpingstrasse 25, D-8068 Pfaffenhofen, Fed. Rep. of Germany

Filed Apr. 25, 1985, Ser. No. 727,361
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1984, 34160809
Int. Cl.⁴ E01D *19/06*; E01C *11/02*
U.S. Cl. 14—16.5 **7 Claims**



1. A joint spanning construction for bridges or similar structures with which sealing bodies, flush with the top surface of the road and made of resilient rubber material, are inserted by means of beading from above into recesses of sills or threshold pieces and, should the occasion arise, of movable intermediate girders, and secured against lifting out by retainer bodies which are basically of circular cross-section and fit partly in a wall of the sill recess and partly in the beading, wherein the sills or intermediate girders have a base substantially parallel with and beneath the road surface, and are provided with webs having sides extending upwardly substantially parallel to each other, directed towards the road surface and projecting into the beading, an outer of said webs having a concave recess facing a mirror-image concave recess in said sealing body, and an inner of said webs having a semicircular upwardly facing end, and the sealing body having sections separated by the webs, each section provided with concave recesses opposite to the web(s), the outer recess is engaged by the retainer body, and the inner recess is engaged by the inner web semicircular end.

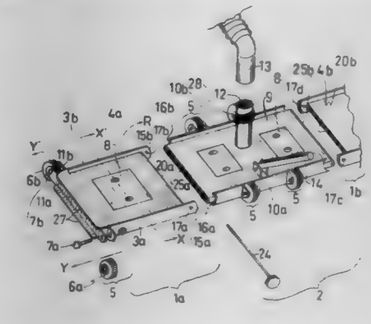
4,637,086

SWIMMING POOL VACUUM CLEANER

John Goode, 9767 Commanche Ave., Chatsworth, Calif. 91311

Filed Jan. 11, 1985, Ser. No. 690,774
Int. Cl.⁴ E04H *3/20*
U.S. Cl. 15—1.7 **5 Claims**

1. A moveable suction head assembly for sweeping swimming pool bottoms comprising:
A. a weighted rectangular central platform, horizontally oriented, incorporating a plurality of rollers so as to form a clearance between the lower surface of said central platform and the pool bottom, the rollers permitting straight line travel;
B. a vertical opening communicating with said clearance with provision at its top end for attachment to a vacuum disposal system;
C. a pivoted push rod mounted on the top surface of the central platform by which it can be propelled from above the surface of the pool;
D. low leakage coupling components mounted on those borders of said central platform which are parallel to the direction of travel and constitute its sides;
E. baffles mounted on those borders of said central platform which are perpendicular to the direction of travel and constitute the leading and trailing edges of the central platform, said baffles extending vertically an equal distance above and below the central platform;
F. two weighted rectangular end platforms each incorporating
i. a plurality of rollers permitting straight line travel and forming a clearance with the bottom of a swimming pool;



ii. low leakage coupling components on one of the borders of the end platform which is parallel to its direction of travel;
iii. two horizontal bumper strips defining upper and lower strips mounted on the border opposite that holding the low leakage coupling components;
iv. baffles mounted on those borders of said end platform which are perpendicular to its direction of travel and constitute the leading and trailing edges, the baffles extending vertically an equal distance above and below the end platform;
whereby one end platform may be attached to each side of the central platform by said coupling components to make up a suction head assembly of increased width and whereby water flow drawn under all the baffles into the clearances is restricted and thus increases temporarily in velocity, an effect which forms suspensions of solid materials found on the bottom and which facilitates solids removal as the suction sweep head is pushed along the bottom.

4,637,087

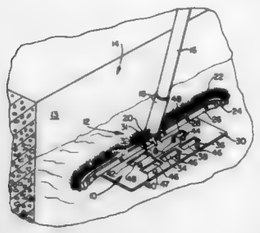
SWIMMING POOL CLEANER ATTACHMENT

Andrew S. Feinberg, 4971 Vista Del Monte, El Paso, Tex. 79922

Filed Aug. 30, 1985, Ser. No. 770,925
Int. Cl.⁴ E04H *3/20*
U.S. Cl. 15—1.7 **8 Claims**

1. An attachment for increasing the cleaning efficiency of a pool cleaning device which has a pole for moving the device, the attachment comprising:
a foil connected to the pole for urging the device against a pool wall when the pole is pushed down through the water in the pool; and

one-way valve means mounted to the foil for allowing flow through the foil when the pole is withdrawn from the



water, thus minimizing water forces on the foil necessary for pole withdrawal.

4,637,088

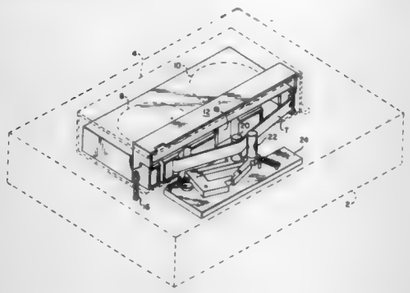
TAPE CLEANING MACHINE

John A. Badaracco, 21 Kilburn Rd., W. Newton, Mass. 02165, and Henry A. Martin, 8 Melo Rd., Woburn, Mass. 01801

Filed Jun. 20, 1984, Ser. No. 622,774

Int. Cl.[4] B08B *11/02*

U.S. Cl. 15—97 R 11 Claims



1. In combination:

a cassette handling machine, a cassette having a band of flexible tape which is moveable from a supply reel to a take-up reel in a predetermined path;

means for locating the cassette in normal operative position in the machine;

means for cleaning the tape while the cassette is in the machine and the tape is moving from reel to reel;

said means for cleaning comprising heads engageable with opposite sides of the tape and located, relative to the normal operating position of the cassette, in inoperative cleaning positions and out of contact with the tape; and,

means for moving the heads into engagement with the tape to apply cleaning action simultaneously to both sides of the tape as it moves from reel to reel.

4,637,089

DEVICE FOR CLEANING LIGHT WAVEGUIDE PLUG CONNECTOR PARTS

Johann Schwarz, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 2, 1985, Ser. No. 751,021

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1984, 8423218[U]

Int. Cl.[4] B08B *11/00*

U.S. Cl. 15—118 10 Claims

1. A device for cleaning light waveguide plug connector parts wherein, at an end of a rod-shaped member, a wick of optical-fiber-compatible material seated in a cavity of said member and guided in a pin-shaped section of said member has a free end conducted out of said member such that said free end of said wick projecting from said member can be crushed to



form a cleaning stopple, said member comprising a hollow-cylindrical region at its other end; and having a further wick seated in said member loosely penetrating said hollow-cylindrical region and having its free end bent around a free edge of said hollow-cylindrical region.

4,637,090

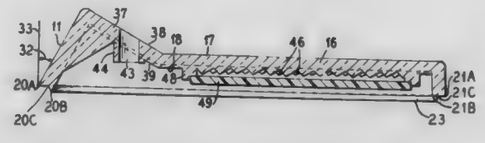
PLASTIC SCRAPER

Jim Kennedy, 324 Streamwood Blvd., Streamwood, Ill. 60103

Filed Apr. 15, 1985, Ser. No. 723,174

Int. Cl.[4] A47L *1/06*; B60S *1/04*

U.S. Cl. 15—236 R 10 Claims



1. A molded scraper for removing deposits from surfaces comprising:

(A) a central generally flattened plate portion having generally opposed front and back faces and having a polygonal straight sided perimeter configuration,

(B) a plurality of integral flange-like continuous extensions upstanding from said back face along said sides and terminating in generally straight blade portions which are generally mutually coplanar with one another,

(C) at least one of said straight blade portions having defined therein a pair of longitudinal continuously extending edge members in spaced parallel relationship to one another,

(D) the interrelationship between said edge members of each such pair being such that both of said edge members generally contact a flattened surface when said central plate portion is inclined relative to said surface at a predetermined first acute angle,

(E) at least one of said extensions being oriented at a predetermined second acute angle relative to said central plate portion,

(F) each said at least one extension terminating in space relationship to said blade portion thereof at a location elevated with respect to said front face, and

(G) a finger abutting plate portion means integrally associated each of said at least one extension terminating locations both with said central plate portion and with adjacent areas of others of said extensions, said finger abutting plate portion means being oriented spacially and, configured to have a front face portion thereof extend generally parallel to said surface when said central plate portion is so inclined.

4,637,091

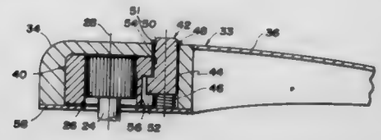
WIPER ARM ASSEMBLY AND SYSTEM UTILIZING SAME

Leonard L. Wu, Livonia, Mich., assignor to American Motors Corporation, Detroit, Mich.

Filed Jun. 27, 1985, Ser. No. 749,528

Int. Cl.[4] B60S *1/34*

U.S. Cl. 15—250.34 15 Claims



1. A window cleaning system for a vehicle having a glass window of the type in which a pane of glass is movable between an open position and a closed position, the system comprising:

wiper means mounted on the vehicle and movable from a park position through a range of travel over the glass window to define a wipe pattern having first and second limit position for wiping the glass window free of matter deposited thereon, said wiper means including a wiper arm pivotable about a pivot axis and a wiper blade assembly secured to the wiper arm;

drive means including a drive shaft pivotable about the pivot axis and a wiper arm driver fixedly mounted on a free end of said drive shaft to rotate therewith whenever the drive shaft pivots about the axis, said wiper arm driver being pivotable about the pivot axis, the drive means being mounted on the vehicle for providing a source of controlled drive power to move the wiper means along the wipe pattern; and

coupling means for alternately coupling said wiper arm to said wiper arm driver in first and second angular positions angularly spaced about the pivot axis to permit movement of said wiper means between said first and second limit positions during normal operation and to the park position wherein said coupling means includes a cam releasably mounted on said wiper arm driver to rotate therewith whenever the wiper arm driver pivots about the pivot axis and locking means for alternately locking said wiper arm to said cam in one of said first and second angular positions.

4,637,092

VACUUM CLEANER WITH AGITATOR

Seizo Hayashi, Ouni Hachimaa; Kenji Okano, Youkaichi, and Nobuhiro Hayashi, Shiga, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 30, 1985, Ser. No. 696,562

Claims priority, application Japan, Jan. 31, 1984, 59-16627

Int. Cl.[4] A47L *9/28*

U.S. Cl. 15—319 17 Claims

1. A vacuum cleaner of the type arranged to drive a rotary brush disposed in a floor nozzle of said vacuum cleaner, comprising:

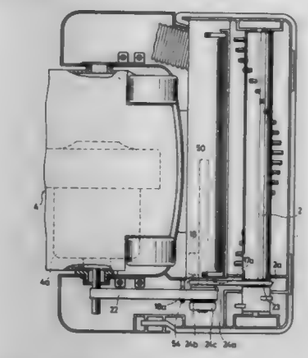
(a) an electric motor for driving said rotary brush;

(b) a manually operable power switch for connecting said electric motor to a power source;

(c) first means for detecting rotation of said rotary brush, said first means producing an output voltage only when detecting the rotation of said rotary brush;

(d) second means responsive to said power switch for producing a voltage across a resistor for a given period of time after said power switch is turned on;

(e) latching means responsive to both said output voltage from said first means and said voltage across a resistor of said second means for producing a control voltage when neither of said output voltage nor said voltage across said resistor is applied thereto; and



(f) a control unit responsive to said control voltage for controlling electrical input to said electric motor such that no power is fed to said electric motor in the presence of said control voltage.

4,637,093

SPRING CUSHIONED CASTER HAVING A SPRING BIASED LOCKING MEMBER

Kenzou Kasai, Osaka, Japan, assignor to Aprica Kasai Kabushikikaisha, Osaka, Japan

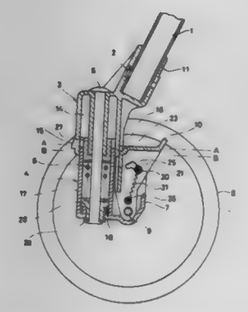
Filed Nov. 19, 1984, Ser. No. 672,708

Claims priority, application Japan, Dec. 1, 1983, 58-185973[U]

The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.

Int. Cl.[4] B60B *33/00*

U.S. Cl. 16—35 R 5 Claims



1. A caster comprising: a fixed bracket (3) to be attached to an object (1) for rolling the object with the aid of the caster, a vertically extending shaft (5) held by said fixed bracket (3), a rotary yoke (4) supported by said shaft (5) for rotation around a vertically extending axis relative to said fixed bracket (3) and for vertical movement relative to the fixed bracket (3), said fixed bracket (3) comprising a lower end and an opening (13) in said lower end of said fixed bracket, said rotary yoke (4) having an upper end received in a telescoping manner in said opening (13) in said lower end of said fixed bracket for supporting said rotary yoke for vertical movement of said rotary yoke (4) relative to said fixed bracket (3), said rotary yoke having a laterally extending bearing bracket (7), a cushion spring (6) acting between said fixed bracket (3) and said rotary yoke (4) for downwardly urging said rotary yoke, a horizontally extending axle (9) supported in said bearing bracket (7) at a position horizontally spaced from said vertical shaft (5), said caster further comprising a locking lever (10) supported on

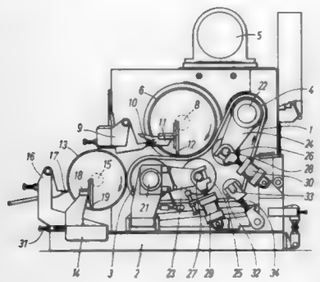
said horizontally extending axle (9), said axle (9) forming a journal shaft for said locking lever (10) in said bearing bracket (7) of said rotary yoke (4), whereby said locking lever (10) is rotatable in a predetermined range about said journal shaft into a locking engagement with said fixed bracket (3) for preventing rotation of the rotary yoke (4) around said vertically extending axis, said locking lever and said fixed bracket comprising cooperating relative rotation preventing members permitting a vertical movement of said rotary yoke in response to a cushioning action of said cushion spring.

4,637,094

APPARATUS FOR COLLECTING FLESH OF FISH

Kaneo Matsubayashi, Kishiwada, Japan, assignor to Toyo Suisan Kikai Co. Ltd. and Taiyo Fishery Co. Ltd., both of, Japan

Filed May 10, 1985, Ser. No. 732,631
Claims priority, application Japan, May 12, 1984, 59-94993
Int. Cl.⁴ A22C *17/00, 25/00*
U.S. Cl. 17—1 G **3 Claims**



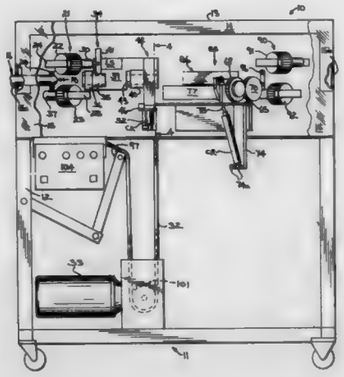
1. An apparatus for collecting flesh of fish comprising:
an endless belt having a conveying side for conveying the flesh of the fish;
a first rotatable hollow roll having a peripheral wall with a plurality of flesh collecting holes therein, said first roll being generally horizontally disposed, closed at one end and open at the other end;
a first contact pressure adjusting means for holding the conveying side of said endless belt in a selected pressing contact with a lower pressing portion of the peripheral wall of said first roll such that flesh of a high quality adjacent said first roll is collected by said first roll while lower quality flesh beneath the high quality flesh is not collected, and for holding the conveying side of said endless belt out of contact with a lower non-contact portion of said first roll downstream of said lower pressing portion below which a drop portion of said endless belt is thereby disposed;
a second rotatable hollow roll having a peripheral wall with a plurality of flesh collecting holes therein, said second roll being generally horizontally disposed, closed at one end, and open at the other end;
a second contact pressure adjusting means for holding the conveying side of said endless belt downstream of said first roll in a selected pressing contact with a pressing portion of the peripheral wall of said second roll such that additional flesh not collected by said first roll is collected by said second roll;
a first scraping knife disposed along the lower non-contact portion of said first roll in sliding contact with the peripheral surface of said first roll such that said first knife is located above the drop portion of said endless belt to cause flesh adhering to said first roll after pressing thereby to fall onto said drop portion of said endless belt and be conveyed to said second roll; and
a second scraper knife in sliding contact with the peripheral surface of said second roll to cause flesh adhering to said second roll to be scraped therefrom.

4,637,095

METHOD AND APPARATUS FOR PEELING SAUSAGE

Gerald F. Maruska, 329 Cheyenne Trail, Madison, Wis. 53705

Filed Dec. 11, 1985, Ser. No. 808,269
Int. Cl.⁴ A22C *11/00, 13/00*
U.S. Cl. 17—49 **13 Claims**



1. A method for removing a casing from a body of a sausage having a leading end and a trailing end, wherein the casing is formed with a tuft on the leading end of the body, the method comprising:
feeding the body of the sausage forward along a feed path through a feeding station;
causing a cut to be made in the casing;
at a casing removal station downstream of the feeding station, encountering the leading end of the sausage head-on, gripping the tuft of the sausage, and then pulling the tuft radially outward from the body of the sausage to separate the casing from the body as the body is fed further along the feed path; and
feeding the trailing end of the body past the casing removal station to allow removal of the casing from the trailing end of the sausage.

4,637,096

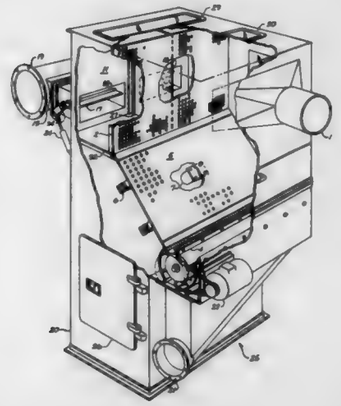
METHOD AND APPARATUS FOR CLEANING COTTON

Dan S. Wise, Kings Mountain, and George A. Miller, Dallas, both of N.C., assignors to Wise Industries, Inc., Kings Mountain, N.C.

Filed Oct. 18, 1985, Ser. No. 789,146
Int. Cl.⁴ D01G *1/00*
U.S. Cl. 19—200 **10 Claims**

1. A method of cleaning cotton or the like comprising:
(a) directing an air stream bearing cotton into a chamber;
(b) drawing said air stream and dirt in said cotton through only a first portion of an air pervious member imposed within the chamber;
(c) collecting the cotton on the upstream side of the first portion of said air pervious member;
(d) drawing said air stream and dirt within the cotton through only a second portion of said air pervious member and at the same time ceasing to draw the air stream through said first portion of said member; and

(e) collecting the cotton on the upstream side of said second portion of said air pervious member and at the same time,



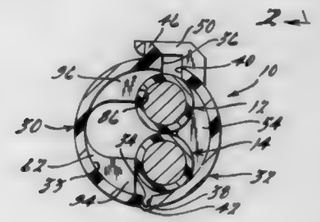
removing the cotton from said first portion of said air pervious member.

4,637,097

CABLE BUNDLER CLIP

Nelson W. Secord, Brighton, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 21, 1985, Ser. No. 789,856
Int. Cl.⁴ B65D *63/00*
U.S. Cl. 24—16 PB **4 Claims**



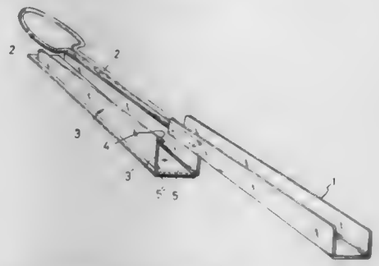
1. In a cable bundler clip comprising a pair of clip halves, each clip half having a pair of longitudinal edges, a hinge connecting adjacent edges of the clip halves thereby hingedly joining the halves together, the hinge permitting the clip halves to be swung to a closed position wherein the other edges of the clip halves substantially meet to define an inner tubular surface for enclosing a plurality of cables, latching structure on the clip halves for securing the clip halves together in the closed position, the improvement comprising rib structure within each of the clip halves, the rib structure within one clip half being oppositely disposed from the rib structure in the other clip when the clip halves are in the closed position, the rib structure of one clip half having first and second side-by-side recesses formed therein, the rib structure of the other clip half having a third recess formed therein, the third recess being located centrally of the first and second recesses when the clip halves are in the closed position, rib structure material of said other clip half being provided on each side of the third recess, said rib structure material overlapping the first and second recesses when the clip halves are in the closed position, each of the recesses adapted to receive a cable, the overlapping rib structure material of said other clip half securely capturing cables received in the first and second recesses when the clip halves are in the closed position, cables received in the first and second recesses securely capturing a cable received in the third recess when the clip halves are in the closed position.

4,637,098

SHIM USED FOR CABLE CLAMP

Masahiko Okura, and Minoru Inayashi, both of Tokyo, Japan, assignors to Okura Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1985, Ser. No. 812,713
Int. Cl.⁴ F16G *11/04*
U.S. Cl. 24—136 R **1 Claim**



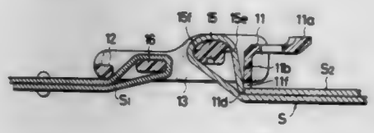
1. In a cable clamp comprising
an elongated transversely U-shaped tapered body member (3) having inturned flanges (4) along the marginal edges of the sides thereof to form guides;
an elongated transversely U-shaped tapered wedge member (1) slidably positioned within said body member and having its marginal edges located in said guides;
a suspending ring member (2) secured to said wedge member; and
shim member (5) disposed within said body member, the improvement comprising
said shim member comprising a substantially flat elongated plate having a slit (5') extending along one side thereof and of a dimension to fit around one side (3') of said body member (3), such that one part of said shim member is located on the outside of said side (3') of said body member, and the remaining part of said shim member is located inside of said body member, whereby (see FIG. 6) manual pushing of said one part of said shim member enables rotation of said shim member about a pivot point of said slit from a position whereat the shim member is flat against the bottom of said body member to another position whereat the shim member is against the side (3') of said body member.

4,637,099

ADJUSTABLE STRAP FASTENER

Kazumi Kasai, Namerikawa, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1985, Ser. No. 813,378
Claims priority, application Japan, Dec. 26, 1984, 59-198836[U]
Int. Cl.⁴ A44B *11/04*
U.S. Cl. 24—200 **2 Claims**



1. A strap fastener molded of a plastic material for adjustably connecting ends of a strap, comprising:
(a) a grip head portion;
(b) a pair of parallel spaced side flanges extending from said grip head portion in a common direction and having a pair of flat bottom surfaces, respectively;
(c) a connecting portion extending between and interconnecting said side flanges;
(d) a pair of parallel spaced first and second cross bars ex-

tending parallel to said connecting portion and connected to said side flange portions, said first cross bar being disposed closer to said grip head portion than said second cross bar;

(e) a retainer portion extending integrally from said head portion perpendicularly to the plane of the fastener and projecting beyond said bottom surfaces of said side flanges, said retainer portion having a flat bottom surface and defining a first strap stop;

(f) said first cross bar having a first projection extending toward said grip head portion and defining a second strap stop and further having a second projection extending toward said connecting portion and defining a third strap stop, said retainer portion and said second strap stop being spaced from one another by a distance larger than the thickness of the strap; and

(g) said first cross bar lying at a level above said second cross bar, said second cross bar lying at a level above said connecting portion, said connecting portion having a lowermost surface lying flush with said bottom surfaces of said flanges.

4,637,100

HOSE CLAMPING DEVICE

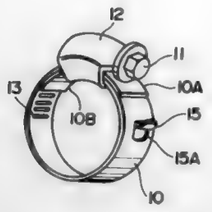
Takato Ishihata, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Apr. 28, 1986, Ser. No. 856,379

Claims priority, application Japan, May 24, 1985, 60-77509[U]

Int. Cl.⁴ B65D *63/02*

U.S. Cl. 24—274 R **9 Claims**



1. A hose clamping device comprising:

a steel clamp band adapted to be tightened around an elastic hose in a ring-like form such that one end underlies the other;

tightening means provided on a portion of said band near the underlying end thereof and adapted to pull or push said overlying end, thereby tightening or loosening said band on said hose; and

a stopper provided on a portion of said band ahead of said overlying end and adapted to be contacted by said overlying end to stop the advance of the same;

said stopper comprising a tab-like portion cut out from a portion of said band and raised such that the upper surface thereof faces the advance of said overlying end of said band, so as to be pressed down towards said cut out by said overlying end when said stopper is forcibly engaged by said overlying end.

4,637,101

ACTUATOR WITH OSMOTIC PRESSURE ACTUATION

Leslie C. Fiedler, 420 W. Coolidge Dr., San Gabriel, Calif. 91775

Filed Jan. 5, 1983, Ser. No. 455,650

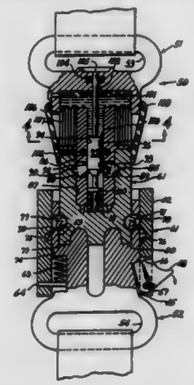
Int. Cl.⁴ B64D *17/32*

U.S. Cl. 24—602 **5 Claims**

1. In combination: a sensor for detecting and responding to the presence of a suitably concentrated liquid solution with a pre-selected concentation of a solute comprising:

a rigid case having an internal wall forming a rigid internal chamber to contain liquid of lesser or no concentration of said solute and through the said wall an exit port entering said chamber:

a closure incorporating a membrane possessing osmotic properties closing said exit port, said membrane occluding at least part of said exit port, whereby liquid leaving said chamber must pass through the membrane; and actuator means responsive to a lowered pressure caused by exit of liquid from the chamber because said membrane contacts



a liquid of at least said pre-selected concentration of solute to result in osmotic flow tending to dilute the last named liquid, said actuator means comrpising:

an axially movable plunger slidingly fitted in an aperture in the wall of the case, entering in and exposed to pressure in said chamber, and exposed externally to a different pressure: and

a separation mechanism responsive to the position of said plunger.

4,637,102

SAFETY BELT BUCKLE FOR VEHICLES

Leonid O. Teder; Tiit A. Org; Vaino G. Lauri, and Ants J. Aas, all of Tallin, U.S.S.R., assignors to Proizvodstvennoe Obiedinenie "Norma", U.S.S.R.

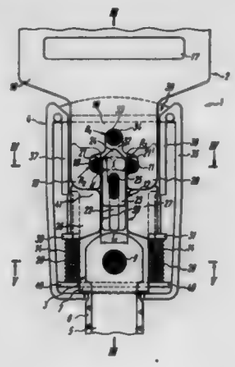
PCT No. PCT/SU84/00050, § 371 Date May 22, 1985, § 102(e) Date May 22, 1985, PCT Pub. No. WO85/01483, PCT Pub. Date Apr. 11, 1985

PCT Filed Sep. 13, 1984, Ser. No. 763,136

Claims priority, application U.S.S.R., Oct. 3, 1983, 3649101; France, Oct. 2, 1984, 84 15128

Int. Cl.⁴ A44B *11/14*

U.S. Cl. 24—642 **16 Claims**



1. A safety belt buckle for vehicles, comprising

two interlocking parts, a latch part and a catch part,

said latch part including a shell formed by two substantially parallel plates disposed inside a housing and connected to a bar secured to a vehicle body, locking elements in the form of rolls movably disposed in said shell, spring-biased members for stopping said rolls in both latched and unlatched positions of the buckle, and a member for unlatching the buckle in the form of a push-button and being slidable along said shell,

said catch part in the form of a prong having a slot to receive the belt and additionally having a substantially flat portion insertable into said shell and provided at an end thereof with substantially symmetrical lugs engageable with said rolls,

wherein substantially coaxial slots extending substantially transversely with respect to a central axis of said shell, are provided in said plates, said slots adapted to receive said rolls,

substantially coaxial slots which extend substantially in line with said central axis of said shell, are also provided in said plates,

said member for stopping said rolls in the latched position of the buckle being in the form of a wedge rigidly connected through said axially-extending slots with said push button and having a tapered end facing said rolls,

said member for stopping said rolls in the unlatched position of the buckle, having the form of plate-like pushing elements situated at sides of said plates forming said shell and for engagement with an end face of said portion of said prong insertable into said shell and with said rolls,

and wherein said prong additionally comprises a shaped recess open at the end face of said insertable portion, said recess defining said lugs of said insertable portion of said prong, such that said lugs face one another.

4,637,103

SIMULTANEOUS BIAXIAL STRETCHING MACHINE FOR THERMOPLASTIC FILM WEBS

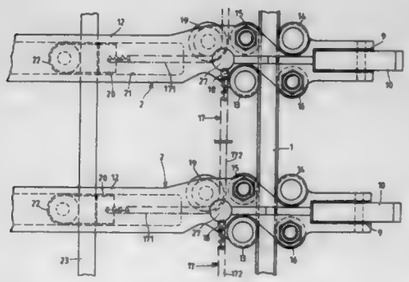
Armin Hutzenlaub, Wiehl, Fed. Rep. of Germany, assignor to Kampf GmbH & Co. Maschinenfabrik, Fed. Rep. of Germany

Filed Feb. 6, 1986, Ser. No. 826,581

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1985, 3503909

Int. Cl.⁴ B29L *55/16*

U.S. Cl. 26—73 **15 Claims**



1. A simultaneous biaxial stretching machine for thermoplastic film webs, comprising:

two transport rails each arranged on a border of the film web,

two guide rails each extending adjacent to a transport rail at a variable, adjustable distance, and

gripping devices disposed on said transport rails for gripping the borders of the film web, each gripping device comprising:

gripping means for gripping the film web,

roller means for moving the gripping device along its transport rail,

flexible connecting elements coupling the gripping device to adjacent gripping devices,

a deflection roller for deflection of a connecting element coming from an adjacent gripping device, and

an extension arm oriented perpendicularly to the moving direction of the gripping device on the transport rail, said extension arm having a slide mounted on a guide rail and connected to the deflected end of the connecting element.

4,637,104

APPARATUS FOR SPREADING OUT A PLURALITY OF FILAMENTS

Kürt Mente, Hanover, Fed. Rep. of Germany, assignor to J. H. Benecke GmbH, Hanover, Fed. Rep. of Germany

Filed Feb. 6, 1986, Ser. No. 826,838

Int. Cl.⁴ D01D *11/02*

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1985, 3504588[U]

U.S. Cl. 28—283 **5 Claims**



1. An apparatus for distributing fiber from a source by pneumatic feed means, including a nozzle having an outlet and baffle means disposed adjacent to said nozzle, the improvement comprising, said baffle means including walls disposed on opposite sides of said outlet, said walls being rigidly connected so as to be movable together along a path in reciprocating motion, each said wall having an edge remote from said outlet with each said edge having a midpoint with a recess being formed in each said edge about each said midpoint.

4,637,105

STRINGTAPE ROLL FOR VENETIAN BLINDS

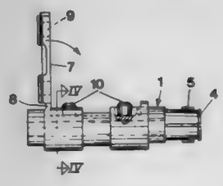
Inge Nordin, Hisings-Backa, Sweden, assignor to Pede AB, Hisings-Backa, Sweden

Filed Oct. 3, 1985, Ser. No. 783,661

Claims priority, application Sweden, Oct. 3, 1984, 8404939

Int. Cl.⁴ B23D *19/04;* **E06B** *9/38*

U.S. Cl. 29—24.5 **4 Claims**



1. A stringtape roll for Venetian blinds having a through channel for receiving and for being nonrotatably connected to the tilting rod of the Venetian blind and being designed with a slotted and tapering end portion and provided with means for axially locking the stringtape roll to the tilting rod and with arresting means for arresting the stringtapes of the Venetian blind, which arresting means is constituted by a tongue formed integral with the stringtape roll and bendably connected thereto and arranged to be bent to contact against the stringtape roll, wherein,

the connection between the stringtape roll and the said

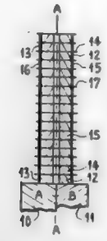
tongue is a hinge, and that the stringtape roll at a distance from said hinge is provided with means intended for locking interconnection with corresponding means at the end of said tongue remote from said hinge, said means being projections and recesses resp. adapted to lock into each other for interconnection with the stringtape roll at a distance from said hinge thereby effecting an arresting of the stringtapes, which are arranged about said stringtape roll over the distance between said hinge and the free end of said tongue, and that the means for axially arresting the stringtape roll on the tilting rod is a ring having an inner diameter, smaller than the outer diameter of a rib-formed collar provided on the slotted end of the stringtape roll in unloaded condition, but somewhat bigger than the diameter thereof when the said end is in compressed condition.

4,637,106

PROCESS FOR THE PRODUCTION OF A LAMINATED CAPACITOR

Daniel Bernard, Seurre, France, assignor to L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques, Bagnolet, France

Filed Jul. 3, 1984, Ser. No. 627,527
Claims priority, application France, Jul. 6, 1983, 83 11258
The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.
Int. Cl.⁴ H01G *4/32*
U.S. Cl. 29—25.42 **9 Claims**



1. A process for the production of laminated capacitors constituted by a stack of dielectric sheets separated by metal layers, plates or foils, those of the even and uneven rows being respectively interconnected by lateral electrical connections, wherein:

a—n juxtaposed master capacitors are produced by stacking dielectric sheets separated by metal layers, plates or foils on the same support,

b—a common interalated layer is placed on the n master capacitors,

c—on said common intercalated layer is placed a further group of n juxtaposed master capacitors, whose edges are substantially aligned with those of the preceding stage in the same stack,

d—m stages of n master capacitors are successively produced in this way,

e—the two lateral edges of the assembly undergo metal spraying,

f—separation takes place parallel to the metal sprayed lateral edges between two successive stacks of master capacitors, so as to produce two groups of master capacitors having a metal sprayed lateral edge and a lateral edge which is not metal sprayed,

g—the other lateral edge of each group is metal sprayed,

h—stages f and g are recommenced if necessary, so as to obtain n groups of m master capacitors, whereof the two lateral edges are metal sprayed,

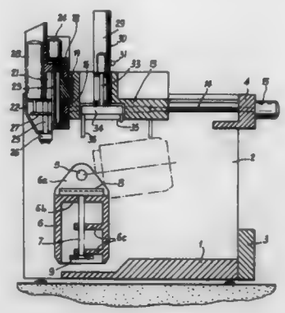
i—the master capacitors are separated from one another.

4,637,107

MACHINING MACHINE

Ramon Romeu, La Segarie, Saint-Jean-Lespinasse, 46 400 Saint Cere, France

PCT No. PCT/FR85/00034, § 371 Date Oct. 15, 1985, § 102(e) Date Oct. 15, 1985, PCT Pub. No. WO85/03893, PCT Pub. Date Sep. 12, 1985
PCT Filed Feb. 27, 1985, Ser. No. 795,360
Int. Cl.⁴ B23C *1/00*; B23P *23/02*; B23Q *1/16*
U.S. Cl. 29—27 C **10 Claims**



1. A machining machine for a workpiece comprising:

a machine frame including two parallel vertical posts in the form of walls having tops, the tops of said walls providing two parallel horizontal upper slideways;

a general slide extending transversally in relation to said posts and being movable along said slideways, said slide having mounted thereon a machining tool means for machining the workpiece including a turning means and at least another tool means;

a cradle mounted on said posts to be movable about a horizontal pivot axis beneath said general slide;

a table for receiving the workpiece to be machined, said table being rotatively mounted on said cradle about a rotary turning axis which is perpendicular to said horizontal pivot axis; and

a mounting means which is mounted on said general slide, said mounting means mounting said machine tool means for movement in the three directions in space so that said machine tool means are moved toward said table while said table is also movable within a wide range of inclination of said cradle relative to the horizontal pivot axis of said cradle.

4,637,108

PALLET CHANGER

Kazushi Murata, Nishio; Toshiharu Takashima, Chiryu, and Kunimichi Nakashima, Anjoh, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 29, 1985, Ser. No. 770,580
Claims priority, application Japan, Sep. 24, 1984, 59-199758
Int. Cl.⁴ B23Q *41/02*; B65G *47/00*
U.S. Cl. 29—33 P **6 Claims**

1. A pallet changer for a machine tool, including:

a base;

a rotary plate provided on said base for rotation about a vertical axis;

a plurality of pallet supports mounted for rotating integrally with said rotary plate, said pallet supports being disposed around said vertical axis;

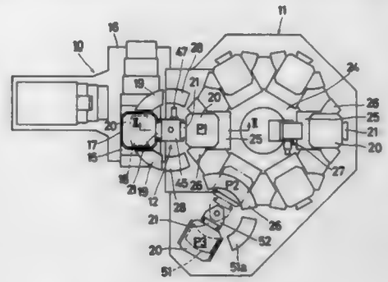
an indexing means for selectively indexing said plural pallet supports to a pallet changing position opposite a table of the machine tool;

pallets for mounting a workpiece to be machined, one of said pallets being carried on each of said pallet supports;

a first arcuate pallet guide for guiding the pallets along an arcuate track attached to each of said pallet supports;

a second arcuate pallet guide provided on said table of the machine tool for guiding the pallets along an arcuate track;

a plurality of third arcuate pallet guides which are provided for connecting as a single circular track the first pallet guide on one of said pallet supports indexed to said pallet changing position and the second pallet guide on said table, wherein said plural third pallet guides include a pair



of fixed pallet guides positioned adjacent both ends of said first pallet guide on said one pallet support which has been indexed to said pallet changing position; and

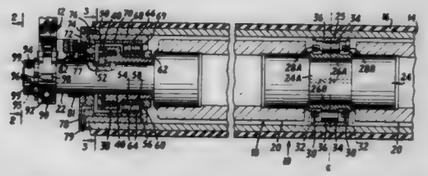
a pallet turning device for turning the pallet on said one pallet support in said pallet changing position and the pallet on said table simultaneously in one direction along the circular track completed by said first, second and third pallet guides, said pallet turning device being provided between said pallet changing position and said table of the machine tool.

4,637,109

CONTROLLED DEFLECTION ROLLER

Jack Bryer, York, Pa., assignor to Motter Printing Press Co., York, Pa.

Continuation of Ser. No. 492,477, May 6, 1983, abandoned. This application Oct. 25, 1985, Ser. No. 791,561
Int. Cl.⁴ B21B *13/02, 31/32*
U.S. Cl. 29—116 AD **5 Claims**



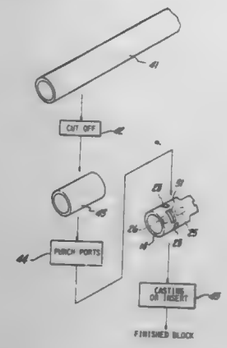
1. A roller adapted to engage and cooperate with a tangential cylinder disposed with its axis substantially parallel with the axis of the roller, the movement of the roller into engagement with the tangential cylinder tending to flex the intermediate portion of the roller away from the tangential cylinder, comprising a continuous hollow cylinder mounted for rotation about the axis thereof and engageable with said tangential cylinder, a control shaft disposed within the hollow cylinder, eccentric means mounted on the control shaft intermediate the ends of the hollow cylinder for exerting a radial force on the hollow cylinder tending to flex the intermediate portion of the hollow cylinder toward the tangential cylinder, thereby improving the uniformity of the engagement between the hollow cylinder and the tangential cylinder, means locking the ends of the control shaft in an adjusted position to orient the eccentric means mounted on the control shaft relative to the axis of the tangential cylinder, an eccentric sleeve mounted for rotation on each end of the control shaft, a bearing mounted on each sleeve for the rotation of the hollow cylinder, each eccentric sleeve being rotatable on the control shaft between two predetermined positions, one position relative to the intermediate eccentric means mounted on the control shaft to render the intermediate eccentric means operative to flex the shaft and another position to release the flexure and neutralize the intermediate eccentric means, and a two-position releasable locking means interconnecting each of the eccentric sleeves and the control shaft for locking the adjustable eccentric sleeves on the control shaft in one of said predetermined positions to render the intermediate eccentric means operative to flex the cylinder, said releasable locking means permitting quick release and adjustment of the eccentric sleeves for rotation on the control shaft from the one predetermined position to the other.

4,637,110

METHOD FOR MAKING A COMPOSITE CYLINDER BLOCK

Hiroshi Yamagata, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 22, 1985, Ser. No. 704,535
Claims priority, application Japan, Feb. 24, 1984, 59-33903
Int. Cl.⁴ B23P *15/00, 17/00*
U.S. Cl. 29—156.4 WL **2 Claims**



1. The method of making a composite cylinder block for an internal combustion engine or the like comprising forming a cylinder liner from a cylindrical pipe section, pre-forming by a punching operation at least one port opening in said cylinder liner, said punching operation being carried out from the outer diameter of the cylinder liner to its inner diameter for forming an inwardly tapered opening, and fixing said cylinder liner in a block of different material by casting the block of different material around the cylinder liner while the cylinder liner is held in place.

4,637,111

PROCESS OF MAKING HEAT EXCHANGERS

Stephen F. Pasternak, Palm Harbor, Fla., and Franz X. Wohrstein, Chicago, Ill., assignors to Peerless of America, Inc., Chicago, Ill.

Division of Ser. No. 386,950, Jun. 10, 1982, Pat. No. 4,554,970. This application Jun. 17, 1985, Ser. No. 745,204
Int. Cl.⁴ B21D *53/02*; B23P *15/26*; F28F *1/20*
U.S. Cl. 29—157.3 A **8 Claims**

1. The method of making a heat transfer element comprising:

a. forming an elongated tubular member having a wall portion and a longitudinal center line therein,

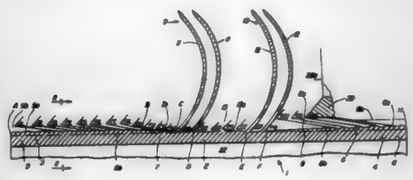
b. successively, from one end portion of said tubular member toward the other end portion thereof,

(1) making cuts into said wall portion with a cutter means to thereby afford elongated fins extending across said

tubular member in a direction transverse to the length thereof,

(2) turning said fins outwardly into outwardly projecting relation to said tubular member, and

c. predeterminedly severing with said cutter means certain of said fins from said wall prior to making the next succes-



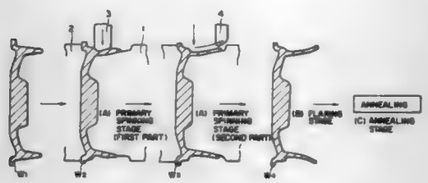
sive cut into said wall to provide at least two groups of fins spaced from each other longitudinally along said wall portion with the spacing therebetween formed by the severed fins stubs having substantially a horizontal outer plane surface with signed to the longitudinal center line of said tubular member.

4,637,112

METHOD FOR SHAPING ALUMINUM WHEEL

Akira Asari, Hyogo; Satoshi Matsumoto, Osaka; Shigeo Hattori, Kobe, and Takayoshi Dosai, Hyogo, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jan. 27, 1986, Ser. No. 822,807
Claims priority, application Japan, Mar. 19, 1985, 60-56348
Int. Cl.⁴ B21K *1/32*
U.S. Cl. 29—159.01 1 Claim



1. A method for forming aluminum wheels from cylindrical forging aluminum blanks of substantially H-shape in section, comprising the steps of:

(A)

i supporting opposite rim portions of an aluminum work by spinning dies, and

ii subjecting said work to primary spinning including press-shaping by a thick-walled-work-stretching first spinning roller and

iii subjecting said work to preliminary spinning by a second spinning roller;

(B) flaring the inner end of said rim;

(C) annealing said work to remove work-hardening resulting from the flaring operation; and

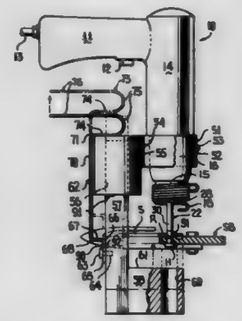
(D) subjecting said work to secondary spinning including final spinning by said second spinning roller and corner R-finishing by a third spinning roller.

4,637,113

TOOL FOR REMOVING AND REAPPLYING RIVETS

John Cook, Rte. 1, Trimble, Tenn. 38259

Continuation of Ser. No. 395,626, Jul. 6, 1982, Pat. No. 4,476,615. This application May 9, 1984, Ser. No. 608,451
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.⁴ B23P *11/00*
U.S. Cl. 29—243.54 4 Claims



1. A power tool adapted for use with power bits to remove old rivets and reapply new rivets relative to an associated riveted element comprising support means for underlying contactingly supporting an element adjacent an associated old rivet in alignment with a punch bit reciprocated by the power tool, means for removably securing said support means to the power tool, anvil means carried by said support means for underlyingly contactingly supporting a new rivet while a shank thereof is upset by a riveting bit reciprocated by the power tool, means for slidably connecting said support means relative to said securing means, said slidably connecting means includes a sleeve telescopically slidably receiving a rod, said support means being carried by said rod, said sleeve being defined by a portion of said removable securing means, means for preventing the inadvertent slidable disconnecting of said rod relative to said sleeve, said disconnecting preventing means including an elongated member connected at a first end thereof to said rod at an end of said rod adjacent said anvil, and said elongated member having a second end remote from said anvil in overlying relationship to an end of said sleeve remote from said anvil.

4,637,114

RIVETING APPARATUS

Jimmie C. Mathews, Sr., 717 Mountain Dr., Birmingham, Ala. 35206

Filed Jun. 21, 1985, Ser. No. 747,323
Int. Cl.⁴ B25B *27/00*
U.S. Cl. 29—243.54 7 Claims

1. Apparatus for fastening disc-like members together uniformly in spacing and compression with a plurality of compressive fasteners, comprising in combination:

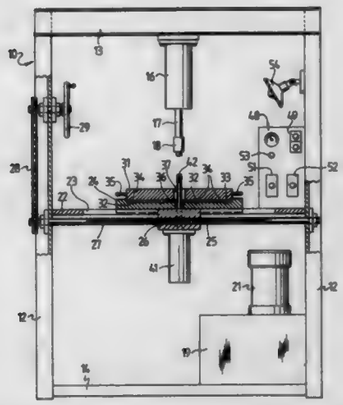
(a) an upright frame including a top support member;

(b) an elongated horizontal threaded member mounted for rotation within said frame in spaced relation to said top support member;

(c) a carriage having a central vertical aperture mounted within said frame with said carriage engaging said threaded member such that rotation of said threaded member translates said carriage horizontally within said frame;

(d) a turntable having a central vertical aperture mounted atop said carriage with the apertures thereof vertically aligned;

(e) a hydraulic ram depending from said top support member at a reference position above said carriage and turntable; and



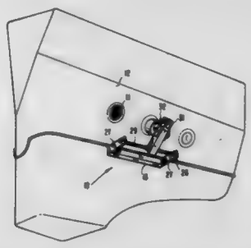
(f) a pneumatically actuated retainer cooperatively mounted beneath said carriage and extending upwards through said apertures to engage and hold said disc-like members.

4,637,115

CORE PLUG DRIVER TOOL

William E. Hillock, R.R. #1, Box 285, Danville, Ind. 46122

Filed Dec. 9, 1985, Ser. No. 806,417
Int. Cl.⁴ B23P *19/04*
U.S. Cl. 29—275 7 Claims



1. A tool for driving core plugs into the core plug holes of an engine block, comprising:

an arm support having a fastening means for fixedly fastening said arm support to said engine block;

an arm pivotally mounted at one end to said arm support and having a free end opposite the one end of said arm, said arm further including a force applying surface adjacent the free end of said arm, said plug driver positioned between said force applying surface and the one end of said arm, said arm support including a means for movably adjusting the position of said arm along the length of said arm support, said arm support further including a yoke having said fastening means thereon and a rod mounted at opposite ends thereof to said yoke, said arm being slidably received over and pivotally mounted to said rod; and

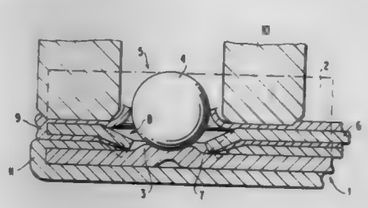
a plug driver pivotally connected to the free end of said arm at a location along said arm spaced apart from said one end, said plug driver having a cylindrical shaped head for driving a core plug into a desired one of the core plug holes in an engine block, whereby a mechanical advantage is provided in driving the core plug by application of force to said force applying surface.

4,637,116

METHOD FOR FASTENING A COVERING PART AT A FRAME PART

Jochen Pfirsch, Herrenberg, and Werner Herlemann, Aidlingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Nov. 8, 1985, Ser. No. 796,061
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441349
Int. Cl.⁴ B23P *11/00*
U.S. Cl. 29—441 R 2 Claims



1. a method for fastening a cover part at a frame part with the aid of fastening means each having a ball head secured at one part and engaging from below at coordinated counter fastener means at the other part, comprising the steps of providing spherical segments formed out of the frame part with fastener means constructed as balls, mounting over the balls counter fastener means in the form of ring-shaped collar means angularly bent in the direction of the frame part and formed out of the cover part, and thereafter pressing flat each collar means by a predetermined amount under straightening thereof during a subsequent pressing operation in which the frame part serves as support surface.

4,637,117

METHOD FOR DEEP DRAWING THIN METAL STOCK INTO CONTAINERS AND THEREAFTER COATING EACH CONTAINER

Richard J. Karas, Addison, and John LaRosa, Carpentersville, both of Ill., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 251,232, Apr. 6, 1981, abandoned, which is a continuation of Ser. No. 016,371, Mar. 1, 1979, abandoned. This application Oct. 4, 1983, Ser. No. 548,812
Int. Cl.⁴ B23P *17/00, 25/00;* B21B *45/02*
U.S. Cl. 29—527.4 15 Claims

1. A method of deep drawing thin metal stock into containers and post-coating said containers including the steps of:

(a) providing a lubricant composition that consists essentially of a combination of (1) air drying type hydroxylated alkyl silicone resin mixed in an aromatic hydrocarbon solvent and (2) peanut oil or lanolin mixed in an aliphatic hydrocarbon solvent;

(b) applying said composition to an uncoated or precoated metal substrate in an amount sufficient to form a uniform dispersion of such composition across the substrate surfaces;

(c) permitting said composition to dry to form a lubricant film over the surfaces of said metal substrate;

(d) progressively forming by deep drawing the lubricant film covered substrate into a deeply drawn container having a depth which is greater than its width;

(e) applying a post-coating synthetic resin composition to said deeply drawn container without removing residual lubricant film, and

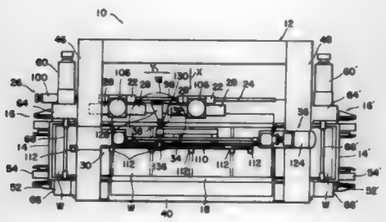
(f) subjecting said post-coated deeply drawn container to elevated temperature to form a bonded film on the surfaces of said container.

4,637,118

MACHINE TOOL FOR DRILLING PRINTED CIRCUIT BOARDS

Kiyoshi Sugiyama, Sasono, and Tomio Furuhashi, Numazu, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1986, Ser. No. 831,614
Claims priority, application Japan, Feb. 25, 1985, 60-36148
Int. Cl.⁴ B23Q *7/06*
U.S. Cl. 29—563 **15 Claims**



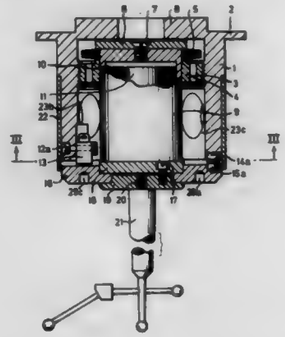
1. A machine tool for working on flat workpieces such as printed circuit boards, comprising:
(a) frame means;
(b) a work supply magazine mounted to the frame means on one side thereof for holding a stack of flat workpieces to be worked upon;
(c) a work recovery magazine mounted to the frame means on the other side thereof for receiving the workpieces that have been worked upon;
(d) a table mounted to the frame means intermediate the work supply magazine and the work recovery magazine;
(e) saddle means mounted to the frame means and constrained to linear travel relative to the same along a predetermined path extending between the work supply magazine and the work recovery magazine;
(f) saddle drive means for controllably moving the saddle means along the predetermined path;
(g) toolhead means mounted to the saddle means and disposed over the table for working on the workpieces on the table;
(h) a carriage disposed over the table and constrained to linear travel relative to the frame means in a direction parallel to the predetermined path of the saddle means;
(i) work transfer means mounted to the carriage for vertical displacement into and out of work transfer engagement with the workpieces in the work supply magazine and on the table; and
(j) drive coupling means for connecting and disconnecting the saddle means and the carriage, the carriage when connected to the saddle means being driven by the saddle drive means for enabling the work transfer means to transfer the successive workpieces from the work supply magazine to the table and thence, upon completion of the required working on the workpieces by the toolhead means, to the work recovery magazine, the carriage when disconnected from the saddle means allowing the toolhead means to work on the workpieces on the table by being driven by the saddle drive means independently of the carriage and the work transfer means.

4,637,119

CHUCKING DEVICE FOR INTERCHANGEABLE HOLDING OF PROBE PINS IN A COORDINATE-MEASURING INSTRUMENT

Horst Schneider, Königsbronn; Rainer Zech, Heidenheim, and Hans J. Neumann, Oberkochen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed May 31, 1984, Ser. No. 615,837
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320127
Int. Cl.⁴ B23Q *3/155*
U.S. Cl. 29—568 **10 Claims**



1. A clamping device for the interchangeable attachment of a work-contacting probe pin or probe-pin combination to the probe head of a coordinate-measuring instrument, wherein the probe pin or probe-pin combination has a connecting member of magnetic flux-conducting material, said clamping device comprising a reference support having means engageable with an applied connecting member in such manner as to unequivocally determine its position in the clamping device on the probe head, a permanent magnet and an electromagnet whose field is superposed on the field of the permanent magnet, the electromagnet being an electrical coil surrounding the permanent magnet and utilizing the permanent magnet as the central core of the electromagnet, the permanent magnet being movable toward and away from the reference support and being so positioned with respect to a connecting member applied to said support as to attract and retain the connecting member in its unequivocally determined position; the electromagnet, when excited in polarized opposition to the permanent magnet, effectively neutralizing the attraction of the permanent magnet to the applied connecting member; and spring means reacting between the support and the permanent magnet and urging the magnet in the direction away from the support and with a force which is less than the force of permanent-magnet attraction to an applied connecting member.

4,637,120

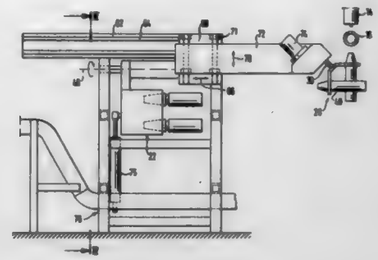
DEVICE FOR CHANGING OF TOOLS OR THE LIKE INTO THE WORK SPINDLE OF A MACHINE TOOL

Michael Geiger, Starnberg, Fed. Rep. of Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 7, 1985, Ser. No. 708,997
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 3408734
Int. Cl.⁴ B23Q *3/157*
U.S. Cl. 29—568 **11 Claims**

1. In a device for changing of tools in a work spindle of a machine tool, comprising a changing arm having a shaft and two arms which are aligned substantially radially with respect to an axis of rotation of said shaft, whereby said axis of rotation of said shaft is aligned at an angle of 45° with respect to an axis

of said work spindle, each arm having a gripping end provided with gripping devices, and means for adjustably moving said changing arm relative to said work spindle in a spindle axis direction, the improvement comprising wherein said gripping ends of said arms are offset laterally with respect to one another with reference to a reference plane which extends through said axis of rotation, so that axes of said tools held by



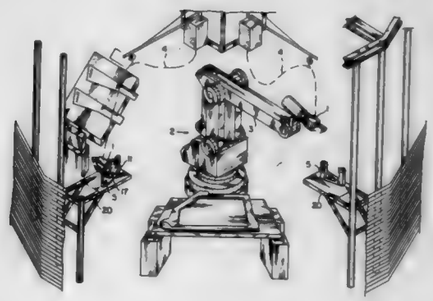
said gripping ends lie in spaced apart planes on opposite sides of and parallel to a plane containing said axis of rotation and do not, therefore, intersect, and wherein said gripping devices each include a support means for orienting said axes of said tools which are to be inserted into said work spindle so that said axes of said tools, on a side of said changing arm having said shaft thereon, extend away from said axis of rotation of said shaft.

4,637,121

METHOD OF OPERATING INDUSTRIAL ROBOTS, AND INDUSTRIAL ROBOT FOR CARRYING OUT THE METHOD

Johannes Wortmann, Georgsmarienhütte, Fed. Rep. of Germany, assignor to Wilhelm Karmann GmbH, Osnabruck, Fed. Rep. of Germany

Filed Mar. 9, 1984, Ser. No. 588,046
Claims priority, application European Pat. Off., Jun. 26, 1984, 84100810.5
Int. Cl.⁴ B23Q *3/155*
U.S. Cl. 29—568 **6 Claims**



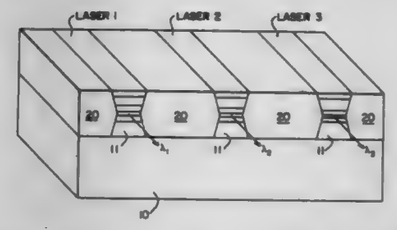
1. An industrial robot supporting a tool thereof, comprising: an arm to which a first tool comprising a connector plate, having clamping blocks, may be releasably connected, said arm including, upon performing given work, means for causing the robot to release the tool, the first tool being thereafter separated from the robot arm, while leaving the first tool provided for such work connected to one or more associated supply lines, and for connecting a second tool including one or more associated supply lines to the robot arm and thereafter causing the robot arm to move the second tool to a desired location, said means comprising a connector plate having clamping jaws adapted to be connected transversely of the connector plate with the clamping blocks, the connector plate of each tool on the one hand, and the connector plate of the arm on the other hand, comprising a pair of guide holes and a pair of mating guide studs, respectively, with the studs in an approaching phase entering the holes to effect positive-engagement final positioning, whereupon the operations for which the second tool is provided are carried out.

4,637,122

INTEGRATED QUANTUM WELL LASERS FOR WAVELENGTH DIVISION MULTIPLEXING

James K. Carney, Eden Prairie, and Robert M. Kolbas, Bloomington, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 533,187, Sep. 19, 1983, Pat. No. 4,577,321. This application Jul. 29, 1985, Ser. No. 759,798
Int. Cl.⁴ H01L *21/18, 21/20*
U.S. Cl. 29—569 L **2 Claims**



1. A process of fabricating an integrated quantum well laser structure which has a plurality of quantum well lasers for providing a plurality of light beams each having a different wavelength, the process steps comprising:
(a) providing a gallium arsenide substrate having a planar surface and patterning the substrate so that a spatial variation in epitaxial growth rates will occur;
(b) growing over said surface a first cladding layer;
(c) growing over said cladding layer an active sandwich layer which includes growing alternating thin layers of $Al_xGa_{1-x}As$ and $Al_yGa_{1-y}As$ followed by a final $Al_zGa_{1-z}As$ layer, said active sandwich layer having a controlled variation in thickness over the surface of said cladded substrate wherein said thickness is different from one to the next of said plurality of quantum well lasers;
(d) growing a second cladding layer over said active sandwich layer;
(e) growing a gallium arsenide layer over said second cladding layer;
(f) locating the position of the individual multiple lasers in the structure and etching away the unwanted layer material between the individual lasers down to the substrate to create voids between the individual lasers; and,
(g) refilling the voids by growing further cladding material into the voids to thereby provide isolation between the individual quantum well lasers.

4,637,123

METHOD OF STANDARDIZING AND STABILIZING SEMICONDUCTOR WAFERS

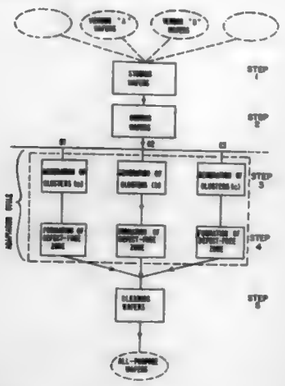
Victor Cascarra, Meaucy, and Jocelyne LeRoseille, Juvisy-/Orge, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 10, 1985, Ser. No. 743,329
Claims priority, application European Pat. Off., Jun. 20, 1984, 84430020.2
Int. Cl.⁴ H01L *21/02, 21/477*
U.S. Cl. 29—569 R **20 Claims**

1. A method of standardizing and stabilizing semiconductor

wafers supplied by a plurality of vendors for use in unipolar and bipolar device manufacture, said method comprising:

(a) sorting said wafers into a plurality of classes in accordance with the oxygen precipitation rate of said wafers and retaining all of said wafers; and



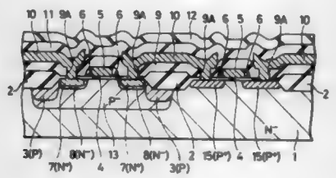
(b) generating in each of said wafers (1) clusters of a concentration corresponding to a predetermined cluster concentration range and (2) a defect-free zone of a thickness corresponding to a predetermined defect-free zone thickness by subjecting the wafers to a thermal adaptation cycle, said thermal adaptation cycle being different for different classes of wafers.

4,637,124

PROCESS FOR FABRICATING SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Kousuke Okuyama, Tachikawa; Norio Suzuki, Koganei; Satoshi Meguro, Tokyo, and Kouichi Nagasawa, Kunitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1985, Ser. No. 712,760
Claims priority, application Japan, Mar. 16, 1984, 59-49042
Int. Cl.[4] H01L *21/38*
U.S. Cl. 29—571 16 Claims



1. A process for fabricating a semiconductor integrated circuit device, comprising the steps of:

(a) providing a semiconductor substrate, said substrate having a well region in a surface region of the substrate, leaving a portion of the semiconductor substrate surface region in which the well region is not formed, the well region being of conductivity type opposite that of said portion of the semiconductor substrate surface region, said substrate having gate oxide films, formed on said well region and on said portion, where semiconductor elements are to be formed;

(b) forming gate electrodes for metal insulator semiconductor field effect transistors both on the gate oxide films on the well region and on said portion of the semiconductor substrate surface region, each gate electrode having opposed sides and adapted to have a channel region in a surface region of the respective well region and semiconductor substrate beneath each gate electrode;

(c) forming side wall spacers at each side of each of the gate electrodes;

(d) introducing a first impurity, of conductivity type the same as that of the semiconductor substrate, into the well region without introduction into said portion of the semiconductor substrate surface region, using the gate electrode on the well region and its respective side wall spacers as a mask;

(e) introducing a second impurity, of conductivity type the same as that of said first impurity, into the well region without introduction into said portion of the semiconductor substrate surface region, using the gate electrode on the well region and its respective side wall spacers as a mask, the second impurity having a lower diffusion speed in the well region than the first impurity;

(f) diffusing the first and second impurities into the well region, to form first and second semiconductor regions, respectively. therein, whereby, due to the different diffusion speeds in the well region, the first semiconductor region covers the second semiconductor region; and

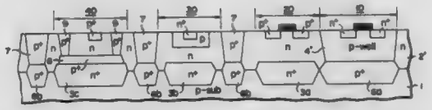
(g) introducing a third impurity, of conductivity type the same as the well region, into said portion of the semiconductor substrate surface region, using the gate electrode on said portion and its respective side wall spacers as masks, so as to form third semiconductor regions, whereby complementary metal insulator semiconductor field effect transistor can be formed in the semiconductor substrate, and whereby the side wall spacers suppress the first, second and third semiconductor regions from extending underneath the gate electrodes.

4,637,125

METHOD FOR MAKING A SEMICONDUCTOR INTEGRATED DEVICE INCLUDING BIPOLAR TRANSISTOR AND CMOS TRANSISTOR

Hiroshi Iwasaki, Chigasaki, and Shintaro Ito, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 652,087, Sep. 19, 1984, abandoned. This application Apr. 3, 1986, Ser. No. 847,150
Claims priority, application Japan, Sep. 22, 1983, 58-175363; Sep. 28, 1983, 58-179558
Int. Cl.[4] H01L *21/38*
U.S. Cl. 29—571 2 Claims



1. A method for manufacturing a semiconductor integrated device comprising the steps of:

selectively doping an impurity of a second conductivity type on a main surface of a semiconductor substrate of a first conductivity type, so as to form first and second high concentration buried regions of the second conductivity type for bipolar transistors and a third high concentration buried region of the second conductivity type for a MOS transistor;

selectively doping an impurity of the first conductivity type having a larger diffusion coefficient than that of said impurity of second conductivity type in said semiconductor substrate, so as to form fourth high concentration buried regions of the first conductivity type so as to respectively surround said first and second high concentration buried regions for the bipolar transistors and a fifth high concentration buried region of the first conductivity type for the MOS transistor, and simultaneously doping said impurity of the first conductivity type on said first high concentration buried regions;

epitaxially growing a semiconductor layer of the second conductivity type on a surface of said semiconductor substrate in which high concentration buried regions are formed, auto-doping said impurity of the first conductivity type which is doped in said first high concentration buried regions, and forming a sixth high concentration buried region of the first conductivity type to be in contact with a surface of said first high concentration buried region;

selectively diffusing an impurity of the first conductivity type from a main surface of said semiconductor layer so as to form a first well region of the first conductivity type to reach said fifth high concentration buried region;

selectively performing high-concentration diffusion of an impurity of the first conductivity type from the main surface of said semiconductor layer or selectively converting said semiconductor layer into an insulating layer, so as to form a first electrical isolation region reaching said fourth high concentration buried regions which are formed so as to respectively surround said first and second high concentration buried regions;

selectively performing high-concentration diffusion of an impurity of the first conductivity type from the main surface of said semiconductor layer, or selectively converting said semiconductor layer into an insulating layer, so as to form a second electrical isolation region reaching said sixth high concentration buried regions, the second electrical isolation region enclosing a part of said semiconductor layer of the second conductivity type; and

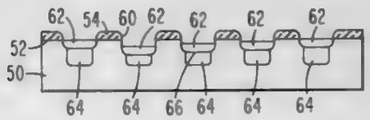
forming two vertical bipolar transistors and MOS transistors of first and second conductivity type channels; said bipolar transistors being formed in the semiconductor region of the second conductivity type surrounded by said first electrical isolation region, one, which includes said semiconductor region as the collector region, in that part of said semiconductor region in which said sixth high concentration buried region is not formed, and the other, which includes said sixth high concentration buried region as the collector, in the other part of said semiconductor region; the MOS transistor of the second conductivity type channel being formed in said first well region of the first conductivity type; and the MOS transistor of the first conductivity type channel being formed on the semiconductor region of the second conductivity type positioned above said third high concentration buried region.

4,637,126

METHOD FOR MAKING AN AVALANCHE PHOTODIODE

Alexander W. Lightstone, Quebec, Canada, assignor to RCA, Inc., Ste-Anne-de-Bellevue, Canada

Filed Aug. 30, 1985, Ser. No. 771,066
Int. Cl.[4] H01L *21/302*
U.S. Cl. 29—572 7 Claims



1. A method of making an avalanche photodiode comprising the steps of:

embedding first type conductivity modifiers into a semiconductor body have a first conductivity type through a portion of a surface thereof wherein the concentration of first type conductivity modifiers is greater than the concentration of first type conductivity modifiers originally in said body;

measuring the concentration of said embedded first type conductivity modifiers;

removing material from said portion of said surface corresponding to the variation in the measured local concentration of said embedded first type conductivity modifiers; and

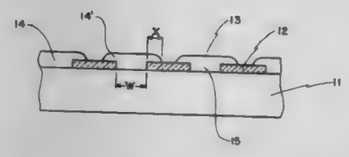
embedding second type conductivity modifiers having the opposite conductivity type to said first type conductivity modifiers into said body through said portion of said first surface in a concentration sufficient to convert a region of said body adjacent to said portion of said surface to said second conductivity type.

4,637,127

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE

Yukinori Kurogi; Nobuhiro Endo, and Kobetsu Tanao, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Japan

Filed Jul. 6, 1982, Ser. No. 395,110
Claims priority, application Japan, Jul. 7, 1981, 56-105882; Jul. 7, 1981, 56-105883; Jul. 7, 1981, 56-105884; Jul. 7, 1981, 56-105885; Jul. 7, 1981, 56-105886; Jul. 7, 1981, 56-105888; Sep. 29, 1981, 56-154376; Sep. 29, 1981, 56-154377; Sep. 29, 1981, 56-154378; Oct. 1, 1981, 56-156683; Oct. 1, 1981, 56-156684
Int. Cl.[4] H01L *21/205, 21/76*
U.S. Cl. 29—576 E 7 Claims



1. A method of manufacturing a semiconductor device comprising the steps of preparing a single crystal silicon substrate having a major surface with an insulating film formed thereon, at least one aperture selectively formed in said film, said insulating film including a silicon dioxide film and a silicon nitride film deposited on the side surface of said aperture formed in said silicon dioxide film, setting said single crystal silicon substrate within a chamber, and growing a silicon monocrystalline layer extending from the portion of said single crystal silicon substrate which is within said aperture, said grown layer extending onto said insulating film, said layer being grown by making dichlorosilane, hydrogen chloride, and a carrier gas flow into said chamber and by reacting them under a reduced gas pressure.

4,637,128

METHOD OF PRODUCING SEMICONDUCTOR DEVICE

Yoshihisa Mizutani, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

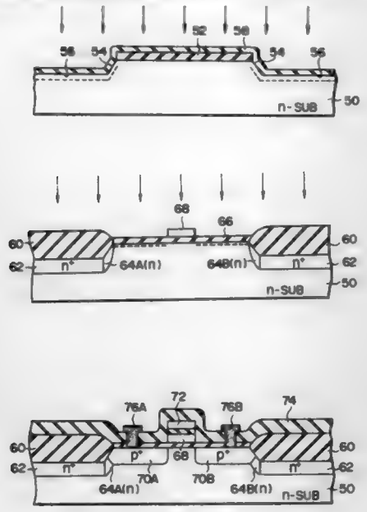
Filed Apr. 23, 1985, Ser. No. 726,399
Claims priority, application Japan, Jun. 18, 1984, 59-124687
Int. Cl.[4] H01L *21/308, 29/78*
U.S. Cl. 29—576 B 12 Claims

1. A method of producing a semiconductor device, comprising the steps of:

(1) forming a film pattern on a semiconductor substrate of a first conductivity type to define a masked surface as an element region;

(2) anisotropically etching the substrate with said film pattern as used as a mask to form a recess having a flat bottom and inclined side in a peripheral region surrounding said element region, said inclined side being located between the flat bottom and the masked surface of said element region and being disposed at a predetermined angle relative to the flat bottom;

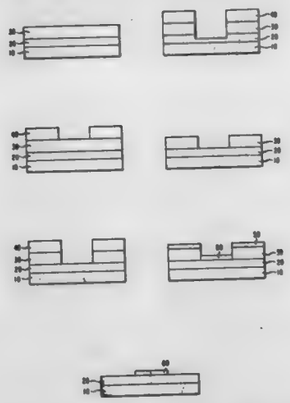
(3) forming a covering layer on said flat bottom and inclined side, said covering layer having a uniform thickness;
(4) implanting impurity ions of the first conductivity type into the substrate through the covering layer in a direction substantially perpendicular to said flat bottom;
(5) forming a field insulation layer on said flat bottom and inclined side and diffusing the implanted impurity ions in



the substrate to form first and second regions of the first conductivity type immediately below the respective flat bottom and inclined side, said first and second regions having different impurity concentrations as determined by said predetermined angle; and
(6) forming, in said element region, a third region of a second conductivity type in contact with said second region.

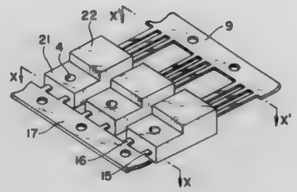
4,637,129
SELECTIVE AREA III-V GROWTH AND LIFT-OFF USING TUNGSTEN PATTERNING
Gustav E. Derkits, Jr., New Providence, and James P. Harbison, Summit, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jul. 30, 1984, Ser. No. 635,902
Int. Cl.⁴ H01L *21/20, 21/302*
U.S. Cl. 29—578 **13 Claims**

1. A method of semiconductor device fabrication comprising the steps of:
growing a Group III–V semiconductor structure;
forming a metal layer on the surface of said Group III–V semiconductor structure, said growing and forming steps performed in the same vacuum system;
pattern delineating said metal layer to expose a portion of the surface of said semiconductor structure;



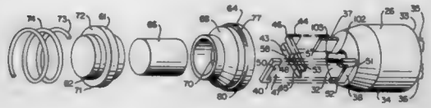
modifying the surface of said structure, said modifying step growing at least one Group III–V epitaxial layer; and
removing said patterned metal layer.

4,637,130
METHOD FOR MANUFACTURING A PLASTIC ENCAPSULATED SEMICONDUCTOR DEVICE AND A LEAD FRAME THEREFOR
Hiroyuki Fujii, Osaka; Kenichi Tateno, Shiga, and Mikio Nishikawa, Kyoto, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan
Division of Ser. No. 352,119, Feb. 25, 1982, Pat. No. 4,507,675.
This application Jan. 17, 1985, Ser. No. 692,385
Claims priority, application Japan, Mar. 5, 1981, 56-32229
The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.
Int. Cl.⁴ H01L *21/56*
U.S. Cl. 29—588 **5 Claims**



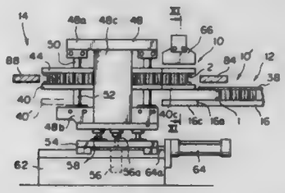
1. A method for manufacturing a plastic encapsulated semiconductor device comprising the steps of clamping at least external leads and strips of a semiconductor device assembly formed using a lead frame which has a first connecting band connected to said external leads extending from one side of a substrate support further used as a heat sink and a second connecting band connected to said strips extending from the other side of said substrate support, clamping at least said external leads and said strips by upper and lower molds so that said substrate support may float in a cavity formed by said upper and lower molds, injecting a plastic into the cavity while parts of said strips are disposed in said cavity, and cutting parts of said strips which extend outside a plastic encapsulating housing and cutting a connecting portion between said external leads and said first connecting band.

4,637,131
DIFFERENTIAL PRESSURE OPERATED ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME
Rolf H. Ochsner, Trumbull, Conn., assignor to Robertshaw Controls Company, Richmond, Va.
Division of Ser. No. 536,305, Sep. 27, 1983, Pat. No. 4,520,245.
This application Mar. 18, 1985, Ser. No. 713,186
Int. Cl.⁴ H01H *11/00*
U.S. Cl. 29—622 **8 Claims**



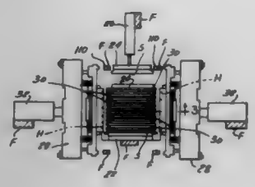
1. In a method of making a differential pressure operated electrical switch construction having a housing means carrying a pair of rigid substantially straight parallel terminals and an electrical switch means for electrically interconnecting said terminals together when said switch means is in one operating condition thereof and for electrically disconnecting said terminals from each other when said switch means is in another operating condition thereof, said method comprising the steps of disposing actuator means in said housing means so as to be responsive to differential pressures acting across the same, and operatively associating said actuator means with said switch means to place said switch means in said one condition thereof when having a certain differential pressure acting across the same and to place said switch means in said other condition thereof when having another certain differential pressure acting across the same, the improvement comprising the steps of forming a substantially rectangular opening that passes transversely and completely through an end of one of said terminals and that defines a substantially straight interior edge means of said one terminal, forming said switch means to comprise a movable switch blade having an L-shape defined by two legs thereof one of which is carried by the other of said terminals, disposing the other leg of said switch blade in said opening for engaging against said edge means and thereby place said switch means in said one condition thereof and for being out of engagement with said edge means and thereby place said switch means in said other condition thereof, and causing said other leg to be disposed at an angle other than a right angle relative to said one leg thereof when said other leg is engaging against said edge means.

4,637,132
APPARATUS FOR ASSEMBLING HEAT EXCHANGER CORE
Takatoshi Iwase, Anjo, and Akira Nakagawa, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Jul. 9, 1985, Ser. No. 753,622
Claims priority, application Japan, Jul. 10, 1984, 59-141372
Int. Cl.⁴ B23P *15/26*
U.S. Cl. 29—726 **14 Claims**



1. An apparatus for assembling a heat exchanger core assembly comprised of a pair of opposed inserts and a plurality of tubes and corrugated fins arranged in an alternate manner between the inserts, said apparatus comprising:
first guide rail means having a front end and a rear end;
second guide rail means having a front end and a rear end, the second guide rail means being arranged in such a manner that the rear end of the second guide rail means faces the front end of the first guide rail means so as to define a substantially continuous guide surface therealong;
a pair of chain attachment means extending between the rear end of the first guide rail means and the front end of the second guide rail means on either side of the guide rail means for movement in a direction from the rear end of the first guide rail means to the front end of the second guide rail means;
loading stations located between the rear end and the front end of the first guide rail means above the chain attachment means for loading the inserts, tubes and corrugated fins, respectively, on the first guide rail means, with the ends of the inserts and tubes engaged with the chain attachment means;
means for elevating the second guide rail means between a first position in which the second guide rail means is in alignment with the first guide rail means and a second position elevated from the first position in which the inserts and the tubes are disengaged from the chain attachment means; and
means for compressively clamping the core assembly on the second guide rail means when said second guide rail means is in the second position and for removing the core assembly from the second guide rail means.

4,637,133
APPARATUS FOR ASSEMBLING RADIATOR COMPONENTS
Herbert J. Freeman, Riverview, Mich., assignor to Progressive Tool & Industries Company, Southfield, Mich.
Filed Jul. 30, 1985, Ser. No. 760,403
Int. Cl.⁴ B23P *15/26;* **B21D** *39/00*
U.S. Cl. 29—727 **10 Claims**



1. An assembly apparatus for locating and fixing one end of a tube to a header within a tube receiving opening in the header, said apparatus comprising a frame, a tool carrier mounted on said frame for forward and rearward movement between spaced front and rear end limits, an expansion tool fixedly mounted on and projecting forwardly from said tool carrier for movement with said tool carrier to be located in a retracted position when said tool carrier is at its rear end limit and to be located at an extended position when said tool carrier is at said front end limit, said tool being operable when driven into the end of a tube to peripherally expand the tube end, a header carrier, means mounting said header carrier on said tool

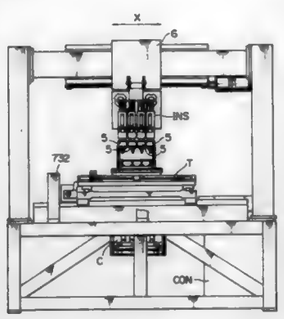
carrier for forward and rearward movement relative to said tool carrier in front of said tool carrier, spring means engaged between said tool carrier and said header carrier biasing said header carrier forwardly from said tool carrier to a selected end limit of forward movement relative to said tool carrier, said header carrier having a passage therethrough accommodating free movement of said tool through said header carrier upon movement of said header carrier relative to said tool carrier, header mounting means for detachably mounting a header on the front of said header carrier with the tube receiving opening in the header aligned with said tool, means operable when said tool carrier is at its rear end limit for locating a tube on said frame with one end of said tube aligned with said tube receiving opening and said tool and spaced forwardly from said header and rearwardly of the extended position of said tool, drive means for driving said tool carrier forwardly from its rear end limit to advance said header and said tool toward said tube, and stop means for stopping forward movement of said header carrier when said one end of said tube is located within the tube receiving opening in said header while accommodating continued forward movement of said tool carrier to said front end limit.

4,637,134

APPARATUS FOR AUTOMATICALLY INSERTING ELECTRONIC PART

Tomoya Tomita, Narita; Sotozi Hiramoto; Takesi Okubo, both of Chiba; Kuniyuki Matsuo, Narashino; Hiromoto Ashihara, Funabashi; Mitsuo Nakamura; Tsutomu Takahashi, both of Sakura; Motoaki Fujino, Narashino, and Kenji Hosaka, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 15, 1985, Ser. No. 702,265
Claims priority, application Japan, Mar. 9, 1984, 59-44015
Int. Cl.⁴ H05K *3/30*
U.S. Cl. 29—741 **9 Claims**



1. An apparatus for automatically inserting electronic parts comprising:

a plurality of electronic parts supplying means, each fixedly disposed at a respective predetermined position to store a multiplicity of electronic parts and to supply said electronic parts successively;

a corresponding plurality of feeding means respectively associated with said supplying means for feeding said electronic parts, after they have been respectively supplied successively from said electronic part supplying means, to a corresponding plurality of fixed predetermined supply positioning ends;

an insertion unit including a corresponding plurality of hand means, each for respectively grasping an electronic part at a respective one of said supply positioning ends to transfer the grasped electronic part to a respective predetermined specific fixed insertion position and inserting the leads of the grasped electronic part into a respective receiving hole of a printed board;

an X-Y table means for holding the printed board into which said electronic part is inserted and moving said printed board to locate said printed board at a desired position on the X-Y plane in accordance with an insertion position instruction;

means for providing an insertion position instruction different for each of said electronic parts;

a clinching means on the opposite side of said table from said insertion unit, to approach the printed board from a fixed original position to support the printed board and then clinch the leads of the electronic part inserted into the printed board; and

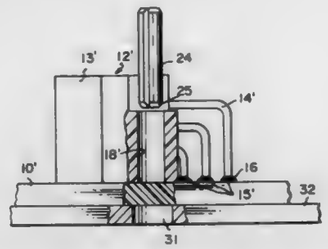
control means for controlling a predetermined operation of each of said means, said control means controlling each of said hands to operate separately from each other during the period of inserting the electronic part, and operate simultaneously during other periods including the grasping and transferring.

4,637,135

METHOD FOR MOUNTING A CONNECTOR TO A SUBSTRATE

Dimitry G. Grabbe, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 1, 1985, Ser. No. 718,769
Int. Cl.⁴ H05K *3/30*
U.S. Cl. 29—832 **5 Claims**



1. A method of mounting a connector to a substrate comprising:

placing a connector having electrical contacts and at least one mounting hole therein onto the substrate so as to align said electrical contacts with respective conductive paths on said substrate;

moving a pin along a longitudinal axis of said mounting hole; and

driving a leading end of the pin through the substrate causing the pin to be frictionally engaged with the substrate as well as an inner wall of the mounting hole thereby securing the connector to the substrate.

4,637,136

METHOD AND APPARATUS FOR WIRING SYSTEM INSTALLATION

Anthony J. Ryan, East Brunswick, and David J. DeCarlo, Toms River, both of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Aug. 31, 1984, Ser. No. 646,595
Int. Cl.⁴ H01R *43/00;* **G01B** *3/30;* **B23Q** *3/00;* **H05K** *1/00*
U.S. Cl. 29—872 **24 Claims**

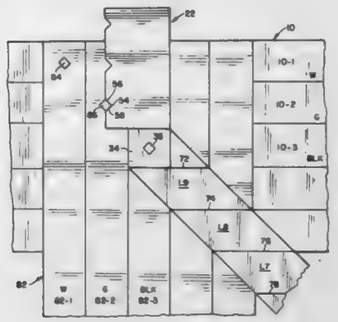
1. A connection zone location and selection device for application to first and second flat multiconductor cables secured to one another in overlapped relation to thereby define a a matrix of connection zones each having in registry therewith a distinct pair of conductors of said cables, said device comprising: a body member adapted for movement with respect to said cables means; on said body member for making perforations through said cables; and means for registering said body member with a preselected location on said cables or with perforations made by such perforating means for disposing said perforating means in registry with selected ones of said connection zones, said perforation means including a punch fixedly secured to said body member for movement therewith, said punch being operable selectively for making a perforation of predetermined configuration through said cables upon operation thereof and wherein such registration means includes a first index for registry with respective first and second margins of said cables, a second index fixedly spaced from said first index, a third index fixedly spaced from said second index and a fourth index aligned with and fixedly spaced from said second and third index each index having configuration in common with said predetermined configuration for registry with perforations made by said punch.

10. A kit of parts for making an updercarpet power installation, comprising:

(a) flat multiconductor cable having elongate conductors on centerlines spaced in electrical insulation laterally by measure D;

(b) electrical connectors adapted for insulation-piercing connection of conductors of plural such cables in overlapped arrangment; and

(c) a connection location and selection device for application to first and second such flat multiconductor cables secured to one another in overlapped relation to thereby define a matrix of connection zones each having in registry therewith a distinct pair of conductors of said cables, said device being adapted for movement with respect to said



cables and including means thereon for making perforations through said cables and means for registering said device with a preselected location on said cables or with perforations made by such perforating means for disposing said perforating means in registry with selected ones of said connection zones comprising less than all of said connection zones, each such registration zone is a square of said length D1 and diagonal length D2, said device including a plate member 5 having a perforating aperture therethrough, said plate member further including a first index for registry with respective first and second margins of said cables for placement of said perforating aperture in registry with an origin connection zone and a second index having configuration in common with said perforating aperture and space therefrom by length D2.

20. In a method for making a power installation with flat cables having plural conductors in electrical insulation, the steps of:

(a) assembling a first such cable in overlapping relation to a second such cable;

(b) supporting a punch and plural locator indices in mutually fixed relation;

(c) registering a first such locator index with a preselected location on such cable assembly;

(d) operating said punch to make a first perforation through said cable assembly;

(e) registering a second such locator index with said first perforation; and

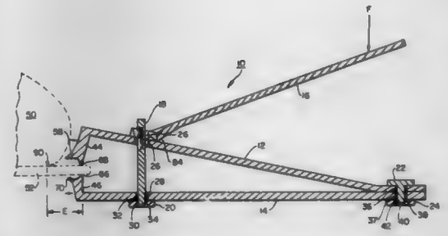
(f) operating said punch to make a second perforation through said cable assembly.

4,637,137

NAIL CLIPPER

Abbas Husain, 5 West Chestnut Ave., Merchantville, N.J. 08109

Filed Jul. 17, 1985, Ser. No. 755,913
Int. Cl.⁴ A45D *29/02*
U.S. Cl. 30—28 **5 Claims**



1. In a clipper for a nail comprising a combination of a pair of cooperative jaws having a normal tendency to separate, a means for connecting said jaws, said means being located in a pivotal relation with said jaws, an operating member cooperating with said means, a means on said operating member projecting therefrom for proximating said jaws when said operating member is operated in one direction, said pair further comprising an upper jaw and a lower jaw, said upper jaw having an upper sharpened edge, said lower jaw having a lower sharpened edge, said upper edge and said lower edge being adapted to engage each other, said upper and lower edges each having a concave curvature projection upon a horizontal plane and each edge being adapted to substantially conform to a curvature of one end of a human finger in plan view, said upper edge further having a concave curvature projection upon a vertical plane, said lower edge further having a convex curvature projection upon a vertical plane, the improvement comprising:

flange member integrally connected to the upper jaw above said upper edge, said flange member tapering orthogonally away from said edge;

means for supporting a nail located adjacent said lower edge and integrally connected to said lower edge; and,

fang-like projections located at each end of said upper jaw in a continuous curvature of said upper cutting edge, said lower cutting surface being adapted to register and mate with said fang-like projections.

4,637,138

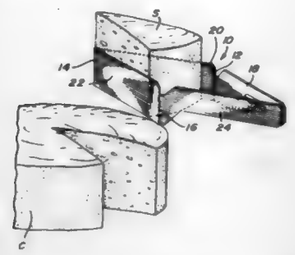
FOODSTUFF SLICER

Richard Piché, 215 Saint-Lambert St., Valleyfield, Canada (J6T 1V1)

Filed Feb. 18, 1986, Ser. No. 830,060
Int. Cl.⁴ A21C *15/04*
U.S. Cl. 30—114 **7 Claims**

1. A foodstuff slicer and server comprising a pair of cutting blades, a first hinge means hinging together one end of said blades, said blades normally diverging from said first hinge means to a predetermined maximum included angle of less than 90°, a pair of handles, second hinge means hinging one end of each handle to the opposite end of said blades respectively,

said handles converging from said second hinge means, third hinge means hinging together the opposite ends of said han-



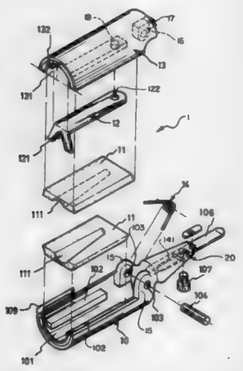
dles, and biasing means to urge said blades to said maximum included angle.

4,637,139

AMPOULE CUTTER

Fu Chen, No. 3, Alley 81, Lane 10, Sec. 2, Chang Ping Road, Taichung, Taiwan

Filed Dec. 7, 1984, Ser. No. 679,507
Int. Cl.[4] B26B *3/00*
U.S. Cl. 30—164.9 8 Claims



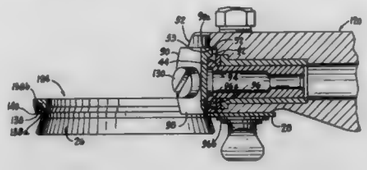
1. An ampoule cutter, comprising a pair of complementary longitudinally elongated shells having an open position and a closed position, each of the shells having a forward portion and a rearward portion, means for pivotably connecting the respective rearward portions of the shells together about a transverse axis, resilient means constantly urging the shells towards their open position, manually-releasable latching means for retaining the shells in their closed position against the force of the resilient means, whereby the shells will open when the latching means is released to allow an ampoule tip to be inserted between the shells, and whereby the shells then may be closed around the ampoule tip, and blade means within the shells for engaging the neck of the ampoule in the closed position of the shells, the blade means including a first elongated substantially-flat portion carried within one of the shells parallel to the longitudinal axis thereof and a second integral blade portion formed substantially at right angles to said first portion and extending toward the other of the shells, the arrangement being such that the ampoule may be rotated to engage the blade means and then snapped off.

4,637,140

BONING AND TRIMMING KNIFE

Louis A. Bettcher, Amherst, Ohio, assignor to Bettcher Industries, Inc., Birmingham, Ohio

Continuation-in-part of Ser. No. 330,553, Dec. 14, 1981, Pat. No. 4,509,261. This application Jan. 31, 1985, Ser. No. 696,456
Int. Cl.[4] A22C *17/04, 17/12*
U.S. Cl. 30—276 27 Claims



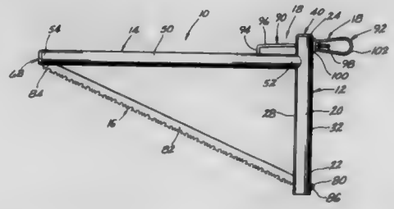
1. For use in a hand knife of the type having a rotary ring blade for cutting meat and other suitable products, a ring blade housing having an axially elongated peripherally continuous portion adapted to be secured to a handle, to cover a blade-driving pinion in the handle, and to guide a continuous ring blade rotatable in the housing, said housing having two axial ends and an outer periphery, a circular recess that opens toward one axial end of the housing, spaced inwardly of the outer periphery, said recess having two radially spaced concentric side wall surfaces one of which is a surface of revolution that forms the recess wider at the opening than interiorly thereof, and said housing having two peripherally spaced axially extending slots in the elongated portion opening through the other axial end.

4,637,141

MULTI-PURPOSE COLLAPSIBLE HAND SAW

Thomas P. Allen, 8211 Purdue, Tyler, Tex. 75703

Filed Feb. 18, 1986, Ser. No. 830,531
Int. Cl.[4] B27B *21/02*
U.S. Cl. 30—512 10 Claims



1. A multi-purpose saw selectively positionable in one of an assembled working mode and a storage mode, said saw comprising:

a hollow handle having opposing first and second ends, the handle further characterized as having a first blade slot formed in the first end on one side thereof and a second blade slot formed in the first end on the opposing side thereof, said first and second blade slots longitudinally aligned with the second blade slot having a length less than the first blade slot, said handle further having a plurality of apertures disposed near the second end thereof, a pair of said apertures being spatially disposed in axial alignment on opposing sides of the handle and in substantial longitudinal alignment with the first and second blade slots, a third of said apertures being disposed on one side of the handle in substantial longitudinal alignment with the first blade slot;

a hollow back bar having opposing first and second ends, and upper and lower sides, the first end being configured with a concave groove for mating abuttment with a portion of the handle when the saw is in the assembled working mode, the back bar partially receivable in the hollow of the handle in the storage mode of the saw, said back bar further characterized as having a back bar blade slot formed in the lower side of the back bar at the second end thereof, and as having a plurality of apertures disposed near the concave first end thereof, a pair of said apertures being axially disposed in the upper and lower sides of the back bar, a third of said apertures being disposed in the upper side of the back bar and in substantial longitudinal alignment with the back bar blade slot;

a saw blade having a first end portion, a medial portion and an opposed second end portion, in the assembled working mode of the saw the first end portion of the saw blade positionable within the first and second blade slots of the handle and the opposed second end portion of the saw positionable within the back bar blade slot of the back bar;

blade stop means supported by the first and second end portions of the saw blade for preventing passage of the first and second end portions of the saw blade through the first and second blade slots of the handle and through the back bar blade slot of the back bar so that the medial portion of the saw blade spans between the first end of the handle and the second end of the back bar when the saw is in its assembled working mode; and,

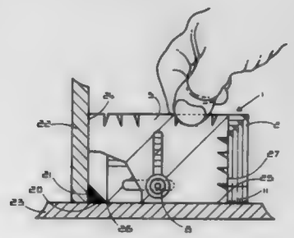
hook retainer means for interconnecting the handle and back bar together, in the saw working mode the hook retainer means being disposed through the axially aligned pair of apertures formed in the handle and engaging the back bar via the third aperture in the upper side thereof such that the hook retainer means, in combination with the tension of spanning the saw blade, secures the handle and back bar in a stable position, and in the storage mode the first end of the back bar being telescopically disposed within the hollow of the handle such that the third aperture in the handle is axially aligned with one of the first and second axially aligned apertures in the back bar such that a portion of the hook retainer means is disposed to engage the aligned third aperture of the handle and one of the first and second apertures of the back bar and to engage the first end of the handle so that the handle and back bar are secured together in the storage mode.

4,637,142

UNIVERSAL ADJUSTABLE WELD GAUGE

Kenneth R. Baker, 214 Kendra St., Vicksburg, Miss. 39180

Filed May 9, 1986, Ser. No. 843,398
Int. Cl.[4] G01B *5/02*
U.S. Cl. 33—169 D 8 Claims



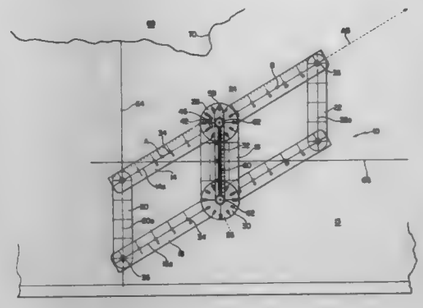
1. A gauge comprising first and second rectangular plates, said second plate terminating in an edge which traverses one corner thereof, the maximum length of width of said second plate being substantially the same as the length and width of the first plate, each plate having an elongated slot therein, said elongated slots being angled with respect to each other when the plates are overlapped with their length and width edges coinciding, and a spring biased fastening means extending through each of said slots to slideably secure said plates in a juxtaposed relationship, whereby the gauge may be used in measuring or checking the various dimensions of a weld.

4,637,143

PLOTTING DEVICE

Norman C. Telles, 80 Middle Rd., Acushnet, Mass. 02743

Filed Apr. 1, 1985, Ser. No. 718,781
Int. Cl.[4] G01C *3/00;* B43L *7/06*
U.S. Cl. 33—457 6 Claims



1. A plotting device comprising first, second, third, and fourth legs, said first and second legs being substantially parallel, said third and fourth legs being substantially parallel, extending between said first and second legs, and being pivotally connected thereto so that said first, second, third, and fourth legs cooperate to define a collapsible, parallelogram structure, leg angle determining means for determining the relative angles between an adjacent connected pair of said legs, a vector element pivotally attached to one of said legs, and vector angle determining means located at the point of pivotal attachment of said vector element for determining the relative angle between said vector element and said leg to which it is attached, said vector element and said vector element angle determining means being adjustably positionable at a plurality of points along the longitudinal extent of said leg to which they are attached and remaining stationary with respect thereto when said first and second legs are pivoted relative to said third and fourth legs.

4,637,144

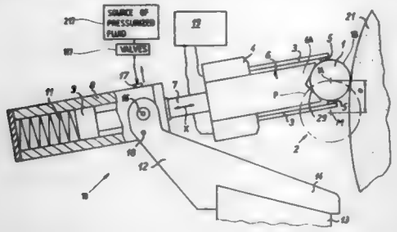
APPARATUS FOR MONITORING THE DIAMETERS OF CRANKPINS DURING TREATMENT IN GRINDING MACHINES

Roland Schemel, Stuttgart, Fed. Rep. of Germany, assignor to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 734,905
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1984, 3424405
Int. Cl.[4] G01B *5/20*
U.S. Cl. 33—550 27 Claims

1. Apparatus for monitoring the diameters of round objects, particularly of substantially cylindrical workpieces during their treatment in a machine tool such as a grinding machine, comprising supporting means defining a predetermined axis and arranged to mount objects in positions such that the axis of the object which is mounted in said supporting means is parallel to said predetermined axis and the object is free to circulate about the predetermined axis along a predetermined path; a guide having an object-contacting portion; at least one sensor provided on said guide and arranged to track the periphery of an object which circulates along said path while said portion of

said guide contacts the periphery of the circulating object; detector means provided on said guide and arranged to monitor the position of said sensor; and carrier means for said guide,



said guide being mounted on said carrier means for movement substantially radially of said path and said carrier means defining for said guide a pivot axis which is at least substantially parallel to said predetermined axis.

4,637,145

LOW PRESSURE MICROWAVE DRYING APPARATUS

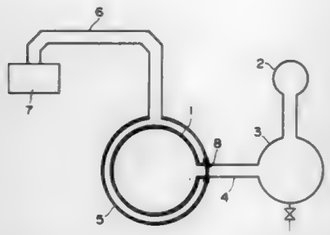
Ko Sugisawa; Yasushi Matsumura, both of Nara; Kazumitsu Taga, Neyagawa, and Ryuichi Hattori, Kyoto, all of Japan, assignors to House Food Industrial Company Ltd., Osaka, Japan

Filed Nov. 23, 1983, Ser. No. 554,861

Claims priority, application Japan, Nov. 24, 1982, 57-177993[U]

Int. Cl.⁴ F26B *23/08*

U.S. Cl. 34—1 **8 Claims**



1. A low pressure microwave drying apparatus which comprises a microwave-permeable and gas-impermeable drying chamber for drying a substance to be treated and a microwave-impermeable microwave applying chamber which encloses the drying chamber at a distance therefrom, the drying chamber being provided with a gas exhaust system and the microwave applying chamber being provided with a microwave generator, whereby a material being dried is subjected to a partial vacuum and the microwave generator operates at ambient pressure.

4,637,146

SPIN DRYER

Yasunari Motoki, Yokohama, and Yuji Ohkuma, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

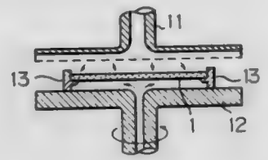
Filed Aug. 14, 1984, Ser. No. 640,643

Claims priority, application Japan, Sep. 19, 1983, 58-173546

Int. Cl.⁴ F26B *11/18*

U.S. Cl. 34—58 **6 Claims**

1. A spin dryer comprising a rotary stage for supporting a substrate to be dried, characterized in that said stage is provided with stopper means at the periphery of said substrate and periphery of said stage for supporting said substrate above the surface of said stage with the center of said substrate located eccentric with the shaft of said rotary stage, said substrate being fixed by said stoppers as said rotary stage rotates and a stationary cover is provided at a space from said substrate, said stationary cover having at least the same area as that of said



substrate, a number of openings being provided in the inner surface of said stationary cover facing said substrate and means for charging a drying gas through said cover and said cover openings onto said substrate for drying said substrate.

4,637,147

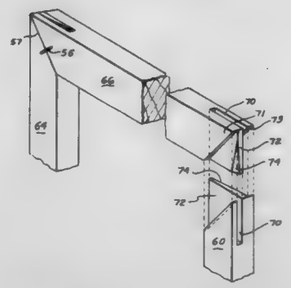
STRETCHER BARS

Clarence K. Wolsey, 441 Fairview, #3, Arcadia, Calif. 91006

Filed Apr. 30, 1985, Ser. No. 729,129

Int. Cl.⁴ D06C *3/08*

U.S. Cl. 38—102.1 **2 Claims**



1. For assembly in a generally rectangular stretch frame for artwork and the like, a plurality of elongated stretcher bars each having first and second end portions, a face surface and a rear surface,

each of said stretcher bars having at each of its said first and second end portions a face mitered section, a rear mitered section and a tongue therebetween, the mitered sections being adapted for abutting engagement to form miter joints, the first end portion tongue being adjacent to the face mitered section and the second end portion tongue being adjacent to the rear mitered section, each tongue section cooperating with one of the mitered sections to define a slot adapted to receive a tongue of another stretcher bar, and

at least one of the tongue sections of each stretcher bar defining a bevel on a corner portion thereof remote from the side defining said slot, thus to facilitate ready entry of the stretcher bar tongue sections into slots of mating adjoining bar tongue sections into slots of mating adjoining bars in non-interfering relationship with the tongue and mitered sections of mating bar end portions.

4,637,148

ELECTROLUMINESCENT BADGE

Dane D. Barlow, 27840 Palmer La., Madison Heights, Mich. 48071

Filed Jul. 8, 1985, Ser. No. 752,618

Int. Cl.⁴ A44C *3/00*

U.S. Cl. 40—1.5 **14 Claims**

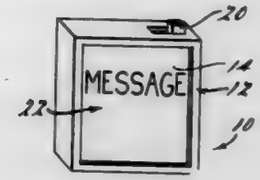
1. A badge comprising:

an electroluminescent panel having an outwardly facing planar surface which directly generates and radiates illumination when excited by an alternating current at a first potential;

a means for securing said panel to the wearer;

a battery for supplying direct current at a second potential; and

an electronic circuit receptive of said direct current for transforming said direct current into alternating current at said first potential and for suppling said transformed current to said panel said electronic circuit comprising a resonant tank circuit, a transistor amplifier coupled to said tank circuit, a transformer having a primary coupled to said transistor amplifier and having a secondary coupled to said panel, and a negative feedback means coupled between said secondary and said tank circuit to maintain oscillation and to thereby deliver alternating current to said panel to produce illumination.



4,637,149

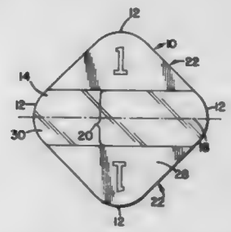
SEMI-PERMANENT FILING, FLAGGING AND INDEXING SYSTEM

Bernard W. Rivkin, 16287 Oak Creek Trail, Poway, Calif. 92064

Filed Aug. 15, 1983, Ser. No. 523,359

Int. Cl.⁴ A01B *23/06*

U.S. Cl. 40—2 R **23 Claims**



1. A flag comprising a unitary sheet of thin semi-rigid flexible material having a central adhesive-bearing section on one side and two enlarged adhesive-free tabs flanking said adhesive-bearing section, said flag being adapted to be releasably attached to a host along a proximate free edge of said host such that one of said flag adhesive-free areas protrudes from the edge of said host, while the other flag adhesive-free area overlays a portion of said host.

4,637,150

LIGHT BOX FOR PROVIDING A BACKGROUND ILLUMINATION HAVING BRIGHTNESS VALUES LOCALLY ADJUSTED TO THE DENSITY OF A TRANSPARENCY TO BE VIEWED BY MEANS OF THE LIGHT BOX

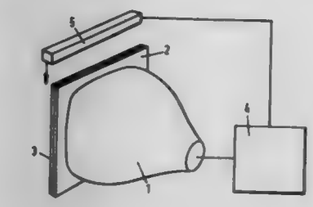
Ronald J. Geluk, Nootdorp, Netherlands, assignor to N.V. Optische Industrie "De Oude Delft", Netherlands

Filed May 17, 1985, Ser. No. 735,801

Claims priority, application Netherlands, May 18, 1984, 8401605

Int. Cl.⁴ G02B *27/02*

U.S. Cl. 40—361 **6 Claims**



1. An assembly for viewing a tranparency, such as an X-ray photograph, which comprises:

a screen for viewing said transparency, said transparency being positioned in front of said screen;

a light source means for illuminating said screen, said light source means capable of forming a light beam on controlled location and intensity on said screen;

means for controlling said light source means to illuminate said screen in accordance with a two-dimensional distribution of brightness level values adjusted to local density of said transparency;

a photosensitive detection means for scanning said transparency for measuring local brightness level values representative of local light intensity levels of said transparency;

random access memory means having memory locations corresponding to said two-dimensional distribution of brightness level values for storing in said memory location said brightness level values measured by said photosensitive detector means; and

a control device for modulating intensity of said light beam of said light source means inversely proportional to said brightness level values read out from said random access memory.

4,637,151

COMBINATION STADIUM CUSHION AND PENNANT

Samuel D. Love, 13510 Old Indian Head Rd., Brandywine, Md. 20613, and Mialan V. Love, 10145 Scotch Hill Dr., Upper Marlboro, Md. 20745

Filed Sep. 26, 1985, Ser. No. 780,637

Int. Cl.⁴ G09F *7/00*

U.S. Cl. 40—584 **7 Claims**

1. A combination portable stadium cushion and pennant, comprising:

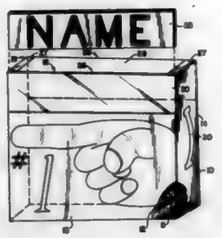
cushion means for providing a cushioned seat;

a message display means mounted to a top part of said cushion means and comprising an inverted U-shaped member having a plurality of pockets formed in side walls thereof; wherein:

said inverted U-shaped member has openings into said pockets at top edges thereof;

said pockets are slightly larger than a bumper sticker-like

means and made of a transparent material, so that said bumper sticker-like means can be recieved slidably and



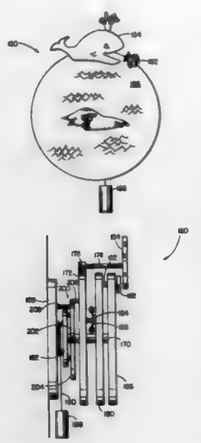
removably in said pockets with information on said bumper sticker-like means visible through said display means.

4,637,152

ROTARY DRIVE MECHANISM FOR ENERGIZING TOYS, KINETIC SCULPTURES, OR THE LIKE

David C. Roy, 32 Frontage Rd., Stafford Springs, Conn. 06076

Filed May 11, 1983, Ser. No. 493,726
Int. Cl.⁴ G09F *11/04*
U.S. Cl. 40—495 **9 Claims**



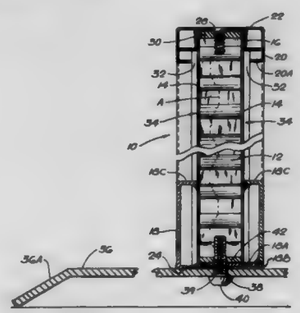
1. An intermittent rotary drive for toys, kinetic sculptures, and the like comprising:
- a mounting structure defining a horizontal axis of rotation in an operative position of the structure;
- a driving wheel mounted on the structure for rotation about the horizontal axis;
- motive means connected to the driving wheel for rotating the driving wheel in one direction about the horizontal axis;
- a driven inertia wheel mounted coaxially of the driving wheel for free rotation about the axis, the driven inertia wheel being rotationally unbalanced with a heavier portion of the wheel disposed at one side of the wheel in offset relationship from the axis of rotation whereby the heavier portion seeks a low point when rotation of the wheel about the horizontal axis stops; and
- escapement means intermittently connecting the driving and driven wheel for causing the driving wheel to engage and rotate the driven wheel in the one direction about the axis and allowing the driven wheel to rotate in the one direction relative to the driving wheel whereby the driven wheel can advance rotationally ahead of the driving wheel in the one direction and the heavier portion of the driven wheel can stop or reverse the rotation in the one direction until the escapement means brings the driving wheel and the driven wheel back into engagement.

4,637,153

MULTIPLE CONFIGURATION DISPLAY SIGN SYSTEM

Michael Kane, River Forest, and Lawrence R. Hogan, Lake Villa, both of Ill., assignors to Kane Graphical Corporation, Chicago, Ill.

Filed Jun. 11, 1984, Ser. No. 618,955
Int. Cl.⁴ G09F *7/00*
U.S. Cl. 40—605 **26 Claims**



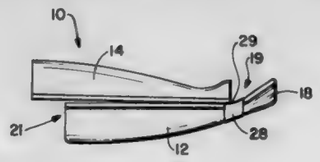
1. A mutliple configuration display sign system comprising:
- at least five upright sign units, each unit having at least two display faces, a top side, a bottom side and two opposite vertical sides;
- top side linking means for linking the top sides of the units; and bottom side linking means for linking the bottom sides of the units; the top side linking means and the bottom side linking means in combination joining the units by abutting together their vertical sides to arrange the units in vertical side-by-vertical side relationship and thereby forming a closed substantially pentagonal configuration wherein only one display face of each unit is presented for display of alpha-numeric indicia and wherein the top side linking means and the bottom side linking means include a plurality of generally triangular plates, each plate having a peripheral edge configuration so that when the plates are abutted together the peripheral edges form a substantially pentagonal configuration.

4,637,154

BULL ELK CALLING DEVICE

Donald R. Laubach, P.O. Box 127, Gardiner, Mont. 59030

Filed Mar. 14, 1986, Ser. No. 839,779
Int. Cl.⁴ A01M *31/06*; A63H *5/00*
U.S. Cl. 43—1 **2 Claims**



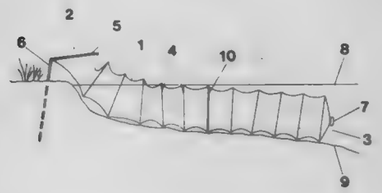
1. A bull elk calling device comprising:
- a first and second rectangular, substantially coextensive, planar members;
- the first and second members being hingedly joined along corresponding longitudinal edges thereof, but with the first and second members being offset from one another thereby creating a lip portion of the first member extending beyond the second member at a first end of the device;
- the first and second members being bowed along their longitudinal axes thereof having a first bow at the first end of the device which is of small size which bow continues into a bow of larger size at a second end of the device opposite the first end;
- the first and second members being positioned opposing one another with their open concave sides facing one another to form a double-tapered cavity at the first end thereof sandwiched between the first and second members and extending in a direction transverse to their longitudinal axes;
- an endless elastic band is stretched around the first member transverse to the longitudinal axis of this member on the lip portion of the first member and is positioned at the entrance into the cavity formed between the first and second members to form a reed element;
- the first and second members further being constructed of resilient and flexible material such that when the two members are squeezed together, the size of the double-tapered cavity is substantially reduced beginning a the ends of the double-tapered cavity and working towards the center of the cavity and when pressure on the two members is released, the size of the double-tapered cavity is restored to its normal size.

4,637,155

KEEPNETS

Michael D. A. Johnson, Flat D, 1 Morpeth Terrace, Westminster, London SW1 P1EN, England

PCT No. PCT/GB85/00230, § 371 Date Jan. 27, 1986, § 102(e) Date Jan. 27, 1986, PCT Pub. No. WO85/05537, PCT Pub. Date Dec. 19, 1985
PCT Filed May 29, 1985, Ser. No. 828,330
Claims priority, application United Kingdom, May 31, 1984, 8413898; Jan. 12, 1985, 8500899
Int. Cl.⁴ A01K *69/02, 79/00*
U.S. Cl. 43—7 **18 Claims**



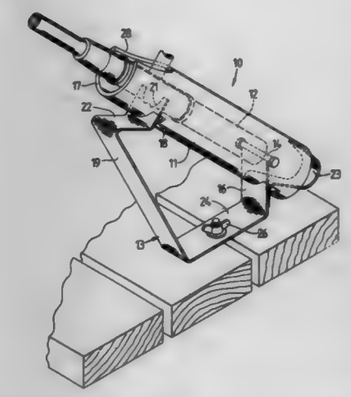
1. A keepnet comprising an elongate tubular net open at one end and closed at the other, a substantially rigid ring or frame at the open end serving to hold open the mouth of the net, and a terminal ring or frame at the closed end thereof, said net being supported by and fixedly attached to a plurality of rings or frames along the length thereof intermediate said mouth-ring or frame and said terminal ring or frame, said rings or frames being spaced and self supportive when operably placed within a body of water and freely collapsible upon each other when removed from said body of water, wherein the improvement comprises: at least one of said intermediate rings or frames being substantially rigid whilst the majority thereof are substantially flexible relative to said at least one substantially rigid ring, and said mouth-ring or frame being sufficiently larger than said intermediate rings or frames including said at least one substantially rigid ring or frame, to permit passage of the latter therethrough, whereby a portion of the keepnet may be collapsed and said at least one substantially rigid ring can serve as a secondary mouth-ring during removal of fish from said net and the effective length of the net is reduced during said removal of fish.

4,637,156

ROD HOLDER

Billy R. Simmons, Odenville, Ala., assignor to Nancy B. Crews, Odenville, Ala., a part interest

Filed Jun. 19, 1986, Ser. No. 875,972
Int. Cl.⁴ A01K *97/10*
U.S. Cl. 43—21.2 **14 Claims**



1. Apparatus for holding a fishing rod having a handle portion and a reel mounting bracket, comprising:
- (a) a tubular member having a length greater than the handle portion of said rod and a diameter greater than said handle portion and having a transverse slot through its under surface near one end thereof;
- (b) a mounting bracket pivotally attached to said tubular member distal said one end and having a first upright portion extending upwards through said transverse slot;
- (c) spring means for biasing said one end downwardly; and
- (d) means for fastening said mounting bracket to a support surface.

4,637,157

MULTI PART BUTT AND REEL SEAT USED ON FISHING RODS

Stuart M. Collins, 526 NE. 190 St., North Miami Beach, Fla. 33179

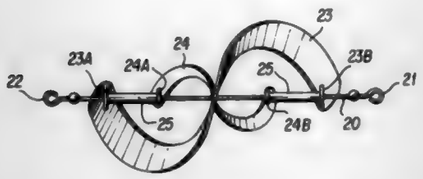
Filed Apr. 7, 1986, Ser. No. 848,769
Int. Cl.⁴ A01K *87/06*
U.S. Cl. 43—22 **9 Claims**



1. A multi part butt assembly of the type designed for use on a trolling type fishing rod, said assembly comprising:
- (a) a shank portion formed of rigid, high strength material and having an elongated configuration and a substantially hollow interior portion extending along the length of said shank portion,
- (b) a first hole formed in one end of said shank and a second hole formed in an opposite end of said shank, said first and said second holes disposed in coaxial relation to one another,
- (c) a gimble portion including an elongated finger defining a leading end thereof, said finger including an open channel for seating the fishing rod and an outside diameter of lesser dimension than a trailing end of said gimble portion,
- (d) said gimble portion fixedly secured to said shank portion

by passing said finger portion through said first hole and into a press fitted engagement with an interior surface of said shank portion adjacent said first hole,
(e) a guide tube having an elongated configuration including one end press fitted into fixed engagement with an interior surface of said shank portion adjacent said second hole and extending outwardly therefrom through said second hole in coaxial disposition to said shank portion,
(f) a reel seat tube telescopically disposed and supported on an outwardly protruding end of said guide tube and including an exteriorly threaded surface along at least a portion of the length thereof,
(g) a fixed hood secured adjacent one end of said reel seat tube and a movable hood being movably mounted on said exterior threaded surface for selective movement towards and away from said fixed hood,
(h) said reel seat tube further including locking means mounted thereon adjacent said movable hood for locking position thereof relative to said fixed hood,
(i) said guide tube having an internal diameter along its length sufficient to slidingly receive a rod blank in close contact therein,
(j) said hollow interior portion having a straight line configuration and a substantially common inner diameter along its length from said opposite end adjacent said second hole to a point substantially adjacent said gimble portion.

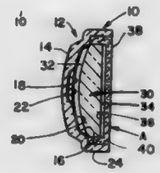
4,637,158
ARCHIMEDIAN SCREW TYPE SPINNER LURE
Dennis D. Reid, P.O. Box 246, Schriever, La. 70395
Filed Apr. 11, 1986, Ser. No. 850,831
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.19 6 Claims



1. An archimedian screw spinner lure comprising a shaft having a line connector at one end and a hook and bait connector at the other end, a first archimedian screw spinner rotatably mounted on said shaft, a second archimedian screw spinner having an internal flight diameter greater than the external flight diameter of said first screw so that said first screw spinner will freely rotate within said second screw spinner, and spacer means carried by said shaft positioned between the rotary mounts of said first and second archimedian screw to position the first and second screws so that each may rotate relative to the other in either clockwise or counterclockwise direction depending upon flight direction of each screw to assure free independent movement of each screw relative to one another.

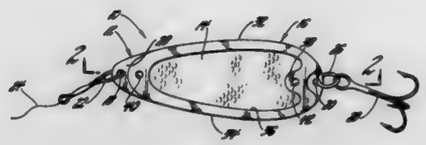
4,637,159
ARTIFICIAL EYE
Joseph E. Kulis, 280 Grand Blvd., Beford, Ohio 44146
Filed Oct. 28, 1985, Ser. No. 792,058
Int. Cl.[4] A61F *1/16*
U.S. Cl. 43—42.32 18 Claims

1. A simulated eye construction comprising:
a generally cup-shaped member including a protruding transparent first lens portion having a convex outer face;
a transparent second lens member positioned in said cup-shaped member behind said first lens portion;
reflecting means positioned behind said second lens member for reflecting at least some of the light entering said cup-shaped member back through said first and second lens members;



closure means for closing the open end of said cup-shaped member; and,
holding means for holding said second lens in place in said cup-shaped member.

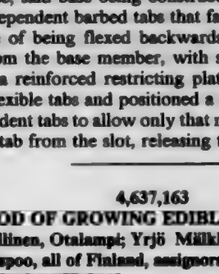
4,637,160
FISH SKIN LURE
Andrew L. Biskup, 6N480 Fairway La., Itasca, Ill. 60143
Filed May 29, 1986, Ser. No. 868,005
Int. Cl.[4] A01K *85/04*
U.S. Cl. 43—42.33 18 Claims



1. A lure for casting or trolling for fish and adapted to be connected to the line of an angler's tackle at one end and adapted to support a hook at the other end, a base member, a fish skin from a fish covering one surface of said base member, a holder member having an outer configuration in general conformity with the outer configuration of said base member and adapted to be moved relative to said base member, said holder member overlying said fish skin and having an opening formed therein of a length substantially equal to the length of said base member so as to expose a major portion of said fish skin, and fastening means for fixedly connecting said holder member to said base member so as to compress portions of said fish skin therebetween and maintain said fish skin on said base member while said lure is in the water.

4,637,161
APPARATUS FOR UNDERGROUND INSECT AND ANIMAL EXTERMINATION
Loren J. Turner, 2125 E. Roby Ave., Porterville, Calif. 93257
Filed Jul. 1, 1985, Ser. No. 750,494
Int. Cl.[4] A01M *1/20, 19/00*
U.S. Cl. 43—130 14 Claims

1. An apparatus for exterminating underground insects and animals, said apparatus including an upstanding tubular ground probe, means at the upper end of said probe for attaching the outlet end of a pressurized steam supply hose thereto, a downwardly domed shield mounted on the lower of said probe for sliding movement therealong and with said probe extending centrally downwardly through said shield, said shield and probe including coacting means limiting downward movement of said shield along said probe, said shield including a downwardly opening vent outlet opening for venting steam from



beneath said said shield, said vent outlet opening being spaced above the lower periphery of said shield.

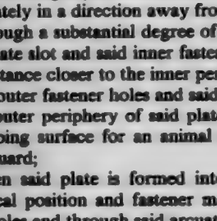
4,637,162
TAMPER-PROOF RODENT BAIT STATION
Daniel A. Sherman, 1355 Bobolink Pl., Los Angeles, Calif. 90069
Filed Jan. 31, 1986, Ser. No. 824,881
Int. Cl.[4] A01M *1/20*
U.S. Cl. 43—131 1 Claim

1. A tamper-proof rodent bait station consisting of a top and base member, the top member having an animal entrance hole on each of two sides and having a plurality of locking tabs and slots that cooperate to form a tamper-proof seal between the top and base; said base being constructed with upwardly extending independent barbed tabs that face outwardly and that are capable of being flexed backwards to release the cover member from the base member, with said base member also containing a reinforced restricting plate located directly behind said flexible tabs and positioned a metered distance from the independent tabs to allow only that movement necessary to release the tab from the slot, releasing the cover member.

4,637,163
METHOD OF GROWING EDIBLE MUSHROOMS
Markku Pellinen, Otalampi; Yrjö Miikki, and Aimo Niskanen, both of Espoo, all of Finland, assignors to Valtion Teknillinen Tutkimuskeskus, Finland
PCT No. PCT/FI84/00044, § 371 Date Feb. 13, 1985, § 102(e) Date Feb. 13, 1985, PCT Pub. No. WO85/00002, PCT Pub. Date Jan. 3, 1985
PCT Filed Jun. 14, 1984, Ser. No. 709,689
Claims priority, application Finland, Jun. 14, 1983, 832135
Int. Cl.[4] A01G *1/04*
U.S. Cl. 47—1.1 7 Claims

1. A method of producing wood-rotting edible mushrooms *Lentinus edodes, Kuehneromyces mutabilis,* Pholiota spp. and Pleurotus spp. utilizing a bed material mixed from a carbohydrate, lignin and protein containing compound material and minor amount of peat, said bed comprising mainly a cellulose containing material, minor amounts of proteinaceous and farinaceous substance as well as water, said method comprising adjusting the bed material to pH value below 5 prior to heating, packing the bed material into packages and heating the packages to an internal temperature of at least 80 and not higher than 100° C., firming the substrate bed without the use of a form; transferring a mushroom mycelium onto the bed; growing the mycelium in the bed at a temperature suitable for the species and strain; and removing the bed from the package for the production of edible mushrooms.

4,637,164
SQUIRREL GUARD
Harold O. Brown, 170 Landor Pl., Athens, Ga. 30606
Filed Feb. 20, 1986, Ser. No. 831,709
Int. Cl.[4] A01G *17/12*
U.S. Cl. 47—24 17 Claims



1. An animal guard for tree trunks comprising:
(a) an annular flexible plate having a central circular opening therein and a skirt portion completely around said central opening:
(b) said skirt portion having at all times a constant width and an inner and outer periphery;
(c) said plate having a first flat planar position and a second truncated conical position and having at least one radial slit extending completely through said skirt from said inner to said outer periphery;
(d) said radial slit forming said plate into a separable member having first and second radial edges of said slit when in said first flat position for permitting said plate to be positioned about a tree trunk;
(e) a pair of spaced fastener holes in said skirt radially aligned and position adjacent said first radial edge of said slit, one of which is the inner and the other of which is the outer fastener hole;
(f) a pair of spaced parallel arcuate slots in said skirt and radially spaced from each other one of which is the inner and the other of which is the outer arcuate slot;
(g) said arcuate slots being radially positioned so that said inner fastener hole and said inner arcuate slot and said outer fastener hole and said outer arcuate slot cooperate with each other respectively when said plate is in said second truncated conical position;
(h) each of said arcuate slots being spaced radially from the axis of said plate a distance substantially equal to the radial distance from the axis of said plate to their respective fastener holes;
(i) said arcuate slots being adjacent a second radial edge and extending arcuately in a direction away from said second radial edge through a substantial degree of arc;
(j) said inner arcuate slot and said inner fastener hole being a substantial distance closer to the inner periphery of said plate than said outer fastener holes and said outer arcuate slot is to said outer periphery of said plate so as not to provide a gripping surface for an animal attempting to pass said tree guard;
(k) whereby when said plate is formed into said second truncated conical position and fastener means are positioned in said holes and through said arcuate aligned slots for positioning about a tree trunk, said plate may be adjusted to trunk size and said fastener means locked to

prevent slippage in said slots thereby maintaining a tight fit at all times about said trunk;

(l) said plate includes a third arcuate slot extending radially from the axis of said plate along a position uniformly between said inner and said outer fastener holes in an arcuate direction away from said first radial edge and extending in a direction opposite to said inner and outer arcuate slots a distance substantially equal to said substantial degree of arc of said inner and outer arcuate slots, said third acruate slot is positioned intermediate said first and second arcuate slots; and,

(m) a fastening notch formed in said second radial edge so as to align and cooperate with said third arcuate slot when said plate is in said second truncated conical position.

4,637,165

CORNER DEFLECTION ASSEMBLY

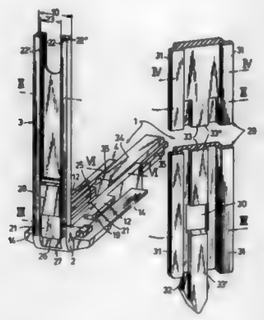
Alfred Schneider, Kreuztal, Fed. Rep. of Germany, assignor to Siegenia-Frank KG, Siegen, Fed. Rep. of Germany

Filed Feb. 17, 1984, Ser. No. 581,275

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1983, 8304739[U]

Int. Cl.⁴ E05D *15/52*

U.S. Cl. 49—192 **19 Claims**



1. Corner deflector assembly of a connecting rod type lock, insertable into undercut, profiled grooves of the frame profiles of windows and doors of metal, plastic, or the like, having an angled casing enclosing a deflection member of flexible bands, the angled casing having a first leg and a second leg, each of the legs of the angled casing guiding an intermediary connection member connected with the deflection member, in which the first leg has a smaller cross sectional height than the second leg, and in which the intermediary connecting member guided by this first leg serves at the same time as a sliding bolt and displays a cam which is guided in an elongated slot at the outside of the first leg, characterized by the fact that:

the elongated slot (23) guiding the cam (28) passes through the first leg (3) to the apex (27) of the angled casing and is opened at the outside of the second leg (4) and that the intermediary connecting member which forms a sliding bolt (29) engages in the elongated slot (23) of the first leg (3) by means of a longitudinal batten (33) molded onto the underside, said batten being carried through up to the free end of a bolt tongue (32).

4,637,166

WIRE COMPENSATOR FOR A WIRE DRIVING WINDOW REGULATOR

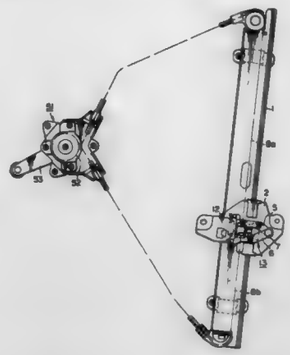
Hiroshi Ujihara, Yokohama, Japan, assignor to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Sep. 11, 1985, Ser. No. 774,917

Claims priority, application Japan, Sep. 14, 1984, 59-138755[U]

Int. Cl.⁴ E05F *11/48*

U.S. Cl. 49—352 **5 Claims**



1. A wire compensator for a wire driving window regulator in which a carrier plate attached to a window glass is mounted onto a vertical guide rail to be raised and lowered freely, flexible wires are extended from a gearing device to the carrier plate along said guide rail so as to form substantially a closed loop and to be driven in either normal and reverse directions by the gearing device along the closed loop, and each end portion of said flexible wires is engaged with said carrier plate, characterized by that:

a pair of moveable levers comprising two lever members pivotally mounted to the carrier plate and separated at a certain distance with each other, said each end portion of the wires is secured to said levers, and said levers are biased by means of a spring in a direction for giving tension to the wires, so that the lever members may be rotated by the elasticity of the spring and elongation of the wires can be absorbed to keep the wires stretched at a certain tensile strength.

4,637,167

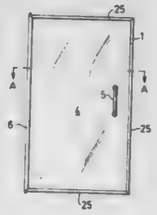
DOOR

Torsten Svensson, Sollentuna, Sweden, assignor to Termofrost Sweden AB, Spanga, Sweden

Filed Feb. 11, 1985, Ser. No. 700,314

Int. Cl.⁴ E05F *1/10*

U.S. Cl. 49—386 **3 Claims**



1. A door for refrigerating and freezer chambers, comprising a door frame, which supports at least one glass pane for exposing through the door refrigerated or frozen goods in said chamber, which door frame at one vertical edge (7), via an elongate first frame section, is intended to be hingedly suspended in a door case (2) and which door frame and door case cooperate with a torsion spring (11) having two ends, said torsion spring (11) being locked at one of its ends relative to the door frame and at the other of its ends relative to the door case, wherein nipples or the like connect to the torsion spring at its upper end (12) and its lower end (13), said nipples or the like, formed as journals (17,18), cooperate with associated bearing means (20, 21) in the door case (2) to thereby pivotally suspend said door; characterized in that means in said door rigidly secure said one vertical edge (7) of said first door frame section (6) to and along only one edge of the glass pane in a U-shaped groove (8) provided along the entire length of said first frame section (6) to provide the sole support for the door; said first frame section comprising an inner longitudinal cavity (10) provided along the entire length of the section, in which cavity said torsion spring extends along substantially the whole length of the section (6); and the remainder of the door frame comprises at least one thin non load bearing strip (25) mounted along each of the remaining three edges of the glass pane.

4,637,168

SPECTACLE LENS EDGE GRINDING MACHINE

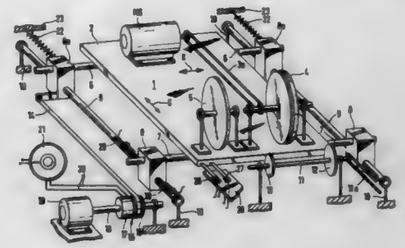
Fritz Kötting, Dormagen, and Günther Barwasser, Neuss, both of Fed. Rep. of Germany, assignors to Wernicke & Co. GmbH, Düsseldorf-Eller, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 502,098, Jun. 8, 1983, abandoned. This application May 22, 1985, Ser. No. 736,801

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1982, 3221713

Int. Cl.⁴ B24B *17/02*

U.S. Cl. 51—50 PC **14 Claims**



1. A spectacle lens edge grinding machine, comprising:

a machine frame;

a support mounted on and movable relative to said machine frame;

a grinding wheel mounted on said support;

a template abutment mounted on said support;

a support shaft for a spectecle lens and a template, said support shaft being fixedly mounted on said machine frame; with said support being movable toward and away from said support shaft;

a spring arrangement operatively associated with said machine frame and said support for bringing the latter into a starting position; said spring arrangement, when viewed in the direction of movement of said support toward said support shaft, acting on that side of said support which is remote from said support shaft; and

a tensioning device operatively associated with said machine frame and said support for effecting movement of the latter toward said support shaft; said tensioning device, when viewed in the direction of movement of said support toward said support shaft, acting on that side of said support which faces said support shaft; said tensioning device being actuatable, and the tensioning force thereof being regulatable to go beyond variation of pressure of engagement of the lens before beginning of grinding procedure to vary the pressure during such grinding procedure dependent upon the shape and the resulting edge thickness of the lens being ground in such grinding procedure, such variation of pressure engagement of tbe lens including less grinding pressure of engagement when grinding a thinner edge portion of the lens edge and greater grinding pressure when grinding a thicker edge portion of the lens.

4,637,169

APPARATUS FOR CONTROLLING THE ADVANCE OF A MACHINE TOOL TOWARD A WORKPIECE

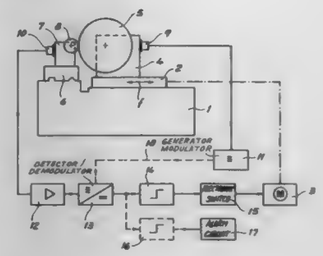
Hans Sigg, Neuchatel, Switzerland, assignor to Meseltron SA, Corcelles, Switzerland

Filed Aug. 16, 1985, Ser. No. 766,373

Claims priority, application France, Aug. 27, 1984, 84 13326

Int. Cl.⁴ B24B *49/10*

U.S. Cl. 51—165.77 **7 Claims**



1. A machine tool apparatus for controlling the advance of a tool (5) during its approach toward a workpiece (8), said machine tool apparatus comprising:

(a) a framework (1),

(b) means (3) for moving said tool on said framework with respect to said workpiece between a non-engaged inoperative position and an engaged operative position of said tool with respect to said workpiece,

(c) acoustic energy generating means (9) for periodically applying acoustic energy to a first element constituted by said tool and said workpiece, said acoustic energy having a predetermined frequency,

(d) modulating means operatively coupled to said acoustic energy generating means for modulating said energy,

(e) acoustic energy detecting means (10) for detecting in a second of said elements acoustic energy at said predetermined frequency exceeding a predetermined level,

(f) demodulating means operatively coupled to said acoustic energy detecting means for demodulating detected acoustic energy, and

(g) control signal generating means associated with said acoustic energy detecting means and said demodulating means for generating a control signal upon detection and demodulation of said acoustic energy, said control signal generating means being connected to said moving means to reduce speed thereof when said control signal is applied thereto.

4,637,170

ABRASIVE APPARATUS

Aleck Block, 900 Warner Ave., Los Angeles, Calif. 90024

Filed Jan. 17, 1985, Ser. No. 692,234

Int. Cl.⁴ B24B *41/04*

U.S. Cl. 51—168 **43 Claims**

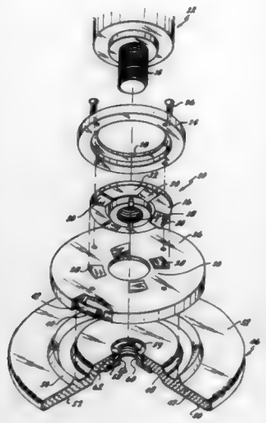
1. In combination for use with an abrasive disc having first and second spaced and parallel faces and including abrasive particles on the first face to act upon a workpiece,

a threaded arbor,

a camming member disposed on the arbor and having an internally threaded bore and having a first face and having at least one inclined surface on the first face, and

a reinforcing plate having an internal bore and disposed on the arbor and having a first face disposed in cooperative

relationship with the first face on the camming member and having on the first face at least one inclined surface cooperative with the inclined surface of the camming member for variable positioning axially along the arbor in accordance with the relative dispositions of the inclined surfaces on the camming member and the reinforcing plate,



the reinforcing plate being disposed on the arbor and having a second surface displaced from the first surface for a clutching relationship with the second face of the abrasive disc and for a positive engagement between the abrasive disc and the reinforcing plate upon the variable positioning of the inclined surface of the first face of the reinforcing plate relative to the inclined surface on the first face of the camming member.

4,637,171

METHOD OF CONTINUOUS COMPENSATION OF UNBALANCE PRESENT IN A ROTOR AND IN PARTICULAR IN A GRINDING WHEEL

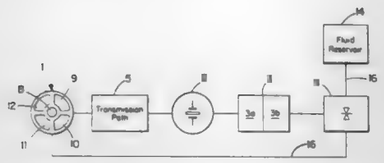
Roland Menigat, Liederbach, and Klaus Gruppenbacher, Dieburg, both of Fed. Rep. of Germany, assignors to Hofmann Werkstatt-Technik GmbH, Pfungstadt, Fed. Rep. of Germany

Filed Feb. 3, 1986, Ser. No. 825,146

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1985, 3503724

Int. Cl.⁴ B24B *41/04*

U.S. Cl. 51—281 R **6 Claims**



1. A method of continuous compensation of unbalance present in a rotor, wherein a compensation fluid is fed into correction chambers rotating with and arranged on said rotor at various angular locations, said supply of fluid being effected in successive balancing operations during rotation of said rotor as a function of the initial unbalance of said rotor as determined by a transducer, the method comprises:

performing a balancing operation with a lesser quantity of said compensation fluid than determined for balancing as a function of said initial unbalance by initially feeding said lesser quantity of said compensation fluid into a certain correction chamber;

determining the phase shift between the actual angular location of said initial unbalance and respective location of vibratory motion represented by transducer outputs;

determining the amplitude transmission error indicating the difference between said actual amount of unbalance and respective transducer output, said amplitude transmission error being based upon a measurement of residual unbalance, said initial unbalance, said lesser quantity of said compensation fluid first fed into said certain correction chamber and said angular location of said chamber; and

feeding a quantity of compensation fluid determined for the compensation of said residual unbalance into said correction chambers based upon said phase shift.

4,637,172

METHOD AND APPARATUS FOR TREATING OPEN-END FRICTION SPINNING ROLLERS

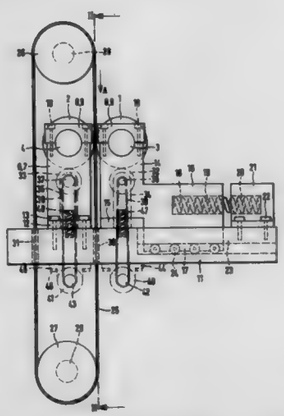
Rolf Griesinger, Göppingen-Faurndau, and Gerhard Fetzer, Süssen, both of Fed. Rep. of Germany, assignors to Spindelfabrik Sussen, Schurr, Stahlecker, Fed. Rep. of Germany

Filed Dec. 3, 1984, Ser. No. 677,464

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343484

Int. Cl.⁴ B24B *21/02*

U.S. Cl. 51—289 R **21 Claims**



1. A process for treating cylindrical surfaces of two rollers of a pair of friction rollers used in an open-end friction spinning unit prior to installation in said spinning unit having said rollers of said pair of rollers arranged in a position that corresponds to their operational position forming a wedge-shaped yarn-forming gap along the length of which gap yarn is formed, comprising:

rotatably mounting said rollers of said pair of rollers adjacent one another on receiving means in an apparatus outside said spinning unit in a position that corresponds to their relative operational position in said spinning unit,

rotating each said rotatably mounted roller about its longitudinal axis, and

treating said cylindrical surfaces of each said roller simultaneously with a common surface treating means.

4,637,173

ROTATING GRINDING OR POLISHING DISC

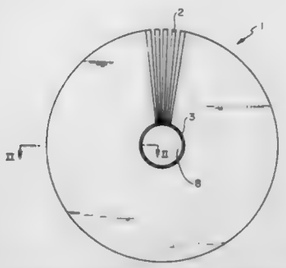
Keld O. Hundebol, Ansager, Denmark, assignor to Udviklingscentret Hansen & Hundebol A/S, Ansager, Denmark

Continuation-in-part of Ser. No. 395,001, Jun. 30, 1982, Pat. No. 4,518,452. This application Jan. 25, 1985, Ser. No. 694,686

Claims priority, application Denmark, Nov. 24, 1980, 4998/80; PCT Int'l Appl., Nov. 20, 1981, PCT/DK81/00104

Int. Cl.⁴ B24B *9/02*

U.S. Cl. 51—334 **5 Claims**



1. A grinding or polishing disc comprising:

a member formed from a substantially rectangular slitted, flat sheet of material folded and shaped to have a central ring defined by two substantially parallel layers joined at an edge having a circular configuration which defines a central hole;

radial grinding or polishing segments extending radially from the central ring in two substantially parallel layers; and

a string of adhesive material situated between the parallel layers along said edge of said central ring for securing the two layers of said central ring together and maintaining said sheet in said circular configuration.

4,637,174

DEVICE AND METHOD FOR THE SURFACE TREATMENT OF COLD-EMBRITTLED PARTS

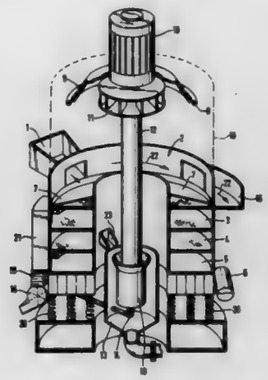
Sabine Donath, Oberhausen, and Peter Holz, Linnich, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt, Fed. Rep. of Germany

Filed Aug. 12, 1985, Ser. No. 764,863

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1984, 3430529

Int. Cl.⁴ B24C *9/00*

U.S. Cl. 51—425 **4 Claims**



1. In a device for the surface treatment of cold-embrittled parts by jet treatment with granulate drawn from a collecting tank and recirculated, and by spraying with a low boiling liquefied gas, comprising a centrifuge wheel throwing off granulate in horizontal direction, a deflecting collar ring arranged around the centrifuge wheel for reflecting the granulate towards the work surface, spray nozzles for the low boiling liquefied gas and a treatment surface which is part of a cradle, with screens for separating granulate, coarse waste and dust, the improvement being means whereby the treatment surface is of circular shape and has the same shape and size as the abrasive jet pattern, said centrifuge wheel being self-priming, said granulate collecting tank being connected to said centrifuge wheel via a suction pipe, said spray nozzle for said low boiling liquefied gas being arranged in the inlet zone of said suction pipe, said treatment surface and said abrasive jet pattern being ring shaped, and said suction pipe extending concentrically through said treatment surface.

4,637,175

CONSTRUCTION FOR FASTENING PARTS TO A CONCRETE WALL

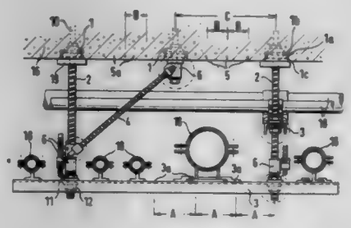
Helmut Froening, and Mohamed Basyouni, both of Mannheim, Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany

Filed Jun. 30, 1983, Ser. No. 509,600

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1982, 3224996

Int. Cl.⁴ F16L *3/22*; E04B *1/38*

U.S. Cl. 52—27 **24 Claims**



1. A construction for fastening parts to a concrete wall comprising:

a grid matrix embedded in said concrete wall and having uniformly shaped grid units,

a plurality of anchors attached to said embedded grid in said concrete wall at uniformly spaced distances to one another,

a plurality of supporting rods, each supporting rod extending from one of said anchors, and

a plurality of beams releasably attached to at least one supporting rod and being suitable for attachment of parts thereto, wherein said anchors are provided with an annular groove, which is engaged by four grid rods forming a grid unit of the grid matrix.

4,637,176

ELEVATOR AIR LOCK

George W. Acock, Jr., Columbus, Ohio, assignor to James A. Rhodes, Columbus, Ohio

Filed Oct. 15, 1985, Ser. No. 786,995

Int. Cl.⁴ B66B *9/00*

U.S. Cl. 52—30 **13 Claims**

1. A pressurized multi-story building having a pressure transition chamber and air lock, said building comprising:

a plurality of walls, a roof, and a plurality of floors, all cooperating to define a multi-story building including a ground floor and at least one upper floor;

a pressurization system for pressurizing the interior of at least some of said upper floors to an elevated pressure, above ambient atmospheric pressure, while leaving at

least said ground floor substantially at ambient atmospheric pressure;

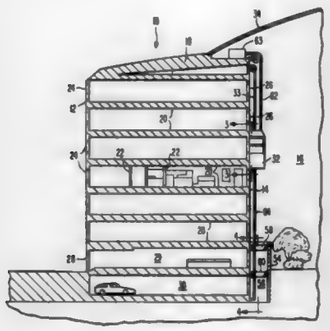
an elevator system including an elevator car having an elevator door, a plurality of elevator shaft doors, one elevator shaft door positioned at each floor of the multi-story building, and means mounting said elevator car for movement to positions corresponding to each floor of the multi-story building with the elevator car door adjacent the elevator shaft door of the floor, said elevator car door and the elevator shaft door for such floor then being openable and closable in concert to permit passage between such floor and the interior of the elevator car;

first sealing means providing a substantially airtight seal on said elevator car door when said elevator car door is closed;

second sealing means providing a substantially airtight seal on the elevator shaft doors of at least those floors at substantially ambient atmospheric pressure when such elevator shaft doors are closed;

pressurization means for pressurizing the interior of said elevator car to a pressure above ambient atmospheric pressure as said elevator car moves from a floor at ambient atmospheric pressure to a floor at said elevated pressure; and

depressurizing means for depressurizing the interior of said



elevator car from said elevated pressure as said elevator car moves from a floor at said elevated pressure to a floor at ambient atmospheric pressure;

whereby, with said elevator car at a floor at ambient atmospheric pressure and with the elevator shaft door of such floor and the elevator car door open, the elevator car interior is substantially at ambient atmospheric pressure and when the elevator car door and the last-named elevator shaft door then close and the elevator car moves to a floor at said elevated pressure, the elevator car interior is pressurized to a pressure above ambient atmospheric pressure, and with said elevator car at a floor at said elevated pressure and with the elevator shaft door of such floor and the elevator car door open, the elevator car interior is substantially at said elevated pressure and when the elevator car door and the last-named elevator shaft door then close and the elevator car moves to a floor substantially at ambient atmospheric pressure, the elevator car interior is depressurized so that said elevator car interior serves as a pressure transition chamber as said elevator car moves between a floor substantially at ambient atmospheric pressure and a floor at said elevated pressure, and said elevator car serves as an air lock inhibiting air flow between locations substantially at ambient atmospheric pressure and locations within said building at said elevated pressure.

4,637,177

MODULAR UNIT ADAPTED FOR OFFICE USE

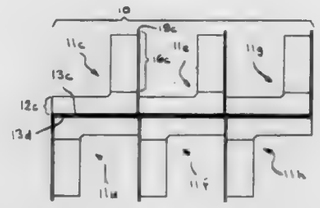
Dennis L. Long, 2524 Santigo S.E., Grand Rapids, Mich. 49506

Continuation of Ser. No. 569,298, Jan. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 518,480, Jul. 29, 1983, Pat. No. 4,511,024, which is a continuation-in-part of Ser. No. 538,513, Oct. 3, 1983, Pat. No. 4,569,163. This application Oct. 30, 1985, Ser. No. 793,717

The portion of the term of this patent subsequent to Feb. 11, 2003, has been disclaimed.

Int. Cl.[4] A47B *5/04*

U.S. Cl. 52—36 **10 Claims**



1. A portable and unfoldable first modular unit for office use positioned adjacent to another second modular unit to form the office or positioned adjacent a building wall to form the office with the building wall for providing work stations which comprises:

(a) a central room divider including a solid vertically oriented first wall having opposite ends and

(b) a vertically oriented panel mounted on one of the side closures by hinge means so as to be unfoldable on a vertical axis into an unfolded position at a 90° angle away from a horizontal line between the ends of the central room divider to provide the work station and so as to be foldable 90° on the vertical axis parallel to the horizontal line between the ends of the central room divider to a closed and folded position between the side closures and adjacent the work surface to enclose the cabinet, wherein the hinge means allows the panel to be moved parallel to the vertical axis away from the side closure for repositioning of the panel to the folded position and to allow the panel to be moved towards the side closure to abut against the side closure when unfolded in the open position so as to be continuous with the side closure to provide a second wall of the office and wherein the hinge means provides a square corner with the side closure in the closed and folded position and wherein the vertically oriented panel sides located between the ends and a top and a bottom, a cabinet structure on at least one side of and adjacent the bottom of the wall, side closures mounted at the ends of the central room divider perpendicular to the wall so as to enclose the opposite ends of the central room divider and with a horizontally oriented first work surface mounted on the cabinet on and between the side closures at a level for typing use; is positioned adjacent to the building wall to form the office or wherein the second modular unit with a second room divider, second end closures and second panel is positioned adjacent the first modular unit to form a third wall of the office; and

(c) a second work surface hingedly mounted on the panel with a second hinge means on the second work surface and on the panel so that the second work surface is foldable upward and at a level for typing use when unfolded and with a retaining means engaging the panel and second work surface when the panel is unfolded.

4,637,178

SCREEN ASSEMBLY AND CLIP THEREFOR

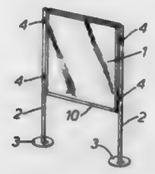
Neil D. Nimmo, Hove; Michael Kenny, and David Willis, both of Kent, all of England, assignors to Nimlok Limited, London, England

Continuation of Ser. No. 528,917, Sep. 2, 1983, abandoned. This application Dec. 7, 1985, Ser. No. 804,221

Claims priority, application United Kingdom, Sep. 3, 1982, 8225122; Aug. 30, 1983, 8322902

Int. Cl.[4] A47B *5/00*; E04C *2/00*

U.S. Cl. 52—36 **24 Claims**



1. A screen assembly including at least one panel with slots along its side edges, a plurality of upright poles and a plurality of fastening elements which engages the upright poles and fasten the panel to the poles with the panel edges in confronting relationship to the poles, wherein the arrangement of the fastening elements and the panel is such that a foot portion of each fastening element can be inserted into a slot until a base of the fastening element abuts the side edge of the panel and can be rotated in the slot about an axis transverse to the slot, whereupon the foot portion becomes progressively more securely clamped in the slot and in a final position is locked to the panel.

4,637,179

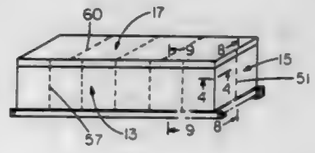
KNOCKDOWN BUILDING

Floyd E. Bigelow, Jr., 10802 Pine Bayou, Houston, Tex. 77024; Floyd E. Bigelow, III, 7903 Midland Forest, Houston, Tex. 77088, and William H. Bigelow, 6903 Oakwood Grove, Houston, Tex. 77040

Filed Feb. 3, 1984, Ser. No. 576,897

Int. Cl.[4] E04H *1/00*

U.S. Cl. 52—79.5 **7 Claims**



1. A knockdown building comprising:

a rectangular floor comprising a plurality of spaced wooden structural members and upper and lower sheets of structural material secured to the structural members with a lower surface of said lower sheets providing a bottom of said floor;

side walls comprising:

a plurality of spaced structural members and an inner and outer skin of structural metal secured to the structural members;

a roof comprising:

a plurality of spaced structural members and an inner and outer skin of structural material secured to the structural members,

said outer skin covered with waterproof materials, and

a rectangular skid of angle iron members arranged with the interior side of each angle iron member in engagement with the bottom and a side of said floors;

said angle iron members secured to said floor and secured to each other at the four corners of the floor with one of the angle iron members extending beyond the rectangular skid at each corner of the floor; and

a hole in each extending angle iron member for engagment by a lifting device,

said floor, side walls and roof being flat and having no protrusions extending upwardly from the floor, inwardly or outwardly of the walls or upwardly or downwardly from the roof other than said angle iron members;

permitting said walls to be stacked on said floor and said roof to be stacked on said walls and buildings to be stacked on each other during shipment.

4,637,180

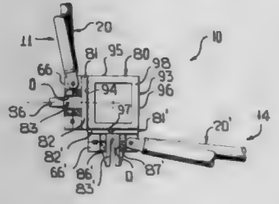
CLIP FOR SELF-LOCKING COLLAPSIBLE/EXPANDABLE STRUCTURES

Theodore R. Zeigler, 9923 Indian Queen Point Rd., Oxon Hill, Md. 20022

Division of Ser. No. 409,435, Aug. 19, 1982, Pat. No. 4,522,008. This application Jun. 10, 1985, Ser. No. 742,867

Int. Cl.[4] B24B *7/00*

U.S. Cl. 52—109 **12 Claims**



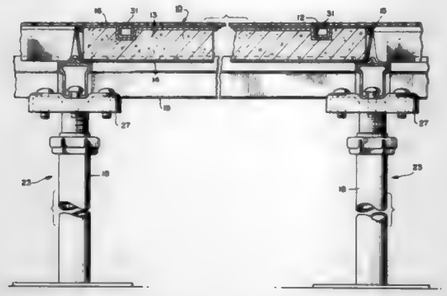
1. A structure comprising a pair of adjacent separate, individual, collapsible and expandable sections, each section being formed of a plurality of pairs of crossed rod elements pivotally interconnected to each other through hubs having openings whereby said sections can be individually collapsed and expanded between two polygonal configurations of respective small and large sizes for respective storage/transport and use, releasable securing means for releasably securing one hub of one section to one hub of another adjacent section when said sections are of expanded large size, said releasable securing means including at least two stems with each stem being interlockingly received in an associated opening of said last-mentioned hubs, said releasable securing means also including a rigid multi-sided supporting element having at least two sides disposed at an angle to one another, first and second bodies each of which has opposite sides, said stems extending from one side of each of said bodies, each stem being at least bifurcated to define a pair of stem portions, each stem having means at the outer and thereof for releasably locking each of the stems to its associated hub by engaging a side of the associated hub remote from the body from which the stem extends, each of said bodies having an opening formed therein, each of said sides on the supporting element having a projection integral with and extending therefom, each of said projections being received within the opening of one of said bodies for locating said bodies such that each side of the supporting element is disposed adjacent the other side of one of said bodies, and bonding means fixedly securing each of said other sides to the adjacent side of the supporting element.

4,637,181

ELEVATED WATERPROOF ACCESS FLOOR SYSTEM AND METHOD OF MAKING THE SAME

Marc M. Cohen, Palo Alto, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 1, 1983, Ser. No. 500,046
Int. Cl.⁴ E04S *5/58*
U.S. Cl. 52—126.5 **10 Claims**



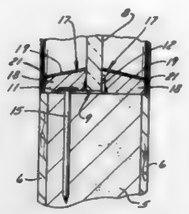
1. An elevated waterproof access floor system that can be opened and subsequently resealed in a waterproof fashion without destroying its aesthetic appearance or the tiles used therein comprising: a support grid, a plurality of tiles supported on said grid, each tile having a recess for receiving an attachment element, a waterproof flooring sheet of heat-resealable material with attachment elements adhered to one surface of said heat-resealable material, said sheet supported on and covering said plurality of tiles with each attachment element mating with a respective tile recess to prevent lateral movement of said sheet with respect to said tiles.

4,637,182

WINDOWED FIRE DOOR

Wendell E. Ellsworth, and Raymond P. Birdsall, both of Green Bay, Wis., assignors to Algoma Hardwoods, Inc., Algoma, Wis.

Filed Apr. 7, 1986, Ser. No. 848,931
Int. Cl.⁴ E06B *3/58*
U.S. Cl. 52—211 **4 Claims**



1. A windowed fire door comprising a core of incombustible material that has opposite surfaces, a wood veneer facing overlying and bonded to each of said surfaces of the core, and a rectangular pane of glass exending across a hole through said core and said facings and having opposite flat surfaces that are parallel to and spaced inwardly from the respective facings, said fire door being characterized by:

A. a plurality of L-shaped clips, each having a pair of legs with opposite flat surfaces, said surfaces of the respective legs being perpendicular to one another, and one of said legs having a nail hole therethrough that is spaced from the other leg,

(1) each said clip having its said one leg extending across an edge of said pane and having its said other leg flatwise engaging the surface of the pane that is remote from said nail hole,

(2) each of certain of said clips having its said other leg engaged with one surface of said pane and each of the rest of said clips having its said other leg engaged with the other surface of said pane;

B. a nail through said nail hole of each clip, engaged in said core to secure the clip thereto and thereby confine the pane against displacement relative to the door; and

C. a plurality of framing bead strips, one along each edge of the pane at each surface thereof, each said strip being secured to the core to comprise a seal between the core and the pane, each said strip comprising

(1) an elongated body of high density incombustible mineral material having a pair of adjacent lengthwise extending surfaces, one of which opposes said core and the other of which opposes said pane, and

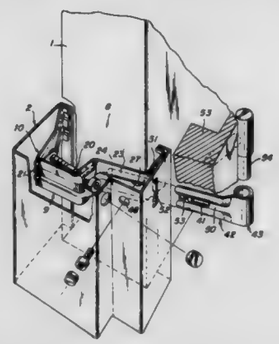
(2) a veneer of wood overlying and bonded to said strip over the other lengthwise extending surface portions thereof.

4,637,183

FRAME FOR DOOR OR WINDOW OPENING

Laureas Metz, Hilversum, Netherlands, assignor to Polynorm, N.V., Netherlands

Filed Oct. 12, 1984, Ser. No. 660,221
Claims priority, application Netherlands, Oct. 13, 1983, 8303519; Dec. 21, 1983, 8304390; Dec. 21, 1983, 8304391
Int. Cl.⁴ E06B *1/04*
U.S. Cl. 52—217 **8 Claims**



1. A frame comprising:

a steel frame element having a substantially u-shaped cross-section, a first opening means, at least one other opening means and two flanged rim means for clamping a wall in between the flanged rim means;

at least one clamping device having steel clamping jaws positioned within said frame element, one of said jaws being provided with a paumelle fastening means;

clamping means for connecting said clamping jaws;

said clamping jaws having a substantially ridge and gutter shaped profile along the longitudinal direction of the clamping jaws, said clamping jaws engaging said flanged rim means;

at least one paumelle having a wing portion thereon which is provided with a paumelle fastening means, along said wing portion, for attaching said wing with one of said clamping jaws, said wing being engaged with said clamping jaws through said first opening means, said wing shaped so as to securely fit within the ridge and gutter shape of said clamping jaw; and

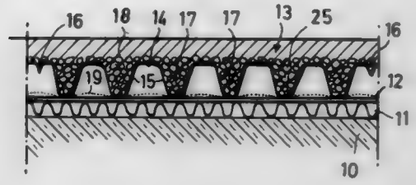
a single screw bolt means being passed through said other opening means, for attaching said wing to one of said clamping jaws.

4,637,184

HOLLOW FLOOR

Wolfgang Radtke, Nachtigallenweg 46, D-5063 Steinenbrück; György Borbely, Schaevenstr. 6, D-5014 Kerpen-Mödrath; Sebald Pallhorn, AM Geisberg 30, D-8752 Goldbach, and Erich Höllfritsch, Rainwiesenweg 21, D-8501 Behringersdorf, all of Fed. Rep. of Germany

Continuation of Ser. No. 343,309, Jan. 27, 1982, abandoned. This application Jul. 10, 1985, Ser. No. 754,194
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1981, 3103632
Int. Cl.⁴ E04F *15/02*; E04B *5/48*; E04G *11/04*
U.S. Cl. 52—220 **22 Claims**



1. A hollow floor system, comprising:

a floor bottom,

a plastic mold emplaced atop said floor bottom, said mold having a plurality of integral feet and having planar portions of flexible sheet material extending between and interconnecting said feet, wherein each foot of the mold has continuous, closed side and bottom walls, each of said foot side walls having a smooth exterior,

a flowable, hardenable substance poured into said mold, the weight of said substance bringing all of said feet into contact with said floor bottom, said planar portions of flexible sheet material permitting adjacent feet to yield under the weight of said substance to thereby enable each of said bottom walls of said adjacent feet to contact said floor bottom even in the event that said floor bottom is uneven,

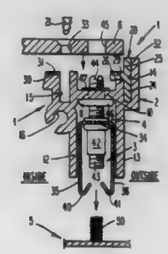
said substance when hardened thereby forming a hollow floor having a floor top supported by plural spaced load bearing legs within said mold feet, there being a hollow cavity between said floor bottom and said floor top in the regions between said legs.

4,637,185

TRENCH DUCTS

Timothy S. Bowman, Parkersburg, W. Va., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Jun. 18, 1984, Ser. No. 621,957
Int. Cl.⁴ E04B *5/48*
U.S. Cl. 52—221 **21 Claims**



1. A side rail for use in a trench duct wherein the side rail extends horizontally:

an elongated upper section comprising a horizontally extending upper bridge having a plurality of clearance openings serially spaced therealong, a pair of spaced apart upper legs extending downwardly from the upper bridge, and means to support a trench duct cover above the upper bridge;

an elongated lower section comprising a horizontally extending lower bridge disposed below said upper bridge, a pair of spaced apart lower legs extending downwardly respectively adjacent said upper legs and each terminating by an inwardly extending bend with the bends facing one another and forming a stud gripping means;

a plurality of adjusting nuts connected to and serially spaced along said lower bridge;

a plurality of adjusting screws respectively disposed in said adjusting nuts and extending upwardly through said clearance openings, each screw having a slot in the upper end to receive a turning tool and having a support flange engaging the under side of said upper bridge to thereby support said upper section; and

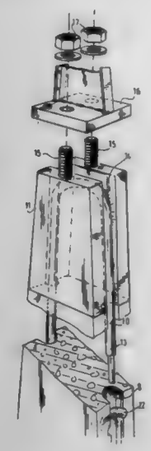
for at least some of said screws, means holding the upper bridge firm against said support flange.

4,637,186

FENCE POLE

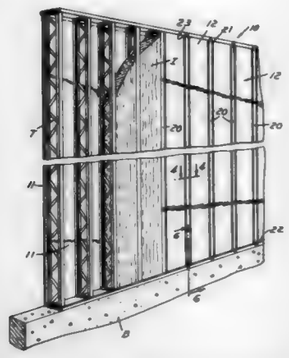
Franciscus B. M. Ruigrok, Soa, Netherlands, assignor to Heras Holding, B.V., Olvechot, Netherlands

Continuation of Ser. No. 440,718, Nov. 10, 1982, abandoned. This application Mar. 27, 1985, Ser. No. 716,597
Claims priority, application Netherlands, Nov. 11, 1981, 8105107
Int. Cl.⁴ E04C *3/26*; E04H *17/14*
U.S. Cl. 52—225 **18 Claims**



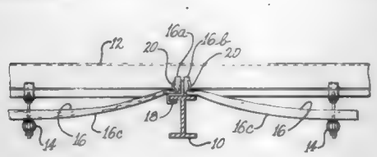
1. A fence post construction comprising an elongate body of cured concrete, said body having opposite side faces, said body being double tapered so that the width thereof between the opposite side faces increases from one end of the body to an intermediate portion thereof and then decreases to an end opposite said one end of the body, a first rigid end member engaged against said one end of the body and a second rigid end member engaged against the opposite end of the body, external tensioning means having one run engaging one of said side faces and another run engaging the other of said side face for holding said end members against the respective ends of the body and securing means holding said tensioning means in tensioned condition for placing the cured concrete of said body under longitudinal compression between said end members and for pressing said runs upon said body to place the cured concrete of said body under transverse compression between said runs.

4,637,187
PREFABRICATED BUILDING PANELS
Henry F. Campbell, 9301 Michigan Ave., Detroit, Mich. 48210
Filed Aug. 2, 1985, Ser. No. 761,913
Int. Cl.[4] E04B 1/74
U.S. Cl. 52—404 15 Claims



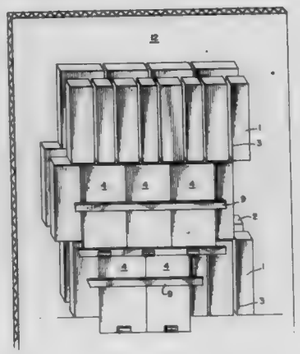
1. A prefabricated building panel comprising
a plurality of longitudinally extending transversely spaced trusses,
each truss comprising opposed bases and an intervening portion extending between the bases,
a first sheet and a second sheet fastened to one of said bases,
insulating material between said sheets,
said first sheet comprising a plurality of transversely spaced grooves defined by transversely spaced narrow ribs extending longitudinally and formed by closely spaced portions of the first sheet bent inwardly,
said grooves having a base wall and a side wall width substantially equal to the width of one of the bases of the truss and receiving one of the bases,
the base of each groove lying in the plane of the sheet and the width of said ribs being substantially less than the width of said grooves such that the overall appearance of the exterior of said first sheet appears to be planar and substantially uninterrupted except for narrow lines defined by the space between the closely spaced portions of the ribs and such that the space between adjacent bases is maximized for receiving insulating material.

4,637,188
SPLICING MEANS FOR FACED INSULATION BATTS
Steven D. Crothers, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Feb. 28, 1986, Ser. No. 834,725
Int. Cl.[4] E04B 1/74
U.S. Cl. 52—404 2 Claims



1. In a roof/ceiling insulation system for a metal building wherein a plurality of spaced parallel purlins are supported by and extend perpendicularly to a plurality of spaced parallel I-beams, spaced parallel insulation supporting tubes are suspended from the purlins and extend parallel to the main beams, and faced fibrous insulation batts are strung over the insulatin supporting tubes and main beams, means for splicing adjacent ends of two of the insulation batts together above one of the main beams and securing said ends with respect to said one main beam, said splicing means comprising a push-on splicing member mounted on an upper flange portion of said one main beam and presenting a flat backing portion extending vertically upwardly therefrom, and a pair of clamping strips respectively securing said ends of the insulation batts to opposite sides of said backing portion.

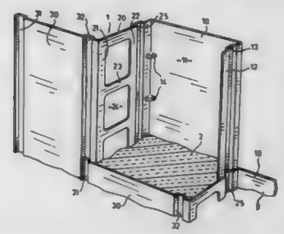
4,637,189
THERMAL INSULATION SYSTEM
Wilhelmus A. Maria van Riet, Nieuw Beijerland, Netherlands, assignor to The Dow Chemical Company, Midland, Mich.
Filed Feb. 25, 1985, Ser. No. 704,829
Claims priority, application Netherlands, Feb. 24, 1984, 8400584
Int. Cl.[4] E04H 7/00
U.S. Cl. 52—309.8 10 Claims



1. An insulation system suitable for insulating a storage tank having a curved surface without using screws, which comprises a thermal insulation layer of a plurality of interconnecting insulation elements, each insulation element being generally rectangular in shape and having at least one guide groove provided in a major surface of the insulation element or formed at a joint of two adjacent elements, a plurality of individual insulation elements are arranged to provide an interconnecting network of insulative elements forming said insulation layer, and a protective layer covering the insulation layer, said protective layer comprising a plurality of sheet elements which are generally rectangular in shape, each sheet element having a flange at one end and a grooved flange at the opposite end; said grooved flange being designed such that when two insulation elements are interlocked together by the sheet element, the flange of one sheet element fits into the grooved flange of a second sheet element and the grooved flange fits into the guide groove of the insulation element; at least one fastening strap securing the insulation and sheet elements; and wherein the grooved flange of the sheet element is closed at one end; the closed end being inclined whereby water will flow outwardly from the grooved flange.

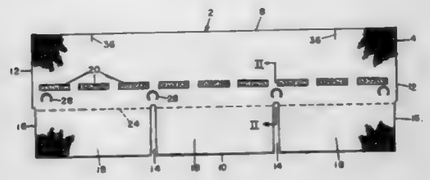
4,637,190
BUILDING PANEL
Gerrard O. Minialoff; Martin J. Minialoff, and Andrew J. Minialoff, all of Box 107, R.R. #1, Kleinberg, Ontario, Canada (L0J 1C0)
Filed Jul. 12, 1984, Ser. No. 630,137
Claims priority, application Canada, Jul. 15, 1983, 432513
Int. Cl.[4] E04C 1/10
U.S. Cl. 52—579 10 Claims

1. A building panel formed from a single sheet of material and comprising:
an outer panel portion, which is generally planar and includes a first coupling channel extending adjacent a free edge of the outer panel portion with a second coupling channel extending parallel to the first coupling channel adjacent an opposite edge of the outer panel portion, which first and second coupling channels have complementary shallow, trapezoidal cross-sections, to enable a first coupling channel to fit within a second coupling channel;
an inner panel portion, adapted to be overlaid by an outer panel portion, which inner panel portion is generally planar and includes a third coupling channel; and



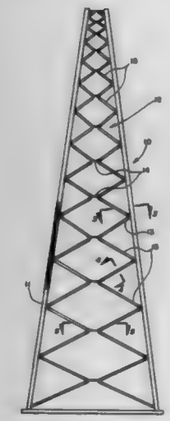
a web portion extending between the inner and outer panel portions and including a fourth coupling channel extending parallel to the third coupling channel adjacent an opposite edge of the inner panel portion, the third and fourth coupling channels having complementary shallow, trapezoidal cross-sections, to enable a fourth coupling channel to fit within a third coupling channel, whereby, in use, a surface of a building can be formed from a plurality of said panels disposed adjacent one another with adjacent inner and outer panel portions overlying one another and with the coupling channels engaging one another.

4,637,191
STARTER SHINGLE
Robert L. Smith, 303 E. Bridge St., Blackwell, Okla. 74631
Filed Dec. 3, 1984, Ser. No. 677,586
Int. Cl.[4] E04D 1/00
U.S. Cl. 52—522 2 Claims



1. A starter shingle comprising a generally rectangular sheet of shingle material having top, bottom and side edges, said sheet having a series of vertical slots formed therein at generally regular intervals across its width, said slots extending normally from said bottom edge to a height less than one-half of the distance between said top and bottom edges and dividing the lower edge portion of said shingle into a series of downwardly extending tabs, said sheet having a strip of heat-sensitive adhesive applied to the top surface thereof along a line parallel to the top and bottom shingle edges and adjacent but spaced above the closed upper ends of said slots, said shingle being deeply scored along a line parallel to the top and bottom edges thereof and generally at the closed upper ends of said slots, said shingle being easily and accurately breakable along said score line whereby to facilitate separation of said tabs from the remainder of the shingle to leave a starter shingle, a series of said starter shingles being adapted to be secured to a sloping roof deck in side-to-side abutting relation at the eave edge of said deck to form a starter course of shingles above which a series similarly slotted standard shingles may be applied in successively upwardly offset courses with the lower edge of the lowermost course of standard shingles also being flush with the eave edge of the roof deck, said starter course providing a continuous, unslotted shingle layer beneath the slotted edge portion of the first course of standard shingles to prevent leakage of water through said slots to said roof deck, the separated tabs being usable to simulate a final topping-out course of shingles adjacent a ridge of the roof.

4,637,192
TELESCOPING SUPPORT STRUCTURE
Wendell E. Brown, 255 E. 100 South, St. George, Utah 84770
Filed Jun. 21, 1985, Ser. No. 747,417
Int. Cl.[4] E04H 12/18
U.S. Cl. 52—632 55 Claims



1. A support structure including, as a lattice structure, a flat plate assemblage of nested components that include outside and intermediate gusset plates with braces extending therebetween, the braces to bend or rotate at their junctions with the respective gusset plates, when a force is applied to said assemblage to telescope that assemblage apart forming tiers, each tier involving sides where the outside gusset plates are shared between tiers with an intermediate gusset plate arranged therebetween on a bias angle across each tier side, the braces each secured at their ends between on a bias angle across each tier side, the braces each secured at their ends between an outside gusset plate and an intermediate gusset plate; means for telescoping apart the flat plate assemblage of components; means for establishing and maintaining the spacing of the adjacent outside gusset plates providing for the erecting of the assemblage to a predetermined height that includes at least three straight corner members that are bent longitudinally to accommodate individual outside gusset plate edges therebetween; and means for securing each outside gusset plate at a location to a straight corner member to provide said desired outside gusset plate spacing.

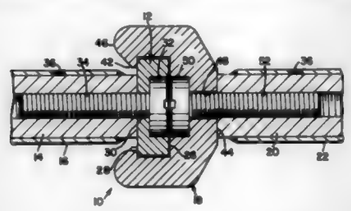
4,637,193
CONNECTING APPARATUS
Fredric A. Lange, Osseo, Minn., assignor to Interlock Structures International, Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 590,738, Mar. 16, 1984, abandoned. This application Mar. 15, 1985, Ser. No. 712,229
Int. Cl.[4] E04H 12/00
U.S. Cl. 52—648 15 Claims

2. Connecting apparatus, comprising:
a tube having opposite first ends;

a cylindrical rod having a second end, said rod being fastened in one of said first ends of said tube;

a cylindrical button attached to said second end of said rod, said button having a first diameter greater than said rod;

means for receiving said button, said receiving means being attached to a structural member, said receiving means including a block having a cylindrical wall with first and



second ends, said block having a second diameter greater than said button, said block having a cavity extending inwardly from the cylindrical wall, said cavity having a semi-cylindrical end coaxial with said block, said block having a slot in the first end for receiving said rod as said cavity receives said button, said slot having a width less than the first diameter of said button.

4,637,194

WOOD BEAM ASSEMBLY

James Knowles, 1275 Club Dr., Bloomfield Hills, Mich. 48013

Filed Dec. 10, 1985, Ser. No. 807,294

Int. Cl.[4] E04C *3/02*

U.S. Cl. 52—690 10 Claims



1. A wood beam assembly for use as a joist and the like, comprising:

a pair of horizontally arranged wood chord members interconnected by a narrower wood web member to form a generally I-beam shaped cross-section;

shear stress plates applied upon the web at each of the opposite ends of the beam and covering the area of maximum shear stress which is located adjacent the beam ends;

the wood chord members and the web each being of substantially uniform cross-section throughout their lengths wherein the opposite ends of the web are thickened by the shear stress plates applied thereon;

and means securely fastening the chords to the web and the shear stress plates to the web, said means for fastening comprising U-shaped wire staples having legs interconnected by a bight with a center line axis extending between and parallel to the legs, the free ends of the legs being beveled at acute angles inwardly towards the center line axis of the staple and away from the bight of the U-shape, so that the legs are shorter along their external edges that are remote from the center line axis of the U-shapes, said staple legs being additionally chamfered at the outermost edges of their bevels relative to the central axis of the staples;

said staple legs crossing the center line axis due to the leg ends tending to move towards and past each other as they are forced longitudinally into the wood during application of the staples for fastening.

4,637,195

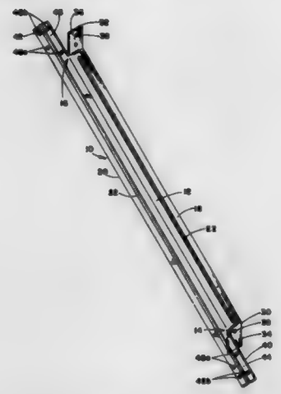
REINFORCING MEMBER FOR WOODEN STRUCTURE

Roy E. Davis, 2215 Albert St., Anderson, Ind. 46012

Filed Dec. 16, 1985, Ser. No. 809,314

Int. Cl.[4] E04C *3/32*

U.S. Cl. 52—693 4 Claims



1. A structural reinforcing member for bracing studs at adjacent spaced locations within a frame of a building wall or the like, said member being comprised of an elongated, generally straight body portion having stud mounting portions at distal ends thereof; said body portion being comprised of first and second planar sections forming a generally L-shaped configuration of said body portion, the width of said first planar section being less than the width of a stud to be mounted at either end of said structural member, said planar sections of said body portion having ends forming said mounting portions; the ends of said first planar section being disposed obliquely with respect to said first planar section, parallel with respect to each other, and in opposite directions with respect to each other, said ends thereby forming outwardly facing, generally flat first mounting surfaces for engagement with opposed faces of adjacent spaced studs, said first mounting portions having apertures through which fasteners may be engaged; the ends of said second planar section forming coplanar extensions thereof, each extension being of a predetermined length greater than the combined thickness of studs found at the spaced location to be mounted thereby; said extensions providing second mounting surfaces in a plane perpendicular to said first mounting surfaces, each second mounting surface being substantially equal in length to said combined stud thickness at said spaced location to be mounted thereby, each second mounting surface having apertures through which fasteners may be engaged; and said extensions being deformable to wrap around said studs such that third mounting surfaces are thereby provided in a plane perpendicular to said second mounting surfaces and parallel to said first mounting surfaces, said third mounting surfaces having apertures through which fasteners may be engaged.

4,637,196

MACHINE HOUSING

Erwin Berner, Waiblingen, and Hans-Dieter Zettel, Waiblingen-Beinstein, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 4, 1984, Ser. No. 646,994

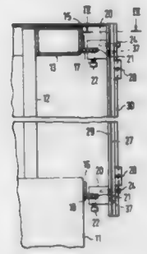
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337218

Int. Cl.[4] B65B *57/00*

U.S. Cl. 53—77 9 Claims

1. In a machine housing having a frame (11) and wall portions (25, 26) the improvement comprising at least a pair of horizontally disposed vertically spaced angle brackets (17, 18)

having offstanding edge portions (21), clamping elements (20) for each said vertically spaced angle bracket provided with slot means adapted to receive said offstanding edge portions of said angle brackets, perforated strut means (29) interconnecting said vertically spaced clamping elements and positioned



perpendicularly thereto, at least one perforated support strip (27) adapted to support said wall portions, means to attach said support strip to said strut means, and bolt means to releasably secure said support strip and said strut means to said clamping elements.

4,637,197

METHOD AND COMPOSITIONS FOR REMOVAL OF MOISTURE

Charles E. Banfield, Nashua, N.H., assignor to Epoxy Technology, Inc., Billerica, Mass.

Continuation of Ser. No. 660,750, Oct. 15, 1984. This application Dec. 26, 1985, Ser. No. 814,572

Int. Cl.[4] B65B *55/00*

U.S. Cl. 53—428 22 Claims

1. A method for absorbing moisture within a moisture-sealed enclosure surrounding an article, the method comprising the steps of

A. mixing a curable epoxy resin with a quantity of an independent curing agent sufficient for curing said resin and an effective amount of an anhydride of a monocarboxylic acid for absorbing moisture,

B. applying said mixture of said resin, curing agent and anhydride to said article, and

C. sealing the enclosure to exclude moisture from entering therein.

7. A method for packaging electronic devices in substantially moisture-free packages, the method comprising the steps of

A. securing the device within the package with a moisture-absorbing epoxy composition comprising a curable epoxy resin, an independent curing agent and an effective amount of an anhydride of a monocarboxylic acid, for absorbing moisture, and

B. sealing the package to exclude moisture from entering therein.

17. A moisture-absorbing composition comprising

A. a curable epoxy resin,

B. a quantity of an independent curing agent sufficient for curing said epoxy resin, and

C. an effective quantity of an anhydride of a monocarboxylic acid for absorbing moisture.

4,637,198

METHOD AND APPARATUS FOR TEMPORARILY STORING PRINTED PRODUCTS ARRIVING IN AN IMBRICATED FORMATION

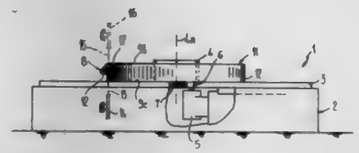
Walter Gerber, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Jun. 23, 1986, Ser. No. 877,130

Claims priority, application Switzerland, Jul. 1, 1985, 02930/85

Int. Cl.[4] B65B *63/04*

U.S. Cl. 53—430 34 Claims



1. A method for the intermediate storage of printed products arriving in an imbricated formation, comprising the steps of:

winding the imbricated formation up to form a wound product package on a rotatably driven winding core about an upright winding axis of said winding core; and

depositing the printed products upon a support structure which rotates conjointly with the winding core, with the lowermost edges of the printed products extending substantially transverse to said upright winding axis of said winding core.

4,637,199

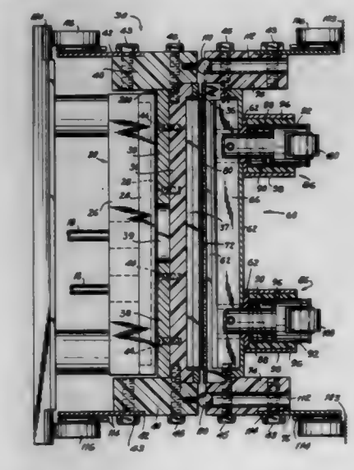
INDUCTION SEALING OF PAPERBOARD

Robert F. Steck, Bensalem, and John L. Baartman, III, Lansdale, both of Pa., assignors to International Paper Company, New York, N.Y.

Filed Jan. 30, 1985, Ser. No. 696,519

Int. Cl.[4] B65B *9/08, 9/22*

U.S. Cl. 53—451 10 Claims



1. A method of sealing packaging material having a layer of thermoplastic material and a layer of electrically conductive material comprising:

(a) compressing the packaging material together between first and second rigid members so that a first thermoplastic material portion is pressed against a second thermoplastic material portion with no relative motion between the first and second rigid members and the first and second thermoplastic material portions, the first and second rigid

members being electrically isolated from ground and the first rigid member having an electrically conductive material on its surface which contacts the packaging material and which is in the form of a first loop and also having a second electrically conductive material in the form of a second loop, said first and second loops being separated by a rigid, nonconductive material;

(b) generating a primary electromagnetic field having an effective range for inducing a current in an electrically conductive material brought within the effective range;

(c) inducing from said primary electromagnetic field a first current in the second electrically conductive material loop of the first rigid member by moving the first rigid member into the effective range of said primary electromagnetic field thereby generating a second electromagnetic field from the first current flowing in the second electrically conductive loop of the first rigid member,

(d) inducing from the second electromagnetic field of the second loop a second current in the first loop thereby generating a third electromagnetic field;

(e) fusing the first and second thermoplastic material portions together by inducing from the third electromagnetic field of the first loop a third current in said electrically conductive material layer of the packaging material for a period of time sufficient to generate enough heat as a result of the induced current flow to soften and fuse together the first and second thermoplastic material portions without adversely affecting the packaging material and;

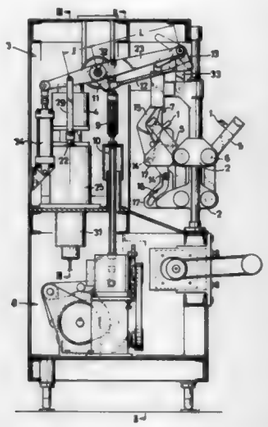
(f) solidifying the heated thermoplastic material into an effective seal after it fused together by removing the first rigid member from the effective range of the first electromagnetic field so that no significant induced currents flow, no heat is generated, and the thermoplastic material is allowed to cool and harden.

4,637,200

CONTAINER FORMING APPARATUS FOR PACKAGING MACHINE

Masato Shibata, Tokushima; Mamoru Eguchi, and Yoshihito Kondo, both of Naruto, all of Japan, assignors to Shikoku Kakooki Co., Ltd., Tokushima, Japan

Filed Oct. 18, 1984, Ser. No. 661,989
Claims priority, application Japan, Oct. 18, 1983, 58-195101
Int. Cl.⁴ B65B *9/06*
U.S. Cl. 53—551 **4 Claims**



1. A container forming apparatus for a packaging machine by which a vertical tube filled with contents is sealed over a required width at a spacing corresponding to the length of one container and is cut at the midportion of the seal width, the apparatus comprising:

an apparatus frame provided with a vertical guide rod, a horizontal pin disposed laterally of the vertical guide rod, and a horizontal rotary axis arranged between the vertical guide rod and the horizontal pin in the horizontal direction and disposed above and parallel to the horizontal pin in the vertical direction;

a slide having forming jaws and movable upward and downward along the vertical guide rod;

a balance cylinder pivotally supported by the horizontal pin at its lower portion and provided with a piston rod possessing a force proportional to the weight of the slide with reciprocally movable parts mounted thereon;

a pivotal arm suspending the slide through a connecting rod at its one end and connected to the piston rod of the balance cylinder at its other end, the pivotal arm being supported at a point between its opposite ends by the horizontal rotary shaft; and,

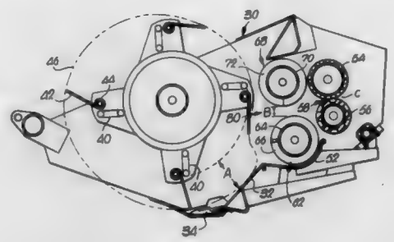
a means mounted on the apparatus frame, for turning the pivotal arm so as to lift the frame.

4,637,201

WIDE-CUT WINDROWER-CONDITIONER HAVING UNIFORM CROP DISTRIBUTION AND CONDITIONING

Martin E. Pruitt, Hesston; Cecil L. Case, and David P. Fritz, both of Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Jul. 24, 1984, Ser. No. 633,933
Int. Cl.⁴ A01D *45/02*
U.S. Cl. 56—16.4 **14 Claims**



13. In a crop harvester:

means for moving severed crop materials along a path of travel toward a point of discharge;

a pair of vertically spaced-apart, transverse augers between said moving means and the point of discharge within said path of travel of the crop materials; and

means for driving said augers in such mutually opposite rotative directions as to cause the augers to receive the crop materials from said moving means, distribute the materials axially inwardly along their mutually opposed, peripheral surfaces, and deliver the distributed materials to said discharge point.

4,637,202

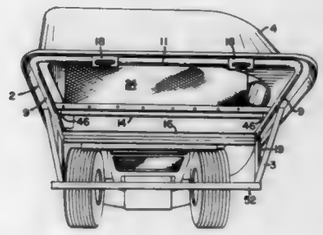
LAWN MOWER GRASS COLLECTOR BAG SUPPORT

Gary R. Lamunga, Prior Lake, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Apr. 30, 1984, Ser. No. 605,329
Int. Cl.⁴ A01D *35/22*
U.S. Cl. 56—16.6 **14 Claims**

12. An improved lawn mower of the type having a mower body that includes a housing in which grass is cut, a chute having one end connected to the housing for conveying grass clippings away from the housing, the chute having its other end connected to a grass directing hood mounted on the mower body, and bag support means for supporting at least one grass bag beneath the hood for receiving grass clippings therefrom, wherein the improvement relates to the bag support means and comprises:

(a) a bag frame from which the grass bag is suspended with the bag frame having an open, cross-sectional area that defines an open upper end of the grass bag, wherein the bag frame is resilient and includes means for selectively contracting the cross-sectional area thereof from a first normal sized area to a second smaller sized area; and



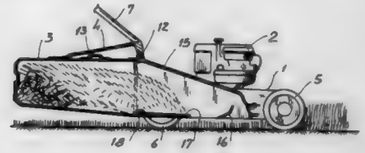
(b) framework means for supporting the bag frame beneath the hood when the bag frame has its normal sized cross-sectional area and for releasing the bag frame for removal and dumping of the bag when the bag frame has its smaller sized cross-sectional area.

4,637,203

GRASS SHAVING MACHINE

Luisa Fedeli, Via dei Gracchi, 26, 20146-Milano, Italy

Continuation of Ser. No. 628,243, Jul. 6, 1984, abandoned. This application Jul. 25, 1985, Ser. No. 758,952
Int. Cl.⁴ A01D *35/22*
U.S. Cl. 56—202 **5 Claims**



1. A grass mowing machine comprising a frame, an engine supported by the frame, a casing having a lowermost edge and being supported by said frame, said casing housing at least one grass cutting blade rotatable around an axis perpendicular to the ground, said casing being open at the bottom and being in communication with the cut grass, a conveyor duct for conveying the cut grass, said conveyor duct having an outlet and an enlarged cross-section at said outlet thereof, a vessel for collecting the cut grass at the rear of said casing, said vessel having an inlet, said vessel being located with its inlet at the outlet of said conveyor duct, the bottom portion of said conveyor duct being formed at least partially of a movable wall mounted at the lower portion of said

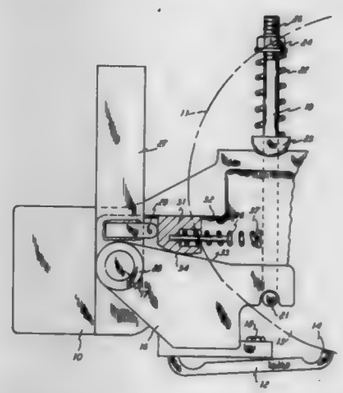
casing at the rear and the top of said casing and being tiltable towards the inlet of said vessel, said movalbe wall having a perimetrical contour fitting said conveyor duct whereby said movable wall pushes grass in said conveyor duct into said vessel when said movable wall is rotated toward said inlet of said vessel, and wherein said movable wall is located substantially at the level of said lowermost edge of said casing and being parallel to the ground whereby it closes said conveyor duct during the grass cutting operation, and is tiltable to be arranged vertically, in a tilted position, during the cut grass discharging operation, said movable wall being rotatable upwardly and rearwardly to said tilted position.

4,637,204

LAWN MOWER BEDKNIFE ADJUSTMENT

Terrance G. Benson, Union Grove, Wis., and Dean M. Lewis, Cedar Falls, Iowa, assignors to Textron Inc., Providence, R.I.

Filed Jan. 11, 1985, Ser. No. 690,738
Int. Cl.⁴ A01D *55/32, 55/20*
U.S. Cl. 56—249 **9 Claims**



1. In a lawn mower having cutting members consisting of a rotatable reel and a bedknife, both having cutting edges thereon, and with one of said cutting members being movable toward and away from the other of said cutting members for adjusting the clearance between the cutting edges, and the mower having a frame, the improvement comprising a spring operative between said frame and said one of said cutting members for yieldingly urging said one of said cutting members toward said other of said cutting members, said mower having a ramp surface, a connecting member connected with said one of said cutting members and being movable therewith and being spaced from said ramp surface on said mower frame, and with said connecting member and said ramp surface defining a wedge-shaped space therebetween, and with the size of said wedge-shaped space being determined by the movement of said connecting member relative to said surface, a movable wedge disposed within said wedge-shaped space for limiting movement of said one of said cutting members in the direction toward said other of said cutting members, to influence the clearance between said cutting edges, and a spring connected with said wedge for yieldingly urging said wedge into said wedge-shaped space.

4,637,205

SPLICER DEVICE FOR THE MECHANICAL SPLICING OF TEXTILE YARNS

Roberto Bedialì, Pordenone; Luciano Bertoli, Salo' , and Claudio Speranzin, Pordenone, all of Italy, assignors to Officine Savio SpA, Pordenone, Italy

Filed Sep. 17, 1984, Ser. No. 651,333
Claims priority, application Italy, Oct. 4, 1983, 83469 A/83
Int. Cl.⁴ B65H *69/06;* **D01H** *15/00*
U.S. Cl. 57—22 **70 Claims**

1. An improved splicer device for the mechanical splicing of textile yarns wherein splicing is accomplished by coupling two single untwisted yarns, said splicer device comprising:

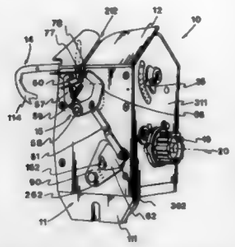
plate means comprising two opposed plate members movable toward and away from each other, having untwist-retwist ring means that cooperate at least momentarily with retwist means, said ring means and said retwist means having facing working surfaces;

yarn coupling means;

means to balance twists in excessive tail ends;

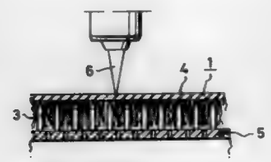
means to pluck and/or tear excessive tail ends of yarn and thereby leave a small tail, said means acting directly along

the axis of said tail ends, said means comprising a stationary portion and a movable portion for engaging the yarn;
means for clamping the twists in the segments of yarn that are not to be torn;
means for bringing the small tails of yarn in the vicinity of adjacent whole yarns;



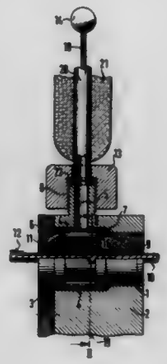
inner clamp means to act on the two yarns;
first adjustable cam means to control the movement of said plate members toward each other; and
second adjustable cam means to control the movement of said plate members away from each other.

4,637,206
FUR-SKIN STRIP MATERIAL AND METHOD FOR PRODUCING THE SAME
Teruko Suwa, 20-1, Sendagaya 1-chome,, Shibuya-ku, Tokyo, Japan
Filed Apr. 9, 1985, Ser. No. 721,479
Int. Cl.⁴ A14B *15/10*; D02G *3/06*; A41H *41/00*
U.S. Cl. 57—31 **4 Claims**



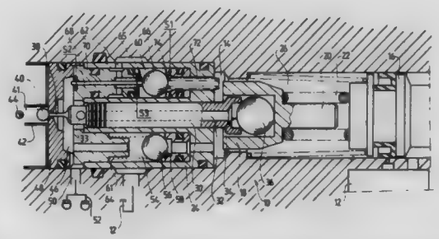
1. A method for producing narrow, leather strips with fur on one side from animal skins having a leather side and a fur side useful in the production of fur yarns made from twisted fur-skin strips comprising the steps of:
(a) placing a fur-skin on numerous upright needles of a skin holding device such that the fur side of said fur-skin faces downward and the leather side of the fur-skin faces upward so as to make the surface of the leather side substantially flat; and
(b) cutting said fur-skin into a plurality of strips by irradiating the leather side of said fur-skin with a moving laser beam under conditions whereby said laser beam cuts the leather of said fur-skin but does not substantially cut fur on the fur-side of said fur-skin.

4,637,207
PNEUMATIC SPINNING METHOD AND PNEUMATIC SPINNING DEVICE
Josef Derichs, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Moenchengladbach, Fed. Rep. of Germany
Filed May 16, 1985, Ser. No. 735,075
Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418322
Int. Cl.⁴ D02G *1/16, 3/22*
U.S. Cl. 57—282 **8 Claims**



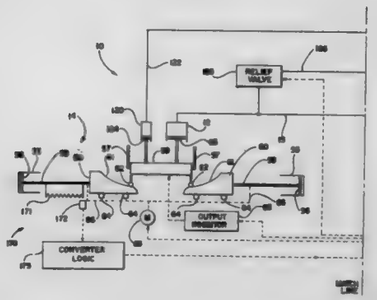
1. Pneumatic spinning method, which comprises conducting sliver formed at least partly of spinning fibers through at least one swirl nozzle, contacting the sliver in the swirl nozzle with at least one heated compressed air jet operating the swirl nozzle, and imparting a twist to the fibers in the swirl nozzle with at least one heated compressed air jet.

4,637,208
HYDRAULIC ASSISTANCE DEVICE FOR BRAKING
Gilbert Kervagoret, Argenteuil, France, assignor to Societe Anonyme D.B.A., Paris, France
Filed Apr. 17, 1985, Ser. No. 724,142
Claims priority, application France, Apr. 26, 1984, 84 06583
Int. Cl.⁴ B60T *13/00*
U.S. Cl. 60—547.1 **10 Claims**



1. A hydraulic assistance device including a casing provided with a bore in which a first piston is mounted so as to slide and be capable of moving under the effect of a brake pedal between a first position in which a first chamber which is joined to brakes of a vehicle is isolated from a high pressure source of fluid and a second position in which the first chamber communicates with the high pressure source, the device including a second chamber formed in the casing, a first passage joining the first and second chambers and first valve means in the first passage so that the passage is normally closed under the effect of pressure in the first chamber, characterized in that the device includes a second passage permitting the second chamber to communicate with a low pressure reservoir and second valve means disposed in the second passage, the second valve means being sensitive to pressures in the first and second chambers so that the second passage normally remains closed during operation of the device but allowing fluid to pass from the second chamber toward the reservoir during release of braking, the device including a sleeve in the bore to separate the first chamber from the second chamber and which includes two bores which comprise the first and second passages each associated with a respective one of the valve means.

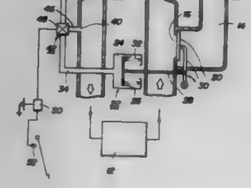
4,637,209
FLUID DRIVEN POWER PLANT
Garry E. Clark, 801 Pierce Rd., Red Oak, Tex. 75154
Continuation-in-part of Ser. No. 514,167, Jul. 15, 1983, Pat. No. 4,541,243, which is a continuation-in-part of Ser. No. 266,933, May 26, 1981, Pat. No. 4,459,084. This application Aug. 19, 1985, Ser. No. 766,937
Int. Cl.⁴ F02B *71/04*
U.S. Cl. 60—595 **22 Claims**



1. A fluid-driven power plant, comprising:
fluid handling means containing a substantially constant system volume of fluid under pressure, said fluid handling means comprising:
an output cylinder including an output piston capable of a fill stroke and an output stroke;
a balance cylinder in fluid communication with said output cylinder;
means for operating said balance cylinder to deliver fluid to said output cylinder during said fill stroke;
means for operating said output cylinder to deliver fluid therefrom;
an accumulator in fluid communication with said output cylinder, the operating pressure level of said accumulator being higher than the pressure within said balance cylinder;
a compression acceleration cylinder in fluid communication with said accumulator and including an acceleration piston linked to said output piston: and
a fluid-driven motor having a port in fluid communication with said accumulator;
said compression acceleration cylinder assisting said balance cylinder during said fill stroke.

4,637,210
SUPERCHARGE PRESSURE CONTROL APPARATUS OF A SUPERCHARGED ENGINE
Wataru Yamamoto, Shizuoka, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan
Filed Aug. 28, 1985, Ser. No. 770,531
Claims priority, application Japan, Aug. 31, 1984, 59-181790
Int. Cl.⁴ F02B *37/12*
U.S. Cl. 60—602 **1 Claim**

1. A supercharge pressure control apparatus for a supercharged engine, comprising:
a supercharger turbine associated with an exhaust passage of the engine;
a supercharge compressor associated with an intake passage of the engine for compressing a gas which is supplied through the intake passage to the engine, the compressor being driven by the turbine;
bypass means associated with said exhaust passage for selectively permitting some of the exhaust gasses discharged from the engine and flowing through the exhaust passage to bypass the turbine, said bypass means including a bypass passage communicating with the exhaust passage for bypassing the turbine, and a bypass valve for controlling the opening and closing of the bypass passage;
actuator means for controlling the opening and closing of said bypass valve, said actuator means including means associated therewith for normally maintaining said bypass valve in a closed position, said actuator means also including pressure responsive means for responding to the pressure of the gas in the intake passage for effecting selective opening of said bypass valve;
first means for sensing the pressure of the gas in the intake passage at a first location disposed a substantial distance downstream of said compressor for activating said actuator means to effect opening of said bypass valve when the pressure in said intake passage at said first location exceeds a preset level;



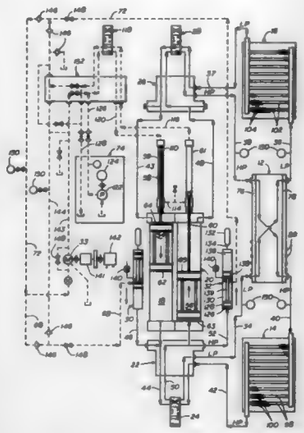
second means for sensing the pressure of the gas in the intake passage at a second location which is upstream a substantial distance from said first location but is disposed downstream of but closely adjacent to said compressor for activating said actuator means to effect opening of said bypass valve when the pressure at said second location exceeds said preset level, the pressure in said intake passage at said second location being lower than the pressure in said intake passage at said first location; and
switching means for permitting said actuator means to be controlled by either said first sensing means or said second sensing means, but not by both at the same time; and
control means for controlling said switching means so that said first sensing means communicates with said actuator means during a stable operational state of the engine and said second sensing means communicates with said actuator means during an accelerating operational state of the engine, said control unit including timing means associated therewith for permitting said second sensing means to control said actuator means for only a predetermined time interval, following which said switching means is automatically activated for causing the actuator means to again be controlled by said first sensing means.

4,637,211

APPARATUS AND METHOD FOR CONVERTING THERMAL ENERGY TO MECHANICAL ENERGY

Dowell White, Pasadena; Daniel L. Craig; Jack L. Duke, both of Houston, and Donald H. Laurie, Porter, all of Tex.

Filed Aug. 1, 1985, Ser. No. 761,600
Int. Cl.[4] F01K *25/02*
U.S. Cl. 60—650 42 Claims



1. In a heat engine having a liquid working fluid which remains in a liquid state throughout a complete cycle of the engine;

a heat exchanger having a low pressure liquid inlet and a low pressure liquid outlet for low pressure working fluid, a high pressure liquid inlet and a high pressure liquid outlet for high pressure working fluid, and separate paths therein for said low pressure working fluid and said high pressure working fluid;

a cooling element adjacent said heat exchanger and in fluid communication with said low pressure liquid outlet;

a heating element adjacent said heat exchanger and in fluid communication with said high pressure liquid outlet;

a pair of double acting cylinders arranged in opposed cycling relation to each other, each cylinder having a piston and a port for the working fluid adjacent each end of the cylinder;

and valve means between said pair of cylinders and said heating and cooling elements for controlling the flow of low pressure working fluid and high pressure working fluid alternately to said cylinders, said valve means operatively connected to said cylinder ports and movable between positions for reversing the flow of low pressure and high pressure working fluids to said cylinders so that low pressure and high pressure working fluids are alternately supplied to said cylinders during each complete cycle of the engine in a continuous operation.

4,637,212

COMBINED HOT AIR TURBINE AND STEAM POWER PLANT

Emile Aguet, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

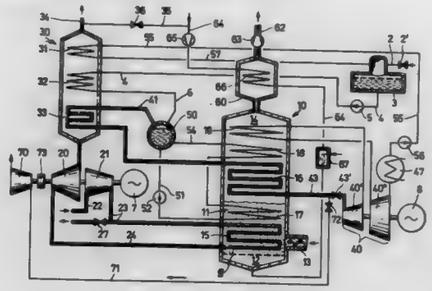
Filed Mar. 26, 1986, Ser. No. 844,480
Claims priority, application Switzerland, Apr. 29, 1985, 01805/85
Int. Cl.[4] F01K *23/10*
U.S. Cl. 60—655 17 Claims

1. A combined hot air turbine and steam power plant comprising

a steam generator having means for creating a fluidized bed in a combustion zone thereof, a smoke flue for exhausting hot gases, at least one air heat exchanger disposed within the fluidized bed, an evaporator and a superheater;

at least one compressor connected to said air heat exchanger to deliver a flow of compressed air thereto;

a hot air turbine connected to said air heat exchanger to receive a flow of hot air therefrom and connected to said compressor to drive said compressor;



at least one waste heat boiler connected to said turbine to receive hot waste air therefrom and having at least one pre-superheater therein connected to said superheater in said steam generator to deliver a flow of steam thereto;

a water-steam separator connected to and between said evaporator and said pre-superheater to deliver a flow of steam from said evaporator to said pre-superheater; and

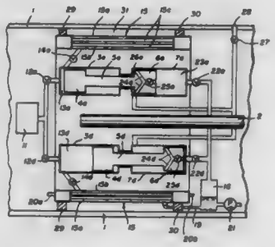
a steam turbine connected to said superheater to receive a flow of steam therefrom.

4,637,213

ARRANGEMENT FOR A SUBMARINE VEHICLE

Hans Lobell, Motala; Klas G. Svensson, Boreasberg; Göran Gladh, Motala, and Björn Höglander, Vadstena, all of Sweden, assignors to Affarsverket FFV, Eskilstuna, Sweden

Filed Jan. 9, 1985, Ser. No. 690,055
Claims priority, application Sweden, Jan. 12, 1984, 8400134
Int. Cl.[4] F01K *9/00*
U.S. Cl. 60—685 6 Claims



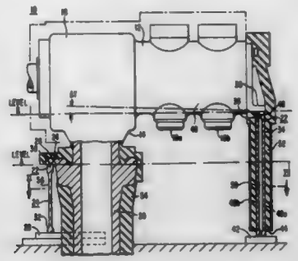
1. In a power plant for a submarine vehicle, a thermal engine, said engine having at least one operating cylinder and an exhaust gas outlet, an operating piston reciprocatable within said operating cylinder, compressor means for compressing exhaust gases from said engine, said compressor means having at least one compressor cylinder and an exhaust gas outlet, a compressor piston reciprocatable within said compressor cylinder, said compressor piston connected to said operating piston, and means for drainage of compressed exhaust gases from said compressor into the water surrounding said vehicle, said operating piston and said compressor piston being interconnected by means of a flexible piston rod.

4,637,214

SINGLE-ENDED STEAM CHEST WITH IMPROVED SUPPORT ASSEMBLY

George W. Y. Chang, Casselberry, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 17, 1985, Ser. No. 809,705
Int. Cl.[4] F01B *31/06*
U.S. Cl. 60—687 8 Claims



1. In combination with a single-ended steam chest for a power plant, said steam chest including a hollow elongated steam chest body, said steam chest body having a steam inlet therethrough proximate the bottom portion of one end thereof, said steam chest body having steam outlets therethrough in predetermined position, inlet pipe means affixed to said steam chest body proximate said steam inlet, the improvement which comprises

support assembly means comprising inlet end flexible plate support means of predetermined dimensions, flange member means affixed to said inlet pipe means in predetermined position, a first base member means for supporting said inlet end flexible plate means, said inlet end flexible plate means affixed at one end to said flange member means and at the other end affixed to said base member means, outlet end flexible support plate means affixed at the top thereof to the outlet end of said steam chest body proximate the bottom portion thereof, a second base member means for supporting said outlet end flexible plate means, said outlet end flexible plate means affixed at one end to said second base member means and at the other end to said steam chest body, said outlet end flexible support plate means comprising a pair of first flexible parallel plate members separated from one another by a predetermined distance so as to form a heating chamber between said first parallel plate members, said outlet end flexible support plate means having a length a predetermined amount greater than said inlet end flexible plate means, first insulation means affixed to and enclosing said outlet end flexible plate means, second insulation means is affixed to and encloses the inlet pipe whereby axial rotation of said steam chest body is diminished by controlling the thermal expansion of said first inlet end flexible support plate means and said outlet end flexible support plate means.

4,637,215

REGENERATOR WITH SPRAY COOLER

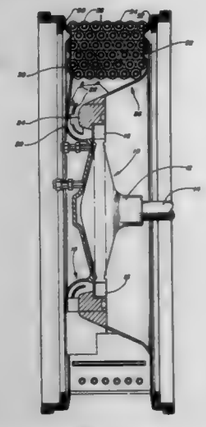
John Symington, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 23, 1985, Ser. No. 768,735
Int. Cl.[4] F01K *7/30*
U.S. Cl. 60—688 7 Claims

1. A steam turbine system comprising:

a rotatable turbine wheel;

an annular heat exchanger radially outwardly of said wheel and having a first fluid path including an annular outlet and an inlet in fluid communication with said turbine wheel to receive exhaust steam therefrom and a second fluid flow path in heat exchange relation with said first path, said second path being adapted to receive feed water for the steam turbine; and



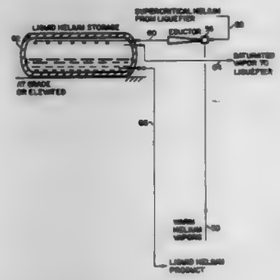
means for generating an annular, liquid spray across said first flow path at said outlet to remove heat from exhaust steam emerging from said outlet of said first fluid flow path.

4,637,216

METHOD OF RELIQUEFYING CRYOGENIC GAS BOILOFF FROM HEAT LOSS IN STORAGE OR TRANSFER SYSTEM

Thirthahalli A. Shenoy, Whitehall, and Arthur R. Winters, Jr., Coopersburg, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 27, 1986, Ser. No. 823,161
Int. Cl.[4] F17C *13/00*
U.S. Cl. 62—54 10 Claims



1. In a process for the liquefaction of a cryogen, said cryogen being selected from a group consisting of hydrogen, helium, and neon, wherein unsaturated vapors are recycled to a liquefier, the improvement comprising:

(a) contacting the unsaturated vapors of said cryogen with the same cryogen in the liquid phase, to produce a saturated, essentially constant enthalpy vapor stream; and

(b) recycling said saturated, essentially constant enthalpy vapor stream back to the liquefier.

4,637,217

RAPID CONSTRUCTION OF ICE STRUCTURES WITH CHEMICALLY TREATED SEA WATER

Lawrence B. Owen, Salt Lake City, Utah; Daniel M. Masterson, Calgary, Canada, and Sidney J. Green, Salt Lake City, Utah, assignors to Terra Tek, Inc., Salt Lake City, Utah and Geotechnical Resources Ltd., Calgary, Canada

Filed Jul. 22, 1985, Ser. No. 757,157
Int. Cl.[4] E02D *17/00*
U.S. Cl. 62—74 13 Claims

1. An improved method for the construction of load-bearing ice structures including ice platforms and grounded ice islands and the like wherein the ambient air temperature is in the range of about one degree C. to minus thirty degrees C. and wherein the structure is constructed from sea water, comprising the steps of:

adding to the sea water to be used in the construction of the load bearing ice structure an effective amount of a material selected from the group consisting of ice nucleation agents and fluorinated surfactants, fluorochemical surfactants, and amphoteric surfactants, and mixtures thereof, for the purpose of at least reducing the effect of supercooling in the case said ice nucleating agent and for reducing the surface tension of sea water in the case of said surfactants whereby solid ice is formed more quickly than in the absence of said material, and

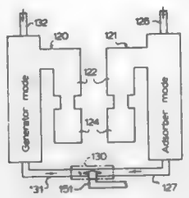
exposing said thus treated sea water to ambient air temperatures in the range of about minus 1 degree C. to minus 30 degrees C. thereby causing freezing to occur more completely by contact with the colder ambient than may be accomplished with untreated sea water exposed to the same ambient air temperatures and thus to form a load bearing ice structure.

4,637,218

HEAT PUMP ENERGIZED BY LOW-GRADE HEAT SOURCE

Dimiter I. Tchernev, 9 Woodman Rd., Chestnut Hill, Mass. 02167

Continuation of Ser. No. 605,812, May 1, 1984, abandoned, which is a continuation-in-part of Ser. No. 11,689, Feb. 12, 1979, Pat. No. 4,584,842, which is a continuation-in-part of Ser. No. 710,609, Aug. 2, 1976, Pat. No. 4,138,850, which is a division of Ser. No. 520,808, Nov. 4, 1974, Pat. No. 4,034,569. This application Nov. 18, 1985, Ser. No. 801,491
Int. Cl.[4] F25B *17/00*
U.S. Cl. 62—106 43 Claims



17. A process for heating and cooling an interior space by using a low-grade heat source, the process comprising the steps of:

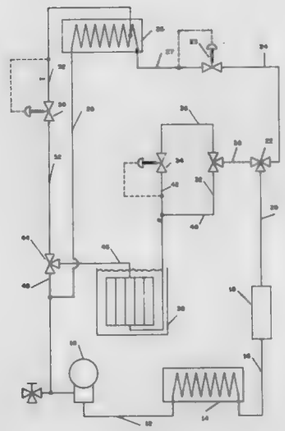
1. providing first and second pressure tight enclosures, each enclosure having a working refrigerant, an adsorbent material, a condenser and an evaporator therein, said adsorbent material being in thermal communication with a conduit which is provided for its respective enclosure, said adsorbent material being capable of adsorbing said refrigerant exothermically;
2. providing a low-grade heat source and means for it to be alternatively in thermal communication with said conduit for each said enclosure;
3. raising the vapor pressure of said refrigerant in said first enclosure and desorbing the refrigerant from said adsorbent material using said low-grade heat source;
4. allowing refrigerant vapor in said first enclosure to be received by said condenser therein, condensing said refrigerant vapor, and transferring said refrigerant's heat of condensation to said internal space or to the atmosphere;
5. lowering the vapor pressure of said refrigerant in said second enclosure by adsorbing said refrigerant by said adsorbent, and transferring the heat of adsorption thereby generated to said first enclosure via said conduits; and
6. repeating steps 3, 4 and 5 in the opposite of said enclosures.

4,637,219

PEAK SHAVING SYSTEM FOR AIR CONDITIONING

Ronald D. Grose, Omaha, Nebr., assignor to Enron Corp., Houston, Tex.

Filed Apr. 23, 1986, Ser. No. 854,910
Int. Cl.[4] F25B *5/00*; F24D *11/00*
U.S. Cl. 62—199 2 Claims



1. In an air conditioning system which comprises a compressor to compress a refrigerant, a condenser to remove heat from the refrigerant and condense it, and an evaporator to evaporate the refrigerant for recycle to the compressor, the improvement which comprises a peak shaving system comprising:

(a) means for storing a medium from which heat can be extracted and in which heat can be stored,

(b) a first control valve for optionally diverting the flow of the refrigerant from the condenser to the first expansion valve and into the evaporator or directing the refrigerant instead to the storage means,

(c) a second control valve for optionally directing the flow of the refrigerant from the first control valve through a second expansion valve before the refrigerant reaches the storage means or bypassing the second expansion valve, and

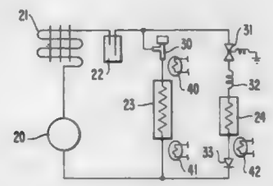
(d) a third constant valve for optionally directing the flow of the refrigerant from the storage means to the compressor or through a third expansion valve to the evaporator.

4,637,220

REFRIGERATION SYSTEM FOR BOTH VEHICLE AIR CONDITIONER AND REFRIGERATOR

Riichi Sakano, Saitama, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Dec. 16, 1985, Ser. No. 809,233
Claims priority, application Japan, Dec. 14, 1984, 59-264234
Int. Cl.[4] F25B *5/00*
U.S. Cl. 62—200 7 Claims



1. In a refrigeration system cooling both a vehicle passenger compartment and a refrigerator compartment located in the vehicle, the refrigeration system having a condenser to condense a pressurized refrigerant, a first evaporator receiving a first portion of the condensed refrigerant to heat the first portion by absorbing heat from the vehicle compartment, a second evaporator receiving a second portion of the condensed refrigerant to heat the second portion by absorbing heat from the refrigerator compartment, and a compressor receiving the heated refrigerant from the first and second evaporators to produce the pressurized refrigerant, the improvement comprising:

an expansion valve connected between the condenser and the first evaporator to vary the first portion of the condensed refrigerant in accordance with a variable control signal and to expand and cool the first portion;

a shutoff valve connected between the condenser and the second evaporator to control the admission of the second portion of the condensed refrigerant to the second evaporator, said shutoff valve having a closed state in which no refrigerant is admitted to the second evaporator and an open state in which the second portion is admitted to the second evaporator;

an expansion device connected in series between said shutoff valve and the second evaporator to expand and cool the second portion; and

control means responsive to the state of said shutoff valve, to a temperature of the first portion, and to a temperature of the second portion, to generate the control signal in accordance with the following criteria:

a. when said shutoff valve is closed, the control signal is generated in accordance with the temperature of the first portion; and

b. when said shutoff valve is open, the control signal is generated in accordance with the temperature of the second portion.

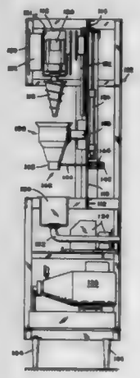
4,637,221

MIXING APPARATUS AND METHOD

Morris M. Levine, Scarsdale, N.Y., assignor to Sweet Victory, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 587,019, Mar. 7, 1984, Pat. No. 4,548,054. This application May 20, 1985, Ser. No. 735,682
The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.
Int. Cl.[4] A23G *9/00*
U.S. Cl. 62—342 7 Claims

1. An apparatus for blending hard ice cream with at least one condiment comprising a refrigeration system, a funnel for holding the ice cream and condiment therein, cooling coil means in thermal communication with said funnel, said coil being coupled to said refrigeration system for freezing the ice cream therein, an auger in alignment with said funnel, an auger motor for rotating said auger in clockwise and counterclockwise directions, thus imparting reciprocating rotational motion to said auger, and means for relatively advancing said auger and said funnel toward each other while said auger is rotated clockwise and counterclockwise until said funnel is telescoped over said auger, said advancing means imparting translatory motion only to said auger simultaneously with said reciprocating rotational motion of said auger.

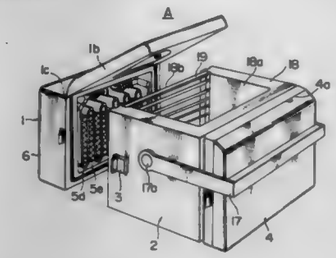


4,637,222

REFRIGERATOR FOR VEHICLE

Kenichi Fujiwara, Kariya; Hideo Asano, Gifu; Eiichi Hasada, Okazaki; Kazuhisa Makida, Kariya, and Akinori Iida, Nishio, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 25, 1985, Ser. No. 727,264
Claims priority, application Japan, Jun. 8, 1984, 59-118879; Dec. 27, 1984, 59-276721
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—244 11 Claims



1. A refrigerator for a vehicle equipped with an air-conditioner having a refrigeration cycle including a compressor driven by an engine of the vehicle, a condenser connected to a discharge side of said compressor and operative to cool and condense refrigerant from said compressor, an air-conditioner pressure reducing means connected to a discharge side of said condenser and operative to reduce the pressure of the thus condensed refrigerant and expand the same, and an air-conditioner evaporator disposed between a discharge side of said pressure reducing means and a suction side of said compressor and operative to evaporate the thus expanded refrigerant, said refrigerator comprising:

a cooling unit including a casing of a heat-insulating structure, a refrigerator expansion means disposed in said casing and connected to said refrigeration cycle in parallel relationship to said air-conditioner pressure reducing

means, a refrigerator evaporator disposed in said casing and having an inlet connected to a discharge side of said refrigerator expansion means and an outlet communicated with a suction side of said compressor, a coldness-accumulating medium to be cooled by said refrigerator evaporator, and means in said casing for supporting said coldness-accumulating medium in heat exchange relationship with said refrigerator evaporator;

said cooling unit being adapted to be secured to the vehicle body;

a portable cool-keeping container of a heat-insulating structure adapted to be detachably connected to said cooling unit and removably accommodate goods to be cooled; and

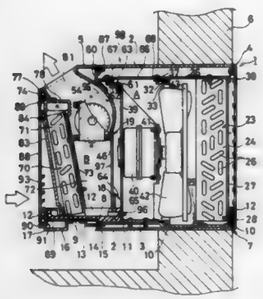
means for transferring the coldness from said cooling unit casing into said cool-keeping container when the latter is connected to said cooling unit and the refrigerator is in operation.

4,637,223

PACKAGED TERMINAL AIR-CONDITIONER

Yoshinori Hosoya; Shyozi Tunekawa; Wazoh Yamada, and Akira Shiraishi, all of Gunma, Japan, assignors to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of, Japan

Filed Jul. 17, 1985, Ser. No. 756,020
Claims priority, application Japan, Jul. 19, 1984, 59-149959
Int. Cl.⁴ F25D *23/12*
U.S. Cl. 62—263 **3 Claims**



1. A packaged terminal air conditioner, comprising:

a housing;

a bottom plate provided in a bottom of the housing;

a fan casing unit mounted on the bottom plate and including a partition which divides the interior of the housing into an indoor section, which is adapted to allow indoor air to flow therethrough, and an outdoor section, which is adapted to allow outdoor air to flow therethrough;

a cross-flow fan mounted in the fan casing unit for circulating indoor air drawn into the indoor section;

a supporting portion formed at a lateral end of the fan casing unit, the supporting portion supporting the cross-flow fan in the vicinity of the front of the partition;

an indoor heat exchanger arranged in front of the cross-flow fan, the indoor heat exchanger having a rear plate mounted at the rear side of the indoor heat exchanger;

a front cover mounted to the housing for covering the indoor heat exchanger and the cross-flow fan;

an outdoor heat exchanger arranged at the rear of the partition in the outdoor section; and

a rear cover mounted to the housing for covering the outdoor heat exchanger;

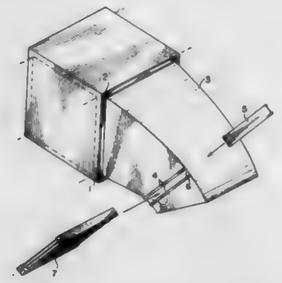
the partition defining a scrolling portion for the cross-flow fan, the partition and the rear plate of the indoor heat exchanger defining an air guide to direct the indoor air drawn into the indoor section toward the cross-flow fan.

4,637,224

HUMIDITY REDUCTION DUCT

Brian G. McGuigan, P.O. Box 965, Eagar, Ariz. 85925

Filed Nov. 13, 1984, Ser. No. 670,046
Int. Cl.⁴ F25D *23/00*
U.S. Cl. 62—271 **15 Claims**



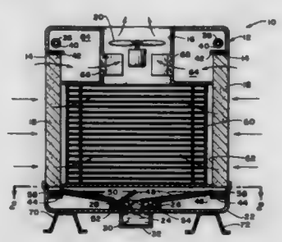
1. A humidity reduction duct assembly for registered installation with the air intake of an evaporative cooler, said assembly comprising: an elongated tapered duct having an upper surface, a lower surface and a first and second side surface enclosing said upper and said lowr surface and defining therewith an inlet at one end thereof and an outlet at the other end thereof, said outlet being positionable in registered sealed alignment with the air intake of the evaporative cooler when said duct assembly is installed thereupon, and slotted tray receiving means operatively interposed between inlet and said outlet in said first side surface of said duct and extending transversely across the interior of said duct to terminate at said second side thereof; a tray assembly having a rigid upper frame member, a rigid lower frame member disposed in generally parallel relationship to said upper member, and a plurality of foraminous cylinders mounted between said upper frame member and said lower frame member in generally parallel spaced relationship to each other, each of said cylinders being filled with an air permeable desiccant, said tray assembly being slidably inserted into said tray receiving means and extending across said duct so that air flow from said duct inlet to said duct outlet passes therethrough; and cover means attachable to said first side of said duct over said tray receiving means to secure said tray assembly therewithin and enclose said first side of said duct.

4,637,225

AIR CONDITIONING APPARATUS

Ralph C. Marshall, 539 East Ave. J-4, Lancaster, Calif. 93535, and Ronald P. Consoli, 16853 Magnolia Blvd., Encino, Calif. 91436

Filed Nov. 12, 1985, Ser. No. 797,010
Int. Cl.⁴ F25D *21/14*
U.S. Cl. 62—285 **3 Claims**



1. An air conditioning apparatus comprising:

a housing forming an internal chamber, said internal chamber having an air inlet opening and an air outlet opening, said housing having a cylindrical sump;

air movement means mounted on said housing within said internal chamber, said air movement means connected with said outlet opening, said air movement means functioning to move air through said inlet opening into said internal chamber and through said outlet opening into the ambient;

air passage means mounted on said housing covering said inlet opening, air is to be moved through said air passage means into said internal chamber;

water contained within said sump, said water to be conducted from said sump and dispersed across said air passage means;

a refrigerant fluid closed system located within said internal chamber, said refrigerant fluid closed system including a first set of coils located within said internal chamber, said first set of coils being located so that the air from said air passage means is conducted across said first set of coils prior to being discharged through said outlet, said refrigerant fluid closed system including a second set of coils, said second set of coils being located within said sump; and

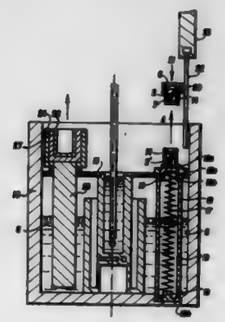
water collection means mounted within said internal chamber, said water collection means to receive the water from said air passage means and conduct such into said sump, said water collection means including a plurality of separate channels to divide said water into a plurality of separate paths to be then permanently discharged into said sump, each said channel to tangentially discharge water into said sump, each said channel having a protruding flange, said protruding flange to extend within the confines of said sump and overhang a portion of said sump to cause said water to cascade into said sump thereby increasing turbulence.

4,637,226

DEVICE FOR THE CRYOGENIC TRANSFER OF SPECIMENS

Hellmuth Sitte, Seefeld, Austria, assignor to C. Reichert Optische Werke, AG, Vienna, Austria

Filed Aug. 15, 1985, Ser. No. 765,639
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1984, 3430471
Int. Cl.⁴ F25B *19/00*
U.S. Cl. 62—514 R **20 Claims**



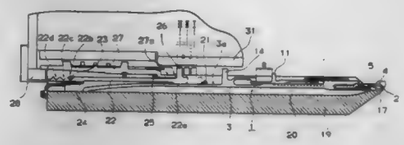
1. A device for use in transferring a specimen from an apparatus containing a cyrogenic coolant comprising a specimen holder and coolant transfer means for introducing coolant from said apparatus into said specimen holder whereby a specimen in said specimen holder is immersed in said coolant, said coolant transfer means including support means for supporting the specimen holder and guide means for guiding displacement of the support means, the guide means comprising a tube having a plurality of openings provided therein to permit said coolant to enter the tube.

4,637,227

FLAT KNITTING MACHINE HAVING COMPOUND NEEDLES

Masahiro Shima, Wakayama, Japan, assignor to Shima Ides Center Co., Ltd., Wakayama, Japan

Filed Jun. 3, 1986, Ser. No. 879,891
Claims priority, application Japan, Jul. 19, 1985, 60-160803
Int. Cl.⁴ D04B *7/00*
U.S. Cl. 66—75.1 **16 Claims**



1. A flat knitting machine having compound needles of the type having a slider combined slidably with a needle body wherein the slider is back and forth movable over a given limited stroke relative to the needle body so that a latch portion of the slider is brought to a closed position and an open position with respect to a hook portion of the needle body, characterized in:

(1) that the needle body is so flexibly constructed as to allow a butt of the needle body to sink into a corresponding needle trick when the upper surface of the needle body is pressed at a point behind the butt;

(2) that both the slider and the needle body have one butt each provided thereon, the butt of the slider being located before the butt of the needle body;

(3) that a selector jack for pressing at the underside of its front portion the upper surface of the needle body at a point behind the butt thereof is disposed in the needle trick, above the needle body and behind the butt thereof, the front portion of the selector jack being pivotally movable and having an upwardly projecting butt provided thereon;

(4) that said selector jack is back and forth movable in the needle trick and adapted to be click stopped adjacent its rear end by means of a click stopper at three positions, advanced position (I), intermediate position (II), and retreated position (III), in the needle trick in the londitudinal direction thereof, being pivotally movable about the click stopper;

(5) that needle selector means for selectively moving any selector jack or jacks to any one of said three positions are arranged in individual needle tricks, at a level above the selector jacks therein, and on a carriage;

(6) that a knitting lock on the carriage includes a tuck position raising cam having a pair of raising cam faces for acting on the butt of each relevant needle body to raise the needle body to a tuck position, a pair of slider guide cams each having a lowering cam face for acting on the butt of slider of each compound needle whose needle body has been raised to the tuck position or into a stitch receiving course, to lower the slider into a tucking course, a pair of slider raising cams each having a raising cam face for acting on the butt of slider of each compound needle whose needle body has been raised to the tuck position or into the stitch receiving course, at a position ahead of said slider guide cam in the direction of movement of the carriage to raise the butt to a position that allows it to pass above said slider guide cam, a center guide cam for acting on the butt of the needle body to lower the needle body, and a pair of stitch cams;

(7) that a space which allows the entry thereinto of the butt of each needle body, when on a welt course, is formed between the respective back sides of said pair of raising

cam faces of the tuck position raising cam, there being disposed in the middle of said space a stitch-receiving-course raising cam having a pair of raising cam faces each for acting on the butt of the needle body at welt position to raise it into the stitch receiving course, with a pair of stitch receiving courses formed above said stitch-receiving-course raising cam, said stitch receiving courses extending from the spaces on both sides of the stitch-receiving course raising cam into the tuck receiving course;

(8) that the raising cam faces of said pair of slider raising cams consist of a pair of slider raising cams located on both sides of a widthwise median portion of the knitting lock, said raising cam faces each fronting toward one or the other direction of movement of the carriage and at a position slightly backward of said widthwise median portion of the knitting lock in the direction of carriage movement;

(9) that on a cam plate there is provided a stitch transfer position raising cam having a pair of raising cam faces for acting on the butt of each needle body raised to tuck position to raise the needle body to stitch transfer position;

(10) that said stitch transfer position raising cam has a half height in projection above the cam plate or is retractable;

(11) that on the cam plate and in relevant courses of action relative to the butts of individual selector jacks at advanced position (I), intermediate position (II), and retreated position (III) respectively, there are provided, at a phase covering the starting end of each raising cam face of said tuck position raising cam in the direction of carriage movement, side presser cams for selectively forcing the butts of needle bodies into the corresponding needle tricks and to their inoperative position relative to said tuck position raising cam; and at phases covering the respective raising cam faces of said stitch transfer position raising, slider raising, and stitch-receiving-course raising cams in the direction of the carriage movement, center presser cams for selectively forcing the butts of needle bodeies into the corresponding needle tricks and to their inoperative positions relative to these raising cams;

(12) that one of said center presser cams may select a half-pressing position at which the butt of each needle body is half depressed into the corresponding needle trick; and

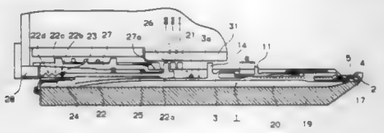
(13) that the butt of said slider is displaceable between its inoperative position and its operative position relative to each of the slider raising cams according to the difference in the amount of depression by said one center presser cam between a full pressing position and a half pressing position or between a half pressing position and a retracted position.

4,637,228

FLAT KNITTING MACHINE HAVING COMPOUND NEEDLES

Masahiro Shima, Wakayama, Japan, assignor to Shima Idea Center Co., Ltd., Wakayama, Japan

Filed Jun. 27, 1986, Ser. No. 879,328
Claims priority, application Japan, Jul. 18, 1985, 60-159662
Int. Cl.[4] D04B *7/00*
U.S. Cl. 66—75.1 **16 Claims**



1. A flat knitting machine having compound needles of the type having a slider combined slidably with a needle body wherein the slider is back and forth movable over a given limited stroke relative to the needle body so that a latch portion of the slider is brought to a closed position and an open position with respect to a hook portion of the needle body, characterized in:

(1) that the needle body is so flexibly constructed as to allow a butt of the needle body to sink into a corresponding needle trick when the upper surface of the needle body is pressed at a point behind the butt;

(2) that both the slider and the needle body have one butt each provided thereon, the butt of the slider being located before the butt of the needle body;

(3) that a selector jack for pressing at the underside of its front portion the upper surface of the needle body at a point behind the butt thereof is disposed in the needle trick, above the needle body and behind the butt thereof, the front portion of the selector jack being pivotally movable and having an upwardly projecting butt provided thereon;

(4) that said selector jack is back and forth movable in the needle trick and adapted to be click stopped adjacent its rear end by means of a click stopper at three positions, advanced position (I), intermediate position (II), and retreated position (III), in the needle trick in the londitudinal direction thereof, being pivotally movable about the click stopper;

(5) that needle selector means for selectively moving any selector jack or jacks to any one of said three positions are arranged in individual needle tricks, at a level above the selector jacks therein, and on a carriage;

(6) that a knitting lock on the carriage includes a tuck position raising cam having a pair of raising cam faces for acting on the butt of each relevant needle body to raise the needle body to a tuck position, a pair of slider guide cams each having a lowering cam face for acting on the butt of slider of each compound needle whose needle body has been raised to the tuck position or into a stitch receiving course, to lower the slider into a tucking course, a slider raising cam having a pair of raising cam faces for acting on the butt of slider of each compound needle whose needle body has been raised to the tuck position, at a position ahead of said slider guide cam in the direction of movement of the carriage to raise the butt to a position that allows it to pass above said slider guide cam, a center guide cam for acting on the butt of the needle body to lower the needle body, and a pair of stitch cams;

(7) that a space which allows the entry thereinto of the butt of each needle body, when on a welt course, is formed between the respective back sides of said pair of raising cam faces of the tuck position raising cam, there being disposed in the middle of said space a stitch-receiving-course raising cam having a pair of raising cam faces each for acting on the butt of the needle body at welt position to raise it into the stitch receiving course, with a pair of stitch receiving courses formed above said stitch-receiving-course raising cam, said stitch receiving courses extending from the spaces on both sides of the stitch-receiving course raising cam into the tuck receiving course;

(8) that on a cam plate there is provided a stitch transfer position raising cam having a pair of raising cam faces for acting on the butt of each needle body raised to tuck position to raise the needle body to stitch transfer position;

(9) that said stitch transfer position raising cam has a half height in projection above the cam plate or is retractable;

(10) that on the cam plate and in relevant courses of action relative to the butts of individual selector jacks at advanced position (I), intermediate position (II), and retreated position (III) respectively, there are provided, at a phase covering the starting end of each raising cam face of said tuck position raising cam in the direction of carriage movement, side presser cams for selectively forcing the butts of needle bodies into the corresponding needle tricks and to their inoperative position relative to said tuck position raising cam; and at phases covering the respective raising cam faces of said stitch transfer position raising, slider raising, and stitch-receiving-course raising cams in the direction of the carriage movement, center presser cams for selectively forcing the butts of needle bodeies into the corresponding needle tricks and to their inoperative positions relative to these raising cams;

(11) that one of said center presser cams may select a half-pressing position at which the butt of each needle body is half depressed into the corresponding needle trick; and

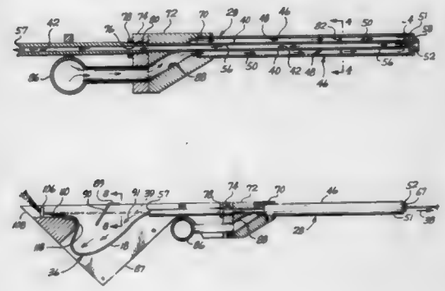
(2) that the butt of said slider is displaceable between its inoperative position and its operative position relative to the slider raising cam according to the difference in the amount of depression by said one center presser cam between a full pressing position and a half pressing position or between a half pressing position and a retracted position.

4,637,229

PNEUMATIC THREAD TENSIONING DEVICE

James W. Taylor, Jr., 5211 - 154th Ave. NE., Redmond, Wash. 98052

Filed Feb. 11, 1985, Ser. No. 700,452
Int. Cl.[4] D04B *15/44*; D03D *47/34*
U.S. Cl. 66—146 **29 Claims**



1. A pneumatic tensioning apparatus for maintaining a desired tension in a thread of yarn and the like, the apparatus comprising:

a first tubular member having an inner passageway extending the length thereof along an axis, and through which said thread may travel in a particular thread feed direction;

a second tubular member surrounding said first member so that the inner walls of said second member and the outer walls of said first member define an outer passageway that is coaxial with said axis;

an air supply means for supplying an airflow into said outer passageway in a direction that is substantially the same as said feed direction;

an orifice including a substantially annular throat region for communicating said airflow from said outer passageway into said inner passageway, said orifice connecting said passageways together in a manner so that the direction of said airflow is reversed and said airflow flows through said inner passageway in a direction opposite to said feed direction, such opposing flow causing a certain amount of tension in said thread; and including

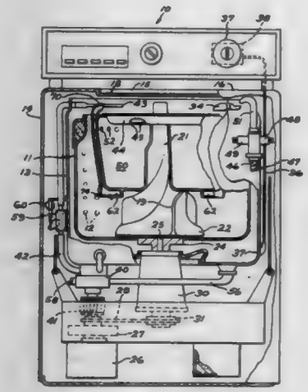
means for adjusting the airflow rate through said orifice throat region by varying the size of said throat region.

4,637,230

CLOTHES WASHING MACHINE

Gerald L. Roberts, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jun. 6, 1985, Ser. No. 742,047
Int. Cl.[4] D06F *31/00*
U.S. Cl. 68—4 **3 Claims**



1. A vertical axis clothes washing machine having wash, rinse, and centrifugal extraction operations comprising:

liquid and clothes containing means including a relatively large substantially imperforate outer receptacle, and a relatively large perforated clothes receptacle positioned within said receptacle;

an agitator extending upwardly into said clothes receptacle;

means for rotating said clothes receptacle and said agitator at a relatively high speed during said centrifugal extraction operation;

means for effecting a washing motion of said agitator;

water inlet means for providing fresh water to said liquid and clothes containing means;

a control system including manually settable means for terminating the flow of water from said inlet means and for starting said means for effecting said washing motion of said agitator and said extraction operation;

a relatively small substantially imperforate basket positioned on said agitator and movable therewith;

a perforated filter pan mounted on said agitator covering substantially the entire top of said imperforate basket;

means being manually settable to provide a relatively high level of water when clothes are to be washed in said clothes receptacle and settable to a relatively low water level when clothes are to be washed in said basket;

a liquid recirculation means including a conduit connected between an inlet in said outer receptacle and an outlet means positioned for supplying water to said basket, pumping means arranged to pump liquid from said outer receptacle through said outlet means;

recirculating water control means including valve means in said conduit operable for terminating the flow of water to said outlet means after a predetermined amount of time so that clothes contained in said basket are washed in the selected volume of water independent of the volume of water in said receptacles; and

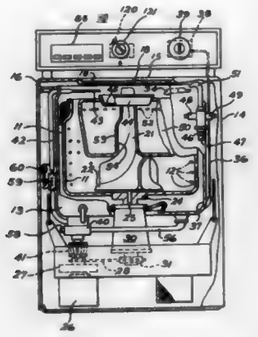
a secondary recirculation means including a conduit connected between an inlet in the lower portion of said imperforate basket and an outlet means positioned for supplying water through said filter pan to said basket whereby said washing motion of said agitator causes water to be pumped through said conduit independent of said liquid recirculation means.

4,637,231

CLOTHES WASHING MACHINE INCLUDING A HIGH DETERGENT CONCENTRATION WASH CYCLE

Stephen L. McMillan, Louisville; Alvin Akers, Jeffersontown, both of Ky., and Daniel N. Toma, Georgetown, Ind., assignors to General Electric Company, Louisville, Ky.

Filed Jun. 6, 1985, Ser. No. 742,032
Int. Cl.[4] D06F *31/00, 33/02*
U.S. Cl. 68—4 4 Claims



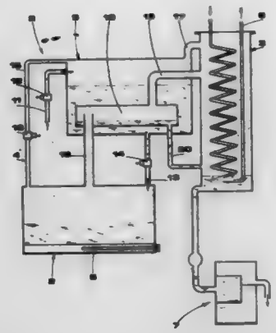
1. A vertical axis clothes washing machine having wash, rinse, and centrifugal extraction operations comprising:
- liquid and clothes containing means including a relatively large substantially imperforate outer receptacle, and a relatively large perforated clothes receptacle positioned within said receptacle;
- an agitator extending upwardly into said clothes receptacle;
- means for rotating said clothes receptacle and said agitator at a relatively high speed during said centrifugal extraction operation;
- means for effecting a washing motion of said agitator;
- water inlet means for providing fresh water to said liquid and clothes containing means;
- a control system including manually settable means for terminating the flow of water from said inlet means and for starting said means for effecting said washing motion of said agitator and said extraction operation;
- a relatively small substantially imperforate basket positioned on said agitator and movable therewith;
- means being manually settable to provide a relatively high level of water when clothes are to be washed in said clothes receptacle and settable to a relatively low water level when clothes are to be washed in said basket;
- a liquid recirculation means including a conduit connected between an inlet in said outer receptacle and an outlet means positioned for supplying water to said basket, pumping means arranged to pump liquid from said outer receptacle through said outlet means; and
- recirculating water control means including valve means in said conduit operable for terminating the flow of water to said outlet means after a predetermined amount of time whereby clothes contained in said basket are washed in a selected volume of water independent of the volume of water in said receptacle.

4,637,232

APPARATUS FOR THE RECYCLING OF SOLVENT USED IN DRY-CLEANING MACHINES AND SIMILAR EQUIPMENT

Guido Zacchini, Castelmaggiore, Italy, assignor to AMA Universal S.p.A., Castelmaggiore, Italy

Filed Apr. 8, 1985, Ser. No. 720,752
Int. Cl.[4] D06F *43/08*
U.S. Cl. 68—18 R 4 Claims



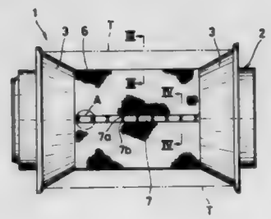
1. An apparatus for recycling solvent used in dry-cleaning machines comprising:
- a distillation chamber having heater elements;
- a pre-distillation unit comprising a tank having a first pipeline for receiving mingled water and solvent from a cleaning cycle and a second pipeline connecting the tank to the distillation chamber for discharging the mingled water and solvent into the distillation chamber, and a heat exchanger located within the tank, the heat exchanger being connected to the distillation chamber through a first pipe for receiving vapor from the distillation chamber; and
- a water and solvent vapor condenser connected to the tank through a duct for exhausting into the condenser the vapor produced by predistillation of an azeotropic mixture of water and solvent.

4,637,233

BEAM FOR A DYEING APPARATUS

Takashi Tanaka, Kurobe, and Satoru Yamamoto, Toyama, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jul. 9, 1984, Ser. No. 628,894
Claims priority, application Japan, Jul. 9, 1983, 58-106756[U]
Int. Cl.[4] D06B *5/18*
U.S. Cl. 68—198 5 Claims



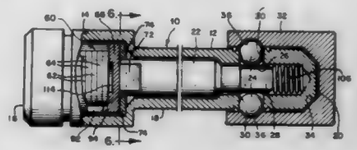
1. A beam for winding thereon materials to be treated with dyeing liquid, comprising:
- (a) an inner tube having a multiplicity of first peripheral holes therethrough and adapted to be connected to a source of dyeing liquid;
- (b) an outer tube having a multiplicity of second peripheral holes therethrough and mounted on said inner tube concentrically therewith in radially spaced relation, said second holes being smaller in size and larger in number per unit area than said first holes;
- (c) a woven screen fixedly encircling and engaging directly throughout the entire peripheral surface thereof said outer tube, and having a multiplicity of meshes smaller in size and larger in number per unit area than said second holes, said screen comprising a material that is resistant to heat and corrosion;
- (d) a separate connector strip; and
- (e) said screen being in the form of a sheet with non-overlapping opposite ends interconnected by said connector strip in an endwisely opposing relation with the latter.

4,637,234

CARTRIDGE LOCK

Pekka A. Mielonen, Reijola, Finland, assignor to Oy Wartsila AB, Finland

Filed Aug. 13, 1984, Ser. No. 640,106
Int. Cl.[4] E05B *29/06, 67/36*
U.S. Cl. 70—34 2 Claims



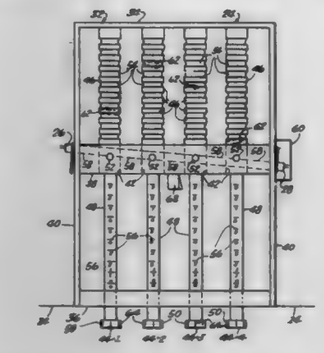
1. A cartridge lock comprising an elongated housing and disposed therein a rotary disc assembly, a locking shaft and at least one bolting element;
- said rotary disc assembly comprising a plurality of discs aligned concentrically within a cylinder, said cylinder being interconnected to one end of said locking shaft by means transmitting turning force therebetween;
- said bolting element being partially disposed within a housing aperture adjacent said locking shaft;
- said lock and locking shaft having a normal locked and an unlocked position, said locking shaft moving between said positions by axial rotation;
- said locking shaft having at least one bearing surface which, when said locking shaft is at its locked position, is presented to said bolting element holding said bolting element partially protruding from out said housing, and when said locking shaft is rotated to its unlocked position, said bearing surface is translated to a position away from said bolting element, wherein upon key action turning said cylinder of said rotary disc assembly in a first direction, said locking shaft is rotated from its locked to its unlocked position and upon key action turning said cylinder in a second and opposite direction, said locking shaft is rotated back to its locked position;
- a governor pin disposed protruding axially inwardly through said housing;
- said cylinder further including a tailpiece about which is seated a C-shaped governor plate, the ends of said C-shaped governor plate forming a first and a second face that meet said governor pin at opposite sides of said governor pin when said locking shaft reaches one of its locked and unlocked positions; and
- a first and a second mounting hole in said housing for said governor pin whereby when said governor pin is mounted in the first mounting hole, the first face of said governor plate meets said governor pin when said locking shaft is at its unlocked position and when said governor pin is mounted in the second mounting hole the first face of said governor plate meets said governor pin when said locking shaft is at its locked position.

4,637,235

OPTO ELECTRIC COMBINATION LOCK

Edward Conner, 170 NE. 18th St., Pompano Beach, Fla. 33060

Filed Dec. 10, 1984, Ser. No. 680,095
Int. Cl.[4] E05B *47/00*
U.S. Cl. 70—277 6 Claims



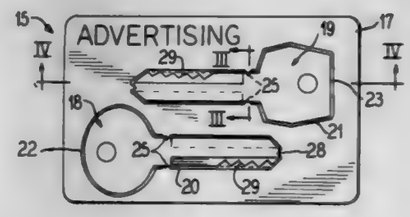
1. A combination actuating device, comprising:
- a plurality of moveable cylinders, each having an opening through the center thereof;
- a frame for holding said cylinders and for allowing said cylinders to be moved according to a predefined combination to align said openings;
- light providing means; and
- light detecting means for causing an actuation signal to be provided when light from said light providing means is provided thereto;
- said light providing means and light detecting means being positioned so that light is directed along a path from said light providing means towards said light detecting means through said cylinder openings when said cylinders have been moved by a predefined rotational angle and a predefined longitudinal distance in accordance with said predefined combination to be in alignment with said path.

4,637,236

KEY AND RETAINER CARD COMBINATION

Donald F. Almblad, 5718 Capri La., Morton Grove, Ill. 60053

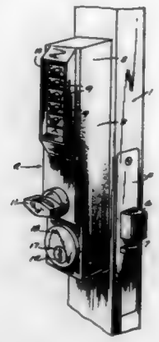
Filed Jun. 12, 1984, Ser. No. 619,936
Int. Cl.[4] A45C *11/32;* A47G *29/10;* A44B *15/00*
U.S. Cl. 70—458 20 Claims



1. A key and card combination, comprising:
- a key carrying generally rectangular wallet size plastic card of credit card-type thickness and dimensions and having opposite faces;
- at least one key recess in said card extending entirely through the thickness of the card;
- a key of greater thickness than the card in said recess consisting of the same plastic material as said card, said key having a thickness for substantially resisting twisting when used in a lock;
- said key having an edge thereabout, and said recess being

defined by an edge substantially surrounding said key edge;
and means on an area of said key edge and on a corresponding area of said recess edge for separably retaining the key in said recess and with the key having a face portion which is elevated from the plane of the adjacent card face.

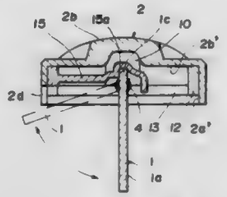
4,637,237
DOOR LOCKING SYSTEM
Edward J. Witkoski, Burlington, and Edgar G. Lizotte, Winsted, both of Conn., assignors to Simplex Security Systems, Inc., Collinsville, Conn.
Filed Sep. 27, 1985, Ser. No. 780,942
Int. Cl.⁴ E05B *37/00*
U.S. Cl. 70—285 **20 Claims**



1. A door locking means comprising:
a door;
a combination lock on said door;
a latch bolt on said door, means normally biasing said latch bolt to an extended latched position,
a latch release for retracting the latch bolt against the biasing force to a retracted position; a mechanism including a member mounted on said door means normally biasing said member to a retracted position connected with said latch release, said mechanism including interposer means selectively and alternatively interrupting and transmitting control through the combination lock or key lock control;
a combination lock control;
a manual latch control operator connected to said combination lock control for selectively and alternatively operating said mechanism and said door latch release for unlatching said latch bolt; and
a key operated lock control for selectively and alternatively operating said mechanism and said latch release to unlatch said latch bolt.

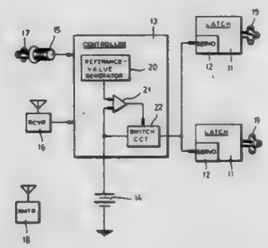
4,637,238
FOLDING KEY FOR VEHICLES
Youichi Uda, Miyazaki; Seiya Matsushima, Sakado; Kazuhiko Saito, Kodaira; Shoji Yamamoto, Tokyo, and Kazuhiro Murakami, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Honda Lock Manufacturing Co., Ltd., Miyazaki, both of, Japan
Filed Dec. 23, 1985, Ser. No. 812,292
Claims priority, application Japan, Dec. 28, 1984, 59-196861[U]; Feb. 20, 1985, 60-23780[U]
Int. Cl.⁴ A44B *15/00*
U.S. Cl. 70—456 R **12 Claims**

1. A folding key for a vehicle having a key cylinder, comprising:
a dished cap having an outer end surface, an outer peripheral surface axially extending from a periphery of said outer end surface and forming a peripheral edge, a cut-out formed in a portion of said peripheral edge of said outer peripheral surface, and an inner end surface having a recess formed therein;
a bearing portion provided in said cap; and
a key body having one end thereof supported by said bearing portion and being pivotable with respect to said cap about said bearing portion, said key body being engageable with said cut-out when said key body pivots ultimately;
said cap being arranged on the vehicle so as to allow said key



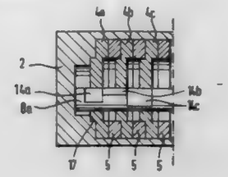
body to be levelled substantially in parallel to an advance direction of the vehicle;
said cap being arranged on the vehicle in a manner such that part of said key cylinder is fitted in said recess of said inner end surface of said cap; and
said portion of the peripheral edge of said cap, in which said cut-out is formed, being located rearwardly of the peripheral edge with reference to the advance direction of the vehicle.

4,637,239
VEHICULAR LOCK SYSTEM WITH ANTILOCKOUT PROTECTION
Frank Kleefeldt, Helligenhaus, and Peter Bartel, Hattingen, both of Fed. Rep. of Germany, assignors to Kiekert GmbH & Co Kommanditgesellschaft, Helligenhaus, Fed. Rep. of Germany
Filed Jan. 16, 1985, Ser. No. 692,023
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 3402788
Int. Cl.⁴ E05B *65/36*
U.S. Cl. 70—264 **4 Claims**



1. A vehicular lock system used in combination with a battery and comprising:
at least one latch settable in an unlocked position, a locked position permitting manually opening only by a key, and an antitheft position preventing manual opening even with the key;
an electric servomotor powerable by the battery for displacement of the latch between at least the antitheft and locked positions, the servomotor being unable to move the latch between the positions when the battery power is below a predetermined minimum;
externally operable control means connected between the battery and the servomotor for feeding the battery power to the servomotor for displacing the latch at least between the antitheft and locked positions;
means for generating a reference signal corresponding to the minimum battery power; and
comparator means connected to the battery and to the generating means for comparing the battery power and the reference signal and connected to the control means for displacing the latch from the antitheft position to the locked position when the battery power falls below the predetermined minimum represented by the reference signal.

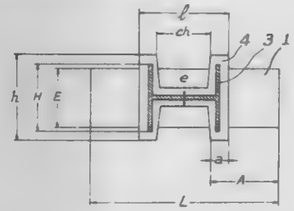
4,637,240
CYLINDER LOCK
Kyösti Nevalainen, and Kaarlo Martikainen, both of Joensuu, Finland, assignors to Oy Wärtsilä Ab, Helsinki, Finland
Filed Jun. 25, 1985, Ser. No. 749,084
Claims priority, application Finland, Jul. 10, 1984, 842749
Int. Cl.⁴ E05B *29/04*
U.S. Cl. 70—366 **11 Claims**

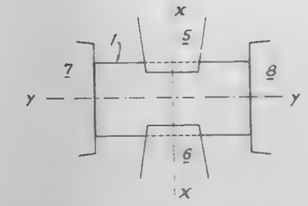


1. A cylinder lock including a number of locking discs each having two substantially parallel opposite end faces and provided with a key opening, the locking discs being arranged in a stack having a predetermined axial length so that a keyway for receiving a key is formed jointly by the key openings, whereby the locking discs are turnable by means of combination surfaces of the key to a predetermined angular position, and at least one of the locking discs having a key-engaging surface that is substantially shorter in the axial direction of the stack than the distance between the two opposite end faces of the disc and is located asymmetrically with respect to a plane of the locking disc that lies midway between and parallel to the two opposite end faces of the disc, so that the location of the key-engaging surface of said one disc relative to other discs of the stack can be changed without affecting the length of the stack by reversing the orientation of said one locking disc in the stack of discs.

4,637,241
FULLY UNIVERSAL ROLLING PROCESS FOR H OR I-BEAM TYPE METAL SECTIONS
Jacques M. Michaux, Joeuf, France, assignor to Sacilor, Hayange, France
Filed Mar. 21, 1984, Ser. No. 591,865
Claims priority, application France, Mar. 21, 1983, 83 04589
Int. Cl.⁴ B21B *1/10, 1/14*
U.S. Cl. 72—225 **17 Claims**

1. A process for forming a rough beam type metal section having a web forming portion and flange forming portions comprising the use of a universal stand and a two-high stand, said universal stand having two horizontal rolls and two vertical rolls, by passing an initial section of rectangular or trapezoidal cross section through a roll gap formed by said rolls of said universal stand, said process comprising the steps of:
(a) recessing the web forming portion in a first series of universal passes through said roll gap by means of the horizontal rolls exerting direct pressure on the central portion of the initial section while the vertical rolls exert only sufficient pressure on the initial section to resist spread of the metal in the horizontal direction caused by recessing of the web and to maintain the initial section in the direction of the centerline of rolling upon discharge from the universal stand for achieving, during this step, greater reduction of the web forming portion than the flange forming portion; and



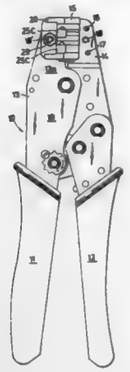


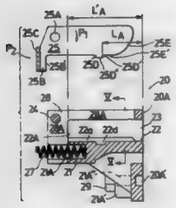
(b) thereafter simultaneously reducing the web and flange forming portions in succeeding passes through said roll gap by means of the horizontal rolls and vertical rolls of the universal stand exerting direct pressure on the web forming portion and flange forming portions, respectively.

4,637,242
LOCATOR DEVICE FOR A TOOL PROVIDED WITH CRIMPING DIES FOR CABLE SHOES
Hans Undin, Åkersberga, and Hans Wiener, Täby, both of Sweden, assignors to C. A. Weidmüller GmbH & Co., Detmold, Fed. Rep. of Germany
Filed Apr. 11, 1984, Ser. No. 599,246
Claims priority, application Sweden, Apr. 19, 1983, 8302185
Int. Cl.⁴ B21D *7/06*
U.S. Cl. 72—410 **8 Claims**

1. A locator device for a tool with crimping dies for cable shoes which have a crimping portion and a contact portion of different lengths, wherein the device comprises a body which has first and second ends and comprises at least one elongated track for accommodating said contact portion of a cable shoe inserted into the tool, means for attaching said body to the tool, said track extending from said first end toward the second end of the body and having a bottom portion, two side walls and a stationary first stop means at said second end, said stop means terminating said track at a distance from said first end which corresponds to the longest crimping portion of a cable shoe to be treated in the tool, a stop carrier with an operating means and which is constantly affected by a spring force and is against this force movable transversely to the direction of the track; at least one movable second stop means arranged on said stop carrier between said first and second ends at a distance from said first end which corresponds to the length of a shorter contact portion of a cable shoe to be treated, and which at least one second stop means either clears or bars said track, depending on the position of the stop carrier, wherein the stop carrier is defined by an elongated planar plate extending parallel with

the track and pivoted to the body at said second end thereof, and said second stop means is defined by a forward edge of a





projection on said plate extending towards the bottom portion of the track.

4,637,243

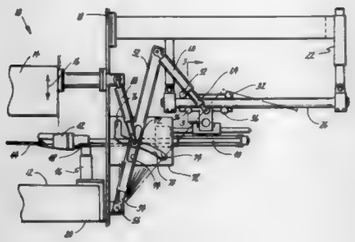
PRESS LINKAGE WITH CONTROLLED DWELL

Irvin D. Bond, 10270 Allen Rd., Clarkston, Mich. 48016

Filed Sep. 3, 1985, Ser. No. 772,037

Int. Cl.⁴ B21J *13/10*

U.S. Cl. 72—421 **8 Claims**



1. The combination comprising:

a frame;

a first press member mounted on the frame;

a second press member mounted on the frame so as to be moveable with respect to the first press member along a first path of motion, between open and closed positions, the first press member and the second press member having an opening between them;

workpiece support means moveable toward positions depending on the position of the first press member and the second press member;

linkage means pivotally mounted on the frame and connected to the workpiece support means such that as the linkage means is pivoted in a first direction, the workpiece support means is moved along a path of motion with respect to the opening defined between the first press member and the second press member, the linkage means having a slot;

an elongated connecting member having a first end connected to the movable, second press member so as to be moveable therewith, and its opposite, second end connected to the slot in the linkage means so as to be moveable therewith;

a cam plate mounted on the frame, the cam plate having a slot; and

follower means connected to the second end of the connecting member and received in the cam slot so as to follow the same whereby as the linkage means is pivoted in said first direction, the workpiece support means moves with respect to the moveable press member with a controlled rate of motion according to the slot in the cam plate.

4,637,244

METER PROVERS

Robert Maurer, 31A The Avenue, Cowley, Uxbridge, Middlesex, and Peter C. Epstein, 8A Fitzroy Park, Highgate, London N6 6HP, both of England

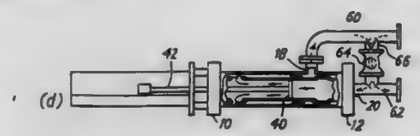
PCT No. PCT/GB83/00306, § 371 Date Jul. 23, 1984, § 102(e) Date Jul. 23, 1984, PCT Pub. No. WO84/02185, PCT Pub. Date Jun. 7, 1984

PCT Filed Nov. 28, 1983, Ser. No. 634,098

Claims priority, application United Kingdom, Nov. 26, 1982, 8233714; May 3, 1983, 8312078

Int. Cl.⁴ G01F *25/00*

U.S. Cl. 73—3 **9 Claims**



1. In a meter prover for proving a meter connected in a fluid flow path where the meter prover is of the type having

(a) means providing a proving bore;

(b) a piston disposed in the proving bore and movable along said bore in sealed engagement with the wall of the bore, said piston starting its proving run from an initial upstream position;

(c) means for connecting the proving bore in parallel with a section of the flow path not containing the meter; and

(d) by pass valve means operable to cause fluid flow selectively through the proving bore or through said parallel flow path section;

whereby in a proving run, the piston moves axially in synchronism with fluid flow along the proving bore and displaces a known volume within the bore, the improvement wherein

the effective area of the upstream face of the piston acted on by fluid pressure is less than the effective area of the piston's downstream face acted on by fluid pressure so that on reestablishment of flow through said parallel flow path section after a proving run, substantially equal fluid pressures act on said faces of the piston, whereby the difference in effective area of those faces causes the piston to be restored to its initial upstream position.

4,637,245

KNOCK DERIVING APPARATUS FOR INTERNAL COMBUSTION ENGINES

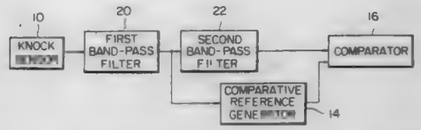
Toshio Iwata, and Atsushi Ueda, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 27, 1985, Ser. No. 749,590

Claims priority, application Japan, Jun. 29, 1984, 59-135718

Int. Cl.⁴ G01L *23/22*

U.S. Cl. 73—35 **3 Claims**



1. A knock deriving apparatus for an internal combustion engine comprising:

a knock sensor responsive to vibrations of the engine producing an output signal containing a broad range of frequencies including a frequency component representing knocks in said engine;

a first frequency filter means having a bandwidth for passing a predetermined frequency component of the output signal of said knock sensor and producing a first filtered signal containing a range of frequencies which is wider than the frequency component representing knocks and includes frequencies representing engine noise including noise resonance frequencies near the knock frequency component;

a second frequency filter means having a narrower bandwidth than and connected to said first frequency filter means for passing the frequency component representing knocks received from said first frequency filter means while blocking frequencies representing engine noise, and producing an output;

a comparative reference generator connected directly to receive the first filtered signal of said first frequency filter means for generating a comparative reference signal representing the average of the first filtered signal produced by said first frequency filter means; and

a comparator for comparing the outputs of said comparative reference generator and said second frequency filter means to derive said knocks.

4,637,246

AXIAL ACCELERATION SENSOR

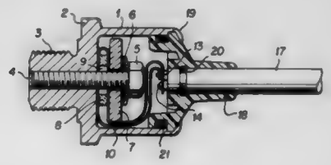
Claude Lombard, Chesnay, Claude Moyses, Paris, Gerad Catier, Issyles Moulineaux, and Bernard Montaron, Toulouse all of France, assignors to Regie Nationale des Usines Renault, Boulogne Billancourt and Renix Electronique, Toulouse, both of, France

Filed Nov. 30, 1984, Ser. No. 676,808

Claims priority, application France, Dec. 2, 1983, 83 19294; May 29, 1984, 84 08380

Int. Cl.⁴ G01L *23/22*

U.S. Cl. 73—35 **7 Claims**



1. A sensor for detection of axial accelerations in an internal combustion engine, comprising:

a case having a base including means for fastening said case to a source of said axial accelerations;

a piezoelectric element in said case and having an aperture;

a seismic mass in said case and having an aperture;

a headed cylindrical element fixed to said base, said cylindrical element passing through said apertures of said piezoelectric element and said seismic mass with said piezoelectric element being positioned on said cylindrical element between said base and said seismic mass;

spring means mounted on said cylindrical element and pressing on said seismic mass for biasing said piezoelectric element between said base and said seismic mass;

electrical output means mounted on said case; and

flexible electrical connection means comprising:

(a) an elongate strip of flexible insulating material having a flat face,

(b) two annular conductive layers on said flat face,

(c) apertures through said insulating material at centers of said annular conductive layers, said insulating material being folded at a position between said conductive layers and said insulating material being mounted on said cylindrical member with said cylindrical member passing through said apertures thereof and said annular conductive layers each engaging an opposite side of said piezoelectric element,

(d) two conductive terminal layers on said flat face at positions spaced from said annular conductive layers and each terminal layer connected to said electrical output means, and

(e) conductive connecting layers on said flat face and each said connecting layer connecting one of said annular conductive layers with one of said terminal layers.

4,637,247

METHOD OF RECOGNIZING KNOCKING SIGNALS IN A RECEIVED SIGNAL DERIVED FROM A KNOCKING SENSOR IN AN INTERNAL COMBUSTION ENGINE, AND SYSTEM CARRYING OUT THE METHOD

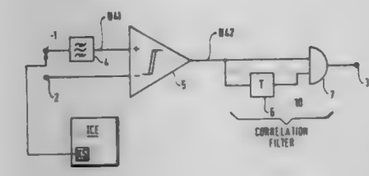
Adolf Dreyer, Oberriexingen, and Herman Roozenbeek, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,612

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430000

Int. Cl.⁴ G01L *23/22*

U.S. Cl. 73—35 **11 Claims**



3. In combination with an internal combustion engine (ICE) subject to knocking, having a knock sensor (KS) providing sensor output signals,

a system for recognizing knocking signals in the sensor output signal, derived from the sensor, which derived signal includes a mixture of background noise signals, disturbance signals, and knocking signals, if said knocking signals are present,

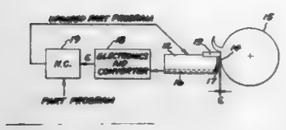
said system comprising, in accordance with the invention,

a correlation filter coupled to receive the derived signal, said correlation filter (40) including

means (63) for generating a cyclically recurring correlation signal having an average frequency which is a function of the knocking signal expected from the engine (ICE) upon knocking or incipient knocking operation thereof, and

means (73) coupled to receive the correlation signal and said derived signal for correlating said signals;
a filter (4) connected to receive signals from the sensor (KS) and filtering said signals with respect to a predetermined bandpass range including the frequencies of the knocking signals expected from the engine (ICE); and
a comparator means (5) having a reference input terminal (2);
wherein (FIG. 4)
the correlation filter (40) is connected between the output of the bandpass filter (4) and another input of the comparator means (5), the frequency of the cyclically recurring signals being tuned to match one of the frequencies passed by the bandpass filter, said correlation filter providing an output upon correlation between the derived signal and the correlation signal and thereby indicating presence of a knocking signal.

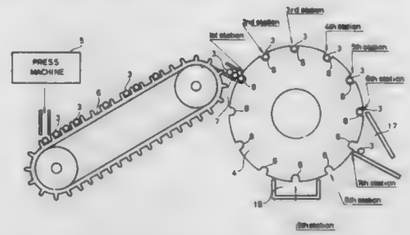
4,637,248
ADAPTIVE DISPLACEMENT SENSOR FOR CONTOUR MACHINING
Robert A. Thompson, Quaker Street, and Robert S. White, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Oct. 3, 1985, Ser. No. 783,894
Int. Cl.⁴ G01B *13/12*
U.S. Cl. 73—37.5 **14 Claims**



1. An adaptive displacement sensing system for in-process tool condition monitoring and inspection of contoured workpieces on a machine tool comprising:
a tool having a cutting tip beneath which is supported a rotating nozzle that has a rectangular displacement sensing orifice;
means to rotate said nozzle so that the plane of said rectangular orifice is kept parallel to machined contoured workpiece surfaces during a machining operation; and
means to supply fluid to said rotating nozzle and for sensing fluid back pressure and generating an output signal representing distance from said nozzle to said workpiece surface.

4,637,249
BATTERY CAN HOLE DETECTING APPARATUS
Morio Ishizaki, Itami, and Akiyoshi Nishikawa, Osaka, both of Japan, assignors to Ishizaki Press Kogyo Co., Ltd., Itami, Japan
Filed Sep. 10, 1985, Ser. No. 774,545
Claims priority, application Japan, Mar. 20, 1985, 60-57014
Int. Cl.⁴ G01M *3/02*
U.S. Cl. 73—41 **3 Claims**

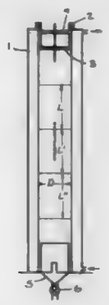
1. An apparatus for detecting and separating defective, leaking battery cans from perfect battery cans made by press drawing, comprising can supply means for providing a substantially continuous flow of cans, rotor means having can receiving and positioning means in its circumferential surface spaced at suitable intervals in said surface, said rotor means being arranged for receiving cans in said can receiving and positioning means from said can supply means, clamping means arranged for cooperation with said can receiving and positioning means for holding a can in a fixed position in said can receiving and positioning means, said clamping means comprising piston cylinder means (9, 9a) including a piston rod for pressing against a closed can end, and an insert portion for insertion into an open can end to hold a can between said piston rod and said insert portion, said insert portion closing an inner space in a can, air introducing means having an air inlet port passing through said insert portion for introducing air under pressure into said inner space in a can, pressure responsive switch means arranged for actuation by a certain air pressure value in said inner space in a can, first can discharge means (17) arranged for discharging perfect cans from said rotor means, second can discharge means (18) arranged downstream of said first can



discharge means (17) as viewed in the direction of rotation of said rotor means for discharging defective cans from said rotor means, first control means operable by said pressure responsive switch means for controlling said clamping means to release a perfect can to said first discharge means when said pressure responsive switch means have been actuated for removing said piston rod from said closed can end, whereby air pressure inside said inner space releases a perfect can from said insert portion to said first discharge means (17), and second control means arranged for cooperation with said clamping means when a defective can reaches said second discharge means (18) for removing said piston rod from said closed end of a defective can, and for substantially simultaneously blowing air through said insert portion to release a defective can from said insert portion to said second discharge means.

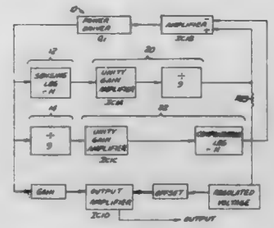
4,637,250
APPARATUS AND METHOD FOR VISCOSITY MEASUREMENTS FOR NEWTONIAN AND NON-NEWTONIAN FLUIDS
Thomas F. Irvine, Jr., and Noh-Aeok Park, both of Stony Brook, N.Y., assignors to State University of New York, Stony Brook, N.Y.
Filed Jan. 25, 1985, Ser. No. 694,747
Int. Cl.⁴ G01N *11/12*
U.S. Cl. 73—57 **19 Claims**

1. An apparatus for the determining viscosity of fluids comprising:
a. A cylinder, of diameter D cm., for holding the fluid for which the viscosity is to be determined;
b. Means for measuring axial displacement a predetermined distance, L cm., along the vertical axis of the cylinder, remote from the top and bottom by a distance of at least D cm.;
c. A needle, made of tubing with rigid side walls the density of which can be adjusted with thin metal wiring to produce a velocity of fall of almost 0 to about 10 cm. per sec. and sealed hemispherically at both ends, having a diameter d cm., wherein b=D/d is at least 5, and a length of l cm., wherein l/D is at least 2.5;
d. Means engaging the top of the cylinder for guiding said needle so that the needle will fall along the axis of said cylinder;
e. Means for maintaining a constant temperature in the cylinder; and



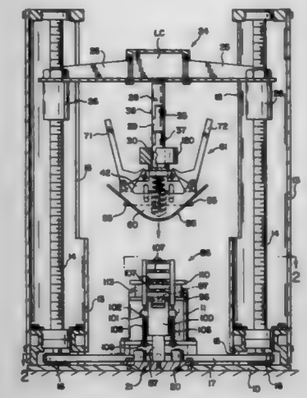
f. Device for measuring the time of fall of the needle between the predetermined distance marked on the cylinder.

4,637,251
SYMMETRICAL BRIDGE CIRCUIT FOR MEASURING MASS AIR FLOW
Ralph W. Carp, Newport News, Va., assignor to Allied Corporation, Morris Township, Morris County, N.J.
Filed Feb. 18, 1986, Ser. No. 830,317
Int. Cl.⁴ G01M *15/00*
U.S. Cl. 73—118.2 **11 Claims**



1. A symmetrical bridge circuit for measuring mass air flow comprising:
power driver means electrically connected to a source of power for supplying electrical power;
sensing leg means including a first sensing leg and a second sensing leg, said sensing leg means having a sensing element located in the air flow and responsive to the rate of the air flowing across said sensing element, each of said first and second sensing legs having an input, an output and a control lead intermediate said input and output;
compensation leg means including a first compensation leg and a second compensation leg, said compensation leg means having a compensation element located in the air flow and responsive to the temperature of the air flow, each of said first and second compensation legs having an input, an output and a control lead intermediate said input and output;
a control amplifier electrically coupled to the control leads from each of said second sensing leg and said compensation leg and operable to control the output of said power driver means for supplying power to the input of said sensing leg means and said compensation leg means; and
an output amplifier means responsive to the output of said power driver means for generating a signal representing the mass of the air flowing across said sensing and compensation elements.

4,637,252
TEXT INSTRUMENT
Chong-Kon Rhee, Broadview Heights, Ohio; David M. McKibben, Cleveland, Ohio, and Jeffrey N. Bibbee, Lake Jackson, Tex., assignors to The Uniroyal Goodrich Tire Company, Akron, Ohio
Continuation of Ser. No. 421,749, Sep. 23, 1982, abandoned. This application Nov. 19, 1984, Ser. No. 672,654
Int. Cl.⁴ G01N *19/04*
U.S. Cl. 73—150 A **22 Claims**

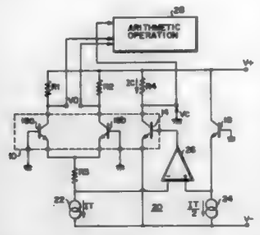


1. The process of measuring tack of elastomeric compositions, comprising the steps of bringing two specimens of elastomeric stock into abutting contact to define a contact area under an initial contact pressure, maintaining said contact pressure between said two specimens for a predetermined first time interval which is a dwell time, separating said contact between said specimens within a second time interval at a predetermined separation rate, measuring the tack as energy per unit contact area required to separate said stock specimens by integrating the force to separate said specimens over said second time interval for complete separation to occur, and multiplying said integral by said separation rate and dividing the product by contact area to give tack.

4,637,253
SEMICONDUCTOR FLOW DETECTOR FOR DETECTING THE FLOW RATE AND FLOWING DIRECTION OF FLUID
Masayuki Sekimura, Yokohama, and Shunji Shirouzu, Ayase, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 14, 1985, Ser. No. 733,796
Claims priority, application Japan, May 22, 1984, 59-103028; May 22, 1984, 59-103030
Int. Cl.⁴ G01F *1/68*; G01P *5/10*
U.S. Cl. 73—189 **13 Claims**

1. A semiconductor flow detector for detecting a flow rate and flowing direction of fluid, comprising:
a first semiconductor flow detecting element including a first heating element formed in the center portion of a semiconductor substrate and a first pair of temperature-measuring elements arranged on side edge portions of the semiconductor substrate to have the first heating element sandwiched therebetween, said temperature measuring elements being positioned symmetrical with respect to the first heating element;
means for detecting the temperature of the fluid under measurement to generate a temperature detection signal;
a first driving means for heating the first heating element in accordance with the temperature detection signal to keep the temperature of the first semiconductor flow detecting

element higher by a prescribed level than the temperature of the fluid under measurement;
a first electric power detecting means for detecting the electric power corresponding to the current flowing through the first heating element and contributing to the heating thereof so as to generate a first electric power detection signal Vc;
a second driving means for driving the first pair of the temperature measuring elements;



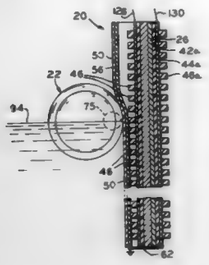
a first temperature difference detecting means for detecting the difference in temperature between the first pair of the temperature measuring elements in terms of an electric signal so as to generate a first temperature difference signal Vo; and
an arithmetic means for performing a prescribed arithmetic operation based on following equations so as to obtain the flow rate Vf and flowing direction θ of the fluid, said equations being $Vc=a\cdot Vf$ and $Vo=b\cdot(Vf)^{\frac{1}{4}}\cos\theta$ wherein a and b are essentially constant.

4,637,254

GAUGE APPARATUS FOR MEASURING LIQUID LEVELS

Jerry F. Dybea, Fort Wayne, Ind., and Stanley S. Wulc, Rydal, Pa., assignors to Tokheim Corporation, Fort Wayne, Ind.

Filed Oct. 10, 1984, Ser. No. 659,326
Int. Cl.[4] G01F *23/68, 23/76*
U.S. Cl. 73—314 **44 Claims**



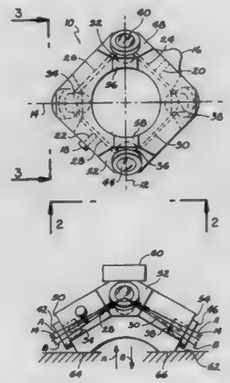
1. Gauge apparatus for measuring liquid levels comprising a buoyant device adapted to float in the liquid being measured, said buoyant device including a body which has an annular portion and is formed of magnetic material, an immersible elongated sensor adapted to be arranged in upright position and having an electrical characteristic which may be varied, means connecting said buoyant device to said sensor for movement with respect thereto for varying said electrical characteristic in response to variations in elevation of said buoyant device caused by changes in level of the aforesaid liquid, said connecting means including force-generating means for holding said buoyant device in operative engagement with said sensor, said force-generating means including a permanently magnetized device that provides a concentrated magnetic field along a path that extends longitudinally of said sensor, said buoyant device and said magnetized device including means for maintaining said buoyant device in aligned registry with said path while said annular portion is in rolling engagement with said sensor, and means for measuring said electrical characteristic thereby to provide an indication of such level.

4,637,255

NON-PLANAR RING LASER ACCELEROMETER

Graham J. Martin, Canoga Park, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Dec. 30, 1985, Ser. No. 814,878
Int. Cl.[4] G01P *15/08*
U.S. Cl. 73—517 R **9 Claims**



1. An accelerometer comprising, in combination:
(a) a block;
(b) a non-planar cavity within said block;
(c) said cavity comprising a plurality of substantially straight intersecting segments;
(d) means for generating at least one rotating beam of laser light within said cavity;
(e) a mirror arranged adjacent each of said cavity intersections to direct light between said intersecting segments;
(f) a proofmass contacting said block so that said block is elastically deformed in a predetermined manner in response to acceleration force; and
(g) means for determining said acceleration force as a function of the light within said cavity.

4,637,256

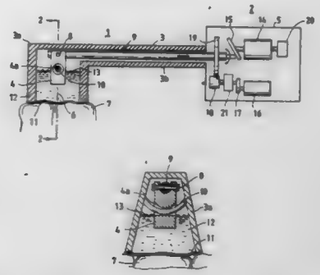
ULTRASONIC PROBE HAVING DUAL-MOTION TRANSDUCER

Yoshiyuki Sugiyama, Ayase; Shinichiro Aoki, Kawasaki, and Yasuyuki Morita, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 22, 1984, Ser. No. 623,752
Claims priority, application Japan, Jun. 23, 1983, 58-113707; Sep. 27, 1983, 58-178529; Dec. 5, 1983, 58-229310
Int. Cl.[4] G01N *29/04;* **A61C** *19/04;* **A61B** *10/00*
U.S. Cl. 73—633 **12 Claims**

1. An ultrasonic probe comprising:
an elongated housing having an acoustic window at one end thereof;
an ultrasonic transducer located in said housing for emitting an acoustic beam through said acoustic window;
a dual motion drive means located at the other end of said housing for providing dual motions having a reciprocating motion and a swing motion transverse to the reciprocating motion; and
means for coupling said drive means to said transducer to transmit thereto said dual motions so that said beam is steerable in orthogonal directions, wherein said coupling means comprises:

a drive shaft connected at one end to said dual motion drive means to transmit said reciprocating and swing motions to the other end thereof; and
means for movably mounting said transducer at the other end of said drive shaft so that said transducer is swingable in a first plane in response to said reciprocating motion and in a second plane normal to said first plane in response to said swing motion, wherein said transducer is formed with an opening extending in the transverse direction of the housing, said mounting means comprising:



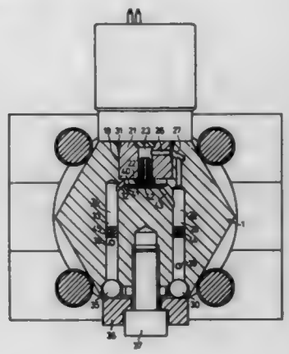
a pivot member extending through said transducer and said drive shaft in said transverse direction; and
an arcuate guide member spaced from said pivot member, the guide member extending through said opening so that said transducer is swingable about said guide member in response to said reciprocating motion and further swingable about the axis of said drive shaft in response to said swing motion.

4,637,257

PRESSURE DIFFERENCE MEASURING DEVICE WITH A SEMICONDUCTOR PRESSURE SENSOR

Moriz von Rauch, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 15, 1985, Ser. No. 798,564
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1984, 3443419
Int. Cl.[4] G01L *7/08, 9/00*
U.S. Cl. 73—706 **2 Claims**



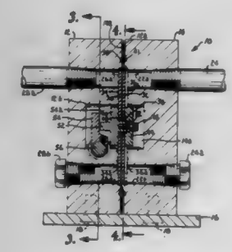
1. A pressure difference measuring device having a semiconductor pressure sensor in a pressure pickup body and having at each end face thereof a separating diaphragm with an adjacent supplemental diaphragm, wherein on both sides of the semiconductor pressure sensor a connecting canal is provided and from each connecting canal, at an end facing away from the semiconductor pressure sensor, a spur canal is provided which leads to a respective separating diaphragm and a further spur canal is provided which leads to a respective supplemental diaphragm adjacent to the other separating diaphragm, and further comprising a damping element arranged in at least one connecting canal, the semiconductor pressure sensor being associated with an equalizing diaphragm having a stiffness which is greater than that of the supplemental diaphragms but less than that of the semiconductor pressure sensor, both sides of the equalizing diaphragm being connected to respective ones of the connecting canals in the region between the semiconductor pressure sensor and the damping element.

4,637,258

PRESSURE DIFFERENTIAL CONTROL MECHANISM

Wayne A. Priest, Kansas City, Kans., assignor to SOR, Inc., Olathe, Kans.

Continuation of Ser. No. 551,027, Nov. 14, 1983, abandoned. This application Oct. 25, 1985, Ser. No. 791,681
Int. Cl.[4] G01L *7/08*
U.S. Cl. 73—716 **2 Claims**



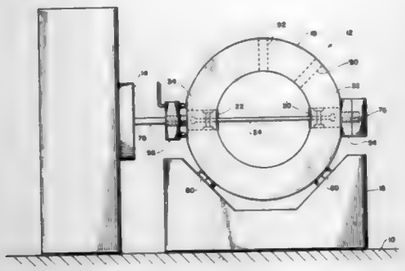
1. An operating assembly for sensing changes in a pressure differential between the high and low sides of a fluid system and translating said changes into movement of a control operating member, said assembly including:
a housing containing a chamber having an outer annular portion defined by confronting parallel walls, an intermediate portion contiguous with said outer annular portion, of substantially greater depth than said annular portion and also defined by confronting parallel walls, and a central piston receiving portion of greater depth than said intermediate portion,
a piston assembly located within said chamber said piston assembly having a high pressure side and an opposed low pressure side, said piston assembly including
(a) A disk-like outer portion fitting into the intermediate portion of said chamber with opposite faces on the disk-like portion parallel to and confronting the respective walls of the intermediate portion of the chamber, the perimeter of said disk-like portion being slightly spaced inwardly from the inward perimeter of said annular portion of said chamber,
(b) A central piston body affixed to said disk-like portion and located in the said central portion of said chamber, and
(c) A flexible, fluid impermeable membrane extending between the perimeter of said disk-like portion and outer perimeter of said annular portion of said chamber and defining with said disk-like outer portion and piston body an uninterrupted barrier dividing said chamber into high and low pressure sides,
means for communicating the pressures on the low and high pressure sides of said fluid system with the low and high pressure sides of said piston assembly,
said membrane permitting movement of said piston assembly in response to a positive pressure differential to bring the low pressure side face of said disk-like portion into bearing contact with the confronting wall of the intermediate portion of said chamber thereby to cause substantially all of the load imposed by the high pressure on said piston assembly to be imposed on said confronting wall, and

control means associated with and operable responsive to movement of said piston body caused by changes in pressure differential in said system.

4,637,259
FATIGUE TEST MACHINE

David I. G. Jones, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 6, 1985, Ser. No. 805,518
Int. Cl.[4] G01N *3/00*
U.S. Cl. 73—794 3 Claims



1. A fatigue testing apparatus for testing a specimen under combined low cycle and high cycle loading which comprises: a test fixture, means for supporting said test fixture and means for applying a dynamic load to said test fixture, wherein said test fixture consists essentially of:

(a) a right circular cylinder having:

an inside diameter, an outside diameter, a height and a central axis;

a first radial opening in said cylinder, said opening having a height dimension parallel to said central axis not greater than about 70% of said cylinder height and a circumferential dimension not greater than about 70% of said cylinder height, and

a second radial opening in said cylinder diametrically opposite said first opening, said second opening having substantially the same dimensions as said first opening;

(b) a pair of specimen clamping means having:

a first portion adapted to slidably fit into said radial openings in said cylinder,

said first portion comprising means for receiving and clamping a specimen, and a second portion comprising means to limit the travel of said clamping means into said radial openings toward said central axis,

wherein at least one of said clamping means further comprises means for applying a static pressure to a specimen clamped between said clamping means,

wherein one of said clamping means further comprises means for connection to said dynamic load-applying means; and

wherein said supporting means comprises means to support said cylinder at at least two nodal points for a desired mode of vibration at a resonant frequency defined by the formula

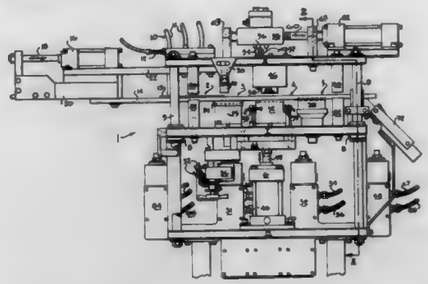
$$f_N = \frac{1}{2\pi}\sqrt{\frac{EH^2N^2(1-N^2)^2}{12\rho R^4(1-\nu^2)(1+N^2)}} \quad (1)$$

where N is an integer corresponding to the mode of vibration, E is Young's modulus, N is the mode number, ρ is the density of the material of said cylinder, ν is Poisson's ratio, H is the thickness of said cylinder and R is the average radius of said cylinder.

4,637,260
CAN END TESTER

Edward C. Gilliam, Midlothian; John M. Jackson, Glade Springs, and Billy J. Lamie, Bristol, all of Va., assignors to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 808,552, Dec. 13, 1985, abandoned.
This application Aug. 14, 1986, Ser. No. 895,589
Int. Cl.[4] G01N *3/08*
U.S. Cl. 73—826 20 Claims

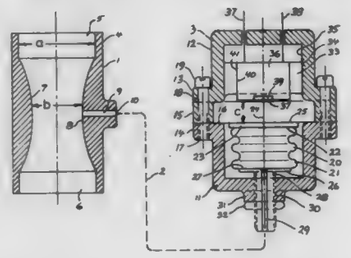


1. Apparatus for testing sequentially a plurality of non-detachable easy-open beverage can ends for proper opening thereof comprising an entry station for said ends, a station for optically orienting said ends into a proper position for opening, a station for opening said ends and subsequently optically testing said ends for proper opening thereof, means for opening and closing said stations and means for transporting said ends through said stations.

4,637,261
MASS-FLOW SENSING TRANSDUCER FOR INTERNAL COMBUSTION ENGINES

Robert A. Kraus, and Edmund J. Kraus, both of 1636-T E. Edinger Ave., both of Santa Ana, Calif. 92705

Filed Nov. 27, 1985, Ser. No. 802,435
Int. Cl.[4] G01F *15/02*; G01M *19/00*
U.S. Cl. 73—861.02 10 Claims



1. Apparatus for measuring the mass flow rate of air, by performing separate air density, and air flow rate sensing functions, and to provide a single electric output signal relevant thereto, comprising in combination:

a. flow obstruction means comprising housing means provided with an air inlet and an air outlet at axial ends thereof, a venturi constriction having a narrow throated portion, and fluid passageway from within said narrow throat to a suction port;

b. ultrasonic device for causing a shift in phase of propagated sonic waves between two elements within a confined space;

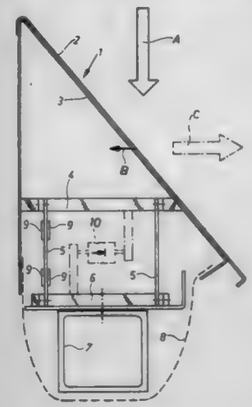
said ultrasonic device comprising first housing portion having concentrically disposed a first cavity, and second housing portion having concentrically disposed a second cavity, each being defined by a cylindrical inner surface and an end wall, said housing portions having suitable means for longitudinal separation to a given distance from each other, so as to form radially extending, fluid communicative passageways from within said cavities to atmosphere; and means for fastening said first and second housing portions to each other; said first cavity houses concentrically within disposed a single ultrasonic generator means, having electric terminals, and centrally disposed, a single piezoelectric element, having leads connected to said terminals, and being disposed to face said second housing portion; said second cavity houses a wave reflecting means facing said piezoelectric element at a specified distance of no less than one quarter wave length apart; said wave reflecting means being fixed to a hermetically sealed, pressure responsive means so as to establish a coaxial relationship between said pressure responsive means, said wave reflecting means, and said ultrasonic generator means; said pressure responsive means having a fluid communicative passageway from within said pressure responsive means; said passageway being fluid communicative connected to said suction port, whereby occurring pressure changes at said suction port causes axial movement of said wave reflecting means, thereby causing a shift in phase of propagated ultrasonic waves between said wave reflecting means and said piezoelectric element; said ultrasonic device further comprises, sequentially connected, electronic oscillator means for generating a fixed oscillator frequency and amplitude, resistance means, and said ultrasonic generator means for generating ultrasonic waves equal to said oscillator frequency; wherein said piezoelectric element of said ultrasonic generator means possesses a natural resonant frequency equal to said oscillator frequency; and wherein in operation said resistance means serves to maintain a constant current flow through said piezoelectric element; said resistance being substantially greater than the impedance of said piezoelectric element, wherein variations in said impedance causes the voltage at said terminals to follow said impedance; and wherein the variations in impedance is a function of antiresonant frequency caused by a shift in phase between the vibrations of the piezoelectric element, and the returning waves impinging on said piezoelectric element; and wherein said shift in phase is a consequence of changes in air temperature and the distance between said piezoelectric element and said wave reflecting element; thereby causing an electric output signal at said terminals being proportional to said mass flow rate.

4,637,262
MASS FLOW RATE METER

Pekka Vesa, Kansakoulukatu 5, 15700 Lahti 70, Finland

Filed Jun. 21, 1985, Ser. No. 747,413
Claims priority, application Finland, Jul. 16, 1984, 842852
Int. Cl.[4] G01F *1/30*
U.S. Cl. 73—861.73 11 Claims

1. A mass flow rate meter, comprising a collision plate (1) for a mass flow to be measured to collide with, means (4, 5) for supporting collision plate (1) so as to allow said collision plate to move along a substantially horizontal path which is substantially transverse to the mass flow direction (A(before impact)), as well as means for sensing the distance travelled by collision plate (1) or the force applied to said collision plate in its travelling direction, characterized in that collision plate supporting means (4, 5) comprise spring plates (5), which are perpendicular to the direction of movement (B) of said collision plate and spaced from each other in the same direction as the direction of movement (B), the upper ends of said spring plates being rigidly fastened to a clamping element (4) of collision plate (1) and the lower ends thereof being rigidly secured to a body (6, 7), the ratio of the stiffness of spring plates (5) relative to the weight of the structure carried by the spring plates being

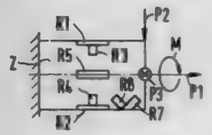


selected in a manner that the specific resonance frequency of said collision plate is higher than 4 Hz.

4,637,263
MULTI-COMPONENT FORCE AND TORQUE MEASUREMENT CELL WITH STRAIN GAUGES

Harald Fritz, Waldbronn, and Peter Wurll, Karlsruhe, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Aug. 22, 1985, Ser. No. 768,392
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431202
Int. Cl.[4] G01L *5/16*
U.S. Cl. 73—862.04 2 Claims



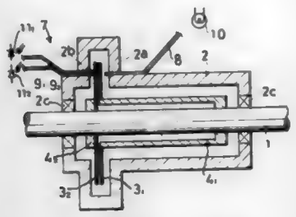
1. A multi-component force and torque measurement cell of the type having a plurality of strain gauges connected to form half-bridge circuits with a constant current source in each branch and being oriented on a measurement spring with a defined force introduction for longitudinal and transverse forces and torques relative to the strain directions of the measurement spring and deriving a clearly correlated response in reference to the forces and torques, said cell having an adequate number of strain gauges so that using the measured voltage tapped at the half-bridge circuits and the standardized elongation effects of the forces or torques impacting the corresponding strain gauges an adequate number of equations can be generated to determine all forces and torques, comprising 2n+2 (n=non-zero integer number) strain gauges subdivided into two series circuits each incorporating half the number of strain gauges and a constant current source which are further connected to each other at both ends and to the ground so that measured voltages can be tapped between sequentially corresponding connecting points of strain gauges immediately adjoining each other in both series circuits.

4,637,264

OPTICAL TORQUE DETECTOR

Tsuneo Takahashi, Kawagoe, and Hirofumi Otsuka, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1985, Ser. No. 736,054
Claims priority, application Japan, May 18, 1984, 59-98631; Nov. 19, 1984, 59-174252[U]
Int. Cl.⁴ G01L *3/12*; G01D *5/38*
U.S. Cl. 73—862.33 **3 Claims**



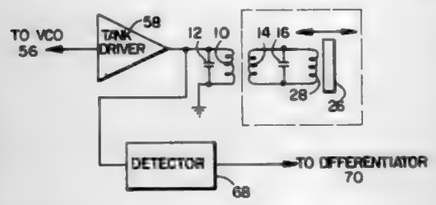
1. An optical torque detecting apparatus for a rotating shaft of which torsional torque is to be detected, comprising a pair of rotary plates disposed as to face one another connected to the shaft with a predetermined interval between the positions where each is connected to the shaft, each plate having a radial optical grid thereon, so that a Moire fringe pattern may be created in accordance with change of relative turning between the two rotary plates caused by torsion of the shaft, and detecting means for detecting a shift of the Moire fringe pattern between radially outer and inner sections of the optical grids so that the torsional torque of the shaft may be detected thereby; each line of the optical grid formed on one of the two rotary plates being a radially extended straight stepless line, and each line of the optical grid formed on the other of the two rotary plates being a stepped one comprising a radial directional inner half portion and a radial directional outer half portion which are different in phase one from another by ½ of the pitch of the optical grid, the detecting means comprising a pair of optical detecting means for detecting respective light rays transmitted through the radial directional outer portion and the radial directional inner portion of the two rotary plates so that the number of times of the shift of the Moire pattern between the foregoing two sections and the direction of the shift thereof may be reliably detected by output signals from the two optical detecting means.

4,637,265

SENSOR APPARATUS

David Fiori, Jr., Yardley, Pa., assignor to Sensor Technologies, Inc., Bensalem, Pa.

Filed Jul. 22, 1985, Ser. No. 757,726
Int. Cl.⁴ G01L *3/10*; G01B *7/16*
U.S. Cl. 73—862.33 **52 Claims**



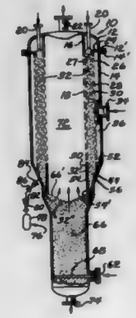
52. Sensor apparatus comprising:
a sensor unit including:
(a) first and second inductively coupled tank circuits which produce a double resonance curve for said first tank circuit, said first tank circuit mechanically isolated from a member to which movement is imparted and said second tank circuit affixed to said member, and
(b) sensing means affixed to said member, electrically connected to said second tank circuit and responsive to a parameter being monitored for changing, in accordance with changes in the said parameter, the relative resonance frequencies of said first tank circuit, the relative amplitudes of the resonance peaks of said first tank circuit, and the relative phases about the resonance peaks of said first tank circuit;
and circuit means responsive to at least one of said changing characteristics of said first tank circuit for developing indications of changes in said parameter.

4,637,266

PROCESS FOR SAMPLING PARTICULATE MATTER PASSING FROM ONE TREATMENT ZONE TO ANOTHER

Arthur R. Greenwood, Niles, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 686,053, Dec. 24, 1984, Pat. No. 4,567,022. This application Dec. 11, 1985, Ser. No. 807,725
Int. Cl.⁴ G01N *1/02*
U.S. Cl. 73—863.86 **9 Claims**



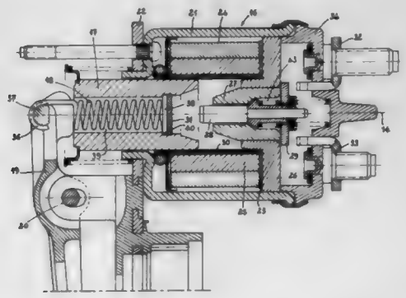
1. A method for obtaining a sample of particles from a system in which said particles move downward in a moving bed and are contacted successively by a first gas and a second gas, said sample being representative of particles which have been contacted with said first gas but which have not been contacted with said second gas, where the particles move through an upper zone in order to contact the first gas and move through a lower zone in order to contact the second gas, where said upper zone is comprised of a cylindrical upper portion of a vertical vessel having disposed within a pair of cylindrical, coaxial, radially-spaced screen elements known as an inner screen element and an outer screen element, where said screen elements confine the particles to form an annular bed of particles, where an annular gas distribution space is formed between the outer screen element and the side wall of said vessel, where the first gas flows radially inward from said gas distribution space through said annular bed and then flows upward within said inner screen member to exit from the upper zone, where the lower zone is comprised of a cylindrical lower portion of said vessel which is wholly filled with particles and of a smaller diameter than the upper portion of said vessel, and where the second gas flows upward through the particles in the lower zone and enters the upper zone, said method comprising: (a) passing particles leaving the upper zone into a transition zone, where said transition zone is an extension of said annular bed which is bounded by (i) a tapered portion of said vessel located between the upper zone and the lower zone, wherein the diameter of said tapered portion of said vessel is at a maximum at the top; (ii) a vertical cylindrical outer transition ring member of the same diameter as the outer screen element and attached thereto and coaxially disposed in the transition zone, where said outer transition ring member extends downward from the bottom of the outer screen element to said tapered side wall; and, (iii) a vertical cylindrical inner transition ring member of the same diameter as the inner screen element and attached thereto and coaxially disposed in the transition zone, where said inner transition ring member extends downward from the bottom of the inner screen element toward the tapered side wall and restricts the horizontal area for catalyst flow out of the annular bed into the lower zone; (b) passing a portion of said first gas from said annular gas distribution space into the top of the transition zone and downward out of the bottom of the transition zone into the lower zone; and, (c) removing said sample from the transition zone.

4,637,267

ENGAGEMENT CONTROL OF THE STARTER PINION FOR INTERNAL COMBUSTION ENGINE STARTER

Alfred B. Mazzorana, Venissieux, France, assignor to Societe de Paris et du Rhone, Lyons, France

Filed Jul. 10, 1985, Ser. No. 753,606
Claims priority, application France, Jul. 10, 1984, 84 11324
Int. Cl.⁴ F02N *15/06*; H01H *50/20*
U.S. Cl. 74—7 A **5 Claims**



1. Engagement control of the starter pinion for a starter of an internal combustion engine, more particularly for the starter of a motor vehicle, including a pinion (11) of the starter (10) axially movable for engagement with a starting ring gear (12) of the internal combustion engine, a solenoid (16) having a mobile core (17) with a central bore (3), a helical spring connected between said core (17) and one end of a lever (19), the lever having another end connected to the drive 13 of the starter (10), said engagement control comprising:
at least one end turn (38) of said helical spring (18), located on the side of said mobile core (17) of said solenoid (16), opposite said lever (19) being brought close to the preceding turn located in a plane perpendicular to the axis (14) of said spring (18), and widened in diameter, to be supported and held against an annular shoulder (40,41*a*) formed in said central bore (39) of said mobile core (17).

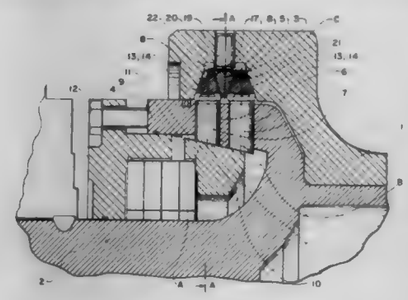
4,637,268

PLANER DRIVE

Gert Braun, and Ernst Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach & Braun Industrieanlagen, Fed. Rep. of Germany

Filed Aug. 27, 1985, Ser. No. 769,867
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432551
Int. Cl.⁴ F16H *15/00*
U.S. Cl. 74—190 **6 Claims**

1. A planar drive, comprising a sprocket wheel for a planing chain and a driveshaft for the sprocket wheel, said sprocket wheel having a secondary chain ring and said drive shaft a primary chain ring, said secondary chain ring having a revolving, conical, annular groove associated with said primary chain ring and having radial holes distributed over its circumference and associated with the annular groove of clutch pins in said radial holes having conical pinheads wedgeable in the annular groove, a freely mounted centering ring with a wedge surface working against the bases of said pin and axially and radially adjustable in said primary chain ring of a pressure ring over said primary chain ring having conical pin heads in the form of clutch pins with friction segments attached to said clutch pins, said primary chain ring having radial holes for said clutch pins



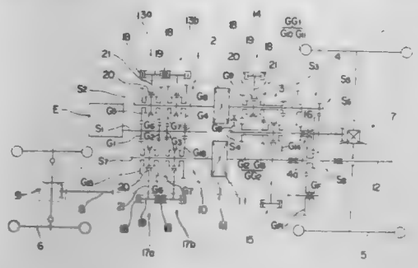
arranged on at least two circles juxtaposed at a predetermined distance, said friction segments being attached to said clutch pins and forming two revolving friction rings whose outer flanks work against the sides of said annular groove, said secondary chain ring having at least on one circle located in projection between the two circles on the primary side, a friction ring immersing centrally between the two friction rings on the primary side and working with an appropriate amount of taper against the inner flanks of the latter, and in that the friction ring on the secondary side is mounted so as to be axially movable in the annular groove.

4,637,269

DRIVE APPARATUS

Shigekazu Hasegawa, and Tetsu Fukui, both of Sakai, Japan, assignors to Kubota, Ltd., Japan

Filed Jun. 6, 1983, Ser. No. 501,486
Claims priority, application Japan, Jul. 16, 1982, 57-108369[U]; Nov. 4, 1982, 57-194400; Nov. 5, 1982, 57-195133
Int. Cl.⁴ F16H *3/02, 3/08, 3/38*; B60K *20/10*
U.S. Cl. 74—335 **6 Claims**



1. A drive apparatus comprising:
an input shaft operatively connected to an engine;
an output shaft operatively connected to travelling means;
a transmission line operatively interconnected between said input and output shafts, said line including first and second intermediate shafts;
clutch means disposed between said first and second intermediate shafts for operatively interconnecting and disconnecting said first and second intermediate shafts;

change speed means including at least one change speed shift means for effecting speed changes between said input shaft and said first intermediate shaft, said shift means including synchro shift means and a first hydraulic switch valve moveable between neutral, first and second change speed positions, said change speed means further including a shift selector for selective operation of said first switch valve;

said clutch means being responsive to the neutral position of the shift means for effecting the operative disconnection, and responsive to the change speed positions of the shift means for effecting the operative interconnection of the first and second intermediate shafts;

a source of pressurized fluid, said shift selector and clutch means being hydraulically connected in parallel to said source of pressurized fluid; and

a first pilot fluid operated switch valve hydraulically connected between said fluid source and clutch means;

said first hydraulic switch valve being (a) operative in the first and second change speed positions to supply pilot fluid to the first pilot fluid operated switch valve for causing said first pilot switch valve to switch to a selected position for providing communication of the clutch means with the source of pressurized fluid, and (b) operative in the neutral position to block the pilot fluid to the first pilot fluid operated switch valve for causing said first pilot switch valve to switch to another selected position for preventing communication of the clutch means with the source of pressurized fluid.

4,637,270

ARRANGEMENT FOR GOVERNING VEHICLE ENGINE SPEED RESPONSIVE TO ACTUAL RUNNING SPEED OF THE VEHICLE

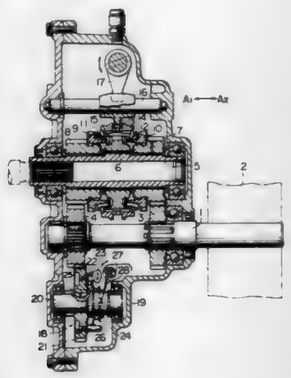
Noboru Yanagiuchi, Kobe; Shigeo Adachi, Akashi; Masatoshi Inoue, Himeji; Hiroshi Takata, Hyogo, and Toyoshi Matsuda, Kakogawa, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Apr. 12, 1985, Ser. No. 722,450

Claims priority, application Japan, Apr. 16, 1984, 59-56187[U]

Int. Cl.⁴ F16H *5/46*

U.S. Cl. 74—336.5 **4 Claims**



1. In combination:

a vehicle engine having an output shaft,

a transmission capable of conducting a shift between a power transmitting stage and a neutral stage and having an input shaft,

an automatic stepless speed changer connecting said input shaft of said transmission to said output shaft of said engine,

a governor device comprising a rotational speed detecting means for producing an output corresponding to speed of said input shaft of the transmission, and

a control means for controlling an output of said engine in accordance with the output of said speed detecting means.

4,637,271

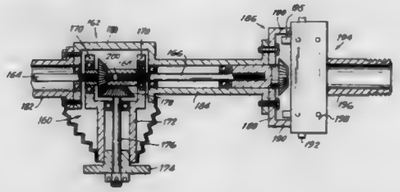
FLEXIBLE UNIVERSAL GEAR BOX SYSTEM WITH YOKES

Joseph Giocastro, 64-28 Metropolitan Ave., Middle Village, and Salvatore Giocastro, 53-11 73rd St., Maspeth, both of N.Y. 11379

Continuation-in-part of Ser. No. 448,846, Dec. 15, 1982, abandoned. This application Sep. 19, 1984, Ser. No. 652,002

Int. Cl.⁴ F16H *35/00*; B60K *17/30*

U.S. Cl. 74—386 **1 Claim**



1. A flexible joint system associated with the front and rear portions of a motor vehicle, comprising, in combination:

a generally horizontal pivot member

a pair of opposed first and second yoke means rotatably connected to said pivot member said first yoke means being secured to the front portion of said vehicle and said second yoke means being secured to the rear portion of said vehicle, said final and second yoke means being movable relative to one another,

a generally horizontal shaft member rotatably connected to and transversely passing through said first yoke means and disposed approximately perpendicular to said pivot member,

first bevel gear means secured to said pivot member between said first and second yoke means,

second bevel gear means perpendicular and meshing with said first bevel gear means and secured to said shaft member,

said second yoke means being for rotating about said pivot member relative to said first yoke means and for rotating said second bevel gear means relative to said first bevel gear means in response to movement of said rear portion of said motor vehicle; and said first yoke means being for rotating about said pivot member relative to and for rotating said first bevel gear means relative to said second bevel gear means in response to movement of said front portion of said motor vehicle,

first bearing means for rotatably supporting said pivot member relative to said first and second yoke means,

second bearing means for rotatably supporting said shaft member relative to said first yoke means,

said second yoke means being connected to the rear portion of said vehicle, said pivot member being axially connected to the rear axle of the rear wheels of said vehicle, said shaft member being the driving member and said pivot member being the driven member, said first yoke means beng connected to the front portion of said vehicle; whereby said vehicle is articulated about the pivot member between the front and rear portions of the vehicle.

4,637,272

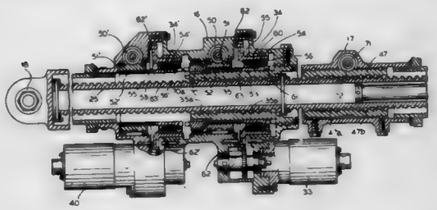
BALLSCREW ACTUATOR

Duane R. Teske, Rockford, Ill.; Henry E. Senasack, Jr., Annapolis, Md., and Mark Wilkins, Burke, Va., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 28, 1985, Ser. No. 791,692

Int. Cl.⁴ F16H *1/00*

U.S. Cl. 74—424.8 R **19 Claims**



16. An actuator which is dual failure tolerant comprising, a ballscrew, a pair of ballnuts on said ballscrew, first and second housings each rotatably mounting one of the ballnuts, a pair of independently operable drive units on the first housing and each having a drive motor, means for drivingly connecting one or the other of said drive motors to a first of said pair of ballnuts associated with the first housing including a pair of clutches having disengaged positions and engaged positions for selectively connecting one of the drive motors to said first ballnut, and a third drive unit on the second housing including a drive motor, and means drivingly connecting the third drive unit motor to the second of said pair of ballnuts.

4,637,273

BICYCLE BRAKE OPERATING DEVICE POSITIONED ON A DROP HANDLE

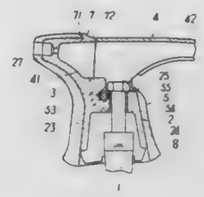
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Feb. 26, 1985, Ser. No. 705,528

Claims priority, application Japan, Mar. 3, 1984, 59-30863[U]

Int. Cl.⁴ G05G *11/00*

U.S. Cl. 74—489 **6 Claims**



1. A brake operating device for a bicycle, said brake operating device being secured to a drop handle of said bicycle, said brake operating device comprising:

a bracket secured to a bent rod section of said drop handle, said bracket having a pair of side walls and front and rear walls in continuation of said side walls respectively and having a rear portion with an opening which opens rearwardly of said bracket;

an operating lever having a pivot portion interposed between said side walls, said pivot portion extending through said opening and being pivoted to said bracket, said operating lever further having an operating portion extending from said pivot portion rearwardly with respect to said opening in said bracket;

a bracket cover formed of an elastic material and covering an outer surface of said bracket; and

a restraint member coupled with one of said bracket and said operating lever, said restraint member being positioned at an opening side of said opening in said bracket and comprising an engaging portion engaging with an edge portion of said bracket cover covering said outer surface of said bracket, whereby when a cyclist steers said bicycle while gripping said brake operating device such that said cyclist's weight is transmitted to said bracket, said restraint member is in position to restrain said bracket cover from moving relative to said bracket in response to application of said cyclist's weight.

4,637,274

AUXILIARY DRIVE FOR PEDAL-DRIVEN ROAD VEHICLES

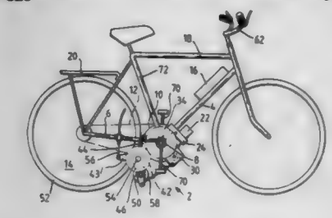
Iliya Goldenfeld, Jerusalem, Israel, assignor to Kibbutz Gordonia Hulda, Mobile Post Ayalon, Israel

Filed Mar. 11, 1985, Ser. No. 710,083

Claims priority, application Israel, Mar. 14, 1984, 71233

Int. Cl.⁴ B60K *1/00*; B62M *23/02*; B62K *11/00*

U.S. Cl. 74—625 **6 Claims**



1. An electric auxiliary drive for a pedal-driven road vehicle comprising:

an electric motor;

a rechargeable multicell battery to power said motor;

switch means to control said motor, which motor is adapted to operate in a first mode in which it functions as a mover, drawing energy from said battery and imparting it to said vehicle, and in a second mode in which it functions as a generator, drawing energy from said vehicle and imparting it to said battery;

first transmission means to provide a kinematic connection between said motor and the pedal axle of said vehicle for the moving thereof when operating in said first mode;

second transmission means to selectively provide a kinematic connection between one wheel of said vehicle and said motor, to enable said motor to operate in said second mode, wherein at least said first transmission means are positive transmission means, and wherein, when operating in said second mode as generator, said motor is adapted to rotate at a speed substantially higher per revolution of said vehicle wheel, than when operating in said first mode as mover.

4,637,275

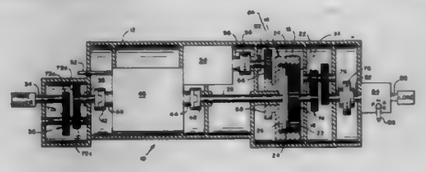
TORQUE FEEDBACK TRANSMISSION

Brian L. Whalen, 102 New York Ave., Smithtown, N.Y. 11787

Filed Sep. 12, 1984, Ser. No. 649,691

Int. Cl.⁴ F16H *47/04*

U.S. Cl. 74—687 **1 Claim**



1. An infinitely variable transmission of inline configuration for interconnecting a prime mover with a load for clutch free

operation in a range of speed including hydraulic neutral comprising:

a. planetary gear train means having a ring gear, a plurality of planetary gears supported by a planetary gear carrier, and a sun gear, said sun gear being connected mechanically to said load, output shaft means for joining said said sun gear to said load;

b. variable torque feedback means comprising (i) a variable displacement hydraulic motor whose rotor shaft is in line with said output shaft means and drivingly connected to said prime mover and said planetary gear carrier during the full range of operation of said transmission, and (ii) a fixed displacement hydraulic pump connected hydraulically to said motor, the rotor shaft of said pump being connected mechanically to said ring gear and being axially displaced from said output shaft means

c. means for adjusting the displacement volume within said hydraulic motor for controlling the torque feedback in said transmission to provide infinitely variable coupling between said prime mover and said load over the full range of said transmission including hydraulic neutral;

d. a speed reducer between said prime mover and said motor rotor shaft and a speed multiplier between said sun gear and said load; and

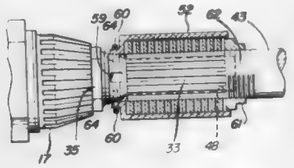
e. mechanical transmission assembly means between said speed multiplier and said load in line with said motor rotor shaft and said output shaft means for providing selection of drive, reverse, park, and neutral.

4,637,276

SINGLE GEAR-PAIR VEHICLE DIFFERENTIAL

Robert J. Holan, 4508 52nd St., and Kelly D. Lindsey, 4513 51st St., both of Drayton Valley, Alberta, Canada (T0E 0M0)

Filed Nov. 23, 1984, Ser. No. 674,263
Int. Cl.⁴ F16H *1/44*
U.S. Cl. 74—713 **4 Claims**



1. An apparatus for transforming rotary power conveyable into said apparatus by a drive shaft to rotary power to at least two wheels of a vehicle comprising:

(a) a driving gear coupleable to an input power drive shaft,

(b) a driven gear meshing with said driving gear,

(c) a first half axle rigidly coupled to said driven gear,

(d) a second half axle colinear with said first half axle,

(e) means for rotatably supporting said driving gear and intermediate longitudinal portions of said first and second half axles,

(f) means for rotatably supporting inner facing portions of said first and second half axles in coaxial alignment, said means comprising a coaxial, cylindrical cavity extending perpendicularly inward from an inner face of one of said first and second half axles, and a constricted diameter inner end of said other half axle adapted to fit insertably and rotatably within said cavity, and

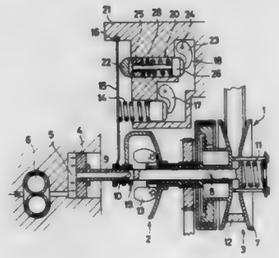
(g) means for slippably connecting said inner facing ends of said first and second half axles.

4,637,277

DEVICE FOR CONTROLLING THE REGULATION IN AN AUTOMATIC TRANSMISSION

Bruno Gaddi, Pisa, Italy, assignor to Piaggio & C. S.p.A., Genoa, Italy

Filed Oct. 12, 1984, Ser. No. 660,398
Claims priority, application Italy, Oct. 17, 1983, 23325 A/83
Int. Cl.⁴ B60K *41/14*; F16H *11/06*
U.S. Cl. 74—865 **3 Claims**



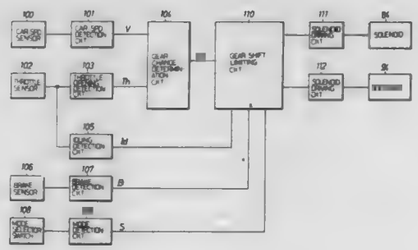
1. A transmission system for continuously varying a transmission ratio between a vehicle engine and its wheels, including a pulley comprising a pair of half pulleys, an operating element arranged to vary the transmission ratio, a shaft in communication at one end to the operating element and at the other end to means for displacing said shaft, a speed regulator mounted on the shaft comprising centrifugal masses and an axially displaceable regulator collar, a first lever in communication at one end with the regulator collar, a first yieldable member preloaded by a second lever connected to an engine feed control which provides a force on the regulator collar through the first lever in opposition to a speed dependent force exerted on the regulator collar by the centrifugal masses, the improvement comprising a second yieldable element preloaded by a manually controlled means connected to said second yieldable element providing a force on the regulator collar through the first lever independent of the force of the first yieldable member so as to oppose the influence of an engine speed thereby maintaining the transmission system at its lowest ratio.

4,637,278

GEAR SHIFT CONTROLLER FOR AUTOMATIC TRANSMISSION

Masao Nishikawa, Tokyo; Shinzo Sakai, Saitama, and Yoshimi Sakurai, Tanashi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 559,145
Claims priority, application Japan, Dec. 7, 1982, 57-214503
Int. Cl.⁴ B60K *41/06*
U.S. Cl. 74—866 **5 Claims**



1. A gear shift controller for an automatic transmission having a gear shift, comprising:

a hydraulic torque converter;

a gear change group, having a plurality of gears, each gear providing a different transmission ratio for the transmission of power from said hydraulic torque converter to the output of the transmission, each of said gears comprising a gear train;

a one-way clutch interposed in at least one of said gear trains;

a plurality of clutch means operatively connected with said gear trains for actuating each of said gear trains selectively;

a gear change determination circuit operatively connected with said clutch means to control the operation of each of said clutch means according to a predetermined gear-shifting program for engaging a gear train selected by the program;

a coasting detection circuit for detecting a car in the coasting state;

a gear shift limiting circuit, operatively connected with said gear change determination circuit and with said coasting detection circuit, for actuating only said gear train in which said one-way clutch is interposed immediately, regardless of the selected gear train and of the operation of said gear change determination circuit, when said coasting detection circuit has determined the car to be coasting; and

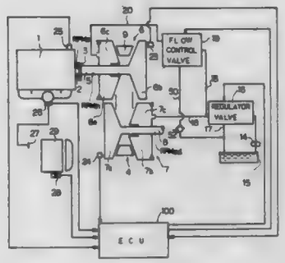
an operation transfer control system including a brake operation detecting means and a mode selector switch means for transferring the operation of the gear shift limiting circuit, said operation transfer control system being adapted to stop, upon detection of one of said brake operation and a reset state of said mode selector switch, the operation of said gear shift limiting circuit and to place said plurality of clutch means under the control of said gear change determination circuit.

4,637,279

METHOD FOR CONTROLLING A CONTINUOUSLY VARIABLE TRANSMISSION

Hiroshi Itoh, and Mitsuru Takada, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Continuation of Ser. No. 574,739, Jan. 30, 1984, abandoned. This application Mar. 17, 1986, Ser. No. 840,542
Claims priority, application Japan, Feb. 7, 1983, 58-17551
Int. Cl.⁴ B60K *41/12*, *41/18*
U.S. Cl. 74—866 **15 Claims**



1. A method for controlling a continuously variable transmission for motor vehicles, having an input shaft for connecting an engine to a continuously variable transmission, a driving pulley mounted on the input shaft, said driving pulley including a non-movable member and a movable member, the movable member being actuated by an hydraulic cylinder to form a V-shaped opening between the non-movable and the movable member, an output shaft, a driven pulley mounted on the output shaft, said driven pulley including another non-movable member and another movable member, the another movable member being similarly actuated by another hydraulic cylinder to form another V-shaped opening between said another non-movable member and said another movable member, a flexible belt member spanning said pulleys, and a memory means; comprising the steps of:

storing data representative of a plurality of discrete relationships between openings of a throttle valve and optimum numbers of revolutions per minute of said input shaft in said memory means, each of said plurality of relationships corresponding to an actual vehicle speed;

detecting an actual opening of said throttle valve which is proportional to an amount of fuel injected into an engine;

detecting an actual number of revolutions per minute of said input shaft;

detecting an actual vehicle speed;

determining an optimum number of revolutions per minute of said input shaft from said plurality of discrete relationships stored in said memory, whereby for each said actual vehicle speed detected, one of said plurality of discrete relationships is chosen, and for said actual throttle opening detected, an optimum number of revolutions per minute is selected;

comparing the detected actual number of revolutions per minute of said input shaft with said selected optimum number of revolutions per minute of said input shaft; and

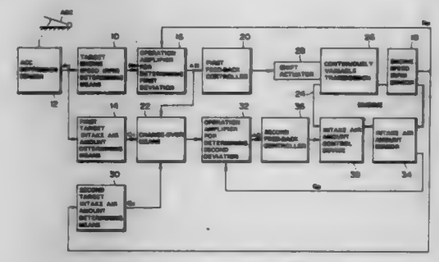
controlling an amount of hydraulic fluid injected into the hydraulic cylinders, in accordance with the comparison between said actual and desired number of revolutions per minute of said input shaft, to achieve said optimum rotation speed.

4,637,280

CONTROL SYSTEM FOR MOTOR VEHICLE WITH CONTINUOUSLY VARIABLE TRANSMISSION AND ENGINE

Katsunori Ochiage, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 31, 1985, Ser. No. 760,766
Claims priority, application Japan, Aug. 3, 1984, 59-162893
Int. Cl.⁴ B60K *41/12*, *41/18*
U.S. Cl. 74—866 **4 Claims**



1. A control system for a motor vehicle having an accelerator, an engine, a device to adjust combustible charge admitted to the engine, and a continuously variable tranmission operatively associated with the engine such that the engine speed varies by effecting shifting in reduction ratio in the continuously variable transmission, said control system comprising:

an accelerator sensor coupled with the accelerator for detecting depression degree of the accelerator and generating an accelerator sensor signal indicative of the detected depression degree of the accelerator;

an engine speed sensor operatively associated with the engine for detecting engine speed of the engine and generating an engine speed sensor signal indicative of the detected engine speed;

means coupled with said accelerator sensor for generating a target engine speed indicative signal indicative of a target engine speed which is a predetermined function of depression degree of the accelerator;

means coupled with said engine speed sensor and said target

engine speed indicative signal generating means for generating a deviation indicative signal indicative of a deviation between the detected and target engine speeds and controlling shifting in reduction ratio in the continuously variable transmission in such a manner as to decrease said deviation toward zero;

means responsive to said deviation indicative signal for selectively generating, as an output signal, a first target value which is a predetermined function of depression degree of the accelerator or a second target value which is a predetermined function of engine speed of the engine; and

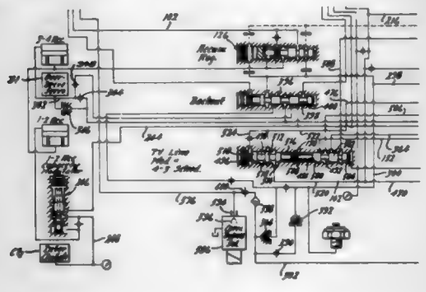
means responsive to said output signal for actuating the device in such a manner that the engine produces horse power indicated by said output signal.

4,637,281

CONTROL VALVE SYSTEM FOR A FOUR-SPEED AUTOMATIC POWER TRANSMISSION TRANSAXLE

Joseph S. Vanselous, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 19, 1985, Ser. No. 756,629
Int. Cl.⁴ B60K *41/16*
U.S. Cl. 74—869 **6 Claims**



1. In a control system for an automatic transmission for an automotive vehicle, said transmission having a torque input shaft, a torque output shaft, a hydrokinetic torque converter with an impeller connected to the torque input shaft and a turbine, and multiple ratio gearing having an input element connected to said turbine and an output element connected to said output shaft;

first clutch and brake means for controlling the relative motion of the elements of said gearing to establish and disestablish ratio changes between a fourth speed ratio and a third speed ratio;

Second clutch and brake means for controlling the relative motion of the elements of said gearing to establish and disestablish ratio changes between a second speed ratio and said third speed ratio;

third clutch and brake means for controlling the relative motion of the elements of said gearing to establish and disestablish ratio changes between a first speed ratio and said second speed ratio;

fluid pressure actuators for each of said clutch and brake means;

a fluid pressure pump;

conduit structure connecting said pump and said actuators including a 1-2 shift valve means for controlling selectively distribution of actuating pressure to the actutor for said third clutch and brak means, a 2-3 shift valve means for controlling selectively distribution of actuating pressure to the actuator for said second clutch and brake mans and a 3-4 shift valve means for controlling selectively distibution of actuating pressure to the actuator for said first clutch and brake means;

a source of a pressure signal proportional in magnitude to input torque and a source of a pressure signal proportional in magnitude to output shaft speed;

said signal sources being in communication with said shift vale means;

a backout valve means for controlling the rate of response of the actuators to shifting of said 2-3 shift vale means to a third speed ratio condition from a second speed ratio condition, said backout valve means comprising a backout valve element in said conduit structure that is movable from a first position to a second position, said torque signal source communicating with said backout valve element whereby the latter is urged to its second position;

flow control orifices in said conduit structure communicating with said backout valve means in parallel relationship, one with respect to the other, said orifices being located in the pressure distribution path of said conduit structure position that feeds said second clutch and brake means;

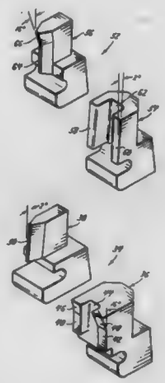
both control orifices being effective to control actuator pressure for said second clutch and brake means when said backout valve element assumes its second position and one orifice being effective to control actuator pressure for each second clutch and brake means when said backout valve element assumes its first position.

4,637,282

METHOD OF MAKING CLEAR DIES FROM BAR STOCK

Frank Gray, 3146 Lin-Tel Rd., St. Louis, Mo. 63125, and Clyde M. Hardin, Jr., 1400 S. Main St., DeSota, Mo. 63020

Filed Apr. 13, 1984, Ser. No. 599,963
Int. Cl.⁴ B21K *5/20*
U.S. Cl. 76—4 **12 Claims**



1. A set of tools for making bends in thin bar stock with wide sides, the tools comprising a female tool having a sloped face for supporting the bar stock and a vertical tapering slot in the face, and a male tool having a sloped bending-edge aligned with the slot to push the bar stock into the slot and bend the bar stock.

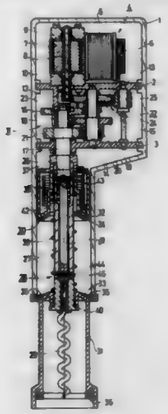
4,637,283

CORKSCREW DEVICE

Leo Bertram, Stolberg, Fed. Rep. of Germany; Romuald L. Bukoschek, and Peter Steiner, both of Klagenfurt, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 24, 1985, Ser. No. 738,131
Claims priority, application Austria, Jun. 1, 1984, 1808/84
Int. Cl.⁴ B67B *7/04*
U.S. Cl. 81—3.2 **16 Claims**

1. A corkscrew which comprises a sleeve coaxial with a corkscrew sprial and formed to cooperate with a bottleneck provided with a cork, the corkscrew sprial being capable of being screwed into the cork in one direction of rotation with the cork being drawn from the bottleneck without the direction of rotation being reversed; a self-starting two-pole single-phase synchronous motor with a diametrically magnetized permanent-magnet rotor for driving the corkscrew spiral; a reduction gear positioned between the motor and the cork-screw sprial and driven by the motor, the reduction gear providing a reduction ratio of 60:1 to 100:1 a reversible unidirectional latch for defining the direction of rotation of the motor, said unidirectional latch cooperating with a part of the reduction gear driven by the motor with an integral reduction ratio; a lead-screw connected to the corkscrew spiral and having a



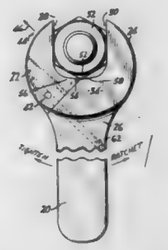
pitch opposite to the pitch of the corkscrew spiral, said lead-screw being driven by the reduction gear; a lead-screw nut cooperating with the lead-screw near the reduction gear, the sleeve being arranged on said lead-screw near the corkscrew spiral so as to be retained and to be slidable freely, the facing sides of the lead-screw nut and the sleeve being provided with abutment surfaces cooperating with each other during removal of the cork from the bottleneck when the lead-screw nut moves along the lead-screw; and means to reverse the blocking direction of the unidirectional latch to select one of the two directions of rotation of the motor.

4,637,284

RATCHET-ACTION OPEN-END WRENCH

Martin J. Rosenbaum, P.O. Box 2402, Bridgeport, Conn. 06606

Filed Sep. 3, 1985, Ser. No. 771,635
Int. Cl.⁴ B25B *13/12*
U.S. Cl. 81—179 **3 Claims**



1. A ratchet-action open-end wrench comprising, in combination:

(a) an elongate handle having a pair of jaws at one end which have nut-engageable faces and are adapted to grasp opposite faces of an hexagonal nut when the handle is moved forward,

(b) one of said jaws being movable with respect to said handle,

(c) cooperable slide mounting means including interfitting dovetail sliding portions of said movable jaw and handle, said dovetail sliding portions having a predetermined direction of relative movement for guiding said movable jaw to enable the entire said jaw to shift with translational movement along an oblique path on said handle end and to have essentially translational movement between a closed nut-gripping and nut-driving position located towards but spaced from said other jaw and an open, nut-releasing position located further away from said other jaw, said slide-mounting means having a reasonably loose fit to enable a limited rocking movement of the movable jaw to

(d) means biasing said movable jaw towards its closed nut-gripping position,

(e) cooperable, separable interfitting means on said movable jaw and handle, tending to resist shifting of the movable jaw from its closed, nut-gripping position, and

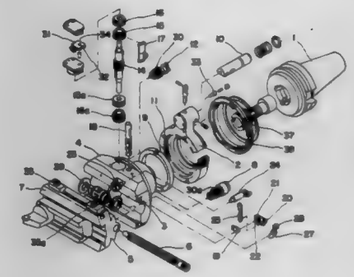
(f) a pivot pin rigidly carried by said movable jaw, said handle having a slot in one of said dovetail portions, extending generally parallel to the direction of relative movement of said portions, and said pivot pin being received and movable in said slot to enable the movable jaw to pivot as a result of application of pressure from the nut thereon, causing separation of said interfitting means and translational shifting of the movable jaw by said nut toward said nut-releasing position.

4,637,285

AUTOMATIC FEED DEVICE FOR A FACING HEAD

Hideo Mizoguchi, 1249-1, Ohaza Ueki, Nogata-shi, Fukuoka-ken, Japan

Filed Jul. 26, 1985, Ser. No. 759,637
Claims priority, application Japan, Aug. 6, 1984, 59-165343
Int. Cl.⁴ B23B *29/034*
U.S. Cl. 82—2 E **9 Claims**



1. In a facing head operable with a shank mounted on a main shaft of a machine tool, comprising a body fixed in coaxial relation to the shank and having dovetail slots extending in a direction normal to the axis of the main shaft, a tool holder slidably fitted to the body through the dovetail slots, and an operating ring fitted between the shank and the body and fixed to said machine tool, said operating ring having an internal stationary gear and also having feed pins projecting from an end face of the operating ring, an automatic feed device for automatically moving said tool holder in a radial direction during rotation of the main shaft, said automatic feed device comprising a worm shaft disposed centrally of the body and extending in a direction normal to the axis of the main shaft and the dovetail slots, clutches and worm wheels rotatably fitted to both ends of the worm shaft respectively and arranged in diagonally opposite relation to the axis of the worm shaft, worm elements meshing with the corresponding worm wheels, a gear arranged in coaxial relation to one of the worm elements and meshing with said stationary gear provided at the inner periphery of the operating ring, a feed gear arranged in coaxial relation to the other worm element and operable to engage said feed pins projecting from the end surface of the operating ring,

an internally threaded worm wheel fitted centrally to the body and meshing with the worm shaft, a feed screw fitted in the tool holder and arranged in parallel relation to the dovetail slots, said feed screw being threadably engaged with the internally threaded worm wheel, a shifter connected simultaneously to the two clutches and being free to slide in a direction parallel to the axis of the worm shaft, a shifter driving shaft engaged with the shifter, said shifter driving shaft being slidable and having an elongated slot therein, a shift lever constituting a cam and having a tapered slot, a forked connecting member pivotally connected to the shifter driving shaft via a pin and received in the tapered slot, a press lever biased by a compression spring and operable to press a cam roller against the cam, and a feed direction detecting lever arranged at the end surface of the body in parallel relation to the axis thereof and connected via a joint to the shift lever.

4,637,286

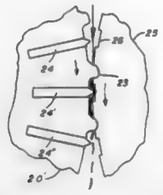
STAPLE CUTTING FOR FIBER REINFORCEMENT MATERIAL

Beryl A. Boggs, Richmond, Va., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 633,835, Jul. 24, 1984, abandoned. This application Nov. 4, 1985, Ser. No. 794,365

Int. Cl.⁴ D01G *1/04*

U.S. Cl. 83—175 **11 Claims**



1. In an apparatus for cutting elongated material into predetermined lengths comprising a rotatable cutting roll having a plurality of radially extending cutting blades, and a cooperating second roll, said rolls rotating in opposite directions and between which said elongated material passes, the improvement comprising: a plurality of projections radially extending from said cutting roll, at least one of said projections being located on each side of a cutting blade and extending further radially from said cutting roll than said blades, said second roll having an elastic material at its periphery which is engaged by said projections in succession to compress the elongated material therebetween.

4,637,287

DIMPLELESS TUBE CUTTING APPARATUS

Mitsuo Kusakabe, Kobe, Japan, assignor to Kusakabe Electric & Machinery Co., Ltd., Japan

Filed Apr. 3, 1984, Ser. No. 596,437

Claims priority, application Japan, Apr. 26, 1983, 58-74700; Jul. 6, 1983, 58-123967

Int. Cl.⁴ B23D *21/00, 25/04*

U.S. Cl. 83—319 **9 Claims**

1. A machine for the dimpleless cutting of tubing, comprising:

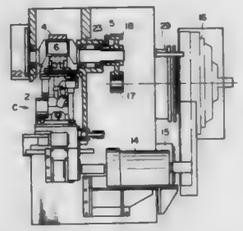
a frame;

a cutting assembly mounted for movement with respect to said frame together with a section of tubing to be cut;

means for moving said cutting assembly with respect to said frame; and

an actuator for said cutting assembly;

said actuator for said cutting assembly comprising: a ram supported on a plurality of crankshafts, said crankshafts having their axes parallel to one another and their crank throws in phase with one another, one of said crankshafts being a driven crankshaft and the others of said crankshafts being follower crankshafts, each of said crankshafts being mounted to said frame by bearing means allowing said crankshafts to rotate about axes fixed with respect to said frame, and each of said crankshafts comprising a crank throw and a crank pin, each said follower crankshaft further comprising a synchronizing arm attached to



the crank pin of said follower crankshaft and forming an angle with the throw of said follower crankshaft; and

synchronizing link means connecting said synchronizing arms to one another, for constraining said follower crankshafts to rotate in phase with one another and with said driven crankshaft.

4,637,288

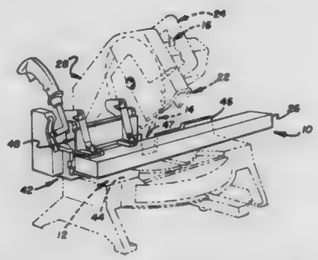
SAFETY MECHANISM FOR SAWS

Joseph C. Olsen, Sunnyvale, and Richard H. Steinbach, Santa Clara, both of Calif., assignors to Engineering Consulting Services, San Jose, Calif.

Filed Dec. 18, 1985, Ser. No. 811,016

Int. Cl.⁴ B27G *19/02*; B27B *5/38*

U.S. Cl. 83—375 **8 Claims**



1. In a sawing apparatus having a workpiece work support structure and an operator moveable electrically powered saw blade having a first normally biased off switch controlling application of electric power thereto, said switch being positioned to be controlled by a hand of an operator which controls movement of the saw blade, an improvement comprising:

a device adapted for gripping, positioning and clamping a workpiece relative to said workpiece work support structure; and

a second normally biased off switch connected in series with said first normally biased off switch, said second switch being positioned to be controlled by the off hand of the operator while the off hand is utilizing said device.

4,637,289

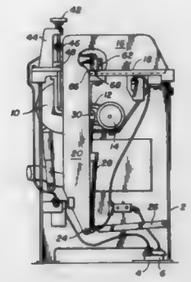
WORK PRESENCE CONTROLLER

Gordon Rameden, Dallas, Tex., assignor to Whirlwind, Inc., Dallas, Tex.

Filed Nov. 2, 1984, Ser. No. 667,583

Int. Cl.⁴ B26D *5/42*

U.S. Cl. 83—380 **12 Claims**



1. In a saw having a frame where an arbor is mounted to drive a circular saw blade from below a flat work surface upward through a slot therein to sever any work piece suitably disposed on said work surface and wherein a guard/clamp above said surface is lowered to engage and clamp each such work piece on said work surface before said saw blade begins its ascent, the guard/clamp having a vertical stem extending through the work surface below the surface, an anchor bracket pivotally connected between the frame and the vertical stem to guide the guard/clamp for vertical movement relative to the work surface, the combination which comprises:

a foot pedal mounted at the base of the saw for initiating and terminating a cutting cycle of the saw;

a single, double-action pneumatic cylinder connected to said guard/clamp and said arbor which lowers said guard/clamp guided by the vertical stem and anchor bracket and then raises said saw blade at initiation of said cutting cycle and which lowers said saw blade and then raises said guard/clamp at termination of said cutting cycle;

a sensor mounted on said guard/clamp to sense the presence of a work piece on said work surface; and

means responsive to said sensor to prevent initiation of said cutting cycle when said sensor fails to establish the presence of said work piece on said work surface.

4,637,290

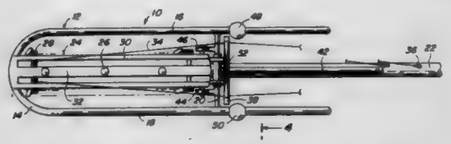
VARIABLE PITCH HARP

Robert S. Grawi, 655 - 6th Ave., Rm. 215, New York, N.Y. 10010

Filed Oct. 4, 1985, Ser. No. 784,617

Int. Cl.⁴ G10D *3/04*

U.S. Cl. 84—173 **10 Claims**



1. A variable pitch harp, comprising in combination:

(a) a U-shaped frame, made of a rigid material, with elongated parallel arms;

(b) a rigid bowed cross member which spans said elongated parallel arms and is perpendicular to said arms such that said U-shaped frame is strengthened;

(c) an elongated member connected to said U-shaped frame at the center of the curved section of said U-shaped frame such that said elongated member is equidistant from said parallel arms and lies in a plane which forms an acute angle with the plane of said parallel arms; wherein said elongated member also contains a multiplicity of string anchor apertures to which strings may be attached;

(d) a head, made of an acoustical semi-resilient material such as wood, wherein said head is attached to the upper surface of said elongated member and is located in the region between the curved section of said U-shaped frame and said rigid cross member; whereby said head comprises a center support section and two tuning device supports each adjacent to said center support;

(e) a multiplicity of strings;

(f) a multiplicity of string tuning devices which are used to adjust the tension on each of said multiplicity of strings, whereby each of said strings is attached to said elongated member at one of said string anchor apertures while the other end of said string is attached to said string tuning device, such that the invention may be tuned prior to playing;

(g) a bridge, located between said string tuning devices and said string anchor apertures, with a multiplicity of notches through which pass each of said strings such that each string is separated from every other string while still being held under tension; and,

(h) a variable pitch tensioning arm, pivoted in a vertical plane relative to the plane of said parallel arms on a pivot consisting of at least one pivot arm connected perpendicularly to said cross member and a pivot pin; wherein said tensioning arm is forked with the opening at the pivot points, such that said bridge spans the opening of said fork, such that when said tensioning arm is raised said bridge is also raised, thereby increasing tension on all of said strings and raising the pitch of the emitted sounds when such strings are bowed, plucked or struck.

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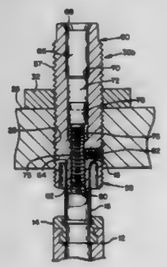
COMBINATION AMMUNITION RELOADING DIE

Kenneth L. Alexander, Oroville, Calif., assignor to Omark Industries, Inc., Portland, Oreg.

Filed Feb. 10, 1986, Ser. No. 827,864

Int. Cl.⁴ F42B *33/10, 33/00*

U.S. Cl. 86—23 **6 Claims**



1. A combination ammunition re-loading die adapted to be threadedly mounted to the die holder of an ammunition reloading apparatus comprising; an elongated housing having first and second ends, an outer threaded surface formed at each of said first and second ends whereby said housing can be threadedly mounted to the die holder by the selective insertion of the first and second ends, a cartridge mouth expander post provided at said first end adapted to engage and flare open the mouth of a cartridge held in the reloading apparatus, the second end of the housing having a cartridge receiving opening extending inwardly through the housing to said post at said first end, said post having a shaft receiving threaded opening forming a continuation of the cartridge receiving opening in the second end, a shaft screwed into said post opening with an end portion positioned in said second end opening, a cartridge reloading member provided on said end of the shaft and positioned in said second end opening of the housing, said cartridge

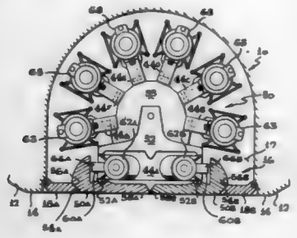
reloading member being adjustably positioned within said second end opening of the housing by screwing the shaft into and out of the post opening, and locking means to lock the shaft at a desired position in the post opening.

4,637,292

ROTARY LAUNCHER SYSTEM FOR AN AIRCRAFT

Paul F. Peterson, Rancho Palos Verdes, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Dec. 23, 1985, Ser. No. 812,565
Int. Cl.⁴ F41F *3/06*
U.S. Cl. 89—1.804 **4 Claims**



1. A rotary launcher system for an aircraft having a weapon bay, the weapon bay having an opening in communication with the exterior of the aircraft, the system comprising:
- a plurality of first doors mounted on the aircraft movable from an open position to a closed position sealing off a portion of the opening and forming a portion of the external contour of the aircraft over the opening;
- a frame member rotatively mounted within the weapon bay;
- at least one first weapon mounting assembly mounted to said frame member alignable with the opening upon rotation of said frame member, said at least one first weapon mounting assembly adapted to mount at east one missile;
- a second weapon mounting assembly mounted to said frame member alignable with the opening upon rotation of said frame member, said second mounting assembly comprising;
- a pair of second door means rotatively mounted to said frame member, said pair of second door means movable from an open position to a closed position wherein said second door means seals off the remaining portion of the opening and form the remaining portion of the external contour of the aircraft over the opening, when said second weapons mounting assembly is aligned with the opening; and,
- a missile dispensing assembly mounted to at least one of said second door means for moving the missile from a retracted position to an extended position wherein the missile can be launched when said door means is in said open position.

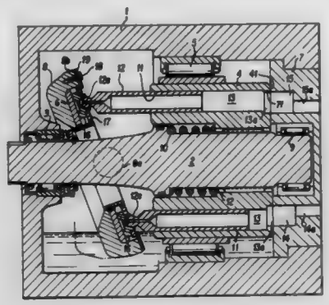
4,637,293

SLANT PLATE TYPE HYDRAULIC DEVICE

Kouji Yamaguchi; Eiichiro Kawahara, both of Tokorozawa, and Noboru Yamamoto, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,390
Claims priority, application Japan, Nov. 14, 1984, 59-239967
Int. Cl.⁴ F01B *13/04;* F01M *1/00*
U.S. Cl. 91—507 **11 Claims**

1. A slant plate type hydraulic device comprising:
- a casing;
- a cylinder block rotatably mounted in said casing and having a plurality of axial bores;
- a slant plate arranged to face said cylinder block and to rotate relative to the same;
- a multiplicity of plungers arranged in an annular array around said axis to freely slide in said bored in the axial direction of said cylinder block;
- a slant plate holder mounted in said casing and supporting said slant plate; and
- a shoe attached to the leading end of each of said plungers and held in sliding contact with said slant plate, the improvement comprising said slant plate having a lubricant chamber enclosing the sliding contact portions of said



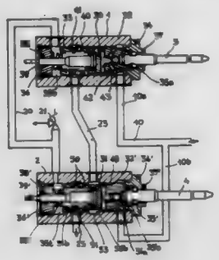
slant plate and said shoes to confine lubricating oil therein, a press plate having a plurality of through holes being rotatably mounted on said slant plate holder, said shoes and said leading ends of said plungers extending through said through holes, and an axially extending cylindrical partition being provided on an inner circumference of said slant plate holder, said press plate and said partition together with said slant plate holder defining said lubricant chamber.

4,637,294

DEVICE FOR CONTROLLING THE SUPPLY OF FLUID UNDER PRESSURE TO A HYDRAUIC CIRCUIT AS A FUNCTION OF THE STATE OF LOCKING OF UNLOCKING OF TWO MECHANICAL MEMBERS

Yves Huet, Versailles, and Christian Perichon, Boulogne-Billancourt, both of France, assignors to Framatome & Cie, Courbevoie, France

Filed Dec. 14, 1984, Ser. No. 681,467
Claims priority, application France, Dec. 16, 1983, 83 20234
Int. Cl.⁴ F15B *13/00;* F01L *15/00;* G21C *13/00;* F16K *37/00*
U.S. Cl. 91—536 **4 Claims**



1. A device for controlling the supply of fluid under pressure to a hydraulic circuit as a function of the state of locking or unlocking of two mechanical members, said device comprising
- (a) a first hydraulic jack (1) having an inlet end and an outlet end the chamber of which contains a piston (30) provided with at least one sealing ring (40), so as to separate the chamber (35) into two parts (35*a* and 35*b*), the first (35*a*) of which is connected to a pipe (10*a*) situated at the inlet end of the jack for the inflow of fluid under pressure into the jack (1), and the second (35*b*) of which is connected to a depressurizing pipe (20) situated at the outlet end of the jack, the piston (30) being, on one side, integrally fixed to a rod (3) connected to one of said two mechanical members and, on the other side, returned by a first spring, the mechanical member being locked or unlocked respectively because the piston (30) is blocked in position toward the inlet end of the jack (1) or is released;
- (b) a second hydraulic jack (2) having an inlet end and an outlet end, the chamber (35') of which contains a piston (31) which incorporates two parts (31*a* and 31*b*) spaced in the axial direction of the jack and which is provided with at least two sets of sealing rings (49, 50), so as to divide the chamber (35') into three parts (35'*a*, 35'*b*, 35'*c*), the first (35'*a*) of which, located at the inlet end of the jack (2), is connected to a pipe (10*b*) for the inflow of fluid under pressure into the jack (2), and the third (35'*c*), located at the outlet end of the jack (2), is connected to a depressurizing pipe (20), the piston (31) being on one side integrally fixed to a rod (4) connected to the second of the two mechanical members and on the other side returned by a second spring, the locking or unlocking being ensured respectively because the piston (31) is blocked toward the inlet end of the jack (2) or is released;
- (c) an interconnecting pipe (23) joining center parts of the chambers (35, 35') of the two jacks (1,2) to each other, said center parts being located between the inlet and outlet ends of the respective jacks;
- (d) a pipe (25) for supplying fluid under pressure to the hydraulic actuating circuit, in communication with the chamber (35') of the second jack (2) .in a zone located between said interconnecting pipe (23) and the outlet end of said second jack;
- (e) the piston (30) of the first jack (1) having, in its blocked position toward the inlet face of the jack (1) under the effect of th first spring, a position such that the interconnecting pipe (23) communicates with the second part (35*b*) of the chamber of the jack (1), said piston (30) being capable of being displaced, when released, toward the outlet end of the jack (1), in such a way that the interconnecting pipe (23) then communicates with the first part (35*a*) of the chamber of the jack (1), the piston of the second jack (2) having, in its blocked position toward the inlet end of the jack (2) under the effect of the second spring, a position such that the interconnecting pipe (23) opens into the second part of the chamber (35') of the jack (2) and the pipe (25) supplying the hydraulic circuit opens into the third part (35'*c*), while this piston (31) of the second jack (2) can be displaced when released, toward the outlet end of the jack (2), in such a way that the interconnecting pipe (23) and the pipe (25) supplying the hydraulic circuit then communicate with the second part (35'*b*) of the chamber of the jack (2).

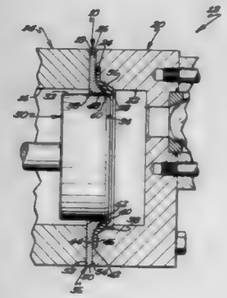
4,637,295

PUMP SEAL WITH CURVED BACKUP PLATE

Frederick A. Powers, 10549 Lancaster La., Maple Grove, Minn. 55369, and Thomas J. Gustafson, 8411 Toledo Ave. N., Brooklyn Park, Minn. 55433

Filed Apr. 9, 1985, Ser. No. 721,872
Int. Cl.⁴ F01B *11/02;* F04B *7/04;* F02F *11/00*
U.S. Cl. 92—170 **5 Claims**

1. A pump for fluent materials and especially suitable for moving heavy fluent and abrasive materials, comprising:
- a housing member providing a hollow cylinder chamber receptive of material to be pumped and having an axially extending chamber wall and opposite ends;
- a piston within and shorter than the cylinder chamber and having its perimeter of smaller diameter than and in limited spaced gap relation to said wall so that material can flow through the gap;
- a closure at one end of the cylinder chamber and means for guiding a piston rod of the piston for axial forward and return strokes of the piston relative to the opposite end of the cylinder chamber;
- a means for driving the piston rod and thereby the piston in said forward and return strokes;
- a closure member and means securing the closure member to said housing member in closing relation to said opposite end of the cylinder chamber, and said closure member having a blind end chamber which forms a forward extension from the cylinder chamber and into which the piston extends a limited distance in the forward stroke of the piston, said blind end extension chamber being of a diameter which is larger than the diameter of the piston perimeter so that there is a limited spaced gap relation between the piston perimeter and said extension chamber when the piston extends into said extension chamber;
- means for introducing into said cylinder chamber material to be pumped, and check valved means for receiving pumped material from said extension chamber;
- a rigid annular ring plate clamped between said housing member and said closure member and having an inner annular rib portion which extends to an inner diameter smaller than the diameters of the cylinder chamber wall and the extension chamber wall but to a larger diameter than the piston perimeter diameter, said rib portion defining a port through which the piston moves freely when a



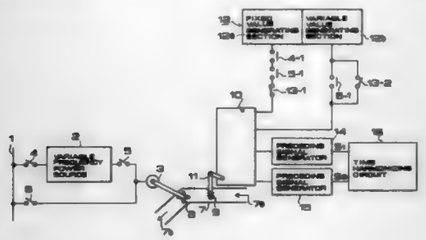
forward end of the piston is entirely within the cylinder chamber and clear of said rib portion; and
- a combination valving, sealing and wiping elastic ring comprising a normally substantially flat elastic annular element fixedly clamped between said ring plate and said closure member and having an annular portion projecting radially inwardly beyond said rib portion to a substantially smaller diameter than the diameter of the piston perimeter, said elastic ring being engaged by the piston during the forward stroke through said rib portion and the piston elastically expanding the radially inwardly projecting portion of the elastic element into a tensioned sealing and wiping annular lip extending forwardly on the piston perimeter and maintaining pumping pressure in said blind end chamber against leakage past said rib flange during said forward stroke of the piston, the improvement comprising said ring plate having an outer diameter, first and second sides facing said housing and closure members, respectively, said first side being planar, said ring plate having a first thickness at said inner diameter and a second thickness less than said first thickness and said elastic ring being relatively soft such that said ring plate supports said elastic ring and urges said elastic ring into a generally frustro-conical shape, wherein said elastic ring comprises an elastomer having an ASTM type-A hardness of approximately 80 to 90.

4,637,296

AIR FLOW CONTROLLING APPARATUS

Yoshihiko Hirosaki, and Nobuharu Takata, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1984, Ser. No. 624,949
Claims priority, application Japan, Jun. 27, 1983, 58-117511
Int. Cl.[4] F24F 7/00; H02J 9/06
U.S. Cl. 98—1 2 Claims



1. An air flow controlling apparatus of the type which includes a damper located in an air course, a ventilator for feeding a wind by way of said damper, an electric motor for driving said ventilator, a changing over means for alternatively connecting said electric motor to a commercial power source or a variable frequency power source, and a damper controlling means for controlling the opening of said damper to obtain a desired air flow, said air flow controlling apparatus comprising:

(a) a preceding controlling signal generating means responsive to an instruction to change over from said commercial power source to said variable frequency power source or vice versa for delivering a preceding controlling signal to said damper controlling means to vary the opening of said damper prior to operation of said changing over means; and

(b) a changing over time harmonizing means for rendering said changing over means operative after lapse of a predetermined period of time after delivery of the preceding controlling signal;

(c) said preceding controlling signal generating means including a first preceding controlling signal generator responsive to a changing over instruction to change over from said commercial power source to said variable frequency power source for delivering a first preceding controlling signal to said damper controlling means;

(d) said first preceding controlling signal having a value which can increase the opening of said damper in accordance with a predetermined function for a period of time from a point of time at which the changing over instruction to change over from said commercial power source to said variable frequency power source is received to another point of time at which said changing over means is rendered operative.

4,637,297

MEANS OF ISOLATING AUTOMOBILE BLOWER INTAKE FROM ENGINE COMPARTMENT AND EXHAUST FUMES

James G. Annekes, 6187 Kingoak Dr., Cincinnati, Ohio 45248

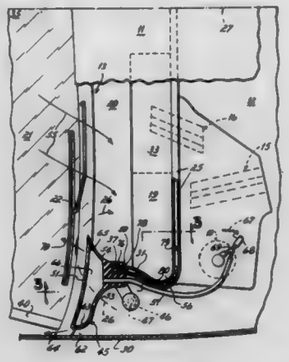
Filed May 13, 1985, Ser. No. 732,945
Int. Cl.[4] B60H 1/00
U.S. Cl. 98—2 14 Claims

1. In an automobile having a blower for delivering air into the passenger compartment, said blower having an air intake adjacent the curb side of the vehicle, said intake being beneath the hood and in front of the windshield, said automobile also having a tailpipe on the same side as said intake and a hood gasket which engages the underside of the hood in front of said intake;

a blower intake isolator for restricting the flow of engine compartment and exhaust fumes into said intake,

said isolator comprising an air flow deflector having an apex secured to said gasket, on the curbside of the blower intake,

said isolator having an outside face which curves rearwardly and outwardly from said apex to an outer corner located inwardly adjacent the curbside fender,



said isolator having an inside face which extends from said apex inwardly and rearwardly of the blower intake, diagonally toward the centerline of said automobile, and

a base extending between said faces and adjacent the windshield,

said outside face of said isolator deflecting engine compartment fumes outwardly and away from the blower intake,

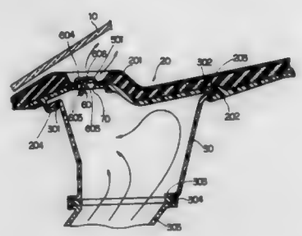
said inside face of said isolator chaneling air to flow into said intake from a region above the centerline of the automobile.

4,637,298

WINDSHIELD DEFROSTER

Hayato Yoshikawa, and Masaho Morisaka, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Apr. 18, 1985, Ser. No. 724,545
Claims priority, application Japan, May 3, 1984, 59-65675[U]; Jul. 12, 1984, 59-145048
Int. Cl.[4] B60H 1/34
U.S. Cl. 98—2.08 10 Claims



1. A windshield defroster assembly, comprising:

a duct which conveys heated air from a heat source to a windshield, said duct having a first outlet, a second outlet, and an upper edge around the first outlet, said first outlet having an inner edge, said duct being installed in a vehicle dashboard having an aperture, a top surface, a bottom surface, and a hook, said first outlet being positioned closer to said dashboard top surface than said second outlet, said upper edge having first and second projections which project outwardly from said duct, said first projection being mounted on said hook, said second projection being inserted in a recess in said bottom surface of said dashboard;

a vane positioned at said first outlet of said duct, said vane having a top edge, a bottom edge, and a control surface defined betwen said top and bottom edge, said vane being located at said first outlet such that said top edge of said vane extends through said dashboard top surface and out of the duct at said first outlet and said bottom edge of said vane remains within said duct near said first outlet, whereby heated ar conveyed through said duct from said heat source to said windshield follows along the control surface of said vane at the first outlet of said duct; and

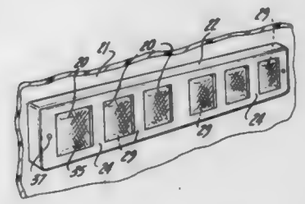
a bar crossing over said aperture, said bar being perpendicular to said top edge of said vane, said bar having two ends, each of said ends being secured to the top surface of said dashboard, and said bar having an intermediate portion, said intermeidate portion being secured to said top edge of said vane.

4,637,299

VENT OPENING FOR PORTABLE BUILDING WALL

George W. Harding, Clearwater, Fla., assignor to Poly-John Enterprises Corp., Whiting, Ind.

Filed Dec. 16, 1985, Ser. No. 809,307
Int. Cl.[4] F24F 7/00
U.S. Cl. 98—29 4 Claims



1. A vent for an enclosure wall panel formed of a thin, somewhat resilient, but relatively stiff sheet of plastic, comprising:

aligned, spaced apart vent openings formed in the panel, with the openings each having an opposed pair of straight, longitudinal edges that are endwise aligned with the corresponding longitudinal edges of the next opening, and with a panel strip portion defining the space between the openings;

flanges formed integral with each of the opening longitudinal edges and terminating in integral flange strips, which strips are parallel and extend towards each other from the respective ends of their opposed flanges;

the junctures of each of the flanges and the panel edge portions defining their respective openings forming an acute angle so that the opposed flanges of each opening angle away from each other, and the juncture of the flanges and their integral free edge strips form an acute angle, so that the opposed flanges and flange strips in each opening provide opposing longitudinal channels and the channels of each opening are longitudinally aligned with the corresponding channels of the next opening;

a relatively stiff, vent cover sheet covering the openings and having longitudinal edges arranged within and frictionally held within their adjacent flange channels;

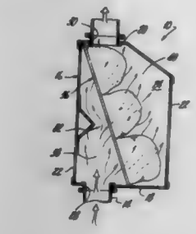
and fastening means securing the opposite transverse ends of the cover sheets to the panel.

4,637,300

FILTER ASSEMBLY FOR AN EXHAUST STACK

James Cole, Flushing, Mich., assignor to Dee Cramer, Inc., Flint, Mich.

Filed Nov. 4, 1985, Ser. No. 794,738
Int. Cl.[4] F01B 31/14
U.S. Cl. 98—60 8 Claims



1. A filter assembly for an exhaust stack comprising:

a housing defining an interior chamber, said housing having an inlet and an outlet connected in series with the exhaust stack, said inlet and outlet being positioned on opposite ends of said housing,

a substantially planar mounting frame secured within said housing chamber so that a plane of said mounting frame extends diagonally across said housing chamber, said mounting frame extending entirely across said housing chamber so that said frame is interposed between said inlet and said outlet,

at least one filter element for removing particulate matter from air flow, and

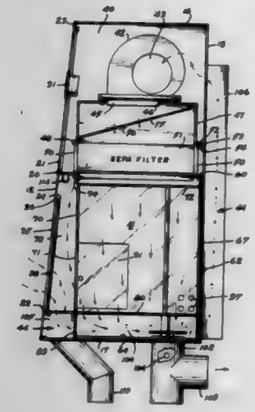
means for detachably securing said at least one filter element to said mounting frame so that substantially all of the air flow from said inlet and to said outlet passes through said filter.

4,637,301

CONTAMINATION CONTROL WORK STATION

William Shields, Los Alamos, N. Mex., assignor to Environmental Air Control, Inc., Hagerstown, Md.

Filed Feb. 6, 1984, Ser. No. 577,413
Int. Cl.[4] B05B 15/12
U.S. Cl. 98—115.3 5 Claims



1. An apparatus for containing toxic fumes and hazardous substances comprising a cabinet having front, sides and rear walls and upper and lower interior portions, a first access opening in said cabinet communicating with said lower interior portion thereof, blower means mounted within said upper

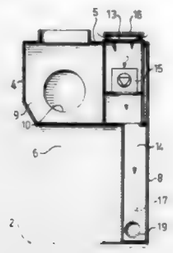
interior portion of said cabinet and having an inlet and a discharge, an enclosed ambient air intake passageway communicating said first access opening and said upper portion of said cabinet, a work area enclosure disposed below said blower means and within said lower interior portion of said cabinet, said work area enclosure being removably mounted as a unit within said lower interior portion of said cabinet, said work area enclosure including front, rear and side panel members which extend vertically from a work support surface member, said front panel member having a second access opening therein, a downdraft air passageway formed between said front wall of said cabinet and said front panel member of said work area enclosure, said work support surface member of said work enclosure having a central imperforate work area surrounded by a perforated portion, a filter means mounted between said discharge of said blower means and said work area enclosures so that air passing into said work area enclosure and said downdraft passageway passes first through said filter means, and a plenum chamber means mounted between said discharge of said blower means and said filter means, said plenum chamber means including a diffusion screen means for equalizing the airflow, across and into said filter means, an exhaust chamber beneath said work support surface member and substantially enclosed with respect to said ambient air intake passageway an outlet means for discharging air from said exhaust chamber.

4,637,302

AIR SUPPLY DEVICE

Helge Enberg, Enköping, Sweden, assignor to AB Babco Ventilation, Sweden

Filed Aug. 16, 1985, Ser. No. 766,145
Claims priority, application Sweden, Aug. 20, 1984, 8404153
Int. Cl.⁴ F25B *1/00*
U.S. Cl. 98—115.3 **9 Claims**



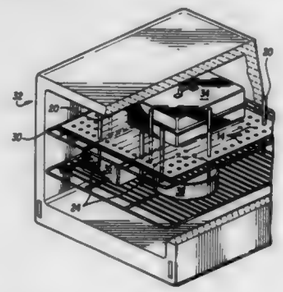
1. In an ejector air supply device for blowing ejector air into an exhaust hood;
said exhaust hood including an upper hood portion and a rear hood wall extending downwardly from said upper hood portion; an upper exhaust device being disposed in said upper hood portion for exhausting polluted air or other gases from the exhaust hood;
a casing located adjacent to said rear hood wall and provided with an elongated blow opening directed upwardly towards said upper exhaust device for entraining polluted air or other gases to be exhausted; the improvement wherein said casing is located at a position in front of and spaced from said rear hood wall and is in the form of an elongated substantially cylindrical body having an upper shield wall portion and an elongated blow opening between said wall shield portion and said rear hood wall;
the lower and rear substantially cylindrical surface of said casing being spaced from said rear hood wall and any supporting structure so as to enable polluted air or other gases to flow about the underside and around the rear of the casing and to be entrained by the ejector air flow created by said blow opening between said shield wall portion and said rear hood wall.

4,637,303

COOKING RACK

Lloyd P. Lucky, P.O. Box 670803, Chugiak, Ak. 99567

Filed Mar. 25, 1985, Ser. No. 715,306
Int. Cl.⁴ A47J *37/00*
U.S. Cl. 99—426 **16 Claims**



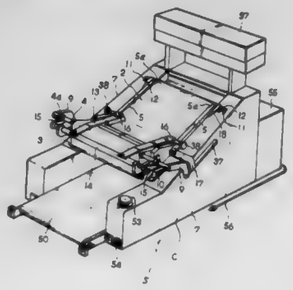
1. A cooking rack assembly for preventing relative motion of cooking utensils during cooking, said assembly comprising:
a plurality of pin means;
plate means positioned on a support means at a plurality of points to rigidly support said plate means relative to a cooking utensil;
a plurality of perforations on said plate means for receiving said pin means;
said pin means being selectively locatable on said plate means so that at least portions of said pin means extend outwardly from selected locations on said plate means for engaging said utensil and preventing said utensil from movement relative to said plate means, said pin means extending through said perforations so that a portion thereof extends from one side of said plate means and a portion thereof extends from the other side of said plate means.

4,637,304

METHOD OF MAKING MAKI-ZUSHI AND AN APPARATUS FOR MAKING MAKI-ZUSHI

Kisaku Suzuki, 19-8, Toshida 1-chome, Nerima-Ku, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,090
Claims priority, application Japan, Sep. 22, 1983, 58-176722; Dec. 28, 1983, 58-205168[U]
Int. Cl.⁴ A23P *1/00*; B29C *69/00*
U.S. Cl. 99—450.2 **1 Claim**



1. An apparatus for producing maki-zushi which comprises in combination
(a) a flexible planar member that comprises a first section and a second section,
(b) means to initially support said first section in a generally horizontal position where it can receive a deposit of rice,

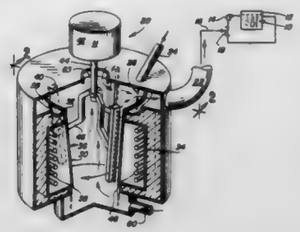
(c) means to initially support said second section in an inclined disposition that extends upwardly from said first section, said inclined second section supporting a sheet of nori,
(d) forming means to change said generally horizontal first section into a generally cylindrical cofiguration and to impart a rolling motion to said cylindrical configuration whereby an elongated cylindrical mass of rice will be formed from said rice deposit,
(e) rolling means to roll the elongated cylindrical mass of rice formed by the forming means upwardly over the surface of said upwardly inclined second section of said flexible planar member that has the sheet of nori supported thereon, whereby the elongated cylindrical rice mass produced by said forming means will be encased by said inclined sheet of nori,
(f) means to discharge said elongated cylindrical mass of rice encased by said nori sheet at the uppermost portion of said upwardly inclined first section and
(d) means to return said horizontal first section from said cylindrical configuration to said original generally horizontal support configuration.

4,637,305

METHOD AND COMPOSITION FOR SMOKING COMESTIBLE PRODUCTS AND SMOKED PRODUCTS PRODUCED THEREWITH

Carroll L. Griffith, Hinsdale, and Albert E. Nielson, Naperville, both of Ill., assignors to Griffith Laboratories U.S.A., Inc., Alsip, Ill.

Division of Ser. No. 676,955, Nov. 30, 1984, Pat. No. 4,588,598.
This application Nov. 27, 1985, Ser. No. 802,848
Int. Cl.⁴ A23B *4/04*
U.S. Cl. 99—481 **20 Claims**



1. An apparatus for regenerating liquid smoke into vapor comprising:
a regenerator chamber;
a regenerator member having a generally vertical surface positioned within said chamber;
means for introducing liquid smoke onto said surface;
means for spreading the liquid smoke on said surface; and
means for heating said member to regenerate the liquid smoke into vapor.

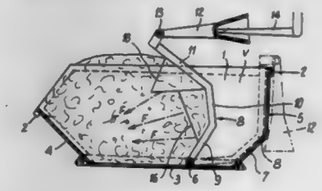
4,637,306

BUCKETS FOR COMPACTABLE PRODUCTS

Jean-Paul Bricaud, 95 Rue du Stade-La Chabossière, 44220 Coueron, and Martine Bricaud, 6 Rue Yves-Marie, 44000 Nantes, both of France

Filed May 16, 1985, Ser. No. 734,591
Claims priority, application France, May 23, 1984, 84 08055; Jan. 24, 1985, 85 00974
Int. Cl.⁴ B30B *7/00*
U.S. Cl. 100—233 **4 Claims**

1. A bucket for compactable products, having a flat horizontal bottom and opposite upstanding side walls, a compaction member pivotally mounted on said bottom for vertical swinging movement about a horizontal axis disposed intermediate said side walls, said compaction member having a shape comprising a first portion that lies against the bottom of the bucket and a second portion that lies against one of said walls in a lowered position of the bucket, and means to move the compaction member from said lowered position to a raised position in which the compaction member compacts material in the bucket against a said side wall which is opposite said one side wall.

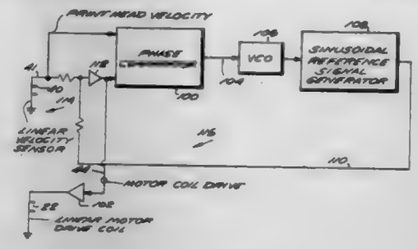


4,637,307

AUTOMATIC MECHANICAL RESONANT FREQUENCY DETECTOR AND DRIVER FOR SHUTTLE PRINTER MECHANISM

Donald E. Miller, Waynesboro, Va., assignor to Genicom Corporation, Waynesboro, Va.

Filed Sep. 13, 1983, Ser. No. 531,648
Int. Cl.⁴ B41J *3/02*
U.S. Cl. 101—93.04 **25 Claims**



1. A shuttle printer comprising:
an electrically driven shuttle print mechanism having a varying instantaneous mechanical resonant frequency for its shuttling movement;
control means coupled to said mechanism for deriving a reference signal representative of the instantaneous value of said mechanical resonant frequency including motion sensor means for detecting the instantaneous motion of said mechanism; and
electrical motor driving circuit means responsive to said reference signal and to said detected instantaneous motion for driving said mechanism in synchromesh with its derived instantaneous mechanical resonant frequency while also conforming to a predetermined motion pattern.

4,637,308

SCREEN PRINTING APPARATUS USING PARTIALLY SATURATED SOLVENT INKING ATMOSPHERE

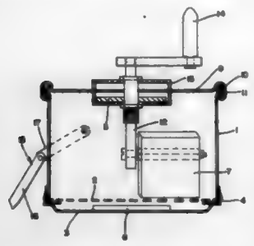
Werner Vidoni, Stoesselstrasse 25, 8720 Schweinfurt, Fed. Rep. of Germany

Filed Dec. 6, 1985, Ser. No. 806,104
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1984, 3446254
Int. Cl.⁴ B41F *15/00*
U.S. Cl. 101—114 **25 Claims**

1. A screen printing apparatus comprising:
a substantially closed box, open on one side;

a screen attached to and disposed across said open side of said substantially closed box;

a cover detachably joined to said box and adapted for closing said open side of said box;



a movable doctor blade located in the interior of said box; and

means for generating a partially saturated solvent atmosphere within said box.

4,637,309

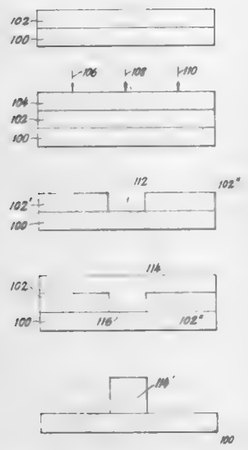
METHOD OF STENCILING USING REMOVABLE PROTECTIVE COAT BEFORE APPLYING STENCIL

Terrance Cafferty, 52 Talmadge Dr., Huntington, N.Y. 11746

Continuation-in-part of Ser. No. 589,024, Mar. 13, 1985, Pat. No. 4,563,948. This application Aug. 16, 1985, Ser. No. 766,191

Int. Cl.[4] B24C *1/04*; B24B *1/00*; B30B *13/00*

U.S. Cl. 101—129 **9 Claims**



5. A stencilling method employing a stencil with openings therein shaped to form characters, said method comprising covering a part to be stencilled with a removable substance, placing said stencil over the removable substance, eroding the removable substance through the stencil, removing the stencil, applying a marking substance over the remaining removable substance and over the area where the removble substance has been eroded, and then removing the removable substance and the marking substance over the same to leave marking substance only on the area where the removable substance was eroded to form said characters.

4,637,310

MESH ROLLER FOR PRINTING PRESS AND METHOD OF FABRICATION

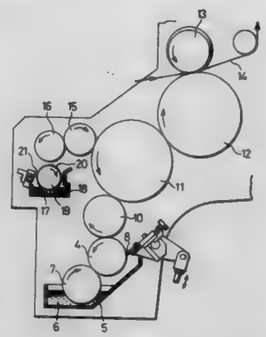
Masayoshi Sato, Kawasaki, and Noritake Harada, Yokohama, both of Japan, assignors to Tokyo Kikai Seisakusho Ltd., Tokyo, Japan

Continuation of Ser. No. 530,026, Sep. 7, 1983, abandoned. This application Apr. 15, 1985, Ser. No. 722,994

Claims priority, application Japan, May 9, 1983, 58-80579

Int. Cl.[4] B41F *31/26*

U.S. Cl. 101—426 **2 Claims**



1. A process for fabricating a mesh roller for a printing press, wherein the roller includes a large number of recesses formed in the operative external surface thereof, with the internal surfaces of the recesses being defined by a layer of hydrophobic material having an affinity for ink, and the external surface areas of the roller surrounding said recesses being defined by a wear resistant layer, said process comprising the steps of: providing a metal mesh roller member formed from a base nitridable material and having said recesses formed in the outer peripheral surface thereof; nitriding the operative external surface of the roller member to provide the external surface of the roller member with a hardened layer without reducing appreciably the volume of the recesses; providing a coating of hydrophobic material over the entire outer peripheral surface of the roller including the internal surfaces of the recesses formed therein: and removing the hydrophobic material from the external surface areas surrounding the recesses and thus exposing the hardened layer of the base nitridable material of the roller member at said external surface areas, with said hardened layer providing a layer of wear resistant material, with only the internal surfaces of the recesses being coated with said hydrophobic material.

4,637,311

METHOD OF, AND APPARATUS FOR, INCREASING THE ENERGY IN AN ELECTROMAGNETIC FUZE SYSTEM

Robert Rehmann, Neerach, Switzerland, assignor to EMS-Inventa AG, Zurich, Switzerland

Filed Feb. 11, 1985, Ser. No. 700,612

Claims priority, application Switzerland, Feb. 24, 1984, 919/84

Int. Cl.[4] F42C *11/02*

U.S. Cl. 102—209 **16 Claims**

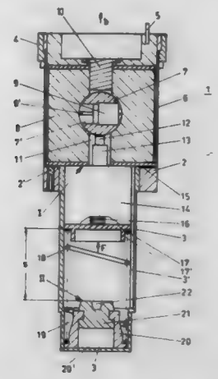
1. A method of generating increased energy in an electromagnetic fuze system of a low-acceleration projectile, said electromagnetic fuze system containing a detonator generator operatively connectable to a fuze element and provided with a reaction member which is displaceable from a rest position with respect to an associated stator under the action of a firing acceleration, the electrical energy produced thereby being storable in a capacitor and being provided thereby for detonating an electric primer capsule located in said fuze element, said method comprising the steps of:

arranging the detonator generator in a first position in a housing of the electromagnetic fuze system;

arranging an impact body in a rear portion of said housing in spaced relationship and opposite to said detonator generator when in said first position;

holding said detonator generator in said first position thereof in a bore of said housing by means of an elastic force acting upon a front side of said detonator generator at the moment of firing said projectile;

after the onset of the firing acceleration, displacing said



detonator generator from said first position thereof and coaxially relative to said housing into a second position due to inertial forces acting upon said detonator generator;

impacting said detonator generator in the second position thereof against said impact body provided with a central bore and thereby accelerating said reaction member in order to generate electrical energy;

thereafter returning said detonator generator from said second position into said first position thereof by means of said elastic force; and

transmitting said electrical energy, after said detonator generator has arrived at its first position, to the fuze element.

4,637,312

EXPLOSIVE PRIMER AND CARRIER THEREFOR

Philip E. Adams; Michael J. McGowan, both of Martinsberg, W. Va., and Malak E. Yunan, Boonton Township, Morris County, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 1, 1985, Ser. No. 729,480

Int. Cl.[4] F42B *3/10*; C06C *5/04*

U.S. Cl. 102—275.12 **14 Claims**



1. A carrier for supporting a primer explosive charge in operative relationship to an initiating means therefor, said carrier comprising a cup having

(a) an open top end and a closed bottom end, said bottom end being provided with a recessed portion;

(b) first and second tubular members projecting into said cup from said recessed portion on axes substantially parallel to said cup's longitudinal axis, (1) the first of said tubular members having an open top end located in the vicinity of said cup's open top end and an open bore which extends from said first tubular member's top end and terminates at the bottom end of said cup in said recessed portion so as to form an opening therein and a first threading tunnel in said cup, and (2) the second of said tubular members having (A) a closed end located inside said cup and a bore which extends from said closed end and terminates at the bottom end of said cup in said recessed portion so as to form an opening therein and a detonator-positioning cavity in said cup, or (B) an open top end located in the vicinity of said cup's open top end and an open bore which extends from said second tubular member's top end and terminates at the bottom end of said cup in said recessed portion so as to form an opening therein and a second threading tunnel or a detonator-positioning cavity in said cup; and

(c) means in said recessed portion for engaging an explosive-containing plastic connecting block.

4,637,313

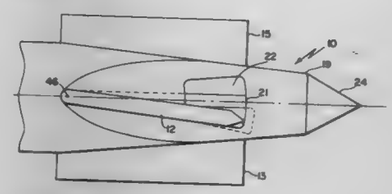
EARTH PENETRATOR

David Henderson, Carlisle; James A. Hollowell, Groton, both of Mass., and Howard A. Woodbury, Plaistow, N.H., assignors to Avco Corporation, Wilmington, Mass.

Continuation of Ser. No. 226,663, Jan. 5, 1981, abandoned. This application Dec. 31, 1984, Ser. No. 702,410

Int. Cl.[4] F42B *25/20*

U.S. Cl. 102—398 **7 Claims**



1. A penetrator comprising:

(a) a tubular body;

(b) symmetric fins extending radially from the axial center of rotation of said body;

(c) said fins being adapted in response to non-axially inertial forces to rotate in a plane about a pivot axis which intersects the center of rotation of roll axis of said body whereby upon impact of said body with an object, any fins subjected to non-axially inertial forces will rotate in a direction opposite to such forces.

4,637,314

RAILROAD SPIKE RESINSTALLATION APPARATUS

David I. Gower, P.O. Box 6266, Reno, Nev. 89513

Filed Jun. 20, 1985, Ser. No. 746,755

Int. Cl.[4] E01B *29/26*

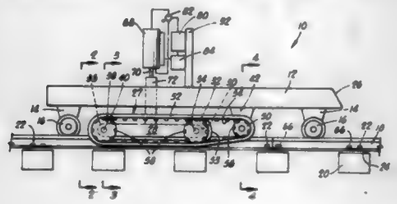
U.S. Cl. 104—17.1 **25 Claims**

1. An apparatus for reinstalling without impacting loosened spikes spaced along a railroad rail for clamping said rail in a position adjacent a road bed, said apparatus comprising:

a wheel-mounted chassis adapted for rolling on said rail; and

a crawler connected to said chassis and adapted for rolling adjacent a lower portion of said rail when in an operating position, said crawler rollingly contacting said loosened

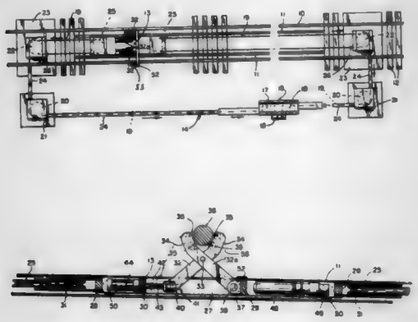
spikes such that weight is applied to said spikes directly by said crawler for downwardly forcing said spikes back to



an installed position as said crawler continuously rolls along said road bed.

4,637,315
Patent Not Issued For This Number

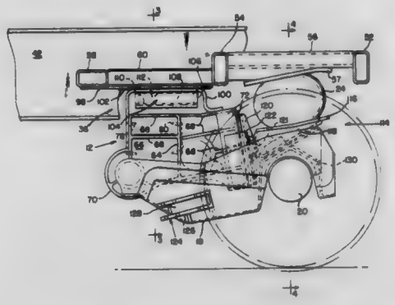
4,637,316
RAIL CAR POSITIONING SYSTEM
Curtis E. Carroll, 9957 Tracy Rd., Atoka, Tenn. 38004
Filed Apr. 25, 1985, Ser. No. 727,124
Int. Cl.[4] B61J *3/04*
U.S. Cl. 104—176 **4 Claims**



2. A rail car movement and positioning apparatus comprising a pair of spaced parallel rails adapted to be mounted on crossties between existing rail car tracks, a low profile carriage guidingly mounted on said rails and lying substantially in a common horizontal plane with said rails, a cable propulsion system for moving said carriage in opposite directions on said rails and having connections with opposite ends of said carriage, a single horizontal axis power cylinder on said carriage and having a piston rod extending longitudinally of said rails substantially at the transverse center of the carriage, the carriage having opposite side horizontal guideways, a transverse horizontal slide having end portions engaged with said guideways and being horizontally movable therealong relative to the carriage and being connected with said piston rod, two cooperating pairs of rail car axle-engaging arms one of said pair of rail engaging arms being pivotally attached to said carriage and the other of said pair of rail engaging arms being pivotally attached at their lower ends to said slide, the arms of each pair crossing and being pivotally connected intermediate their ends, whereby the arms are raised and lowered in unison by the operation of said power cylinder, a self-contained fluid pressurizing system for said power cylinder on said carriage near one end of the carriage, said power cylinder being located near the other end of the carriage and said rail car axle-engaging arms being located near the longitudinal center of the carriage and between the power cylinder and said pressurizing system, a horizontal cross arm on said carriage near said rail car axle-engaging arms and extending laterally outwardly from one side of said carriage and one of said rails, a pivoted member on said cross arm and being swingable thereon in a vertical plane and being located laterally outwardly of said one rail and near and inwardly of one existing rail car track, a rail car wheel flange contact element on said pivoted member, and an electrical limit switch on said cross arm and being operatively connected with said pivoted member.

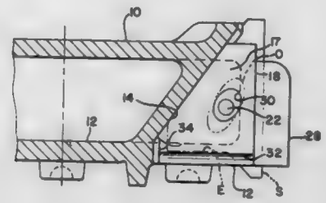
4,637,317
Patent Not Issued For This Number

4,637,318
SWIVELABLE SINGLE AXLE RAILCAR TRUCK AND RAILCAR
H. Neil Paton, 2521 W. Montlake Pl. East, Seattle, Wash. 98112
Filed Feb. 8, 1985, Ser. No. 699,739
Int. Cl.[4] B61F *5/38*
U.S. Cl. 105—167 **27 Claims**



23. A swivelable single axle railcar track which is self-steering in response to wheel creep forces, comprising: damper ramp support means; suspension means mounted by said damper ramp support means supporting a single wheeled axle out from under said damper ramp support means beneath an overhead railcar body, and operative to provide vertical load bearing support for said railcar body adjacent both ends of said axle; and swivel means operatively associated with said damper ramp support means providing horizontal load bearing support for said body about a rotational truck axis outward from said damper ramp support means.

4,637,319
BOLSTER FRICTION SHOE POCKET
Charles Moehling, Arlington Heights, and James A. Henkel, Park Forest, both of Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.
Filed Dec. 3, 1984, Ser. No. 677,390
Int. Cl.[4] B61F *5/40*
U.S. Cl. 105—207 **2 Claims**



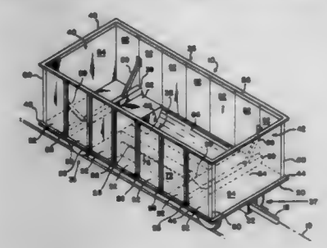
1. A railway truck friction shoe pocket for accommodating a friction shoe therein, said friction shoe pocket comprising a sloping wedge wall providing a wedge seat for the friction shoe, a first lateral wall depending from said wedge wall, a second lateral wall spaced from said first lateral wall and depending from said wedge wall, each of said lateral walls having planar inner faces adapted to engage planar faces on the friction shoe, the friction shoe having an opening on either sidewall thereof, at least one of said planar inner faces on said lateral walls being provided with a recess, said recess including a pinhole and said recess is positioned to allow an edge of said opening in the friction shoe sidewall to slidingly engage the planar inner face of the lateral wall projecting beyond said relieved section thereby preventing the formation of protuberances projecting perpendicularly from the lateral walls of the friction shoe pocket due to wearing away of areas surrounding the pinhole on the planar faces.

4,637,320
ARTICULATED GONDOLA RAILCAR
H. Neil Paton, 2521 W. Montlake Pl. E., and John B. Skilling, 539 McGilvra Blvd. E., both of Seattle, Wash. 98112
Continuation-in-part of Ser. No. 382,728, May 27, 1982, abandoned, which is a continuation-in-part of Ser. No. 238,413, Feb. 26, 1981, abandoned. This application Nov. 2, 1983, Ser. No. 547,967
Int. Cl.[4] B61D *3/00, 7/00*
U.S. Cl. 105—406.1 **21 Claims**

1. A gondola railcar, comprising:

a carbody supported by two spaced apart trucks; and two coupler means respectively located adjacent the ends of said carbody;

wherein said carbody includes: a depressed center section located between said trucks; through sill means extending between said coupler means for transmitting essentially all buff and draft forces between said coupler means along a rectilinear load path aligned with said coupler means; two side wall means respectively positioned on opposite sides of said through sill means and operatively connected to said center section for laterally containing the lading of said carbody and for receiving essentially all vertical loads applied to said center section, said center section extending below said side wall means; and two bolster means extending transversely to and overlying said through sill means for supporting said side wall means, and for receiving vertical load bearing support at four vertical load support points, two of which are spaced apart on opposite sides of said through sill means adjacent one end of said carbody and the other two of which are spaced apart on opposite sides of said through sill means adjacent the other end of said carbody.



4,637,321
RETRACTABLE IRONING BOARD CONSTRUCTION
Georg Hasler, and Rudiger Walz, both of Nagold, Fed. Rep. of Germany, assignors to Hafele KG, Fed. Rep. of Germany
Filed Jan. 18, 1985, Ser. No. 693,010
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1984, 3430491
Int. Cl.[4] A47B *1/04*
U.S. Cl. 108—72 **11 Claims**



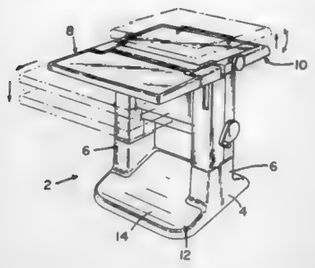
1. A retractible ironing board construction for use with a countertop extending at a horizontal level, comprising a longitudinally extending guide extending substantially parallel to the horizontal level and adapted to be positioned below the countertop, a draw member telescopically engaged with said guide for movement in a pull-out direction substantially parallel to the horizontal level, a plurality of parallel pivotal guide arms pivotally connected at spaced locations on said draw member, an ironing board pivotally connected to said guide arms and being movable between a collapsed position below the countertop and an extended position at the horizontal level when said draw is moved along said guide in said pull-out direction, said ironing board being substantially flush with and alongside the countertop in its extended position, anchor means mounted adjacent said guide, and a flexible member connected between said anchor means and said ironing board and being of a length to hold an end of said ironing board against an end of the countertop in said extended position of said ironing board, the length of said flexible member being selected so that with said ironing board in said extended position said flexible member is pulled taut between said ironing board and said anchor means.

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ADJUSTABLE COMPUTER WORK TABLE

James F. Hampshire, Stephens City, Va.; Hugh F. Groth, Richfield, and John M. Collins, Sagamore Hills, all of Ohio, assignors to Rubbermaid Commercial Products Inc., Winchester, Va.

Filed Feb. 20, 1985, Ser. No. 703,582
Int. Cl.[4] A47B *11/00*
U.S. Cl. 108—102 25 Claims



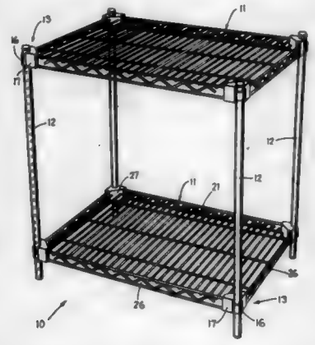
1. An adjustable work table comprising: a frame having spaced-apart vertical sides; a horizontal through-shaft having a longitudinal axis extending between said frame sides; each said frame side including support means for supporting opposite ends of said shaft; a table surface assembly rotatively mounted to said shaft between said frame sides; camming angular adjustment means for rotating said table surface assembly into selective angular positions about said shaft; said angular adjustment means comprising rotary control means having an axis of rotation coincident with said shaft axis.

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CORNER STRUCTURE FOR ADJUSTABLE SHELVING (WITH OPPOSED CLAMPING MEMBERS)

Charles W. Nicely, Dallas Township, Luzerne County, Pa., assignor to United Steel & Wire Company, Battle Creek, Mich.

Filed Jun. 29, 1984, Ser. No. 625,943
Int. Cl.[4] A47B *9/08*
U.S. Cl. 108—107 12 Claims



8. A shelving unit having a plurality of upright posts, a plurality of vertically spaced shelves, and a plurality of corner structures coacting between each said shelf and a respective said post for stationarily securing said shelf relative to said post at a selected vertical location, comprising the improvement wherein:

said corner structure includes a first elongated looplike clamping member positioned in surrounding relationship to a respective said post, said looplike member resembling a strap and being formed as an integral one-piece member from a thin platelike metal, said looplike member defining therein an opening which is elongated in a direction transverse with respect to the longitudinal direction of said post;

said looplike clamping member having a channellike clamping part formed at one end thereof and a channellike wedging part formed at the other end thereof and disposed in opposed relationship to said clamping part, said post being positionable within said clamping part so as to be engaged thereby, said wedging part projecting outwardly from said post on the side thereof opposite from said clamping part so as to define a wedge-receiving space between said wedging part and said post, said wedging part of said first clamping member including a rear wall which is spaced from the post and extends at a slight angle relative to the longitudinal direction of the post, said wedging part also including a pair of spaced side plates which joint to opposite sides of said rear wall and project forwardly therefrom so as to sidewardly embrace opposite sides of said post, said side plates being joined to said channel-shaped clamping part so as to surround said post;

said corner structure including a second clamping member which is stationarily secured to one corner of said shelf and is stationarily engageable with said first clamping member for effecting clamping engagement of said post directly between said first and second clamping members, said second clamping member integrally formed in one piece of a plastics material;

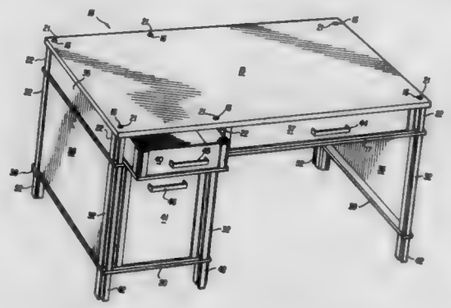
said second clamping member including a body part which is stationarily secured to said shelf and projects-outwardly so as vertically overlie said wedging part of said first clamping member, said second clamping member having a blocklike clamping wedge which is fixed to and projects downwardly in cantilevered fashion from said body part for snug disposition within said wedge-receiving space, said clamping wedge having a front clamping surface which directly clampingly engages the periphery of said post on the side thereof opposite from said clamping part, said clamping wedge also having a rearwardly directed wedge surface which directly wedgingly engages the rear wall of the wedging part of said first clamping member.

4,637,324

FURNITURE ASSEMBLY AND ASSEMBLY DEVICE

Richard W. Jansen, Box 6090, Canton, Ohio 44706

Filed Aug. 27, 1981, Ser. No. 296,789
Int. Cl.[4] A47B *3/06, 13/02*
U.S. Cl. 108—111 6 Claims



1. A spacer for supporting a horizontal platform which comprises an upright member having a uniform cross-section throughout its length, said member defining a groove for receiving a vertical panel and an opening spaced from said groove, said opening adapted to receive a vertical post for connecting a plurality of like spacers with horizontal platforms having aligned openings receiving said vertical post, said

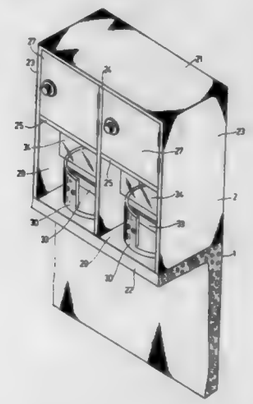
groove defined by two planar parallel longer sides and a shorter interior end so that as seen in cross-section each side is longer than their distance apart, planes coinciding with said sides being parallel to and spaced outwardly of said opening so that they are spaced outboard of and parallel to planes tangent to said opening, and a plane generally coinciding with said interior end throughout its length projecting through about the centerline of said opening, said member defining a further like groove which is adapted to receive a further vertical panel disposed at right angles to said first mentioned vertical panel on the other side of said opening, said grooves as seen in cross-section each having uniform depths defined by said interior ends, lines connecting said interior ends of said grooves to each other and to the centerline of said opening forming substantially a right triangle with the two shorter sides of said right triangle being equal in length, said member having a plane of symmetry which contains said centerline, the outer sides of said member which define in part its periphery coinciding in part, as seen in cross-section, with the sides of a square and said plane of symmetry coinciding with the diagonal of said square, said opening being circular as seen in cross-section.

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SECURITY CASE USED ON COUNTER

Chung-Yieh Hong, No. 9, Lane 493, Yen Pin I Road, Ku San Li, Chi San Cheng, Kao Hsiung Hsien, Taiwan

Filed Aug. 7, 1985, Ser. No. 763,545
Int. Cl.[4] E06B *7/32;* E05G *1/00;* E04B *1/346*
U.S. Cl. 109—19 3 Claims



1. A security case used on a counter comprising:

a housing having a top panel, a bottom panel, two vertical side panels interconnecting said top and bottom panels, at least one shelf disposed between said top and bottom panels, at least one front panel connected to said top panel, said side panels and said shelf for covering the front side of the upper portion of said housing above said shelf, and at least one door means for covering the compartment confined by said top panel, said side panels, said shelf and said front panel disposed at the rear side of said housing, wherein said shelf, said bottom panel and said side panels define a front opening at the front side of said housing and a rear opening in alignment with said front opening at the rear side of said housing;

at least one container mounted in said housing for rotation about a vertical axis between said front and rear openings, said container having at least one access opening; and

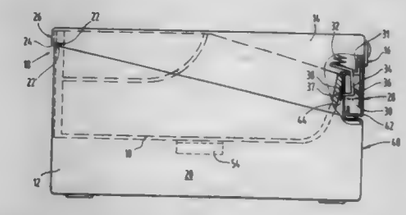
a transparent cover means disposed in said housing for covering at least one portion of said front opening or said rear opening.

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MONEY BOX ARRANGEMENT

Guenter Baitz, and Wilfried Dobring, both of Berlin, Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,418
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 3411686
Int. Cl.[4] E05G *1/00*
U.S. Cl. 109—49 5 Claims



1. A cashbox assembly comprising:

a strongbox comprising the integral combination of a bottom, a rear wall, opposite side walls and a front wall;

a cash drawer insert comprising the integral combination of a bottom, a rear wall, opposite side walls and a front wall, the cash drawer insert overall being of lesser dimension than said strongbox to fit within said strongbox;

means disposed on the interior surfaces of the strongbox side walls to receive said insert and hold said insert within the upper interior volume of said strongbox with the rear wall of said insert abuttingly adjacent the interior surface of the strongbox rear wall and with the front wall of the insert adjacent the interior side of the front wall of the strongbox;

cover means for optionally covering the insert, the strongbox, and the combination of the insert and the strongbox, said cover comprising the integral combination of a top, a rear wall and a front wall;

openings formed respectively in the front and rear walls of the strongbox;

connector means on the rear wall of the cover projecting through the opening in the rear wall of the strongbox and into interfering relationship with the rear wall of the insert to secure said cover to the strongbox and to the insert within said strongbox; and

latch means mounted on the front wall of the cover including a latch bar which, in a latched position, extends through the opening of the front wall of the strongbox into interfering relationship with the front wall of the insert to inhibit relative movement between the cover of the strongbox and the insert.

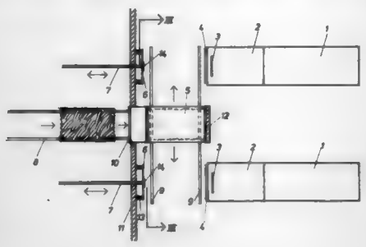
4,637,327

STOKING PLANT FOR FUEL IN WHOLE BALES

Michael L. S. Jorgensen, Aarhus, Denmark, assignor to Jydsk Varmekedelfabrik A/S, Braband, Denmark

Filed Jan. 22, 1986, Ser. No. 821,244
Int. Cl.[4] F23K *3/12*
U.S. Cl. 110—289 **6 Claims**

1. Stoking plant for fuel in whole bales, where the bales are conveyed on a transport track from a store and stoked in the whole condition into one of a number of combustion furnaces, characterized in that means are provided for the transfer of bales through a closable opening to a bale transport carriage which is on rails and formed as a tubular sluice open at both ends and arranged for the transport of one bale at a time, and which conveys the fuel forward to the furnace which is in need of fuel, and when the bale transport carriage has reached a predetermined position at the stoking door of the furnace, the transport carriage is closed with a cover door, whereby a switch element is activated, the stoking door is opened and the fuel is stoked, after which the stoking door is closed, the cover



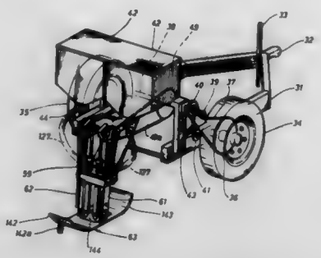
door is withdrawn and the bale transport carriage returns to the closable opening to be refilled.

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NO-TILL PLANTER

Arnold. J. Topham, Booneville, and Harry W. Wilson, Paris, both of Ark., assignors to Dibbler, Inc., Booneville, Ark.

Filed Jul. 25, 1984, Ser. No. 634,278
Int. Cl.[4] A01C *5/00*
U.S. Cl. 111—89 **27 Claims**



1. An apparatus for repeatedly and successively penetrating the soil, to a predetermined depth at a predetermined spacing, and depositing a quantity of material comprising:

(a) means for storing material and transporting the material to a metering device;

(b) a metering device which meters and measures the material to be deposited;

(c) a vertically disposed, pivotally mounted piercing device to pierce the soil with an opening to permit depositing said metered material in the soil, said piercing device operating in a manner to minimize plugging of the opening as the soil is pierced, said metering device operatively coupled to said piercing device;

(d) a drive train to simultaneously operate the piercing device and metering device;

(e) means for horizontally transporting storing means, metering device, piercing device, and drive train; and

(f) means for coupling the metering device, piercing device and transporting means wherein the drive train and transportation means operate cooperatively thereby mechanizing the metering device and piercing device;

(g) a sled assembly, wherein the piercing device and metering device are pivotably mounted to said sled assembly thereby permitting the metering device and piercing device to operate in the vertical plane, while the transporting means moves in the horizontal plane, thereby achieving a leap frog effect.

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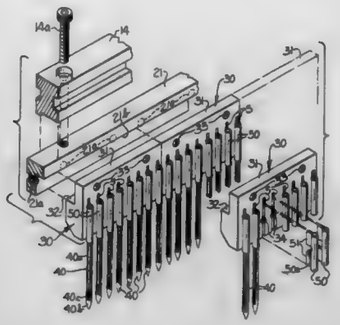
TUFTING MACHINE WITH MODULAR CONSTRUCTED NEEDLE BARS

Paul A. Czelusniak, Jr., Eden, N.C., assignor to Fieldcrest Mills, Inc., Eden, N.C.

Continuation-in-part of Ser. No. 678,072, Dec. 4, 1984, Pat. No. 4,574,716. This application Jan. 21, 1986, Ser. No. 821,036
Int. Cl.[4] D05C *15/00*
U.S. Cl. 112—80.45 **10 Claims**

1. A needle bar of modular construction for use in a tufting machine and comprising an elongate bar and a plurality of

aligned modular needle bar units of tufting needles carried by said bar, each of said modular units comprising an elongate mounting bracket having a face, a plurality of uniformly spaced apart parallel arranged relatively short separate tubes for receiving tufting needles positioned on said mounting bracket transversely thereof and extending along the face of the bracket, means for securing said tubes to said mounting bracket, a plurality of tufting needles each having a shank and an opposing tapered end having a transverse yarn receiving eye therein, the shank of said needles being positioned within



said tubes, fastener means carried by said mounting bracket for securing the tufting needles in a predetermined position within the tubes with eyes of the tufting needles in alignment with each other, and means cooperating with said mounting brackets of said modular units for mounting the modular units on said elongate bar with the eyes of the tufting needles of all of the modular units in alignment with each other and with all the needles in uniformly spaced apart parallel relation to each other.

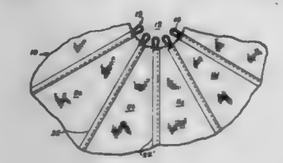
4,637,330

REINFORCED SEAM CONSTRUCTION

Daniel C. Shewmon, 1940 Byram Rd., Clearwater, Fla. 33515

Continuation of Ser. No. 630,802, Jul. 13, 1984, abandoned. This application Jul. 1, 1986, Ser. No. 881,489
Int. Cl.[4] D05B *93/00*; B63B *21/48*
U.S. Cl. 112—417 **5 Claims**

1. A seam for joining a plurality of separate fabric members into a composite structure comprising at least first and second fabric panels having first and second spaced edges, said first edge of said first fabric panel being folded so as to create a first folded edge portion having upper and lower fabric layers, cord means having at least an elongated portion disposed within the extending along said first folded edge portion of said first fabric panel, a first line of stitching extending through said upper and lower fabric layers of said first panel and said elongated portion of said cord means thereby joining said upper and lower fabric layers on generally opposite sides of said cord means, said second edge of said second panel being folded to create a second folded edge portion having upper and lower fabric layers, said first folded edge portion of said first fabric panel and said elongated portion of said cord means and said first line of stitching being disposed between said upper and lower fabric layers of said second folded edge portion of said second fabric panel, another line of stitching passing through and joining said first and second folded edge portions of said first and second fabric panels and said elongated portion of said cord means, said first and second fabric panels being joined





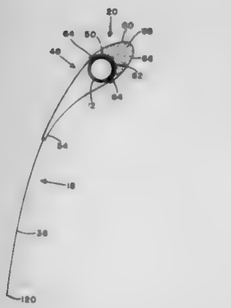
with one another and said elongated portion of said cord means so that said second edge of said first fabric panel is extendable outwardly on a generally opposite side of said elongated portion of said cord means from said first edge of said second fabric panel.

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SAIL AND SAILING RIG

Gregg B. Jackson, 721 Upshur St., NW., Washington, D.C. 20011

Filed Nov. 28, 1984, Ser. No. 675,610
Int. Cl.[4] B63H *9/08*
U.S. Cl. 114—39 **22 Claims**



1. A sail for mounting on a mast of a wind-driven vessel, said sail comprising:

(a) a sail body having a head, tack, luff, and trailing edge, and including a mast-enveloping portion being generally located at the luff of said sail body, said mast-enveloping portion being adapted to at least partially surround and substantially rotate about the mast, and having a leading surface disposed and facing forwardly of the mast; and

(b) a semirigid forward fairing connected to said leading surface of said mast-enveloping portion of said sail body so as to be disposed forwardly of the mast and define, with said mast-enveloping portion, an airfoil rotatable about the mast.

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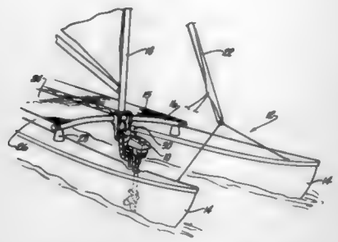
PIVOTAL MOTOR MOUNT

Fred W. Glime, 30640 Balewood, Southfield, Mich. 48076

Continuation of Ser. No. 381,522, May 24, 1982, abandoned. This application Aug. 27, 1985, Ser. No. 769,828

Int. Cl.[4] B63H *21/26*

U.S. Cl. 114—61 **5 Claims**



1. A motor supported for supporting a motor on a twin-hull sailboat, said boat having a center line with first and second spaced apart parallel hulls extending along said center line, said hulls being supported by first and second spaced apart parallel cross-bars positioned perpendicular to said center line, said first cross-bar being positioned approximate the bow of said boat and said second cross-bar being positioned approximate the stern of said boat, said motor support comprising:

an upper member and a lower member pivotally connected at adjacent ends by a coupling means;

said coupling means including a first pivot plate mounted to said upper member and a second pivot plate mounted to said lower member, said plates being coupled to permit pivotal movement of said lower member with respect to said upper member;

said upper member including a bracket means opposite said pivot plate, said bracket means having a shape complimentary to and adapted for rigid attachment to one of said first and second cross-bars;

said lower member including spaced apart substantially parallel arms interconnected by said second pivot plate and extending substantially downwardly therefrom with said opposite end of said lower member being adapted to support said motor means;

said lower member being pivotable with respect to said upper member about an axis substantially parallel to said center line between a first position wherein said second member is substantially parallel to said cross-bar, whereby said motor is in a non-use, stand-by position and a second position, wherein said second member is substantially perpendicular to said cross-bar, whereby said motor is in a use position and operable to propel said boat.

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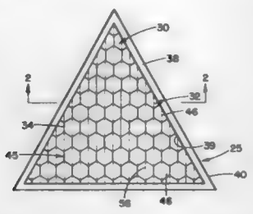
SAIL HAVING A HONEYCOMB ARRAY OF POCKETS

Howard N. Christ, 291 Cedar Ave., Islip, N.Y. 11751

Filed Dec. 9, 1985, Ser. No. 806,560

Int. Cl.[4] B63H *9/06*

U.S. Cl. 114—103 **13 Claims**



1. A sail for driving a wind driven craft, comprising:

a panel having a multiplicity of pockets disposed in a honeycomb array;

said pockets having open ends at one side of said panel, inner concave closed ends, and external convexities at the opposite side of said panel;

said open end of each of said pockets having edges contiguous with edges of open ends of other of said pockets;

each of said pockets having a central axis disposed perpendicularly to said open side of said panel;

each of said pockets having an infinite number of diametral planes including said central axis oriented perpendicular to said oen side of said panel and bisecting said pockets to define two spaces of equal volume; so that the wind drives said craft with maximum efficiency and minimum destabilzing effects when impinging in shifting directions on said one side of said panel; and

flange means at peripheral edges of said honeycomb array overlaying said pockets at said peripheral edges to restrict flow of air between opposite side of said panel; and

wherein said pockets are disposed in parallel rows, with pockets in adjacent rows offset from each other, and with pockets in alternate rows disposed in alignment perpendicular to said rows, so that said pockets define said honeycomb array in said panel.

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ROLLER FURLING ELEMENT FOR BOATS EQUIPPED WITH SAILS

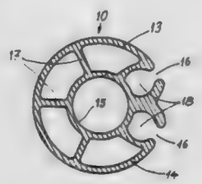
Daniel Montandon, Yverdon-Les-Bains, Switzerland, assignor to Nirvana Espar Systems, S.A., Yverdon-Les-Bains, Switzerland

Filed Jul. 17, 1985, Ser. No. 755,751

Claims priority, application Switzerland, Jul. 27, 1984, 03638/84

Int. Cl.[4] B63H *9/10*

U.S. Cl. 114—106 **6 Claims**



1. A roller furling element for boats equipped with sails comprising a single piece profiled member extruded from a light metal or alloy and including:

two concentric cylindrical tubes defined by peripheral walls of substantially uniform thickness and having substantially the same uniform wall thickness, the peripheral wall of the internal tube being continuous and alone defining a cylindrical chamber adapted to accommodate a stay for rotation of said profiled member around said stay, and the peripheral wall of the external tube having a longitudinal slot allowing passage of a sail therethrough, the bolt rope of which may be held between the two tubes; and,

longitudinal walls distributed within the annular space between the tubes and uniting the tubes to one another, said longitudinal walls being integrally connected to said peripheral walls by said extrusion to provide a single extruded piece having a cellular construction for resisting bending as well as torsion, a plurality of said longitudinal walls having substantially the same thickness as said tubes, and two of said longitudinal walls being proximate the edges of said slot and having concave profiles so as to form a lodging of roughly circular cross-section for receiving and retaining the bolt rope of the sail.

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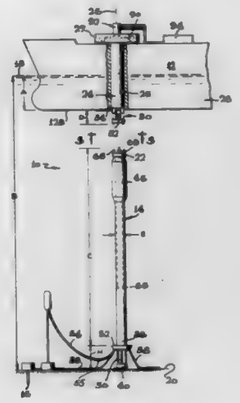
OFFSHORE HYDROCARBON PRODUCTION SYSTEM

Jack Pollack, Reseda, Calif., assignor to Amtel, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 438,322, Nov. 1, 1982. This application Apr. 24, 1984, Ser. No. 603,434

Int. Cl.[4] B63B *21/52*

U.S. Cl. 114—230 **7 Claims**



3. An offshore system comprising:

a vessel;

a universal joint hanging from said vessel and having means for connecting to the top of a column, to permit the column to pivot about a pair of horizontal axes relative to the vessel;

a pair of line guides which closely surround lines extending therethrough, lying on opposite sides of the lower end of said joint;

a winch means on said vessel for pulling up lines;

a column having a lower end anchored by a plurality of chains extending in loose catenary curves to the sea floor, and having an upper end; and

a pair of lines extending from said winch means and through said line guides to the upper end of said column, whereby to urge said joint into alignment with the top of the column as the column is being pulled up.

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PERMANENT ANCHORING ARRANGEMENT FOR FLOATING STRUCTURES

Jürgen Engelskirchen, Hamburg, Fed. Rep. of Germany, assignor to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed Dec. 7, 1984, Ser. No. 679,569

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1983, 33441170

Int. Cl.[4] B63B *21/50*

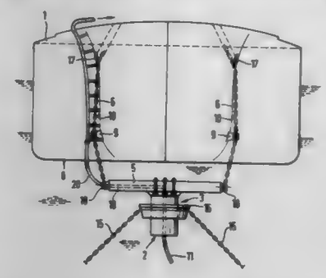
U.S. Cl. 114—293 **15 Claims**

1. An underwater anchoring arrangement for floating structures, such as a tanker in high seas, of the type using a plurality of anchoring ropes and mooring hawsers, the tanker having a hull, the anchoring arrangement comprising:

a spreader beam suspended in a substantially horizontal manner under the tanker and supported by a plurality of mooring hawsers which are guided on the hull of the tanker;

a support column structure rigidly suspended from and supported by said spreader beam, said support column structure having a structural portion with a substantially vertical axis, said support column structure including a diver's chamber, said diver's chamber housing a bearing means enabling relative rotary motion of said diver's chamber about said vertical axis with respect to said structural portion of said support column structure, said bearing means providing support for said structural portion in a direction along said vertical axis and a direction radial thereof; and

a plurality of anchor chains connected to and holding down



said diver's chamber so as to anchor the tanker through the support column structure, whereby the tanker together with the spreader beam is capable of rotary oscillatory movement about said vertical axis with respect to the anchored diver's chamber.

4,637,337

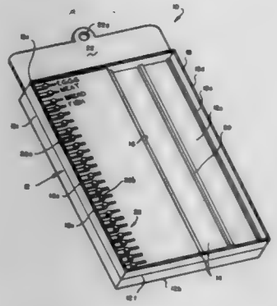
SHOPPING GUIDE DEVICE AND THE LIKE

Alan A. Murray, 120 S. Swall Dr., Apt. 103, Los Angeles, Calif. 90048

Filed Nov. 30, 1984, Ser. No. 677,087

Int. Cl.[4] G09F *7/10*

U.S. Cl. 116—323 **3 Claims**



1. A pre-printed shopping guide device, comprising:

(a) a two-faced rectangular lengthwise elongated table, having shorter top and bottom sides, each face of said table being surrounded by a projecting rim terminating along its elongated sides in an inwardly extending ledge forming a compartment therewith, and a centrally and longitudinally extending first rib dividing said table faces, respectively into two equally sized compartments, respectively provided with a longitudinally centrally disposed second rib said ledge, first and second ribs extending parallel with one another at substantially equal heights.

(b) Four rectangular lengthwise elongated plates, on which, respectively a columnar list of purchasable items are imprinted, being so dimensioned as to be mountable, respectively within said compartments and resting, when so mounted, on said ledge and ribs, each of said plates having along one of its elongated sides a multiplicity of open-ended slits columnarly arranged, respectively vis-a-vis one of said imprinted items on said plates.

(c) A multiplicity of T-shaped tabs, being of shorter length than said slits for insertion respetively, slidably there-

within, any of said tabs capable of being slided towards or away from any of said imprinted items to be

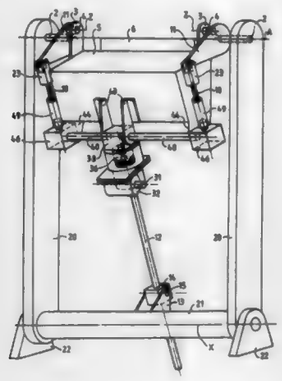
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4,637,338

SCRAPING APPARATUS

Albert Wöhrle, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

PCT No. PCT/EP84/00088, § 371 Date Oct. 5, 1984, § 102(e) Date Oct. 5, 1984, PCT Pub. No. WO84/03847, PCT Pub. Date Oct. 11, 1984
PCT Filed Mar. 29, 1984, Ser. No. 668,374
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3311999
Int. Cl.⁴ B05C *11/04*
U.S. Cl. 118—126 12 Claims



1. An apparatus for scraping off excess composition coating applied to a travelling web, the apparatus comprising:

a doctor support member and a doctor supported thereon, the doctor having a blade edge disposed transversely to the direction of travel of the web and at a predetermined angle of attack thereto;

a frame including first and second spaced supporting bars for pivotally supporting the doctor support member therebetween; and

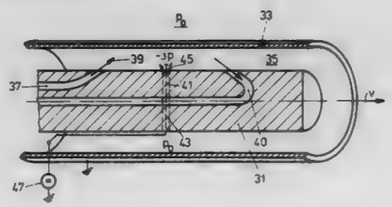
pivoting means for mounting the doctor support member to the frame, the pivoting means being adapted to enable pivoting of the doctor support member to adjust the pressure exerted by the blade on the web and to automatically and simultaneously maintain the angle of attack of the blade edge on the web at said predetermined angle irrespective of the position of the doctor support member, the pivoting means including means for pivotably supporting the pivoting means on the first and second supporting bars and being adapted to pivot the support member about a first axis which passes through the blade of the doctor and to be movable relative to the web in a manner which enables adjustment of the force applied by the blade edge on the web, the doctor support member being mounted to the pivoting means at a location thereon which coincides with the position of a second axis located parallel to but eccentrically removed from the first axis, the second axis being transferrable around the first axis.

4,637,339

ELECTRODE ARRANGEMENT FOR A COATING INSTALLATION

Felix Walser, Hinwil, Switzerland, assignor to Prazisions-Werkzeuge AG, Ruti, Switzerland

Filed Sep. 11, 1985, Ser. No. 774,701
Claims priority, application Switzerland, Sep. 11, 1984, 4335/84
Int. Cl.⁴ B05D *1/06*
U.S. Cl. 118—622 3 Claims



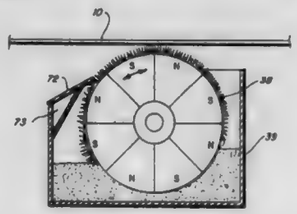
1. A coating installation including a coating chamber in which a coating medium is propelled against an article to be coated, feeding means for feeding the coating medium into the coating chamber by a gas under pressure, thereby providing for a differential pressure within said chamber with respect to an ambient pressure around said installation outside said chamber, electrode means disposed within said coating chamber and connected to a means for applying an electric field between said electrode means and the article, conduit means leading into said chamber in an area of the electrode means and communicating with a pressure source to provide a gas stream to prevent the coating medium from affecting the electrode means, and wherein said pressure source is said differential pressure within said chamber with respect to the ambient pressure at a region of the coating installation outside said chamber providing for a purging gas stream between said chamber and said region.

4,637,340

DEVELOPER METERING STRUCTURE

Michael D. Thompson, Rochester, and Clifford W. Imes, IV, Williamson, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 28, 1985, Ser. No. 737,951
Int. Cl.⁴ G03G *15/09*
U.S. Cl. 118—657 12 Claims



1. Printing apparatus for forming toner images on a charge-retentive surface which surface is moved past processing stations of the printing apparatus, said processing stations including a developer station where latent electrostatic images are rendered visible by the application of single component magnetic developer particles, said apparatus comprising:

developer apparatus positioned at said developer station and comprising a sump for containing a quantity of said single component magnetic developer;

a magnetic developer roll rotatably supported in said sump contiguous said charge-retentive surface whereby developer carried by said developer roll from said sump is presented to said charge-retentive surface; and

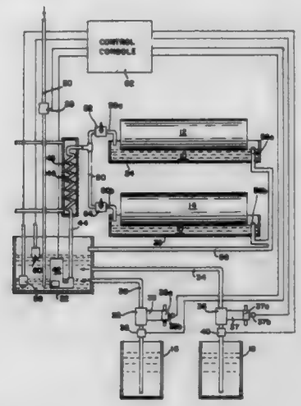
a blade member supported adjacent said developer roll and spaced apart therefrom such that said blade member contacts developer material only after it has been attracted to said developer roll, said blade being fabricated from a soft magnetic material capable of being vibrated due to the influence of the forces created by the magnetic fields created by the rotation of said magnetic developer roll, the degree of vibration of said blade member being insufficient to cause said blade member to contact said developer roll whereby agglomerated developer carried by said developer roller is broken up and the developer is metered to a predetermined height on said developer roll.

4,637,341

APPARATUS FOR APPLYING SILICONE EMULSION TO A PAPER WEB

Thomas G. Switall, Wheeling, Ill., assignor to Rayco Graphic Manufacturing, Inc., Wheeling, Ill.

Filed Aug. 28, 1985, Ser. No. 770,104
Int. Cl.⁴ B05C *11/10, 1/08*
U.S. Cl. 118—694 5 Claims



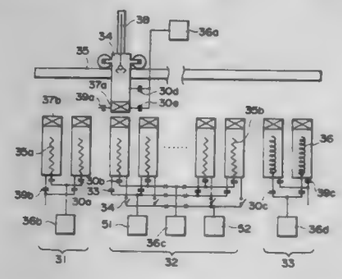
1. A silicone applicator for applying a controlled concentration of an aqueous silicone emulsion to a paper web as the web is moving through a printing press, said applicator comprising at least one silicone concentrate supply mixing tank, a water supply means for containing a supply of water, a mixing tank for mixing silicone concentrate with water to form an aqueous silicone emulsion of the desired concentration, a silicone holding tray for holding a supply of silicone emulsion, roller means for picking up the silicone emulsion from said holding tray and applying it to a paper web, water transfer means for transferring water from said water supply means to said mixing tank in sufficient quantity to fill said mixing tank to a predetermined level, and silicone transfer means for repetitively transferring measured charges of silicone concentrate to said mixing tank from said silicone concentrate supply tank, said water transfer means including low level liquid sensing means for sensing when the level of liquid in said mixing tank is below a predetermined low level, high level liquid sensing means for sensing when the level of liquid in said mixing tank is above a predetermined high level, and valve means responsive to said first and second sensing means for opening to charge water into said mixing tank when said liquid level reaches said low level and for closing to discontinue the charging of water when said liquid level reaches said high level, adjustable control means for controlling the amount of silicone concentrate transferred by said first transfer means to said mixing tank by controlling the number of measured charges of silicone concentrate delivered to said mixing tank for each filling of said mixing tank by said water transfer means, whereby the concentration of the aqueous silicone emulsion mixed in said mixing tank may be controlled, and second transfer means for delivering the controlled concentration of the mixed silicone emulsion from said mixing tank to said holding tray.

4,637,342

VACUUM PROCESSING APPARATUS

Osamu Kasuya, Machida; Yasutomo Fujiyama, Kawasaki; Kyosuke Ogawa, Tokyo, and Takashi Kurokawa, Ueno, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,522
Claims priority, application Japan, Mar. 2, 1984, 59-39896
Int. Cl.⁴ C23C *13/08*
U.S. Cl. 118—719 9 Claims



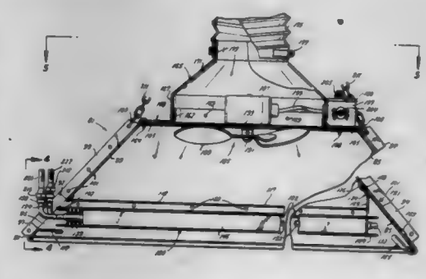
1. A vacuum processing apparatus for applying a vacuum working process to a substrate to be processed by a plurality of processing steps, characterized in that said apparatus comprises vacuum containers exclusively for use for processing disposed in place for each of said processing steps, and a vacuum container exclusively for use for conveyance movable between said vacuum containers exclusively for use for processing, said vacuum containers are provided with opening-closing gates which can be connected to each other, and said substrate to be processed is transferably movable between said vacuum containers exclusively for use for processing and said vacuum container exclusively for use for conveyance.

4,637,343

BROODER UNIT AND SYSTEM

Herbert W. Beck, Rte. 1, Box 303H, Farmington, Mo. 63640, and Ronald L. Franken, Rte. 1, Linn, Mo. 65051

Filed May 7, 1985, Ser. No. 731,508
Int. Cl.⁴ A01K *31/19*
U.S. Cl. 119—31 18 Claims



1. A brooder system in a brooder building for applying heat to young animals such as chicks and the like comprising a plurality of brooder units, each unit having a hood with an air inlet and an air outlet, a hot liquid heat exchanger housed within the hood between the air inlet and outlet and extending over substantially the entire cross-sectional area of the hood at the location of the heat exchanger, and a fan housed within the

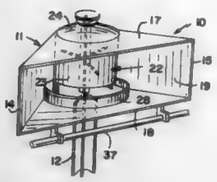
hood between the air inlet and heat exchanger for circulating air drawn into the inlet, over the heat exchanger, and spreading air over substantially the entire air outlet opening, the hood being tapered outwardly such that the air outlet is substantially larger in cross-section than the air inlet, means for supporting the brooder units with the air outlets opening downwardly and spaced a selected distance above the floor of the building, means for supplying hot liquid to the heat exchangers of the brooder units, and means for supplying electrical power to the fans of the units.

4,637,344

BIRD FEEDER

Laetta M. Peterson, Kankakee, Ill., assignor to Mainstay, Inc., Gilmes, Ill.

Filed Oct. 4, 1985, Ser. No. 784,795
Int. Cl.⁴ A01K *39/01*
U.S. Cl. 119—52 R **9 Claims**



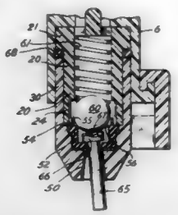
1. A bird feeder comprising, a horn-shaped housing having upstanding connected diverging walls, top and bottom walls, and an opening at the side opposite the connection of the diverging walls, a feed reservoir within the housing including a feed discharge slot therein at the lower end facing said opening, a retaining wall opposite said feed discharge slot to contain the flow of feed from the slot, said wall being in spaced relation to the opening such that said wall is inset within said housing, a vertically disposed shaft adapted to be supported to dispose the feeder above ground level for rotatably mounting the feeder, said shaft having a portion extending upwardly substantially throughout the feed reservoir and including a tubular bearing member surrounding said shaft portion, whereby the upstanding diverging walls function to respond to the wind and directionally rotate the feeder on the shaft so that the opening is away from the wind to shelter birds feeding at the discharge slot and also to protect the feed against inclement weather and from blowing out of the feeder.

4,637,345

WATERING SYSTEM FOR FOWL AND SMALL ANIMALS

Eldon Hostetler, Middlebury, Ind., assignor to Ziggity Systems, Inc., South Middlebury, Ind.

Continuation of Ser. No. 520,099, Apr. 10, 1981, which is a continuation of Ser. No. 113,607, Jan. 21, 1980, Pat. No. 4,284,036. This application Aug. 27, 1984, Ser. No. 644,612
Int. Cl.⁴ A01K *7/06*
U.S. Cl. 119—72.5 **24 Claims**



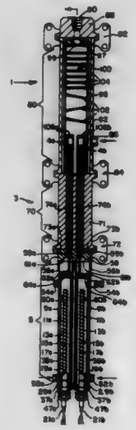
1. In a watering device for fowl and small animals, a valve housing adapted to be connected to a water supply line and having an inlet, an outlet and a valve chamber having a valve seat and a second seat therein, a valve member normally bearing on said valve seat, a valve actuator having clearance in and projecting from said outlet, said actuator having a head within said valve chamber and bearing on said second seat, said actuator head normally being positioned adjacent and confronting said valve member and having a concave surface with a leveraging edge confronting said valve member and positioned and interacting therewith such that said leveraging edge first engages said valve member off center so as to shift said valve member off from said valve seat by leveraged actuation upon tilting movement of said actuator head relative to said second seat caused by slight actuator movement and thereby permit fluid flow from said supply line through said outlet, and said valve member having a convex surface confronting and engageable by said concave surface of said actuator head.

4,637,346

COMPACT MODEL STEAM GENERATOR HAVING MULTIPLE PRIMARIES

Robert Draper, Churchill Boro; Donald G. Loreutz, Irwin; Allen J. Baum, Pittsburgh, and George Economy, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 17, 1985, Ser. No. 724,368
Int. Cl.⁴ F22B *1/00*
U.S. Cl. 122—4 A **34 Claims**



1. An improved model steam generator for simultaneously simulating different sets of thermohydraulic conditions inside a full-scale steam generator in order to monitor the effect of these conditions on heat exchange tubes contained within a full-scale generator, comprising a boiler vessel having a primary and a secondary side, a plurality of sample heat exchange tubes for conducting heat from the primary to the secondary side, wherein said primary side includes a separate primary system for each sample tube, each of which circulates a flow of heated water within its respective tube for conducting heat to the secondary side of the boiler vessel, and a control means connected to each primary system for separately controlling the heat flux of each of the sample heat exchange tubes so that different heat exchange tubes transfer heat at different fluxes.

4,637,347

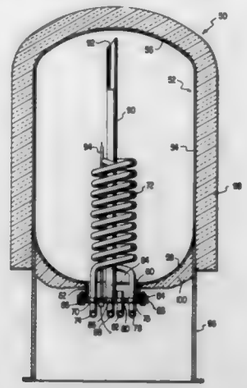
IMPROVED CONTINUOUS LOW FLUID EXCHANGE WATER HEATER

Leonard Troy, 212 Glenburn Rd., Clarks Summit, Pa. 18411

Filed Jul. 18, 1985, Ser. No. 756,322
Int. Cl.⁴ F22B *21/00*
U.S. Cl. 122—20 A **6 Claims**

1. A water heater of the continuous flow, fluid heat ex-

change type wherein the boiler used to heat the heat exchange fluid is a separately contained unit connected by pipe means to said water heater, said water heater comprising a tank having a single opening, the opening located at the bottom of the tank,



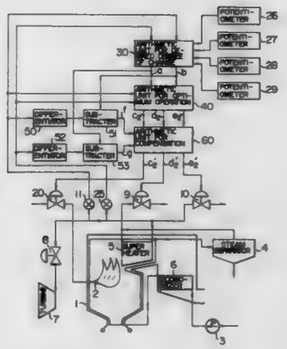
a removable cover plate releasably sealing said opening, and all fluid connections to said tank being carried by said cover plate, one of said connections including a hot water outlet, said hot water outlet including an insulated elongated tube extending into an upper most section of said tank.

4,637,348

APPARATUS FOR CONTROLLING STARTING OPERATION OF BOILER

Yukio Fukayama, Hiroshima, Japan, assignor to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1985, Ser. No. 754,963
Claims priority, application Japan, Jul. 16, 1984, 59-145932
Int. Cl.⁴ F22B *35/04*
U.S. Cl. 122—406 ST **8 Claims**



1. An apparatus for controlling a starting operation of a boiler, the apparatus comprising:

a super heater means and a steam separator means;

a first valve means for bypassing steam of said super heater means;

a second valve means for bypassing steam from said super heater means to a portion other than a primary supply portion to be supplied with steam from said super heater means;

a third valve means for regulating a fuel flow to be supplied to a burner means;

a temperature detecting means for detecting a pressure of steam at a predetermined portion of the boiler;

pressure detecting means for detecting a pressure of steam in the boiler;

first arithmetic means for calculating a desired steam temperature change rate value represented by a preset constant or function of a signal with respect to thermal stress of a super heater outlet header and a desired steam pressure change rate value which is given by a preset constant or function of a signal representing thermal stress of said steam separator which are required for suppresing stresses to be generated in predetermined structural portions of the boiler, on the basis of said steam temperature, said steam pressure, a desired pressure increase value, and a desired temperature increase value; and

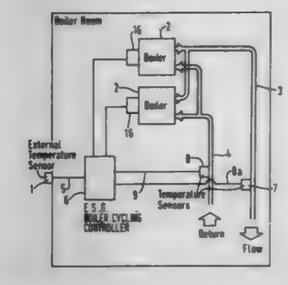
second arithmetic means for calculating manipulated variables of said first valve means, said second valve means and said third valve means, respectively, in dependence upon said steam temperature, said steam pressure, said desired steam temperature change rate value and said desired steam pressure change rate value obtained by said first arithmetic means.

4,637,349

BOILER CYCLING CONTROLLER

Anthony Robinson, London, England, assignor to E.S.G. Controls, Ltd., Cambridge, England

Filed Jul. 9, 1984, Ser. No. 628,992
Claims priority, application United Kingdom, Jul. 7, 1983, 8318452
Int. Cl.⁴ F22B *35/00*
U.S. Cl. 122—448 B **7 Claims**



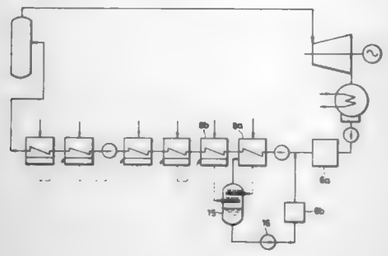
1. A system for controlling the operation of a heating boiler, comprising a thermostatic device continuously operable to switch off the boiler when the flow temperature of the boiler water reaches a predetermined maximum and selectively operable to switch on the boiler when the flow temperature falls to a fixed minimum, a boiler cycling controller connected at its input to devices for sensing the outside temperature and the boiler water temperature and selectively operable in response to the electrical signals received from said temperature sensing devices to switch on the boiler at temperatures which become progressively lower as the outside temperature rises, and a multi-position selector switch interposed between said thermostatic device and said boiler cycling controller on the one hand and the burner controls the boiler on the other hand, the arrangement being such that switching on of the boiler is controlled, in one position of the switch by said thermostatic device and in another position of the switch, by said boiler cycling controller.

4,637,350

SYSTEM FOR RECOVERING DRAIN

Youhun Horibe; Yoshikuni Ohshima, and Toyohiko Masuda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 30, 1985, Ser. No. 781,903
Claims priority, application Japan, Sep. 28, 1984, 59-201479
Int. Cl.[4] F22D *1/28, 1/32*
U.S. Cl. 122—441 12 Claims



1. A system for recovering drain, which is applied to a generating plant provided with feed-water heaters from which drain is recovered into a condensation system including a condenser, said system comprising:

a drain tank;

a high temperature drain inlet for drain to be recovered of high temperature, containing a considerable volume of flush steam, said high temperature drain inlet being provided on said drain tanks, and communicated with one of said feed-water heaters on a low pressure side;

a low temperature drain inlet for drain to be recovered, said low temperature drain inlet being provided on said drain tank to be positioned above said high temperature drain inlet and communicated with said feed-water heaters on a low temperature side;

a first spraying apparatus, provided in said drain tank so as to communicate with said high temperature drain inlet;

a second spraying apparatus provided in said drain tank so as to communicate with said low temperature drain inlet;

a vent outlet provided on said drain tank;

a drain outlet provided on said drain tank; and

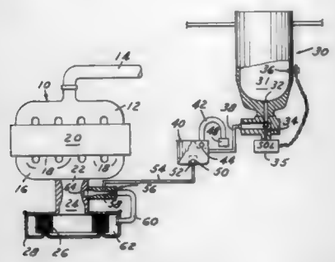
a drain pump for transferring drain in said drain tank to said condensation system on the downstream side of said condenser.

4,637,351

SYSTEM FOR REMOVAL OF WATER FROM DIESEL FUEL SYSTEMS

Benjamin J. Pakula, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 28, 1986, Ser. No. 845,715
Int. Cl.[4] F02D *19/00;* F02M *25/04;* B01D *35/02*
U.S. Cl. 123—25 J 5 Claims



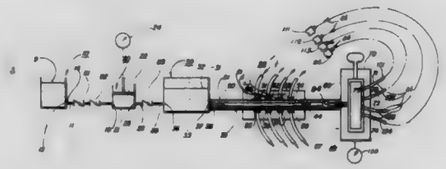
1. A system for automatically removing liquid contaminant-/water from a fuel filter of a diesel engine by the use of air flow through the engine, the filter having a drain opening at atmospheric pressure for removing water separated from the fuel, a drain line connected at one end to the drain opening and at its other end into a fluid aspirator, the aspirator when operable establishing a pressure differential therein sufficient to induce the drain water thereinto and therefrom, means connecting air that flows through the engine to and through the aspirator during engine operation to render the aspirator operable, and means connecting the water from the aspirator to a portion of the engine for disposal herein.

4,637,352

STEAM BOOSTED INTERNAL COMBUSTION ENGINE

Marion A. Green, P.O. Box 205, Kilbourne, La. 71253

Filed Feb. 7, 1983, Ser. No. 464,370
Int. Cl.[4] F02M *25/02*
U.S. Cl. 123—25 P 5 Claims



1. A device to supplement the power produced by burning fuel in an internal combustion engine with steam, said device comprising:

a means for producing a constant flow of water past a boiler means;

a means for allowing the said water to flow in the direction of the said boiler;

a boiler means external to the said internal combustion engine to convert the said water into superheated steam; a means for controlling the pressure of the said water such that the said water pressure is greater than the pressure of the said steam produced by the said boiler; and

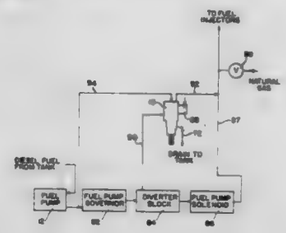
a means for injection of the said superheated steam directly into a cylinder of the said internal combustion engine, a means for producing a constant flow of water at a pressure greater than the pressure of said superheated steam, wherein said constant flow means at greater pressure comprises a chamber with a gaseous component, with said gaseous component being of constant volume and exerting constant pressure upon water within the said chamber.

4,637,353

PILOT FUEL REGULATING DEVICE

Ernest R. Codrington, 1580 Cornell Avenue, Coquitlam, British Columbia V3J 3A1, Canada

Filed Feb. 6, 1984, Ser. No. 577,288
Int. Cl.[4] F02M *21/02, 43/00*
U.S. Cl. 123—27 GE 1 Claim



1. A fuel system for use in a diesel engine converted to burn a fuel mixture of natural gas and a pilot fuel, the fuel system including a fuel pump coupled to the engine drive shaft for supplying pilot fuel to the engine at pressures proportional to the speed of the engine, wherein the improvement comprises:

a pilot fuel governor in fluid communication with the fuel pump for regulating the flow of pilot fuel to the engine when the pilot fuel governor is actuated, the pilot fuel governor comprising:

a main body having an elongated bore;

an inflow passageway extending between the exterior of the main body and the bore for the passage of incoming fuel into the bore;

an outflow passageway extending between the bore and the exterior of the main body for the passage of outgoing fuel from the bore;

a piston slidably mounted in the bore to regulate the flow of fuel passing through the bore, the piston including a major diameter portion, a minor diameter portion and a contoured portion therebetween which are alignable in a plurality of positions with respect to the inflow passageway and outflow passageway to define a control passage in the bore which permits a preset amount of fuel to pass between the inflow passageway and the outflow passageway, the preset amount varying and being determined by the longitudinal position of the piston within the bore;

means for biasing a piston toward a first end of the bore; the fuel pump communicating with the piston to oppose the biasing means and displace the piston toward the second end of the bore when the speed of the engine creates sufficient pressure;

an alternate pilot fuel path for supplying unregulated amounts of fuel to the engine when the pilot fuel governor is deactivated; and

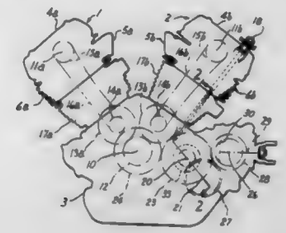
means for alternately activating the pilot fuel governor and alternate pilot fuel path such that when the pilot fuel governor is activated, a regulated amount of pilot fuel will flow to the engine, and when the alternate pilot fuel path is activated, an unregulated amount of pilot fuel will flow to the engine for use as a primary fuel source.

4,637,354

V TYPE MOTORCYCLE ENGINE AND TRANSMISSION

Nobuyoshi Tominaga, Hamamatsu; Nobuyoshi Kurai, Iwata; Hajime Ueno, Shizuoka, and Sadahide Suzuki, Iwata, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 20, 1981, Ser. No. 236,614
Claims priority, application Japan, Feb. 23, 1980, 55-21916
Int. Cl.[4] F02B *75/22;* F02F *7/00*
U.S. Cl. 123—55 VF 1 Claim



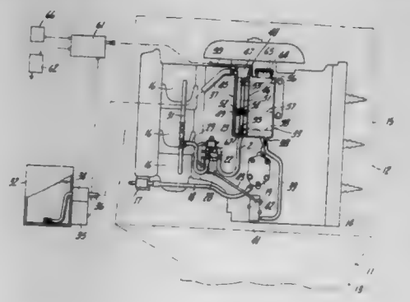
1. In a motorcycle having a forward axis: a V-type internal combustion engine having a crank case with a crank case wall, two cylinders with their axes lying at an angle between planes horizontal to and vertical to the engine, said cylinders, lying in respective vertical planes parallel to the forward axis and forming a V when viewed from a side, and a crank shaft with a laterally extending axis; a transmission having a main shaft with an axis parallel to the crankshaft axis, rearward of it, and below it; and a plurality of stud bolts extending through said cylinders and threaded into the crank case wall, said wall, where the stud bolt approaches said main shaft, being thickened to provide strength for the threads, the orientation of the main shaft relative to the crank shaft enabling the thickness to be provided without interference between crank case and gears on the main shaft.

4,637,355

SEPARATE LUBRICATING SYSTEM FOR OUTBOARD MOTORS

Rou Odashima, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka and Yamaha Hatsudoki Kabushiki Kaisha, Iwata, both of, Japan

Continuation of Ser. No. 606,300, May 2, 1984, abandoned, which is a division of Ser. No. 475,837, Mar. 16, 1983, Pat. No. 4,471,727. This application Oct. 9, 1985, Ser. No. 786,158
Claims priority, application Japan, Apr. 6, 1982, 57-56042
Int. Cl.[4] F01M *3/00*
U.S. Cl. 123—73 AD 8 Claims



1. In an induction system for a two-cycle engine including a carburetor for discharging a fuel/air mixture into an induction passage associated with the engine having a fuel bowl and fuel delivery means extending from the fuel bowl to the induction passage, a fuel tank positioned remotely from said carburetor and a lubricant tank separate from said carburetor and from said fuel tank, the improvement comprising a mixing chamber positioned externally of said carburetor and in proximity thereto, said mixing chamber being defined within an outer housing, fuel pump means separate from said mixing chamber and driven by said engine for delivering fuel from said fuel tank to said mixing chamber under pressure continuously upon running of the engine, lubricant pump means separate from said mixing chamber and said fuel pump means and driven by said engine for delivering lubricant from said lubricant tank under pressure to said mixing chamber, and conduit means for delivering a premixed fuel/lubricant mixture from said mixing chamber to said carburetor.

4,637,356

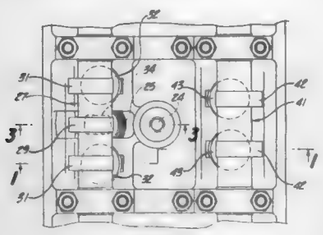
VALVE ACTUATING MECHANISM FOR INTERNAL COMBUSTION ENGINE

Yuuzoh Kuroda, Kakegawa, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 19, 1985, Ser. No. 746,380
Claims priority, application Japan, Aug. 15, 1984, 59-169378
Int. Cl.[4] F01L *1/26*
U.S. Cl. 123—90.27 4 Claims

1. An internal combustion engine comprising a cylinder having a bore, a cylinder head fixed relative to said cylinder, three poppet type valves supported by said cylinder head for reciprocation about respective axes all positioned on the same side of a plane containing the axis of said cylinder bore, a single camshaft having three respective cam lobes each associated with a respective of said valves, said camshaft being rotatable

about an axis extending parallel to said plane and lying on said same side thereof as said valve axes, rocker arms means associated with one of the cam lobes for operating its associated valve, and means for directly operating the remainder of said valves from the remaining cam lobes.

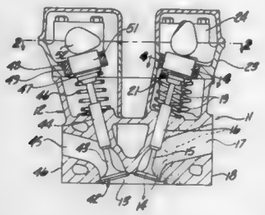


4,637,357

TAPPET ARRANGEMENT FOR ENGINE VALVE TRAIN

Masatoshi Ohmi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 29, 1985, Ser. No. 728,094
Int. Cl.⁴ F01L *1/14, 1/26*
U.S. Cl. 123—90.48 **13 Claims**



1. In a valve arrangement for an internal combustion engine comprising a cylinder head assembly, a plurality of poppet valves supported by said cylinder head assembly at one side thereof for reciprocation between opened and closed positions, said valves being juxtaposed to each other, a camshaft, and a plurality of slidably supported tappets supported by said cylinder head assembly and each interposed between said camshaft and a respective one of said valves, the improvement comprising at least one of said tappets being non-circular in cross-sections taken perpendicular to its line of reciprocation and having a short dimension extending in the direction of the adjacent valves and a long dimension extending in the perpendicular direction, the distance between said valves being less than said long dimension.

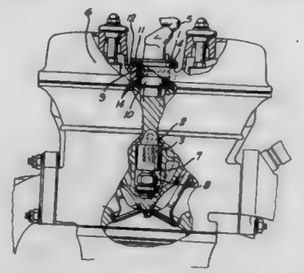
4,637,358

SPARK PLUG CAP APPARATUS

Yoshiki Yano, Saitama, and Toshihiro Oikawa, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1985, Ser. No. 781,247
Claims priority, application Japan, Sep. 27, 1984, 59-144992[U]; Sep. 27, 1984, 59-144991[U]
Int. Cl.⁴ F02P *1/00*
U.S. Cl. 123—169 PA **14 Claims**

1. A spark plug cap apparatus for an engine having an elongated and generally vertical spark plug bore having an upper open end, comprising, an upwardly extending annular protrusion on said upper open end of the bore, a cover means including a flange with means for extending over and sealably engaging an outer surface of said annular protrusion, and said cover means having a downwardly extending seal lip for sealably engaging an inner surface of the bore.

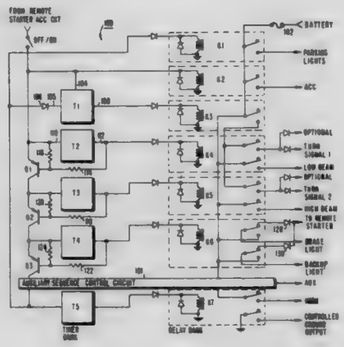


4,637,359

ELECTRONIC DETECTION DEVICE FOR MOTORIZED VEHICLES

Norman E. Cook, Rte. 13, McCloud Rd., Knoxville, Tenn. 37938

Continuation-in-part of Ser. No. 556,989, Dec. 1, 1983. This application Mar. 4, 1985, Ser. No. 707,968
Int. Cl.⁴ F02N *11/08*
U.S. Cl. 123—179 B **10 Claims**



6. A method of automatically detecting the condition of electrical system components of a vehicle having a battery and a plurality of electrical system components, said method comprising the steps:

(a) generating an actuation signal at a location remote from said vehicle;

(b) selectively supplying power to a plurality of electrical system components including vehicle headlights, indicator lights and horn, said supplying step including energizing particular ones of said electrical system components through a plurality of separately actuatable switch means;

(c) actuating said plurality of switch means in a predetermined sequence in response to said actuation signal, and

(d) maintaining at least one of said electrical system components deenergized at any one time during the predetermined sequence,

wherein said actuating step includes sequencing entirely through the predetermined sequence in response to said actuation signal,

whereby all of said electrical system components are automatically energized in response to a single actuation signal while the instantaneous current drain from the battery of said vehicle is limited.

10. The method of claim 9 wherein said vehicle includes an internal combustion engine and a starter circuit for starting said engine, said method further comprising the step:

(i) conducting current from said battery to said starter circuit in response to reception of said actuation signal and before commencing said actuating step,

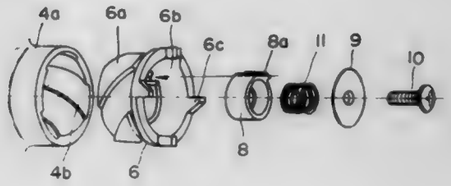
whereby said vehicle engine is running when said actuating step is performed.

4,637,360

RECOIL STARTER

Mitsuo Osakabe, Tokyo, Japan, assignor to Starting Industry Company Limited, Tokyo, Japan

Filed Mar. 1, 1985, Ser. No. 707,034
Claims priority, application Japan, Mar. 12, 1984, 59-255411
Int. Cl.⁴ F02N *5/02*
U.S. Cl. 123—185 A **8 Claims**



1. A recoil starter comprising:

a supporting shaft mounted within a housing;

a reel which is loosely fitted for rotation around said supporting shaft;

a cylindrical hub portion carried integrally by said reel;

a clutch cylinder loosely fitted in coaxial relation on said cylindrical hub portion, said hub portion and said cylinder having a cooperating spiral spline and groove connection whereby relative rotation causes axial projection and retraction of said clutch cylinder;

a plurality of generally axial projections provided at the fore end of said clutch cylinder in a position opposing a plurality of recesses provided integrally with a flywheel which is attached to the end portion of a crankshaft of an engine, for engagement upon projection of said clutch cylinder;

an axially extending notch on said clutch cylinder extending part of the axial length thereof;

means mechanically engaged in said notch to permit relative axial displacement of said clutch cylinder; and

friction means acting on said notch engaging means to brake the same against rotation and thus the clutch cylinder to thereby effect relative rotation of said hub portion and clutch cylinder to project the latter into flywheel engaging position.

4,637,361

NON-ADJUSTABLE THROTTLE POSITION INDICATOR

H. Ron Killen, Rochester; Scott A. Wilkins, Royal Oak, and Douglas C. Frantz, Berkley, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

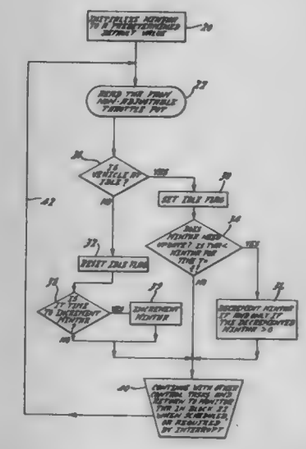
Continuation of Ser. No. 620,350, Jun. 13, 1984, abandoned. This application Jan. 30, 1986, Ser. No. 824,024
Int. Cl.⁴ F02M *3/00*
U.S. Cl. 123—339 **8 Claims**

1. In a vehicle having an engine with a throttle means to regulate flow of combustible elements into the engine, engine control means, means for monitoring and storing various engine parameters and other data and means for storing predetermined values and default values and transfer functions, a throttle position indicator with a variable electrical output in communication with the throttle means such that movement of the throttle means translates to a change in the variable electrical output of the indicator, and stored values of predetermined data and values, including default values for minimum acceptable throttle position, tolerance values for acceptable minimum throttle position, increment and decrement amounts for changing the minimum acceptable throttle position values, a method for indicating throttle position comprising:

sensing the actual throttle position as a function of the electrical output of the indicator;

defining a predetermined default value as the minimum acceptable throttle position value;

determining whether the vehicle is at idle and storing the determination;



comparing the actual throttle position to the minimum acceptable throttle position value to decide whether to update the minimum acceptable throttle position value; and

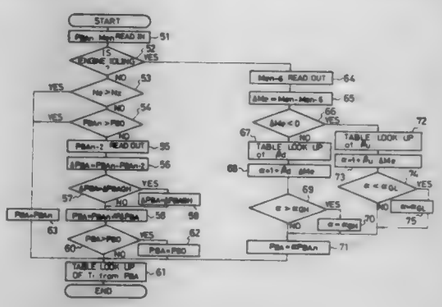
if and only if the vehicle is at idle and if the minimum acceptable throttle position value needs updating, reducing, by a predetermined decrement amount, the minimum acceptable throttle position value if and only if the minimum acceptable throttle position value would be greater than zero after reducing.

4,637,362

METHOD FOR CONTROLLING THE SUPPLY OF FUEL FOR AN INTERNAL COMBUSTION ENGINE

Akimasa Yasuoka, Tokyo; Takahiro Iwata, and Takeo Kiuchi, both of Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1985, Ser. No. 717,117
Claims priority, application Japan, Mar. 29, 1984, 59-061648
Int. Cl.⁴ F02M *5/02*
U.S. Cl. 123—478 **18 Claims**



1. A method for controlling fuel supply of an internal combustion engine having a throttle valve and fuel supply means,

according to the pressure within an intake pipe, comprising the steps of:

(a) sampling said pressure within the intake pipe, with a pressure sensing means, and sampling a value corresponding to the internal combustion engine rotational speed, with a rotational sensing means, at predetermined sampling intervals;

(b) producing a subtraction falue ΔM_e by subtracting from the latest sampled value M_{en}, of said value corresponding to engine rotational speed, a sampled value M_{en-m} which was sampled at a sampling time a predetermined number (m) of cycles before a sampling time of the latest sampled value M_{en};

(c) producing a corrected value P_{BA} by correcting a latest sampled value P_{BAn} of said pressure within the intake pipe according to said subtraction value ΔM_e;

(d) determining a fuel supply amount according to the said corrected value P_{BA}; and

(e) driving said fuel supply means for supplying a fuel to the internal combustion engine in response to said fuel supply amount determined according to said corrected value P_{BA}.

4,637,363

MULTI-CYLINDER INTERNAL-COMBUSTION ENGINE CONTROL DEVICE

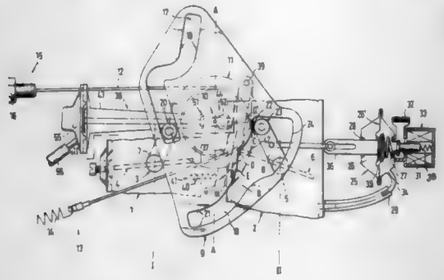
Wolfgang Schmid, Markgröningen, Fed. Rep. of Germany, assignor to Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 27, 1985, Ser. No. 706,449

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1984, 3407000

Int. Cl.⁴ F02D *17/02*

U.S. Cl. 123—481 **19 Claims**



1. In a motor vehicle having a transmission and a gas pedal, a multi-cylinder internal-combustion engine comprising:

at least two cylinder groups, each cylinder group having an intake pipe including a throttle valve attached to a throttle valve shaft; a control lever attached to each throttle valve shaft;

a cam plate connected to the gas pedal for interacting with the control levers to vary the positions of the throttle valves such that the first cylinder group throttle valve opens in a substantially direct relation to an increase in the gas pedal position whereas the opening of the second cylinder group throttle valve is delayed until the gas pedal passes a predetermined position; and

an overriding means responsive to a selective input for overriding the position of the second cylinder group throttle valve such that when activated, said overriding means causes the second cylinder group throttle valve to open in relation to an increasing gas pedal position before the gas pedal reaches said predetermined position;

wherein said overriding means includes a radial cam attached to said cam plate for opening said second cylinder group throttle valve a sufficient distance to admit a quantity of a fuel-air mixture which is approximately one-half of the quantity admitted by the first cylinder group throttle valve.

4,637,364

METHOD FOR CONTROLLING AIR-FUEL RATIO FOR INTERNAL COMBUSTION ENGINE AND APPARATUS THEREFOR

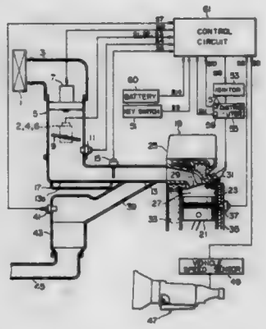
Shinichi Abe, Toyota, and Toshiaki Mizuno, Nagoya, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 597,096, Apr. 5, 1984, abandoned. This application Aug. 23, 1985, Ser. No. 768,925

Claims priority, application Japan, Apr. 12, 1983, 58-64188

Int. Cl.⁴ F02B *3/80*

U.S. Cl. 123—492 **10 Claims**



1. A method of controlling the air fuel ratio of an air-fuel mixture to be supplied to an internal combustion engine comprising the steps of:

(a) detecting and determining that the engine is operating under a first operational state wherein conditions exist where a cooling water temperature is greater than a predetermined cooling water temperature, an engine load is less than a predetermined engine load and a vehicle speed is greater than a first operational condition of a predetermined vehicle speed;

(b) detecting said vehicle speed and determining if an additional first operational condition exists wherein said vehicle speed is less than a second predetermined vehicle speed wherein said second predetermined vehicle speed is greater than said first predetermined vehicle speed;

(c) detecting an engine acceleration and determining if a second additional operational condition exists wherein an acceleration of the engine is commencing; and

(d) determining said air-fuel ratio such that when at least said first operational state exists, the air-fuel ratio is adjusted to the lean side of stroichiometric, and if both first and second additional operational conditions exist, the air-fuel ratio is adjusted towards substantially stoichiometric.

4,637,365

FUEL CONDITIONING APPARATUS AND METHOD

Henry Yunick, Daytona Beach, Fla., assignor to MotorTech, Inc., Daytona Beach, Fla.

Continuation-in-part of Ser. No. 622,409, Jun. 22, 1984, Pat. No. 4,503,833, which is a continuation of Ser. No. 312,495, Oct. 19, 1981, abandoned, which is a continuation-in-part of Ser. No. 247,066, Mar. 24, 1981, abandoned. This application Oct. 22, 1984, Ser. No. 663,552

Int. Cl.⁴ F02M *31/00*

U.S. Cl. 123—545 **7 Claims**

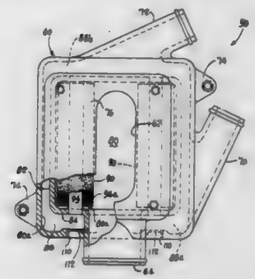
1. A fuel vaporizing apparatus for a spark ignition, internal combustion engine, comprising:

(a) outer structure defining an outer housing including a carburetor mounting plate, outer side walls and an outer bottom wall, enclosing said side walls, said structure further defining a housing inlet for receiving engine coolant and a housing outlet for discharging said coolant after passing through at least a portion of said housing;

(b) inner structure defining an inner vaporization chamber including inner side walls, spaced a predetermined distance from said outer side walls and an inner bottom wall spaced a predetermined distance from the outer bottom wall such that a fluid jacket is defined between an inner surface of said outer housing and an outer surface of said inner chamber, said fluid jacket arranged in fluid communication with said inlet and said outlet;

(c) said carburetor mounting a plate defining an inlet opening spaced above and located in confronting relation with said inner bottom wall, said inlet opening communicating with said chamber for receiving air and entrained fuel discharged by a carburetor;

(d) said chamber extending into fluid communication with a chamber outlet for discharging a fuel mixture from said chamber, said chamber outlet having an axis that is substantially orthogonal to an axis defined by said inlet opening;



(e) heat exchange members disposed in said chamber in fluid communication with said fluid jacket, each heat exchange member including a supply tube through which said coolant is conveyed and a plurality of spine-like heat exchanger surfaces extending radially from said supply tube, and located in heat exchange relationship with the fuel mixture in said chamber;

(f) said heat exchange members being disposed on either side of said inlet opening and in a region of said chamber that is outside a direct flow path defined between said fuel mixture inlet and said fuel mixture outlet whereby said fuel mixture entering said chamber through said inlet is initially heated by impinging on said heated inner bottom wall causing said fuel mixture to expand, reducing its velocity and increasing its pressure such that at least a portion of said fuel mixture travels towards the heat exchange members and circulates around said members before exiting said chamber through said chamber outlet.

4,637,366

FUEL INJECTION APPARATUS AND SYSTEM

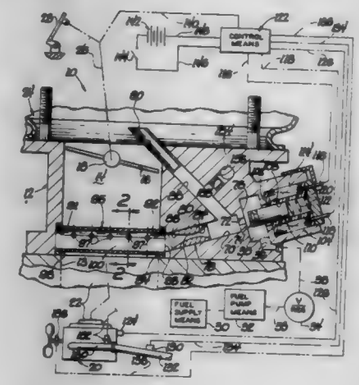
Warren H. Cowles, Farmington Hills, Mich., assignor to Colt Industries Operating Corp., New York, N.Y.

Filed Aug. 5, 1985, Ser. No. 762,387

Int. Cl.⁴ F02M *25/06*

U.S. Cl. 123—568 **21 Claims**

1. Fuel metering apparatus for supplying metered rates of fuel flow to a combustion engine, comprising body means, induction passage means formed through said body means for supplying motive fluid to said engine, throttle valve means situated in said induction passage means for variably controlling the rate of flow of air through said induction passage means, fuel-air mixture discharge means situated for discharge into said induction passage means, air passage means communicating between a source of air and said fuel-air mixture discharge means, said air passage means comprising flow restriction means, said flow restriction means being calibrated as to provide for sonic flow therethrough at conditions of idle engine operation, fuel metering means for metering liquid fuel in response to engine demands and indicia of engine operation, all of said liquid fuel when metered by said fuel metering means being discharged into air flowing through said air passage means at an area thereof downstream of said source of air and upstream of said flow restriction means as to flow through said flow restriction means, wherein said air flowing through said air passage means and said liquid fuel discharged into said air flowing through said air passage means comprises said fuel-air



mixture, a source of engine exhaust gas produced by said engine, and additional calibrated flow restriction passage means for flowing a portion of said engine exhaust gas from said source of engine exhaust gas to said air passage means at an area thereof downstream of said source of air and upstream of said flow restriction means, wherein the volumetric rate of flow through said flow restriction means is such as would during idle engine operation provide for an excessive rate of flow therethrough of said air within said fuel-air mixture, and wherein said portion of said engine exhaust gas serves to prevent said excessive rate of flow of said air by displacement thereof.

4,637,367

CRANKCASE EMISSION CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

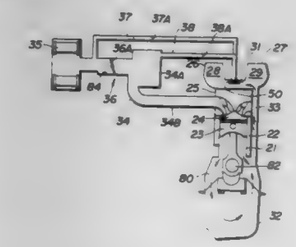
Masato Hatakeyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Mar. 7, 1985, Ser. No. 709,379

Claims priority, application Japan, Mar. 14, 1985, 59-37183[U]

Int. Cl.⁴ F01M *13/00*

U.S. Cl. 123—572 **5 Claims**



1. A crankcase emission control system for an internal combustion engine having an air intake passage and a throttle valve disposed in the air intake passage, the system comprising:

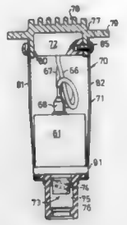
(a) a first cam cover defining at least part of a first cam chamber;
(b) a second cam cover defining at least part of a second cam chamber juxtaposed with respect to the first cam chamber;
(c) means for conducting blow-by gas to the first and second cam chambers;
(d) a first communication passage connecting a first pair of opposing ends of the first and second cam chambers;
(e) a second communication passage connecting a second pair of opposing ends of the first and second cam chambers;
(f) a first gas passage connecting the first communication passage and a point of the air intake passage upstream of the throttle valve;
(g) a second gas passage connecting the second communication passage and a point of the air intake passage downstream of the throttle valve;
(h) means disposed essentially at the connection between the first gas passage and the first communication passage for trapping oil; and
(i) means disposed essentially at the connection between the second gas passage and the second communication passage for trapping oil.

4,637,368

IGNITION SYSTEM FOR AN OTTO-TYPE FOUR-STROKE ENGINE

Per Sune Gillbrand, Enhörna, and Sven H. Johansson, Åmål, both of Sweden, assignors to Saab-Scania Aktiebolag, Sweden

PCT No. PCT/SE83/00256, § 371 Date Mar. 1, 1984, § 102(e) Date Mar. 1, 1984, PCT Pub. No. WO84/00402, PCT Pub. Date Feb. 2, 1984
PCT Filed Jun. 20, 1983, Ser. No. 590,580
Claims priority, application Sweden, Jul. 9, 1982, 8204248
Int. Cl.⁴ F02P *3/06, 15/00*
U.S. Cl. 123—647 **31 Claims**



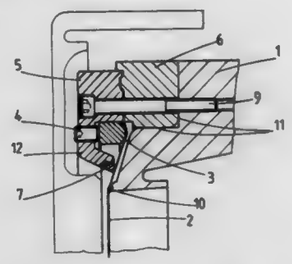
1. An ignition system for a multi-cylinder Otto-type four-stroke engine equipped with at least one spark plug per cylinder, the ignition system comprising:
for each spark plug, a respective ignition device connectible to said spark plug in the engine without cables;
an electrical high-voltage block;
an electrical low-voltage block including an electronic control unit which sends signals to the high-voltage block in response to the operating conditions of the engine for triggering sparks at the spark plugs in a predetermined order;
at least one common, handleable ignition cassette unit, the respective ignition devices of at least two of the spark plugs being included in one common, ignition cassette unit; the high-voltage block being included in at least one common ignition cassette unit.

4,637,369

APPARATUS FOR SPANNING A CENTER-OPENING SAW BLADE

Harald Petermann, and Peter Bauer, both of Nuremberg, Fed. Rep. of Germany, assignors to GMN Georg Muller Nurnberg GmbH, Fed. Rep. of Germany

Filed Nov. 22, 1985, Ser. No. 801,099
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442730
Int. Cl.⁴ B28D *1/04*
U.S. Cl. 125—15 **6 Claims**



1. Apparatus for tensioning a center-opening saw blade having an inner sawing edge, the saw blade to be mounted on a spindle flange of a sawing machine, comprising:
two clamping collars having respective clamping surfaces;
means for releasably connecting said clamping collars to one another at a location remote from the sawing machine so as to clamp an outer peripheral edge region of the saw blade between said clamping surfaces and for said collars and said saw blade together to form an assembly adapted to be mounted over the spindle flange;
a tensioning ring adapted to be mounted onto the spindle flange and having an inner circular edge and an outer centering heel extending around a peripheral region thereof;
means for tightly affixing said assembly to said tensioning ring with at least one of said clamping collars being positioned in said centering heel and an inner region of said saw blade engaging said inner edge of said tensioning ring to impart an initial stress to said saw blade;
a form ring axially slidably mounted within said assembly; and
means for axially sliding said form ring relative to said assembly to engage an intermediate portion of the saw blade which is situated between the outer peripheral edge region and said inner region of said saw blade to impart a fine adjustment stress to the saw blade.

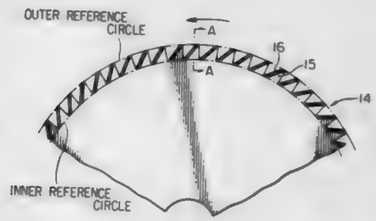
4,637,370

ROTARY SAW BLADE

Hiroshi Ishizuka, 19-2, Ebara 6-chome, Shinagawa-ku, Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,446
Claims priority, application Japan, Oct. 8, 1984, 59-211086
Int. Cl.⁴ B28D *1/04*
U.S. Cl. 125—15 **9 Claims**

1. A rotary saw blade, comprising a series of outward tapering toothlike radial projections on and around a circular core of a base plate of metal, each of said projections comprising a leading surface which is inclined at an angle not greater than



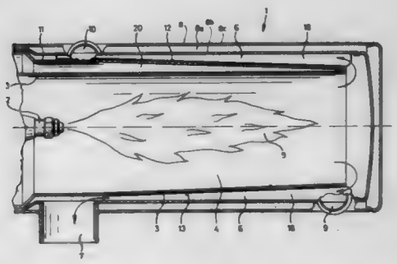
60° to the periphery of the core and deposited with abrasive particles held in an electro-deposited layer of metal.

4,637,371

FUEL-OPERATED HEATING SYSTEM, PARTICULARLY AN AUXILIARY HEATER FOR A VEHICLE

Dieter Räthel, Mittelstetten, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Nov. 7, 1984, Ser. No. 669,230
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341490
Int. Cl.⁴ F24H *3/06*
U.S. Cl. 126—110 B **18 Claims**



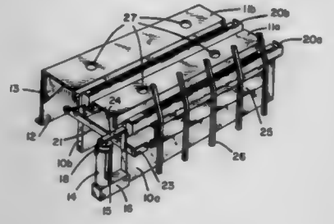
1. An auxiliary heater for vehicles having a burner projecting into a first end of a combustion chamber formed by a combustion tube having an open end, located opposite said first end, from which combustion gases produced by said burner flow out of the combustion chamber; a heat exchanger having an inner chamber for a heat transfer medium and surrounding the combustion tube in a jacket-like manner with an annular out-flow space being located therebetween for directing combustion gases coming out of an open end of the combustion tube, in a flow direction from said open end toward said first end of the combustion tube, to an exhaust outlet in heat exchange realtionship with the heat transfer medium within said heat exchanger; and longitudinally extending fins projecting from a wall of said heat exchanger into said annular out-flow space; wherein the cross-sectional flow-through area of the annular out-flow space is reduced in a direction from said open end of the combustion tube toward said exhaust outlet by increasing the diameter of a boundary wall defining the inner circumference of the out-flow space; wherein the fins project a distance which decreases in correspondence to the reduction of said cross-sectional, flow-through area; and wherein the combustion chamber has a constant diameter substantially throughout its length and wherein a radial distance between said annular out-flow space and said combustion chamber is increased in direct correspondence to the reduction in flow-through area of the annular out-flow space along with a decrease in the ability for heat to be transferred from said combustion chamber to said annular out-flow space.

4,637,372

SIMULATED LOG-BURNING FIREPLACE

Gerald M. Mogol, 2169 Edgecumbe Rd., St. Paul, Minn. 55116, and Leo E. Fox, 357 Stonebridge Blvd., St. Paul, Minn. 55105

Filed Sep. 14, 1981, Ser. No. 302,039
Int. Cl.⁴ F24C *3/00*
U.S. Cl. 126—127 **2 Claims**



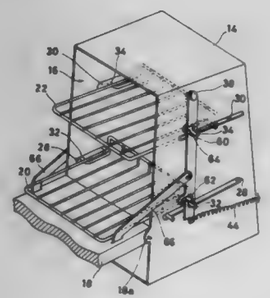
1. A simulated log-burning fireplace for resting on a supporting floor, comprising:
elongated, open-top, rectangular, box-like burner means for containing liquid fuel, said burner means comprising at least two parallel spaced-apart box-like chambers;
support means located adjacent the top but not over the top of the burner means between said chambers for holding a non-combustible artificial log;
a filling tube connected to said burner means for filling said burner means with liquid fuel;
a cap on said filler tube;
a movable arm, said arm extended over said cap in one position for keeping the cap closed and removed from said cap in another position to permit the cap to be opened;
closure means located at the top of said burner means for closing the top opening of said burner means;
said burner means having a height substantially from the supporting floor to said log support means and a width substantially that of the length of an artificial log.

4,637,373

OVEN

Yoshinari Shirai, Osaka, and Tutomu Kuranaga, Hyogo, both of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Oct. 17, 1984, Ser. No. 661,678
Claims priority, application Japan, Nov. 16, 1983, 58-177667[U]; Jan. 19, 1984, 59-8321
Int. Cl.⁴ F24C *15/16*
U.S. Cl. 126—340 **4 Claims**



1. An oven comprising:
a casing having an opening at its front side, said casing defining a baking chamber,
a first rack having a projection extending from a side thereof

and supported in the baking chamber in a manner allowing it to be shifted in a horizontal direction,

a connecting member pivotally mounted on the casing, the connecting member including a first L-shaped opening formed therein for receiving the projection of the rack,

a door pivotally mounted on the casing at its lower end, said door covering the opening of the casing when the door is closed, and

an arm for connecting the door and the connecting member so as to effect movement of the rack in the horizontal direction in response to opening and closing the door,

said projection being slidably received by the L-shaped opening, whereby the projection is adapted to freely slide within the L-shaped opening when the oven door is pivoted between a closed position and a predetermined position to prevent horizontal movement of the rack, and whereby the projection is prevented from sliding within the L-shaped opening when the oven door is pivoted between the predetermined position and a fully opened position to effect horizontal movement of the rack.

4,637,374

SELECTIVE ABSORPTION FILM OF A SOLAR HEAT COLLECTOR

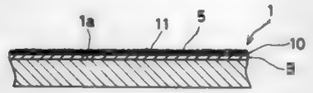
Nobushige Arai, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 8, 1983, Ser. No. 530,264

Claims priority, application Japan, Sep. 8, 1982, 57-156429; Sep. 24, 1982, 57-166857; Nov. 30, 1982, 57-210357; Nov. 30, 1982, 57-181732[U]

Int. Cl.⁴ F24J *2/00*; B05D *3/02*

U.S. Cl. 126—417 **5 Claims**



1. A solar heat collector comprising:

a heat collection fin made of a heat collection material; and

a selective absorption film formed on a heat collection surface of said heat collection fin and selectively absorbing solar rays, said selective absorption film comprising a plated layer primarily including cobalt, disposed on said heat collection fin and a cobalt oxide layer disposed on said plated layer, said absorption film having an absorption rate (α) of 0.91 to 0.96 percent and a radiation rate of 0.06 to 0.10 percent, even when the selective absorption film is exposed to a temperature of about 400° C. and wherein said plated layer contains an iron component.

4,637,375

INTEGRATED SOLAR HEATING UNIT

William J. Larkin, 2622 Newport Blvd., Newport Beach, Calif. 92663

Continuation-in-part of Ser. No. 737,864, May 28, 1985, Pat. No. 4,567,878. This application Jan. 31, 1986, Ser. No. 824,877

Int. Cl.⁴ F24J *2/44*

U.S. Cl. 126—434 **7 Claims**

1. An integral solar heating unit with an integral solar collector and hot water storage system, said unit comprising:

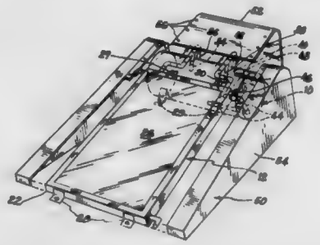
(a) a housing;

(b) a flat plate solar collector panel mounted in said housing and having a generally horizontal upper edge and an uninsulated, open back surface;

(c) a cylindrical hot water tank operatively connected to said solar collector panel and mounted in said housing generally parallel to and adjacent to said upper edge;

(d) said housing comprising a hood around said tank a pair of side skirts extending down at the sides of said panel, said hood and side skirts terminating at lower edges which together substantially define a plane such that upon placing said heating unit on a generally planar surface, said housing substantially encapsulates said collector panel and hot water tank in a substantially enclosed air space;

(e) said collector including a plurality of longitudinally extended U-shaped collector tubes and a glazed window to pass radiation through to said collector tubes, and a first cold water manifold connected to said tubes for delivering fresh water thereto and a second hot water manifold



connected to said tubes to remove heated water therefrom, and said manifolds are adjacent and at least somewhat above and in direct thermal contact with said tank; and,

(f) said skirts and hood lapping around said collector panel, exposing only said glazed window, such that everything else in said heating unit is enclosed by said housing such that heat emanating from the uninsulated, open back face of the collector and tank is captured and retained by said housing to warm said manifolds.

4,637,376

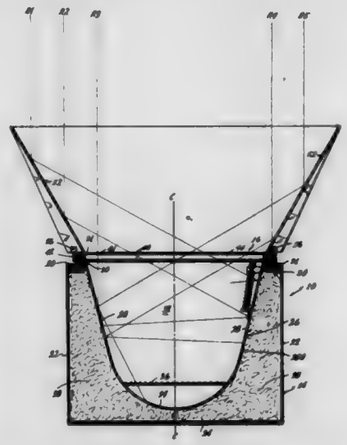
HIGH EFFICIENCY SOLAR HEATER

J. Arnold Varney, 7326 Ogelsby Ave., Los Angeles, Calif. 90045, and Frederick M. Varney, Rte. 9, Box 89FV, Santa Fe, N. Mex. 87501

Filed Jul. 8, 1985, Ser. No. 752,923

Int. Cl.⁴ F24J *3/02*

U.S. Cl. 126—451 **5 Claims**



1. A solar oven comprising a plurality of canted side-walls defining a heating chamber of inverted pyramidal configuration having a rectangular upper aperture for admitting solar radiation into said chamber, a closed bottom, said side walls

having four blackened non-reflective interior surfaces and translucent means closing said upper aperture for containing heated air within said chamber, said four interior surfaces being exposed to radiation entering said chamber through said translucent means, a frusto-pyramidal reflector removably mounted externally of said heating chamber and including four reflector surfaces diverging from each other at a somewhat greater angle than said interior surfaces such that light falling onto said external reflector substantially normally to said translucent means is reflected onto an opposite one of said interior surfaces substantially at right angles thereto; and

temperature responsive means arranged for opening a vent into said chamber in response to temperature rising in said chamber beyond a predetermined level, said temperature responsive means comprising spring means retained in a compressed state by structural means selected to lose structural integrity near said predetermined level, said spring means being released upon said structural means losing structural integrity near said predetermined level and failing under load imposed by said spring means, whereby said spring means is free to operate to open said vent.

4,637,377

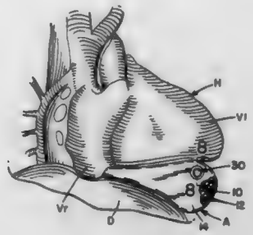
PILLOW OR SUPPORT MEMBER FOR SURGICAL USE

Floyd D. Loop, 1 Brntenahl Pl., #1206, Cleveland, Ohio 44108

Filed Sep. 20, 1985, Ser. No. 778,544

Int. Cl.⁴ A61B *19/00*

U.S. Cl. 128—1 R **3 Claims**



1. The method of performing open heart surgery on a patient including the step of lifting the heart from the pericardial cavity of the patient and then resting the heart against a surgical pillow of generally flat shape inserted between the heart and the diaphragm of the patient and comprised of an inner cushion filler formed of a material comprising one from the group consisting of an aggregate of foamed plastic particles or a foamed spongy body of aeriferous cellular plastic or rubber material completely enclosed and sealed within an envelope comprised of a thin flaccid synthetic plastic sheet material impervious to air and liquid and nonabsorbent of blood and provided with vent means in the side edge wall of the envelope for releasing entrapped air or gas from the pillow on compression thereof.

4,637,378

CLEANING APPARATUS FOR ENDOSCOPE

Hiroyuki Sasa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 792,492

Claims priority, application Japan, Nov. 1, 1984, 59-230667; Nov. 22, 1984, 59-247416

Int. Cl.⁴ A61B *1/12*; B08B *9/02*

U.S. Cl. 128—4 **19 Claims**

1. A cleaning apparatus for cleaning channels of an endoscope which comprises an operating section, an insertion section extending from the operating section, a universal cord extending from the operating section, an air channel, a liquid channel and a suction channel extending inside the endoscope, an air/liquid cylinder provided at the operating section and communicating with the air channel and the liquid channel, and a suction cylinder provided at the operating section and communicating with the suction channel, said air/liquid cylinder and said suction cylinder each including an open end portion projecting from the operating section and an engaging portion formed on the open end portion, said apparatus comprising:

liquid feeding means for feeding a detergent solution;

a connector detachably connected to the air/liquid cylinder and the suction cylinder; and

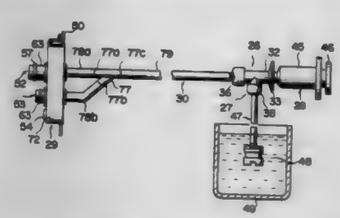
connecting means for connecting the liquid feeding means and the connector to deliver the detergent solution fed from the liquid feeding means into the channels of the endoscope through the connector,

said connector including

a support body,

an air/liquid mouthpiece movably supported by the support body and connected to the open end portion of the air/liquid cylinder in a liquid-tight manner, said air/liquid mouthpiece having a liquid passage communicating with the inside of the air/liquid cylinder and the connecting means and a retaining portion engaging the engaging portion of the air/liquid cylinder,

a suction mouthpiece movably supported by the support body and connected to the open end portion of the suction



cylinder in a liquid-tight manner, said suction mouthpiece having a liquid passage communicating with the inside of the suction cylinder and the connecting means and a retaining portion engaging the engaging portion of the suction cylinder,

a slider slidably supported by the support body and having a first holding portion adapted to engage the engaging portion of the air/liquid cylinder and a second holding portion adapted to engage the engaging portion of the suction cylinder, said slider being movable between a first position where the first and second holding portions of the slider are disengaged from the engaging portions of the cylinders, and a second position where the first holding portion engages the engaging portion of the air/liquid cylinder to hold the engaging portion of the air/liquid cylinder between the first holding portion and the retaining portion of the air/liquid mouthpiece, and where the second holding portion engages the engaging portion of the suction cylinder to hold the engaging portion of the suction cylinder between the second holding portion and the retaining portion of the suction mouthpiece, and

urging means for urging the first and second holding portions toward the respective retaining portions of the air/liquid mouthpiece and the suction mouthpiece when the slider is moved to the second position.

4,637,379

DEVICE FOR IMPARTING CONTINUOUS PASSIVE MOTION TO LEG JOINTS

John H. Saringer, Toronto, Canada, assignor to Toronto Medical Corporation, Scarborough, Canada

Filed Dec. 5, 1984, Ser. No. 678,334

Int. Cl.⁴ A61H *1/02, 1/00*

U.S. Cl. 128—25 R **14 Claims**

1. An apparatus for imparting continuous passive motion to

joints of the leg, including an elongated base having a distal end and a proximal end from which a reclining patient's leg is extended to an elevated connection of the foot with a foot rest for receiving the sole of the foot and retaining the foot unweighted with the toes up and heel down, in which,

the foot rest being fixedly connected to a first member which has a lower pivotal connection to travelling means movable relative to the base forming a linkage with the unweighted ankle, knee and hip joints, and an upper pivotal connection axially aligned with the lower pivotal connection to a second member which, in one mode, is fixed relative to the first member and, in another mode, is pivotal relative to the first member,

means for latching the first member to the second member whereby they must move, in one mode, as a unit about the lower pivotal connection only,



a spacing member for retaining the foot rest substantially a given distance from the proximal end, whereby the leg is held extended,

when the second member is free to move relative to the first member in said other mode,

motor means for imparting reciprocal linear movement to the travelling means whereby, when the spacing member is operative to keep the leg extended, the foot rest pivots back and forth in said other mode about the upper pivotal connection to mobilize only the ankle and, when the spacing member is inoperative, and the first and second members locked together, the foot rest pivots back and forth in said one mode about the lower pivotal connection to mobilize only the hip and knee joints,

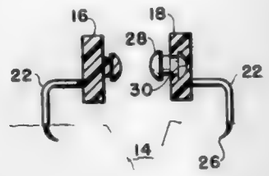
and control means for controlling the motor means to reverse the stroke at given terminal angles of the foot rest to the linear path of travel.

4,637,380

SURGICAL WOUND CLOSURES

Wilmo C. Orejola, 1012 Black Oak Ridge Rd., Wayne, N.J. 07470

Filed Jun. 24, 1985, Ser. No. 748,035
Int. Cl.⁴ A61B *17/04, 17/08*
U.S. Cl. 128—334 C **5 Claims**



1. A wound closure comprising:

a pair of skeleton rods, each rod having a substantially planar inner surface, an outer surface opposite said inner surface, and a bottom surface;

a plurality of pins connected to the outer surface of each of said pair of rods, each pin extending outward from said outer surface and downward to a predetermined position below the level of said bottom surface and thence in an inward turning bend toward the wound to terminate in a short sharpened point for engaging the skin of a patient, each pin of said plurality being coated with a plastic coating between its respective skeleton rod and a predetermined position below the level of said bottom surface, said predetermined position forming a stop for limiting the length of insertion of said sharpened pin points; and

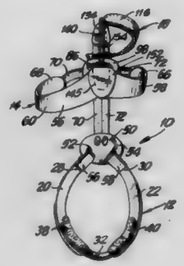
means for interconnecting said planar inner surfaces of said pair of skeleton rods.

4,637,381

FOOT SUPPORTING DEVICE

Gertrude Jungmann, Rangeley, Me., assignor to Institute for Gravitational Strain Pathology, Inc., Rangeley, Me.

Filed Jun. 3, 1985, Ser. No. 740,746
Int. Cl.⁴ A61F *5/00*
U.S. Cl. 128—80 G **9 Claims**



1. A foot supporting device for pulling foot muscles back to a relaxation phase intermediate stress phases placed onto the foot muscles, said device comprising:

an instep strap for disposition around a lower instep portion of a foot, said instep strap including an elongated strip of leather;

first and second elastic bands, one end of said first elastic band being secured to one end of said strip, and one end of said second elastic band being secured to an opposite end of said strip;

a connecting member for disposition proximate the ball of the foot, said connecting member receiving said first and second elastic bands to fittingly maintain said strip around the lower instep portion of the foot, said first and second elastic bands passing through said connecting member;

said connecting member including guide means for directing said first and second elastic bands from a footencircling direction stemming from the opposing ends of said strip to a longitudinal direction along a length of a sole portion of the foot towards a heel portion of the foot;

a heel strap for disposition over the heel portion of the foot;

an adjustment member for disposition on the sole portion of the foot, said adjustment member including adjusting means for adjusting tension in said first and second elastic bands to thereby control any pull along the sole portion of the foot between said instep strap and said heel strap;

said adjustment member including a coupling plate to couple said first and second elastic bands to said heel strap, opposing ends of said heel strap being secured to said coupling plate;

said adjusting means including apertures in said coupling plate for receiving opposite ends of said first and second elastic bands with said opposite ends of said first and second elastic bands projecting out from said coupling plate apertures so that pulling said opposite ends of said first and second elastic bands through said coupling plate apertures provides for adjustment of the tension in said first and second elastic bands; and

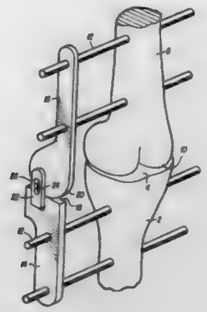
a toe strap elastically coupled to said connecting member for disposition around the big toe of the foot.

4,637,382

MOTION-GUIDING LOAD-BEARING EXTERNAL LINKAGE FOR THE KNEE

Peter S. Walker, Weston, Mass., assignor to Brigham & Women's Hospital, Boston, Mass.

Continuation of Ser. No. 372,109, Apr. 27, 1982, abandoned.
This application Aug. 22, 1984, Ser. No. 642,716
Int. Cl.⁴ A61F *5/04*
U.S. Cl. 128—92 Z **10 Claims**



1. A motion guiding, load bearing, external linkage for a knee joint, comprising:

first and second tibial components respectively secured to the lateral and medial sides of the tibia, each said tibial component having a tibial load bearing surface;

first and second femoral components respectively secured to the lateral and medial sides of the femur, each said femoral component having a femoral load bearing surface movably contacting one of said tibial load bearing surfaces; and

first and second link means respectively connected between said first tibial and femoral components and said second tibial and femoral components, wherein said first and second link means comprise, respectively, first means for positively guiding the relative motion of said first tibial and femoral components along a first predetermined path during knee flexure and second means for positively guiding the relative motion of said second tibial and femoral components along a second predetermined path during knee flexure, said second predetermined path being geometrically different from said first predetermined path, and wherein said first and second means for positively guiding said first and second tibial and femoral components collectively comprise means for forcing transverse rotation of the femur about the longitudinal axis of the tibia during knee flexure.

4,637,383

TOXIC ENVIRONMENTAL BREATHING HOOD

Edward L. Lopez, Newhall, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Dec. 23, 1985, Ser. No. 812,499
Int. Cl.⁴ A62B *7/00*
U.S. Cl. 128—201.25 **3 Claims**

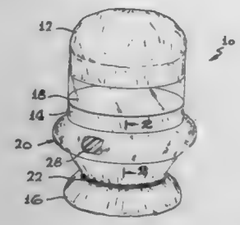
1. A breathing hood assembly for protecting a person from a fire and toxic gases produced, therefrom comprising:

a hood of fire resistant, gas impervious material sufficiently sized so as to fit over the person's head, said hood having a neck portion including means for sealing the hood to the neck of the person, the interior surface of said neck portion lined with a silica gel and barium oxide impregnated cloth;

a transparent window mounted to said hood extending about the periphery thereof; and,

a filter mounted to said hood extending about the periphery thereof, said filter in communication with the interior of said hood, said filter comprising:

an inner sodium bisulfate impregnated cloth layer secured at its edges to and annular opening extending around the periphery of said hood;



an outer fire resistant cloth cover joined at its edges to the edges of said inner cloth layer, said inner and outer cloth layers forming a donut shaped cavity;

a donut shaped cloth bag impregnated with silica gel and barium hydroxide lining said cavity and,

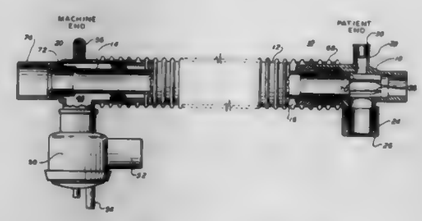
a flexible polyurethane foam filling said cavity, said polyurethane foam impregnated with activated charcoal, micro pumice stone particles coated with caustic soda, and a compound of manganese dioxide and copper oxide.

4,637,384

COAXIAL BREATHING CIRCUIT

Gerhardt P. Schroeder, Madison, Wis., assignor to The BOC Group, Inc., Montvale, N.J.

Filed Feb. 15, 1985, Ser. No. 702,561
Int. Cl.⁴ A61M *16/00*
U.S. Cl. 128—204.18 **5 Claims**



1. A patient breathing circuit for providing gases from a breathing machine to a patient comprising:

a flexible corrugated outer tubing;

a flexible inner tubing generally coaxial with said outer tubing forming a first gas path between said inner and outer tubings, and a second gas path within said inner tubing;

a patient end connector attached to one end of said outer tubing and said inner tubing and forming a path between said first and second gas paths to the patient, said patient end connector comprising a tube end piece having one end secured to said one end of said inner tubing, said end piece including a flexible tab portion which angles radially outwardly and in the direction of said inner tubing, said patient end connector further comprising housing means forming a cylindrical flow chamber, at least three ribs

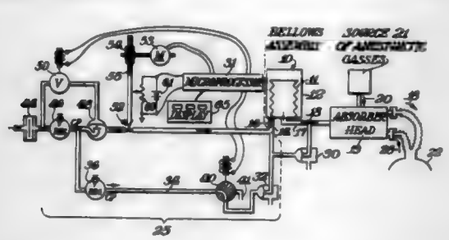
radially spaced around the inside surface of said cylindrical flow chamber and extending longitudinally of and, generally radially into said chamber, and first and second longitudinally spaced apart stop means in said chamber, said tube end piece being slidably positioned along said ribs within said chamber and spaced therefrom by said ribs, and said tube end piece having an opposite end being engaged with said first stop means to allow limited sliding movement of said end piece within said housing in one direction and said flexible tab portion being engaged with said second stop means to allow limited sliding movement of said end piece within said housing in an opposite direction; and a machine end connector connected to the other ends of said inner and outer tubings, said machine end connector having an outlet for discharging gas from said first gas path, said machine end connector further having an opening of predetermined internal diameter through which said inner tubing at least partially extends; a male connector to provide gas to said second gas path from said machine, said male connector having a portion of predetermined external diameter, said portion being within said inner tubing and extending through said opening to frictionally engage and sandwich said inner tubing between said portion and said opening; said inner tubing thereby being affixed to said male connector solely by means of the engagement through said inner tubing.

4,637,385

PULMONARY VENTILATOR CONTROLLER

Tibor Rusz, 761 West St., Pittsfield, Mass. 01201

Filed Jan. 13, 1986, Ser. No. 818,005
Int. Cl.⁴ A61M *16/00*
U.S. Cl. 128—204.21 **4 Claims**



1. A pulmonary-bellows-ventilator system for controlling the breathing of an anesthetized and paralyzed patient undergoing surgery, comprising a pulmonary-bellows assembly having a housing, a bellows mounted within said housing forming a chamber therebetween, an inlet on said housing fluidically communicating with said chamber and an outlet means on said housing fluidically communicating with the interior of said bellows and for delivering gas to a patient said bellows having a maximum tidal volume, TV_{max}, a constant-pressure driving-gas source; a switchable valve and an electrically controllable variable throttling valve, said valves connected in series from the output of said source to the input of said bellows assembly, said source and said throttling valve establishing together a maximum flow rate, F_{max}, of said driving gas through said throttling valve; instruction input means for providing target values of the minute volume, MV, of driving gas delivered each minute from said source to said bellows assembly, the frequency, R, at which said switchable valve is opened and closed, the flow rate, F, of driving gas through said throttling valve during periods when said switchable valve is open, and the quantities F_{max} and TV_{max}, microprocessor means having inputs connected to said instruction input means for accepting and storing said target values, said microprocessor means having outputs connected to said switchable valve and said throttling valve, for establishing the actual frequency R, flow rate F and inspiration time I that corresponds to the time period during which said switchable valve is open, for determining the actual tidal volume TV and the ratio E/I of switchable-valve closed-time to open-time according to the relationships:

$$TV = MV/R \text{ and}$$

$$\frac{E}{I} = \frac{F}{MV} - 1,$$

and when said target value MV_T is larger than that MV value which corresponds to the combination of said target value for R and said maximum bellows tidal volume TV_{max}, for changing said actual frequency R away from said target value R to a frequency R_A corresponding to the combination of said TV_{max} and said MV target value, so that said target MV value is still actually realized according to

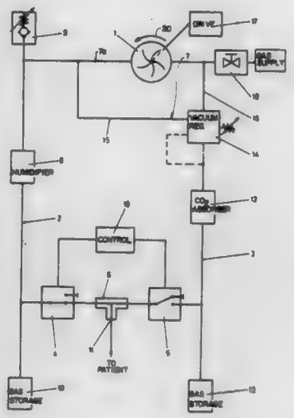
$$R_A = \frac{MV_T}{TV_{max}}.$$

4,637,386

VENTILATION SYSTEM HAVING TRUE VALVE CONTROL FOR CONTROLLING VENTILATION PRESSURES

Marcel Baum, Vienna, Austria, assignor to Drägerwerk AG, Fed. Rep. of Germany

Filed Jun. 7, 1985, Ser. No. 742,608
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422066
Int. Cl.⁴ A61M *16/00*
U.S. Cl. 128—204.21 **7 Claims**



1. A ventilation system for a person, comprising a ring line having an inlet portion, an outlet portion and a bypass portion connected between said inlet and outlet portions, blower means connected between said inlet and outlet portions for blowing gas from said inlet portion to said outlet portion, drive means connected to said blower means for driving said blower means in only one direction for supplying gas from said inlet portion to said outlet portion, an inspiration line connected to said outlet portion of said ring line for receiving gas therefrom, an inhalation valve connected to said inspiration line, an expiration line connected to said inlet portion of said ring line for supplying gas thereto, an exhalation valve connected to said expiration line, a patient connected between said inhalation and exhalation valves and adapted for connection to a person, and control means connected to said inhalation and exhalation valves for alternately opening said inhalation and exhalation valves to establish inhalation and exhalation for a patient connected to said patient connection and wherein said control means comprises a first housing having an input space connected to said inspiration line, a first valve seat in said input space connected between said inspiration line and said input space, said first housing defining a first control space, a first diaphragm inside first housing separating said first control space from said input space and engageable against said first valve seat for closing communication between said inspiration line and said input space, a second housing having an output space connected to said expiration line, a second valve seat in said output space connected between said output space and said expiration line, said second housing defining a second control space, a second diaphragm in said second housing separating said second control space from said output space and engagable against said second valve seat for closing communication between said output space and said expiration line, a compressed gas source, first and second branch lines connected to said gas source, first ejector nozzle means connected to said first housing for directing a jet stream in a direction to reduce pressure in said first control space to move said first diaphragm in a direction opposite to said first valve seat, second ejector nozzle means connected to said second housing for directing a jet stream in a direction for reducing pressure in said second control space to move said second diaphragm in a direction opposite to said second valve seat, and first injector nozzle means connected to said second housing for directing a jet stream in a direction for increasing pressure in said second control space to move said second diaphragm in a direction toward said second valve seat, and second injector nozzle means connected to said first housing for directing a jet stream in a direction for increasing pressure in said first control space to move said first diaphragm in a direction toward said first valve seat, said first ejector nozzle means and said first injector nozzle means being connected to said first branch line for the simultaneous application of compressed gas thereto, said second injector nozzle means and said second ejector nozzle means being connected to said second branch line for the simultaneous application of compressed gas thereto, the control means including valve means for applying compressed gas alternately to said first and second branch lines, said diaphragms and valve seats forming said inhalation and exhalation valves, and said patient connection being connected between said input space and said second valve seat.

4,637,387

BREATHING APPARATUS

Lester B. Hall, 249 Kinsey Ave., Kenmore, N.Y. 14217

Continuation-in-part of Ser. No. 404,059, Aug. 2, 1982, Pat. No. 4,573,463. This application May 27, 1983, Ser. No. 498,932
Int. Cl.⁴ A62B *9/00*, *18/02*
U.S. Cl. 128—205.24 **12 Claims**



1. Breathing apparatus comprising:
(a) a body in the form of a mask adapted to be worn over a user's nose and mouth and defining a breathing chamber adapted to be in fluid communication with only the nose, said body having an inlet in fluid communication with said chamber;
(b) a container holding a quantity of gas for breathing and having an outlet, valve means connected to said outlet for opening and closing thereof, and a movable control means connected to said valve means for opening the same in response to movement of said control means, said container having means adjacent said outlet for direct connection to said body with said container outlet in fluid communication with said body inlet, said movable valve control means adjacent said body inlet and said container adjacent to and supported exclusively by said body, said container releasing a quantity of gas to said chamber and thereby to only the nose of the user in response to opening of said valve means by said control means;
(c) operator means carried by said body for operative connection to said valve control means and for operative association with the mouth of the user for moving said valve control means in response to manipulation by the mouth of the user, said operator means comprising an elongated housing fixed to said direct connection means at one end near said body inlet and having an opposite end spaced from said one end and extending into said body adapted for sealing engagement with the user's mouth when the body is in place, said housing having a longitudinal passage therethrough, and an elongated operator body slidably supported within and extending along the passageway within said housing and into said direct connection means, said body being connected at one end to said valve control means and having an opposite end spaced from said one end and adapted for manipulation by the user's mouth whereby the user moves said operator element along the passageway within said housing by manipulating said opposite end with his mouth; (d) exhalation valve means in said body in fluid communication with said breathing chamber for exhausting from said chamber to the atmosphere in response to exhalation by the user; and
(e) means for holding said body on the face of the user;
(f) whereby the delivery of breathing gas from said container to said breathing chamber is controlled by the user manipulating said operator means with his mouth and inhalation and exhalation is performed by the user through his nose from and to said breathing chamber.

4,637,388

TRACHEAL TUBE OBTURATOR WITH REVERSIBLE TIP

Clifford P. Melendy, North Andover, Mass., assignor to Portex, Inc., Wilmington, Mass.

Filed Oct. 15, 1984, Ser. No. 661,093
Int. Cl.⁴ A61M *16/00*
U.S. Cl. 128—207.14 **6 Claims**



1. A tracheal tube assembly comprising:
a tracheal tube having a proximal end, an elongated bore of uniform diameter, and a distal end, said distal end terminating in an opening with an annular rim of predetermined outer diameter; and
an obturator normally sleeved within the bore of said tube, but withdrawable therefrom, said obturator having a proximal end forming a handle, an elongated shank and a distal end with a soft, flexible, conical tip, mounting thereon and normally projecting from said tube opening and having an outer diameter at least equal to the outer

diameter of said rim to shield, and cover the same during insertion of said assembly between the vocal cords;

said soft tip being of resilient deformable material so as to be withdrawable through the bore of said tube with said obturator;

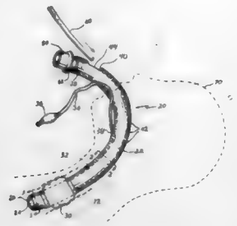
said soft, flexible conical tip includes a blunt rounded leading apex of predetermined length and an integral trailing hollow skirt, of truncated conical configuration, said skirt being substantially equal in length to said apex and invertible toward said apex upon withdrawing of said obturator through said bore to reduce the diameter of said tip.

4,637,389

TUBULAR DEVICE FOR INTUBATION

Eugene L. Heyden, S. 627 Bernard #8, Spokane, Wash. 99204

Filed Apr. 8, 1985, Ser. No. 721,168
Int. Cl.⁴ A61M *16/00*
U.S. Cl. 128—207.15 **30 Claims**



1. A tubular device for intubation of a body pathway, comprising:

an elongated tubular member of resilient material providing a wall with an inner wall surface and an outer wall surface, having a forward segment and end for residing within a body pathway, and also having a rearward segment and end for residing outside a body pathway, said tubular member defining a central axis and a central fluid passage extending therethrough;

an elongated guide means provided by said tubular member adapted and longitudinally sufficient for slidably receiving a suction catheter and guiding the same along a substantial length of said tubular member directionally away from the vicinity of said rearward end toward said forward end, said guide means defined within the wall of said tubular member between said inner wall and said outer wall surfaces for defining a region therein for the accommodation of said suction catheter, said guide means further adapted to modify in configuration from a normally unexpanded attitude to an expanded attitude when accommodating said suction catheter; and

fluid communication means for providing fluid communication between the region within said guide means and said body pathway, said fluid communication means provided by the wall of said tubular member and residing in locations adjacent said guide means between said forward and said rearward ends, said fluid communication means also residing in a plurality of locations along the wall of said tubular member adjacent a plurality of locations within said guide means for providing fluid communication over a substantial length of said guide means between said region and said body pathway, whereby said suction catheter can remove secretions over any of several locations along said tubular member when moved at various depths within said guide means.

4,637,390

ELECTROSURGICAL INSTRUMENT

Oleg A. Sorochenko, Kharkov, U.S.S.R., assignor to Nauchno-Issledovatelsky Institut Obschei i Neotlozhno Khirurgii, Kharkov, U.S.S.R.

PCT No. PCT/SU83/00042, § 371 Date Jul. 30, 1985, § 102(e) Date Jul. 30, 1985, PCT Pub. No. WO85/02335, PCT Pub. Date Jun. 6, 1985
PCT Filed Dec. 1, 1983, Ser. No. 769,987
Int. Cl.⁴ A61B *17/36*
U.S. Cl. 128—303.14 **2 Claims**



1. An electrosurgical instrument comprising:

a first active electrode in the form of a disk cutter;

a second active electrode identical to said first electrode disposed coaxially with said first electrode;

a gap formed between said two electrodes;

a disk of an insulating material having a diameter smaller than the diameters of said electrodes, said disk being located in said gap and being mounted coaxially with said electrodes;

cutting edges of said disk cutters having toothed portions and toothless portions alternating regularly and having an identical length;

said electrodes being so positioned relative to each other so that said toothed portions of one of said electrodes are disposed opposite said toothless portions of the other of said electrodes;

current leads electrically connected to said electrodes for supplying diathermic current to said electrodes; and

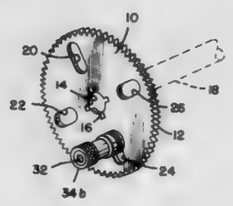
drive means for rotating said cutting edges around an axis passing through the centers of said electrodes.

4,637,391

SURGICAL SAW BLADE

Allen P. Schlein, 107 Curtis Ter., Fairfield, Conn. 06432

Filed Apr. 3, 1986, Ser. No. 847,693
Int. Cl.⁴ A61F *15/02*
U.S. Cl. 128—317 **9 Claims**



1. A surgical saw blade for attachment to a power operated oscillatory surgical saw comprising:

a blade portion having teeth diaposed along at least a portion

of an outer periphery of same and defining an arcuate cutting surface thereat, said blade portion having a central saw connector-receiving opening therethrough for securement of said blade to said saw, and also having an elongated slot therethrough disposed with its long axis on a radius of said blade portion extending between said central opening and the arcuate cutting surface of said blade portion, and

a cutting depth stop including a cylindrical metal sleeve surrounding a hollow cylindrical inner sleeve formed of thermal insulating plastics material and extending outwardly from one side of said blade in a direction perpendicular to the plane of said portion and releasably secured at a desired adjusted position along said elongated slot by a bolt extending through said slot from the other side of said blade portion and threadably engaging said cylindrical inner sleeve, the length of said metal sleeve being sufficient to preclude ingress of said cutting teeth beyond a depth defined by the distance between said cutting teeth and a surface of said metal sleeve closest said teeth.

4,637,392

BIPOLAR ELECTROCOAGULATOR

Oleg A. Sorochenko, Kharkov, U.S.S.R., assignor to Kharkovsky Nauchno-Issledovatelsky Institut Obschei i Neotlozhnoi Khirurgii, Kharkov, U.S.S.R.

Filed Aug. 19, 1985, Ser. No. 773,006
Int. Cl.⁴ A61B *17/36*
U.S. Cl. 128—303.13 **15 Claims**



11. The bipolar electric coagulator according to claim 1, wherein the shape of said working body of revolution is in the form of an ellipsoid.

4,637,393

SURGICAL INSTRUMENT

Andrew I. A. Ray, Chipperfield, United Kingdom, assignor to Microsurgical Equipment Limited, United Kingdom

Filed Jun. 21, 1984, Ser. No. 623,194
Claims priority, application United Kingdom, Jun. 21, 1983, 8316824
Int. Cl.⁴ A61F *17/32*
U.S. Cl. 128—305 **8 Claims**

1. A surgical instrument for causing a member to penetrate into an organ or body part to a depth which is within a desired distance from a remote face of the organ or body part, the instrument comprising

a said member,

a housing for housing said member,

drive means for driving said member with respect to and so as to extend from said housing,

sensing means mounted on the housing for sensing the thickness of the organ or body part in the vicinity of such penetration and arranged to produce a first output signal, said first output signal representing said thickness,

setting means settable to a level indicative of said desired distance and arranged to produce a second output signal, said second output signal representing said desired distance,

comparator means arranged and connected to compare said output signals and to produce a comparison signal representing any difference between said thickness and said desired distance, and



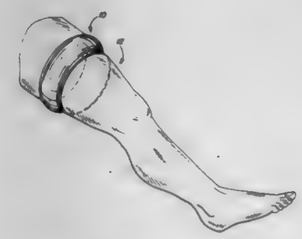
means responsive to said comparison signal to cause said drive means to drive said member to extend from said housing into a said organ or body part to a depth which is said desired distance from said remote face.

4,637,394

CONSTANT PRESSURE TOURNIQUET

Gabor B. Racz, 4504 17th St., Lubbock, Tex. 79416, and Royce C. Lewis, 5233 19th St., Lubbock, Tex. 79407

Filed Jun. 11, 1985, Ser. No. 743,566
Int. Cl.⁴ A61B *17/12*
U.S. Cl. 128—327 **18 Claims**



1. A constant pressure tourniquet of a size to be removably received about a person's limb; said tourniquet includes spaced wall surfaces made of an elastomeric material; said wall surfaces form an inflation chamber therewithin;

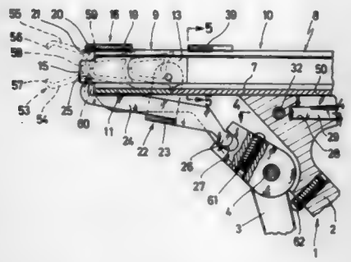
said elastomeric material of at least one wall surface has a thickness and modulus of elasticity that exhibits a threshold pressure which is slightly greater than the blood pressure of the vessels of the limb to which the tourniquet may be attached; whereby, inflation of the tourniquet to a volume greater than the volume attained at the threshold pressure of the elastomeric material causes the tourniquet to apply a substantially constant pressure to the limb and thereby arrest flow of blood from a wound that may be associated with the limb.

4,637,395

APPLICATOR FOR C-SHAPED SCALP CLIPS

Wolfhard Casper, Bad Homburg; Theodor Lutze, Balgheim, and Karl-Ernst Klemzle, Immendingen, all of Fed. Rep. of Germany, assignors to Aesculap-Werke AG, Tuttlingen, Fed. Rep. of Germany

Filed Oct. 2, 1984, Ser. No. 657,269
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1983, 3335986; Feb. 15, 1984, 3405335
Int. Cl.[4] A61B *17/00, 17/04, 17/12*
U.S. Cl. 128—334 R 18 Claims



1. An applicator for C-shaped scalp clips which have two legs joined by a bridge and facing clamping jaws at their free ends, rearwardly projecting application surfaces at the regions where the legs and bridge meet, and laterally projecting edge regions adjoining the application surfaces, comprising

two applying instruments movable between first and second positions and positioned to engage the application surfaces of a scalp clip and displace them towards one another for opening said scalp clip when said applying instruments are in said second position,

a magazine that holds a plurality of the scalp clips arranged one behind the other, with the free ends of one scalp clip resting against the bridge of the adjacent scalp clip, said magazine being open at the end to which the free ends of the legs of the scalp clips point, and guiding the scalp clips for displacement in the longitudinal direction thereof, and

means for urging the scalp clips towards the open end of the magazine,

said applying instruments in the first position being remote from one another, projecting downwardly and upwardly into the feed path of the scalp clips at said open end such that one of said scalp clips moved by said urging means past said applying instruments abuts thereon with said laterally projecting edge regions adjoining the application surfaces and in the second position being closer together with said instruments abutting on the application surfaces of one of said scalp clips held between them and thereby opening said one scalp clip.

4,637,396

BALLOON CATHETER

William A. Cook, Bloomington, Ind., assignor to Cook, Incorporated, Bloomington, Ind.

Filed Oct. 26, 1984, Ser. No. 665,374
Int. Cl.[4] A61M *29/02*
U.S. Cl. 128—344 15 Claims



1. A balloon catheter, comprising:

a hollow flexible catheter tube;

a flexible inner member disposed coaxially within said catheter tube and fixed thereto against relative longitudinal displacement, the distal end of said inner member extending beyond the distal end of said catheter tube, said inner member being sized and configured to provide a longitudinal passageway between said inner member and said catheter tube for the passage of fluid therethrough;

connecting means for connecting the longitudinal passageway to an external source of pressurized fluid; and

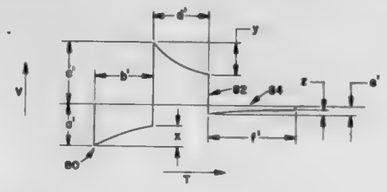
a balloon disposed coaxially about said inner member, the proximal end of said balloon being fixed and sealed to the distal end of said catheter tube and the distal end of said balloon being fixed and sealed to the distal end of said inner member to define an annular balloon chamber, said annular balloon chamber being in fluid flow communication with the longitudinal passageway, said balloon including an impervious elastic wall for retaining pressure therein, said elastic wall being reinforced by a knitted fabric tube for permitting said balloon to expand to a predetermined maximum diameter while remaining fixed in length.

4,637,397

TRIPHASIC WAVE DEFIBRILLATION

Janice L. Jones, and Ronald E. Jones, both of Solon, Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Filed May 30, 1985, Ser. No. 739,133
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 D 16 Claims



1. A method for electrical defibrillation of fibrillating myocardial tissues comprising the steps of:

(a) defining a defibrillating pulse with a defibrillating polarity, a defibrillating voltage, and a defibrillating pulse width between three and fifteen milliseconds in duration;

(b) defining a conditioning pulse with a polarity opposite to the defibrillating polarity, a conditioning pulse voltage level between 20% and 200% of the defibrillating voltage, and a conditioning pulse width between three and fifty milliseconds in duration;

(c) defining a healing pulse with the opposite polarity as the defibrillating polarity, a healing pulse voltage level between 5% and 40% of the defibrillating voltage, and a healing pulse width between one and one-hundred milliseconds in duration; and,

(d) applying the conditioning pulse, the defibrillating pulse, and the healing pulse in sequence to cells in said fabrillating myocardial tissues.

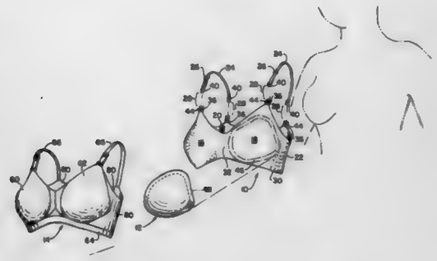
4,637,398

MASTECTOMY BRASSIERE

Janice K. Sherwood, 2 Grove Isle Dr., Coconut Grove, Fla. 33133

Filed Oct. 11, 1985, Ser. No. 786,668
Int. Cl.[4] A41C *3/10*
U.S. Cl. 128—478 9 Claims

1. A singular prosthetic brassiere garment compensating for the loss of a woman's breast consisting of the combination of a separate underbra, a breast prosthesis and an outerbra, the underbra having a band portion to enclose the torso and a supporting cup for the normal breast of the wearer when the wearer has a remaining breast, and a flat portion fitting flat against the chest wall from which a breast has been removed, said prosthesis comprising, a prosthesis pad formed of a desired shape simulating the removed breast and removably adhered to the outer surface of said underbra, said outerbra comprising a conventional brassiere having a pair of breast supporting cups, one of said underbra and outerbra having adjustable strap means, the other of said underbra and outerbra having strap means joined with said adjustable strap means whereby said underbra, prosthetic pad, and outerbra are joined together to form a unitary garment in which said bras are adjustable to be retained fitting against the chest wall of a removed breast and against separation therefrom and to provide the function and produce the appearance of a singular brassiere.

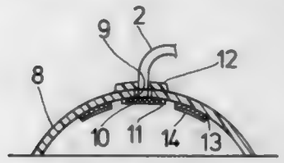


4,637,399

WATERPROOF ELECTRODE FOR RECORDING ELECTROCARDIOGRAM

Toshio Asai, Uchinadamachi, and Yasuhiro Nakaya, Kanazawashi, both of Japan, assignors to Fukuda Denshi Co., Ltd., Tokyo, Japan

Filed Jun. 10, 1985, Ser. No. 742,822
Claims priority, application Japan, Jun. 11, 1984, 59-120379
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—639 1 Claim



1. A waterproof electrode for detecting an electrocardiac signal comprising:

(a) a cup-shaped suction disc constructed from a waterproof, elastic material, said disc having a concave side, a convex side and a through-hole at the center thereof;

(b) an electrode plate having an outer peripheral edge hermetically sealed to the concave surface of said suction disc and closing said through-hole;

(c) a lead wire connecting to said electrode plate and extending through said through-hole and past the convex surface of said suction disc;

(d) elastic sealing means for hermetically sealing together the outer peripheral edge of said electrode plate and the portions of the concave surface of said suction disc in contact with said peripheral edge of said electrode plate;

(e) elastic sealing means hermetically sealing the lead wire at the convex surface of the suction disc; and,

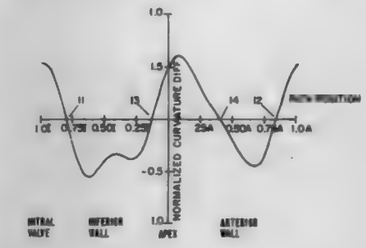
(f) an annular, body-surface adherent strip surrounding said electrode plate and bonded to said concave side of said disc.

4,637,400

FOR CHARACTERIZING A HEART CONDITION

Edward N. Marcus, 49 Fiske Rd., Wellesley, Mass. 02181

Continuation-in-part of Ser. No. 702,131, Feb. 15, 1985, abandoned. This application Aug. 13, 1985, Ser. No. 765,373
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—653 2 Claims



1. A method of characterizing the condition of a heart which method includes the steps of,

medically imaging said heart to obtain the outline of the end diastole image as a first curve and the end systole outline image as a second curve,

determining the normalized curvature of a sequence of points along each of said curves over a predetermined pathlength as a function of the normalized distance of a respective point along said pathlength,

determining for each of said points the functional relationship of said normalized curvature to the normalized distance of the associated point along said pathlength to obtain first normalized curvature values of said first curve and second normalized curvature values of said second curve,

and differentially combining said first normalized curvature values and said second normalized curvature values at corresponding values of position along said pathlengths to provide a difference functional relationship representative of the difference in shape between said first and second curves,

said curves each defining a closed loop and each pathlength corresponding to a segment of a respective closed loop beginning and ending at predetermined reference points on said closed loops.

4,637,401

VOLUMETRIC FLOW RATE DETERMINATION IN CONDUITS NOT DIRECTLY ACCESSIBLE

G. Gilbert Johnston, 417 S. 289th, Federal Way, Wash. 98003

Filed Nov. 1, 1984, Ser. No. 667,333
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—663 11 Claims



1. A catheter for use within an intravascular conduit, said catheter comprising:

an elongated tube having a proximal portion of substantially flexible material and having a distal portion;

flow restriction means carried by said distal portion of said tube, said flow restriction means being selectively controllable between a first state in which said flow restriction means does not substantially restrict flow through a reference plane transverse to the longitudinal axis of such distal portion when said catheter is in use in a location substantially fixed with respect to said reference plane and a second state in which said flow restriction means does substantially restrict flow through said reference plane when said catheter is in said location; and

ultrasonic transducer means carried by said distal portion proximate said flow restriction means, said ultrasonic transducer means being constructed and arranged so as to transmit and receive ultrasonic energy along a beam axis that intersects said reference plane at points always external to said flow restriction means.

4,637,402

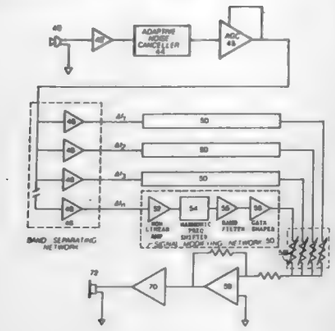
METHOD FOR QUANTITATIVELY MEASURING A HEARING DEFECT

Roger A. Adelman, 1562 Wittlou Pl., Cincinnati, Ohio 45224

Division of Ser. No. 371,584, Apr. 26, 1982, Pat. No. 4,419,544, which is a division of Ser. No. 144,395, Apr. 28, 1980, Pat. No. 4,366,349. This application Dec. 1, 1983, Ser. No. 556,894

Int. Cl.⁴ A61B *5/12*

U.S. Cl. 128—746 **3 Claims**



1. A method of providing a quantitative measure of a hearing defect of a patient in relationship to generalized signal processing parameters, comprising the steps of:

(a) determining and recording frequency bands to which the patient's auditory system responds at a predetermined level and frequency bands to which the patient's auditory system is unable to respond at the predetermined level through the agency of a swept frequency tone generator operated at incremental intensity levels;

(b) providing a number of frequency band limited signal processing paths in accordance with said determining and recording step, the processing paths being operative to generate a signal responsive to those frequency bands to which the patient's auditory system responds at the predetermined level;

(c) adjusting and recording the parameters necessary to shift in a harmonic sustaining manner the frequency bands in which the patient's auditory system does not respond to frequency bands in which the patient's auditory system does respond; and

(d) adjusting and recording within each frequency band processing path and in the aggregrate of all said frequency band processing paths at least such parameters as are necessary to shape, linearly or nonlinearly amplify, amplitude compress, and adaptively filter background noise from the signals generated by the processing paths in a continuously variable and adaptively fashion so as to produce an aurally recognizable signal to the patient.

4,637,403

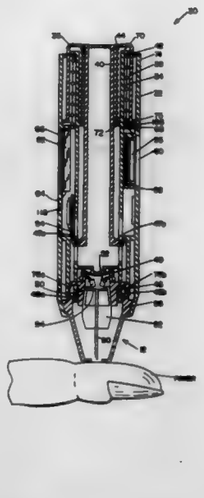
GLUCOSE MEDICAL MONITORING SYSTEM

Fernando S. Garcia; Hartmut Ginnow-Merkert; Paul J. Anderson, and Bertram J. Hudson, all of Eden Prairie, Minn., assignors to Garid, Inc., Eden Prairie, Minn.

Continuation-in-part of Ser. No. 720,906, Apr. 8, 1985. This application Jun. 14, 1985, Ser. No. 744,539

Int. Cl.⁴ A61B *17/3*

U.S. Cl. 128—770 **7 Claims**



1. Hand-held pocketable measurement system for extraction and analysis of blood in a body, comprising:

pocketable housing member including a spring actuated hammer means in said housing member, optical measurement means including a light source and a light sensor for measuring light emanating from said source and reflected by blood reagent chemistry having a color optical characteristic proportional to the component of the liquid to be measured when in contact with the liquid, said optical measurement means generating an electrical signal responsive to a color change of said blood reagent chemistry and therefore also to the component to be measured, display means responsive to said electrical signal to provide a visual readout representative of the analysis on a display means in said housing member, and channel means for removably receiving a disposable diagnostic unit; and,

b. disposable diagnostic unit including a unit housing with opposing tabs for slidably and removably engaging said channel means, means supporting said blood reagent chemistry in said unit housing in a position to be sensed by said optical measurement means when said unit housing is engaged within said channel means, said blood reagent chemistry having said color optical characteristics responsive to the component of the liquid to be measured, spring mounted lance means in said unit housing and positioned to be struck by said hammer means, a hole in said unit housing below said lance means, said lance means moving when struck to pierce the body to allow fluid to flow therefrom, and wick means between said lance means and said blood reagent chemistry means for transporting said fluid flowing from within the body to said reagent means, thereby resulting in a color change yielding a responsive optical characteristic which is read by said optical measurement means.

4,637,404

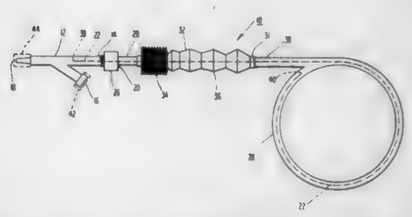
METHOD AND APPARATUS FOR CONVERTING A CATHETER TO A CARDIAC PACING ELECTRODE

Lawrence J. Gessman, 1929 West Point Ct., Cherry Hill, N.J. 08002

Filed Oct. 20, 1983, Ser. No. 543,866

Int. Cl.⁴ A61N *1/05*

U.S. Cl. 128—786 **16 Claims**



1. An apparatus for converting an in-place cardiac catheter to a pacing electrode, said catheter having at least one distal port at one end threof and at least one proximal port at the other end with a lumen connected therebetween, said distal port being positioned within a pre-selected heart chamber, said apparatus comprising:

a. a wire electrode comprising a length of electrically conductive wire having a proximal end adapted for electrical connection to a pacemaker pulse generator and a distal end;

b. a cannular connector having a first port containing adjustable sealing means adapted to receive and adjustable to a first position to permit said wire electrode therethrough and a second position to substantially prevent fluid transmission through said first port, and at least a second port adapted to matingly engage the proximal port of said catheter; and

c. means for advancing said wire electrode through said adjustable sealing means, said cannular connector, said second port and said lumen, until the distal end of said wire electrode emerges from the distal port of said catheter and engages a surface of said heart chamber.

4,637,405

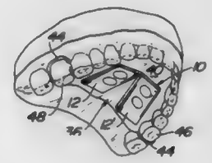
APPARATUS FOR STIMULATING SALIVATION

Henry S. Breamaa, Cinnaminson; Philip Katz, Princeton Junction, both of N.J., and Graydon E. Beatty, Philadelphia, Pa., assignors to Biosonics, Inc., Philadelphia, Pa.

Division of Ser. No. 481,331, Apr. 1, 1983, Pat. No. 4,519,400. This application Oct. 17, 1984, Ser. No. 661,667

Int. Cl.⁴ A61N *1/36*

U.S. Cl. 128—787 **12 Claims**



1. Apparatus for inducing salivation by neural stimulation at neurally sensitive areas within the oral cavity of a user, comprising a housing adapted to be received within the oral cavity of a user, said housing having an enclosure therein, an electrical signal generator disposed in said enclosure, said signal generator including a power supply, at least one electrode operatively associated with said housing and electrically coupled to said signal generator, said electrode being so positioned with respect to said housing as to be juxtaposed to and in operative contact with a neurally sensitive area of the oral cavity, the stimulation of which by electrical energy can induce salivation, when said housing is operatively disposed, whereby said electrode applies a signal generated by said signal generator to the sensitive area to induce salivation.

4,637,406

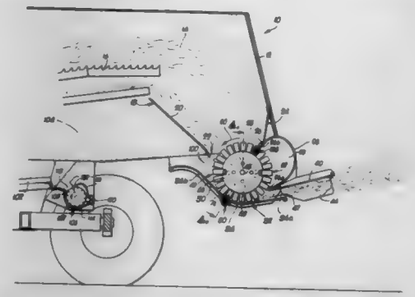
CHAFF AND STRAW SPREADING ATTACHMENT FOR COMBINES

Ronald K. Guinn, Valley Center, and Ferol S. Fell, Newton, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Aug. 9, 1984, Ser. No. 639,251

Int. Cl.⁴ A01F *29/02*

U.S. Cl. 130—27 R **10 Claims**



1. In combination with an agricultural combine having a rearmost discharge for straw residue and a separate forwardly positioned discharge for chaff, apparatus for joining the discharged straw and chaff into a single stream and spreading the same behind the combine as the latter advances across a field, said apparatus comprising:

a housing attached to said straw discharge and having an internal chamber,

said chamber being provided with a straw inlet and an outlet at opposite portions thereof;

a rotor located within said chamber between said inlet and outlet having an axis of rotation transverse to the path of travel of materials therethrough,

said rotor having means thereon capable of impacting materials passing through the rotor during rotation of the latter and of creating a stream of air flowing through the chamber and out said outlet to entrain materials therein,

said housing being provided with a second inlet to said chamber adjacent said straw inlet and remote from said outlet for receiving chaff from said chaff discharge and directing the same into said chamber for admixture with the straw, movement through the rotor, and entrainment in the stream flowing out said outlet;

spreader means associated with said outlet in disposition for impinging the entrained materials issuing from said housing and dispersing the same laterally behind the advancing combine;

a booster impeller adjacent said chaff discharge for producing a chaff-entraining current of air flowing to said chaff inlet of the rotor housing;

an impeller housing about said impeller and provided with an outlet spaced from and oriented toward said chaff inlet of the rotor housing whereby to direct the air current to the rotor housing; and

an open transfer space defined between the outlet of the impeller housing and the chaff inlet of the rotor housing,

said open transfer space being exposed to the chaff discharge and said outlet of the impeller housing being physically separate from and unattached to the chaff inlet of the rotor housing whereby the air current moving through said transfer space and exposed to the chaff discharge may entrain the chaff and carry the same into the rotor housing.

4,637,407

CIGARETTE HOLDER

Mario Bousano, Whiting, N.J.; George Zinonos, Astoria, and Constantin Trantzas, Jackson Heights, both of N.Y., assignors to Cangro Industries, Inc., Farmingdale, N.Y.

Filed Feb. 28, 1985, Ser. No. 706,650
Int. Cl.[4] A24F 7/04
U.S. Cl. 131—175 5 Claims



1. A fire-safe environmentally protective cigarette holder for discharging only filtered smoke to the environment both when the smoker is drawing and when the cigarette is free burning, comprising

a closed casing for containing at least the burnable body portion of the cigarette;

an air inlet port in the casing;

duct means to direct fresh air from the inlet port to the burnable body portion of the cigarette;

motor driven impeller means to move the air from the inlet port to the burnable body to maintain combustion when the smoker is not drawing;

a discharge port for the products of combustion and

filter means in the path of discharge,

whereby the impeller means and the smoker when drawing provide parallel impelling forces for the airflow from the inlet port to the burnable body.

4,637,408

FILTER MATERIAL FOR THE REMOVAL OF NITRIC OXIDE

Norman B. Rainer, Richmond, and Charles S. McClung, Prince George, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 25, 1983, Ser. No. 526,365
Int. Cl.[4] A24D 3/06; B01D 46/02
U.S. Cl. 131—331 14 Claims

1. A composition for NO filtration, comprising, by weight of the total composition, from about 5% to about 40% of a permanganate selected from the group consisting of $NaMnO_4$, $Ca(MnO_4)_2$ and mixtures thereof, from about 0.5% to about 6% colloidal silica, from about 40% to about 90% silica gel and from about 4% to about 30% H_2O, said silica gel having a granule size of from about 20 to about 100 mesh and an initial pore volume of from about 0.6 cc/g to about 1.4 cc/g.

7. A cigarette filter for NO filtration, comprising a plug-space-plug filter wherein the space between the plugs contains the composition of claim 1.

4,637,409

TOBACCO SMOKE FILTER AND METHOD AND APPARATUS FOR MAKING SAME

Richard M. Berger, Midlothian, Va., assignor to American Filtrona Corporation, Richmond, Va.

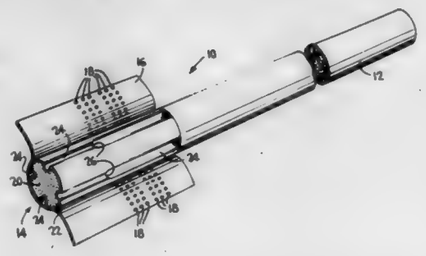
Filed May 7, 1981, Ser. No. 261,690
Int. Cl.[4] A24D 3/04
U.S. Cl. 131—336 39 Claims

1. A smoke filter including a filter element comprising:

a smoke-pervious filter rod having first and second longitudinally-spaced ends;

smoke-impervious rod wrap means wrapped about said filter rod, said rod wrap means being recessed into said filter rod to define at least one continuous grooved portion of said rod wrap means extending from said first end to said second end wherein said grooved portion has a transverse cross-sectional area which varies as a function of the longitudinal displacement from said first end of said filter rod; and

tipping means disposed about said rod wrap means to cover



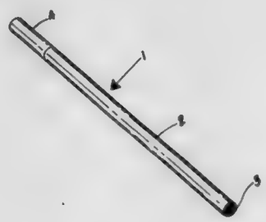
said grooved portion, said tipping means being made of material which is impervious to smoke, said tipping means including ventilation means for providing gas flow communication between said grooved portion and ambient air.

4,637,410

CIGARETTES

John A. Luke, Eastleigh, England, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jul. 22, 1985, Ser. No. 757,406
Claims priority, application United Kingdom, May 24, 1985, 8513233
Int. Cl.[4] A24D 1/00
U.S. Cl. 131—361 5 Claims



1. A cigarette comprising a tobacco rod which rod comprises a tobacco filler and a paper wrapper, the circumference of said rod being within a range of 10 mm to 19 mm, and having a tobacco filler packing density within the range of 150 mg per cm^3 to 350 mg per cm^3 yielding a free burn rate of said rod within a range of 25 to 45 mg min^{-1}.

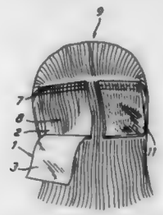
4,637,411

HAIRDRESSER'S AID

Bernard Sanders, St. Peter, Channel Islands, assignor to Raynham Investments Limited, Jersey, Channel Islands

Filed Apr. 6, 1984, Ser. No. 597,596
Claims priority, application United Kingdom, Apr. 11, 1983, 8309719
Int. Cl.[4] A45D 7/00
U.S. Cl. 132—9 2 Claims

1. A disposable hairdresser's masking sheet of flexible material for insulating selected strands of a head of hair from other strands of the hair while selected strands are subjected to a colouring agent, said sheet comprising a substrate of flexible material configured as two adjacent portions having a common boundary defined by a hinge about which one of said adjacent portions is pivotable relative to the other so as to encapsulate said selected strands and securing means carried by said substrate and adapted to engage said selected strands, whereby



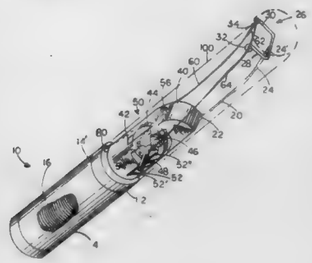
application of the securing means to said selected strands removably unites said sheet with said selected strands.

4,637,412

DEVICE FOR STORING DENTAL FLOSS AND FOR FORMING THREE SEPARATELY-USABLE STRIPS OF FLOSS FOR USE WITH TENSIONING MEANS

Armando Martinez, 4749 Hackett Ave., Lakewood, Calif. 90713

Filed Jun. 27, 1985, Ser. No. 749,517
Int. Cl.[4] A61C 15/00
U.S. Cl. 132—92 R 5 Claims



1. A dental flossing device for storing a spool of floss and allowing the use thereof in a ready and continually adjustable manner, comprising:

a main body portion having a hollow interior thereof for storing a spool of dental floss for paying out the dental floss;

elongated floss guide means having a first end toward said main body portion, and a second end remote therefrom and projecting away from said main body portion so as to define a length by which the dental floss may be extended, said second end of said guide means comprising a first threading and retaining means for a portion of the dental floss, and a second threading and retaining means for another portion of the dental floss, whereby dental floss from the spool may be extended from said main body portion along said guide means and through said first and second threading and retaining means;

means for continually tensioning the dental floss, said means for tensioning comprising a rotatably mounted wheel means, housing means for said wheels means for mounting said wheel means to said main body portion, and a shaft mounted for rotation with said wheel means, said shaft passing through the center of said wheel means such that said wheel means is rotatable in a plane perpendicular to the length of said shaft; said shaft having a first end projecting outwardly of a side surface of said housing having a first groove formed therein, and a second end projecting from another side surface of said housing having a second groove formed therein;

means for conjointly connecting said wheel means and said shaft so that when said wheel means is rotated, said shaft is rotated in unison therewith;

means formed in said side surfaces of said housing for allowing disassembly of said wheel means and said shaft from said housing for cleaning and replacement of parts and for rotatably mounting said first and second ends of said shaft;

means for limiting the rotation of said wheel means and said shaft to only one direction and preventing the rotation thereof in the other direction; and

said housing having a receptacle thereof for mounting therein said wheel means, said wheel means having a circumferential portion of said wheel means projecting beyond said housing to allow access thereto of a finger for rotating said wheel means; wherein the detal floss from the spool may be inserted through said first groove before threading in said first and second threading and retaining means, and inserted through said second groove after threading in said first and second threading and retaining means, said plane of rotation of said wheel means being parallel to the direction from said first end of said guide means toward said second end of said guide means.

5. In a mounting arrangement for mounting a wheel, and the like, via shaft in a housing so as to allow for conjoint rotation of the shaft and wheel and easy disassembly thereof from the housing and from each other, the improvement comprising:

said wheel having a central opening of noncircular shape through which extends said shaft;

said shaft having an enlarged center portion of the same shape as said central opening of said wheel;

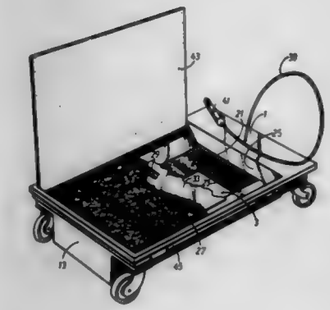
said housing having a first side face and a second parallel side face, said first side face having a circular opening therethrough for the projection of one end of said shaft, and said second face having a pair of overlapping openings, one of said pair being substantially circular in shape, and the other of said pair noncircular.

4,637,413

DEGREASING APPARATUS

Michael Llewellyn, Watsall, and Stephen Holden, Telford, both of England, assignors to Safety-Kleen Corporation, Elgin, Ill.

Filed Jul. 9, 1984, Ser. No. 628,828
Int. Cl.[4] B08B 3/02
U.S. Cl. 134—111 6 Claims



1. A parts washer apparatus adapted for reception beneath an automobile or like object to be repaired, said parts washer including a solvent collection and storage tank which includes a solvent storage well defined by plural side walls, at least two of which are disposed opposite each other and are subdivided into upper and lower side wall portions, with said upper and lower portions being joined to each other by a generally horizontally extending intermediate wall portions, with the top edges of all of said side walls being joined to each other to provide a top opening of a given area larger than the area of said storage well, at least two pairs of support spacers resting

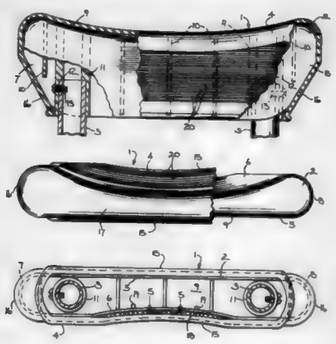
upon said intermediate wall portions, safety cover supports extending between pairs of spacers, said supports extending across the open portion of said storage well, a fire safety cover suspended from said cover supports in generally overlying relation to said storage well and having outer margins overlying said intermediate wall portions and a center panel portion overlying the opening of said storage well, fusible means suspending said cover from said cover support and retaining said cover in vertically spaced apart relation to said center well and said intermediate wall portions, a plurality of wheel assemblies extending downwardly from spaced apart portions of the underside of said intermediate wall portions of said collection and storage tank, whereby the rotational axes of said wheel portions of said wheel assemblies may lie above the bottom surface of said storage well, a pump and conduit assembly forming a part of said parts washer and disposed with said pump inlet within said solvent storage well and said pump outlet communicating with a flexible conduit having an outlet end positionable above said collection and storage tank opening, and a screen disposed above said cover support for retaining parts to be cleaned and permitting solvent return to said well through said screen.

4,637,414

ARM PIECE ASSEMBLY FOR CRUTCH

Ted F. Urban, Oshkosh, Wis., assignor to Lamico, Inc., Oshkosh, Wis.

Filed Apr. 18, 1985, Ser. No. 724,580
Int. Cl.⁴ A61H *3/02*
U.S. Cl. 135—73 **13 Claims**



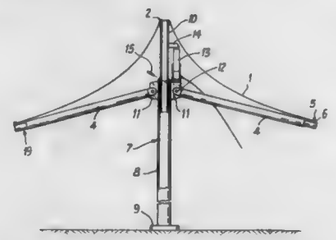
1. An arm piece assembly for a crutch, comprising an arm piece having a pair of opposed side surfaces, a pair of end surfaces and a top surface interconnecting the side surfaces and the end surfaces, said top surface being generally concave in a direction between said end surfaces, one of said side surfaces being concave in a direction between said end surfaces and being inclined upwardly in a direction toward the other of said side surfaces, connecting means disposed on the interior of the arm piece to removably receive the bows of a crutch, each end surface having an opening therein, fastening means interconnecting the connecting means with the respective bow and disposed in alignment with said opening, and a removable elastomeric cover snugly fitting over said arm piece and enclosing said openings.

4,637,415

LIGHT SHELTER IN THE FORM OF A TENT COMPRISING A ROOF CONSTITUTED BY A CANVAS

Pierre Dalo, 153, rue de Fleury, 92140 Clamart, and Jean Dalo, Rue Beaurepaire, 91410 Roinville-sur-Dourdan, both of France

Filed Jan. 14, 1985, Ser. No. 690,883
Int. Cl.⁴ E04H *15/28*; A45B *11/00, 15/00*
U.S. Cl. 135—98 **7 Claims**



1. A shelter such as a tent, said shelter comprising a canvas and a pole having first and second ends, a stationary pole member and movable pole member, said stationary pole member adapted to be supported upright on a substantially horizontal surface, said movable pole member supporting said canvas along a central portion of said canvas, a plurality of substantially vertically arranged bearing plates attached to said pole about the periphery of said pole, a plurality of tensioning arms extending outwardly from said pole and being attached to respective ones of said vertical bearing plates, said canvas having a peripheral portion in the form of a hem and having a cable positioned within said hem about the peripheral portion of said canvas, a generally vertically disposed jack being removable and separably supported by one of said vertical outer bearing plates, said shelter further comprising a stop extending substantially radially outwardly from the periphery of said pole and above said jack, said jack comprising means for articulating said tensioning arms and said canvas about said pole by elevating said stop and the movable pole member, each of said tensioning arms having a first end attached to a respective one of said bearing plates and a second outer end attached to said peripheral canvas portion by a hook which is attached to said cable, said shelter having a closed position in which said arms are substantially vertical and said jack is removed from said support, and an open position in which said arms are substantially horizontal, said jack being extensible in a generally upwardly vertical fashion into abutment with said stop to move said stop and said moveable pole member upwardly, wherein said jack, said stop and said moveable pole member together comprise means for raising said arms upwardly into said substantially horizontal position, said shelter further comprising means for maintaining said peripheral portion of said canvas and said arms in a substantially horizontal position when said shelter is in said open position.

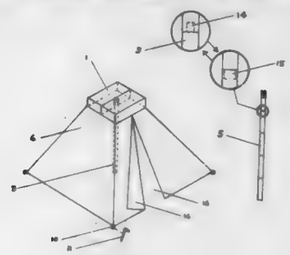
4,637,416

INTEGRAL LIGHTWEIGHT TENT AND BOX FOR PORTABLE APPLICATIONS

Terry McFarlin, 16536 Sharon, Chesaning, Mich. 48616

Filed Oct. 29, 1984, Ser. No. 666,250
Int. Cl.⁴ E04H *15/48, 15/60, 15/30*
U.S. Cl. 135—109 **5 Claims**

1. A portable personal enclosure comprising a rectangular container in the form of a hinged box, said box hinged at the approximate center of one side so that when said box is opened completely, the halves of said side abut to form a double thick center element, said box having sufficient volume to contain the remaining elements of said enclosure, said elements comprising a plurality of collapsible fabric walls, a plurality of stakes for securing said fabric to the ground, a collapsible central support member having at its upper end a slot for receiving said double thick center element, and additional



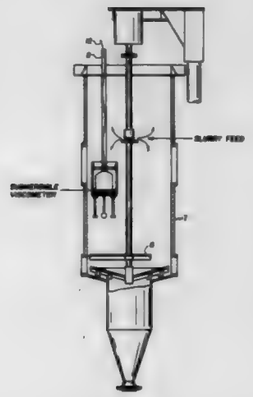
means for retaining the hinged box in a fixed and open configuration.

4,637,417

USE OF A SUBMERSIBLE VISCOMETER IN THE PRIMARY SEPARATION STEP OF THE HOT WATER PROCESS FOR RECOVERY OF BITUMEN FROM TAR SAND

Laurier L. Schramm, Edmonton, Canada, assignor to Alberta Energy Company Ltd.; Canadian Occidental Petroleum Ltd.; Esso Resources Canada Limited, all of Calgary; Gulf Canada Limited, Toronto; Her Majesty the Queen, in right of the Province of Alberta, as represented by the Minister of Energy and Natural Resources, Edmonton; HBOG-Oil Sands Limited Partnership, Calgary; PanCanadian Petroleum Limited, Calgary and Petro-Canada Inc., Calgary, all of, Canada, a part interest

Filed May 3, 1985, Ser. No. 730,173
Int. Cl.⁴ F17D *3/10*
U.S. Cl. 137—4 **2 Claims**



1. In the primary separation step of the hot water process for extracting bitumen from tar sand in primary separation vessel, wherein the bitumen floats upwardly in a tar sand slurry to form a froth layer, the coarse solids drop to form a tailings layer, and a middlings layer is formed between the froth and the tailings, the improvement comprising:

providing a submerged viscometer in the middlings layer and actuating said viscometer to measure the viscosity of the middlings at one or more levels in the vertical column of middlings and produce signals, external of the vessel, which are indicative of said measurements;

taking sufficient measurements to determine the viscosity of the region of maximum viscosity within the middlings layer

and adjusting the viscosity of the middlings in response to said signals to maintain the maximum viscosity in the column below a predetermined value,

whereby the flotation of the bitumen through the middlings layer to the froth layer is substantially enhanced.

4,637,418

FLUID FRICTION REDUCTION

Curtis L. Karl, Minneapolis, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 497,336, Mar. 20, 1983, abandoned. This application Oct. 25, 1984, Ser. No. 664,470
Int. Cl.⁴ F17D *1/16*
U.S. Cl. 137—13 **10 Claims**

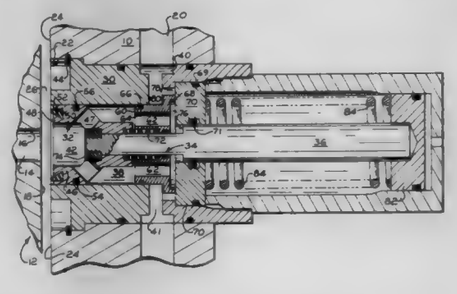
1. In a method for transporting or pumping liquid compositions, the improvement wherein said liquid consists essentially of an alcohol and said liquid has dissolved therein a drag reducing polymer of 2-acrylamido-2-methylpropane sulfonic acid in an amount less than 0.015% by weight based on the weight of said liquid, said polymer having a molecular weight of at least 1,000,000.

4,637,419

SUBSEA CONTROL POD VALVE ASSEMBLY

David W. Hughes, Houston, Tex., assignor to Vetco Offshore, Inc., Ventura, Calif.

Filed Jul. 9, 1984, Ser. No. 629,206
Int. Cl.⁴ F16L *29/00*
U.S. Cl. 137—236.1 **21 Claims**



12. A subsea connector assembly comprising:

a mandrel member having at least a first fluid passage extending therethrough, said passage having first and second ends, a first end of said passage being connectable to a fluid operated well-head component, said second end of said passage defining a mandrel inlet port on an exterior interface surface of said mandrel member;

a control pod member adapted to engage and disengage from said mandrel member, said pod member having at least a first passage therein, said pod member passage having a first end connectable to a source of pressurized fluid, said pod member first passage extending from said first end to a second end which defines an outlet port on an exterior interface surface of said pod member, said exterior interface surface of said pod member being spaced from said exterior interface surface of said mandrel member to form a vent space therebetween when said pod member is engaged with said mandrel member; and

a control valve assembly mounted in said pod member first passage, said control valve assembly including:

valve body means, said body means defining a bore which terminates at a face of said body means, said body means also defining a fluid supply passage which provides fluid communication between a supply port on an exterior surface of said body means and said bore;

means for coupling said supply passage to said mandrel member passage, said coupling means being at least in part housed in said bore and including:

seal means, said seal means being moveable between a first retracted position where said seal means is located within said bore and a second extended position where said seal means is in part extended from said bore beyond said body means face across said vent space to contact said mandrel member interface surface in a region extending about said mandrel inlet port to establish a fluid tight seal to said interface surface, said seal means having a seal means fluid flow passage extending therethrough, a continuous flow path being established between said seal means flow passage and said mandrel member passage when said seal means is in the extended position,

valve means positioned within said bore, said valve means being moveable between a valve means first position where said valve means prevents fluid flow between said supply passage and said seal means flow passage and a valve means second position where said supply passage is in fluid communication with said seal means flow passage via said bore, and

means for resiliently simultaneously biasing said seal means and said valve means in first and second opposite directions, said seal means being biased toward said extended position and said valve means being biased towards said valve means first position; and

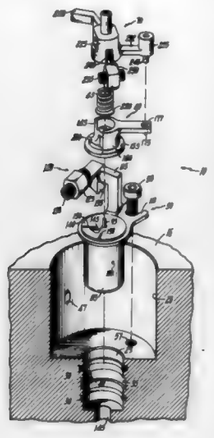
reciprocal actuator means, said actuator means extending into said bore and engaging said seal means to move said seal means against the bias of said resilient biasing means from the extended position into the retracted position during movement of said actuator means in a first of said opposite directions, said actuator means being arranged to engage said valve means to move said valve means against the bias of said resilient biasing means from said valve means first position to said valve means second position during movement of said actuator means in a second of said opposite directions.

4,637,420

METERING VALVE

Gerald P. Dyer, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 16, 1985, Ser. No. 809,367
Int. Cl.⁴ B08B *1/04*; F16K *5/12, 51/00*
U.S. Cl. 137—242 **15 Claims**



1. In a valve comprising a valve body and metering element disposed thereon and rotatable with respect thereto about an axis of rotation, said valve body and metering elements being provided with windows therein, each of said windows including edge portions said windows collectively defining at least in part, a fluid flow passage through said valve, and being selectively registrable by adjustment of the relative rotary position of said metering element with respect to said valve body, the improvement characterized by:

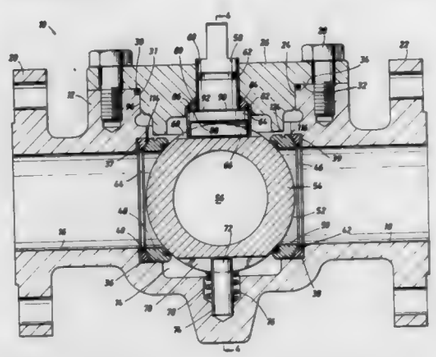
one of said windows including a curved outer edge portion of continuously varying radius with respect to said axis of rotation for progressively closing said flow passage in a radially inward direction by rotation of said metering element, whereby solid contaminants lodged between said windows in said passage are urged radially inwardly by said rotation of said metering element to enhance breakage thereof by shearing between the edge portions of said metering element and valve body windows.

4,637,421

IN-LINE REPAIRABLE TOP ENTRY BALL VALVE

Gerald A. Stankard, P.O. Box 748, Gladewater, Tex. 75647

Filed May 15, 1986, Ser. No. 863,361
Int. Cl.⁴ F16K *43/00*
U.S. Cl. 137—327 **41 Claims**



1. An in-line repairable top entry ball valve, comprising:

(a) a body forming a valve chamber and flow passage means intersecting said valve chamber, said body further forming an access opening in communication with said valve chamber, seat recess means concentrically about said flow passage and arcuate ball/seat spacer receptacle means substantially concentric with said seat recess means;

(b) a ported spherical plug member being positioned for rotation within said valve chamber between open and closed positions relative to said flow passage, said spherical plug member being of a dimension for passage through said access opening;

(c) resilient seat means being disposed within said seat recess means and being positioned in spaced relation with said spherical plug member and defining sealing surface means disposed in concentric relation with said spherical plug member, said resilient seat means being in the form of at least one annular seat member composed of resilient material;

(d) ball/seat spacer means being disposed in sealing engagement with said spherical plug member and said resilient seat means, said sealing engagement being interference sealing engagement induced thereto by said resilient seat means, said ball/seat spacer means being of a dimension for passage through said access opening and being insertable into and removable from said arcuate ball/seat spacer receptacle means with said spherical plug member present within said valve chamber and said resilient seat means present within said seat recess;

(e) bonnet means forming a sealed closure for said access opening and defining a retainer projection disposed to secure said ball/seat spacer means against inadvertent displacement; and

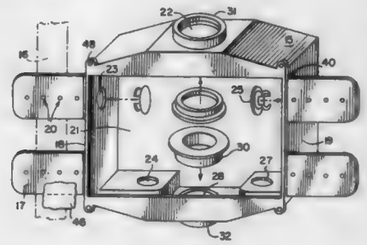
(f) an operating stem extending through said bonnet means and having driving interconnection with said spherical plug member for rotation thereof between open and closed positions relative to said flow passage.

4,637,422

PLASTIC WASHING MACHINE BOX WITH HINGED MOUNTING BRACKETS

Lewis B. Izzi, Sr., Shelby, N.C., assignor to Plastic Oddities Inc., Shelby, N.C.

Filed Jan. 16, 1986, Ser. No. 819,257
Int. Cl.⁴ F16L *5/00*
U.S. Cl. 137—360 **13 Claims**



1. A laundry interface box serving as a connection junction box between plumbing connections in a wall and a washing machine adapted for recessed installation on the studs of a laundry room wall, comprising in combination,

a framework forming a box with a front opening, a back panel and four side walls extending substantially perpendicular from the back panel,

a set of holes extending through the walls adapted for terminal plumbing connections to water and drain pipes located in the laundry room walls, and

a plurality of substantially planar brackets for attachment of the box to the studs of the laundry room wall with each bracket pivotably attached to a side wall of the box to pivot between respective positions parallel to and adjacent the side wall to which the bracket is attached for compact storage of the box and perpendicularly extending from the side wall away from the box for attachment thereof to a wall stud.

4,637,423

PNEUMATIC GAS CYLINDER VALVE ACTUATOR

David K. Gray, 116 Dovefield Dr., Lockhart, Tex. 78640

Filed Sep. 27, 1985, Ser. No. 780,963
Int. Cl.⁴ F16K *27/08*
U.S. Cl. 137—382.5 **8 Claims**

1. A pneumatic gas cylinder valve actuator for operating a manual valve on a gas cylinder comprising:

(a) an actuator valve body up to 4 inches thick, up to 8 inches wide, and up to 10 inches long,

(b) a flat toothed operator gear centrally located in said actuator valve body with a flat plane of said flat toothed operator gear parallel to a longer, flat plane of said actuator valve body,

(c) two piston chambers within said actuator valve body, horizontally opposed with one on either side of said flat toothed operator gear, with a bottom central opening of said piston chambers communicating with said flat toothed operator gear,

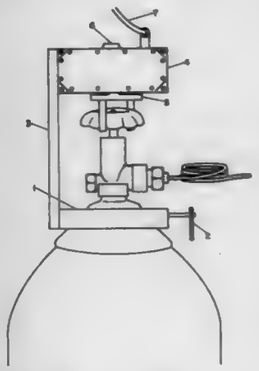
(d) two pistons, one in each of said piston chambers,

(e) sealing means for each of said pistons,

(f) means for introducing and venting up to 100 psi air pressure in said piston chambers above each of said pistons,

(g) means for translating movement of said pistons to operate said manual valve on said gas cylinder to open when said air pressure is admitted into said piston chambers above said pistons,

(h) spring loading means under each of said pistons to reverse said movement of said pistons to close said manual valve when said air pressure is vented from said piston chambers,



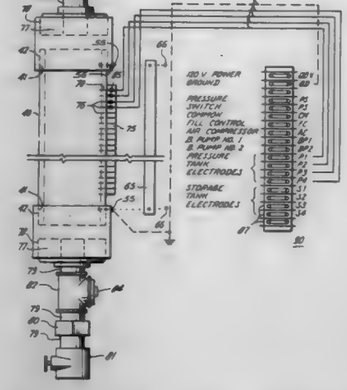
(i) means for adjusting said spring loading means to provide up to 100 inch pounds of torque holding said manual valve in a closed position.

4,637,424

PROBELESS FLUID LEVEL CONTROLLER

Charles L. Morgan, III, P.O. Box 739, Katy, Tex. 77492-0739

Filed May 23, 1985, Ser. No. 738,015
Int. Cl.⁴ F16K *31/02*; G01F *23/00*
U.S. Cl. 137—392 **9 Claims**



4. A probeless level control system for use in monitoring and controlling the level of a conductive fluid within a container, comprising:

a tube having a wall connection means for connecting said tube to the container of fluid;

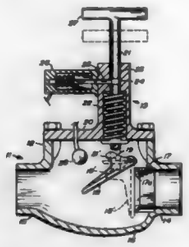
a terminal strip having a plurality of locations thereon attached to said tube;

a first plurality of screws corresponding to said plurality of locations, said first plurality of screws extending through said strip and into the interior of said tube through said wall;

seal means for sealing the interface between said first plurality of screws and said wall, said seal means including a mixture of equal parts of epoxy and filings from said wall mixed to a consistency of thick paint and applied to the interface between said screws and said wall for forming

fluid and pressure tight seals between said screws and said wall;
a level controller;
conductive means for electrically connecting preselected ones of said screws with said level controller.

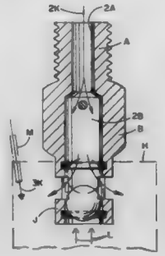
4,637,425
SEWER CHECK VALVE WITH CUTTING SEAT
Robert E. Petersen, R.R. 1 Box 254, Walcott, Iowa 52773
Filed Jun. 2, 1986, Ser. No. 869,608
Int. Cl.[4] F16K *31/02, 15/18, 31/18, 33/00*
U.S. Cl. 137—412 **8 Claims**



1. A positively operating sewer check valve comprising:
a housing having an inlet for normal direction of flow of sewage and an opposite outlet, a flap having a pivotal connection to said inlet to provide check-valve action, the surface about said inlet being a first sealing surface and facing into said housing, said flap having a second sealing surface within the periphery thereof facing said first sealing surface and sealing therewith during closure of said valve, one of said sealing surfaces being a knife-edge facing the other of said sealing surfaces, said other sealing surface being a smooth blunt surface where contacted by said knife-edge to provide unobstructed flow of sewage away from said knife-edge,
a rigid actuating member operatively connected to said housing, said actuating member having operated and unoperated positions, a spring connected to said actuating member, said flap having a portion spaced from said pivotal connection thereof and contacted by said actuating member at least during operation thereof, said spring while said actuating member is operated urging said flap toward said first sealing surface to aid pressure of any back flow to cut through any sewage between said sealing surfaces,
a releasing mechanism connected to said housing and adapted to engage said actuating member, said releasing member normally locking said actuating member in opposition to force of said spring in said unoperated position for allowing said flap to open by the flow of sewage, and
means for actuating said releasing mechanism to unlock said actuating member and thereby permitting said spring to urge said actuating member into said operated position to cause the actuating member to engage said flap and urging it to seat against said first sealing surface and aiding pressure of any backflow to cut through any sewage between said sealing surfaces.

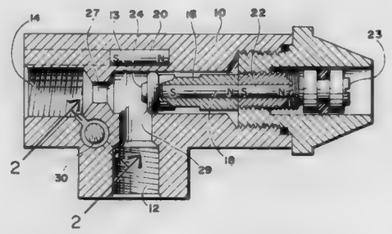
4,637,426
FILL CONTROL VALVE
Ronald J. Lyon, 12029 Smallwood, Downey, Calif. 90241
Filed Nov. 12, 1985, Ser. No. 796,999
Int. Cl.[4] F16K *31/22, 15/04*
U.S. Cl. 137—433 **12 Claims**

7. A valve for controlling the filling of a container with a liquid, comprising
a body portion,
an outlet portion at one end of said body portion,
a cage portion at the opposite end of said body portion,
a bore which passes axially through each of said body portions, said outlet portion and said cage portion.
at least one aperture in the said of said cage portion which communicates with the bore therethrough,
ball means supported in said cage portion,
sealing means provided adjacent the juncture of said cage portion and said body portion,
retaining means provided at the unattached end of said cage portion to retain said ball means within said cage portion,
said sealing means adapted to receive said ball means for selectively forming a seal to prevent fluid from passing



through said bore from said cage portion through said body portion, and
pin means disposed in said body portion and arranged radially relative to said bore for diverting a liquid flow within said bore, and a portion of said ball means extending into said bore and adjacent said at least one aperture when the ball means is received by said sealing means for continuously and further diverting the liquid flow through the side of said cage portion.

4,637,427
MAGNETIC VALVE
John H. Nolan, and William A. Nolan, both of 234 SW. 12th Ave., Deerfield Beach, Fla. 33441
Continuation-in-part of Ser. No. 531,848, Sep. 14, 1983, abandoned. This application May 30, 1985, Ser. No. 739,362
Int. Cl.[4] F16K *17/28*
U.S. Cl. 137—460 **2 Claims**

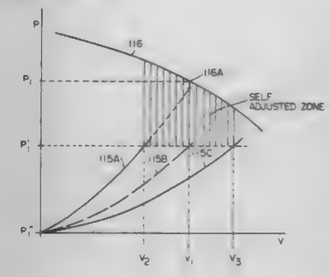


1. A fluid control valve with re-set mechanism, the valve including a housing, a fluid inlet passage therein, and a fluid outlet passage in communication with said fluid inlet passage, said fluid control device comprising:
(a) a re-set channel formed in said housing, connecting said fluid inlet and outlet passages;
(b) an externally movable re-set valve normally blocking said re-set channel;
(c) a reciprocating valve capable of permitting, limiting, or precluding communication between said inlet and outlet passages, said valve comprising a ferromagnetic armature defining a magnetic axis along its axis of reciprocation, said magnetic axis generally corresponding to the longitudinal center of a fluid-tight chamber within said housing within which said valve may reciprocate, said valve having a variable flow-responsive integral first radial end face

disposed within a region of communication between said inlet and outlet passages, said outlet passage having an entrance geometry complemental to the geometry of said first end face;
(d) a fixed pole magnet disposed within said housing and magnetically proximate to said area of communication between the inlet and outlet passages, said fixed pole magnet having a magnetic axis disposed in magnetic communication with the magnetic axis of said valve, to normally attract and hold said valve when said valve is open, and to normally repel said reciprocating valve toward its open direction when said valve is closed; and
(e) magnetic bias and calibration means disposed within said housing and disposed co-linearly and normally in contact with said reciprocating valve, near a radial end thereof opposite to said flow-responsive radial end of said valve, said bias and calibration means provided with an axis of magnetic polarity substantially co-linear with said magnetic axis of said reciprocating valve, in which said reciprocating valve is normally magnetically and thereby mechanically balanced between (i) the force of magnetic attraction, at said first radial end face, between said end of said reciprocating valve and that end of said fixed pole magnet proximate thereto, and (ii) the force of the magnetic contact of said bias and calibration means against said opposite radial end face of said reciprocating valve, said bias and calibration means further comprising external means for selectably advancing said flow-responsive first radial end face partially into said region of inlet-outlet communication to thereby correspondingly calibrate the level of fluid flow necessary to overcome the magnetic co-action between said bias and calibration means, and said reciprocating valve, to thereby precisely regulate the closure thereof,
whereby the reliability of the function of the open and re-set condition of the reciprocating valve is enhanced by the position and function of said fixed pole magnet and, further whereby, the resetting of said valve to its normally open position after an excess of fluid pressure has ceased to exist, may be insured by the opening of said externally moveable re-set valve to thereby permit communication between the inlet and outlet passages of said re-set channel, thereby creating an equalization of pressure between said inlet and outlet passages, thus reducing to zero the pressure differential across the region of communication between said inlet and outlet passages, by eliminating any residual relative vacuum pressure upon the port face of the reciprocating valve that might otherwise prevent the prompt return of the valve to its normally open position.

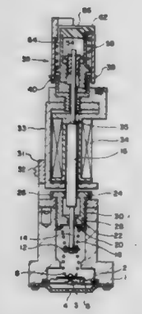
4,637,428
FLUID FLOW CONTROL VALVES
Bengt Berglund, Forel, Switzerland, assignor to Spiro Investment A.G., Boesingen, Switzerland
PCT No. PCT/GB84/00185, § 371 Date Jan. 25, 1985, § 102(e) Date Jan. 25, 1985, PCT Pub. No. WO84/04805, PCT Pub. Date Dec. 6, 1984
PCT Filed May 25, 1984, Ser. No. 694,756
Claims priority, application United Kingdom, May 26, 1983, 8314621; Nov. 3, 1983, 8329333
Int. Cl.[4] G05D *7/01*
U.S. Cl. 137—503 **5 Claims**

1. A fluid control valve for connection into a run of ducting having a predetermined cross-sectional area, said valve including:
(a) a valve casing having an inner face including an inlet region of substantially uniform cross-sectional area, a tapered region tapering outwardly from said inlet region to an outlet region;
(b) a valve member having a valve head convex in a direction toward said inlet region and axially movable within said tapered region to vary the annular gap between said valve head and said tapered region;
(c) actuator means for actuating said valve member comprising:
(i) first and second expansible chambers joined by a common movable wall;
(ii) a first sensing conduit fluidly connecting a location upstream of said valve member with said first expansible chamber;
(iii) a second sensing conduit fluidly connecting a location downstream of said valve member with said second expansible chamber;
(iv) a mechanical linkage connecting said valve member with said movable wall;



(v) biasing means comprising at least one further expansible chamber arranged coaxially with said first and second expansible chambers and coupled thereto, said at least one further expansible chamber being charged with fluid having a predetermined pressure at a given state of compression of said at least one further expansible chamber;
(vi) whereby said actuator means adjustably controls the position of said valve head to maintain substantially constant fluid flow regardless of the pressure drop across said valve head.

4,637,429
FLUID PRESSURE REGULATING VALVE HAVING ADJUSTABLE TWO-STAGE AND NATURAL-LP GAS CHANGEOVER CAPABILITIES
Paul Dietiker, Redondo Beach, Calif., and Marvin D. Nelson, St. Louis Park, Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Oct. 11, 1985, Ser. No. 786,443
Int. Cl.[4] G05D *16/06, 16/20*
U.S. Cl. 137—505.14 **3 Claims**



1. A fluid pressure regulating valve comprising
a flow rate control diaphragm means,
a pressure regulating spring means bearing on said diaphragm means,

first means for adjusting a high flow rate position of said spring means,

second means coaxial with said first means for adjusting a low flow rate position of said spring means and

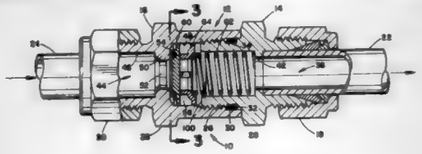
pressure changeover means coaxial with said first and second means for adjusting said spring means between a first and a second regulating pressure diaphragm actuating means including an armature having a first end operatively associated with said first means, said second means and said changeover means and a second end operatively associated with said pressure regulating spring means, a selectively energizable solenoid coil, a hollow valve body enclosing said diaphragm and a valve orifice and said selectively energizable solenoid coil arranged to urge said armature to a first position in opposition to said spring means, an adjusting assembly means mounted on a wall of said valve body for coaxially supporting said first means, said second means and said changeover means and said first end of said armature and a stop means captured on said first end of said armature to limit the movement of said first means, said second means and said changeover means.

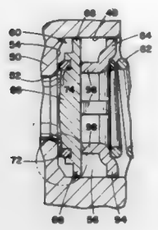
4,637,430

CHECK VALVE

Gary W. Scheffel, Streetsboro; Richard J. Medvick, Shaker Heights, and William C. Steiss, Parma, all of Ohio, assignors to Nupro Company, Willoughby, Ohio

Filed Dec. 31, 1985, Ser. No. 815,377
Int. Cl.⁴ F16K *17/04*
U.S. Cl. 137—516.29 **22 Claims**





1. A poppet check valve comprising:

(a) mating body forming sections which define a valve chamber having a cylindrical inner wall;

(b) a generally cylindrical inlet passage connecting with said valve chamber axially thereof;

(c) a shoulder at the juncture between said inlet passage and said chamber, said shoulder defining an annular valve seat;

(d) a relatively thin disk-like valve element positioned in said valve chamber to extend transversely thereof, said valve element having a generally circular imperforate central section of a diameter greater than the diameter of said inlet passage but less than the diameter of said valve chamber and a plurality of legs extending radially from the periphery of said central section into sliding engagement with the inner wall of said valve chamber;

(e) a circular seal element joined to said central section at a location inwardly of its outer periphery and extending axially toward said valve seat;

(f) a coil spring mounted in said valve chamber and extending axially thereof for maintaining a continual bias on said valve member in a direction toward said seat; and,

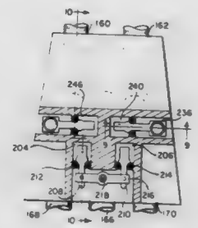
(g) a poppet stop member positioned between said spring and said valve element, said stop member including a plurality of circumferentially spaced axially extending force applying elements for engaging said central section of said valve element on the side opposite said seal elements, and guide surface means extending radially outwardly of said force applying elements into sliding engagement with the inner wall of said valve chamber at a location axially spaced from said valve element.

4,637,431

SUPPLY CONTROL VALVE WITH INTEGRAL PRESSURE LIMITER

John F. Taplin, 15 Sewall St., W. Newton, Mass. 02165

Division of Ser. No. 602,420, Apr. 20, 1984, Pat. No. 4,540,020.
This application Aug. 8, 1985, Ser. No. 763,938
The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.
Int. Cl.⁴ F15B *13/043*
U.S. Cl. 137—596.15 **1 Claim**



1. A pilot operated supply and waste control valve of the type comprising two main valves associated with at least one load port for alternately supplying and exhausting a supply fluid to and from each load port and control means for applying fluid control pressure to open and close a main supply valve associated with each load port while conversely closing and opening a main waste valve associated with each load port, wherein:

each main valve comprises a diaphragm which presses against a valve seat with a high pressure applied to a control surface of the diaphragm opposite to the valve seat; and

the control means is a four-way control valve actuated by a single solenoid and comprises:

first and second output pressure chambers, each having a high pressure inlet port in communication with a source of said supply fluid, a low pressure inlet port and an output control conduit for applying opposite high and low pressures to the control surfaces of the diaphragms of said main supply and waste valves associated with each load port; and

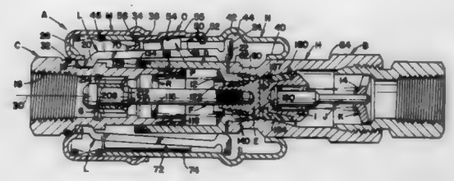
a valve member associated with each output pressure chamber, each valve member being positioned between the high and low pressure inlet ports to move alternately against the high and low pressure inlet ports to close the ports, with the high pressure port to one output pressure chamber closed by one valve member as the opposite, low pressure port to the other output pressure chamber is closed by the other valve member such that the main supply or main waste valve of each load port is opened due to the resultant pressure in one of the chambers and the other main valve of each load port is closed due to the resultant pressure in the other chamber, and the positions of the main valves of each load port are reversed with actuation of the single solenoid, all moving elements of the four way control valve which are exposed to the supply fluid being free of sliding relationship with other elements.

4,637,432

COUPLING

Richard J. Medvick, Shaker Heights; Richard C. Weber, Jr., Hudson; Ross L. Wagner, Akron, and Edward M. Brand, Cuyahoga Falls, all of Ohio, assignors to Swagelok Company, Hudson, Ohio

Filed Jan. 19, 1983, Ser. No. 459,150
Int. Cl.⁴ F16L *29/00*
U.S. Cl. 137—614.03 **30 Claims**



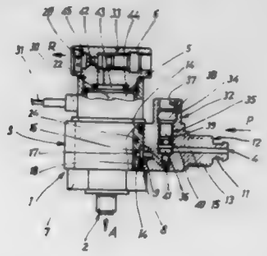
1. A quick connect/disconnect coupling comprising: a pair of separate coupling members positionable together in cooperative relationship along a longitudinal axis; latch means for releasably latching said coupling members together and being movable between latched and unlatched positions; operating means movable to a releasing position for releasing said latch means for movement from said latched position to said unlatched position; stop means mounted on and carried by said operating means for blocking movement of said operating means to said releasing position, said stop means including a blocking portion selectively movable to an unblocking position to free said operating means for movement to said releasing position; and, said operating means being movable to said releasing position upon direct application thereto of manual force acting in a direction generally parallel to said longitudinal axis and; said stop means further including an actuating portion accessible exteriorly of said operating means for moving said blocking portion to said unblocking position upon direct application to said actuating portion of manual force applied exteriorily of said stop means in a direction transversely of said longitudinal axis.

4,637,433

SOLENOID VALVE

Kurt Stoll, Leazhalde 72, 7300 Esslingen, Fed. Rep. of Germany

Continuation of Ser. No. 663,438, Oct. 22, 1984, abandoned.
This application Dec. 19, 1985, Ser. No. 814,003
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1983, 3338418
Int. Cl.⁴ F16K *31/08*
U.S. Cl. 137—625.65 **12 Claims**



5. A solenoid valve comprising:

a valve body having an inner axially extending cylindrical bushing space and an outer axially extending cylindrical surface, said valve body having a floor for bounding a lower end of said cylindrical bushing space, said cylindrical bushing space being open at an end opposite from said floor, said valve body having a first threaded pressure connection extending axially from said floor defining a first fluid duct;

a swivel member rotatably mounted on said valve body, said swivel member having a ring portion slidably engaged over said outer cylindrical surface of said valve body and a second pressure connection extending radially from said ring portion with respect to said valve body, said second pressure connection having a second fluid duct therein, said valve body and said ring portion defining a first annular grooved passage therebetween communicating with said second fluid duct;

a valve cartridge having an outer cylindrical surface disposed in said axial cylindrical bushing space of said valve body, said valve body having a fluid connection for establishing communication between said first annular grooved passage and said outer cylindrical surface of said valve cartridge, said valve cartridge having a first port for communication with said first fluid duct, and a second port for establishing communication with said fluid connection, said valve cartridge defining a valve body space therein communicating with said first and second ports, a valve member movable in said valve body space for closing off communication between said first and second ports and for establishing communication between said first and second ports, and magnetic means for moving said valve member; and

cover means connected to said valve body for covering said axial cylindrical bushing space of said valve body, said cover means including a third fluid duct extending axially therein communicating with a fourth fluid duct in said cartridge, both said third fluid duct and said fourth fluid duct establishing communication between said valve body space and an exterior of said valve body, said valve member while moved for establishing communication between said first and second ports, also arranged for closing off communication to said fourth fluid duct in said cartridge;

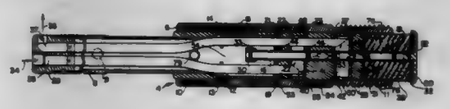
said swivel member including a first throttle valve space communicating with said second fluid duct and a first throttle member engaged in said first throttle valve space for regulating a flow of fluid into said second fluid duct, said cover means including a second throttle valve space with a second throttle valve member movable in said second throttle valve space, said second throttle valve space communicating with said third fluid duct with flow through said third fluid duct being regulatable by a position of said second throttle valve body.

4,637,434

THREE-WAY VALVE POR AN ATTENUATOR

Carl J. Moen, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Jun. 7, 1985, Ser. No. 742,259
Int. Cl.⁴ F16L *55/04*
U.S. Cl. 137—625.66 **4 Claims**



1. A three-way valve for use in a fluid pulsation attenuator type having a flexible diaphragm disposed to move between lower, neutral and upper positions, the diaphragm having one side thereof contacting the fluid having pulsations to be attenu-

ated and the other side disposed to contact the valve, the valve comprising:

an elongate, hollow casing extending within the attenuator having an air inlet for introducing air thereinto, an air outlet for releasing exhaust from the interior thereof;

first and second chambers within the casing, spaced apart therein, and in fluid communication with the air inlet and air outlet, respectively;

a valve head for non-secured, contacting engagement with the diaphragm;

a bore within the casing, said bore having a soft spring means interposed between the valve head and a plate within the bore on one end of the casing;

an elongate sliding tube slidably disposed within the casing having one end attached to the valve head and the other end terminating within the casing, said sliding tube including a plurality of orifices in the wall thereof, said orifices disposed between said first and second chambers when the sliding tube is in its neutral position, and movable between the first and second chambers following corresponding movement of the valve head against the diaphragm, said movement of the orifices into the first and second chambers establishing air communication therebetween and the interior of the casing via the sliding tube;

port means in the casing linking the interior of the casing with the exterior thereof, whereby reciprocal movement of the sliding tube permits selective air communication between the first and second chambers with the interior of the attenuator air tank.

4,637,435

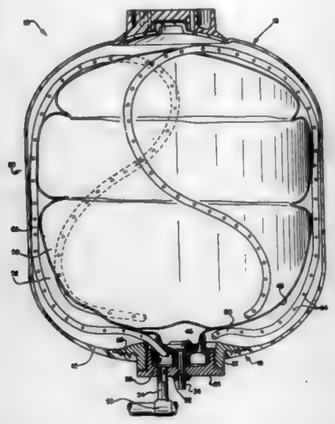
ANTISEAL ARRANGEMENT FOR HYDROPNEUMATIC PRESSURE TANKS

Charles P. Chirdon, Painesville, Ohio, assignor to Easef Corporation, Mentor, Ohio

Filed Aug. 8, 1985, Ser. No. 763,561

Int. Cl.⁴ F16L *55/00*

U.S. Cl. 138—30 **5 Claims**



1. An accumulator tank for pressurizing and supplying liquid to a system, comprising a pressure vessel having a wall defining a closed pressure chamber, access fitting means in said pressure vessel defining an inlet/outlet port means for admitting liquid under pressure to the interior of the vessel and defining an air inlet port for admitting pressurized air to the interior of the vessel, flexible air cell means in fluid communication with said air inlet port and separating said closed chamber into first and second variable volume compartments respectively containing the air and the liquid, perforated conduit means in said second compartment in fluid communication with said port means and extending between the wall of the pressure vessel and said flexible air cell means, said conduit means comprising tubing following a sinusoidal path and having perforations adapted to provide fluid communication between said outlet port means and portions of said second compartment when said air cell means seals against said wall to otherwise isolate those portions of the second compartment but for the fluid communication provided by said perforations of said conduit means.

4,637,436

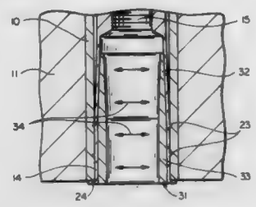
ANNULAR TUBE-LIKE DRIVER

John B. Stewart, Jr., San Francisco; Laszlo Szalvay, San Carlos; Bernard de Brunier, Mountain View, and Jeffrey W. Simpson, Sunnyvale, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 700,373, Feb. 11, 1985, abandoned, which is a continuation-in-part of Ser. No. 552,187, Nov. 15, 1983, abandoned. This application Nov. 5, 1985, Ser. No. 797,351

Int. Cl.⁴ F16L *55/10*

U.S. Cl. 138—89 **13 Claims**



9. A composite structure comprising:

an annular tube insert for insertion within a tube, said insert having an external surface for engagement with the inside tube surface of a tube and being closed at one end to plug said annular tube, said insert having threads at the closed end of the insert; and

an annular tube-like driver within said tube insert made of a shape-memory alloy having a martensitic state and an austenitic state having a configuration such that when it is inserted in its martensitic state it is capable of exerting an outward pressure on said insert while simultaneously being deformed by said insert and when upon transforming to its austenitic state it is capable of recovery to its non-deformed condition to increase the pressure between the insert and the inside tube surface.

4,637,437

BRAKE FOR A WEAVING MACHINE

Wolfgang Greger, Gundetswil, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 13, 1984, Ser. No. 650,224

Claims priority, application Switzerland, Oct. 6, 1983, 5440/83

Int. Cl.⁴ D03D *51/00*; F16D *51/00*

U.S. Cl. 139—336 **8 Claims**

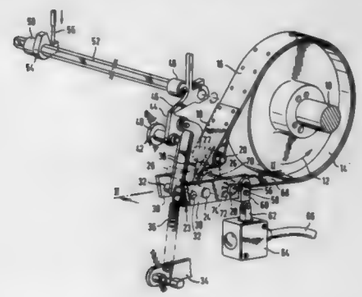
1. A brake for a weaving machine comprising

a rotatable brake drum;

a brake band disposed about said drum to selectively brake rotation of said drum;

a brake lever for engaging one end of said brake band; and

a resilient member having a part between said lever and said one end of said brake band for compression forces therebetween, said part having a plurality of parallel apertures



therein for damping vibrations in said member during transmission of forces between said band and said lever.

4,637,438

METHOD AND DEVICE FOR FILLING CONTAINERS

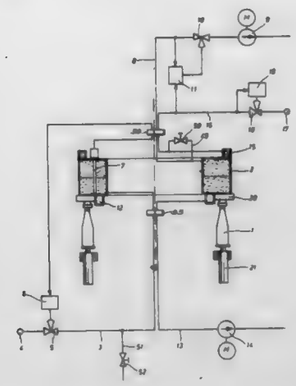
Wilhelm Weiss, Regensburg, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed Aug. 19, 1985, Ser. No. 766,496

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431107

Int. Cl.⁴ B65B *55/24*; B67C *3/06*

U.S. Cl. 141—6 **9 Claims**



1. A method of filling containers such as bottles with a liquid which partially fills a tank and the space above the liquid is filled with a protective gas, said method including the steps of:

evacuating most of the air from a bottle while the bottle is isolated from the atmosphere,

filling said bottle with said gas from the tank to a pressure equal to the pressure in the tank,

causing said liquid to flow by gravity from said tank to said bottle until the bottle is filled to a predetermined level and said liquid in the bottle displaces said gas back into said tank except for residual gas slightly diluted with air above said level,

briefly injecting a quantity of pure protective gas into said bottle in excess of the quantity necessary to displace said residual gas, and

conducting the displaced gas and excess pure protective gas to the gas filled space in the tank before the contents of said bottle are exposed to the atmosphere.

4,637,439

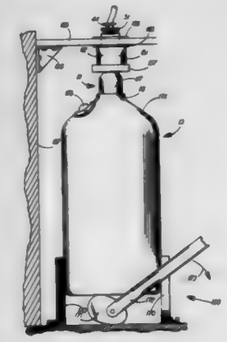
MINI-REGULATOR VALVE ASSEMBLY

Edward L. Jeans, Gwent, Wales, assignor to Cadbury Schweppes, PLC, London, United Kingdom

Continuation-in-part of Ser. No. 232,977, Feb. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 200,021, Oct. 23, 1980, Pat. No. 4,353,252. This application Jun. 28, 1983, Ser. No. 508,558

Int. Cl.⁴ B65B *3/04*

U.S. Cl. 141—18 **25 Claims**



1. A regulating valve for use in a gas cylinder having an opening formed therein comprising:

(a) a first valve member adapted to be retained in the opening in the cylinder;

(b) a second valve member disposed for movement with respect to said first valve member, one of said first and second valve members forming a valve seat and the other forming a sealing edge cooperating with said seat thereby forming an outlet valve from the cylinder;

(c) first biasing means biasing said second valve member against said first valve member so as to bring said sealing edge into contact with said seat and close said valve;

(d) an actuator for acting on said second valve member, said actuator having an outlet passage, said actuator supported for limited axial motion;

(e) means associated with said actuator forming an inner chamber in communication with said outlet valve, said inner chamber having an outer surface of area greater than the area of said outlet passage, and an outer chamber;

(f) at least one port formed in said actuator establishing communication between said inner chamber and said outlet passage;

(g) an axially adjustable support surface; and

(h) second biasing means disposed in said outer chamber between said support surface and said actuator, whereby axially inward movement of said actuator will cause it to move said seat and edge apart to permit a flow of gas into said inner chamber and through said ports, said gas thereupon acting over said outlet passage along with the biasing force of said second biasing means and aided by the biasing force of said first biasing means to tend to close the valve comprising said valve seat and said edge as pressure builds up to the desired value to thereby obtain a regulating effect.

4,637,440

VENTLESS LIQUID RECOVERY SYSTEM FOR PRESSURIZED GAS LINES

Troy J. Potter, 200 Bailey, Dumas, Tex. 79029

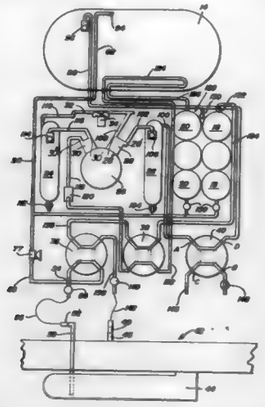
Filed Apr. 24, 1985, Ser. No. 727,243

Int. Cl.⁴ B65B *3/04, 31/04*

U.S. Cl. 141—65 **16 Claims**

1. A liquid recovery system for a pressurized gas line including a liquid sump to be evacuated of liquid through a valve

controlled liquid discharge line, said system incorporating medium pressure storage tank structure including liquid inlet structure and valved liquid outlet structure as well as vapor outlet structure, gas pump structure including suction and discharge ports, high pressure storage tank structure including



gas inlet and gas outlet structure, a first conduit communicating said liquid discharge line with said liquid inlet structure, a second conduit communicating said vapor outlet structure with said suction port, and a third conduit communicating said discharge port with said gas inlet structure.

4,637,441

INLET AND OUTLET VALVES

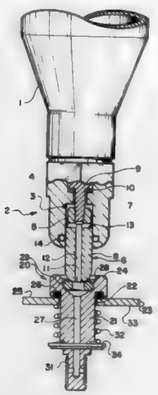
Rodney Gomersall, 82 Banks Road, Slaithwaite, Near Huddersfield, West Yorkshire, England

Continuation-in-part of Ser. No. 578,141, Feb. 8, 1984, abandoned, which is a continuation-in-part of Ser. No. 503,533, Jun. 13, 1983, abandoned. This application Aug. 5, 1985, Ser. No. 763,308

Claims priority, application United Kingdom, Jun. 15, 1982, 8217269

Int. Cl.⁴ B65B *3/04*

U.S. Cl. 141—349 **4 Claims**



1. An inlet and an outlet valve for respective pressure vessels, adapted to cooperate with each other to transfer pressure fluid from one of the vessels to the other, the outlet valve including a sealing member, said sealing member being adapted to form a seal with its pressure vessel from inside said vessel; said outlet valve including a passageway, said passageway being arranged to communicate between the inside and the outside of the pressure vessel; and an operating member, said operating member extending through and being slidably mounted in said passageway and said operating member including a nozzle, said nozzle projecting from said passageway, said outlet valve further including a projection, said projection being arranged to cooperate with said operating member whereby removal of the operating member from the passageway is prevented, said projection being movable to a position in which said operating member may be removed with said sealing member remaining adapted to seal its pressure vessel; said inlet valve including a sealing portion; the valves being adapted to cooperate with each other to transfer fluid out of the outlet valve in through the inlet valve by urging said nozzle against said sealing portion to form a seal between said nozzle and said sealing portion, said urging of said nozzle against said sealing portion also causing urging of said operating member towards said sealing member of said outlet valve to cause the seal of said sealing member with its pressure vessel to be broken.

4,637,442

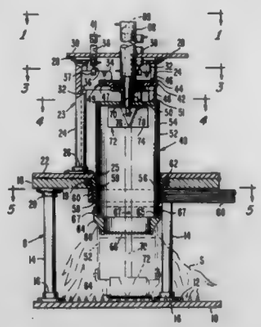
MACHINE FOR CORING STUMPS

Daniel S. Mozer, 126 Grandview Ave., Yardville Heights, N.J. 08620

Filed Aug. 20, 1985, Ser. No. 767,398

Int. Cl.⁴ A01G *23/06*; B27L *7/00*

U.S. Cl. 144—2 N **23 Claims**



1. A machine for coring stumps, comprising:

(a) a support structure;

(b) an annular saw means mounted in said structure for rotation and for advancement along its axis of rotation, through a stump to be cored;

(c) means for rotating said saw means; and

(d) means for advancing the saw means, simultaneously with rotation thereof, to remove a core from said stump, the cylindrical saw means including an elongated hollow cylinder for confining the core while the core is being cut from the stump, said cylinder having a leading end and a trailing end in the sense of the direction in which the saw means is advanced through the stump, and an annular saw blade on the leading end of the cylinder, the support structure including a base adapted to provide a support for the stump to be cored, said saw means being mounted upon the support structure above the base for movement downwardly through the supported stump.

4,637,443

SAW ASSEMBLY

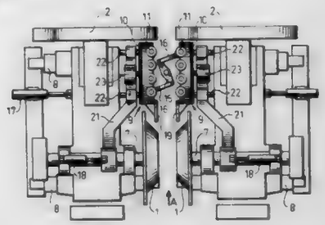
Kurt Jansson, Mariannelund, Sweden, assignor to AB A. K. Eriksson, Mariannelund, Sweden

Filed Sep. 11, 1985, Ser. No. 774,682

Claims priority, application Sweden, Sep. 14, 1984, 8404638

Int. Cl.⁴ B27C *9/00*; B27B *1/00*

U.S. Cl. 144—39 **9 Claims**



1. A saw assembly for reducing logs by passing the logs at least once through the assembly and resawing the thus obtained blocks by re-passing the blocks through the saw assembly, comprising a pair of chippers and at least one pair of band saws located downstream of the chippers, and a pair of guide-and-feed devices located between the chippers and the band saws, the components in each of these pairs of assembly units being located opposite one another on different sides of the saw centre line and being adjustable in relation thereto, the saw assembly further comprising means operative to cause the guide-and-feed devices to accompany synchronously the setting movements of the chippers relative to the centre of the saw line when reducing passing logs; and means which are operative, prior to a resawing operation, to displace the guide-and-feed devices relative to the chippers in a direction towards the centre of the saw line for engagement with the wood block to be resawn, this block passing free from the chippers.

4,637,444

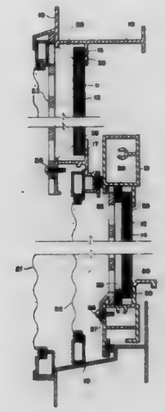
WINDOW PROTECTION

Paul W. Tanner, Rte. 3, Box 1608, Keystone Heights, Fla. 32656

Filed Nov. 13, 1984, Ser. No. 671,112

Int. Cl.⁴ E06B *3/32*

U.S. Cl. 160—91 **11 Claims**



1. A window unit comprising a window frame, at least a lower window member vertically slideably disposed in said window frame;

said window member including a framework formed by two vertical supports, an upper horizontal support and a lower horizontal support with a pane of window glass within said framework;

a sheet of expanded metal spaced apart from said pane and covering the outside surface of said pane, said sheet having outer edges within said framework upper horizontal support and vertical supports;

a resilient spacer located substantially about the perimeter of said pane and sandwiched between said pane and said sheet; and

connecting means to rigidly fasten said sheet along its lower edge portion to said lower horizontal support of said window framework.

4,637,445

ARRANGEMENT IN VENETIAN BLINDS

Berndt R. Nilsson, Adolf Fredriksgatan 6, S-217 74 Malmö, Sweden

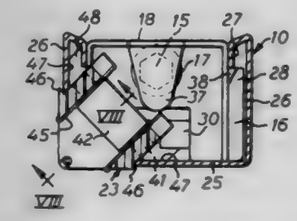
Division of Ser. No. 403,084, Jul. 29, 1982, Pat. No. 4,531,563. This application May 9, 1985, Ser. No. 732,099

Claims priority, application Sweden, Aug. 7, 1981, 8104739

The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.

Int. Cl.⁴ E06B *9/30*

U.S. Cl. 160—178 C **2 Claims**



1. An arrangement in Venetian blinds comprising a substantially U-shaped mounting rail with a web and bent legs and lead-ins for the ladder-tapes, cords and slat operating means, the arrangement further comprising means in the mounting rail for supporting an operating shaft, said operating shaft being connected with the ladder-tapes and adapted to control the angular position of said ladder-tapes and, thus, the angular position of the slats, the operating means of said arrangement comprising a driving device for said operating shaft and a cord lock, wherein said mounting rail has a mounting hole for the cord lock, said mounting hole extending into the web and one leg on either side of the corner of the mounting rail between the web of the rail and said one leg of said rail, and wherein said cord lock is insertable in said mounting rail from the inner side thereof and has snap-in detent means adapted to be moved through said mounting hole solely under deformation of said snap-in detent means and/or said mounting rail for engaging, after mounting, with the edge portions of said mounting hole on either side of said corner; and wherein said cord lock also has abutment faces engaging with the inner side of said one leg and web of said mounting rail and adapted to maintain said snap-in detent means substantially in engagement with said edge portions.

4,637,446

BUILDING AND BI-FOLD DOOR ASSEMBLY

Coy E. McQueen; Lynn O. Twedt, both of Harvard, Ill., and Edwin H. Thurnau, Delavan, Wis., assignors to Erect-A-Tube, Inc., Harvard, Ill.

Filed Dec. 5, 1984, Ser. No. 678,582

Int. Cl.⁴ E05D *15/26*

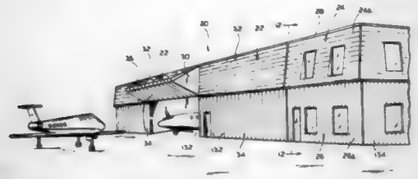
U.S. Cl. 160—207 **38 Claims**

1. A bi-fold door assembly movable between raised and lowered positions for mounting in a building, comprising:

an upper door section hinged to a lower door section, said

door sections having front surfaces adapted to face outwardly of said building, said door sections having rear surfaces adapted to face inwardly of said building;

said outwardly facing front surface of said upper door section being disposed in a plane intersecting a plane defined by said outwardly facing front surface of said lower door section in said lowered position of said door assembly, the plane defined by said outwardly facing front surface of said lower door section being a vertical plane and a top of said upper door section being disposed in said vertical



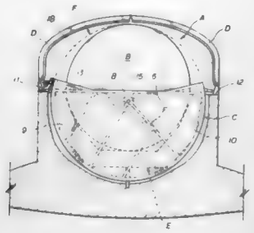
plane in said lowered position of said door assembly, said outwardly facing front surface of said upper door section being sloped downwardly and outwardly of the top thereof to an overlying position defining an overhang relative to said outwardly facing front surface of said lower door section in said lowered position of said door assembly, and a frame portion horizontally disposed between the front and rear surfaces of said upper door section and being secured thereto for supporting said front surface in the sloped position.

4,637,447

SUN SHIELD

Arthur M. Frank, Plainview; Silvio F. DeRespinis, Copiague, and John Mockovciak, Jr., Bayville, all of N.Y., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 12, 1985, Ser. No. 764,805
Int. Cl.[4] A47H *1/00*; B64G *1/58*
U.S. Cl. 160—265 **4 Claims**



1. A rectractable, self-deploying shading device adapted to selectively cover and uncover a subject area by moving a shading material from a compact storage position to an extended shading position comprising in combination:

an elongated, spring biased roller,

a flexible shading member adapted for winding on said roller and for unwinding therefrom,

at least one rotary member having an arcuate periphery adapted for guiding and continuously supporting said flexible shading member as said flexible shading member is selectively moved from an open, exposed unshading position to an extended, closed shading position,

means attached to the rotary member for drawing the shading member from the roller, and

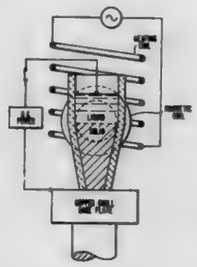
a deployment means for rotating said rotary member.

4,637,448

METHOD FOR PRODUCTION OF COMBUSTION TURBINE BLADE HAVING A SINGLE CRYSTAL PORTION

Michael A. Burke, Pittsburgh, and Cyril G. Beck, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 27, 1984, Ser. No. 644,751
The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.
Int. Cl.[4] B22D *27/02*
U.S. Cl. 164—122.2 **2 Claims**



1. In a process of fabricating directionally solidified turbine blades for combustion turbines of the type wherein a mold containing molten metal is cooled in a controlled fashion such that solidification occurs slow enough to allow single crystal growth beginning at the airfoil end, the improvement comprising:

monitoring said solidification and starting magnetic mixing of the remaining molten metal at approximately the beginning of solidification of said root section and adding grain boundary strengthening elements at approximately the same time that said magnetic mixing is started and then increasing the rate of cooling of said blade to a rate faster than at which directional solidification occurs, whereby a blade is produced with a single crystal airfoil section and a fine grained root section and without a substantially inhomogeneous portion at the interface between the airfoil and root sections.

4,637,449

COMPONENT CASTING

David Mills; Anthony T. Lindahl, and Alan D. Kington, all of Bristol, England, assignors to Rolls-Royce Limited, England

Continuation of Ser. No. 393,549, Jun. 30, 1982, Pat. No. 4,532,974. This application May 22, 1985, Ser. No. 737,280
Claims priority, application United Kingdom, Jul. 3, 1981, 8120598
The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.
Int. Cl.[4] B22C *9/10*
U.S. Cl. 164—132 **13 Claims**

1. A method of casting a nickel- or cobalt-based superalloy component comprising the steps of:

(a) making a mold having a casting cavity in the shape of the component to be cast;

(b) locating a core within said casting cavity, said core comprising:

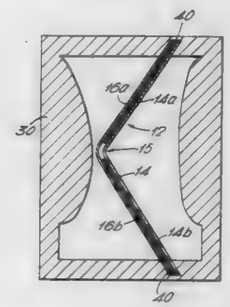
(i) a hollow member, said hollow member comprising two straight leachable ceramic refractory material portions interconnected by a bend; and,

(ii) a ceramic support member, said ceramic support member comprising material of greater refractoriness than said material of said hollow member, wherein said support member comprises two straight portions extending into said hollow member from opposite ends thereof and terminating adjacent said bend, and wherein said support member is disposed within said hollow member with a slight clearance therebetween sufficient only to allow for relative sliding between said support member and said hollow member.

(c) filling the mold with molten superalloy component material and allowing the superalloy component material to solidify; and,

(d) removing the core from the component by withdrawing said support member portions from opposite ends of said hollow member and subsequently leaching said hollow member from the component.

6. A core for use in a mold for casting nickel- or cobalt-based superalloy, said core defining a passage in a nickel- or cobalt-based superalloy casting component and comprising:



(a) a hollow member, said hollow member comprising leachable ceramic refractory material, wherein said hollow member comprises two straight portions interconnected by a bend; and,

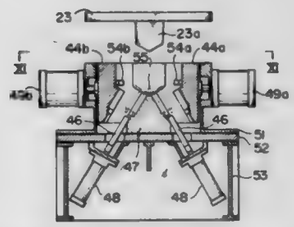
(b) a ceramic support member, said ceramic support member comprising material of greater refractoriness than said material of said hollow member, wherein said ceramic support member comrpises two straight portion sextending into opposite ends of said hollow member the terminating adjacent said bend; and wherein said support member is disposed within said hollow member with a slight clearance therebetween sufficient only to allow for relative sliding between said support member and said hollow member.

4,637,450

ENTIRELY AUTOMATIC, COLD BOX TYPE MACHINE FOR MOLDING AN INTEGRAL CONNECTING CORE

Kazuo Kawai, Toyonaka; Sumikazu Kawai, and Seiji Katashima, both of Amagasaki, all of Japan, assignors to Naniwa Products Co., Ltd., Japan

Division of Ser. No. 486,938, Apr. 20, 1983, Pat. No. 4,559,989. This application Feb. 26, 1985, Ser. No. 705,703
Int. Cl.[4] B22C *15/22*, *7/06*
U.S. Cl. 164—200 **4 Claims**



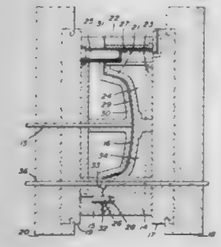
1. Split core boxes for an entirely automatic, old box type machine for molding an integral connecting core, which machine is provided with a sand blowing mechanism and a gassing mechanism, said mechanisms being suspended above an upper frame of the molding machine and traversable, and with a liftable drag car being mounted on a platform of the molding machine, characterized in that said core boxes consist of a combination of a drag core box having cavities for inserting the connecting cores and a cope core box having fixed mandrels at its lower surface and a plurality of blow ports, said drag core box consisting of a fixed pattern provided on a drag core box base, a pair of vise patterns which slide and engage with each other, a pair of loose pieces which slide perpendicular to the sliding direction of said vise patterns, and at least one mandrel around which molding takes place which passes through said drag core box base between said sliding vise patterns and pieces, and the assembly of said drag and cope core boxes is of such mechanism that it is opened or closed in a closed box.

4,637,451

DIE CASTING MOLD

Guido Perrella, Westmount, Canada, and William E. Thompson, Middletown, Ind., assignors to DBM Industries Limited, Quebec, Canada

Filed Feb. 22, 1984, Ser. No. 582,632
Int. Cl.[4] B22D *17/26*
U.S. Cl. 164—342 **7 Claims**



1. A die casting metal mold half for use in high pressure die casting comprising a front wall adapted to form a portion of a die cavity and incorporating a die casting area, side walls extending rearwardly from the front wall, a backing member, and means to fasten said backing member to said side walls, said front wall, side walls and backing member forming a high pressure heat exchange cavity, means for introducing heat exchange fluid under pressure into said high pressure heat exchange cavity and means for releasing fluid under pressure from said high pressure heat exchange cavity.

4,637,452

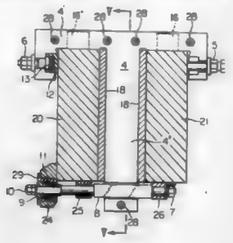
MOLD APPARATUS FOR CONTINUOUS CASTING SYSTEM

Takashi Kawakami, Niihama, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Jan. 29, 1986, Ser. No. 823,560
Claims priority, application Japan, Sep. 2, 1985, 60-193424
Int. Cl.[4] B22D *11/04*
U.S. Cl. 164—420 **5 Claims**

1. A mold apparatus for use in a continuous casting system, having a pair of parallel longer frames disposed to oppose each other and lined at their opposing surfaces, and a pair of shorter frames disposed between opposing ends of said longer frames and lined at their opposing surfaces, said longer and shorter frames in cooperation defining a rectangular mold cavity, said mold apparatus comprising: a core frame disposed between the longitudinal centers of said longer frames such as to divide said mold cavity into two sections, said core frame being split into two segments in the thicknesswise direction and having a substantially T-shaped configuration constituted by a vertical portion disposed between said longer frames and projecting downwardly beyond the lower ends of said longer frames and

top wing portions projected laterally from the top end of said vertical portion and resting on the upper surfaces of said longer frames, said segments of said core frame being lined at their outer surfaces at at least said vertical portion; a core frame upper portion locating means disposed on the upper surfaces of said longer frames substantially at the longitudinal centers of said longer frames and adapted for releasably fixing said wing portions of said core frame; a tie rod detachably secured to the lower ends of said segments of said core frame projected downwardly beyond the lower ends of said longer frames, so as to extend parallel with said wing portions of said core frame;



a core frame lower portion locating means provided on the undersides of said longer frames substantially at the longitudinal centers of said longer frames and adapted for holding respective ends of said tie rod; upper tightening means for pressing said longer frames to the upper portions of both side edges of said vertical portion of said core frame; and a lower tightening means for pressing said longer frames onto both side edges of the lower portion of said vertical portion of said core frame; whereby said core frame is detachably secured between said longer frames, thereby permitting said mold apparatus to be used selectively either in a single or twin casting mode.

4,637,453

METHOD FOR THE CONTINUOUS PRODUCTION OF CAST STEEL STRANDS

Kenzo Ayata; Kiichi Narita, both of Kobe; Takasuke Mori, Ashiya, and Takahiko Fujimoto, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

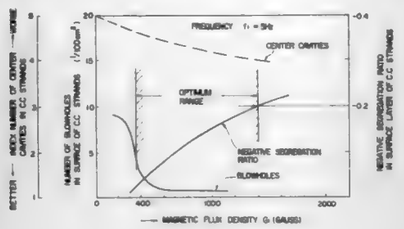
Continuation-in-part of Ser. No. 561,149, Dec. 14, 1983, Pat. No. 4,515,203, which is a continuation of Ser. No. 250,041, Apr. 1, 1981, abandoned. This application Aug. 21, 1984, Ser. No. 642,659

Claims priority, application Japan, Apr. 2, 1980, 55-43339; Apr. 2, 1980, 55-43341; Apr. 20, 1980, 55-43340

The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

Int. Cl.⁴ B22D *27/02, 11/16*

U.S. Cl. 164—468 **12 Claims**



1. A method for the continuous production of cast steel strands which are 200 mm×200 mm or less in cross-section by a continuous casting process in which molten steel containing 0.20% or less of carbon is fed into a casting mold with a lubricant and continuously drawn out downwardly of the casting mold, said method comprising the steps of:

(a) electromagnetically stirring the molten steel at a position within said casting mold by the application of a magnetic field induced by introducing into an electromagnetic coil an alternating current of a frequency (f) in the range of 1.5 to 15 Hz and maintaining the magnetic flux density in the range of 602 $e^{-0.10f}$ to 2441 $e^{-0.11f}$ gauss at the center of the electromagnetic coil, and

(b) electromagnetically stirring the molten steel at a position in the final solidfying zone of said continuously cast strands in which the shorter diameter of the molten steel pool is smaller than ¼ the length of the shorter side of the cast strand, by the application of a magnetic field induced by introducing an alternating current having a freqency in the range of 50 to 60 Hz into an electromagnetic coil and maintaining the magnetic flux density in the range of $0.2 \cdot D^2 + 280$ gauss to $0.343 \cdot D^2 + 451$ gauss at the center of the electromagnetic coil, wherein D is the solidified shell thickness in millimeters of said continuously cast strands, the value of D ranging from 20 to 90.

4,637,454

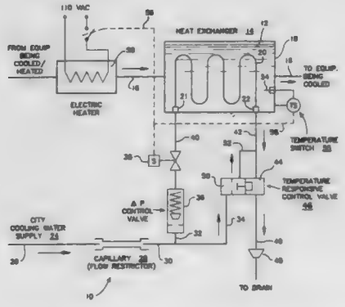
WIDE RANGE TEMPERATURE CONTROL SYSTEM FOR FLUIDS

Albert R. Lowes, Fremont, Calif., assignor to Mydax, Inc., Auburn, Calif.

Filed Apr. 1, 1985, Ser. No. 718,160

Int. Cl.⁴ F25B *29/00;* **G05D** *23/00;* **B60H** *1/00;* **B61D** *27/00*

U.S. Cl. 165—36 **5 Claims**



1. A wide range temperature control system for controlling and maintaining the temperature of a first cooling liquid at a predetermined setpoint within a wide range of temperatures with the use of an indirect heat exchanger, a cooling coil in said exchanger for carrying a flow of a second cooling liquid from a supply for drawing off heat from said first cooling liquid, said system comprising:

flow restrictor means for limiting flow rate from said supply and providing a flow restricted output of said second cooling liquid,

primary flow means communicating between said output and an inlet of said cooling coil, said primary flow means including pressure control means for creating a constant back pressure, and a flow valve for controlling flow through said cooling coil,

bypass flow means communicating from said output through a flow control element of a temperature proportional control valve means to a junction with an outflow of said cooling coil, said junction being located upstream of a temperature sensitive chamber of said temperature proportional control valve means,

outflow means communicating from said junction through said temperature sensitive chamber to a discharge point for discharge of said second cooling liquid,

temperature sensor means including setpoint means for sensing temperature of said first cooling liquid at its outflow from said heat exchanger, for receiving a preset setpoint temperature and for opening said flow valve when sensed outflow temperature is above a said setpoint and for closing said flow valve when sensed outflow temperature is below said setpoint,

wherein said temperature proportional control valve means controls flow of second cooling liquid through said cooling coil by regulating the amount of bypass flow passing through its said flow control element in relation to temperature sensed in its said temperature sensitive chamber.

4,637,455

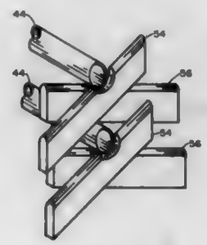
SUPPORT RACK FOR TUBES IMMERSED IN A FLUIDIZED BED

Sebastian Tordonato, West Hartford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 28, 1984, Ser. No. 656,052

Int. Cl.⁴ F28C *3/16;* **F28F** *9/00*

U.S. Cl. 165—104.16 **10 Claims**



1. In a fluidized bed having heat exchange surface in the bed having a plurality of tubes, a rack for supporting a tubular in-bed heat exchanger for transferring heat generated in the bed region of a fluidized bed to a working fluid passing through the tubular heat exchanger comprising:

(a) a plurality of spaced substantially parallel first members extending in a first direction and forming substantially a first plane, each of the plurality of first members are arcuately scalloped to accommodate a tube;

(b) a plurality of spaced substantially parallel second members extending in a second direction forming an angle with respect to the plurality of first members and forming substantially a second plane, the second plane spaced from and substantially parallel to the first plane, the intermember space as projected normal to the first and second planes being an opening having substantially a quadrangular shape formed by adjacent first members and adjacent second members for receiving a tube of the tubular heat exchanger, the tube of the heat exchanger received in the quadrangular shape opening engaging one of the members forming the quadrangular opening such that a portion of the weight of the tube is carried thereby; and

(c) a plurality of spaced third members extending substantially between the first plane and the second plane engaging the plurality of first members and the plurality of second members between adjacent tubes of the tubular heat exchanger, the weight carried by the plurality of first members and the plurality of second members transferred to the plurality of spaced third members and in turn transferred to a support therebeneath, whereby the plurality of first and second members form a criss-cross array with quadrangular openings therebetween through which the tubes of the tubular heat exchanger pass with a portion of the weight of each tube carried by one of the members of the criss-cross array the weight of each tube transferred to the criss-cross array and in turn carried to a support beneath the rack by the spaced third members.

4,637,456

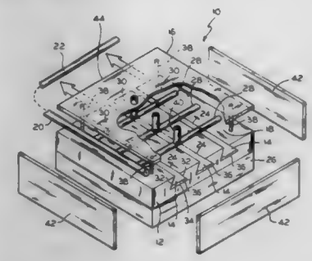
HEAT EXCHANGER

Richard E. Niggemann, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 23, 1985, Ser. No. 812,841

Int. Cl.⁴ H01L *23/46;* **F25C** *1/00*

U.S. Cl. 165—104.33 **19 Claims**



1. A heat exchanger, comprising:

a liquid impingement plate having a liquid carrying channel therein;

means for spraying a liquid into said liquid carrying channel;

a liquid containment plate disposed in spaced relation to said liquid carrying channel, said liquid containment plate and said liquid impingement plate defining a liquid flow chamber therebetween;

liquid inlet means in communication with said liquid spraying means to permit said liquid to flow through said liquid spraying means into said liquid carrying channel;

liquid outlet means in communication with said liquid flow chamber to permit said liquid to be removed from said liquid flow chamber; and

means for cooling said liquid impingement plate on the side thereof opposite said liquid flow chamber to a temperature at or below the freezing point of said liquid;

said liquid carrying channel including means for retaining a portion of said liquid in a frozen state there-within, said retaining means comprising a narrowed channel opening facing said liquid spraying means in spaced relation to said cooling means.

4,637,457

BAFFLE PLATE WITH EIGHT-LOBED TUBE-RECEIVING OPENINGS AND COLD-FORMED FLOW-RESTRICTING TABS IN EACH LOBE

Robert M. Wepfer, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

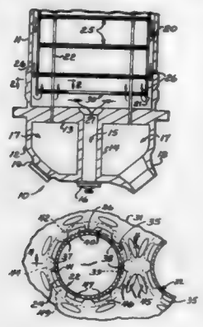
Filed Jan. 25, 1985, Ser. No. 695,036

Int. Cl.⁴ F28F *9/22*

U.S. Cl. 165—162 **20 Claims**

1. In a heat exchanger including a pressure vessel closed at one end by a tube sheet and a plurality of heat exchange tubes within the vessel extending into the tube sheet for heat exchange between a fluid flowing through the tubes and a liquid flowing around the tubes in a flow path extending generally parallel thereto, the improvement comprising: a baffle plate disposed within the vessel and extending transversely thereof in the liquid flow path adjacent to the tube sheet, said baffle plate serving to limit liquid flow parallel to the tubes and to redirect at least a portion of the flow generally parallel to the tube sheet, said baffle plate having parallel upper and lower surfaces and a plurality of tube-receiving openings extending therethrough substantially perpendicular to said upper and lower surfaces for respectively receiving said tubes, each of said openings having a circular central portion dimensioned freely to accommodate the associated tube and a plurality of peripheral lobe portions communicating with said central portion, said baffle plate having a plurality of surface portions cooperating to define said central portions of said openings and

being engageable with the associated tubes at the planes of said upper and lower surfaces, each of said lobe portions extending generally radially outwardly from said central portion for



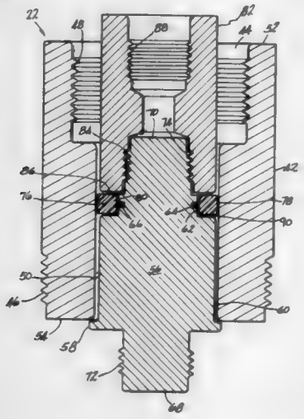
defining a flow channel alongside the associated tube, each of said lobe portions having a transverse cross-sectional area which varies between said upper and lower surfaces of said plate.

4,637,458

BLOWOUT PREVENTER FOR USE IN COMBINATION WITH A DEEP WELL PUMP

Gabriel D. Hernandez, Maracaibo-Edo. Zulia, Venezuela, assignor to Maraven, S.A., Caracas, Venezuela

Filed Jan. 10, 1986, Ser. No. 817,684
Int. Cl.[4] E21B *33/02, 33/06*
U.S. Cl. 166—68 11 Claims



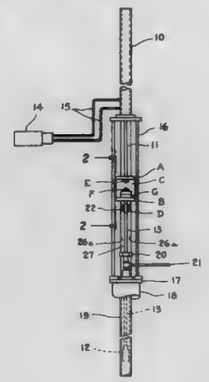
8. A coupling assembly for connecting a polished bar and rod string of a deep well pump comprising a hollow cylindrical nipple having a top and a bottom surface and a cylindrical bore of diameter D_1, a cylindrical mandrel partially received in said hollow cylindrical bore, said cylindrical mandrel having a first diameter portion D_2, a second diameter portion D_3 and a third diameter portion D_4 wherein D_3 is positioned between D_2 and D_4 and $D_2 > D_1 > D_3 > D_4$ such that said first diameter portion abuts the bottom surface of said nipple upon an inordinate increase of pressure in said well.

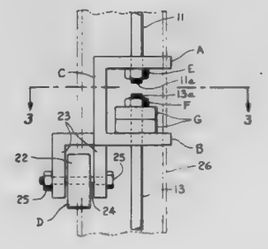
4,637,459

ANTI ROTATIONAL DEVICE FOR DOWN HOLE HYDRAULIC PUMPING UNIT

Louis J. Rousseel, 1500 American Bank Bldg., New Orleans, La. 70130

Filed Jun. 28, 1985, Ser. No. 750,536
Int. Cl.[4] E21B *43/12*
U.S. Cl. 166—72 7 Claims





5. For use in a down hole pumping unit operated by a sucker rod driven by a hydraulic pump having a cylinder and cylinder rod, an anti rotational device for connecting said cylinder rod to said sucker rod while permitting rotation of the sucker rod comprising:

vertical spacer means connectable adjacent an upper end thereof in fixed relation to said cylinder rod;

means rotating said sucker rod;

means connecting said sucker rod adjacent a lower end of said vertical spacer means for rotation relative thereto; and

vertical guide means permitting vertical movement of said vertical spacer means while preventing rotation thereof.

4,637,460

PARALLEL FLOW TUBE APPARATUS

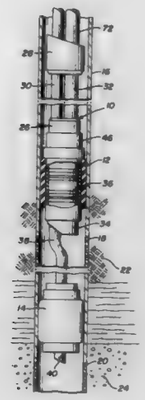
Jody R. McGlothen, Garland, Tex., and Damon P. Little, Bakersfield, Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 21, 1985, Ser. No. 714,588
Int. Cl.[4] E21B *33/122*
U.S. Cl. 166—189 8 Claims

4. An improved parallel flow tube comprising:

a coupling member having first and second generally parallel bores extending therethrough, each said bore being arranged to receive and connect a tubing member from one end and one said bore being arranged to receive and connect a tubing member from the other end of said coupling member;

an elongated seal sleeve having a first end sealingly connected to said other end of said coupling member and extending therefrom terminating in a second end, said sleeve having a diameter sized to encompass both said bores; and



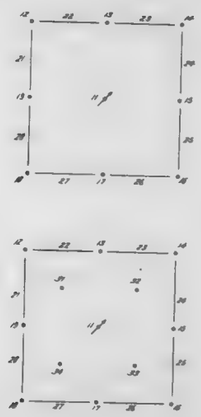
annular seal means encircling said sleeve between said first and second ends for forming a fluid-tight seal between said seal sleeve and a cylindrical member in which said sleeve may be disposed.

4,637,461

PATTERNS OF VERTICAL AND HORIZONTAL WELLS FOR IMPROVING OIL RECOVERY EFFICIENCY

Margaret A. Hight, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 30, 1985, Ser. No. 814,826
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—245 16 Claims



1. A method of recovering hydrocarbons from an underground formation by employing a modified inverted 9 spot well pattern, which comprises:

a substantially vertical central injection well;

four substantially vertical corner wells;

four substantially vertical side wells, each located between two corner wells; and

eight substantially horizontal production wells, each located between one of the side wells and one of the corner wells, said horizontal production wells extending from the ground surface and running a substantially horizontal distance within the hydrocarbon formation,

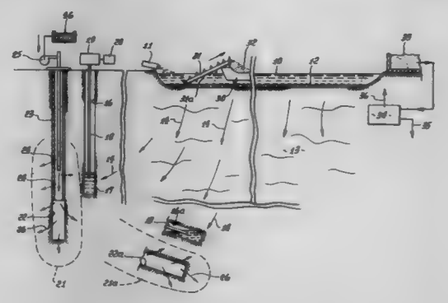
said horizontal wells aligned on the substantially rectangular boundaries of the modified inverted 9 spot running between the corner wells.

4,637,462

LIQUID MUD RING CONTROL OF UNDERGROUND LIQUIDS

Donovan B. Grable, #17 Seasons Ct., Madera, Calif. 93637

Filed Jun. 4, 1985, Ser. No. 740,986
Int. Cl.[4] E21B *33/138, 43/30, 47/00*; E02D *3/12*
U.S. Cl. 166—245 20 Claims



1. The method of controlling subterranean flow of contaminants draining from a zone of contaminant concentration, that includes

(a) determining the locus of flow of contaminants in a porous underground formation,

(b) drilling boreholes in the underground formation at selected locations about said zone of contaminant concentration,

(c) setting casing in the boreholes and cementing the casing in place,

(d) then forming through openings sidewardly through the casings at selected elevations in the boreholes, and in relation to said locus of contaminant flow,

(e) injecting into the formation via said through openings a substance that creates a barrier in the formation to said flow, to thereby establish a controlled height barrier to block said flow,

(f) said (a) step including drilling at least one test hole in the formation to a region or regions toward which contaminant flow is suspected, and testing the composition of the formation via said test hole or holes,

(g) said (b) and (c) steps including locating said boreholes containing said casing further from said zone than said test hole and drilling the boreholes deeper than contamination in the test hole.

12. Apparatus for controlling sub-terranean flow of contaminants draining or seeping into the earth from a zone of contaminant concentration, comprising

(a) first means for determining the locus of flow of contaminants in a porous underground formation, and

(b) second means for injecting into the formation a substance that creates a barrier in the formation to said flow, to thereby block said flow,

(c) said second means including multiple boreholes in the formation, and spaced about said zone at selected locations, casings set in said boreholes, multiple through openings extending sidewardly through walls defined by the casings and at selected elevations in the boreholes, said elevations being laterally of elevations of the contaminant flow,

(d) and said second means also including a source of said substance in mud form, and pump means pumping said

substance into said casings in the boreholes, under pressure, effecting its flow into the formation at elevations determined by the through openings in the casings, establishing a controlled height barrier of said substance, and including said barrier,

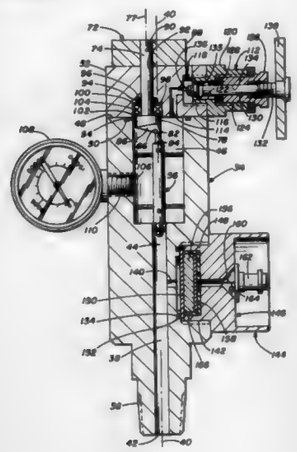
(e) and including said zone which is defined by a settling pond for contaminated water and which receives inflow of contaminants in water, and means removing settled contaminants from the bottom of the pond at a rate in relation to said inflow that contamination by escape of contaminants via subterranean flow, beyond the barrier, is substantially stabilized.

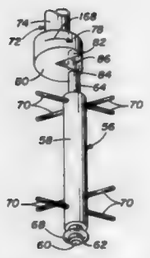
4,637,463

ECHO RANGING GUN

James N. McCoy, 5001 Ditto La., Wichita Falls, Tex. 76301

Filed Aug. 2, 1984, Ser. No. 636,992
Int. Cl.[4] E21B 47/04
U.S. Cl. 166—250 13 Claims





1. A system for sensing the depth of a liquid gas interface in the wellbore, comprising:

a structure defining a volume chamber therein, said structure being adapted for connection to the well and said structure having a passage opening into the volume chamber at one end thereof and exposed to the wellbore gas pressure at the other end thereof when the structure is connected to the well;

a poppet valve positoned in said volume chamber and movable along a first axis between open and closed positions, the poppet valve having sealing means for isolating the passage and volume chamber to prevent gas flow therebetween when said poppet valve is in the closed position, said poppet valve permitting gas flow between the passage and the volume chamber in the open position;

mean for moving the poppet valve to the closed position and for rapidly releasing the poppet valve while in the closed position for movement to the open positions;

a bleed valve mounted in said structure in communication with said volume chamber and the atmosphere which is operable between open and closed positions to permit gas in the volume chamber to be released to the atmosphere in the open position to lower the pressure in the volume chamber while preventing gas flow from the volume chamber to the atmosphere in the closed position;

a microphone for sensing acoustic disturbances, said microphone being exposed to the gas pressure in the passage of said structure; and

the poppet valve initially being in the open position so that the pressure in the volume chamber equals the pressure in the wellbore, the poppet valve subsequently being moved to the closed position by said moving means and said bleed valve being open to reduce the pressure in the volume chamber a predetermined amount below the pressure in the wellbore, said means for moving subsequently rapidly releasing the poppet valve so that the pressure differential between the passage and volume chamber drives the poppet valve to the open position and generates an acoustic event for transmittal through the passage to the wellbore with reflective acoustic signals being transmitted from the wellbore through the passage to the microphone for sensing of the depth of the liquid gas interface;

the poppet valve comprising a shaft having a first end portion with an O-ring groove formed therein and a bearing surface at the second end portion of the shaft opposite the first end portion for contacting by said moving means;

an O-ring seal positioned in the O-ring groove, the O-ring sealing between the wall of the passage and the shaft when the poppet valve is in the closed position; and

a plurality of centering pins attached to said shaft and extending radially outwardly therefrom to guide the shaft and O-ring seal for movement along the first axis.

5. A system for sensing the depth of a liquid gas interface in a wellbore, comprising:

a body having a passage formed therein extending from one face to a region within said body, said passage being centered on a first axis and a volume chamber formed in an opposite face extending into the body and intersecting said passage, said volume chamber also being centered on the first axis;

a cap adapted for attachment to the body over the volume chamber and having a aperture therethrough centered on a second axis parallel the first axis but offset therefrom;

a poppet valve positioned in said volume chamber for movement along the first axis between closed and opened positions and having a gasket means at the end thereof proximate the passage for sealing the passage from the volume chamber in the closed position;

a poppet valve control having a member extending into the volume chamber defining a ramp surface thereon, said control being mounted through the aperture in said cap for rotation about the second axis, rotation of the control in a first direction causing the poppet valve to move to the closed position through contact between the ramp and poppet valve, further rotation of the control causing the poppet valve to be released from contact with the ramp for movement to the open position unrestricted by the control;

means for bleeding gas from the volume chamber; and

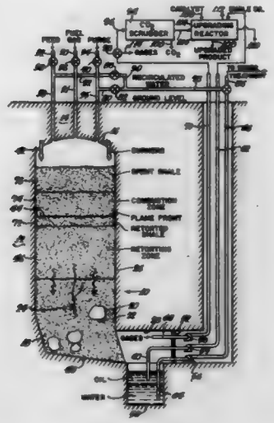
the system operating by permitting gas from the wellbore to enter the passage and volume chamber with the poppet valve open, subsequently rotating said control to close the poppet valve and bleeding sufficent gas from the volume chamber to provide a predetermined pressure differential between the passage and volume chamber and further rotating the control to permit the poppet valve to be driven to the open position to generate an acoustic event.

4,637,464

IN SITU RETORTING OF OIL SHALE WITH PULSED WATER PURGE

John M. Forgac, Elmhurst, and George R. Hoekstra, Wheaton, both of Ill., assignors to Amoco Corporation, Chicago, Ill. and Chevron U.S.A., Inc.

Filed Mar. 22, 1984, Ser. No. 592,376
The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.
Int. Cl.[4] E21B 43/24
U.S. Cl. 166—261 6 Claims



1. A process for retorting oil shale, comprising the steps of:

heating a portion of a rubblized mass of oil shale in a retorting zone of an underground retort to a retorting temperature to liberate shale oil and retort water from said oil shale leaving retorted shale containing residual carbon;

combusting said residual carbon in said oil shale in a combustion zone behind said retorting zone in said underground retort with a flame front fed by an oxgen-containing, combustion-sustaining, feed gas to provide a substantial portion of said heating, said flame front advancing generally in the direction of flow of said feed gas;

injecting a purge liquid comprising retort water in the absence of said oxygen-containing, combustion-sustaining, feed gas into said underground retort to quench said flame front while substantially stopping and blocking the flow of said oxygen-containing, combustion-sustaining, feed gas into said retort while simultaneously continuing to libcrate shale oil and retort water in said underground retort;

said retort water liberated from said retort and injected into said underground retort as said purge liquid, comprising raw, retorted and spent oil shale particulates ranging in size from less than 1 micron to 1000 microns, water, shale oil, phenols, organic carbon, ammonia, sodium, iron, sulfur, magnesium, calcium, nitrogen, nickel, copper, phosphorus, zinc, and arsenic;

reigniting said flame front with said oxygen-containing, combustion-sustaining, feed gas by feeding said oxgen-containing feed gas into said retort in the abeence of said retort water purge liquid while simultaneoulsy substantially stopping and preventing the flow of said retort water purge liquid into said retort; and

withdrawing said liberated shale oil and retort water from said underground retort.

4,637,465

REMOVAL OF PHENOLS IN GROUNDWATER AFTER UNDERGROUND GASIFICATION OF COAL

Bruce W. Gash, Tulsa, Okla., assignor to Standard Oil Company, Chicago, Ill.

Filed Feb. 8, 1985, Ser. No. 699,773
Int. Cl.[4] E21B 43/243, 43/34
U.S. Cl. 166—261 8 Claims

1. A method for removing phenols from an underground gasification zone after coal conversion is terminated, provided with at least one injection well and at least one production well comprising injecting into said zone through at least one well extending into said zone an aqueous alkali metal or ammonium hydroxide solution in an amount sufficient to convert at least a portion of the phenols present in said zone to the corresponding salt, said salt being more water soluble than the phenol, and producing from at least one well extending into said zone an aqueous solution of said salt.

4,637,466

METHOD OF IMPROVING CONFORMANCE IN STEAM FLOODS WITH CARBOXYLATE STEAM FOAMING AGENTS

Jeffrey T. Hawkins, and Vernon H. Schievelbein, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 3, 1986, Ser. No. 848,006
Int. Cl.[4] E21B 43/22, 43/24
U.S. Cl. 166—272 11 Claims

1. A process for recovering hydrocarbons from an underground hydrocarbon formation penetrated by at least one injection well and at least one production well, which comprises:

injecting steam into an injection well;

injecting into the injection well a mixture of steam, about 0.01 to about 5 thousand standard cubic feet of a non-condensable gas per barrel of steam in the injected mixture and about 0.01% to about 5% by weight of a foaming agent based upon the weight of the steam in the injected mixture,

said foaming agent represented by the formula,

$$RO(R'O)_nR''CO_2^-M^+,$$

where R is an alkyl radical, branched or linear, having from about 8 to about 24 carbon atoms in the alkyl chain, R' is ethylene, propylene or a mixture of ethylene and propylene, n has an average value of about 3 to about 11, R'' is methylene or ethylene, and M^+ is an alkali metal or ammonium ion;

injecting steam into said injection well; and

recovering hydrocarbons and other fluids from a production well.

4,637,467

PERMEABILITY CONTRAST CORRECTION

James E. Shaw, and John Westerman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 17, 1985, Ser. No. 755,750
Int. Cl.[4] E21B 33/13, 43/22
U.S. Cl. 166—295 18 Claims

1. A method for permeability contrast correction operations involving in-situ polymerizaion to form water-insoluble polymers in remote subterranean areas which comprises

(1) injecting into high permeability subterranean strata an aqueous solution containing water-soluble monomers comprising a major amount up to 100 weight percent of at least one N-3-oxohydrocarbon-substituted acrylamide and the balance being at least one other monomer selected from alpha,beta-unsaturated amides, alpha,beta-unsaturated nitriles, vinyl-containing sulfonates and N-vinyl amides, and

(2) polymerizing said monomer(s) in the presence of a free

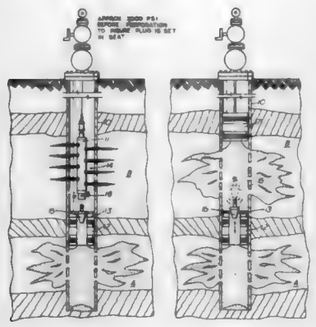
radical polymerization initiator to form water-insoluble polymers in-situ.

4,637,468

METHOD AND APPARATUS FOR MULTIZONE OIL AND GAS PRODUCTION

John M. Derrick, P.O. Box 396, Giddings, Tex. 78942

Filed Sep. 3, 1985, Ser. No. 771,588
Int. Cl.[4] E21B *43/14*
U.S. Cl. 166—297 17 Claims



1. A method for producing an upper formation and a lower formation in a well comprising;
penetrating said upper and lower formations with a casing,
cementing said casing in said well,
perforating said casing adjacent to said lower formation,
setting a first packer with a valve seat in said casing between said upper and lower formations,
lowering a setting tool assembly comprising a perforating gun having a plug releasably attached thereto into said casing,
setting said plug into said packer valve seat,
releasing said plug from said perforating gun,
pressuring said well sufficient to maintain said plug in said valve seat,
perforating said casing adjacent to said upper formation,
setting a second packer in said casing above said upper formation,
said plug being vertically movable relative to said valve seat by differential pressure between said upper and lower formations to allow said upper formation to be produced when said plug is closed and said lower formation to be produced when said plug is open, and
removing said plug from said well after the pressure in each formation has equalized allowing both formations to be produced by mechanical lift.

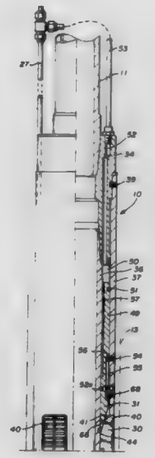
4,637,469

APPARATUS AND METHOD OF WELL PREPARATION FOR CHEMICAL TREATMENT OF PRODUCED FLUIDS

Dennis M. Spriggs, Dallas, and Jody R. McGlothen, Garland, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 6, 1984, Ser. No. 637,671
Int. Cl.[4] E21B *41/02, 23/04*
U.S. Cl. 166—310 18 Claims

1. Apparatus for use on the lower end portion of a string of tubing located in the casing of a production well for chemical treatment of fluid pumped from the well through the tubing, comprising a tubing anchor having:
a tubular mandrel with upper and lower connectors adapted for connection within the tubing string,
a tubular anchor cage concentrically spaced around said mandrel and connected to one of said connectors,
a plurality of slips angularly spaced from each other around said mandrel within said cage and being movable radially outward thereof to embed in the casing.
first and second spaced setting heads connected to said mandrel between said connectors with said slips being disposed between said setting heads and including axially spaced wedging surfaces,
pump means supported by said tubing for pumping fluid from the well upwardly through the mandrel and the tubing,
a collection chamber beneath said pump means and communicating therewith to receive the well fluid to be pumped upwardly through the tubing,





a chemical injection line connected to the outside of said tubing and including a lower outlet and adapted for communication with said collection chamber for injection of a treatment chemical into the well fluid before the latter passes through said pump, and
means associated with said setting heads for moving said wedging surfaces toward each other without tubing rotation to wedge against and drive said slips radially outwardly to embed within the casing in the well, said means including means for pumping a pressure fluid through said chemical injection line to set said slips.

17. A method for installation of well apparatus for chemical treatment of produced fluids comprises the steps of

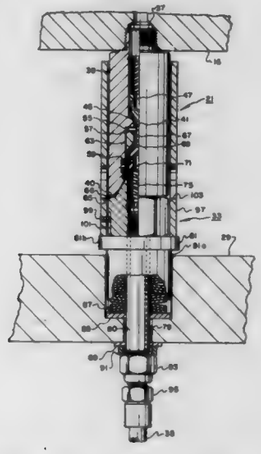
lowering a tubing anchor to a selected position in a well with a collection chamber for a pump at the lower end of the well tubing extending into the well fluid to be produced,
connecting a chemical injection line to the side of the well tubing with an outlet of the injection line disposed within the collection chamber,
temporarily blocking the outlet of chemical injection line,
connecting the chemical injection line with a pressure chamber for setting slips of the tubing anchor above the blocked outlet of the chemical injection line,
pumping a pressure fluid through said chemical injection line and said branch line to at least initially set said anchor slips, thereafter,
unblocking said blocked outlet, and
delivering an injection chemical through said injection line into the collection chamber to mix with the well fluid therein.

4,637,470

SUBSEA HYDRAULIC COUPLING

Gary G. Weathers, and Billy J. Rice, both of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Jun. 19, 1985, Ser. No. 747,081
Int. Cl.[4] E21B *33/038*
U.S. Cl. 166—344 5 Claims



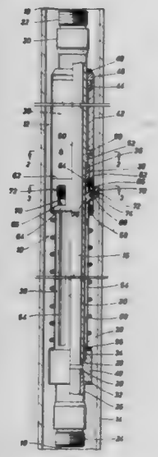
1. In a hydraulic connector assembly of the type having first and second support members for carrying respectively a first connector and a second connector which telescopingly mate to form a hydraulic connection, each connector having an axial bore with a seat and a check valve member for movement between an open position when the connectors are in contact with each other, allowing hydraulic fluid flow, to a closed position when the connectors are apart from each other, blocking hydraulic fluid flow, the check valve members being urged into the closed position by spring means, the improvement comprising in combination:
metal seal means actuable by axial deflection and carried by one of the connectors for sealing the axial bores to each other;
an external flange located on the first connector;
the first connector having conduit means extending through a hole in the first support member and adapted to be connected to a hydraulic fluid line for the delivery of hydraulic fluid, the first connector and conduit means being moveable in unison with each other and with respect to the first support member; and
bias means for urging the connectors together to maintain the seal means in axial deflection, the bias means comprising a plurality of frusto-conical washers encircling the conduit means between the flange and the first support member, so that when the support members are brought together, the first connector and the conduit means will move a slight distance relative to the first support member, deflecting the frusto-conical washers to apply a force to the connectors to maintain them tightly together.

4,637,471

TUBING DRAIN VALVE USEFUL WITH HEAVY, SAND-BEARING OIL

Paul B. Soderberg, Houston, Tex., assignor to Soderberg Research & Development, Inc., Houston, Tex.

Filed Apr. 30, 1985, Ser. No. 729,110
Int. Cl.[4] E21B *34/12*
U.S. Cl. 166—373 28 Claims



8. An apparatus suitable for conducting fluid through a conduit therein from a first to a second port and including means for producing a fluid passage through a wall of said apparatus to communicate said conduit with the exterior of said apparatus intermediate said ports, comprising:
a hollow body having a first section including said first port and a second section including said second port;
a valved fluid passage between the interior and the exterior of said hollow body through a wall of said hollow body intermediate said first and second ports;
means for engaging a surface of an object exterior of said hollow body for temporarily preventing movement of said first section in one direction along the longitudinal axis of said hollow body, said engaging means extending outwardly from said hollow body and being at least partially retractable within said fluid passage in its opened position so that said engaging means is disengaged from said surface and movement of said apparatus is permitted after said fluid passage is in its opened position; and
means for opening said valved passage in response to movement of said second section in said direction along the longitudinal axis of said hollow body while movement of said first section is prevented.

17. A method for opening an initially closed fluid communication passage through the sidewall of a device between the exterior of said device and a conduit suitable for conducting fluid from a first to a second end of said device, said device having first and second longitudinally movable sections, comprising the steps of:
extending engaging means outwardly from said device for temporarily preventing movement in one direction of said first section along the longitudinal axis of said device by engaging a surface of an object exterior of said device;
moving in said direction said second section of said device

along said longitudinal axis until said passage is opened; and

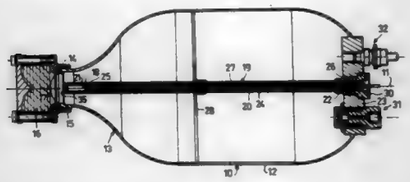
retracting said engaging means at least partially into said opened passage to permit movement of said device.

4,637,472

RAPID DISCHARGE EXTINGUISHER

Frédy Decima, Le Plessis Robinson, France, assignor to ABG Semca, Paris, France

Filed Jun. 6, 1985, Ser. No. 741,919
Claims priority, application France, Jun. 8, 1984, 84 09034
Int. Cl.[4] A62C 35/08
U.S. Cl. 169—35 8 Claims



1. Rapid discharge extinguisher comprising:

a container having a first axis enclosing a liquid inhibitor and a pressurized gas, the liquid inhibitor vaporizing when it expands, the container presenting, a revolution form adjacent to its outlet opening, the resolution form being developed by a rotation about the first axis of an arc of a circle, the center of the circle being located outside the container;

a through cover sealing the container at the outlet opening thereof, the cover being perpendicular to the first axis, no obstacle to the liquid inhibitor being provided near the through cover inside the container; and

explosive charge means for developing a shock wave, upon explosion, to shear the through cover, the explosive charge means being disposed inside the container adjacent to the through cover for causing the shock wave developed by the explosive charge means to travel along the first axis, thereby reducing to a minimum singular pressure drops in the container.

4,637,473

FIRE SUPPRESSION SYSTEM

Joseph P. Gillis, Westboro, and Norval M. Jess, Wrentham, both of Mass., assignors to Kidde, Inc., Saddle Brook, N.J.

Filed Jan. 16, 1986, Ser. No. 819,393
Int. Cl.[4] A62C 37/04
U.S. Cl. 169—61 20 Claims

1. A fire suppression system comprising:

an enclosure for receiving particulate matter and defining an inlet opening and an outlet opening;

an input duct connected to said inlet opening;

air moving means for forcing air through said input duct into said enclosure, and out of said outlet opening;

inlet sensor means providing an inlet output signal dependent on the inlet temperature of combined gas and particulate matter entering said enclosure through said inlet opening;

outlet sensor means providing a discharge output signal dependent on the outlet temperature of air discharged through said outlet opening;

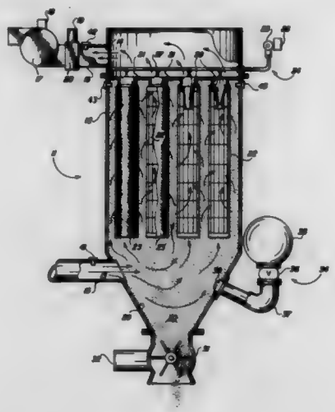
difference circuit means receiving said inlet and discharge output signals and providing a difference signal in response to a predetermined minimum difference therebetween;

a supply of fire extinguishing agent;

an actuator means operable to release said agent into said enclosure;

detector means for providing a detection signal in response to the presence of combustion products within said enclosure; and

control circuit means receiving said detection signal and said



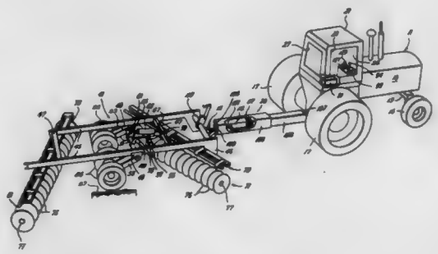
difference signal; said control circuit means adapted to deactivate said air moving means in response to said difference signal and to activate said actuator means to release said agent in response to said detection signal.

4,637,474

TRACTOR AND TOWED IMPLEMENT WITH ELEVATION CONTROL SYSTEM FOR IMPLEMENT INCLUDING PRESSURE RESPONSIVE VALVE ACTUATOR

Willie B. Leonard, 5902 Royalton, Houston, Tex. 77081

Continuation-in-part of Ser. No. 232,868, Feb. 9, 1981, abandoned, and a continuation-in-part of Ser. No. 33,036, Apr. 29, 1979, Pat. No. 4,355,506, said Ser. No. 232,868, is a continuation-in-part of Ser. No. 828,045, Aug. 26, 1977, Pat. No. 4,227,440, which is a continuation-in-part of Ser. No. 772,560, Feb. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 622,760, Oct. 15, 1975, Pat. No. 4,094,229, which is a continuation-in-part of Ser. No. 521,036, Nov. 5, 1974, Pat. No. 4,046,059, which is a continuation-in-part of Ser. No. 489,829, Jul. 18, 1974, Pat. No. 3,988,966. This application Dec. 29, 1983, Ser. No. 566,755
Int. Cl.[4] A01B 63/112
U.S. Cl. 172—7 27 Claims



8. Automotive apparatus comprising

a tractor,

a towed implement including a tool,

connection means connecting the implement to the tractor,

means including a hydraulic motor for adjusting the elevation of the tool relative to the earth's surface,

a source of hydraulic fluid under pressure,

a reservoir,

valve means for selectively connecting the motor to the source and reservoir,

hydraulic line means having a drooping pressure versus flow characteristic,

motive means responsive to the pressure in said line means for actuating the valve means,

operator controlled vent means carried by the tractor for varying the pressure in said line means,

negative feedback vent means connected to the tool for varying the pressure of said line means, upon movement of the tool in response to movement of the operator controlled vent means, to negate the effect of the change of the pressure of said line means caused by the operator controlled vent means,

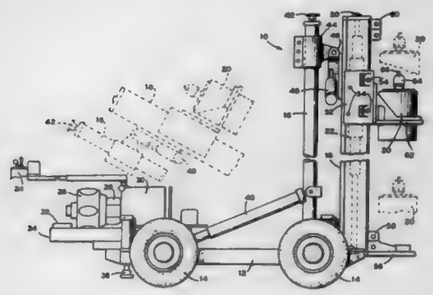
wherein said operator controlled vent means and said feedback means connected to the tool are of like construction, each including a vent valve having a body with a cylindrical bore and diametrically opposed nozzle ports in the body and a generally cylindrical rotor rotatably mounted concentric with said bore and having an undercut eccentric cylindric land extending between said ports when the vent valve is in closed position, the space between said bore and said land being connected to the reservoir.

4,637,475

IN-THE-HOLE DRILL

John R. England, and Richard L. Riach, both of Sudbury, Canada, assignors to Inco Limited, Toronto, Canada

Filed Jan. 23, 1984, Ser. No. 572,831
Claims priority, application Canada, Jan. 5, 1984, 444715
Int. Cl.[4] E21B 15/04
U.S. Cl. 173—43 10 Claims



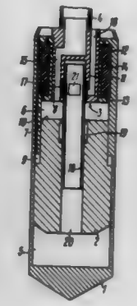
1. A mobile drilling apparatus, the apparatus comprising a frame, the frame having a distal end and a proximal end, a column pivotally mounted on the distal end of the frame, the column movable in a first arc substantially normal to the distal end of the frame, the first arc defined from a proximal lowered position to a distal upright vertical position, anchoring means disposed within the top of the column, a pivot assembly affixed on the distal end of the frame, a box frame mast supported by the column and affixed to the pivot assembly, the mast movable along the first arc in a fixed relationship with the column and along a second arc substantially normal to the first arc independently of the column, a concentric double acting cylinder mounted within the mast, a carrier slidably registered with the mast and ganged with the cylinder so as to move therewith, a stress relief trunnion engaging the cylinder, the stress relief trunnion mounted within a bracket disposed within the mast, the bracket affixed to the carrier, a drill motor affixed to the carrier, and means for securing the apparatus against movement.

4,637,476

PERCUSSIVE ACTION MACHINE FOR MAKING HOLES IN THE GROUND

Konstantin S. Gurkov; Alexandr D. Kostylev; Gennady A. Tkacheako; Ivan P. Leonov, and Vladimir V. Klimashko, all of Novosibirsk, U.S.S.R., assignors to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR, Novosibirsk, U.S.S.R.

Filed Apr. 4, 1985, Ser. No. 720,285
Int. Cl.[4] E21B 1/00
U.S. Cl. 173—136 5 Claims



1. A percussive action machine for making holes in the ground, said machine comprising:

a cylindrical housing;

a hammer capable of reciprocations inside said housing;

a forward stroke chamber formed in said housing by said hammer;

an air-feeding line continuously communicating with said forward stroke chamber;

a return stroke chamber alternately communicating with said forward stroke chamber and with the outside;

a conduit means for communicating said return stroke chamber with said forward stroke chamber and with the outside, said conduit means positioned in said hammer;

a sleeve having an opening communicating with the outside, said sleeve secured in said housing;

a tubular control valve movable relative to said hammer and movable within and relative to said sleeve for opening and closing said opening in said sleeve to define with said sleeve an air-distributor;

a control valve moving means carried in said hammer for moving said tubular control valve to assume two extreme positions relative to said hammer, in one of which positions said return stroke chamber communicates through said conduit means in said hammer and through said valve in said air-distributor with the outside, whereas in the other extreme position said valve provides communication between said air feeding line and the forward stroke chamber;

said forward stroke chamber defined between end faces of said sleeve and said hammer;

said conduit means in the form of at least one bore provided in said hammer in line with its axis;

said tubular control valve communicating with said conduit means and extending through said forward stroke chamber;

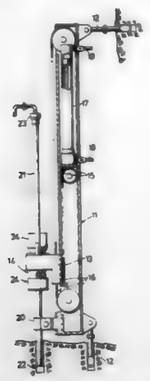
at least one hole provided in the wall of said tubular control valve wherethrough said return stroke chamber communicates with said forward stroke chamber and with the outside.

4,637,477

DEVICE IN ROCK DRILLING MACHINES

Nils G. Jonsson, Tiby, Sweden, assignor to Craelius AB, Marsta, Sweden

Filed Jan. 13, 1985, Ser. No. 696,924
Claims priority, application Sweden, Feb. 3, 1984, 8400574
Int. Cl.[4] B23Q 5/00
U.S. Cl. 173—149 **12 Claims**



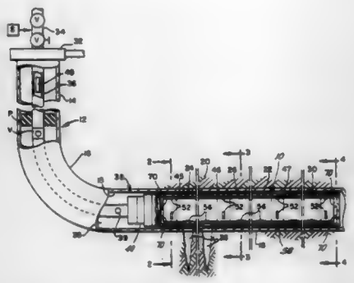
1. Device in rock drilling machines with a gripping device which is rotatably mounted in a non-rotating drilling head and intended to grip a drill string for transferring rotational and axial movements thereto, characterized in that the gripping device (**24**) is hydrostatically mounted (**42, 43, 45–49**) in the drilling head (**14**) whereby the pressure in a pressurized fluid between their coacting bearing surfaces (**42, 43**) automatically increases for increased loading pressure between these surfaces, the hydrostatic mounting including a chamber (**38, 39**) between coacting and mutually relatively rotating first surfaces on the gripping device and the drilling head, said chamber being supplied with pressurized fluid from a pressurized fluid source for further distribution to the bearing surfaces (**42, 43**), and also a variable constriction gap (**49**) proportional to the axial pressure on the drill string (**21**) in conjunction with coacting and mutually relatively rotating second surfaces on the gripping device and drilling head, the pressurized fluid being taken away from the bearing surfaces via said constriction gap.

4,637,478

GRAVITY ORIENTED PERFORATING GUN FOR USE IN SLANTED BOREHOLES

Flint R. George, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 436,075, Oct. 20, 1982, abandoned.
This application Aug. 7, 1985, Ser. No. 763,108
Int. Cl.[4] E21B 43/117
U.S. Cl. 175—4.51 **11 Claims**



1. A tubing conveyed perforating gun assembly for connection to a tubing string to enable the gun to be run downhole into a slanted borehole and detonated in order to perforate the wall of the borehole in a predominantly downward direction including:

a housing secured to said tubing string;

a charge carrier having a plurality of shaped charges therein oriented to fire in a pattern encompassing less then 180 degrees;

a gun firing head connected to detonate the shaped charges of the charge carrier;

means for actuating the gun firing head; and

spaced journal means supporting said charge carrier in low friction relationship relative to the housing;

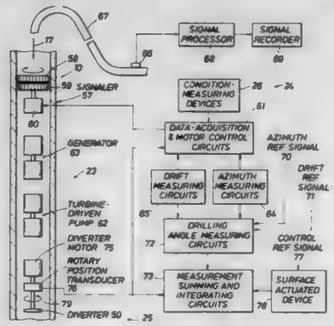
wherein the center of gravity of said charge carrier is displaced from the axis of said journal means in the direction of said firing pattern to cause said shaped charges to gravitate into a position which orients the charges predominantly downwardly so that the penetration, when the charges are detonated, occurs in a downward direction and said charge carrier is received within the housing which, in turn, isolates said charge carrier and said journal means from the wellbore.

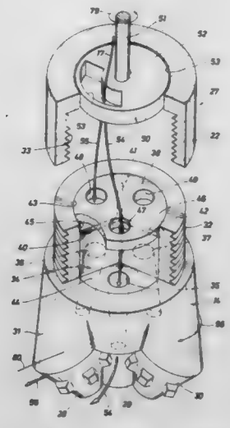
4,637,479

METHODS AND APPARATUS FOR CONTROLLED DIRECTIONAL DRILLING OF BOREHOLES

Lawrence J. Leising, Rosenberg, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed May 31, 1985, Ser. No. 740,110
Int. Cl.[4] E21B 7/08
U.S. Cl. 175—26 **22 Claims**





1. Apparatus adapted for controlling the direction in which a borehole is being excavated and comprising:

a body adapted to be coupled to rotatable earth-boring apparatus and dependently supported in a borehole from a tubular drill string in which a drilling fluid is circulating;

first means cooperatively arranged on said body and adapted for dividing a drilling fluid circulating in a tubular drill string supporting said body into at least two fluid streams to be respectively discharged from rotating earth-boring apparatus coupled to said body and into angularly-spaced sectors of a borehole being excavated; and

second means cooperatively arranged on said body and adapted upon rotation of a rotatable earth-boring apparatus coupled to said body to be either selectively operated for sequentially discharging each of such fluid streams into at least two angularly-separated borehole sectors to direct said body along a first course of excavation or selectively operated for sequentially discharging each of such fluid streams into only a single borehole sector to direct said body along a second course of excavation.

15. A method for selectively excavating an inclined borehole with rotatable earth-boring apparatus suspended from a tubular drill string having a drilling fluid circulating therethrough, said earth-boring apparatus having a plurality of fluid passages respectively arranged therein for discharging a stream of said drilling fluid into an adjacent sector of said inclined borehole as said earth-boring apparatus is being advanced, and comprising the steps of:

determining the azimuthal direction and angular inclination in which said earth-boring apparatus is advancing in said inclined borehole;

whenever said earth-boring apparatus is advancing in a selected azimuthal direction, discharging said drilling fluid in a controlled sequence from each of said fluid passages as said earth-boring apparatus is rotating for selectively directing said streams of drilling fluid into angularly-separated sectors of said inclined borehole to advance said earth-boring apparatus further in said selected azimuthal direction as it continues to excavate said inclined borehole;

whenever said earth-boring apparatus is advancing at a selected angular inclination, discharging said drilling fluid in a controlled sequence from each of said fluid passage as said earth-boring apparatus is rotating for selectively directing said streams of drilling fluid into angularly-separated sectors of said inclined borehole to advance said earth-boring apparatus further at said selected angular inclination as it continues to excavate said inclined borehole;

whenever said earth-boring apparatus is not advancing in said selected azimuthal direction, discharging said drilling fluid in a controlled sequence from each of said fluid passages as said earth-boring apparatus is rotating for selectively directing said streams of drilling fluid into only a single selected sector of said inclined borehole to divert said earth-boring apparatus toward said selected azimuthal direction as it continues to excavate said inclined borehole; and

whenever said earth-boring apparatus is not advancing at said selected angular inclination, discharging said drilling fluid in a controlled sequence from each of said fluid passages as said earth-boring apparatus is rotating for selectively directing said streams of drilling fluid into only a single selected sector of said inclined borehole to divert said earth-boring apparatus toward said selected angular inclination as it continues to excavate said inclined borehole.

4,637,480

AZIMUTH MEASURING METHOD FOR NON-VERTICAL DRILLING

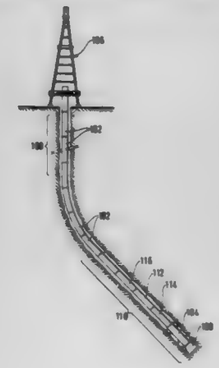
Georges Obrecht, Seyssins, and Claude Dreuilhe, Saint Ismier, both of France, assignors to Alsthom, France

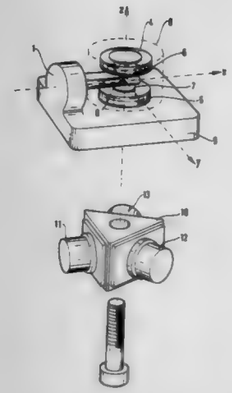
Filed Sep. 9, 1985, Ser. No. 773,728
Claims priority, application France, Sep. 7, 1984, 84 13764
Int. Cl.[4] E21B 7/06
U.S. Cl. 175—45 **10 Claims**

1. Azimuth measuring method for non-vertical drilling using a tool disposed at the lower end of a drill pipe string consisting of a succession of drill pipes and which transmits force and rotates during drilling, comprising the operations of:

producing a gravitational phase reference signal using a member responsive to gravity and a rotating system disposed in a tubular section of the drill pipe string constituting a measuring section and having an axis locally coincident with the drill-hole, this signal being synchronized to the angular position of said system relative to the vertical plane through said axis,

producing by means of a member fastened to said rotating system and responsive to the ambient magnetic field in said section a magnetometric signal synchronized to the angular position of said system relative to said ambient magnetic field, said section consisting of a non-magnetic material so that said ambient magnetic field is not excessively different to the local terrestrial magnetic field,





measuring the phase of said magnetometric signal relative to said gravitational phase reference signal to produce a phase indication, and

using the result of this measurement to determine the azimuth of the measuring section axis relative to magnetic north, in which method:

said gravitational phase reference signal and said magnetometric signal are produced while said drill pipe string is rotating, so as not to interrupt drilling, rotation of said drill pipe string rotating said measuring section which rotates about its axis and constitutes said rotating system,

said drill pipes are of ferromagnetic steel on either side of said measuring section so as to combine low cost with high mechanical strength and to be magnetized by the local terrestrial magnetic field and create in said measur-

ing section a parasitic induced magnetic field, means such as the tubular shape of the ferromagnetic steel drill pipes for cancelling any component of said parasitic induced magnetic field perpendicular to the axis of said measuring section, and wherein said operation of producing said magnetometric signal entails measuring at least one component of said ambient magnetic field along a magnetometric axis associated with said section and perpendicular to its axis to determine variations in said component in order to provide at least one magnetometric signal which is independent of said induced magnetic field and which is independent of the field of any permanently magnetic parts in said measuring section and which alternates at the period of rotation of said drill pipe string, said method further comprising the steps of:

measuring the angle of inclination of the axis of said measuring section relative to the vertical to provide an inclination indication representative of this angle, and

combining said phase indication and said inclination indication with a predefined magnetic field inclination indication representative of the inclination of the terrestrial magnetic field at the drilling site to produce an azimuth indication representative of the angle between the vertical plane through the axis of said measuring section and the vertical plane of the terrestrial magnetic field.

4,637,481

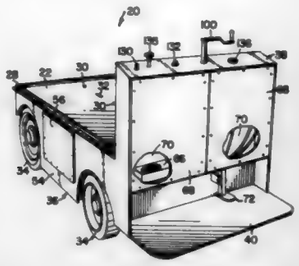
SELF-PROPELLED SCALE TESTING VEHICLE

Roger E. Shoemaker, Rt. 1, Box 87, Webster, S. Dak. 57274

Continuation of Ser. No. 552,671, Nov. 17, 1983, abandoned. This application May 7, 1986, Ser. No. 861,632

Int. Cl.[4] G01G *19/52*

U.S. Cl. 177—50 **7 Claims**



1. A self propelled test weight vehicle for calibrating a weighing scale having a weighing scale deck with a width of substantially ten feet or more; said test weight vehicle comprising:

(a) a platform supported above the surface of the ground by four wheels, said platform including a generally horizontal top surface portion, a plurality of calibration weights of varying sizes, said platform being configured for supporting varying numbers and sizes of said calibration weights, a rail structure being positioned about a major portion of the perimeter of said platform for retaining said calibration weights, the test weight vehicle having a wheel base width of less than one-third the width of the weighing scale deck whereby corners of the weighing scale deck can be calibrated;

(b) a DC motor interconnected to the front two wheels on said platform by a direct drive mechanism;

(c) a DC battery power supply electrically interconnected to said DC motor and providing power to said DC motor;

(d) a mechanical brake assembly interconnected to said direct drive mechanism, said brake assembly including a drum and a shoe assembly;

(e) a mechanical steering mechanism interconnected to the back two wheels, said steering mechanism including a chain and sprocket assembly;

(f) an operator platform provided proximate the back end of the vehicle;

(g) operator controls for braking and steering positioned proximate the back end of the vehicle within easy reach of the operator; and

(h) compartment being provided within said vehicle adapted for receipt of varying amounts of weight, the test weight vehicle itself having a substantially constant weight which can be changed by addition or deletion of the calibration weights whereby the test weight vehicle itself need not be calibrated each time it is used to calibrate a weighing scale.

4,637,482

HYDRAULIC SYSTEM IN WORKING VEHICLES

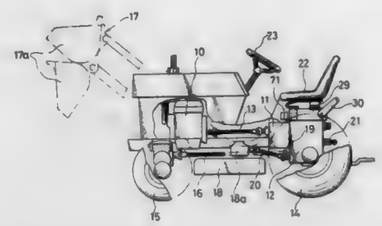
Ryota Ohashi, Sakai; Masahisa Kawamura, and Jiro Shibata, both of Amagasaki, all of Japan, assignors to Kanzaki Kokyukoki Mfg. Co. Ltd., Amagasaki, Japan

Filed Feb. 10, 1986, Ser. No. 827,952

Claims priority, application Japan, Mar. 29, 1985, 60-46488[U]

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—132 **4 Claims**



1. In a working vehicle comprising a hydraulic power steering mechanism, including a power cylinder, and a hydraulic lift mechanism including a lift cylinder, said power cylinder and said lift cylinder being powered by a single pump driven by engine, a hydraulic system comprising:

a flow control valve means (**47**) having an inlet port (**48**) connected to said pump (**43**) via a fluid supply path (**44**), a first outlet port (**49**) connected to said power cylinder (**25**) and a second outlet port (**50**) connected to said lift cylinder (**31**), said control valve means including therein an orifice (**51**) incorporated between said inlet port and said first outlet port and a relief valve (**52**) incorporated between said inlet port and said second outlet port,

said relief valve being fashioned such that, while fluid pressure in the upstream thereof is applied against biasing of a valve spring (**53**) thereof as a pilot pressure, fluid pressure in the downstream of said orifice is applied as another pilot pressure opposing said pilot pressure so that inflow flowing into said inlet port is divided into a constant flow directed towards said power cylinder through said first outlet port and a surplus flow in excess of said constant flow directed towards said lift cylinder through said second outlet port, said constant flow being determined by the flow area of said orifice and by the biasing force of said valve spring;

a piston (**54**) disposed coaxially with said valve spring (**53**) of said relief valve (**52**) and receiving the base end of said valve spring, said piston being movable axially within a predetermined range so as to vary the biasing force of said valve spring; and

another orifice (**55**) incorporated in said fluid supply path (**44**) between said pump (**43**) and said flow control valve means (**47**),

fluid pressure in the upstream of said another orifice being applied to said piston (**54**) so as to urge said piston towards said valve spring (**53**) and fluid pressure in the downstream of said another orifice being applied to said piston so as to urge said piston away from said valve spring, flow area of said another orifice being preset so that said piston is moved from its one end position to its another end position by pressure differential caused across said another orifice within a predetermined low speed range of said pump (**43**).

4,637,483

STEERING CHARACTERISTIC CONTROLLER FOR A POWER STEERING SYSTEM

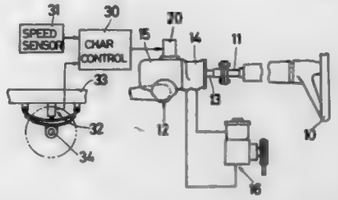
Kunihiko Eto, Toyota; Shigeo Iwashita, and Tsutomu Matsumoto, both of Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 22, 1985, Ser. No. 800,724

Claims priority, application Japan, Nov. 23, 1984, 59-248306; Dec. 6, 1984, 59-258800

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—142 **10 Claims**



1. A steering characteristic controller for a power steering system wherein an actuator is provided for varying the characteristic of an assisting power generated by a power steering gear, and wherein the electric current applied to said actuator is varied based upon both of a vehicle speed signal from vehicle speed sensing means and a vehicle load signal from vehicle load sensing means indicative of one of weight ranges of the weight of a load carried by the vehicle so as to control the operation of said actuator, said controller comprising:

signal converting means responsive to said vehicle speed signal from said vehicle speed sensing means for converting said vehicle speed signal into a signal corresponding thereto;

gain adjusting means responsive to said vehicle load signal from said vehicle load sensing means for varying the output gain of said signal output from said signal converting means in corresponding to the magnitude of said vehicle load signal;

wherein said gain adjusting means comprises:

an additional signal generator for generating an additional signal whose magnitude varies in a predetermined cycle;

a signal synthesizer for synthesizing said vehicle load signal from said vehicle load sensing means with said additional signal from said additional signal generator; and

conversion coefficient adjusting means responsive to a synthesized signal from said signal synthesizer for adjusting the conversion coefficient of said signal coverting means so as to enable said voltage signal from said signal converting means to vary in a stepped manner; and

drive circuit means connected to said actuator for driving the same in response to said signal from said signal converting means.

4,637,484

HYDRAULIC CONTROL APPARATUS FOR A POWER STEERING DEVICE

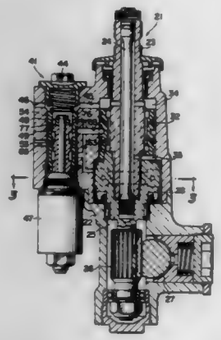
Weichiro Ijiri, Osaka, and Shuzo Hirakushi, Nara, both of Japan, assignors to Koyo Jidoki Kabushiki Kaisha, Nara, Japan

Filed Apr. 22, 1985, Ser. No. 725,422

Claims priority, application Japan, Apr. 20, 1984, 59-79867

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—142 **12 Claims**



1. A hydraulic control apparatus for a handle steering force control system of an automobile having a power steering device for assisting a steering force of the steering handle by a pressurized fluid from a fluid pump and a hydraulic reaction chamber for applying a force opposite the steering force of the steering handle to the steering handle by the pressurized fluid, the hydraulic control apparatus comprising:

a valve case having an inlet connected to the fluid pump, a return outlet connected to a fluid tank, a reaction outlet in communication with the hydraulic reaction chamber, a main valve outlet in communication with a main valve of the power steering device, and a resilient member provided at an end portion of the valve case;

a main spool slidably inserted into the valve case and biased in an axial direction of the valve case by the resilient member and having a first bore in communication with the inlet, a second bore in communication with the reaction outlet, a third bore in communication with the main valve outlet, variable communicating means for selectively connecting the reaction outlet and the return outlet, and an inner peripheral valve surface;

a sub-spool slidably inserted into the main spool and axially movable with respect to the main spool in response to a vehicle speed and having an outer peripheral valve surface, oil passages defined by the inner peripheral valve surface and the outer peripheral valve surface, and operative to variably open the oil passages by relative displacement between the inner and outer peripheral surfaces and to place the first bore in selective communication with the second bore or the third bore;

drive means for axially moving the sub-spool with respect to the main spool in response to the vehicle speed and operative when the vehicle speed is below a certain value to enable the oil passages to connect the first bore and the third bore whereby the fluid from the fluid pump is supplied to the main valve and to enable the variable communicating means to connect the reaction outlet and the return outlet whereby the fluid in the hydraulic reaction chamber is fed to the return outlet, and operative when the vehicle speed is above the certain value to enable the oil passages to connect the first bore and the second bore and to enable the variable communicating means to disconnect the reaction outlet and the return outlet whereby the fluid from the fluid pump is supplied to the reaction

chamber so as to increase the reaction pressure thereof; and

the main spool being responsive to the reaction pressure in the oil passages and movable against the biasing force of the resilient member when the reaction pressure reaches a predetermined value for enabling the variable communicating means to connect the reaction outlet and the return outlet.

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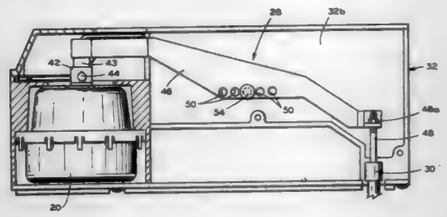
ADJUSTABLE THROTTLE CONNECTOR FOR A VEHICLE SPEED CONTROL UNIT

Jack O. Otteson, Laurinburg, N.C., assignor to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 603,494, Apr. 24, 1984, abandoned. This application Mar. 15, 1985, Ser. No. 712,542

Int. Cl.⁴ B60K *31/06*

U.S. Cl. 180—175 **15 Claims**



1. A speed control unit for controlling the actual speed of a vehicle at a desired speed, the vehicle including an engine having a throttle movable in two directions to increase and decrease the speed of the vehicle, comprising:

means for generating a signal representing the desired speed of the vehicle;

means for generating a signal representing the actual speed of the vehicle;

means responsive to said desired speed signal and said actual speed signal for moving a movable member in a speed increasing direction when the actual speed of the vehicle is less than the desired speed;

means connected between said movable member and the vehicle engine throttle for imparting movement of said movable member to the vehicle engine throttle, said connector means being connected at a first end to said movable member and at a second end to the vehicle engine throttle and including a pivot point disposed between said first and second ends about which said connector means is adapted to pivot; and

means for adjusting the point about which said connector means pivots without shifting said first and second ends relative to said movable member and the vehicle engine throttle, respectively.

4,637,486

AIR INTAKE SYSTEM AND COOLING SYSTEM RELATION FOR THREE-WHEELED MOTOR VEHICLE WITH RIDING SADDLE

Kazuhiro Iwai, Saitama, Japan, assignor to Honda Gikeu Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 3, 1985, Ser. No. 772,091

Claims priority, application Japan, Sep. 3, 1984, 59-184068

Int. Cl.⁴ B60K *13/02;* **B62D** *61/08*

U.S. Cl. 180—225 **5 Claims**

1. A three-wheeled vehicle with a riding saddle comprising:

a frame including

a head pipe, and

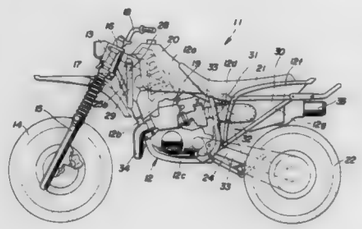
a main pipe extending rearwardly from said head pipe and having a hollow passage therethrough;

said main pipe having air inlet and outlet means on front and rear ends thereof for supplying air into and discharging air from the said hollow passage;

one front wheel and two rear wheels mounted on said frame;

a seat disposed on said main pipe;

an air cleaner connected to said air outlet means below said seat;



an air guide member disposed on one side of said front end of said main pipe for introducing external air into said air inlet means, said air guide member extending in a longitudinal direction of said vehicle;

a water-cooled engine mounted on said frame; and

a radiator disposed on an opposite side of said front end of said main pipe and connected for cooling said water-cooled engine.

4,637,487

TRACTION CONTROL DEVICE OF A MOTOR VEHICLE

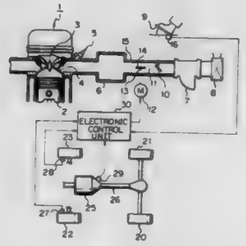
Kazumasa Nakamura, Okazaki; Ikuya Kobayashi; Takahiro Nogami, both of Toyota; Akira Shirai, Toyoake; Yoshihisa Nomura, Toyota, and Kaoru Ohashi, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 3, 1985, Ser. No. 771,774

Claims priority, application Japan, Sep. 3, 1984, 59-184768

Int. Cl.⁴ B60K *27/00*

U.S. Cl. 180—197 **20 Claims**



1. A traction control device for a motor vehicle having a plurality of wheels including at least one drive wheel, and an internal combustion engine having an intake passage and connected to said driven wheel for driving said driven wheel, said device comprising:

a manually operated throttle valve adapted to be coupled in said intake passage;

detecting means adapted for detecting a speed of rotation of said driven wheel and providing an output signal corresponding thereto;

a flow control valve adapted to be coupled in said intake passage in series with said manually operated throttle valve;

drive means for driving said flow control valve; and

electronic control means, coupled to said detecting means and said drive means, for controlling a flow area of said flow control valve in response to said output signal of said detecting means to cause the speed of rotation of said driven wheel to approach a desired speed of rotation at which a frictional force between said driven wheel and the ground reaches a maximum, when the speed of rotation of said driven wheel deviates from said desired speed of rotation during a time of acceleration of the motor vehicle.

4,637,488

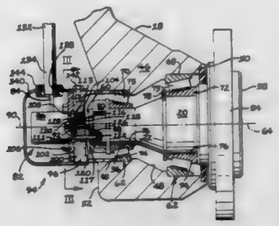
AXLE ASSEMBLY

James R. Fotheringham, Willowick, and David L. Morrow, S. Euclid, both of Ohio, assignors to Caterpillar Industrial Inc., Mentor, Ohio

Filed Sep. 12, 1985, Ser. No. 775,191

Int. Cl.⁴ B60K *17/30;* **B60T** *8/00*

U.S. Cl. 180—253 **17 Claims**



1. An axle assembly, comprising:

a housing;

an output member having a first end and being rotatably connected to said housing;

a support bracket having first and second end portions and being connected at said first end portion to the first end of said output member, said second end portion having first and second spaced apart sides, and a bore opening at said sides;

a wheel;

a spindle having first and second end portions and a longitudinal spindle axis extending between said spindle end portions, said spindle being mounted in said bore and rotatable about said spindle axis, said spindle first end portion being connected to said wheel;

a sensor having a body and an input shaft rotatably connected to said body, said input shaft having a longitudinal axis;

means for connecting the sensor body to the second end portion of the support bracket at a location adjacent the second end portion of the spindle and maintaining the axis of the input shaft within a preselected range of axially aligned positions with respect to the axis of the spindle; and

means for coupling the second end portion of the spindle to the input shaft and transferring rotational motion from the spindle to the input shaft, said coupling means including a drive portion connected to said input shaft and engageable with said spindle, said drive portion being axially and radially movable relative to the spindle second end portion.

4,637,489

ELECTROACOUSTIC TRANSDUCER

Masaya Iwanaka, Kanagawa, and Seiji Kajiwara, Tokyo, both of Japan, assignors to Nippon Chem-Con Corp., Tokyo and Hideo Koide, Aichi, both of, Japan

Filed Sep. 4, 1985, Ser. No. 772,535

Claims priority, application Japan, Sep. 4, 1984, 59-185694

Int. Cl.⁴ G10K *13/00*

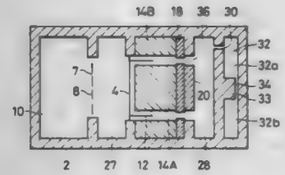
U.S. Cl. 181—160 **4 Claims**

1. An electroacoustic transducer comprising:

a diaphragm having a front side and a rear side;

a front air chamber provided on the front side of the diaphragm, said diaphragm vibrating upon receiving sound waves and producing sound waves upon vibration, said front air chamber having first through holes positioned at a first end thereof;

a back air chamber, provided on the rear side of said diaphragm and behind said front air chamber, said back air chamber being formed integrally with said front air chamber, said back air chamber being communicated with said front air chamber via said first through holes, said back air chamber having second through holes at a rear end thereof; and



an auxiliary air chamber, provided in the rear of said back air chamber and which communicates with said auxiliary air chamber by said second through holes, said auxiliary air chamber being divided into first and second smaller air chamber, said second smaller air chamber not being communicated with said back air chamber, but being communicated with said first smaller air chamber by a small orifice, said auxiliary air chamber including a bridge extending from one wall of said auxiliary air chamber toward an opposing wall to form said small orifice.

4,637,490

JELLYFISH ARRAY

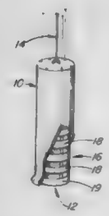
Clifford F. J. Oxner, Halifax, Canada, assignor to Her Majesty the Queen in Right of Canada, Ottawa, Canada

Filed Oct. 8, 1985, Ser. No. 785,539

Claims priority, application Canada, Apr. 11, 1985, 478941

Int. Cl.⁴ G10K *11/00;* **H05K** *5/00*

U.S. Cl. 181—175 **9 Claims**



1. An acoustic array comprising:

a container with an open bottom;

means for suspending the container;

a plurality of transducer elements positionable in a stowed condition wherein the elements are stacked inside the container, and a deployed condition in which the elements are spaced apart in a column depending from the container;

spacer means joining each adjacent pair of transducer elements to limit the separation of the adjacent elements in the deployed condition and joining the uppermost of the transducer elements to the container to limit the separation of the uppermost transducer element from the container; and

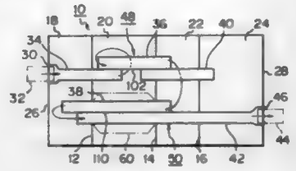
control means secured to the bottommost of the transducer elements and extending therefrom for raising and lowering the bottom most transducer element between its stacked and deployed conditions while sequentially stacking or deploying the remaining transducer elements.

4,637,491

MUFFLER FOR INTERNAL COMBUSTION ENGINE AND METHOD OF MANUFACTURING TUBES FOR USE THEREIN

Masuo Fukuda, Omiya, Japan, assignor to Sankei Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 19, 1985, Ser. No. 746,260
Claims priority, application Japan, Jun. 21, 1984, 59-127766
Int. Cl.[4] F01N *1/08*
U.S. Cl. 181—265 9 Claims



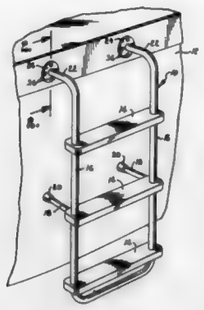
1. A muffler for use in an internal combustion engine comprising:
an enclosure generally cylindrical and having end plates for closing the internal volume of said enclosure;
at least one partition plate for dividing the internal volume of said enclosure into at least two chambers;
an inlet tube, supported by both one of said end plates and at least one partition plate, for conducting combustion gases supplied from the engine to one of said chambers;
an outlet tube, supported by both the other of said end plates and at least one partition plate, for blowing out the gases from remaining one of said chambers; and
a connecting tube supported by said at least one partition plate for interconnecting the volume of adjacent ones of said chambers;
at least two of said inlet, outlet and connecting tubes being integrally made of a single sheet of metal shaped to form a combination tube including said at least two tubes.

4,637,492

LATCH MECHANISM FOR BOAT ACCESSORIES

Richard W. Herr, 1580 52nd St., Marathon, Fla. 33050

Filed Dec. 30, 1985, Ser. No. 814,557
Int. Cl.[4] B63B *29/20*; E06C *5/24*
U.S. Cl. 182—93 20 Claims



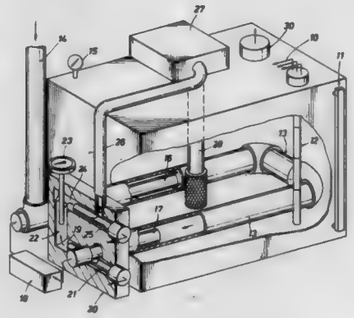
1. A latch mechanism for securing a boat accessory to a boat, said latch mechanism comprising:
a latch plate presenting a socket having a wall and an open end;
means for securing said latch plate to the boat;
a latch surface in said socket facing generally away from the open end thereof;
a tube extending from the accessory and having a tube wall terminating in an open end of the tube, said tube wall having a size and shape to closely enter the socket;
a pair of opposing latch elements carried in said tube and each having a head projecting beyond the end of the tube and presenting a shoulder for latching engagement with said latch surface;
means for mounting said latch elements to the tube for movement between a latching position and a release position, said shoulders being engageable with said latch surface in the latching position to latch the tube in the socket and said heads being passable through said socket in the release position;
yieldable means for urging said latch elements toward the latching position; and
a release element projecting from each latch element through the tube wall, said release elements being accessible to effect movement of the latch elements to the release position.

4,637,493

MIST GENERATORS

Charles W. Ehlert, Katy, Tex., assignor to Lubricating Systems Company of Texas, Inc., Houston, Tex.

Filed Apr. 17, 1981, Ser. No. 255,238
Int. Cl.[4] F01M *1/08, 5/00*
U.S. Cl. 184—55.1 6 Claims



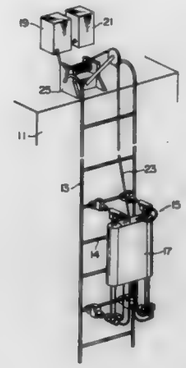
1. An oil mist lubricating system comprising:
an enclosed air-oil admixing reservoir containing liquid oil and having a mist exit opening disposed above the normal surface level of liquid oil in said reservoir;
mist generating means for admixing heated oil from said reservoir and heated air to provide an oil mist in said reservoir, said mist generating means being disposed in said reservoir above the normal surface of oil in said reservoir;
supply tube means for supplying liquid oil within said chamber to said mist generating means;
air flow conduit means which includes a conduit disposed in said chamber so as to be normally submerged in the oil when liquid oil is in said chamber, said conduit being constructed to transfer heat by convection to the liquid oil,
said air flow conduit means having an input constructed and arranged for connection to a source of air under pressure,
heater element means disposed within said air flow conduit of said conduit means for heating the air input to said conduit of said air flow conduit means and for simultaneously heating the liquid oil in said reservoir exterior of said conduit;
said air flow conduit means having an output pipe connected to said mist generator means.

4,637,494

APPARATUS FOR MOVING CARRIAGES ALONG LADDERS

Hitoshi Iida, and Ryoichi Nakayama, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Nov. 14, 1984, Ser. No. 671,419
Claims priority, application Japan, Nov. 15, 1983, 58-213390; Nov. 30, 1983, 58-225969
Int. Cl.[4] B66B *9/20*; E04G *3/14*
U.S. Cl. 187—10 14 Claims



1. Apparatus for moving along a structure having ledges comprising:
a carriage;
a plurality of gripper units operatively associated with said carriage, each one of said gripper units including grippers for gripping a ledge of said structure;
drive means for moving said carriage along said structure in one or another direction;
reciprocating means carried by said carriage for reciprocatingly extending said gripper units toward and away from said ledges;
motive means operatively associated with said gripper units for opening and closing said grippers for causing the same to grip and release said ledges;
detecting means operatively connected to said carriage for detecting positions of said ledges; and
means cooperating with said gripper units and said detecting means for halting extension of said gripper units toward said ledges when said gripper units are sufficiently close to grip one of said ledges.

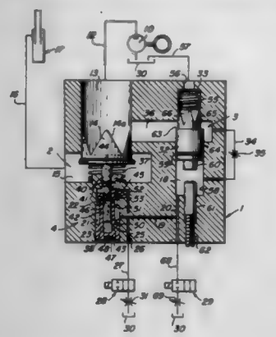
4,637,495

PRESSURE/VISCOSITY COMPENSATED UP TRAVEL FOR A HYDRAULIC ELEVATOR

Roy W. Blain, Bollinger Hofe, D-7100 Heilbronn, Fed. Rep. of Germany

Filed Oct. 9, 1985, Ser. No. 785,780
Int. Cl.[4] B66B *1/04*
U.S. Cl. 187—29 A 7 Claims

1. In an hydraulic elevator control system including a pressure fluid source (10) having a supply and a return, means including a check valve (2) connecting the supply of said source with a cylinder 17 of the elevator, and means including a by-pass valve (3) connected across said source for by-passing said check valve, said by-pass valve normally being biased by biasing means (33) to the open condition and including a by-pass chamber (18) for receiving pressure fluid from said source via a fluid restrictor (35) for displacing said by-pass valve to the closed condition against the force of said biasing means, and means including a solenoid valve (29) operable to connect said chamber with the return of said source and setting valve means (4) for controlling the operation of said check valve means as a function of the pressure of fluid in said by-pass chamber; the improvement which includes means (44,170) for mixing with the fluid supplied from said by-pass chamber to said setting valve a secondary volume of fluid that flows over



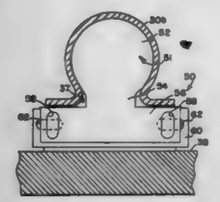
pressure and viscosity sensitive long-edged restrictor means (170).

4,637,496

ELEVATOR RAIL SYSTEM

Richard E. Atkey, Memphis, Tenn., and Oscar E. Gilliland, Nesbit, Miss., assignors to Dover Corporation, New York, N.Y.

Filed Apr. 25, 1985, Ser. No. 726,811
Int. Cl.[4] B66B *7/02*
U.S. Cl. 187—95 18 Claims



1. In an elevator system having a vertically displaceable car, a rail system for guiding said car comprising at least one rail section, omega-shaped in cross-section thereby to have a circular portion defining an interior space and terminating in a pair of oppositely extending flanges, with an elongated slot therebetween running axially the length of the rail section, and mounting means engaging the rail section for mounting the section to a building structure, wherein said mounting means comprises a plurality of bracket means, each having a first bracket portion disposed in the interior space and a second bracket portion extending through said slot to the exterior of the rail section, wherein said first bracket portion is in the form of a substantially flat plate lying at least substantially in a plane transverse to the axis of the rail section and engaging said interior wall at locations for retaining said first bracket portion against movement, relative to said rail section, in said plane, and means engaging said second bracket portion for attaching said bracket means to a building structure.

4,637,497

SELF-ENERGIZING DISC BRAKES

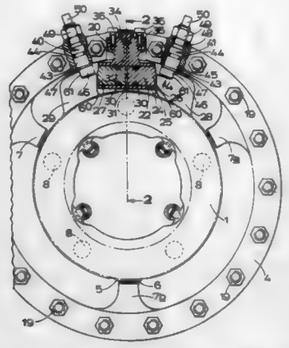
Klaus Hillen, Neuwied, Fed. Rep. of Germany, assignor to Lucas Industries, Birmingham, England

Filed Feb. 12, 1986, Ser. No. 828,785

Claims priority, application United Kingdom, Feb. 13, 1985, 8503658

Int. Cl.[4] F16D *65/46, 65/48, 65/50*

U.S. Cl. 188—71.4 7 Claims



1. A self-energising disc brake comprising a housing, first and second axially spaced braking surfaces in said housing, radial pilot lugs and a drag-taking stop abutment in said housing, first and second pressure plates centred on said pilot lugs, adjacent faces of said pressure plates being provided with co-operating oppositely inclined angularly spaced recesses, rolling bodies located in complementary pairs of said recesses, a rotatable friction member disposed between each said pressure plate and an adjacent one of said braking surfaces, each said member comprising a disc, and first and second linings of friction material for engagement with each said pressure plate and said braking surface carried by opposite faces of said discs, and means for moving said pressure plates angularly relative to said housing to initiate application of said brake with said pressure plates also moving axially to urge the friction members into engagement with said braking surfaces due to a tendency for said rolling bodies to ride up ramps defined by said adjacent faces and constituting camming means, said plates being carried round with said discs until one of said plates is arrested by the engagement of a lug on that plate with said drag-taking stop abutment, whereafter continued angular movement of the other of said plates provides a servo action, wherein said drag-taking stop abutment comprises a cam shaft rotatable in a radial bore in said housing, and a cam which is mounted on the inner end of said cam shaft to adjust the relative circumferential position of said stop abutment in response to rotation of said cam shaft.

4,637,498

SELF ADJUSTING ACTUATOR FOR VEHICLE BRAKES

Richard E. Thompson, Gwent, Wales, and Robert G. Uzzel, Redditch, England, assignors to Lucas Industries, Birmingham, England

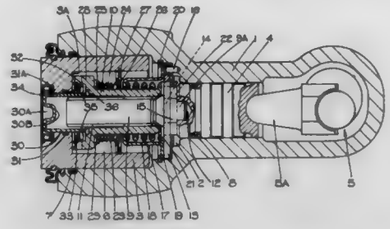
Filed Feb. 1, 1985, Ser. No. 697,509

Claims priority, application United Kingdom, Feb. 9, 1984, 8403388

Int. Cl.[4] F16D *65/56*

U.S. Cl. 188—71.9 13 Claims

1. A brake actuator, comprising: a pair of actuator components separable by the application of hydraulic pressure and associated respectively with first and second adjuster members which are interengaged by means of a reversible screw threaded connection; one of said members being rotatable and the other non-rotatable, the rotatable member being arranged to follow brake-applying movement of one of the actuator components and being movable axially relative to the other adjuster member by rotation therealong in response to excessive movement of said one actuator component; a clutch means operable under spring force normally to prevent rotation of said rotatable adjuster member until adjusting movement thereof is required; said one actuator component including an auxiliary part which is axially and rotationally movable relative to said one component and which is in fluid-tight relationship with the latter; said auxiliary part being manually operable



from an exterior of said one actuator component to drivingly engage said rotatable adjuster member, so that, by roatation of said auxiliary part, said rotatable adjuster member can be rotated relative to said one actuator component in a first direction to effect de-adjustment of the adjuster; said auxiliary part being moveable into engagement with said rotatable adjuster member for de-adjustment of said reversible screw threaded connection, and subsequently being disengaged therefrom.

4,637,499

EXPANDER MECHANISM FOR AN INTERNAL SHOE DRUM BRAKE

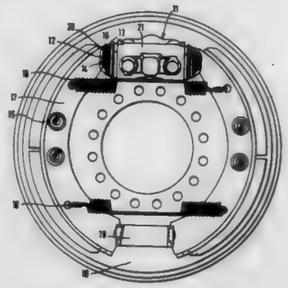
Bernd Rupprecht, Edingen-Neckarhausen, Fed. Rep. of Germany, assignor to Deutsche Perrot-Bremse GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 18, 1985, Ser. No. 777,338

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434736

Int. Cl.[4] F16D *65/24, 65/42*

U.S. Cl. 188—79.5 R 2 Claims



1. An interior shoe drum brake, comprising an expander mechanism affixed to a brake support, the expanding mechanism including opposed co-axial adjusting screws, and pressure pieces interposed between the exterior end surfaces of the respective screws and flange members of the respective brake shoes wherein the exterior end surfaces of the adjusting screws are provided with respective part-spherical inner ends of the pressure pieces, and wherein outer ends of the respective pressure pieces engage the flange members of the respective brake shoes via groove-type guide means perpendicular to the axis of the drum brake for providing wear-compensating relative movement between the brake shoes and the pressure pieces.

4,637,500

HYDRODYNAMIC COUPLING WITH SERIALLY ARRANGED DAMPER UNITS

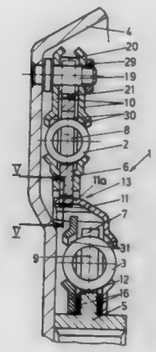
Hilmar Göbel, Schwebenried, and Harald Raab, Schweinfurt, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed May 13, 1983, Ser. No. 494,769

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218192

Int. Cl.[4] F16D *3/12;* F16H *45/02*

U.S. Cl. 192—3.28 5 Claims



1. Hydrodynamic coupling, comprising

a pump wheel (**24**) drivable in rotation about a rotation axis,

a turbine wheel (**25**) coupled fast in rotation with a drive-output shaft (**27**), said turbine wheel being arranged together with said pump wheel (**24**) rotatably coaxially in relation to said pump wheel (**24**) in a hydrodynamic fluid cycle,

a housing (**4**) enclosing said turbine wheel (**25**) and connected fast in rotation with said pump wheel (**24**),

a controllable bridge-over clutch (**23***a*) connected into a torque transmission path betwwen said housing (**4**) and said drive-output shaft (**27**),

a torsional vibration damper (**1**) arranged in said torque transmission path containing said bridge-over clutch (**23***a*),

wherein said torsional vibration damper (**1**) comprises two damper units (**2, 6, 10; 3, 7, 11 12**) arranged in series with one another in said torque transmission path, each of which comprises a separate disc part (**6; 7**) coaxial with said rotation axis, a cover part (**10; 11, 12**) axially adjacent to each said disc part (**6; 7**) and rotatable in relation thereto throught a limited angle about said axis of rotation, and several springs (**2; 3**) held in ports (**8, 30; 9, 31**) of each said disc part (**6; 7**) and of said cover part (**10; 11, 12**) and stressable in the relative rotation of each said disc part (**6; 7**) and said cover part (**10; 11, 12**), said springs (**2**) of a first (**2, 6, 10**) of said two damper units being arranged on a larger radius than said springs (**3**) of a second (**3, 7, 11, 12**) of said two damper units, and means are formed on said first damper unit (**2, 6, 10**) and on said second (**3, 7, 11, 12**) damper unit for the meshed interengement of said first damper unit with said second damper unit so that said first and second damper units are coupled for rotation with one another and said first damper unit and second damper unit being axially displaceable relative to one another.

4,637,501

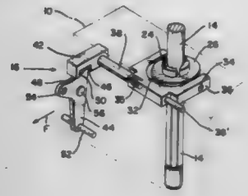
GEAR MOTOR DECOUPLING DEVICE

John C. Vaiden, Wayne, N.J., assignor to Simmonds Precision, Tarrytown, N.Y.

Filed Apr. 9, 1985, Ser. No. 721,543

Int. Cl.[4] F16D *11/04*

U.S. Cl. 192—20 6 Claims



1. A decoupling device for a gear motor comprising,

a housing,

an output shaft extending throught said housing,

a drive gear rotatably mounted on said output shaft,

a coupler member slidably mounted on said output shaft,

an overcenter spring mounted on said output shaft adjacent said coupler member,

a yoke member threadably mounted on an axially rotatable shaft means and defining a threaded joint therebetween, said yoke member being connected to said coupler member for translating movement thereto along said output shaft for coupling said drive gear therewith in one end-stop position and decoupling said drive gear therefrom in another end-stop position,

a cam-follower fixedly supported on one end of said rotatable shaft means,

a cam pivotally supported adjacent said cam-follower for angularly displacing said cam-follower to thereby rotate said rotatable shaft means and said yoke member thereon to one of said end-stop positions, wherein rotation of said rotatable shaft towards one of said end-stop positions serves to tighten said threaded joint, and

said cam-follower having spaced apart stop means for restricting the angular movement of said cam between said end-stop positions.

4,637,502

OVERLOAD RELEASE MECHANISM FOR TORQUE COUPLINGS

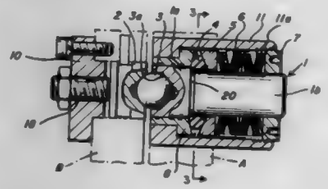
Fritz Mayr, Mauerstetten, and Manfred Dasser, Nesselwang, both of Fed. Rep. of Germany, assignors to Christian Mayr GmbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 23, 1985, Ser. No. 693,898

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 3402580

Int. Cl.[4] F16D *43/20*

U.S. Cl. 192—56 R 5 Claims



1. An overload release mechanism comprising

a control plunger,

a housing for slidably supporting said control plunger for axial displacement from an advanced coupling position to a retracted release position,

said control plunger having a first portion having a first diameter, a second portion having a second smaller diameter and an inclined annular surface joining said first and second portions,

means for maintaining said control plunger at said advanced coupling position until a predetermined axial force is applied and then permitting axial displacement of said control plunger to said retracted release position including a control ring having an inner diameter substantially the same as said second control plunger diameter,

said control ring comprising a plurality of discrete individual circumferential segments forming a substantially continuous ring when extending round said second control plunger portion,

said control ring having a first inclined surface for matingly engaging and substantially coextensive with said inclined annular control plunger surface when said control plunger is at said advanced coupling position,

a pressure ring,

said housing and said pressure ring each including an annular surface, said annular surfaces being tapered towards each other outwardly in the radial direction,

said control ring having a second annular surface for matinly engaging with said pressure ring surface, and a third annular surface for matingly engaging with said housing annular surface, and

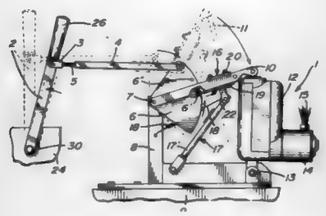
spring means for urging said pressure ring inclined surface in a direction opposite to the direction of movement of said control plunger to said retracted position against said second annular control ring surface to forcefully locate said control ring against said inclined annular control plunger surface.

4,637,503

CONTROL DEVICE FOR CLUTCH

Paul-Eugène Vohl, 1738 Principale Street, Saint-Marc des Carrières, Canada (G0A 4B0)

Filed May 3, 1985, Ser. No. 729,927
Int. Cl.[4] F16D *23/12*
U.S. Cl. 192—83 6 Claims



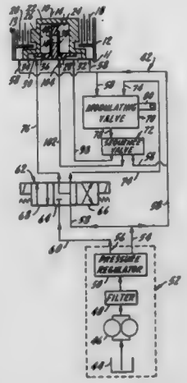
1. A control device for an over center,friction type clutch comprising a main shaft, friction type clutch plates, a floating plate for clampingly engaging said clutch plates, a sleeve axially slidable on said shaft, over center levers interconnecting said sleeve and floating plate, a thrust bearing having an inner race fixed to said sleeve, a manually-operable control lever acting on the outer race of said thrust bearing and pivotable between a first position in which said clutch plates are disengaged, and a second position in which said clutch plates are engaged through axial thrust exerted on said thrust bearing, said control lever, when released, returning to a third position intermediate said first and second positions and close to said second position to eliminate said axial thrust on said thrust bearing, said control device comprising a fixed support, a swing arm and a pivotal plate both pivoted to said support, a link member pivotally interconnecting said control lever and said pivotal plate, a power-operated means connected to said swing arm to pivot the same about said support, a pivotal plate-engaging means movably mounted on said swing arm and biased into engagement with said pivotal plate to fixedly interconnect said swing arm and said pivotal plate, a release means to release said pivotal plate-engaging means from said pivotal plate, said power-operated means actuable to pivot said swing arm, the latter in turn pivoting said pivotal plate through said pivotal plate-engaging means between a first limit and a second limit position causing said control lever to take its first position and its second position, respectively, said release means releasing said pivotal plate-engaging means from engagement with said pivotal plate when said pivotal plate reaches its second limit position to allow said pivotal plate to pivot back towards its first limit position, thereby releasing said control lever to return to its third position.

4,637,504

COMBINATION RANGE AND MASTER CLUTCH ASSEMBLY

Robert D. Rule; Bruce A. Skaggs, and Gerald E. King, all of Rockford, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 3, 1985, Ser. No. 719,406
Int. Cl.[4] F16D *25/11*
U.S. Cl. 192—87.17 13 Claims



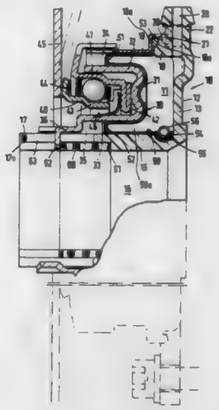
1. A combination range and master clutch assembly comprising a separator plate, first and second clutches, fluid actuated main piston means slidable relative to said separator plate for selectively engaging said first and second clutches, said separator plate and main piston means defining first and second main chambers in communication with each other, first and second fluid actuated accelerator pistons slidable relative to said separator plate and main piston means, said main piston means and first and second accelerator pistons respectively defining first and second accelerator chambers, means responsive to sliding of said accelerator pistons for blocking said communication between said main chambers, and control means for providing fluid at an operating pressure which may be modulated between low and high pressures, said control means including means for modulating said operating pressure, said control means selectively delivering fluid to said first accelerator chamber at said operating pressure when it is below a threshold pressure level, and delivering fluid to said first accelerator and first main chambers at said operating pressure when it is above said threshold pressure level.

4,637,505

FLUID-OPERATED CLUTCH DISENGAGING APPARATUS

Lothar Huber, Bühl-Altschweier, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation of Ser. No. 414,432, Sep. 2, 1982, Pat. No. 4,526,258. This application Jun. 28, 1985, Ser. No. 750,747
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136548
The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.
Int. Cl.[4] F16D *23/14, 25/08*
U.S. Cl. 192—88 A 12 Claims



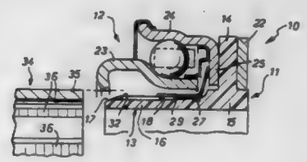
7. A fluid-operated disengaging apparatus for clutches, particularly for the clutches of automotive vehicles, comprising a housing having an open side and including inner and outer walls defining a chamber; a hollow annular piston axially reciprocably received in said housing; means for preventing radial movements of said piston relative to said housing; and a throw-out bearing installed in said hollow piston and arranged to share the axial movements of said piston relative to said housing, said bearing being movable radially of said piston and having rolling elements which are at least partially confined in said piston.

4,637,506

CLUTCH RELEASE BEARING AND ASSEMBLY TOOL FOR SAME

René Billet, Lamorlaye, France, assignor to Valeo, Paris, France

Filed Jun. 1, 1984, Ser. No. 616,277
Claims priority, application France, Jun. 2, 1983, 83 09145
Int. Cl.[4] F16F *1/34;* B25B *27/30*
U.S. Cl. 192—110 B 11 Claims



1. Assembly tool for assembling a clutch release bearing of the type comprising a maneuvering member adapted to be acted on by a control member, a drive member responsive to the maneuvering member to operate the clutch release device of a clutch, two transverse shoulders on the maneuvering member facing each other in the axial direction and an axially acting spring washer for retaining the drive member to the maneuvering member in the axial direction to bear on a first of the shoulders on the maneuvering member and to bias the drive member in the axial direction against a second of the shoulders, the spring washer having axial lugs with free ends for bearing on the first shoulder, and circumferentially spaced axial grooves extending through the first shoulder and accessible from the end of the maneuvering member remote from the second shoulder; said assembly tool being of unitary construction and annular configuration and comprising circumferentially spaced axial rib means for sliding movement in the axial grooves of a clutch release bearing maneuvering member to engage free ends of the axial lugs of a clutch release bearing spring washer to flex the lugs over the first shoulder of a clutch release bearing maneuvering member and into axial abutment with the first shoulder.

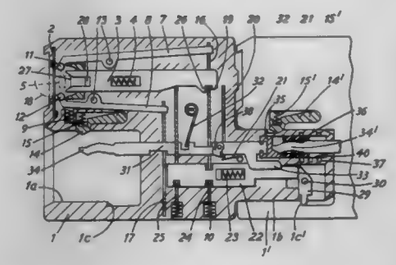
4. clutch release bearing comprising a maneuvering member to be acted on by a control member, a drive member responsive to said maneuvering member to operate a clutch release device of a clutch, two transverse shoulders on said maneuvering member facing each other in the axial direction, and an axially acting spring washer retaining said drive member to said maneuvering member in the axial direction, said spring washer bearing on a first of said shoulders on said maneuvering member to bias said drive member in the axial direction against a second of said shoulders, said spring washer ahving circumferentially spaced axially extending lugs engageable with said first shoulder, circumferentially spaced axial grooves extending through said first shoulder and accessible from the end of said maneuvering member axially remote from said second shoulder.

4,637,507

COIN LOCK DEVICE FOR SHOPPING TROLLEYS

Jacques Ricouard, Sancoins, and Claude Chappoux, Mornant; both of France, assignors to Ronis S.A., Lyons, France

Filed Mar. 27, 1985, Ser. No. 716,867
Int. Cl.[4] G07F *17/10*
U.S. Cl. 194—212 11 Claims



1. A coin lock device comprising

(a) a housing formed with an aperture for the reception of a protruding element of an identical coin lock device,

(b) a protruding element extending from said housing serving to engage an aperture of an identical coin lock device,

(c) a locking mechanism within said housing having a locking member extending into the aperture of said lock device effecting locking together of said coin lock device and an identical coin lock device when said aperture of the coin lock device is in reception of the protruding element of the identical coin lock device,

(d) a coin operated mechanism for releasing said locking mechanism on insertion of an appropriate coin,

(e) means for releasing said coin on introduction of a protruding key element of an identical coin lock device,

(f) an elongated slide piece within said housing,

(g) a key element profiled with raised and recessed portions,

secured to said slide piece at one end thereof and extending from within said housing into the aperture in said housing

(h) a spring urging said slide piece in one direction,

(i) a cylinder core slidably movable within a bore in said housing and secured to the other end of said slide piece, and

(j) tumblers disposed transversely of the longitudinal axis of the bore and engageable with apertures formed in the wall of the bore when said core is in a rest position, said tumblers being capable of being pushed out of engagement with said apertures by the introduction of a protruding key element of an identical coin lock device into the cylinder core, whereupon said core is movable against the influence of said spring to effect release of said locking mechanism.

4,637,508

APPARATUS FOR CARRYING AND SEPARATING ARTICLES

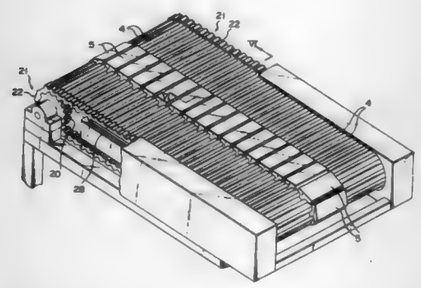
Kunio Kikuchi, Minami-ashigara; Fujio Kamada, Atsugi, and Masao Osawa, Isehara, all of Japan, assignors to Anritsu Electric Company Limited, Tokyo, Japan

Filed Jun. 12, 1985, Ser. No. 743,758

Claims priority, application Japan, Jun. 18, 1984, 59-124873

Int. Cl.⁴ B65G *47/46*

U.S. Cl. 198—365 **6 Claims**



1. An apparatus for carrying and separating articles, comprising:

a pair of parallel carrying means;

a plurality of carrying rods bridging said pair of carrying means;

a number of carriers each provided between adjacent ones of said carrying rods for relative sliding movement; and

separating means for moving said carriers in transverse directions;

wherein each said carrying means includes:

an endless belt with teeth formed of an elastic material, a core embedded in said elastic material, said core being flexible but substantially incapable of elongation or contraction in the length direction, a plurality of pins projecting from the inner side surface of said belt, and opposite ends of said carrying rods are mounted on said belts by said pins;

each of said pins has an embedded portion and an engaged portion, said embedded portion being embedded in a region of the associated belt not occupied by the core, said engaged portion being fitted in an end of the associated carrying rod; and

said embedded portion of each pin has a crescent sectional profile, a plane surface of said embedded portion corresponding to the chord of the crescent section is in close contact with one surface of said core, and a stepped portion is provided in each pin in a region connecting said embedded portion and the remaining part of the pin, said stepped portion abutting said inner side surface of each belt.

4,637,509

ARTICLE GROUPER FOR CASE PACKER

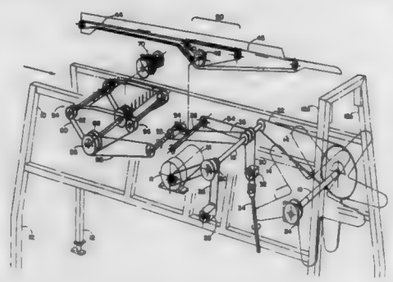
John L. Randat, North Madison, and Timothy H. Thompson, Durham, both of Conn., assignors to Standard-Knapp, Inc., Portland, Conn.

Continuation-in-part of Ser. No. 565,754, Dec. 27, 1983, Pat. No. 4,552,261. This application Jun. 28, 1985, Ser. No. 750,340

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.⁴ B65G *47/26*

U.S. Cl. 198—425 **4 Claims**



1. In a conveyor system wherein side-by-side columns of articles are to be grouped for handling in a packer or the like, the combinaton comprising several side-by-side infeed plate conveyors for moving the columns of articles in a downstream direction, lane guides provided between said plate conveyors to maintain the integrity of the article columns, a plurality of side-by-side conveyor chains, projecting pins carried by said chains, variable speed drive means for moving one of said chains at a speed which varies cyclically as the chains follow a closed orbit that includes an upper run oriented so that the pins moved in the same path and in the same direction as the advancing articles, differential means coupling said one chain to another of said chains so that said pins move in the same orbit but it is speed which varies inversely to that of said one chain and pins, said pins provided in staggered relationship to one another in said orbit to provide a predetermined pitched distance between said pins as they move along said upper run, said pitched distance between pins and said conveyor chains varying cyclically between maximum and minimum limits, means for adjusting said differential means to provide a desired spread or difference between said maximum and minimum pin pitch limits, the individual flat plate conveyor means moving the columns of articles toward said upper runs of said conveyor chains where the articles are decelerated to the plate conveyor by the projecting pins, and said flat plate conveyor is also serving to accelerate the groups of articles away from the pins in order to provide a desired spacing therebetween.

4,637,510

LINE PANS

James E. Tomlinson, Barnsley, England, assignor to Anderson Strathclyde PLC, Glasgow, Scotland

PCT No. PCT/GB83/00244, § 371 Date Jun. 1, 1984, § 102(e) Date Jun. 1, 1984, PCT Pub. No. WO84/01359, PCT Pub. Date Apr. 12, 1984

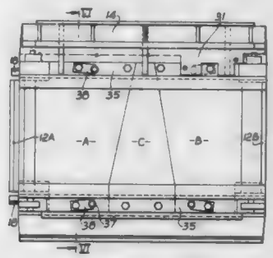
Continuation of Ser. No. 617,999, Jun. 1, 1984, abandoned. This PCT application Sep. 30, 1983, Ser. No. 859,854

Claims priority, application United Kingdom, Oct. 2, 1982, 8228202

Int. Cl.⁴ B65G *19/28*

U.S. Cl. 198—735 **9 Claims**

1. A line pan for an AFC conveyor comprising a pair of sigma-section sides parallel and transversely spaced, a deck plate between the sides and a base plate to which the sides are attached, characterised in that the upper part of each sigma-section side and the deck plate are removably attached to the lower parts of the sigma-section sides and the base plate, said deck plate having a transverse slidable coplanar section supported for sliding movement out of an opening formed between the upper and lower parts of at least one sigma-section side for inspection of line pan conveyor components below such base plate slidable section.



4,637,511

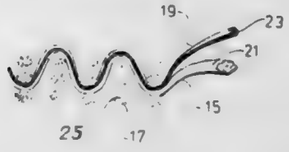
LONGER LASTING WOVEN POLYARAMIDE BELTING FOR HIGH TEMPERATURE APPLICATIONS

Charles E. Johnson, East Aurora, and Richard W. New, Tonawanda, both of N.Y., assignors to Buffalo Weaving and Belting Company, Buffalo, N.Y.

Continuation-in-part of Ser. No. 340,845, Jan. 30, 1982, abandoned. This application Dec. 12, 1984, Ser. No. 680,905

Int. Cl.⁴ B65G *15/30*

U.S. Cl. 198—846 **11 Claims**



1. Woven flexible belting, suitable for conversion to conveyor belting of increased cut resistance, heat resistance, and strength, and longer operating life, comprising warp and fill textile threads and yarns, which threads and yarns are of polyaramide condensation product of terephthalic acid and 1,4-diaminobenzene, and a plurality of unbraided and unfilled separate thermally conductive metal binder wires distributed over the belting width, running longitudinally and extending to a plane between a major surface of the belting and 1 mm. past such surface, with the binder wires each having 4 to 20 filaments therein, and being a distance apart in the range of 1.5 to 5 mm., with 5 to 20% of the lengths of such binder wires projecting to or beyond the major belting surface and with such wires extending about 10 to 80% throught the belting, so that they extend to or beyond one major surface of the belting, but not the other.

4,637,512

TOOTHPICK DISPENSER

Forrest D. Smith, P.O. Box 3784, Eureka, Calif. 95501

Filed Aug. 30, 1985, Ser. No. 771,065

Int. Cl.⁴ B65D *85/28*

U.S. Cl. 206—103 **20 Claims**

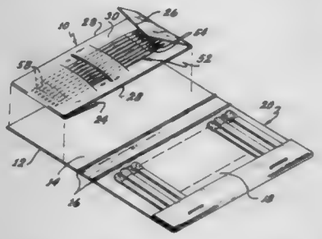
1. A toothpick dispenser useful for attachment to a matchbook cover comprising:

an elongated sheet of thin pliable material having a top side, an underside, two side edges and two ends;

first and second fold lines dividing said sheet into an upper flap, a lower flap and a main panel intermediate said flaps;

first, second and third cuts in said main panel terminating short of said side edges;

said lower flap being folded against the underside of said main panel to define a pocket for receiving the lower ends of toothpicks inserted through said first cut;



said second and third cuts defining a retainer band for holding an intermediate portion of toothpicks inserted thereunder flat against the top side of said main panel;

said upper flap being foldable over the upper ends of the toothpicks and against the topside of the main panel.

4,637,513

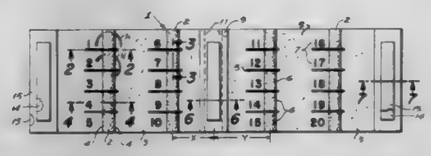
DISPOSABLE SURGICAL IMPLEMENT COLLECTOR

John D. Eldrige, Jr., Newport Beach, Calif., assignor to Instrumetics, Inc., Tustin, Calif.

Continuation of Ser. No. 6,732, Jan. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 940,399, Sep. 8, 1978, abandoned. This application Oct. 20, 1980, Ser. No. 198,827

Int. Cl.⁴ A61B *17/06*; B65D *85/24*

U.S. Cl. 206—370 **1 Claim**



1. A collector for small surgical implements comprising:

(a) a pair of collector sections hinged to a common web and relatively foldable between a coplanar and a mutually engageable position;

(b) a magnet carried by the web for receiving surgical implements;

(c) a plurality of readily penetrable spaced ribs projecting upward from said surfaces;

(d) means dividing each of the ribs into a series of embossments dimensioned to receive a surgical implement; and

(e) means attached to said collector for holding said collector sections in mutual engagement.

4,637,514

THERMOFORMED PLASTIC WRAP DISPENSER

James M. Kildea, Midland, Mich.; Maria D. Bedner, Erie, Pa., and John J. Gulick, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 12, 1985, Ser. No. 743,835

Int. Cl.⁴ B65D *13/00, 85/672*

U.S. Cl. 206—406 **13 Claims**

1. A one-piece thermoformed dispensing carton for a roll of sheet material for wrapping, comprising an elongated one-piece thermoformed body of plastic resin material including a pair of confronting hollow body shells having adjacent longitudinal edges interconnected by an integral hinge and further having confronting longitudinal edges, said body shells having pairs of elongated side walls and pairs of end walls, the end

walls being arranged in confronting pairs from one body shell to the other, the end walls of said confronting pairs having interengageable integral retaining means thereon for retaining said pairs of end walls in confronting relation, at least one of each interengageable means comprising a flange extending from the respective end wall, an integral cutter member comprising a flap having an edge elongated with said side walls and



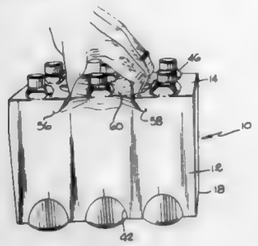
hingedly interconnected to a confronting longitudinal edge of one of said body shells by an integral hinge and overlying a side wall of that body shell and having an opposite integral serrated cutting edge of plastic resin material, and latching means on said flap interfitting with a part of said body to hold said flap in close proximity to the side wall which it overlies to hold sheet material between said flap and the side wall which it overlies.

4,637,515

WRAP-AROUND CARRIER WITH IMPROVED HANDLE

Jerry F. Wilson, West Monroe, and Richard L. Schuster, Monroe, both of La., assignors to Manville Sales Corporation, Denver, Colo.

Filed Oct. 17, 1985, Ser. No. 788,353
Int. Cl.[4] B65D 75/00
U.S. Cl. 206—434 15 Claims



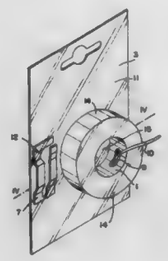
1. A wrap around article carrier, comprising:
a top panel,
a bottom panel,
side panels integral with and foldably connected to the top and bottom panels,
the top panel containing two slits extending transversely of the folds connecting the side panels to the top panel,
the slits extending across the width of the top panel and terminating in the side panels,
the slits being spaced apart a distance permitting either the thumb or the fingers of a person lifting the carrier to be inserted in either slit, and
the top panel containing at least one score line intermediate the slits and extending transversely of the folds connecting the side panels to the top panel, the portions of the top panel between the slits and the score line being adapted to fold upwardly about the score line when the carrier is lifted by the handle portion.

4,637,516

WOUND COIL OF TIE MATERIAL PACKAGED ON A DISPLAY BASE, AND A PROCESS FOR PRODUCING IT

Olivier P. R. de Roure, Rougemont le Chateau, France, assignor to Manufacture de Rougement, Paris, France

Filed Nov. 16, 1984, Ser. No. 672,482
Claims priority, application France, Nov. 23, 1983, 83 18672
Int. Cl.[4] B65D 73/00, 85/04
U.S. Cl. 206—471 13 Claims



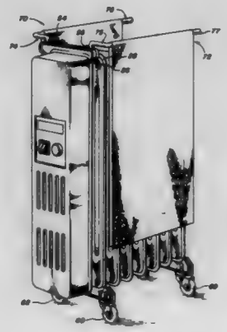
8. A wound coil of tie material packaged on a cardlike display base, the coiled tie material being held in place and surrounded by a protective sheath, the improvement comprising:
(a) said sheath consisting of a thin flexible film conforming in shape to all the visible surfaces of said coil and at least partially adhering thereto;
(b) said film continuously covering the entire surface of said card, including the area inside said coil and the area outside said coil;
(c) the only opening in said film being a hole formed therein by the end of said tie material piercing said film, as said tie material is unrolled from the inside of said coil; and
(d) means for creating a braking action for controlling the unwinding of said tie material from said coil, said means including the at least partial adherence of said film to said coil.

4,637,517

RADIATOR BRACKET

Antóuio B. Barbosa, Rua de Cabanas, 4420 Gondomar, and Joaquim C. de Campos, Rua Faria Guimaraes, 377, 4000 Porto, both of Portugal

Filed Sep. 10, 1984, Ser. No. 648,491
Int. Cl.[4] A47F 5/00
U.S. Cl. 211—86 1 Claim



1. An attachment for a portable radiator having a plurality of radiator sections, each of said sections including a vertically-oriented radiator flange which circumscribes said section, said flange having two vertically extending sides, a top side and a bottom side, comprising:

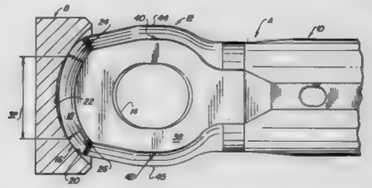
a bracket having a generally U-shaped body including two elongated, parallel and coextensive sidewalls which confront each other to define a horizontal U-shaped channel, said channel being sized for snugly and alternatively receiving and engaging the bottom and two vertical sides and the top and two vertical sides of a radiator flange, said sidewalls being integrally connected so as to form a single unit,
a socket in said body adjacent each end thereof, said socket being sized for receiving a post,
a castor having a post removably connected to said body with said post secured in said socket, whereby said castor provides mobility to a radiator when the bracket receives the bottom and two vertical sides of said radiator flange, and
a hanger having a post removably connected to said body with said post secured in said socket when the bracket receives the top and vertical sides of said radiator, whereby said hanger enables articles to be hung along the sides of the radiator.

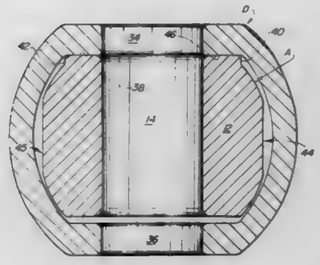
4,637,518

COUPLER FOR A RAILWAY CAR COUPLER ASSEMBLY

Richard M. Hanula, Lyndhurst, Ohio, assignor to Seher Acquisition Corp., Oakbrook Terrace, Ill.

Filed Apr. 8, 1985, Ser. No. 720,798
Int. Cl.[4] B61G 9/20
U.S. Cl. 213—64 5 Claims





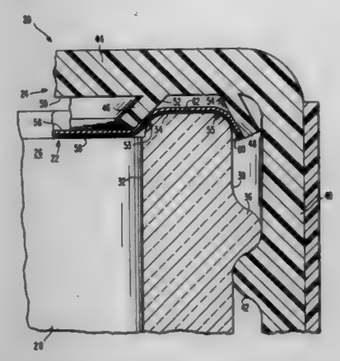
1. A coupling assembly for railway cars and the like, said assembly comprising:
a coupler body including a generally rectangular butt portion having a narrower shank portion extending therefrom; said butt portion being provided at a free end thereof opposite said shank portion with a convex surface and wherein said butt portion comprises recessed spherical corners radially outward from said convex surface; and, a follower member having a concave surface therein for receiving said convex surface, said recessed corners being configured and dimensioned to be placed in a non-contacting relationship with said concave surface for reducing wear and scoring on said butt portion free end; said convex surface having a center spherical area thereof having a radius of curvature greater than the radius of curvature of the contact face of said concave surface so that a clearance is provided between the face of said concave surface and the face of said convex surface, whereby the spherical area of said convex surface defines the initial area of positive engagement with said concave surface.
5. A coupler for a railway car coupling system including a yoke and a follower, said coupler comprising:
a coupler body including a generally rectangular butt portion having a shank portion extending outwardly from one end thereof, said butt portion having a top surface and a bottom surface, and a pair of opposed side surfaces interconnecting said top and bottom surfaces, and a pin receiving aperture communicating between said top and bottom surfaces thereof, said coupler body further including relieved portions in said top surface adjacent said pin receiving aperture for allowing limited angling and preventing wedging of said coupler in an associated coupling assembly, said relieved portions extend generally axially of said butt portion generally at the intersection of said top surface with said pair of side surfaces in generally lateral spaced relation to said pin receiving aperture such that said relieved portions face away from said pin receiving aperture.

4,637,519

TWO PART CLOSURE

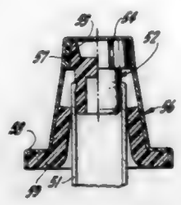
Herbert V. Dutt, and Paul A. Santostasi, both of Sarasota, Fla., assignors to Sun Coast Plastics, Inc., Sarasota, Fla.

Filed Sep. 3, 1985, Ser. No. 771,964
Int. Cl.[4] B65D 53/04
U.S. Cl. 215—232 4 Claims



1. A two part closure securable to a container having an open mouth bounded by an upper, generally planar mouth rim that extends between inner and outer edges of spaced inner and outer neck walls, respectively, said two part closure comprising:
a flexible foil sealing disk having a diameter slightly greater than the diameter of a container mouth rim and positionable generally atop a container mouth, said flexible foil sealing disk including an annular skirt portion at its edge; and
a linerless closure cap securable to a container, said closure cap having spaced downwardly extending inner and outer sealing flanges, said downwardly extending outer sealing flange contacting said annular skirt of said sealing disk and causing said annular skirt to contact an outer edge of an outer neck wall of a container, and said downwardly extending inner sealing flange contacting said sealing disk and causing said disk to contact an inner edge of an inner wall of a container when said two part closure is secured to a container, said spaced, downwardly extending inner and outer sealing flanges placing said flexible foil sealing disk in tension across a container open mouth and in intimate, positive sealing contact across a mouth rim of a container when said two part closure is secured to a container.

4,637,520
TEST TUBE PROTECTOR
Javid R. Alvi, 7970 Larwin Dr., Citrus Heights, Calif. 95610
Filed Aug. 29, 1985, Ser. No. 770,494
Int. Cl.[4] B65D *41/52*
U.S. Cl. 215—320 **3 Claims**

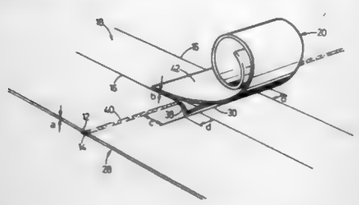


1. A test tube protector for a test tube having a side wall with an inside surface and an outside surface and defining an open mouth closed by a cap including a flange having a diameter greater than that of the test tube mouth and having a centrally extending plug of predetermined length adapted to extend through the test tube mouth and sealing by engaging the inside surface of the side wall, said test tube protector comprising:

a. a sleeve having an upper portion conformed to fit closely over the flange and a lower portion spaced from the plug, said lower portion of said sleeve being of more than the predetermined length of the plug and shaped to extend along the outside surface of the side wall with clearance therebetween, the material of said upper portion of said sleeve being laterally deformable by external radial force into firm gripping engagement with the flange to allow removal of the plug by an axial force simultaneously exerted on said upper portion of said sleeve and the flange and dislodging the plug from sealed position; and,

b. a sponge disc extending across said lower portion of said sleeve, said sponge disc being radially slit to afford a plurality of resilient fingers upwardly deformable by the test tube as said sleeve is urged downwardly over the mouth end of the test tube.

4,637,521
OPENABLE CAN BODY
Paul Opprecht, Bergdietikon; Werner Urech, Kaiserstuhl, and Jürg Opprecht, Widen, all of Switzerland, assignors to Elpatronic AG, Switzerland
Filed Jul. 11, 1985, Ser. No. 754,340
Claims priority, application Switzerland, Jul. 12, 1984, 3404/84
Int. Cl.[4] B65D *17/36*
U.S. Cl. 220—274 **9 Claims**



1. An openable can body (10) made from a sheet-metal blank (28) with

an outer and an inner longitudinal edge (12 and 14 respectively) which are welded to one another in an overlapping manner,

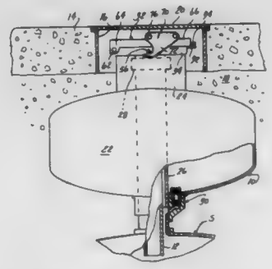
at least one pair of circumferential scorings (16), which extend around the can body (10) transversely to the longitudinal edges (12,14) and define a tearing strip laterally, and

a tongue (20) which extends the tearing strip (18) beyond the outer longitudinal edge (12),

characterized in that the inner longitudinal edge (12) and the outer longitudinal edge (14) of the blank are welded together with limited overlap to form a mash weld; and

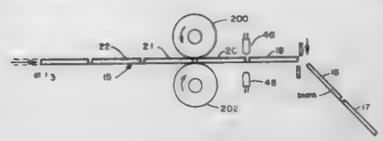
the tongue (20) is welded, as a separate sheet-metal part, to the outer longitudinal edge (12) by means of a separate weld overlying the mash weld.

4,637,522
LOCKING LID FOR OVERFILL-SPILLAGE PROTECTION SYSTEM
Elmer P. Klop, Grand Haven, Mich., assignor to Enterprise Brass Works, Inc., Muskegon, Mich.
Filed Feb. 13, 1986, Ser. No. 829,409
Int. Cl.[4] B65D *45/04*
U.S. Cl. 220—322 **4 Claims**



1. A locking lid assembly for use in closing the open top of a cylindrical stack of a spill containment chamber or the like, said locking lid assembly comprising an annular base member adapted to be seated upon the top of said stack with said base member extending around the outer periphery of said stack and projecting upwardly above the top of said stack, a cover lid mounted on said base member for hinging movement about a hinge axis extending generally tangentially of said base member between a closed position wherein said lid overlies said base member and an open position wherein said lid is hinged upwardly about said hinge axis from said closed position, resilient annular sealing means engageable between said lid and the upper surface of said base member to define a continuous annular fluid-tight seal between said lid and said base member when said lid is in its closed position, a pair of locking pins projecting radially outwardly from said base member at diametrically opposed locations, a pair of locking cams pivotally mounted at diametrically opposite sides of said lid for pivotal movement about a pivot axis parallel to said hinge axis and above the top of said lid, said cams each including an arm portion extending generally radially from said pivot axis in a first direction and a locking pin engaging cam portion radially offset from said pivot axis and angularly displaced about said hinge axis from said arm portion, said cams being pivotal, when said lid is in its closed position, between a cam release position and a locking pin engaging lock position, said arm portions of said cams when in said release position projecting upwardly above the top of said lid and said cam portions being disengaged from said locking pins to accommodate movement of said lid to its open position, said cams when in said lock position having their arm portions extending generally parallel to the top of said lid and said cam portions wedgingly engaged beneath said locking pins to compress said annular sealing means between said lid and base member.

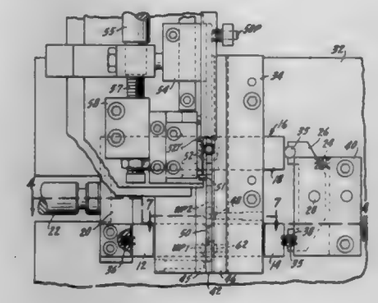
4,637,523
STAMP SCANNING AND DISPENSING MEANS AND METHOD
Joseph L. Levasseur, St. Louis County, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.
Filed Feb. 8, 1985, Ser. No. 699,470
Int. Cl.[4] G07F *11/00, 1/00*
U.S. Cl. 221—13 **57 Claims**



1. Scanning and dispensing means for use in a system for dispensing from a supply strip of serially ordered connected stamp-like items, which supply strip may contain invalid items interspersed among valid items, an output strip which includes one or more serially ordered connected items and at least one valid item for each invalid item included on such output strip, such system including means for producing dispense request signals, item movement means for effecting movement of the supply strip of items and the outputting of items contained thereon as such output strip during an item outputting operation, and item detaching means for use in effecting detachment of the output strip from the supply strip at the termination of such item outputting operation, said scanning and dispensing means comprising dispensing control means responsive to a dispense request signal to enable the item movement means and to thereby effect commencement of such item outputting operation, scanning means for sequentially optically scanning during such item outputting operation each item on the supply strip as the item passes thereby in order to detect the degree of opacity of such item and to produce a scanning output signal representative of such degree of opacity, the degree of opacity being determinative of the validity status of such item, boundary determination means operable to determine the occurrences of item boundaries as the supply strip of items passes by said scanning means and to produce a boundary detection signal when an item boundary occurs, and status detection means responsive to said scanning output signal to produce a status detection signal if the degree of opacity is representative of a particular validity status of the item, said dispensing control means responsive subsequent to such dispense request signal to productions of one or more of said boundary detection signals and status detection signals to control the operation of the item movement means and to effect the outputting on the output strip of at least one valid item for each invalid item included thereon, operation of the item movement means during the item outputting operation effecting the outputting for each item scanned of an item from the supply strip of items regardless of the scanned item's validity status, said dispensing control means operable during such item outputting operation to effect continuation of such item outputting operation if the last item scanned by said scanning means is an invalid item and to effect termination of such item outputting operation only upon the production of a boundary detection signal subsequent to a determination that the last item scanned by said scanning means is a valid item, such continuation of the item outputting operation being effected by further operation of the item movement means, such termination of the item outputting operation being effected by the disabling of the item movement means, said dispensing control means rendering the item detaching means usable upon termination of the item outputting operation.

38. A microprocessor controlled scanning and dispensing means for use in a system for vending from a supply strip of serially ordered connected stamp-like items of a selected type, which supply strip may contain invalid items interspersed among valid items, an output strip which includes one or more serially ordered connected items of the selected type and at least one valid item for each invalid item included on such output strip, such system including item movement means for effecting movement of the supply strip of items and the outputting of items contained thereon as an output strip during an item outputting operation, item detaching means for effecting detachment of the output strip from the supply strip, credit entry means for the entry of credit by a customer, and customer actuatable item selection means for making a vend selection, said scanning and dispensing means comprising scanning means for sequentially optically scanning during such item outputting operation each item on the supply strip as the item passes thereby in order to detect the degree of opacity of such item and to produce a scanning output signal representative of such degree of opacity, the degree of opacity being determinative of the validity status of such item, boundary determination means operable to determine the occurrences of item boundaries as the supply strip of items passes by said scanning means and to produce a boundary detection signal when an item boundary occurs, status detection means responsive to said scanning output signal to produce a status detection signal if the degree of opacity is representative of a particular validity status of the item, and a microprocessor responsive to an actuation of the selection means to determine whether the credit entered by a customer is at least equal to the vend price of the selected vend selection and, if so, said microprocessor being thereafter responsive to subsequent productions of one or more of said boundary detection signals and status detection signals to control the operation fo the item movement means and to effect the outputting on the output strip of at least one valid item for each invalid item included thereon, operation of the item movement means during the item outputting operation effecting the outputting for each item scanned of an item from the supply strip of items regardless of the scanned item's validity status, said microprocessor programmed to operate during such item outputting operation to effect continuation of such item outputting operation if the last item scanned by said scanning means is an invalid item and to effect termination of such item outputting operation only upon the production of a boundary detection signal subsequent to a determination that the last item scanned by said scanning means is a valid item, such continuation of the item outputting operation being effected by further operation of the item movement means, such termination of the item outputting operation being effected by the disabling of the item movement means, said microprocessor programmed to render the item detaching means usable upon termination of the item outputting operation.

4,637,524
MACHINE TOOLS
Adolph V. Klancnik, Glenview, and Kenneth A. Klancnik, Palatine, both of Ill., assignors to Universal Automatic Corporation, Des Plains, Ill.
Filed May 6, 1985, Ser. No. 730,497
Int. Cl.[4] B23Q *7/06*
U.S. Cl. 221—239 **3 Claims**



1. In a machine tool in which small easily distorted work-

pieces such as hollow pins, studs and the like disposed in a supply channel are advanced from a ready position therein to a work station to have a tapping, drilling facing or like operation performed thereon, a pair of self-centering jaw members and force equalizer assembly mounted to the tool for clamping with substantially equal force opposed sides of the workpiece fed to the work station and comprising:

a substantially L-shaped jaw actuating slide having one leg guided for reciprocal movement, and means for reciprocating the slide in an advancing and retracting direction respectively when the workpiece is to be clamped by actuating the jaw members and released by relaxing the jaw members at the work station;

said slide having its other leg located on one side of the work station;

an equalizing rocker arm positioned on the other side of the work station and pivoted at its mid-point to present one end portion thereof in the path of the one leg of the slide for actuation by the advancing slide to locate the jaw members in the clamping mode;

the free end of said one leg of the slide engaging one end of the rocker arm to pivot the rocker arm when the slide advances;

a first jaw member guided for sliding movement and having one end opposed to said other leg of the slide so as to be advanced therewith in a closing direction toward the workpiece at the work station when the slide advances;

a second jaw member guided for sliding movement and disposed on the side of the work station opposite the first jaw member and opposed to the other end portion of said rocker arm to be advanced thereby in a closing direction toward the work station when the rocker arm is actuated;

said jaw members at their inner ends nearer the work station presenting a holding recess for clamping the sides of a workpiece advanced from the supply channel thereto, said equalizing rocker arm assuring the workpiece in the holding recess in held on opposite sides with an equal force when the slide is advanced to actuate both jaw members;

a first spring interposed between said one end of the first jaw member and said other leg of the slide, a second spring interposed between said other end of the rocker arm and said second jaw member, whereby the springs are effective to apply a bias to the jaw members tending to close the jaw members; and

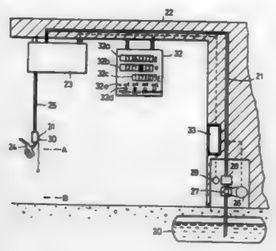
a reciprocal feed finger for feeding the workpieces in the channel successively to the recess presented by the jaw members when the jaw members are relaxed.

4,637,525

CONTROL SYSTEM FOR CONTROLLING THE SUPPLY OF A PREDETERMINED QUANTITY OF FLUID

Yukio Miura, Yokohama, and Yoshikazu Miyamoto, Kokubunji, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Apr. 13, 1984, Ser. No. 600,004
Claims priority, application Japan, Apr. 20, 1983, 58-69410
Int. Cl.⁴ B67D *5/08*
U.S. Cl. 222—22 **2 Claims**



1. A control system for controlling a supply of a predetermined quantity of fluid, said control system comprising:

a pump for supplying a fluid;

a motor for driving said pump, said motor being rotated when a current is applied thereto;

measuring means for measuring a flow quantity of the fluid which is supplied by said pump, said measuring means also measuring an oversupply quantity ΔQ of the fluid which is supplied by the pump after the current to the motor is cut off;

presetting means for presetting, before starting a fluid supplying operation, a preset value P which is indicative of a desired fluid supplying quantity; and

control means supplied with a measured flow quantity from said measuring means and the preset value P from said presetting means for controlling the application of the current to said motor,

said control means comprising memory means for storing minute current applying durations and a predetermined value K, where K is a predetermined value greater than said oversupply quantity ΔQ, each of said minute current applying durations stored in said memory means corresponding to minute quantities of fluid which will be supplied by the pump when the current is applied to the motor for said minute current applying durations, first means for applying the current to said motor until the measured flow quantity from said measuring means becomes equal to P−K, and second means for applying the current to the motor m times for selected minute current applying durations until a total flow quantity Q of supplied fluid measured by said measuring means becomes approximately equal to the preset value P, where m is an integer,

$$Q = (P - K) + \Delta Q + \sum_{n=1}^{m} q'n,$$

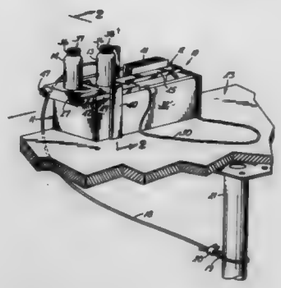
and q'n is a quantity inclusive of an oversupply quantity measured by said measuring means in each of the minute current applying durations, said second means successively calculating a difference P−Q between said preset value P and the total flow quantity Q of supplied fluid measured by said measuring means, successively selecting a current applying duration out of the minute current applying durations stored in said memory means so that the selected current applying duration corresponds to the calculated difference P−Q, and applying the current to said motor for the selected current applying duration to drive said pump so as to reduce the calculated difference.

4,637,526

THEFT RESISTANT CONDIMENT CONTAINER

Edmund G. Ellingboe, Rte. 3, Belgrade, Minn. 56312

Filed Feb. 10, 1986, Ser. No. 827,634
Int. Cl.⁴ B67D *5/62*; A47K *1/08*
U.S. Cl. 222—146.2 **8 Claims**



1. A theft resistant condiment dispenser comprising:

a first support member designed to rest upon the top of a table;

a first elongated flexible member having one portion secured to the first support member and having a spaced end portion in the form of a loop sufficiently large to surround a typical table leg, the flexible member being effective when the loop is so engaged over a table leg to prevent ready removal of the support member from the table supported by the leg;

a second support member normally supported by said first support member;

a condiment receptacle having apertures adjacent the top thereof for dispensing a condiment when the receptacle is tipped sufficiently, the condiment receptacle being fixedly secured to the second support member; and

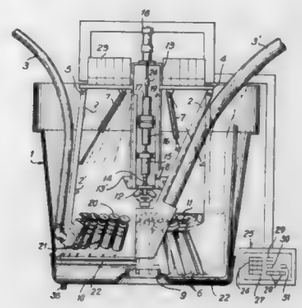
a second flexible member fastened at its opposite ends to the first and second support members, the second flexible member being sufficiently long that the second support member can be removed from the first support member and actuated to move the condiment receptacle secured thereto to the desired point of use on a table and to be tipped to dispense the condiment at the desired location.

4,637,527

APPARATUS FOR DISPENSING PIGMENTS

Giordano Arrigoni, Via Marconi 47, Cassano Magnago, Italy

Filed Jan. 23, 1984, Ser. No. 572,860
Claims priority, application Italy, Feb. 8, 1983, 19479 A/83
Int. Cl.⁴ B67D *5/60*
U.S. Cl. 222—144 **4 Claims**



1. Apparatus for dispensing metered quantities of a plurality of fluid materials, comprising:

plural metering valves arranged in a circular array about a central axis;

plural flexible fluid supply lines respectively connected to an associated one of said metering valves and respectively connected to a supply of one of said fluid materials;

plural guide and support members each carrying one of said metering valves, and movable between an advanced position in which the associated metering valve is substantially aligned with said central axis, and, a retracted position in which the associated metering valve is withdrawn from said central axis and repositioned within said circular array;

plural independent drive means, each said drive means being connected to an independent one of said guide and support members and for moving the associated guide and support member between said advanced and retracted positions;

means sequentially activating selected ones of said independent drive means; and

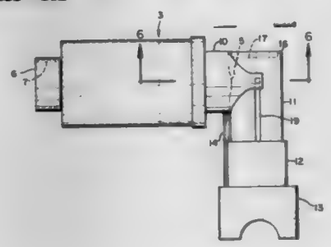
an actuator means for operating said metering valves when in said advanced position, said actuator means being positioned in axial alignment with said central axis, and including gear driven gripping means activated by a rack under the control of a fluid actuated piston and cylinder arrangement.

4,637,528

ARTICULATED JOINT IN AEROSOL MEDICAMENT DISPENSER

Clarence A. Wachinski, Abington, and Thomas J. Bigger, Perkasie, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed Jan. 19, 1984, Ser. No. 572,292
Int. Cl.⁴ B65D *83/14*
U.S. Cl. 222—182 **5 Claims**



1. A medicament spray dispenser for dispensing from an aerosol medicament container having a valve actuable to dispense a measured dose of medicament in aerosol form, comprising:

an elongated housing for holding and at least partially enclosing said container;

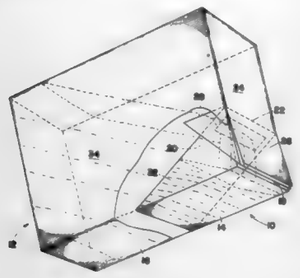
nozzle means at one end of the housing including a passageway connected to said valve, said nozzle means further including a spray nozzle leading from said passageway and pointing outwardly of said housing on an axis extending transverse to the long axis thereof;

a hollow open-ended sleeve telescopically mounted on said housing for longitudinal sliding motion between a retracted position overlying said spray nozzle and an extended position in which at least a major portion of said sleeve extends beyond the nozzle end of the housing;

joint means interconnecting the sleeve and the housing for relative sliding and pivotal movement, said joint means comprising a pair of oppositely disposed pins affixed to and projecting inwardly from the side surfaces of the sleeve, said housing having on its side wall a pair of oppositely disposed longitudinal slots equidistantly disposed from the axis of the spray nozzle, said slots extending to points adjacent the axis of the spray nozzle for receiving said pins, elongated studs attached to the inward end of each said pin, said elongated studs extending perpendicularly to each said pin, each said elongated stud being rigidly fixed relative to said sleeve, said sleeve when in the extended position being rotatable from a position of coaxial alignment with the long axis of the housing, each said stud being elongated in a direction extending lengthwise of its slot when said sleeve is in said position of coaxial alignment with said housing whereby a substantial surface area of each stud underlies the housing side wall adjacent to the end of the slot when the sleeve is in the extended position thereby interlocking the sleeve and the body against accidental separation during rotation of the sleeve from the position of coaxial alignment;

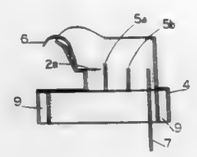
and abutment means positioned adjacent the studs to block rotation of said studs and said sleeve from the position of coaxial alignment in a direction away from the position of alignment with the spray nozzle.

4,637,529
MEASURING DISPENSER
George L. Knight, 305 Larkin Dr., Benicia, Calif. 94510
Filed Nov. 17, 1983, Ser. No. 553,141
Int. Cl.[4] G01F *11/28*
U.S. Cl. 222—452 2 Claims



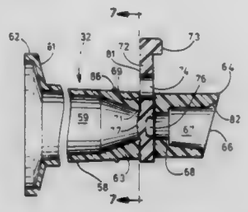
1. A measuring dispenser for particulate material comprising:
an open top receptacle with a pair of side walls of generally triangular configuration;
the top and front edges of said side walls forming substantially right angles;
front and rear walls interconnecting the front and rear edges of said side walls;
means forming a fill-opening in said rear wall near said open top so that said receptacle may be filled by tipping same to bring said front wall downward;
a lid hinged to the top edge of said rear wall; and
a fill-opening closure depending from the rear of said lid to pivot therewith;
said fill-opening closure being disposed at an angle to said lid greater than the angle between the top and rear edges of said side panels so that it may be pivoted with said lid into engagement with said rear wall to cover said fill-opening when said lid is lifted.

4,637,530
DISPENSER FOR A LIQUID CONTAINER
Chih-Chang Jiang, No. 24, Chen-Kang Street 1, Tau-Yuen, Taiwan (330)
Filed May 9, 1985, Ser. No. 732,290
Int. Cl.[4] B67D *3/00*
U.S. Cl. 222—564 5 Claims



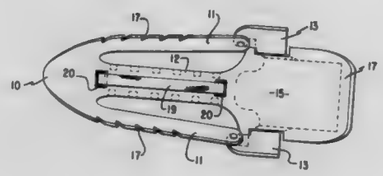
1. A liquid dispenser, comprising a cylindrical throat with a pouring spout protruding from one side of the top end of the throat the spout having a pouring direction perpendicular to a direction of flow through the throat, and an annular flange extending around the throat, said dispenser includes a plurality of substantially parallel vertically arranged flow-interrupting means formed in the pouring spout and throat, said flow-interrupting means extending upwardly to different levels respectively and being disposed substantially perpendicular to the pouring direction of the liquid through the spout, and said dispenser includes a tongue provided on the liquid passage of the pouring spout for directing the liquid flow and for recovery of any drop of liquid that may drip down the outer wall of the container after pouring.

4,637,531
SPOUT WITH GATE
Sven O. Olsson, 7019 Kerry Rd., Edina, Minn. 55435
Continuation-in-part of Ser. No. 428,121, Sep. 29, 1982, Pat. No. D. 227,827. This application Mar. 4, 1985, Ser. No. 707,830
Int. Cl.[4] B65D *47/00*
U.S. Cl. 222—559 17 Claims



8. A spout for dispensing material comprising: a body having a passage, an inlet end, and an outlet end section, said outlet end section having a generally transverse upper lip, a transverse slot extended across said passage and a continuous annular bead surrounding the passage, said bead projected into the slot, and gate means having a hole allowing material to flow through said passage and a convex curved portion spaced from the hole, and a recess opposite said convex curved portion, said convex curved portion projected toward said annular bead, said gate means being movable to a first position wherein the hole is aligned with said passage to allow flow of material through said passage and movable from the first position to a second position wherein the convex curved portion is surrounded by said annular bead to close said passage.

4,637,532
DEVICE FOR ASSISTING IN PUTTING ON ELASTIC HOSIERY
Daryl E. Doorenbos, R.R. 2, Box 85A, Le Mars, Iowa 51031
Filed Mar. 13, 1986, Ser. No. 839,147
Int. Cl.[4] A47G *25/90*
U.S. Cl. 223—111 10 Claims



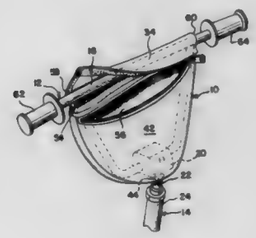
1. A device comprising rail means arranged to spread a stocking, tongue means resiliently mounted on said rail means, said rail means and tongue means being normally in a nearly planar relation, said tongue means being movable to a displaced position out of said planar relation, means to hold said tongue means in said displaced position whereby a stocking disposed over said rail means will be held open for the insertion of a user's foot and leg.

4,637,533
FOOT WEAR DRESSING AID
Maurice Black, 2412 S. Washington Ave., Saginaw, Mich. 48601
Filed Nov. 12, 1985, Ser. No. 797,038
Int. Cl.[4] A47G *25/90*
U.S. Cl. 223—112 17 Claims



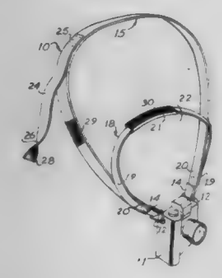
1. A device for assisting a person in donning an article of hosiery, said device comprising an open top, trough-like support member open at both ends and having a bottom and a pair of spaced apart sides upstanding from said bottom; an elongate, rigid handle having opposite ends; and flexible coupling means joining one end of said support member to said handle adjacent one end thereof, the spacing between said sides enabling the accommodation therebetween of a foot of said person, and the spacing between and the height of said sides enabling the opposite end of said support member to be accommodated in said article of hosiery, the flexibility and the length of said coupling means enabling said support member and said handle selectively to occupy positions in which they substantially parallel one another, extend in substantial prolongation of one another, or are in a position substantially normal to one another and in which latter position the bottom of said support member and said one end of said handle simultaneously may engage a flat surface.

4,637,534
ANTITHEFT BICYCLE HANDLEBAR BAG
William W. Leppek, Lima, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Filed Mar. 31, 1986, Ser. No. 846,187
Int. Cl.[4] B62J *7/00*
U.S. Cl. 224—36 11 Claims



1. An antitheft bag for mounting on the handlebars of a bicycle, comprising:
opposing front and rear portions;
a pair of opposing side positions extending between said front and rear portions;
upper closure means extending between said front and rear portions for closing said bag about a handlebar crossbar; and
a bottom portion extending between said front, rear, and side portions and having a hole shaped to receive a handlebar stem therethrough, said bag being continuous about a periphery of said hole, whereby said bag is attachable to a bicycle between an associated handlebar stem and bicycle head tube, and cannot be removed therefrom without separation of a handlebar stem thereof from an associated head tube.

4,637,535
CARRYING STRAP FOR CAMERAS AND THE LIKE
Javier Aleman, 1146 Fourth St., Stone Mountain, Ga. 30083
Filed Oct. 1, 1985, Ser. No. 782,373
Int. Cl.[4] A45F *3/02*
U.S. Cl. 224—202 5 Claims



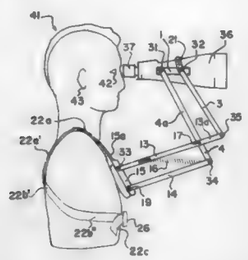
1. A carrying strap assembly for camera and the like, said strap assembly comprising a principal strap for suspending said camera around the neck of a person so that said camera is in position for easy use, and an auxiliary strap means for supporting said camera in a secure position for transport of said camera, said principal strap including a first strap having a first end and a second end connected to said camera for supporting said camera, said first strap being long enough to pass around the neck of the person carrying the camera and to support said camera in an easy use position, said auxiliary strap means including a second strap having a first end and a second end fixed with respect to said camera, said first end and said second end of said second strap being adjacent to said first end and said second end of said first strap, said second strap being shorter than said first strap and having an appropriate length for supporting said camera from said person's shoulder and securing said camera beneath said person's arm, and further including a securing strap, said securing strap having a first end fixed to said first strap and a second end relasably fixable to said first strap, said securing strap being selectively releasably fixable to said second strap for holding said auxiliary strap means with respect to said principal strap.

4,637,536
PERSONAL BINOCULAR SUPPORT
Wilbur Wong, Highway Contract Rte. Box 3228, Oracle, Ariz. 85623
Filed Aug. 14, 1985, Ser. No. 765,878
Int. Cl.[4] A45F *3/08*
U.S. Cl. 224—262 20 Claims

1. A personal optical-aid holder for suporting an optical aid in relation to the body of a user, during use, comprising:
a base;
means for securing the base to, and supporting the base from, such user's torso exclusively;
a platform adapted to receive and hold such optical aid;
a mechanical linkage interconnecting the platform and the base, and positioning the platform in relation to the base, so as to substantially support such received and held opti-

cal aid in viewing positions substantially at such user's eyes;

the linkage being adapted for easy control by such user, without such user's raising his or her hands to the viewing positions of such optical aid; and



the linkage being geometrically arranged to translate and rotate such optical aid vertically, under substantially continuous manipulation by such user, to substantially follow movement of such user's head and eyes in scanning upwardly from the horizon.

4,637,537

PAPER FEEDER FOR A PRINTER

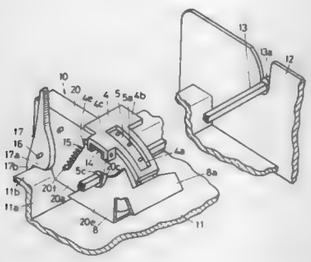
Hiroshi Ikeda, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 21, 1985, Ser. No. 736,313

Claims priority, application Japan, May 22, 1984, 59-74039[U]

Int. Cl.⁴ B65H *20/20*

U.S. Cl. 226—76 **4 Claims**



1. In a printer having a frame, a platen, a pair of paper feed units provided adjacent to said platen to feed a paper web to an underside of said platen, and a common drive shaft for said feed units parallel with the axis of said platen and rotatably supported on the frame, each of said paper feed units comprising:

a case slidably engaged with a support plate of said frame;

a sprocket wheel rotatably mounted on said case and slidably engaged with said drive shaft;

clamping means for securing said case to said support plate;

a paper holder pivotally mounted on a shaft disposed on said case in the paper feeding direction so as to hold said paper web on an upper periphery of said sprocket wheel and to feed said paper web to said underside of the platen; and

a paper guide plate secured to said case;

said paper guide plate having a paper guide portion positioned in a space between said platen and said paper holder so as to guide said paper web to said platen while preventing buckling or wrinkling of said paper web.

4,637,538

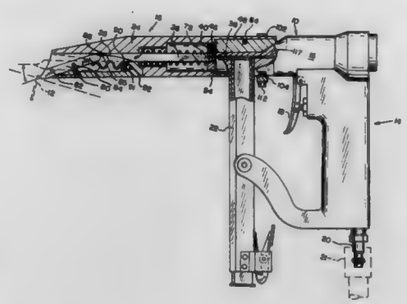
STAPLE REMOVER

Wayne M. Wagner, 102 NW. 76th St., Vancouver, Wash. 98665

Filed Aug. 12, 1985, Ser. No. 764,590

Int. Cl.⁴ B25C *11/00*

U.S. Cl. 227—63 **11 Claims**



1. An apparatus for use in combination with a pneumatic powered staple gun for removing staples from a surface penetrated by a staple, comprising:

an elongate casing having an open nose end;

staple pulling bit means having a chisel shaped end portion with a predetermined length and a width sized for insertion lengthwise along a surface beneath a staple;

means for pivotally mounting the bit means in the casing adjacent the nose end;

a plunger adapted for reciprocal movement lengthwise within the casing relative to the bit means;

translation means mounted on the plunger and adapted to contact the bit means for translating reciprocal movement of the plunger into movement of the bit means transverse of the plunger;

means for moving the plunger reciprocally lengthwise in the casing with respect to the bit means;

means for attaching a rear end portion of the casing opposite said open nose end to a pneumatic powered staple gun; and

means disposed in said rear end portion of the casing for reciprocably coupling the plunger to a driver in the staple gun.

4,637,539

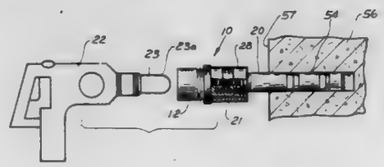
ANCHOR BOLT INSTALLATION TOOL WITH DEPTH STOP

James L. Turcott, 93 Grananda Calle, Grandbury, Tex. 76048-1468, and Rodney C. Matheny, 433 N. Joliet, Keanewick, Wash. 99336

Filed Sep. 10, 1984, Ser. No. 648,988

Int. Cl.⁴ B25C *1/18*; B25D *17/06*

U.S. Cl. 227—156 **4 Claims**



1. An anchor bolt installation tool for use with an impact driving means for installing an anchor bolt to a specified depth within a previously formed receiving hole in concrete or other material, comprising:

a cylindrical body piece having a longitudinal axis, a bolt end and a driver end, the bolt end having a threaded bolt recess formed therein along the longitudinal axis for threadably receiving the anchor bolt therein, said threaded bolt recess having a front wall for contacting end surfaces of the anchor bolt; said driver end having a driver receptacle formed therein along the longitudinal axis for receiving portions of the impact driving means therein, said driver receptacle having a receptacle end wall, said body piece being solid between said receptacle end wall and said front wall of the threaded bolt recess, said body piece having exterior threads formed thereon;

a cylindrical guide piece having internal threads which are adjustably and threadably received upon the exterior threads of the body piece and adjustably extendible beyond the bolt end thereof so as to engage an exposed surface of the material into which the anchor bolt is being installed, thereby determining the depth to which the anchor bolt is driven;

a jamb ring threadably received upon the exterior threads of the body piece for engaging the guide piece and maintaining the position thereof; and

locking means for fixing the relative position of the guide piece upon the body piece.

4,637,540

METHOD AND APPARATUS FOR ASSEMBLING A STRUCTURE COMPOSING A VEHICLE'S BODY AND THE LIKE

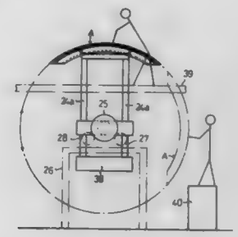
Yoshitada Fujita, Kobe; Sadashi Hanada, Miki, and Yoshiaki Yamamoto, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Nov. 9, 1984, Ser. No. 670,056

Claims priority, application Japan, Nov. 10, 1983, 58-211276

Int. Cl.⁴ B23Q *3/00*

U.S. Cl. 228—49.2 **3 Claims**



1. A method of assembling an elongated structure having a longitudinal axis, comprising the steps of: connecting an elongated box to said structure so that the longitudinal axis of said box extends parallel to and on one side the longitudinal axis of said structure; connecting an elongated balance weight to said elongated box parallel to and on the opposite side of said longitudinal axis of said structure; providing rotatable shaft for the combination of the structure, the elongated box, and the balance weight at longitudinally spaced, opposite ends of said box so that the shafts coincides with the center of gravity of the combination of said structure, elongated box, and balance weight; placing said rotatable shafts with said combination upon at least two pair of driven rollers wherein said rotatable shafts are rotatably retained by gravity on said rollers rotating the structure, elongated box, and balance weight and stopping rotation of the combination of said structure, elongated box and balance weight in desired angular positions to perform assembly operations.

3. An apparatus for assembling an elongated structure, such as a roof of a vehicle body, comprising: a retaining system for the stucture, including an elongated box having a pair of cylindrical shafts at opposite longitudinal ends of said box, and means for supporting the structure essentially parallel to said shafts about the exterior of said elongated box; an elongated adjustable balance weight attached to said elongated box so as to extend essentially parallel to said elongated box on an opposite side of said cylindrical shafts so that the center of gravity of the combination of said elongated box, said balance weight, and the structure essentially coincides with said cylindrical shafts, a pair of cylindrical rollers for rotatably supporting said cylindrical shafts, means for driving said cylindrical rollers, and pedestal means for supporting said shaft and cylindrical rollers, the elongated box, balance weight, and cylindrical shafts assembly being maintained on said rollers by gravity, and readily removeable from said rollers for attachment and disattachment of said structure from said elongated box by lifting said assembly from said cylindrical rollers.

4,637,541

CIRCUIT BOARD SOLDERING DEVICE

Michael W. Tanny, Westminster, Calif., assignor to Unit Industries, Inc., Fullerton, Calif.

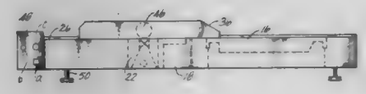
Filed Jun. 28, 1985, Ser. No. 750,333

Int. Cl.⁴ B23K *31/02*

U.S. Cl. 228—180.1 **22 Claims**

MICROFICHE APPENDIX INCLUDED

(1 Microfiche, 15 Pages)



1. A circuit board soldering apparatus comprising the following elements:

(a) a longitudinal base unit having two longitudinally extending sides connected to a first end and an opposing second end, a top portion connected to and bounded by said sides and ends with an open longitudinal central cavity, and two spaced apart parallel longitudinally extending rails mounted on the top portion on opposing sides of said central cavity;

(b) a foam means for generating a flux foam standing wave mounted in said central cavity approximately midway between said ends for applying a flux coating to the solder side of a circuit board;

(c) a heated solder pot mounted in said central cavity approximate said second end to hold a pot, molten solder bath for soldering the solder side of the circuit board;

(d) an air knife means for generating a warm air stream mounted in said central cavity between said foam means and said solder pot for drying a flux coating on the circuit board;

(e) a powered, wheeled circuit board transport adapted to ride on said rails to carry a circuit board from the first end across the foam means and the air knife means to the second end over said solder pot and back again;

(f) two powered cam means laterally mounted in said transport, said cam means rotatable to a high home position, a medium fluxing position and a low soldering position, said cam means adapted to carry and vertically move a circuit board carrier to a high home position, a medium fluxing position and a low soldering position;

(g) first sensing means to detect the position of said transport;

(h) second sensing means to detect the position of each of said cam means; and

(i) control means connected to said first and second sensing means to receive signals therefrom and connected to said

powered transport and said powered cams to send control signals thereto.

12. A process for soldering circuit boards comprising the steps of:

(a) applying a solder flux coating to the solder side of a board;

(b) drying the flux on the board and preheating the solder side of the board by sequentially:

(i) directing a stream of warm gas over the solder side of the board,

(ii) heating, over a hot molten solder bath, the solder side of the board, with the heat emanating from the surface of said bath,

(iii) directing a stream of warm gas over the solder side of the board at a position away from the hot molten solder bath,

(c) soldering the solder junctions on the board by immersing the solder side of the board into the surface of a hot molten solder bath by sequentially:

(i) immersing a first edge of the board into the surface of the solder bath,

(ii) lowering the remainder of the board into the surface of the solder bath,

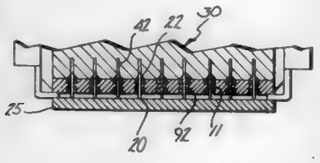
(iii) lifting the board from the surface of said bath at an angle to said surface to drain excess hot molten solder from the board.

4,637,542

PROCESS FOR SOLDERING AND DESOLDERING APERTURED LEADLESS PACKAGES

Carl D. Breske, Scandia, and Jeffrey M. Borning, Ham Lake, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Division of Ser. No. 421,604, Sep. 22, 1982, Pat. No. 4,518,110.
This application Feb. 8, 1985, Ser. No. 699,719
Int. Cl.⁴ B23K *1/12*; H01L *23/48*
U.S. Cl. 228—180.1 **2 Claims**



1. A method of soldering a chip having an array of sockets to an array of pins comprising the steps of:

securing said chip to a heater member with the top of said chip immediately proximate a heating plate of said heater member, said chip having a solder plug formed in each of said sockets;

positioning said tool such that said chip is set onto an array of pins such that each of said pins aligns with one of said sockets;

applying heat to said heating plate to reflow said solder plugs and form solder joints between said pins and said sockets; and

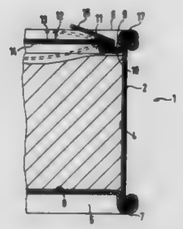
releasing said chip from said heater member to allow such solder joints to cool and solidify.

4,637,543

FIBER CAN WITH REINFORCING CRIMPED METAL CLOSURE

Helmut Kilcherer, Schriesheim, Fed. Rep. of Germany, assignor to Weidenhammer Packungen KG GmbH & Co., Hockenheim, Fed. Rep. of Germany

Continuation of Ser. No. 603,201, Apr. 23, 1984, abandoned.
This application Oct. 2, 1985, Ser. No. 783,060
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3413918
Int. Cl.⁴ B65D *3/14*
U.S. Cl. 229—5.6 **16 Claims**



1. A can comprising: a laminated fiber can body having a gas-tight fusible lining, an end wall shutting off one end of said body, the end wall being in the form of a metal plate with a peripheral crimping lip rolled together with a captured portion of the fiber can body to form an overlapped joint and a metal structural reinforcing ring at said one end of the fiber body, a partly metallic cover on the opposite end of the can body, said cover being formed as a rigid cover member having a peripheral crimping lip that is rolled outwardly together with a captured portion of the fiber can body at the opposite end into an overlapped joint between the rigid cover member and said opposite end of the can body, the rolled crimping lip and captured portion of the fiber can body together providing a structural reinforcing ring at said opposite end of the fiber body to withstand stresses developed at the joint and adjacent areas of the fiber body by pressure differences between the inside and outside of the can, said cover member having on its inner side a fusible coating that has an affinity for and is brought into sealing contact with the lining of the body within the overlapped reinforcing joint to form a gas-tight seal, said rigid cover member forming the structural reinforcing ring for the fiber body having an opening and a flexible covering diaphragm fixed in position over said opening, said covering diaphragm being adapted to undergo a change in form when a pressure difference comes into existence between the inside and outside of the can after the sealing thereof whereby the pressure difference is accommodated without developing significant strain at the crimped and sealed joints between the cover member, the metal end wall, and the fiber body.

4,637,544

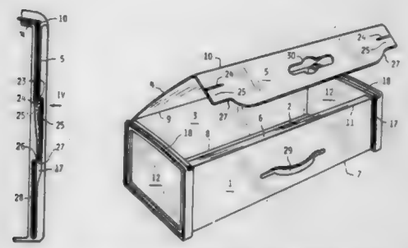
PROCESS FOR THE MANUFACTURE OF BOXES, THE BOXES WHICH RESULT THEREFROM AND THE ELEMENTS FOR THEIR COMPOSITION

Alessandro Quercetti, Strada S. Vito Revigliasco 48, I-10133 Torino, Italy

Filed Dec. 28, 1984, Ser. No. 687,286
Claims priority, application Italy, Jan. 13, 1984, 67027 A/84
Int. Cl.⁴ B65D *5/66*
U.S. Cl. 229—44 R **24 Claims**

6. A box comprising: a punched element of a flexible sheet material having at least five sections and at least four parallel score lines separating said five sections, said punched element being bent along said score lines; and two side walls formed of synthetic material, each side wall having a first U-groove including at least three branches, and a second groove parallel to and closely disposed on the outer side of one of the branches

of said first U-groove; the end edges of at least three of said sections of the punched element being firmly engaged in corresponding branches of said first U-grooves of the two side walls,



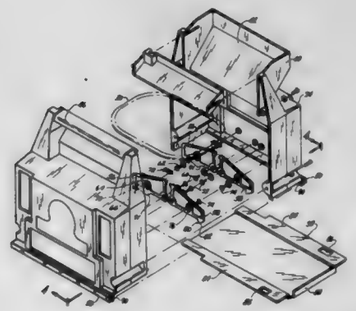
a fourth section forming a lowerable and liftable cover, and the terminal section being adapted to be inserted in, and extracted from, said second groove of the two side walls, to close and to open the box.

4,637,545

WASTE MANAGEMENT SYSTEM

Gene L. Stewart, San Diego, Calif., assignor to Winfield Corporation, San Diego, Calif.

Filed Mar. 25, 1985, Ser. No. 715,638
Int. Cl.⁴ B65D *85/24*
U.S. Cl. 232—43.2 **44 Claims**



22. A waste management system including a movable cart having a waste box for the reception of waste stored in disposable containers, including,

a module for forming a hollow cover having a large open end and with the module including a passageway for receiving medical waste from the exterior to the interior,

a disposable container for reception within the open end of the module to have the container enclosed by the module and with the passageway leading to the disposable container,

a locking plate positioned across the open end of the module to fully enclose the disposable container,

a locking means coupled to the module and the locking plate for locking the locking plate across the open end of the module, and

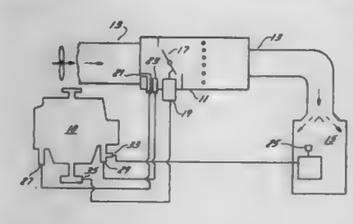
a key plate for disposition between the locking plate and the module for unlocking the locking plate from the open end of the module and with the key plate coupled to the locking means for locking the key plate across the open end of the module in substitution of the locking plate.

4,637,546

PNEUMATIC DIFFERENTIAL PRESSURE CONTROLLER

Roy W. DeMeyer, Oconomowoc, Wis., assignor to Johnson Service Company

Filed Sep. 16, 1985, Ser. No. 776,575
Int. Cl.⁴ F24F *7/00*
U.S. Cl. 236—49 **10 Claims**



1. A differential pressure controller for regulating the flow of air through a duct and including:

a housing;

a diaphragm stack disposed in said housing and including a pair of seal diaphragms and a sensing diaphragm disposed intermediate said seal diaphragms, said sensing diaphragm and said seal diaphragms defining a pair of pressure chambers, said sensing diaphragm being movable in response to the difference in pressures prevailing in said chambers, the pressure in one chamber including a component representative of a thermostat control signal;

a leakport for flowing air to an external control device;

a valving seat coupled to said sensing diaphragm, and movable therewith along an axis of movement, said valving seat coacting with said leakport for controlling the flow of air to said external device;

a first spring disposed coaxially with said axis of movement and exerting a force upon said valving member in a direction to close said leakport;

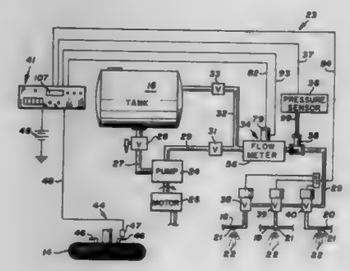
a second spring disposed coaxially with said axis of movement and exerting a force upon said valving seat in a direction to open said leakport, said springs permitting the adjustment of the setpoint of said controller.

4,637,547

CONTROL METHOD AND APPARATUS FOR LIQUID DISTRIBUTOR

Thomas K. Hiniker, Mankato, and Vincent N. Bush, Madison Lake, both of Minn., assignors to Hiniker Company, Mankato, Minn.

Division of Ser. No. 405,323, Aug. 5, 1982, Pat. No. 4,530,463.
This application Mar. 22, 1985, Ser. No. 714,879
Int. Cl.⁴ B05B *9/06*
U.S. Cl. 239—1 **18 Claims**



1. A method of dispensing liquid from a plurality of spray nozzles of a transportable liquid dispensing device over an area

of ground at a uniform density independent of the ground speed of the dispensing device, the nozzles each having conditions of operability and inoperability, comprising the steps of

(a) measuring the ground speed of the transportable dispensing device and generating a first signal in accordance with the ground speed;

(b) entering at least one flow rate parameter into a microprocessor-based control device to provide a given flow rate of liquid to the dispensing device;

(c) measuring the actual liquid flow rate within the dispensing device and providing a second signal in accordance with the measured flow rate;

(d) measuring the liquid pressure within the dispensing device and providing a third signal in accordance with the measured pressure;

(e) entering said first, second, and third signals into the control device;

(f) calculating a control signal in accordance with said first, second, and third signals and said flow rate parameter; and

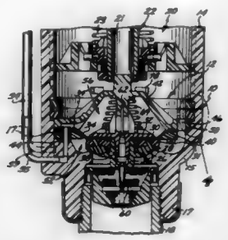
(g) controlling the flow of liquid from the nozzles in the operable condition to provide a constant uniform liquid density over the dispensing area independent of the ground speed of and the pressure within the dispensing device.

4,637,548

RELEASABLE LOCKING ASSEMBLY FOR SPRINKLER VALVE UNITS

Charles A. Ray, Arcadia, and Samuel C. Walker, Diamond Bar, both of Calif., assignors to Anthony Manufacturing Corp., Azusa, Calif.

Filed Jul. 12, 1984, Ser. No. 630,227
Int. Cl.⁴ B05B *15/06*
U.S. Cl. 239—201 **16 Claims**



1. A locking assembly for releaseably locking a valve unit within a sprinkler housing or the like in an operative position for opening and closing a pressurized water inlet port to control water flow into the housing, said locking assembly comprising:

shoulder seat means within the housing for supporting an upstream side of the valve unit when the valve unit is in the operative position;

a radially inwardly opening lock groove formed in the housing generally adjacent the side of the valve unit opposite said shoulder seat means when said valve unit is in the operative position, said lock groove having an upper end limit within the housing and spaced above the valve unit when the valve unit is in the operative position;

a plurality of snap rings releaseably engaged in vertically stacked relation within said housing lock groove, each of said snap rings having an upper and a lower generally radial face, said upper face of the upper of said plurality of vertically stacked snap rings being in abutting engagement with said groove upper end limit, and said lower face of the lower of said plurality of vertically stacked snap rings being engaged with said side of said valve unit opposite said shoulder seat means, each of said snap rings being independently releaseable from said lock groove;

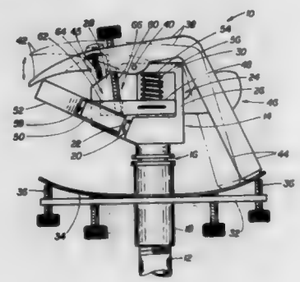
whereby upon release and removal of at least one but less than all of said snap rings from said lock groove, the valve unit can move upwardly within the housing away from the operative position to an extent limited by engagement of said upper face of the upper remaining snap ring with said groove upper end limit thereby opening the pressurized water inlet port yet preventing removal of the valve unit from the housing until all of said remaining snap rings have been released and removed from said lock groove.

4,637,549

ROTATION SPEED CONTROL DEVICE FOR A ROTARY, IMPULSE WATER SPRINKLER AND A WATER SPRINKLER HAVING SAME

Joel Schwartzman, 47 James Dr., Ringwood, N.J. 07456

Filed Apr. 30, 1985, Ser. No. 729,067
Int. Cl.⁴ B05B *3/04*
U.S. Cl. 239—230 **7 Claims**



1. A water sprinkler apparatus comprising:

(a) a dispensing head adapted for rotational movement;

(b) at least one water dispensing nozzle associated with the dispensing head for dispensing a stream of water;

(c) speed control means for varying the rotational speed of the dispensing head as the dispensing head rotates;

(d) movable impulse means associated with the dispensing head and adapted to be at least partially located in the path of a stream of water dispensed from the dispensing nozzle for imparting an impulse force to the dispensing head to rotate the dispensing head as water issues from the dispensing nozzle; and

(e) movable baffle means associated with the dispensing head and adapted to selectively move into and out of the path of water from the dispensing nozzle to deflect the stream of water,

(f) said speed control means being operatively associated with said baffle means and impulse means for selectively limiting movement of said impulse means into the path of water from the nozzle as a function of the position of said baffle means relative to the path of water from the nozzle.

4,637,550

DUAL MATERIAL EXHAUST NOZZLE FLAP

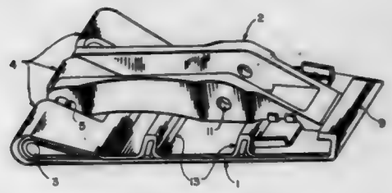
Dudley O. Nash, Cincinnati, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 1, 1985, Ser. No. 782,332
Int. Cl.⁴ B64C *9/38*
U.S. Cl. 239—265.37 **7 Claims**

1. An exhaust nozzle flap comprising:

a support member having a first set of lugs at one end and a tip at its other end;

a base member composed of heat resistant materials, said base member having a second set of lugs at one end and a retainer flap at its other end, said base member being attached to said support member in a manner which allows relative movement therebetween by having its second set of lugs interleaved with the first set of lugs of the support member and said retainer flap encompassing said tip of said support member thereby holding it in place while allowing for differences in thermal expansion between said support member and said base member; and



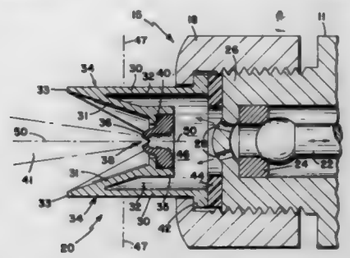
a hinge pin inserted between said first and second set of lugs of said support member and said base member, said hinge pin thereby connecting said support member to said base member.

4,637,551

SAFETY GUARD FOR AIRLESS SPRAY APPARATUS

John W. Seeger, Jr., St. Paul, and John W. Kubiak, Minnetonka, both of Minn., assignors to Seeger Corporation, St. Paul, Minn.

Filed Apr. 5, 1985, Ser. No. 720,087
Int. Cl.⁴ B05B *1/28, 9/01*
U.S. Cl. 239—288.5 **27 Claims**



1. A spray gun apparatus for airlesly spraying a liquid, comprising:

(a) a spray gun housing defining a fluid supply cavity having inlet and outlet ports;

(b) a spray tip connected to said housing at said outlet port suitable for providing a spray of high-pressure fluid passing therethrough, said spray tip defining an orifice extending along an axis and having upstream and downstream ends; sand upstream end being connected in fluid communication with said supply cavity;

(c) means operatively connected with said cavity inlet port for supplying a liquid under pressure to said supply cavity from a pressurized source of such liquid; and

(d) a safety tip guard operatively connected to said housing and disposed adjacent said downstream end of said spray tip orifice and having a portion thereof extending in the direction of said orifice axis, said extending portion having a wall defining a tip guard cavity connected in fluid communication with said supply cavity said tip guard cavity extending to a position downstream of the orifice; wherein

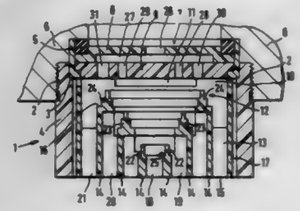
a breach in said wall will cause a portion of liquid within said tip guard cavity to escape through the breach, thereby decreasing pressure within said supply cavity at said upstream end of said spray tip orifice.

4,637,552

WATER JET AERATION FOR SANITARY FITTINGS AND THE LIKE

Werner Fiakbeiner, and Franz Schorn, both of Schiltach, Fed. Rep. of Germany, assignors to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 8, 1985, Ser. No. 699,659
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404662
Int. Cl.⁴ E03C *1/08*; B05B *7/06, 1/14*
U.S. Cl. 239—428.5 **31 Claims**



1. A water jet ventilator for sanitary fittings and the like, comprising:

at least one device for producing a plurality of individual water jets along a direction of flow;

a housing defining at least one chamber arranged downstream of said device for producing individual jets, the housing having an opening for air access to the chambers;

at least one device for splitting and mixing the individual jets with air, having at least two separate devices for splitting up the individual jets, each having two cooperating walls defining passages which catch the individual jets, at least one of the two cooperating walls having lateral obstacles defining a staircase structure projecting into a path of the individual jets, at least one of said separate devices for splitting the individual jets having two facing cooperating walls, the cooperating walls continuing downstream of the devices and defining unobstructed channels, the cooperating walls of the separate devices having obstacles directed towards one another, the separate devices being displaced from one another in the direction of flow, and the separate devices for splitting the individual jets being so closely juxtaposed that the ventilated jets flow out as a joint ventilated jet.

4,637,553

FUEL INJECTION NOZZLE UNIT FOR INTERNAL COMBUSTION ENGINES

Takeo Kashida, and Ketichi Yamada, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1985, Ser. No. 782,871
Claims priority, application Japan, Oct. 9, 1984, 59-210496
Int. Cl.⁴ F02M *57/00*
U.S. Cl. 239—533.4 **2 Claims**

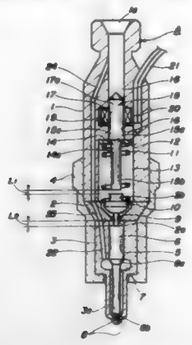
1. In a fuel injection nozzle unit for an internal combustion engine, including a nozzle body having injection holes and a pressure chamber formed therein, a nozzle needle fitted in said nozzle body and being liftable in said nozzle body to open said injection holes, a nozzle spring urging said nozzle needle in a direction of closing said injection holes, and a central plunger having one end thereof arranged opposite one end of said nozzle needle at a distance corresponding to a predetermined lift, said central plunger having another end face which is supplied with pressurized fuel, and said central plunger being liftable together with said nozzle needle against the pressure of said pressurized fuel when said predetermined lift is exceeded, said nozzle needle being lifted by a fuel pressure supplied to said pressure chamber to effect fuel injection,

the improvement comprising:

an annular-shaped, radially deformable piezo-electric ele-

ment provided around said cental plunger, said piezo-electric element having a substantially central hole therein which is penetrated by said cental plunger; and

means for selectively electrically energizing and deenergizing said piezo-electric element to selectively radially deform said piezo-electric element to thereby selectively reduce the diameter of said central hole thereof, said central hole of said piezo-electric element being sufficiently reduced in diameter to contact the peripheral



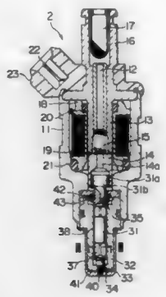
surface of said central plunger to inhibit lifting of said central plunger from a predetermined position closest to said nozzle needle when said piezo-electric element is electrically energized to thereby maintain a low rate injection, and said central hole of said piezo-electric element having a normal increased diameter so as to allow movement of said central plunger in said central hole to thereby allow lifting of said central plunger from said predetermined position when said piezo-electric element is electrically deenergized to thereby obtain a high rate injection.

4,637,554

ELECTROMAGNETIC FUEL INJECTOR WITH MAGNETIC STOP MEMBER

Hideto Takeda, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 25, 1985, Ser. No. 715,946
Claims priority, application Japan, Mar. 27, 1984, 59-60134
Int. Cl.⁴ F02M *51/06*
U.S. Cl. 239—585 **12 Claims**



1. In an electromagnetically actuated fuel injector of the type that includes a movable core adapted to be electromagnetically driven by a solenoid, a valve seat member defining a valve seat and an injection orifice, a valve member connected to said movable core for movement therewith into and out of sealing engagement with said valve seat, one of said movable core and said valve member having a flange formed thereon, and a stationary stop member adapted to cooperate with said flange to limit the movement of said valve member away from said valve seat, the improvement which comprises:

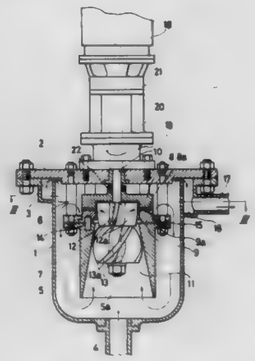
means for magnetically biasing said stop member and said flange away from each other to keep said flange closely spaced from said stop member when said valve member is out of sealing engagement with said valve seat.

4,637,555

CIRCULATION TYPE HOMOGENIZING APPARATUS

Akira Furuichi, Nishinomiya, and Akira Iijima, Takatsuki, both of Japan, assignors to Tokushu Kika Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 21, 1984, Ser. No. 643,002
Claims priority, application Japan, Oct. 24, 1983, 58-197622
Int. Cl.⁴ B02C *7/08*
U.S. Cl. 241—46.02 **10 Claims**



1. A liquid homogenizing apparatus for continuously charging and treating a raw material liquid containing fine particulate solids, comprising:

(a) a stationary main barrel attached to a cover plate, said main barrel being provided at its lower portion with an opening for supply of a raw material liquid to be treated, and having an overflow space located above its upper edge and beneath said cover plate;

(b) a subsidiary barrel fixedly supported within said main barrel, so as to form an annular space between said main barrel and said subsidiary barrel, said subsidiary barrel being open at its lower end directly above and opposite the supply opening in the main barrel and provided at its upper portion with an upper grinding disk and a lower grinding disk, said grinding disks having a gap therebetween and having their respective annular grinding surfaces facing each other, said lower grinding disk being fixed to a lower portion of the subsidiary barrel and the upper grinding disk being connected to a rotary drive shaft that is inserted through said cover plate into a central portion of the subsidiary barrel so as to provide a blind liquid passage;

(c) an upper rotatable blade tube attached to said drive shaft for flowing the raw material liquid in the upper portion of said subsidiary barrel in a radial direction towards the grinding surfaces of the upper and lower grinding disks; and

(d) a lower rotatable blade tube means attached to said drive shaft and located beneath said upper rotatble blade tube for flowing the raw material liquid in an upward direction, so as to enable the raw material liquid supplied into said main barrel to be directed from the lower open end of the subsidiary barrel upwards into said blind liquid passage and then passed through the gap between the upper and lower grinding disks with a portion of the liquid capable of being circulated downwards through the annular space outside the subsidiary barrel and through the lower end

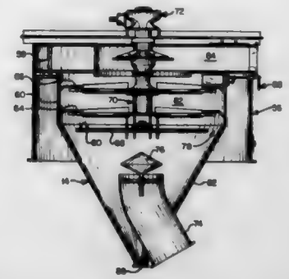
opening of the subsidiary barrel in order to obtain a homogenized liquid product.

4,637,556

HIGH EFFICIENCY SEPARATOR SYSTEM

Mark R. Dunn, Evanston, Ill., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 26, 1985, Ser. No. 759,389
Int. Cl.⁴ B02C *23/34*
U.S. Cl. 241—48 **6 Claims**



1. A high efficiency separator system operative both to grind material and to separate thereafter the ground material into a finished product comprising:

(a) grinding means operative to effectuate the grinding therewithin of the material fed thereto;

(b) high efficiency separator means connected in flow relation with said grinding means for receiving therefrom all of the material ground in said grinding means as well as all of the air vented from said grinding means, said high efficiency separator means being operative to effectuate therewithin a classification of the ground material supplied thereto from said grinding means and for recirculating in the form of tailings to said grinding means for further reduction therein ground material containing particles exceeding a predetermined particle size, said high efficiency separator means comprising:

(i) housing means including a drum portion and a cone portion, said cone portion having one end thereof joined to one end of said drum portion,.

(ii) whizzer blade means supported for rotation at a first location within said housing means, said whizzer blade means defining a classification zone within said housing means, said whizzer blade means being operative to effect a classification based on particle size of feed material into a finished product as the feed material entrained in air passes through said classification zone,

(iii) a distributor plate means positioned within said housing means at a second location and so as to define between the periphery of said distributor plate means and the internal surface of said housing means an annular passage operative as a high velocity mixing zone, said distributor plate means being supported from said whizzer blade means in spaced relation thereto and so as to be rotatable therewith, said distributor plate means being operative to cause the feed material disposed thereon to be dispersed under the influence of gravity into said high velocity mixing zone,

(iv) a feed material inlet means supported in said housing means for supplying feed material on to said distributor plate means, said feed material inlet means being coaxially aligned with said whizzer blade means and having a first end thereof projecting outwardly of said housing means and a second end thereof terminating at a point intermediate said first location of said whizzer blade means and said second location of said distributor plate means,

(v) an air inlet means supported in said cone portion for supplying into the interior of said housing means air at a predetermined rate so as to ensure the existence of a predefined material to air ratio within said housing means, said air inlet means having a first end thereof projecting outwardly of said cone portion and a second end thereof terminating at a point spaced from and aligned with said feed material inlet means such that the air exiting from said second end of said air inlet means follows a once-through flow path within said housing means before exiting therefrom and in the course of doing so is made to pass through said high velocity mixing zone at a high velocity so as to effect the entrainment therewithin of the feed material dispersed into said high velocity mixing zone by said distribution plate means, and

(vi) discharge means formed in said cone portion of said housing means, said discharge means being operative for effectuating the discharge from said high efficiency separator means of the tailings that remain following the classification within said classification zone of the feed material into finished product by said whizzer blade means;

(c) dust collector means connected in flow relation with said high efficiency separator means for receiving therefrom in the form of finished product entrained in air ground containing particles that are of a predetermined particle size, said dust collector means being operative for separating the ground material particles from: the air and for discharging therefrom as separate entities both the ground material particles in the form of finished product and the air that has had the ground material products removed therefrom; and

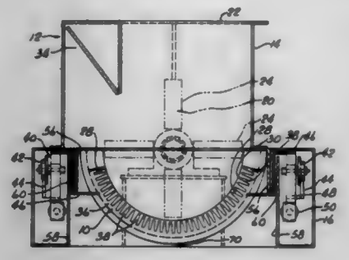
(d) fan means connected in flow relation with said dust collector means for receiving therefrom the air discharged from said dust collector means.

4,637,557

DEVICE FOR CLEANING THE SIZING SCREEN OF A MATERIAL REDUCTION APPARATUS

Edward A. Vitunac, 1618 Powers Run Rd., Pittsburgh, Pa. 15238

Filed Jul. 15, 1985, Ser. No. 754,708
Int. Cl.⁴ B02C *13/284*
U.S. Cl. 241—73 **8 Claims**



1. A device for cleaning a screen in a material processing apparatus, said screen having at least a plurality of elongate bars defining spaces therebetween through which material flows, said device comprising:

rake means having a plurality of members for clearing material blocking said spaces; and

a carriage assembly for guiding said rake means along the length of said elongate bars, said carriage assembly having two rails positioned parallel to and opposite each other on opposing sides of said screen, two wheels, each said wheel being oepratively connected to said rake means and being associated with a different one of said two rails so that said wheels are guided by said rails parallel to and opposite each other on opposing sides of said screen, and paired

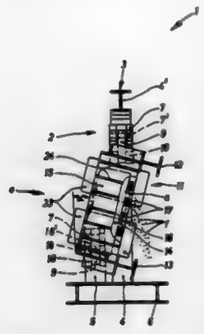
means for moving said wheels along said rails to provide matched drive actuation of said rake means so that said rake means moves along the length of said elongate bars in a manner which maintains said rake means in alignment with said screen.

4,637,558

VIBRATORY DECORING APPARATUS FOR CASTINGS

Günter Jenzsch, Adelsried; Kurt Rauh, Haimhausen, and Hans J. Wegscheider, Gröbenzell, all of Fed. Rep. of Germany, assignors to Rudolph Mirbeth, Puchheim/BHF, Fed. Rep. of Germany

PCT No. PCT/DE84/00247, § 371 Date Jun. 27, 1985, § 102(e) Date Jun. 27, 1985, PCT Pub. No. WO85/02137, PCT Pub. Date May 23, 1985
PCT Filed Nov. 17, 1984, Ser. No. 752,046
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1983, 3341894
Int. Cl.[4] B02C *19/12*
U.S. Cl. 241—79 14 Claims



1. Apparatus for removing core sand from a casting by vibration, comprising:
a framework;
a casting carrying unit including a pair of spaced apart horizontal arms;
means suspending the casting carrying unit from the framework so that the carrying unit can swing and vibrate freely along a path;
the means suspending the casting carrying unit from the framework comprising a pair of vertical spaced apart swingable arms, connected to both of the horizontal arms, which pivotally connect the end of each horizontal arm to the framework;
means to vibrate the casting carrying unit;
the casting carrying unit having a support bed on which a casting can rest loosely; and
the support bed having spaced apart casting restraining means between which a casting fits with predetermined clearance so that the casting can slide between and hit the restraining means when the casting is vibrated.

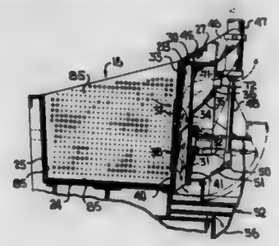
4,637,559

SAND LUMP CRUSHING DEVICE

Joseph E. Bowling, Waynesboro, Pa.; James H. Carpenter, and Russell L. Rowe, both of Hagerstown, Md., assignors to Kennecott Corporation, Stamford, Conn.

Division of Ser. No. 90,028, Oct. 31, 1979, Pat. No. 4,324,367.
This application Oct. 2, 1981, Ser. No. 308,092
Int. Cl.[4] B02C *19/12*
U.S. Cl. 241—94 7 Claims

1. A perforated crusher plate for providing an outer wall portion of a vibratory sand lump crusher tub, said plate comprising a main rectangular shaped body portion adaped to be connected to said tub in an imaginary plane inclined to the horizontal with the front face of the plate facing the interior of the tub to receive sand lumps in pressure engagement against said face, said plate having horizontally extending vertically spaced perforations in the form of slots, and horizontally extending and vertically spaced lugs projecting forwardly from



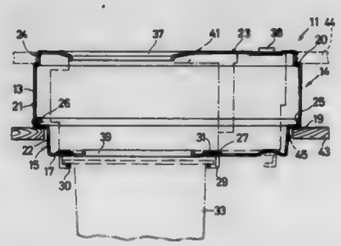
said main plate portion, said lugs having substantially the same vertical dimension of said slots and defining abrading areas in front of said slots for constantly wiping sand lumps in advance of said main plate portion during vibration of said tub to prevent extrusion of sand clumps through said slots.

4,637,560

MACHINE FOR COMMINUTING MATERIALS, SUCH AS DOCUMENTS PARTICULARLY A SHREDDING MACHINE

Albert Goldhammer, Ueberlingen, Fed. Rep. of Germany, assignor to Feraverktechnik Schleicher & Co., Fed. Rep. of Germany

Continuation of Ser. No. 594,671, Mar. 25, 1984, abandoned.
This application Apr. 4, 1986, Ser. No. 848,904
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3312992
Int. Cl.[4] B02C *19/00, 23/00*
U.S. Cl. 241—100 10 Claims



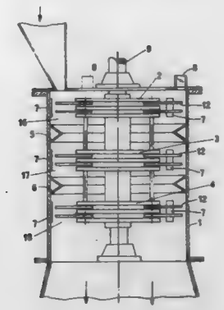
1. In a machine for comminuting paper, having a feed opening and a discharge opening end which is capable of insertion into an opening in a frame, the improvment comprising: a casing having an upper casing part and a separable lower casing part for supporting the apparatus on said frame, said upper casing part having larger dimensions in horizontal extension to said frame opening than the lower casing part, thereby forming an outwardly-directed supporting shoulder between the upper and the lower casing parts for supporting said machine in said framed opening dimensioned to receive the lower casing part, the opening being smaller than the upper casing part, a bottom of the lower casing part being provided with a discharge opening for comminuted material and having a holder for a container for the comminuted material, positioned below the lower casing part.

4,637,561

BEATER MILL HAVING AT LEAST ONE VERTICALLY OR OBLIQUELY EXTENDING CYLINDRICAL MILLING CHAMBER

Dan O. Edberg, Kolding, Denmark, assignor to A/S Ingeniorgruppen AF, Christiansfel, Denmark

Filed Nov. 15, 1983, Ser. No. 551,908
Claims priority, application Denmark, Nov. 15, 1982, 5069/82
Int. Cl.[4] B02C *13/282*
U.S. Cl. 241—154 2 Claims



1. A beater mill for milling materials such as oily grain, comprising at least one upwardly extending milling chamber having a cylindrical inner surface of an impermeable chamber wall, a rotor rotatably supported in the chamber, the axis of said rotor extending parallel to the axis of the chamber, a number of protruding beaters supported pivotably on the rotor, an inlet opening arranged above the rotor for supply of goods to be milled, and an outlet opening as well as an outlet which extends from said outlet opening away from said milling chamber, said outlet opening and said outlet both having a diameter which is at least the same diameter as the largest diameter of the inner surface of the milling chamber arranged below the rotor for discharge of milled goods, wherein the cylindrical inner surface of the milling chamber wall is smooth and free of obstructional means that may form a resistance against the flow of milling foods along the cylindrical inner surface thereby reducing the generation of heat from friction during milling, and wherein the maximum distance of the beaters from the axis of the rotor is less than the distance from said axis to the inner surface of the milling chamber.

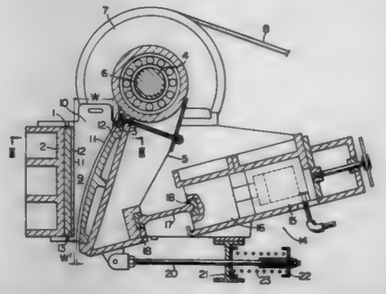
4,637,562

ROCKING SLAG BREAKER

Tatsuo Hagiwara, Funabashi; Keiji Imai, Iharaki, and Shigenori Nagaoka, Chiba, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha and Ishii Syoji, Ltd., both of, Japan

Filed Jan. 4, 1985, Ser. No. 688,889
Claims priority, application Japan, Jan. 10, 1984, 59-2320; May 28, 1984, 59-108104; Nov. 9, 1984, 59-236470
Int. Cl.[4] B02C *1/10*
U.S. Cl. 241—259.2 4 Claims

1. A rocking slag breaker for breaking slags generated in furnaces comprising a stationary breaker plate means and a rocking breaker plate means arranged to oppose said stationary breaker plate means at an inclination with respect thereto to define a breaker chamber therebetween having an axis along which slags move during the breaking operation between an inlet portion defined by the upper ends of said breaker plate mean and an oulet portion defined by the lower ends of said breaker plate means, said breaker plate means both having surfaces providing opposing undulations, each undulation including alternating crests and valleys in a direction substantially perpendicular to said axis such that each crest of one of the breaker plate means opposes a corresponding valley in the other of the breaker plates means and such that the number of crests on one of the breaker plate means corresponds to the number of valleys on the opposed breaker plate means, means for supporting said rocking breaker plate means for rocking movement, breaker plate drive means for imparting rocking movement to said rocking breaker plate means, and hydraulic means connected to said outlet portion of said breaker plate means operating independently of said breaker plate drive means to increase and decrease cyclically and incrementally



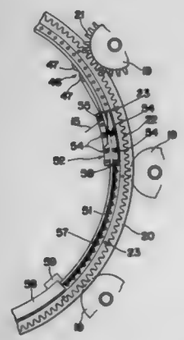
the spacing between the lower ends of the breaker plate means where they define the outlet portion of the breaker chamber to allow the slags to fall downwardly intermittently and progressively along the axis of the breaker chamber in accordance with the incremental change in spacing and cause a change of points of contact between the slags and both breaker plate means to enhance compression of the slags therebetween and reduce stagnation in the breaker chamber.

4,637,563

TOROIDAL WINDING APPARATUS

Kazuhiro Arii; Terusaki Tanaka, both of Kobe; Nobuyuki Sumida, Sakai, and Koubei Arisaka, Takatsuki, all of Japan, assignors to Daihen Corporation, Osaka, Japan

Filed Feb. 11, 1985, Ser. No. 700,309
Claims priority, application Japan, Feb. 14, 1984, 59-18656[U]; Dec. 11, 1984, 59-187979[U]
Int. Cl.[4] H01F *41/08*
U.S. Cl. 242—4 B 4 Claims



1. A toroidal winding apparatus for winding an elongated conductor into a coil around a magnetic core having a central opening, comprising:
a circumferentially extending magazine for storing the conductor around the outer periphery thereof, and including an inside opening to pass the conductor radially inward;
a magazine stand supporting the magazine for rotation along a circumferential path of travel, and including an opening to receive the magnetic core in a position where the path

of travel of the magazine extends through the central opening of the magnetic core;

means to rotate the magazine around the path of travel, to pass the conductor from the magazine, through the inside opening, and to wind the conductor around the magnetic core;

tension slider means supported for movement along the magazine to engage and to maintain tension on the conductor, between the magazine and the magnetic core, as said conductor is wound onto the magnetic core; and

braking means connected to the magazine for rotary movement therewith to apply a braking force to the conductor as said conductor passes from the inside opening of the magazine toward the tension slider means; the braking means comprising

(i) a first roller having a first outside circumferential surface,

(ii) a second roller having a second outside circumferential surface, and

(iii) means to hold the first and second circumferential surfaces in different positions relative to each other,

the first and second rollers being positioned opposite each other to squeeze the conductor between the first and second outside circumferential surfaces as the conductor is pulled from the magazine toward the tension slider means.

4,637,564

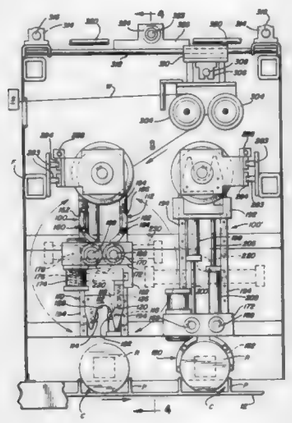
DUAL REEL CONTINUOUS WIRE WINDING MACHINE WITH ROBOTIC REEL LOADING MECHANISM

Mark Hallenbeck, Buffalo Grove, and Robert H. Frankenbush, Highland Park, both of Ill., assignors to FTS Equipment Manufacturing Co., Skokie, Ill.

Filed Nov. 4, 1985, Ser. No. 794,565

Int. Cl.⁴ B65H *54/02, 67/052*

U.S. Cl. 242—25 A **26 Claims**



1. A continuous wire winding machine for winding wire on reels having a pair of spaced flanges connected by a central core, said machine comprising,

a machine frame,

conveyor means for supplying empty reels to and removing wound reels from the machine,

two pairs of arbor means for gripping and rapidly rotating reels for the winding of wire thereon, one of each of said pairs being a driven arbor,

transfer means for transferring empty reels from said conveyor means and wound reels to said conveyor means,

said transfer means comprising a pair of robotic arm assemblies, each assembly comprising a first gripper for grasping an empty reel at one end of the assembly and a second gripper for grabbing a wound reel at the other end of the assembly,

shaft means mounting each said robotic arm assembly for oscillation of said assembly through an arc of 180°, and means for oscillating said shaft, and

driving means mounting said grippers for moving them between an outwardly extended position and an inwardly retracted position relative to said assembly and said shaft,

whereby when said grippers are in their extended positions, they are enabled alternatively to present an empty reel between a pair of said arbors and to grab a wound reel positioned between said pair of arbors, and when said grippers are in their retracted positions, the assembly is enabled to be oscillated about the axis of said shaft.

4,637,565

WINDING APPARATUS FOR FORMING LAPS

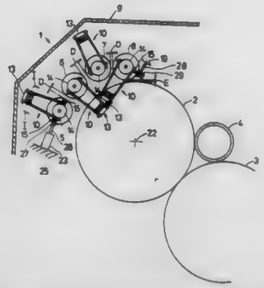
Rene Schmid, Niederneunforn, Switzerland, and Hermann Krehl, Karlsruhe, Fed. Rep. of Germany, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Oct. 3, 1984, Ser. No. 657,352

Claims priority, application Switzerland, Oct. 10, 1983, 5506/83

Int. Cl.⁴ B30B *3/04;* **B65H** *18/06*

U.S. Cl. 242—55.1 **8 Claims**



1. A wind-up apparatus for forming laps, comprising:

at least one rotatable winding roller;

a predetermined number of calender rolls associated with said at least one rotatable winding roller and serving for consolidating a fiber layer into a windable fiber web;

each calendar roll of said predetermined number of calender rolls having a predetermined rest position and an operating position;

guide means provided for said calender rolls to enable said calender rolls to be movable within a given mobility range defined between said rest position and said operating position;

lateral support means for supporting said guide means in substantially fixed relationship to said at least one rotatable winding roller;

said guide means comprising force-producing means for moving the calender rolls into said predetermined rest position thereof;

said force-producing means comprises at least one spring-pair containing two springs held apart from one another with a predetermined spacing; and

one end of the spring-pair being stationary and the end of the spring-pair which is held apart with the predetermined spacing being connected to one end of the calender roll whereby said connection contains at least a portion of the calender roll within said spring-pair.

4,637,566

METHOD AND APPARATUS FOR CONDUCTING THE END OF A WEB

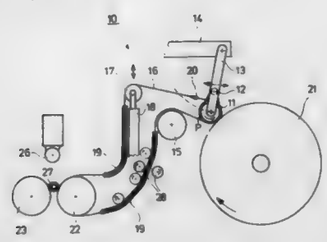
Markku Kyytsönen, Nummineu, Finland, assignor to Oy Wartsila AB, Finland

Filed Sep. 5, 1985, Ser. No. 772,682

Claims priority, application Finland, Sep. 7, 1984, 843526

Int. Cl.⁴ B65H *18/16, 20/16, 27/00*

U.S. Cl. 242—56 R **22 Claims**



10. Apparatus for conducting an end of a web from a machine roll through a subsequent web processing arrangement along a path defined by web guiding members, comprising:

fetching and gripping means for gripping the end of the web on the machine roll and for wrapping the web thereabout a desired number of turns;

conduction means for engaging the web and conducting the web in doubled-over form through the web processing arrangement with the web unwinding simultaneously both from the machine roll and from the fetching and gripping means; and

means for conveying said conduction means along a controlled path.

4,637,567

DEVICE FOR CONTINUOUSLY CUTTING AND WINDING A WEB

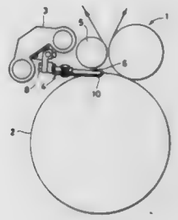
Keiji Tanaka, Kanagawa; Hatsuo Honryo, and Takeri Koga, both of Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 27, 1983, Ser. No. 545,974

Claims priority, application Japan, Oct. 29, 1982, 57-163220[U]

Int. Cl.⁴ B65H *19/26, 19/28;* **B26D** *1/08*

U.S. Cl. 242—56 R **4 Claims**



1. A device for continuously cutting and winding a web, comprising:

a web winding roll;

a guide roll;

means for cutting a web movable in-between said web winding roll and said guide roll, said cutting means including a cutter blade made of an elastic metal plate, said cutter blade having a cutting edge and a flat portion; and

means for moving said cutter blade along an axial direction of said web winding roll, said cutter blade being mounted to said moving means such that at least a part of said flat portion of said cutter blade is maintained in elastic contact with an outer surface of said web winding roll behind said cutting edge while said cutter blade is moved along said axial direction.

4,637,568

MANDREL FOR WINDING FLEXIBLE METAL CATALYST CORE

Richard C. Cornelison, 6587 State Rte. 82, Hiram, Ohio 44234

Filed Jul. 30, 1985, Ser. No. 760,498

Int. Cl.⁴ F01N *3/28*

U.S. Cl. 242—68.5 **5 Claims**



1. A mandrel for winding a thin metal catalyst support about its longitudinal axis, said mandrel having a circular central cross section and bilaterally extending arms along a common axis, each arm having an oval cross section continuously changing in a symmetrical manner along each arm, respectively, in a direction away from the circular central cross section to a terminal oval section having a final major and minor diameter, the major and minor diameters axially along one of said arms being angularly displaced from the major and minor diameters at corresponding axial positions along the other of said arms.

4,637,569

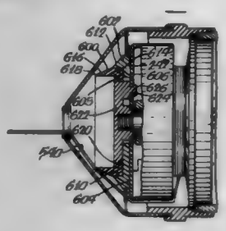
FEATHERING RING FOR FISHING REELS

Steven L. Swisher, Tulsa, Okla., assignor to Brunswick Corporation, Tulsa, Okla.

Filed Mar. 11, 1985, Ser. No. 710,608

Int. Cl.⁴ A01K *89/01*

U.S. Cl. 242—84.2 A **6 Claims**



1. In a fishing reel of the type having a front cover with a conically-shaped portion with an inside surface tapering forwardly to a line guide, a reel body having a deck plate, a center shaft extending through the reel in an axial direction, a spinner head assembly carried by the center shaft, crank drive means for rotating the center shaft and spinner head assembly to retrieve fishing line and means for selectively moving the center shaft and spinner head axially forwardly and rearwardly relative to the deck plate, line feathering structure comprising:

a deformable ring formed from a first material and having a forwardly facing edge and an annular, radially facing surface rearwardly of the edge;

means attaching the ring to the spinner head assembly to follow the axially forward and rearward movement of the center shaft and spinner head assembly;

said annular, radially facing surface situated in nonparallel relationship with the inside surface of the front cover with the feathering structure disengaged;

a line braking member formed from a second material and separate from the ring and having a surface engageable

with the inside surface of the front cover to trap the line against the inside surface of the front cover; and

means attaching the line braking member to the spinner head assembly to follow the axially forward and rearward movement of the center shaft and spinner head assembly;

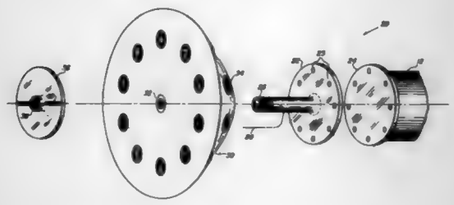
said annular, radially facing surface deforming and residing together with the surface of the line braking member against the inside surface of the front cover with the line braked at the initiation of a cast,

said first material being more deformable than the second material so that smooth progressive feathering of the line can occur as the ring is pressured against the inside surface of the front cover.

4,637,570
DRAG STABILIZER

Gregory N. Mitchell, St. Mary County, and Ronald A. Wilson, Calvert County, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Arlington, Va.

Filed Jan. 9, 1985, Ser. No. 689,890
Int. Cl.⁴ F41J *9/08*
U.S. Cl. 244—1 TD **11 Claims**



1. A drag stabilizer for a towed cylindrical object which comprises:

a body having a shape with a diameter smaller in front than in back, having a hole along and through the longitudinal axis, having a plurality of holes parallel with the central hole and comprises a closed-cell foam with a density of not greater than about three pcf, a buoyancy of at least about 45 pcf, a tensile strength of at least about 40 psi, a tear strength of at least about 10 lb/in, and a water absorption of less than about one weight percent of total foam weight;

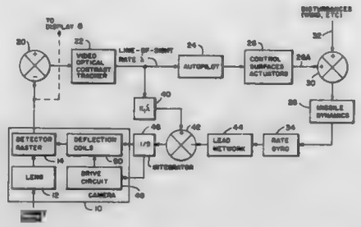
an attachment plate for rigidly attaching said body to said towed object, said plate comprising a plastic with a hardness from about 80 on the Durometer-A scale to about 120 on the Rockwell-R scale, an impact resistance of not less than about 500 J/m at 24° C. and of not less than about 45 J/m at 40° C., a tensile strength of not less than about 20 MPa at 24° C. and not less than about 15 MPa at 50° C., a specific gravity of not more than about 1.6, and a water absorption of not more than one weight percent after 24 hours submersion and said plate having a means for rigidly attaching said plate to said towed object and having a tube normal to one side for passing through said central hole of said body, thereby attaching said body to said towed object; and

a securing plate having a diameter less than the back diameter of said body, having a means for attaching to said tube of said attachment plate, thereby holding said body on said tube, and comprising a material similar to the material of said attachment plate.

4,637,571
ELECTRONIC IMAGE STABILIZATION

Donald W. Holder, Huntsville, and William R. Phillips, Hazlegreen, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 3, 1985, Ser. No. 771,751
Int. Cl.⁴ F41G *7/22*
U.S. Cl. 244—3.16 **6 Claims**



1. In a target tracking system wherein a television image of a target is used for guidance of a missile toward the target, a method of compensating for undesirable missile body motion and providing a stable television image output from the television camera to the missile target tracker, comprising the steps of:

rigidly mounting a video camera to the missile body;

directing the camera lens along a field-of-view that is referred to the missile longitudinal axis;

deriving a television image of a target within the field of view;

sensing missile body disturbances;

providing missile pitch and yaw angular velocity signals in response to said disturbances;

processing said angular velocity signals;

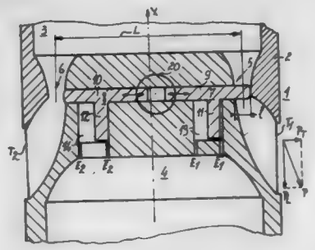
coupling said processed angular velocity signals to a television camera's vertical and horizontal deflection coils and;

moving the camera scanning raster of the television camera in the opposite direction of undesirable missile body motion for providing said stable image output to the missile target tracker.

4,637,572
GAS PROPELLOR FOR GUIDED MISSILE

Pierre Metz, Palaiseau, France, assignor to Thomson Brandt Armements, Paris, France

Filed Jan. 3, 1985, Ser. No. 688,638
Claims priority, application France, Jan. 6, 1984, 84 00172
Int. Cl.⁴ F42B *15/033*
U.S. Cl. 244—3.22 **8 Claims**



1. Gas propulsion apparatus for a missile, comprising:

first and second nozzle means, disposed on substantially opposite sides of said missile, for providing thrust force passageways directed to a rear of said missile;

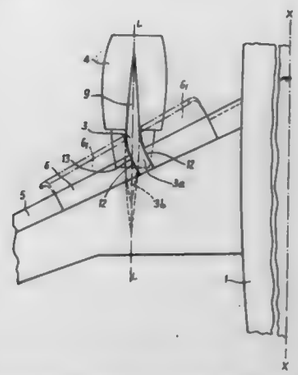
first and second valve means, movable with respect to each other and movably disposed in said first and second nozzle means respectively, for controlling thrust forces passing through said passageways; and

control means for controlling said first and second valve means to (a) prevent said first and second nozzle means from being closed simultaneously, and (b) cause said first and second nozzle means to assume one of three positions, in said first position said first nozzle means is open while said second nozzle means is closed, in said second position said first nozzle means is closed while said second nozzle means is open, and said third position both said first and second nozzle means are fully open.

4,637,573
ARROWLIKE AIRCRAFT WING EQUIPPED WITH A HIGH-LIFT SYSTEM AND WITH A PYLON FOR SUSPENDING THE ENGINE

Robert Perin, Pibrac; Pierre Jourdan, and Bernard Pauly, both of Blagnac, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Nov. 30, 1984, Ser. No. 676,867
Claims priority, application France, Dec. 6, 1983, 83 19480
Int. Cl.⁴ B64D *29/02*
U.S. Cl. 244—54 **5 Claims**



1. An aircraft having a longitudinal axis and an aerodynamic pylon for suspending an engine nacelle below a wing of the aricraft, comprising:

(a) said wing having a leading edge, an upper surface and a lower surface, and said wing having a predetermined sweep angle with respect to said longitudinal axis of said aircraft;

(b) a high-light flap system arranged in said leading edge of said wing and comprising one flap which is displaceable orthogonally with respect to said leading edge between a retracted position and a high-lift out-spread position, said flap being housed inside said wing and forming part of said leading edge and the adjacent part of said upper surface in said retracted position, and said flap projecting forward from said leading edge in said high-lift out-spread position;

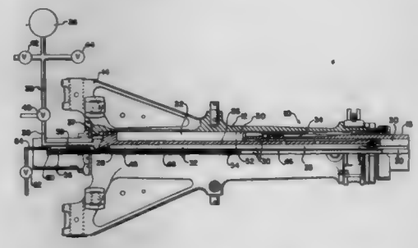
(c) said nacelle mounted below said lower surface and forwardly of said leading edge; and

(d) said aerodynamic pylon having an oblong cross-section and being positioned such that the longitudinal axis of said cross-section is approximately parallel to said air-craft longitudinal axis, said aerodynamic pylon projecting forward from said leading edge of said wing and comprising a front edge joining up with said wing in the vicinity of the leading edge thereof and said aerodynamic pylon having an upper part adjacent said leading edge that is bent longitudinally inwardly toward said longitudinal axis of said aircraft, said upper part having a shape such that in said out-spread position and in any intermediate position between said out-spread and said retracted positions, the gap existing between said flap and said upper part is just enough to allow for the movement of said flap.

4,637,574
ATTENUATING, EXTENDIBLE SHOCK-ABSORBING STRUT

Roy R. Headwerk, Hicksville, N.Y., assignor to Menasco Inc., Burbank, Calif.

Filed Sep. 14, 1984, Ser. No. 650,608
Int. Cl.⁴ B64C *25/60*
U.S. Cl. 244—104 FP **23 Claims**



1. A rapidly extendible, rough-field attenuating, shock-absorbing strut for use with an aircraft to provide angular or upward momentum to the aircraft during takeoff and to prevent damaging forces from being transmitted to the aircraft structure, said strut comprising an outer cylinder secured to said aircraft, an inner cylinder adapted for longitudinal reciprocation within said outer cylinder and having a wheel mounted adjacent an end thereof opposite said outer cylinder, a piston mounted for longitudinal reciprocation within both said outer and inner cylinders, said piston having a piston head on an end thereof opposite said inner cylinder, said piston head being adapted for reciprocation within said outer cylinder, means for applying fluid pressure between the outer cylinder and said piston head to cause said piston to move longitudinally toward said inner cylinder and means in association with said piston and inner cylinder for moving said inner cylinder longitudinally and away from said aircraft and outer cylinder when said piston moves longitudinally toward said inner cylinder, whereby an angular or upward momentum is provided to said aircraft.

4,637,575
HELICOPTER AIRMOBILE WORK PLATFORM FOR WORKING ON POWER LINES AND TOWER STRUCTURES

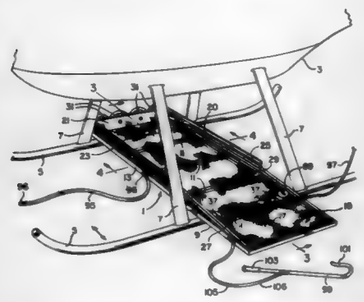
Scott H. Yenzer, 1145 Asturia Ave., Coral Gables, Fla. 33134

Filed Oct. 4, 1984, Ser. No. 657,492
Int. Cl.⁴ B64D *11/00*
U.S. Cl. 244—118.5 **23 Claims**

1. A work platform adapted for attachment to a pair of helicopter skid tubes that extend longitudinally beneath a helicopter fuselage, substantially parallel to each other, for supporting a workman working on high-voltage power lines comprising;

a rectangular base having a length along its major axis

greater than the distance between the helicopter skid tubes, said base including a workman support portion;



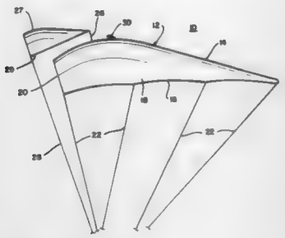
attachment means for directly attaching said base to each of the helicopter skid tubes such that at least one skid tube is capable of lateral movement with respect to the base.

4,637,576

PARACHUTE WITH LEADING-EDGE SLATS

Michael J. Ravnitzky, Peekskill, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,444
Int. Cl.⁴ B64D *17/02, 17/14*
U.S. Cl. 244—145 **9 Claims**



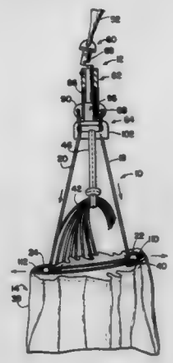
1. A parachute, comprising:
an inflatable canopy structure defining a leading-edge;
a plurality of suspension lines connected at spaced locations to the canopy;
at least one slat structure having a leading edge, a trailing edge and top and bottom surfaces between the leading edge and the trailing edge for directing airflow and producing lift;
means for attaching said at least one slat structure to the canopy structure; and
means for deploying each slat structure so that the leading edge thereof is located forward of and/or above the leading-edge of the canopy structure, said means for deploying including a suspension line attached to the bottom surface of the slat structure at approximately the leading edge thereof and a stow line attached to the bottom surface of the slat structure at approximately the trailing edge thereof and to the upper canopy wall.

4,637,577

DISCARD ASSEMBLY FOR PARACHUTE DEPLOYMENT MECHANISM

George Miseyko; Walter R. Peck, both of Asheville, and Ronald G. Chase, Arden, all of N.C., assignors to Stencel Aero Engineering Corp., Arden, N.C.

Continuation of Ser. No. 593,862, Mar. 27, 1984, abandoned.
This application Apr. 29, 1986, Ser. No. 858,839
Int. Cl.⁴ B64D *17/62*
U.S. Cl. 244—147 **18 Claims**



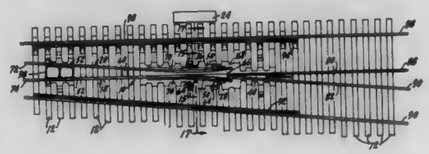
1. In a parachute deployment assembly including a closed parachute packed in a container, a deployment mechanism for extracting the parachute from the container, and a discard assembly for discarding the deployment mechanism from the parachute, the improvement comprising:
means, coupled to the parachute and to the discard assembly, for actuating the discard assembly in response to the transverse opening of the parachute by a preselected amount,
said means for actuating including means for transmitting the force generated by the transverse expansion of the parachute to the discard assembly.

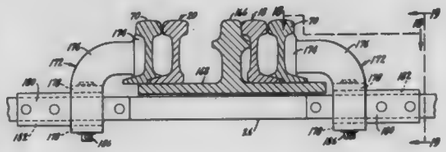
4,637,578

RAILROAD FROG HAVING MOVABLE WING RAILS

Earl E. Frank, Tallman, N.Y., assignor to Abex Corporation, New York, N.Y.

Filed Oct. 26, 1983, Ser. No. 545,488
Int. Cl.⁴ E01B *7/14*
U.S. Cl. 246—391 **7 Claims**





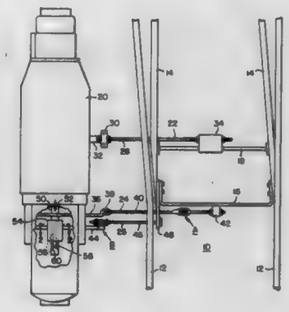
1. In a railroad frog of the type having movable wing rails hinged for lateral movement at a predetermined point and actuated by a throw rod which extends in a horizontal direction beneath the rails and transverse to the vertical axes of the wing rails, the improvement comprising swivel clips for pivotally connecting the throw rod to the wing rails and for resisting rolling action of the wing rails about their bases, the swivel clips comprising:
a bar connected to a wing rail;
an arm connected to the bar and extending downwardly to a point adjacent the throw rod;
a clevis attached to the arm;
a pin block attached to the throw rod; and
a pin pivotally connecting the clevis and pin block, said pin block having an elongated sleeve portion complementally fitting a portion of the throw rod beyond the connection of the arm to the throw rod in an axial direction of the throw rod.

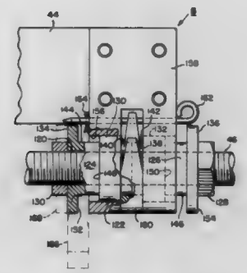
4,637,579

RAILROAD SWITCH MECHANISM

Russell M. Hartung, Webster, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Continuation of Ser. No. 465,402, Feb. 10, 1983, abandoned.
This application Apr. 23, 1985, Ser. No. 726,913
Int. Cl.⁴ E01B *7/00*
U.S. Cl. 246—452 **7 Claims**





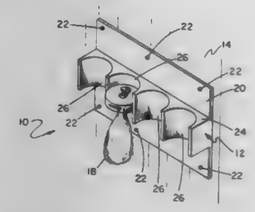
1. A control assembly for a railroad switch mechanism having a switch machine and a railroad track switch connected thereto via said control assembly, which control assembly avoids the need for readjustments after testing, said control assembly comprising a rod assembly movable with said track switch and providing a rigid connection beween said track switch and said switch machine of adjustable length, coupling means in said rod assembly having an opening, a member removable from and replaceable in said opening for releasing said connection so that the adjustment of said connection established by said rod assembly upon replacement of said member in said opening is quickly reestablished thereby reducing the time required for testing to verify the operation of said track switch, said rod assembly being provided by a detector rod assembly, said detector rod assembly comprising a detector connector rod connected at one end thereof to the switch points of said track switch and via said releasing member to the detector bar of said switch machine, said coupling means including a collar having an annular groove defining said opening, said connector rod being connected to said collar, means retaining said collar in longitudinal sliding relationship therewith, and a replaceable retaining member disposed in said groove and engageable with said retaining means for releasing said collar and connector rod for sliding movement when removed from said groove and maintaining said rigid connection when disposed in said groove.

4,637,580

FOOD STORAGE DEVICE

Paul H. Idstein, 506 Stuart, Grayslake, Ill. 60030

Filed Oct. 3, 1985, Ser. No. 783,455
Int. Cl.⁴ A47F *5/08*
U.S. Cl. 248—95 **5 Claims**



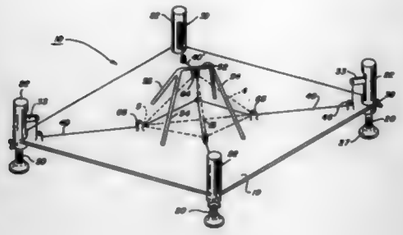
1. Apparatus for resealing a foodstuff container of the bag variety about its neck and releasably supporting said container from a preselected location, comprising:
a closing assembly means for releasably resealing said container about said neck including:
a cavity internal of said assembly means for receiving a portion of said neck;
closing means pivotable about a first end for forcing a portion of said neck into a portion of said cavity whereby said neck portion and said closing means are retainedly and releasably held within said portion of said cavity in a press-fit;
a storage rack means for releasably supporting said closing assembly means; wherein
said first end of said closing means is internal to said closing assembly means;
said cavity is formed about a central longitudinal axis;
said closing means includes a second end extending radially outwards of said axis;
said closing assembly means further includes
pin means for interconnecting said closing means in said pivotable relation about said first end; and
said closing means further includes a second end pivotable about said first end whereby said closing means moves in a plane intersected by said axis when moving between a first and second position;
when said closing means moves between said first and second positions a portion of said closing means moves in a cross-sectional area defined by a plane intersected by said axis and intersecting said cavity;
said storage rack means defines a rack aperture for slidably and releasably receiving and retaining a portion of said closing assembly means;
said closing assembly means further defines a slot in communication with said cavity; and
a portion of said closing means extends through said slot and radially outwards thereof whereby a portion of said closing means moves along said slot when said closing means is moved between said first and second positions.

4,637,581

FOUR POINT SUPPORT FOR COPIERS AND THE LIKE

Lam F. Wong, Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 19, 1985, Ser. No. 777,482
Int. Cl.[4] F16M *11/24*
U.S. Cl. 248—188.3 5 Claims



1. A four-point support for easy leveling a load comprising:

first, second, third and fourth support means for the load, said support means being located at the corners of a quadrilateral, said support means being adapted to bear on a supporting surface at four points for supporting the load above said surface;

each support means having an individual connection with the load for transmission of force from the load to said supporting surface, each support means being movable,

the first and third support means being located at two opposite corners of the quadrilateral and the second and fourth support means being located at the other two opposite corners of the quadrilateral,

first means interconnecting said first support means to a common point for transmitting force from said first support means to said common point on movement of said first support means in one direction and for transmitting force from said common point to said first support means on movement of said common point in the opposite direction;

second means interconnecting said second support means to said common point for transmitting force from said second support means to said common point on movement of said second support means in one direction and for transmitting force from said common point to said second support means on movement of said common point in the opposite direction;

third means interconnecting said third support means to said common point for transmitting force from said third support means to said common point on movement of said third support means in one direction and for transmitting force from said common point to said third support means on movement of said common point in the opposite direction; and

fourth means interconnecting said fourth support means to said common point for transmitting force from said fourth support means to said common point on movement of said fourth support means in one direction and for transmitting force from said common point to said fourth support means on movement of said common point in the opposite direction;

said common point laying within a tetrahedron;

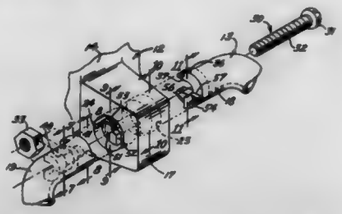
said fourth means passing through the apex of said tetrahedron.

4,637,582

TOWEL RING ASSEMBLY

John W. Boda, Roscoe, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Jan. 13, 1986, Ser. No. 818,218
Int. Cl.[4] A47F *5/00*
U.S. Cl. 248—315 14 Claims



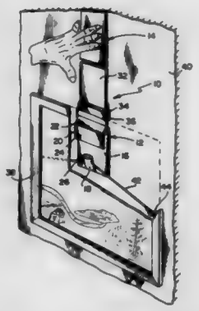
1. A towel ring assembly comprising, in combination, a base having a rear surface adapted to be attached to a wall or the like, a forwardly extending projection on said base and formed with a generally horizontal hole having an axis extending generally parallel to the wall, a split ring having first and second end portions spaced from one another, and located on opposite laterally facing sides of said projection, a fastener assembly comprising a nut and comprising a screw having a head and having a shank extending through said hole and threaded into said nut, first and second ears on the rear sides of the first and second end portions, respectively, of said ring, said first ear being located between said head and one side of said projection in opposing engagement with said head and receiving a portion of said shank, and said second ear being located between said nut and the opposite side of said projection in opposing relation with said nut and receiving another portion of said shank whereby tightening of said fastener assembly causes said head and nut to bear against said ears and to draw the ends of said ring toward said projection while permitting said ring to swing relative to said projection.

4,637,583

DEVICE FOR POSITIONING PICTURE HANGERS ON A WALL SURFACE

Jeffrey M. Babitz, P.O. Box 805, West Dover, Vt. 05356

Filed Dec. 31, 1984, Ser. No. 687,593
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—544 12 Claims



1. A device for positioning pictures and like articles in selected locations for hanging upon a wall, said device comprising:

a hanger member having a flat body plate and at least one nail chute projecting from the front surface of said body plate, said nail chute being sized and positioned to suspend therefrom a support member on the rear of the article to be hung, said nail chute being formed integrally with said hanger member,

an elongated locator member having a length appreciably greater than the length of said hanger member, said elongated locator member being flexible,

means for detachably coupling said locator member to the upper end of said hanger member with said locator member extending upwardly from said hanger member, whereby when said article to be hung is suspended on said hanger member, said locator member extends above the top of said article in a position to be grasped for locating said article in a selected position on said wall, and

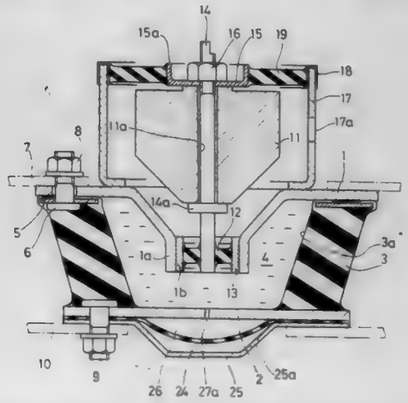
adhesive means on the rear surface of said body plate for temporary attachment of said hanger member on said wall in said selected position.

4,637,584

POWER UNIT MOUNT ASSEMBLY

Shin Takehara, Machida, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 11, 1985, Ser. No. 722,713
Claims priority, application Japan, Apr. 11, 1984, 59-71005
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—559 11 Claims



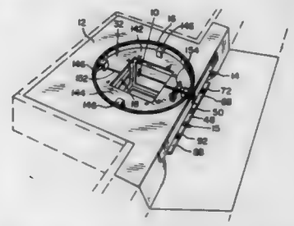
1. A fluid-containing power unit mount assembly comprising a first upper base plate secured to a power unit and a second lower base plate secured to a vehicle body and an elastic member secured between the first and second base plates to define with the elastic member, the first upper base plate and the second lower base plate an inner space forming a first fluid chamber which encloses a fluid; wherein the first upper base plate is provided with an aperture, which aperture is blocked by a second elastic member on which is mounted a mass body.

4,637,585

REUSABLE CONCRETE CURB INLET FORM

August J. Picollo, 628 Beebe Rd., Central Point, Oreg. 97501

Filed Apr. 15, 1985, Ser. No. 723,613
Int. Cl.[4] B28B *7/30*; E01C *19/50*; E02D *29/12*
U.S. Cl. 249—10 16 Claims



1. A reusable concrete crub inlet drain form for forming a curb inlet drain for a catch basin comprising:

a central key section means having a top, a bottom, and sides;

plural curb inlet drain forming means detachably mounted to the sides of the central key section for forming the upper portion of a curb inlet drain;

the curb inlet drain forming means each including a rear wall for detchable mounting to a side of the key section means, a shelf which is generally horizontal, a flange projecting downwardly from a outer edge of the shelf, and a neck segment flange projecting upwardly from the shelf; and

the curb inlet drain forming means including means for forming a drain inlet opening leading to the catch basin.

4,637,586

FORM FOR PRODUCING CONCRETE RAILS

Werner Fastenau, Esslingen-Rüdern, Fed. Rep. of Germany, assignor to Ed. Züblin Aktiengesellschaft, Stuttgart-Möhringen, Fed. Rep. of Germany

Filed Dec. 6, 1985, Ser. No. 806,261
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444296
Int. Cl.[4] B28B *7/04*
U.S. Cl. 249—159 6 Claims



1. A form for producing concrete rails having a horizontal tread and a vertical guide portion for track-guided, rubber-tired vehicles, said form comprising:

a frame which is provided with a first side;

at least one first support and at least one second support, with said second support being adjustably connected to said first side of said frame;

a sheathing having a first end and a second end;

a first lateral sheathing having a first end which is connected to said second end of said sheathing;

a second lateral sheathing having a first end which is connected to a second end of plate members;

a guide portion sheathing which is provided with a first end and a second end, with said second end being positioned at substantially right angles to said first end of said first lateral sheathing and being connected to said first support, and with said guide portion sheathing being continuous and extending along the entire length of said form, and with said guide portion sheathing being capable of being adjustably curved by shifting of said first and said second supports; and

a tread sheathing which is provided with said plate members and a resilient covering, with said plate members being separated from one another by a gap and with said plate members being arranged adjacent one another following the longitudinal direction of said form, and with said plate members being provided with a side remote from said first support, wherein said last-mentioned sides of said plate members are connected by said covering which thereby bridges said gaps and forms a flat shuttering surface, and with a first end of one of said plate members being con-

nected to said first end of said guide portion sheathing forming substantially at right angle therewith.

4,637,587

FACILITY FOR THE MONITORING OF PHYSICAL QUANTITIES ON SYSTEMS

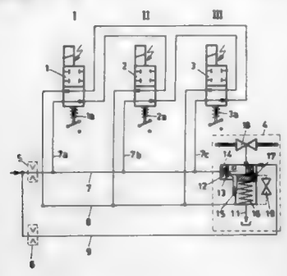
Klaus Kihlstein, Glattbrugg, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jul. 12, 1985, Ser. No. 754,217

Claims priority, application Switzerland, Jul. 20, 1984, 3544/84

Int. Cl.⁴ F16K *31/02*; F01B *25/16*; F01D *21/00*

U.S. Cl. 251—29 **7 Claims**



1. An apparatus for the monitoring of physical quantities on systems, said apparatus comprising:

(a) a quick closing valve comprising:

(i) first, second, and third chambers;

(ii) a first path of fluid communication from said first chamber to said third chamber through said second chamber;

(iii) first valve means for closing said first path of fluid communication in response to an increase in pressure in said second chamber to a value about a first predetermined value;

(iv) a drain to tank in fluid communication with said third chamber; and

(v) second means for actuating a through-flow valve in response to an increase in pressure in said first chamber to a value above a second predetermined value;

(b) a second path of fluid communication for supplying fluid under pressure to said second chamber;

(c) a third path of fluid communication for supplying fluid under pressure to said first chamber;

(d) first, second, and third four-way solenoid valves;

(e) a fourth path of fluid communication for conducting fluid under pressure from said second path of fluid communication through first said first four-way solenoid valve and then through said second four-way solenoid valve to tank;

(f) a fifth path of fluid communication for conducting fluid under pressure from said second path of fluid communication through first said second four-way solenoid valve and then through said third four-way solenoid valve to tank; and

(g) a sixth path of fluid communication for conducting fluid under pressure from said second path of fluid communication through first said third four-way solenoid valve and then through said first four-way solenoid valve to tank, whereby:

(h) when said fourth, fifth, and sixth paths of fluid communication are all open, the pressure in said second chamber does not reach said first predetermined value, said first valve means remains open, the pressure in said first chamber remains beneath said second predetermined value, and said through-flow valve remains un-actuated;

(i) when one of said fourth, fifth, and sixth paths of fluid communication is closed and the other two of said fourth, fifth, and sixth paths of fluid communication are both open, the pressure in said second chamber does not reach said first predetermined value, said first valve means remains open, the pressure in said first chamber remains beneath said second predetermined value, and said through-flow valve remains un-actuated; and

(j) when at least two of said fourth, fifth, and sixth paths of fluid communication are closed, the pressure in said second chamber reaches a value above said first predetermined value, said first valve means closes, the pressure in said first chamber reaches a value above said second predetermined value, and said through-flow valve is actuated.

4,637,588

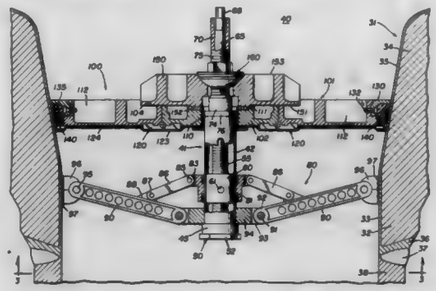
NON-BOLTED RINGLESS NOZZLE DAM

John J. Wilhelm, New Kensington; Gregory L. Calhoun, Allegheny Township, Blair County; Paul H. Dawson, Plum Borough, and Arthur W. Kramer, Franklin Township, Armstrong County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 30, 1984, Ser. No. 605,354

Int. Cl.⁴ F16K *31/44*; F16L *55/12*

U.S. Cl. 251—280 **27 Claims**



1. A foldable nozzle dam for preventing fluid flow through a primary fluid nozzle and the plenum of a nuclear steam generating vessel, said nozzle dam comprising: fluid-impermeable seal means including a plurality of hingedly interconnected sections foldable between a relatively compact access condition facilitating insertion into the steam generating vessel and an expanded sealing condition, said seal means in the sealing condition thereof being disposable within and extending across the nozzle for closing same in frictional engagement with the inner surface of the nozzle around the entire perimeter thereof to form a fluidtight seal; and anchor means separable from said seal means and movable between a relatively compact access configuration for facilitating insertion into the vessel and an expanded anchoring configuration, said anchor means including a base member disposed centrally of the nozzle, a plurality of anchor members pivotally mounted on said base member at equiangularly spaced apart points therearound for pivotal movement between the access and anchoring configurations of said anchor means, an elongated shaft extending axially of the nozzle and coupled at one end thereof to said base member, a collar member disposed in surrounding relationship with said shaft and movable longitudinally thereof, and linkage means interconnecting said anchor members and said collar so that as said collar moves toward said base member said anchor members are urged in an expanding direction, said anchor means being adapted for coupling to said seal means and radially frictionally engageable in its anchoring configuration with the inner surface of the nozzle securely to hold said seal means in its sealing condition.

4,637,589

BI-SECTION ADJUSTABLE CONNECTOR BRIDGING AN OPENED HANDRAIL

Ta C. Lin, 8, Lane 4, Pei Jung Street, Chiayi City, Taiwan

Filed May 16, 1985, Ser. No. 734,703

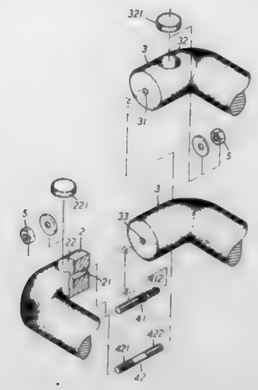
Int. Cl.⁴ E04H *17/14*

U.S. Cl. 256—59 **4 Claims**

1. A device for joining two L-shaped component bars for a stairway railing, comprising:

a first and a second L-shaped component bar, both said first and second component bars defining a horizontally extending opening at one end thereof, and said first component bar also defining a vertically extending opening extending radially from the exterior of said first bar and intersecting said horizontally extending opening in said first component bar;

a bolt means having two ends and threaded at least one end thereof for insertion of said bolt ends within said horizontally extending openings of both said first and second



component bars and thereby joining said first and second component bars, said threaded end terminating within said vertically extending opening, and being of a smaller diameter than said horizontally extending opening in said first bar;

a nut means fitting within said vertically extending opening for screwing onto said threaded end of said bolt means to thereby tighten said joining;

lid means for plugging the exterior of said vertically extending opening.

4,637,590

METHOD AND APPARATUS FOR OPENING AND CLOSING A TAPHOLE IN FURNACES

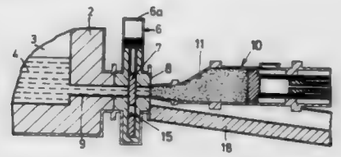
Werner Schneider, Biedenkopfer Strasse 16, D-5900 Siegen 1, Fed. Rep. of Germany

Filed Sep. 24, 1985, Ser. No. 779,988

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1984, 3443143

Int. Cl.⁴ C21B *7/12*

U.S. Cl. 266—45 **2 Claims**



1. A method for the alternating opening and closing of a taphole in furnaces having high internal pressure, comprising the following process steps:

sealing the taphole duct by a closure member;

deploying a plugging gun at the opening of the taphole duct,

reopening the closure member, and

immediately after reopening the closure member, completely filling the taphole duct with plugging compound by means of the plugging gun.

4,637,591

DROSS COOLER AND PROCESSOR

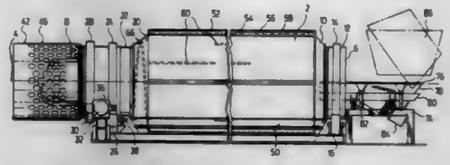
J. Philip McMahon; Han Spoel, and John McGinley, all of 1067 Meyerside Dr., Units 12 and 13, Mississauga, Ontario, Canada

Filed Jun. 13, 1985, Ser. No. 745,244

Claims priority, application Canada, Jun. 22, 1984, 457307

Int. Cl.⁴ C22B *7/04*

U.S. Cl. 266—165 **7 Claims**



1. Dross treatment apparatus comprising:

a drum having a cylindrical shell mounted to rotate about a substantially horizontal axis,

means to rotate said drum about said axis,

an inlet opening at one end of said drum,

said axis being inclined downwardly towards said outlet end at between 0 and 2 degrees from the horizontal,

means to feed dross to the inside of said drum through said inlet opening,

a series of flights at spaced intervals located on the inside surface of said drum shell adapted to tumble the dross therein upon rotation of said drum,

means to remove said tumbled dross from said drum through said outlet opening,

said inlet and outlet openings including a truncated cone extending from the respective end of said shell of said drum radially inwardly and longitudinally beyond the said end of said shell to form an opening of smaller diameter than said drum.

4,637,592

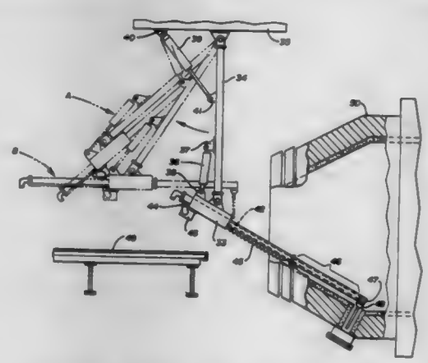
ELEVATED SWINGING DEVICE FOR PLACING SLAG RETENTION DEVICES IN TAPPING CONVERTERS

Michael D. La Bate, II, Ellwood City, and Joseph A. Perri, Coraopolis, both of Pa., assignors to Insul Company, Inc., East Palestine, Ohio

Continuation-in-part of Ser. No. 643,499, Aug. 23, 1984, Pat. No. 4,553,743. This application Jun. 24, 1985, Ser. No. 747,799

Int. Cl.⁴ C21B *5/46*

U.S. Cl. 266—272 **3 Claims**



1. Apparatus for placing a slag retaining device in a tap hole in a converter comprising a two-part boom extensible into said converter, a swingable support member pivotally attached at a top end thereof to and suspended from an overhead support structure, extensible means attached at one end to said over-

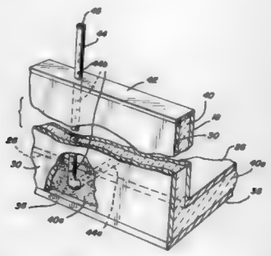
head support structure and at another end to said swingable support member at a location spaced from said swingable support member top end for moving said swingable support member, in a vertical plane on a first arcuate path based on said pivotal attachment to said overhead support structure from a first vertical position adjacent said converter to a second angular position away from said converter, a tubular device pivotally positioned on a lower end of said swingable support member, one part of said two-part boom being positioned in said tubular device, means on said tubular device for moving said one part of said boom telescopically with respect to said tubular device, extendable means having one end attached to said swingable support member and another end attached to said tubular device for moving said tubular device in a second arcuate path in said vertical plane based on said pivotal attachment of said tubular device to said swingable support member, means on one end of the other part of said two-part boom for detachably engaging said slag retaining device, said slag retaining device moving in said vertical plane and remaining in said vertical plane during storage whereby said slag retaining device can be oriented to be aligned with the converter tap hole and moved into and out of a tap hole plugging position without disturbing that alignment and can be in a stored condition above an operating floor while remaining aligned with the tap hole.

4,637,593

LADLE CUP FOR POURING MOLTEN METAL

Richard H. Yinko, Sr., 1377 Kings Ct., Sheboygan, Wis. 53081

Filed Aug. 9, 1985, Ser. No. 764,103
Int. Cl.⁴ C21B *3/00*
U.S. Cl. 266—275 **10 Claims**



1. A submersible ladle for transporting and pouring metal comprising:

A. at least first and second one piece cup-shaped metal shells nested one within the other to form the respective interior and exterior retainer wall surfaces of the ladle and sealed to one another with sealing strips connecting the respective edges of said shells;

B. a vented refractory material layer sandwiched between at least portions of the shells to provide heat insulation therebetween;

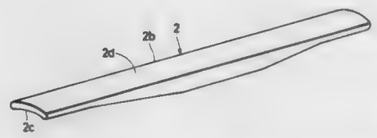
C. said layer having at least one venting conduit for heat, said conduit extending into said layer and communicating with ambient atmosphere for accelerated transfer of heat conducted from said molten metal through said retaioner wall surfaces to ambient atmosphere thereby substantially decreasing degradation of said shells due to heat from said molten metal.

4,637,594

LEAF SPRING CONSTRUCTION

Tsutomu Saito, Chiba; Yoshimichi Hasegawa, Aichi; Kazuo Yoshikawa, Aichi, and Shigetsune Aoyama, Aichi, all of Japan, assignors to Horikiri Spring Mfg. Co., Ltd.; Aichi Steel Works, Ltd. and Kabushiki Kaisha Toyota Chuo Kenkyusho, all of, Japan

Filed Oct. 28, 1982, Ser. No. 437,394
Claims priority, application Japan, Oct. 29, 1981, 56-174051
Int. Cl.⁴ F16F *1/18*
U.S. Cl. 267—47 **13 Claims**



1. A leaf spring comprising: a single spring steel plate adapted to undergo bending deformation in a direction perpendicular to the length and parallel to the thickness thereof;

a center portion of said plate in the lengthwise direction thereof having a constant maximum thickness, the thickness gradually decreasing toward opposite ends of the plate to form tapered portions;

at least said tapered portions having an arcuate shape in transverse cross-section, with a convex surface on a tension side and a concave surface on a compression side thereof, said convex and concave surfaces being defined by an arc of substantially the same radius over the entire width thereof, respectively, and said arcuate shape satisfying the relation:

$$2.0 \geq r_c/b \geq 0.64$$

where b is the width of said plate and r_c is the radius of a transverse center line of said plate; and

said tapered portions satisfying the relation:

$$0.03 \geq \Delta t/l \geq 0.005,$$

where l is the length of each said tapered portion and at is a difference in thickness between opposite ends of each said tapered portion;

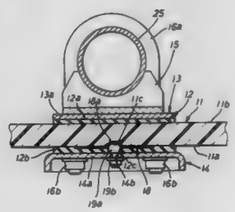
thereby providing a single tapered spring with a reduced weight as well as both flexual rigidity and fatigue strength improved per unit weight of the leaf spring.

4,637,595

LEAF SPRING ASSEMBLY

Yasuhiro Mishima; Katsunori Makibayashi, both of Toyota, and Kiyoaki Kuwayama, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Chuohatsujyo Kabushiki Kaisha, both of Aichi, Japan

Filed Jun. 26, 1984, Ser. No. 624,738
Int. Cl.⁴ F16F *1/26*
U.S. Cl. 267—52 **3 Claims**



1. A leaf spring assembly comprising:

a longitudinal leaf spring made of fiber reinforced plastics having a length in the longitudinal direction, said leaf spring having a first surface to be applied with a tension force and a second surface to be applied with a compression force, said leaf spring being provided only on the second surface thereof with a recess which is located substantially at the central longitudinal portion of said leaf spring;

a pair of retainer plates attached to the first and second surfaces of said leaf spring;

means for clamping said retainer plates to said leaf spring and mounting the same on an axis housing;

a metallic seat plate formed with a protruded portion coupled with the recess of said leaf spring and secured to the second surface of said leaf spring; and

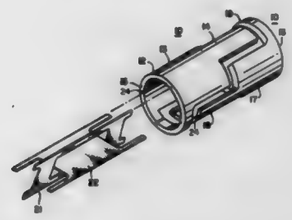
a position pin fixed to said retainer plate attached to the second surface of said leaf spring, said position pin being coupled with the recess of said leaf spring through the protruded portion of said seat plate to position said retainer plates substantially at the central longitudinal portion of said leaf spring, said position pin being in the form of a bolt having a head engaged with the protruded portion of said seat plate and being fastened to said retainer plate by a nut threaded thereto.

4,637,596

STRUCTURAL CORE PIVOT

Richard J. Lewis, New Hartford, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 4, 1985, Ser. No. 784,148
Int. Cl.⁴ F16F *3/02*
U.S. Cl. 267—160 **12 Claims**



1. A flexural pivot comprising:

a first member having a circumferentially extending larger outer diameter arcuate portion extending more than 180° and a reduced outer diameter arcuate portion of less than 180° extending therefrom;

a similarly shaped second member disposed on the same longitudinal axis as said first member with its reduced outer diameter portion extending between the circumferentially spaced apart ends of the larger diameter portion of said first member; and

spring means for connecting said first member and said second member permitting relative rotational movement.

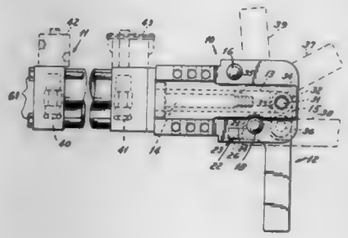
4,637,597

LOCKING POWER CLAMP

Alexander W. McPherson, Farmington, Mich., and Hazem N. Hamed, Torrance, Calif., assignors to De-Sta-Co Division/-Dover Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 427,176, Sep. 29, 1982, Pat. No. 4,458,889. This application Jul. 6, 1984, Ser. No. 628,244
Int. Cl.⁴ B23Q *3/03*; B25B *1/04*
U.S. Cl. 269—32 **14 Claims**

1. Toggle clamp comprising clamp arm means, manual actuating arm means, pivoted toggle linkage means interconnecting said clamp arm and said actuating arm means, including antifriction pivotal bearing means with rolling elements minimizing the ratio of actuating arm to clamp arm forces in locking and unlocking clamp arm pressure within the operational capacity of the clamp, and stop means limiting said actuating arm movement to a locked clamping position of said toggle linkage means, said toggle linkage means including said antifriction pivotal bearing means at each of four parallel spaced



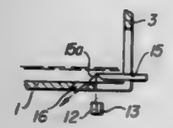
axis pivotal connections, and including central clamp bar, and bifurcated base, side link, and handle elements, one of said pivotal connections extending between said bar and base, a second between said bar and side link a third between said base and handle, and a fourth between said handle and side link elements.

4,637,598

HOLDER FOR A STACK OF SHEETS

Jan M. M. Bouwens, Kessel, and Hendrik E. P. Schiffelers, Simpelveld, both of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

Filed Jul. 12, 1985, Ser. No. 755,197
Claims priority, application Netherlands, Jul. 27, 1984, 8402365
Int. Cl.⁴ B65H *7/14*
U.S. Cl. 271—3.1 **8 Claims**



1. A holder for a stack of sheets in a sheet processing machine, wherein the sheets to be processed are fed from one end of the stack out of the holder, said holder comprising:

(a) at least a separating means movable between an inoperative position in which it is not in contact with a stack in the holder and an operative position in which it can engage between sheets of the stack; and

(b) a light source and a light-sensitive detector positioned below said stack, wherein said separating means and a fixed part of the holder are each provided with a light-reflecting surface for reflecting light from said light source in the direction of the detector when the separating means is in the operative position and in the absence of sheets between the separating means and the detector, and when the separating means is in the inoperative position and in the absence of sheets in the holder.

4,637,599

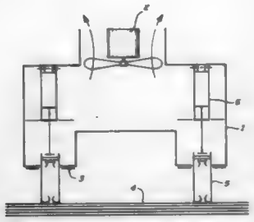
SUCTION-LIFTING CONVEYOR FOR TRANSFER FOR SHEET-SHAPED OBJECTS

Matti V. Eerola, Salmikkala, Finland, assignor to Raute Oy, Lahti, Finland

Filed Oct. 3, 1985, Ser. No. 783,955
Claims priority, application Finland, Oct. 12, 1984, 844029
Int. Cl.⁴ B65H *3/12, 3/44, 5/22*
U.S. Cl. 271—5 **5 Claims**

1. Suction-lifting conveyor for the transfer of sheet-shaped

objects, in particular of sheets of plywood veneer, one by one from a stack to further processing or to another stack, which said device comprises a box-shaped suction-channel equipment extending substantially over the entire length and width of the conveyor, blower means for maintaining a negative pressure in the suction-channel equipment, at least one endless belt performing the transfer of the sheets and running substantially horizontally above the stack or stacks of sheets, the said at least one belt being arranged so that during the transfer movement it runs against the outside of the bottom face of the suction-channel system, being subject to the effect of the negative pressure in the suction-channel equipment, and that during their return movement they run in the suction-channel system, wherein at the transfer side of the conveyor belt, in immediate



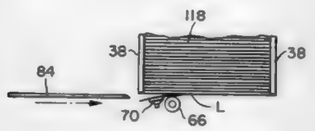
proximity of the running zone of the belt, above each stack of sheets, at least one suction box is provided whose bottom face can be lowered onto the stack of sheets and, correspondingly, whose bottom face can be raised at least to the level of the transfer side of the conveyor belt, said suction-channel equipment being substantially closed to effect said negative pressure maintenance but having means at said bottom face for slidably receiving said suction box while maintaining a suction effect in said suction box, and means defining at least one suction flow slot in said bottom face adjacent said suction box and extending in the direction of travel of said at least one belt, the said suction box being connected to the suction-channel equipment so as to produce said suction effect at the suction flow slot at the bottom face of the suction box.

4,637,600

LABEL SEPARATOR

George F. Bartimes, Chicago, and Leonard A. Blomquist, Joliet, both of Ill., assignors to Continental Plastic Containers, Inc., Stamford, Conn.

Filed Feb. 8, 1982, Ser. No. 346,817
Int. Cl.⁴ B65H *3/32, 3/40*
U.S. Cl. 271—93 6 Claims



5. Apparatus for separating a foremost label from all other labels of a stack of labels, said apparatus comprising displacing means for displacing at least an edge portion of a foremost label from all other labels of a stack, and separator means for thereafter moving between the foremost label and the remaining labels in the stack starting at said edge portion, said displacing means including a suction head mounted for movement in a direction of label dispensing from a label stack, and suction control means for controlling the application of suction to said suction head, said suction control means including means responsive to the position of said separator means.

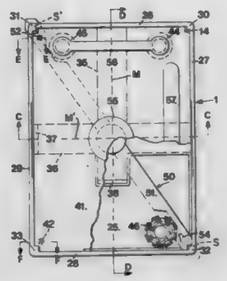
6. A method of assuring the dispensing of a single label from a stack, said method comprising the steps of displacing an edge of a label from the remainder of the stack, and then inserting a separator between the label and the stack starting at the edge, the displacing step utilizes a suction head, and the application of suction to the suction head is controlled by the position of the separator.

4,637,601

CASSETTE FOR A SHEET FEED DEVICE

Jorge Costa, and Wolfgang Reichel, both of Yverdon, Switzerland, assignors to Hermes Precisa International S.A., Switzerland

Filed Jun. 1, 1984, Ser. No. 616,147
Claims priority, application Switzerland, Jun. 3, 1983, 3058/83
Int. Cl.⁴ B65H *1/12*
U.S. Cl. 271—160 8 Claims



1. A cassette intended to hold a stack of sheets to be printed, said cassette and sheets of rectangular configuration and having major and minor axes respectively extending along their length and width, said cassette comprising a rectangular shaped bottom and first and second longest side walls parallel to said major axis and first and second shortest side walls parallel to said minor axis, said cassette adapted to be selectively inserted into a sheet feed device or printer to deliver said sheets thereto in a direction parallel either said major or said minor axis, upper edge holding elements disposed on said first longest side wall and said first shortest side wall to hold the sheets in the cassette, a support plate within said cassette supporting the stack of sheets, selected ones of a plurality of elastic elements pushing said support plate and sheets to urge a first edge of the sheets against said holding elements on said first shortest side wall so that the sheets elastically engage at said first shortest side wall with a removal and transport mechanism of the sheet feed device, selected ones of a plurality of elastic elements adapted to push said support plate and sheets to urge a second edge of the sheets against the holding elements on said first longest side wall so that the sheets elastically engage at said first longest side wall with a removal and transport mechanism of the sheet feed device, and a locking mechanism intended to hold said support plate against the bottom approximately in the vicinity of either said second shortest side wall when the sheets are to be delivered in a direction parallel to said major axis or in the vicinity of said second longest side wall when the sheets are to be delivered in a direction parallel to said minor axis.

4,637,602

DOCUMENT GUIDE APPARATUS FOR PREVENTING JAMS

Thomas J. Gavaghan, Norwalk; Paul D. Boucher, Sandy Hook, and Karel Janatka, Southbury, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 9, 1985, Ser. No. 806,870
Int. Cl.⁴ B65H *9/00*
U.S. Cl. 271—238 6 Claims

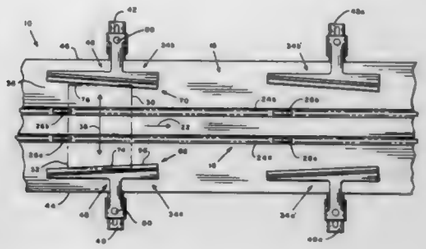
1. In an envelope inserting machine having an elongate feed

deck, means for advancing insert material to be inserted into envelopes along said feed deck, and a plurality of insert material feeding devices spaced along said feed deck for sequentially feeding insert material onto said feed deck in registration with insert material advancing along said feed deck, registration devices for said insert material, said registration devices comprising:

a. a plurality of support members connected to said feed deck and extending laterally outwardly from said feed deck,

b. a plurality of body members each having a first portion overlying said feed deck and extending parallel thereto and a second portion extending laterally outwardly from said first portion and overlying said support members,

c. registration guide means mounted on said first portion of



each of said body members for guiding said insert material into registration with other insert material on said feed deck, said guide means having a generally upright and L-shaped configuration defining a closed unitary corner along which the lateral edge of said insert material moves, and

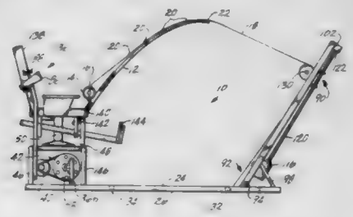
d. means for slidably clamping said second portion of each of said body members to the support member underlying said second portion of each of said body members in a desired lateral position with respect to said feed deck to force each of said guide means into intimate contact with said feed deck whereby said guide means forms a continuous horizontal support for said insert material to prevent said lateral edges of said insert material from being caught between the upper surface of said feed deck and said registration guide.

4,637,603

FISHING SIMULATOR

John A. Fry, 331 Deodar La., Bradbury, Calif. 91010, and Douglas B. Robinson, 1900 N. Altadena Dr., Pasadena, Calif. 91107

Filed Nov. 27, 1984, Ser. No. 675,355
Int. Cl.⁴ A63B *21/24;* A63G *31/02*
U.S. Cl. 272—1 R 12 Claims



1. A device for simulating a fish on a fishing line connected to a rod and reel comprising:

a frame;

a shaft journalled to the frame;

a drum affixed to the shaft;

means for attaching a fishing line from the rod and reel to the drum;

a sprocket supported for rotation about the shaft;

means for rotating the sprocket, a rotor affixed to the shaft, and a clutch adapted to frictionally couple the sprocket and rotor for imparting a torque to the shaft and drum; to tension the line and simulate the pull of a moving fish; and

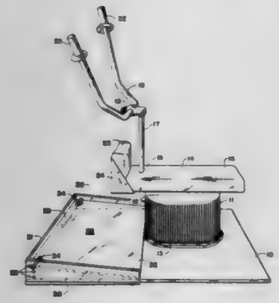
means for simulating the position of a fish including line receiving means disposed on the frame remote from the rod and reel, the fishing line from the rod and reel passed by the receiving means back to the drum.

4,637,604

PHYSICAL THERAPY DEVICE

Blanche A. Burt DuPont, 8220 Hidden Lake Dr. S., Jacksonville, Fla. 32216

Filed Aug. 27, 1984, Ser. No. 644,692
Int. Cl.⁴ A63B *21/00, 23/04*
U.S. Cl. 272—73 23 Claims



1. A therapy device for exercise comprising a solid planar floor base, and elongated vertical member having an upper end and a lower end, said lower end being rigidly affixed to said base, an elongated horizontal straddle seat member having a central portion between its forward and rearward ends with said central portion being rigidly affixed to said upper end of said vertical member substantially medially of the side edges of said seat member and substantially medially of said forward and rearward ends, a substantially vertical post rigidly affixed to and projecting upwardly from said forward end of said seat, upwardly extending ledge means supported by said seat member adjacent said vertical post for protecting the legs of a user from engagement with said vertical post during sitting and exercising on said device, and an elongated handle bar member adjustably mounted generally laterally of said post, adjustable means mounted on said post for attachment to said handle bar member generally medially between the free end portions thereof, said free end portions of said handle bar member being positioned angularly with respect to each other for the user of said device.

4,637,605

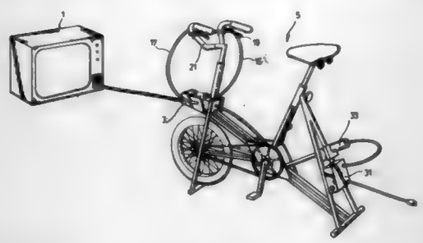
CONTROLS FOR A GAME BIKE

Frank Ritchie, 54 Prince Charles Drive, Georgetown, Ontario, Canada (L7G 3V1)

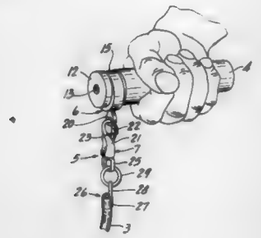
Filed Feb. 17, 1984, Ser. No. 581,362
Int. Cl.⁴ A63B *69/16*
U.S. Cl. 272—73 8 Claims

1. A video game control arrangement comprising manually operated controls for controlling player movement on a video screen and mounting means for mounting said controls in a supported position on hand and arm rest suppoting means of an exercise device for manual operation of said controls with such manual operation being guided by the supporting means of the

exercise device, said manually operated controls comprising hand grip members operating cables for controlling a potentiometer control for controlling player movement on the video screen.



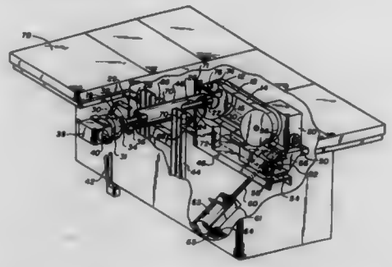
4,637,606
JUMP ROPE
Kevin W. Hunn, 2890 S. Wentworth Ave., Milwaukee, Wis. 53207
Filed Aug. 17, 1984, Ser. No. 642,034
Int. Cl.[4] A63B *5/20*
U.S. Cl. 272—75 3 Claims



1. A jump rope unit, comprising a rigid handle adapted to be attached to the end of a flexible rope, said handle having a hand gripping portion, a rope connecting bearing unit secured to the rope end of said handle, said bearing unit including an axially extending plastic shaft integral with said hand gripping portion and projecting from an annular planar plastic end face on said hand gripping portion, an outer end wall secured to said shaft in outwardly spaced relation to said end face, said outer end wall having an inner plastic bearing face parallel to said annular planar plastic end face and with said shaft defining an annular race having a U-shaped cross-section, a bearing ring journaled on said shaft and having an outside diameter substantially equal to the diameter of said end face and having an inner opening slightly larger than said shaft and an axial length slightly less than the spacing of said outer end wall from said end face, said bearing ring having plastic surfaces engaging said shaft and said outer end wall and said end face to establish low friction bearing surfaces, and a rope-securing means secured to said ring for securement to a rope.

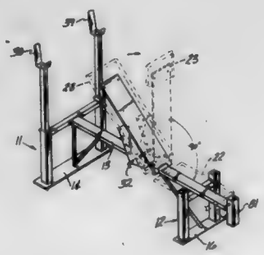
4,637,607
DRIVE UNIT FOR EXERCISING APPARATUS
James McArthur, 1760 Kingsway, Port Coquitlam, British Columbia, Canada (V3C 1S5)
Filed Feb. 15, 1985, Ser. No. 701,929
Int. Cl.[4] A63B *21/22*
U.S. Cl. 272—132 9 Claims

1. A drive unit for an exercising apparatus, having a frame, comprising:
(a) a sub-frame;
(b) a driving sheave wheel, rotatably mounted on said sub-frame;
(c) a driven sheave wheel, rotatably mounted on said sub-frame;
(d) motor means coupled to said driving sheave wheel for rotatably driving same;
(e) an endless frictional belt linking said driving and driven sheave wheels and slipping with respect to one of the latter during rotation of said driving sheave wheel;
(f) a slide way bar affixed to said sub-frame;
(g) a mounting block slidably coupled to said slide way bar



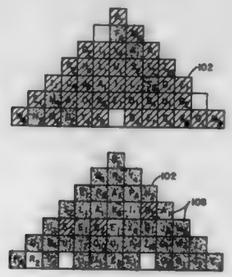
for supporting said driving element and movable in a direction for adjusting friction force between said driving and driven elements;
(h) motor means affixed to said sub-frame and coupled to said mounting block and operable to reversibly move said block over said slide way bar;
(i) stop means mounted on said sub-frame for blocking said driven element from movement beyond a start position, whereby said driving element is continuously driven by said motor means through an exercise.

4,637,608
COMPACT MULTIPLE PURPOSE EXERCISE BENCH
Brian T. Owens, Meriden, and Fredrick W. Corona, Hamden, both of Conn., assignors to Wallingford Barbell Company, Wallingford, Conn.
Filed May 15, 1984, Ser. No. 610,325
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 1 Claim



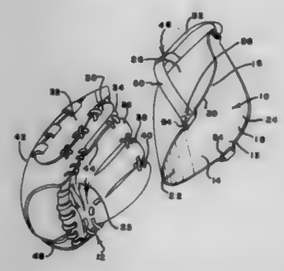
1. An adjustable exercise bench defining a hinged, normally flat body support in the form of a truss comprising
a pair of spaced tubular frames spanned and supported by a central beam, said frames being fixed individually to floor plates, a single diagonal support element individual to each frame and connecting the floor plate of each frame to the central beam to provide rigidity to the truss, a first section of said body support being fixed to the truss, a second section of said body support being hinged to the truss, both sections of said body support overhanging and projecting beyond the truss, a pair of spaced brackets fixed to the second section straddling said beam, indexing means on said brackets cooperating with said central beam for positioning said second section of said body support releasably in a plurality of angular positions relative to said first section of said body support, said indexing means including an array of pairs of registered apertures on said brackets, each pair of apertures being operable to receive and support a pin bearing directly on said central beam,
a first of said tubular frames defining a pair of spaced wells or sockets operable to receive removably mating support members in telescoping fashion, each said support member having a horn or cradle for receiving and supporting a barbell, clamp means on each said socket cooperating with its mating support member for adjusting the height of a support member and thus its cradle relative to the body support,
the other of said tubular frames defining a second pair of spaced sockets, a second body support having legs received telescopically and removably in said second pair of sockets, adjustment means on one of said legs and said second pair of sockets for changing the position of said second body support relative to said normally flat body support, a fifth socket fixed to one end of the bench and being disposed in a medial position, said socket being formed with a through bore and having clamp means,
a leg supporting a leg bracket member is received telescopically in the through bore of said fifth socket, said bracket member being adjustable vertically by said clamp means, said bracket member having a pair of spaced flanges defining a bearing, an L-shaped angle frame supported pivotally by said bearing, said angle frame terminating at each end in a pair of opposed, outwardly projecting stub shafts, and one end of said angle frame having a fifth stub shaft projecting at right angles to an adjacent pair of opposed stub shafts, said second body support and said bracket member being adjustable relative to one another to accommodate the physique of an individual.

4,637,609
METHOD FOR A GAME
John R. Vanderhoof, 200 E. 36th St., New York, N.Y. 10016
Division of Ser. No. 652,223, Sep. 18, 1984, Pat. No. 4,591,161, which is a continuation of Ser. No. 404,410, Aug. 2, 1982, abandoned. This application Mar. 18, 1986, Ser. No. 840,665
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—272 31 Claims



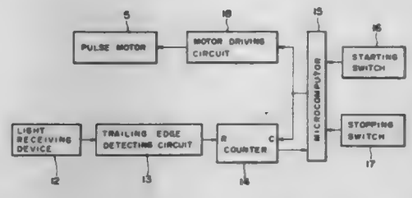
1. A method of playing a game for a plurality of competitors, using an apparatus having means defining a plurality of playing spaces in a grid shaped pattern and means defining a plurality of distinguishable sets of alphanumeric character-representing elements, each element dimensioned for placement within one of said playing spaces, so as to be useful for forming words within said grid shaped pattern, said method comprising:
assigning one of said distinguishable sets of elements to each competitor for manipulation into words in achieving a level of accomplishment characterized by a score;
executing a sequence of playing phases in which said competitors take turns at building words in said grid shaped pattern and then expanding said words into new words, said sequence of playing phases followed by a terminating scoring phase comprising determining a value for each scorable word depending on its structure, and determining each competitor's score by combining the values of only those scorable words which end in one of his elements and were not further expanded;
said scorable words comprising all words which are used in determining any competitor's score.

4,637,610
BASEBALL GLOVE HOLDER AND TRAINING AID
Damon L. Carr, 860 Washoe La., Susanville, Calif. 96130
Filed Feb. 5, 1985, Ser. No. 698,383
Int. Cl.[4] A63B *71/02*
U.S. Cl. 273—26 C 9 Claims



1. A glove retainer in combination with a baseball glove having a central ball pocket and webbing which comprises:
a. a scoop formed of a stiff, shape-retaining sheet material and having a three-sided corner pocket with a rear face having a convex contour conforming to the front surface contour of said baseball glove;
b. glove retaining means carried on the backside of the scoop and including restraining means extending across the rear surface of said baseball glove when the latter is received over the convex surface of said scoop and thereby securing said glove in assembly to said glove retainer with the rear face of said scoop received in the central ball pocket of said glove.

4,637,611
SLOT MACHINE WITH REEL POSITION DETECTOR
Norihiko Hamada, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Oyama, Japan
Filed Jan. 11, 1982, Ser. No. 338,497
Claims priority, application Japan, Jan. 12, 1981, 56-1762[U]; Apr. 27, 1981, 56-59868[U]
Int. Cl.[4] A63F *5/04*
U.S. Cl. 273—143 R 3 Claims



1. A slot machine having a plurality of reels each of which has an annular series of symbols on the peripheral surface thereof at regular intervals, comprising:
pulse motors one individual to each said reel for driving the associated said reels;
means for generating and emitting a series of pulse signals,
motor driving means receiving said pulse signals and causing

said pulse motors to rotate by one step for every received pulse signal;

means for detecting a predetermined point on each said reel once every revolution thereof; and

means to count said pulse signals and to reset to zero its previous contents by a signal from said predetermined point detecting means for detecting the stopped positions of said reels according to the number of said counted pulse signals.

4,637,612

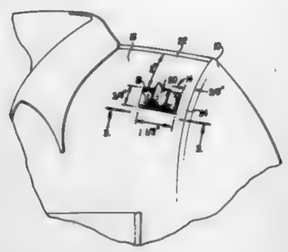
GOLF CLUB SWING TRAINING AID

Judd Wilkins, 281 Littletown Quarter, Williamsburg, Va. 23185

Filed Jul. 25, 1985, Ser. No. 758,946

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—183 B **3 Claims**



1. A sport club-swing marker assembly comprising:

a shirt-type garment having a neck opening and arm openings to be worn on the upper body of a sportsman who will swing a club;

a flat base member having a first side thereof affixed to a front shoulder area of said shirt-type garment, said flat base member covering a relatively large area of said shirt-type garment and comprising, on a second side thereof, facing away from said shirt-type garment, a first fastening means of a fastening pair, said first fastening means being located substantially throughout said relatively large area;

a marker member for repetitive-releasable, attachment to said base member, said marker member being substantially smaller than said flat base member and having a shirt side and an indicator side, said shirt side of said marker member including a second releasable fastening means of said fastening pair for repetitively engaging and disengaging said first fastening means and, when engaged therewith, for remaining engaged thereto until a substantial amount of force is used to pull these two members apart, and said marker side of said marker member including a marker element for contacting a small facial area of said sportsman at some point during a swing of a club and providing a distinctive sensation to said small facial area for indicating to the sportsman that such contact has been made so as to inform said sportsman that a correct swing position has been achieved;

whereby said sportsman can relatively easily move said marker member to various locations on said front shoulder area of said shirt-type garment on said base member to achieve a desired contact between said marker member and said sportsman's face during a club swing by said sportsman.

4,637,613

MOLDED MAGNETIC BINGO CHIP

Kevin Bishop, Livermore, Calif., assignor to Bingo Experience/ARC, Livermore, Calif.

Filed Oct. 25, 1983, Ser. No. 545,367

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—239 **2 Claims**



1. A marker for playing bingo comprising

a disk of transparent material having a predetermined axial thickness and having a peripheral edge, the disk having a concentrically located slot in its peripheral edge; and

a split ring of magnetic material positioned within said slot and being concentric with the disk, the split ring having an axial thickness which is less than the predetermined axial thickness of the disk, and wherein the split ring has first and second ends which are turned inwardly to provide a biasing force against the disk.

4,637,614

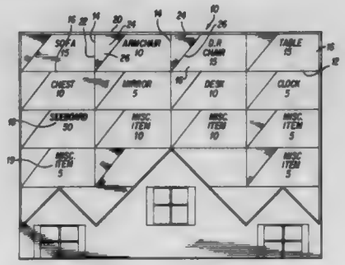
COLLECTOR'S AUCTION GAME

Linda M. Gibbon, and Randolph H. Gibbon, both of 14030 Harrisville Rd., Mt. Airy, Md. 21771

Filed Oct. 18, 1985, Ser. No. 788,967

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—271 **4 Claims**



1. An auction game apparatus providing for competitive bidding between players comprising in combination: a game board for each player, said game board representing a house and having a plurality of pockets thereon for receiving and storing auction-item cards, certain pockets of the game board bearing the names of specific collectable items which must be bought and inserted therein to furnish the house, other pockets for receiving miscellaneous auction-item cards required to fill the game board, all pockets of the game board bearing point values for the auction-item cards inserted therein; a group of auction-item cards each having a description of an item which may be used to furnish the house, said group of cards containing cards indicating a designated collectable item of furniture, a collection to which the item belongs, the history of the item, and its appraised value and each of said collectable item cards corresponding to one of the designated collectable item playing board pockets and said group of auction-item cards containing a number of other cards representing other items which may or may not belong to a collection which may be used to fill pockets on the game board not having a collectable item name, a second deck of cards containing only the names of the specific collections, simulated money for distribution to and use by the players to bid on and acquire auction-item cards, and bonus means for rewarding players for skill in bidding for and acquiring items required to fill the game board.

4,637,615

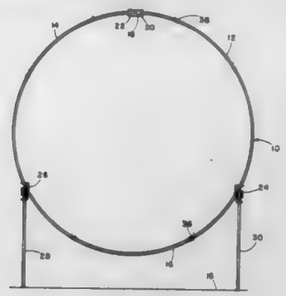
HOLDER FOR SHOTGUN PATTERN PAPER

Howard R. Foreman, Rte. 1, Box 110A, Miami, Okla. 74354

Filed Jul. 26, 1985, Ser. No. 759,332

Int. Cl.[4] F41J *1/10*

U.S. Cl. 273—407 **10 Claims**



1. A holder for shotgun pattern paper comprising:

a ring of two upper loops and one lower loop in the form of archs each upper loop having an upper end and a lower end and the lower loop having a hook at each end;

a top clamp for holding the upper ends of said two upper loops together;

leg means for supporting the holder above a surface;

two bottom clamps for receiving the lower ends of said two upper loops and the hooks on said lower loop and further holes for receiving said leg means.

5. A clamp made from a rectangular piece of material having dimensions X and Y and being folded by six right angles to form two U-shaped sections connected by a planear section, said first U-shaped section having a Leg A, and Leg B and the second U-shaped section having a Leg C and Leg D and in which B is greater in width than said Legs A, C and D, a first hole through said Section A, a second hole through said Section B, said holes aligned to receive one end of an arch shaped rod;

third and fourth holes through said Sections C and D respectively in the center thereof;

fifth and sixth holes through section C on either side of said third hole and seventh and eighth holes on either side of said fourth hole, said seventh and eighth holes being farther from said fourth hole than said holes five and six are from said third hole.

8. A holder for shotgun pattern paper comprising:

a rectangular frame including an upper bar, a first side bar and a second side bar, a bottom section with a hook member at each end thereof;

a first and a second clamping means to clamp said top section to said side section respectively;

leg means for supporting the holder above a surface;

two bottom clamps for receiving the lower end of said two side bars and the hooks on said bottom bar and having holes for receiving said leg means.

4,637,616

MARKING PROJECTILE

Carolyn C. Whiting, 331 Trudelle Street, Unit 78, Scarborough, Ontario M1J 3J9, Canada

Filed Oct. 10, 1985, Ser. No. 786,069

Int. Cl.[4] A63B *37/00, 67/00, 71/02*

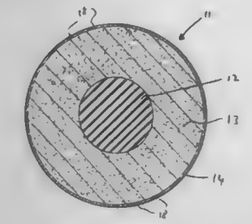
U.S. Cl. 273—418 **9 Claims**

1. A projectile to be thrown by hand to mark its point of impact comprising:

(a) a central core of resiliently deformable material having its density approximately that of rubber and providing substantial mass to the projectile to permit it to be readily thrown by hand;

(b) a porous surrounding cushioning layer of a compressible material relatively less dense than said core;

(c) a marking material in powdered form impregnating the surrounding layer, and



(d) a perforated flexible cover enclosing the surrounding layer, the cover having a plurality of perforations on all sides of the projectile so that, upon impact with a surface, a small quantity of powdered marking material will be ejected through said perforations to mark the point of impact.

4,637,617

DEVICE FOR FORCING PISTON RING RADIALLY OUTWARDLY

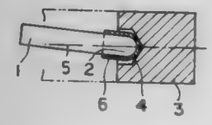
Minoru Kawane, Ishikawa, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed Apr. 9, 1986, Ser. No. 849,953

Claims priority, application Japan, Apr. 15, 1985, 60-54729[U]; Apr. 15, 1985, 60-54730[U]

Int. Cl.[4] F16J *9/06*

U.S. Cl. 277—150 **4 Claims**



1. A device for forcing a piston ring radially outwardly wherein a spring and a plunger are accomodated in each hole on a piston so that reaction force of the spring forces the plunger to press the piston ring against a bore wall of a cylinder, comprising said plunger in the form of a single rod and having a convex and semispherical head, and said piston ring having a substantially conical hole for receving said head.

4,637,618

COMPOSITE GASKET AND FITTING INCLUDING SAME

Jose E. Valls, Ponce, P.R., assignor to Vassallo Research & Development Corporation, Ponce, P.R.

Filed Jul. 13, 1984, Ser. No. 630,527

Int. Cl.[4] F16J *15/10*; F16L *19/07*

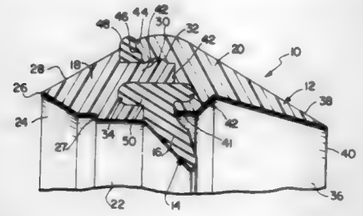
U.S. Cl. 277—152 **29 Claims**

1. A composite gasket for forming a seal between a pipe bell and a spigot, comprising:

a major portion of non-elastomeric plastic material; and

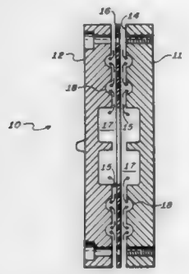
a minor portion of elastomeric material, said minor portion being axially encased by said major portion and having a

first sealing lip extending from said major portion in a radial direction, said major portion including first and



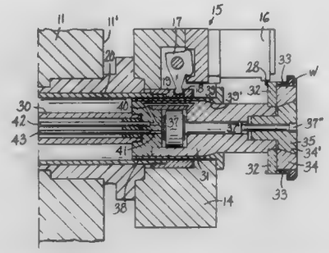
second segments entrapping said minor portion therebetween, said segments having interlocking sections.

4,637,619
CONCENTRIC SEAL RINGS
Warren W. Stansberry, Phoenix, Ariz., assignor to Sperry Corporation, New York, N.Y.
Filed Dec. 19, 1985, Ser. No. 811,065
Int. Cl.[4] F16J 15/12
U.S. Cl. 277—167.5 1 Claim



1. An apparatus providing a seal between two halves of a fluid chamber comprising:
- a fluid housing formed from two halves each having a static sealing face, said housing have an internal cavity when said static sealing faces are held together by a compressive force,
- a plurality of raised concentric rings disposed on each of said static sealing face,
- spaces between said rings forming recesses,
- means for annularly aligning said rings and annularly aligning said recesses on a common axis,
- a planar gasket material extended across and disposed between said sealing faces, said material having a predetermined density when unconstrained, and having the property of deformation with time when subject to compressive forces, and
- means for applying said compressive force to said gasket material so that portions of said material are forced into said recesses, whereby said predetermined density increases within said recesses as said gasket deforms with time.

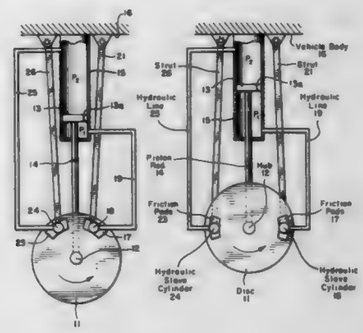
4,637,620
TWO STAGE CHUCK
Merton J. Graham, 253 Fairground Rd., North Springfield, Vt. 05150, and Paul H. Miller, 61 Daffodil La., Meriden, Conn. 06450
Filed Sep. 4, 1984, Ser. No. 646,804
Int. Cl.[4] B23B 31/00
U.S. Cl. 279—1 DA 5 Claims



1. A chuck assembly adapted to be mounted for rotation and axial movement in relation to the headstock of a lathe, comprising:
- a chuck having a body and a plurality of radially movable jaws adapted in a first machining position of the chuck to grip the periphery of an annular work-piece;
- a work-piece locating means associated with each jaw;
- an axially movable jaw actuating means;
- a first hydraulic means adapted to move said actuating means to and from work-piece gripping position;
- an expansible mandrel adapted for movement from a retracted first position to an advanced intermediate position in the bore of the annular work-piece;
- an axially movable support for said mandrel;
- a second hydraulic means for moving the mandrel from said first position to said intermediate position;
- a third hydraulic actuated means for expanding said mandrel in said bore to engage the work-piece;
- means causing said first hydraulic means to move the jaws to work-piece releasing position;
- means causing said second hydraulic means to move the mandrel and work-piece from the intermediate position to a second machining position of the chuck, and
- means causing said third hydraulic means to release the work-piece.

4,637,621
ACTIVE SHOCK ABSORBING SYSTEM FOR A VEHICLE
Harry J. Venema, Wheaton, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Jul. 1, 1985, Ser. No. 750,201
Int. Cl.[4] B60S 9/00
U.S. Cl. 200—6 R 8 Claims

1. An active shock absorbing system for maintaining a horizontally moving vehicle body stable at a constant vertical level despite the presence of disturbing forces that effect vertical movements of the rotating wheels on which the body is supported, said system comprising for each of the wheels:
- sensing means for sensing a change in vertical displacement, between the vehicle body and the wheel, produced by a disturbing force on the vehicle body;
- and stabilizing means, controlled by said sensing means, for utilizing the kinetic energy of the rotating wheel to exert a counter force on the body in the direction opposite to



the disturbing force in order to counterbalance the disturbing force and hold the body at a fixed vertical level.

4,637,622
CHILD SAFETY STRAP
Francis A. Burgard, 12800 W. Cleveland Ave., New Berlin, Wis. 53151
Filed Nov. 2, 1984, Ser. No. 667,620
Int. Cl.[4] A47D 1/10
U.S. Cl. 280—33.99 B 4 Claims

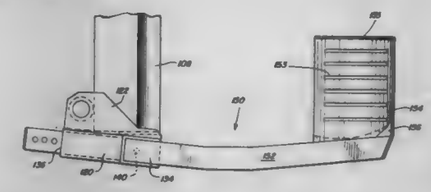


1. A safety strap for children, comprising
- a safety buckle having a closed loop at one side and at its other side a serpentine connector permitting adjustment of a stap connected thereto,
- a strap having one end through said loop and connected back on itself to fix said one end to said one side of said buckle,
- the other end of said strap being led into and through said serpentine connector to adjustably connect said strap to said other side of said buckle with said other end of the strap extending out of the serpentine connector,
- and means fixed on said other end preventing pulling said other end back through and out of said serpentine connector, said means having no connection to said strap between said connector and said loop.

4,637,623
TOWING APPARATUS
Leslie Bubik, Ontario, Canada, assignor to Vulcan Equipment Company, Ltd., Scarborough, Canada
Filed Jul. 8, 1985, Ser. No. 752,980
Int. Cl.[4] B60P 3/12
U.S. Cl. 280—402 14 Claims

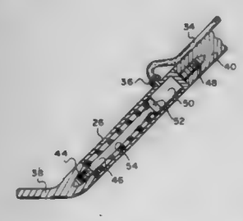
8. An apparatus for use in lifting and towing a vehicle, comprising:
- a support beam;
- two wheel support members, each having an elongated arm and a wheel retainer;
- means for mounting said wheel support members to opposing end portions of said support beam such that said arms are in a generally horizontal orientation and for rotating said wheel support members generally horizontally from a laterally remote position spaced outwardly from the sides of the vehicle to a vehicle lifting position immediately adjacent to the outer sides of a pair of wheels on said vehicle; and
- means for permitting vertical movement of said wheel support members to facilitate location of said wheel support members in said vehicle lifting position.

14. An apparatus for use in lifting and towing a vehicle, comprising:



- a support beam positionable below the vehicle and having end portions which extend outside an opposed pair of wheels on said vehicle;
- two wheel support members, each including an arm and a wheel retainer;
- two collars, each pivotally connected to one of the end portions of said beam and adapted to receive one of the arms of said wheel support members to thereby mount said wheel support members to said beam and permit rotation of said wheel support members;
- each of said collars including a passage increasing in vertical dimension from front to back to permit vertical movement of said wheel support members; and
- means for locking said wheel support members within said collars.

4,637,624
HYDRAULIC RIGHTING MOTORCYCLE KICKSTAND
Don Shur, P.O. Box 728, Cologne, N.J. 08213
Filed Feb. 28, 1986, Ser. No. 835,098
Int. Cl.[4] B62H 1/02
U.S. Cl. 280—298 8 Claims



1. A righting device used in combination with a kickstand device used to support a motorcycle on the ground at a tilted angle wherein the kickstand device is pivotally connected to the motorcycle proximate to the center of a lower frame of the cycle, comprising:
- (a) a fluid actuated cylinder structurally connected as an intermediate section of the kickstand between an upper kickstand connection pivotally connected to the motorcycle frame and a lower foot section of the kickstand to rest on the ground,
- (b) a piston rod in the cylinder extendable downwardly and structurally connected to the foot section, and
- (c) fluid pressure means to supply fluid pressure to the cylin-

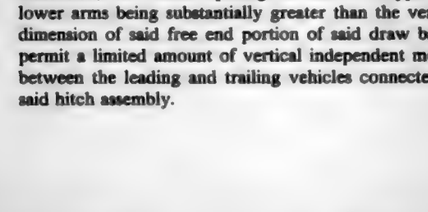
der to force the piston rod downwardly with the foot section against the ground to right the motorcycle.

4,637,625

MOWER HITCH ASSEMBLY

John B. Blackwell, 1507 Woodland Dr., Centerville, Tenn. 37033

Filed Jun. 20, 1985, Ser. No. 746,745
Int. Cl.[4] B60D *1/14*; A01D *75/30*
U.S. Cl. 280—411 C **4 Claims**



1. In a lawn mower towing assembly including a leading vehicle and a trailing vehicle, each vehicle having a longitudinal front-to-rear axis, a hitch assembly comprising:

(a) a leading hitch device comprising leading bracket means for connection to the rear portion of a leading vehicle, and an elongated draw bar extending transversely from said bracket means, laterally of the longitudinal axis of the leading vehicle, and terminating in a free end portion,

(b) means securing said leading bracket means to the rear portion of the leading vehicle,

(c) a trailing hitch device comprising a trailing bracket bar for connection to the front portion of a trailing vehicle, and a single clevis member,

(d) means securing said trailing bracket bar to the front portion of the trailing vehicle in operative position,

(e) said single clevis member comprising vertically spaced upper and lower arms and a bight member connecting said upper and lower arms,

(f) means securing said bight member to said trailing bracket bar so that said upper and lower arms project forwardly in a substantially vertical plane,

(g) said draw bar having a vertical journal hole extending through its free end portion,

(h) said upper and lower arms terminating in free end portions including vertically aligned holes,

(i) a pintle removably inserted substantially vertically through the holes in said upper and lower arms and said vertical journal hole when said free end portion is between said upper and lower arms and said vertical journal hole is in registry with said pintle, in operative position,

(j) said journal hole being large enough to permit free pivotal movement of said draw bar about the vertical axis of said pintle,

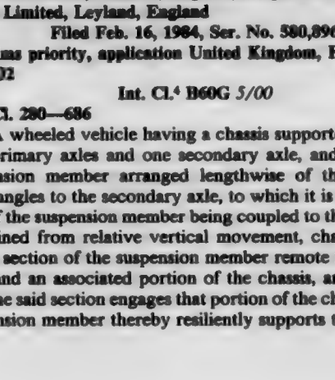
(k) said free end portion of said draw bar having a vertical dimension, the vertical spacing between said upper and lower arms being substantially greater than the vertical dimension of said free end portion of said draw bar to permit a limited amount of vertical independent motion between the leading and trailing vehicles connected by said hitch assembly.

4,637,626

PORTABLE, FOLDABLE AND CONVERTIBLE LUGGAGE TROLLEY

Janet M. P. Foss, Naish Hillhouse, Reybridge, Lacock, England; John Foss, Lacock; C. G. Brooks, Wilts, both of United Kingdom, and Myron H. Ridgely, Waynesboro, Pa., assignors to Janet Mary Penrose Foss, England

Continuation-in-part of Ser. No. 449,824, Dec. 16, 1983. This application Nov. 1, 1984, Ser. No. 667,331
Int. Cl.[4] B67B *3/02*
U.S. Cl. 280—655 **31 Claims**



1. A portable and foldable luggage trolley comprising a base support adapted to be disposed in a generally horizontal plane for supporting luggage thereupon, a handle, first means for pivoting said handle to said base support for pivoting movement between a first position in generally upright relationship to said base support and a second position in generally adjacent relationship to said base support, means for releasably latching said handle relative to said base support in said first postition, second means for pivoting said latching means to said base support for pivoting movement between a first latched position latching said handle relative to said base support in said first handle position and a second unlatched position permitting relative pivoting movement of said handle between the first and second positions thereof, means responsive to pivotal movement of said handle from said second to said first handle position for pivoting said latching means to said first latched position, said releasable latching means being disposed adjacent said first pivoting means, and said second pivoting means being disposed in a generally horizontal plane.

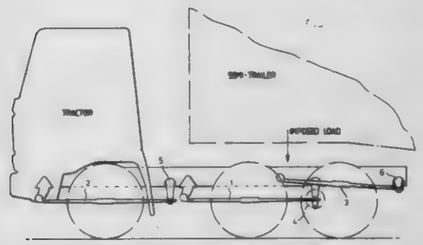
4,637,627

VEHICLE SPRING SUSPENSION ARRANGEMENT

Richard H. Stone, Watford, England, assignor to Leyland Vehicles Limited, Leyland, England

Filed Feb. 16, 1984, Ser. No. 580,896
Claims priority, application United Kingdom, Feb. 17, 1983, 8304402
Int. Cl.[4] B60G *5/00*
U.S. Cl. 280—686 **12 Claims**

1. A wheeled vehicle having a chassis supported by at least two primary axles and one secondary axle, and an elongate suspension member arranged lengthwise of the vehicle at right-angles to the secondary axle, to which it is coupled, one end of the suspension member being coupled to the chassis and restrained from relative vertical movement, characterized in that a section of the suspension member remote from the said end, and an associated portion of the chassis, are adapted so that the said section engages that portion of the chassis, and the suspension member thereby resiliently supports the chassis on the secondary axle, only when a load imposed on the chassis exceeds a predetermined threshold, the suspension member dropping out of supportive engagement with the chassis and permitting all vehicle wheels to remain in ground contact when the imposed load is below the threshold, wherein the suspension member is a leaf spring coupled at its middle region to the secondary axle, the said section of the suspension member is the other, free, end of the leaf spring which engages an



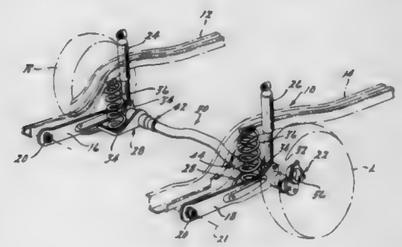
adapted portion of the chassis with imposed loads over the threshold and the leaf spring is mounted on the chassis at the free end by a slipper bracket having an upper portion for engaging the leaf spring when under load, and a lower portion for supporting the leaft spring when it has dropped out of engagement, the upper and lower portions being separated by a controlled vertical air gap wider than the thickness of the free end of the leaf spring.

4,637,628

ANTI-ROLL TORSION BAR ARRANGEMENT FOR VEHICLE REAR SUSPENSION

David J. Perkins, Royal Oak, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 2, 1985, Ser. No. 803,445
Int. Cl.[4] B60G *19/00, 21/00*
U.S. Cl. 280—689 **3 Claims**



1. A rear axle suspension apparatus for the rear wheels of a motor vehicle, the suspension apparatus comprising:

a pair of rearward extending control arms;

means for mounting the forward end of each said control arm to the chassis of said vehicle for pivotal movement about an axis transverse to the longitudinal axis of said vehicle;

a rear axle cross-beam assembly secured at the rearward ends of said control arms, said rear axle cross-beam assembly comprising;

a cylindrical sectioned tubular member extending transversely such that its outboard end portions are each located adjacent to one of said wheels; a pair of first and second outer cylindrical sleeves, said first sleeve concentrically surrounding one outboard end portion of said tubular member so as to be fixedly secured thereto, said second sleeve concentrically surrounding the other outboard end portion of said tubular member so as to be supported by journal means for limited rotation relative to said inner tubular member; each said first and second sleeve being fixedly connected to the rearward end of an associated one of said control arms;

a pair of mirror image first and second castings, each said casting having a inboard collar portion and an outboard wheel support portion; each said casting wheel support portion supporting an associated rear wheel mounting means thereon such that said casting wheel support has its transverse rotational axis offset from the transverse principal axis of said inboard collar portion; each said collar portion defining a transversely aligned bore fixedly receiving therein the outboard end of its associated first and second sleeve;

a single transversely extending anti-roll torsion bar having a predetermined axial dimension of about one fourth the overall axial dimension of said rear axle cross-beam assembly, said anti-roll torsion bar extending axially in a substantially co-extensive manner within said second sleeve and in concentrically spaced relation within said tubular member other outboard end portion;

an annular bushing fixedly received within said tubular member, said torsion bar having an enlarged inboard and outboard head portion at each end thereof whereby said head portions are formed with identical polygonal cross-sections, said outboard head portion having an attachment end plate fixed thereon disposed normal to the principal axis of said torsion bar, said annular bushing having a polygonal cross-section transversely extending bore provided therein shaped complementary to said torsion bar inboard head portion for slidable reception therein;

said second casting inboard collar portion having a polygonal cross-section transversely extending bore therein shaped complementary to said torsion bar outboard head portion for slidable reception therein, said torsion bar head portions each defining a plurality of faces located in common transversely extending planes, said torsion bar inboard and outboard head portions being slidably received in their respective tubular member annular bushing bore and second casting inboard collar portion complementary shaped bore;

such that with said end plate secured by fastener means to said second casting and said inboard head portion secured within said annular bushing by a cross-pin, said torsion bar positively maintains a fixed transverse dimensional relationship between said first and second castings;

and whereby said tubular member being rotatable in a limited manner relative to said second sleeve by said journal means upon opposite pivotal movement between said control arms resulting in said anti-roll torsion bar being subjected to torsion resisting said control arms opposite pivotal movement so as to increase the roll stiffness of the rear axle suspension apparatus.

4,637,629

NON-ENCUMBERING TORSO RESTRAINT SYSTEM

Robert J. Cummings, Hermosa Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 1, 1985, Ser. No. 761,285
Int. Cl.[4] B64D *25/06*; B60R *21/10*
U.S. Cl. 280—801 **20 Claims**

13. An apparatus for protecting the torso of a crewmember from inertial forces while said crewmember is in a seat within a vehicle and which may be used in conjunction with a parachute harness, comprising:

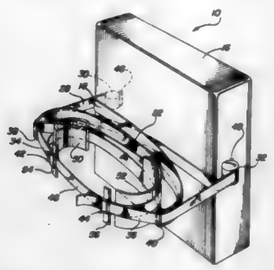
a left support strap;

a left web member connected to said left support strap and forming a first loop therewith encircling the torso of the crewmember, said first loop capable of rotation relative to the seat, said left web member contacting the left lateral side of the torso of the crewmember;

a right support strap;

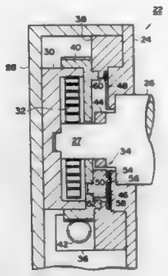
a right web member connected to said right support strap and forming a second loop therewith encircling the torso of the crewmember, said second loop capable of rotation

relative to the seat, said right web member contacting the right lateral side of the torso of the crewmember;
a right vertical strap connecting said right support strap to the torso of the crewmember for preventing said second loop from slipping down the crewmember's torso;
a left vertical strap connecting said left support strap to the torso of the crewmember for preventing said first loop from slipping down the crewmember's torso;
a right inertial reel having a right tension strap, said right reel detachably mounted on the seat at the rignt side thereof;
a left inertial reel having a left tension strap, said left reel detachably mounted on the seat at a left side thereof;



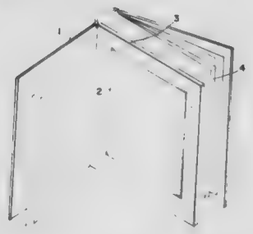
means for rotatably connecting said left tension strap to said first loop so that said first loop can rotate relative to said left inertial reel;
means for rotatably connecting said right tension strap to saio second loop so that said second loop can rotate relative to said right inertial reel;
a right lateral pad mounted at a right lateral front portion of the seat back, said right pad having a portion projecting forward of the seat back, said right tension strap passing over said portion projecting forward;
a left lateral pad mounted at a left lateral front portion of the seat back, said left pad having a portion projecting forward of the seat back, said left tension strap passing over said portion projecting forward.

4,637,630
WEBBING TENSION ADJUSTING APPARATUS
Yuji Nishimura, and Teruhiko Koide, both of Niwa, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan
Filed Jun. 18, 1985, Ser. No. 745,948
Claims priority, application Japan, Jun. 21, 1984, 59-93104[U]
Int. Cl.⁴ B60R *22/44*
U.S. Cl. 280—807 **20 Claims**



1. A webbing tension adjusting apparatus employerl in a webbing retractor in which a takeup shaft for winding up an occupant restraining webbing is biased in the webbing wind-up direction by a resilient member, which comprises:
(a) driving means adapted to actuate said webbing takeup shaft when said means is rotated forwardly such that said takeup shaft is rotated in the webbing wind-off direction; and
(b) a one-way clutch adapted such that, when said driving means is rotated forwardly, said clutch connects said driving means and said webbing takeup shaft, while when said driving means is rotated backwardly, said clutch cancels the connection therebetween,
whereby it is possible to reduce the tension of said webbing when the occupant leaves the vehicle.

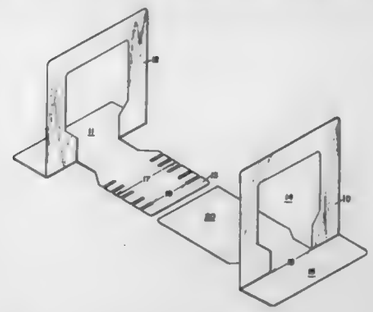
4,637,631
COMBINED BOOK AND MIRROR
Robert J. Baer, Honolulu, Hi., assignor to RJB and C Company, Honolulu, Hi.
Filed Oct. 23, 1984, Ser. No. 664,021
Int. Cl.⁴ B42D *5/00, 15/00;* B42F *3/00*
U.S. Cl. 281—15 R **10 Claims**



1. A book in combination with a mirror, comprising:
(a) a series of sections in laminar alignment, wherein each section is provided with a plurality of flat rectangular sheets in laminar alignment, wherein each sheet is provided with first and second lateral edges, whereby each section contains leaves bound together on one edge, and whereby said one edge is the bound edge, and wherein at least one section is laminated together by means for laminating, whereby a thick, flexible leaf is formed;
(b) a hole in said thick leaf extending partially therethrough;
(c) a mirror immovably placed in said hole by means for attaching;
(d) a cover for said series of sections in laminar alignment connected to said sections at points along said bound edges of said sections.

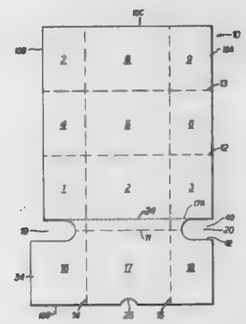
4,637,632
HOLDING DEVICE
Arlyn R. Rubash, 2908 W. Brookside Dr., Peoria, Ill. 61615, and Duane R. Rubash, 684 Garys Dr., Antioch, Ill. 60002
Filed Nov. 15, 1985, Ser. No. 798,442
Int. Cl.⁴ B42D *17/00;* A47B *65/00*
U.S. Cl. 281—45 **10 Claims**

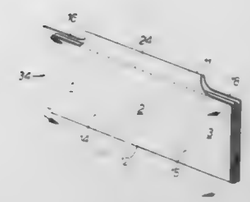
1. A device for holding at least one object in a stable, fixed position, comprising:
a. a first holding member having a surface adapted to be placed into holding contact with said object and having an insert portion having a first width that is its largest width, said first holding member being structurally adapted to be inserted into and placed in locking relationship with a second holding member, said insert portion containing a locking area having a locking area width; and
b. a second holding member having a surface adapted to be placed into holding contact with said object and having an opening structured so as to contain a first distance that is greater than the first width of said insert portion and containing a second distance that is less than said first width but greater than the locking area width so as to enable said insert portion to be inserted into said opening at said first distance and then to be repositioned following said insertion at said locking area width so as to engage said locking area of said first member with a perimeter



portion of said second member thereby creating a stable, fixed locking relationship between said first and second holding members.

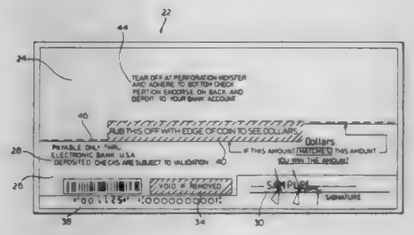
4,637,633
LABEL IN THE FORM OF A SHEET AND ENVELOPE
David J. Instance, Past Heap Farm, Pembury, Tunbridge Wells, Kent, England
Continuation-in-part of Ser. No. 471,846, Mar. 3, 1983, abandoned. This application Apr. 26, 1985, Ser. No. 727,687
Claims priority, application United Kingdom, Mar. 4, 1982, 8206331
Int. Cl.⁴ B42D *15/00;* B41L *1/20;* B26F *3/02*
U.S. Cl. 283—81 **9 Claims**





1. A label in the form of an integral sheet/envelope for attachment to a product, said label comprising a sheet portion such as a sheet of printed instructions, and an envelope portion for removably carrying said sheet portion, said sheet portion and envelope portion being both formed from a common single folded sheet, said sheet comprising opposing side edges interconnected by opposing end edges, said sheet being divided into said least first and second parallel rows of three rectilinear panels each, the panels of said first row forming one of said end edges and being separated from the corresponding panels of said second row by a line of perforations, which extends transversely relative to said side edges of said sheet, said first row of three panels including two outer panels which each have a portion thereof cut away inwardly from respective side edges adjacent said line of perforations so that said line of perforations stops short of said side edges, said second row of panels together with a part of the center panels of the first row being folded so as to lie adjacent corresponding panels of said first row, said two outer panels of said first and second rows being folded behind the remaining center panels such that said first row of panels defines said envelope portion which contains said sheet portion defined by said second row of panels, both cut away portions being dimensioned so that when the envelope portion is folded both cut away portions expose a rearwardly facing region of said part of the center panel of the first row, the rear of said envelope portion being formed from the outer panels of the first row and said region, a front face of said center panel of said first row forming an exposed front of said envelope portion, said envelope portion remaining open along said one end edge which remains uncovered so that when the rear of the envelope portion, including said exposed region thereof, is attached to a surface, said sheet portion is removable from said envelope portion through said one end edge, while said envelope portion remains folded, by tearing said sheet portion along said line of perforations as said exposed region remains attached to the surface.

4,637,634
TWO-PART BANK DRAFT
Seymour L. Troy, and Kenneth E. Mullenix, both of P.O. Box 5027, Ft. Lauderdale, Fla. 33310
Filed Jul. 24, 1985, Ser. No. 758,477
Int. Cl.⁴ B42D *15/00;* G06G *7/14*
U.S. Cl. 283—98 **21 Claims**

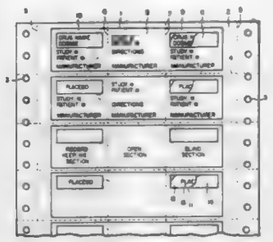


1. A sales promotional check in the form of a bankable draft for direct cashing or deposit at a bank, the bank draft comprising:
a first preprinted sheet having at least a portion which conforms to a first part of a bankable bank draft and having indentifying information thereon;
a second preprinted sheet comprising a second part of a bankable bank draft, the second part of the bankable draft containing identifying information thereon, said identifying information corresponding to the indentifying information on the first part of the bankable draft the first and second sheets firmly affixed adjacent one another by an adhering means to comprise a sheet to form the bankable bank draft.

4,637,635
DOUBLE-BLIND LABELS
Richard A. Levine, 34 Lake Dr., North Brunswick, N.J. 08902
Filed Dec. 3, 1985, Ser. No. 804,044
Int. Cl.⁴ B42D *15/00;* G09F *3/00*
U.S. Cl. 283—101 **3 Claims**

1. At least one pressure sensitive label comprising a backing

sheet having at least one removable, double blind self adhesive label affixed thereto, said label separable into at least two sections, said sections including a blind section comprising a blinded area having information printed thereon, a clear lac-



quer-like coating thereover and an opaque scratch-removable coating over said lacquer-like coating, an open section and a record keeping section which identifies the blinded information.

4,637,636

TUBE COUPLINGS

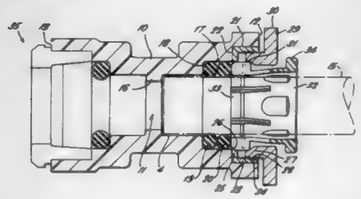
John D. Guest, "IONA", Cannon Hill Way, Bray, Maidenhead, Berkshire, United Kingdom

Filed Oct. 30, 1985, Ser. No. 793,004

Claims priority, application United Kingdom, Nov. 12, 1984, 8428532; Apr. 4, 1985, 8508943

Int. Cl.[4] F16L *35/00*

U.S. Cl. 285—38 9 Claims



1. A tube coupling comprising a hollow body having an opening to be coupled with a tube, a collet having an annular portion having a central axis and resilient arms extending from the annular portion into the hollow body, said resilient arms being deflectable radially with respect to said central axis, a cam member, and means mounting said cam member on the body, said cam member having an internal tapered cam surface reducing in a direction extending out of the body, said cam surface being engageable with the resilient arms of the collet to compress the arms radially inwardly into engagement with the tube in the collet to hold a tube in the body, said collet being axially movable in either direction with respect to the cam member to increase or decrease the radial clamping action of the cam surface on the resilient arms against a tube encircled by the arms, and means located within said hollow body for varying additionally the compressive force applied to the collet by the cam surface of the cam member, said means being operable to adjust the position of the cam member relative to the body in the direction of the collet axis and thereby adjust the radial compressive force applied by the resilient arms to a tube within the collet.

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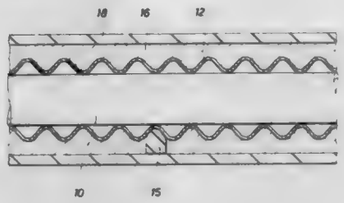
PIPELINE SYSTEM WITH ENCAPSULATED INSULATION

Alexander S. Adorjan, Pearland, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Dec. 11, 1984, Ser. No. 680,421

Int. Cl.[4] F16L *59/14*

U.S. Cl. 285—47 7 Claims



1. A section of a pipeline system, comprising:

a section of pipe;

a first vapor barrier surrounding said pipe section having a first surface facing said pipe section and a second surface opposite said first surface, said first surface having a corrugated construction;

insulation material having a first surface and a second surface, said insulation material concentrically spaced from said pipe section, the first surface of said insulation material encasing and adhering to the second surface of said vapor barrier; and

a second vapor barrier concentrically spaced from said pipe section, said vapor barrier encasing and adhering to the second surface of said insulation material.

4,637,638

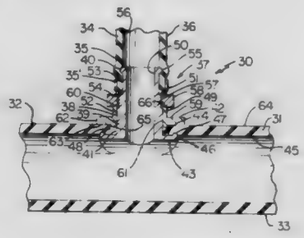
BRANCHED HOSE CONSTRUCTION, JOINT CONSTRUCTION AND PART THEREFOR, AND METHODS OF MAKING THE SAME

James B. Rush, Waynesville; James S. Bryan, Clyde; Jonas L. Gunter, Canton; Guy W. Dillard, Sylva; Roger D. Meadows, Waynesville, and Pearison W. Henry, Sylva, all of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Mar. 8, 1985, Ser. No. 709,962

Int. Cl.[4] F16L *41/00*

U.S. Cl. 285—158 11 Claims



1. In a branched hose construction comprising a first tubular member provided with opposed ends and with an opening therein intermediate said opposed ends thereof, a second tubular member provided with opposed ends, and a joint construction comprising a tubular insert provided with opposed ends joining one of said ends of said second tubular member to said opening by having one end of said tubular insert disposed through said opening and the other end thereof interconnected to said one end of said second tubular member whereby said tubular members are in fluid communication with each other through said tubular insert and said second tubular member branches outwardly from said first tubular member, said joint construction comprising a washer-like member telescoped on

said tubular insert and cooperating with said one end of said tubular insert in mechanically clamping said first tubular member therebetween completely around said opening thereof, said joint construction further comprising securing means securing said washer-like member to said tubular insert in said clamping relation thereof, said one end of said tubular insert comprising an annular flange, said first tubular member having an internal surface means, said annular flange having a surface means facing and engaging said internal surface means of said first tubular member and being provided with an inner peripheral means and an outer peripheral means, said surface means of said annular flange having annular projection means thereon that digs into said internal surface means of said first tubular member around said opening thereof, said first tubular member having an external surface means, said washer-like member having a surface means facing and engaging said external surface means of said first tubular member and being provided with an inner peripheral means and an outer peripheral means, said surface means of said washer-like member having annular projection means thereon that digs into said external surface means of said first tubular member around said opening thereof, the improvement wherein said annular projection means of said annular flange comprises a single annular projection means that is disposed substantially at said outer peripheral means of its respective said surface means and wherein said annular projection means of said washer-like member comprises a single annular projection means that is disposed substantially at said inner peripheral means of its respective said surface means.

4,637,639

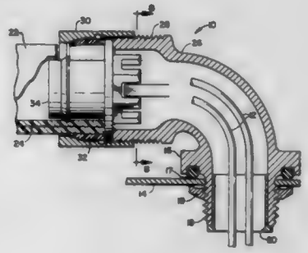
NON-METALLIC LIQUID-TIGHT CONDUIT ENGAGING CONNECTOR

Robert W. Jorgensen, Niles, Mich., and Michael R. Nowak, Mishawaka, Ind., assignors to Harvey Hubbell Incorporated, Orange, Conn.

Filed Jul. 22, 1985, Ser. No. 757,728

Int. Cl.[4] F16L *33/23*

U.S. Cl. 285—249 9 Claims



1. A connector for forming a liquid-tight and mechanically strong connection with a non-metallic, flexible, liquid-tight electrical conduit comprising the combination of

a generally tubular metal body having a substantially flat end face and external threads adjacent said end face;

a plastic ferrule having a tubular portion and a radially outwardly protruding flange shaped and dimensioned to lie against said flat end face of said body,

said ferrule including a radially outwardly protruding rib axially spaced from said flange between said flange and one end of said tubular portion;

means on said body for engaging said ferrule to limit rotation of said ferrule relative to said body;

a plastic tubular sleeve having a maximum outer diameter corresponding to the diameter of said flange, a cylindrical inner surface, an axial length substantially equal to the axial spacing between said rib and said flange and having an inwardly tapering outer surface portion, said sleeve being positioned around said tubular portion of said ferrule with the smaller end of said tapering surface portion radially spaced from said rib to receive an end of said conduit, said sleeve having a plurality of generally triangular slots extending axially inwardly only from said smaller end; and

a metal compression nut having an internally threaded portion at one end dimensioned to threadedly engage said external threads on said body and an inwardly tapering frustoconical inner surface surrounding said tapering outer surface portion of said sleeve,

whereby threading said nut onto said body causes said inwardly tapering surface of said nut to contact said tapering outer surface portion of said sleeve and force said outer surface portion radially inwardly in a uniform fashion, closing said triangular slots and reducing the diameter of said smaller end to engage said conduit between said smaller end and said rib.

4,637,640

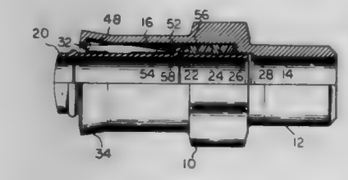
PUSH-IN CONNECT FITTING

Paul J. E. Fournier, Jackson, and Joseph F. Reinker, Jr., Parma, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Feb. 27, 1985, Ser. No. 706,442

Int. Cl.[4] F16L *39/00*

U.S. Cl. 285—319 7 Claims



1. A conduit system fitting characterized by its ease and simplicity of connection comprising, in combination, a first body having an axial passage, a conduit attachment end and a connection end, a recess defined in said body concentric with said passage intersecting said connection end adapted to receive an elongated tube having an end and an external shoulder axially spaced from said tube end, a shoulder defined in said recess adjacent said connection end, a stop defined in said passage engagable with said tube for limiting insertion of said tube within said passage, an annular sheet metal tube retainer fixed within said recess, said retainer being of an annular configuration having a central region, an inner end region and an outer end region, a plurality of cantilevered second resilient fingers each having free ends and located at said retainer inner end region longitudinally extending toward said stop and resiliently inwardly biased wherein the finger ends engage the tube shoulder upon the tube being fully inserted into the recess and a plurality of cantilevered first resilient elongated fingers separate and distinct from said second fingers each having free ends and located at said retainer outer end region extending toward said body connection end and resiliently biased outwardly whereby said first finger ends engage said recess shoulder adjacent said connection end maintaining said retainer within said recess.

4,637,641

ASSEMBLY MEANS FOR STANDARDIZED MECHANICAL JOINT FOR PIPELINE APPURTENANCES

Harold Kennedy, Jr., 18 Fox Hollow, Eastland, Tex. 76448

Filed Jun. 5, 1985, Ser. No. 741,680

Int. Cl.[4] F16L *19/00*

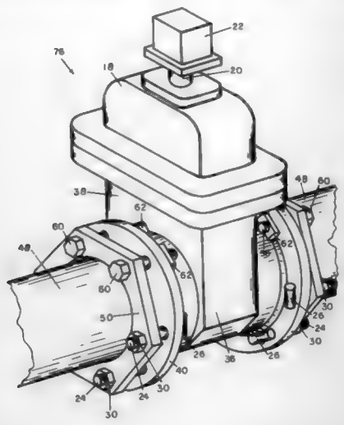
U.S. Cl. 285—337 8 Claims

1. An improvement in the standardized mechanical joint

connection for use on waterworks or gas pipeline appurtenances wherein the shape or dimensions of the body of said appurtenances preclude the insertion and tightening of the standardized T-bolts, said improvement comprising:

a. a screw having an externally threaded cylindrical portion, an hexagonally shaped head on one end of said externally threaded cylindrical portion, said hexagonally shaped head having the same dimensions across flats as the standardized nuts, said externally threaded cylindrical portion having length of such dimension that engagement of said externally threaded cylindrical portion with the internal threads of nut means is provided when a gland, gasket, socket, and spigot are contiguous prior to compression of said gasket, and interference with said externally threaded cylindrical portion is prevented when said screw is tightened and said gasket is compressed,

b. said nut means having an internally threaded elongated



shape so as to prevent turning during tightening, means to provide linear contact with a standardized mechanical joint bell flange surface, said nut means having adjacent surfaces sloping away from said linear contact so as to provide for axial misalignment of said screw,

c. whereby, as many standardized T-bolts as possible having been inserted through the bell flange bolt holes then through the gland bolt holes and threadably connected to standardized nuts, one said screw is inserted through each remaining said gland bolt hole and then through said bell flange bolt hole wherein the use of the standardized T-bolt is prevented, each said screw is threadably connected to said nut means, said screw heads and said standardized nuts being tightened from the gland side of said joint by consecutively or alternatingly connecting the same wrench means to the said hexagonally shaped heads of said screws and said standardized nuts, applying torque until said gasket is compressed and leakage is prevented.

4,637,642

STOWAGE BIN LATCH ASSEMBLY

Carl H. Stoecker, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

PCT No. PCT/US83/01998, § 371 Date Dec. 16, 1983, § 102(e) Date Dec. 16, 1983, PCT Pub. No. WO85/02645, PCT Pub. Date Jun. 20, 1985

PCT Filed Dec. 16, 1983, Ser. No. 592,019

Int. Cl.⁴ E05C *3/30*

U.S. Cl. 292—129 **13 Claims**

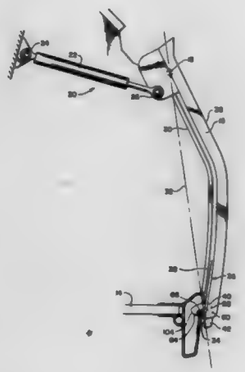
1. A latch assembly particularly adapted to latch a door, such as a door for a stowage bin where the door has a forward side and a rear side, an upper hinge end about which the door is mounted for swing motion about a door hinge axis and a lower swing end opposite to the hinge end, where said door has a closed position at which said door is substantially vertically aligned and is movable in a forward and upward direction to an open position, and where said door has a generally vertical door reference plane which, with the door in its closed position, is coincident with said hinge axis and said swing end, said latch assembly adapted to be mounted at the swing end of the door to latch the swing end to stationary structure, said latch assembly comprising:

a. a base member which has a latch reference plane and which is adapted to be located at and mounted to the swing end of the door in a manner that the latch reference plane is generally parallel to the door reference plane;

b. an actuating member mounted to the base member for substantially linear movement along a generally vertical operating path generally parallel with said latch reference plane between a lower latching position and an upper release position, said actuating member having a through opening, and upper and lower contact members located at upper and lower sides, respectively of said through opening;

c. a first main spring means to urge said actuating member downwardly to its latching position;

d. a latching arm having a forward pivot end by which the arm is pivotally mounted to the base member for rotation



about a latching axis which is generally parallel with the latch reference plane and located forwardly of the through opening of the actuating member, and a rear latching end where the arm has a hook member extending laterally from the latching arm and having a forwardly facing latching surface adapted to engage a matching striker member, said latching end being located rearwardly of the through opening of the latching member, said arm extending through said through opening and having a lengthwise axis extending from the pivot end of the arm to the latching surface, said arm being pivotally movable about said latching axis between a first lower latching position and a second upper release position;

e. said actuating member being arranged in a manner that upward movement of the actuating member causes the lower contact member to engage the latching arm at an intermediate location between the pivot end and the latching end to move the arm to said second release position, and downward movement of said actuating member causes the upper contact member to engage the latching arm at said intermediate location to move the arm to said first latching position; and

f. a second spring means operatively connected between said base member and said latching arm to urge the latching arm toward its release position.

4,637,643

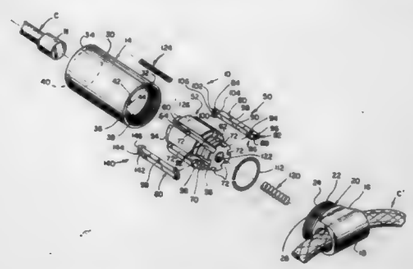
AUTO-RELEASE LOGGING CHOKER

David D. Johnson, Booth, and Cleveland J. Biller, Morgantown, both of W. Va., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 1, 1985, Ser. No. 794,028

Int. Cl.⁴ B66C *1/38*; F16F *15/06*

U.S. Cl. 294—75 **12 Claims**



1. A self-releasing coupling for releasably attaching a first element to a second element comprising:

a casing having attaching means for attaching said casing to the first element, and a ramp;

grasping means movably mounted in said casing for releasably grasping the second element, said grasping means having wedgelike engaging force generating means thereon which cooperate with said casing ramp for forcing said grasping means toward said second element and providing an engaging force between said grasping means and the second element which maintains said grasping means in engagement with the second element and increases as a separating force tending to separate the second element from said grasping means increases when said grasping means is in a first location within said casing with said casing ramp engaging said wedgelike engaging force generating means;

operating means on said grasping means for moving said grasping means into and element grasping configuration and into an element releasing/receiving configuration;

control means on said casing for placing said operating means into an element releasing/receiving configuration while said grasping means is in said element grasping configuration in said first location within said casing, said operating means being prevented from moving said grasping means into said element releasing/receiving configuration by said ramp and said wedgelike engaging force generating means and the separating force; and

moving means connected to said grasping means for moving said grasping means out of said first location when the separating force is released whereby said engaging force is released and said operating means automatically places said grasping means into said element releasing/receiving configuration.

4,637,644

TIRE TRANSPORT JIG

Jack Trethowan, Birmingham, England, assignor to W & A Bates Limited, England

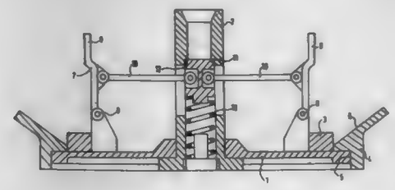
Filed May 9, 1985, Ser. No. 732,268

Claims priority, application United Kingdom, May 22, 1984, 8413084

Int. Cl.⁴ B66C *1/54*; B79H *5/02*

U.S. Cl. 294—97 **8 Claims**

1. A tire transport jig comprising a horizontally disposed, fixed lower bead support, a concentric, horizontally-disposed fixed tire shoulder support and an upper bead holding device comprising a set of radially movable upper bead engagement members and means to effect said radial movement between a first position in engagement with an upper tire bead, and a second position out of engagement, said means to effect radial movement of the upper bead engagement members comprising a single control member and connected from the control member to each of the engagement members by connectors such that movement of the control member moves the engagement members in synchronization.



4,637,645

DEVICE FOR LIFTING AND HANDLING OBJECTS

Sven-Göran Eriksson, 8 Rymdvägen, S-981 44 Kiruna, Sweden

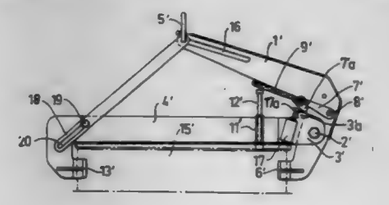
PCT No. PCT/SE84/00334, § 371 Date Jun. 13, 1985, § 102(e) Date Jun. 13, 1985, PCT Pub. No. WO85/01720, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 11, 1984, Ser. No. 744,813

Claims priority, application Sweden, Oct. 13, 1983, 83056366

Int. Cl.⁴ B66C *1/42*

U.S. Cl. 294—104 **2 Claims**



1. A device for lifting and handling objects, including cylindrical objects, comprising a lifting arm having a substantially vertical clamp portion and a substantially horizontal actuating portion provided with a lifting means, a yoke having a substantially vertical clamp portion having ends and a substantially horizontal portion, said clamp portion of the lifting arm being, between its ends, pivotally connected to a free end of the substantially horizontal portion of the yoke, clamping jaws mounted on the clamp portions of the lifting arm and the yoke for engagement with diametrically opposite sides of an object to be lifted, a locking mechanism for releasably locking said lifting arm to the yoke in open position and means for releasing said locking mechanism in downward swinging movement of the actuating portion of the lifting arm to allow the closing of the clamping jaws in order to grip the object to be lifted, said lifting means being arranged for free movement in a slot provided in the actuating portion of the lifting arm and being connected to one end of a link means, said link means having an opposite end portion pivotally connected to the yoke remote from that end thereof which is pivotally connected to the clamp portion of the lifting arm.

4,637,646

WHEEL SET FOR RAIL VEHICLES

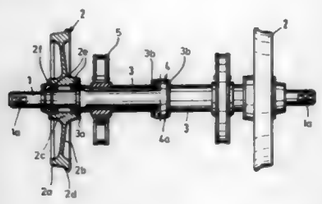
Hermann Ortwein, Cologne; Ottmar Krettek, and Johannes Nicolin, both of Aachen, all of Fed. Rep. of Germany, assignors to Clouth Gummiwerke Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Nov. 16, 1984, Ser. No. 672,576

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1983, 3341950

Int. Cl.[4] B60B *37/00*

U.S. Cl. 295—37 **7 Claims**



1. A torsionelastic wheel set for a railway vehicle comprising:

a shaft;

a pair of axially spaced track-entrained railroad-rail wheels independently journaled on said shaft and rotatable relative to said shaft and to one another;

respective hollow shaft sections connected to each of said wheels and disposed between said wheels, said shaft extending through said sections, said shaft sections being cylindrical and extending toward a location substantially centrally disposed between said wheels, each of said shaft sections having a flange adjoining said location; and

an annular elastic coupling at said location between said hollow shaft sections coaxial therewith and securing them together substantially midway between the wheels for limited elastic relative angular displacement and generating a restoring force reestablishing an original angular orientation of said hollow shaft sections, said coupling being axially sandwiched between said flanges.

4,637,647

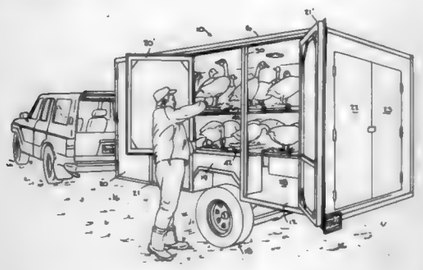
FIELD DECOY TRANSPORT DEVICE

Franklin O. Bunting, and J. Russell Hudson, both of Dagsboro, Del., assignors to Richard W. Gaffney, Brooklyn Heights, N.Y. and Oliver M. Walker, Bethesda, Md.

Filed Feb. 24, 1986, Ser. No. 833,354

Int. Cl.[4] B60R *7/00*

U.S. Cl. 296—24 R **11 Claims**



1. Apparatus for transporting and storing a set of taxidermied water fowl decoys such as Canada geese mounted on rectangular bases comprising:

(a) wheeled enclosure means having a floor, side walls and a roof and trailer attachment means for vehicle towing;

(b) a plurality of horizontal pairs of opposing channel members mounted transversely on the floor of the enclosure means and at at least one level thereabove from side wall to side wall in vertical alignment therewith;

(c) said channel pairs slidably receiving the decoy bases to retain a side by side row of said decoys; and

(d) the side walls, of said enclosure means having vertical door means for each vertical stack of channel pairs positioned to permit the transverse withdrawal and insertion of said decoys.

4,637,648

REAR SEAT BACK LOCKING ARRANGEMENT FOR A MOTOR VEHICLE AND THE LIKE

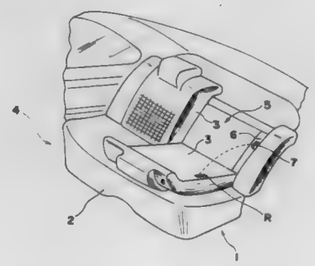
Kiyomi Okino, and Takumi Muramoto, both of Hiroshima, Japan, assignors to Mazda Motor Corporation and Delta Kogyo Co., Ltd., both of Hiroshima, Japan

Filed Aug. 5, 1985, Ser. No. 762,314

Claims priority, application Japan, Aug. 7, 1984, 59-121576[U]

Int. Cl.[4] B60N *1/10*

U.S. Cl. 296—63 **8 Claims**



1. A rear seat back locking arrangement for a motor vehicle and the like which comprises:

(a) a rear seat back arranged to partition an interior of a passenger compartment of the motor vehicle from an interior of a trunk room thereof so as to be capable of being turned down forwardly about its lower edge and having a recess formed adjacent to a peripheral edge at its rear surface in a position confronting a vehicle body when erected,

(b) a striker means fixed at the vehicle body side to confront said recess of the rear seat back and adapted to project toward the rear surface of said rear seat back so as to be fitted into said recess, and

(c) a rear seat back locking means provided on the rear seat back and having a lock means and an operating means, said lock means provided in said recess further including an engaging means engageable with said striker means so as to make it possible to lock the rear seat back, and a releasing means which enables the engaging means to be released from the locked state in association with movement of the operating means, said operating means which effects locking and unlocking of said lock means including a moving means to be moved through manual operation, and a cancelling means positioned between the moving means and the releasing means, said cancelling means cancelling the lock releasing function of said releasing means by the moving means, while permitting movement of said moving means.

4,637,649

LATCH MECHANISM FOR REMOVABLE ROOF PANEL

Emanuel F. Cambria, Tannersville, Pa., assignor to Cars & Concepts, Inc., Brighton, Mich.

Filed May 13, 1985, Ser. No. 733,327

Int. Cl.[4] B60J *7/19*; **E05B** *13/10, 55/06*

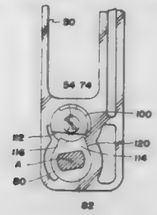
U.S. Cl. 296—224 **14 Claims**

1. A latch mechanism for fastening a hatch panel in a complementary roof opening in the roof of an automobile comprising:

latch means carried by the hatch panel for selectively interlocking the hatch panel with respect to the automobile roof within the roof opening;

operator means for actuating said latch means having an operator member and means for displaceably mounting said member to the latch panel for movement between a closed position corresponding to engagement of the latch means, and an open position corresponding to disengagement of the latch means; and

control means carried by the operator means for selectively coupling said latch means to said operator means in an unlocked mode corresponding to direct interconnection of said operator member and said latch means and a



locked mode corresponding to limited interconnection of said operator member and said latch means, said control means having:

a first means for coupling the latch means and the operator member when the unlocked mode of said control means is selected to effect movement of the latch means in correspondence to the movement of the operator member;

a second means for locked mode coupling of said latch means and said operator member in response to movement of the operator member from the open position; and

a third means for locked mode decoupling of said latch means and said operator member during subsequent movement of said operator member.

4,637,650

TOP COVER MEMBER FIXING ARRANGEMENT IN A VEHICLE SEAT

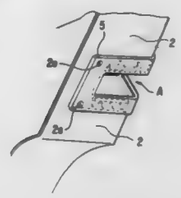
Nobuhiro Inoue, Tokyo, Japan, assignor to Tachikawa Spring Co., Ltd., Japan

Filed Dec. 26, 1984, Ser. No. 686,233

Claims priority, application Japan, Dec. 27, 1983, 58-199849[U]

Int. Cl.[4] A47C *1/10*

U.S. Cl. 297—410 **4 Claims**



1. In a vehicle seat having a top cover, the top cover having a cut-out formed therein and having an edge portion surrounding the cut-out, apparatus for securing the top cover edge portion surrounding the cut-out, the apparatus comprising:

a frame member, the frame member having a body formed as one of a plate and a wire, the frame member having a shape which conforms to the shape of the cut-out, the frame member being disposed adjacent to the top cover edge portion surrounding the cut-out;

a plate-like piece, the piece including a plate-like base portion and a protruding portion joined to and protruding from the base portion, the protruding portion having a thickness which is greater than that of the base portion, the plate-like piece being mounted on the top cover adjacent to the cut-out, the base portion being secured to the top cover edge portion surrounding the cut-out, the frame member and the plate-like piece being positioned relative to each other such that the protruding portion of the piece is more closely disposed to the cut-out than the frame member; and

a holding member, the holding member being formed as a rim positioned adjacent to and surrounding the cut-out, the plate-like piece being interposed between the frame member and the holding piece and being securely held therebetween, thereby securing the edge portion of the top cover.

4,637,651

SEAT PLATE

Gustaf A. Sperr, Trollhättan, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden

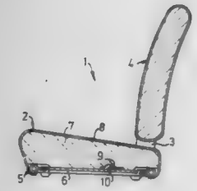
PCT No. PCT/SE84/00270, § 371 Date Apr. 4, 1985, § 102(e) Date Apr. 4, 1985, PCT Pub. No. WO85/00735, PCT Pub. Date Feb. 28, 1985

PCT Filed Aug. 7, 1984, Ser. No. 719,277

Claims priority, application Sweden, Aug. 10, 1983, 83043471

Int. Cl.[4] A47C *7/02*

U.S. Cl. 297—458 **8 Claims**



1. A seat plate in a seat, for supporting the pelvis of a person sitting on the seat, the seat plate being formed on its upper side with two raised, scythe-like ridges which are symmetrically located about a longitudinal center line, one on each side of the center line, each ridge including a substantially transverse ridge portion which outwardly curves slightly backwards and tapers into a basic plane for the seat plate, each ridge also including a substantially longitudinal ridge portion which backwardly curves slightly outwards and tapers into the basic plane for the seat plate, the ridges being contoured to support the seat bone protuberances of the pelvis substantially on their forward and inner side.

4,637,652

PIECE OF FURNITURE

Henning Bergenwall, Sandviken, Sweden, assignor to Mölnlycke Konsumentprodukter AB, Mölnlycke, Sweden

Filed Sep. 3, 1985, Ser. No. 772,138

Int. Cl.[4] A47C *1/02*

U.S. Cl. 297—90 **16 Claims**

1. A piece of furniture, comprising:

a stand a seat, a back support pivotable with respect to said seat, and an upwardly and downwardly pivotable leg support provided with a foot-rest;

at least one operating means pivotably connected with said seat and said support for movement thereof backwardly from a sitting position, in which the feet of a user are resting on said foot-rest, and for a simultaneous pivoting

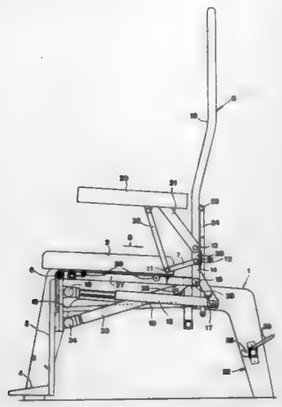
of said leg support upwardly and forwardly to cause a relative movement between said foot-rest and said seat such that knee-adjacent leg portions of the user remain in supporting contact with the supporting areas of the piece of furniture;

said seat being movably arranged in a direction forwardly and backwardly relative said stand through pivoting of said back support;

said leg support being pivotably connected to said stand about a pivot axis fixed with respect to said stand for all movements relative to said stand, said foot-rest being located at a constant distance from said pivot axis during the pivoting of said leg support upwardly and downwardly;

said operating means upon pivoting of said leg support upwardly and forwardly imparting movement of the seat in a direction backwardly relative to said stand and thereby relative to said pivot axis of said leg support, and said operating means comprising at least one link extending between a point on said seat and a point on said back support;

an intermediate part having a first part pivotally hinged through a front hinge to said seat and a second part pivotally hinged through a second hinge to said back support for pivoting of said back support;



power means associated with said intermediate part through said seat for pivoting said support in response to said seat imparting movement to said intermediate part;

said back support having first and second portions, said first portion being connected to said intermediate part about said second hinge so that said first portion extends outwardly from said second hinge, and when said back support is from said second hinge, and when said back support is pivoted to a normal sitting position said first portion extends upwardly and substantially forms the real back supporting part of the back support, and said second portion extends downwardly;

means associated with at least one of said intermediate part and said back support for limiting the pivoting of said first portion of said back support backwardly relative to said intermediate part; and

said link being to said second portion of said back support, wherein said first portion of said back support is arranged to, at the backward pivoting of said back support, enter into supporting engagement with a portion of said stand in such a way that continued influence by said power means on said intermediate part for pivoting thereof in the direction backwardly gives rise to pivoting of said back support relative to said intermediate part so that said first portion of said back support is pivoted upwardly and so that said second portion of said back support is moved at least one of backwardly and downwardly and thereby via said link actuates the seat in the backward direction.

4,637,653

REAR SEAT CUSHION IN MOTOR VEHICLE

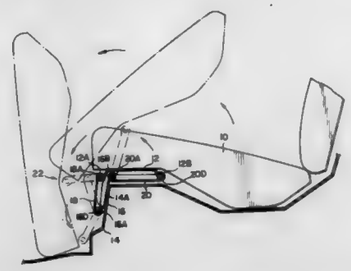
Takeshi Yoshida, Nagoya; Takayasu Honda, Toyota; Shunosuke Kitazume, Takarazuka, and Kouzou Tanaka, Toyonaka, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Daihatsu Motor Co., Ltd., both of, Japan

Filed Dec. 27, 1985, Ser. No. 813,966

Claims priority, application Japan, Dec. 28, 1984, 59-198872[U]

Int. Cl.⁴ B60N *1/10*

U.S. Cl. 297—334 **24 Claims**



1. A rear seat cushion for a motor vehicle, wherein the seat cushion is designed to be rotated forwardly to an erect position to expand the loading space in the rear portion of the vehicle compartment, having

a quadric rotary link mechanism comprises a seat cushion side link connected to said seat cushion substantially horizontally with reference to the longitudinal direction of the vehicle, a floor side link connected to the vehicle floor downwardly from the forward end of said seat cushion and substantially vertically with reference to the longitudinal direction of the vehicle, a lower link pin-connected at opposite top and bottom ends thereof to the forward end portion of said seat cushion side link and the bottom end portion of said floor side link, respectively, and an upper link pin-connected at opposite rear and forward ends thereof to the rear end portion of said seat cushion side link and the top end portion of said floor side link, respectively, and

said seat cushion being secured to the floor through said quadric rotary link mechanism.

4,637,654

ARMCHAIR WITH TILTING SEAT

Paul A. Boardman, 16 Woodman's Way, Bishops Cleeve, Cheltenham GL524DP, England

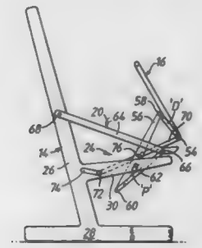
Filed Feb. 19, 1985, Ser. No. 702,654

Claims priority, application United Kingdom, Jun. 18, 1984, PCT/GB84/00215

Int. Cl.⁴ A47C *1/02*

U.S. Cl. 297—337 **16 Claims**

1. An armchair having a seat tiltable relative to a fixed frame of the chair to provide aid to an occupant in rising from the chair, the seat being tiltable from a lowered position to a raised position by a lever mechanism provided beneath the seat, characterised in that the lever mechanism is operatively connected to at least one pivotal arm assembly of the chair and is actuated by downward movement of that arm by force exerted thereon by the occupant in rising from the chair, the fixed frame of the seat comprising a cantilevered support element about which the lever mechanism is pivotal and in that locking means is provided to lock said pivotal arm assembly relative to the support element and thereby arrest movement of the lever mechanism when the chair is in use, said pivotal arm assembly comprising a pivotal arm pivotally mounted to a part of the fixed frame above said cantilevered support element and a connecting strut having one end pivotally connected to the pivotal arm remote from its pivotal mounting and an opposite



end connected to one end of a main tilting lever of the lever mechanism said opposite end of the arm also incorporating the locking means by which the pivotal arm assembly is locked relative to the fixed frame.

4,637,655

ADJUSTABLE HEAD-REST FOR A MOTOR VEHICLE SEAT OR THE LIKE

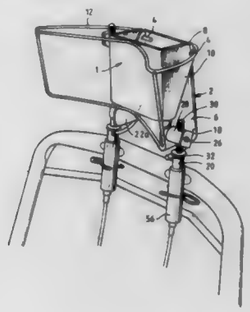
Francois Fourrey, Montbeliard, and Pierre Caburet, Valentigney, both of France, assignors to Cycles Peugeot, Valentigney, France

Filed Aug. 1, 1985, Ser. No. 761,277

Claims priority, application France, Aug. 3, 1984, 84 12360

Int. Cl.⁴ A47C *1/10*

U.S. Cl. 297—410 **10 Claims**



1. An adjustable head-rest for a seat, comprising a fixed mount for fixing on the seat, a first semi-case and a second semi-case, pivot means pivotally interconnecting the two semi-cases in upper parts of the two semi-cases for relative pivotal movement about a first pivot axis, the first semi-case being pivotally mounted in a lower part thereof on the mount to pivot relative to the mount about a second pivot axis, a frame of a padding cushion for supporting a user's head and carried by the second semi-case, a first control device and a second control device mounted respectively in a first position and a second position directly on said mount for respectively adjusting angular positions of the first semi-case and second semi-case about said pivot axes relative to said mount, each semi-case having a lateral wing, first connecting means connecting the first control device to the wing of the first semi-case and second connecting means connecting the second control device to the wing of the second semi-case in an upper part of the wing of the second semi-case in a position adjacent to but spaced from said first pivot axis, said second position of the mounting of the second control device on said mount being spaced from said second pivot axis, and said first and second pivot axes, said second connecting means and said second position forming substantially a deformable parallelogram structure, the second control device and said second connecting means being such as to allow pivotal movements of said semi-cases relative to said mount about said pivot axes when adjusting their angular positions relative to said mount by means of said control devices but maintaining said second connecting means at a fixed distance from the mount determined by the adjustment effected by the second control device so that the pivoting of the first semi-case about said first pivot axis shifts the cushion frame in a substantially horizontal direction while maintaining the cushion frame substantially in the same angular position relative to the mount and the pivoting of the second semi-case by means of the second control device for adjusting purposes does not affect the position of the first semi-case relative to the mount and adjusts the position of the cushion frame in a substantially vertical direction relative to the mount.

4,637,656

WATER JET SCARIFYING APPARATUS

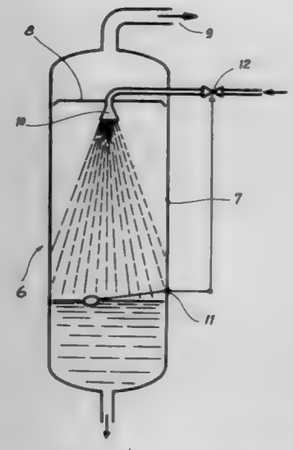
Renzo Medeot, Mossa, Italy, assignor to FIP Industriale S.p.A., Selvazzano Dentro Padova, Italy

Filed Jun. 20, 1985, Ser. No. 746,954

Claims priority, application Italy, Jul. 3, 1984, 21737 A/84

Int. Cl.⁴ E21C *25/60*; E01C *23/12*

U.S. Cl. 299—1 **4 Claims**



1. A hydraulic scarification apparatus comprising a nozzle positioned at one end of a hollow shaft, a ball joint supporting said hollow shaft, high pressure pump means supplying water to said hollow shaft for delivery from said nozzle towards a surface to be scarified, de-gassing means positioned upstream of said high pressure pump, electronic control means operable to maintain said nozzle constantly at a predetermined height above the surface to be scarified, means for the removal of the scarified loose material and water from the region of impact of the water jet with the surface to be scarified, said nozzle being enclosed within a scarification head on which it is supported by said ball joint in such a way as to be freely movable within said scarification head, displacement of said nozzle being effected by nozzle displacement means including a linkage between said nozzle and said scarification head, said degassing means including a water container, a screen in said container, spray means operative to deliver water into said container, suction outlet means from said container leading to means for creating a partial vacuum in said container, said screen being positioned between said spray means and said suction outlet means whereby to prevent the passage of water droplets pro-

duced by said spray means, and level regulator means operating to control the flow of water to said spray means whereby to regulate the level of water in said container.

4,637,657

TUNNEL BORING MACHINE

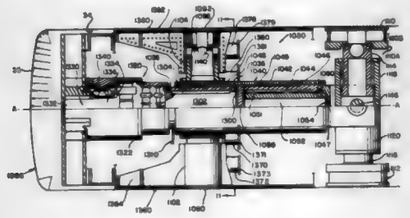
Larry L. Snyder, Golden, Colo., assignor to Harrison Western Corporation, Golden, Colo.

Continuation-in-part of Ser. No. 461,683, Jan. 27, 1983, Pat. No. 4,527,837. This application Mar. 29, 1984, Ser. No. 594,923

The portion of the term of this patent subsequent to Jul. 9, 2003, has been disclaimed.

Int. Cl.⁴ E21D *9/08*

U.S. Cl. 299—31 **18 Claims**



17. An elongated tunnel boring machine, having a central longitudinal machine axis, for boring a linear tunnel section in a linear boring mode of operation or a curvilinear tunnel section in a curvilinear boring mode of operation; the tunnel having an end face and a peripheral side wall including a floor portion, a ceiling portion, and opposite side wall portions spaced from a central longitudinal tunnel axis; and the tunnel boring machine comprising:

rotatable cutting wheel means at the front end of the machine and having a central axis of rotation which is coaxial with the machine axis and adapted to be selectivley located at a desired position approximately at the laterally opposite portion of the central longitudinal tunnel axis and held against the tunnel face during rotation [for cutting material away from the tunnel face during rotation] for cutting material away from the tunnel face to elongate the tunnel and extend the central longitudinal tunnel axis in a selected direction;

extendible and retractable thrust means, including forwardly extending piston-rod means operably associated with said cutting wheel means and rearwardly extending cylinder means operably supporting said forwardly extending piston-rod means, and a plurality of annular thrust devices operatively attached to an annular device, for selectively causing forward movement of said cutting wheel means against the tunnel face in the cutting mode of operation said piston rod means being selectively extendable to cause forward relative axial movement to move the cutting wheel means forwardly during a cutting stroke and being retractable to move said cylinder means forwardly relative to said cutting wheel means to prepare the piston rod means for the next cutting stroke;

motor means operatively connected to said rotatable cutting wheel means for selectively causing rotation thereof in a cutting mode of operation and stopping rotation thereof in a non-cutting mode of operation;

extendible and retractable rear end clamping and positioning means for locating and holding the rear end portion of the machine between opposite tunnel side wall portions with the rear end portion of the central longitudinal machine axis located in approximately coaxial relationship with the laterally adjacent portion of the central longitudinal tunnel axis in the linear boring mode and being selectively movable between outwardly extended engaging positions and inwardly retracted non-engaging positions relative to the tunnel wall to facilitate repositioning of the machine;

pivotal connecting means between said rear end clamping and positioning means and the rear end portion of the machine to provide at least one pivotal axis which intersects the central longitudinal machine axis for enabling the central longitudinal machine axis to be laterally pivotally displaced relative to the central longitudinal tunnel axis about said pivotal axis during a cutting stroke in the curvilinear boring mode of operation; and

extendible and retractable from end clamping and positioning means for fixedly locating and holding the front end portion of the machine between the opposite tunnel side wall portions with the central longitudinal machine axis located in approximately coaxial fixed relationship with the central longitudinal tunnel axis in the linear boring mode and for adjustingly locating and holding the front end portion of the machine between opposite tunnel side wall portions during a cutting stroke with the central longitudinal machine axis in variably displaced laterally offset relationship with the central longitudinal tunnel axis of the last bored tunnel portion in the curvilinear boring mode by lateral pivotal displacement about said pivotal axis.

4,637,658

CUTTERS FOR USE IN MINERAL MINING

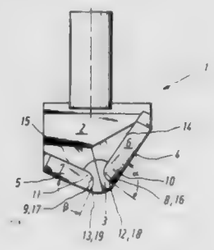
Wolfgang Annipajo, Lunen; Oswald Breuer, Dortmund, and Christoph Rassmann, Lunen, all of Fed. Rep. of Germany

Filed Aug. 2, 1985, Ser. No. 761,852

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, 3433277

Int. Cl.⁴ E21B *10/00*

U.S. Cl. 299—79 **6 Claims**



1. A cutter for use with mineral mining machines; said cutter having a body, a pair of hard metal plates mounted to the body, the hard metal plates providing first and second cutting edges disposed exteriorly of the body, the first and second cutting edges lying in first and second planes, respectively, which are inclined to one another and intersect at a corner junction, a hard metal pin mounted to the body at the corner junction between said hard metal plates; wherein the pin merges smoothly with the cutting edges and is provided with circumferential recesses which receive and support adjacent end zones of the plates.

4,637,659

TOOL MEMBER FOR A ROTARY DRILLING TOOL

Fritz Tibussek, Mönchengladbach, Fed. Rep. of Germany, assignor to Wirth Maschinen- und Bohrgerate-Fabrik GmbH, Erkelenz, Fed. Rep. of Germany

Filed Oct. 16, 1984, Ser. No. 661,305

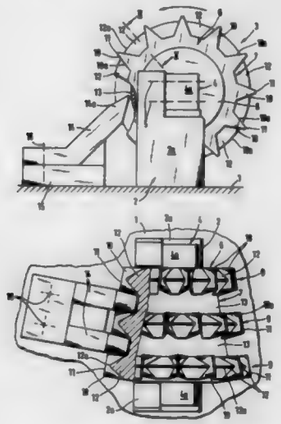
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337931

Int. Cl.⁴ E21B *10/16*

U.S. Cl. 299—89 **5 Claims**

1. A rotary tool member for a drilling tool, comprising:

a body having an axis of rotation, spaced-apart teeth disposed in at least one annular peripheral region of said body, each of said teeth having flanks and a tip, and peripheral ribs extending to said flanks in regions between



said teeth, said ribs each having a cross-section descending on each rib on side from a peak rib region having a lower height than a height of said tip in a radial direction from said axis of said body.

4,637,660

METHOD FOR CONNECTING BRISTLES TO A BRISTLE CARRIER

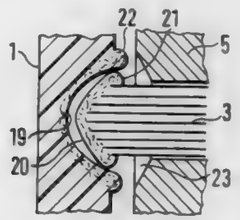
Georg Weihrauch, Waldmichelbach, Fed. Rep. of Germany, assignor to Coronet-Werke Heinrich Schlerf GmbH, Waldmichelbach, Fed. Rep. of Germany

Filed Jan. 30, 1985, Ser. No. 696,639

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1984, 3403341

Int. Cl.⁴ A46D *3/04*

U.S. Cl. 300—21 **7 Claims**



1. A method for connecting bristles to a bristle carrier both of which are made of thermoplastic material, said method comprising the steps of:

melting a bundle of such bristles at one end to such an extent that a reversal of their oriented, stretched molecular form takes place converting the molecules to a non-oriented balled form and thereby thickening the bristle ends to form a thickening on said one end of said bundle,

melting said bristle carrier at a bristle receiving surface,

forming a recess in the melted material of said bristle carrier for receiving said bristle bundle,

during the forming of said recess displacing the material of said bristle carrier to form a bead surrounding said recess and extending outwardly from said bristle receiving surface of said bristle carrier, and

inserting said thickening of said bristle bundle into the melted bristle carrier until the melt of the bristle carrier flows around and thereby encloses said thickening of said bundle.

4,637,661

DECELERATION-BALANCED TYPE BRAKE PRESSURE CONTROL VALVE ASSEMBLY

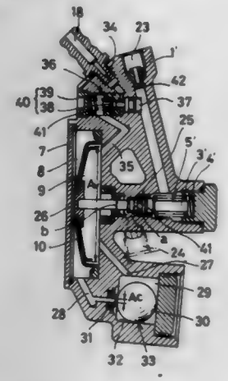
Teruhisa Kohno, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 12, 1985, Ser. No. 764,881

Claims priority, application Japan, Aug. 24, 1984, 59-177309

Int. Cl.⁴ B60T *8/00*

U.S. Cl. 303—24 A **3 Claims**



1. A deceleration-balanced type brake pressure control valve assembly for a vehicle comprising: a vacuum pressure regulating means for generating a controlled vacuum pressure proportional to the deceleration of the vehicle; a fluid motor responsive to differences in atmospheric pressure and the controlled vacuum pressure obtained by said vacuum pressure regulating means;

an inertia body adapted to be acted upon by the deceleration of the vehicle; a valve means having a plunger for opening and closing a passage connecting an inlet of brake fluid with an outlet thereof; sand fluid motor being operatively connected to said plunger;

a spring for urging said plunger in a valve opening direction; said plunger being responsive to the brake fluid pressure and adapted to open and close said valve means when moved axially by the brake fluid, and urged by the fluid pressure at the fluid inlet and said spring in a valve opening direction and urged by the fluid pressure at the fluid outlet and said fluid motor in a valve closing direction;

said valve means being normally kept open by said spring, characterized in that said controlled vacuum pressure is substantially equal to atmospheric pressure until the deceleration of the vehicle reaches a predetermined level, and that said inertia body is disposed in a chamber acted upon by said controlled vacuum pressure.

4,637,662

ANTI-LOCKING MODULATING VALVE FOR DISPLACEMENT TYPE FULL POWER MASTER CYLINDER

G. Emerson Brown, Niles, Mich., assignor to Allied Corporation, Morristown, N.J.

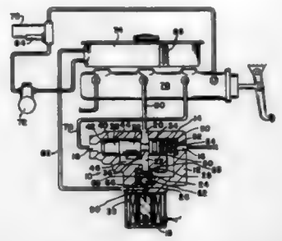
Filed Oct. 18, 1985, Ser. No. 789,202

Int. Cl.⁴ B60T *8/02, 13/18, 13/68*

U.S. Cl. 303—6 R **8 Claims**

1. An integrated isolation/modulation valve for use in an anti-lock braking system which includes at least one brake wheel cylinder, a manually modulated source of pressurized brake fluid having an output and a return and operable to apply pressurized brake fluid to said brake wheel cylinder, and con-

trol means for generating brake pressure control signals in response to behavior of a wheel, comprising: a valve body having a bore, a differential pressure valve element therein reciprocal in said bore between first and second operating positions in response to a differential pressure thereacross, a first inlet port connecting one end of said bore to said manually modulated source output, a second inlet port connecting said bore to said manually modulated source output, an outlet port connecting the other end of said bore to said wheel cylinder, a decay port connected to said return, and a modulating valve means for normally providing communication between one of said input ports and said output port and closing said decay port and operable to a second position interrupting fluid com-



munication between said one of said inlet ports and said outlet port and opening said outlet port to said decay port to cause said fluid pressure differential across said differential pressure valve element, biasing means biasing said differential pressure valve element to said first position to provide communication between said one of said inlet ports and said outlet port in the absence of said differential pressure, said differential pressure valve element blocking communication therebetween when in said second position, and orifice means communicating between said one of said inlet ports and said outlet port when said differential pressure valve element is in said second position for providing restricted flow of pressurized fluid therebetween when said differential pressure valve element is in said second position.

4,637,663

ANTI-SKID BRAKE CONTROL SYSTEM PERFORMING SKID CONTROL WITH BOTH OPEN AND CLOSE FEEDBACK TECHNIQUES

Toshiro Matsuda, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

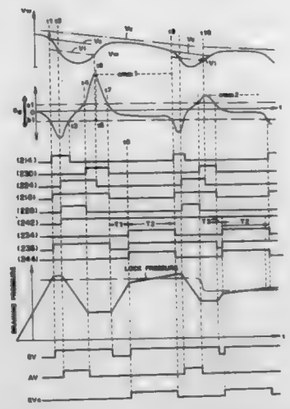
Filed Jul. 26, 1984, Ser. No. 634,489
Claims priority, application Japan, Aug. 11, 1983, 58-145647
Int. Cl.⁴ B60T *8/70*
U.S. Cl. 303—106 **25 Claims**

1. An anti-skid brake control system for an automotive brake system comprising:

a hydraulic brake system including a wheel cylinder for applying braking pressure to a vehicle wheel, and a pressure control valve means including a pressure control valve associated with said wheel cylinder for adjusting fluid pressure in the wheel cylinder at a given first and second rate, said pressure control valve being operative to increase fluid pressure in said wheel cylinder in a first position, to decrease fluid pressure in a second position and to hold fluid pressure in said wheel cylinder constant in a third position;

a wheel speed sensor detecting rotation speed of the wheel and producing a wheel speed indicative signal having a value indicative of the detected wheel speed;

a controller deriving a wheel acceleration value based on said wheel speed indicative signal and a control signal for controlling operation of said pressure control valve to operate the latter in one of said first, second and third positions to control the wheel speed at a given optimal relationship to a vehicle speed, said controller deriving a wheel acceleration dependent value on the basis of the peak of said wheel acceleration value and controlling the pressure control valve in one cycle of anti-skid control in accordance with a predetermined schedule, in which fluid pressure in the wheel cylinder is increased at said given first rate for a period of time variable according to said



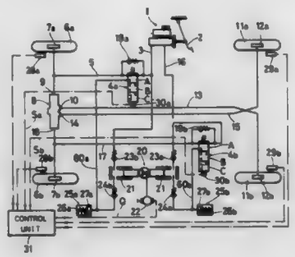
wheel acceleration dependent value and subsequently said controller controlling said pressure control valve means for increasing fluid pressure in the wheel cylinder at said given second rate, smaller than said first rate after expiration of said period of time during operation of said pressure control valve in said first position.

4,637,664

ANTI-SKID CONTROL APPARATUS FOR A VEHICLE BRAKING SYSTEM

Tetsuro Arikawa, Kanagawa, Japan, assignor to Nippon A B S, Ltd., Kanagawa, Japan

Filed Jul. 30, 1985, Ser. No. 760,356
Claims priority, application Japan, Jul. 31, 1984, 59-162046
Int. Cl.⁴ B60T *8/04*
U.S. Cl. 303—111 **5 Claims**



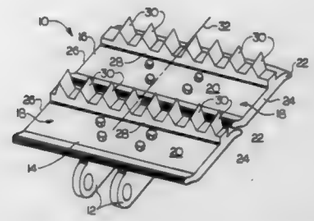
1. In a skid control apparatus for a vehicle braking system of the type comprising a master cylinder and wheel cylinders associated with front and rear wheels, fluid pressure control valve means arranged between the master cylinder and wheel cylinders, a control unit adapted to sense skid conditions, hydraulic reservoir means, and fluid pump means, the improvement wherein a separate fluid pressure control valve means is provided for each one of a pair of front wheel cylinders, and a valve apparatus arranged between said pair of front wheel cylinders and the cylinders of a pair of rear wheels, said valve apparatus normally being open to fluid pressures applied to all said wheel cylinders through the respective fluid pressure control valve means, and wherein sensing of skid conditions at one front wheel cylinder operates the one fluid pressure control means associated with that front wheel cylinder to vary the fluid pressure to said one front wheel cylinder, and means including said valve apparatus connecting said one fluid pressure control means to one of said rear wheel cylinders to also vary the fluid pressure to said one rear wheel cylinder.

4,637,665

TRACK SHOES HAVING TOOTHED GROUSERS

Jon S. Burdick, N. Pekin, and Paul T. Corcoran, Washington, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Nov. 12, 1985, Ser. No. 797,293
Int. Cl.⁴ B62D *55/28*
U.S. Cl. 305—54 **9 Claims**



1. A track shoe for an endless track assembly, comprising:

a generally rectangularly shaped body having a ground engageable surface, a leading end portion, and first and second edge portions;

a grouser bar formed integrally with said body and extending outwardly away from said ground engageable surface, said grouser offset toward said leading end portion and extending across said ground engageable surface between said first and second edge portions;

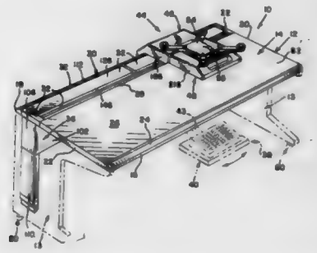
said grouser having at least four teeth substantially equally spaced across said grouser, each tooth having a leading end portion, a trailing end portion, and a tip edge between said leading and trailing end portions, said tip edge being in a plane which is substantially parallel to said first and second edge portions and tapering downwardly at an acute angle relative to said ground engageable surface from said leading end portion to said trailing end portion, said angle being in the range of 10 to 30 degrees.

4,637,666

OFFICE FURNITURE DESK TOP WITH ADJUSTABLE CRT CARRIAGE AND TRACKING ARRANGEMENT THEREFOR

Williams R. Worrell, Hopkins, Minn.; Robert N. Laroche, Montreal, and Michael J. Armstrong, Beaconsfield, both of Canada, assignors to All-Steel Canada Ltd., Montreal, Canada

Filed Jun. 4, 1985, Ser. No. 741,176
Int. Cl.⁴ A47B *17/00*
U.S. Cl. 312—196 **5 Claims**



1. In an office furniture desk including a generally flat desk top and leg means for supporting same from a floor in a substantially horizontal position, with the desk top having oppositely disposed front and rear portions extending between right and left hand side portions on either side of the desk top,

the improvement wherein:

the desk top defines along its front portion a wide and flat upwardly facing work surfacing that extends between its side portions and rearwardly of the desk top toward the desk top rear portion a major proportion of the desk top width, and

the desk top defines along its rear portion a narrow trackway that extends between the desk top side portions with the trackway having its upper surfacing in substantially coplanar relation with said work surfacing,

said improvement further including:

a carriage riding on said trackway for movement the length thereof,

said carriage comprising a rear casing member rollably mounted on said trackway and a front casing member carried by said rear casing member in overhanging relation to said work surfacing,

means for mounting said front casing on said rear casing for rectilinear movement forwardly and rearward of said work surfacing with respect to said rear casing,

said front casing including a turntable assembly defining a rotatable platform structure on which read out equipment may be rested on said carriage against gravity,

said turntable assembly comprising:

a swivel mechanism secured to said front casing member defining a pivot axis that is disposed substantially normally of the desk top work surfacing,

said swivel mechanism defining an upper plate member pivotable about said axis,

a plurality of rectilinear arms carried by said plate member and disposed to extend substantially radially of said axis and having like ends of same projecting laterally outwardly of said turntable assembly,

a cover member overlying the other ends of said arms, and

means for releasably clamping said arm other ends between said cover member and said plate member,

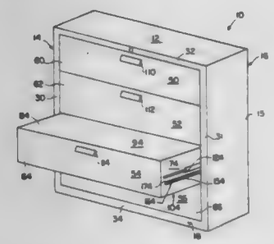
said arms at the respective like ends each carrying a load support disc for receiving the read out equipment to be rested on said carriage.

4,637,667

POSITIVE INTERLOCK FOR FILE CABINET

Iain K. Reid, Scarborough; Eric Staite, Toronto; Doug Richmond, and George Rumbelow, both of Scarborough, all of Canada, assignors to Joyce International, Inc., Great Neck, N.Y.

Filed May 16, 1985, Ser. No. 734,832
Int. Cl.⁴ E05B *65/46*
U.S. Cl. 312—217 **15 Claims**



1. An interlock mechanism for the storage members of a storage cabinet for preventing movement of more than one storage member at a time from a storage position within the cabinet to a position extending from the cabinet; the storage cabinet having a plurality of storage members each disposed in

the cabinet for movement between the storage position and the extended position; the interlock mechanism comprising:

(a) interlock track means fixedly secured to an identical side of each of said storage means;

(b) interlock bar means including a plurality of interlock bars each movably arranged in a stack one above the other at a side of said cabinet and in proximity to said interlock track means, their being one less interlock bar than the number of storage members in said plurality of storage members;

(c) actuator block means carried by each of said interlock bars and proximity to said interlock track means for cooperation therewith; and

(d) extender means carried by each of said interlock track means for relative movement with respect thereto between an extended position and a retracted position;

(e) said interlock track means of a predetermined one of said storage members, upon movement of the storage member from its position within the cabinet towards its position extending therefrom, coacting with said actuator block means of a predetermined one of said interlock bars and thereby to prevent movement of all others of said storage members;

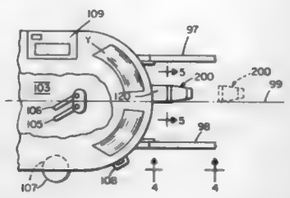
(f) said extender means being disposed to coact with said actuator block means of said predetermined interlock bar upon movement of said predetermined storage member a first distance extending from the cabinet, and such that continued movement of said storage member to a second distance extending from said cabinet effects relative movement of said interlock track means carried by said storage member so moving and said extender means carried thereby.

4,637,668

LOCOMOTIVE SAFETY DEVICE

David R. Kleffman, 3921 Park Ridge Rd., North Platte, Nebr. 69101, and Leroy V. Phiffer, 7209 Hawthorne Dr., Cheyenne, Wyo. 82009

Filed Nov. 21, 1985, Ser. No. 800,323
Int. Cl.⁴ H01R *31/08*
U.S. Cl. 339—10 **8 Claims**



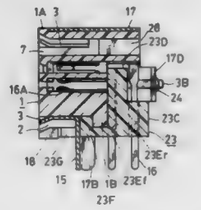
1. For the environment of a longitudinally extending and diesel engine type railroad locomotive classified under a stopped and "blue flag" condition, said locomotive having its traction wheels powerable from a high-voltage main-generator, said locomotive also being equipped with a low-voltage auxiliary-generator having electrical circuitry connected to locomotive installed alarm means, to at least one fuel valve for the diesel engine, to locomotive forward-rearward motive directional control, and to locomotive acceleration control, said low-voltage electrical circuitry extending the locomotive longitudinal length and terminating as two endward multi-pins receptacles, the improvement of a locomotive safety device tending to enforce upon would be locomotive operators said "blue flag" condition, said locomotive safety device being adapted to removably engaged with a said locomotive multi-pins receptacle and comprising: a multi-perforate plug including electrically conductive bushings adapted to be removably inserted into electrically conductive relationship with appropriately selected individual pins of said multi-pins receptacle, one of said plug bushings being adapted to removably engage a receptacle pin corresponding to that for the locomotive alarm means and others of said plug bushings being adapted to removably engage receptacle pins corresponding to those for said forward-rearward motive directional control, whereby any attempt by a would be locomotive operator to actuate the forward-rearward motive directional control will set off the alarm means to the discernments of the said interiorally positioned operator and to the externally positioned locomotive maintenance personnel.

4,637,669

CONNECTOR SOCKET

Kyousuke Tajima, Gunma, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Oct. 28, 1985, Ser. No. 791,869
Claims priority, application Japan, Jun. 7, 1985, 60-86148
Int. Cl.⁴ H01R *4/66*
U.S. Cl. 339—14 R **14 Claims**



1. A connector socket comprising:

an insulating body having an annular recessed groove formed therein to extend from a front surface toward a rear surface of said body, a plurality of female contact accommodating holes formed in a cylindrical column portion surrounded by said annular recessed groove, to extend from the front surface toward the rear surface, and a main positioning recessed groove and an auxiliary positioning recessed groove formed in a circumferential surface of said cylindrical column portion;

a terminal board made of an insulation material attached to one side surface of said insulating body and having a plurality of guide slots for terminal positioning formed to extend in a direction perpendicular to the extending direction of said female contact accommodating holes;

a plurality of female contacts respectively accommodated in said female contact accommodating holes and having bent portions extending at right angles to form terminals behind the rear surface of said insulating body, said terminals being inserted, for positioning, into corresponding said guide slots of said terminal board;

an annular contact concentrically inserted into said annular recessed groove of said insulating body and having first earth terminal means protruded from the rear surface of said insulating body; and

a shield cover electrically and mechanically connected to said first earth terminal means, for covering the side surfaces of said insulating body except for the side of said terminal board, said shield cover having second earth terminal means extending on both sides of said terminal board beyond the surface of said terminal board.

4,637,670

DUAL IN-LINE PACKAGE CARRIER ASSEMBLY

James R. Coller; Paul A. Coon, and Joseph R. Goodman, all of Kernersville, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

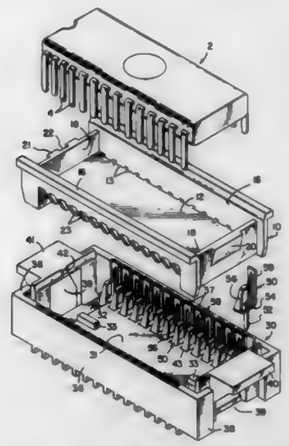
Filed Apr. 23, 1984, Ser. No. 602,879
Int. Cl.⁴ H01R *13/635*
U.S. Cl. 339—46 **5 Claims**

1. A dual in-line package carrier assembly comprising:

a carrier for assembling a dual in-line package thereto, said carrier having a support surface, an opposed bottom surface, and opposed open surface means for assembling the leads of said package thereagainst, said open surface means lying between said support surface and said bottom surface,

a socket for mounting to a printed circuit board and for receiving said carrier therein, said socket having a floor and an opposed bottom surface, said floor having opposed upstanding sidewalls, a row of apertures spaced as said package leads in the floor adjacent each said sidewall,

a row of terminals mounted adjacent each sidewall in the socket, each terminal having a lead portion extending through a respective aperture for contact with the printed circuit board, a shoulder portion bearing against said floor, and a resilient contact portion extending obliquely of said floor, said contact portions in one row converging toward the contact portions in the other row as the



contact portions approach the socket floor, said contact portions being spaced to contact respective package leads disposed against said open surface means and to deflect resiliently toward the adjacent sidewall when said carrier is received in said socket, said resilient contact portions urging said carrier out when said carrier is received in said socket,

aligning means effective between said carrier and said socket to assure proper alignment between said package leads and the contact portions of said terminals,

releasable retaining means effective between said carrier and said socket for retaining said carrier in a first latched position when the carrier is fully received in said socket, and for releasing said carrier to a second unlatched position, said resilient contact portions forcing said carrier from the first latched position to the second unlatched position upon release of said retaining means.

4,637,671

THEFT-RESISTANT DEVICE FOR FLUORESCENT LAMP

George E. Johnson, Bronxville, and Walter Newman, Bayside, both of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Filed Oct. 28, 1985, Ser. No. 790,661
Int. Cl.⁴ H01R *33/08, 33/97, 13/62*
U.S. Cl. 339—50 R **6 Claims**

1. A locking system for a U-type tube of a flourescent lamp, comprising, in combination, said U-tube having opposed connecting and free ends, said connecting end having two pairs of male electrical contacts,

said U-tube includes two parallel tube portions and a coupling member at said connecting end adapted to hold said two tube portions in non-movable alignment,

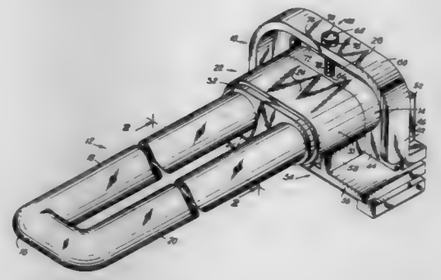
body means connected to a surface, said body means being for mounting said U-tube at said connecting end and for providing two pairs of female electrical contacts adapted to directly receive said male contacts, said body means also being for providing electrical contacts between said female contacts and a source of electrical power,

wherein said mounting body includes a body wall, said U-tube being generally transverse to said body wall, said body wall forming the said two pairs of female electrical receptacles adapted to receive said two pairs of said male members in electrical contact,

said coupling members having a first and a second opposed cross-wall, said cross-walls being disposed across said two U-tube portions in planes generally transverse to said body wall,

locking means connected to said body means for removably securing said connecting end of said U-tube into pressing contact with said body means;

support means connected to said body means for providing support for said U-tube in a direction opposed to the pressing contact exerted by said locking means; whereby



the U-tube cannot easily be removed from its mounted relationship with the body means,

said mounting body includes a flange extending from a portion of said body wall, generally perpendicularly from said body wall, towards said coupling member, spaced from the first cross-wall of said coupling member, said flange forming a hole having internal threads and having an axis generally parallel to the body wall and generally transverse to said first cross-wall, and

said locking means is an elongated screw member having external threads adapted to mate with said internal threads of said hole, said screw member extending through said hole generally transverse to said first cross-wall, said screw member having opposed contact and head ends, said contact end being in pressing contact with said first cross-wall,

said support means comprising a support member extending generally laterally from a portion of said body wall towards said coupling member, spaced from and opposite to said flange, to a position in which a portion of itself is in support contact with said second cross-wall of the coupling member, whereby said support member provides resistance to said screw member.

4,637,672

RADIOTRANSPARENT LEAD ASSEMBLY FOR MONITORING ELECTRODES

Stanley Peterman; Charles W. Orrestad, and Paul Iwanczuk, all of King County, Wash., assignors to Quinton Instrument Company, Seattle, Wash.

Filed Jun. 28, 1984, Ser. No. 626,374
Int. Cl.⁴ H01R *11/24, 4/02;* A61B *5/04*
U.S. Cl. 339—61 R **12 Claims**

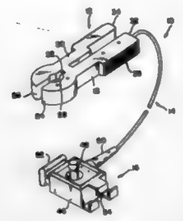
1. A radiotransparent lead assembly for use with diagnostic

equipment and monitoring electrodes including electrically conductive elements thereon, comprising:

a molded, substantially non-metallic radiotransparent electrode clip having two opposing members, each of said members having a first end and a second end, the first end of one of said members provided with an electrical contacting element for contacting with the electrically conductive element of the monitoring electrode, said members connected by a flexible bridge, said members extending generally perpendicular to the axis of the electrically conductive element of the monitoring electrode, said second ends being manually operable to separate said first ends for electrical attachment to the monitoring electrode;

connector means for electrically connecting the electrode clip to the diagnostic equipment; and

a flexible, radiotransparent insulated conductor substantially extending between said contacting element and said connector means for transmitting bioelectric signals therebetween.



4,637,673

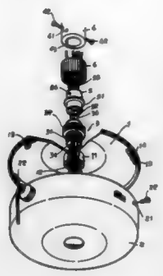
EASILY DISASSEMBLABLE SEPARATE CEILING FAN SWITCH BOX STRUCTURE AND AN ELECTRICAL CONNECTOR THEREFOR

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Aug. 13, 1985, Ser. No. 765,120

Int. Cl.[4] H01R *13/623*

U.S. Cl. 339—89 M **1 Claim**



1. A disassemblable ceiling fan switch box structure of the type for housing therein electrical components of a ceiling fan having electrical wires, in combination, comprising:

an upper cover, the center of which has an inwardly extending flange, and further having a through screw hole formed in the center of said flange;

two or more positioning plates positioned on the inner circumference of said upper cover, each of said positioning plates having a screw hole formed therein;

a lower housing body for receiving therein the electrical components and the electrical wires thereof, said lower housing body having two or more positioning holes formed therein corresponding to the positioning plates;

a first hollow distribution receptacle being substantially cylindrical in shape, having a middle section of enlarged diameter and defining therebelow a lower section of reduced diameter, said middle section and said lower section being threaded on the outer surface thereof;

insulation disposed in said first receptacle;

a second hollow distribution receptacle being substantially cylindrical in shape, and having a middle section of enlarged diameter, said second receptacle having a screw hole formed therein;

insulation disposed in said second receptacle;

a hollow fixing sleeve ring being substantially cylindrical in shape, said sleeve ring being threaded on the inner surface thereof and having an upper end of reduced internal diameter;

said second receptacle being received in the fixing sleeve ring, whereby the middle section of the second receptacle abuts the upper end of the fixing sleeve ring;

said first receptacle being received in the fixing sleeve ring, whereby the middle section of the first receptacle threadily engages the interior of the fixing sleeve ring;

said first receptacle being received in and threadily engaging the screw hole of the upper cover;

whereby the wires of the electrical components are disposed within the screw hole, first receptacle, and second receptacle respectively.

4,637,674

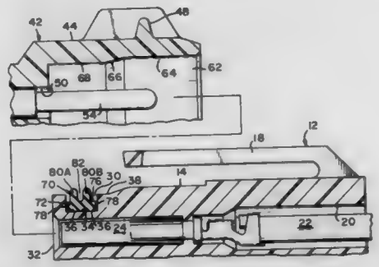
ANNULAR CONNECTOR SEAL

Robert J. Kobler, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 17, 1985, Ser. No. 735,889

Int. Cl.[4] H01R *4/00*

U.S. Cl. 339—94 M **10 Claims**



1. An assembly of a component and an annular sealing member comprising:

a cylindrical component including a plug section having a peripheral surface, said peripheral surface having an annular groove therearound having a preselected axial dimension and a substantially flat coaxial bottom surface having a preselected diameter; and

an annular sealing member comprising a ring-like article molded from a relatively incompressible elastomeric composition, said article having an axially extending body section, a coaxial substantially flat inner surface, a general outer surface substantially parallel to said inner surface, opposing front and rear surfaces, and at least one elastically deformable annular rib extending radially outwardly from said general outer surface of said body section, said body section having an axial dimension less than said preselected axial dimension of said annular groove, and said inner surface having a diameter approximately equal to said preselected diameter of said bottom surface of said annular groove;

said annular sealing member being seated in said annular groove of said component such that said inner surface of said body section is adjacent said bottom groove surface, said general outer surface is disposed within said annular groove, and said at least one annular rib extends radially outwardly beyond said periphral surface of said component, whereby when said plug section of said component with said annular sealing member thereon is axially inserted into a corresponding sleeve-like portion of a mating component, said at least one annular rib is engageable by an inner surface of said sleeve-like portion and is deformably urged axially rearwardly and inwardly thereby, and thereby capable of forming an annular sealing engagement between said inner surface of said sleeve-like portion of said mating component and said plug section of said component.

4,637,675

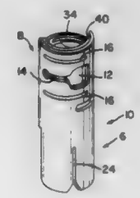
INSULATION DISPLACING BARREL TERMINAL

Winfield W. Loose, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 672,554, Nov. 19, 1984. This application Dec. 19, 1985, Ser. No. 810,800

Int. Cl.[4] H01R *4/24*

U.S. Cl. 339—97 R **8 Claims**



1. A wire-in-slot connecting device of the type comprising a sheet metal tubular body rolled from a flat sheet metal blank, wire admitting opening means in the tubular body proximate to one end thereof and a wire receiving and contacting slot means extending from the opening means partially around the circumference of the body, the connecting device being characterized in that;

the tubular body is of double thickness material around at least a portion of its circumference and comprises an inner layer and an outer layer,

the wire admitting opening means comprises a first opening in the outer layer and a second opening in the inner layer, the wire receiving slot means comprising a first slot in the outer layer and a second slot in the inner layer, the first and second openings and the first and second slots being in substantial registry whereby, a wire in the wire receiving slot means is contacted by the edges of the first slow and the edges of the second slot.

4,637,676

TERMINAL BLOCK MARKING SURFACE

Glenn H. Simonsen, Brookfield, and Clayton J. Klotz, Waukesha, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed May 13, 1985, Ser. No. 733,107

Int. Cl.[4] H01R *9/26*

U.S. Cl. 339—113 R **2 Claims**

1. A molded terminal block arranged for mounting on a supporting track and including;

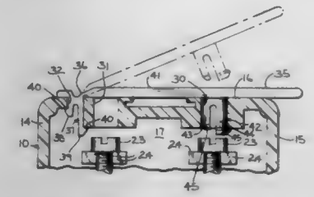
a base portion having means for detachably engaging said track,

an upstanding barrier wall having molded thereon and laterally extending therefrom an apertured ledge portion, a pedestal spaced from said ledge portion and oppositely disposed sidewalls, each cooperating to define a recessed area therebetween;

a wire terminal unit disposed in said recessed area and supported by said pedestal;

clamping screws threadingly engaging said terminal unit and having a portion extending into said recessed area, said screws being accessed for adjustment by means of substantially axially aligned ledge apertures;

a remaining ledge aperture providing identifying orientation means for positioning said terminal block relative to said track; and



an elongated marking strip having an exposed marking surface and overlaying said apertured ledge portion to cover the screw-aligning apertures, one end of said marking strip being provided with a retainer portion insertable in and retained by the said remaining aperture and having the free end thereof releasably engageable with one of the screw-aligning ledge apertures, said marking strip further including an area of reduced cross section intermediate the ends thereof, said area defining an integrally formed hinge therein.

4,637,677

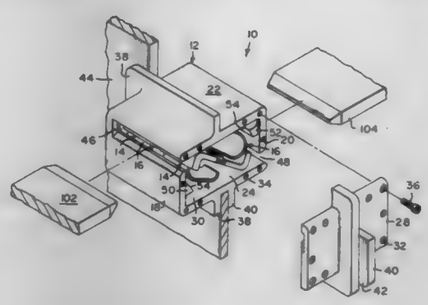
ELECTRICAL CONNECTOR

Lee A. Barkus, Millersburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 18, 1984, Ser. No. 683,082

Int. Cl.[4] H01R *4/52*

U.S. Cl. 339—274 **16 Claims**



1. An electrical connector, comprising:

a housing with a cavity therein and with a slot located in each of two opposing walls providing access to the cavity, one slot being parallel to and adjacent a top wall of the housing and the second slot being parallel to and adjacent a bottom wall of the housing;

an elongated conductor having a convex surface at each end with one convex surface facing a direction opposite to that of the other convex surface; and

a spring member attached to the conductor intermediate the ends thereof and having a spring blade with a convex surface extending from opposite surfaces of the conductor;

said conductor and attached spring member being positioned

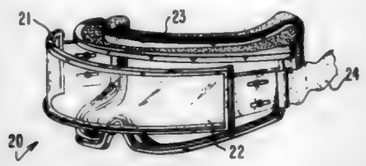
in the cavity so that the convex surface on each end of the conductor and on each spring blade are in line with a slot and are adjacent respectively a top and bottom wall to form therewith first and second receptacles in line with each other for receiving a tab inserted into the slots and further with the spring blades bearing against said top or bottom walls to resiliently position and support the conductor and permit pivoting thereof about the point of attachment as said tabs engage said first receptacles.

4,637,678

HOLOGRAPHIC LASER PROTECTION DEVICE

Gaylord E. Moss, Marina Del Rey; Mao-Jin Chern, Rancho Palos Verdes, and Teena L. Dobbs, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 1, 1982, Ser. No. 384,134
Int. Cl.⁴ G02B *5/32*
U.S. Cl. 350—3.7 **12 Claims**



1. A holographic reflector for reflecting laser radiation at a predetermined wavelength which is incident over a predetermined angular range, said reflector comprising:

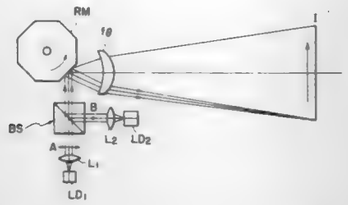
a plurality of holograms conterminously and adjacently disposed on at least one substrate, each of said holograms having holographic fringes with predetermined spacing which make a predetermined angle with respect to the normal to the surface of said substrate, each of said holograms having fringe spacings which are different from the fringe spacing of a hologram adapted to optimally reflect said predetermined wavelength, each of said plurality of holograms having fringe spacings and predetermined angles which are adapted to reflect said predetermined wavelength over separate angular ranges which are different from an angular range associated with a hologram adapted to optimally reflect said predetermined wavelength, said fringe spacings and predetermined angles being such that each of said holograms reflects said predetermined wavelength within said predetermined angular ranges which together comprise said predetermined angular range.

4,637,679

MULTIBEAM PHOTOSCANNER

Hiroyoshi Funato, Chigasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 12, 1983, Ser. No. 513,091
Claims priority, application Japan, Jul. 14, 1982, 57-121237
Int. Cl.⁴ G02B *26/10, 27/10*
U.S. Cl. 350—6.5 **4 Claims**



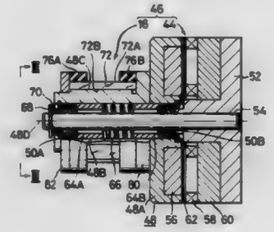
1. A multibeam photoscanner which comprises a laser light source, a laser beam deflector for deflecting and scanning beams from said light source, and a focusing optical system for focusing the deflected beams on a scanning surface, characterized in that said light source comprises a plurality of light sources wherein polarizing directions are different and an angle of incidence upon said deflector is slightly different, and the beams from said plurality of light sources are combined by means of a polarization beam combiner to simultaneously scan a plurality of different scanning lines in one and the same image plane.

4,637,680

BEAM CONVERTER IN OPTICAL MEASURING INSTRUMENT

Yoshiharu Kuwabara, Machida, and Hiroyoshi Hamada, Yokohama, both of Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1984, Ser. No. 621,565
Claims priority, application Japan, Jun. 24, 1983, 58-98433[U]
Int. Cl.⁴ G02B *26/10*
U.S. Cl. 350—6.8 **12 Claims**



1. A ray beam converter having a rotary mirror driven by a motor, for reflecting ray beams to convert the same into rotary scanning ray beams in an optical measuring instrument wherein said ray beams from a beam generator are converted into said rotary scanning ray beams to be scanned in one direction and dimensions of a workpiece to be measured are measured by the utilization of said rotary scanning ray beams, characterized in that a rotor of said motor is rotatably supported by bearings at a plurality of positions in a direction of the rotary axis of said motor, said rotary mirror is integrally formed on said rotor at a portion of said rotor supported by at least two bearings adjacent to each other, and said rotor is rotatably coupled to a spindle affixed to a stator of said motor through said bearings, said spindle being provided with a tubular portion to be coupled to a portion of the spindle protruding from a main body of the rotor, and said rotary mirror is integrally formed on said tubular portion.

4,637,681

OPTICAL PLANE CIRCUIT WITH AN OPTICAL COUPLER AND A METHOD FOR MANUFACTURING THE SAME

Noboru Yamamoto, and Tetsuya Yamasaki, both of Hyogo, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Continuation of Ser. No. 382,965, May 28, 1982. This application Jan. 30, 1985, Ser. No. 696,314
Claims priority, application Japan, Jun. 1, 1981, 56-82522
Int. Cl.⁴ G02B *6/10*; H01L *21/306*; C23F *1/00*
U.S. Cl. 350—96.12 **32 Claims**

1. An optical plane circuit with an optical coupler, comprising:

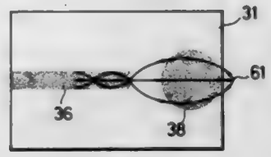
a transparent substrate having a front surface and a rear surface;

an optical waveguide formed by diffusion in said transparent substrate; and

a graded index type lens formed by diffusion in said transparent substrate adjacent to one end of said optical waveguide and serving as said optical coupler for improving the input and/or output efficiency of a light beam in and/or from said optical waveguide wherein the width of said optical waveguide as viewed from said front surface is smaller than the length of said graded index type lens measured in the same direction as said width of said optical waveguide; wherein the maximum thickness of said graded index type lens in the direction perpendicular to said front surface is larger than that of said optical waveguide in said perpendicular direction; wherein said graded index type lens has a varying refractive index in said direction perpendicular to said front surface; and further wherein said optical waveguide and said graded index type lens are buried inside said transparent substrate so as not to be exposed to said front surface thereof.

30. A method for manufacturing an optical plane circuit with an optical coupler, comprising the steps of:

forming, on a surface of a transparent substrate, a first diffusion mask layer of a predetermined pattern having a band-shaped aperture and a block-shaped hole formed at least adjacent to one end of said band-shaped aperture;



diffusing a first diffusion source, which increases a refractive index of said transparent substrate, in said transparent substrate through said first diffusion mask layer,

removing said first diffusion mask layer from said transparent substrate;

forming a second mask layer on said surface of said transparent substrate; and

diffusing a second diffusion source, which decreases the refractive index of said transparent substrate, into a shallow region of said transparent substrate, whereby in said transparent substrate are formed an optical waveguide corresponding to said region in which said first diffusion source is diffused through said band-shaped aperture and being buried below said surface of said transparent substrate, and a graded index type lens corresponding to said region in which said first diffusion source is diffused through said block-shaped hole, being buried below said surface of said transparent substrate, and serving as said optical coupler for improving an input and/or output efficiency of a light beam in and/or from said optical waveguide.

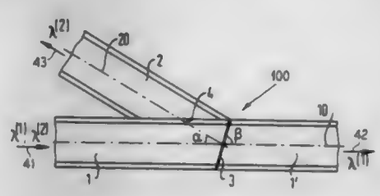
4,637,682

BRANCH CONNECTOR FOR LIGHT WAVEGUIDES

Hans F. Mahlein; Achim Reichelt, both of Unterhaching, and Gerhard Winzer, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 20, 1981, Ser. No. 246,100
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012184
Int. Cl.⁴ G02B *6/26, 6/42*
U.S. Cl. 350—96.15 **6 Claims**

1. In a branch connector for light waveguides utilizing a beam divider principle, said connector comprising means aligning a pair of light waveguides on a common axis, a beam divider mirror being arranged on a plane slanted to the common axis and extending between the ends of the waveguides which are flush therewith, said beam divider mirror reflecting a beam traveling parallel to the common axis along a given direction, and means mounting at least one additional waveguide adjacent one of the pair of aligned waveguides on a second axis extending at an angle α to the common axis and intersecting said common axis at the beam divider mirror, said second axis being oriented to lie in said given direction so that the additional waveguide receives the reflected beam from the beam divider mirror, the improvements comprising means for reducing polarization effects without using lenses, said means for reducing consisting of the beam divider mirror being inclined towards the common axis at an angle β, said angle β being larger than 45° and satisfying the condition $\beta < 90° - \arcsin(A_N/n_0)$, wherein A_N signifies the numerical aperture of the light waveguide and n_0 is the index of refraction on the axis of the light waveguide, said angle α being less than 90° and the additional light waveguide having an end face lying in a plane extending at the angle α to the second axis and parallel to the common axis, said end face contacting one of the waveguides of the pair, said waveguides of the pair of waveguides being core-cladded glass fibers with a portion of the cladding of the one waveguide at the location of contact by the end face of the additional waveguide being removed to provide a planer surface for the end face to engage.

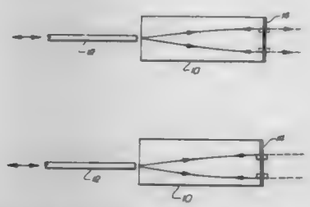


4,637,683

METHOD FOR ALIGNING OPTICAL FIBER CONNECTORS

Charles K. Asawa, Pacific Palisades, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jan. 28, 1985, Ser. No. 695,516
Int. Cl.⁴ G02B *6/32*
U.S. Cl. 350—96.18 **10 Claims**



1. A method for angular alignment of each a plurality of lens-type optical fiber connectors without the use of a precision-made standard component each connector having a lens at one end for mating with the corresponding lens of another connector, the method comprising performing the following steps for each lens;

securing each lens in a holder with one of its end faces exposed;

forming a common reference plane without regard to the precise orientation of the lens, by grinding and polishing the exposed end face of the lens together with the adjacent surface of the holder; and

positioning an optical fiber at the other end face of the lens in such a manner that light rays from the fiber have a perpendicular angle of incidence on the reference plane;

whereby any two connectors will be perfectly angularly

aligned if their reference planes are butted together or placed in a parallel relationship.

4,637,684

METHOD OF MAKING AN OPTICAL COUPLER DEVICE UTILIZING VOLATILE LIQUID TO ACHIEVE OPTICAL CONTACT

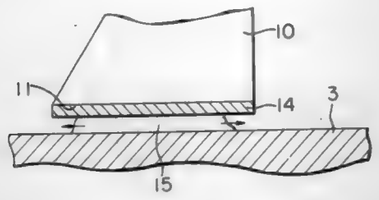
Yasuo Tomita, Yokohama; Shigetaro Ogura, Musashino, and Kazuya Matsumoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 401,249, Jul. 23, 1982. This application Feb. 14, 1985, Ser. No. 701,653

Claims priority, application Japan, Jul. 31, 1981, 56-119155

Int. Cl.⁴ G02B *6/34*; C03B *35/00*

U.S. Cl. 350—96.19 **7 Claims**



1. A method for the manufacture of an optical coupler device comprising the steps of:

forming on a surface of a coupler for coupling a light beam to a waveguide and which coupler is to be joined to said waveguide, a thin film layer optically flat to within a quarter wavelength variation and having a refractive index lower than the refractive indices of said waveguide and said coupler;

joining the optically flat surface of said thin film layer formed on said surface of said coupler to a surface of said waveguide which is also optically flat to within a quarter wavelength variation through a thin film of volatile liquid; and

completely evaporating said volatile liquid to bring the joined surface of said thin film layer into optical contact with said waveguide.

4,637,685

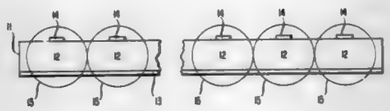
HIGH POWER, BROAD AREA, MONOCHROMATIC LIGHT SOURCE

Eugene I. Gordon, Convent Station, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 8, 1983, Ser. No. 511,848

Int. Cl.⁴ G02B *6/36*

U.S. Cl. 350—96.20 **7 Claims**



5. A light source comprising a plurality of semiconductive chips, each chip including a plurality of injection lasers arranged in a linear array, each laser emitting at substantially the same wavelength, all of said lasers emitting light at essentially the same time, a plurality of ribbon cables each having coupling portions at one end, each cable including a plurality of optical fibers in a linear array, each chip being butt coupled to a ribbon cable with one laser being coupled to one optical fiber, the chip and the coupling portions of the ribbon cable being assembled in a unitary package and the other ends of the ribbon cables being arranged to form a two-dimensional array of fibers each emitting light of substantially said same wavelength at its end.

4,637,686

OPTICAL FIBER WITH LIGHT REFLECTING PARTICLES DISPERSED THROUGH BUFFER LAYERS TO DISSIPATE LEAKY CLADDING MODES

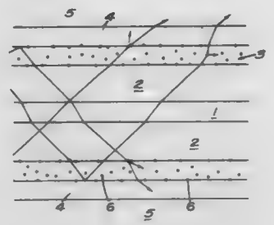
Yoshinao Iwamoto, Fujimi; Yuichi Shirasaki, Tokyo; Masayuki Fujise, Ebina, and Kenichi Asakawa, Hachiohji, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1984, Ser. No. 597,666

Claims priority, application Japan, Apr. 8, 1983, 58-60798

Int. Cl.⁴ G02B *6/02, 6/16*; F21V *7/04*

U.S. Cl. 350—96.29 **5 Claims**



3. An optical fiber structure comprising a central optical core surrounded by cladding, primary buffer and secondary buffer layers in that order, and wherein a particulate light reflecting material is uniformly dispersed along the boundary between and formed by the primary and secondary buffer layers to form nuclei which dissipates light leaking out of the cladding layer.

4,637,687

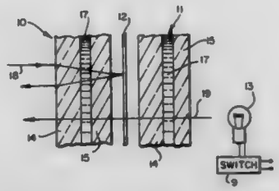
CASCADED, DUAL CELL TRANSFLECTIVE LIQUID CRYSTAL DISPLAY

Elias S. Haim, Windham, N.H., and Richard Albert, Seymour, Conn., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 14, 1984, Ser. No. 620,648

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—335 **6 Claims**



1. A transflective liquid crystal display system comprising:

a. A pair of liquid crystal cells of the guest-host variety, each including a liquid crystal host; an optically active material and one or more dichroic dyes for absorbing the light in the unenergized background portion,

b. each of said cells having display elements of the same configuration which when energized permit passage of light, said cells being positioned to align all display elements and background portions on both cells,

c. a transflective member positioned between said cells for reflecting light passing through the front cell, back through front cell in the reflective mode, and transmitting light through both the front and rear cells in the transmissive mode said rear cell having a greater spacing and thickness of solution than said front cell whereby light absorption therein and the contrast ratio of the assembly is greater in the transmissive mode than in the reflective mode,

d. a light source positioned behind the rear cell and the transflective element and energized during the transmissive mode whereby the light path through the two cells in the transmissive mode is at least as high as the light path through one cell in the reflective mode to maintain the contrast ratio in both operational modes,

e. means for simultaneously energizing both cells in the transmissive mode.

4,637,688

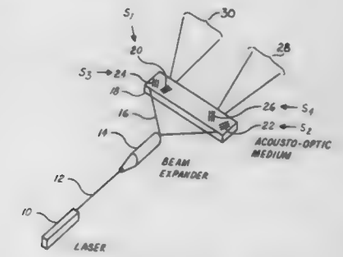
ACOUSTO-OPTIC DIFFRACTION AND SIGNAL MIXING DEVICE

Irwin J. Abramovitz; Norman J. Berg, both of Baltimore, Md., and Michael W. Casseday, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 12, 1984, Ser. No. 599,309

Int. Cl.⁴ G02F *1/33*

U.S. Cl. 350—358 **6 Claims**



1. An acousto-optic apparatus for providing the products of a first signal with a second signal, and a third signal with a fourth signal, comprising:

a. means for producing a laser light beam;

b. means for expanding said laser light beam;

c. means for forming said expanded laser light beam into a sheet beam;

d. an acousto-optic medium having an axis and a planar surface extending between opposite first and second ends, said medium is disposed in the path of said sheet beam such that the sheet beam traverses the medium between the medium ends along and parallel to the medium surface;

e. a first acoustic transducer, disposed at the first end of the acousto-optic medium and supplied with a first signal, for propagating the first signal on the medium surface in the direction of the second end of the acousto-optic medium;

f. a second acoustic transducer, disposed at the second end of the acousto-optic medium and supplied with a second signal, for propagating the second signal on the medium surface in the direction of the first end of the acousto-optic;

g. a third acoustic transducer, disposed at the first end of the acousto-optic medium and supplied with a third signal for propagating the third signal on the medium surface in the direction of the second end of the acousto-optic medium;

h. a fourth acoustic transducer, disposed at the second end of the acousto-optic medium and supplied with a fourth signal, for propagating the fourth signal on the medium surface in the direction of the first end of the acousto-optic medium;

i. wherein said first and second signals diffract said sheet beam to produce a first beam containing the product of said first signal with said second signal; and

j. wherein said third and fourth signals diffract said sheet beam to produce a second beam containing the product of said third signal with said fourth signal.

4,637,689

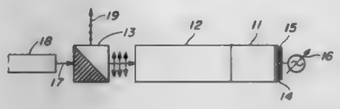
ACOUSTICALLY RESONANT TUNABLE ACOUSTO-OPTIC FILTER

I-Cheng Chang, Sunnyvale, Calif., assignor to Itek Corporation, Beverly Hills, Calif.

Continuation of Ser. No. 482,649, Apr. 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 158,663, Jun. 12, 1980, abandoned. This application Apr. 8, 1986, Ser. No. 849,561

Int. Cl.⁴ G02F *1/11*; G02B *5/30*

U.S. Cl. 350—372 **11 Claims**



1. A tunable acousto-optic filter having a birefringent acousto-optic crystal and, optionally, acoustic prism means for coupling a light beam along a predetermined axis through said birefringent crystal, said crystal and said optional prism coupler forming an acoustic resonator;

means for separating the light beam entering said crystal from the filtered light beam exiting said crystal;

acoustic drive means for exciting a standing acoustic wave in said filter;

means for varying the discrete resonant acoustic frequencies of said standing acoustic wave;

means to vary the frequency of said acoustic drive means to vary the center wavelength of the optical filter passband;

means for reducing the effective finesse of said filter to a value of less than 0.5, thereby to reduce ripples in the tuning bandpass response of said filter;

the said effective finesse, F, of said filter being given by the relation,

$$F=(l/d)(1+4\cot^2\theta_i)^{-\frac{1}{2}}$$

wherein "l" is the acousto-optic interaction length for the light beam,

"d" is the acoustic path length of the acoustic resonator, and "θ_i" is the polar angle of the light beam incidence.

4,637,690

TELECENTRIC ZOOM LENS SYSTEM

Hiroshi Miyamae, Kogunei, and Makoto Banno, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1982, Ser. No. 365,646

Claims priority, application Japan, Apr. 6, 1981, 56-50514; Apr. 14, 1981, 56-55038

Int. Cl.⁴ G02B *15/16*

U.S. Cl. 350—427 **10 Claims**



1. A telecentric zoom lens system comprising at least one movable lens group arranged on a rear side of an iris, said movable lens group being movable along an optical axis thereof according to variation of magnification, means for maintaining the position of said iris near the front focal point of

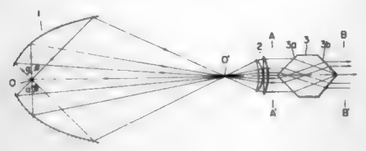
a partial lens system consisting of all lens elements arranged on raid rear side corresponding to the movement of said movable lens group during variation of magnification, whereby a telecentric condition is always obtained.

4,637,691

MIRROR CONVERGING-TYPE ILLUMINATION OPTICAL SYSTEM

Makoto Uehara, Tokyo, and Sumio Hashimoto, Kawasaki, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Feb. 2, 1984, Ser. No. 576,477
Claims priority, application Japan, Feb. 7, 1983, 58-18697
The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.
Int. Cl.⁴ G02B *21/06*
U.S. Cl. 350—432 **9 Claims**



1. An illumination optical system for supplying substantially uniform illumination light of a high efficiency, comprising:

a light source;

light-ray converting means for converting light rays from said light source into parallel light rays, said light-ray converting means having a concave reflecting surface which has an optical axis; and

a refraction member arranged in a path of the parallel light rays, so that said refraction member shifts the incident parallel light rays which are farthest from the optical axis to positions substantially coinciding with the optical axis, and shifts the incident parallel light rays which are nearest to the optical axis to positions substantially farthest from the optical axis, said refraction member having a conical input surface having a convex surface facing toward an incident light ray side and a conical output surface having a convex surface facing toward an exit light ray side, vertices of said conical input and output surfaces being located on the optical axis.

4,637,692

OBSERVATION APPARATUS

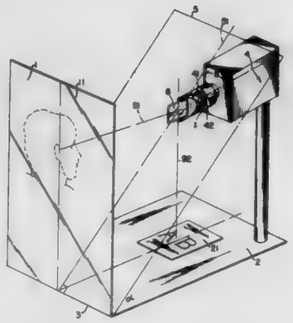
Jean-Michel Baluteau, Livry-Gargan; Michel Saint-Sevin, Gagny, and Patrick Chabanier, Vincennes, all of France, assignors to Societe d'Optique, Precision Electronique et Mecanique-Sopelem, Levallois-Perret, France

Filed May 7, 1984, Ser. No. 607,488
Claims priority, application France, May 11, 1983, 83 07936
Int. Cl.⁴ G02B *26/08*
U.S. Cl. 350—486 **5 Claims**

1. In an apparatus provided with an unmoving observation device for alternate scanning of two objects respectively located in two intersecting planes to present on a vertical plane alternately one of two images thereof positioned in the same direction, whereby it is unnecessary to rotate one image, said device comprising a camera with an objective on a mirror rotatable in front of the camera objective, the improvement according to which:

(a) said camera is located in a bisector plane of a dihedron formed by two imaginary half planes corresponding to the planes of said two objects and forming an angle α therewith, the optical axis of said camera being oriented according to an angle β equal to $(\pi-\alpha)/2$ with a straight center line of said bisector plane perpendicular to the ridge of one of the half planes forming said dihedron;

(b) means for rotating said mirror located in front of the camera objective about an optical axis of said camera objective according to an angle γ such as



$$\tan\frac{\gamma}{2}=\frac{1}{\sin\frac{\alpha}{2}}$$

in order to reproduce alternately on said screen one of said two objects;

(c) said optical axis being so located that its angle of incidence (i) satisfies with said mirror the equation

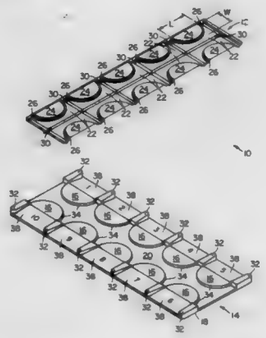
$$\cos 2i=\pm\sin^2\frac{\alpha}{2}\,.$$

4,637,693

MICROSCOPE INSPECTION SLIDE

Vance C. Mitchell, Irvine, Calif., assignor to ICL Scientific Corp., Fountain Valley, Calif.

Filed Jul. 23, 1985, Ser. No. 758,056
Int. Cl.⁴ G01N *21/01*; G02B *21/34*
U.S. Cl. 350—536 **6 Claims**



1. A slide for use in the examination of liquid specimens, said slide comprising:

a base plate having at least one flat examination chamber floor surface, said examination chamber floor surface being raised above an upper deck surface of said base plate;

a cover plate having at least one flat examination chamber roof surface, said examination chamber roof surface being recessed from a lower surface of said cover plate and said examination roof surface having a smaller surface area over said examination chamber floor surface;

a depth control ridge extending away from said examination chamber roof surface on all sides, but one, a sufficient distance to extend beyond the edge of said examination chamber floor surface so that positioning said examination chamber roof surface over said examination floor surface results in a fixed distance being determined by said depth control ridge between said examination chamber roof and floor surfaces, said depth control ridges having at least one notch extending between the examination chamber and the edge of said depth control ridge furthest from said examination chamber to provide for drainage onto said upper deck surface;

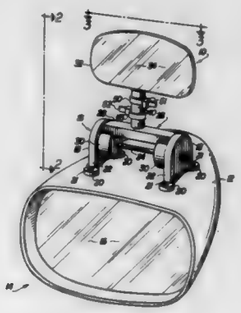
bonding means extending from said cover plate so that positioning said cover plate on said base plate and bonding said cover plate to said upper deck surface affixes said cover plate to said base plate and also forms an essentially continuous bond between said base plate and said cover plate about the perimeter of each examination chamber.

4,637,694

AUXILIARY REAR VIEW MIRROR ASSEMBLY AND OUTBOARD MIRROR

Albert A. Castaneda, 2752 SW. 24 Terrace, Miami, Fla. 33145

Filed Aug. 26, 1985, Ser. No. 769,523
Int. Cl.⁴ G02B *7/18, 5/08*; B60R *1/08*
U.S. Cl. 350—626 **9 Claims**



1. In combination, a rear view mirror assembly and an outboard mirror, said assembly being mounted to said outboard mirror and said outboard mirror being adapted to be installed on a vehicle, said outboard mirror including a casing having an upper surface,

said assembly comprising:

(a) base maans for supporting said mirror assembly to the upper surface of said casing of the outboard mirror,

(b) a support platform movably connected to said base means and rotatable about a substantially central axis thereof and including a connecting structure extending upwardly from said support platform and movable therewith,

(c) a mirror element including a mounting portion extending upwardly from said support platform, said mounting portion and said connecting structure movably connected to one another and cooperatively structured so as to move both rotatably and linearly relative to one another,

(d) locking means disposed in interconnected relation between said mounting portion and said connecting structure and structured to prevent relative movement therebetween,

(e) said central axis of rotation of said base means disposed in perpendicular relation to an axis of rotation of said mounting portion relative to said connecting structure, and

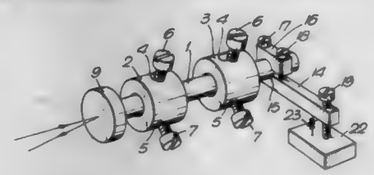
(f) said support platform, connecting structure and mounting portion cooperatively structured and disposed to allow substantial universal positioning of said mirror element relative to said base means.

4,637,695

ADJUSTING THE DIRECTION OF A BEAM OF RADIATION

Charles V. Perkins, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 25, 1985, Ser. No. 748,524
Claims priority, application United Kingdom, Jun. 26, 1984, 8416263
Int. Cl.⁴ A47F *7/14*; G02B *26/08*
U.S. Cl. 350—631 **11 Claims**



6. An arrangement for adjusting the direction of a beam of radiation comprising

a shaft mounted in a bearing structure for rotational adjustment, said shaft being lightly loaded against said bearing structure prior to said adjustment; and

a mirror mounted on said shaft, said mirror having a normal inclined to a longitudinal axis of said shaft;

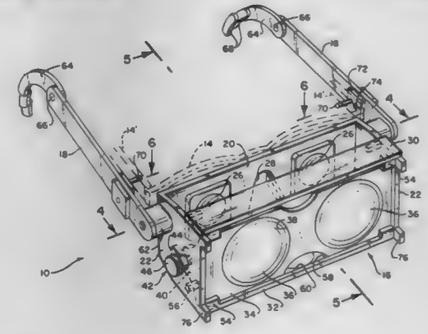
said shaft being rigidly secured in said bearing structure by an adhesive after said adjustment, said shaft being freed of loading against said bearing structure after said adhesive has set.

4,637,696

BINOCULAR EYEGLASSES FOR IMAGE MAGNIFICATION

Vaughn D. Wilkins, 19163 Olympia St., Northridge, Calif. 91326

Filed Dec. 16, 1985, Ser. No. 809,495
Int. Cl.⁴ G02C *7/08, 1/00*
U.S. Cl. 351—41 **10 Claims**



1. Binocular eyeglasses, comprising:

a rear frame panel having a pair of lens openings formed therein;

a pair of eyepiece lenses respectively covering said rear panel lens openings;

a pair of slide panels projecting forwardly from opposite ends of said rear panel;

means cooperating with said side panels to define a slide track extending in a fore-aft direction in front of said rear panel;

a front side panel having a pair of lens openings formed therein and received within said track for fore-aft sliding movement relative to said rear panel;

a pair of objective lenses covering said front panel lens openings, said track including means for maintaining said objective lenses in optical alignment with said eyepiece

lenses throughout fore-aft sliding movement of said front panel;
means forming front and rear limit stops defining front and rear end limits to fore-aft sliding movement of said front panel;
means for releasably locking said front panel against fore-aft sliding movement; and
a pair of bows connected respectively to outboard sides of said side panels and projecting rearwardly therefrom.

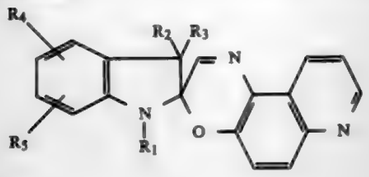
4,637,697
MULTIFOCAL CONTACT LENSES UTILIZING DIFFRACTION AND REFRACTION
Michael H. Freeman, Wales, Wales, assignor to Pilkington P.E. Limited, United Kingdom
Continuation-in-part of Ser. No. 533,993, Sep. 20, 1983, and a continuation-in-part of Ser. No. 368,362, Apr. 14, 1982. This application Oct. 19, 1983, Ser. No. 543,257
Claims priority, application United Kingdom, Oct. 27, 1982, 8230621
Int. Cl.⁴ G02C *7/04, 7/06;* **G02B** *3/08, 27/44*
U.S. Cl. 351—161 **22 Claims**



1. A bifocal contact lens dividing light passing through a common portion thereof and providing two foci for said light, a first portion of said light being focused by refraction and a second portion of said light being focused by asymmetric zone plate surfaces.

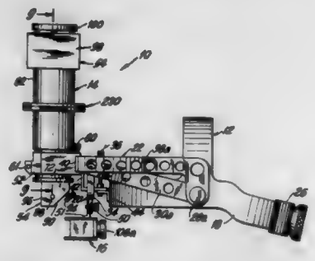
4,637,698
PHOTOCHROMIC COMPOUND AND ARTICLES CONTAINING THE SAME
Won S. Kwak, Akron, and Rodney J. Hurditch, Doylestown, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.
Continuation-in-part of Ser. No. 548,600, Nov. 4, 1983, abandoned. This application Jul. 30, 1984, Ser. No. 635,696
Int. Cl.⁴ G02B *5/23;* **G02F** *1/01*
U.S. Cl. 351—163 **25 Claims**

1. A photochromic compound represented by the following graphic formula:



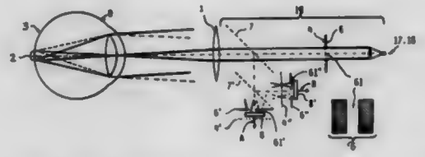
wherein:
(a) R_1 is selected from the group consisting of C_1–C_8 alkyl, phenyl, phen(C_1–C_4)alkyl, allyl and mono- and disubstituted phenyl, said phenyl substituents being selected from C_1–C_4 alkyl and C_1–C_5 alkoxy;
(b) R_2 and R_3 are each selected from the group consisting of C_1–C_5 alkyl, phenyl, C_1–C_4 alkyl and C_1–C_5 alkoxy mono- and disubstituted phenyl, benzyl or combine to form a cyclic ring selected from the group consisting of an alicyclic ring containing from 6 to 8 carbon atoms (including the spiro carbon atoms), norbornyl and adamantyl, and
(c) R_4 and R_5 are each selected from the group consisting of hydrogen, C_1–C_5 alkyl, halogen, C_1–C_5 alkoxy, nitro, cyano and C_1–C_8 alkoxycarbonyl.

4,637,699
BINOCULAR OPHTHALMOSCOPE
Jesse Sigelman, 69 E. 71 St., New York, N.Y. 10021
Continuation-in-part of Ser. No. 391,494, Jun. 24, 1982, Pat. No. 4,538,888. This application Sep. 12, 1984, Ser. No. 650,329
Int. Cl.⁴ A61B *3/10*
U.S. Cl. 351—205 **3 Claims**



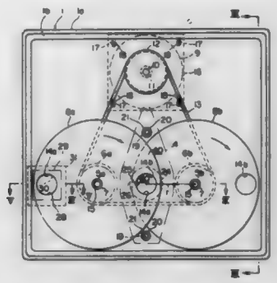
1. A binocular ophthalmoscope, comprising:
an optical viewing system;
light source means having a light outlet for illuminating a patient's eye; and
headgear means mountable on an examiner's head during use for supporting the optical viewing system in optical alignment with the examiner's eyes and the light source means for the light outlet above the optical viewing system;
wherein the light source means includes selecting means for selectively providing both full beam and slit beam illumination of a patient's eye, a first condensing lens for focusing light on the selecting means, a second condensing lens for refocusing the light passing through the selecting means onto an aerial image of the retina, a third lens for shortening the focal length of the beam emitted from the light outlet and means mounting the third lens for pivotal movement into and out of the beam path.

4,637,700
METHOD AND AN APPARATUS FOR DETERMINING REFRACTION OF THE HUMAN EYE
Helmut Krueger, Henckystrasse 5, 8000 Munich 50, Fed. Rep. of Germany
PCT No. PCT/DE83/00025, § 371 Date Oct. 7, 1983, § 102(e) Date Oct. 7, 1983, PCT Pub. No. WO83/02716, PCT Pub. Date Aug. 18, 1983
PCT Filed Feb. 10, 1983, Ser. No. 552,053
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1982, 3204876
Int. Cl.⁴ A61B *3/10*
U.S. Cl. 351—211 **12 Claims**



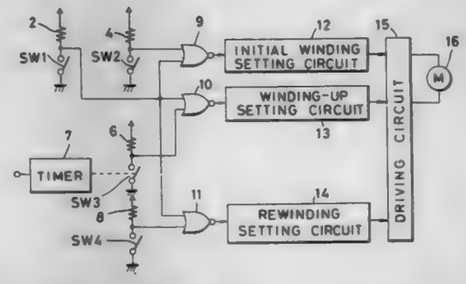
1. A method for determining the time dependent refraction of the human eye comprising the steps of:
imaging a target object having partial portions which extend in depth and offset from one another in the direction of the optical axis in an object space onto the retina of an eye with an optometer lense system so that the retinal image of the object is re-imaged via said lense system into the object space and into an image plane which is conjugated with respect to the retina and depends on the refraction of the eye and the index of refraction of the lense system, the distance of the conjugated image plane from said lense system being a measure of refraction; and
simultaneously analyzing the image sharpness of the beam of rays from the retinal image at at least two different distances from the conjugated image plane by at least first and second objects positioned in the object space and offset in the direction of the optical axis.

4,637,701
SHUTTER FOR USE IN A TELEVISION CAMERA
Yoshihisa Yamaguchi, Tokyo, Japan, assignor to Yamaguchi Cinema Corporation, Tokyo, Japan
Filed May 19, 1986, Ser. No. 865,187
Claims priority, application Japan, Jun. 18, 1985, 60-132407; Jun. 18, 1985, 60-92094; Jun. 18, 1985, 60-92095
Int. Cl.⁴ G03B *9/10*
U.S. Cl. 352—218 **6 Claims**



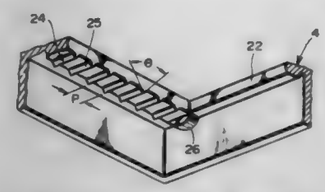
1. A shutter for use in a television camera, comprising:
a casing having a first wall having a first opening formed therethrough for allowing incident light from a lens of the television camera to pass through the first opening and a second wall opposingly disposed to the first wall and having a second opening aligned to the first opening for allowing the incident light to pass through the second opening into a body of the television camera;
a first disc member supported within the casing to be rotatable about an axis thereof and in parallel with the first and the second walls, the first disc member having a first shutter hole formed therethrough;
a second disc member supported within the casing to be rotatable about an axis thereof and in parallel with the first and the second walls, the second disc member having a second shutter hole formed therethrough, the first disc member and the second disc member being disposed to overlap at overlapping areas at peripheries thereof with a gap, the first and second shutter holes formed to be aligned to each other and to the first and second openings at the overlapping areas to define a shutter opening when the first and second disc members rotate;
rotating means, mounted on the casing, for rotating the first and the second disc members in the same direction; and
controlling means for controlling the rotating means to thereby control the rotation of the first and the second disc members so that the forming of the shutter opening is synchronized with a field scanning of the television camera, whereby the incident light is allowed to pass through the first opening, the shutter opening and the second opening in synchronism with the field scanning of the television camera.

4,637,702
SAFETY APPARATUS FOR FEEDING A FILM OF A CAMERA
Kazuyuki Kazami, Tokyo, and Hiroshi Wakabayashi, Yokohama, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan
Filed Oct. 4, 1985, Ser. No. 784,460
Claims priority, application Japan, Oct. 11, 1984, 59-213128
Int. Cl.⁴ G03B *1/12*
U.S. Cl. 354—173.11 **3 Claims**



1. A camera comprising:
shutter means which has a blade member and starts displacement of said blade member for opening an exposing aperture in response to a first electric signal and starts displacement of said blade member for closing said exposing aperture in response to a second electric signal;
film feeding means having an electric motor and means for driving said electric motor for feeding a film installed into said camera, said feeding of the film including initial winding for allowing the first frame of said film to face said aperture, winding-up for allowing the subsequent frame to face said aperture forevery exposure, and rewinding of the exposed film;
monitor means for monitoring the displacement of said blade member and generating a detection output when said aperture is open; and
means for inhibiting the initial winding, winding-up and rewinding of said film feeding means in response to the detection output of said monitor means.

4,637,703
FILM PACK
Minoru Ono, and Teruyoshi Makino, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Aug. 19, 1985, Ser. No. 766,964
Claims priority, application Japan, Aug. 17, 1984, 59-171173
Int. Cl.⁴ B65D *85/67;* **G03B** *17/26*
U.S. Cl. 354—276 **10 Claims**



1. A film pack for containing and removably holding a plurality of instant film sheets, each of said instant film sheets having an emulsion layer on its one surface, said film pack comprising:
a parallelepipedal housing having a flat top wall having an exposure aperture therein;
a pressure plate contained in said housing for urging said instant film sheets against the inner surface of said flat top wall for exposure; and
means for preventing said emulsion surface from receiving

scratch marks, said means comprising a plurality of tapered projections arranged on a part of said housing with which said emulsion surface is in slidable contact when each said instant film sheet is withdrawn from said housing after exposure, said tapered projections have ridge lines extending in the direction of movement of said instant film sheets.

4,637,704

EXCHANGEABLE LENS WHICH EXCHANGES ELECTRICAL SIGNALS WITH A CAMERA BODY

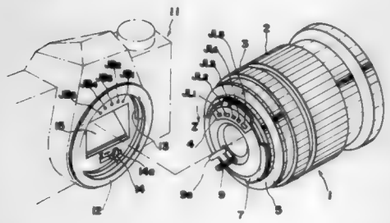
Toshihiko Ishimura, Habikino, and Yukio Maekawa, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 19, 1985, Ser. No. 799,756

Claims priority, application Japan, Nov. 19, 1984, 59-175426[U]

Int. Cl.⁴ G03B *17/12*

U.S. Cl. 354—286 **8 Claims**



1. An exchangeable lens for use with a camera provided with a plurality of terminals which are arranged in a circle, said lens comprising:

a lens barrel to be mounted on the camera body by the rotation thereof in a given direction;

a plurality of terminals fixed on said lens barrel and arranged circularly on said lens barrel concentric with the optical axis of said lens to be brought into mutual contact with corresponding terminals of said camera body respectively, said terminals on said lens barrel including a power supply terminal and a ground terminal through which electric power is supplied from said camera body, and signal terminals through which signals are exchanged between said lens and said camera body;

a CMOS circuit connected to said terminals of said lens and functioning to produce signals upon receiving electric power through said power supply terminal and ground terminal; and

each of said terminals on said lens barrel extending for contact along the direction of rotation of said lens barrel and having a contact commencing point which first comes into contact with a corresponding terminal of said camera body, during the rotation of said lens barrel attendant for the mounting thereof on said camera body, the locations of said contact commencing points of said terminals being such that said power supply terminal and said ground terminal come into contact with their correaponding terminals on said camera body in advance of said signal terminals.

4,637,705

AUTOMATIC FOCUSING CAMERA

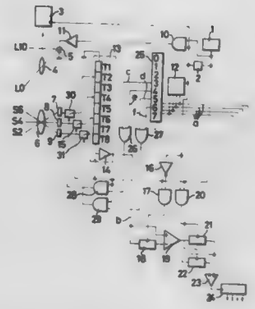
Takashi Kawabata, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1985, Ser. No. 701,969

Claims priority, application Japan, Feb. 18, 1984, 59-29075

Int. Cl.⁴ G03B *3/00*

U.S. Cl. 354—403 **29 Claims**



1. An automatic focusing camera comprising:

(a) light projecting means for projecting a signal light toward an object to be photographed;

(b) deflecting means for deflecting the projection of the signal light from said light projecting means to discrete directions successively;

(c) photosensitive means for receiving the reflection of said signal light from the object, said photosensitive means including a plurality of photosensitive elements positioned to receive the reflections from target points existing only in respective certain prescribed directions;

(d) focusing adjustment information forming means responsive to detection of an object distance information from the output states of said plurality of photosensitive elements related to the reflected position of the signal light by said deflecting means for forming a focusing adjustment information for a photographic lens; and

(e) selecting means for selecting those of said plurality of photosensitive elements which contribute to a formation of the focusing adjustment information depending upon the deflected position of said deflecting means so that the size of a distance measurable area within a picture frame is varied as a function of the distance.

4,637,706

DEVELOPER THIN LAYER FORMING APPARATUS

Atsushi Hosoi, Tokyo; Fumitaka Kan, Yokohama; Hidemi Egami, Zama; Hatsuo Tajima, Matsudo; Shunji Nakamura, and Kimio Nakahata, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1984, Ser. No. 618,558

Claims priority, application Japan, Jun. 14, 1983, 58-104986; Jun. 14, 1983, 58-104987

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 DD **29 Claims**

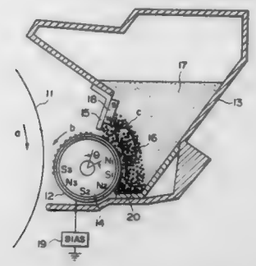
1. A developable apparatus, comprising:

a developer supply container, having an opening, for containing a non-magnetic developer and magnetic particles;

an endlessly movable developer carrying member of a non-magnetic material for carrying a developer, which is movable between an inside of said developer supply container and an outside of said developer supply container through the opening;

a magnetic particle confining member, spaced from an outer surface of said developer carrying member with a gap;

means for generating a fixed magnetic field, having magnetic pole means disposed inside of said carrying member and upstream of said confining member with respect to the movement direction of said developer carrying member; and



a magnet, disposed outside of said carrying member in proximity with said confining member at an upstream side thereof with respect to the movement direction of said developer carrying member.

4,637,707

SUPPLEMENTARY DATA COPYING METHOD AND ORIGINAL PICTURE IMAGE RECORDER HAVING SUPPLEMENTARY DATA DISPLAY MEANS

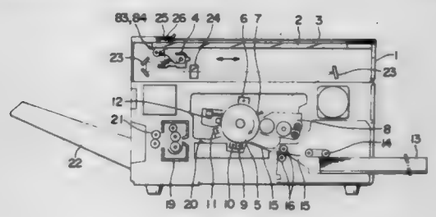
Seitaro Kasahara; Akira Sawaki, both of Hachioji, and Shun Kawata, Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

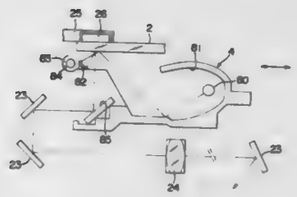
Filed Nov. 6, 1984, Ser. No. 668,731

Claims priority, application Japan, Dec. 28, 1983, 58-245243; Dec. 28, 1983, 58-245244; Dec. 28, 1983, 58-245245; Dec. 28, 1983, 58-245246; Dec. 28, 1983, 58-245247

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 R **9 Claims**





1. An original picture image recorder comprising a supplementary data display means for displaying supplemental data being copied in addition to original data, said display means being provided close to a document glass plate on which documents being recorded are mounted; an image forming assembly for exposing said documents and display means to light and forming electrostatic images corresponding to reflex light therefrom on an image retainer; a developing assembly for developing the electrostatic images into visible ones; and means for preventing the background area of said display means in a display state from generating photographic fog on materials being recorded.

4,637,708

ONE-COMPONENT COPIER TONER WITH ELECTRIC FIELD TRANSFER

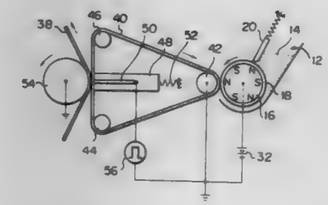
Kazuhiro Yuasa, Zama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 24, 1985, Ser. No. 758,447

Claims priority, application Japan, Jul. 26, 1984, 59-156388; Jul. 26, 1984, 59-156389; Jul. 31, 1984, 59-158573

Int. Cl.⁴ G03G *15/08*

U.S. Cl. 355—3 DD **7 Claims**



1. A recording apparatus for recording image data on a recording medium by means of a one-component high-resistance toner, comprising:

a rotatable sleeve for transporting the toner which has been charged;

a movable endless conveyor belt for transporting the charged toner, which is transported thereto by the rotatable sleeve which is in contact with the belt, to the recording medium;

toner transfer means for developing an electric field directed from the rotatable sleeve toward the belt to transfer the toner from the sleeve to the belt; and

a multi-stylus head which has a number of electrodes in the form of styli which abut against the back of the belt which is opposite to the toner deposition surface of the belt, voltage pulses associated with the image data being applied to the styli.

4,637,709

APPARATUS FOR GENERATING AN IMAGE FROM WITHIN A SHEET-LIKE MEMBER

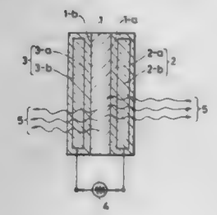
Masaharu Shirai, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 684,710

Claims priority, application Japan, Dec. 23, 1983, 58-242244; Dec. 23, 1983, 58-242246; Dec. 23, 1983, 58-242247

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 R **13 Claims**



1. A device for obtaining an image from at least one surface of a sheet-like member bearing characters by producing light within said member, said device comprising:

two confronting electrodes, at least one of said electrodes having an insulating layer thereon;

means for placing said member between said two electrodes

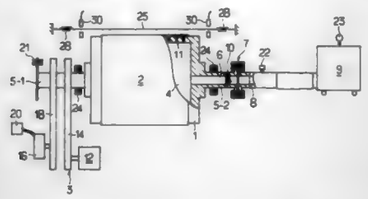
such that said member contacts said electrodes and said insulating layer on at least one of said electrodes;
means including said two electrodes for producing an image of at least one surface of the sheet-like member by inducing a corona discharge within the member, wherein said image is formed by light from said corona discharge attenuated by said characters; and
means for utilizing the image.

4,637,710

DRUM TYPE IMAGE SCANNING AND RECORDING APPARATUS

Teruo Fujii, and Tomikazu Tsutsui, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Nov. 19, 1985, Ser. No. 799,727
Claims priority, application Japan, Dec. 3, 1984, 59-256166
Int. Cl.[4] G03B *27/58*; H04N *1/08*
U.S. Cl. 355—72 **6 Claims**



1. A drum type image scanning and recording apparatus having a drum, around whose cylindrical external surface a film is fixedly wrapped, and a drum driving apparatus mechanically coupled to said drum for rotating the drum, the apparatus comprising:
a string tensionally stretched close to and along the external surface of said drum in parallel with the drum axis;
string stretching means for supporting said string tensionally;
swing detecting means for detecting the swing of said string produced when part of the film and said string are in contact with each other when said drum is rotating and the film separates away from the drum external surface; and
drum braking means for stopping rotation of the drum in accordance with said detection signal from said swing detecting means.

4,637,711

PROCESS FOR ROLLING A DRUM WITH A PHOTOSENSITIVE FILM

Kunio Fujisawa, Saitama; Toyoji Tanaka, Tokyo; Toshio Mochizuki, Saitama; Norio Nakamura, Saitama, and Seiji Kaya, Saitama, all of Japan, assignors to Fujirex Company, Ltd., Japan

Filed Nov. 14, 1985, Ser. No. 798,175
Claims priority, application Japan, Nov. 14, 1984, 59-240189
Int. Cl.[4] G03B *27/58*; H04N *1/08*
U.S. Cl. 355—72 **2 Claims**



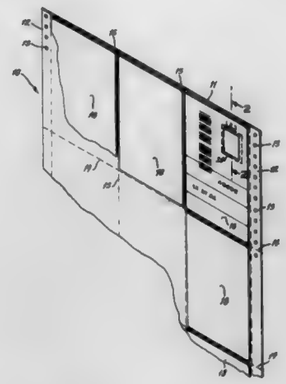
1. A process for rolling a drum with a photosensitizer film, characterized in that the drum is rolled with a photosensitizer film by making the photosensitizer film tubular by uniting the seam-edge parts on both sides of the photosensitive film through a thermally contractible film and that the drum is rolled without any clearance with the photosensitive film by causing the thermally contractible film to contract by heating same.

4,637,712

SYSTEM FOR PACKAGE PHOTOPRINTING

Marc E. Arnold, St. Louis, Mo., and Mitchell S. Marcus, Winnetka, Calif., assignors to Hasco International, Inc., St. Charles, Mo.

Filed Nov. 21, 1984, Ser. No. 673,599
Int. Cl.[4] G03B *27/62, 27/32*
U.S. Cl. 355—75 **11 Claims**



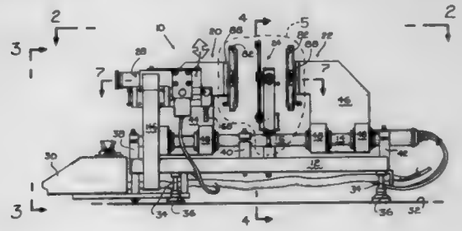
1. For producing an order for package photoprints in a photographic package printer subject to the control of a printer controller, the combination of
an order form and negative carrier having
a rectangular backing of waxed paper, a die-cut front sheet of paper characterized by capability to absorb printing ink and having, in contact with the waxed paper backing, a coating of an adhesive capable of retaining photographic film, the waxed backing and front sheet being scored with a larger frame opening in the backing and a smaller frame opening in the front sheet aligned in centered position relative to said larger frame opening,
the portions of said backing and front sheet within such frame opening scores being removed, whereby to provide a frame portion with a rearwardly presented adhesive frame margin,
a film negative mounted therein by said adhesive, and
an order ink-imprinted on said front sheet, outward of such frame portion, in both visually readable and bar-coded form, in combination with
feeder-reader apparatus for said negative carrier comprising
a loading station at a loading level and means to feed said negative carrier forwardly therefrom,
means to provide a negative carrier path including a downward-sloping path portion extending from said loading station to such package printer and having a first path gap at a level below such loading level,
a bar-code reader positioned along said downward sloping path at a level below that of said first path gap, for reading said negative carrier as it moves along such path, a rejected station at a level below said loading station and adjacent to and aft of said first path gap,
means along such path to retain said negative carrier in position, to advance it along such path, and to reverse its movement therealong, whereby should a reading by said bar-code reader be unacceptable, said negative carrier may be reversed for re-reading or for driving slopingly upward along such path and aft through said first gap to said rejected station, and whereby if such reading is acceptable the negative carrier may be retained until such photographic package printer is unoccupied by any prior negative carrier,
said means to provide a path including a further path portion for feeding said negative carrier forward, at a lesser slope, into such photographic package printer, such further path portion being at a level spacedly below said downward-sloping path, whereby to establish a second gap therebetween,
a completed station adjacent to and aft of said second gap, and
means to advance such negative carrier along such further path portion and to withdraw it therealong, whereby on advancing to insert it into such photographic package printer, and on withdrawing to deliver such negative carrier through said second gap and to such completed station, said feeder-reader apparatus further having
microprocessor means to store such readings and to transmit them to such a printer-controller for controlling the operation of such a photographic package printer when such negative carrier has been so inserted therein.

4,637,713

PELLICLE MOUNTING APPARATUS

Arthur M. Shulenberger, and John A. Piatt, both of Capitola, Calif., assignors to SCSS Instruments, Inc., Santa Cruz, Calif.

Filed Sep. 27, 1985, Ser. No. 781,227
Int. Cl.[4] G03B *27/62, 27/64*; G03F *9/00*
U.S. Cl. 355—76 **10 Claims**



1. A pellicle mounting apparatus for mounting a pellicle to a photomask, said apparatus comprising:
a base provided with a track;
a photomask holder assembly coupled to said base;
a first pellicle holder assembly coupled to said track on a first side of said photomask holder assembly;
a second pellicle holder assembly coupled to said track on a second side of said photomask holder assembly; and
drive means coupled between said first pellicle holder assembly and said second pellicle holder assembly, said drive means being adapted to drive said first pellicle holder assembly and said second pellicle holder assembly along said track towards and away from said photomask holder assembly.

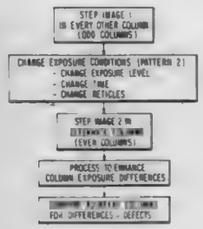
4,637,714

INSPECTION SYSTEM FOR PELLICALIZED RETICLES

Alexander L. Flamholz, Monsey, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,599
Int. Cl.[4] G03B *27/32*
U.S. Cl. 355—77 **14 Claims**

1. A method of detecting defects in a step-and-repeat projection system for imaging patterns from a reticle subject to contamination onto a substrate comprising the steps of:
exposing a first site on said substrate coated with a photosensitive film to radiation through said reticle to achieve a first exposure condition;
exposing a second site on said substrate coated with said photosensitive film to radiation to achieve a second exposure condition; and



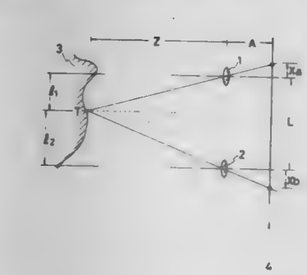
comparing by an optical comparator the first and second sites to identify the presence and location of defects by a difference in optical imagery existing at said first and second sites.

4,637,715

OPTICAL DISTANCE MEASURING APPARATUS

Masanori Idesawa, Saitama, Japan, assignor to Rikagaku Kenkyusho, Japan

Filed Aug. 17, 1984, Ser. No. 642,139
Claims priority, application Japan, Sep. 1, 1983, 58-161088
Int. Cl.[4] G01C *3/00*; G03B *3/00*
U.S. Cl. 356—1 **16 Claims**



1. An optical distance measuring apparatus comprising: a reflector and an observation lens put at such a position that a ray of light from any particular point on an object may fall directly on the observation lens to produce a first image of said point in an observation plane and that a ray of light from the particular point may fall on the observation lens after being reflected by the reflector to produce on said observation plane a second image of the particular point spaced apart from said first image, thus permitting determination of a distance from the observation lens to the particular point on the object according to the triangulation.

4,637,716

FIBER-OPTICAL DOPPLER ANEMOMETER

Helmut Anweter, Ludwigshafen; Dieter Horn, Heidelberg, and Erik Laeddecke, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 20, 1983, Ser. No. 533,866
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1982, 3235369
Int. Cl.[4] G01P *3/36*; G01N *21/00*; G01B *9/02*; G02B *6/26*
U.S. Cl. 356—28.5 **6 Claims**

1. A fiber-optical Doppler anemometer for measuring the Doppler broadening of laser light passing through a scattering

medium containing moving particles, which anemometer comprises:

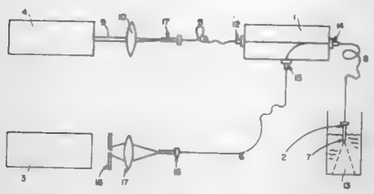
(a) a laser light emitting means;

(b) a fiber-optical coupler arranged to receive the laser light from the emitting means;

(c) a fiber optical probe submerged in the scattering medium and arranged

(c_1) to receive the light from the fiber-optical coupler, and

(c_2) to return the light scattered by the moving particles to



the fiber-optical coupler along with non-shifted light, said non-shifted light being coherent with the scattered light; and

(d) a photodetector device arranged to receive a beam of light split in said fiber-optical coupler, said light including both light scattered by the moving particles and light otherwise returned to the fiber-optical coupler, said photodetector serving to compare the frequencies of the light scattered by he moving particles and the light otherwise returned to the coupler from the optical probe.

4,637,717

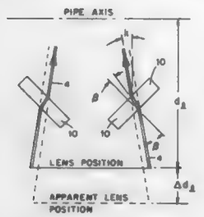
DUAL BEAM TRANSLATOR FOR USE IN LASER DOPPLER ANEMOMETRY

David M. Brudnoy, Albany, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 12, 1984, Ser. No. 599,291

Int. Cl.[4] G01P *3/36*; G02B *26/08*

U.S. Cl. 356—28.5 **30 Claims**



1. A method for attaining substantial spacial coincidence of the intersection volumes of two pairs of intersecting light beams in a fluid flow conduit in a Doppler anemometry device comprising focusing said two pairs of light beams with a beam focusing means and selectively translating the beam paths of at least one of said pairs of beams, said paths being translated in a direction parallel to the original beam paths by a pair of rotatable transparent optical means provided in said beam paths between said beam focusing means and said fluid flow conduit.

4,637,718

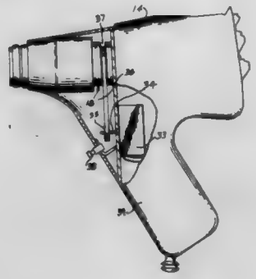
HAND-HELD OPTICAL FUEL PIN SCANNER

Tommy L. Kirchner, and Harshal G. Powers, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 9, 1980, Ser. No. 214,806

Int. Cl.[4] G06K *9/24, 9/32*

U.S. Cl. 356—71 **7 Claims**



1. A portable, hand-held apparatus for optically scanning indicia imprinted about a planar end face of an article having an outer wall surface, said apparatus comprising:

a supporting frame;

light detector means fixed to said frame for digitizing light patterns directed thereto;

indexing means on said frame for engaging said planar end face and locating said end face in a preselected focal plane on the frame, said indexing means having an inner wall surface complementary to said article wall surface for disposition thereabout and terminating in an end portion beyond said planar end face, said inner wall surface having a radially inwardly extending shoulder spaced from said end portion and engagable with said planar end face;

light means directed onto said preselected focal plane;

optical means mounted on said frame about a central axis, said optical means being optically interposed between said indexing means and said light detector means for directing reflected light from said preselected focal plane to said light detector means and including a dove prism centrally aligned along said central axis;

and means for selectively rotating the dove prism relative to the frame about the central axis to thereby rotate the image from the focal plane as transmitted to said light detector means.

4,637,719

OPTICAL MEASUREMENT OF MARINE CONDITIONS

Alex W. Herman, Lower Sackville, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Aug. 14, 1984, Ser. No. 641,044

Int. Cl.[4] G01N *21/85, 21/59*; G06M *11/04*

U.S. Cl. 356—72 **13 Claims**

1. A method of simultaneously determining turbidity caused by small particles and the number of larger particles in a body of water, comprising

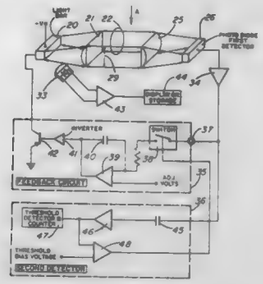
(a) transmitting in a predetermined direction a beam of light of substantially rectangular cross-section having a transmitted intensity,

(b) flowing a sample of said water through the transmitted beam in a direction substantially perpendicular to said transmitting direction,

(c) detecting a received intensity of the beam after passage through the water sample and generating a signal representative of such received intensity, said signal having a basic component corresponding to the turbidity of the water sample and short pulses each corresponding to

passage through the beam of an individual one of said larger particles in said water sample,

(d) causing variations in said basic component to modify the transmitted intensity of the beam before passage through the water sample in such a manner as to maintain said basic component at a substantially constant value,



(e) measuring said transmitted intensity as a determination of said turbidity, and

(f) counting the number of said short pulses as a measure of the number of said larger particles.

4,637,720

LENS METER HAVING A FOCUSING INDICATION SYSTEM WITH DIVIDED-IMAGE REGISTRATION FOCUSING

Moriyasu Shirayanagi; Osamu Shindo; Hirochika Aiura, and Tadao Hara, all of Tokyo, Japan, assignors to Ashahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1983, Ser. No. 550,689

Claims priority, application Japan, Nov. 11, 1982, 57-198292

Int. Cl.[4] G01B *9/00*

U.S. Cl. 356—125 **8 Claims**



1. A lens meter having a focusing indication system with a divided-image registration focusing, comprising:

a target having a non-diffusing transmissive surface and a slit pattern thereon;

a condenser lens for converging a source light toward said target, said condenser lens having a front focal point on a side of said condenser lens opposite said target;

an objective lens for receiving light passing through said slit pattern;

a lens mount for supporting a lens to be examined;

a projection lens downstream of said lens mount for receiving light from said objective lens after passing through said lens to be examined;

a screen for receiving light passing through said projection lens, the arrangement being such that the distance of movement in unison of said condenser lens and said target in the direction of an optical axis is read to detect the vertex power of the lens supported on said lens mount;

an aperture plate disposed in the vicinity of said front focal point of said condenser lens and movable with said condenser lens and said target in the direction of said optical axis; and

at least two deflection prisms disposed with first surfaces in intimate contact with said slit pattern on said target, said first surfaces extending across said slit pattern and being substantially perpendicular to one another;

wherein said aperture plate has an aperture size and each of said deflection prisms has a vertex angle, said aperture size and said vertex angle being determined such that registration sensitivity K, the registration sensitivity of images, ratio B_C, the ratio between luminances of the centers of the images, the ratio B_D, the ratio between luminances of the peripheries of the images, will meet the following relations:

$K \geqq 0.33$

$B_C \geqq 0.1$

$B_D \geqq 0.7$.

4,637,721

LIGHT MEASURING DEVICE

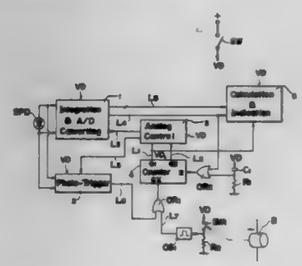
Kazuhiko Naruse, Nabari, and Yoshio Yuasa, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 14, 1984, Ser. No. 580,116

Claims priority, application Japan, Feb. 16, 1983, 58-22172[U]

Int. Cl.[4] G01J *1/46*

U.S. Cl. 356—215 **15 Claims**



1. A light measuring device having an electrical power supply and capable of starting its light measuring operation in response to receiving flash light from a flash device and also to activation of a manual operation, comprising:

light receiving means for receiving light to be measured to produce a light intensity signal representative of the intensity of the light received thereby;

detecting means for detecting any change of the light intensity signal to produce a first signal each time a change is detected;

signal producing means, including a manually operable member, for producing a second signal each time said manually operable member is operated;

measuring means for measuring the amount of light received by the light receiving means for a predetermined time period in accordance with said light intensity signal to produce a light measuring signal representative of the amount measured by said measuring means;

controlling means for controlling said measuring means in accordance with said first and second signals to enable the electrical power supply to said measuring means upon a first receipt of either of said first and second signals, and to start operation of said measuring means upon a second receipt of either of said first and second signals; and

indicating means for indicating a light measuring value in accordance with said light measuring signal.

4,637,722

FIBER OPTICAL ROTATION SENSOR WITH EXTENDED DYNAMIC RANGE

Byoung Y. Kim, Stanford, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Apr. 25, 1983, Ser. No. 488,155

Int. Cl.[4] G01B *9/02*

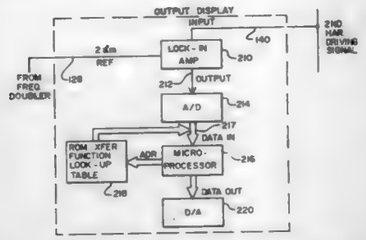
U.S. Cl. 356—350 **34 Claims**

1. An apparatus for sensing an ambient effect such as rotation, comprising:

(A) a loop of fiber optic material for forming an optical path sensitive to said ambient effect;

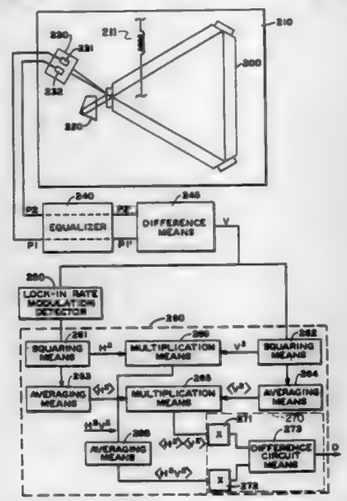
(B) means for introducing light into said loop;

(C) means for sensing said light in said loop to produce a feedback signal responsive to said ambient effect;
(D) means, responsive to said feedback signal, for nulling said feedback signal, to increase the sensing range of said



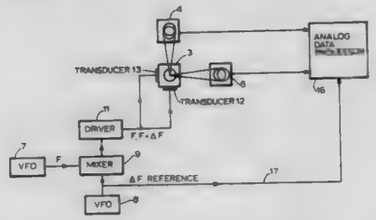
apparatus, said nulling means producing an output signal varying with said ambient effect in accordance with a non-linear relationship; and
(E) an output circuit for superimposing a non-linear transfer function on said output signal.

4,637,723
DISCRIMINANT APPARATUS FOR RING LASER ANGULAR RATE SENSORS
Werner H. Egli, Minneapolis, and Mark W. Weber, Elk River, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Sep. 30, 1982, Ser. No. 430,052
Int. Cl.[4] G01B 9/02; H01S 3/083
U.S. Cl. 356—350 **25 Claims**



1. An apparatus for providing a discriminant signal indicative of the lock-in rate of an angular rate sensor of the class wherein two waves propagate in opposite directions along a closed-loop path, wherein the frequency of each of said waves is a function of the rate of rotation of said closed-loop path, said waves establishing a phase difference therebetween, and wherein said lock-in rate is the rate of rotation of said sensor below which said frequency of said waves tend to lock-in to a common frequency, and said lock-in rate is related to the coupling of energy between each of the said waves traveling along said closed-loop path, the apparatus comprising:
signal means responsive to each of said waves for providing an output signal related to said phase difference between said waves, said output signal having phase and amplitude modulation components resulting substantially from energy coupling between said waves; and
discriminant signal means for signal processing said signal means output signal to extract from said output signal a phase jitter signal representative of said phase modulation of said phase difference, said phase jitter signal providing said signal indicative of said lock-in rate.

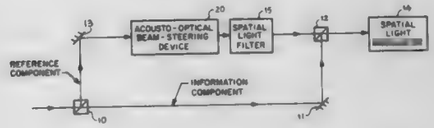
4,637,724
SHEARING INTERFEROMETER EMPLOYING AN ACOUSTO-OPTIC CELL
Richard H. Howell, Melbourne, Fla., and Alan J. MacGovern, Acton, Mass., assignors to Itek Corporation, Lexington, Mass.
Filed Dec. 19, 1983, Ser. No. 562,656
Int. Cl.[4] G01B 9/02
U.S. Cl. 356—353 **16 Claims**



1. In a lateral shearing interferometer having a distorted wavefront incident thereon, for determining relative phase differences between different areas of said distorted wavefront, and for generating signals indicative of said phase differences, and having first and second diffraction gratings, each of which has a slightly different grating frequency, for shearing the wavefront, the improvement comprising:
a. an acousto-optic cell for producing diffraction grating forming travelling acoustic waves therein in response to vibrational forces applied thereto;
b. electro-mechanical transducer means for producing first and second travelling acoustic waves within said cell;
c. electrical signal generator means for applying electrical signals having frequencies of F and F+delta F to said transducer means for producing said waves forming said first and second diffracting grating within said cell, said signal generator means being operable to change the frequency of said signals F and F+delta F through a given frequency range which changes the degree of angular displacement of a given order of diffracted light transmitted through said cell;
d. means for directing said wavefront at said cell; and
e. means for measuring the sheared wavefronts of a given order of light diffracted by said cell.

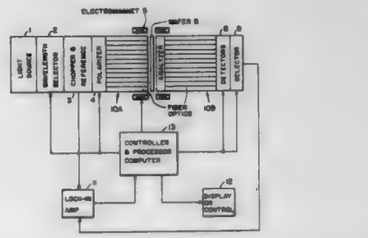
4,637,725
SELF-REFERENCING MACH-ZEHNDER INTERFEROMETER
Michael E. Stefanov, San Jose; Brian J. Sullivan, Menlo Park, both of Calif., and Anthony J. Ticknor, Tucson, Ariz., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.
Filed Sep. 26, 1985, Ser. No. 780,520
Int. Cl.[4] G01B 9/02, 11/02
U.S. Cl. 356—354 **1 Claim**

1. A self-referencing interferometer of the Mach-Zehnder type for monitoring an optical beam wavefront in real time, said interferometer comprising:
(a) beamsplitting elements and reflective elements for dividing said optical beam into an information component and a reference component, and for recombining said information component and said reference component to form an interference pattern indicative of aberrations of said optical beam wavefront;
(b) a spatial light filter positioned to remove second-order aberrations from said reference component of said beam prior to recombination of said information component and said reference component, said spatial light filter having a pin-hole apertured portion for transmitting said reference component while removing said second-order aberrations; and
(c) acousto-optical beam-steering means for steering said reference component of said beam in real time to maintain substantially continuous alignment of a maximum-intensity centroid of said reference component with respect to said pin-hole apertured portion of said spatial light filter, said acousto-optical beam-steering means comprising:
(i) a pair of Bragg cells oriented in crossed configuration



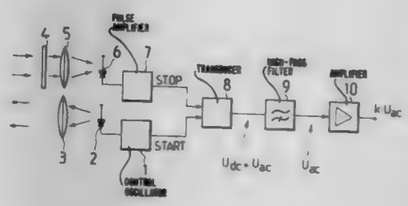
with respect to each other, said Bragg cells being positioned so that said reference component of said beam passes through said Bragg cells in succession prior to being transmitted by said pin-hole apertured portion of said spatial light filter;
(ii) quadrant detector means;
(iii) beamsplitting means for passing a portion of said reference component of said beam from said pair of Bragg cells to said quadrant detector; and
(iv) electronic circuitry responsive to intensity-indicative signals from said quadrant detector for adjusting acoustic grating characteristics of said Bragg cell in real time, said reference component of said beam thereby being deflectable as appropriate to maintain substantially continuous alignment of said maximum-intensity centroid of said reference component with respect to said pin-hole apertured portion of said spatial light filter.

4,637,726
NONDESTRUCTIVE NONCONTACT DEVICE TO CHARACTERIZE SEMICONDUCTOR MATERIAL
Clifford G. Walker, and George A. Tanton, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Feb. 7, 1985, Ser. No. 699,282
Int. Cl.[4] G01N 21/21
U.S. Cl. 356—367 **10 Claims**



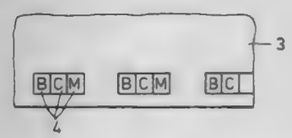
7. In a system for testing a device which will cause Faraday rotation (FR) of polarized light passing therethrough, the improvement comprising a light source for producing polarized light, a first means located between said light source and said device to be tested whereby light from said light source will be directed through said device to be tested, magnetic means positioned so as to produce a magnetic field through said device to be detected so as to cause FR of the polarized light passing through said device, and a plurality of detectors positioned to receive light from individual small areas of said device so as to detect any change in the characteristics of the polarized light cause by said device to be tested.

4,637,727
PROCEDURE FOR ANALYZING RECIPROCATING MOTION
Raimo Ahola, Aippitie 7 A 28, 90530 Oulu 53, and Risto Myllylä, Ketjutie 82, 90560 Oulu 56, both of Finland
Filed Dec. 8, 1983, Ser. No. 559,412
Claims priority, application Finland, Dec. 9, 1982, 824240
Int. Cl.[4] G01B 11/14
U.S. Cl. 356—373 **8 Claims**



1. A method of measuring the reciprocating motion of a given object transverse to the running direction of the object, comprising the steps of: directing periodic light pulses on the object; receiving light pulses reflected back from the object; determining the change in the passage time between subsequent light pulses directed onto and reflected back from the object, in relation to a reference value; transforming said change into an analog voltage signal proportional to said change; and interpreting the alterations in said analog voltage signal as being proportional to alterations in position of the object in a direction transverse to the running direction of said object.

4,637,728
METHOD FOR COLORIMETRICALLY EVALUATING A SHEET PRINTED ON BOTH SIDES THEREOF
Helmut Kipphan, Schwetzingen, and Gerhard Löffler, Walldorf, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany
Filed May 25, 1983, Ser. No. 497,748
Claims priority, application Fed. Rep. of Germany, May 26, 1982, 3219743
Int. Cl.[4] G01J 3/52
U.S. Cl. 356—402 **5 Claims**



1. Method of colorimetrically evaluating a sheet printed on both sides thereof by means of a scanning densitometer having a measuring system and a mechanically controlled measuring head which is guided along a print control strip to be evaluated and which provides a multiplicity of color density values representing color properties of the control strip, which comprises assigning respective control strip measurement fields for different colors to respective printed parts on mutually opposite first form and perfector sides of a sheet, and forming a common control strip set out of all of the measurement fields,

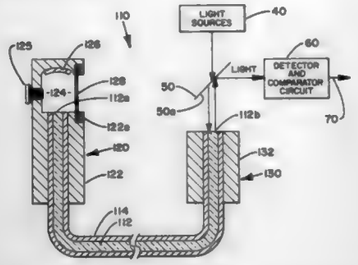
assigning to the measurement fields abbreviations for each of the respective ink colors in accordance with the colors to be printed, and introducing into the measuring system the color abbreviations assigned to the respective printing colors and to the respective sides of the sheet.

4,637,729

FIBER OPTIC MOISTURE ANALYSIS PROBE

Stephen A. Schoch, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,409
Int. Cl.⁴ G01N *21/85*
U.S. Cl. 356—410 **4 Claims**



1. A probe for detecting the presence of a substance in a fluid comprising:

first body means to be sealingly secured in the wall of a casing containing a fluid to be tested;

a passage through said first body means defining a flow path;

first mirror means forming a portion of said passage;

first optical fiber means having one end received in said first body means and defining a first termination which is located across said passage from said first mirror means and forming a portion of said passage;

said first optical fiber means having a second end defining a second termination;

second body means to be sealingly secured in the wall of a casing containing a fluid to be tested;

a sealed chamber in said second body means containing a reference medium;

means for equalizing pressure in said sealed chamber with the pressure acting on said second body means;

second mirror means forming a portion of said sealed chamber;

second optical fiber means having one end received in said second body means and defining a first termination which is located across said sealed chamber from said second mirror means and forming a portion of said sealed chamber;

said second optical fiber means having a second end defining a second termination;

means for supplying light in a first wavelength which is attenuated in the presence of said substance and in a second wavelength which is not attenuated in the presence of said substance such that said light traverses a first path serially including said first optical fiber means from said second termination to said first termination, across said flow path where said light in said first wavelength is subject to attenuation due to the presence of said substance whereupon said light is reflected by said first mirror means and said light in said first wavelength is subject to further attenuation due to the presence of said substance and depending upon the attenuation said light enters said first termination of said first optical fiber means, passes through said first optical fiber means and out said second termination of said first optical fiber means and for supplying light in said first and second wavelengths to a second path serially including said second optical fiber means from said second termination to said first termination, across said sealed chamber to said second mirror means whereupon said light is reflected by said second mirror means and enters said first termination of said second optical fiber means, passes through said second optical fiber means and out of said second termination of said second optical fiber means; and

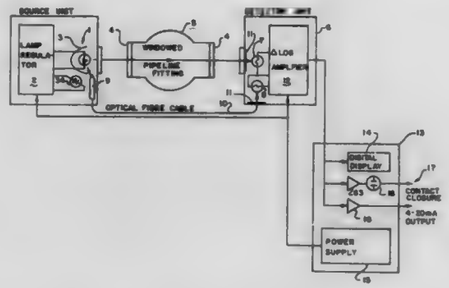
means for detecting the amount of light in both of said wavelengths passing out of each of said second terminations.

4,637,730

OPTICAL AND ELECTRONICALLY COMPARED ABSORPTIOMETER

Michael J. Poenitzgl, Jefferson County; Walter N. Trump, and Robert C. Kessler, both of St. Louis County, all of Mo., assignors to Custom Sample Systems, Inc., St. Louis, Mo.

Filed Sep. 18, 1984, Ser. No. 651,802
Int. Cl.⁴ G01N *21/85, 21/31*
U.S. Cl. 356—411 **5 Claims**



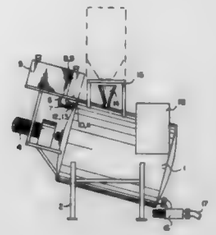
1. An optical absorptionmeter which is characterized by a light source unit of a broad wave length having a source of constant energy which is transmitted as two separate light beams, one of which is transmitted as a main light source beam through a flowing liquid or the like to be measured, and the other beam which is transmitted as a reference beam, said reference beam being tapped from the main light source beam, a power supply for said light source, silicon controlled rectifiers operatively associated with said power source and light source to finely regulate the lamp voltage, said constant energy of the light source being controlled by feed back circuitry, a detector unit which contains two photocells, a position means in the absorptionmeter for optically placing the liquid to be measured between the source unit and one of its photocells and the detector unit, one photocell for measuring the light transmitted through the liquid to be measured, and another photocell which measures the reference beam, a log amplifier electronically connected with the liquid measured photocell and yielding a voltage output logarithm proportional to the signal detected by said photocell, a second log amplifier electronically connected with the reference light detecting photocell and yielding a voltage output logarithm proportional to the reference signal detected by the said photocell which measures the reference beam and the inverter electrically connected with the said latter amplifier and inverting the detected and amplified reference detected voltage, means for measuring the energy difference between the light beams of the measured liquid and reference beam in terms of absorbance, said means comprising a summing point provided within the circuitry of the detector unit and furnishing a voltage detection equal to the difference between the reference and liquid measured yielded voltages, and means for converting this energy difference to an electrical signal for display and control, integrated circuit means electrically connected to said detector unit and capable of receiving said signal therefrom, providing a processing of the said signal and furnishing a readout of digital signals, and a digital display unit coupled to said integrated circuit means and capable of receiving said digital signals and displaying the same, said digital display incorporating a LED display for visually displaying said processed signals.

4,637,731

DEVICE FOR MAKING POROUS CONCRETE

Per O. Dahlin, N. Sillre, Sweden, assignor to Cellexfabrikerna AB, Ange, Sweden

PCT No. PCT/SE84/00214, § 371 Date Jan. 16, 1985, § 102(e) Date Jan. 16, 1985, PCT Pub. No. WO85/00136, PCT Pub. Date Jan. 17, 1985
PCT Filed Jun. 7, 1984, Ser. No. 700,701
Claims priority, application Sweden, Jun. 20, 1983, 8303524
Int. Cl.⁴ B28C *5/08*
U.S. Cl. 366—64 **4 Claims**



1. A device for mixing cement, water and a frothing agent in order to provide a porous concrete for casting, said device comprising

a cylindrical mixing tank which defines a central axis line therethrough and which has an interior surface that defines a mixing chamber therein, and

an impeller rotatably mounted in said mixing chamber within said cylindrical mixing tank, said impeller having a central axle which coincides with said central axis line of said cylindrical mixing tank, said impeller including a plurality of elongated blades that extend helicoidally with respect to said central axle of said impeller and adjacent said interior surface of said cylindrical mixing tank, each said blade consisting of first and second curved strips which extend in parallel to one another, said second strip being located radially outwardly of said first strip, said second strip being inclined along its length less than 90° with respect to the adjacent interior surface of said cylindrical mixing tank, said second strip having along its length a side edge which is adjacent said interior wall of said cylindrical mixing tank.

4,637,732

HAND HELD ATHLETIC OFFICIATING TIMERS

Charles Jones, Rte. 3 Hwy. 29 S., Hope, Ark. 71801; James L. Murphy, and Kenneth Burks, both of Little Rock, Ark., assignors to Charles Jones, Hope, Ark.

Filed Dec. 5, 1983, Ser. No. 557,909
Int. Cl.⁴ G04F *8/00*
U.S. Cl. 368—109 **3 Claims**

1. A hand-held football timer for referees, officials, coaches, umpires or similar users, the timer comprising:

a rigid enclosure adapted to be selectively manually grasped or otherwise retained by said user, said enclosure being geometrically configured to readily facilitate ambidextrous usage by said user;

electronic circuit means disposed within said enclosure for generating an alarm signal when approximately twenty five seconds have elapsed after actuation of said circuit means; said circuit means comprising:

oscillator divider means for generating a first, football timing signal;

triggered counter means for generating second and third football timing signals in response to said oscillator divider means;

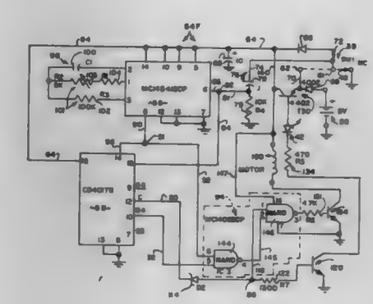
initiation means for initially activating said oscillator divider means and said triggered counter means in response to said primary switch means;

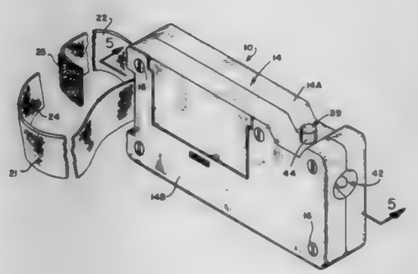
gate means responsive to said first, second and third football timing signals for generating a fourth football timing signal;

motor means for vibrating said enclosure; and,

means responsive to said fourth football timing signal for logically controlling said tactile stimulation means;

tactile stimulation means disposed within said enclosure for generating a warning in response to said alarm signal, said tactile stimulation means comprising means for vibrating said enclosure and thus physically stimulating at least a portion of the body of said user to immediately warn said user notwithstanding where the user may be looking at the time;





user activated primary switch means for manually activating said circuit means, said circuit means including latching means for temporarily latching said primary switch means after initial activation of said primary switch means and means for unlatching said latching means after approximately twenty five second;

battery means disposed within said enclosure for powering said timer;

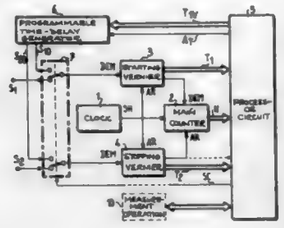
low battery signalling means for warning said user that said battery means is worn out immediately upon activation of said primary switch means; and,

means for immediately providing a visual warning that said battery means is not dead in response to activation of said primary switch means.

4,637,733
HIGH-RESOLUTION ELECTRONIC CHRONOMETRY SYSTEM

Gilbert Charles, Bures sur Yvette; Asaad Assadoullah, Bagneux, and Jean-Marie Bernet, Chambourcy, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 15, 1985, Ser. No. 734,195
Claims priority, application France, May 17, 1984, 84 07652
Int. Cl.[4] G04F *8/00*
U.S. Cl. 368—120 8 Claims



1. An electronic chronometry system for measuring a time period T between a starting instant T_1 and a stopping instant T_2, comprising:

a ramp vernier fine counting means having a time expansion means for measuring said first time T1 between said starting instant and a first later front of a clock signal and for measuring a second time T2 between said stopping instant and a second later clock front;

rough counting means for counting N clock periods of time τ between said first and second fronts;

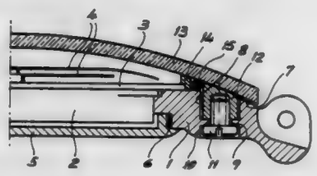
compensation means for compensating for errors of ramp nonlinearity in order to determine both the magnitude and sign of a corrective term (dm) applied to said compensation means at a measured time wherein the output of said compensation means is fed to a calibration cycle means which operates as a function of said first time and the difference between said first time and said second time in order to produce a corrective value ($N\tau+T1-T2+dm$).

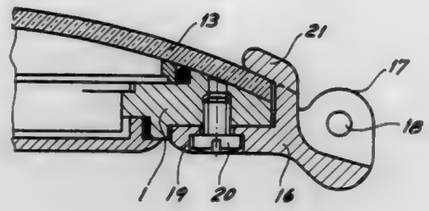
4,637,734
WATCH CASE

Paul Gogniat, Bienne, Switzerland, assignor to Montres Rado S.A., Lengnau, Switzerland

Filed Jul. 8, 1985, Ser. No. 752,681
Claims priority, application Switzerland, Jul. 12, 1984, 3383/84
Int. Cl.[4] G04B *37/00*
U.S. Cl. 368—294 6 Claims

1. A watch case comprising a caseband, a crystal of mineral material the peripheral part of which rests on the caseband and entirely covers it, and a back cover, each of these three elements comprising an outer surface and an inner surface which defines a receptacle intended to accommodate a movement surmounted by a dial, and means for fastening the crystal to the caseband, wherein the inner and outer surfaces of the crystal are both entirely defined by a sphere portion, and at least a part



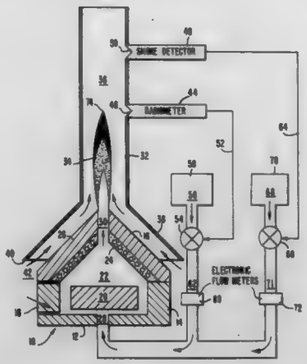


of the crystal periphery is located at a level below that of the dial.

4,637,735
BENCH-SCALE MATERIAL FLAMMABILITY TEST APPARATUS AND PROCESS FOR MEASURING FLAMMABILITY

John de Ris, and George H. Markstein, both of Sharon, Mass., assignors to Factory-Mutual Research Corporation, Norwood, Mass.

Continuation of Ser. No. 569,651, Jan. 10, 1984, abandoned. This application Jan. 27, 1986, Ser. No. 823,124
Int. Cl.[4] G01N *25/00*
U.S. Cl. 374—8 19 Claims



1. A bench-scale apparatus for measuring the heat-release rate of pyrolysis vapors of a material sample comprising

an oven defining a heat chamber for receiving said sample, a flue, and at least one entry port,

a radiometer having a radiation sensor disposed in relation to said flue such that an area into which burning pyrolysis vapors are directed from said flue is adjacent to said radiation sensor,

a flue-gas control valve in communication with said port, and

an electronic flow meter for measuring the amount of fuel-gas passing through said control valve,

wherein signals from said radiometer operate said fuel-gas control valve to provide an amount of fuel-gas sufficient to maintain a flame of said vapors at a predetermined height, and wherein said meter measures said amount of fuel-gas such that the measurement of said meter is used as an indication of the heat-release rate of said pyrolysis vapors, whereby larger amounts of measured fuel-gas indicate lesser sample heat release rates and smaller amounts of fuel-gas indicate greater sample heat release rates.

2. The apparatus of claim 1, further comprising

a smoke detector having a smoke sensor disposed in relation to said flue such that said area is adjacent to said smoke sensor,

a diluent control valve in communication with said port, and

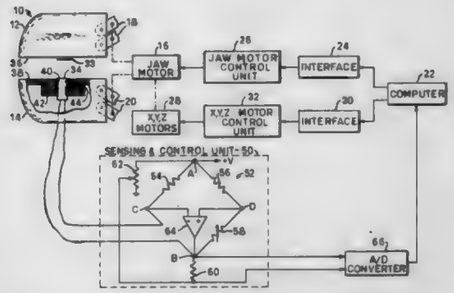
a second electronic flow meter for measuring the amount of diluent passing through said diluent control valve,

wherein signals from said smoke detector operate said diluent control valve to provide an amount of diluent sufficient to maintain the sootiness of said flame at a predetermined level, and wherein said second meter measures said amount of diluent such that the measurement of said second meter is used as in indication of the sootiness of said pyrolysis vapors, whereby larger amounts of measured diluent indicate greater sootiness and smaller amounts of measured diluent indicate lesser sootiness.

4,637,736
SLIP SENSING METHOD AND APPARATUS

Gerry B. Andeen, Menlo Park; Eric J. Shrader, Palo Alto, and Roy D. Kornbluh, Redwood City, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Apr. 19, 1985, Ser. No. 725,127
Int. Cl.[4] G01K *7/00*; B25J *15/02*
U.S. Cl. 374—45 15 Claims



4. Slip sensing means for sensing slip between an object and object supporting means having at least one supporting surface, said slip sensing means comprising

thermal responsive means located at the supporting surface of the object supporting means and adapted for intimate engagement with the face of an object supported thereby,

means for electrically heating said thermal responsive means to maintain the temperature thereof and the localized temperature of the object at the point of engagement therewith above ambient temperature, the temperature at the surface of the object decreasing with distance from the heated thermal responsive means, the temperature of the thermal responsive means at least momentarily changing with initial engagement thereof with the object and with slip of the object along the object supporting means after said initial engagement, and

means for detecting change in the thermal responsive means in response to temperature change thereof due to slip of the object along the object supporting means for sensing said slip,

said thermal responsive means comprising a thermistor,

said means for electrically heating said thermistor comprising a resistor bridge, one arm of which bridge comprises said thermistor,

a load resistor,

a source of d.c. potential connected across one pair of opposed bridge junctions through said load resistor,

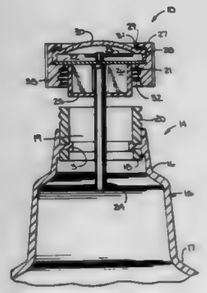
operational amplifier means having a pair of input terminals connected across the other pair of opposed bridge junctions, and

means for connecting the operational amplifier means output to the one bridge junction to which said thermistor and load resistor are connected, said thermistor providing a negative feedback path for said operational amplifier means.

4,637,737
APPARATUS FOR MEASUREMENT OF WATER CONDITIONS IN A WATERMATTRESS

Dominic A. Ricchio, 6021 56th Ave., Kenosha, Wis. 53142

Continuation-in-part of Ser. No. 526,441, Aug. 25, 1983, abandoned. This application Sep. 10, 1984, Ser. No. 648,827
Int. Cl.[4] G01K *1/14*
U.S. Cl. 374—141 8 Claims



1. A gauge for quantitative measurement within a water-filled mattress of the type having an open-ended, recessable filler spout, the gauge comprising:

a cylindrical stopper that fits closely around an inside wall of the recessable filler spout of said water-filled mattress to maintain a cylindrical shape for the filler spout, wherein the stopper has an end that fits closely around the open end of the filler spout;

a quantitative measuring instrument with a sensing stem extending through the cylindrical stopper and with a crystal disposed above the end of the stopper to permit observation outside the mattress of measurements sensed by said instrument, wherein the sensing stem extends to a depth where the sensing stem is in thermal contact with the water when the filler spout is in a recessed position; and

an annular hold-down member that runs around the crystal and the filler spout to secure the stopper in sealing relationship with the filler spout;

said cylindrical stopper, measuring instrument crystal and annualr hold-down member forming a blunt-ended cap with a profile that is non-interfering with use of the mattress when the recessable filler spout is moved to its recessed position.

4,637,738
ALIGNMENT COMPENSATOR FOR LINEAR BEARINGS

Vincent Berkley, 702 Oella Ave., Ellicott City, Md. 21043

Filed Jul. 31, 1985, Ser. No. 760,949
Int. Cl.[4] F16C *29/12*
U.S. Cl. 384—38 17 Claims

1. An alignment compensator for use with a linear bearing mounted on a first support member aligned substantially paral-

lel with a second support member, the first and second support members supporting a movable carriage, said compensator comprising:

a body member formed of an elastically deformable material, said body member having angular deflection means for



compensating for misalignment between said first and second support members via angular elastic deformation of said body member, said angular deflection means comprising substantially rigid support means for maintaining close tolerances between said carriage and said first and second support members.

4,637,739

LINEAR GUIDE DEVICE

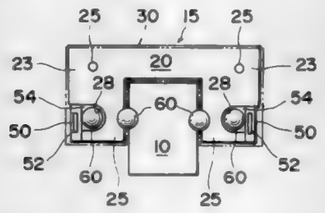
Masaru Hattori, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1985, Ser. No. 792,588

Claims priority, application Japan, Nov. 10, 1984, 59-169819[U]

Int. Cl.⁴ F16C *29/06*

U.S. Cl. 384—45 **4 Claims**



1. A linear guide device comprising:

a rail extending axially and having ball rolling grooves formed lengthwisely thereof in the opposite outer sides thereof; a bearing body of saddle-like shape mounted on said rail and having in the opposite inner sides thereof ball rolling grooves each being opposed to said each ball rolling groove and having in the opposite outer sides thereof open concave grooves formed lengthwisely thereof; closure members each having sufficient width and length to cover said each concave groove; a pair of end caps mounted on the opposite ends of said bearing body and supporting the opposite end portions of said closure members, ball return holes being formed by said concave grooves and said closure members, said end caps being formed with ball circulation holes connecting said ball rolling grooves to said ball return holes; and a number of balls inserted in said ball rolling grooves, said ball return holes and said ball circulation holes.

4,637,740

BEARING BUSHING FOR UNIVERSAL JOINTS

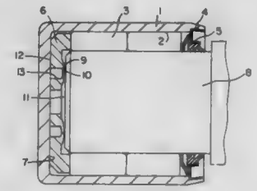
Armin Olschewski, Schweinfurt; Bernhard Bauer, Hassfurt; Elisabeth Zirk, Dittelbrunn, and Rut Heemskerk, Pfaffenhausen, all of Fed. Rep. of Germany, assignors to SKF GmbH Schweinfurt, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 16, 1985, Ser. No. 787,807

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1984, P3438909[U]

Int. Cl.⁴ F16C *17/08*; F16D *3/20*

U.S. Cl. 384—425 **3 Claims**



1. For a bearing bushing of generally cup-like form for universal joints including a universal joint pin, a disk-like check plate having opposing side faces disposed between an axial end face of the pin and a bottom wall of the bushing, a plurality of spaced discrete projections extending outwardly from one side face of said check plate confronting the pin, said projections arranged in a generally circular array and being circumferentially spaced relative to one another, a plurality of recesses extending inwardly from the other face of said check plate aligned with said projections extending inwardly a predetermined distance to define a thin-walled flexible dome-shaped projection, the wall thickness of the check plate surrounding and adjacent said projections being substantially greater than said dome-shaped projections.

4,637,741

PEDAL CARRIER, IN PARTICULAR FOR A CLUTCH AND BRAKE, ON A MOTOR VEHICLE

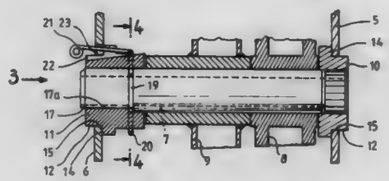
Guy Gillet, Marines, France, assignor to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly-Sur-Seien, both of, France

Filed Nov. 20, 1984, Ser. No. 673,368

Claims priority, application France, Nov. 23, 1983, 83 18662

Int. Cl.⁴ G05G *1/14*; B60K *23/02*; B60T *7/06*

U.S. Cl. 384—428 **4 Claims**



1. A pedal carrier device comprising a support having two spaced-apart side walls each defining an aperture, a pin carrying at least one pedal, for example a clutch or brake pedal, and disposed between said two side walls of a support, said pin having end portions, a sleeve engaged on each end portion of the pin and comprising a generally circular-shaped bearing surface including two parallel flat portions, each bearing surface being cooperative with an inner contour of a respective one of said apertures which has the same diameter and communicates with an edge of the respective side wall through a passage whose width is slightly greater than the distance between the flat portions of the respective sleeve, and means for immobilizing the assembly formed by the pin and the sleeves relative to the side walls, one end of the pin being fixed to a first sleeve of said sleeves while the other end of the pin is freely engaged in a second sleeve of said sleeves, said immobilizing means comprising a first means for immobilizing in rotation the pin relative to the second sleeve, a second means for immobilizing in translation the pin relative to the second sleeve, a third means for immobilizing in rotation said assembly relative to the support and a fourth means for immobilizing in translation said assembly relative to the support, said second means and said third means being formed by a U-shaped resilient member having branches, two transverse opposed recesses in the second sleeve, and a groove in the pin, said branches being simultaneously engaged in said two recesses, said U-shaped member including an extension portion which is substantially parallel to the pin and the respective side wall defining a notch in which notch is resiliently engaged said extension portion, said notch communicating with the aperture in which the second sleeve is engaged.

4,637,742

WIRE DRIVE CIRCUIT IN DOT-MATRIX PRINTER

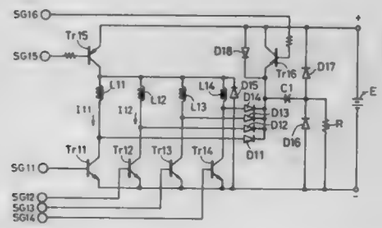
Kiyoharu Sakai, Suzuka, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 10, 1985, Ser. No. 742,907

Claims priority, application Japan, Jun. 15, 1984, 59-124194

Int. Cl.⁴ B41J *9/38*, *3/12*

U.S. Cl. 400—121 **9 Claims**



1. A wire drive circuit in a dot-matrix printer, having a plurality of solenoids for actuating individual print wires, a power-on/off switching element connected commonly to a first end of each of the solenoids, a plurality of solenoid-selecting switching elements, each of the solenoid-selecting switching elements being connected in series to a second end of a respective solenoid, and a DC power supply connected between the power-on/off switching element and the solenoid-selecting switching elements, the solenoids being selectively energized by turning on said power-on/off switching element and respective one of the solenoid-selecting switching elements, whereby the print wires are selectively actuated under selective energization of the respective solenoids, said wire drive circuit further comprising:

a plurality of recifying elements connected to said second ends of the solenoids;

a discharge switching element connected to said second ends of said solenoids through the respective rectifying elements, said discharge switching element being turned on and off when said power-on/off switching element is turned off and on, respectively, to discharge electric energy which is produced by the solenoid previously energized when said power-on/off switching element in turned on;

main energy-absorbing means, connected to said discharge switching element, for absorbing said electric energy while said discharge switching element is on; and

an auxiliary energy-absorbing capacitor connected to said second ends of said solenoids through said rectifying elements, to absorb a portion of said electric energy which has not been discharged through said discharge switching element, after the discharge switching element is turned off.

4,637,743

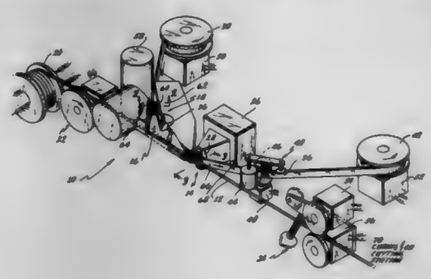
MATRIX PRINTER AND INKER FOR INDEFINITE LENGTH ARTICLES

Aron Kerner, 1531 N. Fuller Ave. Apt. 27, Los Angeles, Calif. 90046, and Andrei Grombchevsky, 24 Lancewood Way, Irvine, Calif. 92715

Continuation of Ser. No. 653,083, Sep. 21, 1984, abandoned. This application Nov. 14, 1985, Ser. No. 798,139

Int. Cl.⁴ B41F *17/10*; B41J *3/20*, *31/14*, *35/04*

U.S. Cl. 400—124 **11 Claims**



1. A printer for printing both variable and repetitive information on a moving surface as such surface passes by a printing station, said printer comprising:

stationary dot matrix impact printing means for imprinting markings on a face of a moving substrate at a printing station;

substrate transport means for transporting said substrate continuously past said printing station in a first direction at a controlled rate;

web transport means for transporting an uninked foil element in said first direction past said printing station once between said face and said printing means from a web supply member to a web takeup member, said printing station being between said supply and takeup members;

detachable inking means including an ink supply and ink applicator means unitary with said ink supply for applying a marking media to a first previously uninked surface of said foil element as said foil element passes in said first direction between said supply member and said printing station, said first surface being disposed in position to contact said face responsive to the action of said printing means whereby said marking media is transferred from said first surface to said face at said printing station said inking means including said ink applicator means being readily detachable as a unit without removal or exchange of said foil element; and

control means for coordinating the operation of said respective printing, substrate transport and web transport and for permitting continuous variation in said markings without interrupting said operation.

4,637,744

ACTUATION DEVICE FOR TWO TYPEWRITER FUNCTIONS

Franco Valle, and Pietro Musso, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Continuation of Ser. No. 252,416, Apr. 9, 1981, Pat. No. 4,472,073. This application Jul. 22, 1983, Ser. No. 516,429

Claims priority, application Italy, Apr. 15, 1980, 67581 A/80

The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.

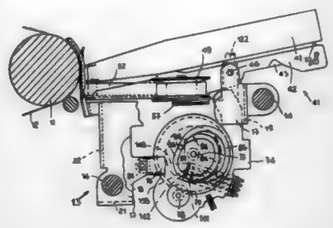
Int. Cl.⁴ B41J *5/30*

U.S. Cl. 400—185 **13 Claims**

1. In a typing machine comprising a platen including a typ-

ing point, a typing ribbon, typing ribbon feed means actuatable for feeding said typing ribbon, a correcting ribbon, a supporting frame for supporting the correcting ribbon, and lift means actuatable for moving the supporting frame between an inoperative position and an operative position, wherein the correcting ribbon is away from the typing point when the supporting frame is in said inoperative position and wherein the correcting ribbon is in front of the typing point for correction of a printed character where the supporting frame is in said operative position, the combination comprising:

a reversible motor having a rotatable motor member, means



controlling said reversible motor for causing said rotatable motor member to execute bidirectional cyclic rotations,

first means responsive to a cyclic rotation of said rotatable motor member for actuating said typing ribbon feed means, and

second means responsive to a unidirectional cyclic rotation of said rotatable motor member according to a given sense of rotation for actuating said lift means, and wherein said second means remain inoperative over said supporting frame upon cyclic rotations of said rotatable motor member opposite to the given sense of rotation of said rotatable motor member.

4,637,745

MELT DISPENSERS

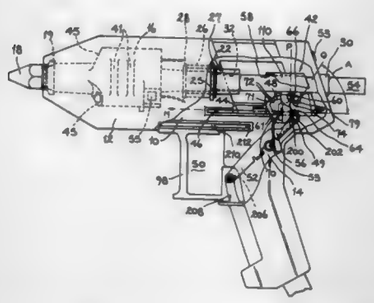
Joachim Speisebecher, Oberursel, and Christian Wooge, Bad Homburg, both of Fed. Rep. of Germany, assignors to USM Corporation, Flemington, N.J.

Filed Jul. 17, 1985, Ser. No. 755,805

Claims priority, application United Kingdom, Jul. 28, 1984, 8419303

Int. Cl.⁴ B67D *5/32*

U.S. Cl. 401—1 **16 Claims**



1. A heat conductive melt body comprising a chamber for melting solid composition provided in the form of a rod the chamber having an inlet through which a rod of composition may be inserted into the chamber and an outlet from which melted composition may be dispensed, fin elements disposed lengthwise within the chamber and of progressively increasing size considered in a direction extending from the inlet to the outlet, the fin elements being so shaped and located that edge surfaces thereof disposed towards an interior of the chamber define surface portions of an opening of progressively reducing cross section the peak of which opening is located adjacent to the outlet but on the inlet side thereof and so that end portions of the fin elements at the outlet are spaced to define a series of exit slots spaced about an axis of the opening to provide the outlet, and at least one housing for receiving electrically operated heating means for heating the melt body.

4,637,746

DISPENSER FOR A TWO-COMPONENT ADHESIVE

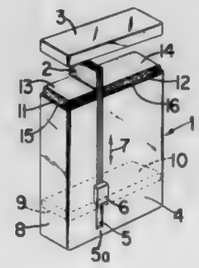
Peter Vierkötter, Leverkusen, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 16,549, Mar. 1, 1979, abandoned. This application May 6, 1981, Ser. No. 260,940

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1978, 2810408

Int. Cl.⁴ B05C *17/00*; A45D *40/24*; B67D *5/42*

U.S. Cl. 401—82 **2 Claims**



1. Dispenser for dispensing two components in a volumetric mixing ration with two chambers each provided to receive one of the components in the mixing ratio corresponding to the volumetric ratio of the components, where the chamber bottoms are provided with slidable pistons for simultaneously pushing the contents of the chambers out of the dispenser, characterized in that the dispenser is a hollow right prism divided by a self-supporting partition of the length of said chambers and extending parallel to the longitudinal axis of the prism and displaceable in the direction of this axis and extending between the walls of said chambers whereby accidental mixing of said components in the chambers is prevented, that pistons forming the bottom surfaces of the chambers are laterally attached to the bottom end of the partition facing the bottom of the dispenser, that stripping edges are present at the top of said chambers, that a slot is provided in one wall of the dispenser along one edge of the partition, and that the partition has a lug directly attached therewith, said lug projecting to the outside through said slot to move the partition and attached pistons up and down in the dispenser and being operated from the outside of the dispenser to displace the partition in a direction parallel to the longitudinal axis of the prism.

4,637,747

DEVICE FOR MOUNTING A PROTECTIVE CAP ON A SUPPORT

Alain Perrin, Bobigny, and Patrice Moinard, Montreuil, both of France, assignors to Societe Anonyme D.B.A., Paris, France

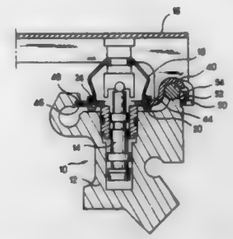
Filed Aug. 23, 1984, Ser. No. 643,600

Claims priority, application France, Sep. 19, 1983, 83 14860

Int. Cl.⁴ F16B *1/04*

U.S. Cl. 403—23 **6 Claims**

1. A locking member for mounting a protective cap on a support, the support having a first bearing surface and a base surface which is intended to be at least partially protected by the protective cap, the locking member comprising a first end joined to the periphery of the cap and the locking member extending between the first end and the first bearing surface, characterized in that the support includes a second bearing surface located adjacent a seat for receiving pin means, the locking member having a first portion engaging the first bearing surface and a second portion which extends over the seat to



engage the second bearing surface, the second portion including a complementary shaped portion for the pin means, the locking member maintained in position by the pin means which is disposed between the seat and complementary shaped portion so that the first portion and second portion engage, respectively, the first and second bearing surfaces.

4,637,748

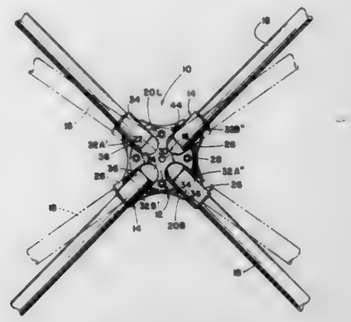
HUB AND STRUT-ENDCAP ASSEMBLY FOR TENT FRAME STRUTS

Allan E. Beavers, Littleton, Colo., assignor to T. A. Pelsue Company, Englewood, Colo.

Filed Jun. 7, 1985, Ser. No. 743,983

Int. Cl.⁴ F16B *17/00*

U.S. Cl. 403—170 **10 Claims**



1. The self-adjusting hub and strut-endcap assembly for tent frame roof and wall struts which comprises: a hub two piece member shaped and joined together to provide four ball-receiving sockets arranged in equiangularly-spaced relation around the center thereof with each such socket adapted to receive and retain a ball for universal movement therein, and said hub member including side-opening channel-forming entryways leading into each socket, said entryways each having divergent sidewalls bordering a pair of intersecting seats at the base thereof bearing an acute angular relation to one another, one of said pair of seats extending radially outward from its ball-receiving socket while the other of said paired seats is skewed with respect to said radially-extending one, and dimetrically-located pairs of said entryways having their skewed seats opposite one another; and, four strut-endcap elements each having a ball on the inner end thereof and a tubular sleeve projecting outwardly from said ball for receiving the inner end of a tent frame strut, said ball when seated in a ball-receiving socket in the hub being shaped and adapted to align the sleeve depending therefrom for limited side-to-side movement between a first position seated in the radially-extending seat of the flared entryway and a second position seated in the skewed seat thereof, said hub member and strut-endcap elements cooperating with one another in assembled relation with the sleeves seated in their first positions to define an assembly specifically adapted to the formation of a square wall or roof frame, and said member and elements cooperating with said sleeves seated in their second positions to define a four-sided polygonal frame having at least two unequal sides.

4,637,749

CONNECTOR FOR MODULAR PHYSIOLOGICAL INSTRUMENTS

Paul W. Jones, Issaquah; Rodney J. Merry, Bothell, and Gregory A. Linstad, Woodinville, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Filed Jan. 8, 1985, Ser. No. 689,743

Int. Cl.⁴ F16B *21/00*; E04G *4/00*

U.S. Cl. 403—322 **16 Claims**



1. An apparatus for connecting first and second physiological instrument components, the first component having an exterior first surface and the second component having an exterior second surface, the apparatus comprising:

means forming a plurality of mutually parallel blades extending outward at the first surface at an acute angle with respect to a direction normal to the first surface;

means forming a plurality of mutually parallel slots extending inwardly at the second surface at said acute angle with respect to a direction normal to the second surface, the slots being sized and spaced to receive the blades to thereby connect the components; and

latch means for selectively engaging and securing one of the blades in its corresponding slot such that the blade cannot be removed from the slot without disengaging the latch means from the blade.

4,637,750

EVAPORATIVE COOLER BLOWER ROTOR-SHAFT SECURING HUB

Edward F. Ward, 8802 CRB, Tucson, Ariz. 85738

Filed May 14, 1984, Ser. No. 610,276

Int. Cl.⁴ F16C *25/00*

U.S. Cl. 403—344 **2 Claims**

1. A securing hub adapted to secure a bushing to a central shaft comprising:

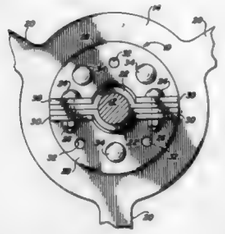
a first strap defining a semi-circle adapted to encircle a portion of the central shaft, said first strap also including a pair of oppositely protruding ears adapted to protrude from the central shaft, each of said pair of ears including an opening therethrough;

a second strap defining a semi-circle adapted to encircle a portion of the central shaft, said second strap also including a pair of oppositely protruding ears adapted to protrude from the central shaft, each of said pair of ears including an opening therethrough; said first and second

straps adapted to co-act in surrounding the central shaft with one of each pair of ears of said first and second strap proximate each other, on opposite sides of the central shaft, and openings aligned;

a first flange adapted to be secured to the bushing and to be secured to said first strap, said first flange defining concentric half circles with a pair of spaced apart right angle brackets attached thereto, each of said pair of brackets including an opening therethrough;

a second flange adapted to be secured to the bushing and to be secured to said second strap, said second flange defining concentric half circles with a pair of spaced apart right angle brackets attached thereto, each of said brackets



including an an opening therethrough, both of each of said first and second flange right angle bracket openings adapted to coincide with said openings of said first and second strap protruding ears respectively; and

a plurality of bolts and nuts adapted to penetrate the aligned openings of said first and second strap, and said first and second flanges respectively, on both sides of the central shaft in order that said nuts may be tightened upon said bolts to compress and secure said first and second straps against the central shaft and to secure said first flange to said first strap and said second flange to said second strap whereby the bushing, being secured to said first and second flange, is thereby secured to the central shaft.

4,637,751

COUPLING DEVICE FOR AGRICULTURAL IMPLEMENTS

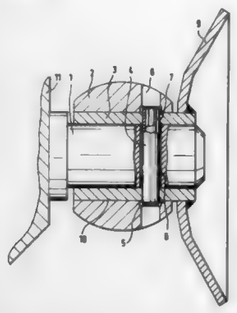
Jürgen Vollmer, Lohmar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar/Rhld., Fed. Rep. of Germany

Filed Oct. 4, 1985, Ser. No. 784,838

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1984, 3439430

Int. Cl.⁴ F16B *7/10*

U.S. Cl. 403—379 **2 Claims**



1. A coupling device for enabling connection of a coupling hook associated with the lower steering arm of a three-point attaching device with a coupling pin of a heavy agricultural implement comprising:

a coupling pin connected with a frame of said agricultural implement;

a slip-on sleeve arranged to be affixed to said coupling pin;

a catch ball having a longitudinal throughbore for receiving said slip-on sleeve therein;

a catch profile fixed to an outer end of said slip-on sleeve;

a first transverse bore in said catch ball;

a second transverse bore in said slip-on sleeve;

a third transverse bore in said coupling pin;

said first transverse bore having a diameter greater than the diameters of said second and third transverse bores;

axial securing means extending through said second and third transverse bores having ends projecting from both sides of said slip-on sleeve for fixing said slip-on sleeve and said coupling pin together; and

an annular groove formed in said catch ball opening into said longitudinal throughbore and arranged to receive therein said ends of said securing means extending from said slip-on sleeve with clearance all around.

4,637,752

ACCESS COVERS FOR MANHOLES

Antony R. Ceuta, Howe Green Lane, Little Berkhamsted, Hertford, Hertfordshire, England (3G13 8LH)

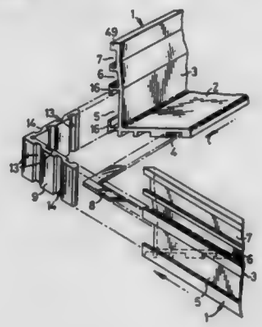
PCT No. PCT/GB84/00280, § 371 Date Apr. 17, 1985, § 102(e) Date Apr. 17, 1985, PCT Pub. No. WO85/00843, PCT Pub. Date Feb. 28, 1985

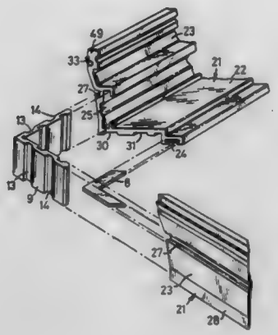
PCT Filed Aug. 13, 1984, Ser. No. 726,898

Claims priority, application United Kingdom, Aug. 18, 1983, 8322225

Int. Cl.⁴ E02D *29/14*

U.S. Cl. 404—25 **4 Claims**





1. An access cover comprising an outer frame and a removable cover member which fits within said outer frame, the cover member comprising an inner frame with an appropriate filling, each said frame being shaped in plan to provide corners and being fabricated from a plurality of lengths of angle-section frame members, each comprising interconnected wall and ledge portions, mitred at their ends to facilitate being joined to each other by joints at said corners to define a substantially vertical wall, formed from said wall portions, and a substantially horizontal ledge, formed from said ledge portions, extending inwardly from the vertical wall, the joint at each corner including an angular corner member with limbs to which the frame members are connected, wherein said lengths of frame members are metal extrusions each formed with a longitudinally extending captive groove in its wall portion, each said angular corner member being shaped so that its limbs fit around the corner within said captive grooves of the associated wall portions, said captive grooves being coaligned, said corner members each defining at least one vertical groove in each of its limbs with a respective wall of each said vertical groove being angled to provide opposed sloping receiving faces in one limb relative to the other limb and, for each corner, the respective frame members being joined together by simultaneously piercing tongues from their wall portions and crimping said tongues directly into positive engagement against the slope of the receiving faces of the corner member to urge the frame members together at the corner concerned.

4,637,753

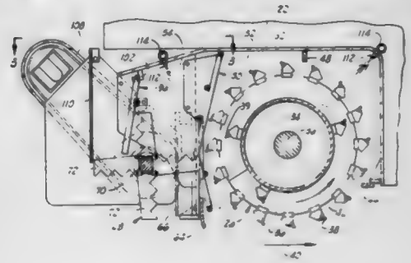
ROAD PLANAR HAVING PARTICLE REDUCING MEANS

George W. Swisher, Jr., Oklahoma City, Okla., assignor to CMI Corporation, Oklahoma City, Okla.

Filed Nov. 19, 1984, Ser. No. 672,939

Int. Cl.⁴ E01C *23/12*

U.S. Cl. 404—90 **9 Claims**



1. In a road planar adapted to travel in a forward direction during a planing operation:

housing means forming a primary cutting chamber and a secondary cutting chamber to the rear of and communicating with the primary cutting chamber;

primary cutter means in the primary cutting chamber mounted for rotation about an axis extending transversely with respect to the planar and adapted to remove chunks of pavement material and direct said removed pavement material rearwardly toward the secondary cutting chamber;

first grid means carried by the housing means between the primary and secondary cutting chambers for sizing the removed pavement material moving from the primary cutting chamber to the secondary cutting chamber;

secondary cutting means mounted in the secondary cutting chamber having radial arms thereon, said secondary cutting means being mounted for rotation whereby said arms move through said first grid means to break up removed pavement material impinging on said first grid means; and

second grid means carried by the housing means in the secondary cutting chamber arranged to the rear of the first grid means in the path of movement of the removed pavement material in a position where said arms pass therethrough to further break up and size the removed pavement material.

4,637,754

LINING OF PIPELINES AND PASSAGEWAYS

Eric Wood, Northants, United Kingdom, assignor to Insituform Holdings Limited, Douglas, Isle of Man

Filed Dec. 14, 1984, Ser. No. 681,964

Claims priority, application United Kingdom, Jan. 7, 1984, 8400364

Int. Cl.⁴ E21D *11/38*; B29C *63/36*

U.S. Cl. 405—150 **7 Claims**



1. A method of lining a pipeline or passageway comprising the steps of:

A. inserting pads of resin absorbent material impregnated with a curable synthetic resin into the pipeline or passageway at spaced intervals by driving an anchoring pin through each pad into a wall of the pipeline or passageway so that a head of said pin traps the respective pad to said wall while leaving an overlapping portion of the pad surrounding the head of the pin;

B. inserting into the pipeline or passageway, before the resin impregnating said pads of material has cured, a resin impregnated tubular liner presenting a face of uncured resin to said pads so that the uncured resin face of the liner comes into resin contact with the overlapping portions of the pads of resin absorbent material; and

C. curing the resin of the pads of resin absorbent material and the liner such that the pin heads become embedded in cured resin and provide compressive hoop stress reinforcement for the liner.

4,637,755

APPARATUS FOR BURYING CONDUIT

Scott Tollefson, 508 E. Irene, Casa Grande, Ariz. 85222; Howard A. Wuertz, and Charles R. Schultz, both of Rte. 1, Box 115A, Coolidge, Ariz. 85228

Continuation-in-part of Ser. No. 607,407, May 7, 1984, abandoned, which is a continuation of Ser. No. 467,383, Feb. 17, 1983, Pat. No. 4,447,173. This application Nov. 19, 1984, Ser. No. 672,958

Int. Cl.⁴ E02F *5/10*

U.S. Cl. 405—181 **1 Claim**

1. Apparatus for burying tubing from a supply thereof in a plowed field having

a plurality of general parallel elongate, upstanding, spaced beds of earth, and

a plurality of elongate spaced furrows, each furrow generally lying along and following a generally horizontally oriented imaginary line,

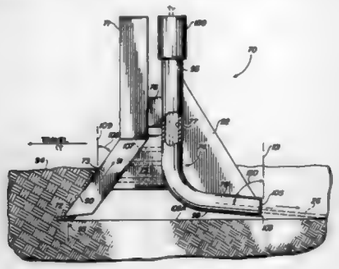
each elongate bed generally lying between a pair of said furrows, said apparatus comprising

(a) a frame,

(b) a plurality of members carried on said frame and each shaped, contoured and dimensioned to track along one of said furrows in a direction of travel generally parallel to said imaginary horizontally oriented line;

(c) an assembly carried on said frame to cut a trench in one of said beds and dispensing tubing having an elongate

cross sectional area in said trench while said apparatus moves in said direction of travel, said assembly including
(i) a vertically disposed elongate blade assembly for cutting said trench, and
(ii) a tube dispensing member including
a generally vertically disposed top section, and
a sloped generally horizontally disposed elongate bottom section, said top and bottom sections having an inner



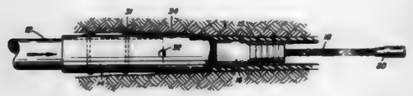
cylindrically shaped channel extending continuously therethrough, said bottom section including
an upper end connected to said top section of said tube dispensing member,
a lower end consisting of a tube dispensing mouth, and
a longitudinal axis extending through said inner cylindrically shaped channel thereof, said axis being at an angle to the vertical of less than 90°.

4,637,756

APPARATUS FOR REMOVING AND REPLACING PIPE BENEATH AN EARTHFILL

Flounoy W. Boles, P.O. Box 847, East Tallassee, Ala. 36023

Filed Jan. 23, 1985, Ser. No. 694,021
Int. Cl.⁴ F16L *1/00*
U.S. Cl. 405—184 **15 Claims**



1. Apparatus for simultaneously removing and replacing a section of service tubing or pipe embedded in an earth fill, the apparatus being capable of removing and replacing service tubing or pipe of varying diameter, comprising:
a length of cable having a free end and an inner end;
an adapter member connected tothe inner end of the cable and being of a diameter less than that of the smallest diameter section of service tubing which is to be replaced;
a plurality of displacement members of substantially cylindrical conformation, each of said displacement members having a differing outer diameter which is greater than at least the inner diameter of the service tubing which is to be replaced by each said displacement member, the displacement members each being hollow to form a longitudinally disposed interior channel, each of said channels having an inner diameter which is greater than the outer diameter of the service tubing which is to be installed by each said displacement member, each of the displacement members having abutment surfaces on one end for abutting against the end of the section of service tubing which is to be replaced;
means on the adaptor means and on each of the displacement members for releasably connecting the adaptor member to the displacement member, each of the plurality of displacement members being connectible to the one adaptor member; and,
means carried by each of the displacement members for connecting a free end of the service tubing which is to be installed to the displacement member, whereby respective displacement members can be substituted for within the apparatus by ready and rapid disconnection of any one of the displacement members from the adaptor member and replacement on the adaptor member with a different sized displacement member to allow service tubing of different sizes to be removed and replaced.

4,637,757

BARBED ANCHOR PILE

Paul M. Aagaard, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 12, 1984, Ser. No. 660,159
Int. Cl.⁴ E02D *5/54, 5/74, 7/02*
U.S. Cl. 405—227 **4 Claims**



1. An anchor for an offshore platform comprising:
an anchor pile having a central axis along its length;
a plurality of movable barbs, each barb having a central axis along its length, said barbs located along the length of the pile, the axis of each movable barb being approximately 90° to the central axis of the pile, said barbs generally shaped like a rhombus having an inner surface and an outer surface, said inner surface facing upward and said outer surface facing downward; and
a spreader tool having a downward and inward sloping lower edge to engage the barbs so that when the tool is driven downward the barbs are forced outward by the contact between the downward and inward sloping lower edge and the barbs' upward facing inner surface.

4,637,758

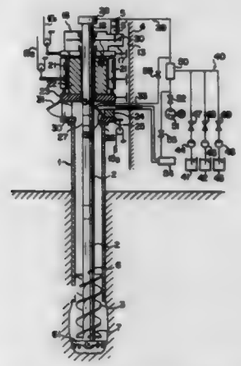
METHOD OF DRIVING HOLLOW PILES INTO THE GROUND

Hiroaki Tamaki, Hiratsuka, and Joji Nakamura, Kamakura, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Division of Ser. No. 357,270, Mar. 11, 1982, Pat. No. 4,494,613. This application Mar. 16, 1984, Ser. No. 576,995
Int. Cl.⁴ E02D *7/24*
U.S. Cl. 405—248 **5 Claims**

1. A method of driving a hollow pile into the ground, comprising the steps of:
(a) inserting a hollow rod into the hollow pile, said hollow rod having a short auger fixedly secured to a leading end portion thereof and a cutter mounted to the leading end thereof;
(b) excavating the ground by the cutter and lifting excavated earth and sand to and around the upper portion of the short auger by rotating the same; and

(c) spouting highly pressurized air from a nozzle provided at a leading end portion of the hollow rod thereby lifting the excavated earth and sand to and beyond the upper end of



the hollow pile and discharging the same from above the hollow pile while continuously excavating the ground by the cutter thereby driving the hollow pile deep into the ground.

4,637,759

METHOD FOR FORMING A MOISTURE BARRIER IN A SOIL CONTAINING SOLUBLE SALTS

Yutaka Owa, Chiba; Yoshiro Tanaka, Ichikawa; Takeshi Saito, and Yoshiro Takeda, both of Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Apr. 24, 1984, Ser. No. 603,367
Claims priority, application Japan, Apr. 30, 1983, 58-77267
Int. Cl.⁴ E02D *3/12*
U.S. Cl. 405—270 **5 Claims**

1. A method for forming a moisture barrier in a soil containing a soluble salt which comprises sprinkling a water-soluble polymer, or a combination of water-soluble polymers capable of being insolubilized by the interaction with the slat in the soil, over the soil, to form a water-impermeable layer in the soil underground, wherein the water-soluble polymer, or the combination of water-soluble polymers is selected from the group consisting of a copolymer of (A) acrylic acid and (B) acrylamide and/or N-vinyl-2-pyrrolidone, and a polymer composition of (C) polyacrylic acid and/or sulfated polysaccharide, and (D) a nonionic polymer solected from the group consisting of polyacrylamide, polyvinyl pyrrolidone, polyvinyl alcohol, hydroxyalkyl celluloses, hydroxyalkyl starches and guar gum.

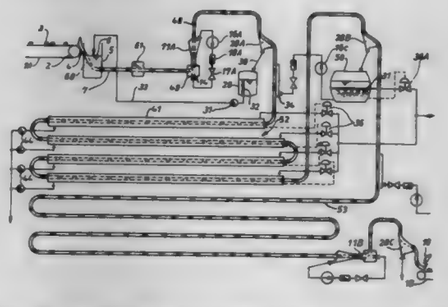
4,637,760

APPARATUS FOR TRANSPORTING ARTICLES BY FLUID FLOW THROUGH A PIPE SYSTEM

Günther Boos, Markdorf, Fed. Rep. of Germany, assignor to Alfred Bolz GmbH & Co. KG, Wangen, Fed. Rep. of Germany

Filed Oct. 22, 1984, Ser. No. 663,759
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339362
Int. Cl.⁴ B65G *53/58, 53/14*
U.S. Cl. 406—105 **11 Claims**

1. Apparatus for transporting articles having a determined geometric shape from a starting location to an end location by fluid flowing through a pipe system, particularly packages containing said articles, and wherein said articles are treated during their transport, comprising in combination
first jet pump means of the Venturi type at a first location, said jet pump means including a suction chamber having a jet nozzle, an article inlet and a mixing outlet, diffusing means having an intake end of a predetermined cross-sectional area connected to said suction chamber, and a diffuser end having a drive fluid outlet of a certain cross-sectional area, and a transport fluid outlet, said predetermined cross-sectional area of said diffuser intake end-widening in a generally hourglass and smooth manner devoid of any sharp transitions to said certain cross-sectional area of said diffuser end,
said first jet pump means further including feed-back means for connecting said drive fluid outlet to said jet nozzle, pumping means downstream of said drive fluid outlet, and regulating valve means downstream of said pumping means for connecting said drive fluid outlet to said jet nozzle, so that at least a portion of the drive fluid passing through said drive fluid outlet is returned to said diffuser means through said suction chamber,



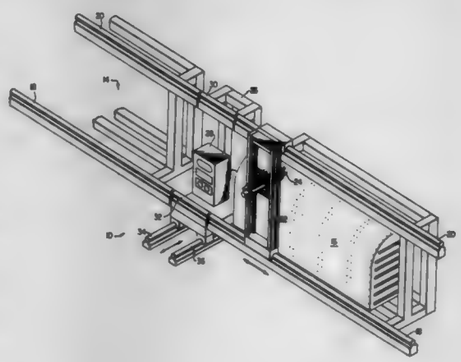
guide means for guiding said articles from said mixing outlet through said diffusing means, said guide means including parallel bars spaced from one another so as to guide the articles therebetween at minimal resistance to fluid flow,
transport pipe means connected to said transport fluid outlet of said diffuser end, and extending to a second location,
injector means for injecting said drive fluid into said transport pipe means under pressure,
at least one additional jet pump means acting in opposition to said first jet pump means, so as to facilitate control of the pressure in said transport pipe means, and
suction pipe means for carrying said articles to said article inlet of said first jet pump means.

4,637,761

AUTOMATED TOOL POSITIONING SYSTEM

William J. Murray, Midlothian, and George A. Earle, III, Dallas, both of Tex., assignors to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Mar. 19, 1984, Ser. No. 590,905
Int. Cl.⁴ B23B *49/00*; B23C *1/12*
U.S. Cl. 408—16 **3 Claims**



1. An automated tool positioning system comprising:

a plurality of work stations, each adapted to support a workpiece and having guide means disposed along one side thereof;

a single control device for generating tool position signals, said control device having guide means disposed along one side thereof;

means for selectively aligning said guide means of said single control device with said guide means of a selected one of said plurality of work stations comprising a guide rail disposed perpendicular to said guide means of said plurality of work stations wherein said single control device may be aligned adjacent to each of said plurality of work stations;

a tool support member movable along said guide means of a selected one of said plurality of work stations in response to said tool position signals for movably support and positioning a cutting tool in proximity to a selected surface on the selected workpiece, said cutting tool having a cutting implement mounted along the axis of said cutting tool with a cutting point extending outward therefrom; and

means for rotating said cutting tool through a conical section having its vertex at said cutting point to position said cutting implement normal to the selected surface on the workpiece.

4,637,762

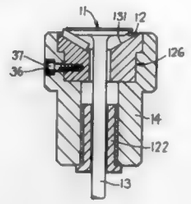
HAND-OPERATED VALVE REFACER

Franklin L. Acker, Owosso, Mich., assignor to Neway Manufacturing, Inc., Corunna, Mich.

Continuation of Ser. No. 793,495, Oct. 30, 1985, which is a continuation of Ser. No. 608,068, May 8, 1984, abandoned. This application Apr. 21, 1986, Ser. No. 856,849

Int. Cl.⁴ B24B *19/26*

U.S. Cl. 408—203.5 **11 Claims**



7. A tool for refacing the annular valve seat formed on the head of a poppet-type valve having an elongated stem projecting from the valve head, comprising:

a sleevelike and substantially cylindrical housing having a stepped bore extending axially therethrough, said stepped bore including a large-diameter bore portion which opens outwardly through one axially end of said housing, said large-diameter bore portion defining an inner annular shoulder on said housing;

a substantially cylindrical sleevelike support removably positioned within and substantially wholly occupying said large-diameter bore portion, said cylindrical support having an inner axial surface which substantially abuts said shoulder;

said cylindrical support having opening means extending coaxially therethrough in alignment and communication with said bore, said opening means including a truncated conical recess which opens inwardly from an outer axial end of said cylindrical support and converges as it projects axially therefrom for communication with a small-diameter opening which projects axially of said cylindrical support from an inner axial end thereof, said conical recess being defined by substantially truncated conical surface which opens inwardly of said one axial end, and said small-diameter opening having a diameter which is only a small fraction of the diameter of said truncated conical surface at the large diameter end thereof as defined at said outer axial end of said cylindrical support;

said cylindrical support being axially split so as to define at least three separable arcuate sectors each extending through an angle of substantially less than 180°, said sectors together effectively defining a complete sleevelike cylinder when positioned within the large-diameter bore portion of said housing;

movable securing means coacting between said housing and each said sector for permitting each said sector to be positioned within said large-diameter bore portion and fixedly but releasably secured to said housing;

each of said arcuate sectors having at least one blade-receiving groove formed in the conical surface thereof, said groove extending substantially radially of said conical surface so that the groove opens outwardly at the opposite ends thereof through the large- and small-diameter ends of the truncated conical surface; and

at least one elongated cutting blade fixedly but removably mounted within at least one of said grooves, said elongated blade extending substantially radially outwardly along said conical surface and having a cutting surface thereon which is spaced outwardly from said conical surface.

4,637,763

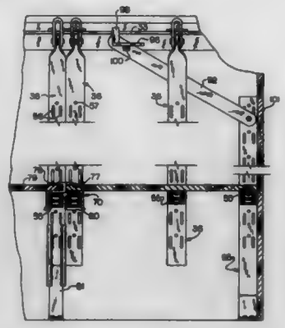
HANGING MULTI-DECK SYSTEM FOR STORING AND SHIPPING ARTICLES IN CONTAINERS

Willem H. P. Van Iperen, Westfield, N.J., assignor to Sea-Land Corporation, Elizabeth, N.J.

Filed Nov. 13, 1984, Ser. No. 670,494

Int. Cl.⁴ B63B *25/18, 25/24*

U.S. Cl. 410—52 **15 Claims**



7. A removable multi-deck system for shipping non-stackable cargo in standardized intermodal containers, said containers having a floor, corner posts, and a pair of overhead extrusions extending between said corner posts, said extrusions having a pair of inwardly extending longitudinal ledges adjacent a roof, said system comprising;

(a) a plurality of removable vertical support hangers, each hanger having a first and a second end,

(b) the first end of each hanger having a releasable ledge engaging means for gripping the inwardly extending ledge adjacent the roof of the intermodal container,

(c) the second end hanging freely to thereby suspend all of the load carried by the hanger from the horizontal ledge of the extrusion,

(d) a plurality of horizontal support means extending between opposing pairs of removable vertical hangers and secured thereto, to thereby provide horizontal support for non-stackable cargo,

whereby said removable hangers and support means may be adjustably spaced along the longitudinal and vertical dimensions of the container, and quickly and easily removed to allow the entire cross-section of the container to be filled with bulk goods.

4,637,764

BOLT ADAPTED FOR ONE-HANDED TIGHTENING BY TIGHTENING TOOL

Yoshio Imai, Abiko, Japan, assignor to Nissan Motor Company, Limited, Yokohama and Sannohashi Seisakusho Company, Limited, Tokyo, both of, Japan

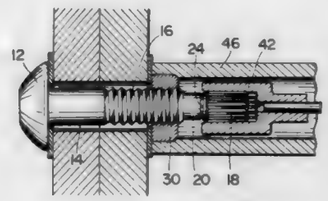
PCT NO PCT/JP83/00089, § 371 Date Nov. 23, 1983, § 102(e) Date Nov. 23, 1983, PCT PUB No. WO83/03451 PCT PUB. Date Oct. 13, 1983

PCT filed Mar. 24, 1983, Ser. No. 537,184

Claims priority, application Japan, Mar. 24, 1982, 57-40340

Int. Cl.⁴ F16B *31/00*

U.S. Cl. 411—5 **21 Claims**



1. A fastener adapted to be tightened from one side by means of a tightening tool having an inner socket for gripping a one-handed tightening bolt to prevent the bolt from rotating and an outer socket for applying a rotational force to a nut to tighten the nut to the bolt,

the one-handed tightening bolt comprising:

a threaded portion engaging an internally threaded nut and extending from a position adjacent a bolt head, said nut having a thickness equal to or greater than the diameter of said bolt;

a grip portion to be gripped by an inner socket of a tightening tool for preventing rotation, said grip portion being located adjacent the end of said bolt remote from said bolt head;

a non-threaded, cylindrical guide section interpositioned between said threaded portion and said grip portion and having a given length, whereby approximately the entire length of the grip portion protrudes from the nut when the nut is preliminarily attached with about one-to-two turns of tightening rotation; and

means, formed on said guide section between said threaded portion and said grip portion, for shearing when the tightening torque of the nut reaches a predetermined value in order to hold the nut tightening torque to the predetermined value, said shearing means being located at the end of said guide section adjacent said grip portion.

4,637,765

TWO-PIECE EXPANDABLE PLASTIC RIVET

Nobuaki Omata, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

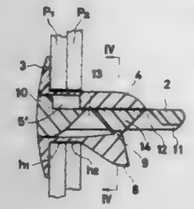
Filed Jul. 15, 1985, Ser. No. 755,032

Claims priority, application Japan, Jul. 18, 1984, 59-107638[U]

Int. Cl.⁴ F16B *13/04, 13/06*

U.S. Cl. 411—41 **4 Claims**

1. A plastic rivet consisting of rivet body comprised of a flanged head and a leg member extending from the bottom of the head and having a tip remote from said head, the rivet body having an axial hole extending through its entire length, and a rotationally asymmetric pin which when inserted into the through-hole of the rivet body expands the leg member, characterized in that the through-hole has a large-diameter portion extending from the head of the rivet body to an intermediate portion of the leg member, a shoulder being formed between the large-diameter portion and the remainder of the through-hole, the leg member being formed to have a single movable leg by providing two off-center slits opening axially outwardly at said tip and running axially inward from the tip of the leg member, said slits communicating with the through-hole, the movable leg being provided on its inner surface with a tooth-like protuberance extending transversely substantially completely across said through-hole, the pin having a shank portion having a transverse dimension and being provided on one end with a head capable of entering the large-diameter portion of the through-hole, the shank of the pin being provided with two V-shaped recesses spaced in the axial direction of the pin and each having a depth substantially equal to said transverse dimension of said pin to leave a tooth-like protuberance therebetween having a height substantially at least as great as said transverse dimension of said pin, and the tip of the tooth-like protuberance of the pin being provided with a shallow notch,



whereby when the pin is inserted into the through-hole from the head end of the rivet body to the point that the protuberance on the movable leg engages with the first recess, the head of the pin is at a position outward from the outer surface of the head of the rivet body, when the head of the pin is pressed further inward to bring its outer surface flush with the outer surface of the head of the rivet body, the notch provided on the protuberance on the shank coming into engagement with the top of the protuberance on the movable leg and causing the movable leg to be deflected outwardly to increase the effective diameter of the leg member, and when the head of the pin is pressed inward still further to cause it to enter the large-diameter portion to the point where it strikes against the shoulder, the protuberance on the movable leg engaging with the second recess allowing the movable leg to close and reduce the effective diameter of the leg member.

4,637,766

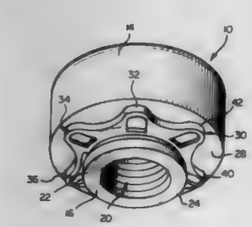
CLINCH TYPE FASTENER

John Milliser, Rochester, Ind., assignor to Textron Inc., Providence, R.I.

Filed Jun. 17, 1985, Ser. No. 745,623

Int. Cl.⁴ F16B *37/04*

U.S. Cl. 411—180 **7 Claims**



1. A self-clinching fastener of the type for connection to a section of sheet material, said fastneer including a head and a shank portion, with a groove formed in said shank portion, with said head including a material deforming portion embeddable ins aid sheet material to displace material thereof into said groove to form a mechanical interlock between said sheet material and said fastener, and said material deforming portion

includng a plurality of radially disposed projections extending axially outward of an undersurface of said head and intermediate said undersurface and said groove, each said projection including an axially facing discrete recess formed therein, a convexed peripheral portion of each said radial projection and a wall portion of said recess associated with said radial projection being defined by a raised ridge on the undersurface of said head, said recess being disposed inwardly of the periphery of said projection and intermediate said periphery and the shank portion, such that the material of the workpiece being displaced will flow into said groove and into the recesses in said projections, with the radial projections and the wall portions of the recesses locking the fastener against rotative movement, and with the material flowing into said groove locking the fastener against axial movement, and the location of said recess assuring complete formation of the projectios during fabrication.

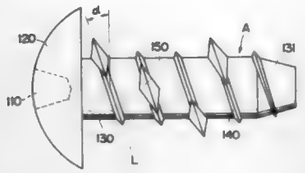
5. In combination, a section of apertured sheet material and a threaded self-clinching fastener engaged therewith, said fastener including a head and a shank portion, with a groove formed in said shank portion, said head including a material deforming portion embeddable in said sheet material to displace material therefrom into said groove to form a mechancial interlock between said sheet material and said fastener, said shank further including an extruding section of a diameter greater than the initial diameter of the aperture formed in said sheet material, such that upon engagement of said fastener with said sheet material, said extruding section will resize said initial aperture preparatory to the seating of said head, said material deforming portion including a plurality of radially disposed projections extending axially outward of the undersurface of said head and intermediate said undersurface and said peripheral groove, each said projection including an axially facing recess formed therein, a convex peripheral portion of each said radial projection and a wall portion of the recess associated with each projection being defined by a raised ridge on the undersurface of said head, said recess being disposed inwardly of the periphery of said projection and intermediate said projectio periphery and the shank portion, said recesses assuring complete formation of the projections during fabrication, and also allowing the material of the workpiece being displaced upon embedding of said material deforming portion in said workpiece to flow into said groove to lock the fastener against axial movement, said material flowing into the recesses in said projections, with the radial projections and the wall portions of the recesses looking the fastener against rotative movement.

4,637,767

THREADED FASTENER

Kouichi Yaotani, Akikawa; Fumio Nakada, Hatano; Takao Tanaka, Hino, and Minoru Yoshida, Hachiouji, all of Japan, assignors to Topura Co., Ltd., Osaka, Japan

Continuation of Ser. No. 332,835, Dec. 21, 1981, abandoned. This application Dec. 28, 1984, Ser. No. 685,620
Claims priority, application Japan, Dec. 26, 1980, 55-187479
Int. Cl.⁴ F16B *35/04*
U.S. Cl. 411—411 **13 Claims**



1. In a threaded fastener of the self-tapping screw type for fastening workpieces made of resilient elastic material having fastener receiving holes preformed therein, the fastener having a shank, a tip end and a head on the shank, and a uniform height helical screw thread on the shank having an appropriate lead angle, and a means on the head to facilitate rotating and driving said fastener, the improvement comprising:

a screw thread having a maximum thread diameter smaller than the diameter of the preformed hole, and smaller than the maximum diameter of the standard screw thread of a standard screw of the same size;

a plurality of screw thread type projections disposed in spaced relationship on said screw thread along the full length of the shank except the tip end thereof and having the same lead angle as said screw thread; and

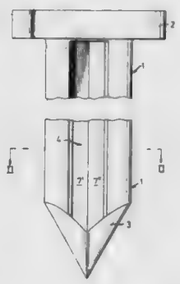
said uniform height screw thread and said screw thread type projections having similar cross-sectional shapes, and said screw thread type projections each having a length shorter than half of the circumference of the shank, and having a crest surface having one end starting from the crest surface of said uniform height screw thread and gradually increasing in the lead direction and forming an enlarged slope surface ending at a thread tip on the crest surface of the projection of maximum height, the width and height thereof in the lead direction from said thread tip gradually decreasing and forming a reduced slope surface with said crest surface of the projection ending at the other end thereof at the crest surface of the uniform height screw thread.

4,637,768

NAIL-TYPE FASTENER, AND PROCESS FOR MANUFACTURING SUCH FASTENERS

Karl L. G. Rabe, Björnbärsvägen 35, S-69147 Karlskoga, Sweden

PCT No. PCT/SE82/00293, § 371 Date May 25, 1983, § 102(e) Date May 25, 1983, PCT Pub. No. WO83/01097, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 23, 1982, Ser. No. 504,686
Claims priority, application Sweden, Sep. 28, 1981, 8105713
Int. Cl.⁴ F16B *15/08*
U.S. Cl. 411—452 **7 Claims**



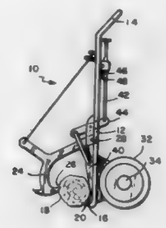
1. A nail type fastener, comprising a straight elongated shank, the lateral surface of which comprises three separate lateral surfaces, there being at one end of the shank a head, while the other end of the shank has a point, characterized in that in each of said lateral surfaces a groove is made extending along the shank, said groove being defined transversely by two opposing side flank surfaces both of which connect via individual corners which are preferably sharp or of small radius, to the groove bottom surface which is, in section, a V-shaped bottom surface (7), the flat halves (7', 7'') of which form an obtuse angle (δ) with each other, suitably an angle of 130 degrees to 170 degrees, preferably about 150 degrees, and that the lateral surfaces of the shank which are provided with grooves are separated from each other transversely by ridges running along the shank, with arcuate crossectional outer contours.

4,637,769

LOG CARRIER

Charles E. Thorndike, P.O. Box 446, Meredith, N.H. 03253

Filed Feb. 4, 1985, Ser. No. 698,110
Int. Cl.⁴ B65G *7/12*
U.S. Cl. 414—454 **11 Claims**



1. A carrying apparatus for lifting and transporting a load comprising:

(A) a frame having a handle extending upwards, and a support surface on one face of the frame upon which the load is held;

(B) a wheel assembly attached at one end of the frame for transporting the carrier and the load;

(C) a hook having at one end a seizing means directed towards said support surface, and at an opposite end a hinged attachment to the frame at a point above the support surface such that the hook can swing generally away from the support surface and upward; and

(D) a load stabilizer movably attached to the frame for applying a force on the load generally downward and outward from said support surface, so that said load is securely restrained by said hook seizing means.

4,637,770

SELF-EQUALIZING LIFTING TRAILER

Robert A. Swadell, 1530 Palomino Dr., Henderson, Nev. 89015

Filed Sep. 17, 1985, Ser. No. 776,933
Int. Cl.⁴ B60P *3/10*
U.S. Cl. 414—495 **3 Claims**



1. A trailer frame apparatus, particularly intended for use with pontoon boats, catamarans and the like, and comprising:

(a) an elongate lower frame (10),

(b) an elongate upper frame (24),

(c) a plurality of spaced coupling arms (32) individually and pivotally connected at opposite ends thereof between the upper and lower frames to define therewith a parallelogram configuration with the upper frame longitudinally and transversely displaceable with respect to the lower frame in a pivotal mode,

(d) a winch (20) mounted on the lower frame proximate a forward end thereof and at an elevated, or the same, height relative to a raised, uppermost position of the upper frame,

(e) drum means rotatably mounted on the lower frame proximate a rear end thereof,

(f) bell crank means (60), pivotally mounted at an elbow portion thereof on the lower frame proximate the rear end thereof, for applying a lifting force to the rear end of said upper frame, and comprising angled first and second arms (62, 32'), the second arm (32') being connected at a distal end thereof to the upper frame,

(g) a first pulley (42) fixed to the forward end of said upper frame,

(h) cable means (20') for transferring a lifting force to the rear and forward ends of said upper frame, and having one end wound around said winch, said cable means passing around said pulley and said drum means and having its other end fixed to said first arm (62) of said bell crank means,

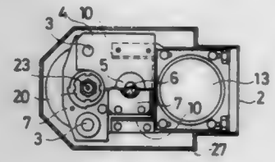
whereby, with a load supported on the upper frame in a lowered position thereof, tension applied by said winch to said cable means to raise the upper frame will initially exert more lifting force on the rear end of said upper frame than on the front end, and, in an inherently automatic and transitional manner, will exert more lifting force on the front end of said upper frame as it is raised to said upper most position.

4,637,771

LIFTING HEAD OF SWIVEL ARM OF ASSEMBLY ROBOT

Kazuyoshi Yasukawa, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Japan

Filed Mar. 11, 1985, Ser. No. 710,268
Claims priority, application Japan, Mar. 12, 1984, 59-34131[U]
Int. Cl.⁴ B25J *15/00*
U.S. Cl. 414—590 **8 Claims**



1. A lifting head of a swivel arm of an assembly robot comprising:

a pair of guide bars fixedly provided on said swivel arm and extending in parallel;

a feed screw rotatably supported on said swivel arm in such a manner that said feed screw extends parallel to said guide bars;

a nut member engaging said feed screw;

a holding plate fixedly secured to an upper side of said swivel arm;

a supporting member fixedly secured to an upper end of said holding plate, said supporting member fixedly supporting upper end portions of said guide bars and rotatably supporting upper end portions of said feed screw;

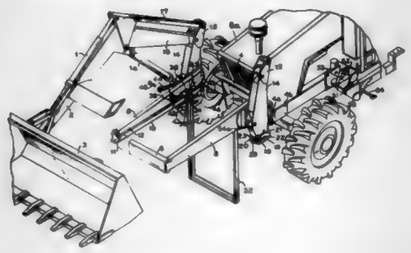
a cylindrical guide having an inner wall of noncircular section, said cylindrical guide being rotatably supported by said swivel arm;

a lifting shaft slidably inserted into said cylindrical guide, said lifting shaft having an upper end portion rotatably supported by said nut member for vertical movement therewith and having a fluid passage formed therein, an upper end of which is coupled to a fluid pipe;

a rotating pulley provided at a lower end of said cylindrical guide; and

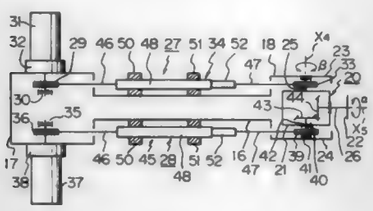
a cover fixedly secured to said swivel arm and covering said guide bars and said feed screw, said cover comprising a pair of guide rollers and having a hole at a top thereof, said guide rollers being supported on both sides of said hole and said pipe extending through said hole and being guided by said guide rollers.

4,637,772
LOADER MOUNT
Leroy Stumpe, Hartford, S. Dak., assignor to Du-Al Manufacturing Company, Sioux Falls, S. Dak.
Filed Sep. 12, 1984, Ser. No. 649,686
Int. Cl.[4] E02F 3/62
U.S. Cl. 414—686 8 Claims



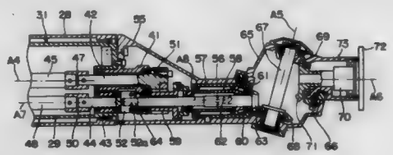
6. A mount for disconnectably attaching an appliance such as a loader on the front end of a tractor comprising in combination:
- a loader mounting frame having a rear side attachment insertion structure at each side;
- a receiving member for being secured on each side of a tractor;
- camming means having coacting mating surfaces on said receiving member and on said insertion structure for camming the insertion structure to a home position as it is moved rearwardly;
- locking means applying a rearwardly directed force to the insertion structure holding the mating surfaces in said home position;
- a forward attachment structure on the frame;
- and a mating forward attachment structure for mounting on a tractor; one of said forward attachment structures including horizontally extending channels at each side of the tractor and the other of said structures including pins for mounting on the tractor to be received by the channels and to slide a distance in the channels determined by the location of said home position.

4,637,773
INDUSTRIAL ROBOT OF THE ARTICULATED ARM TYPE
Seiichiro Nakashima; Kenichi Toyoda, both of Hino; Nobutoshi Torii, Hachioji, and Ryo Nihei, Musashino, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan
PCT No. PCT/JP84/00218, § 371 Date Dec. 31, 1984, § 102(e) Date Dec. 31, 1984, PCT Pub. No. WO84/04269, PCT Pub. Date Nov. 8, 1984
PCT Filed Apr. 27, 1984, Ser. No. 691,301
Claims priority, application Japan, Apr. 30, 1983, 58-74955
Int. Cl.[4] B25J 9/00
U.S. Cl. 414—732 4 Claims



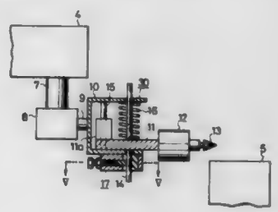
1. An industrial robot of the articulated arm type comprising:
- a movable robot body arranged on a base;
- an upper arm having root and tip portions and rotatably pivoted to said robot body at said root portion;
- a forearm having rear and front ends and rotatably pivoted to said tip portion of said upper arm at a portion between said rear and front ends;
- a wrist assembly arranged on said front end of said forearm and rotatable in relation to said front end about at least one axis; and
- at least one wrist device unit for driving said wrist assembly and rotating it about said axis, said wrist drive unit including a first sprocket which is rotatably arranged in said rear end of said forearm, a drive motor arranged on said rear end of said forearm and coupled with said first sprocket to rotate it, a second sprocket arranged in said front end of said forearm and operatively coupled with said wrist assembly, and a wrapping connector for transmitting rotational movement of said first sprocket to said second sprocket;
- said wrapping connecting including a first chain meshing with said first sprocket, a second chain meshing with said second sprocket, a pair of rods connecting the two ends of said first chain to the two ends of said second chain, respectively, and means for absorbing elongation of said first and second chains;
- said means for absorbing elongation of said first and second chains including at least one tensioner interposed between at least one of said rods and at least one of said chains for providing a constant tensile force to said chains, said at least one tensioner comprising a cylindrical member connected to said at least one of said rods, a rod member connected to said at least one of said chains, a rod guide adjustable mounted in said cylindrical member, said rod member extending through said rod guide and having one end in said cylindrical member, and a plurality of coned disc springs surrounding said rod member interposed in a compressed state between said one end of said rod member and said rod guide.

4,637,774
INDUSTRIAL ROBOT
Hiroshi Nakamura; Osamu Toyama, both of Kariya, and Norikazu Kanii, Chita, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan
Filed Feb. 13, 1985, Ser. No. 701,305
Claims priority, application Japan, Feb. 29, 1984, 59-39525; Mar. 1, 1984, 59-39832; Mar. 6, 1984, 59-43396
Int. Cl.[4] B25J 9/00
U.S. Cl. 414—735 8 Claims



1. An industrial robot comprising:
- (a) an arm body (25);
- (b) a rotary member (31) carried on said arm body (25) for rotation about a first axis (A4);
- (c) a twist body (55) secured to one axial end of said rotary member (31);
- (d) a bend body (65) carried by said twist body (55) for rotation about a second axis (A5) which is slanted with respect to said first axis (A4);
- (e) a swivel body (73) carried by said bend body (65) and comprising a swivel shaft (70), said swivel shaft (70) rotating about a third axis (A6) which is slanted with respect to said second axis (A5);
- (f) a first shaft (62) carried in said twist body (55) and rotatable about a fourth axis (A7) parallel to and eccentrically spaced (E1) with respect to said first axis (A4) for transmitting driving power to said swivel body (73);
- (g) a second shaft (58) carried in said twist body (55) and rotatable about a fifth axis (A8) parallel to and eccentrically spaced (E2) with respect to said fourth axis (A7) for transmitting driving power to said bend body (65);
- (h) a third shaft (35) rotatably carried by said rotary member (31) for rotating said first shaft (62); and
- (i) a fourth shaft (34) rotatably carried by said rotary member (31) for rotating said second shaft (58), said fourth shaft (34) being coaxial with and rotatable about said first axis (A4).

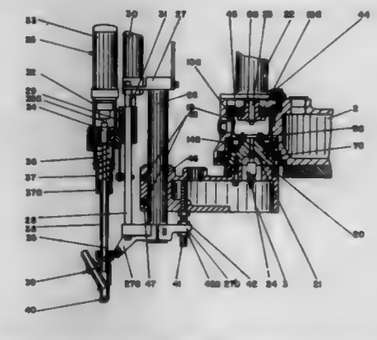
4,637,775
INDUSTRIAL ROBOT DEVICE
Hisao Kato, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Dec. 12, 1984, Ser. No. 680,726
Claims priority, application Japan, Dec. 15, 1983, 235137
Int. Cl.[4] B25J 11/00
U.S. Cl. 414—744 R 12 Claims



1. An industrial robot device in which a work tool such as a cutting or a grinding tool is mounted at a forward end of an arm, said device comprising:
- (a) a support frame for supporting said work tool;
- (b) means provided on said support frame for supporting said work tool displaceably relative to said support frame, said supporting means comprising an elastic member for applying an elastic force in a predetermined direction to said work tool and a displaceable member movable with said work tool; and
- (c) a friction damper comprising a pair of friction members sandwiching said displaceable member therebetween, said friction damper being provided on said support frame for exerting a damping force on said displaceable member, said damping force preventing sudden displacement of said work tool by an external force and by said elastic force.

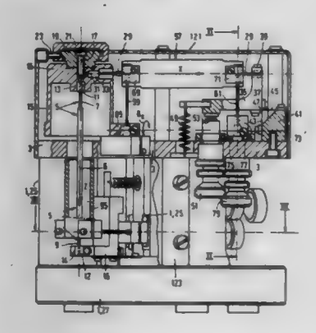
4,637,776
RETAINING STRUCTURE FOR SCREW FASTENING UNIT IN AN ARTICULATED ROBOT
Masayuki Saito, Kyoto, Japan, assignor to Nitto Seiko Co., Ltd., Kyoto, Japan
Filed Jul. 24, 1985, Ser. No. 759,069
Int. Cl.[4] B25J 15/06
U.S. Cl. 414—744 B 1 Claim

1. An articulated robot including a first arm, a second arm which is mounted on said first arm, controlled by motors, respectively, and an end tool unit slidably fixed to the top of the secondary arm by means of a stud bolt and nuts to be mated with it, wherein said secondary arm has an end portion which forms a vertical through hole in which a vertical rod is slidably secured at a predetermined position by lock bolts, said end tool unit is secured to the vertical rod by means of an upper bracket and a lower bracket, said lower bracket being compressed by said pair of stop nuts to be mated with an adjustable stud bolt which is fixed to bottom of the secondary arm parallel to said vertical rod, whereby the height of the top of the end tool unit



for different work pieces can be changed without changing the height of the arms from a supporting base.

4,637,777
MANIPULATOR HAVING SIX DEGREES OF FREEDOM
Hendricus F. G. Smulders, Eindhoven; Adrianus J. J. Franken, Maarheeze; Johannes W. Faber, and Wouter H. Swinkels, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 14, 1984, Ser. No. 671,256
Claims priority, application Netherlands, Sep. 11, 1984, 8402765
Int. Cl.[4] B65G 35/00
U.S. Cl. 414—751 4 Claims



1. A manipulator comprising:
- a frame;
- six driving members, all six driving members being directly connected to the frame;
- six coupling members having first and second opposite ends, the first end of each coupling member being connected to an associated driving member; and
- an object holder supported with respect to the frame by the second ends of the coupling members;
- characterized in that:
- three driving members are arranged to displace the object holder in three substantially orthogonal directions of translation with respect to the frame, each translational driving member and its associated coupling member being identical to each other translational driving member and its associated coupling member; and
- the remaining three driving members are arranged to rotate the object holder in three substantially orthogonal directions of rotation with respect to the frame, each rotational driving member and its associated coupling member being

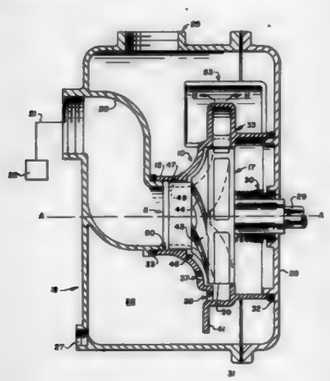
identical to each other rotational driving member and its associated coupling member.

4,637,778

SELF-PRIMING DIFFUSER TYPE CENTRIFUGAL PUMP

Theodore J. Pollari, Ft. Mill, N.C., assignor to Textron Inc., Providence, R.I.

Filed Dec. 12, 1983, Ser. No. 560,502
Int. Cl.⁴ F04D *5/00*
U.S. Cl. 415—53 R **10 Claims**



1. A self-priming centrifugal pump comprising:
a housing having an inlet and an outlet;
an impeller mounted for rotation about a generally horizontal axis of rotation, and within said housing;
means defining a liquid reservoir adjacent said housing and in operative association with said impeller, said liquid reservoir separated from said housing liquid inlet so that no operative communication between said reservoir and said inlet is provided, and said reservoir is in operative communication with an outlet from said housing;
means defining at least one liquid-circulating valveless port in said housing adjacent said impeller for providing effective recirculation of liquid from said liquid reservoir to said impeller for successful priming of said pump; and
air shield means disposed between a housing outlet and said recirculating ports below said axis of rotation, and for preventing air discharge from said housing outlet from passing to said liquid recirculating ports, so that air laden water is kept separate from the liquid in said reservoir wherein said impeller includes a front shroud at a portion thereof closest to said housing inlet; and further comprising external vane means disposed on said impeller front shroud for effecting separation of air flowing with liquid through said housing inlet, and for effecting circulation of liquid from said liquid reservoir through said valveless port.

4,637,779

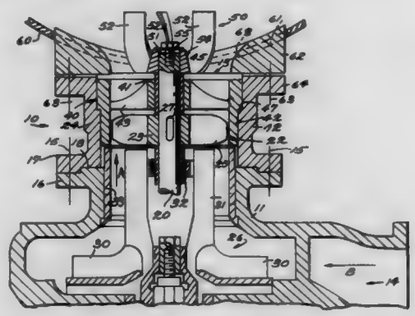
TWO STAGE MEDIUM CONSISTENCY PULP PUMPING

Michael I. Sherman, Glens Falls, N.Y., and Stefan Golston, Bellevue, Wash., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed May 17, 1985, Ser. No. 735,350
Int. Cl.⁴ F04D *1/10*
U.S. Cl. 415—143 **21 Claims**

1. A method of pumping a suspension having a consistency between about 6–20%, comprising the step of continuously acting upon a suspension to progressively
(a) effect initial fluidization of the suspension;
(b) effect removal of extreme pre-rotation of the fluidized suspension, and define a definite directional flow angle of the suspension;
(c) effect a first fluidizing pumping of the suspension, in a first stage, to pump the suspension directly to a second stage; and
(d) effect a second fluidizing centrifugal pumping of the suspension in the second stage.

7. A centrifugal pump for fluent material comprising:
a housing having an inlet and an outlet;
a shaft mounted for rotation within said housing about an axis of rotation;
a first set of vanes mounted to said shaft within said housing adjacent said inlet;



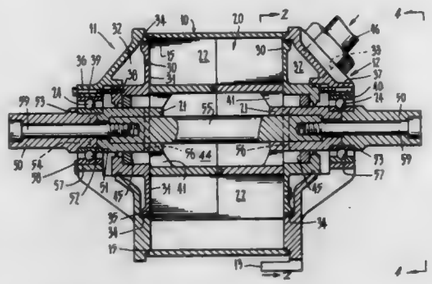
a second set of vanes mounted to said shaft within said housing between said first set of vanes and said outlet;
a third set of vanes stationarily mounted to said housing between said inlet and said first set of vanes, said third set of vanes comprising means for removing extreme prerotation of fluent material passing therethrough; and
means for effecting rotation of said shaft and said first and second sets of vanes with respect to said housing.

4,637,780

WATER RING VACUUM PUMP HAVING ADJUSTABLE PART PLATES AND A HOLLOW IMPELLER

Paul A. Grayden, Wantirna South, Australia, assignor to Prescant Pty. Limited, Australia

Filed May 14, 1985, Ser. No. 733,861
Claims priority, application Australia, May 14, 1984, PG4969
Int. Cl.⁴ F04C *19/00*
U.S. Cl. 417—68 **8 Claims**



1. A water ring pump including:
(a) a body;
(b) end members on the body;
(c) an impeller in the body and having a shaft extending through the end members;
(d) the impeller shaft extending through the end members being journalled for rotation therein;
(e) an inlet in one end member;
(f) an outlet in the other end member;
(g) a pump being characterized in that the impeller has a shaft member extending outwardly from each end thereof, each of which shaft members is located in the inner race of a bearing, a stub shaft fastened to each impeller shaft member within the inner race and being in driving connection therewith, and wherein the impeller has a bore therethrough and a spider or the like connected to each end of the impeller, each of which spiders has a shaft member extending therefrom.

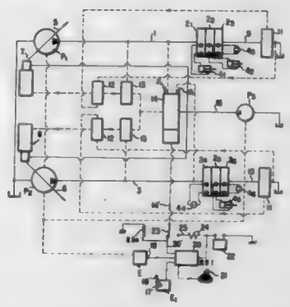
3. A water ring vacuum pump having:
(a) a body;
(b) end members on the body;
(c) an impeller in the body and having a shaft extending through the end members;
(d) the impeller shaft extending through the end members being journalled for rotation therein;
(e) an inlet in one end member;
(f) an outlet in the other end member;
(g) a port plate located in each end member and being located adjacent the blades of the impeller whereby a manifold is formed between each port plate and its adjacent end member, the port plate adjacent the inlet end having an inlet port and the port plate adjacent the outlet end having an outlet port;
(h) the pump being characterized in that each port plate is moveable relative to its adjacent end member by screws or the like passing through the end member, which screws abut the face of the port plate and can act to cause its location against the impeller, and locking means passing through the end member and into threads in the port plate whereby the port plate can be moved away from the impeller, the said locking means, when the impeller is correctly positioned, acting against the screws or the like which abut the port plate, thus serving to lock the port plate in position.

4,637,781

TORQUE REGULATING SYSTEM FOR FLUID OPERATED PUMP DISPLACEMENT CONTROL SYSTEMS

Teruo Akiyama, Yokohama; Katsuyuki Sasaki, Kyoto, and Takaichi Saigo, Chigasaki, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 28, 1985, Ser. No. 717,197
Claims priority, application Japan, Mar. 30, 1984, 59-060841; Nov. 30, 1984, 59-251992
Int. Cl.⁴ F04B *49/00*
U.S. Cl. 417—216 **2 Claims**



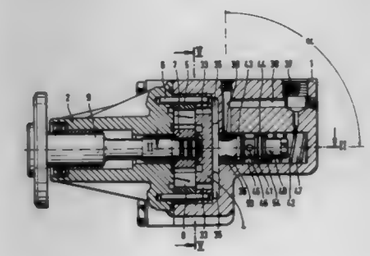
1. A fluid operated pump displacement control system comprising a control means connected to respective displacement control devices of variable displacement pumps and adapted to be operated by discharge pressure fluid from a discrete control pump, said control means including neutral control valve means, cut-off valve means and jet sensor means, a variable torque control valve having a proportional electromagnetic solenoid provided in a circuit connecting said control means with said control pump and adapted to operate pressure reduction by a discharge fluid pressure of said variable displacement pumps and a propelling force of said proportional electromagnetic solenoid, electronic means for detecting set output conditions of a prime mover for driving said variable displacement pumps, and means for supplying current to said proportional electromagnetic solenoid according to the difference between a set reference rotational speed in each of said set output conditions and an actual rotational speed of said prime mover.

4,637,782

ROTARY VANE PUMP

Heinz Teubler, Friedrichsdorf, and Rene Schulz, Neu-Anspach, both of Fed. Rep. of Germany, assignors to Vickers Systems GmbH, Bad Homburg, Fed. Rep. of Germany

Continuation of Ser. No. 696,268, Jan. 30, 1985, abandoned. This application Feb. 18, 1986, Ser. No. 830,254
Claims priority, application European Pat. Off., Feb. 4, 1984, 84101136.4
Int. Cl.⁴ F04B *49/02*
U.S. Cl. 417—300 **7 Claims**



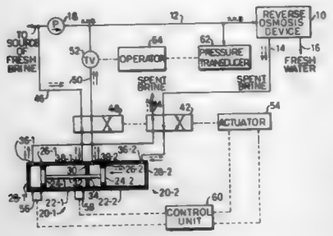
1. A pump comprising:
a casing having a hollow therein;
a fluid supply system including in said casing an inlet port and inlet opening means communicating with said hollow;
a fluid discharge system including outlet opening means from said hollow and an outlet port in said casing;
fluid displacement means arranged in said hollow and adapted to displace fluid from said supply system into said discharge system to form a flow of displaced fluid;
a flow control valve arranged between said fluid supply system and said fluid discharge system and adapted to by-pass fluid from said discharge system into said supply system so as to leave a desired flow within said discharge system between said flow control valve and said outlet port, said flow control valve comprising a housing means having passage means including an orifice, a spool having a pressure area to open said by-pass and a pressure area to close said by-pass, and a valve spring biasing said spool in a direction to close said by-pass;
said orifice having an upstream and a downstream side, and said upstream side being connected to said by-pass-opening pressure area and said downstream side being connected to said by-pass-closing pressure area; and
a venturi throat included in said fluid discharge system and having walls so as to receive all said displaced flow, said orifice being formed as a transverse opening in said walls of said venturi throat and said orifice conducting said desired flow to said outlet port, said venturi throat being disposed substantially coaxially with respect to said spool and being of a width at its downstream end which is substantially equal to the diameter of the spool.

4,637,783

FLUID MOTOR-PUMPING APPARATUS AND METHOD FOR ENERGY RECOVERY

Gerry B. Andeen, Menlo Park, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Oct. 20, 1980, Ser. No. 198,716
Int. Cl.⁴ F04B *9/08*
U.S. Cl. 417—318 **20 Claims**



1. In a method of delivering fresh brine to a reverse osmosis device by use of main pump means and a plurality of interconnected motor-pump means using spent brine from the reverse osmosis device as motive fluid for said motor-pump means, each motor-pump means including a closed cylinder with a reciprocably movable piston therein separating the cylinder into motor and pump chambers, each piston having opposite faces of different effective area with the larger piston face being included in the motor chamber and the smaller face in the pump chamber for pressure amplification, said pistons being interconnected for simultaneous movement thereof, said method comprising

sequentially supplying spent brine from the reverse osmosis device, through non-pressure-increasing means, to the motor chambers for piston movement from start to end positions while simultaneously sequentially pumping fresh brine from the associated pump chambers, through non-pressure-increasing means, to the inlet of the reverse osmosis device for supplying the reverse osmosis device with a first quantity of fresh brine for desalination,

sequentially supplying fresh brine to the pump chambers while simultaneously sequentially dumping spent brine from the associated motor chambers during return piston movement from end to start positions, and

through said main pump means, supplying the reverse osmosis device with a second quantity of fresh brine for desalination.

4,637,784

METERING PUMP WITH DIAPHRAGM

Alden A. Lofquist, Jr., 10609 Farragut Hills Blvd., Knoxville, Tenn. 37922

Filed Oct. 15, 1985, Ser. No. 787,499
Int. Cl.⁴ F04B *19/14*; F01D *23/00*; F03B *9/00*
U.S. Cl. 417—320 **13 Claims**

1. An apparatus for metering small volumes of fluid, comprising:

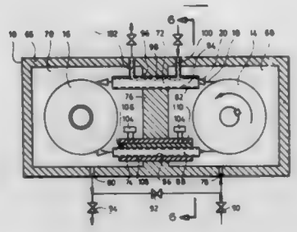
a pump housing having a first fluid space and a second fluid space, and a wall separating said first fluid space from said second fluid space;

an inlet opening for passing fluid into said first fluid space;

an outlet opening for delivering fluid from said second fluid space;

first pump means located in said wall for pumping fluid from said first fluid space to said second fluid space; and

second pump means located in said wall for pumping fluid from said second fluid space to said first fluid space at a slower rate than said first pump means is pumping fluid from said first fluid space to said second fluid space so that said second fluid space is pressurized relative to said first fluid space, whereby fluid flows through said outlet opening out of said second fluid space and through said inlet opening into said first fluid space.



4,637,785

ROTARY PUMP WITH CUTTER DEVICE FOR CONTAMINATED FLUIDS

Hans Blickström, Rymdvägsgatan 14, Västra Frölunda, Sweden (421 33)

PCT No. PCT/SE84/00298, § 371 Date May 14, 1985, § 102(e) Date May 14, 1985, PCT Pub. No. WO85/01327, PCT Pub. Date Mar. 28, 1985
PCT Filed Sep. 13, 1984, Ser. No. 733,764
Claims priority, application Sweden, Sep. 16, 1983, 8304985
Int. Cl.⁴ F04C *2/107, 15/00*; B02C *18/06*
U.S. Cl. 418—48 **2 Claims**

1. A rotary pump for contaminated fluids comprising:

an elongate housing having first and second ends;

an orbiting rotary displacement pump at said first end;

a driving motor having a drive shaft at said second end;

at least one radially directed inlet to said housing, adjacent to said second end;

a hollow drum having an end wall and a cylindrical side wall provided with axial openings and located within said housing inside said radial inlet;

edge steels defining said openings in the side wall of said drum and at least one counter cutting edge at said at least one radial inlet; and

means for connecting said drum end wall concentrically with the drive shaft of said motor, as well as a universal connection means passing from said end wall, through said drum to said displacement pump for driving the same.

4,637,786

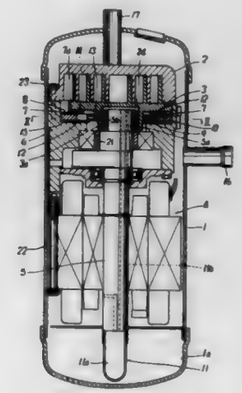
SCROLL TYPE FLUID APPARATUS WITH LUBRICATION OF ROTATION PREVENTING MECHANISM AND THRUST BEARING

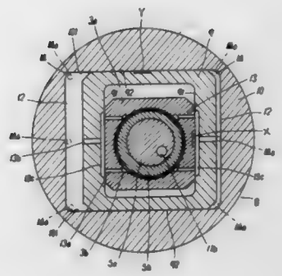
Yoshiaki Matobe, and Hitoshi Ozawa, both of Sakai, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed Jun. 17, 1985, Ser. No. 745,227
Claims priority, application Japan, Jun. 20, 1984, 59-127184; Jun. 23, 1984, 59-93973[U]; Jun. 23, 1984, 59-93974[U]; Apr. 10, 1985, 60-76108
Int. Cl.⁴ F01C *1/04, 21/04*; F16D *3/04*; F16N *1/00*
U.S. Cl. 418—55 **7 Claims**

1. A scroll type fluid apparatus provided with a fixed scroll, an orbiting scroll, a housing for fixing said fixed scroll, a thrust bearing for supporting said orbiting scroll rotatably to said housing, a crankshaft having an eccentric shaft for driving said orbiting scroll, and a rotation preventing mechanism for preventing said orbiting scroll from rotating by itself,

said rotation preventing mechanism comprising a bearing portion provided at the rear side of said orbiting scroll, having a receiving portion for receiving therein said eccentric shaft, and formed to be square at the outer surface; a sliding member having inner surfaces engageable with two opposite outer surfaces at said bearing portion to regulate radial movement of said bearing portion in reciprocating movement, and formed to be square at the outer surface; and a holder for said sliding member, which has inner surfaces engageable with two opposite outer surfaces at said sliding member to regulate movement of said sliding member in the direction perpendicular to said moving direction of said bearing portion; said crankshaft being provided with lubrication means for lubricating said bearing portion, said rotation preventing mechanism being provided before and behind said sliding member in the sliding direction thereof with oil chambers tightly sealed and variable in volume due to the sliding motion of said sliding member, said bearing portion and sliding member being provided with connection means for connecting said oil chambers to said lubrication means, said thrust bearing being provided with communication means for communicating the slidable contact surface of said orbiting scroll with respect to said thrust bearing with said oil chambers.



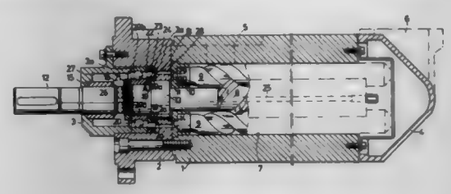


4,637,787

HYDRAULIC SCREW MACHINE

Lars H. Segerström, Skärholmen, Sweden, assignor to IMO AB, Stockholm, Sweden

Filed Jun. 14, 1985, Ser. No. 744,614
Claims priority, application Sweden, Jun. 20, 1984, 8403315
Int. Cl.⁴ F04C *18/24*
U.S. Cl. 418—203 **4 Claims**



1. A hydraulic screw machine including:

a drive screw;

at least one running screw coacting with said drive screw;

a housing enclosing said drive screw and said running screw, said housing having an outlet chamber defining a high pressure side of said machine and an inlet chamber;

a shaft on said drive screw extending out through said housing on said high pressure side of said machine, said shaft being provided with a balancing piston for balancing a part of the axial forces acting on said drive screw;

a first collar on said shaft facing a radially extending wall portion of said housing to define with said balancing piston a balancing chamber forming a hydrostatic axial bearing with bearing surfaces to take up the remaining axial forces acting on said drive screw, characterized in that:

a second collar is arranged radially surrounding said first collar;

spring means is arranged between said second collar and said wall portion; and

a roller bearing is mounted in said housing having inner and outer bearing rings with said outer ring being mounted in said housing for limited axial movement, said inner bearing ring being secured on said shaft with said first collar being held between said balancing piston and said inner bearing ring, and said first collar being held separated from said wall portion by said spring means, said second collar and the axially movable outer ring of said roller bearing when too low a pressure prevails in said balancing chamber.

4,637,788

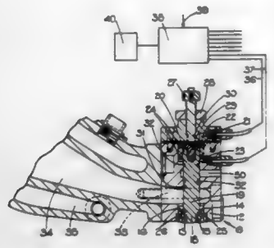
APPARATUS FOR MAKING A CONFECTION INCLUDING A DEPOSITING MEANS AND CONVEYOR CARRIED MOLDS

Brian T. Richards, Birmingham, England, assignor to Cadbury Limited, Bournville, England

Filed Oct. 5, 1983, Ser. No. 538,803
Claims priority, application United Kingdom, Oct. 13, 1982, 8229266; Oct. 29, 1982, 8231008
Int. Cl.⁴ A23G *1/21, 1/22, 1/26*
U.S. Cl. 425—4 R **9 Claims**

1. Apparatus for manufacturing a confection comprising: means for introducing gas under pressure into a confection in liquid phase form; mixing means for mixing said confection in liquid phase form with said gas under pressure; a depositor for receiving and discharging said mixture; means for feeding said mixture from said mixing means to said depositor; and at least one outlet valve means for said mixture in said depositor comprising an annular seat, a movable valve member positioned for co-operation with said annular seat to control the flow of said mixture through said outlet valve means, a portion of said

valve member downstream of said valve seat defining with surrounding means an annular orifice means having a length



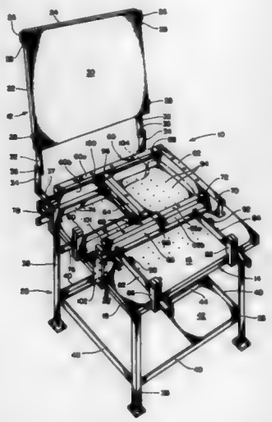
which is not greater than its diameter, said annular orifice means being a final outlet orifice means from said depositor.

4,637,789

CUSHION FABRICATION APPARATUS

Frederick P. Netznik, 8556 Central Park Ave., Skokie, Ill. 60076

Filed May 13, 1985, Ser. No. 732,937
Int. Cl.[4] B29C *39/26, 51/20*
U.S. Cl. 425—89 22 Claims



1. Apparatus for fabricating from a resilient, initially fluid, curable material, a cushion having a support surface contoured in accordance with a negative of the contour of an intended user, said apparatus comprising:

a generally planar plate having a plurality of apertures in a flat upper surface thereof and including a plurality of ducts therein, wherein each of said ducts is coupled to and continuous with at least one of said apertures;

form means disposed upon the upper surface of said plate for defining a closed area thereon, said form means including a plurality of connecting members secured to the upper surface of said plate and forming a closed structure open at the top, wherein some of said connecting members are adjustably movable upon said plate to allow for the fabrication of contoured cushions having a range of lengths and widths;

a plurality of seal means positioned between adjacent connecting members so as to form a sealed, closed structure on said plate;

a positive model positioned upon the upper surface of said plate within the closed area defined by said form means, said positive model having an upper surface configured in accordance with the seating support configuration of the intended user;

a flexible, nonporous membrane positioned over said form means and in contact with the upper surfaces of said positive model and said plate within the closed area defined by said form means thereon;

vacuum means coupled to said plate for evacuating the ducts therein whereupon said membrane is drawn in tight-fitting engagement with said form means and the upper surfaces of said positive model and said plate within the closed area defined by said form means thereon so as to form a closed receptacle adapted to receive and confine the fluid material deposited therein, with a contoured cushion formed therein following the curing of said fluid material; and

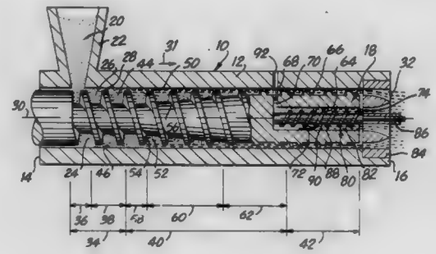
a plurality of control means each coupling said vacuum means to a respective duct within said plate whereby the vacuum within a selected array of apertures in said plate may be controlled in accordance with the length and width of the contoured cushion thus fabricated.

4,637,790

MULTIPLE-STAGE PLASTICATING EXTRUDERS

Imrich Klein, Highland Park, N.J., assignor to Scientific Process & Research, Inc., Somerset, N.J.

Filed Jun. 12, 1985, Ser. No. 744,022
Int. Cl.[4] B29B *7/10*
U.S. Cl. 425—208 25 Claims



1. In a multiple-stage plasticating extruder of the type having an axially-extending elongate barrel for preparing a plasticated material from solids introduced into the extruder and delivering the plasticated material to a discharge outlet, the improvement comprising:

a first screw conveyor for extending along a longitudinal axis in the barrel, said first screw conveyor including a first-stage flight defining a first-stage channel for continuously conveying the material in a downstream direction between a supply of said solids and a first-stage outlet for said plasticated material, as the material is melted within the first-stage channel, said first-stage flight having a leading face facing downstream and a trialing face facing upstream, said first-stage channel extending between the leading face and the trailing face;

a second-stage passage within the screw conveyor, said second-stage passage being axially coextensive with the first-stage channel and commumicating with the first-stage channel at an upstream location and at a downstream location to establish a multiple-stage melting path within the axial extent of the first screw conveyor along which the material will move through the first-stage channel and the second-stage passage, the upstream location being in position to receive some unplasticated material from the first-stage channel, and the downstream location being spaced axially downstream of the upstream location a distance sufficient to enable plastication within the second-stage passage of unplasticated material admitted to the second-stage passage;

a drainage opening interconnecting the first-stage channel and the second-stage passage at the upstream location for enabling the flow of unplasticated material into the second-stage passage at the upstream location;

a second-stage outlet establishing said communication between the second-stage passage and the first-stage channel for enabling the flow of plasticated material from the second-stage passage to merge with the flow of plasticated material from the first-stage channel for delivery of all of the plasticated material to the discharge outlet;

a second screw conveyor located in said second-stage passage and including a second-stage flight defining a second-stage channel arranged to convey material from the upstream location to the downstream location so as to enable movement of material along the multiple-stage melting path through the second-stage passage; and

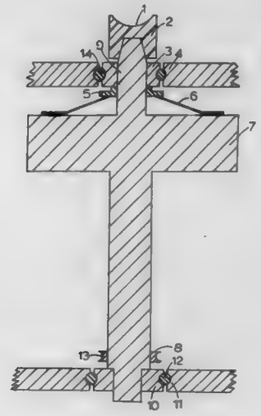
a vent in the barrel adjacent the upstream location.

4,637,791

GYROSCOPICALLY STABILIZED SPIN CAST MACHINE

Charles W. Neefe, 811 Scurry St. Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 642,114, Aug. 17, 1984, Pat. No. 4,534,915, which is a continuation-in-part of Ser. No. 506,873, Jul. 5, 1983, abandoned, which is a continuation-in-part of Ser. No. 417,641, Sep. 9, 1982, Pat. No. 4,416,837. This application Jun. 3, 1985, Ser. No. 740,569
Int. Cl.[4] B29D *11/00*
U.S. Cl. 425—425 1 Claim



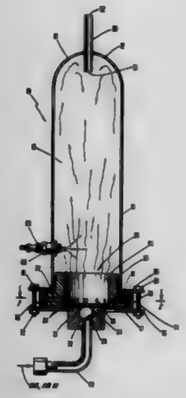
1. A machine for spin casting concave optical surfaces said machine having a concave spin casting mold and a gyro rotor which gyroscopically stabilizes a vertically positioned rotating shaft supported by lower and upper ball bearings, the lower bearings are preloaded by the weight of the rotor and shaft, the upper bearings are preloaded by a spring force which moves a preload collar upward and forces the inner ball bearing race and the ball bearings upward against the outer bearing race, the lower ball bearings positioned below the gyro rotor and the upper ball bearings positioned above the gyro rotor and below the concave spin casting mold, movement of the rotor shaft away from the intended vertical position is resisted by the gyroscopic force provided by the rotating gyro rotor, changes in the rotational speed of the rotating shaft are resisted by the inertia force provided by the rotating gyro rotor.

4,637,792

PULSING COMBUSTION

Robert E. Davis, Mountain Home, Ak., assignor to Arkansas Patents, Inc., Mountain Home, Ak.

Continuation-in-part of Ser. No. 666,458, Oct. 30, 1984, Pat. No. 4,569,310, which is a continuation-in-part of Ser. No. 403,769, May 26, 1982, Pat. No. 4,488,865, which is a continuation-in-part of Ser. No. 218,849, Dec. 22, 1980, Pat. No. 4,479,484. This application Oct. 11, 1985, Ser. No. 785,433
The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.
Int. Cl.[4] F23C *11/04*
U.S. Cl. 431—1 6 Claims



1. A pulsing combustion device comprising:

means for defining an elongate combustion chamber having an inlet for a combustible mixture and an unvalved outlet open to the atmosphere for combustion gases;

a floating valve member mounted in reciprocation relation in a wall of said combustion chamber, said valve member having a first side in communication with said combustion chamber and a second side in communication with a supply of a pressurized combustible mixture and having a plurality of ports through said valve member, means for directing said combustible mixture along the periphery of said combustion chamber; said reciprocation of said floating valve member in said wall closing and opening communication through said ports between said supply of combustible mixture and said combustion chamber;

means for supplying a pressurized combustible mixture to said second side of said floating valve member;

means for igniting and combusting said combustible mixture in said combustion chamber to produce pressurized combustion gases, said floating valve member being reciprocated by said pressurized combustible mixture in communication with said second side and said pressurized combustion gases in communication with said first side to regulate the flow of said combustible mixture into said combustion chamber.

4,637,793

FLARE GAS BURNER

Robert E. Schwartz; Roger K. Noble, and Michael R. Keller, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Continuation of Ser. No. 645,420, Aug. 29, 1984, Pat. No. 4,579,521. This application Nov. 18, 1985, Ser. No. 798,855
Int. Cl.[4] F23Q *9/00*
U.S. Cl. 431—202 3 Claims

1. In a tubular flare gas burner having an inlet end adapted to be mounted to a flare gas conduit and having a discharge end, the improvement whereby said burner is less susceptible to

damage caused by internal and/or external burning comprising:

an internal protective liner formed of refractory material attached within at least the discharge end portion of said burner whereby the internal surfaces of said burner are shielded from flame impingement and excessive heat caused by internal burning;

pilot burner means positioned adjacent the discharge end of said burner including conduits extending along and adjacent the external surfaces of said burner between the discharge and inlet ends thereof; and



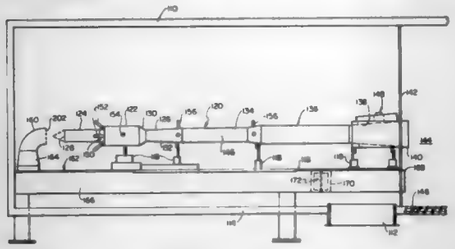
an external protective covering formed of refractory material attached to and over at least the discharge end portion of said burner and the conduits of said pilot burner means extending therealong whereby the external surfaces of said burner and said conduits are substantially shielded from flame impingement and excessive heat caused by external burning and an aerodynamically improved external surface is provided on the discharge end portion of said burner, said external protective covering being comprised of relatively soft and flexible refractory material encasing said external burner surfaces and said conduits and covered by a hard inflexible refractory material.

4,637,794

PULSE COMBUSTION DRYING APPARATUS FOR PARTICULATE MATERIALS

Robert R. Gray, 7110 Via Monte Mar, Gladstone, Oreg. 97027, and Val M. Marguth, 10015 SW. Kennedy St., Beaverton, Oreg. 97005

Filed Oct. 3, 1985, Ser. No. 783,860
Int. Cl.⁴ F27B *15/00*; **F27D** *7/00*; **F23C** *11/04*
U.S. Cl. 432—58 **9 Claims**



6. In pulse jet combustion apparatus for the drying of particulate material of the type having

a combustion chamber having an air entry end, an exhaust end and a common longitudinal axis therebetween, an air inlet conduit coaxially connected to the air entry end thereof,

a primary exhaust gas conduit coaxially connected to the exhaust end thereof and,

a tailpipe coaxially connected to the end of said exhaust gas conduit for directing the exhaust gases past a locus of particulate material introduction and to a dried particulate receiving chamber

the improvements comprising

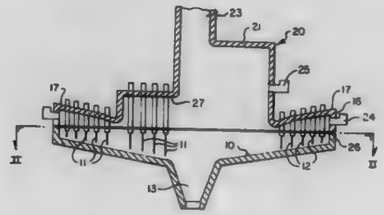
a plurality of primary fuel nozzles mounted at the air entry end of said combustion chamber downstream of said air inlet conduit and positioned to direct combustible fuel to a common location on the longitudinal axis of said combustion chamber spaced a predetermined distance from the air entry end thereof.

4,637,795

METHOD AND APPARATUS FOR CALCINING MATERIAL CONTAINING VOLATILE CONSTITUENTS

William E. Solano; James P. Docherty, and Joseph W. Stubenbort, all of Pittsburgh, Pa., assignors to Salem Furnace Co., Pittsburgh, Pa.

Filed Nov. 12, 1985, Ser. No. 797,150
Int. Cl.⁴ F27B *9/16*; **C10B** *1/00*
U.S. Cl. 432—138 **6 Claims**



1. In a heating furnace for calcining a bulk material containing a volatile constituent including a stationary heated circular chamber, a wall surrounding said chamber, a hearth in said chamber, means for rotating said hearth around its vertical axis, a roof for said chamber, a discharge opening in the center of said hearth, and transport rabbles mounted in said roof extending into said hearth for urging material on said hearth toward said discharge opening when said hearth is rotated, the improvement comprising means positioned intermediate said discharge opening and said chamber wall so as to divide said chamber into at least an inner and an outer connecting co-axial annular portions, means in said outer portion to turn over and mix said material on said hearth in said outer portion against the direction of travel of said material and fuel burners in said dividing means.

4,637,796

OFFICE FABRICATED, ADJUSTABLE FUNCTION REGULATOR

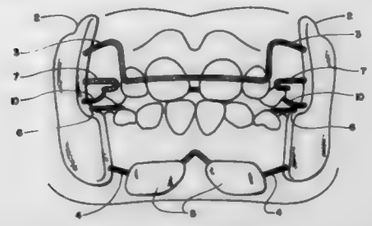
Marcel Korn, 502 Lindell Ave., Leominster, Mass. 01453

Filed Feb. 25, 1985, Ser. No. 704,958
Int. Cl.⁴ A61C *7/00*
U.S. Cl. 433—7 **12 Claims**

1. An orthodontic function regulator adapted for demountable posterior attachment to the rear teeth of the maxillary arch and anterior positioning over the front teeth of the mandibular arch and further adapted for office assembly from a selection of prefabricated elements comprising:

A. Two buccal shield base assemblies adapted to receive and connect said elements of said regulator;

B. A lip-pad, lingual roller assembly unit, said unit being generally "U" shaped and adapted at its anterior, closed end to be positioned over the front teeth of the mandibular arch, said assembly having rotatably mounted thereon labial roller means and lingual roller means adapted to be positioned labially and lingually respectively to the front teeth; said roler means being respectively mounted on generally "U"-shaped labial and lingual connector wires; the posterior ends of said wires being connected on each side of said assembly unit to an attachment plate; each of said plates being adapted to receive connecting means for demountably connecting said assembly unit to said base assemblies;



C. Connecting means for demountably connecting the posterior ends of said roller assembly unit to the anterior surface of said base assemblies;

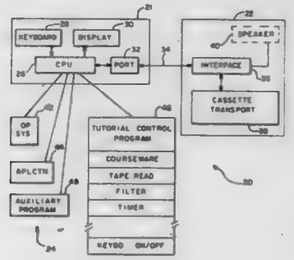
D. Two base assembly connecting means adapted to demountably connect said base assemblies to the buccal surface of the rear teeth of the maxillary arch; wherein one of each of said base assemblies is connected to one of each of the posterior ends of said "U" shaped lip pad, lingual roller assembly unit and one of each of said base assembly connecting means is connected to the posterior surface of each of said base assemblies.

4,637,797

SOFTWARE TRAINING SYSTEM

David R. Whitney, Burlingame, and Ronald B. Whitney, San Carlos, both of Calif., assignors to Access Learning Technology Corporation, San Mateo, Calif.

Filed Jan. 11, 1985, Ser. No. 690,785
Int. Cl.⁴ G09B *19/00*
U.S. Cl. 434—118 **8 Claims**



1. A computer software training system comprising:

(a) a computer system including

central process (CPU) means for executing computer programs;

keyboard means for entering data and commands into said computer system;

display means responsive to said CPU means for displaying messages; and

port means for connecting said CPU means to a peripheral device; and

(b) cassette tape player means for providing an audio signal including oral instructions to a speaker, and for simultaneously providing keystroke data to said computer system;

wherein said audio signal has been previously recorded on the first track of a cassette tape having first and second tracks, and said keystroke data has been recorded on the second track of said cassette tape;

said cassette tape player means including

stereo cassette tape transport means in which a cassette tape having first and second prerecorded tracks can be mounted, including means for producing output signals from said first and second prerecorded tracks and for making signals corresponding to audible sounds which have been recorded on said first prerecorded track of a cassette tape mounted in said cassette tape transport available for transmission to a speaker; and

an interface for connecting said cassette tape player means to said port means, including

means for enabling said computer system to activate and deactivate said cassette tape transport; and

decoder means for receiving from said stereo cassette tape transport means keystroke data signals from said second prerecorded track on a cassette tape mounted in said stereo cassette tape transport, for decoding said keystroke data signals into binary keystroke data signals useable by a computer, and for enabling said computer system to receive said decoded keystroke data;

said computer system further including:

(c) tutorial control means, including

on/off software means for activating and deactivating said cassette tape means; and

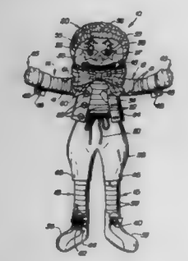
keystroke receiving means for receiving keystroke data from said cassette tape player means and for passing at least some of said keystroke data to said computer system for use as though said keystroke data came from said keyboard means.

4,637,798

CHILD'S DOLL USEFUL FOR TEACHING COUNTING, COLOR IDENTIFICATION, AND FOR PROMOTING MANUAL DEXTERITY

Mary L. Maiden-Nesset, 3072 Sunflower St., Thousand Oaks, Calif. 91360

Filed Nov. 2, 1984, Ser. No. 667,911
Int. Cl.⁴ G09B *19/02*
U.S. Cl. 434—191 **12 Claims**



1. A doll useful as a child's plaything and also for teaching a child to count from 1 through 10, comprising:

a. two legs, two arms, a torso, and a head portion; and

b. at least ten groups of distinctive features, each group comprising a predetermined number of similar features, and said predetermined number being one of the numbers from one to ten so that each number from one to ten is represented by at least one such group;

wherein said ten groups comprise the following features:

a. one heart-shaped area;

b. two eyes;

c. three stars;

d. four snap fasteners;

e. five distinct points on each of said stars;

f. six eyelashes over one of the eyes;

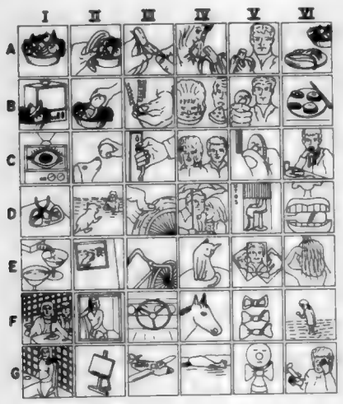
g. seven eyelashes over the other of the eyes;
h. eight shoe eyelets;
i. nine distinct patches;
j. ten distinct fingers.

4,637,799

SYSTEM AND GAME THAT STIMULATES CREATIVE AND VERBAL EXERCISE

Robert A. Bouchal, 48 Liberty Ave., Somerville, Mass. 02144

Continuation of Ser. No. 147,201, May 6, 1980, abandoned, which is a continuation-in-part of Ser. No. 901,132, Apr. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 727,395, Sep. 29, 1976, abandoned. This application Nov. 27, 1981, Ser. No. 325,285
Int. Cl.⁴ G09B *1/34*; A63F *1/00*
U.S. Cl. 434—236 **2 Claims**



1. A method of stimulating operation of associative powers of a subject person and evoking descriptive or narrative response from the subject comprising:

(a) providing a plurality of different, discrete visual representations arrangeable in a matrix-like array comprising a base group of a plurality of said representations and a plurality of additional groups each of a plurality of different discrete visual representations, and said discrete visual representations in said base group displaying examples of the same concept in at least next adjacent discrete representations and showing a concept in sequence, and said discrete representations in said additional groups displaying no example of the same concept as a group but each said representation in each additional group displaying an example of the same concept as a discrete representation relative to at least one other additional group or said base group;

(b) manually presenting first to the subject person said base group of discrete and different visual representations from said matrix with members of the base group arranged in a random order,

in a format permitting the subject person to arrange the said representations as a first visible pattern sequence elected by the subject as a logical order, and

in the said pattern, subsequently at least, to modify said pattern by substituting representations from said additional groups as presented to establish successive visible patterns;

(c) requesting the subject person to arrange the base group representations in a logical order as a first visible pattern;

(d) requesting the subject person to describe what he has done in establishing the pattern, or the significance of that pattern;

(e) manually presenting to the subject, successsively in a predetermined order, said plurality of additional groups of discrete and different visual representations from the matrix,

in a format permitting random presentation of the members in each successive additional group, and

permitting to the subject at least elective substitution of members from each succeedingly presented group for a visual representation in a prevailing said visible pattern of visual representations, and with removal from the visual field of all unused members of each additionally presented group and of members removed from any previously established visible pattern, before presentation of a further group;

(f) requesting the subject person to substitute members from the newly presented groups as presented for members in the prevailing pattern with which there is a logical connection, to establish a new pattern of discrete, visual representations; and when the subject has completed his effort at substitution to remove from view unused members of each additionally presented group and members from the preexisting pattern as a result of the substitution; and

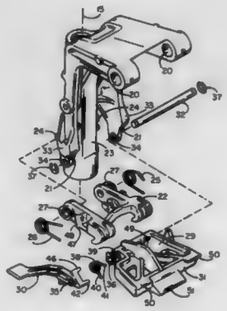
(g) requesting the subject to describe each new pattern of visual representations as determined on presentation of each new additional group of a plurality of discrete visual representations, a majority of all said representations being representations of natural persons, animals, or things.

4,637,800

SHALLOW WATER TILT MECHANISM FOR OUTBOARD MOTORS

Gordon C. Slattery, Omro, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 9, 1985, Ser. No. 765,016
Int. Cl.⁴ B63H *5/06*
U.S. Cl. 440—55 **5 Claims**



5. A tilt mechanism for a marine propulsion device comprising:

(A) a transom bracket for attachment to a boat;

(B) a swivel bracket pivotally supported on said transom bracket for tilting movement about a generally horizontal tilt axis;

(C) a shallow drive bracket pivotally supported on said swivel bracket for rotation about a generally horizontal support axis between a retracted position and a shallow drive position, said shallow drive bracket engaging said transom bracket in said shallow drive position to support said swivel bracket;

(D) an operating lever pivotally mounted on said swivel bracket for rotation about said support axis; and

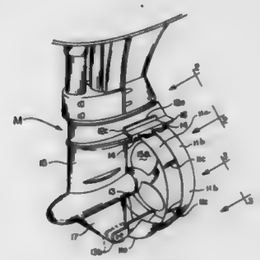
(E) a double acting spring means for biasing said shallow drive bracket toward a fixed angular position relative to said operating lever.

4,637,801

THRUST ENHANCING PROPELLER DUCT ASSEMBLY FOR WATER CRAFT

William C. Schultz, Chula Vista, Calif., assignor to William H. Flood, Chula Vista, Calif., a part interest

Continuation-in-part of Ser. No. 630,329, Jul. 12, 1984, abandoned. This application Oct. 15, 1984, Ser. No. 661,213
Int. Cl.⁴ B63H *5/15*
U.S. Cl. 440—67 **9 Claims**



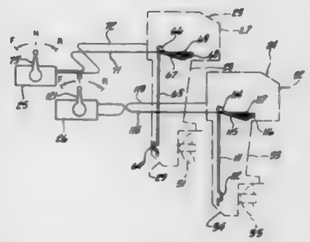
1. A thrust-enhancing duct assembly mounted on the propeller housing of a water craft comprising: a primary cowling mounted on the housing coaxially with the axis of rotation of the propeller, at least a portion of the primary cowling extending forward of the propeller and beyond the plane thereof; a secondary cowling coaxially mounted with respect to the primary cowling and spaced axially therefrom in overlapping relationship therewith so that the leading edge of the secondary cowling extends over the trailing edge of the primary cowling and the trailing edge of the secondary cowling extends rearwardly beyond the plane of the propeller, the secondary cowling being spaced radially from the primary cowling to create an annular space between the primary and secondary cowlings, with the primary cowling controlling the flow of water into the annular space to create a venturi effect; a plurality of axial vanes secured to said primary cowling at spaced annular positions around the outer surface of said primary cowling and secured to the inner surface of said secondary cowling to hold said cowlings in spaced and coaxial relationship, said vanes being shaped and positioned to create a counter rotating vortex in relation with the propeller vortex.

4,637,802

TWIN OUTBOARD DRIVE FOR WATERCRAFT

Michihiro Taguchi, and Akihiro Onoue, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Jan. 29, 1986, Ser. No. 823,593
Claims priority, application Japan, Jan. 31, 1985, 60-15413
Int. Cl.⁴ B63H *21/28*
U.S. Cl. 440—75 **26 Claims**



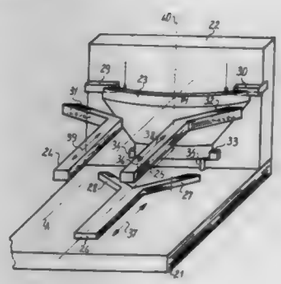
1. In a twin outboard drive for a watercraft comprising a first marine drive having a first transmission providing a forward, a neutral and a reverse drive ratio, a second marine drive having a second transmission providing a forward, a neutral and a reverse drive ratio, a first shift element movable between a forward, a neutral and a reverse position for operating said first transmission in those respective ratios, a second shift element movable between a forward, a neutral and a reverse position for operating said second transmission in those respective ratios, said first and said second shift elements being movable in like directions with the forward position of said first shift element corresponding to the reverse position of said second shift element and vice versa, a first shift control movable between a forward, a neutral and a reverse position, and a second shift control movable between a forward, a neutral and a reverse position, said first and said second shift controls being movable between their positions in like directions, the improvement comprising motion transmitting means operatively connecting said first shift control with said first shift element and said second shift control with said second shift element, said motion transmitting means being constructed and arranged for providing that the movement of said first and said second shift controls in the same direction from their forward position to their reverse position effect opposite movement of said shift elements.

4,637,803

PROCESS FOR POSITIONING AND GRASPING SEMI FERRITES FOR A MAGNETIC CORE AND CENTERING DEVICE FOR OPERATING SAID PROCESS

Jean Rousseau, Gentis, and Jean P. Fourche, Marsannay la Cote, both of France, assignors to Videocolor, Montrouge, France

Filed Feb. 19, 1985, Ser. No. 702,602
Claims priority, application France, Feb. 21, 1984, 84 02570
Int. Cl.⁴ H01J *9/236*
U.S. Cl. 445—23 **16 Claims**



1. Process for positioning and grasping a semi ferrite for a magnetic core, especially for a cathode tube deflector, the semi ferrite comprising on its edges, created by the fracture plane, position reference elements of its magnetic axis, comprising the steps of: applying said semi ferrite on a positioning table; resting said semi ferrite on centering elements in relation to the said reference elements of the semi ferrite; grasping said semi ferrite by a clip in a position such that the clip allows the retention of data as to the position of the magnetic axis, independently of the table and of the centering elements of the table.

4,637,804

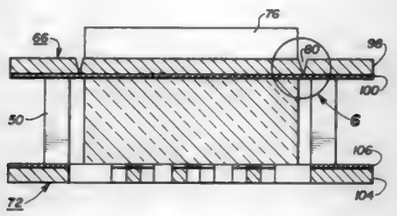
METHOD OF CONSTRUCTING AN ELECTRON GUN HAVING AN IMPROVED TRANSITION MEMBER AND PRODUCT THEREOF

Harry E. McCandless, Manor Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 26, 1986, Ser. No. 844,346
Int. Cl.⁴ H01J *9/12*
U.S. Cl. 445—36 **2 Claims**

1. In a method of constructing an electron gun for a cathode-

ray tube, said electron gun including at least one cathode assembly and at least two spaced, successive electrodes having aligned apertures therethrough for passage of at least one electron beam, said electrodes being held in position from a common ceramic member having a first major surface and an oppositely disposed second major surface with a metallized pattern formed on at least a portion of each major surface, a bimetal first transition member being disposed between at least one of said electrodes and said first major surface of said common ceramic member, said bimetal first transition member comprising two layers of metal bonded face-to-face along an interface extending therebetween, a first layer of metal having a melting point higher than that of a second layer of metal, said second layer being brazed to said metallized pattern on said first major surface, said bimetal first transition member includ-



ing at least one electrode contact portion and a removable frame portion, the improvement comprising

providing a V-notched weakened bridge region interconnecting said frame portion and said electrode contact portion of said first transition member, said V-notched bridge region extending through said first layer of metal and terminating at the interface with said second layer of metal,

removing said frame portion from said electrode contact portion at said V-notched bridge region by melting said second layer of metal when said second layer is brazed to said metallized pattern on said first major surface of said common ceramic member, thereby providing a substantially smooth edge on said contact portion when said frame portion is removed.

4,637,805

APPARATUS AND METHODS FOR ENGAGING TOOTHPICKS TO ASSEMBLE A TOY STRUCTURE

Willard L. Sweetin, 5956 Fazon Rd., Bellingham, Wash. 98226

Filed Dec. 14, 1984, Ser. No. 681,871

Int. Cl.[4] A63H *33/10*

U.S. Cl. 446—71 **18 Claims**

1. Apparatus for engaging toothpicks to assemble a toy structure of multiple configurations, said apparatus comprising:

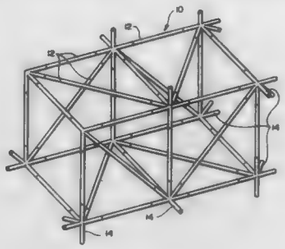
a. a support member including a plurality of support sleeves radiating outwardly therefrom, each of said support sleeves having a conically shaped passageway therein for engaging one of said toothpicks in a frictional fit therewith in proximity to an end of said toothpick, with each of said support sleeves connecting its said toothpick to said support member, whereby said toy structure is assembled by interconnecting said toothpicks with a plurality of said support members to form various structural configurations of said toy structure;

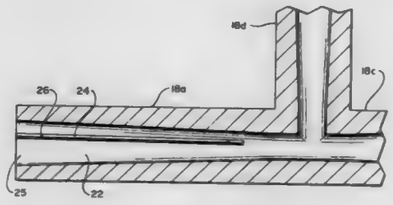
b. at least some of said support sleeves being horizontal support sleeves radiating outwardly from said support member in a horizontal plane to secure at least some of said toothpicks thereto in a horizontal structural relationship, said horizontal support sleeves being sized to a predetermined length to accommodate toothpicks of a uniform length within said structure, said horizontal support sleeves including:

i. at least one first horizontal support sleeve for securing at least one of said toothpicks between adjacent support members which occupy said horizontal plane,

ii. at least one second diagonal horizontal support sleeve for securing at least one of said toothpicks to diagonally located support members which occupy said horizontal plane, said second diagonal horizontal support sleeve having a lengthwise dimension which is greater than the lengthwise dimension of said first horizontal support sleeve to accommodate toothpicks of a uniform length in said toy structure;

c. at least some of said support sleeves being vertical support sleeves radiating outwardly from said support member in a vertical plane to secure at least some of said toothpicks thereto in a vertical structural relationship, said vertical support sleeves being sized to a predetermined length to





accommodate toothpicks of a uniform length within said structure, said vertical support sleeves including:

i. at least one first vertical support sleeve for securing at least one of said toothpicks between adjacent support members occupying said vertical plane;

ii. at least one second diagonal vertical support sleeve for securing at least one of said toothpicks to diagonally located support members which occupy said vertical plane, said second diagonal vertical support sleeve sized to a predetermined length to accommodate toothpicks of uniform length in said toy structure;

d. the length of each second diagonal horizontal support sleeve as measured from a center of said support member to an end of said diagonal support sleeve being determined by the following relationship:

$$d = \frac{t + 2s}{2 \cos A} - \frac{t}{2}$$

wherein "d" is the length of said diagonal horizontal support sleeve, "s" is the length of said first horizontal support sleeve as measured from the center of said support member to an end of said first horizontal support sleeve, "t" is the length of said toothpick minus the length of two end segments of said toothpick defined by the locations where said toothpick is engaged by said support sleeves, and "A" is an angle formed by the convergence of said second diagonal horizontal support sleeve and said first horizontal support sleeve;

e. the length of said second diagonal vertical support sleeve as measured from the center of the support member to the end of said diagonal vertical support sleeve being determined by the following relationship:

$$d = \frac{t + 2s}{2 \cos A} - \frac{t}{2}$$

wherein "d" is the length of said diagonal vertical support sleeve, "s" is the length of said first vertical support sleeve as measured from the center of said support member to the outward end of said first vertical support sleeve, "t" is the length of said toothpick minus the lengths of two end segments of said toothpick defined by the locations where said toothpick is engaged by said support sleeves, and "A" is an angle formed by the convergence of said diagonal vertical support sleeve and said first vertical support sleeve.

4,637,806

ARRANGEMENT FOR MOUNTING SWIVEL PIN BEARING IN YOKE OF UNIVERSAL JOINT

Armin Olschewski, Schweinfurt; Bernhard Bauer, Hassfurt, and Elisabeth Zirk, Dittelbrunn, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 12, 1985, Ser. No. 711,068

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1984, 3409078

Int. Cl.[4] F16D *3/40*

U.S. Cl. 464—130 **6 Claims**

1. In a swivel pin bearing for rotatably seating a swivel pin in a yoke eye of a yoke arm, including a bushing having a base portion and a sleeve portion integrally formed with the periphery of said base portion, said sleeve portion being arranged in said yoke eye with radial seating play and said base portion having a planar outer surface, and a support plate having an inner planar surface arranged to oppose said outer surface of said base portion of said bushing and releasably secured to said yoke arm, the improvement wherein said bearing further includes means for coupling said bushing to said support plate such that axial displacement of said bushing relative to said support plate is substantially prevented and said bushing is capable of a sliding radial displacement relative to said support plate which is greater than said seating play, said coupling means comprising a rigid holding element rigidly connected to said outer surface of said base portion, said support plate having an axial orifice, said holding element comprising an axial portion extending from said outer surface of said base portion and arranged with radial play in said axial orifice and a radial portion rigidly connected to the end of said axial portion, said radial portion of said holding element abutting an outer surface of said support plate in an area adjacent said axial orifice.

4,637,807

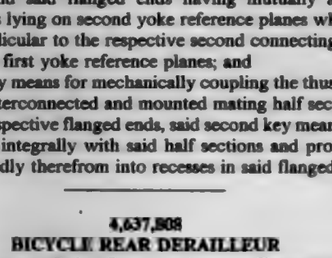
SPLIT YOKE UNIVERSAL JOINT

Robert K. Koelling, Sr., Dallas, Tex., assignor to Morgan Construction Company, Worcester, Mass.

Filed Jun. 13, 1985, Ser. No. 744,227

Int. Cl.[4] F16D *3/40*

U.S. Cl. 464—135 **4 Claims**



1. A universal joint for providing a drive connection between the flanged ends of two rotatable elements, said joint comprising:

a cross formed by two mutually perpendicular pairs of coaxially aligned trunnions;

a pair of yokes, each yoke being subdivided into separate mating half sections, each half section including a base portion with an integral forwardly protruding bearing cap having a blind bore formed therein;

bearings contained in said blind bores, the mating half sections of each yoke being adapted for assembly onto a pair of said trunnions, with each trunnion being journalled for rotation in one of said bearings, and with the base portions of the thus assembled mating half sections having juxtaposed surfaces located on opposite sides of a first yoke reference plane passing through the center of the joint;

first key means for opposing relative movement of the thus assembled mating half sections in directions parallel to their respective first yoke reference planes, said first key means lying on said first yoke reference planes and extending into complimentary opposed keyways in said juxtaposed surfaces;

first connecting means for separably interconnecting the thus assembled mating half sections, said first connecting means extending through said mating half sections in directions perpendicular to their respective first yoke reference planes;

second connecting means for detachably mounting the thus assembled and interconnected mating half sections to a respective one of said flanged ends, said mating half sections and said flanged ends having mutually abutting surfaces lying on second yoke reference planes which are perpendicular to the respective second connecting means and the first yoke reference planes; and

second key means for mechanically coupling the thus assembled, interconnected and mounted mating half sections to their respective flanged ends, said second key means being formed integrally with said half sections and protruding rearwardly therefrom into recesses in said flanged ends.

4,637,808

BICYCLE REAR DERAILLEUR

Shizuo Nakamura, Kobe, Japan, assignor to Kawamura Cycle Co., Ltd., Kobe, Japan

Filed Feb. 15, 1985, Ser. No. 701,874

Claims priority, application Japan, Feb. 16, 1984, 59-28161; Feb. 27, 1984, 59-27896[U]

Int. Cl.[4] F16H *9/24*

U.S. Cl. 474—80 **4 Claims**

1. A bicycle rear derailleur for shifting an endless drive chain from one sprocket to another sprocket of a multiple

freewheel having a plurality of different sized sprockets and mounted on a rear wheel hub of a bicycle, comprising:

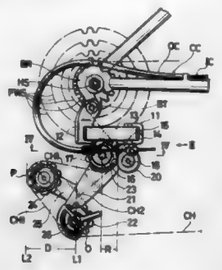
a guide pulley;

a tension pulley;

a tensioner frame means for rotatably supporting said guide pulley and said tension pulley;

a shifter means for shifting said tensioner frame means in directions substantially parallel with respect to an axis of said rear wheel hub;

said tensioner frame means including a tension pulley support arm which is resiliently urged to be pivotally moved rearwardly of said bicycle;



said tension pulley being rotatably supported at a free end of said tension pulley support arm;

a compensating means for compensating a sagging in said endless drive chain; and

said compensating means being arranged so as to stretch out said endless drive chain rearwardly of said bicycle so that a distance between a geometrical vertical line passing through a center of said tension pulley and a vertical tangential line at a rearmost point of a rearwardly stretched portion of said endless drive chain on said compensating means is larger than a radius of said guide pulley when said tension pulley support arm takes its rearmost position.

4,637,809

REAR DERAILLEUR FOR A BICYCLE

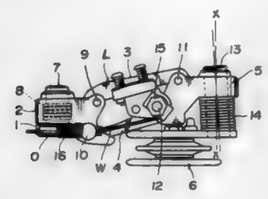
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Nov. 19, 1985, Ser. No. 799,615

Claims priority, application Japan, Nov. 30, 1984, 59-254687; Oct. 2, 1985, 60-219829

Int. Cl.⁴ F16H *9/00*

U.S. Cl. 474—80 **6 Claims**



1. A rear derailleur for a bicycle which shifts a driving chain from one sprocket to another at a multistage sprocket assembly for the bicycle, said rear derailleur comprising,

(a) a fixing member,

(b) a linkage mechanism provided with a base member, two linkage members and a movable member,

(c) a first horizontal shaft for pivoting said linkage mechanism swingably to said fixing member,

(d) a chain guide comprising a guide pulley, a tension pulley, and a pulley plate having an urging surface which extends in the direction of the travelling path of said chain travelling to each sprocket at said multistage sprocket assembly and is opposite to said chain,

(e) a second horizontal shaft for swingably pivoting said chain guide to said movable member,

(f) a first biasing means which is interposed between said fixing member and said linkage mechanism and biases said linkage mechanism in the direction of moving said guide pulley away from the center of said multistage sprocket assembly,

(g) a second biasing means which is interposed between said movable member and said chain guide and biases said chain guide in the direction of applying tension to said chain, and

(h) a holding means which responds to swinging motion of said linkage mechanism and said chain guide when swinging, thereby holding an interval between said urging surface and said chain more than a predetermined interval.

4,637,810

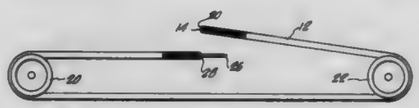
ADJUSTABLE ENDLESS BELT

Paul Beck, 1100 N. Alta Loma Rd., Los Angeles, Calif. 90069

Filed Mar. 12, 1984, Ser. No. 588,733

Int. Cl.⁴ F16G *3/00*

U.S. Cl. 474—253 **10 Claims**



1. A continuously adjustable endless belt for use in power transmission comprising an outer length of flexible tear-resistant material, a cylindrical channel of constant radius extending logitudinally through said outer length of material, at least one length of reinforcing material disposed in said outer length of material and extending the length thereof, a cylindrical cord of constant radius constructed of flexible tear-resistant material slidably disposed within said channel, a length of reinforcing material disposed in said cord and extending the length thereof, the length of said cord being equal to the length of said outer length of flexible material such that upon pulling a portion of said cord from one end of said outer length of material, applying an adhesive material to said portion of said cord and disposing said portion within said channel in the other end of said outer length of material, a continuous belt of uniform construction is defined.

4,637,811

CONTAINER DIE SYSTEM

Joe L. Fortney, Gas City, Ind., assignor to Peerless Machine & Tool Corporation, Marion, Ind.

Filed Oct. 15, 1985, Ser. No. 787,732

Int. Cl.⁴ B31B *1/44*

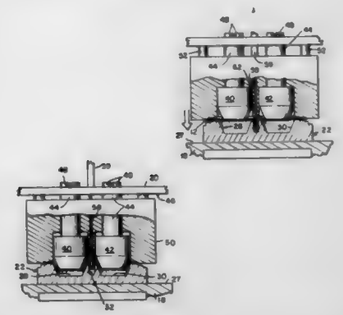
U.S. Cl. 493—167 **13 Claims**

1. A press die system for substantially simultaneously forming at least two containers with a common region extending therebetween from a single sheet of paperboard material or the like, the press die system comprising

a female die assembly formed to include a first container-forming cavity, a second container-forming cavity in spaced relation to the first cavity, and a paperboard material-receiving cavity situated between the first and second container-forming cavities,

blade means confronting the paperboard-receiving cavity for pressing a portion of the sheet into the material-receiving cavity prior to formation of the at least two interconnected containers to provide a reservoir of excess paperboard material for use in forming the at least two interconnected containers, and

male die means for substantially simultaneously pressing the single sheet into the first and second container-forming cavities to form the two interconnected containers causing paperboard material placed in the material-receiving cavity by the blade means to be drawn therefrom toward at least one of the container-forming cavities during operation of the male die means so that common regions interconnecting adjacent containers remain substantially intact and untorn during formation of the interconnected containers.



4,637,812

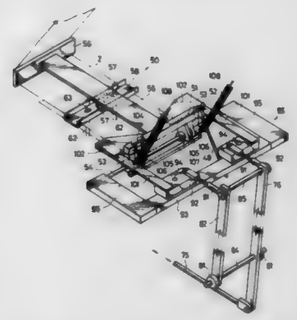
APPARATUS FOR FOLDING WEB-SHAPED MEMBER

Kenji Ogawa, Musashino, Japan, assignor to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1984, Ser. No. 649,391

Int. Cl.⁴ B05B *1/14*

U.S. Cl. 493—357 **8 Claims**



8. A folding device for an elongated continuous strip of plastic web material having laterally spaced elongate cuts formed therein at regular intervals in the longitudinal direction thereof, comprising:

frame means;

a pair of spaced folded end receiving members mounted on said frame means;

means defining a pathway for said web material on said frame means;

reciprocal feed means on said frame means for feeding said continuous strip of plastic web material in a zigzag manner so that web material sections are stacked one on top of the other between folded end portions thereon, said folded end portions thereon being oriented adjacent said folded end receiving members, said feed means including a pair of film feeding arms each having a proximal end and a forward end, said film feeding arms each being pivotally supported at said proximal end adjacent said folded end receiving members so that said forward ends of said film feeding arms are alternately movable to sand from said folded end portions to orient said film in said zigzag manner, said film feeding arms being pivotal between an upright position inclined to the upper surface of said zigzag folded web material spacing said forward end from said folded end portions and a position parallel to the upper surface of said zigzag folded web material, each film feeding arm having intermediate said proximal end and said forward end a keep plate adapted to engage said upper surface of said web material folded in said zigzag manner, said keep plate having means defining holes therein that are alignable with said cuts when said keep plate engages said upper surface; and

a plurality of receiving surfaces for receiving thereon said zigzag folded web material, said receiving surfaces each having at least a pair of holes therethrough;

two rod-like insert members on each of said receiving surfaces received in said cuts in said web material in response to said keep plate pressing down on said upper surface when said film feeding arm is in said position parallel to said upper surface; and

means for tying said web material in a predetermined quantity, including tying members inserted into said cuts in said web material through said insert members and a bend member for bending one end of a said tying member inserted into a superposed arrangement of said cuts.

4,637,813

BLOOD PROCESSING ASSEMBLY INCLUDING A PREPACKAGED FLUID CIRCUIT MODULE

James H. DeVries, McHenry, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 100,975, Dec. 6, 1979, which is a continuation of Ser. No. 843,223, Oct. 18, 1977, abandoned. This application Sep. 27, 1982, Ser. No. 424,823

Int. Cl.⁴ A61F *2/16*

U.S. Cl. 604—6 **20 Claims**

1. A blood processing assembly comprising

an apparatus including at least two pump rotors and a centrifuge device, and

a prepackaged, self-contained fluid circuit module including

flexible first conduit means having an inlet end adapted for communication with the circulatory system of a patient-donor and a spaced outlet end, said first conduit means defining a fluid pathway for whole blood withdrawn from the patient-donor,

a first fluid receiving receptacle attached to said outlet end of said first conduit means and adapted for mounting in said centrifuge device, said first fluid receiving receptacle including zones for the collection of platelet-rich plasma and red blood cells in response to operation of said centrifuge device,

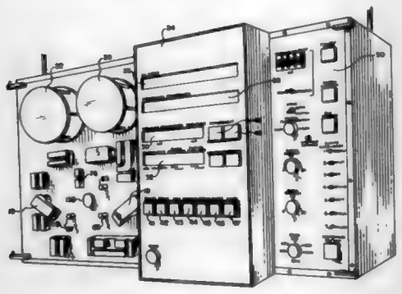
flexible second conduit means having an inlet end attached to and communicating with said first fluid receiving receptacle at said zone for the collection of platelet-rich plasma and a spaced outlet end, said second conduit means defining a fluid pathway for the platelet-rich plasma,

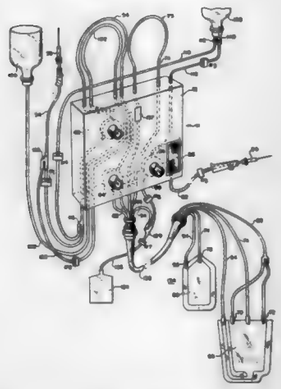
a second fluid receiving receptacle attached to said outlet end of said second conduit means and adapted for mounting in said centrifuge device, said second fluid receiving receptacle including a zone for the collection of plasma in response to operation of said centrifuge device, and

housing means having sidewalls peripherally defining a hollow interior and including means on said sidewalls for supporting each of said conduit means intermediate said inlet and outlet ends thereof within the confines of said hollow interior with a portion of each of said conduit means supported in a predetermined arcuate configuration outwardly bowed from one of said sidewalls and being resiliently biased toward an upright position generally perpendicular to said one side wall with said outwardly bowed portions of said first and second conduit means being positioned in a spaced, noncontiguous relationship

along said one sidewall to accommodate separate operative contact with said pump rotors, and

means for removably mounting said fluid circuit assembly on said apparatus with said one sidewall disposed adjacent to





said pump rotors to enable operative contact of said outwardly bowed portion of said first conduit means with one of said pump rotors and one said outwardly bowed portion of said second conduit means with the other one of said pump rotors.

4,637,814

METHOD AND APPARATUS FOR INTESTINAL IRRIGATION

Arnold Leiboff, 20 Wendell St., Hempstead, N.Y. 11550

Filed Apr. 5, 1985, Ser. No. 720,571

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—27 **21 Claims**

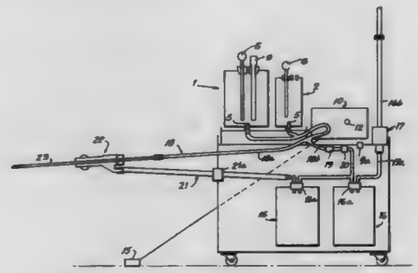
1. Apparatus for undirectional irrigation of at least a portion of the gastrointestinal tract including the bowel, said gatrointestinal tract portion to be irrigated defined between a point of access and an occluded distant point, comprising:

drain tube means for collecting effluent from the gastrointestinal tract portion, said drain tube means including a primary tubular section having a distal end portion and a proximal end portion and further including means for conducting effluent from the gastointestinal tract portion being irrigated to a region external thereof;

irrigating tube means for conducting irrigant to a region proximate to an occluded distant point in the gastrointestinal tract portion, said irrigating tube means having a distal end and a proximal end and including an elongate tubular member having at least one lumen extending between said distal and proximal ends and in fluid communications at its proximal end with a source of irrigant, said irrigating tube means having first aperture means formed therein communicating with said at least one lumen and opening externally of said irrigating tube means only at a region thereof situated substantially proximate to said distal end of said irrigating tube means;

said drain tube means and said irrigating tube means being formed so that a portion of said elongate tubular member of said irrigating tube means is situated within said primary tubular section of said drain tube means, said elongate tubular member of said irrigating tube means having a length such that upon said insertion of said irrigating tube means, said distal end of said irrigating tube means is situated substantially at the occluded distant point of the gastointestinal tract portion and said proximal end of said irrigating tube means is situated externally of said proximal end portion of said drain tube means; and

fluid sealing means extending between said primary tubular section of said drain tube means and said tubular member portion of said irrigating tube for preventing effluent entering into said distal end portion of said primary tubu-



lar section from being discharge from said proximal end portion thereof, said fluid sealing means including a cuff member having a bore formed therethrough through which at least a portion of said tubular member of said irrigating tube passes, said cuff member adapted to sealingly engage said primary tubular section of said drain tube means;

whereby with said drain tube means and irrigating tube means inserted in the gastrointestinal tract portion, irrigant conducted into the proximal end of said at least one lumen flows therethrough and is discahrged therefrom through said first aperture means at said region situated substantially proximate to said distal end of said irrigating tube means at the occlued distant point of the gastrointestinal tract portion whereupon said irrigant flows unidirectionally through said gastointestinal tract portion towards said drain tube means whereupon irrigant carrying the contents or said gastointestinal tract portion in the form of effluent enters into said drain tube means and is discharged therefrom through said effluent conducting means thereof.

4,637,815

IRRIGATIONAL HEMOSTATIC SOLUTION

Gerald M. Lemole, 404 Tomlinson Rd., Huntingdon Valley, Pa. 19046

Filed Aug. 6, 1985, Ser. No. 763,056

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—28 **12 Claims**

1. A method of reducing mediastinal fibrinolysis in open heart surgery patients, comprising the steps of:

topically applying a hemostatic solution to the mediastinum followed by closing the pericardium, said solution comprising a saline solution at body temperature of a pharmacologically active mixture of calcium chloride, epsilon-

aminocaproic acid, protamine, thrombin and norepinephrine dissolved therein.

4,637,816

APPARATUS FOR THE ORAL ADMINISTRATION OF CAPSULES TO ANIMALS

Derek Mann, Derby, England, assignor to Dobson Park Industries, PLC, England

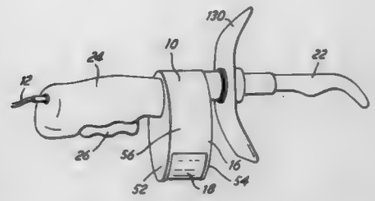
PCT No. PCT/GB84/00143, § 371 Date Dec. 12, 1984, § 102(e) Date Dec. 12, 1984, PCT Pub. No. WO84/04239, PCT Pub. Date Nov. 8, 1984

PCT Filed Apr. 26, 1984, Ser. No. 682,001

Claims priority, application United Kingdom, Apr. 26, 1983, 8311345

Int. Cl.[4] A61M *5/18*

U.S. Cl. 604—62 **19 Claims**



1. Apparatus for the oral administration of capsules to animals, comprising a tubular member having a tip and having a length such that when inserted into the animal's mouth the tubular member extends above the animal's tongue, said tubular member having a lower contact surface which engages the animal's tongue to hold the same in position, and said tip having an upper contact surface forwardly of the lower contact surface which engages the soft palate near the root of the animal's tongue to initiate swallowing, means for introducing a capsule into the tubular member rearwardly of the tip, in which the tip consists of two tip portions extending from the mouth of the tubular member and laterally spaced from one another so as to define a cavity in which a capsule is deposited at the root of the animal's tongue.

4,637,817

SEQUENCE VALVE FOR PIGGYBACK IV ADMINISTRATION WITH OCCLUSION FAILURE SENSING

G. Kent Archibald, White Bear Lake, and Frank A. Slaker, New Brighton, both of Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 676,020, Nov. 29, 1984. This application Nov. 14, 1985, Ser. No. 797,929

Int. Cl.[4] A61M *5/14*

U.S. Cl. 604—81 **27 Claims**

13. A sequence valve for selectively occluding first and second flexible tubes in sequence, the sequence valve comprising:

spring biased pivotable tube pincher means for pinching off the first and then the second flexible tube;

pivotable latch means for holding the tube pincher in a position in which the first tube is pinched off;

a solenoid means which releases the latch in response to a control signal to permit the latch to pivot out of engagement with the tube pincher and thereby allow the tube pincher to pivot to a position in which the second tube is pinched off; and



means for sensing a condition indicative of a failure of the tube pincher to pinch off the second tube and providing a signal in response thereto.

4,637,818

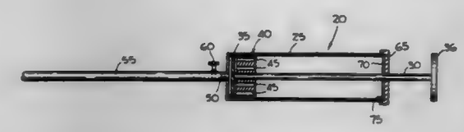
APPARATUS FOR PRODUCING STERILITY IN FEMALE ANIMALS

Richard K. Johnson, 20656 View Oaks Way, San Jose, Calif. 95120, and John W. Algeo, P.O. Box 158, Templeton, Calif. 93465

Division of Ser. No. 555,063, Nov. 23, 1983. This application Nov. 18, 1985, Ser. No. 799,316

Int. Cl.[4] A61M *5/18*

U.S. Cl. 604—89 **7 Claims**



1. Apparatus for injecting flowable material comprising:

(a) a cylinder, said cylinder being formed with a discharge opening at one end thereof;

(b) a piston rod disposed in said cylinder, said piston rod being movable over a rectilinear path in said cylinder, said piston rod at one end section thereof projecting out of said cylinder;

(c) a flexible member disposed in said cylinder and secured to said piston rod at the other end section thereto for movement therewith;

(d) a plunger disposed in said cylinder and secured to said piston rod for movement therewith, said plunger being disposed adjacent said flexible member between said flexible member and said one end section of said piston rod,

(e) said plunger, said flexible member and said piston rod being arranged coaxially, said plunger being formed with a plurality of axially disposed metering apertures therethrough, said metering apertures containing predetermined quantities of material to be mixed within said cylinder;

(f) a sealing lid separately attached to said cylinder at the other end thereof and formed with a central opening to receive said piston rod for reciprocating movement over said rectilinear path, said cylinder being arranged to contain flowable material insertable into said cylinder at the other end thereof; and

(g) a handle attached to said one end section of said piston

rod projecting out of said cylinder for imparting a reciprocating movement to said piston rod over said rectilinear path, the movement of said piston rod away from said discharge opening causes said flexible member to flex in one direction for unsealing said metering apertures in said plunger at the end thereof adjacent said flexible member for the mixing of the material in said metering apertures of said plunger with the flowable material in said cylinder as said piston rod travels away from said discharge opening, and the movement of said piston rod toward said discharge opening causes said flexible member to flex in an opposite direction for sealing said metering apertures in said plunger at the end thereof adjacent said flexible member to urge said mixed material in said cylinder to be discharged through said discharge opening during the travel of said piston rod by the urging action of said plunger and said flexible disc.

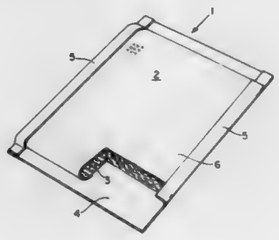
4,637,819

MACROSCOPICALLY EXPANDED THREE-DIMENSIONAL POLYMERIC WEB FOR TRANSMITTING BOTH DYNAMICALLY DEPOSITED AND STATICALLY CONTACTED FLUIDS FROM ONE SURFACE TO THE OTHER

William R. Ouellette; Daniel S. Alcombright; John J. Carro, and E. Kelly Linman, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 31, 1985, Ser. No. 740,083
Int. Cl.⁴ A61F *13/16*
U.S. Cl. 604—369 **30 Claims**

1. A macroscopically expanded, three-dimensional fluid-handling polymeric web having first and second surfaces located in substantially parallel planes which are remote from one another, said web including a multiplicity of fluid-handling capillary networks of macroscopic cross-section for rapidly transmitting fluids which are dynamically deposited on said first surface of said web to said second surface of said web using the dynamic and gravitational head of the fluid as a primary driving force, each of said macroscopic cross-section capillary networks originating as an aperture in said first surface of said web and having a continuously interconnected sidewall extending in the direction of said second surface of said web, said continuously interconnected sidewall terminating to form at least one aperture in said second surface of said web, whereby the bulk of said dynamically deposited fluid is transmitted from said first surface to said second surface of said web by said macroscopic cross-section capillary networks, said



first surface of said web in which said macroscopic cross-section capillary networks originate further including a multiplicity of fluid-handling capillary networks which are substantially smaller in cross-section than said macroscopic cross-section fluid-handling capillary networks, said smaller fluid-handling capillary networks exhibiting a degree of capillary suction sufficient to transmit static fluid contained on the surface of objects which contact said first surface of said web generally in the direction of said second surface of said web by capillary attraction.

4,637,820

COPPER-MODIFIED CARBOXYALKYL-CELLULOSE FIBER

Ingo G. Marini, Lenzing, Austria, and Scarlet Sustmann, Viersen, Fed. Rep. of Germany, assignors to Lenzing Aktiengesellschaft, Lenzing, Austria

Filed Mar. 4, 1985, Ser. No. 708,139
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1984, 3408131
Int. Cl.⁴ D01F *1/10, 2/24*
U.S. Cl. 8—129 **22 Claims**

1. A modified fibrous material consisting essentially of viscose fibers modified by anionic moieties of the general formula:

$$-(CH_2)_n-COO^{(-)};$$

wherein n is from 1 to 3;

which anionic moieties are each attached through an oxygen atom to a viscose anhydroglucose unit; wherein sufficient of said anionic moieties are present, and sufficient of said present anionic moieties are capped by copper cations, that said viscose fibers bind from about 0.1 to 3.0% by weight of copper, based on the weight of said fibers.

4,637,821

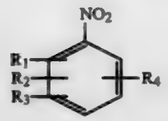
TINCTORIAL COMPOSITION FOR KERATIN FIBRES, BASED ON NITRATED BENZENE DYESTUFFS

Christian Mounais, Neuilly-sur-Seine, and Jean Cotteret, Franconville, both of France, assignors to L'Oreal, Paris, France

Filed Sep. 30, 1982, Ser. No. 428,523
Claims priority, application Luxembourg, Oct. 8, 1981, 83686
Int. Cl.⁴ A61K *7/13*
U.S. Cl. 8—415 **13 Claims**

1. A composition suitable for dyeing human hair, which comprises in an acceptable cosmetic medium, an amount effective to dye hair of

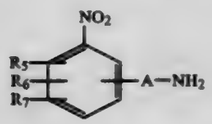
(a) at least one dyestuff of the formula:



(I)

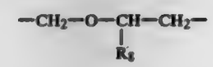
in which R_1 and R_2 independently designate hydrogen, amino, alkylamino, —NH—aliphatic—$(X)_m$, dialkylamino or —N—(aliphatic—$(X)_m)_2$, R_3 designates hydrogen, OH, alkoxy or —O—aliphatic—$(X)_m$, "aliphatic" designates an aliphatic radical having m+1 free valencies, m designates an integer from 1 to 3 such that if m=1, X represents OH, Cl, OCH_3 or OCH_2CH_2OH, or, if m designates 2 or 3, X designates OH, and R_4 designates hydrogen, alkyl or halogen, with the proviso that at least one of R_1, R_2 and R_3 is other than hydrogen, and that, if R_1 and R_2 are both other than hydrogen, R_3 designates hydrogen, and

(b) at least one dyestuff of the formula:



(II)

in which R_5 designates hydrogen, amino, alkylamino, NH—alkylene—$(X)_m$, N—$(alkyl)_2$, N—$(aliphatic(X)_m)_2$, or $NHCH_2CH_2NH_2$, R_6 designates hydrogen, OH, alkoxy, O-$aliphatic(X)_m$ or $O(CH_2)_nNH_2$, R_7 designates hydrogen, alkyl or halogen, A designates —Y—(CH_2)—$_n$, —$OCH_2CHOH—CH_2$— or



where R_8 designates hydrogen or methyl, Y designates oxygen or —NH— and n is an integer from 2 to 4, and m, "aliphatic" and X are as defined above, with the proviso that, if Y designates —NH— and R_6 is other than hydrogen, R_5 designates hydrogen, and, if Y is an oxygen atom, R_6 designates hydrogen, each of alkyl, alkoxy, alkylamino and dialkylamino in formulas (I) and (II) above having 1 to 4 carbon atoms, the shade and chromaticity of the colour obtained with the dyestuff(s) of formula (I) and the shade and chromaticity of the colour obtained with the dyestuff(s) of formula (II) being such that $\Delta H+\Delta C$ is less than or equal to 4.5.

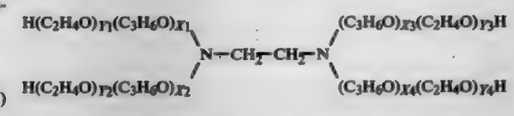
4,637,822

COAL-OIL SLURRIES CONTAINING A SURFACTANT

Joseph H. Y. Niu, The Woodlands, Tex., and Irving R. Schmolka, Grosse Ile, Mich., assignors to BASF Corporation, Wyandotte, Mich.

Filed Nov. 2, 1981, Ser. No. 317,051
Int. Cl.⁴ C10L *1/32*
U.S. Cl. 44—51 **10 Claims**

1. A combustible slurry comprising solid particulate carbonaceous material having particles sufficiently fine so that at least 80 percent pass through a 200 mesh screen, liquid hydrocarbon fuel in the amount of about 45 to 80 percent by weight, about 0.05 to 5 percent by weight of a polyoxyethylene-polyoxypropylene copolymer, and up to about 10 percent by weight of water; said copolymer having the formula:



in which the values of X_1, X_2, X_3 and X_4 may be the same or different, Y_1, Y_2, Y_3 and Y_4 may be the same or different, $Y_1+Y_2+Y_3+Y_4$ give a total oxyethylene content of the molecule of from about 10 to 80 weight percent and X_1, X_2, X_3 and X_4 have values such that the total molecular weight of the molecule is from about 1500 to 30,000.

4,637,823

HIGH TEMPERATURE FURNACE

Michael M. Dach, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 19, 1981, Ser. No. 275,097
Int. Cl.⁴ C10J *3/68*; F27D *1/00*
U.S. Cl. 48—77 **1 Claim**

1. In combination, a high temperature furnace having an outer shell and adapted for being mounted in an upright position,

a temperature resistant lining, comprising

a dome constructed of refractory bricks and located at the upper end of said lining,

a first layer of firebricks having sufficient strength to support said dome and having said dome resting thereon,

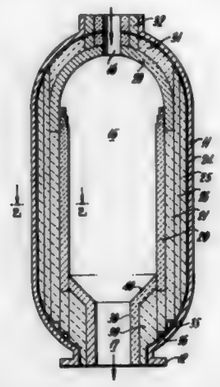
a layer of insulating cement inside of and adjacent to said shell,

a plurality of layers of firebricks between said cement and said first layer of firebricks,

a second layer of freestanding refractory bricks located inside of said first layer of firebricks for withstanding said high temperature,

said second layer comprising replaceable bricks and extend-

ing vertically above the bottom of said dome to permit expansion without any upward thrust to said dome, and



castable insulation filling spaces between said layer of insulating cement and said dome and said other layers of bricks.

4,637,824

PAINT DETACKIFICATION METHOD

Douglas A. Pominville, Edmond, Okla., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 21, 1985, Ser. No. 747,499
Int. Cl.[4] B01D *47/00*
U.S. Cl. 55—85 **12 Claims**

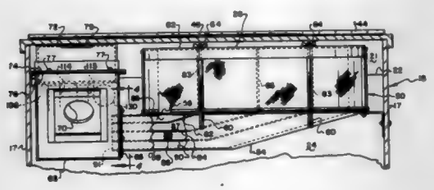
1. In a process for detackifying airborne paint particles comprising removing the paint particles from the air by entrapping them in an aqueous wash stream to which has been added, in sufficient quantity to reduce the tackiness of said paint particles, a water-soluble amphoteric metal salt which hydrolyzes to an hydroxide at a pH above 7, a basic salt in sufficient quantity to adjust the pH of the aqueous wash stream to a value in the range of about 7 to 12 and a polymeric flocculating agent, the improvement comprising using as the basic salt an alkali metal silicate and as the polymeric flocculating agent a diallyldialkylammonium halide homopolymer having an average molecular weight of at least 5000.

4,637,825

FILTER SYSTEM FOR POWER SWEEPER

D. Franklin Howeth, 233 Chuck Wagon Trail, Fort Worth, Tex. 76108

Continuation-in-part of Ser. No. 549,963, Nov. 7, 1983, Pat. No. 4,544,389, and a continuation-in-part of Ser. No. 549,924, Nov. 7, 1983, abandoned, and a continuation-in-part of Ser. No. 657,712, Oct. 9, 1984. This application Dec. 12, 1984, Ser. No. 680,942
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—302 **10 Claims**



1. An air filter unit for apparatus such as a power sweeper, including a debris collection and separation hopper, said filter unit being adapted to be supported in said hopper and including:

a porous media barrier type filter element forming an enclosure defining a clean air chamber and including at least one divider plate means extending across said clean air chamber into a plurality of subchambers with means for supporting said divider plate means in said clean air flow chamber;

support means for said filter element;

means forming an opening through which filtered air flows to said clean air chamber;

a clean air discharge plenum for conducting clean air from said clean air flow chamber to an outlet of said plenum, said plenum being configurered for redirect air flow at substantially a right angle relative to air flow exiting said clean air chamber; and

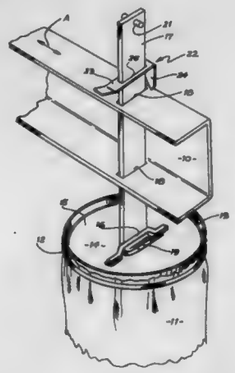
reverse jet air discharge means disposed adjacent to the outlet of said plenum for discharging jets of pressure air through said plenum to backflush said filter element.

4,637,826

FABRIC FILTER SHAKER ASSEMBLY

Robert G. Stephenson, Pasania, Australia, assignor to James Howden Australia Pty. Limited, Australia

Filed May 21, 1985, Ser. No. 736,351
Claims priority, application Australia, May 21, 1984, PG5090
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—304 **7 Claims**



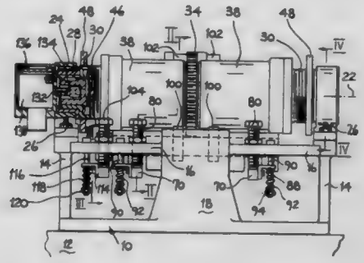
1. In a mechanical shake type fabric filter having a reciprocable shaker rack, a plurality of filter bag support caps suspended from the shaker rack and a fabric filter bag suspended from each cap, the improvement comprising the connection of each support cap to the shaker rack by a substantially vertically disposed support member, each support member extending through an aperture in the shaker rack and having at its lower end connection means releasably connected to the support cap, and positioning means being provided to releasably retain the support member in at least any one of a number of desired vertical positions relative to the shaker rack, characterized in that the positioning means comprises only a spring clip formed of spring steel and slidably disposed on the support member, the spring clip being of an inverted "V" shape having two arms extending from the apex, the support member extending through an aperture in one arm and the other arm having its free end positioned out of alignment with an axis of symmetry of the aperture so that upon that free end contacting the shaker rack the clip will be caused to deform and the side walls of the aperture frictionally engage the support member.

4,637,827

PARISON TRANSFERRING MEANS

Hermann H. Nebelung, Zurich; Robert Huber, Wettingen, and Fritz Futterknecht, Zurich, all of Switzerland, assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Dec. 4, 1985, Ser. No. 805,153
Claims priority, application United Kingdom, Dec. 4, 1984, 8430531
Int. Cl.[4] C03B *9/40*
U.S. Cl. 65—235 **8 Claims**



1. Parison transferring means for use in transferring glass parisons from a parison forming mould of a glassware manufacturing machine to a further mould of the machine in which the parison is formed into an article of glassware, or to further transferring means operable to transfer the parison to the further mould, the transferring means comprising, a shaft mounted on a supporting frame for turning movement about a horizontal longitudinal axis of the shaft, two neck ring supports mounted on the shaft to turn therewith and for sliding movement along the shaft towards or away from one another, moving means operable to move the neck ring supports towards or away from one another as aforesaid so that one or more split neck rings, half of each ring being supported by each support, can grip or release parisons, and turning means operable to turn the shaft back and forth along an arc about the horizontal axis between a position at which a neck ring supported by the supports can grip a parison in the parison forming mould and a position at which the neck ring can release a parison into the further mould or into further transferring means operable to transfer the parison to the further mould, wherein the transferring means comprises adjustable stops mounted on the supporting frame and operable to determine the end positions of the movement along the arc by engagement with projections of the shaft or of the supports.

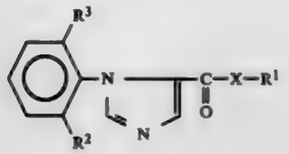
4,637,828

PLANT GROWTH REGULATORS

Ernst-Friedrich Schilse, Hofheim am Taunus; Helmut Bürstell, Frankfurt am Main, and Erwin Hacker, Hocheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jun. 3, 1985, Ser. No. 740,286
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1984, 3420832
Int. Cl.[4] A01N *43/50, 33/12*
U.S. Cl. 71—76 **9 Claims**

1. A plant growth regulator consisting essentially of a compound (I)



wherein X is O or S; R' is hydrogen, $(C_1–C_6)$-alkyl, a metal cation, or an ammonium cation; R^2 and R^3 are the same or different $(C_1–C_4)$-alkyl, or when R^1 is not a cation, (I) is an acid addition salt, a complex salt, or a quaternization product of such a compound, in combination with a synergistically effective amount of compound (II) of the formula

$$Cl—CH_2—CH_2—N^+(CH_3)_3Cl^-.$$

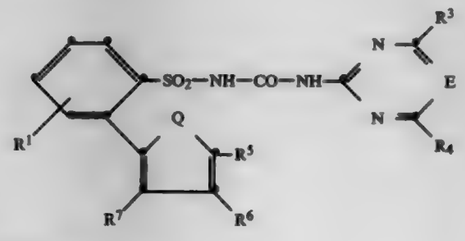
4,637,829

SULFONYLUREAS

Rolf Schurter, Binningen, Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,233
Claims priority, application Switzerland, Apr. 27, 1984, 2062/84
Int. Cl.[4] C07D *239/69, 239/42;* A01N *43/66, 43/54*
U.S. Cl. 71—90 **10 Claims**

1. An N-(2-heterocyclylphenylsulfonyl)-N'-pyrimidinylurea of the formula



wherein

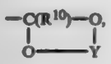
E is methine —CH=,

Q is oxygen or sulfur,

R^1 is hydrogen or chlorine,

R^3 and R^4 are each independently of the other methyl or methoxy,

R_5 is $C_1–C_6$alkyl substituted by cyano, $—COR^{10}$, $—C(R^{10})=NOR^{11}$, $—CH=CH—COOR^{12}$ or



R^6 and R^7 are hydrogen,

R^{10} is hydrogen, unsubstituted $C_1–C_{10}$alkyl or $C_2–C_4$alkenyl,

R^{11} is unsubstituted $C_1–C_6$alkyl,

R^{12} is methyl and

Y is $C_2–C_3$alkylene.

6. A method of controlling undesired plant growth, which method comprises applying to the plants or to the locus thereof an effective amount of a compound of claim 1, or of a composition containing such a compound.

4,637,830

HERBICIDAL CONCENTRATES

Ross M. W. Dyer, Harston, and Edward Nowak, Histon, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 368,497, Apr. 15, 1982, abandoned. This application Nov. 8, 1984, Ser. No. 669,413
Claims priority, application United Kingdom, Apr. 24, 1981, 8112773
Int. Cl.[4] A01N *37/34, 25/00*
U.S. Cl. 71—105 **10 Claims**

1. An aqueous liquid concentrate which comprises at least two herbicides, said herbicides comprising

(a) a first herbicide of low water solubility which herbicide is selected from the group consisting of
(i) a 2,6-diiodo-4-cyanophenyl alkanoate having up to 12 carbon atoms in the alkanoate group;
(ii) a 2,6-dibromo-4-cyanophenyl alkanoate having up to 12 carbon atoms in the alkanoate group; and
(iii) a mixture of (i) and (ii); and
(b) a second herbicide which is a salt of a carboxylic acid in which
(i) the cation is selected from the group consisting of the sodium, potassium, ammonia, dimethylamine, diethylamine, monoethanolamine, diethanolamine, triethanolamine and morpholine cations, and
(ii) the anion is selected from the group consisting of the 2,3,6-trichlorobenzoic acid; 3,6-dichloro-2-methoxybenzoic acid; 2,4-di chloro-phenoxyacetic acid; 2,4,5-trichloro Phenoxyacetic acid; 2-methyl-4-chlorophenoxy acetic acid; 2-(2-methyl-4-chlorophenoxy) propionic acid; 2-(2,4-dichlorophenoxyl)propionic acid; 2-(2,4,5-trichlorophenoxy) propionic acid; 4-(2-methyl-4-chlorophenoxy) butyric acid; and 4-(2,4-dichlorophenoxy)butyric acid anions;

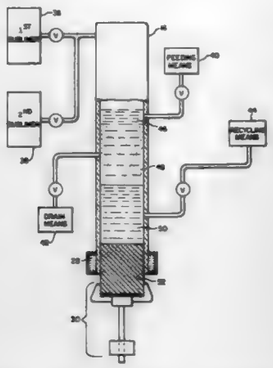
said first herbicide being present in said concentrate in an amount which is herbicidally effective and at a concentration which exceeds the normal solubility of said first herbicide in water but being fully dissolved in an aqueous solution of from a threefold to a twelvefold excess, relative to the amount by weight of said first herbicide, of said second herbicide so as to produce a clear, stable, homogeneous concentrate of said first and second herbicides.

4,637,831

PROCESS FOR REDUCTION OF ZIRCONIUM, HAFNIUM OR TITANIUM USING A ZINC OR TIN SEAL

Richard A. Stoltz, Murrysville Boro, Pa., and Young J. Kwon, Fruit Heights, Utah, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 30, 1985, Ser. No. 739,418
Int. Cl.[4] C22B *34/10*
U.S. Cl. 75—84.5 17 Claims



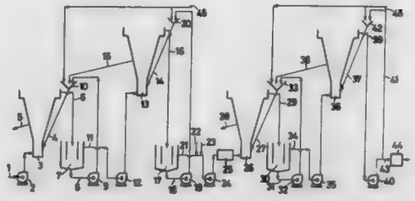
1. In a process of the type wherein a chloride of zirconium, hafnium or titanium is reduced to produce a product metal, the improvement comprising:
a. establishing a layer of a seal metal selected from the group consisting of zinc, zinc together with product metal, tin and tin together with product metal in a vessel, said seal metal layer having an upper molten portion and a lower solid portion, said lower solid portion being located adjacent to a cooling means;
b. establishing a layer of molten magnesium chloride on top of said seal metal;
c. establishing a layer of molten magnesium on top of said layer of magnesium chloride;
d. introducing gaseous chloride of the product metal above said magnesium, thereby causing a reaction which produces product metal chunks which settle through said layers of molten magnesium, molten magnesium chloride and molten seal metal;
e. withdrawing a lower part of said solid seal metal from said vessel and causing a portion of the molten seal metal to be relocated adjacent to said cooling means, whereby the portion of the molten seal metal relocated adjacent to the cooling means solidifies and maintains a seal at the bottom of the vessel while product metal chunks are trapped within the solidified seal metal and can be later withdrawn from said vessel together with solidified seal metal.

4,637,832

PROCESS FOR PURIFYING SOLUTIONS OF ZINC SULPHATE

Sergio Cammi, Rome; Arturo D'Este, Venice, and Alessandro Pescetelli, Rome, all of Italy, assignors to SAMIM Societa Azionaria Minero-Mettallurgica, S.p.A., Rome, Italy

Filed Aug. 1, 1984, Ser. No. 636,815
Claims priority, application Italy, Aug. 2, 1983, 22388 A/83; Feb. 10, 1984, 19556 A/84
Int. Cl.[4] C01G *9/06*
U.S. Cl. 75—109 20 Claims



1. A process for purifying aqueous solutions of zinc sulphate containing one or more metal impurities selected from the group: Cu, Cd, Tl, Ni, Co. Ge, As, and Sb, which comprises cementing out the impurities by using zinc dust and an activator selected form the group consisting of Cu-As and Cu-Sb, wherein the cementation is carried out in at least one stage and at least two reactors disposed in a series or in parallel to each other, having a bottom portion of cylindrical shape, a cone frustum shaped intermediate portion and a top portion which is enlarged relative to the intermediate cone portion, the aqueous solutions of zinc sulphate containing the metal impurities being fed to the side wall of the cylindrically shaped portion with a speed in a range of from 0.02 to 0.07 m/s, and the zinc dust having a grit size of from 0.01 to 1 mm and activator being fed to the side wall of the cylindrically shaped portion above the feeding inlet of the zinc sulphate solution, and operating with a retention time within the range of from 3 to 12 minutes.

4,637,833

INHIBITING CORROSION: BENZYLSULFINYLACETIC ACID OR BENZYLSULFONYLACETIC ACID

Merlin R. Lindstrom, and Harold W. Mark, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Filed Jun. 27, 1985, Ser. No. 749,379
Int. Cl.[4] C04B *9/02*; C09K *3/00*
U.S. Cl. 106—14.13 12 Claims

1. A method of inhibiting the corrosiveness of acidic systems which comprises incorporating into the system a corrosion inhibiting amount of at least one of benzylsulfinylacetic acid and benzylsulfonylacetic acid.

4,637,834

AQUEOUS PROTEIN SOLUTIONS WHICH ARE STABLE TOWARDS DENATURING, PROCESSES FOR THEIR PREPARATION AND THEIR USE

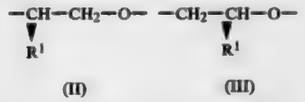
Horst Thurow, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 629,847, Jul. 11, 1984, abandoned. This application Feb. 5, 1986, Ser. No. 825,965
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1984, 3325223
Int. Cl.[4] C08L *89/00*
U.S. Cl. 106—124 8 Claims

1. An aqueous solution of a protein with a molecular weight above 8,500 daltons, which contains a compound of the formula I

$$R^2O-X_n-R^3 \qquad (I)$$

in which X_n is a chain of n members of the formula II or III



(II) (III)

in any desired sequence,
n denotes 2 to 200, preferably 4 to 100 and
R^1 denotes hydrogen, methyl or ethyl, it being possible for the radicals R^1 to be identical or different, but R^1 being hydrogen in more than 75% of the chain members, and
R^2 and R^3 are identical or different and denote hydrogen or an organic radical,
such that the protein is protected from adsorption at interfaces and protected against denaturing and precipitation.

4,637,835

METHODS OF HYDROLYZING CELLULOSE TO GLUCOSE AND OTHER (POLY)SACCHARIDES

Richard T. Nagle, Upper Montclaire, N.J., assignor to Power Alcohol, Inc., Hasbrouck Heights, N.J.

Filed Jun. 28, 1985, Ser. No. 774,071
Int. Cl.[4] C13K *1/02*
U.S. Cl. 127—37 3 Claims

1. A method of hydrolizing cellulose to glucose and other saccharides, said method comprising bringing to a reaction area a feed mixture consisting essentially of at least one alphacellulose containing material, water, a calcium chloride catalyst present in an amount of from 5 to 27.5% by weight on a total solids basis, said calcium chloride catalyst being in an aqueous solution, and a minor amount of hydrochloric acid (HCl), said HCl being present in amount ranging from approximately 0.01 to 0.5% by weight of said calcium chloride catalyst aqueous solution, adjusting the temperature of said feed mixture to between 150° C. to 250° C., at a pressure of from 160 psig to 800 psig, for a finite retention time of up to one minute in the reaction area to convert the alphacellulose containing material to said glucose and other saccharides.

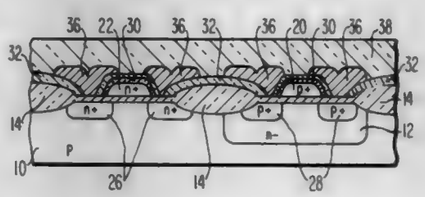
4,637,836

PROFILE CONTROL OF BORON IMPLANT

Doris W. Flatley, Hillsboro Township, Somerset County, and Sheng T. Hsu, W. Windsor Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 23, 1985, Ser. No. 778,986
Int. Cl.[4] H01L *21/265, 21/26*
U.S. Cl. 148—1.5 7 Claims

1. In a process of ion implanting a silicon structure having a thickness of from about 300 nm to about 700 nm overlying a layer of silicon dioxide with a dosage of boron ions of at least about 10^{15} ions per square centimeter thereby rendering the structure p type conductive and annealing said implant, the improvement which comprises doping said structure prior to the boron implant with sufficient phosphorus ions to substantially prevent the migration of the boron ions into the silicon dioxide layer during annealing.

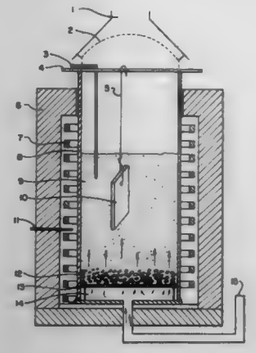


4,637,837

PROCESS FOR BORIDING METALS AND METAL ALLOYS BY MEANS OF SOLID BORIDING AGENTS

Alfred G. von Matuschka, Sauerlach, and Norbert Trausner, Betzigau, both of Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 20, 1985, Ser. No. 747,019
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1984, 3431044
Int. Cl.[4] C23C *9/04*
U.S. Cl. 148—6 8 Claims



1. A process for boriding metals and metal alloys using a solid boriding agent comprised of materials that yield boron, said process comprising conducting said boriding in a fluidized bed at a temperature of from about 580° to about 1300° C. using as the solid boriding agent material in granular form and comprised essentially of spherical particles having a particle size of from about 0.025 to about 5.0 mm.

4,637,838

PROCESS FOR PHOSPHATING METALS

Werner Rausch, Oberursel, and Gerhard Mueller, Hanau am Main, both of Fed. Rep. of Germany, assignors to Metallgesellschaft, A.G., Frankfurt, Fed. Rep. of Germany

Filed Mar. 5, 1985, Ser. No. 708,463
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 3408577
Int. Cl.[4] C23F *7/10*
U.S. Cl. 148—6.15 Z 6 Claims

1. A process for phosphating metals, in particular steel and galvanized steel, by a spray method using an aqueous acidic phosphating solution containing an accelerator, zinc, wherein

the metal surface is brought into contact with a phosphating solution which contains
0.2 to 0.5 g/l of Zn^{++}
8 to 20 g/l of P_2O_5
at least one accelerator selected from the group consisting of:
0.5 to 0.2 g/l of NO_2 and
0.1 to 1 g/l of nitrobenzenesulfonate
and at least one activator from the group consisting formate, nitrilotriacetate, trichloroacetate and ethylenediaminetetraacetate whereby a uniform coating in the range of 0.8 to 2.5 g/m^2 is obtained.

4,637,839

TREATING AUTODEPOSITED COATING WITH CR COMPOSITION

Wilbur S. Hall, Plymouth Meeting, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Continuation of Ser. No. 855,748, Nov. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 609,017, Aug. 29, 1975, abandoned. This application Sep. 4, 1981, Ser. No. 299,496
The portion of the term of this patent subsequent to Mar. 4, 1997, has been disclaimed.
Int. Cl.[4] C23C *22/24, 22/67*
U.S. Cl. 148—6.2 **5 Claims**

1. A coating process for forming on a metallic surface an autodeposited coating of the type which in fused form tends to have a glossy appearance comprising forming on the metallic surface an unfused autodeposited coating by contacting the metallic surface with an autodepositing coating composition comprising an aqueous acidic solution prepared from a ferric iron-containing compound and HF, and including dispersed resin particles, modifying the properties of the coating so that it has a uniformly matte appearance and improved corrosion resistance in its fused form by contacting the unfused coating with an acidic aqueous chromium-containing composition having a pH of no greater than about 4 and consisting essentially of the following dissolved ingredients:
(A) ammonium, potassium or sodium dichromate in an amount equivalent to about 0.3 to about 3 g/l of Cr^{+6};
(B) formaldehyde-reduced chromic acid in an amount equivalent to about 0.3 to about 3 g/l of chromium, with about 50 wt. % of the chromium being in reduced form; and
(C) at least about 0.06 g of phosphoric acid for each gram of total chromium in said mix;
and thereafter fusing the unfused coating.

4,637,840

COATED ALUMINUM-ZINC ALLOY PLATED SHEET STEEL

Haruki Fujii; Shoji Ikada, both of Hyogo; Akimitsu Fukuda, Chiba, and Yasuo Okumura, Aichi, all of Japan, assignors to Nihon Parkerizing Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1985, Ser. No. 713,152
Claims priority, application Japan, Mar. 21, 1984, 59-54789
Int. Cl.[4] C23C *22/26*
U.S. Cl. 148—6.2 **5 Claims**

1. A process for cold forming the surface of aluminum-zinc alloy plated sheet steel comprising (1) contacting the surface with an aqueous composition of a water dispersible or water soluble resin having an acid value of from 10 to 200, from 0.2 to 10 parts of hexavalent chromium per 100 parts of solid resin and exhibiting a pH value of from 3 to 10, (2) thereafter drying the coating and (3) subjecting the sheet to cold forming without the use of a lubricating oil.

4,637,841

SUPERPLASTIC DEFORMATION OF DUPLEX STAINLESS STEEL

Yasuhiro Maehara, Kobe, Japan, assignor to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jun. 21, 1985, Ser. No. 747,433
Claims priority, application Japan, Jun. 21, 1984, 59-128150; Jun. 21, 1984, 59-128151
Int. Cl.[4] C22C *8/00*
U.S. Cl. 148—12 E **12 Claims**

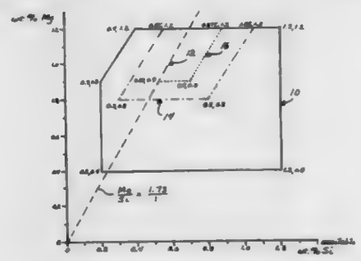
1. A superplastic deforming process of a duplex stainless steel, which comprises the steps of:
heating a ferrite + austenite duplex stainless steel to a temperature between the alpha-temperature and a temperature 200° C. lower than the alpha-temperature, the heating temperature being 1000° C. or higher;
water quenching or force-cooling the duplex stainless steel to a temperature of 500° C. or lower;
reheating it to a temperature of between 700° C. and a temperature 200° C. lower than the alpha-temperature; and
plastic deforming the thus-pretreated duplex stainless steel at a strain rate of 1×10^{-3}–1×10^{-1} S^{-1}.

4,637,842

PRODUCTION OF ALUMINUM ALLOY SHEET AND ARTICLES FABRICATED THEREFROM

Paul W. Jeffrey, and Gilles Marchand, both of Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Mar. 13, 1984, Ser. No. 588,945
Int. Cl.[4] C22F *1/04*
U.S. Cl. 148—12.7 A **16 Claims**



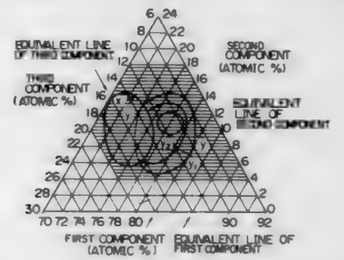
1. A process for producing aluminum alloy sheet of predetermined final gauge, comprising the steps of:
(a) providing a sheet article, at an intermediate gauge from which a reduction of between about 25% and about 71% is required to achieve said final gauge, of a heat-treatable Al-Mg-Si alloy having a major content of Al and a minor content of Mg and available Si such that on a rectangular graph of % Mg plotted against % available Si the point representing said minor content lies within the area of a pentagon defined by the coordinates 0.2% Si, 0.4% Mg; 0.2% Si, 0.9% Mg; 0.4% Si, 1.2% Mg; 1.2% Si, 1.2% Mg; and 1.2% Si, 0.4% Mg;
(b) solution-heat-treating the sheet article at said intermediate gauge by successively heating and quenching the article, for effecting at least substantially complete solution of the Mg and the Si therein;
(c) after quenching, and without intervening heat treatment, naturally aging the sheet article by maintaining the sheet article at ambient temperature for at least about one day;
(d) after natural aging, and without intervening heat treatment, cold rolling the sheet article to said final gauge; and
(e) artificially aging the cold rolled sheet article at said final gauge for increasing the yield strength thereof by heating the article to a predetermined temperature, beginning at a time To, under conditions such that
(i) achievement of the maximum yield strength attainable by artificial aging of said final gauge cold rolled sheet article at said temperature requires continuing the heating until a time T_2 later than T_o, and
(ii) the maximum value of % elongation attainable by artificial aging of said final-gauge cold rolled sheet article at said temperature following the extent of cold reduction performed in step (d) would be achieved by continuing the heating until a time T_1 later than T_o but earlier than T_2 and terminating the heating at T_1;
wherein the improvement comprises:
(f) continuing the heating in step (e) at least until T_1 and terminating the heating at a time prior to T_2 and such that the % elongation value of the article after artifical aging is within 20% of said maximum value of % elongation.

4,637,843

CORE OF A NOISE FILTER COMPRISED OF AN AMORPHOUS ALLOY

Suguru Takayama, Tokyo, and Masao Shigeta, Urayasu, both of Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 592,308, Mar. 22, 1984, abandoned, which is a continuation-in-part of Ser. No. 492,243, May 6, 1983, abandoned. This application May 3, 1985, Ser. No. 730,140
Claims priority, application Japan, May 6, 1982, 57-75915; Nov. 5, 1983, 58-206898; Oct. 1, 1984, 59-204141
The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.
Int. Cl.[4] H01F *17/06*
U.S. Cl. 420—73 **24 Claims**



1. A core of a noise filter comprising a coiled thin strip of an amorphous magnetic alloy which partially contains precipitated crystals and essentially has the following composition:

$$M_xMn_y(Si_tB_qC_l)_z$$

wherein M is Fe or Fe together with at least one transition metal element other than Fe, $x+y+z=100$ atomic %, y is from 0.1 atomic % to 10 atomic %, z is from 16 atomic % to 32 atomic %, $t+q+l=1$, t is from 0.20 to 0.80, l is from 0.0001 to 0.05, the ratio l/q is from 0.01 to 0.4, and $20t+6\leqq z\leqq -50t+67$.

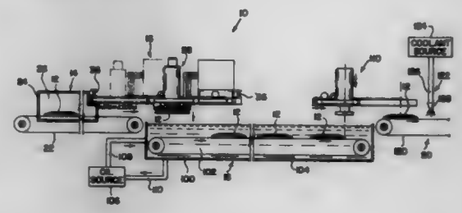
4,637,844

METHOD FOR HEAT TREATING FERROUS PARTS

George D. Pfaffmann, Farmington, Mich., assignor to Tocco, Inc., Boaz, Ala.

Filed Jul. 8, 1985, Ser. No. 752,550
Int. Cl.[4] C21D *1/42*
U.S. Cl. 148—144 **6 Claims**

1. A method of heat treating ferrous annular workpieces comprising:
preheating the entire workpiece to an elevated temperature around the M_s temperature thereof;
inductively further heating thin peripheral surface portions of the workpiece to the austenizing temperature thereof and to a substantial depth while leaving the remaining core portion of the workpiece substantially at the said elevated temperature;
rapidly cooling the inductively heated peripheral surface portions of the workpiece to a predetermined transformation temperature around the said elevated temperature at a rate sufficiently rapid to prevent transformation of the austenite of the austenitized said peripheral surface portions to intermediate matrix phases during the said rapid cooling thereof;



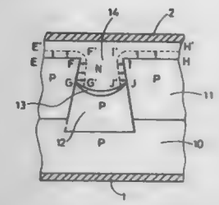
maintaining the entire said workpiece at the said predetermined transformation temperature until the austenite of the said austenitized workpiece surface portions is completely transformed to lower bainite or partially transformed to martensite, depending on said transformation temperature being respectively above, or at or below, the M_s temperature of the workpiece material; and
then cooling the workpiece to ambient temperature below the M_f temperature of the workpiece material.

4,637,845

METHOD OF MANUFACTURING SEMICONDUCTOR LIGHT EMITTING DEVICE

Ryoichi Hirano, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 25, 1984, Ser. No. 664,880
Claims priority, application Japan, Nov. 9, 1983, 58-211952
Int. Cl.[4] H01L *21/208, 21/225*
U.S. Cl. 148—171 **8 Claims**



1. A method of manufacturing a semiconductor light emitting device wherein an exposed surface and a p-n junction displaced therefrom are in a non-intersecting relationship comprising the steps of:
providing a semiconductor substrate (10, 11) having a surface layer of a first conductivity type,
forming a stripe shaped groove (15) in said semiconductor substrate of said first conductivity type,
forming successively a first semiconductor layer (12) of said first conductivity type and a second semiconductor layer (13) of either conductivity type in regions including the inner portion of said groove, and then forming a third semiconductor layer (14) of said second conductivity type on said second semiconductor layer and in regions inside and outside said groove, said third semiconductor layer being directly grown on said surface layer of the substrate and forming a p-n junction interface therein, and
diffusing the impurity of said first conductivity type from said surface layer of the semiconductor substrate into said

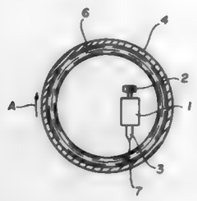
third semiconductor layer by the growth process of the respective semiconductor layers inside and outside said groove, so that the p-n junction interface moves from the inner surfaces of said groove and said surface layer into said third semiconductor layer.

4,637,846

NICKEL-TITANIUM-BERYLLIUM ALLOY WIRE

Kazuo Sawada, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 508,511, Jun. 28, 1983, abandoned. This application Feb. 28, 1985, Ser. No. 706,625
Claims priority, application Japan, Jun. 29, 1982, 57-113420
Int. Cl.⁴ C22C *19/03*
U.S. Cl. 148—402 **4 Claims**



1. A nickel-titanium-beryllium alloy wire produced by the process comprising the steps of:
preparing a nickel-titanium-beryllium alloy having a shape memory effect consisting essentially of 50 to 60 % by weight nickel, 40 to 50% by weight titanium, and beryllium substituted for a portion of the nickel or titanium in quantities of 0.005 to 0.5% by weight,
bringing said nickel-titanium-beryllium alloy to a moltan state,
jetting a melt of said nickel-titanium-beryllium alloy through an orifice having a circular cross-section into a laminar flowing cooling liquid said alloy remaining in a molten state upon exiting said orifice, and
cooling and solidifying said nickel-titanium-beryllium alloy in said laminar flowing cooling liquid from its molten state into a fine wire having a circular cross-section at an average cooling rate in the range of from 10^2 to 10^{4*} C./sec said resulting alloy wire retaining said shape memory effect.

4,637,847

CHEMICAL PASSIVATION OF AMORPHOUS BORON POWDER

Erin G. Nieder, Manassas, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Filed Dec. 21, 1983, Ser. No. 563,969
Int. Cl.⁴ C06B *45/32*
U.S. Cl. 149—6 **26 Claims**

1. A method for treating amorphous boron powder comprising:
(a) reacting the boron powder with an alcohol to form a borate coated boron powder; and
(b) combining the reacted boron powder with a hydroxyl-functional pre-polymer, whereby there is no reaction between the polymer and the reacted boron powder.

4,637,848

HIGH DENSITY GEL EXPLOSIVE

David A. Claramitaro, Benson, Ariz.; David J. Speltz, Spring Valley, Calif., and Jack M. Moore, Benson, Ariz., assignors to Apache Powder Company, Benson, Ariz.

Filed Mar. 14, 1986, Ser. No. 839,757
Int. Cl.⁴ C06B *45/02*
U.S. Cl. 149—21 **16 Claims**

1. A method for producing a water gel explosive composition, said method comprising:
combining a water solution of an oxygen-supplying salt and a gelling agent with an amount of comminuted paper sufficient to increase the viscosity of the mixture to a preselected level while continuously mixing the resulting combination;
thereafter adding an amount of a densifying agent sufficient to increase the specific gravity and introducing a preselected amount of an inert sensitizer to the combination; and
packing the resulting composition into containers, whereby the densifying agent remains substantially uniformly dispersed in the explosive composition.

4,637,849

WATERPROOF AMMONIUM NITRATE FUEL OIL EXPLOSIVES

William F. Harris, Jr., Louisville, Ky., assignor to Celanese Corporation, New York, N.Y.

Filed Sep. 3, 1985, Ser. No. 771,863
Int. Cl.⁴ C06B *33/04*
U.S. Cl. 149—43 **10 Claims**

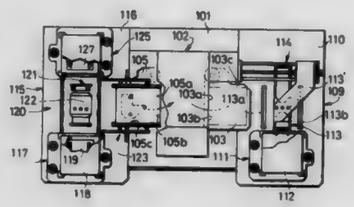
1. A waterproof explosive composition consisting essentially of a nonaqueous blend of:
(a) an inorganic oxidizing salt;
(b) fuel oil; and
(c) a polygalactomannan plus crosslinker wherein (a), (b) and (c) are present in the amount of about 83 to about 94.5 weight percent (a), about 4 to about 7 weight percent (b), and about 1.5 to abuot 10 weight percent (c), said percentages being based on the total weight of (a), (b) and (c).

4,637,1150

PRESS APPARATUS FOR PLANAR MEMBERS

Kazunori Suzuki, Yokohama; Hiroo Katsuta, Kawasaki, and Yuki Toriumi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1984, Ser. No. 670,008
Claims priority, application Japan, Nov. 22, 1983, 58-218745; Nov. 29, 1983, 58-223138
Int. Cl.⁴ B30B *15/30, 15/32*
U.S. Cl. 156—60 **16 Claims**



5. A press apparatus for planar members having:
means for conveying a first planar member;
means for stopping and positioning said first planar member at the terminal end of the conveyance;
a chuck;
means for shifting said first planar member to said chuck;
means for displacing said first planar member to a predetermined position on said chuck;
a first transfer table for transferring said chuck to a press position;
a second transfer table for transferring a second planar member to the press position;
means for aligning said first and second planar members;
means for effecting the parallel feeding of said first and second planar members; and
means for pressing said first and second planar members with a predetermined pressure.

15. A method for pressing a planar member comprising the following steps:
(a) providing a press apparatus;
(b) rotatively transferring a first planar member to a press position of said apparatus employing a first transfer table;
(c) rotatively transferring a second planar member to said press position of said apparatus employing a second transfer table substantially simultaneously with the transfer of said first planar member to the press position;
(d) aligning said first and second planar members;
(e) effecting parallel feeding of said first and second planar members; and
(f) pressing said first and second planar members with a predetermined pressure employing said apparatus, wherein said planar members are rotatively transferred to the press position by rotatively moving said first and second transfer tables to the press position.

4,637,851

METHOD FOR THE PREPARATION OF A LAMINATE

Susumu Ueno; Kouiti Kuroda, both of Ibaraki; Hirokazu Nomura, Tokyo, and Shigeru Tateno, Ibaraki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Otemachi, Japan

Filed Jan. 17, 1986, Ser. No. 819,694
Claims priority, application Japan, Jan. 25, 1985, 60-11885; Jan. 25, 1985, 60-11886
Int. Cl.⁴ B32B *31/00;* B29C *17/08*
U.S. Cl. 156—272.6 **7 Claims**

1. A method for the preparation of a laminate based on fabric sheets of aromatic polyamide fibers which comprises the steps of:
(a) subjecting the fabric sheet of the aromatic polyamide fibers to exposure to an atmosphere of low temperature plasma under continuous introduction of a plasma-supporting gas into the atmosphere under a gaseous pressure in the range from 0.05 to 20 Torr generated by impressing a high-frequency electric power between a grounded electrode and an input electrode;
(b) impregnating the thus plasma-treated fabric sheet with a resinous binder selected from the group consisting of polyimide resins and epoxy resins to give a resin-impregnated prepreg sheet;
(c) laying a plural number of the resin-impregnated prepreg sheets one on the other into a pile; and
(d) pressing the pile of the resin-impregnated prepregs at an elevated temperature so as to convert the prepregs into an integral laminate.

4,637,852

NEOALKOXY TITANATE IN HIGH DENSITY MICA LAMINATES

Dennis J. Skiarski, Deerfield, N.H., assignor to Essex Group, Inc., Fort Wayne, Ind.

Division of Ser. No. 663,535, Oct. 22, 1984. This application Sep. 3, 1985, Ser. No. 772,104
Int. Cl.⁴ B32B *31/26*
U.S. Cl. 156—307.4 **3 Claims**

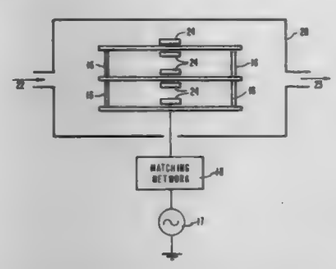
1. A method of making mica composite laminates comprising:
individually impregnating a plurality of mica papers with about 5 percent to about 14 percent by weight of a polysiloxane binder containing about 1 percent to about 4 percent by weight of a neoalkoxy titanate and about 0.5 percent to about 2 percent by weight of a naphthenate in an aromatic solvent, removing the aromatic solvent, stacking the solvent free mica papers, one on top of another, and densifying under pressure and temperature until the binder is cured, wherein the composite has a density greater than about 1.5 g/cc and can withstand immersion in boiling water for 1 hour without delaminating.

4,637,853

HOLLOW CATHODE ENHANCED PLASMA FOR HIGH RATE REACTIVE ION ETCHING AND DEPOSITION

Bruce Bumble, Croton-on-Hudson; Jerome J. Cuomo, Lake Lincolndale; Joseph S. Logan, Poughkeepsie, and Steven M. Rossnagel, White Plains, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 29, 1985, Ser. No. 759,762
Int. Cl.⁴ B44C *1/22;* C03C *15/00, 25/06;* C23F *1/02*
U.S. Cl. 156—345 **4 Claims**



1. In an RF sputter/etching system including an evacuated chamber, the improvement which comprises a partially enclosed electrode structure which produces a pronounced hollow cathode glow within the electrode structure when energized with an RF voltage source,
means for supplying one side of an RF voltage source of up to 300 volts peak to the electrode structure,
said electrode structure comprising a single plate hollow cathode electrode structure having on at least one side thereof a plurality of small individual hollow cathode chambers defined by side walls and a bottom having a uniform cross-sectional size and shape, the tops being open to the system chamber and wherein the side walls are substantially perpendicular to the bottoms,
said individual chambers having an aspect ratio defined as the depth/longest cross-sectional dimension of an individual chamber of at least 1.5,
means for supplying an ionizeable gas to the system from outside the electrode structure, and
means for supporting workpieces adjacent to the hollow cathode glow within the electrode structure for sputter-/etching.

4,637,854

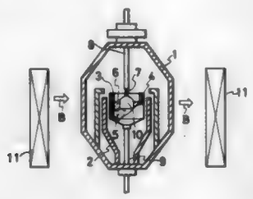
METHOD FOR PRODUCING GAAS SINGLE CRYSTAL

Tsuguo Fukuda, Yokohama, and Kazutaka Terashima, Ebina, both of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Jan. 16, 1984, Ser. No. 571,091
Claims priority, application Japan, Jan. 18, 1983, 58-5181; May 7, 1983, 58-78899; May 7, 1983, 58-78900
Int. Cl.⁴ C30B *15/22, 27/02*
U.S. Cl. 156—607 **7 Claims**

1. A method for the production of a GaAs single crystal by the liquid-encapsulated Czochralski method, which comprises the steps of:
applying a magnetic field to a melt of encapsulated GaAs;
bringing a seed crystal into contact with said encapsulated

melt of GaAs as said magnetic field is being applied, said magnetic field having a sufficient intensity which enables the temperature fluctuations in the neighborhood of the



solid-liquid boundary in said encapsulated melt to be repressed to within 1° C.; and

pulling said seed crystal at a rate of up to about 40 mm/hour, thereby achieving crystal growth.

4,637,855

PROCESS FOR PRODUCING CRYSTALLINE SILICON SPHERES

David E. Witter, Richardson, and Jules D. Levine, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 30, 1985, Ser. No. 728,959
Int. Cl.⁴ C30B 00/00
U.S. Cl. 156—616 R 9 Claims



1. A process for forming crystalline spheres of a crystallizable material, comprising the steps of:

forming a layer of a paste of the crystallizable material on a planar surface of a substrate capable of withstanding temperatures in excess of the melting point of the crystallizable material;

patterning said layer on the surface of said substrate;

heating said patterned layer beyond the melting point of said crystallizable material and supplying an atmosphere which can react with said crystallizable material to form a coating that does not wet said layer thus causing said material to bead as coated spheres at the surface of said patterned layer;

cooling said crystallizble material thus causing the beaded crystallizable material to crystallize into crystalline spheres; and

removing said crystalline spheres from the surface of said patterned layer of crystallizable material.

4,637,856

APPARATUS AND PROCESS FOR ETCHING FLUOROPLASTICS

Frank Lombardo, Warren; Edward L. Jernigan, Bristol, both of R.I., and Paul Furze, Fall River, Mass., assignors to Dixon Industries Corporation, Bristol, R.I.

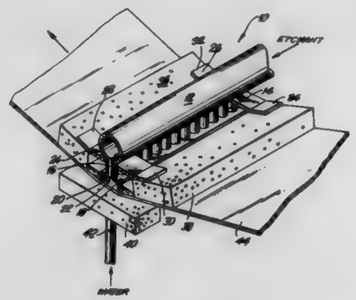
Filed Dec. 12, 1985, Ser. No. 808,073
Int. Cl.⁴ B29C 17/08; B44C 1/22
U.S. Cl. 156—637 2 Claims

1. An apparatus for etching one surface of a fluoroplastic substrate, the apparatus comprising:

a. an etchant distribution means adapted to be placed over the surface of the fluoroplastic substrate to be etched, said etchant distribution means comprised of:

(1) an annularly shaped main body having a hollow core extending therethrough along its longitudinal axis, one end of the hollow core defining an inlet for the main body, the main body also having a series of openings therein along its longitudinal axis and in parallel alignment with one another.

(2) a series of annular shaped extension legs attached to said main body, each of the extension legs having a hollow channel extending therethrough along its longitudinal axis and being in parallel alignment with one another, the longitudinal axis of each of said extension legs being transverse relative to the longitudinal axis of said main body, each of the hollow channels having an enlarged cross-sectional area at one end thereof, which defines an exit means for said etchant, and having an inlet at its other end in communication with the hollow



core of said main body through a respective one of said openings in the main body; and

(3) first and second means for holding first and second sponge means adjacent to and on opposite sides of the main body said first and second sponge means having longitudinal axes which are in substantial parallel alignment with the longitudinal axis of said main body.

b. a water distribution means adapted to be placed under the surface of the fluoroplastic substrate which is not being etched, said water distribution means comprised of:

(1) a retaining sponge means adapted to be placed in substantial contacting relationship with the entire surface of the fluoroplastic substrate which is not being etched and supply fresh water to said surface;

(2) conduit means for feeding a supply of fresh water to said retaining sponge means, said conduit means adapted for connection to said retaining sponge means and to a source of water.

4,637,857

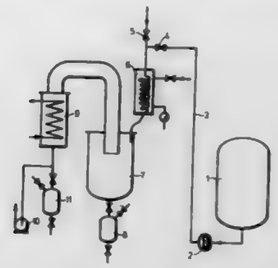
PROCESS FOR THE REMOVAL OF RESIDUAL CONSTITUENTS

Rolf Brockmann, Duesseldorf; Clemens Casper, Krefeld; Walter Damsky, Krefeld; Axel Lippert, Krefeld, and Johannes O. Sajben, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 452,540, Dec. 23, 1982, abandoned, which is a continuation of Ser. No. 61,207, Jul. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 900,678, Apr. 27, 1978, abandoned. This application Nov. 14, 1984, Ser. No. 671,263
Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719968
Int. Cl.⁴ B01D 1/14, 1/22
U.S. Cl. 159—47.1 3 Claims

1. A process for stripping a residual component from a liquid having a viscosity of from 300 to 10,000 poises comprising:

flowing the liquid in the form of a ring flow supported by a gas stream in the center of the ring through a heated tube having a continuous helix shape and a tube diameter to helix diameter ratio of from 0.1:1 to 0.04:1 into a separator vessel; and adding to said gas stream from 10 to 90%, by weight, of externally generated steam and/or an inert gas at an adjusted pressure of



from 50 m bars to 1 bar in said separator vessel for a gas and/or steam velocity in said tube of from 100 m/sec to the speed of sound, wherein said added gas and/or steam is sufficient in quantity and velocity such that a circular flow between the wall of the tube and the surface of the liquid is developed transversely thereof providing thorough transverse mixing of the liquid ring flow.

4,637,858

PYROLYSIS OF BLACK LIQUOR AT HIGH TEMPERATURES USING RADIANT ENERGY

Edwin Matovich, Dana Point, Calif., and Robert J. Spanseth, Washougal, Wash., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Feb. 25, 1985, Ser. No. 705,156
Int. Cl.⁴ D21C 11/12, 11/00
U.S. Cl. 162—30.1 5 Claims

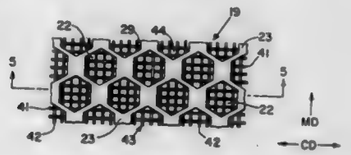
1. A method of converting spent alkaline pulping liquor to reusable pulping liquor containing sodium hydroxide, which method comprises pyrolyzing the pulping liquor by passing the pulping liquor through a zone of radiant energy having a wave length in the near-infrared region and a temperature of at least 3000° F. in the substantial absence of oxygen under conditions such that a solid product containing sodium carbide is produced, and quenching the solid product, before the solid product contacts oxygen gas, in water in order to convert the sodium carbide directly to sodium hydroxide, whereby a reusable pulping liquor containing sodium hydroxide is produced.

4,637,859

TISSUE PAPER

Paul D. Trokhan, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 525,586, Aug. 23, 1983, Pat. No. 4,529,480. This application Mar. 27, 1985, Ser. No. 716,724
Int. Cl.⁴ D21H 5/02
U.S. Cl. 162—109 7 Claims



1. A strong, soft, absorbent paper web of papermaking fibers, said web comprising:

(A) A macroscopically monoplanar, patterned, continuous network region having a relatively low basis weight and a relatively high density; and

(B) A plurality of discrete domes having relatively high basis weights and relatively low densities, essentially all of said domes being dispersed throughout, encompassed by, and isolated one from another by said network region

wherein the average density of said network region is from about 0.400 to about 0.800 gram per cubic centimeter, the average density of said domes is from about 0.040 to about 0.150 gram per cubic centimeter, and the ratio of the average basis weight of said network region to the average basis weight of said domes is less than about 1.0 and greater than about 0.8.

4,637,860

BOARDS AND PANELS

Stephen Harper, London, and David G. Hiscock, Slough, both of England, assignors to Cape Building Products Limited, Uxbridge, England

Continuation of Ser. No. 389,389, Jun. 17, 1981, abandoned. This application Aug. 27, 1984, Ser. No. 644,160
Claims priority, application United Kingdom, Jun. 19, 1981, 8118947
Int. Cl.⁴ D21F 13/00
U.S. Cl. 162—117 17 Claims

1. A process for the manufacture of a non-asbestos corrugated sheet for external use from a mixture comprising, on a dry weight basis, 40–60% cement, 30–40% silica and 5–15% cellulose fibers, comprising the following steps:

(1) processing the cellulose fibers to a freeness of 18°–35° S.R.;

(2) mixing the cellulose fibers with the cement and silica in a flocculating agent to produce an aqueous slurry;

(3) taking up the slurry on the moving permeable belt of a Hatschek machine to form a film of damp composition thereon and transferring said film to a rotating drum on which the mixture builds up;

(4) removing a desired thickness of mixture from the drum in the form of a flat sheet;

(5) forming said flat sheet into a corrugated shape;

(6) placing said corrugated sheet in the press and reducing its thickness therein; and

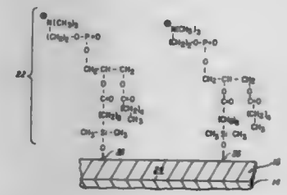
(7) subjecting the pressed corrugated sheet to an autoclaving reaction to cause reaction to occur between said cement and said silica to form a binder matrix.

4,637,861

STABILIZED, LIPID MEMBRANE-BASED DEVICE AND METHOD OF ANALYSIS

Ulrich J. Krull, Weston, and Michael Thompson, Mississauga, both of Canada, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 16, 1985, Ser. No. 809,691
Int. Cl.⁴ G01N 27/30, 27/40
U.S. Cl. 204—1 T 15 Claims



1. A stabilized, lipid membrane-based device comprising a perturbable lipid membrane and a membrane-stabilizing support, said lipid membrane including a complexing agent for

selectively interacting with a specified chemical species to perturb said lipid membrane;

wherein each membrane-forming lipid includes a polar head group, a first long chain through which the lipid is anchored to a binding site on said support, and a fluidity-providing, second long chain, which is unattached to said support; and

wherein the binding sites on said support are spaced appropriately apart from one another to provide a lipid molecular packing density that permits axial rotation of each membrane-forming lipid about its anchored, long chain, and are yet sufficiently close to one another so that said lipid molecular packing density provides a relatively high ion impermeability to said lipid membrane when unperturbed;

said lipid membrane having an increased ion permeability when perturbed.

12. A process for determining the concentration of a selected chemical species in an aqueous electrolytic solution, said process comprising

(a) form electrochemical cell from the device of claim 1 and said aqueous electrolytic solution;

(b) applying across said lipid membrane an electrical potential difference that serves to drive ions through, or into and out of, said membrane, whereby said chemical species interacts with said complexing agent incorporated in said lipid membrane, to produce an analytical signal based upon an increase in membrane ion permeability;

(c) measuring said analytical signal; and

(d) determining said chemical species concentration from the measured analytical signal.

4,637,862

WIRE-GLASS COMPOSITE AND METHOD OF MAKING SAME

Gary L. Eesley, Lake Orion; Andrew M. Mance, Royal Oak, and Martin S. Meyer, Dearborn, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 16, 1985, Ser. No. 809,436

Int. Cl.⁴ C25D *5/02*

U.S. Cl. 204—15 **9 Claims**

1. Method for forming an abrasion resistant, metallic pattern beneath the surface of a glass substrate comprising the steps of:

scoring a narrow groove in said surface, said groove delineating said pattern;

depositing an electrically continuous conductive strip of metal along the length of said groove;

immersing said substrate in an electroplating bath comprising a plethora of glass particles suspended in a solution of metal ions electrolytically reducible to form the metal of said pattern;

passing electrolyzing current through said metal strip and said bath to selectively electrolytically codeposit said pattern metal and said particles in said groove; and

firing said substrate to a temperature and for a time sufficient to fuse said particles one to the other and to said substrate;

whereby a precisely defined, abrasion resistant, electrically conductive pattern is formed beneath the surface of the substrate.

4,637,863

PROCESS FOR THE ELECTROSYNTHESIS OF ALCOHOLS AND OF EPOXY COMPOUNDS

Jacques Perichon, Savigny Sur Orge; Amélie Rabemanantsoa, Malakoff; Soline Sibille, La Varenne Saint Hilaire, and Esther D'Incan, Chatenay Malabry, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Mar. 28, 1986, Ser. No. 845,559

Claims priority, application France, Mar. 29, 1985, 85 04743

Int. Cl.⁴ C25B *3/00*

U.S. Cl. 204—59 R **33 Claims**

1. Process for the electrosynthesis of alcohols by electrochemical reduction of organic halides in the presence of carbonyl derivatives in an electrolysis cell fitted with electrodes in an organic solvent medium containing a supporting electrolyte, comprising using a sacrifical anode made of a metal chosen from the group of the reducing metals and wherein said organic halides contain at least one atom or one functional group which stabilizes carbanions.

4,637,864

ELECTROCHEMICAL SYNTHESIS OF TERNARY PHOSPHIDES

Josephine Covino, and George E. McManis, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 28, 1986, Ser. No. 846,788

Int. Cl.⁴ C25B *1/00*

U.S. Cl. 204—61 **6 Claims**

1. A method for the electrochemical synthesis of ternary phosphides of the general formula $M(II)M(IV)P_2$ by fused salt electrolysis comprising:

forming a melt powder mixture of compounds containing phosphorus;

placing said melt powder mixture in an electrolytic apparatus having a liquid metal cathode containing a silicon source and Zn metal source;

heating said electrolytic apparatus containing said melt powder mixture and liquid metal cathode to a temperature of 1000° C. or greater to form a molten mixture;

electrolyzing said molten mixture at a potential of about 4.0 to 5.0 volts to form a fused reaction melt in which oxygen is excluded as an impurity; and

cooling the mixture and recovering the resulting ceramic compound from said melt by leaching with an acid wash.

4,637,865

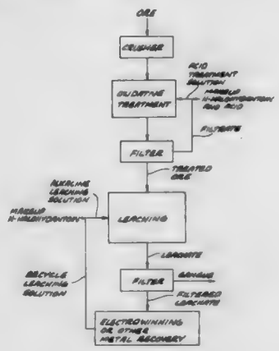
PROCESS FOR METAL RECOVERY AND COMPOSITIONS USEFUL THEREIN

Rodney H. Sergent, West Lafayette, Ind., and Kenneth N. Thanstrom, Sylmar, Calif., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Aug. 16, 1985, Ser. No. 766,833

Int. Cl.⁴ C25C *1/20*

U.S. Cl. 204—111 **50 Claims**



1. A process for extracting a precious metal or base metal from a source material containing said metal, the process comprising contacting said source material with an aqueous leaching solution containing a leaching agent comprising an N-halohydantoin compound, thereby producing an aqueous leachate containing said metal.

4,637,866

RECOVERY METHOD OF TRITIUM FROM TRITIATED WATER

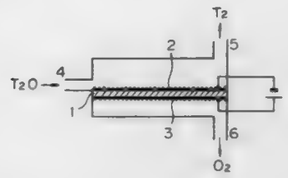
Satoshi Konishi, Tokaimura; Hideo Ohno, Mito; Yuji Naruse, Tokaimura, and Hiroshi Yoshida, Mito, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Continuation of Ser. No. 587,010, Mar. 7, 1984, abandoned. This application Oct. 4, 1985, Ser. No. 785,091

Claims priority, application Japan, Mar. 18, 1983, 58-044394

Int. Cl.⁴ C25B *1/02*

U.S. Cl. 204—129 **1 Claim**



1. A process for recovering tritium gas from tritiated water, comprising the steps of:

disposing an oxygen ion-conductive solid electrolytic membrane, having a cathode and an anode disposed upon opposite sides thereof, within an electrolytic cell;

applying electricity to said cathode and anode electrodes of said electrolytic membrane;

conducting a gas stream, containing tritiated water steam, into said electrolytic cell such that said gas stream only contacts said cathode electrode of said electrolytic membrane;

recovering tritium gas only from said cathode side of said electrolytic cell; and

recovering oxygen gas only from said anode side of said electrolytic cell.

4,637,867

PROCESS FOR PRODUCING HYDROGEN FROM SHORT WAVELENGTH ELECTROMAGNETIC RADIATION

Ralph L. Herbst, Jr., 926 Langdon Ave., Box No. 6, Horsham, Pa. 19044

Filed Oct. 14, 1981, Ser. No. 311,288

Int. Cl.⁴ B01J *19/08*

U.S. Cl. 204—157.52 **26 Claims**

1. A process for producing hydrogen comprising applying gammarays or X-rays to an aqueous composition comprising (1) at least one photoexcitable reagent which strongly absorbs said radiation energy at ground level causing it to enter its oxidized state and donate an electron whereby the reagent is oxidized, and at least one reagent (2) being at least one non-sacrificial chain reaction agent which forms a free radical in said aqueous composition and which reduces the oxidized photoexcited reagent when said composition is exposed to said radiation; and at least one reagent (3) being at least one spectral sensitizer whereby hydrogen is produced.

4,637,868

METHOD OF OXIDIZING HYDRAZO COMPOUNDS TO CORRESPONDING AZO COMPOUNDS BY HYDROGEN PEROXIDE

Julien Moroux, Lamorlaye, France, assignor to Societe Francaise d'Organo-Synthese, Gennevilliers, France

Filed Mar. 4, 1986, Ser. No. 835,910

Claims priority, application France, Mar. 4, 1985, 85 03147

Int. Cl.⁴ C07C *107/02*

U.S. Cl. 204—157.82 **4 Claims**

1. A method of oxidizing hydrazo compounds to corresponding azo compounds, and more particularly 4,4'-hydrazo-bis-4-cyano-pentanoic acid to 4,4'-azobis-4-cyano-pentanoic acid at a temperature close to ambient temperature,

said method comprising the step of effecting oxidation with the aid of hydrogen peroxide, under the following conditions:

catalysis of the reaction by means of UV radiation,

operation in aqueous solution at a $pH \leqq 0.5$, said pH being obtained by addition of hydrochloric acid and/or hydrobromic acid,

operation in a reaction medium comprising Br^- ions at a concentration at least equal to 30 ppm.

4,637,869

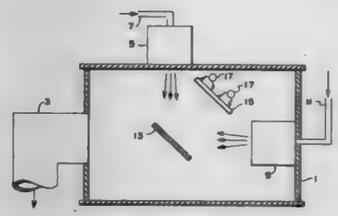
DUAL ION BEAM DEPOSITION OF AMORPHOUS SEMICONDUCTOR FILMS

David A. Glocker, West Henrietta, N.Y.; John R. Miller, Shaker Heights, Ohio; Scott F. Grimshaw, Jordan, N.Y., and Henry Windischmann, Solon, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 647,208, Sep. 4, 1984, abandoned, and a continuation-in-part of Ser. No. 653,168, Sep. 24, 1984, abandoned. This application Dec. 30, 1985, Ser. No. 814,837

Int. Cl.⁴ C23C *14/14, 14/16, 14/18, 14/46*

U.S. Cl. 204—192.11 **18 Claims**



1. A process for depositing a hydrogenated amorphous semiconductor film on a substrate comprising:

simultaneously directing first and second ion beams, produced by first and second ion sources, respectively, against a first target of a semiconductor material that is to be included in said film, said first ion beam including sputtering ions to sputter material from said first target and said second beam including hydrogen ions to reduce the density of localized states in the deposited film;

independently controlling the relative energies and currents of ions in said first and second beams so that the sputtering ions are effective in sputtering semiconductor material from said target and so that the energy of said hydrogen ions in the second ion beam does not exceed about 200 electron volts; and

collecting sputtering products from said first target on said substrate, whereby a film of hydrogenated amorphous semiconductor material substantially free of polyhydrides is efficiently deposited.

4,637,870

HYDROCRACKING WITH PHOSPHOMOLYBDIC ACID AND PHOSPHORIC ACID

Roby Bearden, Jr., and Clyde L. Aldridge, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 728,280, Apr. 29, 1985. This application Oct. 10, 1985, Ser. No. 785,986

Int. Cl.⁴ C10G *47/04*

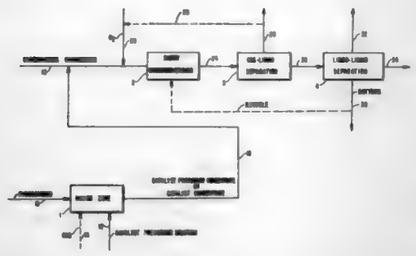
U.S. Cl. 208—112 **12 Claims**

1. A process for hydroconverting a heavy hydrocarbonaceous oil chargestock comprising a catalyst to produce lower boiling hydrocarbon products, which comprises reacting said chargestock with hydrogen at hydroconversion conditions, including a temperature ranging from about 800 to about 900°

F., said catalyst having been prepared by the steps which comprise:

(a) adding phosphoric acid to an aqueous solution of phosphomolybdic acid in an amount to provide in said solution an atomic ratio of phosphorus to molybdenum ranging from 0.12:1 to 0.45:1; and, subsequently

(b) forming a mixture of a hydrocarbonaceous material having a different boiling point range from said chargestock and the aqueous solution resulting from step (a), in an amount to provide in said mixture from about 0.2 to 2 weight percent molybdenum, calculated as elemental



metal, based on said hydrocarbonaceous material to produce a catalyst precursor concentrate;

(c) introducing at least a portion of said catalyst precursor concentrate into said chargestock; and

(d) heating the mixture resulting from step (b), or the mixture resulting from step (c) in the presence of a gas selected from the group consisting of a hydrogen-containing gas, a hydrogen sulfide-containing gas and mixtures thereof at conditions to convert said phosphomolybdic acid and said phosphoric acid to a solid molybdenum and phosphorus-containing catalyst.

4,637,871

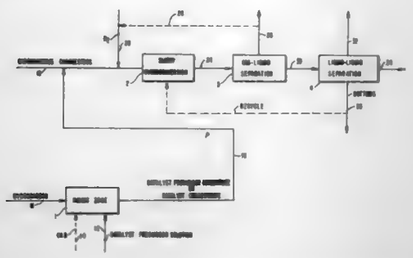
HYDROCRACKING WITH AQUEOUS PHOSPHOMOLYBDIC ACID

Roby Bearden, Jr., and Clyde L. Aldridge, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 728,281, Apr. 29, 1985. This application Oct. 10, 1985, Ser. No. 785,994

Int. Cl.⁴ C10G *47/02*

U.S. Cl. 208—112 **10 Claims**



1. In a method for preparing a catalyst wherein aqueous phosphomolybdic acid is heated in the presence of a hydrocarbonaceous material and a gas selected from the group consisting of a hydrogen-containing gas, a hydrogen sulfide-containing gas and mixtures thereof to convert said phosphomolybdic acid to a solid catalyst, the improvement which comprises:

(a) forming a mixture of a first hydrocarbonaceous material comprising at least about 10 weight percent constituents boiling above about 1050° F. and said aqueous solution of phosphomolybdic acid in an amount to provide in said mixture from about 0.2 to 2 weight percent molybdenum, calculated as elemental metal, based on said first hydrocarbonaceous material, said aqueous solution comprising from about 3 to about 5 weight percent molybdenum derived from said phosphomolybdic acid to produce a catalyst precursor concentrate;

(b) introducing at least a portion of said catalyst precursor concentrate into a second hydrocarbonaceous material having a different boiling point range from said first hydrocarbonaceous material;

(c) heating the mixture resulting from step (a) or the mixture resulting from step (b) in the presence of a gas selected from the group consisting of hydrogen-containing gas, hydrogen sulfide-containing gas, and mixtures thereof at conditions to convert said phosphomolybdic acid to a solid molybdenum-containing catalyst.

4,637,872

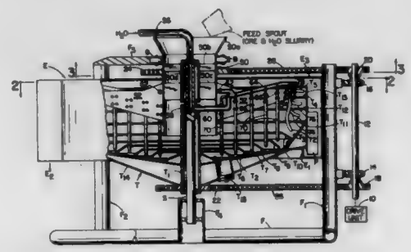
GRAVEL WASHER SEPARATOR

Carl E. Balkus, 147 Deep Wood Dr., Amston, Conn. 06231

Filed Apr. 12, 1985, Ser. No. 722,816

Int. Cl.⁴ B03B *5/58*; B04B *1/06*

U.S. Cl. 209—453 **18 Claims**



1. A separator for extracting gold from a slurry of ore, gravel and water, and comprising in combination:

(a) a fixed frame including tub support spindle means,

(b) an upwardly open tub rotably mounted to said tub support spindle means having a plurality of spaced annular dams projecting from the interior walls of said tub, said annular dams defining annular spaces therebetween,

(c) means for receiving a slurry of gold ore gravel and water into said tub, said slurry receiving means being rotatably monted to said spindle means,

(d) rake means fixedly mounted to said slurry receiving means, said rake means having radially spaced portions provided between the annular dams,

(e) means for rotating said tub and said slurry receiving means in the same direction but at slightly different rotational speeds on a vertical axis defined by said spindle means, and

(f) outlet means for the water and gravel spilling from said upwardly open tub.

4,637,873

FRONT LOAD SKIMMER/FILTER FOR SPAS AND POOLS

Daniel A. DeSousa, Clayton; Gary L. Gockel, Martinez; Ralph D'Innocente, Walnut Creek, and Roy A. Jacuzzi, Moraga, all of Calif., assignors to Jacuzzi Inc., Little Rock, Ark.

Filed Dec. 16, 1985, Ser. No. 815,501

Int. Cl.⁴ E04H *3/20*; C02F *1/00*

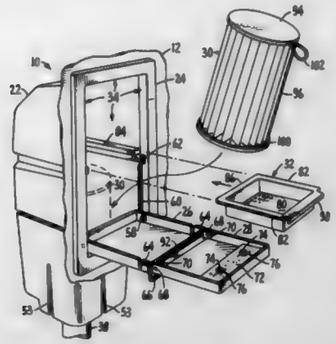
U.S. Cl. 210—169 **13 Claims**

1. An apparatus for filtering water drawn from the surface of a water-filled spa, said apparatus comprising:

a housing affixed to a side wall of the spa, said housing including an opening proximate the water surface through which water enters said housing from the spa, and including a drain through which the water exits said housing;

a filter disposed within said housing and operable for filtering water flowing through said housing, wherein said filter is removable from said housing through said opening;

an access door releasably coupled to said housing and moveable between a closed position that covers an underwater portion of said opening during filtering operation of said



apparatus and an open position that uncovers said opening to provide access for the installation and removal of said filter; and

a weir located above said access door and operatively associated with said opening and moveable between a position wherein said weir regulates the flow of water entering said housing and a position that uncovers said opening to provide access for the installation and removal of said filter.

4,637,874

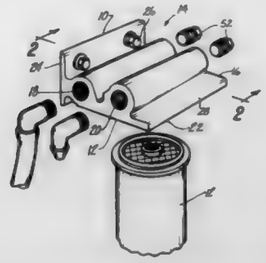
FILTER HEAD FOR SPIN-OFF FILTERS

John J. Aasteth, 2233 Star Ct., Auburn Heights, Mich. 48057

Filed Aug. 12, 1985, Ser. No. 764,475

Int. Cl.⁴ B01D *35/00*

U.S. Cl. 210—232 **14 Claims**



1. A filter head comprising: at least one spin-off filter having a diameter and having a fluid inlet structurally separated from a fluid outlet, said filter head comprising including,:

an extruded body having a first body portion defining a first longitudinal bore, a second body portion defining a second longitudinal bore separated from said first longitudinal bore, and a flat longitudinal surface; and

means for mounting at least one spin-off filter against said flat surface so that said fluid inlet is in fluid communication with said first longitudinal bore and said fluid outlet is in communication with said second longitudinal bore;

wherein the length of said body is about equal to an integral multiple of the diameter of said filter, said multiple corresponding to the number of said at least one filter.

12. A process comprising: forming a filter head for at least one spin-off filter having a diameter and having a fluid inlet structurally separated from a fluid outlet at an end of said filter, by the steps of

extruding a material to form an elongated body having first and second longitudinal bores spaced apart from each other, and a flat exterior surface; and

cross sectionally cutting said elongated body to form a segment having a length at least as long as any integral multiple of the diameter of said at least one filter.

4,637,875

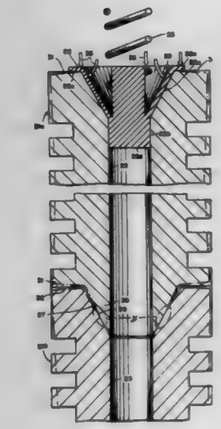
FLUID FILTERING APPARATUS AND TUBULAR FILTER THEREFOR

Loren H. Semler, Jr., Mt. Prospect, Ill., assignor to Semler Industries Inc., Franklin Park, Ill.

Continuation of Ser. No. 171,166, Jul. 22, 1980, abandoned, which is a continuation of Ser. No. 16,336, Feb. 28, 1979, abandoned. This application Jul. 19, 1982, Ser. No. 399,273

Int. Cl.⁴ B01D *25/00*

U.S. Cl. 210—232 **19 Claims**



1. A filter element comprising an elongated body formed of porous fluid-filtering material capable of limited deformation under conditions of use and provided with a flow passage extending longitudinally therethrough; said body having an upper end portion, lower end portion, and an intermediate portion, wherein the improvement comprises said body having a frusto-conical recess in one of its end portions and a frusto-conical protrusion provided by the other of said end portions, said protrusion and said recess being coaxial and the surfaces thereof defining said frusto-conical protrusion and recess, respectively, being of substantially the same slope and being formed of said porous filtering material, said protrusion and recess each being dimensioned to mate with a respective recess or protrusion of another identical filter element coaxial therewith, sind frusto-conical protrusion having a maximum diameter greater than the maximum diameter of said recess.

4,637,876

DISC SHAPED FILTER ELEMENT

Martin Dosoudil, Kwakelkade 28, Alkmaar, Netherlands

Filed Feb. 11, 1985, Ser. No. 700,367

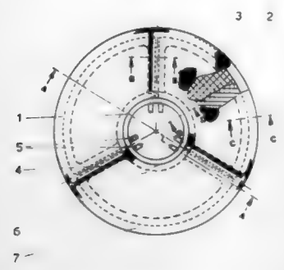
Claims priority, application Netherlands, Mar. 1, 1984, 8400662

Int. Cl.⁴ B01D *33/28*

U.S. Cl. 210—331 **10 Claims**

1. A disc-shaped filter element comprising a pair of generally planar disc-shaped filter members disposed in spaced generally

parallel relation to one another, annular sealing means located between and attached to the outer peripheries of said disc-shaped filter members, a hollow boss-member through which filtrate is to be discharged, said boss member being coaxial with said annular seal member and being attached to each of said filter members adjacent the center of said disc-shaped filter element, a plurality of radial sealing members attached to each of said filter members and extending from said hollow boss member to said annular sealing member between said filter members for subdividing the interior of said filter element into a plurality of separate sectors, and a plurality of conduits which extend from said sectors respectively through said boss member to effect fluid-flow communication between each of said sectors and the interior of said hollow boss member, each of said radial sealing members comprising an elongated web of flexible material which extends across the space between said



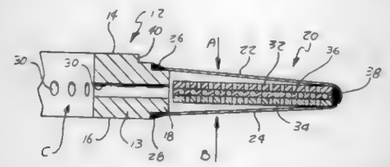
pair of filter members, said elongated web being provided with lips of said flexible material that extend outwardly of said web in opposite directions relative to the direction of elongation of said web and generally parallel to the planes of said filter members, said lips being attached to each of said filter members with the flexible material of said lips penetrating those portions of said filter members which are adjacent to said lips, a first pair of said lips extending outwardly of said web in said opposite directions adjacent one of said disc-shaped filter members, and a second pair of said lips extending outwardly of said web in said opposite directions adjacent the other of said disc-shaped filter members, one of the lips in each of said first and second pairs of lips being attached to its respective adjacent filter member, and the other lip in each of said first and second pairs of lips lying loosely against the surface of its respective adjacent filter member.

4,637,877

FILTER DISC

Wilhelm U. Hartmann, Sepulveda, and James A. Martin, Sylmar, both of Calif., assignors to HR Textron Inc., Valencia, Calif.

Filed Sep. 3, 1985, Ser. No. 771,925
Int. Cl.⁴ B01D *23/00*
U.S. Cl. 210—347 **4 Claims**



1. disc-shaped stainless steel filter element for filtering fluid flowing from outside to inside thereof and including filter media of randomly disposed stainless steel sintered fibers comprising:

a solid stainless steel hub including a body defining a central opening therethrough and having first and second spaced apart surfaces,

a radially extending peripheral flange,

a plurality of radial passageways extending through said body including said flange;

first and second layers of sintered stainless steel ramdomly disposed fiber filter media disposed over said flange and extending radially outwardly from the periphery of said first and second spaced apart surfaces respectively; and

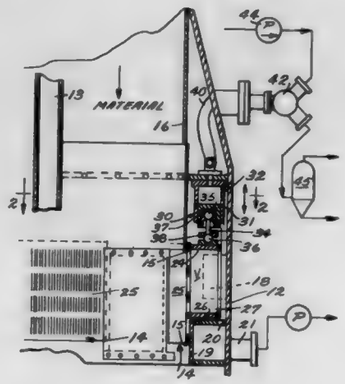
a stainless steel spacer means disposed between said media layers, said layers and said spacer means being continuously fusion welded together about the outer periphery thereof, said layers of said media being continuously fusion welded to said flange at said first and second surfaces.

4,637,878

RECIPROCAL MOVABLE SCREENS IN A VERTICALLY ELONGATED VESSEL

Johan C. F. C. Richter, Oslo, Norway, and Ole J. Richter, Karlstad, Sweden, assignors to Kamyr Aktiebolag, Karlstad, Sweden

Filed Mar. 9, 1982, Ser. No. 356,464
Int. Cl.⁴ B01D *33/00*
U.S. Cl. 210—388 **20 Claims**



1. In a pressurized vessel for vertically passing fibrous material suspended in liquid, the vessel having a vertical wall curved about a vertical axis, a structure comprising:

a vertically elongated screening member, curved about a vertical axis;

means for mounting said screening member inside and adjacent the vertical wall of the vessel, for up and down reciprocal movement, defining a screening volume between the screening member and the vertical wall; and for substantially sealing the screening volume from the interior of the vessel, except through the screening member and clearance gaps between the screening member and the vessel wall, during reciprocation of the screening member; and

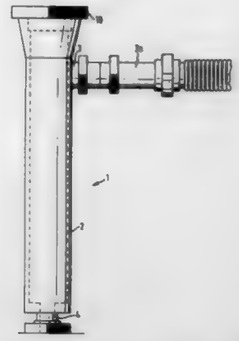
means for reciprocating said screening member vertically up and down with respect to the vertical wall, said reciprocating means comprising: a piston and cylinder assembly mounted within said screening volume; means for operatively attaching said piston to said screening member; a fluid conduit operatively connected to one side of said piston and to a two-way valve, the vessel pressure acting on the other side of said piston; and means for selectively operatively connecting said valve to a source of fluid under pressure or a vent.

4,637,879

APPARATUS FOR USE IN FILTERING A LIQUID

Philip J. Hartley, 24 Ardoyne House, Pembroke Park, Ballsbridge, Dublin 4, Ireland

Filed Jul. 16, 1985, Ser. No. 755,664
Claims priority, application Ireland, Nov. 15, 1984, 2940/84
Int. Cl.⁴ B01D *27/00*
U.S. Cl. 210—448 **7 Claims**



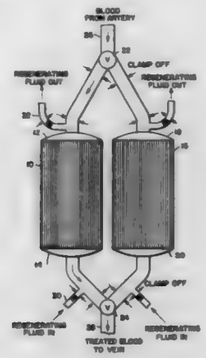
1. An apparatus for use in filtering a liquid which apparatus comprises a casing for receiving the liquid; a removable filtering device housed in the casing, the device comprising a pair of collar members; at least one rod member connecting the collar members; a coil shaped frame linking the collar members; a disposable filter element on the frame; the casing having an inlet port for connection to a source of liquid to be filtered and an outlet port for filtered liquid; a seal member for providing, in use, a fluid tight engagement of the filtering device in the casing; the outlet port having an internal groove in which rests the seal member, the seal member being in the form of a plug having a through bore therein which provides a passage for the liquid being discharged from the casing via the outlet port, the plug having means for tight fit engagement with the collar member at the outlet port.

4,637,880

APPARATUS AND METHOD FOR THERAPEUTIC IMMUNODEPLETION

Seymour P. Halbert, Miami, Fla., assignor to Cordis Laboratories, Inc., Miami, Fla.

Continuation of Ser. No. 326,134, Nov. 30, 1981, abandoned. This application Jun. 1, 1984, Ser. No. 616,789
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—638 **7 Claims**



1. Therapeutic extracorporeal shunt apparatus connectable to an artery and vein of a patient for removal of an agent from the patient's blood, said apparatus including provision for simultaneous treatment and on-line regeneration, comprising:

(a) pick-up means for directing blood from an artery of the patient to the therapeutic extracorporeal shunt apparatus;

(b) return means for directing blood to a vein of the patient from the therapeutic extracorporeal shunt apparatus;

(c) a first blood flow path connecting said pick-up means and said return means and having closable ports for in-flow and out-flow of a regenerating fluid, comprising

(i) a bundle of at least two hundred parallel hollow fibers having covalently bound to their inner surfaces an immunoadsorbent capable of binding said agent, thereby removing it from the patient's blood, and

(ii) a header at each end of said bundle in fluid communication with the interior of the fibers in said bundle to provide a flow passage through the length of the interiors of said hollow fibers;

(d) a second blood flow path, isolatable from said first blood flow path, connecting said pick-up means and said return means and having closable ports for in-flow and out-flow of a regenerating fluid, comprising

(i) a bundle of at least two hundred parallel hollow fibers having covalently bound to their inner surfaces an immunoadsorbent capable of binding said agent, thereby removing it from the patient's blood, and

(ii) a header at each end of said bundle in fluid communication with the interior of the fibers in said bundle to provide a flow passage through the length of the interiors of said hollow fibers;

(e) first valve means for selectively flowing blood through said first blood flow path or said second blood flow path; and

(f) second valve means for selectively flowing regenerating fluid through either said first blood flow path or said second blood flow path while blood is flowing through the other blood flow path,

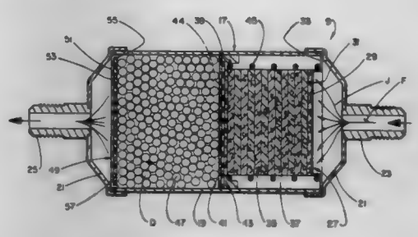
wherein said parallel hollow fibers are of a number and size selected to provide for an extracorporeal blood volume and flow rate sufficient, under the impetus of arterial pressure, to provide adequate flow through and contact with the hollow fibers of said first blood flow path for efficacious, continuous treatment of said patient.

4,637,881

FILTER DRIER

George J. Scinto, St. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 480,225, Mar. 30, 1983, abandoned. This application Dec. 3, 1984, Ser. No. 677,934
Int. Cl.⁴ B01D *27/02;* **F25B** *43/00*
U.S. Cl. 210—689 **4 Claims**



1. A method of filtering liquid refrigerant in a refrigeration system, said system comprising a compressor for receiving refrigerant vapor and for compressing it to an elevated pressure, a condensor for rejecting heat from said compressed vapor, an evaporator for absorbing heat from its surroundings, and a thermostatic expansion valve between said condensor and said evaporator for expanding said refrigerant, said method comprising the steps of:

between said condensor and said evaporator, first directing a jet of said refrigerant into a filter drier, said filter drier having a housing having an inlet and an outlet;
then, diffusing said jet as it enters said filter drier;
then, passing said diffused jet of refrigerant through a primary filtering means, said primary filtering means comprising a plurality filter pads stacked in face-to-face relation;
then, passing said refrigerant through an intermediate perforate support plate;
then, passing said refrigerant through an upstream fibrous filtering pad, said upstream pad being of a fibrous filtering media extending transversely across the full cross section of said filter drier housing, said intermediate plate and said upstream pad being axially shiftable within said filter drier;
then, passing said refrigerant through a bed of desiccant media comprising a multiplicity of desiccant beads;
passing said refrigerant through a downstream fibrous filtering pad;
then, passing said refrigerant through a downstream perforate support plate for discharge from filter drier housing via said outlet; and
resiliently compacting said desiccant bed between said upstream and downstream filtering pads thereby to maintain said desiccant beads in a compacted state even when the flow of said jet of refrigerant is alternately started and terminated so as to substantially prevent movement of said beads relative to one another upon the start-up and shut down of said compressor.

3. A filter drier for installation in a liquid line of a refrigeration system, said filter drier comprising a housing having a shell and a shell end at each end of said shell, an inlet, an outlet, and a flow path for the flow of liquid refrigerant through said housing from said inlet to said outlet, a bed of desiccant media including a multiplicity of desiccant beads within said housing adjacent said outlet, downstream filter means between said desiccant bed and said outlet, downstream perforate support means, the latter being fixed relative to said downstream shell end against axial movement toward said outlet for holding said desiccant bed and said downstream filter means in position within said housing and for permitting the flow of liquid refrigerant from said downstream filter means to said outlet, intermediate perforate support means within said housing on the upstream side of said desiccant bed, said intermediate perforate support means being movable axially within said housing and being positioned upstream from said desiccant bed, upstream filter means disposed between said desiccant bed and said intermediate perforate support means, primary filter means between said intermediate perforate support means and said inlet, said primary filter means having a primary filter body, upstream perforate support means between said primary filter means and said inlet for diffusing a jet of liquid refrigerant discharged from said inlet substantially across the width of said shell at the upstream end thereof so that said diffused stream of refrigerant flows through said primary filter means, said upstream perforate support means being fixed relative to said upstream shell end against axial movement toward and away from said inlet, said downstream and upstream filter means each comprising one or more suitable pads of fibrous filtering media extending transversely across substantially the full cross section of said housing, and a compression spring interposed between said upstream perforate support plate and said intermediate perforate support means for applying a resilient, compacting force on said desiccant bed between said upstream filter pad and said downstream filter pad thereby to maintain said desiccant bed in a compacted state even when the flow of said refrigerant is alternately started and stopped so as to substantially prevent movement of said beads relative to one another, said spring being free of said primary filter body such that said primary filter body is substantially free of axial compaction by said spring.

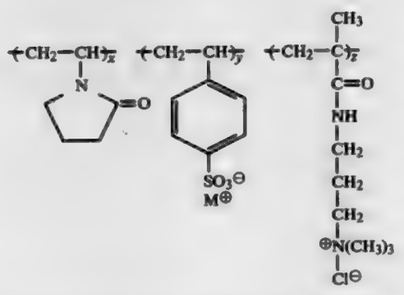
4,637,882

POLYAMPHOLYTES - HIGH TEMPERATURE VISCOSIFIERS FOR HIGH IONIC STRENGTH DRILLING FLUIDS

Dennis G. Peiffer, East Brunswick; Robert D. Lundberg, Bridgewater, both of N.J., and Kenneth W. Pober, Houston, Tex., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 16, 1983, Ser. No. 562,163
The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.
Int. Cl.⁴ C09K *7/00*
U.S. Cl. 252—8.514 **8 Claims**

1. A hydrolytically stable, high temperature water-based drilling mud which comprises:
(a) water;
(b) about 4 to about 30 lbs/bbl of clay;
(c) about 1 to about 30 lbs/bbl of a lignosulfonate, if necessary;
(d) weighting material of sufficient quantity necessary to achieve the desired density;
(e) about 0.25 to about 5 lbs/bbl of a terpolymer having the formula:



wherein x is about 40 to about 98 mole %, y is about 1 to about 50 mole %, z is about 1 to about 50 mole %, wherein y and z are less than 60 mole %, and M is selected from the group consisting of amines and a metallic cation being selected from the group consisting of lead, iron, aluminum, Groups IA, IIA, IB and II of the Periodic Table of Elements; and
(f) base of sufficient quantity to adjust the pH of the water-based drilling mud to about 10 to about 10.5.

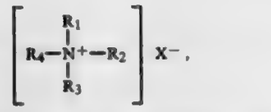
4,637,883

FLUID LOSS ADDITIVES FOR OIL BASE MUDS AND LOW FLUID LOSS COMPOSITIONS THEREOF

Arvind D. Patel, Houston, and Carmelita S. Salandanan, Sugarland, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

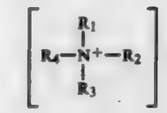
Division of Ser. No. 661,639, Oct. 17, 1984. This application Apr. 7, 1986, Ser. No. 848,559
Int. Cl.⁴ C09K *7/06*
U.S. Cl. 252—8.515 **10 Claims**

1. An oil base drilling mud formulation comprising a petroleum oil, an emulsifier, a water soluble salt, a gelling agent, a weighting agent and a quebracho ammonium salt reaction product of quebracho with an alkyl quaternary ammonium salt having the formula



wherein R_1, R_2, R_3 and R_4 are alkyl groups, at least one of which contains from 1 to 6 carbon atoms and at least one of which contains 10 to 22 carbon atoms, or aralkyl groups wherein the alkyl contains 1 to 3 carbon atoms; X is a halogen, sulfate or hydroxyl anion, said quebracho ammonium salt reaction product being present in an amount sufficient to reduce the fluid loss of said oil base drilling mud by filtration.

6. In a process wherein a petroleum oil base drilling mud is introduced into a well wherein said mud is subject to fluid loss by filtration, the step comprising adding to the oil base drilling mud quebracho ammonium salt reaction product of quebracho with an alkyl quaternary ammonium salt having the formula



wherein R_1, R_2, R_3 and R_4 are alkyl groups, at least one of which contains from 1 to 6 carbon atoms and at least one of which contains 10 to 22 carbon atoms, or an aralkyl group wherein the alkyl contains 1 to 3 carbon atoms; X is a halogen, sulfate or hydroxyl anion, in an amount to reduce the fluid loss of said oil base drilling mud by filtration.

4,637,884

SLIDING MEMBER OF GRAPHITE-BORON CARBIDES

Kenji Miyazaki, Dazaifu; Tsuyoshi Hagio; Ichitaro Ogawa, both of Tosu; Hisayoshi Yoshida, Ogori; Kazuo Kobayashi; Kazutsugu Kashima, both of Tosu; Takashi Tada; Yoichiro Hayashi, both of Fujisawa, and Wataru Abe, Hiratsuka, all of Japan, assignors to Agency of Industrial Science and Technology and Oiles Industry Co., LTD, both of Tokyo, Japan

Filed Jul. 17, 1985, Ser. No. 756,086
Claims priority, application Japan, Jul. 20, 1984, 59-149706
Int. Cl.⁴ F16C *33/16*
U.S. Cl. 252—12 **4 Claims**

1. A high temperature-resistant and abrasion-resistant sliding member of graphite-boron carbides, showing the friction coefficient of 0.01 to 0.13 and the specific abrasion amount of 10^{-7} to 10^{-9} mm^2/kg under the measuring conditions of the load of 20 kg/cm^2 and the sliding velocity of 5 m/min at a temperature of 300° C., the bending strength of 300 to 1600 $kg.f/cm^2$ and Shore hardness of 45 to 60, produced by the process comprising the steps of mixing and stirring from 65 to 95% by weight of powdery carbon of an average particle size of 10 to 150 μm and from 5 to 35% by weight of powdery boron carbide of an average particle size of 0.5 to 2.5 μm until said powdery boron carbide is uniformly dispersed in said powdery carbon, and sintering the thus prepared uniform mixture at a temperature of 2020° C. or more and less than the transition point at which the structure of carbon and boron carbide in said uniform mixture is remarkably changed, under a pressure of from 100 to 250 kg/cm^2.

4,637,885

METAL-WORKING OIL COMPOSITION

Hiroshi Kuwamoto, Fukuyama; Hiroyuki Nagamori; Takashi Mukai, both of Wakayama, and Shuichi Iwado, Fukuyama, all of Japan, assignors to Kao Corporation and Nippon Kokan Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 615,945, May 31, 1984, abandoned. This application Oct. 11, 1985, Ser. No. 786,359
Claims priority, application Japan, Jun. 10, 1983, 58-103627
Int. Cl.⁴ C10M *137/04, 137/08, 137/16*
U.S. Cl. 252—32.5 **17 Claims**

1. A metal-working oil composition consisting essentially of:
(a) 99–50 wt.% of one or more lube-oil components selected from the group consisting of oils, fats, mineral oils and fatty acid esters;
(b) 0.1–20 wt.% of one or more compounds selelcted from the group consisting of salts of:
aliphatic, alicyclic and aromatic amines having 4 to 22 carbon atoms and quaternary ammonium salts formed from aliphatic or aromatic amines having 4 to 22 carbon atoms; and
acidic phosphoric acids selected from the group consisting of:
(i) phosphorous acid, thio compounds thereof, ester compounds thereof and thio compounds of phosphoric acid;
(ii) mono- and di-phosphoric acid esters containing an aryl group and at least one hydroxyl group, thio compounds thereof, and thio compounds of mono- and di-phosphoric acid esters containing an alkyl or alkylaryl group and at least one hydroxyl group;
(iii) mono- or di-phosphonic acids containing a (C_1–C_8) alkyl group, an alkylaryl or aryl group, and thio compounds thereof;
(iv) mono- or di-phosphinic acids containing a (C_1–C_8) alkyl group, an alkylaryl or aryl group, and thio compounds thereof;
(v) mono-, di- or tri-phosphonic acids containing one or more nitrogen atoms;
(vi) phosphonous acids containing a (C_1–C_8) alkyl group, an alkylaryl or aryl group, and thio compounds thereof; and
(vii) phosphinous acids containing a (C_1–C_8) alkyl group; and
(c) 0.2–5.0 wt.% of a non-ionic surfactant.

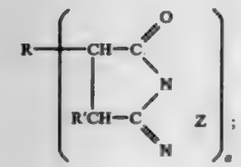
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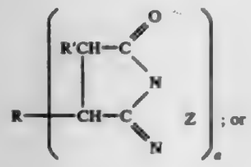
MACROCYCLIC POLYAMINE AND POLYCYCLIC POLYAMINE MULTIFUNCTIONAL LUBRICATING OIL ADDITIVES

Stanley J. Brois, Westfield, and Antonio Gutierrez, Mercerville, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

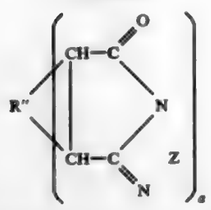
Continuation-in-part of Ser. No. 453,143, Dec. 27, 1982, abandoned, which is a continuation-in-part of Ser. No. 415,980, Sep. 8, 1982, abandoned, which is a division of Ser. No. 243,781, Mar. 16, 1981, abandoned, which is a continuation of Ser. No. 67,546, Aug. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 817,217, Jul. 20, 1977, Pat. No. 4,174,322, and a continuation-in-part of Ser. No. 806,326, Jun. 13, 1977, Pat. No. 4,167,514. This application Nov. 16, 1983, Ser. No. 550,977
Int. Cl.⁴ C10M *149/02, 149/04*
U.S. Cl. 252—51.5 A **9 Claims**

1. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity and 0.01 to 20 wt% of a macrocyclic polyamine compound being a member of the group of compounds and mixtures thereof having the formulas:





-continued



where R' is hydrogen or lower C_1–C_{12} alkyl, R is a hydrocarbon substituent having 2 to 15,000 carbon atoms, R'' is a hydrocarbon substituent of 4 to 15,000 carbon atoms, Z is $—CH_2CH_2CH_2—$ or $—(CH_2CH_2CH_2NH)_nCH_2CH_2CH_2—$ where n is 1–6; or $(CH_2CH_2CH_2NH_m)CH_2(CH_2)_p(NH—CH_2CH_2CH_2)_{m'}—$ where m and m' are each at least 1 and m+m' is 2–5, p is 1–4, and a is 1–20.

4,637,887

LUBRICANTS FOR VINYL CHLORIDE POLYMERS

Kurt Worschech, Loxstedt-Bexhoevede; Frido Loeffelholz, Bremerhaven-Surheide; Peter Wedl, Loxstedt-Bexhoevede, and Bernd Wegemund, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed May 30, 1985, Ser. No. 739,249

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420226

Int. Cl.[4] C10M *129/66, 129/76*

U.S. Cl. 252—56 R **10 Claims**

1. In the process of molding polyvinyl chloride or copolymers predominantly containing vinyl chloride wherein a molding lubricant is employed, the improvement comprising using a lubrication effective amount of a molding lubricant consisting essentially of triglycerides containing hydroxy fatty acid residues obtained by hydrogenating at least one epoxidized natural fat or oil selected from olive oil, linseed oil, sunflower oil, safflower oil, peanut oil, corn oil, palm oil, tall oil, lard oil, herring oil, whale oil, soybean oil, rapeseed oil, or tallow.

4,637,888

REVERSIBLE PHASE CHANGE COMPOSITION FOR STORING ENERGY

George A. Lane, and Harold E. Rossow, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 504,763, Jun. 15, 1983, abandoned. This application Jun. 11, 1985, Ser. No. 743,237

Int. Cl.[4] C09K *5/06*

U.S. Cl. 252—70 **37 Claims**

1. A reversible liquid/solid phase change composition having a melting temperature of from about 5° to about 50° C., said composition comprising a hydrated mixture of from about 20 to about 67 weight percent $CaBr_2$, from greater than zero to about 38 weight percent $CaCl_2$, from about 28 to about 50 weight percent water, and a modifier selected from the group consisting of KBr, and mixtures of KBr and KCl, said modifier being present in an amount greater than zero to less than about 10 weight percent and sufficient to modify the semicongruent melting behavior of the $CaBr_2/CaCl_2$ mixture to reduce, during freezing of the composition, the formation of crystalline $CaBr_2$ and $CaCl_2$ hydrate phases other than the hexahydrate phase.

4,637,889

ORGANOPOLYSILOXANE VISCOUS COUPLER FLUIDS

Keiichi Kishimoto, and Makoto Yoshitake, both of Chiba, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1986, Ser. No. 825,518

Claims priority, application Japan, Feb. 12, 1985, 60-25070

Int. Cl.[4] C10M *107/50;* **C07F** *7/08*

U.S. Cl. 252—75 **9 Claims**

1. An organopolysiloxane viscous coupler fluid comprising

(a) an organopolysiloxane fluid having the average unit formula

$$R_aSiO_{(4-a)/2}$$

in which R is a monovalent hydrocarbon radical and a has an average value of from 1.5 to 3.0

(b) a zirconium-containing organosiloxane compound having in each molecule at least one zirconium atom and at least one siloxane unit of the formula

$$R^1_bSiO_{(4-b)/2}$$

in which R^1 is a monovalent hydrocarbon radical and b is an integer of from 1 to 3 inclusive, where said zirconium-containing organosiloxane contains from 0.001 to 1.0 weight percent zirconium atom based on the weight of component (a), and

(c) a cerium-containing organosiloxane compound having in each molecule at least one cerium atom and at least one siloxane unit of the formula

$$R^2_cSiO_{(4-c)/2}$$

in which R^2 is a monovalent hydrocarbon radical and c is an integer of from 1 to 3, where said cerium-containing organosiloxane contains from 0.001 to 1.0 weight percent cerium atom based on the weight of component (a).

4,637,890

DETERGENT COMPOSITION PROVIDING RINSE CYCLE SUDS AND TURBIDITY CONTROL CONTAINING A SOAP, QUATERNARY AMMONIUM SALT AND A SILICONE

Paul J. Crabtree, Cincinnati, Ohio, and Kazuhiko Imakawa, Takarazuka, Japan, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 23, 1986, Ser. No. 821,670

Int. Cl.[4] B01D *19/04;* **C11D** *9/36, 10/04, 17/06*

U.S. Cl. 252—90 **5 Claims**

1. A granular detergent composition providing reduced sudsing and rinse water turbidity during rinsing following a washing operation, said composition comprising:

(a) at least one surfactant;

(b) at least one soluble detergency builder; and

(c) a plurality of rinse cycle suds control prills comprising:

(i) fatty acid soap;

(ii) at least one quaternary ammonium salt having at least one aliphatic hydrocarbon substituent containing from about 12 to about 18 carbon atoms; and

(iii) at least one silicone fluid suds suppressor;

wherein said prills comprise from about 0.1% to about 14% by weight said silicone fluid, wherein said prills comprise from about 5% to about 55% by weight said soap, wherein the mole ratio of said soap to said quaternary ammonium salt in said prills is from about 0.1:1 to about 4:1, and wherein said composition comprises from about 1% to about 20% by weight of said prills.

4,637,891

PROCESS FOR THE MANUFACTURE OF DETERGENT COMPOSITIONS CONTAINING SODIUM ALUMINOSILICATE

Francois Delwel, Dordrecht, and Marinus L. M. Claassens, Roosendaal, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 358,989, Mar. 17, 1982, abandoned. This application Jan. 28, 1985, Ser. No. 695,742

Claims priority, application United Kingdom, Mar. 20, 1981, 8108807

Int. Cl.[4] C11D *17/06*

U.S. Cl. 252—135 **2 Claims**

1. A process for manufacturing washing powder comprising a synthetic aluminosilicate as a detergency builder, said process comprising the sequence of steps of:

(a) spray-drying a slurry comprising (i) a detergent active material selected from the group consisting of anionic surfactants, nonionic surfactants, a binary mixture of anionic and nonionic surfactants and a ternary mixture of an anionic surfactant, a nonionic surfactant and a soap and (ii) sodium silicate, to form a spray-dried powder;

(b) granulating the spray-dried powder obtained in step (a) with a liquid binder and a detergency builder comprising a synthetic aluminosilicate to form granules in an apparatus separate from the apparatus in which spray-drying step (a) takes place; and

(c) drying the granules obtained in step (b).

4,637,892

CLEANING SOLUTION

Ora S. Merryman, 1711 Lewis, Las Vegas, Nev. 89101

Filed Feb. 4, 1986, Ser. No. 826,011

Int. Cl.[4] C11D *3/42*

U.S. Cl. 252—139 **10 Claims**

1. An improved, all purpose aqueous cleaning solution and deodorizing stain remover for use in cleaning natural and synthetic materials and fabrics, said solution comprising:

from 2 to 25% aromatic petroleum solvent;

from 2 to 25% aqueous wetting agent;

from 2 to 25% hydrated sodium borate; and

from 25 to 94% water.

4,637,893

DELAYED CO-INITIATION PROCESS FOR PREPARING POLYOL BLENDS

Curtis J. Reichel; William W. Levis, Jr., both of Wyandotte, and Robert J. Hartman, Southgate, all of Mich., assignors to BASF Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 458,287, Jan. 17, 1983, abandoned. This application May 16, 1985, Ser. No. 734,850

Int. Cl.[4] C09K *3/00*

U.S. Cl. 252—182 **7 Claims**

1. A delayed co-initiation process for preparing polyol blends comprising

(a) oxyalkylating a first initiator compound which contains at least two active hydrogen atoms to obtain a polyol with an equivalent weight from 100 to 10,000; and

(b) adding a second initiator which may be the same as or different from the first and oxyalkylating to obtain a polyol with an equivalent weight from 100 to 10,000 based upon the second initiator, said oxyalkylations occurring at temperatures from about 105° to about 160° C., wherein said first and second initiator is a polyhydric alcohol.

4,637,894

ACTIVATOR OF PEROXO COMPOUNDS

Jan Smidrkal; Jaroslav Simunek, both of Rakovnik; Jiri Tolman, Krivoklat; Jiri Soucek, Prague; Alois Novacek, Usti; Jan Novak; Vaclav Krob, both of Racovnik; Pavel Kovar, Prague; Miroslav Klofec, and Bohumir Vondracek, both of Usti, all of Czechoslovakia, assignors to Tukovy Prumysl, Koncern, Prague, Czechoslovakia

Filed Feb. 28, 1985, Ser. No. 706,511

Claims priority, application Czechoslovakia, Feb. 29, 1984, 1387-84

Int. Cl.[4] C01B *15/00*

U.S. Cl. 252—186.4 **7 Claims**

1. An activator of peroxo compounds comprising from 4 to 98 percent by weight of phthalic anhydride and from 2 to 96 percent by weight of N-acetylphthalimide.

4,637,895

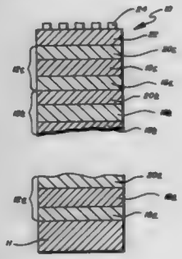
GAS MIXTURES FOR THE VAPOR DEPOSITION OF SEMICONDUCTOR MATERIAL

Stanford R. Ovshinsky, Bloomfield Hills; Subhendu Guha, Clawson; Prem Nath, Rochester; Chi C. Yang, Troy; Jeffrey Fournier, St. Clair Shores, and James Kulman, Detroit, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Apr. 1, 1985, Ser. No. 718,661

Int. Cl.[4] C09K *11/07*

U.S. Cl. 252—188.31 **9 Claims**



1. A gaseous precursor mixture from which semiconductor alloy material may be deposited by glow discharge decomposition:

said mixture including disilane and germane.

4,637,896

POLYMERIC LIQUID CRYSTALS

Paul J. Shannon, Millersville, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

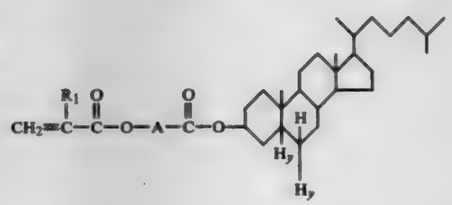
Continuation-in-part of Ser. No. 450,089, Dec. 15, 1982, abandoned. This application Oct. 12, 1984, Ser. No. 660,038

Int. Cl.[4] C09K *19/36, 19/38;* **C08F** *12/32;* **G01K** *11/16*

U.S. Cl. 252—299.7 **16 Claims**

1. A polymeric coating exhibiting a fixed cholesteric optical response, said coating being obtained by photopolymerizing a composition comprising

a photopolymerizable monomer having the structure:



(I)

where R_1=H or CH_3, A=—R_2—, —R_3O—, or —R_4O—, R_2=an alkylene chain having from 3–14 methylene or lower alkyl-substituted methylene groups, R_3=an alkylene chain having from 2–14 methylene or lower alkyl-substituted methylene groups, R_4=an alkylene ether, diether or triether having a total of from 3–14 carbon atoms in the alkylene moieties, provided that the terminal alkylene moiety adjacent the carbonate moiety comprises not less than two carbon atoms, and y=0 or 1; and

a suitable photoinitiator, said composition having exhibited cholesteric liquid crystalline properties at the time photopolymerization occurred.

4,637,897

NEMATIC COMPOUNDS

Stephen M. Kelly, Oberrohrdorf, Switzerland, assignor to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

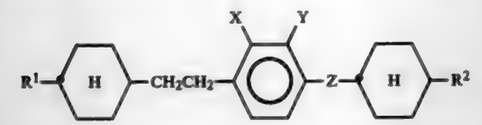
Filed Aug. 6, 1984, Ser. No. 638,089

Claims priority, application Switzerland, Aug. 4, 1983, 234/83; Fed. Rep. of Germany, Mar. 23, 1984, 3410734

Int. Cl.⁴ C07C *49/84, 43/225, 39/42, 69/75, 25/13, 121/52, 121/56;* **C09K** *19/30*

U.S. Cl. 252—299.63 **19 Claims**

1. In a liquid crystalline dielectric comprising at least two liquid crystalline compounds, the improvement wherein at least one of these compounds is a nematic compound with a negative dielectric anisotropy of the formula

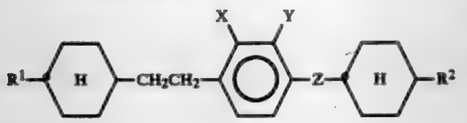


R^1 and R^2 are identical or different and each is alkyl of 1–12 carbon atoms,

Z is a bridging group which is —CH_2CH_2—, —OCH_2—, —O—CO— or —CO—O— and,

one of X and Y is flourine, chlorine, bromine or cyano and the other is hydrogen.

2. A compound of the formula



wherein

R^1 and R^2 are identical or different and each is alkyl of 1–12 carbon atoms,

Z is a bridging group which is —CH_2CH_2—, —OCH_2—, —O—CO— or —CO—O— and,

one of X and Y is fluorine, chlorine, bromine or cyano and the other is hydrogen.

4,637,898

FLUORESCENT COMPOSITIONS, X-RAY INTENSIFYING SCREENS, AND PROCESSES FOR MAKING SAME

Charles D. DeBoer, and George W. Luckey, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 238,404, Feb. 26, 1981, abandoned. This application Apr. 8, 1985, Ser. No. 721,130

Int. Cl.⁴ C09K *11/02*

U.S. Cl. 252—301.36 **13 Claims**

1. A fluorescent coating composition comprising:

(a) from 50 to 90 percent by weight of a substantially isotropic phosphor which is excited by x-rays and substantially transparent to light emitted by said phosphor; and

(b) from 10 to 50 percent by weight of a polymer having an index of refraction within 0.02 of the index of refraction of said phosphor over at least 80 percent of the emission spectrum of said phosphor, said polymer comprising:

(i) from 5 to 99 mole percent of a polymerized co-polymerizable naphthyl carbinyl methacrylate monomer; and

(ii) from 1 to 95 mole percent of a polymerized co-polymerizable naphthyl carbinyl thioacrylate monomer.

4,637,899

CORROSION INHIBITORS FOR CLEANING SOLUTIONS

Weldon C. Kennedy, Jr., Tulsa, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Jan. 30, 1984, Ser. No. 574,837

Int. Cl.⁴ C11D *7/32*

U.S. Cl. 252—542 **22 Claims**

1. An aqueous cleaning solution composition having a pH of from about 1 to about 10, consisting essentially of at least one organic acid, selected from the group consisting of alkylene polyamine polyacetic acid, hydroxyacetic acid, formic acid, and citric acid, or a salt thereof, and further having dissolved or dispersed therein, in at least an amount sufficient to inhibit the corrosion of metals in contact with said solution, a corrosion inhibitor composition comprising:

(1) at least one of an aliphatic pyridinium salt or an aliphatic quinolinium salt; and

(2) a sulfur-containing compound.

4,637,900

FABRICATION OF HIGH EXPOSURE NUCLEAR FUEL PELLETS

James R. Frederickson, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 13, 1984, Ser. No. 570,553

Int. Cl.⁴ G21C *21/02;* **C09K** *11/04;* **B22F** *1/00, 3/16*

U.S. Cl. 252—643 **10 Claims**

1. A method of making a fuel pellet for a nuclear reactor comprising

(A) preparing a mixture of PuO_2 and UO_2 powders, said mixture containing at least about 30% PuO_2, where at least 12% by weight of said Pu is Pu^{240};

(B) adding to said mixture about 0.3 to about 5% of a binder having a melting temperature of at least about 250 F. selected from a group consisting of fatty acid diamides, polyvinyl carboxylate, polyvinyl alcohol, naturally occurring high molecular weight cellulosic polymers, chemically modified high molecular weight cellulosic polymers, and mixtures thereof;

(C) pressing said mixture at about 5000 to about 25,000 psi to form a slug;

(D) granulating said slug;

(E) adding to said granulated slug a positive amount up to about 4.7% of a lubricant having a melting point of at least about 330° F., selected from the group consisting of fatty acid diamides, polyvinyl carboxylate, polyvinyl alcohol, naturally occurring high molecular weight cellulosic polymers, chemically modified high molecular weight cellulosic polymers, and mixtures thereof;

(F) pressing said granulated slug at about 20,000 to about 70,000 psi to form a pellet; and

(G) sintering said pellet at about 1700° C.±200° C.

4,637,901

N-(ALPHA-HALOACYL)-N-HYDROCARBYL CARBAMOYL HALIDES

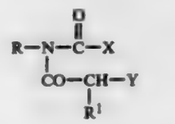
Chennupati K. Rao, Bhopal; Sudershan K. Arora, Hatam Tal; Raman Grover, Bhopal, all of India; John A. Durden, Raleigh, and Themistocles D. J. D'Silva, Chapel Hill, both of N.C., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 743,277, Jun. 11, 1985, abandoned, which is a continuation of Ser. No. 533,725, Sep. 19, 1983, abandoned. This application Oct. 15, 1985, Ser. No. 786,721

Int. Cl.⁴ C07C *125/03*

U.S. Cl. 260—544 C **14 Claims**

1. Carbamoyl halide compounds of the formula:



wherein:

R represents methyl or alkenyl, alkynyl, cycloalkyl, cycloalkenyl, of up to 18 carbon atoms; R^1 represents hydrogen or methyl; and X represents Cl or F and Y represents Cl, F or Br.

4,637,902

MIXED ANHYDRIDES OF CARBAMIC AND HYDROXAMIC ACIDS

Hiroyuki Hirai, and Ken Kawata, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

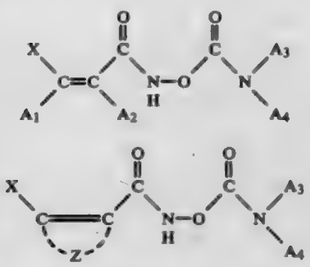
Filed Mar. 14, 1984, Ser. No. 589,289

Claims priority, application Japan, Mar. 14, 1983, 58-42673

Int. Cl.⁴ C07C *83/10, 125/00*

U.S. Cl. 260—545 R **5 Claims**

1. A compound represented by the following formula (A-1) or (A-2):



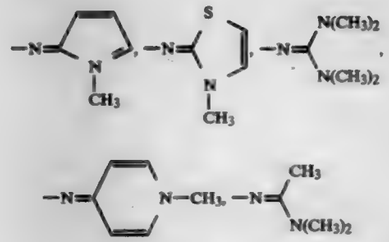
(A-1)

(A-2)

wherein A_1 and A_2 each represents a hydrogen atom, an alkyl group, a substituted alkyl group, a cycloalkyl group, an alkenyl group, an aralkyl group, an aryl group, a substituted aryl group, an acyl group, or a heterocyclic group, A_3 and A_4 each represents a hydrogen atom, an alkyl group, a substituted alkyl group, a cycloalkyl group, or an aralkyl group, and A_3 and A_4 can combine to form a ring or the group



represents an imino group selected from the group



and X represents a nucleophilic group, and



is a 5 or 6 member aromatic ring or a 5 or 6 membered heterocyclic group containing an oxygen atom, a sulfur atom or a nitrogen atom, wherein said substituted alkyl groups for A_1, A_2, A_3 and A_4 are substituted with one or more of a hydroxy group, an alkoxy group, a cyano group, a carboxyl group, a carboalkoxy group, a carbamoyl group or a halogen atom as a substituent and said substituted aryl group is substituted with one or more of an alkyl goup, an alkoxy group, a dialkylamino group, a cyano group, a nitro group, or a halogen atom as a substituent.

4,637,903

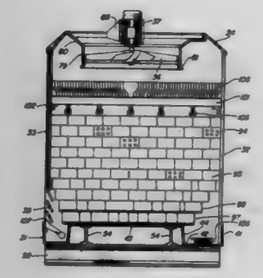
LIGHTWEIGHT COOLING TOWER

Charles J. Bardo; Jesse Q. Seawell, both of Fort Worth; Anthony J. Dylewski, Arlington, and John L. Clark, Jr., Benbrook, all of Tex., assignors to Ceramic Cooling Tower Company, Fort Worth, Tex.

Filed Oct. 30, 1985, Ser. No. 792,775

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—24 **14 Claims**



1. A cooling tower comprising:

a fiberglass reinforced resin basin,

porous means for heat/mass exchange which is supported directly by the basin,

a cover having a fan opening therein,

a plurality of vertically extending fiberglass reinforced resin columns which extend between the basin and the cover and which are supported by the basin and which support the cover,

a fiberglass reinforced resin panel extending between each pair of adjacent columns and attached thereto, and

a fan positioned in the fan opening in the cover and attached to the cover whereby the weight of the fan is supported by the cover and at least some of the columns.

4,637,904

PROCESS FOR MOLDING A POLYMERIC LAYER ONTO A SUBSTRATE

Nicholas A. Rounds, New Britain, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 14, 1983, Ser. No. 551,445
Int. Cl.[4] B29C 39/10, 39/42
U.S. Cl. 264—1.4 19 Claims

1. Process for forming a polymeric layer affixed to a substrate comprising placing a substrate to be coated in a mold having a removable lid, injecting a liquid monomer, having a viscosity of from about 3 centipoises to about 500 centipoises, into said mold and into contact with the surface of the substrate to be coated, holding the substrate in place in said mold prior to curing said monomer, radiation curing said liquid monomer, releasing the hold on said substrate prior to significant shrinkage of the curing liquid monomer, and venting said mold to atmospheric pressure at the portion of the mold remote from the surface of the substrate being coated and prior to significant shrinkage of said liquid monomer and said substrate moves toward said removable lid while said mold and said removable lid remain stationary, and removing the substrate having a polymeric layer affixed thereto from the mold.

4,637,905

PROCESS OF PREPARING MICROCAPSULES OF LACTIDES OR LACTIDE COPOLYMERS WITH GLYCOLIDES AND/OR ε-CAPROLACTONES

David L. Gardner, Bellville, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 466,500, Feb. 18, 1983, Pat. No. 4,532,123, which is a continuation-in-part of Ser. No. 402,164, Jul. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 354,869, Mar. 4, 1982, abandoned. This application Apr. 11, 1985, Ser. No. 722,102
Int. Cl.[4] A61K 9/52; B01J 13/02
U.S. Cl. 264—4.3 6 Claims

1. A process for preparing a microcapsule having an aqueous functional core material encapsulated in a PLA which comprises:

(a) dissolving PLA in a mixture of two miscible organic liquids, the first being a liquid having solvent power for PLA and the second having little or no solvent power for PLA, the two liquids being present in a ratio such that the solution is near its saturation point for PLA, the liquid having solvent power for PLA having a vapor pressure significantly higher than the vapor pressure of the second liquid,

(b) agitating the solution of step (a) and adding thereto an aqueous functional core material so as to uniformly disperse the aqueous functional core material as a fine suspension throughout the continuous liquid phase having the PLA dissolved therein, and

(c) vaporizing the liquid having solvent power for PLA from the suspension of step (b) while continuing agitation so as to cause phase separation of the PLA and encapsulation of the finely dispersed aqueous functional core material with PLA, and

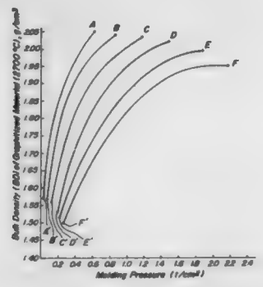
(d) transferring the dispersion of step (c) into an agitated mass of an organic liquid having little or no solvent power for PLA to precipitate any remaining dissolved PLA and harden the PLA which has encapsulated the aqueous functional core material.

4,637,906

METHOD OF PRODUCING CARBON MATERIALS

Noriyoshi Fukuda, and Ken Nagasawa, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Mar. 20, 1985, Ser. No. 713,865
Claims priority, application Japan, Mar. 26, 1984, 59-57892
Int. Cl.[4] C01B 31/02
U.S. Cl. 264—29.1 1 Claim



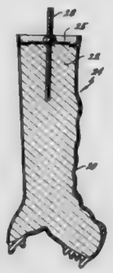
1. A method of producing carbon materials by starting from a calcined product having a benzene insoluble matter of more than 95% by weight, a quinoline insoluble matter of more than 80% by weight and a volatile matter of 4–15% by weight, which is produced by heat-treating coal tar pitch at 350°–600° C., extracting with a solvent, filtering and calcining the resulting residue having a quinoline insoluble matter of less than 95% by weight at a temperature of 250°–500° C. in an inert gas atmosphere, or a classified product obtained by classifying the calcined product into desired particle sizes and then molding, firing and graphitizing it without a binder, the improvement which comprises molding a calcined or classified product having an amount of quinoline soluble and benzene insoluble component of 1.5 to 15% by weight, under a pressure of not more than 1,000 kg/cm^2 without a binder, so as to obtain a carbon material having a bulk density of 1.85–2.05 g/cm^3.

4,637,907

LATEX DIP TOOLING AND METHOD FOR FORMING SAME

James D. Hegel, Torrance, and Davin W. Johnson, Rancho Palos Verdes, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Apr. 5, 1985, Ser. No. 720,337
Int. Cl.[4] B29C 67/22, 39/10; C08J 9/34, 9/22
U.S. Cl. 264—45.7 15 Claims



1. The method of forming a tool for use in a latex dip process for producing a latex skin in a given configuration, including the steps of:

producing an electro-formed female mold from a sculpture of the desired configuration;

casting a vinyl skin from said electro-formed female mold and removing said skin to expose a hollow interior; and

stuffing the vinyl skin with first and second materials, said first material being a ballast material, and said second material including one of glass balls and expanded, cellular beads, said first and second materials being selected in proportion for providing rigidity to said vinyl skin and approximately zero buoyancy for said tool in a latex bath.

4,637,908

PROCESS FOR MANUFACTURING HIGHLY ACTIVE, DISPERSED LOW APPARENT DENSITY ALUMINIUM HYDRATE

Fritz Weingärtner, Kerpen Horrem, Fed. Rep. of Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Sep. 9, 1985, Ser. No. 774,050
Claims priority, application Switzerland, Sep. 14, 1984, 4410/84
Int. Cl.[4] C01F 7/02
U.S. Cl. 264—143 14 Claims

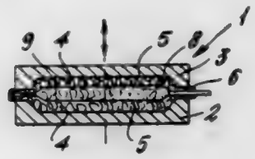
1. Process for manufacturing highly active, low apparent density dispersed aluminum hydrate, which comprises: providing unground, very fine grained aluminum tri-hydroxide, of which more than 99% of the grains are at most 3 μm in size; introducing said aluminum tri-hydroxide continuously into a reactor along with a dry hot air stream, said aluminum tri-hydroxide being heated to 400°–600° C., whirled up in a circulating movement, strongly dispersed and partially dehydrated to contain about 1–8 wt. % water in less than about 4 seconds; removing said partially dehydrated aluminum oxide from the reactor in an air stream; providing a stationary condition in the reactor whereby the amount of partially dehydrated aluminum oxide flowing out of said reactor is the same as the amount of aluminum tri-hydroxide being added; precipitating said aluminum oxide flowing out of the reactor in the air stream; dispersing said precipitated aluminum oxide in water and heating said dispersion, as a result of which the aluminum oxide is rehydrated and aluminum hydroxide is produced in the form of gelled-pseudo-boehmite and bayerite; and drying said aluminum hydroxide at temperatures below the activation temperature.

4,637,909

PROCESS FOR PRODUCING DOUBLE-LAYERED STRUCTURES

Eusebio Lacca, Viverone, Italy, assignor to Matec Holding, Switzerland

Filed Sep. 13, 1984, Ser. No. 650,110
Claims priority, application Italy, Sep. 13, 1983, 22859 A/83
Int. Cl.[4] B29C 43/20, 49/22; B32B 1/10
U.S. Cl. 264—510 2 Claims



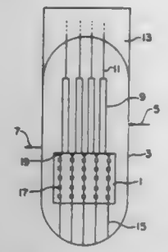
1. Process for the production of a closed hollow moulding substantially filled with an additional sound-absorbing material to provide for sound insulation of vehicles and engines in general by said molding, characterized by the steps of introducing a double package, each package comprising a prepolymerised or semipolymerised fibre layer and a foil of thermoplastics material, into a compression mould, the foils of the double package being disposed facing each other; providing a sound-absorbing material of sufficient porosity to allow a fluid under pressure to pass therethrough; placing a layer of said sound-absorbing material between said foils; introducing a fluid under pressure through said sound-absorbing material and between said foils in order to press each fibre layer against an internal wall of a corresponding compression mould half; applying heat of a temperature which is sufficient for melting said foil and polymerizing said fibre layers completely in order to provide a self-supporting, closed molding; and forming each of said fibre layers against said corresponding mold walls under said pressure and temperature and closing said molding by sealing edges of said packages together.

4,637,910

METHOD AND APPARATUS FOR CONTINUOUS ON-LINE SYNTHESIS OF POWER DISTRIBUTION IN A NUCLEAR REACTOR CORE

Albert J. Impink, Jr., Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 20, 1984, Ser. No. 572,499
Int. Cl.[4] G21C 7/36
U.S. Cl. 376—216 28 Claims



1. A method of on-line synthesis of the local power in a nuclear reactor having rods which are inserted in and retracted from the reactor core axially to control the reactivity thereof and having fixed incore nuclear detectors distributed across the core, said method being operable despite misalignment of a rod and comprising the steps of:

generating and storing reference signals representative of the power in the core under reference conditions at a plurality of specified locations across the core including the location of the detectors and additional locations at which it is desired to determine the local power;

storing signals representative of the positions of the rods under the reference conditions;

detecting the positions of said rods with rod position indicators;

monitoring response signals generated by said detectors;

adjusting the detector response signals to substantially eliminate the local effects thereon of changes in rod position from the reference conditions as detected by the rod position indicators;

generating deviation signals as the fractional difference between the adjusted detector response signals and the stored reference signals for the detector locations;

determining from said deviation signals the location of any misalinged rods and adjusting said deviation signals to substantially eliminate the effects of such any misaligned rods;

generating signals representative of a fitting function fit to said deviation signals as adjusted;

generating signals representative of the deviation at each specified location from said fitting function signals;

adding to said deviation signals, signals representative of the fractional local effects on detector responses due to changes in rod position from said reference conditions as detected by said rod position indicators and due to any misaligned rods to generate current deviation signals for each specified location; and

multiplying said reference signals by one plus the current

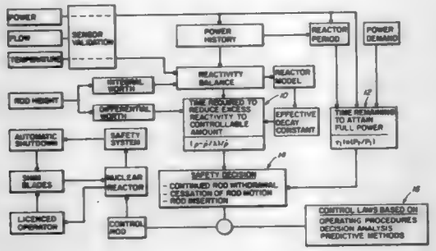
deviation signal for the corresponding specified location to generate current power signals representative of the current local power level at each specified location.

4,637,911

APPARATUS AND METHOD FOR CLOSED-LOOP CONTROL OF REACTOR POWER

John A. Bernard, Jr., Needham Heights, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 24, 1984, Ser. No. 633,939
Int. Cl.[4] G21C *7/36*
U.S. Cl. 376—217 **16 Claims**



1. Apparatus for closed-loop control of reactor power in a nuclear reactor in which power level is altered by adjustments in reactivity balance comprising:

means for adjusting said reactivity balance; and

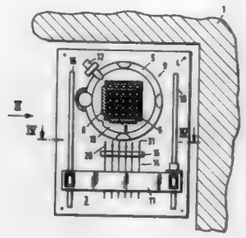
computing apparatus for computing repeatedly at intervals the two functions $[\rho-|\rho|/\lambda_e]/|\rho|$ and $\tau_i \ln(P_f/P_i)$; whereby net reactivity is limited by adjusting said reactivity balance when the two functions become equal.

4,637,912

APPARATUS FOR INSPECTING FUEL ASSEMBLIES, PARTICULARLY FOR DETECTING DEFECTIVE FUEL RODS FROM COMPLETE FUEL ASSEMBLIES OF WATER-COOLED NUCLEAR REACTORS

Rainer Scharpenberg, Waldmichelbach, and Günter Büro, Weinheim, both of Fed. Rep. of Germany, assignors to Brown Boveri Reaktor GmbH, Mannheim, Fed. Rep. of Germany

Filed May 25, 1983, Ser. No. 497,906
Claims priority, application Fed. Rep. of Germany, May 27, 1982, 3219938
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—245 **9 Claims**



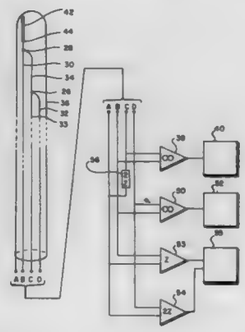
1. Apparatus for inspecting fuel assemblies, comprising a water container, a receptacle disposed in said container for securing bases of fuel assemblies vertically disposed in said container, a beam, a plurality of fingers engaged by said beam, measuring probes supported on said fingers, means disposed in said container at a given position relative to said receptacle for guiding said beam laterally toward said fuel assemblies for inserting said measuring probes in a given direction into spaces between cladding tubes of fuel rods of the fuel assemblies, means for fixing the position of said receptacle and said guiding means relative to each other, said position fixing means being in the form of a common base plate disposed in said container on which said guiding means and said receptacle are fastened, and means for permitting movement of said fingers relative to said given insertion direction after striking an obstacle.

4,637,913

DEVICE FOR MEASURING THE POWER IN A NUCLEAR REACTOR

Jean-Paul Jacquot, Paris, and Patrick Guillery, Saint Germain en Laye, both of France, assignors to Scandpower, Inc., Rockville, Md.

Filed Jul. 5, 1983, Ser. No. 510,591
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—247 **3 Claims**



1. Device for measuring the local power in the core area of a nuclear reactor comprising:

a body which absorbs the gamma radiations placed at this area and a thermocouple with two junctions, one of which is arranged so that it is brought to the temperature of the body and the other of which is at a reference temperature directly connected to the temperature of the coolant of the reactor at this area during stablized operation of the reactor, which junctions are connected to the outside by insulated output conductive wires placed in a metallic sheath which traverses the reactor vessel;

an emitter is connected to one of the wires in the measuring area and that said measuring means are provided to measure the current between said sheath and said emitter, said emitter is made of a vanadium which supplies a collectron current which is a function of the neutron radiation; and

means placed outside the reactor for measuring the total current circulating between at least one of said output conductive wires and said sheath under the action of the neutron and gamma fluxes in the core.

4,637,914

QUICK RELEASE GUIDE SLEEVE ASSEMBLY

David E. Boyle, Kiski, and James R. Chrise, Trafford, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 30, 1984, Ser. No. 574,839
Int. Cl.[4] G21C *7/00*; **F16B** *9/00*
U.S. Cl. 376—353 **8 Claims**

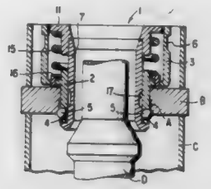
1. A quick release guide sleeve assembly, comprising:

(a) an outer sleeve having an external circumferential surface and a cylindrical enlargement including a radial shoulder;

(b) an inner sleeve axially slidably received in said outer sleeve and having first and second axial positions with respect to said outer sleeve;

(c) locking means movably mounted on said outer sleeve for frictionally engaging wall surfaces defining an opening for receiving the outer sleeve; said locking means having a locking position in which at least part of said locking means projects radially outwardly beyond said external circumferential surface of said outer sleeve; said locking means having a releasing position in which said locking means is in a radially inwardly withdrawn state relative to said circumferential surface of said outer sleeve;

(d) camming means carried on said inner sleeve for pressing



said locking means into said locking position in said first axial position of said inner sleeve and for allowing said locking means to assume said releasing position in said second axial position of said inner sleeve;

(e) spring means for urging said inner sleeve continuously into said first axial position; and

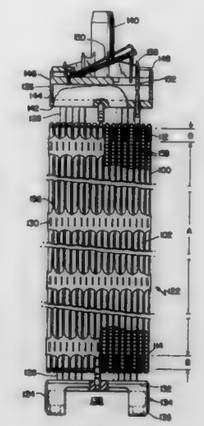
(f) a spring seat ring axially movably positioned adjacent said radial shoulder of said cylindrical enlargement and having portions projecting axially outwardly from said radial shoulder of said cylindrical enlargement in a direction away from said spring means; said spring means being in engagement with, and exerting an axial force, on said spring seat ring.

4,637,915

NUCLEAR REACTOR FUEL ASSEMBLY AND METHOD OF FORMING SAME

Thomas M. Camden, Jr., Washington Township, Fayette County, and Thomas R. Freeman, New Alexandria, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 11, 1984, Ser. No. 609,250
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—435 **11 Claims**



1. A nuclear fuel assembly comprising:

a top nozzle assembly;

a bottom nozzle assemble spaced from said top nozzle assembly

a plurality of guild thimble tubes extending between said top and bottom nozzle assemblies;

a plurality of spacer grid assemblies axially spaced along and attached to said guild thimble tubes;

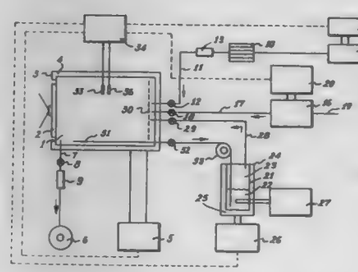
a plurality of fuel rods held in a spaced lateral array between said top and bottom nozzle assemblies by said spacer grid assemblies, each of said fuel rods comprising a fuel zone and a fission gas plenum zone wherein a first group of said fuel rods are disposed in said fuel assembly with said fission gas plenum zone adjacent said top nozzle assembly and a second group of said fuel rods are disposed in said fuel assembly with said fission gas plenums adjacent said bottom nozzle assembly and wherein the fuel zone of said first group of fuel rods is axially shifted with respect to the fuel zone of said second group of fuel rods.

4,637,916

STERILIZATION METHOD EMPLOYING A CIRCULATING GASEOUS STERILANT

Pierre Heunebert, Brussels; Jean Gillard, Tourinnes-La-Grosse, and Michel Roland, Brussels, all of Belgium, assignors to Universite Catholique de Louvain, Ottignies Louvain-la-Neuve and Manufacture Belge de Gembloux S.A., Gembloux, both of, Belgium

Filed Jan. 18, 1984, Ser. No. 571,765
Claims priority, application Belgium, Jan. 28, 1983, 895729
Int. Cl.[4] A01N *27/00*; **A61L** *2/20*
U.S. Cl. 422—36 **6 Claims**



1. A process for sterilizing a material or an article comprising the following steps in combination:

introducing the material or article to be sterilized into a chamber;

evacuating the chamber to a subatmospheric pressure;

admitting steam into the chamber to produce an increase in pressure until a temperature is attained within the chamber which is close to the desired sterilization temperature, while simultaneously maintaining a suction of steam and condensed water out of the chamber;

interrupting the admission of steam;

evacuating the chamber to a reduced pressure until the water which has condensed during the admission of steam has been removed;

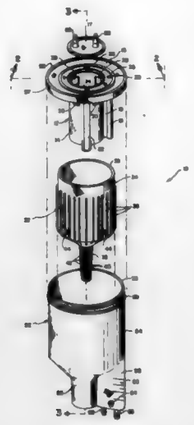
bringing the chamber into communication with a gaseous phase containing formaldehyde to produce a gas mixture comprising the chamber atmosphere and the gaseous phase, said gaseous phase produced by evaporating an aqueous solution of formaldehyde which is kept at a constant temperature equal to the temperature desired for sterilization;

circulating the gas mixture from the chamber to the aqueous solution so that the gas mixture is continuously brought back into contact with the aqueous solution;

after the concentration of formaldehyde in the gas mixture has attained equilibrium with the aqueous solution, introducing a carrier gas into the chamber to increase pressure

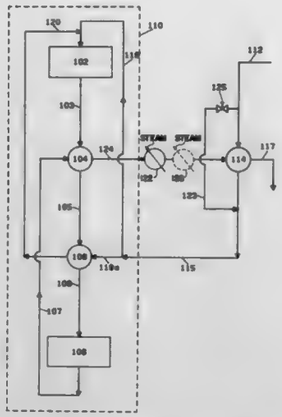
therein until a total pressure at about atmospheric pressure is produced and maintained therein;
exposing the surface of the material or article within the chamber for a time required to produce sterilization under the condition of constant temperature, pressure, formaldehyde concentration and relative humidity by continuing to keep the gas mixture in circulation and continuously bringing it back into contact with the aqueous solution, maintaining the pressure within the chamber at about atmospheric pressure, and maintaining the temperature of the gas mixture at the desired sterilization temperature;
cutting off communication between the aqueous solution and the gas mixture present in the chamber;
removing the formaldehyde present in the chamber by evacuation;
bringing the interior of the chamber back to atmospheric pressure by introduction of said carrier gas; and
withdrawing the material or article.

4,637,917
BUBBLE OXYGENATOR
Charles C. Reed, 5934 Hornwood, Houston, Tex. 77036; Denton A. Cooley, 3014 Del Monte, Houston, Tex. 77019; Terry N. Crane, 2801 Precinct Line Rd., Richmond, Tex. 77469; Edward A. Swanson, 9850 S. Kirkwood, Apt. 2008, Houston, Tex. 77099; Rolf A. Oscarsson, 1550 Winchell Dr., Hudson, Ohio 44236; Vern L. Liebmann, 1460 Meadowbrook Blvd., Stow, Ohio 44224, and Dan L. Cox, 14303 River Forest, Houston, Tex. 77079
Filed Oct. 14, 1983, Ser. No. 541,988
Int. Cl.[4] A61M *1/03*
U.S. Cl. 422—46 **33 Claims**



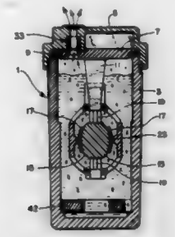
25. An apparatus for oxygenating blood comprising:
a first shell;
a heat exchanger concentrically spaced from said first shell so as to form an annular space between said first shell and said heat exchanger which serves as an oxygenating chamber;
first means for introducing venous blood into said oxygenating chamber;
second means for introducing an oxygen rich gas into said oxygenating chamber;
a second shell concentrically spaced from said first shell so as to form an annular space between said first and second shells which serves as a defoaming chamber, said defoaming chamber being substantially filled with a quantity of essentially porous material treated with a defoaming agent; and
a third shell concentrically spaced from said second shell so as to form an annular spaced between said second and third shells which serves as an arterial blood reservoir, and third shell comprising means for forming an essentially transparent view chamber for visually observing the level of blood in said reservoir, said view chamber having substantially parallel planar sides and having a generally uniform cross-sectional area such that the level of blood in the view chamber and the annular space between the second and third shells arises or falls at a substantially constant rate when blood is added to or withdrawn therefrom, said parallel planar sides being spaced relatively close together in relation to their height and width such that the sides deter the formation of a vortex as blood flows through the third shell.

4,637,918
CATALYTIC GAS SYNTHESIS APPARATUS
Robert M. Osman, Parsippany, and Larry J. Shulik, Morristown, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.
Division of Ser. No. 472,998, Mar. 7, 1983, Pat. No. 4,518,574. This application Jan. 14, 1985, Ser. No. 691,398
Int. Cl.[4] B01J *8/04*
U.S. Cl. 422—148 **14 Claims**



1. In an exothermic catalytic reactor having at least two catalytic beds arranged for sequential gas flow therethrough; gas supply means for introducing a gas feedstream to the first of said catalyst beds for partial reaction of said gas feedstream therein; interbed gas cooling means for cooling the gas effluent from each catalyst bed to remove heat therefrom prior to passing said gas effluent to the next of said sequentially arranged catalyst beds and means for removing a gaseous effluent from the last of such catalyst reactor beds as said gas product, the improvement wherein said reactor additionally comprises (a) reheat exchange means for heating at least a portion of said last catalyst bed effluent gas by indirect heat exchange with a heating fluid comprising at least a portion of the gaseous effluent from at least one other of said reactor beds prior to withdrawal of said product gas from said reactor; and (b) gas quenching means for introducing at least a portion of said gas feedstream as quenching fluid to at least one of (i) said heating fluid after removal of said heating fluid from said reheat exchange means, and (ii) the gaseous effluent from at least one of said catalyst beds other than said last bed or said bed from which said heating fluid is obtained.

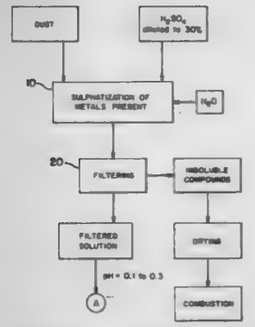
4,637,919
LENS DISINFECTING APPLIANCE WITH IMPROVED VENTING FEATURE
Francis E. Ryder, and Richard Rabeaau, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.
Filed Nov. 5, 1984, Ser. No. 668,293
Int. Cl.[4] A61L *2/18*
U.S. Cl. 422—300 **3 Claims**



1. An appliance for disinfecting contact lenses or the like wherein said lenses are disposed within a disinfecting solution capable of being decomposed to cause a gas to be liberated, said appliance comprising: a container having a body with an open end; a cap assembly closing said container open end; lens holder means for supporting a pair of contact lenses being disposed within said container body; said cap assembly comprising an outer cap member and a disc member assembled in surface-to-surface abutting engagement, aligned openings formed in said outer cap member and said disc member defining a vent passageway for venting liberated gases from said appliance, an inner portion of an opening in said outer cap member and an outer portion of the opening in said disc member, each including a counter bore, which counter bores are adjacent to each other and define a chamber which is intermediate the ends of said vent passageway and bridges between the cap and disc members, a filter assembly disposed in said chamber and bridging between said outer cap and said disc member, said filter assembly including a tubular support member defining an inner bore and formed from a molded plastic material, a filter membrane formed from a gas permeable hydrophobic material supported by said tubular member as an integral component thereof, said membrane being insert molded with said tubular support member and disposed within said inner bore, said tubular support member having an outer diameter sized with respect to the diameter of said chamber, such that said filter assembly is press fitted within said chamber.

4,637,920
PROCESS FOR THE SEPARATION OF METAL COMPOUNDS BY REDUCTION
Adolfo Piuma, Spigno Monferrato, Italy, assignor to VA.NI.M S.r.l, Novara, Italy
Filed May 14, 1985, Ser. No. 734,040
Claims priority, application Italy, Jun. 13, 1984, 12539 A/84
Int. Cl.[4] C01G *31/02*
U.S. Cl. 423—67 **5 Claims**

1. A process for the separation of vanadium and for the production of vanadium pentoxide from material selected from dust, sediment and ashes containing vanadium compounds and originating from the combustion of heavy fuels containing vanadium, in which the material is treated initially with sulfuric acid and then the resultant solution is filtered to separate the insoluble compounds from soluble sulfates comprising:
adding ammonia to the filtered solution until a pH of about 1.0 is reached,
cooling the solution to a temperature of about 25° C.,
passing the solution through a reduction column containing iron scraps to provide vanadium compounds wherein the valence of the vanadium is less than 5, the flow of liquid entering the reduction being adjusted so that the pH of the solution exiting from the bottom of the column is about 1.5 to 2.0, and



adding gaseous ammonia to the solution coming from the reduction column until the pH reaches a value of 5.5 to 6.5 whereby the vanadium precipitates in the form of insoluble compounds.

4,637,921
PROCESS FOR PRODUCING AMMONIUM POLYPHOSPHATE
James E. Sansing, 1709 Eton Ave., Asheboro, N.C. 27203, and Byron M. McCarver, 10821 Landsburg, Baton Rouge, La. 70809
Continuation-in-part of Ser. No. 449,052, Dec. 13, 1982, abandoned. This application Apr. 19, 1985, Ser. No. 726,351
Int. Cl.[4] C01B *15/16, 25/26, 25/16*
U.S. Cl. 423—315 **3 Claims**

1. A process for producing ammonium polyphosphate, comprising in combination: sufficiently evaporating water from feed wet process phosphoric acid solution containing total P_2O_5 at a percentage substantially below about 50% by weight, such that phosphoric acid is obtained having a total P_2O_5 content of about 50% by weight; thereafter settling and removing coagulated-precipitate impurities therefrom; thereafter further evaporating therefrom additional water sufficiently to obtain an ortho-phosphoric acid having a total P_2O_5 content of at-least about 58% by weight of which a predominant proportion thereof is ortho-P_2O_5, thereafter settling and removing coagulated-precipitate impurities therefrom; thereafter mixing said ortho-phosphoric acid with anhydrous ammonin sufficiently to form a mixture, and introducing and treating said mixture in a pipe reactor by way of a feed pipe thereof, said introducing and treating consisting essentially of continuously first-feeding a feed of said mixture into a pipe reactor's evaporation zone while maintaining said evaporation zone at a predetermined temperature within a range of from about 475 degrees Fahrenheit to about 600 degrees Fahrenheit, and simultaneously continuously second-feeding an oppositely directed stream of heated gases consisting essentially of air and gaseous fuel combustion products into contact with said feed within said pipe reactor's evaporation zone at a volume and velocity of said gases at a velocity of from about 0.75 ft./sec. to about 10 ft./sec. such that said feed is entrained in said gas stream as entrained feed within said evaporation zone for a period up to about 5 seconds, said velocity being correlated with rate of said first-feeding, and thereafter continuously passing said entrained feed as a stream through a coalescence zone without cooling said stream more than about 10 degrees below said predetermined temperature sufficiently to produce a product comprising (a) ammonium polyphosphate thereof, of at least about 70% to about 74% of total P_2O_5 by weight of which non-ortho P_2O_5 is between about 71% and 75% by weight, and (b) an emmission of fluoride of low emmission, and continu-

ously removing said ammonium polyphosphate and said emision from said coalescence zone.

4,637,922

METHOD FOR REMOVING ORGANIC MATERIALS FROM A WET PROCESS PHOSPHORIC ACID

Masaki Nakatsai, Tokuyama, and Yoichi Hiraga, Shin-nanyo, both of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Continuation of Ser. No. 456,096, Jan. 6, 1983, abandoned. This application Dec. 30, 1985, Ser. No. 814,298
Claims priority, application Japan, Jan. 18, 1982, 57-4829
Int. Cl.⁴ C01B *25/16*
U.S. Cl. 423—321 R **2 Claims**

1. A method for removing non-coloring organic materials from a wet process phosphoric acid obtained by treating an uncalcined Florida phosphate rock with sulfuric acid, comprising:
(i) contacting wet process phosphoric acid with at least one reducing material selected from the group consisting of chromium, nickel, copper, iron, tin, hypophosphorous acid, its salts and hydrazine; and then
(ii) further contacting said phosphoric acid contacted with a reducing material in step (i), with active carbon in the absence of a solid phase.

4,637,923

SYNTHETIC CRYSTALLINE SILICATE

Rosemarie Szostak, Cumming, Ga., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 27, 1985, Ser. No. 749,239
Int. Cl.⁴ C01B *33/28*
U.S. Cl. 423—328 **11 Claims**

1. A synthetic porous crystalline material having a composition, on an anhydrous basis and in terms of moles of oxides per 100 moles of silica, expressed by the formula

$$(0–5)M_{2/n}O:(0.02–0.2)Al_2O_3:(100)SiO_2$$

wherein M is at least one cation having the valance n, said porous crystalline material being characterized by an X-ray diffraction pattern exhibiting values substantially as set forth in Table 1 of the specification.

4. The crystalline material of claim 3 wherein R is an organic cation derived from a diethylated, linear diquaternary compound having the formula

$$X(CH_3)_2(C_2H_5)N(CH_2)_4N(C_2H_5)(CH_3)_2X$$

wherein X is an anion.

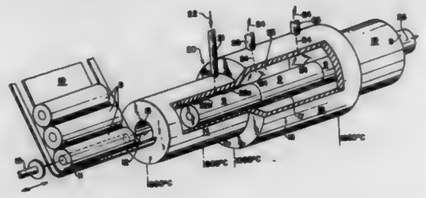
4,637,924

CONTINUOUS SILICON CARBIDE WHISKER PRODUCTION

Ronald L. Beatty, Greer, and Floyd H. Wyman, Mauldin, both of S.C., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 331,331, Dec. 16, 1981, abandoned. This application Dec. 27, 1984, Ser. No. 686,780
Int. Cl.⁴ C01B *31/36*
U.S. Cl. 423—345 **12 Claims**

1. A method of obtaining silicon carbide whiskers on a substantially continuous basis from feed materials comprising carbon and silicon, comprising the steps of:
(a) substantially continuously feeding to a dehydrating zone materials comprising carbon and silicon and producing dehydrated materials which have a water content by weight of less than approximately one percent of the total composition of said materials;
(b) substantially continuously feeding the dehydrated materials formed in step (a) to a conversion zone;
(c) substantially continuously passing said dehydrated materials in an unagitated state through said conversion zone at temperatures of above approximately 1000° C. for a time sufficient for a portion of said materials to react to form silicon carbide whiskers;
(d) substantially continuously purging said conversion zone of gaseous reaction products; and



(e) exhausting said gaseous reaction products directly from said conversion zone before said products deposit on the interior surfaces of said zone or any adjacent processing zones.

4,637,925

ULTRAHIGH STRENGTH CARBON FIBERS

Tohru Hirasatsu, Matsuyama; Yohji Matsuhisa, and Tomitake Higuchi, both of Ehime, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 746,687, Jun. 20, 1985, Pat. No. 4,600,572. This application Apr. 23, 1986, Ser. No. 854,979
Claims priority, application Japan, Jun. 22, 1984, 59-127389; Jun. 22, 1984, 59-127390
Int. Cl.⁴ D01C *5/06*; D01F *9/22*
U.S. Cl. 423—447.4 **5 Claims**



1. A process for producing an ultrahigh strength carbon fiber, which comprises the steps of:
electrochemically oxidizing an acrylic precursor based carbon fiber in an electrolyte solution comprising nitrate ions as the indispensable component and maintained at a temperature of at least 40° C. with an anode being said acrylic precursor based carbon fiber with a quantity of electricity of about 100 to 600 coulomb per gram of said fiber, followed by water washing and drying; heating the electrochemically oxidized carbon fiber in an inert or reductive atmosphere of about 600° to 1,000° C. to remove functional groups from said electrochemically oxidized carbon fiber.

4,637,926

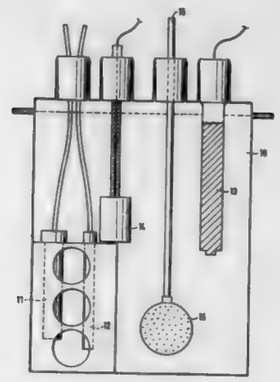
METHOD OF REMOVING HYDROGEN SULPHIDE FROM GASES

Emyr Phillips, Sale, and Brian Holt, Stretford, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

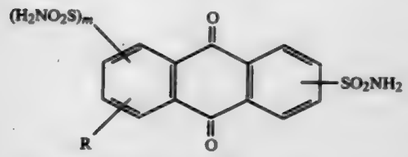
Filed Jul. 24, 1985, Ser. No. 758,013
Claims priority, application United Kingdom, Aug. 1, 1984, 84 19820
Int. Cl.⁴ C01B *17/02*; B01D *53/34*
U.S. Cl. 423—573 R **12 Claims**

1. Process for the absorption of hydrogen sulphide impurity from gases or liquid hydrocarbons comprising:

(a) washing the gas or liquid hydrocarbon containing hydrogen sulphide with an aqueous alkaline solution of



(a1) one or more compounds having the formula:



I

or a water-soluble salt thereof, wherein m is 0 or 1 and R is a hydrogen atom or a methyl or carboxy group, and
(a2) one or more compounds of a metal capable of existing in at least two valency states;
(b) removing sulphur formed by oxidation of hydrogen sulphide; and
(c) re-oxidising the hydroquinone formed from reduction of the compound of formula I.

4,637,927

PROCESS FOR ACCELERATING OF AMORPHIZATION OF INTERMETALLIC COMPOUNDS BY A CHEMICAL REACTION USING LATTICE DEFECTS

Masao Komatsu, Higashi-Osaka, and Hiroshi Fujita, Ibaraki, both of Japan, assignors to Osaka University, Suita, Japan

Filed Mar. 12, 1985, Ser. No. 711,441
Claims priority, application Japan, Sep. 14, 1984, 59-191644
Int. Cl.⁴ C01B *6/24*
U.S. Cl. 423—644 **14 Claims**

1. A process for accelerating the amorphization of intermetallic compounds by a chemical reaction, said process comprising:
a. alloying a mixture consisting essentially of zirconium and aluminum to form intermetallic compounds thereof;
b. treating said intermetallic compounds to provide lattice defects therein; and
c. reacting said treated intermetallic compounds at an elevated temperature in a reaction chamber with a gas including hydrogen gas to produce regions of amorphous hydrides of said treated intermetallic compounds, at least at said lattice defects, said elevated temperature ranging from a temperature effective to cause said chemical reaction to a temperature which does not equal or exceed the temperature at which said regions of amorphous hyrides crystallize.

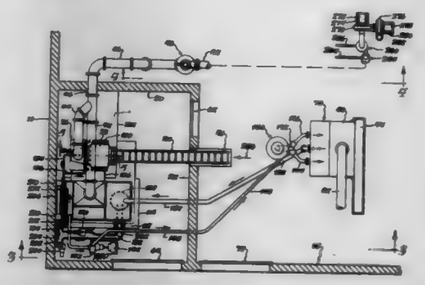
11. Intermetallic compounds having regions of amorphous hydrides thereof prepared by a process for accelerating the amorphization of intermetallic compounds by a chemical reaction, said process comprising:
a. alloying a mixture consisting essentially of zirconium and aluminum to form intermetallic compounds thereof;
b. treating said intermetallic compounds to provide lattice defects therein; and
c. reacting said treated intermetallic compounds at an elevated temperature in a reaction chamber with a gas including hydrogen gas to produce regions of amorphous hydrides of said treated intermetallic compounds at least at said lattice defects, said elevated temperature ranging from a temperature effective to cause said chemical reaction to a temperature which does not equal or exceed the temperature at which said regions of amorphous hydrides crystallize.

4,637,928

METHOD AND APPARATUS FOR NEUTRALIZING REACTIVE MATERIAL SUCH AS BATTERIES

William V. Zajac, Jr.; Henry G. Kautz, both of Clarence; David J. Kautz, Williamsville; Arthur J. Bossert, Clarence, and Sidney Cohen, Grand Island, all of N.Y., assignors to Great-batch Enterprises, Inc., Clarence, N.Y.

Filed Aug. 6, 1982, Ser. No. 406,033
Int. Cl.⁴ H01M *6/50, 10/42*; C01D *15/00*; C01G *21/00*
U.S. Cl. 423—659 **4 Claims**



1. A method for treating high energy density lithium batteries in a manner permitting safe disposal thereof, each of said batteries comprising a casing having reactive material therein, comprising:
(a) introducing said batteries to a hammermill to open the battery casings to allow access to the interiors thereof;
(b) simultaneously deluging said hammermill with an alkaline neutralizing liquid to introduce said liquid to the interiors of said opened casings to neutralize the reactive material in said casings, the blades of said hammermill increasing the velocity of said liquid flowing therethrough;
(c) collecting said liquid and opened casings exiting from said hammermill in a container holding a static quantity of said liquid;
(d) removing gas evolved during opening of said casings and neutralizing of said reactive material and cleaning the gas by scrubbing to remove any particulate contaminants therein;
(e) cooling the liquid in said container; and
(f) filtering the liquid in the container to remove particulate matter larger than a predetermined size.

4,637,929

FERRIOXAMINE-PARAMAGNETIC CONTRAST AGENTS FOR MR IMAGING, COMPOSITION, APPARATUS AND USE

Steven C. Quay, Menlo Park, Calif., assignor to Salutar, Inc., Sunnyvale, Calif.

Filed Jan. 4, 1985, Ser. No. 688,733
Int. Cl.⁴ A61K *49/00*; A61B *5/05, 6/00*
U.S. Cl. 424—9 **24 Claims**

1. A chemically stable physiologically tolerable contrast

agent in a solid state form, for use in vivo solution during diagnostic magnetic resonance (MR) imaging, to enhance the MR image of the region of interest of a subject within the magnetic field of the MR system, comprising:

a composition of matter contrast agent having the form:

A-FOM,

where:

FOM is at least one member of the Ferrioxamine family of chelates selected from the group consisting of A, B, C, D1, D2, E, and F, which has a paramagnetic atom of ionized Fe for locally affecting the magnetic field of the MR system securely chelated therein at a plurality of coordination points to chemically isolate the Fe ion from the in vivo environment;

and

A is an amide group of the form having the chemical form:

A=—NHCO—(CH2)(n—1)—CH3,

for functionally cooperating with the in vivo environment, wherein "n" is an integer indicating the number of Carbon atoms in the Carbon-Hydrogen portion of the amide group A; whereby the contrast agent causes a reduction in the T1 relaxation time near the region of interest within the subject.

4,637,930

TRANSDERMAL FORMULATION OF NICARDIPINE HYDROCHLORIDE

Yutaka Konno; Hiroitsu Kawata; Masayoshi Aruga; Takashi Sonobe, all of Saitama, and Mitsuo Mitomi, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co, Ltd., Tokyo, Japan

Filed Jan. 31, 1985, Ser. No. 696,698

Claims priority, application Japan, Feb. 8, 1984, 59-21404; May 17, 1984, 59-99371; Jul. 26, 1984, 59-156288

Int. Cl.[4] A61F *13/00;* **A61K** *9/70;* **A61L** *15/00*

U.S. Cl. 424—28 **12 Claims**

1. A transdermal formulation containing 1 to 20 weight percent of a nicardipine hydrochloride and wherein said nicardipine hydrochloride is dissolved or suspended in a mixed liquid comprised of, based on the weight of said formulation:

(1) 0.3 to 30 weight percent of a urea, and

(2) at least one member selected from the group consisting of (a) 0.5 to 15 weight percent of propylene glycol, (b) 0.3 to 30 weight percent of thioglycol, (c) 0.3 to 30 weight percent of a monohydric alcohol having from 2 to 4 carbon atoms, (d) 0.3 to 10 weight percent of lactic acid, (e) 0.5 to 20 weight percent of mono- or di-esters of glycerol and fatty acids having 6 to 12 carbon atoms, and (f) 0.5 to 20 weight percent of mono- or di-esters of sorbitol and fatty acids having 6 to 12 carbon atoms, and said formulation containing a pharmaceutically acceptable carrier.

4,637,931

POLYACTIC-POLYGLYCOLIC ACID COPOLYMER COMBINED WITH DECALCIFIED FREEZE-DRIED BONE FOR USE AS A BONE REPAIR MATERIAL

John P. Schmitz, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 9, 1984, Ser. No. 658,945

Int. Cl.[4] A61K *31/74, 35/32*

U.S. Cl. 424—78 **19 Claims**

1. A method for promoting the healing of osseous tissue which comprises implanting at the site of the broken osseous tissue a therapeutically-effective amount of a composition comprising decalcified freeze-dried bone incorporated into a biodegradable polymeric matrix comprised of a copolymer of poly(L)(—)lactide co-glycolide.

11. A pharmaceutical composition useful in promoting the healing of broken osseous tissue comprising decalcified freeze-dried bone incorporated into a biodegradable polymeric matrix comprised of a copolymer of poly(L)(—)lactide co-glycolide.

4,637,932

PROCESS FOR PRODUCING A CONCENTRATE ENRICHED IN COAGULATION FACTORS VII AND VIIA

Nazreen Pancham, San Francisco, Calif., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 15, 1984, Ser. No. 660,762

Int. Cl.[4] A61K *35/16*

U.S. Cl. 424—101 **13 Claims**

1. An improved process for producing a concentrate consisting essentially of blood coagulation factors VII and VIIa and having a specific activity in the range of about 500 to 3000 u/A_{280} consisting essentially of the steps of:

(a) providing an aqueous solution of plasma proteins containing factors VII and VIIa;

(b) contacting the aqueous solution from step (a), adjusted to a pH of about 6 to 8, with an adsorbent having selective affinity for calcium-binding proteins, including factor VII, selected from the group of water-insoluble divalent metal salts, to adsorb calcium-binding proteins;

(c) selectively eluting, by techniques selected from step and gradient elution techniques, factors VII and VIIa from the protein-bound adsorbent from step (b) by the addition of a buffer solution containing suitable soluble salts effective to displace the bound proteins and collecting the eluate pool;

(d) contacting the eluate pool from step (c), adjusted to a pH of about 3 to 11, with an anionic exchange resin having affinity for the calcium-binding proteins, including factors VII and VIIa, and adsorbing thereon the calcium-binding proteins; and

(e) selectively eluting, by techniques selected from step and gradient elution techniques, factors VII and VIIa from the protein-bound adsorbent from step (d) by the addition of a buffer solution containing suitable salts in increasing ionic strength;

wherein the improvement comprises using as the starting aqueous solution containing coagulation factors VII and VIIa in step (a) an aqueous wash eluate, containing about 0.1–0.45M of at least one of ammonium bicarbonate, sodium bicarbonate and sodium chloride and containing 0.05–0.2M of citrate ions, said aqueous solution obtained by (i) contacting a Cohn Effluent I plasma fraction containing coagulation factors II, VII, IX and X with an anion exchange resin and (ii) washing the anion exchange resin having adsorbed thereto plasma proteins contained in said plasma fraction to remove those plasma proteins that are less strongly bound to the anion exchange resin so as to be removeable by contacting the anion exchange resin having adsorbed thereto said plasma proteins with a wash solution containing 0.1–0.45M of at least one of ammonium bicarbonate, sodium bicarbonate and sodium chloride.

4,637,933

COMPOSITION FOR CLEANING THE SKIN

Arlette Zabotto neé Arribas, Paris; Jean-Claude Contamin, Chilly Mazarin; Christian Zaffran, Elancourt, and Constantin Koulbanis, Paris, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 169,767, Jul. 17, 1980, abandoned, which is a continuation of Ser. No. 1,008, Jan. 4, 1979, abandoned. This application Jan. 18, 1985, Ser. No. 692,625

Claims priority, application Luxembourg, Jan. 6, 1978, 78831

Int. Cl.[4] A61K *33/24, 33/26*

U.S. Cl. 424—131 **4 Claims**

1. A cosmetic composition for cleansing the skin, in the form of an oil-in-water emulsion, consisting essentially of 5–30 percent by weight, based on the total weight of the composition, of an oil phase; 30 to 90 percent by weight, based on the total weight of the composition, of a water phase; 1 to 20 percent by weight, based on the total weight of the composition, of an emulsifying agent; and 1 to 30 percent by weight, based on the total weight of the composition, of a mineral phase; said mineral phase being a clay of the kaolinite type in the form of particles having a particle size of less than 60 microns wherein less than 15 percent by weight of said particles have a size which is greater than 2 microns, said clay having a quartz content of less than 20 percent, a kaolinite content greater than 50 percent and a thixotropy less than or equal to 6.

4,637,934

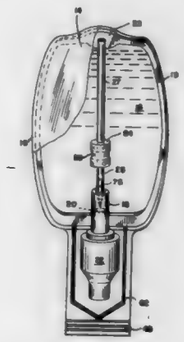
LIQUID CONTAINER WITH INTEGRAL OPENING APPARATUS

Leonard A. White, Gurnee, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 12, 1984, Ser. No. 599,426

Int. Cl.[4] A61J *9/00, 11/00;* **B65D** *27/32*

U.S. Cl. 426—117 **18 Claims**



1. A container for containing a fluid comprising:

at least one flexible wall defining an internal liquid compartment containing a quantity of liquid;

the flexible wall having a conduit extending therethrough the conduit having an inlet opening extending inside the container and an outlet opening which extends beyond the container;

the conduit having penetrable means located therein for closing the conduit; and

rigid means for penetrating the penetrable means, said rigid means being secured to and located inside the container and aligned to penetrate said penetrable means upon movement of said rigid means and said penetrable means together, said rigid means including a conduit for allowing fluid from inside the container to flow into said conduit in said flexible wall and out a dispensing means secured to the outlet opening.

4,637,935

PROCESS FOR MAKING A REDUCED DENSITY ROAST AND GROUND COFFEE

Steven J. Kirkpatrick; Steven A. Zoller, both of Cincinnati, Ohio, and Daniel L. Woods, Winter Haven, Fla., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 31, 1985, Ser. No. 793,592

Int. Cl.[4] A23F *5/08*

U.S. Cl. 426—443 **3 Claims**

1. A process for making a reduced density roast and ground coffee product comprising the steps of:

(a) cracking roasted coffee beans to a size such that about 40% to about 80% are retained on a 6-mesh screen; then

(b) normalizing the cracked beans; and then

(c) grinding the cracked and normalized beans;

the coffee product produced having a density between about 0.24 g/cc and about 0.41 g/cc.

4,637,936

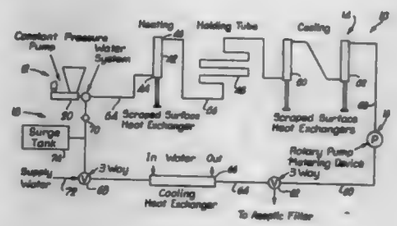
ASPETIC FOOD PROCESSING APPARATUS AND METHOD

James E. White, Overland Park, Kans.; Lewis F. Alley, Kansas City, Mo.; James E. Anderson, Shawnee Mission, Kans., and Jackie D. Birdsell, Kansas City, Mo., assignors to Marlen Research Corporation, Overland Park, Kans.

Filed Aug. 10, 1984, Ser. No. 639,955

Int. Cl.[4] A23L *3/18;* **F25B** *29/00*

U.S. Cl. 426—523 **17 Claims**



11. A method of continuously and aseptically processing and cooking a pumpable food product, comprising the steps of:

passing said product through constant pressure pump means for generating a substantially constant pressure stream of said product notwithstanding variations in processing conditions downstream of said pump means which would induce pressure variations in said stream;

heating said continuous, pressurized stream of product to a desired processing temperature;

holding said heated and pressurized stream in a holding zone for a period of time to assure aseptic cooking thereof; and

passing said cooked stream through metering means to meter the flow of said stream and create a substantially constant flow rate of the aseptically cooked product downstream of the holding zone.

4,637,937

PROCESS FOR MAKING CREAMY BACTERIA-FREE FOAMABLE OIL-IN-WATER EMULSION INCLUDING CHOCOLATE

Kimio Terada; Michio Mori; Yoichi Goto; Takashi Nakazawa; Kunio Muto, and Shozo Usami, all of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1984, Ser. No. 633,242

Int. Cl.[4] A23D *5/02;* **A23G** *1/00*

U.S. Cl. 426—570 **19 Claims**

1. A process for making a creamy, bacteria-free, foamable oil-in-water chocolate emulsion comprising:

(a) emulsifying an aqueous phase containing a hydrophilic emulsifier and 3–30 wt. % of a chocolate component based on the weight of the emulsion with an oil phase containing a lipophilic emulsifier and 15–35 wt. % of oil based on the weight of the emulsion, wherein the total of all solid components in the resulting emulsion is from 40 to 60 wt. %;

(b) homogenizing said resulting emulsion by high pressure homogenization at a pressure of about 50–100 Kg/cm^2 and

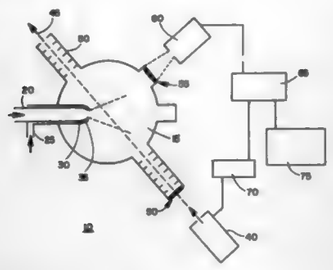
(c) sterilizing said homogenized resulting emulsion by heating at ultra-high temperature.

4,637,938

METHODS OF USING SELECTIVE OPTICAL EXCITATION IN DEPOSITION PROCESSES AND THE DETECTION OF NEW COMPOSITIONS

Henry Lee, Somerville; John P. deNeufville, Mendham, both of N.J., and Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Aug. 19, 1983, Ser. No. 524,923
Int. Cl.[4] B05D *3/06, 5/12*
U.S. Cl. 427—53.1 24 Claims



10. A method of depositing a semiconductor material on a substrate comprising the steps of:

generating a deposition reaction having a species which is a product of a chemical flow reaction using either a diffusion flame or plasma, said deposition reaction in operative contact with a substrate so that the product of said deposition reaction is a body of material deposited on said substrate;

perturbing said deposition reaction in situ by exciting an effective concentration of said species to an electronically excited state so that the deposited semiconductor material is modified, said species being a precursor to the deposited semiconductor film; and

depositing said material on said substrate.

12. A method as defined in claim 10, wherein said excitation is laser induced.

4,637,939

OPTICAL ADHESIVE COMPOSITION

Tooru Marano, Hino; Kouzaburou Nakamura, Tokyo, and Shigekuni Sasaki, Iruma, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Division of Ser. No. 647,637, Sep. 6, 1984, Pat. No. 4,591,627.
This application Feb. 7, 1986, Ser. No. 827,059
Claims priority, application Japan, Sep. 9, 1983, 58-165268; Nov. 21, 1983, 58-217794; Nov. 29, 1983, 58-223087; Jun. 15, 1984, 59-121914; Jun. 15, 1984, 59-121915; Aug. 9, 1984, 59-167232
Int. Cl.[4] B05D *5/06*
U.S. Cl. 427—162 1 Claim

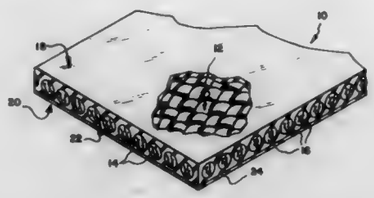
1. A process for the production of optical members, comprising the steps of: preparing a mixture of a composition essentially containing a diglycidyl ether selected from the group consisting of diglycidyl ether of bisphenol-AF and diglycidyl ether of 2,2,3,3,4,4,5,5,6,6,7,7-dodecafluorooctane-1,8-diol; a reactive diluent selected from the group consisting of butyl glycidyl ether, phenyl glycidyl ether, allyl glycidyl ether, glycidyl ether of butane-diol and diglycidyl ether of 2,2,3,3,4,4,5,5,6,6,7,7-dodecafluorooctane-1,8-diol and 4[perfluoro-1,3-dimethyl-2-(1-methylethyl)-1-butenyl-]-oxyphthalic anhydride acting as a hardener; defoaming said mixture; coating the defoamed mixture on an optical member; and then heating said member and said mixture coated thereon to harden said mixture.

4,637,940

ELASTOMER-COATED BIAS REINFORCEMENT FABRIC AND METHOD FOR PRODUCING SAME

Delmar D. Long, Rock Hill, S.C., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 652,394, Sep. 20, 1984, Pat. No. 4,565,715, which is a division of Ser. No. 533,098, May 16, 1983, Pat. No. 4,490,428, which is a continuation-in-part of Ser. No. 350,969, Feb. 22, 1982, Pat. No. 4,501,771. This application Oct. 15, 1985, Ser. No. 787,830
The portion of the term of this patent subsequent to Apr. 25, 2001, has been disclaimed.
Int. Cl.[4] B05D *3/12*
U.S. Cl. 427—176 1 Claim



1. In a method for manufacturing elastomer-coated, bias fabric comprising:

a. transversely stretching a bias fabric having opposed surfaces, yarns, or fiber bundles, and interstices between said yarns or fiber bundles,

b. applying an elastomeric latex composition to both surfaces of said fabric while said fabric is maintained transversely stretched, such that said composition substantially penetrates the interstices of said fabric and provides an elastomeric coating of substantially uniform thickness, and

c. drying said coated latex composition, the improvement which comprises:

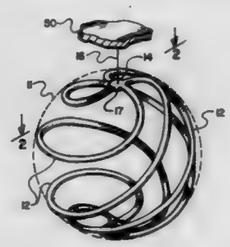
prior to stretching said bias fabric, pre-impregnating said bias fabric with a liquid non-elastomeric composition which facilitates the impregnation of said fabric by an elastomer but does not stabilize the orientation of said yarns or bundles in said fabric, said liquid non-elastomeric composition comprising water and an impregnation facilitating agent disposed in said water.

4,637,941

SEGMENTED GEOMETRIC STRUCTURE

Randall S. Rochte, 5925 Finecrest Dr., Rancho Palos Verdes, Calif. 90274

Filed Jan. 22, 1985, Ser. No. 693,104
Int. Cl.[4] A63H *33/40;* B44C *3/08;* G09F *21/00*
U.S. Cl. 428—8 15 Claims



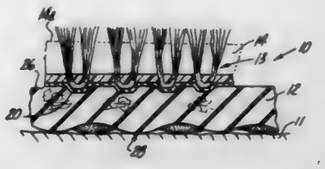
1. A segmented geometric structure comprising a plurality of spirally formed curvilinear segments where the top and bottom end of each said segment is respectively joined to form a single structure where said structure has a vertical axis projecting from the top joint or north pole junction and the bottom joint or south pole junction.

4,637,942

SYNTHETIC GRASS PLAYING FIELD SURFACE

Seymour A. Tomarin, St. Catharines, Canada, assignor to Tecsyn Canada Limited, St. Catharines, Canada

Filed Sep. 23, 1985, Ser. No. 779,322
Int. Cl.[4] A01N *3/00*
U.S. Cl. 428—17 13 Claims



1. A game playing surface, particularly for active running and body contact sports, such as football and the like, formed of a synthetic pile carpet positioned upon a stabilized, substantially flat base surface, comprising:

a relatively thick underpad laid upon the base surface, with said underpad formed of small size, irregularly shaped, closely packed resilient particles which are bonded together into a resilient, relatively dense mass;

the underpad having a substantially flat, rough upper surface and a lower surface with relatively large, relief-type, indentations that are widely and regularly spaced apart to form rounded substantially domed cavities whose open bottoms are covered by the overlapping portions of the base surface;

a pile carpet laid over the upper surface of the underpad and formed of substantially equal length, upwardly extending, relatively densely packed synthetic fibers fastened at their lower ends to a carpet base sheet so that the fibers provide a generally grassy appearance;

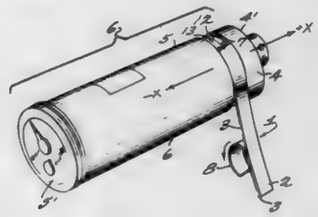
whereby the playing surface provides good foot support for lateral foot movements and resiliently absorbs and disperses foot and body impact forces.

4,637,943

SEALED SPLIT INSTRUMENT HOUSING WITH FOIL-BACKED ACRYLIC TRANSFER ADHESIVE TEARBAND

George D. Bennett, Shelburne, Vt., assignor to Simmonds Precision, New York, N.Y.

Filed Sep. 17, 1984, Ser. No. 651,471
Int. Cl.[4] B60R *13/06;* C09J *7/02*
U.S. Cl. 428—35 16 Claims



1. A hermetically sealed and structurally joined split aircraft instrument housing assembly made of at least two parts having abutting edges, said assembly comprising:

two adjacent chamber subassemblies forming an abutting joint of their edges;

a metallic foil strip of predetermined thickness; and

an acrylic transfer adhesive strip of predetermined thickness adhesively affixed to one side of said metallic foil strip thereby forming a tearband;

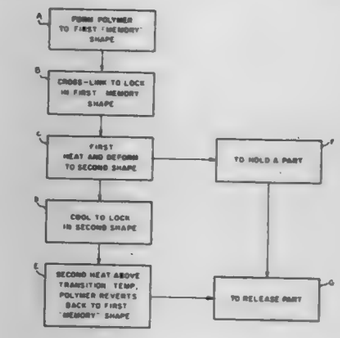
said tearband being adhesively attached, through said acrylic transfer adhesive, to each of said subassemblies about said abutting joint whereby said split housing assembly is assembled and substantially hermetically sealed and structurally joined.

4,637,944

PROCESS AND DEVICE FOR TEMPORARILY HOLDING AND RELEASING OBJECTS

George E. Walker, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 19, 1985, Ser. No. 713,477
Int. Cl.[4] B29C *61/00*
U.S. Cl. 428—35 33 Claims



1. A process for a first part to temporarily hold and release a second part comprising the steps of:

forming a cross-linkable polymeric first part to a first memory shape;

cross-linking said polymeric first part to lock in said first memory shape;

heating said first memory shaped polymeric first part to a temperature above its transition temperature;

deforming said heated memory shaped polymeric first part to a second deformed shape so as to hold onto and surround at least a portion of a second part;

cooling said deformed second shaped first part to temporarily hold and surround the second part; and

heating said deformed second shaped first part above its transition temperature wherein said first part will revert from its deformed second shape to its first memory shape and wherein the held and surrounded second part will be released from said first part whereby said first part and said second part will be totally separated and independent from each other.

4,637,945

ANTI-STATIC JACKET FOR FLOPPY DISK

Takeshi Masui, Konosu, and Morio Sano, Tokyo, both of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1985, Ser. No. 733,283
Claims priority, application Japan, Jul. 23, 1984, 59-111347[U]
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—35 27 Claims

1. A jacket for floppy disk comprising an exterior layer of a material which is antistatic and is selected from the group consisting of a styrene base resin layer externally coated with an antistatic agent and a styrene base resin in admixture with at least one of antistatic agents, conductive carbons and conductive metals, and an interior non-woven cloth layer laminated

internally of said exterior layer, said styrene base resin being selected from the group consisting of high impact strength styrene resins, mixtures of a styrene resin for general uses mixed with at least 20 wt% of a high impact strength styrene resin, acrylonitrile/styrene/butadiene copolymers, methacrylonitrile/styrene/butadiene copolymers, styrene/butadiene block copolymers, acrylonitrile/acrylic rubber/styrene copolymers, acrylonitrile/ethylenepropylene rubber/styrene copolymers; acrylonitrile/chlorosulfonated ethylene/styrene copolymers, acrylonitrile/α-methyl-styrene/butadiene copolymers, nd blends thereof.

4,637,946

ROAD REPAIR MEMBRANE

Hasmukh G. Shah, and Dwight S. Musgrave, both of Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 18, 1985, Ser. No. 799,220
Int. Cl.⁴ B32B *3/26;* **C08L** *95/00;* **E01C** *3/06, 11/2*
U.S. Cl. 428—63 **4 Claims**

1. A membrane for installation upon an old cracked road surface to retard reflective cracking into a later-applied asphalt concrete overlay superimposed on the membrane, said membrane consisting essentially of a glass fiber mat having applied thereto, a binder consisting essentially of a blend of about 40–85% by weight unblown asphalt, about 6–15% by weight elastomer, and about 0–55% by weight mineral filler, the elastomer being a block copolymer having at least two monoalkenyl arene polymer end blocks and at least one elastomeric conjugated diene polymer midblock, and the maximum simulated traffic and thermal moduli of the binder do not exceed the following values:

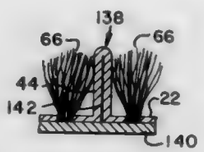
Temp.	Simulated Traffic Modulator at 2-Inch/Min.
0° F.	60,000
−10° F.	120,000
−20° F.	175,000
	Thermal Modulus at 6° F. Reduction/Hour
0° F.	6,000
−10° F.	10,000
−20° F.	20,000
−25° F.	25,000

4,637,948

TUFTED WEATHERSTRIPPING WITH BARRIER FIN

Robert D. Evans, 44 Tubbs Springs Dr., Weston, Conn. 06883, and Robert C. Blenard, 29 Homestead St., North Smithfield, R.I. 02895

Filed Aug. 14, 1984, Ser. No. 640,666
Int. Cl.⁴ D04H *11/00*
U.S. Cl. 428—89 **20 Claims**



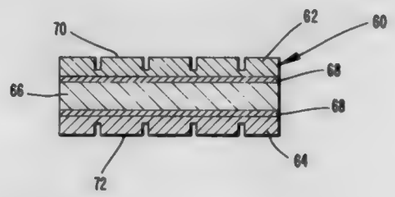
20. Weatherstripping comprising:
a strip of substrate having a barrier fin extending therefrom;
a resilient row of pile attached to the substrate and extending along each side of said barrier fin;
said barrier fin comprising sheet material folded upon itself and enveloping a core spaced from and extending parallel to said substrate, said core creating an enlargement along said barrier fin spaced from said substrate; and
each said row of pile being shorter in height than said barrier fin and engaging under said enlargement to resiliently support said enlargement in position.

4,637,949

SCRIM REINFORCED, FLAT CLOTH-LIKE COMPOSITE LAMINATE AND A METHOD OF MAKING

James H. Manning, and Wayne P. Sorenson, both of Appleton, Wis., assignors to James River Corporation, Richmond, Va.

Continuation of Ser. No. 627,631, Jul. 3, 1984, abandoned. This application Apr. 8, 1985, Ser. No. 720,806
Int. Cl.⁴ B32B *5/12*
U.S. Cl. 428—110 **29 Claims**



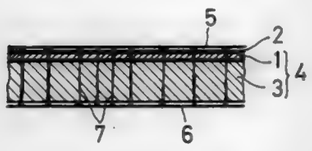
1. A method of making a flat cloth-like composite laminate comprising the steps of:
(a) inserting a scrim coated with a thermoplastic binder between two nonwoven layers, each of the nonwoven layers being formed of three-dimensional cellulosic fibers bound with a latex adhesive;
(b) heating the scrim and the two nonwoven layers to a temperature sufficient to activate the thermoplastic binder while maintaining equal tension on the scrim and the two nonwoven layers; and
(c) pressing the scrim and the two nonwoven layers together to form a flat cloth-like composite laminate having substantially all of each nonwoven layer of cellulosic fibers adhered to opposite sides of the scrim, the surface of each nonwoven layer being planar and interrupted by the scrim.

4,637,947

HEAT INSULATION MATERIAL

Taijiro Maekawa, and Yukio Fujino, both of Tokyo, Japan, assignors to Asmin Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1984, Ser. No. 640,642
Int. Cl.⁴ A41D *13/00, 27/02;* **A47G** *9/00;* **B32B** *15/14*
U.S. Cl. 428—68 **11 Claims**



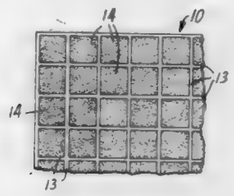
1. A permeable heat insulating material comprising a supporting material composed of fibrous material, a reflecting layer made of metal or non-metal formed on a surface of the supporting material, and a heat insulating fibrous layer laminated on another surface of of the supporting material; the heat insulating material being laminated so that the reflecting layer is placed outwardly, the supporting material is integrally fixed to the heat insulating layer, and the reflecting layer is formed on the surfaces of fibers or yarns of the fibrous sheet material composing the supporting material prior to lamination of the heat insulating layer thereto.

4,637,950

DELAMINATION-RESISTANT CELLULAR RETROREFLECTIVE SHEETING

David L. Bergeson, Mendota Heights; Lee A. Pavelka, Cottage Grove, and Barbara A. Mielke, Inver Grove Heights, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 1, 1985, Ser. No. 729,369
Int. Cl.⁴ B32B *3/28;* **G02B** *5/122*
U.S. Cl. 428—168 **23 Claims**



1. Retroreflective sheeting comprising (1) a base sheet having a layer of retroreflective elements disposed over one of its surfaces; (2) a polymeric cover film disposed in spaced relation from the layer of retroreflective elements; and (3) a network of narrow intersecting bonds extending between said cover film and base sheet to adhere the cover film and base sheet together and form a plurality of cells within which retroreflective elements are hermetically sealed; characterized in that the cover film comprises a continuous polymeric phase and a discontinuous polymeric phase, the film being biaxially oriented such that the discontinuous polymeric phase is in the form of minute disks distributed uniformly throughout the film.

4,637,951

FIBROUS MAT FACER WITH IMPROVED STRIKE-THROUGH RESISTANCE

Frederick A. Gill, and Mario P. Tocci, both of Littleton, Colo., assignors to Manville Sales Corporation, Denver, Colo.

Filed Dec. 24, 1984, Ser. No. 685,699
Int. Cl.⁴ B32B *5/24, 17/10;* **D04H** *3/12*
U.S. Cl. 428—215 **13 Claims**

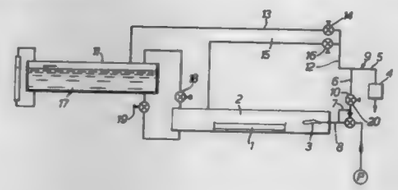
1. A porous, non-woven fabric mat for use as a facer, substrate, or carrier for receiving a curable substance while in the fluid state, said mat comprising a blend of dispersed, substantially randomly oriented fibers and a binder for holding said blend of fibers together;
said blend of fibers comprising microfibers intermixed with base fibers said microfibers comprising between two percent (2%) and about forty percent (40%) of the total weight of said blend, said base fibers having a mean diameter of between about eight (8) microns and about twenty-five (25) microns;
said binder comprising a water miscible combination of a heat settable binder resin and an effective amount of a wet proofing polymer resin compatible with said heat settable binder resin, said wet proofing polymer being selected from a group consisting of a water based silicone elastomer and a fluorchemical emulsion.

4,637,952

METHOD FOR IMPREGNATING WOOD, AND AN APPARATUS FOR CARRYING OUT THE METHOD

Terje Rosenlund, Båtstangveien 12, N-3200 Sandefjord, Norway

PCT No. PCT/NO85/00007, § 371 Date Oct. 2, 1985, § 102(e) Date Oct. 2, 1985, PCT Pub. No. WO85/03474, PCT Pub. Date Aug. 15, 1985
PCT Filed Feb. 1, 1985, Ser. No. 789,970
Claims priority, application Norway, Feb. 2, 1984, 840397; Sep. 14, 1984, 843660
Int. Cl.⁴ B05C *3/00;* **B05D** *1/18, 3/00;* **C23C** *14/00*
U.S. Cl. 427—297 **11 Claims**



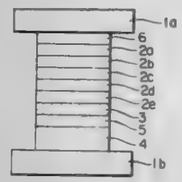
1. A method for impregnating wood by means of an impregnating liquid, comprising placing wood in an airtight, pressure resistant impregnation tank from which air is completely or almost completely evacuated, and subjecting impregnating liquid, following its introduction into the tank, to pressure, wherein the impregnating liquid is completely or almost completely de-aerated of its gas or air content before it is compressed in the impregnation tank, and wherein impregnation occurs under completely airtight conditions so that the impregnating liquid is completely or almost completely devoid of gas and air during impregnation when the liquid is penetrating into the wood, and gas or air has no opportunity to penetrate into the wood between the evacuation of the tank and impregnation of the wood.

4,637,953

MAGNETOOPTICAL RECORDING MEDIUM WITH LAMINATED ANTI-REFLECTION FILM

Mitsuharu Sawamura, Yokohama, and Susumo Ito, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1984, Ser. No. 614,761
Claims priority, application Japan, Jun. 7, 1983, 58-100247
Int. Cl.⁴ G11B *7/24*
U.S. Cl. 428—333 **4 Claims**



1. A magnetooptical recording medium comprising:
(a) a light transmissive substrate formed of a material selected from the group consisting of plastic and glass;
(b) a multilayer film disposed on said light-transmissive substrate, said multilayer film having an odd number of layers of at least 3 in number and being formed by alternate lamination of a high-refractive film which is a binary vapor-deposited film comprising a mixture of Ta_2O_5 and ZrO_2, and a low-refractive film containing SiO_2 as the main constitutent and the film in contact with said light-tramissive substrate being a high refractive film, wherein each of the layers of said multilayer film has an optical thickness of $\lambda/4$, where λ is a wave length of recording and readout light; and

(c) a recording magnetic layer disposed on said multilayer film wherein recording on said magnetic film is performed by a light beam traversing said substrate and said multilayer.

3. A magnetooptical recording medium compriaing:

(a) a light transmissive substrate formed of a material selected from the group consisting of plastic and glass;

(b) a multilayer film disposed on said light-transmissive substrate, said multilayer film having an odd number of layers of at least 3 in number and being formed by alternate lamination of a high-refractive film which is a binary vapor-deposited film comprising a mixture of Nb_2O_5 and ZrO_2, and a low-refractive film contaiing SiO_2 as the main constituent and film in contact with said light-transmissive substrate being a high refractive film, wherein each of the layers of said multilayer film has an optical thickness of $\lambda/4$, where λ is a wave length of recording and readoug light; and

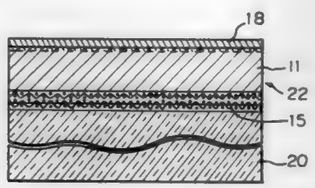
(c) a recording magnetic layer disposed on said multilayer film wherein recording on said magnetic film is performed by a light beam traversing said substrate and said multilayer.

4,637,954

RESIN-TREATED WOODY MATERIAL

Hisayoshi Ohsumi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Aug. 7, 1985, Ser. No. 763,470
Claims priority, application Japan, Aug. 8, 1984, 59-166017; Oct. 30, 1984, 59-228370
Int. Cl.[4] B32B *21/04*
U.S. Cl. 428—342 1 Claim



1. Resin-treated woody material comprising

a crude board of a thickness in a range from 0.1 to 0.6 mm and made of natural wood,

colorant applied to one face of said crude board,

a thermo-setting powdered resin applied to said one face of said crude board over said colorant at an amount from 10 to 300 g/m^2, and

a backing applied to the other face of said crude board at an amount from 10 to 200 g/m^2.

4,637,955

WIRE INSULATED WITH A FLUOROCARBON POLYMER COMPOSITION

Frank J. Glainter, Ipswich, Mass., assignor to High Voltage Engineering Corporation, Burlington, Mass.

Division of Ser. No. 549,500, Nov. 7, 1983, abandoned. This application Oct. 26, 1984, Ser. No. 665,373
Int. Cl.[4] B32B *15/00*
U.S. Cl. 428—379 1 Claim

1. A wire product comprising an electrical conductor and an extruded insulation coating thereon, the coating comprising an irradiation crosslinked composition having a melting point of at least 240° C. prior to irradiation and having been extruded about the conductor and thereafter crosslinked by radiation at a dose level of up to about 40 megarads or more; said composition comprising an ethylene-tetrafluoroethylene copolymer and about 1% wt. to about 50% wt. of polyvinylidene fluoride.

4,637,956

SIZED GLASS FIBERS AND REINFORCED POLYMERS CONTAINING SAME

Balbhadra Das, Pittsburgh; Chester S. Temple, McKees Rocks, and Carl A. Melle, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 29, 1985, Ser. No. 717,758
Int. Cl.[4] B32B *9/00*; D02G *3/00*
U.S. Cl. 428—391 16 Claims

1. Strands of treated glass fibers that are useful in reinforcing polymeric matrices, wherein the treatment is a dried residue of an aqueous chemical treating composition. comprising:

a. an aqueous dispersion of: an ungelled, cationic resinous reaction product of a polyepoxide and primary or secondary amine, where the reaction product has free epoxy functionality and has active hydrogens, and in combination with the reaction product, blocked crosslinkable polyisocyanate which is stable at ordinary room temperature in the presence of active hydrogen containing resin but which is reactive with the active hydrogens of said resinous reaction product at elevated temperatures,

b. one or more organo coupling agents,

c. one or more cationic or nonionic lubricants, and

d. water in an effective amount to provide for the treatment of the glass fibers with the aqueous chemical treatment composition to yield abbut 0.1 to about 5 weight percent solids of the treating composition on the glass fibers.

4,637,957

FINISH COMPOSITION FOR POLYESTER FIBER FOR RUBBER REINFORCEMENT

Shigemitsu Murase, Joyo, Japan, assignor to Unitika Limited, Osaka, Japan

Division of Ser. No. 687,039, Dec. 28, 1984, abandoned, which is a division of Ser. No. 533,011, Sep. 16, 1983, Pat. No. 4,520,050. This application Apr. 14, 1986, Ser. No. 852,380
Claims priority, application Japan, Dec. 29, 1982, 57-234195
Int. Cl.[4] B32B *27/36*
U.S. Cl. 428—395 13 Claims

1. Polyester yarn having applied thereon a fiber finish composition in an amount sufficient to provide improved adhesion of said polyester yarn to rubber, said fiber finish composition comprising an oil portion, said oil portion comprising an effective amount of lubricant and 3 to 30 weight percent of the initial condensation product and its intermediate of a melamine resin.

4,637,958

METHOD FOR IMPROVING THE ADHESION OF ELASTOMERS TO A COATED SUBSTRATE

Karl-Heinrich Wegehaupt, Burghausen, and Hans-Rudolf Pfeffer, Emmerting, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 5, 1985, Ser. No. 720,466
Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418406
Int. Cl.[4] B32B *15/08*; C09J *5/04*
U.S. Cl. 428—416 16 Claims

1. A method for improving the adhesion of elastomers derived from compositions which are crosslinked by a condensation reaction and are based on diorganopolysiloxanes containing rod-shaped copolymers formed by the free-radical copolymerization of styrene and (meth)acrylic acid ester in the presence of the diorganopolysiloxanes, to an undercoating based on epoxy resin and pitch or tar, which comprises applying to the undercoating a primer composition containing in an organic solvent,

(a) a copolymer of a (meth)acrylic acid ester free of silicon atoms and a (meth)acryloxyalkylsilane having at least one SiOC-bonded monovalent organic group; and

(b) a silane which contains a SiC-bonded organic group having at least one amino or imino group and which contains at least one SiOC-bonded monovalent organic group, or a partial hydrolyzate of such a silane, or mixtures thereof and thereafter applying a crosslinkable composition to said primer composition.

9. A coated substrate having an epoxy resin and pitch or tar coating thereon, a primer having SiC-bonded organic groups over said epoxy resin and pitch or tar coat and an overcoat over said primer of a composition which is crosslinked to form an elastomer by a condensation reaction, in which the elastomer is based on diorganopolysiloxanes containing rod-shaped copolymers formed from the free-radical copolymerization of styrene and (meth)acrylic acid ester in the presence of the diorganopolysiloxanes, said primer is obtained from an organic solvent solution containing

(a) a copolymer of a (meth)acrylic acid ester free of silicon atoms and a (meth)acryloxyalkylsilane having at least one SiOC-bonded monovalent organic group; and

(b) a silane which contains a SiC-bonded organic group having at least one amino or imino group and which contains at least one SiOC-bonded monovalent organic group, or a partial hydrolyzate of such a silane, or mixtures thereof.

4,637,959

MAGNETIC RECORDING MEDIUM

Yoshinobu Ninomiya; Masashi Somezawa, and Kiyokazu Oiyama, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 22, 1984, Ser. No. 663,377
Claims priority, application Japan, Oct. 28, 1983, 58-202345
Int. Cl.[4] G11B *5/72*
U.S. Cl. 428—425.9 52 Claims

1. A magnetic recording medium comprising a non-magnetic substrate and a magnetic layer formed thereon composed mainly of magnetic powder and a binder, said binder containing a thermoplastic polyurethane-urea resin hardened by a polyisocyanate and having at least one hydrophilic polar group selected from the group consisting of the groups represented by general formulas:

$$-SO_3M,\ -OSO_3M,\ -COOM \text{ and } -\underset{\underset{O}{\|}}{P}(OM')_2$$

wherein M is hydrogen or alkali metal and M′ is hydrogen, alkali metal or hydrocarbon group, the total concentration of urea groups and urethane groups in said resin being between 1.8 and 3 m mol/g, and the concentration ration between urea groups and ureathane groups in said resin being between 0.3 and 1.6.

39. A magnetic recording medium comprising a non-magnetic substrate, a magnetic layer formed on one surface of said non-magnetic substrate and a back coating layer composed of a binder and non-magnetic pigment formed on the other surface of said non-magnetic substrate, said binder containing a thermoplastic polyurethane-urea resin hardened by a polyisocyanate and having at least one hydrophilic polar group selected from the group consisting of the groups represented by general formulas:

$$-SO_3M,\ -OSO_3M,\ -COOM \text{ and } -\underset{\underset{O}{\|}}{P}(OM')_2$$

wherein M is hydrogen of alkali metal and M′ is hydrogen metal or hydrocarbon group, the total concentration of urea groups and urethane groups in said resin being between 1.8 and 3 m mol/g, and the concentration ratio between urea groups and urethane groups in said resin being between 0.3 and 1.6.

4,637,960

SPACER FOR FURNACE BRAZING HAVING LOW WETTABILITY COATING THEREON

Toshio Hatakeyama, Kawagoe, and Toshihiko Yoshio, Hidakamachi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1984, Ser. No. 670,836
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—469 7 Claims



1. A spacer for use between articles being brazed for preventing a brazing filler metal from flowing from one of said articles to another of said articles when said articles are being brazed, said spacer comprising:

a main body made of a steel plate selectd from the group consisting of hot rolled steel and stainless steel; and

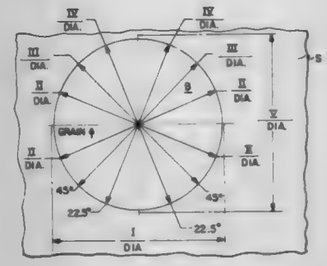
a coating on a top side surface and a bottom side surface of said main body of an inorganic substantce which is low in wettability in relation to the brazing filler metal and repelling said brazing filler metal during brazing for preventing one of said articles at one side of said spacer from being brazed to said spacer and to another of said articles.

4,637,961

SHELL FOR CAN ENDS

Henry C. Bachmann; Omar L. Brown; Ernal C. Fraze; David K. Wyan, all of Dayton, and James R. Gregg, Springboro, all of Ohio, assignors to Dayton Reliable Tool & Mfg. Co., Dayton, Ohio

Continuation of Ser. No. 571,243, Jan. 16, 1984, abandoned. This application Aug. 22, 1985, Ser. No. 768,162
The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.
Int. Cl.[4] B21D *53/00*
U.S. Cl. 428—579 10 Claims



1. A method of forming shells for use in the manufacture of can ends, comprising the steps of:

forming a rounded non-circular blank from a sheet of thin metal, said blank having a greater width across the grain of the metal than along such grain;

then forming into said blank a substantially flat central panel and an upward-extending chuck wall about the edge of said panel to produce a partially formed shell, the junction area between said panel and said chuck wall defining a relatively large radius of curvature;

forming into said blank a lip extending outward from the

upper end of said chuck wall and generally parallel to said panel;

separately gripping the entire panel and said chuck wall and causing relative movement between said panel and said chuck wall and simultaneously wrapping said junction area round a forming punch to form a panel wall in said junction area extending upward from the inner part of said chuck wall.

4,637,962

COMPOSITE MATERIAL IN ROD, TUBE, STRIP, SHEET OR PLATE SHAPE WITH REVERSIBLE THERMOMECHANICAL PROPERTIES AND PROCESS FOR ITS PRODUCTION

Joachim Albrecht, Mülligen, Switzerland, and Thomas Duerig, Fremont, Calif., assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Mar. 6, 1984, Ser. No. 586,837

Claims priority, application Switzerland, Mar. 14, 1983, 1383/83-7

The portion of the term of this patent subsequent to May 21, 2002, has been disclaimed.

Int. Cl.[4] C23C *30/00*

U.S. Cl. 428—616 17 Claims



1. An article having reversible thermomechanical properties, comprising at least two parts, whereby each part has a memory effect, wherein the entire article is made up of at least one shape memory alloy having a two-way effect.

4,637,963

MAGNETIC RECORDING MEDIUM AND METHOD FOR MAKING

Masaharu Nishimatsu; Toshiaki Ide; Yoshiaki Saito, and Yuichi Kubota, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Nov. 19, 1984, Ser. No. 673,029

Claims priority, application Japan, Nov. 17, 1983, 58-216573

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—694 10 Claims

1. A magnetic recording medium comprising a non-magnetic substrate having opposed major surfaces, a non-magnetic undercoat on one major surface of the substrate, and a magnetic layer on the undercoat, characterized in that said undercoat is formed of an undercoating composition comprising 100 parts by weight of a radiation curable base resin and about 0.1 to 50 parts by weight of an anti-static agent, the composition being cured through crosslinking by exposure to radiation, the magnetic recording medium further comprising a non-magnetic backcoat on the other major surface of the substrate, wherein said backcoat is formed of a backcoating composition comprising 100 parts by weight of a radiation curable base resin and about 0.1 to 50 parts by weight of an anti-static agent and 0.1 to 100 parts by weight of a pigment, the composition being cured through crosslinking by exposure to radiation.

4,637,964

MAGNETIC RECORDING MEDIUM

Yoshiro Shimuzu, and Yoshio Tada, both of Nagoya, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Japan

Filed Jul. 12, 1985, Ser. No. 754,867

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—694 3 Claims

1. A magnetic recording medium comprising a magnetic powder binder, which comprises, by weight, 5–90% of a polymer having a molecular weight of 5000–200,000 and containing therein, based on the weight of said polymer, at least 2% of an alkenyl phenol.

4,637,965

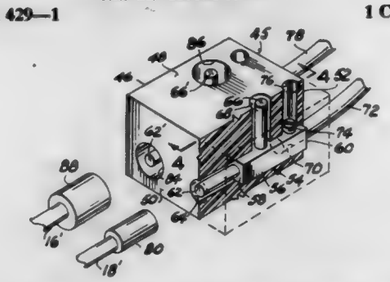
ANTICORROSION BATTERY TERMINAL

Ronald G. Davis, Erick, Okla., assignor to H. Milton Keathley and Douglas Michael Phenix, both of Erick, Okla.

Filed Nov. 22, 1985, Ser. No. 800,872

Int. Cl.[4] H01M *2/30*

U.S. Cl. 429—1 1 Claim



1. In a vehicle lead acid storage battery having terminal posts and a pair of elongated pigtail leads respectively integrally connected at one end portion with said posts, the improvement comprising;

electrically insulated connector means including a receptacle portion indicating polarity on the other end portion of each lead of said pair of pigtail leads; and,

a plug portion remote from the battery electrically connecting the receptacles with a conductor,

said plug portion comprising,

a plug body from dielectric material having opposing spaced-apart parallel end surfaces and having a top surface normal to the end surfaces,

a pair of elongated electrically conductive terminals embedded in parallel spaced relation within said dielectric material body between said end surfaces,

a first prong projecting axially toward said one end surface from one end of each terminal and terminating adjacent but spaced inwardly with respect to said one end surface,

an axial socket formed in the other end of each terminal for electrical connection with vehicle cable conductors,

said dielectric material body having first and second polarity indicating cylindrical recesses respectively surrounding the first and second prongs; and,

a laterally projecting prong on each terminal intermediate its ends projecting toward said top surface,

said top surface having other polarity indicating recesses respectively surrounding the laterally projecting prongs.

4,637,966

SEALED LEAD-ACID CELL

Toshio Uba, Lakewood, and Robert F. Nelson, Aurora, both of Colo., assignors to Gates Energy Products, Inc., Denver, Colo.

Division of Ser. No. 544,333, Oct. 21, 1983. This application Jul. 28, 1986, Ser. No. 890,250

Int. Cl.[4] H01M *10/06*

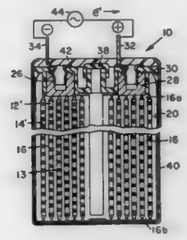
U.S. Cl. 429—57 8 Claims

1. A normally sealed gas recombining lead-acid cell having a high rate discharge capability utilizing an "oxygen cycle" comprising:

a container;

at least one porous positive plate and at least one porous negative plate within the container, both plates having been electrochemically formed in situ in the container;

a separator material interleaved between and in firm pressure contact with the plates, comprised of a mat of microfine glass fibers having a BET surface area of from about 0.2 to about 1.5 m^2/g and a porosity of from about 70 to about 98 percent; and,



liquid sulfuric acid electrolyte substantially fully absorbed within the pores of the plates and separator, the quantity of electrolyte being limited such that the pore volumes of the plates and the separator are less than fully filled.

4,637,967

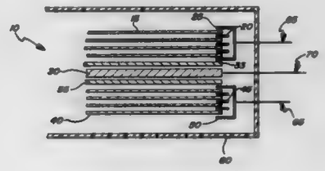
ELECTRODES MADE WITH DISORDERED ACTIVE MATERIAL AND METHODS OF MAKING THE SAME

John E. Keem, Bloomfield Hills; Richard C. Bergeron, Romulus; Russell C. Custer, Clawson, and R. William McCallum, Birmingham, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 546,651, Oct. 28, 1983, abandoned. This application Aug. 29, 1985, Ser. No. 770,704

Int. Cl.[4] H01M *4/86, 4/90*

U.S. Cl. 429—101 33 Claims



1. A hydrogen storage electrode for an alkaline hydrogen storage electrochemical cell comprising at least one solid, metallic, amorphous electrochemically active body, capable of being self-supporting and formed by rapid solidification from a melt thereby having a non-particulate, dimensionally anisotropic shape characterized by a continuous amorphous structure throughout, said body having a composition comprising at least three elements, said three elements comprising titanium, nickel and at least one element selected from the group consisting of aluminum, boron, chromium, cobalt, hafnium, indium, lead, magnesium, molybdenum, niobium, palladium, tin, zirconium and rare earth metals, each of said elements preset in an effective amount so that said electrode is capable of being electrochemically charged with hydrogen to store energy and capable of electrochemically discharging hydrogen and releasing energy, while maintaining its structural integrity during electrochemical charge and discharge cycles.

4,637,968

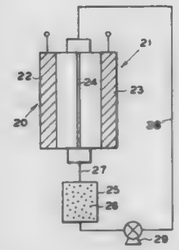
SOLID BROMINE COMPLEXERS

Patrick G. Grimes, Westfield, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Mar. 7, 1986, Ser. No. 837,273

Int. Cl.[4] H01M *10/36*

U.S. Cl. 429—105 9 Claims



1. A metal halogen electrochemical cell comprising:

an aqueous electrolyte containing a metal halide, the metal thereof being selected from zinc and cadmium;

an electrode at which to deposit said metal of said metal halide during charging of said cell;

a counterelectrode at which to generate the halogen of said metal halide during charging of said cell; and

anion exchange resin for storing the halogen generated during charging of the cell and providing a source of halogen during discharging of said cell.

4,637,969

PHOTOELECTRO-CHEMICAL CELL FOR CONVERSION OF SOLAR ENERGY TO ELECTRICITY AND METHOD OF ITS MANUFACTURE

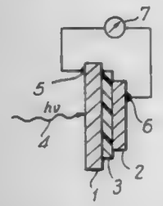
Terje Skotheim, 41 Bay Rd., East Patchoque, N.Y. 11772, and Michel Armand, E.N.S.E.E.G.-Domaine Universitaire-BP44, Saint Martin d'Heres, 38401, France

Division of Ser. No. 208,059, Nov. 18, 1980, Pat. No. 4,352,868. This application Apr. 23, 1982, Ser. No. 371,318

The portion of the term of this patent subsequent to Oct. 5, 1999, has been disclaimed.

Int. Cl.[4] H01M *6/36*

U.S. Cl. 429—111 16 Claims



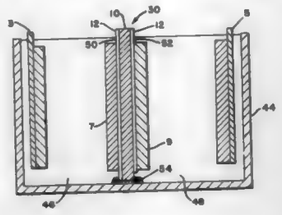
1. A photoelectric device comprising: a transparent counter electrode; a thin dry solid film polymer electrolyte adjacent thereto and electrically interacting therewith; a semiconductor adjacent to said polymer electrolyte film; and a conducting base electrode electrically interacting with said semiconductor.

4,637,970

LEAD-TITANIUM, BIPOLAR ELECTRODE IN A LEAD-ACID BATTERY

Lun-Shu R. Yeh, Summit; Morten Grenness, Califon, and Robert J. Fuller, Hackettstown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 21, 1984, Ser. No. 684,755
Int. Cl.[4] H01M 10/18
U.S. Cl. 429—153 7 Claims



1. An electrochemical battery apparatus for producing electrical power, comprising:

(a) a container for containing an electrolyte;

(b) at least one bipolar electrode for generating said electrical power, which is located in said container to separate said container into a first compartment and a second compartment, said bipolar electrode comprised of

(i) a base member, which is comprised of a core portion composed of titanium,

an integral, substantially continuous and non-porous layer of lead, which is electroplated onto at least one face surface of said core portion and diffused a selected, limited distance into said core portion, and

a substantially continuous, residual layer in said core portion that is substantially free of lead,

(ii) a negative-type active mass connected to a first face surface of said base member,

(iii) a positive-type active mass connected to a second face surface of said base member;

(c) a positive electrode located in said first compartment of said container;

(d) a negative electrode located in said second compartment of said container; and

(e) sealing means for preventing leakage of electrolyte around said bipolar electrode between said first and second compartments of said container.

4,637,971

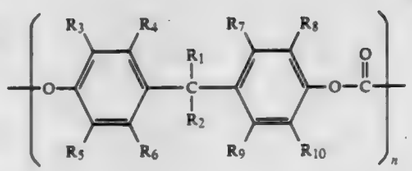
PHOTORECEPTOR HAVING POLYCARBONATE LAYERS AND PROCESS FOR THE PREPARATION THEREOF

Yoshiaki Takei; Hiroyuki Nomori, and Katumi Matuura, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

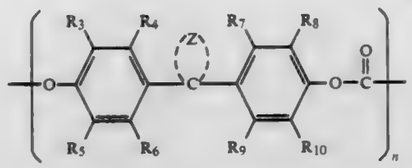
Filed Feb. 11, 1985, Ser. No. 700,671
Claims priority, application Japan, Feb. 16, 1984, 59-28309
Int. Cl.[4] G03G 5/04
U.S. Cl. 430—59 32 Claims

1. A photoreceptor comprising a photosensitive layer and a support wherein said photosensitive layer comprises a carrier generation layer and a carrier transport layer wherein said carrier generation layer and/or said carrier transport layer contains a polycarbonate compound represented by the following Formula (A) or (B) as a binder

formula [A]



formula [B]



wherein R_1 and R_2 are independently hydrogen atom, substituted or unsubstituted aliphatic group, or substituted or unsubstituted hydrocarbon ring provided that at least one of R_1 and R_2 has at least 3 carbon atoms, Z represents a group of atoms necessary for constituting a substituted or unsubstituted carbon ring or a substituted or unsubstituted heterocyclic ring, R_3 to R_{10} in Formulas (A) and (B) are independently a hydrogen atom, a halogen atom, a substituted or unsubstituted aliphatic group or a substituted or unsubstituted hydrocarbon ring, and n is a number from 10 to 1000.

4,637,972

LIGHT RECEIVING MEMBER HAVING AN AMORPHOUS SILICON PHOTOCONDUCTOR

Kyosuke Ogawa, Tokyo; Shigeru Shirai, Yamato; Keishi Saitoh, Tokyo; Teruo Misumi, Kawasaki, and Junichiro Kanbe, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 592,802, Mar. 23, 1984, abandoned.
This application Dec. 30, 1985, Ser. No. 815,123
Claims priority, application Japan, Mar. 28, 1983, 58-52033; Apr. 2, 1983, 58-58348; Apr. 2, 1983, 58-58350
Int. Cl.[4] G03G 05/082
U.S. Cl. 430—84 15 Claims

1. A light-receiving member having a substrate and a light-receiving layer having photoconductivity containing an amorphous material comprising a matrix of silicon atoms provided on said substrate, said light-receiving layer having, from the said support side with respect to the layer thickness direction of said layer, a first layer region containing atoms of the group III of the periodic table at higher concentration toward the side of the substrate, wherein the first layer region comprises a layer region A and a layer region B successively from the side of the substrate, in which the content of group III atons in the layer region A is 30 to 5×10^4 atomic ppm, and the thickness of the layer region A is 20 Å to 20μm, and a second layer region containing atoms of the group III of the periodic table and nitrogen atoms, wherein the content of group III atoms in the second layer region is 0.01 to 1×10^4 atomic ppm and the thickness of the second layer region is 20 Å to 15μm.

4,637,973

IMAGE FORMING PROCESS FOR ELECTROPHOTOGRAPHY

Kunio Shigeta; Yoko Yamamoto, and Jiro Takahashi, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,652
Claims priority, application Japan, Nov. 15, 1984, 59-239540; Nov. 16, 1984, 59-240542; Nov. 26, 1984, 59-247971
Int. Cl.[4] G03G 9/14
U.S. Cl. 430—122 20 Claims

1. A process for forming an image comprising:

forming a latent image on a movable latent image bearing member, said movable latent image bearing member comprising an organic photoconductive photosensitive member;

forming a magnetic brush comprised of a two-component developer, which includes a toner and a carrier, on a movable developer carrying member, said movable developer carrying member having at least a portion thereof opposed to said latent image bearing member in a developing region;

moving said latent image bearing member and said developer carrying member in a developing region; and

developing said latent image on said latent image bearing member by brushing it with said brush in said developing region;

said developer carrying member comprising a single movable sleeve;

said latent image bearing member and said single sleeve of said developer carrying member moved in the same direction in said developing region at respective linear velocities; and

the ratio V_S/V_P of the linear velocity of said single sleeve of said developer carrying member V_S to the linear velocity of said latent image bearing member V_P being within the range of $1.9 \leqq V_S/V_P \leqq 4$.

4,637,974

XEROGRAPHIC COPYING ON A TRANSPARENT SHEET

Raymond G. Kubit, Fox River Grove, Ill., assignor to Weber Marking Systems, Inc., Arlington Heights, Ill.

Continuation of Ser. No. 485,208, Apr. 15, 1983. This application Jan. 10, 1985, Ser. No. 691,352
Int. Cl.[4] G03G 13/16
U.S. Cl. 430—126 4 Claims

1. In a method of making a xerographically imaged transparency wherein an unimaged transparent copy sheet is imaged in a plain paper-type copier, said copier embodying a photoconductive surface on which a toner image is formed, said copy sheet comprising a transparent base film having a transparent coating thereon adapted for receiving and for having fixed thereto a toner image transferred from said photoconductive surface, said copier also embodying an opacity sensor which controls the operation of the copier and which is activated by copy sheet opacity, the improvement for activating indiscriminately the sensors of different copiers having diverse opacity location requirements and for activating such sensors with the transparent copy sheet in any angular disposition in which it is received by their respective copiers, which comprises employing in said method a transparent copy sheet in order to activate said sensor with an opaque border therein that extends completely around the sheet and encompasses on unimaged transparent area of the sheet.

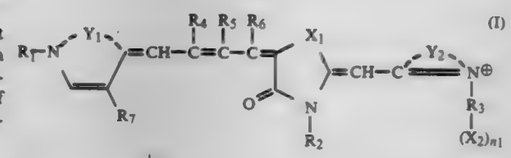
4,637,975

HEAT-DEVELOPABLE PHOTOGRAPHIC MATERIALS

Seiiti Kubodera; Takanori Hioki, and Masaki Okazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 6, 1985, Ser. No. 773,163
Claims priority, application Japan, Sep. 6, 1984, 59-186855
Int. Cl.[4] G03C 1/02
U.S. Cl. 430—353 19 Claims

1. A heat-developable photographic material comprising a support having thereon at least one heat-developable photographic layer containing a light-sensitive silver halide sensitized by an infra-red sensitizing dye represented by formula (I)



(I)

wherein

R_1 and R_3 each represents an unsubstituted or substituted alkyl group or alkenyl group;

R_2 represents a hydrogen atom or an unsubstituted or substituted alkyl group, aryl group, alkenyl group, or aromatic heterocyclic group;

R_4 through R_7 each represents a hydrogen atom or an unsubstituted or substituted alkyl group, aryl group, or alkenyl group; or R_4 and R_6 together form an unsubstituted or substituted alkylene group or alkenylene group;

X_1 represents an oxygen atom, a sulfur atom, or the group



wherein R_8 represents a hydrogen atom, an unsubstituted or substituted alkyl group, aryl group, or alkenyl group;

Y_1 represents an atomic group forming an unsubstituted or substituted pyridine or quinoline ring together with nitrogen and carbon atoms represented in formula (I);

Y_2 represents an atomic group forming an unsubstituted or substituted heterocyclic ring, together with carbon and nitrogen atoms represented in formula (I);

X_2 represents an anion; and

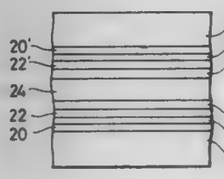
n_1 represents 0 or 1.

4,637,976

INFORMATION RECORDING MEMBER

Motoyasu Terao, Hinodemachi; Yasushi Miyauchi, Hachioji; Kazuo Shigematsu, Saitama, and Shinkichi Horigome, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 20, 1984, Ser. No. 642,260
Claims priority, application Japan, Aug. 19, 1983, 58-150148
Int. Cl.[4] G03C 1/72, 1/76
U.S. Cl. 430—523 3 Claims



1. An information recording member comprising a substrate,

an information recording film which is formed on the substrate either directly or via at least one of inorganic and organic protective layers and which causes the change of atomic arrangement upon being irradiated by a recording beam, said information recording film having an average composition, in a direction of the film thickness, expressed by the following formula:

$$M_xTe_ySe_zO_\alpha$$

wherein x, y, z and α are values within the ranges of $2 \leqq x \leqq 40$, $30 \leqq y \leqq 95$, $3 \leqq z \leqq 45$ and $0 \leqq \alpha \leqq 20$, and M is at least one element selected from the group consisting of As, Sb, Bi, S, Si, Ge, Sn, Pb, Al, Ga, In, Ti, Zn, Cd, Au, Ag, Cu, Ni, Pd, Rh, Cr, Mo, W and Ta; a protective film positioned on at least one side of said information recording film having a composition comprised of GeO_2 or Al_2O_3.

4,637,977

METHOD OF DETERMINING DTK ISOENZYME ACTIVITY AND THE USE THEREOF

Jan S. Gronowitz, Pettbola skola, Pl 2670, S-740 73 Hargshamn, and Clas F. R. Killander, Vallby Husbyborg, S-755 90 Uppsala, both of Sweden

PCT No. PCT/SE83/00190, § 371 Date Jan. 5, 1984, § 102(e) Date Jan. 5, 1984, PCT Pub. No. WO83/04054, PCT Pub. Date Nov. 24, 1983

PCT Filed May 10, 1983, Ser. No. 576,375

Claims priority, application Sweden, May 14, 1982, 8203041

Int. Cl.⁴ C12Q *1/48*

U.S. Cl. 435—15 **8 Claims**

1. A method of determining dTk isoenzyme levels of a human or animal body fluid or cell sample, comprising the steps of reacting said sample with a substrate for said isoenzyme consisting of 2'-deoxy-5-halouridin, containing a radiolabelled 5-halogen, said substrate being present in a concentration ranging from 2×10^{-9} to 5×10^{-6}M, in the presence of a phosphate donor in a concentration sufficient for producing a measurable amount of phosphorylated product, said concentration not exceeding 20 mM and a buffer system sufficient for maintaining a pH within the range of 5 to 9 in a concentration of no more than 250 mM, and measuring the amount of phosphorylated product formed on said substrate, said amount being proportional to isoenzyme level.

4,637,978

ASSAY FOR ANALYSIS OF WHOLE BLOOD

Glen M. Dappen, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1983, Ser. No. 546,694

Int. Cl.⁴ C12Q *1/60, 1/54, 1/26, 1/28*

U.S. Cl. 435—11 **30 Claims**

1. A method for the determination of an analyte other than hemoglobin in whole blood comprising the steps of:

(A) physically contacting a sample of whole blood containing an analyte other than hemoglobin and a multizone element, said element consisting essentially of support having thereon, in order and in fluid contact, a registration zone and a reagent/spreading zone,

provided said element does not contain a radiation-blocking zone,

said reagent/spreading zone having a void volume and average pore size effective to accommodate whole blood, an containing an interactive composition capable of providing, upon interaction with said analyte, a dye which can be spectrophotometrically detected at a wavelength greater than about 600 nm; and

(B) detecting said dye at a wavelength greater than about 600 nm.

4,637,979

COMPOSITION AND TEST DEVICE FOR DETERMINING THE PRESENCE OF LEUKOCYTES CONTAINING A ZWITTERION COUPLING AGENT

A. Christopher Skjold, Elkhart, Ind.; Herbert Hugl, Bergisch-Gladbach, and Gerhard Wolfrum, Leverkusen, both of Fed. Rep. of Germany, assignors to Miles Laboratories, Inc., Elkhart, Ind.

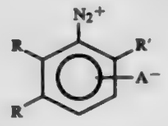
Filed Apr. 6, 1984, Ser. No. 597,611

Int. Cl.⁴ C12Q *1/00, 1/38;* G01N *33/48, 1/48*

U.S. Cl. 435—19 **15 Claims**

1. A composition for determining the presence of an analyte selected from leukocytes, esterase and protease in a test sample, the composition comprising

an ester composed of aromatic phenol or pseudoaromatic phenol and an acid capable of being catalytically hydrolyzed in the presence of leukocytes, esterase or protease to yield phenol which can couple with a diazo zwitterion, and a diazonium salt having the structure



in which A^- is an anion, and R same or different is H, lower alkyl, aryl, or both of R together form a fused ring system, and in which R' is H, OH or lower alkyl.

4,637,980

EXTERNALIZATION OF PRODUCTS OF BACTERIA

Jeffrey I. Auerbach, King of Prussia, and Martin Rosenberg, Malvern, both of Pa., assignors to SmithKline Beckman Corporation, Pa.

Filed Aug. 9, 1983, Ser. No. 521,517

Int. Cl.⁴ C07H *15/12;* C12P *21/00;* C12N *15/00, 1/00, 1/20*

U.S. Cl. 435—68 **31 Claims**

1. A method of producing a gene product which comprises (i) culturing a temperature sensitive bacteria, which bacteria:

(a) expresses the gene product intracellularly,

(b) is a lysogen defective in excision and replication functions and

(c) contains within the prophage DNA sequence a temperature sensitive phage repressor gene and functional phage lysozyme-encoding genes, under permissive conditions such that the gene product is expressed intracellularly and the lysozyme-encoding genes are repressed and then (ii) raising the temperature to produce restrictive conditions such that the lysozyme-encoding genes are expressed.

4,637,981

ANTIBIOTIC A-4696 FACTOR G

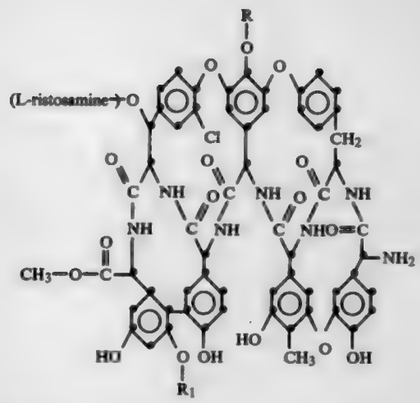
Charles L. Hershberger, New Palestine; Kurt E. Merkel, Mooresville; Robert E. Weeks, and Gene M. Wild, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 426,493, Sep. 29, 1982, Pat. No. 4,461,723, which is a continuation-in-part of Ser. No. 217,960, Dec. 18, 1980, abandoned. This application Mar. 26, 1984, Ser. No. 593,015

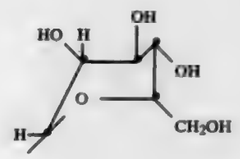
Int. Cl.⁴ C12P *19/60, 19/56;* C12N *1/20;* C12R *1/045*

U.S. Cl. 435—75 **2 Claims**

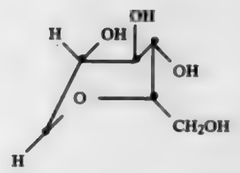
1. The method of producing the antibiotic A4696G of the formula



wherein R is



and R_1 is



which comprises cultivating the organism *Actinoplanes missouriensis* ATCC 31681 in an aqueous nutrient culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a recoverable amount of antibiotic A4696G is produced by said organism in said culture medium.

4,637,982

PROCESS FOR BIOLOGICAL PREPARATION OF AMIDES

Hideaki Yamada, 19-1, Kinomoto-Cho, Matsugasaki, Sakyo-Ku, Kyoto-Shi, Kyoto-Fu, and Yoshiki Tani, Kyoto, both of Japan, assignors to Hideaki Yamada, Kyoto and Nitto Kagaku Kogyo Kabushiki Kaisha, Tokyo, both of, Japan, a part interest

PCT No. PCT/JP82/00393, § 371 Date Jul. 5, 1983, § 102(e) Date Jul. 5, 1983, PCT Pub. No. WO83/01784, PCT Pub. Date May 26, 1983

PCT Filed Sep. 29, 1982, Ser. No. 527,579

Claims priority, application Japan, Nov. 18, 1981, 56-184688

Int. Cl.⁴ C12P *13/02, 1/04;* C12N *9/78;* C12R *1/38*

U.S. Cl. 435—129 **21 Claims**

1. A process for hydrating a nitrile having 2–4 carbon atoms to the correaponding amide which comprises contacting a nitrile with a microorganism of the genus Pseudomonas which produces nitrile hydratase.

14. A process for hydrating a nitrile having 2–4 carbon atoms to the corresponding amide which comprises contacting a nitrile with nitrile hydratase produced by a microorganism of the genus Pseudomonas.

4,637,983

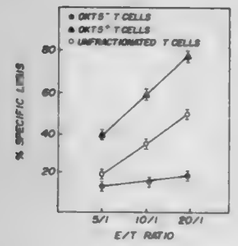
HYBRID CELL LINE FOR PRODUCING MONOCLONAL ANTIBODY TO HUMAN CYTOTOXIC AND SUPPRESSOR T CELLS, ANTIBODY, AND METHODS

Patric C. Kung, Bridgewater, and Gideon Goldstein, Short Hills, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 82,515, Oct. 9, 1979, Pat. No. 4,364,932. This application Oct. 4, 1982, Ser. No. 432,455

Int. Cl.⁴ C12N *5/00, 15/00;* C12P *21/00;* C12R *1/91*

U.S. Cl. 435—240 **1 Claim**



1. A hybridoma having the identifying characteristics of ATCC CRL 8016.

4,637,984

MONOCLONAL ANTI-ORNITHINE DECARBOXYLASE ANTIBODY AND METHOD OF PRODUCING SAME

Thomas G. O'Brien, Drexel Hill; Anthony E. Pegg, Hummelstown, and Meehard Herlyn, Wynnewood, all of Pa., assignors to Wistar Institute of Anatomy and Biology, Philadelphia, Pa. and Research Corporation, Tucson, Ariz., a part interest

Filed Oct. 11, 1983, Ser. No. 540,675

Int. Cl.⁴ C12N *5/00;* C07K *15/04*

U.S. Cl. 435—240 **8 Claims**

1. A continuous cell line which produces a monoclonal antibody of the IgM type which specifically binds to rodent ornithine decarboxylase antigen comprising a fused cell hybrid of rodent spleen cells immunized with rodent ornithine decarboxylase antigen, and rodent myeloma cells.

7. A rodent IgM monoclonal antibody, which binds to rodent ornithine decarboxylase, produced by a continuous cell line comprising a fused hybrid of rodent spleen cells immunized with rodent ornithine decarboxylase antigen, and rodent myeloma cells.

4,637,985

ASSAY PROCESSES AND MATERIALS THEREFOR

Ahmad M. Sidki, and David S. Smith, both of London, England, assignors to Internationale Octrooi Maatschappij "Octrope" B.V., Rotterdam, Netherlands

Filed Sep. 27, 1983, Ser. No. 536,238

Claims priority, application United Kingdom, Sep. 27, 1982, 8227536

Int. Cl.⁴ G01N *33/542, 33/544, 33/553*

U.S. Cl. 436—518 **6 Claims**

1. In a process of carrying out a specific binding assay, for the qualitative detection or quantitative or semi-quantitative determination of an analyte which forms a component of a specific binding reaction, using a labelled conjugate form of a derivative or analogue of one of the relevant specific binding partners, said labelled form being capable of emitting delayed luminescence upon photo-excitation, the improvement which comprises using, as the labelled conjugate form of one of the relevant specific binding partners, a derivative or analogue of the specific binding partner with a derivative of a luminescent substance which shows a delayed light emission upon photoexcitation, the delayed light emission of which is subject to

quenching by molecular oxygen, and carrying out the assay using a time-resolved photometric method in the presence of an effective amount of a quench-inhibiting substance able to prevent quenching by molecular oxygen, said quench inhibiting substance comprising sodium sulphite, bisulphite or metabisulphite present in the assay reaction mixture at a concentration of the order of 10–2M and the luminescent substance being selected from derivatives of brominated and iodinated fluorophors, and fluorescent coumarins and flavones, and their brominated and iodinated derivatives.

4,637,986

FLOW CYTOMETRY LYSING REAGENT WITH LEUKOPROTECTIVE AGENT FOR PRODUCING A 3-PART WBC COUNT

Michael C. Brown, Wayland, and Stefan J. Kirchanski, Framingham, both of Mass., assignors to Ortho Diagnostic Systems, Inc., Raritan, N.J.

Filed Aug. 22, 1983, Ser. No. 525,575
Int. Cl.⁴ G01N *31/00*
U.S. Cl. 436—10 **4 Claims**

1. A lysing reagent for use in a flow cytometry instrument comprising: a combination of an organic, nitrogen containing buffer selected from the group consisting of TRIS and 2-amino-2-methyl-1,3-propanediol, and an ethane sulfonic acid buffer selected from the group consisting of HEPES and TAPS; and a leucoprotective agent selected from the group consisting of methyoxyethanol at a concentration of 100–700 mM, ethoxyethanol or methoxyethoxyethanol at a concentration of 50–500 mM, butoxyethanol or ethoxyethoxyethanol or butoxyethoxyethanol at a concentration of 10–300 mM.

4,637,987

GAS MONITORING DEVICE AND METHOD

Karl Minten, La Hoya, Calif., and William Krug, Hoffman Estates, Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Filed May 7, 1984, Ser. No. 607,514
The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.
Int. Cl.⁴ G01N *27/00, 31/00*
U.S. Cl. 436—151 **25 Claims**

13. A method of monitoring the partial pressure of at least one gas the steps which comprise; disposing a coating of a manganese tertiary phosphine polymer complex film on a piezolelectric crystal; disposing said crystal in a defined enclosed area in which the gas is to be contained; passing the gas through said area; attaching said piezoelectric crystal to measurement means whereby changes in frequency of the piezoelectric device can be recorded.

4,637,988

FLUORESCENT LABELS FOR IMMUNOASSAY

Jerald C. Hinshaw, Ogden, Utah; John L. Toner, Webster, and George A. Reynolds, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 279,398, Jul. 1, 1981, abandoned. This application Feb. 3, 1986, Ser. No. 825,693
Int. Cl.⁴ G01N *21/64*
U.S. Cl. 436—546 **30 Claims**

28. In a method for performing an immunoassay comprising the steps of

(a) fluorescently labeling a ligand of interest, a derivative of said ligand or some other molecular entity, to produce a fluorescently labeled immunologically binding ligand analog of said ligand of interest;

(b) adding a known amount of said fluorescently labeled ligand analog and an unknown amount of ligand to be assayed to a receptor which is capable of binding with said fluorescently labeled ligand analog and also is capable of binding with said ligand to be assayed; and

(c) determining the unknown amount of said ligand to be assayed by measuring the fluorescence of said fluorescently labeled ligand analog bound to said receptor or by measuring the fluorescence of said fluorescently labeled ligand analog remaining unbound,

the improvement wherein the labeled ligand analog comprises ligand adsorbed or covalently bound to a fluorescent label comprising a fluorescent chelate of a lanthanide metal and a chelating agent comprising a nucleus which is a triplet sensitizer having a triplet energy greater than that of said lanthanide metal and at least heteroatom-containing groups and a third heteroatom-containing group or heteroatom which is in or appended to the triplet sensitizer nucleus, each of said two heteroatom-containing groups appended to different carbon atoms of the triplet sensitizer nucleus, said heteroatom-containing groups forming coordinate complexes with lanthanide metals and said groups being located in said chelating agent such that they and said third heteroatom or heteroatom-containing group are capable of forming a chelate structure with the lanthanide metal, wherein each of said two heteroatom-containing groups is selected from the group consisting of nitrilodiacetate, carboxy, hydroxy, alkoxy, amino, amido, carbonyl, and mercapto, and said third heteroatom-containing group or heteroatom is selected from the group consisting of nitrogen, oxygen, sulfur, selenium, and an alkylene group of 1 to 20 carbon atoms, which alkylene group comprises or has appended thereto nitrogen, oxygen, sulfur, selenium, nitrilodiacetate, carboxy, hydroxy, alkoxy, amino, amido, carbonyl, or mercapto.

4,637,989

METHOD OF PREPARING A CERAMIC COMPOSITION

Hung C. Ling, West Windsor Township, Mercer County; Warren W. Rhodes, Raritan, and Man F. Yan, Berkeley Heights, all of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights and Bell Telephone Laboratories, Murray Hill, both of, N.J.

Filed Mar. 29, 1985, Ser. No. 717,814
Int. Cl.⁴ C04B *35/00*
U.S. Cl. 501—135 **3 Claims**

1. A method for forming a sintered ceramic composition having a peak dielectric constant of at least about 7,500 at 1 Khz represented by the formula $Pb(Zn_xMg_{1-x}Nb_2)_4O_3$ wherein x is from about 0.3 to 0.5 and being at least 90% perovskite phase material comprising the steps of:

(a) forming a columbite phase of $Zn_xMg_{1-x}Nb_2O_6$;

(b) reacting the columbite $Zn_xMg_{1-x}Nb_2O_6$ with PbO at a temperature of from greater than 800° C. for a time necessary to form the desired material.

4,637,990

HOLLOW POROUS MICROSPHERES AS SUBSTRATES AND CONTAINERS FOR CATALYSTS AND METHOD OF MAKING SAME

Leonard B. Torobin, Materials Technology Corporation, 120 Interstate North, Parkway East, Ste. 158, Atlanta, Ga. 30339

Continuation-in-part of Ser. No. 639,126, Aug. 9, 1984, and a continuation-in-part of Ser. No. 657,090, Oct. 3, 1984, said Ser. No. 639,126, is a continuation-in-part of Ser. No. 428,923, Sep. 30, 1982, Pat. No. 4,548,196, which is a continuation of Ser. No. 103,113, Dec. 13, 1979, abandoned, which is a division of Ser. No. 59,296, Jul. 20, 1979, abandoned, which is a continuation-in-part of Ser. No. 937,123, Aug. 28, 1978, abandoned, and Ser. No. 944,643, Sep. 21, 1978, abandoned. This application Mar. 14, 1985, Ser. No. 711,951
Int. Cl.⁴ B01J *35/00, 37/00*
U.S. Cl. 502—10 **54 Claims**

1. Hollow porous microsphere catalysts of substantially uniform diameter of 200 to 10,000 microns and of substantially uniform wall thickness of 1.0 to 1000 microns, the walls of said microspheres comprise sintered together particles which define interconnecting voids within the walls and a single central cavity in the interior of the microspheres and inner and outer microsphere wall surfaces, said interconnecting voids are continuous and extend from the outer wall surface to the inner wall surface, said walls have substantially uniform void content and said interconnecting voids are substantially uniformly distributed in the walls of the hollow microspheres, said walls include entrance means through which catalyst can be introduced into the interconnecting voids and into the single central cavity of the microspheres, said microspheres have catalyst on the particles forming the walls or have catalyst contained within the single central cavity or have catalyst on the particles forming the walls and have catalyst contained within the single central cavity, and the walls of said microspheres are free of latent solid or liquid blowing gas materials and are substantially free of relatively thinned wall portions or sections and bubbles.

33. A method of making hollow microsphere catalysts which comprises applying a catalyst to hollow porous microspheres of substantially uniform diameter of 200 to 10,000 microns and of substantially uniform wall thickness of 1.0 to 1000 microns, the walls of said microspheres comprise sintered together inorganic particles which define interconnecting voids within the walls and a single central cavity in the interior of the microspheres and inner and outer microsphere wall surfaces, said interconnecting voids are continuous and extend from the outer wall surfaces to the inner wall surfaces, said walls have substantially uniform void content and said interconnecting voids are substantially uniformly distributed in the walls of the hollow microspheres, said walls include entrance means through which catalysts can be introduced into the interconnecting voids and into the single central cavity of the microspheres, and the walls of said microspheres are free of latent solid or liquid blowing gas materials and are substantially free of relatively thinned wall portions or sections and bubbles, and said catalyst is applied to the particles forming the walls of the microspheres, is placed within the single central cavity of the microspheres or is applied to the particles forming the walls and is placed within the single central cavity of the microspheres.

4,637,991

PILLARED INTERLAYERED CLAYS

David R. Battiste, and Jesse R. Harris, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 10, 1985, Ser. No. 742,815
Int. Cl.⁴ B01J *21/16, 29/06*
U.S. Cl. 502—68 **45 Claims**

1. A method for preparing a pillared, interlayered clay product comprising:

(a) diluting an aluminum hydroxy chloride compound with water to obtain an aqueous solution containing from about 0.4 to about 10 weight percent of aluminum hydroxy chloride;

(b) maintaining said aqueous solution at a temperature in the range from about 20° C. to about 70° C. for a time sufficient to increase the surface area and pore volume of a pillared, interlayered clay product subsequently obtained by reacting smectite clay with said aqueous solution;

(c) reacting smectite clay with said aqueous solution thereby obtaining an aluminum-exchanged clay product in an aqueous liquid;

(d) separating said aluminum-exchanged clay product from said aqueous liquid;

(e) dispersing said aluminum-exchanged clay product in water;

(f) separating aluminum-exchanged clay product from said distilled water;

(g) drying said aluminum-exchanged clay product to obtain a substantially dried aluminum-exchanged clay product; and

(h) calcining said substantially dried aluminum-exchanged clay product to obtain a calcined aluminum-exchanged clay product which is a pillared, interlayered clay product.

9. A method for preparing a pillared, interlayered clay admixed with zeolite comprising:

(a) diluting an aluminum hydroxy chloride compound with water to obtain an aqueous solution containing from about 0.4 to about 10 weight percent of aluminum hydroxy chloride;

(b) maintaining said aqueous solution at a temperature in the range from about 20° C. to about 70° C. for a time sufficient to increase the surface area and pore volume of a pillared, interlayered clay product subsequently obtained by reacting smectite clay with said aqueous solution;

(c) reacting smectite clay with said aqueous solution thereby obtaining an aluminum-exchanged clay product in an aqueous liquid;

(d) separating said aluminum-exchanged clay product from said aqueous liquid;

(e) contacting said aluminum-exchanged clay product with sufficient distilled water to provide a washed aluminum-exchanged clay product;

(f) recovering washed aluminum-exchanged clay product;

(g) agitating washed aluminum-exchanged clay product with aqueous solution containing aluminum hydroxy chloride and zeolite to produce a slurry of a mixture of aluminum-exchanged clay product and aluminum hydroxy chloride treated zeolite in aqueous liquid;

(h) separating said mixture of aluminum-exchanged clay product and aluminum hydroxy chloride treated zeolite from said aqueous liquid;

(i) drying said mixture to obtain a substantially dry mixture of aluminum-exchanged clay product and aluminum hydroxy chloride treated zeolite; and

(j) calcining said mixture of aluminum-exchanged clay product and aluminum hydroxy chloride treated zeolite to obtain a calcined mixture of said aluminum-exchanged clay product and aluminum hydroxy chloride treated zeolite which is a pillared, interlayered clay product.

13. A method for preparing a promoted pillared clay catalyst comprising:

(a) contacting a pillared, interlayered clay product prepared by the method of claim 1 with an impregnating solution of catalytically active compound or mixture of compounds for a time sufficient to impregnate said pillared, interlayered clay product with a catalytic amount of said catalytically active compound or mixture of compounds and

(b) recovering impregnated pillared, interlayered clay product from said impregnating solution.

23. A pillared, interlayered clay product prepared by the method of claim 1.

31. A pillared, interlayered clay admixed with zeolite prepared by the method of claim 9.

4,637,992

INTERCALATED CLAY COMPOSITIONS

Robert M. Lewis, Sugarland, Tex., and Rutger A. Van Santen, Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 17, 1984, Ser. No. 682,732
Int. Cl.⁴ B01J *21/16*
U.S. Cl. 502—84 **7 Claims**

1. A clay composition comprising colloidal inorganic oxide particles intercalated between the swellable layers of said clay wherein said clay layers are separated by a distance of at least 16 angstrom.

2. A process for preparing a clay composition having inorganic oxide particles intercalated between the swellable layers of said clay which process comprises:

a. contacting a swellable layered clay with a solution of colloidal inorganic oxide particles, said particles having net positive surface charges,

b. separating the intercalated clay from the solution and,

c. drying said intercalated clay.

4,637,993

PROCESS FOR PREPARATION OF CATALYST

Willibrord A. van Erp; Johannes M. Nanne, and Martin F. M. Post, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 25, 1985, Ser. No. 780,066
Claims priority, application Netherlands, Oct. 4, 1984, 8403071
Int. Cl.[4] B01J *21/06, 21/08, 23/74*
U.S. Cl. 502—242 4 Claims

1. A process for the preparation of catalysts comprising cobalt and a zirconium promoter supported on a silica carrier, wherein the cobalt is distributed over the carrier in such a manner as to satisfy the relation $(\Sigma V_p/\Sigma V_c) \leqq 0.55$, where ΣV_c represents the total volume of the catalysts particles under consideration and ΣV_p is found by adding up the peel volumes present in the catalyst particles, the latter being regarded as being composed of a kernel surrounded by a peel, which kernel is of such a shape that at every point of the kernel perimeter the shortest distance (d) to the perimeter of the peel is the same, d being equal for all catalyst particles under consideration, and having been chosen such that the quantity of cobalt present in ΣV_p is 90% of the quantity of cobalt present in ΣV_c, which process comprises immersing a porous carrier once or several times in a solution of a cobalt compound, removing the liquid from the composition after each immersion and finally calcining and activating the composition, that during each immersion the following relation between the viscosity measured at 60° C. (v in cS) and the temperature (T in °K.) of the solution, and the immersion time (t in s) is satisfied: $(\log v/t \times T) \times 10^4 \geqq 1$.

4,637,994

ADSORBENT AND PROCESS FOR PREPARING THE SAME

Nobutaka Tani, Minoo, and Tsuneo Hayashi, Ashiya, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 557,061, Dec. 1, 1983, Pat. No. 4,576,928. This application May 28, 1985, Ser. No. 737,880
Claims priority, application Japan, Dec. 2, 1982, 57-212379; Feb. 25, 1983, 58-31194; Apr. 18, 1983, 58-68116; Apr. 21, 1983, 58-70967; Oct. 5, 1983, 58-187365
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.
Int. Cl.[4] B01J *20/22*
U.S. Cl. 502—404 19 Claims

1. An adsorbent for removing low and/or very low density lipoprotein from body fluid in extracorporeal circulation treatment, which comprises a water-insoluble porous hard gel with exclusion limit of 10^6 to 10^9 daltons on which a sulfated compound is immobilized by a covalent linkage; said sulfated compound being a compound obtained by sulfation of a hydroxy-containing compound.

4,637,995

PREPARATION OF MONOLITHIC CATALYST SUPPORTS HAVING AN INTEGRATED HIGH SURFACE AREA PHASE

Thomas P. DeAngelis, Horseheads, and Irwin M. Lachman, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 18, 1985, Ser. No. 712,885
Int. Cl.[4] B01J *20/28, 35/00*
U.S. Cl. 502—439 25 Claims

1. A method of preparing a monolithic catalyst support which comprises:

(a) providing a substantially homogeneous body comprising an admixture of

(i) a first phase sinterable ceramic matrix material, in particulate form finer than 200 mesh, selected from the group consisting of cordierite, mullite, alpha-alumina, lithium aluminosilicate, and mixtures of these, and

(ii) a second phase high surface area catalyst-support material having a crystalline size no larger than 0.2 microns and a surface area of at least 40 m^2/g, said catalyst-support material consisting of transition metal sulfide; a mixture of transition metal sulfides; porous oxide selected from the group consisting of alumina, zirconia, spinel, silica, zeolite, titania, and mixtures of these; or a mixture of said sulfide and said oxide materials;

(b) forming the resultant body into a desired shape; and

(c) heating the shaped body at a temperature sufficient to sinter the first phase matrix material.

17. A monlithic catalyst support comprising 50–90 parts by weight of a sintered ceramic matrix material and 10–50 parts per weight of a high surface area catalyst-support material dispersed throughout the matrix wherein

(a) the ceramic matrix material consists of cordierite, mullite, alpha-alumina, lithium aluminosilicate, or mixtures of these; and

(b) the dispersed catalyst-support material has a surface area of at least 40 m^2/g and a crystallite size no larger than about 0.5 microns, and the catalyst-support material consists of transition metal sulfide; a mixture of transition metal sulfides; porous oxide selected from the group consisting of alumina, zirconia, spinel, silica, zeolite, titania, and mixtures of these; or a mixture of said sulfide and said oxide materials.

4,637,996

ANTIULCER COMPOSITION CONTAINING A DIPEPTIDE COMPOUND

Jin-emon Konishi, Musashino, Japan, assignor to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Filed May 24, 1985, Ser. No. 737,420
Claims priority, application Japan, May 24, 1984, 59-105098
Int. Cl.[4] A61K *37/43*
U.S. Cl. 514—11 5 Claims

1. A method for the treatment of ulcers in mammals which comprises administering to such a mammal an effective amount of a dipeptide as the active substance selected from the group consisting of Gly-Ser, Ser-His, His-Lys and cyclic His-Lys, or a pharmaceutically acceptable salt thereof.

4,637,997

HEXAPEPTIDE, PROCESS FOR OBTAINING II AND THE PHARMACEUTICAL COMPOSITIONS CONTAINING II

Pierre Jolles, Paris; Danièle Migliore-Samour, Le Kremlin-Bicêtre; Fabienne Parker, St. Maur des Fosses, all of France, and Monika Casaretto, Monchen-Gladbach, Fed. Rep. of Germany, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France

Filed Feb. 4, 1985, Ser. No. 697,903
Claims priority, application France, Feb. 7, 1984, 84 01816
Int. Cl.[4] A61K *37/43;* C07K *7/06*
U.S. Cl. 514—17 3 Claims

1. The hexapeptide of formula

Val-Glu-Pro-Ile-Pro-Tyr

in which the amino acids are in L form.

4,637,998

PHARMACEUTICAL COMPOSITION CONTAINING A DERIVATIVE OF PARA-AMINOBENZOIC ACID AS AN ACTIVE INGREDIENT

Chikao Yoshikumi, Kunitachi; Yoshio Ohmura, Funabashi; Fumio Hirose, Tokyo; Masanori Ikuzawa, Tachikawa; Kenichi Matsunaga, Shinjuku; Takayoshi Fujii, Adachi; Minoru Ohhara, Itabashi, and Takao Ando, Setagaya, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 81,190, Oct. 2, 1979, Pat. No. 4,322,408, which is a continuation-in-part of Ser. No. 24,095, Mar. 26, 1979, abandoned. This application Aug. 20, 1981, Ser. No. 294,574
The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—42 16 Claims

1. A pharmaceutical composition in dosage unit form which comprises a dosage effective for the treatment of hyperglycemia, hypertension, hyperlipemia, inflammatory disease, pains due to the accentuation of central nerve and pyrexia due to accentuation of central nerve of a compound of the formula:



wherein R^1 denotes one member selected from the group consisting of the residual groups formed by removing OH at 1(alpha) or 1(beta) position from arabinose, glucose and galactose, or a pharmaceutically acceptable salt thereof; and a carrier or a diluent therefor.

8. A method for the treatment of hyperglycemia, which comprises administering to an animal suffering from hyperglycemia, and effective amount of a compound of the formula:



wherein R^1 denotes one member selected from the group consisting of the residual groups formed by removing OH at 1(alpha) or 1(beta) position from arabinose, glucose, galactose and mannose, or a pharmaceutically acceptable salt thereof.

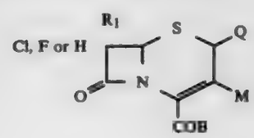
4,637,999

SUBSTITUTED CEPHALOSPORINS AS ANTI-INFLAMMATORY AND ANTIDEGENERATIVE AGENTS

James B. Doherty, New Milford; Paul E. Finke, Metuchen; Raymond A. Firestone, Fanwood; Shrenik S. Shah, Clark, and Kevan R. Thompson, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 2, 1983, Ser. No. 490,617
Int. Cl.[4] C07D *501/20;* A61K *31/545*
U.S. Cl. 514—201 8 Claims

1. A pharmaceutical composition for treating elastase-mediated conditions in a mammalian species comprising a non-toxic pharmaceutical carrier and an effective amount of a compound of structural formula:

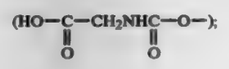


(I)

wherein

M is:

(1) trifluoromethyl;
(2) chloro or fluoro;
(3) —COOH;
(4) —CHO;
(5) tosyloxy; or
(6) $—CH_2A$ wherein A represents
(a) hydrogen;
(b) halo;
(c) hydroxy;
(d) C_{1-6}alkoxy;
(e) phenyloxy;
(f) phenyl C_{1-6}alkoxy;
(g) unsubstituted or substituted mercapto of formula SR_5 wherein R_5 is H, C_{1-6}alkyl, phenyl, benzyl, C_{1-6}alkenyl,
(h) —SCOR, —SCOOR or SCSOR wherein R is H or C_{1-6}alkyl;
(i) C_{1-6}alkanoyloxy, benzylcarboxyloxy or phenylcarbonyloxy;
(j) a substituted or unsubstituted amino or amido group selected from a group consisting of $—NH_2$, —CONHR, $—CON(R)_2$, —NHR, and $—N(R)_2$;
(k) 3-(hydroxycarbonyl)propanoyloxy;
(l) hydroxycarbonylmethylaminocarbonyloxy



R_1 is

(a) hydrogen;
(b) OR'_1 wherein R'_1 is C_{1-6}alkyl, phenyl or phenyl C_{1-6}alkyl;



where R represents H, C_{1-6}alkyl, phenyl, benzyl, or C_{1-6}alkylamino;
(c) C_{1-6}alkyl, phenyl or phenyl C_{1-6}alkyl;
(d) halo;

B is OB_1 or NB_2B_3 wherein B_1 and B_2 independently are:

(a) straight or branched chain alkyl having from 1 to 6 carbon atoms;
(b) phenyl;
(c) cycloalkyl having from 3 to 8 carbon atoms;
(d) alkenyl having from 2 to 8 carbon atoms;
(e) cycloalkenyl having from 5 to 8 carbon atoms;
(f) alkynyl having from 2 to 8 carbon atoms;
(g) alkoxy alkyl having from 2 to 10 carbon atoms;
(h) phenyl C_{1-6}alkyl or C_{1-6}alkylphenyl;
(i) C_{2-8}alkenylalkyl;
(j) C_{2-8}alkanoylalkyl;
(k) C_{2-8}alkanoyloxyalkyl;
(l) C_{1-6}alkoxycarboxylC_{1-6}alkyl;

the above groups (a)–(l) being unsubstituted or substituted by radicals such as alkyl, hydroxy, alkoxy, halo, nitro, mercapto, amino, substituted mono or diC_{1-6}alkyl amino, cyano, carboxy, $—SO_2NH_2$, carbamoyl, carbamoyloxy, alkylsulfonyl, alkylsulfinyl, sulfamoyl, azido, carboxamido or N-substituted carboxamido;

B_3 is B_1 or hydrogen; and

Q is

(1) hydrogen;
(2) C_{1-6}alkyl;
(3) haloC_{1-6}alkyl;
(4) hydroxy C_{1-6}alkyl;
(5) C_{1-6}alkyl methylene, phenylmethylene, or phenylthiomethylene;
(6) C_{1-6}alkoxy C_{1-6}alkyl;
(7) benzyl;

(8) phenylthio C_{1-6}alkyl, phenylsulfinyl C_{1-6}alkyl or phenylsulfonyl C_{1-6}alkyl;
(9) phenoxy C_{1-6}alkyl; or
(10) phenylamino C_{1-6}alkyl.

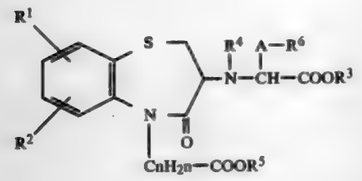
4,638,000

CONDENSED SEVEN-MEMBERED RING COMPOUNDS, THEIR PRODUCTION AND USE

Hirosada Sugihara, Osaka; Kobei Nishikawa, Kyoto, and Katsumi Ito, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

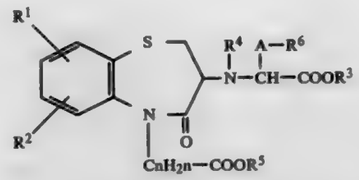
Continuation-in-part of Ser. No. 637,620, Aug. 3, 1984, Pat. No. 4,548,932. This application Jan. 14, 1985, Ser. No. 691,005
Claims priority, application PCT Int'l Appl., Mar. 22, 1984, PCT/JP84/00119; Apr. 6, 1984, PCT/JP84/00172; Jul. 13, 1984, PCT/JP84/00363
Int. Cl.⁴ A61K *31/55*; C07D *417/12*
U.S. Cl. 514—211 **27 Claims**

1. A compound of the formula:



wherein
R^1 and R^2 are independently hydrogen, halogen, trifluoromethyl, C_{1-4} alkyl or C_{1-4} alkoxy, or both jointly form tri- or tetramethylene,
R^3 and R^5 are independently hydrogen, C_{1-4} alkyl or phenyl-C_{1-4} alkyl,
R^4 is hydrogen or C_{1-4} alkyl,
R^6 is oxetanyl, thietanyl, azetidinyl, tetrahydrofuryl, tetrahydrothienyl, pyrrolidinyl, oxanyl, thianyl, piperidyl, oxepanyl, thiepanyl, perhydroazeipinyl, oxocanyl, thiocanyl, perhydroazocinyl, dioxanyl, dithianyl, piperazinyl, morpholinyl, perhydrothiazinyl, oxathianyl, perhydrodiazepinyl, oxathiepanyl, dioxepanyl, dithiepanyl, perhydrooxazepinyl, perhydrothiazepinyl, perhydrooxazocinyl, perhydrothiazocinyl, oxathiocanyl, perhydrodiazocinyl, dithiocanyl, dioxocanyl, chromanyl, isochromanyl, 3,4-dihydro-2H-1-thianaphthyl, 3,4-dihydro-1H-2-thianaphthyl, 1,2,3,4-tetrahydroquinolyl, 1,2,3,4-tetrahydroisoquinolyl, 2,3-dihydrobenzofuryl, 1,3-dihydroisobenzofuryl, 2,3-dihydrobenzothienyl, 1,3-dihydrobenzothienyl, indolinyl, isoindolinyl, 2,3,4,5-tetrahydro-1(1H)-benzoazepinyl, 2,3,4,5-tetrahydro-3(1H)-benzoazepinyl, 2,3,4,5-tetrahydro-2(1H)-benzoazepinyl, 2,3,4,5-tetrahydro-1-benzoxepinyl, 1,3,4,5-tetrahydro-2-benzoxepinyl, 1,2,4,5-tetrahydro-3-bemzoxepinyl, 2,3,4,5-tetrahydro-1-benzothiapinyl, 1,3,4,5-tetrahydro-2-benzothiepinyl, 1,2,4,5-tetrahydro-3-benzothiepinyl, 2,3-dihydro-1,4-benzodioxinyl 2,3-dihydro-1,4-dithianaphthyl, 1,2,3,4-tetrahydroquinoxalinyl, 3,4-dihydro-2H-1,4 benzoxadinyl, 3,4-dihydro-2H-1,4-benzothiadinyl, 2,3-dihydro-1,4-benzoxathienyl, 3,4-dihydro-2H-1,5-benzoxepanyl, 2,3-dihydro-5H-1,4-benzodioxepinyl, 2,3,4,5-tetrahydro-1H-1,5-benzodiazepinyl, 2,3,4,5-tetrahydro-1H-1,4-benzodiazepinyl, 3,4-dihydro-2H-1,5-benzodithiepinyl, 2,3-dihydro-5H-1,4-benzodithiepinyl, perhydroindolyl, perhydroisoindolyl, perhydroquinolyl, perhydroisoquinolyl, perhydro-1-thianaphthyl or perhydro-2-thianaphthyl, each of said groups being unsubstituted or substituted by C_{1-4} alkyl, oxo, C_{1-5} alkanoyl, benzoyl, phenyl-C_{1-4} alkoxycarbonyl or C_{1-4} alkoxycarbonyl,
A is C_{1-16} alkylene and
the group C_nH_{2n} represents methylene, ethylene or ethylidene,
or a pharmaceutically acceptable salt thereof.

27. A method for prevention or treatment of hypertension in a mammal, which comprises administering to said mammal an effective antihypertensive amount of a compound of the formula:



wherein
R^1 and R^2 are independently hydrogen, halogen, trifluoromethyl, C_{1-4} alkyl or C_{1-4} alkoxy, or both jointly from tri- or tetramethylene,
R^3 and R^5 are independently hydrogen, C_{1-4} alkyl or phenyl-C_{1-4} alkyl,
R^4 is hydrogen or C_{1-4} alkyl,
R^6 is oxetanyl, thietanyl, azetidinyl, tetrahydrofuryl, tetrahydrothienyl, pyrrolidinyl, oxanyl, thianyl, piperidyl, oxepanyl, thiepanyl, perhydroazepinyl, oxocanyl, thiocanyl, perhydroazocinyl, dioxanyl, dithianyl, piperazinyl, morpholinyl, perhydrothiazinyl, oxathianyl, perhydrodiazepinyl, oxathiepanyl, dioxepanyl, dithiepanyl, perhydrooxazepinyl, perhydrothiazepinyl, perhydrooxazocinyl, perhydrothiazocinyl, oxathiocanyl, perhydrodiazocinyl, dithiocanyl, dioxocanyl, chromanyl, isochormanyl, 3,4-dihydro-2H-1-thianaphthyl, 3,4-dihydro-1H-2-thianaphthyl, 1,2,3,4-tetrahydroquinolyl, 1,2,3,4-tetrahydroisoquinolyl, 2,3-dihydrobenzofuryl, 1,3-dihydroisopenzofuryl, 2,3-dihydrobenzothienyl, 1,3-dihydrobenzothienyl, indolinyl, isoindolinyl, 2,3,4,5-tetrahydro-1(1H)-benzoazepinyl 2,3,4,5-tetrahydro-3(1H)-benzoazepinyl, 2,3,4,5-tetrahydro-2(1H)-benzoazepinyl, 2,3,4,5-tetrahydro-1-benzoxepinyl, 1,3,4,5-tetrahydro-2benzoxepinyl, 1,2,4,5-tetrahydro-3-benzoxepinyl, 2,3,4,5-tetrahydro-1-benzothiepinyl, 1,3,4,5-tetrahydro-2-benzothiepinyl, 1,2,4,5-tetrahydro-3-benzothiepinyl, 2,3-dihydro-1,4-benzodioxinyl, 2,3-dihydro-1,4-dithianaphthyl, 1,2,3,4-tetrahydroquinoxalinyl, 3,4-dihydro-2H-1,4-benzoxadinyl, 3,4-dihydro-2H-1,4-benzothiadinyl, 2,3-dihydro-1,4-benzoxathienyl, 3,4-dihydro-2H-1,5-benzoxepanyl, 2,3-dihydro-5H-1,4benzodioxepinyl, 2,3,4,5-tetrahydro-1H-1,5-benzodiazepinyl, 2,3,4,5-tetrahydro-1H-1,4-benzodiazepinyl, 3,4-dihydro-2H-1,5-benzodithiepinyl, 2,3-dihydro 5H-1,4-benzodithiepinyl, perhydroindolyl, perhydroisoindolyl, perhydroquinolyl, perhydroisoquinolyl, perhydro-1-thianaphthyl or perhydro-2-thianaphthyl, each of said groups being unsubstituted or substituted by C_{1-4} alkyl, oxo, C_{1-5} alkanoyl, benzoyl, phenyl-C_{1-4} alkoxycarbonyl or C_{1-4} alkoxycarbonyl,
A is C_{1-16} alkylene and
the group C_nH_{2n} represents methylene, ethylene or ethylidene,
or a pharmaceutically acceptable salt thereof.

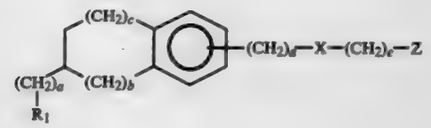
4,638,001

BICYCLIC BENZENOID AMINOALKYLENE ETHERS AND THIOETHERS, PHARMACEUTICAL COMPOSITIONS AND USE

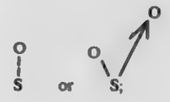
Donald E. Kuhla, Doylestown; Henry F. Campbell, Lansdale, and William L. Studt, Harleysville, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 489,702, Apr. 29, 1983, Pat. No. 4,529,723. This application Apr. 27, 1984, Ser. No. 604,813
The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.
Int. Cl.⁴ A61K *31/41, 31/535*; C07D *249/12, 413/12*
U.S. Cl. 514—212 **21 Claims**

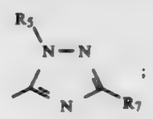
1. A compound of the formula:



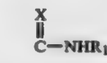
wherein:
a is 0, 1 or 2;
b is 0 or 1;
c is 1-b, 2-b or 3-b
d is 0 or 1;
e is 2, 3 or 4;
X is oxygen, sulfur,



Z is $—NHR_4$;
R_1 is $—NR_2R_3$;
R_2 and R_3 are each independently H or alkyl, or both together with the nitrogen to which they are attached form a 5, 6 or 7-membered ring which may include one to three additional hetero atoms of N, O or S;
R_4 is



R_5 is H or lower alkyl;
R_7 is hydrogen, lower alkyl, lower alkenyl, aryl, arloweralkyl, hydroxyloweralkyl, acyloxyloweralkyl, loweralkoxyloweralkyl, aryloxyalkyl, aroyloxyalkyl, aralkyloxyalkyl, aminoalky, alkylaminoalkyl, dialkylaminoalkyl, hydroxy, alkoxy, alkylthio or halogen or NR_8R_9;
R_8 is hydrogen, loweralkyl,, lower alkenyl or arloweralkyl;
R_9 is hydrogen, COR_{10}, SO_2R_{11} or



R_{10} is hydrogen, loweralkyl, aryl, arloweralkyl, loweralkoxy, heteroaryl, or monocyclic heteroarylalkyl;
R_{11} is lower alkyl or aryl;
R_{12} is hydrogen, lower alkyl, cyclololoweralkyl, aryl or arloweralkyl; wherein any aryl is phenyl or substituted phenyl and any aroyl is benzoyl;
or a pharmaceutically acceptable salt thereof.

18. A method for decreasing acid secretion in the gastrointestinal tract of mammals by administering thereto an antisecretory effective amount of a compound according to claim 1.

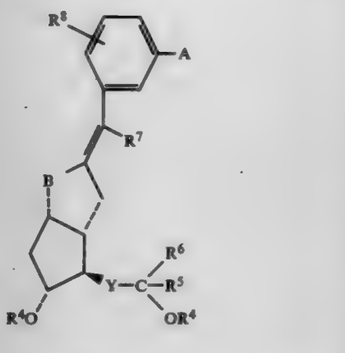
4,638,002

2,3,4-TRINOR-1,5-INTER-META-PHENYLENE-PROSTACYCLIN COMPOUNDS USEFUL IN INHIBITING THROMBOCYTE AGGREGATION

Istvan Szekely, Dunakeszi; Sandor Botar, Budapest; Krisztina Dolgos nee Kekesi, Debrecen; Bela Bertok, Dombovar; Antal Gajary, Budapest; Tamas Szabolcsi, Budapest; Gabor Kovacs, Budapest, and Marianna Lovasz nee Gaspar, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

PCT No. PCT/HU83/00021, § 371 Date Dec. 30, 1983, § 102(e) Date Dec. 30, 1983, PCT Pub. No. WO83/04021, PCT Pub. Date Nov. 24, 1983
PCT Filed May 6, 1983, Ser. No. 576,399
Claims priority, application Hungary, May 6, 1982, 1421/82
Int. Cl.⁴ A61K *31/44*; C07D *307/935*
U.S. Cl. 514—212 **6 Claims**

1. A compound of the Formula (I)



wherein
A stands for carboxy, cyano, tetrazolyl or $—COOR^3$ or $—CONR^1R^2$;
R^3 is C_{1-4} alkyl or an equivalent of a pharmacologically acceptable cation;
R^1 and R^2 each stands for hydrogen, phenyl; C_{1-5} alkyl optionally substituted by carboxy, hydroxy, phenyl or C_{2-5} alkoxycarbonyl; or C_{1-4} alkylsulfonyl; or
R^1 and R^2 together form an α,ω-alkylene chain containing 3–6 carbon atoms;
B stands for oxygen;
Y is optionally bromo-substituted vinylene or a $—C{\equiv}C—$ group;
R^4 stands for hydrogen or tetrahydro-pyran-2-yl;
R^5 represents an alkyl group containing 5–9 carbon atoms, which can be optionally interrupted by one or more oxygen atoms or $—CH{=}CH—$ or $C{\equiv}C$ groups and/or optionally substituted by halogen; or a phenoxymethyl group optionally substituted by halogen or trifluoromethyl; or an alkenoyloxymethyl group containing 3–5 carbon atoms in the alkenoyl group;
R^6 is hydrogen or C_{1-4} alkyl;
R^7 stands for hydrogen, halogen, cyano, C_{1-4} alkyl or C_{1-4} alkoxy;
R^8 is hydrogen, halogen, cyano, nitro, hydroxy or C_{2-5} alkanoylamido;
with the proviso that if
R^5 stands for an alkyl group containing 5 to 9 carbon atoms or haloalkyl with 5 to 9 carbon atoms, or a phenoxymethyl group optionally substituted by halogen or trifluoromethyl, then either R^7 is other than hydrogen, or C_1 to C_4 alkyl, or R^8 is other than hydrogen, or A is other than carboxy or $—COOR^3$, or a salt thereof formed with a pharmaceutically acceptable cation.

6. A method of treating an animal subject in need of a prolonged cytoprotective, thrombocyte aggregation inhibiting, and a low hypotensive effect which comprises the step of administering to said animal subject a pharmaceutically effective amount of the compound of the formula (I) defined in claim 1 or a salt formed thereof with a pharmacologically acceptable cation.

4,638,003

1-(4-ALKYLTHIOPHENYL)-2-(SUBSTITUTED OR UNSUBSTITUTED PIPERAZINE-1-YL)-1,3-PROPANEDIOL, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM USEFUL AS ANTIARRHYTHMIC AND VASODILATING AGENTS

Dario Chiarino, Monza; Angelo Carenzi, Busto Arsizio; Davide Della Bella, Milan, and Mario Fantucci, Piazza Brembana, all of Italy, assignors to Zambon S.p.A., Vicenza, Italy

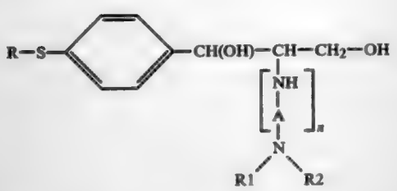
Filed Aug. 1, 1984, Ser. No. 636,714

Claims priority, application Italy, Aug. 5, 1983, 22451 A/83

Int. Cl.⁴ A61K *31/495, 31/135;* **C07D** *241/04*

U.S. Cl. 514—255 **17 Claims**

1. A compound of the Formula



(I)

wherein

R is an alkyl having from 1 to 4 carbon atoms;

n is 0 or 1;

A is an alkyl having from 2 to 6 carbon atoms;

R1 is hydrogen or an alkyl having from 1 to 6 carbon atoms;

R2 is a phenoxyalkyl, a mono- or di-phenylalkyl where the alkyl has from 1 to 6 carbon atoms and the phenyl moiety can be substituted by one or two substituents, equal or different between them, which are selected from the group conprising halogen, 1–4 C alkyl and 1–4 C alkoxy, or

R1 and R2, together with the nitrogen atom to which they are linked, form a piperozinyl ring which can be substituted on one having nitrogen by a 3–6 C cycloalkyl, a 1–6 C alkyl or by a mono- or a diphenylalkyl where, in turn, the alkyl has from 1 to 6 carbon atoms and the phenyl moiety can be substituted by one or two substituents, equal or different between them, which are selected from the group consisting halogen, 1–4 C alkyl and 1–4 C alkoxy,

and pharmaceutically acceptable salts thereof with organic and inorganic pharmaceutically acceptable acids.

5. A method comprising administering to an animal in need thereof a calcium antagonist activity effective amount of a compound according to claim 1.

4,638,004

SUBSTITUTED PHENYLSULPHONYLUREAS

Jörg Stetter, Wuppertal; Heinz-Jürgen Wroblowsky, Langenfeld; Robert R. Schmidt, Bergisch-Gladbach; Hans-Joachim Santel, Cologne; Gerd Hänssler, Leverkusen, and Klaus Lürssen, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

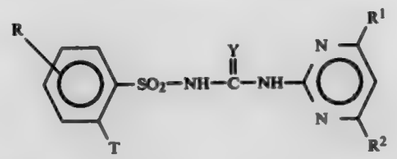
Filed May 15, 1985, Ser. No. 734,503

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1984, 3420769

Int. Cl.⁴ C07D *239/46;* **A01N** *43/54*

U.S. Cl. 514—272 **14 Claims**

1. A substituted phenylsulphonylurea of the formula



in which

R is hydrogen, fluorine, chlorine, bromine, iodine, nitro or alkyl, halogenoalkyl or alkoxy, each of which has up to 4 carbon atoms and, where relevant, up to 9 halogen atoms,

Y is oxygen or sulphur,

T is —X—CH_2—$Si(CH_3)_3$, or



R^1 and R^2 each independently is alkyl, alkoxy, or alkoxyalkyl, each having up to 6 carbon atoms in the individual alkyl parts,

X is oxygen, sulphur, the sulphinyl group or the sulphonyl group,

X′ is hydrogen or alkyl having 1 to 4 carbon atoms, and

R^3 is hydrogen, or alkyl, alkenyl, alkinyl, alkoxyalkyl, alkylthioalkyl, halogenoalkyl or halogenoalkenyl, each of which has up to 6 carbon atoms in the individual alkyl or alkenyl or alkinyl parts, and, where relevant, up to 9 halogen atoms, or is aralkyl which has up to 4 carbon atoms in the alkyl part and 6 to 10 carbon atoms in the aryl part and is optionally substituted in the aryl part by halogen, cyano, nitro, or alkyl, alkoxy or halogenoalkyl, each of which has up to 4 carbon atoms and, where relevant, up to 9 halogen atoms.

11. A method of combating fungi which comprises applying to such fungi or a fungus habitat a fungicidally effective amount of a compound according to claim 1.

4,638,005

MONOQUATERNIZED PYRAZINIUM COMPOUNDS AND THEIR USE AS ELECTRON CARRIERS IN PHOTOSYNTHETIC PROCESSES

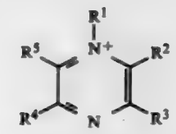
Guillermo A. Iacobucci; George A. King; Jacob H. Goldstein, all of Atlanta, Ga., and John R. Bensemann, Vallejo, Calif., assignors to The Coca-Cola Company

Filed Mar. 18, 1983, Ser. No. 476,544

Int. Cl.⁴ C07D *241/12, 241/18*

U.S. Cl. 544—336 **34 Claims**

1. A monoquaternized pyrazinium compound of the formula:



wherein:

R^1 is alkyl of 1 to 3 carbons, or (carboxy)alkyl of 2 to 4 carbons;

R^2, R^4 and R^5 are independently selected from hydrogen, and alkyl of 1 to 3 carbons;

R^3 is sulfonoxy or a group of the formula $(CH_2)_nCHXY$ wherein

X is hydrogen, hydroxy, carboxy, carboxamido, sulfonoxy, (sulfonoxy)alkyl of 1 to 3 carbons, (carboxy) alkyl of 2 to 4 carbons or dihydroxyalkyl of 2 to 3 carbons;

Y is hydrogen, (sulfonoxy)alkyl of 1 or 3 carbons, dihydroxyalkyl of 2 to 3 carbons or alkyl of 1 to 3 carbons; and n is a whole number from 0 to 3; or n is a whole number from 0 to 6 when either of X or Y constitutes a sulfonoxy group or a (sulfonoxy)alkyl group or when X and Y together constitute multiple polar groups;

provided that

when R^1 is alkyl, R^3 is other than alkyl; and

when R^1 and R^3 together contain other than a carboxy or sulfonoxy substituent, an anion is also present.

4,638,006

AMNESIA REVERSAL WITH N,N-DIALKYLAMINOALKYL-HEXAHYDRO-5-OXO 1H-PYRROLIZINE-3-CARBOXAMIDES

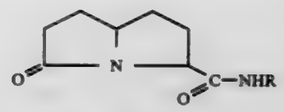
Donald E. Butler, Holland, Mich., assignor to Warner Lambert Company, Morris Plains, N.J.

Filed Sep. 24, 1985, Ser. No. 779,712

Int. Cl.⁴ A61K *31/445;* **C07D** *487/04*

U.S. Cl. 514—323 **22 Claims**

1. A compound having the structural formula



wherein R is $(CH_2)_nNR'R''$ wherein n is one, two, three, or four; R′ and R″ are each independently a straight or branched alkyl of from one to six carbon atoms or combined with the nitrogen to form cis- or trans-2,6-dimethyl piperidine which may optionally be substituted with one or more alkyl groups of from one to four carbon atoms; or a pharmaceutically acceptable acid addition salt thereof.

20. A cognition activating pharmaceutical composition comprising an effective amount of a compound as defined in claim 1 in combination with a pharmaceutically acceptable carrier.

4,638,007

TRIAZOLE ANTIFUNGAL AGENTS

Kenneth Richardson, and Peter J. Whittle, both of New York, N.Y., assignors to Pfizer Inc., New York, N.Y.

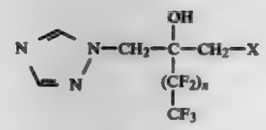
Filed Aug. 20, 1984, Ser. No. 642,301

Claims priority, application United Kingdom, Aug. 26, 1983, 8322983

Int. Cl.⁴ A61K *31/41;* **C07D** *401/12, 249/08*

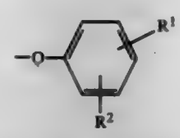
U.S. Cl. 514—340 **21 Claims**

1. A compound having the formula



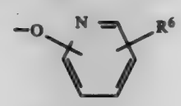
(I)

or a pharmaceutically or agriculturally acceptable salt thereof, wherein n is zero or an integer of from 1 to 4; and X is:



(a)

where R^1 and R^2 are each independently H, F, Cl, Br, I, CF_3, C_1–C_4 alkyl, C_1–C_4 alkoxy, —CN or —NO_2; or R^1 is H and R^2 is 1,2,4-triazol-1-yl;



(b)

where R^6 is H, F, Cl, Br, I, CF_3, C_1–C_4 alkyl, C_1–C_4 alkoxy, —CN or —NO_2;

$S(O)_m(C_1$–C_4 alkyl) (c)

where m is 0, 1 or 2; or

—$CONR^3R^4$ (d)

where R^3 and R^4 are each independently H or C_1–C_4 alkyl.

4,638,008

ANTIARRHYTHMIC AGENTS

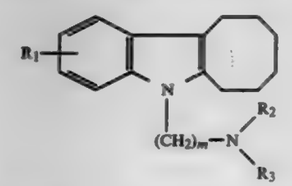
Magid A. Abou-Gharbia, Wilmington, Del.; Meier E. Freed, and Thomas J. Colatsky, both of Paoli, Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 684,211, Dec. 20, 1984, Pat. No. 4,546,193. This application Jun. 3, 1985, Ser. No. 740,651

Int. Cl.⁴ A61K *31/40*

U.S. Cl. 514—411 **3 Claims**

1. A method for preventing or relieving cardiac arrhythmia and coronary artery vasospasm which comprises orally or parenterally administering to an aminal in need thereof an effective amount of a compound of the formula:



in which

R_1 is —$NHCO_2R_8$ or —$NHCO_2(CH_2)_o$—NR_9R_{10} where R_8 is alkyl of 1 to 6 carbon atoms; R_9 and R_{10} are alkyl of 2 to 6 carbon atoms and o is 1 to 6;

R_2 and R_3 are alkyl of 1 to 6 carbon atoms; and

m is one of the integers 1,2,3 or 4;

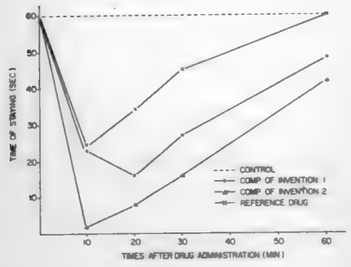
or a pharmaceutically acceptable salt thereof.

4,638,009

DERIVATIVES OF 3-PYRROLIDINOPROPIOPHENONE AND A PROCESS FOR PREPARATION THEREOF

Yasuo Itho, Katsuyamashi; Hideo Kato, Kentoku; Nobuo Ogawa, Katsuyamashi; Kagari Yamagishi, Katsuyamashi; Eiichi Koshinaka, Katsuyamashi, and Hiroyuki Nishino, Katsuyamashi, all of Japan, assignors to Hokurika Pharmaceutical Co., Ltd., Katsuyamashi Fukui, Japan

Filed Jan. 25, 1984, Ser. No. 573,862
Int. Cl.[4] A61K *31/41*; C07D *207/06*
U.S. Cl. 514—428 6 Claims



1. A compound which is selected from the group consisting of 4'-ethyl-2-methyl-3-pyrrolidinopropiophenone and a pharmaceutically-acceptable acid addition salt thereof.

5. A method of relaxing muscles in a subject in need thereof comprising the step of administering an effective muscle-relaxant amount of 4'-ethyl-2-methyl-3-pyrrolidinopropiophenone or an acid-addition salt thereof to the said subject.

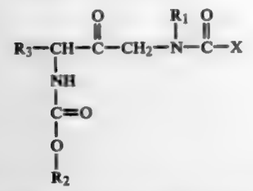
4,638,010

ESTER SUBSTITUTED AMINOALKANOYLUREIDO AMINO AND IMINO ACID AND ESTER COMPOUNDS

Harold N. Weller, III, and Eric M. Gordon, both of Pennington, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

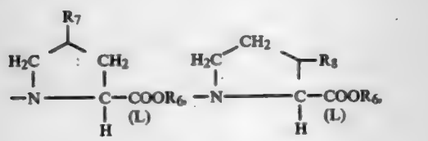
Filed Feb. 28, 1985, Ser. No. 707,123
Int. Cl.[4] C07D *207/04*; A61K *31/40, 31/34, 31/38*
U.S. Cl. 514—423 13 Claims

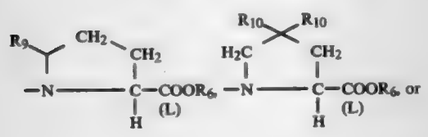
1. A compound of the formula



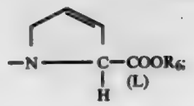
including a pharmaceutically acceptable salt thereof wherein:

X is

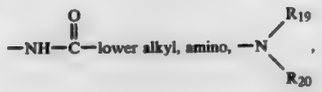


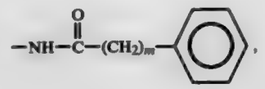


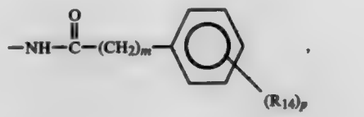
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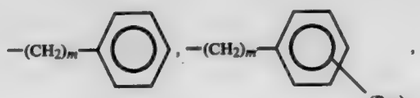


R_7 is hydrogen, lower alkyl, halogen, hydroxy,

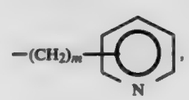




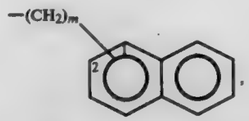




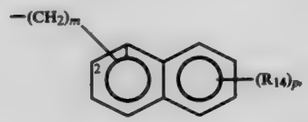




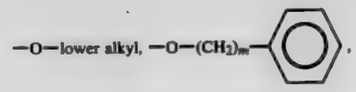
a 1- or 2-naphthyl of the formula



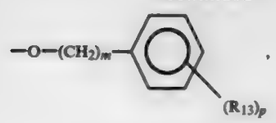
a substituted 1- or 2-naphthyl of the formula



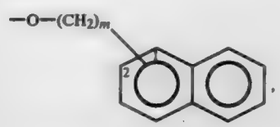




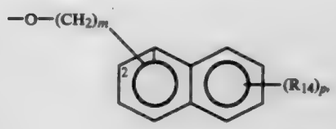
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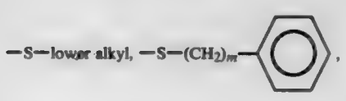


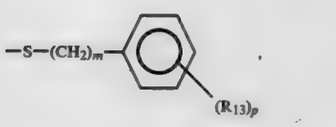
a 1- or 2-naphthyloxy of the formula



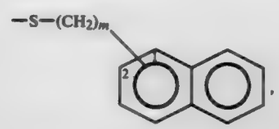
a substituted 1- or 2-naphthyloxy of the formula



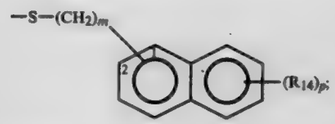




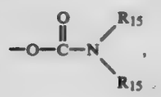
a 1- or 2-naphthylthio of the formula



or a substituted 1- or 2-naphthylthio of the formula

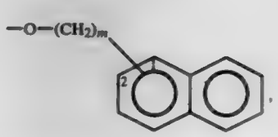


R_8 is halogen,

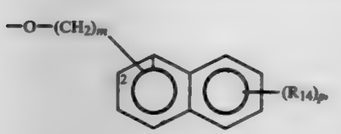


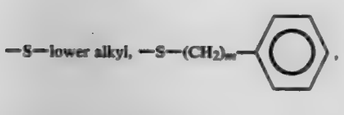


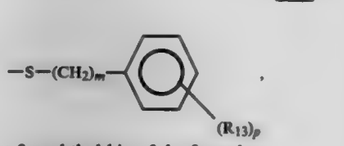
—O—lower alkyl, a 1- or 2-naphthyloxy of the formula



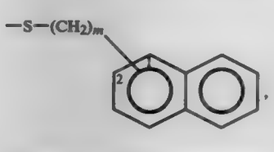
a substituted 1- or 2-naphthyloxy of the formula



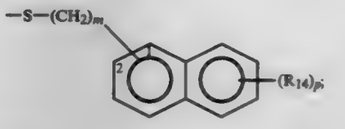




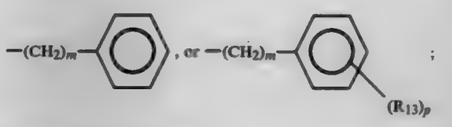
a 1- or 2-naphthylthio of the formula



or a substituted 1- or 2-naphthylthio of the formula



R_9 is keto,



R_{10} is halogen or —Y—R_{16};

R_{13} is lower alkyl of 1 to 4 carbons, lower alkoxy or 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;

R_{14} is lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl or hydroxy;

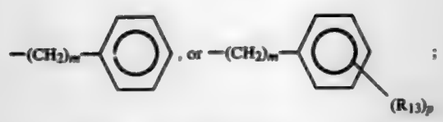
m is zero, one, two, three, or four;

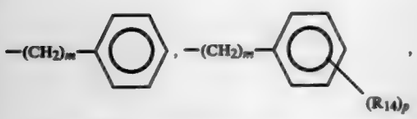
p is one, two or three provided that p is more than one only if R_{13} or R_{14} is methyl, methoxy, chloro, or fluoro;

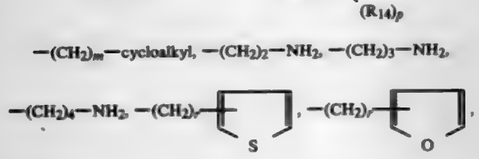
R_{15} is hydrogen or lower alkyl of 1 to 4 carbons;

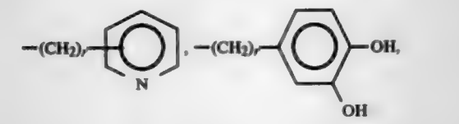
Y is oxygen or sulfur;

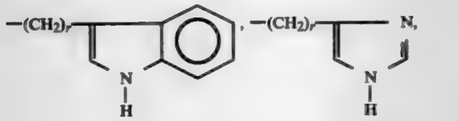
R_{16} is lower alkyl of 1 to 4 carbons

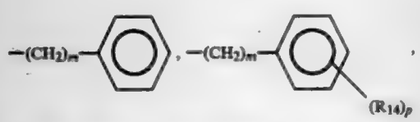


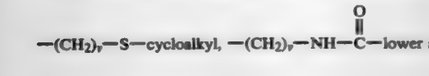


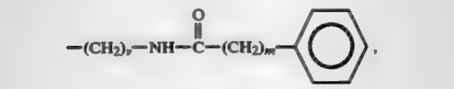


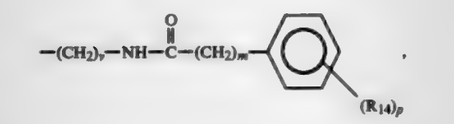




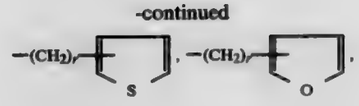








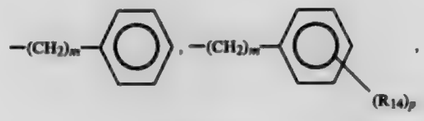
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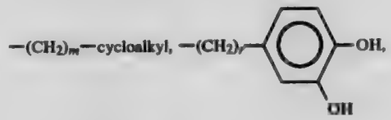


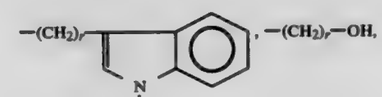
r is an integer from 1 to 4;
v is an integer from 2 to 4;
R_3 is hydrogen, lower alkyl,

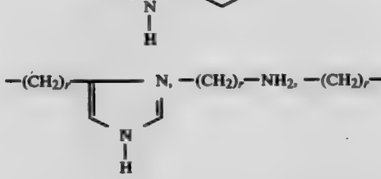


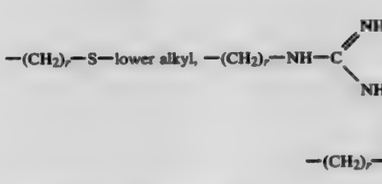




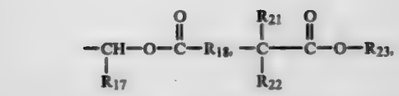


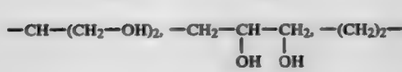


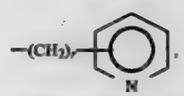




R_6 is hydrogen, lower alkyl, benzyl, benzhydryl,







or a pharmaceutically acceptable salt forming ion;
R_{17} is hydrogen, lower alkyl, cycloalkyl, or phenyl;
R_{18} is hydrogen, lower alkyl, lower alkoxy or phenyl;
R_{21} and R_{22} are independently selected from hydrogen and lower alkyl; and
R_{23} is lower alkyl.

13. The method of treating hypertension in a mammalian host which comprises administering a hypotensively effective amount of the composition of claim 12.

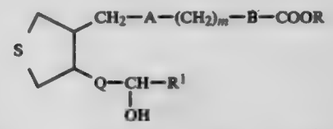
4,638,011

TETRAHYDROTHIENYL SUBSTITUTED PROSTAGLANDIN ANALOGS

Jagabandhu Das, Plainsboro, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 17, 1984, Ser. No. 682,713
Int. Cl.[4] A61K *31/38*; C07D *333/24*
U.S. Cl. 514—438 **18 Claims**

1. A compound of the structure



including all stereoisomers thereof, wherein A is $(CH_2)_n$—CH=CH— or a single bond; m is 1 to 8; B is —CH=CH— single bond, but where B is —CH=CH—, m is 1 to 6; Q is —CH=CH— or $-(CH_2)_n$—; n is 1 to 4; R is H, lower alkyl or alkali metal; and R^1 is lower alkyl, aryl, arylalkyl, cycloalkyl, cycloalkylalkyl or lower alkoxy.

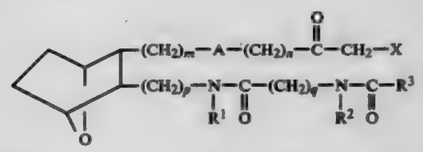
4,638,012

7-OXABICYCLOHEPTANE α-SUBSTITUTED KETONE PROSTAGLANDIN ANALOGS USEFUL IN THE TREATMENT OF THROMBOTIC DISEASE

Masami Nakane, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 5, 1985, Ser. No. 795,287
Int. Cl.[4] A61K *31/557, 31/34*; C07D *307/00*
U.S. Cl. 514—469 **18 Claims**

1. A compound having the structure



including all stereoisomers thereof, wherein m is 0 to 4; A is —CH=CH— or —CH_2—CH_2—; n is 1 to 5; X is halogen, alkanoyloxy or hydroxyl; p is 1 to 4; R^1 is H or lower alkyl; q is 1 to 12; R^2 is H or lower alkyl; and R^3 is H, lower alkyl, lower alkenyl containing 2 to 12 carbons, lower alkynyl containing 2 to 12 carbons, aryl, arylalkyl, lower alkoxy, aryloxy, amino, alkylamino, or arylamino, wherein lower alkyl or alkyl alone or as part of another group contains 1 to 12 carbons and is unsubstituted or is substituted with halo, CF_3, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl, alkylcycloalkyl, hydroxy, alkylamino, alkanoylamino, arylcarbonylamino, nitro, cyano, thiol or alkylthio;

aryl alone or as part of another group contains 6 to 10 carbons in the ring portion and is unsubstituted or is substituted with 1 or 2 lower alkyl groups, 1 or 2 halogens, 1 or 2 hydroxy groups, 1 or 2 lower alkoxy groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups and/or 1 or 2 alkylthio groups;

cycloalkyl alone or as part of another group contains 3 to 12 carbons and is unsubstituted or is substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups, 1 or 2 lower alkoxy groups, 1 or 2 hydroxyl groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups and/or 1 or 2 alkylthio groups;

$(CH_2)_m$, $(CH_2)_n$ and $(CH_2)_p$ may contain 1 or 2 lower alkyl and/or 1 or 2 halo substituents; and $(CH_2)_q$ may contain one or more halo, hydroxy, alkoxy, amino, alkylamino, arylamino, amido, thioamido, thiol, alkylthio, arylthio, cyano or nitro groups.

17. A method of inhibiting platelet aggregation or inhibiting bronchoconstriction associated with asthma, which comprises administering to a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,638,013

DIETETIC SUPPLEMENT AND PREPACKAGED FOOD IN WHICH IT IS CONTAINED, PROCESS OF PREPARATION AND METHOD OF ADMINISTRATION

Egidio A. Moja, Milan, and Gianluigi Gessa, Cagliari, both of Italy, assignors to Boehringer Biochemia Robin S.p.A., Italy

Filed Nov. 26, 1984, Ser. No. 674,853
Claims priority, application Italy, Nov. 30, 1983, 23959 A/83
Int. Cl.[4] A61K *31/195*
U.S. Cl. 514—561 **8 Claims**

1. A method for prolonging stage 4 sleep in humans which comprises administering to said humans, a tryptophan-free dietetic supplement comprising L-isoleucine, 4–16%; L-leucine, 9–27%; L-lysine, 7–20%; L-methionine, 9–27%; L-phenylalanine, 9–27%; L-threonine, 4–12%, and L-valine, 6–19%.

4,638,014

ANTICONVULSANT METHOD AND FORMULATIONS

C. Randall Clark, Auburn, Ala., assignor to Research Corporation, Tucson, Ariz.

Filed Aug. 26, 1985, Ser. No. 769,521
Int. Cl.[4] A61K *31/165*
U.S. Cl. 514—619 **5 Claims**

1. A method for treating or preventing convulsions in mammals in need of such treatment which comprises administering to said mammal an effective amount of a 3- or 4-amino-N-[(alkyl)$_n$phenyl)]benzamide or a pharmaceutically acceptable acid addition salt thereof, and wherein said alkyl group contains 1 to about 4 carbon atoms and n is 1 or 2.

4,638,015

EXPANDED POLYPROPYLENE FILMS

Jean-Noel M. Bertrand, Wezembeek-Oppem, Belgium, assignor to Montefina, S.A., Brussels, Belgium

Filed Sep. 30, 1985, Ser. No. 782,797
Claims priority, application Luxembourg, Oct. 8, 1984, 85577
Int. Cl.[4] C08J 9/08
U.S. Cl. 521—85 **13 Claims**

1. Films made of expanded polypropylene characterized by having (i) a uniform specific gravity d of from about 4.25×10^{-6} to about 6.50×10^{-6} Newton/mm^3, (ii) a crystallization temperature of from about 115° C. to about 135° C., and (iii) an elastic modulus Me expressed in Newton/mm^2 such that the ratio Me:d is from about 1.6×10^8 to about 2.0×10^8 mm.

4,638,016

PROCESS FOR PRODUCING HIGH DENSITY ELASTIC POLYURETHANE USING A COMBINATION OF 4-METHYL-1-(2-DIMETHYLAMINOETHYL) PIPERAZINE TOGETHER WITH ANOTHER TERTIARY AMINE CATALYST

Shoji Arai; Yutaka Tamano, and Masazumi Hasegawa, all of Yamaguchi, Japan, assignors to Toya Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Aug. 21, 1985, Ser. No. 767,870
Int. Cl.[4] C08G 18/18
U.S. Cl. 521—129 **8 Claims**

1. Process for producing a high density elastic polyurethane of reduced weight which comprises a polyol having a molecular weight of 500–4,000, a cross linking agent, a blowing agent, an organic polyisocyanate which is a terminal isocyanate prepolymer which is the reaction product of polyisocyanate and/or of a mixture of polyisocyanate and a compound containing two or more active hydrogen atoms in the molecule, comprising employing as catalyst 4-methyl-1-(2-dimethylaminoethyl) piperazine or a mixture of 4-methyl-1-(2-dimethylaminoethyl)-piperazine and another tertiary amine compound as co-catalyst.

4,638,017

HYDROPHILIC POLYURETHANE/POLYUREA SPONGE

Wayne K. Larson, and Steven T. Hedrick, both of Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 9, 1985, Ser. No. 806,758
Int. Cl.[4] C08G 18/14
U.S. Cl. 521—157 **15 Claims**

1. A water-absorbing sponge comprising at least one of a sulfo- group containing polyurea and polyurethane, the polymer containing at least one sulfonate equivalent per 20,000 molecular weight units.

4,638,018

ACRYLIC TELOMERS WITH GRAFTS WHICH CAN BE CROSS LINKED BY LIGHT, THEIR SYNTHESIS AND THEIR APPLICATIONS IN COATING METALS

Gerard Banduin; Bernard Boutevin, both of Montpellier; Willy-Jean Deiss, Grenoble, and Yves Pietrasanta, Meze, all of France, assignors to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

PCT No. PCT/FR84/00092, § 371 Date Dec. 10, 1984, § 102(e) Date Dec. 10, 1984, PCT Pub. No. WO84/04097, PCT Pub. Date Oct. 25, 1984
PCT Filed Apr. 6, 1984, Ser. No. 686,547
Claims priority, application France, Apr. 11, 1983, 83 06066
Int. Cl.[4] C08F 2/50, 22/16, 20/38
U.S. Cl. 522—103 **16 Claims**

1. Telomers which can be cross linked by light, of the general formula

$$A\text{+}\text{+}(Xi)_x\text{—}\underset{H}{(Xi)_y}\text{+}H]_\beta,$$

wherein Xi is a taxogen which is an acrylic acid or an ester thereof, R is a organic group which has at least one double bond which can be cross linked by light, x+y is less than or equal to 100 and A and H are the elements of a telogen, AH_β, wherein AH_β is a mercaptan where A has the formula BS_β where B is an organic group and $\beta \leq 2$,

and wherein

(1) taxogen Xi is an acrylic acid selected from the group consisting of acrylic, methacrylic, chloroacrylic, cyanoacrylic and itaconic acids, and

group R is produced by grafting a compound selected from the group consisting of glycidyl acrylate, glycidyl methacrylate, glycidyl cinnamate, glycidyl cinnamylidene, glycidyl furylacrylate, glycidyl allylate, 2-(1-aziridinyl-)ethyl acrylate and methacrylate, 3-(1-aziridinyl)propyl acrylate and methacrylate, 4-(1-aziridinyl)butyl acrylate and methacrylate, 6-(1-aziridinyl)hexyl acrylate and methacrylate and 8-(1-aziridinyl)octyl acrylate and methacrylate; or

(2) taxogen Xi is an acrylic acid ester selected from the group consisting of a glycidyl acrylate, an aziridinyl acrylate, glycidyl methacrylate, and 2-(1-aziridinyl)ethyl methacrylate, and

group R is produced by grafting a compound selected from the group consisting of acrylic, methacrylic, cinnamic, cinnamylidic, and furylacrylic acids.

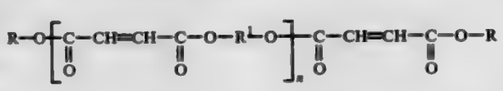
4,638,019

METHOD FOR RADICAL CROSS-LINKING OF ORGANIC POLYMERS

Wolfgang Von Gentzkow, Kleinsendelbach; Helmut Markert, Nürnberg; Hans Hanschildt, Erlangen, and Manfred Schmiedel, Nürnberg-Groessgründlach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 1, 1984, Ser. No. 585,250
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1983, 3307408
Int. Cl.[4] C08J 3/24/3/28
U.S. Cl. 522—104 **6 Claims**

1. In a method for radical cross-linking of an organic polymer in the presence of a cross-linking enhancer, the improvement which comprises using as said enhancer an oligomeric ester of the following formula



wherein R is alkenyl or alkynyl; R^1 is alkylene, alkenylene, alkynylene or $—(R^2—O)_m—R^2—$, with R^2 being CH_2, $(CH_2)_2$, $(CH_2)_3$ or $CH_2—CH(CH_3)$, and m being 1 to 50; n is 1 to 10; said method is carried out in the absence of polythiol; and the cross-linking enhancer is present in an amount of from 0.1 to 10 mass percent, relative to the weight of the polymer.

4,638,020

AQUEOUS COMPOSITION COMPRISING A PHOSPHATED EPOXY AND NON-SELF DISPERSIBLE RESIN

Roger M. Christenson, Gibsonia; Mary E. Rosenberger, Allison Park, and Marvin T. Tetenbaum, Wexford, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 23, 1984, Ser. No. 674,452
Int. Cl.[4] C08L 63/02
U.S. Cl. 523—406 **30 Claims**

1. An aqueous composition comprising:

(i) a resin which is non-self dispersible with a base, in water,

(ii) a non-gelled phosphated-epoxy which is derived from reacting a 1,2-epoxy material with a phosphoric acid, said phosphated-epoxy being present in an amount sufficient to effect dispersion of the resin of (i) in the aqueous composition,

(iii) a neutralizing base, and

(iv) water.

4,638,021

EPOXY RESIN COMPOSITION

Toshiharu Ando, Itami, and Masaru Tsuchihashi, Sanda, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1985, Ser. No. 701,304
Int. Cl.[4] C08L 63/00
U.S. Cl. 523—457 **6 Claims**

1. An epoxy resin composition which comprises a mixture a) obtained by mixing:

(i) 100 parts by weight of a polybasic carboxylic acid anhydride, with

(ii) from 10–70 parts by weight of a compound having at least 2 phenol groups in the molecule,

(iii) an epoxy resin having at least 2 epoxy groups in the molecule,

(iv) powered alumina, and

(v) from 0.05–5 parts by weight of zinc octylate.

4,638,022

MOLDING COATING COMPOSITION AND PROCESS

Carroll W. Cope, Marion, Va., assignor to DG Shelter Products, Marion, Va.

Filed Mar. 24, 1986, Ser. No. 843,203
Int. Cl.[4] C08K 11/00
U.S. Cl. 524—15 **3 Claims**

1. A basecoat formulation for forming a coating on wood or plastic surfaces, said coating capable of accepting a wood-colored stain, comprising, in parts by volume:

water-miscible thickener	0.179 part
dimethyl ethanol	0.187
defoamer	0.227
water dispersing resins	0.837
wetting agent	0.847
priming pigments	2.960
inert pigment	3.393
talc pigment	10.464
colloidal defoamer	0.194
fungicide	0.129
coalescer	1.629
acrylic emulsion	41.333
acrylic resin	12.748
pecan shell flour	2.326
water	24.875

4,638,023

PROCESS FOR THE PRODUCTION OF REAGENT FILMS AND REAGENT FILMS PRODUCED THEREBY

Heinz-Freidrich Trasch, Ludwigshafen; Anselm Rothe, Birkenau; Bernward Sojka, Viernheim; Wolfgang Werner, Mannheim, and Hans Wielinger, Weinheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Feb. 13, 1985, Ser. No. 701,089
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1984, 3406328
Int. Cl.[4] G01N 31/22, 33/52
U.S. Cl. 524—21 **7 Claims**

1. In a process for the production of reagent films of the type comprising applying a coating of an aqueous synthetic resin dispersion which contains adjuvants and reagents onto a solid substrate or onto a thin fabric in a thin layer, and thereafter drying said thin layer on said substrate or fabric;

the improvement comprising:

adding to the aqueous synthetic resin dispersion used for the coating, 0.5 to 5% by weight of a scleroprotein hydrolysate with a molecular weight of from 5000 to 50,000 which is cold soluble in said dispersion and 0.5 to 10% by weight of a higher alcohol containing 5 to 10 carbon atoms.

4,638,024

POLYMER COMPOSITION COMPRISING A PROTEIN AND A BLOCK COPOLYMER WHICH CONTAINS A POLYVINYL ALCOHOL POLYMER UNIT AND AN IONIC POLYMER UNIT

Toshiaki Sato; Junnosuke Yamauchi, both of Kurashiki, and Takuji Okaya, Nagaokakyo, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed May 3, 1985, Ser. No. 730,100
Claims priority, application Japan, May 14, 1984, 59-97359; Jun. 7, 1984, 59-117858
Int. Cl.[4] C08L 29/04, 53/00, 89/00
U.S. Cl. 524—22 **5 Claims**

1. A polymer composition comprising:

a block copolymer containing a polyvinyl alcohol polymer unit as one constituent and a polymer unit having an ionic group as another constituent; and

at least one protein;

wherein the polyvinyl alcohol polymer unit has at least 20 mole percent of vinyl alcohol units and has a degree of polymerization of from 10 to 3500, and contains up to 20 mole percent of other monomeric components; wherein the ratio by weight of the polyvinyl alcohol polymer unit to the polymer unit having an ionic group in the block copolymer is in the range of from 0.2 to 50; wherein the polymer unit having an ionic group contains 0.5 to 100 mole percent of the ionic group based on the polymer unit having an ionic group; and further wherein the ratio by weight of protein to the block copolymer is in the range of from 10/90 to 99/1.

4,638,025

PIGMENTED WATER-ABSORBABLE PLASTIC MATERIALS

Ari Fuhrman, Miami Beach, Fla., assignor to Color Optics, Ltd., N.Y.

Continuation of Ser. No. 347,082, Feb. 8, 1982, abandoned. This application Apr. 17, 1985, Ser. No. 724,039
Int. Cl.[4] G02C 7/04; C08F 220/28
U.S. Cl. 524—40 **11 Claims**

1. A colored opacified plastic material comprising an organic binder, at least one pigment, a water-absorbable plastic material and a cross-linking agent, wherein said organic binder is cellulose acetate butyrate in a concentraction of from about 0.4 to 0.74% by weight and said water-absorbable plastic material is 2-hydroxyethylemthacrylate in a concentration of from about 96 to 99% by weight.

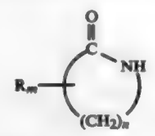
4,638,026

OZONE-STABILIZED RUBBERY ELASTOMERS

Bernard Sambuis, Montgeron, and Daniel Gavory, Epinay sur Orge, both of France, assignors to Vulnax International Limited, Saint-Cloud, France

Filed Oct. 19, 1984, Ser. No. 662,517
Claims priority, application France, Oct. 19, 1983, 83 16854
Int. Cl.[4] C08K 5/34, 5/13; C09K 15/16, 15/22
U.S. Cl. 524—98 15 Claims

1. A composition of matter comprising (i) a natural or synthetic rubbery elastomer, said elastomer having incorporated therein (ii) 0.1 to 5% by weight of said rubbery elastomer (i) of a lactam antiozonant having the general formula:



(I)

wherein n is an integer ranging from 3 to 20, m is 1 or 2, and R is lower alkyl or phenyl.

4,638,027

POLYCARBONATE EXHIBITING IMPROVED HEAT RESISTANCE FROM CYCLOALKYLIDENE DIPHENOL

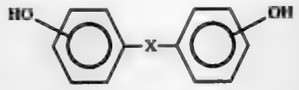
Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Continuation-in-part of Ser. No. 453,105, Dec. 27, 1982, abandoned. This application Dec. 20, 1984, Ser. No. 684,098
Int. Cl.[4] C08G 63/62
U.S. Cl. 524—157 33 Claims

1. A thermoplastic, linear, high molecular weight, end-capped aromatic polycarbonate polymer exhibiting improved heat resistance which remains thermoplastic after heating for a time of about one hour at about 195° C. in air derived from:

(i) a carbonate precursor; and

(ii) at least one dihydric phenol represented by the general formula



wherein X is selected from monocyclic cycloalkylidene radicals containing from 12 to about 16 rings carbon atoms.

4,638,028

RUBBER POLYMERASES AND METHODS FOR THEIR PRODUCTION AND USE

Joseph H. Lui, Akron, and David S. Shreve, Mogadore, both of Ohio, assignors to Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 8, 1985, Ser. No. 720,740
Int. Cl.[4] C08K 5/05
U.S. Cl. 524—387 7 Claims

1. A process for stabilizing natural rubber latex which comprises adding to said natural rubber latex a stabilizing composition comprising a polyhydroxy compound, an antimicrobial agent, and a buffer.

4,638,029

CERAMIC COMPOSITION AND PROCESS FOR USE THEREOF

Debra J. Meschke, Valley Cottage, N.Y.; Kenneth L. Hoy, St. Albans, and Louis F. Theiling, Jr., Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 641,640, Aug. 17, 1984, which is a continuation-in-part of Ser. No. 468,670, Feb. 22, 1983, abandoned. This application Jun. 21, 1985, Ser. No. 747,181
Int. Cl.[4] C08K 3/34
U.S. Cl. 524—430 39 Claims

1. A ceramic composition comprising a ceramic material, clay, a dispersant and a polymeric binder, the binder comprising a connected branch copolymer comprising:

(A) a core segment having a valence of v, wherein v is an integer, and having correspondingly v terminal bonds each connected to one of a group of:

(B) v polyvalent, non-crosslinked branched polymer segments each having an average of t terminal bonds, wherein t is greater than about two, one of said terminal bonds being connected to said core segments, and each of said branched polymer segments being connected via its remaining (t−1) terminal bonds to:

(C) a set of linear polymer segments, with an average of t−1 linear polymer segments per set, to provide a group of about v(t−1) linear polymer segments wherein the linear polymer segments have substantially similar chain lengths and composition within said group, the connected branch copolymer having a group of terminal linear polymer segments bearing terminal groups capable of effecting hydrogen bonding.

4,638,030

POLYPROPYLENE INTERIOR PARTS FOR AUTOCARS

Hiroyoshi Asakuno, Ichihara; Kinya Mori, Chiba; Kiyoaki Suzuki, Ichihara; Mamoru Nishida, Chiba; Kenji Iwai, Ichihara; Masahiro Tamamushi, and Teruo Kawasaki, both of Yokohama, all of Japan, assignors to Chisso Corporation, Osaka and Nissan Motor Co. Ltd., Kanagawaken, both of, Japan

Filed Jun. 25, 1985, Ser. No. 748,438
Claims priority, application Japan, Jul. 9, 1984, 59-141844
Int. Cl.[4] C08L 23/16, 53/00
U.S. Cl. 524—536 2 Claims

1. Polypropylene interior parts for autocars, obtained by molding a material comprising a propylene-ethylene block copolymer prepared by

(1) polymerizing propylene in a first stage so that the resulting propylene homopolymer has a relation between its isotactic pentad ratio (P) and MFR of $1.00 \geqq P \geqq 0.015 \log MFR + 0.955$ and amounts to 70 to 95% by weight of the block polymer,

(2) thereafter polymerizing ethylene or ethylene and propylene in an amount of 30 to 5% by weight of the total polymerization quantity in at least one other stage, so as to give an ethylene content occupying 3 to 12% by weight of the block polymer,

(3) blending 5 to 30% by weight of a filler into said block polymer,

said interior parts having

(a) a percentage opening of the cross section perpendicular to the direction of the major axis thereof of 20 to 48%;

(b) two or more fixed points at a fixing patch of 300 mm or less; and

(c) a geometrical moment of inertia in the cross section at the central part between the fixed points of at least 50 mm^4.

4,638,031

PROCESS FOR PREPARING SUPERIOR HIGH SOLIDS COATINGS

Constantine J. Bouboulis, Union, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 558,953, Dec. 7, 1983, Pat. No. 4,532,294. This application Feb. 14, 1985, Ser. No. 701,680
The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.
Int. Cl.[4] C08K 5/10; C08L 33/14
U.S. Cl. 524—773 17 Claims

1. An improved process for forming acrylic copolymer resins suitable for electrostatic spraying in high solids coatings containing at least 50 wt % solids which comprises contacting under polymerizing conditions a polymerization mixture comprising at least one hydroxy-substituted alkyl (methyl)acrylate monomer and at least one non-hydroxy substituted alkyl (meth)acrylate monomer in the presence of a free radical initiator and a solvent therefor, said solvent being employed in an amount of from about 10 to 70 wt. % of the polymerization mixture, and said solvent comprising at least one normally liquid ester selected from the group consisting of compounds having the formula:



wherein R^1 is a straight or branched chain alkyl of 1 to 6 carbon atoms, and R'' is a straight or branched chain alkyl of 8 to 13 carbon atoms, with the proviso that R^1 and R'' together contain from 11 to 15 carbon atoms, said hydroxy-substituted alkyl (meth)acrylate monomer comprising from about 5 to 40 wt % of the total monomers charged to said polymerization reaction, and said non-hydroxy substituted alkyl (meth)acrylate monomer comprising from about 5 to 95 wt % of the total monomers charged to said polymerization reaction.

4,638,032

MAGNETIC PARTICLES AS SUPPORTS FOR ORGANIC SYNTHESIS

Steven A. Benner, Cambridge, Mass., assignor to Genetics Institute, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 449,399, May 31, 1983, abandoned. This application Aug. 10, 1984, Ser. No. 640,027
Claims priority, application Canada, Dec. 12, 1983, 443105; European Pat. Off., Dec. 12, 1983, 82103253.7
Int. Cl.[4] C08F 283/12; H01F 1/00; C09D 5/23
U.S. Cl. 525—54.11 28 Claims

1. Oligomer synthesis support comprising a magnetic particle covalently bound to oligomer subunits, said oligomer subunits comprising subunits of deoxyribonucleic acid or ribonucleic acid.

4,638,033

RESINOUS COMPOSITION OF A CARBONATE RESIN AND A GRAFTED DERIVATIVE OF ETHYLENE-PROPYLENE-DIENE TERPOLYMER EXHIBITING IMPROVED RESISTANCE TO ORGANIC SOLVENTS

Omar M. Boutni, Mt. Vernon, Ind., and Ping Y. Liu, Naperville, Ill., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 23, 1985, Ser. No. 812,264
Int. Cl.[4] C08L 69/00
U.S. Cl. 525—67 38 Claims

1. An improved resin composition exhibiting improved resistance to organic solvents comprising (i) a blend comprised of at least one aromatic carbonate resin and at least one grafted derivative of an ethylene-propylene-diene terpolymer; the improvement comprising said composition additionally comprising (ii) an amount at least effective to improve the impact properties and resistance to organic solvents of said blend of a least one polymer selected from

(a) a polyolefin,

(b) an olefin-acrylate or methacrylate copolymer, or

(c) a selectively hydrogenated linear, sequential or radial teleblock copolymer of a vinyl aromatic compound and an olefinic elastomer.

4,638,034

PREPARATION OF ETHYLENE-ACRYLIC ACID COPOLYMER OR SALT THEREOF

Dorothee M. McClain, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, Va.

Filed Jun. 24, 1985, Ser. No. 747,591
Int. Cl.[4] C08F 8/00
U.S. Cl. 525—369 13 Claims

1. A process for preparing an ethylene-acrylic acid copolymer salt which comprises saponifying an ethylene-alkyl acrylate copolymer in the molten state, in the absence of solvent or water other than by-product alkanol, with alkali metal hydroxide or alkaline earth metal hydroxide under non-static mixing conditions so as to thereby form alkanol and an alkali metal or alkaline earth metal salt of ethylene-acrylic acid copolymer, and separately recovering said alkanol and said salt.

4,638,035

CATALYST SYSTEMS FOR TWO-PACK ACRYLIC ADHESIVE FORMULATIONS

Vincent D. McGinniss, Delaware, Ohio, assignor to Three Bond Co., Ltd., Tokyo, Japan

Division of Ser. No. 416,270, Sep. 9, 1982, Pat. No. 4,446,246. This application Jun. 29, 1984, Ser. No. 603,592
Int. Cl.[4] C80F 4/32
U.S. Cl. 525—384 6 Claims

1. A method for catalytically curing a curable mixture comprising at least one ethylenically unsaturated compound which is curable in the presence of a peroxide initiator and said peroxide initiator therefor, which comprises blending with said ethylenically unsaturated compound a catalyst system comprising said peroxide initiator, a furfuryl alcohol, and an acid catalyst, the proportion of said acid catalyst being an effective proportion for catalyzing said furfuryl alcohol and the proportion of furfuryl alcohol being adequate in the generation of heat with the acid catalyst to generate free radicals from said peroxide initiator for curing said ethylenically unsaturated compound.

4,638,036

POLYCARBONATE EXHIBITING IMPROVED HEAT RESISTANCE FROM HALOGENATED CYCLOALKYLIDENE DIPHENOL

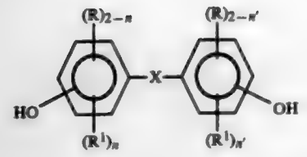
Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Division of Ser. No. 621,472, Jun. 18, 1984, Pat. No. 4,554,330, which is a continuation-in-part of Ser. No. 453,105, Dec. 27, 1982, abandoned. This application Sep. 6, 1985, Ser. No. 773,138
Int. Cl.[4] C08G 63/64
U.S. Cl. 525—462 18 Claims

1. Thermoplastic linear polycarbonate resin composition comprising the polymeric reaction products of:

(a) a carbonate precursor, and

(b) at least one dihydric phenol represent by the general formula



wherein
R is independently selected from hydrogen or lower alkyl radicals,
R^1 is indepdently selected from halogen radicals,
X is selected from monocyclic cycloalkylidene radicals containing from 12 to about 16 ring carbon atoms, and
n and n′ are independently selected from whole numbers having a value of from 0 to 2 inclusive, with the proviso that the sum of n plus n′ is at least one.

4,638,037

METHOD OF INCREASING MOLECULAR WEIGHT OF POLY(ARYL ETHERS)

Mary V. Ward, Middlesbrough; Eric Nield, and Philip A. Staniland, both of Cleveland, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 4, 1984, Ser. No. 607,308
Claims priority, application United Kingdom, May 12, 1983, 8313110
Int. Cl.[4] C08F *283/00;* **C08G** *14/00, 16/00;* **C08L** *61/00*
U.S. Cl. 525—471 **14 Claims**

1. A method of increasing the molecular weight of a poly(aryl ether) comprising providing a mixture of (1) at least one polyaryl ether comprising polymer chains having end groups of the formula

—Ar—X

and (2) a reagent having nucleophilic activity selected from alkaline salts of Group I and Group II metals, the alkaline salts being salts of a species of pK value of at least 2.5 for the dissociation step, or for the first dissociation step where the species is multifuntional, or an oxide or hydroxide of a Group I or Group II metal, wherein Ar represents an arylene radical and X is a monovalent radical capable of nucleophilic displacement from Ar and heating the mixture to a temperature above the melting point of the polymer until a desired increase in molecular weight has occurred.

4,638,038

CARBOXYLIC ACID-GRAFTED PHENOXY RESINS

George A. Salensky, Hunterdon County, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 22, 1985, Ser. No. 725,535
Int. Cl.[4] C08G *59/14, 59/16;* **C08L** *63/00*
U.S. Cl. 525—533 **15 Claims**

1. A phenoxy resin having pendant secondary hydroxyl groups of which about 3 to about 50% of such hydroxyl groups have been reacted to produce moieties having pendant carboxyl groups.

4,638,039

ALTERNATING BLOCK COPOLYMERS OF POLYARYLENE POLYETHERS AND PROCESS FOR THEIR PREPARATION

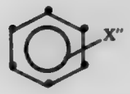
Virgil Percec, Pepper Pike, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 28, 1984, Ser. No. 655,925
Int. Cl.[4] C08F *283/00;* **C08G** *75/00*
U.S. Cl. 525—534 **9 Claims**

1. A substantially linear thermoplastic polyarylene polyether copolymer (PAPE) represented by the formula

R^e—O—"PAPE"—O—R^e

wherein,
R^e represents a residuum selected from $R_1{}^eX'$ and $R_2{}^eRH$;
$R_1{}^eX'$ represents a residuum of a reactive bis(haloallyl)moiety "HAM";
$R_2{}^e$ represents the group



X′ represents halogen selected from the group consisting of fluorine, chlorine and bromine;
X″ represents an inert substituent defined hereinbelow; and,
"PAPE" represents the residuum of an oligomer selected from an unsaturated alternating block copolymer represented by

["DHP_1"—"DHP_2"—$_{n'}$—HAM—"DHP_3"—$_{n''}$

and a regular unsaturated oligomer formed by chain extension represented by

[HAM—"DHP_1"—"DHP_2"—HAM]$_{n'''}$

wherein, "DHP_1" and "DHP_2" are the residues of dihydric phenols DHP_1 and DHP_2 which are the same or different, and "DHP_3" is the residue of a dihydric phenol DHP_3 which may be the same as either DHP_1 or DHP_2, or different;
HAM represents the residue of a reactive bis(haloallyl)moiety selected from a bis(haloallyl)olefin having from 4 to about 20 carbon atoms including cis- or trans-dichlorobutene, a bis(haloallyl)cycloolefin having from 4 to about 8 ring carbon atoms including 1,4-bis(chloromethy)-1,3-cyclohexadiene, and a bis(haloallyl)arylene having from 8 to about 26 carbon atoms including 1,4-bis(chloromethyl)-benzene; and,
n′, n″ and n‴ independently represent an integer in the range from 2 to about 100.

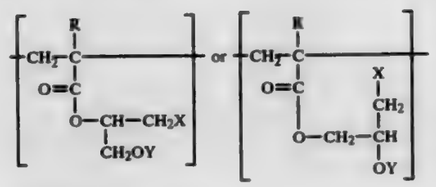
4,638,040

ACRYLATE AND METHACRYLATE MONOMERS AND POLYMERS

W. James Hammar, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 500,782, Jun. 3, 1983, Pat. No. 4,578,504. This application May 17, 1985, Ser. No. 735,377
Int. Cl.[4] C08F *14/18*
U.S. Cl. 526—245 **24 Claims**

1. A polymer comprising monomeric structural units:



or combinations thereof, wherein
R is hydrogen or methyl;
X is fluoro, chloro, bromo, iodo, perfluoroalkyl-sulfonoxy of one to three carbon atoms, perfluoroacyloxy of one to three carbon atoms, benzoyloxy, or trichloroacetoxy;
Y is trichloroacetyl, perfluoroacyl of the formula



trialkylsilyl of the formula $[CH_3(CH_2)_m]_3Si$—, wherein n is zero to six; and m is zero to three; said polymer having a molecular weight in the range of 100,000 to 1,000,00.

4,638,041

FLUOROOXYALKYL VINYL ETHERS

Akira Ohmori; Nobuyuki Tomihashi; Hiroshi Inukai, and Kazuhiro Nakai, all of Osaka, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Division of Ser. No. 713,609, Mar. 19, 1985, Pat. No. 4,568,773. This application Oct. 4, 1985, Ser. No. 784,590
Claims priority, application Japan, Mar. 22, 1984, 59-55724
Int. Cl.[4] C08F *14/18*
U.S. Cl. 526—247 **4 Claims**

1. A polymer comprising a fluorooxyalkyl vinyl ether of the formula:



wherein n is an integer of 0 to 5.

4,638,042

COPOLYMERS CONTAINING INDENE

George S. Li, Solon; Muyen M. Wu, Hudson, and Elmer J. De Witt, Cuyahoga Falls, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 5, 1986, Ser. No. 859,521
Int. Cl.[4] C08F *32/06*
U.S. Cl. 526—280 **2 Claims**

1. Normally solid copolymers that are the result of addition polymerization of methyl methacrylate and indene, containing the monomers combined in the polymer structure in the following weight percentages:

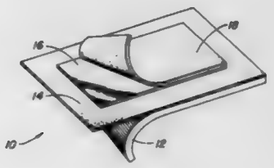
	Weight Percent
Methyl methacrylate	46–95
Indene	54–5.

4,638,043

DRUG RELEASE SYSTEM

Michael Szycher, Lyanfield; Donald J. Dempsey, Newbury, and Jonathan L. Rolfe, North Easton, all of Mass., assignors to Thermedics, Inc., Woburn, Mass.

Continuation-in-part of Ser. No. 670,810, Nov. 13, 1984. This application Aug. 23, 1985, Ser. No. 768,623
The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.
Int. Cl.[4] C08G *18/10;* **A61F** *13/00*
U.S. Cl. 528—75 **26 Claims**



1. A drug releasing member for incorporation into a medical patch comprised of a drug dispensing polyurethane having a therapeutically effective amount of a drug or drugs dispersed therein and capable of being released in a sustained manner, said polyurethane consisting essentially of the reaction product of:
(a) a diisocyanate;
(b) a glycol having a number average molecular weight between the range of 500–5000 molecular weight units; and
(c) an acrylyl chain terminator having a number average molecular weight between the range of 40–200 molecular weight units; and wherein there are 2 diisocyanate units for each glycol unit, and there is only one acrylyl group terminator at each end of the polyurethane chain.

4,638,044

PROCESS FOR PREPARING POLY(ARYL ETHER KETONE)S

Donald R. Kelsey, Hillsborough, N.J., assignor to Amoco Corporation, Chicago, Ill.

Filed Mar. 20, 1985, Ser. No. 713,845
Int. Cl.[4] C08G *8/02*
U.S. Cl. 528—125 **11 Claims**

1. An improved process for preparing poly(aryl ether ketone)s by reacting a mixture of at least one bisphenol and at least one dihalobenzenoid compound, or a halophenol, wherein the improvement comprises providing to the reaction a combination of sodium carbonate and/or bicarbonate and an alkali metal halide selected from potassium, rubidium or cesium fluoride or chloride, or combinations thereof.

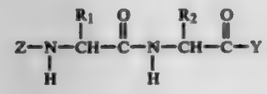
4,638,045

NON-PEPTIDE POLYAMINO ACID BIOERODIBLE POLYMERS

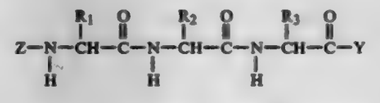
Joachim Kohn, Brookline, and Robert S. Langer, Somerville, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 19, 1985, Ser. No. 703,153
Int. Cl.[4] C07K *1/06*
U.S. Cl. 530—323 **14 Claims**

1. A bioerodible polymer formed by polymerizing a dipeptide formed exclusively of L-alpha amino acids of the formula:



or by polymerizing a tripeptide formed exclusively of L-alpha amino acids of the formula:



wherein at least one of Z or Y is an amine or carboxyl protecting group and wherein polymerization is effected through at least one of R_1, R_2 or R_3 without the formation of additional peptide bonds through the terminal, amine and carboxyl groups of said dipeptide or tripeptide.

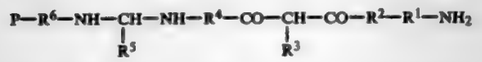
4,638,046

RETRO-INVERSO C-TERMINAL HEXAPEPTIDE ANALOGUES OF SUBSTANCE P

Antonio S. Verdini, and Giuseppe C. Viscomi, both of Rome, Italy, assignors to ENI-Ente Nazionale Idrocarburi, Rome, Italy

Filed Jan. 9, 1985, Ser. No. 689,911
Claims priority, application Italy, Jan. 13, 1984, 19142 A/84
Int. Cl.⁴ C07K *7/02*
U.S. Cl. 530—332 **15 Claims**

1. Compounds corresponding to general formula I:



in which P is a hydrogen atom, a linear or branched aliphatic alkyl group with 1–6 carbon atoms, or a saturated or unsaturated linear or branched chain aliphatic acyl group such as formyl, acetyl, propionyl, n-butyryl, isobutyryl, n-valeryl, isovaleryl, hexanoyl, isohexanoyl, heptanoyl, octanoyl, crotonoyl, methacryloyl, acryloyl; or a substituted acyl group such as hydroxyacetyl, 2-hydroxypropionyl, 3-hydroxypropionyl, aminoacetyl, 4-hydroxyphenylacetyl, 4-hydroxyphenylpropionyl, 2-aminopropionyl, 3-aminopropionyl, O-ethylmalonyl, ethoxyformyl, methoxyacetyl, 3-methoxypropionyl, 3-ethoxypropionyl, chloroacetyl, dichloroacetyl, 2-chloropropionyl, 3-chloropropionyl, 2,3-dichloropropionyl, bromoacetyl, 4-hydroxy-3,5-diiodophenylacetyl, 3-oxobutyryl, 3-oxovaleryl, 4-oxovaleryl, methylthioacetyl, 3-methylthiopropionyl, ethylthioacetyl, 3-ethylthiopropionyl, nicotinoyl, 4-aminobutyryl, N^{α}-[(1-(9-adenyl)β-D-ribofuranuronosyl)], N^{α}-[(1-(9-hypoxanthyl)-β-D-ribofuranuronosyl]; or a group such as benzyloxycarbonyl, tert-butyloxycarbonyl, tert-amyloxycarbonyl, isobornyloxycarbonyl, adamantyloxycarbonyl, or chloro or nitro-substituted benzyloxycarbonyl;

R^1 is a residue of methionine, methioninesulphoxide, methionine sulphone, selenomethionine, leucine, norleucine, valine or norvaline;

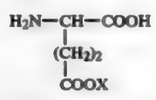
R^2 is a residue of leucine, norleucine, valine, norvaline, alanine or isoleucine;

R^3 is a hydrogen atom or methyl;

R^4 is an amino acid residue of D configuration such as phenylalanine, tryptophan, tyrosine, valine, norvaline, leucine, norleucine, isoleucine, serine or derivatives, threonine or derivatives, histadine or derivatives, methionine, methionine-S-methyl, methionine sulphone, arginine or derivatives, lysine or derivatives, ornithine or derivatives, 2,4-diaminobutyric acid or derivatives, 2,3-diaminopropionic acid or derivatives, glutamic acid or aspartic acid or their suitable derivatives;

R^5 is a hydrogen atom or the side-chain of amino acids such as phenylalanine, tyrosine, 4-chlorophenylalanine, O-benzyltyrosine (or their acetyl, cyclopentyl, tert-butyloxycarbonyl or 4-hydroxyphenylacetyl derivatives);

R^6 is an amino acid residue such as glutamine or derivatives, pyroglutamic acid, alanine, tyrosine, lysine or derivatives, proline, N-formyl-proline, β-alanine, N-acetyl-β-alanine, glycine, desaminophenylalanine, desaminoaspartic acid, methyldesaminoaspartic acid, or glutamic acid esters represented by general formula (II):



in which X is methyl, ethyl, methoxyethyl, methoxy(ethoxy)$_n$ethyl where n=1, 2 or 3.

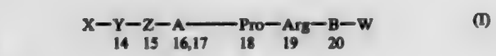
4,638,047

ENZYME INHIBITION

Michael Szelke, Ruislip, and David M. Jones, Hayes, both of England, assignors to Aktiebolaget Hassle, Sweden

PCT No. PCT/GB84/00063, § 371 Date Oct. 31, 1984, § 102(e) Date Oct. 31, 1984, PCT Pub. No. WO84/03507, PCT Pub. Date Sep. 13, 1984
PCT Filed Feb. 28, 1984, Ser. No. 668,277
Claims priority, application United Kingdom, Mar. 4, 1983, 8305985
Int. Cl.⁴ C07K *5/02, 7/06*
U.S. Cl. 530—332 **7 Claims**

1. Polypeptide analogues of the formula:



(I)

where

X=H or an N-protecting group:

F, Cl, Br, I, $—CF_3$, —OH, —OR or —R (R=C_1–C_6 alkyl) or R—O—CO— where R=t-butyl, benzyl, 2,2,2-trichloroethyl

or $R^6—SO_2$— where R^6=Ph, α-naphthyl β-naphthyl

or one or more amino acyl residues either as such or in protected form bearing a group X above

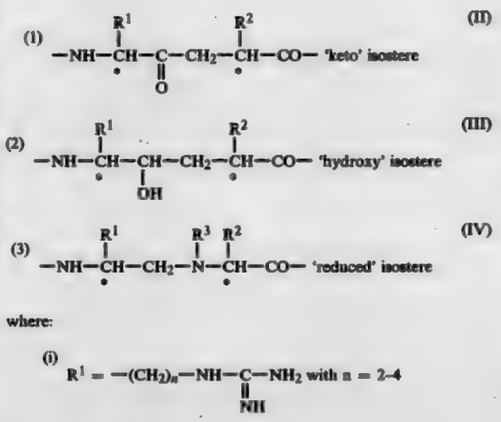
Y=absent, or glycine, or D- or L-phenylalanine or a lipophilic amino acid residue selected from the group consisting of Phg, Cha, α—Nal, β—Nal and p-iodophenylalanyl

Z=L- or D-proline or a ring homologue selected from the group consisting of azetidine-2-carboxylic acid and piperidine-2-carboxylic acid or L- or D-valine or N-methyl-alanine or glycine

or Y and Z are as:

where the peptide bond —CO—NH— between Y and Z has been reduced (and protected) to give $—CH_2—(X)—$, X being a protective group as defined above

A=



(II)

(III)

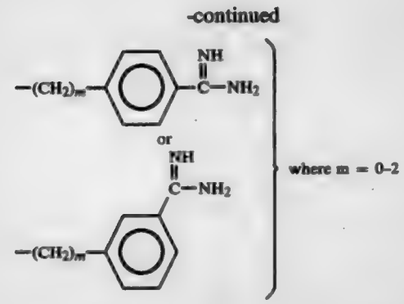
(IV)

where:

(i) $R^1 = —(CH_2)_n—NH—C(=NH)—NH_2$ with n = 2–4

or

-continued



(ii) R^2=H, lower alkyl (C_1–C_4) or 1-hydroxy-ethyl,

(iii) R^3=group X as defined above

(iv) configuration at the asymmetric centres * is either R or S

Arg or Pro and Arg may be absent, Pro or Pro substituted with hydroxy-proline and arg or Arg substituted with Z^1, Tos or $—NO_2$

B=D or L-valine or D or L-proline or $—NH—(CH_2)_n—CO—$, where n=0–5, or absent

W=—OH $—OR^4$ where R^4=lower alkyl (C_1–C_5), $—NH_2—$, $—NHR_2^5$ or $—NH^5$ where R^5=lower alkyl (C_1–C_5), cycloalkyl C_3C_7 or cycloalkyl substituted with a group selected from carboxyl and alkyl (C_1–C_5) group(s)

B-W represents an aminoalcohol derivative of B as such or in protected form

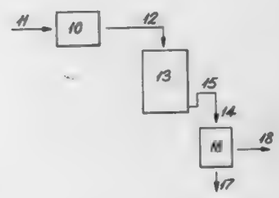
and where further in said compounds of formula I the two terminals are optionally linked by a peptide bond to form a cyclic structure.

4,638,048

METHOD OF EXTRACTING CRYOPRECIPITATE FROM FROZEN BLOOD PLASMA

Peter R. Foster, Edinburgh, Scotland, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 691,736, Jan. 16, 1985, abandoned, which is a continuation of Ser. No. 558,558, Dec. 5, 1983, abandoned, which is a continuation of Ser. No. 362,517, Mar. 26, 1982, abandoned. This application Feb. 12, 1986, Ser. No. 828,608
Claims priority, application United Kingdom, Apr. 2, 1981, 8110354
Int. Cl.⁴ A23J *1/06*; B01D *17/00*; C07K *3/26*
U.S. Cl. 530—380 **5 Claims**



1. A method of extracting cryoprecipitate from frozen blood plasma, which comprises:

crushing the frozen plasma obtained from a multiplicity of individual blood donations;

conveying the crushed plasma to a bulk thawing zone;

continuously circulating the crushed plasma in said zone to rotate around an upright axis and, at the same time, to move respectively upwardly and downwardly in the circumferentially peripheral and axially central regions of said zones, and radially between these zone regions;

steadily heating the exterior of said zone during said circulation to thaw said crushed plasma to produce liquor and cryoprecipitate in mixture with the remainder of said crushed plasma;

progressively removing, as it is formed, said liquor and cryoprecipitate from the lowermost region of said zone by way of a path which extends therefrom initially in an opposite direction to that of said rotation, and also upwardly and then downwardly;

and mutually separating said removed liquor and cryoprecipitate.

4,638,049

ANTITUMOR PROTEIN HYBRID AND PROCESS FOR THE PREPARATION THEREOF

Yasuhiko Masuho, Hino; Takeshi Hara, Hachioji, and Teruhisa Noguchi, Fujisawa, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 4, 1980, Ser. No. 137,193
Claims priority, application Japan, Apr. 9, 1979, 54-41919
Int. Cl.⁴ C07K *15/14*
U.S. Cl. 530—388 **9 Claims**

1. Antitumor protein hybrid comprising (1) a moiety which is substantially the fragment Fab of an antitumor immunoglobulin and (2) a moiety which is substantially the fragment A of a diphtheria toxin, which antitumor protein hybrid is expressed by the following formula (I):

$$Fab—S_1—(X)_n—S_2—FA)_m \quad (I)$$

where FAB indicates a moiety which is substantially the fragment FAB of an antitumor immunoglobulin; FA indicates a moiety which is substantially the fragment A of a diphtheria toxin; X indicates a divalent organic radical; S_1 and S_2 are both sulfur atoms, S_1 indicating a sulfur atom arising from the disulfide bond in the immunoglobulin and S_2 a sulfur atom arising from the disulfide bond in the diphtheria toxin; n represents 0 or 1 and m represents an integer of 1 to 5.

4,638,050

THROMBIN-BINDING SUBSTANCE AND PROCESS FOR ITS PRODUCTION

Nobuo Aoki, Tokyo, Japan, and Shinichiro Kuroasawa, Oklahoma City, Okla., assignors to Kowa Co., Ltd., Nagoya, Japan

Filed Mar. 20, 1985, Ser. No. 713,821
Claims priority, application Japan, Mar. 23, 1984, 59-55792
Int. Cl.⁴ C07K *3/20, 3/28*
U.S. Cl. 530—413 **5 Claims**

1. A thrombin-binding substance derived from human tissue and obtained by (1) extracting human tissue with a buffer containing a non-ionic surfactant, and (2) isolating the said thrombin-binding substance in pure form from the resulting extract by diisopropylphosphorothrombin affinity chromatography, gel filtration, or a combination thereof; said thrombin-binding substance having the following properties:

(a) molecular weight: 88,000±20,000 in reduced form, and 71,000±20,000 in unreduced form;

(b) isoelectric point: pH 4.2±0.5;

(c) affinity: strong for thrombin;

(d) activity: capable of promoting the thrombin-catalyzed activation of protein C and prolonging clotting time; and

(e) stability: stable over a pH range of 2 to 10 and stable to denaturing agents and to a pepsin treatment.

4,638,051

BRAIN IMAGING RADIOPHARMACEUTICALS

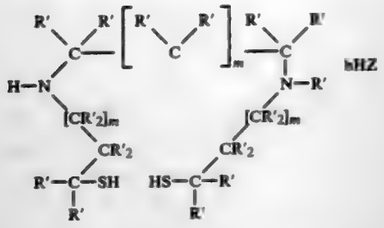
Hugh D. Burns, BelAir; Susan E. Zemyan; Leon A. Epps, both of Baltimore; Alfred V. Kramer, and Robert F. Dannals, both of Baltimore, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 605,368, Apr. 30, 1984, abandoned. This application Apr. 17, 1985, Ser. No. 723,011

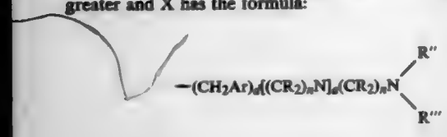
Int. Cl.[4] C07F *11/00*

U.S. Cl. 534—14 9 Claims

1. A compound of the structure:



wherein each R′ is independently a hydrogen atom, an alkyl group or X, and at least one of the groups R′ is X, m is 0 or 1, Z is the anion of a strong mineral acid, b is an integer of 2 or greater and X has the formula:



where R is hydrogen or an alkyl group, R″ and R‴ are independently hydrogen atoms or alkyl groups, Ar is an aromatic group, and a, d and n are 0 or integers.

9. A coordination compound comprising the technetium 1:1 complex of the compound set forth in claim 1.

4,638,052

AZO-PIGMENT CONTAINING HYDROXY NAPHTHOIC ACID AMIDE AND AN IMINOOXOISOINDOLENINE COMPONENTS

Kimihide Kawamura, Koshigaya; Shojiro Horiguchi, Omiya, and Hisao Okamoto, Washinomiya, all of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1984, Ser. No. 686,900

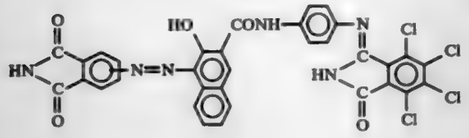
Claims priority, application Japan, Jan. 17, 1984, 59-4775; Jun. 18, 1984, 59-123627; Jun. 18, 1984, 59-123628; Jun. 18, 1984, 59-123629

Int. Cl.[4] C09B *29/036, 29/20, 29/22, 67/20*

U.S. Cl. 534—575 4 Claims

1. An azo pigment represented by the formula:

(I′)



4,638,053

PROCESS FOR THE PREPARATION OF CHLOROZINCATE SALTS OF BENZO THIAZOLIUM AZO DYESTUFFS BY ALKYLATING WITH DIALKYLSULFATE IN AQUEOUS MEDIUM IN THE PRESENCE OF ZN-CONTAINING ACID ACCEPTOR AT PH≦7

Rudolf Neeb, Oberursel, and Reinhard Mohr, Offenbach am Main, both of Fed. Rep. of Germany, assignors to Hoechstaktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 218,449, Dec. 19, 1980, abandoned, which is a continuation of Ser. No. 143,716, Mar. 29, 1978, abandoned, which is a continuation of Ser. No. 925,871, Jul. 18, 1978, abandoned. This application Sep. 11, 1985, Ser. No. 775,111

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733178

Int. Cl.[4] C09B *29/045, 43/11, 44/20*

U.S. Cl. 534—589 8 Claims

1. In a process for the preparation of a chlorozincate salt of a benzothiazolium azo compound by treating a benzothiazole azo compound with a dialkylsulfate having of from 1 to 4 carbon atoms, in an aqueous medium at a temperature of from about 10° to 80° C., the improvement which comprises carrying out the alkylation with the use of 1.8 to 2.5 mols of the dialkylsulfate calculated on the starting azo compound, and in the presence of an acid acceptor consisting essentially of a zinc compound capable of binding an acid, at a pH not exceeding 7, and separating the tetrachlorozincate salt of the benzothiazolium azo compound formed by adding an alkali metal chloride.

4,638,054

AMINONAPHTHOL BISAZO REACTIVE DYES

Karl J. Herd, and Martin Michna, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,334

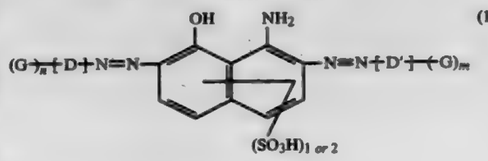
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1983, 3340590

Int. Cl.[4] G09B *62/02, 62/022, 62/026, 62/03*

U.S. Cl. 534—637 5 Claims

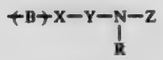
1. A reactive dyestuff of the formula

(1)



or their alkali metal salts, where

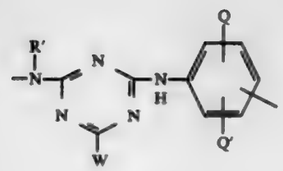
G is a radical of the formula

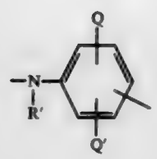


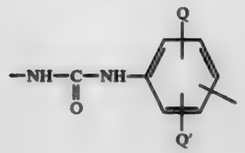
n and m are each 0 or 1 such that $n+m=1$ or 2,

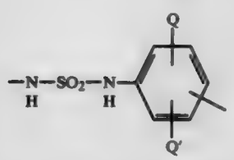
D and D′ are each a benzene, naphthalene or heterocyclic radical or a benzene, naphthalene or heterocyclic radical substituted by an azo-containing radical,

B is a direct bond between D or D′ and X or a bridge member of the structure (2) to (5)









each of which is bonded with the amine function to a C atom of the ring system of D or D′ and with the free bond of the phenyl system to X,

X is S, SO or SO_2,

Y is C_1–C_6-alkylene unsubstituted or substituted by —OH, —SO_3H, —COOH or -halogen,

R is H, C_1–C_4-alkyl unsubstituted or substituted by —OH, —SO_3H, —COOH, -halogen or —OSO_3H,

Z is a fibre-reactive radical,

R′ is H, C_1–C_4-alkyl which is unsubstituted or substituted by —OH or —COOH; or phenyl which is unsubstituted or substituted by —OH or —COOH,

W is OH, Cl, F, Br, SO_3H, NHR′



alkoxy, phenoxy and

Q and Q′, independently of each other, are each H, OH, halogen, SO_3H COOH, C_1–C_4-alkyl or C_1–C_4-alkoxy.

4,638,055

IRON, COPPER AND CHROMIUM COMPLEXES OF DISAZO DYES

Udo Bergmann, Darmstadt; Guenter Hansen, Ludwigshafen, and Georg Zeidler, Dannstadt-Schauernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 478,101, Mar. 23, 1983, Pat. No. 4,547,566. This application May 10, 1985, Ser. No. 721,712

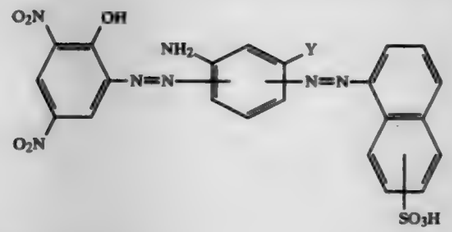
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1982, 3212240

Int. Cl.[4] C09B *45/26, 45/30, 45/32, 45/58*

U.S. Cl. 534—678 4 Claims

1. A metal complex selected from the group consisting of Fe, Co or Cr of the compound which in free acid form corresponds to the formula

(2)



(3)

wherein

Y is hydrogen or amino.

(4)

4,638,056

OPTHALMIC WAFER

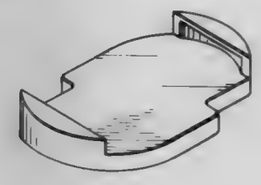
Wayne B. Callahan, Milton; Harold O. Koch, Barboursville; Philip R. Palin, and James R. Cook, both of Huntington, all of W. Va., assignors to Cilco, Inc., Huntington, W. Va.

Continuation-in-part of Ser. No. 516,341, Jul. 22, 1983, abandoned. This application Sep. 2, 1983, Ser. No. 528,857

Int. Cl.[4] A61F *2/16;* C07H *5/04, 5/10*

U.S. Cl. 536—54 8 Claims

(5)



1. A wafer of viscoelastic material adapted to hold an intraocular lens, wherein said viscoelastic material is chondroitin sulfate or a mixture of chondroitin sulfate and a hyaluronate.

4,638,057

CELLULOSE ACETATE MOLDING CONTAINING ODORIFEROUS SUBSTANCE

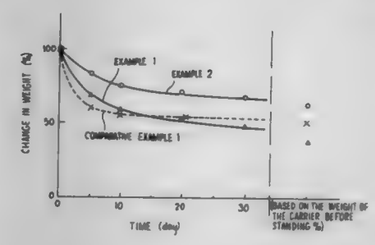
Shigeyuki Takahashi, Himeji; Masaba Uchida, and Kazuhiro Yamazaki, both of Hyogo, all of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Feb. 27, 1985, Ser. No. 706,219

The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

Int. Cl.[4] C08B *3/06*

U.S. Cl. 536—76 3 Claims



1. Substantially spherical porous particles of cellulose acetate containing from about 50 to about 60% by weight of an odoriferous substance in the pores thereof, said cellulose acetate having a degree of acetylation of 50 to 58%, said particles

having a pore volume of at least 0.65 cc/g, a collapsing strength of at least 10 kg, a particle size of from 0.5 to 10.0 mm and a sphericity of at least 0.8.

4,638,058

ETHERS OF BETA-CYCLODEXTRIN AND A PROCESS FOR THEIR PREPARATION

Lothar Brandt, Wiesbaden, and Utz-Hellmuth Felcht, Bad Soden-Neuenhain, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1984, Ser. No. 682,413

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345779

Int. Cl.⁴ C08B *37/16*

U.S. Cl. 536—103 **16 Claims**

1. A mixture of water-soluble ethers of β-cyclodextrin having different degrees of substitution and wherein each substituent is the same and is either ethyl or an N,N-dialkyl(C_1 to C_4)amino ethyl group.

4,638,059

GEL-FORMING POLYSACCHARIDES

Ian W. Sutherland, Edinburgh, Scotland, assignor to National Research Development Corp., London, England

Filed Jun. 28, 1984, Ser. No. 625,548

Claims priority, application United Kingdom, Jul. 7, 1983, 8318403

Int. Cl.⁴ C08B *37/00*

U.S. Cl. 536—121 **7 Claims**

1. A polysaccharide having the following features:

(1) it contains D-glucose, L-fucose and D-glucuronate residues in the approximate molar rtio of 3:1:1;

(2) when oxidized by periodate it gives a product containing D-glucose residues of the unoxidized polymer, substantially all the L-fucose residues of the unoxidized polymer and substantially no D-glucuronate;

(3) it forms gels when cations of at least any one of the elements lithium, sodium, potassium, rubidium and caesium opf Group Ia of the Periodic Table and magnesium, calcium, strontium and barium of Group IIa of the Periodic Table are added to an aqueous solution of the polymer;

(4) the gels thus formed melt at a temperature effective to melt the gel but ineffective to decompose it and set on cooling reversibly;

(5) the strength of the gels increases with increasing concentration of the polymer in aqueous solution;

(6) the polymer forms stronger gels with Group Ia and IIa cations of an ionic radus of about 0.1 nm than with other Group Ia and IIa cations of smaller or larger ionic radius and

(7) the polymer is obtainable by isolation from the bacterium NCIB 11870 or from a variant or mutant thereof.

3. A polysaccharide according to claim 1 wherein the gel formed by addition of 0.17 M aqueous sodium chloride solution to a 0.3% w/v (g/100 ml) aqueous solution of the polymer at ambient temperature has a yield stress at 25° C. of at least 10 g/cm².

4,638,060

O-SULFATED SPIRO β-LACTAM HYDROXAMIC ACIDS

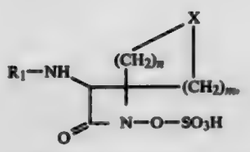
Joseph E. Sundeen, Yardley, Pa.; William H. Koster, East Amwell Township, Hunterdon County, and Robert Zahler, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 29, 1985, Ser. No. 728,432

Int. Cl.⁴ C07D *205/08, 417/12, 495/10, 493/10*

U.S. Cl. 540—203 **6 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein

R_1 is acyl;

n and m are each independently 1, 2 or 3 and X is a saturated carbon bond; or n and m are each independently 1, 2 or 3, the sum of n+m≦4 and X is



and

R_2 is alkyl, aryl, hydroxy, alkoxy, alkanoyloxy, carbamoyloxy, alkanoylamino or ureido.

4,638,061

[3S(Z)]-2-[[[1-(2-AMINO-4-THIAZOLYL)-2-[[2,2-DIMETHYL-4-OXO-1-(SULFOOXY)-3-AZETIDINYL]AMINO]-2-OXOETHYLIDENE]-AMINO]OXY] ACETIC ACID AND INTERMEDIATE

William A. Slusarchyk, Belle Mead, and William H. Koster, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 28, 1985, Ser. No. 695,775

Int. Cl.⁴ C07D *205/08, 403/12*

U.S. Cl. 540—355 **2 Claims**

1. The inner salt or a pharmaceutically acceptable basic salt of [3S(Z)]-2-[[[1-(2-amino-4-thiazolyl)-2-[[(2,2-dimethyl-4-oxo-1-(sulfooxy)-3-azetidinyl]amino]-2oxoethylidene]amino]oxy] acetic acid.

2. The compound (3S)-3-amino-2-oxo-4,4-dimethyl-1-azetidinylsulfate or a basic salt thereof.

4,638,062

3-ACYLAMINO-2-OXO-1-AZETIDINESULFONIC ACIDS

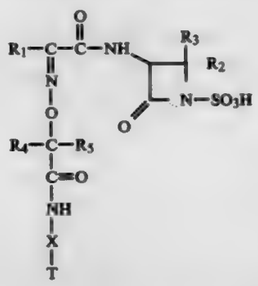
David Kronenthal, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 17, 1985, Ser. No. 745,467

Int. Cl.⁴ C07D *205/08, 401/12, 403/12, 403/04*

U.S. Cl. 540—355 **15 Claims**

1. A compound having the formula

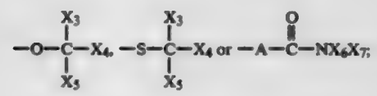


or a pharmaceutically acceptable salt thereof, wherein

R_1 is phenyl, substituted phenyl, 2-amino-4-thiazolyl, 5-amino-3-(1,2,4-thiadiazolyl), 2-amino-4-oxazolyl, 2-amino-4-imidazolyl, or 2-amino-6-pyridyl;

R_2 and R_3 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted phenyl or a 4, 5, 6 or 7-membered heterocycle or one of

R_2 and R_3 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, 2-phenylethenyl, 2-phenylethynyl, carboxyl, $—CH_2X_1$, $—S—X_2$, $—O—X_2$,



R_4 and R_5 are the same or different and each is hydrogen or alkyl, or R_4 and R_5 together with the carbon atom to which they are attached are cycloalkyl;

X is $—(CH_2)_n—$ wherein n is 0 or 1,

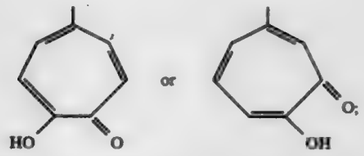


wherein the carbonyl group is bonded to the "T" group, or

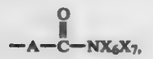


wherein the carbonyl group is bonded to the "T" group;

T is



X_1 is azido, amino, hydroxy, carboxyl, alkoxycarbonyl, alkanoylamino, phenylcarbonylamino, (substituted phenyl)carbonylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl, cyano,



$—S—X_2$, or $—O—X_2$;

X_2 is alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, phenylalkanoyl, (substituted phenyl)alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, or heteroarylcarbonyl;

one of X_3 and X_4 is hydrogen and the other is hydrogen or alkyl, or X_3 and X_4 when taken together with the carbon atom to which they are attached form a cycloalkyl group;

X_5 is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)-carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkyl-carbonyl, carboxyl, alkoxycarbonyl, aminocarbonyl, (substituted amino)carbonyl, or cyano;

X_6 and X_7 are the same or different and each is hydrogen, alkyl, phenyl or substituted phenyl, or X_6 is hydrogen and X_7 is amino, substituted amino, alkanoylamino or alkoxy, or X_6 and X_7 when taken together with the nitrogen atom to which they are attached form a 4, 5, 6 or 7-membered heterocycle;

A is $—CH=CH—$, $—(CH_2)_m—$, $—(CH_2)_m—O—$, $—(CH_2)_m—NH—$ or $—CH_2—S—CH_2—$; and

m is 0, 1 or 2; and

wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the term "cycloalkyl" refers to groups having 3, 4, 5, 6 or 7 carbon atoms;

the term "substituted alkyl" refers to alkyl groups substituted with one or more azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl, or alkylsulfonyl groups;

the terms "alkanoyl", "alkenyl" and "alkynyl" refer to groups having 2 to 10 carbon atoms;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, alkanoyloxy, aminocarbonyl, or carboxy groups;

the term "a 4, 5, 6 or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyi, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazoyl, triazinyl, tetrazolyl, azetidinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl, hexahydroazepinyl or one of the above groups substituted with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, benzylideneamino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl or one of the above groups substituted with one or more halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, benzylideneamino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups; and

the term "substituted amino" refers to a group having the formula $—NX_8X_9$ wherein X_8 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, and X_9 is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy, or amino.

4,638,063

PROCESS FOR THE PREPARATION OF 6-METHYL-3,4-DIHYDRO-1,2,3-OXATHIAZIN-4-ONE 2,2-DIOXIDE AND ITS NON-TOXIC SALTS

Karl Clauss, Kelkheim; Adolf Linkies, Frankfurt am Main, and Dieter Reuschling, Butzbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 714,175, Mar. 20, 1985, Pat. No. 4,563,521. This application Nov. 19, 1985, Ser. No. 799,622

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1984, 3410440

The portion of the term of this patent subsequent to Jan. 7, 2003, has been disclaimed.

Int. Cl.⁴ C07D *291/06*

U.S. Cl. 544—2 **12 Claims**

1. A process for the preparation of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one 2,2-dioxide and its non-toxic salts, which comprises reacting acetoacetamide with at least approximately twice the molar amount of SO_3 in an inert inorganic or organic solvent.

4,638,064

PROCESS FOR PREPARING ETHYLENICALLY UNSATURATED HETEROCYCLIC THIOCARBONYL COMPOUNDS AND THEIR ORGANO-OXYLATED PRECURSORS

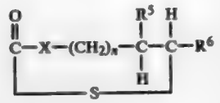
Pen-Chung Wang, Midland, Mich., and James M. Renga, Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 1, 1985, Ser. No. 718,754

Int. Cl.⁴ C07D *279/04, 277/04, 277/06, 327/02, 327/04, 327/06, 333/22, 333/24, 335/02, 333/16, 337/04, 339/02, 339/08*

U.S. Cl. 544—54 **13 Claims**

1. A process for forming oxylated derivatives of heterocyclic thiocarbonyl compounds comprising the step of contacting a heterocyclic precursor represented by the following formula



in which

X is selected from the group of bivalent moieties O, S, CR^7R^8 and NR^9;

R^5, R^6, R^7, R^8 and R^9 are independently selected from the group of monovalent moieties hydrogen, lower alkyl, aryl and acyl; and

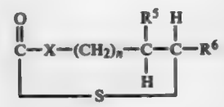
n is between 0 and about 15;

with an oxylating agent which is represented by the formula $R^4OM_{1/y}$ in which R^4 is alkyl or acyl and M is either hydrogen or a metal cation of charge y under anodic alkoxylation or acyloxylation conditions sufficient to form an oxylated derivative represented by the formula:



in which X, R^4, R^5, R^6 and n are as previously defined.

10. A process for producing a mono-unsaturated heterocyclic thiocarbonyl which comprises (1) contacting a heterocyclic precursor represented by the following formula



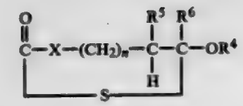
in which

X is selected from the group of bivalent moieties O, S, CR^7R^8 and NR^9;

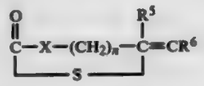
R^5, R^6, R^7, R^8 and R^9 are independently selected from the group of monovalent moieties hydrogen, lower alkyl, aryl and acyl; and

n is between 0 and about 15;

with an oxylating agent which is represented by the formula $R^4OM_{1/y}$ in which R^4 is alkyl or acyl and M is either hydrogen or a metal cation of charge y under anodic alkoxylation or acyloxylation conditions sufficient to form an oxylated derivative represented by the formula:



in which X, R^4, R^5, R^6 and n are as previously defined and (2) dehydroxylating by heating the oxylated derivative to produce a compound represented by the following formula:



in which X is selected from the group of bivalent moieties O, S, CR^7R^8 and NR^9; R^5 and R^6 are independently selected from the group of monovalent moieties hydrogen, lower alkyl, aryl and acyl; and n is between 0 and about 15.

4,638,065

CRYSTALLIZATION METHOD FOR HMX AND RDX

Leif Svensson; Jan-Olof Nyqvist, both of Karlskoga, and Lars Westling, Stenungsund, all of Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Mar. 26, 1985, Ser. No. 716,066

Claims priority, application Sweden, Apr. 4, 1984, 8401857

Int. Cl.⁴ C07D *251/59, 225/02*

U.S. Cl. 544—196 **10 Claims**

1. A process for recrystallizing the high explosives HMX and RDX, in which crystals of the starting explosive are dissolved in a low molecular weight, liquid (at room temperature) lactone with 5 or 6 carbon atoms in the ring, after which the degree of saturation of the solution obtained is changed in order to form new crystals of the explosive.

4,638,066

INDENO PYRAZINE AND BENZOQUINOXALINE INTERMEDIATES

Laramie M. Gaster, Bishop's Stortford, and Barry S. Orlek, London, both of England, assignors to Beecham Group p.l.c., Epsom, England

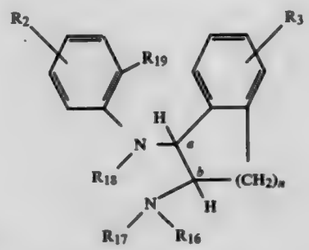
Division of Ser. No. 472,218, Mar. 4, 1983, Pat. No. 4,504,480. This application Dec. 20, 1984, Ser. No. 684,080

Claims priority, application United Kingdom, Mar. 5, 1982, 8206558

Int. Cl.⁴ C07D *241/38, 241/44, 241/42, 401/06*

U.S. Cl. 544—346 **2 Claims**

1. A compound of formula (XXVI):



(XXVI)

wherein R_2 and R_3 are the same or different and are hydrogen, hydroxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halogen or trifluoromethyl, and n is 1 or 2, the hydrogen atom bonded to the C_a carbon atom being trans to the hydrogen atom bonded to the C_b carbon atom and either R_{16} is hydrogen, C_{1-7} alkyl, C_{3-7} cycloalkyl, C_{4-7} cycloalkenyl or C_{1-4} alkyl substituted by C_{2-7} alkenyl, C_{2-7} alkynyl, C_{3-7} cycloalkyl, hydroxy, thiol, C_{1-4} alkoxy, C_{1-4} alkylthio, carboxy, C_{1-4} alkoxycarbonyl, C_{1-4} alkanoyl, amino optionally substituted by one or two C_{1-4} alkyl or by C_{4-6} polymethylene optionally interrupted by an oxygen atom or by NH, aminocarbonyl optionally N-substituted by one or two C_{1-4} alkyl, or benzoyl or phenyl either being optionally ring-substituted by C_{1-4} alkyl, C_{1-4} alkoxy, halogen or trifluoromethyl, or C_{1-4} alkoxycarbonyl, phenoxycarbonyl or benzyloxycarbonyl and R_{17} and R_{18} together are either ethylene or $(CO)_{s'}$—$(CH_2)_{t'}$—$(CO)_{u'}$ wherein s' and u' and 0 or 1 and t' is 0 to 2 such that s'+t'+u' is 2; and R_{19} is G wherein G is formyl, carboxy or a C_{1-4} alkyl ester thereof or is CH_2L_1, wherein L_1 is selected from the group consisting of hydroxy, bromo, chloro, C_{1-4} alkoxy, C_{1-4} alkanoyloxy, C_{1-4} alkoxycarbonyloxy, tosyloxy or mesyloxy.

4,638,067

ANTIBACTERIAL AGENTS

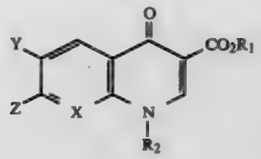
Townley P. Culbertson, Ann Arbor; John M. Domagala, Canton; Thomas F. Mich, Ann Arbor, and Jeffrey B. Nichols, Ypsilanti, all of Mich., assignors to Warner-Lambert Co., Morris Plains, N.J.

Division of Ser. No. 692,820, Jan. 23, 1985, which is a continuation-in-part of Ser. No. 581,157, Feb. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 522,275, Aug. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 416,406, Sep. 9, 1982, abandoned. This application Aug. 12, 1985, Ser. No. 764,357

Int. Cl.⁴ C07D *471/04, 401/14, 215/02*

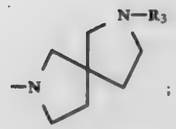
U.S. Cl. 546—15 **8 Claims**

1. A compound of the formula



wherein

Z is



X is CH, CCl, CF, CO-alkyl having from one to three carbon atoms, C—NH—alkyl having from one to three carbon atoms or N;

Y is hydrogen, fluorine, chlorine, or bromine;

R_1 is hydrogen, alkyl having from one to six carbon atoms or a cation;

R_2 is alkyl having from one to four carbon atoms, vinyl, haloalkyl, or hydroxyalkyl having from two to four carbon atoms or cycloalkyl ahving three to six carbon atoms;

R_3 is hydrogen, alkyl having from one to four carbon atom or cycloalkyl having three to six carbon atoms

or a pharmaceutically acceptable acid addition or base salt thereof.

4,638,068

2-(2-IMIDAZOLIN-2-YL)-PYRIDINES AND QUINOLINES, PROCESS AND INTERMEDIATES FOR THE PREPARATION THEREOF, AND USE OF SAID COMPOUNDS AS HERBICIDAL AGENTS

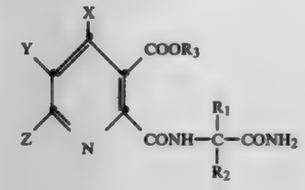
Marinus Los, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 252,704, Apr. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 155,909, Jun. 2, 1980, abandoned, Ser. No. 155,910, Jun. 2, 1980, abandoned, Ser. No. 155,867, Jun. 2, 1980, abandoned, Ser. No. 155,908, Jun. 2, 1980, abandoned, and Ser. No. 155,865, Jun. 2, 1980, abandoned. This application May 25, 1982, Ser. No. 382,041

Int. Cl.⁴ C07D *213/56, 215/14, 221/04*

U.S. Cl. 546—169 **8 Claims**

1. A compound having the structure:

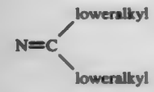


wherein

R_1 is C_1–C_4 alkyl;

R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl; and when R_1 and R_2 are taken together with the carbon to which they are attached they may represent C_3–C_6 cycloalkyl optionally substituted with methyl;

R_3 is hydrogen,



C_1–C_{12} alkyl optionally substituted with one of of the following groups: C_1–C_3 alkoxy, halogen, hydroxyl, C_3–C_6 cycloalkyl, benzyloxy, furyl, phenyl, halophenyl, loweralkylphenyl, loweralkoxyphenyl, nitrophenyl, carboxyl, loweralkoxycarbonyl, cyano or triloweralkylammonium halide;

C_3–C_{12} alkenyl optionally substituted with one of the following groups: C_1–C_3 alkoxy, phenyl, halogen or loweralkoxycarbonyl or with two C_1–C_3 alkoxy groups or two halogen groups;

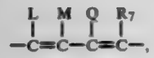
C_3–C_6 cycloalkyl optionally substituted with one or two C_1–C_3 alkyl groups;

C_3–C_{16} alkynyl; or,

A cation;

X is hydrogen, halogen, hydroxyl or methyl, with the proviso that when Y and Z are taken together to form a ring and YZ is represented by the structure: $—(CH_2)_n—$, where n is 3 or 4, X is hydrogen;

Y and Z are each hydrogen, halogen, C_1–C_6 alkyl, hydroxyloweralkyl, C_1–C_6 alkoxy, C_1–C_4 alkylthio, phenoxy, C_1–C_4 haloalkyl, nitro, cyano, C_1–C_4 alkylamino, diloweralkylamino or C_1–C_4 alkylsulfonyl group, or phenyl optionally substituted with one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; and, when taken together, Y and Z may form a ring in which YZ are represented by the structure: $—(CH_2)_n—$, where n is an integer of 3 or 4, provided that X is hydrogen; or



where L, M, Q and R_7 are each hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfonyl, C_1–C_4 haloalkyl, NO_2, CN, phenyl, phenoxy, amino, C_1–C_4 alkylamino, diloweralkylamino, chlorophenyl, methylphenyl, or phenoxy substituted with one Cl, CF_3, NO_2 or CH_3 group, with the proviso that only one of L, M, Q or R_7 may represent a substituent other than hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy;

and the N-oxides thereof provided that in the N-oxidase Y and Z cannot be aklkylamino, dialkylamino or alkylthio; and when R_1 and R_2 represent different substituents, the optical isomers thereof.

4,638,069

ISOCYANIC ACID-PHENYL ESTER PYRIDINE DERIVATIVES

Manfred Bläger, Weil am Rhein, Fed. Rep. of Germany, and Josef Drabek, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

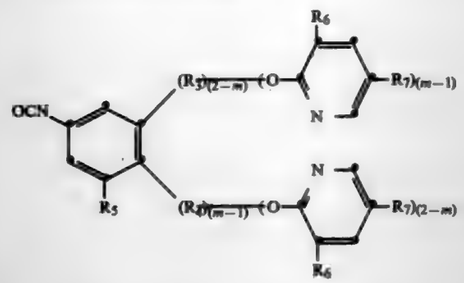
Division of Ser. No. 639,039, Aug. 9, 1984, Pat. No. 4,550,108. This application May 17, 1985, Ser. No. 734,989

Claims priority, application Switzerland, Aug. 17, 1983, 4487/83; Apr. 13, 1984, 1861/84; Jul. 13, 1984, 3424/84

Int. Cl.⁴ C07D *211/04*

U.S. Cl. 546—300 **9 Claims**

1. A compound of the formula



wherein

R_3 and R_4 are each hydrogen, halogen or C_1–C_4-alkyl,

R_5 is hydrogen, halogen, C_1–C_4-alkyl or —$COOR_8$,

R_6 is hydrogen or halogen,

R_7 is mono- or polyhalogenated C_1–C_4-alkyl,

R_8 is hydrogen or C_1–C_4-alkyl, and

m is 1 or 2.

4,638,070

HETEROCYCLIC AMINO-ALCOHOL DERIVATIVES

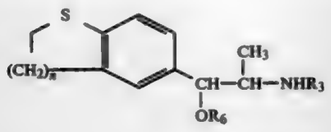
Georges E. Lambelin, Brussels; Roméo R. Rosaccci, Rosières-St-André ; Joseph Robe, Waulin, and Claude L. Gillet, Brussels, all of Belgium, assignors to Continental Pharma, Brussels, Belgium

Continuation of Ser. No. 971,715, Dec. 21, 1978, abandoned, which is a continuation-in-part of Ser. No. 742,917, Nov. 17, 1976, abandoned. This application Jun. 30, 1980, Ser. No. 164,326

Int. Cl.⁴ C07D *337/00, 327/06, 333/52, 335/04*

U.S. Cl. 549—23 **4 Claims**

1. Amino-alcohol derivative having the formula:



wherein:

R_3 is a linear or branched alkyl radical (C_6–C_{10}) or a linear or branched alkyl group (C_2–C_3) substituted by a phenoxy or a phenylthio radical or a linear or branched alkyl group (C_3–C_4) substituted by a phenyl or a benzoyl radical; said phenoxy, phenylthio, phenyl and benzoyl radicals can be substituted by a halogen or a methyl,

R_6 is hydrogen or a linear or branched alkanoyl(C_1–C_4) radical or a cycloalkanoyl(C_3–C_6) radical, and

n is equal to 1,2 or 3.

4,638,071

CYCLOALKYL ETHERS AND THIOETHERS OF DIPEPTIDES

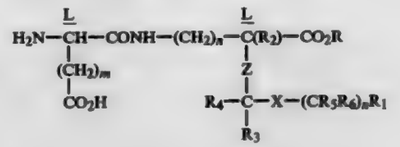
Ronald E. Barnett, Suffern; Paul R. Zanno, Nanuet, and Glenn M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 27, 1984, Ser. No. 686,577

Int. Cl.⁴ C07D *331/04, 327/02, 315/00, 307/02;* C07C *69/74*

U.S. Cl. 549—88 **82 Claims**

1. A compound represented by the formula:



wherein

R is alkyl containing 1–3 carbon atoms;

when X=S

R_1 is cycloalkyl, cycloalkenyl, lower alkyl-substituted cycloalkyl or cycloalkenyl, bicycloalkyl, bycycloalkenyl, tricycloalkyl, aryl, alkylaryl, cyclic ether, cyclic thioether, cyclic sulfoxide or cyclic sulfone, containing up to 10 ring carbon atoms and up to a total of 12 carbon atoms;

when X=O

R_1 is cyclic ether or cyclic thioether containing up to 10 ring carbon atoms and up to a total of 12 carbon atoms;

R_2, R_3, R_4 and R_6 are each H or lower alkyl;

R_5 is H, lower alkyl or cycloalkyl containing up to 3–5 ring carbon atoms;

each n=0, 1 or 2;

m=0 or 1;

Z is an alkylene chain containing 0–2 carbon atoms in the principal chain and up to a total of 6 carbon atoms;

and food acceptable salts.

4,638,072

DISUBSTITUTED MALEIC ANHYDRIDE COMPOUNDS

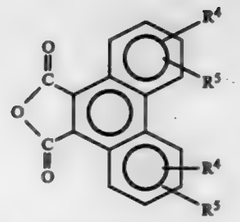
Ellis K. Fields, River Forest; Mark L. Winzenburg, Naperville, and Steven J. Behrend, Glendale Heights, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 630,361, Jul. 12, 1984, Pat. No. 4,596,867. This application Dec. 11, 1985, Ser. No. 807,677

Int. Cl.⁴ C07D *307/77, 493/04*

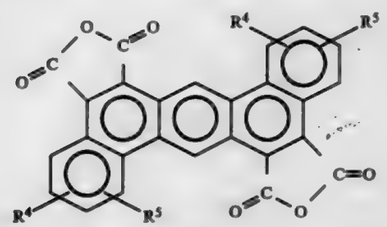
U.S. Cl. 549—234 **3 Claims**

1. A substituted phenanthrene anhydride compound of the structural formula



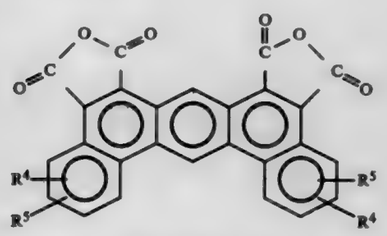
wherein R^4 and R^5 are individually selected from the group consisting of —NH_2 and —$CH{=}CH_2$.

2. A substituted dibenzanthracene dianhydride compound of the structural formula



wherein R^4 and R^5 are individually selected from the group consisting of hydrogen, alkyl moieties of 1 to 10 carbon atoms, phenyl moieties, naphthyl moieties, —NO_2, —$NHCOCH_3$, —NH_2, —$OCOCH_3$, —OH, —OCH_3, —$CH{=}CH_2$, —$COOCH_3$ and —COOH.

3. A substituted dibenzanthracene dianhydride compound of the structural formula



wherein R^4 and R^5 are individually selected from the group consisting of hydrogen, alkyl moieties of 1 to 5 carbon atoms, phenyl moieties, naphthyl moieties, —NO_2, —$NHCOCH_3$, —NH_2, —$OCOCH_3$, —OH, —OCH_3, —$CH{=}CH_2$, —$COOCH_3$, and —COOH.

4,638,073

SYNTHESIS OF NEW LIQUID CRYSTAL MATERIALS POSSESSING PHENYLBENZOATE OR BIPHENYL CORE UNITS AND (2,3)-EPOXYALKYLOXIRANEMETHANOL CHIRAL TAILS

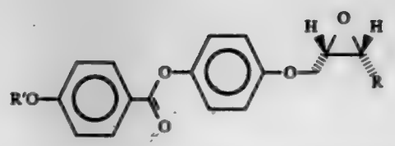
David M. Walba, 3199 Westwood Ct., Boulder, Colo. 80302, and Rohini Vohra, 3877 Arbol Ct., Boulder, Colo. 80301

Filed Oct. 1, 1985, Ser. No. 782,348

Int. Cl.⁴ C07D *303/16, 303/18;* C09K *19/34, 19/20*

U.S. Cl. 549—356 **25 Claims**

1. A compound of formula:



wherein R is an alkyl of one to seven carbon atoms, and R′ is an alkyl of five to twelve carbon atoms.

4,638,074

EXTRACTION OF TIN FROM ITS ORES

Frank S. Holland, Stockport, England, assignor to Manchem Limited, Manchester, England

Filed Jan. 14, 1986, Ser. No. 818,760

Claims priority, application United Kingdom, Jan. 18, 1985, 8501249

Int. Cl.⁴ C07F *7/22*

U.S. Cl. 556—98 **14 Claims**

1. A process for the direct recovery of tin from reduced but unrefined tin ores and ore slags of a tin content of at most about 70 wt % which consists essentially in

forming a comminuted, reduced but unrefined tin ore of fine particles;

treating said unrefined tin ore with a hydrocarbyl halide to form an organo hydrocarbyl tin compound; and

separating said organo hydrocarbyl tin compound from the tin-depleted solid ore residues.

4,638,075

HERBICIDAL SULFONAMIDES

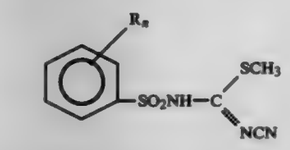
William A. Kleschick, Martinez; Anna P. Vinogradoff, Concord, both of Calif., and Joseph E. Dunbar, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 691,331, Jan. 14, 1985. This application Dec. 23, 1985, Ser. No. 812,612

Int. Cl.⁴ C07C *157/14;* C07D *333/38, 333/32, 487/00*

U.S. Cl. 558—5 **1 Claim**

1. A compound having the formula



wherein each R individually represents hydrogen, halo, nitro, C_1–C_4 alkyl or alkoxy or C_1–C_2 mono- or polyfluoroalkyl or alkoxy and n is an integer from 0 to 5.

4,638,076

PHOSPHORAMIDE ADDITIVES FOR PREPARATION OF ORGANIC CARBONATES

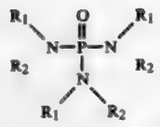
Ajit K. Bhattacharya, Hopewell Junction, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Aug. 16, 1985, Ser. No. 766,325

Int. Cl.⁴ C07C *68/00*

U.S. Cl. 558—277 **9 Claims**

1. A method of preparing dimethyl carbonate which comprises reacting methanol (CH_3OH) with carbon monoxide (CO) and oxygen (O_2) in the presence of a catalyst system containing as a catalyst cupric methoxychloride Cu(OMe)Cl, and as an additive for the catalyst a phosphoramide of the formula



where R_1 and R_2 are (C_1–C_8) alkyl, alkylene or oxa-, thia-, aza-alkylene groups; and recovering the organic carbonate product.

4,638,077

METHOD FOR THE PREPARATION OF CHLOROFORMATE COMPOSITIONS

Daniel J. Brunelle, Scotia; Thomas G. Shannon, Schenectady, both of N.Y., and Niles R. Rosenquist, Evansville, Ind., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 676,353, Nov. 29, 1984. This application Oct. 24, 1985, Ser. No. 790,909
Int. Cl.[4] C01B *31/24*
U.S. Cl. 558—281 10 Claims

1. A method for preparing chloroformate compositions which comprises passing phosgene into a heterogeneous mixture of a substantially inert organic liquid and a hydroxy compound of the formula

$$R^2(OH)_x \qquad \text{(III)}$$

wherein R^2 is an aliphatic or alicyclic radical free from acetylenic unsaturation or an aromatic radical and x is at least 1, said mixture being maintained at a temperature within the range of about 10°–40° C., with the proviso that the phosgene addition rate is high enough to effect rapid and complete reaction of phosgene with dissolved hydroxy compound when x is greater than 1 and the temperature is above 30° C., and simultaneously introducing a hydrogen chloride scavenger comprising an aqueous alkali metal or alkaline earth metal hydroxide solution as necessary while maintaining a pH in the range of 0.5–8 in the aqueous phase; the ratio of equivalents of total phosgene used to hydroxy compound being about 1.0–1.1:1.

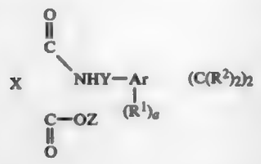
4,638,078

ARYLCYCLOBUTENYL AMIDO ALKENOIC ACIDS AND SALTS THEREOF

Robert A. Kirchhoff, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 25, 1985, Ser. No. 727,162
Int. Cl.[4] C07C *121/64, 103/34*
U.S. Cl. 558—414 19 Claims

10. A compound which corresponds to the formula



wherein

Ar is an aromatic radical;

R^1 is separately in each occurrence a hydrocarbyl, hydrocarbyloxy, hydrocarbylthio, electron-donating or electron-withdrawing group;

R^2 is separately in each occurrence hydrogen or an electron-withdrawing group;

X is an alkenylene moiety which can be substituted with one or more hydrocarbyl, hydrocarbyloxy or hydrocarbylthio groups;

Y is a direct bond or divalent organic moiety;

Z is hydrogen or a cation derived from ammonia, a primary or secondary amine, an alkali metal base or alkaline earth metal base; and

a is an integer of between about 0 and 3.

4,638,079

INHIBITING POLYMERIZATION OF ETHYLENICALLY UNSATURATED MONOMERS

Ervin B. Inskip, Troy, Ill., and Joseph M. Patane, Manchester, Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jan. 17, 1985, Ser. No. 692,080
Int. Cl.[4] C07C *67/62, 51/50*
U.S. Cl. 560—4 25 Claims

1. A process for inhibiting polymerization of a polymerizable ethylenically unsaturated acid monomer, which comprises admixing therewith per 100 parts by weight of the monomer 0.001–0.5 part by weight of at least one metal complex of N-nitrosophenylhydroxylamine having the formula MA_n where M is a cation selected from cobalt (III), nickel (II) and manganese (II), A is the anion of N-nitrosophenylhydroxylamine and n is a number equal to the valence of M.

9. A process of inhibiting polymerization in the substantial absence of oxygen of a polymerizable ethylenically unsaturated ester monomer, which comprises admixing with said monomer per 100 parts by weight of the monomer 0.001–0.5 part by weight of at least one metal complex of N-nitrosophenylhydroxylamine having the formula MA_n where M is the cobalt (III) cation, A is the anion of N-nitrosophenylhydroxylamine and n is 3.

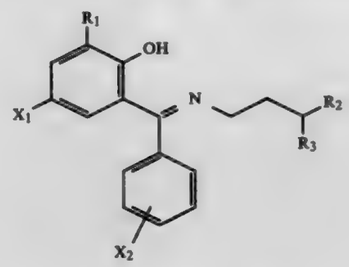
4,638,080

PREPARATION OF DIPHENYLAZOMETHINES

Bernard Raizon, Vigneux; Guy Rossey, Montigny-Le-Bretonneux, and Alexander Wick, St Nom-De-Breteche, all of France, assignors to Synthelabo, Paris, France

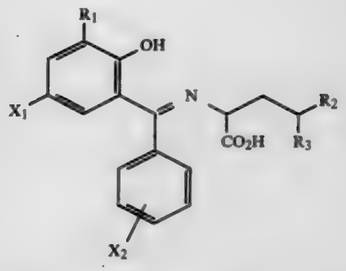
Filed Feb. 25, 1986, Ser. No. 832,690
Claims priority, application France, Feb. 26, 1985, 85 02724
Int. Cl.[4] C07C *101/72*
U.S. Cl. 560—35 2 Claims

1. A process for preparing a compound of formula (II)



(II)

wherein X_1 and X_2 are the same or different and each is hydrogen, halogen or methyl; R_1 is hydrogen or straight or branched (C_{1-4})alkyl; R_2 is —COOH, straight or branched (C_{1-4})alkyl, —$CONH_2$ or straight or branched —$COO(C_{1-4})$alkyl and R_3 is hydrogen or methyl, comprising decarboxylating a compound of formula (I)



(I)

wherein X_1, X_2, R_1, R_2 and R_3 are as defined above.

4,638,081

PROCESS FOR PREPARING α-ASPARTYL-L-PHENYLALANINE METHYL ESTER

Biagio Elefante, Gorgonzola, Italy, assignor to DE-BI Derivati Biologici International SpA, Milan, Italy

Filed May 10, 1984, Ser. No. 608,983
Claims priority, application Italy, May 13, 1983, 21080 A/83
Int. Cl.[4] C07C *101/32;* C07K *5/06*
U.S. Cl. 560—40 11 Claims

1. A process for preparing α-aspartyl-L-phenylalanine methyl ester from N-formyl-L-aspartic anhydride and L-phenylalanine methyl ester, while simultaneously increasing the relative production of the α isomer over the β isomer, comprising:

(a) contacting N-formyl-L-aspartic anhydride and L-phenylalanine methyl eter, in a molar ratio of about 1:1, with a solid cation exchange resin having free sulphonic, phosphonic or carboxylic acid groups, the ratio of the acid equivalents of said resin acid groups to the number of moles of the one or the other of said reagents being from about 0.05:1 to about 1:1, and operating in the liquid phase in an inert organic solvent at a temperature of about −15° C. to about 40° C. for a period of about 5 minutes to about 2 hours, until a mixture of N-formyl-α-L-aspartyl-L-phenylalanine methyl ester and N-formyl-β-L-aspartyl-L-phenylalanine methyl ester forms;

(b) deformylating said N-formyl-α-L-aspartyl-L-phenylalanine methyl ester and N-formyl-β-L-aspartyl-L-phenylalanine methyl ester; and

(c) separating and recovering the α-L-aspartyl-L-phenylalanine methyl ester from said deformylated products.

4,638,082

METHOD OF PRODUCING THE P-CHLOROPHENOL ESTER OF P-CHLOROPHENOXYISOBUTYRIC ACID

Claude Feniou, Pessac, and Patrick Descas, Bordeaux, both of France, assignors to Societe Corial, S.A., Paris, France

Filed Feb. 25, 1986, Ser. No. 832,688
Claims priority, application France, Feb. 28, 1985, 85 03094
Int. Cl.[4] C07C *69/76*
U.S. Cl. 560—62 15 Claims

1. A method for the preparation of the p-chlorophenol ester of p-chlorophenoxyisobutyric acid, comprising:

(i) converting p-chlorophenol to a salt in the presence of a non-polar solvent, and

(ii) reacting the said salt of p-chlorophenol with an acyl halide derivative of a haloisobutyric acid, wherein at least 2 moles of the said salt of p-chlorophenol are used per mole of the said haloisobutyric acid.

4,638,083

ETHYNYL TERMINATED ESTER OLIGOMERS AND POLYMERS THEREFROM

Paul M. Hergenrother, Yorktown, and Stephen J. Havens, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

Division of Ser. No. 613,138, May 23, 1984, Pat. No. 4,567,240. This application Jul. 31, 1985, Ser. No. 760,797
Int. Cl.[4] C07C *69/76*
U.S. Cl. 560—104 2 Claims

1. A method of preparing 2-2-bis(4-ethynylbenzoyloxy-4'-phenyl)propane comprising:

adding 4-ethynylbenzoyl chloride to a stirred solution of 2,2-bis(4-hydroxyphenyl)propane in dry pridine,

stirring this mixture approximately twelve hours and precipitating the mixture in a 5% solution of hydrochloric acid,

combining the solid precipitate with a 10% sodium bicarbonate solution,

collecting the solid by filtration and air drying the recovered solid,

recrystallization the solid from a 80/20 ethanol/chloroform mixture to recover light yellow needle crystals of 2,2-bis(4-ethynylbenzoyloxy-4-phenyl)propane.

4,638,084

PROCESS FOR DIMERIZING ACRYLATES AND METHACRYLATES

David M. Singleton, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 12, 1985, Ser. No. 775,077
Int. Cl.[4] C07C *67/343*
U.S. Cl. 560—202 7 Claims

1. A catalytic dimerization process comprising contacting, at about 0° C. to about 150° C., a lower alkyl acrylate or lower alkyl methacrylate with lower alkyl being alkyl of 1 to 8 carbon atoms with a catalyst prepared by reacting chlorobis(ethylene)rhodium(I)dimer and silver tetrafluoroborate in a mole ratio of dimer to tetrafluoroborate of about 0.5:1 and wherein the ratio of moles of acrylate or methacrylate to gram atoms of rhodium ranges from about 10:1 to about 10000:1.

4,638,085

PREPARATION OF METHYL METHACRYLATE FROM METHACROLEIN

Franz J. Broecker, Ludwigshafen; Gerd Duembgen, Dannstadt-Schauernheim; Gerd Fouquet, Neustadt; Richard Krabetz, Kirchheim; Franz Merger, Frankenthal, and Friedbert Nees, Stutensee, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 473,601, Mar. 9, 1983, abandoned. This application Nov. 21, 1984, Ser. No. 660,978
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1982, 3210708
Int. Cl.[4] C07C *67/39*
U.S. Cl. 560—208 2 Claims

1. A process for the preparation of methyl methacrylate by reacting methacrolein, methanol and oxygen at from 20° to 100° C. over a catalyst for the preparation of carboxylic acid esters from aldehydes and alcohols in the presence of oxygen, said catalyst containing palladium and lead as active constituents, wherein

(a) the active constituents are supported on a carrier which contains two or more of oxides selected from the group consisting of ZnO, Al_2O_3, La_2O_3 and TiO_2, and

(b) said catalyst is free from alkali metal compounds and alkaline earth metal compounds.

4,638,086

PROCESS FOR THE RACEMIZATION OF OPTICALLY ACTIVE AMINOACIDS

Susanne Grubley, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 25, 1984, Ser. No. 654,266
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1983, 3334849
Int. Cl.[4] C07B *55/00*
U.S. Cl. 562—401 10 Claims

1. A process for racemization of optically active amino acids which comprises heating said amino acids with an effective amount of benzoic or phenylacetic acid or their derivatives which are monosubstituted or polysubstituted on the nucleus by identical or different substituents selected from the group consisting of halogen, lower alkyl, lower alkoxy, hydroxy, acyloxy, and nitro.

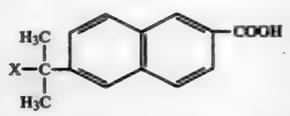
4,638,087

6-SUBSTITUTED NAPHTHALENE-2-CARBOXYLIC ACIDS AND PROCESS FOR PRODUCING THE SAME

Akira Iizuka; Yutaka Konsi; Takashi Yamauchi, and Shoichiro Hayashi, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1986, Ser. No. 838,525
Int. Cl.[4] C07C *63/34*
U.S. Cl. 562—467 8 Claims

1. 6-substituted naphthalene-2-carboxylic acids represented by the formula (I):



(I)

wherein X represents a hydroperoxy group or a hydroxy group.

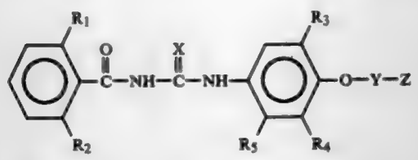
4,638,088

PESTICIDAL BIPHENYLYLOXY AND BIPHENYLYLALKOXY ARYL ACYL UREA COMPOUNDS

David T. Chou, and Robert C. Ligon, both of Raleigh, N.C., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 15, 1984, Ser. No. 672,007
Int. Cl.[4] C07C *127/22, 157/12, 143/833, 149/40*
U.S. Cl. 564—23 22 Claims

1. A compound of the formula:



wherein:

R_1 is halogen, C_{1-6} alkyl, alkoxy, polyhaloalkyl, polyhaloalkoxy or nitro;

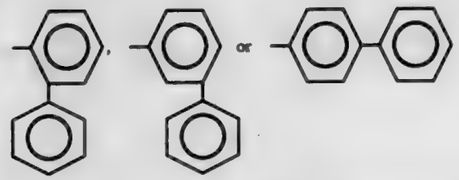
R_2 is hydrogen, halogen, C_{1-6} alkyl, alkoxy, polyhaloalkyl, polyhaloalkoxy or nitro;

R_3, R_4, and R_5 are independently hydrogen, halogen, C_{1-6} alkyl, alkoxy, polyhaloalkyl, polyhaloalkoxy, nitro, cyano, carboxylic acid, carboxylic acid salt or carboxylic acid ester;

X is oxygen or sulfur;

Y is C_{1-8} alkylene or a covalent bond; and

Z is substituted or unsubstituted



wherein the permissible substituents are one or more halo, C_{1-6} alkyl, alkoxy, polyhaloalkyl, polyhaloalkoxy, nitro, cyano, carboxylic acid, carboxylic acid salt or carboxylic acid ester substituents which may be the same or different.

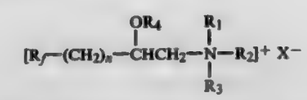
4,638,089

FLUORINE-CONTAINING QUATERNARY AMMONIUM COMPOUNDS AND THEIR PRODUCTION

Iwao Hisamoto, Osaka; Chiaki Maeda, Kyoto, and Mitsuhiro Nishiwaki, Osaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Apr. 24, 1981, Ser. No. 257,194
Claims priority, application Japan, Apr. 26, 1980, 55-56049
Int. Cl.[4] C07C *91/26*
U.S. Cl. 564—292 10 Claims

1. A fluorine-containing quaternary ammonium compound of the formula:



wherein R_f is a fluorine-containing aliphatic hydrocarbon or polyether group, R_1, R_2 and R_3 are each an alkyl, hydroxyalkyl alkenyl group aryl or aralkyl group, R_4 is a hydrogen atom or an acyl group, X^- is an anion and n is an integer of 1 to 3.

4,638,090

PROCESSES FOR THE PREPARATION OF NITROSAMINE-FREE N,N-DISUBSTITUTED NITROAROMATIC AMINES AND FOR THE STABILIZATION OF THESE COMPOUNDS AGAINST THE FORMATION OF NITROSAMINES

Rüdolf Heinrich, and Konrad Albrecht, both of Kelkheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschat, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 12, 1984, Ser. No. 680,750
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345157
Int. Cl.[4] C07C *85/26*
U.S. Cl. 564—437 10 Claims

1. A process for stabilizing a N,N-disubstituted dinitroaniline compound against the formation of a nitrosamine, which comprises adding an aromatic sulfonic acid with up to 18 carbon atoms to a molten N,N-disubstituted dinitroamiline compound in an amount up to 1% by weight based on the amiline.

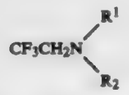
4,638,091

CHEMICAL PROCESS

Roy D. Bowden, Warrington, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Feb. 11, 1985, Ser. No. 700,384
Claims priority, application United Kingdom, Feb. 17, 1984, 8404225
Int. Cl.[4] C07C *85/08, 45/00*
U.S. Cl. 564—473 5 Claims

1. A method for the preparation of a fluorinated amine of the formula:



wherein each of R^1 and R^2, independently, represents hydrogen or lower alkyl, which comprises the steps of

(a) reacting trichloroacetaldehyde with hydrogen flouride at an elevated temperature in the presence of a fluorination catalyst to form trifluoroacetadehyde,

(b) dissolving the trifluoroacetaldehyde in an aqueous medium, and

(c) contacting the aqueous solution of trifluoroacetaldehyde with a nitrogenous base of the formula:



and hydrogen in the presence of a hydrogenation catalyst.

4,638,092

NEW ORGANIC BORON POLYMERS AND THEIR USE

Wolfgang Ritter, Düsseldorf, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 407,886, Aug. 13, 1982, abandoned. This application May 29, 1985, Ser. No. 738,902
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1982, 3201780
Int. Cl.[4] C07F *5/02*
U.S. Cl. 568—1 20 Claims

1. An organo-boron compound having a boron-free polymer matrix having at least one organic polymer chain to which are attached as side chains boron-containing groups in which the boron atoms are attached only to carbon atoms, wherein the boron-containing groups are attached to the polymer matrix through the boron atom, and wherein the boron-containing groups have either two hydrocarbon radicals in which the radicals are the same or different and each radical has up to 25 carbon atoms, or a cyclic hydrocarbon radical having up to 25 carbon atoms each end of which is bound to the boron atom with a boron-carbon bond, said boron-free polymer matrix being largely inert to atmospheric oxygen and having an iodine number from about 1 to about 500 before attachment of the boron-containing groups, said organo-boron compound being in the form of a viscous fluid to a solid mass that is largely free of solvents.

4,638,093

PREPARATION OF SECONDARY THIOLS

Herbert E. Fried, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 484,051, Apr. 11, 1983, abandoned. This application Apr. 2, 1985, Ser. No. 718,912
Int. Cl.[4] C07C *149/06*
U.S. Cl. 568—73 10 Claims

1. A process for the preparation of C_{10} to C_{22} secondary thiols in enhanced selectivity which comprises contacting in a liquid phase at a temperature in the range from about 50° to 100° C. and at a pressure in the range from about 400 to about 1500 psig, one or more C_{10} to C_{22} linear mono-olefins with hydrogen sulfide, the molar ratio of said hydrogen sulfide to said olefins in said liquid phase being at least about 10.0 to 1, in the presence of a catalytically effective amount of a decationized or cation exchanged Type Y zeolite catalyst.

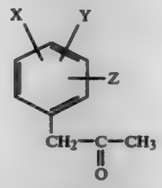
4,638,094

PROCESS FOR PRODUCING PHENYLACETONES

Mamoru Nakai, and Takuji Enomiya, both of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

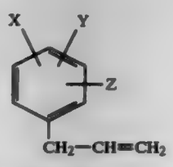
Filed Jul. 29, 1983, Ser. No. 518,691
Claims priority, application Japan, Aug. 6, 1982, 57-136346; Aug. 10, 1982, 57-138024; Dec. 7, 1982, 57-213324; Jan. 11, 1983, 58-001744; Jan. 13, 1983, 58-002854; May 26, 1983, 58-091474; Jun. 6, 1983, 58-099579; Jun. 9, 1983, 58-101665
Int. Cl.[4] C07C *45/00*
U.S. Cl. 568—309 16 Claims

1. A process for producing a phenylacetone or its derivative having the general formula (I):



(I)

wherein X, Y, and Z are independently a hydrogen atom, a hydroxyl group, a halogen atom, a nitro group, an amino group, a lower alkyl group having 1 to 6 carbon atoms, a lower alkoxy group having 1 to 6 carbon atoms, or a benzyloxy group, and any two substituents of X, Y, and Z may form, together with the benzene ring, a heterocyclic ring having 5 to 7 members including 1 or 2 oxygen atoms comprising the step of reacting a 3-phenylpropylene or its derivative having the general formula (II):



(II)

wherein X, Y, and Z are as defined above, with an alkyl nitrite having the general formula (III):

RONO (III)

wherein R is an aliphatic, aromatic, or alicyclic saturated or unsaturated hydrocarbon group in the presence of (a) water, (b) an alcohol, and (c) a palladium catalyst.

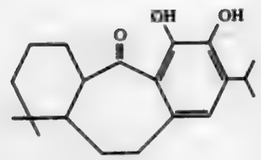
4,638,095

ISOLATION OF A NOVEL ANTIOXIDANT ROSMARIDIPHENOL FROM *ROSMARINUS OFFICINALIS* L.

Stephen S. Chang; Chi-Tang Ho, both of East Brunswick, and Christopher M. Houlihan, Parsippany, all of N.J., assignors to Research Corporation, New York, N.Y.

Filed Aug. 10, 1984, Ser. No. 639,899
Int. Cl.[4] C07C *49/573*
U.S. Cl. 568—326 1 Claim

1. A compound of the formula:



4,638,096
PROCESS OF PREPARING HYDROXYARYLALDEHYDES AND CATALYST THEREFOR

Michael J. Virnig, Fridley, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Oct. 12, 1982, Ser. No. 433,745
Int. Cl.[4] C07C *47/565, 45/45*
U.S. Cl. 568—433 32 Claims

1. In a process of preparing an hydroxyarylaldehyde wherein a phenolic compound is reacted with formaldehyde in the presence of a solvent and a catalyst, the improvement wherein said catalyst is an organic moiety containing titanium (IV) or zirconium (IV) compound.

4,638,097
REDUCING THE CONTENT OF CYCLIC OLIGOMERIC ETHERS IN POLYTETRAMETHYLENE ETHER GLYCOLS OR POLYOXYBUTYLENE POLYOXYALKYLENE GLYCOLS

Herbert Mueller, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 21, 1986, Ser. No. 842,467
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1985, 3514547
Int. Cl.[4] C07C *41/38*
U.S. Cl. 568—617 7 Claims

1. A process for reducing the content of cyclic oligomeric ethers in a polytetramethylene ether glycol or polyoxybutylene polyoxyalkylene glycol, wherein a polytetramethylene ether glycol or a polyoxybutylene polyoxyalkylene glycol which contains the said ethers and has a mean molecular weight of from 200 to 450 is mixed with a mixture of water and a hydrocarbon, and, after phase separation, the purified polytetramethylene ether glycol or polyoxybutylene polyoxyalkylene glycol is isolated from the aqueous phase.

4,638,098
CATALYTIC ETHERIFICATION OF PHENOLS TO ALKYL ARYL ETHERS

Allen B. Mousman, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Mar. 10, 1986, Ser. No. 838,108
Int. Cl.[4] C07C *41/09*
U.S. Cl. 568—630 12 Claims

1. A process for etherifying phenols comprising reacting phenols at elevated temperature and pressure with a reactant selected from the group consisting of alcohol, ether and mixtures thereof in the presence of a catalyst comprising a sulfated oxide of a Group IIB metal selected from the group consisting of Zn, Cd, Hg and mixtures thereof on a support.

4,638,099
METHOD FOR MAKING 4,4'-DIHYDROXYDIPHENYL ETHER

Achim Riemann, Griesheim, and Werner Uda, Darmstadt, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jan. 23, 1986, Ser. No. 821,899
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1985, 3506845
Int. Cl.[4] C07C *41/26, 43/295*
U.S. Cl. 568—638 10 Claims

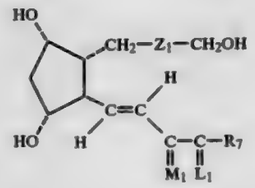
1. A method for making 4,4'-dihydroxy-diphenyl ether from diphenyl ether, which method comprises
oxidatively iodinating diphenyl ether;
hydrolyzing the iodinated diphenyl ether with a base to form diphenyl-ether-4,4'-diphenolate and iodide;
liberating 4,4'-dihydroxydiphenyl ether in the basic hydrolyzate by the addition of acid thereto;
oxidizing iodide in the acidic filtrate to iodine; and
recycling said iodine to the iodination of diphenyl ether.

4,638,100
AROMATIC OR INTER-OXA 2-DECARBOXY-2-HYDROXYMETHYL-PGFα COMPOUNDS

Norman A. Nelson, Charleston Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 329,081, Dec. 9, 1981, abandoned, which is a continuation of Ser. No. 914,330, Jun. 5, 1978, abandoned, which is a continuation of Ser. No. 822,022, Aug. 5, 1977, abandoned, which is a continuation of Ser. No. 822,021, Aug. 5, 1977, abandoned, which is a continuation of Ser. No. 822,032, Aug. 5, 1977, abandoned, which is a continuation of Ser. No. 822,304, Aug. 5, 1977, abandoned, which is a division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602, and a continuation of Ser. No. 778,646, Mar. 17, 1977, abandoned, and a continuation of Ser. No. 778,648, Mar. 17, 1977, abandoned, which is a division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419. This application Sep. 30, 1985, Ser. No. 783,048
Int. Cl.[4] C07C *43/205*
U.S. Cl. 568—645 1 Claim

1. A prostaglandin analog of the formula



wherein L_1 is α-R_3:β-R_4, α-R_4:β-R_3 or a mixture of α-R_3:β-R_4 and a-R_4:β-R_3, wherein R_3 and R_4 are hydrogen, methyl, or fluoro, with the provisos that
(1) one of R_3 and R_4 is methyl only when the other is hydrogen or methyl; and
(2) one of R_3 and R_4 is fluoro only when R_7 is other than phenoxy,
wherein M_1 is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl,
wherein Z_1 is
—(m—Ph)—Z_3—$(CH_2)_g$—,
wherein —(m—Ph)— is inter-m-phenylene, Z_3 is oxa, and g is one, 2 or 3, and
R_7 is phenoxy optionally substituted by one, 2, or 3 chloro, fluoro, trifluoromethyl, (C_1–C_3) alkyl, or (C_1–C_3) alkoxy, the various substituents being the same or different with the proviso that not more than two such substituents are other than alkyl.

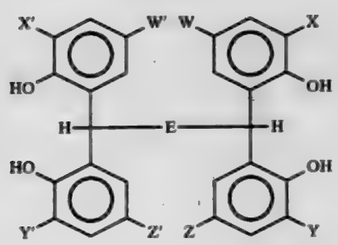
4,638,101
COMPOSITIONS

Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Division of Ser. No. 688,244, Jan. 2, 1985, Pat. No. 4,604,434. This application Mar. 24, 1986, Ser. No. 843,201
Int. Cl.[4] C07C *39/12*
U.S. Cl. 568—720 7 Claims

1. A composition comprising a compound of the formula

FIG. II



wherein X, X', Y, Y', W, W', Z, Z' and E are the same or different and are hydrogen or alkyl of one to about six carbon atoms, inclusive; W, W', Z and Z' are the same or different and are alkyl of one to about six carbon atoms, inclusive; and E is alkylene or alkylidene of two to about twelve carbon atoms, inclusive.

4,638,102
RECRYSTALLIZATION OF BISPHENOL A BY AZEOTROPICALLY DRYING THE SOLVENT

Douglas J. Little, Wichita, Kans., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 30, 1985, Ser. No. 814,814
Int. Cl.[4] C07C *37/84, 37/68*
U.S. Cl. 568—724 18 Claims

1. The method of separating o,p'isomers of bisphenol A from the p,p'-isomers of bisphenol A comprising the steps of:
(a) mixing said isomeric mixture of bisphenol A with water (H_2O) and an organic solvent (not miscible in water) for said bisphenol at between about 85° and about 105° C. in the presence of water;
(b) slowly heating the resulting mixture with agitation to between about 68° C. and the melting point of bisphenol A under a pressure sufficient to vaporize only an azeotropic ratio of water and the organic solvent at the temperature employed;
(c) removing the azeotropic vapors which form from the heated mixture, to reduce the total volume of water in the liquid state of the mixture until crystallization initiates in the liquid at the temperature of the mixture;
(d) cooling the remaining mixture to effectuate first mass of crystalline solids formation in the mixture;
(e) separating the crystalline solids from the mother liquor prior to cooling the mixture to below about 64° C., and recovering a solid product having less o,p'-isomer than in the bisphenol A fed to step (a), and
further, optionally subjecting the so recovered solid to at least one of the steps selected from the group consisting of
(f) washing the crystalline solids with a solvent; and/or
(g) drying the crystalline solids.

4,638,103
PREPARATION OF DELTA-TERPINEOL

Peter W. D. Mitchell, Freehold, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Oct. 1, 1985, Ser. No. 782,646
Int. Cl.[4] C07C *35/18*
U.S. Cl. 568—827 6 Claims

1. A method of preparing delta-terpineol, comprising an E2 elimination reaction of 1,8-cineole, wherein the elimination reagent is an alkali metal aryl compound wherein aryl is selected from the group consisting of phenyl, tolyl, xylyl, p-phenoxyphenyl, biphenyl, p-terphenyl, naphthyl, anthryl, phenanthryl and pyrenyl.

4,638,104
PREPARATION OF TERPINEN-4-OLS AND INTERMEDIATES

Peter W. D. Mitchell, Freehold, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Oct. 1, 1985, Ser. No. 782,647
Int. Cl.[4] C07C *35/18*
U.S. Cl. 568—827 8 Claims

1. A method for the preparation of 1-terpinen-4-ol and 1(7)-terpinen-4-ol, comprising an E2 elimination of 1,4-cineole, wherein the elimination reagent is an alkali metal aryl compound wherein aryl is selected from the group consisting of phenyl, tolyl, xylyl, p-phenoxyphenyl, biphenyl, p-terphenyl, naphthyl, anthryl, phenanthryl and pyrenyl.

4,638,105
ACID-CATALYZED XYLENE ISOMERIZATION

Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 713,213, Mar. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 631,688, Jul. 16, 1984, Pat. No. 4,524,140, which is a continuation-in-part of Ser. No. 465,987, Feb. 14, 1983, Pat. No. 4,513,091. This application Oct. 15, 1985, Ser. No. 787,572
Int. Cl.[4] C07C *5/27*
U.S. Cl. 585—481 15 Claims

1. A process for converting feedstock comprising xylene isomers to isomerization conversion product comprising xylene isomers which comprises contacting said feedstock at conversion conditions sufficient to convert said feedstock to said product with a catalyst composition prepared by a method for substituting aluminum or gallium for boron or iron contained in the robust framework of a high silica content crystalline zeolite, which method comprises hydrothermally treating said zeolite in the presence of a compound of said aluminum or gallium, said hydrothermal treatment being under conditions effective to induce said substitution.

4,638,106
TWO STAGE PROCESS FOR IMPROVING THE CATALYST LIFE OF ZEOLITES IN THE SYNTHESIS OF LOWER OLEFINS FROM ALCOHOLS AND THEIR ETHER DERIVATIVES

Wim J. M. Pieters, Morristown, N.J., and Yoshiharu Okumura, Tokyo, Japan, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 630,636, Jul. 13, 1984, Pat. No. 4,554,260. This application Aug. 26, 1985, Ser. No. 769,357
Int. Cl.[4] C07C *1/00*
U.S. Cl. 585—640 11 Claims

1. A process for converting an alcohol and/or ether feed as hereinafter defined to a hydrocarbon mixture rich in olefins which comprises contacting, under conversion conditions at a conversion reaction temperature of from about 300° to 350° C., a feed comprising one or more monohydric alcohols having from about 1 to about 4 carbon atoms, ethers derived therefrom, or mixtures of said alcohols and ethers, with a modified crystalline metalosilicate shape selective acidic zeolite, wherein said metalosilicate is selected from the group consisting of aluminum, gallium, and mixtures thereof, and wherein said zeolite, prior to modification and in the absence of any coke deposited thereon, possesses:
(a) the capability of catalyzing said alcohol and/or ether conversion reaction;

(b) a channel size and structure such as to permit (i) entry of the said feed into the zeolite and diffusion to the active acid sites within said zeolite, and (ii) formation of olefin products within said zeolite and diffusion of said products out of the zeolite; and

(c) hydrothermal stability at temperatures of at least about 290° C.; and wherein the modification of said zeolite is conducted in a manner sufficient to increase the catalyst life of said zeolite, relative to the absence of said modification when said zeolite is employed as a catalyst for said alcohol and/or ether conversion reaction, by a process comprising:

(A) contacting said zeolite with coke precursor forming feed for a period of from about 0.5 to about 4 hours, said coke precursor forming feed being (i) comprised of at least one member selected from the group consisting of monohydric alcohols having from 1 to about 4 carbon atoms, ethers derived from said alcohols, olefins having from about 1 to about 5 carbon atoms, and mixtures thereof; and (ii) heated to a temperature of from about 320° to about 350° C.; and

(B) contacting the zeolite, treated in accordance with Step (A), with an inert gas heated to a temperature of from about 350° to about 425° C. for a period of at least 1 hour.

4,638,107

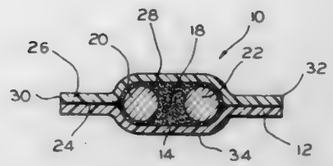
HEAT SENSITIVE TAPE AND METHOD OF MAKING SAME

Bayard C. Davis, Lombard, Ill., assignor to XCO International, Inc., Elgin, Ill.

Continuation of Ser. No. 542,007, Oct. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 352,978, Feb. 26, 1982, abandoned. This application May 23, 1985, Ser. No. 738,521

Int. Cl.⁴ H01L *35/08*

U.S. Cl. 136—237 31 Claims



1. A heat sensitive tape operable in a predictable fashion over a range of temperatures for generating a measurable voltage indicative of the temperature along said tape to provide a continuous temperature sensor, comprising:

an elongated flexible strip of electrically non-conductive material;

a pair of thermoelectric conductors extending along said strip in spaced apart side-by-side relation,

said conductors being formed of thermoelectrically dissimilar materials; and

means for passively self-generating a continuous temperature representative measurable voltage between said conductors when said tape is exposed to ambient temperature without the use of an external power source, said continuous temperature representative measurable voltage being adapted for conversion into ambient temperature measured in degrees, said passive self-generating means comprising a material having a negative temperature coefficient in contact with both of said conductors substantially along their entire length;

said passive self-generating means causing an increase or decrease in said continuous temperature representative measurable voltage responsive to an associated increase or decrease in ambient temperature at every location along said tape, the change in said voltage under such condition being measurable and representative of an increase or decrease in ambient temperature and adapted for conversion into a new ambient temperature along said cable measured in degrees, said passive self-generating means also causing a change in said continuous temperature representative measurable voltage responsive to an associated increase in temperature above the prevailing ambient at any location along said tape, the change in said voltage under such condition also being measurable and representative of an increase in localized temperature and adapted for conversion into a maximum temperature along said tape measured in degrees;

whereby said heat sensitive tape may be utilized not only to monitor ambient temperature but also to monitor for any localized increase in temperature over said range of temperatures for said tape in a predictable fashion to provide a continuous temperature sensor.

4,638,108

PHOTOELECTRIC CONVERSION DEVICE

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

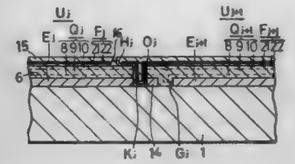
Division of Ser. No. 620,171, Jun. 13, 1984, which is a division of Ser. No. 554,807, Nov. 23, 1983, Pat. No. 4,527,006. This application Jul. 31, 1985, Ser. No. 760,873

Claims priority, application Japan, Nov. 24, 1982, 57-206809; Nov. 24, 1982, 57-206806; Feb. 22, 1983, 58-28211; Apr. 29, 1983, 58-75713; Oct. 31, 1983, 58-204443

The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl.⁴ H01L *27/14*

U.S. Cl. 136—244 9 Claims



1. A photoelectric conversion device comprising:

a substrate having an insulating surface; and

a plurality n (n being an integer larger than one) of semiconductor elements U_1 to U_n sequentially formed thereon side by side and connected in series one after another;

wherein the semiconductor element U_i (i=1, 2, 3 . . . n) has a first electrode E_i formed on the substrate, a non-single-crystal semiconductor laminate member Q_i formed on the first electrode E_i and having formed therein at least one semiconductor junction, and a second electrode F_i formed on the non-single-crystal semiconductor laminate member Q_i in opposing relation to the first electrode E_i;

wherein the first electrodes E_j and E_{j+1} (j=1, 2, . . . (n−1)) are separated by a first groove G_j;

wherein the second electrode F_{j+1} of the semiconductor element U_{j+1} is coupled with the first electrode E_j of the semiconductor element U_j through a coupling portion K_j formed by an extension of the second electrode F_{j+1} and extending into a second groove O_j formed in the non-single-crystal semiconductor laminate member Q_j and spaced from the first groove G_j; and

wherein the second electrodes F_j and F_{j+1} are separated by an isolating portion H_j, the isolating portion H_j being a third groove in said second electrode opposite the first electrode E_j but spaced from the second groove O_j and extending to and terminating at the semiconductor laminate member Q_j.

4,638,109

SUN LIGHT ELECTRICITY GENERATOR

Takashi Ishihara, Ashiya; Kazuhiro Okaniwa, Itami, and Genshiro Nakamura, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1985, Ser. No. 731,276

Claims priority, application Japan, May 15, 1984, 59-97848

Int. Cl.⁴ H01L *31/06, 27/14*

U.S. Cl. 136—244 5 Claims

1. A sun light electricity generator including an amorphous sun light battery, comprising:

a conductive substrate, said conductive substrate being an output electrode;

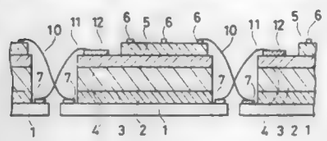
amorphous semiconductor layers provided on said substrate, said layers including at least a single p-i-n junction structure for the formation of a sun light battery element and a protection diode;

a collection electrode affixed on said sun light battery element and a metal electrode provided for said protection

diode, said metal electrode and said collection electrode being affixed to the same light incident surface of said amorphous semiconductor layers but separated from each other by a predetermined distance; and

a connection electrode provided on a region of said conductive substrate where said amorphous layers are not provided;

said collection electrode, said metal electrode, and said connection electrode being simultaneously affixed to said sun light battery element, said protection diode, and said



conductive substrate, respectively, thereby reducing construction time and enhancing reliability.

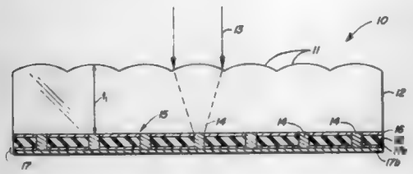
A sun light generator as set forth in claim 1, wherein a plurality of amorphous sun light batteries are provided, said collection electrode for said sun light battery element being connected to said connection electrode of an adjacent amorphous sun light battery element and said metal electrode provided for said protection diode being connected to said connection electrode of another adjacent amorphous sun light battery.

4,638,110

METHODS AND APPARATUS RELATING TO PHOTOVOLTAIC SEMICONDUCTOR DEVICES

Virgil Erbert, Tijeras, N. Mex., assignor to Illuminated Data, Inc., Albuquerque, N. Mex.

Filed Jun. 13, 1985, Ser. No. 744,424
Int. Cl.[4] H01L *27/14, 31/18*
U.S. Cl. 136—246 45 Claims



28. A laminated sheet product useful in photovoltaic devices comprising:

a light-transmissive lens sheet having a first side in which a matrix of a multiplicity of concentrating lenses is formed and having an opposing substantially flat second side;

a substrate adhered to the second side of said lens sheet including a layer of electrically conductive material forming a first conductor;

a matrix of voids forming cell sites in said substrate extending at least through the first conductor and optically below the concentrating lenses whereby radiation concentrated by a lens is directed to a cell site for a selected angle of incidence of the radiation.

44. The invention of any one of claims 28, 29 or 30 further comprising:

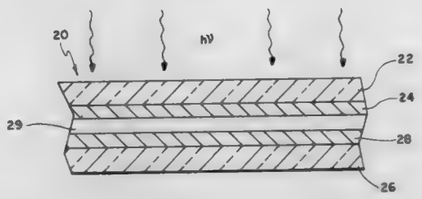
a photovoltaic semiconductor crystal disposed at each cell site, in electrical contact with the first conductor and optically visible through the lens sheet.

4,638,111

THIN FILM SOLAR CELL MODULE

Robert R. Gay, Granada Hills, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 4, 1985, Ser. No. 741,084
Int. Cl.[4] H01L *25/08, 31/06*
U.S. Cl. 136—249 14 Claims



1. A thin film solar cell module comprising a first solar cell panel containing an array of solar cells consisting of a TFS semiconductor sandwiched between a transparent conductive zinc oxide layer and a transparent conductive layer selected from the group consisting of tin oxide, indium tin oxide, and zinc oxide deposited upon a transparent superstrate,

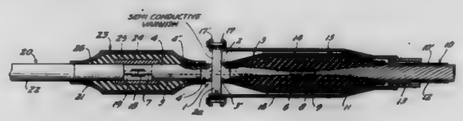
and a second solar cell panel containing an array of solar cells consisting of a CIS semiconductor layer sandwiched between a zinc oxide semiconductor layer and a conductive metal layer deposited upon an insulating substrate, said zinc oxide semiconductor layer containing a first relatively thin layer of high resistivity zinc oxide adjacent said CIS semiconductor and a second relatively thick layer of low resistivity zinc oxide overlying said high resistivity zinc oxide layer, said transparent conductive zinc oxide layer of said first panel facing said low resistivity zinc oxide layer of said second panel, said first and second panels being positioned optically in series and separated by a transparent insulating layer.

4,638,112

STOP JOINT FOR INTERCONNECTING TWO ELECTRICAL CAHLES OF DIFFERENT TYPES

Giancarlo Giorgio, and Bruno Parmigiani, both of Milan, Italy, assignors to Societa' Cavi Pirelli S.p.A., Milan, Italy

Filed Dec. 16, 1985, Ser. No. 809,147
Claims priority, application Italy, Dec. 17, 1984, 24092 A/84
Int. Cl.[4] H02G *15/25*
U.S. Cl. 174—22 R 6 Claims



1. Stop joint between two electrical cables of different types, one of said cables being insulated with layers of solid insulation which are impregnated with a dielectric fluid and having a sheath and the other of said cables having extruded solid insulation without a dielectric fluid and each of said cables having a conductor, said stop joint comprising:

a body of insulating material enclosing a metal rod except at end portions thereof, one end portion of said rod extending from one end of said body and the other end portion of said rod extending from the other end of said body, said body having an outer surface of a decreasing taper in the direction from a portion of the body intermediate its ends toward said one end of said body and of cylindrical form in the direction from said portion of said body intermediate its ends to said other end of said body;

first connecting means mechanically and electrically connecting said one end portion of said rod to the end of the conductor of said one of said cables;

layers of solid insulation around said first connecting means, around a portion of the insulating material of said body adjacent said one end portion of said rod and around an end portion of said insulation of said one cable;

a conductive enclosure around the last-mentioned said layers of solid insulation and said first connecting means and connected in fluid-tight relation at one end with said sheath and at the opposite end with said body to provide a fluid-tight enclosure around the last-mentioned said layers of solid insulation and said first connecting means;

dielectric fluid of said one cable in said enclosure;

second connecting means mechanically and electrically connecting said other end portion of said rod to the end of the conductor of said other of said cables; and

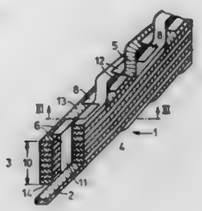
a composite sleeve including solid insulation around said second connecting means, a portion of the insulating material of said body adjacent to said other end portion of said rod and a portion of the extruded solid insulation of said other of said cables adjacent to said second connecting means, said composite sleeve being without a metal enclosure therearound.

4,638,113

TRANSPOSED BAR FOR AN ELECTRICAL MACHINE

Jürgen Höwing, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Jul. 5, 1985, Ser. No. 752,408
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1984, 3425982
Int. Cl.[4] H02K *3/14*
U.S. Cl. 174—34 3 Claims



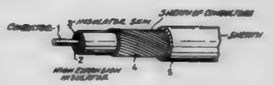
1. A transposed bar for an electrical machine consisting of individually insulated conductor elements which are arranged in adjoining conductor element stacks, each conductor element passing through all levels and being transposed at the narrow sides of the bars by offsets alternating from one to the other conductor element stack, in which a strip of insulating material designated as a strut is arranged vertically between the conductor element stacks extending beyond the conductor element stacks in height and wherein a plurality of sections of insulating material are positioned horizontally beneath a plurality of offset points of the conductor elements, the improvement comprising, having uniform incisions on the strip running along both longitudinal edges forming the plurality of sections with that portion between each opposite incision having a vertical height which matches the height of the conductor element stacks, the sections being bent into a horizontal position located underneath the offset points of the transposed conductor element.

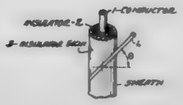
4,638,114

SHIELDED ELECTRIC WIRES

Akinori Mori, Tochigi, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 17, 1985, Ser. No. 744,995
Claims priority, application Japan, Jun. 19, 1984, 59-92291[U]
Int. Cl.[4] H01B *7/34*
U.S. Cl. 174—36 7 Claims





1. A shielded electric wire comprising:

an electric conductor having a longitudinal axis;

a high expansion insulating layer having a degree of expansion of at least 65% provided around said conductor; and

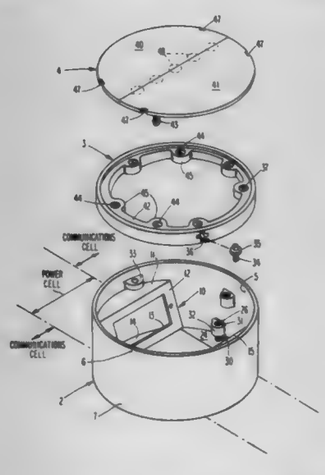
closed shield layer means, surrounding said insulating layer, for shielding said insulating layer and said conductor without compressing said insulating layer and without hindering an expansion thereof, said shield layer means including a plurality of electrically conducting wires wound around said insulating layer at a winding angle of 80°–85° to a perpendicular to said longitudinal axis of said conductor.

4,638,115

THREE SERVICE AFTERSET

Richard D. Benscoter, Vienna, W. Va., assignor to Butler Manufacturing Company, Kansas City, Mo.

Continuation of Ser. No. 685,030, Dec. 21, 1984, abandoned.
This application Apr. 18, 1986, Ser. No. 853,702
Int. Cl.[4] H02G *3/08*
U.S. Cl. 174—48 5 Claims



1. A three service afterset to be disposed over cellular raceway means having a power cell and communications cells located on opposite sides thereof with each cell having an access opening in the crest thereof, the afterset comprising:

an annular shaped, hollow housing having an inner wall, a top end, and a bottom end;

a first top connected to said inner wall adjacent said top end and extending outwardly from the inner wall, a first receptacle mounting plate connected to the first top and extending toward said bottom end and the first receptacle plate having an opening to receive a receptacle;

said first top, said inner wall and said first receptacle mounting plate forming a first hollow power compartment to be disposed over the access opening in said power cell;

a second top connected to the inner wall adjacent said top end at a position diametrically opposite to the first top and extending outwardly from the inner wall, and a second receptacle mounting plate connected to the second top and extending toward said bottom end and the second receptacle mounting plate having an opening to receive a receptacle;

said second top, said inner wall, and said second receptacle mounting plate forming a second hollow power compartment to be disposed over the access opening in said power cell;

a bottom cover having a first pair of opposite edges and a second pair of opposite edges, the bottom cover being disposed between the lower ends of said first and second receptacle plates and the first pair of opposite edges of the bottom cover being connected respectively to the lower ends of said first and second mounting receptacle plates and the second pair of opposite edges each being spaced from said inner wall; and

said inner wall and each edge of said second pair of opposite edges forming first and second communications openings to be respectively disposed over the access openings in said communications cells.

4,638,116

MASKING OF HOLES IN CIRCUIT PATTERNS ON CIRCUIT BOARDS PRIOR TO FLOW SOLDERING

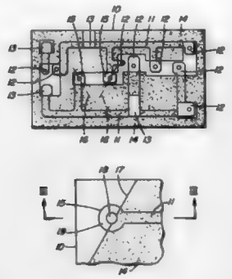
Beverley W. Gumb, London, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 618,901, Jun. 8, 1984. This application Sep. 4, 1985, Ser. No. 772,573

Claims priority, application Canada, Jun. 4, 1984, 455752

Int. Cl.⁴ H05K *1/00, 3/00*

U.S. Cl. 174—68.5 **4 Claims**



1. A circuit board having a circuit pattern on a surface thereof, said circuit pattern including at least one contact area, a hole extending through said contact area and said circuit board, said hole having a constant diameter through the contact area and the circuit board, the hole having an unplated periphery in the circuit board, and a layer of solder resist extending over said circuit pattern, said layer extending over part of said contact area and for part of the periphery of the hole.

3. A method for preventing the closing of an unoccupied hole in a circuit board, said circuit board including a circuit pattern on a surface thereof, said circuit pattern including a plurality of contact areas and said hole extending through one of said contact areas and said circuit board, said hole having a constant diameter through the contact area and circuit board and having an unplated periphery in the circuit board, comprising applying a layer of solder resist over said circuit pattern, the solder resist extending over part of said one of said contact areas and extending for part of the periphery of the hole.

4,638,117

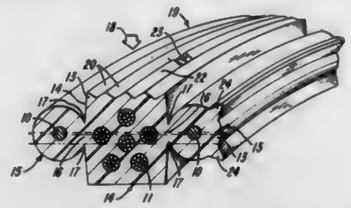
ELECTRICAL CABLE FOR COMMUNICATION PURPOSES

Robert Ney, Langerwehe Kreis Düren, Fed. Rep. of Germany, assignor to Lynenwerk GmbH & Co. Kommanditgesellschaft, Aachen, Fed. Rep. of Germany

Filed Jun. 14, 1985, Ser. No. 745,316

Int. Cl.⁴ H01B *7/08*

U.S. Cl. 174—117 F **19 Claims**



1. An electrical cable, for communication purposes, having at least two spaced-apart, insulated electrical conductor means, between which is disposed a portion having a block-shaped cross-section, with a plurality of tension-absorbing elements of high-strength fibers being disposed in said block-shaped portion; the insulation of said conductor means, and said block-shaped portion, being formed by a connecting casing of thermoplastic or elastomeric material in which said conductor means and said tension-absorbing elements are embedded in such a way that they are essentially oriented in the longitudinal direction of said cable parallel to one another; and provided between a given block-shaped portion and an adjoining casing of a conductor means, are longitudinally extending separating grooves, so that said cable has an at least three-part cross-sectional configuration;

the improvement comprising a number of said tension-absorbing elements, which are distributed in said block-shaped portion; said conductor means are placed on the bending axis of said cable, which is determined by said tension-absorbing elements, by the effect of said conductor means on the bending properties, and by said casing material; an imaginary line, which connects said conductor means, is displaced to such an extent that it coincides with the bending axis which is optimum for said cable, so that the transverse central planes of said conductor means are disposed in said bending axis; bridges of said casing material are respectively formed between a given block-shaped portion and an adjoining casing of a conductor means at the location of said separating grooves, with the depth of the latter being such that said bridges of material are uniformly aligned with said optimum bending axis, i.e. are centrally disposed over said imaginary line which connects said conductor means; said tension-absorbing elements being disposed in said block-shaped portions in an unsymmetrical manner.

4,638,118

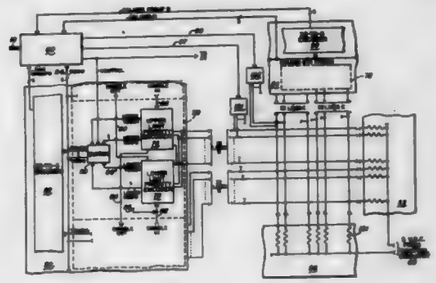
WRITING PAD

An Wang, Lincoln; Shu-Kuang Ho, Carlisle, both of Mass., and Carlos I. Mainemer, Nashua, N.H., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Mar. 11, 1985, Ser. No. 710,198

Int. Cl.⁴ G08C *21/00*

U.S. Cl. 178—18 **24 Claims**



1. Scanning circuitry for a writing pad of the kind having a succession of parallel electrical sensing lines defining a series of positions along one dimension of a writing surface of said pad, said electrical sensing lines being responsive to writing stimuli received at said writing surface, said scanning circuitry comprising

identifying circuitry for identifying the upper and lower boundaries along said dimension of an adaptive local region at which said writing stimuli is being received, said local region encompassing more than one said position at which stimuli are being received, and said local region changes its location according to the position at which stimuli are being received to maintain the positioning of said local region relative to the current stimuli position.

4,638,119

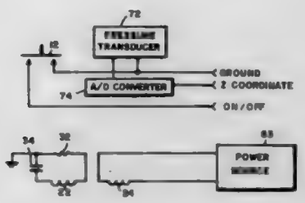
POSITION INDICATING APPARATUS FOR USE IN A DIGITIZING TABLET SYSTEM

Barry A. Blesser, Raymond, N.H., and Thomas C. Prentice, West Newton, Mass., assignors to Pencept, Inc., Waltham, Mass.

Filed Nov. 16, 1984, Ser. No. 672,310

Int. Cl.⁴ G08C *21/00*

U.S. Cl. 178—19 **34 Claims**



1. A position indicating implement comprising:

a first coil;

an alternating current power source connected to said first coil to produce a current in said first coil;

a second coil positioned so as to be inductively coupled with said first coil; and

a capacitor connected in series with said second coil so that the current in said first coil induces a phase shifted current in said second coil.

4,638,120

METHOD AND SYSTEM FOR TRANSMISSION OF CONFIDENTIAL DATA

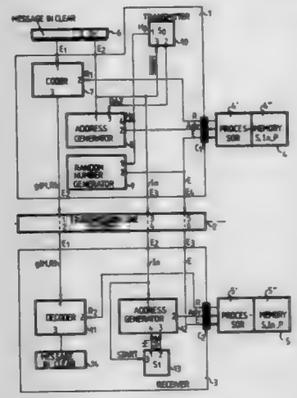
Robert J. L. Herve, Versailles, France, assignor to Compagnie Internationale pour l'Informatique Cii Honeywell Bull, Paris, France

Continuation of Ser. No. 657,470, Oct. 4, 1984, abandoned, which is a continuation of Ser. No. 235,505, Feb. 18, 1981, abandoned. This application Jan. 21, 1986, Ser. No. 820,594

Claims priority, application France, Mar. 3, 1980, 80 04701

Int. Cl.⁴ H04L *9/02*

U.S. Cl. 178—22.08 **14 Claims**



1. A method for transmission of confidential data between a transmitter and a receiver connected by a transmission line system, the transmitter including a coding device and the receiver including a decoding device, said method comprising:

generating a first key and transmitting the first key to the receiver;

calculating in a first portable electronic object coupled to the transmitter a second key from a first code stored in the first portable electronic object, from a second code related to the data to be transmitted and which identifies data authorized to be transmitted by a bearer of the first portable electronic object, and from the first key;

transmitting the second code to the receiver;

coding at the transmitter the data to be transmitted with the second key;

calculating at the receiver, in a second portable electronic object coupled to the receiver, a third key using the first key and the second code and a third code stored in the second portable electronic object; and

decoding the data received with the third key calculated at the receiver.

4,638,121

TELEPHONE PAY STATION

Robert A. Clark, Jr., Ft. Lauderdale, Fla., assignor to Communications Equipment and Engineering Co., Plantation, Fla.

Filed Jul. 10, 1985, Ser. No. 753,534

Int. Cl.⁴ H04M *17/02*

U.S. Cl. 379—145 **12 Claims**

1. A coin receiving telephone station for local calls only includes a telephone receiver and transmitter with a handset and a supporting hook switch cradle therefor comprising:

a coin chute having an open end for receiving a coin and a lower end for discharging coins into a coin box;

solenoid controlled arm means movable into said coin chute adjacent said open end for retaining a coin deposited in said chute in a partially exposed retrievable position permitting manual retraction from said chute; and

circuit means for activating said solenoid controlled arm

means to move out of said coin chute for permitting a coin previously retained therein to drop into said coin box



when a called party answers a call over three digits dialed at said station.

4,638,122

MONOLITHICALLY INTEGRATABLE TELEPHONE CIRCUIT FOR GENERATING CONTROL SIGNALS FOR DISPLAYING TELEPHONE CHARGES

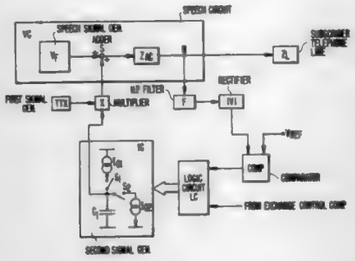
Marco Siligoni, Milan; Ferdinando Lari, Mantova; Vanni Savi-otti, Milan, and Vittorio Comino, Turin, all of Italy, assignors to SGS-ATES Componenti Elettronici SpA, Milan, Italy

Filed May 6, 1985, Ser. No. 731,167

Claims priority, application Italy, May 4, 1984, 20783 A/84; Jun. 6, 1984, 21270 A/84

Int. Cl.⁴ H04M *15/18*

U.S. Cl. 379—124 **2 Claims**



1. A telephone circuit for generating control signals for a subscriber's charging display and constituting an interface between a subscriber's telephone line and exchange control components together with a subscriber's line speech circuit, said subscriber's line speech circuit comprising a speech signal generator and a circuit means for adapting signals supplied by said speech signal generator to the subscriber's telephone line, said telephone circuit comprising: a first voltage signal generator for supplying an AC signal having a predetermined amplitude and frequency which are constant over time, and a second voltage signal generator for supplying pulse signals which are uniformly spaced over time and which have a trapezoidal pulse waveshape, said second voltage generator being coupled to said exchange control components which determine starting times of a leading edge and a trailing edge of each of said pulse signals;

a multiplier circuit which is connected to said first and second voltage generators and which has a gain which is varied in a linear manner in accordance with a voltage level of said pulse signals generated bY said second voltage generator, said multiplier calculating the product over time of said voltage signals supplied by said first and second voltage generators and supplying a voltage signal which is added to signals generated by said speech signal generator included in said subscriber's line speech circuit and a coupling means for receiving, at a point along a signal path of said subscriber's line speech circuit, an image signal of said signals adapted to said subscriber's telephone line:

a high-pass filter connected to said coupling means for filtering said image signal so as to eliminate components of said signal included in a telephone band of speech signals; a rectifier circuit connected to said high-pass filter for rectifying said filtered image signal; and

a comparator connected to said rectifier circuit and to a reference signal generator for comparing a rectified signal output by said rectifier circuit with a reference signal generated by said reference signal generator and for generating, if an amplitude of said rectified signal is greater than an amplitude of said reference signal, a signal for stopping an increase of the signal level of a leading edge of signals which are generated by said second voltage generator, said signal level being kept constant up to the beginning of a trailing edge of said signals for said second voltage signal generator by means of a memory means included in the said second signal voltage generator.

4,638,123

CIRCUIT ARRANGEMENT FOR A SMALL PABX WITH A SWITCHING MATRIX THAT HAS ELECTRONIC CROSSPOINTS

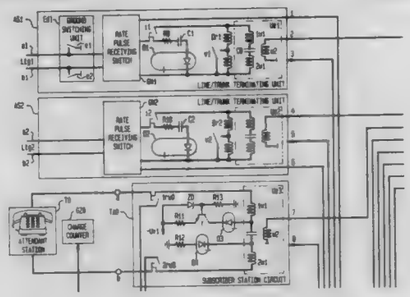
Alois Altendorfer; Ewald Dotzauer, both of Sauerlach, and Wolfgang Mueller, Geretsried, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

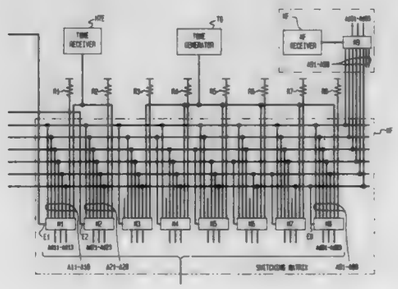
Filed Mar. 19, 1984, Ser. No. 590,638

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310546

Int. Cl.⁴ H04M *7/14*; H04Q *3/52*

U.S. Cl. 379—229 **7 Claims**





1. In a circuit arrangement for a small private branch switching exchange for connecting subscriber station lines and exchange lines having a control computer unit that directs the line switching procedures of the private branch switching exchange and has access to memory devices in which information necessary for the switching procedures is contained and directs internal and external connections by adjustment of a switching matrix with electronic crosspoints, the improvement comprising the switching matrix having a plurality of integrated selector components whose terminals at least equal the sum of the number of exchange lines and the number of subscriber stations, each of which selector components includes a plurality of terminals of a first kind, at least equal to the number of subscribers, and a single terminal of a second kind, which is assigned either to a subscriber station or to an exchange line, and on these selector components, based on control information fed to corresponding address inputs of a selector component by the control computer unit, a terminal is selected from the terminals of the first kind and connected with the terminal of the second kind, and each selector component, having its single terminal of a second kind assigned to a subscriber station, is coupled through the terminal of the second kind with the assigned one subscriber station and through the terminals of the first kind respectively with all other subscriber stations and each of the selector components, having its single terminal of a second kind assigned to an exchange line, is coupled through the terminal of the second kind with the assigned one exchange line and through the terminals of the first kind respectively with all the subscriber stations.

4,638,124

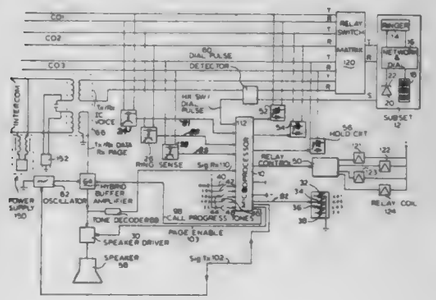
KEY TELEPHONE SYSTEM WITH DISTRIBUTED CONTROL

Franklin Hargrave, and Francisco A. Middleton, both of Newtown, Conn., assignors to ITT Corporation, New York, N.Y.

Filed Sep. 21, 1984, Ser. No. 653,742

Int. Cl.⁴ H04M *9/06*

U.S. Cl. 379—159 **36 Claims**



1. A communication system, comprising:

an intercom line;

a plurality of stations, each station connected to said intercom line and a plurality of telephone lines, said stations each including, means for transmitting and receiving information, switch means for selectively accessing said transmitting and receiving means to one of said telephone lines and intercom line, and control means for generating and receiving control signals and for controlling said switch means, said control means of each station being adapted to generate binary control signals, and each station further comprises means for converting said binary signals to PCM control signals; and

means for exchanging said control signals between stations, whereby the system is distributively controlled by said control means in each station and there is no need for centralized control.

4,638,125

HEARING AID WITH A HOUSING TO BE WORN BEHIND THE EAR

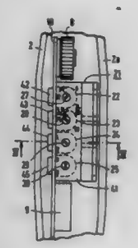
Gerhard Buettner, Grossenseebach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 9, 1984, Ser. No. 628,797

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1983, 8327115[U]

Int. Cl.⁴ H04R *25/00*

U.S. Cl. 381—68.4 **11 Claims**



1. A hearing aid having a housing to be worn behind a user's ear, said housing containing a microphone, an amplifier, a current source and an acoustic coil and a plurality of regulators for controlling selected operating characteristics of said hearing aid, said regulators and said acoustic coil being mounted in combination in a single unit in said housing and attached to said amplifier, said unit having a first portion having a plurality of receptacles for respectively receiving said regulators and a second portion in which said acoustic coil is embedded and a projection carried on at least one of said first and second portions and an eyelet carried on the other of said first and second portions for receiving said projection therethrough for rigidly connecting said first and second portions.

4,638,126

CRADLE SWITCH FOR A TELEPHONE APPARATUS

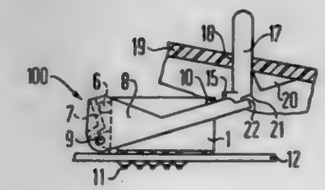
Karl-Jan Bres, Groebenzell, and Hans-Joachim Schinke, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 669,758

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342730

Int. Cl.⁴ H04M *1/08*

U.S. Cl. 379—427 **8 Claims**



8. In a cradle switch for a telephone apparatus having a housing with an opening in a wall and cradle at said opening, said cradle switch including a carrier having movable switch contacts, an actuating lever mounted at one end to the carrier for pivotal movement to actuate the contacts, and a switch member engaging the lever to mechanically actuate the lever and extending through the opening in the wall of the housing and into the cradle, the improvements comprising said actuating lever having a pair of parallel extending arms which extend along opposite sides of the carrier of the cradle switch, and

means for pivotally connecting said switch member for pivotal movement on a first axis at a free end of the lever, said means guiding the member for longitudinal movement with axial play relative to the first axis, said means including coacting pairs of pivot pins and bearing bores with the pins being provided on one of the lever and member and the bores being provided in the other of the lever and member, said pins and bores coacting to form a releasable connection.

4,638,127

ELECTRICAL CONTACTS FOR OSCILLATING YOKE OF LOAD SELECTOR

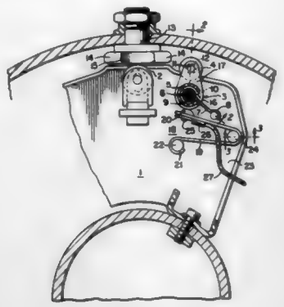
Jean-Claude Dufrasnes, Couillet, Belgium, assignor to Ateliers de Constructions Electriques de Charleroi (ACEC) Societe Anonyme, Brussels, Belgium

Filed Sep. 5, 1985, Ser. No. 772,686

Claims priority, application European Pat. Off., Sep. 5, 1984, 84201272

Int. Cl.⁴ H01H *1/16*

U.S. Cl. 200—11 K **5 Claims**



1. An electrical contact assembly comprising: a swiveling yoke mounted on a movable linkage, at least one roller cooperating with fixed contacts, said swiveling yoke having a return spring exerting a pivotal biasing force on said roller when said roller engages and rotates on each of said fixed contacts, said swiveling yoke having a cylindrical surface, an electrical conducting element connected to a voltage output and biased against said cylindrical surface by a mechanical force from a spring means.

4,638,128

DELAY SWITCH

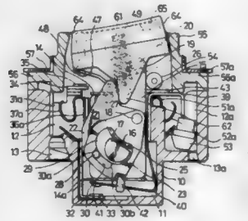
Hideo Kuwabara, and Takao Ohta, both of Tsu, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Aug. 16, 1985, Ser. No. 766,397

Claims priority, application Japan, Aug. 25, 1984, 59-177312

Int. Cl.⁴ H01H *7/00*

U.S. Cl. 200—33 R **8 Claims**



8. A delay switch comprising a body; a delay element disposed within said body and including a rotary output shaft; delay cam means arranged to be driven from a start position to a final position by said delay element, said delay cam means including a first pivotably mounted cam operably connected to said output shaft to be rotated thereby, and a second pivotably mounted cam operably connected to said first cam to be driven by a lost motion connection therebetween whereby said second cam remains stationary during a predetermined amount of rotation of said first cam and is thereafter rotated to said final position by said first cam; electrical contact means for connection to an external electrical component to be operated, said contact means arranged to be actuated by said second cam when said delay cam means is in said start position to operate said external component and deactuated when said delay cam means is in said final position; and a manual handle movable to a first position for setting said delay cam means in said start position and movable to a second position for actuating said delay element.

4,638,129

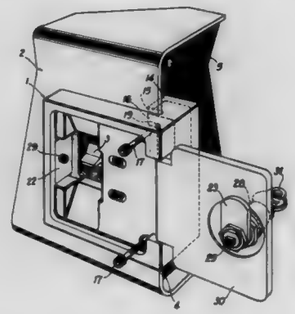
CONTROL SWITCH COVER

Fred P. Partus, Marietta, and Michael A. Jones, Atlanta, both of Ga., assignors to National Product Marketing, Atlanta, Ga.

Filed Dec. 14, 1984, Ser. No. 681,668

Int. Cl.⁴ H01H *9/20*

U.S. Cl. 200—43.22 **10 Claims**



1. A control switch cover assembly, for attachment to the cabinet of electronic or other equipment having a lipped edge adjacent to a control switch, which comprises:

a master plate of one piece solid construction which comprises a major portion having a flat face and an opening for access to the switch when said master plate is installed over the switch, and an el-shaped extension at the rear of said flat portion having flanges at the top and bottom thereof which form a notch between each of said flanges and the flat face of said major portion, for receiving the lipped edge of the cabinet when said plate is installed over the switch;

a door connected to said master plate with locking means, for covering the switch access opening of said master plate;

a tension plate, received within said flanges and said el-shaped extension of said master plate;

means for connecting and tightening said tension plate to said master plate, for applying force to the lip of the cabinet when the lip is located within the notches of said master plate to hold the control switch cover assembly in place on the cabinet; and

means for engaging said master plate with the control switch to prevent movement of the control switch cover assembly when the control switch cover assembly is installed over the switch.

4,638,130

ACCELERATION SENSOR

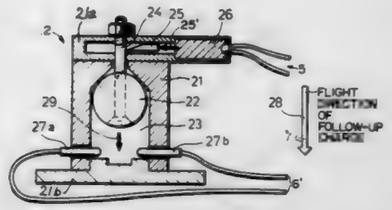
Peter Gröszler, Hochstadt, and Norbert Nissl, Aresing, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,089

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1983, 3338784

Int. Cl.⁴ H01H *35/14*

U.S. Cl. 200—61.45 R **5 Claims**



1. An acceleration sensor having a high sensitivity in a wide range of accelerations, comprising housing means (21) forming a cavity having a central axis defining a sensing direction, acceleration sensing mass means (22), mounting means (24) releasably mounting said sensing mass means in said cavity of said housing means, releasing means including a cutting member operatively arranged for severing said mounting means for releasing said sensing mass means for movement in said cavity of said housing means in said sensing direction upon release of said sensing mass means, force applying means arranged for applying a cutting force to said cutting member, and switch means operatively arranged in said housing means in a position for actuation of said switch means by said sensing mass means after said sensing mass means has moved through a predetermined distance in said sensing direction in said cavity.

4,638,131

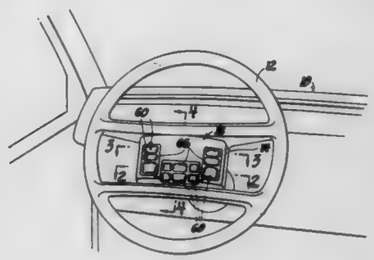
STEERING WHEEL PAD KEYBOARD SWITCH ASSEMBLY

Richard L. Kidd, Sterling Heights, Mich.; Jerry A. Graf, Cortland, Ohio; Philip J. Engler, Leavittsburg, Ohio, and Song-Chin S. Lu, Vienna, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 15, 1986, Ser. No. 818,955

Int. Cl.⁴ H01H *9/00, 13/70*

U.S. Cl. 200—61.55 **7 Claims**



2. A steering wheel pad keyboard switch assembly for mounting on a steering wheel comprising:

a base having means for attaching the assembly to a steering wheel hub,

a printed circuit board which is mounted on the base and which has a plurality of open contact grids disposed in a predetermined array within a U-shaped area which borders three sides of the printed circuit board,

a U-shaped elastomeric switch member which is mounted on the U-shaped area of the printed circuit board and which has a plurality of hollow buttons each having a conductive disc inside to provide a plurality of movable contacts which are disposed in the same said predetermined array for selectively closing the contact grids,

a guide plate which is disposed over the printed circuit board with the switch member sandwiched therebetween, said guide plate having a U-shaped peripheral portion which has a plurality of guide holes disposed in the same said predetermined array for guiding operators into operative contact with the movable contacts of the switch member for selectively moving the contacts of the switch member into engagement with the contact grids,

said guide plate further having a pad portion nested within the U-shaped peripheral portion,

a horn switch disposed on the pad portion of the guide plate, and

a push button sub-assembly which overlies the guide plate and which is attached to the base to provide a unit handled assembly,

said push button sub-assembly comprising a frame member having a plurality of slide chambers disposed in the same said predetermined array, a plurality of push buttons slideably retained in the plurality of slide chambers respectively, and a soft decorative cover member,

said push buttons having stem pieces which extend into the guide holes of the guide plate and act as the aforesaid operators for selectively moving the contacts of the switch member into engagement with the contact grids, and

said cover having a depressible portion for operating the horn switch and cut-outs providing access to the push buttons.

4,638,132

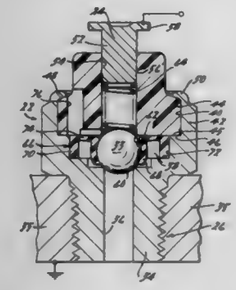
ELECTRICAL PRESSURE SWITCH

Ellsworth S. Miller, Mt. Clemens, Mich., assignor to Lectron Products, Inc., Rochester, Mich.

Filed Oct. 28, 1985, Ser. No. 791,712

Int. Cl.⁴ H01H *35/38*

U.S. Cl. 200—81 R **13 Claims**



1. An electrical pressure switch comprising

a housing provided with an internal chamber having an annular peripheral wall and an inlet communicating with said chamber and adapted to be connected to and to communicated with a source of relatively high and relatively low fluid pressures;

first and second electrical terminals electrically insulated from each other and disposed coaxially with respect to said peripheral wall;

a valve seat in said chamber disposed coaxially with respect to said wall and to said terminals;

a ball valve in said chamber movable within predetermined limits to and from said valve seat;

a compression spring confined between one of said terminals and said ball valve holding the latter at one limit of its travel with respect to said valve seat; and

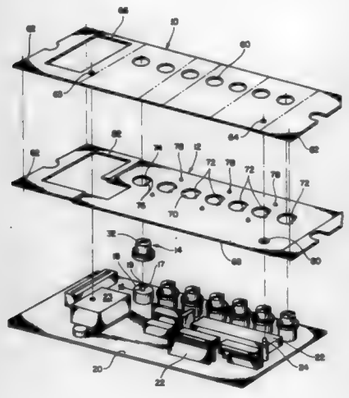
a one-piece sealing element in said chamber having radially spaced inner and outer sealing lips extending axially in the direction of said inlet and of the other of said terminals, said ball valve being movable with respect to said valve seat to one limit of its travel against the resilient action of said spring means by fluid pressure in said chamber, and the sealing lips of said sealing element being urged in opposite directions by said fluid pressure into sealing engagement with said ball valve and said annular wall.

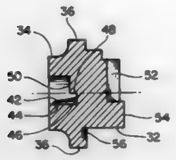
4,638,133

ROTARY SWITCH ASSEMBLY

Robert F. Dvorak, Mount Vernon, and Charles E. Netolicky, Cedar Rapids, both of Iowa, assignors to Square D Company, Palatine, Ill.

Filed Apr. 5, 1985, Ser. No. 720,219
Int. Cl.⁴ H01H *9/04, 3/08*
U.S. Cl. 200—302.1 **8 Claims**





1. A rotary switch assembly used for operating a rotary switch having a pin rotatable among a plurality of selectable positions, said assembly comprising:

a knob having a top portion, a bottom portion and a circumferential flange intermediate said top portion and said bottom portion;

said bottom portion including a generally circular recess extending toward said top portion and having a straight side wall and a base, said recess shaped and dimensioned to receive and encircle said pin,

said side wall including a crush rib extending into said recess toward said top portion adapted to be shaved in response to insertion of said pin into said recess; and

a compartment provided within said recess for receiving said shaved portions of said crush rib, said compartment partially defined by said side wall and recessed further than said base.

6. A rotary switch assembly used for operating a plurality of rotary switches, each switch having a pin rotatable among a plurality of selectable positions, said assembly comprising;

a knob provided for each switch which will be user operated, each knob having a generally circular top portion, a generally circular bottom portion and a circumferential flange intermediate said top portion and said bottom portion,

said bottom portion including receiving means for receiving said pin;

a thin bottom plate positioned over said knobs, said bottom plate having a slightly offset portion including a plurality of bottom apertures respectively receiving said top portion of a respective knob, said bottom plate including a lock tab extending into each said aperture towards the top portion of said knob, a thin, generally flat top plate including a plurality of apertures respectively aligned in registration with said bottom apertures and encircling said top portion of a respective knob in substantially close relationship with said knob; a plurality of dimples spacing said offset portion of said bottom plate from said top plate; and

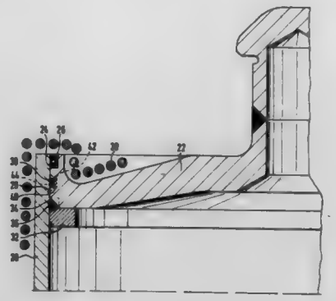
a stop tab provided on said flange and operably associated with said lock tab to prevent the complete rotation of said knob within said bottom apertures.

4,638,134

DEVICE FOR EVACUATING, FILLING AND CLOSING FINAL STORAGE CONTAINERS FOR RADIOACTIVE MATERIALS

Detlef Stritzke, Mol, Belgium, assignor to Deutsche Gesellschaft, Fed. Rep. of Germany

Division of Ser. No. 343,827, Jan. 29, 1982. This application Oct. 18, 1984, Ser. No. 662,344
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104366
Int. Cl.⁴ G21C *19/40*; B23K *13/00*
U.S. Cl. 219—9.5 **3 Claims**



1. A device for closing a metal storage container for radioactive material comprising

a cover for gas-tight closing of said container

an annular flange projecting from the inner wall of said container supporting said cover

the outer edge of said cover having at least one recess open only toward

the inside wall of said container

a shaped solder part disposed in said recess

an induction heater arranged around said cover and said container in the region where the cover joins the inside wall of said container for melting said solder part to seal the gap between the edge of the cover and the inside wall of said container

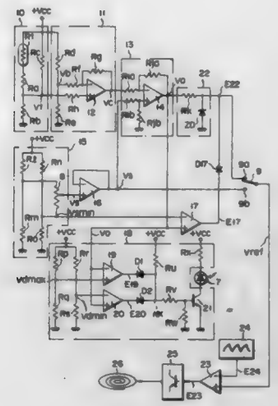
said induction heater comprising a copper coil and control means for heating the cover faster than the container.

4,638,135

INDUCTION HEAT COOKING APPARATUS

Masayuki Aoki, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 7, 1985, Ser. No. 689,338
Claims priority, application Japan, Jan. 20, 1984, 59-7961; Feb. 10, 1984, 59-23087
Int. Cl.⁴ H05B *6/06*
U.S. Cl. 219—10.49 R **19 Claims**



1. An induction heat cooking apparatus, comprising:

a heating coil for providing an electromagnetic field, when excited to inductively heat a load;

exciter means for exciting said heating coil to cause variable amount of heating power to be output therefrom;

temperature setting means for providing a temperature set signal which designates a desired target temperature of said load;

temperature measuring means for measuring a temperature of said load to generate a temperature measure signal indicative thereof; and

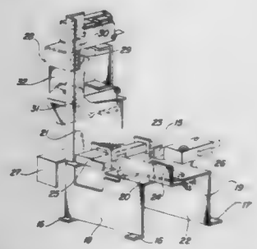
difference detector means, coupled to said temperature measuring means, said temperature setting means and said exciter means, for detecting a difference between said temperature set signal and said temperature measure signal and generating a difference signal indicative of said difference, and for supplying a difference signal to said exciter means to control the degree of excitation thereof, said heating power for said heating heating coil being continuously controlled to variable power levels in accordance with said difference signal so that said heating power is maintained at a first constant power level until said load temperature reaches a first value, and said heating power is then decreased at a definite rate until said load temperature reaches a second value greater than said first value, said rate being less than infinity to cause said heating power to gradually decrease as a function of time, so that when said load temperature approaches said set temperature, said heating power has been lowered from said first constant level, and therefore a rate of temperature increase of the load has been lowered to thereby maintain said load temperature close to said set temperature by varying said heating power to minimize an amount of temperature overshoot.

4,638,136

MICROWAVE OVEN WITH DOOR LATCHING ASSEMBLY

Yuichiro Oya, Sakai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 1, 1985, Ser. No. 707,204
Claims priority, application Japan, Mar. 1, 1984, 59-30298[U]
Int. Cl.⁴ H05B *6/76*
U.S. Cl. 219—10.55 C **4 Claims**



1. A door latching assembly for a microwave oven, comprising:

a housing provided with a door, said door having a latch head means for securing the door and a lever means, operatively associated with the latch head means, for releasing the latch head means;

a door opening/closing unit having a horizontal plate provided between downwardly projecting vertical supporting plates, said horizontal plate further provided with an upwardly projecting vertical base plate extending from a side of said horizontal plate, said upwardly projecting vertical base plate being positioned behind a front panel aligned with the door;

a latch hook attached to the upwardly projecting vertical base plate so that the latch hook and the latch head means releasably engage behind a peripheral edge of the door wherein the latch head means is thereby secured to the vertical base plate;

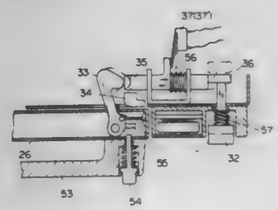
said door opening/closing unit including said latch hook, upwardly projecting vertical plate, horizontal plate and downwardly projecting vertical plates being secured only to the bottom plate of the oven.

4,638,137

HEATING APPLIANCE HAVING A FAIL-SAFE START SWITCH

Hirai Kazumi, Nabari, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP81/00241, § 371 Date Apr. 29, 1982, § 102(e) Date Apr. 29, 1982, PCT Pub. No. WO82/01056, PCT Pub. Date Apr. 1, 1982
Continuation of Ser. No. 380,863, Apr. 29, 1982, abandoned.
This PCT application Sep. 21, 1981, Ser. No. 639,615
Claims priority, application Japan, Sep. 22, 1980, 55-132089
Int. Cl.⁴ H05B *6/64*
U.S. Cl. 219—10.55 B **3 Claims**



1. A heating appliance having a microcomputer which is governed by input signals introduced via a keyboard and hav-

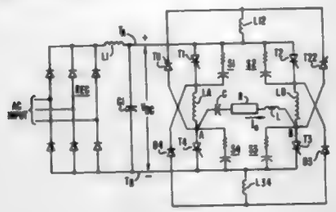
ing an oscillator which is controlled by output signals from said microcomputer and having a main power supply circuit which is enabled only in response to a manual operation of a heating start switch which is mechanically operable independently of said keyboard.

4,638,138

HIGH FREQUENCY INVERTER CIRCUIT FOR MELTING AND INDUCTION HEATING

John Ross, Penn Hills, Pa., and William E. Frank, Baltimore, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 23, 1984, Ser. No. 633,775
Int. Cl.⁴ H05B *6/04*
U.S. Cl. 219—10.77 **7 Claims**



1. A two-pole inverter bridge mounted between opposite DC terminals supporting a voltage source including two poles mounted across said DC terminals, and a resonant load mounted across said poles;

each pole including first and second controlled switches and an inductor therebetween;

each pole having an inductor connected in series with said first and second switches, one end of said inductor being connected to the cathode electrode of one of said first and second switches, the other end of said inductor being connected to the anode electrode of the other of said first and second switches, the ends of respective inductors associated with identical electrodes forming two pairs across said poles;

said resonant load being connected between the ends of one of said two pairs;

each pole having a first circuit connected in antiparallel to one of said first and second switches and to said inductor, and a second circuit connected in antiparallel to the other of said first and second switches and to said inductor;

said first antiparallel circuit being effective to turn OFF a corresponding one of said switches upon one alternation of said resonant load, said second antiparallel circuit being effective to turn OFF a corresponding one of said switches upon the other alternation of said resonant load;

one of said first and second antiparallel circuits in each pole being connected to one of the ends of said resonant load and having an auxiliary switch and an auxiliary inductor in series thereto;

the other of said first and second antiparallel circuits in each pole having a diode and an auxiliary inductor in series thereto.

4,638,139

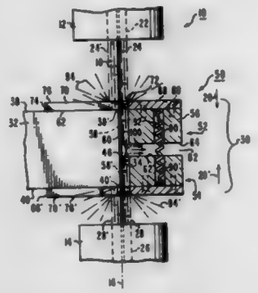
ELECTRICAL DISCHARGE MACHINE COOLING FLUID CONTAINMENT APPARATUS

Vincent A. Pirone, Lawrenceville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 21, 1984, Ser. No. 653,049
Int. Cl.⁴ B23H *7/02, 1/10*
U.S. Cl. 219—69 W **11 Claims**

1. Apparatus for controlling a cooling fluid stream applied parallel to an electrical discharge machine wire electrode dispensed adjacent an exterior surface of an electrically conductive workpiece to be processed thereby, said stream being directed toward said workpiece and tending to splash and be diverted from said wire electrode in a region adjacent said surface upon impingement on an edge of said workpiece at said surface, said apparatus comprising:

channel means adapted to abut an exterior surface of a workpiece for containing the fluid stream to reduce splashing



and diversion so that at least a portion of the stream surrounds the wire throughout a region adjacent the surface of the workpiece; and

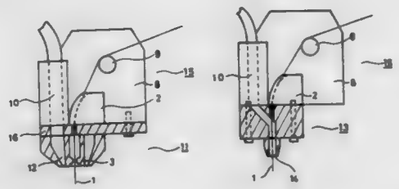
clamp means attached to said channel means to releasably secure said channel means to said workpiece surface, whereby said clamp means is carried by said workpiece.

4,638,140

APPARATUS FOR GUIDING A WIRE ELECTRODE OF A WIRE ELECTRODE DISCHARGE MACHINE

Haruki Obara, Sagamihara, and Toshiyuki Aso, Hino, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP84/00303, § 371 Date Jan. 28, 1985, § 102(e) Date Jan. 28, 1985, PCT Pub. No. WO85/00025, PCT Pub. Date Jan. 3, 1985
PCT Filed Jun. 12, 1984, Ser. No. 700,886
Claims priority, application Japan, Jun. 14, 1983, 58-104926
Int. Cl.⁴ B23H *1/00, 7/10*
U.S. Cl. 219—69 W **1 Claim**



1. An apparatus for guiding a wire electrode of a wire electrode discharge machine, comprising:

(a) a V-groove-type guide unit, including a V-groove-type wire guide and means for supplying a machining liquid; and

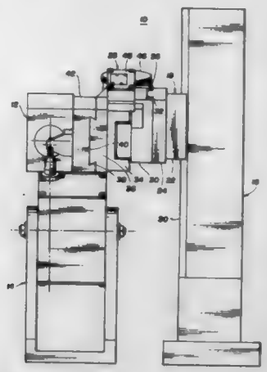
(b) a die-type wire guide unit removably attached at the lower surface of said V-groove-type guide unit, said die-type wire guide unit including a die-type wire guide and a machining liquid nozzle, and said machining liquid nozzle being connected to said machining liquid supply means and having a liquid channel surrounding said die-type wire guide.

4,638,141

MODULAR EDM SYSTEM

Leif Houman, Oyster Bay, and Leonard M. Wohlabaugh, Miller Place, both of N.Y., assignors to Xermac, Inc., Royal Oak, Mich.

Filed May 20, 1985, Ser. No. 736,138
Int. Cl.⁴ B23H *1/00, 7/26*
U.S. Cl. 219—69 R **7 Claims**



1. A modular EDM system adapted to support an electrode assembly to move in a controlled fashion, said system comprising:

a base tool adapted to removably and adjustably receive and retain a first accessory tool thereon;

a first accessory tool comprising a swivel spacer adapted to be removably and adjustably mounted on said base tool, said spacer permitting angular adjustment and also being adapted to removably and adjustably receive and retain a second accessory tool thereon; and

a second accessory tool comprising a servo slide assembly including a frame member adapted to be removably and adjustably mounted on said spacer and a slide member slidably supported on said frame member, said slide member being adapted to removably and adjustably receive and retain the electrode assembly thereon, said slide assembly further including a motor coupled to said slide member and adapted to receive an electrical control signal to controllably move said slide member relative to said frame member along a slide axis wherein said swivel spacer permits angular adjustment of the slide assembly relative to said base tool.

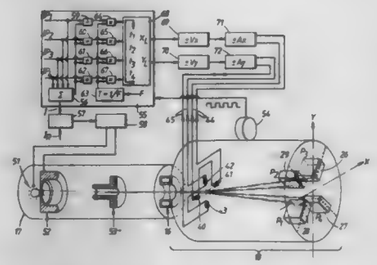
4,638,142

MACHINE FOR ELECTRON-BEAM INTERNAL BUTT WELDING OF TUBES

Xavier F. Puisais, Levallois Perret; Jean-Pierre Hamon, Cergy; Michel Jégousse, Saint-Herblain, and Michel Kaluszynski, Vitry-su-Seine, all of France, assignors to TOTAL Compagnie Francaise des Petroles, Paris, France

Filed Oct. 9, 1985, Ser. No. 785,699
Claims priority, application France, Oct. 22, 1984, 84 16114
Int. Cl.⁴ B23K *15/00*
U.S. Cl. 219—121 EC **4 Claims**

1. A machine for the electron-beam internal welding of two tubes disposed coaxially end-to-end comprising a fixed electron gun for emitting an axial electron beam, deflection means for deflecting said electron beam in the radial direction, and a rotatable support carrying said deflection means and adapted to rotate about an axis coinciding with the axis of said tubes, wherein said rotatable support carries a number n, which is at least equal to two, of said deflection means arranged so as to deflect the electron beam in different radial directions spaced 360/n degrees apart, and, upstream of said deflection means, a deflection system adapted to deliver in a cycle the axial electron beam emitted by said electron gun successively to each of said n deflection means, at a high rate.

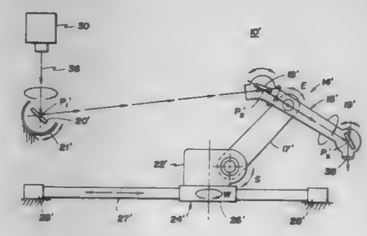


4,638,143

ROBOT-LASER SYSTEM

Hadi A. Akeel, Sterling Heights, Mich., assignor to GMF Robotics Corporation, Troy, Mich.

Filed Jan. 23, 1985, Ser. No. 694,031
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 215—121 LQ **17 Claims**



1. A robot-laser system for providing a laser beam at a desired location, the system comprising:

a laser beam source;

a robot including a plurality of movable parts including a hollow robot arm having a central axis along which the laser source directs the laser beam;

at least one mirror for reflecting the laser beam from the source to the desired location, said mirror being mounted within the robot arm to move therewith and relative thereto to about a transverse axis that extends angularly to the central axis of the robot arm; and

an automatic programmable control system for automatically moving said mirror about said transverse axis relative to and in synchronization with movement of the robot arm to thereby direct the laser beam to the desired location as the arm is moved.

4,638,144

INDEXING LASER MARKER

William A. Latta, Jr., Linesville, Pa., assignor to Automated Industrial Systems, Erie, Pa.

Filed Apr. 24, 1985, Ser. No. 726,706
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 LH **24 Claims**

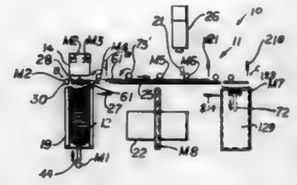
1. A machine for marking indicia on plate like articles of manufacture,

said machine (10) comprising:

a frame,

a rotatable turret on said frame,

a plurality of spaced magazines supporting means on said turret,
a conveyor extending diametrically of said turret and having a first end and a second end,
a feed station on said frame adjacent said first end of said conveyor,
a loading station and a reloading station on said frame between said feed station and said reloading station for loading magazines onto said turret,
said reloading station being disposed at said frame adjacent said second end of said conveyor for removing



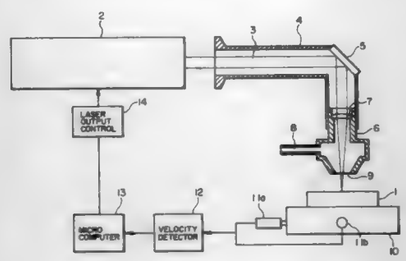
magazines reloaded with marked articles of manufacture,
laser marking means on said frame between said first end of said conveyor and said second end of said conveyor,
indexing means on said frame adapted to index said turret moving said magazines supported on said turret successively from said loading station to said feed station and to said reloading station,
said conveyor being adapted to receive articles from said magazines at said feed station and to move said articles past said laser marking means on said machine at said first end of said conveyor to said reloading station.

4,638,145

LASER MACHINING APPARATUS

Hisayuki Sakuma, and Susumu Hoshinouchi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1985, Ser. No. 799,686
Claims priority, application Japan, Nov. 20, 1984, 59-244852
Int. Cl.⁴ B23K *26/02*
U.S. Cl. 219—121 LU **8 Claims**



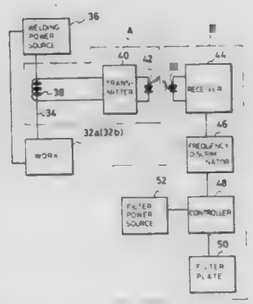
1. A laser machining apparatus comprising: a laser oscillator for irradiating a workpiece with laser light, drive means for effecting transverse movement of said laser light relative to said workpiece, a speed detector for determining a relative speed of transverse movement between said laser light and said workpiece from movement of said drive means, optimum laser operating parameter storage means for storing values of laser operating parameters optimum with respect to the speed of transverse movement of said laser light relative to said workpiece and with respect to a material type and thickness of said workpiece, optimum laser operating parameter determining means for determining optimum laser operating parameters in accordance with said relative speed detected by said speed detector and on the basis of a content of said optimum laser operating parameter storage means, and laser operating parameter control means for controlling operating parameters of said laser oscillator according to an output of said optimum laser operating parameter determining means.

4,638,146

METHOD OF PROTECTING EYES FROM WELDING RAYS IN ARC WELDING AND APPARATUS THEREFOR

Ario Koyama, Tokyo, Japan, assignor to Nagase Sangyo Kabushiki Kaisha and Kabushiki Kaisha Sensor Gijutsu Kenkyujo, both of, Japan

Filed Oct. 8, 1985, Ser. No. 785,588
Claims priority, application Japan, Oct. 16, 1984, 59-216976
Int. Cl.⁴ B23K *9/32*
U.S. Cl. 219—147 **14 Claims**



1. A method of protecting eyes against arc in welding which utilizes a personal eye-protector having a filter plate formed of a material capable of exhibiting an electro-optic effect and arranged thereon, comprising the steps of:
detecting a magnetic field generated around a welding current cable to detect the occurrence of a transient built-up current in a welding current and generating a detection signal; and
controlling a voltage applied to said filter plate depending upon said detection signal;
occurrence of said magnetic field being detected by a magnetic field detector provided on an electrode holder; and
said detection signal being converted into a light signal or wave signal of a predetermined frequency and being received by a receiver provided at a position of said eye-protector.

4,638,147

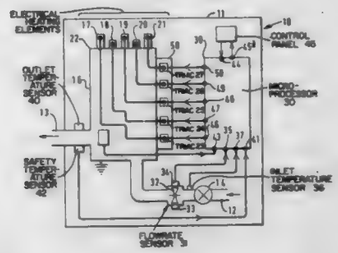
MICROPROCESSOR CONTROLLED THROUGH-FLOW ELECTRIC WATER HEATER

Anthony Dytch, 3 Brompton Lawns, Mill Lane, Tettenhall, Wolverhampton, West Midlands; Andrew Keatley, 21 The Leasow, Aldridge, Walsall, West Midlands, and William Wright, 13 Boscobel Road, Walsall, West Midlands, all of United Kingdom

Filed Oct. 17, 1984, Ser. No. 661,903
Claims priority, application United Kingdom, Oct. 18, 1983, 8327865
Int. Cl.⁴ H05B *1/02*; F24H *1/10*
U.S. Cl. 219—308 **8 Claims**

1. A water heater comprising a water inlet and a water outlet, passage means between said water inlet and outlet to permit a continuous flow of water from the inlet to the outlet, means to heat the water as it flows from the inlet to the outlet, the heating means comprising first electrical heating means comprising a plurality of heating elements and second electrical heating means comprising at least one heating element, means being provided to switch each of said heating elements of the first electrical heating means on and off in different

combinations in response to a control means to achieve different levels of heat dissipation to the flowing water by the first electrical heating means, means to burst fire said at least one heating element of the second electrical heating means to vary the heat dissipated to the flowing water by the second electrical heating means between maximum and minimum heating



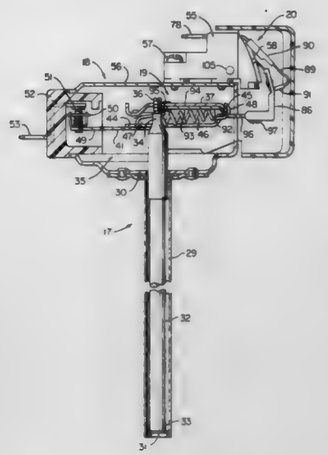
levels, the control means switching the at least one heating element of second electrical heating means on with at least some of the different combinations of heating elements of the first electrical heating means, and controlling the level of heat dissipation by the first and second electrical heating means to achieve a desired total level of heat dissipation.

4,638,148

CONTROL SYSTEM AND CONTROL DEVICE FOR CONTROLLING A HEATING UNIT AND METHOD OF MAKING THE SAME

Harvey J. Shopsky, Latrobe, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 534,340, Sep. 21, 1983, abandoned. This application Mar. 8, 1985, Ser. No. 709,889
Int. Cl.⁴ H05B *1/02*
U.S. Cl. 219—497 **18 Claims**



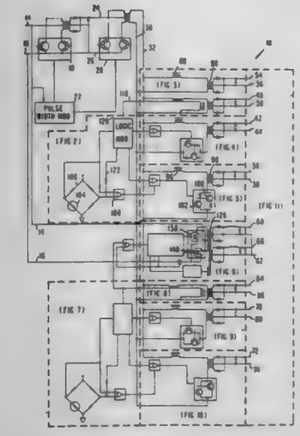
1. In a control device having a rod and tube temperature sensing unit for providing linear motion of a part thereof along a substantially straight linear path in relation to the temperature being sensed by said unit and having a potentiometer means provided with an electrical output producing means operatively interconnected to said part of said unit so as to produce a variable electrical signal in relation to the temperature being sensed by said unit, said electrical output means being movable along an arcuate linear path by said part of said unit, said potentiometer means having a member provided with an arcuate electrical resistance means having a wiper contacting face, said electrical output means comprising an electrical wiper means being disposed in sliding engagement with said wiper contacting face whereby said arcuate electrical resistance means defines said arcuate path, said control device having movable interconnecting means operatively interconnecting said part of said unit to said electrical output means of said potentiometer means, said movable interconnecting means comprising a pivotally mounted lever, said lever having a pivot point, said electrical output means being carried by said lever to move in unison therewith whereby said arcuate path is defined by a radius extending from said pivot point of said lever to said electrical output means of said potentiometer means, the improvement wherein said linear path of said electrical output means and said linear path of said part of said unit are substantially coplanar and said wiper contacting face of said potentiometer means is convex and is also defined by a radius extending from said pivot point of said lever to said wiper contacting surface of said potentiometer means and wherein said member is movable relative to said device along an arcuate path that is substantially concentric to said arcuate path of said electrical output means for calibrating said device.

4,638,149

POWER-PROCESSING UNIT

Frank J. Wessel, Santa Monica, and Donald J. Hancock, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 27, 1983, Ser. No. 507,659
Int. Cl.⁴ H05B *1/02*; H02P *13/24*
U.S. Cl. 219—499 **11 Claims**



1. A power-processing unit comprising:
a pair of alternating current buses for connection to supply alternating current power;
a plurality of power supply circuits each consisting of a serially connected inductor and a transformer primary connected between said buses, said circuits each also comprising a transformer secondary magnetically coupled to each said transformer primary, a rectifier connected to each said transformer secondary so that each of said secondaries can be connected to a load in an ion thruster for supplying a current limited direct current thereto;
at least one serially connected second inductor, second transformer primary and switch connected between said buses, a second transformer secondary magnetically coupled to said second transformer primary and second rectifiers connected to said second transfomer secondary to supply a current limited load, a temperature sensor connected to said switch to control said switch in accordance with sensed temperature of the load so that the load connectable to said second transformer secondary is current

limited and powered in accordance with sensed temperature;

a pair of unregulated DC buses for connection to a substantially unregulated DC source and connected thereto is a DC to DC regulator for providing current at a substantially constant voltage and connected thereto is a DC to AC inverter for supplying alternating current at a substantially fixed frequency and voltage, said alternating current buses being supplied by said DC to AC inverter; and

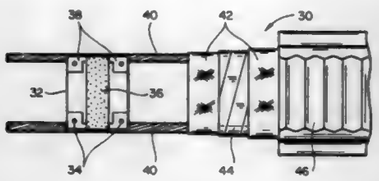
including a high voltage power supply having separate transformer secondaries for connection to a screen and an accelerator electrode of the ion thruster for applying potential thereto, said high voltage supply receiving power from said unregulated DC buses and having a high voltage transformer primary therein, said primary being connected to said buses through a pulse width modulated switch so that the output voltages of both said high voltage secondaries are controlled.

4,638,150

MODULAR ELECTRICAL HEATER

Wells Whitney, Menlo Park, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jul. 19, 1984, Ser. No. 632,776
Int. Cl.[4] H05B *3/16*
U.S. Cl. 219—543 20 Claims



1. A heater comprising

(1) a pair of flexible elongate parallel conductors which are connectable to a power supply;

(2) a plurality of rigid heating modules connected in parallel with each other between the conductors, each of said heating modules being physically spaced apart from each of the conductors and comprising

(a) a rigid insulating substrate; and

(b) a resistive heating component which has been deposited on the substrate and which generates heat when the conductors are connected to a suitable power supply; and

(3) electrical leads which physically and electrically connect the modules to the elongate conductors, the portions of each of the leads which are not connected either to a module or to a conductor having a tension and torsion modules of elasticity less than 10^8 psi and an aspect ratio greater than 0.5, where the aspect ratio is defined as length/diameter of the lead and the diameter is an equivalent diameter; wherein the quantity

$$-\mathrm{Log}\left[\frac{1}{d}\ \frac{F}{ED^2}\right]$$

is not more than 6,

where

l=length of lead;

d=equivalent diameter of lead;

E=modulus of elasticity of the elongate parallel conductors;

D=equivalent diameter of the elongate parallel conductors; and

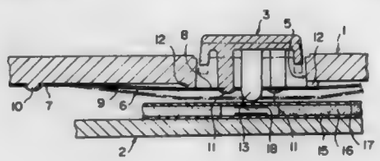
F=minimum force required to break the bond between lead to module.

4,638,151

KEYBOARD OF AN ELECTRONIC APPARATUS

Kazuno Sawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1985, Ser. No. 735,194
Claims priority, application Japan, May 25, 1984, 59-105719; May 25, 1984, 59-105720; May 25, 1984, 59-105721
Int. Cl.[4] G06C *7/02*
U.S. Cl. 235—145 R 7 Claims



1. A keyboard for an electronic apparatus comprising:

a plurality of keytops for inputting information;

a frame having opening portions to expose said plurality of keytops from the inside of the electronic apparatus to the outside; and

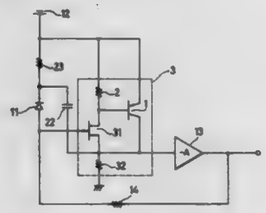
a spring member elastically supporting said plurality of keytops, wherein said spring member is fixed to said frame and includes a single flat and thin plate and said frame includes stopper portions projected near said opening portions for contacting said spring member to cause said spring member to be deformed.

4,638,152

PHOTOELECTRIC CONVERTING CIRCUIT HAVING A LOW PARASITIC CAPACITANCE

Hitoshi Takada, Kanagawa, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 13, 1985, Ser. No. 797,500
Claims priority, application Japan, Nov. 13, 1984, 59-239095
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—214 A 1 Claim



1. A bootstrap photoelectric converting circuit comprising:

a light receiving element with a first end connected to a power supply through a resistor,

a field effect transistor (FET) coupled in source follower arrangement, having a gate input terminal connected to a second end of said light receiving element,

an inverting amplifier for inversely amplifying the output of said FET,

a feedback resistor coupling an output of said inverting amplifier to the gate input of said field effect transistor,

a capacitor for applying an a.c. output signal component of said FET to one end of said light receiving element, and

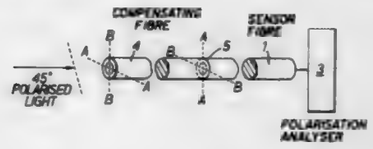
a bipolar transistor connected complementary to said FET to cause said amplifier to have a substantially unity gain and a small output impedance to reduce the influence of capacitance parasitic on said light receiving element on the frequency characteristics of said photoelectric converting circuit.

4,638,153

OPTICAL FIBRE SENSING ARRANGEMENTS

John P. Dakin, Barridge, England, assignor to Plessey Overseas Limited, Ilford, England

Filed May 18, 1984, Ser. No. 611,998
Claims priority, application United Kingdom, May 26, 1983, 8314570
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 8 Claims



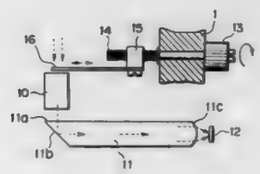
1. An optical arrangement suitable for the detection of acoustic waves and/or temperature or magnetic field changes, comprising means for producing polarised light which in operation of the arrangement will be applied for detection purposes to the input end of an optical sensor for transmission therethrough, whereby a relative phase delay is produced between orthogonal components of the polarised light at the output end of the optical sensor, and relative phase delay compensation means optically coupled to and so orientated with respect to one end of the sensor, that the relative phase delay between the orthogonally polarised components transmitted through the compensation means and the corresponding relative phase delay in the optical sensor are mutually opposite, thereby reducing the noise content of an output signal derived from the arrangement and fed to polarisation analyser means for producing an indication of structural changes which have occurred in the optical sensor.

4,638,154

REFLECTION-TYPE PHOTOELECTRIC SWITCHING APPARATUS WITH LIGHT-ADJUSTABLE REFERENCE LIGHT DETECTION

Fumiaki Itsuki, Nagaokakyo, and Seiji Oku, Osaka, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 238,703, Feb. 27, 1981, abandoned.
This application Dec. 20, 1983, Ser. No. 563,642
Claims priority, application Japan, Mar. 15, 1980, 55-32878
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 6 Claims



1. In a reflection-type photoelectric switching apparatus having a light projecting element for projecting light rays to an object, a detection light receiving photoelectric element for receiving reflected light rays from said object, a circuit device for processing output signals from said detection light receiving element, and a housing for enclosing at least said light projecting and detection light receiving elements and circuit device,

the improvement comprising a reference light receiving photoelectric element disposed adjacent to said detection light receiving element, said reference light receiving element and said detection light receiving element being reversely connected with respect to each other such that the output of one of said elements cancels the output of the other of said elements, and a reference light path including conducting means for guiding some of said light rays projected from the light projecting element to said reference light receiving element, and

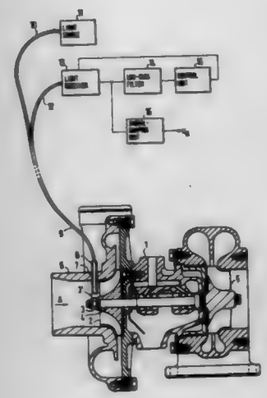
means for adjusting a quantity of light rays guided by said reference light conducting means to a predetermined quantity whereby the resultant output of said reversely connected photoelectric elements can be adjusted to a desired quantity.

4,638,155

OPTOELECTRONIC MEASURING DEVICE

Konrad Dorr, Leonberg, Fed. Rep. of Germany, assignor to Dr.Ing.h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 22, 1985, Ser. No. 692,985
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401858
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE 14 Claims

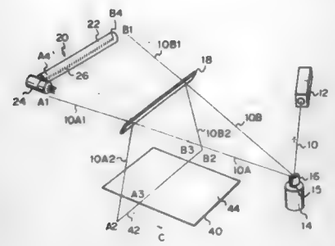


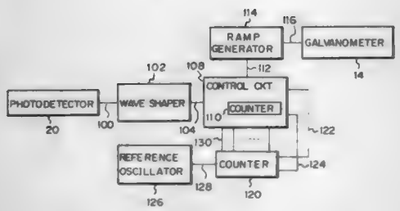
1. An apparatus for the optoelectronic measuring of the speed of a shaft, especially of a turbosupercharger shaft, comprising: a light modulator affixed to the shaft, a light source, and a light receiver component having an evaluating electronic system connected to its outlet side, a pencil of light guiding means having a first and second end for the optical transmission of signals, the pencil of light guiding means consisting essentially of several individual fibers and, at its second end facing away from the light modulator, being split into two approximately equal halves for the coupling-in of light from the light source and the coupling-out of light to the light receiver component, the light modulator consisting of a component already existing on the shaft which over its circumference has varying degrees of reflection and reflects the light in a radial direction, and wherein the light receiver component includes a phototransistor for receiving coupled-out light, the emitter (E) of which is connected to a negative distribution voltage, and the collector of which is connected to a positive distribution voltage by means of a changeable collector resistance that is controlled by a low-pass filter having an integral control unit connected to its outlet side and is switchably connected to a ground potential, and the collector being additionally connected to a signal shaping unit for obtaining a processable alternating signal of a frequency that is proportional to the rotational speed.

4,638,156
LIGHT BEAM SCANNING APPARATUS WITH ADJUSTABLE SCANNING SPEED AND OFFSET

Kazuo Horikawa, and Yuji Ohara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 543,558, Oct. 19, 1983, abandoned.
This application Jan. 9, 1986, Ser. No. 873,300
Claims priority, application Japan, Oct. 19, 1982, 57-182172
Int. Cl.[4] G02B 26/10; H01J 3/28
U.S. Cl. 250—235 6 Claims



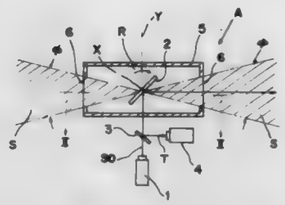


1. A light beam scanning apparatus comprising:
means for sweeping a light beam in response to a ramp signal;
means for dividing the swept light beam into first and second portions, said first portion being directed onto a medium to be scanned;
an optical grating disposed in the path of said second portion and extending in a direction of sweep of said second portion;
light detecting means receiving light passing through said optical grating for producing a detection signal having a pulse for each time said second portion crosses a line of said grating;
a reference oscillator for producing reference clock pulses having a frequency greater than a frequency of said pulses of said detection signal;
a first counter for counting said reference clock pulses;
a second counter for counting said pulses of said detection signal; and
control means for enabling said first counter to count said reference clock pulses when said second counter has reached a first predetermined count of said pulses of said detection signal and disabling said first counter from counting said pulses of said detection signal when said second counter has reached a second predetermined count of said pulses of said detection signal, said first and second predetermined counts corresponding to boundaries of a reference region along said grating, and adjusting a slope of said ramp signal in response to a count reached by said first counter when said second counter has reached said second predetermined count to thereby maintain a scan speed of said beam substantially constant.

4,638,157
DETECTING APPARATUS UTILIZING LIGHT BEAMS

Hiroshi Tatsumi, Fujiidera, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Oct. 12, 1984, Ser. No. 660,352
Claims priority, application Japan, May 11, 1984, 59-95401
Int. Cl.[4] H01J 3/14, 5/16, 40/14
U.S. Cl. 250—236 10 Claims

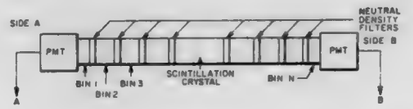


1. An apparatus for detecting an object by utilizing a light beam comprising
a light beam source for emitting a light beam,
a light beam receiving means,
reflecting means for reflecting the light beam emitted from the light beam source and directing said light beam along a light path onto a retroreflector means provided on said object to be detected for reflecting an incident light beam in a predetermined direction,
drive means for rotating said reflecting means on an axis (X) normal to an optical axis (Y) of said light beam emitted from the light beam source, and
slits (6) provided in light beam exit portions to determine a scanning angle by said light beam reflected by the reflecting means.

4,638,158
GAMMA RAY MEASUREMENT OF EARTH FORMATION PROPERTIES USING A POSITION SENSITIVE SCINTILLATION DETECTOR

Darrell S. Sonne, Katy, and William J. Beard, Houston, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 18, 1984, Ser. No. 571,897
Int. Cl.[4] G01V 5/00; G01T 1/20
U.S. Cl. 250—266 8 Claims

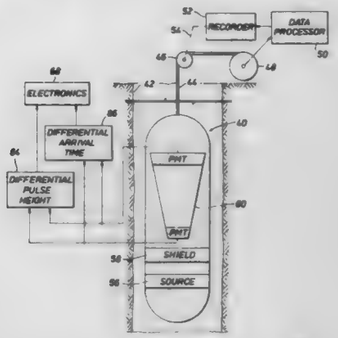


1. A system for measuring properties of earth formations in the vicinity of a well borehole at a plurality of different radial distances from the borehole, comprising:
a fluid tight hollow body member sized and adapted for passage through a well borehole and housing therein;
a source of gamma rays and means for directing gamma rays from said source outwardly from said body member into earth formations in the vicinity of the borehole; and
a position sensitive scintillation detector for detecting gamma rays scattered back into said body member from the earth formation in the vicinity of the borehole, means for collimating said scattered gamma rays onto said detector, said detector comprising scintillation crystal means having a plurality of discrete longitudinally spaced active regions or bins and being longitudinally spaced from said gamma ray source and having a longitudinal length L and two opposite ends and having photomultiplier tubes optically coupled to said opposite ends for providing output voltage signals having voltage amplitudes A and B representative of the intensity of scintillation events occurring in said crystal and impinging at said opposite ends thereof, means separating said bins for selectively attenuating light passing therebetween, and means for combining said output voltage signals A and B according to a predetermined relationship to derive the discrete bin along said length L of each of said scintillation events in said crystal, thereby providing measurements of the gamma ray scattering properties of the earth formations at different radial distances from the borehole.

4,638,159
GRADED SHAPED SPATIAL RESOLUTION NUCLEAR DETECTORS

Allen Nunley, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Mar. 27, 1985, Ser. No. 716,887
Int. Cl.[4] G01V 5/08; G01T 1/20
U.S. Cl. 250—267 12 Claims



1. For use in a sonde adapted to be lowered into a well borehole to conduct well logging operations by the observation of nuclear events impinging on the apparatus, a nuclear event scintillation detector having a specified size and shape between two spaced ends, one end being a near end and the other end being a far end, the cross section increasing monotonically along the detector from the near end to the far end to define a bias along the length thereof wherein the bias opposes a bias in spatial distribution of nuclear events measured by such a detector wherein the increase modifies nuclear event distribution in the detector within upper and lower scintillation count limits, and wherein said scintillation detector is constructed and arranged to receive nuclear events from any direction to create scintillations therein.

4,638,160
HIGH CLARITY MASS SPECTROMETER CAPABLE OF MULTIPLE SIMULTANEOUS DETECTION

Georges Slodzian, Sceaux; Francois Costa De Beauregard, Paris; Bernard Daigne, Chatenay Malabry, and Francois Girard, Paris, all of France, assignors to Office National d'Etudes et de Recherche Aerospatiales (ONERA), Chatillon and Universite de Paris-sud, Orsay, both of, France

Filed Jan. 28, 1985, Ser. No. 695,240
Claims priority, application France, Jan. 27, 1984, 84 01332
Int. Cl.[4] H01J 49/32
U.S. Cl. 250—296 12 Claims

1. A mass spectrometer, comprising:
inlet means for receiving a beam of charged particles having horizontal trajectory components in a radial plane and vertical trajectory components transverse to said radial plane;
first deflection means for impinging a first deflection, in the radial plane, to the beam of particles received from said inlet means, said first deflection varying with the velocity of the particles;
correcting means, arranged on the path of the particle beam, for compensating for second order aperture aberrations of said first deflection means for trajectories in the radial plane;
beam shaping means for independently adapting the horizontal and vertical trajectory components of the beam received from said first deflection means to provide a parallel beam having a thin vertical section transverse to said radial plane, and for passing the parallel beam through an aperture slot; and
second deflection means for impinging a second deflection, in the radial plane, to the beam of particles received from said aperture slot, said second deflection varying with



both the mass and energy of the particles, and the energy dependent component of the second deflection being substantially compensated for by said first deflection in the first deflection means,
said second deflection means having a planar inlet face inclined by an angle ϵ, with respect to a normal to the axis of the particle beam incident thereon, in the direction of the deflection in said second deflection means, and having a planar outlet face in a plane passing through the intersection of the inlet face and the axis of the particle beam, so that the following equation is satisfied

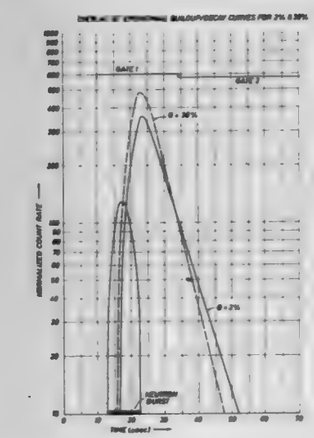
$$\tan(\theta/2)\tan(\theta-\epsilon)=2,$$

where θ designates the angle of deflection of the beam in said second deflection means.

4,638,161
EPITHERMAL NEUTRON POROSITY MEASUREMENT

Harry D. Smith, Jr., and Jerry L. Verbout, both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 24, 1983, Ser. No. 544,039
Int. Cl.[4] G01V 5/10
U.S. Cl. 250—269 6 Claims



1. A method for determining the porosity of earth forma-

tions in the vicinity of a well borehole passing therethrough, comprising:

(a) emitting, in a portion of the borehole substantially adjacent the formations of interest, repetitive relatively short duration with respect to a typical epithermal neutron decay time constant pulses of fast neutrons for moderation to epithermal energies by interaction with nuclei of materials in the borehole and surrounding earth formations, creating thereby repetitive bursts of populations of epithermal neutrons in the borehole and surrounding earth formations,

(b) detecting epithermal neutrons at a longitudinally spaced distance in the borehole during at least two non-overlapping predetermined time intervals, comprising a first interval substantially spanning the build-up of the epithermal neutron population and including each such fast neutron pulse and a second interval substantially spanning at least a portion of only the die-away of the epithermal neutron population and substantially only between said fast neutron pulses, said detected epithermal neutrons being representative of the epithermal neutron population in at least the surrounding earth formations,

(c) generating at least two count rate signals by generating, during said at least two time intervals, corresponding count rate signals representative of the corresponding said epithermal neutron populations,

(d) obtaining a measurement signal representative of the porosity of the surrounding earth formations by taking a ratio of the count rate signal during said first time interval to the count rate signal during said second time interval to improve the statistical formation measurements by utilizing data from both the epithermal neutron population build-up and the die-away, said count rate signal during said first time interval being due primarily to epithermal neutron population build-up, and

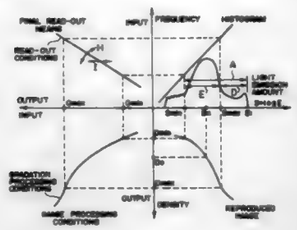
(e) recording said measurement signal as a function of borehole depth.

4,638,162

METHOD OF ADJUSTING RADIATION IMAGE READ-OUT CONDITION

Hiroi Tanaka, and Tokukazu Saito, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Mar. 5, 1985, Ser. No. 708,767
Claims priority, application Japan, Mar. 5, 1984, 59-42260
Int. Cl.⁴ G01T *1/105*
U.S. Cl. 250—327.2 **8 Claims**



1. A method of adjusting radiation image read-out conditions in which preliminary read-out conducted by scanning a stimulable phosphor sheet carrying a radiation image of an object stored therein by stimulating rays of a level lower than the level of the stimulating rays used in final read-out and obtaining a histogram of the amount of the light emitted by the stimulable phosphor sheet is carried out prior to the final read-out wherein the stimulable phosphor sheet is scanned by stimulating rays which cause the stimulable phosphor sheet to emit light in proportion to the radiation energy stored and detecting the emitted light by a photoelectric read-out means to obtain an image signal, and read-out conditions in the final read-out are adjusted on the basis of the histogram obtained by the preliminary read-out,

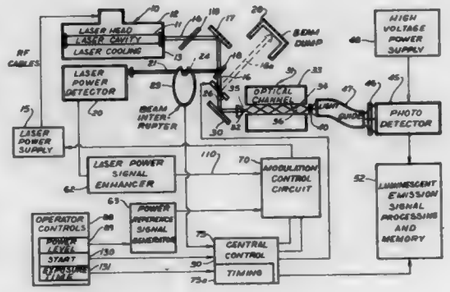
wherein the improvement comprises adjusting the read-out conditions on the basis of a histogram section ranging from the maximum light emission amount in the histogram obtained by the preliminary read-out to a value offset from said maximum amount by an offset value determined by image recording conditions.

4,638,163

METHOD AND APPARATUS FOR READING THERMOLUMINESCENT PHOSPHORS

Peter F. Braunlich, SW. 730 City View, Pullman, Wash. 99163, and Wolfgang Tetzlaff, Pullman, Wash., assignors to Peter F. Braunlich, Pullman, Wash.

Filed Sep. 20, 1984, Ser. No. 652,829
Int. Cl.⁴ G01T *1/115*
U.S. Cl. 250—337 **15 Claims**



1. A thermoluminescent phosphor reading apparatus for reading the level of ionization existing in a thermoluminescent phosphor as a result of exposure of the phosphor to ionizing radiation, comprising:

laser beam source means for generating and emitting a laser beam; said laser beam source means being capable of modulation to control power of the laser beam;

laser beam power detection means for measuring the power of the laser beam at least once during an exposure period during which the laser beam is directed upon the thermoluminescent phosphor;

phosphor positioning means for holding the thermoluminescent phosphor in position to be exposed to the laser beam;

laser power control means for rapidly and adjustably modulating the power output of the laser beam source means to maintain the power of the emitted laser beam at a desired level;

shutter means positioned to control exposure of the thermoluminescent phosphor held by the phosphor positioning means, without interfering with operation of the laser beam power detection means; and

thermoluminescent emission measuring means for measuring the output of any thermoluminescent emission occurring when the thermoluminescent phosphor is heated by the laser beam.

4,638,164

HIGH RESOLUTION SCINTILLATION CRYSTAL

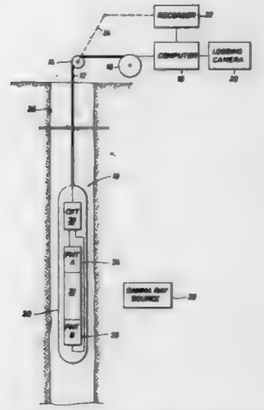
Darrell S. Soane, Katy, and Allen Nunley, Houston, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 17, 1984, Ser. No. 661,636
Int. Cl.⁴ G01V *5/06*; G01T *1/208, 1/202*
U.S. Cl. 250—366 **7 Claims**

1. A scintillation detector for well logging usage and responsive to a gamma ray passage for providing a compensated output signal having a specified energy range comprising:

(a) a single elongated scintillation crystal having specified physical configuration including two ends longitudinally spaced apart, said crystal converting a gamma ray passage event into a light emission having an origin within said crystal and wherein the light emission is attenuated by said crystal during light transmission to each of said end portions;

(b) first and second photomultiplier tubes optically coupled



to said end portions of said crystal for forming electrical signals output on detection of the light emission; and

(c) circuit means connected to said first and second photomultiplier tubes for receiving the signals therefrom, said circuit means forming an output signal representative of the energy of the gamma ray passage event including a portion thereof compensating for the light emission lost by attenuation in said crystal means.

4,638,165

DETECTOR APPARATUS AND METHOD FOR COMPUTER TOMOGRAPHY AND RADIOGRAPHY

Peter Glasow, and Wolfgang Rühle, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 1, 1985, Ser. No. 707,352
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 3408681
Int. Cl.⁴ G01T *1/22*
U.S. Cl. 250—370 **12 Claims**



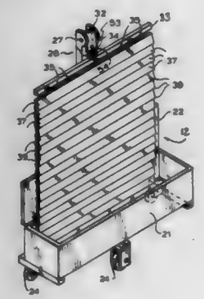
1. A detector system operable without cooling for ionizing rays for computer tomography or computer radiography comprising a plurality of flat detectors which are arranged with their flat sides alongside each other and a narrow side of which is provided for the reception of the ionizing rays, each flat side being provided with an electrode, with one of said electrodes including a blocking junction disposed thereon, the detectors being of high purity germanium and having a particular volume such that the contribution of generation-recombination current to shot noise of the detectors is substantially smaller than the quantum noise of the rays, with the system operating at or below room temperature.

4,638,166

RADIATION SHIELD

Thomas O. Baudro, Gales Ferry, Conn., assignor to Proto-Power Corporation, Groton, Conn.

Filed Mar. 1, 1985, Ser. No. 707,070
Int. Cl.⁴ G21F *3/00*
U.S. Cl. 250—515.1 **23 Claims**



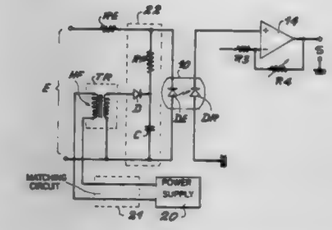
1. A vertically collapsible radiation shield device including a shield adapted to be moved between a first raised condition and a second collapsed condition, flexible suspension means for raising and lowering said shield; said shield including a plurality of overlapping horizontally elongated slats of radiation shielding material, each of which is individually attached near its top edge to said suspension means so that said slats are individually suspended at spaced intervals along the suspension means.

4,638,167

INSULATOR CIRCUIT WITH AN OPTOELECTRONIC COUPLER

Jean-Yves Lesecure, 7A rue PaPu, Rennes 35000; Charbonnel Pierre, and Christian Lanus, both of Bettos, all of France, assignors to Jean-Yves Lesecure, Rennes and Etablissement Public de Diffusion Dit "Telediffusion de France" , Montrouge, both of, France

Filed Sep. 19, 1984, Ser. No. 652,306
Claims priority, application France, Sep. 20, 1983, 83 14920
Int. Cl.⁴ G02B *27/00*
U.S. Cl. 250—551 **5 Claims**



1. An insulator circuit comprising an optoelectronic coupler consisting of a photoemitting diode positioned facing a photodetector, a photoemitting diode polarizing circuit, an audiofrequency signal input connected to the photoemitting diode and an output amplifier connected to the photodetector, wherein the photoemitting diode polarizing circuit comprises a high frequency power supply, said high frequency being in the

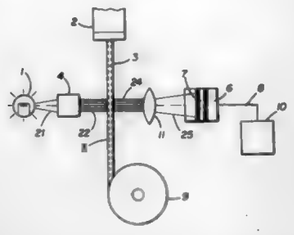
range 2-20 MHz, a high frequency transformer connected to said power supply, and a rectifier circuit with two inputs connected to said transformer and two outputs connected to said photoemitting diode.

4,638,168

APPARATUS FOR MEASUREMENT OF HOLLOW FIBER DIMENSIONS

Dean F. Marino; William E. Ryan, both of Antioch, and Arthur J. Kamp, Oakley, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 24, 1984, Ser. No. 664,277
Int. Cl.⁴ G01B *11/12*
U.S. Cl. 250—560 **21 Claims**



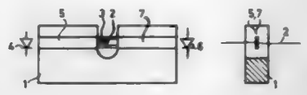
1. An apparatus for measurement of both the outside and inside diameter of a non-opaque hollow fiber comprising:
(a) at least one photosensitive detector for measuring differential light absorption of a non-opaque hollow fiber in a dimension generally pependicular to the fiber's axis;
(b) an incoherent light source which can project light on the photosensitive detector;
(c) a means for positioning the fiber to be measured so an image of light from the incoherent source which is transmitted through the fiber is projected on the photosensitive detector; and
(d) means for relating the differential light absorption to outside and inside dimensions of the hollow fiber.

4,638,169

MEASURING DEVICE FOR MEASURING THE CROSS-SECTION OF TEXTILE YARNS

Christof Thomann, Maur, Switzerland, assignor to Zellweger Uster, Ltd., Uster, Switzerland

Filed Sep. 26, 1984, Ser. No. 654,460
Claims priority, application Switzerland, Oct. 4, 1983, 5392/83
Int. Cl.⁴ G01B *11/02, 11/08*
U.S. Cl. 250—560 **12 Claims**



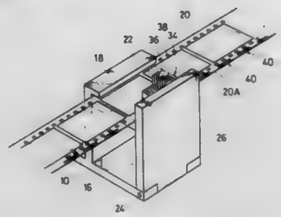
1. A device for measuring the cross-section of textile yarns, comprising:
a light source including means for projecting a band of light through a measuring field in which the textile yarn whose cross-section is to be measured may be disposed so as to intercept said band of light;
means disposed between said light source and said measuring field for homogenizing said band of light prior to its passage through said measuring field so that the shadow produced by said yarn as it intercepts said band of light does not change in size with a change of position of the yarn, including a first light guide having reflecting surfaces which subject light passing through the light guide to multiple reflections and having an elongated shape with a length greater than the longest dimension of its cross-section;
light receiver means for detecting the light passing through said measuring field from said light source and for generating a signal indicative of the cross-section of said yarn; and
a second light guide disposed between said measuring field and said light receiver means to conduct said light from said measuring field to said light receiver means.

4,638,170

METHOD OF READING BAR CODE

Kazufumi Kubota, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 15, 1985, Ser. No. 712,065
Claims priority, application Japan, Mar. 16, 1984, 59-051757; Mar. 16, 1984, 59-051758
Int. Cl.⁴ G06K *7/10*
U.S. Cl. 250—566 **21 Claims**



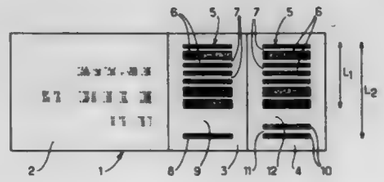
1. A method of reading a bar code formed on an object subjected to information detection, comprising the steps of:
(a) detecting the pattern of light and dark portions of said bar code using a detecting means which includes a plurality of pattern detecting members disposed in the bar code reading direction, at least two of said detecting members being confined within the widthwise dimension of a single clock bar of said bar code and being disposed in the bar code reading direction;
(b) determining the type of light and dark pattern detected by said detecting means; and
(c) determining the direction of advancement of said bar code relative to said pattern detecting members in accordance with the direction of change of said pattern of light and dark portions, thereby obtaining the position of a clock bar code relative to said detecting members.

4,638,171

METHOD AND DEVICE FOR THE DETECTION OF THE POSITION OF OBJECTS STACKED ON PALLETS

Max Gassmann, l'Etang la Ville, France, assignor to L'Oreal, Paris, France

Filed Mar. 19, 1984, Ser. No. 590,761
Claims priority, application France, Mar. 25, 1983, 83 04992
Int. Cl.⁴ G06K *7/10*
U.S. Cl. 250—566 **20 Claims**



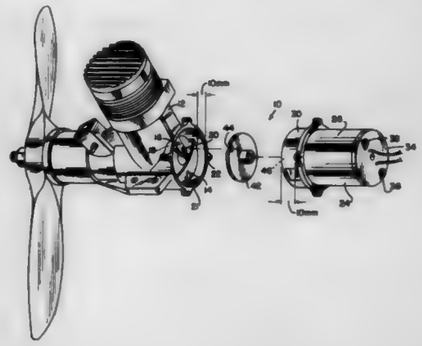
1. In a method for detecting the position of identical parallelepiped-shaped objects and for transferring them by automatic transfer means from a first receptacle to at least one other receptacle, wherein each of the said objects carries a position marker carrier having at least two adjacent flat label sections, each of which label sections is provided with a target mark for optical reading, one part of the target mark having a predetermined length, and being displayed on a respective one of two adjacent sides of the object, one of the sides being a large side delimited by the length and height of the object and the other side being a small side delimited by the width and the height of the object, the objects having been stored on each first receptacle so that, as regards each one of them, one of the label sections of the corresponding marker carrier is substantially parallel to a reference side of the first receptacle on which this object is stored,
the improvement wherein, for each said object the following steps are carried out:
(a) the said predetermined length part of the target mark of the label section which is substantially parallel to the reference side of the first receptacle is scanned at least once with an optical reading bean emitted by a light source and displaced at a constant speed,
(b) the scanning time T of the predetermined length part is measured, and
(c) the distance separating the light source from the respective side of the object is calculated from the predeterminted length, the constant scanning speed, and the measured time.

4,638,172

COMBINATION, A MODEL VEHICLE ENGINE AND A DIRECT-CURRENT GENERATOR

George A. Williams, 16 Grant St., Dover, N.J. 07801

Filed Nov. 27, 1984, Ser. No. 675,227
Int. Cl.⁴ H02K *7/18*
U.S. Cl. 290—1 R **15 Claims**



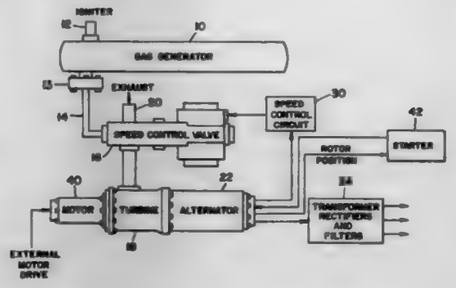
1. In combination, an engine for a model vehicle, such as a model airplane or the like, and a direct-current generator, comprising:
an internal-combustion engine; and
a direct-current generator operatively coupled to said engine; wherein
said generator comprises an armature, and a drive coupling member drivingly engaged with said armature;
said armature has three poles;
each of said poles has not less than six hundred turns of magnetic wire;
said engine having first means comprising a crankshaft, and second means comprising a connecting rod; and
one of said first and second means has means for drivingly engaging said drive coupling for imparting rotation to said generator from said engine.

4,638,173

ELECTROMECHANICAL POWER SOURCE

Ronald L. Milton, Cupertino, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 14, 1985, Ser. No. 733,834
Int. Cl.⁴ H02K *21/12*
U.S. Cl. 290—52 **7 Claims**



1. An electromechanical power source for aerospace vehicles which comprises:
(a) a solid propellant gas generator;
(b) a turbine coupled to be driven by gas from said solid propellant gas generator;
(c) an alternator coupled to be driven by said turbine;
(d) means for measuring an output parameter of said alternator;
(e) gas flow control valve for controlling the gas flow between said gas generator and said turbine, said gas flow control valve being an electromagnetically controlled flapper valve having a first gas output coupled to the input of said turbine, a second gas output coupled to an exhaust means and a gas input; and
(f) control means for comparing said output parameter of said alternator with the required value of said parameter, said control means being coupled to control said gas flow control valve to adjust the gas flow to drive said output parameter to the required value, said control means being coupled to control said flapper valve to couple said gas flow to said turbine when the value of said parameter is lower than the required value of said parameter and to control said flapper valve to couple said gas flow to said exhaust means when the value of said parameter is higher than the required value of said parameter.

4,638,174

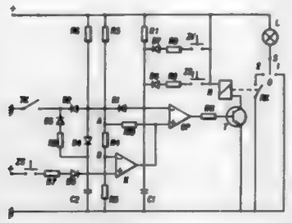
SWITCHING DEVICE FOR LIGHTING THE INTERIOR OF A MOTOR VEHICLE

Axel Bier, Gundelsheim, Fed. Rep. of Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Fed. Rep. of Germany

PCT No. PCT/DE84/00057, § 371 Date Feb. 25, 1985, § 102(e) Date Feb. 25, 1985, PCT Pub. No. WO84/03670, PCT Pub. Date Sep. 27, 1984
PCT Filed Mar. 14, 1984, Ser. No. 685,453
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1983, 3309548
Int. Cl.⁴ B60Q *3/02*
U.S. Cl. 307—10 LS **3 Claims**

1. Switching device used in the interior lighting of a motor vehicle provided with an ignition lock and a battery, with a timing element that is controlled by a door contact switch, which is opened when a door of the vehicle is closed, and that permits the interior lighting to be left switched on for a first specified time after the door is closed, characterized in that a second timing element (C2 R2) is provided, which is controlled by closing the door contact switch (TK) and which turns off the interior lighting (L) after a second specified time

when the ignition switch (ZS) is open and the door contact switch (TK) remains closed wherein said second specified time



is selected to prevent discharge of said battery to a level hindering ignition of the engine of said motor vehicle.

4,638,175

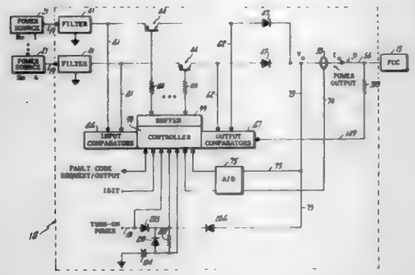
ELECTRIC POWER DISTRIBUTION AND LOAD TRANSFER SYSTEM

Michael P. Bradford, Orange; Gerald W. Parkinson, and Ross M. Grant, both of Shelton, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 3, 1984, Ser. No. 627,706

Int. Cl.⁴ H02J *7/00*

U.S. Cl. 307—64 **2 Claims**



1. A power distribution system, comprising:

at least two switch means for controlling the application of power from a plurality of power sources, to a power output;

at least two current means for preventing reverse power flow through respective ones of said plurality of switch means; and

processing means for providing control signals to operate said switch means, effective to switch respective ones of said power sources between on and off states with respect to said power output; characterized by:

first voltage detection means for detecting the levels of first voltages at a first side of corresponding ones of said switch means;

first comparator means for comparing the voltages detected by said first voltage detection means to selected upper and lower voltage thresholds and for providing a signal indication of an abnormal voltage condition to said processing means when any of said first detected voltages are at a level not within the bounds of said upper and lower voltage thresholds, said processing means responding to said abnormal signal indicator such that power sources are selectively switched with respect to said power output in view of any abnormal voltage conditions.

4,638,176

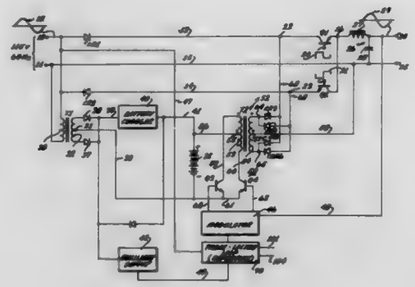
UNINTERRUPTIBLE POWER SUPPLY

Robert M. Martinelli, Torrance, Calif., assignor to Mullett Associates, Inc., Los Angeles, Calif.

Filed Aug. 1, 1985, Ser. No. 761,471

Int. Cl.⁴ H02J *9/00*

U.S. Cl. 307—64 **9 Claims**



1. An uninterruptible power supply system for supplementing a utility power supply with an auxiliary power supply when the utility power fails, said system comprising:

an input terminal having input sinewaves of said utility power supplied thereto;

an output terminal for supplying output sinewaves to a load;

a plus d.c. line and minus d.c. line connected to said input terminal;

rectifying means in said plus d.c. line and said minus d.c. line responsive to input sinewaves on said input terminal to provide positive half sinewaves on said plus d.c. line and negative half sinewaves on said minus d.c. line;

a plus d.c. bus and a minus d.c. bus;

said auxiliary power supply including means responsive to output sinewaves on said output terminal for detecting the loss in amplitude of the output sinewaves when the utility power supply partially fails to drive said auxiliary power supply and including rectifying means to provide positive going bursts of varying width pulses whose duty cycles vary sinusoidally on said plus d.c. bus and negative going bursts of varying width pulses whose duty cycles vary sinusoidally on said minus d.c. bus;

a first synchronous switch and a second oppositely phased synchronous switch, each said switches having an input and an output with the outputs joined to a common junction;

said plus d.c. line and said plus d.c. bus connected to provide positive going composite waveforms on the input of said first synchronous switch for passing positive going composite waveforms to said common junction during the positive halves of the input sinewaves;

said minus d.c. line and said minus d.c. bus connected to provide negative going composite waveforms on the input of said second oppositely phased synchronous switch for passing negative going composite waveforms to said common junction during the negative halves of the input sinewaves; and

a low pass filter for filtering out the high frequencies of said positive and negative going composite waveforms on said common junction to provide output sinewaves on said output terminal.

4,638,177

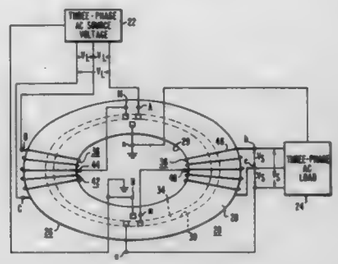
ROTATING FLUX TRANSFORMER

David S. Takach, Brentwood, Mo.; Rao L. Boggavarapu, Monroeville, Pa., and Ram R. P. Sinha, Watkinsville, Ga., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 14, 1985, Ser. No. 798,259

Int. Cl.⁴ H01H *85/02*

U.S. Cl. 307—83 **4 Claims**



1. A rotating flux transformer comprising:

a magnetic core defining a closed loop having an outer surface disposed about a longitudinal axis,

said magnetic core further defining an axially extending opening,

a toroidal primary winding disposed about the outer surface of said magnetic core, said toroidal primary winding having first and second ends and a center tap,

a poloidal primary winding disposed through the axially extending opening of said magnetic core, said poloidal primary winding having first and second ends and a tap N,

said toroidal and poloidal primary windings being T-connected, with the first end of said poloidal primary winding being connected to the center tap of said toroidal primary winding,

a three-phase source of alternating potential having a line-to-line voltage V_L and first, second and third output terminals respectively connected to the second end of said poloidal primary winding and to the first and second ends of said toroidal primary winding,

and at least one secondary winding disposed in inductive relation with a selected one of said primary windings,

said poloidal primary winding being constructed to have about 0.866 times the number of turns of the toroidal primary winding, and about 0.288 times the number of turns of the toroidal winding from the tap N to the center tap of the toroidal primary winding.

4,638,178

MODULAR POWER SYSTEM

Dennis J. Kayser, Hudson, N.H., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Sep. 3, 1985, Ser. No. 771,872

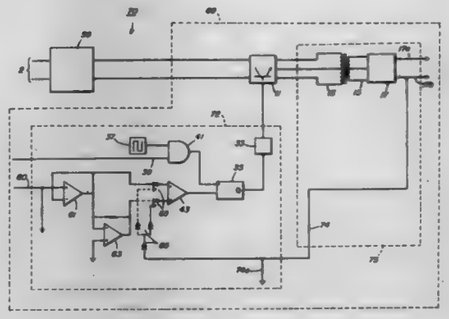
Int. Cl.⁴ H02J *1/00*

U.S. Cl. 307—85 **10 Claims**

1. A modular switching power system for supplying power to a digital computer comprising:

input means for receiving and rectifying input alternating current (AC) power including a storage capacitor; and

at least one power module including a switching device coupled to the storage capacitor, feedback regulation means coupled to the switching device for control thereof, both being fixedly mounted on the power module, and a transformer and regulator means coupled to the switching means to produce a desired direct current (DC) output voltage, and voltage setting means for scaling the output voltage to a reference voltage used by the feedback means to regulate the particular voltage output, said transformer, regulator means and voltage setting means contained in a submodule removably mounted on the module,



whereby a regulated DC voltage associated with the module is changed by replacing one submodule with another having a different DC voltage output.

4,638,179

EXTENDED RESPONSE TRIGGER CIRCUIT

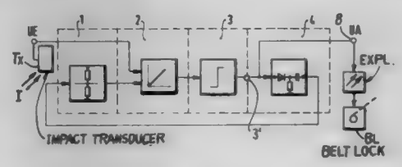
Bernhard Mattes, Sachsenheim; Klaus Oswald, Denkendorf, and Wadym Suchowerskyj, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,471

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, P3411359.2

Int. Cl.⁴ B60R *21/08*

U.S. Cl. 307—10 SB **8 Claims**



1. Extended response trigger circuit, particularly for a passenger restraint system in a motor vehicle, having

means (Tx) for providing a trigger signal (UE);

a reference forming circuit (1) providing a reference level signal;

an integrator (2) receiving the trigger and reference level signals and providing an integrated trigger output signal;

a threshold circuit (3) connected to an responsive to the integrated trigger output signal from the integrator (2); and

an output circuit (EXPL) coupled to and responsive to output (3') of the threshold circuit (3) and requiring a signal of a predetermined minimum duration,

and comprising, in accordance with the invention,

feedback means (4, 44) coupled to said output (3') of the threshold circuit (3) and to an input of said reference forming circuit (1), for extending the duration of the response of the threshold circuit (3) by modifying the reference level signal applied to said integrator (2).

4,638,180

FREQUENCY DIVIDER CIRCUITS

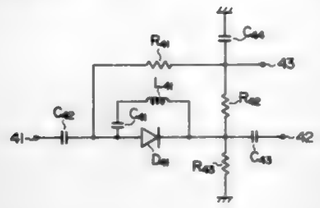
Morikazu Segawa, Hachioji; Yoshikazu Mori; Motoi Ohbe, both of Kawasaki; Mitsuo Makimoto, Yokohama, and Sadahiko Yamashita, Sagamihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 7, 1985, Ser. No. 709,288

Claims priority, application Japan, Mar. 9, 1984, 59-45802; Mar. 9, 1984, 59-45803; Jul. 27, 1984, 59-157827

Int. Cl.⁴ H03B *19/00*

U.S. Cl. 307—219.1 **15 Claims**



1. A frequency divider circuit comprising:
a diode component supplied with an input signal from the anode side;
the capacitance of said diode component varying in accordance with the voltage applied thereacross;
an LC series circuit having a capacitor and an inductor connected in parallel with said diode component; and
means for forward biasing said diode component, whereby a frequency-divided output signal is obtained from said diode component.

4,638,181

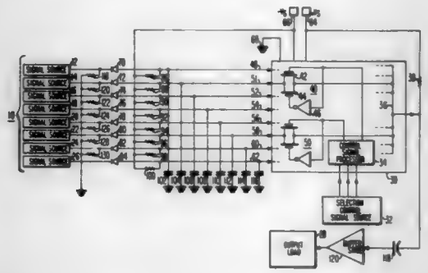
SIGNAL SOURCE SELECTOR

Michael S. Deiss, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 29, 1984, Ser. No. 676,105

Int. Cl.⁴ H03K *17/00, 17/56*

U.S. Cl. 307—243 **20 Claims**



5. A signal source selector comprising:
a plurality of signal input terminals for receiving respective signals to be selected;
an output terminal for providing a selected signal;
a source of a selection signal;
a first plurality of selectively operable switch means, said switch means having respective first and second terminals and being individually responsive to said selection signal for coupling a signal therebetween, said respective first terminals being coupled to said output terminal;
a source of a bias signal coupled to said output terminal for applying said bias signal thereto; and
a second plurality of controllable switch means, said switch means of said second plurality being coupled between respective ones of said signal input terminals and respective ones of said second terminals of said switch means of said first plurality, for coupling a signal therebetween in response to said bias signal being coupled by said selectively operable switch means of said first plurality.

4,638,182

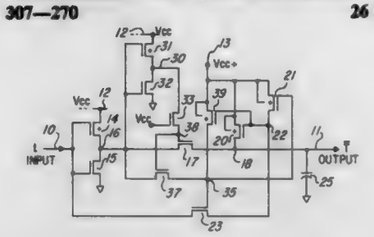
HIGH-LEVEL CMOS DRIVER CIRCUIT

Hugh P. McAdams, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 11, 1984, Ser. No. 630,470

Int. Cl.⁴ H03K *17/10, 17/687, 19/094, 3/027*

U.S. Cl. 307—270 **26 Claims**



1. A driver circuit, comprising:
an input node having a first logic state and a second logic state, said first and second logic states represented by different voltages,
an output node having capacitance to be charged when said input node goes from said first logic state to said second logic state,
charging means, connected to a first voltage supply and having an output, responsive to said input node so that said charging means connects said first voltage supply to said output of said charging means in response to said input node going from said first logic state to said second logic state,
a series transistor having a source-to-drain path connected between said output of said charging means and said output node, and having a gate coupled to said first voltage supply so that said source-to-drain path of said series transistor connects said output of said charging means to said output node, thereby causing said capacitance to be charged by said first voltage supply in response to said input node going from said first logic state to said second logic state, and
means, coupled to said input node, for connecting a second voltage supply of magnitude greater than said first voltage supply to said output node in response to said input node going from said first logic state to said second logic state.

4,638,183

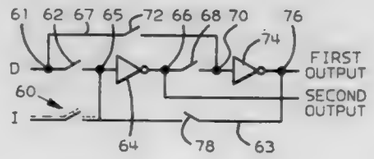
DYNAMICALLY SELECTABLE POLARITY LATCH

Dale A. Rickard, and Glen H. Rudelis, both of Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 20, 1984, Ser. No. 652,257

Int. Cl.⁴ H03K *3/356*

U.S. Cl. 307—291 **15 Claims**



1. A selective true or complement storage latch, comprising:
a data input switch having a first input node which can assume either a zero or a one value, connecting to a binary bit input source, a control input for accepting a first or second control state signals, a first data output node which is selectively connected to said data input node when said control input is in said first state and a second data output node which is selectively connected to said data input node when said control input is in said second state;
a first inverting gate having an input connected to said first data output of said data input switch and an output connected to a first storage node;
a second inverting gate having an input coupled to said first storage node and an output coupled to a second storage node, said input of said second inverting gate being connected to said second output of said data input switch, said output of said second inverting gate being coupled to said input of said first inverting gate;
said data input node being selectively connected to said input of said first inverting gate through said first output of said data input switch when said control input is in a first state and said data input node being selectively connected to said input of said second inverting gate through said second output of said data input switch when said control input is in said second state;
whereby the true value of the data at said data input node is stored in said latch when said control input is in said first state and the complement of the data at said data input node is stored in said latch when said control input is in said second state.

4,638,184

CMOS BIAS VOLTAGE GENERATING CIRCUIT

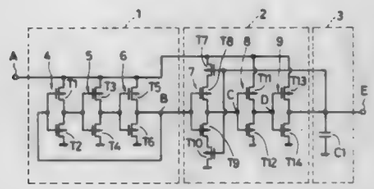
Kikuo Kimura, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1984, Ser. No. 650,408

Claims priority, application Japan, Sep. 22, 1983, 58-174109

Int. Cl.⁴ G05F *1/56*

U.S. Cl. 307—297 **6 Claims**



1. A CMOS bias voltage generating circuit for use in a semiconductor integrated circuit device and for reducing an external DC power supply voltage to a lower DC bias voltage, comprising:
oscillating means coupled to said external DC power supply for converting said external voltage into a first clock pulse signal;
smoothing circuit means for converting a second clock pulse signal into said lower DC bias voltage;
CMOS inverter means for inverting said first clock pulse signal from said oscillating means;
CMOS buffer means for varying the pulse duration of the output signal from said CMOS inverter means to output said second clock pulse signal to said smoothing circuit means; and
voltage compensating means for varying the transconductance of said CMOS inverter means in response to a variation of said lower DC bias voltage to regulate the pulse duration of said first clock pulse signal to thereby regulate said lower DC bias voltage to a predetermined amplitude.

4,638,185

ANALOG SIGNAL MEASURING APPARATUS

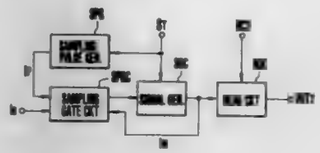
Kensuke Kobayashi, Tokyo, and Yasuo Tazoh, Kanagawa, both of Japan, assignors to Iwatsu Electric Co., Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

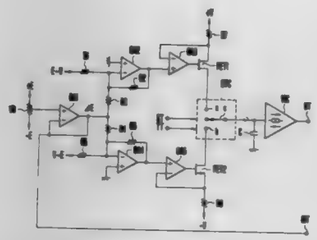
Filed Nov. 13, 1984, Ser. No. 670,622

Claims priority, application Japan, Nov. 15, 1983, 58-213289

Int. Cl.⁴ H03K *17/00, 17/92*

U.S. Cl. 307—352 **3 Claims**





1. An analog signal measuring apparatus for measuring an analog signal inputted thereto comprising:
a sampling pulse generating means responsive to a trigger signal supplied thereto to generate a sampling pulse signal;
a sampling gate means having, means for obtaining a sum signal representing the sum of an analog signal to be measured, a feedback signal and said sampling pulse signal and means for comparing a level of said sum signal with a predetermined threshold level to output a compared signal which has a high or low level;
an integrating means supplied with said compared signal and said trigger signal, for producing said feedback signal which is fed back to said sampling gate means, said integrating means being controlled in accordance with a control signal so that, upon reception of said trigger signal, said feedback signal is increased or decreased so as to invert said compared signal, thereby said feedback signal converging to a value;
a control means for providing said control signal to said integrating means; and
a reading means for reading out the converged value of said feedback signal outputted from said integrating means.

4,638,186

HMOS LOGIC GATE

Kevin L. McLaughlin, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 2, 1985, Ser. No. 803,691

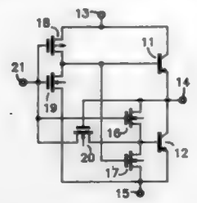
Int. Cl.⁴ H03K *19/01*

U.S. Cl. 307—446 **6 Claims**

1. A circuit comprising:
a first supply voltage terminal;
a second supply voltage terminal;
an input terminal;
an output terminal;
a first bipolar transistor having its collector-emitter current path coupled between said first supply voltage terminal and said output terminal;
a second bipolar trnsistor having its collector-emitter cur-

rent path coupled between said output terminal and said second supply voltage terminal;

first means coupled between said first and second supply voltage terminals and coupled to said input terminal and a base of said first transistor for providing a voltage for biasing said first transistor, said first means providing a high impedance to said input terminal;



second means coupled between said output terminal and a base of said second bipolar transistor and coupled to said input terminal for biasing said second transistor; and

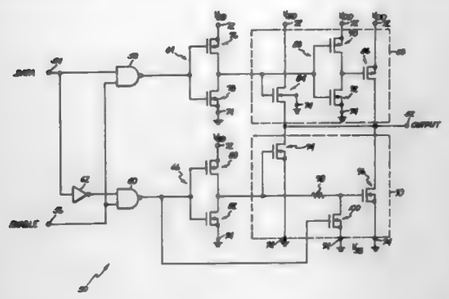
third means coupled between said input terminal and said base of said second bipolar transistor and coupled to said output terminal for further biasing said second bipolar transistor.

4,638,187

CMOS OUTPUT BUFFER PROVIDING HIGH DRIVE CURRENT WITH MINIMUM OUTPUT SIGNAL DISTORTION

Clifford H. Boler, Bloomington; William W. Leake, St. Paul; Surinder S. Rai, Plymouth, and Gene B. Zemke, Minneapolis, all of Minn., assignors to VTC Incorporated, Eagan, Minn.

Filed Oct. 1, 1985, Ser. No. 782,639
Int. Cl.[4] H03K *21/10*
U.S. Cl. 307—451 32 Claims



1. An output buffer for producing an output at an output terminal comprising:

a pull-up circuit responsive to a first signal for pulling the output toward a first supply potential when turned on, the pull-up circuit including first and second FETs, each having a gate, a source and a drain, the first and second FETs each having a current path formed by their source and drain connected in parallel between the output terminal and a first supply potential terminal, and first delay means connected to the gate of the second FET for delaying turn-on of the second FET with respect to turn-on of the first FET; and

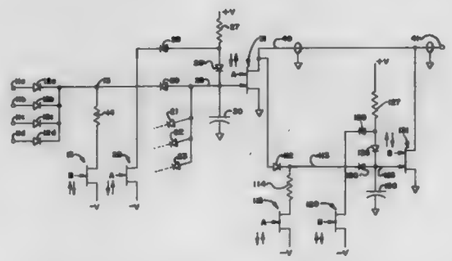
a pull-down circuit responsive to a second signal for pulling the output at the output terminal toward a second supply potential when turned on, the pull-down circuit including third and fourth FETs each having a gate, a source and a drain, the third and fourth FETs each having a current path formed by their source and drain connected in parallel between the output terminal and a second supply potential terminal, and a second delay means connected to the gate of the fourth FET for delaying turn-on of the third FET with respect to turn-on of the third FET.

4,638,188

PHASE MODULATED PULSE LOGIC FOR GALLIUM ARSENIDE

Seymour R. Cray, Chippewa Falls, Wis., assignor to Cray Research, Inc., Minneapolis, Minn.

Filed Aug. 27, 1984, Ser. No. 644,249
Int. Cl.[4] H03K *17/04*
U.S. Cl. 307—453 17 Claims



1. In a gallium arsenide integrated circuit, a plurality of logic gates for use in constructing digital logic networks, each comprising:

a plurality of logic signal inputs, a clock signal input for receiving clock signals having first and second intervals, and a logic signal output;

a capacitance element;

means responsive to said logic signal inputs and to said clock signal input and operative in a first interval of a clock period for charging or discharging said capacitance element depending on the logical state of applied logic signals; and

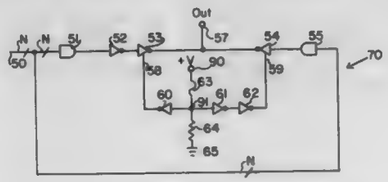
means responsive to said clock signal input and operative in a second interval of a clock period for transmitting a logic signal to said output having a logical state corresponding to the charged condition developed on said capacitance element.

4,638,189

FAST AND GATE WITH PROGRAMMABLE OUTPUT POLARITY

George Geannopoulos; Cyrus Tsui; Mark Fitzpatrick, all of San Jose, and Andy Chan, Milpitas, all of Calif., assignors to Monolithic Memories, Incorporated, Santa Clara, Calif.

Filed Jun. 29, 1984, Ser. No. 626,377
Int. Cl.[4] H03K *19/20, 19/082, 19/003;* G06F *11/28*
U.S. Cl. 307—465 16 Claims



1. A programmable polarity circuit having a first input terminal, a second input terminal, an output terminal, a first programming input terminal and a second programming input terminal comprising:

a first inverter having an output lead, and having an input lead connected to said first input terminal;

a second inverter having an input lead connected to said output lead of said first inverter, an output lead connected to said output terminal, and an enable input lead connected to said first programming input terminal wherein, when the programming input signal applied to said enable input lead of said second inverter is a first binary state said second inverter is enabled, and when the input signal applied to said enable input lead of said second inverter is a second binary state opposite said first binary state, said second inverter is disabled; and

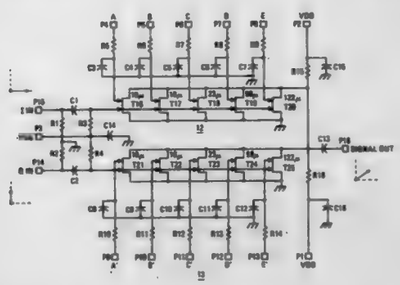
a third inverter having an input lead connected to said second input terminal, an output lead connected to said output terminal, and an enable input lead connected to said second programming input terminal wherein, when the input signal applied to said enable input lead of said third inverter is said first logical state said third inverter is enabled, and when the input signal applied to said enable input lead of said third inverter is said second logical state said third inverter is disabled.

4,638,190

DIGITALLY CONTROLLED WIDEBAND PHASE SHIFTER

Ying C. Hwang, Liverpool; Young K. Chen, Syracuse, and Louis J. Ragonese, Liverpool, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed May 20, 1985, Ser. No. 735,990
Int. Cl.[4] G01R *25/04*
U.S. Cl. 307—512 31 Claims



1. A digitally controlled wideband phase shifter, which is adjustable in selected discrete angular steps, comprising

A. an input terminal for application of an AC input signal;

B. phase splitting means coupled to said input terminal for resolving said input signal into a first and a second vector component in mutual quadrature, and including a first and a second output terminal for supplying said first and second components respectively;

C. a first and a second dual gate MESFET, each MESFET having a source terminal, a drain terminal, a signal gate terminal and n-fold control terminals, and being subdivided into an n-fold plurality of selectively activated MESFET segments,

each segment having a predetermined width to achieve a desired transconductance, and including

(1) an electroded source region connected to said MESFET source terminal

(2) an electroded drain region connected to said MESFET drain terminal, and

(3) a gate region defined between said source and drain regions having

(i) a signal gate electrode disposed between said source and an activating gate electrode, electrically connected to said MESFET signal gate terminal for modifying the AC output signal current of said MESFET as a function of the segment transconductance, and

(ii) an activating gate electrode disposed between said signal gate electrode and said drain for turning current flow "ON" or "OFF" in said MESFET segment and electrically connected to one of said control terminals,

said first and second of said quadrature related vector components being applied to the signal gate terminals of said first and second MESFETS respectively,

said segments of said first MESFET being proportioned and ordered for connection to an electrical control signal coupled to the n-fold control terminals of said first MESFET such that successive combinations of active segments provide successive transfer values proportional to successive values of the sine function of an angle theta

said segments of said second MESFET being proportioned and ordered for connection to an electrical control signal coupled to the n-fold control terminals of said second MESFET such that successive combinations of activated segments provide successive transfer values proportional to successive values of the cosine function of said angle theta; and

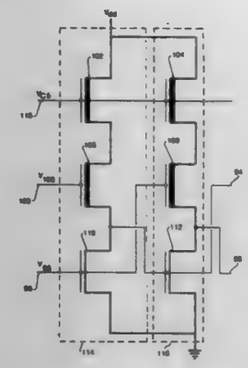
D. means for combining the quadrature related vector components at the outputs of said first and second MESFETS respectively proportioned to said sine and cosine values of said angle theta to form an output signal the phase of whose vector resultant represents a stepped rotation by said angle theta of the vector resultant of the input signal.

4,638,191

AMPLITUDE INSENSITIVE DELAY LINE

Richard A. Baumgartner, Palo Alto; John N. Dukes, Los Altos Hills, both of Calif., and George A. Fisher, Andover, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 5, 1984, Ser. No. 628,069
Int. Cl.[4] H03K *17/284, 17/693*
U.S. Cl. 307—602 13 Claims



1. A circuit for delaying a signal comprising a plurality of cascaded saturating circuit elements wherein each element in the plurality of cascaded saturating circuit elements comprises:

control means for varying delay through the element, the control means having a first node coupled to a voltage source, a second node and a third node wherein a signal may be placed on the third node in order to vary delay through the element;

a first depletion-type MOSFET including a drain node coupled to the second node of the control means, a gate node coupled to a prior element and a source node coupled to a subsequent element;

a first enhancement-type MOSFET including a drain node coupled to the source node of the first depletion-type

MOSFET, a source node coupled to ground, and a gate node coupled to the prior element and to a gate note of a depletion-type MOSFET in the subsequent element.

4,638,192

LINEAR DC MOTOR

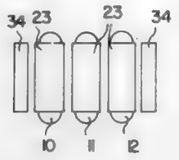
Johann von der Heide, Schramberg, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Filed Dec. 10, 1982, Ser. No. 448,681

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1982, 3149214

Int. Cl.⁴ H02K *41/00*

U.S. Cl. 310—12 **10 Claims**



1. A direct current linear motor, particularly for use in data processing drive systems, said motor comprising:

a permanent magnetic system formed of a plurality of permanent magnet poles disposed linearly adjacent each other;

a ferromagnetic structure formed of at least one slotted flux-carrying member and a multi-strand winding formed into a plurality of coils, the coils disposed linearly adjacent each other on the flux-carrying member, the coils being energized in cyclic sequence and each said coil wound without overlap around a pole of the at least one flux-carrying member between adjacent slots thereof forming a multi-phase d.c. structure, each pole terminating in a shoe at one of its ends;

a flat air gap defined between and separating said permanent magnetic system and the pole shoes of said ferromagnetic structure,

said permanent magnetic system and said ferromagnetic structure being linearly movable relative to each other in their longitudinal direction, the axis of each said coil of said ferromagnetic structure extending perpendicular to the direction of movement; and

an auxiliary ferromagnetic pole at each end of said ferromagnetic structure with respect to the direction of movement thereof to substantially reduce or eliminate reluctance forces tending to impede relative movement between said permanent magnetic system and said ferromagnetic structure, said auxiliary ferromagnetic pole being formed by an additional pole separate from the winding poles at each end of said ferromagnetic structure, the auxiliary poles being formed from outwardly extending bent ends of a U-shaped ferromagnetic part that provides said additional poles, and the upward bend height of the auxiliary poles being 0.1–0.5 times and preferably about 0.2 times the intercoil pitch of the ferromagnetic structure.

4,638,193

LINEAR IMPULSE MOTOR

J. Paul Jones, Gleanmoore, Pa., assignor to Med-Tech Associates, Broomall, Pa.

Filed Nov. 23, 1984, Ser. No. 674,185

Int. Cl.⁴ H02K *33/00*

U.S. Cl. 310—15 **1 Claim**

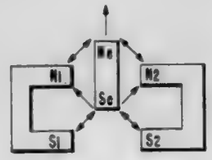
1. The method of creating a linear impulse motor comprising the steps of:

providing a first C-shaped core and providing first coil means on the first core, the ends of the first core to periodically constitute respectively north and south poles when the first coil means is periodically energized to periodically establish a first magnetic field the flux path of which extends through the core and between said ends;

providing a second C-shaped core identical to the first core and providing second coil means on the second core the ends of the second core to periodically constitute respectively north and south poles when the second coil means is periodically energized simultaneously with said first coil means to establish a second magnetic field the flux path of which extends through the second core and between the ends thereof;

arranging the first and second cores so that when said magnetic fields are established said north poles of each are spaced apart and face one another and said south poles of each are spaced apart and face one another to provide a concentrated flux path extending between said opposing north and south poles;

providing an elongated permanent magnet the length of which is less than the outside length between said north and south poles but greater than one-half of said outside length and also providing for the permanent magnet to be



movable back and forth along said concentrated flux path between a first position and a second position;

establishing said first position so that when the permanent magnet is in the first position the mid-section thereof is between said north poles of the first and second cores and the north pole of the permanent magnet is spaced outboard of said north poles of the first and second cores and the south pole of the permanent magnet is midway between said north and south poles of the first and second cores;

establishing said second position so that when the permanent magnet is in the second position the south pole thereof is between said north poles of the first and second cores and the north pole of the permanent magnet is spaced outboard of said north poles of the first and second cores a distance greater than first said spacing thereof; and

periodically energizing said coils to cause the permanent magnet to move from said first to said second position and respectively after each said energizing deenergizing said coils to permit the permanent magnet to move from the second position to the first position by its own permanent magnetic force.

4,638,194

COHERENT MAGNETO-CALORIC EFFECT SUPERCONDUCTIVE HEAT ENGINE PROCESS CYCLE

Peter D. Keefe, Box 259, Roseville, Mich. 48066

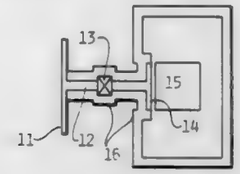
Filed Jul. 18, 1983, Ser. No. 515,062

Int. Cl.⁴ H02K *9/00*

U.S. Cl. 310—40 R **52 Claims**

1. A method for producing work from a superconductive heat engine having field control means for applying a magnetic field and heat reservoir means for supplying fuel for said heat engine, comprising the steps of:

providing at least one thermally and electrically substantially isolated segment made from a superconductive material having $100\xi(T)$ greater than $\sqrt{5}\lambda(T)$ and having a size between $100\xi(T)$ and $\sqrt{5}\lambda(T)$, which will achieve a magneto-caloric effect phase transition affecting substantially the entire volume of said segment in which a mixture of phase state is substantially absent during said phase transition, where $\xi(T)$ is defined as the temperature dependent range of coherence of the superconductive electrons and $\lambda(T)$ is defined as the temperature dependent depth of penetration into the superconductor by a magnetic field, and where a magneto-caloric effect is defined as a superconductive phase variation process in which latent heat evolution is capable of varying the temperature of the superconductor;



cycling said segment between a superconductive phase and a normal phase by varying the applied magnetic field relative to said segment in a predetermined relationship with a change in the temperature of said segment and selectively supplying heat from said heat reservoir means in cooperation with a magneto-caloric effect, said work being produced by the relative change in the applied magnetic field during said superconductive phase.

4,638,195

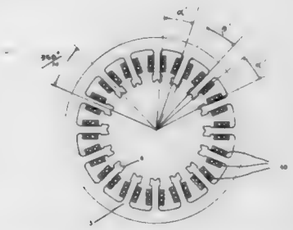
MULTIPLE-POLE STEPPING MOTOR

Ted T. Lin, 20850 Stevens Creek Blvd., Cupertino, Calif. 95014

Filed Feb. 11, 1985, Ser. No. 700,039

Int. Cl.⁴ H02K *37/00*

U.S. Cl. 310—49 R **8 Claims**



1. A multiple pole stepping motor comprising,

an annular stator having an even number of stator poles around an inner circumference where adjacent stator poles are grouped in pairs, where each stator poles has a plurality of pole teeth, and wherein the angle α between the closest, adjacent teeth between said first stator pole and said second stator pole of each group is governed by the relationship:

$$\alpha = 2t(2n+1)$$

where n is any integer greater than zero, and t is the step angle,

a stator winding which winds around a first stator pole of each pair of stator poles in a first direction, and which winds around a second stator pole of each pair of stator poles in a second direction, such that the said first stator pole and said second stator pole may develop a magnetic flux having the same phase but opposite polarity when said stator winding is energized, and

a rotor disposed within said annular stator, said rotor including magnetic means polarized in an axial direction between two ends thereof for carrying magnetic flux, a first pole cap having a number of rotor teeth being attached to a first end of said magnetic means, and a second pole cap having a number of rotor teeth being attached to a second end of said magnetic means, the rotor teeth of said first and second pole caps being juxtapositioned proximate to said teeth of said stator poles, where the rotor teeth of said first pole cap and the rotor teeth of said second pole cap are angularly offset.

4,638,196

HAND-HELD TOOL WITH AN ELECTRIC MOTOR AND WEARING SHELLS FOR SUPPORTING THE SAME

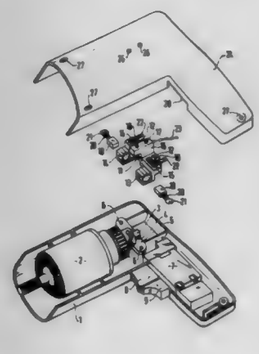
Ernst Krinzler, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 18, 1985, Ser. No. 713,264

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1984, 3413233

Int. Cl.⁴ H02K *5/04, 7/14, 11/00*

U.S. Cl. 310—50 **6 Claims**



1. A hand-held machine tool including a housing having housing shells connectable to each other, an electric motor, and a split motor bearing accommodated in said housing and including a lower shell half and an upper shell half connectable to an disconnectable from said lower shell half, both shell halves supporting in assembly a brush-side end of a motor shaft; and electric structural components, said lower shell half being secured in said housing and remaining therein whereas said upper shell half is simultaneously a carrier for supporting said electric structural components and forms with said electric structural components a pre-assembled integral component assembly removable from and insertable into said housing.

4,638,197

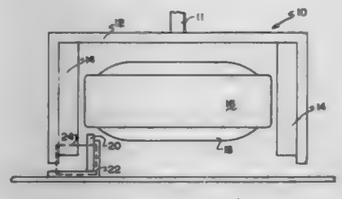
MAGNETIC FLUX SHIELD AND ENHANCER FOR BRUSHLESS MOTORS

Memorial Kalagidis, North Canton, Ohio, assignor to Ametek, Inc., Kent, Ohio

Filed Sep. 27, 1985, Ser. No. 781,409

Int. Cl.⁴ H02K *11/00*

U.S. Cl. 310—67 R **11 Claims**



1. A motor, comprising:

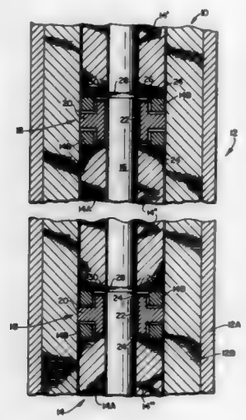
a rotor having a plurality of magnetic elements uniformly positioned about a first surface thereof;
a plurality of magnetic sensing devices in fixed spaced relationship from said first surface; and
a magnetic flux conducting element extending from each said magnetic sensing device to a point in juxtaposition to said rotor, said magnetic flux conducting element having first and second orthogonal legs, said first leg having a center portion in alignment with said magnetic sensing device and side portions extending on each side of said center portion, and beyond said magnetic sensing device, said center portion being of less magnetic reluctance than each of said side portions.

4,638,198

ELECTRIC SUBMERGIBLE MOTOR WITH BEARING ASSEMBLY ISOLATED FROM AXIAL LOADS

Susan Cochran, Bartlesville, Okla., assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 22, 1985, Ser. No. 693,200
Int. Cl.⁴ H02K *5/16*
U.S. Cl. 310—871 **7 Claims**



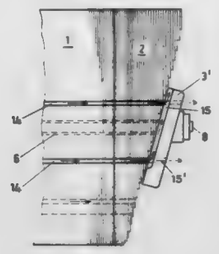
1. In a submergible electric motor having an elongated cylindrical stator containing an elongated cylindrical rotor, said rotor including a shaft extending axially of the motor and at least a pair of axially spaced upper and lower rotor sections coupled to the shaft for rotation therewith, but capable of limited axial movement relative thereto, and a bearing assembly disposed between said rotor sections and including a fixed bearing ring and a coaxial bearing sleeve therein rotatable with the shaft, said shaft extending continuously through said bearing assembly for the transmission of axial loads along said shaft without transferring said loads to said bearing assembly, the improvement comprising means on said shaft separate from said bearing sleeve for supporting the lower end of the upper rotor section, for receiving axial loads therefrom, and for preventing the exertion of such loads upon said bearing assembly, the lower end of the upper rotor section being close enough to said bearing assembly to exert axial loads on said bearing assembly during the operation of said motor in the absence of said supporting means.

4,638,199

STATOR BODY WITH LAMINATED COMPRESSION PLATES

Ernst Brem, Schlieren, and Josef Merki, Würenlingen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 12, 1985, Ser. No. 754,213
Claims priority, application Switzerland, Aug. 9, 1984, 3824/84
Int. Cl.⁴ H02K *5/00*
U.S. Cl. 310—91 **5 Claims**



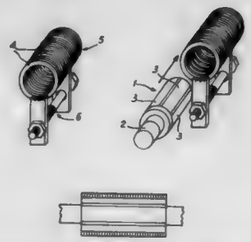
1. A stator comprising a stator body (1) which is axially compressed at one axial end by a compression plate (2) by means of a tension bolt (8) passing through said compression plate (2) and non-magnetic tie plates (3), in which arrangement said compression plate (2) comprises laminations (4) which are stacked together and bonded to each other, said compression plate (2) having a conical outside contour on the outside surface facing away from said stator body (1), said compression plate (2) having a stepped outside contour, said non magnetic tie plates (3) having on the surface facing said compression plate (2) a contour which essentially matches the stepping of said compression plate (2), said non-magnetic tie plates (3) comprising individual annular segments (3') and having on the surface facing said compression plate (2) radially-extending grooves (15) which communicate with axially extending holes (14) for cooling gas in said compression plate (2).

4,638,200

HIGH SPEED PERMANENT MAGNET ROTOR

Loic Le Corre, Colombes, and Albert L. Rolland, Paris, both of France, assignors to Precision Mecanique Labinal, Bois d'Arcy, France

PCT No. PCT/FR85/00121, § 371 Date Dec. 23, 1985, § 102(e) Date Dec. 23, 1985, PCT Pub. No. WO85/05506, PCT Pub. Date Dec. 5, 1985
PCT Filed May 21, 1985, Ser. No. 822,405
Claims priority, application France, May 23, 1984, 8408015
Int. Cl.⁴ H02K *15/02, 21/14*
U.S. Cl. 310—156 **11 Claims**



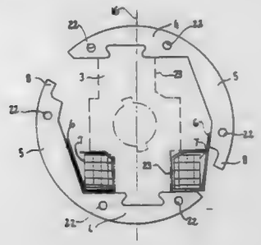
1. In rotors for rotating machines having peripheral magnets on the rotor adapted to rotate at very high speeds, in particular in machines whose magnets are fixed to the rotor, the improvement characterized in that the peripheral magnets of the rotor are surrounded by a thin cylindrical hoop forming a sleeve and exerting a pre-stressing force on the subjacent magnets, said hoop being made from one or more thin bands wound around the rotor under conditions which produce a pre-stressing force having a magnitude such that when the rotor rotates at maximum speed, the geometric possibility of the magnets coming away from the surface of the rotor is prevented, said band being made from a non-magnetic, work-hardened, metallic material having a high elastic limit and a small thickness.

4,638,201

ELECTRONICALLY COMMUTATED DC MOTOR

Josef Feigel, Landshut, Fed. Rep. of Germany, assignor to Standard Elektrik Lorenz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 610,160, May 14, 1984. This application Feb. 28, 1986, Ser. No. 834,674
Claims priority, application Fed. Rep. of Germany, May 20, 1983, 3318463
Int. Cl.⁴ H02K *1/00*
U.S. Cl. 310—216 **16 Claims**



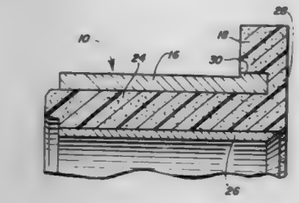
1. An electronically commutated direct current motor comprising, in combination:
a direct current motor including a rotor having a dome-shaped body comprised of magnetizable material having a permanent magnet disposed on an inner circumference of said dome-shaped body, said rotor being a bipolar external rotor;
a stator located within said permanent magnet and including a yoke stack and a plurality of pole stacks and further including a longitudinal stator axis providing a longitudinal axis of symmetry through said motor;
a plurality of coilforms carried by said yoke having a plurality of stator windings wound on said coilforms, said stator winding for providing an alternating current field, said stator having a double T-shaped design with said stator winding being disposed on a common leg of said double T-shaped stator, said pole stacks and said yoke stack with said stator windings wound thereon being disposed asymmetrical to said longitudinal stator axis;
a plurality of stator pole stack extensions projecting in the same circumferential direction and separated from said permanent magnet by a constant air gap, said air gap located between said stator and said rotor, said stator alternating current field having a polar axis staggered parallel to said longitudinal stator axis by a fixed distance and said rotor permanent magnet having a polar axis orthogonal to a rotor neutral zone and displaced from said stator alternating current polar axis by a non-zero angle epsilon when said stator winding is currentless;
a rotor shaft penetrating said dome-shaped body for turning an external load;
a printed circuit board mounted adjacent to said coilform and supported by a mounting flange within said dome-shaped body, said printed circuit board having an electronic circuit for providing commutation of an input signal; and
a plurality of lugs connected to said plurality of stator pole stack extensions, each of said pole stack extensions including one of said plurality of lugs for further projecting each of said pole stack extensions along a circumferential direction of said plurality of pole stacks for providing a single defined rest position for said rotor when said stator windings are currentless and wherein said plurality of lugs connected to said plurality of stator pole stack extensions provides a non-constant magnetic resistance to said rotor along the circumference of said stator creating said non-zero angle epsilon and said single defined rest position of said rotor when said stator winding is currentless for providing an optimal starting torque for said direct current motor.

4,638,202

COMMUTATOR AND METHOD OF MAKING SAME

Howard A. Ebner, Glencoe, Ill., assignor to Resinoid Engineering Corporation, Skokie, Ill.

Filed Sep. 11, 1985, Ser. No. 774,710
Int. Cl.⁴ H02K *13/04*
U.S. Cl. 310—235 **9 Claims**



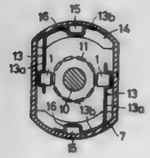
1. A commutator assembly, comprising:
a core of insulating material;
a plurality of commutator segments disposed around the core and combining to define an outside, generally cylindrical surface means; and
riser means molded to one end of the core and projecting radially outwardly beyond said surface means, the riser means including a plurality of locating means for receiving and positioning the coil ends of an appropriate motor armature in engagement with respective ones of the commutator segments.

4,638,203

ATTACHMENT STRUCTURE FOR BRUSH HOLDER SPRINGS

Yohji Maki, and Norio Umezawa, both of Takefu, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 21, 1985, Ser. No. 749,472
Int. Cl.⁴ H02K *5/14*
U.S. Cl. 310—239 **4 Claims**



1. An attachment structure for brush holder springs in a motor having frame and a shaft supporting a commutator, comprising:
(a) a motor bracket adapted to be mounted on the motor frame and having a pair of diametrically opposite projec-

tions on inner peripheral wall surfaces thereof, each of said projections having a transverse dovetail-shaped cross section including a radially inward end wider than a radially outward end thereof; and

(b) a pair of brush holder springs supporting on one end portion thereof brushes, respectively, for sliding contact with the commutator and having on an opposite end portion thereof a gripping member fitting complementarily over said projections, respectively, under resilient forces, each of said gripping members having a dovetail-shaped configuration complementary to one of said projections.

4,638,204

HAMMER BRUSH HOLDER ASSEMBLY FOR A COMMUTATOR MOTOR

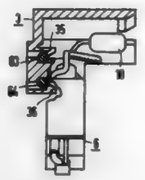
Albert Kirchner, Schweinfurt; Juergen Schoen, Wuerzburg, and Ortwin Happ, Rossbrunn, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 19, 1985, Ser. No. 777,909

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1984, 3434390

Int. Cl.⁴ H02K *13/00*

U.S. Cl. 310—239 **12 Claims**



1. A hammer brush holder for a commutator motor having a brush rocker, fastened to a housing of the commutator motor, with axially extending mounting means integrally molded on said brush rocker at one axial end, and a brush support arm swivel-mounted in a fixed axial position onto another end of each respective mounting means, the improvement comprising:

a brush fastened to each brush support arm respectively, and located at an end of said brush support arm opposite said swivel mounting;

each mounting means defining a lug respectively; and

a mounting means molded in one piece on the axial ends of the brush rocker in the interior of the housing, said means being molded in one piece on the brush lug; and

each brush support arm having a sleeve-shaped end means for swivel-mounting on and encompassing said respective lug, integrally molded thereon, whereby the sleeve-shaped end means slides onto the lug up to an axially positioning groove connection with the brush rocker.

4,638,205

PIEZO-ELECTRIC TRANSDUCER

Hideo Fujita; Yuichi Saito, and Masatoshi Miura, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

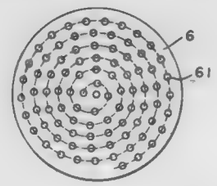
Filed Apr. 27, 1981, Ser. No. 257,652

Claims priority, application Japan, May 6, 1980, 55-6061[U]; Oct. 7, 1980, 55-142329[U]; Dec. 17, 1980, 55-180137[U]

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—312 **1 Claim**

1. In a first piezo-electric transducer comprising a piezo-electric ceramic sheet bonded to a vibrating reed and one or more electrodes bonded to said piezo-electric ceramic sheet, an improvement wherein said vibrating reed has a first plurality through-holes formed on a nodal line for vibration of said vibrating reed, wherein said vibrating reed has a second plurality of through-holes which are not formed on said nodal line and wherein each of said first and second plurality of through-holes are arranged in such a manner that a spiral form of holes



is formed from the center to the peripheral part of said vibrating reed.

4,638,206

SHEET-LIKE PIEZOELECTRIC ELEMENT

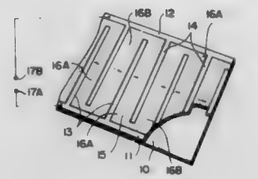
Tsutomu Tsunooka, Kariya; Tadashi Takeuchi, Nagoya; Kunihiro Ushida, Aichi, and Shogo Kawajiri, Nagoya, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jun. 14, 1985, Ser. No. 744,618

Claims priority, application Japan, Jun. 14, 1984, 59-122435

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—313 B **7 Claims**





1. A sheet-like piezoelectric element comprising a pair of oppositely arranged terminals, comb-shaped electrodes projecting alternately from respective terminals of said pair of terminals and arranged in a zigzag shape formed with a slit in the lengthwise direction between the adjacent electrodes, and a piezoelectric layer made of composite piezoelectric material filling the slits in such a manner that the adjacent piezoelectric layer portions are polarized in opposite directions to each other, said piezoelectric layer having a thickness which is substantially the same of that of said electrodes.

4,638,207

PIEZOELECTRIC POLYMERIC FILM BALLOON SPEAKER

Peter F. Radice, Upper Merion, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 19, 1986, Ser. No. 841,137

Int. Cl.⁴ H01L *41/08*

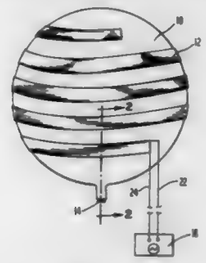
U.S. Cl. 310—328 **13 Claims**

1. Apparatus for retransmitting audio signals from an audio device remotely located from, and supplying said signals to, said apparatus which comprises

inflatable means having curved outer surfaces,

piezoelectric polymer film means conformably adhering to said outer surfaces of said inflatable means while inflated, said piezoelectric film having an electrode film coating disposed over each face thereof,

conductor means operably connected between output of said audio device and said electrode coatings for transmitting said audio signals to said film, said film converting electro-



magnetic energy of said transmitted signals to retransmitted audio signals corresponding to said transmitted audio signals.

4,638,208

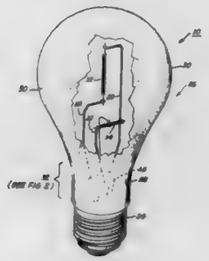
SANDBLASTED INCANDESCENT LAMPS WITH AN IMPROVED NECK SECTION

Lee W. Otto, Pepper Pike, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 25, 1985, Ser. No. 780,065

Int. Cl.⁴ H01K *1/32*

U.S. Cl. 313—116 **7 Claims**



1. An incandescent lamp comprising:

at least a major filament mounted on an insulated stem;

an electrically conductive base affixed to said insulative stem and appropriately connected to at least said major filament;

an envelope having spatially disposed therein said mounted filament, said envelope having a neck section sealed to said electrically conductive base, said envelope having an electrostatically deposited light-diffusion coating substantially covering its inner surface, and an outer surface which is sandblasted except for the neck section of the outer envelope.

4,638,209

ION BEAM GENERATING APPARATUS

Tatsuo Asamaki, and Takao Kato, both of Tokyo, Japan, assignors to Anelva Corporation, Japan

Filed Sep. 4, 1984, Ser. No. 646,438

Claims priority, application Japan, Sep. 8, 1983, 58-165628

Int. Cl.⁴ H05H *29/00*

U.S. Cl. 313—359.1 **21 Claims**

1. An ion beam generating apparatus comprising:

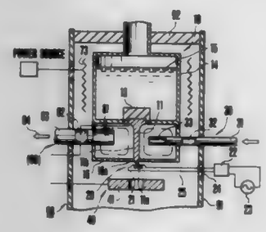
a vacuum chamber capable of being evacuated to a predetermined pressure;

an anode assembly disposed in said vacuum chamber, said anode assembly having an anode which has a needle like tip at one end thereof;

an extraction electrode disposed a predetermined distance from said needle-like tip;

gas supply means for supplying a predetermined gas to the vicinity of said anode assembly;

means for colling said anode assembly to a temperature



sufficient for said predetermined gas to condense on said anode;

means for heating said cooled anode assembly to maintain said anode assembly at a temperature between the melting point and the boiling point of said predetermined gas; and

power source means for providing an electric potential between said anode and said extraction electrode to ionize said predetermined gas condensed on said anode.

4,638,210

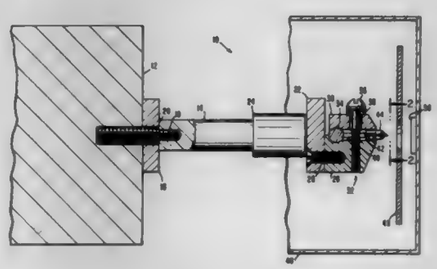
LIQUID METAL ION SOURCE

Jerg B. Jergenson, Santa Barbara, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 5, 1985, Ser. No. 720,470

Int. Cl.⁴ H01J *1/00*

U.S. Cl. 313—362.1 **20 Claims**



1. A body for serving as an ion source, said body comprising:

a billet of electrically conductive or semi-conductive material, said billet having a point end, a back end and sides, a slot in said billet extending from adjacent said point end to said back end and to said sides to separate said billet substantially to said point end into upper and lower portions; and

a rigid insulator in said slot to support said upper and lower portions with respect to each other; and

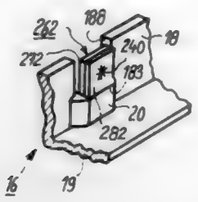
a point formed on said billet on said point end, said point being adjacent the end of said slot so that said billet has electrical continuity from said upper portion to said lower portion adjacent said point.

4,638,211

SHADOW MASK FOR A COLOR IMAGE TUBE AND IMAGE TUBE COMPRISING THE SAME

Carlo L. Fonda, Anagni, Italy, assignor to Videocolor, Montrouge, France

Filed Nov. 21, 1984, Ser. No. 673,824
Claims priority, application France, Nov. 25, 1983, 83 18853
Int. Cl.[4] H01J *29/07*
U.S. Cl. 313—405 9 Claims



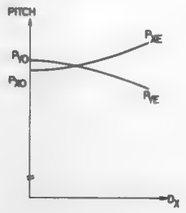
1. A color cathode ray tube comprising: a perforated mask for the selection of colors in order that an electron beam intended for a particular color only reaches, on the screen, the luminescent material of that color, the mask presenting an edge fixed to a frame through intermediate bimetallic strips, the frame being integral with the internal face of the glass wall of the tube adjacent to the screen, wherein the bimetallic strips between the edge of the mask and the frame are disposed along the length of the vertical sides, with a bimetallic strip located substantially at the center of each of these vertical sides and bimetallic strips located adjacent to the corners, the bending of the bimetallic strips adjacent to the corners being greater than the bending of the bimetallic strips at the substantially central position on the vertical sides.

4,638,212

COLOR CATHODE-RAY TUBE

Koji Nakamura, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1984, Ser. No. 620,702
Claims priority, application Japan, Jun. 30, 1983, 58-120829
Int. Cl.[4] H01J *29/07, 29/10*
U.S. Cl. 313—408 7 Claims



1. A color cathode-ray tube, comprising:
a set of three electron guns provided in an in-line array for emitting three electron beams;
a shadow mask with a curved surface disposed ahead of paths of said electron beams from said electron guns, in a direction intersecting with said paths, said shadow mask having a plurality of circular small apertures and the respective apertures transmitting sets of said electron beams;
a fluorescent screen with a curved surface disposed in parallel with said shadow mask, said fluorescent screen including sets of three fluorescent dots for three different colors at positions respectively associated with said three electron beams passing through each said aperture of said shadow mask; and
said shadow mask including, in its flat state before bring formed to have a curved surface, an X axis and a Y axis passing through the center of said flat mask, the X axis being horizontal in parallel with the direction of said in-line array, the Y axis being vertical to the X axis, rows of said apertures in the X axis direction being curved more prominently in the shape of a barrel according to increase of the distance from the X axis and columns of said apertures in the Y axis direction being all straight lines parallel to the Y axis;
wherein P_{YO} is the distance from the column on the Y axis to the next adjacent column; P_{YO} is half the distance from the aperture on said center to the adjacent aperture on the Y axis; P_{XE} is the distance between adjacent columns located in a corner portion of said flat mask; and P_{YE} is half the associated distance between the adjacent apertures in a column located in said corner portion of said flat mask; P_{XO}, P_{XE} and P_{YE} being selected such that the following relations are satisfied:

$$P_{XO} \leqq P_{XE} \leqq 1.2P_{XO}$$

$$P_{YO}-25 \leqq PO_{YE} < P_{YO}\ (\mu m),$$

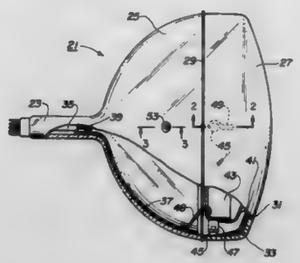
and wherein the distances P_{YE} and P_{YO} are selected such that a relation: $P_{YE}=P_{YO}(1-K_1N^2)$ is satisfied, where K_1 is a constant and N is a column number counted from said center (N=0 corresponding to the column on the Y axis).

4,638,213

CRT WITH INTERNAL CONTACT STRIPE OR PATCH AND METHOD OF MAKING SAID STRIPE OR PATCH

Samuel B. Deal, Lancaster, and Donald W. Bartch, Wrightsville, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 8, 1980, Ser. No. 195,183
Int. Cl.[4] H01J *31/00*
U.S. Cl. 313—479 4 Claims



1. In a cathode-ray tube comprising an evacuated glass envelope including a glass funnel, a neck integral with said funnel, a glass faceplate panel sealed to said funnel, a luminescent layer on the interior surface of said faceplate, an electrically-conductive layer supported from the interior glass surface of said envelope, an electrically-conductive metal body attached to said interior envelope surface, and an electrically-conductive coating contacting said interior glass surface and both said electrically-conductive layer and said metal body, the improvement wherein said electrically-conductive coating consists essentially of a major proportion of metallic silver particles and a minor proportion of lithium silicate binder.

4,638,214

FLUORESCENT LAMP CONTAINING ALUMINATE PHOSPHOR

William W. Beers, Lyndhurst, and Thomas G. Parham, Gates Mills, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 715,858, Mar. 25, 1985. This application Apr. 21, 1986, Ser. No. 854,272
Int. Cl.[4] H01J *61/44*
U.S. Cl. 313—487 7 Claims

1. A fluorescent lamp having a sealed envelope enclosing means to generate a low-pressure mercury discharge within said envelope and a phosphor coating to convert at least a portion of the radiation emitted from said discharge to visible light, wherein said phosphor coating includes a phosphor comprising a plurality of fine-sized crystals having the general formula:

$$Ce_{1-x-y}La_xTb_yMg_zAl_{11}O_{19}$$

wherein
La is an optional constituent and x is in an amount up to about 0.50,
y is in the range from about 0.20 up to about 0.50, and
z is in the range from about 0.60 up to about 0.87,
said crystals having a median particle size of about 5.0 micron, and being further characterized by a ratio between its 544 nanometers wavelength peak emission to its 490 nanometers wavelength peak emission of at least 5.0 along with exhibiting trichromatic coordinate values in the range X=0.3190–0.3202 and Y=0.5377–0.5402.

4. A fluorescent lamp having a sealed envelope enclosing means to generate a low-pressure mercury discharge within said envelope and a phosphor coating to convert at least a portion of the radiation emitted from said discharge to visible light, wherein said phosphor coating comprises the combination of a blue color emission phosphor having an emission band in the wavelength range from about 430 nanometers wavelength up to about 490 nanometers, a red color emission phosphor having an emission band in the wavelength range from about 590 nanometers wavelength up to about 630 nanometers wavelength, and a green color emission phosphor having principal visible emission in the wavelength range from about 520 nanometers wavelength up to about 565 nanometers wavelength, said green color emission phosphor comprising a plurality of fine-sized crystals having the general formula:

$$Ce_{1-x-y}La_xTb_yMg_xAl_{11}O_{19}$$

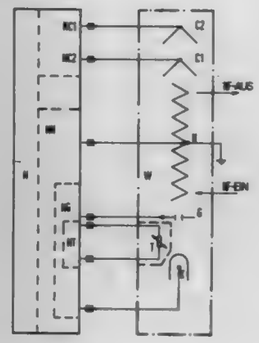
wherein
La is an optional constituent and x is in an amount up to about 0.50,
y is in the range from about 0.20 up to about 0.50, and
z is in the range from about 0.60 up to about 0.87,
said crystals having a median particle size of about 5.0 microns diameter, and being further characterized by a ratio between its 544 nanometers wavelength peak emission to its 490 nanometers wavelength peak emission of at least 5.0 along with exhibiting trichromatic coordinate values in the range X=0.3190–0.3202 and Y=0.5377–0.5402, and with said phosphor combination containing about 34 up to about 48 parts by weight of said green color emission phosphor about 6 up to about 17 parts by weight of said blue color emission phosphor, and about 40 up to about 60 parts by weight of said red color emission phosphor to produce visible light of a white color.

4,638,215

CIRCUIT ASSEMBLY FOR TEMPERATURE-DEPENDENT CATHODE CURRENT TRACKING IN TRAVELING-WAVE TUBES

Eckart Schmid, Poing, and Ludwig Wanninger, Neubiberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 27, 1984, Ser. No. 593,953
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311674
Int. Cl.[4] H01J *25/34*
U.S. Cl. 315—3.5 4 Claims



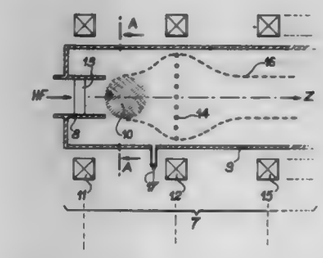
3. Travelling wave tube with control arrangement having a cathode and at least one cathode current-controlling electrode for maintaining the cathode current at a substantially constant value, comprising a temperature-dependent network thermally coupled to the tube for measuring the tube temperature; and an electronic control circuit, being part of the tube's power supply and being operatively responsive to said temperature, controllingly engaging said cathode current-controlling electrode for, by controlling the voltage at said electrode, maintaining the cathode current substantially at said constant value.

4,638,216

ELECTRON CYCLOTRON RESONANCE ION SOURCE

Marc Delaunay; René Gualandris; Richard Geller, all of Grenoble; Claude Jacquot, St Egreve; Paul Ludwig, Grenoble; Jean-Marc Mathonnet, Grenoble; Jean-Claude Rocco, Clair; Pierre Sermet, Grenoble; Francois Zadworny, Corenc, and Francois Bourg, St. Martin d'Héres, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 18, 1984, Ser. No. 611,625
Claims priority, application France, May 20, 1983, 83 08401
Int. Cl.[4] H01J *7/24;* H05B *31/26*
U.S. Cl. 315—111.81 10 Claims



1. A multimode electron cyclotron resonance ion source comprising: a system for injecting an ultra-high frequency power into a container containing a gas or a vapor of a material for forming a plasma, said system having a tight window in a

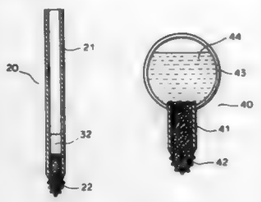
plane, a magnetic configuration in which said plasma is created and confined, and an ion extraction system, said magnetic configuration comprising: at least one group of coils supplying a magnetic field having a maximum value which is higher than that of the electron cyclotron resonance, in the plane defined by the tight window, and said magnetic field decreasing to a minimum value in front of the ion extraction system, while passing through the value of the magnetic induction B_r corresponding to the cyclotron resonance, the value of said magnetic field continually decreasing from said window to said ion extraction system.

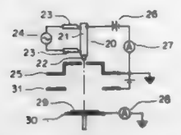
4,638,217

FUSED METAL ION SOURCE WITH SINTERED METAL HEAD

Masao Okubo, Kanagawa; Kiyoshi Sugaya, Ibaragi; Toshinori Takagi, and Junzo Ishikawa, both of Kyoto, all of Japan, assignors to Nihon Denshizairyo Kabushiki Kaisha, Amagasaki, Japan

Filed Mar. 18, 1983, Ser. No. 476,470
Claims priority, application Japan, Mar. 20, 1982, 57-044884
Int. Cl.⁴ H01J *7/24*; H05B *31/26*
U.S. Cl. 315—111.81 **6 Claims**





1. A field emission ion source comprising:
a container for a fusible material to be ionized, said container being formed of a material having a higher fusing point than said fusible material and having an opening therein; and
an ioning tip fixed in and protruding from said opening, said tip comprising a body formed of pulverulent metal having a degree of porosity to allow said fusible material to infiltrate therethrough in the molten state, wherein said porosity is determined by mixing pulverulent metal particles of different size.

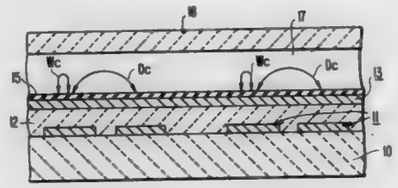
4. A field emission fused metal ion source comprising:
a container for a fusible metal to be ionized, said container being formed of a material having a higher fusing point than said fusible metal;
a pipe forming part of said container and including a body of molded sintered material fixed therein, said sintered material being wettable by said fusible metal in the molten state and comprising a mixture of sintered particles having a degree of porosity to said molten fusible metal to allow its infiltration therethrough said porosity being determined by mixing sintered material particles of different size;
said body being formed with an end of substantially conical shape forming an ionizing tip and being fixed in said pipe with said conical end protruding from an end of said pipe; and
heating means for melting said fusible metal whereby said molten fusible metal will wet said body of sintered material and infiltrate therethrough to said ionizing tip.

4,638,218

GAS DISCHARGE PANEL AND METHOD FOR DRIVING THE SAME

Tsutae Shinoda, Akashi, and Atsuo Niinuma, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 14, 1984, Ser. No. 640,579
Claims priority, application Japan, Aug. 24, 1983, 58-153545; Oct. 13, 1983, 58-192179; Dec. 6, 1983, 58-231169
Int. Cl.⁴ G09G *3/10*
U.S. Cl. 315—169.4 **26 Claims**



1. A surface discharge type gas discharge panel, comprising:
first and second substrates positioned to oppose each other and define a space for receiving a discharge gas therebetween;
a plurality of sustaining electrode pairs provided on the first substrate, each sustaining electrode pair comprising two substantially parallel electrodes;
a dielectric layer provided on the sustaining electrode pairs and the first substrate;
a plurality of address electrodes provided on the dielectric layer and arranged to intersect the sustaining electrode pairs;
a plurality of separator means corresponding to respective ones of the address electrodes, provided on the dielectric layer; and
surface insulating layer means having a thickness of 1 μm or less provided on the address electrodes, the separator electrodes and the dielectric layer, the surface insulating means comprising means for permitting a leakage current to flow from the surface of the surface insulating layer means to the address electrodes.

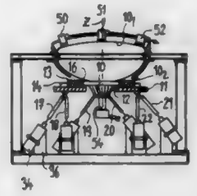
17. A method of driving a gas discharge panel including a first substrate, a plurality of pairs of sustaining electrodes positioned on the first substrate, a dielectric layer covering the sustaining electrodes, a plurality of address electrodes arranged to intersect the sustaining electrode pairs positioned on the dielectric layer, insulating layer means covering the address electrodes and the dielectric layer and having a surface on which charges accumulate comprising means for permitting a leakage current to flow from the surface of the insulating layer means to the address electrodes, and a second substrate opposing the first substrate in parallel relation to form a gas discharge space, comprising the steps of:
(a) applying a sustaining voltage to a first sustaining electrode of a pair of sustaining electrodes; and
(b) applying a write voltage having a polarity which is positive with respect to the sustaining voltage to an address electrode to generate a discharge at the intersection of the first sustaining electrode and the address electrode.

4,638,219

APPARATUS FOR ADJUSTING THE POSITION OF A DEFLECTOR ON A TELEVISION TUBE, PARTICULARLY A COLOR TUBE

Claude Pons, Rome, Italy, assignor to Videocolor, Montrouge, France

Filed Apr. 23, 1984, Ser. No. 603,047
Claims priority, application France, Apr. 26, 1983, 83 06834
Int. Cl.⁴ H01J *29/70*; H04N *5/655*
U.S. Cl. 315—368 **5 Claims**



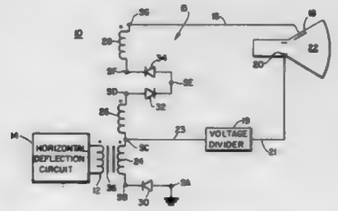
1. A deflection yoke adjustment apparatus for a cathode ray tube comprising:
a platform having a central opening therein for receiving a deflection yoke of a tube installed in a housing;
pairs of connection points located on the platform and defining a symmetrical closed geometric pattern, each corner thereof having a pair of connection points;
a plurality of arms connected at first ends thereof to corresponding connection points in oblique angular inclination to a rear surface of the platform to create a substantially symmetrical tapered space in back of the yoke;
actuating means secured to the housing and connected to second ends of respective arms for selectively adjusting the positions of the arms and, hence, the connected platform; and
an electrical connector connected to the tube and independent of mechanical contact with the platform;
wherein the inclination of the arms and symmetrical closed pattern spatially distributes stress forces evenly in the arms as well as generating a large workable enlarging tapered space behind the tube for facilitating connection and removal of the connector from the tube.

4,638,220

HIGH VOLTAGE TRANSFORMER

Robert C. Beutel, Portsmouth, Va., assignor to General Electric Company, Portsmouth, Va.

Filed Mar. 4, 1985, Ser. No. 708,146
Int. Cl.⁴ H01J *29/70*
U.S. Cl. 315—411 **6 Claims**



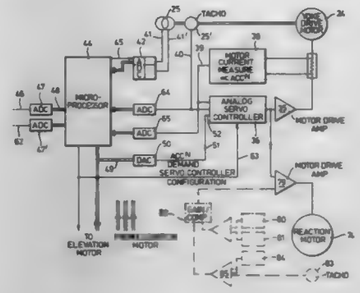
1. A high voltage transformer comprising:
a primary winding; and
a secondary circuit coupled to said primary winding for developing a high voltage in response to the energizing of said primary winding, said secondary circuit including first, second and third windings and first and second rectifying means;
said first rectifying means being connected in a selected polarity between ground and a first end of said first winding;
the opposite end of said first winding being connected to a first end of said second winding;
said second rectifying means being connected in said selected polarity between the opposite end of said second winding and a first end of said third winding; and
terminal means at the opposite end of said third winding at which said high voltage appears for supplying said high voltage to an external load.

4,638,221

REACTION FORCE COMPENSATOR

Nicolas L. Brignall, Edinburgh, Scotland, assignor to Ferranti plc, London, England

Filed Nov. 8, 1985, Ser. No. 796,117
Claims priority, application United Kingdom, Nov. 9, 1984, 8428412
Int. Cl.⁴ H02P *1/54*
U.S. Cl. 318—48 **7 Claims**



1. A structure supporting a body capable of undergoing acceleration about an axis of the structure including reaction force compensation means comprising a further axis through the structure extending in the same direction as the axis about which the body can accelerate, a reaction member, having a moment of inertia greater than the body, supported by the structure for rotation about said further axis, reaction drive means, responsive upon acceleration of the body to accelerate the reaction member independent of, and simultaneously with, the body in the opposite direction thereto and velocity step-down coupling means disposed between the reaction member and reaction drive means to rotate the reaction member at a lower acceleration rate than the body, said reaction drive means being arranged to produce a rate of change of angular momentum in the compensation means such that the torsional reaction forces of the body and compensation means on the structure are equal and opposite.

4,638,222

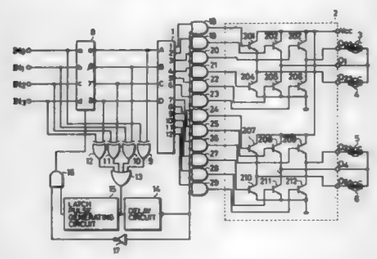
DC MOTOR DRIVING CIRCUIT FOR ELIMINATING SPURIOUS TRANSITION CONDITIONS

Manabu Sawaki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 9, 1985, Ser. No. 764,044
Claims priority, application Japan, Aug. 13, 1984, 59-168995
Int. Cl.⁴ H02P *7/68*
U.S. Cl. 318—111 **4 Claims**

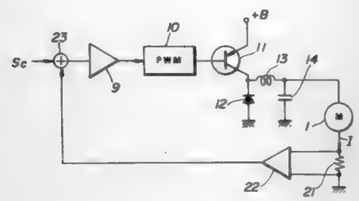
1. A DC motor driving device comprising:
latch means for holding an input digital signal and outputting an output digital signal in response to a detection signal;
detecting means for producing said detection signal when corresponding bits of said input signal and said output signal of said latch means are not the same;
first and second switch elements series-connected to each

other through a series-connecting point also connected to a first terminal of a DC motor;
third and fourth switch elements series-connected to each other through a series-connecting point also connected to a second terminal of said DC motor;
means for supplying a voltage to a series circuit of said first and second switch elements and to a series circuit of said third and fourth switch elements;
decoder means, having output terminals connected to control inputs of respective ones of said first through fourth



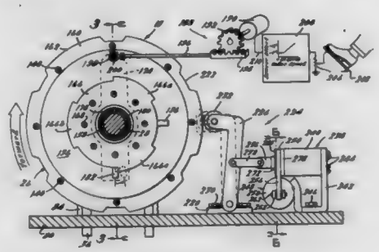
switch elements, for subjecting an output a signal of said latch means to logical conversion and selectively turning on ones of said first through fourth switch elements according to signal produced on said output terminals of said decoder means as a result of said logical conversion; and
delaying and switching means responsive to said detecting means for delaying an output signal of said decoder to said first through fourth switch elements after a predetermined period of time and for turning off said first through fourth switch elements for said predetermined period of time following production of said detection signal.

4,638,223
MOTOR DRIVING CIRCUIT
Shigeru Tajima, Kanagawa, and Toshiya Nakabayashi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed May 28, 1985, Ser. No. 738,305
Claims priority, application Japan, Jun. 7, 1984, 59-116944
Int. Cl.⁴ H02P *6/02*
U.S. Cl. 318—254 **2 Claims**



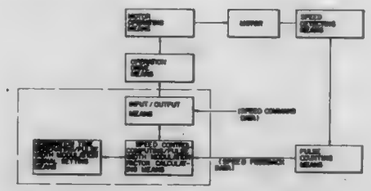
1. A driving circuit for a motor, comprising:
(a) means for generating a control signal which depends on rotation of the motor;
(b) a PWM circuit outputting pulses which depend on the control signal;
(c) means for generating a voltage which depends on the pulses from the PWM circuit;
(d) means for applying the voltage to the motor;
(e) means for sensing a current through the motor;
(f) means for controlling the PWM circuit on the basis of the sensed current and the control signal; and
(g) means for cutting off dc and low-frequency components of the sensed current.

4,638,224
MECHANICALLY SHIFTED POSITION SENOR FOR SELF-SYNCHRONOUS MACHINES
David J. Gritter, Southfield, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed Aug. 29, 1984, Ser. No. 645,227
Int. Cl.⁴ H02K *29/08*
U.S. Cl. 318—254 **5 Claims**



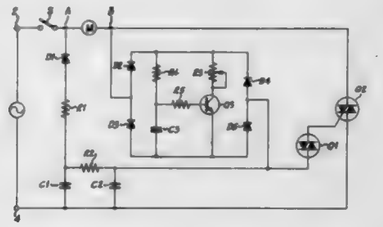
1. A drivetrain for use with an electrically powered vehicle comprising:
an electric power source;
an electrical motor including a stator and a rotor;
flag means rotating in a timed relationship with said rotor;
sensor means mounted in a predetermined angular relationship with the stator for sensing the presence of the flag means as the rotor turns and for generating a signal representative of rotor position;
adjustment means for selectively altering the angular relationship between the sensor means and the stator as a function of motor speed to effect a desired load angle and back EMF; and
circuit means connected to said power source for selectively energizing said motor as a function of rotor position.

4,638,225
METHOD AND APPARATUS THEREFOR IN MOTOR SPEED CONTROL
Shigeki Morinaga; Kunio Miyashita, both of Hitachi; Hiroshi Hayashida, Mito, and Tadashi Takahashi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 597,747, Apr. 6, 1984, abandoned. This application Jan. 31, 1986, Ser. No. 824,923
Claims priority, application Japan, Apr. 8, 1983, 58-60911
Int. Cl.⁴ H02P *5/06*
U.S. Cl. 318—341 **6 Claims**



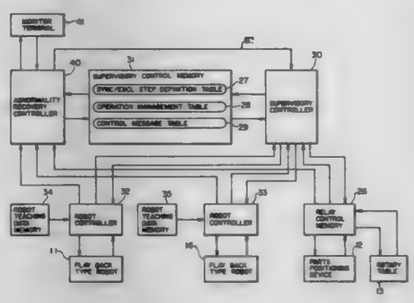
1. A pulse width control apparatus for controlling motor speed in which the number of pulses relating to motor speed feedback data is counted so as to control the speed of the motor in accordance with speed command data and a generated pulse width modulation signal of variable pulse width based on the counted number of pulses, comprising a free-running hardware timer for generating an interrupt request signal at variable times in dependence upon ON-time data and OFF-time data of the pulse width modulation signal set therein, a microcomputer being responsive to said interrupt request signal from said free running hardware timer for generating the pulse width modulation signal, said microcomputer including means forming a soft-timer implemented in a program controlled by an instruction execution time of said microcomputer, ON-time data and OFF-time data of the pulse width modulation signal being selectively set in one and the other of said hardware timer and said soft-timer means in dependence on values of ON and OFF times, respectively, the ON and OFF states of the pulse width signal being changed when the contents of said hardware timer and soft-timer means reach predetermined values for controlling the pulse width of the generated pulse modulation signal, said microcomputer including means for correcting the ON-time data and OFF-time data set in selected ones of said hardware timer and said soft-timer means in accordance with ON and OFF processing times therefor, and means for determining whether the pulse width modulation signal is to be in the ON or the OFF state when the contents of said hardware timer and said soft-timer means reach the predetermined values.

4,638,226
SPEED CONTROL SYSTEM WITH FEEDBACK AND SOFT-START
Michael A. Damiano, Germantown; Richard F. Schmerda, Oak Creek, and Lawrence G. Searing, Milwaukee, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio
Filed Feb. 7, 1985, Ser. No. 699,522
Int. Cl.⁴ H02P *5/16*
U.S. Cl. 318—345 R **5 Claims**



1. An adjustable speed control system for a universal motor connected in a supply circuit for providing full-wave AC power to said motor comprising, in combination:
a bidirectional conducting thyristor having a pair of main electrodes connected in series circuit relation with said motor in said supply circuit and having a gate electrode; and
a double-time constant triggering circuit connected across said supply circuit in parallel circuit relation with said thyristor and connected to said gate electrode for controlling the conduction angle of said thyristor, said triggering circuit comprising;
a first time constant circuit comprising a first resistor and capacitor and a unidirectional diode connected in series across said supply circuit at one side of said motor for sensing counter emf in said motor and providing a feedback signal in said triggering circuit only on alternate half cycles of said full-wave AC power;
a second time constant circuit comprising an adjustable resistor and a second capacitor connected in series across said supply circuit at an opposite side of said motor for setting the speed of said motor;
a third resistor connecting the junction of said first resistor and capacitor to the junction of said adjustable resistor and second capacitor across said motor; and
means connecting said last mentioned junction to said gate electrode.

4,638,227
METHOD AND APPARATUS FOR RECOVERING NORMALITY IN MOVING SEQUENCE OF MACHINERY
Masanori Katsuyama, Nihari; Norihisa Komoda, Kawasaki; Tomohiro Murata, Ebina, and Kazuo Kera, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 16, 1985, Ser. No. 691,910
Claims priority, application Japan, Jan. 18, 1984, 59-5577; Feb. 1, 1984, 59-15188; Apr. 11, 1984, 59-70853
Int. Cl.⁴ G05B *23/02, 19/00*
U.S. Cl. 318—565 **4 Claims**

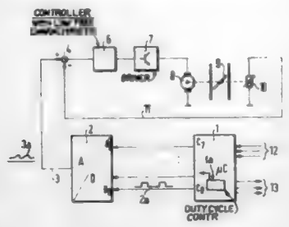


1. A method of controlling machine tools in which a series of operations in a sequence is executed by a combination of synchronous control and exclusive control with respect to unit operations programmed in advance and in which said unit operations are subject to possible abnormality, wherein the method of recovering normality of the series of movements following abnormality, comprises a first storing of data indicating the relationship in the sequence of the execution of each unit operation to the execution of other unit operations to be controlled synchronously or exclusively, said data including information on a series of steps specifying the correspondence between at least one execute stand-by unit operation number and at least one completion stand-by unit operation number; a second storing of information relating to the operational status of each unit operation, said information including information on operation management indicating the execution management status and operation status of each unit operation; a third storing of operation instructions for executing each unit operation; and when machine tools have stopped due to the occurrence of an abnormality while a series of unit operations are being executed by the operational instruction stored by said third storing, appointing a unit operation for restarting on the basis of the relationship of the sequence of execution of the unit operations stored by said first storing and correcting information concerning the operational status stored by said second storing by following a reverse sequence to a normal status with reference to said data stored by said first storing.

4,638,228
DIGITALLY CONTROLLED ANALOG OPERATING CONTROL SYSTEM, AND METHOD
Erich Junginger, Stuttgart; Eberhard Schnaibel, Hemmingen, and Erich Schneider, Kirchheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Aug. 12, 1985, Ser. No. 764,882
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430078; Jul. 25, 1985, 3526620
Int. Cl.⁴ G05B *19/18*
U.S. Cl. 318—569 **5 Claims**

1. In combination with a fuel supply control element (9) of an internal combustion engine of a motor vehicle, a high-resolution control system, for controlling positioning of said element (9), having
means (12) for receiving digital control signals;
computer means (1) for processing the digital control signals

in accordance with a predetermined program, and providing digital command signals in n-bit parallel digital form;
a digital/analog converter (2) receiving the digital command signals and providing an analog command signal;
a positioning means (8) mechanically coupled to said control element (9) and controlling the position thereof;
an analog control loop including a position transducer (10) sensing the actual position of the positioned control element (9) and providing as actual position signal,
a controller (6) controlling the positioning means (8) and providing a position control signal, and
a comparator (4) connected to and comparing the actual position signal with the analog command signal derived from the digital/analog converter, and providing a deviation signal to the controller (6) for controlling the positioning means (8),
and comprising, in accordance with the invention,



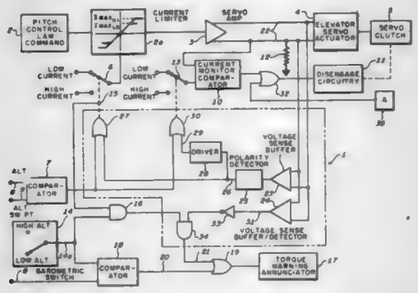
means for providing a resolution of more than 2^n levels in said position control signal, including
means (1a) chopping at least the lowest-order bit (D_0) of said digital command signal at a predetermined modulation frequency into a sequence of pulses in which the duty cycle, or pulse-duration/pulse-gap ratio, is adjustable to correspond to a desired position control signal level and hence a desired position setting of said fuel supply control element (9), and
low-pass filter means (5; 6) filtering said predetermined modulation frequency from the output from the digital-/analog converter to derive an analog value representative of the pulse energy applied to the digital/analog converter at the lowest-order bit in accordance with the pulse-duration/pulse-gap ratio being transmitted thereto by the computer means (1).

4,638,229

ASYMMETRIC TORQUE SWITCHING FOR AIRCRAFT AUTOPILOT

Byron F. Birkedahl, Glendale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Aug. 15, 1985, Ser. No. 765,752
Int. Cl.⁴ B64C *13/18*
U.S. Cl. 318—584 **6 Claims**



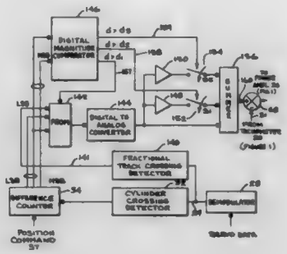
1. Apparatus for providing asymmetrical torque switching at high altitude in an aircraft autopilot of the type having a first and second state current limiter for limiting maximum pitch maneuvers of said aircraft, a current monitor for disengaging said autopilot in case of malfunction and a torque warning annunciator for alerting aircraft crew of said aircraft if said autopilot malfunctions, said apparatus comprising:
a first sensing means for determining polarity of a signal representative of direction of pitch of said aircraft and for providing a first signal when said aircraft pitch is upward,
means coupled to said first sensing means for providing a first switching signal to said autopilot for switching said current limiter to a first state upon receipt of said first signal,
means coupled to said first sensing means for providing a second switching signal to said autopilot for switching said current monitor to said first state upon receipt of said first signal,
a second sensing means for determining polarity of said signal representative of direction of pitch of said aircraft and for providing a second signal when said aircraft pitch is upward,
means coupled to said second sensing means for providing a third switching signal to said autopilot for inhibiting output of said annunciator upon receipt of said second signal, and
means to monitor G-loading of said aircraft for providing a signal to disengage said autopilot when said aircraft G-load exceeds a predetermined limit.

4,638,230

BANG-BANG CONTROLLED VELOCITY COMMAND GENERATOR

Patrick S. Lee, Campbell, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 418,508, Sep. 15, 1982. This application Nov. 8, 1985, Ser. No. 797,173
Int. Cl.⁴ G05D *23/275*
U.S. Cl. 318—632 **9 Claims**



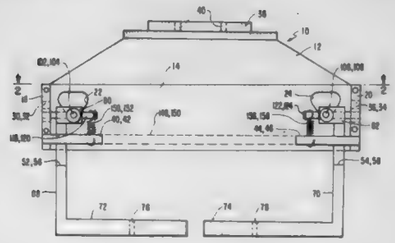
1. Apparatus for indicating a desired velocity for a moveable element according to a predefined distance velocity relationship responsive to an existing distance between a desired terminal position and a current position, comprising:
means for generating the existing distance between a desired terminal position and the current position;
comparing means for comparing the existing distance between the desired terminal position and the current position with at least one of a plurality of predefined distances and generating at least one indication of the predefined distances which are exceeded by the existing distance;
first means for producing a single discrete velocity value and a second plurality of selected discrete velocity values when the existing distance exceeds a specified one of said predefined distances, each velocity value of said second values corresponding to a preselected distance which is less than the specified predefined distance and for combining said first and at least one of said second velocity values to generate a value corresponding to the existing distance between the desired terminal position and the current position;
second means for producing a plurality of signals each having a predefined level in response to the indication generated by said comparing means; and
summing means responsive to said first single discrete velocity value and to said second plurality of selected velocity values produced by said first means and to at least one of the signals produced by said second means for producing a signal equal to their sum.

4,638,231

ROBOTIC COLLISION SENSORS AND COMPLIANCE DEVICES

Mathew L. Monforte, Hamilton, N.J., assignor to Monforte Robotics, Inc., Trenton, N.J.

Filed Dec. 6, 1984, Ser. No. 678,997
Int. Cl.⁴ G05B *1/06*
U.S. Cl. 318—640 **12 Claims**



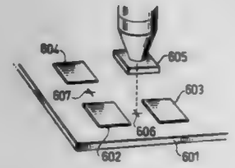
1. A collision sensor and compliance device for use with a computer controlled robotic arm adapted to have a robotic hand disposed on the distal end thereof, comprising:
(a) housing means disposed between said robotic arm and said robotic hand, said housing means having;
(i) affixment means for affixing said housing means to the distal end of said robotic arm,
(ii) a front and rear wall and a pair of side walls, each of said walls being provided with a pair of generally triangularly-shaped apertures, each of said apertures being disposed proximate the distal ends of each of said walls and in a common plane, the apex of each said triangularly-shaped aperture being positioned equidistant from the lower edges of each of said walls,
(iii) light emitting means centrally disposed in one pair of said oppositely disposed walls;
(b) means disposed proximate the distal end of said robotic hand for attaching said robotic hand to said housing means, said attaching means having;
(i) bracket means for affixment to said robotic hand, said bracket means including at least a pair of bearing means disposed at right angles to each other adapted to be received and cooperate with a pair of said triangularly-shaped apertures provided in said housing, and bearing means having free movement within said apertures,
(ii) spring means having one end thereof affixed to said bracket means and the other end thereof affixed to said housing means for urging each of said bearing means to the same relative position in each of said apertures,
(iii) light sensing means disposed in said bracket means in alignment with said light emitting means disposed in a pair of said housing walls for providing an electrical signal when aligned therewith and not providing an electrical signal when misaligned therewith.

4,638,232

METHOD AND APPARATUS FOR CALIBRATING A POSITIONING SYSTEM

Lennart Stridsberg, Enskede, and Gunnar Rodin, Bromma, both of Sweden, assignors to Mydata Automation AB, Stockholm, Sweden

PCT No. PCT/SE85/00021, § 371 Date Aug. 30, 1985, § 102(e) Date Aug. 30, 1985, PCT Pub. No. WO85/03368, PCT Pub. Date Aug. 1, 1985
PCT Filed Jan. 18, 1985, Ser. No. 776,111
Claims priority, application Sweden, Jan. 20, 1984, 8400287
Int. Cl.⁴ G05B *1/06*
U.S. Cl. 318—640 **3 Claims**



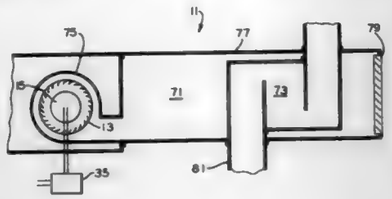
1. In a positioning system of the type which includes a positioning device for positioning an object against a work surface, a control unit for controlling said positioning device, and means for sensing the location of the positioning device and providing a signal to said control unit, a method of calibrating the system comprising the steps of:
providing a calibration board made of electrically insulating materal and having a plurality of calibration points and associated electrically conducting test areas at predetermined respective locations on a surface of said board which corresponds to a work surface;
entering the coordinate values of said calibration points into said control unit;
positioning said calibration board with said positioning device so as to bring an electrically conducting calibration component which corresponds to said object against said surface of said board at a location which nominally corresponds to the center of one of said calibration points entered into the control unit;
moving said calibration board and said calibration component relative to one another along a coordinate axis and determining the location of two extreme positions on said axis at respective opposite sides of said one calibration point by detecting test areas associated with said one calibration point;
determining the actual center of said one calibration point from said extreme positions;
comparing the actual center with the value that was entered into said control unit for said calibration point; and
storing any difference between the actual and entered values for subsequent use in compensating for errors in the positioning system.

4,638,233

METHOD OF ESTABLISHING A PREFERRED RATE OF AIR FLOW, METHOD OF DETERMINING TORQUE, AND APPARATUS

David M. Erdman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Oct. 24, 1985, Ser. No. 791,026
Int. Cl.[4] G05D *7/06*; H02P *6/02*
U.S. Cl. 318—644 **19 Claims**



17. A method of determining torque of an electronically commutated motor arranged to drive a blower means for flowing air through a contained space, the electronically commutated motor and the blower means having a combined predetermined inertia, the method comprising the steps of:

applying power to the electronically commutated motor and accelerating thereby the blower means to a predetermined speed;

removing power from the electronically commutated motor and decelerating thereby the blower means; and

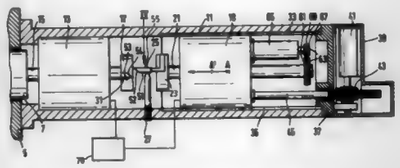
measuring the deceleration of the blower means and calculating the torque of the electronically commutated motor from the measured deceleration.

4,638,234

APPARATUS FOR PERFORMING REMOTELY-MANIPULATED MAINTENANCE ON PARTS OF EQUIPMENT IN A SHIELDED NUCLEAR FACILITY

Günter Schröder, Minden-Dützen, and Helmut Berning, Bochum, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Sep. 23, 1985, Ser. No. 779,385
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434934
Int. Cl.[4] G05B *1/06*
U.S. Cl. 318—661 **8 Claims**



1. In a remotely-operable handling arrangement for use in a radioactively-loaded large-area cell of a facility for processing irradiated nuclear fuel, the arrangement including an industrial robot having a robot joint connecting two arms, a process computer for controlling the robot and an apparatus for monitoring the position of one of the arms of the robot joint, the apparatus comprising:

a first resolver for sensing the angular position of said one arm relative to the other one of said arms;

said robot joint having a drive shaft fixedly attached to said one arm and rotatably journalled in said other one of said arms;

said first resolver having a first shaft connected to said drive shaft so as to be rotatable therewith;

first contact engaging means arranged on said first shaft;

zero mark means fixedly mounted on said other arm;

a second resolver mounted coaxially to said first shaft for ascertaining the true position of said one arm, said second resolver having a second shaft;

second contact engaging means mounted on said second shaft for engaging said zero mark means when said second shaft is rotated thereby defining the rest position; and,

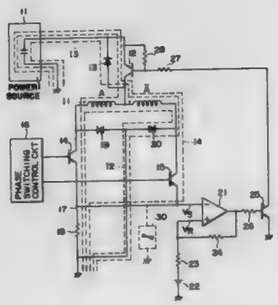
drive means for rotatively driving said second shaft so as to bring said second contact means from said rest position into contact engagement with said first contact engaging means thereby providing an indication of the true position of said one arm.

4,638,235

MOTOR DRIVING APPARATUS

Masahiko Ogura, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 26, 1985, Ser. No. 716,134
Claims priority, application Japan, Mar. 27, 1984, 59-59025
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **2 Claims**



1. An apparatus for driving a stepper motor with first and second stator windings inductively connected to each other, said apparatus comprising:

a power source section for supplying an excitation current to the first and second stator windings;

first switching means connected between one end of said power source section and the node of the first and second stator windings;

second switching means connected at one end to the other end of the first stator winding and at the other end to the other end of said power source section;

third switching means connected at one end to the other end of the second stator winding and at the other end to the other end of said power source section;

first and second diodes so arranged as to be biased in the opposite directions by said power source section, said first diode being connected between one end of the first stator winding and the other end of said power source section, and said second diode being connected between the other end of the second stator winding and the other end of said power source;

current detecting means for detecting a current flowing through said first and second stator windings;

reference means for selectively producing a first reference level and a second reference level less than half of the first reference value according to a conductivity state of said first switching means;

comparing means connected to said current sensing means and said reference means for comparing the current detected by said current detecting means with one of the first and second reference values output by said reference means; and

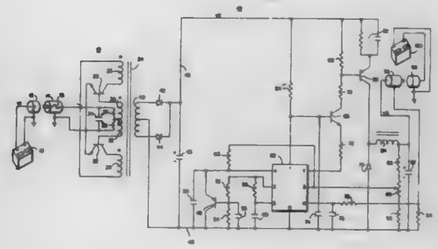
switching control means for turning on and off said first switching means in accordance with the result of the comparison performed by said comparing means.

4,638,236

DC TO DC BATTERY CHARGER

Francis L. Carr, Downers Grove, and Larry R. Terrill, Bloomingdale, both of Ill., assignors to A. G. Busch & Co., Inc., Chicago, Ill.

Filed Nov. 8, 1984, Ser. No. 669,663
Int. Cl.[4] H02J *7/00*
U.S. Cl. 320—21 **1 Claim**



1. A DC to DC battery charger for a vehicle comprising:

adapter plug means for making electrical connections to a first battery through a cigarette lighter socket in said vehicle;

means for making electrical connections to a second battery to be charged;

a DC to AC converter and an AC to DC rectifier for elevating the voltage from said first battery to a voltage above that of said second battery;

integrated circuit means for generating a pulse width modulated current as a function of the charged condition of said second battery;

transistor switch means supplied with said pulse width modulated current for developing a charging voltage;

a choke coil and a capacitor serially connected to said transistor switch means; and

a diode connected across said choke coil and said capacitor whereby said capacitor is charged during pulses of current from said transistor switch means through said choke coil, said choke coil reversing polarity at the termination of said pulses of current and continuing to charge said battery through said diode, said DC rectified voltage being controlled by said integrated circuit means for regulating current through said choke coil.

4,638,237

BATTERY CONDITION INDICATOR

Emilio A. Fernandez, Fairfax County, Va., assignor to Pulse Electronics, Inc., Rockville, Md.

Filed Jan. 3, 1985, Ser. No. 688,327
Int. Cl.[4] H02J *7/00*
U.S. Cl. 320—48 **8 Claims**

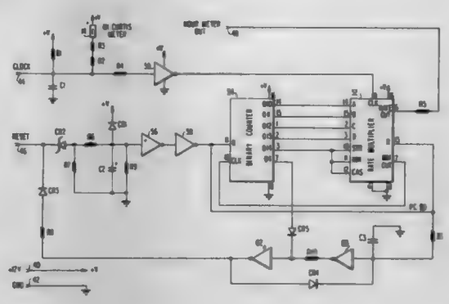
1. A battery condition indicator for indicating both the charge used and the life remaining in a rechargeable battery comprising:

rate multiplying and counting means for indirectly measuring the charge used by the battery between charges;

means for supplying variable rate clock pulses to said rate multiplying and counting means, the rate of said clock pulses being a function of whether a high current consumption load is connected to the battery or not;

timing means for measuring the total time in service of the battery;

charge used display means responsive to said rate multiplying and counting means for providing an indication of the charge remaining in the battery; and



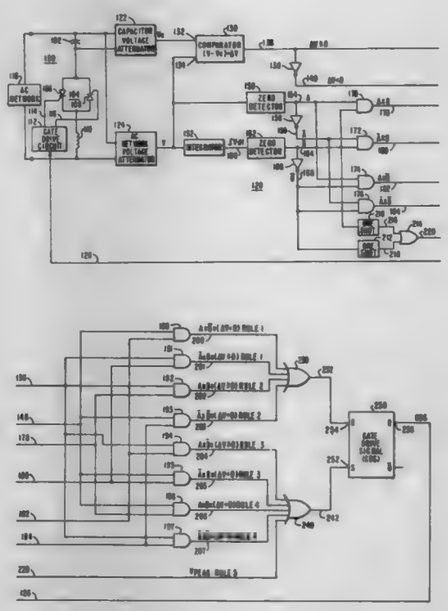
age display means responsive to said timeing means for providing an indication of the life or age of the battery.

4,638,238

SWITCHING TECHNIQUE FOR THYRISTOR-SWITCHED CAPACITORS TO ACHIEVE NETWORK DAMPING

Laszlo Gyugyi, Penn Hills Township, Allegheny County, and Mark G. Gernhardt, Herminie, both of Pa., assignors to Westinghouse Electric Corp, Pittsburgh, Pa.

Filed Oct. 15, 1985, Ser. No. 787,283
Int. Cl.[4] H02J *3/18*
U.S. Cl. 323—211 **8 Claims**



1. In a static VAR generator for providing reactive power compensation to an ac network and including a thyristor-switched capacitor bank having a series combination of a capacitor, a bidirectional thyristor switch having gate drive, and a current limiting reactance with an applied voltage V appearing across the combination with a current being conducted therethrough and a voltage Vc appearing across the capacitor, a method for switching the thyristor switch to

achieve damping of oscillatory transients generated by the switching of the capacitor in the network, comprising:

determining the magnitude and polarity of a voltage difference Δv defined by the formula $\Delta v=(V-Vc)$;

determining the occurrence of the prepeak quadrant and the postpeak quadrant of the applied voltage V;

removing the gate drive of the thyristor switch

(a) during the prepeak quadrant of the applied voltage V when the polarity of Δv is opposite to the polarity of the applied voltage V;

(b) during the postpeak quadrant of the applied voltage V when the polarity of Δv is the same as that of the applied voltage V; and

applying the gate drive of the thyristor switch

(a) during the prepeak quadrant of the applied voltage V when the polarity of Δv is the same as the polarity of the applied voltage V;

(b) during the postpeak quadrant of the applied voltage V when the polarity of Δv is opposite to that of the applied voltage V; and

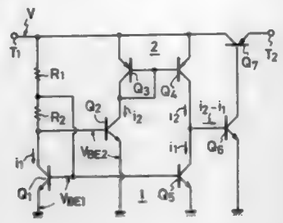
(c) at the occurrence of the voltage peak of the applied voltage V.

4,638,239

REFERENCE VOLTAGE GENERATING CIRCUIT

Takeshi Hachimori, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 10, 1986, Ser. No. 817,555
Claims priority, application Japan, Jan. 24, 1985, 60-11542
Int. Cl.[4] G05F *3/20*
U.S. Cl. 323—281 5 Claims



1. A reference voltage generating circuit comprising:

an input terminal for receiving a power supply source voltage susceptible to variation;

an output terminal from which a stable output voltage is to be derived;

a control transistor having a collector-emitter path connected between said output terminal and said input terminal;

a current detection transistor having a collector-emitter path connected in series with a series circuit of first and second resistors between said output terminal and the ground, said current detection transistor having a base connected to a connection point in said series circuit between said first and second resistors;

a third transistor having a base-emitter path connected in parallel to said collector-emitter path of said current detection transistor and having an emitter periphery area n times an emitter periphery area of the current detection transistor;

a fourth transistor of the same conductivity type as said current detection transistor and having a base connected to said base of said current detection transistor; and

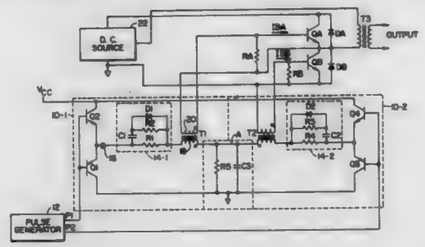
detecting means for detecting a difference between a signal corresponding to a collector current of said third transistor and a signal corresponding to a collector current of said fourth transistor and providing to a base of said control transistor a negative feedback signal corresponding to said difference.

4,638,240

BASE DRIVE CIRCUIT FOR HIGH-POWER SWITCHING TRANSISTOR

Armando Pauker, Sunnyvale, and Richard B. Preuit, Cupertino, both of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Dec. 5, 1985, Ser. No. 805,497
Int. Cl.[4] H02P *13/20*; H02M *3/335*
U.S. Cl. 323—289 20 Claims



1. A wave-shaping circuit for producing a base drive current to be applied to a power switching transistor by a coupling transformer, the current being produced in response to a control pulse, the circuit comprising:

an input terminal adapted to receive the control pulse;

a first resistance coupling the input terminal to the primary winding of the coupling transformer;

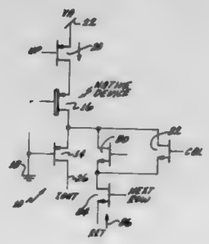
variable impedance means coupled to the first resistance for varying the impedance between the input terminal and the primary winding in response to the control pulse.

4,638,241

REGULATED CURRENT SUPPLY

Joseph H. Colles, Oceanside, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Sep. 13, 1985, Ser. No. 775,524
Int. Cl.[4] G05F *3/08*
U.S. Cl. 323—312 22 Claims



1. In combination for providing a regulated flow of current,

a first semi-conductor,

a second semi-conductor constituting a native device relative to the first semi-conductor,

a third semi-conductor,

the first, second and third semi-conductors being connected in a series circuit,

means for biasing the third semi-conductor to a state of conductivity, and

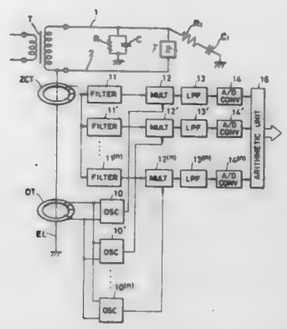
means for commonly biasing the first and second semi-conductors to obtain a saturated flow of current through the first and second semi-conductors when the third semi-conductor is conductive.

4,638,242

METHOD AND DEVICE FOR MEASURING INSULATION DETERIORATION OF ELECTRIC LINE

Tatsuji Matsumo, Samukawa, Japan, assignor to Toyo Communication Equipment Co., Ltd., Kanagawa, Japan

PCT No. PCT/JP82/00251, § 371 Date Aug. 4, 1983, § 102(e) Date Aug. 4, 1983
PCT Filed Jul. 1, 1982, Ser. No. 522,175
Claims priority, application Japan, Jul. 1, 1981, 56-103718
Int. Cl.[4] G01R *27/00*
U.S. Cl. 324—51 7 Claims



7. An improved method for measuring insulation resistance of electric line in which a measuring signal of low frequency is applied to the electric line, an effective component of the measuring signal returned to an earth line of the electric line is measured in an operating state of said electric line, and the insulation resistance is calculated based on said effective component, said improved method characterized in that

low frequency signals of at least two mutually different frequency are first applied to the electric line as said measuring signal;

effective components returned to an earth line of each said low frequency measuring signals are measured;

whether or not effective components values calculated corresponding to said measuring signals of said at least two mutually different frequencies are identical is determined, and if the two insulation resistance values are identical, then these values are adopted as the insulation resistance of the electric line;

else if the two insulation resistance values are different, then a predetermined operation is executed based on an effective component value calculated corresponding to a measuring signal of further different frequency together with said two effective component values so as to obtain the insulation resistance of the electric line.

4,638,243

SHORT DETECTOR FOR FUSIBLE LINK ARRAY USING SINGLE REFERENCE FUSE

Andrew K. Chan, Milpitas, Calif., assignor to Monolithic Memories, Inc., Santa Clara, Calif.

Filed Jun. 5, 1985, Ser. No. 741,658
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—51 5 Claims

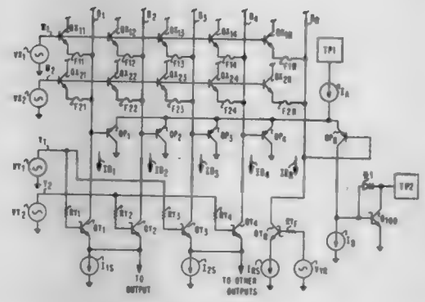
1. Circuitry for testing for short circuits in a fusible link array, said array having a plurality of discrete fusible links each having a nominal resistance RF, any short circuits in one of said fusible links presenting a resistance RFS which is substantially lower than RF, said circuitry comprising:

means for electrically isolating one of said fusible links from the other of said links;

a reference fusible link having a nominal resistance RF;

a reference voltage circuit, said reference fusible link being connected in said reference voltage circuit;

means for applying a voltage across the one of said fusible links under test and across said reference fusible link; and



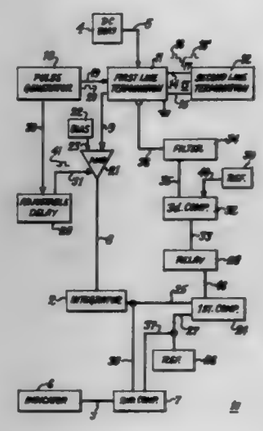
means for comparing the voltage across said fusible link under test with the voltage across said reference fusible link to provide an indication of the presence or absence of a short circuit across said fusible link under test.

4,638,244

GROUND CONNECTION MONITOR

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Oct. 22, 1984, Ser. No. 663,644
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—51 13 Claims



1. Apparatus for monitoring the continuity of a pair of conductors in a multiconductor cable comprising:

pulse generating means for transmitting a pulse of a first polarity from a first line termination at one end of said conductors along said pair of conductors;

means for receiving said pulse upon reflection from a second line termination at an opposite end of said conductors and for comparing the polarity of said received pulse relative to said transmitted pulse;

means connected with said comparison means for providing a response in accordance with said comparison;

said means connected with said comparison means providing said response when said reflected pulse arrives at said receiving means with a predetermined polarity and at a predetermined time after said transmitted pulse; and

said receiving means including an amplifier connected at one of its inputs to said first line termination and at another of its inputs to a DC reference for amplifying said received

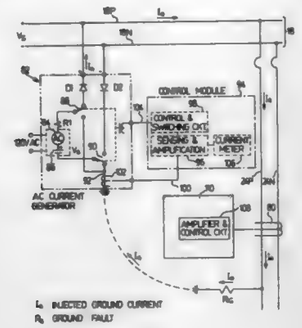
pulse when said received pulse is of a predetermined polarity.

4,638,245

DETECTION OF GROUND FAULTS IN UNGROUNDED DC POWER SUPPLY SYSTEMS

Colin A. A. MacPhee, Scarborough, and Ohjhong Yoon, Markham, both of Canada, assignors to Federal Pioneer Limited, Toronto, Canada

Filed Jan. 8, 1985, Ser. No. 689,698
Claims priority, application Canada, Sep. 27, 1984, 464177
Int. Cl.⁴ G01R *31/02*
U.S. Cl. 324—51 **9 Claims**



1. Apparatus for detecting a ground fault in an ungrounded DC power supply system having a DC power supply connected by positive and negative lines to a load, comprising:

means for applying an AC voltage selectively between a positive line and ground or between a negative line and ground, and

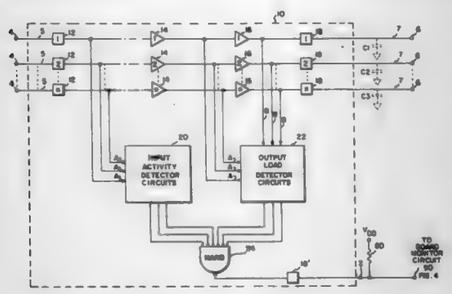
current sensing means comprising an electrical coil surrounding said positive and negative lines and responsive to significant alternating current in one of said lines, when said AC voltage is applied to said one line and said one line has a ground fault, to thereby indicate said fault.

4,638,246

INTEGRATED CIRCUIT INPUT-OUTPUT DIAGNOSTIC SYSTEM

Hans G. Blank, Chestnut Hill, and Jeffrey R. Fox, Concord, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 21, 1984, Ser. No. 653,441
Int. Cl.⁴ G01R *17/02*
U.S. Cl. 324—73 R **11 Claims**



2. A circuit chip defect detection system for detecting open circuits associated with chip input pads wherein external input signals of predetermined frequency are coupled to the chip input pads; comprising:

(a) an input circuit defect detector having:

(i) an integrator circuit coupled to the chip input pad for integrating the input signals over the predetermined time period of said input signal;

(ii) comparator means for comparing the integrated signal with a predetermined reference signal and providing an output signal of one of two possible states depending upon whether the integrated signal is less than the reference signal or is equal to or greater than the reference signal.

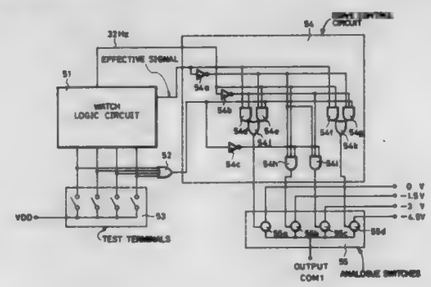
11. An output circuit fault monitoring circuit in which a dummy circuit is connected to the output circuit which dummy circuit is a scaled-down version of the output circuit and has a time delay intermediate that of the output circuit operating into a connected output pad and that of the output circuit when operating into a disconnected output pad; and means for determining the time of arrival of the dummy circuit signal in relation to that of the actual output signal to indicate the presence or absence of a disconnected output pad.

4,638,247

INTEGRATED CIRCUIT FOR CONVERTING A DRIVE SIGNAL OF THREE OR MORE VOLTAGE LEVELS TO TWO VOLTAGE LEVELS

Takehiro Ishikawa, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Sep. 15, 1982, Ser. No. 418,269
Claims priority, application Japan, Sep. 16, 1981, 56-145887
Int. Cl.⁴ G01R *15/12*
U.S. Cl. 324—73 R **2 Claims**



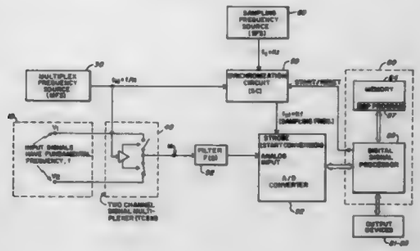
1. An integrated circuit capable of producing a first signal of at least three voltage levels at an output terminal thereof for driving a liquid crystal during a normal mode of operation and capable of changing the first signal to a second signal of two voltage levels for use in testing the first signal during a test mode of operation, the integrated circuit comprising: a logic circuit for generating a reference signal and an effective signal to control the driving of a liquid crystal; testing means for producing a test signal during the test mode of operation; drive control circuit means for receiving said reference signal and said effective signal and operative to produce normal drive control signals in the absence of said test signal and operative to produce test drive control signals in response to said test signal; and analogue switch means responsive to the drive control signals for producing the said first signal of at least three voltage levels when said testing means does not produce said test signal and for producing the said second signal of two voltage levels when said testing means produces said test signal.

4,638,248

METHODS AND APPARATUS FOR MEASURING RELATIVE GAIN AND PHASE OF VOLTAGE INPUT SIGNALS VERSUS VOLTAGE OUTPUT SIGNALS

Robert K. Schweickert, Colorado Springs, Colo., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 10, 1985, Ser. No. 743,165
Int. Cl.⁴ G01R *19/00*
U.S. Cl. 324—76 R **10 Claims**



1. Apparatus for determining the relative gain and phase of two analog input electrical signals comprising:

(a) multiplexing means for time-division multiplexing the two analog signals at a predetermined rate;

(b) converter means for converting the multiplexed analog signals to digital signals;

(c) storage means for storing said digital signals;

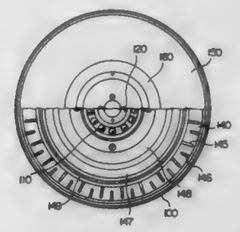
(d) processor means for demultiplexing the stored digital signals at said predetermined rate and for reconstructing such signals into two separate digital signals corresponding to the two separate analog input signals.

4,638,249

INCREMENTAL ENCODER ROTATIONAL POSITION DETECTOR

Hiroaki Tanaka, and Shigeyuki Akita, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 18, 1982, Ser. No. 340,254
Claims priority, application Japan, Jan. 22, 1981, 56-7524[U]
Int. Cl.⁴ G08C *19/10*
U.S. Cl. 324—166 **2 Claims**



1. An incremental rotational position detector of electrostatic capacitance type comprising:

a first plate including a first electrode having a plurality of electrode pieces arranged radially at equal spatial intervals to each other, a second electrode having a plurality of electrode pieces arranged radially between said electrode pieces of said first electrode, annular third and fourth electrodes, and an annular earth electrode arranged between said first and third electrodes and set to the earth potential;

a second plate including 5th, 6th, 7th and 8th electrodes arranged in opposed relation to said first, second, third and fourth electrodes of said first plate respectively, said 5th electrode and said 7th electrode of said second plate being electrically connected to each other, said 6th electrode and said 8th electrode of said second plate being electrically connected to each other; and

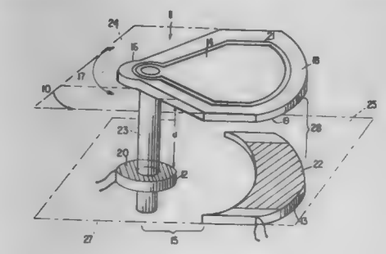
a detector circuit for supplying signals of opposite phases to selected one of the pair of said first and second electrodes of said first plate and the pair of said third and fourth electrodes thereof, so that the change of the electrostatic capacitance generated between the electrodes of said plates when said second plate is rotated in relation with said first plate is detected thereby to detect an incremental rotational position of said second plate.

4,638,250

CONTACTLESS POSITION SENSOR WITH CORELESS COIL COUPLING COMPONENT

Chaim D. Shen-Orr, and Eitan Berg, both of Haifa, Israel, assignors to Fiscint, Inc., Boston, Mass.

Filed Jan. 30, 1984, Ser. No. 574,974
Int. Cl.⁴ G01B *7/14*; G08C *19/06*
U.S. Cl. 324—207 **28 Claims**



1. A magnetic position sensor for monitoring the change of position of an element in a contactless manner, said sensor comprising:

(a) a magnetic field generator component through which a varying current flows for inducing a first varying magnetic field;

(b) a magnetic field coupling component including an untuned coreless coil mounted to be magnetically coupled to the magnetic field generator component and to have current induced therein by said first varying magnetic field, said induced current generating a second varying magnetic field;

(c) a magnetic field sensor component magnetically coupled to said magnetic field coupling component through said second varying magnetic field;

(d) means for mounting the magnetic field coupling component to said element to move with said element relative to said other two components, the degree of magnetic coupling between said coupling component and the magnetic field generator component being substantially independent of the movement of said element while the degree of magnetic coupling between said coupling component and the magnetic field sensor component being a function of the movement of said element; and

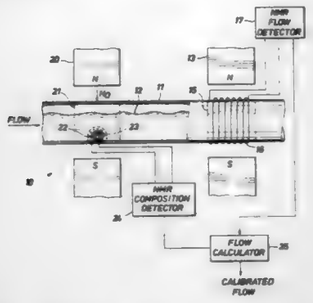
(e) means for measuring the signal induced in said magnetic field sensor component by the said second varying magnetic field for indicating the position of the element whose change in position is being monitored.

4,638,251

METHOD AND APPARATUS FOR MEASURING FLOW OF NON-HOMOGENEOUS MATERIAL IN INCOMPLETELY FILLED FLOW CHANNELS

James D. King, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Oct. 29, 1984, Ser. No. 665,669
Int. Cl.[4] G01R *33/20*; G01F *1/56*; G01N *24/08*
U.S. Cl. 324—306 19 Claims



1. A flow measuring apparatus cooperative with a flow stream of non-homogeneous material wherein the volume thereof fluctuates to less than the full volume of the conduit for the flowing stream, the apparatus comprising:

(a) a nuclear magnetic resonance flow detector including a magnet forming a field in a sensitive region of the flow stream and also including a first detection coil for detecting the population of a particular nuclear species within that sensitive region and forming an output signal indicative of the flow velocity thereof;

(b) a second coil comprising a composition sensor positioned relative to the flowing material and defining a sensitive volume therein in conjunction with a cooperative magnetic field intensity, thereby defining a sensitive region for said second coil, said second coil being positioned relative to the flowing material to be fully filled during measurements with the flowing material, said second coil being connected with a nuclear magnetic resonance composition detector means forming an output signal indicative of the concentration of the selected nuclear species in the flowing material; and

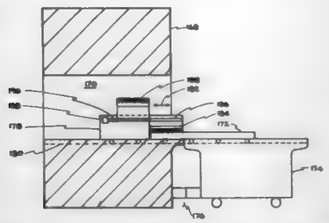
(c) flow calculator means provided with the output (1) from said composition detector means and (2) from said flow detector to form an output indicative of the quantity of flowing non-homogeneous materials without regard to the volume filling the sensitive region of said flow detector.

4,638,252

CIRCUIT FOR DETECTING RF COIL ASSEMBLY POSITION IN AN MR SCANNER

Kenneth M. Bradshaw, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Dec. 21, 1984, Ser. No. 684,553
Int. Cl.[4] A61B *5/05*
U.S. Cl. 324—318 3 Claims



1. An MR scanner including an RF power amplifier, an RF receiver preamplifier, and an RF coil assembly made up of an upper coil assembly disposed slidably relative to a lower coil assembly, said MR scanner comprising:

transmit/receive switch means having a plurality of switching devices for selectively coupling said power amplifier and said preamplifier to said coil assembly;

switch means operably coupled to said upper coil assembly to shunt at least one of said switching devices in and out of said transmit/receive switch depending on the position of said upper coil assembly so as to change the voltage drop across one of the unshunted switching devices; and

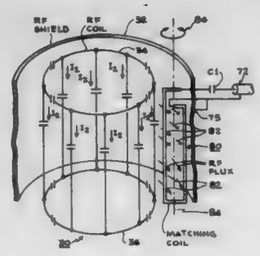
comparator circuit means for comparing said voltage drop to a predetermined reference voltage and providing an output signal indicative of the position of said upper coil assembly.

4,638,253

MUTUAL INDUCTANCE NMR RF COIL MATCHING DEVICE

Patrick L. Jaskolski, Wauwatosa, and Matthew G. Eash, Oconomowoc, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Oct. 29, 1984, Ser. No. 665,487
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 8 Claims



1. An NMR scanner apparatus comprising:

RF coil means for transmitting and receiving radio frequency signals;

first means for energizing said RF coil means when said coil is operated in the transmitting mode;

means for receiving radio frequency signals when said coil is operated in the receiving mode; and

first matching coil means for coupling said RF coil means to said means for energizing and means for receiving said matching coil means being disposed in the magnetic flux field of said RF coil, such that in operation said matching coil means and said RF coil means are coupled by mutual inductance.

4,638,254

METHOD OF DETERMINING AND DISPLAYING THE ORIENTATION OF SUBSURFACE FORMATIONS

Duane C. Uhri, Grand Prairie, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 2, 1983, Ser. No. 490,919
Int. Cl.[4] G01V *3/38*
U.S. Cl. 324—323 13 Claims

1. The method of producing a plot of preferred geological orientation of a subsurface formation comprising:

(a) repeatedly measuring said geological orientation;

(b) generating original vectors representing the azimuth and dip of the measurements;

(c) converting said original vectors into lineations representing the extension of each vector to its intersection with a unit sphere;

(d) designating one of said original vectors as a reference vector;

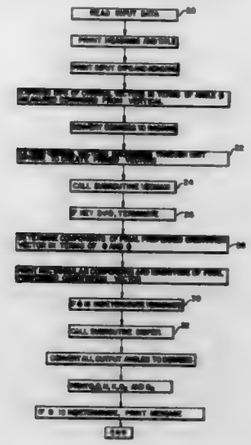
(e) selecting the half axes of all lineations within 90° of the reference vector and transforming them into unit vectors;

(f) vector averaging the selected unit vectors to produce a resultant vector;

(g) determining the magnitude of said resultant vector;

(h) repeating steps (c)–(f) for each of said original vectors;

(i) selecting the resultant vector having the maximum magnitude as the preferred orientation of said formation;



(j) repeating steps (b)–(i) for a plurality of measurements; and

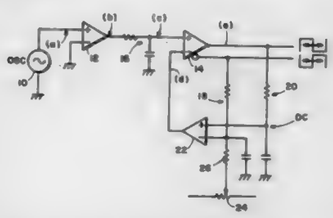
(k) plotting the resultant vectors having maximum magnitudes.

4,638,255

RECTANGULAR WAVE PULSE GENERATORS

Bruce J. Penney, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 537,999, Sep. 30, 1983, abandoned. This application Nov. 25, 1985, Ser. No. 801,268
Int. Cl.[4] H03K *3/017*, *3/023*, *5/153*
U.S. Cl. 328—36 9 Claims



1. Signal processing apparatus comprising:

an electronic device having a signal input, a signal output and a clock input;

a circuit having an output at which it provides a first train of voltage pulses;

means for converting said first train of voltage pulses into a second train of voltage pulses each having a trailing edge and a leading edge, at least one of said edges being of generally ramp-like form;

a comparator having a first input to which said second train of voltage pulses is applied, a second input to which a reference d.c. voltage level is applied and an output at which is developed a periodic rectangular wave signal having a duty cycle which is a function of the reference d.c. voltage level, the periodic rectangular wave signal being input to the clock input of said electronic device such that said electronic device is clocked by the periodic rectangular wave signal in a time relationship to said first train of voltage pulses that is adjustable in dependence upon said reference d.c. voltage level; and

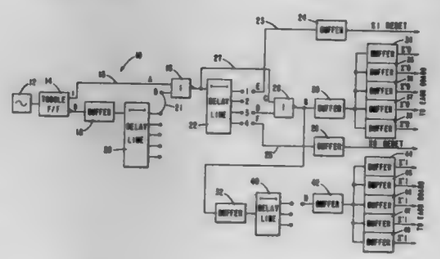
means for generating the reference d.c. voltage level from the periodic rectangular wave signal.

4,638,256

EDGE TRIGGERED CLOCK DISTRIBUTION SYSTEM

Vuong B. Hoang, Laguna Hills; Stuart C. Rowson; Richard A. Daniel, both of Escondido, and Paul M. Rostek, San Diego, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 15, 1985, Ser. No. 765,770
Int. Cl.[4] H03K *5/15*
U.S. Cl. 328—105 7 Claims



1. A clock distribution system comprising:

a generator for generating a train of pulses;

transition means connected to the output of said generator for generating a clock signal having spaced apart transitions of a desired polarity;

distribution means distributing said clock signal to a plurality of boards which utilize said clock signal;

flip-flop means on each of the boards which utilize said clock signal, each of said flip-flop means being connected to said distribution means for receiving said clock signal and for generating clock pulses defined by said spaced apart transitions;

reset pulse generating means connected to said generator means for generating reset pulses after every second transition of a desired polarity;

reset means in said flip-flop means for receiving said reset pulses and for resetting said flip-flop means to a desired state after every one of said clock pulses;

alternate clock signal means in said transition means for additionally generating an alternate clock signal having two alternate transitions of a desired polarity after every second transitions of said clock signal;

alternate flip-flop means in said flip-flop means for receiving said alternate clock signal and for generating alternate clock pulses each defined by said two alternate transitions;

alternate reset pulse generating means connected to said generator means for generating alternate reset pulses after every second one of said alternate transitions;

alternate reset means in said alternate flip-flop means for receiving said alternate reset pulses and for resetting said alternate flip-flop means to a desired state after every one of said alternate clock pulses;

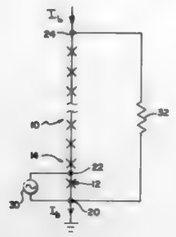
first delay line means in said transition means for delaying the alternate clock signal so as to time the alternate clock pulses of said alternate flip-flop means centrally between adjacent ones of said clock pulses.

4,638,257

AMPLIFICATION BY A PHASE LOCKED ARRAY OF JOSEPHSON JUNCTIONS

Donald G. McDonald, Boulder, Colo., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Nov. 26, 1985, Ser. No. 801,972
Int. Cl.[4] H03F *19/00*
U.S. Cl. 330—61 R 8 Claims



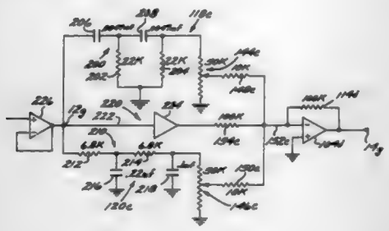
1. An amplifier comprising:
an array of n Josephson junctions connected in series, where n is an integer greater than 1, said junctions being in a finite voltage state and mutually electromagnetically phase locked;
input means having m of said Josephson junctions connected therebetween for connecting an input signal to said amplifier, m being an integer less than n and greater than 0; and
output means including impedance load means and having at least m+1 Josephson junctions of said series connected therebetween for providing an output signal from said amplifier.

4,638,258

REFERENCE LOAD AMPLIFIER CORRECTION SYSTEM

Robert C. Crooks, Huntington Beach, Calif., assignor to Barcus-Berry Electronics, Inc., Huntington Beach, Calif.

Continuation-in-part of Ser. No. 352,794, Feb. 26, 1982, Pat. No. 4,482,866. This application Nov. 7, 1984, Ser. No. 669,071
Int. Cl.[4] H03F *1/08*
U.S. Cl. 330—149 18 Claims



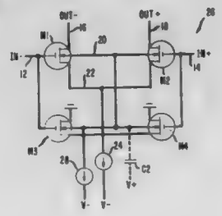
1. A method of correcting for variations in a load having inductive reactance and characteristics resembling those of capacitive reactance, which load is driven by a power amplifier that has an input circuit line through which it receives a variable waveform input program voltage signal, which comprises:
applying said program signal in a separate high frequency channel to inductor correction component high pass phase shifting network means to produce a high frequency correction signal which has a phase lead and frequency response that increase with increasing frequencies so as to compensate for inductive reactance of said load,
applying said program signal in a separate low frequency channel to capacitor correction component low pass phase shifting network means to produce a low frequency correction signal which has a phase lag and frequency response that increase with decreasing frequencies so as to compensate for characteristics of said load which resemble capacitive reactance,
passing said program signal through a separate midrange channel having midrange band pass filter means therein, and
after said program signal has passed through said midrange channel, mixing said high and low frequency correction signals with said program signal and applying such mixture of signals to said power amplifier.

4,638,259

CMOS DIFFERENTIAL AMPLIFIER STAGE WITH BULK ISOLATION

Veikko R. Saari, Spring Lake Heights, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 27, 1985, Ser. No. 814,199
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—253 6 Claims



1. In a differential amplifier of the type having:
first and second field-effect transistors having one side of their conduction paths connected to a first current source, the control electrodes of the first and second transistors being first and second input nodes, respectively, and the other side of the conduction paths of the first and second transistors being first and second output nodes, respectively,
The improvement therein comprising:
third and fourth field-effect transistors having one side of their conduction paths connected to the bulk regions of the first, second, third and fourth transistors and to a second current source, the control electrodes of the third and fourth transistors being connected, respectively, to the control electrodes of the first and second transistors, and the other side of the conduction path of the third and fourth transistors being connected to a common reference voltage.

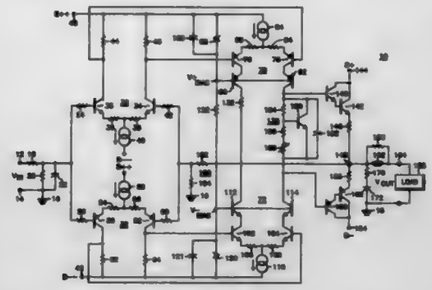
4,638,260

AUDIO AMPLIFIER

James P. Hamley, 2922 Cottonwood Dr. South, Mill Creek, Wash. 98012

Filed Sep. 21, 1984, Ser. No. 652,722
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—254 34 Claims

1. An audio amplifier comprising:
an input stage for receiving a signal to be amplified;
an intermediate stage for gain amplifying the signal from the input stage; and,
an output stage, adapted to be coupled to a load, for power amplifying the signal from the intermediate stage,
wherein said input stage comprises a complementary-symmetry, differential amplifier pair, each differential amplifier having first and second output terminals, said signal to be amplifier being coupled to the first input terminal of each of said amplifiers;
wherein said intermediate stage comprises a complementary-symmetry, cascode differential amplifier pair, each intermediate stage amplifier pair having first and second input terminals coupled to the first and second output terminals of one of said input stage differential pairs, and each intermediate stage having first and second output terminals;



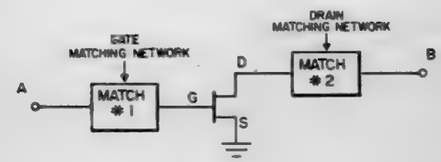
wherein said output stage comprises power amplifier means connected to at least one of said output terminals from each of said intermediate stage amplifiers for power amplifying the signal thereon; and
a feedback circuit coupled from said output stage to the second input terminal of each of said input stage differential amplifiers for applying a feedback signal thereto.

4,638,261

LOW NOISE AMPLIFIER WITH HIGH INTERCEPT POINT

Charles F. McGuire, Kaysville; Gordon C. Steyaert, Salt Lake City, both of Utah, and John M. Fontaine, Scottsdale, Ariz., assignors to Sperry Corporation, Blue Bell, Pa.

Filed Aug. 26, 1985, Ser. No. 769,377
Int. Cl.[4] H03F *3/60*
U.S. Cl. 330—277 6 Claims



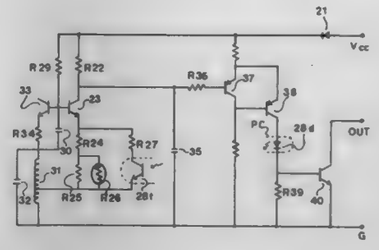
1. A low noise, high intercept point, single ended, linear amplifier comprising,
a field effect transistor including a gate electrode, a source electrode and a drain electrode,
said transistor having large gate width parameters on the order of 3000 microns,
a gate matching network comprising a distributed dispersive media connected to the gate electrode of said transistor to present a standard noise match to said gate electrode thereby to achieve a minimum noise factor for said amplifier, and
a drain matching network comprising a distributed dispersive media connected to the drain electrode of said transistor in order to provide the optimal power load for said transistor thereby to achieve a high intercept point.

4,638,262

PROXIMITY SWITCH WITH IMPROVED RESPONSE TIME AND ANTIMAGNETIC FIELD CIRCUITRY

Kiyoshi Miyamoto, Otsu, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 8, 1985, Ser. No. 709,760
Claims priority, application Japan, Mar. 9, 1984, 59-46155; Mar. 9, 1984, 59-34740
Int. Cl.[4] G01N *27/00*
U.S. Cl. 331—65 11 Claims



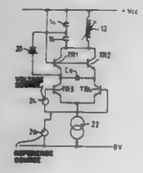
1. A high frequency oscillation type proximity switch having an oscillation circuit with an oscillation output and a detecting circuit for detecting an object by a decrease in the oscillation output,
wherein said oscillating circuit has an oscillation adjusting resistor for changing the oscillation amplitude,
said proximity switch comprising
comparing means for comparing the oscillation output from said oscillating circuit with a predetermined level to detect the decrease therein,
oscillation control means for changing the resistance of the oscillation adjusting resistor of said oscillating circuit on the basis of the output from said comparing means,
oscillation output discrimination means for discriminating the oscillation output from said oscillating circuit on the basis of a predetermined level to provide an output when the oscillation amplitude lowers, and
an integrating circuit for integrating the output from said output discrimination means and providing an output on the basis of which the switch detects an object.

4,638,263

VOLTAGE CONTROLLED OSCILLATOR INCLUDING TWO VARIABLE GAIN FEEDBACK CIRCUITS

Herman W. van Rumpt, Eindhoven, Netherlands, and Charles J. H. Razzell, Cambridge, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 9, 1984, Ser. No. 658,833
Claims priority, application United Kingdom, Oct. 7, 1983, 8326822
Int. Cl.[4] H03B *5/12, 5/36*
U.S. Cl. 331—116 R 10 Claims



1. A voltage controlled oscillator comprising two active

elements having respective feedback paths with each path having a different phase shift, the phase shift in one of said two paths being substantially constant, signal outputs of the two feedback paths being summed vectorially, and a tunable L.C. circuit for receiving said summed signal outputs, further comprising means for varying the gain distribution between the two feedback paths, said gain varying means comprising two control devices respectively coupled to the two active elements, and means for applying a frequency control voltage to each of the control devices to vary the distribution of the current through their associated connected active elements to alter the gain in each path whereby the total phase shift and frequency of the oscillator is modified.

4,638,264

VOLTAGE CONTROLLED OSCILLATOR WITH SERIES CONNECTED RESONANCE ELEMENT AND SWITCHED CAPACITANCE

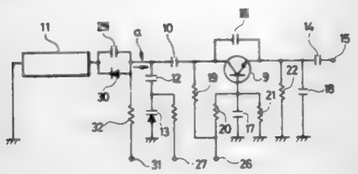
Moriaki Ueno, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Dec. 27, 1985, Ser. No. 814,187

Claims priority, application Japan, Dec. 27, 1984, 59-197795[U]

Int. Cl.⁴ H03B *5/00*

U.S. Cl. 331—117 D **4 Claims**



1. A voltage controlled oscillator of the type comprising a distributed parameter line functioning as a resonance circuit, and a variable capacitance diode connected to a connection point in parallel with said distributed parameter line which has its capacitance varied by means of a control voltage,

the improvement wherein said distributed parameter line is connected in a series circuit with said connection point through a capacitor and a switching diode in parallel with said capacitor, said switching diode including a terminal for applying a bias voltage for rendering said diode conducting or non-conducting to thereby short-circuit or include said capacitor in said series circuit, respectively, whereby the resonance wavelength of said distributed parameter line can be varied without substantially varying the sensitivity of said oscillator.

4,638,265

BALANCED VARIABLE REACTANCE CIRCUIT AND METHOD OF PRODUCING THE SAME

Gerald K. Luan, Scottsdale; W. Eric Main, Mesa, and Michael McGlun, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 3, 1985, Ser. No. 740,366

Int. Cl.⁴ H03H *7/48*

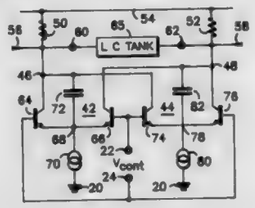
U.S. Cl. 333—214 **19 Claims**

1. A circuit for producing a controllable and variable reactance across first and second terminal, comprising:

first current steering means having a common terminal for steering first and second proportional currents to the first and second terminals from said common terminal in response to receiving an applied control signal;

second current steering means having a common terminal for steering third and fourth proportional currents to the first and second terminals from said common terminal in response to said applied control signal, said first and third currents being in antiphased relationship with respect to each other;

first reactive means coupled between the first terminal and said common terminal of said first current steering means for sourcing a first reactive current to said common terminal; and



second reactive means coupled between the second terminal and said common terminal of said second current steering means for sourcing a second reactive current to said common terminal, said second reactive current being in antiphase with said first reactive current.

4,638,266

ACOUSTOOPTICAL MODULATOR AND/OR DEFLECTOR

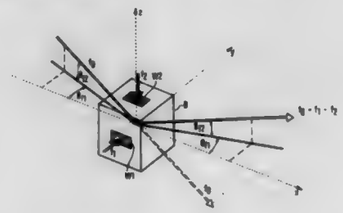
Wilfried Alich, Asperg, and Eberhard Schlemper, Vaihingen, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 7, 1984, Ser. No. 669,489

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340809

Int. Cl.⁴ G02F *1/33*

U.S. Cl. 332—7.51 **7 Claims**



1. An acoustooptical device comprising:

(a) an optically transparent material;

(b) means for producing a first acoustic wave of frequency f_1 and propagating said first acoustic wave into said material in a first wave propagation direction;

(c) means for producing a second acoustic wave of frequency f_2, different from said frequency f_1, and propagating said second acoustic wave into said material in a second wave propagation direction at least approximately perpendicular to said first wave propagation direction; and

(d) means for directing an incident light beam into said transparent material in a predetermined incident beam propagation direction having a component opposite to said first wave propagation direction and also having a component codirectional with said second wave propagation direction, so that Bragg reflection occurs, whereby an output light beam is provided having a frequency shift of (f_1-f_2) with respect to the frequency of the incident beam.

4,638,267

MILLIMETER WAVE CIRCULATOR

Wolfgang Holpp, Illertissen, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,708

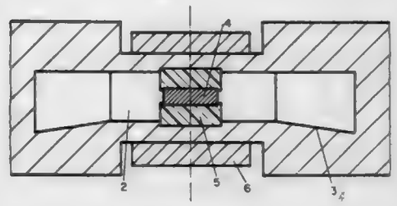
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 3411621

Int. Cl.⁴ H01P *1/39*

U.S. Cl. 333—1.1 **5 Claims**

1. A millimeter wave circulator comprising an H-plane

waveguide junction, means defining a static magnetic field in the vicinity of said junction, a circularly cylindrical ferrite body at the center of said waveguide junction exposed to said static magnetic field, said ferrite body being dimensioned so that the operating frequency of said circulator falls within the



range of two neighboring closely spaced resonant frequencies of higher order than that of the dominant mode of said ferrite body, said two neighboring closely spaced resonant frequencies being of TE_{011} and TE_{211} modes.

4,638,268

MICROWAVE ABSORBER COMPRISED OF A DENSE SILICON CARBIDE BODY WHICH IS WATER COOLED

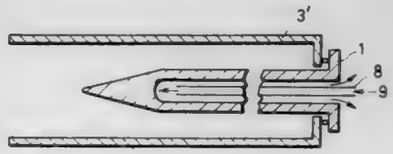
Masakazu Watanabe, and Akiyasu Okuno, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jul. 24, 1984, Ser. No. 634,012

Claims priority, application Japan, Nov. 8, 1983, 58-171958[U]

Int. Cl.⁴ H01P *1/26*

U.S. Cl. 333—22 F **3 Claims**



1. A microwave absorber comprising: a body entirely of dense silicon carbide having two ends, wherein a hollow portion is located at one end and a closed tip end portion is located at the other end, and a pipe, for guiding cooling water into said hollow portion.

4,638,269

WIDE BAND MICROWAVE ANALOG PHASE SHIFTER

Dale E. Dawson, Glen Burnie; Anthony L. Conti, Baltimore; Soong H. Lee, Rockville, all of Md.; Gary F. Shade, and Lawrence E. Dickens, both of Colorado Springs, Colo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 28, 1985, Ser. No. 738,794

Int. Cl.⁴ H01P *1/185*

U.S. Cl. 333—164 **3 Claims**

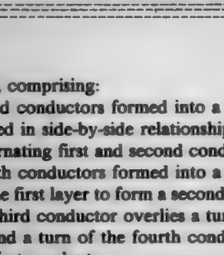
1. A microwave hybrid coupled phase shifter comprising:

(a) an insulating substrate;

(b) four conductor pads disposed upon the substrate and comprising an rf input pad, an rf output pad, and first and second phase shifting pads;

(c) a generally U-shaped, closely spaced conductor pattern disposed on the substrate and extending between the rf input pad and the rf output pad, and the first and second phase shifting pads, which conductor pattern comprises an air bridged quadrature coupler;

(d) first and second conductors disposed on the substrate and extending from respective first and second phase shifting pads to the anodes of Schottky varactor diodes, with the cathodes of said Schottky varactor diodes being serially connected to the cathodes of another set of Schottky varactor diodes to form two pairs upon said substrate; and with the anodes of the other Schottky varactor diodes of each pair being connected to a ground conductor disposed upon the substrate;



(e) bias means contact pads disposed upon the substrate with conductors extending from said contact pad to the cathodes of the Schottky varactor diode pairs, which bias means contact pad is connectable to reverse bias potential means for varying the capacitance of the Schottky varactor diode pairs and the phase of the output rf signal as a function of the reverse bias potential.

4,638,270

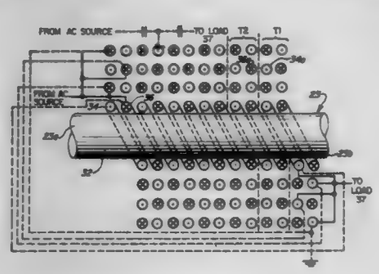
RESONATOR COMPRISING A COIL FORMED OF MULTIPLE LAYER ALTERNATELY ARRANGED CONDUCTIVE TURNS

George A. Machamer, 2201 N. Hawthorne St., Melrose Park, Ill. 60164

Filed Feb. 17, 1984, Ser. No. 581,912

Int. Cl.⁴ H03H *7/09*

U.S. Cl. 333—175 **16 Claims**



5. A resonator, comprising:

first and second conductors formed into a coil and having turns disposed in side-by-side relationship to form a first layer of alternating first and second conductor turns;

third and fourth conductors formed into a coil and having turns atop the first layer to form a second layer wherein a turn of the third conductor overlies a turn of the second conductor and a turn of the fourth conductor overlies a turn of the first conductor;

fifth and sixth conductors formed into a coil and having turns atop the second layer to form a third layer wherein a turn of the fifth conductor overlies a turn of the fourth conductor and a turn of the sixth conductor overlies a turn of the third conductor; and

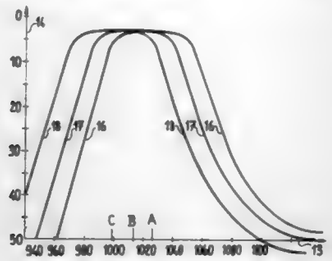
means for connecting separate conductors together in parallel to form a plurality of terminals.

4,638,271

METHOD OF INCREMENTALLY ADJUSTING THE CENTER FREQUENCY OF A MICROSTRIP-LINE PRINTED FILTER BY MANUEVERING DIELECTRIC LAYERS

Jean-René Jecko, Talence, and Marcel Motola, Paris, both of France, assignors to Thomson-CSF, Paris, France

Filed May 25, 1984, Ser. No. 614,083
Claims priority, application France, May 31, 1983, 83 09008
Int. Cl.⁴ H01P *1/203*
U.S. Cl. 333—205 **3 Claims**



2. A method for fabricating a printed circuit filter having a reversibly adjustable center frequency, the method comprising the steps:

forming a plurality of microstrip resonators in generally parallel relationship on a substrate;

depositing a stack of aligned individual layers of dielectric material lengthwise along the substrate and generally perpendicularly across the parallel resonators to achieve an initial filter center frequency;

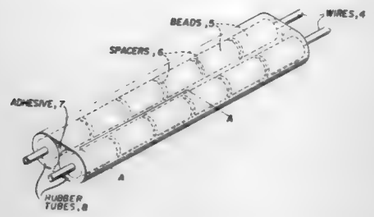
incrementally maneuvering individual ones of the dielectric layers to and from the stack corresponding to incremental center frequency shifts of the filter.

4,638,272

LOSSY TRANSMISSION LINE USING SPACED FERRITE BEADS

Richard A. Ive, Eaton Town, N.J., assignor to The Commonwealth of Australia, Canberra, Australia

PCT No. PCT/AU84/00076, § 371 Date Jan. 2, 1085, § 102(e) Date Jan. 2, 1985, PCT Pub. No. WO84/04426, PCT Pub. Date Nov. 8, 1984
PCT Filed May 4, 1984, Ser. No. 692,885
Claims priority, application Australia, May 5, 1983, PF 9191/83
Int. Cl.⁴ H01P *3/04*
U.S. Cl. 333—236 **8 Claims**



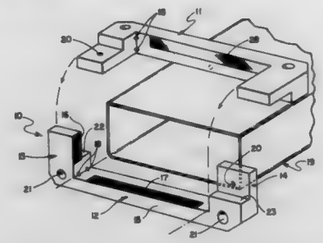
1. A lossy transmission line comprising a conducting wire threaded with resistive ferrite beads which exhibits substantially constant power loss per unit length, and wherein the resistive ferrite beads are distributed sparsely at the beginning of the wire with frequency of distribution increasing to a maximum per unit length which is related to the size of the beads and the available space per unit length of the wire.

4,638,273

WAVEGUIDE ASSEMBLY

John D. Foglesonger, Los Angeles, and David M. Vranson, Canyon Country, both of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Jul. 16, 1984, Ser. No. 631,425
Int. Cl.⁴ H01P *1/04*
U.S. Cl. 333—254 **4 Claims**



1. A subassembly for a waveguide joint comprising:

a metallic rectangular waveguide section having four sides forming four corners;

a compressible metallic flange for mounting to said waveguide, said flange arranged and configured for compression fitting onto said waveguide and having four interior corners; and

means for creating an electromagnetic seal at each of said four corners of said waveguide, said means creating said electromagnetic seal when said flange is compressed upon said waveguide;

wherein said means for creating an electromagnetic seal comprises a plurality of angular projections disposed on interior surfaces of said flange, said projections disposed within said interior corners of said flange and at least on both sides of each of said interior corners in order to completely engage said corners of said waveguide upon compression of said flange,

whereby said subassembly is substantially electromagnetically leak-proof upon assembly.

4,638,274

RELAY SWITCH APPARATUS

Wendel E. Archer, Gahanna; James L. Milton, Columbus, both of Ohio; Paul W. Renaut, and Nelson H. Winquist, both of Lee's Summit, Mo., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 6, 1986, Ser. No. 836,681
Int. Cl.⁴ H01H *1/08, 29/00*
U.S. Cl. 335—52 **8 Claims**

1. A mercury switch construction (1, 2, 3) comprising

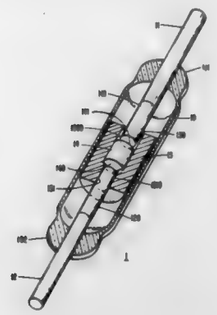
mercury wettable magnetic contact structures (11, 12, 211, 212, 221, 222, 311, 312),

envelope means (10, 20, 30) for supporting said magnetic contact structures in a spaced apart relationship, and

means responsible to an external magnetic field for establishing an electrical conducting path between said magnetic contact structures

characterized in that

said electrical conducting path establishing means comprises mercury holding means (13, 23, 33) slidably located within said envelope means adjacent said magnetic contact structures and having magnetic means (14, 24, 34) attached thereto responsive to said external magnetic field for



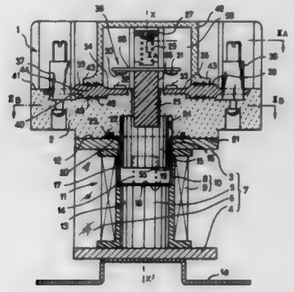
engaging said mercury holding means with said contact structures and establishing said electrical conducting path.

4,638,275

ELECTRIC SWITCHING UNIT COMPRISING A GAS-TIGHT CASING FOR PROTECTION OF CONTACTS

Elie Belbel, Vaucresson; Robert Candron, Meudon; Louis Fèchant, Le Vesinet; André Haury, Le Raincy; Michel Lauraire, Courbevoie; Jacques Muniesa, Boulogne Billancourt, and Lucien Siffrol, Versailles, all of France, assignors to La Telemecanique Electrique, Nanterre, France

Filed Mar. 22, 1985, Ser. No. 714,928
Claims priority, application France, Mar. 28, 1984, 84 04826
Int. Cl.⁴ H01H *1/66, 51/00*
U.S. Cl. 335—151 **13 Claims**



1. An electric switching unit comprising:

a body (2, 65),

an electromagnet (11, 80) having a stationary yoke (7, 76), a moving armature (15, 75) and a stationary excitation coil (10, 78), said electromagnet being rigidly fixed to said body through one of its stationary elements (7, 76),

a plurality of switches (36) each comprising a stationary contact member (34, 35) and a moving contact (28) which are provided with contact-studs (30, 31, 32, 33), the moving contacts being urged by pressure springs toward a closed position, said springs and contacts being mounted on an insulating contact-holder (26, 62) which is capable of displacement in sliding motion within said body in order to cause opening and closing of said switches and which is mechanically associated with said moving armature whilst the stationary contacts are rigidly fixed to said body,

a gas-tight protective casing (42) which is fixed on the body so as to contain the switches and is provided with insulation with respect to said switches,

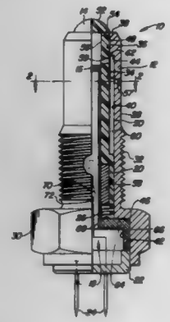
resilient means (14, 79) capable of placing said moving armature (15, 75) in a rest position in which said armature is located at a distance from said yoke (7, 76), wherein the contact-studs (30, 31, 32, 33) are made of cuprous material whilst the protective casing (42) is filled with a non-oxidizing medium and sealed by sealing means (23, 55, 69, 47) which are placed on the one hand between the moving armature (15, 75) and a first face (21, 72) of the body (2, 65) and on the other hand between the protective casing (42) and a second face (41) of the body which is opposite to the first face.

4,638,276

REED SWITCH WITH A HOUSING AND A PULSE GENERATOR

Klaus Hauk, Altrip, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Apr. 26, 1985, Ser. No. 727,654
Int. Cl.⁴ H01H *1/66, 51/00*
U.S. Cl. 335—151 **1 Claim**



1. A reed switch comprising:

a hollow cylindrical housing having an axial bore therein with larger and smaller diameter bore portions;

a switch element supported within the housing;

a hollow cylindrical magnet carrier movable in the housing and having larger and smaller outer diameter sections, the larger section slidably engaging a wall of the larger bore portion of the housing, the smaller section slidably and sealingly engaging a wall of the smaller bore portion of the housing, the carrier including a blind bore extending therein for slidably receiving the switch element, the carrier and the switch element cooperating to define a variable volume chamber therebetween within the carrier at one end thereof, the larger diameter section of the carrier having a plurality of peripherally spaced apart, axially extending grooves in an outer surface thereof, the carrier having a first passage extending therethrough from the chamber to an outer surface of its smaller diameter section, the carrier having a second passage extending therethrough from the chamber to one of the grooves in the larger diameter section, the carrier being movable in the housing between an inner and an outer position therein, the resilient means urging the carrier to its outer position.

4,638,277

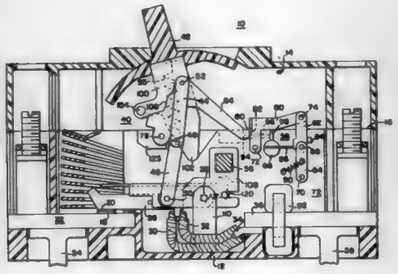
CIRCUIT BREAKER WITH BLOW OPEN LATCH

Glenn R. Thomas, Brighton Twp., Beaver County, and Jere L. McKee, Scott Twp., Lawrence County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 1, 1985, Ser. No. 782,669
Int. Cl.⁴ H01H *3/00*
U.S. Cl. 335—190 **4 Claims**

1. A circuit breaker with blow open contact arm, comprising:

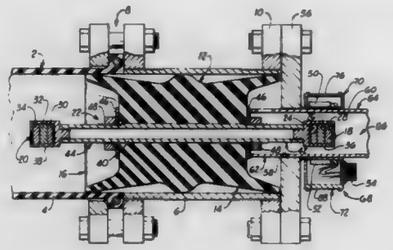
a circuit breaker unit having a pair of separable contacts operable between open and closed positions and including a releasable member;
the contacts sustaining a repulsion magnetic force which force is proportional to the square of the current load flowing through the contacts and which is operable to separate the contacts upon the occurrence of a predetermined current overload;
a trip mechanism movable in respone to the occurrence of a predetermined electric current overload to release the releasable member;
the circuit breaker unit including a contact arm carrying one of the contacts;
mounting means mounting the contact arm for pivotal movement upon actuation of the trip mechanism;
the mounting means including one of a cam and cam follower means for retaining the contact arm in either open or closed positions;
the contact arm including the other of the cam and cam follower means;



the cam follower means moves from a first cam position to a second cam position when the contact arm is propelled to the open contact position in response to a repulsion magnetic force occurring when the current exceeds the predetermined value;
the trip mechanism actuating the circuit breaker unit to the open contact position causing the mounting means to rotate and causing the cam follower means to move to the second cam position from the first cam position;
the cam follower means comprising a cam follower and spring means for holding the cam follower against the cam;
the assembly of the cam and cam follower means is disposed on the side of the pivot opposite the contact;
the cam is on the contact arm and the cam follower means is on the mounting means; and
the cam follower means comprising a pin slidable in slot means, said slot means being provided in the mouting means and a coil spring connected to the cam follower means for holding the pin against the cam.

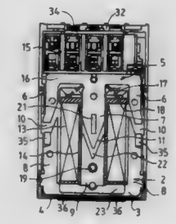
4,638,278
MAGNETIC DETECTOR APPARATUS
Mark E. Bullock, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.
Filed Jan. 14, 1986, Ser. No. 819,167
Int. Cl.[4] H01H *9/00*
U.S. Cl. 335—207 **19 Claims**

1. An apparatus for detecting a location of a movable member in a conduit, comprising:
a magnet connected to the movable member so that said magnet moves with the movable member inside the conduit;
a magnetically responsive switch means, connected to the outside of the conduit, for changing switch states when said magnet moves to an internal location of the conduit where the magnetic flux of said magnet actuates said switch means;
an end member attached to the conduit, said end member having an aperture defined therethrough;
a stop member extending through said aperture so that a first portion extends beyond one side of the end member into



the conduit and so that a second portion extends beyond another side of the end member outside the conduit, said first portion engaging the movable member when the movable member reaches a predetermined location in the conduit; and
attachment means for attaching said switch means to said second portion of said stop member.

4,638,279
NOISELESS ELECTROMAGNET AND A CONTACTOR USING SUCH AN ELECTROMAGNET
Alain Brisson, and Jean R. Clément, both of Poitiers, France, assignors to La Telemecanique Electrique, France
Filed Jul. 19, 1985, Ser. No. 756,618
Int. Cl.[4] H01F *3/00, 7/08*
U.S. Cl. 335—257 **5 Claims**



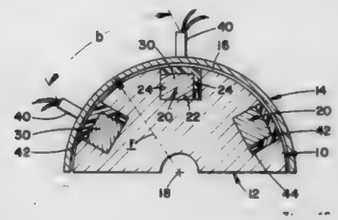
1. An electromagnet with DC supply which comprises a fixed magnetic circuit having an E shape including a first web, a first central leg having a first end face and two first side legs which comprise two respective outer faces each having a chamfered portion and a stud bearing a damper element made from an amagnetic material, which serves as working position stop of the electromagnet, and a mobile magnetic circuit movable in translation, said mobile magnetic circuit having an E shape including a second web, a second central leg having a second end face and two second side legs which comprise two respective inner faces each having a chamfered portion and an end surface which comes to bear on said damper element in the working position, said second central leg being aligned and disposed with said second end face facing said first end face so as to form a central air gap, and said two second side legs being respectively aligned with said two first side legs with said chamfered portions and said end surfaces of the second side legs facing respectively the chamfered portions and the studs of the two first side legs to form between said chamfered portions two lateral air gaps oblique with respect to each other and between said end surfaces and said studs two small end air gaps.

4,638,280
MULTIPOLAR MAGNETIZING DEVICE PROVIDED WITH COOLING MEANS
Dietrich Steingroever, 5060, Berg.-Gladbach, and Erich Steingroever, Flensburger Str. 33, 5300 Bonn 1, both of Fed. Rep. of Germany
Filed Oct. 29, 1985, Ser. No. 778,207
Int. Cl.[4] H01F *13/00*
U.S. Cl. 335—284 **10 Claims**



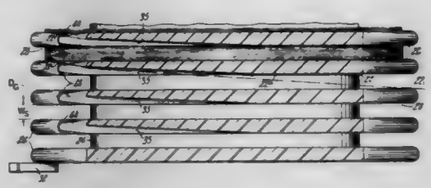
1. In a multipolar magnetizing device for generating magnetic poles of alternating polarity in a permanent magnet body, of the type which includes a supporting plate of electrically insulating material provided with a surface to closely conform with the surface of said magnet body and an electrically conductive circuit array recessed in said insulating plate to generate selected magnetic poles in said magnet body when supported by the plate:
said conductive array including a plurality of series-connected magnetizing sections each comprising a single wire or rod, of low-resistance electrically conductive material arranged to define said magnetic poles to be generated in the magent body when energized by a unidirectional high-intensity electrical current, and;
a plurality of cooling sections each additional lengths of said wire, or rod, joining respective adjacent ends of said magnetizing sections and shaped to resemble a closely wound double helix disposed remotely with respect to said magnet body.

4,638,281
MAGNETIC ROLL FOR COPY MACHINES AND METHOD FOR MANUFACTURING SAME
Horst Baermann, Roerath-Rambrucken, Fed. Rep. of Germany, assignor to Max Baermann, G.m.b.H., Gladbach, Fed. Rep. of Germany
Filed Apr. 1, 1985, Ser. No. 718,637
Claims priority, application European Pat. Off., Nov. 26, 1984, 84114262
Int. Cl.[4] H01F *3/00*
U.S. Cl. 335—303 **30 Claims**



1. A magnetic roll for electro-photographic copying machines, comprising: a carrier having a longitudinal axis; a circumferentially spaced series of elongated permanent magnetic components extending axially on said carrier; said magnetic components having radially outwardly extending flux fields; and, means for selectively and independently rigidly positioning each magnet radially and circumferentially relative to said carrier so that the induction of each magnetic pole cooperates with the induction at neighboring poles to provide a predetermined magnetic field extending radially outwardly from said roll.

4,638,282
WIRE CROSS-OVER ARRANGEMENT FOR COIL ASSEMBLY
Donald E. Ellison, St. Clair Shores, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.
Filed Jul. 18, 1985, Ser. No. 756,463
Int. Cl.[4] H01F *27/30*
U.S. Cl. 336—185 **6 Claims**

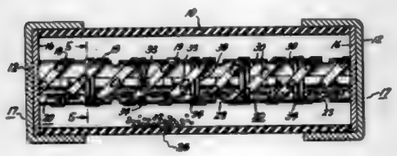


1. In a coil assembly including a bobbin and a multi-turn winding of coil wire disposed on the bobbin, the bobbin including a central spindle and a plurality of axially-spaced annular flanges extending from the spindle to define a plurality of respective slots between the axially-inner surfaces of adjacent pairs of said flanges and the winding being disposed in multiple layers in the respective said slots on the bobbin and being continuous between successive said slots in which it is disposed, the improvement wherein:
one flange of each pair of said flanges between which the winding is disposed including a cross-over groove formed in the axially inner surface thereof for receiving the coil wire which transitions from one said slot to another, said cross-over groove extending from a position near the radially-outer edge of the respective said flange in an inward direction substantially tangent to and to a position of substantial tangential coincidence with said bobbin spindle, the width and depth of said groove in the respective said flange being such as to receive the full diameter of the coil wire therewithin throughout the extent of said groove while also preserving the separating function of the flange, thereby to minimize or prevent contact of the coil wire transitioning into a slot with the radially outward windings in the respective slot and with the radially inward windings in the slot from which it is transitioning, and wherein the axial thickness of a said flange is greater than the axial width of a said slot, the diameter of the coil wire is many times less than said axial width of a respective said slot, said cross-over groove is directly axially open to said slot, and the depth of a said cross-over groove for a respective said slot at least near its outer end relative to the bobbin spindle is substantially as great as the axial width of the respective said slot such that the coil wire necessarily lies within said groove for substantially the full length of said groove.

4,638,283
EXOTHERMICALLY ASSISTED ELECTRIC FUSE
Gerhard Frind, Altamont; James J. Carroll, Clifton Park, both of N.Y.; John H. Van Noy, Pittsburgh, Pa.; John G. Leach, and Radha K. Ranjan, both of Hickory, N.C., assignors to General Electric Company, Schenectady, N.Y.
Filed Nov. 19, 1985, Ser. No. 799,711
Int. Cl.[4] H01H *85/04*
U.S. Cl. 337—162 **19 Claims**

1. An exothermically assisted electric fuse comprising:
a pair of spaced-apart electrically conductive terminals;

a fusible conductive element connected between said terminals;
an exothermic body disposed adjacent to said fusible element, said exothermic body formed from material which exothermically reacts when heated to a predetermined temperature;
a triggering circuit connected between said terminals independently of said fusible element for initiating an exothermic reaction in said exothermic body in response to a disruption of said fusible element;



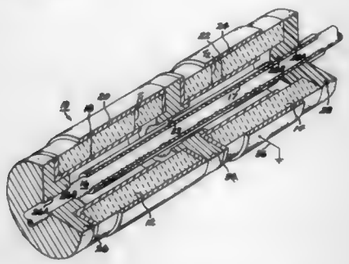
a containment body partially enclosing said exothermic body so as to confine the heat energy resulting from said exothermic reaction and to direct said heat energy in a predetermined direction; and
means for supporting said fusible element, said triggering circuit, and said containment body such that said exothermic body is in heat transfer relationship with both said fusible element and said triggering circuit so that upon disruption of said fusible element said heat energy generated by said exothermic reaction is directed by said containment body at said fusible element for causing additional disruptions therein.

4,638,284

TUBULAR VARISTOR ARRANGEMENT

Lionel M. Levinson, Schenectady, N.Y., assignor to General Electric Corp., Schenectady, N.Y.

Filed Dec. 5, 1984, Ser. No. 678,726
Int. Cl.⁴ H01C *7/10*
U.S. Cl. 338—21 **5 Claims**



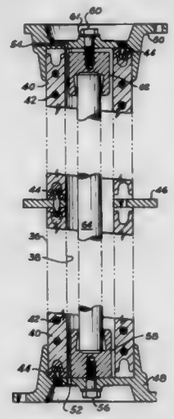
1. A tubular varistor arrangement, comprising:
(a) first and second generally tubular varistor sections, aligned with each other;
(b) a center conductor disposed, generally concentrically, within said first and second varistor sections;
(c) first and second generally tubular electrodes respectively adjoining the radially inner and the radially outer surfaces of said first varistor section; and
(d) third and fourth generally tubular electrodes respectively adjoining the radially inner and radially outer surfaces of said second varistor section;
(e) said first tubular electrode being electrically shorted to said center conductor, said second tubular electrode being electrically shorted to said third tubular electrode, and said fourth tubular electrode being electrically shorted to a reference potential conductor, whereby the varistor breakdown voltage between said center conductor and said reference potential conductor constitutes the cumulation of breakdown voltages of said first and second varistor sections.

4,638,285

SURGE SUPPRESSING RESISTOR FOR A DISCONNECT SWITCH

Donald L. Lott, Portland, Oreg., assignor to Siemens Energy & Automation, Inc., Atlanta, Ga.

Filed Feb. 28, 1985, Ser. No. 706,715
Int. Cl.⁴ H01C *7/10*
U.S. Cl. 338—21 **2 Claims**



1. A surge resistor, comprising:
at least first and second hollow, thermally conductive, electrically resistive bodies, each having an exterior surface and an interior surface for transferring heat from said body, said bodies being aligned along a common longitudinal axis;
a center flange positioned between the first and second resistor bodies;
a first end flange associated with the end of the first resistor body opposite the center flange;
a second end flange associated with the end of the second resistor body opposite the center flange; and
an electrically insulative stacking rod positioned along the longitudinal axis inside the first and second resistor bodies and extending between the first and second end flanges and releasably connected thereto forming a unitary structure wherein the end flanges, center flange and resistor bodies are electrically connected.

4,638,286

REACTIVE GAS SENSOR

Leo F. Nichols, Omaha, Nebr., assignor to Enron Corp., Houston, Tex.

Filed Mar. 26, 1985, Ser. No. 716,183
Int. Cl.⁴ H01L *7/00;* **H01B** *1/00*
U.S. Cl. 338—34 **8 Claims**

1. A reactive gas sensor which comprises:
(a) an electrically conductive polymer composite comprising:
(i) an inner layer of an electrically conductive polymer selected from the group consisting of polyacetylene, poly(phenylene), poly(phenylene sulfide) and poly(phenylene oxide),
(ii) intermediate layers of a polymer which exhibits a low degree of gas permeability, and
(iii) protective outer layers of a polymer which exhibits a low degree of moisture permeability, and
(b) means for measuring the resistance of the electrically conductive polymer.

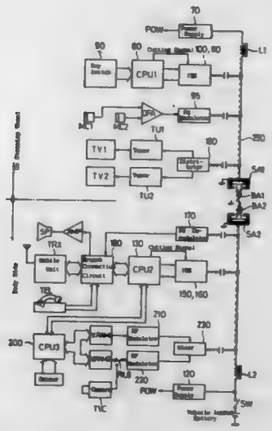
5. An electrically conductive polymer composite which comprises:
(a) an inner layer of an electrically conductive polymer selected from the group consisting of polyacetylene, poly(phenylene), poly(phenylene sulfide) and poly(phenylene oxide),
(b) intermediate layers of a polymer which exhibits a low degree of gas permeability, and
(c) protective outer layers of a polymer which exhibits a low degree of moisture permeability.

4,638,287

VEHICLE-LOADED DISPLAY DEVICE

Kazuyuki Umebayashi, and Takahiro Yamada, both of Ikenohata, Japan, assignors to Aisin Seiki Kabushikikaisha, Aichi, Japan

Filed Jan. 10, 1984, Ser. No. 569,682
Claims priority, application Japan, Mar. 1, 1983, 58-34263; Mar. 1, 1983, 58-34264
Int. Cl.⁴ G08G *1/00*
U.S. Cl. 340—22 **6 Claims**



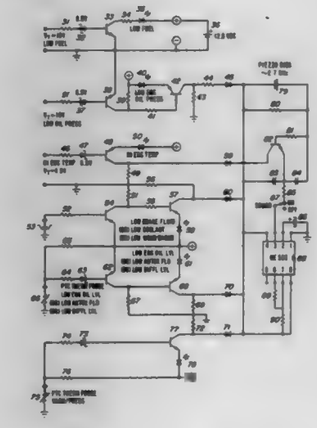
1. A vehicle-loaded display device mounted on a vehicle having a steering wheel, said device comprising:
transmission line means, including an electric conductor;
a control board disposed at a central portion of said steering wheel;
a supporting mechanism for supporting said control board in a stationary condition irrespective of turning of said steering wheel;
at least one two-dimensional display means incorporated in said control board;
electric filter means, incorporated in said control board, for transmitting a first electric signal having a frequency, within a desired frequency range, through said transmitting means;
a first demodulation means incorporated in said control board for demodulating the first electric signal, received from said electric filter means, into display information and then applying the display information to said two-dimensional display means;
a plurality of command switches incorporated in said control board;
a first modulation means incorporated in said control board for FSK modulating a predetermined input code signal and for outputting a second electric signal through said transmission line means;
a first electronic control device incorporated in said control board to be connected with said command switches and said first modulation means for generating said code signal in accordance with operation of said command switches and then applying the code signal to said first modulation means;
a second modulation means disposed on a vehicle body in a position mechanically separated from said steering wheel for modulating an information signal into the first electric signal having a frequency different from and an amplitude much less than that of said second electric signal output by said first modulation means and then applying the first electric signal to said first demodulation means;
a display information generating means for generating said display information and then applying the display information to said second modulation means;
a second demodulation means, including a Schmitt trigger, disposed on the vehicle body in a position mechanically separated from said steering wheel, for demodulating said second electric signal into said code signal;
a second electronic control device disposed on the vehicle body in a position mechanically separated from said steering wheel and electrically connected to said second demodulation means for instructing said display information generating means to generate the display information in accordance with said code signal; and
an electric interconnection means, disposed beneath said steering wheel, said electric interconnection means comprising direct current blocking means for electrically connecting said first demodulation means and said first modulation means to said second modulation means and said second demodulation means, respectively, alternating current blocking means for electrically connecting a power supply line of said control board to a vehicle-loaded power supply, and said transmission line means,
whereby said first and second electric signals having different amplitudes and frequencies, and said code signal which is FSK modulated, all may be transmitted over said transmission line means.

4,638,288

THERMAL LEVEL DETECTOR FOR CONDUCTIVE OR NONCONDUCTIVE LIQUIDS OR GASES

Matthew J. Remec, 2337 S. Fifth Ave., North Riverside, Ill. 60546

Filed Mar. 22, 1982, Ser. No. 197,005
Int. Cl.⁴ G08B *21/00*
U.S. Cl. 340—52 F **15 Claims**



1. A monitoring system comprising:
a thermistor (13) having a turnover temperature, said thermistor assuming a predetermined resistance when the tem-

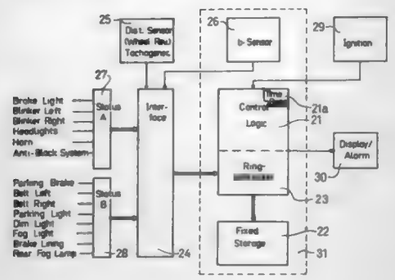
perature of said thermistor is above said turnover temperature;
means (15) for thermally coupling said thermistor to a liquid in a vessel when the level of said liquid is above a predetermined level, said liquid lowering the temperature of said thermistor below said turnover temperature when thermally coupled thereto;
means (10) for thermally insulating said coupling means from said vessel;
a tone generator (45, 59, 60, 70, 71, 79–90) for sounding a plurality of warning signals;
a warning circuit (9, 11, 12, 14, 15) directly connected to said thermistor and electrically isolated from said liquid for generating one of said warning signals indicating that the level of said liquid is below said predetermined level when said thermistor assumes said predetermined resistance; and
an annunciator (61–65, 67–69) for displaying said one warning signal.

4,638,289

ACCIDENT DATA RECORDER

Edmund Zottnik, Gerlingen, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

PCT No. PCT/DE84/00041, § 371 Date Oct. 23, 1984, § 102(e) Date Oct. 23, 1984, PCT Pub. No. WO84/03359, PCT Pub. Date Aug. 30, 1984
PCT Filed Feb. 24, 1984, Ser. No. 676,193
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306814; Feb. 17, 1984, 3405757
Int. Cl.[4] B60Q *11/00*; G01P *15/125*; G06F *15/50*
U.S. Cl. 340—52 H 14 Claims



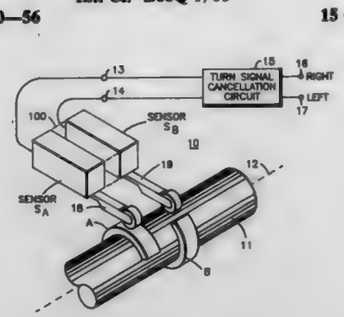
1. A method of recording and storing vehicle data representing events and conditions relating to an accident of a motor vehicle having wheels that normally revolve with longitudinal travel of the vehicle and which is subjected to at least one of longitudinal, transverse and rotational acceleration during an accident, comprising:
generating a wheel revolution signal corresponding to revolutions of a wheel of the vehicle;
providing an acceleration sensor having at least three cantilever mounted tongues each acting as a movable plate of a capacitor, and a fixed capacitor plate for each tongue which is fixed with respect to the vehicle, two of said tongues lying in a common plane transverse to the direction of longitudinal travel of the vehicle, and the remaining tongue lying in a plane extending in the direction of longitudinal travel, said movable plates being movable toward and away from said fixed plates when the vehicle is subjected to longitudinal, transverse and rotational accelerations to change capacitance between said fixed and movable plates, said sensor including an oscillator circuit for each set of fixed and movable plates which produces frequency variation with a capacitance for each set of fixed and movable plates, said frequency variations comprising acceleration signals which are indicative of longitudinal, transverse and rotational accelerations of the vehicle;
generating a plurality of additional data signals corresponding to additional conditions of the vehicle;
continuously generating central timing pulses indicative of the absolute passage of time;
subjecting said revolution signal and said acceleration signals to an analog-to-digital conversion to form digital revolution data and digital acceleration data corresponding to the revolution and acceleration signals;
writing the digital revolution data, the acceleration data and the additional data signals into a sequence of data storing locations of a fixed storage at intervals timed by the central timing pulses, the locations being disposed in a primary storage loop having a beginning and an end, with the data being stored in sequential locations from the beginning to the end of the primary loop and then back into the beginning of the primary loop;
generating a trigger event when an accident occurs; and
after the occurrence of the trigger event, writing additional revolution data, acceleration data and data signals which occur after the trigger event, into a secondary loop of storage locations having a new starting address in the fixed storage so that data remains stored in the primary loop and additional data after the trigger event becomes stored in the secondary loop.

4,638,290

ELECTRONIC TURN SIGNAL CANCELLATION APPARATUS

David J. Wagner, Lake Zurich, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 22, 1985, Ser. No. 736,874
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—56 15 Claims



1. An electronic turn signal cancellation apparatus comprising:
a shaft rotatable about an axis and rotated in accordance with the rotation of a vehicle steering wheel;
first and second means fixed to said shaft and rotatable therewith, said first and second means positioned at ditferent relative angular positions about said shaft axis with respect to each other and axially spaced apart from each other;
first and second sensor means located separate from and about said shaft and positioned axially spaced apart from each other and at fixed angular positions with respect to said shaft axis;
said first sensor means associated with and positioned for sensing the rotation of said first means about said axis and providing a first sensor output signal in accordance therewith, said first output signal being unresponsive to the rotation of said second means, and said second sensor means being associated with and positioned for sensing the rotation of said second means about said axis and providing, in response thereto, a second sensor output signal independent of said first output signal, said second output signal being unresponsive to the rotation of said first means, each of said first and second output signals, respectively, related to the rotational positions of said first and second means about said axis; and

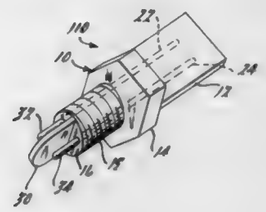
means for receiving said first and second output signals and providing separate right/left turn signal cancellation signals in accordance therewith.

4,638,291

SENSOR ASSEMBLY FOR A RADIATOR MOUNTED COOLANT LEVEL MONITORING SYSTEM

Boris Puscasu, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 13, 1984, Ser. No. 620,298
Int. Cl.[4] B60Q *1/00*; G01F *23/00*
U.S. Cl. 340—59 6 Claims



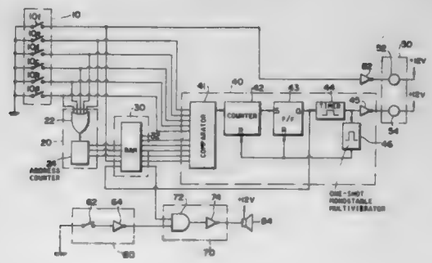
1. An electrically conductive liquid level sensor comprising, a pair of identical and parallelly spaced electrically conducting probes of equal length exposed along their lengths for contact by said liquid, an electrical insulator partition extending between and beyond the length of said probes so as to interrupt any direct conduction path therebetween, said probes are configured for connection to a source of electrical potential, whereby an electrically conductive path is established between said probes around said insulator partition only when said probes are immersed in said conductive liquid.

4,638,292

THEFT PREVENTION SYSTEM IN AN AUTOMOTIVE KEYLESS ENTRY SYSTEM WITH AUTOMATIC DOOR LOCKING

Haruo Mochida, and Hirotoshi Namazue, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited and Kokusan Kinzoku Kogyo, both of, Japan

Filed Aug. 24, 1982, Ser. No. 411,096
Claims priority, application Japan, Aug. 26, 1981, 56-132565
Int. Cl.[4] B60R *25/00*; G06F *7/04*
U.S. Cl. 340—63 9 Claims



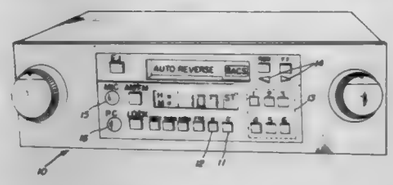
1. A theft prevention system in an automotive keyless entry system comprising:
a vehicle door-lock mechanism:
an actuator associated with said door-lock mechanism to operate the door-lock mechanism to a first, door-locked, position and to a second, door-unlocked, position;
an input unit including a plurality of push buttons respectively representing preset values;
first means, comprising a preselected door locking push button in said input unit, for operating said actuator to operate said door lock-mechanism to said first position when said door locking push button is depressed;
second means for operating said actuator to operate said door-lock mechanism to said second position;
third means, associated with said first and second means, for continuously producing a first signal when said actuator is operated to maintain said door-lock mechanism at said first position in response to depression of said door locking push button, said third means being responsive to operation of said first means to produce said first signal and being responsive to operation of said second means to stop producing said first signal;
fourth means for producing a second signal in response to opening of the vehicle door; and
fifth means for producing a theft preventive alarm upon simultaneous occurrence of both of said first and second signals.

4,638,293

BURGLAR ALARM BUILT IN CAR STEREO

Byung-Woo Min, 970 S. Kingsley Dr. #310, Los Angeles, Calif. 90006

Filed Aug. 20, 1984, Ser. No. 642,431
Int. Cl.[4] B60R *25/00*
U.S. Cl. 340—63 19 Claims



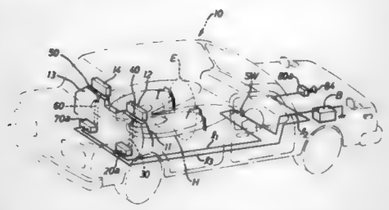
1. A car alarm system comprising:
(a) a radio/tape player device within the car including speakers for generating audio sounds, an electronic control circuit and a plurality of function selector switches;
(b) alarm circuit means for sensing alarm conditions within said car and generating alarm signals in response thereto, said alarm circuit means being programmable by said function selector switches;
(c) mode selection circuit means for operatively interfacing said electronic control circuit and said function selector switches in a normal mode, and operatively interfacing said alarm circuit means and said function selector switches in an alarm mode, said mode selection circuit means being responsive to coded signals generated by the actuation of predetermined ones of said function selector switches to change between the normal and alarm modes; and
(d) disarming means for said alarm circuit means including,
1. input circuit means for inputting multi-bit disarming codes generated by sequential actuation of a plurality of said function selector switches,
2. memory means for storing multi-bit codes input by said plurality of said function selector switches during a programming mode of said disarming means; and
3. equality detector means for determining when a multi-bit code input by the sequential action of said plurality of function selector switches equals the multi-bit code stored in said memory means, and when equal, generating a disarm signal to said alarm circuit means to change said system to said normal mode.

4,638,294

UNAUTHORIZED ENTRY DETECTION SYSTEM

Takashi Sakurai, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 23, 1984, Ser. No. 633,443
Claims priority, application Japan, Jul. 25, 1983, 58-135486
Int. Cl.⁴ B60R *25/00*; G08B *13/18*
U.S. Cl. 340—63 **11 Claims**



1. An unauthorized entry detection system for an automotive vehicle having a passenger compartment of a given size, comprising:

oscillator means, adapted to be disposed in said vehicle, for generating an oscillation signal having a predetermined frequency corresponding to said passenger compartment size;

first antenna means, adapted to be disposed within said passenger compartment and coupled to said oscillator means, for generating an electromagnetic wave inside said passenger compartment to cause said passenger compartment to resonate as a cavity resonator at said predetermined frequency, said electromagnetic wave corresponding to said oscillation signal;

second antenna means, adapted to be disposed in said passenger compartment, for generating an induced voltage in response to a magnetic component of said electromagnetic wave; and

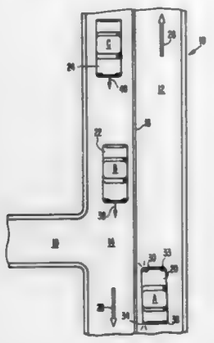
detecting means, coupled to said second antenna means, for detecting a change in said induced voltage and providing a detection signal corresponding to said change.

4,638,295

VEHICULAR MOVEMENT INDICATOR SAFETY SYSTEM

Robert B. Middlebrook, 47 Hemlock Cir., Princeton, N.J. 08540, and W. Bard Turner, 7 Bryant Rd., Lexington, Mass. 02173

Filed May 7, 1984, Ser. No. 607,954
Int. Cl.⁴ B60Q *1/34*
U.S. Cl. 340—73 **2 Claims**



1. A turn signal apparatus for use on a motor vehicle comprising:

turn signal lamp means with a predetermined flashrate;

automobile turn indicator switch means;

front wheel directional sensor means for sensing when at least one of the front wheels of said vehicle is turned;

vehicle motion commitment sensor means for sensing the commitment of said vehicle to motion;

vehicle speed detection means for detecting when the speed of said motor vehicle exceeds a predetermined speed;

brake sensor means for sensing when the brakes of said vehicle are applied;

microprocessor means connected to said automobile turn indicator switch means, said front wheel directional sensor means, said vehicle motion commitment sensor means, said brake sensor means, and said vehicle speed detection means for determining when said motor vehicle is unambiguously committed to executing a turn; and,

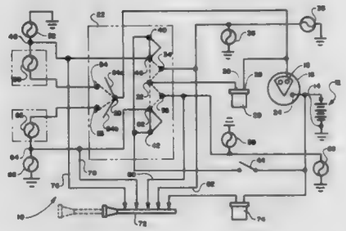
signal lamp timing means for increasing the flash rate of said predetermined flash rate in response to said microprocessor means.

4,638,296

DIRECTIONAL SIGNAL SWITCH AND ALTERNATING LIGHTING OF REAR LAMPS

William A. Heidman, Jr., 4604 Robbins, San Diego, Calif. 92122

Continuation-in-part of Ser. No. 139,789, Apr. 14, 1980, Pat. No. 4,354,174. This application Jun. 11, 1982, Ser. No. 387,457
Int. Cl.⁴ B60Q *1/46*
U.S. Cl. 340—83 **12 Claims**



1. A turn signal switching circuit for an automotive vehicle, said vehicle having an ignition switch with an output terminal, first and second turn signal and brake lamp circuits each having at least one front turn signal lamp, rear turn signal and brake lamp on opposite sides of said vehicle, each of said lamps have first and second element connections comprising:

a flasher element having an input connection connected to the output terminal of said ignition switch and an output connection;

a common electrical ground;

a battery having a positive and negative terminal, said positive terminal connected to the input terminal of said ignition switch and said negative terminal connected to said common electrical ground;

a turn signal switch interconnected between the first element connection of said front and rear turn signal lamps and brake lamps circuits and the output connection of said flasher element for selectively connecting one of said turn signals and brake lamp circuits to the output connection of said flasher element;

switching means mechanically interconnected to said turn signal switch for operation therewith and electrically interconnected between the output terminal of said ignition switch and the second terminal of the rear turn signal lamp on each side of said vehicle; and

said second element connection of said brake lamp and front turn signal lamp on each side of said vehicle is connected to said common electrical ground,

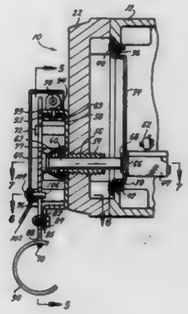
said turn signal switch and mechanically interconnected switching means acting, when operated for lamp illumination on a selected side of said vehicle to illuminate said rear turn signal lamp alternately with illumination of said brake, and front turn signal lamps on said selected side of said vehicle.

4,638,297

REMOTE SIGNALING BOX

Rolland R. Roots, St. Louis, Mo., assignor to Killark Electric Manufacturing Company, St. Louis, Mo.

Filed Aug. 20, 1984, Ser. No. 642,442
Int. Cl.⁴ G08B *25/00*; H01H *27/10*
U.S. Cl. 340—304 **20 Claims**



1. A remote control assembly for a signaling box of the kind defined by an enclosure including a cover plate and having a switch located within the enclosure and operable by a spring-loaded push button mounted on the switch, comprising:

a door,

means for mounting the door on the cover plate for pivotal movement of the door between a closed position and an open position,

means for preventing operation of the switch, said means being affixed to the door so that when the door is closed, the switch is prevented from operating and when the door is open, the switch can be operated, and means for remote activation of the spring-loaded push button comprising a plunger, means to mount the plunger so that it extends through the cover plate in alignment with the push button and is slidable between first and second positions, whereby the plunger depresses the push button in the first position of the plunger and releases the push button in the second position of the plunger, the means for preventing operation of the switch comprising a barrier for blocking movement of the plunger to the second position when the door is closed.

4,638,298

COMMUNICATION SYSTEM HAVING MESSAGE REPEATING TERMINALS

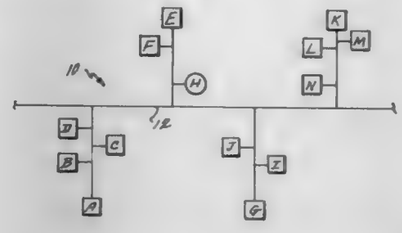
Jan L. Spiro, Santa Clara, Calif., assignor to Telautograph Corporation, Los Angeles, Calif.

Filed Jul. 16, 1985, Ser. No. 756,097
Int. Cl.⁴ H04M *11/04*
U.S. Cl. 340—827 **37 Claims**

1. A system for communicating on a single bus formed by a power distribution network, said system comprising a plurality of units joinable to the network, including at least three terminal units, each terminal unit being connectable directly with at least one external communication device, such as an input or output device, and having when connectable to an input device, means responsive to a message received therefrom for generating a message to be received by another terminal unit, and when connectable to an output device, means responsive to a message received from another terminal unit for transmitting the message to the output device, at least a first one of said terminal units further comprising:

means for receiving on the network a message transmitted from a second terminal unit;

means for determining whether the message is intended for a third terminal unit; and



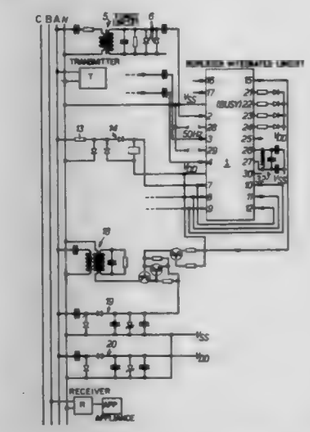
means for retransmitting on the network such a message intended for a third terminal unit.

4,638,299

ELECTRICAL APPLIANCE CONTROL

David C. Campbell, Fife, Scotland, assignor to Pico Electronics Limited, Fife, Scotland

Filed Mar. 28, 1983, Ser. No. 479,397
Claims priority, application United Kingdom, Apr. 6, 1982, 8210198
Int. Cl.⁴ H04M *11/04*
U.S. Cl. 340—310 A **10 Claims**



1. A repeater circuit for repeating a digital control message transmitted on an electical multi-phase power main system, the message including a sequence of digital words with the words transmitted in respective time intervals spaced apart by intermediate time intervals which are at least as long as said respective time intervals, and each word conveyed by a phase of the main system having bits transmitted in synchronism with the voltage zero-crossings of that phase, said multi-phase power main system including a first section from which said words are to be received and a second section onto which said words are to be repeated, the repeater circuit comprising:

first zero-crossing detection means electrically coupled to said first multi-phase power main section to detect the moments substantially at which the voltages on the phases of said section pass through zero;

data input means working cooperatively with said first multi-phase power main section to receive therefrom the digital words conveyed by the phases of said section;

storage means coupled to said data input means and con-

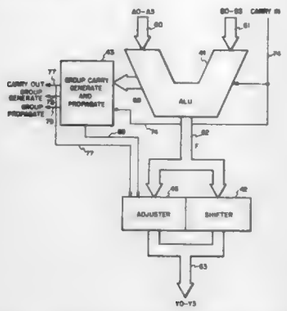
trolled by said first zero-crossing means for storing the bits of a word received in said respective time intervals;
second zero-crossing detection means electrically coupled to said second multi-phase power main section to detect the moments substantially at which the voltages on the phases of said second section pass through zero;
time slot defining means working cooperatively with both detection means for defining, in dependence upon said moments detected by the detection means, output time slots synchronized with the phases of said second section for the transmission of the bits of said words in said intermediate time intervals; and
output means electrically connected to the storage means for conveying the bits of a word stored in the storage means onto the phases of said second section in the defined output time slots in said intermediate time intervals.

4,638,300

CENTRAL PROCESSING UNIT HAVING BUILT-IN BCD OPERATION

Michael J. Miller, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 10, 1982, Ser. No. 376,317
Int. Cl.⁴ H03K *13/24*; G06F *5/006*
U.S. Cl. 340—347 DD **13 Claims**



1. In a circuit for converting binary digital signals into BCD digital signals by correcting and shifting said binary signals iteratively, an ALU for correcting said binary digital signals comprising:
recognition combinatorial logic means responsive to said binary digital signals for generating an enabling signal,
correction combinatorial logic means responsive to said enabling signal and said binary digital signals for generating correction signals,
half adder means responsive to said binary digital signals and said correction signals for generating corrected signals and
additional half adder and logic means responsive to said binary digital signals, said additional half adder and logic means generating true and complementary signals of said binary signals for said recognition logic means and said correction means, and true signals for said half adder means.

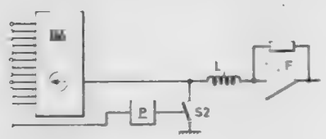
4,638,301

STRAY PULSE ELIMINATING DEVICE

Mats P. Akerlund, and Tare J. Strömbäck, both of Järfälla, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 6, 1984, Ser. No. 638,135
Claims priority, application Sweden, Aug. 5, 1983, 8304290
Int. Cl.⁴ H03K *5/159*
U.S. Cl. 340—347 CC **5 Claims**

1. A device for eliminating stray pulses occurring at the output of a digital-to-analogue converter by preventing said stray pulses from reaching a connected circuit for a time period during which the pulse is predicted to occur, wherein said device comprises an inductor serially connected between the output of the digital-to-analogue converter and the connected circuit and a switch connected between the output of the



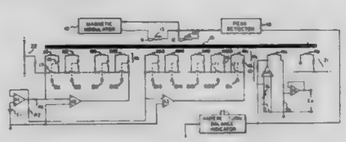
digital-to-analogue converter and a reference level, and means for operating said switch to short-circuit the output of the digital-to-analogue converter to the reference level for the time period during which a stray pulse is predicted to occur.

4,638,302

DIGITAL-TO-ANALOG CONVERTER

Eddy So, and William J. M. Moore, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited-Societe Canadienne des Brevets et d'Exploitation Limitee, Ottawa, Canada

Filed Aug. 15, 1985, Ser. No. 766,136
Int. Cl.⁴ H03K *13/02*
U.S. Cl. 340—347 DA **3 Claims**



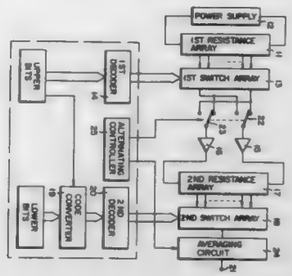
1. A converter for converting a series of digital input bits to an analog output, comprising
(a) magnetic core means,
(b) primary and secondary ratio windings coupled with the core means,
(c) the primary winding being divided into at least two sections,
(d) means for passing a first predetermined primary direct current through a first of said sections,
(e) means controlled by a first group of the more significant input bits for varying the number of turns of said first section traversed by the first current,
(f) means for passing a second predetermined primary direct current through a second of said sections,
(g) means controlled by a second group of less significant input bits for varying the number of turns of said second section traversed by the second current,
(h) means for passing a secondary direct current through the secondary winding, including means for varying said secondary current proportionally with the number of turns of the first primary section traversed by the first primary current,
(i) means coupled with the core means for detecting a net ampere-turns unbalance of the primary and secondary currents in said ratio windings,
(j) means controlled by said detecting means for further varying the secondary current to tend to bring said unbalance to zero, and
(k) an analog output proportional to the secondary current.

4,638,303

DIGITAL-ANALOG CONVERTER

Eiji Masuda, and Shigemi Sakamoto, both of Kawasaki, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 528,972, Sep. 2, 1983, abandoned. This application Oct. 28, 1985, Ser. No. 792,181
Claims priority, application Japan, Jul. 9, 1982, 57-155521
Int. Cl.⁴ H03K *13/02*
U.S. Cl. 340—347 DA **8 Claims**



1. A digital analog converter, coupled to a reference voltage, for receiving a multi-bit digital signal and producing an analog value, said converter comprising:
a first resistor array consisting of a plurality of resistors connected in series to divide said reference voltage into M output voltages, where M is a positive integer;
a first switch array for receiving said output voltages of said first resistor array to select two adjacent ones of said output voltages in accordance with a first number of upper bits of said digital signal;
a first select switch for outputting one of said two adjacent output voltages selected by said first switch array;
a second select switch for outputting the other of said two adjacent output voltages selected by said first switch array;
two buffer amplifiers, coupled to said select switches, each receiving a different one of the two selected output voltages from said select switches in accordance with the states of said first and second select switches;
a second resistor array consisting of a plurality of resistors connected in series to receive said output voltages from said buffer amplifiers and divide said output voltages into N voltages, where N is a positive integer;
a second switch array for selecting one of said output voltages from said second resistor array in accordance with the contents of a second number of lower bits of said digital signal;
an averaging circuit including means for receiving the selected output voltage from the second switch array and obtaining an average of said selected output voltage; and
an alternating controller for synchronously controlling said select switches and said averaging circuit.

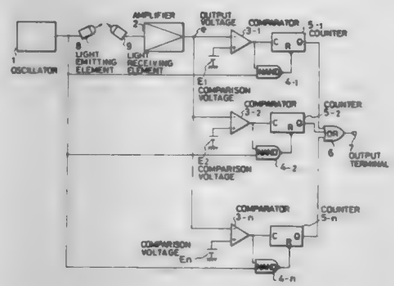
4,638,304

ENVIRONMENTAL ABNORMALITY DETECTING APPARATUS

Tetsuo Kimura, Tokyo; Seiichi Tanaka, Chiba, and Takasi Suzuki, Tokyo, all of Japan, assignors to Nittan Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1984, Ser. No. 680,768
Claims priority, application Japan, Dec. 13, 1983, 58-233692
Int. Cl.⁴ G08B *23/00*, *17/10*
U.S. Cl. 340—500 **11 Claims**

10. A system for detecting an environmental paramter, comprising the steps of:
means for detecting analog information representing changes in an environmental parameter and for converting the analog information to an electrical signal;
means for comparing a magnitude of the electrical signal to at least first and second reference levels and for providing respective first and second outputs given respective desired comparisons, the first reference level being different than the second reference level; and



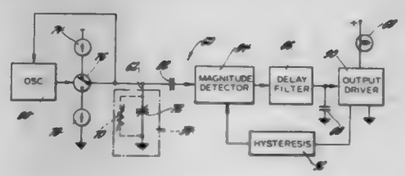
timing circuit means connected to receive the first and second outputs and for providing a control output after a predetermined time, said predetermined time having a first value in response to the first output and a second different value in response to the second output so that the predetermined time is dependent upon the magnitude of the detected analog information.

4,638,305

APPARATUS FOR DETECTING WATER IN FUEL

Stephen J. Sutton, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 22, 1985, Ser. No. 714,887
Int. Cl.⁴ G08B *21/00*; H01H *29/00*
U.S. Cl. 340—620 **3 Claims**



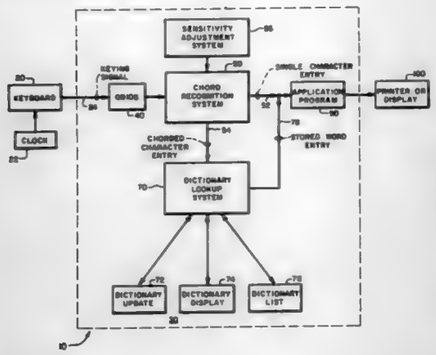
1. Apparatus for detecting water in a fuel container wherein the fuel has a tendency to deposit an insulating coating on surfaces it contacts, comprising
a conductive probe for location in a conductive fuel container at a level to contact water that may collect in the container, so that the probe when contacting the water in the absence of an insulating coating, will be resistively coupled to the container and when contacting the water while covered with an insulating coating will be capacitively coupled to the container, and
a detection circuit ccupled to the probe and having means responsive to low probe resistance or high probe capacitance for generating an output signal indicative of water contact with the probe.

4,638,306

KEYBOARD ENTRY SYSTEM

Philip Rollhaus, Chicago, Ill., and Yukio Endo, Thornton, N.H., assignors to Quixote Corporation, Chicago, Ill.

Filed Jan. 30, 1984, Ser. No. 574,894
Int. Cl.[4] G06F *3/02*; G08C *9/00*
U.S. Cl. 340—365 R **22 Claims**



1. A keyboard entry system for a selected language, said system comprising:

a keyboard comprising a plurality of keys, said plurality of keys comprising a set of letter keys comprising a respective key for each letter of said selected language;

first means, responsive to the plurality of letter keys, for generating keying signals in response to activation of the letter keys, each keying singal characterized by a respective activation time;

second means, responsive to the first means, for generating output signals in response to the keying signals, said second means comprising:

means for classifying a plurality of keying signals as a key chord in the event the respective activation times satisfy predetermined criteria, said classifying means comprising;

means for setting a time threshold value prior to initiation of a typing session in said selected language;

means for comparing an elapsed time separating the activation times of a pair of the keying signals included in the plurality of keying signals with said time threshold value; and

means for designating said plurality of keying signals as a key chord in the event a selected one of the elapsed time and the time threshold value is greater than the other;

means for storing a list of stored texts, each corresponding to a respective chord;

means, responsive to the key chord for utilizing the keying signals associated with the key chord to select the one of the stored texts in the list of stored texts which correspond to the key chord;

means for setting the output signal to correspond to the selected one of the stored text and

means for setting the output signal to correspond to the letters corresponding to the activated letter keys in the event the respective activation times fail to satisfy said criteria.

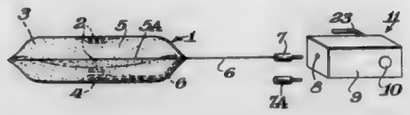
4,638,307

PATIENT POSITION MONITORING SYSTEM

Willson C. Swartout, 31 Phoenix Ave., Newark, Del. 19711

Filed Oct. 15, 1985, Ser. No. 787,102
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—666 **8 Claims**

1. Apparatus for issuing an alarm when a weight is lifted from a pad switch assembly, said apparatus comprising a compressible pad, a thin sealed reed switch affixed on one side of said pad, and a magnet affixed on the opposite side of said pad in approximate close parallel registry with said reed switch, said reed switch being connected in an electrical circuit containing a power source and an alarm issuing means such that when said pad is compressed by a weight causing said magnet



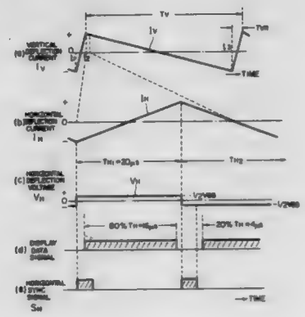
to be in closer proximity to said switch, the circuit is open and no alarm issues, but when said weight is lifted and said pad decompresses causing said magnet to move away from close proximity to said reed switch, the circuit closes and said alarm issues.

4,638,308

CRT PICTURE DISPLAY APPARATUS

Hiroshi Kuwabara, Hitachi; Jushi Ide, Mito; Yasuji Kamata, Hitachi, and Kenkichi Yamashita, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 26, 1984, Ser. No. 654,390
Claims priority, application Japan, Sep. 28, 1983, 58-178041
Int. Cl.[4] G09G *1/08*
U.S. Cl. 340—736 **5 Claims**



1. A CRT display apparatus for the raster scan type comprising:

a cathode ray tube for raster scanning;

a horizontal deflection circuit for supplying a horizontal deflection current to a horizontal deflection coil of said cathode ray tube;

a vertical deflection circuit for supplying a vertical deflection current to a vertical deflection coil of said cathode ray tube in synchronism with a vertical sync signal; and

display data generator means for supplying data to be displayed to said cathode ray tube,

said horizontal deflection circuit producing as said horizontal deflection current a triangular waveform current having one period which is twice a horizontal scanning period, said triangular waveform current having a series of triangular waveforms each having a first portion which increases in response to a horizontal sync signal at a predetermined inclination and a second portion which decreases in response to the next horizontal sync signal at said predetermined inclination and continues until the further next horizontal sync signal, whereby the period for a scanning line to proceed from lefthand end to righthand end of a raster on a screen of said cathode ray tune is made substantially equal to a period for the next scanning line to proceed from righthand end to lefthand end,

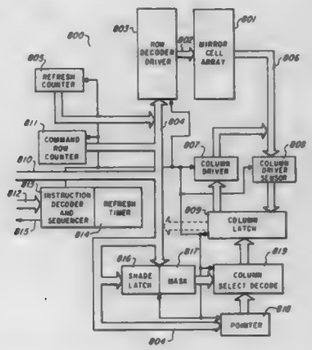
and wherein data is displayed during both of these periods, said horizontal deflection circuit including two voltage divider elements connected in seri s to a DC power supply, and a series connection of two switching elements connected in parallel with said two voltage divider elements, said horizontal deflection coil being connected between a junction of said two voltage divider elements and a junction of said two switching elements, and said two switching elements being responsive to the horizontal sync signal to be turned on alternately.

4,638,309

SPATIAL LIGHT MODULATOR DRIVE SYSTEM

Granville E. Ott, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 8, 1983, Ser. No. 530,329
Int. Cl.[4] G09G *3/20*
U.S. Cl. 340—752 **12 Claims**



1. A spatial light modulating device comprising:

a plurality of row conductors;

a plurality of column conductors arranged transversely to said plurality of row conductors and extending thereacross to define a plurality of intersections between respective row and column conductors;

a plurality of charge storage cells respectively disposed at each of the intersections of said row conductors and said column conductors, each charge storage cell having a light modulator cell associated therewith as so to collectively define a matrix array of charge storage cells and associated light modulator cells arranged in rows and columns, the light modulation of each of said light modulator cells corresponding to the charge stored in said associated charge storage cell;

row decode means connected to said row conductors for receiving a digital row signal and coupling a predetermined voltage to a selected one of said row conductors corresponding to said digital row signal, thereby selecting one of said rows;

column drive means connected to said column conductors for receiving a digital column signal of more than one bit for each column conductor and generating a column drive signal on each of said column conductors proportional to said corresponding digital column signal, thereby storing a charge corresponding to said column drive signal in the charge storage cells of said selected row;

column sensor means connected to said column conductors for sensing the charge stored in the charge storage cells of said selected row and generating a digital column signal of more than one bit for each column conductor;

column latch means connected to said column drive means and to said column sensor means for storing therein the digital column signals generated by said column sensor means and for applying the digital column signals stored therein to said column drive means;

a refresh counter connected to said row decode means for storing therein a digital row signal corresponding to one of said plurality of row conductors;

sequencing means connected to said row decode means, said refresh counter, said column drive means, said column sensor means and said column latch means for periodically enabling the following automatic refresh sequence:

(1) applying the digital row signal stored in said refresh counter to said row decode means for selecting a row conductor corresponding to said digital row signal;

(2) enabling said column sensor means to sense the charge stored in each charge storage cell in said selected row and generate a corresponding set of digital column signals;

(3) storing said digital column signals in said column latch means;

(4) applying said digital column signals stored in said column latch means to said column drive means, thereby causing said column drive means to store a charge in each charge storage cell in said selected row proportional to said corresponding digital column signal; and

(5) incrementing the digital row signal stored in said refresh counter to correspond to the next sequential row conductor;

command input means connected to said sequencing means for receiving a multibit command input; and

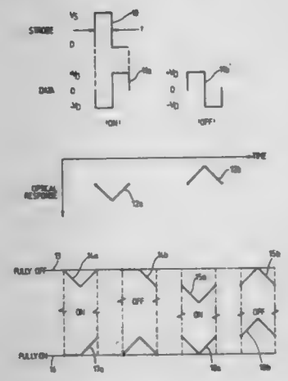
said sequencing means further including means for alternately enabling said automatic refresh sequence and enabling a command sequence corresponding to a received command input.

4,638,310

METHOD OF ADDRESSING LIQUID CRYSTAL DISPLAYS

Peter J. Ayliffe, Bishops Stortford, England, assignor to International Standard Electric Company, New York, N.Y.

Filed Sep. 6, 1984, Ser. No. 647,567
Claims priority, application United Kingdom, Sep. 10, 1983, 8324304
Int. Cl.[4] G09G *3/36*
U.S. Cl. 340—805 **14 Claims**



1. A method of addressing a matrix array type liquid crystal display device with a ferro-electric liquid crystal layer whose pixels are defined by the areas of overlay between the members of a first set of electrodes on one side of the liquid crystal layer and the members of a second set of electrodes on the other side of the layer, and whose pixels exhibit optical properties when selectively operated to fully on and fully off states, wherein strobing pulses are applied serially to the members of the first set while data pulses are applied in parallel to the second set in order to address the cell line by line, and wherein the waveform of a data pulse is balanced bipolar and at least twice the

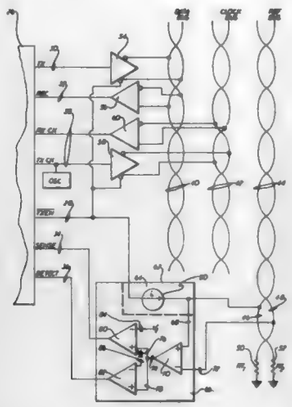
duration of a strobing pulse, and wherein the balanced bipolar data pulse when applied to a non-addressed pixel in other than a fully on state or fully off state restores such pixel to its original condition at the end of the data pulse.

4,638,311

APPARATUS FOR PROVIDING MASTERLESS COLLISION DETECTION

Eugene P. Gerety, Wolcott, Conn., assignor to ITT Corporation, New York, N.Y.

Filed Nov. 13, 1984, Ser. No. 670,701
Int. Cl.[4] H04H *1/00*
U.S. Cl. 340—825.06 **20 Claims**



1. An apparatus for providing masterless collision detection in a communication network having a plurality of nodes each being capable of transmitting data; said apparatus comprising:
a data transmission bus, said data transmission bus being common to all of said nodes;
a collision detection reference bus, said collision detection reference bus being common to all of said nodes and distinct from said data transmission bus;
means, associated with each said node, for injecting a current onto said collision detection reference bus;
means, associated with each said node, for monitoring the current on said collision detection reference bus, said monitoring means providing a signal indicative of said current said current monitoring means including a comparator having one input thereto connected to said collision detection reference bus and the other input connected to a preselected reference, said comparator generating a logic level signal only when at least two of said current injecting means are operative; and
means, associated with each said node and responsive to said signal, for providing a signal for controlling the injection of data onto said data transmission bus.

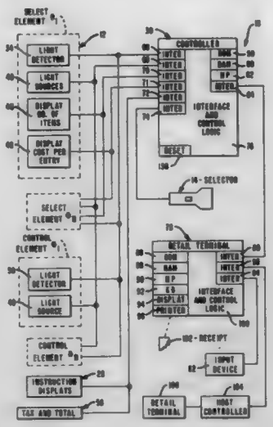
4,638,312

ORDER ENTRY SYSTEM INCLUDING AN INTERACTIVE MENU DISPLAY

Bruce A. Quinn, Beavercreek, and Scott N. Barton, Dayton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 25, 1985, Ser. No. 791,629
Int. Cl.[4] H04Q *7/00*; E04H *3/04*
U.S. Cl. 340—825.35 **13 Claims**

1. A data entry system comprising:
a display having data entry elements and control elements positioned on said display and lighting means to light up said data entry and control elements when selected; each said data entry element and control element having a detector associated therewith; said display also having a first display area for indicating parameters such as the number of units of said data entry elements selected;
an aiming selector having means for emitting first and second light signals directed at said data entry and control elements which are to be selected;
control means for controlling the operation of said data entry system;
said control means including means coupled to said detectors for producing first and second outputs in response to



said first light signals and said second light signals, respectively, falling on said detectors;
said first output being used by said control means and said lighting means to give a first indication that said aiming selector is directed to a particular one of said data entry or control elements, and said second output being used by said control means and said lighting means to give a second indication that said particular one of said data entry or control elements is selected for entry into said data entry system.

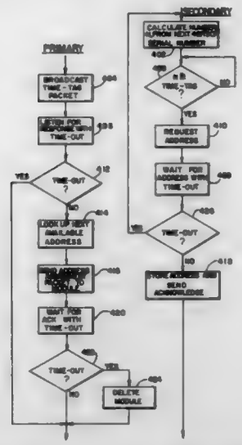
4,638,313

ADDRESSING FOR A MULTIPOINT COMMUNICATION SYSTEM FOR PATIENT MONITORING

Glen R. Sherwood, Jr., Hillsboro; James B. Moon, and Gordon A. Moyle, both of Portland, all of Oreg., assignors to Space-Labs, Inc., Chatsworth, Calif.

Filed Nov. 8, 1984, Ser. No. 669,289
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.52 **6 Claims**

1. A method of synchronizing to a multipoint communication system wherein a primary station repeatedly polls a plurality of secondary stations coupled together over a serial data bus comprising the steps of:
dynamically assigning an address to a new secondary station upon coupling to said system, said step of dynamically assigning further comprising the steps of:
broadcasting time-tags to all of said secondary stations simultaneously during an address initialization phase at the beginning of each poll interval;
automatically determining a first time-tag count number of poll intervals for each of said new secondary stations upon coupling to said system;
waiting said time-tag count number of poll intervals to choose a poll interval for requesting an address assignment from said primary station during said address initialization phase of said chosen poll interval;
requesting said address assignment, and



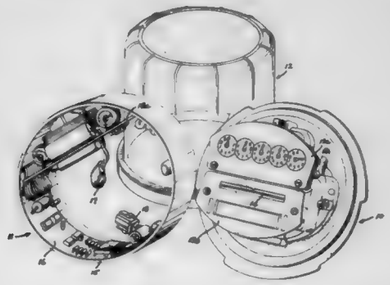
assigning an address to said secondary station in response to said request.

4,638,314

METER TRANSPONDER HYBRID

Franz Keller, Boston, Mass., assignor to American Science and Engineering, Inc., Cambridge, Mass.

Filed Jan. 12, 1984, Ser. No. 570,118
Int. Cl.[4] G08C *9/06*
U.S. Cl. 340—870.02 **5 Claims**



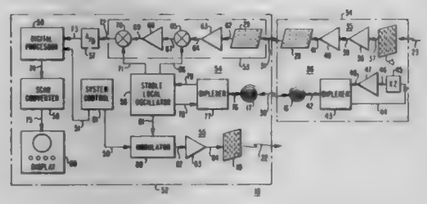
1. In an energy consumption measuring system of the type comprising a standard watt-hour meter consisting of a meter movement mounted within a standard enclosing cover, said meter movement being connected to power lines and having a metallic disc mounted for rotation at a rate related to the consumption by a consumer of energy supplied over the said power lines, a pulse initiator located within said standard meter cover and responsive to rotation of said disc for generating pulses indicative of the said energy consumption, and a transponder for effecting two-way communication between said watt-hour meter and a remote central location, said transponder including means for receiving signals transmitted from a remote central location over said power lines and means for transmitting metering information to said remote central location over said power lines, said transponder further including means responsive to said pulses generated by said pulse initiator for providing the metering information that is to be transmitted over said power lines upon receipt of a signal over said power lines from the remote central location, the improvement wherein said transponder comprises a circuit board of substantially annular configuration which is disposed externally of and in at least partially surrounding relation to said standard watt-hour meter movement within said standard cover of said meter, said transponder comprising a plurality of electrical components which are mounted on said annular circuit board in spaced relation to one another adjacent the exterior of the meter movement and within said standard meter cover, coupling means for connecting selected ones of said transponder electrical components to said pulse initiator, and further coupling means for connecting other selected ones of said transponder electrical components to said power lines, said transponder and each of said coupling means being located entirely within said standard cover.

4,638,315

ROTOR TIP SYNTHETIC APERTURE RADAR

Robert S. Raven, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 20, 1984, Ser. No. 622,516
Int. Cl.[4] G01S *13/90*
U.S. Cl. 342—5 **11 Claims**



1. A rotor tip synthetic aperture radar comprising:
a rotor operable to rotate;
a first receiver positioned at a first location in said rotor for receiving target reflected microwave signals;
a transmitter positioned at a second location including means for generating and transmitting microwave signals towards a target;
said first receiver including means for amplifying said received microwave signals and for retransmitting said amplified microwave signals to a second receiver positioned at said second location;
said second receiver including means for extracting information from said amplified microwave signals;
first means for generating a pilot signal having a first predetermined frequency positioned at said second location and for transmitting said pilot signal to a second means positioned at said first location for receiving said pilot signal, multiplying its frequency and retransmitting said multiplied pilot signal to said second location;
third means at said second location for receiving and multiplying the frequency of said received pilot signal to provide a first signal;
fourth means for mixing said first signal with a second predetermined frequency to provide a second signal; and
fifth means for mixing said second signal with said amplified microwave signals received by said second receiver to cancel first order doppler frequency shifts of said amplified microwave signals in passing from said first location to said second location.

4,638,316

RADAR REFLECTING ELECTROLYTES

Theodore D. Austin, Landover, and John P. Consaga, Clinton, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 30, 1973, Ser. No. 408,973
Int. Cl.[4] G01S *7/38*
U.S. Cl. 342—14 **8 Claims**

1. A method for reflecting electromagnetic energy which

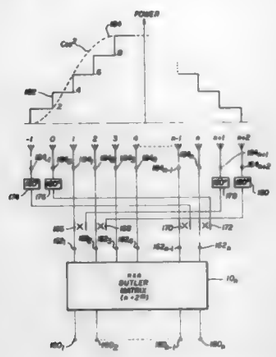
comprises the step of imposing in the path of the electromagnetic energy a solution of a solvent and an organic electrolyte, said solution having a dielectric constant of at least ninety at 25° C.

4,638,317

ORTHOGONAL BEAM FORMING NETWORK

Gary E. Evans, Trappe, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 19, 1984, Ser. No. 622,300
Int. Cl.[4] H01Q *03/40*
U.S. Cl. 342—373 **20 Claims**



1. A method of expanding an orthogonal beam forming matrix, having a first plurality of antenna elements ports, into a matrix having a second plurality of ports, said second plurality of ports being coupled to a respective number of antenna elements greater in number than said first plurality of ports, comprising the steps of:

isophase coupling said first plurality of ports to a like number of respectively positioned ports of said second plurality of ports;

coupling at least one port of said first plurality of ports to a corresponding numbered additional port of said second plurality of ports adjacent the isophase coupled ports; and

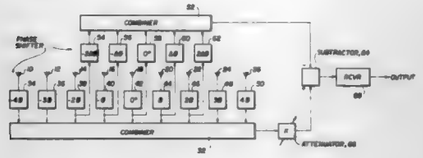
effecting an additional 180° phase shift of signals coupled between said at least one port and said additional port.

4,638,318

SMALL ANGULAR BEAMWIDTH ANTENNA SYSTEM

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 26, 1983, Ser. No. 526,735
Int. Cl.[4] H04B *15/00*; H01Q *25/00*
U.S. Cl. 342—383 **9 Claims**



1. A narrow beamwidth radio frequency antenna system for eliminating undesired interference signals at the receiver end of communications trunk transmission links operating in a dense communications environment comprising:

a first receiving antenna including a first phased linear array of a first number of like antenna elements progressively phase shifted in predetermined incremental steps of a first angle to provide a first relatively narrow beamwidth directive antenna pattern providing reception of signals in a predetermined narrow angular sector corresponsing to said first pattern;

a second receiving antenna including a second phased linear array of a second smaller number of like antenna elements progressively phase shifted in predetermined incremental steps of a second larger angle to provide a second relatively narrow beamwidth directive antenna pattern providing reception of signals in a narrow angular sector corresponding to said second pattern greater than said first antenna pattern;

means for scanning said antenna patterns such that said patterns overlap with one side thereof being substantially mutually coincident providing a single small incremental angular sector between the other sides of said first narrow sector and greater second sector where said antenna patterns do not overlap;

first means for combining signals from said first number of antenna elements and first phase shifted angle;

second means for combining signals from said second number of antenna elements and second phase shifted angle; and

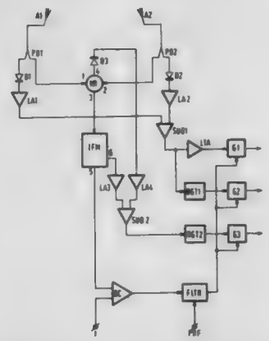
means for subtracting signals from said first and second combining means providing signal cancellation of substantially all signals arriving at said overlapping antenna patterns and having only the remaining single incremental antenna pattern angular sector for receiving signals.

4,638,319

R.F. SYSTEM

Lye-Whatt Chua, South Nutfield, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 15, 1984, Ser. No. 621,029
Claims priority, application United Kingdom, Jun. 17, 1983, 8316499
Int. Cl.[4] G01S *5/02, 13/46*
U.S. Cl. 342—417 **9 Claims**



1. An R.F. direction-finding system for determining the direction of incidence R.F. radiation without down conversion to I.F., said system comprising:

(a) first and second antennas disposed on opposite sides of a direction-indicating axis and having respective main lobe axes angled such that they intersect on said direction-indicating axis;

(b) first and second diode detector means each coupled to both of the first and second antennas;

(c) phase comparison means coupled to the first diode detector means for producing a single signal having a magnitude which varies continuously with the direction of incidence of R.F. radiation over a predefined operating range, said magnitude representing first and second angles of incidence on opposite sides of a predefined direction,

one of said first and second angles being the actual direction of incidence of the R.F. radiation; and

(d) amplitude comparison means coupled to the second diode detector means for producing a signal having a magnitude r

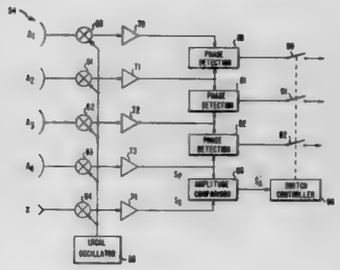
(d) amplitude comparison means coupled to the second diode detector means for producing a signal having a magnitude representing the relative magnitudes of signals produced by the first and second antennas in response to the incident R.F. radiation, said magnitude approximately representing the direction of incidence of the R.F. radiation relative to said predefined direction, said signal designating which of the angles determined by the phase comparison means accurately represents the direction of incidence of the R.F. radiation.

4,638,320

DIRECTION FINDING INTERFEROMETER

Dennis J. Eggert, Hermosa Beach; Charles E. Hendrix, Pacific Palisades, and Barnet Krinsky, Torrance, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 5, 1982, Ser. No. 439,458
Int. Cl.[4] G01S *5/04*
U.S. Cl. 342—442 **4 Claims**



1. A two-dimensional, long-baseline direction finding interferometer receiving system comprising:

a plurality of primary antenna receiving means, said plurality comprising

four primary antenna receiving means arranged in a two-dimensional planar fashion, with three of said primary antenna means being positioned on two orthogonal axes, and

a remaining one of said primary antenna means positioned on a third axis, which is arranged asymmetrically and non-orthogonally to said orthogonal axes;

an auxiliary antenna receiving means for permitting said system to reject errant signals;

a common local oscillator means;

a plurality of mixer means, each of which is connected respectively to one of said antenna receiving means and said common local oscillator means;

a plurality of filter amplifier means, each of which is adapted to receive the output signal from a corresponding one of said mixer means;

a plurality of phase detection means, each of which is adapted to compare the output signals of two adjacent filter amplifier means;

an amplitude comparison means which is adapted to compare the output signal of one of said primary antenna means with the output signal of said auxiliary antenna means, said amplitude comparison means producing an output acceptance signal when the amplitude of said signal from one of said primary antenna means exceeds the amplitude of said signal from said auxiliary antenna means;

a plurality of switches, each of which is adapted to receive the output signal from one of said phase detection means; and

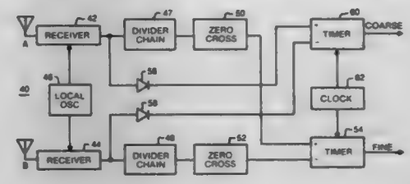
a switch controller connected to said amplitude comparison means is adapted to close said plurality of switches when said output acceptance signal is present to allow said signals from said plurality of phase detection means to propagate through said interferometer receiving system for further processing.

4,638,321

UNAMBIGUOUS WIDE BASELINE INTERFEROMETER

Edwin M. Drogin, Dix Hills, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 1, 1984, Ser. No. 616,096
Int. Cl.[4] G01S *5/02*
U.S. Cl. 342—444 **20 Claims**



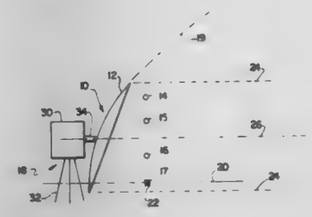
1. In a system for receiving an RF signal having envelopes of RF carrier cycles, said RF carrier cycles having zero crossings, means for measuring the differential arrival time of said RF signal at two antennas spaced apart by a distance greater than one wavelength of the RF carrier, comprising first and second triggering means, one for each antenna, each said first and second triggering means having a digital output, said first and second triggering means being responsive to said zero crossings of said RF carrier cycles from its respective said antenna and providing outputs preserving RF carrier phase differential from said antennas, and timer means for measuring the time difference between said outputs of said first and second triggering means.

4,638,322

MULTIPLE FEED ANTENNA

Bernard J. Lamberty, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 14, 1984, Ser. No. 580,013
Int. Cl.[4] H01Q *03/20*
U.S. Cl. 343—761 **9 Claims**



1. A multiple feed antenna, comprising:

a primary focussing element having a focal axis;

at least two feeds, said feeds being spaced from each other;

means for moving said primary focussing element to a different position for each said feed such that each of said feeds is individually positioned on said focal axis; and

wherein said moving means produces rotation of said focussing element about an axis parallel to said focal axis such that said antenna has a common boresight in each of said different positions of said focussing element.

4,638,323

ASYMMETRIC RIDGE WAVEGUIDE COLLINEAR SLOT ARRAY ANTENNA

Harold Shnitkin, Roslyn, N.Y., and Julius Green, Trumbull, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 25, 1985, Ser. No. 727,316
Int. Cl.[4] H01Q *13/12*
U.S. Cl. 343—771 5 Claims



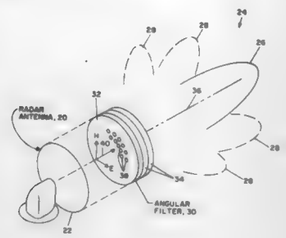
1. A slotted array antenna, comprising a plurality of waveguide elements each comprising opposite radiating and non-radiating sides, wherein said waveguide elements are characterized in that said radiating side defining a series of radiating slots along a centerline thereof, in that said non-radiating side includes an axial ridge of constant height directed toward said radiating slots, and in that each of said waveguide elements defines first and second pluralities of alternating side chambers on opposite sides of said axial ridge, said alternating side chambers alternating between predetermined high and low levels, whereby secondary radar beams are eliminated.

4,638,324

RESISTIVE LOOP ANGULAR FILTER

Peter W. Hannan, Smithtown, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Filed Dec. 10, 1984, Ser. No. 679,844
Int. Cl.[4] H01Q *15/02*
U.S. Cl. 343—909 12 Claims



1. An angular filter which attenuates electromagnetic energy of a wave incident upon and propagating through the filter, the attenuation being dependent upon the angle of the filter, said filter comprising:

an array of resistive elements disposed parallel to a surface substantially normal to a direction of propagation of the electromagnetic wave;

a dielectric support substantially transparent to the wave and being disposed along said surface, each of said elements being surrounded by said dielectric and being held in preset positions of said array by said support; and wherein

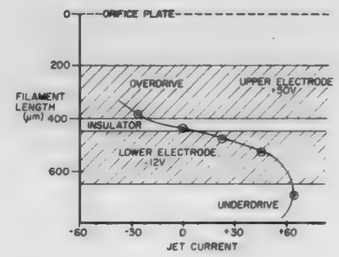
each of said elements being electrically independent of the other elements, each of said elements comprising an electrically conductive member curved in a plane normal to said direction of propagation for interaction with the magnetic vector component of a portion of a wave having an axis of propagation angled relative to said direction of propagation, there being essentially no interaction between each of said elements and said magnetic vector for zero angle of incidence resulting in substantial transparency of said filter to electromagnetic waves incident at zero angle of incidence, said interaction with a consequent attenuation of the energy increasing with increasing angle of incidence.

4,638,325

INK JET FILAMENT LENGTH AND STIMULATION AMPLITUDE ASSESSMENT SYSTEM

John M. Schneider, Spring Valley; Michael J. Platt, enon; Mark E. Brown, West Carrollton, and Mark C. Bowers, Vandalia, all of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 9, 1985, Ser. No. 773,496
Int. Cl.[4] G01D *18/00*
U.S. Cl. 346—1.1 30 Claims



1. A method for sensing the length of an ink jet filament in response to stimulation amplitude in a continuous ink jet printer, characterised by:

locating a narrow charging electrode, extending less than or equal to one drop spacing in the direction of the ink jet filament, adjacent the ink jet filament and applying a charging voltage to the narrow electrode;

changing the amplitude of the stimulation signal to change the length of the ink jet filament;

detecting the magnitude of the charge imparted to the ink drops by the narrow charging electrode; and

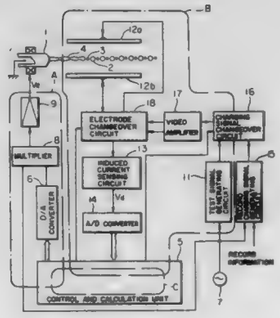
sensing the length of the ink jet filament as a function of the detected charge.

4,638,326

INK JET RECORDING APPARATUS

Takahiro Yamada, Ibaraki; Satoshi Namekawa, Hitachi; Eiji Yoshino, Hitachi, and Yasumasa Matsuda, Hitachi, all of Japan, assignors to Hitachi, Ltd.; Hitachi Seiko Ltd. and Hitachi Koki Co., Ltd., all of Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 834,813
Int. Cl.[4] G01D *18/00*
U.S. Cl. 346—75 2 Claims



1. In an ink jet recording apparatus including:

a nozzle;

means for introducing ink into said nozzle and jetting said ink from the nozzle orifice;

means for exciting said nozzle so as to alternately separate the leading end of an columnar ink stream jetted from said nozzle into ink droplets of large diameter and ink droplets of small diameter and make those ink droplets fly toward the recording medium;

deflection control means for charging and deflecting the ink droplets according to the record signal so as to cause the ink droplets to impinge against said substance to be recorded thereon at predetermined positions thereof; and

a record condition optimizing device for setting the optimum excitation voltage of said nozzle excitation means in order to ensure the generation and charging of the ink droplet,

an ink jet recording apparatus wherein said record condition optimizing device comprises:

first means for sweeping the excitation voltage on the substantially logarithmic scale;

second means for successively detecting an excitation voltage value which causes an ink droplet of large diameter to be separated from the columnar ink stream and generated at a phase θ_k, and an excitation voltage value which causes an ink droplet of small diameter to be separated from the columnar ink stream and generated at the phase θ_k; and

third means for, on the basis of the results detected by said second means, calculating a space Wn on the logarithmic scale between an excitation voltage value vn generating an ink droplet of small diameter and an excitation voltage value Vn generating an ink droplet of large diameter which is adjacent to and lower than said excitation voltage value vn, calculating a space wn on the logarithmic scale between said excitation voltage value vn generating an ink droplet of small diameter and an excitation voltage value Vn+1 generating an ink droplet of large diameter which is adjacent to and higher than said excitation voltage value vn, calculating the value of |Wn−wn|, and setting the excitation voltage at such a value as to minimize the value of |Wn−wn|.

4,638,327

APPARATUS TO DAMP TURBULENCE IN AN INK JET FLUID SUPPLY CHAMBER

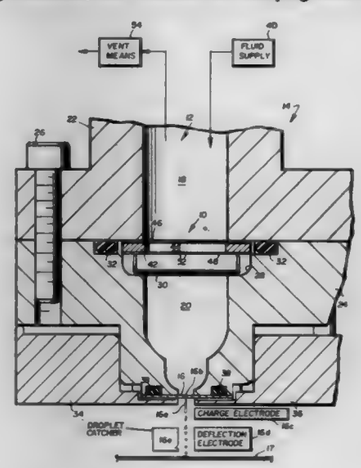
Richard Sutera, Centerville; John L. Dressler, Spring Valley, and Bruce W. Halliday, Centerville, all of Ohio, assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Apr. 8, 1985, Ser. No. 720,735
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 10 Claims

1. Turbulence damping structure for a fluid supply chamber of an ink-jet printing head assembly comprising:

upper and lower damping members each defining upper and lower apertures, respectively; and

a support member having plural openings therein, said support member being rigidly fixed between and separating said upper and lower damping members and, together with said upper and lower damping members, dividing said fluid chamber into upper and lower subchambers such that said openings establish fluid communication between respective ones of said upper and lower apertures, wherein said openings between said upper and lower damping members define a plurality of fluid quieting chambers, and wherein said damping fluid structure



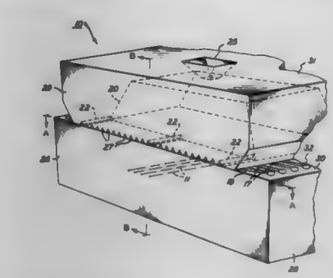
provides step-wise damping of fluid in said fluid supply chamber.

4,638,328

PRINTHEAD FOR AN INK JET PRINTER

Donald J. Drake, Rochester; William G. Hawkins; Roger G. Markham, both of Webster, and Richard V. LaDonna, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 1, 1986, Ser. No. 858,143
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 11 Claims



1. In a continuous stream ink jet printer of the type having a printhead with a manifold for containing a replenishable supply of ink, a plurality of orifices, and individual channels connecting the orifices to the manifold for providing ink flow paths therebetween, the printhead comprising:

a first substrate having one edge and having on one surface thereof at least one heating element and addressing electrodes for providing current pulses thereto;

a second substrate having one edge and containing a recess and a plurality of parallel grooves in one surface thereof, one end of the grooves extending through the edge of the second substrate and the other end opening into the recess;

the first and second substrates being mated and permanently bonded together, so that their respective edges lie in the same plane and the recess and grooves are closed by the first substrate to produce the manifold and channels, respectively, with said at least one heating element contactable by the ink, the channel groove ends that penetrate the second substrate edges serving as the orifices;

means to continually supply pressurized ink to the manifold; and

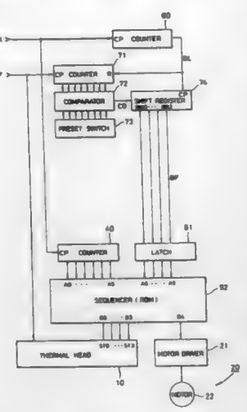
circuit means to provide said at least one heating element with a continual series of current pulses via the addressing electrodes at a predetermined frequency and power, so that the ink contacting the at least one heating element during the application of thermal pulses sustains a constant uniform change in the density, viscosity, or surface tension of the ink because of a fluctuation in temperature without that the temperature of the ink being raised to a level that would vaporize or produce a change of state therein.

4,638,329

THERMAL RECORDING METHOD AND APPARATUS

Toshihiko Nakayama; Fujio Moriguchi; Tomio Murayama, and Yasuhiro Takeo, all of Ebina, Japan, assignors to Fuji-Xerox Co. Ltd., Japan

Filed Aug. 29, 1985, Ser. No. 770,708
Claims priority, application Japan, Aug. 31, 1984, 59-182934
Int. Cl.⁴ G01D *15/10*
U.S. Cl. 346—76 PH **12 Claims**



1. In a thermal recording method for printing picture information for one unit by a multi-element thermal head simultaneously or with a plurality of times, in which the number of printing operations for one unit made by said thermal head is determined by the ratio of black data and white data to be printed contained in the picture information for one unit, the improvement comprising that said picture information for one unit is divided into a plurality of blocks, the number of black data points in each block is counted and compared to a standard to generate an over the standard or under the standard signal for each of the blocks and said number of printing operations is determined by the signals associated with each of said divided blocks.

4,638,330

IMAGE FORMING APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 4, 1985, Ser. No. 741,136
Claims priority, application Japan, Jun. 11, 1984, 59-119515
Int. Cl.⁴ G01D *15/10*
U.S. Cl. 346—76 PH **24 Claims**

1. An image forming apparatus employing image-forming signals for forming an image on a sheet, comprising:

a transfer medium having four regions coated with ink arranged serially along the length of said transfer medium, said four regions respectively comprising coatings of yellow, magenta, cyan and black inks, said yellow, magenta and cyan ink regions having substantially the same sizes, said black ink region being different in size from each of said three other regions;

holding means for holding said transfer medium; and

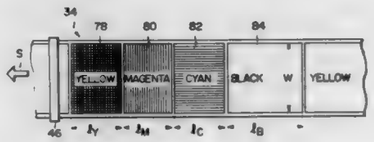


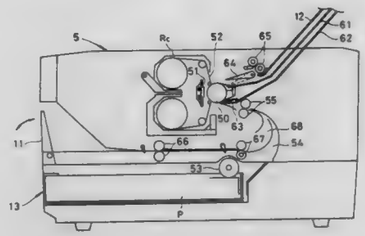
image forming means for forming an image by applying said cyan, magenta and yellow inks one over another in accordance with color signals representing a color image and for transferring black ink in response to a black-color signal.

4,638,331

IMAGE BUILDING APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 25, 1985, Ser. No. 758,750
Claims priority, application Japan, Jul. 27, 1984, 59-156718
Int. Cl.⁴ G01D *15/10*
U.S. Cl. 346—76 PH **7 Claims**



1. An image forming apparatus comprising:

a platen for transporting a sheet of printing medium while the latter is partially wound about said platen,

a strip of ink donor medium having a width less than the width of the printing medium,

ink donor supporting and transporting means for supporting and transporting the ink donor medium which is spanned between a pair of cores while both end parts of the printing medium as seen in a transverse direction, which is essentially perpendicular to the transport direction of said printing medium and of said ink donor supporting and transporting means, are exposed outside of said ink donor medium when the ink donor medium is brought in contact with the printing medium,

a printing head adopted to be displaced toward and away from the platen to thermally transfer at least one coloring agent on the ink donor medium to the printing medium when said printing head and the printing medium come in pressure contact with the platen with the ink donor medium interposed therebetween;

a pair of retaining members disposed at said both ends of the printing medium as seen in said transverse direction to thrust the exposed ends of the printing medium against the platen under the effect of a thrusting force given by said retaining members, and

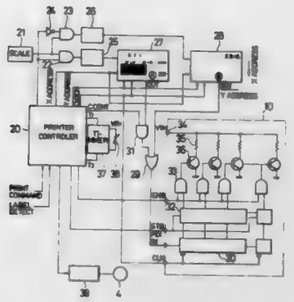
driving means for displacing said retaining members toward and away from said platen.

4,638,332

THERMAL PRINTER

Yasuhiro Sakura; Hitoshi Nimura, and Satoshi Nakayama, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1986, Ser. No. 829,612
Claims priority, application Japan, Feb. 21, 1985, 60-33385
Int. Cl.⁴ G01D *15/16*
U.S. Cl. 346—76 PH **4 Claims**



1. A thermal printer apparatus comprising:

recording papers each having multi-color-forming temperature characteristic;

a thermal head containing a multiplicity of heating elements and capable of printing the recording paper over the entire width thereof while being kept in contact therewith during its unidirectional motion;

at least two print buffers for feeding print data to control energization of the heating elements of said thermal head;

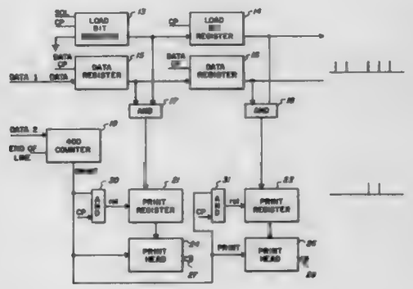
and a current on-time control circuit for differentially setting the on-time periods of a constant current to the heating elements of said thermal head in response to selection of said print buffers under the predetermined condition that a basic color for general print data is formed at a low temperature while a different particular color for specific print data is formed at a high temperature in a printing operation on the recording paper by the heating elements of said thermal head, wherein the current on-time is extended only when said print buffer for the different particular color has the print data therein.

4,638,333

THERMAL PRINTING CIRCUIT

I-an Feng, San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 25, 1985, Ser. No. 791,483
Int. Cl.⁴ G01D *15/10*
U.S. Cl. 346—76 PH **4 Claims**



1. A circuit for controlling a thermal printer to print a line of data by using thermal print elements comprising:

a modulo n counter for counting bits of one state in said line, said state being the one which requires its associated print element to be turned on,

means responsive to said counter for dividing said line into a plurality of segments having variable numbers of bits of both sides each of which, except the last, contains n bits of said one state, and a last segment containing the remainder of said bits of said one state, and

printing means responsive to said means for dividing for printing all of the bits of each segment in parallel and for completing the printing of one segment before starting the printing of the next segment.

4,638,334

ELECTRO-OPTIC LINE PRINTER WITH SUPER LUMINESCENT LED SOURCE

Robert D. Burnham, Palo Alto; Thomas L. Paoli, Los Altos; Robert L. Thornton, East Palo Alto, and Robert A. Sprague, Saratoga, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 3, 1985, Ser. No. 719,595
Int. Cl.⁴ G01D *9/42*
U.S. Cl. 346—108 **7 Claims**



1. In an electro-optic line printer comprising

a recording medium,

an electro-optic line modulator for presenting picture elements in spatially predetermined positions along a printing line laterally of said recording medium and having an optically transmissive electro-optic element and a plurality of spaced, addressable electrodes disposed on one side of said electro-optic element forming at the interface with said element an interactive region,

an LED side-facet source for producing an output light beam from a side facet thereof and comprising a semiconductor laser structure converted to a superluminescent source characterized by having high output intensity and a uniform far field pattern without intensity variations along the beam width,

optical means for collecting the light from said LED side-facet source onto said interactive region of said modulator, said optical means comprising a first lens means to collect the light emitted from said LED side-facet source in the tangential and sagittal directions and second toric lens means to collimate said light into a sheetlike beam in said tangential direction and focus said light in the sagittal direction to a line at said interactive region,

imaging means optically aligned between said modulator and said recording medium for imaging said beam onto said recording medium, and

means for advancing said recording medium at a predetermined rate in a cross line direction relative to said printing line.

4,638,335

OPTICAL RECORDING MEMBER

Thomas W. Smith, Penfield; Anthony T. Ward, Webster; David J. Luca, Rochester, and Gordon E. Johnson, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 566,765, Dec. 29, 1983, abandoned.
This application Nov. 8, 1985, Ser. No. 795,757
Int. Cl.⁴ G01D *15/34*
U.S. Cl. 346—135.1 **45 Claims**

1. A multi-layer optical recording member for use with a recording laser for optically recording and retrieving informa-

tion thereon comprising in sequential order a structural substrate, a thermally degradable polymer layer, a thin light absorbing recording layer, a thermally degradable polymer dielectric layer and a reflective layer, said substrate and said thermally degradable polymer layers being stable under ambient light and temperature conditions and substantially transparent to the recording and reading optical radiation, the combined thickness of said light absorbing layer and said dielectric layer being such as to provide anti-reflecting conditions at the recording wavelength and optical contrast between marked



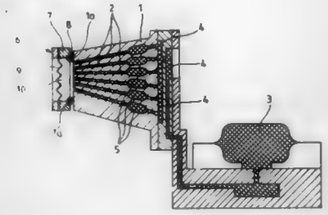
and unmarked areas at the reading wavelength, said thermally degradable polymer layers decomposing substantially to gaseous products at temperatures below the melting point of the light absorbing recording layer wherein, upon exposure to recording radiation the portion of the light absorbing layer exposed is heated by the absorbed energy which in turn heats adjacent areas of both thermally degradable polymer layers to a level where at least some polymer decomposition with the consequent evolution of gaseous decomposition products occurs resulting in the formation of a hole in the exposed area of the light absorbing layer.

4,638,336

COVER FOR VACUUM INK PRINTING HEAD

Wilfried Hofmann, Taufkirchen, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Aug. 19, 1985, Ser. No. 767,356
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432620
Int. Cl.⁴ G01D *15/18*
U.S. Cl. 346—140 R **14 Claims**



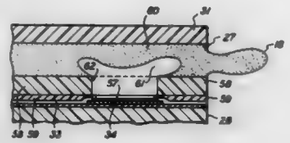
1. A cover for nozzles of a vacuum ink printing head having an end side and a predetermined surface tension of meniscus-shaped ink surfaces in its nozzles during non-use, the cover comprising a circumferential sealing element formed so that when the cover is arranged on the printing head said sealing element abuts against the end side of the printing head; and a diaphragm arranged so that said sealing element and said diaphragm together form a pressure chamber, said diaphragm being formed so that its own tension is smaller than the surface tension of the meniscus-shaped ink surfaces in the nozzles during non-use.

4,638,337

THERMAL INK JET PRINTHEAD

Peter A. Torpey, Rochester, N.Y., and Roger G. Markham, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1985, Ser. No. 761,922
Int. Cl.⁴ G01D *15/18*
U.S. Cl. 346—140 R **3 Claims**



1. A thermal ink jet printhead for ejecting and propelling ink droplets on demand therefrom along a flight path from orifices in the printhead toward a recording medium spaced therefrom by momentarily heating ink located in straight capillary channels within the printhead that interconnect respective ones of the orifices with an ink supplying reservoir also within the printhead, the channels and orifices having substantially equal cross-sectional areas, thus forming a straight ink flow path therebetween to produce temporary vapor bubbles in the channels, the heating of the ink being in response to electrical input signals representing digitized signals selectively applied to individual heating elements located one each in the channels adjacent the orifices, the printhead comprising:

an upper substrate having first and second parallel surfaces and two opposing, parallel edge faces that are perpendicular to the substrate surfaces, the first surface containing a depression and a plurality of parallel straight grooves, one end of the grooves perpendicularly penetrating one upper substrate face and the other ends of the grooves opening into the depression;

a lower substrate having first and second parallel surfaces and an edge face perpendicular to the lower substrate surfaces, a plurality of heating elements having surfaces with predetermined areas and being formed in a row on the lower substrate first surface parallel with and a predetermined distance from the lower substrate face, together with respective electrodes for selectively addressing the heating elements with said electrical input signals, the addressing electrodes having terminal ends at the edges of the lower substrate first surface other than the one adjacent its edge face;

a passivation layer covering the lower substrate first surface, including said addressing electrodes, but excluding the heating element surfaces and the terminal ends of the addressing electrodes, these having been cleared of the passivation layer;

a thick film insulative layer having a predetermined thickness overlaying only the passivation layer, so that the thickness of the thick film layer provides substantially perpendicular walls that individually surround each of the heating elements, thus placing each heating element surface at the bottom of a recess produced by said thick film walls;

said upper and lower substrate being aligned and bonded together to form the printhead with their respective first surfaces being confrontingly joined and with the upper substrate face having the groove penetrations being coplanar with the lower substrate face, so that the upper substrate depression and grooves respectively become the ink reservoir and the ink channels, the groove penetrations in the upper substrate face become the orifices, the alignment of the upper and lower substrates places one recessed heating element in each channel a predetermined distance from an associated orifice, so that the thick film walls

inhibit the growth of the vapor bubbles in a direction parallel with the ink flow path in said channels while promoting bubble growth in a direction normal to the heating elements, whereby the heating element recess in said thick film layer enables closer placement of the heating elements to the orifices and the consequent ejection of higher velocity droplet and yet prevents vaporized ink blowout during said droplet ejecting bubble generation;

means for connecting the printhead reservoir to a source of ink under a predetermined pressure external to the printhead; and

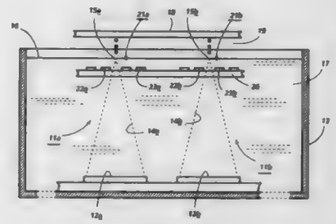
means for addressing the electrode terminal ends with said input signals.

4,638,338

CAPILLARY WAVE CONTROLLERS FOR NOZZLELESS DROPLET EJECTORS

Scott A. Elrod, Menlo Park, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 21, 1986, Ser. No. 820,045
Int. Cl.⁴ G01D *15/18*
U.S. Cl. 346—140 R **18 Claims**



1. In combination with a nozzleless droplet ejector having a pool of liquid with a free surface, and means for launching a pressure wave into said pool such that said pressure wave comes to a focus approximately at said free surface, the improvement comprising a capillary wave emission controller for said ejector; said controller including

a conductor and a counter electrode, said conductor being shallowly immersed in said pool and being proximate to the focus of said pressure wave, and

means coupled across said conductor and said counter electrode for applying a periodic voltage therecross on command to cause a free propagating capillary surface wave to radiate from said conductor, whereby said capillary wave interacts with said pressure wave to control at least one emission characteristic of said ejector.

4,638,339

ELECTROGRAPHIC CHARGE DEPOSITION APPARATUS

Richard J. Coburn, West Hartford; Walter C. Dean, III, Simsbury, both of Conn.; Thomas D. Kegelman, Palm Harbor, Fla., and Norman L. Milliard, Stafford Springs, Conn., assignors to KCR Technology, Inc., Hartford, Conn.

Filed Nov. 4, 1985, Ser. No. 794,640
Int. Cl.⁴ G01D *15/06*
U.S. Cl. 346—153.1 **10 Claims**

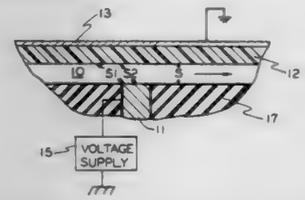
1. Apparatus for establishing the spacing between a conductive member and a moving dielectric member in an electrogaphic printer comprising:

a flexible dielectric member having an electrically conductive ground plane backing element and reinforcing layer;

support means for the dielectric member including two closely spaced support areas defined by parti-cylindrical surfaces engaging the dielectric member and defining an unsupported region of the dielectric member therebetween,

a conductive member and means supporting said conductive members in the unsupported region of the dielectric member and spaced therefrom;

the bending modulus of said dielectric and reinforcing members being sufficient to preclude contact with the conductive member between said support areas when said dielectric member is in tension,



whereby the desired spacing between the conductive member and the electric member to effect electrostatic charge deposition occurs in the unsupport region of the dielectric member.

4,638,340

TWO-COLOR THERMOSENSITIVE RECORDING LABEL

Kiyotaka Iiyama, Mishima, and Norihiko Inaba, Numazu, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 759,736
Claims priority, application Japan, Jul. 27, 1984, 59-158054
Int. Cl.⁴ B41M *5/18*
U.S. Cl. 346—204 **13 Claims**

1. A two-color thermosensitive recording label capable of forming two different colors when heated at different temperatures comprising:

(a) a support material,

(b) a first thermosensitive coloring layer which is colored in a first color at a predetermined high temperature T, formed on one side of said support material, comprising a coloring agent and a first color developer capable of inducing color formation in said coloring agent when heated to the temperature T,

(c) a decolorizing layer containing a decolorizing agent, formed on said first thermosensitive coloring layer,

(d) an intermediate layer formed on said decolorizing layer,

(e) a second thermosensitive coloring layer comprising a leuco dye and a second color developer capable of inducing color formation in said leuco dye when heated, formed on said intermediate layer, which coloring layer is colored in a second color at a predetermined low temperature t which is lower than said temperature T, said second color developed at said low temperature t being different from said first color, decolorized by said decolorizing agent when heated to a predetermined temperature which is higher than the temperature t so as to prevent the color developed in said second thermosensitive coloring layer from being mixed with said color developed in said first thermosensitive coloring layer comprising a thermofusible material and said second thermosensitive coloring layer and said second color being protected from said decolorizing layer by said intermediate layer so long as said second thermosensitive coloring layer is not heated up to said predetermined temperature,

(f) a protective layer for protecting said second thermosensitive coloring layer, formed on said second thermosensitive coloring layer,

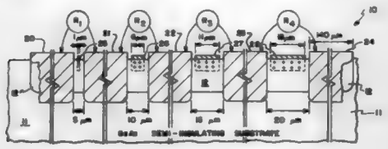
(g) an adhesive layer formed on the other side of said support, and

(h) a disposable backing sheet which is attached to said adhesive layer and can be peeled off said adhesive layer when said thermosensitive recording label is used.

4,638,341
GATED TRANSMISSION LINE MODEL STRUCTURE FOR CHARACTERIZATION OF FIELD-EFFECT TRANSISTORS

Steven M. Baier; Nicholas C. Cirillo, Jr.; Steven A. Hanka, all of Minneapolis, and Michael S. Shur, Golden Valley, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 6, 1984, Ser. No. 647,769
Int. Cl.[4] H01L *29/48, 29/56, 29/64*
U.S. Cl. 357—15 12 Claims



1. A gated transmission line model TLM pattern for use in field-effect transistor characterization, comprising:

a semiconductor substrate having a major surface which has a conducting channel of uniform width formed into and along a region on said surface;

a plurality of at least four spaced ohmic contacts deposited on the substrate surface at and along said conducting channel region;

wherein a first space between a first and a second of said ohmic contacts is a different dimension from a second space between the second and a third of said ohmic contacts, and a third space between said third and fourth of said ohmic contacts is a different dimension from the first and second spaces;

a plurality of at least three Schottky metal gates deposited on said surface, one gate being deposited, respectively, in each of said spaces between the plurality of ohmic contacts, the dimension of the gate being smaller than the dimension of the space it is in to establish a gate-to-ohmic spacing,

whereby the plurality of Schottky metal gates includes a first, a second and a third gate positioned in said first, second and third spaces, respectively, with the length of each of said gates being x (where x is a number) microns smaller than the dimension of the related space so that the gate-to-ohmic spacing remains the same in each of said spaces.

4,638,342
SPACE CHARGE MODULATION DEVICE

John L. Freeouf, Peekskill; Thomas N. Jackson, Ossining; Steven E. Laux, Mount Kisco, and Jerry M. Woodall, Bedford Hills, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

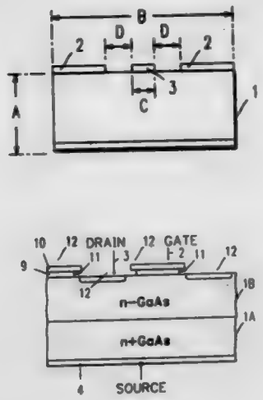
Filed Sep. 17, 1982, Ser. No. 419,381
Int. Cl.[4] H01L *29/56*
U.S. Cl. 357—15 10 Claims

1. A semiconductor structure comprising in combination:

a single band gap semiconductor material body having at least a first surface,

a first contact on said first surface of said body, said first contact having at least one dimension of the order of the Debye length in said semiconductor,

a second essentially rectifying contact on said first surface positioned within said Debye length of said first contact, and

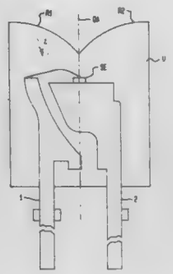


a third contact to said semiconductor body positioned remote from said first and second contacts.

4,638,343
OPTICAL RADIATION SOURCE OR DETECTOR DEVICE HAVING PLURAL RADIATING OR RECEIVING CHARACTERISTICS

Hans-Ludwig Althaus, Lappersdorf; Jörg Klaus, Thumhausen, and Wilhelm Kuny, Grünwald, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 15, 1985, Ser. No. 723,236
Claims priority, application Fed. Rep. of Germany, Jan. 4, 1985, 8500013[U]
Int. Cl.[4] H01L *33/00*
U.S. Cl. 357—17 8 Claims

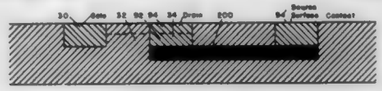


1. An optical device including an envelope (U) having light refractive surfaces which provide a desired optical characteristic, the envelope of the optical device comprising at least two light refractive surfaces having lenticular curves (L 1, L 2) each with a far focus inside the envelope that are coincident in location, the optical device being disposed at the location and the two refractive surfaces defining two light propogation paths from them to the optical device.

4,638,344
JUNCTION FIELD-EFFECT TRANSISTOR CONTROLLED BY MERGED DEPLETION REGIONS

Walter T. Cardwell, Jr., 217 Bedford Forrest Ave., Anderson, S.C. 29621

Continuation-in-part of Ser. No. 83,092, Oct. 9, 1979. This application Apr. 15, 1982, Ser. No. 368,839
Int. Cl.[4] H01L *29/80, 27/04*
U.S. Cl. 357—22 52 Claims



1. A semiconductor device comprising:

a first semiconductor region of first conductivity type;

a second semiconductor region of second conductivity type opposite to said first conductivity type, said second region forming a PN junction with said first region;

said first region being sufficiently thin and having sufficiently low doping level that a depletion region formed by reverse biasing said PN junction can extend into said first region;

first means for electrically contacting said first region;

spaced second and third means for electrically contacting said second region;

means for applying a first constant voltage between said first electrical contacting means and said second or third electrical contacting means of a polarity to reverse bias the PN junction;

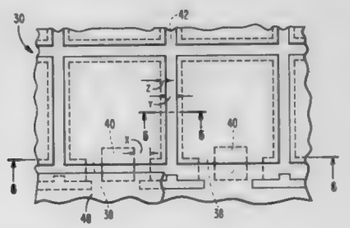
gate means contacting said first semiconductor region in a manner so as to form a potential barrier with the first semiconductor region such as to permit a depletion region to be created in the first semiconductor region upon suitable bias, said gate means being spaced from the second semiconductor region by the first semiconductor region;

fourth means for applying a signal voltage between the gate means for the first region, said signal voltage having at least intermittently a sufficient magnitude and polarity to create a depletion region in the first region which merges with the depletion region due to the reverse bias applied to the PN junction by said first voltage so that the impedance of the second region is controlled by said signal voltage.

4,638,345
IR IMAGING ARRAY AND METHOD OF MAKING SAME

Hammam Elabd, East Windsor, and Walter F. Kosonocky, Skillman, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 1, 1983, Ser. No. 500,187
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—24 7 Claims



1. An array of infra-red detectors comprising

a substrate of single crystal silicon of one conductivity type,

a plurality of spaced apart detector areas of a conductive material at one surface of said substrate with each of said conductive areas forming a Schottky-barrier junction with said substrate,

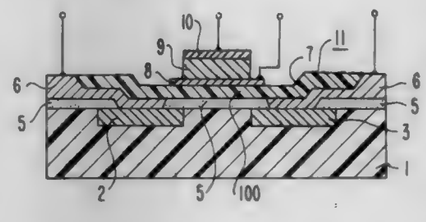
each conductive area including a conductive coupling region of a conductivity type opposite to that of the substrate within the substrate under and in contact with a portion of the conductive material, and

means between adjacent detector areas isolating said areas from each other, said isolating means consisting of a region of a conductivity type opposite to that of the substrate in said substrate and extending along said one surface between said areas with each of said areas contacting said region, said region extending around the conductive areas and being spaced from the coupling regions.

4,638,346
FIELD EFFECT TRANSISTOR-TYPE MOISTURE SENSOR

Yasuhiko Izumi; Masanori Watanabe, and Masaya Hijikigawa, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 8, 1985, Ser. No. 763,691
Claims priority, application Japan, Aug. 29, 1984, 59-182068
Int. Cl.[4] G01N *27/12*
U.S. Cl. 357—25 8 Claims



1. A field effect transistor-type moisture sensor comprising a field effect transistor device incorporated with a moisture sensitive means, the electrostatic capacity or the electrical conductivity of which varies with the absorption and the desorption of water vapor or moisture, wherein said moisture sensitive means is disposed on a double-layered gate insulating film of said field effect transistor device, a gate electrode is connected to said moisture sensitive means, an auxiliary electrode for the application of a drift-cancellation voltage to said moisture sensitive means is located at the interface between said gate insulating film and said sensitive means, and said moisture sensitive means is a film prepared by cross-linking cellulose acetate butyrate with at least one compound selected from the group consisting of compounds containing two or more isocyanate groups, compounds containing two or more epoxy groups, compounds containing two or more carboxylic acid groups, and acid anhydrides of carboxylic acids.

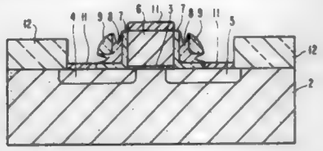
4,638,347
GATE ELECTRODE SIDEWALL ISOLATION SPACER FOR FIELD EFFECT TRANSISTORS

Subramanian S. Iyer, Mt. Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 447,543, Dec. 7, 1982, abandoned. This application Aug. 9, 1985, Ser. No. 763,897
Int. Cl.[4] H01L *29/94, 29/78*
U.S. Cl. 357—54 11 Claims

1. A sidewall isolation structure for the gate electrode of an insulated gate field effect transistor which comprises a first electrical insulating material and a second and different electrical insulating material contiguous with said first electrical insulating material, and wherein said second and different electrical insulating material being etched below the surface level of said first electrical insulating material and being etched to a greater extent than and at a rate faster than said first elec-

trical insulating material to provide a recess in said sidewall isolation structure wherein said recess is such as to prevent the formation of a continuous metal film over the sidewall isolation.



4,638,348

SEMICONDUCTOR CHIP CARRIER

David F. Brown, 22 Waterpump Court, Thorplands, Northampton, and Michael J. Anstey, Peshallow, Kiln-Ride-Extension, Workingham, Berkshire, both of England

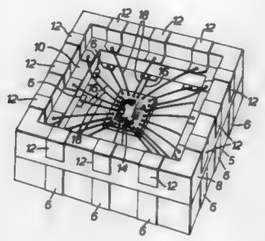
PCT No. PCT/GB83/00198, § 371 Date Mar. 30, 1984, § 102(e) Date Mar. 30, 1984, PCT Pub. No. WO84/00851, PCT Pub. Date Mar. 1, 1984

PCT Filed Aug. 8, 1983, Ser. No. 595,454

Claims priority, application United Kingdom, Aug. 10, 1982, 8222947

Int. Cl.⁴ H01L *23/02*

U.S. Cl. 357—74 **17 Claims**



1. A chip carrier comprising:
a body of flat electrically insulating material of rectangular external configuration defining upper and lower major surfaces;
a first plurality of electrical contacts arranged side-by-side along the four sides of the upper surface and a second plurality of electrical contacts arranged side-by-side along the four sides of the lower surface, the contacts of the first plurality being separate from the contacts of the second plurality;
a single chip mounted on the insulating material and completely enclosed; and
electrical connections between the chip and the contacts,
the body of insulating material being a single square slab of insulating material having the chip mounted on the upper surface, the chip being enclosed by encapsulation.

4,638,349

METHOD OF AND CIRCUIT FOR DIGITALLY DEMODULATING AN AMPLITUDE-MODULATED SIGNAL PRODUCED BY SUPPRESSED-CARRIER AMPLITUDE MODULATION OF TWO CARRIERS OF THE SAME FREQUENCIES IN A PHASE-QUADRATURE RELATIONSHIP

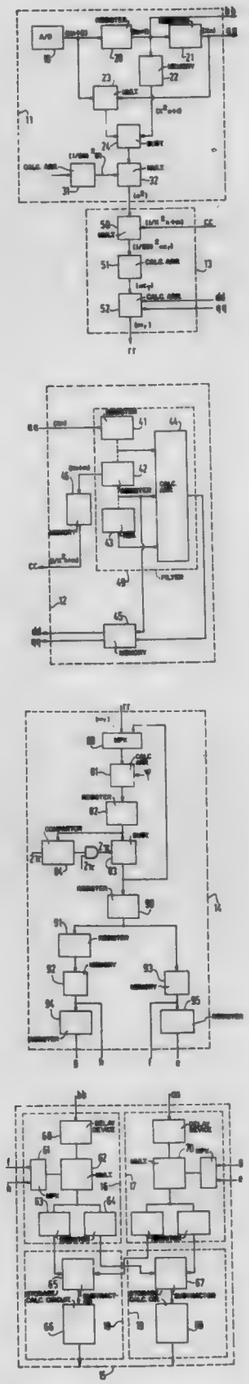
Gérard Le Floch, Montgeron, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 12, 1984, Ser. No. 649,872

Claims priority, application France, Sep. 23, 1983, 83 15135

Int. Cl.⁴ H04N *9/65*

U.S. Cl. 358—23 **6 Claims**



1. A method of digitally demodulating an amplitude-modulated signal, produced by suppressed-carrier amplitude modulation of two quadrature-phase carriers of the same frequencies Fs, including determining the square a_2 of the peak amplitude a of a sinusoidal reference signal which is in synchronism with the modulated signal, and sampling, at a rate defined by frequency Fe, said modulating signal being written:

$$m_{p+1} = u \cdot \cos(\alpha + K\phi) + v \cdot \sin(\alpha + k\phi)$$

wherein

$$\phi = \frac{\omega}{Fe} = 2\pi \frac{Fs}{Fe},$$

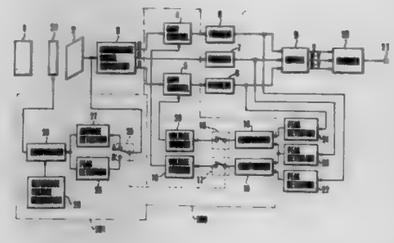
α is an initial angular phase shift and k the number of periods $T = 1/Fe$, characterized in that the method comprises the following steps:
determining and thereafter storing the sign of the reference signal x_{n+m} and the sign of the derivative of said reference signal at a predetermined instant t_{n+m} for which k is given the value zero;
determining at the instant t_{n+m} the square of the sine of the initial angular phase shift denoted as the real angular phase shift α_r or the inverse of this square in accordance with the expression $1/\sin^2 \alpha_r = a^2/x^2_{n+m}$;
determining the values of sin α_r, thereafter a value α_T which corresponds to one of the values of arc sin α_r chosen in one of the four quadrants of a customary trigonometrical presentation;
determining the value of the real angular phase shift α_r from the value of α_T, knowledge of the selected quadrant, and the signs of the reference signal and the derivative of said reference signal for the same instant t_{n+m};
determining and thereafter storing, sequentially at each instant of the sampling rate, the values $\alpha_r + k\phi$ modulo 2π;
determining and storing, sequentially, pairs of values of sin $(\alpha_r + k\phi)$ and cos $(\alpha_r + k\phi)$, sin $(\alpha_r + (k-1)\phi)$ and cos $(\alpha_r + (k-1)\phi)$ for two consecutive instants of the rate; and
determining values which are proportional to the modulating signals u and y, from the two samples m_p and m_{p+1} of the modulated signal, by:

$m_p \sin(\alpha_r + k\phi) - m_{p+1} \sin(\alpha_r + (k-1)\phi)$
proportional to u

and

$m_{p+1} \cos(\alpha_r + (k-1)\phi) - m_p \cos(\alpha_r + k\phi)$
proportional to v.

(c) balance control means for adjusting the balance of peak levels of a plurality of color signals included in the output of said image sensing means so as to be equal to each other;
(d) switch means for changing between a first mode in which the adjustment by said balance control means is permitted and a second mode in which the adjustment has ceased; and



(e) attenuation control means for controlling the attenuation of the output level of said image sensing means according to whether said switch means is in the first mode or in the second mode, said attenuation control means first rendering the output level of said image sensing means smaller in the first mode than the output level of said image sensing means in the second mode.

4,638,350

COLOR IMAGE SENSING DEVICE

Tokuzo Kato, Chiba; Tsutomu Takayama, and Toshio Kaji, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1983, Ser. No. 547,877

Claims priority, application Japan, Nov. 2, 1982, 57-193090

Int. Cl.⁴ H04N *9/64, 5/238*

U.S. Cl. 358—29 **17 Claims**

1. A color image sensing device comprising:
(a) image sensing means for converting an optical image into an electrical signal output having a plurality of color information components;
(b) peak detecting means for detecting the peak values of the plurality of color information components included in the output of said image sensing means;

4,638,351

ADAPTIVE FILTER FOR USE IN COLOR VIDEO SIGNAL PROCESSING

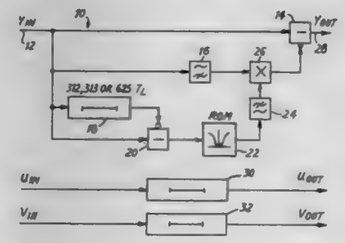
Christopher K. P. Clarke, Crawley, England, assignor to British Broadcasting Corporation, London, England

Filed Sep. 19, 1983, Ser. No. 533,766

Claims priority, application United Kingdom, Sep. 20, 1982, 8226798

Int. Cl.⁴ H04N *9/77*

U.S. Cl. 358—38 **9 Claims**



1. A filter arrangement for filtering the luminance component of a colour video signal in which chrominance information is carried, in an encoded signal, in the upper portion of the luminance band, said filter arrangement comprising
an input for receiving a colour video luminance signal;
means being connected to said input and receiving the full bandwidth luminance signal for detecting movement in the scene content between successive frames of said video signal to produce a control signal; and
a filter connected to said input and the transmission characteristic of which in the said upper portion of said luminance band is dynamically variable, said filter being adapted to receive said control signal when movement is

detected so as to vary the filter transmission dynamically so as to attenuate the luminance signals in said upper portion relative to the signals in the remainder of said band.

4,638,352

COLOR VIDEO CAMERA SIGNAL PROCESSING CIRCUIT

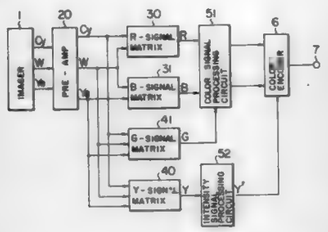
Masaru Noda, Fujisawa, and Toshihiro Shiga, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 14, 1984, Ser. No. 650,523

Claims priority, application Japan, Sep. 16, 1983, 58-169184; Oct. 13, 1983, 58-189877

Int. Cl.⁴ H04N *7/04, 9/64*

U.S. Cl. 358—44 **21 Claims**



1. A video camera signal processing circuit adapted to be connected to imaging means including photo-electric conversion means having a plurality of photo-sensors: arranged for generating a plurality of color signals in response to a plurality of color rays, comprising:

first intensity signal generating circuit means for generating a first intensity signal containing each of said color signals at predetermined proportions; said first intensity signal generating circuit means including proportion setting circuit means for setting said predetermined proportions such that products of said predetermined proportions for said respective color signals and ratios of sensitivities of corresponding photo-sensors are substantially equal; and

circuit means for generating color difference signals on the basis of said color signals, said color difference signal generating circuit means including color signal matrix circuit means for generating signals R (red) and B (blue) and a secondary intensity signal based on said color signals and processing circuit means for generating said color difference signals on the basis of said signals R and B and said second intensity signal.

4,638,353

ILLUMINATING MEANS FOR COLOR IMAGE SENSING

Tatsuo Nagasaki, Musashino, and Hiroyoshi Fujimori, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,520

Claims priority, application Japan, Sep. 5, 1983, 58-163582; Sep. 5, 1983, 58-163583; Sep. 5, 1983, 58-163584

Int. Cl.⁴ A61B *1/04, 1/06*; H04N *7/18, 9/07*

U.S. Cl. 358—98 **11 Claims**

1. Color image sensing means of a sequential three color mode for an endoscope assembly, comprising:

an elongated insert member;

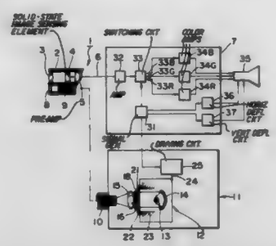
illuminating means having a light source for emitting illuminating light from the tip of said insert member;

a solid-state image sensing element positioned at the tip of said insert member and incorporating an imaging optical system for focussing the image of an object, illuminated by said illuminating means, on an image sensing surface having a great number of receiver elements having photoelectric conversion properties positioned on the focal plane of said imaging optical system;

video processor means for receiving the signals issued from said solid-state image sensing element and processing the signals by amplifying or the like to output the color signals at a predetermined timing;

color displaying means for displaying the color signals supplied from said video processor means;

filter means comprising a plurality of three color filters, and each color alternately arranged in the form of stripes arranged repeatedly at a predetermined pitch for transmitting each of said three colors of light therethrough, said



filter means positioned in an optical path between said light source and said solid-state image sensing element;

light transmitting means disposed proximal to said filter means and including light transmitting portions facing a group of said monochromatic filters for allowing light to pass therethrough and residual shutter portions for preventing light from passing therethrough;

vibrator means for reciprocating said filter means with respect to said light transmitting means sequentially so as to shift said group of monochromatic filters to a subsequent group of monochromatic filters of another color with respect to said light transmitting portions; and

driving means for supplying electrical signals for driving said vibrator means; thereby providing light to said solid-state image sensing means which has three different wave lengths successively by actuating said vibrator means.

4,638,354

RAPID PROFILE RECORDING DEVICE

Philippe Denimal, Pont-du-Chateau, France, assignor to PROGE, Paris, France

Filed Feb. 21, 1985, Ser. No. 703,710

Claims priority, application France, Feb. 23, 1984, 84 02927

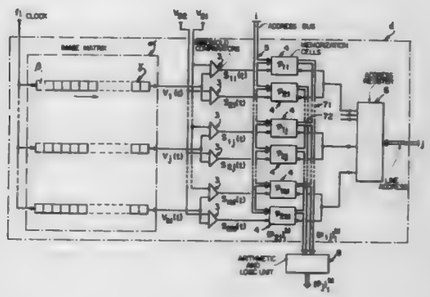
Int. Cl.⁴ H04N *7/14*

U.S. Cl. 358—106 **12 Claims**

1. A profile recording device comprising a plurality of elementary photosensitive image points produced on the same semiconductor substrate in a matrix having M lines and P columns and adapted to accumulate electric charges in response to brightness information impinging thereon and representing collectively a profile to be recorded, and also comprising, associated with each of the M lines, means for reading and transfer of the electric charges accumulated by the image points in order to provide an electric signal $V_j(t)$ for each line which is a function of the electric charges, said means being organized for a reading in parallel of the M lines, characterized by the fact that said device comprises, integrated on the same said semiconductor substrate,

(a) at least one threshold comparator per line responsive to the corresponding electric line signal $V_j(t)$ for providing an indication of a variation of the level of said electrical signal, at least one memorization cell per comparator,

means for recording in said respective memorization cells the positions in space where each of said variations in level



occurs, thereby establishing M positions in space representing the profile; and

(b) means for the reading of said M positions in space.

4,638,355

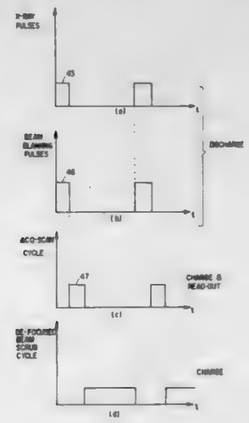
SYSTEM AND METHODS FOR IMPROVING VIDEO CAMERA PERFORMANCE

Haim Melman, Hertzlia, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed Nov. 27, 1984, Ser. No. 675,436

Int. Cl.⁴ H05G *1/64*; H04N *5/32*

U.S. Cl. 358—111 **8 Claims**



1. A method for improving the performance of TV cameras used in digital subtraction angiography systems, said cameras having tubes comprising a target with elemental areas in said target corresponding to pixels of the image, said tube also having a focus coil for focusing the electron beam thereof onto the elemental areas of said target, said method comprising the steps of:

a. charging the target with an electron beam that scans the target during a preliminary charge scan period of said electron beam;

b. said electron beam being normally focused on a single target elemental area;

c. blanking said electron beam during a discharge period caused by an exposure pulse of radiation;

d. exposing said target elemental areas to photons generated by said radiation during said discharge period such that certain of said target elemental areas are discharged;

e. acquiring data by recharging said certain of said target elemental areas during a reading scan of a target area comprising a plurality of lines;

f. further recharging said target elemental areas in said target area during a scrub period prior to the next beam blanking period; and

g. defocusing said electron beam during said scrub period to cause said electron beam to encompass a plurality of said elemental areas during said scrub period.

4,638,356

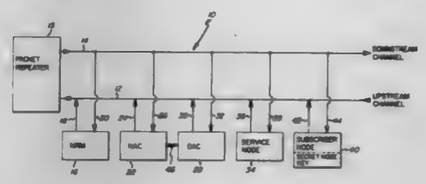
APPARATUS AND METHOD FOR RESTRICTING ACCESS TO A COMMUNICATION NETWORK

William A. Frezza, Warminster, Pa., assignor to General Instrument Corporation, New York, N.Y.

Filed Mar. 27, 1985, Ser. No. 716,384

Int. Cl.⁴ H04N *7/00, 7/167*; H04K *1/02, 1/00*

U.S. Cl. 358—118 **15 Claims**



1. In a communication network having:

an upstream communication channel,

a downstream communication channel,

at least one service node for providing services to subscribers using the network,

at least one subscriber node including:

means for generating a frame verifier code, and

means for transmitting said frame verifier code on the upstream communication channel of said network, and

packet repeater means for receiving communications on said upstream communication channel and retransmitting the same on said downstream communication channel,

the improvement comprising:

access restricting apparatus including:

means coupled to said downstream channel for examining the frame verifier code from said subscriber node for validity; and

means for jamming said upstream channel if an invalid frame verifier code is detected by said examining means.

4,638,357

AUDIO SCRAMBLER

Paul A. Heimbach, New York, N.Y., assignor to Home Box Office, Inc., New York, N.Y.

Filed Jan. 20, 1984, Ser. No. 572,445

Int. Cl.⁴ H04M *1/70*; H04N *7/67*

U.S. Cl. 358—121 **10 Claims**

1. A method for secure transmission of an audio signal, comprising the steps of:

generating a program audio signal;

generating an interference signal;

generating control information;

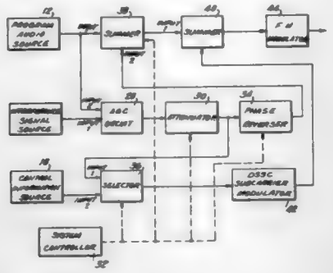
varying the level of said interference signal as a function of said program audio signal;

intermittently adding said interference signal to said program audio signal during predetermined periods of time to produce a scrambled signal;

transmitting said scrambled signal on one carrier;

simultaneously transmitting said interference signal on a second carrier; and

transmitting said control information on said second carrier during at least one interval between the predetermined



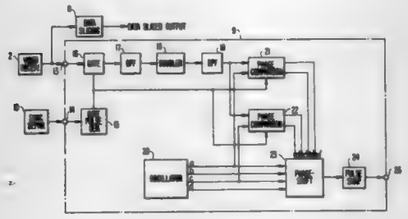
periods the interference signal is added to the program audio signal.

4,638,358

SAMPLING CLOCK REPRODUCING CIRCUIT

Toshiro Nozoe, Yamatokouriyama, and Akira Yamashita, Takatsuki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Jul. 19, 1983, Ser. No. 515,256
Claims priority, application Japan, Jul. 19, 1982, 57-126379; Jul. 19, 1982, 57-126380; Feb. 2, 1983, 58-16471
Int. Cl.⁴ H04N 5/04
U.S. Cl. 358—147 **9 Claims**



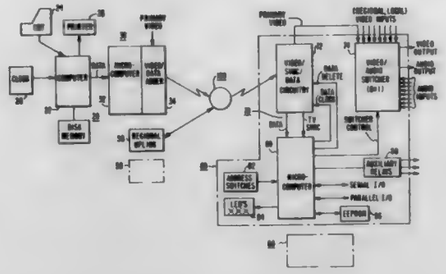
1. A sampling clock reproducing circuit for teletext receiver comprising: a gate circuit for passing a clock-run-in signal included in a teletext signal; a first band-pass filter connected to said gate circuit and having a tuning frequency which is equal to a repeated frequency of said clock-run-in signal; a doubler circuit for doubling the frequency of an output signal of said band-pass filter; a second band-pass filter connected to said doubler circuit and having a tuning frequency which is about two times as large as the repeated frequency of said clock-run-in signal; an oscillator circuit oscillating at a frequency two times as large as the repeated frequency of said clock-run-in signal; phase comparison circuits each detecting a phase difference between a respective one of output signals of said oscillator circuit and an output signal of said second band-pass filter; and a phase-shift circuit which is given said output signals of said oscillator circuit and selectively mixes said output signals of said oscillator circuit with a changing mixing ratio therebetween in accordance with output signals of said phase comparison circuits, so that a sampling clock signal is reproduced from an output signal of said phase-shift circuit.

4,638,359

REMOTE CONTROL SWITCHING OF TELEVISION SOURCES

John N. Watson, Moorestown, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 19, 1983, Ser. No. 496,030
Int. Cl.⁴ H04N 7/087
U.S. Cl. 358—147 **7 Claims**



1. Apparatus for transmitting command and control information from a central television programming source to one or more remote local television subscriber systems via encoded signals combined with video signals of a video program comprising,

data generating means for developing binary command data messages,

computer means for converting the binary command data messages into a pulse width modulated waveform representing the binary command data message,

a shift register means having data and clock inputs operatively connected to said computer means said computer means loading said shift register means with a bit pattern that represents said pulse width modulated waveform, the number of shift register bits used to represent a particular data bit determining the width of the corresponding pulse in the waveform and hence its encoded value,

a high speed clock means for shifting said waveform out of said shift register means,

a sync detector circuit means for supplying sync information of said video signals to said computer means, said computer means responding to the vertical sync information by enabling said high speed clock means to shift said waveform from said shift register, and

adder means for inserting said pulse waveform output from said shift register means into the vertical blanking interval of the video signal of the video program for transmission to the remote local television subscriber system,

said pulse width modulated waveform consisting of narrow pulses and wide pulses, said computer means counting the logic zeros and logic ones in each binary command data message received from said data generating means and assigning the narrow pulses to represent the logic level which appears most often in the message and further including a mode bit in transmitted waveform to alert the local systems as to which pulse width corresponds to which logic level.

4,638,360

TIMING CORRECTION FOR A PICTURE-IN-PICTURE TELEVISION SYSTEM

Todd J. Christopher; Donald H. Willis, both of Indianapolis, and Russell T. Fling, Fishers, all of Ind., assignors to RCA Corporation, Princeton, N.J.

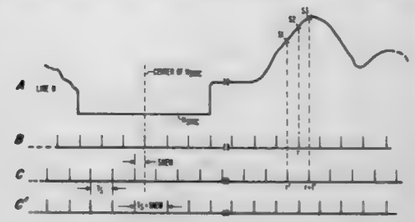
Filed Sep. 3, 1985, Ser. No. 771,700
Int. Cl.⁴ H04N 5/04, 5/262
U.S. Cl. 358—148 **17 Claims**

1. In a video signal processing system including a source of first video signal having a periodic horizontal line synchronizing signal component and a memory for holding sampled data representing a second video signal, apparatus for processing said sampled data in synchronism with said first video signal comprising:

means coupled to said source for developing horizontal synchronizing pulses representing the horizontal line synchronizing signal component of said first video signal:

a terminal for applying a clock pulse signal wherein the occurrence of clock pulses possibly exhibits varying amounts of skew relative to said horizontal synchronizing pulses;

skew measuring means coupled to said clock signal terminal



and responsive to said horizontal synchronizing pulses for generating a control signal corresponding to the difference in time, as a proper fraction of the period of said clock pulse signal, between the occurrence of a horizontal synchronizing pulse and a pulse of said clock signal;

means coupled to said clock signal terminal, for controlling the reading of the sampled data from said memory; and

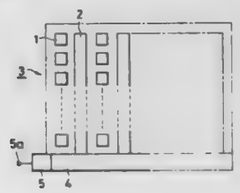
skew correcting means coupled to said clock signal terminal, to said memory and to said skew measuring means for effecting a time displacement of the signal represented by the sampled data read from said memory, the magnitude of said time displacement being determined by said control signal.

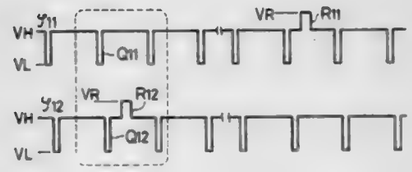
4,638,361

SOLID STATE IMAGE PICKUP

Kaneyoshi Takeshita, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP82/00374, § 371 Date May 16, 1983, § 102(e) Date May 16, 1983, PCT Pub. No. WO83/01170, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 17, 1982, Ser. No. 499,159
Claims priority, application Japan, Sep. 17, 1981, 56-146873
Int. Cl.⁴ H04N 3/14
U.S. Cl. 358—213 **1 Claim**





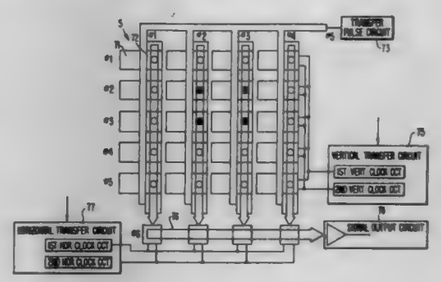
1. A solid state image pickup apparatus employing a solid state image pickup device which comprises a plurality of photodetectors arranged horizontally and vertically, transfer gate areas each corresponding to each of the photodetectors, a plurality of vertical transfer portions comprising charge coupled devices each extending vertically and positioned contiguously to the transfer gate areas which have transfer areas and storage regions, and a horizontal transfer portion coupled with the end of each of the vertical transfer portions and an output portion, wherein a reading pulse voltage which takes a first high level is applied to an even numbered rows of transfer gates during even field periods and is applied to odd numbered rows of transfer gates during odd field periods, so that signal charges are read out from said storage regions of said vertical transfer portions, a voltage which takes a second high level which is lower than said first high level is applied to said storage regions of said vertical transfer portions during each horizontal video period, transfer pulse voltages which take a low level at respective different phases within each horizontal blanking period are applied to said vertical transfer portions, so that the signal charges which are read out to said vertical transfer portions are transferred vertically to said horizontal transfer portion, and the signal charges which have been transferred to the horizontal transfer portion are further transferred in the horizontal direction through the horizontal transfer portion to an output portion.

4,638,362

SOLID-STATE IMAGE PICKUP DEVICE

Mitsuaki Oshima, Moriguchi, and Kazufumi Yamaguchi, Yao, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 28, 1984, Ser. No. 687,426
Claims priority, application Japan, Dec. 28, 1983, 58-250930
Int. Cl.⁴ H04N 3/14
U.S. Cl. 358—213 **12 Claims**



1. A solid-state image pickup device comprising:

a photosensitive picture element unit comprising photosensitive picture elements arranged in a matrix in horizontal and vertical directions to convert light containing picture element information into electrical charges corresponding to individual picture elements through photoelectric conversion;

a horizontal charge transfer means which transfers said electrical charges corresponding to individual picture elements in the horizontal direction; and

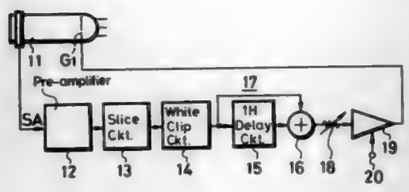
a vertical charge transfer means which transfers said electrical charges corresponding to individual picture elements in the vertical direction;

wherein at least one of said vertical charge transfer means and said horizontal charge transfer means is controlled in response to external control signals so that a part of said electrical charges corresponding to individual picture elemenfs in a specified part of said photosensitive picture elements are outputted as picture element output signals; and

wherein said horizontal charge transfer means has a plurality

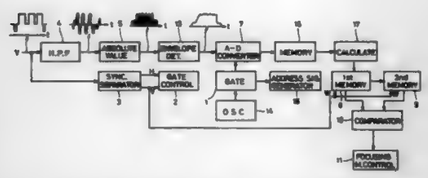
of output takeout outlets which are selectively actuated according to said external control signals.

4,638,363
AUTOMATIC BEAM CURRENT CONTROL SYSTEM FOR TELEVISION CAMERA
Sadaaki Tanaka, and Hisashi Ushijima, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Nov. 22, 1985, Ser. No. 800,820
Claims priority, application Japan, Nov. 22, 1984, 59-247738
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—219 7 Claims



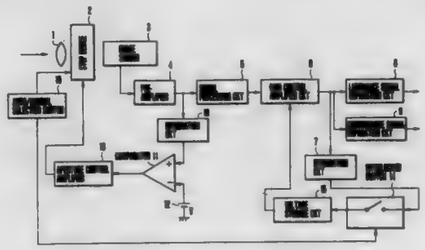
1. An automatic beam current control system for a television camera in which a beam current is detected from a target electrode of a camera tube and a beam current control signal is supplied to a beam current control electrode of the camera tube to thereby control the beam current comprising:
(a) beam current detecting means for detecting a beam current from a target current delivered from said target electrode of said camera tube;
(b) wave reshape means connected to said beam current detecting means for reshaping a waveform by a non-linear circuit;
(c) line adder means connected to said wave reshape means for generating a beam current control signal derived by adding a signal obtained by scanning a first line with an electron beam and a signal obtained by scanning a second line near said first line; and
(d) beam current control electrode drive means supplied with said beam current control signal for generating an electron beam of a predetermined intensity.

4,638,364
AUTO FOCUS CIRCUIT FOR VIDEO CAMERA
Tatsuo Hiramatsu, Higashiosaka, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan
Filed Oct. 28, 1985, Ser. No. 791,843
Claims priority, application Japan, Oct. 30, 1984, 59-228308
Int. Cl.[4] H04N *5/232*
U.S. Cl. 358—227 9 Claims



1. An auto focus circuit for a video camera including a focusing motor for focusing, comprising:
a high-pass filter circuit to which a luminance signal of a video signal is applied so that a high frequency component higher than a predetermined frequency is extracted from said applied luminance signal,
an absolute value calculating circuit connected to said high-pass filter circuit for obtaining an absolute value of the output of said high-pass filter circuit, an A-D converting circuit connected to said absolute value calculating circuit for converting an analog absolute value output signal provided from said absolute value calculating circuit to a digital signal,
a calculating circuit connected to said A-D converting circuit for adding the converted digital signal with a predetermined period cycle,
a comparing circuit connected to said calculating circuit for comparing the output of calculation in one predetermined period and the output of calculation in the predetermined period coming one predetermined period ahead of said predetermined period, and
a focusing motor control circuit connected to said comparing circuit for providing a signal for controlling the rotation of the focusing motor included in said video camera in the clockwise direction or in the counterclockwise direction based on the output of said comparing circuit.

4,638,365
IMAGE SENSING DEVICE
Tokuzo Kato, Chiba, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 22, 1985, Ser. No. 693,559
Claims priority, application Japan, Jan. 31, 1984, 59-15819
Int. Cl.[4] H04N *5/26*
U.S. Cl. 358—228 31 Claims

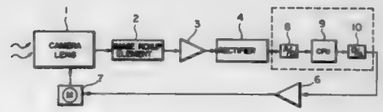


1. An image sensing device comprising:
(a) image sensing means for sensing an optical image;
(b) exposure control means for controlling light incident on said image sensing means;
(c) gain control means for automatically controlling the gain of a signal produced from said image sensing means;
(d) an operation member for a manual operation on said exposure control means; and
(e) memory means for holding the gain of said gain control means when the operation member operates.

4,638,366
AUTOMATIC IRIS ADJUSTMENT SYSTEM
Yasuo Yoshimura, Hachioji; Kunio Yamauchi, and Kenji Saito, both of Kodaira, all of Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 24, 1985, Ser. No. 779,793
Claims priority, application Japan, Sep. 28, 1984, 59-145860[U]
Int. Cl.[4] H04N *5/238*
U.S. Cl. 358—228 4 Claims

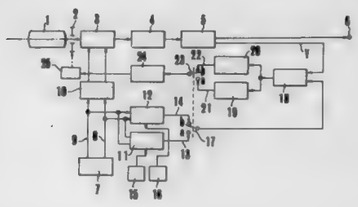
1. An automatic iris adjustment system comprising:
a camera lens including an iris driving means for controlling the iris value;
an image pickup element for converting the amount of light incident to said camera lens into an electrical signal;
calculation means which compares the iris adjustment signal voltage V_I provided by said image pickup element with a reference voltage V_O to evaluate an error voltage V_E (i.e., $V_E=V_I-V_O$);

calculation means which evaluates a varying component $\Delta IRIS$ of iris control value as a predetermined function of the error voltage V_E



calculation means which evaluates an iris control value $IRIS_n$ basing on the calculated varying component $\Delta IRIS$ of iris control value; and
means for controlling said iris driving means in response to the calculated iris control value $IRIS_n$.

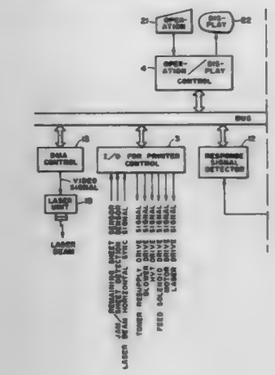
4,638,367
LIGHT METERING AND PROCESSING SYSTEM PARTICULARLY FOR A VIDEO CAMERA
Toshio Sakane, and Tokuichi Tsunekawa, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 238,685, Feb. 27, 1981, abandoned.
This application Feb. 6, 1985, Ser. No. 698,749
Claims priority, application Japan, Feb. 27, 1980, 55-23696
Int. Cl.[4] G03B *7/00*
U.S. Cl. 358—228 37 Claims

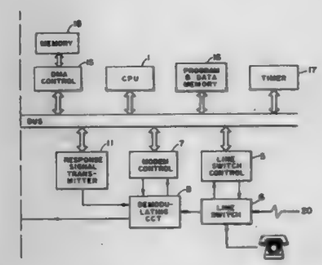


1. An optical measuring device comprising:
(a) image pick-up means for converting an optical image into electrical image information;
(b) reading means for time-serially reading out the electrical image information converted in the image pick-up means;
(c) operating means for applying a predetermined function signal to the electrical image information read out of the image pick-up means by the reading means thereby forming ouputs;
(d) adjusting means for changing the time correlation between the function signal and the time-serial electrical image information read out of the image pick-up means; and
(e) averaging means for averaging the outputs of the operating means.

4,638,368
REPRODUCTION APPARATUS
Katsuichi Shimizu, Kunitachi; Shunichi Masuda, Tokyo; Toshiaki Yagasaki, Hino, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 278,563, Jun. 29, 1981, abandoned.
This application Sep. 21, 1984, Ser. No. 653,072
Claims priority, application Japan, Jun. 30, 1980, 55-88722; Jun. 30, 1980, 55-88723
Int. Cl.[4] H04N *1/00*
U.S. Cl. 358—256 10 Claims

1. An image processing system, comprising:
means for reading an original image by photoelectric conversion and for generating original imaga data in bit image form;
means for entering character code data representing a character image;
means for converting the character code data entered by said entering means into character image data in bit image form;
first memory means for storing a page of image data in bit image form;
means for causing said first memory means to store the original image data and the character image data;





means for forming on a recording medium a reproduction image based on the image data read out from said first memory means, wherein in the reproduction image the character image has been inserted in the original image;
second memory means for storing bit image data corresponding to the image data stored in said first memory means; and
means for displaying an image based on the bit image data stored in said second memory means.

4,638,369
EDGE EXTRACTION TECHNIQUE
Robert C. Hsieh, Rancho Palos Verdes, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Sep. 4, 1984, Ser. No. 646,878
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—283 4 Claims

1. A method of producing an enhancement value for enhancing the edges of a halftone copy of a halftone original comprising the steps of:
scanning the original to produce a one bit per pixel raster,
isolating an m bit by m bit segment of the raster, where m is an odd number, and the N bit is the center bit,
calculating an edge sharpness value of the horizontal edges directly above and below the N bit,
calculating an edge sharpness value of the vertical edges directly to the left and right of the N bit,
for each direction, finding a most positive and a most nega-

tive sharpness value from the two sharpness values and zero,

taking the root mean square of the two most positive values, and of the two most negative values, to create positive and negative enhancement values,

testing the enhancement values by dividing their difference by the larger of the two, and comparing the absolute value of the result of said division to a first threshold,

using the positive enhancement value as the enhancement value if N is a "1" and the first threshold was not exceeded,

using the negative of the negative enhancement value as the enhancement value if N is a "0" and the first threshold was not exceeded,

using the positive enhancement value as the enhancement value if the positive value is larger than the negative value, and if the first threshold was exceeded,

selecting the negative of the negative enhancement value as the enhancement value if the negative value is larger than the positive value, and if the first threshold was exceeded,

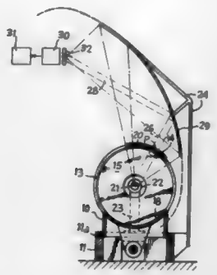
testing the absolute value of the selected enhancement value against a second threshold,

adding the selected enhancement value to the sum of the "1" bits in said m by m bit segment to create an edge enhanced gray scale pixel if the second threshold is exceeded, or adding nothing to said sum if the second threshold is not exceeded.

4,638,370
APPARATUS FOR DIGITALIZING AN IMAGE BY ANALYSIS BY MEANS OF A LIGHT BEAM

Jean-Claude Rosier; Claude Fouche, both of Gassy, and Gabriel Maincent, Tourny, all of France, assignors to Societe Europeenne de Propulsion, France

PCT No. PCT/FR84/00191, § 371 Date Apr. 22, 1985, § 102(e) Date Apr. 22, 1985, PCT Pub. No. WO85/01170, PCT Pub. Date Mar. 14, 1985
PCT Filed Aug. 23, 1984, Ser. No. 725,743
Claims priority, application France, Aug. 24, 1983, 83 13663
Int. Cl.[4] H04N *1/06*
U.S. Cl. 358—293 4 Claims



1. An apparatus for digitalizing an image carried by a transparent medium, comprising:

(a) a transparent analysis cradle shaped as a portion of a cylinder for receiving a transparent medium carrying an image to be digitalized;

(b) light source means;

(c) a first optical device for projecting a light beam emitted from the light source means onto an image carried by a medium fixed on the analysis cradle, said first optical device comprising a mirror which is rotatable about an axis aligned with that of the analysis cradle and which is oriented for receiving said light beam and reflecting said light beam perpendicularly to the surface of the analysis cradle;

(d) means for rotating the mirror about said axis;

(e) a second optical device comprising optico-electrical means hving a photosensitive surface to convert light received by said photosensitive surface into an electrical signal, and an elliptic mirror with a reflecting surface situated on a portion of a surface of a cylinder having an ellipse as a base and having an axis parallel to the axis of the analysis cradle, the center of the rotatable mirror and the center of the photosensitive surface being respectively substantially located at the focal points of the elliptic mirror, said elliptic mirror receiving the light beams which have gone through the analysis cradle and an image carrying medium fixed thereon as the rotatable mirror is rotated to scan one image line, and said elliptic mirror reflecting the received light beam onto the photosensitive surface so as to convert successive image elements of said image line into respective electrical signals;

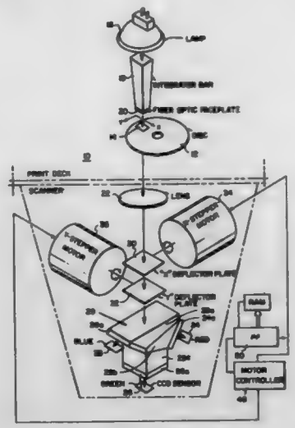
(f) means for digitalizing said electrical signals; and

(g) means for moving the analysis cradle in translation with respect to the rotatable mirror and second optical device so that an image carrying medium fixed on the analysis cradle is scanned line by line.

4,638,371
MULTIPLE EXPOSURE OF AREA IMAGE SENSOR HAVING A SPARSE ARRAY OF ELEMENTS

James R. Milch, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 11, 1985, Ser. No. 710,206
Int. Cl.[4] H04N *1/10, 3/06, 5/30, 9/04*
U.S. Cl. 358—293 2 Claims

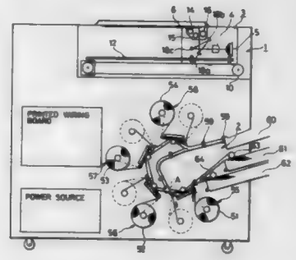


1. Image scanning apparatus comprising an area sensor including a sparse array of sensor elements which are exposed by pixels of a light image, said pixels of said light image being effectively the same size as said sensor elements, such that at a given relative position between said sensor and said light image, nearest-neighbor sensor elements of the array are exposed by non-neighboring pixels of the light image, means responsive to said exposed sensor elements to produce a digital image and means for moving the light image relative to the sensor to produce successive exposures of each sensor element by different light image pixels which have not previously exposed a sensor element, said moving means being adapted to move the light image relative to the sensor in such a pattern that digital image pixels of the digital image produced by individual sensor elements have nearest-neighbor digital image pixels produced by different sensor elements, and means coupled to the sensor and responsive to the successive exposures of the sensor elements for forming a digital image having rows and columns of digital image pixels, wherein the successive exposures of each sensor element produce digital image pixels in at least three different columns and three different rows of said digital image.

4,638,372
COLOR COPIER

Svay Leng; Hiroyuki Saitoh; Toshiharu Inui; Norihiko Koizumi; Haruhiko Moriguchi; Takashi Omori; Masami Kurata, and Yasuo Katoh, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1984, Ser. No. 654,403
Claims priority, application Japan, Oct. 17, 1983, 58-192531
Int. Cl.[4] H04N *1/21, 1/23, 1/46*
U.S. Cl. 358—296 11 Claims



1. A color copier, comprising a platen for mounting thereon a manuscript to be copied, a scanner unit adapted to reciprocate relative to said platen and generate image signals divided into three primary colors by reading said manuscript for each line or for each set of a plurality of lines, feed means for feeding cut recording sheets, a paper transfer route for transferring recording sheets fed out of said feed means, a first thermal head for feeding image signals in black disposed on said paper transfer route most closely to said feed means, second, third, and fourth thermal heads for feeding image signals in three colors other than black disposed sequentially on a downstream side relative to said first thermal head, paper transfer route switch means disposed in said paper transfer route between said first thermal head and said second thermal head, a by-pass paper transfer route formed between said paper transfer route switch means and a downstream side of said fourth thermal head, means for feeding ink donor sheets in black and in three colors other than black respectively to said thermal heads, first tightly pressing means for tightly pressing said recording sheet against said first thermal head through a medium of said ink donor sheet in black, first peel means for separating said recording paper from said ink donor sheet in black after completion of thermal transfer recording by said first thermal head, second, third, and fourth tightly pressing means and peel means similar to said first tightly pressing means and peel means, and paper discharge means for discharging said recording sheet separated by said first or fourth peel means, which color copier is characterized by the fact that for recording not in colors, said recording paper is separated by said first peel means and then guided by said paper transfer route switch means to said by-pass paper transfer route not passing said second, third and fourth thermal heads.

4,638,373
METHOD AND APPARATUS FOR IMPROVING GRAY SCALE RESOLUTION IN AN INK JET PRINTING SYSTEM

David J. Logan, Glastonbury, Conn., assignor to Metromedia, Inc., Secaucus, N.J.

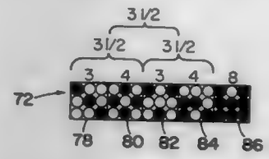
Filed Mar. 6, 1985, Ser. No. 708,744
Int. Cl.[4] H04N *1/21;* G01D *9/00, 15/16*
U.S. Cl. 358—298 4 Claims

1. A method for increasing the gray scale resolution of a graphic generated by an ink jet printing system, said ink jet printing system including ink jet printing means and means for controlling and operating said ink jet printing means to apply or not apply substantially equal sized dots of one color to a plurality of pixel areas located sequentially along a line scanned by said printing means and within each of which pixel areas, potential dot positions form an array identical for all pixel areas, said method comprising the steps of:

producing a sequential series of image density signals each substantially representative of the gray scale color intensity level associated with a respective one of said pixel areas;

converting said gray scale color intensity level value to an equivalent dot level value for each of said pixel areas;

comparing the dot level value associated with each of said pixel areas to a plurality of sets of dot level values, at least one set comprising integer dot level values and another set including dot level values other than integer values, each of said integer values corresponding to one of N integral color intensity values that may be represented by printing dots in said pixel dot position array;



identifying adjacent side-by-side pixel areas having dot level values corresponding to values in said another set wherein said identified pixel areas haye dot level values falling between the same two successive integer values;

alternately adding one and another of a predetermined dot level value to the dot level value associated with those identified adjacent side-by-side pixel areas having dot level values between two successive integers so that the dot level value of one of the two adjacent pixel areas is increased by said one predetermined dot level value and the other is decreased by said another predetermined dot level value;

rounding off each of the increased and decreased pixel dot level values to the nearest integer value so that the resulting dot level value of one of the two pixels is one dot level value more than the dot level value of the other pixel, and

printing each of said two pixels in accordance with the resulting dot level value determined such that the average of the sum of the dot level values of the two printed pixels more nearly approximates the gray scale value corresponding to the associated image density signal.

4,638,374
DEFECT DETECTING APPARATUS FOR A ROTARY RECORDING MEDIUM

Yuji Yoshitake, Fujisawa; Kentaro Yokouchi, Yokosuka, and Hiroyoshi Yoshikawa, Zama, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Jun. 14, 1984, Ser. No. 620,803
Claims priority, application Japan, Jun. 16, 1983, 58-108882
Int. Cl.[4] H04N *5/781, 5/94*
U.S. Cl. 358—336 6 Claims

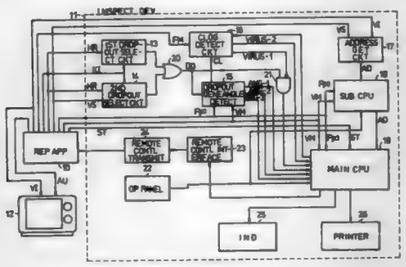
1. A defect detecting apparatus for detecting defects of a rotary recording medium based on various signals received from a reproducing apparatus which plays the rotary recording medium, said rotary recording medium having a frequency modulated multiplexed signal pre-recorded on a spiral track or concentric tracks thereof, said frequency modulated multiplexed signal being a multiplexed signal which has an address signal indicative of track positions multiplexed to information signals at least including a composite video signal, and which

has been subjected to a frequency modulation, said defect detecting apparatus comprising:

a first dropout selecting circuit supplied with a dropout detection signal which is produced from said reproducing apparatus when a decrease in the amplitude of a signal reproduced from the rotary recording medium is detected in said reproducing apparatus, for producing a first dropout detection signal having a predetermined pulse width responsive to one or a plurality of the dropout detection signals which are received from said reproducing apparatus during a predetermined duration in which a plurality of dropouts may be visually considered as being one dropout;

a second dropout selecting circuit supplied with the dropout detection signal and a reproduced vertical synchronizing signal from said reproducing apparatus, for producing a second dropout detection signal responsive to the dropout detection signal which is received from said reproducing apparatus with a phase which is at least in a vicinity of a beginning of the reproduced vertical synchronizing signal;

an angle detecting circuit supplied with a reference signal which is reproduced by said reproducing apparatus with a period of one track turn and the first and second dropout detection signals received from the respective first and second dropout selecting circuits, for generating an angle detection signal indicative of angular positions on the rotary recording medium where the first and second dropout detection signals are generated with respect to a reference position which is related to the reference signal;



a clog detecting circuit supplied with the frequency modulated multiplexed signal which is reproduced from the rotary recording medium in said reproducing apparatus and a clock signal having a constant frequency, for detecting at least a dropout which is caused by a clog on the rotary recording medium and has a duration of over a predetermined duration, and for generating a clog detection signal having a duration corresponding to the detected dropout;

compensating means for compensating a value of the address signal which is detected and reproduced from the frequency modulated multiplexed signal which is reproduced from the rotary recording medium in said reproducing apparatus, by comparing the value of the address signal which is detected and reproduced with a value of the address signal which was previously detected and reproduced;

processing means for sequentially performing a first process in which the existence of a tracking error is discriminated by comparing the value of the reproduced address signal from said compensating means and real time, a second process in which the existence of a clog is discriminated responsive to the clog detection signal from said clog detecting circuit, and a third process in which at least the existence of an interval in which a dropout is generated is discriminated based on the angle detection signal from said angle detecting circuit and the first and second dropout detection signals from the respective first and second dropout selecting circuits; and

at least an output device for storing or displaying a result of the processing in said processing means.

4,638,375

VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS

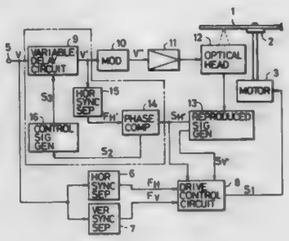
Tadashi Motoyama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 24, 1984, Ser. No. 613,572

Claims priority, application Japan, May 25, 1983, 58-92139; May 25, 1983, 58-92140

Int. Cl.⁴ H04N *5/76*; G11B *21/10*

U.S. Cl. 358—338 **8 Claims**



1. Apparatus for recording and reproducing a video signal on a disc which is subject to an eccentricity capable of causing a phase error in said signal and which is provided with a record track formed thereon and for reproducing a video signal from the record track on the disc; said apparatus comprising:

a head assembly containing recording and reading portions;

disc rotating meand for driving the disc to rotate in relation to said head assembly;

input terminal means for receiving said video signal;

signal path means extending from said input terminal means to the recording portion;

first control circuit means for receiving at least a first reference signal reproduce from the disc through the reading portion and a first synchronous signal in the video signal supplied to said input terminal, and controlling said disc rotating means so as to vary the rotation thereof in response to the phase of said first synchronous signal;

variable delay means provided in said signal path for delaying the video signal supplied to said input terminal to vary the time base thereof; and

second control circuit means for receiving a second reference signal reproduced from the disc through the reading portion and a second synchronous signal in the video signal in said signal path, and controlling the delay time in said variable delay means so as to cause the time base of the video signal derived from said variable delay means to vary in response to the phase of said second reference signal in such a manner as substantially to elminate said phase error due to said eccentricity.

4,638,376

ROTARY RECORDING MEDIUM WHICH IS PLAYABLE IN STILL PICTURE, SLOW-MOTION AND NORMAL REPRODUCTION MODES

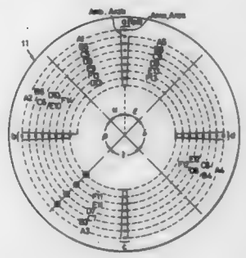
Hiroyuki Sugiyama, Iechara; Masaki Sakurai; Ryozo Abè, both of Yokohama; Kenji Yoshihara, Chiba, and Yasuo Haneji, Kanagawa, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 433,872, Oct. 13, 1982, abandoned. This application Jan. 10, 1986, Ser. No. 818,057

Claims priority, application Japan, Oct. 14, 1981, 56-163999; Oct. 14, 1981, 56-164000; Oct. 14, 1981, 56-164001; Oct. 14, 1981, 56-164002; Oct. 14, 1981, 56-164003

Int. Cl.⁴ H04N *5/76*

U.S. Cl. 358—342 **8 Claims**



1. A rotary recording medium which is playable in still-picture, slow-motion and normal reproduction modes on a reproducing apparatus which comprises a reproducing element for reproducing signals from the rotary recording medium, said rotary recording medium comprising:

at least one recording surface;

a spiral track formed on said recording surface, said spiral track being made up of a plurality of track turns;

a first video signal related to a unit which is repeatedly recorded with N field periods in each of said track turns, where N is a natural number which is greater than one, said unit being equal to one picture of a movie film;

a track shift address signal recorded in at least one position in each of said track turns with a constant period regardless of whether said unit is one field of the second video signal or one picture of the movie film, said track shift address signal comprising a rotary recording medium discriminating code for indicating a specific track pattern recorded on said rotary recording medium which comprises as recorded signals the first video signal related to the unit which is repeatedly recorded with N field periods in each of said track turns, a kick existence instructing code for indicating the existence of a forced track shift of the reproducing element from one track turn to another track turn, and a kick direction instructing code for indicating the direction of the forced track shift; and

divided audio signal segments successively arranged and recorded in accordance with a scanning locus of the reproducing element in the normal reproduction mode of the reproducing apparatus, said divided audio signal segments being obtained by segments of an audio signal,

said rotary recording medium having track parts with said divided audio signal segments recorded on at least a part of said recording surface,

said first video signal being repeatedly recorded for four field periods in each of said track turns, each of said track turns comprising first through fourth vertical blanking period recorded parts (a, b, c, d), each of said parts being recorded with a vertical blanking period of said first video signal, each of said track turns starting from said first vertical blanking period recorded part (a), an (M+1)-th divided audio signal segment out of said divided audio signal segments extending for eight fields of said first video signal from an intermediate point between said second and third vertical blanking period recorded parts (b, c) on a (2M+2)-th track turn, where M is a natural number including zero, said (M+1)-th divided audio signal segment containing an audio information in a first half part thereof which extends over four fields of said first video signal, said audio information being indentical to an audio information which is contained in a latter half part of an M-th divided audio signal segment, said latter half part of said M-th divided audio signal segment extending over four fields of said first video signal,

said kick existence instructing code and said kick direction instructing code of said track shift address signal having values such that the forced track shift of the reproducing element in the normal reproduction mode occurs in a (2M+1)-th track turn within said third vertical blanking period recorded part (c) in the inner peripheral direction of said rotary recording medium, so that a normal reproduction picture is obtained together with a continuously reproduced audio signal in response to a 2-2 pull-down performed in the reproducing apparatus, a still picture being obtainable in the still picture reproduction mode when the forced track shift of the reproducing element occurs within said first vertical blanking period recorded part in the outer peripheral direction of said rotary recording medium so as to repeately reproduce the same track turn.

4,638,377

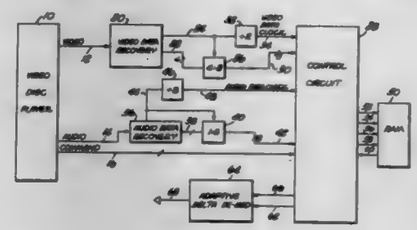
SELECTABLE VIDEO/AUDIO CODED DATA RECOVERY FROM A RECORD MEDIUM

Wayne R. Dakin, Huntington Beach, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 342,292, Jan. 25, 1982, abandoned. This application Sep. 6, 1984, Ser. No. 647,779

Int. Cl.⁴ H04N *5/76, 5/78*; G11B *7/00*

U.S. Cl. 358—343 **8 Claims**



1. Apparatus for recovering an audio message from a selected one of a plurality of blocks of composite digital audio data recorded on a record medium as at least one video encoded digital audio data block and at least one audio encoded digital audio data block, each said data block comprising a series of digitally encoded audio message units, each said audio message unit comprising a message portion, said apparatus comprising:

player means for recovering said blocks of composite digital data from said record medium, and including means capable of outputting recovered video encoded digital audio data blocks, means capable of outputting recovered audio encoded digital audio data blocks, and means for outputting command data;

selector means coupled to said player means and receiving any recovered video encoded data blocks and any recovered audio encoded data blocks of composite digital audio data, and including data select means responsive to said command data for selecting and outputting one of said recovered video and audio encoded data blocks of composite digital audio data;

addressable data storage means;

write means for receiving said selected block of composite digital audio data from said data select means, and for

writing said selected block of composite digital audio data into predetermined data storage locations in said addressable storage means; and

data readout means responsive to said command data for reading out of said addressable storage means the message portion of a selected audio message unit.

4,638,378

FIDELITY CONTROL DURING OPERATION OF DUPLICATOR MACHINES

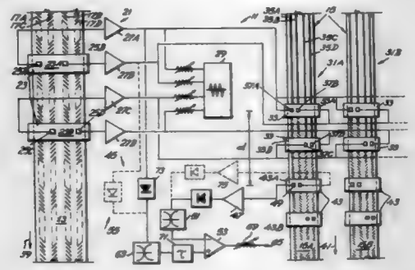
Arrigo Zanessi, Montevideo 215, 5500 Mendoza, Argentina

Filed Jun. 12, 1985, Ser. No. 743,778

Claims priority, application Argentina, Jun. 12, 1984, 296890

Int. Cl.[4] G11B *5/02, 5/09, 5/86, 27/36*

U.S. Cl. 360—15 3 Claims



1. A fidelity monitor apparatus for use with a high-speed recorder machine which has reader means for reproducing a master signal from a master source and producing an output signal indicative thereof, and recorder means including at least one recorder head for recording, at a substantially higher than normal rate, said output signal on each track of a slave means which has at least one moving track, said fidelity monitor apparatus comprising:

slave monitor means including at least one pick-up head spaced a predetermined distance downtrack from each recorder head, for obtaining a slave sample of said master signal just recorded on said moving track by said recorder head;

electronic means connected to said output signal of said reader means for electronically deriving a master reference which is in phase with said slave sample from said output signal, said electronic means including means for producing a master sample from said master signal as soon as said master signal is read at said higher than normal rate from said master source, said produced master sample being in a lower frequency range than that of said master signal;

comparator means for generating a malfunction signal when said slave sample differs from said master reference in more than a predetermined manner; and

werein said electronic means further includes delay means, connected between said producing means and said comparator means, for delaying said master sample to enphase said master sample with said slave sample to obtain said master reference, wherein said delay device is selected to operate in said lower frequency range and to provide a time-delay substantially equal to a quotient of said predetermined distance divided by a speed of said moving track relative to slave pick-up and said recorder heads.

4,638,379

TRACKING CONTROL SYSTEM FOR A VIDEO TAPE RECORDER

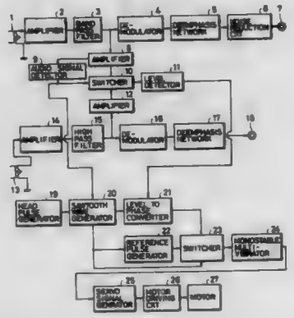
Tsunehiko Tashima, Mito, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 759,962

Claims priority, application Japan, Jul. 27, 1984, 59-155297

Int. Cl.[4] H04N *5/78, 5/76;* G11B *5/45*

U.S. Cl. 360—19.1 5 Claims



1. A tracking control system for a VTR having a rotary head which is composed of a rotatable drum, at least one audio head for recording and reproducing an audio FM signal, and at least one video head for recording and reproducing a video FM signal, both heads being mounted on a circumference of the rotatable drum with a predetermined distance from each other, said system comprising;

a detector for detecting the existence of the audio FM signal reproduced by the audio head;

a level detector for detecting a level of a signal applied thereto and producing an output an amplitude of which is proportional to the level of the signal applied thereto;

a switching circuit for selectively supplying the level detector with the audio FM signal reproduced by the audio head when the audio FM signal exists and with the video FM signal reproduced by the video head when the audio FM signal does not exist, in response to an output of the detector for detecting the existence of the audio FM signal; and

means for controlling a tracking position of the rotary head on the basis of the output of the level detector so as to make the output of the level detector maximum.

4,638,380

DIGITAL VIDEO TAPE RECORDER APPARATUS

James H. Wilkinson, and Clive H. Gillard, both of Basingstoke, United Kingdom, assignors to Sony Corporation, Tokyo, Japan

Filed May 9, 1984, Ser. No. 608,516

Claims priority, application United Kingdom, May 19, 1983, 8313821

Int. Cl.[4] G11B *5/02;* H04N *5/78*

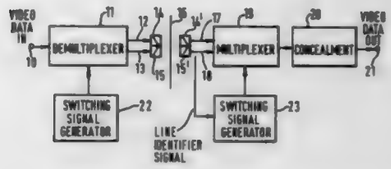
U.S. Cl. 360—22 9 Claims

1. Digital video tape recorder apparatus comprising:

a recording head assembly having 2n heads, where n is an integer;

a demultiplexer responsive to an incoming digital video signal organized in a plurality of video lines, each line being formed of a plurality of video samples, for demultiplexing said video signal sample by sample into 2n channels for supply to said 2n recording heads; and

switching means for switching the connections between said channels and said heads line-by-line of said television



signal, so that said connections are different from one line to the next.

4,638,381

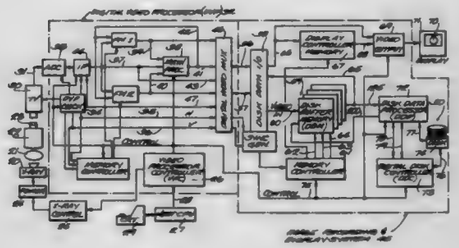
STORAGE OF DIGITIZED VIDEO IMAGES ON DISK

Steven T. Vaughn, Wales, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 6, 1984, Ser. No. 637,873

Int. Cl.[4] G11B *5/09, 5/43*

U.S. Cl. 360—51 2 Claims



1. A digital data deskewing circuit for use with a parallel transfer digital disk drive having a plurality of coaxially arranged magnetic disks rotating together at a constant speed, a plurality of digital data transmission channels and read/write heads magnetically coupling the channels to the disks, respectively, a master clock controlling writing on the respective disks a number of digital words, bytes or other digital data bit groups, said groups being written on each disk as a serial stream of bits, during reading of the streams from the disks said drive providing a bit read clock pulse train for each channel for defining the bits and a sync data bit grouping derived from the disk and preceding valid digital data, said clock pulses sometimes being out of synchronism with each other such that the data bits are skewed in time relative to each other during readout of the disks, said disk drive issuing an index pulse for each disk revolution sectors pulses marking each disk sector,

deskewing circuit means comprising master sequencer means referenced to the index and sector time base of the disk drive and operative to provide clock pulse signals for serial bit stream outputs from all channels at the same time,

each channel including serial-to-parallel converter means having a data input for serial bits from a disk and an input for said bit read clock of the channel, said converter having a predetermined number of parallel bit outputs,

sync detector means coupled to said parallel bit outputs of said converter means, detection of said sync data indicating that serial bits composing valid data follow,

digital latch means having parallel bit inputs coupled to the respective parallel bit outputs of said converter means and having corresponding outputs and a clock pulse input which clock rate is a fraction of the bit read clock rate to said serial-to-parallel converter, so that for every latch means clock said predetermined number of bits will be transferred from said converter to said latch means,

first-in, first-out (FIFO) memory means having parallel bit inputs coupled to corresponding outputs of said latch means, having corresponding parallel bit outputs and having an input clock that is such fraction of said read clock rate and having an output clock supplied by said master sequencer means for controlling the rate at which parallel bits are transferred together out of said FIFO memory means,

parallel-to-serial converter means having parallel bit inputs coupled to corresonding outputs of said FIFO memory means and having a bit rate output control clock supplied by said master sequencer and having an output for serially arranged bits, and

another sequencer means with its input coupled to said sync detector means and responding to detection of said sync data by initiating control and clocking of said latch means and FIFO memory means to transfer said predetermined number of parallel bits per clock pulse.

4,638,382

PUSH-PULL AMPLIFIER AND METHOD FOR OPERATION, PARTICULARLY RECORDING AMPLIFIER FOR VIDEO TAPE RECORDERS

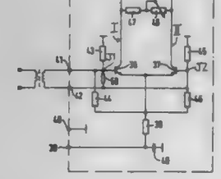
Josef Sochor, Dieburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 18, 1984, Ser. No. 631,845

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1983, 3326066

Int. Cl.[4] G11B *5/02*

U.S. Cl. 360—68 10 Claims



1. A video head wheel-recording transducer-recording amplifier combination having

a rotatable head wheel (1);

at least one transducer head (6, 7, 8, 9), each having a transducer coil (30, 109, L_R) and end terminals (34, 35; 107, 108) located on the rotating head wheel;

a plurality of rotating electrical transmission elements (11) on the head wheel, forming part of electrical transfer paths for transferring electrical energy between the rotating head wheel and stationary components;

and at least one push-pull transistor amplifier located on the rotatable head wheel,

wherein the transistor push-pull amplifier comprises

a push-pull amplifier circuit which has a minimum number of electrical transfer paths between the rotating head wheel on the stationary component and is characterized by a circuit configuration which determines the operating point of the transistors of the transistor amplifier by control of the voltage of a power source, coupling power via power connection sections of the electrical transfer paths to the transistor push-pull amplifier,

said transistor push-pull amplifier circuit comprising

two branches (I, II; I', II') each including a transistor (36, 37; 101, 102, 103, 104) of identical conductivity type;

a common resistor (38, 118) having a first and a second terminal,

the emitters of both transistors of the two branches (I, II) being connected together and to the first terminal of said common resistor only, and the second terminal of the common resistor being connected to one terminal (39, 119) of the power connection section of the transfer paths;

two resistor circuits, each having at least two resistors (43, 44, 45, 46; 112, 113, 116, 117), and a common junction or tap point (J1, J2, J1', J2'; J3, J4) connecting said at least two resistors of the two resistor series circuits,

each resistor series circuit having one end terminal connected to the other terminal (40, 110) of the power connection section transfer paths including the head wheel, and another end terminal connected to said one terminal of the common resistor (39, 118) and hence to the emitters of the transistors (36, 37; 101, 102, 103, 104) of the two branches (I, II; I', II');

a connection between the junctions or tap points of each of the resistor series circuits of a transistor in a respective branch (I, II; I', II'); and

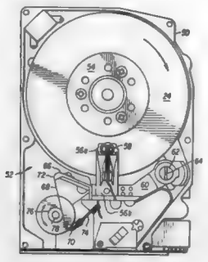
wherein the end terminals (34, 35; 107, 108) of the transducer coil are coupled to respective collectors of the transistors in the respective branches.

4,638,383

MICRO HARD-DISK DRIVE SYSTEM

James G. McGinlay, 103 Ralston Drive, Kirkcaldy, Scotland, and Roderick M. Urquhart, 10 Balgeddie Way, Glenrothes, Scotland

Continuation of Ser. No. 582,554, Feb. 22, 1984, Pat. No. 4,568,988. This application Nov. 19, 1985, Ser. No. 790,621
The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.
Int. Cl.[4] G11B *5/012, 5/55, 5/56*
U.S. Cl. 360—77 16 Claims



1. A computer disk drive system for operating a micro hard-disk, said disk drive system comprising:

at least one micro hard-disk having a diameter of between 92 and 96 millimeters fixedly mounted in a sealed housing;

means for rotatably supporting said hard-disk;

means for rotating said hard-disk;

transducer means having two read/write heads for writing digital information on and reading digital information from said hard-disk on both planar sides of said hard-disk in a format so that said hard-disk has digital information stored on concentric tracks at a density providing at least 5 Megabytes of storage per disk; and,

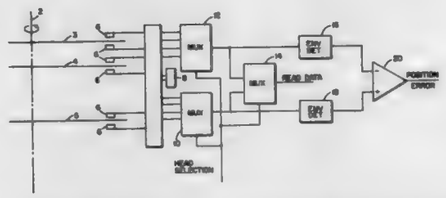
positioning means for moving said transducer means between the tracks on said hard-disk, said positioning means being arranged to substantially limit the total variance of the angle of said transducer means to a line tangential to each of said concentric tracks, said positioning means including a stepper motor and means for operating said stepper motor in step increments, each increment causing said transducer means to move from one track to the next adjacent track on said hard-disk.

4,638,384

HEAD POSITIONING MECHANISM FOR ROTATING DISK DATA STORAGE SYSTEM

Alexander Stewart; Duncan S. Furness, and Sham P. Bhatia, all of Boca Raton, Fla., assignors to Rodime, PLC, Scotland

Filed Nov. 19, 1985, Ser. No. 799,595
Int. Cl.[4] G11B *5/56*
U.S. Cl. 360—77 20 Claims



1. A fine position closed loop servo system for use in conjunction with a closed loop servo positioning system for a magnetic disk storage media having at least two data storage disks rotatingly driven at a constant velocity with a plurality of concentric data tracks on at least one of the surfaces of each of said data storage disks, at least one data transducer associated with and in close proximity to each of said data storage disks, said data transducers being mounted to a common head mounting structure for movement by driver means across said plurality of concentric tracks on each of said at least two data storage disks, comprising:

first servo burst signals on a surface of a first of said at least two data storage disks, said first servo burst signals being recorded on said first data storage disk at radial positions one-half track displaced from one of the odd and even numbered concentric track centerlines;

second servo burst signals on a surface of another of said at least two data storage disks, said second servo burst signals being recorded at radial positions one-half track displaced from the not already selected one of the odd and even numbered concentric track centerlines;

means for simultaneously enabling the data transducers associated with the surfaces of said at least two data storage disks containing said first and second servo burst signals for reading said servo burst signals;

means for simultaneously separately detecting the absolute value of the envelope of each of said first and second servo burst signals; and

means for comparing each of said detected envelope signals in order to generate a position error signal for application to said driver means for promoting and maintaining track centerline alignment of an enabled data transducer during operation of said magnetic disk storage means.

4,638,385

TAPE RECORDER HAVING AN IMPROVED SYSTEM FOR CONTROLLING TAPE TRAVEL AND MAGNETIC HEAD MOVEMENT

Naomichi Kohri, Maebashi, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 14, 1984, Ser. No. 610,247
Claims priority, application Japan, May 18, 1983, 58-87364
Int. Cl.[4] G11B *5/008, 5/54, 21/22, 21/08*
U.S. Cl. 360—96.4 9 Claims

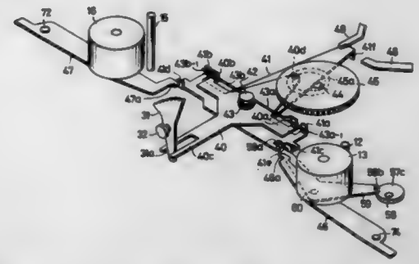
1. A tape recorder having an improved system for controlling tape travel and magnetic head movement, said tape recorder playing a tape cassette which accommodates a tape and is loaded into said tape recorder in a mode which is selected out of a forward reproduction mode in which a reproduction is carried out while the tape moves in a forward direction, a reverse reproduction mode in which the reproduction is carried out while the tape moves in a reverse direction, and a third mode other than the forward and reverse reproduction modes, said tape recorder comprising:

a first pinch roller mechanism for pressing against a first capstan and for moving the tape in the forward direction during said forward reproduction mode;

a second pinch roller mechanism for pressing against a second capstan and for moving the tape in the reverse direction during the reverse reproduction mode;

a magnetic head mechanism having a magnetic head for rotating the magnetic head over one-half revolution in response to a reversal of the tape traveling direction, said magnetic head assuming first rotational position of the magnetic head when said tape moves in the forward direction and assuming a second rotational position of the magnetic head when said tape moves in the reverse direction;

control means for selectively operating said first pinch roller mechanism or said second pinch roller mechanism responsive to said mode, and for operating said magnetic head mechanism, said control means comprising a first rotary lever for operating said magnetic head mechanism so as to determine a rotational position of the magnetic head by rotating the magnetic head over one-half revolution responsive to a rotational position of the first rotary lever, first rotating means for rotating said first rotary lever, a second rotary lever coupled to said first rotary lever through a resilient member, said second rotary lever rotating together with said first rotary lever so as to assume one



of first and second rotational positons of said second rotary lever depending on the rotational position of said first rotary lever, said first and second rotary levers having a common rotary axis, and second rotating means for deforming said resilient member and for rotating said second rotary lever to a third rotational position separately from said first rotary lever during said third mode, said first rotating means comprising a cam part for engaging with a part of said first rotary lever so as to determine said rotational position of said first rotary lever depending on the mode of said tape recorder; and

driving means for driving said cam part of said first rotating means,

said second rotary lever making it possible to transmit a rotation to a take-up reel shaft, making said first pinch roller mechanism operative, and making said second pinch roller mechanism inoperative in said first rotational position of said second rotary lever,

said second rotary lever making it possible to transmit a rotation to a supply reel shaft, making said second pinch roller mechanism operative, and making said first pinch roller mechanism inoperative in said second rotational position of said second rotary lever,

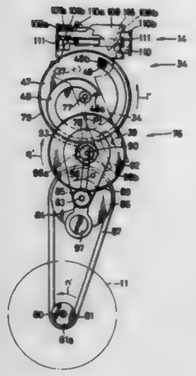
said second rotary lever making it impossible to transmit a rotation to said take-up reel shaft and said supply reel shaft, and making said first and second pinch roller mechanisms inoperative in said third rotational position of said second rotary lever.

4,638,386

OPERATION CHANGING MECHANISM RESPONSIVE TO DIRECTION CHANGE OF A REVERSIBLE MOTOR

Ryoji Takamatsu, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 22, 1983, Ser. No. 506,664
Claims priority, application Japan, Jan. 23, 1982, 57-108143
Int. Cl.[4] G11B *5/008, 15/00, 17/00*; G03B *1/04*
U.S. Cl. 360—96.5 3 Claims



1. An operation changing mechanism for an electronic apparatus, comprising:

a rotatable driving gear;

means including an electric motor for selectively rotating said driving gear in opposed first and second directions;

a first swinging gear in meshing engagement with said driving gear for rotation by the latter and a second swinging gear coaxial with said first swinging gear and rotatably coupled with the latter;

mounting means rotatable supporting said first and second swinging gears and being swingable about the axis of said driving gear for orbital movements of the common axis of said first and second swinging gears about said driving gear while maintaining said meshing engagement between the latter and said first swinging gear;

stop means for limiting said orbital movements in opposite directions at first and second positions of said common axis and to which the latter is urged in reaction to rotation of said driving gear in said first and second directions, respectively, while in said meshing engagement with said first swinging gear;

a rotary cam member having peripheral gear teeth engageable by said second swinging gear from turning of said rotary cam member between first and second rotary positions said peripheral gear teeth having a toothless gap with a peripheral dimension to accommodate said second swinging gear and thereby halt turning of said rotary cam member in said first and second positions when said common axis of the swinging gears is in said first and second positions, respectively thereof, the extent of said orbital movements between said first and second positions of the common axis being related to said peripheral dimension of the toothless gap so that with said common axis in one of said first and second positions thereof and said second swinging gear accommodated in said toothless gap of the rotary cam member in one of said first and second positions of the latter, the orbital movement of said common axis to the other of said first and second positions engages said second swinging gear with said peripheral gear teeth for turning said rotary cam member in a respective direction to the other of said first and second positions of the latter, said rotary cam member further having at least one cam surface thereon;

an actuating member engaging said cam surface and being

reciprocally moved thereby in response to turning of said rotary cam member between said first and second positions of the latter for changing a respective operation of an electronic apparatus; and

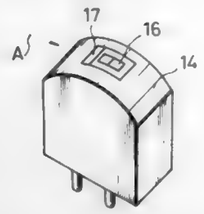
locking means for selectively locking said rotary cam member at said first and second positions thereof and thereby preventing inadvertent turning of said rotary cam member.

4,638,387

COMPOSITION FOR SLIDING CONTACT PART OF RECORDING/REPRODUCING APPARATUS

Koichi Mukasa; Takashi Hatanai, both of Nigata; Keishi Nakashima, Yunotani, and Kazumasa Onishi, Nigata, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Dec. 5, 1983, Ser. No. 558,328
Int. Cl.⁴ G11B *5/187, 15/60*
U.S. Cl. 360—122 **10 Claims**



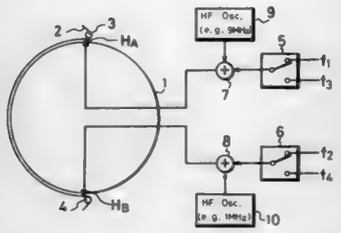
1. A recording/reproducing apparatus characterized in that a sliding contact part coming into sliding contact with a magnetic recording medium is provided adjacent a magnetic head core on an upstream side thereof, as determined by a running direction of the magnetic recording medium relative to the magnetic head core, and at least a portion of the sliding contact part, said portion coming into sliding contact with the magnetic recording medium, is made of a composite material comprising a carbonaceous material, of 50–95% by volume, and a mechanical strength-increasing material.

4,638,388

METHOD OF MAKING A LINEARITY STANDARD MAGNETIC TAPE

Masaru Hara, Aichi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 685,122
Claims priority, application Japan, Dec. 26, 1983, 58-251877
Int. Cl.⁴ G11B *5/02, 27/36*
U.S. Cl. 360—18 **7 Claims**



1. A method of making a linearity standard magnetic tape comprising the steps of:

(a) providing rotary magnetic head means including a pair of magnetic heads having gaps with different azimuth angles, respectively, and for recording slant tracks alternately on a magnetic tape;

(b) supplying a first pilot signal of low frequency and a linearity standard signal of high frequency to one of said magnetic heads; and

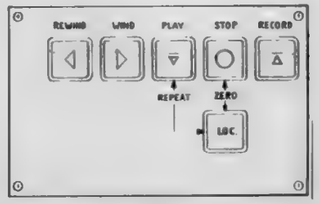
(c) supplying to the other of said magnetic heads a second pilot signal of low frequency and a bias signal of sufficiently higher frequency than said linearity standard signal as to be omitted from the recording on said tape by said other magnetic head.

4,638,389

CONTROL PANEL FOR A TAPE RECORDER

Rüdiger Barth, Insel Reichenau, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

Filed Jan. 7, 1986, Ser. No. 816,717
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1985, 3500540
Int. Cl.⁴ G11B *15/18*
U.S. Cl. 360—72.1 **2 Claims**



1. A control panel for a magnetic tape recorder comprising a main memory associated with said recorder, and wind, rewind, recording, playback, location, and stop buttons, and button responsive means for carrying out the designations indicated by the buttons, and wherein on actuating one of the recording buttons (RECORD) and the playback button (PLAY) the respective tape location is automatically stored in said main memory by said button responsive means;

under said stop buttton designated (STOP) said location button designated (LOC) is arranged;

on actuating said location button (LOC), the magnetic tape is stopped, the tape locations stored in the main memory is read, and the magnetic tape is rewound to this tape location by said button responsive means;

on simultaneous actuation of the location button (LOC) and of this stop button (STOP), the magnetic tape is stopped and rewound to the tape location zero by said button responsive means;

on simultaneous actuation of the location button (LOC) and of the playback button (PLAY), the magnetic tape is stopped, the tape location reached is stored as per "take" end, the magnetic tape is rewound to the last recording or playback location stored in the memory, and in automatic repetition played back between the tape location the stopped location by said button responsive means.

4,638,390

RECORDING APPARATUS

Susumu Kozuki, Tokyo; Kenichi Nagasawa, Kanagawa; Hiroo Edakubo, Tokyo; Junichi Sato, Kanagawa, and Nobutoshi Takayama, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

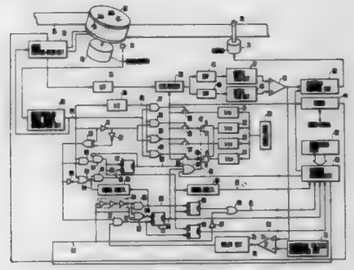
Filed Dec. 3, 1985, Ser. No. 804,350
Claims priority, application Japan, Dec. 4, 1984, 59-256760
Int. Cl.⁴ G11B *15/18, 5/56*
U.S. Cl. 360—74.1 **24 Claims**

20. A recording apparatus for recording an information signal on a record bearing medium, comprising:

(a) recording means for forming recording tracks by recording said information signal on said record bearing medium;

(b) synchronous signal generating means for generating a synchronous signal in accordance with the recording track forming action of said recording means;

(c) instruction means for producing a recording stop instruction to bring the recording operation of said recording apparatus to a stop; and



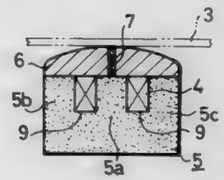
(d) stopping means for detecting said synchronous signal and, upon completion of formation of a predetermined number of said recording tracks, after the instruction of said instruction means is produced, to cause the recording operation of said recording means to come to a stop.

4,638,391

VERTICAL RECORDING MAGNETIC HEAD HAVING SINGLE CORE BODY BONDED WITH MAIN MAGNETIC POLE IN GUARD LAYER

Takashi Hatanai, Koide; Keishi Nakashima, Yunotani, and Koichi Mukasa, Koide, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jun. 11, 1984, Ser. No. 619,034
Claims priority, application Japan, Sep. 6, 1983, 58-101747; Sep. 6, 1983, 58-101748; Nov. 6, 1983, 58-103540
Int. Cl.⁴ G11B *5/12, 5/22*
U.S. Cl. 360—125 **9 Claims**



1. A magnetic head for recording vertically by a main magnetic pole oriented perpendicular to a horizontal surface of a recording medium, comprising:

(a) a core body made of magnetic material having a central leg extending vertically therefrom with one end facing in the direction of the recording medium, means defining a recess adjacent said central leg for supporting an electromagnetic coil therein, and side legs spaced apart from said central leg;

(b) a guard member made of non-magnetic material supported on one side thereof on said central and side legs of said core body, and having on an opposite side thereof a surface adapted to be placed in contact with said recording medium;

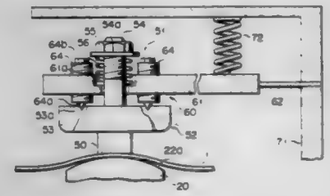
(c) said guard member having formed therein a thin layer of magnetic material extending vertically therethrough from said one side to said opposite side to said contact surface acting as a main magnetic pole for vertical recording on said recording medium, said thin magnetic layer having one end placed in contact with said one end of said central leg of said core body.

4,638,392

MAGNETIC HEAD PRESSURE PAD DEVICE

Mitsuru Akutsu, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 21, 1983, Ser. No. 477,362
Claims priority, application Japan, Jul. 12, 1982, 57-105393[U]
Int. Cl.⁴ G11B *15/60, 5/56*
U.S. Cl. 360—130.32 **8 Claims**



1. A magnetic head device comprising:

(a) a magnetic head for recording a signal on a recording medium and for reproducing the signal therefrom, said magnetic head comprising:

(i) a head guide including an engaging portion in a side surface thereof and p2 (ii) a guide surface which is brought into sliding contact with the recording medium during use of the device;

(b) supporting means for supporting said magnetic head, said supporting means comprising:

(i) a support table;

(ii) a support member attached to said support table and arranged to be movable so as to support and move said magnetic head toward and away from said support table; and

(iii) an elastic member provided on said support table and engaged with said engaging portion in said head guide so as to bias said head guide toward said support member;

(c) a pressure pad opposing said guide surface in position to urge a recording medium which travels between said guide surface and said pressure pad toward said guide surface during use of the device;

(d) a mounting portion for mounting said pressure pad; and

(e) a supporting portion for supporting said mounting portion, said supporting portion comprising:

(i) a base plate movably mounted with respect to said support table;

(ii) means for resiliently biasing said base plate toward said magnetic head;

(iii) a shaft on which said mounting portion is mounted, said shaft being slidably received in a throughhole in said base plate;

(iv) means for biasing said mounting portion toward said base plate; and

(v) a plurality of threaded members threadedly engaged in said base plate and bearing against said mounting portion, said plurality of threaded members being usable to adjust the distance between said mounting portion and said base plate by turning said plurality of threaded members in said base plate.

4,638,393

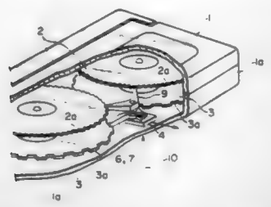
MAGNETIC TAPE CASSETTE HAVING AN IMPROVED BRAKING MECHANISM

Kengo Oishi, and Osamu Suzuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 2, 1983, Ser. No. 529,180
Claims priority, application Japan, Sep. 2, 1982, 57-151781
Int. Cl.⁴ G11B *23/02*
U.S. Cl. 360—132 **4 Claims**

1. A magnetic tape cassette comprising a pair of tape reels

rotatably mounted within said cassette for rotation about parallel spaced apart axes, each reel having upper and lower flanges with one of said flange having the periphery thereof formed into a flat-tooth-shaped gear and the other of said flanges having a periphery thereof formed into a saw-tooth-shaped gear, and a reel braking assembly moveably mounted within said cassette comprising first ratchet pawls engageable with



said flat-tooth-shaped gears, second ratchet pawls engageable with said saw-tooth-shaped gears, and support means for said first and second ratchet pawls, said first ratchet pawls being selectively disengageable from said flat-tooth-shaped gear at a first time during operation of a tape recorder, said second ratchet pawls being selectively disengageable from said saw-tooth-shaped gear at a second time, subsequent to said first time, during said operation of said tape recorder.

4,638,394

TAPE AMOUNT DISPLAYING APPARATUS

Masaharu Hayakawa, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1983, Ser. No. 520,520
Claims priority, application Japan, Sep. 2, 1982, 57-154417
Int. Cl.⁴ G11B *15/18, 19/06*
U.S. Cl. 360—137 **6 Claims**



1. A tape amount displaying apparatus for displaying sequentially an amount of a tape of known thickness of d wound on a rotating reel with a tape winding hub of known radius r_h, comprising;

outermost periphery length indicating signal outputting means for outputting a signal indicating the length of the outermost periphery of said tape wound on said reel;

number of turns detecting means for detecting the number of turns n made by said reel;

rotational direction detecting means for detecting the direction of said rotation of said reel;

first arithmetic means, operative in synchronization with said output signal from said number of turns detecting means, for adding a predetermined value $2\pi rnd$ from said signal from said outermost periphery length indicating signal outputting means, respectively according to whether said tape is wound on or off said rotating wheel, so that a current outermost periphery length l_f of said tape is evaluated as a first evaluation result;

second arithmetic means for evaluating as a second evaluation result the current tape amount L_t wound on said reel based on said first evaluation result from said first arithmetic means such that $L_t=(l_f^2-4\pi r_h^2)/4\pi d$; and

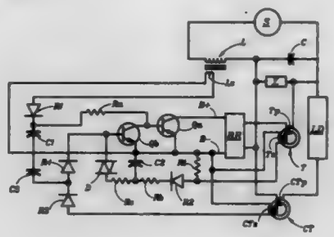
displaying means for displaying said second evaluation result from said second arithmetic means.

4,638,395

PROTECTOR FOR SERIES-EXCITED PARALLEL-LOADED RESONANT CIRCUIT

Ole K. Nilssen, Caesar Dr., Barrington Hills, Ill. 60010

Filed Dec. 26, 1984, Ser. No. 686,447
Int. Cl.⁴ H02H *3/12*
U.S. Cl. 361—93 **10 Claims**



10. A power supply arrangement comprising:

a source of periodic high-frequency AC voltage;

an L-C circuit series-connected across said source, said L-C circuit being resonant at or near the frequency of said AC voltage and having at least one inductive and one capacitive reactance means;

a load connected in parallel with one of said reactance means; and

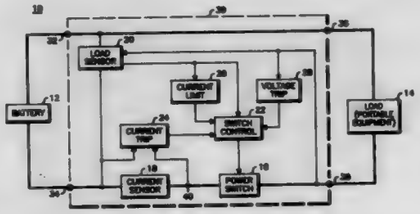
shorting means operative, except when current is flowing through the load, to effectively provide an intermittently interrupted short circuit across said one of said reactance means.

4,638,396

INTRINSICALLY SAFE BATTERY CIRCUIT

Glenn A. Mukli, Aurora; Paul C. Frew, and David R. Mills, both of Scarborough, all of Canada, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1984, Ser. No. 687,666
Int. Cl.⁴ H02H *9/02*
U.S. Cl. 361—101 **13 Claims**



1. An overload protection circuit for limiting the amount of power delivered from a power source to a load, said protection circuit comprising:

input terminals;

output terminals;

power controlling means coupling said input terminals to said output terminals for controlling the amount of power delivered to said output terminals; and

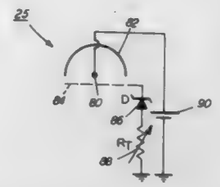
load sensing means for sensing the presence of a load at said output terminals and for directing said power controlling means to deliver power to said output terminals only when a load is present, said load sensing means preventing said power controlling means from consuming power from said input terminals except when a load is present.

4,638,397

SELF-BIASED SCOROTRON AND CONTROL THEREFOR

Geoffrey M. T. Foley, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1984, Ser. No. 685,182
Int. Cl.⁴ H01T *19/04*
U.S. Cl. 361—212 **9 Claims**



1. A corona discharge device for use with a charge retentive surface, said device comprising:

at least one electrode;

a conductive shield spaced from said electrode;

means for applying a voltage to said electrode;

a wire grid supported adjacent said electrode, said electrode being disposed intermediate said conductive shield and said wire grid; and

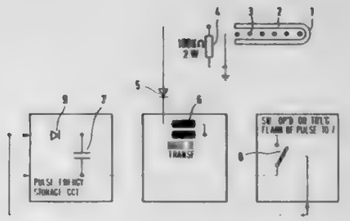
self-biasing means including constant voltage impedance means and manually settable variable impedance means connecting said wire grid to ground, said manually settable variable impedance means serving to effect adjustment of said self-biasing means in accordance with the nominal impedance value of said constant voltage impedance means.

4,638,398

APPARATUS FOR PRODUCING POSITIVE OR NEGATIVE IONS, ESPECIALLY FOR NEUTRALIZING CHARGED WORKPIECES

Hermann Brennecke, Darmstadt; Horst Liere, Eppertshausen, and Michael Kiesel, Gross-Umstadt, all of Fed. Rep. of Germany, assignors to IRS Industrie Rationalisierungs-Systeme GmbH, Darmstadt-Eberstadt, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,443
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, 3412563
Int. Cl.⁴ B03C *3/66*
U.S. Cl. 361—214 **14 Claims**



1. Apparatus for producing ions of a preselected polarity including a grounded electrode having electric-field accentuating points and a high-voltage electrode near, but spaced from, said grounded electrode and insulated by solid insulation from its surroundings but substantially uninsulated from said grounded electrode except by intervening air space, and further comprising:

a capacitor (7) having a substantially grounded terminal and an ungrounded terminal, for intermittently storing electric energy;

means for intermittently charging said capacitor and thereby intermittently accumulating a voltage of a predetermined polarity at said ungrounded terminal of said capacitor;

circuit means for intermittently discharging said capacitor at instants when it has reached a predetermined level of charge and simultaneously providing a high-voltage pulse for said high-voltage electrode;

a connection between said high-voltage electrode and said discharging circuit means for applying, to said high-voltage electrode, high voltage pulses provided by said discharging circuit means, said connection including a diode (5) interposed between said high-voltage electrode and said discharging means for preventing a return flow of current from said high-voltage electrode and assuring that ions produced are predominantly of the same polarity, and

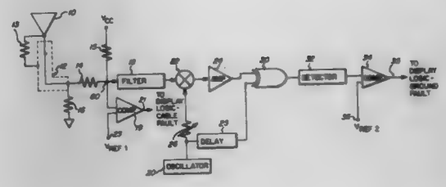
an electrical resistance (4) connected between said high-voltage electrode and ground for substantially discharging said high-voltage electrode during intervals between said high-voltage pulses said electrical resistance being of a resistance magnitude permitting substantial discharge of said high-voltage electrode during each one of said intervals between said high-voltage pulses.

4,638,399

WRIST STRAP GROUND MONITOR

Ralf P. Marosey, Orange; Gregory A. Fishkind, Milford, and Frederick Schneider, Stratford, all of Conn., assignors to Plug-In Storage Systems, Inc., Milford, Conn.

Filed Oct. 4, 1985, Ser. No. 784,053
Int. Cl.⁴ H05F *3/02*; A61N *1/14*; G01R *31/02*
U.S. Cl. 361—220 **22 Claims**



1. Apparatus for monitoring the integrity of a wrist strap ground comprising:

an input terminal;

an oscillator;

means for mixing the output of said oscillator with a signal from said input terminal to provide a composite signal;

an exclusive OR-gate;

means for coupling the composite signal to a first input of said OR-gate;

means for coupling the output of said oscillator to a second input of said OR-gate; and

means for processing the output of said OR-gate to produce an output signal indicative of the phase relationship between said oscillator output and said composite signal;

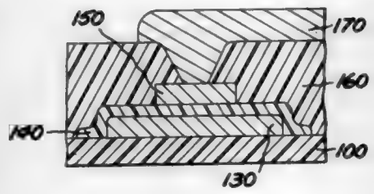
whereby grounding said input terminal varies the phase relationship between said oscillator output and said composite signal resulting in a change in said output signal.

4,638,400

REFRACTORY METAL CAPACITOR STRUCTURES, PARTICULARLY FOR ANALOG INTEGRATED CIRCUIT DEVICES

Dale M. Brown; Manjin J. Kim, both of Schenectady; Richard D. Baertsch, Scotia, and Thomas L. Vogelsong, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 24, 1985, Ser. No. 790,911
Int. Cl.[4] H01G *1/015*; B41M *3/08*; H01L *27/02*
U.S. Cl. 361—304 19 Claims



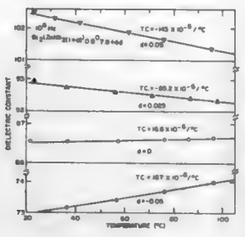
1. A capacitor structure, for use in integrated circuit devices, said capacitor structure comprising:
a substrate having an insulative layer disposed thereon;
a first layer of conductive material disposed on said insulative layer on said substrate;
a dielectric layer deposited over said first conductive layer;
a layer of metal disposed on said dielectric layer, said layer of metal comprising a refractory metal;
an insulative layer disposed over said refractory metal layer, said insulative layer having an aperture therein adjacent to at least a portion of said refractory metal layer; and
an interconnection metal layer disposed on said insulative layer and extending through said aperture in said insulative layer so as to make contact with said refractory metal.

4,638,401

CERAMIC COMPOSITIONS AND DEVICES

Hung C. Ling, West Windsor Township, Mercer County, and Man F. Yan, Berkeley Heights, both of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights and Bell Telephone Laboratories, Inc., Murray Hill, both of, N.J.

Continuation-in-part of Ser. No. 666,200, Oct. 29, 1984, abandoned. This application Jan. 10, 1986, Ser. No. 817,805
Int. Cl.[4] H01G *4/10*; C04B *33/34*, *35/46*
U.S. Cl. 361—321 16 Claims



1. A capacitor comprising at least one pair of spaced electrodes and a ceramic composition therebetween said composition comprising a sintered mixture as represented by the formula

$$(1-x)Bi_2(ZnNb_{2(1+d)})_yO_{3+6y+5dy}-(x)Bi_3(Ni_2Nb)O_9$$

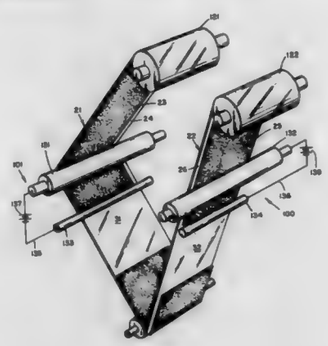
where $0<x<1$, $0.6\leq y\leq 1.1$ and $-0.05\leq d\leq 0.05$, x representing a weight fraction.

4,638,402

MULTI-SECTION CAPACITOR ELECTRICALLY COUPLED IN PARALLEL

Basilio Y. Lim, 12931 Sunnyside Pl., Santa Fe Springs, Calif. 90670, and Richard N. Marsh, 5424 Sunflower Ct., Livermore, Calif. 94550

Filed May 7, 1985, Ser. No. 731,852
Int. Cl.[4] H01G *4/38*, *7/00*
U.S. Cl. 361—328 1 Claim



1. A multi-section capacitor comprising:
a. a plurality of capacitor sections with each of said plurality of capacitor sections having a right end and a left end and being wound from a length of a first metallized dielectric film having disposed on its near surface a first thin metallized layer which terminates short of both its left edge and its right edge leaving a first non-metallized strip along said left edge and a second non-metalized edge along said right edge in combination with a length of a second metallized dielectric film having disposed on its near surface a second thin metallized layer which extends to its left edge but terminates short of its center and a third thin metallized layer which extends to its right edge but also terminates short of its center leaving a non-metallized strip therealong so that said first, second and third thin metalized layers are separated by dieletric film wherein a portion of said first thin metalize layer is removed at a region intermediate the ends of said length for a distance sufficient to encircle said capacitor section at least once;
b. first electrically contacting means for making an electrical contact with said second thin metalized layer of each of said plurality of capacitor sections with said first electrically contacting means being disposed adjacent and mechanically coupled to each of said left ends of said plurality of capacitor sections; and
c. second electrically contacting means for making an electrical contact with said third thin metalized layer of each of said plurality of capacitor sections with said second electrically contacting means being disposed adjacent and mechanically coupled to each of said right ends of said plurality of capacitor sections.

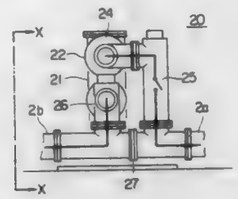
4,638,403

GAS-INSULATED SWITCHGEAR APPARATUS

Naoki Amano; Hitoshi Kayaba, and Takehiro Kikuchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 8, 1984, Ser. No. 618,480
Claims priority, application Japan, Jun. 15, 1983, 58-105667
Int. Cl.[4] H02B *1/04*
U.S. Cl. 361—341 7 Claims

1. A gas-insulated switchgear apparatus comprising two main bus bars extending substantially along a common axis and having respective end portions spaced from each other, feeder units connected to said two main bus bars, respectively, and a bus-bar dividing unit including one circuit breaker of vertical type disposed with its vertical axis substantially aligned with the end portion of one of said two main bus bars, when viewed in a direction perpendicular to the common axis of said two main bus bars, a lower electric path directly connecting said



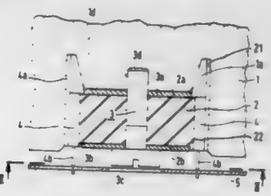
one circuit breaker to the end portion of said one of said two main bus bars, and an upper electric path including at least a portion perpendicular to a direction of said common axis and a portion parallel to the direction of said common axis to directly connect said one circuit breaker to the end portion of the other of said two main bus bars so that said two main bus bars are connected through said one circuit breaker.

4,638,404

CLAMPING DEVICE FOR PLATE-SHAPED SEMICONDUCTOR COMPONENTS

Kurt Grossmann, Hallerndorf; Jurgen Bliemser, Hemhofen, and Joachim Schikor, Uttenreuth, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 11, 1983, Ser. No. 483,734
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215192
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—388 6 Claims



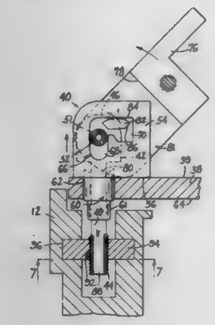
1. A device which clamps a plurality of plate-shaped semiconductor components to a heat sink provided with a recess having a plurality of walls formed by respective inner surfaces of the heat sink, comprising:
a pressure element having a plurality of lateral contact surfaces and a pair of transverse end faces, each lateral contact surface being oriented parallel to an associated wall of said recess, said pressure element consisting of elastically compressible material, and
pressure application means engageable with said end faces and exerting a clamping force thereon to compress said pressure element, each semiconductor component being disposed between one of said lateral contact surfaces and the associated wall of said recess, each semiconductor component having a planar face substantially entirely in contact with the respective lateral contact surface of said pressure element, each of said lateral contact surfaces being shiftable laterally outwardly and substantially perpendicularly to the associated wall of said recess upon an application of said clamping force to said end faces, whereby said semiconductor components are clamped to said heat sink.

4,638,405

INJECTOR/EJECTOR DEVICE FOR CIRCUIT BOARD

Kenneth R. Smith, Southington, Conn., assignor to Bicc-Vero Electronics, Inc., Trumbull, Conn.

Filed Dec. 16, 1985, Ser. No. 809,473
Int. Cl.[4] H01R *13/62*; H05K *5/02*
U.S. Cl. 361—399 14 Claims



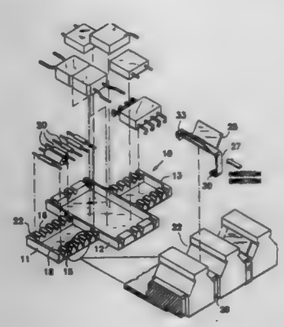
1. An injection/ejection device to aid in the entry and removal of an object from a mating apparatus, said device comprising:
a lever with a bifurcated portion, said portion, being rotatably attached to the ends of a pivot pin;
bracket means slidably mounted onto said pivot pin within said bifurcated portion and further comprising means for rotatably mounting the device onto the object;
anchor means fixedly attached within said bifurcated portion to said pivot pin and further having engagement means to attach the object to the apparatus at an opposite end;
first means for generating an outwardly directed linear force within said object; and
second means for generating an inwardly directed linear force within the object, whereby the object may be injected into and ejected from the apparatus.

4,638,406

DISCRETE COMPONENT MOUNTING ASSEMBLY

Robert Samson, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

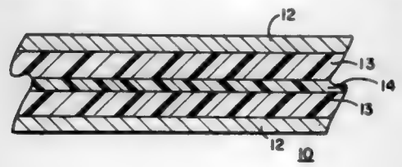
Continuation of Ser. No. 657,639, Oct. 4, 1984, abandoned. This application Apr. 14, 1986, Ser. No. 854,680
Int. Cl.[4] H05K *1/18*
U.S. Cl. 361—403 9 Claims



1. A discrete component mounting assembly comprising:

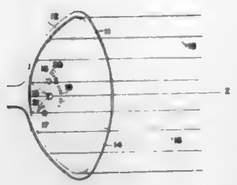
a base member formed of electrically insulating material with first and second spaced apart end portions;
each of said first and second end portions having elongated notches formed therein with a generally v shaped cross section for receiving component leads therein;
a generally trough shaped contact, formed of electrically conductive material, fixedly positioned in each of said notches and including a portion extending beyond the notch for external electrical connection; and
said base member further including a relatively flat mounting surface and the extending portion of each trough shaped contact extending into a partial overlying position with said flat surface to form a connecting pad.

4,638,407
SOLID STATE ELECTROCHEMICAL DEVICE
Jorgen S. Lundegaard, c/o Hope Industries, Inc., 2421 Wyandotte Rd., Willow Grove, Pa. 19090
Filed May 20, 1985, Ser. No. 735,880
Int. Cl.[4] H01G 9/00
U.S. Cl. 361—433 10 Claims



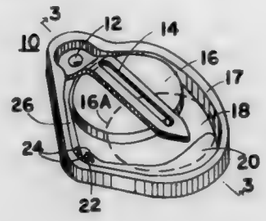
1. An all-solid state multicell electrochemical device comprising in combination:
(a) a plurality of carbon-containing bipolar electrode structures; and
(b) a plurality of solid-state electrolyte layers consisting essentially of a polymer material rendered ionically conductive by addition of an inorganic salt; said electrode structures and said electrolyte layers being functionally arranged to provide an electrochemical device.

4,638,408
AUTOMOBILE HEADLIGHT-FOG LIGHT COMBINATION
Aubrey D. Wetherington, Rte. 1, Box 181, Hahira, Ga. 31632
Filed Jun. 28, 1984, Ser. No. 625,833
Int. Cl.[4] B60Q 1/00
U.S. Cl. 362—61 2 Claims



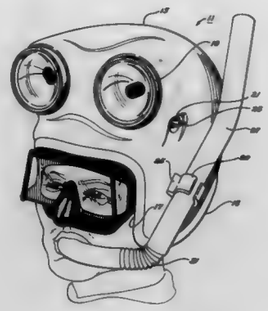
1. An automobile headlight having a parabolic reflector and a transparent lens with a segment at the bottom of the lens tinted to cause the light passing therethrough to function as a fog light, said headlight having a high beam filament positioned substantially at the focus of the parabolic reflector, a low beam filament positioned above said high beam filament and so as to direct light against said reflector to reflect light in a downward direction, and a fog light filament positioned below said high beam filament and having a reflector shield positioned above and rearward of said fog light filament so as to direct substantially all light from said filament through said reflector such that the light reflected therefrom will pass through said tinted segment.

4,638,409
SWITCHING METHOD AND DEVICE USING MOVABLE BATTERY
Marc Borman, 10 Ashford St., Allston, Mass. 02134
Filed Nov. 8, 1985, Ser. No. 796,165
Int. Cl.[4] A44C 9/00
U.S. Cl. 362—104 20 Claims



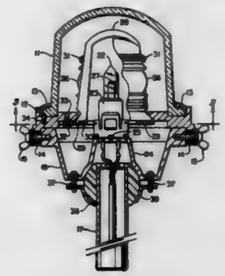
1. A movable power source switching means for an electrically powered element or device, wherein the switching means comprises:
an electrically powered device;
a receiving means for an electrical power source, wherein the receiving means comprises a retaining means for slidably retaining the power source between at least a first and second position within the retaining means;
an electrical conductor connecting the power source receiving means to the electrically powered device, wherein the power source in the first position contacts the conductor to make a closed circuit between the power source and the electrically powered device thereby activating the electrically powered device, and wherein the power source in the second position breaks the circuit thereby deactivating the electrically powered device.

4,638,410
DIVING HELMET
Randall R. Barker, 6200 Carswell Access Rd. #3, Fort Worth, Tex. 76114
Filed Feb. 23, 1981, Ser. No. 236,871
Int. Cl.[4] F21L 15/14
U.S. Cl. 362—105 11 Claims



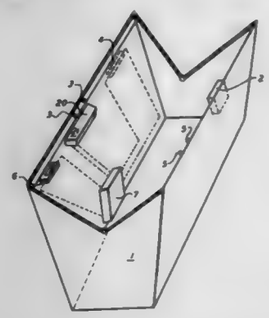
1. In a diving helmet of the type having a rigid exterior, an interior for receiving a diver's head, the interior being open at the bottom and face, the improvement comprising:
a cavity located in the top portion of the helmet, sealed from the interior of the helmet and having a cylindrical entrance facing forwardly;
a cylindrical lamp housing slidably and rotatably mounted in the entrance of the cavity, and having a light source contained therein;
seal means between the lamp housing and the entrance for sealing the cavity from water; and
directional means for directing light from the light source at an acute angle with respect to the axis of the lamp housing, so that the light source will point in different directions as the lamp housing is rotated.

4,638,411
MODULAR HIGH-INTENSITY ELEVATED RUNWAY EDGE OR THRESHOLD LIGHT
Willis H. Trainor, Newark, Ohio, assignor to ADB-Almaco, Inc., Columbus, Ohio
Filed Oct. 4, 1985, Ser. No. 784,069
Int. Cl.[4] F21S 1/14
U.S. Cl. 362—145 3 Claims



1. An elevated modular high-intensity runway edge or threshold light comprising:
a substantially hollow base having a bottom wall,
a ball joint centrally positioned in the bottom wall of said base and adapted to receive an upstanding conduit, said ball joint comprising an adjustable securing means for fixedly positioning said base and said ball joint onto said upstanding conduit,
means supported centrally on said base adapted to receive a light source and fixedly positioned with respect to said base,
a cover comprising a lower annular portion and a hollow glass dome, including oppositely disposed prism portions adapted to compress the light emanating from said light source in one plane, said glass dome being sealed in said lower annular portion and fixedly positioned with respect thereto, said lower annular portion having an inner base portion resting on the upper portion of said hollow base,
a hollow circular support removably secured to the lower portion of said inner base portion of said cover and supporting two hollow prisms adapted to surround said light source and being fixedly positioned in relation to the prisms in said hollow glass dome, said two hollow prisms being adapted to compress the light emanating from said light source in a plane perpendicular to the plane in which the light from said light source is compressed by the prism portions of said hollow glass dome before said light passes through the prism portions of said hollow glass dome,
whereby said two hollow prisms and said prisms in said hollow glass dome are fixedly positioned in relation to each other and in combination provide two oppositely disposed areas of high-intensity light, and said entire assemblage may be readily removed for maintenance.

4,638,412
AUTOMATIC POCKETBOOK ILLUMINATOR
Hans Weigert, Ridgewood, N.J., assignor to Mixed Bag Imports, Inc., Englewood, N.J.
Filed Jan. 27, 1986, Ser. No. 822,885
Int. Cl.[4] F21V 33/00
U.S. Cl. 362—156 10 Claims



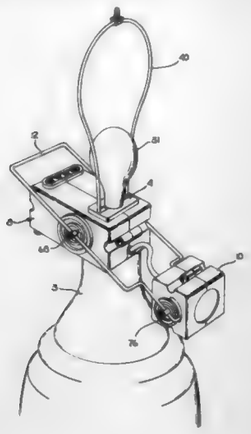
1. A method for energizing a lightbulb mounted on an interior surface of a pocketbook, for illuminating the interior of said pocketbook, comprising the steps of:
sensing the level of ambient light at times that said pocketbook is opened; and
energizing said light bulb whenever the sensed level of ambient light is relatively low.

3. Apparatus for illuminating the interior of a pocketbook, comprising:
lamp means mounted on an inside surface of said pocketbook, for upon energization illuminating the interior of said pocketbook; and
control means mounted within said pocketbook, including means for indicating an open pocketbook, and means for sensing the level of ambient light, for energizing said lamp means only in response to both an open pocketbook and a relatively low-level of ambient light.

4,638,413
COMBINATION SPOTLIGHT AND TABLE LAMP
Kenneth Tarlow, 138 Waterview St., Playa del Rey, Calif. 90293
Filed Nov. 15, 1984, Ser. No. 671,677
Int. Cl.[4] F21V 13/00
U.S. Cl. 362—242 5 Claims

1. A combination electrical spotlight and table lamp, comprising:
(a) a spotlight fixture;
(b) a lamp fixture surrounding and eccentrically offset to a lamp socket with a central longitudinal axis; and
(c) an extension element, pivotally attached to a portion of the lamp fixture which is longitudinally offset to the socket and extending past and away from the central axis

of the lamp socket, wherein the spotlight fixture is pivotally attached to the extension element at a location offset



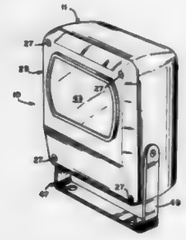
from the socket central axis in a direction opposite said offset portion.

4,638,414

LUMINAIRE WITH ROTATABLE REFLECTOR

Hendrik A. J. de Vos, and Elzear R. Labouliere, both of Swansea, Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Apr. 4, 1985, Ser. No. 720,111
Int. Cl.[4] F21V *11/00*
U.S. Cl. 362—370 **12 Claims**



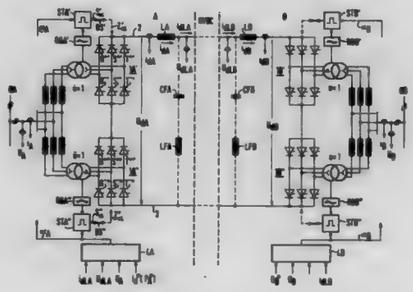
1. A luminaire comprising:
- a housing of substantially boxlike configuration and defining an opening therein;
- a component mounting plate of substantially planar configuration and secured to said housing substantially across said opening, said component mounting plate including an aperture therein defined by two pairs of opposed sides, the sides of a first of said pairs being of substantially straight configuration and the sides of a second of said pairs being of substantially curved configuration;
- a cover member secured to said housing for providing a cover for said opening, said cover member including a lens therein;
- a reflector rotatively positioned on said component mounting plate adjacent said aperture and capable of occupying at least two positions thereon each oriented at least about ninety degrees relative to the other, said reflector reflecting light through both said aperture within said component mounting plate and said lens;
- a socket secured to said reflector; and
- a lamp positioned within said socket and being located within said reflector, both said lamp and said socket thereby being rotated simultaneously with said reflector such that said luminaire is capable of providing light output distributions of at least two different orientations relative to said luminaire.

4,639,415

METHOD AND APPARATUS FOR RESUMPTION OF NORMAL OPERATION OF A HIGH-VOLTAGE D. C. TRANSMISSION LINE

Helmut Neupauer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,754
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407656; Sep. 26, 1984, 3435305; Oct. 18, 1984, 3438236
Int. Cl.[4] H02J *3/36*
U.S. Cl. 363—35 **26 Claims**



19. An apparatus for High Voltage Direct Current, HVDC, transmission having a high-voltage d.c. transmission line; a first station connected to one end of the high-voltage d.c. transmission line; a first converter connected to the first station and normally operated in system-synchronous operation as a rectifier; a first a.c. system connected to the first converter; a second station connected to the other end of the high-voltage d.c. transmission line; a second converter connected to the second station and normally operated as a system-synchronous inverter, and a second a.c. system connected to the second converter; included in each station is a drive unit, controlled by a control and regulating device using a control angle and operated synchronously with the respective a.c. voltage system by a reference voltage generator, forming a sequence of system-synchronous firing commands for the respective converter, further included with each converter is a monitoring unit and a clamping circuit, whereby the clamping circuit being capable of inhibiting the respective firing commands when instructed to do so by the monitoring unit when a release signal is formed, or capable of being converted to providing firing commands for the converter thyristors, further comprising:

first monitoring means within and connected to the monitoring unit connected to the previously malfunctioning station forming a leading release signal whenever monitoring of the a.c. voltage network connected thereto indicates the existence of a normal condition of the a.c. voltage system;

second monitoring means within and connected to the monitoring unit connected to the continuously functioning station forming a derived release signal as soon as monitoring of the d.c. voltage side electrical quantities connected thereto detectably indicates the resumption of normal operation of the previously malfunctioning station;

means to inhibit the conductance of firing pulses whenever a fault indication signal occurs, connecting to each clamping circuit of the respective station said conductance inhibiting means being released by a respective leading or a derived release signal occurring; and

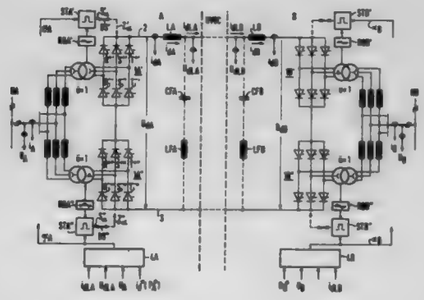
a respective run-up function generator connected in each station with a pre-programmed run-up function, said generator being triggered by said respective release signal and after a set run-up time is approximately the same as the operating level of control of the respective converter, to preset the control angle upon resumption of normal operation.

4,638,416

METHOD AND APPARATUS FOR HIGH-VOLTAGE D.C. TRANSMISSION WITH A BYPASS CIRCUIT FOR MALFUNCTIONS

Helmut Neupauer; Wolfgang Kaufhold, both of Erlangen, and Georg Wild, Langensendelbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,755
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407656; Sep. 26, 1984, 3435305
Int. Cl.[4] H02J *3/36*
U.S. Cl. 363—35 **39 Claims**



28. An apparatus for HVDC transmission, including:
- a first station connecting to a first a.c. system to draw electrical power therefrom;
- a first converter being part of said first station and being connected to said first a.c. system; and operating as a system-synchronous rectifier during normal operation;
- a HVDC transmission line being connected at one end to said first converter;
- a second converter being connected to the other end of said HVDC transmission line and operating as a system-synchronous inverter during normal operation;
- a second station having said second converter a part thereof and having connections thereto;
- a second a.c. voltage system being connected to said second station;
- a first reference voltage generator located in and connected to the first station for generating a system-synchronous reference voltage with respect to the first a.c. system;
- a second reference voltage generator located in and connected to the second station for generating a system-synchronous reference voltage with respect to the second a.c. system;
- a first controller forming a first control angle, connected to the first station;
- a second controller forming a second control angle, connected to the second station B;
- a first drive unit connecting to said first controller for forming a first set of system-synchronous firing commands;
- a second drive unit connecting to said second controller for forming a second set of system-synchronous firing commands;
- a first monitoring means monitoring the values of the electrical quantities of the first station and forming therefrom a first fault indication signal when a malfunction is indicated and a first release signal when return to normal operation is indicated;
- a second monitoring means monitoring the values of the electrical quantities of the second station and forming therefrom a second fault indication signal when a malfunction is indicated and a second release signal when return to normal operation is indicated;
- a first clamping circuit connected to a first drive unit and said first monitoring means inhibiting the transmission of said first firing commands whenever said first monitoring means forms said first fault indication signal, and transmitting said first fixing commands whenever said first monitoring means forms said first release signal; and
- a second clamping circuit connected to a second drive unit and said second monitoring means inhibiting the transmission of said second firing commands whenever said second monitoring means forms said second fault indication signal, and transmitting said second firing commands whenever said second monitoring means forms said second release signal, comprising:
- a first generating means as a part of the first monitoring means for generating a first leading fault indication signal when monitoring of the first a.c. system electrical quantities indicate the occurrence of a malfunction relative to the first station;
- a second generating means as a part of the second monitoring means for generating a second leading fault indicator signal when monitoring of the second a.c. system electrical quantities indicate the occurrence of a malfunction relative to the second station;
- a third generating means as a part of the first monitoring means for generating a first leading release signal when monitoring of the first a.c. system electrical quantities indicates discontinuance of a malfunction relative to the first station;
- a fourth generating means as a part of the second monitoring means for generating a second leading release signal when monitoring the second a.c. system electrical quantities indicates the discontinuance of a malfunction relative to the second station;
- a fifth generating means as a part of the first monitoring means for generating a first derived fault indication signal when monitoring the d.c. voltage electrical quantities indicates the occurrence of a malfunction in a location other than the first station;
- a sixth generating means as a part of the second monitoring means for generating a second derived fault indication signal when monitoring the d.c. voltage electrical quantities indicates the occurrence of a malfunction in a location other than the second station;
- a seventh generating means as a part of the first monitoring means for generating a first derived release signal when monitoring the d.c. voltage electrical quantities indicates a discontinuance of malfunction outside of the first station;
- an eighth generating means as a part of the second monitoring means for generating a second derived release signal when monitoring the d.c. voltage electrical quantities indicates a discontinuance of malfunction outside of the second station;
- a first memory as part of the first clamping circuit of the first station storing a combination of converter thyristors selected as bypass thyristors in the first station;
- a second memory as part of the second clamping circuit of the second station storing a combination of converter thyristors selected as bypass thyristors in the second station;
- a first and second switching means proximately located and connected to said first and second memory respectively, and further connected respectively to converter thyristors in the first and second converters, inhibiting the system synchronous firing commands to said converter thyristors of the respective station when a leading fault indication signal occurs therein, and generating bypass firing com-

mands to selected bypass thyristors of said respective station;

a first and second selector circuit connected to and proximately located to the first and second drive unit respectively, having a third and fourth memory respectively, contained therein, whereby after the firing of bypass thyristors in the respective station, a combination of start thyristors is stored for resumption of normal operation of the respective station;

a first and second logic circuit connected to said first and second selector circuit respectively, eliminating the inhibiting of system-synchronous firing commands after said respective leading release signal has occurred, and subsequently a firing command for one of the thyristors of said respective starting thyristor combination occurs; and

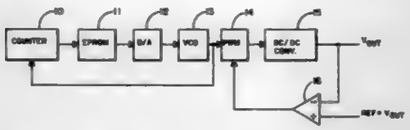
a first and second pre-programmed circuit, connected to the first and second control angle controllers respectively, interacting with the respective control angle in such a manner that after the start of the respective derived fault indication signal, the converter in the functional station is operated as a rectifier in bypass operation, until the occurrence of the respective derived release signal at which time bypass operation is terminated and normal operation resumed.

4,638,417

POWER DENSITY SPECTRUM CONTROLLER

Hubert C. Martin, Jr., Sandy; Gene D. Hitler, and David W. Parsley, both of Salt Lake City, all of Utah, assignors to Sperry Corporation, Blue Bell, Pa.

Filed Aug. 16, 1985, Ser. No. 766,186
Int. Cl.[4] H02M 1/12
U.S. Cl. 363—41 11 Claims



1. A signal control circuit which produces an output signal having little or no ripple, noise or signature, comprising,

pulse width modulator means,

voltage controlled oscillator (VCO) means connected to supply signals to the input of said pulse width modulator means,

coded means connected to supply signals to said VCO means and including storage means for storing a prescribed signal pattern which is selectively supplied to said VCO means,

control means comprising counter means for supplying signals to said storage means thereby to selectively address said storage means to supply said signal pattern to said VCO means,

signal converter means connected to the output of said pulse width modulator means and operative to produce an output signal which is a function of the duty ratio of the pulse width modulator, and

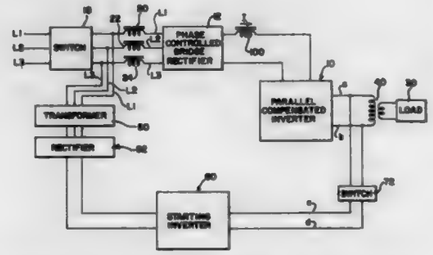
comparator means connected to the output of said signal converter means and operative to compare said output signal with a reference signal and to supply a control signal to said pulse width modulator to control the duty ratio thereof.

4,638,418

POWER INVERTER

Jonathan W. Alexander, Boaz, Ala., assignor to Tocco, Inc., Boaz, Ala.

Filed Aug. 26, 1985, Ser. No. 769,246
Int. Cl.[4] H02P 1/04, 13/20
U.S. Cl. 363—49 11 Claims



1. In a power inverter for converting direct current from a constant current supply into alternating current, for use in applications requiring frequent energizations of serial loads having varying Q characteristics, said power inverter including a starter inverter providing initial energization of each said load, said starting inverter having a direct current input from said supply and an alternating current output which may be selectively applied across each load, means responsive to an energization level of said load to remove said starting inverter from said load when a preselected energization level is reached, and means to energize said power inverter in timed relationship with the removal of said starting inverter with said load, said power inverter having an output voltage level below which there is starting instability, the improvement comprising:

means in said power inverter for increasing the apparent Q of the load to be energized, whereby the voltage level of output instability of the power inverter is substantially reduced to a lower output voltage; and,

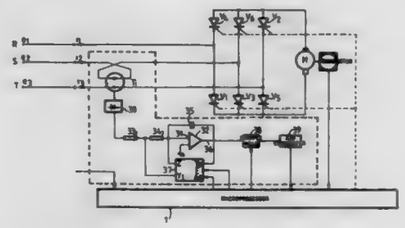
means providing an output voltage at said starting inverter at least as high as said lower output voltage, whereby commutation failure of said power inverter is precluded.

4,638,419

PROCESS AND DEVICE FOR DETERMINING THE MEAN VALUE OF THE CURRENT DELIVERED BY A CONTROLLABLE VALVE RECTIFIER BRIDGE

Jean-Pierre Fauvet, Rueil Malmaison, and Jacques Pariset, Maisons Laffitte, both of France, assignors to La Telemecanique Electrique, France

Filed Jul. 19, 1985, Ser. No. 756,550
Claims priority, application France, Aug. 3, 1984, 84 12321
Int. Cl.[4] H02M 7/04
U.S. Cl. 363—87 2 Claims



1. A device for determining the mean value of the current delivered by a controlled valve rectifier bridge fed by a three

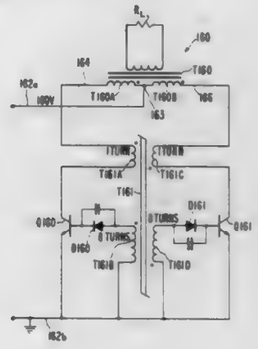
phase network having first and second and third phase conductors having phase voltages each having a period zone, said first phase conductor having a looped part and said device comprising a current transformer having a primary circuit coupled with said looped part and with said second phase conductor and a secondary circuit which produces a signal representative of the difference between the currents flowing through said first and said second phase conductors, a single full wave rectifier having an input which receives said signal and an output connected to a first resistor, a second resistor serially mounted with said first resistor through a junction point and connected to an integrating assembly formed by an operational amplifier having an integrating input connected to said second resistor and an output connected to said integrating input by a capacitor and by a switching device, one particular of said two resistors having two terminals which are connected to said switching device, a microprocessor adapted for controlling said switching device so as to obtain successive integration cycles of duration equal to the period zones of the phase voltages of the network but phase shifted with respect thereto, for resetting said integrator assembly at the end of each cycle and by short-circuiting said particular resistor to cause the gain of the operational amplifier to pass alternately from a first value to a second value, a sample hold circuit connected to the output of the operational amplifier and controlled by the microprocessor so as to produce sampling at the end of each integration cycle in a time preceeding said resetting, said sample hold circuit having an output connected to an analog digital converter.

4,638,420

APPARATUS FOR MAINTAINING CONSTANT FREQUENCY IN A DC TO SQUARE WAVE INVERTER

Charles O. Forge, Los Altos, Calif., assignor to Boschert Inc., Milpitas, Calif.

Filed Apr. 1, 1985, Ser. No. 717,782
Int. Cl.[4] H02M 7/537
U.S. Cl. 363—132 25 Claims



1. A circuit comprising:

an output transformer having a primary winding and a secondary winding, said secondary winding being adapted to provide a load current;

a transistor having a collector, a base, and an emitter, said emitter being coupled to said primary winding of said output transformer, current through the base of said transistor increasing in response to an increase in said load current;

a second transformer having a saturable core, said second transformer being coupled across the base emitter junction of said transistor; and

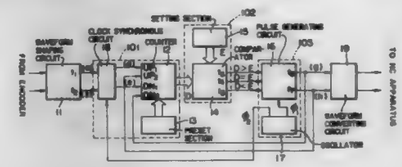
negative resistance means coupled between said second transformer and the base of said transistor, said negative resistance means tending to cancel the increase in the base emitter voltage drop of said transistor occurring when the load current of said output transformer increases.

4,638,421

POSITION FEEDBACK SYSTEM

Norio Kimizuka; Akira Sogabe, and Mituyosi Abo, all of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Sep. 14, 1984, Ser. No. 650,542
Claims priority, application Japan, Sep. 14, 1983, 58-169971
Int. Cl.[4] G05B 9/00
U.S. Cl. 364—167 9 Claims



1. A position feedback system adapted to return a detection signal of a measuring device provided on the side of a machine tool to an NC apparatus to determine the working position of the machine tool when the machine tool is controlled by a command signal from said NC apparatus comprising:

a counter means adapted to carry out the up-counting and down-counting of a counting pulse formed on the measuring device side and used to discriminate the direction of movement and detect the amount of movement;

a comparator means for carrying out the comparison between the counted value of said counter means and a predetermined reference value; and

a pulse generating means adapted to output one counting pulse for up-counting or one counting pulse for down-counting to said NC apparatus side at a time period larger than a minimum time period necessary for said NC apparatus side to carry out the signal reading operation, and supply said counting pulse for up-counting as a down-count input to said counter means and return said counting pulse for down-counting as an up-count input to said counter means;

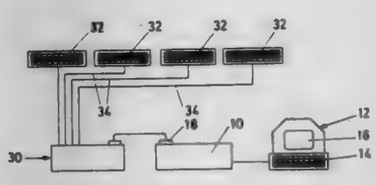
whereby said counting pulse is output from said pulse generating means to said NC apparatus die until said counted value of said counter means becomes the same as the reference value of said comparator means.

4,638,422

DATA ENTRY INTERFACE ASSEMBLY

Elwyn Rees, Maesydd, Llangan, United Kingdom

Filed May 18, 1984, Ser. No. 611,981
Claims priority, application United Kingdom, May 19, 1983, 8313919
Int. Cl.[4] G06F 3/00
U.S. Cl. 364—200 7 Claims



1. An interface assembly enabling a central processing unit to accept and allocate information from a number of remote data entry terminals, which assembly comprises:

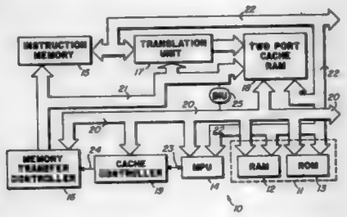
an interface to match the interface convention at an i/o port of the central processing unit;
a memory buffer comprising one byte of memory for each of the remote data entry terminals to be served;
means for supplying data from the said remote data entry terminals to individually assigned bytes of the memory buffer;
an address generator for addressing individual bytes of the said memory buffer in sequence;
means for transferring to the said interface information identifying each individual byte address and the value held by the byte at each said address;
and means for resetting the value of each byte addressed to a null value on such transfer.

4,638,423

EMULATING COMPUTER

Danny B. Ballard, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 6, 1985, Ser. No. 708,632
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—200 **22 Claims**



7. A method of emulating a computer comprising the steps of:
transmitting an instruction to a processing unit;
checking a cache memory for a translated instruction;
loading an instruction block into an instruction memory if said translated instruction is not in said cache memory;
translating an instruction of said instruction block providing a translated instruction;
storing said translated instruction in said cache memory; and
transmitting said translated instruction from said cache memory to said processing unit.

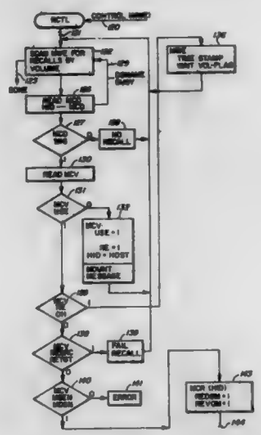
4,638,424

MANAGING DATA STORAGE DEVICES CONNECTED TO A DIGITAL COMPUTER

Thomas W. Beglin; Jane R. Pence; Harvey E. Kamionka, and Jerry W. Pence, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 12, 1984, Ser. No. 570,054
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—200 **14 Claims**

1. In the machine-implemented method of operating a data-storage hierarchy having a plurality of primary and secondary data-storage volumes, each of said volumes being addressable and having a given plurality of addressable data-storage areas for respectively storing a predetermined amount of data, each of said primary volumes having relatively rapid-access characteristics for data stored therein while each of said secondary volumes having relatively slow access characteristics for data stored therein, means coupled to said volume for transferring data therebetween;
including the steps of:
transferring data from a first one of said secondary volumes to a first one of said primary volumes for constituting a recall of data stored in said first one secondary volume;
transferring data from a second one of said primary volumes to a second one of said secondary volumes for constituting a migration of data stored in said second one primary volume;
initiating a one of a said migrations of data and a one of said recalls of data, respectively, as a migration step and as a recall step;
upon initiating each said migration step, first determining the accessibility of said second one of said secondary volumes which is to receive and store data to be migrated, upon determining said second one of said secondary volumes is accessible, performing said migration step; upon determining that said second one of said secondary volumes is not accessible, assigning a third one of said secondary volumes to receive and store said data to be migrated and then performing said migration step to said third one of said secondary volumes;
upon initiating a said recall step, first determining the accessibility of said first one of said secondary volumes, if said first one of said secondary volumes is accessible, then performing said recall step, otherwise setting a flag bit indicating that the initiated recall is being delayed;
during said migration step, repeatedly sensing said flag bit for determining if a recall is being delayed; when said flag bit is reset, continuing said migration step, otherwise when the flag bit is set, determining if said second one of said secondary volumes is to be said first one of said secondary volumes; if not, continuing the migration step, otherwise selecting a fourth one of said secondary volumes to receive a remaining portion of the data to be migrated and continuing said migration step with said fourth one of said secondary volumes for receiving and storing said remaining portion; and
then performing said recall step with said second one of said secondary volumes.



4,638,425

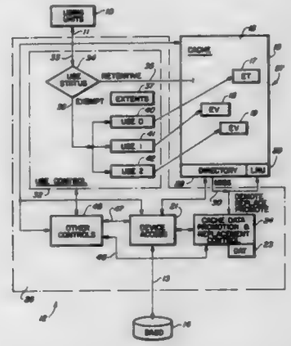
PERIPHERAL DATA STORAGE HAVING ACCESS CONTROLS WITH ERROR RECOVERY

Michael H. Hartung, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 426,367, Sep. 29, 1982, Pat. No. 4,574,346.
This application Nov. 20, 1985, Ser. No. 800,177
Int. Cl.[4] G06F *13/00, 12/08*
U.S. Cl. 364—200 **20 Claims**

1. The machine-implemented method of operating a data-storage system connecting to a host and having a volatile front store and a retentive back store, each store having a plurality of addressable data storage areas; means for enabling all data stored in said front store and said back store to be addressable by addresses of data storage areas of said back store;

including the steps of:
estab'ishing a zone of data volatility in said front store identifiable by designated ones of said data storage area addresses;
storing data in said front store identifiable as being within said zone of volatility (exempted data) and signalling completion of data storage operations to said host without storing said exempted data as retentive data in said back store;
monitoring operation of said front store with respect to said zone of volatility;
for each data storage operation which stores data outside said zone of data volatility in the datastorage system received from a host, always first storing such data as retentive data in said back store before signalling completion of said data storage operation to said host;



during said monitoring, detecting a loss of said exempted data in said data-storage system stored within said zone of volatility and then inhibiting access to the exempted data stored in said front store within said zone of volatility;
signalling said host that in error has occurred relating to said zone of volatility;
in said host, performing error recovery related to and for said loss of exempted data, sending a message from said host to the data storage system that the host has recovered from said signalled error; and
receiving from said message and then again permitting access by said host to said zone of volatility.

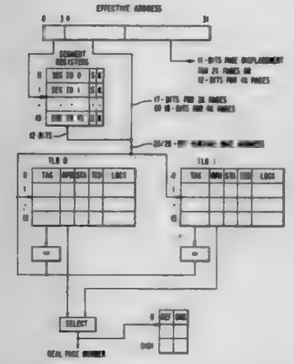
4,638,426

VIRTUAL MEMORY ADDRESS TRANSLATION MECHANISM WITH CONTROLLED DATA PERSISTENCE

Albert Chang, Yorktown Heights; John Cocke, Bedford; Mark F. Mergen, Mount Kisco, and George Radin, Piermont, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/US82/01829, § 371 Date Sep. 19, 1983, § 102(e) Date Sep. 19, 1983, PCT Pub. No. WO84/02784, PCT Pub. Date Jul. 19, 1984
PCT Filed Dec. 30, 1982, Ser. No. 573,975
Int. Cl.[4] G06F *12/10*
U.S. Cl. 364—200 **12 Claims**

1. A method for converting virtual memory addresses supplied by an associated central processing unit into real memory addresses within a large hierarachical memory system wherein the virtual memory address space is significantly larger than the actual memory which method comprises;
the CPU generating a first virtual address comprising a segment identifier field, a page offset field, and a byte offset field,
utilizing the segment identifier field to access a set of segment registers pointed to by the segment identifier field,
accessing the contents of the addressed segment register and concatenating the contents of same with the page offset and byte offset fields of said first virtual address to form a significantly larger second virtual address, wherein portions of said second virtual address obtained from said segment registers and the page offset portion of said first virtual address comprise a virtual page address to be utilized as a search argument in a subsequent address translation procedure which procedure comprises
utilizing a subset of said virtual page address as the search argument in a set of high speed translation-look-aside buffers,
comparing a complete virtual address stored at an accessed location of said translation look-aside buffers with the complete virtual address utilized as the search argument and accessing an associated real page address in the main memory from the translation look-aside buffers if the virtual address comparison is successful,
in the event of an unsuccessful search for the virtual address



in said translation look-aside buffers, continuing the search in a specified segment of storage in main memory (page frame tables) including
hashing said virtual page address,
accessing the page frame tables in main memory as a function at said hashed address, determining if the desired virtual address is at the hashed address and if not
determining if the hashed address is the initial member of a linked list of virtual addresses, all of which would produce the same hashed address,
continuing the search for the desired virtual address in said linked address list in said page frame tables until either the desired complete virtual address is found or it is determined that no such address is present,
accessing the real page address associated with said complete virtual page address, if found, in said page frame tables and utilizing said real page address as the requested real memory address.

4,638,427

PERFORMANCE EVALUATION FOR AN ASYMMETRIC MULTIPROCESSOR SYSTEM

Daniel B. Martin, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

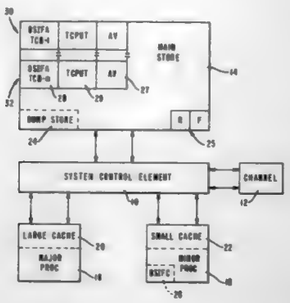
Filed Apr. 16, 1984, Ser. No. 600,622
Int. Cl.[4] G06F *15/16, 9/44*
U.S. Cl. 364—200 **16 Claims**

1. A method for adjusting CPU usage time in an asymmetric multiprocessor system (AMP) having at least one major processor and at least one minor processor, the minor processor being designed to execute without emulation a subset of instructions executable also without emulation by the major processor, and other instructions being executable with emulation by the minor processor but being executable without emulation on the major processor, each processor executing dispatched program tasks, each task comprised of a plurality of

the major processor's instructions, the processors being capable of interchanging the execution of any task in the AMP, the method comprising the steps of:

determining a real time measurement for each task that executes on the major processor and on the minor processor,

generating an adjusted time value for each task that executes on the minor processor by modifying the real time measurement for the minor processor according to emulation characteristics of the minor processor for tasks executed on the minor processor,



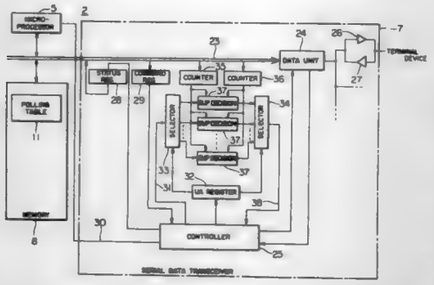
accumulating an adjusted total time value for the minor processor by summing the adjusted time values for all tasks executed on the minor processor over a given set of tasks or over a time period, and accumulating an actual total time value for the major processor by summing the real time measurements for all tasks executed on the major processor over a given set of tasks or over a time period, essentially the same amount of data processing being represented by a unit of the actual total time value for the major processor and by a unit of the adjusted total time value for the minor processor.

4,638,428

POLLING CONTROL METHOD AND SYSTEM

Hideaki Gemma, and Masafumi Hino, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 13, 1984, Ser. No. 681,028
Claims priority, application Japan, Dec. 14, 1983, 58-235298
Int. Cl.⁴ G06F *13/22*
U.S. Cl. 364—200 **7 Claims**



1. A polling method in a control unit having a plurality of terminal device address for a plurality of terminal devices comprising the steps of:

sequentially polling to said terminal device addresses;

counting the number of times of non-response to the polling for each of said terminal device addresses; and

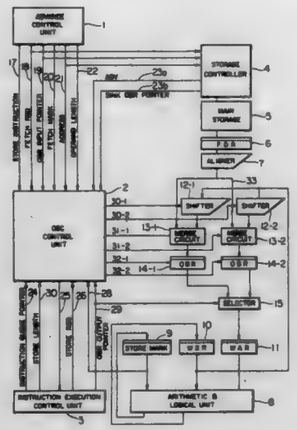
partially suppressing the polling to the terminal device address when said count for said terminal device address exceeds a predetermined number.

4,638,429

DATA PROCESSING APPARATUS FOR PROCESSING OPERAND STORE CONFLICT

Masaya Watabe, and Shuichi Abe, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 682,999
Claims priority, application Japan, Dec. 19, 1983, 58-239504
Int. Cl.⁴ G06F *9/34*
U.S. Cl. 364—200 **7 Claims**



1. A data processing apparatus for processing a store-type instruction which stores an operand as a result of an instruction execution in a storage location of a storage and a fetch-type instruction which fetches an operand from a storage location, comprsing:

a detecting means for detecting that an execution result of said store-type instruction for which a store operation has not been completed is utilized as an operand of said fetch-type instruction which succeeds said store-type instruction; and

a control means for aligning an operand position with the operand fetched by said fetch-type instruction and for merging an store operand in response to a detection by said detecting means and a store operation for storing said execution result.

4,638,430

EAROM AND EEPROM DATA STORAGE MANAGEMENT

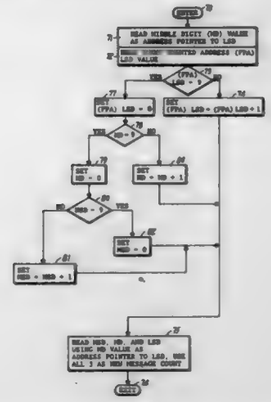
Raymond C. Perra, Windsor Locks; Stephen B. Wilmot, Farmington, and John E. Games, Granby, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 15, 1983, Ser. No. 514,214
Int. Cl.⁴ G06F *15/00*
U.S. Cl. 364—300 **4 Claims**

1. A method of recording successive values of high sample frequency parameters in a nonvolatile memory having a plurality of addressable signal storage locations for storing digital data recorded therein over a maximum number of recording cycles, comprising the steps of:

identifying a data signal block for each high sample frequency parameter as including a plurality of addressable storage locations at least equal to the ratio of the predicted number of recordings of each high sample frequency parameter in a selected lifetime interval, divided by the maximum number of recording cycles specified for each location; and

recording successive values of sample data in alternate ones of the data block signal locations so as to limit the number of recordings in each location to a number which is not greater than the maximum number of recording cycles specified.

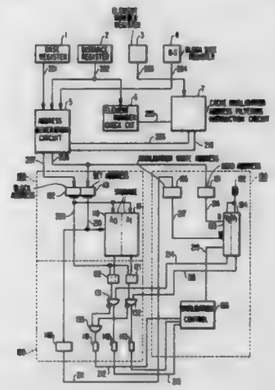


4,638,431

DATA PROCESSING SYSTEM FOR VECTOR PROCESSING HAVING A CACHE INVALIDATION CONTROL UNIT

Hiroyuki Nishimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,369
Int. Cl.⁴ G06F *12/08, 12/00, 13/00*
U.S. Cl. 364—200 **2 Claims**



1. In a data processing system for vector data processing and scalar data processing including:

a main memory;

parallel vector operation means for performing vector data processing, having a plurality of interfaces to said main memory for accessing element data; and

scalar operation means for performing scalar data processing, having a cache memory unit coupled to said main memory;

a cache memory unit, associated with said scalar operation means, comprising:

a cache memory for storing groups of data;

cache directory means for holding block address data associated with data stored in said cache memory; and

cache invalidation control means for invalidating an address of said cache directory;

said cache invalidation control means compriaing:

address generation means for generating cache invalidation addresses corresponding to store addresses of vector element data for vector store instructions which define a start address, a distance between element data, and a number of vector store elements, indicated by said vector store instructions;

detection means for checking whether or not a block address including said cache invalidation addresses which are applied to said detection means from said address generation means is filed in the cache directory or a copy of the cache directory and, if filed, generating a coincidence signal;

invalidation means for invalidating an associated filed address of the cache directory in response to the coincidence signal outputted from said detection means;

element number check means for checking a number of vector elements contained in a block by checking a distance between the vector store elements in said block and generating a signal corresponding to the number of vector elements in and the size of said block; and

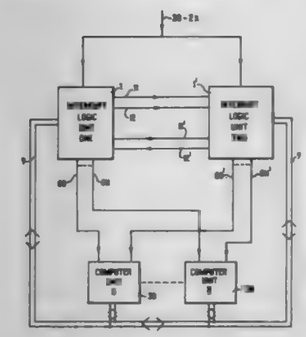
cache invalidation address filtering instruction means for delivering an instruction to said address generation means to filter out said cache invalidation address in response to the output of the element number check means.

4,638,432

APPARATUS FOR CONTROLLING THE TRANSFER OF INTERRUPT SIGNALS IN DATA PROCESSORS

John A. Niblock, Nuneaton; Jayant Patel, Coventry; Dennis Fisher, Tipton, and Anthony P. Lamb, Nuneaton, all of England, assignors to The General Electric Company, p.l.c., England

Filed Apr. 9, 1984, Ser. No. 598,469
Claims priority, application United Kingdom, Apr. 13, 1983, 8310003
Int. Cl.⁴ G06F *11/00, 11/30, 13/24*
U.S. Cl. 364—200 **5 Claims**



1. Input signal handling apparatus for controlling the transfer of input signals to a data processor, wherein two input signal units are provided one of which is selected as an active unit and the other of which is selected as a monitoring unit, and each of which has a plurality of inputs each arranged for connection to a respective source of input signals, an output for connection to a data processor, a data store which stores each signal received on one of said inputs, and control means which compares each signal so received and stored with presettable criteria which determine whether the received signal is an immediate input signal and, if so, causes all said input signals currently stored in the active input signal unit to be passed to its respective output and the subsequent erasure of those input signals, whereby all input signals received and stored as aforesaid are transferred to a connected data processor, and wherein on occurrence of an immediate input signal, the monitoring

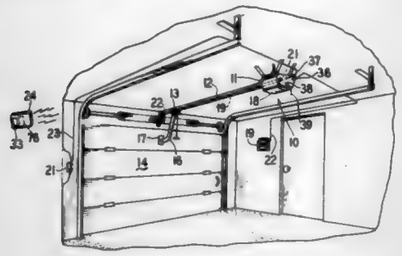
input signal unit monitors an output of the active input signal unit to determine whether that unit has acted to transfer input signals in the manner aforesaid and, if so, erases corresponding input signals from its respective data store and, if not, causes those corresponding input signals to be transferred to its respective output such that the input signals for transfer to a connected data processor are not lost if one of the input signal units fails.

4,638,433

MICROPROCESSOR CONTROLLED GARAGE DOOR OPERATOR

Wayne R. Schindler, Lisle, Ill., assignor to Chamberlain Manufacturing Corporation, Elmhurst, Ill.

Filed May 30, 1984, Ser. No. 615,339
Int. Cl.[4] G06F *15/20*; H02P *1/22*; E05F *11/00*, *15/10*
U.S. Cl. 364—400 **2 Claims**



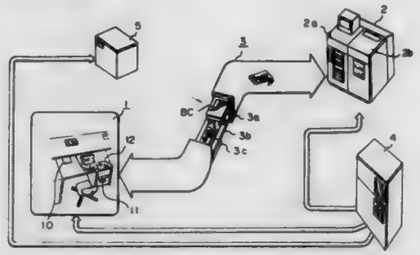
1. A garage door operator for a garage door comprising, a motor with an output shaft connected to said garage door to open and close it, a control unit with an energize switch and up and down setting switches, a microprocessor connected to said control unit and to said motor to energize it, a program switch settable to operate and program positions and connected to said microprocessor, a rotation detector mounted so as to monitor rotation and direction of rotation of the output shaft of said motor, and said rotation detector connected to supply an input to said microprocessor when said program switch is in the program position, and the motor will move in the down direction when said down setting switch is energized and the motor will move in the up direction when said up setting switch is energized and down and up limits will be set when the door has been moved, and means for automatically setting the force limits connected to said microprocessor to set the force limits when the garage door is initially operated, wherein a radio receiver is connected to said microprocessor and a radio transmitter is capable of transmitting a signal to energize said radio receiver to operate said door, including a door condition indicator connected to said microprocessor and energized when a problem exists with the door and the garage door operation, wherein said radio transmitter when energized radiates a coded signal and said radio receiver receives and detects said coded signal, means for storing a stored coded signal at said receiver, said microprocessor receiving and comparing said coded signal with said stored coded signal, and said microprocessor producing a garage door operator signal if said transmitted coded signal and said stored coded signal are the same, wherein said means for storing is a memory means into which the coded signal from the transmitter can be supplied so as to change the stored coded signal in said means for storing, wherein said means for storing is a multicontact switch which can be manually set, wherein said door condition indicator produces an intermittent output when there is a fault in the garage door operator and said indicator produces a continuous output when the mechanical condition of the door is improper, and including a one inch obstruction switch connected to said microprocessor to set a one inch reversal limit.

4,638,434

CASH PROCESSING SYSTEM

Yoshihiko Aizaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Nov. 30, 1984, Ser. No. 676,990
Claims priority, application Japan, Nov. 30, 1983, 58-225692; Nov. 30, 1983, 58-225694
Int. Cl.[4] G06F *15/22*, *15/20*, *13/30*
U.S. Cl. 364—401 **19 Claims**



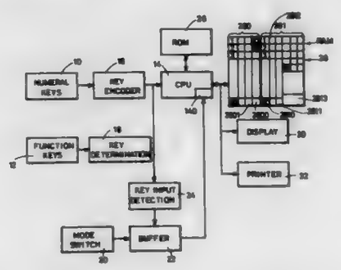
1. A cash processing system comprising:
a transaction terminal having opening means for taking out and putting in cash, and means for demanding the payment or receipt of cash;
a cashier terminal which is provided separately from the transaction terminal to effect the payment and receipt of the cash;
passage means for connecting the transaction terminal and the cashier terminal;
carriage means capable of moving along and on the passage means for conveying the cash between the terminals;
a system controller for controlling the receipt and payment of the cash by the cashier terminal, in response to a demand from the transaction terminal; and,
a conveyance controller for controlling the conveyance of the cash by the carriage means in accordance with outputs from the system controller.

4,638,435

ELECTRONIC CASH REGISTER HAVING DIRECT PRICE LOOK-UP FUNCTION

Kumehiko Matsuda, Jyoyo, and Kensaku Komai, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1983, Ser. No. 564,205
Claims priority, application Japan, Dec. 27, 1982, 57-231087
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—405 **1 Claim**



1. In an electronic cash register including a plurality of department keys for introducing department access code information, a plurality of numeral keys for introducing numeral data, and a PLU instruction key for instructing a PLU (price look-up) operation, the improvement comprising:

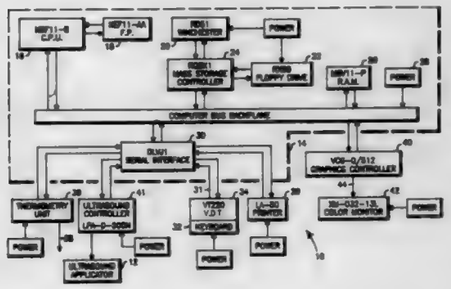
memory means for storing preset data and registered data, said memory means including,
a first memory section storing a plurality of price look-up codes and unit cost information associated with each price look-up code, and
a second memory section storing a pluraity of department access codes each department access code being associated with one of said plurality of department keys, and a selected number of said plurality of price look-up codes, each of said selected number of said plurality of price look-up codes corresponding to one of said plurality of department access codes;
mode select means for choosing an operation for the electronic cash register from at least two operation modes including a price look-up registration mode and a direct price look-up mode;
processing means, responsive to said mode select means, for carrying out the operation chosen by said mode select means, where in said direct price look-up mode said processing means is responsive to an entered department key, said processing means accessing said second memory section and identifying a department access code corresponding to said entered department key, said processing means identifying a price look-up code corresponding to the department access code, and said processing means accessing a unit cost information associated with the price look-up code in said first memory section, and in said price look-up registration mode, said processing means is responsive to said numeral keys and the PLU instruction key, said processing means receiving a price look-up code entered with said numeral keys, said processing means accessing the unit cost information associated with said entered price look-up code from said first memory section.

4,638,436

TEMPERATURE CONTROL AND ANALYSIS SYSTEM FOR HYPERTHERMIA TREATMENT

Christopher W. Badger; Everette C. Burdette, both of Champaign, Ill.; Steven C. Leech, Tinton Falls, N.J., and John F. McCarthy, Champaign, Ill., assignors to Labthermics Technologies, Inc., Champaign, Ill.

Filed Sep. 24, 1984, Ser. No. 654,603
Int. Cl.[4] G06F *15/42*; A61F *7/00*; A61N *1/08*
U.S. Cl. 364—414 **46 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 48 Pages)



1. A system for controlling a hyperthermia treatment device of the type which has applicator means for applying energy to attain a predetermined temperature protocol for portions of a patient's body, the system monitoring said energy application and being capable of adjusting said energy application responsive to operator manipulation, said system comprising:
means for sensing temperature of the patient's body and for providing a temperature signal;
computer means having associated instruction and data storage means for interacting with other systems means to perform the energy application, said computer means monitoring said temperature signal and adjusting said energy application responsive to the operator manipulation and having data and instructions defining said predetermined temperature protocol, said computer means utilizing said temperature signal and said protocol defining data and instructions to selectively provide an operator prompt signal indicating the desirability of the operator adjusting said energy application and further providing correlative temperature data associated with said portions of the patient's body;
operator means responsive to the operator manipulation for providing an operator signal to control said energy applicator means via said computer means; and
means responsive to said correlative data and said protocol defining data and instructions for displaying a video presentation of said correlative temperature data to the operator, said correlative temperature data displayed in a color coded manner such that preselected colors represent predetermined temperature effectiveness zones of hyperthermia treatment, the operator capable of adjusting said energy application by evaluating said color coded video presentation and providing said operator signal.

4. The system as defined in claim 1 wherein said correlative temperature data comprises selectively at least one of temperature data from (a) a group of said sensing means inside a tumor region, (b) a group of said sensing means outside said tumor region, (c) a mixture of groups from inside and outside said tumor region, (d) a group of said temperature sensing means within said preselected subelement wherein said system is adapted to control the temperature, and (e) a group of said temperature sensing means within and without each said preselected subelement wherein said system is adapted to control the temperature.

20. A method for preparing a predetermined hyperthermia treatment protocol for a tumor in a portion of a patient's body using a hyperthermia treatment data base defining a plurality of general hyperthermia treatment protocols, comprising the steps of:
identifying location, size and type characteristics of said tumor in the patient's body;
mapping data in said hyperthermia treatment data base corresponding to tumor characteristics identified in said patient's body; and
modifying a selected one of said general hyperthermia treatment protocols for said tumor to account for said identified location, size and type characteristics of said tumor in said patient's body to develop said predetermined hyperthermia treatment protocol.

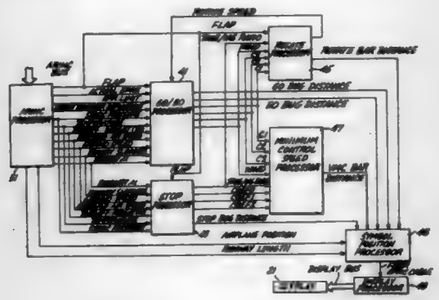
35. A method of determining figures of merit for use in a hyperthermia treatment of a tumor in a portion of a patient's body using an apparatus having a group of temperature sensors disposed in the tumor and another group of temperature sensors disposed in surrounding normal tissue, comprising the steps of;
applying energy to heat said portion of the patient's body;
sensing temperatures periodically throughout said hyperthermia treatment for said group of temperature sensors disposed in said tumor and said group in said surrounding normal tissue;
storing in storage means said sensed temperatures for each said group of temperature sensors;
assigning a temperature threshold zone to each said sensed temperatures;
determining percentages for each said group of said sensed temperatures which lie within each said temperature threshold zone; and
calculating said figures of merit by comparing selected ones of said determined percentages associated with said temperature threshold zones.

4,638,437

AIRCRAFT PERFORMANCE MARGIN INDICATOR

Patrick J. Cleary, Federal Way; Lloyd S. Keiman, Redmond, and Richard L. Horn, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 25, 1984, Ser. No. 624,280
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—427 **18 Claims**



1. An aircraft performance margin indicator for informing the pilot of an aircraft, during takeoff and landing, of the ability of the aircraft to stop safely or achieve a safe flying speed before reaching the end of the runway comprising:

(a) a two-part display, one part of the display including a GO bug symbol and the other part of said display including a STOP bug symbol; and,

(b) a display control system connected to said two-part display for continuously:

(1) receiving data about the aircraft, the runway and the existing environmental condition;

(2) determining the runway distance needed for the aircraft to both: (i) stop safely if maximum braking is applied; and (ii), achieve a safe flying speed if maximum thrust is applied;

(3) producing GO and STOP bug signals suitable for controlling the position of said GO and STOP bug symbols such that the position of said STOP bug symbol depicts the ability of the aircraft to stop safely before reaching the end of the runway if maximum braking is applied and the position of said GO bug symbol depicts the ability of the aircraft to achieve a safe flying speed before reaching the end of the runway if maximum thrust is applied; and,

(4) applying said GO and STOP bug signals to said two-part display to control the position of said GO and STOP bug symbols.

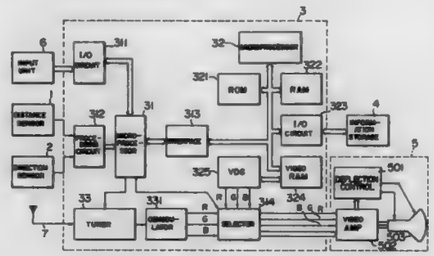
4,638,438

NAVIGATION APPARATUS FOR AUTOMOTIVE

Akira Endo, Mito; Jiro Takezaki, Katsuta; Fumio Tsujii, Mito, and Takanori Shibata, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 22, 1984, Ser. No. 612,856
Claims priority, application Japan, May 23, 1983, 58-89141
Int. Cl.[4] G06F *15/50*; G09B *29/10*
U.S. Cl. 364—449 **5 Claims**

1. A navigation apparatus for an automotive vehicle, comprising: sensor means for sensing the travelled distance of a vehicle, sensor means for sensing the advancing direction of the vehicle, information storage means for storing map data, signal processor means for computing the present position of the vehicle on the basis of the output signals from said travelled distance sensor means and said advancing direction sensor means and for generating a display signal including the data of the computed present position of the vehicle and the map data corresponding to said vehicle's present position as read out from said information storage means, and display means for displaying said dispaly signal, wherein said map data is stored in the form of position coordinate information of division points dividing roads on the road map into sections that can be approximated by linear interpolation between division points,



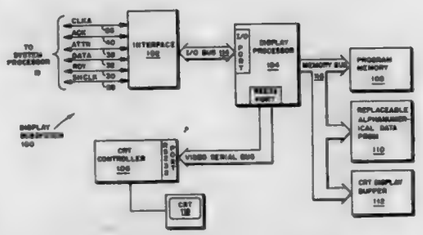
and wherein said signal processor means comprises means for effecting linear interpolation of said map data stored in said information storage means in the form of said position coordinate information of division points to generate said display signal.

4,638,439

POSTAGE METERING SYSTEM WITH DISPLAY

Edward P. Daniels, Bridgeport, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed May 5, 1983, Ser. No. 491,843
Int. Cl.[4] G07B *17/02*; G06F *15/20*
U.S. Cl. 364—446 **6 Claims**



1. A postage metering system comprising

(a) postal scale means for determing postage values for items to be mailed as a function of the weight of said items and additional information entered by an operator, said postage values comprising a plurality of components;

(b) a peripheral display subsystem connectable to said postal scale means, said subsystem further comprising:

(b1) display means for displaying alphanumeric information;

(b2) memory means for storing data, said data including data defining alphanumeric information describing said components of said postage values

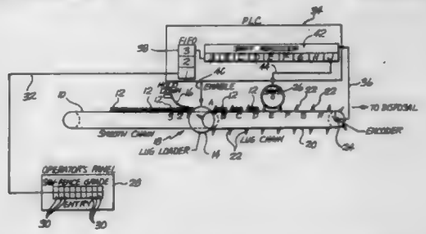
(b3) display processor means operatively connected to said display means and said memory means, and connectable to said postal scale means, for receiving from said postal scale means signals identifying and defining said components of said postage values, for matching said describing alphanumeric information with said components, and for controlling said display means so that said describing information is displayed in predetermined alphanumeric format.

4,638,440

FEEDING AND DATA ENTRY SYSTEM FOR LUMBER TRIMMER

William R. Brough, Federal Way, and James C. Borgen, Aberdeen, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 218,852, Dec. 22, 1980, abandoned.
This application Oct. 1, 1984, Ser. No. 656,415
Int. Cl.[4] G06F *15/46*; G05B *19/19*
U.S. Cl. 364—475 **10 Claims**



1. A feeding and data entry system for a lumber trimmer, comprising:

a first conveyor means for bringing marked boards to a data entry zone where each board makes at least one step within the zone,

a second conveyor means for accepting boards from the first conveyor means,

a data processing and control means for receiving and sending data,

a loader means for transferring each board to the second conveyor means only after data is entered into the data processing and control means indicative of at least the decision of the location of trimming cuts, and

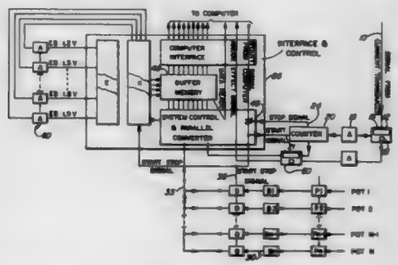
means for tracking each board as it moves on the second conveyor means into the trimmer and for activating the selected saws to make the trim cuts.

4,638,441

DATA ACQUISITION SYSTEM FOR THE COMPUTER CONTROL OF ALUMINUM SMELTERS

Andrew E. Deczky, Ottawa, Canada, assignor to R.F.J. Associates Limited, Scarborough, Canada, a part interest

Filed May 31, 1984, Ser. No. 615,730
Claims priority, application Canada, Jan. 18, 1984, 445554
Int. Cl.[4] G01R *19/00*; C25C *3/00, 3/06, 3/20*
U.S. Cl. 364—483 **10 Claims**



1. A method of measuring current independent corrected cell potentials in an aluminum potline having a plurality of cells connected in series, comprising:

(a) generating a first signal having a frequency proportional to current through said cells, said signal having a predetermined frequency when said current is at a set-point value,

(b) determining a time interval by counting cycles of said first signal from a start time until a predetermined count value is reached,

(c) generating a plurality of second signals each having a frequency proportional to total voltage across a different one of said cells,

(d) generating a plurality of third signals each having a frequency proportional to different possible values of back e.m.f. of a cell,

(e) counting cycles of said second signals during said time interval to obtain counts proportional to current independent total cell voltages,

(f) using said third signals to decrement, during said time interval, counters having counts proportional to the different possible values of back e.m.f. to thereby determine any error values that might exist for the back e.m.f. values as a result of a change in said current from its set-point value, and

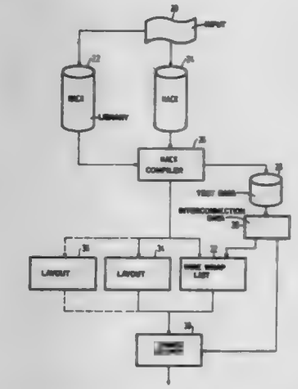
(g) algebraically subtracting the error values determined in step (f) from the current independent total cell voltages to determine current independent corrected cell voltages.

4,638,442

COMPUTER AIDED DESIGN METHOD AND APPARATUS COMPRISING MEANS FOR AUTOMATICALLY GENERATING PIN-TO-PIN INTERCONNECTION LISTS BETWEEN RESPECTIVE DISCRETE ELECTRICAL COMPONENT CIRCUITS

Stewart F. Bryant, Redhill; Stephen J. Baker, Brighton, and Richard A. Cook, Haywards Heath, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 6, 1984, Ser. No. 669,207
Claims priority, application United Kingdom, Nov. 9, 1983, 8329688
Int. Cl.[4] G06F *15/60*
U.S. Cl. 364—489 **9 Claims**



1. An arrangement for generating a component interconnection list for an electrical circuit, each interconnection being in the form of a link between a first individual component pin and a second individual component pin, said arrangement comprising means for entering

a component list containing any component used,

a component description of any component used inclusive of a functional pin description thereof, and

a circuit interconnection description containing elements of the form of a first array of pins of a second array of named components connected to a third array of pins of a fourth array of named components, at least one array being non-unitary,

wherein for any circuit interconnection description element in which both said first and said third arrays are non-unitary the first and third arrays have equal numbers of array elements, said arrangement furthermore containing library means for storing said component descriptions as standard component descriptions, processing means for processing, under program control, the circuit interconnection description and the list of

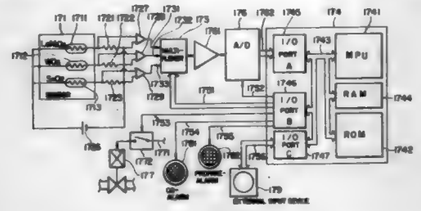
components used while addressing said library means for accessing said component descriptions, and output means for after said processing outputting said component interconnection list.

4,638,443

GAS DETECTING APPARATUS

Masayoshi Kaneyasu; Hideo Arima, both of Yokohama; Mitsuko Ito, Yokosuka; Shoichi Iwanaga, Yokohama; Nobuo Sato, Yokosuka; Takasobe Noro; Akira Ikagami, both of Yokohama, and Tokio Isogai, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 21, 1984, Ser. No. 581,667
Claims priority, application Japan, Feb. 21, 1983, 58-26166
Int. Cl.⁴ G01N *27/12;* **G06F** *15/20;* **G08B** *17/10*
U.S. Cl. 364—497 **7 Claims**



1. A gas detecting apparatus comprising:

a plurality of gas detecting semiconductor elements having gas detection characteristics differing from one another;

storage means for storing a plurality of standard patterns prepared by measuring previously the gas detection characteristics of said gas detecting semiconductor elements in dependence on species of gas components and mixing ratios thereof and patterning the measured detection characteristics; and

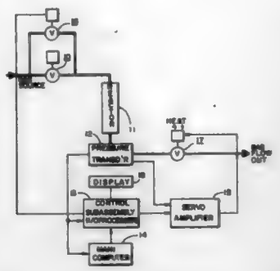
arithmetic means for arithmetically processing gas detection outputs of said plural gas detecting semiconductor elements, said arithmetic means including means for comparing a detected pattern reproduced from gas detection outputs of said plural gas detecting semiconductor elements with said standard patterns stored in said storage means for identifying the species of a gas to be detected.

4,638,444

MICROPROCESSOR-CONTROLLED BACK-PRESSURE SYSTEM FOR SMALL VOLUME CHEMICAL ANALYSIS APPLICATIONS

Robert Laragione, Christiana; Steven M. Larcott, West Chester, both of Pa.; Woodford A. Bowe, Rising Sun, Md., and Eugene J. Levy, Oxford, Pa., assignors to Chemical Data Systems, Inc., Oxford, Pa.

Filed Feb. 17, 1983, Ser. No. 467,461
Int. Cl.⁴ G05B *11/00*
U.S. Cl. 364—510 **18 Claims**



1. A system for maintaining back-pressure in a low flow, low volume chemical testing apparatus, said apparatus including a chamber having input and output ends and in which pressure is to be maintained, means for applying at least one gas to the input end of said chamber, transducer means for measuring the pressure of said gas at the output end of said chamber and producing a first signal corresponding thereto, means downstream of said transducer for adjusting the back pressure of said chamber, means for producing a second signal corresponding to the magnitude of a desired back Pressure within said chamber, a microprocessor-based control subassembly coupled to receive said second signal from said signal-producing means and to receive said first signal from said measuring means transducer, said subassembly producing a modified set-point signal in response to said two signals indicating the departure of the actual pressure as measured by said transducer from said desired back pressure, servo means for comparing said first signal and said modified set point signal for producing a difference error signal and supplying the latter to regulate said means for adjusting the back preasure thereby to cause the pressure within said chamber to approach closely the desired back pressure;

said means for applying said gas including a first automatically-operated flow valve in parallel with a second fast-acting prepressure flow valve, said second flow valve enabling said chamber to be quickly filled to approach the desired pressure at start up of said system; and

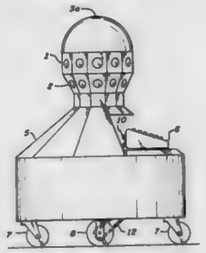
said control subassembly including means for producing a third signal which is applied to said second valve for opening said second valve when the actual pressure in said chamber as measured by said transducer deviates by more than a predetermined amount from the desired set-point pressure.

4,638,445

AUTONOMOUS MOBILE ROBOT

Paul J. Mattaboni, 9 Wildwood Dr., Medfield, Mass. 02052

Filed Jun. 8, 1984, Ser. No. 618,438
Int. Cl.⁴ G06F *15/50*
U.S. Cl. 364—513 **6 Claims**



1. In a mobile robot of the type having

(a) a vision system,

(b) memory means for storing data derived from the robot vision system, and

(c) a computer for processing data derived from the robot's vision system,

the improvement wherein the robot's vision system comprises

(i) a first array of ranging transducers for obtaining data on the position and distance of far objects in a volume of space, the transducers of the first array being symmetrically disposed on the mobile robot with respect to an axis of symmetry within the mobile robot, each transducer of the first array being fixed in position with respect to that axis of symmetry and seeing a portion of the volume of space seen by its entire array;

(ii) a second array of ranging transducers for obtaining data of the position and distance of near objects in the same or an overlapping volume of space, the transducers of the second array being symmetrically disposed on the mobile robot with respect to said axis of symmetry, each transducer of the second array being fixed in position with respect to said axis of symmetry and seeing a portion of the volume of space seen by its entire array, the angle of view of the transducers of the second array being different from the angle of view of the transducers of the first array with respect to the same object in space; and

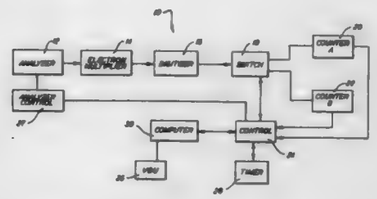
(iii) means for polling said ranging transducers in sequences determined by the computer.

4,638,446

APPARATUS AND METHOD FOR REDUCING TOPOGRAPHICAL EFFECTS IN AN AUGER IMAGE

Paul W. Palmberg, Bloomington, Minn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 31, 1983, Ser. No. 499,596
Int. Cl.⁴ H01J *39/00*
U.S. Cl. 364—555 **6 Claims**



1. A system for reducing topographical effects in forming an Auger image by sequentially focusing a primary electron source at points along a line of a raster pattern, said system comprising:

an electron analyzer, said analyzer having means for selectively passing electrons therethrough at a first preselected energy level and at a second preselected energy level, said analyzer producing a signal responsive to the passage therethrough of said electrons;

means for digitizing said signal from said analyzer;

first and second digital counters, each said counter being switchably connected to said digitizing means;

a timer;

control means having first means for connecting said first counter to said digitizing means and for setting said electron analyzer at said first energy level and for activating said timer to determine the time interval to bring the signal in the first counter to a preselected value, and said control means having second means for connecting said second counter to said digitizing means and for setting said electron analyzer at said second energy level to ascertain the signal in the second counter after the lapse of the same time interval;

means for calculating the difference between the count in said first counter and the count in said second counter;

means for displaying said difference in said counters; and

means for refocusing said primary electron source on the next adjacent point along said line of the raster pattern.

4,638,447

METHOD FOR DETERMINING CONSISTENT OIL RELATIVE PERMEABILITY VALUES FROM DYNAMIC DISPLACEMENT DATA

Aziz S. Odeh, Plano, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 21, 1983, Ser. No. 544,175
Int. Cl.⁴ G01N *15/08*
U.S. Cl. 364—556 **7 Claims**

1. A method for determining correct relative oil permeability values for a core sample, comprising the steps of:

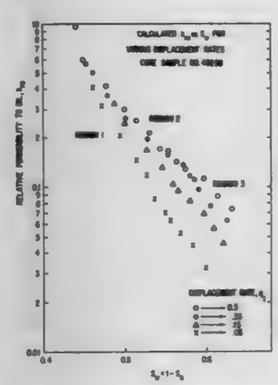
performing oil flood dynamic displacement measurements on said core sample;

determining characteristics of said core sample;

determining from data collected during said measurements, and from said characteristics of said core sample, relative oil permeability values (k_{ro}) for said core, said determined relative oil permeability values (k_{ro}) being offset from correct relative oil permeability values (k_{roc}) as a result of an end effect which introduces an increased fluid pressure drop at an effluent end of said core sample; and

correcting said determined relative oil permeability (k_{ro}) values toward said correct relative oil permeability values (k_{roc}) thereby minimizing the effects caused by said end effect on said determined relative oil permeability values (k_{ro}), and wherein said correcting step comprises the steps of:

initially plotting a ratio q_o/k_{ro} vs. average fluid saturation of said core sample, where q_o is the rate of oil produced at the effluent end of said core sample during said oil flood dynamic displacement measurements;



determining an initial relative oil permeability value (k_{roi}) at a residual water saturation of said core sample, said value (k_{roi}) being used to determine the first point of the plot of q_o/k_{ro} vs. average fluid saturation;

determining if a straight line segment exists in said plotted ratio in areas thereof corresponding to high oil saturation and, if so, drawing and extrapolating said straight line segment to the limit of the plotted data, otherwise, constructing a tangent curve to the plotted ratio beginning at the point corresponding to k_{roi}; and

determining corrected relative permeability values k_{roc}, where

$$k_{roc} = k_{ro}\frac{(q_o/k_{ro})}{(q_o/k_{ro})SL}$$

and (q_o/k_{ro}) is the initially plotted ratio and $(q_o/k_{ro})SL$ is the value appearing on the drawn and extrapolated straight line segment or the constructed tangent curve for the same average fluid saturation value.

4,638,448

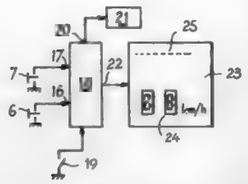
ELECTRONIC ODOMETER IN PARTICULAR FOR A CYCLE

Antoine L. Cuvelier, and Guy M. G. Boucher, both of Paris, France, assignors to Huret et ses Fils, Nanterre, France

Filed Sep. 12, 1983, Ser. No. 531,754
Claims priority, application France, Sep. 15, 1982, 82 15593
Int. Cl.⁴ G06M *3/06;* **G01C** *22/00;* **B62J** *39/00;* **G06F** *15/02*
U.S. Cl. 364—565 **13 Claims**

1. An electronic odometer in particular for a cycle, comprising a case having a bottom and a cover pivotally mounted on said bottom, a micro-processor in the case, a sensor of movements for associating with a wheel of the cycle and connected to the micro-processor, display means connected to said micro-processor for displaying items of information, such as distance, speed of time information, a signal generator connected to said

micro-processor and adapted for identifying under the control of said micro-processor the nature of said items of information displayed on said display means, and at least a first control key relating to the display of items of information processed in the micro-processor, said first control key being constituted by said cover of the case, said signal generator emitting signals respectively corresponding to the nature of the items of infor-



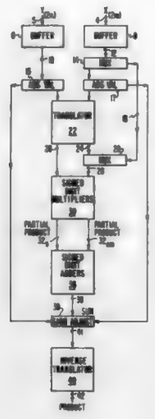
mation displayed on said display means, a switch adapted to control through said micro-processor main functions of the odometer, said switch being associated with said first control key and connected to the micro-processor, the actuation of said switch resulting in the display of items of information processed by said micro-processor and the emission by the signal generator of signals characterizing the displayed items of information.

4,638,449

MULTIPLIER ARCHITECTURE

Alexander H. Frey, Cabin John, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 504,358, Jun. 15, 1983, abandoned. This application Aug. 14, 1985, Ser. No. 765,567
Int. Cl.⁴ G06F *7/52*
U.S. Cl. 364—760 **2 Claims**



1. An improved multiplier for multiplying a first operand Y times a second operand X, comprising:

a Booth-type translator having an input connected to receive the first operand Y having 2N binary bits Y_j, for translating the binary expression for the sequence of N pairs (Y_{j+1}, Y_j) of said first operand Y into a sequence of N signed digits Y_j said translator operating on positive 2's complement numbers, to translate for Y,

Y_{j+1}	Y_j	Y_{j-1}	Y_j
1	1	1	0
1	1	0	−1
1	0	1	−1

-continued

Y_{j+1}	Y_j	Y_{j-1}	Y_j
1	0	0	−2
0	1	1	+2
0	1	0	+1
0	0	1	+1
0	0	0	0;

a partial product generator having a first input connected to the output of said translator and its second input connected to receive said second operand X having 2M binary bits grouped into M pairs (X_{I+1}, X_I) expressed as the numerical value X_j of the respective pair, for multiplying said translated first operand times said second operand and outputting partial products consisting of signed digits, said partial product generator operating to multiply for

$Y_j = +2;\ X_j \cdot Y_j = +X_{I-1}$

$Y_j = -2;\ X_j \cdot Y_j = -X_{I-1}$

$Y_j = +1;\ X_j \cdot Y_j = +X_I$

$Y_j = -1;\ X_j \cdot Y_j = -X_I$

$Y_j = 0;\ X_j \cdot Y_j = 0$.

to generate N×M partial products consisting of signed digits X_j times Y_j;

an array of adders, each adder having an input connected to two outputs from said partial product generator, for adding a first signed digit $A = X_j$ times Y_j of a first partial product, to a second signed digit $B = X_j$ times Y_j of a second partial product, providing a sum consisting of a sequence of signed digits, each adder operating on

INPUTS:

$-3 \leqq A \leqq +3$

$-3 \leqq B \leqq 3$

Carry In $= -1, 0, +1$

and generating

OUTPUTS:

Carry Out $= -4, 0, +4$ Independent of Carry In $-3 \leqq C \leqq +3$

so that

For $+3 \leqq A+B \leqq +6$, Carry out $= +4$

$-2 \leqq A+B \leqq +2$, Carry Out $= 0$

$-6 \leqq A+B \leqq -3$, Carry Out $= -4$

the result is $A+B-(Carry\ Out) = -2, -1, 0, +1, +2$

$-3 \leqq \{A+B-(Carry\ Out)+(Carry\ In)\} \leqq +3$ said sequence of signed digits output from said array of adders being the full product Z' expressed as a plurality of M+N−1 signed digits Z_I;

an inverse translator having an input connected to the output of said adders, for operating on said sequence of signed digits Z_I output from said adders, for providing a conventional binary expression Z OUT expressed as the value Z_j of pairs of adjacent binary numbers for the product of said first and second operands, said inverse translator operating

on an input $-2 \leqq Z_j \leqq +3$ and eliminating negative values, by using $-1 = -2+1$ to generate an output where Z_j is given by the Table

Z_j

1_jIN	+3	+2	+1	0	−1	−2	−3
1	2	1	0	3	2	1	0
0	3	2	1	0	3	2	1;

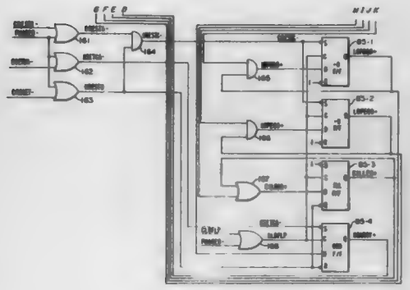
where the value 1_jIN is a binary "1" if there is a minus carry in and is a "0" if there is no minus carry in.

4,638,450

EQUAL NINE APPARATUS FOR SUPPORTING ABSOLUTE VALUE SUBTRACTS ON DECIMAL OPERANDS OF UNEQUAL LENGTH

Brian L. Stoffers, No. Billerica, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 30, 1983, Ser. No. 537,751
Int. Cl.⁴ G06F *7/38*; G05F *7/50*
U.S. Cl. 364—715 **1 Claim**



1. A digit equal nine apparatus for indicating if the difference from subtracting two operands is equal to the digit nine comprising:

A. a programmable read-only memory (PROM) having an address input including higher order and lower order bits, the higher order bits having one operand applied thereto and the lower order bits having a second operand applied thereto, said first and said second operands making up an address to read out the contents of a storage location in said PROM in which is stored a number that is equal to the difference between said two operands, and also stored in said addressed storage location is a digit equal nine bit that indicates if the number in the addressed PROM storage location has the value nine, said PROM having a first output on which a digit equal nine signal is placed responsive to said digit equal nine bit when said storage location is addressed using said two operands, said digit equal nine signal having a first state and a second state, said first state indicating that the result of the subtraction of said two operands is a digit other than the digit nine, said second state indicating that the result of the subtraction of said two operands is the digit nine,

B. an AND gate having a first data input for receiving said digit equal nine signal from said PROM output, a second input, and an output,

C. a flip-flop having a data input coupled to said AND gate output for receiving said digit equal nine signal, said flip-flop having a reset input for receiving a reset signal which places said flip-flop in a first state, said flip-flop also having a clocking input for receiving a clock signal which indicates that said PROM has subtracted said two operands applied to its address input, whereby said flip-flop will remain in said first state until the second state of said digit equal nine signal is on said first output from said PROM and in response thereto said flip-flop changes to its second state, and said flip-flop remains in said second state to indicate that the result of the subtraction performed by said PROM using said two operands is equal to the digit nine until said flip-flop is reset by said reset signal at the beginning of a subsequent subtraction operation, and said flip-flop also has an output on which is a first signal when said flip-flop is in its first state and on which is a second signal when said flip-flop is in its second state, said first signal providing an indication that the result of the subtraction by said PROM is other than the digit nine, said second signal providing an indication that the subtraction result is equal to the digit nine, and said flip-flop output also being applied to said second input of said AND gate, and

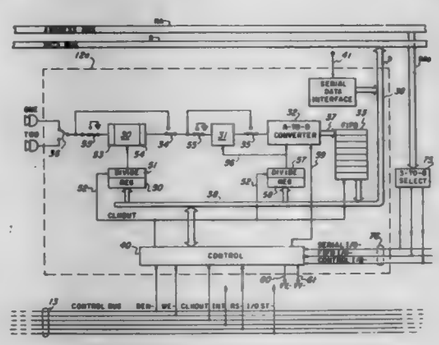
D. means for inhibiting the clocking of said flip-flop so that operands applied to the address input of said PROM can be subtracted without changing the state of said flip-flop.

4,638,451

MICROPROCESSOR SYSTEM WITH PROGRAMMABLE INTERFACE

Richard K. Hester, Whitewright, and Khen-Sang Tan, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 3, 1983, Ser. No. 491,140
Int. Cl.⁴ G06F *3/05, 13/00*
U.S. Cl. 364—900 **7 Claims**



1. A microcomputer system with programmable interface circuits comprising:

(a) processing means having a CPU, a memory, control bus means, and data bus means,

(b) an input interface circuit for said system coupled to said control bus means and to said data bus means; said input interface circuit including:

a data input, first translating means having an input connected to said data input and having an output, said first translating means performing a selectable translation of the form of data from said data input to produce translated data at said output, first memory means connected to receive said translated data from said output of said first translating means, said first memory means having an output coupled to said data bus means, and first control means receiving commands from said control bus means and receiving coded controls from said data bus means, said first control means selecting said translation of form used in said first translating means,

(c) an output interface circuit for said system coupled to said control bus means and to said data bus means, said output interface circuit including:

second memory means, said second memory means having an input connected to said data bus means and an output coupled to second translating means, said second translating means performing a selectable translation of the form of data from said output of the second memory means to produce translated data at an output, a data output coupled to said output of said second translating means, and second control means receiving commands from said control bus means and receiving coded controls from said data bus means, said second control

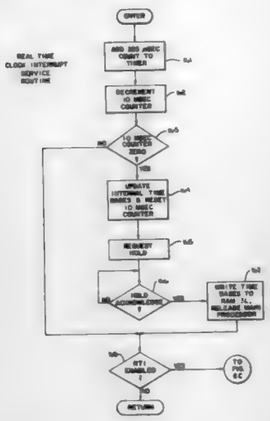
means selecting said translation of form used in said second translating means.

4,638,452

PROGRAMMABLE CONTROLLER WITH DYNAMICALLY ALTERED PROGRAMMABLE REAL TIME INTERRUPT INTERVAL

Ronald E. Schultz, Willoughby; Otomar Schmidt, Willoughby Hills, and David A. Johnston, Mentor, all of Ohio, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Feb. 27, 1984, Ser. No. 584,128
Int. Cl.[4] G06F *15/18*
U.S. Cl. 364—900 3 Claims



1. In a programmable controller which comprises:

a memory for storing a user control program comprised of a set of control program instructions and for storing a user interrupt routine comprised of a second set of control program instructions;

data table means for storing a real time interrupt interval number;

main processor means coupled to the memory and the data table means for repeatedly executing the user control program to operate a machine connected to the programmable controller, said processor means including means for writing a real time interrupt interval number to the data table means when the processor means executes selected ones of the control program instructions;

real time clock means coupled to the main processor means and the data table means, which interrupts the execution of the user control program at time intervals determined by the value of the stored real time interrupt interval number;

wherein the main processor means executes the user interrupt routine each time the user control program is interrupted; and

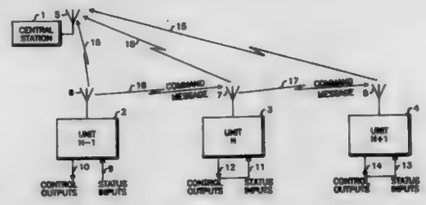
in which the real time clock means includes RTI in progress means for establishing the length of time required by the main processor means to execute the user interrupt routine after it is interrupted by the real time clock means, and comparison means for altering the length of time between real time interrupts from that indicated by the real time interrupt interval number when the length of time required by the main processor means to execute the user interrupt routine exceeds a preestablished portion of the interrupt interval indicated by the real time interrupt interval number.

4,638,453

SIGNAL PROCESSING UNIT

Paul Gras, Kfar Saba; Haim Feiner, Herzilia; Nissim Ben-Dayan, Tel-Aviv, all of Israel; Marian Stefanin, Don Mills, Canada, and Yechiam Mar-Chaim, Tel Aviv, Israel, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 28, 1983, Ser. No. 479,537
Int. Cl.[4] G06F *13/38*
U.S. Cl. 364—900 11 Claims



1. A signal processing unit for use in a supervisory control system having at least one central station for communicating with a plurality of said units each identified by an unit address, said signal processing unit comprising:

means for receiving messages including at least an address signal and an from said central station and/or said preceding unit;

processing means for processing said information signal including means for modifying said address signal to provide a destination signal and preambling said destination signal to said processed information signal; and

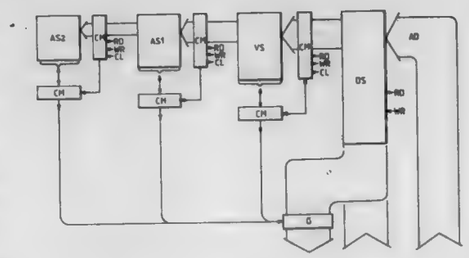
means for transmitting said processed information signal preambled by said destination signal to said central station and/or said succeeding unit.

4,638,454

DIGITAL DATA STORAGE APPARATUS

John R. Waterworth, Cheadle, England, assignor to Ferranti plc, Cheshire, England

Filed Dec. 3, 1982, Ser. No. 446,458
Claims priority, application United Kingdom, Dec. 4, 1981, 8136083
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—900 6 Claims



1. Digital data storage apparatus comprising:

a data store having a plurality of word locations for storing multiple-bit words;

said data store having a multiple bit address input and a data output;

a gate for controlling the data output, said gate having a plurality of logical OR control inputs such that any gate control input can block data output;

a validity store having a lesser plurality of word locations than said data store for storing multiple-bit words, each individual bit in said validity store corresponding to one word location in said data store and capable of being set to a particular state to indicate the corresponding word in said data store is invalid, and each word in said validity store corresponding to a sequence of several words in said data store based on the individual bits of said validity store word;

a plurality of auxiliary stores organized in an increasing order of significance defined as commencing with a first auxiliary store which is of lowest significance and of largest storage capacity, and ending with a smallest auxiliary store which is of highest significance;

said first auxiliary store having a number of bit locations at least equal to the number of word locations in said validity store, said first auxiliary store bit locations being organized as a plurality of first auxiliary store word locations for storing multiple-bit words, each of said number of first auxiliary store bit locations corresponding to a respective separate word in said validity store and capable of being set to a particular state to indicate invalidity of a sequence of words in said data store in turn corresponding to the corresponding separate word in said validity store, and each word in said first auxiliary store thus corresponding to a sequence of words in said data store based on the individual bits of each of the validity store words respectively corresponding to the bits of said first auxiliary store word;

each successively more significant auxiliary store having a lesser number of bit locations, the bit locations of each of the auxiliary stores of lesser significance than the smallest auxiliary store being organized as a plurality of word locations for storing multiple-bit words, and each auxiliary store bit location corresponding to a separate word in the next less significant auxiliary store and capable of being set to a particular state to indicate invalidity of a sequence of words in said data store corresponding to the corresponding word in each successively less significant auxiliary store of said plurality of auxiliary stores;

said validity store and each of said auxiliary stores having a respective address input connected to a number of the most significant address bits input to said data store sufficient to address a single bit in said validity store and each of said auxiliary stores; and

said validity store and each of said auxiliary stores having a validity data output applied as a control input to said gate such that if any bit addressed in said validity store or in said auxiliary stores indicates invalid data then data output from said data store is blocked;

whereby areas of said data store between selected limits can be declared invalid by setting bits in selected ones of said validity store and said auxiliary stores to the particular state.

4,638,455

FUNCTION DIAGNOSING SYSTEM

Etuo Yamazaki, Hachioji, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

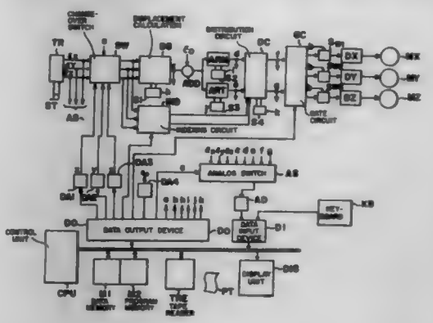
PCT No. PCT/JP83/00253, § 371 Date Apr. 4, 1984, § 102(e) Date Apr. 4, 1984, PCT Pub. No. WO84/00626, PCT Pub. Date Feb. 16, 1984
PCT Filed Aug. 4, 1983, Ser. No. 599,617
Claims priority, application Japan, Aug. 5, 1982, 57-136627
Int. Cl.[4] G06F *11/22*
U.S. Cl. 364—900 2 Claims

1. An automatic regulation system for a machine controller that includes an input, an output and regulatable and testable functional units and produces output signals for controlling a machine, said system comprising:

control means, operatively connected to the machine controller and responsive to a prestored diagnostic instruction, for causing each functional unit of said machine controller to produce diagnostic output signals and producing regulation control signals for each functional unit for correcting the diagostic output signals; and

regulating means, operatively connected to said control means and the machine controller, for regulating and fixing the levels of the diagnostic output signals in dependence upon the regulation control signals to correct the diagnostic output signals, so that the machine controller produces the output signals at predetermined levels, and said control means comprising:

a control computer, operatively connected to the machine controller, for controlling the machine controller in dependence upon a command program having a diagnostic instruction, said control computer generating diagnostic input signals and input/output control signals and when the diagnostic instruction is executed, said control computer generating regulation control signals for the regulating means in dependence upon the diagnostic output signals to adjust the diagnostic output signals to predetermined levels, thereby adjusting the levels of the machine controller output control signals;



an input switch, operatively connected to said control computer, the machine and the input of the machine controller, for disconnecting the input to the machine controller from the machine and connecting the diagnostic input signals to the machine controller in dependence upon the input control signal;

an output switch, operatively connected to said control computer, the machine and the output of the machine controller, for disconnecting the output of the machine controller to the machine in dependence upon the output control signal; and

an analog switch, operatively connected to the machine controller and said control computer, for connecting the diagnostic output signals to said control computer.

4,638,456

SPOT QUANTITATION

John G. Elias, Wilmington, and Allen P. Jansson, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 27, 1984, Ser. No. 574,712
Int. Cl.[4] G06F *15/20;* G06K *9/00*
U.S. Cl. 364—518 18 Claims

1. A method of quantitating spatially integrated intensities of individual spots contained in a multiple spot image defined by a discrete pixel-by-pixel representation of the intensities, which establishes a first sense, of the spots comprising the steps of:

(a) searching the image for the pixel representing the greatest intensity deviation in the first sense from a reference intensity level,

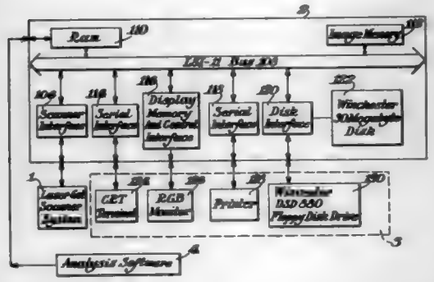
(b) constructing a mathematical three dimensional model of the spot containing such pixel, one of the dimensions being related to spot intensity,

(c) compensating the image by subtracting the mathematical model therefrom leaving possible overcompensated regions in the image which; regions together constitute a reduction volume,

(d) adjusting the dimensions of the model by the amount

necessary to give the model the same volume as the volume removed from the image in step (c) less the reduction volume,

(e) restoring all such overcompensated regions to the reference intensity level,



(f) quantitating the spot from the adjusted model by determining the volume of the adjusted model by multiplying the model's dimensions together and

(g) repeating steps (a) through (f) for successive pixels each having a lower intensity deviation from the reference level until the image is of substantially constant intensity.

4,638,457

METHOD AND APPARATUS FOR THE NON-VOLATILE STORAGE OF THE COUNT OF AN ELECTRONIC COUNTING CIRCUIT

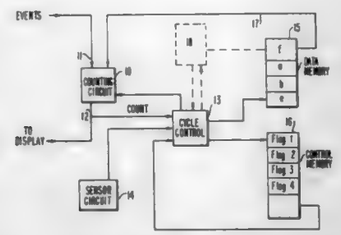
Hartmut Schrenk, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 383,196

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1981, 3123444

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—189 **14 Claims**



1. Method for non-volatile storage of successive old and new counts in an electronic counting circuit in which said counts are stored by electronically reprogramming a non-volatile data memory in a reprogramming operation, which comprises: writing the respective new count data into first storage cells of said data memory prior to erasure of old count data in second storage cells of said first data memory, and during said reprogramming operation writing into storage cells of a non-volatile control memory control information which is indicating the actual state of said reprogramming operation and from which in case of interruption of said programming operation, the completion of said reprogramming operation is derived by logical arithmetic processing of said control information.

4,638,458

SEMICONDUCTOR MEMORY ADDRESS LINES WITH VARIED INTERVAL CONTACT HOLES

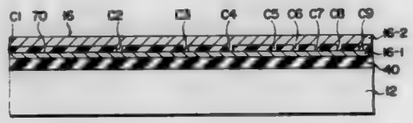
Yasuo Itoh, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 25, 1985, Ser. No. 715,360

Claims priority, application Japan, Mar. 30, 1984, 59-62730

Int. Cl.⁴ G11C *5/10*

U.S. Cl. 365—51 **5 Claims**



1. A semiconductor memory device comprising:

(a) a semiconductor substrate;

(b) a plurality of memory cells, which are formed on said semiconductor substrate, each having a memory cell transistor and a memory cell capacitor which is charged so as to reflect the logic state of its memory cell; and

(c) address lines which extend in row and column directions on said semiconductor substrate and select a particular memory cell for reading/writing data from/in the desired memory cell, said address lines including double layered address lines each of which comprises,

(i) first and second conductive lines of linear shapes each of which has a first end portion for receiving a voltage signal for selecting the particular memory cell and a second end portion at an opposite side of said first end portion, which are stacked, and which extend in one of the row and column directions, and

(ii) a linear insulative layer which extends along an extending direction of said first and second conductive lines, is sandwiched between said first and second conductive lines, has contact holes formed along the extending direction of said first and second conductive lines, and allows electrical connection between said first and second conductive lines through the contact holes, an interval of two neighbouring contact holes at the second end portion of each of said first and second conductive lines being set to be smaller than that of two neighbouring contact holes at the first end portion of each of said first and second conductive lines, thereby decreasing the maximum delay time in signal transfer at the second end portion of each of said double layered address lines, and the interval between two neighbouring contact holes at the first end portion of each of said first and second conductive lines is increased, thereby avoiding an increase in the total number of contact holes.

4,638,459

VIRTUAL GROUND READ ONLY MEMORY

Henry W. Pechar, Jr., Commack, and James D. Sproch, Rocky Point, both of N.Y., assignors to Standard Microsystems Corp., Hauppauge, N.Y.

Filed Jan. 31, 1985, Ser. No. 696,591

Int. Cl.⁴ G11C *17/00*

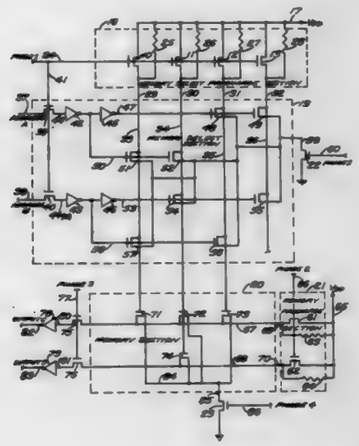
U.S. Cl. 365—104 **10 Claims**

1. A read only memory comprising:

(a) a memory select section including input means and a plurality of memory select lines;

(b) virtual grounding means connected to a reference node for switched coupling said reference node in response to a first lock signal to a reference potential;

(c) switching means connected to said memory select lines for selectively coupling said memory select lines to said reference node in respose to a second clock signal applied to said input means, said virtual grounding means providing said reference node with said reference potential in one switching state thereof; and



(d) a memory section connected to said memory select section, said memory section being responsive to the electrical state of said memory select lines so as to produce an output determined thereby.

4,638,460

SEMICONDUCTOR MEMORY DEVICE

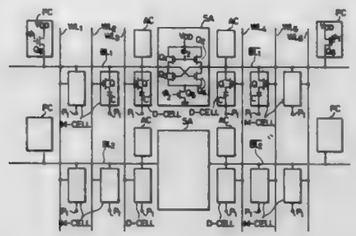
Tetsuro Matsumoto, Tachikawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 530,079

Claims priority, application Japan, Sep. 22, 1982, 57-163888

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—149 **6 Claims**



1. A semiconductor memory device comprising:

a memory cell which includes a series connection comprised of a switching MISFET and a storage capacitor connected in series, said storage capacitor being comprised of a semiconductor region of a semiconductor substrate, a silicon nitride film formed over a surface of said semiconductor region, and a conductive layer formed over said silicon nitride film;

a bit line which is connected to one end of said series connection and which supplies a signal voltage having a predetermined maximum value to said memory cell; and

a terminal which is connected to the other end of said series connection and which supplies a voltage to said other end of said series connection so that a voltage of said storage capacitor to be stored between said semicoductor region and said conductive layer has a smaller absolute value than an absolute value of said maximum value of said signal voltage supplied to said bit line.

4,638,461

SEMICONDUCTOR MEMORY DEVICE

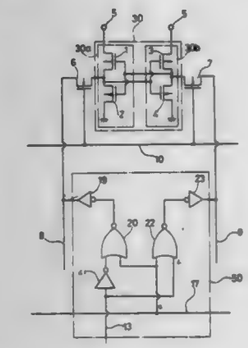
Ryo Yonezu, and Kazuhiro Sakashita, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1984, Ser. No. 638,678

Claims priority, application Japan, Aug. 17, 1983, 58-151263

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—189 **4 Claims**



3. A semiconductor device with the ability to write data into storage and read data out of storage, comprising:

memory cell, said memory cell having a plurality of input-/output lines, each of said input/output lines for inputting data into and outputting data from said memory cell;

a plurality of data bit lines for transmitting data to and from said memory cell, said plurality of data bit lines corresponding to said input/output lines in a one-to-one manner;

a plurality of transfer control means, one of said transfer control means connected between each of said data bit lines and said input/output lines, for controlling a flow of data between said bit lines and said input/output lines; and

writing circuit means, connected to each of said data bit lines and responsive to a write-in signal, for writing data onto selected ones of said bit lines from an external source when said write-in signal is indicative of a writing operation and charging all of said bit lines and placing the bit lines in a reading mode when said write-in signal is indicative of no writing operation.

4,638,462

SELF-TIMED PRECHARGE CIRCUIT

Thekkemadathil V. Rajeevakumar, Scarsdale, and Lewis M. Terman, South Salem, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1985, Ser. No. 696,624

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—203 **5 Claims**

1. A circuit for generating a precharge clock output signal in response to a memory array wordline signal resetting from a high to a low signal state comprising

a first reset signal and a second reset signal which is the complement of said first reset signal,

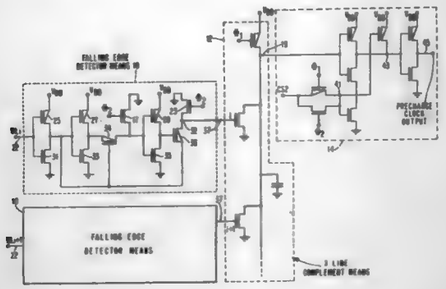
a plurality of identical falling edge detector means, each of said falling edge detector means connected to a separate memory array wordline, each of said falling edge detector means responsive to a signal change on an associated wordline from a high to a low signal state for producing an output signal which changes from a low to a high signal state in response to said wordline high to low signal change,

each of said falling edge detector means including first and second switching devices connected respectively between first and second nodes and a voltage supply equal to a low

signal state level, said first and second switching devices being turned off by said second reset signal, placing said first node at a high signal state and said second node at a low signal state when said wordline signal to said falling edge detector changes from said low to said high signal state, and

further including a falling edge detector output lead connected to said second node and wherein said signal thereon is said falling edge detector output signal,

an X-line complement inverter means connected to the outputs of all of said plurality of falling edge detector



means for producing an output signal which changes from a high signal state to a low signal state in response to a low to high output signal change from any of said plurality of falling edge detector means, and

a precharge generator means connected to the output of said X-line complement means for producing a precharge clock output signal only in response to said high to low signal state change from said X-line complement means, said precharge clock output signal, therefore, also being produced only in response to said high to low signal state change on a wordline.

4,638,463

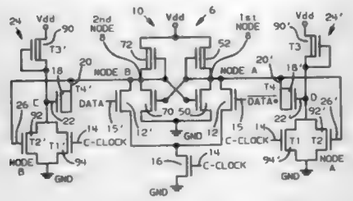
FAST WRITING CIRCUIT FOR A SOFT ERROR PROTECTED STORAGE CELL

Leonard R. Rockett, Jr., Washington, D.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 24, 1985, Ser. No. 694,590

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—205 **4 Claims**



1. A fast writing circuit for a soft error protected storage cell, the protected storage cell having a first node and a second node which are respectively connected to a charging source, said storage cell being connected to a first binary state input device which is enabled by a write-enable input, said first node being selectively charged during a write interval when said write-enable input is on, to represent a stored, first binary logic state for said storage cell, the soft error protection circuit including an insulated gate, field effect capacitor having a diffusion electrode connected to said second node and having a gate electrode, for selectively loading said second mode with an additional capacitance when its gate is biased with respect to said diffusion electrode, said soft error protection circuit further including an inverter circuit having an input connected to said second node and an output for applying a capacitance enhancing bias to said gate electrode of said capacitor, for capacitively loading said second node, wherein the improvement comprises:

an insulated gate field effect transistor disabling device having its source connected to a reference potential, its drain connected to said gate of said capacitor and its gate connected to said write-enable input, for removing said bias on said gate of said capacitor in response to said write-enable input, thereby minimizing the capacitive load on said second node during said write interval;

whereby said soft error protected storage cell can be written into at a faster rate than has been previously possible.

4,638,464

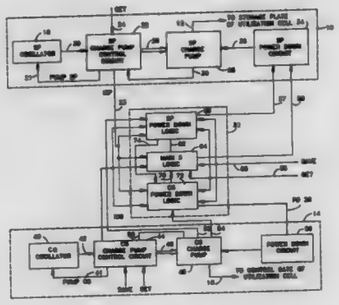
CHARGE PUMP SYSTEM FOR NON-VOLATILE RAM

Hayden C. Cranford, Jr., Apex, and Stacy J. Garvin, Durham, both of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,450

Int. Cl.⁴ G11C *11/24*

U.S. Cl. 365—226 **7 Claims**



1. An on-chip voltage generating system for providing a plurality of different voltages to drive an integrated circuit (IC) chip comprising:

a first charge pump means having an output for supplying a plurality of different voltages;

a second charge pump means having an output for supplying a plurality of different voltages;

a first control means coupled to the first charge pump;

a second control means coupled to the second charge pump;

each of said first and second control means being responsive to an externally generated mode control signal and operable for sensing the voltage level at the output of its respective charge pump and for generating a first set of control signals for controlling said charge pump and a second set of control signals;

a first power down control means; and

a second power down control means, each of said power down control means being responsive to the second set of control signals and operable to adjust the voltage level at the output of its respective charge pump.

4,638,465

INTEGRATED STRUCTURE MICROCOMPUTER PROVIDED WITH NON-VOLATILE RAM MEMORY

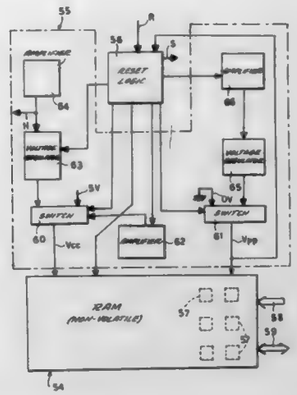
Paolo Rosini, Monza; Roberto Finaurini, Ancona, and Maurizio Galbotti, Barlassina, all of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Catania, Italy

Filed Jan. 31, 1984, Ser. No. 575,686

Claims priority, application Italy, Aug. 4, 1983, 22415 A/83

Int. Cl.⁴ G11C *00/00*

U.S. Cl. 365—228 **7 Claims**



1. An integrated structure microcomputer, comprising:

a non-volatile RAM memory; and

voltage control circuitry joined to said memory, said circuitry being responsive to voltage changes on a supply line associated with said circuitry to alter a supply voltage applied by the circuitry to said memory, the memory including a matrix of non-volatile RAM cells responsive to changes in voltage supplied by the circuitry whereby data is stored in the cells, each of said cells comprising a bistable circuit with two interconnected branches, alternatively conducting and non-conducting, one of which includes a non-volatile memory element which can be electrically programmed in one or the other of two electric states as a function of the state in which said bistable circuit is at the moment of turn-off of power on said supply line and which also is able to cause the restoration of said state of the bistable circuit at the moment of power turn-on, each branch of said bistable circuit also including a control switch element controlled by the level of said power and by the state of the other branch of the bistable circuit whereby power turn-off allows the non-conducting branch of the bistable circuit to cause interdiction of the conducting branch of the same bistable circuit for consequent programming of said non-volatile memory element without current absorption.

4,638,466

PROGRAMMABLE SEMICONDUCTOR MEMORY DEVICE HAVING SEPARATE READ WORD LINE DRIVERS AND WRITE-ONLY WORD LINE DRIVERS

Toshio Fukumoto, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 31, 1984, Ser. No. 687,353

Claims priority, application Japan, Dec. 29, 1983, 58-247702

Int. Cl.⁴ G11C *8/00*

U.S. Cl. 365—230 **6 Claims**

1. A programmable semiconductor memory device comprising:

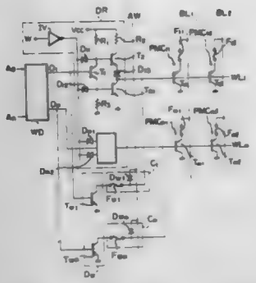
a plurality of word lines;

a plurality of bit lines intersecting said word lines;

programmable memory cells arranged on respective intersecting portions between said word lines and said bit lines;

a word line address decoder for selecting one of said word lines in response to an input address signal;

a read word line driver for absorbing a current from the selected word line during a read operation of said programmable memory cells, based on the output signal from said word line address decoder;



a write-only word line driver having a plurality of write-driving output transistors, each for absorbing a current from the selected word line during a write operation of said programmable memory cell, based on the output signal from said word line address decoder; and

a cutting means for cutting, after completion of write operation, the connection between said write-driving output transistors and said word lines.

4,638,467

AZIMUTH ADAPTIVE PHASED ARRAY SONAR

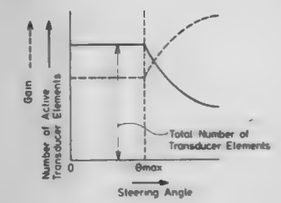
Yasuhito Takenchi, Tokyo, Japan, assignor to Yokogawa Medical Systems, Limited, Tokyo, Japan

Filed Jun. 4, 1984, Ser. No. 617,083

Claims priority, application Japan, Aug. 31, 1983, 58-160105

Int. Cl.⁴ G01N *29/00*

U.S. Cl. 367—105 **2 Claims**



1. An azimuth adaptive phased array sonar comprising

a probe comprising an array of a plurality of transducer elements, said array having two ends;

a transmission and reception device for scanning in a sectorial pattern an ultrasonic beam transmitted and received by said probe in a phased array manner, wherein said transmission and reception device comprises

a receiver circuit comprising a delay line having a plurality of taps along the length thereof,

an amplifier circuit for receiving an output signal from said delay line, and

a cross point switch comprising a plurality of columns, a plurality of lines, and a plurality of switching elements arranged in a matrix at the intersections of said columns and said lines, said columns being connected to respective ones of said plurality of taps of said delay line, and said lines being connected to respective ones of said plurality of transducer elements; and

control means for selectively opening and closing said plurality of switching elements of said cross point switch;

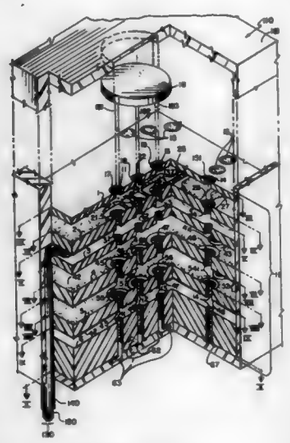
wherein said control means comprises means for directing said ultrasonic beam beyond the limit of azimuth angle of said ultrasonic beam such that signals generated from transducer elements remaining operative after an equal number of transducer elements from each end of said array are rendered inoperative, are switched through selected ones of said switching elements of said cross point switch and supplied over the entire length of said delay line.

4,638,468

POLYMER HYDROPHONE ARRAY WITH MULTILAYER PRINTED CIRCUIT WIRING

Samuel A. Francis, Marion, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 3, 1984, Ser. No. 637,664
Int. Cl.⁴ H04R *1/00*
U.S. Cl. 367—153 **8 Claims**



1. A hydrophone array comprising:

a layer of piezoelectric polymer having a plurality of discrete first areas of electrically conductive film attached to one side of said layer and a second area of conductive film opposite said plurality of areas on the other side of said layer, each discrete area forming a hydrophone;

said plurality of discrete areas being arranged in a row;

a plurality of printed wiring layers in contact with each other and at least one side of said polymer layer;

one of said printed wiring layers having a plurality of parallel first output conductors parallel to said row and electrically isolated from each other;

a different one of said plurality of printed wiring layers having a plurality of second conductors, one under each area, transverse to said row;

a plurality of amplifying means, each having an input and an output;

a plurality of plated-through holes;

said holes making a plurality of selective electrical connections of one of said first area conductive films to the input of its associated said amplifier means, a plurality of selective electrical connections of one of said parallel first conductors to one of said plurality of second conductors connected to the output of said amplifying means, and selective electrical connections of said second area conductive film to a different one of said parallel first conductors;

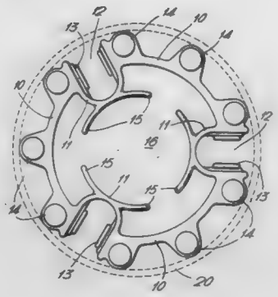
whereby said plated-through holes provide electrical connection between each of said hydrophones of the array and a respective one of said parallel first output conductors.

4,638,469

MECHANICAL SPACER FOR TOWED ACOUSTIC ARRAY

Michael J. Bryant; Frank R. Attenborough, both of Kent; Christopher G. Sykes, Medstead, and Neil W. Cameron, London, all of England, assignors to Britoil Public Limited Company, Glasgow, Scotland

Filed May 18, 1984, Ser. No. 611,976
Claims priority, application United Kingdom, May 18, 1983, 8313796
Int. Cl.⁴ G01V *1/38*; H02G *7/12*
U.S. Cl. 367—154 **3 Claims**



1. A mechanical spacer for a towed acoustic array comprising a number of angularly spaced arcuate single strip sections joined together by intervening portions forming radially outwardly facing U-shaped recesses between the ends of adjacent strip sections, the parallel inner walls of each U-shaped recess being shaped to accept fastening means whereby a rope or like strain member can be secured in the base of the U-shaped recess, the arcuate strip sections each being provided with one or more radially outwardly resilient protrusions, each protrusion being in the shape of a hollow tube-like structure having a thin resilient wall section at its point furthermost from the center of the spacer.

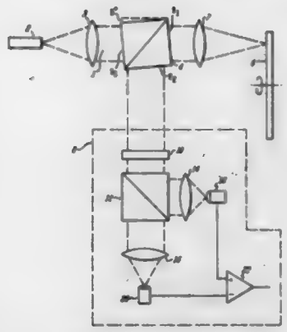
4,638,470

APPARATUS USING BEAM SPLITTER CUBE WITH SPECIFIC CHARACTERISTICS FOR READING INFORMATION RECORDED IN A MAGNETO-OPTIC MEDIUM

G. A. Neville Connell, Cupertino, and Jimmy D. Godwin, San Jose, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 9, 1984, Ser. No. 608,581
Int. Cl.⁴ G11B *11/00*
U.S. Cl. 369—13 **1 Claim**

1. A system for providing a read signal from a magneto-optic storage medium having information encoded as directional magnetized domains, said system including first means for directing a focused, polarized light beam of a given wavelength λ_1 onto regions of the storage medium to provide an information beam having both s and p components due to the polar Kerr effect on the medium, and said system further including second means for measuring the phase direction of said s component of said information beam by referencing it to the phase direction of said p component of said information beam, said second means including a beam splitter cube, said beam splitter cube having the design characteristic of very high transmission of the p component of light of wavelength λ_2 and very high reflectance of the s component of light of wavelength λ_2, said wavelength λ_2 being different than said wavelength λ_1, said beam splitter cube being oriented such that said information beam of wavelength λ_1 strikes one of its faces at normal incidence, due to said beam splitter cube being of design wavelength λ_2 said beam splitter cube operates in a leaky mode when the information beam of wavelength λ_1 is incident thereon whereby said beam splitter cube directs a small portion of the p component of the information beam and a large portion of the s component of the information beam along a common path for utilization by other components of said second means.

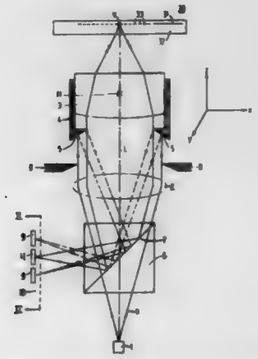


4,638,471

OPTICAL SCANNING UNIT COMPRISING A TRANSLATIONAL-POSITION AND ANGULAR-POSITION DETECTION SYSTEM FOR AN ELECTRO-MAGNETICALLY SUSPENDED OBJECTIVE

Gerard E. van Rosmalen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1985, Ser. No. 769,102
Claims priority, application Netherlands, Jun. 10, 1985, 8501665
Int. Cl.⁴ G11B *7/00, 21/10*
U.S. Cl. 369—46 **10 Claims**



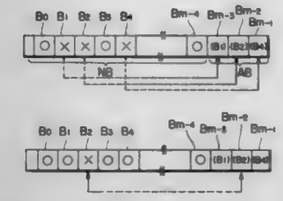
1. An optical scanning unit comprising a radiation source, an objective lens for focussing a radiation beam produced by the radiation source to form a scanning spot on a surface to be scanned, a translational-position and angular-position detection system for detecting the translational positions of the objective lens along and the angular positions of said lens about two orthogonal axes which both extend perpendicularly to the chief ray of the radiation beam, and an actuating device for translating and tilting the objective lens in response to control signals supplied by the translational-position and angularposition detection system, characterized in that the translation-position and angular-position detection system comprises a conical-ring mirror which is centred and fixed relative to the objective lens and a radiation-sensitive detection system which is arranged in the path of the radiation reflected from the mirror and which comprises two detectors which are spaced by an annular strip and are each divided into four quadrants.

4,638,472

INFORMATION RECORDING SYSTEM AND METHOD FOR USING ALTERNATIVE RECORD AREA IN WRITING AND READING OF DATA ON OPTICAL DISK

Mikito Ogata; Masahito Mori, both of Odawara; Takashi Doi, Hadano; Michio Miyazaki, and Takafumi Oka, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 9, 1984, Ser. No. 587,961
Claims priority, application Japan, Mar. 11, 1983, 58-39213
Int. Cl.⁴ G11B *20/12, 20/18*
U.S. Cl. 369—54 **8 Claims**



1. An information recording method for reading information after said information has been written onto a record medium, and if a record error area which does not meet a predetermined criterion is detected, rewriting alternative information for the information of said record error area into a different area on said record medium, characterized by

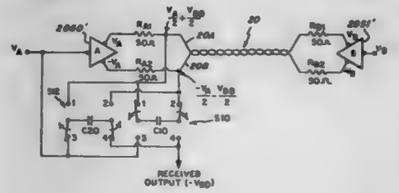
rewriting the information into said different area while the information of said record error area is kept valid.

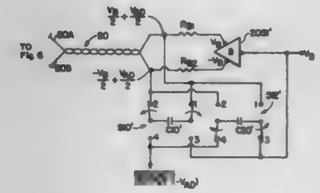
4,638,473

TWO WIRE BIDIRECTIONAL DIGITAL TRANSMISSION SYSTEM

Michael Cooperman, Framingham, and Richard W. Sieber, Attleboro, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 28, 1984, Ser. No. 687,372
Int. Cl.⁴ H04B *1/56*
U.S. Cl. 370—27 **5 Claims**





5. A twisted pair two wire bidirectional transmission system

for transmitting electrical signals simultaneously in opposite directions between first and second terminals connected at opposite ends to said twisted pair of two wires comprising:

a. a transmitter at the first terminal for generating a voltage signal VA onto a first one of said wires and the negative of said VA signal onto the second of said wires;

b. a transmitter at the second terminal for generating a voltage signal VB onto a first one of said wires and the negative of said VB signal onto the second of said wires;

c. capacitor means at said first terminal periodically coupled across said wires at the first terminal end and in series with said voltage signal VA to produce a delayed and attenuated version of the VB signal at the first terminal; and

d. capacitor means at said second terminal periodically coupled across said wires at the second terminal end and in series with said voltage signal VB to produce a delayed and attenuated version of the VA signal at the second terminal.

4,638,474

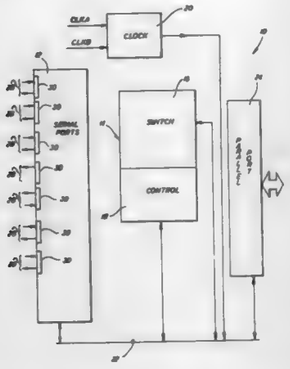
COMMUNICATION SYSTEM

Alain R. G. Chalet, Overijse, Belgium, assignor to ITT Corporation, New York, N.Y.

Filed Dec. 14, 1984, Ser. No. 682,038

Int. Cl.[4] H04Q *11/04*; H04J *3/24*

U.S. Cl. 370—60 **6 Claims**



1. An apparatus for establishing communications paths comprising:

a digital switching network having at least one terminal element interconnected therewith for providing access thereto;

means for interfacing a plurality of subscribers with said switching network, said interfacing means including a first apparatus for establishing communication paths and a second apparatus for establishing communication paths, said first apparatus being adapted to interface said plurality of subscribers to said switching network via said terminal element and said second apparatus being adapted to interface said same plurality of subscribers directly to said switching network.

4,638,475

ROUTER UNIT AND ROUTING NETWORK FOR DETERMINING AN OUTPUT PORT BY DETECTING A PART OF AN INPUT PACKET

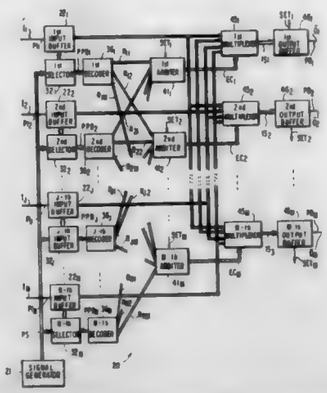
Nobuhiko Koike, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 21, 1983, Ser. No. 506,264

Claims priority, application Japan, Jun. 21, 1982, 57-106453; Jun. 21, 1982, 57-106454

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—60 **6 Claims**



1. A router unit for use in a routing network to respond to a plurality of input packets supplied through a plurality of input ports, respectively, and to distribute said input packets to at least one of a plurality of output ports as output packets, each of said input packets including destination bit series representative of a destination and being divisible into a plurality of partial bit series placed at bit series positions, respectively, said router unit comprising:

first means for producing a position signal indicative of a predetermined one of said bit series positions that is preassigned to said router unit as a function of the position of said router unit in said routing network;

a plurality of second means coupled to respective input ports and said first means for selecting predetermined ones of the bit positions from the respective input packets in response to said position signal to derive predetermined ones of said partial bit series corresponding to said predetermined bit positions from said destination bit series; and

third means coupled to the respective second means and the respective output ports and responsive to the respective input packets for selecting said at least one output port with reference to said predetermiend ones of the partial bit series selected by said second means so as to deliver each of said input packets as said output packets to said at least one output port selected by said third means.

4,638,476

TECHNIQUE FOR DYNAMIC RESOURCE ALLOCATION IN A COMMUNICATION SYSTEM

Anthony Acampora, Freehold, and Michael J. Gans, Monmouth Beach, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 21, 1985, Ser. No. 747,430

Int. Cl.[4] H04J *3/16*

U.S. Cl. 370—83 **10 Claims**

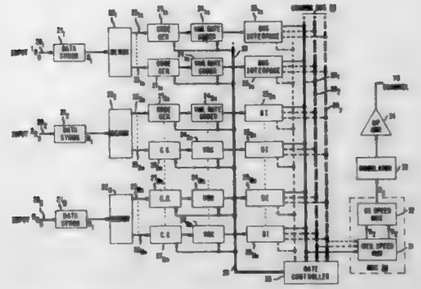
1. A transmitter for a communication system comprising:

a plurality of coding means, each encoding means being disposed to receive a separate input signal and for encoding the input signal into an encoded output signal using a predetermined one of a plurality of codes with different

redundancies at any instant of time in response to a separate control signal;

a common bus comprising one or more buses;

a plurality of bus interface (BI) units, each BI unit being disposed to receive the encoded output signal from a separate one of the plurality of encoding means and for assembling the received encoded signal into packers of information for insertion in a next free time alot on a bus of the common bus associated with the BI unit; and



control means responsive to data propagating within the transmitter for generating control signals to predetermined ones of the plurality of encoding means for changing the codes used and the data rate of the encoded output signal to maintain the data propagating on each bus at a predetermined maximum threshold level while providing a predetermined amount of margin for overcoming fading or interference at a remote receiver.

4,638,477

PACKET EXCHANGE DATA TRANSMISSION SYSTEM

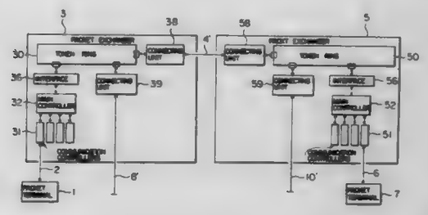
Jun Okada; Koichi Kunimasa, both of Hadano, and Hiroshi Nakase, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,593

Claims priority, application Japan, Dec. 26, 1983, 58-243685

Int. Cl.[4] H04J *3/26*

U.S. Cl. 370—94 **2 Claims**



1. A packet exchange data transmission system having at least two packet exchangers, each of said packet exchangers having a packet terminal and an external transmission line connected thereto, sending a data packet supplied from said packet terminal to said external transmission line through an internal transmission line, supplying the data packet sent from said external transmission line to said packet terminal through said internal transmission line and being connected to another packet exchanger through said external transmission line, said packet exchangers each comprising:

first means for checking a validity of the data packet sent from said packet terminal and sending the data packet to said internal transmission path, and reading in the data packet on said internal transmission line, checking a validity of the data packet and sending the data packet to said packet terminal, and

second means including a memory for storing the data packet on said internal transmission line into said memory, reading out the data packet from said memory and sending the data packet to said external transmission line, and storing the data packet transmitted from said external transmission line in said memory, reading the data packet from said memory and sending the data packet to said internal transmission line,

wherein said internal transmission line is a token ring constructed to send a transmission right token to each of said first and second means for acquiring a transmission right, said first means sends the data packet sent from said packet terminal to said token ring, receiving the data packet from said token ring and sending the data packet to said packet terminal, and said second means stores the data packet of said token ring into said memory, reads out the data packet from said memory and sends the data packet to said external transmission line, stores the data packet sent from said external transmission line into said memory, reads out the data packet from said memory and sends the data packet to said token ring.

4,638,478

FRAME SYNCHRONIZING SYSTEM IN A RECEIVER IN A TIME-DIVISION MULTIPLEX TRANSMISSION SYSTEM

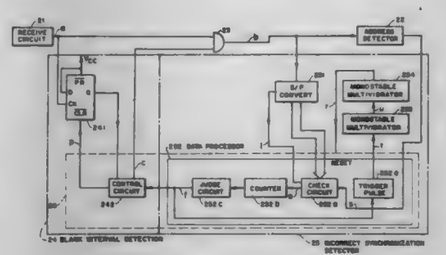
Michinori Hatabe, Kawasaki, Japan, assignor to Nitsuko Limited, Kawasaki, Japan

Filed Jun. 21, 1985, Ser. No. 747,722

Claims priority, application Japan, Jun. 21, 1984, 59-126327

Int. Cl.[4] H04J *3/26*

U.S. Cl. 370—94 **11 Claims**



1. In a frame synchronizing system is a receiver receiving a time-division multiplex signal having a plurality of channels corresponding to a plurality of receivers, each channel signal comprising a start signal part correspoding to a start bit, an address signal part representing an address assigned to a corresponding receiver, an error detecting code signal part, an information signal part representing information to be transmitted to a corresponding receiver, and a blank interval, said frame synchronizating system comprising an address detecting means detecting the address signal part of the channel signal correspon to the receiver in the multiplex signal to generate a channel detection signal, the improvement which comprises means detecting said blank interval in the time-division multiplex signal received at the receiver, said blank interval detecting means generating a blank interval detection signal at a time when said blank interval is detected, said blank interval detection signal being maintained after first detection of said blank interval, gate means for blocking transmission of the multiplex signal to said address detecting circuit but permitting the multiplex signal to be transmitted to said address detecting circuit in response to said blank interval detection signal from said blank interval detecting means, and incorrect synchronization detecting means for detecting incorrect synchronization due to production of said error detecting code signal after reception

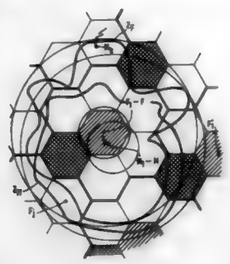
of said channel detection signal from said address detecting means, said incorrect synchronization detecting means generating an incorrect synchronization signal to reset said blank interval detecting means to an initial condition.

4,638,479

METHOD OF TWO-WAY RADIOCOMMUNICATION BETWEEN FIXED STATIONS AND MOBILE STATIONS

Roger P. J. Alexis, Neuilly sur Seine, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1984, Ser. No. 678,617
Claims priority, application France, Dec. 9, 1983, 83 19749
Int. Cl.[4] H04J *3/16*; H04Q *7/00*; H04B *1/00*
U.S. Cl. 370—95 15 Claims



1. A method for selecting channels for two-way radiocommunication between fixed stations and mobile stations using a set of communication channels wherein a first group of said channels forms a "down" path that is reserved for transmission from all the fixed stations and a second group of said channels forms an "up" path that is reserved for transmission from all the mobile stations, and at least one semaphore channel, each pair of communication channels formed by one of the communication channels of the "up" path and one of the communication channels of the "down" path being capable of handling two-way communication between any of the fixed stations and any of the mobile stations comprising the steps of: each fixed station detecting the channels in the "up" path occupied by communications from mobile stations for which the power level received from the said mobile stations exceeds a first predetermined threshold; each fixed station storing the addresses of the detected channels; each fixed station continuously transmitting via the semaphore channel assigned to said fixed station the addresses stored by the fixed station, and in which, in order to establish communication with a fixed station the further steps of: a mobile station detecting the channels in the "down" path occupied by communications from fixed stations for which the power level received from the said fixed stations exceeds a second predetermined threshold; said mobile station storing the addresses of the detected channels and selecting a pair of free communication channels whose addresses are different from the addresses of the busy channels detected by the said mobile station and from the addresses of busy channels transmitted via the semaphore channel allocated to the selected fixed station.

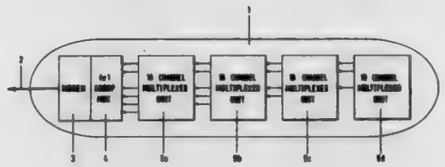
4,638,480

DISTRIBUTED DIGITAL SIGNAL MULTIPLEXING

Kenneth S. Darton, Bishops Stortford, England, assignor to Standard Telephones & Cables Public Limited Company, London, England

Filed Apr. 10, 1985, Ser. No. 721,770
Int. Cl.[4] H04J *3/04, 3/00*
U.S. Cl. 370—112 6 Claims

1. An arrangement for digital multiplexing onto a common highway a plurality of analogue input signals, the arrangement including a series of m time division multiplexing units, each multiplexing unit having for each of n separate analogue input signals a signal channel comprising an analogue-to-digital encoding means, a shift register in which said encoding means output may be temporarily stored, and means for periodically reading out the contents of the shift register to an outlet common to all the n channels, clock and timing means and synchronising means for controlling the encoding and said shift register, in each of the n channels whereby the digitally encoded signals in the n shift register are read out to said outlet in a predetermined multiplexed sequence, outlets from the m time division multiplexing units being fed to a common multiplexer where the m outlets of n channels each are multiplexed onto



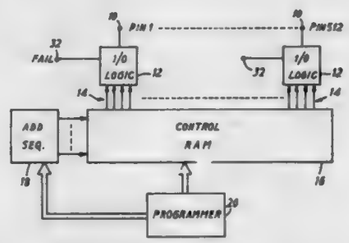
said common highway, the clock, said timing and synchronising means in the m time division multiplexing units being cascaded, the multiplexing unit furthest from the common multiplexer having clock and sync pulse generating means generating initial clock and synchronisiong pulses for the n channels, each subsequent multiplexing unit nearer the common multiplexer and the common multiplexer itself having means for regenerating clock and sync pulses received from the preceding multiplexing unit and means for deriving from the regenerated pulses the local clock and sync pulses required in the multiplexing unit or common multiplexer.

4,638,481

METHOD AND APPARATUS FOR GENERATING SEQUENCE OF MULTIBIT WORDS

Michael P. Crane, and David J. Marsh, both of Poole, England, assignors to Membrain Limited, Wimborne, England

Filed Oct. 26, 1984, Ser. No. 665,240
Claims priority, application United Kingdom, Oct. 28, 1983, 8328880
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—27 9 Claims



1. A machine method of generating a sequence of m-bit multibit words selected from a set N of the words, wherein m is an integer, N is a substantially larger integer not exceeding 2^m and the words are formed in succession in a plurality m of bistable devices, the method comprising the steps of:

(a) storing a set n of change words each of which consists of a corresponding selection of change commands, where n is a plural integer substantially smaller than n,

(b) addressing a sequence of the stored change words where said sequence is larger than n and at least some of said change words appear repeatedly in said sequence, and

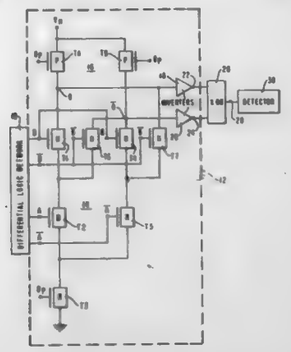
(c) applying each addressed change word to effect changes of state of selected ones of the bistable devices in accordance with the change commands included in such change word.

4,638,482

RANDOM LOGIC ERROR DETECTING SYSTEM FOR DIFFERENTIAL LOGIC NETWORKS

William R. Griffin, Shelburne, Vt.; Lawrence G. Heller, Boca Raton, Fla., and Peter N. Horowitz, Essex Junction, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,880
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—63 12 Claims



1. A system comprising

a differential logic network having a plurality of complementary pairs of output terminals,

a differential exclusive OR circuit having inputs for receiving signals from the output terminals of said logic network and first and second output terminals,

a second exclusive OR circuit having first and second input terminals coupled to the first and second output terminals of said differential exclusive OR circuit and having a single output terminal with first and second output states, and

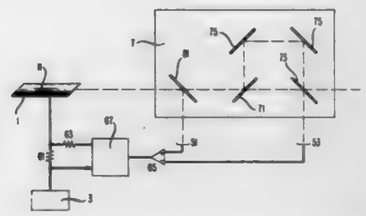
means connected to said single output terminal for detecting said output states.

4,638,483

HIGH SPEED INTENSITY MODULATED LIGHT SOURCE

John E. Bowers, East Brunswick, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 30, 1984, Ser. No. 635,754
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—26 9 Claims



1. A direct intensity modulated light source comprising a single frequency laser;

means for frequency modulating said laser to yield a frequency modulated output beam; and

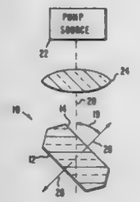
means for delaying a first portion of said output beam with respect to a second portion of said output beam and recombining said portions to produce intensity modulation.

4,638,484

SOLID STATE LASER EMPLOYING DIAMOND HAVING COLOR CENTERS AS A LASER ACTIVE MATERIAL

Stephen C. Rand, Agoura, and Larry G. DeShazer, Palos Verdes Estates, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 20, 1984, Ser. No. 673,304
Int. Cl.[4] H01S *3/16*
U.S. Cl. 372—42 20 Claims



1. A laser comprising:

resonant cavity means for supporting coherent radiation;

a diamond containing color centers as a laser active material;

means for exciting the color centers to emit coherent radiation; and

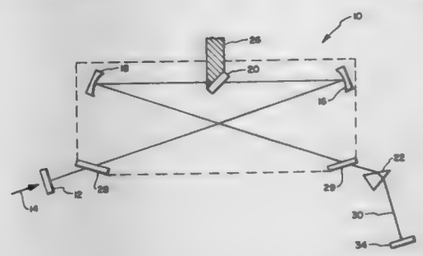
optical path means for providing an exit path for the radiation from the resonant cavity means.

4,638,485

SOLID STATE VIBRATIONAL LASERS USING F-CENTER/MOLECULAR-DEFECT PAIRS IN ALKALI HALIDES

Werner Gellermann; Yihong Yang, and Fritz Luty, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Continuation-in-part of Ser. No. 591,465, Mar. 20, 1984. This application Oct. 3, 1985, Ser. No. 783,978
Int. Cl.[4] H01S *3/16*
U.S. Cl. 372—42 9 Claims



1. A laser having a laser action in the infrared wavelength region comprising:

an alkali halide crystal having dilute diatomic molecular defects;

F-center defects in said alkali halide crystal associated with said molecular defects;

cooling means for cooling said crystal below about 77K;

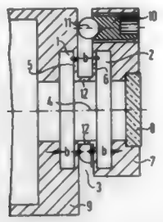
optical pumping means for pumping the F-center/molecular defect pairs in the visible wavelength range.

4,638,486

ADJUSTMENT DEVICE FOR A REFLECTOR MIRROR OF A LASER RESONATOR

Willibald Dost, and Hans Kreutzer, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 28, 1985, Ser. No. 717,106
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1984, 3423381
Int. Cl.[4] H01S *3/08*
U.S. Cl. 372—107 5 Claims



1. In a laser resonator of the type which includes a reflector mirror mounted in an adjustment head carrier and spaced from the carrier by an outer peripheral recess therebetween and in which the carrier and the adjustment head comprise a light passageway therethrough having an axis, and in which adjustment elements are carried by the adjustment head and engage the carrier, the improvement therein comprising:

first means defining a first radially extending circular recess about the light passage in the carrier and a first thin discoid wall separating said first recess from the outer peripheral recess; and

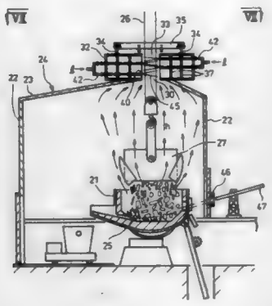
second means defining a second circular recess about the light passageway in the adjustment head and a second thin discoid wall separating said second recess from the outer peripheral recess.

4,638,487

SHROUD FOR ARC FURNACE

Fumio Tomizawa, Yokohama, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1985, Ser. No. 696,087
Claims priority, application Japan, Aug. 30, 1984, 59-131849[U]
Int. Cl.[4] F27D *23/00*
U.S. Cl. 373—9 3 Claims



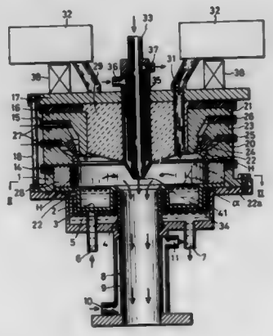
1. A shroud for a steel making arc furnace having dust-proof side walls and a duct-proof top wall, said walls surrounding an arc furnace main body, and also having doors for movement of a suspended scrap bucket into and out of said shroud, said top wall having an opening of a minimum width, sufficiently wide for a bucket suspension device to move transversely to a center of said arc furnace main body, a suction duct disposed at said top wall at said opening, said suction duct having a top, passage at said top of said suction duct and through which said bucket suspension device is movable laterally, and a plurality of suction ports opposed to each other horizontally across said opening, a plurality of injection pipes in said suction ports disposed such that injection pipes in one of the suction ports are staggered vertically in zig-zag manner with respect to injection pipes in the other suction port, said injection pipes having a plurality of nozzles for spraying fluid horizontally toward an opposed suction port, and a top door for selectively opening and closing said passage.

4,638,488

FINE GRAINS PRODUCING APPARATUS

Yasunobu Shimomoto, Nagoya, Japan, assignor to Daidotokushuko Kabushikikaisha, Nagoya, Japan

Filed Aug. 20, 1985, Ser. No. 767,245
Claims priority, application Japan, Jun. 20, 1985, 60-135075
Int. Cl.[4] H05H *1/00*
U.S. Cl. 373—22 4 Claims



1. A fine-grain-produced apparatus comprising a furnace, a toroidal melting pot provided in the lower portion of said furnace for containing a toroidal pile of raw material for fine grains, a ring plasma torch mounted over said pile of raw material for generating a plasma arc rotating azimuthally between said plasma torch and the surface of said pile of raw material, and a discharge port centrally provided around the major axis of said toroidal melting pot and communicating with the same for collecting fine grains produced from said pile of raw material together with neutral gas for plasma medium.

4,638,489

METHOD AND MEANS FOR USE IN THE INSTALLATION OF PLASMA GENERATORS IN SHAFT FURNACES

Jan Thörnblom, and Gunnar Astner, both of Hofors, Sweden, assignors to SKF Steel Engineering AB, Hofors, Sweden

Filed Mar. 28, 1985, Ser. No. 717,312
Claims priority, application Sweden, Oct. 19, 1984, 8405229
Int. Cl.[4] H05H *1/26*
U.S. Cl. 373—24 15 Claims

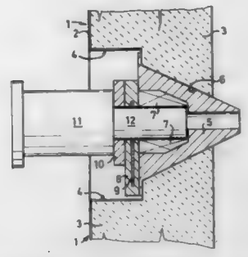
7. A plasma melting furnace arrangement comprising:

(A) a refractory lined furnace wall having an opening therein for receiving a plasma generator and, fixably mounted in said opening:

(1) a field coil arranged to cooperate with an electrode of said plasma generator to effect rotation of an electric arc and

(2) a sealing means arranged to effect a gas type seal with said plasma generator; and

(B) a plasma generator removably mounted in said opening of said refractory lined furnace wall and having electrodes for generating an electric arc therebetween, said plasma generator comprising a nose portion which is extendible



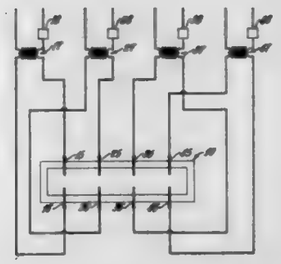
through said sealing means and into said field coil, one of said electrodes being provided in said nose portion.

4,638,490

MELTING FURNACES

Charles S. Dunn, Pataskala; Mark A. Propster, and Charles M. Hohman, both of Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 5, 1984, Ser. No. 658,018
Int. Cl.[4] C03B *5/027*
U.S. Cl. 373—35 4 Claims



1. An electrically heated melter for forming molten material from particulate batch and discharging at its bottom the molten material directly into a product forming region comprising:

a chamber formed of heat resistant material for holding molten material, the chamber having at least one outlet at its bottom in communication with a product forming region;

each product forming region including a forming means disposed to receive molten material directly discharged from an outlet in the bottom of the chamber;

a first group of spaced apart electrodes located within the chamber;

a second group of spaced apart electrodes located within the chamber;

the electrodes in the first and second groups being arranged in pairs of opposed electrodes in spaced apart relationship wherein each pair of electrodes includes one electrode from the first group and one electrode from the second group; and

independent means for controllably supplying electrical current separately to each pair of opposed electrodes to allow the temperature of the molten glass entering the outlets to be adjusted to provide molten material to the outlets with a heat pattern which will optimize forming performance,

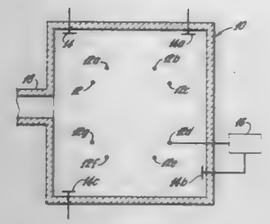
said melter creating an essentially isothermal condition across a given horizontal plane of the body of molten material.

4,638,491

METHOD FOR PROTECTING THE HEATING ELECTRODES OF GLASS MELTING FURNACES

Richard A. Perkins, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 14, 1981, Ser. No. 263,440
Int. Cl.[4] C03B *5/027*
U.S. Cl. 373—39 1 Claim



1. A method of operating an electric melting furnace containing a body of molten material and having heating electrodes immersed in the molten material comprising the steps of:

(a) applying a source of alternating current to the heating electrodes;

(b) immersing at least one counter electrode in the molten material;

(c) applying a source of direct current between the counter electrodes and heating electrodes;

(d) establishing a corrosion current density for the heating electrodes measured in units of amperes per square centimeter of electrode surface; and

(e) establishing a concentration polarization limit for the counter electrode measured in units of amperes per square centimeter of electrode surface; and

(f) maintaining a current density at the heating electrodes that is slightly above the corrosion current density of step (d) and maintaining a current density at the counter electrodes that is well below the concentration polarization limit of step (e) wherein the heating electrodes have a large surface area in comparison to the surface area of the counter electrodes and wherein the counter electrodes have a small surface area in comparison to the surface area of the heating electrodes.

4,638,492

ROOF ASSEMBLY FOR AN ELECTRIC ARC FURNACE

Robert L. Kerr, Poland, Ohio, assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Jan. 13, 1986, Ser. No. 818,441
Int. Cl.[4] F27D *1/02*
U.S. Cl. 373—74 6 Claims

1. A fluid cooled roof assembly for an electric arc furnace where electrodes are inserted in the interior of the furnace, which furnace has sidewalls for holding metal scrap and which roof assembly has conduits for bringing to and carrying away coolant from said roof assembly, comprising:

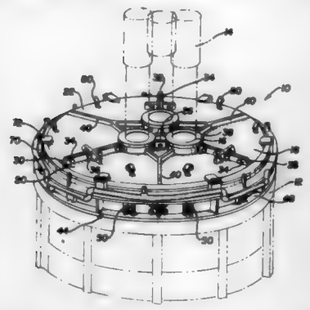
outer ring means defining the outer periphery of said roof and constructed and arranged in a manner to rest on said sidewalls of said furnace and to extend upwardly away from said sidewalls giving added height to said furnace, and

a number of circular panel sectors connected together to form a main roof section for said roof assembly and associated to said outer ring means and secured to each other in a manner such that said roof assembly is in a relatively flat disposition covering the top of said furnace,

said each panel sector being in a triangular shape and having opposed outer longitudinal edges along which an indented area is formed upon which when said panel sectors are assembled said indented area cooperates with an indented

area of an adjacent panel sector to form an opening for said insertion of one of said electrodes,

said each panel sector further having an area along its said opposed longitudinal edges inwardly of said indented area



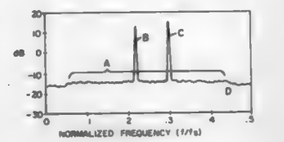
which upon said connection of said panel sectors mate with that of its said adjacent sector to form a central juncture and a central electrode area encompassing said formed electrode openings.

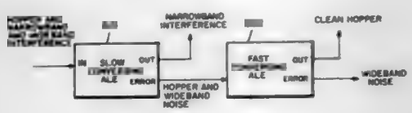
4,638,493

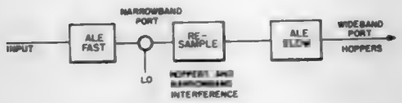
ADAPTIVE INTERFERENCE REJECTION FOR IMPROVED FREQUENCY HOP DETECTION

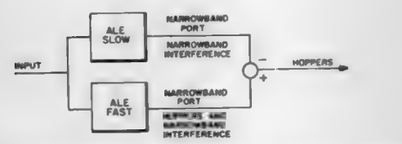
F. Avery Bishop, and Ronald S. Leahy, both of Salt Lake City, Utah, assignors to Sperry Corporation, Blue Bell, Pa.

Filed Jun. 17, 1985, Ser. No. 745,487
Int. Cl.[4] H04B *15/00*; H04L *27/30*
U.S. Cl. 375—1 13 Claims









1. A time-bandwidth discrimination system for providing enhanced frequency hop detection comprising,

a first adaptive line enhancer (ALE) with a relatively slow convergence factor, and

a second adaptive line enhancer (ALE) with a relatively fast convergence factor connected to said first adaptive line enhancer thereby to separate, isolate and distinguish frequency hop signals from interference signals,

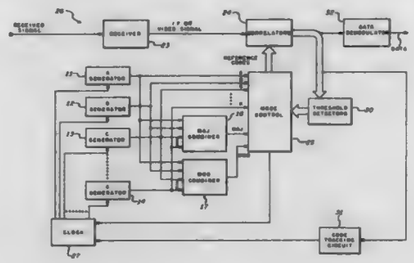
each of said first and second ALEs having an input terminal, a signal output terminal, and an error output terminal wherein, the respective convergence factor is defined by an iterative algorithm by which the signal at the error output terminal is "converged" toward a minimum value.

4,638,494

SYSTEM FOR THE ACQUISITION OF CODE SIGNALS

Earl M. Kartchner, Salt Lake City, Utah; Robert Price, Lexington, Mass., and Gary R. Van Horn, Salt Lake City, Utah, assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 19, 1970, Ser. No. 65,040
Int. Cl.[4] H04K *1/08*
U.S. Cl. 375—2.2 23 Claims



16. A data communication system comprising:

a data transmitting system including component code generation means for providing acquisition component code signals, composite code generation means responsive to said acquisition component code signals for providing an acquisition composite code signal composed therefrom in accordance with a first composition rule whereby at least one of said acquisition component codes correlates with said acquisition composite code and a transmitter means for transmitting said acquisition composite code signal; and

a data receiving system including reference component code generation means for providing reference component codes that correlate with said acquisition component codes respectively, acquisition means responsive to said reference component codes and said transmitted signal for acquiring said transmitted signal with respect to each of said reference component codes thereby acquiring said transmitted signal in accordance with said acquisition composite code, verification code generation means responsive to said reference component codes for providing a verification composite code signal composed therefrom in accordance with a second composition rule of such a character that said verification composite code correlates with said acquisition composite code only when all of said reference component codes are aligned to correlate respectively with the corresponding acquisition component codes in said acquisition composite code, and correlator means responsive to said verification composite code signal and said acquired transmitted signal for obtaining the cross-correlation therebetween, thereby providing a verification signal representative of the successful acquisition of said transmitted acquisition composite code signal.

4,638,495

AUTOMATIC ADAPTIVE EQUALIZER

Shoichi Mizoguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

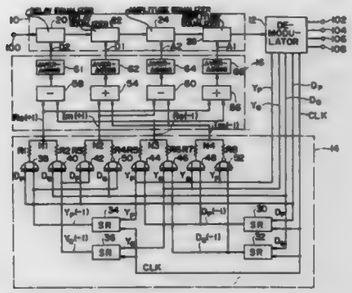
Filed Apr. 19, 1984, Ser. No. 601,885
Claims priority, application Japan, Apr. 19, 1983, 58-68635
Int. Cl.[4] H03H *7/30*; H03K *5/159*
U.S. Cl. 375—14 4 Claims

1. An automatic adaptive equalizer for use in a digital radio transmission system, comprising:

a first means for equalizing at least one of amplitude and delay distortions of an incoming IF signal;

a demodulator being supplied with the output of said first means, and generating a plurality of data signals and a plurality of error signals;

a control signal generator receiving said plurality of data signals and said plurality of error signals, and generating a plurality of in-phase control signals and a plurality of quadrature control signals; and



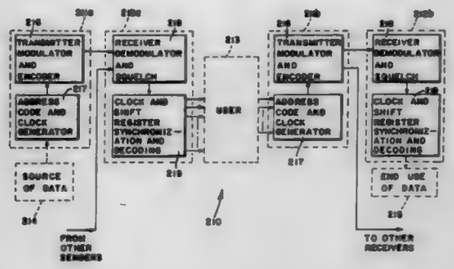
a second means coupled to the output of said control signal generator, said second means performing additions and subtractions of said in-phase and quadrature control signals, and for applying the results of said addition and subtractions to said first means.

4,638,496

SECURE RELIABLE TRANSMITTING AND RECEIVING SYSTEM FOR TRANSFER OF DIGITAL DATA

Garold K. Jensen, 1024 Falcon Dr., River Falls, Wis. 54022

Division of Ser. No. 347,952, Feb. 11, 1982, Pat. No. 4,536,747.
This application Apr. 15, 1985, Ser. No. 723,316
Int. Cl.[4] H04B *1/10*
U.S. Cl. 375—104 4 Claims



3. A secure reliable transmitting and receiving system for the transfer of digital data, comprising:

means for encoding a block of information, said block of information having a predetermined number of clock cycles, a predetermined number of bits of digital data, and a predetermined unmodulated time gap all repeated a preselected number of times, said block of information having a waveform distinct from that of noise and interference;

means for generating a radio frequency carrier;

means connected with said radio frequency carrier means for modulation of said radio frequency carrier with said block of information;

receiving means for receiving and demodulating said block of information;

circuit means associated with said receiving means for transmitting said block of information and rejecting noise and interference, said circuit means including:

(i) first low pass filter and high and low level schmitt trigger circuitry for providing a first stage of discrimination between said block of information and noise and interference in random bursts or in continuous form;

(ii) gating circuitry associated with said filter and trigger circuitry for transmitting the block of information immediately following said block of information to additional signal processing circuitry and for blocking transmission of noise and interference;

(iii) second low pass filter and one shot trigger circuitry for providing a second stage of discrimination between said immediately following block of information and noise and interference and for providing an output decoder reset pulse when the signal received by said second low pass filter and one shot trigger circuitry is said immediately following block of information and for providing no output decoder reset pulse when noise or interference is received by said filter and one-shot trigger circuitry;

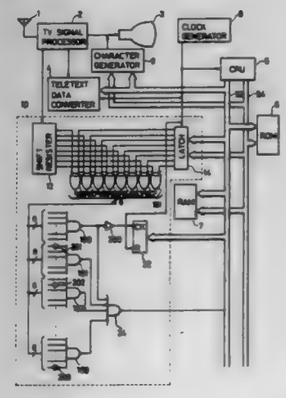
(iv) divider, gating, phase locked loop clock generator, shift register and decoding circuitry for providing a third stage of discrimination between transmitted said immediately following block of information and noise and interference, said third stage of discrimination beginning only on receipt of said output decoder reset pulse signaling receipt by said second state of discrimination of said immediately following block of information rather than receipt of noise or interference, receipt of both said output decoder reset pulse and said immediately following block of information initiating count of said clock cycles and count of said digital data bits where start and termination times of said counts determine precise time periods when said clock cycles may be admitted to the phase lock loop for synchronization of said phase lock loop and the shift register and when said digital data bits may be entered into shift register, loading of said shift register terminates said counts thereby initiating off-loading of said digital data bits in said shift register in parallel to said decoding circuitry, clearing said shift register of all said digital data bits, outputting a readout enable pulse, and locking up all circuit operations of the divider, gating, phase locked loop clock generator, shift register, and decoding circuitry pending reactivation by receipt of additional said output decoder reset pulses.

4,638,497

FRAMING CODE DETECTOR FOR A TELETEXT RECEIVER

Shigeru Komatsu, Yokohama, and Keiji Kawata, Kamakura, both of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Video Engineering, Ltd., Kanagawa, both of, Japan

Filed Sep. 24, 1984, Ser. No. 653,524
Claims priority, application Japan, Sep. 26, 1983, 58-176224
Int. Cl.[4] H04L *7/08*; H04J *3/06*; H04N *1/36*
U.S. Cl. 375—116 15 Claims



1. A framing code detector for a teletext receiver capable of

receiving different broadcasting teletext signals each having a different framing code, the framing code being repeated a plurality of times in each broadcast teletext signal comprising:

memory means for storing a pattern code corresponding to an anticipated one of said plurality of framing codes;

comparing means for comparing a received framing code with said pattern code stored in said memory means to produce an output signal when a substantial predetermined correspondence is detected between said received framing code and said stored pattern code;

counter means for counting the generation of said output signal of said comparing means during a predetermined period during which a framing code of a given broadcasting teletext signal is received a plurality of times by said comparing means; and

control means for writing another pattern code into said memory means when the count value in said counter means is less than a predetermined value at the end of said predetermined period and for producing an identification signal when said count value in said counter means is equal to or greater than said predetermined value at the end of said predetermined period.

4,638,498

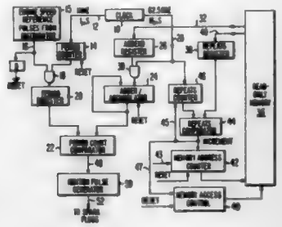
DIGITAL TIMING SYSTEM

Joseph O. Sinniger, Pennington, and Anthony D. Robbi, Hopewell, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Division of Ser. No. 437,836, Oct. 29, 1982, Pat. No. 4,575,809, which is a division of Ser. No. 161,454, Jun. 20, 1980, Pat. No. 4,375,209. This application Sep. 27, 1985, Ser. No. 780,898

Int. Cl.⁴ G06M *3/02*; F02P *5/04*

U.S. Cl. 377—39 **3 Claims**



1. A system for producing an output pulse at a time which is a function of the spacing of two input pulses, comprising

a source of clock pulses,

a counter connected to count the number of clock pulses occurring in the period between said two input pulses,

a source of an addend quantity,

adder/accumulator means responsive to said source of clock pulses and to said source of an addend quantity to repeatedly add said addend quantity, and

a comparator producing an output pulse when the sum provided by said adder/accumulator corresponds with the counted number of clock pulses.

4,638,499

HIGH RESOLUTION COLLIMATOR SYSTEM FOR X-RAY DETECTOR

Jeffrey W. Eberhard, Schenectady, and Dallas E. Cain, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 638,171, Aug. 6, 1984, abandoned. This application Jun. 16, 1986, Ser. No. 875,021

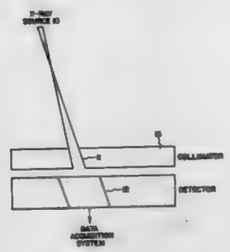
Int. Cl.⁴ G21K *1/02*

U.S. Cl. 378—7 **3 Claims**

1. A high resolution collimator/detector for a computerized tomography system having a source of X-ray beams to irradiate an object, comprising:

an X-ray detector including an array of wide detector elements comprised of a printed circuit detector board having a collector plate divided into wide strips and a parallel voltage plate between which is impressed an electric field;

a housing having an X-ray transparent section and a chamber containing said detector board and voltage plate and a high pressure gaseous medium to convert incident X-rays into charged particles that drift under the influence of said electric field;



a collimator secured to said detector housing comprised of a central layer in which narrow tapered slits are cut and continuous enclosing side layers, said central layer having at the top flexure pieces each pressed toward an edge of the respective slit to yield a controlled slit width at the top of 3 mils or less to limit and define the width of X-ray beams incident on said detector elements and hence the system resolution;

every narrow tapered slit being approximately centered on one wide detector element which collects all the charged particles formed in that element, and having a length equal to the thickness of said central layer which determines the slice thickness of said computerized tomography system.

4,638,500

METHOD OF DETERMINING VOLTAGE AND CURRENT FOR A GIVEN OPERATING PERIOD OF AN X-RAY SOURCE

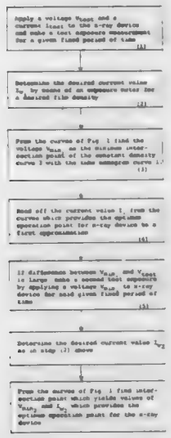
Wigle F. Smits, Emmasingel, and Willem E. Spaak, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 512,920, Oct. 7, 1974, abandoned. This application Feb. 19, 1976, Ser. No. 659,427

Int. Cl.⁴ H05G *1/46*

U.S. Cl. 378—109 **6 Claims**

1. A method of determining voltage and current values to be applied to an x-ray source and associated with a given exposure period of the x-ray source in which a desired current time product is determined with the aid of an x-ray exposure meter for a desired radiation quantity comprising, determining the current time product at a given voltage applied to the radiation source, and determining, with the aid of a voltage-current function related to the desired radiation quantity, which function is passed through the current intensity associated with the desired current time product, and with the aid of an operating range limitation nomogram of the X-ray source with the same current scale as the voltage-current function, the point of intersection of the voltage-current function and the operating range limitation nomogram having the lowest voltage value,



said lowest voltage value being taken as a target value for the current determination with the aid of the load nomogram.

4,638,501

FRONT PLATE OF X-RAY FILM CASSETTE

Yoshitsugu Nishi, and Yukitaka Daigo, both of Saitama, Japan, assignors to Somar Corporation, Tokyo, Japan

Filed Oct. 12, 1984, Ser. No. 660,037

Claims priority, application Japan, Oct. 14, 1983, 58-158039[U]

Int. Cl.⁴ G03B *42/04*

U.S. Cl. 378—182 **10 Claims**



1. A front plate of an X-ray film cassette, comprising:

a multi-layer laminated body having

(i) an intermediate layer made of carbon fiber reinforced plastic; and

(ii) outer layers made of aromatic polyamide fiber reinforced plastic for covering both surfaces of said intermediate layer, wherein said intermediate layer and said outer layers are formed in an integrally laminated body.

4,638,502

ANTHROPOMORPHIC PHANTOMS

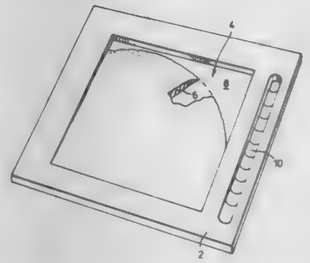
Martin J. Yaffe, Toronto, Canada, assignor to The Ontario Cancer Institute, Toronto, Canada

Filed Jul. 8, 1985, Ser. No. 753,025

Int. Cl.⁴ G01D *18/00*

U.S. Cl. 378—207 **22 Claims**

1. A method for producing a radiological phantom comprising obtaining a radiograph representing a radiographic image of a particular view of a body part to be simulated in a defined radiographic environment, densitometrically scanning the radiograph with a densitometer, digitizing and sampling the densitometer output at a sampling rate sufficient to produce data defining a densitometric image of the body part having a spatial resolution sufficient that the phantom can substantially reproduce the original radiograph when imaged in the same environment, obtaining the phantom, such as to relate radiographic density to material thickness in the radiographic environment used for obtaining the radiograph and over a range of densities comprising the density range of the radiograph, using the calibration data to translate the densitometric data defining the image into thickness data, and using said thickness data to form from the same material as the sample a three dimensional



representation of the thickness data configured to overlay a radiographic image plane and to produce in said defined radiographic environment an image similar to that which would have been produced by said particular view of the original body part in that environment.

4,638,503

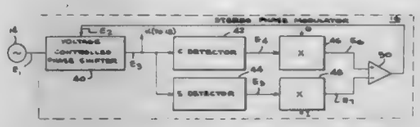
FULLY COMPATIBLE AM STEREOPHONIC TRANSMITTING SYSTEM

Charles S. Wright, Springfield, Va., assignor to Delta Electronics, Alexandria, Va.

Filed Feb. 20, 1985, Ser. No. 703,681

Int. Cl.⁴ H04H *5/00*

U.S. Cl. 381—16 **8 Claims**



1. Apparatus for transmitting in quadrature a single carrier signal carrying information corresponding to first and second signals including means supplying said first, second, and carrier signals, said apparatus further comprising:

(a) means for providing a third signal indicative of the difference of said first and second signals and a fourth signal indicative of the sum of said first and second signals;

(b) means responsive to a feedback signal for phase modulating said carrier signal in accordance with said feedback signal;

(c) feedback means for providing said feedback signal and comprising means for detecting a component of said phase modulated carrier signal in phase with said carrier signal to provide an in phase signal and detecting a gomponent of said phase modulated carrier signal out of phase with said carrier signal to provide a quadrature signal;

(d) means for multiplying respectively said in phase and quadrature signals by said third and fourth signals to provide first and second multiplied signals;

(e) means for obtaining the difference of said first and second multiplied signals to provide said feedback signal whereby said phase modulating means phase modulates said carrier signal in accordance with the ratio of said third signal to said fourth signal; and

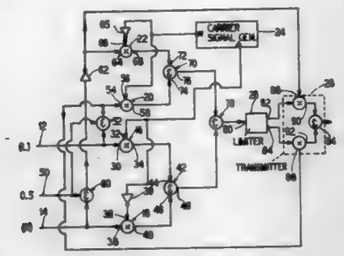
(f) means for amplitude modulating said phase modulated carrier signal in accordance with said third signal, said transmitted carrier signal being fully compatible for reception and reproduction of said third signal with substantially no distortion.

4,638,504

INDEPENDENT CHANNEL MODULATION SYSTEM FOR AM STEREO

Stanley Salek, Mesa, Ariz., assignor to Broadcast Electronics, Inc., Quincy, Ill.

Filed Jun. 28, 1985, Ser. No. 749,814
Int. Cl.⁴ H04H *5/00*
U.S. Cl. 381—16 **12 Claims**



1. An independent channel modulation system for generating a signal to be transmitted for use with a generator for generating first, second, third and fourth carrier signals comprising:

first and second input terminals;

a first modulator connected to said first input and to said means for generating said first carrier signal for modulating said first carrier signal with a signal from said first input;

a second modulator connected to said second input and to said means for generating said second carrier signal for modulating said second carrier signal by a signal from said second input;

a third modulator connected to said first input and to said means for generating said third carrier signal for modulating said third carrier signal by a signal from said first input;

a fourth modulator connected to said second input and to said means for generating said fourth carrier signal for modulating said fourth carrier signal by a signal from said second input;

first summing means connected for summing the outputs of said first and second modulators;

second summing means connected for summing the outputs of said third and fourth modulators; and

third summing means connected for summing the outputs of said first and second summing means, said third summing means having an output for said signal to be transmitted.

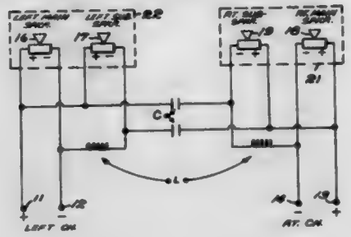
4,638,505

OPTIMIZED LOW FREQUENCY RESPONSE OF LOUDSPEAKER SYSTEMS HAVING MAIN AND SUB-SPEAKERS

Matthew S. Polk, and Colin B. Campbell, both of Baltimore, Md., assignors to Polk Audio Inc., Baltimore, Md.

Filed Aug. 26, 1985, Ser. No. 769,345
Int. Cl.⁴ H04R *5/00*
U.S. Cl. 381—24 **5 Claims**

1. A loudspeaker system for a stereophonic sound reproduction system having a right channel output signal R with plus and minus output terminals and a left channel output signal L with plus and minus output terminals, said loudspeaker system comprising a right main speaker and a right sub-speaker, a left main speaker and a left sub-speaker, each of said main speakers and sub-speakers having plus and minus input terminals, interspeaker cabling means for applying signal R to said right main speaker, and a signal R-L to said right sub-speaker, and a signal L to said left main speaker and a signal L-R to said left sub-speaker, said interspeaker cabling means including impedance means having values selected to substantially attenuate the −L portion of the R-L applied to the right sub-speaker signal and



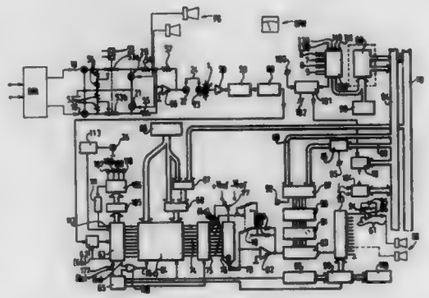
the −R portion of the L-R signal applied to the left sub-speaker for signal frequencies of below approximately 200 Hz.

4,638,506

SOUND FIELD SIMULATION SYSTEM AND METHOD FOR CALIBRATING SAME

Hok L. Han, No. 67 Thorbeckestraat, 2613 BV Delft, Netherlands

Continuation of Ser. No. 574,639, Jan. 30, 1984, abandoned, which is a continuation of Ser. No. 305,198, Sep. 24, 1981, abandoned. This application Mar. 4, 1985, Ser. No. 707,527
Int. Cl.⁴ H03G *3/00*
U.S. Cl. 381—34 **4 Claims**



1. In the method of calibrating a sound field simulation system which comprises the steps of:

(a) switching off secondary loudspeaker units of the simulation system;

(b) generating a first sound source sound at least predominantly corresponding to pink noise;

(c) measuring the sound pressure level of the first sound source sound generated in step (b);

(d) switching on the secondary loudspeaker units;

(e) producing a second sound source sound from said secondary loudspeaker units corresponding to said pink noise of step (b);

(f) measuring the sound pressure level of said second sound source sound; and

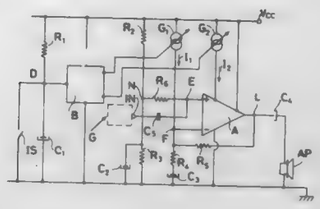
(g) adjusting the level of said second sound source sound as measured in step (f) to the level measured in step (c) or differing therefrom by a chosen amount.

4,638,507

AUDIO AMPLIFIER SWITCH-ON CONTROL CIRCUIT

Sergio Palara, Bareggio, and Aldo Torazzina, Monza, both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Catania, Italy

Filed Apr. 12, 1985, Ser. No. 722,386
Claims priority, application Italy, Apr. 20, 1984, 20645 A/84
Int. Cl.⁴ H03F *1/26*
U.S. Cl. 381—94 **11 Claims**



1. Audio amplifier switch-on control circuit in an audio signal generating apparatus, comprising:

a progressively chargeable capacitor, which charges when said apparatus is turned on; and

an oscillating circuit which responds to an increase in a load voltage of said capacitor beyond a preset value to progressively shift from a first to a second operating state, in which a switch-on current for switching on the audio amplifier, is produced

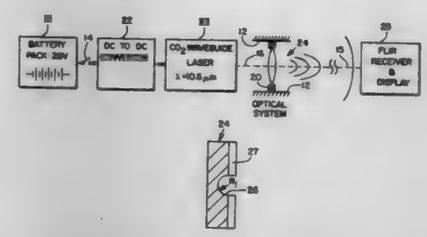
said oscillating circuit including two commutating devices, each of which are controllable by an electrical signal, a first of which being controlled by a load voltage of said capacitor and a second of which being controlled by the state of said first commutating device, said second commutating device causing said oscillating circuit to assume said first operating state after said load voltage reaches said preset value.

4,638,508

PORTABLE FLIR BEACON

Robert T. Hintz, China Lake, and Roy L. Nichols, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 10, 1978, Ser. No. 895,407
Int. Cl.⁴ H04B *9/00*; G02B *3/00*
U.S. Cl. 455—617 **8 Claims**



1. A radiant energy signal system comprising:

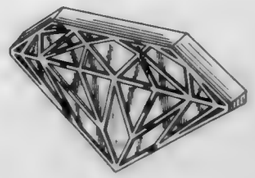
a portable housing configured for manual manipulation to a predetermined spatial orientation with respect to an operator thereof for aiming said signal system;

a source of electrical energy mounted within said portable housing;

an electro-optical transducer means mounted within said portable housing and effectively connected to said source of electrical energy for producing a radiant energy signal having a wavelength within the eight-to-twelve micron range; and

an optical element effectively mounted within said housing and in optical alignment with said electro-optical transducer means and configured to have two cylindrical concave surfaces of different radii with axes at right angles and on the same surface thereof to direct said radiant energy into a fan shaped beam which with said predetermined spatial orientation causes said radiant energy signal to impinge a desired receptor.

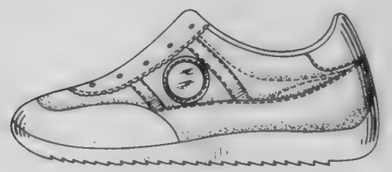
287,780
CANDY
Robert J. Farber, 2423 Brookwood Dr., Flossmoor, Ill. 60422
Filed May 25, 1983, Ser. No. 496,110
Term of patent 14 years
U.S. Cl. D1—106



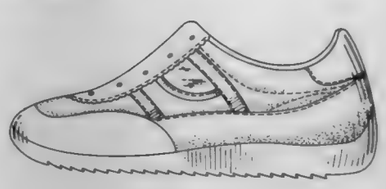
287,781
EDIBLE CHRISTMAS TREE
Gunter Schmidt, Bahnhofstr. 23, 2832 Twistringen, Fed. Rep. of Germany
Filed Nov. 14, 1984, Ser. No. 671,299
Claims priority, application Fed. Rep. of Germany, May 16, 1984, 25 MR 10
Term of patent 14 years
U.S. Cl. D1—115



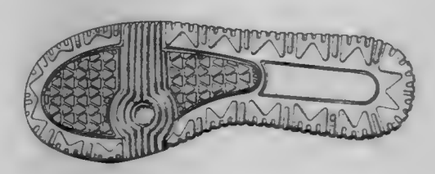
287,782
SHOE
Jorge E. M. Palacio, Col. del Valle, Mexico, assignor to Calzado Puma, S.A. de C.V., Edo. de Mexico, Mexico
Division of Ser. No. 544,354, Oct. 21, 1983. This application Sep. 24, 1985, Ser. No. 779,493
Term of patent 14 years
U.S. Cl. D2—309



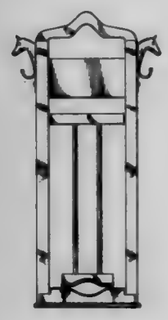
287,783
SHOE
Jorge E. M. Palacio, Col. del Valle, Mexico, assignor to Calzado Puma, S.A. de C.V., Edo. de Mexico, Mexico
Division of Ser. No. 544,354, Oct. 21, 1983. This application Sep. 24, 1985, Ser. No. 779,511
Term of patent 14 years
U.S. Cl. D2—309



287,784
SHOE SOLE
James K. Tong, Beaverton, and Bruce MacGregor, Lake Oswego, both of Oreg., assignors to Penn, Inc., Portland, Oreg.
Filed Dec. 17, 1985, Ser. No. 809,749
Term of patent 14 years
U.S. Cl. D2—320



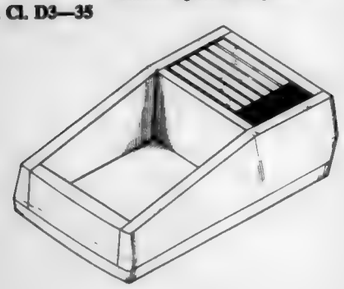
287,785
BOOTJACK
Charles L. Lashoff, Rte. 2, Box 578, Amarillo, Tex. 79101
Filed Jun. 22, 1984, Ser. No. 623,414
Term of patent 14 years
U.S. Cl. D2—642

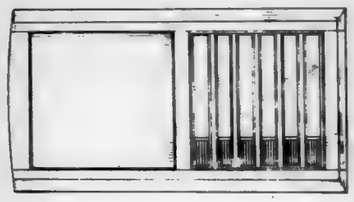


287,786
CIGARETTE LIGHTER HOLDER
Willard C. Knight, 2118 Schoenburg, Fort Wayne, Ind. 46808
Filed Mar. 22, 1984, Ser. No. 592,094
Term of patent 14 years
U.S. Cl. D3—106

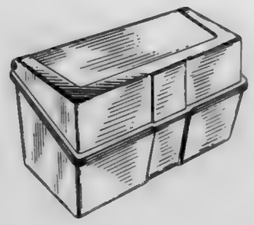


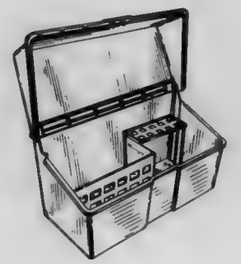
287,787
CASSETTE TAPE HOLDER
Richard S. Dunchock, South Laguna, Calif., assignor to SL Corporation, Troy, Mich.
Filed Aug. 20, 1984, Ser. No. 642,532
Term of patent 14 years
U.S. Cl. D3—35



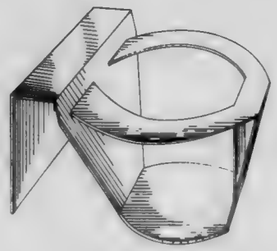


287,788
ORGANIZER AND STORAGE CONTAINER FOR BATHROOM SUPPLIES
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Jul. 13, 1984, Ser. No. 630,827
Term of patent 14 years
U.S. Cl. D3—39





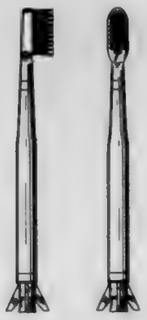
287,789
DRINK CUP HOLDER FOR AN AUTOMOBILE
Jon T. Johnson, 6071 Stanleyville Dr., Rural Hall, N.C. 27045
Filed Jul. 9, 1984, Ser. No. 629,184
Term of patent 14 years
U.S. Cl. D3—40



287,790
TOOTHBRUSH
Andreas Fay, Vienna, Austria, assignor to Lever Brothers Company, New York, N.Y.
Filed Mar. 6, 1985, Ser. No. 709,243
Claims priority, application Austria, Sep. 6, 1984, 533644
Term of patent 14 years
U.S. Cl. D4—104



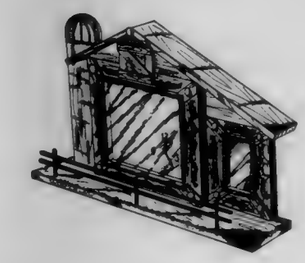
287,791
TOOTH BRUSH
Daniel Arnaud, 41 rue Chambre de l'Edit, Castres 81100, France
Filed Jul. 27, 1983, Ser. No. 517,946
Term of patent 14 years
U.S. Cl. D4—107



287,792
TOOTH BRUSH
Daniel Arnaud, 41 rue Chambre de l 'Edit, Castres 81100, France
Filed Oct. 31, 1983, Ser. No. 546,868
Term of patent 14 years
U.S. Cl. D4—107



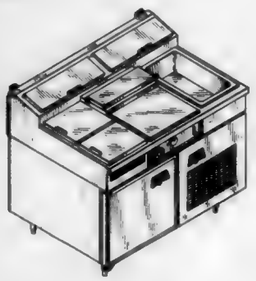
287,793
PICTURE FRAME
Robert E. Johnson, Box 112, Castlewood, S. Dak. 57223
Division of Ser. No. 461,591, Jan. 27, 1983, Pat. No. Des. 283,085. This application Oct. 15, 1985, Ser. No. 787,778
Term of patent 14 years
U.S. Cl. D6—303

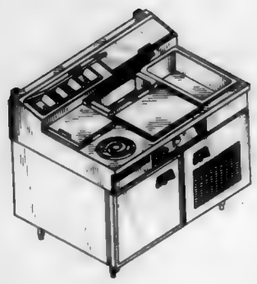


287,794
BAR STOOL
Vladimir W. Zekharov, Baldwin Park, Calif., assignor to Mikhail Darafeev, Inc., Baldwin Park, Calif.
Filed Feb. 19, 1985, Ser. No. 702,577
The portion of the term of this patent subsequent to Nov. 4, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—360

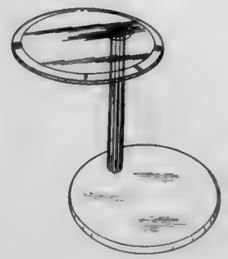


287,795
FOOD PREPARATION TABLE FOR PASTAS, SANDWICHES AND THE LIKE
Gary Streepy, Witchita, Kans., assignor to Pizza Hut, Inc., Wichita, Kans.
Filed Mar. 21, 1984, Ser. No. 592,334
Term of patent 14 years
U.S. Cl. D6—436

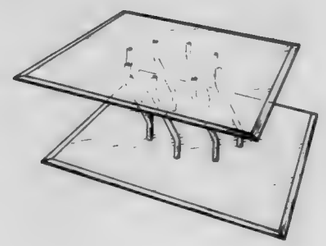




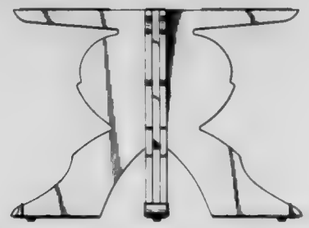
287,796
TABLE
Paul R. Evans, New Hope, Pa., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Apr. 10, 1984, Ser. No. 596,821
Term of patent 14 years
U.S. Cl. D6—483



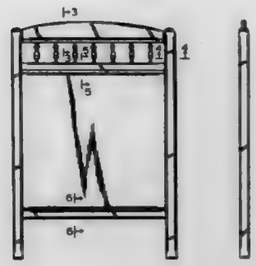
287,797
TABLE
Paul R. Evans, New Hope, Pa., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Apr. 10, 1984, Ser. No. 596,822
Term of patent 14 years
U.S. Cl. D6—483



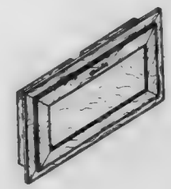
287,798
TABLE BASE
Robert Venturi, Philadelphia, Pa., assignor to Knoll International, Inc., New York, N.Y.
Filed Feb. 22, 1984, Ser. No. 582,325
Term of patent 14 years
U.S. Cl. D6—498

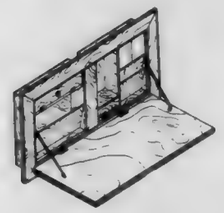


287,799
CRIB FOOTBOARD
Merlin A. Brunner, New London, and Harvey J. Draheim, Weyauwega, both of Wis., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Jul. 30, 1984, Ser. No. 635,879
Term of patent 14 years
U.S. Cl. D6—505

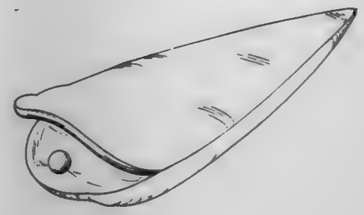


287,800
BUILT-IN WALL CABINET
Layton G. Lance, P.O. Box 1472, St. Charles, Mo. 63302
Filed Mar. 19, 1984, Ser. No. 590,787
Term of patent 14 years
U.S. Cl. D6—559





287,801
PAJAMA BAG/PILLOW
Beverly K. O'Brien, 83 Bridle Path Rd., Southbury, Conn. 06488
Filed Jan. 16, 1984, Ser. No. 570,826
Term of patent 14 years
U.S. Cl. D6—597



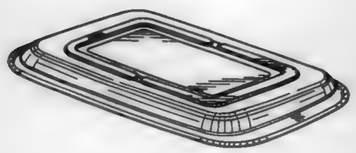
287,802
COVERED SERVING TRAY OR THE LIKE
Robert H. C. M. Deenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 31, 1984, Ser. No. 646,386
Term of patent 14 years
U.S. Cl. D7—17







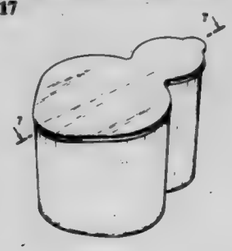
287,803
CASSEROLE DISH COVER OR THE LIKE
Robert H. C. M. Dacnen, Hekelgem; Pieter K. J. DeCoster, Aalst, both of Belgium, and Martin J. Wolff, North Providence, R.I., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Sep. 21, 1984, Ser. No. 653,388
Term of patent 14 years
U.S. Cl. D7—40



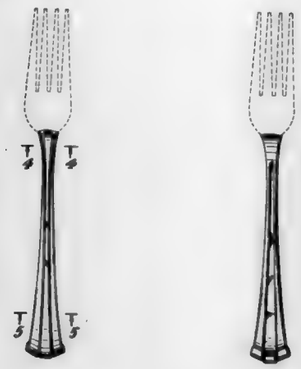
287,805
INSULATED JUG
Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Dr. Anso Zimmermann Isolierflaschen, Niederaula, Fed. Rep. of Germany
Filed Feb. 14, 1984, Ser. No. 580,145
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 8AR 206/83
Term of patent 14 years
U.S. Cl. D7—317

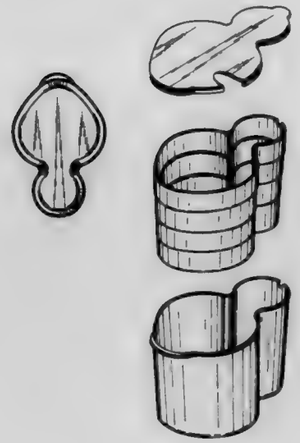


287,806
WATER CARAFE
Harlan F. Boria, 4049 Arcadia Way, Ocean Hills, Calif. 92056
Filed Aug. 9, 1984, Ser. No. 639,023
Term of patent 14 years
U.S. Cl. D7—317

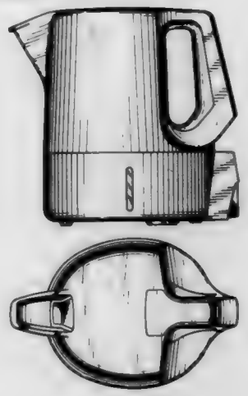


287,804
HANDLE FOR AN ARTICLE OF FLATWARE
Richard O. Cragin, Lincoln, R.I., assignor to Textron Inc., Providence, R.I.
Filed Oct. 18, 1984, Ser. No. 663,468
Term of patent 14 years
U.S. Cl. D7—152



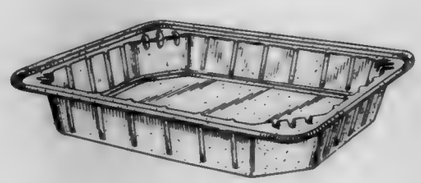


287,807
ELECTRIC KETTLE
Ian G. Wilson, New South Wales, Australia, assignor to Sunbeam Corporation, Downers Grove, Ill.
Filed Sep. 21, 1984, Ser. No. 653,811
Term of patent 14 years
U.S. Cl. D7—317

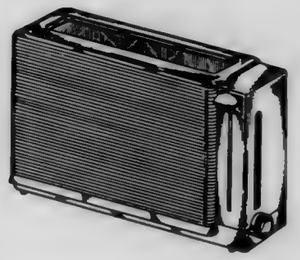




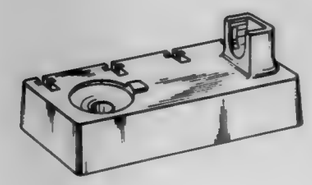
287,809
ROASTER
Frederick D. Alexander, Arlington Heights, Ill., assignor to Elrco Products, Inc., Wheeling, Ill.
Filed Jun. 28, 1985, Ser. No. 750,426
Term of patent 14 years
U.S. Cl. D7—359



287,808
TOASTER
Franz A. Stutzer, and Michael Knochner, both of Offenbach, Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Fed. Rep. of Germany
Filed Nov. 28, 1984, Ser. No. 675,688
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 5MR10533; Sep. 28, 1984, 5MR10561
Term of patent 14 years
U.S. Cl. D7—330



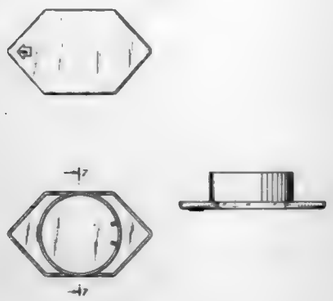
287,810
BASE FOR KITCHEN APPLIANCE
Robert Ouit, Annapolis, Md., assignor to Black & Decker, Inc., Newark, Del.
Filed Sep. 19, 1984, Ser. No. 652,059
Term of patent 14 years
U.S. Cl. D7—412



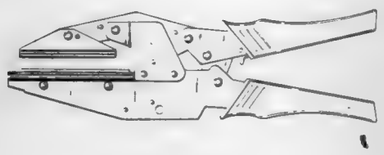
287,811
TIRE REPAIR TOOL
Vincent A. Walla, 420 Galway Dr., Bethel Park, Pa. 15102
Filed Feb. 21, 1984, Ser. No. 582,026
Term of patent 14 years
U.S. Cl. D8—31



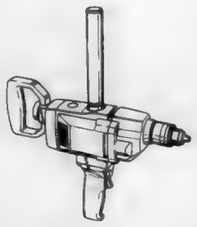
287,812
SAFETY BOTTLE CAP REMOVER
Frank Bordonaro, Saddlebrook, and James McTiernan, Woodcliff Lake, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Filed Mar. 14, 1984, Ser. No. 589,618
Term of patent 14 years
U.S. Cl. D8—40



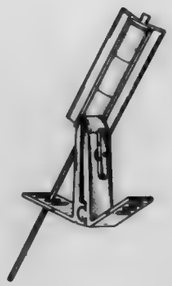
287,813
CRIMPING TOOL
Jan O. Higg, Stenkumra, and Lars-Olov Persson, Älvdalen, both of Sweden, assignors to Pressmaster Tool AB, Älvdalen, Sweden
Filed Feb. 14, 1984, Ser. No. 579,963
Term of patent 14 years
U.S. Cl. D8—51



287,814
ELECTRIC DRILL
Etsuo Hiraishi; Tetsuyuki Doi, and Hiroshi Morikawa, all of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Feb. 10, 1984, Ser. No. 579,051
Claims priority, application Japan, Aug. 20, 1983, 58-36385
Term of patent 14 years
U.S. Cl. D8—67



287,815
KNIFE BLADE SHARPENER OR THE LIKE
Donald R. Johannsen, Dearborn, Mich., assignor to Bonnie S. Carris, Detroit, Mich.
Filed Jan. 13, 1984, Ser. No. 570,583
Term of patent 14 years
U.S. Cl. D8—93

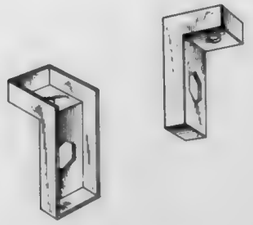


287,816
CUP HOOK
Lee R. Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Mar. 20, 1985, Ser. No. 714,179
Term of patent 14 years
U.S. Cl. D8—367

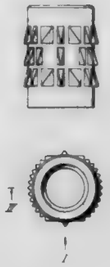




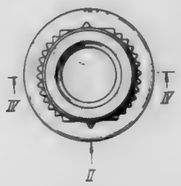
287,817
FRAME MOUNTING BRACKET FOR A SWINGING DOOR
Kirk Henin, Manhasset, N.Y., assignor to Harris Hardware Sales Corp., Port Washington, N.Y.
Filed Aug. 15, 1985, Ser. No. 765,838
Term of patent 14 years
U.S. Cl. D8—380



287,818
SCREW-THREADED INSERT
Stephen R. Bullen, Honeybourne, Nr. Evesham; Paul M. Dunn, and Martin A. Phillips, both of Redditch, all of England, assignors to Dynacast International Limited, England
Filed Nov. 16, 1984, Ser. No. 672,140
Claims priority, application United Kingdom, May 18, 1984, 1019772
Term of patent 14 years
U.S. Cl. D8—385



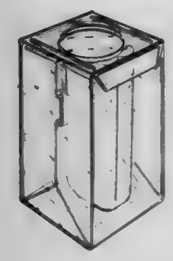
287,819
SCREW-THREADED INSERT
Stephen R. Bullen, Honeybourne, Nr. Evesham; Paul M. Dunn, and Martin A. Phillips, both of Redditch, all of England, assignors to Dynacast International Limited, England
Filed Nov. 16, 1984, Ser. No. 672,196
Claims priority, application United Kingdom, May 18, 1984, 1019774
Term of patent 14 years
U.S. Cl. D8—385



287,820
SCREW-THREADED INSERT
Stephen R. Bullen, Honeybourne, nr. Evesham; Paul M. Dunn, and Martin A. Phillips, both of Redditch, all of England, assignors to Dynacast International Limited, England
Filed Dec. 26, 1984, Ser. No. 686,393
Claims priority, application United Kingdom, Jul. 3, 1984, 1020710
Term of patent 14 years
U.S. Cl. D8—385



287,821
PACKAGING CONTAINER FOR A BOTTLE OR THE LIKE
Robert D. Holewinski, Lakehurst; Leslie Hamilton, Trenton, and William J. Blatherwick, Hamilton Square, all of N.J., assignors to Johnson & Johnson Dental Products Company, East Windsor, N.J.
Filed Apr. 9, 1984, Ser. No. 597,900
Term of patent 14 years
U.S. Cl. D9—341



287,822
CONTAINER FOR REFRIGERANT GEL OR THE LIKE
Stanley A. Katz, Houston, Tex., assignor to Igloo Corporation, Houston, Tex.
Filed Apr. 10, 1984, Ser. No. 598,795
Term of patent 14 years
U.S. Cl. D9—407



287,823
BOTTLE, OR SIMILAR ARTICLE
Karen A. Rosenwinkel, Oak Park, Ill., assignor to W. Braun Company, Chicago, Ill.
Filed Apr. 9, 1984, Ser. No. 598,228
Term of patent 14 years
U.S. Cl. D9—413



287,824
CONTAINER FOR LIQUIDS
Adrien P. Rayner, Iver, England, assignor to Metal Box p.l.c., Reading, England
Filed May 27, 1983, Ser. No. 498,657
Term of patent 14 years
U.S. Cl. D9—428



287,825
CONTAINER FOR LIQUIDS
Adrien P. Rayner, Iver, England, assignor to Metal Box p.l.c., Reading, England
Filed May 27, 1983, Ser. No. 499,316
Term of patent 14 years
U.S. Cl. D9—428



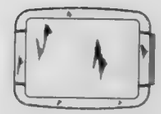
287,826
CLOCK
Fernando C. Richards, 56 Peabody St., Salem, Mass. 01970
Filed Feb. 23, 1984, Ser. No. 583,056
Term of patent 14 years
U.S. Cl. D10—7

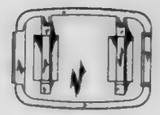


287,827
HEAD FOR A DIFFERENTIAL PRESSURE MEASURING AND TRANSMITTING HOUSING
David A. Broden, Chanhassen, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.
Filed Sep. 6, 1983, Ser. No. 529,883
Term of patent 14 years
U.S. Cl. D10—46

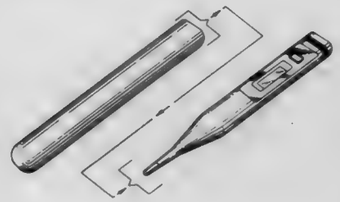


287,828
DOSIMETER FOR MONITORING RADIATION EXPOSURE
Robert Pollock, Aurora, Ill.; Douglas Patton; David Sharbaugh, both of Irvine, Calif., and John Goodin, Long Beach, Calif., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.
Filed Feb. 28, 1983, Ser. No. 468,117
Term of patent 14 years
U.S. Cl. D10—47





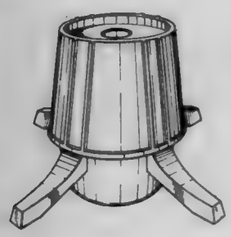
287,829
COMBINED ELECTRONIC THERMOMETER AND COVER THEREFOR
Kazumi Osaka, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed May 3, 1984, Ser. No. 607,016
Claims priority, application Japan, Nov. 4, 1983, 58-47932
Term of patent 14 years
U.S. Cl. D10—57



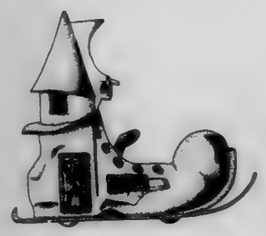
287,830
ELECTRONIC THERMOMETER OR SIMILAR ARTICLE
Bernhard Schwan, Werbach-Gamburg, Fed. Rep. of Germany, assignor to Atmos Fritzsching & Co. GmbH, Viernheim, Fed. Rep. of Germany
Filed Apr. 6, 1984, Ser. No. 597,370
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1983, MR 139
Term of patent 14 years
U.S. Cl. D10—57



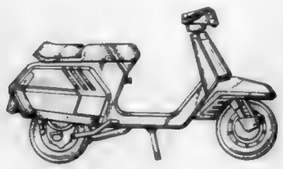
287,831
STAND FOR TREES, POLES OR SIMILAR ARTICLE
Gerhard Stephan, Ottawa, Canada, assignor to Ava Tech International Ltd. and M. R. St. Jacques Associates, Inc., both of Ottawa, Canada
Filed May 30, 1984, Ser. No. 615,126
Claims priority, application Canada, Feb. 16, 1984, 16-02-84-2
Term of patent 14 years
U.S. Cl. D11—130.1



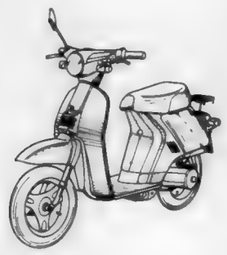
287,832
VEHICLE
Margaret A. H. Byrd, 14811 Wildwood, Magnolia, Tex. 77355
Filed Apr. 30, 1984, Ser. No. 605,300
Term of patent 14 years
U.S. Cl. D12—83



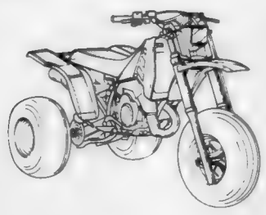
287,833
MOTORCYCLE
Giulio Moselli, Turin, Italy, assignor to Yeu Tyan Machinery Mfg., Co., Ltd., Chung HWA, Taiwan
Filed Jan. 2, 1985, Ser. No. 688,414
Term of patent 14 years
U.S. Cl. D12—110



287,834
MOTORCYCLE
Kentaro Ito, and Chiharu Sasaki, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 24, 1984, Ser. No. 583,253
Claims priority, application Japan, Aug. 29, 1983, 58-37646
Term of patent 14 years
U.S. Cl. D12—110



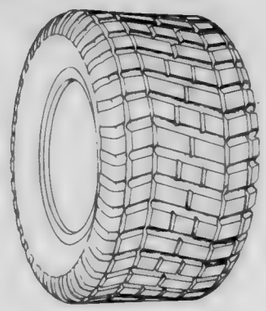
287,835
MOTOR TRICYCLE
Akio Makita; Toru Nishino, both of Tokyo, and Tetsuya Nakazawa, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 23, 1984, Ser. No. 613,511
Claims priority, application Japan, Nov. 24, 1983, 58-50964
Term of patent 14 years
U.S. Cl. D12—110



287,836
MOTORIZED WHEELCHAIR
Wilfred Chan; Michael Marr, and Augusto De Sousa, all of Toronto, Canada, assignors to Fortress Scientific Limited, Ontario, Canada
Filed Oct. 1, 1984, Ser. No. 656,499
Claims priority, application Canada, May 30, 1984, 30-05-84-7
Term of patent 14 years
U.S. Cl. D12—131



287,837
VEHICLE TIRE
Hisashi Shintomi, Izumi-Ohtsu, Japan, assignor to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed Nov. 28, 1984, Ser. No. 675,581
Claims priority, application Japan, Jun. 30, 1984, 59-27169
Term of patent 14 years
U.S. Cl. D12—140



287,838
AUTOMOBILE TIRE
Kenji Takehara, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Oct. 9, 1984, Ser. No. 658,875
Claims priority, application Japan, May 28, 1984, 59-21857
Term of patent 14 years
U.S. Cl. D12—143



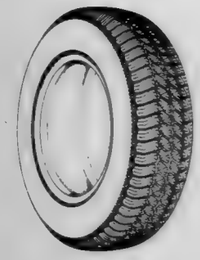
287,839
AUTOMOBILE TIRE
Mitsutern Miyata, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed May 17, 1984, Ser. No. 611,077
Claims priority, application Japan, Mar. 28, 1984, 59-12265
Term of patent 14 years
U.S. Cl. D12—146



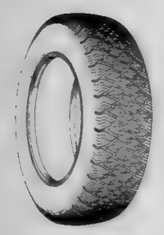
287,840
AUTOMOBILE TIRE
Masaharu Ono, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Sep. 10, 1984, Ser. No. 648,938
Claims priority, application Japan, Jul. 25, 1984, 59-31359
Term of patent 14 years
U.S. Cl. D12—147



287,841
AUTOMOBILE TIRE
Masaharu Ono, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Sep. 10, 1984, Ser. No. 648,941
Claims priority, application Japan, Jul. 25, 1984, 59-31360
Term of patent 14 years
U.S. Cl. D12—147



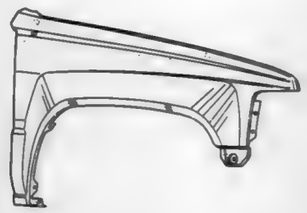
287,842
AUTOMOBILE TIRE
Kenji Hatakenaka, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Kobe, Japan
Filed May 16, 1984, Ser. No. 610,793
Claims priority, application Japan, Mar. 28, 1984, 59-12268
Term of patent 14 years
U.S. Cl. D12—151



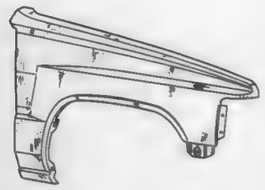
287,843
RADIATOR GRILLE FOR AN AUTOMOBILE
Mitsuo Katoh, and Hiroki Amano, both of Hachioji, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jun. 19, 1984, Ser. No. 622,281
Term of patent 14 years
U.S. Cl. D12—163



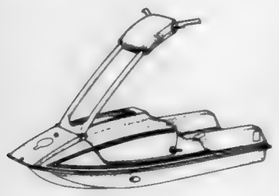
287,844
FRONT FENDER FOR AN AUTOMOBILE
Kintaro Matsumoto, Hino; Mitsuo Kato, and Hideto Kikuchi, both of Hachioji, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Aug. 7, 1984, Ser. No. 638,654
Term of patent 14 years
U.S. Cl. D12—184



287,845
FRONT FENDER FOR AN AUTOMOBILE
Kintaro Matsumoto, Hino; Mitsuo Kato, and Hideto Kikuchi, both of Hachioji, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Aug. 7, 1984, Ser. No. 638,655
Term of patent 14 years
U.S. Cl. D12—184



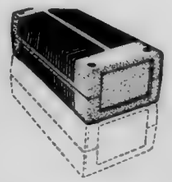
287,846
MOTORBOAT
Hiroshi Nishida, Hyogo, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan
Filed Mar. 1, 1984, Ser. No. 585,168
Term of patent 14 years
U.S. Cl. D12—307



287,847
PONTOON
William Bobinac, 124 Letcher Street, Sault Ste. Marie, Ontario P6C 4X8, Canada
Filed May 7, 1984, Ser. No. 607,775
Term of patent 14 years
U.S. Cl. D12—317



287,848
MODULAR POWER SUPPLY HOUSING
Leroy B. Keely, Portola Valley; Diab E. Freige, Los Altos, and Michael J. Nuttall, Palo Alto, all of Calif., assignors to Convergent Technologies, Inc., San Jose, Calif.
Filed May 8, 1984, Ser. No. 608,065
Term of patent 14 years
U.S. Cl. D13—11



287,849
COMMUNICATIONS HEADSET
Kieran O'Malley, Louisburgh; John Preisler, Riverside, and Bernie Larkin, Callan, all of Ireland, assignors to Northern Telecom Limited, Montreal, Canada
Filed Sep. 21, 1984, Ser. No. 653,129
Claims priority, application Canada, Mar. 23, 1984, 23-03-84-1
Term of patent 14 years
U.S. Cl. D14—36

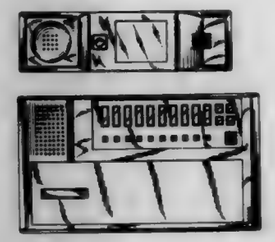


287,850
TELEPHONE SET
Eric J. Marshall, London, England, assignor to The Marshall Telephone Corporation Limited, Kent, England
Filed Mar. 2, 1984, Ser. No. 585,865
Term of patent 14 years
U.S. Cl. D14—53





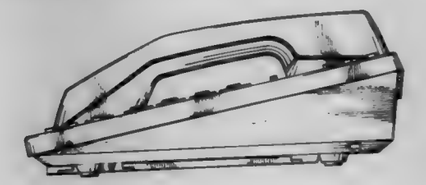
287,851
HANDSET AND STAND TELEPHONE UNIT
Winter W. Y. Hoi, Kowloon, Hong Kong, assignor to Elec & Eltek Company Limited, Kowloon, Hong Kong
Filed Jul. 25, 1984, Ser. No. 634,413
Claims priority, application United Kingdom, Jan. 25, 1984, 1017504
Term of patent 14 years
U.S. Cl. D14—53





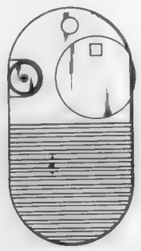
287,852
TELEPHONE STATION SET
Wilbert C. Brown, Fairfield, and Philip B. Saba, Trumbull, both of Conn., assignors to TIE/Communications, Inc., Shelton, Conn.
Filed May 3, 1984, Ser. No. 606,891
Term of patent 14 years
U.S. Cl. D14—58



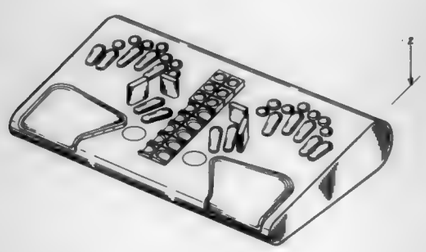




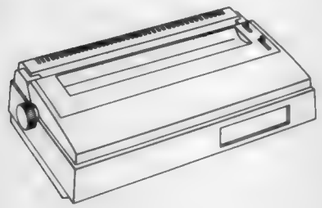
287,853
RADIO
Paul F. Siegel, Ridgefield, Conn., assignor to Sun Hill Industries, Inc., Stamford, Conn.
Filed Sep. 28, 1984, Ser. No. 656,099
Term of patent 14 years
U.S. Cl. D14—70



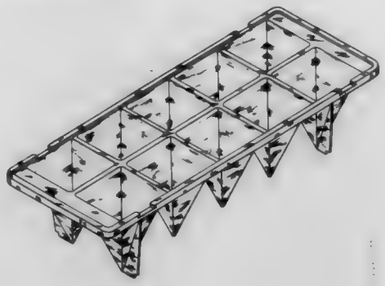
287,854
KEYBOARD
Jay A. Crews, 721 Johnson Ave., San Luis Obispo, Calif. 93401
Filed Feb. 21, 1984, Ser. No. 581,588
Term of patent 14 years
U.S. Cl. D14—100



287,855
PRINTER
Toshio Yamamoto, Kanagawa, Japan, assignor to Ricoh Company Ltd., Japan
Filed Oct. 1, 1984, Ser. No. 656,449
Claims priority, application Japan, Mar. 30, 1984, 59-012392
Term of patent 14 years
U.S. Cl. D14—111



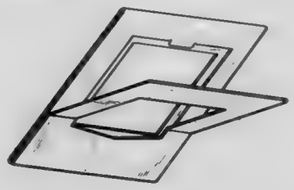
287,856
ICE CUBE TRAY
Ray F. Stewart, 2567 Hampton Ave., Redwood City, Calif. 94061
Filed Sep. 19, 1983, Ser. No. 533,307
Term of patent 14 years
U.S. Cl. D15—90



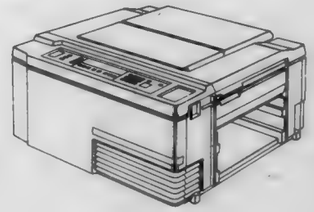
287,857
CUTTER FOR A SHEET OF FILM, PAPER, PLASTIC OR THE LIKE
Junichi Inoue, Tokyo, Japan, assignor to Yotsuwa Sangyo & Co., Ltd., Tokyo, Japan
Filed Apr. 10, 1984, Ser. No. 598,586
Claims priority, application Japan, Oct. 18, 1983, 58-44886
Term of patent 14 years
U.S. Cl. D15—139



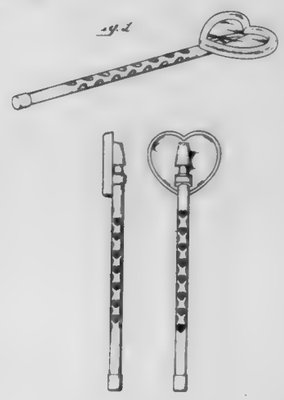
287,858
TRANSPARENCY MOUNT FOR OVERHEAD PROJECTORS
Arild O. Gautestad, Ploummeveien 5A, N-4600 Kristiansand S., Norway
Filed Feb. 22, 1983, Ser. No. 468,206
Claims priority, application Norway, Aug. 19, 1982, 63.191
Term of patent 14 years
U.S. Cl. D16—26



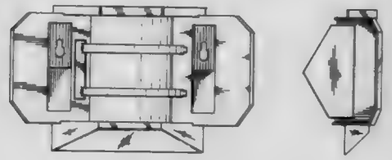
287,859
ELECTROPHOTOGRAPHIC COPYING MACHINE
Masanori Hashimoto, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Jun. 26, 1984, Ser. No. 624,582
Claims priority, application Japan, Dec. 26, 1983, 58-056764
Term of patent 14 years
U.S. Cl. D16—31



287,860
PEN
Susan McShirley, 4216½ Glencoe Ave., Marina del Rey, Calif. 90292
Filed Nov. 26, 1984, Ser. No. 674,980
Term of patent 14 years
U.S. Cl. D19—42



287,861
FLIP CARD FILE HOLDER
Calvin G. Husbands, 7237 SW. Canyon Dr., Portland, Oreg. 97225
Filed Mar. 30, 1984, Ser. No. 595,048
Term of patent 14 years
U.S. Cl. D19—76



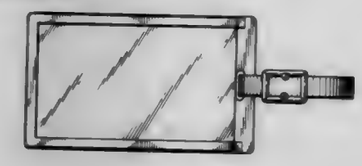
287,862
DESK TRAY
Mark W. Hauser, Hudson, Wis., and David C. Windorski, Cottage Grove, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Aug. 1, 1984, Ser. No. 636,726
Term of patent 14 years
U.S. Cl. D19—78



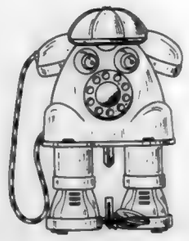
287,863
VENDING MACHINE FOR BEVERAGES OR THE LIKE
Louis A. Cedrone, Eastchester, and Bruce J. Vahjen, Yorktown Heights, both of N.Y., assignors to PepsiCo, Inc., Purchase, N.Y.
Filed Nov. 3, 1983, Ser. No. 548,509
Term of patent 14 years
U.S. Cl. D20—5



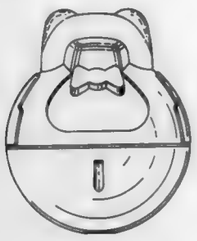
287,864
IDENTIFICATION CARDHOLDER
Alan J. Perfect, Crosswicks, N.J., assignor to LaFrance Corporation, Philadelphia, Pa.
Filed Apr. 6, 1984, Ser. No. 598,180
Term of patent 14 years
U.S. Cl. D20—27



287,865
TELEPHONE FIGURE PULL TOY
Mario Colnaghi, Cislano, Italy, assignor to Eurostil, S.r.l., Arluno, Italy
Filed May 30, 1984, Ser. No. 615,120
Term of patent 14 years
U.S. Cl. D21—111



287,866
ACTION TOY
Harry S. Thomson, Richmond; David M. Raffo, and John A. Pape, both of Hitchin, all of England, assignors to Hestair Kiddicraft Limited, Couldson, England
Filed Feb. 19, 1985, Ser. No. 702,485
Claims priority, application United Kingdom, Jan. 14, 1985, 1024388
Term of patent 14 years
U.S. Cl. D21—150



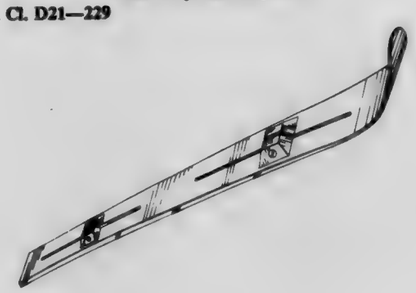
287,867
BAR EXERCISER
Larry D. Wollersheim, Aspen, Colo., assignor to Charles of the Ritz Group Ltd., New York, N.Y.
Filed Apr. 6, 1984, Ser. No. 597,703
Term of patent 14 years
U.S. Cl. D21—198



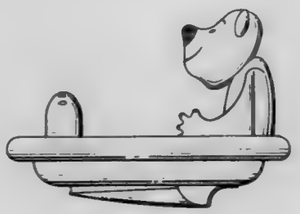
287,868
SPORTING GAME ARTICLE
Milton H. Whaley, 2000 Bidwell Way, Sacramento, Calif. 95818
Filed Jun. 11, 1984, Ser. No. 619,670
Term of patent 14 years
U.S. Cl. D21—196



287,869
SKI
Andrej Robic, Radovljica, Yugoslavia, assignor to Flan Tovarna Sportnega Orodja n.sol.o., Begunje na Gorenjskem, Yugoslavia
Filed Aug. 8, 1984, Ser. No. 638,687
Term of patent 14 years
U.S. Cl. D21—229



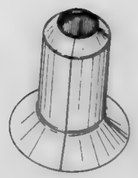
287,870
INFANT'S SWIMMING POOL FLOAT
Henry S. Wolfe, P.O. Box 6025, Clearwater, Fla. 33518
Filed Dec. 12, 1984, Ser. No. 680,973
Term of patent 14 years
U.S. Cl. D21—237



287,871
SEISMIC GAS SHUT-OFF VALVE
David E. Ritchie, 6166 Palo Alto Dr., Anaheim Hills, Calif. 92807, and Edward E. Seay, 881 Nordlea, Anaheim, Calif. 92806
Filed Apr. 2, 1984, Ser. No. 595,693
Term of patent 14 years
U.S. Cl. D23—19



287,872
SEALING DEVICE FOR SURROUNDING THE POINT OF EMERGENCE OF A PIPE FROM A WALL OR FLOOR
Stellan Eriksson, Sollebrunn, Sweden, assignor to Indoor Innovation Aktiebolag, Ludvika, Sweden
Filed Dec. 2, 1983, Ser. No. 557,526
Term of patent 14 years
U.S. Cl. D23—40



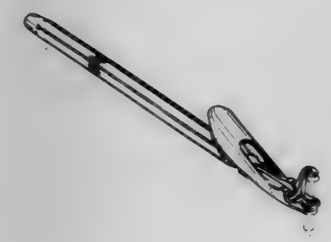
287,873
POLLUTANT COLLECTOR FOR CLEANING AIR RISING FROM KEROSENE HEATER
Nathan J. Gillotti, Danbury, Conn., assignor to Spinair Corporation, Danbury, Conn.
Filed Jan. 20, 1984, Ser. No. 572,473
Term of patent 14 years
U.S. Cl. D23—127



287,874
COMBINED HOLDER AND DISPENSER FOR DENTAL COMPOSITE MATERIAL CARTRIDGE
William J. Blatherwick, Hamilton Square; Leslie Hamilton, Trenton, and Robert D. Holewinski, Lakehurst, all of N.J., assignors to Johnson & Johnson Dental Products Company, East Windsor, N.J.
Filed Dec. 3, 1984, Ser. No. 677,428
Term of patent 14 years
U.S. Cl. D24—10



287,875
COMBINED HOLDER AND DISPENSER FOR DENTAL COMPOSITE MATERIAL CARTRIDGE
William J. Blatherwick, Hamilton Square; Leslie Hamilton, Trenton, and Robert D. Holewinski, Lakehurst, all of N.J., assignors to Johnson & Johnson Dental Company, East Windsor, N.J.
Filed Dec. 3, 1984, Ser. No. 677,646
Term of patent 14 years
U.S. Cl. D24—10



287,876
SINGLE DOSE CARTRIDGE FOR DENTAL COMPOSITE MATERIAL

William J. Blatherwick, Hamilton Square; Leslie Hamilton, Trenton, and Robert D. Holewinski, Lakehurst, all of N.J., assignors to Johnson & Johnson Dental Company, East Windsor, N.J.

Filed Dec. 3, 1984, Ser. No. 677,653
Term of patent 14 years
U.S. Cl. D24—10



287,877
DENTAL SYRINGE

Robert D. Holewinski, Lakehurst; Edward A. Weissenburger, Mercerville, and William J. Blatherwick, Hamilton Square, all of N.J., assignors to Johnson & Johnson Dental Products Company, East Windsor, N.J.

Filed Jul. 20, 1984, Ser. No. 632,971
Term of patent 14 years
U.S. Cl. D24—14



287,878
SPHYGMOMANOMETER UNIT FOR BLOOD PRESSURE MEASURING SYSTEMS

Donald H. Peeler, Pittsford, N.Y., assignor to Nalge Company, Saddle Brook, N.J.

Filed Feb. 9, 1983, Ser. No. 465,287
Term of patent 14 years
U.S. Cl. D24—21



287,879
ELECTROSURGICAL HANDLE

Charles R. Braxton, Boulder; Alan Z. Puszman, Lyons, and William A. Johnk, Boulder, all of Colo., assignors to Valleylab, Inc., Boulder, Colo.

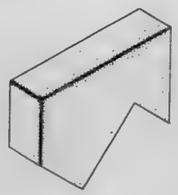
Filed Sep. 10, 1984, Ser. No. 649,242
Term of patent 14 years
U.S. Cl. D24—30



287,880
NOSE TAMPON

Donald E. Doyle, 9201 Sunset Blvd., Ste. 611, Los Angeles, Calif. 90069

Filed Feb. 23, 1984, Ser. No. 582,962
Term of patent 14 years
U.S. Cl. D24—51



287,881
INCONTINENCE PAD

Maj I. Ternström, Mölnlycke, Sweden, assignor to Molnlycke Aktiebolag, Gothenburg, Sweden

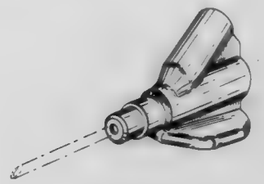
Filed Oct. 16, 1984, Ser. No. 663,044
Claims priority, application Sweden, Apr. 18, 1984, 84-1285
Term of patent 14 years
U.S. Cl. D24—51



287,882
NEEDLE HUB

Dean M. Glash, McHenry; Robert J. Kruger, Arlington Heights; Steven L. Olson, McHenry, all of Ill., and Richard L. West, Salem, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 15, 1983, Ser. No. 485,544
The portion of the term of this patent subsequent to Jan. 27, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—61



287,883
STORE FRONT

Afra Bianchi Scarpa, and Tobia Scarpa, both of Trevignano, Italy, assignors to Centro Studi e Servizi Moda di Paolo Bertagnin & C. S.A.S., Treviso, Italy

Division of Ser. No. 537,792, Sep. 20, 1983. This application Jun. 13, 1985, Ser. No. 744,519
Claims priority, application Italy, Apr. 1, 1983, 21345/83[U]
Term of patent 14 years
U.S. Cl. D25—9

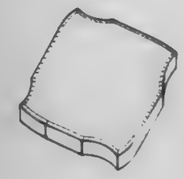




287,884
PAVING STONE

Rolf Scheiwiller, Lindeneggweg 10, CH-3645 Gwatt, Switzerland

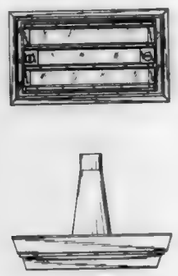
Filed Jul. 1, 1983, Ser. No. 510,219
Claims priority, application Switzerland, Jan. 4, 1983, DMA/066170
Term of patent 14 years
U.S. Cl. D25—80



287,885
HURRICANE LAMP
Pierre-Yves Bolduc, 8420 Melrose Pl., Los Angeles, Calif. 90069
Filed Sep. 26, 1983, Ser. No. 535,720
Term of patent 14 years
U.S. Cl. D26—11



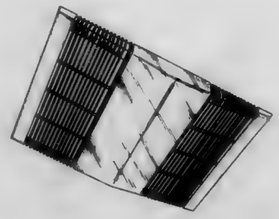
287,886
MOTORCYCLE LIGHT
Gordon E. McMahon, 7400 NW. 31st, Bethany, Okla. 73008
Continuation-in-part of Ser. No. 501,178, Jun. 6, 1983. This application Jul. 30, 1984, Ser. No. 635,850
Term of patent 14 years
U.S. Cl. D26—28



287,887
BICYCLE HEAD LIGHT
Sadaharu Tsuyama, Osaka, Japan, assignor to Tsuyama Mfg. Co., Ltd., Japan
Filed Apr. 20, 1984, Ser. No. 602,618
Claims priority, application Japan, Nov. 14, 1983, 58-49534
Term of patent 14 years
U.S. Cl. D26—29



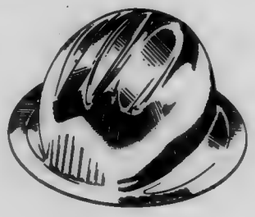
287,888
COMBINATION CEILING LIGHT AND VENT GRILLE
Dennis B. Castor, Cincinnati, and John W. Harper, Hamilton, both of Ohio, assignors to NuTone Inc., Cincinnati, Ohio
Filed Feb. 23, 1984, Ser. No. 582,943
Term of patent 14 years
U.S. Cl. D26—59



287,889
COLLAPSIBLE LAMPSHADE
Paul Goldstein, 5810 Cowen Pl. NE., Seattle, Wash. 98105
Filed Sep. 6, 1984, Ser. No. 648,120
Term of patent 14 years
U.S. Cl. D26—118



287,890
LUMINAIRE REFLECTOR
Hendrik A. J. De Vos, Swansea, Mass., assignor to GTE Products Corporation, Stamford, Conn.
Filed Nov. 7, 1984, Ser. No. 669,274
Term of patent 14 years
U.S. Cl. D26—118

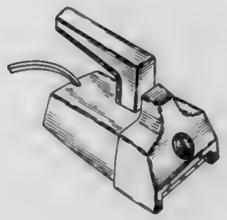


287,891
HEAD ORNAMENT
Mario P. Cavaliere, 9219 W. Cermak Rd., North Riverside, Ill. 60546
Filed May 1, 1984, Ser. No. 605,946
Term of patent 14 years
U.S. Cl. D28—41

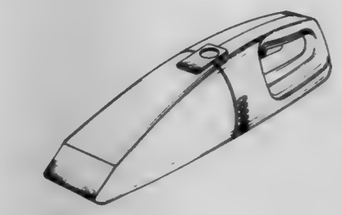




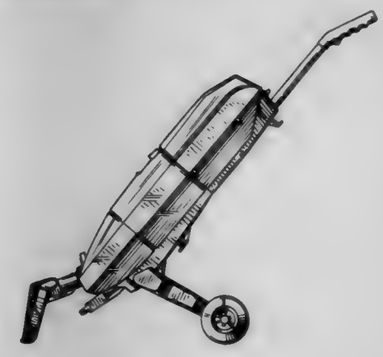
287,892
GARMENT STEAMER
Richard L. Rosa, Sebastopol, and Edward H. Gauer, Jr., Geyserville, both of Calif., assignors to Hybrinetics, Inc., Santa Rosa, Calif.
Filed Apr. 25, 1984, Ser. No. 603,620
Term of patent 14 years
U.S. Cl. D32—17



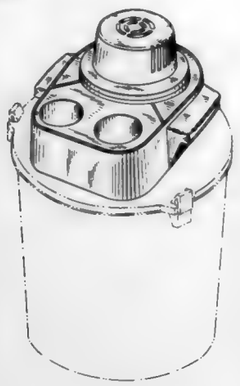
287,893
PORTABLE VACUUM CLEANER
Ichiro Fujii; Hiroshi Yajima, both of Osaka, and Toyomi Arita, Hyogo, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed May 15, 1984, Ser. No. 610,403
Claims priority, application Japan, Nov. 18, 1983, 58-50403
Term of patent 14 years
U.S. Cl. D32—21

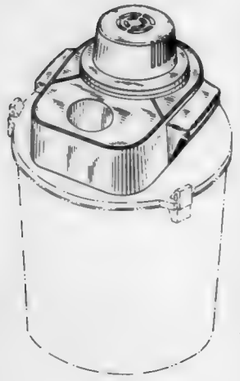


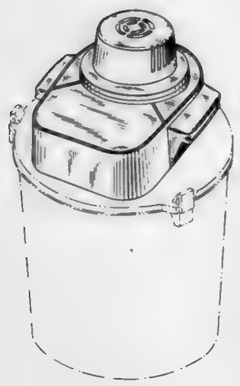
287,894
CARPET CLEANER
Donald E. Watkins, Parma, Ohio, and Frank P. Aadahl, Bound Brook, N.J., assignors to Regina Co. Inc., Rahway, N.J.
Filed Mar. 2, 1984, Ser. No. 585,729
The portion of the term of this patent subsequent to Jan. 27, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—22



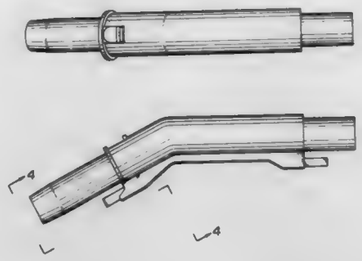
287,895
MOTOR HOUSING FOR CANISTER TYPE ELECTRIC VACUUM CLEANER
Robert C. Berfield, Jersey Shore; Ronald F. Meland, Muncy, and Robert L. Creviing, Jr., Williamsport, all of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.
Filed Jan. 18, 1984, Ser. No. 571,848
The portion of the term of this patent subsequent to Jan. 6, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—25



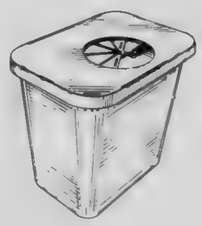




287,896
VACUUM CLEANER HOSE ADAPTER
Joseph Genoa, Freeport; Harold Kaskel, Long Beach, both of N.Y., and Carl Nelson, Wyckoff, N.J., assignors to Atlantic Vacuum Parts Corp., Long Beach, N.Y.
Filed Sep. 7, 1984, Ser. No. 648,642
Term of patent 14 years
U.S. Cl. D32—32



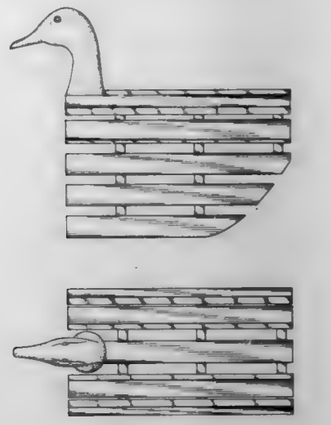
287,897
NEEDLE/SYRINGE COLLECTION CONTAINER
Paul H. Haniffl, Barrington, Ill., assignor to Sage Products, Inc., Cary, Ill.
Filed Aug. 17, 1984, Ser. No. 642,041
Term of patent 14 years
U.S. Cl. D34—1

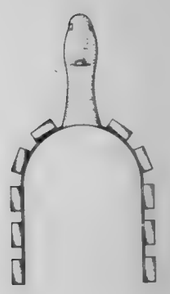


287,898
DOOR CONTROLLED FLAG FOR MAILBOX
Henry P. Carter, 412 S. Broadway, Grove, Okla. 74344
Continuation-in-part of Ser. No. 541,885, Oct. 14, 1983. This application Mar. 7, 1985, Ser. No. 709,829
Term of patent 14 years
U.S. Cl. D99—29



287,899
MAILBOX COVER
Thom Lindheimer, Rte. 1, P.O. Box 240, Castle Hayne, N.C. 28429
Filed Apr. 20, 1984, Ser. No. 602,283
Term of patent 14 years
U.S. Cl. D99—30





LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF JANUARY, 1987

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. G. Busch & Co., Inc.: *See*—
Carr, Francis L.; and Terrill, Larry R., 4,638,236, Cl. 320-21.000.

A/S Ingeniorgruppen AF: *See*—
Edberg, Dan O., 4,637,561, Cl. 241-154.000.

Aagaard, Paul M., to Chevron Research Company. Barbed anchor pile. 4,637,757, Cl. 405-227.000.

Aas, Ants J.: *See*—
Teder, Leonid O.; Org, Tiit A.; Lauri, Vaino G.; and Aas, Ants J., 4,637,102, Cl. 24-642.000.

AB A. K. Eriksson: *See*—
Jansson, Kurt, 4,637,443, Cl. 144-39.000.

AB Bahco Ventilation: *See*—
Enberg, Helge, 4,637,302, Cl. 98-115.300.

Abe, Ryozo: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yoshihara, Kenji; and Haneji, Yasuo, 4,638,376, Cl. 358-342.000.

Abe, Shinichi; and Mizuno, Toshiaki, to Toyota Jidosha Kabushiki Kaisha. Method for controlling air-fuel ratio for internal combustion engine and apparatus therefor. 4,637,364, Cl. 123-492.000.

Abe, Shuichi: *See*—
Watabe, Masaya; and Abe, Shuichi, 4,638,429, Cl. 364-200.000.

Abe, Wataru: *See*—
Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kobayashi, Kazuo; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Yoichiro; and Abe, Wataru, 4,637,884, Cl. 252-12.000.

Abex Corporation: *See*—
Frank, Earl E., 4,637,578, Cl. 246-391.000.

ABG Semca: *See*—
Decima, Fredy, 4,637,472, Cl. 169-35.000.

Abo, Mituyosi: *See*—
Kimizuka, Norio; Sogabe, Akira; and Abo, Mituyosi, 4,638,421, Cl. 364-167.000.

Abou-Gharbia, Magid A.; Freed, Meier E.; and Colatsky, Thomas J., to American Home Products Corporation. Antiarrhythmic agents. 4,638,008, Cl. 514-411.000.

Abramovitz, Irwin J.; Berg, Norman J.; and Casseday, Michael W., to United States of America, Army. Acousto-optic diffraction and signal mixing device. 4,637,688, Cl. 350-358.000.

Acampora, Anthony; and Gans, Michael J., to AT&T Bell Laboratories. Technique for dynamic resource allocation in a communication system. 4,638,476, Cl. 370-83.000.

Access Learning Technology Corporation: *See*—
Whitney, David R.; and Whitney, Ronald B., 4,637,797, Cl. 434-118.000.

Acker, Franklin L., to Neway Manufacturing, Inc. Hand-operated valve refacer. 4,637,762, Cl. 408-203.500.

Acock, George W., Jr., to Rhodes, James A. Elevator air lock. 4,637,176, Cl. 52-30.000.

Adachi, Shigeo: *See*—
Yanagiuchi, Noboru; Adachi, Shigeo; Inoue, Masatoshi; Takata, Hiroshi; and Matsuda, Toyoshi, 4,637,270, Cl. 74-336.500.

Adams, Philip E.; McGowan, Michael J.; and Yunan, Malak E., to Du Pont de Nemours, E. I., and Company. Explosive primer and carrier therefor. 4,637,312, Cl. 102-275.120.

ADB-Alnaco, Inc.: *See*—
Trainor, Willis H., 4,638,411, Cl. 362-145.000.

Adelman, Roger A. Method for quantitatively measuring a hearing defect. 4,637,402, Cl. 128-746.000.

Adorjan, Alexander S., to Exxon Production Research Co. Pipeline system with encapsulated insulation. 4,637,637, Cl. 285-47.000.

Advanced Micro Devices, Inc.: *See*—
Miller, Michael J., 4,638,300, Cl. 340-347.0DD.

Aeroquip Corporation: *See*—
Fournier, Paul J. E.; and Reinker, Joseph F., Jr., 4,637,640, Cl. 285-319.000.

Aesculap-Werke AG: *See*—
Caspar, Wolfhard; Lutze, Theodor; and Kienzle, Karl-Ernst, 4,637,395, Cl. 128-334.00R.

Affarsverket FFV: *See*—
Lobell, Hans; Svensson, Klas G.; Gladh, Goran; and Hoglander, Bjorn, 4,637,213, Cl. 60-685.000.

Agency of Industrial Science and Technology: *See*—
Fukuda, Tsuguo; and Terashima, Kazutaka, 4,637,854, Cl. 156-607.000.
Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kobayashi, Kazuo; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Yoichiro; and Abe, Wataru, 4,637,884, Cl. 252-12.000.

Agfa-Gevaert AG: *See*—
Hofmann, Wilfried, 4,638,336, Cl. 346-140.00R.

Aguet, Emile, to Sulzer Brothers Limited. Combined hot air turbine and steam power plant. 4,637,212, Cl. 60-655.000.

Ahola, Raimo; and Myllyla, Risto. Procedure for analyzing reciprocating motion. 4,637,727, Cl. 356-373.000.

Aichi Steel Works, Ltd.: *See*—
Saito, Tsutomu; Hasegawa, Yoshimichi; Yoshikawa, Kazuo; and Aoyama, Shigetsune, 4,637,594, Cl. 267-47.000.

Air Products and Chemicals, Inc.: *See*—
Shenoy, Thirthahalli A.; and Winters, Arthur R., Jr., 4,637,216, Cl. 62-54.000.

Aisin Seiki Kabushikikaisha: *See*—
Umebayashi, Kazuyuki; and Yamada, Takahiro, 4,638,287, Cl. 160-22.000.

Aiura, Hirochika: *See*—
Shirayanagi, Moriyasu; Shindo, Osamu; Aiura, Hirochika; and Hara, Tadao, 4,637,720, Cl. 356-125.000.

Aizaki, Yoshihiko, to Fujitsu Limited. Cash processing system. 4,638,434, Cl. 364-401.000.

Akeel, Hadi A., to GMF Robotics Corporation. Robot-laser system. 4,638,143, Cl. 215-121.0LQ.

Akerlund, Mats P.; and Stromback, Ture J., to U.S. Philips Corporation. Stray pulse eliminating device. 4,638,301, Cl. 340-347.0CC.

Akers, Alvin: *See*—
McMillan, Stephen L.; Akers, Alvin; and Toma, Daniel N., 4,637,231, Cl. 68-4.000.

Akita, Shigeyuki: *See*—
Tanaka, Hiroaki; and Akita, Shigeyuki, 4,638,249, Cl. 324-166.000.

Akiyama, Teruo; Sasaki, Katsuyuki; and Saigo, Takaichi, to Kabushiki Kaisha Komatsu Seisakusho. Torque regulating system for fluid operated pump displacement control systems. 4,637,781, Cl. 417-216.000.

Aktiebolaget Bofors: *See*—
Svensson, Leif; Nyqvist, Jan-Olof; and Westling, Lars, 4,638,065, Cl. 544-196.000.

Aktiebolaget Hassle: *See*—
Szelke, Michael; and Jones, David M., 4,638,047, Cl. 530-332.000.

Akutsu, Mitsuru, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic head pressure pad device. 4,638,392, Cl. 360-130.320.

Albert, Richard: *See*—
Haim, Elias S.; and Albert, Richard, 4,637,687, Cl. 350-335.000.

Alberta Energy Company Ltd.: *See*—
Schramm, Laurier L., 4,637,417, Cl. 137-4.000.

Albrecht, Joachim; and Duerig, Thomas, to BBC Brown Boveri & Company Limited. Composite material in rod, tube, strip, sheet or plate shape with reversible thermomechanical properties and process for its production. 4,637,962, Cl. 428-616.000.

Albrecht, Konrad: *See*—
Heinrich, Rudolf; and Albrecht, Konrad, 4,638,090, Cl. 564-437.000.

Alcan International Limited: *See*—
Jeffrey, Paul W.; and Marchand, Gilles, 4,637,842, Cl. 148-12.70A.

Alcombright, Daniel S.: *See*—
Ouellette, William R.; Alcombright, Daniel S.; Curro, John J.; and Linman, E. Kelly, 4,637,819, Cl. 604-369.000.

Aldridge, Clyde L.: *See*—
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,637,870, Cl. 208-112.000.
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,637,871, Cl. 208-112.000.

Aleman, Javier. Carrying strap for cameras and the like. 4,637,535, Cl. 224-202.000.

Alexander, Jonathan W., to Tocco, Inc. Power inverter. 4,638,418, Cl. 363-49.000.

Alexander, Kenneth L., to Omark Industries, Inc. Combination ammunition reloading die. 4,637,291, Cl. 86-23.000.

Alexis, Roger P. J., to U.S. Philips Corporation. Method of two-way radiocommunication between fixed stations and mobile stations. 4,638,479, Cl. 370-95.000.

Alfred Bolz GmbH & Co. KG: *See*—
Boos, Gunther, 4,637,760, Cl. 406-105.000.

Algeo, John W.: *See*—
Johnson, Richard K.; and Algeo, John W., 4,637,818, Cl. 604-39.000.

Algoma Hardwoods, Inc.: *See*—
Ellsworth, Wendell E.; and Birdsall, Raymond P., 4,637,182, Cl. 52-211.000.

All-Steel Canada Ltd.: *See*—
Worrell, Williams R.; Laroche, Robert N.; and Armstrong, Michael J., 4,637,666, Cl. 312-196.000.

Allen-Bradley Company: *See*—
Simonsen, Glenn H.; and Klotz, Clayton J., 4,637,676, Cl. 339-113.00R.

Allen-Bradley Company, Inc.: *See*—
Schultz, Ronald E.; Schmidt, Otomar; and Johnston, David A., 4,638,452, Cl. 364-900.000.

Allen, Thomas P. Multi-purpose collapsible hand saw. 4,637,141, Cl. 30-512.000.

Alley, Lewis F.: *See*—
White, James E.; Alley, Lewis F.; Anderson, James E.; and Birdsell, Jackie D., 4,637,936, Cl. 426-523.000.

Allied Corporation: *See*—
Boggs, Beryl A., 4,637,286, Cl. 83-175.000
Brown, G. Emerson, 4,637,662, Cl. 303-6.00R.
Carp, Ralph W., 4,637,251, Cl. 73-118.200.
Krull, Ulrich J.; and Thompson, Michael, 4,637,861, Cl. 204-1.00T.
Lewis, Richard J., 4,637,596, Cl. 267-160.000.
Yeh, Lun-Shu R.; Grenness, Morten; and Fuller, Robert J., 4,637,970, Cl. 429-153.000.

Almblad, Donald F. Key and retainer card combination. 4,637,236, Cl. 70-458.000.

Alps Electric Co., Ltd.: *See*—
Hatanai, Takashi; Nakashima, Keishi; and Mukasa, Koichi, 4,638,391, Cl. 360-125.000.
Mukasa, Koichi; Hatanai, Takashi; Nakashima, Keishi; and Onishi, Kazumasa, 4,638,387, Cl. 360-122.000.
Ueno, Moriaki, 4,638,264, Cl. 331-117.00D.

Alsthom: *See*—
Obrecht, Georges; and Dreuilhe, Claude, 4,637,480, Cl. 175-45.000.

Altendorfer, Alois; Dotzauer, Ewald; and Mueller, Wolfgang, to Siemens Aktiengesellschaft. Circuit arrangement for a small PABX with a switching matrix that has electronic crosspoints. 4,638,123, Cl. 379-229.000.

Althaus, Hans-Ludwig; Klann, Jorg; and Kuny, Wilhelm, to Siemens Aktiengesellschaft. Optical radiation source or detector device having plural radiating or receiving characteristics. 4,638,343, Cl. 357-17.000.

Alvi, Javid R. Test tube protector. 4,637,520, Cl. 215-320.000.

AMA Universal S.p.A.: *See*—
Zucchini, Guido, 4,637,232, Cl. 68-18.00R.

Amano, Naoki; Kayaba, Hitoshi; and Kikuchi, Takehiro, to Hitachi, Ltd. Gas-insulated switchgear apparatus. 4,638,403, Cl. 361-341.000.

Amchem Products, Inc.: *See*—
Hall, Wilbur S., 4,637,839, Cl. 148-6.200.

American Can Company: *See*—
Karas, Richard J.; and LaRosa, John, 4,637,117, Cl. 29-527.400.

American Cyanamid Company: *See*—
Los, Marinus, 4,638,068, Cl. 546-169.000.

American Filtrona Corporation: *See*—
Berger, Richard M., 4,637,409, Cl. 131-336.000.

American Home Products Corporation: *See*—
Abou-Gharbia, Magid A.; Freed, Meier E.; and Colatsky, Thomas J., 4,638,008, Cl. 514-411.000.

American Motors Corporation: *See*—
Wu, Leonard L., 4,637,091, Cl. 15-250.340.

American Science and Engineering, Inc.: *See*—
Keller, Franz, 4,638,314, Cl. 340-870.020.

Amerock Corporation: *See*—
Boda, John W., 4,637,582, Cl. 248-315.000.

Ametek, Inc.: *See*—
Kalagidis, Memorial, 4,638,197, Cl. 310-67.00R.

Amoco Corporation: *See*—
Forgac, John M.; and Hoekstra, George R., 4,637,464, Cl. 166-261.000.
Kelsey, Donald R., 4,638,044, Cl. 528-125.000.
Mossman, Allen B., 4,638,098, Cl. 568-630.000.

AMP Incorporated: *See*—
Barkus, Lee A., 4,637,677, Cl. 339-274.000.
Coller, James R.; Coon, Paul A.; and Goodman, Joseph R., 4,637,670, Cl. 339-46.000.
Grabbe, Dimitry G., 4,637,135, Cl. 29-832.000.
Kobler, Robert J., 4,637,674, Cl. 339-94.00M.
Loose, Winfield W., 4,637,675, Cl. 339-97.00R.

Ampex Corporation: *See*—
Lee, Patrick S., 4,638,230, Cl. 318-632.000.

Amsted Industries Incorporated: *See*—
Moehling, Charles; and Henkel, James A., 4,637,319, Cl. 105-207.000.

Amtel, Inc.: *See*—
Pollack, Jack, 4,637,335, Cl. 114-230.000.

Andeen, Gerry B.; Shrader, Eric J.; and Kornbluh, Roy D., to SRI International. Slip sensing method and apparatus. 4,637,736, Cl. 374-45.000.

Andeen, Gerry B., to SRI International. Fluid motor-pumping apparatus and method for energy recovery. 4,637,783, Cl. 417-318.000.

Anderson, James E.: *See*—
White, James E.; Alley, Lewis F.; Anderson, James E.; and Birdsell, Jackie D., 4,637,936, Cl. 426-523.000.

Anderson, Paul J.: *See*—
Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Anderson, Paul J.; and Hudson, Bertram J., 4,637,403, Cl. 128-770.000.

Anderson Strathclyde PLC: *See*—
Tomlinson, James E., 4,637,510, Cl. 198-735.000.

Ando, Takao: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,637,998, Cl. 514-42.000.

Ando, Toshiharu; and Tsuchihashi, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Epoxy resin composition. 4,638,021, Cl. 523-457.000.

Anelva Corporation: *See*—
Asamaki, Tatsuo; and Kato, Takao, 4,638,209, Cl. 313-359.100.

Ammin Manufacturing Co., Ltd.: *See*—
Maekawa, Taijiro; and Fujino, Yukio, 4,637,947, Cl. 428-68.000.

Anneken, James G. Means of isolating automobile blower intake from engine compartment and exhaust fumes. 4,637,297, Cl. 98-2.000.

Annipajo, Wolfgang; Breuer, Oswald; and Rassmann, Christoph. Cutters for use in mineral mining. 4,637,658, Cl. 299-79.000.

Anritsu Electric Company Limited: *See*—
Kikuchi, Kunio; Kamada, Fujio; and Osawa, Masao, 4,637,508, Cl. 198-365.000.

Ansteth, John J. Filter head for spin-off filters. 4,637,874, Cl. 210-232.000.

Anstey, Michael J.: *See*—
Brown, David F.; and Anstey, Michael J., 4,638,348, Cl. 357-74.000.

Anthony Manufacturing Corp.: *See*—
Ray, Charles A.; and Walker, Samuel C., 4,637,548, Cl. 239-201.000.

Aoki, Masayuki, to Kabushiki Kaisha Toshiba. Induction heat cooking apparatus. 4,638,135, Cl. 219-10.49R.

Aoki, Nobuo; and Kurosawa, Shinichiro, to Kowa Co., Ltd. Thrombin-binding substance and process for its production. 4,638,050, Cl. 530-413.000.

Aoki, Shinichiro: *See*—
Sugiyama, Yoshiyuki; Aoki, Shinichiro; and Morita, Yasuyuki, 4,637,256, Cl. 73-633.000.

Aoyama, Shigetsune: *See*—
Saito, Tsutomu; Hasegawa, Yoshimichi; Yoshikawa, Kazuo; and Aoyama, Shigetsune, 4,637,594, Cl. 267-47.000.

Apache Powder Company: *See*—
Ciaramitaro, David A.; Speltz, David J.; and Moore, Jack M., 4,637,848, Cl. 149-21.000.

Aprica Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,637,093, Cl. 16-35.00R.

Arai, Nobushige, to Sharp Kabushiki Kaisha. Selective absorption film of a solar heat collector. 4,637,374, Cl. 126-417.000.

Arai, Shoji; Tamano, Yutaka; and Hasegawa, Masazumi, to Toya Soda Manufacturing Co., Ltd. Process for producing high density elastic polyurethane using a combination of 4-methyl-1-(2-dimethylaminoethyl) piperazine together with another tertiary amine catalyst. 4,638,016, Cl. 521-129.000.

Archer, Wendel E.; Milton, James L.; Renaut, Paul W.; and Winquist, Nelson H., to AT&T Bell Laboratories. Relay switch apparatus. 4,638,274, Cl. 335-52.000.

Archibald, G. Kent; and Slaker, Frank A., to Minnesota Mining & Manufacturing Company. Sequence valve for piggyback IV administration with occlusion failure sensing. 4,637,817, Cl. 604-81.000.

Arii, Kazuhiro; Tanaka, Teruaki; Sumida, Nobuyuki; and Arisaka, Kouhei, to Daihen Corporation. Toroidal winding apparatus. 4,637,563, Cl. 242-4.00B.

Arikawa, Tetsuro, to Nippon A B S, Ltd. Anti-skid control apparatus for a vehicle braking system. 4,637,664, Cl. 303-111.000.

Arima, Hideo: *See*—
Kaneyasu, Masayoshi; Arima, Hideo; Ito, Mitsuko; Iwanaga, Shoichi; Sato, Nobuo; Noro, Takanobu; Ikagami, Akira; and Isogai, Tokio, 4,638,443, Cl. 364-497.000.

Arisaka, Kouhei: *See*—
Arii, Kazuhiro; Tanaka, Teruaki; Sumida, Nobuyuki; and Arisaka, Kouhei, 4,637,563, Cl. 242-4.00B.

Arkansas Patents, Inc.: *See*—
Davis, Robert E., 4,637,792, Cl. 431-1.000.

Armand, Michel: *See*—
Skotheim, Terje; and Armand, Michel, 4,637,969, Cl. 429-111.000.

Armstrong, Michael J.: *See*—
Worrell, Williams R.; Laroche, Robert N.; and Armstrong, Michael J., 4,637,666, Cl. 312-196.000.

Armstrong World Industries, Inc.: *See*—
Shannon, Paul J., 4,637,896, Cl. 252-299.700.

Arnold, Marc E.; and Marcus, Mitchell S., to Hasco International, Inc. System for package photoprinting. 4,637,712, Cl. 355-75.000.

Arora, Sudershan K.: *See*—
Rao, Chennupati K.; Arora, Sudershan K.; Grover, Raman; Durden, John A.; and D'Silva, Themistocles D. J., 4,637,901, Cl. 260-544.00C.

Arrigoni, Giordano. Apparatus for dispensing pigments. 4,637,527, Cl. 222-144.000.

Aruga, Masayoshi: *See*—
Konno, Yutaka; Kawata, Hiroitsu; Aruga, Masayoshi; Sonobe, Takashi; and Mitomi, Mitsuo, 4,637,930, Cl. 424-28.000.

Asahi Denka Kogyo Kabushiki Kaisha: *See*—
Terada, Kimio; Mori, Michio; Goto, Yoichi; Nakazawa, Takashi; Muto, Kunio; and Usami, Shozo, 4,637,937, Cl. 426-570.000.

Asai, Toshio; and Nakaya, Yasuhiro, to Fukuda Denshi Co., Ltd. Waterproof electrode for recording electrocardiogram. 4,637,399, Cl. 128-639.000.

Asakawa, Kenichi: *See*—
Iwamoto, Yoshinao; Shirasaki, Yuichi; Fujise, Masayuki; and Asakawa, Kenichi, 4,637,686, Cl. 350-96.290.

Asakuno, Hiroyoshi; Mori, Kinya; Suzuki, Kiyoaki; Nishida, Mamoru; Iwai, Kenji; Tamamushi, Masahiro; and Kawasaki, Teruo, to Chisso Corporation; and Nissan Motor Co. Ltd. Polypropylene interior parts for autocars. 4,638,030, Cl. 524-536.000.

Asamaki, Tatsuo; and Kato, Takao, to Anelva Corporation. Ion beam generating apparatus. 4,638,209, Cl. 313-359.100.

Asano, Hideo: *See*—
Fujiwara, Kenichi; Asano, Hideo; Hasada, Eiichi; Makida, Kazuhisa; and Iida, Akinori, 4,637,222, Cl. 62-244.000.

Asari, Akira; Matsumoto, Satoshi; Hattori, Shigeo; and Dosai, Takayoshi, to Kabushiki Kaisha Kobe Seiko Sho. Method for shaping aluminum wheel. 4,637,112, Cl. 29-159.010.

Asawa, Charles K., to TRW Inc. Method for aligning optical fiber connectors. 4,637,683, Cl. 350-96.180.

Ashahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Shirayanagi, Moriyasu; Shindo, Osamu; Aiura, Hirochika; and Hara, Tadao, 4,637,720, Cl. 356-125.000.

Ashihara, Hiromoto: *See*—
Tomita, Tomoya; Hiramoto, Sotozi; Okubo, Takesi; Matsuo, Kuniyuki; Ashihara, Hiromoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, 4,637,134, Cl. 29-741.000.

Aso, Toshiyuki: *See*—
Obara, Haruki; and Aso, Toshiyuki, 4,638,140, Cl. 219-69.00W.

Assadoullah, Assad: *See*—
Charles, Gilbert; Assadoullah, Assad; and Bernet, Jean-Marie, 4,637,733, Cl. 368-120.000.

Astner, Gunnar: *See*—
Thornblom, Jan; and Astner, Gunnar, 4,638,489, Cl. 373-24.000.

AT&T Bell Laboratories: *See*—
Acampora, Anthony; and Gans, Michael J., 4,638,476, Cl. 370-83.000.
Archer, Wendel E.; Milton, James L.; Renaut, Paul W.; and Winquist, Nelson H., 4,638,274, Cl. 335-52.000.
Bowers, John E., 4,638,483, Cl. 372-26.000.
Derkits, Gustav E., Jr.; and Harbison, James P., 4,637,129, Cl. 29-578.000.
Gordon, Eugene I., 4,637,685, Cl. 350-96.200.
Saari, Veikko R., 4,638,259, Cl. 330-253.000.

AT&T Technologies, Inc.: *See*—
Ling, Hung C.; Rhodes, Warren W.; and Yan, Man F., 4,637,989, Cl. 501-135.000.
Ling, Hung C.; and Yan, Man F., 4,638,401, Cl. 361-321.000.

Ateliers de Constructions Electriques de Charleroi (ACEC) Societe Anonyme: *See*—
Dufrasnes, Jean-Claude, 4,638,127, Cl. 200-11.00K.

Atkey, Richard E.; and Gilliland, Oscar E., to Dover Corporation. Elevator rail system. 4,637,496, Cl. 187-95.000.

Atlantic Research Corporation: *See*—
Nieder, Erin G., 4,637,847, Cl. 149-6.000.

Atlantic Richfield Company: *See*—
Beatty, Ronald L.; and Wyman, Floyd H., 4,637,924, Cl. 423-345.000.
Gay, Robert R., 4,638,111, Cl. 136-249.000.
Pominville, Douglas A., 4,637,824, Cl. 55-85.000.

Attenborough, Frank R.: *See*—
Bryant, Michael J.; Attenborough, Frank R.; Sykes, Christopher G.; and Cameron, Neil W., 4,638,469, Cl. 367-154.000.

Auch, Wilfried; and Schlemper, Eberhard, to International Standard Electric Corporation. Acoustooptical modulator and/or deflector. 4,638,266, Cl. 332-7.510.

Audi NSU Auto Union Aktiengesellschaft: *See*—
Bier, Axel, 4,638,174, Cl. 307-10.0LS.

Auerbach, Jeffrey I.; and Rosenberg, Martin, to SmithKline Beckman Corporation. Externalization of products of bacteria. 4,637,980, Cl. 435-68.000.

Austin, Theodore D.; and Consaga, John P., to United States of America, Navy. Radar reflecting electrolytes. 4,638,316, Cl. 342-14.000.

Automated Industrial Systems: *See*—
Latta, William A., Jr., 4,638,144, Cl. 219-121.0LH.

Automobiles Citroen: *See*—
Gillet, Guy, 4,637,741, Cl. 384-428.000.

Automobiles Peugeot: *See*—
Gillet, Guy, 4,637,741, Cl. 384-428.000.

Auweter, Helmut; Horn, Dieter; and Lueddecke, Erik, to BASF Aktiengesellschaft. Fiber-optical Doppler anemometer. 4,637,716, Cl. 356-28.500.

Avco Corporation: *See*—
Henderson, David; Hollowell, James A.; and Woodbury, Howard A., 4,637,313, Cl. 102-398.000.

Ayata, Kenzo; Narita, Kiichi; Mori, Takasuke; and Fujimoto, Takahiko, to Kabushiki Kaisha Kobe Seiko Sho. Method for the continuous production of cast steel strands. 4,637,453, Cl. 164-468.000.

Ayliffe, Peter J., to International Standard Electric Company. Method of addressing liquid crystal displays. 4,638,310, Cl. 340-805.000.

B. F. Goodrich Company, The: *See*—
Percec, Virgil, 4,638,039, Cl. 525-534.000.

Baartman, John L., III: *See*—
Steck, Robert F.; and Baartman, John L., III, 4,637,199, Cl. 53-451.000.

Babcock-Hitachi Kabushiki Kaisha: *See*—
Fukayama, Yukio, 4,637,348, Cl. 122-406.0ST.

Babitz, Jeffrey M. Device for positioning picture hangers on a wall surface. 4,637,583, Cl. 248-544.000.

Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Wynn, David K.; and Gregg, James R., to Dayton Reliable Tool & Mfg. Co. Shell for can ends. 4,637,961, Cl. 428-579.000.

Backstrom, Hans. Rotary pump with cutter device for contaminated fluids. 4,637,785, Cl. 418-48.000.

Badaracco, John A.; and Martin, Henry A. Tape cleaning machine. 4,637,088, Cl. 15-97.00R.

Badger, Christopher W.; Burdette, Everette C.; Leech, Steven C.; and McCarthy, John F., to Labthermics Technologies, Inc. Temperature control and analysis system for hyperthermia treatment. 4,638,436, Cl. 364-414.000.

Badiali, Roberto; Bertoli, Luciano; and Speranzin, Claudio, to Officine Savio SpA. Splicer device for the mechanical splicing of textile yarns. 4,637,205, Cl. 57-22.000.

Baer, Robert J., to RJB and C Company. Combined book and mirror. 4,637,631, Cl. 281-15.00R.

Baermann, Horst, to Max Baermann, G.m.b.H. Magnetic roll for copy machines and method for manufacturing same. 4,638,281, Cl. 335-303.000.

Baertsch, Richard D.: *See*—
Brown, Dale M.; Kim, Manjin J.; Baertsch, Richard D.; and Vogelsong, Thomas L., 4,638,400, Cl. 361-304.000.

Baier, Steven M.; Cirillo, Nicholas C., Jr.; Hanka, Steven A.; and Shur, Michael S., to Honeywell Inc. Gated transmission line model structure for characterization of field-effect transistors. 4,638,341, Cl. 357-15.000.

Baitz, Guenter; and Dobring, Wilfried, to Nixdorf Computer AG. Money box arrangement. 4,637,326, Cl. 109-49.000.

Baker, Kenneth R. Universal adjustable weld gauge. 4,637,142, Cl. 33-169.00D.

Baker, Stephen J.: *See*—
Bryant, Stewart F.; Baker, Stephen J.; and Cook, Richard A., 4,638,442, Cl. 364-489.000.

Balkus, Carl E. Gravel washer separator. 4,637,872, Cl. 209-453.000.

Ballard, Danny B., to Motorola, Inc. Emulating computer. 4,638,423, Cl. 364-200.000.

Baluteau, Jean-Michel; Saint-Sevin, Michel; and Chabanier, Patrick, to Societe d'Optique, Precision Electronique et Mecanique-Sopelem. Observation apparatus. 4,637,692, Cl. 350-486.000.

Banfield, Charles E., to Epoxy Technology, Inc. Method and compositions for removal of moisture. 4,637,197, Cl. 53-428.000.

Banno, Makoto: *See*—
Miyamae, Hiroshi; and Banno, Makoto, 4,637,690, Cl. 350-427.000.

Barbosa, Antonio B.; and de Campos, Joaquim C. Radiator bracket. 4,637,517, Cl. 211-86.000.

Barcus-Berry Electronics, Inc.: *See*—
Crooks, Robert C., 4,638,258, Cl. 330-149.000.

Bardo, Charles J.; Seawell, Jesse Q.; Dylewski, Anthony J.; and Clark, John L., Jr., to Ceramic Cooling Tower Company. Lightweight cooling tower. 4,637,903, Cl. 261-24.000.

Barker, Randall R. Diving helmet. 4,638,410, Cl. 362-105.000.

Barkley, Vincent. Alignment compensator for linear bearings. 4,637,738, Cl. 384-38.000.

Barkus, Lee A., to AMP Incorporated. Electrical connector. 4,637,677, Cl. 339-274.000.

Barlow, Dane D. Electroluminescent badge. 4,637,148, Cl. 40-1.500.

Barnett, Ronald E.; Zanno, Paul R.; and Roy, Glenn M., to General Foods Corporation. Cycloalkyl ethers and thioethers of dipeptides. 4,638,071, Cl. 549-88.000.

Baro, Gunter: *See*—
Scharpenberg, Rainer; and Baro, Gunter, 4,637,912, Cl. 376-245.000.

Bartch, Donald W.: *See*—
Deal, Samuel B.; and Bartch, Donald W., 4,638,213, Cl. 313-479.000.

Bartel, Peter: *See*—
Kleefeldt, Frank; and Bartel, Peter, 4,637,239, Cl. 70-264.000.

Barth, Rudiger, to Licentia Patent-Verwaltungs-GmbH. Control panel for a tape recorder. 4,638,389, Cl. 360-72.100.

Bartimes, George F.; and Blomquist, Leonard A., to Continental Plastic Containers, Inc. Label separator. 4,637,600, Cl. 271-93.000.

Barton, Scott N.: *See*—
Quinn, Bruce A.; and Barton, Scott N., 4,638,312, Cl. 340-825.350.

Barwasser, Gunther: *See*—
Kotting, Fritz; and Barwasser, Gunther, 4,637,168, Cl. 51-50.0PC.

BASF Aktiengesellschaft: *See*—
Auweter, Helmut; Horn, Dieter; and Lueddecke, Erik, 4,637,716, Cl. 356-28.500.
Bergmann, Udo; Hansen, Guenter; and Zeidler, Georg, 4,638,055, Cl. 534-678.000.
Broecker, Franz J.; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,638,085, Cl. 560-208.000.
Mueller, Herbert, 4,638,097, Cl. 568-617.000.

BASF Corporation: *See*—
Niu, Joseph H. Y.; and Schmolka, Irving R., 4,637,822, Cl. 44-51.000.
Reichel, Curtis J.; Levis, William W., Jr.; and Hartman, Robert J., 4,637,893, Cl. 252-182.000.

Basyouni, Mohamed: *See*—
Froening, Helmut; and Basyouni, Mohamed, 4,637,175, Cl. 52-27.000.

Battelle Corporation: *See*—
Gardner, David L., 4,637,905, Cl. 264-4.300.

Battiste, David R.; and Harris, Jesse R., to Phillips Petroleum Company. Pillared interlayered clays. 4,637,991, Cl. 502-68.000.

Baudro, Thomas O., to Proto-Power Corporation. Radiation shield. 4,638,166, Cl. 250-515.100.

Bauduin, Gerard; Boutevin, Bernard; Deiss, Willy-Jean; and Pietrasanta, Yves, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Acrylic telomers with grafts which can be cross linked by light, their synthesis and their applications in coating metals. 4,638,018, Cl. 522-103.000.

Bauer, Bernhard: *See—*
Olschewski, Armin; Bauer, Bernhard; Zirk, Elisabeth; and Heemskerk, Rut, 4,637,740, Cl. 384-425.000.
Olschewski, Armin; Bauer, Bernhard; and Zirk, Elisabeth, 4,637,806, Cl. 464-130.000.

Bauer, Peter: *See—*
Petermann, Harald; and Bauer, Peter, 4,637,369, Cl. 125-15.000.

Baum, Allen J.: *See—*
Draper, Robert; Lorentz, Donald G.; Baum, Allen J.; and Economy, George, 4,637,346, Cl. 122-4.00A.

Baum, Marcel, to Dragerwerk AG. Ventilation system having true valve control for controlling ventilation pressures. 4,637,386, Cl. 128-204.210.

Baumgartner, Richard A.; Dukes, John N.; and Fisher, George A., to Hewlett-Packard Company. Amplitude insensitive delay line. 4,638,191, Cl. 307-602.000.

Baxter Travenol Laboratories, Inc.: *See—*
DeVries, James H., 4,637,813, Cl. 604-6.000.
White, Leonard A., 4,637,934, Cl. 426-117.000.

Bayer Aktiengesellschaft: *See—*
Brockmann, Rolf; Casper, Clemens; Damsky, Walter; Lippert, Axel; and Sajben, Johannes O., 4,637,857, Cl. 159-47.100.
Herd, Karl J.; and Michna, Martin, 4,638,054, Cl. 534-637.000.
Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Schmidt, Robert R.; Santel, Hans-Joachim; Hanssler, Gerd; and Lurssen, Klaus, 4,638,004, Cl. 514-272.000.

BBC Brown Boveri & Company Limited: *See—*
Albrecht, Joachim; and Duerig, Thomas, 4,637,962, Cl. 428-616.000.
Brem, Ernst; and Merki, Josef, 4,638,199, Cl. 310-91.000.
Kuhnlein, Klaus, 4,637,587, Cl. 251-29.000.

Beard, William J.: *See—*
Sonne, Darrell S.; and Beard, William J., 4,638,158, Cl. 250-266.000.

Bearden, Roby, Jr.; and Aldridge, Clyde L., to Exxon Research and Engineering Company. Hydrocracking with phosphomolybdic acid and phosphoric acid. 4,637,870, Cl. 208-112.000.

Bearden, Roby, Jr.; and Aldridge, Clyde L., to Exxon Research and Engineering Company. Hydrocracking with aqueous phosphomolybdic acid. 4,637,871, Cl. 208-112.000.

Beatty, Graydon E.: *See—*
Brenman, Henry S.; Katz, Philip; and Beatty, Graydon E., 4,637,405, Cl. 128-787.000.

Beatty, Ronald L.; and Wyman, Floyd H., to Atlantic Richfield Company. Continuous silicon carbide whisker production. 4,637,924, Cl. 423-345.000.

Beavers, Allan E., to T. A. Pelsue Company. Hub and strut-endcap assembly for tent frame struts. 4,637,748, Cl. 403-170.000.

Beck, Cyril G.: *See—*
Burke, Michael A.; and Beck, Cyril G., 4,637,448, Cl. 164-122.200.

Beck, Herbert W.; and Franken, Ronald L. Brooder unit and system. 4,637,343, Cl. 119-31.000.

Beck, Paul. Adjustable endless belt. 4,637,810, Cl. 474-253.000.

Bedner, Maria D.: *See—*
Kildea, James M.; Bedner, Maria D.; and Gulick, John J., 4,637,514, Cl. 206-406.000.

Beecham Group p.l.c.: *See—*
Gaster, Laramie M.; and Orlek, Barry S., 4,638,066, Cl. 544-344.000.

Beers, William W.; and Parham, Thomas G., to General Electric Company. Fluorescent lamp containing aluminate phosphor. 4,638,214, Cl. 313-487.000.

Beglin, Thomas W.; Pence, Jane R.; Kamionka, Harvey E.; and Pence, Jerry W., to International Business Machines Corporation. Managing data storage devices connected to a digital computer. 4,638,424, Cl. 364-200.000.

Behrend, Steven J.: *See—*
Fields, Ellis K.; Winzenburg, Mark L.; and Behrend, Steven J., 4,638,072, Cl. 549-234.000.

Belbel, Elie; Caudron, Robert; Fechant, Louis; Haury, Andre ; Lauraire, Michel; Muniesa, Jacques; and Siffroi, Lucien, to La Telemecanique Electrique. Electric switching unit comprising a gas-tight casing for protection of contacts. 4,638,275, Cl. 335-151.000.

Bell Telephone Laboratories: *See—*
Ling, Hung C.; Rhodes, Warren W.; and Yan, Man F., 4,637,989, Cl. 501-135.000.

Bell Telephone Laboratories, Inc.: *See—*
Ling, Hung C.; and Yan, Man F., 4,638,401, Cl. 361-321.000.

Beloit Corporation: *See—*
Moen, Carl J., 4,637,434, Cl. 137-625.660.

Ben-Dayan, Nissim: *See—*
Gran, Paul; Feiner, Haim; Ben-Dayan, Nissim; Stefaniu, Marian; and Mar-Chaim, Yechiam, 4,638,453, Cl. 364-900.000.

Benemann, John R.: *See—*
Iacobucci, Guillermo A.; King, George A.; Goldstein, Jacob H.; and Benemann, John R., 4,638,005, Cl. 544-336.000.

Benner, Steven A., to Genetics Institute, Inc. Magnetic particles as supports for organic synthesis. 4,638,032, Cl. 525-54.110.

Bennett, George D., to Simmonds Precision. Sealed split instrument housing with foil-backed acrylic transfer adhesive tearband. 4,637,943, Cl. 428-35.000.

Benscoter, Richard D., to Butler Manufacturing Company. Three service afterset. 4,638,115, Cl. 174-48.000.

Benson, Terrance G.; and Lewis, Dean M., to Textron Inc. Lawn mower bedknife adjustment. 4,637,204, Cl. 56-249.000.

Berg, Eitan: *See—*
Shen-Orr, Chaim D.; and Berg, Eitan, 4,638,250, Cl. 324-207.000.

Berg, Norman J.: *See—*
Abramovitz, Irwin J.; Berg, Norman J.; and Casseday, Michael W., 4,637,688, Cl. 350-358.000.

Bergenwall, Henning, to Molnlycke Konsumentprodukter AB. Piece of furniture. 4,637,652, Cl. 297-90.000.

Berger, Richard M., to American Filtrona Corporation. Tobacco smoke filter and method and apparatus for making same. 4,637,409, Cl. 131-336.000.

Bergeron, Richard C.: *See—*
Keem, John E.; Bergeron, Richard C.; Custer, Russell C.; and McCallum, R. William, 4,637,967, Cl. 429-101.000.

Bergeson, David L.; Pavelka, Lee A.; and Mielke, Barbara A., to Minnesota Mining and Manufacturing Company. Delamination-resistant cellular retroreflective sheeting. 4,637,950, Cl. 428-168.000.

Berglund, Bengt, to Spiro Investment A.G. Fluid flow control valves. 4,637,428, Cl. 137-503.000.

Bergmann, Udo; Hansen, Guenter; and Zeidler, Georg, to BASF Aktiengesellschaft. Iron, copper and chromium complexes of disazo dyes. 4,638,055, Cl. 534-678.000.

Berman, Marc. Switching method and device using movable battery. 4,638,409, Cl. 362-104.000.

Bernard, Daniel, to L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques. Process for the production of a laminated capacitor. 4,637,106, Cl. 29-25.420.

Bernard, John A., Jr., to Massachusetts Institute of Technology. Apparatus and method for closed-loop control of reactor power. 4,637,911, Cl. 376-217.000.

Bernard, Montaron; Claude, Lombard; Claude, Moyses; and Gerard, Catier, to Regie Nationale des Usines Renault; and Renix Electronique. Axial acceleration sensor. 4,637,246, Cl. 73-35.000.

Berner, Erwin; and Zettel, Hans-Dieter, to Robert Bosch GmbH. Machine housing. 4,637,196, Cl. 53-77.000.

Bernet, Jean-Marie: *See—*
Charles, Gilbert; Assadoullah, Assad; and Bernet, Jean-Marie, 4,637,733, Cl. 368-120.000.

Berning, Helmut: *See—*
Schroder, Gunter; and Berning, Helmut, 4,638,234, Cl. 318-661.000.

Bertok, Bela: *See—*
Szekely, Istvan; Botar, Sandor; Dolgos nee Kekesi, Krisztina; Bertok, Bela; Gajary, Antal; Szabolcsi, Tamas; Kovacs, Gabor; and Lovasz nee Gaspar, Marianna, 4,638,002, Cl. 514-212.000.

Bertoli, Luciano: *See—*
Badiali, Roberto; Bertoli, Luciano; and Speranzin, Claudio, 4,637,205, Cl. 57-22.000.

Bertram, Leo; Bukoschek, Romuald L.; and Steiner, Peter, to U.S. Philips Corporation. Corkscrew device. 4,637,283, Cl. 81-3.200.

Bertrand, Jean-Noel M., to Montefina, S.A. Expanded polypropylene films. 4,638,015, Cl. 521-85.000.

Bettcher Industries, Inc.: *See—*
Bettcher, Louis A., 4,637,140, Cl. 30-276.000.

Bettcher, Louis A., to Bettcher Industries, Inc. Boning and trimming knife. 4,637,140, Cl. 30-276.000.

Beutel, Robert C., to General Electric Company. High voltage transformer. 4,638,220, Cl. 315-411.000.

Bhatia, Sham P.: *See—*
Stewart, Alexander; Furness, Duncan S.; and Bhatia, Sham P., 4,638,384, Cl. 360-77.000.

Bhattacharya, Ajit K., to Texaco Inc. Phosphoramide additives for preparation of organic carbonates. 4,638,076, Cl. 558-277.000.

Bibbee, Jeffrey N.: *See—*
Rhee, Chong-Kon; McKibben, David M.; and Bibbee, Jeffrey N., 4,637,252, Cl. 73-150.00A.

Bicc-Vero Electronics, Inc.: *See—*
Smith, Kenneth R., 4,638,405, Cl. 361-399.000.

Bier, Axel, to Audi NSU Auto Union Aktiengesellschaft. Switching device for lighting the interior of a motor vehicle. 4,638,174, Cl. 307-10.0LS.

Bigelow, Floyd E., Jr.; Bigelow, Floyd E., III; and Bigelow, William H. Knockdown building. 4,637,179, Cl. 52-79.500.

Bigelow, Floyd E., III: *See—*
Bigelow, Floyd E., Jr.; Bigelow, Floyd E., III; and Bigelow, William H., 4,637,179, Cl. 52-79.500.

Bigelow, William H.: *See—*
Bigelow, Floyd E., Jr.; Bigelow, Floyd E., III; and Bigelow, William H., 4,637,179, Cl. 52-79.500.

Bigger, Thomas J.: *See—*
Wachinski, Clarence A.; and Bigger, Thomas J., 4,637,528, Cl. 222-182.000.

Biller, Cleveland J.: *See—*
Johnson, David D.; and Biller, Cleveland J., 4,637,643, Cl. 294-75.000.

Billet, Rene , to Valeo. Clutch release bearing and assembly tool for same. 4,637,506, Cl. 192-110.00B.

Bingo Experience/ARC: *See—*
Bishop, Kevin, 4,637,613, Cl. 273-239.000.

Biosonics, Inc.: *See—*
Brenman, Henry S.; Katz, Philip; and Beatty, Graydon E., 4,637,405, Cl. 128-787.000.

Birdsall, Raymond P.: *See—*
Ellsworth, Wendell E.; and Birdsall, Raymond P., 4,637,182, Cl. 52-211.000.

Birdsell, Jackie D.: *See—*
White, James E.; Alley, Lewis F.; Anderson, James E.; and Birdsell, Jackie D., 4,637,936, Cl. 426-523.000.

Birkedahl, Byron F., to Sperry Corporation. Asymmetric torque switching for aircraft autopilot. 4,638,229, Cl. 318-584.000.

Bishop, F. Avery; and Leahy, Ronald S., to Sperry Corporation. Adaptive interference rejection for improved frequency hop detection. 4,638,493, Cl. 375-1.000.

Bishop, Kevin, to Bingo Experience/ARC. Molded magnetic bingo chip. 4,637,613, Cl. 273-239.000.

Biskup, Andrew L. Fish skin lure. 4,637,160, Cl. 43-42.330.

Black, Maurice. Foot wear dressing aid. 4,637,533, Cl. 223-112.000.

Blackwell, John B. Mower hitch assembly. 4,637,625, Cl. 280-411.00C.

Blain, Roy W. Pressure/viscosity compensated up travel for a hydraulic elevator. 4,637,495, Cl. 187-29.00A.

Blank, Hans G.; and Fox, Jeffrey R., to GTE Laboratories Incorporated. Integrated circuit input-output diagnostic system. 4,638,246, Cl. 324-73.00R.

Blesser, Barry A.; and Prentice, Thomas C., to Pencept, Inc. Position indicating apparatus for use in a digitizing tablet system. 4,638,119, Cl. 178-19.000.

Blezard, Robert C.: *See—*
Evans, Robert D.; and Blezard, Robert C., 4,637,948, Cl. 428-89.000.

Bliesner, Jurgen: *See—*
Grossmann, Kurt; Bliesner, Jurgen; and Schikor, Joachim, 4,638,404, Cl. 361-388.000.

Block, Aleck. Abrasive apparatus. 4,637,170, Cl. 51-168.000.

Blohm & Voss AG: *See—*
Engelskirchen, Jurgen, 4,637,336, Cl. 114-293.000.

Blomquist, Leonard A.: *See—*
Bartimes, George F.; and Blomquist, Leonard A., 4,637,600, Cl. 271-93.000.

Boardman, Paul A. Armchair with tilting seat. 4,637,654, Cl. 297-337.000.

BOC Group, Inc., The: *See—*
Schroeder, Gerhardt P., 4,637,384, Cl. 128-204.180.

Boda, John W., to Amerock Corporation. Towel ring assembly. 4,637,582, Cl. 248-315.000.

Boehringer Biochemia Robin S.p.A.: *See—*
Moja, Egidio A.; and Gessa, Gianluigi, 4,638,013, Cl. 514-561.000.

Boehringer Mannheim GmbH: *See—*
Trasch, Heinz-Freidrich; Rothe, Anselm; Sojka, Bernward; Werner, Wolfgang; and Wielinger, Hans, 4,638,023, Cl. 524-21.000.

Boeing Company, The: *See—*
Cleary, Patrick J.; Kelman, Lloyd S.; and Horn, Richard L., 4,638,437, Cl. 364-427.000.
Lamberty, Bernard J., 4,638,322, Cl. 343-761.000.
Stoecker, Carl H., 4,637,642, Cl. 292-129.000.

Boger, Manfred; and Drabek, Jozef, to Ciba-Geigy Corporation. Isocyanic acid-phenyl ester pyridine derivatives. 4,638,069, Cl. 546-300.000.

Boggavarapu, Rao L.: *See—*
Takach, David S.; Boggavarapu, Rao L.; and Sinha, Ram R. P., 4,638,177, Cl. 307-83.000.

Boggs, Beryl A., to Allied Corporation. Staple cutting for fiber reinforcement material. 4,637,286, Cl. 83-175.000.

Boler, Clifford H.; Leake, William W.; Rai, Surinder S.; and Zemske, Gene B., to VTC Incorporated. CMOS output buffer providing high drive current with minimum output signal distortion. 4,638,187, Cl. 307-451.000.

Boles, Flounoy W. Apparatus for removing and replacing pipe beneath an earthfill. 4,637,756, Cl. 405-184.000.

Bonanno, Mario; Zinonos, George; and Trantzas, Constantin, to Cangro Industries, Inc. Cigarette holder. 4,637,407, Cl. 131-175.000.

Bond, Irvin D. Press linkage with controlled dwell. 4,637,243, Cl. 72-421.000.

Boos, Gunther, to Alfred Bolz GmbH & Co. KG. Apparatus for transporting articles by fluid flow through a pipe system. 4,637,760, Cl. 406-105.000.

Borbely, Gyorgy: *See—*
Radtke, Wolfgang; Borbely, Gyorgy; Pallhorn, Sebald; and Hollfritsch, Erich, 4,637,184, Cl. 52-220.000.

Borg-Warner Corporation: *See—*
Rule, Robert D.; Skaggs, Bruce A.; and King, Gerald E., 4,637,504, Cl. 192-87.170.
Venema, Harry J., 4,637,621, Cl. 200-6.00R.

Borgen, James C.: *See—*
Brough, William R.; and Borgen, James C., 4,638,440, Cl. 364-475.000.

Borning, Jeffrey M.: *See—*
Breske, Carl D.; and Borning, Jeffrey M., 4,637,542, Cl. 228-180.100.

Boschert Inc.: *See—*
Forge, Charles O., 4,638,420, Cl. 363-132.000.

Bossert, Arthur J.: *See—*
Zajac, William V., Jr.; Kautz, Henry G.; Kautz, David J.; Bossert, Arthur J.; and Cohen, Sidney, 4,637,928, Cl. 423-659.000.

Botar, Sandor: *See—*
Szekely, Istvan; Botar, Sandor; Dolgos nee Kekesi, Krisztina; Bertok, Bela; Gajary, Antal; Szabolcsi, Tamas; Kovacs, Gabor; and Lovasz nee Gaspar, Marianna, 4,638,002, Cl. 514-212.000.

Bouboulis, Constantine J., to Exxon Research & Engineering Co. Process for preparing superior high solids coatings. 4,638,031, Cl. 524-773.000.

Bouchal, Robert A. System and game that stimulates creative and verbal exercise. 4,637,799, Cl. 434-236.000.

Boucher, Guy M. G.: *See—*
Cuvelier, Antoine L.; and Boucher, Guy M. G., 4,638,448, Cl. 164-365.000.

Boucher, Paul D.: *See—*
Gavaghan, Thomas J.; Boucher, Paul D.; and Janatka, Karel, 4,637,602, Cl. 271-238.000.

Bourg, Francois: *See—*
Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, 4,638,216, Cl. 315-111.810.

Boutevin, Bernard: *See—*
Bauduin, Gerard; Boutevin, Bernard; Deiss, Willy-Jean; and Pietrasanta, Yves, 4,638,018, Cl. 522-103.000.

Boutni, Omar M.; and Liu, Ping Y., to General Electric Company. Resinous composition of a carbonate resin and a grafted derivative of ethylene-propylene-diene terpolymer exhibiting improved resistance to organic solvents. 4,638,033, Cl. 525-67.000.

Bouwens, Jan M. M.; and Schiffelers, Hendrik E. P., to Oce-Nederland B.V. Holder for a stack of sheets. 4,637,598, Cl. 271-3.100.

Bowden, Roy D., to Imperial Chemical Industries PLC. Chemical process. 4,638,091, Cl. 564-473.000.

Bowe, Woodford A.: *See—*
Laragione, Robert; Lurcott, Steven M.; Bowe, Woodford A.; and Levy, Eugene J., 4,638,444, Cl. 364-510.000.

Bowers, John E., to AT&T Bell Laboratories. High speed intensity modulated light source. 4,638,483, Cl. 372-26.000.

Bowers, Mark C.: *See—*
Schneider, John M.; Piatt, Michael J.; Brown, Mark E.; and Bowers, Mark C., 4,638,325, Cl. 346-1.100.

Bowling, Joseph E.; Carpenter, James H.; and Rowe, Russell L., to Kennecott Corporation. Sand lump crushing device. 4,637,559, Cl. 241-94.000.

Bowman, Timothy S., to Butler Manufacturing Company. Trench ducts. 4,637,185, Cl. 52-221.000.

Boyle, David E.; and Chrise, James R., to Westinghouse Electric Corp. Quick release guide sleeve assembly. 4,637,914, Cl. 376-353.000.

Bradford, Michael P.; Parkinson, Gerald W.; and Grant, Ross M., to United Technologies Corporation. Electric power distribution and load transfer system. 4,638,175, Cl. 307-64.000.

Bradshaw, Kenneth M., to General Electric Company. Circuit for detecting RF coil assembly position in an MR scanner. 4,638,252, Cl. 324-318.000.

Brand, Edward M.: *See—*
Medvick, Richard J.; Weber, Richard C., Jr.; Wagner, Ross L.; and Brand, Edward M., 4,637,432, Cl. 137-614.030.

Brandt, Lothar; and Felcht, Utz-Hellmuth, to Hoechst Aktiengesellschaft. Ethers of beta-cyclodextrin and a process for their preparation. 4,638,058, Cl. 536-103.000.

Braun, Ernst: *See—*
Braun, Gert; and Braun, Ernst, 4,637,268, Cl. 74-190.000.

Braun, Gert; and Braun, Ernst, to Halbach & Braun Industrieanlagen. Planer drive. 4,637,268, Cl. 74-190.000.

Braunlich, Peter F.; and Tetzlaff, Wolfgang, to Braunlich, Peter F. Method and apparatus for reading thermoluminescent phosphors. 4,638,163, Cl. 250-337.000.

Brem, Ernst; and Merki, Josef, to BBC Brown, Boveri & Company, Limited. Stator body with laminated compression plates. 4,638,199, Cl. 310-91.000.

Brenman, Henry S.; Katz, Philip; and Beatty, Graydon E., to Biosonics, Inc. Apparatus for stimulating salivation. 4,637,405, Cl. 128-787.000.

Brennecke, Hermann; Liere, Horst; and Kiesel, Michael, to IRS Industrie Rationalisierungs-Systeme GmbH. Apparatus for producing positive or negative ions, especially for neutralizing charged workpieces. 4,638,398, Cl. 361-214.000.

Breske, Carl D.; and Borning, Jeffrey M., to Control Data Corporation. Process for soldering and desoldering apertured leadless packages. 4,637,542, Cl. 228-180.100.

Breu, Karl-Jan; and Schinke, Hans-Joachim, to Siemens Aktiengesellschaft. Cradle switch for a telephone apparatus. 4,638,126, Cl. 379-427.000.

Breuer, Oswald: *See—*
Annipajo, Wolfgang; Breuer, Oswald; and Rassmann, Christoph, 4,637,658, Cl. 299-79.000.

Bricaud, Jean-Paul; and Bricaud, Martine. Buckets for compactable products. 4,637,306, Cl. 100-233.000.

Bricaud, Martine: *See—*
Bricaud, Jean-Paul; and Bricaud, Martine, 4,637,306, Cl. 100-233.000.

Brigham & Women's Hospital: *See—*
Walker, Peter S., 4,637,382, Cl. 128-92.00Z.

Brignall, Nicolas L., to Ferranti plc. Reaction force compensator. 4,638,221, Cl. 318-48.000.

Brisson, Alain; and Clement, Jean R., to La Telemecanique Electrique. Noiseless electromagnet and a contactor using such an electromagnet. 4,638,279, Cl. 335-257.000.

British Broadcasting Corporation: *See—*
Clarke, Christopher K. P., 4,638,351, Cl. 358-38.000.

Britoil Public Limited Company: *See—*
Bryant, Michael J.; Attenborough, Frank R.; Sykes, Christopher G.; and Cameron, Neil W., 4,638,469, Cl. 367-154.000.

Broadcast Electronics, Inc.: *See—*
Salek, Stanley, 4,638,504, Cl. 381-16.000.

Brockmann, Rolf; Casper, Clemens; Damsky, Walter; Lippert, Axel; and Sajben, Johannes O., to Bayer Aktiengesellschaft. Process for the removal of residual constituents. 4,637,857, Cl. 159-47.100.

Broecker, Franz J.; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, to BASF Aktiengesellschaft. Preparation of methyl methacrylate from methacrolein. 4,638,085, Cl. 560-208.000.

Brois, Stanley J.; and Gutierrez, Antonio, to Exxon Research & Engineering Co. Macrocyclic polyamine and polycyclic polyamine multifunctional lubricating oil additives. 4,637,886, Cl. 252-51.50A.

Brooks, Christopher G.: *See*—
Foss, Janet M. P.; Foss, John; Brooks, Christopher G.; and Ridgely, Myron H., 4,637,626, Cl. 280-655.000.

Brooktree Corporation: *See*—
Colles, Joseph H., 4,638,241, Cl. 323-312.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Sakai, Kiyoharu, 4,637,742, Cl. 400-121.000.

Brough, William R.; and Borgen, James C., to Weyerhaeuser Company. Feeding and data entry system for lumber trimmer. 4,638,440, Cl. 364-475.000.

Brown Boveri Reaktor GmbH: *See*—
Scharpenberg, Rainer; and Baro, Gunter, 4,637,912, Cl. 376-245.000.

Brown, Dale M.; Kim, Manjin J.; Baertsch, Richard D.; and Vogelsong, Thomas L., to General Electric Company. Refractory metal capacitor structures, particularly for analog integrated circuit devices. 4,638,400, Cl. 361-304.000.

Brown, David F.; and Anstey, Michael J. Semiconductor chip carrier. 4,638,348, Cl. 357-74.000.

Brown, G. Emerson, to Allied Corporation. Anti-locking modulating valve for displacement type full power master cylinder. 4,637,662, Cl. 303-6.00R.

Brown, Harold O. Squirrel guard. 4,637,164, Cl. 47-24.000.

Brown, Mark E.: *See*—
Schneider, John M.; Piatt, Michael J.; Brown, Mark E.; and Bowers, Mark C., 4,638,325, Cl. 346-1.100.

Brown, Michael C.; and Kirchanski, Stefan J., to Ortho Diagnostic Systems, Inc. Flow cytometry lysing reagent with leukoprotective agent for producing a 3-part WBC count. 4,637,986, Cl. 436-10.000.

Brown, Omar L.: *See*—
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Wynn, David K.; and Gregg, James R., 4,637,961, Cl. 428-579.000.

Brown, Wendell E. Telescoping support structure. 4,637,192, Cl. 52-632.000.

Brown & Williamson Tobacco Corporation: *See*—
Luke, John A., 4,637,410, Cl. 131-361.000.

Brudnoy, David M., to United States of America, Energy. Dual beam translator for use in Laser Doppler anemometry. 4,637,717, Cl. 356-28.500.

Brunelle, Daniel J.; Shannon, Thomas G.; and Rosenquist, Niles R., to General Electric Company. Method for the preparation of chloroformate compositions. 4,638,077, Cl. 558-281.000.

Brunswick Corporation: *See*—
Slattery, Gordon C., 4,637,800, Cl. 440-55.000.
Swisher, Steven L., 4,637,569, Cl. 242-84.20A.

Bryan, James S.: *See*—
Rush, James B.; Bryan, James S.; Gunter, Jonas L.; Dillard, Guy W.; Meadows, Roger D.; and Henry, Pearison W., 4,637,638, Cl. 285-158.000.

Bryant, Michael J.; Attenborough, Frank R.; Sykes, Christopher G.; and Cameron, Neil W., to Britoil Public Limited Company. Mechanical spacer for towed acoustic array. 4,638,469, Cl. 367-154.000.

Bryant, Stewart F.; Baker, Stephen J.; and Cook, Richard A., to U.S. Philips Corporation. Computer aided design method and apparatus comprising means for automatically generating pin-to-pin interconnection lists between respective discrete electrical component circuits. 4,638,442, Cl. 364-489.000.

Bryer, Jack, to Motter Printing Press Co. Controlled deflection roller. 4,637,109, Cl. 29-116.0AD.

Bubik, Leslie, to Vulcan Equipment Company, Ltd. Towing apparatus. 4,637,623, Cl. 280-402.000.

Buettner, Gerhard, to Siemens Aktiengesellschaft. Hearing aid with a housing to be worn behind the ear. 4,638,125, Cl. 381-68.400.

Buffalo Weaving and Belting Company: *See*—
Johnson, Charles E.; and New, Richard W., 4,637,511, Cl. 198-846.000.

Bukoschek, Romuald L.: *See*—
Bertram, Leo; Bukoschek, Romuald L.; and Steiner, Peter, 4,637,283, Cl. 81-3.200.

Bullock, Mark E., to Halliburton Company. Magnetic detector apparatus. 4,638,278, Cl. 335-207.000.

Bumble, Bruce; Cuomo, Jerome J.; Logan, Joseph S.; and Rossnagel, Steven M., to International Business Machines Corporation. Hollow cathode enhanced plasma for high rate reactive ion etching and deposition. 4,637,853, Cl. 156-345.000.

Bunting, Franklin O.; and Hudson, J. Russell, to Gaffney, Richard W.; and Walker, Oliver M. Field decoy transport device. 4,637,647, Cl. 296-24.00R.

Burdette, Everette C.: *See*—
Badger, Christopher W.; Burdette, Everette C.; Leech, Steven C.; and McCarthy, John F., 4,638,436, Cl. 364-414.000.

Burdick, Jon S.; and Corcoran, Paul T., to Caterpillar Inc. Track shoes having toothed grousers. 4,637,665, Cl. 305-54.000.

Burgard, Francis A. Child safety strap. 4,637,622, Cl. 280-33.99B.

Burke, Michael A.; and Beck, Cyril G., to Westinghouse Electric Corp. Method for production of combustion turbine blade having a single crystal portion. 4,637,448, Cl. 164-122.200.

Burks, Kenneth: *See*—
Jones, Charles; Murphy, James L.; and Burks, Kenneth, 4,637,732, Cl. 368-109.000.

Burlington Industries, Inc.: *See*—
Sutera, Richard; Dressler, John L.; and Halliday, Bruce W., 4,638,327, Cl. 346-75.000.

Burnham, Robert D.; Paoli, Thomas L.; Thornton, Robert L.; and Sprague, Robert A., to Xerox Corporation. Electro-optic line printer with super luminescent LED source. 4,638,334, Cl. 346-108.000.

Burns, Hugh D.; Zemyan, Susan E.; Epps, Leon A.; Kramer, Alfred V.; and Dannals, Robert F., to Johns Hopkins University, The. Brain imaging radiopharmaceuticals. 4,638,051, Cl. 534-14.000.

Burstell, Helmut: *See*—
Schulze, Ernst-Friedrich; Burstell, Helmut; and Hacker, Erwin, 4,637,828, Cl. 71-76.000.

Burt DuPont, Blanche A. Physical therapy device. 4,637,604, Cl. 272-73.000.

Bush, Vincent N.: *See*—
Hiniker, Thomas K.; and Bush, Vincent N., 4,637,547, Cl. 239-1.000.

Butler, Donald E., to Warner Lambert Company. Amnesia reversal with N,N-dialkylaminoalkyl-hexahydro-5-oxo 1H-pyrrolizine-3-carboxamides. 4,638,006, Cl. 514-323.000.

Butler Manufacturing Company: *See*—
Benscoter, Richard D., 4,638,115, Cl. 174-48.000.
Bowman, Timothy S., 4,637,185, Cl. 52-221.000.

C. A. Weidmuller GmbH & Co.: *See*—
Undin, Hans; and Wiener, Hans, 4,637,242, Cl. 72-410.000.

C. Reichert Optishe Werke, AG: *See*—
Sitte, Heilmuth, 4,637,226, Cl. 62-514.00R.

Caburet, Pierre: *See*—
Fourrey, Francois; and Caburet, Pierre, 4,637,655, Cl. 297-410.000.

Cadbury Limited: *See*—
Richards, Brian T., 4,637,788, Cl. 425-4.00R.

Cadbury Schweppes, PLC: *See*—
Jeans, Edward L., 4,637,439, Cl. 141-18.000.

Cafferty, Terrance. Method of stenciling using removable protective coat before applying stencil. 4,637,309, Cl. 101-129.000.

Cain, Dallas E.: *See*—
Eberhard, Jeffrey W.; and Cain, Dallas E., 4,638,499, Cl. 378-7.000.

Calhoun, Gregory L.: *See*—
Wilhelm, John J.; Calhoun, Gregory L.; Dawson, Paul H.; and Kramer, Arthur W., 4,637,588, Cl. 251-280.000.

Callahan, Wayne B.; Koch, Harold O.; Palin, Philip R.; and Cook, James R., to Cilco, Inc. Opthalmic wafer. 4,638,056, Cl. 536-54.000.

Cambria, Emanuel F., to Cars & Concepts, Inc. Latch mechanism for removable roof panel. 4,637,649, Cl. 296-224.000.

Camden, Thomas M., Jr.; and Freeman, Thomas R., to Westinghouse Electric Corp. Nuclear reactor fuel assembly and method of forming same. 4,637,915, Cl. 376-435.000.

Cameron, Neil W.: *See*—
Bryant, Michael J.; Attenborough, Frank R.; Sykes, Christopher G.; and Cameron, Neil W., 4,638,469, Cl. 367-154.000.

Cammi, Sergio; D'Este, Arturo; and Pescetelli, Alessandro, to SAMIM Societa Azionaria Minero-Metallurgica, S.p.A. Process for purifying solutions of zinc sulphate. 4,637,832, Cl. 75-109.000.

Campbell, Colin B.: *See*—
Polk, Matthew S.; and Campbell, Colin B., 4,638,505, Cl. 381-24.000.

Campbell, David C., to Pico Electronics Limited. Electrical appliance control. 4,638,299, Cl. 340-310.00A.

Campbell, Henry F. Prefabricated building panels. 4,637,187, Cl. 52-404.000.

Campbell, Henry F.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,638,001, Cl. 514-212.000.

Canada, Her Majesty the Queen in Right of: *See*—
Oxner, Clifford F. J., 4,637,490, Cl. 181-175.000.

Canadian Occidental Petroleum Ltd.: *See*—
Schramm, Laurier L., 4,637,417, Cl. 137-4.000.

Canadian Patents and Development Limited: *See*—
Herman, Alex W., 4,637,719, Cl. 356-72.000.

Canadian Patents and Development Limited-Societe Canadienne des Brevets et d'Exploitation Limitee: *See*—
So, Eddy; and Moore, William J. M., 4,638,302, Cl. 340-347.0DA.

Cangro Industries, Inc.: *See*—
Bonanno, Mario; Zinonos, George; and Trantzas, Constantin, 4,637,407, Cl. 131-175.000.

Canon Kabushiki Kaisha: *See*—
Hosoi, Atsushi; Kan, Fumitaka; Egami, Hidemi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,637,706, Cl. 355-3.0DD.
Kamiya, Osamu; Fujiyama, Yasutomo; Ogawa, Kyosuke; and Kurokawa, Takashi, 4,637,342, Cl. 118-719.000.
Kato, Tokuzo; Takayama, Tsutomu; and Kaji, Toshio, 4,638,350, Cl. 358-29.000.
Kato, Tokuzo, 4,638,365, Cl. 358-228.000.
Kawabata, Takashi, 4,637,705, Cl. 354-403.000.
Kozuki, Susumu; Nagasawa, Kenichi; Edakubo, Hiroo; Sato, Junichi; and Takayama, Nobutoshi, 4,638,390, Cl. 360-74.100.
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,637,972, Cl. 430-84.000.
Sakane, Toshio; and Tsunekawa, Tokuichi, 4,638,367, Cl. 358-228.000.
Sawamura, Mitsuharu; and Ito, Susumo, 4,637,953, Cl. 428-333.000.

Shimizu, Katsuichi; Masuda, Shunichi; Yagasaki, Toshiaki; and Sakamaki, Hisashi, 4,638,368, Cl. 358-256.000.
Suwa, Kaname, 4,638,151, Cl. 235-145.00R.
Suzuki, Kazunori; Katsuta, Hiroo; and Toriumi, Yuki, 4,637,850, Cl. 156-60.000.
Tomita, Yasuo; Ogura, Shigetaro; and Matsumoto, Kazuya, 4,637,684, Cl. 350-96.190.

Cape Building Products Limited: *See*—
Harper, Stephen; and Hiscock, David G., 4,637,860, Cl. 162-117.000.

Cardwell, Walter T., Jr. Junction field-effect transistor controlled by merged depletion regions. 4,638,344, Cl. 357-22.000.

Carenzi, Angelo: *See*—
Chiarino, Dario; Carenzi, Angelo; Della Bella, Davide; and Fantucci, Mario, 4,638,003, Cl. 514-255.000.

Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See*—
Schneider, Horst; Zeeh, Rainer; and Neumann, Hans J., 4,637,119, Cl. 29-568.000.

Carney, James K.; and Kolbas, Robert M., to Honeywell Inc. Integrated quantum well lasers for wavelength division multiplexing. 4,637,122, Cl. 29-569.00L.

Carp, Ralph W., to Allied Corporation. Symmetrical bridge circuit for measuring mass air flow. 4,637,251, Cl. 73-118.200.

Carpenter, James H.: *See*—
Bowling, Joseph E.; Carpenter, James H.; and Rowe, Russell L., 4,637,559, Cl. 241-94.000.

Carr, Damon L. Baseball glove holder and training aid. 4,637,610, Cl. 273-26.00C.

Carr, Francis L.; and Terrill, Larry R., to A. G. Busch & Co., Inc. DC to DC battery charger. 4,638,236, Cl. 320-21.000.

Carrier Corporation: *See*—
Schoch, Stephen A., 4,637,729, Cl. 356-410.000.

Carroll, Curtis E. Rail car positioning system. 4,637,316, Cl. 104-176.000.

Carroll, James J.: *See*—
Frind, Gerhard; Carroll, James J.; Van Noy, John H.; Leach, John G.; and Ranjan, Radha K., 4,638,283, Cl. 337-162.000.

Cars & Concepts, Inc.: *See*—
Cambria, Emanuel F., 4,637,649, Cl. 296-224.000.

Casaretto, Monika: *See*—
Jolles, Pierre; Migliore-Samour, Daniele; Parker, Fabienne; and Casaretto, Monika, 4,637,997, Cl. 514-17.000.

Case, Cecil L.: *See*—
Pruitt, Martin E.; Case, Cecil L.; and Fritz, David P., 4,637,201, Cl. 56-16.400.

Case Western Reserve University: *See*—
Jones, Janice L.; and Jones, Ronald E., 4,637,397, Cl. 128-419.00D.

Caspar, Wolfhard; Lutze, Theodor; and Kienzle, Karl-Ernst, to Aesculap-Werke AG. Applicator for C-shaped scalp clips. 4,637,395, Cl. 128-334.00R.

Casper, Clemens: *See*—
Brockmann, Rolf; Casper, Clemens; Damsky, Walter; Lippert, Axel; and Sajben, Johannes O., 4,637,857, Cl. 159-47.100.

Casseday, Michael W.: *See*—
Abramovitz, Irwin J.; Berg, Norman J.; and Casseday, Michael W., 4,637,688, Cl. 350-358.000.

Castaneda, Albert A. Auxiliary rear view mirror assembly and outboard mirror. 4,637,694, Cl. 350-626.000.

Caterpillar Inc.: *See*—
Burdick, Jon S.; and Corcoran, Paul T., 4,637,665, Cl. 305-54.000.

Caterpillar Industrial Inc.: *See*—
Fotheringham, James R.; and Morrow, David L., 4,637,488, Cl. 180-251.000.

Caudron, Robert: *See*—
Belbel, Elie; Caudron, Robert; Fechant, Louis; Haury, Andre ; Lauraire, Michel; Muniesa, Jacques; and Siffroi, Lucien, 4,638,275, Cl. 335-151.000.

Cazcarra, Victor; and LeRoueille, Jocelyne, to International Business Machines Corporation. Method of standardizing and stabilizing semiconductor wafers. 4,637,123, Cl. 29-569.00R.

Cegedur Societe de Transformation de l'Aluminium Pechiney: *See*—
Bauduin, Gerard; Boutevin, Bernard; Deiss, Willy-Jean; and Pietrasanta, Yves, 4,638,018, Cl. 522-103.000.

Celanese Corporation: *See*—
Harris, William F., Jr., 4,637,849, Cl. 149-43.000.

Cellexfabrikerna AB: *See*—
Dahlin, Per O., 4,637,731, Cl. 366-64.000.

Centa, Antony R. Access covers for manholes. 4,637,752, Cl. 404-25.000.

Ceramic Cooling Tower Company: *See*—
Bardo, Charles J.; Seawell, Jesse Q.; Dylewski, Anthony J.; and Clark, John L., Jr., 4,637,903, Cl. 261-24.000.

Chabanier, Patrick: *See*—
Baluteau, Jean-Michel; Saint-Sevin, Michel; and Chabanier, Patrick, 4,637,692, Cl. 350-486.000.

Chalet, Alain R. G., to ITT Corporation. Communication system. 4,638,474, Cl. 370-60.000.

Chamberlain Manufacturing Corporation: *See*—
Schindler, Wayne R., 4,638,433, Cl. 364-400.000.

Chan, Andrew K., to Monolithic Memories, Inc. Short detector for fusible link array using single reference fuse. 4,638,243, Cl. 324-51.000.

Chan, Andy: *See*—
Geannopoulos, George; Tsui, Cyrus; Fitzpatrick, Mark; and Chan, Andy, 4,638,189, Cl. 307-465.000.

Chang, Albert; Cocke, John; Mergen, Mark F.; and Radin, George, to International Business Machines Corporation. Virtual memory address translation mechanism with controlled data persistence. 4,638,426, Cl. 364-200.000.

Chang, Clarence D.; and Miale, Joseph N., to Mobil Oil Corporation. Acid-catalyzed xylene isomerization. 4,638,105, Cl. 585-481.000.

Chang, George W. Y., to Westinghouse Electric Corp. Single-ended steam chest with improved support assembly. 4,637,214, Cl. 60-687.000.

Chang, I-Cheng, to Itek Corporation. Acoustically resonant tunable acousto-optic filter. 4,637,689, Cl. 350-372.000.

Chang, Stephen S.; Ho, Chi-Tang; and Houlihan, Christopher M., to Research Corporation. Isolation of a novel antioxidant rosmaridiphenol from *Rosmarinus officinalis* L. 4,638,095, Cl. 568-326.000.

Chappoux, Claude: *See*—
Ricouard, Jacques; and Chappoux, Claude, 4,637,507, Cl. 194-212.000.

Charles, Gilbert; Assadoullah, Assad; and Bernet, Jean-Marie, to Commissariat a l'Energie Atomique. High-resolution electronic chronometry system. 4,637,733, Cl. 368-120.000.

Chase, Ronald G.: *See*—
Miseyko, George; Peck, Walter R.; and Chase, Ronald G., 4,637,577, Cl. 244-147.000.

Chemical Data Systems, Inc.: *See*—
Laragione, Robert; Lurcott, Steven M.; Bowe, Woodford A.; and Levy, Eugene J., 4,638,444, Cl. 364-510.000.

Chen, Fu. Ampoule cutter. 4,637,139, Cl. 30-164.900.

Chen, Young K.: *See*—
Hwang, Ying C.; Chen, Young K.; and Ragonese, Louis J., 4,638,190, Cl. 307-512.000.

Chern, Mao-Jin: *See*—
Moss, Gaylord E.; Chern, Mao-Jin; and Dobbs, Teena L., 4,637,678, Cl. 350-3.700.

Chevron Research Company: *See*—
Aagaard, Paul M., 4,637,757, Cl. 405-227.000.

Chevron U.S.A., Inc.: *See*—
Forgac, John M.; and Hoekstra, George R., 4,637,464, Cl. 166-261.000.

Chiarino, Dario; Carenzi, Angelo; Della Bella, Davide; and Fantucci, Mario, to Zambon S.p.A. 1-(4-alkylthiophenyl)-2-(substituted or unsubstituted piperazine-1-yl)-1,3-propanediol, pharmaceutical compositions containing them useful as antiarrhythmic and vasodilating agents. 4,638,003, Cl. 514-255.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Szekely, Istvan; Botar, Sandor; Dolgos nee Kekesi, Krisztina; Bertok, Bela; Gajary, Antal; Szabolcsi, Tamas; Kovacs, Gabor; and Lovasz nee Gaspar, Marianna, 4,638,002, Cl. 514-212.000.

Chirdon, Charles P., to Essef Corporation. Antiseal arrangement for hydropneumatic pressure tanks. 4,637,435, Cl. 138-30.000.

Chisso Corporation: *See*—
Asakuno, Hiroyoshi; Mori, Kinya; Suzuki, Kiyoaki; Nishida, Mamoru; Iwai, Kenji; Tamamushi, Masahiro; and Kawasaki, Teruo, 4,638,030, Cl. 524-536.000.

Chou, David T.; and Ligon, Robert C., to Union Carbide Corporation. Pesticidal biphenylyloxy and biphenylylalkoxy aryl acyl urea compounds. 4,638,088, Cl. 564-23.000.

Chrise, James R.: *See*—
Boyle, David E.; and Chrise, James R., 4,637,914, Cl. 376-353.000.

Christ, Howard N. Sail having a honeycomb array of pockets. 4,637,333, Cl. 114-103.000.

Christenson, Roger M.; Rosenberger, Mary E.; and Tetenbaum, Marvin T., to PPG Industries, Inc. Aqueous composition comprising a phosphated epoxy and non-self dispersible resin. 4,638,020, Cl. 523-406.000.

Christian Mayr GmbH & Co. KG: *See*—
Mayr, Fritz; and Dasser, Manfred, 4,637,502, Cl. 192-56.00R.

Christopher, Todd J.; Willis, Donald H.; and Fling, Russell T., to RCA Corporation. Timing correction for a picture-in-picture television system. 4,638,360, Cl. 358-148.000.

Chrysler Motors Corporation: *See*—
Killen, H. Ron; Wilkins, Scott A.; and Frantz, Douglas C., 4,637,361, Cl. 123-339.000.
Perkins, David J., 4,637,628, Cl. 280-689.000.
Secord, Nelson W., 4,637,097, Cl. 24-16.0PB.

Chua, Lye-Whatt, to U.S. Philips Corporation. R.F. system. 4,638,319, Cl. 342-417.000.

Chuohatsujyo Kabushiki Kaisha: *See*—
Mishima, Yasuhiro; Makibayashi, Katsunori; and Kuwayama, Kiyoaki, 4,637,595, Cl. 267-52.000.

Ciaramitaro, David A.; Speltz, David J.; and Moore, Jack M., to Apache Powder Company. High density gel explosive. 4,637,848, Cl. 149-21.000.

Ciba-Geigy Corporation: *See*—
Boger, Manfred; and Drabek, Jozef, 4,638,069, Cl. 546-300.000.
Dyer, Ross M. W.; and Nowak, Edward, 4,637,830, Cl. 71-105.000.
Phillips, Emyr; and Holt, Brian, 4,637,926, Cl. 423-573.00R.
Schurter, Rolf; and Pissiotas, Georg, 4,637,829, Cl. 71-90.000.

Cilco, Inc.: *See*—
Callahan, Wayne B.; Koch, Harold O.; Palin, Philip R.; and Cook, James R., 4,638,056, Cl. 536-54.000.

Cirillo, Nicholas C., Jr.: *See*—
Baier, Steven M.; Cirillo, Nicholas C., Jr.; Hanka, Steven A.; and Shur, Michael S., 4,638,341, Cl. 357-15.000.

Citizen Watch Co., Ltd.: *See*—
Ikeda, Hiroshi, 4,637,537, Cl. 226-76.000.

Classsens, Marinus L. M.: *See*—
Delwel, Francois; and Classsens, Marinus L. M., 4,637,891, Cl. 252-135.000.

Clark, C. Randall, to Research Corporation. Anticonvulsant method and formulations. 4,638,014, Cl. 514-619.000.
Clark, Garry E. Fluid driven power plant. 4,637,209, Cl. 60-593.000.
Clark, John L., Jr.: *See*—
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Clark, Richard N., to Tecla Company, Inc. Fold-down seat construction. 4,637,081, Cl. 5-18.00R.
Clark, Robert A., Jr., to Communications Equipment and Engineering Co. Telephone pay station. 4,638,121, Cl. 379-145.000.
Clarke, Christopher K. P., to British Broadcasting Corporation. Adaptive filter for use in color video signal processing. 4,638,351, Cl. 358-38.000.
Claude, Lombard: *See*—
Bernard, Montaros; Claude, Lombard; Claude, Moyses; and Gerard, Catier, 4,637,246, Cl. 73-35.000.
Claude, Moyses: *See*—
Bernard, Montaros; Claude, Lombard; Claude, Moyses; and Gerard, Catier, 4,637,246, Cl. 73-35.000.
Claus, Karl; Linkies, Adolf; and Reuschling, Dieter, to Hoechst Aktiengesellschaft. Process for the preparation of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one 2,2-dioxide and its non-toxic salts. 4,638,063, Cl. 544-2.000.
Cleary, Patrick J.; Kelman, Lloyd S.; and Horn, Richard L., to Boeing Company, The. Aircraft performance margin indicator. 4,638,437, Cl. 364-427.000.
Clement, Jean R.: *See*—
Brisson, Alain; and Clement, Jean R., 4,638,279, Cl. 335-257.000.
Clouth Gummiwerke Aktiengesellschaft: *See*—
Ortwein, Hermann; Krettek, Ottmar; and Nicolin, Johannes, 4,637,646, Cl. 295-37.000.
CMI Corporation: *See*—
Swisher, George W., Jr., 4,637,753, Cl. 404-90.000.
Coburn, Richard J.; Dean, Walter C., III; Kegelman, Thomas D.; and Milliard, Norman L., to KCR Technology, Inc. Electrographic charge deposition apparatus. 4,638,339, Cl. 346-153.100.
Coca-Cola Company, The: *See*—
Iacobucci, Guillermo A.; King, George A.; Goldstein, Jacob H.; and Benemann, John R., 4,638,005, Cl. 544-336.000.
Cochran, Susan, to TRW Inc. Electric submergible motor with bearing assembly isolated from axial loads. 4,638,198, Cl. 310-871.000.
Cocke, John: *See*—
Chang, Albert; Cocke, John; Mergen, Mark F.; and Radin, George, 4,638,426, Cl. 364-200.000.
Codrington, Ernest R. Pilot fuel regulating device. 4,637,353, Cl. 123-27.0GE.
Cohen, Marc M., to United States of America, National Aeronautics and Space Administration. Elevated waterproof access floor system and method of making the same. 4,637,181, Cl. 52-126.500.
Cohen, Sidney: *See*—
Zajac, William V., Jr.; Kautz, Henry G.; Kautz, David J.; Bossert, Arthur J.; and Cohen, Sidney, 4,637,928, Cl. 423-659.000.
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Levasseur, Joseph L., 4,637,523, Cl. 221-13.000.
Colatsky, Thomas J.: *See*—
Abou-Gharbia, Magid A.; Freed, Meier E.; and Colatsky, Thomas J., 4,638,008, Cl. 514-411.000.
Cole, James, to Dee Cramer, Inc. Filter assembly for an exhaust stack. 4,637,300, Cl. 98-60.000.
Coller, James R.; Coon, Paul A.; and Goodman, Joseph R., to AMP Incorporated. Dual in-line package carrier assembly. 4,637,670, Cl. 339-46.000.
Colles, Joseph H., to Brooktree Corporation. Regulated current supply. 4,638,241, Cl. 323-312.000.
Collins, John M.: *See*—
Hampshire, James F.; Groth, Hugh F.; and Collins, John M., 4,637,322, Cl. 108-102.000.
Collins, Stuart M. Multi part butt and reel seat used on fishing rods. 4,637,157, Cl. 43-22.000.
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Fuhrman, Ari, 4,638,025, Cl. 524-40.000.
Colt Industries Operating Corp.: *See*—
Cowles, Warren H., 4,637,366, Cl. 123-568.000.
Combustion Engineering, Inc.: *See*—
Dunn, Mark R., 4,637,556, Cl. 241-48.000.
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Comino, Vittorio: *See*—
Siligoni, Marco; Lari, Ferdinando; Saviotti, Vanni; and Comino, Vittorio, 4,638,122, Cl. 379-124.000.
Commissariat a l'Energie Atomique: *See*—
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Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, 4,638,216, Cl. 315-111.810.
Commonwealth of Australia, The: *See*—
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Communications Equipment and Engineering Co.: *See*—
Clark, Robert A., Jr., 4,638,121, Cl. 379-145.000.
Compagnie Internationale pour l'Informatique Cii Honeywell Bull: *See*—
Herve, Robert J. L. A., 4,638,120, Cl. 178-22.080.
Connell, G. A. Neville; and Godwin, Jimmy D., to Xerox Corporation. Apparatus using beam splitter cube with specific characteristics for reading information recorded in a magneto-optic medium. 4,638,470, Cl. 369-13.000.
Conner, Edward. Opto electric combination lock. 4,637,235, Cl. 70-277.000.
Consaga, John P.: *See*—
Austin, Theodore D.; and Consaga, John P., 4,638,316, Cl. 342-14.000.
Consoli, Ronald P.: *See*—
Marshall, Ralph C.; and Consoli, Ronald P., 4,637,225, Cl. 62-285.000.
Contamin, Jean-Claude: *See*—
Zabotto nee Arriban, Arlette; Contamin, Jean-Claude; Zaffran, Christian; and Koulbanis, Constantin, 4,637,933, Cl. 424-131.000.
Conti, Anthony L.: *See*—
Dawson, Dale E.; Conti, Anthony L.; Lee, Soong H.; Shade, Gary F.; and Dickens, Lawrence E., 4,638,269, Cl. 333-164.000.
Continental Pharma: *See*—
Lambelin, Georges E.; Roncucci, Romeo R.; Roba, Joseph; and Gillet, Claude L., 4,638,070, Cl. 549-23.000.
Continental Plastic Containers, Inc.: *See*—
Bartimes, George F.; and Blomquist, Leonard A., 4,637,600, Cl. 271-93.000.
Control Data Corporation: *See*—
Breske, Carl D.; and Borning, Jeffrey M., 4,637,542, Cl. 228-180.100.
Cook, Incorporated: *See*—
Cook, William A., 4,637,396, Cl. 128-344.000.
Cook, James R.: *See*—
Callahan, Wayne B.; Koch, Harold O.; Palin, Philip R.; and Cook, James R., 4,638,056, Cl. 536-54.000.
Cook, John. Tool for removing and reapplying rivets. 4,637,113, Cl. 29-243.540.
Cook, Norman E. Electronic detection device for motorized vehicles. 4,637,359, Cl. 123-179.00B.
Cook, Richard A.: *See*—
Bryant, Stewart F.; Baker, Stephen J.; and Cook, Richard A., 4,638,442, Cl. 364-489.000.
Cook, William A., to Cook, Incorporated. Balloon catheter. 4,637,396, Cl. 128-344.000.
Cooley, Denton A.: *See*—
Reed, Charles C.; Cooley, Denton A.; Crane, Terry N.; Swanson, Edward A.; Oscarsson, Rolf A.; Liebmann, Vern L.; and Cox, Dan L., 4,637,917, Cl. 422-46.000.
Coon, Paul A.: *See*—
Coller, James R.; Coon, Paul A.; and Goodman, Joseph R., 4,637,670, Cl. 339-46.000.
Cooperman, Michael; and Sieber, Richard W., to GTE Laboratories Incorporated. Two wire bidirectional digital transmission system. 4,638,473, Cl. 370-27.000.
Cope, Carroll W., to DG Shelter Products. Molding coating composition and process. 4,638,022, Cl. 524-15.000.
Corcoran, Paul T.: *See*—
Burdick, Jon S.; and Corcoran, Paul T., 4,637,665, Cl. 305-54.000.
Cordis Laboratories, Inc.: *See*—
Halbert, Seymour P., 4,637,880, Cl. 210-638.000.
Cornelison, Richard C. Mandrel for winding flexible metal catalyst core. 4,637,568, Cl. 242-68.500.
Cornell Research Foundation, Inc.: *See*—
Ravnitzky, Michael J., 4,637,576, Cl. 244-145.000.
Corning Glass Works: *See*—
DeAngelis, Thomas P.; and Lachman, Irwin M., 4,637,995, Cl. 502-439.000.
Corona, Fredrick W.: *See*—
Owens, Brian T.; and Corona, Fredrick W., 4,637,608, Cl. 272-134.000.
Coronet-Werke Heinrich Schlerf GmbH: *See*—
Weihrauch, Georg, 4,637,660, Cl. 300-21.000.
Costa De Beauregard, Francois: *See*—
Slodzian, Georges; Costa De Beauregard, Francois; Daigne, Bernard; and Girard, Francois, 4,638,160, Cl. 250-296.000.
Costa, Jorge; and Reichel, Wolfgang, to Hermes Precisa International S.A. Cassette for a sheet feed device. 4,637,601, Cl. 271-160.000.
Cotteret, Jean: *See*—
Monnais, Christian; and Cotteret, Jean, 4,637,821, Cl. 8-415.000.
Covino, Josephine; and McManis, George E., to United States of America, Navy. Electrochemical synthesis of ternary phosphides. 4,637,864, Cl. 204-61.000.
Cowles, Warren H., to Colt Industries Operating Corp. Fuel injection apparatus and system. 4,637,366, Cl. 123-568.000.
Cox, Dan L.: *See*—
Reed, Charles C.; Cooley, Denton A.; Crane, Terry N.; Swanson, Edward A.; Oscarsson, Rolf A.; Liebmann, Vern L.; and Cox, Dan L., 4,637,917, Cl. 422-46.000.
Crabtree, Paul J.; and Imakawa, Kazuhiko, to Procter & Gamble Company, The. Detergent composition providing rinse cycle suds and turbidity control containing a soap, quaternary ammonium salt and a silicone. 4,637,890, Cl. 252-90.000.
Craelius AB: *See*—
Jonsson, Nils G., 4,637,477, Cl. 173-149.000.
Craig, Daniel L.: *See*—
White, Dowell; Craig, Daniel L.; Duke, Jack L.; and Laurie, Donald H., 4,637,211, Cl. 60-650.000.
Crane, Michael P.; and Marah, David J., to Membrain Limited. Method and apparatus for generating sequence of multibit words. 4,638,481, Cl. 371-27.000.

Crane, Terry N.: *See*—
Reed, Charles C.; Cooley, Denton A.; Crane, Terry N.; Swanson, Edward A.; Oscarsson, Rolf A.; Liebmann, Vern L.; and Cox, Dan L., 4,637,917, Cl. 422-46.000.
Cranford, Hayden C., Jr.; and Garvin, Stacy J., to International Business Machines Corp. Charge pump system for non-volatile ram. 4,638,464, Cl. 365-226.000.
Cray Research, Inc.: *See*—
Cray, Seymour R., 4,638,188, Cl. 307-453.000.
Cray, Seymour R., to Cray Research, Inc. Phase modulated pulse logic for gallium arsenide. 4,638,188, Cl. 307-453.000.
Crews, Nancy B.: *See*—
Simmons, Billy R., 4,637,156, Cl. 43-21.200.
Crooks, Robert C., to Barcus-Berry Electronics, Inc. Reference load amplifier correction system. 4,638,258, Cl. 330-149.000.
Crothers, Steven D., to Owens-Corning Fiberglas Corporation. Splicing means for faced insulation batts. 4,637,188, Cl. 52-404.000.
Crown Zellerbach Corporation: *See*—
Matovich, Edwin; and Spannuth, Robert J., 4,637,858, Cl. 162-30.100.
Culbertson, Townley P.; Domagala, John M.; Mich, Thomas F.; and Nichols, Jeffrey B., to Warner-Lambert Co. Antibacterial agents. 4,638,067, Cl. 546-15.000.
Cummings, Robert J., to Rockwell International Corporation. Non-encumbering torso restraint system. 4,637,629, Cl. 280-801.000.
Cuomo, Jerome J.: *See*—
Bumble, Bruce; Cuomo, Jerome J.; Logan, Joseph S.; and Rossnagel, Steven M., 4,637,853, Cl. 156-345.000.
Curro, John J.: *See*—
Ouellette, William R.; Alcombright, Daniel S.; Curro, John J.; and Linman, E. Kelly, 4,637,819, Cl. 604-369.000.
Custer, Russell C.: *See*—
Keem, John E.; Bergeron, Richard C.; Custer, Russell C.; and McCallum, R. William, 4,637,967, Cl. 429-101.000.
Custom Sample Systems, Inc.: *See*—
Ponstingl, Michael J.; Trump, Walter N.; and Kessler, Robert C., 4,637,730, Cl. 356-411.000.
Cuvelier, Antoine L.; and Boucher, Guy M. G., to Huret et ses Fils. Electronic odometer in particular for a cycle. 4,638,448, Cl. 364-563.000.
Cycles Peugeot: *See*—
Fourrey, Francois; and Caburet, Pierre, 4,637,655, Cl. 297-410.000.
Czelusniak, Paul A., Jr., to Fieldcrest Mills, Inc. Tufting machine with modular constructed needle bars. 4,637,329, Cl. 112-80.450.
Dach, Michael M., to Texaco Inc. High temperature furnace. 4,637,823, Cl. 48-77.000.
Dahlin, Per O., to Cellexfabrikerna AB. Device for making porous concrete. 4,637,731, Cl. 366-64.000.
Daicel Chemical Industries, Ltd.: *See*—
Takahashi, Shigeyuki; Uchida, Manabu; and Yamazaki, Kazuhiro, 4,638,057, Cl. 536-76.000.
Daidotokushuko Kabushikikaisha: *See*—
Shimomoto, Yasunobu, 4,638,488, Cl. 373-22.000.
Daigne, Bernard: *See*—
Slodzian, Georges; Costa De Beauregard, Francois; Daigne, Bernard; and Girard, Francois, 4,638,160, Cl. 250-296.000.
Daigo, Yukitaka: *See*—
Nishi, Yoshitsugu; and Daigo, Yukitaka, 4,638,501, Cl. 378-182.000.
Daihatsu Motor Co., Ltd.: *See*—
Yoshida, Takeshi; Honda, Takayasu; Kitazume, Shunosuke; and Tanaka, Kouzou, 4,637,653, Cl. 297-334.000.
Daihen Corporation: *See*—
Arii, Kazuhiro; Tanaka, Teruaki; Sumida, Nobuyuki; and Arisaka, Kouhei, 4,637,563, Cl. 242-4.00B.
Daikin Industries, Ltd.: *See*—
Matoba, Yoshiaki; and Ozawa, Hitoshi, 4,637,786, Cl. 418-55.000.
Ohmori, Akira; Tomihashi, Nobuyuki; Inukai, Hiroshi; and Nakai, Kazuhiro, 4,638,041, Cl. 526-247.000.
Daikin Kogyo Co., Ltd.: *See*—
Hisamoto, Iwao; Maeda, Chiaki; and Nishiwaki, Mitsuhiro, 4,638,089, Cl. 564-292.000.
Daimler-Benz Aktiengesellschaft: *See*—
Parisch, Jochen; and Herlemann, Werner, 4,637,116, Cl. 29-441.00R.
Dainichiseika Color & Chemicals Mfg. Co., Ltd.: *See*—
Kawamura, Kimihide; Horiguchi, Shojiro; and Oksmoto, Hisao, 4,638,052, Cl. 534-575.000.
Dainippon Screen Mfg. Co., Ltd.: *See*—
Fujii, Teruo; and Tsutsui, Tomikazu, 4,637,710, Cl. 355-72.000.
Dakin, John P., to Plessey Overseas Limited. Optical fibre sensing arrangements. 4,638,153, Cl. 250-227.000.
Dakin, Wayne R., to Discovision Associates. Selectable video/audio coded data recovery from a record medium. 4,638,377, Cl. 358-341.000.
Dalo, Jean: *See*—
Dalo, Pierre; and Dalo, Jean, 4,637,415, Cl. 135-98.000.
Dalo, Pierre; and Dalo, Jean. Light shelter in the form of a tent comprising a roof constituted by a canvas. 4,637,415, Cl. 135-98.000.
Damiano, Michael A.; Schmerda, Richard F.; and Searing, Lawrence G., to Eaton Corporation. Speed control system with feedback and soft-start. 4,638,226, Cl. 318-345.00R.
Damsky, Walter: *See*—
Brockmann, Rolf; Casper, Clemens; Damsky, Walter; Lippert, Axel; and Sajben, Johannes O., 4,637,857, Cl. 159-47.100.
Dana Corporation: *See*—
Otteson, Jack O., 4,637,485, Cl. 180-175.000.
Daniel, Richard A.: *See*—
Hong, Vuong B.; Rowson, Stuart C.; Daniel, Richard A.; and Rostek, Paul M., 4,638,256, Cl. 328-105.000.
Daniels, Edward P., to Pitney Bowes Inc. Postage metering system with display. 4,638,439, Cl. 364-446.000.
Dannals, Robert F.: *See*—
Burns, Hugh D.; Zemyan, Susan E.; Epps, Leon A.; Kramer, Alfred V.; and Dannals, Robert F., 4,638,051, Cl. 534-14.000.
Dappen, Glen M., to Eastman Kodak Company. Assay for analysis of whole blood. 4,637,978, Cl. 435-11.000.
Darton, Kenneth S., to Standard Telephones & Cables Public Limited Company. Distributed digital signal multiplexing. 4,638,480, Cl. 370-112.000.
Das, Balbhadra; Temple, Chester S.; and Melle, Carl A., to PPG Industries, Inc. Sized glass fibers and reinforced polymers containing same. 4,637,956, Cl. 428-391.000.
Das, Jagabandhu, to E. R. Squibb & Sons, Inc. Tetrahydrothienyl substituted prostaglandin analogs. 4,638,011, Cl. 514-438.000.
Dasser, Manfred: *See*—
Mayr, Fritz; and Dasser, Manfred, 4,637,502, Cl. 192-56.00R.
Davis, Bayard C., to XCO International, Inc. Heat sensitive tape and method of making same. 4,638,107, Cl. 136-237.000.
Davis, Robert E., to Arkansas Patents, Inc. Pulsing combustion. 4,637,792, Cl. 431-1.000.
Davis, Ronald G., to Keathley, H. Milton; and Phenix, Douglas Michael. Anticorrosion battery terminal. 4,637,965, Cl. 429-1.000.
Davis, Roy E. Reinforcing member for wooden structure. 4,637,195, Cl. 52-693.000.
Dawson, Dale E.; Conti, Anthony L.; Lee, Soong H.; Shade, Gary F.; and Dickens, Lawrence E., to Westinghouse Electric Corp. Wide band microwave analog phase shifter. 4,638,269, Cl. 333-164.000.
Dawson, Paul H.: *See*—
Wilhelm, John J.; Calhoun, Gregory L.; Dawson, Paul H.; and Kramer, Arthur W., 4,637,588, Cl. 251-280.000.
Dayco Corporation: *See*—
Long, Delmar D., 4,637,940, Cl. 427-176.000.
Rush, James B.; Bryan, James S.; Gunter, Jonas L.; Dillard, Guy W.; Meadows, Roger D.; and Henry, Pearison W., 4,637,638, Cl. 285-158.000.
Dayton Reliable Tool & Mfg. Co.: *See*—
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ernal C.; Wynn, David K.; and Gregg, James R., 4,637,961, Cl. 428-579.000.
DBM Industries Limited: *See*—
Perrella, Guido; and Thompson, William E., 4,637,451, Cl. 164-342.000.
DE-BI Derivati Biologici International SpA: *See*—
Elefante, Biagio, 4,638,081, Cl. 560-40.000.
De-Sta-Co Division/Dover Corporation: *See*—
McPherson, Alexander W.; and Hamed, Hazem N., 4,637,597, Cl. 269-32.000.
Deal, Samuel B.; and Bartch, Donald W., to RCA Corporation. CRT with internal contact stripe or patch and method of making said stripe or patch. 4,638,213, Cl. 313-479.000.
Dean, Walter C., III: *See*—
Coburn, Richard J.; Dean, Walter C., III; Kegelman, Thomas D.; and Milliard, Norman L., 4,638,339, Cl. 346-153.100.
DeAngelis, Thomas P.; and Lachman, Irwin M., to Corning Glass Works. Preparation of monolithic catalyst supports having an integrated high surface area phase. 4,637,995, Cl. 502-439.000.
DeBoer, Charles D.; and Luckey, George W., to Eastman Kodak Company. Fluorescent compositions, x-ray intensifying screens, and processes for making same. 4,637,898, Cl. 252-301.360.
de Brunier, Bernard: *See*—
Stewart, John B., Jr.; Szalvay, Laszlo; de Brunier, Bernard; and Simpson, Jeffrey W., 4,637,436, Cl. 138-89.000.
de Campos, Joaquim C.: *See*—
Barbosa, Antonio B.; and de Campos, Joaquim C., 4,637,517, Cl. 211-86.000.
DeCarlo, David J.: *See*—
Rynk, Anthony J.; and DeCarlo, David J., 4,637,136, Cl. 29-472.000.
Decima, Fredy, to ABG Semca. Rapid discharge extinguisher. 4,637,472, Cl. 169-35.000.
Deczky, Andrew E., to R.F.J. Associates Limited, a part interest. Data acquisition system for the computer control of aluminum smelters. 4,638,441, Cl. 364-483.000.
Dee Cramer, Inc.: *See*—
Cole, James, 4,637,300, Cl. 98-60.000.
Deere & Company: *See*—
Hauk, Klaus, 4,638,276, Cl. 335-151.000.
Deiss, Michael S., to RCA Corporation. Signal source selector. 4,638,181, Cl. 307-243.000.
Deiss, Willy-Jean: *See*—
Bauduin, Gerard; Boutevin, Bernard; Deiss, Willy-Jean; and Pietrasanta, Yves, 4,638,018, Cl. 522-103.000.
Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, to Commissariat a l'Energie Atomique. Electron cyclotron resonance ion source. 4,638,216, Cl. 315-111.810.
Della Bella, Davide: *See*—
Chiarino, Dario; Carenzi, Angelo; Della Bella, Davide; and Fantucci, Mario, 4,638,003, Cl. 514-255.000.
Delta Electronics: *See*—
Wright, Charles S., 4,638,503, Cl. 381-16.000.

Delta Kogyo Co., Ltd.: *See*—
Okino, Kiyomi; and Muramoto, Takumi, 4,637,648, Cl. 296-63.000.

Delwel, Francois; and Claassens, Marinus L. M., to Lever Brothers Company. Process for the manufacture of detergent compositions containing sodium aluminosilicate. 4,637,891, Cl. 252-135.000.

DeMeyer, Roy W., to Johnson Service Company. Pneumatic differential pressure controller. 4,637,546, Cl. 236-49.000.

Dempsey, Donald J.: *See*—
Szycher, Michael; Dempsey, Donald J.; and Rolfe, Jonathan L., 4,638,043, Cl. 528-75.000.

deNeufville, John P.: *See*—
Lee, Henry; deNeufville, John P.; and Ovshinsky, Stanford R., 4,637,938, Cl. 427-53.100.

Denimal, Philippe, to PROGE. Rapid profile recording device. 4,638,354, Cl. 358-106.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Masui, Takeshi; and Sano, Morio, 4,637,945, Cl. 428-35.000.

DeRespinis, Silvio F.: *See*—
Frank, Arthur M.; DeRespinis, Silvio F.; and Mockovciak, John, Jr., 4,637,447, Cl. 160-265.000.

Derichs, Josef, to W. Schlafhorst & Co. Pneumatic spinning method and pneumatic spinning device. 4,637,207, Cl. 57-282.000.

de Ris, John; and Markstein, George H., to Factory-Mutual Research Corporation. Bench-scale material flammability test apparatus and process for measuring flammability. 4,637,735, Cl. 374-8.000.

Derkits, Gustav E., Jr.; and Harbison, James P., to AT&T Bell Laboratories. Selective area III-V growth and lift-off using tungsten patterning. 4,637,129, Cl. 29-578.000.

de Roure, Olivier P. R., to Manufacture de Rougement. Wound coil of tie material packaged on a display base, and a process for producing it. 4,637,516, Cl. 206-471.000.

Derrick, John M. Method and apparatus for multizone oil and gas production. 4,637,468, Cl. 166-297.000.

Descas, Patrick: *See*—
Feniou, Claude; and Descas, Patrick, 4,638,082, Cl. 560-62.000.

DeShazer, Larry G.: *See*—
Rand, Stephen C.; and DeShazer, Larry G., 4,638,484, Cl. 372-42.000.

DeSousa, Daniel A.; Gockel, Gary L.; D'Innocente, Ralph; and Jacuzzi, Roy A., to Jacuzzi Inc. Front load skimmer/filter for spas and pools. 4,637,873, Cl. 210-169.000.

D'Este, Arturo: *See*—
Cammi, Sergio; D'Este, Arturo; and Pescetelli, Alessandro, 4,637,832, Cl. 75-109.000.

Deutsche Gesellschaft: *See*—
Stritzke, Detlef, 4,638,134, Cl. 219-9.500.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See*—
Schroder, Gunter; and Berning, Helmut, 4,638,234, Cl. 318-661.000.

Deutsche Perrot-Bremse GmbH: *See*—
Rupprecht, Bernd, 4,637,499, Cl. 188-79.50R.

de Vos, Hendrik A. J.; and Labouliere, Elzear R., to GTE Products Corporation. Luminaire with rotatable reflector. 4,638,414, Cl. 362-370.000.

DeVries, James H., to Baxter Travenol Laboratories, Inc. Blood processing assembly including a prepackaged fluid circuit module. 4,637,813, Cl. 604-6.000.

De Witt, Elmer J.: *See*—
Li, George S.; Wu, Muyen M.; and De Witt, Elmer J., 4,638,042, Cl. 526-280.000.

DG Shelter Products: *See*—
Cope, Carroll W., 4,638,022, Cl. 524-15.000.

Dibbler, Inc.: *See*—
Topham, Arnold. J.; and Wilson, Harry W., 4,637,328, Cl. 111-89.000.

Dickens, Lawrence E.: *See*—
Dawson, Dale E.; Conti, Anthony L.; Lee, Soong H.; Shade, Gary F.; and Dickens, Lawrence E., 4,638,269, Cl. 333-164.000.

Diesel Kiki Co., Ltd.: *See*—
Kushida, Takeo; and Yamada, Keiichi, 4,637,553, Cl. 239-533.400.

Dietiker, Paul; and Nelson, Marvin D., to Honeywell Inc. Fluid pressure regulating valve having adjustable two-stage and natural-LP gas changeover capabilities. 4,637,429, Cl. 137-505.140.

Dillard, Guy W.: *See*—
Rush, James B.; Bryan, James S.; Gunter, Jonas L.; Dillard, Guy W.; Meadows, Roger D.; and Henry, Pearison W., 4,637,638, Cl. 285-158.000.

D'Incan, Esther: *See*—
Perichon, Jacques; Rabemanantsoa, Amelie; Sibille, Soline; and D'Incan, Esther, 4,637,863, Cl. 204-59.00R.

D'Innocente, Ralph: *See*—
DeSousa, Daniel A.; Gockel, Gary L.; D'Innocente, Ralph; and Jacuzzi, Roy A., 4,637,873, Cl. 210-169.000.

Discovision Associates: *See*—
Dakin, Wayne R., 4,638,377, Cl. 358-343.000.

Dixon Industries Corporation: *See*—
Lombardo, Frank; Jernigan, Edward L.; and Furze, Paul, 4,637,856, Cl. 156-637.000.

Dobbs, Teena L.: *See*—
Moss, Gaylord E.; Chern, Mao-Jin; and Dobbs, Teena L., 4,637,678, Cl. 350-3.700.

Dobring, Wilfried: *See*—
Baitz, Guenter; and Dobring, Wilfried, 4,637,326, Cl. 109-49.000.

Dobson Park Industries, PLC: *See*—
Mann, Derek, 4,637,816, Cl. 604-62.000.

Docherty, James P.: *See*—
Solano, William E.; Docherty, James P.; and Stubenbort, Joseph W., 4,637,795, Cl. 432-138.000.

Doherty, James B.; Finke, Paul E.; Firestone, Raymond A.; Shah, Shrenik S.; and Thompson, Kevan R., to Merck & Co., Inc. Substituted cephalosporins as anti-inflammatory and antidegenerative agents. 4,637,999, Cl. 514-201.000.

Doi, Takashi: *See*—
Ogata, Mikito; Mori, Masahito; Doi, Takashi; Miyazaki, Michio; and Oka, Takafumi, 4,638,472, Cl. 369-54.000.

Dolgos nee Kekesi, Krisztina: *See*—
Szekely, Istvan; Botar, Sandor; Dolgos nee Kekesi, Krisztina; Bertok, Bela; Gajary, Antal; Szabolcsi, Tamas; Kovacs, Gabor; and Lovasz nee Gaspar, Marianna, 4,638,002, Cl. 514-212.000.

Domagala, John M.: *See*—
Culbertson, Townley P.; Domagala, John M.; Mich, Thomas F.; and Nichols, Jeffrey B., 4,638,067, Cl. 546-15.000.

Donath, Sabine; and Holz, Peter, to Messer Griesheim GmbH. Device and method for the surface treatment of cold-embrittled parts. 4,637,174, Cl. 51-425.000.

Doorenbos, Daryl E. Device for assisting in putting on elastic hosiery. 4,637,532, Cl. 223-111.000.

Dorr, Konrad, to Dr.Ing.h.c.F. Porsche Aktiengesellschaft. Optoelectronic measuring device. 4,638,155, Cl. 250-231.0SE.

Dosai, Takayoshi: *See*—
Asari, Akira; Matsumoto, Satoshi; Hattori, Shigeo; and Dosai, Takayoshi, 4,637,112, Cl. 29-159.010.

Dosoudil, Martin. Disc shaped filter element. 4,637,876, Cl. 210-331.000.

Dost, Willibald; and Kreutzer, Hans, to Siemens Aktiengesellschaft. Adjustment device for a reflector mirror of a laser resonator. 4,638,486, Cl. 372-107.000.

Dotzauer, Ewald: *See*—
Altendorfer, Alois; Dotzauer, Ewald; and Mueller, Wolfgang, 4,638,123, Cl. 379-229.000.

Dover Corporation: *See*—
Atkey, Richard E.; and Gilliland, Oscar E., 4,637,496, Cl. 187-95.000.

Dow Chemical Company, The: *See*—
Kildea, James M.; Bedner, Maria D.; and Gulick, John J., 4,637,514, Cl. 206-406.000.
Kirchhoff, Robert A., 4,638,078, Cl. 558-414.000.
Kleschick, William A.; Vinogradoff, Anna P.; and Dunbar, Joseph E., 4,638,075, Cl. 558-5.000.
Lane, George A.; and Rossow, Harold E., 4,637,888, Cl. 252-70.000.
Little, Douglas J., 4,638,102, Cl. 568-724.000.
Maria van Riet, Wilhelmus A., 4,637,189, Cl. 52-309.800.
Marino, Dean F.; Ryan, William E.; and Kamp, Arthur J., 4,638,168, Cl. 250-560.000.
Wang, Pen-Chung; and Renga, James M., 4,638,064, Cl. 544-54.000.

Dowell Schlumberger Incorporated: *See*—
Kennedy, Weldon C., Jr., 4,637,899, Cl. 252-542.000.

Dr.Ing.h.c.F. Porsche Aktiengesellschaft: *See*—
Dorr, Konrad, 4,638,155, Cl. 250-231.0SE.

Drabek, Jozef: *See*—
Boger, Manfred; and Drabek, Jozef, 4,638,069, Cl. 546-300.000.

Dragerwerk AG: *See*—
Baum, Marcel, 4,637,386, Cl. 128-204.210.

Drake, Donald J.; Hawkins, William G.; Markham, Roger G.; and LaDonna, Richard V., to Xerox Corporation. Printhead for an ink jet printer. 4,638,328, Cl. 346-75.000.

Draper, Robert; Lorentz, Donald G.; Baum, Allen J.; and Economy, George, to Westinghouse Electric Corp. Compact model steam generator having multiple primaries. 4,637,346, Cl. 122-4.00A.

Dresser Industries, Inc.: *See*—
McGlothen, Jody R.; and Little, Damon P., 4,637,460, Cl. 166-189.000.
Patel, Arvind D.; and Salandanan, Carmelita S., 4,637,883, Cl. 252-8.515.
Spriggs, Dennis M.; and McGlothen, Jody R., 4,637,469, Cl. 166-310.000.

Dressler, John L.: *See*—
Sutera, Richard; Dressler, John L.; and Halliday, Bruce W., 4,638,327, Cl. 346-75.000.

Dreuilhe, Claude: *See*—
Obrecht, Georges; and Dreuilhe, Claude, 4,637,480, Cl. 175-45.000.

Dreyer, Adolf; and Roozenbeek, Herman, to Robert Bosch GmbH. Method of recognizing knocking signals in a received signal derived from a knocking sensor in an internal combustion engine, and system carrying out the method. 4,637,247, Cl. 73-35.000.

Drogin, Edwin M., to Eaton Corporation. Unambiguous wide baseline interferometer. 4,638,321, Cl. 342-444.000.

D'Silva, Themistocles D. J.: *See*—
Rao, Chennupati K.; Arora, Sudershan K.; Grover, Raman; Durden, John A.; and D'Silva, Themistocles D. J., 4,637,901, Cl. 260-544.00C.

Du-Al Manufacturing Company: *See*—
Stumpe, Leroy, 4,637,772, Cl. 414-686.000.

Duembgen, Gerd: *See*—
Broecker, Franz J.; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,638,085, Cl. 560-208.000.

Duerig, Thomas: *See*—
Albrecht, Joachim; and Duerig, Thomas, 4,637,962, Cl. 428-616.000.

Dufraanes, Jean-Claude, to Ateliers de Constructions Electriques de Charleroi (ACEC) Societe Anonyme. Electrical contacts for oscillating yoke of load selector. 4,638,127, Cl. 200-11.00K.

Duke, Jack L.: *See*—
White, Dowell; Craig, Daniel L.; Duke, Jack L.; and Laurie, Donald H., 4,637,211, Cl. 60-650.000.

Dukes, John N.: *See*—
Baumgartner, Richard A.; Dukes, John N.; and Fisher, George A., 4,638,191, Cl. 307-602.000.

Dunbar, Joseph E.: *See*—
Kleschick, William A.; Vinogradoff, Anna P.; and Dunbar, Joseph E., 4,638,075, Cl. 558-5.000.

Dunn, Charles S.; Propster, Mark A.; and Hohman, Charles M., to Owens-Corning Fiberglas Corporation. Melting furnaces. 4,638,490, Cl. 373-35.000.

Dunn, Mark R., to Combustion Engineering, Inc. High efficiency separator system. 4,637,556, Cl. 241-48.000.

Du Pont de Nemours, E. I., and Company: *See*—
Adams, Philip E.; McGowan, Michael J.; and Yunan, Malak E., 4,637,312, Cl. 102-275.120.
Elias, John G.; and Jansson, Allan P., 4,638,456, Cl. 364-518.000.

Durden, John A.: *See*—
Rao, Chennupati K.; Arora, Sudershan K.; Grover, Raman; Durden, John A.; and D'Silva, Themistocles D. J., 4,637,901, Cl. 260-544.00C.

Dutt, Herbert V.; and Santostasi, Paul A., to Sun Coast Plastics, Inc. Two part closure. 4,637,519, Cl. 215-232.000.

Dvorak, Robert F.; and Netolicky, Charles E., to Square D Company. Rotary switch assembly. 4,638,133, Cl. 200-302.100.

Dyben, Jerry F.; and Wulc, Stanley S., to Tokheim Corporation. Gauge apparatus for measuring liquid levels. 4,637,254, Cl. 73-314.000.

Dyer, Gerald P., to United Technologies Corporation. Metering valve. 4,637,420, Cl. 137-242.000.

Dyer, Ross M. W.; and Nowak, Edward, to Ciba-Geigy Corporation. Herbicidal concentrates. 4,637,830, Cl. 71-105.000.

Dylewski, Anthony J.: *See*—
Bardo, Charles J.; Seawell, Jesse Q.; Dylewski, Anthony J.; and Clark, John L., Jr., 4,637,903, Cl. 261-24.000.

Dytch, Anthony; Keatley, Andrew; and Wright, William. Microprocessor controlled through-flow electric water heater. 4,638,147, Cl. 219-308.000.

E. R. Squibb & Sons, Inc.: *See*—
Das, Jagabandhu, 4,638,011, Cl. 514-438.000.
Kronenthal, David, 4,638,062, Cl. 540-355.000.
Nakane, Masami, 4,638,012, Cl. 514-469.000.
Slusarchyk, William A.; and Koster, William H., 4,638,061, Cl. 540-355.000.
Sundeen, Joseph E.; Koster, William H.; and Zahler, Robert, 4,638,060, Cl. 540-203.000.
Weller, Harold N., III; and Gordon, Eric M., 4,638,010, Cl. 514-423.000.

E.S.G. Controls, Ltd.: *See*—
Robinson, Anthony, 4,637,349, Cl. 122-448.00B.

Earle, George A., III: *See*—
Murray, William J.; and Earle, George A., III, 4,637,761, Cl. 408-16.000.

Eash, Matthew G.: *See*—
Jaskolski, Patrick L.; and Eash, Matthew G., 4,638,253, Cl. 324-318.000.

Eastman Kodak Company: *See*—
Dappen, Glen M., 4,637,978, Cl. 435-11.000.
DeBoer, Charles D.; and Luckey, George W., 4,637,898, Cl. 252-301.360.
Hinshaw, Jerald C.; Toner, John L.; and Reynolds, George A., 4,637,988, Cl. 436-546.000.
Milch, James R., 4,638,371, Cl. 358-293.000.
Schneider, John M.; Piatt, Michael J.; Brown, Mark E.; and Bowers, Mark C., 4,638,325, Cl. 346-1.100.

Eaton Corporation: *See*—
Damiano, Michael A.; Schmerda, Richard F.; and Searing, Lawrence G., 4,638,226, Cl. 318-345.00R.
Drogin, Edwin M., 4,638,321, Cl. 342-444.000.
Gritter, David J., 4,638,224, Cl. 318-254.000.

Eberhard, Jeffrey W.; and Cain, Dallas E., to General Electric Company. High resolution collimator system for X-ray detector. 4,638,499, Cl. 378-7.000.

Ebner, Howard A., to Resinoid Engineering Corporation. Commutator and method of making same. 4,638,202, Cl. 310-235.000.

Economy, George: *See*—
Draper, Robert; Lorentz, Donald G.; Baum, Allen J.; and Economy, George, 4,637,346, Cl. 122-4.00A.

Ed. Zublin Aktiengesellschaft: *See*—
Fastenau, Werner, 4,637,586, Cl. 249-159.000.

Edakubo, Hiroo: *See*—
Kozuki, Susumu; Nagasawa, Kenichi; Edakubo, Hiroo; Sato, Junichi; and Takayama, Nobutoshi, 4,638,390, Cl. 360-74.100.

Edberg, Dan O., to A/S Ingeniorgruppen AF. Beater mill having at least one vertically or obliquely extending cylindrical milling chamber. 4,637,561, Cl. 241-154.000.

Eerola, Matti V., to Raute Oy. Suction-lifting conveyor for transfer for sheet-shaped objects. 4,637,599, Cl. 271-5.000.

Eesley, Gary L.; Mance, Andrew M.; and Meyer, Martin S., to General Motors Corporation. Wire-glass composite and method of making same. 4,637,862, Cl. 204-15.000.

Egami, Hidemi: *See*—
Hosoi, Atsushi; Kan, Fumitaka; Egami, Hidemi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,637,706, Cl. 355-3.0DD.

Eggert, Dennis J.; Hendrix, Charles E.; and Krinsky, Barnet, to Hughes Aircraft Company. Direction finding interferometer. 4,638,320, Cl. 342-442.000.

Egli, Werner H.; and Weber, Mark W., to Honeywell Inc. Discriminant apparatus for ring laser angular rate sensors. 4,637,723, Cl. 356-350.000.

Eguchi, Mamoru: *See*—
Shibata, Masato; Eguchi, Mamoru; and Kondo, Yoshihito, 4,637,200, Cl. 53-551.000.

Ehlert, Charles W., to Lubricating Systems Company of Texas, Inc. Mist generators. 4,637,493, Cl. 184-55.100.

Elabd, Hammam; and Kosonocky, Walter F., to RCA Corporation. IR imaging array and method of making same. 4,638,345, Cl. 357-24.000.

Eldrige, John D., Jr., to Instranetics, Inc. Disposable surgical implement collector. 4,637,513, Cl. 206-370.000.

Elefante, Biagio, to DE-BI Derivati Biologici International SpA. Process for preparing α-aspartyl-L-phenylalanine methyl ester. 4,638,081, Cl. 560-40.000.

Elektroschmelzwerk Kempten GmbH: *See*—
von Matuschka, Alfred G.; and Trausner, Norbert, 4,637,837, Cl. 148-6.000.

Eli Lilly and Company: *See*—
Hershberger, Charles L.; Merkel, Kurt E.; Weeks, Robert E.; and Wild, Gene M., 4,637,981, Cl. 435-75.000.

Elias, John G.; and Jansson, Allan P., to Du Pont de Nemours, E. I., and Company. Spot quantitation. 4,638,456, Cl. 364-518.000.

Ellingboe, Edmund G. Theft resistant condiment container. 4,637,526, Cl. 222-146.200.

Ellison, Donald E., to United Technologies Automotive, Inc. Wire cross-over arrangement for coil assembly. 4,638,282, Cl. 336-185.000.

Ellsworth, Wendell E.; and Birdsall, Raymond P., to Algoma Hardwoods, Inc. Windowed fire door. 4,637,182, Cl. 52-211.000.

Elpatronic AG: *See*—
Opprecht, Paul; Urech, Werner; and Opprecht, Jurg, 4,637,521, Cl. 220-274.000.

Elrod, Scott A., to Xerox Corporation. Capillary wave controllers for nozzleless droplet ejectors. 4,638,338, Cl. 346-140.00R.

Elscint Ltd.: *See*—
Melman, Haim, 4,638,355, Cl. 358-111.000.

Emerson Electric Co.: *See*—
Sciuto, George J., 4,637,881, Cl. 210-689.000.

Emhart Industries, Inc.: *See*—
Nebelung, Hermann H.; Huber, Robert; and Futterknecht, Fritz, 4,637,827, Cl. 65-235.000.

EMS-Inventa AG: *See*—
Rehmann, Robert, 4,637,311, Cl. 102-209.000.

Enberg, Helge, to AB Bahco Ventilation. Air supply device. 4,637,302, Cl. 98-115.300.

Endo, Akira; Takezaki, Jiro; Tsujii, Fumio; and Shibata, Takanori, to Hitachi, Ltd. Navigation apparatus for automotive. 4,638,438, Cl. 364-449.000.

Endo, Nobuhiro: *See*—
Kurogi, Yukinori; Endo, Nobuhiro; and Tanno, Kohetsu, 4,637,127, Cl. 29-576.00E.

Endo, Yukio: *See*—
Rollhaus, Philip; and Endo, Yukio, 4,638,306, Cl. 340-365.00R.

Energy Conversion Devices, Inc.: *See*—
Keem, John E.; Bergeron, Richard C.; Custer, Russell C.; and McCallum, R. William, 4,637,967, Cl. 429-101.000.
Lee, Henry; deNeufville, John P.; and Ovshinsky, Stanford R., 4,637,938, Cl. 427-53.100.
Ovshinsky, Stanford R.; Guha, Subhendu; Nath, Prem; Yang, Chi C.; Fournier, Jeffrey; and Kulman, James, 4,637,895, Cl. 252-188.310.

Engelskirchen, Jurgen, to Blohm & Voss AG. Permanent anchoring arrangement for floating structures. 4,637,336, Cl. 114-293.000.

Engineering Consulting Services: *See*—
Olsen, Joseph C.; and Steinbach, Richard H., 4,637,288, Cl. 83-375.000.

England, John R.; and Riach, Richard L., to Inco Limited. In-the-hole drill. 4,637,475, Cl. 173-43.000.

Engler, Philip J.: *See*—
Kidd, Richard L.; Graf, Jerry A.; Engler, Philip J.; and Lu, Song-Chin S., 4,638,131, Cl. 200-61.550.

English, Lawrence J.: *See*—
Ingrisano, Louis A.; Moon, Stephen H.; and English, Lawrence J., 4,637,075, Cl. 2-94.000.

ENI-Ente Nazionale Idrocarburi: *See*—
Verdini, Antonio S.; and Visconi, Giuseppe C., 4,638,046, Cl. 530-332.000.

Enomiya, Takuji: *See*—
Nakai, Mamoru; and Enomiya, Takuji, 4,638,094, Cl. 568-309.000.

Enron Corp.: *See*—
Grose, Ronald D., 4,637,219, Cl. 62-199.000.
Nichols, Leo F., 4,638,286, Cl. 338-34.000.

Enterprise Brass Works, Inc.: *See*—
Klop, Elmer P., 4,637,522, Cl. 220-322.000.

Environmental Air Control, Inc.: *See*—
Shields, William, 4,637,301, Cl. 98-115.300.

Epoxy Technology, Inc.: *See*—
Banfield, Charles E., 4,637,197, Cl. 53-428.000.

Epps, Leon A.: *See*—
Burns, Hugh D.; Zemyan, Susan E.; Epps, Leon A.; Kramer, Alfred V.; and Dannals, Robert F., 4,638,051, Cl. 534-14.000.

Epstein, Peter C.: *See*—
Maurer, Robert; and Epstein, Peter C., 4,637,244, Cl. 73-3.000.

Erbert, Virgil, to Illuminated Data, Inc. Methods and apparatus relating to photovoltaic semiconductor devices. 4,638,110, Cl. 136-246.000.

Erdman, David M., to General Electric Company. Method of establishing a preferred rate of air flow, method of determining torque, and apparatus. 4,638,233, Cl. 318-644.000.

Erect-A-Tube, Inc.: *See*—
McQueen, Coy E.; Twedt, Lynn O.; and Thurnau, Edwin H., 4,637,446, Cl. 160-207.000.

Eriksson, Sven-Goran. Device for lifting and handling objects. 4,637,645, Cl. 294-104.000.

Esef Corporation: *See*—
Chirdon, Charles P., 4,637,435, Cl. 138-30.000.

Essex Group, Inc.: *See*—
Sklarski, Dennis J., 4,637,852, Cl. 156-307.400.

Esso Resources Canada Limited: *See*—
Schramm, Laurier L., 4,637,417, Cl. 137-4.000.

Etablissement Public de Diffusion Dit "Teledifusion de France" : *See*—
Leseure, Jean-Yves; Pierre, Charbonnel; and Laure, Christian, 4,638,167, Cl. 250-551.000.

Eto, Kunihiko; Iwashita, Shigeo; and Matsumoto, Tsutomu, to Toyoda Koki Kabushiki Kaisha. Steering characteristic controller for a power steering system. 4,637,483, Cl. 180-142.000.

Evans, Gary E., to Westinghouse Electric Corp. Orthogonal beam forming network. 4,638,317, Cl. 342-373.000.

Evans, Robert D.; and Blezard, Robert C. Tufted weatherstripping with barrier fin. 4,637,948, Cl. 428-89.000.

Exxon Production Research Co.: *See*—
Adorjan, Alexander S., 4,637,637, Cl. 285-47.000.

Exxon Research and Engineering Company: *See*—
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,637,870, Cl. 208-112.000.
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,637,871, Cl. 208-112.000.
Bouboulis, Constantine J., 4,638,031, Cl. 524-773.000.
Brois, Stanley J.; and Gutierrez, Antonio, 4,637,886, Cl. 252-51.50A.
Grimes, Patrick G., 4,637,968, Cl. 429-105.000.
Osman, Robert M.; and Shulik, Larry J., 4,637,918, Cl. 422-148.000.
Peiffer, Dennis G.; Lundberg, Robert D.; and Pober, Kenneth W., 4,637,882, Cl. 252-8.514.
Pieters, Wim J. M.; and Okumura, Yoshiharu, 4,638,106, Cl. 585-640.000.

Faber, Johannes W.: *See*—
Smulders, Hendricus F. G.; Franken, Adrianus J. J.; Faber, Johannes W.; and Swinkels, Wouter H., 4,637,777, Cl. 414-751.000.

Factory-Mutual Research Corporation: *See*—
de Ris, John; and Markstein, George H., 4,637,735, Cl. 374-8.000.

Fantucci, Mario: *See*—
Chiarino, Dario; Carenzi, Angelo; Della Bella, Davide; and Fantucci, Mario, 4,638,003, Cl. 514-255.000.

Fanuc Ltd.: *See*—
Nakashima, Seiichiro; Toyoda, Kenichi; Torii, Nobutoshi; and Nihei, Ryo, 4,637,773, Cl. 414-732.000.
Yamazaki, Etuo, 4,638,455, Cl. 364-900.000.

Fanuc Ltd: *See*—
Obara, Haruki; and Aso, Toshiyuki, 4,638,140, Cl. 219-69.00W.

Fastenau, Werner, to Ed. Zublin Aktiengesellschaft. Form for producing concrete rails. 4,637,586, Cl. 249-159.000.

Fauvet, Jean-Pierre; and Parisel, Jacques, to La Telemecanique Electrique. Process and device for determining the mean value of the current delivered by a controllable valve rectifier bridge. 4,638,419, Cl. 363-87.000.

Fechant, Louis: *See*—
Belbel, Elie; Caudron, Robert; Fechant, Louis; Haury, Andre ; Lauraire, Michel; Muniesa, Jacques; and Siffroi, Lucien, 4,638,275, Cl. 335-151.000.

Fedeli, Luisa. Grass shaving machine. 4,637,203, Cl. 56-202.000.

Federal Pioneer Limited: *See*—
MacPhee, Colin A. A.; and Yoon, Ohjhong, 4,638,245, Cl. 324-51.000.

Feigel, Josef, to Standard Elektrik Lorenz Aktiengesellschaft. Electronically commutated dc motor. 4,638,201, Cl. 310-216.000.

Feinberg, Andrew S. Swimming pool cleaner attachment. 4,637,087, Cl. 15-1.700.

Feiner, Haim: *See*—
Gran, Paul; Feiner, Haim; Ben-Dayan, Nissim; Stefaniu, Marian; and Mar-Chaim, Yechiam, 4,638,453, Cl. 364-900.000.

Felcht, Utz-Hellmuth: *See*—
Brandt, Lothar; and Felcht, Utz-Hellmuth, 4,638,058, Cl. 536-103.000.

Fell, Ferol S.: *See*—
Guinn, Ronald K.; and Fell, Ferol S., 4,637,406, Cl. 130-27.00R.

Feng, I-an, to Xerox Corporation. Thermal printing circuit. 4,638,333, Cl. 346-76.0PH.

Feniou, Claude; and Descas, Patrick, to Societe Corial, S.A. Method of producing the p-chlorophenol ester of p-chlorophenoxyisobutyric acid. 4,638,082, Cl. 560-62.000.

Ferag AG: *See*—
Gerber, Walter, 4,637,198, Cl. 53-430.000.

Fernandez, Emilio A., to Pulse Electronics, Inc. Battery condition indicator. 4,638,237, Cl. 320-48.000.

Fernwerktechnik Schleicher & Co.: *See*—
Goldhammer, Albert, 4,637,560, Cl. 241-100.000.

Ferranti plc: *See*—
Brignall, Nicolas L., 4,638,221, Cl. 318-48.000.
Waterworth, John R., 4,638,454, Cl. 364-900.000.

Fetzer, Gerhard: *See*—
Griesinger, Rolf; and Fetzer, Gerhard, 4,637,172, Cl. 51-289.00R.

Fichtel & Sachs AG: *See*—
Gobel, Hilmar; and Raab, Harald, 4,637,500, Cl. 192-3.280.

Fiedler, Leslie C. Actuator with osmotic pressure actuation. 4,637,101, Cl. 24-602.000.

Fieldcrest Mills, Inc.: *See*—
Czelusniak, Paul A., Jr., 4,637,329, Cl. 112-80.450.

Fields, Ellis K.; Winzenburg, Mark L.; and Behrend, Steven J., to Standard Oil Company (Indiana). Disubstituted maleic anhydride compounds. 4,638,072, Cl. 549-234.000.

Finaurini, Roberto: *See*—
Rosini, Paolo; Finaurini, Roberto; and Gaibotti, Maurizio, 4,638,465, Cl. 365-228.000.

Finkbeiner, Werner; and Schorn, Franz, to Hans Grohe GmbH & Co. KG. Water jet aeration for sanitary fittings and the like. 4,637,552, Cl. 239-428.500.

Finke, Paul E.: *See*—
Doherty, James B.; Finke, Paul E.; Firestone, Raymond A.; Shah, Shrenik S.; and Thompson, Kevan R., 4,637,999, Cl. 514-201.000.

Fiori, David, Jr., to Sensor Technologies, Inc. Sensor apparatus. 4,637,265, Cl. 73-862.330.

FIP Industriale S.p.A.: *See*—
Medeot, Renzo, 4,637,656, Cl. 299-1.000.

Firestone, Raymond A.: *See*—
Doherty, James B.; Finke, Paul E.; Firestone, Raymond A.; Shah, Shrenik S.; and Thompson, Kevan R., 4,637,999, Cl. 514-201.000.

Fiscint, Inc.: *See*—
Shen-Orr, Chaim D.; and Berg, Eitan, 4,638,250, Cl. 324-207.000.

Fisher, Dennis: *See*—
Niblock, John A.; Patel, Jayant; Fisher, Dennis; and Lumb, Anthony P., 4,638,432, Cl. 364-200.000.

Fisher, George A.: *See*—
Baumgartner, Richard A.; Dukes, John N.; and Fisher, George A., 4,638,191, Cl. 307-602.000.

Fishkind, Gregory A.: *See*—
Maroney, Ralf P.; Fishkind, Gregory A.; and Schneider, Frederick, 4,638,399, Cl. 361-220.000.

Fitzpatrick, Mark: *See*—
Geannopoulos, George; Tsui, Cyrus; Fitzpatrick, Mark; and Chan, Andy, 4,638,189, Cl. 307-465.000.

Flamholz, Alexander L., to International Business Machines Corporation. Inspection system for pellicalized reticles. 4,637,714, Cl. 355-77.000.

Flatley, Doris W.; and Hsu, Sheng T., to RCA Corporation. Profile control of boron implant. 4,637,836, Cl. 148-1.500.

Fling, Russell T.: *See*—
Christopher, Todd J.; Willis, Donald H.; and Fling, Russell T., 4,638,360, Cl. 358-148.000.

Flood, William H.: *See*—
Schultz, William C., 4,637,801, Cl. 440-67.000.

Foglesonger, John D.; and Vranson, David M., to ITT Corporation. Waveguide assembly. 4,638,273, Cl. 333-254.000.

Foley, Geoffrey M. T., to Xerox Corporation. Self-biased scorotron and control therefor. 4,638,397, Cl. 361-212.000.

Fonda, Carlo L., to Videocolor. Shadow mask for a color image tube and image tube comprising the same. 4,638,211, Cl. 313-405.000.

Fontaine, John M.: *See*—
McGuire, Charles F.; Steyaert, Gordon C.; and Fontaine, John M., 4,638,261, Cl. 330-277.000.

Ford Motor Company: *See*—
Pakula, Benjamin J., 4,637,351, Cl. 123-25.00J.
Puscasu, Boris, 4,638,291, Cl. 340-59.000.
Vanselous, Joseph S., 4,637,281, Cl. 74-869.000.

Foreman, Howard R. Holder for shotgun pattern paper. 4,637,615, Cl. 273-407.000.

Forgac, John M.; and Hoekstra, George R., to Amoco Corporation; and Chevron U.S.A., Inc. In situ retorting of oil shale with pulsed water purge. 4,637,464, Cl. 166-261.000.

Forge, Charles O., to Boschert Inc. Apparatus for maintaining constant frequency in a DC to square wave inverter. 4,638,420, Cl. 363-132.000.

Fortney, Joe L., to Peerless Machine & Tool Corporation. Container die system. 4,637,811, Cl. 493-167.000.

Foss, Janet M. P.; Foss, John; Brooks, Christopher G.; and Ridgely, Myron H., to Foss, Janet Mary Penrose. Portable, foldable and convertible luggage trolley. 4,637,626, Cl. 280-655.000.

Foss, Janet Mary Penrose: *See*—
Foss, Janet M. P.; Foss, John; Brooks, Christopher G.; and Ridgely, Myron H., 4,637,626, Cl. 280-655.000.

Foss, John: *See*—
Foss, Janet M. P.; Foss, John; Brooks, Christopher G.; and Ridgely, Myron H., 4,637,626, Cl. 280-655.000.

Foster, Peter R., to National Research Development Corporation. Method of extracting cryoprecipitate from frozen blood plasma. 4,638,048, Cl. 530-380.000.

Fotheringham, James R.; and Morrow, David L., to Caterpillar Industrial Inc. Axle assembly. 4,637,488, Cl. 180-253.000.

Fouche, Claude: *See*—
Rosier, Jean-Claude; Fouche, Claude; and Maincent, Gabriel, 4,638,370, Cl. 358-293.000.

Fouquet, Gerd: *See*—
Broecker, Franz J.; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Neea, Friedbert, 4,638,085, Cl. 560-201.000.

Fourche, Jean P.: *See*—
Rousseau, Jean; and Fourche, Jean P., 4,637,803, Cl. 445-23.000.

Fournier, Jeffrey: *See*—
Ovshinsky, Stanford R.; Guha, Subhendu; Nath, Prem; Yang, Chi C.; Fournier, Jeffrey; and Kulman, James, 4,637,895, Cl. 252-188.310.

Fournier, Paul J. E.; and Reinker, Joseph F., Jr., to Aeroquip Corporation. Push-in connect fitting. 4,637,640, Cl. 285-319.000.

Fourrey, Francois; and Caburet, Pierre, to Cycles Peugeot. Adjustable head-rest for a motor vehicle seat or the like. 4,637,655, Cl. 297-410.000.

Fox, Jeffrey R.: *See*—
Blank, Hans G.; and Fox, Jeffrey R., 4,638,246, Cl. 324-73.00R.

Fox, Leo E.: *See*—
Mogol, Gerald M.; and Fox, Leo E., 4,637,372, Cl. 126-127.000.

Framatome & Cie: *See*—
Huet, Yves; and Perichon, Christian, 4,637,294, Cl. 91-536.000.

Francis, Samuel A., to Raytheon Company. Polymer hydrophone array with multilayer printed circuit wiring. 4,638,468, Cl. 367-153.000.

Frank, Arthur M.; DeRespinis, Silvio F.; and Mockovciak, John, Jr., to United States of America, National Aeronautics and Space Administration. Sun shield. 4,637,447, Cl. 160-265.000.

Frank, Earl E., to Abex Corporation. Railroad frog having movable wing rails. 4,637,578, Cl. 246-391.000.

Frank, William E.: *See*—
Rosa, John; and Frank, William E., 4,638,138, Cl. 219-10.770.

Franken, Adrianus J. J.: *See*—
Smulders, Hendricus F. G.; Franken, Adrianus J. J.; Faber, Johannes W.; and Swinkels, Wouter H., 4,637,777, Cl. 414-751.000.

Franken, Ronald L.: *See*—
Beck, Herbert W.; and Franken, Ronald L., 4,637,343, Cl. 119-31.000.

Frankenbush, Robert H.: *See*—
Hallenbeck, Mark; and Frankenbush, Robert H., 4,637,564, Cl. 242-25.00A.

Frantz, Douglas C.: *See*—
Killen, H. Roe; Wilkins, Scott A.; and Frantz, Douglas C., 4,637,361, Cl. 123-339.000.

Fraze, Ermal C.: *See*—
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Wynn, David K.; and Gregg, James R., 4,637,961, Cl. 428-579.000.

Frederickson, James R., to United States of America, Energy. Fabrication of high exposure nuclear fuel pellets. 4,637,900, Cl. 252-643.000.

Freed, Meier E.: *See*—
Abou-Gharbia, Magid A.; Freed, Meier E.; and Colatsky, Thomas J., 4,638,008, Cl. 514-411.000.

Freeman, Herbert J., to Progressive Tool & Industries Company. Apparatus for assembling radiator components. 4,637,133, Cl. 29-727.000.

Freeman, Michael H., to Pilkington P.E. Limited. Multifocal contact lenses utilizing diffraction and refraction. 4,637,697, Cl. 351-161.000.

Freeman, Thomas R.: *See*—
Camden, Thomas M., Jr.; and Freeman, Thomas R., 4,637,915, Cl. 376-435.000.

Freeouf, John L.; Jackson, Thomas N.; Laux, Steven E.; and Woodall, Jerry M., to International Business Machines Corporation. Space charge modulation device. 4,638,342, Cl. 357-15.000.

Frew, Paul C.: *See*—
Mukli, Glenn A.; Frew, Paul C.; and Mills, David R., 4,638,396, Cl. 361-101.000.

Frey, Alexander H., to International Business Machines Corporation. Multiplier architecture. 4,638,449, Cl. 364-760.000.

Frezza, William A., to General Instrument Corporation. Apparatus and method for restricting access to a communication network. 4,638,356, Cl. 358-118.000.

Fried, Herbert E., to Shell Oil Company. Preparation of secondary thiols. 4,638,093, Cl. 568-73.000.

Friedrich Deckel Aktiengesellschaft: *See*—
Geiger, Michael, 4,637,120, Cl. 29-568.000.

Frind, Gerhard; Carroll, James J.; Van Noy, John H.; Leach, John G.; and Ranjan, Radha K., to General Electric Company. Exothermically assisted electric fuse. 4,638,283, Cl. 337-162.000.

Fritz, David P.: *See*—
Pruitt, Martin E.; Case, Cecil L.; and Fritz, David P., 4,637,201, Cl. 56-16.400.

Fritz, Harald; and Wurll, Peter, to Siemens Aktiengesellschaft. Multicomponent force and torque measurement cell with strain gauges. 4,637,263, Cl. 73-862.040.

Froening, Helmut; and Besyouni, Mohamed, to Hochtemperatur-Reaktorbau GmbH. Construction for fastening parts to a concrete wall. 4,637,175, Cl. 52-27.000.

Fry, John A.; and Robinson, Douglas B. Fishing simulator. 4,637,603, Cl. 272-1.00R.

FTS Equipment Manufacturing Co.: *See*—
Hallenbeck, Mark; and Frankenbush, Robert H., 4,637,564, Cl. 242-25.00A.

Fuhrman, Ari, to Color Optics, Ltd. Method of pigmenting water-absorbable plastic and products therefrom. 4,638,025, Cl. 524-40.000.

Fuji Photo Film Co., Ltd.: *See*—
Hirai, Hiroyuki; and Kawata, Ken, 4,637,902, Cl. 260-545.00R.
Horikawa, Kazuo; and Ohara, Yuji, 4,638,156, Cl. 250-235.000.
Kubodera, Seiiti; Hioki, Takanori; and Okazaki, Masaki, 4,637,975, Cl. 430-353.000.
Kubota, Kazufumi, 4,638,170, Cl. 250-566.000.
Oishi, Kengo; and Suzuki, Osamu, 4,638,393, Cl. 360-132.000.
Ono, Minoru; and Makino, Teruyoshi, 4,637,703, Cl. 354-276.000.
Tanaka, Hiroshi; and Saito, Tokukazu, 4,638,162, Cl. 250-327.200.
Tanaka, Keiji; Hosaryo, Hatsuo; and Koga, Takeri, 4,637,567, Cl. 242-56.00R.

Fuji Xerox Co., Ltd.: *See*—
Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katoh, Yasuo, 4,638,372, Cl. 358-296.000.
Nakayama, Toshihiko; Moriguchi, Fujio; Murayama, Tomio; and Takeo, Yasuhiro, 4,638,329, Cl. 346-76.0PH.
Shirai, Masaharu, 4,637,709, Cl. 355-3.00R.

Fujii, Haruki; Ikada, Shoji; Fukuda, Akimitsu; and Okumura, Yasuo, to Nihon Parkerizing Co., Ltd. Coated aluminum-zinc alloy plated sheet steel. 4,637,840, Cl. 148-6.200.

Fujii, Hiroyuki; Tateno, Kenichi; and Nishikawa, Mikio, to Matsushita Electronics Corporation. Method for manufacturing a plastic encapsulated semiconductor device and a lead frame therefor. 4,637,130, Cl. 29-588.000.

Fujii, Takayoshi: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,637,998, Cl. 514-42.000.

Fujii, Teruo; and Tsutsui, Tomikazu, to Dainippon Screen Mfg. Co., Ltd. Drum type image scanning and recording apparatus. 4,637,710, Cl. 355-72.000.

Fujimori, Hiroyoshi: *See*—
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,638,353, Cl. 358-98.000.

Fujimoto, Takahiko: *See*—
Ayata, Kenzo; Narita, Kiichi; Mori, Takasuke; and Fujimoto, Takahiko, 4,637,453, Cl. 164-468.000.

Fujino, Motoaki: *See*—
Tomita, Tomoya; Hiramoto, Sotozi; Okubo, Takesi; Matsuo, Kuniyuki; Ashihara, Hironoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, 4,637,134, Cl. 29-741.000.

Fujino, Yukio: *See*—
Maekawa, Taijiro; and Fujino, Yukio, 4,637,947, Cl. 428-68.000.

Fujirex Company, Ltd.: *See*—
Fujisawa, Kunio; Tanaka, Toyoji; Mochizuki, Toshio; Nakamura, Norio; and Kaya, Seiji, 4,637,711, Cl. 355-72.000.

Fujisawa, Kunio; Tanaka, Toyoji; Mochizuki, Toshio; Nakamura, Norio; and Kaya, Seiji, to Fujirex Company, Ltd. Process for rolling a drum with a photosensitive film. 4,637,711, Cl. 355-72.000.

Fujise, Masayuki: *See*—
Iwamoto, Yoshinao; Shirasaki, Yuichi; Fujise, Masayuki; and Asakawa, Kenichi, 4,637,686, Cl. 350-96.290.

Fujita, Hideo; Saito, Yuichi; and Miura, Masatoshi, to TDK Electronics Co., Ltd. Piezo-electric transducer. 4,638,205, Cl. 310-312.000.

Fujita, Hiroshi: *See*—
Komatsu, Masao; and Fujita, Hiroshi, 4,637,927, Cl. 423-644.000.

Fujita, Yoshitada; Hanada, Sadashi; and Yamamoto, Yoshiaki, to Kawasaki Jukogyo Kabushiki Kaisha. Method and apparatus for assembling a structure composing a vehicle's body and the like. 4,637,540, Cl. 228-49.200.

Fujitsu Limited: *See*—
Aizaki, Yoshihiko, 4,638,434, Cl. 364-401.000.
Fukumoto, Toshio, 4,638,466, Cl. 365-230.000.
Motoki, Yasunari; and Ohkuma, Yuji, 4,637,146, Cl. 34-58.000.
Shinoda, Tsutae; and Niinuma, Atsuo, 4,638,218, Cl. 315-169.400.

Fujiwara, Kenichi; Asano, Hideo; Hasada, Eiichi; Makida, Kazuhisa; and Iida, Akinori, to Nippondenso Co., Ltd. Refrigerator for vehicle. 4,637,222, Cl. 62-244.000.

Fujiyama, Yasutomo: *See*—
Kamiya, Osamu; Fujiyama, Yasutomo; Ogawa, Kyosuke; and Kurokawa, Takashi, 4,637,342, Cl. 118-719.000.

Fukayama, Yukio, to Babcock-Hitachi Kabushiki Kaisha. Apparatus for controlling starting operation of boiler. 4,637,348, Cl. 122-406.0ST.

Fukuda, Akimitsu: *See*—
Fujii, Haruki; Ikada, Shoji; Fukuda, Akimitsu; and Okumura, Yasuo, 4,637,840, Cl. 148-6.200.

Fukuda Denshi Co., Ltd.: *See*—
Asai, Toshio; and Nakaya, Yasuhiro, 4,637,399, Cl. 128-639.000.

Fukuda, Masuo, to Sankei Giken Kogyo Kabushiki Kaisha. Muffler for internal combustion engine and method of manufacturing tubes for use therein. 4,637,491, Cl. 181-265.000.

Fukuda, Noriyoshi; and Nagasawa, Ken, to Kawasaki Steel Corporation. Method of producing carbon materials. 4,637,906, Cl. 264-29.100.

Fukuda, Tsuguo; and Terashima, Kazutaka, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Method for producing GaAs single crystal. 4,637,854, Cl. 156-607.000.

Fukui, Tetsu: *See*—
Hasegawa, Shigekazu; and Fukui, Tetsu, 4,637,269, Cl. 74-335.000.

Fukumoto, Toshio, to Fujitsu Limited. Programmable semiconductor memory device having separate read word line drivers and write-only word line drivers. 4,638,466, Cl. 365-230.000.

Fuller, Robert J.: *See*—
Yeh, Lun-Shu R.; Grenness, Morten; and Fuller, Robert J., 4,637,970, Cl. 429-153.000.

Funato, Hiroyoshi, to Ricoh Company, Ltd. Multibeam photoscanner. 4,637,679, Cl. 350-6.500.
Furness, Duncan S.: *See*—
Stewart, Alexander; Furness, Duncan S.; and Bhatia, Sham P., 4,638,384, Cl. 360-77.000.
Furuhashi, Tomio: *See*—
Sugiyama, Kiyoshi; and Furuhashi, Tomio, 4,637,118, Cl. 29-563.000.
Furuichi, Akira; and Iijima, Akira, to Tokushu Kika Kogyo Kabushiki Kaisha. Circulation type homogenizing apparatus. 4,637,555, Cl. 241-46.020.
Furze, Paul: *See*—
Lombardo, Frank; Jernigan, Edward L.; and Furze, Paul, 4,637,856, Cl. 156-637.000.
Futaba Denshi Kogyo Kabushiki Kaisha: *See*—
Kimizuka, Norio; Sogabe, Akira; and Abo, Mituyosi, 4,638,421, Cl. 364-167.000.
Futterknecht, Fritz: *See*—
Nebelung, Hermann H.; Huber, Robert; and Futterknecht, Fritz, 4,637,827, Cl. 65-235.000.
Gaddi, Bruno, to Piaggio & C. S.p.A. Device for controlling the regulation in an automatic transmission. 4,637,277, Cl. 74-865.000.
Gaffney, Richard W.: *See*—
Bunting, Franklin O.; and Hudson, J. Russell, 4,637,647, Cl. 296-24.00R.
Gaibotti, Maurizio: *See*—
Rosini, Paolo; Finaurini, Roberto; and Gaibotti, Maurizio, 4,638,465, Cl. 365-228.000.
Gajary, Antal: *See*—
Szekely, Istvan; Botar, Sandor; Dolgos nee Kekesi, Krisztina; Bertok, Bela; Gajary, Antal; Szabolcsi, Tamas; Kovacs, Gabor; and Lovasz nee Gaspar, Marianna, 4,638,002, Cl. 514-212.000.
Games, John E.: *See*—
Perra, Raymond C.; Wilmot, Stephen B.; and Games, John E., 4,638,430, Cl. 364-300.000.
Gans, Michael J.: *See*—
Acampora, Anthony; and Gans, Michael J., 4,638,476, Cl. 370-83.000.
Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Anderson, Paul J.; and Hudson, Bertram J., to Garid, Inc. Glucose medical monitoring system. 4,637,403, Cl. 128-770.000.
Gardner, David L., to Battelle Corporation. Process of preparing microcapsules of lactides or lactide copolymers with glycolides and/or ε-caprolactones. 4,637,905, Cl. 264-4.300.
Garid, Inc.: *See*—
Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Anderson, Paul J.; and Hudson, Bertram J., 4,637,403, Cl. 128-770.000.
Garvin, Stacy J.: *See*—
Cranford, Hayden C., Jr.; and Garvin, Stacy J., 4,638,464, Cl. 365-226.000.
Gash, Bruce W., to Standard Oil Company. Removal of phenols in groundwater after underground gasification of coal. 4,637,465, Cl. 166-261.000.
Gassmann, Max, to L'Oreal. Method and device for the detection of the position of objects stacked on pallets. 4,638,171, Cl. 250-566.000.
Gaster, Laramie M.; and Orlek, Barry S., to Beecham Group p.l.c. Indeno and benzoquinoxaline. 4,638,066, Cl. 544-344.000.
Gates Energy Products, Inc.: *See*—
Uba, Toshio; and Nelson, Robert F., 4,637,966, Cl. 429-57.000.
Gavaghan, Thomas J.; Boucher, Paul D.; and Janatka, Karel, to Pitney Bowes Inc. Document guide apparatus for preventing jams. 4,637,602, Cl. 271-238.000.
Gavory, Daniel: *See*—
Sambuis, Bernard; and Gavory, Daniel, 4,638,026, Cl. 524-98.000.
Gay, Robert R., to Atlantic Richfield Company. Thin film solar cell module. 4,638,111, Cl. 136-249.000.
Geannopoulos, George; Tsui, Cyrus; Fitzpatrick, Mark; and Chan, Andy, to Monolithic Memories, Incorporated. Fast and gate with programmable output polarity. 4,638,189, Cl. 307-465.000.
Geiger, Michael, to Friedrich Deckel Aktiengesellschaft. Device for changing of tools or the like into the work spindle of a machine tool. 4,637,120, Cl. 29-568.000.
Geller, Richard: *See*—
Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, 4,638,216, Cl. 315-111.810.
Gellermann, Werner; Yang, Yihong; and Luty, Fritz, to University of Utah. Solid state vibrational lasers using F'-center/molecular-defect pairs in alkali halides. 4,638,485, Cl. 372-42.000.
Geluk, Ronald J., to N.V. Optische Industrie "De Oude Delft". Light box for providing a background illumination having brightness values locally adjusted to the density of a transparency to be viewed by means of the light box. 4,637,150, Cl. 40-361.000.
Gemma, Hideaki; and Hino, Masafumi, to Hitachi, Ltd. Polling control method and system. 4,638,428, Cl. 364-200.000.
General Electric Company: *See*—
Beers, William W.; and Parham, Thomas G., 4,638,214, Cl. 313-487.000.
Beutel, Robert C., 4,638,220, Cl. 315-411.000.
Boutni, Omar M.; and Liu, Ping Y., 4,638,033, Cl. 525-67.000.
Bradshaw, Kenneth M., 4,638,252, Cl. 324-318.000.
Brown, Dale M.; Kim, Manjin J.; Baertsch, Richard D.; and Vogelsong, Thomas L., 4,638,400, Cl. 361-304.000.
Brunelle, Daniel J.; Shannon, Thomas G.; and Rosenquist, Niles R., 4,638,077, Cl. 558-281.000.
Eberhard, Jeffrey W.; and Cain, Dallas E., 4,638,499, Cl. 378-7.000.
Erdman, David M., 4,638,233, Cl. 318-644.000.
Frind, Gerhard; Carroll, James J.; Van Noy, John H.; Leach, John G.; and Ranjan, Radha K., 4,638,283, Cl. 337-162.000.
Haim, Elias S.; and Albert, Richard, 4,637,687, Cl. 350-335.000.
Howell, Edward K., 4,638,244, Cl. 324-51.000.
Hwang, Ying C.; Chen, Young K.; and Ragonese, Louis J., 4,638,190, Cl. 307-512.000.
Jaskolski, Patrick L.; and Eash, Matthew G., 4,638,253, Cl. 324-318.000.
Mark, Victor; and Hedges, Charles V., 4,638,027, Cl. 524-157.000.
Mark, Victor; and Hedges, Charles V., 4,638,036, Cl. 525-462.000.
McMillan, Stephen L.; Akers, Alvin; and Toma, Daniel N., 4,637,231, Cl. 68-4.000.
Otto, Lee W., 4,638,208, Cl. 313-116.000.
Roberts, Gerald L., 4,637,230, Cl. 68-4.000.
Rosenquist, Niles R., 4,638,101, Cl. 568-720.000.
Thompson, Robert A.; and White, Robert S., 4,637,248, Cl. 73-37.500.
Vaughn, Steven T., 4,638,381, Cl. 360-51.000.
General Electric Company, p.l.c., The: *See*—
Niblock, John A.; Patel, Jayant; Fisher, Dennis; and Lumb, Anthony P., 4,638,432, Cl. 364-200.000.
General Electric Corp.: *See*—
Levinson, Lionel M., 4,638,284, Cl. 338-21.000.
General Foods Corporation: *See*—
Barnett, Ronald E.; Zanno, Paul R.; and Roy, Glenn M., 4,638,071, Cl. 549-88.000.
General Instrument Corporation: *See*—
Frezza, William A., 4,638,356, Cl. 358-118.000.
General Motors Corporation: *See*—
Eesley, Gary L.; Mance, Andrew M.; and Meyer, Martin S., 4,637,862, Cl. 204-15.000.
Kidd, Richard L.; Graf, Jerry A.; Engler, Philip J.; and Lu, Song-Chin S., 4,638,131, Cl. 200-61.550.
Sutton, Stephen J., 4,638,305, Cl. 340-620.000.
General Signal Corporation: *See*—
Hartung, Russell M., 4,637,579, Cl. 246-452.000.
Genetics Institute, Inc.: *See*—
Benner, Steven A., 4,638,032, Cl. 525-54.110.
Genicom Corporation: *See*—
Miller, Donald E., 4,637,307, Cl. 101-93.040.
George, Flint R., to Halliburton Company. Gravity oriented perforating gun for use in slanted boreholes. 4,637,478, Cl. 175-4.510.
Geotechnical Resources Ltd.: *See*—
Owen, Lawrence B.; Masterson, Daniel M.; and Green, Sidney J., 4,637,217, Cl. 62-74.000.
Gerard, Catier: *See*—
Bernard, Montaron; Claude, Lombard; Claude, Moyses; and Gerard, Catier, 4,637,246, Cl. 73-35.000.
Gerber, Walter, to Ferag AG. Method and apparatus for temporarily storing printed products arriving in an imbricated formation. 4,637,198, Cl. 53-430.000.
Gerety, Eugene P., to ITT Corporation. Apparatus for providing masterless collision detection. 4,638,311, Cl 340-825.060.
Gernhardt, Mark G.: *See*—
Gyugyi, Laszlo; and Gernhardt, Mark G., 4,638,238, Cl. 323-211.000.
Gessa, Gianluigi: *See*—
Moja, Egidio A.; and Gessa, Gianluigi, 4,638,013, Cl. 514-561.000.
Gessman, Lawrence J. Method and apparatus for converting a catheter to a cardiac pacing electrode. 4,637,404, Cl. 128-786.000.
Gibbon, Linda M.; and Gibbon, Randolph H. Collector's auction game. 4,637,614, Cl. 273-271.000.
Gibbon, Randolph H.: *See*—
Gibbon, Linda M.; and Gibbon, Randolph H., 4,637,614, Cl. 273-271.000.
Gill, Frederick A.; and Tocci, Mario P., to Manville Sales Corporation. Fibrous mat facer with improved strike-through resistance. 4,637,951, Cl. 428-215.000.
Gillard, Clive H.: *See*—
Wilkinson, James H.; and Gillard, Clive H., 4,638,380, Cl. 360-22.000.
Gillard, Jean: *See*—
Hennebert, Pierre; Gillard, Jean; and Roland, Michel, 4,637,916, Cl. 422-36.000.
Gillbrand, Per Sune; and Johansson, Sven H., to Saab-Scania Aktiebolag. Ignition system for an Otto-type four-stroke engine. 4,637,368, Cl. 123-647.000.
Gillet, Claude L.: *See*—
Lambelin, Georges E.; Roncucci, Romeo R.; Roba, Joseph; and Gillet, Claude L., 4,638,070, Cl. 549-23.000.
Gillet, Guy, to Automobiles Peugeot; and Automobiles Citroen. Pedal carrier, in particular for a clutch and brake, on a motor vehicle. 4,637,741, Cl. 384-428.000.
Gilliam, Edward C.; Jackson, John M.; and Lamie, Billy J., to Reynolds Metals Company. Can end tester. 4,637,260, Cl. 73-826.000.
Gilliland, Oscar E.: *See*—
Atkey, Richard E.; and Gilliland, Oscar E., 4,637,496, Cl. 187-95.000.
Gillis, Joseph P.; and Jess, Norval M., to Kidde, Inc. Fire suppression system. 4,637,473, Cl. 169-61.000.
Ginnow-Merkert, Hartmut: *See*—
Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Anderson, Paul J.; and Hudson, Bertram J., 4,637,403, Cl. 128-770.000.

Giocastro, Joseph; and Giocastro, Salvatore. Flexible universal gear box system with yokes. 4,637,271, Cl. 74-386.000.
Giocastro, Salvatore: *See*—
Giocastro, Joseph; and Giocastro, Salvatore, 4,637,271, Cl. 74-386.000.
Giorgio, Giancarlo; and Parmigiani, Bruno, to Societa' Cavi Pirelli S.p.A. Stop joint for interconnecting two electrical cables of different types. 4,638,112, Cl. 174-22.00R.
Girard, Francois: *See*—
Slodzian, Georges; Costa De Beauregard, Francois; Daigne, Bernard; and Girard, Francois, 4,638,160, Cl. 250-296.000.
Gladh, Goran: *See*—
Lobell, Hans; Svensson, Klas G.; Gladh, Goran; and Hoglander, Bjorn, 4,637,213, Cl. 60-685.000.
Glaister, Frank J., to High Voltage Engineering Corporation. Wire insulated with a fluorocarbon polymer composition. 4,637,955, Cl. 428-379.000.
Glasow, Peter; and Ruhle, Wolfgang, to Siemens Aktiengesellschaft. Detector apparatus and method for computer tomography and radiography. 4,638,165, Cl. 250-370.000.
Glime, Fred W. Pivotal motor mount. 4,637,332, Cl. 114-61.000.
Glocker, David A.; Miller, John R.; Grimshaw, Scott F.; and Windischmann, Henry, to Standard Oil Company, The. Dual ion beam deposition of amorphous semiconductor films. 4,637,869, Cl. 204-192.110.
GMF Robotics Corporation: *See*—
Akeel, Hadi A., 4,638,143, Cl. 215-121.0LQ.
GMN Georg Muller Nurnberg GmbH: *See*—
Petermann, Harald; and Bauer, Peter, 4,637,369, Cl. 125-15.000.
Gobel, Hilmar; and Raab, Harald, to Fichtel & Sachs AG. Hydrodynamic coupling with serially arranged damper units. 4,637,500, Cl. 192-3.280.
Gockel, Gary L.: *See*—
DeSousa, Daniel A.; Gockel, Gary L.; D'Innocente, Ralph; and Jacuzzi, Roy A., 4,637,873, Cl. 210-169.000.
Godwin, Jimmy D.: *See*—
Connell, G. A. Neville; and Godwin, Jimmy D., 4,638,470, Cl. 369-13.000.
Gogniat, Paul, to Montres Rado S.A. Watch case. 4,637,734, Cl. 368-294.000.
Goldenfeld, Iliya, to Kibbutz Gordonia Hulda. Auxiliary drive for pedal-driven road vehicles. 4,637,274, Cl. 74-625.000.
Goldhammer, Albert, to Fernwerktechnik Schleicher & Co. Machine for comminuting materials, such as documents particularly a shredding machine. 4,637,560, Cl. 241-100.000.
Goldstein, Gideon: *See*—
Kung, Patric C.; and Goldstein, Gideon, 4,637,983, Cl. 435-240.000.
Goldstein, Jacob H.: *See*—
Iacobucci, Guillermo A.; King, George A.; Goldstein, Jacob H.; and Benemann, John R., 4,638,005, Cl. 544-336.000.
Golston, Stefan: *See*—
Sherman, Michael L; and Golston, Stefan, 4,637,779, Cl. 415-143.000.
Gomersall, Rodney. Inlet and outlet valves. 4,637,441, Cl. 141-349.000.
Goode, John. Swimming pool vacuum cleaner. 4,637,086, Cl. 15-1.700.
Goodman, Joseph R.: *See*—
Coller, James R.; Coon, Paul A.; and Goodman, Joseph R., 4,637,670, Cl. 339-46.000.
Goodwin, Vernon L., to Support Systems International, Inc. Fluidized patient support apparatus. 4,637,083, Cl. 5-453.000.
Goodyear Tire & Rubber Company: *See*—
Lui, Joseph H.; and Shreve, David S., 4,638,028, Cl. 524-387.000.
Gordon, Eric M.: *See*—
Weller, Harold N., III; and Gordon, Eric M., 4,638,010, Cl. 514-423.000.
Gordon, Eugene I., to AT&T Bell Laboratories. High power, broad area, monochromatic light source. 4,637,685, Cl. 350-96.200.
Goto, Yoichi: *See*—
Terada, Kimio; Mori, Michio; Goto, Yoichi; Nakazawa, Takashi; Muto, Kunio; and Usami, Shozo, 4,637,937, Cl. 426-570.000.
Gould Inc.: *See*—
Minten, Karl; and Krug, William, 4,637,987, Cl. 436-151.000.
Gower, David I. Railroad spike reinstallation apparatus. 4,637,314, Cl. 104-17.100.
Grabbe, Dimitry G., to AMP Incorporated. Method for mounting a connector to a substrate. 4,637,135, Cl. 29-832.000.
Grable, Donovan B. Liquid mud ring control of underground liquids. 4,637,462, Cl. 166-245.000.
Grabley, Susanne, to Hoechst Aktiengesellschaft. Process for the racemization of optically active aminoacids. 4,638,086, Cl. 562-401.000.
Graf, Jerry A.: *See*—
Kidd, Richard L.; Graf, Jerry A.; Engler, Philip J.; and Lu, Song-Chin S., 4,638,131, Cl. 200-61.550.
Graham, Merton J.; and Miller, Paul H. Two stage chuck. 4,637,620, Cl. 279-1.0DA.
Gran, Paul; Feiner, Haim; Ben-Dayan, Nissim; Stefaniu, Marian; and Mar-Chaim, Yechiam, to Motorola, Inc. Signal processing unit. 4,638,453, Cl. 364-900.000.
Grant, Ross M.: *See*—
Bradford, Michael P.; Parkinson, Gerald W.; and Grant, Ross M., 4,638,175, Cl. 307-64.000.
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Gray, Robert R.; and Marguth, Val M. Pulse combustion drying apparatus for particulate materials. 4,637,794, Cl. 432-58.000.
Grayden, Paul A., to Prescant Pty. Limited. Water ring vacuum pump having adjustable part plates and a hollow impeller. 4,637,780, Cl. 417-68.000.
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Sergent, Rodney H.; and Thanstrom, Kenneth N., 4,637,865, Cl. 204-111.000.
Greatbatch Enterprises, Inc.: *See*—
Zajac, William V., Jr.; Kautz, Henry G.; Kautz, David J.; Bossert, Arthur J.; and Coben, Sidney, 4,637,928, Cl. 423-659.000.
Green, Julius: *See*—
Shnitkin, Harold; and Green, Julius, 4,638,323, Cl. 343-771.000.
Green, Marion A. Steam boosted internal combustion engine. 4,637,352, Cl. 123-25.00P.
Green, Sidney J.: *See*—
Owen, Lawrence B.; Masterson, Daniel M.; and Green, Sidney J., 4,637,217, Cl. 62-74.000.
Greenwood, Arthur R., to UOP Inc. Process for sampling particulate matter passing from one treatment zone to another. 4,637,266, Cl. 73-863.160.
Greger, Wolfgang, to Sulzer Brothers Limited. Brake for a weaving machine. 4,637,437, Cl. 139-336.000.
Gregg, James R.: *See*—
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Grenness, Morten: *See*—
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Glocker, David A.; Miller, John R.; Grimshaw, Scott F.; and Windischmann, Henry, 4,637,869, Cl. 204-192.110.
Gritter, David J., to Eaton Corporation. Mechanically shifted position senor for self-synchronous machines. 4,638,224, Cl. 318-254.000.
Grombchevsky, Andrei: *See*—
Kerner, Aron; and Grombchevsky, Andrei, 4,637,743, Cl. 400-124.000.
Gronowitz, Jan S.; and Kallander, Clas F. R. Method of determining dTk isoenzyme activity and the use thereof. 4,637,977, Cl. 435-15.000.
Grose, Ronald D., to Earon Corp. Peak shaving system for air conditioning. 4,637,219, Cl. 62-199.000.
Grossler, Peter; and Nisal, Norbert, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Acceleration sensor. 4,638,130, Cl. 200-61.45R.
Grossmann, Kurt; Bliesner, Jurgen; and Schikor, Joachim, to Siemens Aktiengesellschaft. Clamping device for plate-shaped semiconductor components. 4,638,404, Cl. 361-388.000.
Groth, Hugh F.: *See*—
Hampshire, James F.; Groth, Hugh F.; and Collins, John M., 4,637,322, Cl. 108-102.000.
Grover, Raman: *See*—
Rao, Chennupati K.; Arora, Sudershan K.; Grover, Raman; Durden, John A.; and D'Silva, Themistocles D. J., 4,637,901, Cl. 165-544.000.
Gruppenbacher, Klaus: *See*—
Menigat, Roland; and Gruppenbacher, Klaus, 4,637,171, Cl. 51-281.00R.
GTE Laboratories Incorporated: *See*—
Blank, Hans G.; and Fox, Jeffrey R., 4,638,246, Cl. 324-73.00R.
Cooperman, Michael; and Sieber, Richard W., 4,638,473, Cl. 370-27.000.
GTE Products Corporation: *See*—
de Vos, Hendrik A. J.; and Labouliere, Elzear R., 4,638,414, Cl. 362-370.000.
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Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, 4,638,216, Cl. 315-111.810.
Guest, John D. Tube couplings. 4,637,636, Cl. 285-38.000.
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Ovshinsky, Stanford R.; Guha, Subhendu; Nath, Prem; Yang, Chi C.; Fournier, Jeffrey; and Kulman, James, 4,637,895, Cl. 252-188.310.
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Gumb, Beverley W., to Northern Telecom Limited. Masking of holes in circuit patterns on circuit boards prior to flow soldering. 4,638,116, Cl. 174-68.500.

Gunter, Jonas L.: *See—*
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Gurkov, Konstantin S.; Kostylev, Alexandr D.; Tkachenko, Gennady A.; Leonov, Ivan P.; and Klimashko, Vladimir V., to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR. Percussive action machine for making holes in the ground. 4,637,476, Cl. 173-136.000.

Gustafson, Thomas J.: *See—*
Powers, Frederick A.; and Gustafson, Thomas J., 4,637,295, Cl. 92-170.000.

Gutierrez, Antonio: *See—*
Brois, Stanley J.; and Gutierrez, Antonio, 4,637,886, Cl. 252-51.50A.

Gutleber, Frank S., to United States of America, Army. Small angular beamwidth antenna system. 4,638,318, Cl. 342-383.000.

Gyugyi, Laszlo; and Gernhardt, Mark G., to Westinghouse Electric Corp. Switching technique for thyristor-switched capacitors to achieve network damping. 4,638,238, Cl. 323-211.000.

Hachimori, Takeshi, to Sony Corporation. Reference voltage generating circuit. 4,638,239, Cl. 323-281.000.

Hacker, Erwin: *See—*
Schulze, Ernst-Friedrich; Burstell, Helmut; and Hacker, Erwin, 4,637,828, Cl. 71-76.000.

Hafele KG: *See—*
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Hagiwara, Tatsuo; Imai, Keiji; and Nagaoka, Shigenori, to Kawasaki Jukogyo Kabushiki Kaisha; and Ishii Syoji, Ltd. Rocking slag breaker. 4,637,562, Cl. 241-259.200.

Haim, Elias S.; and Albert, Richard, to General Electric Company. Cascaded, dual cell transflective liquid crystal display. 4,637,687, Cl. 350-335.000.

Halbach & Braun Industrieanlagen: *See—*
Braun, Gert; and Braun, Ernst, 4,637,268, Cl. 74-190.000.

Halbert, Seymour P., to Cordis Laboratories, Inc. Apparatus and method for therapeutic immunodepletion. 4,637,880, Cl. 210-638.000.

Hall, Lester B. Breathing apparatus. 4,637,387, Cl. 128-205.240.

Hall, Wilbur S., to Amchem Products, Inc. Treating autodeposited coating with Cr composition. 4,637,839, Cl. 148-6.200.

Hallenbeck, Mark; and Frankenbush, Robert H., to FTS Equipment Manufacturing Co. Dual reel continuous wire winding machine with robotic reel loading mechanism. 4,637,564, Cl. 242-25.00A.

Halliburton Company: *See—*
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George, Flint R., 4,637,478, Cl. 175-4.510.
Nunley, Allen, 4,638,159, Cl. 250-267.000.
Smith, Harry D., Jr.; and Verbout, Jerry L., 4,638,161, Cl. 250-269.000.
Sonne, Darrell S.; and Beard, William J., 4,638,158, Cl. 250-266.000.
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Halliday, Bruce W.: *See—*
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Hamada, Hiroyoshi: *See—*
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Hamada, Norihiko, to Kabushiki Kaisha Universal. Slot machine with reel position detector. 4,637,611, Cl. 273-143.00R.

Hamed, Hazem N.: *See—*
McPherson, Alexander W.; and Hamed, Hazem N., 4,637,597, Cl. 269-32.000.

Hamley, James P. Audio amplifier. 4,638,260, Cl. 330-254.000.

Hammar, W. James, to Minnesota Mining and Manufacturing Company. Acrylate and methacrylate monomers and polymers. 4,638,040, Cl. 526-245.000.

Hamon, Jean-Pierre: *See—*
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Hampshire, James F.; Groth, Hugh F.; and Collins, John M., to Rubbermaid Commercial Products Inc. Adjustable computer work table. 4,637,322, Cl. 108-102.000.

Han, Hok L. Sound field simulation system and method for calibrating same. 4,638,506, Cl. 381-34.000.

Hanada, Sadashi: *See—*
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Hancock, Donald J.: *See—*
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Handwerk, Roy R., to Menasco Inc. Attenuating, extendible shock-absorbing strut. 4,637,574, Cl. 244-104.0FP.

Haneji, Yasuo: *See—*
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Hanka, Steven A.: *See—*
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Hannan, Peter W., to Hazeltine Corporation. Resistive loop angular filter. 4,638,324, Cl. 343-909.000.

Hans Grohe GmbH & Co. KG: *See—*
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Hansen, Guenter: *See—*
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Hansler, Gerd: *See—*
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Hanula, Richard M., to Seher Acquisition Corp. Coupler for a railway car coupler assembly. 4,637,518, Cl. 213-64.000.

Happ, Ortwin: *See—*
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Hara, Masaru, to Sony Corporation. Method of making a linearity standard magnetic tape. 4,638,388, Cl. 360-18.000.

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Hara, Takeshi: *See—*
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Harada, Noritake: *See—*
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Harding, George W., to Poly-John Enterprises Corp. Vent opening for portable building wall. 4,637,299, Cl. 98-29.000.

Hargrave, Franklin; and Middleton, Francisco A., to ITT Corporation. Key telephone system with distributed control. 4,638,124, Cl. 379-159.000.

Harper, Stephen; and Hiscock, David G., to Cape Building Products Limited. Boards and panels. 4,637,860, Cl. 162-117.000.

Harris, Jesse R.: *See—*
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Harris, William F., Jr., to Celanese Corporation. Waterproof ammonium nitrate fuel oil explosives. 4,637,849, Cl. 149-43.000.

Harrison Western Corporation: *See—*
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Hartkorn, Alfred. Joint spanning construction for bridges or similar structures. 4,637,085, Cl. 14-16.500.

Hartley, Philip J. Apparatus for use in filtering a liquid. 4,637,879, Cl. 210-448.000.

Hartman, Robert J.: *See—*
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Hartmann, Wilhelm U.; and Martin, James A., to HR Textron Inc. Filter disc. 4,637,877, Cl. 210-347.000.

Hartung, Michael H., to International Business Machines Corporation. Peripheral data storage having access controls with error recovery. 4,638,425, Cl. 364-200.000.

Hartung, Russell M., to General Signal Corporation. Railroad switch mechanism. 4,637,579, Cl. 246-452.000.

Harvey Hubbell Incorporated: *See—*
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Hasada, Eiichi: *See—*
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Hasegawa, Shigekazu; and Fukui, Tetsu, to Kubota, Ltd. Drive apparatus. 4,637,269, Cl. 74-335.000.

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Hasler, Georg; and Walz, Rudiger, to Hafele KG. Retractable ironing board construction. 4,637,321, Cl. 108-72.000.

Hatabe, Michinori, to Nitsuko Limited. Frame synchronizing system in a receiver in a time-division multiplex transmission system. 4,638,478, Cl. 370-94.000.

Hatakenaka, Masato, to Nissan Motor Company, Limited. Crankcase emission control system for an internal combustion engine. 4,637,367, Cl. 123-572.000.

Hatakeyama, Toshio; and Yoshio, Toshihiko, to Honda Giken Kogyo Kabushiki Kaisha. Spacer for furnace brazing having low wettability coating thereon. 4,637,960, Cl. 428-469.000.

Hatanai, Takashi; Nakashima, Keishi; and Mukasa, Koichi, to Alps Electric Co., Ltd. Vertical recording magnetic head having single core body bonded with main magnetic pole in guard layer. 4,638,391, Cl. 360-125.000.

Hatanai, Takashi: *See—*
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Hattori, Masaru, to Nippon Seiko Kabushiki Kaisha. Linear guide device. 4,637,739, Cl. 384-45.000.

Hattori, Ryuichi: *See—*
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Hattori, Shigeo: *See—*
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Hauk, Klaus, to Deere & Company. Reed switch with a housing and a pulse generator. 4,638,276, Cl. 335-151.000.

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Belbel, Elie; Caudron, Robert; Fechant, Louis; Haury, Andre ; Lauraire, Michel; Muniesa, Jacques; and Siffroi, Lucien, 4,638,275, Cl. 335-151.000.

Hauschildt, Hans: *See—*
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Hawkins, Jeffrey T.; and Schievelbein, Vernon H., to Texaco Inc. Method of improving conformance in steam floods with carboxylate steam foaming agents. 4,637,466, Cl. 166-272.000.

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Hayashi, Seizo; Okano, Kenji; and Hayashi, Nobuhiro, to Matsushita Electric Industrial Co., Ltd. Vacuum cleaner with agitator. 4,637,092, Cl. 15-319.000.

Hayashi, Shoichiro: *See—*
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HBOG-Oil Sands Limited Partnership: *See—*
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Hedges, Charles V.: *See—*
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Mark, Victor; and Hedges, Charles V., 4,638,036, Cl. 525-462.000.

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Hegei, James D.; and Johnson, Davin W., to Mattel, Inc. Latex dip tooling and method for forming same. 4,637,907, Cl. 264-45.700.

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Heidman, William A., Jr. Directional signal switch and alternating lighting of rear lamps. 4,638,296, Cl. 340-83.000.

Heimbach, Paul A., to Home Box Office, Inc. Audio scrambler. 4,638,357, Cl. 358-121.000.

Heinrich, Rudolf; and Albrecht, Konrad, to Hoechst Aktiengesellschat. Processes for the preparation of nitrosamine-free N,N-disubstituted nitroaromatic amines and for the stabilization of these compounds against the formation of nitrosamines. 4,638,090, Cl. 564-437.000.

Heller, Lawrence G.: *See—*
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Henderson, David; Hollowell, James A.; and Woodbury, Howard A., to Avco Corporation. Earth penetrator. 4,637,313, Cl. 102-398.000.

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Henkel Corporation: *See—*
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Worschech, Kurt; Loeffelholz, Frido; Wedl, Peter; and Wegemund, Bernd, 4,637,887, Cl. 252-56.00R.

Hennebert, Pierre; Gillard, Jean; and Roland, Michel, to Universite Catholique de Louvain; and Manufacture Belge de Gembloux S.A. Sterilization method employing a circulating gaseous sterilant. 4,637,916, Cl. 422-36.000.

Henry, Pearison W.: *See—*
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Henschel, Edward W. Form-retaining insert for caps. 4,637,077, Cl. 2-185.00B.

Her Majesty the Queen, in right of the Province of Alberta, as represented by the Minister of Energy and Natural Resources: *See—*
Schramm, Laurier L., 4,637,417, Cl. 137-4.000.

Heras Holding, B.V.: *See—*
Ruigrok, Franciscus B. M., 4,637,186, Cl. 52-225.000.

Herbst, Ralph L., Jr. Process for producing hydrogen from short wavelength electromagnetic radiation. 4,637,867, Cl. 204-157.520.

Herd, Karl J.; and Michna, Martin, to Bayer Aktiengesellschaft. Aminonaphthol bisazo reactive dyes. 4,638,054, Cl. 534-637.000.

Hergenrother, Paul M.; and Havens, Stephen J., to United States of America, National Aeronautics & Space Administration. Ethynyl terminated ester oligomers and polymers therefrom. 4,638,083, Cl. 560-104.000.

Herlemann, Werner: *See—*
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Herlyn, Meehard: *See—*
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Herman, Alex W., to Canadian Patents and Development Limited. Optical measurement of marine conditions. 4,637,719, Cl. 356-72.000.

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Hernandez, Gabriel D., to Maraven, S.A. Blowout preventer for use in combination with a deep well pump. 4,637,458, Cl. 166-68.000.

Herr, Richard W. Latch mechanism for boat accessories. 4,637,492, Cl. 182-93.000.

Hershberger, Charles L.; Merkel, Kurt E.; Weeks, Robert E.; and Wild, Gene M., to Eli Lilly and Company. Antibiotic A-4696 factor G. 4,637,981, Cl. 435-75.000.

Herve, Robert J. L. A., to Compagnie Internationale pour l'Informatique Cii Honeywell Bull. Method and system for transmission of confidential data. 4,638,120, Cl. 178-22.080.

Hesston Corporation: *See—*
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Pruitt, Martin E.; Case, Cecil L.; and Fritz, David P., 4,637,201, Cl. 56-16.400.

Hester, Richard K.; and Tan, Khen-Sang, to Texas Instruments Incorporated. Microprocessor system with programmable interface. 4,638,451, Cl. 364-900.000.

Hewlett-Packard Company: *See—*
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Heyden, Eugene L. Tubular device for intubation. 4,637,389, Cl. 128-207.150.

High Voltage Engineering Corporation: *See—*
Glaister, Frank J., 4,637,955, Cl. 428-379.000.

Hight, Margaret A., to Texaco Inc. Patterns of vertical and horizontal wells for improving oil recovery efficiency. 4,637,461, Cl. 166-245.000.

Higuchi, Tomitake: *See—*
Hiramatsu, Tohru; Matsuhisa, Yohji; and Higuchi, Tomitake, 4,637,925, Cl. 423-447.400.

Hijikigawa, Masaya: *See—*
Inami, Yasuhiko; Watanabe, Masanori; and Hijikigawa, Masaya, 4,638,346, Cl. 357-25.000.

Hillen, Klaus, to Lucas Industries. Self-energizing disc brakes. 4,637,497, Cl. 188-71.400.

Hillock, William E. Core plug driver tool. 4,637,115, Cl. 29-275.000.

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Hiniker, Thomas K.; and Bush, Vincent N., to Hiniker Company. Control method and apparatus for liquid distributor. 4,637,547, Cl. 239-1.000.

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Gemma, Hideaki; and Hino, Masafumi, 4,638,428, Cl. 364-200.000.

Hinshaw, Jerald C.; Toner, John L.; and Reynolds, George A., to Eastman Kodak Company. Fluorescent labels for immunoassay. 4,637,988, Cl. 436-546.000.

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Kubodera, Seiiti; Hioki, Takanori; and Okazaki, Masaki, 4,637,975, Cl. 430-353.000.

Hiraga, Yoichi: *See—*
Nakatani, Masaki; and Hiraga, Yoichi, 4,637,922, Cl. 423-321.00R.

Hirai, Hiroyuki; and Kawata, Ken, to Fuji Photo Film Co., Ltd. Mixed anhydrides of carbamic and hydroxamic acids. 4,637,902, Cl. 260-545.00R.

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Ijiri, Waichiro; and Hirakushi, Shuzo, 4,637,484, Cl. 180-142.000.

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Hiscock, David G.: *See*—
Harper, Stephen; and Hiscock, David G., 4,637,860, Cl. 162-117.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
Yoshimura, Yasuo; Yamauchi, Kunio; and Saito, Kenji, 4,638,366, Cl. 358-228.000.

Hitachi Koki Co., Ltd.: *See*—
Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, 4,638,326, Cl. 346-75.000.

Hitachi, Ltd.: *See*—
Amano, Naoki; Kayaba, Hitoshi; and Kikuchi, Takehiro, 4,638,403, Cl. 361-341.000.
Endo, Akira; Takezaki, Jiro; Tsujii, Fumio; and Shibata, Takanori, 4,638,438, Cl. 364-449.000.
Gemma, Hideaki; and Hino, Masafumi, 4,638,428, Cl. 364-200.000.
Horibe, Youshun; Ohshima, Yoshikuni; and Masuda, Toyohiko, 4,637,350, Cl. 122-441.000.
Kaneyasu, Masayoshi; Arima, Hideo; Ito, Mitsuko; Iwanaga, Shoichi; Sato, Nobuo; Noro, Takanobu; Ikagami, Akira; and Isogai, Tokio, 4,638,443, Cl. 364-497.000.
Katayama, Masanori; Komoda, Norihisa; Murata, Tomohiro; and Kera, Kazuo, 4,638,227, Cl. 318-565.000.
Komatsu, Shigeru; and Kawata, Keiji, 4,638,497, Cl. 375-116.000.
Kuwabara, Hiroshi; Ide, Jushi; Kamata, Yasuji; and Yamashita, Kenkichi, 4,638,308, Cl. 340-736.000.
Matsumoto, Tetsuro, 4,638,460, Cl. 365-149.000.
Morinaga, Shigeki; Miyashita, Kunio; Hayashida, Hiroshi; and Takahashi, Tadashi, 4,638,225, Cl. 318-341.000.
Noda, Masaru; and Shiga, Toshihiro, 4,638,352, Cl. 358-44.000.
Ogata, Mikito; Mori, Masahito; Doi, Takashi; Miyazaki, Michio; and Oka, Takafumi, 4,638,472, Cl. 369-54.000.
Okada, Jun; Kunimasa, Koichi; and Nakase, Hiroshi, 4,638,477, Cl. 370-94.000.
Okuyama, Kousuke; Suzuki, Norio; Meguro, Satoshi; and Nagasawa, Kouichi, 4,637,124, Cl. 29-571.000.
Terao, Motoyasu; Miyauchi, Yasushi; Shigematsu, Kazuo; and Horigome, Shinkichi, 4,637,976, Cl. 430-523.000.
Teshima, Tsunehiko, 4,638,379, Cl. 360-19.100.
Tomita, Tomoya; Hiramoto, Sotozi; Okubo, Takesi; Matsuo, Kuniyuki; Aahihara, Hiromoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, 4,637,134, Cl. 29-741.000.
Watabe, Masaya; and Abe, Shuichi, 4,638,429, Cl. 364-200.000.
Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, 4,638,326, Cl. 346-75.000.

Hitachi Seiko Ltd.: *See*—
Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, 4,638,326, Cl. 346-75.000.

Hitachi Video Engineering, Ltd.: *See*—
Komatsu, Shigeru; and Kawata, Keiji, 4,638,497, Cl. 375-116.000.

Hitler, Gene D.: *See*—
Martin, Hubert C., Jr.; Hitler, Gene D.; and Parsley, David W., 4,638,417, Cl. 363-41.000.

Ho, Chi-Tang: *See*—
Chang, Stephen S.; Ho, Chi-Tang; and Houlihan, Christopher M., 4,638,095, Cl. 568-326.000.

Ho, Shu-Kuang: *See*—
Wang, An; Ho, Shu-Kuang; and Mainemer, Carlos I., 4,638,118, Cl. 178-18.000.

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Froening, Helmut; and Basyouni, Mohamed, 4,637,175, Cl. 52-27.000.

Hodge, Robert R. Backflow preveating attachment for toilets. 4,637,079, Cl. 4-427.000.

Hoechst Aktiengesellschaft: *See*—
Brandt, Lothar; and Felcht, Utz-Hellmuth, 4,638,058, Cl. 536-103.000.
Clauss, Karl; Linkies, Adolf; and Reuschling, Dieter, 4,638,063, Cl. 544-2.000.
Grabley, Susanne, 4,638,086, Cl. 562-401.000.
Schulze, Ernst-Friedrich; Burstell, Helmut; and Hacker, Erwin, 4,637,828, Cl. 71-76.000.
Thurow, Horst, 4,637,834, Cl. 106-124.000.

Hoechst Aktiengesellschat: *See*—
Heinrich, Rudolf; and Albrecht, Konrad, 4,638,090, Cl. 564-437.000.

Hoechstaktiengesellschaft: *See*—
Neeb, Rudolf; and Mohr, Reinhard, 4,638,053, Cl. 534-589.000.

Hoekstra, George R.: *See*—
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Hofmann Werkstatt-Technik GmbH: *See*—
Menigat, Roland; and Gruppenbacher, Klaus, 4,637,171, Cl. 51-281.00R.

Hofmann, Wilfried, to Agfa-Gevaert AG. Cover for vacuum ink printing head. 4,638,336, Cl. 346-140.00R.

Hogan, Lawrence R.: *See*—
Kane, Michael; and Hogan, Lawrence R., 4,637,153, Cl. 40-605.000.

Hoglander, Bjorn: *See*—
Lobell, Hans; Svensson, Klas G.; Gladh, Goran; and Hoglander, Bjorn, 4,637,213, Cl. 60-685.000.

Hohman, Charles M.: *See*—
Dunn, Charles S.; Propster, Mark A.; and Hohman, Charles M., 4,638,490, Cl. 373-35.000.

Hokuriku Pharmaceutical Co., Ltd.: *See*—
Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Nishino, Hiroyuki, 4,638,009, Cl. 514-428.000.

Holan, Robert J.; and Lindsey, Kelly D. Single gear-pair vehicle differential. 4,637,276, Cl. 74-713.000.

Holden, Stephen: *See*—
Llewellyn, Michael; and Holden, Stephen, 4,637,413, Cl. 134-111.000.

Holder, Donald W.; and Phillips, William R., to United States of America, Army. Electronic image stabilization. 4,637,571, Cl. 244-3.160.

Holland, Frank S., to Manchem Limited. Extraction of tin from its ores. 4,638,074, Cl. 556-98.000.

Hollfritsch, Erich: *See*—
Radtke, Wolfgang; Borbely, Gyorgy; Pallhorn, Sebald; and Hollfritsch, Erich, 4,637,184, Cl. 52-220.000.

Hollowell, James A.: *See*—
Henderson, David; Hollowell, James A.; and Woodbury, Howard A., 4,637,313, Cl. 102-398.000.

Holpp, Wolfgang, to Licentia Patent-Verwaltungs-GmbH. Millimeter wave circulator. 4,638,267, Cl. 333-1.100.

Holt, Brian: *See*—
Phillips, Emyr; and Holt, Brian, 4,637,926, Cl. 423-573.00R.

Holz, Peter: *See*—
Donath, Sabine; and Holz, Peter, 4,637,174, Cl. 51-425.000.

Home Box Office, Inc.: *See*—
Heimbach, Paul A., 4,638,357, Cl. 358-121.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hatakeyama, Toshio; and Yoshio, Toshihiko, 4,637,960, Cl. 428-469.000.
Iwai, Kazuhiro, 4,637,486, Cl. 180-225.000.
Nishikawa, Masao; Sakai, Shinzo; and Sakurai, Yoshimi, 4,637,278, Cl. 74-866.000.
Takahashi, Tsuneo; and Otsuka, Hirofumi, 4,637,264, Cl. 73-862.330.
Uda, Youichi; Matsushima, Seiya; Saito, Kazuhiko; Yamamoto, Shoji; and Murakami, Kazuhiro, 4,637,238, Cl. 70-456.00R.
Yamaguchi, Kouji; Kawahara, Eiichiro; and Yamamoto, Noboru, 4,637,293, Cl. 91-507.000.
Yano, Yoshiki; and Oikawa, Toshihiro, 4,637,358, Cl. 123-169.0PA.

Honda Kiken Kogyo Kabushiki Kaisha: *See*—
Yasuoka, Akimasa; Iwata, Takahiro; and Kiuchi, Takeo, 4,637,362, Cl. 123-478.000.

Honda Lock Manufacturing Co., Ltd.: *See*—
Uda, Youichi; Matsushima, Seiya; Saito, Kazuhiko; Yamamoto, Shoji; and Murakami, Kazuhiro, 4,637,238, Cl. 70-456.00R.

Honda, Takayasu: *See*—
Yoshida, Takeshi; Honda, Takayasu; Kitazume, Shunosuke; and Tanaka, Kouzou, 4,637,653, Cl. 297-334.000.

Honeywell Inc.: *See*—
Baier, Steven M.; Cirillo, Nicholas C., Jr.; Hanka, Steven A.; and Shur, Michael S., 4,638,341, Cl. 357-15.000.
Carney, James K.; and Kolbas, Robert M., 4,637,122, Cl. 29-569.00L.
Dietiker, Paul; and Nelson, Marvin D., 4,637,429, Cl. 137-505.140.
Egli, Werner H.; and Weber, Mark W., 4,637,723, Cl. 356-350.000.

Honeywell Information Systems Inc.: *See*—
Stoffers, Brian L., 4,638,450, Cl. 364-715.000.

Hong, Chung-Yieh. Security case used on counter. 4,637,325, Cl. 109-19.000.

Hong, Vuong B.; Rowson, Stuart C.; Daniel, Richard A.; and Rostek, Paul M., to NCR Corporation. Edge triggered clock distribution system. 4,638,256, Cl. 328-105.000.

Honryo, Hatsuo: *See*—
Tanaka, Keiji; Honryo, Hatsuo; and Koga, Takeri, 4,637,567, Cl. 242-56.00R.

Horibe, Youshun; Ohshima, Yoshikuni; and Masuda, Toyohiko, to Hitachi, Ltd. System for recovering drain. 4,637,350, Cl. 122-441.000.

Horigome, Shinkichi: *See*—
Terao, Motoyasu; Miyauchi, Yasushi; Shigematsu, Kazuo; and Horigome, Shinkichi, 4,637,976, Cl. 430-523.000.

Horiguchi, Shojiro: *See*—
Kawamura, Kimihide; Horiguchi, Shojiro; and Okamoto, Hisao, 4,638,052, Cl. 534-575.000.

Horikawa, Kazuo; and Ohara, Yuji, to Fuji Photo Film Co., Ltd. Light beam scanning apparatus with adjustable scanning speed and offset. 4,638,156, Cl. 250-235.000.

Horikiri Spring Mfg. Co., Ltd.: *See*—
Saito, Tsutomu; Hasegawa, Yoshimichi; Yoshikawa, Kazuo; and Aoyama, Shigetsune, 4,637,594, Cl. 267-47.000.

Horn, Dieter: *See*—
Auweter, Helmut; Horn, Dieter; and Lueddecke, Erik, 4,637,716, Cl. 356-28.500.

Horn, Richard L.: *See*—
Cleary, Patrick J.; Kelman, Lloyd S.; and Horn, Richard L., 4,638,437, Cl. 364-427.000.

Horowitz, Peter N.: *See*—
Griffin, William R.; Heller, Lawrence G.; and Horowitz, Peter N., 4,638,482, Cl. 371-63.000.

Hosaka, Kenji: *See*—
Tomita, Tomoya; Hiramoto, Sotozi; Okubo, Takesi; Matsuo, Kuniyuki; Ashihara, Hiromoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, 4,637,134, Cl. 29-741.000.

Hoshinouchi, Susumu: *See*—
Sakuma, Hisayuki; and Hoshinouchi, Susumu, 4,638,145, Cl. 219-121.0LU.

Hosiden Electronics Co., Ltd.: *See*—
Tajima, Kyousuke, 4,637,669, Cl. 339-14.00R.

Hosoi, Atsushi; Kan, Fumitaka; Egami, Hidemi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, to Canon Kabushiki Kaisha. Developer thin layer forming apparatus. 4,637,706, Cl. 355-3.0DD.

Hosoya, Yoshinori; Tunekawa, Shyozi; Yamada, Wazoh; and Shiraishi, Akira, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Packaged terminal air-conditioner. 4,637,223, Cl. 62-263.000.

Hostetler, Eldon, to Ziggity Systems, Inc. Watering system for fowl and small animals. 4,637,345, Cl. 119-72.500.

Houlihan, Christopher M.: *See*—
Chang, Stephen S.; Ho, Chi-Tang; and Houlihan, Christopher M., 4,638,095, Cl. 568-326.000.

Houman, Leif; and Wohlabaugh, Leonard M., to Xermac, Inc. Modular EDM system. 4,638,141, Cl. 219-69.00R.

House Food Industrial Company Ltd.: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; and Hattori, Ryuichi, 4,637,145, Cl. 34-1.000.

Howell, Edward K., to General Electric Company. Ground connection monitor. 4,638,244, Cl. 324-51.000.

Howell, Richard H.; and MacGovern, Alan J., to Itek Corporation. Shearing interferometer employing an acousto-optic cell. 4,637,724, Cl. 356-353.000.

Howeth, D. Franklin. Filter system for power sweeper. 4,637,825, Cl. 55-302.000.

Howing, Jurgen, to Siemens Aktiengesellschaft. Transposed bar for an electrical machine. 4,638,113, Cl. 174-34.000.

Hoy, Kenneth L.: *See*—
Meschke, Debra J.; Hoy, Kenneth L.; and Theiling, Louis F., Jr., 4,638,029, Cl. 524-430.000.

HR Textron Inc.: *See*—
Hartmann, Wilhelm U.; and Martin, James A., 4,637,877, Cl. 210-347.000.

Hsieh, Robert C., to Xerox Corporation. Edge extraction technique. 4,638,369, Cl. 358-283.000.

Hsu, Sheng T.: *See*—
Flatley, Doris W.; and Hsu, Sheng T., 4,637,836, Cl. 148-1.500.

Huber, Lothar, to Luk Lamellen und Kupplungsbau GmbH. Fluid-operated clutch disengaging apparatus. 4,637,505, Cl. 192-88.00A.

Huber, Robert: *See*—
Nebelung, Hermann H.; Huber, Robert; and Futterknecht, Fritz, 4,637,827, Cl. 65-235.000.

Hudson, Bertram J.: *See*—
Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Andersen, Paul J.; and Hudson, Bertram J., 4,637,403, Cl. 128-770.000.

Hudson, J. Russell: *See*—
Bunting, Franklin O.; and Hudson, J. Russell, 4,637,647, Cl. 296-24.00R.

Huet, Yves; and Perichon, Christian, to Framatome & Cie. Device for controlling the supply of fluid under pressure to a hydraulic circuit as a function of the state of locking of unlocking of two mechanical members. 4,637,294, Cl. 91-536.000.

Hughes Aircraft Company: *See*—
Eggert, Dennis J.; Hendrix, Charles E.; and Krinsky, Barnet, 4,638,320, Cl. 342-442.000.
Jergenson, Jerg B., 4,638,210, Cl. 313-362.100.
Moss, Gaylord E.; Chern, Mao-Jin; and Dobbe, Teena L., 4,637,678, Cl. 350-3.700.
Rand, Stephen C.; and DeShazer, Larry G., 4,638,484, Cl. 172-42.000.
Wessel, Frank J.; and Hancock, Donald J., 4,638,149, Cl. 219-499.000.

Hughes, David W., to Vetco Offshore, Inc. Subsea control pod valve assembly. 4,637,419, Cl. 137-236.100.

Hughes Tool Company: *See*—
Weathers, Gary G.; and Rice, Billy J., 4,637,470, Cl. 166-344.000.

Hugl, Herbert: *See*—
Skjold, A. Christopher; Hugl, Herbert; and Wolfrum, Gerhard, 4,637,979, Cl. 435-19.000.

Hundebol, Keid O., to Udviklingscentret Hansen & Hundebol A/S. Rotating grinding or polishing disc. 4,637,173, Cl. 51-334.000.

Hunn, Kevin W. Jump rope. 4,637,606, Cl. 272-75.000.

Hurditch, Rodney J.: *See*—
Kwak, Won S.; and Hurditch, Rodney J., 4,637,698, Cl. 351-163.000.

Huret et ses Fils: *See*—
Cuvelier, Antoine L.; and Boucher, Guy M. G., 4,638,448, Cl. 364-563.000.

Husain, Abbas. Nail clipper. 4,637,137, Cl. 30-28.000.

Hutchinson, Charles H. Air volume control. 4,637,080, Cl. 4-542.000.

Hutzenlaub, Armin, to Kampf GmbH & Co. Maschinenfabrik. Simultaneous biaxial stretching machine for thermoplastic film webs. 4,637,103, Cl. 26-73.000.

Hwang, Ying C.; Chen, Young K.; and Ragonese, Louis J., to General Electric Company. Digitally controlled wideband phase shifter. 4,638,190, Cl. 307-512.000.

Iacobucci, Guillermo A.; King, George A.; Goldstein, Jacob H.; and Benemann, John R., to Coca-Cola Company, The. Monoquaternized pyrazinium compounds and their use as electron carriers in photosynthetic processes. 4,638,005, Cl. 544-336.000.

ICL Scientific Corp.: *See*—
Mitchell, Vance C., 4,637,693, Cl. 350-536.000.

Ide, Jushi: *See*—
Kuwabara, Hiroshi; Ide, Jushi; Kamata, Yasuji; and Yamashita, Kenkichi, 4,638,308, Cl. 340-736.000.

Ide, Toshiaki: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, 4,637,963, Cl. 428-694.000.

Idemitsu Petrochemical Co., Ltd.: *See*—
Ogawa, Kenji, 4,637,812, Cl. 493-357.000.

Idesawa, Masanori, to Rikagaku Kenkyusho. Optical distance measuring apparatus. 4,637,715, Cl. 356-1.000.

Idstein, Paul H. Food storage device. 4,637,580, Cl. 248-95.000.

Iida, Akinori: *See*—
Fujiwara, Kenichi; Asano, Hideo; Hasada, Eiichi; Makida, Kazuhisa; and Iida, Akinori, 4,637,222, Cl. 62-244.000.

Iida, Hitoshi; and Nakayama, Ryoichi, to Kabushiki Kaisha Toshibe. Apparatus for moving carriages along ladders. 4,637,494, Cl. 187-10.000.

Iijima, Akira: *See*—
Furuichi, Akira; and Iijima, Akira, 4,637,555, Cl. 241-46.020.

Iiyama, Kiyotaka; and Inaba, Norihiko, to Ricoh Company, Ltd. Two-color thermosensitive recording label. 4,638,340, Cl. 346-204.000.

Iizuka, Akira; Konsi, Yutaka; Yamauchi, Takashi; and Hayashi, Shoichiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. 6-substituted naphthalene-2-carboxylic acids and process for producing the same. 4,638,087, Cl. 562-467.000.

Ijiri, Waichiro; and Hirakushi, Shuzo, to Koyo Jidoki Kabushiki Kaisha. Hydraulic control apparatus for a power steering device. 4,637,484, Cl. 180-142.000.

Ikada, Shoji: *See*—
Fujii, Haruki; Ikada, Shoji; Fukuda, Akimitsu; and Okumura, Yasuo, 4,637,840, Cl. 148-6.200.

Ikagami, Akira: *See*—
Kaneyasu, Masayoshi; Arima, Hideo; Ito, Mitsuko; Iwanaga, Shoichi; Sato, Nobuo; Noro, Takanobu; Ikagami, Akira; and Isogai, Tokio, 4,638,443, Cl. 364-497.000.

Ikeda, Hiroshi, to Citizen Watch Co., Ltd. Paper feeder for a printer. 4,637,537, Cl. 226-76.000.

Ikuzawa, Masanori: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,637,998, Cl. 514-42.000.

Illuminated Data, Inc.: *See*—
Erbert, Virgil, 4,638,110, Cl. 136-246.000.

Imai, Keiji: *See*—
Hagiwara, Tatsuo; Imai, Keiji; and Nagaoka, Shigemori, 4,637,562, Cl. 241-259.200.

Imai, Yoshio, to Nissan Motor Company, Limited; and Sannohashi Seisakusho Company, Limited. Bolt adapted for one-handed tightening by tightening tool. 4,637,764, Cl. 411-5.000.

Imakawa, Kazuhiko: *See*—
Crabtree, Paul J.; and Imakawa, Kazuhiko, 4,637,890, Cl. 252-90.000.

Imes, Clifford W., IV: *See*—
Thompson, Michael D.; and Imes, Clifford W., IV, 4,637,340, Cl. 118-637.000.

IMO AB: *See*—
Segerstrom, Lars H., 4,637,787, Cl. 418-203.000.

Imperial Chemical Industries PLC: *See*—
Bowden, Roy D., 4,638,091, Cl. 564-473.000.
Ward, Mary V.; Nield, Eric; and Staniland, Philip A., 4,638,037, Cl. 525-471.000.

Impink, Albert J., Jr., to Westinghouse Electric Corp. Method and apparatus for continuous on-line synthesis of power distribution in a nuclear reactor core. 4,637,910, Cl. 376-216.000.

Inabe, Norihiko: *See*—
Iiyama, Kiyotaka; and Inabe, Norihiko, 4,638,340, Cl. 346-204.000.

Inami, Yasuhiko; Watanabe, Masanori; and Hijikigawa, Masaya, to Sharp Kabushiki Kaisha. Field effect transistor-type moisture sensor. 4,638,346, Cl. 357-25.000.

Inayashi, Minoru: *See*—
Okura, Masahiko; and Inayashi, Minoru, 4,637,098, Cl. 24-136.00R.

Inco Limited: *See*—
England, John R.; and Risch, Richard L., 4,637,475, Cl. 173-43.000.

Ing. C. Olivetti & C., S.p.A.: *See*—
Valle, Franco; and Musso, Pietro, 4,637,744, Cl. 400-185.000.

Ingrisano, Louis A.; Moon, Stephen H.; and English, Lawrence J., to Med-Vest Inc. Emergency medical services system. 4,637,075, Cl. 2-94.000.

Inoue, Masatoshi: *See*—
Yanaghuchi, Noboru; Adachi, Shigeo; Inoue, Masatoshi; Takata, Hiroshi; and Matsuda, Toyoshi, 4,637,270, Cl. 74-336.500.

Inoue, Nobuhiro, to Tachikawa Spring Co., Ltd. Top cover member fixing arrangement in a vehicle seat. 4,637,650, Cl. 297-410.000.

Insituform Holdings Limited: *See*—
Wood, Eric, 4,637,754, Cl. 405-150.000.

Inskip, Ervin B.; and Patane, Joseph M., to Mallinckrodt, Inc. Inhibiting polymerization of ethylenically unsaturated monomers. 4,638,079, Cl. 560-4.000.

Instance, David J. Label in the form of a sheet and envelope. 4,637,633, Cl. 283-81.000.

Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR: *See*—
Gurkov, Konstantin S.; Kostyiev, Alexandr D.; Tkachenko, Gennady A.; Leonov, Ivan P.; and Klimashko, Vladimir V., 4,637,476, Cl. 173-136.000.

Institut National de la Sante et de la Recherche Medicale: *See*—
Jolles, Pierre; Migliore-Samour, Daniele; Parker, Fabienne; and Casaretto, Monika, 4,637,997, Cl. 514-17.000.

Institute for Gravitational Strain Pathology, Inc.: *See*—
Jungmann, Gertrude, 4,637,381, Cl. 128-80.00G.

Instranetics, Inc.: *See*—
Eldrige, John D., Jr., 4,637,513, Cl. 206-370.000.

Insul Company, Inc.: *See*—
La Bate, Michael D., II; and Perri, Joseph A., 4,637,592, Cl. 166-272.000.

Interlock Structures International, Inc.: *See*—
Lange, Fredric A., 4,637,193, Cl. 52-648.000.

International Business Machines Corporation: *See*—
Beglin, Thomas W.; Pence, Jane R.; Kamionka, Harvey E.; and Pence, Jerry W., 4,638,424, Cl. 364-200.000.
Bumble, Bruce; Caomo, Jerome J.; Logan, Joseph S.; and Rossnagel, Steven M., 4,637,853, Cl. 156-345.000.
Cazcarra, Victor; and LeRoueille, Jocelyne, 4,637,123, Cl. 29-360.00R.
Chang, Albert; Cocke, John; Mergen, Mark F.; and Radin, George, 4,638,426, Cl. 364-200.000.
Cranford, Hayden C., Jr.; and Garvin, Stacy J., 4,638,464, Cl. 365-226.000.
Flamholz, Alexander L., 4,637,714, Cl. 355-77.000.
Freeouf, John L.; Jackson, Thomas N.; Laux, Steven E.; and Woodall, Jerry M., 4,638,342, Cl. 357-15.000.
Frey, Alexander H., 4,638,449, Cl. 364-760.000.
Griffin, William R.; Heller, Lawrence G.; and Horowitz, Peter N., 4,638,482, Cl. 371-63.000.
Hartung, Michael H., 4,638,425, Cl. 364-200.000.
Iyer, Subramanian S., 4,638,347, Cl. 357-54.000.
Martin, Daniel B., 4,638,427, Cl. 364-200.000.
Rajeevakumar, Thekkemadathil V.; and Terman, Lewis M., 4,638,462, Cl. 365-203.000.
Rickard, Dale A.; and Rudelis, Glen H., 4,638,183, Cl. 307-291.000.
Rockett, Leonard R., Jr., 4,638,463, Cl. 365-205.000.

International Paper Company: *See*—
Steck, Robert F.; and Baartman, John L., III, 4,637,199, Cl. 53-451.000.

International Standard Electric Company: *See*—
Ayliffe, Peter J., 4,638,310, Cl. 340-805.000.

International Standard Electric Corporation: *See*—
Auch, Wilfried; and Schlemper, Eberhard, 4,638,266, Cl. 332-7.510.

Internationale Octrooi Maatschappij "Octropa" B.V.: *See*—
Sidki, Ahmad M.; and Smith, David S., 4,637,985, Cl. 436-518.000.

Inui, Toshiharu: *See*—
Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katoh, Yasuo, 4,638,372, Cl. 358-296.000.

Inukai, Hiroshi: *See*—
Ohmori, Akira; Tomihashi, Nobuyuki; Inukai, Hiroshi; and Nakai, Kazuhiro, 4,638,041, Cl. 526-247.000.

IRS Industrie Rationalisierungs-Systeme GmbH: *See*—
Brennecke, Hermann; Liere, Horst; and Kiesel, Michael, 4,638,398, Cl. 361-214.000.

Irvine, Thomas F., Jr.; and Park, Noh-Aeok, to State University of New York. Apparatus and method for viscosity measurements for Newtonian and non-Newtonian fluids. 4,637,250, Cl. 73-57.000.

Ishihara, Takashi; Okaniwa, Kazuhiro; and Nakamura, Genshiro, to Mitsubishi Denki Kabushiki Kaisha. Sun light electricity generator. 4,638,109, Cl. 136-244.000.

Ishihata, Takato, to Toyota Jidosha Kabushiki Kaisha. Hose clamping device. 4,637,100, Cl. 24-274.00R.

Ishii Syoji, Ltd.: *See*—
Hagiwara, Tatsuo; Imai, Keiji; and Nagaoka, Shigenori, 4,637,562, Cl. 241-259.200.

Ishikawa, Junzo: *See*—
Okubo, Masao; Sugaya, Kiyoshi; Takagi, Toshinori; and Ishikawa, Junzo, 4,638,217, Cl. 315-111.810.

Ishikawa, Takehiro, to Kabushiki Kaisha Daini Seikosha. Integrated circuit for converting a drive signal of three or more voltage levels to two voltage levels. 4,638,247, Cl. 324-73.00R.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Kawane, Minoru, 4,637,617, Cl. 277-150.000.
Tomizawa, Fumio, 4,638,487, Cl. 373-9.000.

Ishimura, Toshihiko; and Maekawa, Yukio, to Minolta Camera Kabushiki Kaisha. Exchangeable lens which exchanges electrical signals with a camera body. 4,637,704, Cl. 354-286.000.

Ishizaki, Morio; and Nishikawa, Akiyoshi, to Ishizaki Press Kogyo Co., Ltd. Battery can hole detecting apparatus. 4,637,249, Cl. 73-41.000.

Ishizaki Press Kogyo Co., Ltd.: *See*—
Ishizaki, Morio; and Nishikawa, Akiyoshi, 4,637,249, Cl. 73-41.000.

Ishizuka, Hiroshi. Rotary saw blade. 4,637,370, Cl. 125-15.000.

Isogai, Tokio: *See*—
Kaneyasu, Masayoshi; Arima, Hideo; Ito, Mitsuko; Iwanaga, Shoichi; Sato, Nobuo; Noro, Takanobu; Ikagami, Akira; and Isogai, Tokio, 4,638,443, Cl. 364-497.000.

Itek Corporation: *See*—
Chang, I-Cheng, 4,637,689, Cl. 350-372.000.
Howell, Richard H.; and MacGovern, Alan J., 4,637,724, Cl. 356-351.000.

Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Nishino, Hiroyuki, to Hokuriku Pharmaceutical Co., Ltd. Derivatives of 3-pyrrolidinopropiophesone and a process for preparation thereof. 4,638,009, Cl. 514-428.000.

Ito, Katsumi: *See*—
Sugihara, Hirosada; Nishikawa, Kohei; and Ito, Katsumi, 4,638,000, Cl. 514-211.000.

Ito, Mitsuko: *See*—
Kaneyasu, Masayoshi; Arima, Hideo; Ito, Mitsuko; Iwanaga, Shoichi; Sato, Nobuo; Noro, Takanobu; Ikagami, Akira; and Isogai, Tokio, 4,638,443, Cl. 364-497.000.

Ito, Shintaro: *See*—
Iwasaki, Hiroshi; and Ito, Shintaro, 4,637,125, Cl. 29-571.000.

Ito, Susumo: *See*—
Sawamura, Mitsuharu; and Ito, Susumo, 4,637,953, Cl. 428-333.000.

Itoh, Hiroshi; and Takada, Mitsuru, to Toyota Jidosha Kabushiki Kaisha. Method for controlling a continuously variable transmission. 4,637,279, Cl. 74-866.000.

Itoh, Yasuo, to Kabushiki Kaisha Toshiba. Semiconductor memory address lines with varied interval contact holes. 4,638,458, Cl. 365-51.000.

Itsuki, Fumiaki; and Oku, Seiji, to Omron Tateisi Electronics Co. Reflection-type photoelectric switching apparatus with light-adjustable reference light detection. 4,638,154, Cl. 250-227.000.

ITT Corporation: *See*—
Chalet, Alain R. G., 4,638,474, Cl. 370-60.000.
Foglesonger, John D.; and Vranson, David M., 4,638,273, Cl. 333-254.000.
Gerety, Eugene P., 4,638,311, Cl. 340-825.060.
Hargrave, Franklin; and Middleton, Francisco A., 4,638,124, Cl. 379-159.000.

Ive, Richard A., to Commonwealth of Australia, The. Lossy transmission line using spaced ferrite beads. 4,638,272, Cl. 333-236.000.

Iwado, Shuichi: *See*—
Kuwamoto, Hiroshi; Nagamori, Hiroyuki; Mukai, Takashi; and Iwado, Shuichi, 4,637,885, Cl. 252-32.500.

Iwai, Kazuhiro, to Honda Giken Kogyo Kabushiki Kaisha. Air intake system and cooling system relation for three-wheeled motor vehicle with riding saddle. 4,637,486, Cl. 180-225.000.

Iwai, Kenji: *See*—
Asakuno, Hiroyoshi; Mori, Kinya; Suzuki, Kiyoaki; Nishida, Mamoru; Iwai, Kenji; Tamamushi, Masahiro; and Kawasaki, Teruo, 4,638,030, Cl. 524-536.000.

Iwamoto, Yoshinao; Shirasaki, Yuichi; Fujise, Masayuki; and Asakawa, Kenichi, to Kokusai Denshin Denwa Co., Ltd. Optical fiber with light reflecting particles dispersed through buffer layers to dissipate leaky cladding modes. 4,637,686, Cl. 350-96.290.

Iwanaga, Shoichi: *See*—
Kaneyasu, Masayoshi; Arima, Hideo; Ito, Mitsuko; Iwanaga, Shoichi; Sato, Nobuo; Noro, Takanobu; Ikagami, Akira; and Isogai, Tokio, 4,638,443, Cl. 364-497.000.

Iwanaka, Masaya; and Kajiwara, Seiji, to Nippon Chem-Con Corp.; and Koide, Hideo. Electroacoustic transducer. 4,637,489, Cl. 181-160.000.

Iwanczuk, Paul: *See*—
Peterman, Stanley; Orrestad, Charles W.; and Iwanczuk, Paul, 4,637,672, Cl. 339-61.00R.

Iwasaki, Hiroshi; and Ito, Shintaro, to Kabushiki Kaisha Toshiba. Method for making a semiconductor integrated device including bipolar transistor and CMOS transistor. 4,637,125, Cl. 29-571.000.

Iwase, Takatoshi; and Nakagawa, Akira, to Nippondenso Co., Ltd. Apparatus for assembling heat exchanger core. 4,637,132, Cl. 29-726.000.

Iwashita, Shigeo: *See*—
Eto, Kunihiko; Iwashita, Shigeo; and Matsumoto, Tsutomu, 4,637,483, Cl. 180-142.000.

Iwata, Takahiro: *See*—
Yasuoka, Akimasa; Iwata, Takahiro; and Kiuchi, Takeo, 4,637,362, Cl. 123-478.000.

Iwata, Toshio; and Ueda, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Knock deriving apparatus for internal combustion engines. 4,637,245, Cl. 73-35.000.

Iwatsu Electric Co., Ltd.: *See*—
Kobayashi, Kensuke; and Tazoh, Yasuo, 4,638,185, Cl. 307-352.000.

Iyer, Subramanian S., to International Business Machines Corporation. Gate electrode sidewall isolation spacer for field effect transistors. 4,638,347, Cl. 357-54.000.

Izzi, Lewis B., Sr., to Plastic Oddities Inc. Plastic washing machine box with hinged mounting brackets. 4,637,422, Cl. 137-360.000.

J. H. Benecke GmbH: *See*—
Mente, Kurt, 4,637,104, Cl. 28-283.000.

J. M. Voith GmbH: *See*—
Wohrle, Albert, 4,637,338, Cl. 118-126.000.

Jackson, Gregg B. Sail and sailing rig. 4,637,331, Cl. 114-39.000.

Jackson, John M.: *See*—
Gilliam, Edward C.; Jackson, John M.; and Lamie, Billy J., 4,637,260, Cl. 73-826.000.

Jackson, Thomas N.: *See*—
Freeouf, John L.; Jackson, Thomas N.; Laux, Steven E.; and Woodall, Jerry M., 4,638,342, Cl. 357-15.000.

Jacquot, Claude: *See*—
Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, 4,638,216, Cl. 315-111.810.

Jacquot, Jean-Paul; and Guillery, Patrick, to Scandpower, Inc. Device for measuring the power in a nuclear reactor. 4,637,913, Cl. 376-247.000.

Jacuzzi Inc.: *See*—
DeSousa, Daniel A.; Gockel, Gary L.; D'Innocente, Ralph; and Jacuzzi, Roy A., 4,637,873, Cl. 210-169.000.

Jacuzzi, Roy A.: *See*—
DeSousa, Daniel A.; Gockel, Gary L.; D'Innocente, Ralph; and Jacuzzi, Roy A., 4,637,873, Cl. 210-169.000.

James Howden Australia Pty. Limited: *See*—
Stephenson, Robert G., 4,637,826, Cl. 55-304.000.

James River Corporation: *See*—
Manning, James H.; and Sorenson, Wayne P., 4,637,949, Cl. 428-110.000.

Janatka, Karel: *See*—
Gavaghan, Thomas J.; Boucher, Paul D.; and Janatka, Karel, 4,637,602, Cl. 271-238.000.

Janson, Richard W. Furniture assembly and assembly device. 4,637,324, Cl. 108-111.000.

Jansson, Allan P.: *See*—
Elias, John G.; and Jansson, Allan P., 4,638,456, Cl. 364-518.000.

Jansson, Kurt, to AB A. K. Eriksson. Saw assembly. 4,637,443, Cl. 144-39.000.

Japan Atomic Energy Research Institute: *See*—
Konishi, Satoshi; Ohno, Hideo; Naruse, Yuji; and Yoshida, Hiroshi, 4,637,866, Cl. 204-129.000.

Jaskolski, Patrick L.; and Eash, Matthew G., to General Electric Company. Mutual inductance NMR RF coil matching device. 4,638,253, Cl. 324-318.000.

Jean Walterscheid GmbH: *See*—
Vollmer, Jurgen, 4,637,751, Cl. 403-379.000.

Jeans, Edward L., to Cadbury Schweppes, PLC. Mini-regulator valve assembly. 4,637,439, Cl. 141-18.000.

Jecko, Jean-Rene ; and Motola, Marcel, to Thomson-CSF. Method of incrementally adjusting the center frequency of a microstrip-line printed filter by manuevering dielectric layers. 4,638,271, Cl. 333-205.000.

Jeffrey, Paul W.; and Marchand, Gilles, to Alcan International Limited. Production of aluminum alloy sheet and articles fabricated therefrom. 4,637,842, Cl. 148-12.70A.

Jegousse, Michel: *See*—
Puissais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel; and Kaluszynski, Michel, 4,638,142, Cl. 219-121.0EC.

Jensen, Garold K. Secure reliable transmitting and receiving system for transfer of digital data. 4,638,496, Cl. 375-104.000.

Jenzsch, Gunter; Rauh, Kurt; and Wegscheider, Hans J., to Mirbeth, Rudolph. Vibratory decoring apparatus for castings. 4,637,558, Cl. 241-79.000.

Jergenson, Jerg B., to Hughes Aircraft Company. Liquid metal ion source. 4,638,210, Cl. 313-362.100.

Jernigan, Edward L.: *See*—
Lombardo, Frank; Jernigan, Edward L.; and Furze, Paul, 4,637,856, Cl. 156-637.000.

Jess, Norval M.: *See*—
Gillis, Joseph P.; and Jess, Norval M., 4,637,473, Cl. 169-61.000.

Jiang, Chih-Chang. Dispenser for a liquid container. 4,637,530, Cl. 222-564.000.

Johansson, Sven H.: *See*—
Gillbrand, Per Sune; and Johansson, Sven H., 4,637,368, Cl. 123-647.000.

John Zink Company: *See*—
Schwartz, Robert E.; Noble, Roger K.; and Keller, Michael R., 4,637,793, Cl. 431-202.000.

Johns Hopkins University, The: *See*—
Burns, Hugh D.; Zemyan, Susan E.; Epps, Leon A.; Kramer, Alfred V.; and Dannals, Robert F., 4,638,051, Cl. 534-14.000.

Johnson, Charles E.; and New, Richard W., to Buffalo Weaving and Belting Company. Longer lasting woven polyaramide belting for high temperature applications. 4,637,511, Cl. 198-846.000.

Johnson, David D.; and Biller, Cleveland J., to United States of America, Agriculture. Auto-release logging choker. 4,637,643, Cl. 294-75.000.

Johnson, Davin W.: *See*—
Hegel, James D.; and Johnson, Davin W., 4,637,907, Cl. 264-45.700.

Johnson, George E.; and Newman, Walter, to Leviton Manufacturing Company, Inc. Theft-resistant device for fluorescent lamp. 4,637,671, Cl. 339-90.00R.

Johnson, Gordon E.: *See*—
Smith, Thomas W.; Ward, Anthony T.; Luca, David J.; and Johnson, Gordon E., 4,638,335, Cl. 346-135.100.

Johnson, Michael D. A. Keepnets. 4,637,155, Cl. 43-7.000.

Johnson, Richard K.; and Algeo, John W. Apparatus for producing sterility in female animals. 4,637,818, Cl. 604-89.000.

Johnson Service Company: *See*—
DeMeyer, Roy W., 4,637,546, Cl. 236-49.000.

Johnston, David A.: *See*—
Schultz, Ronald E.; Schmidt, Otomar; and Johnston, David A., 4,638,452, Cl. 364-900.000.

Johnstoa, G. Gilbert. Volumetric flow rate determination in conduits not directly accessible. 4,637,401, Cl. 128-663.000.

Jolles, Pierre; Migliore-Samour, Daniele; Parker, Fabienne; and Casaretto, Monika, to Institut National de la Sante et de la Recherche Medicale. Hexapeptide, process for obtaining II and the pharmaceutical compositions containing II. 4,637,997, Cl. 514-17.000.

Jones, Charles; Murphy, James L.; and Burks, Kenneth, to Jones, Charles. Hand held athletic officiating timers. 4,637,732, Cl. 368-109.000.

Jones, David I. G., to United States of America, Air Force. Fatigue test machine. 4,637,259, Cl. 73-794.000.

Jones, David M.: *See*—
Szelke, Michael; and Jones, David M., 4,638,047, Cl. 530-332.000.

Jones, J. Paul, to Med-Tech Associates. Linear impulse motor. 4,638,193, Cl. 310-15.000.

Jones, Janice L.; and Jones, Ronald E., to Case Western Reserve University. Triphasic wave defibrillation. 4,637,397, Cl. 128-419.00D.

Jones, Michael A.: *See*—
Partus, Fred P.; and Jones, Michael A., 4,638,129, Cl. 200-43.220.

Jones, Paul W.; Merry, Rodney J.; and Linstad, Gregory A., to Physio-Control Corporation. Connector for modular physiological instruments. 4,637,749, Cl. 403-322.000.

Jones, Ronald E.: *See*—
Jones, Janice L.; and Jones, Ronald E., 4,637,397, Cl. 128-419.00D.

Jonsson, Nils G., to Craelius AB. Device in rock drilling machines. 4,637,477, Cl. 173-149.000.

Jorgensen, Michael L. S., to Jydsk Varmekedelfabrik A/S. Stoking plant for fuel in whole bales. 4,637,327, Cl. 110-289.000.

Jorgensen, Robert W.; and Nowak, Michael R., to Harvey Hubbell Incorporated. Non-metallic liquid-tight conduit engaging connector. 4,637,639, Cl. 285-249.000.

Jourdan, Pierre: *See*—
Perin, Robert; Jourdan, Pierre; and Pauly, Bernard, 4,637,573, Cl. 244-54.000.

Joyce International, Inc.: *See*—
Reid, Iain K.; Staite, Eric; Richmond, Doug; and Rumbelow, George, 4,637,667, Cl. 312-217.000.

Junginger, Erich; Schnaibel, Eberhard; and Schneider, Erich, to Robert Bosch GmbH. Digitally controlled analog operating control system, and method. 4,638,228, Cl. 318-569.000.

Jungmann, Gertrude, to Institute for Gravitational Strain Pathology, Inc. Foot supporting device. 4,637,381, Cl. 128-80.00G.

Jydsk Varmekedelfabrik A/S: *See*—
Jorgensen, Michael L. S., 4,637,327, Cl. 110-289.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Ishikawa, Takehiro, 4,638,247, Cl. 324-73.00R.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Asari, Akira; Matsumoto, Satoshi; Hattori, Shigeo; and Dosai, Takayoshi, 4,637,112, Cl. 29-159.010.
Ayata, Kenzo; Narita, Kiichi; Mori, Takasuke; and Fujimoto, Takahiko, 4,637,453, Cl. 164-468.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Akiyama, Teruo; Sasaki, Katsuyuki; and Saigo, Takaichi, 4,637,781, Cl. 417-216.000.
Tamaki, Hiroaki; and Nakamura, Joji, 4,637,758, Cl. 405-248.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Yasukawa, Kazuyoshi, 4,637,771, Cl. 414-590.000.

Kabushiki Kaisha Sensor Gijutsu Kenkyujo: *See*—
Koyama, Ario, 4,638,146, Cl. 219-147.000.

Kabushiki Kaisha Toka-Rika-Denki-Seisakusho: *See*—
Nishimura, Yuji; and Koide, Teruhiko, 4,637,630, Cl. 280-807.000.

Kabushiki Kaisha Toshiba: *See*—
Aoki, Masayuki, 4,638,135, Cl. 219-10.49R.
Iida, Hitoshi; and Nakayama, Ryoichi, 4,637,494, Cl. 187-10.000.
Itoh, Yasuo, 4,638,458, Cl. 365-51.000.
Iwasaki, Hiroshi; and Ito, Shintaro, 4,637,125, Cl. 29-571.000.
Mizutani, Yoshihisa, 4,637,128, Cl. 29-576.00B.
Ogura, Masahiko, 4,638,235, Cl. 318-696.000.
Sekimura, Masayuki; and Shirouzu, Shunji, 4,637,253, Cl. 73-189.000.
Watanabe, Junji, 4,638,330, Cl. 346-76.0PH.
Watanabe, Junji, 4,638,331, Cl. 346-76.0PH.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Saito, Tsutomu; Hasegawa, Yoshimichi; Yoshikawa, Kazuo; and Aoyama, Shigetsune, 4,637,594, Cl. 267-47.000.

Kabushiki Kaisha Universal: *See*—
Hamada, Norihiko, 4,637,611, Cl. 273-143.00R.

Kaji, Toshio: *See*—
Kato, Tokuzo; Takayama, Tsutomu; and Kaji, Toshio, 4,638,350, Cl. 358-29.000.

Kajiwara, Seiji: *See*—
Iwanaka, Masaya; and Kajiwara, Seiji, 4,637,489, Cl. 181-160.000.

Kalagidis, Memorial, to Ametek, Inc. Magnetic flux shield and enhancer for brushless motors. 4,638,197, Cl. 310-67.00R.

Kallander, Clas F. R.: *See*—
Gronowitz, Jan S.; and Kallander, Clas F. R., 4,637,977, Cl. 435-15.000.

Kaluszynski, Michel: *See*—
Puissais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel; and Kaluszynski, Michel, 4,638,142, Cl. 219-121.0EC.

Kamada, Fujio: *See*—
Kikuchi, Kunio; Kamada, Fujio; and Osawa, Masao, 4,637,508, Cl. 198-345.000.

Kamata, Yasuji: *See*—
Kuwabara, Hiroshi; Ide, Jushi; Kamata, Yasuji; and Yamashita, Kenkichi, 4,638,308, Cl. 340-736.000.

Kamionka, Harvey E.: *See*—
Beglin, Thomas W.; Pence, Jane R.; Kamionka, Harvey E.; and Pence, Jerry W., 4,638,424, Cl. 364-200.000.

Kamiya, Osamu; Fujiyama, Yasutomo; Ogawa, Kyosuke; and Kurokawa, Takashi, to Canon Kabushiki Kaisha. Vacuum processing apparatus. 4,637,342, Cl. 118-719.000.

Kamp, Arthur J.: *See*—
Marino, Dean F.; Ryan, William E.; and Kamp, Arthur J., 4,638,168, Cl. 250-560.000.

Kampf GmbH & Co. Maschinenfabrik: *See*—
Hutzenlaub, Armin, 4,637,103, Cl. 26-73.000.

Kamyr Aktiebolag: *See*—
Richter, Johan C. F. C.; and Richter, Ole J., 4,637,878, Cl. 210-388.000.

Kamyr, Inc.: *See*—
Sherman, Michael I.; and Golston, Stefan, 4,637,779, Cl. 415-143.000.

Kan, Fumitaka: *See*—
Hosoi, Atsushi; Kan, Fumitaka; Egami, Hidemi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,637,706, Cl. 355-3.00D.

Kanbe, Junichiro: *See*—
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,637,972, Cl. 430-84.000.

Kane Graphical Corporation: *See*—
Kane, Michael; and Hogan, Lawrence R., 4,637,153, Cl. 40-605.000.

Kane, Michael; and Hogan, Lawrence R., to Kane Graphical Corporation. Multiple configuration display sign system. 4,637,153, Cl. 40-605.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Tani, Nobutaka; and Hayashi, Tsuneo, 4,637,994, Cl. 502-404.000.

Kaneyasu, Masayoshi; Arima, Hideo; Ito, Mitsuko; Iwanaga, Shoichi; Sato, Nobuo; Noro, Takanobu; Ikagami, Akira; and Isogai, Tokio, to Hitachi, Ltd. Gas detecting apparatus. 4,638,443, Cl. 364-497.000.

Kanii, Norikazu: *See*—
Nakamura, Hiroshi; Toyama, Osamu; and Kanii, Norikazu, 4,637,774, Cl. 414-735.000.

Kanzaki Kokyukoki Mfg. Co. Ltd.: *See*—
Ohashi, Ryota; Kawamura, Masahisa; and Shibata, Jiro, 4,637,482, Cl. 180-132.000.

Kao Corporation: *See*—
Kuwamoto, Hiroshi; Nagamori, Hiroyuki; Mukai, Takashi; and Iwado, Shuichi, 4,637,885, Cl. 252-32.500.

Karas, Richard J.; and LaRosa, John, to American Can Company. Method for deep drawing thin metal stock into containers and thereafter coating each container. 4,637,117, Cl. 29-527.400.

Karl, Curtis L., to Henkel Corporation. Fluid friction reduction. 4,637,418, Cl. 137-13.000.

Kartchner, Earl M.; Price, Robert; and Van Horn, Gary R., to Sperry Corporation. System for the acquisition of code signals. 4,638,494, Cl. 375-2.200.

Kasahara, Seitaro; Sawaki, Akira; and Kawata, Shun, to Konishiroku Photo Industry Co., Ltd. Supplementary data copying method and original picture image recorder having supplementary data display means. 4,637,707, Cl. 355-3.00R.

Kasai, Kazumi, to Nippon Notion Kogyo Co., Ltd. Adjustable strap fastener. 4,637,099, Cl. 24-200.000.

Kashima, Kazutsugu: *See*—
Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kobayashi, Kazuo; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Yoichiro; and Abe, Wataru, 4,637,884, Cl. 252-12.000.

Kassai, Kenzou, to Aprica Kassai Kabushikikaisha. Spring cushioned caster having a spring biased locking member. 4,637,093, Cl. 16-35.00R.

Katashima, Seiji: *See*—
Kawai, Kazuo; Kawai, Sumikazu; and Katashima, Seiji, 4,637,450, Cl. 164-200.000.

Katsyama, Masanori; Komoda, Norihisa; Murata, Tomohiro; and Kera, Kazuo, to Hitachi, Ltd. Method and apparatus for recovering normality in moving sequence of machinery. 4,638,227, Cl. 318-565.000.

Kato, Hideo: *See*—
Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Nishino, Hiroyuki, 4,638,009, Cl. 514-428.000.

Kato, Hisao, to Mitsubishi Denki Kabushiki Kaisha. Industrial robot device. 4,637,775, Cl. 414-744.00R.

Kato, Takao: *See*—
Asamaki, Tatsuo; and Kato, Takao, 4,638,209, Cl. 313-359.100.

Kato, Tokuzo; Takayama, Tsutomu; and Kaji, Toshio, to Canon Kabushiki Kaisha. Color image sensing device. 4,638,350, Cl. 358-29.000.

Kato, Tokuzo, to Canon Kabushiki Kaisha. Image sensing device. 4,638,365, Cl. 358-228.000.

Katoh, Yasuo: *See*—
Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katoh, Yasuo, 4,638,372, Cl. 358-296.000.

Katsuta, Hiroo: *See*—
Suzuki, Kazunori; Katsuta, Hiroo; and Toriumi, Yuki, 4,637,850, Cl. 156-60.000.

Katz, Philip: *See*—
Brenman, Henry S.; Katz, Philip; and Beatty, Graydon E., 4,637,405, Cl. 128-787.000.

Kaufhold, Wolfgang: *See*—
Neupauer, Helmut; Kaufhold, Wolfgang; and Wild, Georg, 4,638,416, Cl. 363-35.000.

Kautz, David J.: *See*—
Zajac, William V., Jr.; Kautz, Henry G.; Kautz, David J.; Bossert, Arthur J.; and Cohen, Sidney, 4,637,928, Cl. 423-659.000.

Kautz, Henry G.: *See*—
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Kawabata, Takashi, to Canon Kabushiki Kaisha. Automatic focusing camera. 4,637,705, Cl. 354-403.000.

Kawahara, Eiichiro: *See*—
Yamaguchi, Kouji; Kawahara, Eiichiro; and Yamamoto, Noboru, 4,637,293, Cl. 91-507.000.

Kawai, Kazuo; Kawai, Sumikazu; and Katashima, Seiji, to Naniwa Products Co., Ltd. Entirely automatic, cold box type machine for molding an integral connecting core. 4,637,450, Cl. 164-200.000.

Kawai, Sumikazu: *See*—
Kawai, Kazuo; Kawai, Sumikazu; and Katashima, Seiji, 4,637,450, Cl. 164-200.000.

Kawajiri, Shogo: *See*—
Tsunooka, Tsutomu; Takeuchi, Tadashi; Ushida, Kunihiro; and Kawajiri, Shogo, 4,638,206, Cl. 310-313.00B.

Kawakami, Takashi, to Sumitomo Heavy Industries, Ltd. Mold apparatus for continuous casting system. 4,637,452, Cl. 164-420.000.

Kawamura Cycle Co., Ltd.: *See*—
Nakamura, Shizuo, 4,637,808, Cl. 474-80.000.

Kawamura, Kimihide; Horiguchi, Shojiro; and Okamoto, Hisao, to Dainichiseika Color & Chemicals Mfg. Co., Ltd. Azo-pigment containing hydroxy naphthoic acid amide and an iminooxoisoindolenine components. 4,638,052, Cl. 534-575.000.

Kawamura, Masahisa: *See*—
Ohashi, Ryota; Kawamura, Masahisa; and Shibata, Jiro, 4,637,482, Cl. 180-132.000.

Kawane, Minoru, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Device for forcing piston ring radially outwardly. 4,637,617, Cl. 277-150.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujita, Yoshitada; Hanada, Sadashi; and Yamamoto, Yoshiaki, 4,637,540, Cl. 228-49.200.
Hagiwara, Tatsuo; Imai, Keiji; and Nagaoka, Shigenori, 4,637,562, Cl. 241-259.200.
Yanagiuchi, Noboru; Adachi, Shigeo; Inoue, Masatoshi; Takata, Hiroshi; and Matsuda, Toyoshi, 4,637,270, Cl. 74-336.500.

Kawasaki Steel Corporation: *See*—
Fukuda, Noriyoshi; and Nagasawa, Ken, 4,637,906, Cl. 264-29.100.

Kawasaki, Teruo: *See*—
Asakuno, Hiroyoshi; Mori, Kinya; Suzuki, Kiyoaki; Nishida, Mamoru; Iwai, Kenji; Tamamushi, Masahiro; and Kawasaki, Teruo, 4,638,030, Cl. 524-536.000.

Kawata, Hiroitsu: *See*—
Konno, Yutaka; Kawata, Hiroitsu; Aruga, Masayoshi; Sonobe, Takashi; and Mitomi, Mitsuo, 4,637,930, Cl. 424-28.000.

Kawata, Keiji: *See*—
Komatsu, Shigeru; and Kawata, Keiji, 4,638,497, Cl. 375-116.000.

Kawata, Ken: *See*—
Hirai, Hiroyuki; and Kawata, Ken, 4,637,902, Cl. 260-545.00R.

Kawata, Shun: *See*—
Kasahara, Seitaro; Sawaki, Akira; and Kawata, Shun, 4,637,707, Cl. 355-3.00R.

Kaya, Seiji: *See*—
Fujisawa, Kunio; Tanaka, Toyoji; Mochizuki, Toshio; Nakamura, Norio; and Kaya, Seiji, 4,637,711, Cl. 355-72.000.

Kayaba, Hitoshi: *See*—
Amano, Naoki; Kayaba, Hitoshi; and Kikuchi, Takehiro, 4,638,403, Cl. 361-341.000.

Kayser, Dennis J., to Wang Laboratories, Inc. Modular power system. 4,638,178, Cl. 307-85.000.

Kazami, Kazuyuki; and Wakabayashi, Hiroshi, to Nippon Kogaku K. K. Safety apparatus for feeding a film of a camera. 4,637,702, Cl. 354-173.110.

Kazumi, Hirai, to Matsushita Electric Industrial Co., Ltd. Heating appliance having a fail-safe start switch. 4,638,137, Cl. 219-10.55B.

KCR Technology, Inc.: *See*—
Coburn, Richard J.; Dean, Walter C., III; Kegelman, Thomas D.; and Milliard, Norman L., 4,638,339, Cl. 346-153.100.

Keathley, H. Milton: *See*—
Davis, Ronald G., 4,637,965, Cl. 429-1.000.

Keatley, Andrew: *See*—
Dytch, Anthony; Keatley, Andrew; and Wright, William, 4,638,147, Cl. 219-308.000.

Keefe, Peter D. Coherent magneto-caloric effect superconductive heat engine process cycle. 4,638,194, Cl. 310-40.00R.

Keem, John E.; Bergeron, Richard C.; Custer, Russell C.; and McCallum, R. William, to Energy Conversion Devices, Inc. Electrodes made with disordered active material and methods of making the same. 4,637,967, Cl. 429-101.000.

Kegelman, Thomas D.: *See*—
Coburn, Richard J.; Dean, Walter C., III; Kegelman, Thomas D.; and Milliard, Norman L., 4,638,339, Cl. 346-153.100.

Keller, Franz, to American Science and Engineering, Inc. Meter transponder hybrid. 4,638,314, Cl. 340-870.020.

Keller, Michael R.: *See*—
Schwartz, Robert E.; Noble, Roger K.; and Keller, Michael R., 4,637,793, Cl. 431-202.000.

Kelly, Stephen M., to Merck Patent Gesellschaft mit beschrankter Haftung. Nematic compounds. 4,637,897, Cl. 252-299.630.

Kelman, Lloyd S.: *See*—
Cleary, Patrick J.; Kelman, Lloyd S.; and Horn, Richard L., 4,638,437, Cl. 364-427.000.

Kelsey, Donald R., to Amoco Corporation. Process for preparing poly(aryl ether ketone)s. 4,638,044, Cl. 528-125.000.

Kennecott Corporation: *See*—
Bowling, Joseph E.; Carpenter, James H.; and Rowe, Russell L., 4,637,559, Cl. 241-94.000.

Kennedy, Harold, Jr. Assembly means for standardized mechanical joint for pipeline appurtenances. 4,637,641, Cl. 285-337.000.

Kennedy, Jim. Plastic scraper. 4,637,090, Cl. 15-236.00R.

Kennedy, Weldon C., Jr., to Dowell Schlumberger Incorporated. Corrosion inhibitors for cleaning solutions. 4,637,899, Cl. 252-542.000.

Kenny, Michael: *See*—
Nimmo, Neil D.; Kenny, Michael; and Willis, David, 4,637,178, Cl. 52-36.000.

Kera, Kazuo: *See*—
Katayama, Masanori; Komoda, Norihisa; Murata, Tomohiro; and Kera, Kazuo, 4,638,227, Cl. 318-565.000.

Kerner, Aron; and Grombchevsky, Andrei. Matrix printer and inker for indefinite length articles. 4,637,743, Cl. 400-124.000.

Kerr, Robert L., to Wean United, Inc. Roof assembly for an electric arc furnace. 4,638,492, Cl. 373-74.000.

Kervagoret, Gilbert, to Societe Anonyme D.B.A. Hydraulic assistance device for braking. 4,637,208, Cl. 60-547.100.

Kessler, Robert C.: *See*—
Ponstingl, Michael J.; Trump, Walter N.; and Kessler, Robert C., 4,637,730, Cl. 356-411.000.

Kharkovsky Nauchno-Issledovatelsky Institut Obechei i Neotlozhnoi Khirurgii: *See*—
Sorochenko, Oleg A., 4,637,392, Cl. 128-303.130.

Kibbutz Gordonia Hulda: *See*—
Goldenfeld, Iliya, 4,637,274, Cl. 74-625.000.

Kidd, Richard L.; Graf, Jerry A.; Engler, Philip J.; and Lu, Song-Chin S., to General Motors Corporation. Steering wheel pad keyboard switch assembly. 4,638,131, Cl. 200-61.550.

Kidde, Inc.: *See*—
Gillis, Joseph P.; and Jess, Norval M., 4,637,473, Cl. 169-61.000.

Kiekert GmbH & Co Kommanditgesellschaft: *See*—
Kleefeldt, Frank; and Bartel, Peter, 4,637,239, Cl. 70-264.000.

Kienzle, Karl-Ernst: *See*—
Caspar, Wolfhard; Lutze, Theodor; and Kienzle, Karl-Ernst, 4,637,395, Cl. 128-334.00R.

Kiesel, Michael: *See*—
Brennecke, Hermann; Liere, Horst; and Kiesel, Michael, 4,638,398, Cl. 361-214.000.

Kikuchi, Kunio; Kamada, Fujio; and Osawa, Masao, to Anritsu Electric Company Limited. Apparatus for carrying and separating articles. 4,637,508, Cl. 198-365.000.

Kikuchi, Takehiro: *See*—
Amano, Naoki; Kayaba, Hitoshi; and Kikuchi, Takehiro, 4,638,403, Cl. 361-341.000.

Kildea, James M.; Bedner, Maria D.; and Gulick, John J., to Dow Chemical Company, The. Thermoformed plastic wrap dispenser. 4,637,514, Cl. 206-406.000.

Killark Electric Manufacturing Company: *See*—
Roots, Rolland R., 4,638,297, Cl. 340-304.000.

Killen, H. Ron; Wilkins, Scott A.; and Frantz, Douglas C., to Chrysler Motors Corporation. Non-adjustable throttle position indicator. 4,637,361, Cl. 123-339.000.

Kim, Byoung Y., to Leland Stanford Junior University, The Board of Trustees of the. Fiber optical rotation sensor with extended dynamic range. 4,637,722, Cl. 356-350.000.

Kim, Manjin J.: *See*—
Brown, Dale M.; Kim, Manjin J.; Baertsch, Richard D.; and Vogelsong, Thomas L., 4,638,400, Cl. 361-304.000.

Kimizuka, Norio; Sogabe, Akira; and Abo, Mituyosi, to Futaba Denshi Kogyo Kabushiki Kaisha. Position feedback system. 4,638,421, Cl. 364-167.000.

Kimura, Kikuo, to Oki Electric Industry Co., Ltd. CMOS bias voltage generating circuit. 4,638,184, Cl. 307-297.000.

Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takasi, to Nittan Co., Ltd. Environmental abnormality detecting apparatus. 4,638,304, Cl. 340-500.000.

King, George A.: *See*—
Iacobucci, Guillermo A.; King, George A.; Goldstein, Jacob H.; and Benemann, John R., 4,638,005, Cl. 544-336.000.

King, Gerald E.: *See*—
Rule, Robert D.; Skaggs, Bruce A.; and King, Gerald E., 4,637,504, Cl. 192-87.170.

King, James D., to Southwest Research Institute. Method and apparatus for measuring flow of non-homogeneous material in incompletely filled flow channels. 4,638,251, Cl. 324-306.000.

Kington, Alan D.: *See*—
Mills, David; Lindahl, Anthony T.; and Kington, Alan D., 4,637,449, Cl. 164-132.000.

Kipphan, Helmut; and Loffler, Gerhard, to Heidelberger Druckmaschinen AG. Method for colorimetrically evaluating a sheet printed on both sides thereof. 4,637,728, Cl. 356-402.000.

Kirchanski, Stefan J.: *See*—
Brown, Michael C.; and Kirchanski, Stefan J., 4,637,986, Cl. 436-10.000.

Kirchhoff, Robert A., to Dow Chemical Company, The. Arylcyclobutenyl amido alkenoic acids and salts thereof. 4,638,078, Cl. 558-414.000.

Kirchner, Albert; Schoen, Juergen; and Happ, Ortwin, to Siemens Aktiengesellschaft. Hammer brush holder assembly for a commutator motor. 4,638,204, Cl. 310-239.000.

Kirchner, Tommy L.; and Powers, Hurshal G., to United States of America, Energy. Hand-held optical fuel pin scanner. 4,637,718, Cl. 356-71.000.

Kirkpatrick, Steven J.; Zoller, Steven A.; and Woods, Daniel L., to Procter & Gamble Company, The. Process for making a reduced density roast and ground coffee. 4,637,935, Cl. 426-443.000.

Kishimoto, Keiichi; and Yoshitake, Makoto, to Toray Silicone Co., Ltd. Organopolysiloxane viscous coupler fluids. 4,637,889, Cl. 252-75.000.

Kitazume, Shunosuke: *See*—
Yoshida, Takeshi; Honda, Takayasu; Kitazume, Shunosuke; and Tanaka, Kouzou, 4,637,653, Cl. 297-334.000.

Kiuchi, Takeo: *See*—
Yasuoka, Akimasa; Iwata, Takahiro; and Kiuchi, Takeo, 4,637,362, Cl. 123-478.000.

Klancnik, Adolph V.; and Klancnik, Kenneth A., to Universal Automatic Corporation. Machine tools. 4,637,524, Cl. 221-239.000.

Klancnik, Kenneth A.: *See*—
Klancnik, Adolph V.; and Klancnik, Kenneth A., 4,637,524, Cl. 221-239.000.

Klann, Jorg: *See*—
Althaus, Hans-Ludwig; Klann, Jorg; and Kany, Wilhelm, 4,638,343, Cl. 357-17.000.

Kleefeldt, Frank; and Bartel, Peter, to Kiekert GmbH & Co Kommanditgesellschaft. Vehicular lock system with antilockout protection. 4,637,239, Cl. 70-264.000.

Kleffman, David R.; and Phiffer, Leroy V. Locomotive safety device. 4,637,668, Cl. 339-10.000.

Klein, Imrich, to Scientific Process & Research, Inc. Multiple-stage plasticating extruders. 4,637,790, Cl. 425-208.000.

Kleschick, William A.; Vinogradoff, Anna P.; and Dunbar, Joseph E., to Dow Chemical Company, The. Herbicidal sulfonamides. 4,638,075, Cl. 558-5.000.

Klimashko, Vladimir V.: *See*—
Gurkov, Konstantin S.; Kostylev, Alexandr D.; Tkachenko, Gennady A.; Leonov, Ivan P.; and Klimashko, Vladimir V., 4,637,476, Cl. 173-136.000.

Klofec, Miroslav: *See*—
Smidrkal, Jan; Simunek, Jaroslav; Tolman, Jiri; Soucek, Jiri; Novacek, Alois; Novak, Jan; Krob, Vaclav; Kovar, Pavel; Klofec, Miroslav; and Vondracek, Bohumir, 4,637,894, Cl. 252-186.400.

Klop, Elmer P., to Enterprise Brass Works, Inc. Locking lid for overfill-spillage protection system. 4,637,522, Cl. 220-322.000.

Klotz, Clayton J.: *See*—
Simonsen, Glenn H.; and Klotz, Clayton J., 4,637,676, Cl. 339-113.00R.

Knight, George L. Measuring dispenser. 4,637,529, Cl. 222-452.000.

Knowles, James. Wood beam assembly. 4,637,194, Cl. 52-690.000.

Kobayashi, Ikuya: *See*—
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Nomura, Yoshihisa; and Ohashi, Kaoru, 4,637,487, Cl. 180-197.000.

Kobayashi, Kazuo: *See*—
Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kobayashi, Kazuo; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Yoichiro; and Abe, Wataru, 4,637,884, Cl. 252-12.000.

Kobayashi, Kensuke; and Tazoh, Yasuo, to Iwatsu Electric Co., Ltd.; and Nippon Telegraph & Telephone Public Corporation. Analog signal measuring apparatus. 4,638,185, Cl. 307-352.000.

Kobler, Robert J., to AMP Incorporated. Annular connector seal. 4,637,674, Cl. 339-94.00M.

Koch, Harold O.: *See*—
Callahan, Wayne B.; Koch, Harold O.; Palin, Philip R.; and Cook, James R., 4,638,056, Cl. 536-54.000.

Koelling, Robert K., Sr., to Morgan Construction Company. Split yoke universal joint. 4,637,807, Cl. 464-135.000.

Koga, Takeri: *See*—
Tanaka, Keiji; Honryo, Hatsuo; and Koga, Takeri, 4,637,567, Cl. 242-56.00R.

Kohn, Joachim; and Langer, Robert S., to Massachusetts Institute of Technology. Non-peptide polyamino acid bioerodible polymers. 4,638,045, Cl. 530-323.000.

Kohno, Teruhisa, to Sumitomo Electric Industries, Ltd. Deceleration-balanced type brake pressure control valve assembly. 4,637,661, Cl. 303-24.00A.

Kohri, Naomichi, to Victor Company of Japan, Ltd. Tape recorder having an improved system for controlling tape travel and magnetic head movement. 4,638,385, Cl. 360-96.400.

Koide, Hideo: *See*—
Iwanaka, Masaya; and Kajiwara, Seiji, 4,637,489, Cl. 181-160.000.

Koide, Teruhiko: *See*—
Nishimura, Yuji; and Koide, Teruhiko, 4,637,630, Cl. 280-807.000.

Koike, Nobuhiko, to NEC Corporation. Router unit and routing network for determining an output port by detecting a part of an input packet. 4,638,475, Cl. 370-60.000.

Koizumi, Norihiko: *See*—
Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katoh, Yasuo, 4,638,372, Cl. 358-296.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Iwamoto, Yoshinao; Shirasaki, Yuichi; Fujise, Masayuki; and Asakawa, Kenichi, 4,637,686, Cl. 350-96.290.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Nagy, Jeno; Szendrodi, Valer; and Tari, Istvan, 4,637,315, Cl. 104-135.000.

Kokusan Kinzoku Kogyo: *See*—
Mochida, Haruo; and Namazue, Hirotoshi, 4,638,292, Cl. 340-63.000.

Kolbas, Robert M.: *See*—
Carney, James K.; and Kolbas, Robert M., 4,637,122, Cl. 29-569.00L.

Komai, Kensaku: *See*—
Matsuda, Kumehiko; and Komai, Kensaku, 4,638,435, Cl. 364-805.000.

Komatsu, Masao; and Fujita, Hiroshi, to Osaka University. Process for accelerating of amorphization of intermetallic compounds by a chemical reaction using lattice defects. 4,637,927, Cl. 423-644.000.

Komatsu, Shigeru; and Kawata, Keiji, to Hitachi, Ltd.; and Hitachi Video Engineering, Ltd. Framing code detector for a teletext receiver. 4,638,497, Cl. 375-116.000.

Komoda, Norihisa: *See*—
Katayama, Masanori; Komoda, Norihisa; Murata, Tomohiro; and Kera, Kazuo, 4,638,227, Cl. 318-565.000.

Konai, Yutaka: *See*—
Iizuka, Akira; Konai, Yutaka; Yamauchi, Takashi; and Hayashi, Shoichiro, 4,638,087, Cl. 562-467.000.

Kondo, Yoshihito: *See*—
Shibata, Masato; Eguchi, Mamoru; and Kondo, Yoshihito, 4,637,200, Cl. 53-551.000.

Konishi, Jin-emon, to Nippon Zoki Pharmaceutical Co., Ltd. Antiulcer composition containing a dipeptide compound. 4,637,996, Cl. 514-11.000.

Konishi, Satoshi; Ohno, Hideo; Naruse, Yuji; and Yoshida, Hiroshi, to Japan Atomic Energy Research Institute. Recovery method of tritium from tritiated water. 4,637,866, Cl. 204-129.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Kasahara, Seitaro; Sawaki, Akira; and Kawata, Shun, 4,637,707, Cl. 355-3.00R.
Miyamae, Hiroshi; and Banno, Makoto, 4,637,690, Cl. 350-427.000.
Shigeta, Kunio; Yamamoto, Yoko; and Takahashi, Jiro, 4,637,973, Cl. 430-122.000.
Takei, Yoshiaki; Nomori, Hiroyuki; and Matsuura, Katumi, 4,637,971, Cl. 430-59.000.

Konno, Yutaka; Kawata, Hiroitsu; Aruga, Masayoshi; Sonobe, Takashi; and Mitoni, Mitsuo, to Yamanouchi Pharmaceutical Co, Ltd. Transdermal formulation of nicardipine hydrochloride. 4,637,930, Cl. 424-28.000.

Korn, Marcel. Office fabricated, adjustable function regulator. 4,637,796, Cl. 433-7.000.

Kornbluh, Roy D.: *See*—
Andeen, Gerry B.; Shrader, Eric J.; and Kornbluh, Roy D., 4,637,736, Cl. 374-45.000.

Koshinaka, Eiichi: *See*—
Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Nishino, Hiroyuki, 4,638,009, Cl. 514-428.000.

Kosonocky, Walter F.: *See*—
Elabd, Hammam; and Kosonocky, Walter F., 4,638,345, Cl. 357-24.000.

Koster, William H.: *See*—
Slusarchyk, William A.; and Koster, William H., 4,638,061, Cl. 540-355.000.
Sundeen, Joseph E.; Koster, William H.; and Zahler, Robert, 4,638,060, Cl. 540-203.000.

Kostylev, Alexandr D.: *See*—
Gurkov, Konstantin S.; Kostylev, Alexandr D.; Tkachenko, Gennady A.; Leonov, Ivan P.; and Klimashko, Vladimir V., 4,637,476, Cl. 173-136.000.

Kotting, Fritz; and Barwasser, Gunther, to Wernicke & Co. GmbH. Spectacle lens edge grinding machine. 4,637,168, Cl. 51-50.0PC.

Koulbanis, Constantin: *See*—
Zabotto nee Arribau, Arlette; Contamin, Jean-Claude; Zaffran, Christian; and Koulbanis, Constantin, 4,637,933, Cl. 424-131.000.

Kovacs, Gabor: *See*—
Szekely, Istvan; Botar, Sandor; Dolgos nee Kekesi, Krisztina; Bertok, Bela; Gajary, Antal; Szabolcsi, Tamas; Kovacs, Gabor; and Lovasz nee Gaspar, Marianna, 4,638,002, Cl. 514-212.000.

Kovar, Pavel: *See*—
Smidrkal, Jan; Simunek, Jaroslav; Tolman, Jiri; Soucek, Jiri; Novacek, Alois; Novak, Jan; Krob, Vaclav; Kovar, Pavel; Klofec, Miroslav; and Vondracek, Bohumir, 4,637,894, Cl. 252-186.400.

Kowa Co., Ltd.: *See*—
Aoki, Nobuo; and Kurosawa, Shinichiro, 4,638,050, Cl. 530-413.000.

Koyama, Ario, to Nagase Sangyo Kabushiki Kaisha; and Kabushiki Kaisha Sensor Gijutsu Kenkyujo. Method of protecting eyes from welding rays in arc welding and apparatus therefor. 4,638,146, Cl. 219-147.000.

Koyo Jidoki Kabushiki Kaisha: *See*—
Ijiri, Waichiro; and Hirakushi, Shuzo, 4,637,484, Cl. 180-142.000.

Kozuki, Susumu; Nagasawa, Kenichi; Edakubo, Hiroo; Sato, Junichi; and Takayama, Nobutoshi, to Canon Kabushiki Kaisha. Recording apparatus. 4,638,390, Cl. 360-74.100.

Krabetz, Richard: *See*—
Broecker, Franz J.; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,638,085, Cl. 560-208.000.

Kramer, Alfred V.: *See*—
Burns, Hugh D.; Zemyan, Susan E.; Epps, Leon A.; Kramer, Alfred V.; and Dannals, Robert F., 4,638,051, Cl. 534-14.000.

Kramer, Arthur W.: *See*—
Wilhelm, John J.; Calhoun, Gregory L.; Dawson, Paul H.; and Kramer, Arthur W., 4,637,588, Cl. 251-280.000.

Kranzler, Ernst, to Robert Bosch GmbH. Hand-held tool with an electric motor and wearing shells for supporting the same. 4,638,196, Cl. 310-50.000.

Kraus, Edmund J.: *See*—
Kraus, Robert A.; and Kraus, Edmund J., 4,637,261, Cl. 73-861.020.

Kraus, Robert A.; and Kraus, Edmund J. Mass-flow sensing transducer for internal combustion engines. 4,637,261, Cl. 73-861.020.

Krehl, Hermann: *See*—
Schmid, Rene; and Krehl, Hermann, 4,637,565, Cl. 242-55.100.

Krettek, Ottmar: *See*—
Ortwein, Hermann; Krettek, Ottmar; and Nicolin, Johannes, 4,637,646, Cl. 295-37.000.

Kreutzer, Hans: *See*—
Dost, Willibald; and Kreutzer, Hans, 4,638,486, Cl. 372-107.000.

Krinsky, Barnet: *See*—
Eggert, Dennis J.; Hendrix, Charles E.; and Krinsky, Barnet, 4,638,320, Cl. 342-442.000.

Krob, Vaclav: *See*—
Smidrkal, Jan; Simunek, Jaroslav; Tolman, Jiri; Soucek, Jiri; Novacek, Alois; Novak, Jan; Krob, Vaclav; Kovar, Pavel; Klofec, Miroslav; and Vondracek, Bohumir, 4,637,894, Cl. 252-186.400.

Kronenthal, David, to E. R. Squibb & Sons, Inc. 3-acylamino-2-oxo-1-azetidinesulfonic acids. 4,638,062, Cl. 540-355.000.

Krones AG Hermann Kronseder Maschinenfabrik: *See*—
Weiss, Wilhelm, 4,637,438, Cl. 141-6.000.

Krueger, Helmut. Method and an apparatus for determining refraction of the human eye. 4,637,700, Cl. 351-211.000.

Krug, William: *See*—
Minten, Karl; and Krug, William, 4,637,987, Cl. 436-151.000.

Krull, Ulrich J.; and Thompson, Michael, to Allied Corporation. Stabilized, lipid membrane-based device and method of analysis. 4,637,861, Cl. 204-1.00T.

Kubiak, John W.: *See*—
Seeger, John W., Jr.; and Kubiak, John W., 4,637,551, Cl. 219-218.500.

Kubit, Raymond G., to Weber Marking Systems, Inc. Xerographic copying on a transparent sheet. 4,637,974, Cl. 430-126.000.

Kubodera, Seiiti; Hioki, Takanori; and Okazaki, Masaki, to Fuji Photo Film Co., Ltd. Heat-developable photographic materials. 4,637,975, Cl. 430-353.000.

Kubota, Kazufumi, to Fuji Photo Film Co., Ltd. Method of reading bar code. 4,638,170, Cl. 250-566.000.

Kubota, Ltd.: *See*—
Hasegawa, Shigekazu; and Fukui, Tetsu, 4,637,269, Cl. 74-335.000.
Tatsumi, Hiroshi, 4,638,157, Cl. 250-236.000.

Kubota, Yuichi: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, 4,637,963, Cl. 428-694.000.

Kucherer, Helmut, to Weidenhammer Packungen KG GmbH & Co. Fiber can with reinforcing crimped metal closure. 4,637,543, Cl. 229-5.600.

Kuhls, Donald E.; Campbell, Henry F.; and Studt, William L., to William H. Rorer, Inc. Bicyclic benzenoid aminoalkylene ethers and thioethers, pharmaceutical compositions and use. 4,638,001, Cl. 514-212.000.

Kuhnlein, Klaus, to BBC Brown, Boveri & Company Limited. Facility for the monitoring of physical quantities on systems. 4,637,587, Cl. 251-29.000.

Kulis, Joseph E. Artificial eye. 4,637,159, Cl. 43-42.320.

Kulman, James: *See*—
Ovshinsky, Stanford R.; Guha, Subhendu; Nath, Prem; Yang, Chi C.; Fournier, Jeffrey; and Kulman, James, 4,637,895, Cl. 252-188.310.

Kung, Patric C.; and Goldstein, Gideon, to Ortho Pharmaceutical Corporation. Hybrid cell line for producing monoclonal antibody to human cytotoxic and suppressor T cells, antibody, and methods. 4,637,983, Cl. 435-240.000.

Kunimasa, Koichi: *See*—
Okada, Jun; Kunimasa, Koichi; and Nakase, Hiroshi, 4,638,477, Cl. 370-94.000.

Kuny, Wilhelm: *See*—
Althaus, Hans-Ludwig; Klann, Jorg; and Kuny, Wilhelm, 4,638,343, Cl. 357-17.000.

Kurai, Nobuyoshi: *See*—
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, 4,637,354, Cl. 123-55.0VF.

Kuranaga, Tutomu: *See*—
Shirai, Yoshinari; and Kuranaga, Tutomu, 4,637,373, Cl. 126-140.000.

Kuraray Co., Ltd.: *See*—
Sato, Toshiaki; Yamauchi, Junnosuke; and Okaya, Takuji, 4,638,024, Cl. 524-22.000.

Kurata, Masami: *See*—
Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katoh, Yasuo, 4,638,372, Cl. 358-296.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Iizuka, Akira; Konai, Yutaka; Yamauchi, Takashi; and Hayashi, Shoichiro, 4,638,087, Cl. 562-467.000.
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,637,998, Cl. 514-42.000.

Kuroda, Kouiti: *See*—
Ueno, Susumu; Kuroda, Kouiti; Nomura, Hirokazu; and Tateno, Shigeru, 4,637,851, Cl. 156-272.600.

Kuroda, Yuuzoh, to Yamaha Hatsudoki Kabushiki Kaisha. Valve actuating mechanism for internal combustion engine. 4,637,356, Cl. 123-90.270.

Kurogi, Yukinori; Endo, Nobuhiro; and Tanno, Kohetsu, to Nippon Electric Co., Ltd. Method for manufacturing a semiconductor device. 4,637,127, Cl. 29-576.00E.

Kurokawa, Takashi: *See*—
Kamiya, Osamu; Fujiyama, Yasutomo; Ogawa, Kyosuke; and Kurokawa, Takashi, 4,637,342, Cl. 118-719.000.

Kurosawa, Shinichiro: *See*—
Aoki, Nobuo; and Kurosawa, Shinichiro, 4,638,050, Cl. 530-413.000.

Kusakabe Electric & Machinery Co., Ltd.: *See*—
Kusakabe, Mitsuo, 4,637,287, Cl. 83-319.000.

Kusakabe, Mitsuo, to Kusakabe Electric & Machinery Co., Ltd. Dimpleless tube cutting apparatus. 4,637,287, Cl. 83-319.000.

Kushida, Takeo; and Yamada, Keiichi, to Diesel Kiki Co., Ltd. Fuel injection nozzle unit for internal combustion engines. 4,637,553, Cl. 239-533.400.

Kuwabara, Hideo; and Ohta, Takao, to Matsushita Electric Works, Ltd. Delay switch. 4,638,128, Cl. 200-33.00R.

Kuwabara, Hiroshi; Ide, Jushi; Kamata, Yasuji; and Yamashita, Kenkichi, to Hitachi, Ltd. CRT picture display apparatus. 4,638,308, Cl. 340-716.000.

Kuwabara, Yoshiharu; and Hamada, Hiroyoshi, to Mitutoyo Mfg. Co., Ltd. Beam converter in optical measuring instrument. 4,637,680, Cl. 350-6.800.

Kuwamoto, Hiroshi; Nagamori, Hiroyuki; Mukai, Takashi; and Iwado, Shuichi, to Kao Corporation; and Nippon Kokan Kabushiki Kaisha. Metal-working oil composition. 4,637,885, Cl. 252-32.500.

Kuwayama, Kiyoaki: *See*—
Mishima, Yasuhiro; Makibayashi, Katsunori; and Kuwayama, Kiyoaki, 4,637,595, Cl. 267-52.000.

Kwak, Won S.; and Hurditch, Rodney J., to PPG Industries, Inc. Photochromic compound and articles containing the same. 4,637,698, Cl. 351-163.000.

Kwon, Young J.: *See*—
Stoltz, Richard A.; and Kwon, Young J., 4,637,831, Cl. 75-84.500.

Kyytsonen, Markku, to Oy Wartsila AB. Method and apparatus for conducting the end of a web. 4,637,566, Cl. 242-56.00R.

L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques: *See*—
Bernard, Daniel, 4,637,106, Cl. 29-25.420.

La Telemecanique Electrique: *See*—
Belbel, Elie; Caudron, Robert; Fechant, Louis; Haury, Andre ; Lauraire, Michel; Muniesa, Jacques; and Siffroi, Lucien, 4,638,275, Cl. 335-151.000.
Brisson, Alain; and Clement, Jean R., 4,638,279, Cl. 335-257.000.
Fauvet, Jean-Pierre; and Parisei, Jacques, 4,638,419, Cl. 363-87.000.

La Bate, Michael D., II; and Perri, Joseph A., to Insul Company, Inc. Elevated swinging device for placing slag retention devices in tapping converters. 4,637,592, Cl. 266-272.000.

Labouliere, Elzear R.: *See*—
de Vos, Hendrik A. J.; and Labouliere, Elzear R., 4,638,414, Cl. 362-370.000.

Labthermics Technologies, Inc.: *See*—
Badger, Christopher W.; Burdette, Everette C.; Leech, Steven C.; and McCarthy, John F., 4,638,436, Cl. 364-414.000.

Lachman, Irwin M.: *See*—
DeAngelis, Thomas P.; and Lachman, Irwin M., 4,637,995, Cl. 502-439.000.

LaDonna, Richard V.: *See*—
Drake, Donald J.; Hawkins, William G.; Markham, Roger G.; and LaDonna, Richard V., 4,638,328, Cl. 346-75.000.

Lambelin, Georges E.; Roncucci, Romeo R.; Roba, Joseph; and Gillet, Claude L., to Continental Pharma. Heterocyclic amino-alcohol derivatives. 4,638,070, Cl. 549-23.000.

Lamberty, Bernard J., to Boeing Company, The. Multiple feed antenna. 4,638,322, Cl. 343-761.000.

Lamico, Inc.: *See*—
Urban, Ted F., 4,637,414, Cl. 135-73.000.

Lamie, Billy J.: *See*—
Gilliam, Edward C.; Jackson, John M.; and Lamie, Billy J., 4,637,260, Cl. 73-826.000.

Lamuaga, Gary R., to Toro Company, The. Lawn mower grass collector bag support. 4,637,202, Cl. 56-16.600.

Lane, George A.; and Rossow, Harold E., to Dow Chemical Company, The. Reversible phase change composition for storing energy. 4,637,888, Cl. 252-70.000.

Lange, Fredric A., to Interlock Structures International, Inc. Connecting apparatus. 4,637,193, Cl. 52-648.000.

Langer, Robert S.: *See*—
Kohn, Joachim; and Langer, Robert S., 4,638,045, Cl. 530-323.000.

Laragione, Robert; Larcott, Steven M.; Bowe, Woodford A.; and Levy, Eugene J., to Chemical Data Systems, Inc. Microprocessor-controlled back-pressure system for small volume chemical analysis applications. 4,638,444, Cl. 364-510.000.

Lari, Ferdinando: *See*—
Siligoni, Marco; Lari, Ferdinando; Saviotti, Vanni; and Comino, Vittorio, 4,638,122, Cl. 379-124.000.

Larkin, William J. Integrated solar heating unit. 4,637,375, Cl. 126-434.000.

Laroche, Robert N.: *See*—
Worrell, Williams R.; Laroche, Robert N.; and Armstrong, Michael J., 4,637,666, Cl. 312-196.000.

LaRosa, John: *See*—
Karas, Richard J.; and LaRosa, John, 4,637,117, Cl. 29-527.400.

Larson, Wayne K.; and Hedrick, Steven T., to Minnesota Mining and Manufacturing Company. Hydrophilic polyurethane/polyurea sponge. 4,638,017, Cl. 521-157.000.

Latta, William A., Jr., to Automated Industrial Systems. Indexing laser marker. 4,638,144, Cl. 219-121.0LH.

Laubach, Donald R. Bull elk calling device. 4,637,154, Cl. 43-1.000.

Lauraire, Michel: *See*—
Belbel, Elie; Caudron, Robert; Fechant, Louis; Haury, Andre ; Lauraire, Michel; Muniesa, Jacques; and Siffroi, Lucien, 4,638,275, Cl. 335-151.000.

Laure, Christian: *See*—
Leseure, Jean-Yves; Pierre, Charbonnel; and Laure, Christian, 4,638,167, Cl. 250-551.000.

Lauri, Vaino G.: *See*—
Teder, Leonid O.; Org, Tiit A.; Lauri, Vaino G.; and Aas, Ants J., 4,637,102, Cl. 24-642.000.

Laurie, Donald H.: *See*—
White, Dowell; Craig, Daniel L.; Duke, Jack L.; and Laurie, Donald H., 4,637,211, Cl. 60-650.000.

Laux, Steven E.: *See*—
Freeouf, John L.; Jackson, Thomas N.; Laux, Steven E.; and Woodall, Jerry M., 4,638,342, Cl. 357-15.000.

Leach, John G.: *See*—
Frind, Gerhard; Carroll, James J.; Van Noy, John H.; Leach, John G.; and Ranjan, Radha K., 4,638,283, Cl. 337-162.000.

Leahy, Ronald S.: *See*—
Bishop, F. Avery; and Leahy, Ronald S., 4,638,493, Cl. 375-1.000.

Leake, William W.: *See*—
Boler, Clifford H.; Leake, William W.; Rai, Surinder S.; and Zemske, Gene B., 4,638,187, Cl. 307-451.000.

Le Corre, Loic; and Rolland, Albert L., to Precision Mecanique Labinal. High speed permanent magnet rotor. 4,638,200, Cl. 310-156.000.

Lectron Products, Inc.: *See*—
Miller, Ellsworth S., 4,638,132, Cl. 200-81.00R.

Lee, Henry; deNeufville, John P.; and Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Methods of using selective optical excitation in deposition processes and the detection of new compositions. 4,637,938, Cl. 427-53.100.

Lee, Patrick S., to Ampex Corporation. Bang-bang controlled velocity command generator. 4,638,230, Cl. 318-632.000.

Lee, Soong H.: *See*—
Dawson, Dale E.; Conti, Anthony L.; Lee, Soong H.; Shade, Gary F.; and Dickens, Lawrence E., 4,638,269, Cl. 333-164.000.

Leech, Steven C.: *See*—
Badger, Christopher W.; Burdette, Everette C.; Leech, Steven C.; and McCarthy, John F., 4,638,436, Cl. 364-414.000.

Le Floch, Gerard, to U.S. Philips Corporation. Method of and circuit for digitally demodulating an amplitude-modulated signal produced by suppressed-carrier amplitude modulation of two carriers of the same frequencies in a phase-quadrature relationship. 4,638,349, Cl. 358-21.000.

Leiboff, Arnold. Method and apparatus for intestinal irrigation. 4,637,814, Cl. 604-27.000.

Leising, Lawrence J., to Schlumberger Technology Corporation. Methods and apparatus for controlled directional drilling of boreholes. 4,637,479, Cl. 175-26.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Kim, Byoung Y., 4,637,722, Cl. 356-350.000.

Lemole, Gerald M. Irrigational hemostatic solution. 4,637,815, Cl. 604-28.000.

Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katoh, Yasuo, to Fuji Xerox Co., Ltd. Color copier. 4,638,372, Cl. 358-296.000.

Lenzing Aktiengesellschaft: *See*—
Marini, Ingo G.; and Sustmann, Scarlet, 4,637,820, Cl. 8-129.000.

Leonard, Willie B. Tractor and towed implement with elevation control system for implement including pressure responsive valve actuator. 4,637,474, Cl. 172-7.000.

Leonov, Ivan P.: *See*—
Gurkov, Konstantin S.; Kostylev, Alexandr D.; Tkachenko, Gennady A.; Leonov, Ivan P.; and Klimashko, Vladimir V., 4,637,476, Cl. 173-136.000.

Leppek, William W., to Mead Corporation, The. Antitheft bicycle handlebar bag. 4,637,534, Cl. 224-36.000.

LeRoueille, Jocelyne: *See*—
Cazcarra, Victor; and LeRoueille, Jocelyne, 4,637,123, Cl. 29-569.00R.

Leseure, Jean-Yves; Pierre, Charbonnel; and Laure, Christian, to Leseure, Jean-Yves; and Etablissement Public de Diffusion Dit "Telediffusion de France" . Insulator circuit with an optoelectronic coupler. 4,638,167, Cl. 250-551.000.

Levasseur, Joseph L., to Coin Acceptors, Inc. Stamp scanning and dispensing means and method. 4,637,523, Cl. 221-13.000.

Lever Brothers Company: *See*—
Delwel, Francois; and Claassens, Marinus L. M., 4,637,891, Cl. 252-135.000.

Levine, Jules D.: *See*—
Witter, David E.; and Levine, Jules D., 4,637,855, Cl. 156-616.00R.

Levine, Morris M., to Sweet Victory, Inc. Mixing apparatus and method. 4,637,221, Cl. 62-342.000.

Levine, Richard A. Double-blind labels. 4,637,635, Cl. 283-101.000.

Levinson, Lionel M., to General Electric Corp. Tubular varistor arrangement. 4,638,284, Cl. 338-21.000.

Levis, William W., Jr.: *See*—
Reichel, Curtis J.; Levis, William W., Jr.; and Hartman, Robert J., 4,637,893, Cl. 252-182.000.

Leviton Manufacturing Company, Inc.: *See*—
Johnson, George E.; and Newman, Walter, 4,637,671, Cl. 339-50.00R.

Levy, Eugene J.: *See*—
Laragione, Robert; Lurcott, Steven M.; Bowe, Woodford A.; and Levy, Eugene J., 4,638,444, Cl. 364-510.000.

Lewis, Dean M.: *See*—
Benson, Terrance G.; and Lewis, Dean M., 4,637,204, Cl. 56-249.000.

Lewis, Richard J., to Allied Corporation. Structural core pivot. 4,637,596, Cl. 267-160.000.

Lewis, Robert M.; and Van Santen, Rutger A., to Shell Oil Company. Intercalated clay compositions. 4,637,992, Cl. 502-84.000.

Lewis, Royce C.: *See*—
Racz, Gabor B.; and Lewis, Royce C., 4,637,394, Cl. 128-327.000.

Leyland Vehicles Limited: *See*—
Stone, Richard H., 4,637,627, Cl. 280-686.000.

Li, George S.; Wu, Muyen M.; and De Witt, Elmer J., to Standard Oil Company, The. Copolymers containing indene. 4,638,042, Cl. 526-280.000.

Licentia Patent-Verwaltungs-GmbH: *See*—
Barth, Rudiger, 4,638,389, Cl. 360-72.100.
Hoipp, Wolfgang, 4,638,267, Cl. 333-1.100.
Zottnik, Edmund, 4,638,289, Cl. 340-52.00H.

Liebmann, Vern L.: *See*—
Reed, Charles C.; Cooley, Denton A.; Crane, Terry N.; Swanson, Edward A.; Oscarson, Rolf A.; Liebmann, Vern L.; and Cox, Dan L., 4,637,917, Cl. 422-46.000.

Liere, Horst: *See*—
Brennecke, Hermann; Liere, Horst; and Kiesel, Michael, 4,638,398, Cl. 361-214.000.

Lightstone, Alexander W., to RCA, Inc. Method for making an avalanche photodiode. 4,637,126, Cl. 29-572.000.

Ligon, Robert C.: *See*—
Chou, David T.; and Ligon, Robert C., 4,638,088, Cl. 564-23.000.

Lim, Basilio Y.; and Marsh, Richard N. Multi-section capacitor electrically coupled in parallel. 4,638,402, Cl. 361-328.000.

Lin, Ta C. Bi-section adjustable connector bridging an opened handrail. 4,637,589, Cl. 256-59.000.

Lin, Ted T. Multiple-pole stepping motor. 4,638,195, Cl. 310-49.00R.

Lindahl, Anthony T.: *See*—
Mills, David; Lindahl, Anthony T.; and Kington, Alan D., 4,637,449, Cl. 164-132.000.

Lindsey, Kelly D.: *See*—
Holan, Robert J.; and Lindsey, Kelly D., 4,637,276, Cl. 74-713.000.

Lindstrom, Merlin R.; and Mark, Harold W., to Phillips Petroleum Co. Inhibiting corrosion: benzylsulfinylacetic acid or benzylsulfonylacetic acid. 4,637,833, Cl. 106-14.130.

Ling, Hung C.; Rhodes, Warren W.; and Yan, Man F., to AT&T Technologies, Inc.; and Bell Telephone Laboratories. Method of preparing a ceramic composition. 4,637,989, Cl. 501-135.000.

Ling, Hung C.; and Yan, Man F., to AT&T Technologies, Inc.; and Bell Telephone Laboratories, Inc. Ceramic compositions and devices. 4,638,401, Cl. 361-321.000.

Linkies, Adolf: *See*—
Clauss, Karl; Linkies, Adolf; and Reuschling, Dieter, 4,638,063, Cl. 544-2.000.

Linman, E. Kelly: *See*—
Ouellette, William R.; Alcombright, Daniel S.; Carro, John J.; and Linman, E. Kelly, 4,637,819, Cl. 604-369.000.

Linstad, Gregory A.: *See*—
Jones, Paul W.; Merry, Rodney J.; and Linstad, Gregory A., 4,637,749, Cl. 403-322.000.

Lion Corporation: *See*—
Owa, Yutaka; Tanaka, Yoshiro; Saito, Takeshi; and Takeda, Yoshiro, 4,637,759, Cl. 405-270.000.

Lippert, Axel: *See*—
Brockmann, Rolf; Casper, Clemens; Damsky, Walter; Lippert, Axel; and Sajben, Johannes O., 4,637,857, Cl. 159-47.100.

Little, Damon P.: *See*—
McGlothen, Jody R.; and Little, Damon P., 4,637,460, Cl. 166-189.000.

Little, Douglas J., to Dow Chemical Company, The. Recrystallization of bisphenol A by azeotropically drying the solvent. 4,638,102, Cl. 568-724.000.

Litton Systems, Inc.: *See*—
Martin, Graham J., 4,637,255, Cl. 73-517.00R.

Liu, Ping Y.: *See*—
Boutni, Omar M.; and Liu, Ping Y., 4,638,033, Cl. 525-67.000.

Lizotte, Edgar G.: *See*—
Witkoski, Edward J.; and Lizotte, Edgar G., 4,637,237, Cl. 70-285.000.

Llewellyn, Michael; and Holden, Stephen, to Safety-Kleen Corporation. Degreasing apparatus. 4,637,413, Cl. 134-111.000.

Lobell, Hans; Svensson, Klas G.; Gladh, Goran; and Hoglander, Bjorn, to Affarsverket FFV. Arrangement for a submarine vehicle. 4,637,213, Cl. 60-685.000.

Lockheed Corporation: *See*—
Lopez, Edward L., 4,637,383, Cl. 128-201.250.
Peterson, Paul F., 4,637,292, Cl. 89-1.804.

Lockheed Missiles & Space Company, Inc.: *See*—
Stefanov, Michael E.; Sullivan, Brian J.; and Tickner, Anthony J., 4,637,725, Cl. 356-354.000.

Loeffelholz, Frido: *See*—
Worschech, Kurt; Loeffelholz, Frido; Wedl, Peter; and Wegemund, Bernd, 4,637,887, Cl. 252-56.00R.

Loffler, Gerhard: *See*—
Kipphan, Helmut; and Loffler, Gerhard, 4,637,728, Cl. 356-402.000.

Lofquist, Alden A., Jr. Metering pump with diaphragm. 4,637,784, Cl. 417-320.000.

Logan, David J., to Metromedia, Inc. Method and apparatus for improving gray scale resolution in an ink jet printing system. 4,638,373, Cl. 358-298.000.

Logan, Joseph S.: *See*—
Bumble, Bruce; Cuomo, Jerome J.; Logan, Joseph S.; and Rossnagel, Steven M., 4,637,853, Cl. 156-345.000.

Lombardo, Frank; Jernigan, Edward L.; and Furze, Paul, to Dixon Industries Corporation. Apparatus and process for etching fluoroplastics. 4,637,856, Cl. 156-637.000.

Long, Delmar D., to Dayco Corporation. Elastomer-coated bias reinforcement fabric and method for producing same. 4,637,940, Cl. 427-176.000.

Long, Dennis L. Modular unit adapted for office use. 4,637,177, Cl. 52-36.000.

Loop, Floyd D. Pillow or support member for surgical use. 4,637,377, Cl. 128-1.00R.

Loose, Winfield W., to AMP Incorporated. Insulation displacing barrel terminal. 4,637,675, Cl. 339-97.00R.

Lopez, Edward L., to Lockheed Corporation. Toxic environmental breathing hood. 4,637,383, Cl. 128-201.250.

L'Oreal: *See*—
Gassmann, Max, 4,638,171, Cl. 250-566.000.
Monnais, Christian; and Cotteret, Jean, 4,637,821, Cl. 8-415.000.
Zabotto nee Arribau, Arlette; Contamin, Jean-Claude; Zaffran, Christian; and Koulbanis, Constantin, 4,637,933, Cl. 424-131.000.

Lorentz, Donald G.: *See*—
Draper, Robert; Lorentz, Donald G.; Baum, Allen J.; and Economy, George, 4,637,346, Cl. 122-4.00A.

Los, Marinus, to American Cyanamid Company. 2-(2-imidazolin-2-yl)-pyridines and quinolines, process and intermediates for the preparation thereof, and use of said compounds as herbicidal agents. 4,638,068, Cl. 546-169.000.

Lott, Donald L., to Siemens Energy & Automation, Inc. Surge suppressing resistor for a disconnect switch. 4,638,285, Cl. 338-21.000.

Lovasz nee Gaspar, Marianna: *See*—
Szekely, Istvan; Botar, Sandor; Dolgos nee Kekesi, Krisztina; Bertok, Bela; Gajary, Antal; Szabolcsi, Tamas; Kovacs, Gabor; and Lovasz nee Gaspar, Marianna, 4,638,002, Cl. 514-212.000.

Love, Mialan V.: *See*—
Love, Samuel D.; and Love, Mialan V., 4,637,151, Cl. 40-584.000.

Love, Samuel D.; and Love, Mialan V. Combination stadium cushion and peasant. 4,637,151, Cl. 40-584.000.

Lowes, Albert R., to Mydax, Inc. Wide range temperature control system for fluids. 4,637,454, Cl. 165-36.000.

LTV Aerospace and Defense Company: *See*—
Murray, William J.; and Earle, George A., III, 4,637,761, Cl. 408-16.000.

Lu, Song-Chin S.: *See*—
Kidd, Richard L.; Graf, Jerry A.; Engler, Philip J.; and Lu, Song-Chin S., 4,638,131, Cl. 200-61.550.

Lubricating Systems Company of Texas, Inc.: *See*—
Ehlert, Charles W., 4,637,493, Cl. 184-55.100.

Luca, David J.: *See*—
Smith, Thomas W.; Ward, Anthony T.; Luca, David J.; and Johnson, Gordon E., 4,638,335, Cl. 346-135.100.

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Hillen, Klaus, 4,637,497, Cl. 188-71.400.
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Lucca, Eusebio, to Matec Holding. Process for producing double-layered structures. 4,637,909, Cl. 264-510.000.

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Auweter, Helmut; Horn, Dieter; and Lueddecke, Erik, 4,637,716, Cl. 356-28.500.

Lui, Joseph H.; and Shreve, David S., to Goodyear Tire & Rubber Company. Rubber polymerases and methods for their production and use. 4,638,028, Cl. 524-387.000.

Luk Lamellen und Kupplungsbau GmbH: *See*—
Huber, Lothar, 4,637,505, Cl. 192-88.00A.

Luke, John A., to Brown & Williamson Tobacco Corporation. Cigarettes. 4,637,410, Cl. 131-361.000.

Lumb, Anthony P.: *See*—
Niblock, John A.; Patel, Jayant; Fisher, Dennis; and Lumb, Anthony P., 4,638,432, Cl. 364-200.000.

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Lundsgaard, Jorgen S. Solid state electrochemical device. 4,638,407, Cl. 361-433.000.

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Laragione, Robert; Lurcott, Steven M.; Bowe, Woodford A.; and Levy, Eugene J., 4,638,444, Cl. 364-510.000.

Lurssen, Klaus: *See*—
Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Schmidt, Robert R.; Santel, Hans-Joachim; Hanssler, Gerd; and Lurssen, Klaus, 4,638,004, Cl. 514-272.000.

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Gellermann, Werner; Yang, Yihong; and Luty, Fritz, 4,638,485, Cl. 372-42.000.

Lutze, Theodor: *See*—
Caspar, Wolfhard; Lutze, Theodor; and Kienzle, Karl-Ernst, 4,637,395, Cl. 128-334.00R.

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Ney, Robert, 4,638,117, Cl. 174-117.00F.

Lyon, Ronald J. Fill control valve. 4,637,426, Cl. 137-433.000.

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Howell, Richard H.; and MacGovern, Alan J., 4,637,724, Cl. 356-351.000.

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MacPhee, Colin A. A.; and Yoon, Ohjhong, to Federal Pioneer Limited. Detection of ground faults in ungrounded DC power supply systems. 4,638,245, Cl. 324-51.000.

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Mahlein, Hans F.; Reichelt, Achim; and Winzer, Gerhard, to Siemens Aktiengesellschaft. Branch connector for light waveguides. 4,637,682, Cl. 350-96.150.

Maiden-Nesset, Mary L. Child's doll useful for teaching counting, color identification, and for promoting manual dexterity. 4,637,798, Cl. 434-191.000.

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Maincent, Gabriel: *See*—
Rosier, Jean-Claude; Fouche, Claude; and Maincent, Gabriel, 4,638,370, Cl. 358-293.000.

Mainemer, Carlos I.: *See*—
Wang, An; Ho, Shu-Kuang; and Mainemer, Carlos I., 4,638,118, Cl. 178-18.000.

Mainstay, Inc.: *See*—
Peterson, Luetta M., 4,637,344, Cl. 119-52.00R.

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Makibayashi, Katsunori: *See*—
Mishima, Yasuhiro; Makibayashi, Katsunori; and Kuwayama, Kiyoaki, 4,637,595, Cl. 267-52.000.

Makida, Kazuhisa: *See*—
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Makimoto, Mitsuo: *See*—
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Makino, Teruyoshi: *See*—
Ono, Minoru; and Makino, Teruyoshi, 4,637,703, Cl. 354-276.000.

Malkki, Yrjo : *See*—
Pellinen, Markku; Malkki, Yrjo ; and Niskanen, Aimo, 4,637,163, Cl. 47-1.100.

Mallinckrodt, Inc.: *See*—
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Mance, Andrew M.: *See*—
Easley, Gary L.; Mance, Andrew M.; and Meyer, Martin S., 4,637,862, Cl. 204-15.000.

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Holland, Frank S., 4,638,074, Cl. 556-98.000.

Mann, Derek, to Dobson Park Industries, PLC. Apparatus for the oral administration of capsules to animals. 4,637,816, Cl. 604-62.000.

Manning, James H.; and Sorenson, Wayne P., to James River Corporation. Scrim reinforced, flat cloth-like composite laminate and a method of making. 4,637,949, Cl. 428-110.000.

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Hennebert, Pierre; Gillard, Jean; and Roland, Michel, 4,637,916, Cl. 422-16.000.

Manufacture de Rougement: *See*—
de Roure, Olivier P. R., 4,637,516, Cl. 206-471.000.

Manville Sales Corporation: *See*—
Gill, Frederick A.; and Tocci, Mario P., 4,637,951, Cl. 428-215.000.
Wilson, Jerry F.; and Schuster, Richard L., 4,637,515, Cl. 206-434.000.

Mar-Chaim, Yechiam: *See*—
Gran, Paul; Feiner, Haim; Ben-Dayan, Nissim; Stefaniu, Marian; and Mar-Chaim, Yechiam, 4,638,453, Cl. 364-900.000.

Maraven, S.A.: *See*—
Hernandez, Gabriel D., 4,637,458, Cl. 166-68.000.

Marchand, Gilles: *See*—
Jeffrey, Paul W.; and Marchand, Gilles, 4,637,842, Cl. 148-12.70A.

Marcus, Edward N. For characterizing a heart condition. 4,637,400, Cl. 128-653.000.

Marcus, Mitchell S.: *See*—
Arnold, Marc E.; and Marcus, Mitchell S., 4,637,712, Cl. 355-75.000.

Marguth, Val M.: *See*—
Gray, Robert R.; and Marguth, Val M., 4,637,794, Cl. 432-58.000.

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Marini, Ingo G.; and Sustmann, Scarlet, to Lenzing Aktiengesellschaft. Copper-modified carboxyalkyl-cellulose fiber. 4,637,820, Cl. 8-129.000.

Marino, Dean F.; Ryan, William E.; and Kamp, Arthur J., to Dow Chemical Company, The. Apparatus for measurement of hollow fiber dimensions. 4,638,168, Cl. 250-560.000.

Mark, Harold W.: *See*—
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Mark, Victor; and Hedges, Charles V., to General Electric Company. Polycarbonate exhibiting improved heat resistance from cycloalkylidene diphenol. 4,638,027, Cl. 524-157.000.

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Von Gentzkow, Wolfgang; Markert, Helmut; Hauschildt, Hans; and Schmiedel, Manfred, 4,638,019, Cl. 522-104.000.

Markham, Roger G.: *See*—
Drake, Donald J.; Hawkins, William G.; Markham, Roger G.; and LaDonna, Richard V., 4,638,328, Cl. 346-75.000.
Torpey, Peter A.; and Markham, Roger G., 4,638,337, Cl. 346-140.00R.

Markstein, George H.: *See*—
de Ris, John; and Markstein, George H., 4,637,735, Cl. 374-8.000.

Marlen Research Corporation: *See*—
White, James E.; Alley, Lewis F.; Anderson, James E.; and Birdsell, Jackie D., 4,637,936, Cl. 426-523.000.

Maroney, Ralf P.; Fishkind, Gregory A.; and Schneider, Frederick, to Plug-In Storage Systems, Inc. Wrist strap ground monitor. 4,638,399, Cl. 361-220.000.

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Crane, Michael P.; and Marsh, David J., 4,638,481, Cl. 371-27.000.

Marsh, Richard N.: *See*—
Lim, Basilio Y.; and Marsh, Richard N., 4,638,402, Cl. 361-328.000.

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Nevalainen, Kyosti; and Martikainen, Kaarlo, 4,637,240, Cl. 70-366.000.

Martin, Daniel B., to International Business Machines Corporation. Performance evaluation for an asymmetric multiprocessor system. 4,638,427, Cl. 364-200.000.

Martin, Graham J., to Litton Systems, Inc. Non-planar ring laser accelerometer. 4,637,255, Cl. 73-517.00R.

Martin, Henry A.: *See*—
Bedaracco, John A.; and Martin, Henry A., 4,637,088, Cl. 15-97.00B.

Martin, Hubert C., Jr.; Hitler, Gene D.; and Parsley, David W., to Sperry Corporation. Power density spectrum controller. 4,638,417, Cl. 363-41.000.

Martin, James A.: *See*—
Hartmann, Wilhelm U.; and Martin, James A., 4,637,877, Cl. 210-347.000.

Martinelli, Robert M., to Mullett Associates, Inc. Uninterruptible power supply. 4,638,176, Cl. 307-64.000.

Martinez, Armando. Device for storing dental floss and for forming three separately-usable strips of floss for use with tensioning means. 4,637,412, Cl. 132-92.00R.

Maruno, Tooru; Nakamura, Kouzaburou; and Sasaki, Shigekuni, to Nippon Telegraph & Telephone Public Corporation. Optical adhesive composition. 4,637,939, Cl. 427-162.000.

Maruska, Gerald F. Method and apparatus for peeling sausage. 4,637,095, Cl. 17-49.000.

Massachusetts Institute of Technology: *See*—
Bernard, John A., Jr., 4,637,911, Cl. 376-217.000.
Kohn, Joachim; and Langer, Robert S., 4,638,045, Cl. 530-323.000.
Schweickert, Robert K., 4,638,248, Cl. 324-76.00R.

Masterson, Daniel M.: *See*—
Owen, Lawrence B.; Masterson, Daniel M.; and Green, Sidney J., 4,637,217, Cl. 62-74.000.

Masuda, Eiji; and Sakamoto, Shigemi, to Tokyo Shibaura Denki Kabushiki Kaisha. Digital-analog converter. 4,638,303, Cl. 340-347.0DA.

Masuda, Shunichi: *See*—
Shimizu, Katsuichi; Masuda, Shunichi; Yagasaki, Toshiaki; and Sakamaki, Hisashi, 4,638,368, Cl. 358-256.000.

Masuda, Toyohiko: *See*—
Horibe, Youshun; Obshima, Yoshikuni; and Masuda, Toyohiko, 4,637,350, Cl. 122-441.000.

Masuho, Yasuhiko; Hara, Takeshi; and Noguchi, Teruhisa, to Teijin Limited. Antitumor protein hybrid and process for the preparation thereof. 4,638,049, Cl. 530-388.000.

Masui, Takeshi; and Sano, Morio, to Denki Kagaku Kogyo Kabushiki Kaisha. Anti-static jacket for floppy disk. 4,637,945, Cl. 428-35.000.

Matec Holding: *See*—
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Matheny, Rodney C.: *See*—
Turcott, James L.; and Matheny, Rodney C., 4,637,539, Cl. 227-156.000.

Mathews, Jimmie C., Sr. Riveting apparatus. 4,637,114, Cl. 29-243.540.

Mathonnet, Jean-Marc: *See*—
Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, 4,638,216, Cl. 315-111.810.

Matoba, Yoshiaki; and Ozawa, Hitoshi, to Daikin Industries, Ltd. Scroll type fluid apparatus with lubrication of rotation preventing mechanism and thrust bearing. 4,637,786, Cl. 418-55.000.

Matovich, Edwin; and Spannuth, Robert J., to Crown Zellerbach Corporation. Pyrolysis of black liquor at high temperatures using radiant energy. 4,637,858, Cl. 162-30.100.

Matsubayashi, Kaneo, to Toyo Suisan Kikai Co. Ltd.; and Taiyo Fishery Co. Ltd. Apparatus for collecting flesh of fish. 4,637,094, Cl. 17-1.00G.

Matsuda, Kumehiko; and Komai, Kensaku, to Sharp Kabushiki Kaisha. Electric cash register having direct price look-up function. 4,638,435, Cl. 364-405.000.

Matsuda, Toshiro, to Nissan Motor Company, Limited. Anti-skid brake control system performing skid control with both open and close feedback techniques. 4,637,663, Cl. 303-106.000.

Matsuda, Toyoshi: *See*—
Yanagiuchi, Noboru; Adachi, Shigeo; Inoue, Masatoshi; Takata, Hiroshi; and Matsuda, Toyoshi, 4,637,270, Cl. 74-336.500.

Matsuda, Yasumasa: *See*—
Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, 4,638,326, Cl. 346-75.000.

Matsuhisa, Yohji: *See*—
Hiramatsu, Tohru; Matsuhisa, Yohji; and Higuchi, Tomitake, 4,637,925, Cl. 423-447.400.

Matsumoto, Kazuya: *See*—
Tomita, Yasuo; Ogura, Shigetaro; and Matsumoto, Kazuya, 4,637,684, Cl. 350-96.190.

Matsumoto, Satoshi: *See*—
Asari, Akira; Matsumoto, Satoshi; Hattori, Shigeo; and Dosai, Takayoshi, 4,637,112, Cl. 29-159.010.

Matsumoto, Tetsuro, to Hitachi, Ltd. Semiconductor memory device. 4,638,460, Cl. 365-149.000.

Matsumoto, Tsutomu: *See*—
Eto, Kunihiko; Iwashita, Shigeo; and Matsumoto, Tsutomu, 4,637,483, Cl. 180-142.000.

Matsumura, Yasushi: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; and Hattori, Ryuichi, 4,637,145, Cl. 34-1.000.

Matsunaga, Kenichi: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,637,998, Cl. 514-42.000.

Matsuno, Tatsuji, to Toyo Communication Equipment Co., Ltd. Method and device for measuring insulation deterioration of electric line. 4,638,242, Cl. 324-51.000.

Matsuo, Kuniyuki: *See*—
Tomita, Tomoya; Hiramoto, Sotozi; Okubo, Takesi; Matsuo, Kuniyuki; Ashihara, Hiromoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, 4,637,134, Cl. 29-741.000.

Matsushima, Seiya: *See*—
Uda, Youichi; Matsushima, Seiya; Saito, Kazuhiko; Yamamoto, Shoji; and Murakami, Kazuhiro, 4,637,238, Cl. 70-456.00R.

Matsushita Electric Industrial Co., Ltd.: *See*—
Hayashi, Seizo; Okano, Kenji; and Hayashi, Nobuhiro, 4,637,092, Cl. 15-319.000.
Kazumi, Hirai, 4,638,137, Cl. 219-10.55B.
Maki, Yohji; and Umezawa, Norio, 4,638,203, Cl. 310-239.000.
Nozoe, Toshiro; and Yamashita, Akira, 4,638,358, Cl. 358-147.000.
Oshima, Mitsuaki; and Yamaguchi, Kazufumi, 4,638,362, Cl. 358-213.000.
Sagawa, Morikazu; Mori, Yoshikazu; Ohba, Motoi; Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,638,180, Cl. 307-219.100.
Sugiyama, Yoshiyuki; Aoki, Shinichiro; and Morita, Yasuyuki, 4,637,256, Cl. 73-633.000.

Matsushita Electric Works, Ltd.: *See*—
Kuwabara, Hideo; and Ohta, Takao, 4,638,128, Cl. 200-33.00R.

Matsushita Electronics Corporation: *See*—
Fujii, Hiroyuki; Tateno, Kenichi; and Nishikawa, Mikio, 4,637,130, Cl. 29-588.000.

Mattaboni, Paul J. Autonomous mobile robot. 4,638,445, Cl. 364-513.000.

Mattel, Inc.: *See*—
Hegel, James D.; and Johnson, Devin W., 4,637,907, Cl. 264-45.700.

Mattes, Bernhard; Oswald, Klaus; and Suchowerskyj, Wadym, to Robert Bosch GmbH. Extended response trigger circuit. 4,638,179, Cl. 307-10.05B.

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Takei, Yoshiaki; Nomori, Hiroyuki; and Matuura, Katumi, 4,637,971, Cl. 430-59.000.

Maurer, Robert; and Epstein, Peter C. Meter provers. 4,637,244, Cl. 73-3.000.

Max Baermann, G.m.b.H.: *See*—
Baermann, Horst, 4,638,281, Cl. 335-303.000.

Mayr, Fritz; and Dasser, Manfred, to Christian Mayr GmbH & Co. KG. Overload release mechanism for torque couplings. 4,637,502, Cl. 192-56.00R.

Mazda Motor Corporation: *See*—
Okino, Kiyomi; and Muramoto, Takumi, 4,637,648, Cl. 296-63.000.

Mazzorana, Alfred B., to Societe de Paris et du Rhone. Engagement control of the starter pinion for internal combustion engine starter. 4,637,267, Cl. 74-7.00A.

McAdams, Hugh P., to Texas Instruments Incorporated. High-level CMOS driver circuit. 4,638,182, Cl. 307-270.000.

McArthur, James. Drive unit for exercising apparatus. 4,637,607, Cl. 272-132.000.

McCallum, R. William: *See*—
Keem, John E.; Bergeron, Richard C.; Custer, Russell C.; and McCallum, R. William, 4,637,967, Cl. 429-101.000.

McCandless, Harry E., to RCA Corporation. Method of constructing an electron gun having an improved transition member and product thereof. 4,637,804, Cl. 445-36.000.

McCarthy, John F.: *See*—
Badger, Christopher W.; Burdette, Everette C.; Leech, Steven C.; and McCarthy, John F., 4,638,436, Cl. 364-414.000.

McCarver, Byron M.: *See*—
Sansing, James E.; and McCarver, Byron M., 4,637,921, Cl. 423-315.000.

McClain, Dorothee M., to National Distillers and Chemical Corporation. Preparation of ethylene-acrylic acid copolymer or salt thereof. 4,638,034, Cl. 525-369.000.

McClung, Charles S.: *See*—
Rainer, Norman B.; and McClung, Charles S., 4,637,408, Cl. 131-331.000.

McCoy, James N. Echo ranging gun. 4,637,463, Cl. 166-250.000.

McDonald, Donald G., to United States of America, Commerce. Amplification by a phase locked array of Josephson junctions. 4,638,257, Cl. 330-61.00R.

McFarlin, Terry. Integral lightweight tent and box for portable applications. 4,637,416, Cl. 135-109.000.

McGinlay, James G.; and Urguhart, Roderick M. Micro hard-disk drive system. 4,638,383, Cl. 360-77.000.

McGinley, John: *See*—
McMahon, J. Philip; Spoel, Han; and McGinley, John, 4,637,591, Cl. 266-165.000.

McGinn, Michael: *See*—
Lunn, Gerald E.; Main, W. Eric; and McGinn, Michael, 4,638,265, Cl. 333-214.000.

McGinniss, Vincent D., to Three Bond Co., Ltd. Catalyst systems for two-pack acrylic adhesive formulations. 4,638,035, Cl. 525-384.000.

McGlothen, Jody R.; and Little, Damon P., to Dresser Industries, Inc. Parallel flow tube apparatus. 4,637,460, Cl. 166-189.000.

McGlothen, Jody R.: *See*—
Spriggs, Dennis M.; and McGlothen, Jody R., 4,637,469, Cl. 166-310.000.

McGowan, Michael J.: *See*—
Adams, Philip E.; McGowan, Michael J.; and Yunan, Malak E., 4,637,312, Cl. 102-275.120.

McGuigan, Brian G. Humidity reduction duct. 4,637,224, Cl. 62-271.000.

McGuire, Charles F.; Steyaert, Gordon C.; and Fontaine, John M., to Sperry Corporation. Low noise amplifier with high intercept point. 4,638,261, Cl. 330-277.000.

McKee, Jere L.: *See*—
Thomas, Glenn R.; and McKee, Jere L., 4,638,277, Cl. 335-190.000.

McKibben, David M.: *See*—
Rhee, Choong-Kon; McKibben, David M.; and Bibbee, Jeffrey N., 4,637,252, Cl. 73-150.00A.

McLaughlin, Kevin L., to Motorola, Inc. BIMOS logic gate. 4,638,186, Cl. 307-446.000.

McMahon, J. Philip; Spoel, Han; and McGinley, John. Dross cooler and processor. 4,637,591, Cl. 266-165.000.

McManis, George E.: *See*—
Covino, Josephine; and McManis, George E., 4,637,864, Cl. 204-61.000.

McMillan, Stephen L.; Akers, Alvin; and Toma, Daniel N., to General Electric Company. Clothes washing machine including a high detergent concentration wash cycle. 4,637,231, Cl. 68-4.000.

McPherson, Alexander W.; and Hamed, Hazem N., to De-Sta-Co Division/Dover Corporation. Locking power clamp. 4,637,597, Cl. 269-32.000.

McQueen, Coy E.; Twedt, Lynn O.; and Thurnau, Edwin H., to Erect-A-Tube, Inc. Building and bi-fold door assembly. 4,637,446, Cl. 160-207.000.

Mead Corporation, The: *See*—
Leppek, William W., 4,637,534, Cl. 224-36.000.

Meadows, Roger D.: *See*—
Rush, James B.; Bryan, James S.; Gunter, Jonas L.; Dillard, Guy W.; Meadows, Roger D.; and Henry, Pearison W., 4,637,638, Cl. 285-154.000.

Med-Tech Associates: *See*—
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Med-Vest Inc.: *See*—
Ingrisano, Louis A.; Moon, Stephen H.; and English, Lawrence J., 4,637,075, Cl. 2-94.000.

Medeot, Renzo, to FIP Industriale S.p.A. Water jet scarifying apparatus. 4,637,656, Cl. 299-1.000.

Medvick, Richard J.; Weber, Richard C., Jr.; Wagner, Ross L.; and Brand, Edward M., to Swagelok Company. Coupling. 4,637,432, Cl. 137-614.030.

Medvick, Richard J.: *See*—
Scheffel, Gary W.; Medvick, Richard J.; and Steiss, William C., 4,637,430, Cl. 137-516.290.

Meguro, Satoshi: *See*—
Okuyama, Kousuke; Suzuki, Norio; Meguro, Satoshi; and Nagasawa, Kouichi, 4,637,124, Cl. 29-571.000.

Melendy, Clifford P., to Portex, Inc. Tracheal tube obturator with reversible tip. 4,637,388, Cl. 128-207.140.

Melle, Carl A.: *See*—
Das, Balbhadra; Temple, Chester S.; and Melle, Carl A., 4,637,956, Cl. 428-391.000.

Melman, Haim, to Elacint Ltd. System and methods for improving video camera performance. 4,638,355, Cl. 358-111.000.

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Crane, Michael P.; and Marsh, David J., 4,638,481, Cl. 371-27.000.

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Menigat, Roland; and Gruppenbacher, Klaus, to Hofmann Werkstatt-Technik GmbH. Method of continuous compensation of unbalance present in a rotor and in particular in a grinding wheel. 4,637,171, Cl. 51-281.00R.

Mente, Kurt, to J. H. Benecke GmbH. Apparatus for spreading out a plurality of filaments. 4,637,104, Cl. 28-283.000.

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Doherty, James B.; Finke, Paul E.; Firestone, Raymond A.; Shah, Shrenik S.; and Thompson, Kevan R., 4,637,999, Cl. 514-201.000.

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Kelly, Stephen M., 4,637,897, Cl. 252-299.630.

Mergen, Mark F.: *See*—
Chang, Albert; Cocke, John; Mergen, Mark F.; and Radin, George, 4,638,426, Cl. 364-200.000.

Merger, Franz: *See*—
Broecker, Franz J.; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,638,085, Cl. 560-208.000.

Merkel, Kurt E.: *See*—
Hershberger, Charles L.; Merkel, Kurt E.; Weeks, Robert E.; and Wild, Gene M., 4,637,981, Cl. 435-75.000.

Merki, Josef: *See*—
Brem, Ernst; and Merki, Josef, 4,638,199, Cl. 310-91.000.

Merry, Rodney J.: *See*—
Jones, Paul W.; Merry, Rodney J.; and Linstad, Gregory A., 4,637,749, Cl. 403-322.000.

Merryman, Ora S. Cleaning solution. 4,637,892, Cl. 252-139.000.

Meschke, Debra J.; Hoy, Kenneth L.; and Theiling, Louis F., Jr., to Union Carbide Corporation. Ceramic composition and process for use thereof. 4,638,029, Cl. 524-430.000.

Meseltron SA: *See*—
Sigg, Hans, 4,637,169, Cl. 51-165.770.

Messer Griesheim GmbH: *See*—
Donath, Sabine; and Holz, Peter, 4,637,174, Cl. 51-425.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Grosser, Peter; and Nissl, Norbert, 4,638,130, Cl. 200-61.45R.

Metallgesellschaft, A.G.: *See*—
Rausch, Werner; and Mueller, Gerhard, 4,637,838, Cl. 148-6.15Z.

Metromedia, Inc.: *See*—
Logan, David J., 4,638,373, Cl. 358-298.000.

Metz, Laurens, to Polynorm, N.V. Frame for door or window opening. 4,637,183, Cl. 52-217.000.

Metz, Pierre, to Thomson Brandt Armements. Gas propellor for guided missile. 4,637,572, Cl. 244-3.220.

Meyer, Martin S.: *See*—
Easley, Gary L.; Mance, Andrew M.; and Meyer, Martin S., 4,637,862, Cl. 204-15.000.

Miale, Joseph N.: *See*—
Chang, Clarence D.; and Miale, Joseph N., 4,638,105, Cl. 585-481.000.

Mich, Thomas F.: *See*—
Culbertson, Townley P.; Domagala, John M.; Mich, Thomas F.; and Nichols, Jeffrey B., 4,638,067, Cl. 546-15.000.

Michaux, Jacques M., to Secilor. Fully universal rolling process for H or I-beam type metal sections. 4,637,241, Cl. 72-225.000.

Michna, Martin: *See*—
Herd, Karl J.; and Michna, Martin, 4,638,054, Cl. 534-637.000.

Microsurgical Equipment Limited: *See*—
Ray, Andrew I. A., 4,637,393, Cl. 128-305.000.

Middlebrook, Robert B.; and Turner, W. Bard. Vehicular movement indicator safety system. 4,638,295, Cl. 340-73.000.

Middleton, Francisco A.: *See*—
Hargrave, Franklin; and Middleton, Francisco A., 4,638,124, Cl. 379-159.000.

Mielke, Barbara A.: *See*—
Bergeson, David L.; Pavelka, Lee A.; and Mielke, Barbara A., 4,637,950, Cl. 428-168.000.

Mielonen, Pekka A., to Oy Wartsila AB. Cartridge lock. 4,637,234, Cl. 70-34.000.

Migliore-Samour, Daniele: *See*—
Jolles, Pierre; Migliore-Samour, Daniele; Parker, Fabienne; and Cesaretto, Monika, 4,637,997, Cl. 514-17.000.

Milch, James R., to Eastman Kodak Company. Multiple exposure of area image sensor having a sparse array of elements. 4,638,371, Cl. 358-293.000.

Miles Laboratories, Inc.: *See*—
Pancham, Nazreen, 4,637,932, Cl. 424-101.000.
Skjold, A. Christopher; Hugl, Herbert; and Wolfrum, Gerhard, 4,637,979, Cl. 435-19.000.

Miller, Donald E., to Genicom Corporation. Automatic mechanical resonant frequency detector and driver for shuttle printer mechanism. 4,637,307, Cl. 101-93.040.

Miller, Ellsworth S., to Lectron Products, Inc. Electrical pressure switch. 4,638,132, Cl. 200-81.00R.

Miller, George A.: *See*—
Wise, Dan S.; and Miller, George A., 4,637,096, Cl. 19-200.000.

Miller, John R.: *See*—
Glocker, David A.; Miller, John R.; Grimshaw, Scott F.; and Windischmann, Henry, 4,637,869, Cl. 204-192.110.

Miller, Michael J., to Advanced Micro Devices, Inc. Central processing unit having built-in BCD operation. 4,638,300, Cl. 340-347.0DD.

Miller, Paul H.: *See*—
Graham, Merton J.; and Miller, Paul H., 4,637,620, Cl. 279-1.0DA.

Milliard, Norman L.: *See*—
Coburn, Richard J.; Dean, Walter C., III; Kegelman, Thomas D.; and Milliard, Norman L., 4,638,339, Cl. 346-153.100.

Milliser, John, to Textron Inc. Clinch type fastener. 4,637,766, Cl. 411-180.000.

Mills, David; Lindahl, Anthony T.; and Kington, Alan D., to Rolls-Royce Limited. Component casting. 4,637,449, Cl. 164-132.000.

Mills, David R.: *See*—
Mukli, Glena A.; Frew, Paul C.; and Mills, David R., 4,638,396, Cl. 361-101.000.

Milton, James L.: *See*—
Archer, Wendel E.; Milton, James L.; Renaut, Paul W.; and Winquist, Nelson H., 4,638,274, Cl. 335-52.000.

Milton, Ronald L, to United States of America, Navy. Electromechanical power source. 4,638,173, Cl. 290-52.000.

Min, Byung-Woo. Burglar alarm built in car stereo. 4,638,293, Cl. 340-63.000.

Minialoff, Andrew J.: *See*—
Minialoff, Gerrard O.; Minialoff, Martin J.; and Minialoff, Andrew J., 4,637,190, Cl. 52-579.000.

Minialoff, Gerrard O.; Minialoff, Martin J.; and Minialoff, Andrew J. Building panel. 4,637,190, Cl. 52-579.000.

Minialoff, Martin J.: *See*—
Minialoff, Gerrard O.; Minialoff, Martin J.; and Minialoff, Andrew J., 4,637,190, Cl. 52-579.000.

Ministry of International Trade and Industry: *See*—
Fukuda, Tsuguo; and Terashima, Kazutaka, 4,637,854, Cl. 156-607.000.

Minnesota Mining & Manufacturing Company: *See*—
Archibald, G. Kent; and Slaker, Frank A., 4,637,817, Cl. 604-81.000.
Bergeson, David L.; Pavelka, Lee A.; and Mielke, Barbara A., 4,637,950, Cl. 428-168.000.
Hammar, W. James, 4,638,040, Cl. 526-245.000.
Larson, Wayne K.; and Hedrick, Steven T., 4,638,017, Cl. 521-157.000.

Minolta Camera Kabushiki Kaisha: *See*—
Ishimura, Toshihiko; and Maekawa, Yukio, 4,637,704, Cl. 354-286.000.
Naruse, Kazuhiko; and Yuasa, Yoshio, 4,637,721, Cl. 356-215.000.

Minten, Karl; and Krug, William, to Gould Inc. Gas monitoring device and method. 4,637,987, Cl. 436-151.000.

Mirbeth, Rudolph: *See*—
Jenzach, Gunter; Rauh, Kurt; and Wegacheider, Hans J., 4,637,558, Cl. 241-79.000.

Mineyko, George; Peck, Walter R.; and Chase, Ronald G., to Stencel Aero Engineering Corp. Discard assembly for parachute deployment mechanism. 4,637,577, Cl. 244-147.000.

Mishima, Yasuhiro; Makibayashi, Katsunori; and Kuwayama, Kiyoaki, to Toyota Jidosha Kabushiki Kaisha; and Chuohatsujyo Kabushiki Kaisha. Leaf spring assembly. 4,637,595, Cl. 267-52.000.

Misumi, Teruo: *See*—
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,637,972, Cl. 430-84.000.

Mitchell, Gregory N.; and Wilson, Ronald A., to United States of America, Navy. Drag stabilizer. 4,637,570, Cl. 244-1.0TD.

Mitchell, Peter W. D., to Union Camp Corporation. Preparation of delta-terpineol. 4,638,103, Cl. 568-827.000.

Mitchell, Peter W. D., to Union Camp Corporation. Preparation of terpinen-4-ols and intermediates. 4,638,104, Cl. 568-827.000.

Mitchell, Vance C., to ICL Scientific Corp. Microscope inspection slide. 4,637,693, Cl. 350-536.000.

Mitomi, Mitsuo: *See*—
Konno, Yutaka; Kawata, Hiroitsu; Aruga, Masayoshi; Sosobe, Takashi; and Mitomi, Mitsuo, 4,637,930, Cl. 424-28.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Ando, Toshiharu; and Tsuchihashi, Masaru, 4,638,021, Cl. 523-457.000.
Hayakawa, Masaharu, 4,638,394, Cl. 360-137.000.
Hirano, Ryoichi, 4,637,845, Cl. 148-171.000.
Hirosaki, Yoshihiko; and Takata, Nobuharu, 4,637,296, Cl. 98-1.000.
Ishihara, Takashi; Okaniwa, Kazuhiro; and Nakamura, Genshiro, 4,638,109, Cl. 136-244.000.
Iwata, Toshio; and Ueda, Atsushi, 4,637,245, Cl. 73-35.000.
Kato, Hisao, 4,637,775, Cl. 414-744.00R.
Nakamura, Koji, 4,638,212, Cl. 313-408.000.
Sakuma, Hisayuki; and Hoshinouchi, Susumu, 4,638,145, Cl. 219-121.0LU.
Yonezu, Ryo; and Sakashita, Kazuhiro, 4,638,461, Cl. 365-189.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Shimuzu, Yoshiro; and Tada, Yoshio, 4,637,964, Cl. 428-694.000.
Mitutoyo Mfg. Co., Ltd.: *See*—
Kuwabara, Yoshiharu; and Hamada, Hiroyoshi, 4,637,680, Cl. 350-6.80J.
Miura, Masatoshi: *See*—
Fujita, Hideo; Saito, Yuichi; and Miura, Masatoshi, 4,638,205, Cl. 310-312.000.
Miura, Yukio; and Miyamoto, Yoshikazu, to Tokico Ltd. Control system for controlling the supply of a predetermined quantity of fluid. 4,637,525, Cl. 222-22.000.
Mixed Bag Imports, Inc.: *See*—
Weigert, Hans, 4,638,412, Cl. 362-156.000.
Miyamae, Hiroshi; and Banno, Makoto, to Konishiroku Photo Industry Co., Ltd. Telecentric zoom lens system. 4,637,690, Cl. 350-427.000.
Miyamoto, Kiyoshi, to Omron Tateisi Electroaics Co. Proximity switch with improved response time and antimagnetic field circuitry. 4,638,262, Cl. 331-65.000.
Miyamoto, Yoshikazu: *See*—
Miura, Yukio; and Miyamoto, Yoshikazu, 4,637,525, Cl. 222-22.000.
Miyashita, Kunio: *See*—
Morinaga, Shigeki; Miyashita, Kunio; Hayashida, Hiroshi; and Takahashi, Tadashi, 4,638,225, Cl. 318-341.000.
Miyauchi, Yasushi: *See*—
Terao, Motoyasu; Miyauchi, Yasushi; Shigematsu, Kazuo; and Horigome, Shinkichi, 4,637,976, Cl. 430-523.000.
Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kobayashi, Kazuo; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Yoichiro; and Abe, Wataru, to Agency of Industrial Science and Technology; and Oiles Industry Co., LTD. Sliding member of graphite-boron carbides. 4,637,884, Cl. 252-12.000.
Miyazaki, Michio: *See*—
Ogata, Mikito; Mori, Masahito; Doi, Takashi; Miyazaki, Michio; and Oka, Takafumi, 4,638,472, Cl. 369-54.000.
Mizoguchi, Hideo. Automatic feed device for a facing head. 4,637,285, Cl. 82-2.00E.
Mizoguchi, Shoichi, to NEC Corporation. Automatic adaptive equalizer. 4,638,495, Cl. 375-14.000.
Mizuno, Toshiaki: *See*—
Abe, Shinichi; and Mizuno, Toshiaki, 4,637,364, Cl. 123-492.000.
Mizutani, Yoshihisa, to Kabushiki Kaisha Toshiba. Method of producing semiconductor device. 4,637,128, Cl. 29-576.00B.
Mobil Oil Corporation: *See*—
Chang, Clarence D.; and Miale, Joseph N., 4,638,105, Cl. 585-481.000.
Odeh, Aziz S., 4,638,447, Cl. 364-556.000.
Szostak, Rosemarie, 4,637,923, Cl. 423-328.000.
Uhri, Duane C., 4,638,254, Cl. 324-323.000.
Mochida, Haruo; and Namazue, Hirotoshi, to Nissan Motor Company, Limited; and Kokusan Kinzoku Kogyo. Theft prevention system in an automotive keyless entry system with automatic door locking. 4,638,292, Cl. 340-63.000.
Mochizuki, Toshio: *See*—
Fujisawa, Kunio; Tanaka, Toyoji; Mochizuki, Toshio; Nakamura, Norio; and Kaya, Seiji, 4,637,711, Cl. 355-72.000.
Mockovciak, John, Jr.: *See*—
Frank, Arthur M.; DeRespinis, Silvio F.; and Mockovciak, John, Jr., 4,637,447, Cl. 160-265.000.
Moehling, Charles; and Henkel, James A., to Amsted Industries Incorporated. Bolster friction shoe pocket. 4,637,319, Cl. 105-207.000.
Moen, Carl J., to Beloit Corporation. Three-way valve for an attenuator. 4,637,434, Cl. 137-625.660.
Mogol, Gerald M.; and Fox, Leo E. Simulated log-burning fireplace. 4,637,372, Cl. 126-127.000.
Mohr, Reinhard: *See*—
Neeb, Rudolf; and Mohr, Reinhard, 4,638,053, Cl. 534-589.000.
Moinard, Patrice: *See*—
Perrin, Alain; and Moinard, Patrice, 4,637,747, Cl. 403-23.000.
Moja, Egidio A.; and Gessa, Gianluigi, to Boehringer Biochemia Robin S.p.A. Dietetic supplement and prepackaged food in which it is contained, process of preparation and method of administration. 4,638,013, Cl. 514-561.000.
Molnlycke Konsumentprodukter AB: *See*—
Bergenwall, Henning, 4,637,652, Cl. 297-90.000.
Monforte, Mathew L., to Monforte Rebotics, Inc. Robotic collision sensors and compliance devices. 4,638,231, Cl. 318-640.000.
Monforte Rebotics, Inc.: *See*—
Monforte, Mathew L., 4,638,231, Cl. 318-640.000.
Monnais, Christian; and Cotteret, Jean, to L'Oreal. Tinctorial composition for keratin fibres, based on nitrated benzene dyestuffs. 4,637,821, Cl. 8-415.000.
Monolithic Memories, Inc.: *See*—
Chan, Andrew K., 4,638,243, Cl. 324-51.000.
Geannopoulos, George; Tsui, Cyrus; Fitzpatrick, Mark; and Chan, Andy, 4,638,189, Cl. 307-465.000.
Monsanto Company: *See*—
Walker, George E., 4,637,944, Cl. 428-35.000.
Montandon, Daniel, to Nirvana Espar Systems, S.A. Roller furling element for boats equipped with sails. 4,637,334, Cl. 114-106.000.
Montefina, S.A.: *See*—
Bertrand, Jean-Noel M., 4,638,015, Cl. 521-85.000.
Montres Rado S.A.: *See*—
Gogniat, Paul, 4,637,734, Cl. 368-294.000.
Moon, James B.: *See*—
Sherwood, Glen R., Jr.; Moon, James B.; and Moyle, Gordon A., 4,638,313, Cl. 340-825.520.
Moon, Stephen H.: *See*—
Ingrisano, Louis A.; Moon, Stephen H.; and English, Lawrence J., 4,637,075, Cl. 2-94.000.
Moore, Jack M.: *See*—
Ciaramitaro, David A.; Speltz, David J.; and Moore, Jack M., 4,637,848, Cl. 149-21.000.
Moore, Jerry; and Yanglin, Dennis W., to New World Manufacturing, Inc. Waterbed with removable side cushions. 4,637,082, Cl. 5-452.000.
Moore, William J. M.: *See*—
So, Eddy; and Moore, William J. M., 4,638,302, Cl. 340-347.0DA.
Morgan, Charles L., III. Probeless fluid level controller. 4,637,424, Cl. 137-392.000.
Morgan Construction Company: *See*—
Koelling, Robert K., Sr., 4,637,807, Cl. 464-135.000.
Mori, Akinori, to Sumitomo Electric Industries, Ltd. Shielded electric wires. 4,638,114, Cl. 174-36.000.
Mori, Kinya: *See*—
Asakuno, Hiroyoshi; Mori, Kinya; Suzuki, Kiyoaki; Nishida, Mamoru; Iwai, Kenji; Tamamushi, Masahiro; and Kawasaki, Teruo, 4,638,030, Cl. 524-536.000.
Mori, Masahito: *See*—
Ogata, Mikito; Mori, Masahito; Doi, Takashi; Miyazaki, Michio; and Oka, Takafumi, 4,638,472, Cl. 369-54.000.
Mori, Michio: *See*—
Terada, Kimio; Mori, Michio; Goto, Yoichi; Nakazawa, Takashi; Muto, Kunio; and Usami, Shozo, 4,637,937, Cl. 426-570.000.
Mori, Takasuke: *See*—
Ayata, Kenzo; Narita, Kiichi; Mori, Takasuke; and Fujimoto, Takahiko, 4,637,453, Cl. 164-468.000.
Mori, Yoshikazu: *See*—
Sagawa, Morikazu; Mori, Yoshikazu; Ohba, Motoi; Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,638,180, Cl. 307-219.100.
Moriguchi, Fujio: *See*—
Nakayama, Toshihiko; Moriguchi, Fujio; Murayama, Tomio; and Takeo, Yasuhiro, 4,638,329, Cl. 346-76.0PH.
Moriguchi, Haruhiko: *See*—
Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katoh, Yasuo, 4,638,372, Cl. 358-296.000.
Morinaga, Shigeki; Miyashita, Kunio; Hayashida, Hiroshi; and Takahashi, Tadashi, to Hitachi, Ltd. Method and apparatus therefor in motor speed control. 4,638,225, Cl. 318-341.000.
Morisaka, Manabu: *See*—
Yoshikawa, Hayato; and Morisaka, Manabu, 4,637,298, Cl. 99-2.000.
Morita, Yasuyuki: *See*—
Sugiyama, Yoshiyuki; Aoki, Shinichiro; and Morita, Yasuyuki, 4,637,256, Cl. 73-633.000.
Moroux, Julien, to Societe Francaise d'Organo-Synthese. Method of oxidizing hydrazo compounds to corresponding azo compounds by hydrogen peroxide. 4,637,868, Cl. 204-157.820.
Morrow, David L.: *See*—
Fotheringham, James R.; and Morrow, David L., 4,637,488, Cl. 180-233.000.
Moss, Gaylord E.; Chern, Mao-Jin; and Dobbs, Teena L., to Hughes Aircraft Company. Holographic laser protection device. 4,637,678, Cl. 350-3.700.
Mossman, Allen B., to Amoco Corporation. Catalytic etherification of phenols to alkyl aryl ethers. 4,638,098, Cl. 568-630.000.
Motoki, Yasunari; and Ohkuma, Yuji, to Fujitsu Limited. Spin dryer. 4,637,146, Cl. 34-58.000.
Motola, Marcel: *See*—
Jecko, Jean-Rene ; and Motola, Marcel, 4,638,271, Cl. 333-205.000.
Motorola, Inc.: *See*—
Ballard, Danny B., 4,638,423, Cl. 364-200.000.
Gran, Paul; Feiner, Haim; Ben-Dayan, Nissim; Stefaniu, Marian; and Mar-Chaim, Yechiam, 4,638,453, Cl. 364-900.000.
Lunn, Gerald K.; Main, W. Eric; and McGinn, Michael, 4,638,265, Cl. 333-214.000.
McLaughlin, Kevin L., 4,638,186, Cl. 307-446.000.
Mukli, Glenn A.; Frew, Paul C.; and Mills, David R., 4,638,396, Cl. 361-101.000.
Samson, Robert, 4,638,406, Cl. 361-403.000.
Wagner, David J., 4,638,290, Cl. 340-56.000.
MotorTech, Inc.: *See*—
Yunick, Henry, 4,637,365, Cl. 123-545.000.
Motoyama, Tadashi, to Sony Corporation. Video signal recording and reproducing apparatus. 4,638,375, Cl. 358-338.000.

Motter Printing Press Co.: *See*—
Bryer, Jack, 4,637,109, Cl. 29-116.0AD.
Moyle, Gordon A.: *See*—
Sherwood, Glen R., Jr.; Moon, James B.; and Moyle, Gordon A., 4,638,313, Cl. 340-825.520.
Mozer, Daniel S. Machine for coring stumps. 4,637,442, Cl. 144-2.00N.
Mueller, Gerhard: *See*—
Rausch, Werner; and Mueller, Gerhard, 4,637,838, Cl. 148-6.15Z.
Mueller, Herbert, to BASF Aktiengesellschaft. Reducing the content of cyclic oligomeric ethers in polytetramethylene ether glycols or polyoxybutylene polyoxyalkylene glycols. 4,638,097, Cl. 568-617.000.
Mueller, Wolfgang: *See*—
Altendorfer, Alois; Dotzauer, Ewald; and Mueller, Wolfgang, 4,638,123, Cl. 379-229.000.
Mukai, Takashi: *See*—
Kuwamoto, Hiroshi; Nagamori, Hiroyuki; Mukai, Takashi; and Iwado, Shuichi, 4,637,885, Cl. 252-32.500.
Mukasa, Koichi; Hatanai, Takashi; Nakashima, Keishi; and Onishi, Kazumasa, to Alps Electric Co., Ltd. Composition for sliding contact part of recording/reproducing apparatus. 4,638,387, Cl. 360-122.000.
Mukasa, Koichi: *See*—
Hatanai, Takashi; Nakashima, Keishi; and Mukasa, Koichi, 4,638,391, Cl. 360-125.000.
Mukli, Glenn A.; Frew, Paul C.; and Mills, David R., to Motorola, Inc. Intrinsically safe battery circuit. 4,638,396, Cl. 361-101.000.
Mullenix, Kenneth E.: *See*—
Troy, Seymour L.; and Mullenix, Kenneth E., 4,637,634, Cl. 283-98.000.
Mullett Associates, Inc.: *See*—
Martinelli, Robert M., 4,638,176, Cl. 307-64.000.
Muniesa, Jacques: *See*—
Belbel, Elie; Caudron, Robert; Fechant, Louis; Haury, Andre ; Lauraire, Michel; Muniesa, Jacques; and Siffroi, Lucien, 4,638,275, Cl. 335-151.000.
Murakami, Kazuhiro: *See*—
Uda, Youichi; Matsushima, Seiya; Saito, Kazuhiko; Yamamoto, Shoji; and Murakami, Kazuhiro, 4,637,238, Cl. 70-456.00R.
Muramoto, Takumi: *See*—
Okino, Kiyomi; and Muramoto, Takumi, 4,637,648, Cl. 296-63.000.
Murase, Shigemitsu, to Unitika Limited. Finish composition for polyester fiber for rubber rein/orcement. 4,637,957, Cl. 428-395.000.
Murata, Kazushi; Takashima, Toshiharu; and Nakashima, Kunimichi, to Toyoda Koki Kabushiki Kaisha. Pallet changer. 4,637,108, Cl. 29-33.00P.
Murata, Tomohiro: *See*—
Katayama, Masanori; Komoda, Norihisa; Murata, Tomohiro; and Kera, Kazuo, 4,638,227, Cl. 318-565.000.
Murayama, Tomio: *See*—
Nakayama, Toshihiko; Moriguchi, Fujio; Murayama, Tomio; and Takeo, Yasuhiro, 4,638,329, Cl. 346-76.0PH.
Murphy, James L.: *See*—
Jones, Charles; Murphy, James L.; and Burks, Kenneth, 4,637,732, Cl. 368-109.000.
Murray, Alan A. Shopping guide device and the like. 4,637,337, Cl. 116-323.000.
Murray, William J.; and Earle, George A., III, to LTV Aerospace and Defense Company. Automated tool positioning system. 4,637,761, Cl. 408-16.000.
Musgrave, Dwight S.: *See*—
Shah, Hasmukh G.; and Musgrave, Dwight S., 4,637,946, Cl. 428-63.000.
Musso, Pietro: *See*—
Valle, Franco; and Musso, Pietro, 4,637,744, Cl. 400-185.000.
Muto, Kunio: *See*—
Terada, Kimio; Mori, Michio; Goto, Yoichi; Nakazawa, Takashi; Muto, Kunio; and Usami, Shozo, 4,637,937, Cl. 426-570.000.
Mydata Automation AB: *See*—
Stridsberg, Lennart; and Rodin, Gunnar, 4,638,232, Cl. 318-640.000.
Mydax, Inc.: *See*—
Lowes, Albert R., 4,637,454, Cl. 165-36.000.
Myllyla, Risto: *See*—
Ahola, Raimo; and Myllyla, Risto, 4,637,727, Cl. 356-373.000.
Nagamori, Hiroyuki: *See*—
Kuwamoto, Hiroshi; Nagamori, Hiroyuki; Mukai, Takashi; and Iwado, Shuichi, 4,637,885, Cl. 252-32.500.
Nagano, Masashi, to Shimano Industrial Company Limited. Bicycle brake operating device positioned on a drop handle. 4,637,273, Cl. 74-489.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Rear derailleur for a bicycle. 4,637,809, Cl. 474-80.000.
Nagaoka, Shigenori: *See*—
Hagiwara, Tatsuo; Imai, Keiji; and Nagaoka, Shigenori, 4,637,562, Cl. 241-259.200.
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, to Olympus Optical Co., Ltd. Illuminating means for color image sensing. 4,638,353, Cl. 358-98.000.
Nagasawa, Ken: *See*—
Fukuda, Noriyoshi; and Nagasawa, Ken, 4,637,906, Cl. 264-29.100.
Nagasawa, Kenichi: *See*—
Kozuki, Susumu; Nagasawa, Kenichi; Edakubo, Hiroo; Sato, Junichi; and Takayama, Nobutoshi, 4,638,390, Cl. 360-74.100.
Nagasawa, Kouichi: *See*—
Okuyama, Kousuke; Suzuki, Norio; Meguro, Satoshi; and Nagasawa, Kouichi, 4,637,124, Cl. 29-571.000.
Nagase Sangyo Kabushiki Kaisha: *See*—
Koyama, Ario, 4,638,146, Cl. 219-147.000.
Nagle, Richard T., to Power Alcohol, Inc. Methods of hydrolyzing cellulose to glucose and other (poly)saccharides. 4,637,835, Cl. 127-37.000.
Nagy, Jeno; Szendrodi, Valer; and Tari, Istvan, to Kokusai Denshin Denwa Kabushiki Kaisha. Load platform and transport track system for the transport of passenger baggage and parcels as air freight. 4,637,315, Cl. 104-135.000.
Nakabayashi, Toshiya: *See*—
Tajima, Shigeru; and Nakabayashi, Toshiya, 4,638,223, Cl. 318-254.000.
Nakada, Fumio: *See*—
Yaotsai, Kouichi; Nakada, Fumio; Tanaka, Takao; and Yoshida, Minoru, 4,637,767, Cl. 411-411.000.
Nakagawa, Akira: *See*—
Iwase, Takatoshi; and Nakagawa, Akira, 4,637,132, Cl. 29-726.000.
Nakahata, Kimio: *See*—
Hosoi, Atsushi; Kan, Fumitaka; Egami, Hidemi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,637,706, Cl. 355-3.0DD.
Nakai, Kazuhiro: *See*—
Ohmori, Akira; Tomihashi, Nobuyuki; Inukai, Hiroshi; and Nakai, Kazuhiro, 4,638,041, Cl. 526-247.000.
Nakai, Mamoru; and Enomiya, Takuji, to Ube Industries, Ltd. Process for producing phenylacetones. 4,638,094, Cl. 568-309.000.
Nakamura, Genshiro: *See*—
Ishihara, Takashi; Okaniwa, Kazuhiro; and Nakamura, Genshiro, 4,638,109, Cl. 136-244.000.
Nakamura, Hiroshi; Toyama, Osamu; and Kanii, Norikazu, to Toyoda Koki Kabushiki Kaisha. Industrial robot. 4,637,774, Cl. 414-735.000.
Nakamura, Joji: *See*—
Tamaki, Hiroaki; and Nakamura, Joji, 4,637,758, Cl. 405-248.000.
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Nakamura, Kouzaburou: *See*—
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Tomita, Tomoya; Hiramoto, Sotozi; Okubo, Takesi; Matsuo, Kuniyuki; Ashihara, Hiromoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, 4,637,134, Cl. 29-741.000.
Nakamura, Norio: *See*—
Fujisawa, Kunio; Tanaka, Toyoji; Mochizuki, Toshio; Nakamura, Norio; and Kaya, Seiji, 4,637,711, Cl. 355-72.000.
Nakamura, Shizuo, to Kawamura Cycle Co., Ltd. Bicycle rear derailleur. 4,637,808, Cl. 474-80.000.
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Hosoi, Atsushi; Kan, Fumitaka; Egami, Hidemi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,637,706, Cl. 355-3.0DD.
Nakane, Masami, to E. R. Squibb & Sons, Inc. 7-oxabicycloheptane α-substituted ketone prostaglandin analogs useful in the treatment of thrombotic disease. 4,638,012, Cl. 514-469.000.
Nakase, Hiroshi: *See*—
Okada, Jun; Kunimasa, Koichi; and Nakase, Hiroshi, 4,638,477, Cl. 370-94.000.
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Hatanai, Takashi; Nakashima, Keishi; and Mukasa, Koichi, 4,638,391, Cl. 360-125.000.
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Nakashima, Kunimichi: *See*—
Murata, Kazushi; Takashima, Toshiharu; and Nakashima, Kunimichi, 4,637,108, Cl. 29-33.00P.
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Nakaya, Yasuhiro: *See*—
Asai, Toshio; and Nakaya, Yasuhiro, 4,637,399, Cl. 128-639.000.
Nakayama, Ryoichi: *See*—
Iida, Hitoshi; and Nakayama, Ryoichi, 4,637,494, Cl. 187-10.000.
Nakayama, Satoshi: *See*—
Sakura, Yasuhiro; Nimura, Hitoshi; and Nakayama, Satoshi, 4,638,332, Cl. 346-76.0PH.
Nakayama, Toshihiko; Moriguchi, Fujio; Murayama, Tomio; and Takeo, Yasuhiro, to Fuji-Xerox Co. Ltd. Thermal recording method and apparatus. 4,638,329, Cl. 346-76.0PH.
Nakazawa, Takashi: *See*—
Terada, Kimio; Mori, Michio; Goto, Yoichi; Nakazawa, Takashi; Muto, Kunio; and Usami, Shozo, 4,637,937, Cl. 426-570.000.
Namazue, Hirotoshi: *See*—
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Namekawa, Satoshi: *See*—
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Naniwa Products Co., Ltd.: *See*—
Kawai, Kazuo; Kawai, Sumikazu; and Katashima, Seiji, 4,637,450, Cl. 164-200.000.
Nanne, Johannes M.: *See*—
van Erp, Willibrord A.; Nanne, Johannes M.; and Post, Martin F. M., 4,637,993, Cl. 502-242.000.
Narita, Kiichi: *See*—
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Naruse, Kazuhiko; and Yuasa, Yoshio, to Minolta Camera Kabushiki Kaisha. Light measuring device. 4,637,721, Cl. 356-215.000.
Naruse, Yuji: *See*—
Konishi, Satoshi; Ohno, Hideo; Naruse, Yuji; and Yoshida, Hiroshi, 4,637,866, Cl. 204-129.000.
Nash, Dudley O., to United States of America, Air Force. Dual material exhaust nozzle flap. 4,637,550, Cl. 239-265.370.
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National Distillers and Chemical Corporation: *See*—
McClain, Dorothee M., 4,638,034, Cl. 525-369.000.
National Product Marketing: *See*—
Partus, Fred P.; and Jones, Michael A., 4,638,129, Cl. 200-43.220.
National Research Development Corporation: *See*—
Foster, Peter R., 4,638,048, Cl. 530-380.000.
Sutherland, Ian W., 4,638,059, Cl. 536-121.000.
Nauchno-Issledovatelsky Institut Obschei i Neotlozhno Khirurgii: *See*—
Sorochenko, Oleg A., 4,637,390, Cl. 128-303.140.
NCR Corporation: *See*—
Hong, Vuong B.; Rowson, Stuart C.; Daniel, Richard A.; and Rostek, Paul M., 4,638,256, Cl. 328-105.000.
Quinn, Bruce A.; and Barton, Scott N., 4,638,312, Cl. 340-825.350.
Nebelung, Hermann H.; Huber, Robert; and Futterknecht, Fritz, to Emhart Industries, Inc. Parison transferring means. 4,637,827, Cl. 65-235.000.
NEC Corporation: *See*—
Koike, Nobuhiko, 4,638,475, Cl. 370-60.000.
Mizoguchi, Shoichi, 4,638,495, Cl. 375-14.000.
Nishimura, Hiroyuki, 4,638,431, Cl. 364-200.000.
Neeb, Rudolf; and Mohr, Reinhard, to Hoechstaktiengeseilschaft. Process for the preparation of chlorozincate salts of benzo thiazolium azo dyestuffs by alkylating with dialkylsulfate in aqueous medium in the presence of Zn-containing acid acceptor at pH≦7. 4,638,053, Cl. 534-589.000.
Neefe, Charles W. Gyroscopically stabilized spin cast machine. 4,637,791, Cl. 425-425.000.
Nees, Friedbert: *See*—
Broecker, Franz J.; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,638,085, Cl. 560-208.000.
Nelson, Marvin D.: *See*—
Dietiker, Paul; and Nelson, Marvin D., 4,637,429, Cl. 137-505.140.
Nelson, Norman A., to Upjohn Company, The. Aromatic or inter-oxa 2-decarboxy-2-hydroxymethyl-PGF$_{2\alpha}$ compounds. 4,638,100, Cl. 568-645.000.
Nelson, Robert F.: *See*—
Uba, Toshio; and Nelson, Robert F., 4,637,966, Cl. 429-57.000.
Netolicky, Charles E.: *See*—
Dvorak, Robert F.; and Netolicky, Charles E., 4,638,133, Cl. 200-302.100.
Netznik, Frederick P. Cushion fabrication apparatus. 4,637,789, Cl. 425-39.000.
Neumann, Hans J.: *See*—
Schneider, Horst; Zeeh, Rainer; and Neumann, Hans J., 4,637,119, Cl. 29-568.000.
Neupauer, Helmut, to Siemens Aktiengesellschaft. Method and apparatus for resumption of normal operation of a high-voltage D. C. transmission line. 4,638,415, Cl. 363-35.000.
Neupauer, Helmut; Kaufhold, Wolfgang; and Wild, Georg, to Siemens Aktiengesellschaft. Method and apparatus for high-voltage D.C. transmission with a bypass circuit for malfunctions. 4,638,416, Cl. 363-35.000.
Nevalainen, Kyosti; and Martikainen, Kaarlo, to Oy Wartsila Ab. Cylinder lock. 4,637,240, Cl. 70-366.000.
New, Richard W.: *See*—
Johnson, Charles E.; and New, Richard W., 4,637,511, Cl. 198-846.000.
New World Manufacturing, Inc.: *See*—
Moore, Jerry; and Yanglin, Dennis W., 4,637,082, Cl. 5-452.000.
Neway Manufacturing, Inc.: *See*—
Acker, Franklin L., 4,637,762, Cl. 408-203.500.
Newman, Walter: *See*—
Johnson, George E.; and Newman, Walter, 4,637,671, Cl. 339-50.00R.
Ney, Robert, to Lynenwerk GmbH & Co. Kommanditgesellschaft. Electrical cable for communication purposes. 4,638,117, Cl. 174-117.00F.
NGK Spark Plug Co., Ltd.: *See*—
Tsunooka, Tsutomu; Takeuchi, Tadashi; Ushida, Kunihiro; and Kawajiri, Shogo, 4,638,206, Cl. 310-313.00B.
Watanabe, Masakazu; and Okuno, Akiyasu, 4,638,268, Cl. 333-22.00F.
Niblock, John A.; Patel, Jayant; Fisher, Dennis; and Lumb, Anthony P., to General Electric Company, p.l.c., The. Apparatus for controlling the transfer of interrupt signals in data processors. 4,638,432, Cl. 364-200.000.
Nicely, Charles W., to United Steel & Wire Company. Corner structure for adjustable shelving (with opposed clamping members). 4,637,323, Cl. 108-107.000.
Nichols, Jeffrey B.: *See*—
Culbertson, Townley P.; Domagala, John M.; Mich, Thomas F.; and Nichols, Jeffrey B., 4,638,067, Cl. 546-15.000.
Nichols, Leo F., to Enron Corp. Reactive gas sensor. 4,638,286, Cl. 338-34.000.
Nichols, Roy L.: *See*—
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Nicolin, Johannes: *See*—
Ortwein, Hermann; Krettek, Ottmar; and Nicolin, Johannes, 4,637,646, Cl. 295-37.000.
Nieder, Erin G., to Atlantic Research Corporation. Chemical passivation of amorphous boron powder. 4,637,847, Cl. 149-6.000.
Nield, Eric: *See*—
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Nielson, Albert E.: *See*—
Griffith, Carroll L.; and Nielson, Albert E., 4,637,305, Cl. 99-461.000.
Nifco Inc.: *See*—
Omata, Nobuaki, 4,637,765, Cl. 411-41.000.
Niggemann, Richard E., to Sundstrand Corporation. Heat exchanger. 4,637,456, Cl. 165-104.330.
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Nihon Denshizairyo Kabushiki Kaisha: *See*—
Okubo, Masao; Sugaya, Kiyoshi; Takagi, Toshinori; and Ishikawa, Junzo, 4,638,217, Cl. 315-111.810.
Nihon Parkerizing Co., Ltd.: *See*—
Fujii, Haruki; Ikada, Shoji; Fukuda, Akimitsu; and Okumura, Yasuo, 4,637,840, Cl. 148-6.200.
Niinuma, Atsuo: *See*—
Shinoda, Tsutae; and Niinuma, Atsuo, 4,638,218, Cl. 315-169.400.
Nilsen, Ole K. Protector for series-excited parallel-loaded resonant circuit. 4,638,395, Cl. 361-93.000.
Nilsson, Berndt R. Arrangement in Venetian blinds. 4,637,445, Cl. 160-178.00C.
Nimlok Limited: *See*—
Nimmo, Neil D.; Kenny, Michael; and Willis, David, 4,637,178, Cl. 52-36.000.
Nimmo, Neil D.; Kenny, Michael; and Willis, David, to Nimlok Limited. Screen assembly and clip therefor. 4,637,178, Cl. 52-36.000.
Nimura, Hitoshi: *See*—
Sakura, Yasuhiro; Nimura, Hitoshi; and Nakayama, Satoshi, 4,638,332, Cl. 346-76.0PH.
Ninomiya, Yoshinobu; Somezawa, Masashi; and Oiyama, Kiyokazu, to Sony Corporation. Magnetic recording medium. 4,637,959, Cl. 428-425.900.
Nippon A B S, Ltd.: *See*—
Arikawa, Tetsuro, 4,637,664, Cl. 303-111.000.
Nippon Chem-Con Corp.: *See*—
Iwanaka, Masaya; and Kajiwara, Seiji, 4,637,489, Cl. 181-160.000.
Nippon Electric Co., Ltd.: *See*—
Kurogi, Yukinori; Endo, Nobuhiro; and Tanno, Kohetsu, 4,637,127, Cl. 29-576.00E.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Ohsumi, Hisayoshi, 4,637,954, Cl. 428-342.000.
Nippon Kogaku K. K.: *See*—
Kazami, Kazuyuki; and Wakabayashi, Hiroshi, 4,637,702, Cl. 354-173.110.
Uehara, Makoto; and Hashimoto, Sumio, 4,637,691, Cl. 350-432.000.
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Kuwamoto, Hiroshi; Nagamori, Hiroyuki; Mukai, Takashi; and Iwado, Shuichi, 4,637,885, Cl. 252-32.500.
Nippon Notion Kogyo Co., Ltd.: *See*—
Kasai, Kazumi, 4,637,099, Cl. 24-200.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Hattori, Masaru, 4,637,739, Cl. 384-45.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Yamamoto, Noboru; and Yamasaki, Tetsuya, 4,637,681, Cl. 350-96.120.
Nippon Soken, Inc.: *See*—
Tanaka, Hiroaki; and Akita, Shigeyuki, 4,638,249, Cl. 324-166.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Kobayashi, Kensuke; and Tazoh, Yasuo, 4,638,185, Cl. 307-352.000.
Maruno, Tooru; Nakamura, Kouzaburou; and Sasaki, Shigekuni, 4,637,939, Cl. 427-162.000.
Nippon Zoki Pharmaceutical Co., Ltd.: *See*—
Konishi, Jin-emon, 4,637,996, Cl. 514-11.000.
Nippondenso Co., Ltd.: *See*—
Fujiwara, Kenichi; Asano, Hideo; Hasada, Eiichi; Makida, Kazuhisa; and Iida, Akinori, 4,637,222, Cl. 62-244.000.
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Nirvana Espar Systems, S.A.: *See*—
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Nishi, Yoshitsugu; and Daigo, Yukitaka, to Somar Corporation. Front plate of X-ray film cassette. 4,638,501, Cl. 378-182.000.

Nishida, Mamoru: *See*—
Asakuno, Hiroyoshi; Mori, Kinya; Suzuki, Kiyoaki; Nishida, Mamoru; Iwai, Kenji; Tamamushi, Masahiro; and Kawasaki, Teruo, 4,638,030, Cl. 524-536.000.
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Nishikawa, Kohei: *See*—
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Nishikawa, Masao; Sakai, Shinzo; and Sakurai, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Gear shift controller for automatic transmission. 4,637,278, Cl. 74-866.000.
Nishikawa, Mikio: *See*—
Fujii, Hiroyuki; Tateno, Kenichi; and Nishikawa, Mikio, 4,637,130, Cl. 29-588.000.
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, to TDK Corporation. Magnetic recording medium and method for making. 4,637,963, Cl. 428-694.000.
Nishimura, Hiroyuki, to NEC Corporation. Data processing system for vector processing having a cache invalidation control unit. 4,638,431, Cl. 364-200.000.
Nishimura, Yuji; and Koide, Teruhiko, to Kabushiki Kaisha Toksi-Rika-Denki-Seisakusho. Webbing tension adjusting apparatus. 4,637,630, Cl. 280-807.000.
Nishino, Hiroyuki: *See*—
Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Nishino, Hiroyuki, 4,638,009, Cl. 514-421.000.
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Matsuda, Toshiro, 4,637,663, Cl. 303-106.000.
Mochida, Haruo; and Namazue, Hirotoshi, 4,638,292, Cl. 340-63.000.
Oshiage, Katsunori, 4,637,280, Cl. 74-866.000.
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Nitsuko Limited: *See*—
Hatabe, Michinori, 4,638,478, Cl. 370-94.000.
Nittan Co., Ltd.: *See*—
Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takasi, 4,638,304, Cl. 340-500.000.
Nitto Kagaku Kogyo Kabushiki Kaisha: *See*—
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Nitto Seiko Co., Ltd.: *See*—
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Niu, Joseph H. Y.; and Schmolka, Irving R., to BASF Corporation. Coal-oil slurries containing a surfactant. 4,637,822, Cl. 44-51.000.
Nixdorf Computer AG: *See*—
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Noble, Roger K.: *See*—
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Noda, Masaru; and Shiga, Toshihiro, to Hitachi, Ltd. Color video camera signal processing circuit. 4,638,352, Cl. 358-44.000.
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Nolan, John H.; and Nolan, William A. Magnetic valve. 4,637,427, Cl. 137-460.000.
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Nordin, Inge, to Pede AB. Stringtape roll for Venetian blinds. 4,637,105, Cl. 29-24.500.
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Nowak, Michael R.: *See*—
Jorgensen, Robert W.; and Nowak, Michael R., 4,637,639, Cl. 285-249.000.
Nozoe, Toshiro; and Yamashita, Akira, to Matsushita Electric Industrial Co., Ltd. Sampling clock reproducing circuit. 4,638,358, Cl. 358-147.000.
Nunley, Allen, to Halliburton Company. Graded shaped spatial resolution nuclear detectors. 4,638,159, Cl. 250-267.000.
Nunley, Allen: *See*—
Sonne, Darrell S.; and Nunley, Allen, 4,638,164, Cl. 250-366.000.
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Svensson, Leif; Nyqvist, Jan-Olof; and Westling, Lars, 4,638,065, Cl. 544-196.000.
Obara, Haruki; and Aso, Toshiyuki, to Fanuc Ltd. Apparatus for guiding a wire electrode of a wire electrode discharge machine. 4,638,140, Cl. 219-69.00W.
Obrecht, Georges; and Dreuilhe, Claude, to Alsthom. Azimuth measuring method for non-vertical drilling. 4,637,480, Cl. 175-45.000.
O'Brien, Thomas G.; Pegg, Anthony E.; and Herlyn, Meehard, to Wistar Institute of Anatomy and Biology; and Research Corporation, a part interest. Monoclonal anti-ornithine decarboxylase antibody and method of producing same. 4,637,984, Cl. 435-240.000.
Oce-Nederland B.V.: *See*—
Bouwens, Jan M. M.; and Schiffelers, Hendrik E. P., 4,637,598, Cl. 271-3.100.
Ochsner, Rolf H., to Robertshaw Controls Company. Differential pressure operated electrical switch construction and method of making the same. 4,637,131, Cl. 29-622.000.
Odashima, Ron, to Sanshin Kogyo Kabushiki Kaisha; and Yamaha Hatsudoki Kabushiki Kaisha. Separate lubricating system for outboard motors. 4,637,355, Cl. 123-73.0AD.
Odeh, Aziz S., to Mobil Oil Corporation. Method for determining consistent oil relative permeability values from dynamic displacement data. 4,638,447, Cl. 364-556.000.
Office National d'Etudes et de Recherche Aerospatiales (ONERA): *See*—
Slodzian, Georges; Costa De Beauregard, Francois; Daigne, Bernard; and Girard, Francois, 4,638,160, Cl. 250-296.000.
Officine Savio SpA: *See*—
Badiali, Roberto; Bertoli, Luciano; and Speranzin, Claudio, 4,637,205, Cl. 57-22.000.
Ogata, Mikito; Mori, Masahito; Doi, Takashi; Miyazaki, Michio; and Oka, Takafumi, to Hitachi, Ltd. Information recording system and method for using alternative record area in writing and reading of data on optical disk. 4,638,472, Cl. 369-54.000.
Ogawa, Ichitaro: *See*—
Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kobayashi, Kazuo; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Yoichiro; and Abe, Wataru, 4,637,884, Cl. 252-12.000.
Ogawa, Kenji, to Idemitsu Petrochemical Co., Ltd. Apparatus for folding web-shaped member. 4,637,812, Cl. 493-357.000.
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, to Canon Kabushiki Kaisha. Light receiving member having an amorphous silicon photoconductor. 4,637,972, Cl. 430-84.000.
Ogawa, Kyosuke: *See*—
Kamiya, Osamu; Fujiyama, Yasutomo; Ogawa, Kyosuke; and Kurokawa, Takashi, 4,637,342, Cl. 118-719.000.
Ogawa, Nobuo: *See*—
Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Nithino, Hiroyuki, 4,638,009, Cl. 514-421.000.
Ogura, Masahiko, to Kabushiki Kaisha Toshiba. Motor driving apparatus. 4,638,235, Cl. 318-696.000.
Ogura, Shigetaro: *See*—
Tomita, Yasuo; Ogura, Shigetaro; and Matsumoto, Kazuya, 4,637,684, Cl. 350-96.190.
Ohara, Yuji: *See*—
Horikawa, Kazuo; and Ohara, Yuji, 4,638,156, Cl. 250-235.000.
Ohashi, Kaoru: *See*—
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Nomura, Yoshihisa; and Ohashi, Kaoru, 4,637,487, Cl. 180-197.000.
Ohashi, Ryota; Kawamura, Masahisa; and Shibata, Jiro, to Kanzaki Kokyukoki Mfg. Co. Ltd. Hydraulic system in working vehicles. 4,637,482, Cl. 180-132.000.
Ohba, Motoi: *See*—
Sagawa, Morikazu; Mori, Yoshikazu; Ohba, Motoi; Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,638,180, Cl. 307-219.100.

Ohhara, Minoru: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,637,998, Cl. 514-42.000.

Ohi Seisakusho Co., Ltd.: *See*—
Ujihara, Hiroshi, 4,637,166, Cl. 49-352.000.

Ohkuma, Yuji: *See*—
Motoki, Yasunari; and Ohkuma, Yuji, 4,637,146, Cl. 34-58.000.

Ohmi, Masatoshi, to Yamaha Hatsudoki Kabushiki Kaisha. Tappet arrangement for engine valve train. 4,637,357, Cl. 123-90.480.

Ohmori, Akira; Tomihashi, Nobuyuki; Inukai, Hiroshi; and Nakai, Kazuhiro, to Daikin Industries, Ltd. Fluorooxyalkyl vinyl ethers. 4,638,041, Cl. 526-247.000.

Ohmura, Yoshio: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,637,998, Cl. 514-42.000.

Ohno, Hideo: *See*—
Konishi, Satoshi; Ohno, Hideo; Naruse, Yuji; and Yoshida, Hiroshi, 4,637,866, Cl. 204-129.000.

Ohshima, Yoshikuni: *See*—
Horibe, Youhun; Ohshima, Yoshikuni; and Masuda, Toyohiko, 4,637,350, Cl. 122-441.000.

Ohsumi, Hisayoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Resin-treated woody material. 4,637,954, Cl. 428-342.000.

Ohta, Takao: *See*—
Kuwabara, Hideo; and Ohta, Takao, 4,638,128, Cl. 200-33.00R.

Oikawa, Toshihiro: *See*—
Yano, Yoshiki; and Oikawa, Toshihiro, 4,637,358, Cl. 123-169.0PA.

Oiles Industry Co., LTD: *See*—
Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kobayashi, Kazuo; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Yoichiro; and Abe, Wataru, 4,637,884, Cl. 252-12.000.

Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic tape cassette having an improved braking mechanism. 4,638,393, Cl. 360-132.000.

Oiyama, Kiyokazu: *See*—
Ninomiya, Yoshinobu; Somezawa, Masashi; and Oiyama, Kiyokazu, 4,637,959, Cl. 428-425.900.

Oka, Takafumi: *See*—
Ogata, Mikito; Mori, Masahito; Doi, Takashi; Miyazaki, Michio; and Oka, Takafumi, 4,638,472, Cl. 369-54.000.

Okada, Jun; Kunimasa, Koichi; and Nakase, Hiroshi, to Hitachi, Ltd. Packet exchange data transmission system. 4,638,477, Cl. 370-94.000.

Okamoto, Hisao: *See*—
Kawamura, Kimihide; Horiguchi, Shojiro; and Okamoto, Hisao, 4,638,052, Cl. 534-575.000.

Okaniwa, Kazuhiro: *See*—
Ishihara, Takashi; Okaniwa, Kazuhiro; and Nakamura, Genshiro, 4,638,109, Cl. 136-244.000.

Okano, Kenji: *See*—
Hayashi, Seizo; Okano, Kenji; and Hayashi, Nobuhiro, 4,637,092, Cl. 15-319.000.

Okaya, Takuji: *See*—
Sato, Toshiaki; Yamauchi, Junnosuke; and Okaya, Takuji, 4,638,024, Cl. 524-22.000.

Okazaki, Masaki: *See*—
Kubodera, Seiiti; Hioki, Takanori; and Okazaki, Masaki, 4,637,975, Cl. 430-353.000.

Oki Electric Industry Co., Ltd.: *See*—
Kimura, Kikuo, 4,638,184, Cl. 307-297.000.

Okino, Kiyomi; and Muramoto, Takumi, to Mazda Motor Corporation; and Delta Kogyo Co., Ltd. Rear seat back locking arrangement for a motor vehicle and the like. 4,637,648, Cl. 296-63.000.

Oku, Seiji: *See*—
Itsuki, Fumiaki; and Oku, Seiji, 4,638,154, Cl. 250-227.000.

Okubo, Masao; Sugaya, Kiyoshi; Takagi, Toshinori; and Ishikawa, Junzo, to Nihon Denshizairyo Kabushiki Kaisha. Fused metal ion source with sintered metal head. 4,638,217, Cl. 315-111.810.

Okubo, Takesi: *See*—
Tomita, Tomoya; Hiramoto, Sotoxi; Okubo, Takesi; Matsuo, Kuniyuki; Ashihara, Hiromoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, 4,637,134, Cl. 29-741.000.

Okumura, Yasuo: *See*—
Fujii, Haruki; Ikada, Shoji; Fukuda, Akimitsu; and Okumura, Yasuo, 4,637,840, Cl. 148-6.200.

Okumura, Yoshiharu: *See*—
Pieters, Wim J. M.; and Okumura, Yoshiharu, 4,638,106, Cl. 585-640.000.

Okuno, Akiyasu: *See*—
Watanabe, Masakazu; and Okuno, Akiyasu, 4,638,268, Cl. 333-22.00F.

Okura Electric Industry Co., Ltd.: *See*—
Okura, Masahiko; and Inayashi, Minoru, 4,637,098, Cl. 24-136.00R.

Okura, Masahiko; and Inayashi, Minoru, to Okura Electric Industry Co., Ltd. Shim used for cable clamp. 4,637,098, Cl. 24-136.00R.

Okuyama, Kousuke; Suzuki, Norio; Meguro, Satoshi; and Nagasawa, Kouichi, to Hitachi, Ltd. Process for fabricating semiconductor integrated circuit device. 4,637,124, Cl. 29-571.000.

Olschewski, Armin; Bauer, Bernhard; Zirk, Elisabeth; and Heemskerk, Rut, to SKF GmbH Schweinfurt. Bearing bushing for universal joints. 4,637,740, Cl. 384-425.000.

Olschewski, Armin; Bauer, Bernhard; and Zirk, Elisabeth, to SKF GmbH. Arrangement for mounting swivel pin bearing in yoke of universal joint. 4,637,806, Cl. 464-130.000.

Olsen, Joseph C.; and Steinbach, Richard H., to Engineering Consulting Services. Safety mechanism for saws. 4,637,288, Cl. 83-375.000.

Olsson, Sven O. Spout with gate. 4,637,531, Cl. 222-559.000.

Olympus Optical Co., Ltd.: *See*—
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,638,353, Cl. 358-98.000.
Sasa, Hiroyuki, 4,637,378, Cl. 128-4.000.

Omark Industries, Inc.: *See*—
Alexander, Kenneth L., 4,637,291, Cl. 86-23.000.

Omata, Nobuaki, to Nifco Inc. Two-piece expandable plastic rivet. 4,637,765, Cl. 411-41.000.

Omori, Takashi: *See*—
Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katob, Yasuo, 4,638,372, Cl. 358-296.000.

Omron Tateisi Electronics Co.: *See*—
Itsuki, Fumiaki; and Oku, Seiji, 4,638,154, Cl. 250-227.000.
Miyamoto, Kiyoshi, 4,638,262, Cl. 331-65.000.

Onishi, Kazumasa: *See*—
Mukasa, Koichi; Hatanai, Takashi; Nakashima, Keishi; and Onishi, Kazumasa, 4,638,387, Cl. 360-122.000.

Ono, Minoru; and Makino, Teruyoshi, to Fuji Photo Film Co., Ltd. Film pack. 4,637,703, Cl. 354-276.000.

Onoue, Akihiro: *See*—
Taguchi, Michihiro; and Onoue, Akihiro, 4,637,802, Cl. 440-75.000.

Ontario Cancer Institute, The: *See*—
Yaffe, Martin J., 4,638,502, Cl. 378-207.000.

Opprecht, Jurg: *See*—
Opprecht, Paul; Urech, Werner; and Opprecht, Jurg, 4,637,521, Cl. 220-274.000.

Opprecht, Paul; Urech, Werner; and Opprecht, Jurg, to Elpatronic AG. Openable can body. 4,637,521, Cl. 220-274.000.

Orejola, Wilmo C. Surgical wound closures. 4,637,380, Cl. 128-334.00C.

Org, Tiit A.: *See*—
Teder, Leonid O.; Org, Tiit A.; Lauri, Vaino G.; and Aas, Ants J., 4,637,102, Cl. 24-642.000.

Orlek, Barry S.: *See*—
Gaster, Laramie M.; and Orlek, Barry S., 4,638,066, Cl. 544-344.000.

Orrestad, Charles W.: *See*—
Peterman, Stanley; Orrestad, Charles W.; and Iwanczuk, Paul, 4,637,672, Cl. 339-61.00R.

Ortho Diagnostic Systems, Inc.: *See*—
Brown, Michael C.; and Kirchanski, Stefan J., 4,637,986, Cl. 436-10.000.

Ortho Pharmaceutical Corporation: *See*—
Kung, Patric C.; and Goldstein, Gideon, 4,637,983, Cl. 435-240.000.

Ortwein, Hermann; Krettek, Ottmar; and Nicolin, Johannes, to Clouth Gummiwerke Aktiengesellschaft. Wheel set for rail vehicles. 4,637,646, Cl. 295-37.000.

Osaka University: *See*—
Komatsu, Masao; and Fujita, Hiroshi, 4,637,927, Cl. 423-644.000.

Osakabe, Mitsuo, to Starting Industry Company Limited. Recoil starter. 4,637,360, Cl. 123-185.00A.

Osawa, Masao: *See*—
Kikuchi, Kunio; Kamada, Fujio; and Osawa, Masao, 4,637,508, Cl. 198-365.000.

Oscarsson, Rolf A.: *See*—
Reed, Charles C.; Cooley, Denton A.; Crane, Terry N.; Swanson, Edward A.; Oscarsson, Rolf A.; Liebmann, Vern L.; and Cox, Dan L., 4,637,917, Cl. 422-46.000.

Oshiage, Katsunori, to Nissan Motor Co., Ltd. Control system for motor vehicle with continuously variable transmission and engine. 4,637,280, Cl. 74-866.000.

Oshima, Mitsuaki; and Yamaguchi, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Solid-state image pickup device. 4,638,362, Cl. 358-213.000.

Osman, Robert M.; and Shulik, Larry J., to Exxon Research & Engineering Co. Catalytic gas synthesis apparatus. 4,637,918, Cl. 422-148.000.

Oswald, Klaus: *See*—
Mattes, Bernhard; Oswald, Klaus; and Suchowerskyj, Wadym, 4,638,179, Cl. 307-10.0SB.

Otsuka, Hirofumi: *See*—
Takahashi, Tsuneo; and Otsuka, Hirofumi, 4,637,264, Cl. 73-862.330.

Ott, Granville E., to Texas Instruments Incorporated. Spatial light modulator drive system. 4,638,309, Cl. 340-752.000.

Otteson, Jack O., to Dana Corporation. Adjustable throttle connector for a vehicle speed control unit. 4,637,485, Cl. 180-175.000.

Otto, Lee W., to General Electric Company. Sandblasted incandescent lamps with an improved neck section. 4,638,208, Cl. 313-116.000.

Ouellette, William R.; Alcombright, Daniel S.; Curro, John J.; and Lipman, E. Kelly, to Procter & Gamble Company, The. Macroscopically expanded three-dimensional polymeric web for transmitting both dynamically deposited and statically contacted fluids from one surface to the other. 4,637,819, Cl. 604-369.000.

Ovshinsky, Stanford R.; Guha, Subhendu; Nath, Prem; Yang, Chi C.; Fournier, Jeffrey; and Kulman, James, to Energy Conversion Devices, Inc. Gas mixtures for the vapor deposition of semiconductor material. 4,637,895, Cl. 252-188.310.

Ovshinsky, Stanford R.: *See*—
Lee, Henry; deNeufville, John P.; and Ovshinsky, Stanford R., 4,637,938, Cl. 427-53.100.

Owa, Yutaka; Tanaka, Yoshiro; Saito, Takeshi; and Takeda, Yoshiro, to Lion Corporation. Method for forming a moisture barrier in a soil containing soluble salts. 4,637,759, Cl. 405-270.000.

Owen, Lawrence B.; Masterson, Daniel M.; and Green, Sidney J., to Terra Tek, Inc.; and Geotechnical Resources Ltd. Rapid construction of ice structures with chemically treated sea water. 4,637,217, Cl. 62-74.000.

Owens, Brian T.; and Corona, Fredrick W., to Wallingford Barbell Company. Compact multiple purpose exercise bench. 4,637,608, Cl. 272-134.000.

Owens-Corning Fiberglas Corporation: *See*—
Crothers, Steven D., 4,637,188, Cl. 52-404.000.
Dunn, Charles S.; Propster, Mark A.; and Hohman, Charles M., 4,638,490, Cl. 373-35.000.
Perkins, Richard A., 4,638,491, Cl. 373-39.000.
Shah, Hasmukh G.; and Musgrave, Dwight S., 4,637,946, Cl. 428-63.000.

Oxner, Clifford F. J., to Canada, Her Majesty the Queen in Right of. Jellyfish array. 4,637,490, Cl. 181-175.000.

Oy Wartsila AB: *See*—
Kyytsonen, Markku, 4,637,566, Cl. 242-56.00R.
Mielonen, Pekka A., 4,637,234, Cl. 70-34.000.
Nevalainen, Kyosti; and Martikainen, Kaarlo, 4,637,240, Cl. 70-366.000.

Oya, Yuichiro, to Sharp Kabushiki Kaisha. Microwave oven with door latching assembly. 4,638,136, Cl. 219-10.55C.

Ozawa, Hitoshi: *See*—
Matoba, Yoshiaki; and Ozawa, Hitoshi, 4,637,786, Cl. 418-55.000.

Pakula, Benjamin J., to Ford Motor Company. System for removal of water from diesel fuel systems. 4,637,351, Cl. 123-25.00J.

Palara, Sergio; and Torazzina, Aldo, to SGS-ATES Componenti Elettronici S.p.A. Audio amplifier switch-on control circuit. 4,638,507, Cl. 381-94.000.

Palin, Philip R.: *See*—
Callahan, Wayne B.; Koch, Harold O.; Palin, Philip R.; and Cook, James R., 4,638,056, Cl. 536-54.000.

Pallhorn, Sebald: *See*—
Radtke, Wolfgang; Borbely, Gyorgy; Pallhorn, Sebald; and Hollfritsch, Erich, 4,637,184, Cl. 52-220.000.

Palmberg, Paul W., to Perkin-Elmer Corporation, The. Apparatus and method for reducing topographical effects in an auger image. 4,638,446, Cl. 364-555.000.

PanCanadian Petroleum Limited: *See*—
Schramm, Laurier L., 4,637,417, Cl. 137-4.000.

Pancham, Nazreen, to Miles Laboratories, Inc. Process for producing a concentrate enriched in coagulation factors VII and VIIa. 4,637,932, Cl. 424-101.000.

Paoli, Thomas L.: *See*—
Burnham, Robert D.; Paoli, Thomas L.; Thornton, Robert L.; and Sprague, Robert A., 4,638,334, Cl. 346-108.000.

Papst-Motoren GmbH & Co. KG: *See*—
von der Heide, Johann, 4,638,192, Cl. 310-12.000.

Parham, Thomas G.: *See*—
Beers, William W.; and Parham, Thomas G., 4,638,214, Cl. 313-487.000.

Parisch, Jochen; and Herlemann, Werner, to Daimler-Benz Aktiengesellschaft. Method for fastening a covering part at a frame part. 4,637,116, Cl. 29-441.00R.

Parisel, Jacques: *See*—
Fauvet, Jean-Pierre; and Parisel, Jacques, 4,638,419, Cl. 363-87.000.

Park, Noh-Aeok: *See*—
Irvine, Thomas F., Jr.; and Park, Noh-Aeok, 4,637,250, Cl. 73-57.000.

Parker, Fabienne: *See*—
Jolles, Pierre; Migliore-Samour, Daniele; Parker, Fabienne; and Casaretto, Monika, 4,637,997, Cl. 514-17.000.

Parkinson, Gerald W.: *See*—
Bradford, Michael P.; Parkinson, Gerald W.; and Grant, Ross M., 4,638,175, Cl. 307-64.000.

Parmigiani, Bruno: *See*—
Giorgio, Giancarlo; and Parmigiani, Bruno, 4,638,112, Cl. 174-77.000.

Parsley, David W.: *See*—
Martin, Hubert C., Jr.; Hitler, Gene D.; and Parsley, David W., 4,638,417, Cl. 363-41.000.

Partus, Fred P.; and Jones, Michael A., to National Product Marketing. Control switch cover. 4,638,129, Cl. 200-43.220.

Pasternak, Stephen F.; and Wohrstein, Franz X., to Peerless of America, Inc. Process of making heat exchangers. 4,637,111, Cl. 29-157.30A.

Patane, Joseph M.: *See*—
Inskip, Ervin B.; and Patane, Joseph M., 4,638,079, Cl. 560-4.000.

Patel, Arvind D.; and Salandanan, Carmelita S., to Dresser Industries, Inc. Fluid loss additives for oil base muds and low fluid loss compositions thereof. 4,637,883, Cl. 252-8.515.

Patel, Jayant: *See*—
Niblock, John A.; Patel, Jayant; Fisher, Dennis; and Lumb, Anthony P., 4,638,432, Cl. 364-200.000.

Paton, H. Neil. Swivelable single axle railcar truck and railcar. 4,637,318, Cl. 105-167.000.

Paton, H. Neil; and Skilling, John B. Articulated gondola railcar. 4,637,320, Cl. 105-406.100.

Pauker, Armando; and Preuit, Richard B., to Tandem Computers Incorporated. Base drive circuit for high-power switching transistor. 4,638,240, Cl. 323-289.000.

Pauly, Bernard: *See*—
Perin, Robert; Jourdan, Pierre; and Pauly, Bernard, 4,637,573, Cl. 244-54.000.

Pavelka, Lee A.: *See*—
Bergeson, David L.; Pavelka, Lee A.; and Mielke, Barbara A., 4,637,950, Cl. 428-168.000.

Pechar, Henry W., Jr.; and Sproch, James D., to Standard Microsystems Corp. Virtual ground read only memory. 4,638,459, Cl. 365-104.000.

Peck, Walter R.: *See*—
Miseyko, George; Peck, Walter R.; and Chase, Ronald G., 4,637,577, Cl. 244-147.000.

Pede AB: *See*—
Nordin, Inge, 4,637,105, Cl. 29-24.500.

Peerless Machine & Tool Corporation: *See*—
Fortney, Joe L., 4,637,811, Cl. 493-167.000.

Peerless of America, Inc.: *See*—
Pasternak, Stephen F.; and Wohrstein, Franz X., 4,637,111, Cl. 29-157.30A.

Pegg, Anthony E.: *See*—
O'Brien, Thomas G.; Pegg, Anthony E.; and Herlyn, Meehard, 4,637,984, Cl. 435-240.000.

Peiffer, Dennis G.; Lundberg, Robert D.; and Pober, Kenneth W., to Exxon Research and Engineering Company. Polyampholytes - high temperature viscosifiers for high ionic strength drilling fluids. 4,637,882, Cl. 252-8.514.

Pellinen, Markku; Malkki, Yrjo ; and Niskanen, Aimo, to Valtion Teknillinen Tutkimuskeskus. Method of growing edible mushrooms. 4,637,163, Cl. 47-1.100.

Pence, Jane R.: *See*—
Beglin, Thomas W.; Pence, Jane R.; Kamionka, Harvey E.; and Pence, Jerry W., 4,638,424, Cl. 364-200.000.

Pence, Jerry W.: *See*—
Beglin, Thomas W.; Pence, Jane R.; Kamionka, Harvey E.; and Pence, Jerry W., 4,638,424, Cl. 364-200.000.

Pencept, Inc.: *See*—
Blesser, Barry A.; and Prentice, Thomas C., 4,638,119, Cl. 178-19.000.

Penney, Bruce J., to Tektronix, Inc. Rectangular wave pulse generators. 4,638,255, Cl. 328-36.000.

Pennwalt Corporation: *See*—
Radice, Peter F., 4,638,207, Cl. 310-328.000.

Percec, Virgil, to B. F. Goodrich Company, The. Alternating block copolymers of polyarylene polyethers and process for their preparation. 4,638,039, Cl. 525-534.000.

Perichon, Christian: *See*—
Huet, Yves; and Perichon, Christian, 4,637,294, Cl. 91-536.000.

Perichon, Jacques; Rabemanantsoa, Amelie; Sibille, Soline; and D'Incan, Esther, to Societe Nationale des Poudres et Explosifs. Process for the electrosynthesis of alcohols and of epoxy compounds. 4,637,863, Cl. 204-59.00R.

Perin, Robert; Jourdan, Pierre; and Pauly, Bernard, to Societe Nationale Industrielle Aerospatiale. Arrowlike aircraft wing equipped with a high-lift system and with a pylon for suspending the engine. 4,637,573, Cl. 244-54.000.

Perkin-Elmer Corporation, The: *See*—
Palmberg, Paul W., 4,638,446, Cl. 364-555.000.

Perkins, Charles V., to U.S. Philips Corporation. Adjusting the direction of a beam of radiation. 4,637,695, Cl. 350-631.000.

Perkins, David J., to Chrysler Motors Corporation. Anti-roll torsion bar arrangement for vehicle rear suspension. 4,637,628, Cl. 280-689.000.

Perkins, Richard A., to Owens-Corning Fiberglas Corporation. Method for protecting the heating electrodes of glass melting furnaces. 4,638,491, Cl. 373-39.000.

Perra, Raymond C.; Wilmot, Stephen B.; and Games, John E., to United Technologies Corporation. EAROM and EEPROM data storage management. 4,638,430, Cl. 364-300.000.

Perrella, Guido; and Thompson, William E., to DBM Industries Limited. Die casting mold. 4,637,451, Cl. 164-342.000.

Perri, Joseph A.: *See*—
La Bate, Michael D., II; and Perri, Joseph A., 4,637,592, Cl. 266-272.000.

Perrin, Alain; and Moinard, Patrice, to Societe Anonyme D.B.A. Device for mounting a protective cap on a support. 4,637,747, Cl. 403-23.000.

Pescetelli, Alessandro: *See*—
Cammi, Sergio; D'Este, Arturo; and Pescetelli, Alessandro, 4,637,832, Cl. 75-109.000.

Peterman, Stanley; Orrestad, Charles W.; and Iwanczuk, Paul, to Quinton Instrument Company. Radiotransparent lead assembly for monitoring electrodes. 4,637,672, Cl. 339-61.00R.

Petermann, Harald; and Bauer, Peter, to GMN Georg Muller Nurnberg GmbH. Apparatus for spanning a center-opening saw blade. 4,637,369, Cl. 125-15.000.

Petersen, Robert E. Sewer check valve with cutting seat. 4,637,425, Cl. 137-412.000.

Peterson, Luetta M., to Mainstay, Inc. Bird feeder. 4,637,344, Cl. 119-52.00R.

Peterson, Paul F., to Lockheed Corporation. Rotary launcher system for an aircraft. 4,637,292, Cl. 89-1.804.

Petro-Canada Inc.: *See*—
Schramm, Laurier L., 4,637,417, Cl. 137-4.000.

Pfaffmann, George D., to Tocco, Inc. Method for heat treating ferrous parts. 4,637,844, Cl. 148-144.000.
Pfeffer, Hans-Rudolf: *See*—
Wegehaupt, Karl-Heinrich; and Pfeffer, Hans-Rudolf, 4,637,958, Cl. 428-416.000.
Pfizer Inc.: *See*—
Richardson, Kenneth; and Whittle, Peter J., 4,638,007, Cl. 514-340.000.
Phenix, Douglas Michael: *See*—
Davis, Ronald G., 4,637,965, Cl. 429-1.000.
Phiffer, Leroy V.: *See*—
Kleffman, David R.; and Phiffer, Leroy V., 4,637,668, Cl. 339-10.000.
Philip Morris Incorporated: *See*—
Rainer, Norman B.; and McClung, Charles S., 4,637,408, Cl. 131-331.000.
Phillips, Emyr; and Holt, Brian, to Ciba-Geigy Corporation. Method of removing hydrogen sulphide from gases. 4,637,926, Cl. 423-573.00R.
Phillips Petroleum Company: *See*—
Battiste, David R.; and Harris, Jesse R., 4,637,991, Cl. 502-68.000.
Lindstrom, Merlin R.; and Mark, Harold W., 4,637,833, Cl. 106-14.130.
Shaw, James E.; and Westerman, John, 4,637,467, Cl. 166-295.000.
Phillips, William R.: *See*—
Holder, Donald W.; and Phillips, William R., 4,637,571, Cl. 244-3.160.
Physio-Control Corporation: *See*—
Jones, Paul W.; Merry, Rodney J.; and Linstad, Gregory A., 4,637,749, Cl. 403-322.000.
Piaggio & C. S.p.A.: *See*—
Gaddi, Bruno, 4,637,277, Cl. 74-865.000.
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Shulenberger, Arthur M.; and Piatt, John A., 4,637,713, Cl. 355-76.000.
Piatt, Michael J.: *See*—
Schneider, John M.; Piatt, Michael J.; Brown, Mark E.; and Bowers, Mark C., 4,638,325, Cl. 346-1.100.
Piche, Richard. Foodstuff slicer. 4,637,138, Cl. 30-114.000.
Pico Electronics Limited: *See*—
Campbell, David C., 4,638,299, Cl. 340-310.00A.
Picollo, August J. Reusable concrete curb inlet form. 4,637,585, Cl. 249-10.000.
Pierre, Charbonnel: *See*—
Leseure, Jean-Yves; Pierre, Charbonnel; and Laure, Christian, 4,638,167, Cl. 250-551.000.
Pieters, Wim J. M.; and Okumura, Yoshiharu, to Exxon Research & Engineering Co. Two stage process for improving the catalyst life of zeolites in the synthesis of lower olefins from alcohols and their ether derivatives. 4,638,106, Cl. 585-640.000.
Pietrasanta, Yves: *See*—
Bauduin, Gerard; Boutevin, Bernard; Deiss, Willy-Jean; and Pietrasanta, Yves, 4,638,018, Cl. 522-103.000.
Pilkington P.E. Limited: *See*—
Freeman, Michael H., 4,637,697, Cl. 351-161.000.
Pioneer Electronic Corporation: *See*—
Sawaki, Manabu, 4,638,222, Cl. 318-111.000.
Pirone, Vincent A., to RCA Corporation. Electrical discharge machine cooling fluid containment apparatus. 4,638,139, Cl. 219-69.00W.
Pisiotas, Georg: *See*—
Schurter, Rolf; and Pisiotas, Georg, 4,637,829, Cl. 71-90.000.
Pitney Bowes Inc.: *See*—
Daniels, Edward P., 4,638,439, Cl. 364-446.000.
Gavaghan, Thomas J.; Boucher, Paul D.; and Janatka, Karel, 4,637,602, Cl. 271-238.000.
Piuma, Adolfo, to VA.NI.M S.r.l. Process for the separation of metal compounds by reduction. 4,637,920, Cl. 423-67.000.
Plastic Oddities Inc.: *See*—
Izzi, Lewis B., Sr., 4,637,422, Cl. 137-360.000.
Plessey Overseas Limited: *See*—
Dakin, John P., 4,638,153, Cl. 250-227.000.
Plug-In Storage Systems, Inc.: *See*—
Maroney, Ralf P.; Fishkind, Gregory A.; and Schneider, Frederick, 4,638,399, Cl. 361-220.000.
Pober, Kenneth W.: *See*—
Peiffer, Dennis G.; Lundberg, Robert D.; and Pober, Kenneth W., 4,637,882, Cl. 252-8.514.
Polk Audio Inc.: *See*—
Polk, Matthew S.; and Campbell, Colin B., 4,638,505, Cl. 381-24.000.
Polk, Matthew S.; and Campbell, Colin B., to Polk Audio Inc. Optimized low frequency response of loudspeaker systems having main and sub-speakers. 4,638,505, Cl. 381-24.000.
Pollack, Jack, to Amtel, Inc. Offshore hydrocarbon production system. 4,637,335, Cl. 114-230.000.
Pollari, Theodore J., to Textron Inc. Self-priming diffuser type centrifugal pump. 4,637,778, Cl. 415-53.00R.
Poly-John Enterprises Corp.: *See*—
Harding, George W., 4,637,299, Cl. 98-29.000.
Polynorm, N.V.: *See*—
Metz, Laurens, 4,637,183, Cl. 52-217.000.
Pominville, Douglas A., to Atlantic Richfield Company. Paint detackification method. 4,637,824, Cl. 55-85.000.
Pons, Claude, to Videocolor. Apparatus for adjusting the position of a deflector on a television tube, particularly a color tube. 4,638,219, Cl. 315-368.000.
Poestingl, Michael J.; Trump, Walter N.; and Kessler, Robert C., to Custom Sample Systems, Inc. Optical and electronically compared absorptiometer. 4,637,730, Cl. 356-411.000.
Porsche Aktiengesellschaft: *See*—
Schmid, Wolfgang, 4,637,363, Cl. 123-481.000.
Portex, Inc.: *See*—
Melendy, Clifford P., 4,637,388, Cl. 128-207.140.
Post, Martin F. M.: *See*—
van Erp, Willibrord A.; Naanne, Johannes M.; and Post, Martin F. M., 4,637,993, Cl. 502-242.000.
Potter, Troy J. Ventless liquid recovery system for pressurized gas lines. 4,637,440, Cl. 141-65.000.
Power Alcohol, Inc.: *See*—
Nagle, Richard T., 4,637,835, Cl. 127-37.000.
Powers, Frederick A.; and Gustafson, Thomas J. Pump seal with curved backup plate. 4,637,295, Cl. 92-170.000.
Powers, Hurshal G.: *See*—
Kirchner, Tommy L.; and Powers, Hurshal G., 4,637,718, Cl. 356-71.000.
PPG Industries, Inc.: *See*—
Christenson, Roger M.; Rosenberger, Mary E.; and Tetenbaum, Marvin T., 4,638,020, Cl. 523-406.000.
Das, Balbhadra; Temple, Chester S.; and Melle, Carl A., 4,637,956, Cl. 428-391.000.
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Precision Mecanique Labinal: *See*—
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Preuit, Richard B.: *See*—
Pauker, Armando; and Preuit, Richard B., 4,638,240, Cl. 323-289.000.
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Priest, Wayne A., to SOR, Inc. Pressure differential control mechanism. 4,637,258, Cl. 73-716.000.
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Crabtree, Paul J.; and Imakawa, Kazuhiko, 4,637,890, Cl. 252-90.000.
Kirkpatrick, Steven J.; Zoller, Steven A.; and Woods, Daniel L., 4,637,935, Cl. 426-443.000.
Ouellette, William R.; Alcombright, Daniel S.; Curro, John J.; and Linman, E. Kelly, 4,637,819, Cl. 604-369.000.
Trokhan, Paul D., 4,637,859, Cl. 162-109.000.
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Denimal, Philippe, 4,638,354, Cl. 358-106.000.
Progressive Tool & Industries Company: *See*—
Freeman, Herbert J., 4,637,133, Cl. 29-727.000.
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Teder, Leonid O.; Org, Tiit A.; Lauri, Vaino G.; and Aas, Ants J., 4,637,102, Cl. 24-642.000.
Propster, Mark A.: *See*—
Dunn, Charles S.; Propster, Mark A.; and Hohman, Charles M., 4,638,490, Cl. 373-35.000.
Proto-Power Corporation: *See*—
Baudro, Thomas O., 4,638,166, Cl. 250-515.100.
Pruitt, Martin E.; Case, Cecil L.; and Fritz, David P., to Hesston Corporation. Wide-cut windrower-conditioner having uniform crop distribution and conditioning. 4,637,201, Cl. 56-16.400.
Puisais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel; and Kaluszynski, Michel, to TOTAL Compagnie Francaise des Petroles. Machine for electron-beam internal butt welding of tubes. 4,638,142, Cl. 219-121.0EC.
Pulse Electronics, Inc.: *See*—
Fernandez, Emilio A., 4,638,237, Cl. 320-48.000.
Pucasu, Boris, to Ford Motor Company. Sensor assembly for a radiator mounted coolant level monitoring system. 4,638,291, Cl. 340-59.000.
Quay, Steven C., to Salutar, Inc. Ferrioxamine-paramagnetic contrast agents for MR imaging, composition, apparatus and use. 4,637,929, Cl. 424-9.000.
Quercetti, Alessandro. Process for the manufacture of boxes, the boxes which result therefrom and the elements for their composition. 4,637,544, Cl. 229-44.00R.
Quinn, Bruce A.; and Barton, Scott N., to NCR Corporation. Order entry system including an interactive menu display. 4,638,312, Cl. 340-825.350.
Quinton Instrument Company: *See*—
Peterman, Stanley; Orrestad, Charles W.; and Iwanczuk, Paul, 4,637,672, Cl. 339-61.00R.
Quixote Corporation: *See*—
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R.F.J. Associates Limited: *See*—
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Raab, Harald: *See*—
Gobel, Hilmar; and Raab, Harald, 4,637,500, Cl. 192-3.280.
Rabe, Karl L. G. Nail-type fastener, and process for manufacturing such fasteners. 4,637,768, Cl. 411-452.000.

Rabemananttsoa, Amelie: *See*—
Perichon, Jacques; Rabemananttsoa, Amelie; Sibille, Soline; and D'Incan, Esther, 4,637,863, Cl. 204-59.00R.
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Racz, Gabor B.; and Lewis, Royce C. Constant pressure tourniquet. 4,637,394, Cl. 128-327.000.
Radice, Peter F., to Pennwalt Corporation. Piezoelectric polymeric film balloon speaker. 4,638,207, Cl. 310-328.000.
Radin, George: *See*—
Chang, Albert; Cocke, John; Mergen, Mark F.; and Radin, George, 4,638,426, Cl. 364-200.000.
Radtke, Wolfgang; Borbely, Gyorgy; Pallhorn, Sebald; and Hollfritsch, Erich. Hollow floor. 4,637,184, Cl. 52-220.000.
Ragonese, Louis J.: *See*—
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Rai, Surinder S.: *See*—
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Rainer, Norman B.; and McClung, Charles S., to Philip Morris Incorporated. Filter material for the removal of nitric oxide. 4,637,408, Cl. 131-331.000.
Raizon, Bernard; Rossey, Guy; and Wick, Alexander, to Synthelabo. Preparation of diphenylazomethines. 4,638,080, Cl. 560-35.000.
Rajeevakumar, Thekkemadathil V.; and Terman, Lewis M., to International Business Machines Corporation. Self-timed precharge circuit. 4,638,462, Cl. 365-203.000.
Ramsden, Gordon, to Whirlwind, Inc. Work presence controller. 4,637,289, Cl. 83-380.000.
Rand, Stephen C.; and DeShazer, Larry G., to Hughes Aircraft Company. Solid state laser employing diamond having color centers as a laser active material. 4,638,484, Cl. 372-42.000.
Ranjan, Radha K.: *See*—
Frind, Gerhard; Carroll, James J.; Van Noy, John H.; Leach, John G.; and Ranjan, Radha K., 4,638,283, Cl. 337-162.000.
Rao, Chennupati K.; Arora, Sudershan K.; Grover, Raman; Durden, John A.; and D'Silva, Themistocles D. J., to Union Carbide Corporation. N-(alpha-haloacyl)-N-hydrocarbyl carbamoyl halides. 4,637,901, Cl. 260-544.00C.
Rassmann, Christoph: *See*—
Annipajo, Wolfgang; Breuer, Oswald; and Rassmann, Christoph, 4,637,658, Cl. 299-79.000.
Rathel, Dieter, to Webasto-Werk W. Baier GmbH & Co. Fuel-operated heating system, particularly an auxiliary heater for a vehicle. 4,637,371, Cl. 126-110.00B.
Raudat, John L.; and Thompson, Timothy H., to Standard-Knapp, Inc. Article grouper for case packer. 4,637,509, Cl. 198-425.000.
Rauh, Kurt: *See*—
Jenzach, Gunter; Rauh, Kurt; and Wegscheider, Hans J., 4,637,558, Cl. 241-79.000.
Rausch, Werner; and Mueller, Gerhard, to Metallgesellschaft, A.G. Process for phosphating metals. 4,637,838, Cl. 148-6.15Z.
Raute Oy: *See*—
Eerola, Matti V., 4,637,599, Cl. 271-5.000.
Raven, Robert S., to Westinghouse Electric Corp. Rotor tip synthetic aperture radar. 4,638,315, Cl. 342-5.000.
Ravnitzky, Michael J., to Cornell Research Foundation, Inc. Parachute with leading-edge slats. 4,637,576, Cl. 244-145.000.
Ray, Andrew I. A., to Microsurgical Equipment Limited. Surgical instrument. 4,637,393, Cl. 128-305.000.
Ray, Charles A.; and Walker, Samuel C., to Anthony Manufacturing Corp. Releasable locking assembly for sprinkler valve units. 4,637,548, Cl. 239-201.000.
Raychem Corporation: *See*—
Stewart, John B., Jr.; Szalvay, Laszlo; de Brunier, Bernard; and Simpson, Jeffrey W., 4,637,436, Cl. 138-89.000.
Whitney, Wells, 4,638,150, Cl. 219-543.000.
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Raynham Investments Limited: *See*—
Sanders, Bernard, 4,637,411, Cl. 132-9.000.
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Francis, Samuel A., 4,638,468, Cl. 367-153.000.
Razzell, Charles J. H.: *See*—
van Rumpt, Herman W.; and Razzell, Charles J. H., 4,638,263, Cl. 331-116.00R.
RCA Corporation: *See*—
Christopher, Todd J.; Willis, Donald H.; and Fling, Russell T., 4,638,360, Cl. 358-148.000.
Deal, Samuel B.; and Bartch, Donald W., 4,638,213, Cl. 313-479.000.
Deiss, Michael S., 4,638,181, Cl. 307-243.000.
Elabd, Hamman; and Kosonocky, Walter F., 4,638,345, Cl. 357-24.000.
Flatley, Doris W.; and Hsu, Sheng T., 4,637,836, Cl. 148-1.500.
McCandless, Harry E., 4,637,804, Cl. 445-36.000.
Pirone, Vincent A., 4,638,139, Cl. 219-69.00W.
Sinniger, Joseph O.; and Robbi, Anthony D., 4,638,498, Cl. 377-39.000.
RCA, Inc.: *See*—
Lightstone, Alexander W., 4,637,126, Cl. 29-572.000.
Reed, Charles C.; Cooley, Denton A.; Crane, Terry N.; Swanson, Edward A.; Oscarson, Rolf A.; Liebmann, Vern L.; and Cox, Dan L. Bubble oxygenator. 4,637,917, Cl. 422-46.000.
Rees, Elwyn. Data entry interface assembly. 4,638,422, Cl. 364-200.000.
Regie Nationale des Usines Renault: *See*—
Bernard, Montaron; Claude, Lombard; Claude, Moyses; and Gerard, Catier, 4,637,246, Cl. 73-35.000.
Rehmann, Robert, to EMS-Inventa AG. Method of, and apparatus for, increasing the energy in an electromagnetic fuze system. 4,637,311, Cl. 102-209.000.
Reichel, Curtis J.; Levis, William W., Jr.; and Hartman, Robert J., to BASF Corporation. Delayed co-initiation process for preparing polyol blends. 4,637,893, Cl. 252-182.000.
Reichel, Wolfgang: *See*—
Costa, Jorge; and Reichel, Wolfgang, 4,637,601, Cl. 271-160.000.
Reichelt, Achim: *See*—
Mahlein, Hans F.; Reichelt, Achim; and Winzer, Gerhard, 4,637,682, Cl. 350-96.150.
Reid, Dennis D. Archimedian screw type spinner lure. 4,637,158, Cl. 43-42.190.
Reid, Iain K.; Staite, Eric; Richmond, Doug; and Rumbelow, George, to Joyce International, Inc. Positive interlock for file cabinet. 4,637,667, Cl. 312-217.000.
Reinker, Joseph F., Jr.: *See*—
Fournier, Paul J. E.; and Reinker, Joseph F., Jr., 4,637,640, Cl. 283-319.000.
Remec, Matthew J. Thermal level detector for conductive or nonconductive liquids or gases. 4,638,288, Cl. 340-52.00F.
Renaut, Paul W.: *See*—
Archer, Wendel E.; Milton, James L.; Renaut, Paul W.; and Winquist, Nelson H., 4,638,274, Cl. 335-52.000.
Renga, James M.: *See*—
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Renix Electronique: *See*—
Bernard, Montaron; Claude, Lombard; Claude, Moyses; and Gerard, Catier, 4,637,246, Cl. 73-35.000.
Research Corporation: *See*—
Chang, Stephen S.; Ho, Chi-Tang; and Houlihan, Christopher M., 4,638,095, Cl. 568-326.000.
Clark, C. Randall, 4,638,014, Cl. 514-619.000.
O'Brien, Thomas G.; Pegg, Anthony E.; and Herlyn, Meehard, 4,637,984, Cl. 435-240.000.
Resinoid Engineering Corporation: *See*—
Ebner, Howard A., 4,638,202, Cl. 310-235.000.
Reuschling, Dieter: *See*—
Clauss, Karl; Linkies, Adolf; and Reuschling, Dieter, 4,638,063, Cl. 544-2.000.
Reynolds, George A.: *See*—
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Reynolds Metals Company: *See*—
Gilliam, Edward C.; Jackson, John M.; and Lamie, Billy J., 4,637,260, Cl. 73-826.000.
Rhee, Chong-Kon; McKibben, David M.; and Bibbee, Jeffrey N., to Uniroyal Goodrich Tire Company, The. Test instrument. 4,637,252, Cl. 73-150.00A.
Rhodes, James A.: *See*—
Acock, George W., Jr., 4,637,176, Cl. 52-30.000.
Rhodes, Warren W.: *See*—
Ling, Hung C.; Rhodes, Warren W.; and Yan, Man F., 4,637,989, Cl. 501-135.000.
Riach, Richard L.: *See*—
England, John R.; and Riach, Richard L., 4,637,475, Cl. 173-43.000.
Ricchio, Dominic A. Apparatus for measurement of water conditions in a watermattress. 4,637,737, Cl. 374-141.000.
Rice, Billy J.: *See*—
Weathers, Gary G.; and Rice, Billy J., 4,637,470, Cl. 166-344.000.
Richards, Brian T., to Cadbury Limited. Apparatus for making a confection including a depositing means and conveyor carried molds. 4,637,788, Cl. 425-4.00R.
Richardson, Kenneth; and Whittle, Peter J., to Pfizer Inc. Triazole antifungal agents. 4,638,007, Cl. 514-340.000.
Richmond, Doug: *See*—
Reid, Iain K.; Staite, Eric; Richmond, Doug; and Rumbelow, George, 4,637,667, Cl. 312-217.000.
Richter, Johan C. F. C.; and Richter, Ole J., to Kamyr Aktiebolag. Reciprocal movable screens in a vertically elongated vessel. 4,637,878, Cl. 210-388.000.
Richter, Ole J.: *See*—
Richter, Johan C. F. C.; and Richter, Ole J., 4,637,878, Cl. 210-388.000.
Rickard, Dale A.; and Rudelis, Glen H., to International Business Machines Corporation. Dynamically selectable polarity latch. 4,638,183, Cl. 307-291.000.
Ricoh Company, Ltd.: *See*—
Funato, Hiroyoshi, 4,637,679, Cl. 350-6.500.
Iiyama, Kiyotaka; and Inaba, Norihiko, 4,638,340, Cl. 346-204.000.
Yuasa, Kazuhiro, 4,637,708, Cl. 355-3.0DD.
Ricouard, Jacques; and Chappoux, Claude, to Ronis S.A. Coin lock device for shopping trolleys. 4,637,507, Cl. 194-212.000.
Ridgely, Myron H.: *See*—
Foss, Janet M. P.; Foss, John; Brooks, Christopher G.; and Ridgely, Myron H., 4,637,626, Cl. 280-655.000.
Riemann, Achim; and Ude, Werner, to Rohm GmbH. Method for making 4,4'-dihydroxydiphenyl ether. 4,638,099, Cl. 568-638.000.
Rieter Machine Works Limited: *See*—
Schmid, Rene; and Krehl, Hermann, 4,637,565, Cl. 242-55.100.
Rikagaku Kenkyusho: *See*—
Idesawa, Masanori, 4,637,715, Cl. 356-1.000.

Ritchie, Frank. Controls for a game bike. 4,637,605, Cl. 272-73.000.
Ritter, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. New organic boron polymers and their use. 4,638,092, Cl. 568-1.000.
Rivkin, Bernard W. Semi-permanent filing, flagging and indexing system. 4,637,149, Cl. 40-2.00R.
RJB and C Company: *See*—
Baer, Robert J., 4,637,631, Cl. 281-15.00R.
Roba, Joseph: *See*—
Lambelin, Georges E.; Roncucci, Romeo R.; Roba, Joseph; and Gillet, Claude L., 4,638,070, Cl. 549-23.000.
Robbi, Anthony D.: *See*—
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Robert Bosch GmbH: *See*—
Berner, Erwin; and Zettel, Hans-Dieter, 4,637,196, Cl. 53-77.000.
Dreyer, Adolf; and Roozenbeek, Herman, 4,637,247, Cl. 73-35.000.
Junginger, Erich; Schnaibel, Eberhard; and Schneider, Erich, 4,638,228, Cl. 318-569.000.
Kranzler, Ernst, 4,638,196, Cl. 310-50.000.
Mattes, Bernhard; Oswald, Klaus; and Suchowerskyj, Wadym, 4,638,179, Cl. 307-10.0SB.
Sochor, Josef, 4,638,382, Cl. 360-68.000.
Roberts, Gerald L., to General Electric Company. Clothes washing machine. 4,637,230, Cl. 68-4.000.
Robertshaw Controls Company: *See*—
Ochsner, Rolf H., 4,637,131, Cl. 29-622.000.
Shopsky, Harvey J., 4,638,148, Cl. 219-497.000.
Robinson, Anthony, to E.S.G. Controls, Ltd. Boiler cycling controller. 4,637,349, Cl. 122-448.00B.
Robinson, Douglas B.: *See*—
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Rocco, Jean-Claude: *See*—
Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, 4,638,216, Cl. 315-111.810.
Rochte, Randall S. Segmented geometric structure. 4,637,941, Cl. 428-1.000.
Rockett, Leonard R., Jr., to International Business Machines Corporation. Fast writing circuit for a soft error protected storage cell. 4,638,463, Cl. 365-205.000.
Rockwell International Corporation: *See*—
Cummings, Robert J., 4,637,629, Cl. 280-801.000.
Rodime, PLC: *See*—
Stewart, Alexander; Furness, Duncan S.; and Bhatia, Sham P., 4,638,384, Cl. 360-77.000.
Rodin, Gunnar: *See*—
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Rohm GmbH: *See*—
Riemann, Achim; and Ude, Werner, 4,638,099, Cl. 568-638.000.
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Roland, Michel: *See*—
Hennebert, Pierre; Gillard, Jean; and Roland, Michel, 4,637,916, Cl. 422-36.000.
Rolfe, Jonathan L.: *See*—
Szycher, Michael; Dempsey, Donald J.; and Rolfe, Jonathan L., 4,638,043, Cl. 528-75.000.
Rolland, Albert L.: *See*—
Le Corre, Loic; and Rolland, Albert L., 4,638,200, Cl. 310-156.000.
Rollhaus, Philip; and Endo, Yukio, to Quixote Corporation. Keyboard entry system. 4,638,306, Cl. 340-365.00R.
Rolls-Royce Limited: *See*—
Mills, David; Lindahl, Anthony T.; and Kington, Alan D., 4,637,449, Cl. 164-132.000.
Romeu, Ramon. Machining machine. 4,637,107, Cl. 29-27.00C.
Roncucci, Romeo R.: *See*—
Lambelin, Georges E.; Roncucci, Romeo R.; Roba, Joseph; and Gillet, Claude L., 4,638,070, Cl. 549-23.000.
Ronis S.A.: *See*—
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Roots, Rolland R., to Killark Electric Manufacturing Company. Remote signaling box. 4,638,297, Cl. 340-304.000.
Roozenbeek, Herman: *See*—
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Rosa, John; and Frank, William E., to Westinghouse Electric Corp. High frequency inverter circuit for melting and induction heating. 4,638,138, Cl. 219-10.770.
Rosenbaum, Martin J. Ratchet-action open-end wrench. 4,637,284, Cl. 81-179.000.
Rosenberg, Martin: *See*—
Auerbach, Jeffrey I.; and Rosenberg, Martin, 4,637,980, Cl. 435-68.000.
Rosenberger, Mary E.: *See*—
Christenson, Roger M.; Rosenberger, Mary E.; and Tetenbaum, Marvin T., 4,638,020, Cl. 523-406.000.
Rosenlund, Terje. Method for impregnating wood, and an apparatus for carrying out the method. 4,637,952, Cl. 427-297.000.
Rosenquist, Niles R., to General Electric Company. Compositions. 4,638,101, Cl. 568-720.000.
Rosenquist, Niles R.: *See*—
Brunelle, Daniel J.; Shannon, Thomas G.; and Rosenquist, Niles R., 4,638,077, Cl. 558-281.000.
Rosier, Jean-Claude; Fouche, Claude; and Maincent, Gabriel, to Societe Europeenne de Propulsion. Apparatus for digitalizing an image by analysis by means of a light beam. 4,638,370, Cl. 358-293.000.
Rosini, Paolo; Finaurini, Roberto; and Gaibotti, Maurizio, to SGS-ATES Componenti Elettronici S.p.A. Integrated structure microcomputer provided with non-volatile RAM memory. 4,638,465, Cl. 365-228.000.
Rossey, Guy: *See*—
Raizon, Bernard; Rossey, Guy; and Wick, Alexander, 4,638,080, Cl. 560-35.000.
Rossnagel, Steven M.: *See*—
Bumble, Bruce; Cuomo, Jerome J.; Logan, Joseph S.; and Rossnagel, Steven M., 4,637,853, Cl. 156-345.000.
Rossow, Harold E.: *See*—
Lane, George A.; and Rossow, Harold E., 4,637,888, Cl. 252-70.000.
Rostek, Paul M.: *See*—
Hong, Vuong B.; Rowson, Stuart C.; Daniel, Richard A.; and Rostek, Paul M., 4,638,256, Cl. 328-105.000.
Rothe, Anselm: *See*—
Trasch, Heinz-Freidrich; Rothe, Anselm; Sojka, Bernward; Werner, Wolfgang; and Wielinger, Hans, 4,638,023, Cl. 524-21.000.
Rounds, Nicholas A., to Rohm and Haas Company. Process for molding a polymeric layer onto a substrate. 4,637,904, Cl. 264-1.400.
Rousseau, Jean; and Fourche, Jean P., to Videocolor. Process for positioning and grasping semi ferrites for a magnetic core and centering device for operating said process. 4,637,803, Cl. 445-23.000.
Roussel, Louis J. Anti rotational device for down hole hydraulic pumping unit. 4,637,459, Cl. 166-72.000.
Rowe, Russell L.: *See*—
Bowling, Joseph E.; Carpenter, James H.; and Rowe, Russell L., 4,637,559, Cl. 241-94.000.
Rowson, Stuart C.: *See*—
Hong, Vuong B.; Rowson, Stuart C.; Daniel, Richard A.; and Rostek, Paul M., 4,638,256, Cl. 328-105.000.
Roy, David C. Rotary drive mechanism for energizing toys, kinetic sculptures, or the like. 4,637,152, Cl. 40-495.000.
Roy, Glenn M.: *See*—
Barnett, Ronald E.; Zanno, Paul R.; and Roy, Glenn M., 4,638,071, Cl. 549-88.000.
Rubash, Arlyn R.; and Rubash, Duane R. Holding device. 4,637,632, Cl. 281-45.000.
Rubash, Duane R.: *See*—
Rubash, Arlyn R.; and Rubash, Duane R., 4,637,632, Cl. 281-45.000.
Rubbermaid Commercial Products Inc.: *See*—
Hampshire, James F.; Groth, Hugh F.; and Collins, John M., 4,637,322, Cl. 108-102.000.
Rudelis, Glen H.: *See*—
Rickard, Dale A.; and Rudelis, Glen H., 4,638,183, Cl. 307-291.000.
Ruhle, Wolfgang: *See*—
Glasow, Peter; and Ruhle, Wolfgang, 4,638,165, Cl. 250-370.000.
Ruigrok, Franciscus B. M., to Heras Holding, B.V. Fence pole. 4,637,186, Cl. 52-225.000.
Rule, Robert D.; Skaggs, Bruce A.; and King, Gerald E., to Borg-Warner Corporation. Combination range and master clutch assembly. 4,637,504, Cl. 192-87.170.
Rumbelow, George: *See*—
Reid, Iain K.; Staite, Eric; Richmond, Doug; and Rumbelow, George, 4,637,667, Cl. 312-217.000.
Rupprecht, Bernd, to Deutsche Perrot-Bremse GmbH. Expander mechanism for an internal shoe drum brake. 4,637,499, Cl. 188-79.50R.
Rush, James B.; Bryan, James S.; Gunter, Jonas L.; Dillard, Guy W.; Meadows, Roger D.; and Henry, Pearison W., to Dayco Corporation. Branched hose construction, joint construction and part therefor, and methods of making the same. 4,637,638, Cl. 285-158.000.
Rusz, Tibor. Pulmonary ventilator controller. 4,637,385, Cl. 128-204.210.
Ryan, William E.: *See*—
Marino, Dean F.; Ryan, William E.; and Kamp, Arthur J., 4,638,168, Cl. 250-560.000.
Ryder, Francis E.; and Rabenau, Richard, to Ryder International Corporation. Lens disinfecting appliance with improved venting feature. 4,637,919, Cl. 422-300.000.
Ryder International Corporation: *See*—
Ryder, Francis E.; and Rabenau, Richard, 4,637,919, Cl. 422-300.000.
Rynk, Anthony J.; and DeCarlo, David J., to Thomas & Betts Corporation. Method and apparatus for wiring system installation. 4,637,136, Cl. 29-872.000.
Saab-Scania Aktiebolag: *See*—
Gillbrand, Per Sune; and Johansson, Sven H., 4,637,368, Cl. 123-647.000.
Sperr, Gustaf A., 4,637,651, Cl. 297-458.000.
Saari, Veikko R., to AT&T Bell Laboratories. CMOS differential amplifier stage with bulk isolation. 4,638,259, Cl. 330-253.000.
Sacilor: *See*—
Michaux, Jacques M., 4,637,241, Cl. 72-225.000.
Safety-Kleen Corporation: *See*—
Llewellyn, Michael; and Holden, Stephen, 4,637,413, Cl. 134-111.000.
Sagawa, Morikazu; Mori, Yoshikazu; Ohba, Motoi; Makimoto, Mitsuo; and Yamashita, Sadahiko, to Matsushita Electric Industrial Co., Ltd. Frequency divider circuits. 4,638,180, Cl. 307-219.100.

Saigo, Takaichi: *See*—
Akiyama, Teruo; Sasaki, Katsuyuki; and Saigo, Takaichi, 4,637,781, Cl. 417-216.000.
Saint-Sevin, Michel: *See*—
Baluteau, Jean-Michel; Saint-Sevin, Michel; and Chabanier, Patrick, 4,637,692, Cl. 350-486.000.
Saito, Kazuhiko: *See*—
Uda, Youichi; Matsushima, Seiya; Saito, Kazuhiko; Yamamoto, Shoji; and Murakami, Kazuhiro, 4,637,238, Cl. 70-456.00R.
Saito, Kenji: *See*—
Yoshimura, Yasuo; Yamauchi, Kunio; and Saito, Kenji, 4,638,366, Cl. 358-228.000.
Saito, Masayuki, to Nitto Seiko Co., Ltd. Retaining structure for screw fastening unit in an articulated robot. 4,637,776, Cl. 414-744.00B.
Saito, Takeshi: *See*—
Owa, Yutaka; Tanaka, Yoshiro; Saito, Takeshi; and Takeda, Yoshiro, 4,637,759, Cl. 405-270.000.
Saito, Tokukazu: *See*—
Tanaka, Hiroshi; and Saito, Tokukazu, 4,638,162, Cl. 250-327.200.
Saito, Tsutomu; Hasegawa, Yoshimichi; Yoshikawa, Kazuo; and Aoyama, Shigetsune, to Horikiri Spring Mfg. Co., Ltd.; Aichi Steel Works, Ltd.; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Leaf spring construction. 4,637,594, Cl. 267-47.000.
Saito, Yoshiaki: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, 4,637,963, Cl. 428-694.000.
Saito, Yuichi: *See*—
Fujita, Hideo; Saito, Yuichi; and Miura, Masatoshi, 4,638,205, Cl. 310-312.000.
Saitoh, Hiroyuki: *See*—
Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katoh, Yasuo, 4,638,372, Cl. 358-296.000.
Saitoh, Keishi: *See*—
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,637,972, Cl. 430-84.000.
Sajben, Johannes O.: *See*—
Brockmann, Rolf; Casper, Clemens; Damsky, Walter; Lippert, Axel; and Sajben, Johannes O., 4,637,857, Cl. 159-47.100.
Sakai, Kiyoharu, to Brother Kogyo Kabushiki Kaisha. Wire drive circuit in dot-matrix printer. 4,637,742, Cl. 400-121.000.
Sakai, Shinzo: *See*—
Nishikawa, Masao; Sakai, Shinzo; and Sakurai, Yoshimi, 4,637,278, Cl. 74-866.000.
Sakamaki, Hisashi: *See*—
Shimizu, Katsuichi; Masuda, Shunichi; Yagasaki, Toshiaki; and Sakamaki, Hisashi, 4,638,368, Cl. 358-256.000.
Sakamoto, Shigemi: *See*—
Masuda, Eiji; and Sakamoto, Shigemi, 4,638,303, Cl. 340-347.0DA.
Sakane, Toshio; and Tsunekawa, Tokuichi, to Canon Kabushiki Kaisha. Light metering and processing system particularly for a video camera. 4,638,367, Cl. 358-228.000.
Sakano, Riichi, to Sanden Corporation. Refrigeration system for both vehicle air conditioner and refrigerator. 4,637,220, Cl. 62-200.000.
Sakashita, Kazuhiro: *See*—
Yonezu, Ryo; and Sakashita, Kazuhiro, 4,638,461, Cl. 365-189.000.
Sakuma, Hisayuki; and Hoshinouchi, Susumu, to Mitsubishi Denki Kabushiki Kaisha. Laser machining apparatus. 4,638,145, Cl. 219-121.0LU.
Sakura, Yasuhiro; Nimura, Hitoshi; and Nakayama, Satoshi, to Tokyo Electric Co., Ltd. Thermal printer. 4,638,332, Cl. 346-76.0PH.
Sakurai, Masaki: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yoshihara, Kenji; and Haneji, Yasuo, 4,638,376, Cl. 358-342.000.
Sakurai, Takashi, to Nippondenso Co., Ltd. Unauthorized entry detection system. 4,638,294, Cl. 340-63.000.
Sakurai, Yoshimi: *See*—
Nishikawa, Masao; Sakai, Shinzo; and Sakurai, Yoshimi, 4,637,278, Cl. 74-866.000.
Salandanan, Carmelita S.: *See*—
Patel, Arvind D.; and Salandanan, Carmelita S., 4,637,883, Cl. 252-8.515.
Salek, Stanley, to Broadcast Electronics, Inc. Independent channel modulation system for AM stereo. 4,638,504, Cl. 381-16.000.
Salem Furnace Co.: *See*—
Solano, William E.; Docherty, James P.; and Stubenbort, Joseph W., 4,637,795, Cl. 432-138.000.
Salensky, George A., to Union Carbide Corporation. Carboxylic acid-grafted phenoxy resins. 4,638,038, Cl. 525-533.000.
Salutar, Inc.: *See*—
Quay, Steven C., 4,637,929, Cl. 424-9.000.
Sambuis, Bernard; and Gavory, Daniel, to Vulnax International Limited. Ozone-stabilized rubbery elastomers. 4,638,026, Cl. 524-98.000.
SAMIM Societa Azionaria Minero-Metallurgica, S.p.A.: *See*—
Cammi, Sergio; D'Este, Arturo; and Pescetelli, Alessandro, 4,637,832, Cl. 75-109.000.
Samson, Robert, to Motorola, Inc. Discrete component mounting assembly. 4,638,406, Cl. 361-403.000.
Sanden Corporation: *See*—
Sakano, Riichi, 4,637,220, Cl. 62-200.000.
Sanders, Bernard, to Raynham Investments Limited. Hairdresser's aid. 4,637,411, Cl. 132-9.000.
Sankei Giken Kogyo Kabushiki Kaisha: *See*—
Fukuda, Masuo, 4,637,491, Cl. 181-265.000.
Sannohashi Seisakusho Company, Limited: *See*—
Imai, Yoshio, 4,637,764, Cl. 411-5.000.
Sano, Morio: *See*—
Masui, Takeshi; and Sano, Morio, 4,637,945, Cl. 428-35.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Odashima, Rou, 4,637,355, Cl. 123-73.0AD.
Taguchi, Michihiro; and Onoue, Akihiro, 4,637,802, Cl. 440-75.000.
Sansing, James E.; and McCarver, Byron M. Process for producing ammonium polyphosphate. 4,637,921, Cl. 423-315.000.
Santel, Hans-Joachim: *See*—
Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Schmidt, Robert R.; Santel, Hans-Joachim; Hanssler, Gerd; and Lurasen, Klaus, 4,638,004, Cl. 514-272.000.
Santostasi, Paul A.: *See*—
Dutt, Herbert V.; and Santostasi, Paul A., 4,637,519, Cl. 215-232.000.
Sanyo Electric Co., Ltd.: *See*—
Hiramatsu, Tatsuo, 4,638,364, Cl. 358-227.000.
Hosoya, Yoshinori; Tunekawa, Shyozi; Yamada, Wazoh; and Shirashi, Akira, 4,637,223, Cl. 62-263.000.
Shirai, Yoshinari; and Kuranaga, Tutomu, 4,637,373, Cl. 126-140.000.
Saringer, John H., to Toronto Medical Corporation. Device for imparting continuous passive motion to leg joints. 4,637,379, Cl. 128-25.00R.
Sasa, Hiroyuki, to Olympus Optical Co., Ltd. Cleaning apparatus for endoscope. 4,637,378, Cl. 128-4.000.
Sasaki, Katsuyuki: *See*—
Akiyama, Teruo; Sasaki, Katsuyuki; and Saigo, Takaichi, 4,637,781, Cl. 417-216.000.
Sasaki, Shigekuni: *See*—
Maruno, Tooru; Nakamura, Kouzaburou; and Sasaki, Shigekuni, 4,637,939, Cl. 427-162.000.
Sato, Junichi: *See*—
Kozuki, Susumu; Nagasawa, Kenichi; Edakubo, Hiroo; Sato, Junichi; and Takayama, Nobutoshi, 4,638,390, Cl. 360-74.100.
Sato, Masayonshi; and Harada, Noritake, to Tokyo Kikai Seisakusho Ltd. Mesh roller for printing press and method of fabrication. 4,637,310, Cl. 101-426.000.
Sato, Nobuo: *See*—
Kaneyasu, Masayoshi; Arima, Hideo; Ito, Mitsuko; Iwanaga, Shoichi; Sato, Nobuo; Noro, Takanobu; Ikagami, Akira; and Isogai, Tokio, 4,638,443, Cl. 364-497.000.
Sato, Toshiaki; Yamauchi, Junnosuke; and Okaya, Takuji, to Kuraray Co., Ltd. Polymer composition comprising a protein and a block copolymer which contains a polyvinyl alcohol polymer unit and an ionic polymer unit. 4,638,024, Cl. 524-22.000.
Saviotti, Vanni: *See*—
Siligoni, Marco; Lari, Ferdinando; Saviotti, Vanni; and Comino, Vittorio, 4,638,122, Cl. 379-124.000.
Sawada, Kazuo, to Sumitomo Electric Industries, Ltd. Nickel-titanium-beryllium alloy wire. 4,637,846, Cl. 148-402.000.
Sawaki, Akira: *See*—
Kasahara, Seitaro; Sawaki, Akira; and Kawata, Shun, 4,637,707, Cl. 355-3.00R.
Sawaki, Manabu, to Pioneer Electronic Corporation. DC motor driving circuit for eliminating spurious transition conditions. 4,638,222, Cl. 318-111.000.
Sawamura, Mitsuharu; and Ito, Susumo, to Canon Kabushiki Kaisha. Magnetooptical recording medium with laminated anti-reflection film. 4,637,953, Cl. 428-333.000.
Scandpower, Inc.: *See*—
Jacquot, Jean-Paul; and Guillery, Patrick, 4,637,913, Cl. 376-247.000.
Scharpenberg, Rainer; and Baro, Gunter, to Brown Boveri Reaktor GmbH. Apparatus for inspecting fuel assemblies, particularly for detecting defective fuel rods from complete fuel assemblies of water-cooled nuclear reactors. 4,637,912, Cl. 376-245.000.
Schaudt Maschinenbau GmbH: *See*—
Schemel, Roland, 4,637,144, Cl. 33-550.000.
Scheffel, Gary W.; Medvick, Richard J.; and Steiss, William C., to Nupro Company. Check valve. 4,637,430, Cl. 137-516.290.
Schemel, Roland, to Schaudt Maschinenbau GmbH. Apparatus for monitoring the diameters of crankpins during treatment in grinding machines. 4,637,144, Cl. 33-550.000.
Schievelbein, Vernon H.: *See*—
Hawkins, Jeffrey T.; and Schievelbein, Vernon H., 4,637,466, Cl. 166-272.000.
Schiffelers, Hendrik E. P.: *See*—
Bouwens, Jan M. M.; and Schiffelers, Hendrik E. P., 4,637,598, Cl. 271-3.100.
Schikor, Joachim: *See*—
Grossmann, Kurt; Bliesner, Jurgen; and Schikor, Joachim, 4,638,404, Cl. 361-388.000.
Schindler, Wayne R., to Chamberlain Manufacturing Corporation. Microprocessor controlled garage door operator. 4,638,433, Cl. 364-400.000.
Schinke, Hans-Joachim: *See*—
Breu, Karl-Jan; and Schinke, Hans-Joachim, 4,638,126, Cl. 379-427.000.
Schlein, Allen P. Surgical saw blade. 4,637,391, Cl. 128-317.000.
Schlemper, Eberhard: *See*—
Auch, Wilfried; and Schlemper, Eberhard, 4,638,266, Cl. 332-7.510.
Schlumberger Technology Corporation: *See*—
Leising, Lawrence J., 4,637,479, Cl. 175-26.000.
Schmerda, Richard F.: *See*—
Damiano, Michael A.; Schmerda, Richard F.; and Searing, Lawrence G., 4,638,226, Cl. 318-345.00R.

Schmid, Eckart; and Wanninger, Ludwig, to Siemens Aktiengesellschaft. Circuit assembly for temperature-dependent cathode current tracking in traveling-wave tubes. 4,638,215, Cl. 315-3.500.

Schmid, Rene; and Krehl, Hermann, to Rieter Machine Works Limited. Winding apparatus for forming laps. 4,637,565, Cl. 242-55.100.

Schmid, Wolfgang, to Porsche Aktiengesellschaft. Multi-cylinder internal-combustion engine control device. 4,637,363, Cl. 123-481.000.

Schmidt, Otomar: *See*—
Schultz, Ronald E.; Schmidt, Otomar; and Johnston, David A., 4,638,452, Cl. 364-900.000.

Schmidt, Robert R.: *See*—
Stetter, Jorg; Wrobiowsky, Heinz-Jurgen; Schmidt, Robert R.; Santel, Hans-Joachim; Hanssler, Gerd; and Lurssen, Klaus, 4,638,004, Cl. 514-272.000.

Schmiedel, Manfred: *See*—
Von Gentzkow, Wolfgang; Markert, Helmut; Hauschildt, Hans; and Schmiedel, Manfred, 4,638,019, Cl. 522-104.000.

Schmitz, John P., to United States of America, Army. Polyactic-polyglycolic acid copolymer combined with decalcified freeze-dried bone for use as a bone repair material. 4,637,931, Cl. 424-78.000.

Schmolka, Irving R.: *See*—
Niu, Joseph H. Y.; and Schmolka, Irving R., 4,637,822, Cl. 44-51.000.

Schnaibel, Eberhard: *See*—
Junginger, Erich; Schnaibel, Eberhard; and Schneider, Erich, 4,638,228, Cl. 318-569.000.

Schneider, Alfred, to Siegenia-Frank KG. Corner deflection assembly. 4,637,165, Cl. 49-192.000.

Schneider, Erich: *See*—
Junginger, Erich; Schnaibel, Eberhard; and Schneider, Erich, 4,638,228, Cl. 318-569.000.

Schneider, Frederick: *See*—
Maroney, Ralf P.; Fishkind, Gregory A.; and Schneider, Frederick, 4,638,399, Cl. 361-220.000.

Schneider, Horst; Zeeh, Rainer; and Neumann, Hans J., to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Chucking device for interchangeable holding of probe pins in a coordinate-measuring instrument. 4,637,119, Cl. 29-568.000.

Schneider, John M.; Piatt, Michael J.; Brown, Mark E.; and Bowers, Mark C., to Eastman Kodak Company. Ink jet filament length and stimulation amplitude assessment system. 4,638,325, Cl. 346-1.100.

Schneider, Werner. Method and apparatus for opening and closing a taphole in furnaces. 4,637,590, Cl. 266-45.000.

Schoch, Stephen A., to Carrier Corporation. Fiber optic moisture analysis probe. 4,637,729, Cl. 356-410.000.

Schoen, Juergen: *See*—
Kirchner, Albert; Schoen, Juergen; and Happ, Ortwin, 4,638,204, Cl. 310-239.000.

Schorn, Franz: *See*—
Finkbeiner, Werner; and Schorn, Franz, 4,637,552, Cl. 239-428.500.

Schramm, Laurier L., to Alberta Energy Company Ltd.; Canadian Occidental Petroleum Ltd.; Esso Resources Canada Limited; Gulf Canada Limited; Her Majesty the Queen, in right of the Province of Alberta, as represented by the Minister of Energy and Natural Resources; HBOG-Oil Sands Limited Partnership; PanCanadian Petroleum Limited; and Petro-Canada Inc., a part interest. Use of a submersible viscometer in the primary separation step of the hot water process for recovery of bitumen from tar sand. 4,637,417, Cl. 137-4.000.

Schrenk, Hartmut, to Siemens Aktiengesellschaft. Method and apparatus for the non-volatile storage of the count of an electronic counting circuit. 4,638,457, Cl. 365-189.000.

Schroder, Gunter; and Berning, Helmut, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Apparatus for performing remotely-manipulated maintenance on parts of equipment in a shielded nuclear facility. 4,638.234, Cl. 318-661.000.

Schroeder, Gerhardt P., to BOC Group, Inc., The. Coaxial breathing circuit. 4,637,384, Cl. 128-204.180.

Schultz, Charles R.: *See*—
Tollefson, Scott; Wuertz, Howard A.; and Schultz, Charles R., 4,637,755, Cl. 405-181.000.

Schultz, Ronald E.; Schmidt, Otomar; and Johnston, David A., to Allen-Bradley Company, Inc. Programmable controller with dynamically altered programmable real time interrupt interval. 4,638,452, Cl. 364-900.000.

Schultz, William C., to Flood, William H., a part interest. Thrust enhancing propeller duct assembly for water craft. 4,637,801, Cl. 440-67.000.

Schulz, Rene: *See*—
Teubler, Heinz; and Schulz, Rene, 4,637,782, Cl. 417-300.000.

Schulze, Ernst-Friedrich; Burstell, Helmut; and Hacker, Erwin, to Hoechst Aktiengesellschaft. Plant growth regulators. 4,637,828, Cl. 71-76.000.

Schurter, Rolf; and Pissiotas, Georg, to Ciba-Geigy Corporation. Sulfonylureas. 4,637,829, Cl. 71-90.000.

Schuster, Richard L.: *See*—
Wilson, Jerry F.; and Schuster, Richard L., 4,637,515, Cl. 206-434.000.

Schwartz, Robert E.; Noble, Roger K.; and Keller, Michael R., to John Zink Company. Flare gas burner. 4,637,793, Cl. 431-202.000.

Schwartzman, Joel. Rotation speed control device for a rotary, impulse water sprinkler and a water sprinkler having same. 4,637,549, Cl. 239-230.000.

Schwarz, Johann, to Siemens Aktiengesellschaft. Device for cleaning light waveguide plug connector parts. 4,637,089, Cl. 15-118.000.

Schweickert, Robert K., to Massachusetts Institute of Technology. Methods and apparatus for measuring relative gain and phase of voltage input signals versus voltage output signals. 4,638,248, Cl. 324-76.00R.

Scientific Process & Research, Inc.: *See*—
Klein, Imrich, 4,637,790, Cl. 425-208.000.

Sciuto, George J., to Emerson Electric Co. Filter drier. 4,637,881, Cl. 210-449.000.

SCSS Instruments, Inc.: *See*—
Shulenberger, Arthur M.; and Piatt, John A., 4,637,713, Cl. 355-76.000.

Sea-Land Corporation: *See*—
Van Iperen, Willem H. P., 4,637,763, Cl. 410-52.000.

Searing, Lawrence G.: *See*—
Damiano, Michael A.; Schmerda, Richard F.; and Searing, Lawrence G., 4,638,226, Cl. 318-345.00R.

Seawell, Jesse Q.: *See*—
Bardo, Charles J.; Seawell, Jesse Q.; Dylewski, Anthony J.; and Clark, John L., Jr., 4,637,903, Cl. 261-24.000.

Secord, Nelson W., to Chrysler Motors Corporation. Cable bundler clip. 4,637,097, Cl. 24-16.0PB.

Seeger Corporation: *See*—
Seeger, John W., Jr.; and Kubiak, John W., 4,637,551, Cl. 239-288.500.

Seeger, John W., Jr.; and Kubiak, John W., to Seeger Corporation. Safety guard for airless spray apparatus. 4,637,551, Cl. 239-288.500.

Segerstrom, Lars H., to IMO AB. Hydraulic screw machine. 4,637,787, Cl. 418-203.000.

Seher Acquisition Corp.: *See*—
Hanula, Richard M., 4,637,518, Cl. 213-64.000.

Sekimura, Masayuki; and Shirouzu, Shunji, to Kabushiki Kaisha Toshiba. Semiconductor flow detector for detecting the flow rate and flowing direction of fluid. 4,637,253, Cl. 73-189.000.

Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 4,638,108, Cl. 136-244.000.

Semler Industries Inc.: *See*—
Semler, Loren H., Jr., 4,637,875, Cl. 210-232.000.

Semler, Loren H., Jr., to Semler Industries Inc. Fluid filtering apparatus and tubular filter therefor. 4,637,875, Cl. 210-232.000.

Senasack, Henry E., Jr.: *See*—
Teske, Duane R.; Senasack, Henry E., Jr.; and Wilkins, Mark, 4,637,272, Cl. 74-424.80R.

Sensor Technologies, Inc.: *See*—
Fiori, David, Jr., 4,637,265, Cl. 73-862.330.

Sergent, Rodney H.; and Thanstrom, Kenneth N., to Great Lakes Chemical Corporation. Process for metal recovery and compositions useful therein. 4,637,865, Cl. 204-111.000.

Sermet, Pierre: *See*—
Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, 4,638,216, Cl. 315-111.810.

SGS-ATES Componenti Elettronici S.p.A.: *See*—
Palara, Sergio; and Torazzina, Aldo, 4,638,507, Cl. 381-94.000.
Rosini, Paolo; Pinaurini, Roberto; and Gaibotti, Maurizio, 4,638,465, Cl. 365-228.000.

SGS-ATES Componenti Elettronici SpA: *See*—
Siligoni, Marco; Lari, Ferdinando; Saviotti, Vanni; and Comino, Vittorio, 4,638,122, Cl. 379-124.000.

Shade, Gary F.: *See*—
Dawson, Dale E.; Conti, Anthony L.; Lee, Soong H.; Shade, Gary F.; and Dickens, Lawrence E., 4,638,269, Cl. 333-164.000.

Shah, Hasmukh G.; and Musgrave, Dwight S., to Owens-Corning Fiberglas Corporation. Road repair membrane. 4,637,946, Cl. 428-63.000.

Shah, Shrenik S.: *See*—
Doherty, James B.; Finke, Paul E.; Firestone, Raymond A.; Shah, Shrenik S.; and Thompson, Kevan R., 4,637,999, Cl. 514-201.000.

Shannon, Paul J., to Armstrong World Industries, Inc. Polymeric liquid crystals. 4,637,896, Cl. 252-299.700.

Shannon, Thomas G.: *See*—
Brunelle, Daniel J.; Shannon, Thomas G.; and Rosenquist, Niles R., 4,638,077, Cl. 558-281.000.

Sharp Kabushiki Kaisha: *See*—
Arai, Nobushige, 4,637,374, Cl. 126-417.000.
Inami, Yasuhiko; Watanabe, Masanori; and Hijikigawa, Masaya, 4,638,346, Cl. 357-25.000.
Matsuda, Kumehiko; and Komai, Kensaku, 4,638,435, Cl. 364-405.000.
Oya, Yuichiro, 4,638,136, Cl. 219-10.55C.

Shaw, James E.; and Westerman, John, to Phillips Petroleum Company. Permeability contrast correction. 4,637,467, Cl. 166-295.000.

Shell Oil Company: *See*—
Fried, Herbert E., 4,638,093, Cl. 568-73.000.
Lewis, Robert M.; and Van Santen, Rutger A., 4,637,992, Cl. 502-84.000.
Singleton, David M., 4,638,084, Cl. 560-202.000.
van Erp, Willibrord A.; Nanne, Johannes M.; and Post, Martin F. M., 4,637,993, Cl. 502-242.000.

Shen-Orr, Chaim D.; and Berg, Eitan, to Fiscint, Inc. Contactless position sensor with coreless coil coupling component. 4,638,250, Cl. 324-207.000.

Shenoy, Thirthahalli A.; and Winters, Arthur R., Jr., to Air Products and Chemicals, Inc. Method of reliquefying cryogenic gas boiloff from heat loss in storage or transfer system. 4,637,216, Cl. 62-54.000.

Sherman, Daniel A. Tamper-proof rodent bait station. 4,637,162, Cl. 43-131.000.

Sherman, Michael I.; and Golston, Stefan, to Kamyr, Inc. Two stage medium consistency pulp pumping. 4,637,779, Cl. 415-143.000.

Sherwood, Glen R., Jr.; Moon, James B.; and Moyle, Gordon A., to SpaceLabs, Inc. Addressing for a multipoint communication system for patient monitoring. 4,638,313, Cl. 340-825.520.

Sherwood, Janice K. Mastectomy brassiere. 4,637,398, Cl. 128-478.000.

Shewmon, Daniel C. Reinforced seam construction. 4,637,330, Cl. 112-417.000.

Shibata, Jiro: *See*—
Ohashi, Ryota; Kawamura, Masahisa; and Shibata, Jiro, 4,637,482, Cl. 180-132.000.

Shibata, Masato; Eguchi, Mamoru; and Kondo, Yoshihito, to Shikoku Kakooki Co., Ltd. Container forming apparatus for packaging machine. 4,637,200, Cl. 53-551.000.

Shibata, Takanori: *See*—
Endo, Akira; Takezaki, Jiro; Tsujii, Fumio; and Shibata, Takanori, 4,638,438, Cl. 364-449.000.

Shields, William, to Environmental Air Control, Inc. Contamination control work station. 4,637,301, Cl. 98-115.300.

Shiga, Toshihiro: *See*—
Noda, Masaru; and Shiga, Toshihiro, 4,638,352, Cl. 358-44.000.

Shigematsu, Kazuo: *See*—
Terao, Motoyasu; Miyauchi, Yasushi; Shigematsu, Kazuo; and Horigome, Shinkichi, 4,637,976, Cl. 430-523.000.

Shigeta, Kunio; Yamamoto, Yoko; and Takahashi, Jiro, to Konishiroku Photo Industry Co., Ltd. Image forming process for electrophotography. 4,637,973, Cl. 430-122.000.

Shigeta, Masao: *See*—
Takayama, Suguru; and Shigeta, Masao, 4,637,843, Cl. 420-73.000.

Shikoku Kakooki Co., Ltd.: *See*—
Shibata, Masato; Eguchi, Mamoru; and Kondo, Yoshihito, 4,637,200, Cl. 53-551.000.

Shima Idea Center Co., Ltd.: *See*—
Shima, Masahiro, 4,637,227, Cl. 66-75.100.
Shima, Masahiro, 4,637,228, Cl. 66-75.100.

Shima, Masahiro, to Shima Idea Center Co., Ltd. Flat knitting machine having compound needles. 4,637,227, Cl. 66-75.100.

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Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,637,273, Cl. 74-489.000.
Nagano, Masashi, 4,637,809, Cl. 474-80.000.

Shimizu, Katsuichi; Masuda, Shunichi; Yagasaki, Toshiaki; and Sakamaki, Hisashi, to Canon Kabushiki Kaisha. Reproduction apparatus. 4,638,368, Cl. 358-256.000.

Shimomoto, Yasunobu, to Daidotokushuko Kabushikikaisha. Fine grains producing apparatus. 4,638,488, Cl. 373-22.000.

Shimuzu, Yoshiro; and Tada, Yoshio, to Mitsui Toatsu Chemicals, Inc. Magnetic recording medium. 4,637,964, Cl. 428-694.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Ueno, Susumu; Kuroda, Kouiti; Nomura, Hirokazu; and Tateno, Shigeru, 4,637,851, Cl. 156-272.600.

Shindo, Osamu: *See*—
Shirayanagi, Moriyasu; Shindo, Osamu; Aiura, Hirochika; and Hara, Tadao, 4,637,720, Cl. 356-125.000.

Shinoda, Tsutae; and Niinuma, Atsuo, to Fujitsu Limited. Gas discharge panel and method for driving the same. 4,638,218, Cl. 315-169.400.

Shirai, Akira: *See*—
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Nomura, Yoshihisa; and Ohashi, Kaoru, 4,637,487, Cl. 180-197.000.

Shirai, Masaharu, to Fuji Xerox Co., Ltd. Apparatus for generating an image from within a sheet-like member. 4,637,709, Cl. 355-3.00R.

Shirai, Shigeru: *See*—
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Terso; and Kanbe, Junichiro, 4,637,972, Cl. 430-84.000.

Shirai, Yoshinari; and Kuranaga, Tutomu, to Sanyo Electric Co., Ltd. Oven. 4,637,373, Cl. 126-340.000.

Shiraishi, Akira: *See*—
Hosoya, Yoshinori; Tunekawa, Shyozi; Yamada, Wazoh; and Shiraishi, Akira, 4,637,223, Cl. 62-263.000.

Shirasaki, Yuichi: *See*—
Iwamoto, Yoshinao; Shirasaki, Yuichi; Fujise, Masayuki; and Asakawa, Kenichi, 4,637,686, Cl. 350-96.290.

Shirayanagi, Moriyasu; Shindo, Osamu; Aiura, Hirochika; and Hara, Tadao, to Ashahi Kogaku Kogyo Kabushiki Kaisha. Lens meter having a focusing indication system with divided-image registration focusing. 4,637,720, Cl. 356-125.000.

Shirouzu, Shunji: *See*—
Sekimura, Masayuki; and Shirouzu, Shunji, 4,637,253, Cl. 73-189.000.

Shnitkin, Harold; and Green, Julius, to United Technologies Corporation. Asymmetric ridge waveguide collinear slot array antenna. 4,638,323, Cl. 343-771.000.

Shoemaker, Roger E. Self-propelled scale testing vehicle. 4,637,481, Cl. 177-50.000.

Shopsky, Harvey J., to Robertshaw Controls Company. Control system and control device for controlling a heating unit and method of making the same. 4,638,148, Cl. 219-497.000.

Shrader, Eric J.: *See*—
Andeen, Gerry B.; Shrader, Eric J.; and Kornbluh, Roy D., 4,637,736, Cl. 374-45.000.

Shreve, David S.: *See*—
Lui, Joseph H.; and Shreve, David S., 4,638,028, Cl. 524-387.000.

Shulenberger, Arthur M.; and Piatt, John A., to SCSS Instruments, Inc. Pellicle mounting apparatus. 4,637,713, Cl. 355-76.000.

Shulik, Larry J.: *See*—
Osman, Robert M.; and Shulik, Larry J., 4,637,918, Cl. 422-148.000.

Shur, Don. Hydraulic righting motorcycle kickstand. 4,637,624, Cl. 280-293.000.

Shur, Michael S.: *See*—
Baier, Steven M.; Cirillo, Nicholas C., Jr.; Hanka, Steven A.; and Shur, Michael S., 4,638,341, Cl. 357-15.000.

Sibille, Soline: *See*—
Perichon, Jacques; Rabemanantsoa, Amelie; Sibille, Soline; and D'Incan, Esther, 4,637,863, Cl. 204-59.00R.

Sidki, Ahmad M.; and Smith, David S., to Internationale Octrooi Maatschappij "Octropa" B.V. Assay processes and materials therefor. 4,637,985, Cl. 436-518.000.

Sieber, Richard W.: *See*—
Coopersman, Michael; and Sieber, Richard W., 4,638,473, Cl. 370-27.000.

Siegenia-Frank KG: *See*—
Schneider, Alfred, 4,637,165, Cl. 49-192.000.

Siemens Aktiengesellschaft: *See*—
Altendorfer, Alois; Dotzauer, Ewald; and Mueller, Wolfgang, 4,638,123, Cl. 379-229.000.
Althans, Hans-Ludwig; Klann, Jorg; and Kuny, Wilhelm, 4,638,343, Cl. 357-17.000.
Breu, Karl-Jan; and Schinke, Hans-Joachim, 4,638,126, Cl. 379-427.000.
Buettner, Gerhard, 4,638,125, Cl. 381-68.400.
Dost, Willibald; and Kreutzer, Hans, 4,638,486, Cl. 372-107.000.
Fritz, Harald; and Wurll, Peter, 4,637,263, Cl. 73-862.040.
Glasow, Peter; and Ruhle, Wolfgang, 4,638,165, Cl. 250-370.000.
Grossmann, Kurt; Bliesner, Jurgen; and Schikor, Joachim, 4,638,404, Cl. 361-388.000.
Howing, Jurgen, 4,638,113, Cl. 174-34.000.
Kirchner, Albert; Schoen, Juergen; and Happ, Ortwin, 4,638,204, Cl. 310-239.000.
Mahlein, Hans F.; Reichelt, Achim; and Winzer, Gerhard, 4,637,682, Cl. 350-96.150.
Neupauer, Helmut, 4,638,415, Cl. 363-35.000.
Neupauer, Helmut; Kaufhold, Wolfgang; and Wild, Georg, 4,638,416, Cl. 363-35.000.
Schmid, Eckart; and Wanninger, Ludwig, 4,638,215, Cl. 315-3.500.
Schrenk, Hartmut, 4,638,457, Cl. 365-189.000.
Schwarz, Johann, 4,637,089, Cl. 15-118.000.
Von Gentzkow, Wolfgang; Markert, Helmut; Hauschildt, Hant; and Schmiedel, Manfred, 4,638,019, Cl. 522-104.000.
von Rauch, Moriz, 4,637,257, Cl. 73-706.000.

Siemens Energy & Automation, Inc.: *See*—
Lott, Donald L., 4,638,285, Cl. 338-21.000.

Siffroi, Lucien: *See*—
Belbel, Elie; Caudron, Robert; Fechant, Louis; Haury, Andre ; Lauraire, Michel; Muniesa, Jacques; and Siffroi, Lucien, 4,638,275, Cl. 335-151.000.

Sigelman, Jesse. Binocular ophthalmoscope. 4,637,699, Cl. 351-205.000.

Sigg, Hans, to Meseltron SA. Apparatus for controlling the advance of a machine tool toward a workpiece. 4,637,169, Cl. 51-165.770.

Siligoni, Marco; Lari, Ferdinando; Saviotti, Vanni; and Comino, Vittorio, to SGS-ATES Componenti Elettronici SpA. Monolithically integratable telephone circuit for generating control signals for displaying telephone charges. 4,638,122, Cl. 379-124.000.

Simmonds Precision: *See*—
Bennett, George D., 4,637,943, Cl. 428-35.000.
Vaiden, John C., 4,637,501, Cl. 192-20.000.

Simmons, Billy R., to Crews, Nancy B., a part interest. Rod holder. 4,637,156, Cl. 43-21.200.

Simonsen, Glenn H.; and Klotz, Clayton J., to Allen-Bradley Company. Terminal block marking surface. 4,637,676, Cl. 339-113.00R.

Simplex Security Systems, Inc.: *See*—
Witkoski, Edward J.; and Lizotte, Edgar G., 4,637,237, Cl. 70-285.000.

Simpson, Jeffrey W.: *See*—
Stewart, John B., Jr.; Szalvay, Laszlo; de Brunier, Bernard; and Simpson, Jeffrey W., 4,637,436, Cl. 138-89.000.

Simunek, Jaroslav: *See*—
Smidrkal, Jan; Simunek, Jaroslav; Tolman, Jiri; Soucek, Jiri; Novacek, Alois; Novak, Jan; Krob, Vaclav; Kovar, Pavel; Klofec, Miroslav; and Vondracek, Bohumir, 4,637,894, Cl. 252-186.400.

Singleton, David M., to Shell Oil Company. Process for dimerizing acrylates and methacrylates. 4,638,084, Cl. 560-202.000.

Sinha, Ram R. P.: *See*—
Takach, David S.; Boggavarapu, Rao L.; and Sinha, Ram R. P., 4,638,177, Cl. 307-83.000.

Sinniger, Joseph O.; and Robbi, Anthony D., to RCA Corporation. Digital timing system. 4,638,498, Cl. 377-39.000.

Sitte, Hellmuth, to C. Reichert Optische Werke, AG. Device for the cryogenic transfer of specimens. 4,637,226, Cl. 62-514.00R.

Skaggs, Bruce A.: *See*—
Rule, Robert D.; Skaggs, Bruce A.; and King, Gerald E., 4,637,504, Cl. 192-87.170.

SKF GmbH: *See*—
Olschewski, Armin; Bauer, Bernhard; and Zirk, Elisabeth, 4,637,806, Cl. 464-130.000.

SKF GmbH Schweinfurt: *See*—
Olschewski, Armin; Bauer, Bernhard; Zirk, Elisabeth; and Heemskerk, Rut, 4,637,740, Cl. 384-425.000.

SKF Steel Engineering AB: *See*—
Thornblom, Jan; and Astner, Gunnar, 4,638,489, Cl. 373-24.000.
Skilling, John B.: *See*—
Paton, H. Neil; and Skilling, John B., 4,637,320, Cl. 105-406.100.
Skjold, A. Christopher; Hugl, Herbert; and Wolfrum, Gerhard, to Miles Laboratories, Inc. Composition and test device for determining the presence of leukocytes containing a zwitterion coupling agent. 4,637,979, Cl. 435-19.000.
Sklarski, Dennis J., to Essex Group, Inc. Neoalkoxy titanate in high density mica laminates. 4,637,852, Cl. 156-307.400.
Skotheim, Terje; and Armand, Michel. Photoelectro-chemical cell for conversion of solar energy to electricity and method of its manufacture. 4,637,969, Cl. 429-111.000.
Slaker, Frank A.: *See*—
Archibald, G. Kent; and Slaker, Frank A., 4,637,817, Cl. 604-31.000.
Slattery, Gordon C., to Brunswick Corporation. Shallow water tilt mechanism for outboard motors. 4,637,800, Cl. 440-55.000.
Slodzian, Georges; Costa De Beauregard, Francois; Daigne, Bernard; and Girard, Francois, to Office National d'Etudes et de Recherche Aerospatiales (ONERA); and Universite de Paris-sud. High clarity mass spectrometer capable of multiple simultaneous detection. 4,638,160, Cl. 250-296.000.
Slusarchyk, William A.; and Koster, William H., to E. R. Squibb & Sons, Inc. [3S(Z)]-2-[[[1-(2-amino-4-thiazolyl)-2-[[2,2-dimethyl-4-oxo-1-(sulfooxy)-3-azetidinyl]amino]-2-oxoethylidene]-amino]oxy] acetic acid and intermediate. 4,638,061, Cl. 540-355.000.
Smidrkal, Jan; Simunek, Jaroslav; Tolman, Jiri; Soucek, Jiri; Novacek, Alois; Novak, Jan; Krob, Vaclav; Kovar, Pavel; Klofec, Miroslav; and Vondracek, Bohumir, to Tukovy Prumyal, Koncern. Activator of peroxo compounds. 4,637,894, Cl. 252-186.400.
Smith, David S.: *See*—
Sidki, Ahmad M.; and Smith, David S., 4,637,985, Cl. 436-518.000.
Smith, Forrest D. Toothpick dispenser. 4,637,512, Cl. 206-103.000.
Smith, Harry D., Jr.; and Verbout, Jerry L., to Halliburton Company. Epithermal neutron porosity measurement. 4,638,161, Cl. 250-269.000.
Smith, Kenneth R., to Bicc-Vero Electronics, Inc. Injector/ejector device for circuit board. 4,638,405, Cl. 361-399.000.
Smith, Robert L. Starter shingle. 4,637,191, Cl. 52-522.000.
Smith, Thomas W.; Ward, Anthony T.; Luca, David J.; and Johnson, Gordon E., to Xerox Corporation. Optical recording member. 4,638,335, Cl. 346-135.100.
SmithKline Beckman Corporation: *See*—
Auerbach, Jeffrey I.; and Rosenberg, Martin, 4,637,980, Cl. 435-68.000.
Smits, Wigle F.; and Spaak, Willem E., to U.S. Philips Corporation. Method of determining voltage and current for a given operating period of an X-ray source. 4,638,500, Cl. 378-109.000.
Smulders, Hendricus F. G.; Franken, Adrianus J. J.; Faber, Johannes W.; and Swinkels, Wouter H., to U.S. Philips Corporation. Manipulator having six degrees of freedom. 4,637,777, Cl. 414-751.000.
Snyder, Larry L., to Harrison Western Corporation. Tunnel boring machine. 4,637,657, Cl. 299-31.000.
So, Eddy; and Moore, William J. M., to Canadian Patents and Development Limited-Societe Canadienne des Brevets et d'Exploitation Limitee. Digital-to-analog converter. 4,638,302, Cl. 340-347.0DA.
Sochor, Josef, to Robert Bosch GmbH. Push-pull amplifier and method for operation, particularly recording amplifier for video tape recorders. 4,638,382, Cl. 360-68.000.
Societa' Cavi Pirelli S.p.A.: *See*—
Giorgio, Giancarlo; and Parmigiani, Bruno, 4,638,112, Cl. 174-22.00R.
Societe Anonyme D.B.A.: *See*—
Kervagoret, Gilbert, 4,637,208, Cl. 60-547.100.
Perrin, Alain; and Moinard, Patrice, 4,637,747, Cl. 403-23.000.
Societe Corial, S.A.: *See*—
Feniou, Claude; and Descas, Patrick, 4,638,082, Cl. 560-62.000.
Societe de Paris et du Rhone: *See*—
Mazzorana, Alfred B., 4,637,267, Cl. 74-7.00A.
Societe d'Optique, Precision Electronique et Mecanique-Sopelem: *See*—
Baluteau, Jean-Michel; Saint-Sevin, Michel; and Chabanier, Patrick, 4,637,692, Cl. 350-486.000.
Societe Europeenne de Propulsion: *See*—
Rosier, Jean-Claude; Fouche, Claude; and Maincent, Gabriel, 4,638,370, Cl. 358-293.000.
Societe Francaise d'Organo-Synthese: *See*—
Moroux, Julien, 4,637,868, Cl. 204-157.820.
Societe Nationale des Poudres et Explosifs: *See*—
Perichon, Jacques; Rabemanantsoa, Amelie; Sibille, Soline; and D'Incan, Esther, 4,637,863, Cl. 204-59.00R.
Societe Nationale Industrielle Aerospatiale: *See*—
Perin, Robert; Jourdan, Pierre; and Pauly, Bernard, 4,637,573, Cl. 244-54.000.
Soderberg, Paul B., to Soderberg Research & Development, Inc. Tubing drain valve useful with heavy, sand-bearing oil. 4,637,471, Cl. 166-373.000.
Soderberg Research & Development, Inc.: *See*—
Soderberg, Paul B., 4,637,471, Cl. 166-373.000.
Sogabe, Akira: *See*—
Kimizuka, Norio; Sogabe, Akira; and Abo, Mituyosi, 4,638,421, Cl. 364-167.000.
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Trasch, Heinz-Freidrich; Rothe, Anselm; Sojka, Bernward; Werner, Wolfgang; and Wielinger, Hans, 4,638,023, Cl. 524-21.000.
Solano, William E.; Docherty, James P.; and Stubenbort, Joseph W., to Salem Furnace Co. Method and apparatus for calcining material containing volatile constituents. 4,637,795, Cl. 432-138.000.
Somar Corporation: *See*—
Nishi, Yoshitsugu; and Daigo, Yukitaka, 4,638,501, Cl. 378-182.000.
Somezawa, Masashi: *See*—
Ninomiya, Yoshinobu; Somezawa, Masashi; and Oiyama, Kiyokazu, 4,637,959, Cl. 428-425.900.
Sonne, Darrell S.; and Beard, William J., to Halliburton Company. Gamma ray measurement of earth formation properties using a position sensitive scintillation detector. 4,638,158, Cl. 250-266.000.
Sonne, Darrell S.; and Nunley, Allen, to Halliburton Company. High resolution scintillation crystal. 4,638,164, Cl. 250-366.000.
Sonobe, Takashi: *See*—
Konno, Yutaka; Kawata, Hiroitsu; Aruga, Masayoshi; Sonobe, Takashi; and Mitomi, Mitsuo, 4,637,930, Cl. 424-28.000.
Sony Corporation: *See*—
Hachimori, Takeshi, 4,638,239, Cl. 323-281.000.
Hara, Masaru, 4,638,388, Cl. 360-18.000.
Motoyama, Tadashi, 4,638,375, Cl. 358-338.000.
Ninomiya, Yoshinobu; Somezawa, Masashi; and Oiyama, Kiyokazu, 4,637,959, Cl. 428-425.900.
Tajima, Shigeru; and Nakabayashi, Toshiya, 4,638,223, Cl. 318-254.000.
Takamatsu, Ryoji, 4,638,386, Cl. 360-96.500.
Takeshita, Kaneyoshi, 4,638,361, Cl. 358-213.000.
Tanaka, Sadaaki; and Ushijima, Hisashi, 4,638,363, Cl. 358-219.000.
Wilkinson, James H.; and Gillard, Clive H., 4,638,380, Cl. 360-22.000.
SOR, Inc.: *See*—
Priest, Wayne A., 4,637,258, Cl. 73-716.000.
Sorenson, Wayne P.: *See*—
Manning, James H.; and Sorenson, Wayne P., 4,637,949, Cl. 428-110.000.
Sorochenko, Oleg A., to Nauchno-Issledovatelsky Institut Obschei i Neotlozhno Khirurgii. Electrosurgical instrument. 4,637,390, Cl. 128-303.140.
Sorochenko, Oleg A., to Kharkovsky Nauchno-Issledovatelsky Institut Obschei i Neotlozhnoi Khirurgii. Bipolar electrocoagulator. 4,637,392, Cl. 128-303.130.
Soucek, Jiri: *See*—
Smidrkal, Jan; Simunek, Jaroslav; Tolman, Jiri; Soucek, Jiri; Novacek, Alois; Novak, Jan; Krob, Vaclav; Kovar, Pavel; Klofec, Miroslav; and Vondracek, Bohumir, 4,637,894, Cl. 252-186.400.
Southwell, Patricia C. Undergarment for handicapped. 4,637,078, Cl. 2-408.000.
Southwest Research Institute: *See*—
King, James D., 4,638,251, Cl. 324-306.000.
Spaak, Willem E.: *See*—
Smits, Wigle F.; and Spaak, Willem E., 4,638,500, Cl. 378-109.000.
SpaceLabs, Inc.: *See*—
Sherwood, Glen R., Jr.; Moon, James B.; and Moyle, Gordon A., 4,638,313, Cl. 340-825.520.
Spannuth, Robert J.: *See*—
Matovich, Edwin; and Spannuth, Robert J., 4,637,858, Cl. 162-30.100.
Speisebecher, Joachim; and Wooge, Christian, to USM Corporation. Melt dispensers. 4,637,745, Cl. 401-1.000.
Speltz, David J.: *See*—
Ciaramitaro, David A.; Speltz, David J.; and Moore, Jack M., 4,637,848, Cl. 149-21.000.
Speranzin, Claudio: *See*—
Badiali, Roberto; Bertoli, Luciano; and Speranzin, Claudio, 4,637,205, Cl. 57-22.000.
Sperr, Gustaf A., to Saab-Scania Aktiebolag. Seat plate. 4,637,651, Cl. 297-458.000.
Sperry Corporation: *See*—
Birkedahl, Byron F., 4,638,229, Cl. 318-584.000.
Bishop, F. Avery; and Leahy, Ronald S., 4,638,493, Cl. 375-1.000.
Kartchner, Earl M.; Price, Robert; and Van Horn, Gary R., 4,638,494, Cl. 375-2.200.
Martin, Hubert C., Jr.; Hitler, Gene D.; and Parsley, David W., 4,638,417, Cl. 363-41.000.
McGuire, Charles F.; Steyaert, Gordon C.; and Fontaine, John M., 4,638,261, Cl. 330-277.000.
Stansberry, Warren W., 4,637,619, Cl. 277-167.500.
Spindelfabrik Sussen, Schurr, Stahlecker: *See*—
Griesinger, Rolf; and Fetzer, Gerhard, 4,637,172, Cl. 51-289.00R.
Spiro Investment A.G.: *See*—
Berglund, Bengt, 4,637,428, Cl. 137-503.000.
Spiro, Jan L., to Telautograph Corporation. Communication system having message repeating terminals. 4,638,298, Cl. 340-827.000.
Spoel, Han: *See*—
McMahon, J. Philip; Spoel, Han; and McGinley, John, 4,637,591, Cl. 266-165.000.
Sprague, Robert A.: *See*—
Burnham, Robert D.; Paoli, Thomas L.; Thornton, Robert L.; and Sprague, Robert A., 4,638,334, Cl. 346-108.000.
Spriggs, Dennis M.; and McGlothen, Jody R., to Dresser Industries, Inc. Apparatus and method of well preparation for chemical treatment of produced fluids. 4,637,469, Cl. 166-310.000.
Sproch, James D.: *See*—
Pechar, Henry W., Jr.; and Sproch, James D., 4,638,459, Cl. 365-104.000.

Square D Company: *See*—
Dvorak, Robert F.; and Netolicky, Charles E., 4,638,133, Cl. 200-302.100.
SRI International: *See*—
Andeen, Gerry B.; Shrader, Eric J.; and Kornbluh, Roy D., 4,637,736, Cl. 374-45.000.
Andeen, Gerry B., 4,637,783, Cl. 417-318.000.
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Reid, Iain K.; Staite, Eric; Richmond, Doug; and Rumbelow, George, 4,637,667, Cl. 312-217.000.
Standard Elektrik Lorenz Aktiengesellschaft: *See*—
Feigel, Josef, 4,638,201, Cl. 310-216.000.
Standard-Knapp, Inc.: *See*—
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Standard Microsystems Corp.: *See*—
Pechar, Henry W., Jr.; and Sproch, James D., 4,638,459, Cl. 365-104.000.
Standard Oil Company: *See*—
Gash, Bruce W., 4,637,465, Cl. 166-261.000.
Glocker, David A.; Miller, John R.; Grimshaw, Scott F.; and Windischmann, Henry, 4,637,869, Cl. 204-192.110.
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Fields, Ellis K.; Winzenburg, Mark L.; and Behrend, Steven J., 4,638,072, Cl. 549-234.000.
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Darton, Kenneth S., 4,638,480, Cl. 370-112.000.
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Ward, Mary V.; Nield, Eric; and Staniland, Philip A., 4,638,037, Cl. 525-471.000.
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Starting Industry Company Limited: *See*—
Osakabe, Mitsuo, 4,637,360, Cl. 123-185.00A.
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Irvine, Thomas F., Jr.; and Park, Noh-Aeok, 4,637,250, Cl. 73-57.000.
Steck, Robert F.; and Baartman, John L., III, to International Paper Company. Induction sealing of paperboard. 4,637,199, Cl. 53-451.000.
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Olsen, Joseph C.; and Steinbach, Richard H., 4,637,288, Cl. 83-375.000.
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Bertram, Leo; Bukoschek, Romuald L.; and Steiner, Peter, 4,637,283, Cl. 81-3.200.
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Miseyko, George; Peck, Walter R.; and Chase, Ronald G., 4,637,577, Cl. 244-147.000.
Stephenson, Robert G., to James Howden Australia Pty. Limited. Fabric filter shaker assembly. 4,637,826, Cl. 55-304.000.
Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Schmidt, Robert R.; Santel, Hans-Joachim; Hanssler, Gerd; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Substituted phenylsulphonylureas. 4,638,004, Cl. 514-272.000.
Stewart, Alexander; Furness, Duncan S.; and Bhatia, Sham P., to Rodime, PLC. Head positioning mechanism for rotating disk data storage system. 4,638,384, Cl. 360-77.000.
Stewart, Gene L., to Winfield Corporation. Waste management system. 4,637,545, Cl. 232-43.200.
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Stoecker, Carl H., to Boeing Company, The. Stowage bin latch assembly. 4,637,642, Cl. 292-129.000.
Stoffers, Brian L., to Honeywell Information Systems Inc. Equal nine apparatus for supporting absolute value subtracts on decimal operands of unequal length. 4,638,450, Cl. 364-715.000.
Stoll, Kurt. Solenoid valve. 4,637,433, Cl. 137-625.650.
Stoltz, Richard A.; and Kwon, Young J., to Westinghouse Electric Corp. Process for reduction of zirconium, hafnium or titanium using a zinc or tin seal. 4,637,831, Cl. 75-84.500.
Stone, Richard H., to Leyland Vehicles Limited. Vehicle spring suspension arrangement. 4,637,627, Cl. 280-686.000.
Stridsberg, Lennart; and Rodin, Gunnar, to Mydata Automation AB. Method and apparatus for calibrating a positioning system. 4,638,232, Cl. 318-640.000.
Stritzke, Detlef, to Deutsche Gesellschaft. Device for evacuating, filling and closing final storage containers for radioactive materials. 4,638,134, Cl. 219-9.500.
Stromback, Ture J.: *See*—
Akerlund, Mats P.; and Stromback, Ture J., 4,638,301, Cl. 340-347.0CC.
Stubenbort, Joseph W.: *See*—
Solano, William E.; Docherty, James P.; and Stubenbort, Joseph W., 4,637,795, Cl. 432-138.000.
Studt, William L.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,638,001, Cl. 514-212.000.
Stumpe, Leroy, to Du-Al Manufacturing Company. Loader mount. 4,637,772, Cl. 414-686.000.
Stunkard, Gerald A. In-line repairable top entry ball valve. 4,637,421, Cl. 137-327.000.
Suchowerskyj, Wadym: *See*—
Mattes, Bernhard; Oswald, Klaus; and Suchowerskyj, Wadym, 4,638,179, Cl. 307-10.0SB.
Sugaya, Kiyoshi: *See*—
Okubo, Masao; Sugaya, Kiyoshi; Takagi, Toshinori; and Ishikawa, Junzo, 4,638,217, Cl. 315-111.810.
Sugihara, Hirosada; Nishikawa, Kohei; and Ito, Katsumi, to Takeda Chemical Industries, Ltd. Condensed seven-membered ring compounds, their production and use. 4,638,000, Cl. 514-211.000.
Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; and Hattori, Ryuichi, to House Food Industrial Company Ltd. Low pressure microwave drying apparatus. 4,637,145, Cl. 34-1.000.
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yoshihara, Kenji; and Haneji, Yasuo, to Victor Company of Japan, Ltd. Rotary recording medium which is playable in still picture, slow-motion and normal reproduction modes. 4,638,376, Cl. 358-342.000.
Sugiyama, Kiyoshi; and Furuhashi, Tomio, to Toshiba Kikai Kabushiki Kaisha. Machine tool for drilling printed circuit boards. 4,637,118, Cl. 29-563.000.
Sugiyama, Yoshiyuki; Aoki, Shinichiro; and Morita, Yasuyuki, to Matsushita Electric Industrial Co., Ltd. Ultrasonic probe having dual-motion transducer. 4,637,256, Cl. 73-633.000.
Sullivan, Brian J.: *See*—
Stefanov, Michael E.; Sullivan, Brian J.; and Ticknor, Anthony J., 4,637,725, Cl. 356-354.000.
Sulzer Brothers Limited: *See*—
Aguet, Emile, 4,637,212, Cl. 60-655.000.
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Sumida, Nobuyuki: *See*—
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Sumitomo Electric Industries, Ltd.: *See*—
Kohno, Teruhisa, 4,637,661, Cl. 303-24.00A.
Mori, Akinori, 4,638,114, Cl. 174-36.000.
Sawada, Kazuo, 4,637,846, Cl. 148-402.000.
Takada, Hisashi, 4,638,152, Cl. 250-214.00A.
Sumitomo Heavy Industries, Ltd.: *See*—
Kawakami, Takashi, 4,637,452, Cl. 164-420.000.
Sumitomo Metal Industries, Ltd.: *See*—
Maehara, Yasuhiro, 4,637,841, Cl. 148-12.00E.
Sun Coast Plastics, Inc.: *See*—
Dutt, Herbert V.; and Santostasi, Paul A., 4,637,519, Cl. 215-232.000.
Sundeen, Joseph E.; Koster, William H.; and Zahler, Robert, to E. R. Squibb & Sons, Inc. O-sulfated spiro β-lactam hydroxamic acids. 4,638,060, Cl. 540-203.000.
Sundstrand Corporation: *See*—
Niggemann, Richard E., 4,637,456, Cl. 165-104.330.
Symington, John, 4,637,215, Cl. 60-688.000.
Teske, Duane R.; Senasack, Henry E., Jr.; and Wilkins, Mark, 4,637,272, Cl. 74-424.80R.
Support Systems International, Inc.: *See*—
Goodwin, Vernon L., 4,637,083, Cl. 5-453.000.
Sustmann, Scarlet: *See*—
Marini, Ingo G.; and Sustmann, Scarlet, 4,637,820, Cl. 8-129.000.
Sutera, Richard; Dressler, John L.; and Halliday, Bruce W., to Burlington Industries, Inc. Apparatus to damp turbulence in an ink jet fluid supply chamber. 4,638,327, Cl. 346-75.000.
Sutherland, Ian W., to National Research Development Corp. Gel-forming polysaccharides. 4,638,059, Cl. 536-121.000.
Sutton, Stephen J., to General Motors Corporation. Apparatus for detecting water in fuel. 4,638,305, Cl. 340-620.000.
Suwa, Kaname, to Canon Kabushiki Kaisha. Keyboard of an electronic apparatus. 4,638,151, Cl. 235-145.00R.
Suwa, Teruko. Fur-skin strip material and method for producing the same. 4,637,206, Cl. 57-31.000.
Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
Yamamoto, Wataru, 4,637,210, Cl. 60-602.000.
Suzuki, Kazunori; Katsuta, Hiroo; and Toriumi, Yuki, to Canon Kabushiki Kaisha. Press apparatus for planar members. 4,637,850, Cl. 156-60.000.
Suzuki, Kisaku. Method of making maki-zushi and an apparatus for making maki-zushi. 4,637,304, Cl. 99-450.200.
Suzuki, Kiyoaki: *See*—
Asakuno, Hiroyoshi; Mori, Kinya; Suzuki, Kiyoaki; Nishida, Mamoru; Iwai, Kenji; Tamamushi, Masahiro; and Kawasaki, Teruo, 4,638,030, Cl. 524-536.000.
Suzuki, Norio: *See*—
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Suzuki, Osamu: *See*—
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Suzuki, Sadahide: *See*—
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, 4,637,354, Cl. 123-55.0VF.

Suzuki, Takasi: *See*—
Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takasi, 4,638,304, Cl. 340-500.000.

Svensson, Klas G.: *See*—
Lobell, Hans; Svensson, Klas G.; Gladh, Goran; and Hoglander, Bjorn, 4,637,213, Cl. 60-685.000.

Svensson, Leif; Nyqvist, Jan-Olof; and Westling, Lars, to Aktiebolaget Bofors. Crystallization method for HMX and RDX. 4,638,065, Cl. 544-196.000.

Svensson, Torsten, to Termofrost Sweden AB. Door. 4,637,167, Cl. 49-386.000.

Swadell, Robert A. Self-equalizing lifting trailer. 4,637,770, Cl. 414-495.000.

Swagelok Company: *See*—
Medvick, Richard J.; Weber, Richard C., Jr.; Wagner, Ross L.; and Brand, Edward M., 4,637,432, Cl. 137-614.030.

Swanson, Edward A.: *See*—
Reed, Charles C.; Cooley, Denton A.; Crane, Terry N.; Swanson, Edward A.; Oscarsson, Rolf A.; Liebmann, Vern L.; and Cox, Dan L., 4,637,917, Cl. 422-46.000.

Swartout, Willson C. Patient position monitoring system. 4,638,307, Cl. 340-666.000.

Sweet Victory, Inc.: *See*—
Levine, Morris M., 4,637,221, Cl. 62-342.000.

Sweetin, Willard L. Apparatus and methods for engaging toothpicks to assemble a toy structure. 4,637,805, Cl. 446-71.000.

Swinkels, Wouter H.: *See*—
Smulders, Hendricus F. G.; Franken, Adrianus J. J.; Faber, Johannes W.; and Swinkels, Wouter H., 4,637,777, Cl. 414-751.000.

Swisher, George W., Jr., to CMI Corporation. Road planar having particle reducing means. 4,637,753, Cl. 404-90.000.

Swisher, Steven L., to Brunswick Corporation. Feathering ring for fishing reels. 4,637,569, Cl. 242-84.20A.

Swiss Aluminium Ltd.: *See*—
Weingartner, Fritz, 4,637,908, Cl. 264-143.000.

Switall, Thomas G., to Rayco Graphic Manufacturing, Inc. Apparatus for applying silicone emulsion to a paper web. 4,637,341, Cl. 118-694.000.

Sykes, Christopher G.: *See*—
Bryant, Michael J.; Attenborough, Frank R.; Sykes, Christopher G.; and Cameron, Neil W., 4,638,469, Cl. 367-154.000.

Symington, John, to Sundstrand Corporation. Regenerator with spray cooler. 4,637,215, Cl. 60-688.000.

Synthelabo: *See*—
Raizon, Bernard; Rossey, Guy; and Wick, Alexander, 4,638,080, Cl. 560-35.000.

Szabolcsi, Tamas: *See*—
Szekely, Istvan; Botar, Sandor; Dolgos nee Kekesi, Krisztina; Bertok, Bela; Gajary, Antal; Szabolcsi, Tamas; Kovacs, Gabor; and Lovasz nee Gaspar, Marianna, 4,638,002, Cl. 514-212.000.

Szalvay, Laszlo: *See*—
Stewart, John B., Jr.; Szalvay, Laszlo; de Brunier, Bernard; and Simpson, Jeffrey W., 4,637,436, Cl. 138-89.000.

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Szelke, Michael; and Jones, David M., to Aktiebolaget Hassle. Enzyme inhibition. 4,638,047, Cl. 530-332.000.

Szendrodi, Valer: *See*—
Nagy, Jeno; Szendrodi, Valer; and Tari, Istvan, 4,637,315, Cl. 104-135.000.

Szostak, Rosemarie, to Mobil Oil Corporation. Synthetic crystalline silicate. 4,637,923, Cl. 423-328.000.

Szycher, Michael; Dempsey, Donald J.; and Rolfe, Jonathan L., to Thermedics, Inc. Drug release system. 4,638,043, Cl. 528-75.000.

T. A. Pelsue Company: *See*—
Beavers, Allan E., 4,637,748, Cl. 403-170.000.

Tachikawa Spring Co., Ltd.: *See*—
Inoue, Nobuhiro, 4,637,650, Cl. 297-410.000.

Tada, Takashi: *See*—
Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kobayashi, Kazuo; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Yoichiro; and Abe, Wataru, 4,637,884, Cl. 252-12.000.

Tada, Yoshio: *See*—
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Taga, Kazumitsu: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; and Hattori, Ryuichi, 4,637,145, Cl. 34-1.000.

Taguchi, Michihiro; and Onoue, Akihiro, to Sanshin Kogyo Kabushiki Kaisha. Twin outboard drive for watercraft. 4,637,802, Cl. 440-75.000.

Taheri, Syde A. Protective garment. 4,637,074, Cl. 2-2.000.

Taiyo Fishery Co. Ltd.: *See*—
Matsubayashi, Kaneo, 4,637,094, Cl. 17-1.00G.

Tajima, Hatsuo: *See*—
Hosoi, Atsushi; Kan, Fumitaka; Egami, Hidemi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,637,706, Cl. 355-3.0DD.

Tajima, Kyousuke, to Hosiden Electronics Co., Ltd. Connector socket. 4,637,669, Cl. 339-14.00R.

Tajima, Shigeru; and Nakabayashi, Toshiya, to Sony Corporation. Motor driving circuit. 4,638,223, Cl. 318-254.000.

Takach, David S.; Boggavarapu, Rao L.; and Sinha, Ram R. P., to Westinghouse Electric Corp. Rotating flux transformer. 4,638,177, Cl. 307-83.000.

Takada, Hisashi, to Sumitomo Electric Industries, Ltd. Photoelectric converting circuit having a low parasitic capacitance. 4,638,152, Cl. 250-214.00A.

Takada, Mitsuru: *See*—
Itoh, Hiroshi; and Takada, Mitsuru, 4,637,279, Cl. 74-866.000.

Takagi, Toshinori: *See*—
Okubo, Masao; Sugaya, Kiyoshi; Takagi, Toshinori; and Ishikawa, Junzo, 4,638,217, Cl. 315-111.810.

Takahashi, Jiro: *See*—
Shigeta, Kunio; Yamamoto, Yoko; and Takahashi, Jiro, 4,637,973, Cl. 430-122.000.

Takahashi, Shigeyuki; Uchida, Manabu; and Yamazaki, Kazuhiro, to Daicel Chemical Industries, Ltd. Cellulose acetate molding containing odoriferous substance. 4,638,057, Cl. 536-76.000.

Takahashi, Tadashi: *See*—
Morinaga, Shigeki; Miyashita, Kunio; Hayashida, Hiroshi; and Takahashi, Tadashi, 4,638,225, Cl. 318-341.000.

Takahashi, Tsuneo; and Otsuka, Hirofumi, to Honda Giken Kogyo Kabushiki Kaisha. Optical torque detector. 4,637,264, Cl. 73-862.330.

Takahashi, Tsutomu: *See*—
Tomita, Tomoya; Hiramoto, Sotozi; Okubo, Takesi; Matsuo, Kuniyuki; Ashihara, Hiromoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, 4,637,134, Cl. 29-741.000.

Takamatsu, Ryoji, to Sony Corporation. Operation changing mechanism responsive to direction change of a reversible motor. 4,638,386, Cl. 360-96.500.

Takashima, Toshiharu: *See*—
Murata, Kazushi; Takashima, Toshiharu; and Nakashima, Kunimichi, 4,637,108, Cl. 29-33.00P.

Takata, Hiroshi: *See*—
Yanagiuchi, Noboru; Adachi, Shigeo; Inoue, Masatoshi; Takata, Hiroshi; and Matsuda, Toyoshi, 4,637,270, Cl. 74-336.500.

Takata, Nobuharu: *See*—
Hirosaki, Yoshihiko; and Takata, Nobuharu, 4,637,296, Cl. 98-1.000.

Takayama, Nobutoshi: *See*—
Kozuki, Susumu; Nagasawa, Kenichi; Edakubo, Hiroo; Sato, Junichi; and Takayama, Nobutoshi, 4,638,390, Cl. 360-74.100.

Takayama, Suguru; and Shigeta, Masao, to TDK Corporation. Core of a noise filter comprised of an amorphous alloy. 4,637,843, Cl. 420-73.000.

Takayama, Tsutomu: *See*—
Kato, Tokuzo; Takayama, Tsutomu; and Kaji, Toshio, 4,638,350, Cl. 358-29.000.

Takeda Chemical Industries, Ltd.: *See*—
Sugihara, Hirosada; Nishikawa, Kohei; and Ito, Katsumi, 4,638,000, Cl. 514-211.000.

Takeda, Hideto, to Nippondenso Co., Ltd. Electromagnetic fuel injector with magnetic stop member. 4,637,554, Cl. 239-585.000.

Takeda, Yoshiro: *See*—
Owa, Yutaka; Tanaka, Yoshiro; Saito, Takeshi; and Takeda, Yoshiro, 4,637,759, Cl. 405-270.000.

Takehara, Shin, to Nissan Motor Co., Ltd. Power unit mount assembly. 4,637,584, Cl. 248-559.000.

Takei, Yoshiaki; Nomori, Hiroyuki; and Matuura, Katumi, to Konishiroku Photo Industry Co., Ltd. Photoreceptor having polycarbonate layers and process for the preparation thereof. 4,637,971, Cl. 430-59.000.

Takeo, Yasuhiro: *See*—
Nakayama, Toshihiko; Moriguchi, Fujio; Murayama, Tomio; and Takeo, Yasuhiro, 4,638,329, Cl. 346-76.0PH.

Takeshita, Kaneyoshi, to Sony Corporation. Solid state image pickup. 4,638,361, Cl. 358-213.000.

Takeuchi, Tadashi: *See*—
Tsunooka, Tsutomu; Takeuchi, Tadashi; Ushida, Kunihiro; and Kawajiri, Shogo, 4,638,206, Cl. 310-313.00B.

Takeuchi, Yasuhito, to Yokogawa Medical Systems, Limited. Azimuth adaptive phased array sonar. 4,638,467, Cl. 367-105.000.

Takezaki, Jiro: *See*—
Endo, Akira; Takezaki, Jiro; Tsujii, Fumio; and Shibata, Takanori, 4,638,438, Cl. 364-449.000.

Tamaki, Hiroaki; and Nakamura, Joji, to Kabushiki Kaisha Komatsu Seisakusho. Method of driving hollow piles into the ground. 4,637,758, Cl. 405-248.000.

Tamamushi, Masahiro: *See*—
Asakuno, Hiroyoshi; Mori, Kinya; Suzuki, Kiyoaki; Nishida, Mamoru; Iwai, Kenji; Tamamushi, Masahiro; and Kawasaki, Teruo, 4,638,030, Cl. 524-536.000.

Tamano, Yutaka: *See*—
Arai, Shoji; Tamano, Yutaka; and Hasegawa, Masazumi, 4,638,016, Cl. 521-129.000.

Tan, Khen-Sang: *See*—
Hester, Richard K.; and Tan, Khen-Sang, 4,638,451, Cl. 364-900.000.

Tanaka, Hiroaki; and Akita, Shigeyuki, to Nippon Soken, Inc. Incremental encoder rotational position detector. 4,638,249, Cl. 324-166.000.

Tanaka, Hiroji; and Saito, Tokukazu, to Fuji Photo Film Co., Ltd. Method of adjusting radiation image read-out condition. 4,638,162, Cl. 250-327.200.

Tanaka, Keiji; Honryo, Hatsuo; and Koga, Takeri, to Fuji Photo Film Co., Ltd. Device for continuously cutting and winding a web. 4,637,567, Cl. 242-56.00R.

Tanaka, Kouzou: *See*—
Yoshida, Takeshi; Honda, Takayasu; Kitazume, Shunosuke; and Tanaka, Kouzou, 4,637,653, Cl. 297-334.000.

Tanaka, Sadaaki; and Ushijima, Hisashi, to Sony Corporation. Automatic beam current control system for television camera. 4,638,363, Cl. 358-219.000.

Tanaka, Seiichi: *See*—
Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takasi, 4,638,304, Cl. 340-500.000.

Tanaka, Takao: *See*—
Yaotani, Kouichi; Nakada, Fumio; Tanaka, Takao; and Yoshida, Minoru, 4,637,767, Cl. 411-411.000.

Tanaka, Takashi; and Yamamoto, Satoru, to Yoshida Kogyo K. K. Beam for a dyeing apparatus. 4,637,233, Cl. 68-198.000.

Tanaka, Teruaki: *See*—
Arii, Kazuhiro; Tanaka, Teruaki; Sumida, Nobuyuki; and Arisaka, Kouhei, 4,637,563, Cl. 242-4.00B.

Tanaka, Toyoji: *See*—
Fujisawa, Kunio; Tanaka, Toyoji; Mochizuki, Toshio; Nakamura, Norio; and Kaya, Seiji, 4,637,711, Cl. 355-72.000.

Tanaka, Yoshiro: *See*—
Owa, Yutaka; Tanaka, Yoshiro; Saito, Takeshi; and Takeda, Yoshiro, 4,637,759, Cl. 405-270.000.

Tandem Computers Incorporated: *See*—
Pauker, Armando; and Preuit, Richard B., 4,638,240, Cl. 323-289.000.

Tani, Nobutaka; and Hayashi, Tsuneo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Adsorbent and process for preparing the same. 4,637,994, Cl. 502-404.000.

Tani, Yoshiki: *See*—
Yamada, Hideaki; and Tani, Yoshiki, 4,637,982, Cl. 435-129.000.

Tanner, Paul W. Window protection. 4,637,444, Cl. 160-91.000.

Tanno, Kohetsu: *See*—
Kurogi, Yukinori; Endo, Nobuhiro; and Tanno, Kohetsu, 4,637,127, Cl. 29-576.00E.

Tanny, Michael W., to Unit Industries, Inc. Circuit board soldering device. 4,637,541, Cl. 228-180.100.

Tanton, George A.: *See*—
Walker, Clifford G.; and Tanton, George A., 4,637,726, Cl. 356-367.000.

Taplin, John F. Supply control valve with integral pressure limiter. 4,637,431, Cl. 137-596.150.

Tari, Istvan: *See*—
Nagy, Jeno; Szendrodi, Valer; and Tari, Istvan, 4,637,315, Cl. 104-135.000.

Tarlow, Kenneth. Combination spotlight and table lamp. 4,638,413, Cl. 362-242.000.

Tartt, Evangeline; and Webber, Sandra. Convertible vest-bag. 4,637,076, Cl. 2-102.000.

Tateno, Kenichi: *See*—
Fujii, Hiroyuki; Tateno, Kenichi; and Nishikawa, Mikio, 4,637,130, Cl. 29-588.000.

Tateno, Shigeru: *See*—
Ueno, Susumu; Kuroda, Kouiti; Nomura, Hirokazu; and Tateno, Shigeru, 4,637,851, Cl. 156-272.600.

Tatsumi, Hiroshi, to Kubota, Ltd. Detecting apparatus utilizing light beams. 4,638,157, Cl. 250-236.000.

Taylor, James W., Jr. Pneumatic thread tensioning device. 4,637,229, Cl. 66-146.000.

Tazoh, Yasuo: *See*—
Kobayashi, Kensuke; and Tazoh, Yasuo, 4,638,185, Cl. 307-352.000.

Tchernev, Dimiter I. Heat pump energized by low-grade heat source. 4,637,218, Cl. 62-106.000.

TDK Corporation: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, 4,637,963, Cl. 428-694.000.
Takayama, Suguru; and Shigeta, Masao, 4,637,843, Cl. 420-73.000.

TDK Electronics Co., Ltd.: *See*—
Fujita, Hideo; Saito, Yuichi; and Miura, Masatoshi, 4,638,205, Cl. 310-312.000.

Tecla Company, Inc.: *See*—
Clark, Richard N., 4,637,081, Cl. 5-18.00R.

Tecsyn Canada Limited: *See*—
Tomarin, Seymour A., 4,637,942, Cl. 428-17.000.

Teder, Leonid O.; Org, Tiit A.; Lauri, Vaino G.; and Aas, Ants J., to Proizvodstvennoe Obiedinenie "Norma". Safety belt buckle for vehicles. 4,637,102, Cl. 24-642.000.

Teijin Limited: *See*—
Masuho, Yasuhiko; Hara, Takeshi; and Noguchi, Teruhisa, 4,638,049, Cl. 530-388.000.

Tektronix, Inc.: *See*—
Penney, Bruce J., 4,638,255, Cl. 328-36.000.

Telautograph Corporation: *See*—
Spiro, Jan L., 4,638,298, Cl. 340-827.000.

Telles, Norman C. Plotting device. 4,637,143, Cl. 33-457.000.

Temple, Chester S.: *See*—
Das, Balbhadra; Temple, Chester S.; and Melle, Carl A., 4,637,956, Cl. 428-391.000.

Terada, Kimio; Mori, Michio; Goto, Yoichi; Nakazawa, Takashi; Muto, Kunio; and Usami, Shozo, to Asahi Denka Kogyo Kabushiki Kaisha. Process for making creamy bacteria-free foamable oil-in-water emulsion including chocolate. 4,637,937, Cl. 426-570.000.

Terao, Motoyasu; Miyauchi, Yasushi; Shigematsu, Kazuo; and Horigome, Shinkichi, to Hitachi, Ltd. Information recording member. 4,637,976, Cl. 430-523.000.

Terashima, Kazutaka: *See*—
Fukuda, Tsuguo; and Terashima, Kazutaka, 4,637,854, Cl. 156-607.000.

Terman, Lewis M.: *See*—
Rajeevakumar, Thekkemadathil V.; and Terman, Lewis M., 4,638,462, Cl. 365-203.000.

Termofrost Sweden AB: *See*—
Svensson, Torsten, 4,637,167, Cl. 49-386.000.

Terra Tek, Inc.: *See*—
Owen, Lawrence B.; Masterson, Daniel M.; and Green, Sidney J., 4,637,217, Cl. 62-74.000.

Terrill, Larry R.: *See*—
Carr, Francis L.; and Terrill, Larry R., 4,638,236, Cl. 320-21.000.

Teshima, Tsunehiko, to Hitachi, Ltd. Tracking control system for a video tape recorder. 4,638,379, Cl. 360-19.100.

Teske, Duane R.; Senasack, Heary E., Jr.; and Wilkins, Mark, to Sundstrand Corporation. Ballscrew actuator. 4,637,272, Cl. 74-424.80R.

Tetenbaum, Marvin T.: *See*—
Christenson, Roger M.; Rosenberger, Mary E.; and Tetenbaum, Marvin T., 4,638,020, Cl. 523-406.000.

Tetzlaff, Wolfgang: *See*—
Braunlich, Peter F.; and Tetzlaff, Wolfgang, 4,638,163, Cl. 250-337.000.

Teubler, Heinz; and Schulz, Rene, to Vickers Systems GmbH. Rotary vane pump. 4,637,782, Cl. 417-300.000.

Texaco Inc.: *See*—
Bhattacharya, Ajit K., 4,638,076, Cl. 558-277.000.
Dach, Michael M., 4,637,823, Cl. 48-77.000.
Hawkins, Jeffrey T.; and Schievelbein, Vernon H., 4,637,466, Cl. 166-272.000.
Hight, Margaret A., 4,637,461, Cl. 166-245.000.

Texas Instruments Incorporated: *See*—
Hester, Richard K.; and Tan, Khen-Sang, 4,638,451, Cl. 164-900.000.
McAdams, Hugh P., 4,638,182, Cl. 307-270.000.
Ott, Granville E., 4,638,309, Cl. 340-752.000.
Witter, David E.; and Levine, Jules D., 4,637,855, Cl. 156-616.00R.

Textron Inc.: *See*—
Benson, Terrance G.; and Lewis, Dean M., 4,637,204, Cl. 56-249.000.
Milliser, John, 4,637,766, Cl. 411-180.000.
Pollari, Theodore J., 4,637,778, Cl. 415-53.00R.

Thanstrom, Kenneth N.: *See*—
Sergent, Rodney H.; and Thanstrom, Kenneth N., 4,637,865, Cl. 204-111.000.

Theiling, Louis F., Jr.: *See*—
Meschke, Debra J.; Hoy, Kenneth L.; and Theiling, Louis F., Jr., 4,638,029, Cl. 524-430.000.

Thermedics, Inc.: *See*—
Szycher, Michael; Dempsey, Donald J.; and Rolfe, Jonathan L., 4,638,043, Cl. 528-75.000.

Thomann, Christof, to Zellweger Uster, Ltd. Measuring device for measuring the cross-section of textile yarns. 4,638,169, Cl. 250-560.000.

Thomas & Betts Corporation: *See*—
Rynk, Anthony J.; and DeCarlo, David J., 4,637,136, Cl. 29-872.000.

Thomas, Glenn R.; and McKee, Jere L., to Westinghouse Electric Corp. Circuit breaker with blow open latch. 4,638,277, Cl. 335-190.000.

Thompson, Kevan R.: *See*—
Doherty, James B.; Finke, Paul E.; Firestone, Raymond A.; Shah, Shrenik S.; and Thompson, Kevan R., 4,637,999, Cl. 514-201.000.

Thompson, Michael: *See*—
Krull, Ulrich J.; and Thompson, Michael, 4,637,861, Cl. 204-1.00T.

Thompson, Michael D.; and Imes, Clifford W., IV, to Xerox Corporation. Developer metering structure. 4,637,340, Cl. 118-657.000.

Thompson, Richard E.; and Uzzel, Robert G., to Lucas Industries. Self adjusting actuator for vehicle brakes. 4,637,498, Cl. 188-71.900.

Thompson, Robert A.; and White, Robert S., to General Electric Company. Adaptive displacement sensor for contour machining. 4,637,248, Cl. 73-37.500.

Thompson, Timothy H.: *See*—
Raudat, John L.; and Thompson, Timothy H., 4,637,509, Cl. 198-425.000.

Thompson, William E.: *See*—
Perrella, Guido; and Thompson, William E., 4,637,451, Cl. 164-342.000.

Thomson Brandt Armements: *See*—
Metz, Pierre, 4,637,572, Cl. 244-3.220.

Thomson-CSF: *See*—
Jecko, Jean-Rene ; and Motola, Marcel, 4,638,271, Cl. 333-205.000.

Thornblom, Jan; and Astner, Gunnar, to SKF Steel Engineering AB. Method and means for use in the installation of plasma generators in shaft furnaces. 4,638,489, Cl. 373-24.000.

Thorndike, Charles E. Log carrier. 4,637,769, Cl. 414-454.000.

Thornton, Robert L.: *See—*
Burnham, Robert D.; Paoli, Thomas L.; Thornton, Robert L.; and Sprague, Robert A., 4,638,334, Cl. 346-108.000.
Three Bond Co., Ltd.: *See—*
McGinniss, Vincent D., 4,638,035, Cl. 525-384.000.
Thurnau, Edwin H.: *See—*
McQueen, Coy E.; Twedt, Lynn O.; and Thurnau, Edwin H., 4,637,446, Cl. 160-207.000.
Thurow, Horst, to Hoechst Aktiengesellschaft. Aqueous protein solutions which are stable towards denaturing, processes for their preparation and their use. 4,637,834, Cl. 106-124.000.
Tibussek, Fritz, to Wirth Maschinen- und Bohrgerate-Fabrik GmbH. Tool member for a rotary drilling tool. 4,637,659, Cl. 299-89.000.
Ticknor, Anthony J.: *See—*
Stefanov, Michael E.; Sullivan, Brian J.; and Ticknor, Anthony J., 4,637,725, Cl. 356-354.000.
Tkachenko, Gennady A.: *See—*
Gurkov, Konstantin S.; Kostylev, Alexandr D.; Tkachenko, Gennady A.; Leonov, Ivan P.; and Klimashko, Vladimir V., 4,637,476, Cl. 173-136.000.
Tocci, Mario P.: *See—*
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Tocco, Inc.: *See—*
Alexander, Jonathan W., 4,638,418, Cl. 363-49.000.
Pfaffmann, George D., 4,637,844, Cl. 148-144.000.
Tokheim Corporation: *See—*
Dyben, Jerry F.; and Wulc, Stanley S., 4,637,254, Cl. 73-314.000.
Tokico Ltd.: *See—*
Miura, Yukio; and Miyamoto, Yoshikazu, 4,637,525, Cl. 222-22.000.
Tokushu Kika Kogyo Kabushiki Kaisha: *See—*
Furuichi, Akira; and Iijima, Akira, 4,637,555, Cl. 241-46.020.
Tokyo Electric Co., Ltd.: *See—*
Sakura, Yasuhiro; Nimura, Hitoshi; and Nakayama, Satoshi, 4,638,332, Cl. 346-76.0PH.
Tokyo Kikai Seusakusho Ltd.: *See—*
Sato, Masayonshi; and Harada, Noritake, 4,637,310, Cl. 101-426.000.
Tokyo Sanyo Electric Co., Ltd.: *See—*
Hosoya, Yoshinori; Tunekawa, Shyozi; Yamada, Wazoh; and Shiraishi, Akira, 4,637,223, Cl. 62-263.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Akutsu, Mitsuru, 4,638,392, Cl. 360-130.320.
Masuda, Eiji; and Sakamoto, Shigemi, 4,638,303, Cl. 340-347.0DA.
Tollefson, Scott; Wuertz, Howard A.; and Schultz, Charles R. Apparatus for burying conduit. 4,637,755, Cl. 405-181.000.
Tolman, Jiri: *See—*
Smidrkal, Jan; Simunek, Jaroslav; Tolman, Jiri; Soucek, Jiri; Novacek, Alois; Novak, Jan; Krob, Vaclav; Kovar, Pavel; Klofec, Miroslav; and Vondracek, Bohumir, 4,637,894, Cl. 252-186.400.
Toma, Daniel N.: *See—*
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Tomarin, Seymour A., to Tecsyn Canada Limited. Synthetic grass playing field surface. 4,637,942, Cl. 428-17.000.
Tomihashi, Nobuyuki: *See—*
Ohmori, Akira; Tomihashi, Nobuyuki; Inukai, Hiroshi; and Nakai, Kazuhiro, 4,638,041, Cl. 526-247.000.
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, to Yamaha Hatsudoki Kabushiki Kaisha. V type motorcycle engine and transmission. 4,637,354, Cl. 123-55.0VF.
Tomita, Tomoya; Hiramoto, Sotozi; Okubo, Takesi; Matsuo, Kuniyuki; Ashihara, Hiromoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, to Hitachi, Ltd. Apparatus for automatically inserting electronic part. 4,637,134, Cl. 29-741.000.
Tomita, Yasuo; Ogura, Shigetaro; and Matsumoto, Kazuya, to Canon Kabushiki Kaisha. Method of making an optical coupler device utilizing volatile liquid to achieve optical contact. 4,637,684, Cl. 350-96.190.
Tomizawa, Fumio, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Shroud for arc furnace. 4,638,487, Cl. 373-9.000.
Tomlinson, James E., to Anderson Strathclyde PLC. Line pans. 4,637,510, Cl. 198-735.000.
Toner, John L.: *See—*
Hinshaw, Jerald C.; Toner, John L.; and Reynolds, George A., 4,637,988, Cl. 436-546.000.
Topham, Arnold. J.; and Wilson, Harry W., to Dibbler, Inc. No-till planter. 4,637,328, Cl. 111-89.000.
Topura Co., Ltd.: *See—*
Yaotani, Kouichi; Nakada, Fumio; Tanaka, Takao; and Yoshida, Minoru, 4,637,767, Cl. 411-411.000.
Toray Industries, Inc.: *See—*
Hiramatsu, Tohru; Matsuhisa, Yohji; and Higuchi, Tomitake, 4,637,925, Cl. 423-447.400.
Toray Silicone Co., Ltd.: *See—*
Kishimoto, Keiichi; and Yoshitake, Makoto, 4,637,889, Cl. 252-75.000.
Torazzina, Aldo: *See—*
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Tordonato, Sebastian, to Combustion Engineering, Inc. Support rack for tubes immersed in a fluidized bed. 4,637,455, Cl. 165-104.160.
Torii, Nobutoshi: *See—*
Nakashima, Seiichiro; Toyoda, Kenichi; Torii, Nobutoshi; and Nihei, Ryo, 4,637,773, Cl. 414-732.000.
Toriumi, Yuki: *See—*
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Toro Company, The: *See—*
Lamusga, Gary R., 4,637,202, Cl. 56-16.600.
Torobin, Leonard B. Hollow porous microspheres as substrates and containers for catalysts and method of making same. 4,637,990, Cl. 502-10.000.
Toronto Medical Corporation: *See—*
Saringer, John H., 4,637,379, Cl. 128-25.00R.
Torpey, Peter A.; and Markham, Roger G., to Xerox Corporation. Thermal ink jet printhead. 4,638,337, Cl. 346-140.00R.
Toshiba Kikai Kabushiki Kaisha: *See—*
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TOTAL Compagnie Francaise des Petroles: *See—*
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Toya Soda Manufacturing Co., Ltd.: *See—*
Arai, Shoji; Tamano, Yutaka; and Hasegawa, Masazumi, 4,638,016, Cl. 521-129.000.
Toyama, Osamu: *See—*
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Toyo Communication Equipment Co., Ltd.: *See—*
Matsuno, Tatsuji, 4,638,242, Cl. 324-51.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
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Toyo Suisan Kikai Co. Ltd.: *See—*
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Toyoda, Kenichi: *See—*
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Toyoda Koki Kabushiki Kaisha: *See—*
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Murata, Kazushi; Takashima, Toshiharu; and Nakashima, Kunimichi, 4,637,108, Cl. 29-33.00P.
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Toyota Jidosha Kabushiki Kaisha: *See—*
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Ishihata, Takato, 4,637,100, Cl. 24-274.00R.
Itoh, Hiroshi; and Takada, Mitsuru, 4,637,279, Cl. 74-866.000.
Mishima, Yasuhiro; Makibayashi, Katsunori; and Kuwayama, Kiyoaki, 4,637,595, Cl. 267-52.000.
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Nomura, Yoshihisa; and Ohashi, Kaoru, 4,637,487, Cl. 180-197.000.
Yoshida, Takeshi; Honda, Takayasu; Kitazume, Shunosuke; and Tanaka, Kouzou, 4,637,653, Cl. 297-334.000.
Yoshikawa, Hayato; and Morisaka, Manabu, 4,637,298, Cl. 89-7.000.
Trainor, Willis H., to ADB-Alnaco, Inc. Modular high-intensity elevated runway edge or threshold light. 4,638,411, Cl. 362-145.000.
Trantzas, Constantin: *See—*
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Trasch, Heinz-Freidrich; Rothe, Anselm; Sojka, Bernward; Werner, Wolfgang; and Wielinger, Hans, to Boehringer Mannheim GmbH. Process for the production of reagent films and reagent films produced thereby. 4,638,023, Cl. 524-21.000.
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Trethowan, Jack, to W & A Bates Limited. Tire transport jig. 4,637,644, Cl. 294-97.000.
Trokhan, Paul D., to Procter & Gamble Company, The. Tissue paper. 4,637,859, Cl. 162-109.000.
Troy, Leonard. Improved continuous low fluid exchange water heater. 4,637,347, Cl. 122-20.00A.
Troy, Seymour L.; and Mullenix, Kenneth E. Two-part bank draft. 4,637,634, Cl. 283-98.000.
Trump, Walter N.: *See—*
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TRW Inc.: *See—*
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Tsuchihashi, Masaru: *See—*
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Tsuncoka, Tsutomu; Takeuchi, Tadashi; Ushida, Kunihiro; and Kawajiri, Shogo, to NGK Spark Plug Co., Ltd. Sheet-like piezoelectric element. 4,638,206, Cl. 310-313.00B.
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Tukovy Prumysl, Koncern: *See—*
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Tunekawa, Shyozi: *See—*
Hosoya, Yoshinori; Tunekawa, Shyozi; Yamada, Wazoh; and Shiraishi, Akira, 4,637,223, Cl. 62-263.000.
Turcott, James L.; and Matheny, Rodney C. Anchor bolt installation tool with depth stop. 4,637,539, Cl. 227-156.000.
Turner, Loren J. Apparatus for underground insect and animal extermination. 4,637,161, Cl. 43-130.000.
Turner, W. Bard: *See—*
Middlebrook, Robert B.; and Turner, W. Bard, 4,638,295, Cl. 340-73.000.
Twedt, Lynn O.: *See—*
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Uba, Toshio; and Nelson, Robert F., to Gates Energy Products, Inc. Sealed lead-acid cell. 4,637,966, Cl. 429-57.000.
Ube Industries, Ltd.: *See—*
Nakai, Mamoru; and Enomiya, Takuji, 4,638,094, Cl. 568-309.000.
Uchida, Manabu: *See—*
Takahashi, Shigeyuki; Uchida, Manabu; and Yamazaki, Kazuhiro, 4,638,057, Cl. 536-76.000.
Uda, Youichi; Matsushima, Seiya; Saito, Kazuhiko; Yamamoto, Shoji; and Murakami, Kazuhiro, to Honda Giken Kogyo Kabushiki Kaisha; and Honda Lock Manufacturing Co., Ltd. Folding key for vehicles. 4,637,238, Cl. 70-456.00R.
Ude, Werner: *See—*
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Ueda, Atsushi: *See—*
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Uehara, Makoto; and Hashimoto, Sumio, to Nippon Kogaku K. K. Mirror converging-type illumination optical system. 4,637,691, Cl. 350-432.000.
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Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, 4,637,354, Cl. 123-55.0VF.
Ueno, Moriaki, to Alps Electric Co., Ltd. Voltage controlled oscillator with series connected resonance element and switched capacitance. 4,638,264, Cl. 331-117.00D.
Ueno, Susumu; Kuroda, Kouiti; Nomura, Hirokazu; and Tateno, Shigeru, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of a laminate. 4,637,851, Cl. 156-272.600.
Uhri, Duane C., to Mobil Oil Corporation. Method of determining and displaying the orientation of subsurface formations. 4,638,254, Cl. 324-323.000.
Ujihara, Hiroshi, to Ohi Seisakusho Co., Ltd. Wire compensator for a wire driving window regulator. 4,637,166, Cl. 49-352.000.
Umebayashi, Kazuyuki; and Yamada, Takahiro, to Aisin Seiki Kabushikikaisha. Vehicle-loaded display device. 4,638,287, Cl. 340-22.000.
Umezawa, Norio: *See—*
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Undin, Hans; and Wiener, Hans, to C. A. Weidmuller GmbH & Co. Locator device for a tool provided with crimping dies for cable shoes. 4,637,242, Cl. 72-410.000.
Union Camp Corporation: *See—*
Mitchell, Peter W. D., 4,638,103, Cl. 568-827.000.
Mitchell, Peter W. D., 4,638,104, Cl. 568-827.000.
Union Carbide Corporation: *See—*
Chou, David T.; and Ligon, Robert C., 4,638,088, Cl. 564-23.000.
Meschke, Debra J.; Hoy, Kenneth L.; and Theiling, Louis F., Jr., 4,638,029, Cl. 524-430.000.
Rao, Chennupati K.; Arora, Sudershan K.; Grover, Raman; Durden, John A.; and D'Silva, Themistocles D. J., 4,637,901, Cl. 260-544.00C.
Salensky, George A., 4,638,038, Cl. 525-533.000.
Uniroyal Goodrich Tire Company, The: *See—*
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Unit Industries, Inc.: *See—*
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Agriculture: *See—*
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Jones, David I. G., 4,637,259, Cl. 73-794.000.
Nash, Dudley O., 4,637,550, Cl. 239-265.370.
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Abramovitz, Irwin J.; Berg, Norman J.; and Casseday, Michael W., 4,637,688, Cl. 350-358.000.
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Holder, Donald W.; and Phillips, William R., 4,637,571, Cl. 244-3.160.
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Austin, Theodore D.; and Consaga, John P., 4,638,316, Cl. 342-14.000.
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Hintz, Robert T.; and Nichols, Roy L., 4,638,508, Cl. 455-617.000.
Milton, Ronald I., 4,638,173, Cl. 290-52.000.
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U.S. Philips Corporation: *See—*
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Alexis, Roger P. J., 4,638,479, Cl. 370-95.000.
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Bryant, Stewart F.; Baker, Stephen J.; and Cook, Richard A., 4,638,442, Cl. 364-489.000.
Chua, Lye-Whatt, 4,638,319, Cl. 342-417.000.
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Weingartner, Fritz, to Swiss Aluminium Ltd. Process for manufacturing highly active, dispersed low apparent density aluminium hydrate. 4,637,908, Cl. 264-143.000.
Weiss, Wilhelm, to Krones AG Hermann Kronseder Maschinenfabrik. Method and device for filling containers. 4,637,438, Cl. 141-6.000.
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Raven, Robert S., 4,638,315, Cl. 342-5.000.
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Stoltz, Richard A.; and Kwoa, Young J., 4,637,831, Cl. 75-84.500.
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White, James E.; Alley, Lewis F.; Anderson, James E.; and Birdsell, Jackie D., to Marlen Research Corporation. Aspetic food processing apparatus and method. 4,637,936, Cl. 426-523.000.
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Wilkins, Vaughn D. Binocular eyeglasses for image magnification. 4,637,696, Cl. 351-41.000.
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Williams, George A. Combination, a model vehicle engine and a direct-current generator. 4,638,172, Cl. 290-1.00R.
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Willis, Donald H.: *See*—
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Fields, Ellis K.; Winzenburg, Mark L.; and Behrend, Steven J., 4,638,072, Cl. 549-234.000.

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Mahlein, Hans F.; Reichelt, Achim; and Winzer, Gerhard, 4,637,682, Cl. 350-96.150.
Wirth Maschinen- und Bohrgerate-Fabrik GmbH: *See—*
Tibussek, Fritz, 4,637,659, Cl. 299-89.000.
Wise, Dan S.; and Miller, George A., to Wise Industries, Inc. Method and apparatus for cleaning cotton. 4,637,096, Cl. 19-200.000.
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Wise, Dan S.; and Miller, George A., 4,637,096, Cl. 19-200.000.
Wistar Institute of Anatomy and Biology: *See—*
O'Brien, Thomas G.; Pegg, Anthony E.; and Herlyn, Meehard, 4,637,984, Cl. 435-240.000.
Witkoski, Edward J.; and Lizotte, Edgar G., to Simplex Security Systems, Inc. Door locking system. 4,637,237, Cl. 70-285.000.
Witter, David E.; and Levine, Jules D., to Texas Instruments Incorporated. Process for producing crystalline silicon spheres. 4,637,855, Cl. 156-616.00R.
Wohlabaugh, Leonard M.: *See—*
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Wohrle, Albert, to J. M. Voith GmbH. Scraping apparatus. 4,637,338, Cl. 118-126.000.
Wohrstein, Franz X.: *See—*
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Wolfrum, Gerhard: *See—*
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Wolsey, Clarence K. Stretcher bars. 4,637,147, Cl. 38-102.100.
Wong, Lam F., to Xerox Corporation. Four point support for copiers and the like. 4,637,581, Cl. 248-188.300.
Wong, Wilbur. Personal binocular support. 4,637,536, Cl. 224-262.000.
Wood, Eric, to Insituform Holdings Limited. Lining of pipelines and passageways. 4,637,754, Cl. 405-150.000.
Wood, Michael D. Crimping and cutting tool. 4,637,084, Cl. 7-134.000.
Woodall, Jerry M.: *See—*
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Woodbury, Howard A.: *See—*
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Worrell, Williams R.; Laroche, Robert N.; and Armstrong, Michael J., to All-Steel Canada Ltd. Office furniture desk top with adjustable CRT carriage and tracking arrangement therefor. 4,637,666, Cl. 312-196.000.
Worschech, Kurt; Loeffelholz, Frido; Wedl, Peter; and Wegemund, Bernd, to Henkel Kommanditgesellschaft auf Aktien. Lubricants for vinyl chloride polymers. 4,637,887, Cl. 252-56.00R.
Wortmann, Johannes, to Wilhelm Karmann GmbH. Method of operating industrial robots, and industrial robot for carrying out the method. 4,637,121, Cl. 29-568.000.
Wright, Charles S., to Delta Electronics. Fully compatible AM stereophonic transmitting system. 4,638,503, Cl. 381-16.000.
Wright, William: *See—*
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Wroblowsky, Heinz-Jurgen: *See—*
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Wu, Leonard L., to American Motors Corporation. Wiper arm assembly and system utilizing same. 4,637,091, Cl. 15-250.340.
Wu, Muyen M.: *See—*
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Wuertz, Howard A.: *See—*
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Wulc, Stanley S.: *See—*
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Connell, G. A. Neville; and Godwin, Jimmy D., 4,638,470, Cl. 369-13.000.
Drake, Donald J.; Hawkins, William G.; Markham, Roger G.; and LaDonna, Richard V., 4,638,328, Cl. 346-75.000.
Elrod, Scott A., 4,638,338, Cl. 346-140.00R.
Feng, I-an, 4,638,333, Cl. 346-76.0PH.
Foley, Geoffrey M. T., 4,638,397, Cl. 361-212.000.
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Yagasaki, Toshiaki: *See—*
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Yamada, Hideaki; and Tani, Yoshiki, to Yamada, Hideaki; and Nitto Kagaku Kogyo Kabushiki Kaisha, a part interest. Process for biological preparation of amides. 4,637,982, Cl. 435-129.000.
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Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, to Hitachi, Ltd.; Hitachi Seiko Ltd.; and Hitachi Koki Co., Ltd. Ink jet recording apparatus. 4,638,326, Cl. 346-75.000.
Yamada, Takahiro: *See—*
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Yamagata, Hiroshi, to Yamaha Hatsudoki Kabushiki Kaisha. Method for making a composite cylinder block. 4,637,110, Cl. 29-156.4WL.
Yamagishi, Kagari: *See—*
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Yamaguchi, Kouji; Kawahara, Eiichiro; and Yamamoto, Noboru, to Honda Giken Kogyo Kabushiki Kaisha. Slant plate type hydraulic device. 4,637,293, Cl. 91-507.000.
Yamaguchi, Yoshihisa, to Yamaguchi Cinema Corporation. Shutter for use in a television camera. 4,637,701, Cl. 352-218.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See—*
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Odashima, Rou, 4,637,355, Cl. 123-73.0AD.
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Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, 4,637,354, Cl. 123-55.0VF.
Yamagata, Hiroshi, 4,637,110, Cl. 29-156.4WL.
Yamamoto, Noboru; and Yamasaki, Tetsuya, to Nippon Sheet Glass Co., Ltd. Optical plane circuit with an optical coupler and a method for manufacturing the same. 4,637,681, Cl. 350-96.120.
Yamamoto, Noboru: *See—*
Yamaguchi, Kouji; Kawahara, Eiichiro; and Yamamoto, Noboru, 4,637,293, Cl. 91-507.000.
Yamamoto, Satoru: *See—*
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Yamamoto, Wataru, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Supercharge pressure control apparatus of a supercharged engine. 4,637,210, Cl. 60-602.000.
Yamamoto, Yoko: *See—*
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Yamamoto, Yoshiaki: *See—*
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Yamashita, Akira: *See—*
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Yamazaki, Etuo, to Fanuc Ltd. Function diagnosing system. 4,638,455, Cl. 364-900.000.
Yamazaki, Kazuhiro: *See—*
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Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Photoelectric conversion device. 4,638,108, Cl. 136-244.000.
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Ling, Hung C.; and Yan, Man F., 4,638,401, Cl. 361-321.000.
Yanagiuchi, Noboru; Adachi, Shigeo; Inoue, Masatoshi; Takata, Hiroshi; and Matsuda, Toyoshi, to Kawasaki Jukogyo Kabushiki Kaisha. Arrangement for governing vehicle engine speed responsive to actual running speed of the vehicle. 4,637,270, Cl. 74-336.500.
Yang, Chi C.: *See—*
Ovshinsky, Stanford R.; Guha, Subhendu; Nath, Prem; Yang, Chi C.; Fournier, Jeffrey; and Kulman, James, 4,637,895, Cl. 252-188.310.
Yang, Tai-Her. Easily disassemblable separate ceiling fan switch box structure and an electrical connector therefor. 4,637,673, Cl. 339-19.00M.
Yang, Yihong: *See—*
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Yano, Yoshiki; and Oikawa, Toshihiro, to Honda Giken Kogyo Kabushiki Kaisha. Spark plug cap apparatus. 4,637,358, Cl. 123-169.0PA.
Yaotani, Kouichi; Nakada, Fumio; Tanaka, Takao; and Yoshida, Minoru, to Topura Co., Ltd. Threaded fastener. 4,637,767, Cl. 411-411.000.
Yasukawa, Kazuyoshi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Lifting head of swivel arm of assembly robot. 4,637,771, Cl. 414-590.000.
Yasuoka, Akimasa; Iwata, Takahiro; and Kiuchi, Takeo, to Honda Kiken Kogyo Kabushiki Kaisha. Method for controlling the supply of fuel for an internal combustion engine. 4,637,362, Cl. 123-478.000.
Yeh, Lun-Shu R.; Grenness, Morten; and Fuller, Robert J., to Allied Corporation. Lead-titanium, bipolar electrode in a lead-acid battery. 4,637,970, Cl. 429-153.000.
Yenzer, Scott H. Helicopter airmobile work platform for working on power lines and tower structures. 4,637,575, Cl. 244-118.500.
Yinko, Richard H., Sr. Ladle cup for pouring molten metal. 4,637,593, Cl. 266-275.000.
Yokogawa Medical Systems, Limited: *See—*
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Yoshihara, Kenji: *See—*
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Yoshikawa, Hayato; and Morisaka, Manabu, Toyota Jidosha Kabushiki Kaisha. Windshield defroster. 4,637,2[illegible], Cl. 98-2.080.
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Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pharmaceutical composition containing a derivative of para-aminobenzoic acid as an active ingredient. 4,637,998, Cl. 514-42.000.
Yoshimura, Yasuo; Yamauchi, Kunio; and Saito, Kenji, to Hitachi Denshi Kabushiki Kaisha. Automatic iris adjustment system. 4,638,366, Cl. 358-228.000.
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Yoshitake, Yuji; Yokouchi, Kentaro; and Yoshikawa, Hiroyoshi, to Victor Company of Japan, Ltd. Defect detecting apparatus for a rotary recording medium. 4,638,374, Cl. 358-336.000.
Yuasa, Kazuhiro, to Ricoh Company, Ltd. One-component copier toner with electric field transfer. 4,637,708, Cl. 355-3.0DD.
Yuasa, Yoshio: *See—*
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Yunick, Henry, to MotorTech, Inc. Fuel conditioning apparatus and method. 4,637,365, Cl. 123-545.000.
Zabotto nee Arribau, Ariette; Contamin, Jean-Claude; Zaffran, Christian; and Koulbanis, Constantin, to L'Oreal. Composition for cleaning the skin. 4,637,933, Cl. 424-131.000.
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Zeeh, Rainer: *See—*
Schneider, Horst; Zeeh, Rainer; and Neumann, Hans J., 4,637,119, Cl. 29-568.000.
Zeidler, Georg: *See—*
Bergmann, Udo; Hansen, Guenter; and Zeidler, Georg, 4,638,055, Cl. 534-678.000.
Zeigler, Theodore R. Clip for self-locking collapsible/expandable structures. 4,637,180, Cl. 52-109.000.
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Zinonos, George: *See—*
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Zirk, Elisabeth: *See—*
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Zoller, Steven A.: *See—*
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Zottnik, Edmund, to Licentia Patent-Verwaltungs-GmbH. Accident data recorder. 4,638,289, Cl. 340-52.00H.
Zucchini, Guido, to AMA Universal S.p.A. Apparatus for the recycling of solvent used in dry-cleaning machines and similar equipment. 4,637,232, Cl. 68-18.00R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF JANUARY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Deyrup, Edward J., to Du Pont de Nemours, E. I., and Company. Molding resins. Re. 32,334, Cl. 524-292.000.

Du Pont de Nemours, E. I., and Company: *See*—
Deyrup, Edward J., Re. 32,334, Cl. 524-292.000.

Eli Lilly and Company: *See*—
Hamill, Robert L.; and Hoehn, Marvin M., Re. 32,333, Cl. 530-321.000.

Hamill, Robert L.; and Hoehn, Marvin M., to Eli Lilly and Company. A-21978 Antibiotics and process for their production. Re. 32,333, Cl. 530-321.000.

Hoehn, Marvin M.: *See*—
Hamill, Robert L.; and Hoehn, Marvin M., Re. 32,333, Cl. 530-321.000.

Kato, Masami, to Toska Co., Ltd. Cluster type tag pin assembly. Re. 32,332, Cl. 206-346.000.

Toska Co., Ltd.: *See*—
Kato, Masami, Re. 32,332, Cl. 206-346.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bechthold, Horst; and Bottger, Paul, to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft. Method of removing SO_2 and/or other acid components from waste gases. B1 4,039,304, 1-20-87, Cl. 55-10.000.

Bottger, Paul: *See*—
Bechthold, Horst; and Bottger, Paul, B1 4,039,304, Cl. 55-10.000.

Carl Freudenberg, Firma: *See*—
Ringel, Wolfgang; Rutsch, Peter; Schneider, Rolf; and Kohl, Edgar, B1 4,056,375, Cl. 55-381.000.

Fortel Corp.: *See*—
Hanscom, Bradford E., B1 4,451,707, Cl. 179-84.00R.

Hall, Randall C., to Purdue Research Foundation. Electrolytic conductivity detector system. B1 4,032,296, 1-20-87, Cl. 422-89.000.

Hanscom, Bradford E., to Fortel Corp. Ring detector and telephone line monitoring system for telephone answering instrument. B1 4,451,707, 1-20-87, Cl. 179-84.00R.

Kohl, Edgar: *See*—
Ringel, Wolfgang; Rutsch, Peter; Schneider, Rolf; and Kohl, Edgar, B1 4,056,375, Cl. 55-381.000.

Maschinenfabrik Buckau R. Wolf Aktiengesellschaft: *See*—
Bechthold, Horst; and Bottger, Paul, B1 4,039,304, Cl. 55-10.000.

Purdue Research Foundation: *See*—
Hall, Randall C., B1 4,032,296, Cl. 422-89.000.

Ringel, Wolfgang; Rutsch, Peter; Schneider, Rolf; and Kohl, Edgar, to Carl Freudenberg, Firma. Gas filter element. B1 4,056,375, 1-20-87, Cl. 55-381.000.

Rutsch, Peter: *See*—
Ringel, Wolfgang; Rutsch, Peter; Schneider, Rolf; and Kohl, Edgar, B1 4,056,375, Cl. 55-381.000.

Schneider, Rolf: *See*—
Ringel, Wolfgang; Rutsch, Peter; Schneider, Rolf; and Kohl, Edgar, B1 4,056,375, Cl. 55-381.000.

LIST OF DESIGN PATENTEES

Aadahl, Frank P.: *See*—
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Alexander, Frederick D., to Ekco Products, Inc. Roaster. 287,809, 1-20-87, Cl. D7-359.000.

Amano, Hiroki: *See*—
Katoh, Mitsuo; and Amano, Hiroki, 287,843, Cl. D12-163.000.

Arita, Toyomi: *See*—
Fujii, Ichiro; Yajima, Hiroshi; and Arita, Toyomi, 287,893, Cl. D32-21.000.

Arnaud, Daniel. Tooth brush. 287,791, 1-20-87, Cl. D4-107.000.

Arnaud, Daniel. Tooth brush. 287,792, 1-20-87, Cl. D4-107.000.

Atlantic Vacuum Parts Corp.: *See*—
Genoa, Joseph; Kaskel, Harold; and Nelson, Carl, 287,896, Cl. D32-32.000.

Atmos Fritzsching & Co. GmbH: *See*—
Schwan, Bernhard, 287,830, Cl. D10-57.000.

Ava Tech International Ltd.: *See*—
Stephan, Gerhard, 287,831, Cl. D11-130.100.

Baxter Travenol Laboratories, Inc.: *See*—
Glash, Dean M.; Kruger, Robert J.; Olson, Steven L.; and West, Richard L., 287,882, Cl. D24-61.000.

Berfield, Robert C.; Meland, Ronald F.; and Crevling, Robert L., Jr., to Shop-Vac Corporation. Motor housing for canister type electric vacuum cleaner. 287,895, 1-20-87, Cl. D32-25.000.

Bianchi Scarpa, Afra; and Scarpa, Tobia, to Centro Studi e Servizi Moda di Paolo Bertagnin & C. S.A.S. Store front. 287,883, 1-20-87, Cl. D25-9.000.

Black & Decker, Inc.: *See*—
Osit, Robert, 287,810, Cl. D7-412.000.

Blatherwick, William J.; Hamilton, Leslie; and Holewinski, Robert D., to Johnson & Johnson Dental Products Company. Combined holder and dispenser for dental composite material cartridge. 287,874, 1-20-87, Cl. D24-10.000.

Blatherwick, William J.; Hamilton, Leslie; and Holewinski, Robert D., to Johnson & Johnson Dental Company. Combined holder and dispenser for dental composite material cartridge. 287,875, 1-20-87, Cl. D24-10.000.

Blatherwick, William J.; Hamilton, Leslie; and Holewinski, Robert D., to Johnson & Johnson Dental Company. Single dose cartridge for dental composite material. 287,876, 1-20-87, Cl. D24-10.000.

Blatherwick, William J.: *See*—
Holewinski, Robert D.; Hamilton, Leslie; and Blatherwick, William J., 287,821, Cl. D9-341.000.
Holewinski, Robert D.; Weissenburger, Edward A.; and Blatherwick, William J., 287,877, Cl. D24-14.000.

Bobinac, William. Pontoon. 287,847, 1-20-87, Cl. D12-317.000.

Bolduc, Pierre-Yves. Hurricane lamp. 287,885, 1-20-87, Cl. D26-11.000.

Bordonaro, Frank; and McTiernan, James, to Hoffmann-La Roche Inc. Safety bottle cap remover. 287,812, 1-20-87, Cl. D8-40.000.

Borin, Harlan F. Water carafe. 287,806, 1-20-87, Cl. D7-317.000.

Braxton, Charles R.; Puszman, Alan Z.; and Johnk, William A., to Valleylab, Inc. Electrosurgical handle. 287,879, 1-20-87, Cl. D24-30.000.

Broden, David A., to Rosemount Inc. Head for a differential pressure measuring and transmitting housing. 287,827, 1-20-87, Cl. D10-46.000.

Brown, Wilbert C.; and Sabe, Philip B., to TIE/Communications, Inc. Telephone station set. 287,852, 1-20-87, Cl. D14-58.000.

Brunner, Merlin A.; and Draheim, Harvey J., to Simmons Universal Corporation. Crib footboard. 287,799, 1-20-87, Cl. D6-505.000.

Bullen, Stephen R.; Dunn, Paul M.; and Phillips, Martin A., to Dynacast International Limited. Screw-threaded insert. 287,818, 1-20-87, Cl. D8-385.000.

Bullen, Stephen R.; Dunn, Paul M.; and Phillips, Martin A., to Dynacast International Limited. Screw-threaded insert. 287,819, 1-20-87, Cl. D8-385.000.

Bullen, Stephen R.; Dunn, Paul M.; and Phillips, Martin A., to Dynacast International Limited. Screw-threaded insert. 287,820, 1-20-87, Cl. D8-385.000.

Byrd, Margaret A. H. Vehicle. 287,832, 1-20-87, Cl. D12-83.000.

Calzado Puma, S.A. de C.V.: *See*—
Palacio, Jorge E. M., 287,782, Cl. D2-309.000.
Palacio, Jorge E. M., 287,783. Cl. D2-309.000.

Carris, Bonnis S.: *See*—
Johannsen, Donald R., 287,815, Cl. D8-93.000.

Carter, Henry P. Door controlled flag for mailbox. 287,898, 1-20-87, Cl. D99-29.000.

Castor, Dennis B.; and Harper, John W., to NuTone Inc. Combination ceiling light and vent grille. 287,888, 1-20-87, Cl. D26-59.000.

Cavaliere, Mario P. Head ornament. 287,891, 1-20-87, Cl. D28-41.000.

Cedrone, Louis A.; and Vahjen, Bruce J., to PepsiCo, Inc. Vending machine for beverages or the like. 287,863, 1-20-87, Cl. D20-5.000.

Centro Studi e Servizi Moda di Paolo Bertagnin & C. S.A.S.: *See*—
Bianchi Scarpa, Afra; and Scarpa, Tobia, 287,883, Cl. D25-9.000.

Chan, Wilfred; Marr, Michael; and De Sousa, Augusto, to Fortress Scientific Limited. Motorized wheelchair. 287,836, 1-20-87, Cl. D12-131.000.

Charles of the Ritz Group Ltd.: *See*—
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Chasen, Lee R., to Coats & Clark, Inc. Cup hook. 287,816, 1-20-87, Cl. D8-367.000.

Coats & Clark, Inc.: *See*—
Chasen, Lee R., 287,816, Cl. D8-367.000.

Colnaghi, Mario, to Eurostil, S.r.l. Telephone figure pull toy. 287,865, 1-20-87, Cl. D21-111.000.

Convergent Technologies, Inc.: *See*—
Keely, Leroy B.; Freige, Diab E.; and Nuttall, Michael J., 287,848, Cl. D13-11.000.

Cragin, Richard O., to Textron Inc. Handle for an article of flatware. 287,804, 1-20-87, Cl. D7-152.000.

Crevling, Robert L., Jr.: *See*—
Berfield, Robert C.; Meland, Ronald F.; and Crevling, Robert L., Jr., 287,895, Cl. D32-25.000.

Crews, Jay A. Keyboard. 287,854, 1-20-87, Cl. D14-100.000.

Daenen, Robert H. C. M., to Dart Industries Inc. Covered serving tray or the like. 287,802, 1-20-87, Cl. D7-17.000.

Daenen, Robert H. C. M.; DeCoster, Pieter K. J.; and Wolff, Martin J., to Dart Industries Inc. Casserole dish cover or the like. 287,803, 1-20-87, Cl. D7-40.000.

Dart Industries Inc.: *See*—
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Daenen, Robert H. C. M.; DeCoster, Pieter K. J.; and Wolff, Martin J., 287,803, Cl. D7-40.000.

DeCoster, Pieter K. J.: *See*—
Daenen, Robert H. C. M.; DeCoster, Pieter K. J.; and Wolff, Martin J., 287,803, Cl. D7-40.000.

Design Institute America, Inc.: *See*—
Evans, Paul R., 287,796, Cl. D6-483.000.
Evans, Paul R., 287,797, Cl. D6-483.000.

De Sousa, Augusto: *See*—
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De Vos, Hendrik A. J., to GTE Products Corporation. Luminaire reflector. 287,890, 1-20-87, Cl. D26-118.000.

Dr. Anso Zimmermann Isolierflaschen: *See*—
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Doi, Tetsuyuki: *See*—
Hiraishi, Etsuo; Doi, Tetsuyuki; and Morikawa, Hiroshi, 287,814, Cl. D8-67.000.

Doyle, Donald E. Nose tampon. 287,880, 1-20-87, Cl. D24-51.000.

Draheim, Harvey J.: *See*—
Brunner, Merlin A.; and Draheim, Harvey J., 287,799, Cl. D6-505.000.

Dunchock, Richard S., to SL Corporation. Cassette tape holder. 287,787, 1-20-87, Cl. D3-35.000.

Dunn, Paul M.: *See*—
Bullen, Stephen R.; Dunn, Paul M.; and Phillips, Martin A., 287,818, Cl. D8-385.000.
Bullen, Stephen R.; Dunn, Paul M.; and Phillips, Martin A., 287,819, Cl. D8-385.000.
Bullen, Stephen R.; Dunn, Paul M.; and Phillips, Martin A., 287,820, Cl. D8-385.000.

Dynacast International Limited: *See*—
Bullen, Stephen R.; Dunn, Paul M.; and Phillips, Martin A., 287,818, Cl. D8-385.000.
Bullen, Stephen R.; Dunn, Paul M.; and Phillips, Martin A., 287,819, Cl. D8-385.000.
Bullen, Stephen R.; Dunn, Paul M.; and Phillips, Martin A., 287,820, Cl. D8-385.000.

Ekco Products, Inc.: *See*—
Alexander, Frederick D., 287,809, Cl. D7-359.000.

Elec & Eltek Company Limited: *See*—
Hoi, Winter W. Y., 287,851, Cl. D14-53.000.

Eriksson, Stellan, to Indoor Innovation Aktiebolag. Sealing device for surrounding the point of emergence of a pipe from a wall or floor. 287,872, 1-20-87, Cl. D23-40.000.

Eurostil, S.r.l.: *See*—
Colnaghi, Mario, 287,865, Cl. D21-111.000.

Evans, Paul R., to Design Institute America, Inc. Table. 287,796, 1-20-87, Cl. D6-483.000.

Evans, Paul R., to Design Institute America, Inc. Table. 287,797, 1-20-87, Cl. D6-483.000.

Farber, Robert J. Candy. 287,780, 1-20-87, Cl. D1-106.000.

Fay, Andreas, to Lever Brothers Company. Toothbrush. 287,790, 1-20-87, Cl. D4-104.000.

Flan Tovarna Sportnega Orodja n.sol.o.: *See*—
Robic, Andrej, 287,869, Cl. D21-229.000.

Fortress Scientific Limited: *See*—
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Freige, Diab E.: *See*—
Keely, Leroy B.; Freige, Diab E.; and Nuttall, Michael J., 287,848, Cl. D13-11.000.

Fujii, Ichiro; Yajima, Hiroshi; and Arita, Toyomi, to Sanyo Electric Co., Ltd. Portable vacuum cleaner. 287,893, 1-20-87, Cl. D32-21.000.

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Rosa, Richard L.; and Gauer, Edward H., Jr., 287,892, Cl. D32-17.000.

Gautestad, Arild O. Transparency mount for overhead projectors. 287,858, 1-20-87, Cl. D16-26.000.

Genoa, Joseph; Kaskel, Harold; and Nelson, Carl, to Atlantic Vacuum Parts Corp. Vacuum cleaner hose adapter. 287,896, 1-20-87, Cl. D32-32.000.

Gillotti, Nathan J., to Spinair Corporation. Pollutant collector for cleaning air rising from kerosene heater. 287,873, 1-20-87, Cl. D23-127.000.

Glash, Dean M.; Kruger, Robert J.; Olson, Steven L.; and West, Richard L., to Baxter Travenol Laboratories, Inc. Needle hub. 287,882, 1-20-87, Cl. D24-61.000.

Goldstein, Paul. Collapsible lampshade. 287,889, 1-20-87, Cl. D26-118.000.

Goodin, John: *See*—
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GTE Products Corporation: *See*—
De Vos, Hendrik A. J., 287,890, Cl. D26-118.000.

Hagg, Jan O.; and Persson, Lars-Olov, to Preasmaster Tool AB. Crimping tool. 287,813, 1-20-87, Cl. D8-51.000.

Hamilton, Leslie: *See*—
Blatherwick, William J.; Hamilton, Leslie; and Holewinski, Robert D., 287,874, Cl. D24-10.000.
Blatherwick, William J.; Hamilton, Leslie; and Holewinski, Robert D., 287,875, Cl. D24-10.000.
Blatherwick, William J.; Hamilton, Leslie; and Holewinski, Robert D., 287,876, Cl. D24-10.000.
Holewinski, Robert D.; Hamilton, Leslie; and Blatherwick, William J., 287,821, Cl. D9-341.000.

Hanifl, Paul H., to Sage Products, Inc. Needle/syringe collection container. 287,897, 1-20-87, Cl. D34-1.000.

Harper, John W.: *See*—
Castor, Dennis B.; and Harper, John W., 287,888, Cl. D26-59.000.

Harris Hardware Sales Corp.: *See*—
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Hashimoto, Masanori, to Ricoh Company, Ltd. Electrophotographic copying machine. 287,859, 1-20-87, Cl. D16-31.000.

Hatakenaka, Kenji, to Sumitomo Rubber Industries. Automobile tire. 287,842, 1-20-87, Cl. D12-151.000.

Hauser, Mark W.; and Windorski, David C., to Minnesota Mining and Manufacturing Company. Desk tray. 287,862, 1-20-87, Cl. D19-78.000.

Henin, Kirk, to Harris Hardware Sales Corp. Frame mounting bracket for a swinging door. 287,817, 1-20-87, Cl. D8-380.000.

Hestair Kiddicraft Limited: *See*—
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 287,866, Cl. D21-150.000.

Hiraishi, Etsuo; Doi, Tetsuyuki; and Morikawa, Hiroshi, to Ryobi Ltd. Electric drill. 287,814, 1-20-87, Cl. D8-67.000.

Hoffmann-La Roche Inc.: *See*—
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Hoi, Winter W. Y., to Elec & Eltek Company Limited. Handset and stand telephone unit. 287,851, 1-20-87, Cl. D14-53.000.

Holewinski, Robert D.; Hamilton, Leslie; and Blatherwick, William J., to Johnson & Johnson Dental Products Company. Packaging container for a bottle or the like. 287,821, 1-20-87, Cl. D9-341.000.

Holewinski, Robert D.; Weissenburger, Edward A.; and Blatherwick, William J., to Johnson & Johnson Dental Products Company. Dental syringe. 287,877, 1-20-87, Cl. D24-14.000.

Holewinski, Robert D.: *See*—
Blatherwick, William J.; Hamilton, Leslie; and Holewinski, Robert D., 287,874, Cl. D24-10.000.
Blatherwick, William J.; Hamilton, Leslie; and Holewinski, Robert D., 287,875, Cl. D24-10.000.
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ito, Kentaro; and Sasaki, Chiharu, 287,834, Cl. D12-110.000.
Makita, Akio; Nishino, Toru; and Nakazawa, Tetsuya, 287,835, Cl. D12-110.000.

Husbands, Calvin G. Flip card file holder. 287,861, 1-20-87, Cl. D19-76.000.

Hybrinetics, Inc.: *See*—
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Inoue, Junichi, to Yotsuwa Sangyo & Co., Ltd. Cutter for a sheet of film, paper, plastic or the like. 287,857, 1-20-87, Cl. D15-139.000.

Ito, Kentaro; and Sasaki, Chiharu, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 287,834, 1-20-87, Cl. D12-110.000.

Johannsen, Donald R., to Carris, Bonnis S. Knife blade sharpener or the like. 287,815, 1-20-87, Cl. D8-93.000.

Johnk, William A.: *See*—
Braxton, Charles R.; Puszman, Alan Z.; and Johnk, William A., 287,879, Cl. D24-30.000.

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Holewinski, Robert D.; Hamilton, Leslie; and Blatherwick, William J., 287,821, Cl. D9-341.000.
Holewinski, Robert D.; Weissenburger, Edward A.; and Blatherwick, William J., 287,877, Cl. D24-14.000.

Johnson, Jon T. Drink cup holder for an automobile. 287,789, 1-20-87, Cl. D3-40.000.

Johnson, Robert E. Picture frame. 287,793, 1-20-87, Cl. D6-303.000.

Kaskel, Harold: *See*—
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Matsumoto, Kintaro; Kato, Mitsuo; and Kikuchi, Hideto, 287,845, Cl. D12-184.000.

Katoh, Mitsuo; and Amano, Hiroki, to Toyota Jidosha Kabushiki Kaisha. Radiator grille for an automobile. 287,843, 1-20-87, Cl. D12-163.000.

Katz, Stanley A., to Igloo Corporation. Container for refrigerant gel or the like. 287,822, 1-20-87, Cl. D9-407.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
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Keely, Leroy B.; Freige, Diab E.; and Nuttall, Michael J., to Convergent Technologies, Inc. Modular power supply housing. 287,848, 1-20-87, Cl. D13-11.000.

Kikuchi, Hideto: *See*—
Matsumoto, Kintaro; Kato, Mitsuo; and Kikuchi, Hideto, 287,844, Cl. D12-184.000.
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Knight, Willard C. Cigarette lighter holder. 287,786, 1-20-87, Cl. D3-106.000.

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LaFrance Corporation: *See*—
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Lance, Layton G. Built-in wall cabinet. 287,800, 1-20-87, Cl. D6-559.000.

Larkin, Bernie: *See*—
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Lauhoff, Charles L. Bootjack. 287,785, 1-20-87, Cl. D2-642.000.

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Lindheimer, Thom. Mailbox cover. 287,899, 1-20-87, Cl. D99-30.000.

M. R. St. Jacques Associates, Inc.: *See*—
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MacGregor, Bruce: *See*—
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Makita, Akio; Nishino, Toru; and Nakazawa, Tetsuya, to Honda Giken Kogyo Kabushiki Kaisha. Motor tricycle. 287,835, 1-20-87, Cl. D12-110.000.

Marr, Michael: *See*—
Chan, Wilfred; Marr, Michael; and De Sousa, Augusto, 287,836, Cl. D12-131.000.

Marshall, Eric J., to Marshall Telephone Corporation Limited, The. Telephone set. 287,850, 1-20-87, Cl. D14-53.000.

Marshall Telephone Corporation Limited, The: *See*—
Marshall, Eric J., 287,850, Cl. D14-53.000.

Matsumoto, Kintaro; Kato, Mitsuo; and Kikuchi, Hideto, to Toyota Jidosha Kabushiki Kaisha. Front fender for an automobile. 287,844, 1-20-87, Cl. D12-184.000.

Matsumoto, Kintaro; Kato, Mitsuo; and Kikuchi, Hideto, to Toyota Jidosha Kabushiki Kaisha. Front fender for an automobile. 287,845, 1-20-87, Cl. D12-184.000.

McMahon, Gordon E. Motorcycle light. 287,886, 1-20-87, Cl. D26-28.000.

McShirley, Susan. Pen. 287,860, 1-20-87, Cl. D19-42.000.

McTiernan, James: *See*—
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Meland, Ronald F.: *See*—
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Metal Box p.l.c.: *See*—
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Rayner, Adrien P., 287,825, Cl. D9-428.000.

Mikhail Darafeev, Inc.: *See*—
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Miyata, Mitsuteru, to Sumitomo Rubber Industries, Ltd. Automobile tire. 287,839, 1-20-87, Cl. D12-146.000.

Molnlycke Aktiebolag: *See*—
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Morikawa, Hiroshi: *See*—
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Moselli, Giulia, to Yeu Tyan Machinery Mfg., Co., Ltd. Motorcycle. 287,833, 1-20-87, Cl. D12-110.000.

Nakazawa, Tetsuya: *See*—
Makita, Akio; Nishino, Toru; and Nakazawa, Tetsuya, 287,835, Cl. D12-110.000.

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Nishida, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Motorboat. 287,846, 1-20-87, Cl. D12-307.000.

Nishino, Toru: *See*—
Makita, Akio; Nishino, Toru; and Nakazawa, Tetsuya, 287,835, Cl. D12-110.000.

Northern Telecom Limited: *See*—
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Nuttall, Michael J.: *See*—
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O'Brien, Beverly K. Pajama bag/pillow. 287,801, 1-20-87, Cl. D6-597.000.

Ohtsu Tire & Rubber Co., Ltd., The: *See*—
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Olson, Steven L.: *See*—
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O'Malley, Kieran; Preisler, John; and Larkin, Bernie, to Northern Telecom Limited. Communications headset. 287,849, 1-20-87, Cl. D14-36.000.

Ono, Masaharu, to Sumitomo Rubber Industries, Ltd. Automobile tire. 287,840, 1-20-87, Cl. D12-147.000.

Ono, Masaharu, to Sumitomo Rubber Industries, Ltd. Automobile tire. 287,841, 1-20-87, Cl. D12-147.000.

Osaka, Kazumi, to Sharp Corporation. Combined electronic thermometer and cover therefor. 287,829, 1-20-87, Cl. D10-57.000.

Osit, Robert, to Black & Decker, Inc. Base for kitchen appliance. 287,810, 1-20-87, Cl. D7-412.000.

Palacio, Jorge E. M., to Calzado Puma, S.A. de C.V. Shoe. 287,782, 1-20-87, Cl. D2-309.000.

Palacio, Jorge E. M., to Calzado Puma, S.A. de C.V. Shoe. 287,783, 1-20-87, Cl. D2-309.000.

Pape, John A.: *See*—
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Peeler, Donald H., to Nalge Company. Sphygmomanometer unit for blood pressure measuring systems. 287,878, 1-20-87, Cl. D24-21.000.

Pensa, Inc.: *See*—
Tong, James K.; and MacGregor, Bruce, 287,784, Cl. D2-320.000.

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Perfect, Alan J., to LaFrance Corporation. Identification cardholder. 287,864, 1-20-87, Cl. D20-27.000.

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Bullen, Stephen R.; Dunn, Paul M.; and Phillips, Martin A., 287,820, Cl. D8-385.000.

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Pollock, Robert; Patton, Douglas; Sharbaugh, David; and Goodin, John, to Siemens Gammasonics, Inc. Dosimeter for monitoring radiation exposure. 287,828, 1-20-87, Cl. D10-47.000.

Preisler, John: *See*—
O'Malley, Kieran; Preisler, John; and Larkin, Bernie, 287,849, Cl. D14-36.000.

Pressmaster Tool AB: *See*—
Hagg, Jan O.; and Persson, Lars-Olov, 287,813, Cl. D8-51.000.

Puszman, Alan Z.: *See*—
Braxton, Charles R.; Puszman, Alan Z.; and Johnk, William A., 287,879, Cl. D24-30.000.

Raffo, David M.: *See*—
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 287,866, Cl. D21-150.000.

Rayner, Adrien P., to Metal Box p.l.c. Container for liquids. 287,824, 1-20-87, Cl. D9-428.000.

Rayner, Adrien P., to Metal Box p.l.c. Container for liquids. 287,825, 1-20-87, Cl. D9-428.000.

Regina Co. Inc.: *See*—
Watkins, Donald E.; and Aadahl, Frank P., 287,894, Cl. D32-22.000.

Richards, Fernando C. Clock. 287,826, 1-20-87, Cl. D10-7.000.

Ricoh Company, Ltd.: *See*—
Hashimoto, Masanori, 287,859, Cl. D16-31.000.
Yamamoto, Toshio, 287,855, Cl. D14-111.000.

Ritchie, David E.; and Seay, Edward E. Seismic gas shut-off valve. 287,871, 1-20-87, Cl. D23-19.000.

Robic, Andrej, to Flan Tovarna Sportnega Orodja n.sol.o. Ski. 287,869, 1-20-87, Cl. D21-229.000.

Rosa, Richard L.; and Gauer, Edward H., Jr., to Hybrinetics, Inc. Garment steamer. 287,892, 1-20-87, Cl. D32-17.000.

Rosemount Inc.: *See*—
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Rosenwinkel, Karen A., to W. Braun Company. Bottle, or similar article. 287,823, 1-20-87, Cl. D9-413.000.

Rowenta-Werke GmbH: *See*—
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Ryobi Ltd.: *See*—
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Saba, Philip B.: *See*—
Brown, Wilbert C.; and Saba, Philip B., 287,852, Cl. D14-58.000.

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Sanyo Electric Co., Ltd.: *See*—
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Sasaki, Chiharu: *See*—
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Scarpa, Tobia: *See*—
Bianchi Scarpa, Afra; and Scarpa, Tobia, 287,883, Cl. D25-9.000.

Scheiwiller, Rolf. Paving stone. 287,884, 1-20-87, Cl. D25-80.000.

Schmidt, Gunter. Edible Christmas tree. 287,781, 1-20-87, Cl. D1-115.000.

Schwan, Bernhard, to Atmos Fritzsching & Co. GmbH. Electronic thermometer or similar article. 287,830, 1-20-87, Cl. D10-57.000.

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Shames, Sidney J.; and Shames, Harold. Organizer and storage container for bathroom supplies. 287,788, 1-20-87, Cl. D3-39.000.

Sharbaugh, David: *See*—
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Sharp Corporation: *See*—
Osaka, Kazumi, 287,829, Cl. D10-57.000.

Shintomi, Hisashi, to Ohtsu Tire & Rubber Co., Ltd., The. Vehicle tire. 287,837, 1-20-87, Cl. D12-140.000.

Shop-Vac Corporation: *See*—
Berfield, Robert C.; Meland, Ronald F.; and Crevling, Robert L., Jr., 287,895, Cl. D32-25.000.

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Simmons Universal Corporation: *See*—
Brunner, Merlin A.; and Draheim, Harvey J., 287,799, Cl. D6-505.000.

SL Corporation: *See*—
Dunchock, Richard S., 287,787, Cl. D3-35.000.

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Gillotti, Nathan J., 287,873, Cl. D23-127.000.

Stephan, Gerhard, to Ava Tech International Ltd.; and M. R. St. Jacques Associates, Inc. Stand for trees, poles or similar article. 287,831, 1-20-87, Cl. D11-130.100.

Stewart, Ray F. Ice cube tray. 287,856, 1-20-87, Cl. D15-90.000.

Streepy, Gary, to Pizza Hut, Inc. Food preparation table for pastas, sandwiches and the like. 287,795, 1-20-87, Cl. D6-436.000.

Stutzer, Franz A.; and Knochner, Michael, to Rowenta-Werke GmbH. Toaster. 287,808, 1-20-87, Cl. D7-330.000.

Sumitomo Rubber Industries: *See*—
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Sumitomo Rubber Industries, Ltd.: *See*—
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Ono, Masaharu, 287,840, Cl. D12-147.000.
Ono, Masaharu, 287,841, Cl. D12-147.000.
Takehara, Kenji, 287,838, Cl. D12-143.000.

Sun Hill Industries, Inc.: *See*—
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Sunbeam Corporation: *See*—
Wilson, Ian G., 287,807, Cl. D7-317.000.

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Ternstrom, Maj L., to Molnlycke Aktiebolag. Incontinence pad. 287,881, 1-20-87, Cl. D24-51.000.

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Matsumoto, Kintaro; Kato, Mitsuo; and Kikuchi, Hideto, 287,845, Cl. D12-184.000.

Tsuyama Mfg. Co., Ltd.: *See*—
Tsuyama, Sadaharu, 287,887, Cl. D26-29.000.

Tsuyama, Sadaharu, to Tsuyama Mfg. Co., Ltd. Bicycle head light. 287,887, 1-20-87, Cl. D26-29.000.

Vahjen, Bruce J.: *See*—
Cedrone, Louis A.; and Vahjen, Bruce J., 287,863, Cl. D20-5.000.

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Braxton, Charles R.; Puszman, Alan Z.; and Johnk, William A., 287,879, Cl. D24-30.000.

Venturi, Robert, to Knoll International, Inc. Table base. 287,798, 1-20-87, Cl. D6-498.000.

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Rosenwinkel, Karen A., 287,823, Cl. D9-413.000.

Walla, Vincent A. Tire repair tool. 287,811, 1-20-87, Cl. D8-31.000.

Watkins, Donald E.; and Aadahl, Frank P., to Regina Co. Inc. Carpet cleaner. 287,894, 1-20-87, Cl. D32-22.000.

Weissenburger, Edward A.: *See*—
Holewinski, Robert D.; Weissenburger, Edward A.; and Blatherwick, William J., 287,877, Cl. D24-14.000.

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Glash, Dean M.; Kruger, Robert J.; Olson, Steven L.; and West, Richard L., 287,882, Cl. D24-61.000.

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Windorski, David C.: *See*—
Hauser, Mark W.; and Windorski, David C., 287,862, Cl. D19-70.000.

Wolfe, Henry S. Infant's swimming pool float. 287,870, 1-20-87, Cl. D21-237.000.

Wolff, Martin J.: *See*—
Daenen, Robert H. C. M.; DeCoster, Pieter K. J.; and Wolff, Martin J., 287,803, Cl. D7-40.000.

Wollersheim, Larry D., to Charles of the Ritz Group Ltd. Bar exerciser. 287,867, 1-20-87, Cl. D21-198.000.

Yajima, Hiroshi: *See*—
Fujii, Ichiro; Yajima, Hiroshi; and Arita, Toyomi, 287,893, Cl. D32-21.000.

Yamamoto, Toshio, to Ricoh Company Ltd. Printer. 287,855, 1-20-87, Cl. D14-111.000.

Yeu Tyan Machinery Mfg., Co., Ltd.: *See*—
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Yotsuwa Sangyo & Co., Ltd.: *See*—
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Caldwell, Edward B. Spathyphyllum plant "Jeanene". 5,863, 1-20-87, Cl. 88.000.

Gavello, Louis E., to Naka Nurseries, Inc. Hebe plant named Lavender Lace. 5,861, 1-20-87, Cl. 54.000.

Jackson & Perkins Company: *See*—
Warriner, William A., 5,859, Cl. 18.000.
Warriner, William A., 5,860, Cl. 22.000.

Monrovia Nursery Company: *See*—
Ponto, Bill, 5,862, Cl. 54.000.

Naka Nurseries, Inc.: *See*—
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Warriner, William A., to Jackson & Perkins Company. Rose plant Jacale. 5,860, 1-20-87, Cl. 22.000.

Weeks, O. L. Rose plant. 5,858, 1-20-87, Cl. 11.000.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 20, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

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94	4,637,075
102	4,637,076
185 B	4,637,077
408	4,637,078

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542	4,637,080

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453	4,637,083

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CLASS 8

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415	4,637,821

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118	4,637,089
236 R	4,637,090
250.34	4,637,091
319	4,637,092

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49	4,637,095

CLASS 19

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300	4,637,099
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602	4,637,101
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159.01	4,637,112
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	4,637,114
275	4,637,115
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568	4,637,119
	4,637,120
	4,637,121
569 L	4,637,122
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571	4,637,124
	4,637,125
572	4,637,126
576 B	4,637,128
576 E	4,637,127
578	4,637,129
588	4,637,130
622	4,637,131
726	4,637,132
727	4,637,133
741	4,637,134
832	4,637,135
872	4,637,136

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114	4,637,138
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276	4,637,140
512	4,637,141

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457	4,637,143
550	4,637,144

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1	4,637,145
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CLASS 36

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CLASS 40

1.5	4,637,148
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361	4,637,150
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584	4,637,151
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42.33	4,637,160
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131	4,637,162

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CLASS 47

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24	4,637,164

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168	4,637,170
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189 R	4,637,172
334	4,637,173
425	4,637,174

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30	4,637,176
36	4,637,177
	4,637,178
79.5	4,637,179
109	4,637,180
126.5	4,637,181
211	4,637,182
217	4,637,183
220	4,637,184
221	4,637,185
225	4,637,186
309.8	4,637,189
404	4,637,187
	4,637,188
522	4,637,191
579	4,637,190
632	4,637,192
648	4,637,193
690	4,637,194
693	4,637,195

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77	4,637,196
428	4,637,197
430	4,637,198
451	4,637,199
551	4,637,200

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302	4,637,825
304	4,637,826
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16.6	4,637,202
202	4,637,203
249	4,637,204

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282	4,637,207

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547.1	4,637,208
595	4,637,209
602	4,637,210
650	4,637,211
655	4,637,212
685	4,637,213
687	4,637,214
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CLASS 62

54	4,637,216
74	4,637,217
106	4,637,218
199	4,637,219
200	4,637,220
244	4,637,222
263	4,637,223
271	4,637,224
285	4,637,225
342	4,637,221
514 R	4,637,226

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CLASS 66

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	4,637,228
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CLASS 68

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	4,637,231
18 R	4,637,232
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CLASS 70

34	4,637,234
264	4,637,239
277	4,637,235
285	4,637,237
366	4,637,240
458 R	4,637,238
458	4,637,236

CLASS 71

76	4,637,828
90	4,637,829
105	4,637,830

CLASS 72

225	4,637,241
410	4,637,242
421	4,637,243

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1	4,637,244
35	4,637,245
	4,637,246
	4,637,247
37.5	4,637,248
41	4,637,249
57	4,637,250
118.2	4,637,251
150 A	4,637,252
189	4,637,253
314	4,637,254
517 R	4,637,255
633	4,637,256
706	4,637,257
716	4,637,258
794	4,637,259
826	4,637,260
861.02	4,637,261
861.93	4,637,262
862.04	4,637,263
862.33	4,637,264
	4,637,265
863.86	4,637,266

CLASS 74

7 A	4,637,267
190	4,637,268
335	4,637,269
336.5	4,637,270
386	4,637,271
424.8 R	4,637,272
489	4,637,273
625	4,637,274
687	4,637,275
713	4,637,276
865	4,637,277
866	4,637,278
	4,637,279
	4,637,280
869	4,637,281

CLASS 75

84.5	4,637,831
109	4,637,832

CLASS 76

4	4,637,282

CLASS 81

3.2	4,637,283
179	4,637,284

CLASS 82

2 E	4,637,285

CLASS 83

175	4,637,286
319	4,637,287
375	4,637,288
380	4,637,289

CLASS 84

173	4,637,290

CLASS 86

13	4,637,291

CLASS 89

1.804	4,637,292

CLASS 91

507	4,637,293
536	4,637,294

CLASS 92

170	4,637,295

CLASS 98

1	4,637,296
2	4,637,297
2.08	4,637,298
19	4,637,299
60	4,637,300
115.3	4,637,301
	4,637,302

CLASS 99

426	4,637,303
450.2	4,637,304
481	4,637,305

CLASS 100

233	4,637,306

CLASS 101

93.04	4,637,307
114	4,637,308
129	4,637,309
426	4,637,310

CLASS 102

209	4,637,311
275.12	4,637,312
398	4,637,313

CLASS 104

17.1	4,637,314
135	4,637,315
176	4,637,316

CLASS 105

167	4,637,318
207	4,637,319
406.1	4,637,320

CLASS 106

14.13	4,637,833
124	4,637,834

CLASS 108

72	4,637,321
102	4,637,322
107	4,637,323
111	4,637,324

CLASS 109

19	4,637,325
49	4,637,326

CLASS 110

289	4,637,327

CLASS 111

89	4,637,328

CLASS 112

80.45	4,637,329
417	4,637,330

CLASS 114

39	4,637,331
81	4,637,332
103	4,637,333
106	4,637,334
230	4,637,335
293	4,637,336

CLASS 116

323	4,637,337

CLASS 118

126	4,637,338
622	4,637,339
657	4,637,340
694	4,637,341
719	4,637,342

CLASS 119

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52 R	4,637,344
72.5	4,637,345

CLASS 122

4 A	4,637,346
20 A	4,637,347
408 ST	4,637,348
441	4,637,350
448 B	4,637,349

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25 J	4,637,351
25 P	4,637,352
27 GE	4,637,353
55 VF	4,637,354
73 AD	4,637,355
80.27	4,637,356
90.48	4,637,357
169 PA	4,637,358
170 B	4,637,359
185 A	4,637,360
339	4,637,361
478	4,637,362
481	4,637,363
492	4,637,364
545	4,637,365
588	4,637,366
572	4,637,367
647	4,637,368

CLASS 125

15	4,637,369
	4,637,370

CLASS 126

110 B	4,637,371
127	4,637,372
340	4,637,373
417	4,637,374
434	4,637,375
451	4,637,376

CLASS 127

37	4,637,835

CLASS 128

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4	4,637,378
23 B	4,637,379
80 G	4,637,381
92 Z	4,637,382
101.25	4,637,383
104.18	4,637,384
204.21	4,637,385
205.24	4,637,386
205.24	4,637,387
207.14	4,637,388
207.15	4,637,389
303.13	4,637,392
303.14	4,637,390
305	4,637,393
317	4,637,391
327	4,637,394
334 C	4,637,380
334 R	4,637,395
344	4,637,396
419 D	4,637,397
478	4,637,398
639	4,637,399
653	4,637,400
663	4,637,401
746	4,637,402
770	4,637,403
786	4,637,404
787	4,637,405

CLASS 130

27 R	4,637,406

CLASS 131

175	4,637,407
331	4,637,408
336	4,637,409
361	4,637,410

CLASS 132

9	4,637,411
92 R	4,637,412

CLASS 134

111	4,637,413

CLASS 135

73	4,637,414
98	4,637,415
109	4,637,416

CLASS 136

237	4,638,107
244	4,638,108
	4,638,109
246	4,638,110
249	4,638,111

CLASS 137

4	4,637,417
13	4,637,418
236.1	4,637,419
242	4,637,420
327	4,637,421
360	4,637,422
382.5	4,637,423
392	4,637,424
412	4,637,425
433	4,637,426
460	4,637,427
503	4,637,428
505.14	4,637,429
516.29	4,637,430
590.15	4,637,431
614.03	4,637,432
625.65	4,637,433
625.66	4,637,434

CLASS 138

30	4,637,435
89	4,637,436

CLASS 139

336	4,637,437

CLASS 141

6	4,637,438
18	4,637,439
65	4,637,440
349	4,637,441

CLASS 144

2 N	4,637,442
39	4,637,443

CLASS 148

1.5	4,637,836
6	4,637,837
6.15 Z	4,637,838
8.2	4,637,839
	4,637,840

12 E 4,637,841
12.7 A 4,637,842
144 4,637,844
171 4,637,845
402 4,637,846

CLASS 189

6 4,637,847
21 4,637,848
43 4,637,849

CLASS 156

60 4,637,850
272.6 4,637,851
307.4 4,637,852
345 4,637,853
607 4,637,854
616 R 4,637,855
637 4,637,856

CLASS 159

47.1 4,637,857

CLASS 160

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178 C 4,637,445
207 4,637,446
265 4,637,447

CLASS 162

30.1 4,637,858
109 4,637,859
117 4,637,860

CLASS 164

122.2 4,637,448
132 4,637,449
200 4,637,450
342 4,637,451
420 4,637,452
468 4,637,453

CLASS 165

16 4,637,454
104.16 4,637,455
104.33 4,637,456
162 4,637,457

CLASS 166

68 4,637,458
72 4,637,459
189 4,637,460
245 4,637,461
4,637,462
251 4,637,463
261 4,637,464
4,637,465
272 4,637,466
295 4,637,467
297 4,637,468
310 4,637,469
344 4,637,470
373 4,637,471

CLASS 169

35 4,637,472
61 4,637,473

CLASS 172

7 4,637,474

CLASS 173

43 4,637,475
136 4,637,476
149 4,637,477

CLASS 174

22 R 4,638,112
34 4,638,113
36 4,638,114
48 4,638,115
68.5 4,638,116
117 F 4,638,117

CLASS 175

4.51 4,637,478
26 4,637,479
45 4,637,480

CLASS 177

50 4,637,481

CLASS 178

18 4,638,118
19 4,638,119
22.08 4,638,120

CLASS 179

84 R B1 4,451,707

CLASS 180

132 4,637,482
142 4,637,483
4,637,484
175 4,637,485
197 4,637,487
225 4,637,486
253 4,637,488

CLASS 181

160 4,637,489
175 4,637,490
265 4,637,491

CLASS 182

93 4,637,492

CLASS 184

55.1 4,637,493

CLASS 187

10 4,637,494
29 A 4,637,495
95 4,637,496

CLASS 188

71.4 4,637,497
71.9 4,637,498
79.5 R 4,637,499

CLASS 192

3.28 4,637,500
20 4,637,501
56 R 4,637,502
83 4,637,503
87.17 4,637,504
88 A 4,637,505
110 B 4,637,506

CLASS 194

212 4,637,507

CLASS 198

365 4,637,508
425 4,637,509
735 4,637,510
846 4,637,511

CLASS 200

6 R 4,637,621
11 K 4,638,127
33 R 4,638,128
43.22 4,638,129
61.45 R 4,638,130
61.55 4,638,131
81 R 4,638,132
302.1 4,638,133

CLASS 204

1 T 4,637,861
15 4,637,862
59 R 4,637,863
61 4,637,864
111 4,637,865
129 4,637,866
157.52 4,637,867
157.82 4,637,868
192.11 4,637,869

CLASS 206

103 4,637,512
346 Re.32,332
370 4,637,513
406 4,637,514
434 4,637,515
471 4,637,516

CLASS 208

112 4,637,870
4,637,871

CLASS 209

453 4,637,872

CLASS 210

169 4,637,873
232 4,637,874
4,637,875
331 4,637,876
347 4,637,877
388 4,637,878
448 4,637,879
638 4,637,880
689 4,637,881

CLASS 211

86 4,637,517

CLASS 213

64 4,637,518

CLASS 215

121 LQ 4,638,143
232 4,637,519
320 4,637,520

CLASS 219

9.5 4,638,134
10.49 R 4,638,135
10.55 B 4,638,137
10.55 C 4,638,136
10.77 4,638,138
69 R 4,638,141
69 W 4,638,139
4,638,140
121 EC 4,638,142
121 LH 4,638,144
121 LU 4,638,145
147 4,638,146
188 4,638,147
497 4,638,148
499 4,638,149
543 4,638,150

CLASS 220

274 4,637,521
322 4,637,522

CLASS 221

13 4,637,523
239 4,637,524

CLASS 222

22 4,637,525
144 4,637,527
146.2 4,637,526
182 4,637,528
452 4,637,529
559 4,637,531
564 4,637,530

CLASS 223

111 4,637,532
112 4,637,533

CLASS 224

36 4,637,534
202 4,637,535
262 4,637,536

CLASS 226

76 4,637,537

CLASS 227

63 4,637,538
156 4,637,539

CLASS 228

49.2 4,637,540
180.1 4,637,541
4,637,542

CLASS 229

5.6 4,637,543
44 R 4,637,544

CLASS 232

43.2 4,637,545

CLASS 235

145 R 4,638,151

CLASS 236

49 4,637,546

CLASS 239

1 4,637,547
201 4,637,548
230 4,637,549
265.37 4,637,550
288.5 4,637,551
428.5 4,637,552
533.4 4,637,553
585 4,637,554

CLASS 241

46.02 4,637,555
48 4,637,556
73 4,637,557
79 4,637,558
94 4,637,559
100 4,637,560
154 4,637,561
259.2 4,637,562

CLASS 242

4 B 4,637,563
25 A 4,637,564
55.1 4,637,565
56 R 4,637,566
4,637,567
68.5 4,637,568
84.2 A 4,637,569

CLASS 244

1 TD 4,637,570
3.16 4,637,571
3.22 4,637,572
54 4,637,573
104 FP 4,637,574
118.5 4,637,575
145 4,637,576
147 4,637,577

CLASS 246

391 4,637,578
452 4,637,579

CLASS 248

95 4,637,580
188.3 4,637,581
315 4,637,582
544 4,637,583
559 4,637,584

CLASS 249

10 4,637,585
159 4,637,586

CLASS 250

214 A 4,638,152
227 4,638,153
4,638,154
231 SE 4,638,155
235 4,638,156
236 4,638,157
266 4,638,158
267 4,638,159
269 4,638,161
296 4,638,160
327.2 4,638,162
337 4,638,163
366 4,638,164
370 4,638,165
515.1 4,638,166
551 4,638,167
560 4,638,168
4,638,169
566 4,638,170
4,638,171

CLASS 251

29 4,637,587
280 4,637,588

CLASS 252

8.514 4,637,882
8.515 4,637,883
12 4,637,884
32.5 4,637,885
51.5 A 4,637,886
56 R 4,637,887
70 4,637,888
75 4,637,889
90 4,637,890
135 4,637,891
139 4,637,892
182 4,637,893
186.4 4,637,894
188.31 4,637,895
299.63 4,637,897
299.7 4,637,896
301.36 4,637,898
542 4,637,899
643 4,637,900

CLASS 256

59 4,637,589

CLASS 260

544 C 4,637,901
545 R 4,637,902

CLASS 261

24 4,637,903

CLASS 264

1.4 4,637,904
4.3 4,637,905
29.1 4,637,906
45.7 4,637,907
143 4,637,908
310 4,637,909

CLASS 266

45 4,637,590
165 4,637,591
272 4,637,592
275 4,637,593

CLASS 267

47 4,637,594
52 4,637,595
160 4,637,596

CLASS 269

32 4,637,597

CLASS 271

3.1 4,637,598
5 4,637,599
93 4,637,600
160 4,637,601
238 4,637,602

CLASS 272

1 R 4,637,603
73 4,637,604
4,637,605
4,637,606
75 4,637,606
132 4,637,607
134 4,637,608

CLASS 273

26 C 4,637,610
143 R 4,637,611
183 B 4,637,612
239 4,637,613
271 4,637,614
272 4,637,609
407 4,637,615
418 4,637,616

CLASS 277

150 4,637,617
152 4,637,618
167.5 4,637,619

CLASS 279

1 DA 4,637,620

CLASS 280

33.99 B 4,637,622
298 4,637,624
402 4,637,623
411 C 4,637,625
655 4,637,626
686 4,637,627
689 4,637,628
801 4,637,629
807 4,637,630

CLASS 281

15 R 4,637,631
45 4,637,632

CLASS 283

81 4,637,633
98 4,637,634
101 4,637,635

CLASS 285

38 4,637,636
47 4,637,637
158 4,637,638
249 4,637,639
319 4,637,640
337 4,637,641

CLASS 290

1 R 4,638,172
52 4,638,173

CLASS 292

129 4,637,642

CLASS 294

75 4,637,643
97 4,637,644
104 4,637,645

CLASS 295

37 4,637,646

CLASS 296

24 R 4,637,647
63 4,637,648
224 4,637,649

CLASS 297

90 4,637,652
334 4,637,653
337 4,637,654
410 4,637,650
4,637,655
458 4,637,651

CLASS 299

1 4,637,656
31 4,637,657
79 4,637,658
89 4,637,659

CLASS 300

21 4,637,660

CLASS 303

6 R 4,637,662
24 A 4,637,661
106 4,637,663
111 4,637,664

CLASS 305

54 4,637,665

CLASS 307

10 LS 4,638,174
10 SB 4,638,179
64 4,638,175
4,638,176
83 4,638,177
85 4,638,178
219.1 4,638,180
243 4,638,181
270 4,638,182
291 4,638,183
297 4,638,184
352 4,638,185
446 4,638,186
451 4,638,187
453 4,638,188
465 4,638,189
512 4,638,190
602 4,638,191

CLASS 310

12 4,638,192
15 4,638,193
40 R 4,638,194
49 R 4,638,195
50 4,638,196
67 R 4,638,197
91 4,638,199
156 4,638,200
216 4,638,201
235 4,638,202
239 4,638,203
4,638,204
312 4,638,205
313 B 4,638,206
328 4,638,207
871 4,638,198

CLASS 312

196 4,637,666
217 4,637,667

CLASS 313

116 4,638,208
359.1 4,638,209
362.1 4,638,210
405 4,638,211
408 4,638,212
479 4,638,213
487 4,638,214

CLASS 315

3.5 4,638,215
111.81 4,638,216
4,638,217
169.4 4,638,218
368 4,638,219
411 4,638,220

CLASS 318

48 4,638,221
111 4,638,222
254 4,638,223
4,638,224
341 4,638,225
345 R 4,638,226
565 4,638,227
569 4,638,228
584 4,638,229
632 4,638,230
640 4,638,231
4,638,232
644 4,638,233
661 4,638,234
696 4,638,235

CLASS 320

21 4,638,236
48 4,638,237

CLASS 323

211 4,638,238
281 4,638,239
289 4,638,240
312 4,638,241

CLASS 324

51 4,638,242
4,638,243
4,638,244
4,638,245
73 R 4,638,246
4,638,247
76 R 4,638,248
166 4,638,249
307 4,638,250
306 4,638,251
318 4,638,252
4,638,253
323 4,638,254

CLASS 328

36 4,638,255
105 4,638,256

CLASS 330

61 R 4,638,257
149 4,638,258
253 4,638,259
254 4,638,260
277 4,638,261

CLASS 331

65 4,638,262
116 R 4,638,263
117 D 4,638,264

CLASS 332

7.51 4,638,266

CLASS 333

1.1 4,638,267
22 F 4,638,268
164 4,638,269
175 4,638,270
205 4,638,271
214 4,638,265
236 4,638,272
254 4,638,273

CLASS 335

52 4,638,274
151 4,638,275
4,638,276
190 4,638,277
207 4,638,278

257 4,638,279
284 4,638,280
303 4,638,281

CLASS 336

185 4,638,282

CLASS 337

162 4,638,283

CLASS 338

21 4,638,284
4,638,285
34 4,638,286

CLASS 339

10 4,637,668
14 R 4,637,669
46 4,637,670
50 R 4,637,671
61 R 4,637,672
89 M 4,637,673
94 M 4,637,674
97 R 4,637,675
113 R 4,637,676
274 4,637,677

CLASS 340

22 4,638,287
52 F 4,638,288
52 H 4,638,289
56 4,638,290
59 4,638,291
63 4,638,292
4,638,293
4,638,294
73 4,638,295
83 4,638,296
304 4,638,297
310 A 4,638,299
347 CC 4,638,301
347 DA 4,638,302
4,638,303
347 DD 4,638,300
365 R 4,638,306
500 4,638,304
620 4,638,305
666 4,638,307
736 4,638,308
752 4,638,309
805 4,638,310
825.06 4,638,311
825.35 4,638,312
825.52 4,638,313
827 4,638,298
870.02 4,638,314

CLASS 342

5 4,638,315
14 4,638,316
373 4,638,317
383 4,638,318
417 4,638,319
442 4,638,320
444 4,638,321

CLASS 343

761 4,638,322
771 4,638,323
909 4,638,324

CLASS 346

1.1 4,638,325
75 4,638,326
4,638,327
4,638,328
76 PH 4,638,329
4,638,330
4,638,331
4,638,332
4,638,333
108 4,638,334
135.1 4,638,335
140 R 4,638,336
4,638,337
4,638,338
153.1 4,638,339
204 4,638,340

CLASS 350

3.7 4,637,678
6.5 4,637,679
6.8 4,637,680
96.12 4,637,681
96.15 4,637,682
96.18 4,637,683
96.19 4,637,684
96.20 4,637,685
96.29 4,637,686
335 4,637,687
358 4,637,688
372 4,637,689
427 4,637,690
432 4,637,691
486 4,637,692
536 4,637,693
626 4,637,694
631 4,637,695

CLASS 351

41 4,637,696
161 4,637,697
163 4,637,698
205 4,637,699
211 4,637,700

CLASS 352

218 4,637,701

CLASS 354

173.11 4,637,702
276 4,637,703
286 4,637,704
403 4,637,705

CLASS 355

3 DD 4,637,706
4,637,708
3 R 4,637,707
4,637,709
72 4,637,710
4,637,711
75 4,637,712
76 4,637,713
77 4,637,714

CLASS 356

1 4,637,715
28.5 4,637,716
4,637,717
71 4,637,718
72 4,637,719
125 4,637,720
215 4,637,721
350 4,637,722
4,637,723
353 4,637,724
354 4,637,725
367 4,637,726
373 4,637,727
402 4,637,728
410 4,637,729
411 4,637,730

CLASS 357

15 4,638,341
4,638,342
17 4,638,343
22 4,638,344
24 4,638,345
25 4,638,346
54 4,638,347
74 4,638,348

CLASS 358

23 4,638,349
39 4,638,350
38 4,638,351
44 4,638,352
98 4,638,353
106 4,638,354
111 4,638,355
118 4,638,356
121 4,638,357
147 4,638,358
4,638,359
148 4,638,360
213 4,638,361
4,638,362
219 4,638,363
227 4,638,364
228 4,638,365
4,638,366
4,638,367
256 4,638,368
283 4,638,369
293 4,638,370
4,638,371
296 4,638,372
298 4,638,373
336 4,638,374
338 4,638,375
342 4,638,376
343 4,638,377

CLASS 360

15 4,638,378
18 4,638,388
19.1 4,638,379
22 4,638,380
51 4,638,381
88 4,638,382
72.1 4,638,389
74.1 4,638,390
77 4,638,383
4,638,384
96.4 4,638,385
96.5 4,638,386
122 4,638,387
125 4,638,391
130.32 4,638,392
132 4,638,393
137 4,638,394

CLASS 361

93 4,638,395
101 4,638,396
212 4,638,397
214 4,638,398
220 4,638,399
304 4,638,400
321 4,638,401
328 4,638,402
341 4,638,403
388 4,638,404
399 4,638,405
403 4,638,406
433 4,638,407

CLASS 362

61 4,638,408
104 4,638,409
105 4,638,410
145 4,638,411
156 4,638,412
242 4,638,413
370 4,638,414

CLASS 363

35 4,638,415
4,638,416
41 4,638,417
49 4,638,418
87 4,638,419
132 4,638,420

CLASS 366

167 4,638,421
200 4,638,422
4,638,423
4,638,424
4,638,425
4,638,426
4,638,427
4,638,428
4,638,429
4,638,431
4,638,432
300 4,638,430
400 4,638,433
401 4,638,434
405 4,638,435
414 4,638,436
427 4,638,437
446 4,638,439
449 4,638,438
475 4,638,440
483 4,638,441
489 4,638,442
497 4,638,443
510 4,638,444
513 4,638,445
518 4,638,456
555 4,638,446
556 4,638,447
565 4,638,448
715 4,638,450
760 4,638,449
900 4,638,451
4,638,452
4,638,453
4,638,454
4,638,455

CLASS 368

51 4,638,458
104 4,638,459
149 4,638,460
189 4,638,457
4,638,461
203 4,638,462
205 4,638,463
226 4,638,464
228 4,638,465
230 4,638,466

CLASS 369

64 4,637,731

CLASS 367

105 4,638,467
153 4,638,468
154 4,638,469

CLASS 368

109 4,637,732
120 4,637,733
294 4,637,734

CLASS 369

13 4,638,470
46 4,638,471
54 4,638,472

CLASS 370

27 4,638,473
60 4,638,474
4,638,475
83 4,638,476
94 4,638,477
4,638,478
95 4,638,479
112 4,638,480

CLASS 371

27 4,638,481
63 4,638,482

CLASS 372

26 4,638,483
42 4,638,484
4,638,485
107 4,638,486

CLASS 373

9 4,638,487
22 4,638,488
24 4,638,489
35 4,638,490
39 4,638,491
74 4,638,492

CLASS 374

8 4,637,735
45 4,637,736
141 4,637,737

CLASS 375

1 4,638,493
2.2 4,638,494
14 4,638,495
104 4,638,496
116 4,638,497

CLASS 376

216 4,637,910
217 4,637,911
245 4,637,912
247 4,637,913
353 4,637,914
435 4,637,915

CLASS 377

39 4,638,498

CLASS 378

7 4,638,499
109 4,638,500
182 4,638,501
207 4,638,502

CLASS 379

124 4,638,122
145 4,638,121
159 4,638,124
229 4,638,123
427 4,638,126

CLASS 381

16 4,638,503
4,638,504
24 4,638,505
34 4,638,506
68.8 4,638,125
94 4,638,507

CLASS 384

38 4,637,738
43 4,637,739
425 4,637,740
428 4,637,741

CLASS 400

121 4,637,742
124 4,637,743
183 4,637,744

CLASS 401

1 4,637,745
82 4,637,746

CLASS 403

23 4,637,747
170 4,637,748
322 4,637,749
344 4,637,750
379 4,637,751

CLASS 404

25 4,637,752
90 4,637,753

CLASS 405

150 4,637,754
181 4,637,755
184 4,637,756
227 4,637,757
248 4,637,758
270 4,637,759

CLASS 406

108 4,637,760

CLASS 408

16 4,637,761
203.5 4,637,762

CLASS 419

52 4,637,763

CLASS 411

3 4,637,764
41 4,637,765
180 4,637,766
411 4,637,767
452 4,637,768

CLASS 414

454 4,637,769
495 4,637,770
590 4,637,771
686 4,637,772
732 4,637,773
735 4,637,774
744 B 4,637,776
744 R 4,637,775
751 4,637,777

CLASS 415

53 R 4,637,778
143 4,637,779

CLASS 417

88 4,637,780
216 4,637,781
300 4,637,782
318 4,637,783
320 4,637,784

CLASS 418

48 4,637,785
55 4,637,786
203 4,637,787

CLASS 420

73 4,637,843

CLASS 422

36 4,637,916
46 4,637,917
89 B1 4,032,296
148 4,637,918
300 4,637,919

CLASS 423

67 4,637,920
315 4,637,921
321 R 4,637,922
328 4,637,923
345 4,637,924
447.4 4,637,925
573 R 4,637,926
644 4,637,927
659 4,637,928

CLASS 424

9 4,637,929
28 4,637,930
78 4,637,931
101 4,637,932
131 4,637,933

CLASS 425

4 R 4,637,788
89 4,637,789
208 4,637,790
425 4,637,791

CLASS 426

117 4,637,934
443 4,637,935
523 4,637,936
570 4,637,937

CLASS 427

53.1 4,637,938
162 4,637,939
176 4,637,940
297 4,637,952

CLASS 428

8 4,637,941
17 4,637,942
35 4,637,943
4,637,944
4,637,945
83 4,637,946
88 4,637,947
89 4,637,948
110 4,637,949
168 4,637,950
215 4,637,951
333 4,637,953
342 4,637,954
379 4,637,955
391 4,637,956
395 4,637,957
416 4,637,958
425.9 4,637,959
449 4,637,960
579 4,637,961
816 4,637,962
884 4,637,963
4,637,964

CLASS 429

1 4,637,965
57 4,637,966
101 4,637,967
105 4,637,968
111 4,637,969
153 4,637,970

CLASS 430

59 4,637,971
84 4,637,972
122 4,637,973
148 4,637,974
353 4,637,975
523 4,637,976

CLASS 431

1 4,637,792
202 4,637,793

CLASS 432

58 4,637,794
138 4,637,795

CLASS 433

7 4,637,796

CLASS 434

118 4,637,797
191 4,637,798
236 4,637,799

CLASS 435

11 4,637,978
15 4,637,977
19 4,637,979
88 4,637,980
75 4,637,981
129 4,637,982
240 4,637,983
4,637,984

CLASS 436

10 4,637,986
151 4,637,987
518 4,637,985
546 4,637,988

CLASS 440

55 4,637,800
67 4,637,801
75 4,637,802

CLASS 445

13 4,637,803
36 4,637,804
71 4,637,805

CLASS 455

617 4,638,508

CLASS 464

130 4,637,806
135 4,637,807

CLASS 474

80 4,637,808
4,637,809
253 4,637,810

CLASS 493

167 4,637,811
357 4,637,812

CLASS 501

135 4,637,989

CLASS 502

10 4,637,990
88 4,637,991
84 4,637,992
242 4,637,993
404 4,637,994
439 4,637,995

CLASS 514

11 4,637,996
17 4,637,997
42 4,637,998
201 4,637,999
211 4,638,000
212 4,638,001
4,638,002
255 4,638,003
272 4,638,004
323 4,638,006
340 4,638,007
411 4,638,008
423 4,638,010
428 4,638,009
438 4,638,011
469 4,638,012
501 4,638,013
619 4,638,014

CLASS 521

85 4,638,015
129 4,638,016
157 4,638,017

	CLASS 822	67	4,638,033	413	4,638,050	336	4,638,025		CLASS 860	326	4,638,095
		369	4,638,034		CLASS 534	344	4,638,066	4	4,638,079	433	4,638,096
103	4,638,018	384	4,638,035					35	4,638,080	617	4,638,097
104	4,638,019	462	4,638,036	14	4,638,051		CLASS 546	40	4,638,081	630	4,638,098
	CLASS 833	471	4,638,037	575	4,638,052	15	4,638,067	62	4,638,082	638	4,638,099
		533	4,638,038	589	4,638,053	169	4,638,068	104	4,638,083	645	4,638,100
406	4,638,020	534	4,638,039	637	4,638,054	300	4,638,069	202	4,638,084	720	4,638,101
457	4,638,021		CLASS 526	678	4,638,055		CLASS 549	208	4,638,085	724	4,638,102
	CLASS 834	245	4,638,040		CLASS 536	23	4,638,070		CLASS 862	827	4,638,103
15	4,638,022	247	4,638,041	54	4,638,056	88	4,638,071	401	4,638,086		4,638,104
21	4,638,023	280	4,638,042	76	4,638,057	234	4,638,072	467	4,638,087		CLASS 585
22	4,638,024		CLASS 528	103	4,638,058	556	4,638,073		CLASS 864	481	4,638,105
40	4,638,025	75	4,638,043	121	4,638,059		CLASS 556	23	4,638,088	640	4,638,106
98	4,638,026	125	4,638,044		CLASS 540	98	4,638,074	292	4,638,089		CLASS 604
157	4,638,027		CLASS 530	203	4,638,060		CLASS 558	437	4,638,090	6	4,637,813
292	Re.32,334	321	Re.32,333	355	4,638,061	5	4,638,075	473	4,638,091	27	4,637,814
387	4,638,028	323	4,638,045		4,638,062	277	4,638,076		CLASS 868	28	4,637,815
430	4,638,029	332	4,638,046		CLASS 544	281	4,638,077	1	4,638,092	62	4,637,816
536	4,638,030		4,638,047	2	4,638,063	414	4,638,078	73	4,638,093	81	4,637,817
773	4,638,031	380	4,638,048	54	4,638,064	309	4,638,094	89	4,637,818	369	4,637,819
	CLASS 835	388	4,638,049	196	4,638,065						
54.11	4,638,032										

CLASSIFICATION OF DESIGNS

D1—	106	287,780		559	287,800			287,820		147	287,840	D19—	42	287,860		51	287,880
	115	287,781		597	287,801	D9—	341	287,821			287,841		76	287,861			287,881
D2—	309	287,782	D7—	17	287,802		407	287,822		151	287,842		78	287,862		61	287,882
		287,783		40	287,803		413	287,823		163	287,843	D20—	5	287,863	D25—	9	287,883
	320	287,784		152	287,804		428	287,824		184	287,844		27	287,864		80	287,884
	642	287,785		317	287,805			287,825			287,845	D21—	111	287,865	D26—	11	287,885
D3—	35	287,787			287,806	D10—	7	287,826		307	287,846		150	287,866		28	287,886
	39	287,788			287,807		46	287,827		317	287,847		198	287,867		29	287,887
	40	287,789		330	287,808		47	287,828	D13—	11	287,848			287,868		59	287,888
	106	287,786		359	287,809		57	287,829	D14—	36	287,849		229	287,869		118	287,889
D4—	104	287,790		412	287,810			287,830		53	287,850		237	287,870			287,890
	107	287,791	D8—	31	287,811	D11—	130.1	287,831			287,851	D23—	19	287,871	D28—	41	287,891
		287,792		40	287,812	D12—	83	287,832		58	287,852		40	287,872	D32—	17	287,892
D6—	303	287,793		51	287,813		110	287,833		70	287,853		127	287,873		21	287,893
	360	287,794		67	287,814			287,834		100	287,854	D24—	10	287,874		22	287,894
	436	287,795		93	287,815			287,835		111	287,855			287,875		25	287,895
	483	287,796		167	287,816		131	287,836	D15—	90	287,856			287,876		32	287,896
		287,797		180	287,817		140	287,837		139	287,857		14	287,877	D34—	1	287,897
	498	287,798		385	287,818		143	287,838	D16—	26	287,858		21	287,878	D99—	29	287,898
	505	287,799			287,819		146	287,839		31	287,859		30	287,879		30	287,899

CLASSIFICATION OF PLANTS

P.—	7	5,857									
	11	5,858	18	5,859	22	5,860	54	5,861	5,862	88	5,863

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
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Guam	14	New Jersey	34	West Virginia	54
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Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,637,114	4,637,513	4,638,258	11 :	4,637,331	4,637,632	4,637,459
	4,637,156	4,637,520	4,638,273		4,638,463	4,637,665	4,637,515
	4,637,571	4,637,529	4,638,293	12 :	4,637,111	4,637,789	4,637,870
	4,637,726	4,637,536	4,638,296		4,637,157	4,637,813	4,637,871
	4,637,756	4,637,541	[illegible]		4,637,214	4,637,875	23 :	4,637,075
	4,637,919	4,637,545	4,638,300		4,637,235	4,637,934	4,637,381
	4,638,014	4,637,548	4,638,320		4,637,299	4,637,974	24 :	Re.32,334
	4,638,418	4,637,603	4,638,333		4,637,330	4,638,072	4,637,151
02 :	4,637,303	4,637,610	4,638,334		4,637,365	4,638,079	4,637,180
	4,637,792	4,637,613	4,638,338		4,637,398	[illegible]	4,637,570
04 :	4,637,224	4,637,629	4,638,369		4,637,427	4,638,107	4,637,614
	4,637,619	4,637,678	4,638,377		4,637,444	[illegible]	[illegible]
	4,637,750	4,637,683	4,638,402		4,637,492	4,638,236	4,637,738
	4,637,755	4,637,689	4,638,413		4,637,519	4,638,270	4,637,931
	4,637,848	4,637,693	4,638,420		4,637,575	[illegible]	4,638,051
	4,638,186	4,637,696	4,638,470		4,637,604	4,638,290	[illegible]
	4,638,229	4,637,713	4,638,484		4,637,634	4,638,306	4,638,315
	4,638,265	4,637,722	[illegible]		4,637,694	4,638,395	4,638,316
	4,638,406	4,637,725	4,451,707		4,637,724	4,638,433	4,638,317
	4,638,423	4,637,736	08 :	4,637,657		4,637,880	4,638,436	4,638,449
	4,638,424	4,637,743	4,637,748		4,638,025	18 :	Re.32,333	[illegible]
	4,638,425	4,637,757	4,637,951		4,638,121	4,637,079	[illegible]
	4,638,504	4,637,783	4,637,966		[illegible]	4,637,115	25 :	4,637,088
05 :	4,637,328	4,637,797	4,638,073	13 :	4,637,164	4,637,195	4,637,143
	4,637,732	4,637,798	4,638,248		4,637,535	4,637,254	4,637,218
06 :	4,637,078	4,637,801	4,638,257		4,637,923	4,637,345	4,637,313
	4,637,082	4,637,810	09 :	4,637,131		4,637,990	4,637,396	4,637,382
	4,637,086	4,637,818	4,637,152		[illegible]	4,637,766	4,637,385
	4,637,101	4,637,858	4,637,237		4,638,129	4,637,811	[illegible]
	4,637,147	4,637,864	4,637,284		[illegible]	4,637,865	4,637,400
	4,637,149	4,637,873	4,637,391	15 :	4,637,631	4,637,979	4,637,431
	4,637,161	4,637,877	4,637,420	17 :	4,637,090	4,637,981	4,637,473
	4,637,162	4,637,907	4,637,455		4,637,117	4,638,027	4,637,735
	4,637,170	4,637,929	4,637,509		4,637,153	4,638,033	4,637,796
	4,637,181	4,637,932	4,637,602		4,637,160	4,638,036	4,637,799
	4,637,225	4,637,941	4,637,608		4,637,215	4,638,101	4,637,911
	4,637,255	4,637,987	4,637,872		4,637,236	4,638,181	4,637,944
	4,637,261	4,638,075	4,637,948		4,637,266	4,638,233	4,637,955
	4,637,288	4,638,111	4,638,124		4,637,272	[illegible]	[illegible]
	4,637,291	4,638,149	4,638,166		4,637,305	[illegible]	4,638,032
	4,637,292	4,638,150	4,638,175		4,637,319	19 :	4,637,425	4,638,043
	4,637,335	4,638,168	4,638,244		4,637,341	4,637,532	4,638,045
	4,637,337	4,638,173	4,638,311		4,637,344	4,638,133	4,638,118
	4,637,375	4,638,176	4,638,339		4,637,446	20 :	4,637,201	[illegible]
	4,637,376	[illegible]	4,638,373		4,637,456	4,637,258	4,638,314
	4,637,383	4,638,191	4,638,399		4,637,464	4,637,406	[illegible]
	4,637,412	4,638,195	[illegible]		4,637,504	4,637,936	4,638,414
	4,637,426	4,638,210	4,638,430		4,637,524	4,638,102	4,638,445
	4,637,429	4,638,230	4,638,439		4,637,556	21 :	4,637,230	[illegible]
	4,637,436	4,638,240	10 :	4,637,647		4,637,564	4,637,231	[illegible]
	4,637,454	4,638,241	[illegible]		4,637,582	4,637,849	4,638,473
	4,637,462	4,638,243	4,638,307		4,637,600	22 :	4,637,158	26 :	4,637,081
	4,637,512	[illegible]	4,638,456		4,637,621	4,637,352	4,637,091

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DESIGN PATENTS

06 : 287,787
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55 : 287,799
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PLANT PATENTS

06 : 5,858
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5,861

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12 : 5,863

34 : 5,857

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
January 27, 1987 Volume 1074 Number 4

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THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
All cases:	1015.00
International fees	
Basic fee (first 30 pages):	430.00
Basic Supplemental fee (for each page over 30):	8.00
Designation fee for the first 10 national or regional offices:	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Sept. 30, 1986.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Jan. 24, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,426,739 through 4,428,078
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 9, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,073	06/654,190	1/28/86
(4,358,549)	06/288,289	(11/9/82)
4,357,726	06/257,200	11/9/82
4,357,740	06/264,359	11/9/82
4,357,752	06/216,157	11/9/82
4,357,753	06/291,397	11/9/82
4,357,776	06/230,410	11/9/82
4,357,778	06/295,109	11/9/82
4,357,789	06/244,604	11/9/82
4,357,804	06/236,550	11/9/82
4,357,807	06/223,569	11/9/82
4,357,850	06/226,694	11/9/82
4,357,873	06/231,802	11/9/82
4,357,885	06/292,094	11/9/82
4,357,898	06/242,893	11/9/82
4,357,905	06/301,558	11/9/82
4,357,909	06/234,383	11/9/82
4,357,952	06/316,892	11/9/82
4,357,966	06/259,479	11/9/82
4,357,976	06/252,865	11/9/82
4,357,978	06/245,595	11/9/82
4,357,982	06/299,861	11/9/82
4,357,993	06/216,337	11/9/82
4,358,036	06/248,265	11/9/82
4,358,066	06/239,171	11/9/82
4,358,078	06/234,022	11/9/82
4,358,085	06/285,677	11/9/82
4,358,091	06/279,060	11/9/82
4,358,096	06/242,511	11/9/82
4,358,106	06/225,675	11/9/82
4,358,112	06/299,272	11/9/82
4,358,113	06/233,921	11/9/82
4,358,120	06/262,502	11/9/82
4,358,142	06/236,219	11/9/82
4,358,144	06/223,934	11/9/82
4,358,185	06/294,008	11/9/82
4,358,190	06/302,762	11/9/82
4,358,194	06/287,918	11/9/82
4,358,205	06/243,550	11/9/82
4,358,212	06/277,094	11/9/82
4,358,218	06/339,569	11/9/82
4,358,219	06/346,791	11/9/82
4,358,258	06/291,285	11/9/82
4,358,268	06/216,242	11/9/82
4,358,271	06/233,409	11/9/82
4,358,276	06/285,300	11/9/82
4,358,316	06/220,596	11/9/82
4,358,323	06/340,775	11/9/82
4,358,332	06/235,930	11/9/82
4,358,348	06/352,347	11/9/82
4,358,352	06/275,725	11/9/82
4,358,378	06/249,587	11/9/82
4,358,396	06/226,456	11/9/82
4,358,424	06/317,554	11/9/82
4,358,430	06/311,164	11/9/82
4,358,437	06/253,360	11/9/82
4,358,438	06/253,238	11/9/82
4,358,483	06/331,048	11/9/82
4,358,495	06/251,084	11/9/82
4,358,498	06/262,928	11/9/82
4,358,504	06/271,043	11/9/82
4,358,515	06/301,126	11/9/82
4,358,544	06/279,539	11/9/82
4,358,590	06/238,480	11/9/82
4,358,595	06/311,078	11/9/82
4,358,596	06/226,899	11/9/82
4,358,606	06/275,099	11/9/82
4,358,613	06/243,732	11/9/82
4,358,651	06/233,927	11/9/82
4,358,668	06/253,354	11/9/82
4,358,754	06/267,408	11/9/82
4,358,755	06/241,895	11/9/82
4,358,758	06/244,294	11/9/82
4,358,760	06/256,853	11/9/82
4,358,795	06/242,050	11/9/82
4,358,834	06/254,809	11/9/82
4,358,841	06/252,569	11/9/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,428,272, Re. S.N. 825,015, Filed Jan. 31, 1986, Cl. 84/413, DRUM HOOP, Robert Andre, et al., Owner of Record: *The Selmer Co., Elkhart, Ind.,* Attorney or Agent: Thomas A. Briody, et al., Ex. Gp.: 211

4,506,439, Re. S.N. 750,113, Filed Dec. 3, 1985, Cl. 29/747, APPARATUS FOR SECURING AN ELECTRONIC UNIT TO AN AVIONICS TRAY, Joseph C. Roake, Owner of Record: *Barry Wright Corp., Newton Lower Falls, Mass.,* Attorney or Agent: Milton E. Gilbert, et al., Ex. Gp.: 326

4,518,972, Re. S.N. 919,951, Filed Oct. 17, 1986, Cl. 346/139R, GRAPHICS PLOTTER TURRET HEAD, Charles Gunderson, et al., Owner of Record: *Sanders Associates, Inc., Nashua, N.H.,* Attorney or Agent: Richard I. Seligman, et al., Ex. Gp.: 216

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue

Interference Practice: Fraud and Inequitable Conduct Allegations

In patent interference cases, the Board of Patent Appeals and Interferences will review every "fraud" and "inequitable conduct" issue which is properly raised at final hearing on the basis of the record as presented. Whatever basis may exist during the interlocutory stages of an interference for raising and pursuing such issues, Counsel is forewarned that when an interference approaches the final hearing stage, he or she should maturely reflect on the state of the record. Only if the record supports the fraud or inequitable conduct allegations by clear and convincing evidence should such issues be pursued at final hearing. Failure to heed this warning by pursuit of such issues at final hearing without a reasonable evidentiary basis to support each element thereof may result in the case being referred to the Office of Enrollment and Discipline for disciplinary investigation.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Dec. 23, 1986.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceed-

ings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Gynecic Laboratories, Inc., assignee, by mesne assignment, of Larre Laboratories, Inc., Yonkers, N.Y., Reg. No. 236,354, for the mark "ARC", Canc. No. 15,795.

Zenith Integrated-Data Processing, Inc., Sacramento, Calif., Reg. No. 890,658, for the mark "ZIP", Canc. No. 15,836.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Status of PTO Services

The following is an update of the status of PTO services for December 1986:

Service Item	FY 1987 Goal (Calendar Days*)	Monthly Average (Calendar Days*)
Filing Receipts:		
Patents	22	30
Trademarks	30	37**
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	15 Hours
Window Coupons	5	2
Mail Coupons	12	4
Letter Orders	16	18
Certified Copies:		
Trademark Registrations	21	36
Applications-As-Filed	17	14***
File-Wrapper/Contents	N/A	15
Walk-up Certification	1	2
Trademark Search Library:		
Filing Pending Marks	21	30
Filing Reg. Certificates	Issue Date	4 days Late
Assignments:		
Patents	20	18
Trademarks	20	18
Avg. Days from Issue Fee Payment to Issue Date	90–100	117****
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule
Patent Copies Available	Issue Date	95% on Issue Date
Trademark Copies Available	Issue Date	99% on Issue Date

* Unless otherwise noted.
** Delays in Mailroom processing.
*** The 5% of orders for which fiche are not on site are not included in calculations.
**** Interval from fee payment to issuance is increasing because of the budget cut which necessitated the printing of 4,000 fewer patents than originally planned in FY 86.

IMPROVEMENTS TO SERVICES

- *PTO Forms* — As a result of comments from a patent attorney, it was brought to our attention that the PTOL 85(b) and the PTOL 85c, "Issue Fee Transmittal", do not line up in the bottom right corner. This necessitates typing entries separately on each of the two forms. Also, it was pointed out that the back of the PTOL 85 is labeled PTOL 85(c) rather than PTOL 85(a). These errors occurred with the last revision and reprinting of the form. Corrections will be made with the next reprinting of this form.

  Also, as a result of a comment from a patent attorney, we learned that the Date Mailed heading on examiner action forms is sometimes illegible. This has been due primarily to misalignment of the printing of mail headings on the PTO forms. This is being corrected. Also, mail clerks have been instructed to check all copies of the forms carefully before mailing to ensure the information in the mail heading is legible.

HELPFUL HINTS

- *Official Searches* — The PTO has had an unusually large number of official search status letters returned by the Postal Service due to insufficient/incomplete addresses. When requesting an official search for a lost patent or trademark file, please ensure that all pertinent information is completely filled out on the PTO Form 1216. In the case of an individual working for a particular firm, the firm's name should be included in block number 5 of the form along with the name of the requester. If you have any questions in this matter, please call Luther Campbell on (703) 557–3560.

Jan. 5, 1987.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 27, 1987

D. 286,420	4,592,561	4,608,079	4,615,879
4,213,458	4,592,924	4,608,299	4,616,035
4,330,414	4,592,939	4,608,321	4,616,084
4,441,247	4,593,999	4,608,349	4,616,276
4,522,062	4,594,516	4,608,531	4,616,282
4,528,246	4,594,613	4,608,938	4,616,336
4,533,885	4,594,640	4,608,948	4,616,363
4,536,169	4,594,800	4,609,258	4,616,530
4,537,654	4,594,816	4,610,426	4,616,724
4,546,119	4,595,279	4,610,752	4,618,043
4,553,855	4,595,520	4,610,952	4,618,299
4,556,658	4,597,018	4,611,281	4,618,698
4,557,419	4,598,733	4,611,301	4,618,932
4,560,520	4,600,072	4,611,306	4,619,002
4,563,521	4,600,365	4,611,375	4,619,310
4,567,116	4,600,588	4,611,508	4,619,335
4,568,278	4,601,036	4,612,320	4,619,427
4,568,963	4,601,504	4,612,337	4,619,467
4,572,237	4,601,802	4,612,533	4,619,874
4,573,928	4,602,183	4,612,625	4,620,088
4,581,491	4,602,257	4,613,042	4,620,371
4,581,735	4,602,315	4,613,182	4,620,465
4,582,892	4,602,667	4,613,374	4,620,597
4,586,703	4,602,817	4,613,664	4,620,767
4,587,193	4,603,245	4,613,693	4,621,120
4,587,281	4,603,385	4,614,487	4,621,155
4,588,174	4,603,824	4,614,639	4,621,202
4,588,283	4,604,341	4,614,799	4,621,920
4,590,595	4,606,505	4,615,504	4,621,959
4,591,539	4,607,230	4,615,643	4,622,080
4,592,143	4,607,633	4,615,856	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Connecticut	New Haven: Science Park Library	(203) 786-5000
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 6, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	8-15-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-29-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-15-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-25-85
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-19-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	7-03-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	6-22-84
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	11-06-84
DESIGN, GROUP 290—K. L. CAGE, Director	6-13-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	8-29-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	7-09-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during December 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,480,966 to 3,487,469, inclusive

Plant Patents ..... Numbers 2,945 to 2,958 inclusive

REISSUES

JANUARY 27, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,335

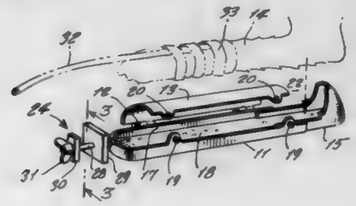
FLUID ADMINISTRATION SPLINT

Betty M. Heck, 3151 Glendale Hodgenville Rd., West Elizabethtown, Ky. 42701

Original No. 4,505,270, dated Mar. 19, 1985, Ser. No. 498,075, May 25, 1983. Application for reissue Jun. 10, 1985, Ser. No. 743,052

Int. Cl.[4] **A61F** *5/04, 13/00*; **A01K** *29/00*

U.S. Cl. 128—88 **8 Claims**



4. A fluid administration leg splint for animals comprising

a splint member for confining at least a portion of a leg of an animal therein,

a hard cover disposed over a substantial central portion of said splint member for preventing an animal whose leg is confined in said splint member from chewing or tearing away an intervenous needle and catheter taped to said leg,

a raised peripheral lip around said splint member forming a central depression for receiving an animal's leg having a catheter taped thereto, and

a latch for securing a forward end of said splint member to a cage containing said animal.

Re. 32,336

METHOD AND APPARATUS FOR CONDUCTING LOGGING OR PERFORATING OPERATIONS IN A BOREHOLE

Pierre C. Escaron, and Joachim A. Hoppe, both of Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Original No. 4,349,072, dated Sep. 14, 1982, Ser. No. 194,016, Oct. 6, 1980. Application for reissue Jun. 15, 1984, Ser. No. 620,987

Int. Cl.[4] **E21B** *23/08, 43/11, 47/00*

U.S. Cl. 166—250 **45 Claims**

35. A method for logging earth formations surrounding a borehole by means of a well-logging tool, comprising:

providing a drill pipe with a tubular protection means at the end thereof, in such manner that the protection means forms an extension to said drill pipe,

attaching the well-logging tool to the end of the drill pipe so that said tool is positioned within said protection means,

lowering the protection means with the tool carried therein into the borehole, and

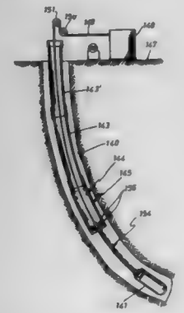
moving the tool through the borehole to log at least a portion of the formations surrounding the borehole.

45. An apparatus for logging earth formations surrounding a borehole, comprising:

a drill pipe

a tubular protection means coupled to the end of the drill pipe for releasably mounting therein, a well-*logging tool, said protection means forming an extension to said drill pipe, and having an inner diameter larger than that of the drill pipe, means for displacing the tool beyond the protection means into the borehole, and*

means for moving the tool through the borehole.



Re. 32,337

SYSTEM FOR CONVEYING CONICAL ARTICLES

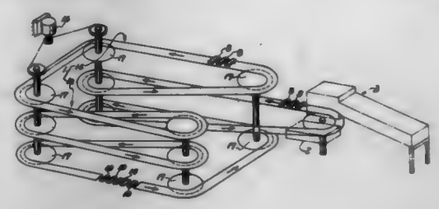
Yoshio Oizumi, Ibaragi, Japan, assignor to Yamakyu Automatics Co., Ltd., Osaka, Japan

Original No. 4,454,942, dated Jun. 19, 1984, Ser. No. 314,515, Oct. 23, 1981. Application for reissue May 3, 1985, Ser. No. 730,133

The portion of the term of this patent subsequent to Jul. 7, 1998, has been disclaimed.

Int. Cl.[4] **B65G** *37/00*

U.S. Cl. 198—463.6 **7 Claims**



4. A combination of a conveyor belt, a means for feeding conical articles to the conveyor belt, and a means for delivering the conical articles from the conveyor belt, wherein the conveyor belt comprises stands arranged equidistantly along the belt, each having a receiving portion for fitting said conical article therein with the tapered end of said article directed downward, a multiplicity of support bars arranged side by side and each having branches projecting from the opposite sides of said support bar, and a connecting rod attached to said branches on one side of each said support bar and engaged with said branches of an adjacent support bar; and said means for delivering comprises a pair of opposed endless chains arranged on the opposite sides of a path of transfer of said conical articles and spaced apart from each other by a larger distance in an upstream section and by a smaller distance in a downstream section, said chains being raised toward their downstream ends, and support pieces projecting from said chains and engageable with an upper end peripheral portion of said conical article to lift said article from said receiving portion with the rise of said endless chains.

Re. 32,338

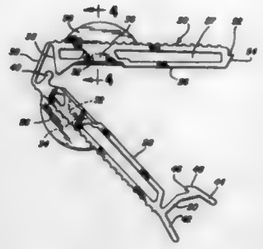
GRIPPER MEMBER FOR RETENTION OF A PLASTIC TUBE

John B. Alexander, Evanston; Michael T. Dennehey, Arlington Heights; Richard J. Greff, Ingleside, and John M. Munsch, Libertyville, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Original No. 4,227,730, dated Oct. 14, 1980, Ser. No. 43,061, May 29, 1979. Application for reissue Aug. 23, 1982, Ser. No. 410,749

Int. Cl.⁴ C25B *7/02*

U.S. Cl. 294—16 **17 Claims**



12. A gripper member which comprises: an openable and closable pair of handles interconnected by a hinge member, each handle defining, an arcuate recess positioned to face the corresponding recess of the other handle, and a wall member positioned longitudinally on each handle across each arcuate recess and at the same side thereof, whereby a flexible plastic tube may be surrounded and gripped in the arcuate recesses of said handles for rotational retention thereof as a connector member is inserted into or withdrawn from said tube, said wall members pinching said tube into closed, sealed relation when occupying said recesses with the handles in closed position.

Re. 32,339

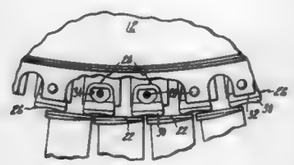
BLADE TO BLADE VIBRATION DAMPER

John C. Jones, Stuart; Perry P. Sifford, Jupiter, and Joel F. Sutton, North Palm Beach, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Original No. 4,347,040, dated Aug. 31, 1982, Ser. No. 193,514, Oct. 2, 1980. Application for reissue Jul. 31, 1984, Ser. No. 636,442

Int. Cl.⁴ F01D *5/10*

U.S. Cl. 416—190 **8 Claims**



1. In a rotor assembly of the axial flow rotary machine type in which a plurality of individually mounted blades, each having a platform section, extend outwardly on the machine, the improvement comprising:

a blade to blade damper adapted to seat against a pair of adjacent blade platform sections in response to centrifugally generated loads in an operating engine and of essentially "T" shaped cross section geometry including a top bar and a web extending circumferentially with respect to the machine between said pair of adjacent blade platform sections wherein the top bar provides longitudinal stiffness in the direction of expected slip load forces and the web provides transverse stiffness in the direction normal to the expected slip load forces.

3. The invention according to claims 1 or 2 in which said blade to blade dampers are of sufficiently light weight to limit the magnitude of the sliploat force required to cause relative movement between said damper and said platform sections in an operative environment to a value below that which is generated by blade vibration such that energy in the vibrating blade is capable of being dissipated in the form of heat energy at the points of contact between the damper and platform sections.

4. The invention according to claim 3 wherein the weight of said dampers is approximately [four one hundredths of a pound (0.04 lb.).] *four one thousandths of a pound (0.004 lb.).*

Re. 32,340

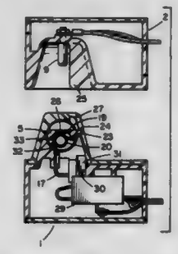
ELECTRICAL SWITCH-PLUG ASSEMBLY WITH BAFFLE

William C. Dobson, West Bend, Wis., and Carl R. Spoeth, New Port Richey, Fla., assignors to Dart Industries Inc., Northbrook, Ill.

Original No. 4,528,429, dated Jul. 9, 1985, Ser. No. 583,631, Mar. 2, 1984. Application for reissue Sep. 30, 1985, Ser. No. 772,110

Int. Cl.⁴ H01H *9/20*; H01R *33/30*

U.S. Cl. 200—50 B **23 Claims**



1. A plug and socket electrical connector, comprising:

(a) a plug having an electrically conductive plug prong,

(b) a socket engagable with said plug, having a passage comprising one or more apertures and an electrically conductive socket contact proximate said passage, said passage adapted to receive at least a portion of said plug prong in a position of engagement with said socket contact,

(c) means for establishing electrical union between said socket contact and a power supply,

(d) a movable baffle [rotatably] supported by said socket, *rotatable about an axis generally transverse to said passage,* having a shield movable to a closed position intermediate said passage and said socket contact and movable to an open position in which said socket contact is exposed to said passage,

(e) a baffle control arm rotatably supported by said socket and cooperative with said baffle, movable to a first position corresponding to said closed position of said shield, and having an engagement surface separate from said shield engagable to move said baffle control arm from said first position to a second position corresponding to said open position of said shield,

(f) means for moving said shield from said open position to said closed position when said baffle control arm is disengaged,

(g) means for moving said baffle control arm from said second position to said first position when said baffle control arm is disengaged, and

(h) a projection carried by said plug separate from said plug prong in a position of alignment with said engagement surface when said plug prong is in alignment with said passage, *said projection* adapted to engage said engagement surface and to move said baffle control arm from said first position to said second position as said plug prong is moved from said position of alignment toward said position of engagement with said socket contact, whereby said shield is moved to said open position and said socket contact is exposed to said plug prong for engagement to establish an electrical connection between said socket and said plug.

5. The electrical connector of claim 4, wherein said [menas] *means* for establishing electrical union between said socket contact and a power supply comprises an electric switch between said socket contact and said power supply, means for biasing said switch open, and means for closing said switch when said plug is engaged with said socket.

Re. 32,341

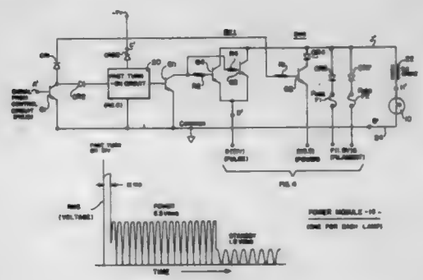
DISCO LIGHT ASSEMBLY

Robert M. Smith, 1443 Centinela Ave., Santa Monica, Calif. 90404

Original No. 4,389,598, dated Jun. 21, 1983, Ser. No. 233,173, Feb. 10, 1981. Application for reissue Mar. 12, 1984, Ser. No. 588,914

Int. Cl.⁴ G05F *1/00*; H05B *37/02, 39/04, 41/36*

U.S. Cl. 315—291 **18 Claims**



1. A *rapid turn-on* control system for selectively energizing a plurality of *filament-type* electric lamps including: power supply means; a plurality of control modules connected to said power supply means for respectively energizing respective ones of said lamps; and control circuitry connected to said control modules for causing the control modules selectively to activate the lamps, each of said control modules including: [first circuit means for supplying a continuous electric current to the corresponding lamp within an amplitude sufficient to maintain the filament of the lamp in a warm state but insufficient to illuminate the lamp, second circuit means including switching means responsive to control pulses from said control circuitry for selectively introducing a power current to the corresponding lamp of sufficient intensity to illuminate the lamp, and] circuit means including switching means responsive to [said] control *turn-on* pulses from said control circuitry for *selectively* introducing *high intensity* current pulses to the [corresponding] lamp [filament of a high amplitude as compared with the amplitude of said power current, each of said current pulses being introduced to the lamp filament] *filaments* for a [limited] *relatively brief* time interval; *and further circuit means including switching means responsive to said control turn-on pulses from said control circuitry for selectively introducing power currents to the corresponding lamp filaments of an intensity less than said high intensity current pulses but of sufficient intensity and of a relatively long duration to illuminate each lamp for a predetermined time interval.*

Re. 32,342

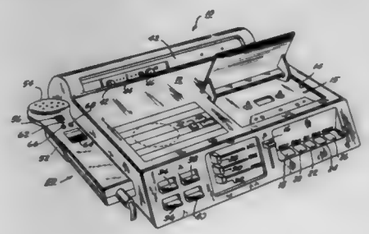
INSTRUCTION INDICATING APPARATUS FOR A RECORD AND/OR PLAYBACK DEVICE

Leslie N. Wilder; James C. Whitney, both of Fairfield, and Gary G. Matison, Wilton, all of Conn., assignors to Dictaphone Corporation, Rye, N.Y.

Original No. 4,051,540, dated Sep. 27, 1977, Ser. No. 678,697, Apr. 20, 1976. Continuation of Ser. No. 79,171, Sep. 26, 1974, abandoned. Application for reissue Jul. 26, 1984, Ser. No. 629,314

Int. Cl.⁴ G11B *15/18*

U.S. Cl. 360—72.2 **19 Claims**



18. Indicator apparatus for use in a dictation/transcription device to provide a visual indication of the relative locations on a record medium used with said device at which predetermined signals are recorded, said apparatus comprising:

an array of selectively energizable visual indicating elements;

energizing means for selectively energizing said visual indicating elements;

scanning means for scanning said record medium for occurrences of said predetermined signals;

detecting means operable with said scanning means for detecting the recorded predetermined signals as said record medium is scanned and for producing an actuating signal in response to a detected predetermined signal; and

means operable in synchronism with said scanning means, said means causing said energizing means to be activated, in accordance with the actuating signals when the record medium has been scanned, so as to provide a visual indication of the relative locations of said predetermined signals.

PLANT PATENTS

GRANTED JANUARY 27, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,864

ROSE PLANT—MEIKRUZA VARIETY

Marie-Louise Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Oct. 11, 1984, Ser. No. 659,942
Claims priority, application France, Oct. 12, 1983, 4212
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—15 **1 Claim**

1. A new and distinct variety of Hybrid Tea rose plant characterized by the fact that:

(a) from a physical point of view, the plant has deep green adult wood, an upright growth habit, and forms attractive pale yellow blossoms of long duration which often are very lightly suffused with a light salmon pink coloration and comprise consistent petals; and

(b) from a biological point of view, the plant has vigorous vegetation, flowers abundantly, and exhibits good resistance to diseases;

substantially as herein shown and described.

5,865

PEACH TREE, SUMMER LADY

Hideo P. Yamashiro, Parlier, Calif., assignor to The Burchell Nursery, Inc., Modesto, Calif.

Filed Mar. 1, 1985, Ser. No. 707,489
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, characterized by similarity in tree and fruit to that of the O'Henry variety of peach tree (U.S. Plant Pat. No. 2,964), from which it is a single scaffold mutation and from which it is distinguished and characterized as to novelty by bearing fruit which ripens approximately one week to ten days earlier than fruit of the O'Henry variety and which is distinguished from the fruit of the O'Henry in being more nearly globose and by displaying less green fruit ground color and a more uniform and brighter overall red skin coloration than that of the O'Henry at maturity.

5,866

NERIUM OLEANDER CV. MONVIS

Richard L. Purvis, Anaheim, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Jul. 8, 1985, Ser. No. 752,822
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct selection of *Nerium oleander* as substantially shown and described herein, that is characterized particularly as a novelty by the unique combination of large bright rose flowers, early flowering and a dense compact growth habit.

5,867

FELICIA AMELLOIDES HARTLEY WHITE

Richard R. Hartley, and Kathleen R. Hartley, both of 5737 Busch Dr., Malibu, Calif. 90265

Filed Sep. 21, 1984, Ser. No. 653,958
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of *Felicia amelloides* as described and shown herein characterized particularly by its vigorous growth pattern, and by its white ray flowers with yellow centers, as compared with the Blue Marguerite variety.

5,868

IMPATIENS PLANT NAMED ENTERPRISE

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Oct. 19, 1984, Ser. No. 663,677
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of New Guinea Impatiens plant named Enterprise, as described and illustrated, and particularly characterized by its intense pink flowers, large leaf size with distinct variegation, tolerance to moisture stress, and its vigorous self-branching bush growth habit, which makes it useful for pot and hanging basket use.

5,869

IMPATIENS PLANT NAMED TWILIGHT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Oct. 19, 1984, Ser. No. 663,708
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of New Guinea Impatiens plant named Twilight, as described and illustrated, and particularly characterized by its distinct red and light pink bicolor flowers, distinct variegated leaves, vigorous, highly self-branching dense bush growth habit making it useful for pot, hanging basket and bedding plant use; and by its adaptability to various environments of use.

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PATENTS

GRANTED JAN. 27, 1987

ERRATA

For CLASS	See PATENT NO.
530-303	4,639,332
530-303	4,639,333
548-952	4,639,334
540-304	4,639,335
380-043	4,639,548
379-062	4,639,549
379-062	4,639,550
323-231	4,639,551
379-199	4,639,552
379-377	4,639,553
340-365	4,639,554
379-327	4,639,555
381-068	4,639,556
379-029	4,639,557

PATENTS

GRANTED JANUARY 27, 1987

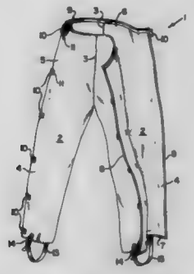
GENERAL AND MECHANICAL

4,638,509

PROTECTIVE OUTER GARMENT FOR DIVERS

Rene Charron, 4115 - 67 Street N. W., Calgary, Canada (T3B 2J2)

Filed Sep. 23, 1985, Ser. No. 778,642
Int. Cl.[4] B63C *11/04;* A41D *13/00*
U.S. Cl. 2—2.1 R 2 Claims



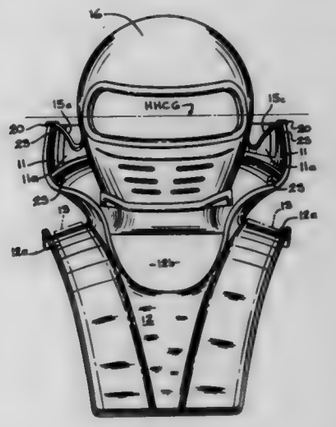
1. Protective trousers for use by divers in combination with a diving suit for preventing the expansion of air below the waist of the user comprising panel means defining leg, hip and waist encircling trousers, thread means permanently interconnecting said panel means along at least one edge thereof, whereby said panel means define trousers having openings along the entire length of at least one side thereof to permit the escape of air without disrupting the buoyancy of the user, loop means for engaging the feet of a user for retaining the trousers over substantially the entire length of the legs of a user; and coupling means for closing said open side of said trousers.

4,638,510

NECK PROTECTION DEVICE WITH OCCUPANT OF A HIGH PERFORMANCE VEHICLE

Robert P. Hubbard, 160 Kenberry, East Lansing, Mich. 48823

Filed Nov. 29, 1985, Ser. No. 802,986
Int. Cl.[4] A42B *3/02;* A62B *35/00;* B64D *25/06*
U.S. Cl. 2—6 15 Claims



1. A neck protection device for a shoulder and lap belted driver or other occupant of a high performance vehicle having forward and lateral fields of view with a helmet on the head of the occupant and with horizontal level center of gravity of the head and helmet combined at about eye level of the occupant which comprises:

(a) a stiff restraining means including lateral, front and rear portions relative to the occupant which is contoured to fit the rib cage and shoulders and around the neck of the occupant;

(b) a stiff high collar mounted on the restraining means, having lateral, front and rear portions relative to the occupant, which extends upward to adjacent the center of gravity of the head and helmet combined and adjacent the neck of the occupant around the lateral and rear portions of the restraining means and which is open at the front portion of the restraining means and allows movement of the helmeted head to provide the forward and lateral fields of view; and

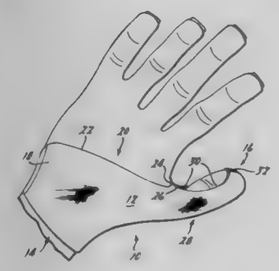
(c) first fastening means mounted around the collar adjacent the center of gravity of the helmeted head for attaching a plurality of tethers between the lateral and rear portions of the collar and the helmet, wherein the tethers provide a restraint which is in a substantially horizontal plane between the helmet and the collar and wherein in normal vehicle operation or in a crash the collar transmits forces to the restraining means from the tethers thereby reducing the forces being transmitted through the neck which cause fatigue and injury in vehicle operation or in a crash.

4,638,511

BOWLING GLOVE

Peggy J. Haack, 4913 Elmhurst, Royal Oak, Mich. 48073

Filed Nov. 18, 1985, Ser. No. 799,145
Int. Cl.[4] A41D *19/00;* A63D *5/00*
U.S. Cl. 2—161 A 8 Claims



1. A bowling glove comprising a wrist band and a thumb stall conected to said wrist band, said thumb stall having an open portion wherein when said glove is applied to a wearer's hand the top of the wearer's thumb is covered and said open portion corresponds to and exposes substantially the entire inner face of said wearer's thumb.

4,638,512

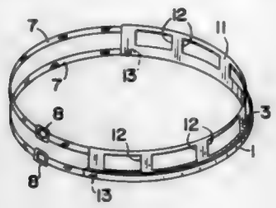
SWEAT COLLECTING HEADBAND

Alfred R. Frankel, 403 Gulf Way - Apt. 701, St. Petersburg, Fla. 33706

Filed Apr. 11, 1985, Ser. No. 721,887
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—171 5 Claims

1. A headband assembly comprising a headband of flexible non-absorbent material adapted to be fitted directly and snugly against the forehead of the wearer, said headband having at least one trough permanently fixed therein extending along a substantial portion of the length of said headband, said trough being disposed in said headband so as to intercept and collect sweat running down the head of the wearer and having drain-

ing means located so as to be positioned at the side of the wearer's head to allow the running off of collected sweat from said trough, the side of said trough adapted to being fitted tightly against the wearer's forehead comprising a strip having



a width of 0.25–2.5 inches and having open portions therein comprising a total of 25–95% open area, said assembly also comprising a means for holding said headband tightly against the wearer's forehead.

4,638,513

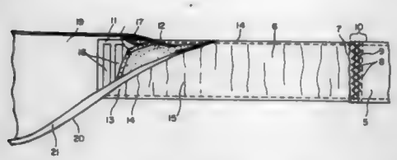
LATERALLY STABILIZED BRA STRAP

Alma J. Woods, 2400 Oneida, Denver, Colo. 80207

Filed Nov. 25, 1985, Ser. No. 801,292

Int. Cl.[4] A41D *27/26*

U.S. Cl. 2—268 **19 Claims**



1. In a strap for use with garments and packs and adapted for use adjacent the skin, the improvement comprising:

elastic ribbon means adapted to stretch in at least the longitudinal direction and substantially resistant to bending laterally;

padding means enclosing the elastic ribbon means;

smooth-faced material means enclosing the padding means and having a longitudinal excess of smooth-faced material means sufficient to create undulations in the surface of said smooth-faced material means when the elastic ribbon means is unstretched and a smooth surface in said smooth-faced material means when the elastic ribbon means is partially stretched; and

stitching means attaching the elastic ribbon means, padding means and smooth-faced material means along each of the longitudinal edges of the strap.

4,638,514

RAISED SUPERIMPOSED TOILET SEAT AND BIDET-LIKE DEVICE IN COMBINATION

Kurt Landsberger, 103 Harrison St., Verona, N.J. 07044

Filed Mar. 24, 1986, Ser. No. 842,938

Int. Cl.[4] A47K *13/00;* **A61H** *35/00;* **E03D** *9/08*

U.S. Cl. 4—239 **10 Claims**

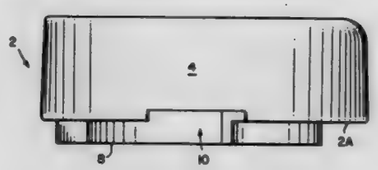
1. For use with a toilet of the type having a bowl, a raised superimposed toilet seat and bidet-like device in combination, characterized by:

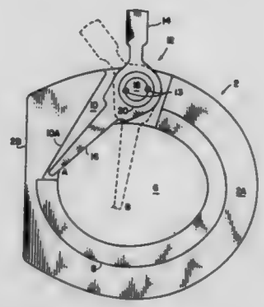
the raised seat including an upper portion which rests on the bowl, a lower portion which fits into the bowl, a hole extending through the upper and lower portions, an underside and a back;

a channel disposed on the underside of the raised seat and extending through a side of said seat;

the bidet-like device supported in the channel for displacement in a plane parallel to the plane of the seat;

the bidet-like device having a member extending external the channel through the side of the seat and operable for displacing said device; and





the channel arranged to provide clearance for the device when said member is operated for displacing the device from a non-use position near the back of the seat to a use position near the center of the hole.

4,638,515

TOILET HOOK

Anthony Caputo, and Gary P. Culter, both of 2273 Dundas Street West, Mississauga, Ontario, Canada (L5K 1R6)

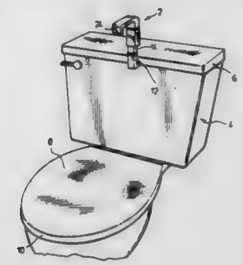
Filed Dec. 24, 1985, Ser. No. 813,228

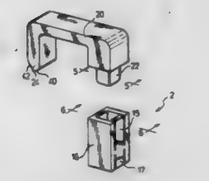
Int. Cl.[4] A47K *13/00, 17/00*

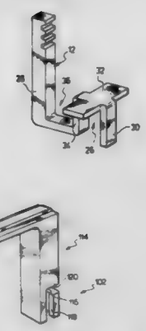
U.S. Cl. 4—661 **8 Claims**

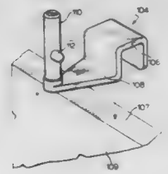
1. Apparatus for releasably maintaining a toilet seat in a generally vertical position comprising mounting means for securing said apparatus to a toilet and means for selectively contacting and maintaining such toilet seat in the vertical position and wherein said mounting means includes a channel means for engaging either side and the top edge of a toilet tank wall with an upright portion to one side of said channel means for adjustably receiving and engaging said selective means, said selective means including a collar portion one end of which is adapted for adjustable connection with said upright portion and the other end adapted to allow horizontal rotation of said selective means about said upright portion, said selective means including a forwardly extending arm at the end opposite said collar portion having a cam surface for contacting a toilet seat which moves there past by resiliently bending

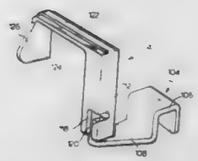
said arm, said arm returning to a position to cause said cam surface to engage such seat and maintain the same between said











cam surface and said collar unless acted upon by a non gravitational force urging such seat towards a horizontal position.

4,638,516

THERAPEUTIC BED SUPPORT

John H. Vrzalik, San Antonio, Tex., assignor to Kinetic Concepts, Inc., San Antonio, Tex.

Continuation of Ser. No. 567,224, Dec. 30, 1983, abandoned, which is a division of Ser. No. 226,118, Jan. 19, 1981, Pat. No. 4,432,353. This application Jan. 22, 1986, Ser. No. 821,207

Int. Cl.[4] A61G *7/00*

U.S. Cl. 5—64 **5 Claims**

1. An undercarriage for a bed comprising:

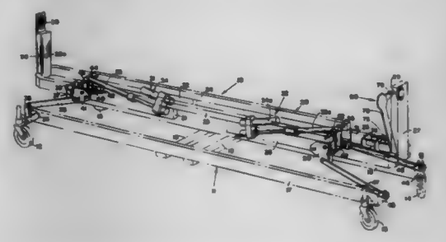
a base comprising a plurality of longitudinally extending, substantially parallel beams and a transverse beam rigidly mounted to said longitudinally extending beams, said transverse beam holding said longitudinally extending beams in transversely spaced relationship;

a bed support comprising

a first longitudinally extending beam,

a second longitudinally extending beam substantially parallel to said first longitudinally extending beam and spaced longitudinally therefrom, and

a third longitudinally extending beam substantially parallel to and connected to said first and second longitudinally extending beams, said third longitudinally extending beam being connected to said first and second longitudinally extending beams on the side away from said base;



means for lowering said first, second and third longitudinally extending beams into a position in which said first and second longitudinally extending beams enter the space between the longitudinally extending beans of said base, the lowering of said first, second and third longitudinally extending beams being limited by engagement of the transverse beam of said base by said third set of longitudinally extending beams; and

a patient support platform mounted to said first and second longitudinally extending beams.

4,638,517

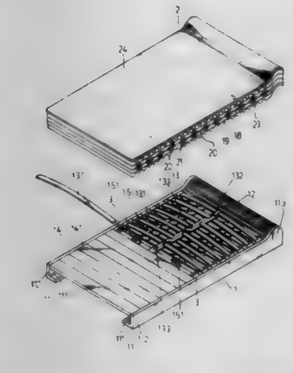
STRUCTURE FOR BED

Yan Y. Yang, and Chu H. Tsair, both of Taipei, Taiwan, assignors to Ming Cherng Tsai, Taipei, Taiwan

Filed Jun. 6, 1985, Ser. No. 741,797

Int. Cl.[4] A47C *23/06, 27/16*

U.S. Cl. 5—236 R **2 Claims**



1. An improved structure for bed comprising:

a rectangular main frame provided at its opposite long sides with a pair of parallel supporting members each of which is formed with a first wall and a second wall perpendicular thereto, each said second wall being furnished with an arcuate end, a pillow portion being disposed on the arcu-

ate ends of the supporting members to receive a human's head, an end portion being located on the opposite ends of the supporting members to receive the human's legs and feet, an arcuate portion being placed on the middle of the supporting members and located between the pillow portion and the end portion thereof to receive a human's shoulders, back and hips, the arcuate portion comprising a plurality of bamboo pieces which are bent downwardly to form a predetermined curve;

a plurality of fixing seats each of which consists of a pair of closed upper and lower hollow bodies wherein the upper body is formed with a pair of opposite flat sides and another pair of opposite arcuate sides symmetrically extending upwardly while, the lower body is formed with a pair of opposite flat sides and another pair of opposite arcuate sides symmetrically extending downwardly, the upper body being provided at its interior with a pair of pins which are parallel to each other and to the flat side thereof and form a slit therebetween, the closed upper end of the upper body being formed with a slot which can be associated with the slit therein to serve as a fixing means, said fixing seats being respectively disposed on the first walls of the supporting members in such a manner that each fixing seat located on one of the supporting members is aligned with its corresponding fixing seat located on the other supporting member thereof, a plurality of supporting pieces each of which is connected between the upper bodies of each pair of aligned fixing seats, a pair of short supporting columns respectively disposed on the upperside of each supporting piece and each supporting column being provided at its upper end with a shaved portion, each bamboo piece of the arcuate portion corresponding to each pair of aligned fixing seats being so arranged that its both ends are respectively inserted through the slots and then into the slits of the fixing seats and finally clamped between the pins therein, when the bamboo pieces fixed in the corresponding fixing seats, the angle between each bamboo piece and its corresponding supporting piece being preferably 15° and the underside of each bamboo piece being contacting slightly with the shaved portions of the supporting columns, a fixing strip furnished with a plurality of slits through which a plurality of corresponding bamboo pieces may pass to fix said bamboo pieces fixedly connected together;

a mattress body comprising a pair of sponge pads which are overlapped with each other and form a plurality of recesses therebetween, a sheet of cotton disposed between the sponge pads, to absorb the moisture therein, a pair of EVA pads, which are wave-like on one surface, respectively disposed on the upperside and the underside of the sponge pads; wherein the EVA pads are formed into wave type for obtaining a better ventilation effect,

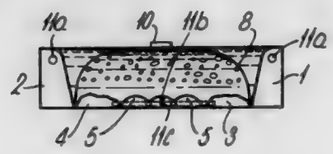
a top pad disposed on the upperside of the mattress body, wherein the interior of the top pad is filled with tea and mint to provide a comfortable feeling for a human's body.

4,638,518
WATER BED MATTRESS

Winfried P. Barbulla, Bregneveien 22, N-1825 Tomter, Norway

Filed Dec. 4, 1985, Ser. No. 805,422
Claims priority, application Norway, Dec. 17, 1984, 845056
Int. Cl.⁴ A47C *27/10*
U.S. Cl. 5—452 **7 Claims**

1. A water bed mattress made from a waterproof, flexible material having tensile strength, provided with at least three chambers with valves, one chamber of which contains water, and a particulate material floatable on water and the other chambers containing air, characterized in that said chamber containing water and buoyancy particles is bordered on its bottom portion and laterally at least at each longitudinal side by said air chambers and that the water-/buoyancy particle chamber is provided with a flexible partition wall, formed as an intermediate bottom that is secured to the bottom member of said mattress and is arcuate upwards in breadth as well as the longitudinal direction in a non-loaded state, resulting in an upper and a lower chamber portion, said lower chamber being filled with water and buoyancy particles immersed in the water and said upper chamber portion being filled with water, said

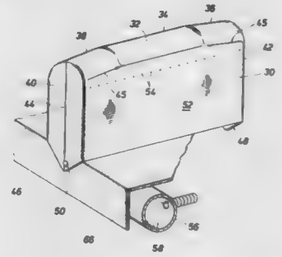


intermediate bottom adapted to retain said buoyancy particles in said lower chamber and, the longitudinal arch of the intermediate bottom being more steeply arched at the head of said water bed mattress than at its foot end in a non-loaded state.

4,638,519
FLUIDIZED HOSPITAL BED

Jack H. Hess, Houston, Tex., assignor to Air Plus, Inc., Houston, Tex.

Filed Apr. 4, 1985, Ser. No. 719,874
Int. Cl.⁴ A47C *27/10, 27/08*
U.S. Cl. 5—455 **14 Claims**



1. A fluidized hospital bed system comprising:

(a) patient support means being adjustably positionable for the comfort of a patient and defining adjustable bed segments;

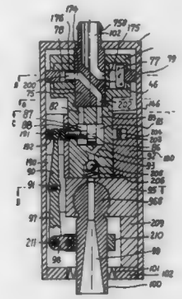
(b) a plurality of generally identical patient supporting air bags being positioned in side-by-side relation on said patient support means and defining elongated crevices therebetween, said air bags being formed of air and water impervious, water vapor permeable material, said air bags each defining a bottom surface, an upper surface, side surfaces and end surfaces, each of said air bags having a single air inlet opening in said bottom surface and defining elongate air distribution bands located in said crevices, said elongate air distribution bands being located generally along an upper portion of at least one of said side surfaces and being defined by a plurality of small air vent openings disposed along the upper portion of at least one of said side surfaces of said air bags, said small air vent openings being located in spaced relation to establish a condition of continuous evenly distributed air circulation from said air bags along the length of said crevices and immediately beneath the patient; and

(c) air supply means being in communication with said air supply opening means of said air bags and being operative to maintain said air bags suitably inflated for patient support and comfort and to compensate for air flow from said small air vent openings into said crevices.

4,638,520
TOOTHBRUSH CAPABLE OF MULTIDIRECTIONAL BRUSHING

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 421,637, Sep. 22, 1982, abandoned, which is a division of Ser. No. 180,747, Aug. 25, 1980, abandoned. This application Jan. 23, 1984, Ser. No. 573,255
Int. Cl.⁴ A46B *13/06*
U.S. Cl. 15—22 R **3 Claims**



1. A device which has chambers which are able to contain fluid, wherein inlet means and outlet means are provided to lead fluid to and away from said chambers, said chambers are provided to a rotor which is revolvably borne in said device and surrounded by a stroke guide for guiding the increase and decrease of said volume of said chambers in combination with means to periodically at each single revolution of said rotor to increase and decrease the volumes of said chambers, individually for each of said chambers when fluid flows through said chambers, said device contains also a medial portion, a shaft with said shaft pivotally borne in the housing of said device, a control body to control the flow of said fluid to said chambers, a transfer arrangement and an improvement with said improvement comprising, a combination,

wherein said transfer arrangement includes a transfer lever which is swingably borne substantially by its medial portion on a bearing in the housing of said device while said lever has two ends with one of its ends subjectable to thrust by a piston rod and the other of its ends connected to said shaft,

wherein said medial portion is provided with a rotary member,

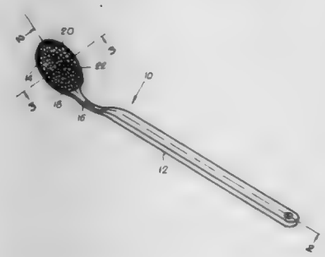
wherein a radially extending space is provided in said rotary member with a reciprocable piston provided in said space with a piston rod extending from said piston through a portion of said space and through a portion of said rotary member outwards of said rotary member to be able to engage a ring provided between said piston rod and said one end of said lever, and,

wherein said rotary member is provided with ports and passages to transfer fluid from one of its ports to one end of said space and from the other of its ports to the other end of said space when said ports revolve over respective control ports which are provided on said control body, by which said fluid in said ends of said space provides thrusts onto the ends of said piston to press said piston towards one end of said ends of said space and thereby to press said piston rod against said ring, said ring against said one end of said lever to swing said lever whereby the other end of said lever pivots said shaft in said housing of said device.

4,638,521
ORAL CLEANING DEVICE

John E. Potente, and Daniel F. Potente, both of 4 Nichols Ct., Muttontown, N.Y. 11545

Filed Aug. 14, 1985, Ser. No. 765,459
Int. Cl.⁴ A46B *9/04*
U.S. Cl. 15—111 **16 Claims**



1. An oral cleaning device comprising a generally spoon-shaped body having a handle coxtensive with a bowl-like head that forms the insertion end of said device at one end, at least one cleaning element located in said bowl and extending upward from and about the curved interior of the bowl substantially to the rim of said bowl, and said cleaning element being curved to fit the curved contour of the tongue and mouth and conforming with the surfaces of the tongue and mouth with which it comes into contact to permit said cleaning elements to clean the same.

4,638,522
CURLING BROOMS

Charles M. Robertson, 36 Simonston Blvd., Thornhill, Ontario, Canada (L3T 4L2)

Filed Mar. 11, 1985, Ser. No. 710,387
Int. Cl.⁴ A46B *17/00;* **A25B** *1/04*
U.S. Cl. 15—160 **2 Claims**



1. A curling push-broom comprising:

(a) a longitudinally elongated broom handle having a proximal end and a distal end and a longitudinal extent of uniform diameter extending between said ends which is equal to the length of a conventional curling broom handle,

(b) a brush head mounted at the distal end of said handle,

(c) a sleeve having a slipway opening inwardly from one end thereof, said slipway having a length which is not more than about 60% of the length of said broom handle such that a substantial portion of the handle will project from the sleeve when the broom handle is fully telescoped within the sleeve, said slipway having a substantially uniform diameter along its full length to receive said proximal end of said broom handle in a free-fitting sliding relationship so as to permit reciprocating movement of the handle within said sleeve during sweeping, said proximal end of said broom handle being slidably mounted in said

slipway, said sleeve being located on said broom handle so as to be interposed between the broom handle and the point of contact of the broom handle with the clothing of a curler such that during sweeping, the broom handle will move relative to the sleeve while the sleeve remains substantially stationary with respect to the clothing of the curler, thereby to substantially prevent wear damage to the clothing of the curler.

4,638,523

AIR GUARD DIFFUSER

Mike J. Todd, Eagan, Minn., assignor to Multi-Clean, Inc., St. Paul, Minn.

Filed Apr. 5, 1985, Ser. No. 720,258
Int. Cl.[4] A47L *11/14, 11/40*
U.S. Cl. 15—98 **7 Claims**



1. In combination, a rotary floor polishing machine having a polishing element rotatable at high rotary speed for engaging and polishing the floor; a shroud partially enclosing said element and having a lower peripheral edge normally spaced above the surface of the floor to define an annular air space about said polishing element; and an air guard diffuser comprising an air permeable element of flexible material extending about said shroud and from the peripheral edge of said shroud to the floor to encompass substantially all of said air space beneath the peripheral edge of said shroud with air permeable material to intercept particles forced outwardly by said polishing element while permitting air resulting from the rotation of said element to pass, said material characterized as free from scratching or marring the floor, and mounting means for removably mounting said air permeable element to said shroud including a circular mounting ring having a plurality of spaced apertures and adapted to couple with said shroud and extend beneath the peripheral edge thereof to receive the upper portion of said air permeable element, and a circular retaining clip encompassing the air permeable element for mounting the same to said mounting ring, said circular mounting ring defining a plurality of radial orifices spaced thereabout and permitting the free passage of air flowing from said polishing element to pass through said air permeable element and said mounting means.

4,638,524

CREOSOTE CUTTER MOUNTING BRACKET ASSEMBLY

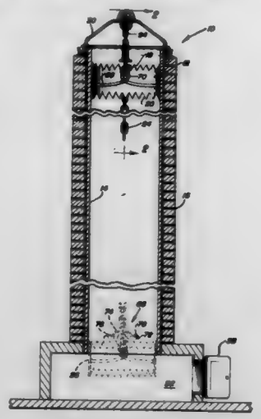
Leland D. Marcellus, P.O. Box 657, Unadilla, N.Y. 13849

Filed Jan. 24, 1984, Ser. No. 573,321
Int. Cl.[4] F23J *3/00*
U.S. Cl. 15—249 **18 Claims**

1. A new and improved chimney cleaner mounting bracket assembly comprising:

a bracket bar positionable across a topmost portion of said chimney;

pulley means substantially centrally positioned on said bracket bar, said pulley means comprising a length of cylindrical conduit, said bracket bar being unattachably directed through an interior portion of said conduit, said conduit having an interior diameter substantially greater than a dimensional diameter of said bracket bar, said conduit hanging freely upon a horizontal portion of said bracket bar, said pulley means being operable to receive a supporting chain for said chimney cleaner and having the same directed thereover, said pulley means being erratically radially movable in multiple directions relative to said bracket bar, thereby to compensate for irregular axial movement of said supporting chain during a movement of said chimney cleaner within said chimney;



a support plate fixedly attached to said bracket bar and being positionable on a topmost surface of said chimney; and

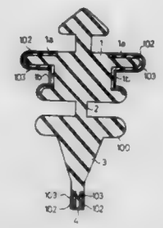
a banding guide forming a part of said bracket bar and being designed to receive a banding iron for fixedly securing said chimney cleaner mounting bracket assembly to said chimney.

4,638,525

WIPER BLADE RUBBER

Hiroshi Sugita; Tadanobu Iwasa; Takemasa Yasukawa, and Masanori Aritake, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jul. 23, 1985, Ser. No. 758,091
Claims priority, application Japan, Jul. 30, 1984, 59-160953
Int. Cl.[4] B60S *1/38*
U.S. Cl. 15—250.36 **11 Claims**



1. A wiper blade rubber, comprising:

a longitudinally elongated matrix integrally joined along the length thereof at a forward end thereof, with a lip, both said matrix and said lip having two laterally opposite sides, and said lip having a forward end adapted to be slid in wiping contact with a windshield surface;

said matrix, at least throughout a major portion thereof exclusive of two laterally-opposed contact portions which are provided for contacting metal wiper fixtures for mounting the wiper blade rubber for windshield wiper use, being made of a rubber mixture which is peroxide-vulcanized preponderantly EPDM rubber;

said lip, at least on said two laterally opposite sides thereof being made of a preponderantly non-EPDM, surface-

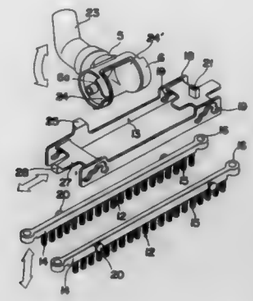
chlorinated diene rubber selected from the group consisting of styrene-butadiene, natural rubber, isoprene, butadiene and chloroprene.

4,638,526

NOZZLE ASSEMBLY FOR VACUUM CLEANER

Yoshitaka Murata, Shiga; Tsuyoshi Hatano, and Hideo Ohkubo, both of Yokaichi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 18, 1985, Ser. No. 713,031
Claims priority, application Japan, Mar. 19, 1984, 59-52507; Mar. 19, 1984, 59-52548
Int. Cl.[4] A47L *9/06*
U.S. Cl. 15—367 **11 Claims**



1. A suction nozzle assembly for a vacuum cleaner, which comprises: a suction spout having a coupling stem for fluid-connection with the vacuum cleaner, a generally rectangular nozzle housing tiltably connected with the suction spout and having a sweeping surface defined at the bottom thereof, said sweeping surface being adapted to confront a surface to be cleaned, an elongated brush assembly carried by the nozzle housing for movement between projected and retracted positions in a direction perpendicular to the longitudinal direction of the housing through the sweeping surface, a brush height adjustment means for adjustably moving the brush assembly to either the projected or the retracted position, and a restraining means for restraining the housing from undergoing an arbitrary tilting motion relative to the suction spout, said restraining means being operatively associated with said brush height adjustment means.

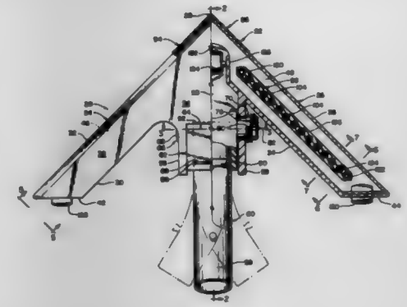
4,638,527

VACUUM CLEANER ATTACHMENTS

Eugene T. Fleischhauer, 1413 Wesanne La., Midlothian, Va. 23113

Division of Ser. No. 832,173, Feb. 20, 1986. This application Jul. 17, 1986, Ser. No. 886,399
Int. Cl.[4] A47L *9/06*
U.S. Cl. 15—371 **14 Claims**

1. A vacuum cleaner attachment which is particularly adapted to reach into corners and crevices and to reach along walls, said attachment comprising: a V-shaped housing having a pair of legs which meet and form a sharp nose at the forward end of the attachment, said legs each having inner, outer, top, and rear walls which cooperate to form an elongated, open bottom vacuum chamber with an inverted U cross-section; a tubular vacuum fitting in communication at its forward end with the vacuum chambers in the first and second legs at the nose of said V-shaped housing; a support for said vacuum fitting which defines a vacuum plenum which provides fluid communication between said vacuum fitting and the vacuum chambers in the legs of said housing; a cleaning brush extending longitudinally along and housed in each of said vacuum chambers, said brushes having bristles which are adapted to come into contact with and dislodge foreign substances from a surface being cleaned; means at the opposite ends of said brushes for mounting the brushes in the vacuum chambers formed in the legs of said housing for vertical movement



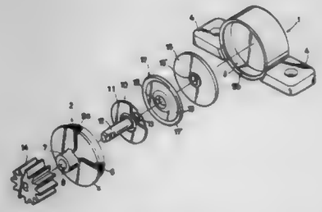
therein; and means at said opposite ends of said brushes for biasing said ends of brushes toward the open lower sides of said legs of said housing.

4,638,528

OIL TYPE DAMPER

Nobuaki Omata, Yokohama, Japan, assignor to Nifco Inc., Awa, Japan

Filed Apr. 25, 1983, Ser. No. 488,470
Claims priority, application Japan, Jun. 12, 1982, 57-86756[U]
Int. Cl.[4] E05F *5/02*
U.S. Cl. 16—82 **7 Claims**



1. An oil type damper, including:

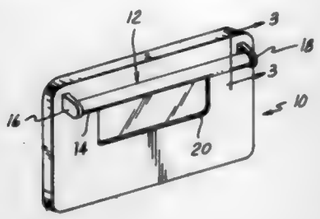
a housing having a cylindrical chamber open at one end, a centrally apertured cap for closing said chamber, a flexible membrane positioned intermediate the ends of said chamber for dividing said cylindrical chamber into two compartments and including a centrally located aperture having a flexible annular lip, a shaft liquid-tightly extending through said annular lip and having one end of said shaft projecting out of said housing through said centrally aperture cap, said shaft having means for transmitting rotational force fixed to said one end thereof, a braking disc contained within one of said compartments which is filled with oil, said disc fixed to rotate in concert with said shaft on one side of said membrane and a rotating member fixed to said shaft on the opposite side of said membrane and contained within the other of said two compartments, said member adapted to rotate in concert with said braking disc, said rotating member and said braking disc being in confining contact with adjacent edges of the annular lip therebetween and caused to pinch said annular lip of said flexible membrane against said shaft said flexible membrane being fixed relative to said housing while said shaft rotates relative to said membrane.

4,638,529

HANDLE CONSTRUCTION

Joseph W. Katona, Walled Lake, Mich., assignor to Mills Products, Inc., Farmington, Mich.

Filed Jul. 5, 1985, Ser. No. 751,878
Int. Cl.[4] E05B *1/00*
U.S. Cl. 16—111 R **7 Claims**



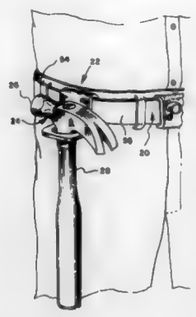
1. A handle assembly for a unit such as an oven door, comprising an elongated handle grip section and an end cap at each end of said handle grip section, said handle grip section being a longitudinally split tubular member having longitudinal edges defining said split, said longitudinal edges having inturned flanges, said end caps each having means for engaging and mounting an end of said handle grip section alternatively in either of two angularly spaced rotative positions, said engaging and mounting means comprising an outer wall defining a socket receiving said handle grip section, and support means inwardly of said wall fitting within the hollow interior of said handle grip section and relieved at angularly spaced locations to accommodate said flanges in both of said two angularly spaced rotative positions.

4,638,530

TOOL CARRIER

Roger A. Perry, 15 Pruett Pl., Oakdale, Conn. 06370

Filed Oct. 9, 1981, Ser. No. 310,044
Int. Cl.[4] A44B *21/00*
U.S. Cl. 24—3 L **5 Claims**



1. A tool carrier for suspending from a person's belt a hammer of the type having a head with two ends and a handle extending transversely of the head from a location intermediate the ends of the head comprising:

a cradle including a base for supporting at spaced locations the head of the hammer and having an opening adapted to freely receive therethrough the handle of the hammer; and

mounting means for releasably suspending said cradle from a person's belt such that when the head of the hammer is supported on said cradle, the head lies in a plane beneath the plane of the belt, said mounting means including at least one forward member having upper and lower ends and at least one associated rear member having upper and lower ends, said forward and rear members lying in spaced apart generally parallel planes, bridge means joining said forward and rear members at said upper ends, said forward and rear members defining a belt receiving slot therebetween such that when said tool carrier is in its operational position, said rear member lies between the inside surface of the belt and the person's body and said forward member lies contiguous to the outer surface of the belt;

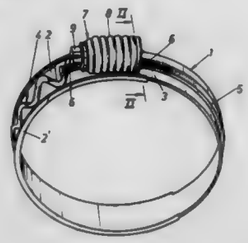
said cradle being joined to said rear member at said lower end thereof and lying in a plane generally transverse of said rear member, said forward member terminating above said cradle a distance generally equivalent to the width of the belt to enable the belt to be received in the belt receiving slot between said forward and rear members.

4,638,531

HOSE CLAMP

Sven Ribrant, Färjestaden, Sweden, assignor to Allmanna Brandreskapsaffaren AB, Stockholm, Sweden

PCT No. PCT/SE85/00034, § 371 Date Sep. 20, 1985, § 102(e) Date Sep. 20, 1985, PCT Pub. No. WO85/03336, PCT Pub. Date Aug. 1, 1985
PCT Filed Jan. 29, 1985, Ser. No. 779,776
Claims priority, application Sweden, Jan. 30, 1984, 8400435
Int. Cl.[4] B65D *63/02*
U.S. Cl. 24—274 R **4 Claims**



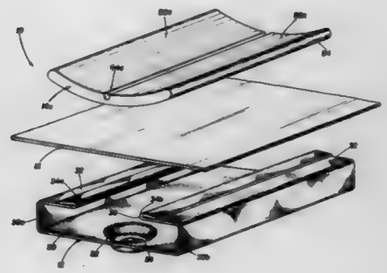
1. An improved hose clamp comprising a tightening band bent to annular shape, end portions on said tightening band, transverse grooves provided in a first of said end portions of said tightening band, a screw worm having threads therein, said transverse grooves in said first end portion engaging in said screw worm threads, a sleeve enclosing said screw worm, said screw worm being rotatably journalled in said sleeve but axially non-slidable therein, a space in said sleeve allowing said threaded tightening band end portion to be moved out of said sleeve upon rotation of said screw worm therein, a second of said tightening band end portions opposite said first band end portion being fixed to said sleeve, a pressure strap bent to annular shape with its end portions overlapping, said tightening band being elastic in its lengthwise direction and enclosing said pressure strap, said pressure strap arranged to form a guide means to said screw worm sleeve and to said tightening band between said sleeve and said tightening band and an enclosed article, the improvement comprising said tightening band having an arcuate configuration in the plane of the external face of said pressure strap along the major portion of the circumference of said pressure strap, said arcuate configuration being adapted to resiliently deflect upon tightening of said tightening band for maintaining a substantial uniform pressure upon said pressure band during time.

4,638,532

MECHANICAL FASTENING SYSTEM

James H. C. Yang, Cleveland, and Walter Tomaszewski, Canton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 516,622, Jul. 25, 1983, abandoned. This application Apr. 18, 1985, Ser. No. 724,054
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.
Int. Cl.[4] A44B *21/00*; E04B *1/00*
U.S. Cl. 24—462 **22 Claims**



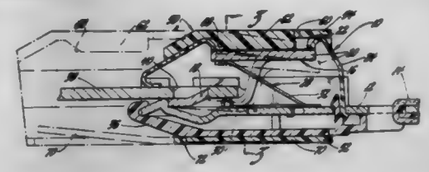
1. An attachment device for mechanically securing at least one flexible elastomeric sheet to the upper surface of a roof, said attachment device comprising a substantially rigid channel member and an insert member for retaining at least one said elastomeric sheet within said channel member and over said roof, said channel member having a top wall, bottom wall, a rectangular cross-section, and a continuous central longitudinal slot in said top wall opening into said channel member, opposed side walls which are substantially flat and which are arranged in parallel, said side walls being substantially perpendicular to said top and bottom walls, and means for receiving a fastening element to attach the channel member to said upper roof surface, said receiving means being positioned within the bottom wall of said channel member and said channel member having a width which is defined by said opposed side walls, said insert member comprising cans for maintaining said at least one flexible elastomeric sheet in said channel member, said insert member being formed from a resilient material and having two outer arcuate edges which define between them a lateral extent less than the width of said channel member when said insert member is unflexed, said insert member also comprising a central longitudinal flex notch in one surface which defines two adjacent insert member wing portions and which comprises means for facilitating the temporary elastic deformation of said insert member from a first position in which said insert member has a substantially unflexed natural shape into a second position in which said insert member has a generally inverted V-shape so that said edges can be inserted, together with a portion of said at least one elastomeric sheet, through said slot and into said channel member, by deforming said insert member along said flex notch and without deforming said top wall or said side walls of said channel member, said insert member and said longitudinal flex notch together comprising means for maintaining said at least one elastomeric sheet against an interior surface of said channel member when said insert member is substantially flattened into a third position in which the shape of said insert member is returned approximately to said natural shape, thereby permitting lateral and vertical shifting of said insert member and said at least one flexible sheet within said channel member.

4,638,533

VARIABLE RELEASE SEAT BELT BUCKLE

Lawrence A. Gloomis, Sterling Heights, and Gregory S. Ches, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 15, 1985, Ser. No. 723,571
Int. Cl.[4] A44B *11/26*
U.S. Cl. 24—633 **2 Claims**



1. An assembly comprising a seat belt buckle and a device selectively unable for increasing the release force of said seat belt buckle of the type having a brickle housing with a top cover and a spring loaded pushbutton accessible for depression by the occupant through a pushbutton opening recessed below the surface of said top cover of said buckle housing also having a bottom cover, said device comprising:

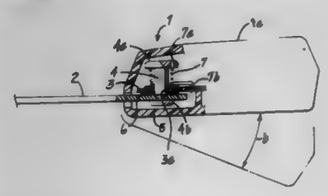
a molded plastic tubular sleeve slidably and removably installed onto the buckle and having a top wall overlying the top cover of the buckle and a bottom wall underlying the bottom cover of the buckle, said top wall having a U-shaped slit molded integrally therein and defining a pushbutton flap registering with the pushbutton in overlying relationship therewith and integrally connected to the tubular sleeve by an integral living hinge axis, said pushbutton flap having an underside of increased thickness so that the pushbutton flap depends into the pushbutton opening of the buckle housing top cover to thereby retain the sleeve on the buckle and engage with the pushbutton at least upon depression of the pushbutton flap to concomitantly depress the pushbutton of the buckle, said pushbutton flap further having an angled cam face on the underside thereof so that sliding movement of the sleeve to remove the sleeve from the buckle imparts an upward pivotal movement to the pushbutton flap with respect to the pushbutton opening to enable said sliding removal of the sleeve.

4,638,534

PIVOT STRUCTURE FOR SEAT BELT BUCKLE

Kiichi Sasaki, Saitama, and Iimuro Takashi, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,615
Claims priority, application Japan, Sep. 19, 1984, 59-142087[U]
Int. Cl.[4] A44B *11/00*; A62B *35/00*
U.S. Cl. 24—683 **5 Claims**



1. Pivot structure for a seat belt buckle which is supported on a free end of a substantially rigid anchor stay, wherein: a base plate of the seat belt buckle is connected to a free end of the anchor stay by way of a pin in such a manner that the base plate is rotatable about the pin along a plane of a major surface

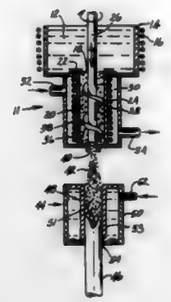
of the free end of the anchor stay and is free to incline relative to the major plane, the base plate is biased by spring means towards a position in which the base plate aligns with an axial line of the anchor stay, and said spring means comprises a coil spring fitted over the pin with one end of the coil spring engaged to the pin while the other end of the coil spring is engaged to the base plate.

4,638,535

APPARATUS FOR FORMING A THIXOFORGED COPPER BASE ALLOY CARTRIDGE CASING

Michael J. Pryor, Woodbridge; Joseph Winter, New Haven, and Jonathan A. Dantzig, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 616,022, May 31, 1984, abandoned, which is a division of Ser. No. 337,560, Jan. 6, 1982, Pat. No. 4,494,461. This application Dec. 2, 1985, Ser. No. 803,280
Int. Cl.⁴ B21D *51/54*
U.S. Cl. 29—1.3 16 Claims



1. An apparatus for forming a cartridge casing, said apparatus comprising:

means for forming a semi-solid slurry from an age-hardenable copper base alloy;

means for forging said copper base slurry into said cartridge casing, said cartridge casing being a thin-walled, elongated member; and

means for age-hardening said forged cartridge casing.

4,638,536

METHOD OF MAKING A RESONATOR HAVING A DESIRED FREQUENCY FROM A QUARTZ CRYSTAL RESONATOR PLATE

John R. Vig, Colts Neck, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 17, 1986, Ser. No. 819,652
Int. Cl.⁴ H01L *41/22*
U.S. Cl. 29—25.35 16 Claims

1. Method of making a resonator having a desired frequency from a quartz crystal resonator plate, said method including the steps of:

(A) etching the quartz crystal resonator plate to a frequency slightly higher than the desired frequency,

(B) depositing metallic electrodes onto the active area of the resonator plate to lower the frequency to a frequency that very closely approaches the desired frequency, and

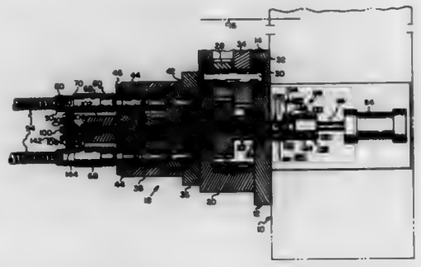
(C) treating the plate with the deposited electrodes with UV-ozone to oxidize the electrodes in a slow, precisely controlled manner to the desired frequency.

4,638,537

CONCISE QUICK RELEASE TOOL HOLDER

Gary L. Baker, Portland, Mich., assignor to Crankshaft Machine Company, Jackson, Mich.

Filed Apr. 22, 1985, Ser. No. 725,494
Int. Cl.⁴ B23B *3/18, 7/04*
U.S. Cl. 29—40 10 Claims



1. A quick release tool holder system for machine tools characterized by its concise configuration and ability to simultaneously release and hold a plurality of adjacent tools comprising, in combination, a frame, a machine tool head mounted on said frame, a plurality of elongated spindles mounted upon said head parallel to and substantially equally radially spaced from a center axis and each rotatable about its own spindle axis, drive means mounted on said head drivingly connected to said spindles for simultaneously rotating said spindles, each spindle including a free end, a socket defined in each spindle free end concentric to the associated spindle axis and shaped to receive a standard tool adapter, an annular sleeve exteriorly mounted upon each spindle in axial alignment with the associated socket and axially displaceable thereon in opposite tool releasing and tool holding directions, detent means mounted on each spindle interposed between the associated sleeve and socket operatively connected to the associated sleeve engaging and holding a tool adapter in said socket when the associated sleeve is moved in its tool holding direction and releasing the tool adapter when the asssociated sleeve is moved in its tool releasing direction, a sleeve actuator simultaneously operatively associated with the sleeves of all the tool spindles associated with a common center axis for simultaneously displacing all of the sleeves thereof in said tool releasing direction, and means connected to said actuator for axially displacing said actuator in a direction parallel to said center axis to simultaneously displace said sleeves in said tool releasing direction.

4,638,538

METHOD OF MANUFACTURING WOUND BUSH BEARING WITH NOTCH-FREE FLANGE AND MOLD ASSEMBLY FOR MANUFACTURING THE SAME

Masayuki Kohama, Moriyama; Tatsuro Wakabayashi, and Kouichi Tsunoda, both of Shiga, all of Japan, assignors to Oiles Industry Co., Ltd., Tokyo, Japan

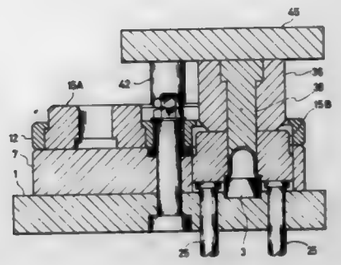
Filed Apr. 25, 1984, Ser. No. 603,656
Claims priority, application Japan, Apr. 28, 1983, 58-74068
Int. Cl.⁴ B21D *53/10, 22/08*
U.S. Cl. 29—149.5 C 7 Claims

1. A method of manufacturing a wound bush bearing with a notch-free flange, comprising the steps of:

(a) preparing a cylindrical bush workpiece having one end portion and another end portion along an axial direction thereof, said one end portion being uniformly tapered at at least one of the outer and inner circumferential surfaces thereof so that the radial thickness of said one end portion is gradually decreased toward one end of said workpiece, the length of said one end portion in said axial direction of said workpiece being greater than the width of a rear face of a notch-free flange to be formed;

(b) applying an axial pressing force at one of the end portions of said workpiece and varying continuously from a radially outward direction to said axial direction a vector direction of a bending force applied to said one end of said workpiece by the pressing force so that said one end portion is bent radially outward in order to form said one end portion into a flange part; and





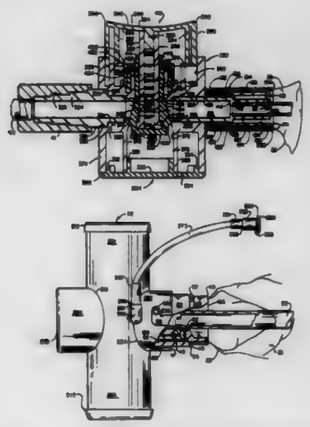
(c) further applying said pressing force in said axial direction while restricting the radially outward movement of said one end portion of said workpiece after step (b) in order to form said notch-free flange from said flange part.

4,638,539

ASPIRATING/VENTILATING APPARATUS AND METHOD

Darrel Palmer, Sandy, Utah, assignor to Ballard Medical Products, Midvale, Utah

Division of Ser. No. 633,570, Jul. 23, 1984, Pat. No. 4,569,344. This application Aug. 20, 1985, Ser. No. 767,400
Int. Cl.⁴ B21D *53/00*
U.S. Cl. 29—157 R 1 Claim



1. A method of manufacturing a ventilating/aspirating assembly comprising the steps of:

assembling a manual aspirating control valve by placing a plunger in a closed end of an exteriorally tapered elastic seal member and placing the plunger/sealing member assembly within a tapered sealing bore of a valve body having an open top and an open bottom, folding a wall which comprises an open end of the sealing member upon itself in reverse curve orientation, anchoring and sealing said wall in said reverse curve orientation in stretch fit relation thereby biasing the sealing member into a closed sealing position by forces comprising the memory of the material from which the sealing member is made;

placing a bottom closure and a top actuator upon the valve body following installation of the plunger/sealing member assembly;

linearly force-fit connecting the distal and proximal ends of a sterility preserving flexible manually collapsible envelope respectively between a ventilating/aspirating fitting and the manual aspirating control valve;

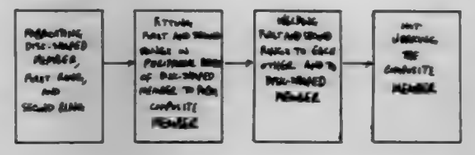
stationarily connecting the proximal end of an aspirating catheter tube to the aspirating control valve and slidably associating the distal end of the catheter tube with the ventilating/aspirating fitting.

4,638,540

METHOD FOR MANUFACTURING RAILWAY WHEELS

Ake Hasselöf; Carl-Gustaf Lenasson, and Lennart Nordhall, all of Surahammar, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Dec. 31, 1984, Ser. No. 687,759
Claims priority, application Sweden, Jan. 3, 1984, 8400020
Int. Cl.⁴ B21H *1/04*
U.S. Cl. 29—168 9 Claims



1. A method for making a near-finished wheel blank for use in manufacturing a railway wheel which has a base region, a flange region and a tread region, said flange region being divided into first and second portions and said tread region being divided into first and second portions, the second portion of said flange region abutting the first portion of said tread region, said base region and said first portion of said flange region being made of a first material, at least said second portion of said flange region being made of a second material which is more wear-resistant than said first material, and said second portion of said tread region being made of a third material which has a higher frictional resistance than said first material, said method including the steps of

(1) fabricating (a) a first component part from said first material which is shaped to form said base region and said first portion of said flange region, (b) a second component part from said second material which is shaped to form at least said second portion of said flange region, and (c) a third component part from said third material which is shaped to form said second portion of said tread region, said first, second and third component parts being shaped to fit closely against each other,

(2) machining and cleaning each of said first, second and third component parts to remove impurities therefrom,

(3) fitting together said first, second and third component parts so as to form a composite member,

(4) welding said first, second and third component parts together along their abutting edges which are exposed such that air cannot enter said composite member between said component parts, and

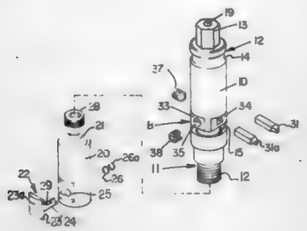
(5) hot-working said composite member to provide a good bond between said first, second and third component parts and to provide said near-finished wheel blank.

4,638,541

TOOLS FOR REPAIRING A DIESEL ENGINE CYLINDER HEAD

Edward F. Schindler, Jr., 4917 Orange Grove Dr., Houston, Tex. 77039

Filed Jun. 22, 1984, Ser. No. 623,380
Int. Cl.⁴ B23P *6/02, 19/08;* **B25B** *13/08*
U.S. Cl. 29—402.06 **32 Claims**



1. A repair tool for cutting and enlarging a retainer ring groove in a pushrod bore, having an open top end and a bottom end closed by a cam follower, of a Detroit diesel engine cylinder head while the cylinder head is mounted to a Detroit diesel engine block, a portion of the pushrod bore where the retainer ring groove is located including a gap in the circumference of the pushrod bore in which a tool projecting beyond a radius of the pushrod bore can fit, the tool comprising:

a tubular cutting element having a longitudinal axial bore, adapted to fit within said pushrod bore around a pushrod to enlarge the retainer ring groove in said pushrod bore;

a tubular spacing and anchor element threadedly interconnected with said tubular cutting element having a longitudinal axial bore, adapted to fit within said pushrod bore around a pushrod, below said cutting member, in contact with the cam follower at the bottom closed end of the pushrod bore;

means for radially orienting a cutting member on said cutting element to project beyond the pushrod bore a predetermined distance; and

means for rotating the cutting element when the repair tool is oriented in the pushrod bore with the cutting element and stop and anchor element threadedly interconnected and oriented in the pushrod bore around a pushrod with the cutting element positioned in the gap, for cutting and enlarging the retainer ring groove.

4,638,542

METHOD AND APPARATUS FOR FORMING ELEMENT-FREE SPACES IN SLIDE FASTENER CHAINS

Hideki Akiyama, Toyama, and Shigeru Imai, Namerikawa, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

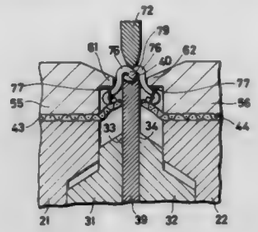
Filed Jun. 22, 1984, Ser. No. 623,116
Claims priority, application Japan, Jun. 28, 1983, 58-116300; Jul. 2, 1983, 58-103089[U]
Int. Cl.⁴ B23P *11/00*
U.S. Cl. 29—408 **10 Claims**

1. A method of forming an element-free space in a slide fastener chain composed of a pair of stringer tapes supporting an intermeshing row of coupling elements secured to confronting longitudinal edges of the stringer tapes by sewing threads and having coupling heads and lower legs disposed on the upper sides of the respective stringer tapes, comprising the steps of:

(a) gripping the stringer tapes by upper grippers and lower grippers with the coupling elements spaced vertically and directed away from a pair of spaced fixed cutter blades;

(b) lowering the upwardly facing coupling heads with a punch blade acting thereon to tilt the coupling elements and the marginal edges of the stringer tapes downwardly towards the spaced fixed cutter blades for thereby angularly spreading the confronting tape edges such that the spaced fixed cutter blades pass between the spread confronting tape edges and then engage the lower tape-engaging legs of the coupling elements at positions which are disposed close to the confronting tape edges;

(c) continuously depressing the coupling heads further to push the lower legs against the spaced fixed cutter blades, thereby cutting off the lower tape-engaging legs of the coupling elements on the fixed cutter blades;



(d) lifting the severed coupling elements away from said fixed cutter blades while they are being clamped between the punch blade and a knockout blade vertically aligned therewith until the severed coupling elements pulled out of engagement with the sewing threads; and

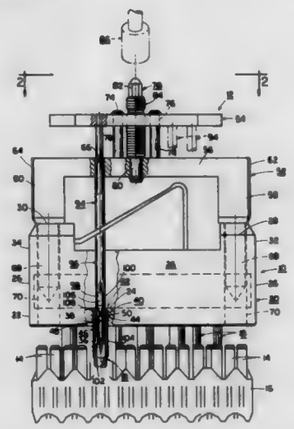
(e) holding the sewing threads in engagement with overlying portions of the upper grippers during the pulling portion of said lifting step (d).

4,638,543

LOCKING TUBE REMOVAL FIXTURE AND METHOD IN A RECONSTITUTABLE FUEL ASSEMBLY

John M. Shallenberger, Fox Chapel, and Stephen J. Ferlan, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 28, 1985, Ser. No. 695,762
Int. Cl.⁴ B23P *19/00, 17/00;* **B23Q** *13/14*
U.S. Cl. 29—426.5 **11 Claims**



11. For use with a reconstitutable fuel assembly including a top nozzle with an adapter plate having at least one passageway, at least one guide thimble with an upper end portion and an attaching structure having a hollow locking tube for releasably locking the upper end portion of the guide thimble within the passageway of the top nozzle adapter plate, a method for removing the locking tube from its locking position, comprising the steps of:

(a) disposing a locking tube engaging means having a lower segmented rim within an opening in a tool guide and extending downward therefrom;

(b) positioning the tool guide on the top nozzle so as to align its opening with the passageway of the top nozzle adapter plate and extend the locking tube engaging means through the locking tube in the upper end portion of the guide thimble positioned within the passageway with the segmented rim of the tube engaging means disposed at a level below a lower edge of the locking tube; and

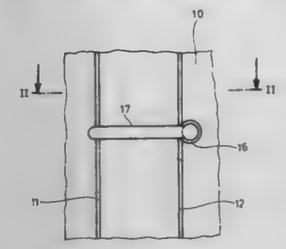
(c) moving a tool holder having an elongated actuating means mounted thereon and extending through the tube engaging means from a first to a second position so as to move the actuating means from a disengaged to an engaged position and thereby the tube engaging means from a collapsed to an expanded position in which its segmented rim is expanded from a position in which it is withdrawn from under the lower edge of the locking tube to a position underlying the lower edge of the locking tube so that the locking tube will be removed from its locking position by the tube engaging means upon withdrawal of the tool guide and the tool holder therewith from the top nozzle.

4,638,545

PROCEDURE FOR COATING AND HEAT INSULATING OF WALLS AND CEILINGS, ETC., AND DEVICE FOR CARRYING OUT THE PROCEDURE

Hans Bingener, Friedrichshafen, Fed. Rep. of Germany, assignor to Durol Flying Lindauer Ikh Montage GmbH, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,713
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407459
Int. Cl.⁴ B23P *19/04;* **E04C** *1/00, 3/16;* **E04F** *13/06*
U.S. Cl. 29—460 **8 Claims**



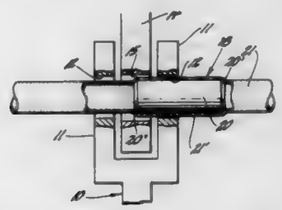
1. A method of applying an insulation coating to a wall surface, comprising applying strips of a length of the insulation coating to be applied to the wall surface, so that the strips are disposed outwardly of the wall surface up to the desired thickness of the insulation coating and so that the strips are fixed to the wall surface, the strips defining a space therebetween, spraying the coating between adjacent strips to fill the space therebetween and to a thickness at least up to the surface of the strips, and thereafter smoothing the coating which has been applied back to the desired thickness of the insulation coating and back to a plane which abuts outer portions of the strips.

4,638,544

PLASTIC COVERED FASTENING DEVICE AND METHOD OF ASSEMBLY

James E. McNeil, Santa Barbara, Calif., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 9, 1985, Ser. No. 806,636
Int. Cl.⁴ E05D *5/10*
U.S. Cl. 29—434 **5 Claims**



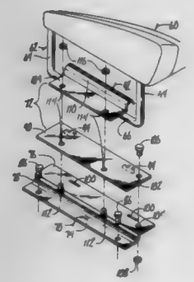
1. A method for securing a first element with at least one aperture therein of a predetermined internal diameter to a second element with at least one aperture therein of predetermined internal diameter located coaxial with said aperture in said first element by means of a plastic coated fastening device including the steps of inserting a rigid pin into a tube of resilient, plastic material of a predetermined nominal exterior diameter; applying an axial tension force to said tube whereby to reduce the effective external diameter of the combined pin and tube to a size less than that of the apertures; threading an end of said tube through said coaxial apertures; then, while still applying the axial tension force, axially moving said tube and said pin until said pin and the pin encircling portion of said tube are located in said apertures; releasing the tension force on said tube whereby said pin encircling portion of said tube can then expand radially outward to effect axial securement of said pin relative to at least said one aperture in said first element; and, trimming said tube adjacent to opposite ends of said pin.

4,638,546

METHOD AND MEANS FOR MOUNTING A VEHICLE SEAT

Steven C. Beukhoof, 2816 Lyon St., Des Moines, Iowa 50317

Continuation-in-part of Ser. No. 609,966, May 14, 1984, abandoned. This application Nov. 5, 1985, Ser. No. 795,190
Int. Cl.⁴ B23P *19/00;* **B60N** *1/00*
U.S. Cl. 29—526 R **4 Claims**



1. A bracket for securing a seat to the floor of a vehicle, said vehicle having a longitudinal centerline, said seat having a horizontal tubular member thereon, said bracket comprising:

a floor plate means having more than one floor plate bolt hole therein for anchoring said floor plate means to said vehicle floor, said floor plate means having a raised horizontal portion which is spaced above and parallel to said vehicle floor when said floor plate means is anchored to said vehicle floor;

said horizontal portion having at least two elongated bayo-

net slots therein and a round first bolt hole extending therethrough in spaced relation to said bayonet slots, said bayonet slots each having opposite ends and extending in a direction parallel to said longitudinal axis of said vehicle;

a base plate means having attachment means for securing said base plate means to said floor plate means and further having tube engaging means for retentively engaging said tubular member of said seat;

said attachment means comprising at least two spaced apart integral bayonet members, each of said bayonet members comprising a downwardly extending leg and a finger extending in a direction parallel to said longitudinal axis of said vehicle.

4,638,547

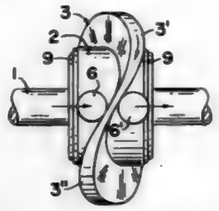
PROCESS FOR PRODUCING A CAM WITH SINUSOIDAL CAM LOBE SURFACES

Francis E. Waller, Dover, Fla., assignor to Leonard J. E. Waller, Palm Harbor; Wm. J. Gdovin, New Port Richey and Walter J. Monacelli, St. Peter, all of, Fla., a part interest to each

Continuation-in-part of Ser. No. 582,262, Feb. 22, 1984, abandoned, which is a continuation-in-part of Ser. No. 420,390, Sep. 20, 1982, abandoned, which is a division of Ser. No. 320,213, Nov. 12, 1981, Pat. No. 4,432,310, which is a continuation of Ser. No. 265,559, May 19, 1981, abandoned, which is a continuation of Ser. No. 35,553, May 3, 1979, abandoned. This application Aug. 1, 1985, Ser. No. 761,488

Int. Cl.⁴ B23P *13/04*; B23C *3/08*

U.S. Cl. 29—558 **3 Claims**



1. The process of preparing an original cam with sinusoidal cam lobe surfaces which comprises: (1) rotating a cylinder of appropriate material about its cylindrical axis; (2) rotating a cutting or grinding tool near a flat end portion of said cylinder; (3) advancing said flat end portion of said cylinder, while being rotated, into a cutting or grinding relationship with the side of said cutting or grinding tool at a controlled rate and then retracting said end portion of said cylinder away from said cutting or grinding tool at said same controlled rate, the said controlled rate being such that there are at least two advancements of said cylinder toward said tool per revolution of said cylinder and at least two retractions per revolution of said cylinder, the amount of advancement in each case being in accordance with the capacity of said cutting or grinding tool; (4) advancing incrementally the supporting means for said cylinder and for the advancing and retracting means for said cylinder, said incremental advancing supporting means being independent of the said supporting and activating means for said cutting or grinding tool, the increments of said advancing of said supporting means being no greater than the capacity of said cutting or grinding tool, the said incremental advancement of said supporting means being continued until the desired depth of the reverse rise has been cut in the said end of said cylinder; and (5) thereafter repeating above steps (1) through (4) until there has been cut two or more rises and two or more reverse rises in the opposite end of said cylinder by a cutting or grinding tool positioned at the opposite end of said cylinder, said rises at one side of said cam lobe being opposite the reverse rises in the other side of said cam lobe, and the distance between a reverse rise on one of said sinusoidal cam lobe surfaces from the opposite rise on the other of said sinusoidal cam lobe surfaces gives the desired cam lobe thickness.

4,638,548

METHOD OF FORMING A HELICAL BALL SCREW MEMBER

Michael A. Miller, Metamora, Mich., assignor to 20th Century Machine, Sterling Heights, Mich.

Filed Feb. 8, 1984, Ser. No. 578,379

Int. Cl.⁴ B23P *13/04*; B24B *5/00*; F16H *1/14*

U.S. Cl. 29—558 **17 Claims**



1. A method of forming a ball screw member from a workpiece having a first end, a second end opposite said first end, a longitudinal axis extending from said first end to said second end, a cylindrical portion interposed said first end and said second end, and a cylindrical outer surface on said cylindrical portion, said method comprising:

a first machining step of machining a helical ball screw thread in said cylindrical outer surface, said helical ball screw thread being located during said first machining step relative to said cylindrical outer surface, said helical ball screw thread having a partial circular cross-sectioned helical groove and a helical crest surface adjacent thereto; and

a second machining step of machining end treatments on said workpiece adjacent said first end of said workpiece, said end treatments being located during said second machining step relative to said helical crest surface.

4,638,549

APPARATUS FOR MANUFACTURING ELECTRICAL HARNESSES

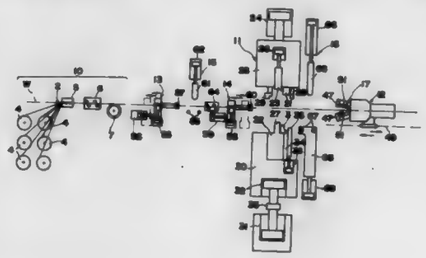
Takashi Okazaki, Toyoakashi; Yukio Matsu'ura, Takatsukishi, and Yoshihiko Saijo, Ibaragishi, all of Japan, assignors to Nippon Acchakutanshi Seizo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 13, 1985, Ser. No. 775,772

Claims priority, application Japan, Sep. 13, 1984, 59-192267

Int. Cl.⁴ B23P *23/00*; H01R *43/05, 43/01*

U.S. Cl. 29—564.4 **4 Claims**



1. Apparatus for making electrical harnesses including wires and electrical connectors, the apparatus comprising:

a wire feed path extending and substantially horizontally and axially of the apparatus;

a connector attaching device comprising a co-operating assembling punch and die pair disposed on respective sides of the wire feed path, and a wire cutting blade located adjacent to the punch and die pair;

a connector supplying device for supplying the connectors to the assembling die;

a first chuck reciprocally movable along the wire feed path for pulling out the wires in an advancing movement for a distance corresponding to a desired length of the electrical harness;

a second chuck for holding the supplied wires laterally at equal intervals, and guiding the same to the connector attaching device along the wire feed path, the second chuck reciprocally movable in a small range during which movement to align top ends of the wires;

an insulation covering stripping device mounted on the second chuck;

whereby, upon operation, the wires supplied to the connector attaching device are pulled out by the first chuck to a desired length from a connector attaching position; then the insulation covering stripping device being operated to slit insulation covering of each wire, and the connector attaching device being operated to cut the wires to a desired length, and attach one of said connectors to tail ends of the wires.

4,638,550

HORIZONTAL DRILLING AND MILLING MACHINE

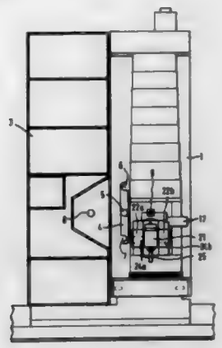
Matthias Malzkorn, Jüchen, Fed. Rep. of Germany, assignor to Scharmann GmbH & Co., Mönchengladbach, Fed. Rep. of Germany

Filed Sep. 16, 1983, Ser. No. 533,252

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 3234498

Int. Cl.⁴ B23Q *3/157*

U.S. Cl. 29—568 **12 Claims**



1. A horizontal drilling and milling machine having a work table with a workpiece thereon undergoing a rotation in a horizontal plane such that even the most difficult workpieces, without having to be reclamped and tilted, can be machined on five sides accurately at all angles of application of a tool including accurate drilling of bores via such tool being brought into horizontally respectively vertically inclined positioning, said machine comprising:

a vertically extending column;

a headstock movable up and down on said column;

a rotatable drive drilling spindle which is provided with means for operative connection thereof with said headstock and having a central longitudinal axis therewith;

an angle-cutting milling head provided with a milling spindle and a drive shaft, means coupling said shaft to be coaxially directly engaged and driven by said drilling spindle; said milling head being provided with means for rotary indexing thereof about said longitudinal axis of said drilling spindle for exact positioning of a tool in a working position thereof taking into consideration encountering of torque and reaction forces exerted between said headstock and said tool, and being further provided with means for said milling head to be pivoted into a tool exchanging position about an axis which extends at right angles to said longitudinal axis of said drilling spindle.

4,638,551

SCHOTTKY BARRIER DEVICE AND METHOD OF MANUFACTURE

Willem G. Einthoven, Belle Mead, N.J., assignor to General Instrument Corporation, New York, N.Y.

Continuation of Ser. No. 422,386, Sep. 24, 1982, abandoned. This application Feb. 21, 1985, Ser. No. 703,703

Int. Cl.⁴ H01L *29/48*

U.S. Cl. 29—571 **12 Claims**



1. A method of manufacturing a Schottky barrier device comprising:

(a) providing a semiconductor layer of a first conductivity type;

(b) forming an insulating layer over one face of the semiconductor layer;

(c) forming an opening in the insulating layer;

(d) depositing a photoresistant layer over the insulating layer and over the semiconductor layer where it is exposed by the opening in the insulating layer;

(e) forming an opening in the photoresistant layer surrounding the periphery of the opening in the insulating layer such that adjacent areas of the insulating and semiconductor layers are exposed;

(f) directing activated ions of the type producing a conductivity opposite to that of the semiconductor layer at the opening in the photoresistant layer for introduction into the semiconductor layer below said opening, the energy of the ions being such that the insulating layer acts as a partial shield to the ions.

(g) removing the photoresistant layer;

(h) depositing a conductor layer over the semiconductor layer where it is exposed by the opening in the insulating layer.

4,638,552

METHOD OF MANUFACTURING SEMICONDUCTOR SUBSTRATE

Masaru Shimbo; Kiyoshi Fukuda, and Yoshiaki Ohwada, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 14, 1985, Ser. No. 701,516

Claims priority, application Japan, May 9, 1984, 59-92442; May 9, 1984, 59-92443

Int. Cl.⁴ H01L *21/302, 21/76*

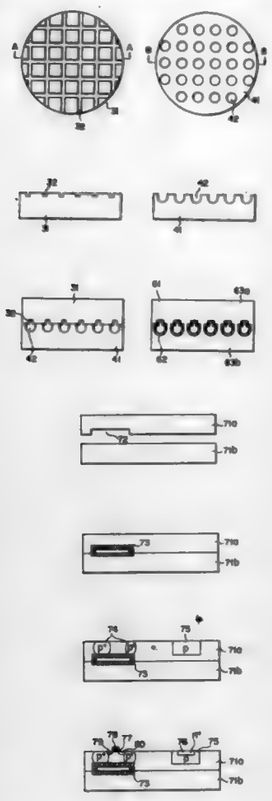
U.S. Cl. 29—576 J **15 Claims**

1. A method of manufacturing a semiconductor substrate having a modified layer therein, comprising the steps of:

mirror-polishing one surface of each of first and second semiconductor plates;

forming a modified layer on at least one of the polished surfaces of said first and second semiconductor plates; and

bonding the polished surfaces of said first and second semiconductor plates with each other in a clean atmosphere



without thermal fusing of said first and second semiconductor plates.

4,638,553

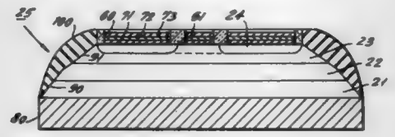
METHOD OF MANUFACTURE OF SEMICONDUCTOR DEVICE

Anders Nilarp, Rancho Palos Verdes, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Division of Ser. No. 447,760, Dec. 8, 1982. This application Oct. 4, 1985, Ser. No. 784,177

Int. Cl.⁴ H01L *21/302, 29/743*

U.S. Cl. 29—580 **22 Claims**



1. The method of making a plurality of semiconductor devices which are simultaneously processed and metallized with plural metallizing layers while said devices constitute parts of a common thin, flat silicon wafer having substantially parallel first and second surfaces; said metallizing being intimately secured in ohmic contact with a plurality of spaced portions of said first surface and being capable of withstanding temperatures which are encountered in subsequent processing steps; said metallizing including a non-junction-forming metal in contact with said first surface of said wafer and an outer solderable metal layer which is non-reactive to a caustic etch; said method comprising the steps of: separating a plurality of wafer elements from said wafer with each of said wafer elements having at least one respective metallizing area on at least a portion of the first surface thereof; securing a respective expansion plate contact to the second surface of each of said wafer elements; and etching the outer periphery of each of said wafer elements with a caustic etch.

4,638,554

METHOD OF CONSTRUCTING TRANSFORMERS USING A TRANSFORMER-COIL WINDING WHEEL

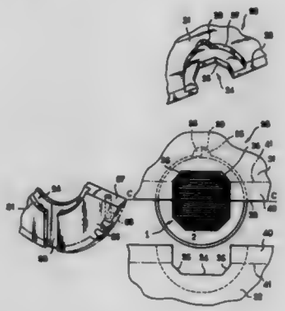
Jean-Claude Beisser, La Chaux de Fonds, France, assignor to Societe Nouvelle Transfix, Cahors, France

Division of Ser. No. 466,660, Feb. 15, 1983, Pat. No. 4,542,362. This application Aug. 3, 1984, Ser. No. 637,330

Claims priority, application France, Feb. 19, 1982, 82 02753; Feb. 19, 1982, 82 02754

Int. Cl.⁴ H01F *7/06*

U.S. Cl. 29—605 **2 Claims**



1. A method of constructing a transformer, comprising the steps of:

forming a magnetic frame with at least one core and at least one yoke which define together at least one substantially rectangular window;

disposing an insulating tube around the magnetic core;

placing a driving wheel around the core and detachably coupling said wheel to at least one end of said tube;

winding electrical turns around the insulating tube by causing a movement of rotation of the wheel, while keeping end portions of the tube free from electrical turns;

removing the driving wheel from the tube;

interposing axially between the yoke and each end of an electric winding comprising the wound electric turns an annular spacer while centering a respective one of said end portions of the tube in a first aperture surface of the annular spacer, centering a second aperture surface of the annular spacer around the magnetic core, and abutting an annular end of the tube against an annular shoulder provided on the spacer between the two aperture surfaces.

4,638,555

SODIUM SULPHUR CELLS AND THEIR MANUFACTURE

Stuart MacLachlan, Runcorn, and Christopher O'Neill Bell, Great Sankey, both of United Kingdom, assignors to Chloride Silent Power Ltd., Runcorn, United Kingdom

Filed Jun. 26, 1985, Ser. No. 748,933

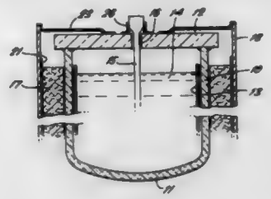
Claims priority, application United Kingdom, Jun. 26, 1984, 8416220

Int. Cl.⁴ H01M *6/00;* **B23K** *35/36*

U.S. Cl. 29—623.1 **18 Claims**

1. A method of constructing an alkali metal energy conver-

sion device having an external casing, a solid electrolyte element dividing the interior of the casing into two electrode regions, an electrically insulating ceramic element joined to the electrolyte element, and at least one metal member sealed to



the insulating element, which method includes the steps of securing the metal member directly to the insulating ceramic element by thermocompression bonding before joining the insulating element to the electrolyte element by glazing.

4,638,556

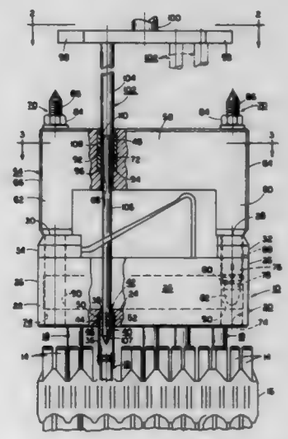
LOCKING TUBE INSERTION FIXTURE AND METHOD IN A RECONSTITUTABLE FUEL ASSEMBLY

John M. Shallenberger, Fox Chapel, and Stephen J. Ferlan, Wilkins Twp., Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 8, 1985, Ser. No. 689,696

Int. Cl.⁴ B23P *19/00, 17/00;* **B23Q** *13/14*

U.S. Cl. 29—723 **14 Claims**



14. For use with a reconstitutable fuel assembly including a top nozzle with an adapter plate having at least one passageway, at least one guide thimble with an upper end portion and an attaching structure having a hollow locking tube for releasably locking the upper end portion of the guide thimble within the passageway of the top nozzle adapter plate, a method for inserting the locking tube into its locking position, comprising the steps of:

(a) releasably disposing a locking tube within an opening in a tool guide;

(b) locking the tool guide on the top nozzle so as to align its opening with the passageway of the top nozzle adapter plate and the locking tube disposed within the opening in alignment with the upper end portion of the guide thimble positioned within the passageway; and

(c) moving a tool holder having a locking tube insertion tool mounted thereon toward the tool guide so as initially to cause the tool to extend through the guide opening and locking tube and into the upper end portion of the guide thimble and thereafter to engage the locking tube causing its release from the tool guide opening and insertion into the guide thimble upper end portion to its locking position therein.

4,638,557

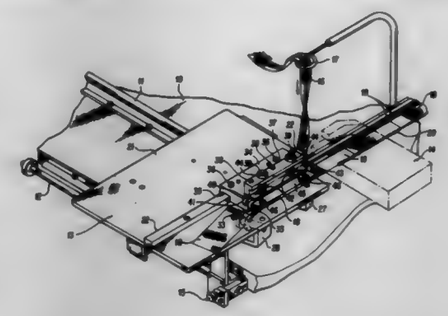
SEMI-AUTOMATIC APPARATUS FOR ATTACHING FLYPIECES TO A SLIDE FASTENER CHAIN

Sisir K. Sen Gupta, Meadville, Pa., assignor to Talon, Inc., Meadville, Pa.

Filed Jan. 24, 1986, Ser. No. 821,975

Int. Cl.⁴ B21D *53/50;* **A41H** *37/06*

U.S. Cl. 29—766 **15 Claims**



1. In a machine for attaching flypieces to a slide fastener chain, a sewing machine, means to deliver a slide fastener chain to a sewing station defined by the sewing machine, and an apparatus to receive, orient and convey flypieces to the sewing station in a required sequence, said apparatus comprising a top plate on which flypieces can be randomly placed, a flypiece guide bar on said top plate with which flypieces can be engaged and guided on a path of movement toward the sewing station, conveyor belt means having a top run projecting somewhat above the top face of said top plate and adapted to engage flypieces on the top plate and shift them into engagement with said guide bar while conveying the flypieces toward the sewing station, and a cooperative adjustable flypiece guide and drag producing means on the top plate in overlying relationship to said top run of said conveyor belt means, whereby the machine can process flypieces of varying thicknesses and can maintain a desired uniform gapping or substantial abutment between the ends of flypieces passing through the machine.

4,638,558

WIRE PROCESSING METHOD AND APPARATUS

Homer L. Eaton, Leucadia, Calif., assignor to MTS Vektronics Corporation, Carlsbad, Calif.

Filed May 31, 1984, Ser. No. 615,933

Int. Cl.⁴ H01R *43/04;* **B21F** *00/00;* **B65G** *15/14*

U.S. Cl. 29—861 **41 Claims**

1. The method of feeding a predetermined length of elongated material to a work station comprising

withdrawing said material from a material supply station,

feeding said material from said supply station to a temporary storage station,

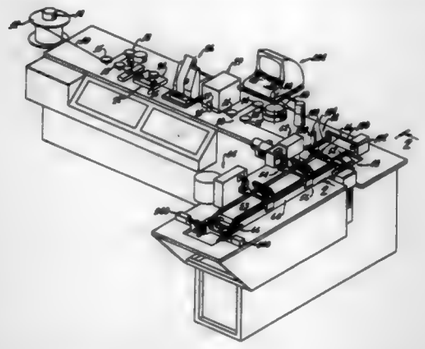
stopping withdrawal of material from the supply station when said predetermined length has been withdrawn,

withdrawing material from the storage station and feeding it to the work station, and

stopping withdrawal from the storage station when the amount of material in said storage station decreases to a predetermined amount.

11. The method of elongated material end processing comprising winding a length of material on a reel with at least a first end of the material projecting from the reel, grasping the projecting material end in a clamp, cutting the material adjacent the reel to sever a length of material on the reel from

material not yet wound on the reel, and moving the clamp to thereby transport the reel and material thereon to an end processing station to present said material end to said station while said length of material remains on said reel.

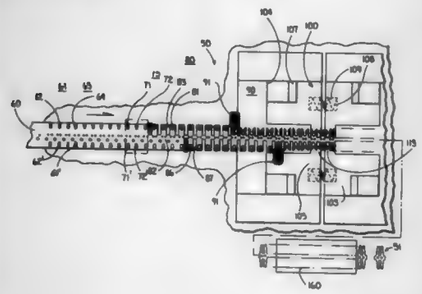


4,638,559

METHODS OF AND APPARATUS FOR MAKING SLOTTED BEAM CONTACT ELEMENTS

Charles McGonigal, Grayson, Ga., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Oct. 30, 1984, Ser. No. 666,526
Int. Cl.[4] H01R *43/16*
U.S. Cl. 29—874 13 Claims



1. A method of making a slotted beam contact element, said method comprising the steps of:

forming an opening in a strip of metallic material having major surfaces which are connected by edge surfaces;

forming a furcated beam in the strip with the furcations of the beam being spaced apart and with the opening being disposed between at least portions of inner edge surfaces of the furcations; and

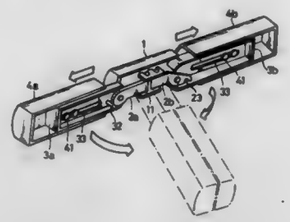
applying forces to at least one of the major surfaces at a location adjacent to an outer edge surface of at least one furcation to cause relative movement between the furcations to reduce the spacing therebetween and cause the portions of the inner edge surfaces to define a conductor-receiving slot having a predetermined configuration.

4,638,560

SAFETY RAZOR

Kanji Higashi, Omochanomachi, Japan, assignor to Kabushiki Kaisha Bandai, Japan

Filed Mar. 17, 1986, Ser. No. 840,078
Claims priority, application Japan, Oct. 17, 1985, 60-231758
Int. Cl.[4] B26B *21/00*
U.S. Cl. 30—47 3 Claims



1. A safety razor comprising: a holding member for holding a razor blade; a pair of shaft members rotatably connected to the rear side of said holding member opposite to said razor blade; a pair of cover members each slidably connected to a corresponding one of said shaft members for covering said holding member when said shaft members are moved substantially in parallel with said holding member; and wherein said pair of shaft members each include first and second shaft members, said first shaft member being rotatably connected to the rear side of said holding member and said second shaft member being rotatably coupled to said first shaft member, wherein said cover members are each slidably connected to said second shaft member.

4,638,561

COMBINED KNIFE AND SLICER

Akira Koike, Takarazaka, Japan, assignor to Daishoku Kako Kabushiki Kaisha, Itami, Japan

Filed Jul. 18, 1985, Ser. No. 756,111
Claims priority, application Japan, Feb. 22, 1985, 60-24939[U]
Int. Cl.[4] B26B *3/03*
U.S. Cl. 30—284 2 Claims



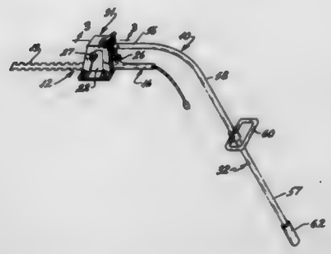
1. A combined knife and slicer which comprises a generally elongated knife having a knife edge at one side thereof, a pair of spaced stub shafts connected to the opposite end portions of the blade so as to protrude laterally of the blade in the same direction, a generally elongated spacer guide comprising a spacer bar and a pair of generally plate-like support arms connected to the opposite ends of the spacer bar so as to extend in the same direction at right angles to the spacer bar, said support arms having their outer side edges slidingly received in circumferentially extending guide grooves in guide collars, one for each stub shaft, said guide collars threadingly mounted on each of the stub shafts for permitting the spacer guide to be adjustably supported by said stub shafts so as to extend in parallel relation to the longitudinal sense of the blade and also for adjusting the spacing between the spacer guide and the blade, said guide collars having two circumferentially extending guide grooves defined therein in which a respective portion of the spacer guide is slidingly guided, and a biasing element comprising a wire spring having a substantially intermediate portion secured to the spacer bar, said wire spring having its opposite ends engaged in the second circumferentially extending groove in the respective collars for elastically urging the spacer guide so as to permit the spacer guide to assume a position spaced a distance from the knife edge in a direction parallel to the direction in which the blade is moved during a cutting procedure.

4,638,562

EXTENSION HANDLES FOR HEDGE TRIMMERS

Tom Drake, 130 Harbor Rd., Rye, N.H. 03870

Filed Feb. 26, 1986, Ser. No. 832,793
Int. Cl.[4] A01G *3/04*
U.S. Cl. 30—296 R 20 Claims



1. A powered hedge trimmer apparatus comprising cutting blades driven by a motor mounted within a motor housing, said motor housing having oppositely oriented upper and lower, front and rear and spaced side wall portion, at least two elongated handle mounting means, each of said elongated handle mounting means being disposed along different one of said wall portions of said housing so as to be oriented outwardly of said housing in different alignment, an elongated handle means, said elongated handle means having first and second ends and an intermediate portion, said intermediate portions being generally curved so that said first and second ends of said handle means are angularly oriented with respect to one another, and means for selectively connecting said first end of said elongated handle means to either of said elongated handle mounting means so that said motor housing is supported by said elongated handle means.

4,638,563

TELESCOPING MEASURING STICK WITH SIGNAL MEANS

Egbert D. N. Buniff, 23674 Gerrad Way, Canoga Park, Calif. 91307

Continuation-in-part of Ser. No. 773,541, Sep. 9, 1985, abandoned. This application May 5, 1986, Ser. No. 859,715
Int. Cl.[4] G01B *3/08*
U.S. Cl. 33—169 R 4 Claims

1. A telescoping measuring stick for determining the height of a cross-bar in an athletic event, comprising:

(a) a hollow outer tubular member, having marked thereon gradations of length;

(b) at least one nested inner slide member adapted to slide within an outer tubular member, haivng marked thereon gradations of length in association with gradations of length on said outer tubular member;

(c) means for clamping said at least one inner slide member at a pre-selected extended position; and

(d) an assembly for detecting the presence or absence of said cross-bar and for providing an indication of same, said assembly including:

(1) means for sensing said presence or absence of said cross-bar,

(2) at least one indicating means for indicating said presence or absence of said cross-bar, said indicating means cooperatively associated with said sensing means, and

(3) means for providing a source of power to activate said at least one indicating means upon sensing said presence of said cross-bar: said assembly comprises:

(a) a housing

(b) a mounting post for supporting said housing and adapted to be inserted in said inner slide member;

(c) a micro-switch assembly mounted on the bottom of said housing for indicating the height of said cross-bar;



(d) a light emitting diode mounted on said mounting post for indicating closure of said micro-switch;

(e) a buzzer mounted in said housing for indicating closure of said micro-switch; and

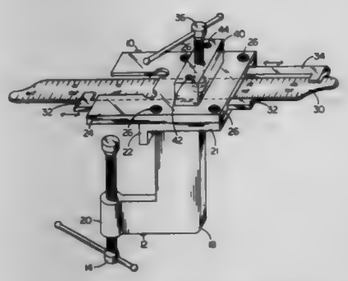
(f) means for providing a source of power to activate said light emitting diode and said buzzer upon closure of said micro-switch.

4,638,564

MEASURING GUIDE FOR SAW AND MEASURING GUIDE SYSTEM

Philip J. Burrows, 46 Cliff Dr., Narragansett, R.I. 02882

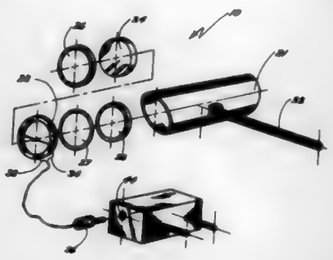
Filed Mar. 24, 1986, Ser. No. 842,904
Int. Cl.[4] B27B *9/04*; B43L *7/00*
U.S. Cl. 33—185 R 6 Claims



1. A guide having a first planar surface for placement upon the surface of a workpiece and a second planar surface perpendicular to said first planar surface for placement against an edge of said workpiece, said guide having a first opening slidingly receiving a rule and second and third openings for slidingly receiving first and second indicators, first clamping means operative to clamp against the surface of said workpiece and second clamping means operative to clamp against the surface of said rule, and first and second indicators slidingly received within said second and third openings respectively, said rule being operative to extend over the surface of said workpiece and said first and said second indicators being oper-

ative to extend over the surface of said rule to indicate a predetermined setting for said rule relative to the surface of said workpiece.

4,638,565
BOW SIGHT
Clayton J. Podany, 7317 Valley St., and Richard W. Glaseman, 6103 Oak St., both of Omaha, Nebr. 68124
Filed Oct. 3, 1979, Ser. No. 81,452
Int. Cl.[4] F41G *1/34*
U.S. Cl. 33—265 4 Claims



1. A sight for use with a weapon, the sight comprising:
housing means have a passage formed longitudinally therethrough;
mounting means secured to said housing means and projecting therefrom, said mounting means adapted for affixment to the weapon;
an aiming reference disposed in said passage, said aiming reference including a light source means for producing a light, said light source means including enclosed filament means for receiving electricity therethrough spaced from the walls of said passage, said filament means having a variable intensity and said electrical means including a variable means for adjusting said intensity, said aiming reference including a mounting unit laterally disposed in said housing and having an opening formed therein with said filament means disposed in said opening;
electrical means connected to said filament means for conducting electricity to said filament means;
power means connected to said electrical means wherein said filament means is energized thus producing light; and
said mounting means including a mounting ring formed from a non-conductive material, a pair of spaced copper bands affixed to said mounting means, a pair of leads, each secured on one end to one of said bands respectively with the other end of each lead secured to said filament means with said leads positioning said filament means at the center of said mounting ring.

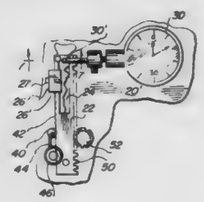
4,638,566
HOLE ANGULARITY GAUGE
Douglas Thompson, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Mar. 27, 1985, Ser. No. 716,663
Int. Cl.[4] G01B *5/24*
U.S. Cl. 33—534 17 Claims

1. A gauge for measuring the deviation from a predetermined angle of the relative angle between a hole in an object and a surface of the object through which the hole extends, comprising:
a first member including an upper portion, and a lower portion that inciudes a downwardly tapered plug dimensioned to be snugly receivable into the hole; and having a use position in which the plug is so received into the hole;
a second member including an upper portion, and a lower portion positioned radially outwardly from the plug and having end surface means; said second member having a use position in which said end surface means contacts said surface of the object around the hole;
attaching means for slidably and pivotably attaching said members together, to slide upwardly and downwardly with respect to each other along a line toward and away from said use positions, and to pivot with respect to each other about a pivot axis perpendicular to said line;



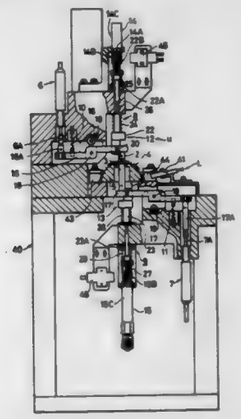
spring means for biasing one of the members downwardly into said one member's use position when the other member is placed into said other member's use position; and
indicator means, carried by said upper portions and responsive to relative pivotal movement between said upper portions, for indicating the amount of said deviation.

4,638,567
KEY DECODING DEVICE FOR AUTOMOBILES
Garrett J. Leversee, 5669 W. 78th St., Los Angeles, Calif. 90045
Filed Jan. 6, 1986, Ser. No. 816,363
Int. Cl.[4] G01B *5/20*
U.S. Cl. 33—540 6 Claims



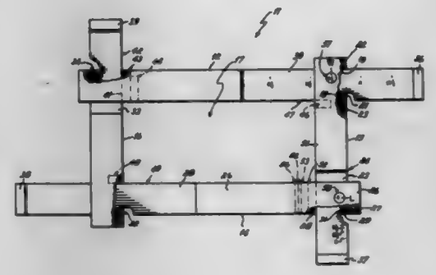
1. A key-decoding device for Mercedes Benz keys, and the like, for precisely measuring the depth of each cut of a key, the cuts defining a key code, comprising:
a measuring gauge having a projecting depth measuring tip for insertion into each of the cuts of the key to be measured for determining the depth of cut of each cut thereof in order to determine said key code;
slide carrier means for holding the key to be measured and for selectively positioning each cut of the key to be measured directly adjacent and in alignment with said projecting depth measuring tip on a cut-by-cut basis, so that said tip may enter into each cut for measuring the depth of the cut;
incrementing means for advancing said slide carrier means on an incremental basis so as to position the key to be measured in alignment with said tip for all of the depths of cut of the key that determine the unique and individual key code of the key;
positioning means for holding said slide carrier in each of the incremented positions by which a cut of the key to be measured is gauged by said tip;
housing means for mounting said slide carrier means for reciprocal movement, said incrementing means and said positioning means;
said slide carrier means comprising an elongated, substantially-horizontal channel of substantially U-shaped cross-section in which is placed the key to be measured for movement along with said slide carrier means when said incrementing means moves said slide carrier means, so that said slide carrier means may position the key in alignment with said tip at each of incremented positions thereof, the depths of which are to be measured, said elongated channel having a depth less than the thickness of a key to be measured so that cuts of the key project above said elongated channel so that said measuring tip may measure the depths of the cuts of the key thereby;
said slide carrier means having an elongated side edge surface extending the length of said elongated channel and parallel thereto; said incrementing means comprising a rack-and-pinion arrangement, said rack being formed along said side edge surface of said slide carrier means, and said pinion being mounted on said housing means for cooperative engagement with said rack;
said measuring gauge tip being mounted for reciprocal movement in a direction transverse to the direction of movement of said slide carrier means.

4,638,568
METHOD AND APPARATUS FOR MEASURING WALL THICKNESS OF A WORKPIECE
Hiroo Umemura, Aichi, Japan, assignor to Taiho Kogyo Corporation, Ltd., Toyota, Japan
Filed Jan. 31, 1985, Ser. No. 696,811
Claims priority, application Japan, Jan. 31, 1984, 59-14328
Int. Cl.[4] G01B *7/06*
U.S. Cl. 33—549 20 Claims



1. a device for measuring the wall thickness of a workpiece in the form of a half cylinder, comprising:
a measuring table; a block for supporting said workpiece above said measuring table insuch a manner that an inner surface of said workpiece is directed towards said measuring table and lower legs of said workpiece are spaced from said measuring table, said block having a supporting surface with a curved shape substantially similar in shape to said inner surface of said workpiece; an upper measuring unit for determining the position of an upper surface of said workpiece; a lower measuring unit for determing in the position of said inner surface of said workpiece; and means, responsive to the positions determined by said first and second measuring units, for determining the wall thickness of said workpiece.

4,638,569
BUSINESS FORM DESIGN AID
Thomas D. Dove, Cincinnati, Ohio, assignor to Bedinghaus Business Forms, Inc., Cincinnati, Ohio
Filed Apr. 22, 1985, Ser. No. 725,493
Int. Cl.[4] G01B *3/14*
U.S. Cl. 33—562 6 Claims



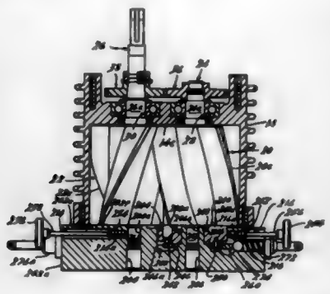
1. A business form design aid comprising four elongated elements, each element having
two space-apart, opposite ends;
first and second outer, parallel segments; and
a middle segment disposed parallel to and between said first and second segments, said first, second and middle segments extending between said opposite ends;
said first and second segments each being discontinuous over a substantial portion of its length between a first point proximate one of said opposite ends of said element and a second point intermediate said opposite ends to expose a portion of said middle segment, said exposed portion being of a predetermined width;
said middle segment being interrupted proximate another of said opposite ends of said element through a longitudinal distance at least equal to said predetermined width to define a channel for slidably receiving an exposed portion of the middle segment of another said element;
said first, second and middle segments of all said elements being located in first, second and middle planes, respectively, with said middle planes disposed between said first and second planes;
the exposed portion of the middle segment of each said element being slidably received in the channel of an adjacent element disposed perpendicular thereto to permit relative perpendicular sliding motion of the adjacent element along the exposed portion of the middle segment of the other element between said first and second points such that each element is movable in a first direction relative to one adjacent element and movable in a second, substantially perpendicular, direction relative to a second adjacent element, each element having an inner edge meeting the inner edges of the two adjacent elements substantially at right angles so that the inner edges of the four elements define an enclosed, generally rectangular area of variable size but with a minimum size defined between the inner edge and the midstream location of at least two adjacent elements, each element further including a business form design indicium spaced apart from the inner edge of one adjacent element, each element moving relative to said one adjacent element such that the business form indicium remains spaced apart from the inner edge of said one adjacent element by a constant amount.

4,638,570

SUPERCHARGER ASSEMBLY AND ROTOR PHASING FIXTURE AND METHOD OF PARTIALLY ASSEMBLING

Raymond A. Soeters, Jr., West Bloomfield Township, Oakland County, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 506,075, Jun. 20, 1983, abandoned. This application Sep. 13, 1985, Ser. No. 775,556
Int. Cl.[4] G01B 5/14
U.S. Cl. 33—562 31 Claims



1. A machine operative to time meshed, lobed rotors of a partially assembled rotary blower, the blower during assembly and machine in combination comprising:

a housing section; first and second meshed, lobed rotors having first and second pairs of adjacent end faces at their opposite ends; first and second shaft portions respectively fixed to the first and second rotors and extending axially beyond the first pair of adjacent end faces; bearing assemblies carried by the housing section and supporting the shaft portions a predetermined transverse distance apart; a first timing gear fixed to one of said shaft portions; and a second timing gear adapted to be fixed to the other shaft portion and meshed with the first timing gear for establishing a fixed angular relation between the rotors; and

a base having first and second surfaces disposed in a common plane for supporting the second pair of adjacent end faces of the rotors thereon against rotation relative to their respective supporting surfaces about the shaft axes and with shaft axes spaced a predetermined distance apart, one of said surfaces defined by a member mounted for rotation relative to the other surface and about the axis of the associated rotor shaft to allow setting a predetermined clearance between the meshed lobes prior to fixing the second timing gear to the other shaft.

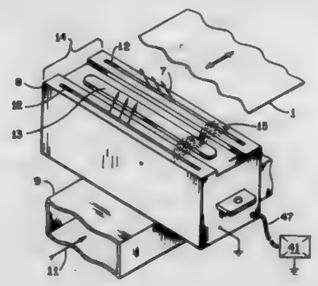
4,638,571

RADIO FREQUENCY NOZZLE BAR DRYER

William A. Cook, 2105 Swinnen Dr., Wilmington, Del. 19810

Filed Apr. 2, 1986, Ser. No. 847,208
Int. Cl.[4] F26B 3/34
U.S. Cl. 34—1 8 Claims

1. In a nozzle bar for treating a web with a gas, an electrically conductive structural housing comprising an internal gas distribution plenum connected to a source of treating gas and a perforate surface in proximity to the web for directing the gas flow from the bar upon the web; the improvement comprising at least one electrode insulatedly mounted on the perforate surface of the nozzle bar and a radio frequency power source electrically connected between the electrode and the nozzle bar housing whereby establishing a plurality of fringing radio frequency fields between said electrode and the structural housing; such fields substantially confined to the proximate space of the perforate surface and the web and intercepting the



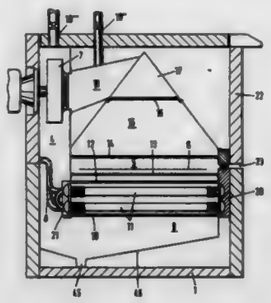
proximate web and transfering heating energy from the R.F. source to the web.

4,638,572

HEAT TREATMENT TUNNEL

Heinz Fleissner, Riehen, Switzerland, assignor to Vepa Aktiengesellschaft, Riehen/Basel, Switzerland

Division of Ser. No. 468,299, Feb. 22, 1983, Pat. No. 4,586,268. This application Oct. 3, 1985, Ser. No. 783,532
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3205962; Feb. 20, 1982, 3206158; May 4, 1982, 3216558; Jun. 23, 1982, 3223401
Int. Cl.[4] F26B 13/02
U.S. Cl. 34—41 15 Claims



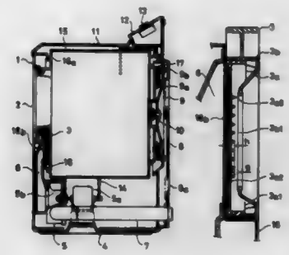
1. A heat treatment tunnel for the treatment of fibrillary material wherein the fibrillary material is transported along a travel path, in endless length form, through a horizontally arranged tunnel, said tunnel comprising a heat insulated housing having at the end faces thereof an inlet slot and an outlet slot, respectively, through which the fibrillary material moves along said travel path, a material feed slot arranged along one longitudinal side of said housing extending the entire length thereof, the material to be heated, being introduced through said feed slot over the length of the tunnel, during start-up of the heat treatment within said tunnel, a sealing means for preventing entry of atmosphereic air into said tunnel via said feed slot, said sealing means including a wall which, against resistance, yields briefly in the upward or downward direction and which, in its operative position, closes said slot.

4,638,573

LINT AND RAVELING COLLECTOR FOR CLOTHES DRYER

Shin Nakamura; Keiji Hikino, both of Hitachi; Shinichi Kaji, Katsuta, and Tsunetoshi Komatsu, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 7, 1985, Ser. No. 795,771
Claims priority, application Japan, Nov. 9, 1984, 59-235126
Int. Cl.[4] F26B 11/04
U.S. Cl. 34—82 6 Claims



1. A lint and raveling collector for a clothes dryer in which clothing is housed and dried by heated air supplied to a rotating drum, a lint and raveling collector being installed in the side of the clothes dryer where the heated air is discharged from said rotating drum so as to collect the lint, raveling and similar fine waste coming out of the clothing, said lint and raveling collector comprising:

a lint and raveling filter having a net-like filter member for collecting lint, raveling and similar fine waste, and means including a plurality of ribs provided on the surface of said filter member for preventing the occurrence of any friction from direct contact between said net-like filter member and the clothing; and

a lint and raveling collecting box having an opening portion formed at a portion facing said ribs of said lint and raveling filter, said lint and raveling collecting box covering said lint and raveling filter in such a manner that a space for accumulation of the lint, raveling and similar fine waste is defined between said lint and raveling filter and an inner wall of the whole portion of said lint and raveling collecting box, except for the opening portion thereof.

4,638,574

REMOVABLE SHOE PROTECTOR

Dominick A. Roda, Meadville, Pa., assignor to Roda Industries, Inc., Meadville, Pa.

Continuation-in-part of Ser. No. 323,183, Nov. 20, 1981, abandoned. This application Aug. 19, 1985, Ser. No. 767,102
Int. Cl.[4] A43B 3/20, 13/22
U.S. Cl. 36—7.2 2 Claims



1. A shoe protector comprising,

a relatively flat half sole having a first part and a second part,

a toe protector made of thermoplastic material integrally molded to said first part of said half sole and adapted to extend rearwardly thereon,

said toe protector comprising a metallic toe protector member, of substantially the same shape and size as said toe protector, imbedded in said thermoplastic material of said toe protector,

said toe protector being adapted to receive the toe of a shoe, having a toe, a sole and a heel, with said half sole terminating adjacent said heel of said shoe,

a metallic bar imbedded in said half sole below said second part of said toe protector for reinforcing said half sole,

said part of said half sole adjacent said heel being relatively thin and extending outwardly and terminating in outwardly extending first and second wings integrally attached to said half sole,

said wings forming a continuation of the sides of said half sole and terminating in an edge approximately equal in length to the height of said toe of said toe protector,

a strap having a first end, a second end and an intermediate part between said first end and said second end,

said first end of said strap being fixed to the upper end of said first wing and said intermediate part extending rearwardly around the rear part of said shoe,

said second end of said strap attached to said second wing then extending forwardly through a loop attached to said toe protector and then rearwardly to said first wing,

a buckle on said first end of said strap,

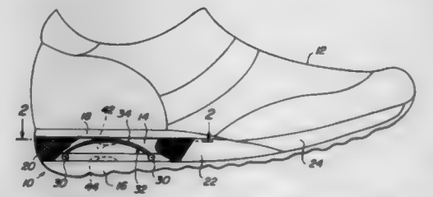
said second end of said strap being received in said buckle whereby said toe protector is supported on said shoe.

4,638,575

SPRING HEEL FOR SHOE AND THE LIKE

Vito J. Illustrato, 928 Peace St., Pelham Manor, N.Y. 10803

Filed Jan. 13, 1986, Ser. No. 818,377
Int. Cl.[4] A43B 21/30, 21/00
U.S. Cl. 36—38 3 Claims



1. A shoe incorporating a spring heel, comprising, in combination, a hollow chamber inside a heel of said shoe, a plurality of flexing leaf springs that bear between the inside bottom surface of the hollow chamber and a bottom surface of a sole of said shoe and is free to slidably move with respect to both said surfaces, the side walls of said chamber including flexible vent means for outside air to circulate into said chamber when said chamber alternately collapses and expands at each step by a person and weight application upon said heel, said leaf springs being upwardly curved and extending forwardly-rearwardly in said heel, and comprising wheel means at its distal end which roll in a track means contained within said chamber.

4,638,576

ATHLETIC SHOE WITH EXTERNAL COUNTER AND CUSHION ASSEMBLY

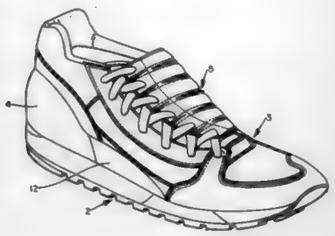
Rui M. Parracho, Peabody; Lloyd S. Smith, Newton Center; Richard P. Busch, Reading, and Alexander L. Gross, Boston, all of Mass., assignors to Converse Inc., North Reading, Mass.

Filed Apr. 24, 1985, Ser. No. 726,508
Int. Cl.[4] A43B 7/14, 7/20
U.S. Cl. 36—68 10 Claims

1. An athletic shoe comprising:

an upper;

a sole, including a midsole and an outsole;
a substantially rigid exterior counter member having a perimeter flange portion and a wall portion, said flange portion extending along a lower edge of the wall portion and being attached to the midsole, and said wall portion including lateral and medial walls, said medial wall extending forwardly from the heel area on the medial side to approximately just behind the first metatarsal; and



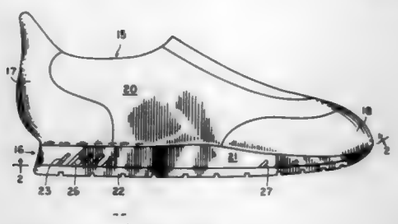
a cushion member, having a floor and side wall portions, the cushion member fitting intermediate the external counter member and the upper with said side wall portions external to the upper, wherein the side wall portion of the cushion member includes a medial side wall that is approximately coextensive in length and height with the medial wall of the external counter, and forming with the external counter a counter and cushion assembly.

4,638,577

SHOE WITH ANGULAR SLOTTED MIDSOLE

Donnie E. Riggs, P.O. Box 2409, Carson City, Nev. 89702

Filed May 20, 1985, Ser. No. 736,099
Int. Cl.[4] A43B *13/04, 13/18*
U.S. Cl. 36—114 **13 Claims**



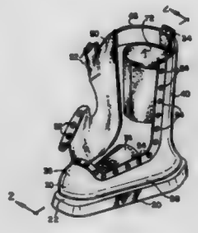
1. An athletic shoe comprising:
an upper portion forming a cavity to receive the wearer's foot and having heel and toe areas, and a lower portion to provide stability and cushioning to the wearer's foot, said lower portion comprising:
a midsole fixed to the upper portion and being formed at least in part of a first material,
a wear surface formed on the bottom of the midsole to contact the ground,
said midsole including a plurality of channels extending generally crosswise of the shoe and in the direction from shoe upper portion toward said wear surface to allow the midsole to compress and cushion the foot as the wearer's weight is exerted on said midsole and to form therebetween crossbeams to provide stability and transmit forces between the foot and the ground;
at least some of said channels in the midsole adjacent the heel area of said upper portion extending at one angle other than perpendicular to the wear surface and thereby being configured to absorb the shock of the shoe contacting the ground and at least some of said channels adjacent the toe area of the upper portion extending at a different angle from that of the channels adjacent the heel area and thereby being configured to provide rigidity to transfer force from the wearer's foot to the ground.

4,638,578

SKI BOOT

Harrison Eiteljorg, II, 541 E. Hector St., Conshohocken, Pa. 19428

Continuation-in-part of Ser. No. 450,764, Dec. 17, 1982, Pat. No. 4,510,703. This application Apr. 16, 1985, Ser. No. 723,865
The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—119 **11 Claims**



1. A boot for supporting a user, comprising:
a sole block;
a first member forming a partial enclosure portion, fixed to the sole block and partially surrounding the user's foot at the toe, sides and back of the foot, the partial enclosure together with the sole block extending under and around the user's foot, and partially around a rear portion of the user's lower leg, the partial enclosure surrounding the foot and lower leg but for portions at a top of the foot and a front of the lower leg;
first belt means attached along edges of the sole block, the first belt means adapted to surround the user's foot at the instep, spaced forward from the user's ankle holding the foot block with respect to the sole block and exerting a downward pressure on the foot;
second belt means attached to the partial enclosure, the second belt means being spaced upwards from the sole block and surrounding the user's lower leg, the second belt means being adapted for fixing the user's lower leg to said partial enclosure, the second belt means exerting a rearward pressure on the lower leg; and,
a second member forming a cover, removably attachable to the partial enclosure over said top of the foot and said front of the lower leg.

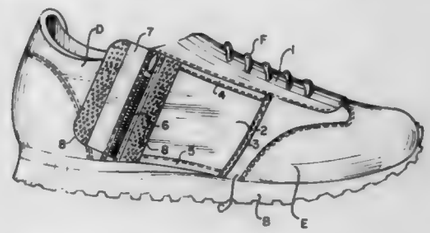
4,638,579

POCKETED ATHLETIC SHOE

Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., Chesterfield, Mo.

Continuation of Ser. No. 612,992, May 21, 1984, abandoned, which is a continuation of Ser. No. 314,134, Oct. 23, 1981, abandoned, which is a continuation-in-part of Ser. No. 231,251, Feb. 3, 1981, Pat. No. 4,384,414, which is a division of Ser. No. 107,092, Dec. 26, 1979, Pat. No. 4,296,559. This application Nov. 27, 1985, Ser. No. 802,935
Int. Cl.[4] A43B *23/00, 5/00*
U.S. Cl. 36—136 **4 Claims**

1. In a pocket for an athletic shoe and of the type incorporating a sole, quarter portions, counters, eyestay, and a vamp, all formed of flexible material, and securing together to form a structured athletic shoe, the quarter portions, counters, and vamp connecting with the shoe at its sole shank, and said shoe pocket designed to hold smaller sized personal items, such as keys, coins, or the like, as during jogging, comprising, said shoe having a quarter portion secured at the lower extent to the sole shank, a pocket being formed securing with at least one of the shoe quarter portions and being of substantial size so as to overlie a substantial portion of the underlying shoe quarter portion, said pocket being secured at its lower part by being turned under with said quarter portion for securement with the sole at its shank, said pocket also having upper, front, and back edges, with said pocket edges being stitched to the contiguous quarter portion, said upper pocket edge being arranged adjacent the shoe eyestay, and being affixed in adjacency therewith, said front pocket edge being arranged proximate the shoe vamp, and said back pocket edge being arranged proximate the shoe counter, a slot being provided within said pocket to allow access into the pocket interior for the deposit of the aforesaid type of items therein, there being ends for the formed pocket slot, and one end of said slot terminating adjacent the lower



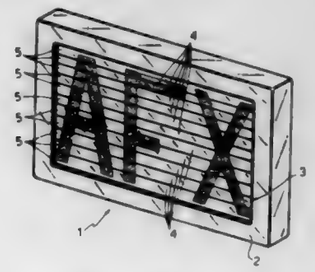
edge of the formed pocket, while the opposite end of the pocket slot terminating just proximate the upper edge of the formed pocket and in proximity with its connected eyestay, the disposed slot extending in adjacency upon the quarter portion overlying the shape of the foot of its wearer therein, and arranged just proximate the back edge of the formed pocket, zipper means provided upon the said shoe and within the region of and upon the opening of said pocket and disposed for providing closure for its formed slot, said pocket slot being disposed approximately in alignment with the said disposed back edge of the formed pocket, said zipper means being arranged aligned with the back edge of the formed pocket, and extending approximately from its eyestay to the sole shank of the athletic shoe, said zipper means being arranged aligned just slightly forwardly of the said rearward edge of the formed pocket.

4,638,580

PUBLICITY BOARD WITH ROTATING PRISMATIC MEMBERS

Anna Giannetti; Sergio Massa, both of Turin, and Cesare Re, Reano, all of Italy, assignors to S.r.l. LO.GI.CAM - Lombarda General Engeneering Costruzioni Automatiche, Italy

Filed Apr. 12, 1985, Ser. No. 722,817
Claims priority, application Italy, Apr. 20, 1984, 53291/84[U]
Int. Cl.[4] G09F *11/02*
U.S. Cl. 40—503 **12 Claims**



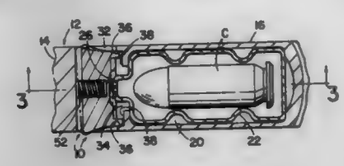
1. A publicity board comprising:
a plurality of elongated prismatic members (4), each of said members (4) having a plurality of display faces (5), said members (4) mounted with their longitudinal axes in parallel, said members being adapted to rotate about their longitudinal axes to cause said display faces (5) to cyclically lie in a single plane;
motion generator means (7) for rotating said members (4) and having a drive shaft (12);
motion transmission means (10) coupled to said drive shaft (12), for transmitting rotating motion to said members (4), said motion transmission means (10) including an operating shaft (11), said operating shaft being coplanarly arranged with the longitudinal axes of said members and further including means (15, 27) carried by an end pivot (14) of each said prismatic member (4) for cooperating with said operating shaft (11) to cause periodic rotation of said prismatic members through an angle substantially equal to twice the angle formed at the center of said display faces (5) of said prismatic members (4), said shaft (11) arranged perpendicularly to the longitudinal axes of said prismatic members (4), said motion transmission means characterized in that said operating shaft (11) is modular and is constructed from a plurality of coaxially arranged substantially identical elements (17), said elements (17) being axially coupled together and angularly offset with a predetermined phase angle (S) between adjacent said element (17), whereby mechanical interference between said prismatic members (4) is prevented during the rotation of said members (4).

4,638,581

AMBIDEXTEROUS MAGAZINE CATCH

Wildey J. Moore, 610 Bloomingrove Tpk., New Windsor, N.Y. 12550

Filed Oct. 31, 1984, Ser. No. 666,201
Int. Cl.[4] F41C *25/06*
U.S. Cl. 42—7 **8 Claims**



1. In a firearm having a frame defining a magazine well for receiving a magazine therein, and a magazine catch supported within an opening in the frame and moveable between a magazine retaining position wherein the magazine catch is engaged with an associated portion of a magazine contained within said well and a magazine releasing position wherein the magazine catch is out of engagement with the associated portion, the improvement wherein said magazine catch comprises a unitary member having supporting and restraining means integrally formed thereon for supporting said magazine catch on said frame to pivot within said opening about either one of its ends and to said magazine releasing position in response to force applied to the other one of its ends and restraining said magazine catch against substantial lateral movement relative to said frame, and means for biasing said magazine catch toward its magazine retaining position.

4,638,582

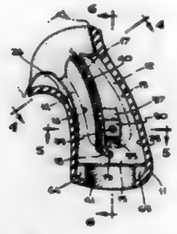
GRIP FOR HAND GUN

Frank W. Farrar, 11941 Paseo Bonita, Los Alamitos, Calif. 90720

Filed Aug. 6, 1985, Ser. No. 762,930
Int. Cl.[4] F41C *23/00*
U.S. Cl. 42—71.01 **11 Claims**

1. A grip for a hand gun provided with a handle frame having an open mid-portion and a hammer spring, said grip comprising a substantially integral mass of yieldable elasto-

meric material having the form of a hand held grip on the exterior and having a pocket within the grip for reception of the handle frame, said pocket having a perimetrical wall adapted to extend around and into engagement with fore and aft and butt edges of said frame, said pocket having side walls intermediate the perimetrical wall adapted to enclose sides of



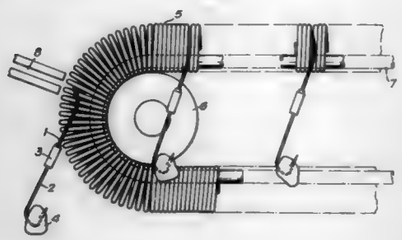
said frame, said grip having a passageway between the pocket and the exterior of the grip at an end of said pocket opposite from the butt edge, said end of said pocket being expandable in response to insertion and removal of said frame along an insertion axis between opposite ends of the pocket and being retractable into engagement with said frame for retention of said grip on said frame.

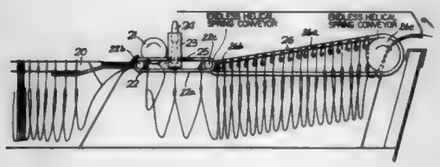
4,638,583

CONVEYER APPARATUS FOR FISHING LINE HAVING SNOODS ALONG ITS LENGTH

Kolbjörn Björnbol, N-6560, Lanöyneset, Norway

PCT No. PCT/NO84/00015, § 371 Date Nov. 23, 1984, § 102(e) Date Nov. 23, 1984, PCT Pub. No. WO84/03687, PCT Pub. Date Sep. 27, 1984
PCT Filed Mar. 20, 1984, Ser. No. 676,395
Claims priority, application Norway, Mar. 25, 1983, 831077
Int. Cl.[4] A01K 79/00
U.S. Cl. 43—4 2 Claims





1. A delivery system for delivering a fishing line which has freely suspended snoods along its length from a first location to a second location, said delivery system comprising a first conveyor apparatus and a second conveyor apparatus,

said first conveyor apparatus comprising

first and second spaced apart turning rollers, said first turning roller being positioned at said first location and said second turning roller being positioned at an intermediate location between said first and second locations,

a first endless helical spring having tightly wound windings movably mounted around said first and second turning rollers, adjacent windings of said endless helical spring being partially separated as said endless helical spring passes around each of said first and second turning rollers, and

a feed element positioned adjacent said first turning roller to sequentially place individual snoods attached to said fishing line in the spacing between adjacent windings of said endless helical spring as it passes around said first turning roller, said individual snoods being released from between adjacent windings as said endless helical spring passes around said second turning roller,

said second conveyor apparatus comprising

third and fourth spaced apart turning rollers, said third turning roller being positioned at said intermediate location and said fourth turning roller being positioned at said second location, and

a second endless helical spring having tightly wound windings movably mounted around said third and fourth turning rollers, adjacent windings of said second endless helical spring being partially separated as said endless helical spring passes around each of said third and fourth turning rollers, said third turning roller being located relative to said second turning roller such that individual snoods attached to said fishing line which are released from adjacent windings of said first helical spring as it passes around said second turning roller will transfer into the spacing between adjacent windings of said second endless helical spring as it passes around said third turning roller.

4,638,584

LUMINESCENT FISHING LURES

William R. Lindsay, Rte. 10, Box 610, Arkansas Rd., West Monroe, La. 71291

Filed May 7, 1985, Ser. No. 731,548
Int. Cl.[4] A01K 85/01
U.S. Cl. 43—17.6 4 Claims



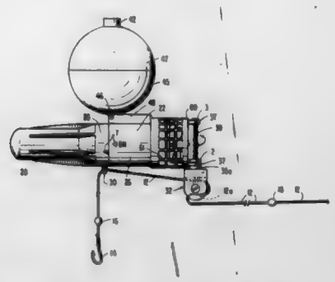
1. A luminescent fishing lure for attachment to a fishing line and attracting fish comprising a shaped lure body having a substantially opaque exterior surface and provided with a substantially transparent pattern in at least a portion of said surface; at least one mixing capsule provided in said body, said mixing capsule characterized by a flexible outer capsule and an inner capsule, said inner capsule having at least one first compartment for containing a first chemiluminescent compound, a second compartment for containing a second chemiluminescent compound and at least one frangible membrane separating said first compartment from said second compartment, whereby when said frangible membrane is ruptured, said first chemiluminescent component is mixed with said second chemiluminescent component to form said luminescent material; and eye means secured to said lure body for attaching said lure body to the fishing line.

4,638,585

MOTORIZED FISHING DEVICE AND METHOD

Gerald A. Korte, 14330 Regis St., Brookfield, Wis. 53005

Filed Mar. 13, 1985, Ser. No. 711,260
Int. Cl.[4] A01K 97/00
U.S. Cl. 43—26.1 6 Claims



1. A fishing device comprising in combination,

a body,

means for propelling the body in the water,

means for mounting the body to an associated fishing line for movement relative to each other,

means including a catch for releasably fixing the body to the associated line to permit the body to feed out the line in the water upon propulsion of the body in the water, said means being releasable to permit the body and the associated line to move relative to each other while the body remains mounted on the line,

indicia means connected to the body for indicating the location of the body while in the water,

and wherein said catch is constructed such that when the line is released from the catch the line is movable relative to the body without interference from the catch,

and wherein said indicia means includes a float connected to the body,

and wherein said body has an upper portion including a mounting means and said float is attached to said mounting means such that the body extends longitudinally below the float.

4,638,586

FISHING LURE

Joseph P. Hall, P.O. Box 505, Branson, Mo. 65616

Filed Jun. 9, 1986, Ser. No. 872,169
Int. Cl.[4] A01K 85/00
U.S. Cl. 43—42.13 39 Claims





1. In a weight for a fishing lure, said weight comprising a substantially bullet (slug) shaped configuration in at least the leading portion thereof, with a substantially rounded, semiconical front end, a substantially cylindrical body portion and a rear end portion following said body portion, there being a hook lead wire received in part in said weight and fixed with respect to same, the following shank wire of the hook extending substantially axially rearwardly with respect to the longitudinal axis of said weight, said shank connected to the bend of the hook, at the end of which there is at least one barb, the improvement which comprises:

a resilient sleeve fitted over a substantial portion of the front end and body portion of said weight in expanded, tensioned manner,

the front part of said sleeve tapered forwardly in near conical manner, an intermediate portion of said sleeve being of substantially cylindrical form and the rear portion of said sleeve being slit to provide a multiplicity of elongate tendrils, strands or streamers said streamers having base portions at the junctures of said slit ends with said sleeve intermediate portion,

the intermediate portion of said sleeve just before said streamers being folded over upon itself on the said weight substantially cylindrical body portion

and means securing the two sleeve thicknesses in said folded over intermediate portion to one another and said weight body portion closely adjacent to the bases of said streamers,

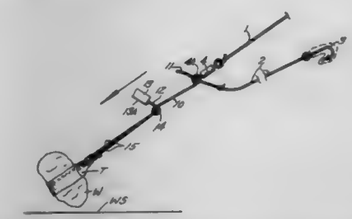
whereby the streamers extend first forwardly, then outwardly and finally rearwardly around said hook shank, bend and barb, as well as the rear weight portion.

4,638,587

DISPOSABLE CASTING AID

Alexander W. Koch, P.O. Box 847, Winchester, Oreg. 97495

Continuation-in-part of Ser. No. 718,536, Apr. 1, 1985, abandoned. This application May 13, 1985, Ser. No. 733,601
Int. Cl.[4] A01K 91/02
U.S. Cl. 43—43.12 7 Claims



1. A disposable casting aid for temporary attachment to and automatic release from a fishing line, said aid comprising,

an elongate main body member having a hook-shaped arm at one end for releasable hook engagement with the fishing line,

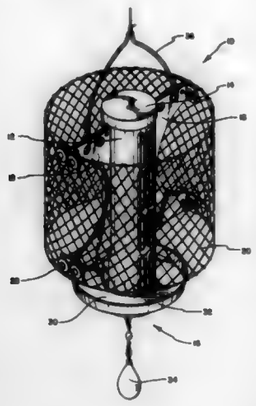
a buoyant member of low density material located at the other end of said elongate main body member,

and a casting weight attached to said main body member at a point intermediate the ends thereof,

said point of attachment of said casting weight constituting a fulcrum about which said buoyant member may act to rotate said body member in the water,

said buoyant member upon being submerged rotating said main body member and said arm thereon to disengage said hook-shaped arm and thus the casting aid from the fishing line.

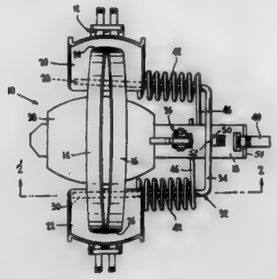
4,638,588
FISH ATTRACTING DEVICE
Carole R. Abadie, 3505 Bellah Ct., Irving, Tex. 75062
Filed Jan. 7, 1985, Ser. No. 689,136
Int. Cl.[4] A01K *69/06*
U.S. Cl. 43—44.99 14 Claims



1. Apparatus for attracting fish, comprising:
(a) A hollow container for retaining fish bait therein, said container having first and second open ends and at least one aperture therein for permitting fish bait to exit said container;
(b) A first closure member for attachment to said first end of said container for closing said first end;
(c) A second closure member for attachment to said second end of said container for closing said second end;
(d) A solid tray member mounted with said second end of said container for collecting fish bait that exits said container; and
(e) a single cylindrically shaped open ended mesh screen mounted substantially concentrically about said container by diametrically opposed support structures extending radially from, and formed integrally with, said container, spacing said screen from said container whereby smaller fish may freely swim through said screen, as well as around the screen through said open ends, and may freely feed on accesible fish bait within said container and on fish bait collected in said tray, but wherein said screen prevents larger fish from feeding on fish bait within said container, fish bait collected in said tray, and smaller fish within the interior of said screen.

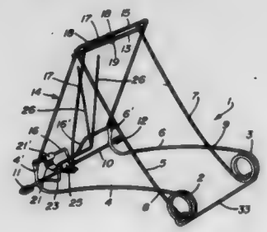
4,638,589
ANIMAL TRAP WITH IMPROVED SECURITY
William E. Askins, Lititz, Pa., assignor to Woodstream Corporation, Lititz, Pa.
Filed Jul. 22, 1985, Ser. No. 757,803
Int. Cl.[4] A01M *23/26*
U.S. Cl. 43—88 2 Claims

1. In an animal trap of the type including a pair of pivotal jaws, and spring loaded actuators for moving the jaws from open to closed position, the actuators each embracing the respective arms of a U-shaped retention pin, the arms of the retention pin further carrying springs for the respective actuators, and the retention pin having a base portion connecting the arms of the pins which base portion extends across a frame member of the trap between a bait pan attachment and a dog mounting end of the frame member, the improvement comprising means for preventing an animal caught in the trap from withdrawing the arms of the pin from the actuators and thereby dismantling the trap, said means comprising a lance upset from the frame member between the base portion of the pin and the dog mounting end of the frame member, the lance having a free end positioned for engagement by an outer surface of the base portion of the pin precluding axial movement



of the pin arms in a direction withdrawing same from the actuators.

4,638,590
HUMANE ANIMAL TRAP
Wilfrid Desrosiers, 6 Cournoyer Street, Kapuskasing, Ontario, Canada (P5N 2N1), and Gaston Labelle, 58 Government Road, Kapuskasing, Ontario, Canada (P5N 1X2)
Filed Sep. 10, 1985, Ser. No. 774,476
Int. Cl.[4] A01M *23/26*
U.S. Cl. 43—88 6 Claims



1. An animal trap comprising two pairs of spaced-apart and parallel first and second arms made of a resilient material and having forward and rearward ends, both arms of each of said pairs being integrally formed at their rearward ends with a coil spring portion; the latter biasing the two arms of each pair towards each other; each first arm having an upturned forward end potion and adapted to contact with the ground on which the trap is placed; a transverse abutment member joining each said upturned forward end portion; a rigid transverse striking bar being adapted to be set in vertically-spaced relation to the transverse abutment member against the biasing force of the two coiled spring portions; setting means to set said striking bar in said vertically-spaced relation and comprising: a frame-like setting member having an inner part pivoted to each said upturned forward end potion and having an outer transverse retaining segment which extends above said striking bar in the set position of the latter; release means to release said striking bar, said release means including a hook means pivotally mounted on said outer retaining segment and releasably engaging said striking bar, and trigger means actuatable by an animal to release said hook means; wherein said hook means includes a hook and a release rod to pivot said hook, said release rods extending downwardly from said outer retaining segment when in said set position; said trigger means including a tripping plate having an inner end pivotally secured to said transverse abutment member and an outer end portion formed with a slot adapted to releasably retain the lower end portion of said release rod; depression of said tripping plate releasing said release rod.

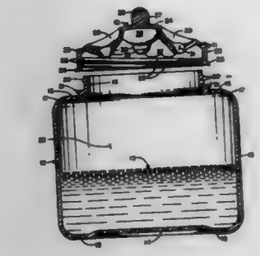
4,638,591
FISH SECURING DEVICE
David B. Neumann, P. O. Box 3194, Manhattan Beach, Calif. 90266, and Robert D. Hunt, 4166 137th St., Hawthorne, Calif. 90250
Filed Feb. 10, 1986, Ser. No. 827,458
Int. Cl.[4] A01K *83/04*
U.S. Cl. 43—89 11 Claims



1. A fish securing device comprising:
an axial guide member having a proximal end and a distal end;
a fish hook carrier axially slideable on said axial guide at said distal end thereof ;
a plunger slideable along said axial guide member;
a plurality of spear arms hingedly mounted to said axial guide intermediate said plunger and said fish hook carrier;
actuating means connected between said spear arms and said plunger for simultaneously pivoting said spear arms between an open cocked position and a closed fish engaging position responsive to axial movement of said plunger;
spring means between said plunger and axial guide for urging said spear arms towards their fish engaging closed position ,
over-the-center locking hinge means operatively connecting between said carrier and said axial guide;
said locking hinge means being engageable for supporting said spear arms in said open position against said spring urging, said locking hinges releasing said spear arms for movement towards their fish engaging closed position in response to distally directed axial tugging force on said carrier .

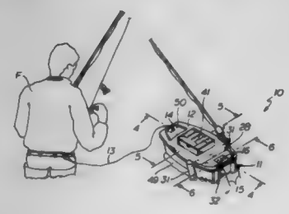
4,638,592
FLY TRAP AND ATTRACTANT THEREFORE
Rodney G. Schneidmiller, E. 8604 S. Riverway, Spokane, Wash. 99206
Filed Oct. 21, 1985, Ser. No. 789,850
Int. Cl.[4] A01M *1/10*
U.S. Cl. 43—122 7 Claims

1. A containment type fly trap comprising in combination:
a peripherally defined body having a neck in its upper portion with means to releasably interconnect a top, said body defining an entrapment chamber and being translucent to light and heat waves and
a top having a lower cylindrical portion configured to fit about and releasably interconnect with the body neck and an upwardly convex top element defining
a plurality of spacedly arrayed concave entryway dimples, each carrying in the medial portion thereof a downwardly extending entryway tube, each said entryway tube defining an entryway channel to allow downward entry of flies therethrough to the entrapment chamber and means to aid in preventing flies' upward



exit from the entrapment chamber through the entryway channels.

4,638,593
FLOATING FISHING ACCESSORY
Robert L. Garcia, 226 Stiles, Houston, Tex. 77011
Filed May 6, 1985, Ser. No. 730,555
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—54.1 10 Claims



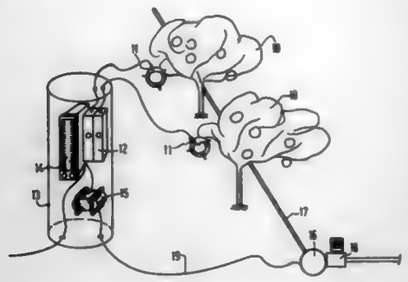
1. A floating fishing accessory comprising
a unitary generally enclosed bouyant hull having front and rear walls, spaced side walls, and top and bottom walls defining a storage space therein,
said storage space divided into a first compartment for receiving and containing live bait and a second adjoining compartment for storing various articles,
said first compartment having an apertured closure member pivotally mounted in said top wall providing access thereto and a plurality of apertures through said hull positioned at the general location of the surface of the water in the floating position whereby both fresh water and air circulate therethrough as said hull moves in the water due to wave action for maintaining the bait in a live condition for an extended period of time,
said second compartment provided with a closure member pivotally mounted in said top wall providing access thereto and an interior lining of thermally insulating material suitable for selectively storing articles in a thermally insulated condition or other articles in a relatively dry condition,
at least one generally rectangular fin depending from said bottom wall of said hull and extending longitudinally a distance therealong for stabilizing said hull in a balanced position in the water and supporting said accessory in a horizontal position out of the water on a ground surface,
bouyancy means on said hull for maintaining said hull in a balanced floating position in the water when loaded with heavy articles,
tubular rod holding means on the exterior of said hull adapted to receive and hold fishing rods, and
attaching means on said hull for releasably attaching said accessory to the user to float at a convenient distance therefrom.

4,638,594

PROCESS AND APPARATUS FOR AUTOMATICALLY CONTROLLING THE IRRIGATION OF PLANTS

Jean-Gérard Huguet, Le Pontet, and Bernard Jaussely, Montfavet, both of France, assignors to Institut National de la Recherche Agronomique, Paris, France

Filed Feb. 5, 1985, Ser. No. 698,590
Claims priority, application France, Feb. 9, 1984, 84 02020
Int. Cl.[4] A01G *25/16*
U.S. Cl. 47—1 R 22 Claims



1. A process for irrigating plant crops which comprises the following steps:
(a) measuring daily variations in diameter of a specific part of a plant that reflects water requirements and resources of the plant as a whole,
(b) determining a maximum daily decrease in the diameter, corresponding to lack of any need for irrigation, climatic influences being taken into account,
(c) fixing a threshold valve for the decrease so that, when said decrease exceeds the threshold value, a deficiency of irrigation is presumed,
(d) comparing each measured decrease with said threshold value and forming a control signal when the threshold value is exceeded,
(e) triggering irrigation and delivering a predetermined quantity of water when the control signal is formed.

4,638,595

PLANT TRANSPORTING DEVICE

Mauricio Rivero, 3411 SW. 16 Ter., Miami, Fla. 33145

Continuation-in-part of Ser. No. 453,580, Aug. 11, 1983, abandoned. This application Mar. 5, 1985, Ser. No. 708,540
Int. Cl.[4] A47G *7/00*
U.S. Cl. 47—39 4 Claims



1. A device for transporting plants in their pots, comprising:
A. a wheeled frame;
B. support bracket means mounted on said frame;
C. a base member mounted on said support bracket means in a spaced apart relationship with respect to said frame thereby forming a compartment and said base member further including a drainage hole;
D. a plurality of upwardly extending first rigid members attached to the periphery of said base member, said rigid members biased inwardly providing a flexible enclosure to keep said pots in place during transportation;
E. reservoir means positioned within said compartment so that it may collect the excess water dripping from said drainage hole;
F. a plurality of upwardly extending second rigid members alternatively arranged between said first rigid members being smaller size, and said first and second rigid members being mechanically connected between adjoining members so that further structural integrity is provided insuring the availability of said sufficient tension; and
G. telescopic handle means for pulling said device, said handle means being concealed within said device and having a plurality of tubular members that can be housed within each other so that said handle means may be concealed.

4,638,596

SAFETY LOCK FOR SECURITY WINDOW GRATINGS

Mike Gallardo, 16829 E. 14th St., San Leandro, Calif. 94578

Filed Sep. 9, 1985, Ser. No. 773,935
Int. Cl.[4] E06B *3/68*
U.S. Cl. 49—56 2 Claims



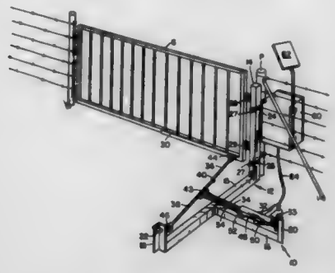
1. A security grating system for securing a window of a building against outside intrustion including:
a window covering grating having first and second side ends, said grating being hinged on a first side end thereof to the building wall, said grating having locking means on the second side end thereof for locking engagement with a vertical rod;
a substantially vertical locking rod slideably positioned adjacent the second side end of said grating, in a raised position said locking rod being in locking engagement with said grating locking means, in a lowered position said locking rod being released from locking engagement with said grating locking means, said locking rod vertically extending from said grating locking means to a point near the floor level of said building and having a horizontal groove in a side surface of said rod at a position above said point;
a tubular member attached to said building and slideably engaging a lower portion of said locking rod; and
a lever bar having first and second ends, said second end supporting a pedal, the first end of said lever bar being horizontally bent to engage the horizontal groove in the side surface of said locking rod, said lever bar being pivotally coupled near its center to said tubular member, said lever bar being spring biased into locking engagement in the groove in said locking rod when said locking rod is in locking engagement with said grating locking means.

4,638,597

MODULAR AUTOMATIC GATE OPENER

Robert W. Lybecker, San Antonio, Tex., assignor to Bomar Corporation, Inc., San Antonio, Tex.

Filed Mar. 21, 1986, Ser. No. 842,560
Int. Cl.[4] E05F *15/02*
U.S. Cl. 49—340 11 Claims



1. An automatic gate opening apparatus, comprising:
a frame assembly comprising a vertical portion, said vertical portion of said frame assembly comprising a shaft having a generally square cross-section and a plurality of axially aligned apertures in opposing faces of said shaft, a horizontal portion, and a gate-receiving means hingedly secured to said vertical portion, said vertical and horizontal portions being attached in a predetermined fixed relationship, said horizontal portion comprising first and second mounting means;
a linkage assembly hinged secured on one end to said first mounted means and hingedly secured on the other end to said gate-receiving means;
actuator means hingedly secured on one end to said second mounted means said actuator comprising an extendible shaft having one end received in said actuator and having the other end attached to said linkage assembly;
control means connected to said actuator means for operating said actuator; and
sensor means for signaling said control means to activate said actuator means, thereby causing said sahft of said actuator means to move said gate-receiving bracket between said open and said closed position.

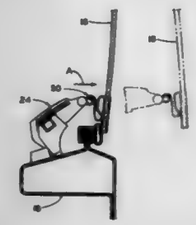
4,638,598

FORCE HINGE CONNECTION FOR THE LATCHING MECHANISM OF A PANEL TRUCK OR VAN WINDOW

Peter N. Gold, 465 North Wood Rd., Rockville Centre, N.Y. 11570

Filed May 2, 1986, Ser. No. 858,711
Int. Cl.[4] E05B *65/06*
U.S. Cl. 49—394 4 Claims

1. A casement window for a panel truck, van or the like having a window pane hung along one edge of a window frame by a flexure mechanism arranged to permit pivotal movment of said window pane about an axis oriented along the corresponding edge of the window frame, an over centered handle latch mounted on said window frame and being operable to move said window pane between an open and closed position, and a resilient hinge connecting said latch directly to said window pane so as to enable said latch and pane to have relative elastic movement in both the closed and open condition, said resilient hinge comprising a serpentine band having a pair of interconnected U-shaped sections, one of which being adapted to envelop and be adhesively secured along the edge of said window pane, the other of which comprises a compressible spring the free end of which is secured to said latch.

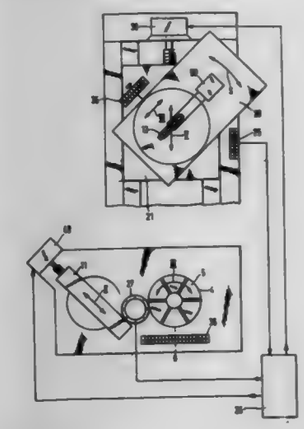


4,638,599

GEAR GRINDING MACHINE FOR RADIAL OR HELICAL SPUR GEARS

Kurt Maier, Langestrasse 112, D-7500 Karlsruhe 51, Fed. Rep. of Germany

PCT No. PCT/DE84/00130, § 371 Date Dec. 28, 1984, § 102(e) Date Dec. 28, 1984, PCT Pub. No. WO84/04894, PCT Pub. Date Dec. 20, 1984
PCT Filed Jun. 8, 1984, Ser. No. 684,591
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320914
Int. Cl.[4] B24B *3/00*
U.S. Cl. 51—52 R 4 Claims



1. A rolling type gear grinding machine for grinding radially or helically toothed spur gears including a rolling mechanism having a translational and a rotational component for an involute tooth gear of the type including;
a machine stand having a plurality of guides mounted thereon;
a main slide mounted on at least two of said guides for reciprocating movement of said main slide along an axis on said stand, said main slide having at least two guides mounted thereon, said main slide providing said translational component;
an auxiliary slide mounted on said two guides on said main slide for reciprocating movement of said auxiliary slide along an axis which is at an angle to the axis of movement of said main slide;
means cooperating with said auxiliary slide for producing said rotational component, said means including a sliding

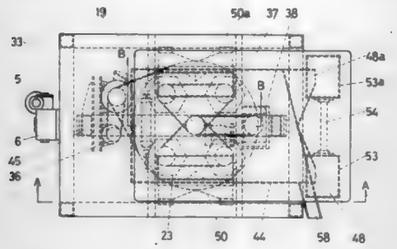
element in a guide slot, said element capable of reciprocating movement in said guide slot, said guide slot being adjustable about an axis of rotation;
a belt drive cooperating with said auxiliary slide;
a workpiece table on said main slide;
an arcuate rolling member mounted on said workpiece table and drivably connected to said auxiliary slide via said belt drive, said workpiece table being rotated by said arcuate rolling member;
the improvement comprising in combination:
said grinding machine further includes a vertically adjustable slide on said machine stand and a tool slide mounted on said vertically adjustable slide, said auxiliary guide being drivable according to the position of said main slide to the helix angle and other data pertinent to a gear to be ground, such that when said guide slot is adjusted and locked in a position parallel to said axis of movement of said auxiliary slide, said machine operates as a form grinding machine and, when said guide slot is rotated to a posotion which is at an angle relative to the axis of movement of said auxiliary slide, said grinding machine operates as a generation grinding machine.

4,638,600

MULTI-FUNCTION WORK FINISHING MACHINE USING BARREL CONTAINERS

Hisamine Kobayashi, and Katsuhiro Izuhara, both of Nagoya, Japan, assignors to Lipton Manufacturing Corporation, Nagoya, Japan

Filed Mar. 28, 1985, Ser. No. 717,293
Claims priority, application Japan, Oct. 16, 1984, 59-217143
Int. Cl.⁴ B24B *31/02*
U.S. Cl. 51—164.2 **9 Claims**



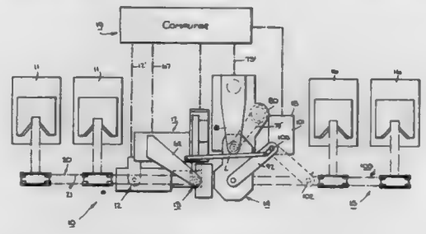
1. A multi-function barrel finishing apparatus comprising:
a machine pedestal;
a main spindle pivotably mounted on said machine pedestal, said main spindle having a central axis and being rotatable about said central axis;
first and second rollers rotatably mounted on said machine pedestal, said first and second rollers being connected by a first shaft;
third and fourth rollers rotatably mounted on said machine pedestal, said third and fourth rollers being connected by a second shaft which is parallel to said first shaft;
a first rolling plate rotatably supported by said first and third rollers;
a second rolling plate rotatably supported by said second and fourth rollers, said second rolling plate being parallel to said first rolling plate;
a pair of parallel lateral plates extending between said first and second rolling plates, said lateral plates rotatably supporting said main spindle;
means for rotating at least one of said rollers to thereby pivot said main spindle to any one of a plurality of desired angular positions with respect to said machine pedestal;
a turret rotatably supported by said main spindle;
a plurality of barrels rotatably mounted on said turret, said barrels being rotatable about barrel axes which are offset from said central axis, each of said barrels having an equilateral polygonal cross-section;
barrel rotation means for rotating said barrels about said barrel axes;
turret rotation means for rotating said turret about said central axis, said turret rotation means being operable independently from said barrel rotation means; and
means for and holding said main spindle at any one of a plurality of desired angular positions with respect to said machine pedestal.

4,638,601

AUTOMATIC EDGE GRINDER

Robert Steere, Boonton, and Thomas Lewandowski, Wanaque, both of N.J., assignors to Silicon Technology Corporation, Oakland, N.J.

Filed Nov. 4, 1985, Ser. No. 794,629
Int. Cl.⁴ B24B *9/10*
U.S. Cl. 51—165.71 **31 Claims**



1. An automatic edge grinder comprising
at least one wafer unloading station for delivering a series of wafers;
a thickness measuring station for sequentially receiving the series of wafers, said measuring station having means for measuring the thickness of a delivered wafer;
a centering station having means for centering a wafer therein and probe means for aligning a centered wafer relative to a longitudinal axis;
a grinding station having means for grinding an edge of a received wafer;
a first transfer mechanism for moving a centered and aligned wafer from said centering station in parallel to said axis to said grinding station;
at least one loading station for receiving a series of edge-ground wafers; and
a second transfer mechanism for moving an edgeground wafer from said grinding station to said loading station.

4,638,602

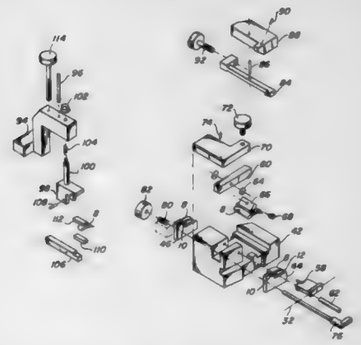
TURBINE BLADE HOLDING DEVICE

Dominic A. Cavalieri, P.O. Box 248, Hibernia Rd., Salt Point, N.Y. 12578

Continuation-in-part of Ser. No. 815,945, Jan. 3, 1986, abandoned. This application Mar. 12, 1986, Ser. No. 838,943
Int. Cl.⁴ B24B *41/06*
U.S. Cl. 51—217 R **18 Claims**

1. Apparatus for securely holding a turbine blade during grinding of the root form portion thereof, comprising
(a) a fixed base;
(b) a first datum plate connected with said base adjacent the front portion thereof for supporting the leading and trailing edges of a first section of the turbine blade;
(c) a second datum plate connected with said base adjacent the rear portion thereof for supporting the leading edge of a second section of the turbine blade;
(d) a longitudinally extending pin connected with said base and adapted to abut against the datum point of the blade; and

(e) means for clamping the blade against said first and second datum plates and said pin, said clamping means including
(1) a clamping device pivotally connected with said base and arranged along the fulcrum of the blade; and



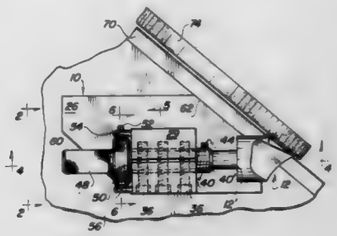
(2) means for displacing said clamping device against the upper surface of the blade.

4,638,603

DEVICE FOR SHARPENING SINGLE-FLUTE COUNTERSINKS

Harvey E. Hanson, 8770 Van Nuys Blvd., #6, Panorama City, Calif. 91402, and John A. Amaniera, 13939 Wallabi Ave., Slymar, Calif. 91342

Filed Jan. 29, 1986, Ser. No. 823,803
Int. Cl.⁴ B24B *3/24*
U.S. Cl. 51—219 R **3 Claims**



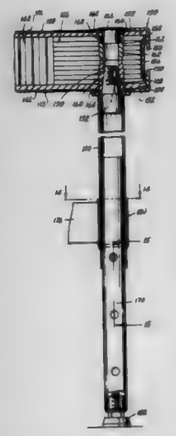
1. A device for sharpening a single-flute countersink comprising:
a mounting plate;
an upstanding post mounted on said mounting plate and having an enlarged opening formed therethrough at an upper portion thereof;
a threaded countersink mounting means for mounting in said enlarged opening having means at one end thereof for securing thereto a shaft of a single flute countersink;
means operatively associated with said threaded mounting means for limiting the rotation of said threaded mounting means to considerably less than 360 degrees in said enlarged opening;
a grinding machine having a work-table for supporting thereon said upstanding post, a guide rail, and a surface grinding wheel rotatable in a vertical plane, said grinding wheel having a front grinding surface face contained in a vertical plane against which a single-flute countersink is sharpened;
means for orienting said threaded mounting means at a desired angular position relative to said front face of said grinding wheel, said means for orienting comprising a first canted side edge surface of said mounting plate, and a second canted side edge surface of said mounting plate, said first and second side edge surfaces being diametrically opposite each other, so that each of said side edge surfaces may be used to position said mounting plate at a desired angle relative to said front face of said grinding wheel, said first side edge surface having a different angle of cut than said second side edge surface to accomodate two different types of single-flute countersinks, one of said first and second canted side edge surfaces being in abutting contact with said guide rail of said grinding machine;
means for manually rotating said threaded mounting means in said enlarged opening at the other end thereof; said one end of said threaded mounting means lying on the opposite side of said upstanding post as compared with said other end of said threaded mounting means;
said mounting plate and said upstanding post mounting thereon being positioned on said work table in front of said front face of said surface grinding wheel, said threaded countersink mounting means comprising a shaft having a hollow end, said shaft lying entirely in front of said front face and at an angle with respect thereto of one of the angles of one of said first and second canted side edge surfaces such that the longitudinal axis of said shaft intersects said front face at said one angle;
said means limiting the rotation comprising a collar member rotatable with said shaft at the end thereof remote from said hollow end, said collar member comprising a circumferentially projecting pin, said upstanding post having a side surface facing toward said collar and having a pair of angularly spaced-apart projecting stop members projecting away from said grinding wheel for limiting the rotation of said collar and said shaft by the cooperation of said pin member with said pair of stop members, said collar having an inner threaded opening for receiving therethrough said end of said shaft remote from said hollow end, whereby said collar may be adjusted along the length of said shaft.

4,638,604

STAGING STRUCTURE

O. David Rogers, Farwell; John Bardwick, III, Tipton, and Kenneth Staten, Clare, all of Mich., assignors to Stage Rite Corporation, Farwell, Mich.

Filed May 7, 1984, Ser. No. 607,978
Int. Cl.⁴ E04H *3/10*
U.S. Cl. 52—6 **7 Claims**



1. A staging system for construction of flat stages, choral risers and the like which comprises:
(a) a flat structural load-bearing square, rectangular or trape-

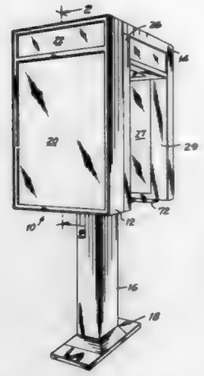
zoidal panel to serve as a module having spaced upper and lower surfaces,
(b) an edge piece secured to one or more edges of said panel having an external re-entrant groove parallel to said panel surfaces,
(c) said panel having, at each corner, recessed sockets on a common axis and opening respectively to the upper and lower surfaces of said panel,
(d) railing supporting stanchions recessed into sockets opening to the top surface of a module to support railings along an edge of staging assemblies,
(e) said supporting stanchions having a retractable threaded shaft at the lower end,
(f) means to bias said shafts to a retracted position, and
(g) means including a cross-pin and bayonet slot to lock said shafts in extended position for assembly.

4,638,605

MOUNTING MECHANISM FOR CONNECTING LIGHT BOX TO TELEPHONE ENCLOSURE

Frank Rosa, Brooklyn, N.Y., assignor to Redyref-Pressed & Welded, Inc., Long Island City, N.Y.

Filed Feb. 14, 1985, Ser. No. 701,392
Int. Cl.⁴ E04F *19/00*
U.S. Cl. 52—28 **7 Claims**



1. A device for connecting a light box having a rear wall and a bottom wall to a telephone enclosure having a side wall with an opening therein and a lower edge, said device comprising a first bracket secured to said rear wall and having a projection adapted for mating engagement with said opening, and a second bracket secured to said bottom wall and having a channel adapted to engage said lower edge.

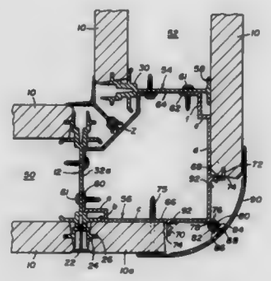
4,638,606

DECORATIVE TRIM SYSTEM FOR PARTITION ADAPTED TO SUPPORT A CANTILEVERED LOAD

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Continuation-in-part of Ser. No. 551,424, Nov. 14, 1983, Pat. No. 4,570,390. This application Sep. 9, 1985, Ser. No. 773,785
Int. Cl.⁴ E04B *1/56*
U.S. Cl. 52—36 **12 Claims**

1. A system for forming an outside corner of a kerfed-edge wallboard partition adapted to support a contilevered load, and for mounting decorative trim at said corner, said system comprising:
a stud having a web which comprises a plate portion and a bifurcated channel housing for a two-tiered longitudinal channel, the first tier being proximate to the plate and having confronting threaded or threadable facets so that the channel may accept a screw at any level, the second tier being open to the frontal insertion of a slotted standard, said stud also having a kerf-engaging flange extending laterally from the housing of the second tier; and
a corner stud having a first flange fastened to the plate of the bifurcated stud, a web having a first segment extending at a right angle from said flange, a second segment extending at a right angle from the first segment in opposition to said flange, a third segment offset from but in a plane parallel to the first segment, a fourth segment extending at a right angle from the third segment and through the plane of the



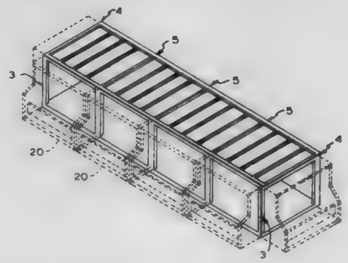
first segment, a fifth segment at a right angle to the fourth segment and extending toward the plane of the second segment, a sixth segment at a right angle to the fifth segment and extending away from the plane of the third segment, a second flange extending at a right angle from the sixth segment toward the plane of the first flange, and a channel housing opening outwardly from the juncture of the third and fourth segments and diagonally disposed with respect to said segments; and
means for fastening wallboard to the corner stud.

4,638,607

BOX-UNIT AND MOLDING APPARATUS FOR ITS PRODUCTION

Anatoli M. Hadjiiski; Hristo P. Varbanov; Michail T. Mishonov; Vladimir P. Stamov; Rosen P. Savov; Strahil K. Radenkov; Vladimir B. Panev, and Alexander S. Velev, all of Sofia, Bulgaria, assignors to Issledovatelski Centar "Tekom", Sofia, Bulgaria

Filed May 17, 1985, Ser. No. 735,432
Claims priority, application Bulgaria, May 17, 1984, 65533; Jun. 28, 1984, 66037
Int. Cl.⁴ E04B *1/348*
U.S. Cl. 52—79.9 **4 Claims**



1. In a box-unit including a floor and ceiling slab and a spatially reinforced concrete framework made of two longitudinal frames and a number of transverse frames composed of the relevant cross bars and columns; the said transverse frames being two at the ends and at least one in the middle, the improvement wherein the cross bars of the longitudinal frames have a reinforced cross section asymmetrical as regards the cross section of the columns and an uninterrupted and equal

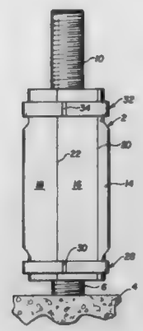
reinforcement of upper and lower cross bars which has a closed shape incorporating the cross bars of the longitudinal frames and the columns of the end transverse frames, and at a modular distance from each other in the cross bars of the longitudinal frames there are provided critical zones with double cross sections with regard to the cross bars and the columns of the end transverse frames to connect in them the reinforcement of the cross bars and the columns respectively of the middle transverse frames and each of the columns, and each of the cross bars of the middle transverse frames has a variable cross section ranging from a single to double cross section.

4,638,608

BREAKAWAY STANDARD SUPPORT ASSEMBLY

William H. Coy, Lancaster, Pa., assignor to Precisionform, Inc., Lancaster, Pa.

Filed Oct. 7, 1985, Ser. No. 784,931
Int. Cl.⁴ E04C *1/00*
U.S. Cl. 52—98 **21 Claims**



1. A breakaway standard support assembly comprising
a base member,
a standard member,
a coupler securing said base member to said standard member,
said coupler having a plurality of body elements and strap means securing said body elements in a coupler body assembly,
said coupler body assembly having a generally axial bore,
said strap means being frangible for fracture upon application of a predetermined generally horizontal impact load to said assembly,
said strap means surrounding and securing said body elements in said coupler body assembly,
base anchor means extending into one end of said coupler body assembly bore, and
standard anchor means extending into the other end of said coupler bore assembly bore, whereby said coupler will support the static load of said standard and normal wind loads but will become disassembled upon application of a predetermined generally horizontal impact load adequate to fracture said strap means.

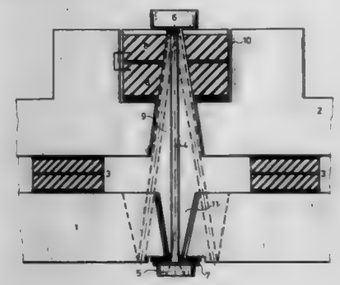
4,638,609

SYSTEM FOR REDUCING THE SEISMIC LOAD OF TALL BUILDINGS

Béla Csák, Budapest, Hungary, assignor to Budapest Muszaki Egyetem, Budapest, Hungary

Filed Jun. 22, 1984, Ser. No. 623,715
Claims priority, application Hungary, Jun. 7, 1984, 2202/84
Int. Cl.⁴ E02D *27/34*
U.S. Cl. 52—167 **2 Claims**

1. In a system for reducing the seismic loads of tall buildings having a foundation and a superstructure with high centre of gravity and to prevent the tipping over of buildings, the improvement comprising elastic elements provided between the foundation and the superstructure, vertical cavities (9,11) having a predetermined diameter formed in the foundation (1) and in the superstructure (2), means for mounting cables (4) in said



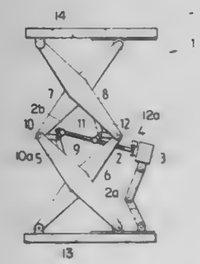
cavities between the foundation (1) and the superstructure (2), both ends of said cables being provided with lower and upper head pieces (5,6) wider than the diameter of the cavities (9,11), and elastic padding means installed in the upper head piece (6), wherein the diameter of the cavities (11) in the foundation (1) is increasing upwards.

4,638,610

THEATRICAL STAGE

Urho Heikkinen, Helsinki 40, Finland, assignor to Elevator GmbH, Baar, Switzerland

Continuation of Ser. No. 471,833, Mar. 3, 1983, abandoned. This application Sep. 23, 1985, Ser. No. 778,761
Int. Cl.⁴ E04H *12/18*
U.S. Cl. 52—109 **5 Claims**



1. A theatrical stage, comprising: a plurality of side-by-side screw-operated shearlegs tables, each said table having a platform and a base member connected by shearlegs members located one above the other and each having its own operating mechanism connected to a screw located between the platform and the base member, wherein the vertical movements of the platform is accomplished by the screw being pivotally connected to the shearlegs members at their common pivot points by transmission members, each transmission member including a pair of linkage arms in which one linkage arm is pivotally connected to the screw and the other linkage arm is pivotally connected to the common pivot point of the shearlegs members by the aid of which the vertical movement of each platform is almost linear in relation to the rotation of each said screw, and wherein the vertical movements of each shearlegs table platform is synchronized by using for each said operating mechanism an electric-hydraulic step motor connected to the screw.

4,638,611

GUY-WIRE GUARD ASSEMBLY AND FASTENING SYSTEMS THEREFOR

Charles R. Vaughn, P.O. Box 33417, San Diego, Calif. 92103

Filed Jan. 6, 1986, Ser. No. 816,553
Int. Cl.⁴ E04H *12/20*
U.S. Cl. 52—147 **53 Claims**



1. A guard assembly for a guy-wire connected to a ground anchor rod, said guard assembly comprising

an elongate generally semi-tubular body having an arcuate, generally semicircular portion and at each end thereof a tangentially extending extension portion, said extension portions being parallel to each other, said body having an inner wall and an outer wall,

a plurality of bolts, each extending diametrically across the body between said parallel extension portions, each bolt having a head at one end and a nut threaded on the other end, to secure said body around said wire, so that the wire lies between the bolts and the arcuate portion of said body,

one said bolt being near the lower end of said body, and another said bolt being spaced therefrom and near the upper end of said body,

said guard body having at least one circumferentially aligned pair of fastener openings through its said arcuate portion, and

a fastener combination for each said pair of fastener openings for holding the guy wire or rod against the inner wall of said body, comprising two principal members, namely a bolt member with a head bearing on said outer wall outside the guard assembly and extending inwardly through one said fastener opening to a nut at its inner end and a locking washer member inside said guard assembly, having a flat portion with an opening therethrough, said bolt-like member passing through said opening inside the area enclosed by said guard assembly, between said head and said nut, and an end tab of said locking washer member extending out at an angle from one end of said flat portion to a hooked outer end extending through the other said fastener opening and engaging the outer wall of the adjacent guard body, whereby either the guy wire or the ground anchor rod can be clamped between said guard body and said flat portion in a location between said bolt member and said end tab.

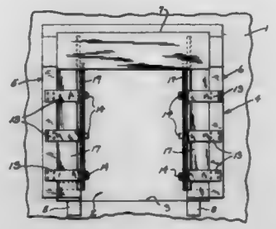
4,638,612

DOCK SHELTER

Mark A. Bennett, Milwaukee, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed Jan. 6, 1986, Ser. No. 816,346
Int. Cl.⁴ E04H *14/00*
U.S. Cl. 52—173 DS **18 Claims**

1. A dock shelter to be mounted alongside the doorway in a dock, comprising a resilient pad mounted on the dock and projecting outwardly from said dock, a flexible panel secured to the outer end of the pad and extending inwardly from the pad toward the center of the doorway and disposed at an acute angle with respect to the dock, an arm connected to the inner end of the panel and extending outwardly in a direction away from the dock, said arm being disposed at an angle of about 90°



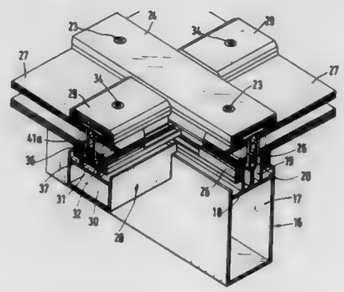
with respect to said panel, the rear end of a truck backing toward said dock engaging said panel to deflect said pad and thereby move the panel into engagement with the side of the truck and simultaneously move the arm into engagement with the end of the truck body.

4,638,613

METAL-GLASS STRUCTURE FOR A FRONT WALL OR A ROOF

Armin Tönsmann, Bielefeld, Fed. Rep. of Germany, assignor to Schüco Heinz Schürmann GmbH & Co., Bielefeld, Fed. Rep. of Germany

Filed May 24, 1985, Ser. No. 738,023
Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419538; Jul. 26, 1984, 3427511
Int. Cl.⁴ E04B *2/88*
U.S. Cl. 52—235 **16 Claims**



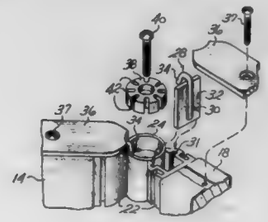
1. In a metal-glass structure for a front wall or a roof, comprising a metal framework having flats covered with glass panels, said framework including a plurality of main frame sections at a building side, a plurality of crossbar frame sections extending transversely of said main frame sections, and a plurality of cover profiles screwed to said main and crossbar frame sections and extending over edges of said glass panels, said main frame sections, said crossbar frame sections and said cover profiles having anchoring grooves and sealing strips partially received in said anchoring grooves, respectively and supported on the edges of the glass panels, said main and crossbar frame sections each enclosing a hollow chamber and being provided with gutters for condensed water and grooves for percolating water, the improvement comprising each groove (32) for percolating water in each crossbar frame section (28) having a bottom wall (41) which extends up to an upper edge of a respective groove (19) for percolating water of an adjacent main frame section (16) and is supported against said upper edge, each main frame section having two longitudinal grooves being defined by outer profiled wall portions which form the anchoring grooves (25) for receiving first sealing strips (26), each crossbar frame section having at least two anchoring grooves (35) for receiving second sealing strips (36), said two anchoring grooves having the same height as that of said grooves (32) for percolating water, the height of said first sealing strips (26) being greater than that of said second sealing strips, said first and second sealing strips being supported against a common face of a respective glass panel, and said two anchoring grooves (35) for the sealing strips having bottom walls which in a region of overlapping are supported on walls of the anchoring grooves (25) of the adjacent main frame section.

4,638,614

ADJUSTABLE ROOM PARTITION

Roger H. Wilcox, 56862 Inwood Ct., Elkhart, Ind. 46516

Continuation-in-part of Ser. No. 762,630, Aug. 5, 1985, Pat. No. 4,601,145. This application Apr. 11, 1986, Ser. No. 850,531
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.⁴ E04B *1/343;* **A47G** *5/00*
U.S. Cl. 52—238.1 **5 Claims**



1. A room partition comprising a plurality of partition members, each partition member including spaced end edges and top and bottom edges, one of said end edges positioned adjacent an end edge of a second partition member, a post positioned between said partition member adjacent end edges, a hook secured to each partition member at one of said top and bottom edges, and said hooks constituting means for rotatably securing said partition members to said post wherein said partition members are shiftable between a multiplicity of positions and a cap member removably secured to one of said post top and bottom edges, said cap member constituting means for securing said partition members in one of said multiplicity of positions, each partition including first and second faces, a vertical groove cut in one of said partition member first and second faces, shelf support means secured in said groove for supporting a generally horizontal shelf.

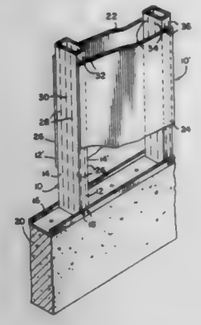
4,638,615

METALLIC STRUCTURAL MEMBER PARTICULARLY FOR SUPPORT OF WALLS AND FLOORS OF BUILDINGS

Lawrence H. Taylor, P.O. Box 49-58, 48th St. Station, Union City, N.J. 07087

Filed Oct. 17, 1985, Ser. No. 788,643
Int. Cl.⁴ E04C *3/30*
U.S. Cl. 52—364 **5 Claims**

1. A structural metallic member particularly useful for forming interior and exterior wall, floor and ceiling support means of building structures consisting of a hollow, generally quadrangular in transverse crossection stud consisting of at least three contiguous walls comprising a pair of end walls and middle wall connecting the pair of end walls at a pair of corners, each of said walls having lengths and widths such as to form the structural member, the middle of the at least three walls being provided with a multiplicity of parallel, spaced, longitudinal rows of longitudinally spaced slits and each of the pair of end walls of the three walls being provided with a row of longitudinally spaced slits spaced about ½ the width of the end walls adjacent the corner contiguous with the middle wall said slits having a width of about 15,000 ths. of an inch to



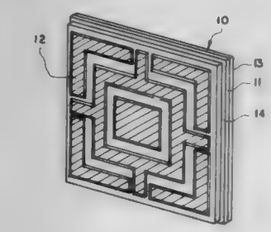
thereby reduce transmission of heat and sound there across and prevent convection of air currents therethrough.

4,638,616

THERMALLY INSULATIVE SELF-SUPPORTING PANEL

Chester P. Fredericks, 3535 W. 72nd Pl., Chicago, Ill. 60629

Filed Sep. 26, 1985, Ser. No. 780,654
Int. Cl.⁴ E04B *1/80, 1/90*
U.S. Cl. 52—397 **6 Claims**



1. A ceiling panel comprised of:

(a) a rigid center portion of rectangular perimeter comprised of gypsum board having flat upper and lower surfaces,

(b) a lower layer of compact inorganic material associated with the lower surface of said center portion, having a downwardly disposed contoured surface and having a perimeter uniformly inwardly displaced from the perimeter of said center portion, thereby forming a shoulder,

(c) a resilient flat sealing strip associated with said shoulder as a continuous border, and

(d) an upper stratum of low heat transfer material disposed upon the upper surface of said center portion,

(e) the weight and perimeter of the panel being such that the sealing strip experiences a downward force between about 1.5 and 4.5 pounds per linear foot.

4,638,617

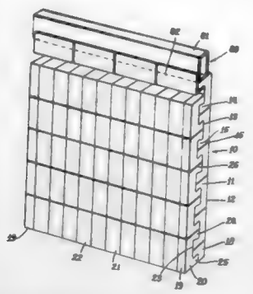
REFRACTORY CURTAIN WALL

Barry R. James, Apple River, Ill., assignor to Merkle Engineers, Inc., Galena, Ill.

Filed Oct. 19, 1984, Ser. No. 662,576
Int. Cl.⁴ E04C *1/04;* **E06B** *3/54*
U.S. Cl. 52—474 **20 Claims**

1. In a vertically suspended refractory curtain wall comprising two courses of refractory shapes; a first course comprising a plurality of adjacent horizontal rows each comprising a plurality of side-by-side rectangular refractory shapes each having a solid rectangular flat exposed face and an opposite

face having a horizontal central through recess parallel to a plane of said refractory curtain wall and portions extending above and below said recess, the portion of the refractory extending above said recess forming an upper horizontal hanger portion and the portion of the refractory extending below said recess forming a lower horizontal hanger portion; and a second course comprising a plurality of adjacent horizontal rows each comprising a plurality of side-by-side rectangular refractory shapes each having a solid rectangular flat exposed face and an opposite face having a horizontal central through recess parallel to a plane of said refractory curtain wall and portions extending above and below said recess, the



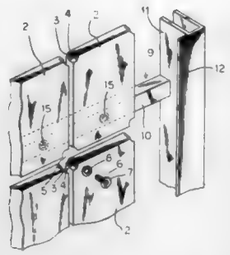
portion of the refractory extending above said recess forming an upper horizontal hanger portion and the portion of the refractory extending below said recess forming a lower horizontal hanger portion; said lower horizontal hanger portions of one said horizontal row of said first course refractories fitting within the upper portion of said horizontal recesses of one said horizontal row of said second course refractories, thereby suspending said second course refractories and said upper horizontal hanger portions of an adjacent lower said horizontal row of said first course refractories fitting within the lower portion of the same said horizontal recesses of said second course refractories thereby suspending said adjacent lower horizontal row of said first course refractories.

4,638,618

DECORATIVE PANELS COMPRISING REPLACEABLE DECORATIVE SHEETS

Takashi Iesaka, Tokoname; Takeaki Wada, Handa; Ikumi Ohta, Mie, and Masayuki Izumi, Setagaya, all of Japan, assignors to Inax Corporation and Japan Alpha Corporation, both of, Japan

Filed Jul. 10, 1985, Ser. No. 753,415
Claims priority, application Japan, Mar. 4, 1985, 60-30471
Int. Cl.⁴ E04F *13/00*
U.S. Cl. 52—509 **20 Claims**



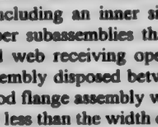
1. A decorative panel comprising thin right-angled tetragonal rigid decorative sheets assembled without substantial gaps and replaceably installed on a structural support by the use of fixing means having flanges at the heads thereof; said decorative sheet having substantially quarter-round cutouts at the corners thereof and substantially quarter-round depressions adjacent to the cutouts; each of the corners of four decorative sheets assembled together forming a cut-out hole and a depression around the hole; said structural support containing mating means for the fixing means; the cut-out holes of the assembled sheets being arranged on the mating means; the fixing means being fitted to the mating means through the cut-out holes; the flanges at the heads of the fixing means being recessed on the depressions around the cut-out holes; the heads of the fixing means recessed on the depressions being not higher than the level of the decorative surface of the decorative sheets; the fixing means having an inner hole at the head thereof and the inner holes holding therein a decorative cap, a soft cap for pinning, a hook, a hanger, a magnet or magnetizable piece, and/or a rod for supporting a shelf.

4,638,619

WOOD I-JOIST AND METHOD OF FABRICATING THE SAME

David C. Fischetti, 903 W. Maynard Rd., Cary, N.C. 27511

Filed Dec. 19, 1983, Ser. No. 563,181
Int. Cl.⁴ E04C *3/30*
U.S. Cl. 52—729 **9 Claims**



3. A fabricated I-joist comprising: upper and lower elongated wood flange assemblies, each wood flange assembly including a plurality of elongated wood member subassemblies that extend throughout the length of each wood flange assembly and which include a series of individual elongated wood members secured together in end-to-end relationship; means for securing the individual wood members together in end-to-end relationship to form respective elongated wood member subassemblies, said securing means including glue applied between respective ends of the individual wood members for securing the same together in end-to-end relationship; means for securing said formed elongated wood member subassemblies together in side-by-side relationship to form a respective wood flange assembly having a cross sectional area comprised of a series of said individual wood members, said means for securing said elongated wood member subassemblies together in side-by-side relationship including glue applied between respective wood member subassemblies; each formed wood flange assembly including an inner side having two spaced apart wood member subassemblies that define and naturally form an elongated web receiving opening therebetween; an elongated web assembly disposed between said inner sides of said elongated wood flange assembly wherein said web assembly has a thickness less than the width of each of said openings formed about the inner side of the respective wood flange assemblies; said elongated web assembly including two outer edge portions that extend into the respective formed web receiving openings formed about the inner sides of said respective wood flange assemblies; and means for securing the outer edge portions of said web assembly in and to said web receiving openings of said wood flange assemblies formed by the spacing of said two elongated wood member subassemblies apart so as to form an integral fabricated wood I-joist having a pair of upper and lower wood flange assemblies comprised of both face and edge glued wood members and wherein the respective wood flange assemblies are specifically designed and formed with said web receiving openings existing specifically to receive said web assembly, said means for securing said plywood web in said web receiving opening of the respective wood flange assemblies including wedge means that are driven into said web receiving opening between each side of said web assembly and an adjacent elongated wood member subassembly forming said web receiving opening so as to securely bind said web assembly between said wedge means.

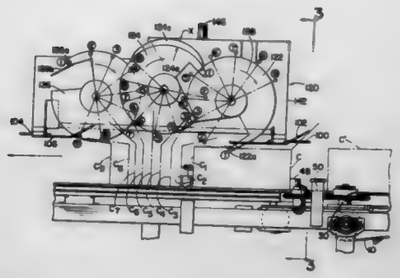
8. A method of forming a prefabricated wood I-joist comprising the steps of: forming a plurality of elongated wood member subassemblies by gluing and securing a plurality of individual wood members, having a generally uniform and generally square cross sectional area, together in end-to-end relationship; gluing and securing said formed elongated wood member subassemblies together in side-by-side relationship to form upper and lower elongated wood flange assemblies, each wood flange assembly being comprised in cross sectional area of a plurality of said generally square individual wood members; forming an inner side for each wood flange assembly by providing two elongated wood member subassemblies in spaced apart relationship so as to define and naturally form an elongated opening between the two spaced apart elongated wood member subassemblies; mounting a web assembly between the two inner sides of said upper and lower wood flange assemblies by inserting opposite outer edge portions of said web assembly into said web receiving opening formed about the inner side of said wood flange assemblies; and securing each outer edge portion of said web assembly into said web receiving opening so as to form an integral wood I-joist comprised of said web assembly secured between the inner sides of said wood flange assemblies and wherein the wood flange assemblies include both face and edge glue joints and wherein respective elongated wood member subassemblies comprise a plurality of individual wood members joined end to end and wherein the same wood member subassemblies are secured together in side-by-side relationship, the step of securing respective outer edge portions of said web assembly in and to said web receiving openings including the step of driving wooden wedge members into said web receiving openings between each side of said plywood web and adjacent respective wood member subassemblies forming said web receiving opening.

4,638,620

CARTON FLAP OPENER

Lloyd D. Johnson, Portland, Conn., assignor to Standard-Knapp, Inc., Portland, Conn.

Filed Apr. 23, 1985, Ser. No. 726,093
Int. Cl.⁴ B65B *43/38*
U.S. Cl. 53—382 **6 Claims**



1. In a machine of the type wherein upwardly open packing cases are moved in spaced relationship to one another and in a downstream direction toward a station where they are to be loaded, each case having leading and trailing top flaps hingedly connected to the front and rear end panels respectively, and wherein these top flaps are to be opened prior to arrival of the case at such a load station, the improvement comprising

(a) leading front top flap opening mechanism provided above the path of movement of the cases and including rotating flap engageable wheels clustered so that their axes are spaced from one another less than one half their combined diameters, and so that their respective peripheries have segments overlapping one another at least slightly,

(b) adjacent wheels of said clustered wheels displaced axially relative to one another at least in the region where their segments overlap, said wheels having substantially the same rotational speeds, which wheels speed results in tangential peripheral speeds for the wheels exceeding that of the speed of movement of the cases moving in the downstream directions below said adjacent wheels,

(c) one of said adjacent clustered wheels defining a radially outwardly open notch with a first side trailing a second notch side as viewed in the direction of wheel rotation, said first notch side defined more particularly by a radially outwardly and tangentially forwardly projecting portion of said one wheel periphery, said one wheel projecting portion adapted to move downwardly into the packing case and then upwardly at a peripheral speed greater than that of the packing case to raise the leading top flap as said one wheel portion continues to rotate through an angle at least approximately equal to the corresponding angular displacement of the top flap itself as measured from an initial closed position relative the case,

(d) another of said adjacent wheels also defining a radially outwardly open notch with first trailing and second leading notch sides, said first notch side so defined in said another adjacent wheel and said wheels so timed relative to one another that said another wheel notch has its trailing notch side engageable with said leading top flap as said projection portion moves upwardly out of contact with the leading top flap to fold the latter through an additional angle which is approximately equal to the corresponding additional angular displacement of the top flap as measured from its initial closed position and after said angular displacement acheived by said one wheel projecting portion,

(e) a third clustered wheel adjacent said another of said clustered wheels and having its axis spaced from said another wheel less than one half their respective combined diameters so that their respective peripheries have segments that overlap one another at least slightly, said third wheel arranged downstream of said one and said another wheel cluster and also defining a radially outwardly open notch with a first side trailing a second notch side as viewed in the direction of wheel rotation, all of said wheels rotating in the same direction.

4,638,621

METHOD AND SYSTEM FOR PROCESSING AQUATIC PLANTS

E. Allen Stewart, III, Cocoa, and Evan L. Keesling, Lake Helen, both of Fla., assignors to Amasek, Inc., Cocoa, Fla.

Continuation-in-part of Ser. No. 533,012, Sep. 16, 1983, Pat. No. 4,520,616. This application Feb. 19, 1985, Ser. No. 703,144
Int. Cl.⁴ A01D *44/00*
U.S. Cl. 56—9 **29 Claims**

1. An apparatus for harvesting and processing aquatic plants comprising:

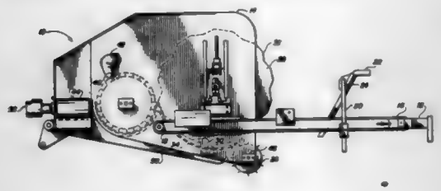
a first drum adapted for positioning in a water reservoir containing aquatic plants, said first drum having a plurality of surface projections for engaging the plants and being rotatable in a direction to lift the plants over said first drum;

a second drum having a plurality of spiral wound projections, said second drum being positioned above said first drum and being rotatable in a direction to engage and direct the plants on said first drum along a passageway;

a third drum having a plurality of tooth-like projections, said third drum being positioned at an end of the passageway

whereby plants directed along the passageway by said second drum are picked up by said toothlike projections on said third drum;

a cutter bar positioned against said third drum;



means for rotating said third drum whereby the plants are shredded by being driven into said cutter bar; and

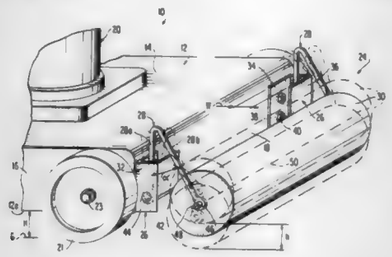
means for collecting the shredded plants.

4,638,622

SAFETY ROLLER ASSEMBLY FOR BRACKET MOUNTING TO THE TOP OR REAR FACE OF ROTARY LAWN MOWER DECK

David C. Smith, Rte. 3, Box 630, Proctorville, Ohio 45669

Filed Dec. 18, 1985, Ser. No. 810,129
Int. Cl.[4] A01D *53/08*
U.S. Cl. 56—17.4 3 Claims



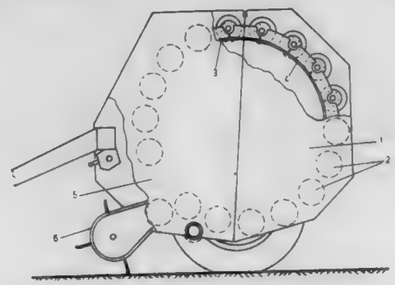
1. A safety roller assembly for mounting to a rotary lawn mower, said rotary lawn power mower being of a type having a hollow mower deck comprising at least a top wall, spaced lateral sidewalls and a vertical rear wall, a horizontal blade rotatably mounted within the hollow mower deck and a plurality of vertically adjustable wheels mounted to the side walls of said lower deck for adjustably elevating the mower deck off the ground and for controlling the cutting height of the mower, said safety roller assembly comprising; a pair of U-shaped mounting brackets, said mounting brackets including a base and integral, right angle legs extending generally parallel to each other from opposite sides of said base, a pair of angle arms, said angle arms having integral branches angled relative to each other, means for pivoting the free end of one branch of said angle arms to the base of respective U-shaped bracket, a roller of a length generally equal to the length of the mower deck rear wall and extendable thereacross, axle means carried axially by said roller for mounting said roller for rotation about its axis, means for fixing said axle, at respective ends, to the free ends of the other branches of said angle arms, means for fixedly mounting one of said bracket legs of both brackets to one of said top wall and rear wall of said mower deck such that the one branch of the angle arms appended to the base of the U-shaped brackets respectively pivots to an extent limited by the bracket legs, thereby controlling the vertical travel of the safety device roller, and wherein the length of said branches of said angle arms and the angle therebetween and the position of the brackets on the mower deck are such that the periphery of the roller is maintained in contact with the ground during movement of the roller to follow the contour of the ground with the roller rising and falling to the extend limited by the distance between the legs of said U-shaped brackets.

4,638,623

ROUND BALING PRESS

Siegfried Schaible, Singen, and Edwin Schneble, Gailingen, both of Fed. Rep. of Germany, assignors to Kloeckner-Humboldt-Deutz AG Zweigniederlassung Fahr, Gottmadingen, Fed. Rep. of Germany

Filed Jun. 4, 1984, Ser. No. 617,189
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1983, 3320715
Int. Cl.[4] A01D *39/00*
U.S. Cl. 56—341 2 Claims



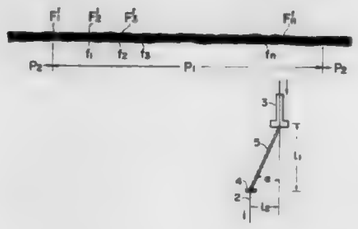
1. A round baling press with a pick-up device to pick up the crop material having a rolling chamber with side walls on which a plurality of rollers each mounted on bearing shafts are mounted rotatably in bearing housing orifices, characterised in that outwardly opening substantially semi-circular bearing housing orifices extend as indentations about the external circumference of a pair of spaced rolling chamber side walls into which the bearing shafts are radially inserted, rollers are provided with pre-assembled flanged bearing halves retained thereon and means connecting the flanged bearing halves, having been radially inserted into said bearing housing orifices, by a part of their circumference to the rolling chamber side walls, about said semi-circular orifice.

4,638,624

FALSE TWIST CRIMPED YARN HAVING IMPROVED COHERENCY

Soichi Hakoyama, Kobe; Shigetatu Mori, Kanazawa; Yoshiyuki Takebe, Kanazawa, and Kanya Imaoka, Kanazawa, all of Japan, assignors to Teijin Limited and Kitanihon Spinning Co., Ltd., both of, Japan

Filed Nov. 22, 1983, Ser. No. 554,406
Claims priority, application Japan, Nov. 22, 1982, 57-203681
Int. Cl.[4] D01H *7/92*; D02G *1/06, 3/38*
U.S. Cl. 57—208 6 Claims



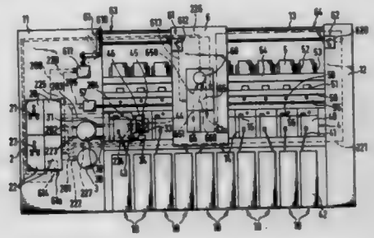
1. A false twist crimped yarn comprised of a single false twist crimped yarn having a loose structure and consisting essentially in filaments having substantially the same characteristics and having a plurality of spaced apart coherent structures of smaller thickness than said loose structure wherein at least one of said coherent structures is comprised of a bundle of filaments having substantially no twist and is bound spirally by several wrapping filaments in a direction conforming to the false twist with said wrapping filaments being part of said single yarn and said bundle of filaments being the remaining filaments of said single yarn and at least one co-existing additional coherent structure is comprised of a different configuration.

4,638,625

PROCESS AND APPARATUS FOR STOPPING AND RESTARTING AN OPEN-END SPINNING MACHINE WITH A PLURALITY OF SPINNING DEVICES

Kurt Lovas, Böhmfeld, and Franz Deisinger, Ingolstadt, both of Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik, Ingolstadt, Fed. Rep. of Germany

Filed Jan. 28, 1983, Ser. No. 462,023
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1982, 3205535
Int. Cl.[4] D01H *15/02*
U.S. Cl. 57—263 12 Claims



1. A process for stopping and restarting an open-end spinning machine with a plurality of spinning devices, each of which contains a spinning cell working under vacuum and having a fiber-collecting surface, and a spooling device, said process comprising the steps of

stopping all the spinning device together while further maintaining the vacuum;

successively preparing the thread end resulting from the interruption of the spinning process at each spinning unit for thread-joining;

feeding each prepared thread end to its respective spinning device in a thread-joining position;

then, cutting off the vacuum;

starting the open-end spinning machine after the vacuum has been applied;

feeding the threads located in the thread-joining position together, on all the spinning devices, to the respective fiber collecting surfaces thereby joining threads at all spinning devices and obtaining high grade piecers;

before the vacuum is cut off, performing the steps of: delivering up the thread to the fiber-collecting surfaces of the already stopped spinning cells and, before the spinning cells are put into operation, bringing the threads into the thread-joining position by drawing the threads simultaneously and partially out of the spinning cells while forming thread-joining reserves at the same time, said thread-joining reserves being released simultaneously after the spinning cells have been put into operation; and

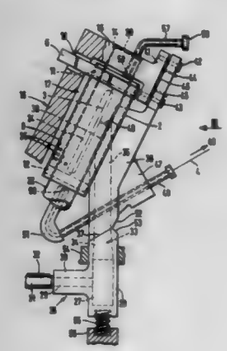
drawing the ends of the threads partially out of the spinning cells to form thread reserves and securing the threads in this position against untwisting.

4,638,626

FIBER FEED CHANNEL ARRANGEMENT FOR OPEN END FRICTION SPINNING MACHINE

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Uberkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Nov. 27, 1985, Ser. No. 802,457
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1984, 3443901
Int. Cl.[4] D01H *1/135, 7/898*
U.S. Cl. 57—401 25 Claims



1. An apparatus for open-end friction spinning including a pair of adjacently arranged friction rollers, both said rollers being rotatably disposed in a single common structural unit means, and fiber feeding duct means having a mouth portion, said rollers defining a yarn forming wedge-shaped gap therebetween and said mouth portion extending along said wedge-shaped gap, comprising:

rigid connecting means for fixedly connecting said mouth portion of said fiber feeding duct means to said single common structural unit means rotatably supporting said pair of rollers, thereby causing said mouth portion to be positively located relative to said wedge shaped gap.

4,638,627

WRISTLET HAVING LINKS

Andreas Wullschleger, Lengnau, and Othmar Brunner, Langendorf, both of Switzerland, assignors to ETA SA Fabriques d'Ebauches, Grenchen, Switzerland

Filed May 22, 1985, Ser. No. 736,738
Claims priority, application France, Jun. 8, 1984, 84 09177
Int. Cl.[4] F16G *13/00*
U.S. Cl. 59—80 13 Claims

1. A wristlet comprising a succession of links and of hinged connection elements for hingedly connecting adjacent links to each other:

wherein each connection element has two parts, each of said parts having an upper face and a lower face and one of said parts being permanently secured by its upper face to one adjacent link and the other of said parts being permanently secured by its upper face to the other adjacent link;

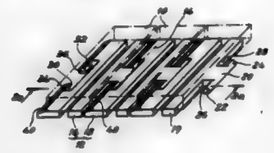
wherein each of said two parts of the connection element has a male member and a female member, the male member of each part being received in and cooperating with the female member of the other part, the male member of one of said parts being generally cylindrical with an axis providing a hinge axis between said two parts, and the male member of the other of said parts being generally parallel-epipedic;

wherein the upper faces of said two parts are each covered by a portion of each of the two adjacent links to prevent the male member of each part from moving out of the

female member of the other part in the direction of said upper faces;

wherein the parallelepipedic male member of the other of said two parts of the connection element is relieved by a bevel in the region thereof contiguous to the link secured to the one of said two parts provided with the generally cylindrical male member to enable said two parts to pivot relative to each other about said hinge axis, the scope of said pivotal motion being defined by the slope of said bevel;

wherein a curved surface of said generally cylindrical male member contacts a substantially planar surface of said generally parallelepipedic male member along substantially a line of contact;





wherein each of said links comprises a plate each end of which in the direction of said succession of links has a substantially planar end face, the end faces of the plates of adjacent links being in opposed relation so as to define a border region between said plates positioned substantially above said line of contact;

wherein said generally cylindrical male member is fitted substantially without play into said cooperating female member and they play between adjacent links in the border region between said plates is sufficiently small that the male member of each part of said connection element is prevented from moving out of the female member of the other part in the direction of the lower faces of said two parts; and,

wherein the lower faces of said connection element parts are exposed to form the bottom side of said wristlet.

4,638,628

PROCESS FOR DIRECTING A COMBUSTION GAS STREAM ONTO ROTATABLE BLADES OF A GAS TURBINE

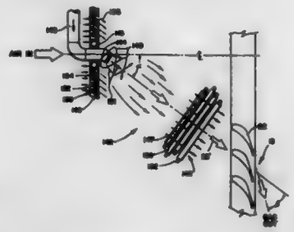
Ivan G. Rice, P.O. Box 233, Spring, Tex. 77373

Division of Ser. No. 486,334, Apr. 19, 1983, Pat. No. 4,545,197, and a continuation-in-part of Ser. No. 274,660, Jun. 17, 1981, abandoned, which is a division of Ser. No. 47,571, Jun. 11, 1979, Pat. No. 4,314,442, and a continuation-in-part of Ser. No. 224,496, Jan. 13, 1981, Pat. No. 4,438,625, which is a division of Ser. No. 954,832, Oct. 26, 1978, Pat. No. 4,272,953. This application Mar. 26, 1985, Ser. No. 716,373

Int. Cl.⁴ F02C *7/00*

U.S. Cl. 60—39.02 **3 Claims**

1. In a process for directing a combustion gas stream onto the surfaces of rotatable blades to produce work comprising; directing compressed air along a linear inlet flow path to a combustor, igniting said compressed air and a combustible fuel in said combustor to form a combustion gas, directing said combustion gas from said combustor as a combustion gas stream along a second linear flow path to a gas nozzle which is positioned upstream of said blades, said gas nozzle turning said combustion gas stream from said second flow path to an exit flow path necessary to extract the desired amount of work from said rotatable blades, the angle formed by the intersection of said second flow path and said exit flow path being the vane turning angle and is the amount said combustion gas stream is



displaced from said second flow path by said gas nozzle, the improvement comprising; turning said combustion gas stream in said combustor from said inlet flow path to said second flow path whereby said vane turning angle is reduced relative to the vane turning angle formed by the intersection of said inlet flow path and said exit flow path.

4,638,629

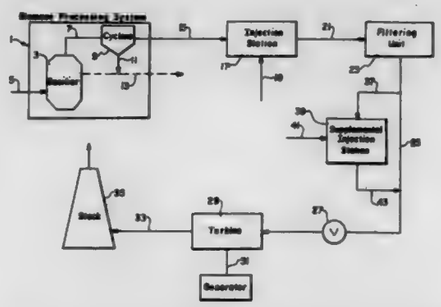
PROCESS FOR ELECTRIC POWER PRODUCTION USING A BIOGAS

David H. Archer, Pittsburgh; Frank I. Bauer, Perry Township, Perry County, and Edward J. Vidt, Churchill Boro, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 668,591, Nov. 5, 1984, abandoned. This application Mar. 19, 1986, Ser. No. 841,670

Int. Cl.⁴ F02C *3/28*

U.S. Cl. 60—39.05 **7 Claims**



1. A process for the production of electric power with a biogas used as a fuel for an electric power producing combustion turbine which drives a generator, which turbine will accept such a biogas only at a temperature below a predetermined temperature, wherein a biomass is gasified to produce a hot stream of a biogas, said biogas being at temperatures of between about 650°–875° C. and containing vaporized tar components and solid particulate matter, characterized in that:

said hot stream of biogas, consisting essentially of a biogas, vaporized tars and solid particulate matter, has water injected thereto to partially cool the biogas to a temperature below said predetermined temperature by vaporization of said water, but above a temperature at which said vaporized tars in said biogas would condense out of said stream;

filtering said partially cooled biogas to remove said particulate matter; and

directly charging said partially cooled, filtered biogas containing said vaporized water and vaporized tars to an

electric power producing combustion turbine to produce electric power.

4,638,630

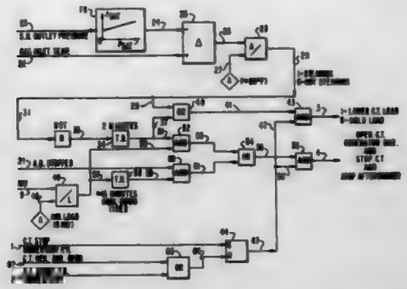
COOLDOWN CONTROL SYSTEM FOR A COMBINED CYCLE ELECTRICAL POWER GENERATION PLANT

Alan Martens, Berwyn, and Bennie E. Snow, West Chester, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 27, 1984, Ser. No. 686,956

Int. Cl.⁴ F02C *6/18*

U.S. Cl. 60—39.182 **4 Claims**



1. In a combined cycle electrical power plant including a steam turbine, a heat recovery steam generator for supplying steam to the steam turbine, a gas turbine for supplying heat to the heat recovery steam generator, said steam generator and gas turbine each producing electrical power under load, the gas turbine having a control circuit determining the operation thereof; the combination of:

first means for detecting one of a steaming condition and a non-steaming condition in said heat recovery steam generator;

second means responsive to said steaming condition and to a gas turbine STOP signal for reducing the load of said gas turbine toward a minimum load level;

third means responsive to said non-steaming condition and to said minimum load level being reached for generating a STOP command and applying said STOP command to the control circuit of said gas turbine, thereby to indicate a sequence of steps to stop the gas turbine.

4,638,631

MULTIFLOW TURBO JET ENGINE SECONDARY FLOW ADJUSTING DEVICE

Pierre Debeneix, Saint Sauveur sur Ecole, and Marcel J. Tournere, Paris, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.-M.A.", Paris, France

Filed Aug. 6, 1984, Ser. No. 637,834

Claims priority, application France, Aug. 18, 1983, 83 13418

Int. Cl.⁴ F02K *3/02*

U.S. Cl. 60—226.3 **9 Claims**

1. In a multiflow turbojet engine having an annular secondary duct defined by inner and outer annular walls,

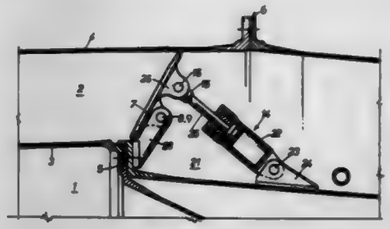
a secondary flow regulating device for varying the passage section of said annular secondary duct including:

partly-annular vanes regularly distributed within the annular secondary duct of the engine,

each vane being movable about two circumferentially-spaced fixed pins,

the axis of two pins of any one vane being a continuation one of the other so that at the center of each vane of the common axis is tangential to an imaginary circle within the annular secondary duct, and means located downstream of said vane for operatively controlling each vane for pivoting the vane about the pivot pins thereof,

the control means being disposed downstream of the vane with respect to the direction of flow of the secondary air and being secured to one of said walls of the annular secondary duct and to a part of the vane wherein each vane has an axis of radial symmetry and two lugs provided with bores, said pins are engaged in the bores, and wherein



brackets are mounted on said inner wall of the annular secondary duct, said brackets having bores within which said pins are disposed and a clevis arranged on said axis or radial symmetry of each said vane and in an opposite half in a radial sense to a half having the lugs, the clevis being connected with the control means.

4,638,632

EXHAUST GAS PIPE COOLED BY AMBIENT AIR

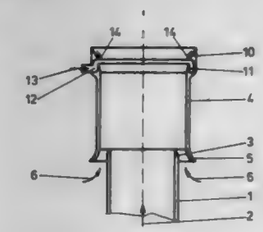
Rudolf Wulf, Göttingen, and Wolfgang Stiger, Hann-Münden, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs-und Versuchsanstalt für Luft-und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 517,160, Jun. 16, 1983, abandoned, which is a continuation of Ser. No. 245,112, Mar. 18, 1981, abandoned. This application Feb. 27, 1985, Ser. No. 705,419

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3018598

Int. Cl.⁴ F01N *3/02*

U.S. Cl. 60—319 **7 Claims**



1. Exhaust gas pipe with a free end cooled by ambient air, and for the removal of hot gases from drive means, comprising: a jacket part surrounding said exhaust gas pipe in the region of said free end and beyond said free end in outflow direction, a ring-shaped chamber between said jacket part and said exhaust gas pipe for the passage of cooling ambient air, cooling ambient air and hot exhaust gases mixing in a mixing zone, said cooling ambient air passing through said ring-shaped chamber being directed substantially along the inner wall of said jacket part and preventing hot exhaust gases and mixing zone gases from contacting the inner wall of said jacket part, said jacket part surrounding said exhaust gas pipe and being free from contact with said exhaust gas, said jacket part forming with said free end of the exhaust gas pipe an ejector for the admixing of cool ambient air, said jacket part having at all locations a greater diameter than the exhaust gas pipe, a visibility angle being formed by lines connecting mouths of said exhaust gas pipe and said jacket part, said jacket part having a diameter which is related to the length of said jacket part so that the visibility angle on the end of the exhaust gas pipe is reduced substan-

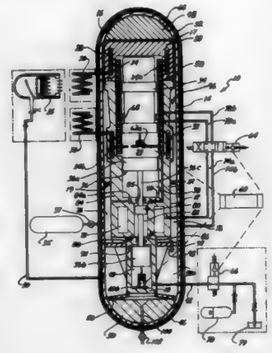
tially from 180°, an annular conduit in said jacket part for supplying auxiliary air under pressure, said annular conduit having nozzle means for blowing said auxiliary air to the inner wall of the jacket part.

4,638,633

EXTERNAL COMBUSTION ENGINES

John L. Otters, 11317 Miller Rd., Whittier, Calif. 90604

Filed Oct. 22, 1985, Ser. No. 790,039
Int. Cl.[4] F02G *1/04, 1/06*
U.S. Cl. 60—518 33 Claims



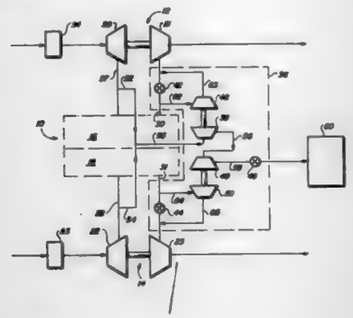
1. In a thermal machine of the type including a machine body having a main axis extending between a thermal end and a work end, a working fluid at relatively high pressure in a working fluid chamber defined in said body and a displacer element reciprocable in said chamber for displacing the working fluid between a hot space and a cold space of said working fluid chamber for subjecting the fluid to a thermodynamic cycle in cooperation with a work piston, the improvement comprising outer shell means enclosing said machine body for maintaining at atmosphere of said working fluid about said machine body at a pressure substantially lower than in said working fluid chamber.

4,638,634

ENGINE POWERED AUXILIARY AIR SUPPLY SYSTEM

John R. McLean, San Pedro, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 4, 1985, Ser. No. 784,133
Int. Cl.[4] F02B *33/44*
U.S. Cl. 60—612 21 Claims



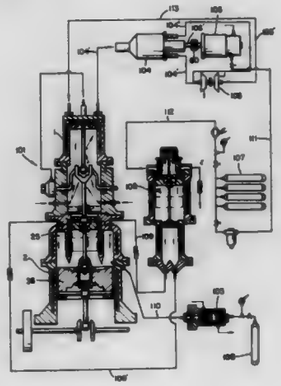
1. An auxiliary air supply system comprising:
an engine;
at least one exhaust driven turbocharger including a turbine and a compressor associated therewith for supply of compressed air to the engine;
a low pressure compressor including means for powering said low pressure compressor utilizing the engine exhaust gas and flow connected to receive a portion of the compressed air exiting said engine turbocharger compressor;
a high pressure compressor including means for powering said high pressure compressor utilizing the engine exhaust gas and flow connected to receive the compressed air exiting the low pressure compressor; and
means for directing engine exhaust gases between said at least one engine turbocharger and said means for powering said low and high pressure compressors.

4,638,635

INTERNAL COMBUSTION ENGINE SYSTEM

Chul W. Nam, No. 225-13, Sinwoul-Dong, Kangseo-ku, Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 438,647, Nov. 3, 1982, Pat. No. 4,531,480. This application May 17, 1985, Ser. No. 735,243
Int. Cl.[4] F02B *73/00*
U.S. Cl. 60—716 7 Claims



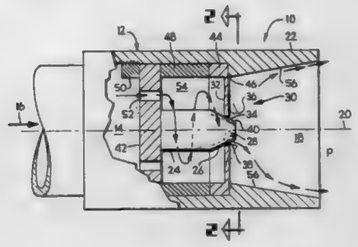
1. An internal combustion engine:
an engine body including a main combustion engine for transmitting the power generated by explosion pressure to a pumping piston and a power transmission apparatus for transmitting to a power crank shaft power that is increased by the ratio of the cross-sectional area of a combustion chamber piston to a power piston, wherein the stroke distance of the combustion chamber piston is equal to that of the power piston;
a swash plate-type stirling engine coupled to an exhaust gas outlet of said main combustion engine to be driven by exhaust heat therefrom;
a one-stage screw-type compressor coupled by a driving shaft to the swash plate-type stirling engine, thereby generating a great amount of compressed air;
a turbo-charger mounted adjacent to a gas outlet of the stirling engine to force a supply of fresh air into the combustion chamber of the main combustion engine;
a booster being mounted between a compressed air source and said power transmission apparatus to amplify the air pressure derived from the compressed air source and then provide the amplified air pressure to said power transmission apparatus by operation of a cam in accordance with the rotation of the first crankshaft;
a plurality of compressed air sources being mounted between said compressor and said booster for storing a great amount of compressed air from said compressor; and
an accumulator in communication with said power transmission apparatus through a fluid oil pipe, thereby maintaining constant control of the oil pressure in said power transmission apparatus.

4,638,636

FUEL NOZZLE

Joseph D. Cohen, Danvers, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Jun. 28, 1984, Ser. No. 625,745
Int. Cl.[4] F02C *1/00*; F02G *3/00*
U.S. Cl. 60—741 9 Claims



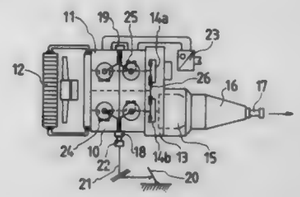
1. A fuel nozzle comprising:
a hollow body having an inlet, an outlet and a stationary surface;
means for modulating fuel flow from said inlet to said outlet comprising a flexible pressure-responsive diaphragm fixedly mounted in said body and having an edge disposed adjacent to said body stationary surface and defining therebetween a discharge port, said port having a flow area being increasable in response to increasing fuel pressure in said inlet as said fuel pressure acts against said diaphragm to displace said edge away from said body surface; and
wherein said diaphragm is sized and configured for operating in substantially only two positions: a first position wherein said discharge port has a minimum flow area and a second position wherein said discharge port has a maximum flow area, said first position being maintainable for relatively low fuel pressures and upon reaching a predetermined intermediate pressure said diaphragm being allowed to pop into said second position, said second position being maintainable for relatively high fuel pressures.

4,638,637

VEHICLE PROPULSION PLANT

Sven O. Kronogard, deceased, late of Lomma; Allen Lindén, administrator, Gothenburg; Clas O. Kronogard, Gråbo, and Hakan Kronogard, Lund, all of Sweden, assignors to AB Volvo, Gothenburg, Sweden

Continuation-in-part of Ser. No. 302,626, Sep. 15, 1981, abandoned. This application Nov. 9, 1984, Ser. No. 669,893
Claims priority, application Sweden, Sep. 29, 1980, 8006805
Int. Cl.[4] F02B *73/00*
U.S. Cl. 60—718 2 Claims



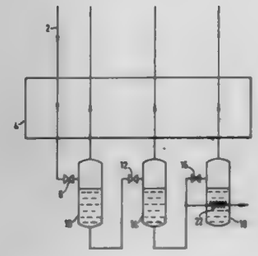
1. A vehicle propulsion unit comprising an internal combustion engine having a plurality of cylinders for driving an output shaft, the cylinders being arranged in first and second groups in a common engine block with first and second crank shafts for the respective groups, a permanent drive connection between the first crank shaft and the output shaft, and a second drive connection including a selectively operable clutch for selectively connecting the second crank shaft with said permanent drive connection whereby the output shaft can be driven selectively by said first group of cylinders alone and by both said first and second groups of cylinders through the selective disconnection and connection respectively of said clutch, the propulsion unit including supercharging means associated with the second group of cylinders.

4,638,638

REFRIGERATION METHOD AND APPARATUS

John Marshall, Ascot, and John D. Oakey, London, both of England, assignors to The BOC Group, PLC, Windlesham, England

Filed Jul. 23, 1985, Ser. No. 758,000
Claims priority, application United Kingdom, Jul. 24, 1984, 8418841
Int. Cl.[4] F25J *1/00*
U.S. Cl. 62—9 10 Claims



1. In a method liquefying a nitrogen gas stream, including the reduction of the temperature of the nitrogen gas stream at super-critical pressure to below its critical temperature in which the reduction in temperature is effected at least in part by countercurrent heat exchange with work expanded nitrogen working fluid, at least some of such working fluid being at a temperature below the critical temperature of nitrogen when it is brought into heat exchange relationship with the nitrogen gas stream; the improvement comprising withdrawing said super-critical pressure nitrogen gas stream at a temperature of 107 to 117K from heat exchange relationship with said work-expanded working fluid and subjecting the nitorgen gas stream to at least three successive isenthalpic expansions to below its critical pressure to produce a liquid and a flash gas; separating said flash gas from said liquid after each isenthalpic expansion, wherein liquid from each isenthalpic expansion, except the final insenthalpic expansion, is the fluid that is expanded in the immediately succeeding expansion, and heat exchanging at least some of the said flash gas with said super-critical pressure nitrogen gas stream.

4,638,639

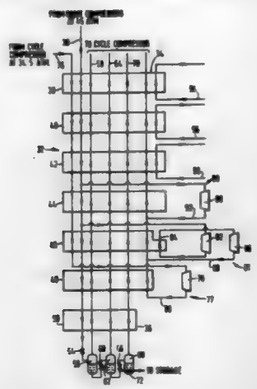
GAS REFRIGERATION METHOD AND APPARATUS

John Marshall, Ascot, and John D. Oakey, London, both of England, assignors to The BOC Group, plc, Windlesham, England

Filed Jul. 23, 1985, Ser. No. 758,001
Claims priority, application United Kingdom, Jul. 24, 1984, 8418840
Int. Cl.[4] F25J *1/00*
U.S. Cl. 62—9 22 Claims

1. In a method providing refrigeration to liquify a permanent gas stream, including the steps of reducing the temperature of

the permanent gas stream at elevated pressure to below its critical temperature, and performing at least two working fluid cycles to provide at least part of the refrigeration necessary to reduce the temperature of the permanent gas to below its critical temperature, each such working fluid cycle comprising compressing the working fluid, cooling it, work expanding the cooled working fluid, and warming the work expanded working fluid in countercurrent heat exchange with the permanent



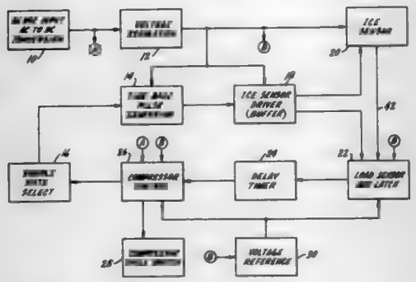
gas stream, refrigeration thereby being provided for the permanent gas stream, the improvement comprising, the condition that the working fluid is at a pressure of at least 10 atmospheres on completion of each working fluid cycle in which the working fluid is brought into countercurrent heat exchange relationship with the permanent gas stream at a temperature of the working fluid below the critical temperature of the permanent gas.

4,638,640

ICE THICKNESS CONTROLLER FOR AN ICE MAKING MACHINE

Wayne L. Whetstone, Winona, and Fredrick W. Tryan, Lewiston, both of Minn., assignors to Lake Center Industries, Winona, Minn.

Filed Oct. 25, 1985, Ser. No. 791,365
Int. Cl.[4] F25C *1/00*
U.S. Cl. 62—139 **8 Claims**



1. In an ice making machine of the type having a compressor connected to evaporator tubes submerged in a container of water, an improved ice thickness controller, comprising:

a time base pulse generator for generating an intermittent sampling pulse;

an ice sensor circuit for generating an ice level signal, including a motor connected to a power supply, the motor having a shaft extending below the water line in the container, with the ice sensor circuit monitoring the motor current to develop the ice level signal;

a load sensor and latch circuit responsive to the ice level signal to generate and maintain a compressor control signal;

an ice sensor buffer responsive to the sampling pulse to turn the ice sensor motor on and disable the load sensor and latch circuit during a sample pulse and to turn the motor off and enable the load sensor and latch circuit in the absence of a sampling pulse; and

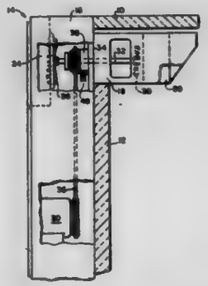
a compressor control circuit responsive to the compressor control signal to turn the compressor on and off as needed to maintain the desired ice thickness in the container.

4,638,641

TRANSPORT REFRIGERATION UNIT WITH EVAPORATOR FAN DRIVE USING RAM AIR PRESSURE

David H. Taylor, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Feb. 19, 1985, Ser. No. 703,167
Int. Cl.[4] B60H *1/32*
U.S. Cl. 62—180 **1 Claim**



1. A transport refrigeration system, comprising:

a trailer or like vehicle having an interior defined by an enclosure which includes a front wall;

and a refrigeration unit mounted on said front wall adapted to supply conditioned air to the interior of the trailer;

said refrigeration unit including a refrigerant evaporator in said enclosure; a refrigerant condenser outside said enclosure and forwardly of the front wall; an evaporator fan and a condenser fan on a common shaft which extends through said front wall between the evaporator and condenser; a refrigerant compressor; a prime mover for driving said refrigerant compressor; means selectively operating said prime mover in accordance with the temperature condition in said trailer, with said prime mover being off when the temperature is in a null band; and coupling means for selectively coupling and uncoupling said prime mover and said common shaft,

said coupling means coupling said prime mover means and said common shaft when said prime mover is operating, to drive said common shaft and cause the condenser and evaporator fans to move exterior and interior air respectively through said condenser and said evaporator, and uncoupling said prime mover and said common shaft when said prime mover is not operating;

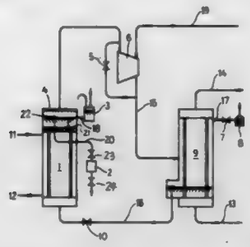
said condenser fan being a propeller fan so that when the trailer moves forwardly with said common shaft uncoupled from said prime mover, the ram air pressure effect drives the condenser fan, and in turn the evaporator fan, to effect at least limited air circulation in the interior of said trailer while the temperature condition is in said null band.

4,638,642

HEAT PUMP

Sanji Tokuno, Hofu, Japan, assignor to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Jan. 8, 1985, Ser. No. 689,805
Claims priority, application Japan, Jan. 10, 1984, 59-2273
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—498 **9 Claims**



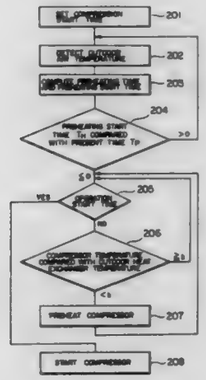
1. A heat pump operated below atmospheric pressure, said pump comprising an evaporator, a compressor and a condenser and conduit means for connecting the evaporator, the compressor and the condenser, successively, in fluid communication with each other and for providing a flow of refrigerant therethrough; said refrigerant being water, said evaporator being equipped with a feed water control device and a draining device for maintaining a liquid level of water refrigerant within a predetermined range in said evaporator and said condenser being equipped with a vacuum generating means for maintaining a vacuum within said condenser; said compressor withdrawing heated vapor from said evaporator via said conduit means at below atmospheric pressure, compressing the heated vapor, and directing the resulting pressurized vapor into the condenser.

4,638,643

CONTROL SYSTEM FOR COMPRESSOR MOTOR USED WITH AIR-CONDITIONING UNIT

Akio Sakazume; Hiroki Yoshikawa, and Hiroaki Matsushima, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 21, 1985, Ser. No. 767,807
Claims priority, application Japan, Aug. 22, 1984, 59-173224
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—209 **8 Claims**



1. A control system for a compressor motor of an air condition unit comprising a refrigerant compressor having the compressor motor, an outdoor coil, a restrictor, and an indoor coil, said control system comprising:

(a) an operation switch,

(b) a microcomputer connected to said operation switch and including timer, a processing circuit and a memory for storing data on a rotating magnetic field generation signal capable of supplying a first current for generating a rotating magnetic field to the compressor motor and data on a non-rotating magnetic field generation signal capable of supplying a second current for generating a non-rotating magnetic field, said memory being supplied from the operation switch with data designating the operation start time of the heat pump, which data is stored in said memory, said microcomputer introducing data for generating a non-rotating magnetic field from said memory before the heat pump start time thereby to generate a non-rotating magnetic field generation signal, said microcomputer further introducing data for generating a rotating magnetic field from the memory after said start time to generate a rotating magnetic field generation signal,

(c) compressor motor drive means inserted between said microcomputer and said compressor motor and supplied with a non-rotating magnetic field generation signal and a rotating magnetic field generation signal from the microcomputer, said signals being applied to said compressor motor,

(d) outdoor air temperature detection means for detecting the outdoor air temperature θ_H,

(e) means for providing a start time T (θ_H) to start introduction of the data for generating a non-rotating magnetic field from said memory in accordance with the outdoor air temperature θ_H, and

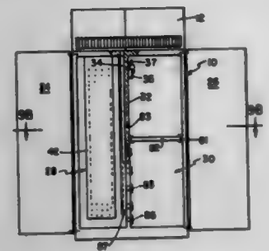
(f) means for starting generation of a signal for generating a non-rotating magnetic field at the start time T (θ_H).

4,638,644

CIRCULATING AIR REFRIGERATOR WITH REMOVABLE DIVIDER SHELF

Edward Gideg, 16 Duke of Gloucester, Manhasset, N.Y. 11030

Division of Ser. No. 283,482, Jul. 15, 1981, Pat. No. 4,467,618, which is a division of Ser. No. 894,603, Apr. 7, 1978, Pat. No. 4,304,101. This application Feb. 28, 1984, Ser. No. 584,499
Int. Cl.[4] F25D *23/00*
U.S. Cl. 62—329 **5 Claims**



1. In a side-by-side combination freezer and refrigerator apparatus which utilizes circulating refrigerated air to cool and thermostatically control the temperature of at least a freezer compartment and refrigerator compartment separated by an insulated wall, the improvement in combination therewith which comprises at least one divider shelf formed at least in part of at least one insulating material and dimensioned and configured to be positioned at any of a plurality of selectable locations within at least one of said freezer and refrigerator compartments, said shelf having resilient sealing means positioned along all peripheral portions thereof to engage corresponding wall portions defining said compartment in sealed relation therewith sufficient to prevent the flow of air thereby when positiond in one of said selectable locations such that when said shelf is positioned in one of said selectable locations, said shelf divides said at least one compartment into at least

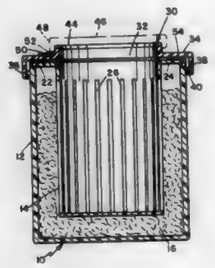
two sections and alters the flow of refrigerated air such that one section of said at least one compartment is not subject to the cooling effects of the refrigerated air and thereby inactivated and means to facilitate recirculation of the flow of refrigerated air through said insulated wall as altered by said shelf.

4,638,645

BEVERAGE CONTAINER COOLER

Eric J. Simila, 2548 Washington St., Lemon Grove, Calif. 92045

Filed Oct. 3, 1985, Ser. No. 783,404
Int. Cl.⁴ F25D *3/08*
U.S. Cl. 62—457 **10 Claims**



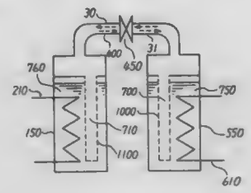
1. A beverage container cooler, comprising:
an outer cylindrical container having an open upper end;
an inner cylindrical container having an open upper end and being coaxially mounted within the outer container with its base spaced above the bottom of the outer container, the inner container being dimensioned to receive a beverage container in a sleeve-like fashion;
the opposed inner and outer surfaces of the outer and inner container, respectively, defining a coolant chamber surrounding the cylindrical walls and base of the inner container for receiving a coolant material;
the inner container having a plurality of openings for communicating the coolant chamber with a beverage container in the inner container;
the outer container having an annular ledge around its upper end and the inner container having an annular flange around its upper end for resting on the ledge to hold the inner container in the outer container with its lower end spaced above the bottom of the outer container to allow coolant material in the coolant chamber to extend beneath the inner container;
the annular flange having a series of openings around its periphery for adding coolant material to the coolant chamber; and
a locking cap for locking the inner container in the outer container, having an annular flange with a downwardly depending skirt for engaging over the open upper end of the outer container, the flange having a central opening for alignment with the opening in the inner container when the cap is engaged on the outer container, and releasable means for releasably locking the cap on the outer container, the flange further having a drain opening for draining material from the coolant chamber and a removable cover for normally covering the drain opening.

4,638,646

HEAT STORING APPARATUS

Yasuo Koseki, Hitachiohta; Akira Yamada, Hitachi; Hideki Kurokawa, Hitachi; Harumi Matsuzaki, Hitachi; Katsuya Ebara, Mito, and Sankichi Takahashi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 825,877
Claims priority, application Japan, Feb. 4, 1985, 60-18557
Int. Cl.⁴ F25B *17/02*
U.S. Cl. 62—478 **11 Claims**



1. A heat storing apparatus comprising:
(1) first container for a first medium which absorbs and desorbs a vapor component;
(2) second container for storing a second medium which absorbs and desorbs the vapor component;
(3) means for communicating said first and second storing means with a vapor-passage;
(4) first membrane means which is in contact with said first medium, for separating vapor of said vapor component and liquid in either of said first medium or second medium, or both;
(5) second membrane means which is in contact with said second medium, for separating the vapor of said vapor component and liquid in either of said first medium or second medium, or both; and
(6) means for supplying heat to said first medium so as to effect vaporization of said vapor component in said first medium, whereby only the vapor is transferred to said second medium through said first and second membrane means;
wherein said first medium and second medium have a boiling point higher than that of said vapor component.

4,638,647

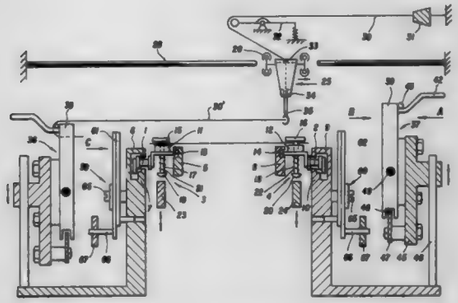
METHOD AND FLAT WARP-KNITTING MACHINE FOR THE PRODUCTION OF A WEFT-AND-WARP-KNIT FABRIC

Dietmar Grenzendoerfer; Achim Wierzgon, both of Karl Marx Stadt; Gerhard Mueller, Garnsdorf; Dieter Erth, Gruena; Ludwig Guenther, Karl Marx Stadt, and Rolf Kuenzel, Gelenau, all of German Democratic Rep., assignors to VEB Kombinat Textima, Karl Marx Stadt, German Democratic Rep.

Filed Dec. 24, 1985, Ser. No. 813,319
Claims priority, application German Democratic Rep., Mar. 4, 1985, 273732
Int. Cl.⁴ D04B *23/06*
U.S. Cl. 66—84 A **29 Claims**

1. In a method for the production of a warp-and-weft knit fabric comprising:
constantly guiding a continuous thread or yarn group in a weft yarn insertion device moving back and forth, the insertion device inserting the yarn group between a first weft yarn conveyor means and a second weft yarn conveyor means;
transferring a weft yarn group of the yarn group to the conveyor means and separating the weft yarn group from the insertion device and yarn group, whereby the weft yarn group has two free ends;
conveying the weft yarn group to a looping point; and
connecting the weft yarn group to loop-forming warp yarns

to form a fabric; the improvement comprising performing the following steps a plurality of times:
auxiliarily grasping and holding tightly, prior to transfer to the conveyor means, beginnings of the weft yarn group in a first weft yarn holding means;
auxiliarily grasping and holding tightly, prior to transfer to the conveyor means, the weft yarn group at a point other than the beginnings in a second weft yarn holding means;
separating the weft yarn group from the second weft yarn holding means and the insertion device in the vicinity of the second holding means after the weft yarn group being auxiliarily grasped and held tightly by the holding means has been transferred to the weft yarn conveyor means;
approximately simultaneously freeing the beginnings of the weft yarn group from the first weft yarn holding means;
transferring the weft yarn group being grasped and held



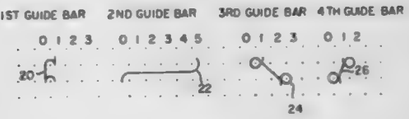
tightly by the second holding means to the first holding means, after the weft yarn group having free ends has been conveyed to the looping point, to auxiliarily grasp and hold the weft yarn group tightly in the first holding means and to form a new weft yarn group between the holding means;
transferring the new weft yarn group to the weft yarn conveying means;
separating the new weft yarn group from the first holding means and the insertion device in the vicinity of the first holding means after the new weft yarn group being auxiliarily grasped and held tightly by the holding means has been transferred to the weft yarn conveying means;
approximately simultaneously freeing the new weft yarn group from the second holding means; and
conveying the new weft yarn group to the looping point for connection to the loop-forming warp yarns.

4,638,648

LAYERED WARP KNITS

Bharat J. Gajjar, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 1, 1986, Ser. No. 858,142
Int. Cl.⁴ D04B *23/08*
U.S. Cl. 66—193 **7 Claims**



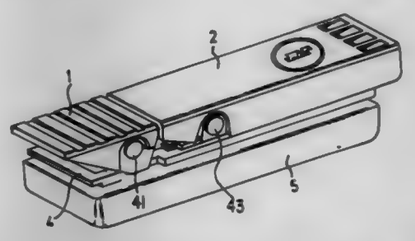
1. In a knitted fabric that includes four (4) sets of threads knitted in a stitch pattern from first, second, third and fourth guide bars of a warp knitting machine forming spaced wales of knitted loops, the improvement comprising:
(a) first guide bar threads of continuous filament yarn partially threaded in the first guide bar with at least one end in and one end out and using a knit-in stitch pattern;
(b) second guide bar threads of a yarn having a denier at least twice that of the first guide bar yarn partially threaded in said second guide bar to duplicate the threading of the first guide bar and laid-in;
(c) third guide bar threads of continuous filament yarn fully threaded in said third guide bar using a knit-in stitch pattern; and
(d) fourth guide bar threads of elastomeric yarn fully threaded in said fourth guide bar using a knit-in stitch pattern.

4,638,649

DUAL ACTION LUGGAGE LATCH

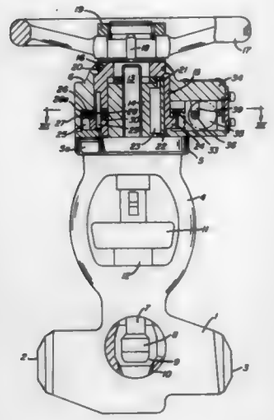
Ting-Tsung Chao, Taipei, Taiwan, assignor to Echolac Co., Ltd., Taipei, Taiwan

Filed May 7, 1985, Ser. No. 731,283
Int. Cl.⁴ E05B *65/52;* **E05C** *3/04*
U.S. Cl. 70—71 **9 Claims**



1. A latch for use in latching a hasp of a luggage case, said latch comprising a base having a first portion; a first actuating member rotatably mounted on said front portion of said base by a first pivot pin, said first actuating member including a front surface and outer and inner edges, said outer edge being movable in response to an external force applied to said outer edge to rotate said first actuating member in a first direction from a first position to a second position about said first pivot pin; a second actuating member rotatably mounted on said front portion of said base by a second pivot pin which is parallel to said first pivot pin, said second actuating member including a front surface, an inner edge disposed adjacent said inner edge of said first actuating member, and an outer edge which is movable in response to an external force applied to said outer edge, to rotate said second actuating member in a second direction opposite said first direction from a first position to a second position, said second actuating member being engageable with the hasp in said first position of said second actuating member and disengaged from the hasp in said second position of said second actuating member; and a sliding member mounted behind said first and second actuating members and slidable relative thereto between first and second positions associated with said first and second positions, respectively, of said first actuating member; said first actuating member including first displacement means for sliding said sliding member from its first position to its second position in response to rotation of said first actuating member from its first position to its second position; said sliding member including a stop which, in said first position of said sliding member, is positioned behind a portion of said second actuating member to prevent the latter from being rotated from its first position to tis second position, said stop being moved from behind said portion of said second actuating member when said sliding member is in its second position, to permit said second actuating member to be rotated to its second position.

4,638,650
ROTARY DRIVE LOCK
Carl H. Hafele, Bergstrasse 83, 4050 Moenchengladbach 1, Fed. Rep. of Germany
Filed Sep. 10, 1984, Ser. No. 648,552
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333061
Int. Cl.⁴ F16K *35/00, 31/44;* G05G *5/00*
U.S. Cl. 70—179 7 Claims



1. In An adjustable lock for rotating drives such as screw-down and gate valves wherein a casing for a locking mechanism extends around a driven rotating member of the drive, a locking sleeve corotates with the rotating member and its rotation is transmitted to a valve spindle or the like, and a lock bolt having a key-operable cylinder lock is movable between a locking position and a release position and adapted to locate the locking sleeve in a selected position, the improvement in said lock comprising:

an annular flange on the locking sleeve formed with peripherally-consecutive radial recesses which are open on at least one side of the flange,

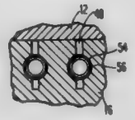
at least two axially-contiguous, internally-toothed rings mounted to surround the locking sleeve adjacent the annular flange, one such ring comprising a guide ring which is stationary but adjustable, the other such ring comprising a control ring which is rotatable and differs in tooth number from the guide ring by at least one tooth,

a pinion engaging the internal tooth systems of the guide ring and control ring, the pinion being rotatable mounted on the locking sleeve and cooperating with the guide ring and control ring to form a planetary transmission,

said control ring being formed on its periphery with a single recess which is open on an end face of the control ring which engages the annular flange and which, when in registration with a radial recess in the annular flange, forms part of a combined recess of an opening of cross section such that the lock bolt can be introduced positively thereinto in the peripheral direction, and

outer toothing on the guide ring engageable by adjustable locking means for adjustment of the locking position of the lock.

4,638,651
LOCK CYLINDER HAVING TWO SETS OF TUMBLERS AND KEY THERFOR
Walter E. Surko, Jr., Southington, Conn., assignor to Yale Security Inc., Charlotte, N.C.
Filed Aug. 7, 1985, Ser. No. 763,205
Int. Cl.⁴ E05B *27/02*
U.S. Cl. 70—364 A 15 Claims



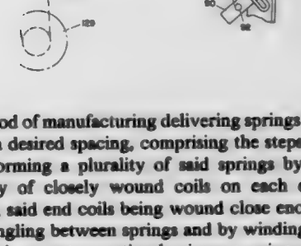
1. In combination, a key having front and back surfaces and comprising a head and a blade, the blade having on its front surface along one longitudinal edge conventional edge bittings and along the opposite edge a side rail, the side rail having a contoured edge code, the edge code extending a substantial part of the length of the blade including a series of bittings defined by lines transverse of the blade and substantially parallel to the plane of the key, the blade having at its end farthest from the head a nose portion including an incline plane on the side rail tapering down from the front of the blade to meet the back of the blade in a fine edge; and lock cylinder receiving the key and comprising a housing having a cylindrical opening, a lock core in the cylindrical opening and formed with a keyway including a portion receiving the side rail, the core and the housing being provided with the conventional pin tumblers and pin tumbler openings above the keyway, the pin tumblers engaging the top edge bittings on the key, the core also formed with transverse slots intersecting the keyway, partial disc tumblers disposed in the respective slots, spring means urging the disc tumblers to a position with their ends disposed in the keyway, the disc tumblers being formed with gates on their outer periphery at selected points respectively, a side bar normally disposed partly in a recess in the core and also partly in a longitudinal groove in the housing at one side of the cylindrical opening, the groove having sloping walls, means urging the side bar outward, the side bar being cammed inward of the housing when the core is turned, such turning being made possible only provided the key is inserted in the keyway, said fine edge serving to wedge under the ends of the partial disc tumblers in insertion to move them, and the contoured edge code engaging the ends of the disc tumblers to position the disc tumblers with their gates in alignment with the side bar and thereby permitting the side bar to move inward totally into the recess in the core.

4,638,652
SEALING CAP
Milton Morse, Fort Lee, and John Morris, Oakland, both of N.J., assignors to Nena Morse, Fort Lee, N.J.
Filed Aug. 22, 1983, Ser. No. 525,442
Int. Cl.⁴ E05B *17/18*
U.S. Cl. 70—454 35 Claims

1. A cover member comprising:

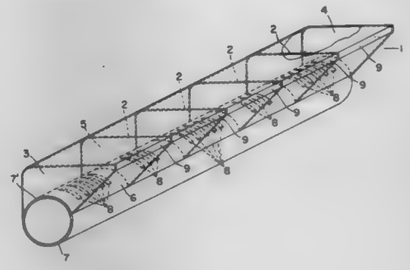
a circular member having outer and inner surfaces; and

a slit therein extending from the outer surface to the inner surface at an oblique angle of from about 25° to 45° from the outer surface, the opening in the outer surface being substantially in the center of the surface; and



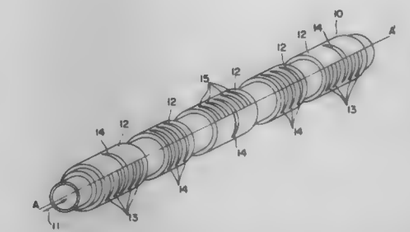
at least one plug and socket formed on the inner surface adapted to matingly engage a similar socket and plug of another cover member.

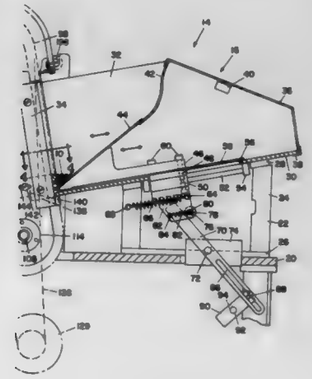
4,638,654
DEVICE FOR CONTROL OF ROLL CAMBER IN A ROLLING MILL
Maurizio Lubrano, Rome, Italy, assignor to Centro Sperimentale Metallurgico S.p.A., Rome, Italy
Filed Sep. 5, 1985, Ser. No. 772,722
Claims priority, application Italy, Sep. 25, 1984, 48902 A/84
Int. Cl.⁴ B21B *27/10*
U.S. Cl. 72—201 4 Claims



1. Device for control of the camber of rolling mill rolls, by which cooling liquid is delivered onto the body of each roll involved, characterized by the fact that said device consists of an elongated, hollow-shaped distributor set with a major axis parallel to the body of the roll and divided internally into several non-intercommunicating chambers by means of dividers that are integral with the walls of said hollow body, said dividers being arranged transversely to said major axis of the distributor; a coolant supply manifold; each of said chambers having a number of adjustable-sized openings on one of its walls for the inflow of cooling liquid from said coolant supply manifold; said device being further provided with means for adjusting the size of said openings; and the distributor itself having upper and lower walls which converge toward the roll body and terminate a short distance therefrom as a narrow slit of uniform width parallel to the roll body and extending the whole length thereof.

4,638,653
METHOD OF MANUFACTURING AND DELIVERING COIL SPRINGS
William H. Walsh, Marina del Rey, Calif., assignor to The Gillette Company, Boston, Mass.
Filed Dec. 18, 1984, Ser. No. 683,914
Int. Cl.⁴ B21F *3/00, 11/00, 21/00, 35/00*
U.S. Cl. 72—129 5 Claims





1. A method of manufacturing delivering springs to a desired location at a desired spacing, comprising the steps of:

spirally forming a plurality of said springs by winding a plurality of closely wound coils on each end of said springs, said end coils being wound close enough to prevent tangling between springs and by winding a plurality of coils in a center portion having a spacing greater than said wound coils on said ends;

placing a plurality of said springs into parallely spaced bundles with the ends of said springs generally aligned;

placing said bundles of said generally aligned springs into a feedbox having an opened side;

passing a plurality of spring carrying platens over said opened side of said feedbox; and

urging said springs into grooves in said platens as said platens are passed over said opened side of said feedbox, wherein said springs are placed in a desired spacing and delivered from said feedbox by said platens.

4,638,655
HOLDING AND GUIDING A MANDREL ROD IN ROLLED STOCK IN AND ADJACENT TO A TUBE ROLLING MILL
Wilhelm Sebastian, Heiligenhaus; Wilhelm Nickel, Muelheim, and Klaus-Peter Schirmag, Ratingen, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany
Filed Nov. 30, 1984, Ser. No. 676,664
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345665
Int. Cl.⁴ B21B *25/02*
U.S. Cl. 72—208 2 Claims

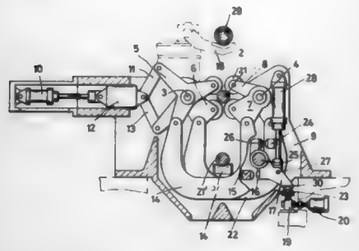
1. Device for holding a mandrel rod adjacent to a mill for rolling and for guiding the rolled stock, there being a rolling

axis and a delivery path for fresh mandrel rods being arranged in vertical alignment, comprising:

a basically U-shaped frame structure arranged on three sides of the rolling axis as well as of the mandrel rod delivery path, said frame structure being open on the fourth side to permit removal of a mandrel rod with rolled hollow thereon in the direction opposite the disposition of the mandrel rod delivery axis;

a first pair of levers arranged and mounted on the frame structure to one side of the rolling axis and respectively having guide elements, one of the guide elements being disposed above the rolling axis the other guide element being disposed below the rolling axis;

a second pair of levers arranged and mounted on the frame



structure to another side of the rolling axis each likewise having a guide element, one of guide elements of the second pair of levers being disposed above the rolling axis and the other one of the guide elements of the second pair of levers being disposed below the rolling axis;

a pair of U-shaped connecting elements interconnecting levers pertaining to different ones of said pairs such that a lever of one of the pairs having a guide element disposed above the rolling axis is connected to a lever of the other pair having a guide element disposed below the rolling axis; and

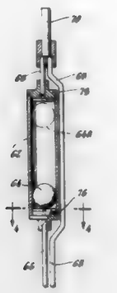
a common drive means connected to one of the pairs for moving all said levers in unison in between different positions in which the respective guide elements have different radial distances from said axis of rolling.

4,638,656

APPARATUS AND METHOD FOR CALIBRATING SPAN OF PRESSURE MEASURING INSTRUMENTS

George E. Sgourakes, Millis, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Oct. 17, 1984, Ser. No. 661,807
Int. Cl.⁴ G01L *27/00*; G01K *11/00*
U.S. Cl. 73—4 R **34 Claims**



1. In a pressure measuring instrument of the type including a sealed interior pressure chamber containing a fill-liquid and having diaphragm means to apply thereto an input pressure signal to be measured, said instrument further including sensing means responsive to the input pressure signal applied to said fill-liquid to produce a corresponding output signal;

that improvement for calibrating the span of the instrument comprising:

reference pressure means forming in integral part of said instrument and including means in communication with said fill-liquid to apply thereto a reference pressure of precisely-controlled predetermined magnitude; and

said reference pressure means being activatable while said input pressure signal is stable to apply said reference pressure to said fill-liquid so as to produce from said sensing means an output signal corresponding to said reference pressure magnitude;

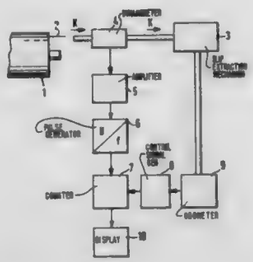
whereby the span of the instrument can be monitored and adjusted as necessary to assure that the output signal will correspond exactly to said reference pressure magnitude.

4,638,657

DEVICE FOR MEASURING THE WINDING HARDNESS OF A STRIP, ESPECIALLY A STRIP OF PAPER, WOUND INTO A REEL

Gerhard Buschmann, Dusseldorf, and Georg Muller, Neuss, both of Fed. Rep. of Germany, assignors to Jagenberg Ag, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 17, 1985, Ser. No. 745,761
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1984, 3426301
Int. Cl.⁴ G01N *3/00*
U.S. Cl. 73—78 **2 Claims**



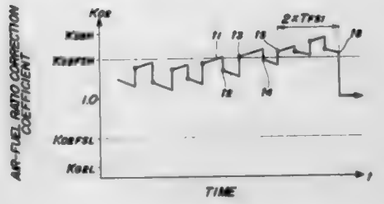
1. In a device for measuring the winding hardness of a strip wound into a reel with a plurality of coils, the device including a mechanism for extracting a slip of paper that has been inserted tightly between two coils of the reel of paper with one end extending out of the side of the reel and a dynamometer for measuring the force necessary to extract the slip over a certain distance, the improvement comprising: means for extracting the slip at a constant extracting speed; a pulse generator for producing counting pulses having a frequency proportional to the force measured by the dynamometer; an up-down counter receptive to the counting pulses; an odometer for detecting equal distances of movement of the slip; and means for switching the counter from up to down when a given distance is reached and stopping the counter when a distance equal to the given distance is again reached as detected by the odometer.

4,638,658

METHOD OF DETECTING ABNORMALITY IN A SYSTEM FOR DETECTING EXHAUST GAS INGREDIENT CONCENTRATION OF AN INTERNAL COMBUSTION ENGINE

Yutaka Otobe, Shiki, Japan, assignor to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Sep. 16, 1985, Ser. No. 776,466
Claims priority, application Japan, Sep. 19, 1984, 59-194586
Int. Cl.⁴ G01M *15/00*; F02M *7/00*
U.S. Cl. 73—117.3 **3 Claims**



1. A method of detecting an abnormality in a system for detecting the concentration of an ingredient contained in exhaust gases emitted from an internal combustion engine, said system including sensor means for detecting the exhaust gas ingredient concentration, wherein a correction value for the air-fuel ratio of a mixture being supplied to said engine is set in response to an output signal from said sensor means, and the air-fuel ratio of said mixture is controlled in response to said correction value thus set, said correction value being applied in detecting said abnormality, the method comprising the steps of:

(1) setting a first predetermined value and a second predetermined value smaller than said first predetermined value, which values both lie within a first range defined by (i) an upper limit value of said correction value which is larger than said first predetermined value and (ii) a lower limit value of said correction value which is smaller than said second predetermined value, said upper limit value and said lower limit value being extreme values that can be assumed while said sensor means is functioning normally when said engine is in normal operating conditions;

(2) determining whether or not said correction value has continually been lying outside a second range defined by said first predetermined value and said second predetermined value over a limited period of time, said first range and said limited period of time being set at such values as to detect a change in output characteristics of said sensor means due to degradation in performance thereof; and

(3) providing a signal indicating that said system for detecting the exhaust gas ingredient concentration including said sensor means is abnormal if it is determined that said correction value has continually been lying outside said second range over said limited period of time at said step (2).

4,638,659

DEVICE FOR THE INDIRECT CONTACTLESS ELECTRICAL MEASURING OF SHORT PATHS

Edmund Schiessle, Schorndorf, and Werner Forkel, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 676,848
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343269
Int. Cl.⁴ G01M *15/00*
U.S. Cl. 73—119 A **15 Claims**

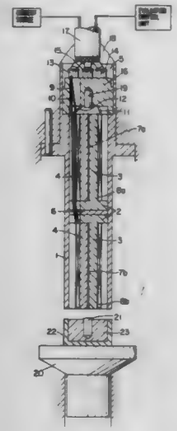
10. A device for indirectly measuring a short distance, the device comprising:

a housing having a longitudinal axis,

a measurement coil assembly including a first coil having opposite ends, a companion first core of a soft-magnetic alloy, and a measurement face defined by one of the ends of the first coil,

a control element including a permanent magnet and a measurement face defined by the permanent magnet,

means for supporting the control element for rectilinear movement along the longitudinal axis of the housing to present the measurement face of the control element in axially spaced confronting relation to the measurement face of the first coil such that movement of the permanent magnet in relation to the first coil causes a change in the magnetic flux density in the first core to effect a change in



the dynamic permeability of the first core and thereby change the inductance of the coil,

means for detecting a change in the inductance of the first core to indicate the distance between the measurement face of the control element and the axially spaced apart measurement face of the first core,

a reference coil assembly including a second coil having opposite ends, a companion second core of a soft-magnetic alloy, and a reference face defined by one of the ends of the second coil, and

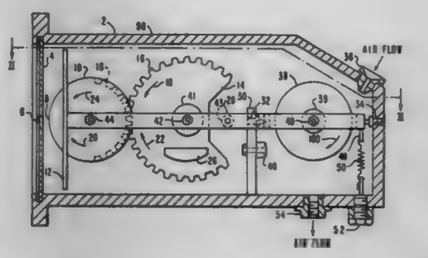
a reference magnet fixed in spaced-relation to the reference face of the second core to generate a certain magnetic flux density in the second core.

4,638,660

BASIC FLIGHT INSTRUMENT

Richard D. Henry, Box 331-A, Clinton, Pa. 15026

Filed Jan. 6, 1986, Ser. No. 816,453
Int. Cl.⁴ G01C *21/00*
U.S. Cl. 73—178 R **5 Claims**



1. A basic flight instrument comprising a vertical axis referenced rate gyro in combination with a display drum, said drum possessing a horizon demarcation line, wherein, by compara-

tive reference of said line to an aircraft silhouette etched into the glass display face of the basic instrument the pilot may determine roll and or pitch for determination of his or her flight situation, whereby, roll erection will be provided by a gimbal cage erection spring, said cage being 45 degree deflective limited and pitch erection accomplished by the drum rotation receiving reversal input from a lead weighted drive gear, said weight being responsive to the gravitational tug force of the earth, said display drum rotation will be pitch limited to a maximum of 45 degrees, whereby said basic instrument will be totally free of possible tumble.

4,638,661

APPARATUS FOR MEASURING THE VOLUME OF A MEASURING GAS

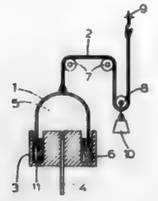
Anthony B. Bergmans, Bilthoven, Netherlands, assignor to Gould Electronics B.V., Netherlands

Filed Jun. 20, 1985, Ser. No. 747,065

Claims priority, application Netherlands, Jun. 28, 1984, 8402041

Int. Cl.⁴ G01F *3/34*

U.S. Cl. 73—237 **9 Claims**



1. An apparatus for measuring the volume of a gas comprising:
- a stationary body having a circumferential channel for receiving a fluid;
- a measuring bell movable upwardly and downwardly in vertical direction which is suspended into the circumferential channel so that a measuring space is formed between the measuring bell and the stationary body;
- a measuring conduit extending axially through the stationary body wherein the conduit communicates at one end with the measuring space and at the other end with the gas to be measured;
- a flexible cable for suspending the measuring bell into the circumferential channel which is fixed at one end to the top of the measuring bell and at the other end to a fixed point wherein the flexible cable passes over at least two guide rolls before it terminates at the fixed point;
- a free pulley supported by the flexible cable between the at least two guide rolls and the fixed point end of the cable wherein the free pulley sits in a free hanging loop of the cable between the guide rolls and the fixed point; and
- a balance weight supported by the free pulley having a weight sufficient to position the circumferential edge of the bell in the circumferential channel of the body but not in contact with the body.

4,638,662

TANK LEAKAGE DETECTOR

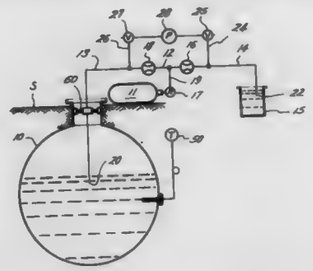
Edward P. Watson, Hamilton Square, N.J., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Nov. 12, 1985, Ser. No. 796,885

Int. Cl.⁴ G01F *23/00*

U.S. Cl. 73—302 **6 Claims**

1. A method for detecting a change in the amount of liquid in a storage tank comprising the steps of:
- (a) providing a source of gas at greater than atmospheric pressure;
- (b) positioning a gas line communicating with said gas source in said storage tank, the end of said gas line being below the surface of the liquid;
- (c) positioning a second gas line communicating with said gas source into a liquid filled cup, the end of said line being movable between a first position at the surface of the liquid and a second position below the surface;
- (d) sensing the differential pressure between said first and second gas lines and adjusting said second position of said second gas line until said differential pressure is zero;



- (e) computing the depth of the end of said first line from the observed depth of the end of said second line;
- (f) holding said first gas line in fixed position for a predetermined time; and
- (g) re-zeroing the differential pressure between said first and second lines after said predetermined time by repositioning the end of said second line and recalculating the depth of said first gas line.

4,638,663

LEVEL INDICATING DEVICE FOR LIQUID CONTAINERS

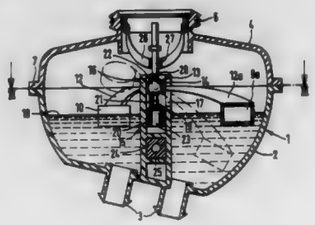
Gottfried Seelhorst, Dinklage, Fed. Rep. of Germany, assignor to Firma Riesselmann & Sohn, Lohne, Fed. Rep. of Germany

Filed Dec. 11, 1985, Ser. No. 807,809

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1984, 3445475

Int. Cl.⁴ H01H *35/18*; G01F *23/36*

U.S. Cl. 73—313 **11 Claims**



1. A level indicating device for liquid containers comprising:
- (a) a plurality of floats disposed on a single plane in said container;
- (b) a plurality of lever arms, each lever arm supporting one of said floats;
- (c) a guide maintained approximately centrally in said container and approximately vertically with respect to the surface of a liquid in said container when at rest;
- (d) a union supported for free movement in said guide and to which each of said lever arms is connected; and
- (e) said union operatively connected for coaction with means mounted for connection to a signal device to indicate at least one level of the liquid.

4,638,664

QUARTZ BAROMETER

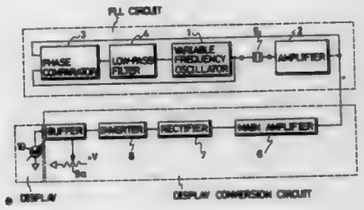
Fujio Tamura, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Oct. 2, 1985, Ser. No. 783,249

Claims priority, application Japan, Oct. 3, 1984, 59-207576

Int. Cl.⁴ G01L *11/00*

U.S. Cl. 73—384 **1 Claim**



1. In a quartz barometer of the type which includes at least:
- a phase locked loop circuit (PLL circuit) component consisting of a variable frequency oscillator, a phase comparator, a low-pass filter and an amplifier;
- a quartz oscillator connected to said variable frequency oscillator;
- a display conversion circuit portion connected to said PLL circuit portion; and
- a display portion connected to said display conversion circuit portion;

and which measures the pressure of an environmental gas of said quartz oscillator from a resistance value at resonance or current value at resonance or voltage value at resonance of said quartz oscillator, the improvement wherein a temperature-dependent resistor having temperature characteristics opposite those of the resistance at resonance of said quartz oscillator and the resistance value thereof not dependent upon the ambient pressure of the gas is connected in series with said quartz oscillator.

4,638,665

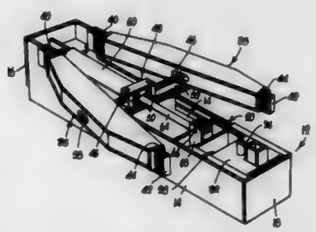
TUBE BENDER

David A. Beason, Hutchinson, and Ray A. Dilts, Sedgwick, both of Kans., assignors to Full Vision, Inc., Newton, Kans.

Filed Oct. 3, 1985, Ser. No. 783,734

Int. Cl.⁴ B21D *9/05*

U.S. Cl. 72—389 **18 Claims**



1. A tube bender comprising:

an enlongated, primary support;

a secondary support carried by the primary support for reciprocation longitudinally of the primary support;

power means interconnecting the supports for reciprocating the secondary support;

a die assembly carried by the secondary support for reciprocation therewith, said assembly including:

a pair of members disposed to receive a bendable tube therebetween,

a die between the members, presenting a core around which the tube is bent, and

releasable means for clamping the members against the tube; and

a pair of spaced anvils carried by the primary support within the path of travel of the tube against which the latter is pressed into shape.

4,638,666

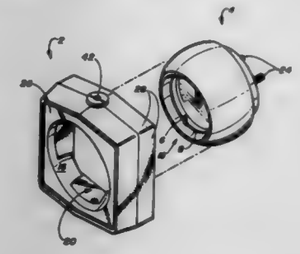
MOVABLE GAUGE HOUSING

John K. Y. Wong, and Simon K. Y. Wong, both of Tainan Hsien, Taiwan, assignors to Lumen Electronics Corporation, Tainan Hsien, Taiwan

Filed Nov. 20, 1985, Ser. No. 800,511

Int. Cl.⁴ G01D *11/24*

U.S. Cl. 73—431 **16 Claims**



1. An automotive gauge housing providing a viewing surface with one or more openings therein for retention and movement of one or more gauges comprising:
- (a) a housing with at least one circular opening extending through the interior of said housing, said opening framed therewithin by a plurality of concave supporting members; and
- (b) at least one spherical gauge body having a gauge face; wherein said supporting members conform to and retain said gauge body while allowing said said gauge body to be freely revolvable within said housing.

4,638,667

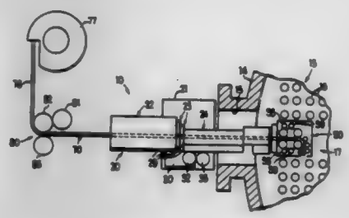
REMOTE PROBE POSITIONING APPARATUS

John J. Zimmer, Turtle Creek, and Richard G. Soltesz, Gibsonia, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 20, 1984, Ser. No. 572,498

Int. Cl.⁴ G01N *29/00*

U.S. Cl. 73—432.1 **1 Claim**



1. Apparatus for positioning a probe within an enclosure defined by a vessel wall from outside the wall through an opening therein, said apparatus comprising: an elongated extensible boom having a longitudinal axis, said boom having an end adapted for longitudinal extension into and retraction from the enclosure through the opening therein; boom drive means coupled to said boom for effecting extension and retraction thereof; an elongated carrier extending along said boom from

outside the vessel wall, said carrier being relatively rigid in the directions of its length and width and being relatively flexible in the direction of its thickness; feed means on said boom adjacent to said end thereof for longitudinally feeding said carrier from said boom independently of the movement of said boom in a feeding direction into the enclosure orthogonal to said axis, said feed means including means for deflecting said carrier into a path angularly disposed with respect to said axis, and tractor means engageable with said carrier for feeding said carrier in said feeding direction through said deflecting means; withdrawal means disposed outside the vessel wall for moving said carrier longitudinally in a withdrawing direction opposite to said feeding direction independently of the movement of said boom; a probe supported by said carrier at one end thereof; swivel means including an internally-toothed ring gear fixedly mounted on said feed means, and a drive gear mounted on said boom and disposed in meshing engagement with said ring gear, said swivel means effecting bidirectional rotational movement of said feed means about an axis parallel to said longitudinal axis thereby to permit positioning of said probe, first measuring means for measuring the movement of sais boom; second measuring means for measuring the movement of said carrier with respect to said boom, each of said first and second measuring means including a rotary resolving means for converting a linear distance into a corresponding rotational angle, said second measuring means including two measuring devices respectively associated with said feed means and said withdrawal means for respectively measuring movement of said carrier in said feeding direction and said withdrawing direction; third measuring means for measuring the angle through which said feed means is rotated by said swivel means; and a microcomputer system for processing the measurements of said first and second and third measuring means for accurately determining the position of said probe within the enclosure.

4,638,668

MEASUREMENT COUPLING FOR FLUIDIC SYSTEMS

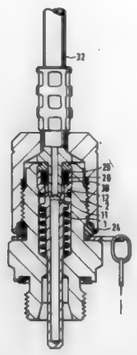
Siegfried Leverberg, Oberhausen, and Manfred Hofmann, Altendiez, both of Fed. Rep. of Germany, assignors to Hydrotechnik GmbH, Limburg, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 672,640

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1983, 3341860

Int. Cl.⁴ G01D *21/02*; G01L *19/00*; G01K *1/14*

U.S. Cl. 73—866.5 **18 Claims**



1. A measurement coupling for taking working pressures and temperatures of fluid media in fluid systems, comprising:

a coupling bushing under duct pressure in the built-in state;

a support ring and an O-ring arranged in a widened portion of an internal bore of a hollow guide insert arranged within a bore of said coupling bushing;

a spring-loaded and mechanically actuatable check valve arranged within the bore of said coupling;

said check valve including a valve body exhibiting a valve body cylindrical bore and a closed bottom face; said valve body having an end exhibiting said closed bottom face and which faces the fluid system and is prolonged beyond the coupling bushing; and

a radial transverse bore located in a wall of the valve body.

4,638,669

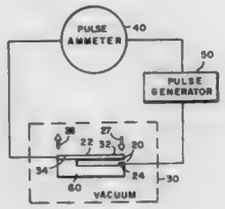
QUANTUM TUNNELING CANTILEVER ACCELEROMETER

Stephen Y. Chou, Stanford, Calif., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 7, 1985, Ser. No. 731,715

Int. Cl.⁴ G01P *15/08*

U.S. Cl. 73—517 R **10 Claims**



1. An accelerometer comprising;

a vacuum chamber;

an electrode fixed in position within said vacuum chamber;

a cantilevered electrode located within said vacuum chamber having a fixed end and a free end, the free end of said cantilevered electrode being aligned with and separated from said fixed electrode such that acceleration of said accelerometer causes the free end of said cantilevered electrode to move towards said fixed electrode;

means for providing a voltage pulse across said fixed electrode and said cantilevered electrode; and

means for measuring the current flow caused by said voltage pulse, the amount of acceleration being determinable from the current measurement.

4,638,670

APPARATUS FOR THE DETERMINATION OF THE DISTANCE TRAVELED BY A PISTON IN A CYLINDER

Bernd Moser, Hamm/Sieg, Fed. Rep. of Germany, assignor to Boge GmbH, Eitorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 653,930, Sep. 24, 1984, Pat. No. 4,587,850, which is a continuation-in-part of Ser. No. 621,075, Jun. 15, 1984, Pat. No. 4,577,509. This application Aug. 16, 1985, Ser. No. 766,871

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430045

Int. Cl.⁴ G01R *27/26*

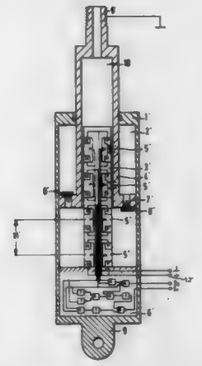
U.S. Cl. 73—658 **20 Claims**

1. Apparatus for a cylinder assembly, said apparatus being for determining location of piston means in a cylinder means of said cylinder assembly, said piston means having a predetermined range of movement, said apparatus comprising:

semiconductor means including a plurality of semiconductor elements, said plurality of semiconductor elements being sensitive to predetermined electric fields and having a predetermined range of displacement substantially related to said movement range of said piston means;

electric field generating means for generating said predetermined electric fields to which said plurality of semiconductor elements are sensitive, said electric field generating means having means for connection to a first source of predetermined electrical potential, whereby at least one portion of said cylinder assembly is maintained in operation at a predetermined electrical potential, said predetermined electrical potential being determined by said said first source of predetermined electrical potential;

said semiconductor means having means for connection to a second source of predetermined electrical potential, said second source of predetermined electrical potential having a different electrical potential than said first source of predetermined electrical potential; and



said semiconductor means being disposed with respect to said cylinder assembly such that said predetermined electrical potential of said at least one portion of said cylinder assembly generates said predetermined electric field and actuates, in operation, at least one of said plurality of semiconductor elements in said predetermined range of movement of said piston means with said cylinder means, whereby said location of said piston means within said cylinder means is determined.

4,638,671

CHECKER FOR AIR CONDITIONER

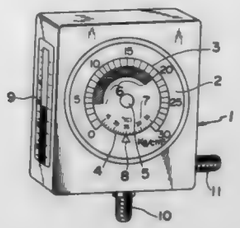
Yoshinori Yamamoto, Urayashu, Japan, assignor to Daikyo Service Station Development Co. Ltd., Japan

Filed May 24, 1985, Ser. No. 738,011

Claims priority, application Japan, Jun. 1, 1984, 59-80446[U]

Int. Cl.⁴ G01L *19/04*

U.S. Cl. 73—708 **2 Claims**



1. A device for checking an air conditioner, the air conditioner including coolant for circulation therein, a coolant charge hose and a coolant pressure hose device comprising;

A pressure gauge having a pressure gauge indicator, movable in a circular path on a circular dial plate which has an annularly extending pressure indicating scale;

A circulator or auxiliary dial plate engagable over the circular dial plate of the pressure gauge and having a temperature correction gradution along its edge on the one side and an indicator zone along its edge on a diametrically opposite side from said graduation with a plurality of gas charge operating conditions indicated thereon, said operating range conditions and said temperature graduation corrections being arranged so that when the ambient temperature indication is aligned with a reference mark the pressure gauge needle will be positioned in an appropriate operating indicating range.

Finger piece means, associated with said auxiliary dial plate and coaxial therewith, for manual rotational manipulation of said auxiliary dial plate and for selecting an appropriate ambient temperature indication on said temperature correction graduation; first hose connection means for connecting the air conditioner coolant pressure hose to said pressure gauge; and,

second hose connection means for connecting the air conditioner coolant charge hose to said device and for effecting a charging of the coolant gas when said pressure gauge needle is positioned in an inappropriate operating indicating range.

4,638,672

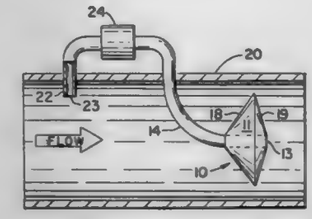
FLUID FLOWMETER

Floyd McCall, Hemet, Calif., assignor to Ametek, Inc., New York, N.Y.

Filed Sep. 11, 1984, Ser. No. 649,512

Int. Cl.⁴ G01F *1/40*

U.S. Cl. 73—861.52 **11 Claims**



1. Apparatus for measuring fluid flow through a conduit, comprising:

(a) A fluid flow displacement member mounted in said conduit and having sloped wall means for deflecting the fluid to flow through a region defined by the periphery of said fluid displacement member and the interior surface portion of said conduit proximate said periphery, said slope wall means being effective to substantially linearize the velocity profile of said fluid in at least said region over a predetermined range of fluid flow rates through said conduit;

(b) conduit means extending transversely through said displacement member for diverting a portion of the fluid passing through said conduit along an auxiliary flowpath having one end positioned upstream of said fluid displacement member and its opposite end positioned downstream of said region; and

(c) totalizer means in said auxiliary flowpath for determining the total fluid flow therethrough.

4,638,673

METHOD AND APPARATUS FOR DETERMINING THE TORQUE OF A TORQUE GENERATOR

Felix Blaschke, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed May 10, 1985, Ser. No. 733,302

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418617

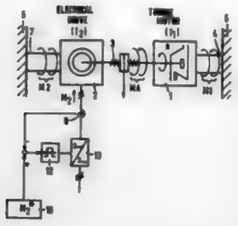
Int. Cl.⁴ G01L *3/22*

U.S. Cl. 73—862.17 **7 Claims**

1. A method for determining the torque of a torque generator coupled to an electrical drive with a controllable electrical torque wherein the torque generator torque interchanged with

the drive ("interchange torque") is being measured, comprising:

determining a model value for the internal torque in accordance with a functional relationship which determines the internal torque of the torque generator as a function of the electrical torque, the interchange torque (MA) and the moments of inertia of the torque generator and drive, based on the electrical torque, the measured value of the



interchange torque, and a parameter for the moments of inertia;

calibrating the parameter for the moments of inertia to a minimal dependency of the model value on the variation of the electrical torque by varying the electrical torque, and

registering the model value as the value of the internal torque.

4,638,674

SAMPLE-COLLECTING DEVICE FOR GASEOUS OR VAPOROUS CONDENSABLE RADIOACTIVE SUBSTANCES, ESPECIALLY FOR COLLECTING TRACES OF TRITIUM

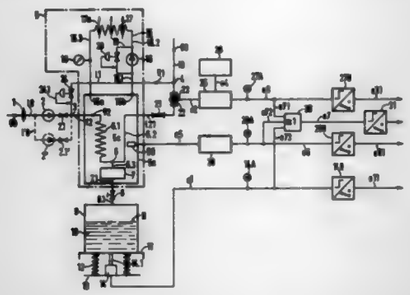
Eckhard Redmann, Frankfurt, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim an der Ruhr, Fed. Rep. of Germany

Filed Jun. 6, 1984, Ser. No. 617,634

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1983, 3321063

Int. Cl.⁴ G01N *1/24*

U.S. Cl. 73—863.12 **11 Claims**



1. A sample collecting system for collecting gaseous or vaporous condensable radioactive substances in air from a nuclear installation which will operate over an extended monitoring period with no or few disturbances, and in the event that a disturbance occurs, gives at least one trouble signal, which comprises

(a) a fine filter through which a gas stream of air containing gaseous or vaporous condensable radioactive substances passes for removal of entrained particles suspended in the gas stream

(b) at least one suction branch line into which the filtered gas stream flows

(c) a measuring gas pump in the suction branch line propelling the gas stream from the suction branch line through a precipitate line enclosed in a measuring gas cooler, said precipitate line extending downwardly in the measuring gas cooler, at least partially as a helical coil for condensing the condensable radioactive substances together with H_2O if present and aiding in separating the condensate from the uncondensed gas in the gas stream

(d) a condensate collecting point at about the lowest point of the precipitate line for discharge of the condensate from the precipitate line

(e) a rising gas branch from the condensate collecting point upwards and then out of the measuring gas cooler for conducting the uncondensed gas from the condensate collecting point

(f) a measuring gas choke in the measuring gas line for determining the flow resistance in that line, followed by a transducer which aids in controlling the gas mass flow, and following the transducer, the gas therefrom is returned to the source from which the gas stream for sampling was withdrawn

(g) a pressure measuring line with a pressure difference control valve from the output of the flow transducer to the input of the precipitate line for regulating the measuring gas pressure of the measuring gas pump at the input of the precipitate line

(h) at least one temperature sensor in the measuring gas cooler and temperature indicating means outside the measuring gas cooler for ascertaining the temperature and indicating if an upper temperature is exceeded

(i) a fine separator system into which the condensate from the collecting point at the low point of the precipitate line flows

(j) a condensate line with a drain valve through which the condensate from the fine separator system discharges

(k) a condensate collecting tank located underneath the fine separtor system and into which the condensate from the condensate line flows, said tank also acting in determining the liquid level therein.

4,638,675

LIQUID SAMPLING SYSTEM

William A. Sperinck, Warrington, and Michael J. Hall-Wilton, Capenhurst, both of England, assignors to British Nuclear Fuels plc, Warrington, England

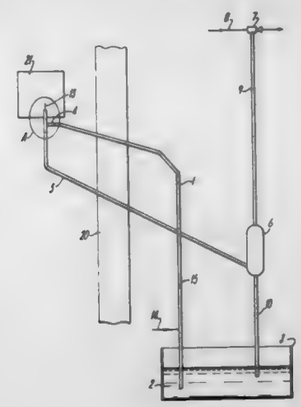
Filed Feb. 25, 1985, Ser. No. 704,597

Claims priority, application United Kingdom, Mar. 9, 1984, 8406209

Int. Cl.⁴ G01N *1/14*

U.S. Cl. 73—864.34 **5 Claims**

1. A sampling system for obtaining representative samples from a bulk liquid comprising a first pipe arranged to be immersed at its lower end in the liquid, a needle sampling station at the opposite end of the pipe, a return flow pipe from the sampling station, means for maintaining a depression in the pipes and at the sampling station, a pulsed pressure fluid means communicating with the first pipe for lifting slugs of liquid to the sampling station, a needle at the sampling station and a bottle for receiving sample cooperable with the needle such that with the bottle located on the needle the bottle is evacuated by the depression at the sampling station to allow liquid to



collect in the bottle and on removal of the bottle the depression prevents escape of liquid at the needle.

4,638,676

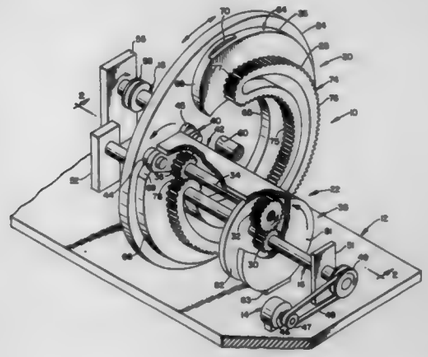
RECIPROCATING DRIVE MECHANISM WITH POSITIVE PINION-TO-RACK GEAR ENGAGEMENT

Gordon R. Lively, Longview, and Jerry M. Lang, Lindale, both of Tex., assignors to Rota-Flex Corporation, Longview, Tex.

Filed Feb. 25, 1985, Ser. No. 704,923

Int. Cl.⁴ F16H *21/16, 19/08*

U.S. Cl. 74—31 **14 Claims**



1. A reciprocating drive mechanism powered by a rotating prime mover, the combination comprising:

a base;

an output shaft rotatably coupled to said base;

a wheel rigidly coupled to said output shaft;

an arcuate cam rigidly coupled to said wheel and having an endless cam track;

an arcuate rack gear rigidly coupled to said wheel and having an endless gear track with arcuate opposite ends;

an input shaft coupled to said base for rotation, coupled to said rotating prime mover for rotation therewith and having a driving gear rigidly coupled thereto;

a transmission shaft positioned parallel to said input shaft;

a driven gear rigidly coupled to said transmission shaft, engaging said driving gear and being rotated by said driving gear;

a pinion rigidly coupled to said transmission shaft and engaging said endless gear track;

a first rigid support rotatably receiving said input shaft and said transmission shaft therein and maintaining said input shaft and said transmission shaft at a fixed distance apart;

a second rigid support rotatably receiving said transmission shaft therein and having first and second cam followers rotatably coupled thereto and rotatably engaging said endless cam track; and

a third rigid support rigidly interconnecting and coupled to said first and second supports,

whereby rotation of said input shaft rotates said driving gear, which in turn rotates said driven gear, transmission shaft and pinion, and

whereby rotation of said pinion reciprocates said arcuate rack gear, wheel and output shaft as said pinion traverses the entire extent of said endless gear track,

said pinion walking around said endless gear track at said arcuate opposite ends thereof as said driven gear travels partially around said driving gear,

said endless gear track being located inside said endless cam track,

said first and second cam followers and said transmission shaft having parallel central axes,

the central axes of said transmission shaft, said first cam follower, and said second cam follower defining the three points of a triangle in end view.

4,638,677

INTERMITTENT DRIVE MEMBER

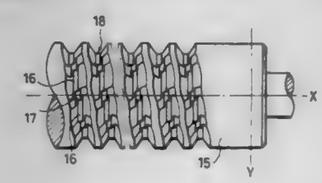
Takamichi Fuke, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 12, 1984, Ser. No. 650,401

Claims priority, application Japan, Sep. 12, 1983, 58-140169[U]

Int. Cl.⁴ F16H *25/20, 55/02*

U.S. Cl. 74—84 R **4 Claims**



1. In an intermittent drive mechanism of the type comprising a shaft rotatable about an axis, a spiral groove formed in the outer peripheral surface of the shaft leading in one axial direction, and a tip end portion of a movable member riding in the spiral groove, the sprial groove having a plurality of groove portions positioned offset in stepwise axial increments along the sprial groove, each groove portion having a bottom wall formed at a predetermined depth and inclined side walls opposing each other on each side of the bottom wall such that the tip end portion of the movable member can ride along the bottom wall of the groove guided by the inclined side walls, the tip end portion being intermittently driven in stepwise axial increments along the one axial direction as it rides along successive groove portions of the spiral groove in conjunction with rotation of the shaft,

the improvement comprising:

each groove portion having a linear bottom wall extending in a direction transverse to said axis of said shaft, a leading side wall on the side leading in said axial direction, and a trailing side wall on the opposite side trailing in said axial direction;

each groove portion alternating with a chamfered portion leading from a preceeding groove portion to a next groove portion, each chamfered portion having opposing leading and trailing side walls for guiding the transition of said tip portion from the preceeding groove portion to the

next groove portion, each side wall of said chamfered portion extending from an end of a side wall of the preceeding groove portion to a beginning of a side wall of the next groove portion;

the leading side wall of each chamfered portion being positioned to overlap along said axis with the end of a trailing side wall of the preceeding groove portion;

the beginning of the leading side wall of the next groove portion also being positioned to overlap along said axis with the end of the trailing side wall of the preceeding groove portion; and

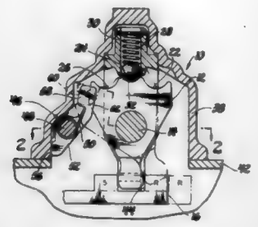
the trailing side wall of each chamfered portion being positioned to overlap along said axis with the beginning of a leading side wall of the next groove portion.

4,638,678

MANUAL TRANSMISSION SHIFT CONTROL MECHANISM HAVING A REVERSE INHIBITOR

Michael J. Gorman, Madison Heights, and William R. McClellan, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 30, 1985, Ser. No. 781,340
Int. Cl.⁴ F16H *57/06*
U.S. Cl. 74—476 **2 Claims**



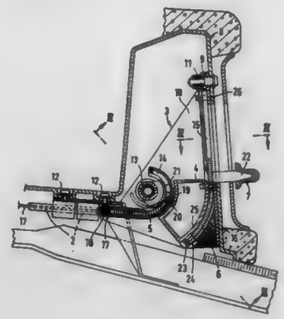
1. A control mechanism for a manually shifted transmission including an inhibitor mechanism which prevents direct shifting from the highest forward speed ratio to the reverse speed ratio, the transmission having a neutral condition, a plurality of forward speed ratio positions including a highest ratio and a lowest ratio and a reverse ratio position, said control comprising; a housing; selector lever means movable linearly along a selector axis in the neutral condition between preselecting conditions for each of the forward speed ratio positions and the reverse speed ratio position and being rotatable about the selector axis from the neutral condition to a select position for the desired speed ratio; and reverse inhibitor means including a support pin secured in said housing and defining an inhibitor axis parallel to and offset from the selector axis, inhibitor lever means having two abutment pads and being slidably and rotatably disposed on said support pin and spring means for simultaneously urging said inhibitor lever means linearly and rotatably to one position to force one of the abutment pads into abutment with said housing to position a portion of the inhibitor lever means in linear alignment with said selector lever means, said selector lever means moving said inhibitor lever means linearly against said spring means when said selector lever means is moved in the neutral condition to the preselection condition for the highest speed ratio position and the reverse speed ratio position, said selector lever means moving out of linear alignment and out of physical contact with said inhibitor lever means when the highest forward speed ratio position is selected by pivotal movement of said selector lever means, said spring means returning said inhibitor lever means to said one position when said highest forward speed ratio position is selected to align said inhibitor lever means with the path of pivotal movement of said selector lever means, said selector lever means contacting and pivoting said inhibitor lever means upon pivoting of said selector lever means from the highest forward speed ratio position to the highest ratio neutral preselecting condition and said inhibitor lever means pivoting against said spring means until the other of said abutment pads contacts with said housing to prevent further pivoting of said selector lever means toward said reverse speed ratio position prior to linear movement of said selector lever means in the neutral condition toward said lowest forward speed ratio preselecting condition.

4,638,679

ADJUSTING MECHANISM FOR A BOWDEN CABLE

Gerd Tannenlaufer, Remscheid, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed May 17, 1984, Ser. No. 611,458
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321187
Int. Cl.⁴ F16C *1/10*
U.S. Cl. 74—501 R **3 Claims**



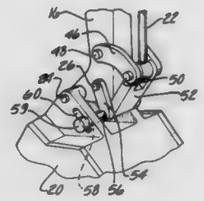
1. An adjusting mechanism for a Bowden cable having an outer sleeve and an inner cable comprising a casing connected to the sleeve, a first flexible push and pull element carried for guided movement with respect to the casing and connected to the inner cable, a first arcuate guide carried with the casing for guidingly receiving the first push and pull element, a lever arm pivotally mounted with respect to the casing and connected to the first push and pull element, a second flexible push and pull element connected to the lever arm, and a second arcuate guide carried with the casing and having a straight section and receiving the second push and pull element to permit movement of the second push and pull element in response to movement of a control knob connected thereto along a substantially linear path.

4,638,680

BUCKET LINKAGE

Allan Albrecht, Rothschild, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Aug. 22, 1985, Ser. No. 768,260
Int. Cl.⁴ G05G *1/04*
U.S. Cl. 74—516 **2 Claims**



1. An attaching means for attaching a bucket to a boom arm for rotation about said arm between a first position and a second position, said attachment means comprising:

an offset hinge point on said arm positioned a predetermined distance from the longitudinal center line of said arm;

said bucket pivotally connected to said offset hinge point such that said bucket is rotatable about said arm; and

a linkage system interconnecting said bucket to said arm, said system having a continually adjustable power point that automatically reduces the radius of bucket rotation as measured between said power point and said hinge point as said bucket rotates from said first position to said second position, thereby providing increased power at said first position and continually increasing the bucket speed as said bucket rotates to said second position; and said linkage system further comprising:

a first link pivotally connected at one end to said arm adjacent said offset, a second link pivotally connected at one end to said arm a spaced distance from said first link, and a third link pivotally interconnecting the opposite ends of said first and second links;

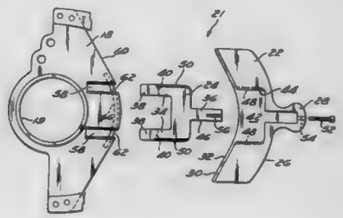
said first and third links connected by a pin which is received by and moveable within a slot formed in said bucket thereby forming said continually adjustable power point.

4,638,681

REPLACEMENT LEVER

John D. Eldridge, Jr., Newport Beach, Calif., assignor to Jodel Associates, Inc., Newport Beach, Calif.

Filed Aug. 19, 1985, Ser. No. 767,139
Int. Cl.⁴ G05G *7/12*
U.S. Cl. 74—544 **14 Claims**



1. A replacement control lever for attachment to a movable member behind a slot in an automobile dashboard, without removing said dashboard, said lever comprising:

a main lever body having a knob for manipulating the lever within the slot in the dashboard;

an insert member for securing said main lever body to said movable member; and

means for adjustably fastening said insert and said main lever body together from the front of the dashboard, said fastening means drawing said insert member toward said main lever body to clamp said movable member between the insert member and the main lever body, to allow installation of said lever without removal of the dashboard.

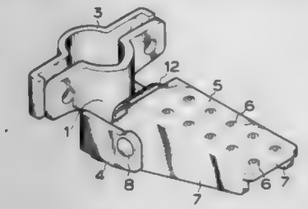
4,638,682

AUXILIARY PEDAL DEVICE FOR TRICK-CYCLING ATTACHED TO THE FRONT FORK BLADE OF A BICYCLE

Hisao Michiyama, No. 48-1, Yahiro 2-Chome, Sumida-Ku, Tokyo, Japan

Filed Aug. 26, 1985, Ser. No. 769,960
Claims priority, application Japan, Jun. 19, 1985, 60-91544[U]
Int. Cl.⁴ G05G *1/14*
U.S. Cl. 74—560 **3 Claims**

1. An auxiliary pedal device for trick-cycling attached to a front fork blade of a bicycle, comprising a pedal, a plate spring, and a pair including a fixture and a counterpart fixture, said fixture being adapted to be attached to the front fork blade of the bicycle together with said counterpart fixture by bolts and nuts and provided with a pair of parallel brackets positioned at both sides of a lower portion of the fork blade, said brackets protruding from the fork blade in two opposite directions, said pedal having an upper face and being provided with a pair of side plates positioned at both sides thereof, said side plates being inserted between said brackets, a supporting shaft fixed



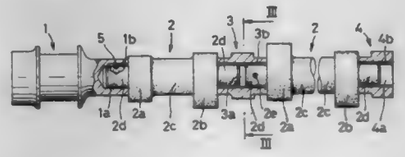
to the brackets and rotatably supporting said plates, said brackets having a pair of stopper pawls which are outwardly extending from said brackets, said fixture having a hole and a lower edge, said pawls being engaged with said lower edge, said plate spring having a first end portion engaged in said hole of said fixture, a second end portion supported on said shaft, and an intermediate portion which is circularly bent to engage and push up an underside of said pedal.

4,638,683

CAMSHAFT FOR ENGINE

Yutaka Ogawa; Takayuki Ogasawara, and Yoshiaki Hori, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 10, 1985, Ser. No. 742,915
Claims priority, application Japan, Jun. 18, 1984, 59-124762
Int. Cl.⁴ F16H *53/00*
U.S. Cl. 74—567 **19 Claims**



1. A camshaft having a plurality of cams disposed on a metal shaft in a spaced-apart relationship with each other in an axial direction on the shaft, wherein the improvement comprises:

at least one ceramic cam portion comprising a ceramic material, each of said at least one ceramic cam portion having a pair of joining protrusions which extend from opposite axial ends thereof in said axial direction of the metal shaft; and

a plurality of metallic shaft portions separated from each other by said at least one ceramic cam portion, each of said metallic shaft portions including joining holes which engage said joining protrusions of said at least one ceramic cam portion, such that said at least one ceramic cam portion is joined integrally to said metallic shaft portions.

4,638,684

ASSEMBLY FOR TAKING UP AND COMPENSATING FOR TORQUE-INDUCED SHOCKS

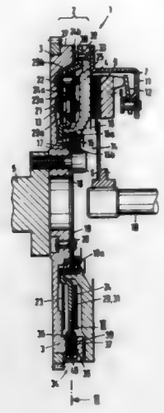
Paul Maucher, Sasbach, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Oct. 15, 1984, Ser. No. 661,028

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1983, 3338574; Mar. 5, 1984, 3410367

Int. Cl.⁴ F16D *43/04*

U.S. Cl. 74—574 **26 Claims**



1. An assembly for taking up and compensating for torque-induced shocks, especially for taking up and compensating for fluctuations of torque which is transmitted by an internal combustion engine to a change-speed transmission in a motor vehicle, comprising a flywheel including coaxial first and second parts mounted for rotation at a variable speed and for limited angular movement relative to each other, one of said parts being arranged to receive torque from the engine and the other of said parts being arranged to transmit torque to the input element of the transmission; damping means operative to resist said relative angular movement; and means for regulating the resistance to rotation of said parts relative to each other so that such resistance decreases with increasing rotational speed of said parts.

4,638,685

ORTHOPAEDIC SAFETY STRAP SUITABLE FOR BICYCLE PEDALS

Flavio Cigolini, Via Martinengo 22506 Sant'Andrea di Concesio, Brescia, Italy

Filed Dec. 13, 1984, Ser. No. 681,128

Claims priority, application Italy, Dec. 14, 1983, 5235 A/83; Mar. 23, 1984, 5133 A/84

Int. Cl.⁴ G05G *1/14*

U.S. Cl. 74—594.6 **4 Claims**

1. An orthopaedic safety strap which, in use, is passed through slits in a bicycle pedal and over the cyclist's foot to bind the cyclist's foot on the pedal and in a toe-piece, said orthopaedic safety strap comprising:

(a) a first elongated tape comprising:

(i) a first portion sized and shaped to pass through the slits in a bicycle pedal;

(ii) a second portion connected to said first portion, said second portion being substantially broader than said first portion and being sized and shaped to provide orthopaedic lateral support to the cyclist's foot;

(iii) a third portion connected to said second portion, said third portion being substantially narrower than said second portion and being sized and shaped to be received in and held by a buckle (to be recited); and

(iv) a plurality of first snaps mounted on said first portion;

(b) a second elongated tape comprising:

(i) a first portion sized and shaped to pass through the slits in the bicycle pedal;

(ii) a second portion connected to said first portion, said second portion being substantially broader than said first portion and being sized and shaped to provide orthopaedic lateral support to the cyclist's foot;

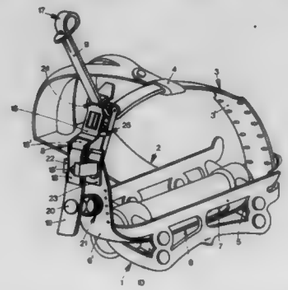
(iii) a plurality of second snaps mounted on said first portion, said plurality of second snaps being sized, shaped, and positioned so that a selected one of said first snaps can be engaged with a selected one of said second snaps, permitting the size of the orthopaedic safety strap to be adjusted to the size of the cyclist's foot;

(c) a clip attached to the end of said second elongated tape remote from said first portion of said second elongated tape;

(d) a buckle attached to said clip, said buckle comprising:

(i) a roller about which said third portion of said first elongated tape is passed during use of the orthopaedic safety strap;

(ii) a swinging element that is pivotally mounted on said clip for movement between a first position and a second position, said swinging element containing a throughhole lined with detents, said swinging element, said throughhole, and said detents being sized, shaped, and positioned so that, when said swinging element is in its first position and said third portion of said first elon-



gated tape is passed around said roller and through said throughhole, said detents engage said third portion of said first elongated tape and bind the cyclist's foot on the pedal and so that, when said swinging element is in its second position, said detents release said third portion of said first elongated tape; and

(iii) a balancing element connected to said swinging element such that movement of said balancing element from a first position to a second position causes said swinging element to move from its first position to its second position; and

(e) a button for the automatic release of the orthopaedic safety strap, said button comprising a first element mounted on said second portion of said second elongated tape, a second element mounted on said balancing element in position to releasably engage said first element, and a spring resiliently biasing said balancing element away from said second portion of said second elongated tape, said first and second elements being designed to release engagement in response to lateral movement of the cyclist's foot against said first element,

whereby, when the cyclist moves his foot laterally against said second portion of said second elongated tape, said first and second elements of said button disconnect, said spring forces said balancing element from its first position to its second position, the movement of said balancing element from its first position to its second position moves said swinging element from its first position to its second position, said detents release said third portion of said first elongated tape, and the bicyclist can quickly and safely remove his foot from the toe-piece.

4,638,686

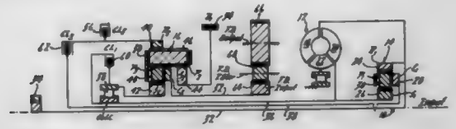
TRANSAXLE FOR A VEHICLE DRIVELINE

George E. Lemieux, Livonia; Reginald T. Lewicki, Dearborn Heights, and Julius A. Clauss, Birmingham, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 26, 1980, Ser. No. 134,240

Int. Cl.⁴ F16H *47/08*

U.S. Cl. 74—688 **1 Claim**



1. A transaxle for delivering torque from a driving member to a pair of driven members comprising a compound planetary gear unit, a hydrokinetic unit, a differential gear unit and a planetary gear torque splitter unit, the hydrokinetic unit and the planetary gear unit being assembled on a first axis;

a transaxle housing having a first housing portion enclosing said hydrokinetic unit and said torque splitter unit and having an opening at one side of said first housing portion whereby said hydrokinetic unit and said torque splitter unit may be assembled therethrough;

a second housing portion enclosing said compound planetary gear unit and having an opening at the side of said second housing portion opposite to said one side whereby said planetary gear unit may be assembled therethrough;

a housing wall adapted to close the opening in said second housing portion following assembly of said planetary gear unit;

a third housing portion enclosing said differential gear unit and having an opening in the lower side of said third housing portion whereby said differential gear unit may be assembled therethrough;

an oil pan covering the opening in said third housing portion;

said third housing portion being situated with respect to the axis of said hydrokinetic unit between said first and second housing portions and laterally offset therefrom;

said torque splitter unit having a torque input element and two torque output elements;

said hydrokinetic unit having an impeller connected to said torque input element and a turbine connected to one of said torque output elements;

a pair of concentric torque delivery shafts, one torque delivery shaft being connected to one of said torque output elements and the other being connected to the other torque output element;

said compound planetary gear unit having first and second sun gears, first and second planet gear sets mounted on a common carrier and engaging each other, said first sun gear engaging said first planet gear set and said second sun gear engaging said second planet gear set, and a ring gear engaging said first planet gear set;

a final drive input gear connected to said common carrier and a final drive output gear connected to an input side of said differential gear unit;

first brake means for selectively braking said first sun gear during low and intermediate drive operation;

first clutch means for connecting said one torque delivery shaft to said second sun gear;

second clutch means for connecting said other torque delivery shaft to said ring gear during intermediate and high ratio operation;

second brake means for selectively braking said ring gear during reverse drive operation;

both clutch means being applied during high ratio operation,

said first clutch means being located in said second housing portion radially inward of said second clutch means on the side of said compound planetary gear unit remote from said hydrokinetic unit, said final drive gears being located between said hydrokinetic unit and said compound planetary gear unit;

said first clutch means comprising an overrunning coupling and a selectively engageable friction clutch in parallel relationship with respect to said overrunning coupling;

said first clutch means comprising also an input member located radially inward of an output member of said second clutch means on the side of said final drive gears remote from said hydrokinetic unit, said ring gear being connected to said output member of said second clutch means, an output member of said first clutch means being connected to said first sun gear, said final drive gears being connected drivably by a final drive idler gear;

said differential gear unit having a carrier housing, a ring gear on said carrier housing engaging said final drive output gear, separate output side gears of said differential gear unit being connected respectively to each of said driven members, said hydrokinetic unit having an impeller connected to said driving member;

said transaxle housing comprising a single-piece unitary casting in which said first, second and third housing portions are separately defined;

said first and second housing portions being separated by a bearing support wall that forms a part of said unitary casting;

the upper side of said second housing portion being adapted for supporting thereon a control valve assembly.

4,638,687

CONTINUOUSLY-VARIABLE-RATIO TRANSMISSION HAVING A SINGLE INPUT MEMBER

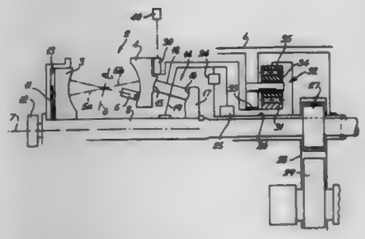
Forbes G. De Brie Perry, Charlbury, England, assignor to National Research Development Corporation, London, England

Filed May 28, 1985, Ser. No. 738,470

Claims priority, application United Kingdom, May 30, 1984, 8413728

Int. Cl.⁴ F16H *37/06, 37/00*

U.S. Cl. 74—691 **8 Claims**



1. A transmission of the toroidal race rolling traction type presenting a principal axis of rotation and having a rotary output capable of rotation in both forward and reverse directions and having at least first and second regimes of operation, and comprising a variator including a first, ratio varying component presenting an output member and an input and a secondary component including gearing capable of being set in different combinations so as to effect change-over between said first and second regime in which:

a rotary thrust bearing supports said output member of said variator;

said rotary thrust bearing includes a part serving also in the said combination of said secondary component that is operable in said first regime, and

said combination of said secondary component that is operable in said first regime also includes a one-way drive member and a locking member arranged in parallel,

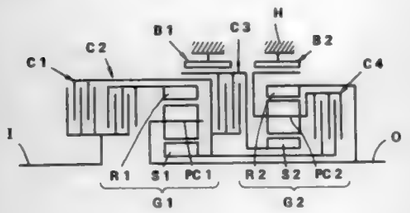
through which drive is alternatively transmitted to said transmission output during said first regime according to whether said transmission output is rotating in said forward or said reverse direction; said one-way drive and locking members being arranged in parallel and connected directly both to said rotary thrust bearing part and to said rotary output of said transmission, so that said rotary output rotates at the same speed as said thrust bearing part and in the same rotary sense.

4,638,688

PLANETARY GEAR TRAIN FOR AUTOMOTIVE TRANSMISSION OR THE LIKE

Kazuyoshi Hiraiwa, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 30, 1984, Ser. No. 595,533
Claims priority, application Japan, Apr. 4, 1983, 58-57830; Apr. 4, 1983, 58-57831
Int. Cl.⁴ F16H *57/10*
U.S. Cl. 74—763 **6 Claims**



1. A planetary gear train transmission comprising:
an input shaft operatively connected with a source of rotational energy;
first and second planetary gear sets respectively including first and second sun gears, first and second ring gears, first and second pinion carriers and first and second sets of pinion gears operatively mounted on said first and second pinion carriers and respectively arranged to mesh with their respective sun and ring gears;
a first clutch selectively providing a drive connection between said input shaft and said first sun gear;
a second clutch selectively providing a drive connection between said input shaft and said first ring gear;
a third clutch selectively providing a drive connection between first and second sun gears;
a fourth clutch selectively providing a drive connection between said first sun gear and said second pinion carrier;
a first brake selectively rendering said second sun gear stationary with respect to a housing in which the transmission is disposed;
a second brake selectively rendering said second pinion carrier stationary with respect to said housing; and
an output shaft in drive connection with said first pinion carrier and said second ring gear, such that said transmission produces four forward speeds using only two planetary gear sets.

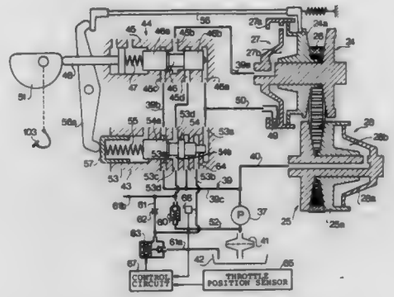
4,638,689

HYDRAULIC LINE PRESSURE CONTROL SYSTEM FOR AN INFINITELY VARIABLE TRANSMISSION

Yasuhito Sakai, Musashino, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1984, Ser. No. 648,450
Claims priority, application Japan, Oct. 9, 1983, 58-167272
Int. Cl.⁴ B60K *41/14*
U.S. Cl. 74—866 **9 Claims**

1. An improved control system for an infinitely variable transmission for transmitting the power of an internal combustion engine mounted on a vehicle, the transmission comprising a primary pulley having a hydraulically shiftable disc and a hydraulic cylinder for shifting the disc, a secondary pulley having a hydraulically shiftable disc and a hydraulic cylinder for operating the disc, a belt engaged with both pulleys, a hydraulic circuit having a pump for supplying oil, a transmission ratio control valve responsive to engine speed for controlling the oil and for shifting the disc of the primary pulley to change the transmission ratio, and a pressure regulator valve responsive to the transmission ratio for increasing the line pressure of the hydraulic circuit with increase of the transmission ratio, wherein the improvement comprises:
first means comprising a throttle position sensor for detecting the torque of said engine and an electronic circuit responsive to an output signal of the throttle position sensor for producing a control signal proportional to said torque;



second means responsive to said control signal for operating said pressure regulator valve so as to increase the line pressure with increase of the torque;
said second means comprises a hydraulic control circuit for applying a part of drain oil to said pressure regulator valve and a solenoid operated valve responsive to said control signal for controlling the oil passing through said hydraulic control circuit and for regulating the line pressure;
a pressure sensor for detecting the pressure of the part of the drain oil supplied to the pressure regulator valve and connected to said electronic circuit, the latter producing said control signal further dependent on the pressure of the part of the drain oil supplied to the pressure regulator valve.

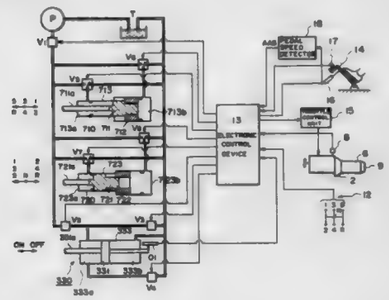
4,638,690

METHOD AND APPARATUS FOR CONTROLLING ELECTRONICALLY CONTROLLED TRANSMISSIONS

Toshihiro Hattori, Ayase; Masaki Ishihara, Fujisawa, and Makoto Uriuhara, Yokohama, all of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Oct. 28, 1983, Ser. No. 546,394
Claims priority, application Japan, Oct. 30, 1982, 57-191244
Int. Cl.⁴ B60K *41/18*
U.S. Cl. 74—866 **10 Claims**

1. A method of controlling an electronically controlled transmission of a vehicle during an abrupt depression of an accelerator pedal to accelerate the vehicle, the transmission having an actuator for a gear changing operation controlled by an electronic control device for changing gear ratios, said method comprising the steps of:
(a) monitoring the speed of depression of an accelerator pedal;
(b) detecting when said speed of depression of the accelerator pedal exceeds a predetermined value;
(c) locking a gear changing operation when said speed of depression of the accelerator pedal exceeds said predetermined value; and



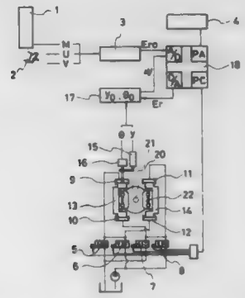
(d) effecting the gear shifting operation after said speed of depression of the accelerator pedal is less than said predetermined value.

4,638,691

CONTROL DEVICE OF AN INFINITELY VARIABLE TRANSMISSION

Hirohisa Tanaka, Tokyo, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1984, Ser. No. 638,785
Claims priority, application Japan, Aug. 19, 1983, 58-150264
Int. Cl.⁴ B60K *41/18*; **F16H** *15/00*
U.S. Cl. 74—866 **1 Claim**



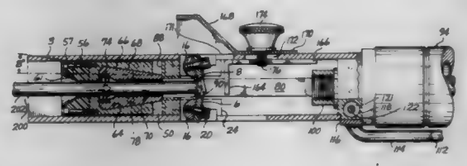
1. An automatic control system for a toric type infinitely variable transmission of a running vehicle, the speed of which is changed by varying a gear ratio corresponding to a running mode of the vehicle selected by a driver, said transmission comprising coaxially disposed input and output shafts with input and output disks having toroidal surfaces and repectively secured to the input and output shafts, a traction roller engaged with the toroidal surfaces of the disks, and a trunnion rotatably supporting the traction roller on a rotary shaft, said trunnion being linearly movable in the direction of a pivot axis which is perpendicular to the rotary shaft of the traction roller and being pivotable around the pivot axis so that the gear ratio between the input shaft and the output shaft may be changed, said control system comprising:
a hydraulic cylinder receiving an axial end of the trunnion;
a hydraulic circuit connecting the hydraulic cylinder with a hydraulic source, said hydraulic circuit including a solenoid valve, said valve having means for repeatedly opening and closing the valve at predetermined intervals and controlling hydraulic supply to said hydraulic cylinder and thereby controlling the linear movement of the trunnion in the direction of the pivot axis so as to vary the gear ratio;
first detector means for detecting the amount of the linear movement of the trunnion in the direction of the pivot axis and producing a first signal;
second detector means for detecting the amount of the pivotal movement of the trunnion and producing a second signal; and
an electronic control circuit for receiving said first and second signals from said first and second detector means, determining a suitable gear ratio conforming to the running mode and said signals and feeding a pulse signal according to the suitable gear ratio back to the solenoid valve in order to open and close the solenoid valve at the predetermined intervals.

4,638,692

WIRE STRIPPER WITH DOUBLE WEDGE SPRING LOADED GRIPPER

Isaac M. Bensussen, and Hans Tittel, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 26, 1985, Ser. No. 769,958
Int. Cl.⁴ H02G *1/12*
U.S. Cl. 81—9.41 **31 Claims**



1. For use with wire of the type having an inner core and an outer covering, a wire stripper for removing an end portion of the covering from the core, said stripper comprising:
blade means for cutting substantially through the covering in a substantially radial direction, said blade means being positioned and dimensioned to provide clearance between itself and the core to avoid contact with the core;
gripping means positioned axially outwardly of the blade means for gripping wire to be stripped; said gripping means including an axially slidable gripper housing, gripper jaw means, and first and second biasing means; said housing having an axial passageway extending therethrough for receiving the wire, and portions defining a chamber which surrounds the passageway and has generally axially extending sidewall means that tapers toward the blade means; said jaw means being dimensioned to be slidably and closely received into the chamber defined by the housing; said jaw means including a plurality of gripper jaws, each of which has a tapered outer surface that slidingly engages said sidewall means and an axially extending inner grip surface for gripping the wire; said first biasing means urging the jaws radially outwardly toward said sidewall means; and said second biasing means urging the jaws axially inwardly toward the blade means; and
actuating means for engaging the housing and moving it axially outwardly, to tighten the jaws around the wire and pull the wire away from the blade means to in turn strip said end portion of the covering from the core.

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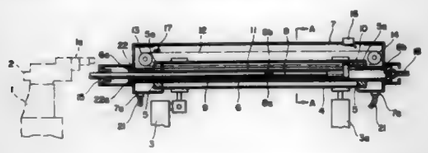
BAR STOCK FEEDER

Kenji Sugimoto, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1984, Ser. No. 645,670
Claims priority, application Japan, Sep. 27, 1983, 58-179005
Int. Cl.⁴ B26D *13/02, 13/04*
U.S. Cl. 82—2.5 **7 Claims**

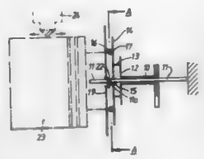
1. A bar stock feeder for a processing machine having a hollow spindle, comprising:
first support means;

cover means provided adjacent said hollow spindle and pivotally supported by said first support means;
second support means;
at least one rod guide tube supported by said second support means in said cover means and having a front end opening for passing a bar stock and a longitudinal slit;
an elongated flexible member provided to be moved along said rod guide tube in the longitudinal direction;
guide means for guiding said elongated flexible member;
a push rod slidably mounted in said rod guide tube;
a flag for operatively connecting said push rod to said elongated flexible member through said slit;



means for moving said elongated flexible member to advance said push rod;
said cover means being for covering the entirety of the rod guide tube, flexible member, guide means, and flag;
lubricating oil passage means from an inlet formed in a rear portion of the rod guide tube to an outlet formed in a lower portion of the cover means passing through the rod guide tube;
lubricating oil supply means for supplying lubricating oil to said rod guide tube passing through said passage means; and
drain means connected to said passage means for returning lubricating oil to said supply means.

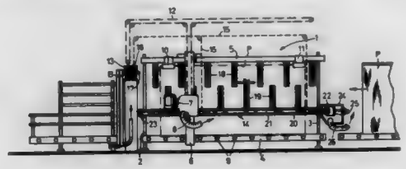
4,638,694
MANUFACTURE OF PISTONS
Roger H. Slee, Warwick, England, assignor to AE Plc, Warwickshire, England
Filed Jun. 26, 1985, Ser. No. 748,976
Claims priority, application United Kingdom, Jun. 27, 1984, 8416380
Int. Cl.[4] B23B *5/24, 41/04*
U.S. Cl. 82—18 **3 Claims**





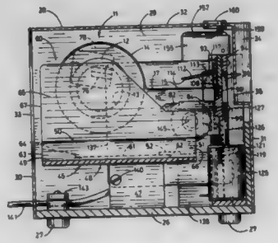
1. A machine tool for turning a piston having a surface of oval cross-section, comprising:
a rotatable input shaft for imparting rotational drive to the piston and having an axis of rotation,
slide means connected to the rotatable input shaft for rotation thereby about said input shaft axis of rotation,
a piston-carrying member engaging said slide means for rotation thereby, said slide means permitting reciprocation of the piston-carrying member relative to said input shaft in a direction normal to said axis of rotation,
a link connected at one end to a fixed pivot defining a link axis of rotation, said link axis of rotation being offset from said input shaft axis of rotation, and connected at an end opposite to said one end to said piston-carrying member, a line between said connections being parallel to the said direction of reciprocation of said piston-carrying member,
a tool carried on mounting means for movement in directions towards and away from the axis of rotation of the input shaft, the tool turning said surface when at a fixed point in said direction of movement.

4,638,695
BOARD SAW WITH SAWDUST EXHAUST
Ludwig Striebig, Lucerne, Switzerland, assignor to Striebig AG, Switzerland
Filed May 8, 1984, Ser. No. 608,127
Claims priority, application Switzerland, May 9, 1983, 2528/83
Int. Cl.[4] B27B *5/06;* **B27G** *3/00*
U.S. Cl. 83—100 **8 Claims**



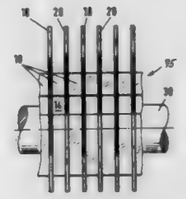
1. Apparatus for making horizontal and vertical cuts comprising an upright frame having a length and a height, at least one motor-driven sawing unit which is supported by the frame and displaceable in the vertical and horizontal directions and which further includes a circular saw blade having a perimeter, an exhaust pipe connectable at one end to a vacuum source and connected at the other end to the at least one sawing unit, an exhaust duct which is connectable to a vacuum source and extends along the frame length, and is slidably vertically mounted upon the frame, the exhaust duct having a closed hollow profile with a blade face and a frame face, a movably mounted band supported by the frame which is movable along the blade face and which is positively connected to the horizontal displacement of the sawing unit, the band having an exhaust slot adjacent the saw blade at the point of sawing, considered in the sawing direction, such that the object being sawn passes between the saw unit and the exhaust duct to exhaust the sawdust produced behind the object being sawn.

4,638,696
APPARATUS FOR DISPENSING STRIP MATERIAL OR THE LIKE
Peter R. Urwyler, Modesto, Calif., assignor to Simtek Inc., Modesto, Calif.
Filed Sep. 17, 1984, Ser. No. 651,263
Int. Cl.[4] B65H *75/00;* **B26D** *5/22*
U.S. Cl. 83—261 **7 Claims**



3. An apparatus for dispensing strip material or the like from a source of said material, the apparatus comprising a frame; a drive wheel mounted on the frame for substantially rotational movement; means borne by the frame for mounting a source of said strip material and having a pair of spaced substantially parallel guides mounted thereon, the guides of said pair spaced from each other a distance permitting a lead portion of said strip material to be supported on and extended between the guides with said guides on opposite sides of the drive wheel and with said lead portion of the strip material above the drive wheel; control means borne by the frame for placing the lead portion of the strip material in contact with the drive wheel; and means connected in driving relation to the drive wheel for selectively rotating the drive wheel to feed the lead portion of the strip material from the frame upon engagement of the lead portion with said drive wheel.

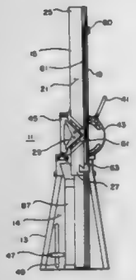
4,638,697
FROZEN MEAT CUTTER
Juergen Hager, Hückeswagen; Walter Vieth, Wermelskirchen, and Werner Manderla, Remscheid, all of Fed. Rep. of Germany, assignors to Magurit-Gefrierschneider GmbH, Hoehenweg, Fed. Rep. of Germany
Filed Jan. 9, 1986, Ser. No. 817,392
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1985, 8505329[U]
Int. Cl.[4] B26D *3/22*
U.S. Cl. 83—356.3 **11 Claims**



1. In a machine for slicing and cutting slabs of frozen meat into generally cube-like portions, a rotatable slicing and cutting drum comprising:
a plurality of side-by-side, alternatingly disposed slitting discs and knife discs mounted for rotation together as a unit,
said slitting discs being operable to make parallel longitudinal slices in a meat slab fed radially against the drum as the latter rotates to thereby produce a plurality of side-by-side meat strips,
said knife discs being operable to cut the meat strips laterally into individual cube-like portions,
said slitting discs having a slicing edge extending between a first point on the disc which is forward relative to the direction of rotation of the drum, and a trailing point, said trailing point being disposed at a greater radial distance from the axis of rotation of the disc than said first point.

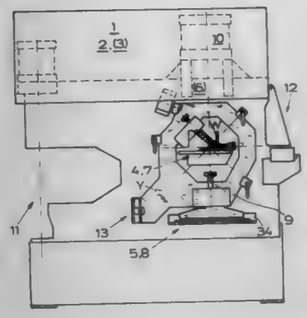
4,638,698
DROP FEED MITERING MACHINE
Bruce D. Omholt, Rohnert Park, Calif., assignor to Prints Plus, Inc., Martinez, Calif.
Filed Feb. 28, 1986, Ser. No. 834,623
Int. Cl.[4] B27G *5/04*
U.S. Cl. 83—444 **17 Claims**

1. A drop feed mitering machine comprising
(a) a base,
(b) an elongated work table extending upwardly from said base in a near vertical orientation, said work table having top and bottom ends and a front work plane that defines the front of said machine,
(c) a cutting throat running through said table intermediate the top and bottom ends thereof,
(d) a cutting element moveably mounted to pass through said cutting throat,
(e) means accessible from the front of said machine for causing said cutting element to pass in a cutting action through said cutting throat,



(f) means accessible from the front of said machines for drop feeding a length of molding downwardly along the front plane of said work table over said cutting throat to a preadjusted position whereby said cutting element can by actuated to cut the molding to yield a cut piece of molding of a predetermined length.

4,638,699
SHEAR FOR PROFILE AND/OR FLAT AND/OR SOLID-SECTION STEEL STOCK
Werner Schröder, Auf dem Hahne 5, 5950 Finnentrop 1, Fed. Rep. of Germany
Filed Aug. 30, 1985, Ser. No. 771,364
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432672
Int. Cl.[4] B23D *23/00*
U.S. Cl. 83—452 **14 Claims**



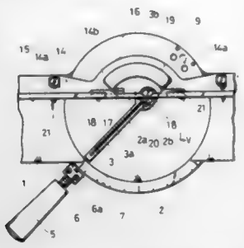
1. In a shear for cutting profile and/or flat and/or solid-section steel and comprising:
at least one vertical frame plate;
at least one fixed blade carried on the plate;
a working slide displaceable on the frame plate and carrying a movable blade passing past the fixed blade on movement of the slide on the frame plate; and
means including a holddown engageable between a workpiece and the frame for pressing the workpiece against the fixed blade, the improvement comprising
pivot means defining for the holddown on the frame a first vertical axis parallel to the plate and a second horizontal axis generally perpendicular thereto for pivotal displacement of the holddown on the frame.

4,638,700

PORTABLE MITER SAWS

Fusao Fushiya; Nobuo Hakamata; Hiroyuki Abe, and Nobuhiro Inoue, all of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan

Filed Mar. 10, 1986, Ser. No. 837,820
Claims priority, application Japan, Jun. 12, 1985, 60-127838
Int. Cl.[4] B27B *5/24*
U.S. Cl. 83—467 R **7 Claims**



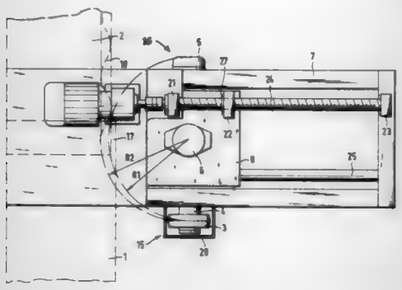
1. A portable miter saw of the type driven by an electric motor, comprising:
- a supporting base;
- a horizontal turntable mounted for selective rotatable movement on said supporting base;
- a support arm having a lower end fixedly connected with one peripheral portion of said turntable and an upper end adapted to move along a vertical path relative to said turntable;
- a saw blade rotatably carried on said upper end of said support arm generally above said turntable;
- a guide fence mounted on said base and including a pair of work engaging surfaces longitudinally aligned across a blade clearance gap formed therebetween to provide passage of said saw blade; and
- shutter means operatively connected to said turntable for shutting said blade clearance gap and slidable on said guide fence upon rotation of said turntable to selectively change the cutting angle of said saw blade.

4,638,701

SHEARS, ESPECIALLY CIRCULAR KNIFE SHEARS

Karol H. Oberländer, Mainleus, and Norbert Umlauf, Haferkamp 64, D-5800 Hagen 1, both of Fed. Rep. of Germany, assignors to Norbert Umlauf, Hagen, Fed. Rep. of Germany

Filed Jan. 2, 1985, Ser. No. 688,302
Claims priority, application Fed. Rep. of Germany, Jan. 4, 1984, 3400122
Int. Cl.[4] B23D *31/04*
U.S. Cl. 83—490 **12 Claims**



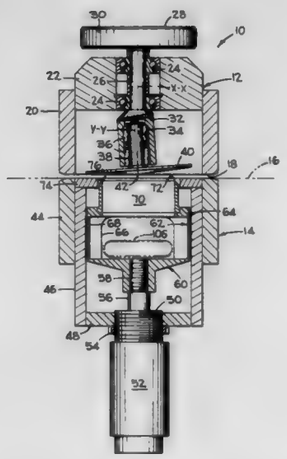
1. Shears for cutting out segments and strips from metal bands movable along a generally horizontal rectilinear path of travel, comprising a linearly displaceable guide block, said guide block includes a knife carrier, an upper and a lower circular knife mounted on said knife carrier and arranged to cooperate and cut the metal bands, a pivoting drive mounted on said guide block and in engagement with said knife carrier for displacing said upper and lower circular blades spaced outwardly from said pivoting drive along a generally horizontal arcuate path from a location spaced laterally from the path of travel of the metal bands to a location in the path of travel of the metal bands for cutting the metal bands, said guide block having a recess therein extending upwardly from said knife carrier, a vertical journal secured to said knife carrier and extending upwardly into the recess, said pivoting drive includes a pivoting motor secured to and extending upwardly from said guide block and said pivoting motor includes a splined shaft extending downwardly from said motor and disposed in engagement with said journal for pivoting said knife carrier.

4,638,702

WEB CUTTING METHOD AND APPARATUS

René F. DeBin, Aalst, and Emiel Y. Lambrecht, Gijzegem - Aalst, both of Belgium, assignors to FMC Corporation, Chicago, Ill.

Filed Jul. 17, 1984, Ser. No. 631,694
Int. Cl.[4] B26F *1/00*; B26D *1/45*
U.S. Cl. 83—509 **6 Claims**



1. An apparatus for cutting an aperture of a selected nonlinear configuration in thin web material comprising a knife having a cutting edge located in a plane and formed to define the selected configuration;
- means for tangentially engaging the cutting edge with sufficient force to penetrate a web adjacent the cutting edge; means for rotating said tangentially engaging means about an axis contained within the projected area defined by the cutting edges; and means for translating the cutting edge engaging means along the cutting edge at least until the web overlaying the cutting edge has been cut.

4,638,703

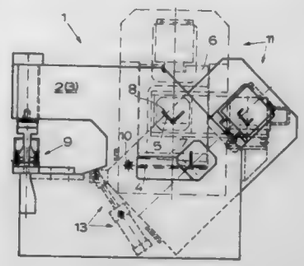
SHEAR FOR DIFFERENT STRUCTURAL SHAPES

Karl-Heinz Muhr, In der Stesse 2, D-5952 Attendorn, Fed. Rep. of Germany

Filed May 20, 1985, Ser. No. 735,919
Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418423
Int. Cl.[4] B26D *9/00*
U.S. Cl. 83—518 **18 Claims**

1. A shear for severing at least two different structural shapes, comprising:

- a machine body;
- a shear slide pivotally mounted on said machine body to swing about a horizontal axis between a first operating position and a second operating position angularly offset from said first position about said axis, said shear slide being capable of rectilinear movement;
- a pair of fixed blades spaced apart in the direction of said rectilinear movement when said slide is in said first operating position and oriented to cut respective structural shapes; and
- a respective movable blade on said slide juxtaposed and paired with each of said fixed blades and cooperating with the respective fixed blade to sever the respective structural shape upon said rectilinear movement of said slide, said blades being positioned with respect to said axis so that each pair of blades is disposed at a common given working height in a respective severing position thereof.

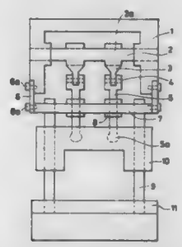


4,638,704

PRESS DEVICE HAVING MEANS TO ENABLE RAM AND BOLSTER TO BE REMOVED AS A UNIT

Hiroshi Wanibuchi, and Akira Kubota, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha and Kabushiki Kaisha Kuboto Tekkojo, both of Tokyo, Japan

Filed Sep. 1, 1983, Ser. No. 528,533
Int. Cl.[4] B26F *1/02*
U.S. Cl. 83—628 **4 Claims**



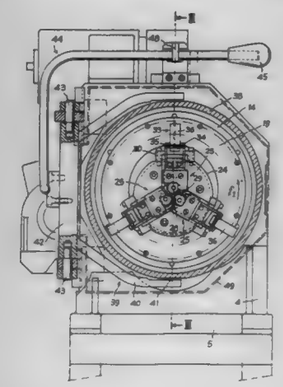
1. In a press device having an upstanding main frame: a support member detachably disposed on a lower portion of the main frame; a plate member disposed at a middle portion of the main frame and having a plurality of openings extending therethrough; securing members detachably securing the plate member to the middle portion of the main frame; a plurality of upstanding struts connected at their bottom ends to the support member and at their top ends to the plate member; a ram mounted to undergo reciprocal sliding movement along the struts and coacting with the support member for performing a work-pressing operation during use of the press device; a plurality of connecting members slidably extending through respective ones of the plate member openings and having their lower ends connected to the ram; a turnable crank shaft turnably mounted on an upper portion of the main frame; and means detachably connected to the upper ends of the connecting members for converting the turning movement of the crank shaft into linear movement of the connecting members to thereby raise and lower the ram; whereby the plate member, connecting members, ram, support member and struts can all be detached from the main frame and removed therefrom as a single unit.

4,638,705

MACHINE FOR TRIMMING AND DISBUDDING VINE SHOOTS

Chazalon Michel, La Bastide, Vogue-07200 Aubenas, France

Filed Feb. 21, 1986, Ser. No. 831,537
Claims priority, application France, Feb. 26, 1985, 85 03005
Int. Cl.[4] A01G *17/00*
U.S. Cl. 83—701 **10 Claims**



1. Machine for trimming and disbudding vine shoots destined to be used subsequently as graft-supports, of the type comprising, a cutting device with an inlet hatch for a vine shoot, and at least one cutter rotating about the horizontal axis of said inlet hatch mounted on a supporting frame and a forward drive assembly for the shoot; formed at by at least two press-rollers resiliently disposed in superposed manner, one at least of which is driven in rotation by a drive member, said machine having a vertical frame, said frame defining a cylindrical bearing surface of horizontal axis, supporting a rotating trimming and disbudding head comprising:
- a main annular plate,
- a tool-holding annular platen, mounted loosely radially with elastic centering on the plate with which it defines the inlet hatch,
- a plurality of combined tools, at equal annular distance one from the other, mounted on said platen each tool being formed by:
  - a radial slide-block carrying a cutter and a rotating roller of which the rotation plane forms an angle different from 90° with the axis of the hatch, said slide-block being urged into a centripetal movement by an elastic member,
  - a lever, including a small branch and a large branch, carried by the platen, and of which the small branch is engaged under a yoke of the slide-block,
- a ring, the large branch of each lever resting against the ring, and which ring is carried by a fork hinged on to the frame, and
- means for controlling, via said fork, the axial movement of the ring in the same direction as that into which the slide-blocks are urged by the levers moving centrifugally against the action of their elastic return members.

4,638,706

ELECTRONICAL MUSICAL INSTRUMENT WITH NOTE FREQUENCY DATA SETTING CIRCUIT AND INTERPOLATION CIRCUIT

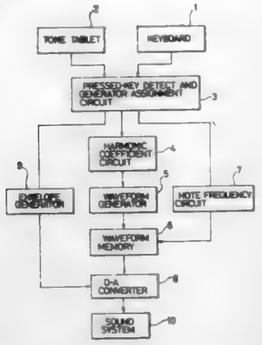
Yoichi Nagashima, Hamamatsu; Tatsunori Kondo, Shizuoka; Kiyomi Takasaji, Hamamatsu; Mineo Kitamura, Hamamatsu; Tadashi Matsushima, Hamamatsu; Eiji Nagashima, Kami, and Masafumi Mizoguchi, Hamamatsu, all of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Oct. 26, 1984, Ser. No. 665,126

Claims priority, application Japan, Oct. 27, 1983, 58-201664

Int. Cl.⁴ G10H *7/00*

U.S. Cl. 84—1.01 **2 Claims**



1. An electronic musical instrument of the type that forms a musical waveform by calculating the waveform amplitude value at each sample point of the musical waveform through Fourier synthesis, comprising:

a memory circuit for storing a plurality of sets of artibrary harmonic coefficients for use in the Fourier synthesis, each set of arbitrary harmonic coefficients including a series of arbitrary harmonic coefficients occupying different addresses in said memory circuit, said arbitrary harmonic coefficients in each set having a characteristic wave pattern of a musical waveform to be synthesized;

a note frequency data setting circuit for setting a component ratio of a harmonic coefficient in accordance with the note frequency of a musical waveform to be synthesized, said note frequency data setting circuit selecting from and between the sets of arbitrary harmonic coefficients stored in said memory circuit;

an address data generator for generatig readout addresses for reading out one set of the arbitrary harmonic coefficients from the memory circuit in accordance with the note frequency data of the musical waveform to be synthesized;

an interpolation circuit for calculating actual harmonic coefficient data by starting at a starting address of the readout addresses from the address data generator, and by skipping by a selected skip value along the series of arbitrary harmonic coefficients in the readout addresses, the musical waveform to be synthesized having its characteristic wave pattern because of the selection of the set of arbitraryharmonic coefficients while having acual harmonic coefficients calculated by said interpolation circuit.

4,638,707

DATA MASK TONE VARIATION IN AN ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Oct. 4, 1984, Ser. No. 657,648

Int. Cl.⁴ G10H *1/06*

U.S. Cl. 84—1.19 **10 Claims**

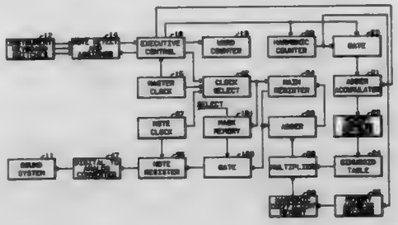
1. In combination with a musical instrument in which a plurality of data words corresponding to the amplitudes of points defining the waveform of a musical tone are computed from a preselected set of harmonic coefficients and are transferred sequentially to a means for conversion into musical waveshapes, apparatus for selectively modifying said waveform of a musical tone in response to a control signal comprising;

a first waveshape memory means,

a means for computing responsive to said preselected set of harmonic coefficients whereby said plurality of data words corresponding to the amplitudes of points defining the waveform of a musical tone are computed and stored in said first waveshape memory means,

a mask data generator means for creating a mask data word in response to said control signal wherein said mask data word is in a binary digital format having a number of bits equal in number to said plurality of data words corresponding to the amplitudes of points defining the waveform of a musical tone,

a memory addressing means for simultaneously reading out



a data word stored in said first waveshape memory means and for selecting a corresponding bit of said mask data word created by said mask data generator means,

a second waveshape memory means,

a mask gate responsive to said selected bit provided by said memory addressing means whereby said data word read out from said first memory means is transferred unaltered if the corresponding bit of said mask data word has a logic value of "1" and whereby a zero value data word is transferred if said corresponding bit of said mask data word has a logic value of "0" and whereby the transferred data words are stored in said second waveshape memory means,

a waveshape reading means whereby data words are sequentially and repetitively read out from said second waveshape memory means, and

a means for producing musical tones responsive to product data words read out of said second waveshape memory means.

4,638,708

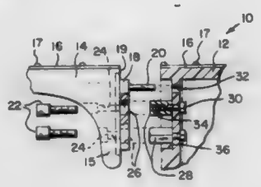
STRINGED INSTRUMENT

Benjelloun Kamal, 45 Sintsink Dr., West, Port Washington, N.Y. 11050

Filed Mar. 24, 1986, Ser. No. 842,923

Int. Cl.⁴ G10D *3/00*

U.S. Cl. 84—293 **4 Claims**



1. An improved stringed instrument of the type having a body with an elongated neck extending therefrom, said neck having a heel adjacent said body and a fingerboard having frets thereon, said fingerboard mounted onto said neck and said body, the improvement comprising:

(a) said neck being removable from said boy and including a bracket mounted to back end of said heel, said bracket having an alignment post extending therefrom and a pair of hex holes spaced below said alignment post, said heel having a pair of mounting holes therein in alignment with said hex holes;

(b) said body having a recess for receiving said bracket, said recess having an alignment hole for receiving said alignment post;

(c) a pair of hex bolts having threaded holes therein, said hex bolts mounted within said recess below said alignment hole for receiving said hex holes of said bracket; and

(d) a pair of mounting bolts for extending through said mounting holes in said heel to thread within said threaded holes of said hex bolts for securing said neck to said body so that said neck can be removed for storing said stringed instrument in a smaller area.

4,638,709

ELECTRONIC MUSICAL INSTRUMENT WITH TEMPORAL VARIATION DATA GENERATING CIRCUIT AND INTERPOLATION CIRCUIT

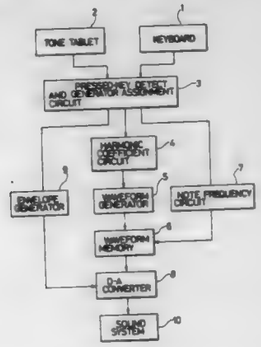
Yoichi Nagashima, Hamamatsu; Tatsunori Kondo, Shizuoka; Kiyomi Takasaji; Mineo Kitamura, both of Hamamatsu; Tadashi Matsushima, Hamamatsu; Eiji Nagashima, Kami, and Masafumi Mizoguchi, Hamamatsu, all of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Oct. 26, 1984, Ser. No. 665,125

Claims priority, application Japan, Oct. 27, 1983, 58-201663

Int. Cl.⁴ G10H *7/00*

U.S. Cl. 84—1.19 **2 Claims**



1. An electronic musical instrument of the type that forms a musical waveform by calculating the waveform amplitude value at each sample point of the musical waveform through Fourier synthesis, comprising:

a memory circuit for storing a plurality of sets of arbitrary harmonic coefficients for use in the Fourier synthesis, each set of arbitrary harmonic coefficients including a series of arbitrary harmonic coefficients occupying different addresses in said memory circuit, said arbitrary harmonic coefficients in each set having a characteristic wave pattern of a musical waveform to be synthesized;

a temporal variation data generating circuit for setting a component ratio of a harmonic coefficient in accordance with temporal variations which vary with time, of a musical waveform to be synthesized, and by selecting from and between the sets of arbitrary harmonic coefficients stored in said memory circuit;

an address data generator for generating readout addresses for reading out one set of the arbitrary harmonic coefficients from the memory circuit in accordance while varying them in response to the temporal variations of the musical waveform to be synthesized;

an interpolation circuit for calculating actual harmonic coefficient data by starting at a starting address of the readout addresses from the address data generator, and by skipping by a selected skip value along the series of arbitrary harmonic coefficients in the readout addresses, the musical waveform to be synthesized having its characteristic wave pattern because of the selection of the set of arbitrary harmonic coefficients calculated by said interpolation circuit.

4,638,710

PERIODIC WAVEFORM GENERATION BY NONRECYCLICALLY READING LOWER FREQUENCY AUDIO SAMPLES AND RECYCLICALLY READING HIGHER FREQUENCY AUDIO SAMPLES

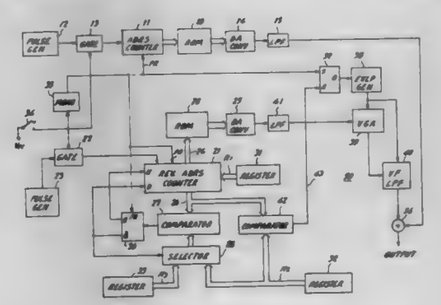
Masatsugu Kitamura, Atsugi; Kikuji Wagatsuma, Sagamihara; Tokumi Watanabe, Tokyo; Naoki Yamashita, Tokyo, and Hiroshi Yoshida, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Nov. 2, 1984, Ser. No. 667,622

Claims priority, application Japan, Nov. 5, 1983, 58-207982

Int. Cl.⁴ G10H *1/02, 7/00*

U.S. Cl. 84—1.26 **6 Claims**



1. An electronic musical instrument comprising:

a first memory with a plurality of amplitude data stored at sequentially addressible locations of the first memory, the amplitude data stored in the first memory representing the amplitudes of lower frequency components of a section of a percussive waveform;

a second memory with a plurality of amplitude data stored at sequentially addressible locations of first and second portions of the second memory, the amplitude data stored in said first portion representing the amplitudes of higher frequency components of a rising section of said percussive waveform and the amplitude data stored in said second portion representing the amplitudes of said higher frequency components of a second section of the percussive waveform which immediately follows said rising section, a phase variation of said higher frequency components being unnoticeable by human ears;

first memory address means for addressing said first memory at a lower rate and generating from said first memory a first output waveform corresponding to the waveform of the lower frequency components;

second memory address means for addressing the first and second portions of said second memory at a higher rate in forward scan and subsequently recyclically addressing the second portion in rearward and forward scans and generating from said second memory a second output waveform having a first part corresponding to said rising section of the waveform of the higher frequency components and a second part corresponding to a series of the recyclically addressed versions of said second section of said higher frequency waveform; and

means for combining said first and second output waveforms.

4,638,711

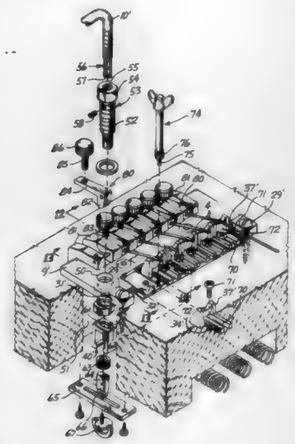
TREMOLO ACCESSORY

Paul F. Stroh, 10229 42nd S.W., Seattle, Wash. 98146

Continuation-in-part of Ser. No. 315,318, Oct. 26, 1981. This application Aug. 17, 1984, Ser. No. 642,220

Int. Cl.⁴ G10D *3/04, 3/12*

U.S. Cl. 84—313 **10 Claims**



1. In a guitar-like musical instrument having a body portion, several generally parallel strings anchored to such body portion, such body portion including a tremolo bridge engaged by the strings and normally movable in opposite senses from a central position relative to the remainder of the body portion, movement of the tremolo bridge in one sense from the central position effecting an increase in the string tension and movement of the tremolo bridge in the opposite sense from its central position effecting a decrease in the string tension for producing a tremulous tone effect, and resilient means biasing the tremolo bridge to its central position, the improvement comprising means for selectively locking the tremolo bridge in its central position so as to block substantial movement of the tremolo bridge mechanism in either sense from such position.

4,638,712

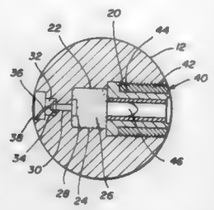
BULLET PERFORATING APPARATUS, GUN ASSEMBLY AND BARREL

Manmohan S. Chawla, and Junius L. Speights, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 11, 1985, Ser. No. 690,701

Int. Cl.⁴ E21B *43/116*

U.S. Cl. 89—1.15 **5 Claims**



1. A bullet perforating gun for use in a borehole traversing subsurface earth formations, comprising:

an elongated gun body member adopted to traverse a borehole, said body member including a plurality of lateral apetures therein, said apetures having a threaded portion thereof;

a plurality of replaceable barrel members, each of said barrel members having an axis of perforation generally perpendicular to the longitudinal axis of said gun body member and consisting of a first tubular member of low thermal expansion ceramic material, said first tubular member having a longitudinal bore therethrough for closely passing a protectible therethrough, and a second generally tubular member of shape memory material coaxially disposed about said first tubular member, said second member having an enlarged outer diameter base portion; and

an outer member for each said barrel members coaxially disposed about said second member and threadably engagable into said apertures within said gun body member, said outer member abutting said enlarged outer diameter base portion of said second member for retaining said second member within said gun body member.

4,638,713

THERMAL SLEEVE FOR GUN BARRELS

Alistair R. Milne, Washington, and Grenville Davison, Newcastle Upon Tyne, both of England, assignors to Vickers Public Limited Company, London, England

Filed Nov. 25, 1985, Ser. No. 801,573

Claims priority, application United Kingdom, Nov. 26, 1984, 8429775

Int. Cl.⁴ F41F *17/04, 17/06*

U.S. Cl. 89—14.1 **5 Claims**



1. A thermal sleeve for a gun barrel comprising a cylinder of substantially rigid, thermally insulating material shaped to embrace at least part of the gun barrel, a plurality of longitudinally and circumferentially spaced spacer members on the inside face of the cylinder for engagement with the gun barrel to define an annular gap between the cylinder and the gun barrel, means for sealing said annular gap, and a series of axially spaced circumferential clamps each surrounding the cylinder, each clamp being axially aligned with an associated series of circumferentially spaced spacer members whereby, on tightening of the clamp, said spacer members are urged into pressurized contact with the gun barrel.

4,638,714

CANNON WITH LONGITUDINALLY SHIFTABLE BARREL

Wolfgang Heintz; Manfred Pehker, both of Duesseldorf, and Josef Metz, Neuss, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH., Duesseldorf, Fed. Rep. of Germany

Filed Nov. 30, 1982, Ser. No. 445,453

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1981, 3148265

Int. Cl.⁴ F41D *11/24*

U.S. Cl. 89—37.01 **16 Claims**

1. In a cannon barrel assembly having:

a barrel centered on and extending along a barrel axis,

a barrel tube member generally coaxially surrounding the barrel and having a pair of axially opposite tube member muzzle and breech ends; and

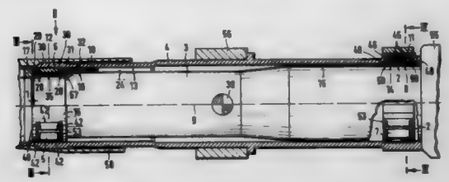
respective muzzle and breech bearings mounted at the tube member ends axially displaceably supporting the barrel therein;

the improvement wherein at least one of the bearings comprises:

an inner bearing ring tightly coaxially fitted on said barrel;

a support on the bearing ring for the spring means;

two lower and one upper segmental slide elements generally angularly equispaced about the axis of the barrel and radially mounted in bearing ring against axial displacement therein, the two lower elements being also mounted in said the tube member against radial displacement therein, the upper element being limitedly radially displaceable in the bearing ring; and



spring means braced between the supporting ring support and the upper slide element for urging said element radially outward against a confronting surface of said tube member which is in surface contact therewith and thereby urging the two lower slide elements in surface contact against the confronting surfaces of said tube member.

4,638,715

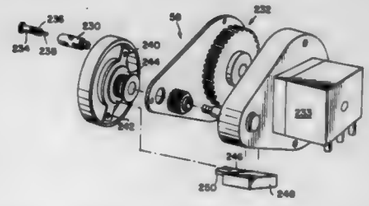
HANDWHEEL ASSEMBLY FOR WEAPON SYSTEM

Richard S. LeBlanc, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 680,799, Dec. 13, 1984, Pat. No. 4,574,683, which is a continuation of Ser. No. 437,853, Oct. 29, 1982, abandoned. This application Aug. 2, 1985, Ser. No. 761,916

Int. Cl.⁴ F41F *21/08*

U.S. Cl. 89—41.12 **2 Claims**



1. A weapon system comprising:

a main gun having a firing mechanism mounted for rotation about a horizontal axis,

a hydraulic cylinder means operatively connected at one end to said gun for rotating said gun in elevation about said horizontal axis,

a pump operatively connected to said hydraulic cylinder means,

a gear box assembly operatively connected to said pump,

a handwheel assembly operatively connected to said gear box assembly,

a handle connected to said handwheel assembly for rotating said handwheel assembly relative to said gear box assembly,

a trigger attached to said handle,

a switch having an actuating member and operatively connected to said firing mechanism, said switch being actuated by movement of said actuating member,

a connecting means for connecting said trigger with said actuating member so that when said trigger is depressed said actuating member is moved thereby actuating said switch,

said connecting means including a yoke connected at one end to said trigger and fixed at an opposite end to said rotatable handwheel assembly so that said one end moves relative to said handwheel assembly when said trigger is depressed, a switch plate engageable with said yoke and with said actuating member and positioned so that when said one end is moved by the depression of said trigger said switch plate moves said actuating member thereby actuating said switch,

said handwheel assembly including a drive shaft rotated by the movement of said handle relative to said gear box assembly and operatively connected to said gear box assembly,

said yoke and said switch plates having openings and said drive shaft passing through said openings, and

a second spring means being disposed about said drive shaft for returning said switch plate to its original position after said trigger has been released.

4,638,716

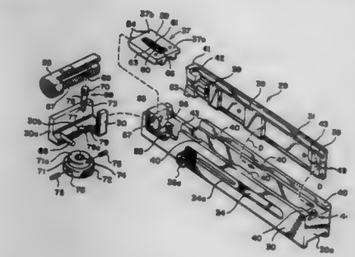
MACHINE GUN RECEIVER TOP STRAP

Charles W. Goff, 1267 W. 1875 North, Farmington, Utah 84025, and Charles W. Goff, Jr., 479 Laurelwood Dr., Kaysville, Utah 84037

Division of Ser. No. 580,366, Feb. 15, 1984, Pat. No. 4,573,394. This application Nov. 25, 1985, Ser. No. 801,222

Int. Cl.⁴ F41C *11/00*

U.S. Cl. 89—199 **5 Claims**



1. An arrangement for maintaining a top strap in covering engagement over an open top portion of a receiver of a weapon that includes a feed block comprising, with a gun that includes a rectangular shaped receiver that mounts a feed block in a forward end thereof to be adjacent to a barrel breech of an assembled gun, which receiver is open along a top portion that is stepped upwardly from said feed block mount for supporting a bolt therein; a top strap formed to fit in covering engagement over the receiver stepped up portion such that a forward end of said top strap will overlap the feed block rearmost edge to maintain said feed block edge positioning in said receiver, which top strap includes flange sections that extend horizontal outwardly, at spaced intervals, from along opposite longitudinal sides of said top strap undersurface; in the receiver, spaced apart horizontal inwardly projecting rail sections formed at intervals along longitudinal sides of the receiver upwardly stepped top portion to accommodate said flange sections for fitting therebetween to slide along said rail section undersurfaces as the top strap is moved longitudinally to a covering attitude; and means on the receiver distal end for releasably maintaining the top strap in its receiver covering attitude.

4,638,717

COMBINATION OF CUSHION, ADJUSTER AND SIDE PORTS IN A SINGLE UNIT ROTARY ACTUATOR

Paul Carr, Massillon, Ohio, assignor to Flo-Tork, Inc., Orrville, Ohio

Filed Feb. 1, 1985, Ser. No. 697,345

Int. Cl.⁴ F15B *15/22, 15/24*

U.S. Cl. 91—26 **9 Claims**

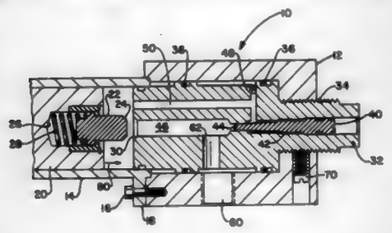
1. A fluid controlled actuator including a housing defining a first cylinder with a linear moving driving piston therein which is characterized by:

a separate cylinder head fixedly defining a second cylinder and attached to the housing with the respective cylinders in alignment;

an adjuster piston slidably received in the aligned cylinders;

means to control and lock the linear position of the adjuster pistion at a desired location within the aligned cylinders, thus limiting the length of travel of the driving piston;

means to provide cushioning of the termination of the driving piston stroke by mechanism associated with the respective pistons themselves, said means comprising a spring pressed pin reciprocable in a cavity in said driving piston and projecting beyond the end thereof, a first passage in said adjuster piston in axial alignment with said



pin, said first passage being normally open at the inner end of said adjuster piston and being closed by said pin as said driving piston approaches the forward end of its travel, second passage means extending through said adjuster piston from the inner end thereof to said first passage means, and an adjustable needle in said adjuster piston for restricting the flow of fluid through said second passage means;

a first side port extending through the cylinder head in a direction transverse to the direction of piston movement to provide fluid pressure to said driving piston; and

a second side port extending transversely through the adjuster piston and communicating with said first passage means and said first side port.

4,638,718

FLUID-PRESSURE DRIVING DEVICE

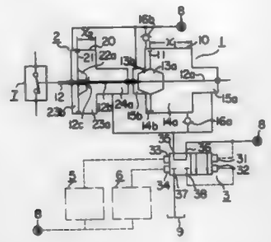
Ichiro Nakamura, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 25, 1984, Ser. No. 664,847

Claims priority, application Japan, Oct. 28, 1983, 58-200924

Int. Cl.⁴ F15B *15/17*

U.S. Cl. 91—178 **5 Claims**



1. A fluid-preasure driving device having a control valve means operable in response to an operation instruction and an actuator means in which actuating power is produced by a pressurized working fluid from the control valve means, said actuator means comprising:

a main actuator unit displaceable over a predetermined stroke;

an accelerating actuator unit separate from and coaxially disposed in relation to said main actuator unit and having a smaller stroke displacement than that of said main actuator unit;

said main actuator unit having a piston, a rod, and fluid chambers on both sides of said main actuator unit piston;

said accelerating actuator unit having a piston and fluid chambers on both sides of said accelerating actuator unit piston, which is displaceable along said rod such that both pistons move together in a low accelerating speed range while only said main actuator unit piston moves after acceleration beyond the range; and

one of said chambers of said main actuator unit communicate with a source of the pressurized working fluid through a check valve, while the remaining chamber of said main actuator unit communicates with the source of pressurized working fluid through another check valve, said piston of said main actuator unit having a projecting cushioning portion, one of said chambers of said accelerating actuator unit communicates with the source of said pressurized working fluid while the other of said chambers of said accelerating unit communicates with said control valve means, wherein said control valve means drives said main actuator unit and said accelerating actuator unit in response to an operation instruction.

4,638,719

UNBALANCED HYDRAULIC AMPLIFIER VALVE ASSEMBLY

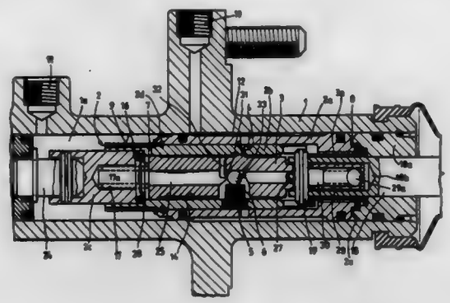
Günter Leineweber; Rolf Warnecke, both of Gifhorn, and Heinz Rühmer, Wolfenbüttel, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Oct. 30, 1985, Ser. No. 792,833

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1984, 3440292

Int. Cl.⁴ F15B *9/10*

U.S. Cl. 91—373 **4 Claims**



1. In a pressure-unbalanced hydraulic amplifier valve assembly including a housing provided with a housing bore having a longitudinal axis; an amplifier piston axially slidably received in said housing bore and having an axially extending piston bore; means for maintaining a hydraulic system pressure in one part of said housing bore; means defining a control port in said amplifier piston; said control port being asymmetrical relative to a circumference of said amplifier piston; a control plunger axially slidably received in said piston bore with a sufficiently loose fit to provide for a slight radial excursion of said control plunger relative to said amplifier piston; said control plunger being arranged for cooperating with said control port; a transverse piston supported in said amplifier piston for sliding motions radially relative to said axis; said transverse piston being exposed to said system pressure; a first force-transmitting means being in engagement with said transverse piston and said control plunger for pressing said control plunger, in a zone of said control port, radially against said amplifier piston; a pressure piston axially slidably supported in said housing axially adjacent said control plunger; said pressure piston being arranged for exposure to an external axial force oriented towards said control plunger; and a second force-transmitting means for applying said external axial force from said pressure piston to said control plunger; the improvement wherein said control plunger has an inner wall defining a throughgoing axial plunger bore including an axially linear track; said first force-transmitting means comprising a ball being in contact with said transverse piston and with said track and being arranged for rolling engagement with said track; said second force-transmitting means comprising a first pin held in said pressure piston and a second pin held in said control plunger adjacent said first pin; said first and second pins being oriented transversely to one another and being in a substantially point-contact with one another; a spring means for urging said first and second pins into contact with one another; said spring means having first and second ends; and an insert placed between said first pin and said first end of said spring; said insert having a planar end face being oriented towards and in contact with said first end of said spring means; said second end of said spring being supported by said control plunger.

4,638,720

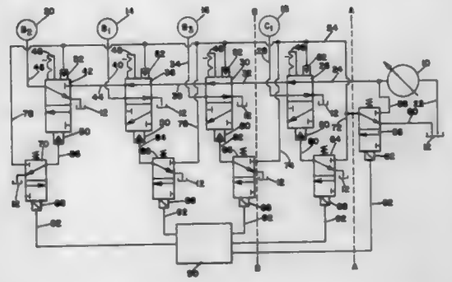
ELECTRO-HYDRAULIC CONTROL SYSTEM

Kevin D. McKee, Waterloo, and Charles W. Formwalt, Jr., Janesville, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 1, 1980, Ser. No. 211,486

Int. Cl.⁴ F15B *11/00*

U.S. Cl. 91—522 **12 Claims**



1. An electro-hydraulic control system for a hydraulic system having a plurality of functions, the control system comprising:

a plurality of two-position control valves for controlling the flow of fluid to and exhaust of fluid from the plurality of hydraulic functions;

first and second servo means associated with each control valve responsive to fluid pressure to move the control valve to first and second positions, respectively;

a two-position, solenoid-operated, reset valve for controlling the flow of fluid to and exhaust of fluid from the second servo means of the plurality of control valves; and

a two-position, solenoid-operated, pilot valve associated with each control valve for controlling the flow of fluid to and exhaust of fluid from the first servo means of the associated control valve.

4,638,721

PRESSURE RESPONSIVE DEVICE

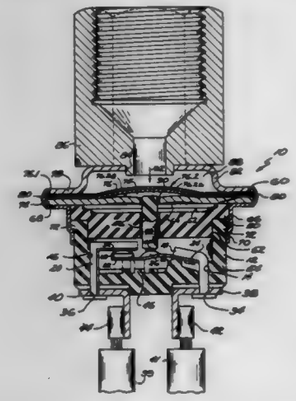
Henry J. Boulanger, Cumberland, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 24, 1980, Ser. No. 171,682

Int. Cl.⁴ H01H *35/34*

U.S. Cl. 92—6 D **7 Claims**

1. A pressure responsive device comprising a preformed dished metal diaphragm having a domed central part and a flange part and having the domed central part of the diaphragm joined to the flange part at a location extending in a plane to mount the diaphragm, the domed central part of the diaphragm originally having a concave side and a convex side upstanding from said plane and being adapted to move from an original dished configuration toward an inverted dished configuration to tend to pass through said plane with snap action in response to application of a selected pressure to the originally convex side of the diaphragm to perform a control function, characterized in that support means engage and mount the flange part of the diaphragm at said plane and in that a portion of the support means extends up through that plane into the space defined by the originally concave side of the original dished configuration of the domed central part of the diaphragm adjacent at least a portion of the domed central part



of the diaphragm extending around the periphery of the domed central part of the diaphragm, said portion of the support means being originally spaced from the concave side of the domed central part of the diaphragm but being disposed for intercepting and engaging said portion of the diaphragm extending around the periphery of the domed central part of the diaphragm on said originally concave side of the diaphragm within said space during such snap-acting movement to limit snap acting movement of said periphery of the domed central part of the diaphragm and to positively support and prevent movement of at least said peripheral portion of the domed central part of the diaphragm through said plane for avoiding the development of excessive stresses in that peripheral portion of the domed central part of the diaphragm.

4,638,722

BELLOWS

Barbara Schneider, Landsham; Kurt Hennig, Munich, and Manfred Klein, Ismaning, all of Fed. Rep. of Germany, assignors to Gebr. Hennig GmbH, Ismaning, Fed. Rep. of Germany

Filed Nov. 22, 1982, Ser. No. 443,468

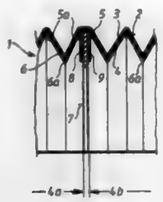
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1981, 3149428

Int. Cl.⁴ F01B *19/00*

U.S. Cl. 92—42 **19 Claims**

1. An elongate bellows comprising a pleated outer cover member and a correspondingly pleated inner cover member having confronting portions secured to each other, said inner cover member having a length greater than that of said outer

cover member, said inner cover member having its excess length taken up by longitudinally spaced apart flap-like sections that are unsecured to said outer cover member and extend transversely and inwardly of said outer cover member.



4,638,723

REDUCED PRESSURE CONTROL DEVICE FOR MOVING A MOVABLE MEMBER BETWEEN THREE POSITIONS

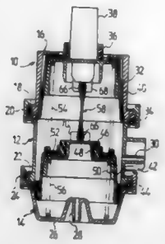
Jean-Francois Bouvot, Dampierre, and José Leborgne, Trappes, both of France, assignors to Valeo, Paris, France

Filed Aug. 1, 1984, Ser. No. 636,739

Claims priority, application France, Aug. 10, 1983, 83 13182

Int. Cl.⁴ F01B *19/00*

U.S. Cl. 92—48 **5 Claims**



1. A reduced pressure control device for moving a movable member between three position, the device comprising:

a housing defined by surrounding walls including an end wall;

first and second flexible and deformable membranes fixed inside the housing to form first and second independent sealed chambers inside the housing, the first chamber extending between the first and second membranes, and the second chamber extending between the second membrane and the end wall of the housing;

a movable member extending through a wall of the housing remote from the end wall;

a first cup mounted on the first membrane and connected to the movable member to move said movable member;

a second cup mounted on the second membrane and connected to the first cup by a link having predetermined maximum and mimimum lengths;

a first spring interposed between the two cups;

a second spring interposed between the second cup and the end wall of the housing; and

first and second orifice means for connecting said first and said chambers respectively to atmospheric pressure or to a source of reduced pressure;

the improvement wherein the said link between the first and second cups is a flat single-piece strip of rigid material having opposed ends and being non-extensible and elongate in form, the strip having a portion of reduced thickness centrally between its ends defining a folding hinge, the link being capable of assuming an extended position between the first and second cups which are then separated by a predetermined maximum distance, and also being capable of assuming a folded position of greater that 90° between the cups which are then separated by a minimum distance, and a transverse disk integral with the strip at one of its ends, said strip having a second portion of reduced thickness between the strip and the disk defining a second folding hinge whereby said link is capable of assuming a folded position relative to said disk, said transverse disk having resiliently deformable tabs for snap fitting to one of the cups, said one cup including aperture means defined therethrough for receiving said resiliently deformable tabs and locking said transverse disk to said one cup, said resiliently deformable tabs being integrally formed with said transverse disk and projecting outwardly relative to said strip from peripherally spaced points about said disk, said one cup to which said tabs are snap-fitted comprising said first cup and including an annular sleeve extending outward and terminating in an open end receiving said deformable tabs therethrough, said aperture means being defined laterally through said sleeve inward of the open end thereof.

4,638,724

DEVICE FOR PRODUCING MECHANICAL FORCE BY PRESSURE OF A FLUID

Manfred Emmert, Postfach 12, 7859 Efringen-Kirchen, Fed. Rep. of Germany

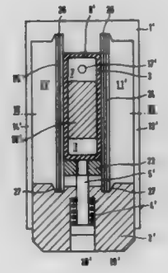
Division of Ser. No. 563,412, Nov. 29, 1983, Pat. No. 4,543,877.

This application Jun. 3, 1985, Ser. No. 740,693

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212155; May 5, 1982, 3216753; PCT Int'l Appl., Mar. 24, 1983, PCT/DE83/00055

Int. Cl.⁴ F16J *1/10, 3/00*; F01B *19/00*

U.S. Cl. 92—84 **9 Claims**



1. A device for producing mechanical force by means of a pressure fluid comprising:

(a) a cylinder (**1**) having two side walls (**9, 10**) with surfaces (**11, 12**) which are plain-parallel to each other and having a lower side wall (**8**) at right angle to said two side walls (**9, 10**);

(b) a piston (**2**) in said cylinder (**1**) between said two surfaces (**11, 12**) and guided by said cylinder (**1**) for movements along said two surfaces (**11, 12**);

(c) an elastic cylindrical sleeve (**3**) having two opening edges, said sleeve being arranged in said cylinder (**1**) between said lower side wall (**8**) and said piston (**2**) with its edges in sealing contact with said two surfaces (**11, 12**);

(d) at least one bore (**17**) for said pressure fluid in one of said two side walls (**9, 10**) communicating with the interior (**7**) of said sleeve (**3**);

(e) flat springs (**24, 25, 36**) being arranged between said lower side wall (**8**) and said piston (**2**) and resting against an area of the outer surface of said sleeve (**3**) to deform said sleeve (**3**);

said flat springs (**24, 25, 36**) being deformed by said sleeve (**3**) when pressure fluid is supplied in its interior (**7**) increasing its volume by moving said area laterally towards said flat springs (**24, 25, 36**), whereby piston (**2**) moves as a result of the deformation of said flat springs (**24, 25, 36**).

4,638,725

LIGHT ALLOY PISTON

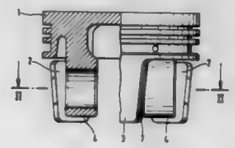
Emil Ripberger, Remseck, and Gotthard Stuska, Fellbach, both of Fed. Rep. of Germany, assignors to Mahle GmbH, Fed. Rep. of Germany

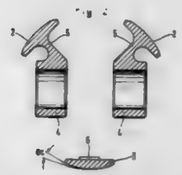
Filed Feb. 13, 1986, Ser. No. 828,789

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1985, 3505037

Int. Cl.⁴ F16J *1/04*

U.S. Cl. 92—237 **4 Claims**





1. A light alloy piston for internal combustion engines comprising

(a) a piston crown,

(b) a skirt depending from said crown and having external surfaces for sliding engagement within a cylinder bore,

(c) a pair of gudgeon pin bosses suspended freely on the piston crown and a skirt, which bosses except for a narrow ring land beneath the lowermost piston ring groove lying above the gudgeon pin bores, consist merely of segments covering individual partial zones of the piston circumference,

(d) two guide plates provided on one of the bearing sides of the piston as skirt elements,

(e) ribs for supporting said guide plates on the gudgeon pin boss respectively, each rib extending in the longitudinal direction of the piston, with outer surfaces adapted to the cylinder bore surface which extend circumferentially, seen from the diagonal plane lying at 45 degrees between gudgeon pin plane and connecting rod oscillation plane, each through about 15–25 degrees to both sides, and

(f) a single guide plate formed on to the ring part section of the piston head part on the opposite bearing side as a skirt element and beyond the narrow ring land lying beneath the lowermost ring groove, which guide plate reaches in the piston longitudinal direction at least to the level of the gudgeon pin axis and extends circumferentially 10 degrees to 25 degrees to each side of the plane of oscillation of the connecting rod.

4,638,726

LOAD BEARING SWAB CUP

Phil E. Johnson, and Robert K. Brock, both of Arlington, Tex., assignors to LTV Energy Products Company, Dallas, Tex.

Filed Apr. 10, 1985, Ser. No. 721,911

Int. Cl.⁴ F16J *9/00*

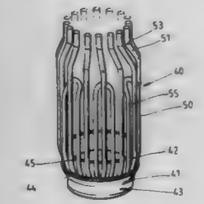
U.S. Cl. 92—241 **14 Claims**

1. An improved reinforcement cage assembly for use in the manufacture of a load lifting swab cup, said swab cup including an elastomeric material bonded to said reinforcement cage assembly, said swab cup having an axial bore therethrough and being configured to be fittably received by a supporting mandrel, said reinforcement cage assembly comprising:

(a) a metal base assembly including inner and outer ring members;

(b) a plurality of axially disposed reinforcing wire members, at least one end of each of said wire members being retained between said inner and outer ring members;

(c) a first portion of said plurality of axially disposed reinforcing wire members extending for the entire axial length of said swab cup; and



(d) a second portion of said plurality of axially disposed reinforcing wire members extending less than the entire axial length of said swab cup said second portion of said plurality of axially disposed reinforcing wire members comprising reinforcing wires configured such that both ends of each reinforcing wire of said second portion are retained between said inner and outer ring members of said base assembly.

4,638,727

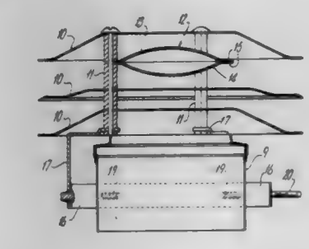
CHIMNEY COWLS

Arthur W. Mitchell, "Sandyacre", 18 Ballyardle Road, Kilkeel, County Down, Northern Ireland

Filed Aug. 22, 1983, Ser. No. 525,396

Int. Cl.⁴ F23L *17/12*

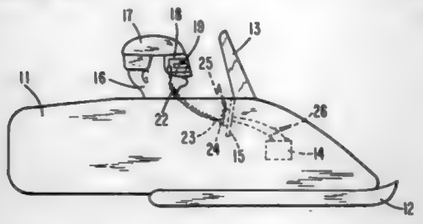
U.S. Cl. 98—79 **4 Claims**



1. Means for clamping to a chimney outlet, said outlet having an outside surface, an inside surface and a top surface, a chimney cowl comprising a series of annular vanes lying in spaced horizontal planes, the uppermost and lowermost of which are parallel and substantially frusto-conical in shape, said vanes having central apertures and centered about a common axis and arranged in a predepernimed vertical spaced relationship, a plurality of supports connected to said vanes and positioned parallel to and radial of said axis, respective brackets connected to said supports, the lower two of said vanes converging toward their centers to form a venturi at their inner peripheries, and a device of aerodynamic shape mounted co-axially with the vanes and located between the upper two vanes, the device being circular in plan and masking the central apertures in the vanes and having upper and lower convex air-deflecting walls arranged base-to-base about said common axis, the upper walls of the device being parallel or substantially parallel to the uppermost and lowermost vanes, the means comprising a clamping ring formed by an annular surround spaced below and connected via said brackets to said supports beneath said lowermost vane, and having provided

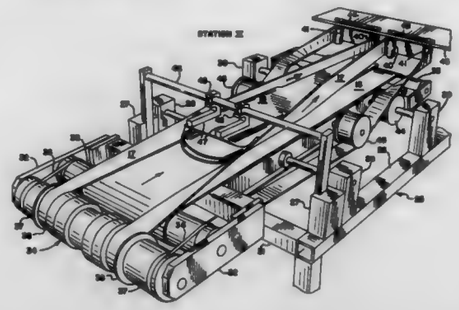
therein two or more tapped bores each engaged by a screw-threaded element for urging inwardly against the outside surface of a chimney outlet whereby said cowl is mounted on said outlet without contact with or extending within the confines of the inside surface of the chimney outlet, said supports contacting said top surface and said screw-threaded elements contacting said outside surface.

4,638,728
VISOR DEFROSTER
Allen Elesewski, Rte. 2, 2270 15th La., Friendship, Wis. 53934
Filed Jul. 31, 1985, Ser. No. 760,988
Int. Cl.[4] B60H *1/03*
U.S. Cl. 98—2.08 **22 Claims**



1. In combination, an optically transparent face shield adapted to be mounted on a helmet of the type worn by an outdoor open air vehicle operator, a resistance heating coil fixedly secured on a first surface of the visor, the first visor surface being the visor surface in closest proximity to the face of the operator, said coil having a tortous path that does not interfere with the field of view of the driver and including horizontally and vertically extending segments, adjacent ones of the horizontally extending segments having ends in proximity to edges of the visor and being electrically connected to each other by the vertically extending segments, an electric connector housing fixedly attached to a lower corner of the visor on a second surface of the visor opposite from the first surface, the bottom horizontally extending segment having an end terminating at and electrically connected to a first terminal of the connector housing, said end of the bottom horizontally extending segment not being connected to a vertically extending segment, the vertically extending segment connected to an end of the top horizontally extending segment on the same side of the visor as said end of the bottom horizontally extending segment having a bottom end electrically connected to a second terminal of the connector housing, the bottom end of the vertically extending segment not being connected to a horizontally extending segment, the connector housing being located to the side of and approximately at the same horizontal level as the mouth of the pertor when the shield is being worn, a cable having first and second lead wires, connector means for respectively electrically connecting one side of the first and second lead wires to the first and second terminals, a second side of the first and second lead wires respectively terminating on a center metal pin and exterior metal taps of a male electric connector jack adapted to be connected to a female electric connector jack fixedly mounted on an open air vehicle having a power supply connected to the female jack, the connections of the cable to the jack and to the connector means and the cable length and configuration being such that (a) the operator wearing the visor while the cable is connected to the connector means and the jacks so the element is energized by the power supply is able to move normally in a cockpit of the vehicle without affecting the electric connection between the jacks, the cable and the connector means, (b) the male jack pulls out of the female jack without affecting the connection of the cable to the element via the terminal means in response to a sudden force exerted on the cable, as in the case of the operator encountering an emergency, and (c) the cable is not pulled from the connector means when it contacts unavoidable obstructions.

4,638,729
TORTILLA FOLDER
Gary C. Woodworth, Davenport, Iowa, and Gary F. Roberts, Colona, Ill., assignors to The Kartridg Pak Co., Davenport, Iowa
Filed Dec. 4, 1985, Ser. No. 804,814
Int. Cl.[4] A21C *9/00, 11/00*
U.S. Cl. 99—450.6 **6 Claims**

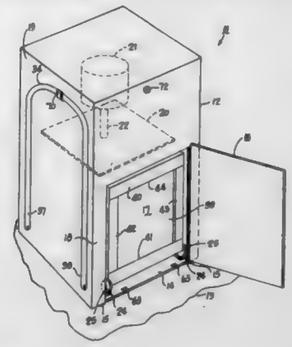


1. In apparatus for forming a dough sheet so as to enclose therein a foodstuff filling comprising, conveyor means and folding means for folding a dough sheet which as it is being conveyed has a leading portion, a trailing portion and opposite side portions so as to enclose a foodstuff filling deposited thereon and wherein the leading portion of the sheet as it is being conveyed is first folded over said filling with the resulting fold extending generally transversely to the conveying direction and thereafter the opposite side portions of the sheet are infolded upwardly, inwardly and downwardly with the resulting side folds extending generally parallel to the conveying direction;
infolding means comprising, in combination,
a conveyor having a generally horizontal upper run;
side belts having opposing runs extending along opposite sides of said upper run with each of said side belts runs being generally co-planar with the upstream end of said upper run of said conveyor and twisting spirally through at least 90° in an upward and inward direction so as to be inwardly convergent approaching the downstream end of said upper run; and,
stationary elongated dough sheet engaging means disposed lengthwise over said upper run of said conveyor and between said side belt runs, said dough sheet engaging means having elongated opposite side surfaces against which said side portions of said dough sheet are slidably pressed by said side belts during said infolding thereof.

4,638,730
TRASH COMPACTOR
Robert W. Bonacorsi, North Canton, Ohio, assignor to Phillips Home Products, Akron, Ohio
Filed Oct. 4, 1985, Ser. No. 784,317
Int. Cl.[4] B30B *15/06*
U.S. Cl. 100—229 A **18 Claims**

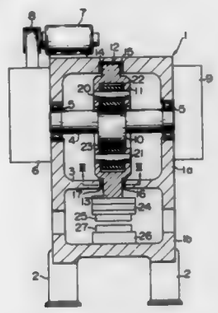
1. A trash compactor comprising, in combination:
a cabinet having upper and lower portions and adapted to rest on a floor;
a wheeled bin receivable inside the lower portion of the cabinet;
a compactor mechanism in the upper portion of said cabinet adapted to compact trash in the bin;
first and second wheels;
means journaling said first and second wheels on said bin;

generally vertical lost motion means acting between said journal means and said bin permitting the two wheels to be moved upwardly relative to said bin at least when said bin is in said cabinet and acted on by said compactor mechanism;
a bin support in said cabinet above the floor;
said lost motion means permitting said two wheels to be moved upwardly relative to said bin and establishing said



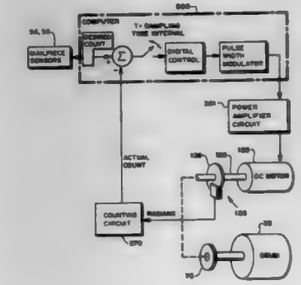
two wheels rollable on said bin support as the bin is pushed into the cabinet, and conversely permitting the wheels to drop downwardly a limited extent as the bin is withdrawn from said cabinet; and
reaction means acting between said bin and said journal means to establish the wheels in a downward position whereby the wheeled bin may be withdrawn from the cabinet and be supported on the wheels for rolling engagement with the floor.

4,638,731
PRESS MACHINE
Heizaburo Kato, Shizuoka, Japan, assignor to Sankyo Manufacturing Co., Ltd., Tokyo, Japan
Filed Oct. 18, 1985, Ser. No. 789,276
Claims priority, application Japan, Jun. 14, 1985, 60-89827[U]; Jun. 14, 1985, 60-89828[U]; Jun. 14, 1985, 60-89829[U]
Int. Cl.[4] B30B *1/06*
U.S. Cl. 100—282 **5 Claims**



1. A press machine comprising:
a frame;
a horizontal input shaft rotatably carried by said frame rotationally driven by a driving system;
a cam means including at least one cam mounted on said input shaft;
a cam follower means including a cam follower slide embracing said cam and mounted on said frame for free vertical movement, said cam follower slide being adapted to be moved reciprocatingly up and down in accordance with the rotation of said cam;
a movable die portion fixed to the lower end of said cam follower slide; and
a stationary die portion provided on the bottom of said frame for cooperation with said movable die portion;
wherein said cam has a contour which approximates a spherical regular polygon having 2n+1 apices (n being an integer) which are rounded, the surfaces of the sides of said spherical regular polygon being formed by the same curve, and
wherein said cam slide includes a hub projecting upwardly from the top thereof and a shaft projecting downwardly from the bottom thereof, said hub and said shaft being supported vertically slidably by means of metals mounted on said frame.

4,638,732
SHEET HANDLING APPARATUS
Edilberto I. Salazar, Brookfield, and Wallace Kirschner, Trumbull, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.
Filed Jan. 18, 1985, Ser. No. 692,755
Int. Cl.[4] B41K *3/48, 3/64*
U.S. Cl. 101—91 **11 Claims**



1. Sheet handling apparatus comprising:
a. means for feeding a sheet in a predetermined path of travel, the sheet having a reference edge;
b. means for sensing the reference edge of the sheet in the path of travel and providing at least one sensing signal indicative of the velocity thereof;
c. rotary printing means for printing postage indicia on the sheet; and
d. means for controlling the printing means, the sensing means coupled to the controlling means, the controlling means including microcomputer means constructed and arranged to be energized from a local source of supply of power, the microcomputer means including means responsive to said at least one sensing signal for providing a time delay before commencement of operation of the printing means, the microcomputer means including means for controlling the angular velocity of the printing means in consideration of sampled increments of angular velocity thereof to cause the postage indicia to be printed on the sheet a predetermined marginal distance from the reference edge of the sheet, the controlling means including keyboard means coupled to the microcomputer means, the keyboard means including at least one key selectively operable for generating at least one key signal representative of a desired change in the marginal distance, the microcomputer means including means responsive to said key signal for providing an adjusted time delay before commencement of operation of the printing means whereby the printing means is controlled to cause the postage indicia to be printed on the sheet a changed mar-

ginal distance from the reference edge of the sheet, the changed marginal distance including the predetermined distance changed by the desired change in the marginal distance, and the microcomputer means including non-volatile memory means for storing therein an amount representative of the desired change in marginal distance when the microcomputer means is de-energized.

4,638,733

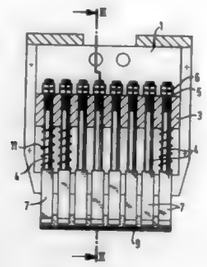
SQUEEGEE HEAD FOR PRINTING OF BODIES BY THE SCREEN PRINTING METHOD

Günther Schneider, Tettau/Langenau, and Artwin Priebisch, Stockheim, both of Fed. Rep. of Germany, assignors to Horst Rebhan, Stockheim-Wolferdorf, Fed. Rep. of Germany

Continuation of Ser. No. 572,584, Jan. 20, 1984, abandoned. This application Dec. 5, 1985, Ser. No. 805,409

Int. Cl.⁴ B41F *15/44*

U.S. Cl. 101—114 **9 Claims**



1. A squeegee head assembly for printing by the screen printing method, said squeegee head assembly comprising an elongated squeegee rubber having a contact edge and a base edge and a holder retaining said base edge of said rubber, said holder including a plurality of clamp heads, each clamp head being connected at an individual point along the length of said base edge, said holder further including a holder mounting strip having bores therein, a plurality of holder members comprising rods mounted parallel to each other and each slidably in one of said bores for independent reciprocating movement in said bores, respectively, during a printing operation, individual biasing means mounted on each of said rods between said clamp head and said holder mounting strip to yieldingly bias said clamp heads individually in a contact direction, means connecting each of said rods to one of said clamp heads, and adjustable stop means carried by each of said rods on the end remote from said clamp head, said rubber base edge being fixed to said independently moveable clamp heads at said points along the length of said rubber, said rubber contact edge being urged thereby yieldably against a working surface, thereby being conformed to said surface during said printing operation.

4,638,734

ARRANGEMENT FOR PRINTING MACHINE PLATE CYLINDER ZERO POSITION ADJUSTMENT

Stefan Grossmann, Radebeul, and Erhard Nitzsche, Dohna, both of German Democratic Rep., assignors to EB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

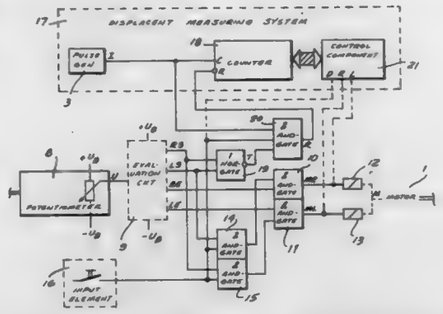
Filed Mar. 4, 1986, Ser. No. 836,235

Claims priority, application German Democratic Rep., Mar. 4, 1985, 273756

Int. Cl.⁴ B41F *13/14, 33/06*

U.S. Cl. 101—248 **3 Claims**

1. An arrangement for controlling the operation of a motor, which has a mechanical output connected by a transmission to a plate cylinder of a printing machine and electrical inputs connected to respective protection devices for the two senses of rotation of the motor, during the adjustment of the plate cylinder to a zero position, comprising potentiometer means for detecting and issuing an electrical signal representative of the instantaneous position of the transmission; an evaluation circuit having an input connected to said potentiometer means and four outputs and operative for generating and presenting at the respective ones of said outputs respective control signals for a right-hand end position, for a left-hand end position, for a right-hand switching point, and for a left-hand switching point; an input element for the zero position; a plurality of AND-gates interposed between said evaluation circuit outputs and the protection devices and connected to said input ele-



ment; an incremental displacement measuring system including a pulse generator having an output and a counter having a counting input connected to said pulse generator output and a resetting input; a NOR-gate having inputs connected to those of said outputs of said evaluation circuit which carry said switching point control signals, and an output; and another AND-gate having inputs respectively connected to said NOR-gate output, to said input element, and to said pulse generator output, and an output connected to said resetting input of said counter.

4,638,735

COMBUSTION INHIBITOR BASED ON AN ALIPHATIC POLYURETHANE ELASTOMER FOR A PROPELLANT, AND BLOCK COATED WITH THIS INHIBITOR

André E. Lelu, Saint-Medard en Jalles; Jean R. Grignon, Pessac; Bruno F. Gonthier, Saint-Medard en Jalles, and Jean-Michel Tauzia, Caychac, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed May 17, 1985, Ser. No. 735,368

Claims priority, application France, May 17, 1984, 84 07657

Int. Cl.⁴ C06B *45/28, 45/22, 45/18*

U.S. Cl. 102—290 **9 Claims**

1. Combustion inhibitor composition for a solid propelling composition, said combustion inhibitor composition comprising an aliphatic polyurethane obtained by the reaction of at least one polyisocyanate with a mixture of at least one polyfunctional polyether polyol having a molecular weight between 400 and 4500 containing at least three hydroxy groups per molecule and at least one difunctional polymer containing two hydroxy groups per molecule, the said combustion inhibitor composition incorporating a gasifiable organic filler or an aliphatic plasticizer, wherein the said difunctional polymer is selected from the group consisting of a lactone polymer having a molecular weight between 500 and 3000 and a tetrahydrofuran polymer having a molecular weight between 600 and 2,000, the molar fractions of the difunctional polymer and of the polyfunctional polyether polyol being determined by the following relationship (I):

$$R = \frac{Mx \cdot \gamma x}{fx} \cdot \frac{fy}{My \cdot \gamma y} > 1 \qquad (I)$$

in which

Mx, γx and fx, respectively, denote the molecular weight, the molar fraction and the number of OH groups per molecule of the difunctional polymer; and

My, γy and fy, respectively, denote the molecular weight, the molar fraction and the number of OH groups per molecule of the polyfunctional polyether polyol,

the proportion of the number of carbon atoms to the number of oxygen atoms in said polyurethane being greater than 4.

4,638,736

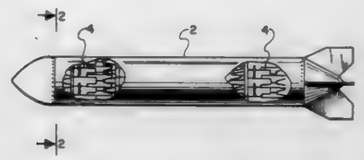
BOMBLET DISPERSION SYSTEM FOR A CLUSTER BOMB

James R. Farmer, Lititz, Pa., assignor to ISC Technologies, Inc., Lancaster, Pa.

Filed Mar. 20, 1984, Ser. No. 591,608

Int. Cl.⁴ F42B *25/02, 25/16*

U.S. Cl. 102—393 **6 Claims**



1. In a cluster bomb comprising a separable canister housing a plurality of bomblets, the canister being formed from a plurality of sections adapted to separate in flight, the bomblets being disposed within the canister to be dispersed over an area when the canister is opened, and a transmission wire arranged in a serpentine path adjacent the bomblets to transmit information signals to the bomblets, the wire being attached to at least one of the canister sections at a plurality of selected locations, the improvement comprising:

explosive means positioned adjacent the transmission wire between successive pairs of attachment locations, and

means for detonating the explosive means upon opening of the canister to sever the transmission wire between its attachment locations, and thereby enable the resulting wire sections to be pulled away from the bomblets by at least one of the canister sections.

4,638,737

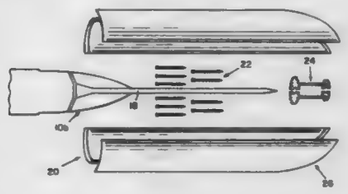
MULTI-WARHEAD, ANTI-ARMOR MISSILE

Pat H. McIngvale, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 28, 1985, Ser. No. 749,847

Int. Cl.⁴ F42B *13/04, 13/50, 15/26*

U.S. Cl. 102—489 **5 Claims**



1. A missile for defeating active armor of a target comprising a missile having a primary warhead and secondary warheads mounted at the front of the missile in nose cone sections with said primary warhead being designed to defeat basic armor of a target and said secondary warheads being designed for defeating explosive charge armor about the basic armor, said secondary warheads being mounted and clustered about a portion of said primary warhead and being encased in a portion of said nose cone sections and with a front most nose cone structure secured to said portion of said nose cone sections, and means mounting said secondary warheads, said portion of said nose cone sections and said front most nose cone structure whereby said secondary warheads can be released in flight to the target as a cluster prior to the main warhead arriving at the target to allow the secondary warheads to destroy explosive charge armor of the target prior to the main warhead delivering its blow to the basic armor of the target.

4,638,738

FIN STABILIZED SUBCALIBER SHELL OF LARGE LENGTH TO DIAMETER RATIO

Bernhard Bisping, Ratingen, and Klaus Borsefeld, Duesseldorf, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH., Duesseldorf, Fed. Rep. of Germany

Filed Oct. 29, 1984, Ser. No. 666,181

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339078

Int. Cl.⁴ F42B *11/08*

U.S. Cl. 102—516 **12 Claims**



1. A fin-stabilized subcaliber armor piercing projectile having a large length to diameter ratio comprising

a metallic rear body,

a metallic middle body, and

a pointed front nose body, all of which are operatively joined to each other;

the middle body is made of metal of high density selected from the group of depleted uranium and tungsten of at least a density of 18 gm/cm^3, of lower ductility but higher brittleness than the metal of the rear body in a binder phase containing iron and nickel

said rear body is made of metal of high density selected from the group of tungsten and depleted uranium in a binder phase containing iron and nickel, said rear body having a density of at least 18 g/cm^3;

the volume of the middle body is substantially equal to the rear body;

the pointed front nose body consists of a metal of high ductility and density which has pyrophoric properties;

the rear body and middle body are joined to each other by butt surfaces and a metal sheathing surrounds said rear and middle bodies at these butt surfaces;

said sheathing extends only to about the middle of the middle body and has a front cutting edge;

said sheathing consists of steel;

said steel sheathing has means on its external periphery for connecting it to a sabot;

the rear body coaxially extends into said sheathing and

fin-stabilization means are mounted on said steel sheathing; and

said middle body and rear body are joined by hard welding to each other.

4,638,739

SABOT FOR AN ELECTROMAGNETICALLY-ACCELERATED, UNGUIDED HYPERVELOCITY PENETRATOR

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 14, 1986, Ser. No. 829,339
Int. Cl.[4] F42B 13/16
U.S. Cl. 102—520 6 Claims



1. A sabot arrangement for supporting a conically shaped penetrator for launching from a launch tube, said sabot arrangement comprising a forward sabot comprised of a multiplicity of equal segments having a center bore section for engaging the outer surface of the penetrator, and said segments being made of electrical and thermal insulating material, said sabot arrangement also including a base sabot that includes a metallic shell that includes three integral parts that are connected to form a unitary structure and are composed of a central spherical dome, an intermediate toroidal shell section and an outer hoop ring for supporting an outer edge of the toroidal shell section, and a rear cap fitted over the rear end of a portion of said toroidal shell section, said spherical dome and said hoop ring, said cap being made of electrical and thermal insulating material and said dome having a portion for engaging an end of the penetrator for connection thereto.

4,638,740

DEVICE FOR SELECTIVELY COUPLING A MOVABLE LOAD BEARING UNIT TO A LINK CHAIN CONVEYOR FLIGHT

Arthur B. Rhodes, 3347 Camp Ground Rd., Louisville, Ky. 40211

Filed Dec. 30, 1985, Ser. No. 814,808
Int. Cl.[4] B61B 10/04
U.S. Cl. 104—172.2 11 Claims

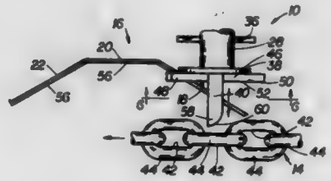
1. A device for selectively coupling and uncoupling a movable load bearing unit to a moving link chain conveyor flight comprising:

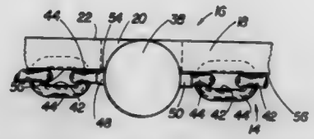
stem means attached to the load bearing unit, the stem means being movable between a raised chain conveyor flight disengaged position and a lowered chain conveyor flight engaged position;

pin means for insertion into the opening of the link chain conveyor flight, the pin means being associated with the stem means for movement therewith, and the pin means being generally rectangular in transverse cross-section;

a planar plate extending perpendicular from the pin means in a forward direction from the front side of the pin means and in a rearward direction from the rear side of the pin means, the bottom surface of the planar plate being adapted to contact the chain links of the chain link conveyor flight to the upstream and downstream sides of the opening in the chain link in which the pin means is inserted when the stem means is in the lowered engaged position; and,

a beveled surface formed in the depending end of the pin means for guiding the pin means into the opening of the





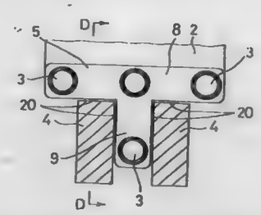
chain link as the pin means moves downwardly into the conveyor flight engaged position.

4,638,741

PRECISION ROLLER ATTACHMENT FOR AUTOMATION PROCESSION

Nobuyuki Tsuboi, 2-1, Okayama 5-Chome, Shijonawate City, Osaka 575, Japan

Filed Sep. 8, 1982, Ser. No. 415,904
Int. Cl.[4] B61B 13/04
U.S. Cl. 105—141 8 Claims



1. A roller device for attachment to an article to facilitate the movement of said article along at least one guide line, said roller device comprising:

(a) an angular frame comprising a plurality of angular members layered in the direction of the motion of said roller device, the number of said plurality of angular members being variable to facilitate precise running of articles of differing shapes, sizes, and weights along said at least one guide line, and said frame having a plurality of recesses in its outer periphery, each aligned normally to said outer perphery, and also having a plurality of rivet holes aligned in the direction of said motion for receiving rivets to unite said angular members, and

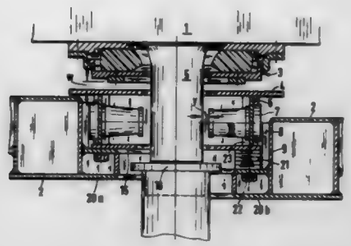
(b) a plurality of rollers mounted in said normal recesses to roll against said at least one guide line in the direction of said motion.

4,638,742

VERTICALLY ADJUSTABLE EMERGENCY SUPPORT OF A CAR BODY

Gerd Potel, and Karl-Heinz Buchholz, both of Nuremberg, Fed. Rep. of Germany, assignors to MAN Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 698,932
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404377
Int. Cl.[4] B61F 5/16
U.S. Cl. 105—199.3 5 Claims



1. A vertically adjustable emergency support for a car body having an emergency spring mounted on an underside of the car body in such a way as to be concentric relative to a center pivot; a striker plate disposed around said center pivot and provided at a distance "w" from said emergency spring; said emergency support comprising:

a box, which is disposed around said center pivot and is connected to that side of said striker plate remote from said emergency spring; said box having side plates disposed at right angles to said striker plate;

guide elements provided on those sides of said side plates remote from said center pivot;

first buffers and second rubber buffers provided on those sides of said side plates facing said center pivot, said first buffers and second rubber buffers, surrounding said center pivot with clearance in the longitudinal and transverse directions of said car body respectively;

a bogie frame likewise disposed around said center pivot, and having a rectangular cutout which is open toward said striker plate;

sliding-contact liners, on which said guide elements are movably guided in a vertical direction as provided therewith; and

means for adjustable fixing said box to said bogie frame in such a way that said distance "w" further exists between said emergency spring and said striker plate even when encountering bearing surface wear.

4,638,743

METHOD OF REINFORCING A COVERED HOPPER CAR HATCH

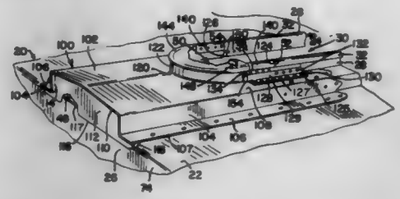
Russell M. Loomis, Palos Heights, Ill., assignor to Railcar Specialties, Inc., Alsip, Ill.

Filed Jul. 18, 1985, Ser. No. 756,291
Int. Cl.[4] B61D 39/00
U.S. Cl. 105—377 21 Claims

1. A process of reinforcing a railroad hopper car having a roof and a rectangular hatch opening through the roof, the hatch including a coaming upstanding from the roof peripheral of the opening and sloping inwardly of the opening, and the hatch having an end including two substantially rectangular corners, the process comprising:

A. removing a section of the roof including the end of the hatch having the two substantially rectangular corners by forming in the roof an aperture extending from said hatch opening, said removing including exposing two ends of the roof coaming that slopes inwardly of the opening;

B. covering said aperture with a planar roof sheet, said covering including aligning an arcuate "U"-shaped cut-out in one end of said roof sheet with said hatch opening to form an arcuate "U"-shaped end of said hatch opening, and said covering including abutting and joining together at two joints the two exposed ends of the roof coaming that slopes inwardly of the opening and the two opposed ends of parallel leg portions of a "U"-shaped coaming web upstanding normal from said roof sheet at said arcuate cut-out; and



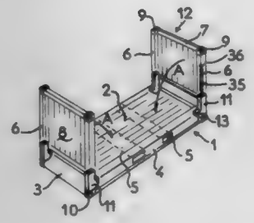
C. bridging each said joint with an elongate reinforcing member, having an elongate base portion, an elongate first portion angled from said base portion and an elongate second portion extending normal to said base portion, by securing said base part of said member to both of said roof and roof sheet, securing to said roof coaming said first portion of said member upstanding from said base at the same angle that the roof coaming slopes from said roof and securing to said coaming web leg portion said second portion of said member upstanding from said base at the same angle that the coaming web stands from said roof sheet.

4,638,744

CORNER MECHANISM FOR COLLAPSABLE CONTAINER

Martin Clive-Smith, 151, Broomwood Road, London, SW11 6JU, England

Filed Feb. 21, 1984, Ser. No. 581,614
Claims priority, application United Kingdom, Feb. 23, 1983, 8304952; Jun. 1, 1983, 8315092
Int. Cl.[4] B65D 19/12
U.S. Cl. 108—56.1 8 Claims



1. A collapsible flat having a loading platform, a stub post extending upwardly form each corner of said loading platform and having an outer profile surface on the upper, outer edge thereof opposite a corner post pivotally mounted about a pivot axis to each tub post so that the corner post is selectively pivotable out of an upright operational position into a collapsed stowed position and vice versa, said stub post being exposed only when the corner post is collapsed, a top handling aperture in the uppermost surface of said stub post, a latching device pivotally mounted between the walls of said corner post and, in the operational position, engaging said stub post to securely hold the corner post in its upright operational posi-

tion, said latching device engaging the outer profile surface of the upper end of said stub post which is the furthest possible point on the stub post as measured diagonally from said pivot axis between the corner post and said stub post, whereby the distance between the pivot point and the latching point is maximized to reduce play in the upright corner post as much as possible.

4,638,745

TELESCOPING DISPLAY STAND

Phil B. Sheffer, New Oxford, Pa., assignor to Merchandising Innovations, Inc., Hanover, Pa.

Filed Nov. 12, 1985, Ser. No. 797,399
Int. Cl.[4] A47B *3/06*
U.S. Cl. 108—111 **9 Claims**



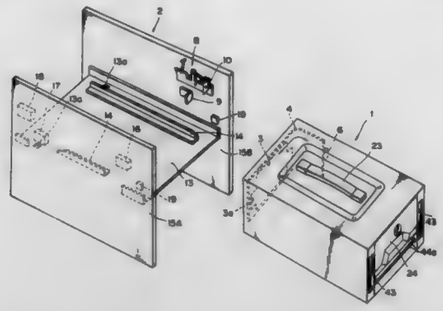
1. A leg assembly for a telescoping display stand wherein said leg assembly comprises,
a first lower zone (80),
said first lower zone (80) having a plurality of sections formed therein via vertical score lines (20),
at least one tab (30) formed on an outer section (11) of said first lower zone,
wherein one of the sections of said first lower zone (80) has at least one slot (40) formed therein, said slot (40) being formed at the same level as said tab (30),
a second upper zone (90) attached to said first lower zone (80) via a vertical score line (20),
said second upper zone (90) extending substantially above said first lower zone (80),
said second upper zone (90) having a plurality of sections formed therein via vertical score lines (20),
wherein one of the sections of said second upper zone (90) has at least one slot (50) formed therein, said slot (50) being formed at the same level as said tab (30) and said slot (40),
means for manually rolling said leg assembly along said vertical score lines (20) such that said at least one slot (40) in said first lower zone (80) overlies said at least one slot (50) in said second upper zone (90),
means whereby said plurality of sections are formed such that said at least one tab (30) may be inserted into said slots (40, 50) to thereby retain the leg in a locked position ready for use,
means whereby upon being in said locked position a ledge (70) is formed between said first lower zone (80) and said second upper zone (90),
said ledge (70) being formed around the entire periphery of said leg assembly when in its locked position,
wherein said leg assembly is comprised entirely of corrugated fiberboard material and requires no separate fastener elements,
wherein said plurality of sections of said second upper zone (90) are of reduced width relative to said plurality of sections in said first lower zone (80) to provide means whereby said second upper zone, upon assembly, may be slidably and securely received into a first lower zone of another identical leg assembly,
wherein said second upper zone (90) is positioned laterally of said first lower zone (80) when said leg assembly is in its flattened position.

4,638,746

DEVICE FOR AUTOMATICALLY OPENING AND CLOSING CASH CONTAINER

Kazuaki Ishigure, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed May 16, 1985, Ser. No. 734,664
Claims priority, application Japan, May 19, 1984, 59-101603
Int. Cl.[4] E05G *1/04*
U.S. Cl. 109—52 **7 Claims**



1. A device for automatically opening and closing a cash container having an opening, comprising:
a rack provided within a cash handling apparatus for receiving the cash container therein,
a shutter provided inside the cash container and slidable along a wall thereof for opening and closing the opening,
a knob attached to the shutter and projecting outward from the cash container,
an opening stopper engageable with the knob when the container is installed into the rack and a closing stopper engageable with the knob when the container is withdrawn from the rack, the stoppers being attached to a side plate of the rack,
a shutter lock lever engageable with a side edge of the shutter when the shutter is in its opening closing position and retainable in the engaging position by a first spring, the lever being provided within the cash container,
a slider provided slidably within the cash container for shifting the lock lever from the engaging position against the first spring,
a lock piece engageable with a portion of the slider for holding the slider immovable and provided with a first magnet, the lock piece being held in the slider engaging position by a second spring, and
a second magnet attached to the rack and operable on the first magnet when the cash container is installed into the rack to shift the lock piece from the slider engaging position.

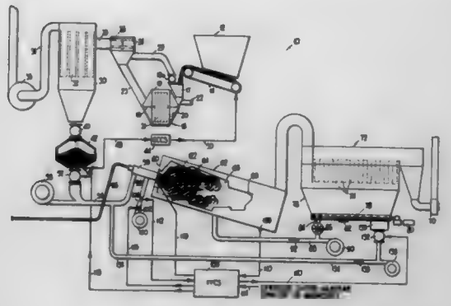
4,638,747

COAL-FIRED ASPHALT PLANT

J. Donald Brock, Chattanooga, and James G. May, Hixson, both of Tenn., assignors to Astec Industries, Inc., Chattanooga, Tenn.

Filed Apr. 1, 1985, Ser. No. 718,070
Int. Cl.[4] F23C *1/10*; B28C *5/06*; F23D *17/00*
U.S. Cl. 110—264 **3 Claims**

1. A coal-fired burner system for use with an asphalt plant having a rotary drum, said burner system comprising:
means for pulverizing coal to particles of a predetermined size;
exhaust means for creating an exhaust airflow through and out of said pulverizing means so that the particles of pulverized coal are entrained in said exhaust airflow and carried out of said pulverizing means;
means for recovering pulverized coal particles from said exhaust airflow;
means in communication with said coal recovery means for storing said pulverized coal particles recovered from said exhaust airflow;
a burner having swirl vanes to provide a cyclonic flame pattern, mounted in one end of said rotary drum;
means for providing a primary flow of air to enter said burner substantially tangentially;
means for introducing said pulverized coal particles from said coal particle storage means into said primary airflow, whereby a mixture of air and coal is delivered into said burner;



means for providing a secondary flow of air to enter said burner substantially tangentially and to mix with said primary airflow with coal particles entrained therein;
means for controlling the rate of said secondary airflow to said burner;
means for detecting said rate of said secondary airflow;
means responsive to a change in said rate of said secondary airflow for changing the rate at which coal particles are delivered from said coal particle storage means into said primary airflow, whereby the rate at which fuel is delivered into said burner is responsive to the rate of said secondary airflow; and
means associated with said burner for igniting said mixture of primary and secondary air with coal particles entrained therein.

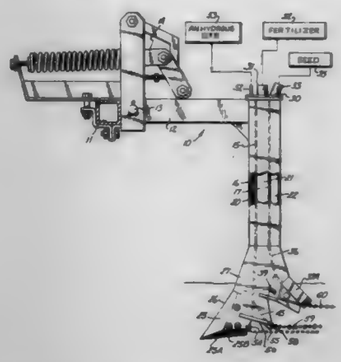
4,638,748

APPLICATOR AND GRAIN DRILL SHANK

Ivyl D. Kopecky, Ypsilanti, N. Dak., assignor to Haybuster Manufacturing, Inc., Jamestown, N. Dak.

Filed Jun. 7, 1985, Ser. No. 742,210
Int. Cl.[4] A01C *23/02*
U.S. Cl. 111—7 **4 Claims**

1. A shank for opening a furrow comprising:
a tubular shank portion having a furrow opening point at a lower end thereof and in a leading position relative to the direction of travel, the shank having a width defining a furrow opening in the earth;
means for providing three uprightly extending passageways in said shank;
a first passageway in said shank comprising a tube carrying gaseous fertilizer material and being positioned immediately to the rear of the furrow opening point at the lowermost part of the furrow being formed, said tube having a first outlet opening at the lower end thereof;
a first sealer plate mounted on and extending laterally outwardly from and rearwardly from said shank immediately above the first outlet opening for said gaseous fertilizer material and to the rear thereof and inclining downwardly in rearward direction to cover the gaseous fertilizer with soil from the surfaces defining the furrow as the gaseous fertilizer material is discharged from the tube;
a second outlet opening leading from a second passageway of the shank immediately above said first sealer plate, said first sealer plate extending rearwardly from the first outlet opening for said gaseous fertilizer material and the second outlet opening being immediately to the rear of the first sealer plate;
a second sealer plate mounted on said shank above said second outlet opening and to the rear thereof with respect



to the direction of travel, said second sealer plate extending laterally outward from the shank and being adapted to cover material discharging from said second outlet opening with soil from surfaces of the furrow formed by the shank, and having a tapered surface means for firmly packing soil to form a packed seed bed, said second sealer plate inclining downwardly in rearward direction; and
a third of the passageways in said shank having a third outlet opening means for permitting seed to be discharged onto the packed seed bed to the rear of the second sealer plate and above the first and second outlet openings.

4,638,749

AUTOMATED SYSTEM FOR SEQUENTIALLY LOADING LOWERMOST SEGMENTS FROM A SHINGLED STACK OF LIMP MATERIAL SEGMENTS

George A. Wood, Lincoln, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Apr. 10, 1986, Ser. No. 850,237
Int. Cl.[4] D05B *21/00*
U.S. Cl. 112—121.12 **7 Claims**

1. A system for selectively loading the lowermost segment of a shingled stack of limp material segments to a seam joining apparatus, each segment including one or more adjacent layers of said limp material, wherein adjacent segments of said stack are laterally offset by a predetermined minimum distance, comprising:
A. an endless belt transport system defining a substantially planar transport surface adapted to support said shingled stack of limp material segments thereon, said belt transport system including an associated means for driving said endless belt transport system to selectively transport said stack in the direction of a reference axis,
B. detection means for detecting when the leading edge of the lowermost segment of said stack passes a reference point along said reference axis,
C. selectively operable extraction means for transporting said lowermost segment in the direction of said reference axis and away from said stack and to said seam joining apparatus,
D. selectively operable limit means for applying a limit force to one or more adjacent segments of said stack including

the next to lowermost segment but not said lowermost segment,

E. controller responsive to said detection means, said controller including means cyclically operative following the loading of a lowermost segment, for:

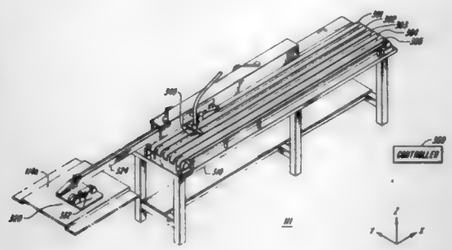
i. controlling the operation of said drive means in a cycle to advance said shingled stack in the direction of said reference axis until the leading edge of the current lowermost segment passes said reference point, and for maintaining said stack stationary otherwise during a cycle,

ii. during a cycle following the time when said leading edge passes said reference point, controlling said limit means to apply said limit force,

iii. in association with the initiation of the operation of said limit means in a cycle, controlling said extraction means to perform said transporting of said lowermost segment

wherein said endless belt transport system includes a plurality of substantially parallel, transversely spaced apart endless belts, the uppermost surface of said plurality of belts defining said transport surface, and

wherein said extraction means includes one or more sets of hinged jaws positioned for movement in the direction of said





reference axis and between pairs of said endless belts, said sets of jaws being adapted to selectively grip a portion of said leading edge of said lowermost segment.

4. A system for selectively loading the lowermost segment of a shingled stack of limp material segments, each segment including one or more adjacent layers of said limp material, wherein adjacent segments of said stack are laterally offset along a reference axis by a predetermined minimum distance, comprising:

A. substantially planar surface adapted to support said shingled stack of limp material segments thereon, in a position whereby the leading edge of said lowermost segment is adjacent to a reference point along said reference axis,

B. selectively operable extraction means for transporting said lowermost segment in the direction of said reference axis and away from said stack, and

wherein said extraction means includes one or more sets of hinged jaws positioned for movement in the direction of said reference axis between said reference point and a point displaced from said reference point along said reference axis, said sets of jaws being adapted to selectively grip a portion of said leading edge of said lowermost segment when said leading edge is adjacent to said reference point.

4,638,750

SEWING MACHINE LOOP TAKER ATTACHING CONSTRUCTION

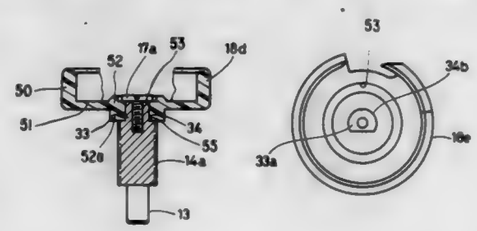
Yoshio Mikuni, Osaka, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Osaka, Japan

Continuation of Ser. No. 615,737, May 31, 1984, abandoned. This application Oct. 23, 1985, Ser. No. 790,645

Claims priority, application Japan, Mar. 9, 1984, 59-34751[U]

Int. Cl.⁴ D05B *57/08, 57/36*

U.S. Cl. 112—230 **12 Claims**



1. A sewing machine loop taker attaching construction attachable to a first rotary shaft for transmitting rotation to said loop taker, said rotary shaft driven by a second shaft through meshing gears carried on said shafts, one of said meshing gears carried on said first rotary shaft being integral with said shaft, comprising a loop taker body having a base portion and a side wall projecting upward from the base portion, said base portion being formed with a central hub having a cylindrical hub wall depending downwardly below the base portion, said cylindrical hub including a socket having a cross-sectional shape in the form of a chipped circle, and a spigot formed in an upper end of the first shaft whose cross-sectional shape is substantially the same as that of said socket so that it is fitted in said socket, said meshing gear being disposed below said spigot, said spigot being of lesser diameter than said meshing gear to define an upwardly facing annular shoulder therewith, said side wall carrying a hook for arresting a needle loop, and means for removably attaching said loop taker body to said first rotary shaft, said attaching means connecting the central hub of the loop taker body to said spigot inserted with said socket with the cylindrical hub wall seated upon said shoulder and said attaching means being accessible from a top side of the loop taker body facing a sewing machine needle for fastening and unfastening the loop taker with respect to the first shaft by removal of the central hub from the spigot without interrupting the meshing state of said gears; and support means for securing said first shaft in an axially immovable position and formed separately from said attaching means to prevent interruption of the meshing state of said gears when said attaching means is operated to remove the loop taker body form the first shaft.

4,638,751

SEWING MACHINE WITH A DEVICE FOR SETTING THREAD TENSION

Susumu Hanyu; Kazumasa Hara, both of Tokyo; Akiyoshi Sasano, Musashino, and Mikio Koike, Ome, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

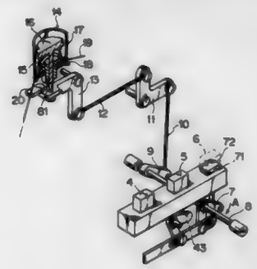
Filed Sep. 3, 1985, Ser. No. 773,198

Claims priority, application Japan, Aug. 31, 1984, 59-180421

Int. Cl.⁴ D05B *63/00, 47/02*

U.S. Cl. 112—254 **5 Claims**

1. In a sewing machine of the type having a machine frame, means for supplying an upper thread, means for supplying a lower thread, and means for setting thread tension, the thread tension setting means comprising selecting means for selecting a thread tension in response to a thickness of a fabric being sewn and mounted to the machine frame; upper thread tension adjusting means positioned on same frame and operatively connected to said selecting means and actuated thereby to adjust the tension of the upper thread in response to the thickness of the fabric; and lower thread tension adjusting means operatively connected to said selecting means to adjust the tension of the lower thread in response to the thickness of the fabric being sewn, said thread tension adjusting means includ-



ing a cup shaped case, a spring receiving member, a spring mounted on said spring receiving member, a disk attached to said case and a first link means interconnected between said selecting means and said thread tension adjusting means, the upper thread being received between said disc and said case from the upper thread supply means.

4,638,752

SEWING MACHINE FOR PRODUCING A STITCH PATTERN

Jürgen Hartwig, Karlsruhe-Durlach, Fed. Rep. of Germany, assignor to Pfaff Haushaltmaschinen GmbH, Fed. Rep. of Germany

Filed Oct. 1, 1985, Ser. No. 782,721

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1984, 3436366

Int. Cl.⁴ D05B *3/02*

U.S. Cl. 112—458 **7 Claims**

1. A sewing machine for producing at least one stitch pattern in a workpiece, the stitch pattern consisting of a plurality of different single stitches which are formed in a sequence, comprising:

stitch forming means for forming stitches in a sequence;

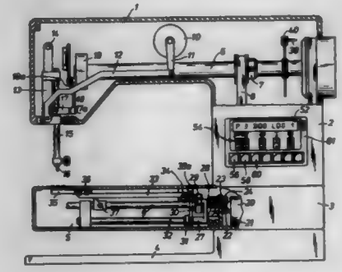
a workpiece feeding mechanism operatively connected to said stitch forming means and having a workpiece feeder, said feeding mechanism including feeder drive means for moving said feeder alternately to execute an active workpiece moving motion and an inactive return motion;

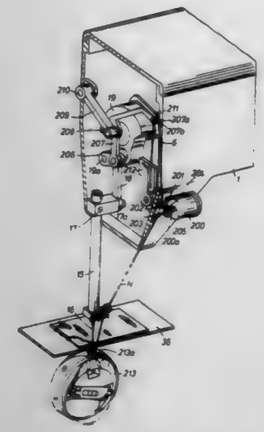
setting means connected to said drive means for varying the size and direction of the feeder motion;

a step motor connected to said setting means for setting said setting means during the inactive return motion of said feeder;

electronic control means connected to said step motor and including a read-and-write memory for receiving into storage the single successive stitches of the stitch pattern; said electronic control means also including means for controlling the displacement amount of said step motor and comparator means for comparing the displacement amount of the step motor to a selected maximum amount; and

means for preventing a stitch formation from the final point of penetration of a stitch and the initial point of penetration of the successive stitch when the displacement amount exceeds the selected maximum amount.





4,638,753

RING SEGMENT SHIP HULL

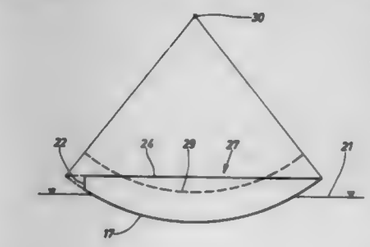
Henry Maruschewski, Dürerweg 11b, D - 2190 Cuxhaven 13, Fed. Rep. of Germany

Filed Jan. 8, 1985, Ser. No. 689,673

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401908

Int. Cl.⁴ B63B *1/00*

U.S. Cl. 114—56 **8 Claims**

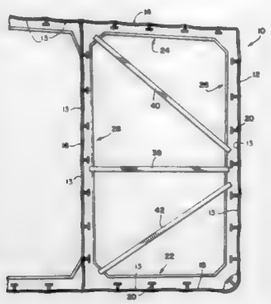


1. A ship's hull configuration as defined by a longitudinal keel line, and a plurality of frame lines taken at equally spaced station planes transverse to the keel line and parallel to each other, characterized by:

(a) the frame lines (10–16) defining circular arcs of equal radius,

(b) the frame lines (11–16) equidistant fore and aft from a central frame line (10) being identically configured to establish fore and aft symmetry,
(c) the keel line (17) defining a circular arc of larger radius than the frame line arcs, and
(d) center points (28) of the frame line arcs lying on a common circular arc defining a constant metacenter line (29) regardless of heel angle, said metacenter line lying in a vertical plane including the keel line, having a common center of curvature (30) with and a smaller radius of curvature than the keel line arc and being concentrically parallel thereto, and said common center of curvature defining a constant longitudinal metacenter,
(e) a submerged portion of the hull lying below a waterline (21) thus comprising a segment of a toroid having a circular cross-section.

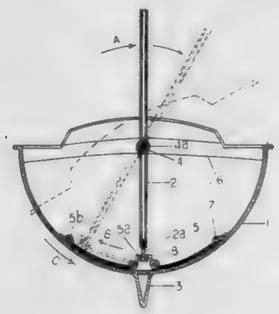
4,638,754
VESSEL HULL AND BULKHEADS CONSTRUCTION EMPLOYING CURVED PLATING
Edmund G. Tornay, 4 E. 95th St., New York, N.Y. 10128
Filed Mar. 27, 1985, Ser. No. 716,689
Int. Cl.[4] B63B *3/00*
U.S. Cl. 114—79 R **6 Claims**



1. A vessel comprising sides, bottom and at least one deck, said sides, bottom and at least one deck formed of welded together rectangular steel plates, said plates being formed to a slight cylindrical curvature the axis of which is parallel to the longer of the edges of the plates, said plates having a recurved cusp portion midway between the long edges and parallel thereto, and girders welded along the recurved cusp portions parallel to the longer edges of the plates.

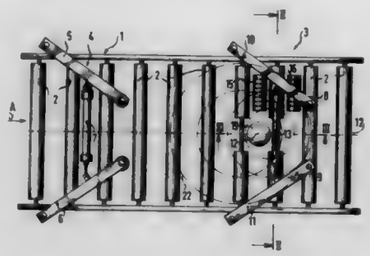
4,638,755
BOAT WITH A SWINGING MAST
Kemal Butka, 372 Central Park West, New York, N.Y. 10023
Filed Jun. 24, 1985, Ser. No. 748,152
Int. Cl.[4] B63B *15/00*
U.S. Cl. 114—91 **4 Claims**

1. A boat, comprising a body having a longitudinal axis; a mast arranged on said body so that under the action of a wind component acting in a lateral direction transverse to said longitudinal axis, said mast turns relative to said body clockwise or counterclockwise; and means for connecting said mast with said body so that when said mast is turned clockwise said mast forcedly turns said body counterclockwise and vice versa, said connecting means including at least two rope members each having a distal end which is connected with said body at a location laterally spaced from said mast and proximal end which cooperates with said mast so that when said mast is



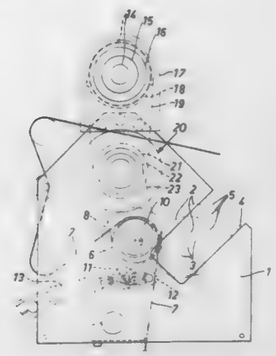
turned clockwise it pulls said rope member clockwise and thereby pushes said body counterclockwise and vice versa.

4,638,756
DEVICE FOR THE POSITIONING OF TIRES
Wilhelm Collmann, Auf der Höhe 25, 2400 Lübeck, Fed. Rep. of Germany
Filed Feb. 5, 1985, Ser. No. 698,424
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406719
Int. Cl.[4] B05C *1/02, 7/06;* **B65G** *47/22*
U.S. Cl. 118—215 **9 Claims**



1. A device for laterally positioning a tire lying on a conveyor, which tire is conveyed individually to a station of the conveyor at which station the lying tire is aligned laterally with respect to a vertical plane of the conveyor extending in the longitudinal direction of the latter by means of stops which are movable between a position above the conveyor to block the passage of the tire thereon and a position allowing the passage of the tire, and at which station the tire is subjected to a processing step, wherein there is provided at least one rotationally symmetrical element forming a stop for the tire when said movable stops are in the position allowing the passage of the tire, said element being rotatable about its longitudinal axis lying parallel to the rotational axis of the tire lying on the conveyor and being movable between a working position in which it stops the tire and a non-working positioning allowing the passage of the tire, said station including at least one support member which is formed roller-like, laterally spaced to one side of said vertical plane, and arranged within a free region of the conveyor, and being rotatable about an axis lying at right angles to said vertical plane, and being liftable against the downwardly directed tire sidewall for the purpose of one-sided tilting of the tire and being lowerable therefrom, whereby, when said support member is lifted, rotation of the tilted tire is caused by virtue of the contact of a region of the tire sidewall still resting on the conveyor, with the conveyor.

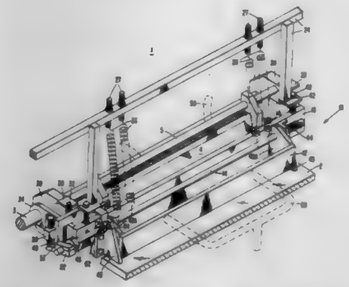
4,638,757
APPARATUS FOR SPREADING JOINTING ADHESIVE ON A PAPER WEB WHICH MAKE ONE SIDE OF A FORM ENVELOPE
Lasse Sandgren, Kerava, Finland, assignor to Oplatek Oy, Leppavirta, Finland
PCT No. PCT/FI84/00077, § 371 Date Jun. 19, 1985, § 102(e) Date Jun. 19, 1985, PCT Pub. No. WO85/01700, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 19, 1984, Ser. No. 756,154
Claims priority, application Finland, Oct. 21, 1983, 833851
Int. Cl.[4] B05C *5/02*
U.S. Cl. 118—411 **9 Claims**



1. In an apparatus for applying jointing adhesive to opposite sides of transverse perforations defining tear lines on a paper web, the combination comprising a rotatably mounted adhesive spreading roll; a rotatable counter roll oppositely disposed to said adhesive spreading roll; means for passing a paper web having transverse perforations at regular longitudinal intervals between said adhesive spreading roll and said counter roll; said adhesive spreading roll having two parallel arrays of adhesive dispensing nozzles with adhesive dispensing distal ends extending lengthwise of said adhesive spreading roll for applying adhesive at regular longitudinal intervals to a paper web; means for supplying adhesive under pressure to said nozzles; and means for altering the radial distance between the adhesive dispensing nozzle distal ends and the axis of rotation of an adhesive spreading roll in said apparatus whereby the interval between the application of adhesive to a paper web by said parallel arrays of adhesive dispensing nozzles is altered.

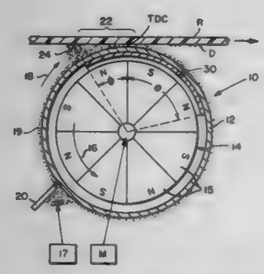
4,638,758
CAPPED PRINTING PLATE MAKING MACHINE
William Bloothoofd, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Feb. 15, 1985, Ser. No. 702,014
Int. Cl.[4] B05C *5/02*
U.S. Cl. 118—412 **14 Claims**

1. In an automatic plate making machine where liquid photopolymerizable resin is applied to a support for making a printing plate, the improvement being said machine being capable of producing a capped printing plate, including a first trough for applying a resin layer to the support, a second trough for applying a resin layer to the support, actuating means on said first trough for engagement with complementary actuating means on said second trough whereby the actuation of said first trough for applying its resin to the support automatically causes actuation of said second trough for applying its resin to the support, said first trough being movably mounted to said second trough by means of a first mounting unit, said first mounting unit including plate means secured to said first trough, said actuating means being secured to said plate means of said first mounting unit, a second mounting unit, said second trough being secured to said second mounting unit, said complementary actuating means being secured to said second mounting unit, said complementary actuating means being disposed in the path of movement of said actuating means whereby during movement of said first mounting unit said actuating means engages said complementary actuating means to cause said second trough to be positioned and to open, said second trough having a dispensing opening formed between a back wall and a bottom wall of said second trough, said bottom wall being disposed for selective contact against said back wall



and selective movement away from said back wall, said actuating means including at least one abutment member on said first mounting unit, said complementary actuating means including at least one pressure pin on said second mounting unit disposed in the path of travel of said abutment member, said second trough being pivotally mounted on a shaft in such a manner that said second trough is rotated downward from its inactive position upon said abutment member contacting and reacting against said pressure pin.

4,638,759
MAGNETIC BRUSH APPARATUS FOR DEVELOPING ELECTROSTATIC IMAGES
Ivan B. Ville, Spencerport; James D. Walling, Fairport, and Kevin E. Yousey, Brockport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 17, 1985, Ser. No. 744,874
Int. Cl.[4] G03G *15/10*
U.S. Cl. 118—657 **10 Claims**



1. In an electrographic development apparatus for applying a magnetically attractable developer to a latent electrostatic image-bearing surface moving along a path to render such image visible, such apparatus comprising a hollow sleeve positioned adjacent said path to define a nip region at which the outer surface of said sleeve and said image-bearing surface come into contact; a cylindrically-shaped multi-pole magnetic core rotatably mounted within said sleeve, said core comprising a plurality of magnetic pole pieces extending parallel to the core axis around the circumference thereof, said pole pieces alternating in polarity from one to the other and being closely spaced relative to said sleeve so that the magnetic field of said pole pieces extends through and beyond said sleeve; means for

supplying magnetically attractable developer to the sleeve surface; and means for rotating said magnetic core to effect movement of the developer over the sleeve surface toward said nip region at which the developer contacts said image-bearing surface and effects development of said latent electrostatic image, the improvement comprising shunt means positioned between said sleeve and said core for reducing the magnetic field produced by said magnetic core outside said sleeve in the vicinity of said nip region, whereby any tendency for the developer to move away from the developed image as such image leaves said nip region is minimized.

4,638,760

DEVELOPING APPARATUS

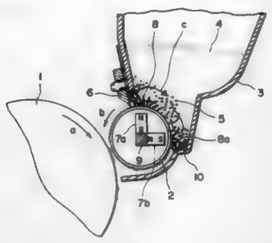
Shunji Nakamura, Kawasaki; Fumitaka Kan, Yokohama; Hidemi Egami, Zama; Atsushi Hosoi, Tokyo; Hatsuo Tajima, Matsudo, and Kimio Nakahata, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 594,863, Mar. 29, 1984, Pat. No. 4,563,978. This application Jul. 25, 1985, Ser. No. 759,110

Claims priority, application Japan, Apr. 8, 1983, 58-61852; Apr. 8, 1983, 58-61854; Apr. 8, 1983, 58-61855; Apr. 18, 1983, 58-68645

Int. Cl.⁴ G03G *15/09*

U.S. Cl. 118—658 **35 Claims**



1. A method of sealing a developing device which has a developer container for containing developer including magnetic particles and non-magnetic toner particles, a developer carrying member disposed in an opening of the container and rotatable so that its surface travels out of the container at an outlet portion adjacent an upper part of the opening and travels into the container at an inlet portion adjacent a lower part of the opening and a regulating member, disposed adjacent the outlet portion, for regulating passage of the developer through the outlet to outside of the container, said method comprising:

forming a magnetic field between a stationary magnet disposed in the developer carrying member and extending codirectionally with a rotational axis of the developer carrying member and a stationary magnetic member which is disposed between the container and the developer carrying member without contact with the surface of the developer carrying member at such a position to be cooperable with the stationary magnet, whereby a relatively soft and low density magnetic brush is formed, wherein the magnetic brush prevents the developer from leaking out of the container in a direction opposite to a direction of movement of the developer carrying member and allows the developer traveling back to the container to enter the container.

4,638,761

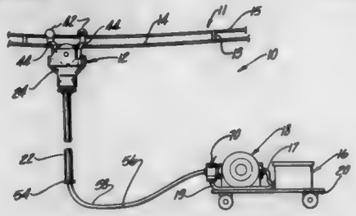
APPLICATOR FOR COATING SUSPENDED CABLE

Lee Carrick, 2 Jefferson Ct., Grosse Pointe, Mich. 48230

Continuation-in-part of Ser. No. 628,857, Jul. 9, 1984, abandoned. This application Apr. 12, 1985, Ser. No. 722,791

Int. Cl.⁴ B05C *1/08, 5/00*

U.S. Cl. 118—694 **27 Claims**



1. An applicator for applying a flowable coating to a suspended cable comprising:

a supply reservoir,

an open top housing defining a coating reservoir therein,

fluid passage means between and in fluid communication with said supply and coating reservoirs for supplying said coating reservoir with the coating and for draining the coating from said coating reservoir,

said fluid passage means comprising a conduit means for defining a single flow passageway in fluid communication with said supply and coating reservoirs, said passageway being the sole fluid means for supplying and draining fluid to and from said coating reservoir,

means for selectively maintaining a predetermined level of fluid in said coating reservoir,

a coating roller having a circumferential groove adapted to receive the cable therein, and

means for rotatably supporting said roller in said housing so that at least a portion of said roller is immersed in said coating reservoir.

4,638,762

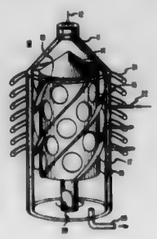
CHEMICAL VAPOR DEPOSITION METHOD AND APPARATUS

Myung K. Kim, Plainsboro Township, Middlesex County, and Montri Viriyayuthakorn, Hamilton Township, Mercer County, both of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Aug. 30, 1985, Ser. No. 770,906

Int. Cl.⁴ C23C *13/08*

U.S. Cl. 118—725 **6 Claims**



1. A chemical vapor deposition apparatus comprises a susceptor confined within a housing to form a deposition chamber, a plurality of gas inlet orifices for the entry of gases into the chamber, a gas outlet orifice to expel gases from the chamber, means for heating the susceptor and means for rotating the susceptor, wherein the susceptor includes means for supporting a plurality of substrates around the susceptor and a plurality of helical baffles extending from a top region of the susceptor to a bottom region of the susceptor.

4,638,763

ANIMAL LITTER FORMULATION

Bernard Greenberg, 89-19 32nd Ave., E. Elmhurst, N.Y. 11369

Filed Apr. 10, 1985, Ser. No. 721,672

Int. Cl.⁴ A01K *1/015*

U.S. Cl. 119—1 **9 Claims**

1. In a litter for accumulation of animal feces and urine, the improvement comprising the addition to the base material of the litter of an effective amount of anhydrous sodium sulfate.

4,638,764

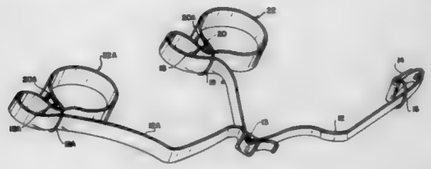
SECURITY SYSTEM

Sharon K. Anderson, 5608 N. Roosevelt, Loveland, Colo. 80537

Filed May 20, 1985, Ser. No. 735,755

Int. Cl.⁴ A62B *35/00*

U.S. Cl. 119—96 **7 Claims**



1. A security system adapted to secure two children to an adult, said security system comprising (a) a first length of flexible strap having first and second ends, and (b) a second length of flexible strap having first and second ends; wherein said first end of said second strap is secured to said first strap; wherein said first end of said first strap is adapted to form a first loop which is capable of being detachably fastened to said adult; wherein said second ends of said first and second straps each comprise a loop which is adapted to be detachably secured around the wrist of one of said children; and wherein each said second loop of said first and second straps is adapted to maintain a fixed diameter after being placed around the wrist of one of said children.

4,638,765

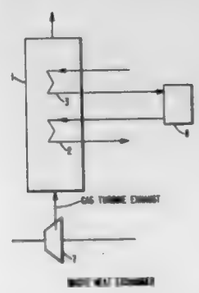
HEAT RECOVERY SYSTEM

Geoffrey F. Skinner, Reading, England, assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Oct. 24, 1985, Ser. No. 791,175

Int. Cl.⁴ F22D *1/00*

U.S. Cl. 122—7 R **13 Claims**



1. A process for recovering heat from gas turbine exhaust comprising passing said exhaust through a waste heat exchanger consisting of a high pressure steam superheater and a high pressure feedwater heater where said exhaust gas first contacts said high pressure steam superheater and then contacts said high pressure feedwater heater.

4,638,766

PROCESS FOR THE TREATMENT OF BOILER CONDENSATE

Graham Bunch, Aldershot, and Richard G. Dawes, Cove, both of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Feb. 28, 1986, Ser. No. 834,954

Claims priority, application United Kingdom, Mar. 7, 1985, 8505870

Int. Cl.⁴ F22B *37/48*; F22D *5/00*

U.S. Cl. 122—398 **4 Claims**

1. The process for preparing boiler feed water which comprises subjecting a boiler condensate to a step of removing insoluble oil, and then passing the condensate under elevated pressure into contact with one side of a reverse osmosis membranes the other side of which is maintained at a lower pressure, recovering purified water from said other side of the membrane, and recycling the purified water to the boiler feed.

4,638,767

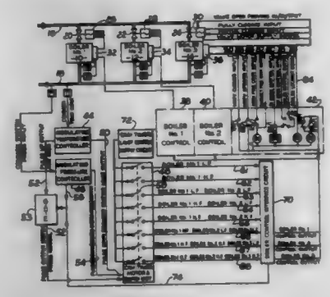
HEATING SYSTEM

Martin C. J. George, Great Barr, England, assignor to Stone Allen Limited, Princes End, England

Filed Jul. 8, 1985, Ser. No. 752,943

Int. Cl.⁴ F22D *37/42*

U.S. Cl. 122—448 B **2 Claims**



1. A heating system having a plurality of boilers, a flow main and a return main across which the boilers are connected in parallel, a separate control valve for each boiler, interposed in the flow path through the boiler, said valve having a wide-open position, a partly open position and a closed position, a control for placing the valve in its partly open position when its boiler is not being fired, and a thermostatic control responsive to the temperature of the water leaving the boiler for closing the valve when the temperature has fallen to a preset value.

4,638,768

STEAM GENERATOR TUBESHEET/CHANNEL HEAD/CENTERSTAY ASSEMBLY

Todd M. Wetherill, Fawn Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 4, 1985, Ser. No. 720,206

Int. Cl.⁴ F22B *17/02, 37/10*

U.S. Cl. 122—512 **10 Claims**

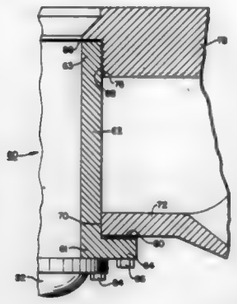
1. A tubesheet/channel head/centerstay assembly for a steam generator, comprising:

(a) a tubesheet having a threaded internal portion formed therein;

(b) a channel head located adjacent the tubesheet having an opening formed therein; and

(c) a hollow centerstay having an external threaded portion

formed therein corresponding to the threaded portion of the tubesheet,



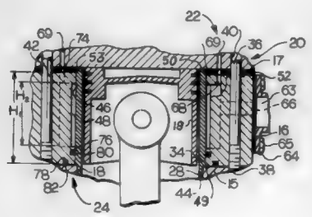
wherein the threaded centerstay is screw-inserted to join the channel head and the tubesheet and to reinforce the tubesheet under pressure against the channel head.

4,638,769

ENGINE HAVING A MULTIPIECE CYLINDER BLOCK

Benny Ballheimer, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Mar. 18, 1985, Ser. No. 712,501
Int. Cl.[4] F02F *1/16*
U.S. Cl. 123—41.84 **19 Claims**



1. An engine including a multipiece block and a cylinder head, said multipiece block having a bottom block portion having a bore therein, comprising:

a top block portion positioned between the bottom block portion and the cylinder head and having a bore substantially coaxial with the bore in the bottom block portion;

means for attaching the cylinder head to the bottom block portion; and

a removable midsupported cylinder liner having an end contacting the cylinder head, an upper portion positioned within the bore of the top block portion and a lower portion extending into the bore of the bottom block portion and an annular support surface positioned between the upper portion and the lower portion, said support surface seating on the bottom block portion and said end and said support surface of the midsupported cylinder liner being fixedly biased between the cylinder head and the bottom block portion.

4,638,770

PORTING SYSTEM FOR TWO CYCLE INTERNAL COMBUSTION ENGINES

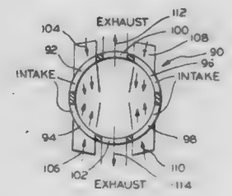
Duke Fox, 5305 Towson Ave., Ft. Smith, Ark. 72901

Filed Sep. 13, 1985, Ser. No. 775,588
Int. Cl.[4] F02B *75/40*
U.S. Cl. 123—65 P **6 Claims**

1. A porting system for two cycle engines comprising a cylinder having two exhaust ports positioned on diametrically opposed sides of the cylinder, four intake ports, one of said intake ports being positioned on each of the four opposite sides of said two exhaust ports, and means for feeding an incoming stream of a fuel mixture through each of said intake ports, each of said incoming streams being fed into said cylinder directly toward another individually associated stream on the same side of said exhaust ports and with sufficient velocity to cause turbulence in areas where said incoming streams collide, the intake streams having sufficient velocity to produce a laminar flow which preludes a mixing of intake and exhaust streams.

4. A method of scavenging a cylinder of a two-cycle engine, said method comprising the steps of:

forming six ports in the walls of said cylinder, two of said ports being diametrically opposed to each other, the other four ports being formed on opposite sides of said two ports;



directing a plurality of incoming streams of a fuel mixture through said four ports, pairs of said incoming streams being directed toward each other within said cylinder, a space in the center of the cylinder remaining between said incoming streams;

giving said incoming streams a velocity which is sufficient to cause turbulence in the area where the incoming streams collide, said velocity also being sufficient to producing a laminar flow along at least the edges of incoming streams confronting said center space between said incoming streams;

said colliding streams rising within said cylinder striking the top of said cylinder, mushrooming, and descending into said center space between said incoming streams; and

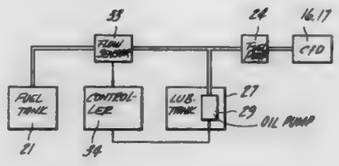
said exhaust ports being positioned at opposite ends of said center space for enabling said descending stream to exit said port.

4,638,771

LUBRICATING SYSTEM FOR TWO-CYCLE INTERNAL COMBUSTION ENGINE

Atsushi Mori, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 660,748, Oct. 15, 1984, abandoned.
This application May 27, 1986, Ser. No. 868,203
Claims priority, application Japan, Oct. 24, 1983, 58-197659
Int. Cl.[4] F02B *33/04*
U.S. Cl. 123—73 AD **14 Claims**



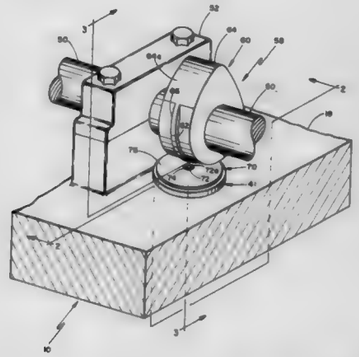
1. In a lubricating system for a two-cycle internal combustion engine having a fuel feed system including charge forming means and means for delivering fuel from a fuel source to said charge forming means and a lubricant system for the engine, the improvement comprising means for measuring the amount of fuel supplied to said charge forming device and means for supplying lubricant to said engine lubricating system at a rate determined only by the measured amount of fuel supplied.

4,638,772

VALVE ACTUATING APPARATUS FOR MINIMIZING THE NEED FOR LASH ADJUSTMENT

Corliss O. Burandt, Plymouth, Minn., assignor to Investment Rarites, Incorporated, Minneapolis, Minn.

Continuation of Ser. No. 595,302, Mar., 1984. This application Jan. 25, 1985, Ser. No. 693,847
Int. Cl.[4] F01L *1/04*
U.S. Cl. 123—90.6 **14 Claims**



1. Apparatus for actuating a valve member relative to a valve seat associated with a combustion chamber of an internal combustion engine comprising a cam unit rotatable about an axis spaced from said valve seat, said cam unit including a lobe portion and ramp portions having a reduced width in relation to the width of said lobe portion, said ramp portions extending in opposite angular directions from said lobe portion, and cam follower means associated with said valve member having a generally flat working surface engageable by said reduced width ramp portions and said lobe portion, said cam follower means including a follower portion no wider than said reduced width ramp portions, said lobe portion spanning said follower portion and spanning a portion of said working surface to one side of said follower portion.

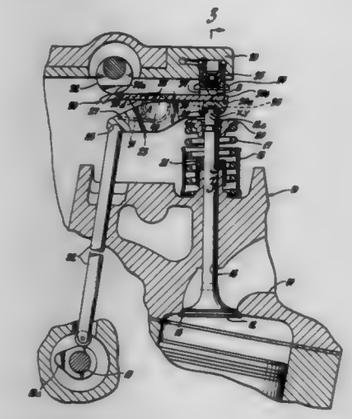
4,638,773

VARIABLE VALVE LIFT/TIMING MECHANISM

Duane J. Bouvallet, Ann Arbor, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 28, 1986, Ser. No. 834,791
Int. Cl.[4] F01L *31/14*
U.S. Cl. 123—90.16 **3 Claims**

1. A valve train for an internal combustion engine of the type having a body means defining a cylinder with a port, said valve train including a valve with an axial extending valve stem located for axial movement in said port and normally biased to a predetermined position; a valve actuator spaced from said valve and operable to effect reciprocation of said valve; a rocker arm pivotably supported at one end on said valve stem and at its other end engaging said valve actuator; said body means including a fixed overhead support means extending over said rocker arm and spaced therefrom a predetermined distance; a lash adjuster including a plunger means operatively positioned in said overhead support means with said plunger means having an outboard end projecting toward said valve stem in substantial coaxial alignment therewith, a pivotable eccentric means operatively located in said overhead support means so as to substantially overlie said other end of said rocker arm, an upper reaction member pivotably supported at one end by said outboard end of said plunger means, the opposite end of said upper reaction member being adapted to be engaged by said eccentric; and a spring means operatively associated with said rocker arm and with said upper reaction member to bias said opposite end of said upper reaction member into engagement with said eccentric and to bias said other end of said rocker arm into engagement with said valve actuator; said upper reaction member and said rocker arm having opposed working surfaces one of which is flat and the other of which has a cam surface contour terminating at spaced apart points A and B on said rocker arm, said cam surface contour being in accordance with the following equation



$$y = a\frac{c - v}{l} + v$$

wherein:

v=maximum valve lift

c=cam lift

a=position of cam surface contact with the working surface of the upper reaction member

l=distance between the pivot axis of the valve actuator and said valve stem relative to the rocker arm connecting one end of the vertical lines representing c and v

y=height above a straight line extending between the opposite end of the lines representing c and v.

4,638,774

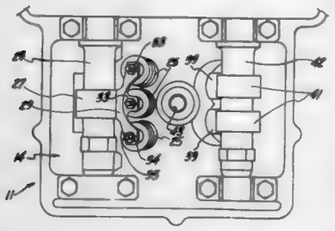
VALVE ACTUATING MECHANISM FOR INTERNAL COMBUSTION ENGINE

Kazuo Aoi, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 11, 1985, Ser. No. 743,601
Claims priority, application Japan, Jun. 12, 1984, 59-119183
Int. Cl.[4] F01L *1/26*
U.S. Cl. 123—90.22 **6 Claims**

1. In an internal combustion engine having a cylinder head defining at least in part with a cylinder bore a combustion chamber, a set of a plurality of intake valves supported by said cylinder head at one side of a plane containing the axis of said cylinder bore for controlling the flow of an intake charge into said combustion chamber, a set of a plurality of exhaust valves supported by said cylinder head at the other side of said plane for controlling the flow of the exhaust charge from the combustion chamber, first and second cam means disposed on

opposite sides of said plane, means for directly operating the valves of one of said sets from said first cam means, and rocker



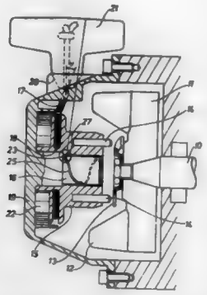
arm means for operating the valves of the other set from said second cam means.

4,638,775

HAND-ACTUATED ENGINE STARTER

Fred B. Lindström, Jönköping, Sweden, assignor to AB Electrolux, Stockholm, Sweden

Filed Aug. 9, 1985, Ser. No. 764,016
Claims priority, application Sweden, Aug. 23, 1984, 8404205
Int. Cl.[4] F02N *3/00*
U.S. Cl. 123—185 G **6 Claims**



1. In a hand-actuated starter for an internal combustion engine wherein a first clutch member is journalled on a first shaft and a second clutch member is mounted on an engine shaft, the first clutch member having a pulley and being axially displaceable with respect to said second clutch member in response to rotation of said pulley, the first shaft and first clutch member having first and second mutually engaging bearing surfaces respectively; the improvement wherein one of said surfaces has threads and the other of said surfaces has a helical groove and a helical spring in said groove positioned to engage said threads, said spring being radially displaceable in said groove.

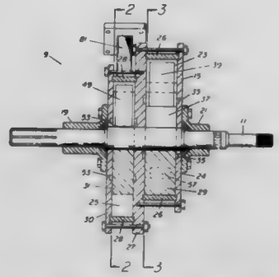
4,638,776

ROTARY INTERNAL COMBUSTION ENGINE

William Critteaden, Salt Lake City, Utah, assignor to Matt Biljanic, Salt Lake City, Utah

Filed Apr. 1, 1985, Ser. No. 718,843
Int. Cl.[4] F02B *53/04*
U.S. Cl. 123—235 **10 Claims**

1. An improved rotary internal combustion engine comprising:
(a) a combustion chamber which is generally circular in cross-section and which has a ring-like peripheral wall;
(b) a driven shaft member journaled for rotation and disposed to pass eccentrically through the combustion chamber;
(c) a compression chamber which is generally circular in cross-section positioned with a ring-like wall is adjacent to and spatially offset with the combustion chamber such that the driven shaft passes centrally therethrough;
(d) a circular combustion rotor fixed concentrically to the shaft member for rotation eccentrically within the combustion chamber, the combustion rotor being positioned such that the space between the periphery of the rotor and the periphery of the combustion chamber results in a crescent shape;
(e) a circular compression rotor fixed concentrically to the shaft member for rotation eccentrically within the compression chamber, the compression rotor being positioned such that the space between the periphery of the rotor and the periphery of the compression chamber results in a crescent shape which is in a generally opposed relationship with said crescent shape formed in the combustion chamber;
(f) a first radial slot means formed radially through the compression rotor;
(g) a first circular guide track formed within a sidewall of the compression chamber concentric with the axial centerline thereof;
(h) a first piston-vane disposed within the first radial slot means and in mechanical communication with the first circular guide track such that the first pistonvane moves reciprocatively relative to the compression rotor as the same rotates within the compression chamber, the first piston-vane being dimensioned such that its distal end is in sliding engagement with the peripheral wall of the compression chamber;
(i) a second radial slot means formed radially through the combustion rotor;
(j) a second circular guide track within the sidewall of the combustion chamber concentric with the axial centerline thereof;
(k) a second piston-vane disposed within the second radial slot means and in mechanical communication with the second circular guide track such that the second piston-vane moves reciprocatively relative to the combustion rotor as the same rotates within the combustion chamber, the second piston-vane being dimensioned such that its distal end is in sliding engagement with the peripheral wall of the combustion chamber;
(l) a port means for providing a communicative gaseous flow between the compression chamber and the combustion chamber, the port means being formed and located within the compression chamber such that the compression rotor blocks the flow of compressed gases into the port means except when the first radial slot means is in registry with the port means, and the port means being located within the combustion chamber such that the combustion rotor blocks the flow of compressed gases into the combustion chamber except when the second radial slot means is in registry with the port means.

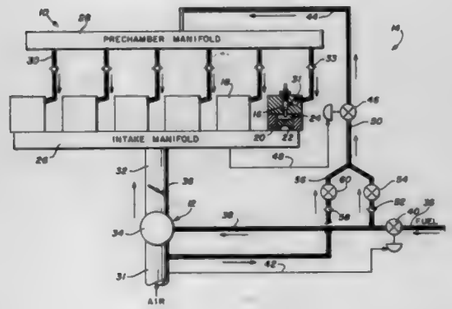


4,638,777

PRECHAMBER FUEL CONTROL SYSTEM

John C. Fanner, Fridley, Minn., and Warren E. Snyder, Elm Grove, Wis., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 5, 1984, Ser. No. 658,001
Int. Cl.[4] F02M *21/04*
U.S. Cl. 123—277 **10 Claims**



1. An improved method of fuel control for a gaseous fueled internal combustion engine that includes a prechamber for each of a plurality of combustion chambers, an ignition system for igniting the fuel, and an intake manifold connected with each combustion
chamber, the improved method comprising the steps of:
supplying fuel gas to the prechambers at a pressure not less than intake manifold pressure;
simultaneously supplying a fuel gas and air mixture to the combustion chambers;
igniting the gas in said prechambers to ignite the gas and air mixture in said combustion chamber;
supplying a fuel gas and air mixture to said prechambers at a pressure higher than the pressure of the fuel gas initially supplied thereby stopping flow of fuel gas alone to said prechambers;
varying the pressure of said fuel gas and air mixture in accordance with the intake manifold pressure; and,
simultaneously controlling the mixture of fuel gas and air supplied to the prechambers.

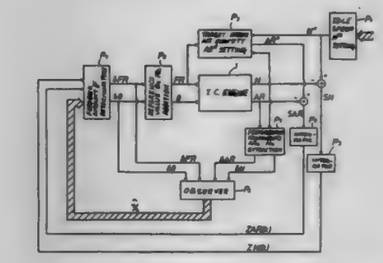
3. An improved prechamber fuel system for a gaseous fueled engine including a prechamber for each of a plurality of cylinders; a reciprocating piston located in each cylinder; a head closing one end of each cylinder; said head, cylinders and pistons forming a plurality of combustion chambers; an intake manifold connected with each combustion chamber; a source of pressurized fuel gas; a source of combustion air; and, each said prechamber having ignition means therein, the improvement comprising:
a prechamber manifold connected with each prechamber;
conduit means connecting said prechamber manifold with the source of combustion air and with the source of pressurized fuel gas;
flow control means in said conduit means for controlling the ratio of fuel gas to air; and,
pressure control means in said conduit means for regulating the pressure of said fuel gas and air relative to the pressure in said inlet manifold.

4,638,778

IDLE SPEED CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Eiichi Kamei, Nagoya, and Hideaki Namba, Oobu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 19, 1986, Ser. No. 830,935
Claims priority, application Japan, Feb. 19, 1985, 60-31265
Int. Cl.[4] F02D *11/10*
U.S. Cl. 123—339 **2 Claims**



1. Apparatus for controlling an internal combustion engine equipped with one or more fuel injection valves, comprising:
(a) a throttle actuator for adjusting opening degree of a throttle valve disposed in an intake pipe of said engine;
(b) engine speed detecting means for producing a first signal indicative of the rotational speed of said engine;
(c) intake air quantity detecting means for producing a second signal indicative of the intake air quantity sucked by said engine; and
(d) an electronic control means responsive to said first and second signals for producing and supplying fuel injection valve drive signals to said fuel injection valves and for producing and supplying throttle actuator drive signal to said throttle actuator, said electronic control means having a target idle speed setting unit, said electronic control means also having:
(i) a target intake air quantity setting unit for determining a target intake air quantity corresponding to minimum fuel amount with which the rotational speed of said engine can be maintained at said target idle speed, on the basis of fuel injection amount-intake air quantity correlation pattern which is predetermined in accord with said target idle speed; and
(ii) an integral-added optimal regulator for determining feedback amounts respectively in connection with the amount of fuel to be injected and the opening degree of said throttle valve in receipt of said target idle speed and said target intake air quantity on the basis of predetermined operating formulas used for estimating the internal state of said engine which formulas are determined in accordance with a dynamic model of the system relating to the operation of said engine, and an optimal feedback gain, and for outputting said fuel injection valve drive signals and said throttle actuator drive signals which are produced according to said feedback amounts thus determined.

4,638,779

APPARATUS FOR CONTROLLING AN ENGINE IN A HYDRAULICALLY DRIVEN VEHICLE

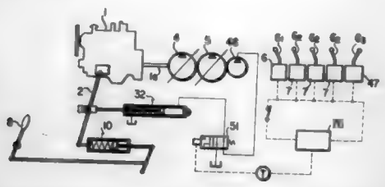
Tomowo Kitada, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 28, 1985, Ser. No. 717,070
Claims priority, application Japan, Mar. 30, 1984, 59-45113
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—385 **1 Claim**

1. An apparatus for controlling the internal combustion engine of a hydraulically driven vehicle comprising:
a transmission mechanism for transmitting the operation of a

fuel control lever to a governor control lever and having a loose spring mechanism with a loose spring therein:

a hydraulic decelerator cylinder connected to said transmission mechanism and having a spring and piston therein, said deceleration cylinder spring having a slightly larger spring force than said loose spring in said loose spring mechanism and applying a force absorbing action, in the absence of hydraulic force acting on said piston, to set said governor control lever in its deceleration position when said fuel control lever is moved to its full engine speed position and for moving said governor control lever to its full engine speed position when hydraulic force is applied to said piston;



an electromagnetic valve for applying fluid pressure from a control pump driven by said engine to said piston in said decelerator cylinder and releasing said fluid pressure; and

an electric circuit including a plurality of switches operationally associated with levers for operating a hydraulic valve for controlling the swinging of the vehicle, a hydraulic valve for controlling the operation of a work machine on the vehicle and a hydraulic valve for controlling the travel of the vehicle, respectively and for opening and closing said electromagnetic valve, said electric circuit including time delay means for delaying the operation of said electromagnetic valve several seconds after said switches have been turned off and said operating levers are all in their neutral positions.

4,638,780

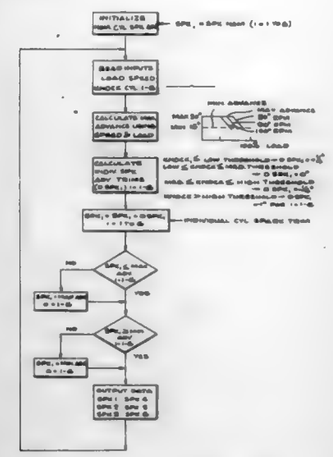
INDIVIDUAL CYLINDER IGNITION CONTROL

Lahn T. Trinh, and Thomas E. Lewis, both of San Diego, Calif., assignors to Allied Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 593,457, Mar. 26, 1984, abandoned. This application Sep. 25, 1985, Ser. No. 779,895

Int. Cl.[4] F02P *5/00, 5/14*

U.S. Cl. 123—416 **12 Claims**



1. An ignition system for providing individual cylinder spark control for multicylinder engines including a shaft encoder directly connected to the engine crankshaft, said encoder producing a large number of encoder pulses per engine revolution (NC), means connected to said shaft encoder producing a single timing reference pulse every other shaft revolution at the same reference shaft position, a first counter connected to receive said timing reference pulses and said encoder pulses (NC) and to produce a carry pulse after every N counts where N is equal to 2NC/number of cylinders of said engine and N counts thus represents the theoretical crank angle between successive cylinder reference shaft positions,

second and third counters connected to receive each carry pulse, said second counter delaying said carry pulse by a fixed number of encoder output pulses to produce a maximum timing advance, said third counter being incremented one step for each carry pulse and being also connected to be reset by each timing reference pulse to synchronize said third counter with engine rotation,

memory means having a plurality of memory locations containing code information representing actual measured individual offset crankshaft angles for each individual cylinder of the engine being controlled,

a variable delay counter and means connecting said second counter to said memory means and to said variable delay counter to cause said memory means to unload a code number to said variable delay counter corresponding to the cylinder indicated by said third counter, each said code number being delayed by said maximum timing advance, said variable delay counter thereby producing ignition pulses for each cylinder in which the timing is retarded from said maximum timing advance as defined by its corresponding code number.

4,638,781

FUEL CUT-OFF DEVICE FOR INTERNAL COMBUSTION ENGINE

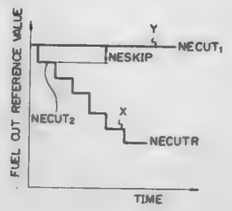
Kazuhiro Shiki, Okazaki, and Takao Iura, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 5, 1985, Ser. No. 772,639

Claims priority, application Japan, Sep. 7, 1984, 59-187821

Int. Cl.[4] F02D *41/12*

U.S. Cl. 123—493 **8 Claims**



1. A fuel cut-off device for an internal combustion engine having a fuel supply means into the engine, said device comprising:

a first detecting means for detecting the rotational speed of the engine;

a second detecting means for detecting a racing condition of the engine;

a means for determining a fuel cut-off reference value in response to an output of said second detecting means to provide a first predetermined value at a relatively higher engine revolution range than a normal operation range when the engine is in a loaded condition and a second predetermined value below said first predetermined value when the engine is in a racing condition; and

a fuel cut-off means for cutting the supply of the fuel into the engine in response to an output of said first detecting means when the rotational speed of the engine is above said fuel cut reference value.

4,638,782

APPARATUS FOR CONTROLLING FUEL INJECTION TIMING IN A FUEL INJECTION PUMP

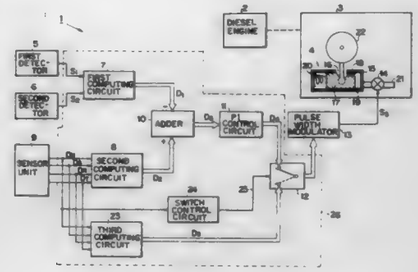
Seishi Yasuhara, Yokohama; Mitsuo Hagiwara, Higashimatsuyama; Kazuo Inoue, Higashimatsuyama; Kyoichi Fujimori, Higashimatsuyama; Akira Sekiguchi, Higashimatsuyama, and Hiroshi Okada, Isezaki, all of Japan, assignors to Diesel Kiki Co., Ltd., Japan

Filed Jan. 10, 1984, Ser. No. 569,673

Claims priority, application Japan, Jan. 11, 1983, 58-2592

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—502 **12 Claims**



1. An apparatus for controlling the timing of injection of fuel supplied to an internal combustion engine from a fuel injection pump having a member for adjusting the timing of injection of fuel, said apparatus comprising:

means for operating said member;

a first means for generating a first signal relating to the actual timing of injection of fuel supplied from said fuel injection pump;

a second means for generating a second signal relating to the target timing of injection of fuel determined by the condition of operation of said internal combustion engine;

means responsive to said first and second signals for generating an actuating signal for driving said operating means so as to make said actual timing of injection coincident with said target timing of injection by closed loop control;

a third means for producing a third signal for driving said operating means, said third signal being representative of a normal operating condition of the engine but unrelated to said actual timing of injection;

means for detecting whether or not said internal combustion engine is being operated in a predetermined low engine speed range; and

means responsive to the detected result of said detecting means for selectively applying said actuating signal or said third signal to said operating means so as to select said third signal when the engine speed is within said predetermined low engine speed range and said actuating signal when the engine is not within said predetermined low engine speed range.

4,638,783

CARBURETION SYSTEM FOR ENGINES

Warren E. Snyder, Elm Grove, Wis., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 12, 1985, Ser. No. 722,666

Int. Cl.[4] F02B *43/00*

U.S. Cl. 123—527 **16 Claims**

1. An improved carburetion system for spark-ignited, gaseous fueled engines having an intake system and an exhaust system, said carburetion system comprising:

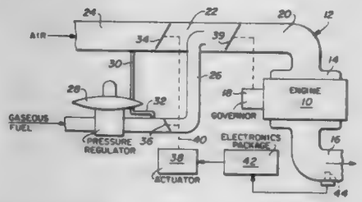
a fuel and air mixer having an outlet for connection to said intake system;

pressure regulated fuel supply means connected to said mixer;

air supply means connected to said mixer;

first valve means in said air supply means for regulating the flow of air to said mixer;

second valve means in said fuel supply means for regulating the flow of fuel to said mixer;



fuel and air control means for positioning said valve means to decrease the fuel supplied to said mixer while increasing the air supplied to said mixer and vice versa; and,

pressure regulating means for controlling the pressure of said fuel being supplied to said mixer.

4,638,784

METHOD OF AND APPARATUS FOR CONTROLLING VACUUM MODULATING VALVE FOR EXHAUST GAS RECIRCULATION CONTROL

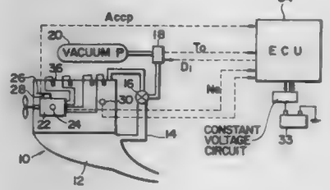
Shinji Ikeda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

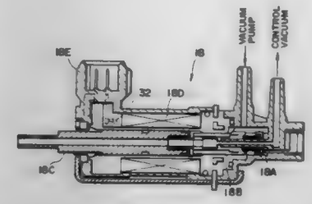
Filed Jul. 12, 1985, Ser. No. 754,161

Claims priority, application Japan, Jul. 16, 1984, 59-147139

Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—571 **9 Claims**





1. An apparatus for controlling a vacuum modulating valve for exhaust gas recirculation control, incorporating therein a temperature detecting element, wherein said method comprises:

means for detecting an engine speed;

means for detecting an engine load;

means for determining a required drive signal of said vacuum modulating valve in accordance with operating conditions of an engine, including the engine speed and the engine load;

means for correcting said required drive signal in accordance with a temperature of said vacuum modulating valve detected by said temperature detecting element, a battery voltage and a driving level of said required drive signal to obtain a corrected drive signal; and means for

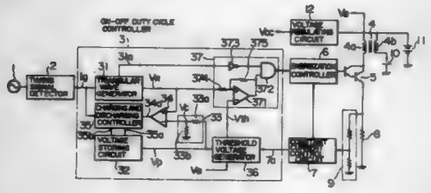
driving said vacuum modulating valve in response to the corrected drive signal.

4,638,785

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Takeshi Matsui, Toyohashi; Shunichi Takeda, Obu, and Tomoatsu Makino, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 7, 1986, Ser. No. 827,167
Claims priority, application Japan, Feb. 11, 1985, 60-24993
Int. Cl.[4] F02P *5/08*
U.S. Cl. 123—644 **12 Claims**



1. An ignition system for an internal combustion engine comprising:

timing signal detecting means responsive to a rotation speed of an engine to generate a pulse signal including a leading edge and a trailing edge corresponding to an ignition timing and having a predetermined duty cycle;

triangular wave generating means for generating a triangular wave voltage synchronized with the trailing edge of said pulse signal;

voltage storing means for storing a voltage level of said triangular wave voltage in synchronism with the leading edge of said pulse signal;

a voltage divider for dividing the stored voltage in said voltage storing means to generate a reference voltage;

comparing means for comparing said reference voltage and said triangular wave voltage to detect a difference therebetween;

charging and discharging control means for correcting the stored voltage in said voltage storing means to reduce said difference at the leading edge of said pulse signal to zero;

threshold voltage generating means for generating a threshold voltage which is offset from said stored voltage by a voltage value corresponding to a desired dwell time of an ignition coil; and

energization control means for controlling a dwell time of said ignition coil in accordance with a result of a comparison between said threshold voltage and said triangular wave voltage.

4,638,786

MAGNETIC UTENSIL-HOLDER

Lloyd P. Lucky, P.O. Box 670803, Chugiak, Ak. 99567

Filed Jan. 30, 1985, Ser. No. 696,292
Int. Cl.[4] F24C *15/30*
U.S. Cl. 126—24 **21 Claims**

1. A magnetic utensil-holder for preventing movement of a cooking utensil placed on a cooking surface, comprising:

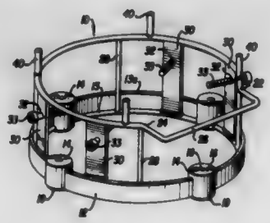
frame means, including:

first ring means having a substantially circular shape;

means for magnetically securing said first ring means to said cooking surface;

second ring means having a substantially circular shape; and,

means for supporting said second ring means a predetermined distance above said first ring means; and,



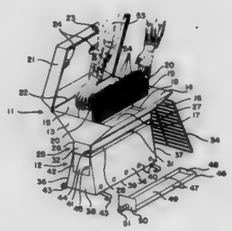
means on said frame means for adjusting said holder to accommodate various utensil sizes.

4,638,787

GRILL MEANS

William H. Tyson, Greenville, N.C., assignor to John G. Mills, Wake Forest, N.C., a part interest

Filed Jun. 17, 1985, Ser. No. 744,955
Int. Cl.[4] A47J *37/00*
U.S. Cl. 126—25 R **6 Claims**



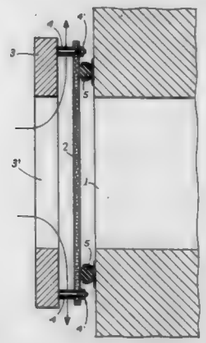
1. An improved charcoal ignition and grilling means comprising: an ignition chamber having a bottom, a surrounding wall structure extending upwardly from said bottom, and an open top wherein said surrounding wall structure slopes inwardly from said bottom to said open top; a grill chamber having a surrounding wall structure, an open bottom and an open top wherein said surrounding wall structure slopes outwardly from said open bottom to said open top; a collar extending between said open top of said ignition chamber and said open bottom of said grill chamber for supporting said grill chamber above said ignition chamber and for providing means for air to flow between said ignition chamber and said grill chamber; basket type means disposed within said grill chamber for receiving and containing charcoal directly above said open bottom; means for supporting said basket type means within said grill chamber; a removable ash pan which can be inserted into said collar so as to substantially close the horizontal cross section of said collar; a generally horizontal grill disposed within said grill chamber above said basket type means; means for supporting said grill within said grill chamber; and a smoke cover movable between an open and closed position for closing said open top of said grill chamber whereby when a readily combustible material is placed within said ignition chamber and ignited, flames will be funneled upwardly through said collar into said grill chamber where said flames will ignite charcoal in said basket type means.

4,638,788

DEVICE FOR MOUNTING A GLASS PANE ON AN OVEN DOOR

Pierre Lancelot, Gommegnies, France, assignor to Eurofours, Gommegnies, France

Filed Dec. 19, 1984, Ser. No. 683,544
Claims priority, application France, Jan. 17, 1983, 84 00684
Int. Cl.[4] F23M *7/00*; F24C *15/04*
U.S. Cl. 126—198 **6 Claims**



1. An oven glass door system comprising in combination an oven including an opening for providing access; a gasket means, said gasket means being secured to said oven about said opening and an oven door, said oven door including at least one transparent panel means having a first face and a second opposed face secured to the oven door in spaced relationship thereto so that said first face of said transparent panel is disposed in facing relationship with the oven door and so that said second face of said transparent panel is disposed in cooperative engagement with said gasket means to form a seal therebetween when said door is in a closed position.

4,638,789

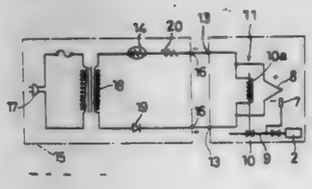
SAFETY APPARATUS FOR COMBUSTION DEVICE

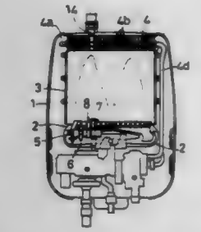
Takashi Ueki, Tokyo, and Yoshihiro Ishikawa, Kagamihara, both of Japan, assignors to Rinnai Kabushiki Kaisha, Nagoya and Tokyo Gas Kabushiki Kaisha, Tokyo, both of, Japan

Filed Feb. 8, 1985, Ser. No. 700,002
Int. Cl.[4] F24H *1/08*; F23N *5/24*
U.S. Cl. 126—351 **13 Claims**

1. In a combustion unit having at least one burner therein, a safety valve in a fuel supply passage to the burner, a solenoid means for controlling the valve, and means for providing a reference voltage to the solenoid means, the improvement which comprises a detecting means including a sensor means operatively positioned and arranged with respect to the combustion unit for sensing concentration of CO in space influenced by exhaust gas therefrom, said detecting means also including a power source and a switching means, the sensor means being connected between the power source and the switching means; and wherein in the event of a potentially hazardous situation, the detecting means generates a voltage of opposite polarity to the reference voltage, and wherein at a predetermined difference between the reference voltage and the generated voltage from the detecting means, the solenoid means is actuated to close the valve in the fuel supply passage, thereby turning off the burner.

6. In a gas water heater, the combination of at least one burner, a heat exchanger, a body between the burner and the heat exchanger, a safety valve in a fuel supply passage to the burner, a solenoid means for controlling the valve, means including a thermocouple mounted in the heater in juxtaposition to the burner for providing a reference voltage, a pair of external terminals on the heater, a detecting unit connected to the terminals and generating a voltage of opposite polarity to the reference voltage, the detecting unit including a power source, a switching element and a sensor means connected therebetween, and the sensor means comprising a CO sensor whose resistance changes in accordance with the gas concentration, whereby at a predetermined difference between the reference voltage and the voltage generated by the detecting unit, the solenoid means is actuated to close the valve, thereby turning off the burner.



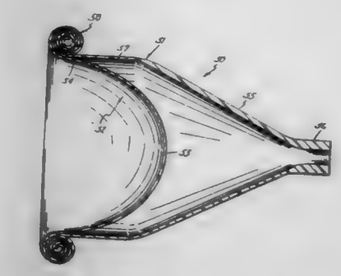


4,638,790

CONTRACEPTIVE HOOD

Anthony J. Conway; Peter R. Conway, both of Chatfield, and Philip J. Conway, Stewartville, all of Minn., assignors to Mentor Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 577,602, Feb. 10, 1984, abandoned, which is a continuation-in-part of Ser. No. 475,852, Mar. 16, 1983, abandoned. This application Mar. 25, 1985, Ser. No. 715,608
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—138 R **15 Claims**



1. A contraceptive hood to be adhesively applied to a penis, said contraceptive hood including:

an inner thin flexible cylindrical member having a closed and an open end;

an outer relatively thick cylindrical member, said outer member having an open and a partically closed end;

said cylindrical members being rolled outwardly upon themselves from their open ends to form a single roll with consecutively larger turns;

the outer surface of said outer cylindrical member having an adhesive release layer thereon and said members having a layer of pressure sensitive adhesive therebetween in

contact with the inner surface of the inner member and in contact with the release layer so that upon said cylindrical members being unrolled onto a penis, the adhesive adheres only to the inner surface of said inner cylindrical member to cause the inner cylindrical member to adhere to the penis; and

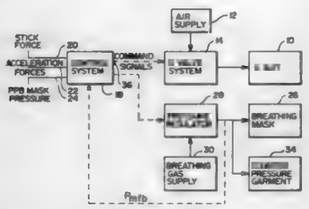
said outer cylindrical member being removable outwardly from said inner member after said members have been unrolled onto a penis.

4,638,791

APPARATUS AND METHODS FOR PROVIDING RAPID PROTECTION FROM ACCELERATIVE FORCES EXPERIENCED BY AIRCRAFT CREW MEMBERS

Steven B. Krogh, King County, and Adam J. P. Lloyd, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 22, 1985, Ser. No. 757,740
Int. Cl.⁴ A62B *7/14*
U.S. Cl. 128—1 A **31 Claims**



1. Apparatus for controlling the pressurization of an anti-acceleration garment worn by an occupant of an aircraft, said apparatus comprising:

a. first valve means for regulating the flow of fluid to said anti-acceleration garment to control the pressurization thereof;

b. control means including:

(1) means for (i) determining a level of an anticipated accelerative force which is generally perpendicular to a longitudinal axis of said aircraft in a manner that said level of anticipated accelerative force is determined as a function of a level of control force applied to said aircraft that would create said accelerative force, and (ii) for generating a first output indicative of said anticipated accelerative force level,

(2) means (i) for determining a level of sensed accelerative force which is generally perpendicular to said longitudinal axis of said aircraft, and (ii) for generating a second output indicative of said sensed accelerative force level,

(3) means for compensating for an increase in said sensed accelerative force level by decreasing said first output at a selected rate as said level of sensed accelerative force increases and for generating a third output indicative of said decreased first output,

(4) means for combining said second output with said third output to generate a first command output equal to the sum of said second and third outputs; and

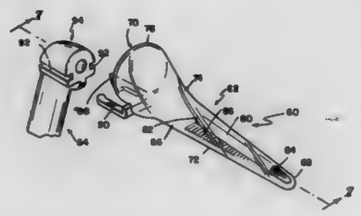
c. first valve control means (i) responsive to saud command output, and (ii) operatively connected to said first valve means, for regulating said first valve means to control the flow of fluid to said anti-acceleration garment as a function of said command output.

4,638,792

ADJUSTABLE SPECULUM WITH INCORPORATED LIGHTING SYSTEM

Kermit H. Burgin, R.R. #1, Box 334, Whitestown, Ind. 46075

Continuation of Ser. No. 394,291, Jul. 1, 1982, Pat. No. 4,502,468, which is a continuation-in-part of Ser. No. 105,509, Dec. 20, 1979, Pat. No. 4,344,419, and a continuation-in-part of Ser. No. 354,812, Mar. 4, 1982, and a continuation-in-part of Ser. No. 284,484, Jul. 17, 1981, abandoned. This application Mar. 4, 1985, Ser. No. 708,159
Int. Cl.⁴ A61B *1/06*
U.S. Cl. 128—6 **4 Claims**



1. An examination instrument, comprising

a base unit having a somewhat pistol-grip shaped handle portion, and a head portion formed with said handle portion, said head portion comprising a first front surface and two side surfaces adjacent said front surface;

a light source mounted in said head portion for providing light in said head portion of said base unit;

a light-transmissive examination member for contacting a body surface to be examined;

a means for removably attaching and securing said examination member to said head portion of said base unit such that said examination member is attached adjacent said light source, said attachment means including a groove extending at least partially across each of said two side surfaces, said grooves positioned on opposite sides of said head portion of said base unit and opening away from each other, said examination member including a proximal end portion configured with rearwardly projecting fingers spaced apart from each other along a rearward surface of said examination member a distance equal to the spacing of said grooves, said grooves receiving said fingers in sliding frictional engagement for sliding insertion of said examination member into, and sliding removal from said grooves.

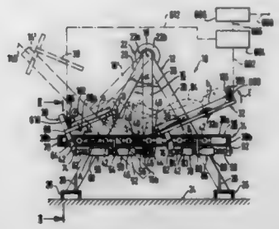
4,638,793

COUCH OF ADJUSTABLE INCLINATION FOR BODY EXTENSION

Jens Therkorn, Volpinistrassee 2, 8000 Munich 19, Fed. Rep. of Germany

PCT No. PCT/EP84/00186, § 371 Date Feb. 26, 1985, § 102(e) Date Feb. 26, 1985, PCT Pub. No. WO85/00104, PCT Pub. Date Jan. 17, 1985
PCT Filed Jun. 22, 1984, Ser. No. 709,025
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1983, 3323310
Int. Cl.⁴ A61H *1/02*
U.S. Cl. 128—71 **27 Claims**

1. Couch of adjustable inclination, especially for body extension of a person lying on the couch in a head-down position, comprising a couch carrier means, a support table securable on the carrier means in different inclinations, a foot retaining device mounted at one end of the table and a head rest mounted at the other end of the table, a back rest articulated to the table and supporting said head rest, a calf support mounted on the support table for supporting the legs with knees bent, the calf support adjustable continuously or in fine stages for the variation of the bending angle of the knee defined between lower leg and thigh, wherein a total body support length is defined by the length of the calf support, the length of the back rest and the distance between adjacent ends of the calf support and the back rest, the body support length being adjustable continuously or in fine stages in accordance with the increasing body extension with the table occupied and inclined in a head-down position, and wherein the foot retaining device is mounted on the support table so that the distance between the foot retaining device and the head rest does not decrease when the calf support is adjusted for changing the bending angle of the knee.

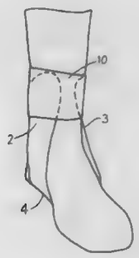


4,638,794

JOINT CUFF

Gunter Grisar, Am Suedhang 3B, D-6301 Wettenberg 3, Fed. Rep. of Germany

Filed Feb. 19, 1985, Ser. No. 702,512
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1984, 8405572[U]; Sep. 29, 1984, 3435955
Int. Cl.⁴ A61F *5/37, 5/14*
U.S. Cl. 128—90 H **8 Claims**



1. A joint cuff, in particular for the support and joint guiding of an ankle joint of a user, comprising: an elongated member having two longitudinally extending side portions interconnected by a bottom portion, said two side portions having a lateral width to enable only laterally facing portions of the ankle joint to be covered thereby, both lateral edges of said bottom portion defining an angle opening in the same direction, the entirety of said bottom portion extending to one lateral side of said central longitudinal axis of said side portions, wherein said joint cuff includes a thermoplastic material which is deformable upon application of heat thereto to enable said thermoplastic material to be conformed to the ankle joint, said thermoplastic material having a stiff characteristic at ambient temperature, and said lateral width dimension of said two side portions of said joint cuff being such that the forwardly and rearwardly facing sides of the tibia remain free from coverage by said joint cuff, while said joint cuff is substantially juxtaposed against and covers the laterally facing sides thereof, so that, in use after said side portions and said bottom portion have been respectively form fitted and fitted against the laterally facing sides of the user's ankle and the bottom of the user's foot, respectively, said side portions are held against the laterally facing sides of the ankle joint by a bandage member, the user's foot having mobility to enable the toe portion of the foot to move freely up and down but the ankle joint being reinforced in the lateral directions of movement of the foot due to said stiff characteristic of said thermoplastic material at ambient temperature.

4,638,795

MATERIAL FOR SUPPORT DRESSINGS

Roland Richter, Cologne; Hanns P. Müller, Odenthal, and Christian Wegner, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 19, 1985, Ser. No. 757,093
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 3426732
Int. Cl.⁴ A61F *5/04*
U.S. Cl. 128—90 **10 Claims**

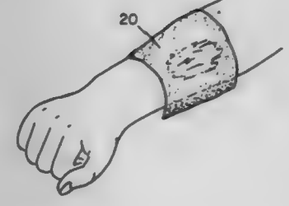
1. In a material which hardens on access of moisture, for the production of support dressing in human or veterinary medicine comprising a flexible carrier material impregnated and/or coated with an agent containing isocyanate groups, the improvement wherein the agent containing isocyanate groups includes an addition product of a sulphonyl isocyanate with at least one of a tertiary amine and a compound with a tin(II) or tin(IV) carboxylate structure.

4,638,796

METHOD OF DRESSING WOUNDS

Calvin L. Sims, Richardson, Tex., assignor to Winfield Laboratories, Inc., Richardson, Tex.

Continuation of Ser. No. 352,117, Feb. 25, 1982, abandoned. This application Jun. 15, 1984, Ser. No. 621,074
Int. Cl.⁴ A61F *13/00*
U.S. Cl. 128—155 **26 Claims**



1. A method of dressing an open wound, burn or skin graft, comprising:

placing an adhesive-free surfacing barrier without a backing layer and, without any barrier supporting base layer pieces, in direct contact with the wound, burn or graft, said barrier being in direct contact with the surfaces of the body adjacent the wound, burn or graft, said barrier being comformable to the contours of the wound, burn or graft site and the adjacent body surfaces, said barrier consisting of a nonwoven, netted material integrally formed in a synthetic polymeric material and possessing straight smooth parallel longitudinal ribs interconnected by a plurality of fibrillated and split strands exhibiting a plurality of small fibres non-uniformly interspersed with a plurality of differently sized voids and said synthetic polymeric material consisting of a blend of at least two incompatible polymers extruded in sheet form, the blend comprising a mixture of a major proportion by weight of a polyolefin and a minor proportion by weight of a polymer containing an aryl group, said barrier being permeable and nonabsorbent to blood and serum and said barrier being substantially nonadherent to the wound, burn or graft site or adjacent body surfaces; and

placing an absorbent covering dressing over the surfacing

barrier, said covering dressing being of a predetermined thickness to adsorb fluid from the wound, burn or graft whereby traumatic disruption of the graft, burn or wound is minimized upon removable of said covering dressing for visual examinations of the graft, burn or wound or changes of said cover dressing.

4,638,797

REINFORCED MOISTURE VAPOR PERMEABLE, PRESSURE-SENSITIVE ADHESIVE WOUND DRESSINGS

Richard E. Merrill, Sanbornton, N.H., and Craig L. Allard, Wakefield, Mass., assignors to Acme United Corporation, Fairfield, Conn.

Filed Apr. 23, 1986, Ser. No. 855,586
Int. Cl.⁴ A61L *15/00*
U.S. Cl. 128—156 **15 Claims**

1. A homogeneous, reinforced, moisture vapor permeable, pressure-sensitive adhesive wound dressing comprising

A. a reinforced membrane film or layer incorporating a homogeneous blend of

a. at least one thermoplastic polyurethane resin,

b. a non-urethane copolymer resin, and

c. silica; and

B. a moisture vapor permeable, pressure sensitive adhesive applied to one surface of said membrane film or base,

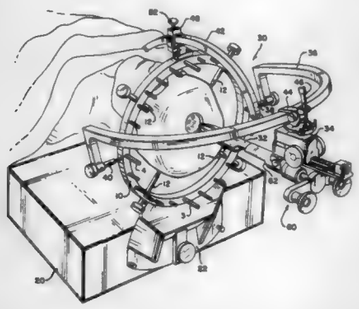
whereby a reinforced, moisture vapor permeable, pressure sensitive adhesive wound dressing is achieved which possesses a substantially increased modulus of elasticity, imparting greater stiffness and rigidity to the wound dressing for increased handling ease.

4,638,798

STEREOTACTIC METHOD AND APPARATUS FOR LOCATING AND TREATING OR REMOVING LESIONS

C. Hunter Shelden, 1345 Bedford Rd., San Marino, Calif. 91108, and Gilbert D. McCann, 2247 No Villa Hts. Rd., Pasadena, Calif. 91107

Filed Sep. 10, 1980, Ser. No. 185,937
Int. Cl.⁴ A61B *17/00*
U.S. Cl. 128—303 B **9 Claims**



1. In a stereotactic system for treating a region of a patient's body, a method for using a tomography scanner for defining a selected point of the region in a three-dimensional coordinate system with reference to a predetermined point of means attached to the patient for establishing a reference point of said coordinate system for accurate control of instruments used to treat said region, comprising the steps of

placing said means on the patient for precise correlation between the location of the region to be treated and the control system for treatment of the region in said three-dimensional coordinate system,

conducting a series of parallel tomography scans through said region to be treated and at least part of said means for determination of three-dimensional coordinates of points in said region of the body of said patient to be treated relative to said reference point of said means,

determining from data of said scan series three-dimensional coordinates with respect to said reference point of said means of at least one point of said region,

determining all parameters of the system for control of instruments used for treatment with respect to said reference means, and

completing the treatment with instruments guided by said control system with reference to said means still attached to said patient,

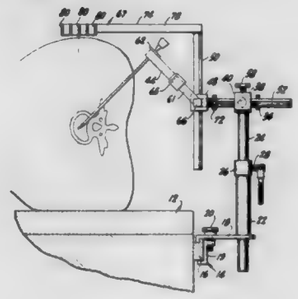
wherein said reference means is a ring attached to the patient, and said reference point is the center thereof.

4,638,799

NEEDLE GUIDE APPARATUS FOR DISCOLYSIS PROCEDURES

Robert R. Moore, 4010 East Ave., Hayward, Calif. 94545

Filed Jun. 13, 1985, Ser. No. 744,392
Int. Cl.⁴ A61B *17/00*
U.S. Cl. 128—303 B **12 Claims**



1. A needle guide apparatus for directing an injection needle into a spinal disc of a patient on a conventional operating table having a side rail with the patient having a sagittal this longitudinally oriented to the table comprising:

(a) mounting means for connecting the apparatus to the table in a posterior location to a patient lying in a lateral decubital position on the table;

(b) needle guide means for guiding the injection needle on a select penetration angle into the lateral posterior of the patient;

(c) adjustable support structure supporting said needle guide means and interconnecting said guide means with said mounting means said support structure having adjustable means for locating said needle guide means at a predetermined location for accurate guide of a needle into a select spinal disc wherein said adjustable support structure comprises at least one vertical member with adjustment means for adjusting the height of the needle guide means, at least one horizontal member disposed parallel to the sagittal axis of the patient, said horizontal member cooperating with connected adjustment means for adjusting the fore and aft position of said needle guide means parallel to the sagittal axis of the patient, and at least one transverse member disposed transverse of the sagittal axis of the patient said transverse member cooperating with connected adjustment means for adjusting the cross position of said needle guide means transvrse to the sagittal axis of the patient;

(d) indicator means connected to said support structure for indicating the relative position of said guide means relative to the select disc.

4,638,500

LASER BEAM SURGICAL SYSTEM

Thomas J. Michel, Miami, Fla., assignor to Research Physics, Inc, Hollywood, Fla.

Filed Feb. 8, 1985, Ser. No. 699,933
Int. Cl.⁴ A61B *17/36*
U.S. Cl. 128—303.1 **13 Claims**



1. A steerable laser beam system for performing surgery at a target in a surgical site within a body cavity, said system comprising:

A. a cannula insertable into a body passage leading to the surgical site, said cannula including a rotatable inner tube provided with an inlet section having an input port and an outlet section provided with a lateral output port which, by rotation of the inner tube, can be made to assume a position adjacent the target;

B. a laser source coupled to said input port to produce a collimated laser beam which is directed toward said outlet section;

C. a normally planar deformable membrane having a reflective surface supported in said outlet section at an angle with respect to the inner tube axis to project the laser beam impinging thereon through said output port toward the target in the surgical site; and

D. a controllable actuator coupled to the rear of the membrane at its geometric center to force said membrane to assume a concave form having a quasi-parabolic shape which optically brings said beam to a focus at the surgical site target, so that by rotating the inner tube and by focusing the beam projected from said output port one can steer the beam to precisely strike the target; said membrane having an elliptical form and being peripherally joined by an elastomeric coupler to a rigid supporting ring so that the membrane, when it is deformed to assume a quasi-parabolic shape, is not distorted at its periphery.

4,638,801

LASER OPHTHALMIC SURGICAL SYSTEM

Richard T. Daly, Huntington, and Stephen L. Trokel, New York, both of N.Y., assignors to Lasers for Medicine, Hauppauge, N.Y.

Continuation of Ser. No. 511,191, Jul. 6, 1983, abandoned. This application Oct. 23, 1985, Ser. No. 790,637
Int. Cl.⁴ A61B *17/36*
U.S. Cl. 128—303.1 **10 Claims**

1. An apparatus for performing microsurgery on a tissue of an eye comprising:

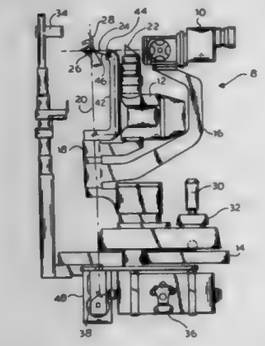
a frame;

first and second arms rotatably mounted on said frame;

means mounted on said first arm for projecting a slit image along a first optical axis on said tissue for illuminating said tissue, said slit image comprising a first and a second segment separated by a dark area with a horizontal center line, said dark area being provided as a fiducial reference within the eye;

means mounted on said second arm for observing said slit image within the eye along a second optical axis, said first and second axis defining a horizontal plane;

a source for a laser beam having a focal point; and



focusing means mounted on said first arm for focusing said laser beam into the eye by shifting said focal point along a third axis with respect to said slit image, said third axis being at an acute angle with respect to said horizontal plane;

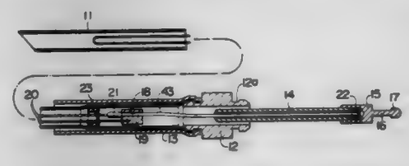
whereby the actual position of said focal point with respect to said slit image is indicated by the relative position of said focused laser image with respect to said fiducial reference as observed along said second optical axis.

4,638,802

HIGH FREQUENCY INSTRUMENT FOR INCISION AND EXCISION

Tsutomu Okada, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Sep. 6, 1985, Ser. No. 773,053
Claims priority, application Japan, Sep. 21, 1984, 59-198053
Int. Cl.⁴ A61B *17/36*
U.S. Cl. 128—303.14 **11 Claims**



1. An instrument for use with a source of high frequency power for incision and excision of affected tissue, said instrument comprising:

a sheath formed by a pipe of flexible, electrically insulating material and having a substantial length;

a wire electrode disposed within said sheath so as to be freely movable therein between a first position wherein said wire electrode is wholly within said sheath and a second position wherein said wire electrode extends outside said sheath and forms a loop which can be passed over an affected part;

an operating pipe means disposed for movement into and out of said sheath through an opening formed in said sheath at a proximate end of the sheath and for causing an advancing and retracting movement of said wire electrode; and

an operating unit including a slider connected to said operat-

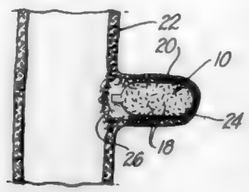
ing pipe which permits an operator to cause advancing and retracting movement of said pipe, said operating pipe being rotatable relative to said wire electrode.

4,638,803

MEDICAL APPARATUS FOR INDUCING SCAR TISSUE FORMATION IN A BODY

Robert W. Raud, 521 N. Bristol St., Los Angeles, Calif. 90049

Continuation of Ser. No. 429,088, Sep. 30, 1982, abandoned. This application Nov. 30, 1984, Ser. No. 677,601
Int. Cl.⁴ A61B *17/12*
U.S. Cl. 128—325 **14 Claims**



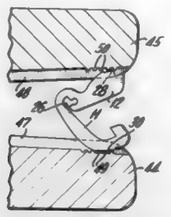
8. A medical balloon which comprises:
an inflatable balloon formed from an elastomeric material;
a composition present on at least the outside surface of said balloon, said composition chosen from the group consisting of iron, copper, tantalum, gold, silver, platinum, chromium and their derivatives whereby said composition is capable of inducing the formation of thrombosis followed by invasion of capillaries and fibroblasts and subsequent scar tissue formation.

4,638,804

DOUBLE-LATCHED NON-METALLIC, BIO-COMPATIBLE HEMOSTATIC CLIP

Stephen J. Jewusiak, Denville, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 277,582, Jun. 26, 1981, abandoned, which is a continuation-in-part of Ser. No. 123,878, Feb. 25, 1980, abandoned. This application Jun. 14, 1985, Ser. No. 744,832
Int. Cl.⁴ A61B *17/12*
U.S. Cl. 128—325 **6 Claims**



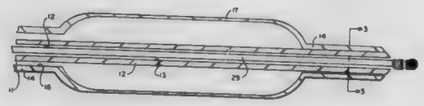
1. A non-metallic, bio-compatible polymeric hemostatic clip capable of being applied to a blood vessel to close said vessel using a clip applying instrument, said clip comprising first and second leg members, each leg member having an outer surface and an inner vessel clamping surface, in opposition to a vessel clamping surface of the leg member;
said first leg member terminating at each end in a return bend forming a hook member extending outward from said vessel clamping surface;
said second leg member terminating at each end in a configuration adapted for engagement by said hook members of said first leg member;
integral resilient hinge means joining said first and second leg members proximal to one end of said leg members;
a shearable web extending from the vessel clamping surface of the first leg member to the proximal end of the second leg member when said clip is in the open position, said web being sheared during closure of the clip;
applier gripping means disposed on the outer surface of said first and second leg members;
said first and second leg members being pivotable about said resilient hinge means from an open position to a closed position with the ends of said second leg member being engaged by the corresponding hook members of the first leg members as said leg members are pivoted to a closed position whereby said clip is maintained the resilient hinge means deteriorates.

4,638,805

SELF-VENTING BALLOON DILATATION CATHETER AND METHOD

Philip E. Powell, Mountain View, Calif., assignor to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed Jul. 30, 1985, Ser. No. 760,637
Int. Cl.⁴ A61M *29/02*
U.S. Cl. 128—344 **10 Claims**



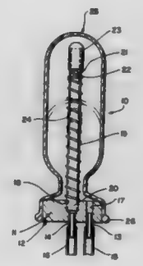
1. In a self-venting balloon dilatation catheter, a flexible tubular member having first and second lumens extending therethrough, an inflatable balloon carried by the distal extremity of the tubular member in such a manner so that the first lumen extends through the balloon and is out of communication with that interior of the balloon and the second lumen is in communication with the distal extremity interior of the balloon and means disposed between the balloon and the tubular member for venting air from the interior of the balloon but inhibiting the escape of liquid from the balloon.

4,638,806

RECTAL HEMORRHOID THERAPEUTIC APPARATUS

Lawrence D. Bartlett, Hartford, Ky., assignor to Robert T. Johnson, Hartford, Ky., a part interest

Filed Jul. 9, 1985, Ser. No. 753,193
Int. Cl.⁴ A61F *7/12*
U.S. Cl. 128—400 **3 Claims**



1. A topical hemorrhoid therapy apparatus, comprising in combination,
an inserter having a base, a central aperture in said base, a second aperture in said base radially spaced from said central aperture in said base, a tubular rod means with one end disposed in said central aperture in said base, a cap secured over an extremity of said tubular rod means remote from said base, a third aperture in said tubular rod means which allows fluid to flow through said rod means,

a flexible cover secured over said rod and secured to an outer circumference of said base by an elastic means for snug engagement with said base, first and second hose nipples extending from a bottom portion of said base and connected with said central aperture and said second aperture, respectively, said central aperture and said first nipple connected thereto serving as a unitary outlet means for fluid flowing from within said flexible cover, said second aperture and said second nipple serving as a unitary inlet means for fluid flow into said inserter, inlet and outlet tubing members connected to said nipples, and means surrounding said tubular rod means to prevent said cover from obstructing fluid entry into said third aperture whereby said inserter may provide topical therapeutic benefit to a bodily orifice such as the rectum.

4,638,807

HEADBAND ELECTRODE SYSTEM

Francis E. Ryder, Arab, Ala., assignor to Ryder International Corporation, Arab, Ala.

Filed Aug. 27, 1985, Ser. No. 770,150
Int. Cl.⁴ A61B *5/04*
U.S. Cl. 128—644 **16 Claims**



1. A headband electrode system comprising: an elongate flexible band; a center electrode mounted upon said band at a central portion of said band at a first elevation relative to said band; a pair of temporal electrodes; a pair of arm members each carrying one of said temporal electrodes, said arm members extending from said band to dispose the temporal electrodes at a second elevation relative to the band such that said temporal electrodes are below said center electrode, and pivotal mounting means connecting the arm members to the band, such that said arm members are pivotally mounted to the band, one to either side of the center electrode for mounting each of said temporal electrodes for pivotal movement relative to said band; said arm members being pivotally movable for positioning said temporal electrodes at a plurality of positions relative to said center electrode; and means for affixing said band to the head of a subject so as to position said center electrode substantially centrally upon the forehead of the subject and said temporal electrodes for pivotal movement beneath and to either side of said center electrode, said band comprising a relatively flat member of predetermined thickness over a major portion thereof and having two cross-sectional regions of decreased thickness which extends transversely and continuously across said band, one said continuous region of decreased thickness being disposed on either side of said center electrode to increase the flexibility of the band and facilitate the ability of the band to conform to the contour of the head of a wearer.

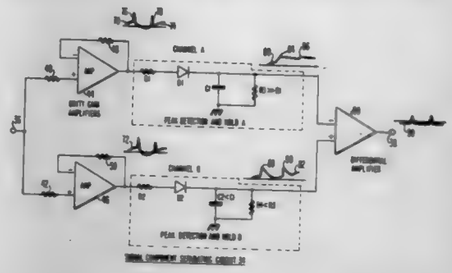
4,638,808

CIRCUIT FOR SEPARATING ONE TYPE SIGNAL COMPONENT FROM ANOTHER

Daniel D. Mawhinney, Livingston, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 16, 1984, Ser. No. 641,464
Int. Cl.⁴ A61B *5/04*
U.S. Cl. 128—653 **11 Claims**

6. A heart rate monitor comprising a continuous wave microwave transceiver having a transmitting/receiving antenna capable of being directed toward the heart of a patient and, when so directed, for producing a signal having a periodically pulsing component, the period corresponding to the period of successive heart beats and having a reciprocating component corresponding to breathing of said patient, said heart rate monitor further comprising in combination:
a comparator; and
first and second channels coupled to receive said pulsing and reciprocating signal,
said first and second channels being coupled to respective inputs of said comparator, each channel comprising a peak detection and holding circuit (PDH) receptive of said pulsing and reciprocating signal and coupled at its output



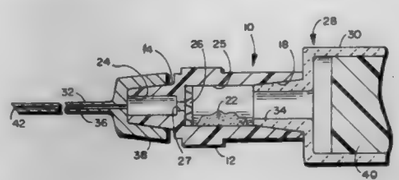
to the comparator, each PDH comprising a charging and discharging circuit, the second channel charging and discharging circuit having a faster charging and discharging time than the first channel charging and discharging circuit, the second channel PDH attenuating the input signal more than the first channel PDH, said comparator being receptive of the two peak detected and held signals for producing a signal having a component corresponding to the time when the pulsing component of the input signal representing heart beat is present.

4,638,809

METHOD OF PREPARING RADIONUCLIDE DOSES

John H. Kuperus, 10430 Mohawk, Cypress, Calif. 90630

Filed Mar. 22, 1984, Ser. No. 592,091
Int. Cl.⁴ A61B *5/14*
U.S. Cl. 128—653 **7 Claims**

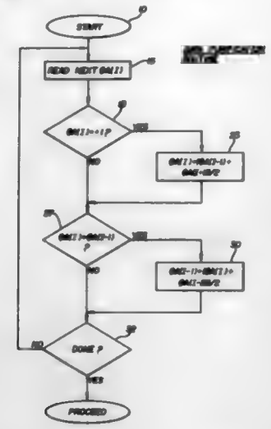


1. A method of preparing aliquot doses of a tracer material useful in diagnostic nuclear medicine comprising:
storing descrete quantities of a lyophilized radionuclide carrier in separate tubular containers from which air and moisture is excluded,
selecting from said tubular containers a container in which is stored a carrier appropriate for a nuclear diagnostic test to be performed,
interposing said selected container between the needle and the barrel of a hypodermic syringe, and drawing a predetermined amount of a liquid containing a radionuclide tracer in known concentration into said hypodermic syringe barrel through said hypodermic needle and through said selected container to disolve the discrete quantity of lyophilized carrier therein to combine said carrier with said redionuclide tracer to form an aliquot dose of nuclear diagnostic tracer material, as needed.

4,638,810
AUTOMATED DIASTOLIC BLOOD PRESSURE MONITOR WITH DATA ENHANCEMENT

Maynard Ramsey, III, Tampa; Richard Medero, Lutz, and Rush W. Hood, Jr., Tampa, all of Fla., assignors to Critikon, Inc., Tampa, Fla.

Filed Jul. 5, 1985, Ser. No. 751,825
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—681 **9 Claims**



2. In combination in digital processor controlled automated blood pressure measuring apparatus operative in conjunction with a stored program; (a) an inflatable cuff; (b) means for inflating and deflating said cuff; (c) pressure transducer means coupled to said cuff for signalling the pressure obtaining in said cuff; (d) means responsive to the pressure signalled by said transducer for generating a signal representing blood pressure complexes sensed by said cuff and said transducer coupled thereto; (e) complex peak storing means for storing values characterizing the peak amplitudes of said signals representing complexes at different cuff pressures; (f) cuff pressure storing means for storing the cuff pressures obtaining when said pulse peak signals arose; (d) data purifying means operative upon values stored by said complex peak amplitude characterizing means pressure complex peak storing means for correcting data inaccuracies; and (h) diastolic pressure determining means, said diastolic pressure determining means comprising (i) means for locating the maximum peak amplitude stored in said complex peak storing means, (ii) computing means for computing two different levels during a given measurement cycle, each a different fraction of said peak amplitude value, (iii) means responsive to the values determined by said computing means for selecting from said complex peak storing means plural peak amplitudes generated at cuff pressures lower than that obtaining when said maximum cuff pressure pulse peak signal arose, and (iv) determining means for determining diastolic pressure from said selected plural amplitudes and the cuff pressures stored in said cuff pressure storing means corresponding to said selected plural signals.

4,638,811
VASCULAR INTERFACE

Jose Biscra, Camarillo; James H. Carrington, Los Angeles, and Max H. Weil, Beverly Hills, all of Calif., assignors to Institute of Critical Care Medicine, Los Angeles, Calif.

Continuation of Ser. No. 830,847, Sep. 6, 1977, Pat. No. 4,258,717. This application Dec. 15, 1980, Ser. No. 216,189
Int. Cl.[4] A61B 5/00; A61M 35/00, 5/00
U.S. Cl. 128—673 **5 Claims**

1. A vascular interface apparatus, for connection to a patient comprising:

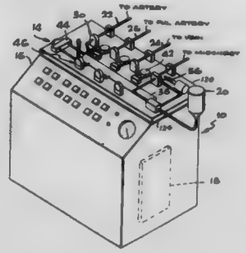
an arterial station including an arterial station valve with first, second, and third ports and an arterial catheter coupled to said first port for connection to an artery of the patient;

a venous station including a venous catheter for connection to a vein of the patient;

a sample station which includes a sample valve having first, second, and third ports and a valve member movable to connect said first port to said second or third ports, and a syringe receiver means at said third port for receiving a syringe means that can hold a blood sample;

a first conduit coupling said second port of said arterial station valve to said first port of said sample valve;

a second conduit coupling said second port of said sample valve to said venous station;



means for operating said sample valve to interconnect said first and second sample valve ports to cause blood flow from an artery to a vein past said sample station, and to interconnect said first and third sample valve ports to enable the filling of a syringe means with a blood sample;

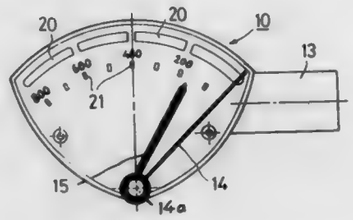
a flushing source which includes a container of flushing solution coupled to said third port of said arterial station valve; and

flushing means for operating said arterial station valve to connect said third port to said first port to flush said arterial catheter by passing flushing solution through it, and also to pass flushing solution through the first and second conduits and through the venous catheter to the patient.

4,638,812
EXHALATION FLOW METER

Taisto Hilkkinen, Hämeenlinna, Finland, assignor to Etela Hameen Keuhkovammayhdistys R.Y., Finland

PCT No. PCT/FI83/00001, § 371 Date Jul. 19, 1984, § 102(e) Date Jul. 19, 1984, PCT Pub. No. WO84/02642, PCT Pub. Date Jul. 19, 1984
PCT Filed Jan. 4, 1984, Ser. No. 637,211
Int. Cl.[4] A61B 5/08
U.S. Cl. 128—726 **8 Claims**



1. A device for measuring peak flow of exhalation of an individual, said device comprising,

a housing having an interior,

an axle affixed to said housing in the interior thereof,

a flap disposed within said housing interior and having a substantially tubular portion rotatably mounted on said axle,

a spring mounted within said tubular portion, said spring having a first end connected to said tubular portion and a second end connected to said housing,

a pointer rotatably mounted in said housing situated in a position to be contacted by said flap, and

mouthpiece means provided on said housing for directing a flow of fluid into said housing interior, said flap and said pointer being situated in said housing with said flap being positioned between said pointer and said mouthpiece means,

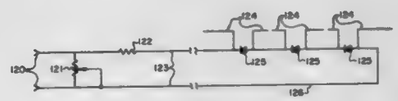
whereby upon initiating a flow of fluid through said mouthpiece means and into said housing interior, said flap rotates about said axle from an initial position and contacts and rotates said pointer to a position indicative of peak flow, and

upon termination of said fluid flow, said spring returns said flap to the initial position, while said pointer remains at the position indicative of peak flow.

4,638,813
ELECTRIC FIELD PROBE

Paul F. Turner, North Salt Lake City, Utah, assignor to BSD Medical Corporation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 405,947, Aug. 6, 1982, which is a continuation-in-part of Ser. No. 136,506, Apr. 2, 1980, Pat. No. 4,462,412. This application Mar. 15, 1984, Ser. No. 590,030
Int. Cl.[4] A61N 5/00
U.S. Cl. 128—804 **12 Claims**



1. A system for heating a target with electromagnetic radiation, comprising:

a central control unit;

a source coupled to said control unit, said source generating electromagnetic energy at a frequency and power in response to said control unit;

means coupled to said source for transferring energy from said source to said target; and

input means coupled to said control unit for indicating the status of the target, wherein operation of the system is controlled by said control unit as a function of the target status, said input means including a plurality of electric field probe arrays, each electric field probe array including a plurality of dipole probes aligned along a common axis, each including a diode connected between two linear conductors and said diodes of each probe array collectively connected in series.

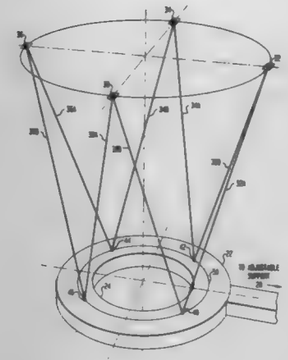
11. An electric field probe array comprising:

a plurality of dipole probes aligned along a common axis, each including a diode and two linear conductors, said diode connected between the two linear conductors, said diodes of each probe of the array collectively connected in a series with two resistive leads connected to opposing ends of said series connection, said resistive leads having a resistance per unit length of a value greater than that of one of the dipole conductors.

4,638,814
ELECTRON ACCELERATOR UNIT FOR ELECTRON BEAM THERAPY

Keith A. Spanswick, Oceanport, N.J., assignor to Siemens Medical Laboratories, Walnut Creek, Calif.

Filed Sep. 11, 1984, Ser. No. 649,392
Int. Cl.[4] A61N 5/00
U.S. Cl. 128—804 **14 Claims**



1. An electron accelerator unit for electron beam therapy, comprising:

a source of an electron beam;

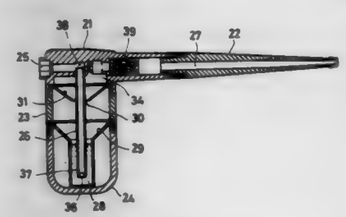
means for finally directing at least a portion of said beam to a therapy site, said directing means being mechanically independant of, and electrically isolated from, said source, and having a target area; and

means for aligning said source with said directing means, said aligning means comprising means for projecting at least one beam of light from the source toward said target area.

4,638,815
WATER PIPE

Takeo Yoshioka, 8-16, Saihigashimachi 1-chome, Okayama, Japan

Filed Dec. 16, 1985, Ser. No. 809,414
Claims priority, application Japan, Jun. 26, 1985, 60-98444
Int. Cl.[4] A24F 1/30
U.S. Cl. 131—173 **1 Claim**



1. A water pipe comprising:

a bowl having a chamber and formed with a hole communicating with said chamber to receive a cigarette;

a stem mounted on said bowl so as to extend laterally therefrom and formed with a smoke passage extending therethrough communicating with said chamber;

a tubular member mounted on said bowl at bottom thereof and having a funnel-shaped wall formed with a hole in the center thereof;

a cap removably mounted on said tubular member at bottom thereof and having a funnel-shaped surface formed with a water reservoir in the center thereof to contain water;

a smoke tube extending vertically through the hole in said funnel-shaped wall into said water reservoir so as to communicate said hole for a cigarette with said water reservoir, said smoke tube having a small hole at a point slightly above its bottom; and

a ball mounted in said smoke tube so as to be movable up and down therein, said smoke tube being adapted to hold said ball therein.

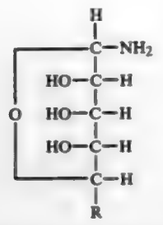
4,638,816

SMOKING COMPOSITIONS CONTAINING A GLYCOSYLAMINE FLAVORANT ADDITIVE

Richard H. Cox, Midlothian; Harvey J. Grubbs, Mechanicsville, and Stephen A. Haut, Chesterfield, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Mar. 22, 1985, Ser. No. 714,774
Int. Cl.[4] A24B *3/12*
U.S. Cl. 131—276 **15 Claims**

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco and tobacco substitutes, and (2) between about 0.001 and 5 weight percent, based on the total weight of filler, of a glycosylamine flavorant-release additive corresponding to the formula:



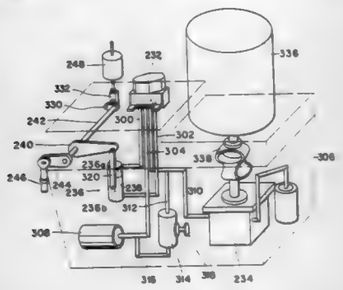
where R is a hydrogen, methyl or methylol substituent.

4,638,817

DEVICE FOR CONTROLLING CONTENTS OF TOBACCO ON CIGARETTE MACHINE

Yutaka Okumoto, Musashino, Japan, assignor to Japan Tobacco, Inc., Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 705,314
Claims priority, application Japan, May 8, 1984, 59-090257
Int. Cl.[4] A24C *5/14*
U.S. Cl. 131—280 **3 Claims**



1. A tobacco content control device for a cigarette making machine wherein tobacco is transferred along a predetermined path in said cigarette making machine, said tobacco content control device comprising:

a radiometricdensity detector including first and second density detectors provided along said predetermined path to obtain two electric signals representative of tobacco density;

control means connected to said first and second density detectors for maintaining a flow rate of the tobacco at a predetermined level in accordance with said electric signals;

subtractor means connected to said first and second density detectors for obtaining a difference between said two electric signals;

voltage generating means provided independently of said control means and said subtractor means for producing two voltage signals set at two predetermined range;

comparison means connected to said subtractor means and said voltage generating means for comparing said difference between the two electric signals with said two voltage signals to produce an output signal when said predetermined range is outrun;

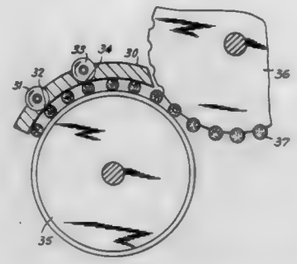
alarm means connected to said comparison means for informing of an abnormality of said radiometric density detector upon receipt of said output signal of said comparison means.

4,638,818

METHOD OF MAKING A FILTER CIGARETTE

Walter A. Nichols, and Reginald W. Newsome, both of Richmond, Va., assignors to Philp Morris Incorporated, New York, N.Y.

Division of Ser. No. 582,600, Feb. 22, 1984, Pat. No. 4,570,649, which is a continuation-in-part of Ser. No. 429,354, Sep. 30, 1982, abandoned. This application Dec. 3, 1985, Ser. No. 804,042
Int. Cl.[4] A24C *1/38*
U.S. Cl. 131—281 **2 Claims**



1. A method of making a filter cigarette comprising a substantially cylindrical tobacco rod, a substantially cylindrical filter plug, plug wrap circumscribing the filter plug, and tipping paper circumscribing the plug wrap and a portion of the tobacco rod, at least one of said plug wrap and said tipping paper being substantially air-impermeable, wherein the tobacco rod and the wrapped filter plug have substantially the same cross-sectional area and shape, the filter plug has a rod end and a mouth end open to permit passage of air and smoke, the tobacco rod and the wrapped filter plug are axially aligned in abutting, end-to-end relation, the plug wrap comprises, in sequence, abutting mouth-end, central, and rod-end bands, the rod-end band has a first opening therein, the rod-end band and the mouth-end band are fixed to the filter plug, the central band is rotatable about the longitudinal axis of the filter plug, the tipping paper comprises a first band and an abutting second band, the first band extends from the mouth end of the filter plug to a position overlying the rod-end band and is attached only to the central band for rotation therewith, the first band has a second opening therein positioned such that rotation of the first band rotates the second opening into varying degrees of registry with the first opening, and the second band extends from the first band to a position on the tobacco rod and joins the tobacco rod to the wrapped filter plug; said method comprising:

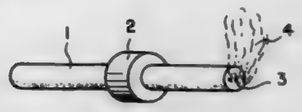
making two parallel, circumferentially extending rows of closely spacely perforations in the plug wrap to define the mouth-end, the central, and the rod-end bands, one of said rows spaced from said mouth end and defining said mouth-end and central bands, the second of said rows spaced from the first of said rows and defining said central and rod-end bands, axially aligning the tobacco rod and the wrapped filter plug in abutting end-to-end relation, making a row of perforations in the tipping paper to define the first and the second bands, applying an adhesive on one side of the tipping paper at a first position overlying the tobacco rod and the portion of the rod-end band to be circumscribed by the second band, and at a second position corresponding to the location of the central band, wrapping the adhesive-coated side of the tipping paper around the axially aligned tobacco rod and filter plug, and forming an opening in the first band and the underlying rod-end band.

4,638,819

DEVICE FOR DECREASING SIDE STREAM SMOKE OF TOBACCO PRODUCTS

Sakio Ikeda, Nagareyama, Japan, assignor to Dynic Corporation, Kyoto and Mine Kinzoku Kogyo Kabushiki Kaisha, Yokohama, both of, Japan

Filed Mar. 29, 1985, Ser. No. 717,704
Claims priority, application Japan, Mar. 30, 1984, 59-61040; Apr. 17, 1984, 59-75729; Jul. 4, 1984, 59-137223
Int. Cl.[4] A24F *1/02*
U.S. Cl. 131—331 **5 Claims**



1. A device for decreasing generation of side stream smoke from a burning, generally cylindrical tobacco product, comprising:

a main body made of material which is non-combustible in the presence of heat generated by burning tobacco, said main body being formed with a longitudinal through hole for slidably accommodating the outer periphery of said tobacco product;

wherein said through hole has a cross-sectional area in the range of about $\pi r^2 mm^2$ to $\pi(r+2)^2 mm^2$, where r equals the radius of the tobacco product in millimeters;

said main body has a plurality of openings spaced from one another in the longitudinal direction and extending between the outer periphery of said main body and the inner surface of said through hole; and

the ratio between the total area of said openings and the total inner surface of said through hole is selected in the range of about 5 to 15%.

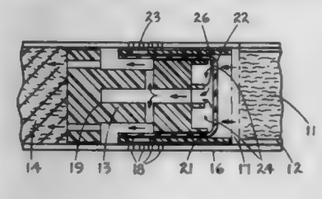
4,638,820

PUFF CONTROL CIGARETTE

Donald L. Roberts; Anthony L. Angel; Douglas C. Clark, all of Winston-Salem, N.C.; Jack F. Clearman, Blakely, Ga., and T. Stephen Sink, Lexington, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Feb. 3, 1986, Ser. No. 825,563
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—336 **6 Claims**

2. A smoking article comprising in combination a smoke producing material, air ventilation means for providing air to the smoking article and valve means operatively associated with said air ventilation means and adapted to move from a first position to a second position during each puff to deliver to a smoker a stream containing a first concentration of smoke from the smoke producing material during the first portion of the puff and a second lower concentration of smoke and substantially increased concentration of air from the air ventilation



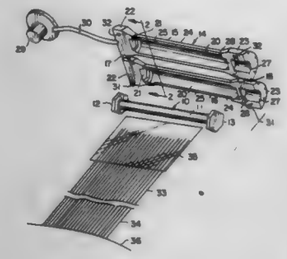
means during the remainder of the puff and then return to the first position at the end of the puff.

4,638,821

METHOD AND APPARATUS FOR ISOLATION OF HAIR FROM TREATMENT MATERIALS

Donald R. Smith, Rock Hill, S.C., assignor to Michael H. King, Tega Cay, S.C., a part interest

Filed Jan. 7, 1985, Ser. No. 689,463
Int. Cl.[4] A45D *7/00*
U.S. Cl. 132—7 **7 Claims**



5. A method of protecting a portion of hair from hair treatment chemicals applied to an unprotected portion of hair on a person's head, said method comprising the steps of:

(a) providing a core,

(b) wrapping a portion of hair to be protected on the core,

(c) providing a protective socket extendable about the core with the protected portion of hair wound thereon,

(d) placing the core and the said protected portion of hair within the socket,

(e) closing the socket about the core and the protected portion of hair thereon with an unprotected portion of hair extending outwardly from the socket,

(f) releasably locking the socket to prevent relative movement between the core and socket and thereby retain the said protected portion of hair on the core within the socket,

(g) applying a conditioner to the unprotected hair extending from the socket to prevent entry of the hair treatment chemicals into the socket, and

(h) rolling an unprotected portion of hair around the socket.

4,638,822

HAIR-SETTING PROCESS

Jean-Francois Grollier; Claire Fiquet; Chantal Fourcadier, all of Paris; Claude Dubief, Le Chesnay, and Daniele Cauwet, Paris, all of France, assignors to L'Oreal, Paris, France

Filed Jul. 21, 1983, Ser. No. 516,052
Claims priority, application Luxembourg, Jul. 21, 1982, 84286
Int. Cl.[4] A45D *7/04; A61K 7/09, 7/11*
U.S. Cl. 132—7 **35 Claims**

1. A hair-setting process, which comprises first treating the hair with at least one cationic polymer and at least one anionic

polymer, in a solvent medium selected from the group consisting of water and a mixture of water and alcohol; drying the hair; and immediately after drying the hair, wetting or rinsing the hair with an aqueous composition; and then setting and drying the hair, said aqueous composition being selected from the group consisting of (1) water, (2) a mixture of water and a cationic polymer, (3) a mixture of water and a cationic surface-active agent, (4) a mixture of water, a cationic polymer and a cationic surface-active agent, (5) a mixture of water, a cationic polymer and an anionic polymer, (6) a mixture of water, a cationic surface-active agent and an anionic polymer, and (7) a mixture of water, a cationic polymer, a cationic surface-active agent and an anionic polymer.

4,638,823

FLUORIDE-COATED DENTAL FLOSS

Michael G. Newman, 809 Alma Real Dr., Pacific Palisades, Calif. 90272, and Fermin A. Carranza, Jr., 10577 Eastborne Ave., Los Angeles, Calif. 90024

Division of Ser. No. 475,234, Mar. 14, 1983, Pat. No. 4,548,219. This application Jun. 27, 1985, Ser. No. 749,262

Int. Cl.⁴ A61C *15/00*

U.S. Cl. 132—91 **5 Claims**

1. Dental floss made by dissolving a fluoride composition in water, adding the mixture to melted water-soluble wax, and applying the mixture to dental floss.

4,638,824

DENTAL FLOSS DEVICE

Jorge W. De La Hoz, 330 W. 10th St., Apt. #3, Hialeah, Fla. 33010

Filed Sep. 9, 1985, Ser. No. 773,869

Int. Cl.⁴ A61C *15/00*

U.S. Cl. 132—91 **4 Claims**



1. A device for releasably holding dental floss in operative taughtness comprising:

A. a substantially flat substrate containing an aperture so arranged, sized and disposed to admit the passage thereinto of a human finger at an angle substantially normal to the plane of said substrate;

B. a lip, formed integrally with said aperture so as to remove any sharp internal edge from said aperture;

C. a deck formed on said substrate wherein said deck includes three prong means and said flat substrate has substantially a toroidal shape, and said prong means protruding therefrom for releasably holding said dental floss.

4,638,825

COIN COUNTER

Michael F. Gifford, San Jose, and James H. Coffman, Woodside, both of Calif., assignors to Coffman Systems, Inc., Burlingame, Calif.

Filed Jul. 1, 1985, Ser. No. 750,026

Int. Cl.⁴ G07D *9/00*

U.S. Cl. 133—8 R **19 Claims**

1. In a coin-activated machine:

a coin-receiving device for accepting coins of a selected denomination;

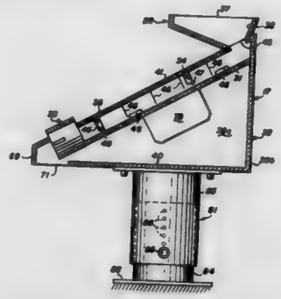
coin reservoir means mounted within the coin-receiving device for collecting said accepted coins;

a coin-counting device mounted in coin-flow communication with the reservoir means for receiving and counting coins which spill over from the reservoir means, the counting device including:

hopper means in spill over relation to the coin reservoir means to receive said coins spilling over from the reservoir means, the hopper means having an outlet for said coins;

an inclined planar member mounted to receive, at its upper ends, coins at said outlet of the hopper means to provide a face for coins to slide upon;

gate means mounted at spaced-apart locations transversely across the lower end of the inclined planar member to count coins sliding downward on said face of the inclined planar member;



means mounted to extend across the inclined planar member at a distance thereabove sufficient to prevent two or more coins from sliding one atop the other, into the gate means; and

a plurality of spaced-apart resilient pin members mounted to extend downwardly toward said face of the inclined planar member and terminate less than one coin width distance above said face of the inclined planar member such that coins sliding down said face of the inclined planar member strike said pin members and are dispersed laterally across said face.

4,638,826

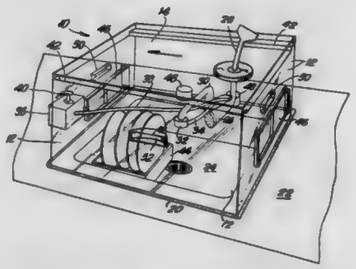
DISHWASHING APPARATUS

Joseph F. Canosa, 5701 Blvd. E, Apt. 3A, West New York, N.J. 07093

Filed Jun. 26, 1985, Ser. No. 749,106

Int. Cl.⁴ B08B *3/02*

U.S. Cl. 134—100 **17 Claims**



1. Apparatus for placement over a sink to facilitate the washing of dishes and the like, comprising:

an enclosure formed, at least in part, of a substantially translucent plastic material, said enclosure having side portions and a top portion;

sealing means disposed along lower edges of said side portions of said enclosure, for substantially sealing the interior of said enclosure from the exterior thereof, when said lower edges of said side portions are disposed about the perimeter of said sink;

a nozzle connected to said enclosure and disposed on the interior thereof;

means for connecting said nozzle to a faucet on said sink;

means for supplying a detergent to the interior of said enclosure; and

means for manually moving said nozzle from the exterior of said enclosure.

4,638,827

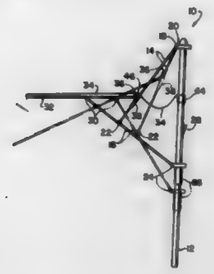
FOLDING UMBRELLA

Joseph DeMarco, 60 Seaman Ave., New York, N.Y. 10034

Filed Jun. 7, 1985, Ser. No. 742,316

Int. Cl.⁴ A45B *19/06, 11/00*

U.S. Cl. 135—26 **2 Claims**



1. A folding umbrella comprising a central rod having an upper and a lower end, a plurality of circumferentially spaced ribs each having a slide at one end and each of a length less than the intended radius of the umbrella, a fabric cover of a size coextensive with the intended radius of the umbrella disposed over said ribs, and an articulating strut arrangement for extending said ribs outwardly with respect to said rod to deploy said cover and for folding said ribs and cover toward said rod, said strut arrangement comprising a set of upper struts and a set of lower struts, each set having a number corresponding to the number of said ribs and arranged in associated triads, the upper strut of each triad being hinged at one end to the upper end of said rod and at its other end to a correspondingly lower strut medial of the ends of said lower strut, the lower strut in each pair being hinged at one end to a corresponding rib which has said slide thereon disposed about a corresponding upper strut for movement up and down therealong and being connected at its other end to a slide runner disposed for sliding movement up and down along said rod, the downward movement of said slide runner causing said lower and upper struts to extend outwardly from the rod forming therewith a triangle and opening said cover thereon to the fullest size thereof corresponding to the intended radius of the umbrella, and the downward movement of said slide runner causing said lower and upper struts to fold against said rod substantially parallel therewith simultaneously with causing a folding in said cover above said slides of said ribs whereby said cover in said closed umbrella is of a reduced radial extent equal to that of said ribs.

4,638,828

WATER TEMPERATURE ACTUATED DRIP VALVE

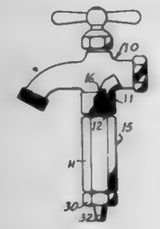
Wyman L. Barrineau, Sr., 20 Loring Pl., and Julius P. Barrineau, 944 Morningside Dr., both of, Sumter, S.C. 29150

Filed Oct. 22, 1985, Ser. No. 790,065

Int. Cl.⁴ F16K *17/00;* **G05D** *23/02*

U.S. Cl. 137—62 **4 Claims**

1. A self actuating drip valve in combination with a water pipe for preventing freezing of water in said water pipe, said drip valve comprising an elongate housing defining an opening therethrough, a portion of said opening including a central threaded hole, and a plurality of additional holes radially outward of said threaded hole, a temperature sensing means received within said opening at one end thereof for being contacted by said water in said water pipe, said temperature sensing means including an externally threaded end threadedly engaged with said central threaded hole, a tip projectable at high temperatures and retractable at near-freezing temperatures, a plunger within said opening in said housing and located to be directly and adjustably engaged by said tip for urging said plunger downwardly, said plunger including a head slidable within said opening, said head having flat faces for defining water passages between said flat faces and said opening, a round section below said head, said round section having a smaller diameter than the diameter of said opening, and a sealing means at the lower end of said round section, a seat



assembly received within said opening of said housing, said seat assembly including a bore for receiving said round section of said plunger with said sealing means, a valve seat defined within said bore, and a spring held by said seat assembly for urging said plunger upwardly, said valve seat being selectively engageable by said sealing means, said additional holes allowing water flow through said housing adjacent to said temperature sensing means, said plunger allowing water flow through said opening in said housing to said sealing means, the arrangement being such that engagement of said sealing means with said valve seat prevents water flow through said housing, and motion of said sealing means towards and away from said valve seat allows varying water flow which is dependent upon the direct and adjustable engagement between said tip and said plunger.

4,638,829

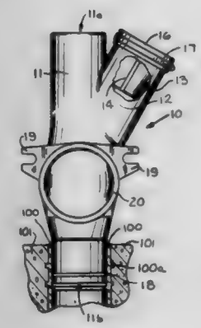
FIRESTOP FITTING FOR CARRIER MOUNTED WATER CLOSETS

Kenneth R. Cornwall, 902 Summit North, Atlanta, Ga. 30324

Continuation-in-part of Ser. No. 555,121, Nov. 25, 1983, Pat. No. 4,583,565. This application May 9, 1985, Ser. No. 732,055

Int. Cl.⁴ F16K *17/14*

U.S. Cl. 137—75 **8 Claims**



1. An improved one piece fitting for a fluid connection to a

water closet which is supported on a carrier mounted on a floor of a building and which fitting prevents spread of fire between the floor of the building through a plastic pipe connected to the fitting which comprises:

(a) a non-flammable, fluid carrying main conduit having a first longitudinal axis between two opposed openings defining an inside diameter of the main conduit and an enlarged chamber between the openings and adapted to be connected into plastic pipes between floors of a building;

(b) a non-flammable extension conduit from the enlarged chamber of the main conduit positioned with a second axis at an acute angle from the longitudinal axis of the main conduit with an opening;

(c) a non-flammable plug having a diameter larger than the inside diameter of the main conduit and smaller than the enlarged chamber mounted in the extension conduit on a plastic support mounted on the extension conduit which is releasable by melting upon exposure of the support to heat less than necessary for heat destruction of the plastic pipe to which it is adapted to be fitted through the main conduit from a fire in the building in which it is adapted to be provided to thereby move into and close the main conduit, wherein the plastic support is provided by a harness with a strap upon which the plug rests, wherein the harness has two straps which are overlapping in an x pattern joined to a holding ring which is mounted inside the extension conduit and wherein the strap is broken by heat from a fire to release the plug which moves by gravity into the main conduit;

(d) closure means for the extension conduit opening;

(e) a short pipe connected to a side opening in the main conduit in the enlarged chamber for fluid connection to a water closet; and

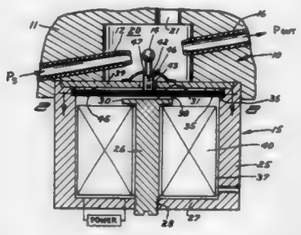
(f) attachment means on the fitting for connecting the fitting to the carrier.

4,638,830

HIGH SENSITIVITY MAGNETIC ACTUATOR

Gregory C. Brown, Chaska, and James L. Gravel, Prior Lake, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Sep. 27, 1985, Ser. No. 781,358
Int. Cl.[4] G05D *16/00*; F16K *31/08*
U.S. Cl. 137—83 10 Claims



1. A magnetic actuator for providing a mechanical actuation representative of an input current comprising:

a coil extending from a first end to a second end along a central axis and having an inner diameter about the central axis for producing a magnetomotive force in response to an input current;

a ferromagnetic core having first and second ends and positioned in the interior of the coil and having a pole face extending outwardly from the first end of the coil;

a housing formed of ferromagnetic material disposed around the coil and core, said housing having a first end plate in low reluctance contact with the second end of the core and a second end plate spaced from the pole face of the core, said second end plate having an aperture therethrough aligned with the pole face;

a diaphragm spring formed of a ferromagnetic material having an outer rim fastened to the housing and a central region, overlying the pole face and spaced from the second end plate and the pole face in a rest position, the central region of said diaphragm spring being deflectable proportional to the input current toward and away from the pole face; and

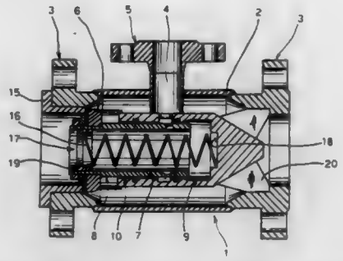
a permanent magnet mounted on the central region of the diaphragm spring and extending through the aperture in the second end plate, said permanent magnet being aligned along the central axis, a first permanent magnet pole face engaging the diaphragm spring on a side thereof opposite the pole face of the core, and a second permanent magnet pole face extending outside the housing.

4,638,831

VALVE ARRANGEMENT FOR UNLOADING LIQUID FLOW AT A NON-RETURN VALVE

Nils E. Lindgren, Borlänge, Sweden, assignor to SSAB Svenskt Stal AB, Stockholm, Sweden

PCT No. PCT/SE85/00189, § 371 Date Dec. 24, 1985, § 102(e) Date Dec. 24, 1985, PCT Pub. No. WO85/05430, PCT Pub. Date Dec. 5, 1985
PCT Filed Apr. 26, 1985, Ser. No. 828,758
Claims priority, application Sweden, May 11, 1984, 8402542
Int. Cl.[4] G05D *7/01*
U.S. Cl. 137—117 6 Claims



1. A minimum flow valve device which can be used in a fluid line connected to an operating centrifugal pump to supply cooling liquid thereto even when the fluid flow through the line is stopped, said valve device comprising

a housing which provides a liquid passageway therethrough, said liquid passageway having an inlet end and an outlet end and defining a center line therethrough,

an elongated guide element fixedly positioned in said liquid passageway in said housing so as to be aligned with said center line, said guide element including a sleeve portion nearest said inlet end of said liquid passageway and an end portion nearest said outlet end of said liquid passageway, said sleeve portion and said end portion defining an internal chamber which is open towards said inlet end and closed towards said outlet end of said liquid passageway; said sleeve portion having an outer surface and an inner sliding surface, an annular groove which is open towards said internal chamber and a discharge orifice which extends from said annular groove to said outer surface,

an unloading pipe which extends through said housing and connects with the outer surface of said sleeve portion of said guide element so as to communicate with said discharge orifice,

a non-return valve element which is movably positioned in said liquid passageway between said guide element and the inlet end of said liquid passageway, and

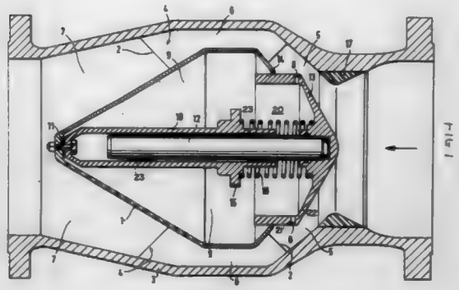
a valve sleeve member which is connected to said non-return valve element and is movable within said internal chamber of said guide element, said valve sleeve providing an internal channel therein and having an outer sliding surface which is slidingly movable with respect to the inner sliding surface of the sleeve portion of said guide element and a plurality of orifices which extend therethrough in a common radial place; said non-return valve element and said valve sleeve being jointly movable back and forth from a first position where they block liquid flow through said liquid passageway to a second position where they allow liquid flow through said liquid passageway, said orifices in said valve sleeve being in communication with said annular groove in the sleeve portion of said guide element only when said non-return valve element and said valve sleeve member are in their first position, thus enabling liquid to flow from said inlet end of said liquid passageway, through said interior channel, through said discharge orifice and through said unloading pipe.

4,638,832

NONRETURN PISTON SLIDE VALVE

Nicolaas J. Mokveld, Reeuwijk, Netherlands, assignor to Mokveld Valves bv., Gouda, Netherlands

Continuation-in-part of Ser. No. 37,054, May 8, 1979, abandoned. This application Dec. 17, 1980, Ser. No. 217,213
Claims priority, application Fed. Rep. of Germany, May 16, 1978, 2821255
Int. Cl.[4] F16K *17/30, 21/10*
U.S. Cl. 137—220 9 Claims



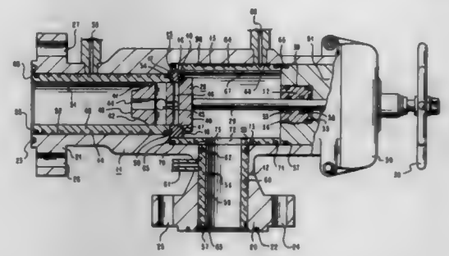
1. A nonreturn piston slide valve having a longitudinal flow axis, said valve being normally open in response to flow of a medium in a desired direction through the valve, comprising inner housing means confining an inner space, outer housing means and means operatively securing said inner housing means coaxially in said outer housing means to form an annular flow passage coaxially through the valve, said annular flow passage forming a venturi action zone of maximum flow speed, said outer housing means comprising valve seat means adjacent the annular flow passage, said valve seat means defining a plane extending perpendicularly to said longitudinal flow axis, piston means having a valve closing piston face and piston wall means extending substantially coaxially to said longitudinal flow axis, said inner housing means having an axially facing opening (**14**), said piston means being coaxially supported inside said inner housing means in sliding relationship with said inner housing means through said axially facing opening (**14**) for cooperation with said valve seat means, spring means held in said inner housing means for biasing said piston means against said valve seat means to close the valve in response to a flow direction opposite to said desired flow direction, said spring means being constructed and arranged so that the valve piston means remains in the normally open position during flow through the valve in the desired direction, and aperture means (**8**) extending substantially radially to said flow axis through said piston wall means adjacent the piston face, said aperture means (**8**) operatively connecting said inner space of said inner housing with said maximum flow speed venturi action zone during a substantial first portion of a valve opening stroke of said piston means (**21**), while said aperture means (**8**) are moving with the piston means for avoiding secondary flows inside said inner housing means, for preventing oscillating movements of the piston means in any position of the piston means, and for facilitating a rapid opening of the valve, said opening (**14**) of said inner housing means being located relative to said aperture means (**8**), so that said aperture means (**8**) in the piston wall means (**21**) pass inside the inner housing means only during a second, short end portion of said valve opening stroke, thereby providing a pronounced hydraulic damping or braking action (**32**) during the short end portion of the valve opening stroke of the piston means, said aperture means (**8**) also limiting an initial valve closing speed of said piston means as long as the aperture means are still covered by the inner housing means at the beginning of a valve closing piston movement.

4,638,833

CHOKE VALVE

Herbert A. Wolcott, II, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 676,328, Nov. 29, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 821,118
Int. Cl.[4] F16K *1/34*
U.S. Cl. 137—312 5 Claims



1. A well flow line choke control valve comprising:

valve body means including a valve inlet flow passage adapted to be connected to a flow line, an inner surface defining a valve chamber, and a valve outlet flow passage adapted to be connected to a flow line;

valve seat means disposed in said body between said inlet flow passage and said outlet flow passage, said valve seat means having a valve seat flow passage extending therethrough;

valve throttle means adapted to be moved relative to said valve seat means and to control the rate of fluid flowing through said control valve;

liner means inside said valve body, said liner means having opposed ends and an inner surface defining a liner flow passage;

an inner surface of said valve body and an outer surface on said liner means adapted to define a monitoring flow passage for monitoring for a leak in said liner means, said monitoring flow passage being further defined by a spiralling groove formed in said outer surface on said liner means to provide for supportive engagement of said liner means between said inner surface of said valve body and said outer surface of said liner means;

a flow passage extending through said valve body and communicating with said monitoring flow passage; and

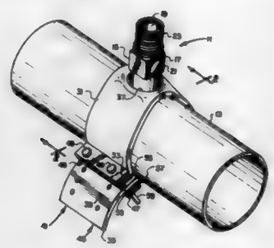
sealing means adapted to form a fluid-tight seal near respective ones of said ends of said liner means between said liner means and said valve body.

4,638,834

TAPPING SADDLE

Ronald S. Montgomery, 1308 Cherry St., Gainesville, Tex. 76240

Filed Sep. 20, 1985, Ser. No. 778,362
Int. Cl.[4] F16K *43/00, 51/00*
U.S. Cl. 137—315 2 Claims



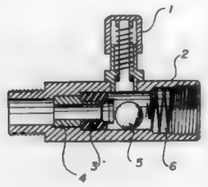
1. A tapping saddle for establishing a lateral connection to a pipe which comprises:
- a tapping valve;
- a flexible metal band connected to said tapping valve, said metal band having first and second ends with a length therebetween sufficient to encircle the pipe, said metal band including a plurality of holes spaced apart lengthwise on said band adjacent said second end;
- a first lug connected to said first end of said metal band;
- a second lug positionable adjacent said first lug with said second end of said metal band extending between and beyond said first and second lugs;
- bolt means passing through one of said holes for drawing together said first and second lugs;
- and urging means disposed between one of said lugs and said second end of said metal band for urging said second end of said metal band into contact with the other of said lugs when said first and second lugs are drawn together, and said urging means includes a tab connected to one of said lugs radially outward of said bolt means and engageable with the extended second end of said metal band for causing said first and second lugs to rotate as the metal band is tightened on the pipe.

4,638,835

AUTOMATIC OVERFLOW CONTROL APPARATUS FOR THE PIPELINE PASSAGE

Rong-Chao Chuang, 113 Nan-Yang Road, Nan-Tsu, Kao Hsiung, Taiwan

Filed Sep. 11, 1985, Ser. No. 775,025
Int. Cl.[4] F16K *17/24*
U.S. Cl. 137—519.5 10 Claims



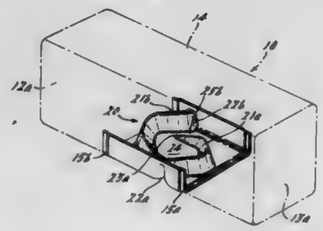
1. In an automatic overflow control apparatus of the type having a housing, an inlet port connected to an external flow supply, an outlet port, a flow channel being positioned between, and in communication with the inlet port and the outlet port, and a safety valve having a ball member disposed in the flow channel, to prevent overflow through the apparatus, wherein the improvement being the safety valve comprising:
- a main body portion having an inlet end and an outlet end;
- a valve seat having an inlet end, and an outlet end being integrally formed on the inlet end of the main body portion and extending therefrom; and
- an elastic annular shell integrally formed on the inlet end of the valve seat, wherein the ball member may be seated in the valve seat, deforming the shell and being gripped therein, thereby sealing the flow channel.

4,638,836

MOTOR VEHICLE FUEL TANK WITH UNITARY FUEL RESERVOIR

Wallace O. Bailey, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 26, 1985, Ser. No. 727,700
Int. Cl.[4] B65D *1/24*
U.S. Cl. 137—574 7 Claims



1. A motor vehicle fuel tank having a fluid pressure thermoformed tank wall comprising a bottom wall and opposed side walls unitary with and extending upwardly from said bottom wall, said fuel tank comprising a fuel reservoir unitary with said tank wall and comprising two opposed substantially C-shaped ridges extending upwardly into said tank from the plane of said bottom wall, each said ridge being of certain height at a first end unitary with a corresponding one of said side walls and each said ridge fairing into said corresponding one of said side walls and extending toward the opposed side wall to a second end, said ridges each having a maximum height substantially less than the overall height of the tank and from a point remote from said second end diminishing in height substantially continuously to approximately the plane of said bottom wall, said ridges cooperating to partially surround a portion of said surface area of said bottom wall, a channel between the second end of each said ridge and the other said ridge extending substantially in the plane of said bottom wall to permit fuel to flow to said partially surrounded surface area from the remaining portion of the surface area of said bottom wall.

4,632,837

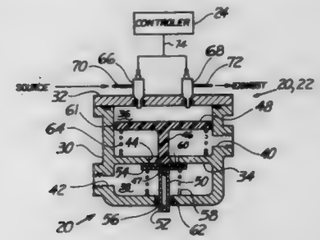
ELECTRO/PNEUMATIC PROPORTIONAL VALVE

James W. Bulke, Union Lake, and William C. Eddy, West Bloomfield, both of Mich., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 13, 1984, Ser. No. 670,686
Int. Cl.[4] F16K *31/06, 11/14;* F15B *13/043*
U.S. Cl. 137—627.5 19 Claims

1. An electrically actuated proportional valve for outputting a fluid at a pressure proportional to at least one continuously variable component of an electrical signal comprising:
- an enclosed housing defining an internal chamber, said housing having an inlet port for receiving a pressurized fluid, an outlet port, and vent port;
- a piston disposed in said internal chamber operative to assume a first position and displaceable in response to a fluid pressure applied to one side of said piston;

- first valve means, opened in response to said piston being in said first position to connect said outlet port to said vent port and closed in response to said piston being displaced from said first position;
- second valve means closed in response to said piston being in said first position and opened in response to said piston being displaced from said first position to connect said outlet port with said inlet port, said second valve in said open state also applying a fluid pressure to the side of said piston opposite said one side to balance the position of said piston such that the fluid pressure at the outlet port is



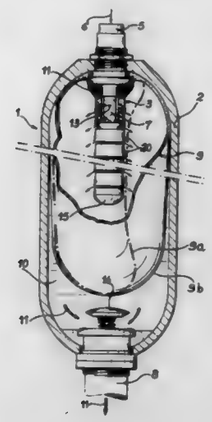
proportional to the fluid pressure applied to said one side of the piston; and
- electrically actuated pilot valve means responsive to the electrical signal for applying a fluid to said one side of said piston having a fluid pressure proportional to the value of the variable component of said electrical signal, said fluid pressure displacing said piston and opening said second valve means to produce a pressure applied to the other side of said piston and at said outlet port proportional to the value of the variable component of said electrical signal.

4,638,838

HYDROPNEUMATIC ACCUMULATOR

Philippe Richard, Bures sur Yvette; Jean-Charles Papillon, Fontenay le Fleury; Alain Guyot, Les Loges en Josas, and Carlo Corbellini, Sausset les Paris, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 24, 1984, Ser. No. 633,920
Claims priority, application France, Aug. 4, 1983, 83 12895
Int. Cl.[4] F16L *55/04*
U.S. Cl. 138—30 11 Claims



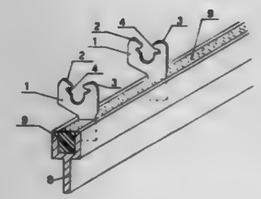
1. A hydropneumatic accumulator with a bag, comprising a body having an inlet and an outlet, a bag made from a flexible, deformable material insulating the inlet from the outlet, a liquid contained in the bag on the outlet side, a tube connected to said inlet with openings on its side wall and closed at its end and a diffuser assembly mounted around the tube, wherein the diffuser assembly is made from a flexible material similar to that of the bag and has openings with a large passage cross-section compared with that of the openings in the tube, and wherein the diffuser assembly is constituted by diffuser rings, mounted on the tube with a given spacing, so as to provide an annular passage for a fluid between two successive rings.

4,638,839

GUIDE FOR THE GRIPPER CARRYING STRAPS INSIDE THE SHED OF WEAVING LOOMS

Nello Pezzoli, Leffe, Italy, assignor to Vamatex S.p.A., Villa Di Serio, Italy

Filed Oct. 10, 1984, Ser. No. 668,873
Claims priority, application Italy, Oct. 10, 1983, 23232 A/83
Int. Cl.[4] D03D *47/00*
U.S. Cl. 139—449 1 Claim



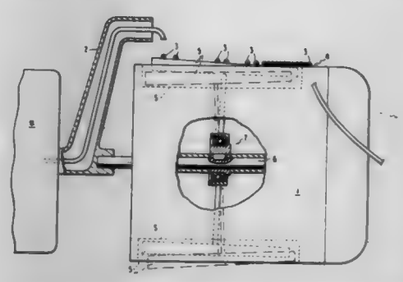
1. In a weaving loom having a reed, flat horizontal gripper-carrying straps mounted for reciprocal movement inside the shed of the loom, and a plurality of supports of said straps mounted adjacent said reed, each said support comprising an upright plate having two lateral beaks delimiting a seat for the strap, the seat including a portion below the strap having a central undercut area so as to support only the edges of said strap; the improvement comprising the beak closer to the reed being higher than the other beak, and in which the seat portion and the supported strap edges are downwardly inclined toward said central undercut area.

4,638,840

WEFT FEEDER FOR WEAVING LOOMS

Florenzo Ghiardo, Vigliano Biellese, and Bruno Maina, Valdengo, both of Italy, assignors to ROJ Electrotex S.p.A., Biella, Italy

Filed May 28, 1985, Ser. No. 738,386
Claims priority, application Italy, Jun. 4, 1984, 21249 A/84
Int. Cl.[4] D03D *47/36;* B65H *51/20*
U.S. Cl. 139—452 3 Claims



1. A weft feeder for weaving looms, comprising a stationary drum, means to wind a weft yarn around the drum, a set of columns that extend along the drum from the feeder inlet end

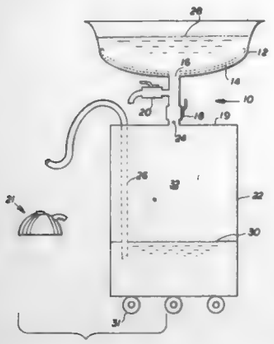
of the drum toward the outlet end of the drum and are disposed in seats in the periphery of the drum, a drive shaft disposed axially within the drum, a skew bushing on the drive shaft, and means mounting said columns on said skew bushing, the columns having outer surfaces inclined to the periphery of the drum such that upon rotation of the drive shaft, the skew bushing causes each column successively to take up a position in which the column has a portion adjacent said feeder inlet end which is substantially farther from the axis of the drum than is the periphery of the drum and a portion toward said feeder outlet end which extends radially outwardly of the drum no farther than the periphery of the drum, the drum having a portion of substantial axial extent adjacent said outlet end beyond which the columns do not extend, thereby to establish adjacent said outlet end a region on the drum in which the turns of weft yarn lie in contact with each other.

4,638,841

DEVICE FOR HANDLING FLUIDS DRAINED FROM A VEHICLE

Thomas E. Heath, 2630 Fujiama Dr., Clearwater, Fla. 33520

Filed Nov. 18, 1985, Ser. No. 799,149
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—98 **3 Claims**



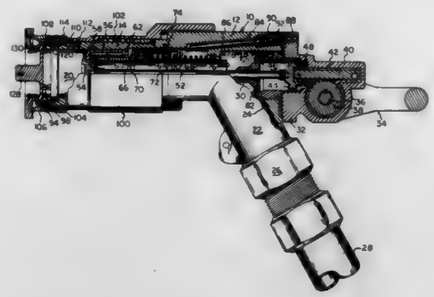
1. A device for handling liquid fluids drained from vehicles, comprising:
- a wide-mouth funnel having dimensions sufficient to collect fluid draining from a vehicle at widely spaced locations;
- a storage tank in the form of a drum;
- a funnel downspout member depending to said funnel, said downspout member disposed in fluid communicating relation to said funnel and said drum;
- said drum having a substantially imperforate closure means;
- a portable container for transiently holding fluids;
- a drum bypass means;
- a first valve member positioned in said drum bypass means;
- said drum bypass means provided in the form of a passageway confluent with said downspout member and disposed normal thereto;
- said drum bypass means communicating with said downspout member in an upper portion of said downspout member just downwardly of said funnel;
- a second valve member, positioned in said downspout member below the intersection of said bypass means and said downspout member;
- an air inlet member, positioned in said downspout member below said second valve member;
- said air inlet means confluent with an air compressor means;
- an elongate hose member having a first end immersed in fluid collected in said drum and having a second end extending outwardly of said drum through an aperture formed in the closure means for said drum;
- said air compressor means adapted to introduce compressed air into said air inlet member so that when said second valve member is closed, compressed air enters said drum and expels fluids collected therein through said hose member to a fluid collection means positioned externally of said drum;
- whereby when said first valve member is open and said second valve member is closed, fluid contained in said funnel is routed to said container;
- and whereby when said first valve member is closed and said second valve member is open, fluid contained in said funnel is routed to said drum.

4,638,842

CLOSED CIRCUIT REFUELING NOZZLE

Frank D. Hawley, Chelsea, and Russell L. Rogers, Munith, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Jul. 8, 1985, Ser. No. 752,837
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—302 **11 Claims**



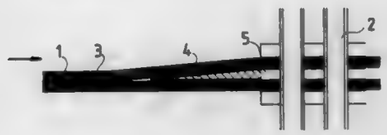
1. A fueling nozzle for a closed circuit fuel system having a fuel tank inlet comprising, in combination, a hollow tubular body having an elongated passage having an inlet end and an outlet end, a fuel supply channel defined in said body in communication with said passage inlet end, releasable fuel tank inlet connection means defined on said body adjacent said passage outlet end movable between lock and release positions, operating means associated with said connection means mounted on said body movable between lock and release positions, an elongated plunger concentrically mounted within said elongated passage for axial movement between extended and retracted positions, said plunger having an inner end located adjacent said passage inlet end and an outer end adjacent said passage outlet end, an enlarged head mounted on said plunger outer end, plunger operating means mounted on said body connected to said plunger for translating said plunger between said extended and retracted positions, an annular valve sleeve sealingly received within said body passage adjacent to and accessible from said outlet end and axially displaceable between plunger head engaged and disengaged positions, engagement of said valve sleeve and plunger head closing said passage outlet end to fluid flow therethrough and connection of said body to a fuel tank inlet when said plunger is in said extended position disengaging said valve sleeve from said head to open said passage outlet end, first spring means axially biasing said valve sleeve toward said plunger head, an annular pressure regulator sleeve concentrically located within said body passage between said plunger head and passage inlet end axially displaceable within said passage and sealed with respect thereto, a valve seat defined within said body passage adjacent said passage inlet end in alignment with said regulator sleeve, valve means defined on said regulator sleeve engagable with said valve seat to close the interior of said regulator sleeve with respect to said fuel supply channel, differential pressure faces defined on said regulator sleeve exposed to the fluid pressure within said body passage imposing opposite axial forces on said regulator sleeve, and second spring means within said body imposing an axial force on said regulator sleeve tending to separate said regulator sleeve valve means and said valve seat, a predetermined pressure within said body passage axially displacing said regulator sleeve against the force of said second spring to engage said valve means and valve seat and close the interior of said regulator sleeve with respect to said fuel supply channel.

4,638,843

METHOD FOR THE MANUFACTURE OF A VENEER BEAM

Hannu Sinko, Lahti, Finland, assignor to Raute Oy, Lahti, Finland

Filed Nov. 4, 1985, Ser. No. 794,386
Claims priority, application Finland, Dec. 5, 1984, 844824
Int. Cl.[4] B27D *1/00*
U.S. Cl. 144—350 **7 Claims**



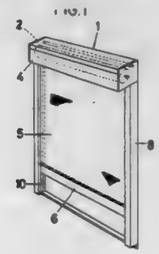
7. A method for producing beams from a plurality of laminated veneer beam blanks comprising:
- providing a continuous setting comprising layered sheets of veneer with adhesive between the sheets but having at least one adhesive-free gap extending the width of the setting between the sheets;
- dividing the setting along the gap into separate beam blanks;
- passing each of the beam blanks into separate hot-press gaps to form a plurality of laminated veneer beam blanks; and
- passing each of the laminated veneer beam blanks to separate means for sawing the blanks into beams.

4,638,844

WINDOW SCREEN

Seizo Hayashiguchi, 3454, Tsuoki, Sendo-cho, Tsu-shi, Mie, Japan

Filed Aug. 20, 1985, Ser. No. 767,510
Claims priority, application Japan, Feb. 1, 1985, 60-018978
Int. Cl.[4] E06B *9/08*
U.S. Cl. 160—23 R **4 Claims**



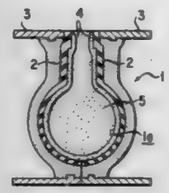
1. A window screen comprising:
- a frame having a pair of vertical stiles;
- a casing provided at top of said frame;
- a roller rotatably mounted in said casing;
- a cover sheet wound around said roller with one end thereof secured thereto and having a bar secured to the other end thereof and having a fastener member attached to the side edges thereof over its entire length;
- a rail provided in each of said stiles so as to extend vertically and formed with a groove to hold said fastener member therein; and
- a bracket integral with said stiles for holding said rail, and cushioning members mounted between said bracket and said rail so as to press said rail toward said stile, said rails being loosely held in said bracket.

4,638,845

PROCESS FOR MAKING FOUNDRY MOLDS

Kanichi Sato; Mikio Setoyama; Shoji Kiguchi, all of Hirakata, and Toshio Tanaka, Daito, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 10, 1985, Ser. No. 774,412
Claims priority, application Japan, Sep. 13, 1984, 59-190623
Int. Cl.[4] B22C *9/02, 9/12*
U.S. Cl. 164—12 **12 Claims**



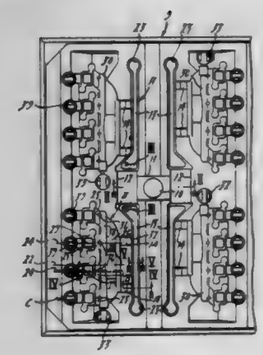
1. A process for making a foundry mold for use in metal casting, which comprises the steps of:
- (a) heating and drying mold sand composed of refractory particles and a water-soluble binding agent;
- (b) charging a cavity formed in a mold pattern with the dried mold sand while keeping, moisture on the inside surface of the cavity which corresponds to the peripheral surface of a mold to be made, and
- (c) heating the mole pattern of which the cavity has been filled completely with the mold sand to thereby cure the peripheral surface of the mold.

4,638,846

METHOD OF MAKING THIN-WALLED DUCTILE IRON CASTINGS

Allen D. Ackerman, Troy; Conrad G. Perkey, Dearborn Heights; Robert A. Martin, Northville, and William M. Justusson, Farmington Hills, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 1, 1980, Ser. No. 164,867
Int. Cl.[4] B22D *27/00*
U.S. Cl. 164—55.1 **1 Claim**



1. A method of making a ductile iron casting in a mold assembly having walls defining first and second casting cavity portions with at least one thin space interconnecting said cavity portions, said thin space having a cross-sectional thickness dimension of 0.2 inches or less and a length of at least 12 times said dimension, and said thin space being the sole conduit for

filling the second of the cavity portions, the method comprising:

(a) introducing molten iron, of the type that would form gray iron with flake graphite if solidified untreated, to said mold assembly and, while in said mold assembly, treating said molten iron with a nodularizing/inoculating agent prior to the molten metal passing into the cavity portions;

(b) feeding the treated molten iron into said first mold cavity portion and thence into one extremity of said thin space; and

(c) while continuing to feed said treated molten iron to fill said mold assembly, creating a reservoir of treated molten iron at about a midstation of said thin space to be in series between said one extremity of said thin space and the remainder of said thin space and second cavity portion, said reservoir feeding molten iron to said remainder of the thin space after having passed from said one extremity, said reservoir also serving as an integral functional part of the casting when solidified.

4,638,847

METHOD OF FORMING ABRASIVE RESISTANT WHITE CAST IRON

Wallace Day, Columbus, Ga., assignor to GIW Industries, Inc., Grovetown, Ga.

Continuation-in-part of Ser. No. 600,552, Mar. 16, 1984, abandoned. This application Oct. 22, 1984, Ser. No. 663,669

Int. Cl.[4] B22D *27/00*

U.S. Cl. 164—35.1 **4 Claims**

1. The process of forming globular shaped carbides in cast iron comprising:

adding 0.001 to 4.0% boron to alloy cast iron comprising 0.001% to 30% vanadium, titanium, niobium, molybdenum, nickel, copper, tantalum or chromium or mixtures thereof and 1.8% to 4.5% carbon to form a molten cast iron composition, cooling said molten alloy cast iron composition below equilibrium solidification temperature to a super cooled temperature, for solidifying said molten cast iron composition to produce globular shaped carbides having an average size less than the average conventional cast iron carbide particle, continuing solidifying said molten cast iron composition by continuing to cool said molten cast iron composition to super cooled temperature to form globular shaped carbides having said average size less than about 4 microns.

4,638,848

METAL MOULD AND VENTHOLE ARRANGEMENT THEREOF

Kojiro Yamasaki, 10-10, Ikedauemachi, Nagata-Ku, Kobe-Shi, Hyogo 653, Japan

PCT No. PCT/JP81/00163, § 371 Date Dec. 16, 1982, § 102(e) Date Dec. 16, 1982, PCT Pub. No. WO83/00301, PCT Pub. Date Feb. 3, 1983

PCT Filed Jul. 15, 1981, Ser. No. 456,083

Int. Cl.[4] B22D *17/00*

U.S. Cl. 164—305 **3 Claims**

1. A metal mould comprising:

a removable half portion having an inner surface and a trapezoidal-shaped cross-sectional projection, said projection being integrally formed with and projecting inwardly from the inner surface of the removable half portion;

a vacuum pump in communication with the removable half portion;

a mating fixed half portion having an inner surface with a first recess means therein, said first recess means having dimensions larger than that of the projection on the removable half portion and being adapted to receive the projection in order to define a first cavity therewith when the inner surfaces of the removable and fixed half portions are mated together;

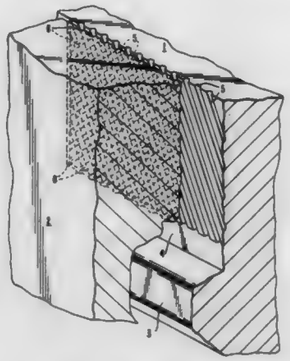
a venthole arrangement having

a plurality of upwardly extending parallel and spaced first inclined gas escape grooves having lower inlet ends and upper outlet ends, said first grooves being formed in the inner surface of the removable half portion in communication at said lower inlet ends with the first cavity;

a horizontally oriented second safety cavity having a bottom and being formed in the removable half portion in communication at said bottom with the upper outlet ends of the first grooves;

a hole means, having two ends and being formed in the removable half portion, for communicating at one end with the safety cavity and at the other end with the vacuum pump; and

a plurality of upwardly extending parallel and spaced second inclined gas escape grooves having two ends and being formed in the inner surface of the fixed half



portion in opposing relationship to the first grooves in communication at one end with the lower inlet ends of the first grooves leading to the first cavity and in communication at the other end with the upper outlet ends of the first grooves leading to the safety cavity;

said first and second grooves being inclined at an angle within a range of about 5° to about 85° with respect to a vertical axis and extending in opposite directions to each other so that a criss-cross pattern with cross points is formed;

whereby molten metal flowing through the first and second grooves impinges at the cross points and is prevented from forming a laminar flow, which causes appreciable differences in cooling, while gas between the mated removable and fixed half portions is positively discharged therefrom.

4,638,849

NOZZLE ASSEMBLY FOR DIE CASTING APPARATUS

Sydney H. Whitehorn, Birmingham, Mich., assignor to VSI Corporation, Pasadena, Calif.

Filed Aug. 25, 1985, Ser. No. 779,984

Int. Cl.[4] B22D *17/02*

U.S. Cl. 164—311 **6 Claims**

1. A nozzle assembly for conducting molten metal from a molten metal source to a die casting mold, said assembly comprising:

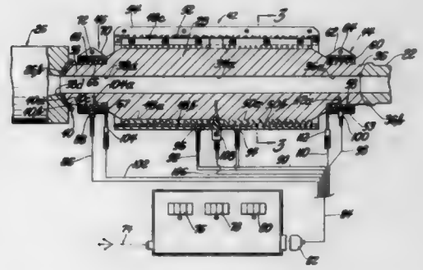
A. an elongated relatively large diameter nozzle main body section having an axial through passage adapted to receive molten metal at its inlet end from said source;

B. an elongated relatively small diameter outlet nozzle tip section having a through axial bore coaxial with the through bore in said nozzle main body section;

C. an elongated relatively small diameter inlet nozzle tip section having a through axial bore coaxial with the through bores in said nozzle main body section and said outlet nozzle tip section;

D. a separate heater assembly respectively wrapped around and extending for substantially the entire exposed axial length of said nozzle main body section, said outlet nozzle tip section, and said inlet nozzle tip section; and

E. control means operative to separately sense the temperatures of said nozzle main body section, said outlet nozzle



tip section, and said inlet nozzle tip section and selectively and separately energize said heater assemblies to separately maintain predetermined set point nozzle body, outlet tip, and inlet tip temperatures.

4,638,850

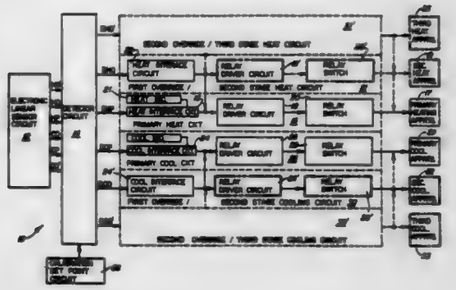
ELECTRONIC THERMOSTAT

Alfred T. Newell, III, Birmingham, Ala., and E. Lane Nichols, Clearwater, Fla., assignors to A. T. Newell Co. Inc., Birmingham, Ala.

Division of Ser. No. 584,398, Feb. 28, 1984. This application Dec. 18, 1984, Ser. No. 683,009

Int. Cl.[4] F25B *29/00*

U.S. Cl. 165—26 **5 Claims**



1. An electronic thermostat for controlling both cooling and heating apparatus, comprising:

means for sensing the temperature;

means for controlling the heating apparatus in response to the temperature sensing means including

primary means for actuating the heating apparatus in response to the sensed temperature decreasing below a preselected set temperature, said heat apparatus actuating means causing continuous actuation of the heating apparatus and including a primary actuating means responsive to the set temperature, and a separate override actuating means responsive to said sensed temperature decreasing below a heat override temperature which is less than said set temperature by a preselected increment to actuate the heating apparatus independently of actuation thereof by said primary means;

means for deactuating the heating apparatus in response to the sensed temperature rinsing to a heat deactuating temperature slightly greater than said set temperature to establish a hysteresis characteristic in the actuation and deactuation of the heating apparatus; and

means for controlling the cooling apparatus in response to said temperature sensing means including

means for actuating the cooling apparatus in response to the sensed temperature rising to a cool actuation temperature greater than said heat deactuation temperature to establish a preselected dead zone between heating and cooling cycles, and

means for deactuating the cooling apparatus when the second temperature decreases to a preselected cool deactuation temperature which is slightly less than said cool actuation temperature to establish a hysteresis characteristic in the actuation and deactuation of the cooling apparatus; and

means for selectively varying the temperature increment between said set temperature and said cool actuation temperature to alter said dead zone.

4,638,851

COOLING APPARATUS FOR METAL STRIP

Katsumi Makihara; Kenichi Yanagi; Takeo Fukushima, all of Hiroshima; Namio Suganuma, Kurashiki; Ichiro Sanejima, Kurashiki, and Seiichi Takahashi, Kurashiki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Kawasaki Steel Coporation, both of Tokyo, Japan

Filed Apr. 11, 1985, Ser. No. 722,213

Claims priority, application Japan, Apr. 17, 1984, 59-75809

Int. Cl.[4] B21B *13/02*

U.S. Cl. 165—32 **7 Claims**



1. An apparatus for cooling metal strip, comprising:

a plurality of cooling rolls disposed for having the strip pass successively thereacross in contact with a segment of the outer circumferential surfaces thereof;

means for passing a respective flow of coolant through each of said cooling rolls so as to cool the strip as the strip passes across said cooling rolls; and

a plurality of temperature detectors and a plurality of coolant temperature adjusters, one each of said detectors and said adjusters being associated with a respective one of said cooling rolls, each of said detectors comprising a means for detecting the temperature of the strip prior to contact of the strip with the associated cooling roll and a means for providing a strip temperature signal indicative of said temperature, each of said adjusters comprising a means for adjusting the temperature of the coolant passing through the associated cooling roll to a corresponding predetermined temperature range in response to the strip temperature from said strip temperature signal providing means of the temperature detector associated with said associated cooling roll, so as to limit the temperature drop of the strip as it passes across the associated cooling roll, to thereby limit temperature related irregularities and distortion in the configuration of the strip;

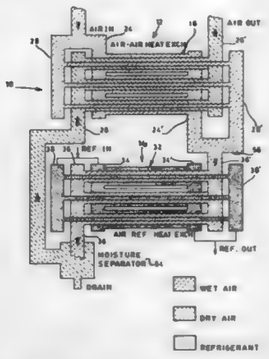
said means for passing a respective flow of coolant comprising means for passing through each cooling roll a respective flow of liquid coolant having a liquid state in the predetermined temperature range corresponding to the adjuster associated with said each cooling roll.

4,638,852

AIR DRYER FOR PNEUMATIC SYSTEMS

Sanjiv K. Bassoon, 131 Bay Path Dr., Oak Ridge, Tenn. 37830, and Richard A. Harlan, Rte. 2, Box 1081, Wartburg, Tenn. 37887

Filed Aug. 16, 1985, Ser. No. 766,835
Int. Cl.[4] F25D *17/06*; F28D *7/10*; F25J *3/08*; F28B *9/10*
U.S. Cl. 165—47 7 Claims



1. A heat exchanger system for removing moisture from compressed air that is to be used in a pneumatic system, which comprises:

a first heat exchanger portion substantially arranged in a first plane, said first heat exchanger portion having

(a) a first plurality of substantially parallel straight tube units, each tube unit formed of three concentric tubes defining an inner channel, an intermediate annulus and an outer annulus, each of said tube units having a first end and a further end,

(b) first and second groups of first, second and third straight headers attached, respectively, to said first and further ends of each of said first tube units, said first header of each group being in fluid communication with said inner channels, said second header of each group being in fluid communication with said intermediate annuli and said third header of each group being in fluid communication with said outer annuli,

(c) a first inlet attached to and in fluid communication with said first and third headers of said first group, said first inlet adapted to receive a flow of said compressed air for said pneumatic system,

(d) a second inlet attached to and in fluid communication with said second header of said first group,

(e) a first outlet attached to and in communication with said first and third headers of said second group, and

(f) a second outlet attached to and in communication with said second header of said second group, said second outlet adapted to deliver demoisturized air to said pneumatic system;

a second heat exchanger portion substantially arranged in a second plane substantially parallel to said first plane, said second heat exchanger portion having,

(a) a second plurality of substantially parallel straight tube units, each of said tube units formed of three concentric tubes defining an inner channel, an intermediate annulus and an outer annulus, each of said tube units having a first end and a further end,

(b) third and fourth groups of first, second and third straight headers attached, respectively, to said first and further ends of each of said second tube units, said first header of each group being in fluid communication with said inner channels, said second header of each group being in fluid communication with said intermediate annuli, said third header of each group being in fluid communication with said outer annuli,

(c) a third inlet attached to and in fluid communication with said first and third headers of said third group,

(d) a fourth inlet attached to and in fluid communication with said first outlet of said first heat exchanger portion and said second header of said fourth group adapted to receive a flow of air from said first heat exchanger portion,

(e) a third outlet attached to an in fluid communication with said second header of said third group, and

(f) a fourth outlet attached to and in fluid communication with said first and third headers of said fourth group;

a centrifugal moisture separator connected to, and in communication with, said third outlet of said second heat exchanger portion and said second inlet of said first heat exchanger portion to remove entrained moisture from air passing through said second portion and return demoisturized air to said first heat exchanger portion; and

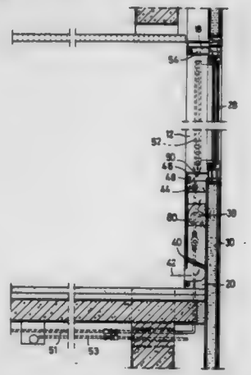
means for introducing a flow of refrigerant into said third inlet of said second heat exchanger portion, and for removing said refrigerant from said fourth outlet of said second heat exchanger portion.

4,638,853

APPARATUS FOR CONDITIONING AND CONTROLLING THE TEMPERATURE OF ROOMS IN A BUILDING

Viktor Papak, Aachen, Fed. Rep. of Germany, assignor to Josef Gartner & Co., Donau, Fed. Rep. of Germany

Filed Jul. 25, 1984, Ser. No. 634,298
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327459; Aug. 23, 1983, 3330394
Int. Cl.[4] F24F *3/06*
U.S. Cl. 165—50 28 Claims



1. Apparatus for conditioning the environment within a room or room area of a building bounded by a facade wall or walls thereof including means defining a function field of said apparatus comprising, with reference to a floor level of said room or room area to which it applies, and in a wall portion thereof, at least one pair of laterally spaced hollow uprights interconnected with and bridged by a plurality of hollow cross bars which are vertically spaced and include upper, lower and intermediately positioned cross bars, an intermediate of said cross bars being a railing cross bar which bounds one limit of the vertical extent of a railing zone of said function field the opposite limit of which is defined by another of said cross bars and the lateral limits of which are defined by portions of said one pair of uprights, said hollow uprights and cross bars defining a framework including therein means defining a flow path interconnected with means extending through said railing zone for delivering thereto and inducing the passage therethrough of a flow of hot or cold liquid, as needs require, means in connection with and within the railing zone of said framework including a cross stream blower defining a passage for movement of air from an inlet thereto, which is upstream of said blower and communicates with the interior of said room or room area the environment of which must be conditioned, to an interior portion of said railing cross bar, said cross stream

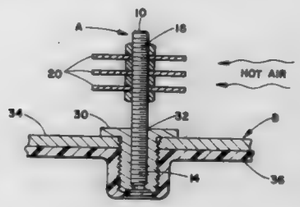
blower, when energized, being operative to draw air from said room or room area through said inlet and deliver it to and through said railing zone and to and from said railing cross bar in the process of which to inherently subject said air to the influence of said hot or cold liquid and means providing for discharge of said air so conditioned by way of openings from one or more of said hollow uprights and vertically spaced cross bars directly back to said room or room area from which said air was originally drawn, thereby to provide a simple, complete and highly effective system for conditioning the environment thereof.

4,638,854

HEAT PIPE ASSEMBLY

Don W. Noren, 846 Blandford Blvd., Redwood City, Calif. 94062

Filed Jun. 15, 1983, Ser. No. 504,527
Int. Cl.[4] F28D *15/00*; F28F *1/30*
U.S. Cl. 165—76 16 Claims



1. A means for accurately controlling the transfer of heat to or from a device, comprising:

a heat pipe having a condenser end and an evaporator end;

a first securing means for securing the heat pipe to a desired section of the device;

a heat sink means includings a plurality of fins which are each selectively positionable on the heat pipe for selectively controlling the amount of heat transferred between the surrounding environment and said heat pipe; and

a second securing means for securing the heat sink means to the heat pipe, wherein the second securing means comprises at least one nut selectively threadable onto a threaded exterior periphery of the heat pipe and wherein at least two nuts are provided, one nut being threaded on either side of each of said fins to secure each fin in position on the heat pipe, and to space each fin from each adjacent fin.

4,638,855

HEAT EXCHANGE TREATMENT OF FLUIDS

Carl L. Elmore; Ted M. Poulin, and Mark D. Barrett, all of Glens Falls, N.Y., assignors to Kamyr, Inc., Karlstad, Sweden

Division of Ser. No. 480,752, Mar. 31, 1983, Pat. No. 4,519,446.
This application Aug. 3, 1984, Ser. No. 637,574
Int. Cl.[4] F28F *27/02*
U.S. Cl. 165—101 12 Claims

1. An assembly for treating process fluids to effect heat-exchange therebetween, comprising:

a plurality of vertically arranged pairs of heat-transfer plates disposed in pairs and are disposed in an annular arrangement around the interior of a vertical vessel;

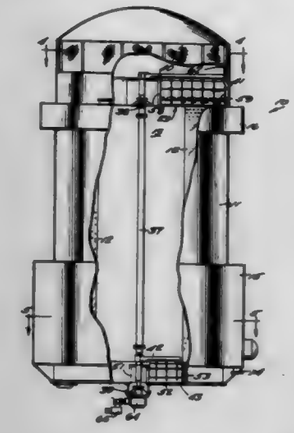
means for passing a heated fluid between pairs of said plates to reduce the heat content of said fluid, and returning said fluid with reduced heat content to a source;

means effecting a first flow of liquid over the exterior surfaces of a plurality of said heat-transfer plates;

means for effecting a second flow of liquid over the exterior surfaces of a second plurality of said heat-transfer plates;

means for segregating said first and second flows so that liquid in said first and second flows does not intermix comprising first and second liquid inlets disposed at the top of said vessel on the opposite sides of a top fixed radially extending baffle, and first and second outlets disposed at the bottom of the said vessel on the opposite sides of a bottom radially extending fixed baffle; and

means for adjusting the number of heat-transfer plates the liquid in said first flow comes in contact with, with respect



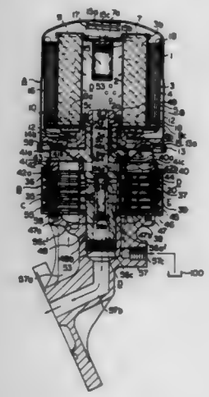
to the number of heat-transfer plates the liquid in said second flow comes in contact with, comprising top and bottom movable baffles rotatable by a central shaft to vary the arcuate spacing between said movable baffle and each of said first and second liquid inlets and outlets.

4,638,856

OIL FILTER AND COOLER FOR INTERNAL COMBUSTION ENGINE

Yasutoshi Yamanaka, Kariya; Kazunobu Ageishi, Toyota, and Teruo Izumida, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 5, 1985, Ser. No. 762,533
Claims priority, application Japan, Aug. 7, 1984, 59-166227
Int. Cl.[4] F28F *19/00*
U.S. Cl. 165—119 6 Claims



1. A heat exchanger apparatus comprising:

a heat exchanger constituted by a multiplicity of heat exchanger units laminated one upon another;

a filter having first and second filter elements for removing any unnecessary substance mixed into a working fluid;

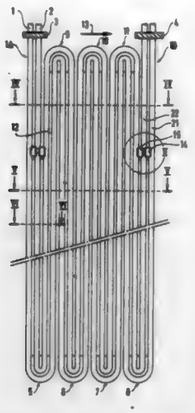
holding means, including an end plate, for holding said filter therein;
a fixing member having a cylindrical end portion to which said end plate faces and disposed such as to extend through said heat exchanger so that said heat exchanger and said filter are integrally secured to each other;
a communicating passage provided within said heat exchanger such as to communicate with the upstream side of said first and second filter elements;
a main flow passage provided within said heat exchanger such as to communicate with the downstream side of said first filter element;
a subsidiary flow passage provided within said heat exchanger such as to communicate with the downstream side of said second filter element;
single seal means for separating said main flow passage and subsidiary flow passage, said seal means being contacting at said end portion of said fixing member so that said seal means travels only a short distance on an outer surface of said end portion of said fixing member when said filter is fixed with said fixing member; and
embracing means provided in said end plate, including three wall means, for embracing all surfaces of said seal means except one surface on which said end portion of said fixing member abuts.

4,638,857

VERTICAL TUBE HEAT EXCHANGER PANEL FOR WASTE-RECOVERY BOILERS SUCH AS BLACK LIQUID BOILERS OR HOUSEHOLD WASTE INCINERATOR FURNACES, AND METHODS OF MANUFACTURE

Jean Fournier, Rochefort En, France, assignor to Stein Industrie, France

Filed Jun. 5, 1985, Ser. No. 741,335
Claims priority, application France, Jun. 5, 1984, 84 08787
Int. Cl.[4] F22B *37/24*
U.S. Cl. 165—162 6 Claims



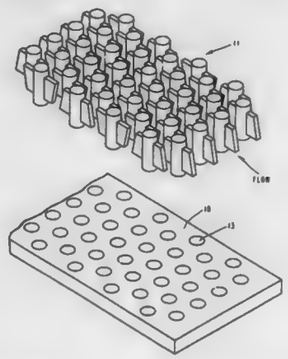
1. In a heat exchanger panel comprising; a plurality of vertical tubes interconnected alternately by top loops and by bottom loops to extend in a sinuous path from an inlet to an outlet, the improvement comprising: means fixed to said inlet and outlet of said vertical tubes for suspending said panel from a rigid structure solely via said inlet and said outlet, and wherein tubes come into contact via their outer surfaces with a soot-laden gas and are subject to differential thermal expansion from the inlet to the outlet, adjacent vertical tubes being separated from one another at a pitch which is a little greater than their diameter and being laterally interconnected by longitudinal fins, and wherein short fixing members are welded on either side to adjacent tubes at a level which is below the level of the top loops of the panel to fix the end ones of said tubes which are directly suspended from said rigid structure to one another and to the immediately adjacent tube with is not directly suspended thereby, with the interconnecting fins between said end tubes and said immediately adjacent tubes extending below said short fixing members, but not thereabove.

4,638,858

COMPOSITE HEAT TRANSFER DEVICE WITH PINS HAVING WINGS ALTERNATELY ORIENTED FOR UP-DOWN FLOW

Richard C. Chu, Poughkeepsie, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 16, 1985, Ser. No. 787,868
Int. Cl.[4] F28F *7/00*
U.S. Cl. 165—185 9 Claims



1. A heat transfer device with improved composite pin fins, comprising,
a base to be cooled or heated by a fluid directed across a surface of the base,
pins of a heat conducting material mounted on the surface of the base in columns in the direction for fluid flow,
wings attached to the pins and extending generally in the upstream and downstream directions of fluid flow, the wings in combination with the associated pin having a generally trapezoidal shape as viewed along the surface of the base at right angles to the direction of fluid flow, the trapezoid shape having a short parallel edge and a long parallel edge generally parallel to the base and having two non-parallel edges,
the composite pin fins along the direction of fluid flow being oriented with the short parallel edges alternately near the edges of wings of consective composite pin fins being spaced apart,
the pins being substantially uniform in cross section whereby the pin provides substantially the same heat transfer characteristics and impedance to the fluid flow in either orientation of the pin fin,
whereby the fluid flow is retarded by the drag from the surface of the wings more near the long parallel edge of the wings than near the short parallel edge and consequently the fluid flow past the wings is deflected toward the short parallel edge and an up-down corrugated flow is produced for improved heat transfer.

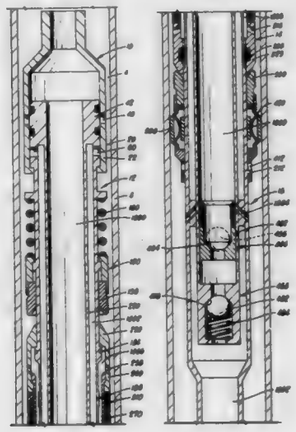
4,638,859

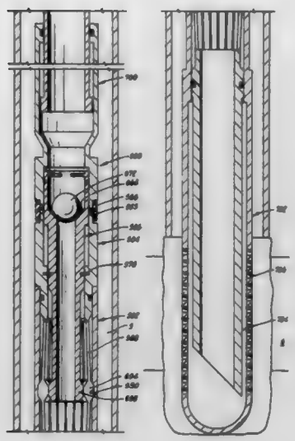
GRAVEL PACKER

Gary D. Zunkel, Chickasha, Okla., and Michael L. Bolin, Knoxville, Tenn., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 19, 1985, Ser. No. 757,040
Int. Cl.[4] F21B *43/04*
U.S. Cl. 166—51 20 Claims

1. A retrievable gravel packer for placing a gravel pack in a wellbore about a gravel screen disposed therebelow across a producing formation comprising:
a gravel packer assembly;
a packer element disposed on the exterior of said assembly;
J-slot means in said assembly for selectively maintaining said packer element in an unset mode;
ratchet means in said assembly for releasably locking said packer element in a set mode;
an intake passage in said assembly for receiving fluid from a tubing string in said well bore above and secured to said gravel packer;
a return passage for receiving fluid from the interior of said gravel screen;





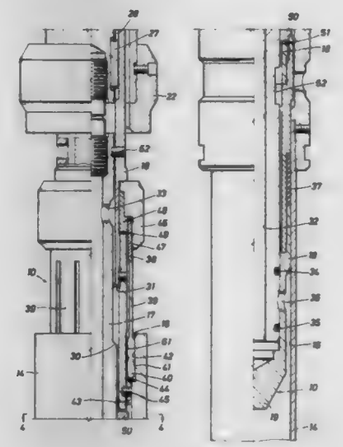
a circulation passage extending from the exterior of said gravel packer below said packer element to said intake passage;
closeable crossover means to receive fluid from said return passage and guide said received fluid from said return passage to the exterior of said assembly above said packer element;
first check valve means for preventing back flow to said intake passage from the interior of said gravel screen;
second check valve means adapted to selectively open said intake passage to said circulation passage in response to a positive pressure differential between the exterior of said gravel packer and said intake passage; and
check valve release means for inactivating said second check valve means in response to a fluid pressure buildup in said intake passage thereabove.

4,638,860

APPARATUS FOR BLOCKING COMMUNICATION BETWEEN WELL BORE INTERVALS

Robert L. Magee, Jr., Fort Worth, and Marvin B. Traweek, IV, Houston, both of Tex., assignors to Arlington Automatics Inc., Grand Prairie, Tex.

Filed Jan. 31, 1986, Ser. No. 825,085
Int. Cl.[4] E21B *33/10*
U.S. Cl. 166—114 11 Claims



1. Apparatus adapted to be moved into the upwardly-opening axial bore of a central member of a packer anchored in a well bore for selectively closing communication between formation intervals above and below the packer and comprising:
a tubular body adapted to be telescopically disposed within an internally-threaded upper bore portion and a smooth-wall lower bore portion in the central packer member;
seal means on said body for sealingly engaging the smooth-wall bore to block communication therethrough around said body;
a mandrel telescopically arranged within said body and adapted for longitudinal movement between upper and lower positions;
bypass means cooperatively arranged for closing communication through said body in one position of said mandrel and for opening said communication in the other position and said mandrel;
latching means including a plurality of flexible collet fingers dependently secured around said body having externally-threaded enlarged heads cooperatively arranged for threadedly engaging the internally-threaded bore portion to anchor said body within the the central packer member; and
retaining means including a retaining member cooperatively mounted on said mandrel and movable against said collet fingers in response to upward movement of said mandrel for threadedly engaging said enlarged heads within the internally-threaded bore portion, and means normally securing said retainer member to said mandrel and operable only in response to a force on said mandrel of at least a predetermined magnitude to release said retainer member for movement away from said enlarged heads.

4,638,861

METHOD FOR TREATING THE BOTTOM-HOLE FORMATION ZONE

David A. Kaushansky, Moscow, U.S.S.R., assignor to Moskovsky Institut Neftekhimicheskoi i Gazovoi Promyshlennosti, Moscow, U.S.S.R.

PCT No. PCT/SU84/00034, § 371 Date Mar. 11, 1985, § 102(e) Date Mar. 11, 1985, PCT Pub. No. WO85/00403, PCT Pub. Date Jan. 31, 1985

PCT Filed Jul. 11, 1984, Ser. No. 740,072

Claims priority, application U.S.S.R., Jul. 12, 1983, 3611705

Int. Cl.[4] E21B *21/00, 41/02, 43/27*

U.S. Cl. 166—247 **7 Claims**

1. A method for treating a bottom-hole formation zone comprising the steps of

irradiating the zone with a bactericidal agent comprising gamma rays at a dose of at least 300 krad, and

maintaining the pressure within said zone between 2 and 50 MPa during said irradiating step.

6. A method for treating a bottom-hole formation zone comprising the steps of

irradiating the zone with a bactericidal agent comprising gamma rays at a dose of at least 150 krad,

maintaining the pressure within said zone between 2 and 50 MPa during said irradiating step, and

treating said zone with a chemical bactericidal agent at regular intervals during said irradiating step.

4,638,862

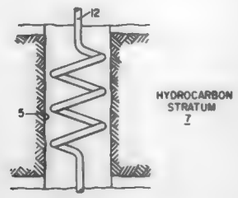
MEANS AND METHOD FOR PRODUCING HYDROCARBONS FROM AN EARTH FORMATION DURING THE RF RETORTING OF A HYDROCARBON STRATUM

Kerry D. Savage, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 10, 1985, Ser. No. 786,393

Int. Cl.[4] E21B *43/00*

U.S. Cl. 166—248 **7 Claims**



1. A method for obtaining hydrocarbon liquid from a hydrocarbon strata of an earth formation traversed by a borehole, said hydrocarbon strata being subjected to RF electromagnetic energy retorting, comprising the steps of:

(a) forming metal tubing so as to create a tubing coil having a predetermined electrical inductance,

(b) connecting straight metal tubing with the metal tubing of step (a) so that the tubing of steps (a) and (b) form a production string, and

(c) pumping the hydrocarbon liquid from the borehole through the production string to the surface of the earth formation.

4,638,863

WELL PRODUCTION METHOD USING MICROWAVE HEATING

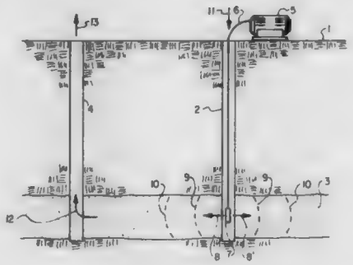
Robert Wilson, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 25, 1986, Ser. No. 878,147

Int. Cl.[4] E21B *36/00, 43/24*

U.S. Cl. 166—248 **10 Claims**

1. In a method for stimulating the production of hydrocarbonaceous fluid from a subterranean geologic formation in the earth which contains both a hydrocarbonaceous fluid and a non-hydrocarbonaceous fluid which has a higher electrical conductivity than said hydrocarbonaceous fluid, said formation being penetrated by at least one wellbore, and microwave heating being employed in at least one wellbore to heat said formation and hydrocarbonaceous fluid contained therein to enhance the flow of said hydrocarbonaceous fluid into at least one wellbore for recovery of same at the surface of the earth, the improvement comprising displacing at least a portion of



said non-hydrocarbonaceous fluid which is in said formation near said wellbore away from said wellbore and further into said formation, the amount of non-hydrocarbonaceous fluid displaced being that which is effective to substantially reduce the overall electrical conductivity of said formation and its contained fluids in a finite volume around said wellbore thereby to increase the effectiveness of said microwave heating in said finite volume and stimulate the movement of said hydrocarbonaceous fluid in the portion of said formation from which said nonhydrocarbonaceous fluid has been displaced.

4,638,864

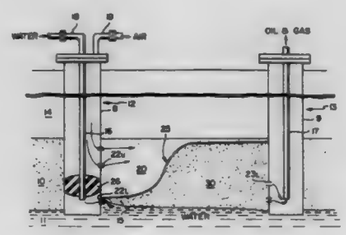
RECOVERY OF HEAVY CRUDE OIL FROM SHALLOW FORMATIONS BY IN SITU COMBUSTION

Issam S. Boussaid, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 2, 1984, Ser. No. 667,669

Int. Cl.[4] E21B *43/243*

U.S. Cl. 166—251 **7 Claims**



1. The method of carrying out an in situ combustion operation for the production of hydrocarbons from an underground formation containing heavy crude oil, said formation being penetrated by an injection well and at least one production well and being underlain by a water stratum at an oil-water contact, which comprises

initiating in situ combustion in said formation in a zone adjacent said injection well,

introducing into said formation via said injection well bore to maintain in situ combustion therein a combustion-supporting gas at a pressure lower than that at which said gas would break through to the surface in order to propagate a combustion front to travel between said injection and production wells,

at a time determined from known relationships between formation and operating parameters injecting water in said injection well at about the level of said oil-water contact to increase reservoir pressure acting against a combustion front as the latter moves toward the production well while continuing injection of combustion supporting gas into said formation, and

producing hydrocarbon fluids through said at least one production well.

4,638,865

BIORESISTANT WATER-SOLUBLE ALKYL SUBSTITUTED ACRYLAMIDE POLYMERS AND ENHANCED OIL RECOVERY METHOD EMPLOYING SAME

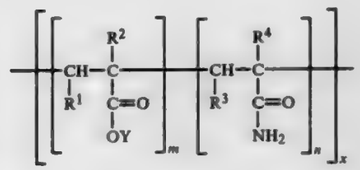
Lawrence E. Ball, Akron; William M. Griffin, Chesterland; Kathleen M. Wallace, Chardon, and Amy L. Nemecek, Garfield Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 30, 1985, Ser. No. 739,478

Int. Cl.[4] E21B *43/16*

U.S. Cl. 166—274 **21 Claims**

1. A method for recovering oil from a subterranean formation comprising injecting into said formation an aqueous composition comprising a thickening amount of a polymeric thickener represented by the formula



wherein

Y is hydrogen, ammonium, an alkali metal or an alkaline earth metal,

R^1 and R^3 are hydrogen;

R^2 is an alkyl group of 2 to about 3 carbon atoms, and R^4 is hydrogen;

m is a number sufficient to provide the acid or salt portion of said polymer at a level of from about 10% to about 90% by weight of the total weight of said polymer,

n is a number sufficient to provide the amide portion of said polymer at a level of from about 10% to about 90% by weight of the total weight of said polymer, and

x is a number sufficient to provide said polymer with a molecular weight of at least about 100,000.

4,638,866

FIRE-SPRINKLER CUT-OFF DEVICE

Vincent Capasso, Lansdale, Pa., and Charles W. Kalck, Sr., 635 Camp Wawa Rd., Lederach, Pa. 19450, assignors to Charles W. Kalck, Sr. and Kathy Kalck, both of Lederach, Pa.

Filed Jan. 31, 1986, Ser. No. 824,729

Int. Cl.[4] A62C *39/00*

U.S. Cl. 169—90 **4 Claims**

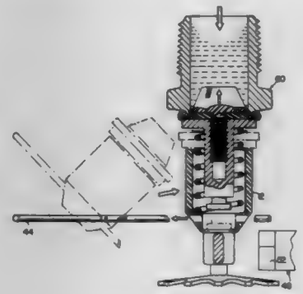
1. An apparatus for stopping the flow of water through an opening in a fire-sprinkler head, said fire-sprinkler head being of the type having a support frame spaced about and downstream of said opening, comprising:

a body member, composed of a meltable material and of a size allowing insertion in a sprinkler head, having a first bore formed therein with a shoulder formed in said bore at one end thereof and at least one second bore formed therein in a direction generally transverse to said first bore and in contact with said first bore at the end wherein said shoulder is formed;

a piston having a central post with a radially extending plate fixed to one end of said post and at least one transverse slot formed in the other end of said post, said post having a portion positioned within said first bore and of sufficient length so that said at least one slot may be aligned with said at least one second bore;

a resilient member fixed to said plate, said resilient member being engageable with a periphery of said opening;

a spring of sufficient compressive resistance to counteract the pressure of said water flowing through said fire-sprinkler head, positioned so that one end thereof rests against said shoulder and the other end thereof rests against said plate, said spring being of sufficient length so that when



extended said resilient member is forced against said opening in the fire sprinkler head stopping the flow of water therefrom; and

a retaining pin capable of insertion in said at least one second bore and capable of engaging said at least one slot so that when said pin engages said at least one slot said spring is compressed and said piston is held motionless relative to said body member whereby transverse movement of said pin out of said at least one slot releases said piston, such that said apparatus is retained between the opening in the fire-sprinkler head and the support frame.

4,638,867

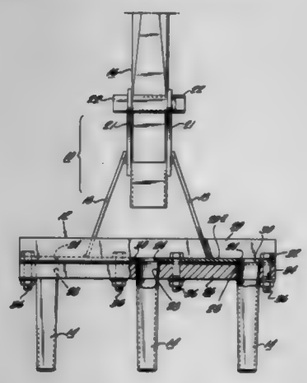
TINE HOLDER FOR TURF AERATING APPARATUS

Loren F. Hansen, and Mark E. Lamb, both of Lincoln, Nebr., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jan. 16, 1985, Ser. No. 691,847

Int. Cl.[4] A01B *45/02*; B60B *27/06*

U.S. Cl. 172—22 **9 Claims**



1. A mounting arrangement for securing one end of a hollow turf aerating tine to a tine supporting member, said mounting arrangement comprising an outwardly tapered portion of said tine at the secured end thereof tapered to provide a maximum tine width at said tine end, an aperture in said tine supporting

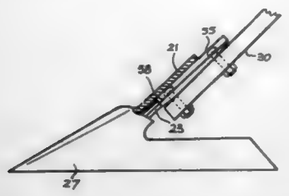
member, a tine holding bar disposed in spaced relation to said tine supporting member, a tapered aperture in said tine holding bar having substantially the same taper as said tapered tine end portion for cooperatively receiving said tine end portion, the end of said tapered tine end portion protruding beyond said bar into engagment with said tine supporting member upon seating of said end portion in said aperture, and demountable attachment means for biasing said tine holding bar toward said tine supporting member and thereby clamping said protruding tine end against said tine supporting member in alignment with said aperture, said tine being additionally tapered from its tapered end portion to its free end with the smallest diameter thereof being at its free end, said additional taper being a more gradual taper than said end portion taper.

4,638,868

EARTH ENGAGING IMPLEMENTS

William M. Johnson, Winchelsea, and Ilmar Mere, St. Marys, both of Australia, assignors to Ralph McKay Limited, Maidstone, Australia

Filed Mar. 27, 1985, Ser. No. 716,624
Claims priority, application Australia, Mar. 30, 1984, PG4343
Int. Cl.[4] A01B *23/02*
U.S. Cl. 172—762 **4 Claims**



1. An earth engaging implement and tine construction comprising a tine having bolted thereto an adaptor having an upper surface externally tapered in cross section, and an elongated slot extending through said adaptor adapted to receive a bolt head and the lower surface of the adaptor comprises a central flat portion and two radiused portions at either end of said central portion, and an earth engaging implement comprising an earth engaging portion and an attachment portion, said attachment portion comprising a tapered socket of complementary cross sectional shape to said upper surface of said adaptor, said earth engaging implement being secured to said adaptor by a wedging frictional grip on to said upper surface, said adaptor being further characterized in that the angle of inclination of the upper surface of the adaptor when mounted on the tine corresponds to the angle of the attachment portion of the earth engaging implement when it is oriented for ground engagement.

4,638,869

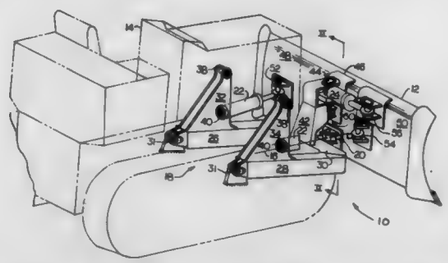
BULLDOZER BLADE MOUNTING AND STABILIZING ARRANGEMENT

Michael J. Murphy, Peoria, and Kent D. Smith, Mapleton, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Apr. 14, 1986, Ser. No. 851,847
Int. Cl.[4] E02F *3/76*
U.S. Cl. 172—821 **12 Claims**

1. In a mounting arrangement adapted for supporting and stabilizing a bulldozer blade on a vehicle, said mounting arrangement having a longitudinal axis and said bulldozer blade having a rear central portion, rear side portions and being adapted to angle and tilt relative to the longitudinal axis of said mounting arrangement, said mounting arrangement also including a mounting frame having side members each with one end adapted for pivotable connection to the vehicle and extending longitudinally therefrom, and an intermediate member interconnecting the other end of each of the side members; a universal joint connection interconnecting the rear central portion of the blade with the intermediate member of the mounting frame, said universal joint connection defining a center of motion with said longitudinal axis of the vehicle passing through said center of motion; a pair of hydraulic angling cylinders pivotably connected between the mounting frame and the respective rear side portions of the bulldozer blade; and a hydraulic tilt cylinder pivotably connected between the intermediate member of the mounting frame and one of the rear side portions of the bulldozer blade and in vertically spaced relation to said universal joint connection, the improvement comprising:

a bracket apparatus connected between the intermediate member of the mounting frame and the rear central portion of the bulldozer blade, said bracket apparatus being vertically spaced from the universal joint connection and



having a first bracket assembly secured to one of said intermediate member of the mounting frame and said rear central portion of the bulldozer blade, said first bracket assembly defining a generally transverse slot therein relative to said longitudinal axis, said slot defining a center substantially vertically aligned with the center of motion of the universal joint connection; and a second bracket assembly secured to the other of the intermediate member of the mounting frame and the rear central portion of the bulldozer blade, said second bracket assembly having a pin assembly attached thereto and disposed in the slot of the first bracket assembly substantially coaxially with the center of said slot when the bulldozer blade is in its non-tilted position, said pin assembly being freely movable in said slot to allow normal pitching of the bulldozer blade when said bulldozer blade is being tilted.

4,638,870

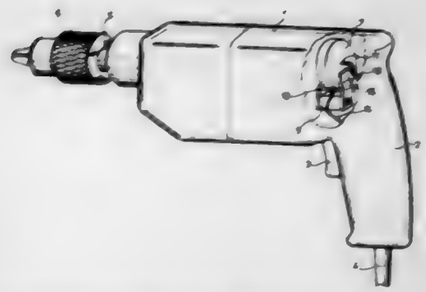
MOTOR DRIVEN HAND-HELD DEVICE CONTAINING A DISPLACEMENT MASS

Heinz Kousek, Feldkirch-Tisis, Australia, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Dec. 11, 1984, Ser. No. 680,390
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346215
Int. Cl.[4] B23Q *5/00*
U.S. Cl. 173—12 **7 Claims**

1. Motor driven hand-held device for imparting rotary movement to a tool inserted into said device, comprising a housing having a rotational axis, a mass located within said housing, a sealed container located within said housing and formed of a non-electrically conductive material, said container comprises a hollow cylinder with the cylindrical axis diposed in parallel relation with the rotational axis of said housing, said cylinder is rigidly secured to said housing, said mass located within said container and comprising an electrically conductive liquid, said container arranged in said housing so that said mass is movable relative to said container in a direction extending perpendicularly of the rotational axis, means within said housing for forming a magnetic field with said electrically conductive liquid at least partially traversing

said magnetic field, and means for tapping voltage induced in said electrically conductive liquid by the relative movement of



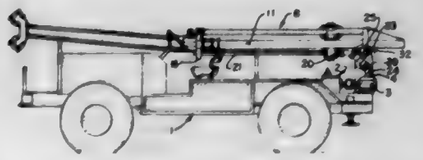
said electrically conductive liquid with respect to the magnetic field.

4,638,871

EARTH DRILL RIG

Charles L. Rassieur, St. Louis, Mo., assignor to Central Mine Equipment Company, St. Louis, Mo.

Filed Feb. 21, 1985, Ser. No. 704,074
Int. Cl.[4] E21B *15/04*
U.S. Cl. 173—26 **3 Claims**



1. In an earth drill rig wherein an upwardly and downwardly moving drill-string-turning rotary table is rotated by a kelly bar connected at its lower end to a vertical drive shaft, said kelly bar being journalled for rotation in and fixed against axial movement with respect to a drill frame assembly and said rotary table being mounted for axial movement on and along said drill frame assembly, said drill frame assembly being pivotally mounted on a vehicle on a substantially horizontal axis for pivoting between an upright position and a substantially horizontal position for transportation, the improvement comprising said drill frame assembly pivot axis positioned below the lower end of the kelly bar and above the upper end of said vertical drive shaft, and a universal coupling connecting said lower end of said kelly bar and said vertical drive shaft said universal coupling comprising universal joints at opposite ends of an elongated slip joint connector and connected there-by for relative axial movement but driving coupling between said universal joints, said universal joints lying generally on a circle of which the drill frame assembly pivot axis is the center, whereby said drill frame assembly can be moved between said upright and said substantially horizontal positions without disconnecting said kelly bar from said vertical drive shaft, said kelly bar being revolvable by said drive shaft through substantially the entire range of movement of said drill frame assembly.

4,638,872

CORE MONITORING DEVICE

Arthur Park, Odessa, and Bob T. Wilson, Midland, both of Tex., assignors to Diamond Oil Well Drilling Company, Midland, Tex.

Filed Apr. 1, 1985, Ser. No. 718,543
Int. Cl.[4] E21B *23/00*
U.S. Cl. 175—46 **18 Claims**



1. A well core drilling apparatus for retrieving a core from a bore hole, comprising:

coring means for boring the well core at the bottom of the bore hole;

container means associated with said coring means for containing the well core;

measurement means disposed in the upper end of said coring means for generating signal directed downwards toward the core and receiving the energy of said signals reflected from the core and calculating the distance of the core from said measurement means;

said measurement means calculating time versus distance for storage internal thereto and comparing said distance versus time measurement with a predetermined value;

means for generating a fault signal when said distance versus time calculation is less than its predetermined value indicating that the core is not progressing up into said container means at a rate defined by said predetermined value; and

means for indicating to the surface that said fault signal has been generated.

17. A method for measuring the rate at which a well core proceeds up into the inner barrel of a well coring device, comprising:

providing an inner barrel;

generating an ultrasonic signal at the upper end of the inner barrel in the well coring device;

detecting the energy that reflects from the core and travels upward to the upper end of the inner barrel;

measuring the time interval between generation of the ultrasonic signal and reception of the reflected energy from the core and calculating distance;

storing said calculated distance;

calculating the difference between two successive distance measurements;

comparing said calculated difference with a predetermined value and generating a fault signal if said calculated difference is less than a predetermined value; and

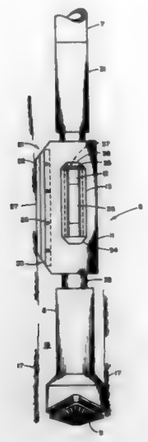
providing an indication to the surface of the generation of said fault signal.

4,638,873

DIRECTION AND ANGLE MAINTENANCE TOOL AND METHOD FOR ADJUSTING AND MAINTAINING THE ANGLE OF DEVIATION OF A DIRECTIONALLY DRILLED BOREHOLE

Austin E. Welborn, Rte. 1, Box 96A, Greensburg, La. 70441

Filed May 23, 1984, Ser. No. 613,360
Int. Cl.[4] E21B *7/04, 7/08*
U.S. Cl. 175—73 15 Claims



1. A direction and angle maintenance tool for drilling directionally oriented boreholes, comprising:

(a) a mandrel having a longintudinal bore, an upper end attachable to a rotary drill pipe, a lower end attachable to a rotary drill bit sub and a reduced diameter section;

(b) a sleeve, rotatably attachable around said reduced diameter section of said mandrel, said sleeve having an eccentric longitudinal bore forming a weighted side, and a gauge insert which is longitudinally and fixedly attached to said weighted side said longitudinal bore being of sufficient diameter to allow free relative rotation between said mandrel and said sleeve; and

(c) a means, attachable to said sleeve and said insert, for longitudinally and fixedly attaching said gauge insert to said sleeve on said weighted side.

15. A method for adjusting and maintaining the angle of deviation of a directionally drilled borehole, comprising the steps of:

(a) attaching between a drill string and a drill bit a direction and angle maintenance tool comprising:

(i) a mandrel having a longintudinal bore, an upper end attachable to a rotary drill pips, a lower end attachable to a rotary drill bit sub and a reduced diameter section; and

(ii) a sleeve, rotatably attachable around said reduced diameter section of said mandrel, said sleeve having an eccentric longitudinal bore forming a weighted side, and a gauge insert which is longitudinally and fixedly attachable to said weighted side, said longitudinal bore being of sufficient diameter to allow free relative rotation between said mandrel and said sleeve,

(b) attaching to said sleeve on said weighted side said gauge insert of a particular thickness so as to achieve a desired deviation from vertical;

(c) lowering said drill string, said tool and said bit into said borehole; and

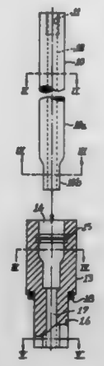
(d) rotating said drillstring relative to said tool and drilling to a desired depth at said desired deviation from vertical.

4,638,874

DRILL ADAPTOR

Stephen G. Dawe, Middelburg, and James A. Brews, Springs, both of South Africa, assignors to Coalequip (Proprietary) Limited, Transvaal, South Africa

Filed Jul. 26, 1983, Ser. No. 517,365
Claims priority, application South Africa, Jul. 26, 1982, 82/5334; Nov. 26, 1982, 82/8725
Int. Cl.[4] E21B *17/00*
U.S. Cl. 175—321 3 Claims



1. An adaptor for coupling a circular drill rod to a polygonal drive socket forming part of a drilling machine, comprising a body member having a tail portion, said tail portion being receivable in the polygonal socket in spigot and socket arrangement, and being of a mating polygonal profile, the body member further having a leading portion which defines an axial recess adapted to receive a trailing end of the drill rod, the trailing end of the drill rod defining a first locking formation, and the axial recess defining a second corresponding locking formation, with inter-connection between the locking formations preventing relative rotation between the drill rod and the body, a fluid passage passing through the body member and having an inlet thereto in the zone of the polygonal tail, and an outlet therefrom in the axial recess, the body member further defining an external peripheral collar adjacent the tail, and a resilient buffer ring on the tail adjacent the collar, the collar and buffer ring forming an abutment against which the polygonal socket sealingly engages so that the fluid passage is sealed relative to the interior of the polygonal socket, and sealing means provided within the axial recess of the body to form a fluid-type seal between the tailing end of the drill rod and the outlet of the fluid passage, so that fluid can be passed from the polygonal socket along the fluid passage in the body and along an axial passage provided in the drill rod, complementary locking formations are provided on the drill rod and within the axial recess, in the form of tongue and groove formations.

4,638,875

BLENDING SYSTEM WEIGHING UNIT

William R. Murray, Gastonia, N.C., assignor to Fiber Controls Corp., Gastonia, N.C.

Filed Dec. 24, 1984, Ser. No. 685,482
Int. Cl.[4] G01G *19/00, 19/52, 23/18, 19/22*
U.S. Cl. 177—1 43 Claims

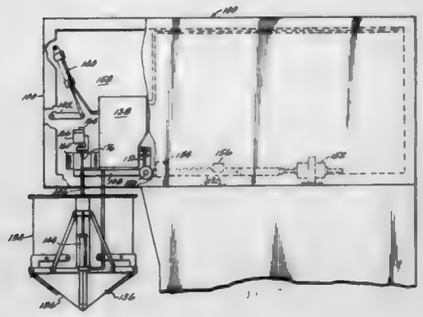
1. Fiber weighing apparatus comprising:

a pan;

means for filling said pan with fibers;

means for emptying said pan when the weight of fibers in said pan exceeds a predetermined value;

means for generating an excessive fill time signal when a first predetermined time occurs from the beginning of filling without said pan being emptied; and



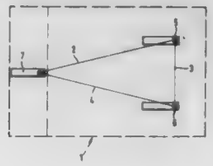
means for maintaining said excessive fill time signal until said filling means and emptying means are deactivated.

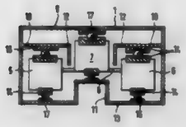
4,638,876

WEIGHING APPARATUS

Franz Balduin, Ellendorferstr. 145, 5100 Aachen, Fed. Rep. of Germany, and Ernst Adenauer, Aachen, Fed. Rep. of Germany, assignors to Franz Balduin, Aachen, Fed. Rep. of Germany

Filed Oct. 3, 1985, Ser. No. 783,760
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1984, 8429287[U]; Aug. 3, 1985, 8522425[U]
Int. Cl.[4] G01G *19/08*
U.S. Cl. 177—139 3 Claims





1. A weighing apparatus having at least three weight measuring systems which input a computing device for use with a forklift, said forklift having two parallel supporting struts extending from a crosspiece therebetween with rollers supported at the ends of the struts, steering head arranged at the front end of the forklift, an undercarriage for the forklift, coupling bar arranged in said struts and operatively interconnecting the steering head and the rollers, said weighing apparatus comprising:

a weighing plate forming the loading surface of the forklift;

said undercarriage supporting a weight measuring system disposed on the center axis of the forklift behind said steering head and at least one weight measuring system disposed on the center axis of each supporting strut in front of the rollers supported thereby, each said weight measuring system being disposed between said undercarriage and said weighing plate and a ball bearing supported between each said undercarriage and weighing plate and the associated weight measuring system with a slight clearance; and

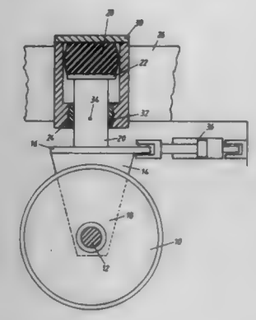
each coupling bar including at least in the zone of the weight measuring system supported by the respective strut, two rails disposed around said respective weight measuring system with a spacing between said respective coupling bar and said respective weight measuring system.

4,638,877

STEERING AXLE ARRANGEMENT FOR A WHEEL BODY OF A VEHICLE

Hans Baumers, Dusseldorf; Heinz Lietzke, Neuss, and Winfred Schulte, Ratigen, all of Fed. Rep. of Germany, assignors to Losenhausen Maschinenbau AG & Co. Kommanditgesellschaft, Fed. Rep. of Germany

Filed Mar. 9, 1984, Ser. No. 588,003
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312175
Int. Cl.[4] B62D *61/00, 5/02*
U.S. Cl. 180—21 8 Claims



1. In a steering axle assembly for a wheel body of a vehicle which has a vehicle frame, said steering axle assembly including:

(a) a steering frame in which the wheel body is mounted;

(b) a steering axle rigidly connected with a steering frame;

(c) bearing means for the steering axle; and

(d) an elastomeric supporting element between the vehicle frame and the steering axle; the improvement which comprises:

(e) said bearing means comprising a guide bushing which is connected with the vehicle frame and in which the steering axle is axially slidingly guided, said guide bushing being supported on the vehicle frame in a manner permitting pendulous motion of the steering axle, steering frame and wheel body relative to the vehicle frame;

(f) said elastomeric supporting element being arranged coaxially with respect to the steering axle; and

(g) said elastomeric supporting element, on one side, being non-rotatably connected with the steering axle.

4,638,878

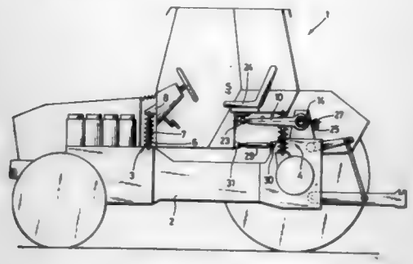
DEVICE FOR THE CUSHIONED MOUNTING OF A TRACTOR CAB

Hermann-Josef Komp, Bad Münstereifel Im Kronenberg, Fed. Rep. of Germany, assignor to Kloeckner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Filed Oct. 2, 1985, Ser. No. 783,103
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1984, 3436169
Int. Cl.[4] B62D *33/06*
U.S. Cl. 180—89.13 8 Claims

1. A vehicle comprising a chassis and a cab having a front and a rear mounted thereon, three spring action cushioning mounting points between the cab and the chassis, at least one

point being of the long stroke type, one mounting point being near the front of the cab and the other two near the rear and opposed to each other on a line transverse to the longitudinal axis of the chassis, an approximately triangular transversal



swinging arm pivotally attached at one end to two points on an axle secured to the chassis, the axle located near the rear of the cab and extending transverse to the longitudinal axis of the chassis, the swinging arm attached to the cab at the other end by a ball joint located near the center of gravity of the cab.

4,638,879

DEVICE FOR REGULATING THE SPEED OF A VEHICLE, PARTICULARLY AN AUTOMOTIVE VEHICLE, HAVING AN ELECTRONIC REGULATOR

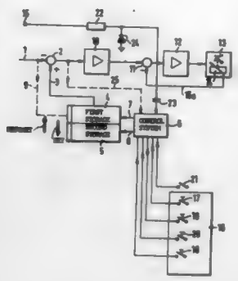
Harald Collonia, Glashütten, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 14, 1985, Ser. No. 701,606

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405707

Int. Cl.⁴ B60K *31/04*

U.S. Cl. 180—179 **4 Claims**



3. In a device for regulating the speed of a vehicle and particularly of an automotive vehicle having an electronic regulator; and wherein said regulator comprises a first storage for storing a speed desired-value signal and a control system for operating the storage; said regulator including means for comparing a speed actual-value signal with the speed desired-value signal to produce a corresponding setting signal; and said control system having an operating device which is connected to the regulator and has at least one button for setting the storage to the speed desired-value signal, one button for disconnecting regulation of the regulator, the improvement comprising

means in the regulator including a second storage for storing a second speed desired-value signal, said second storage being connected with the first storage in a stack which is controllable by the control system, and

means for storing the same present speed desired-value signal in the first storage and in the second storage upon the first actuation of the setting button after energization of the ignition.

4,638,880

SIDE STAND OF A MOTORCYCLE

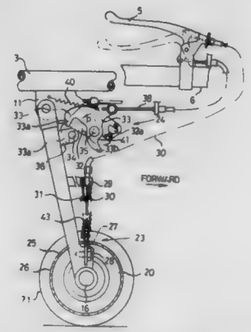
Toshio Togashi, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed May 21, 1985, Ser. No. 736,350

Claims priority, application Japan, May 21, 1984, 59-103009

Int. Cl.⁴ B62H *1/02*

U.S. Cl. 180—219 **8 Claims**



1. A means for supporting a motorcycle comprising:

a manually operable clutch lever movably mounted on a handle of the motorcycle and adapted to be placed either in a first position or in a second position;

a side stand pivotally mounted on a frame element of the motorcycle and adapted to be located in a stored location adjacent to the frame element when said clutch lever is in said first position and in a deployed location for supporting the motorcycle when said clutch lever is in said second position;

side stand moving means connecting said side stand to said clutch lever for moving said side stand from said stored location to said deployed location when said clutch lever is moved from said first position into said second position;

an auxiliary wheel rotatably mounted on said side stand;

wheel locking means on said side stand for locking said auxiliary wheel against rotation, said wheel locking means being adapted to be located in a locking position in which rotation of said auxiliary wheel is prevented when said clutch lever is in said first position and in a freeing position in which said auxiliary wheel is free to rotate when said clutch lever is in said second position;

wheel locking means moving means connecting said wheel locking means to said clutch lever for moving said wheel locking means from said locking position to said freeing position when said clutch lever is moved from said first position into said second position;

both said side stand moving means and said wheel locking means moving means being connected to said clutch lever to be operated simultaneously so that said auxiliary wheel is freed to rotate simultaneously with the deployment of said side stand into said deployed location and said auxiliary wheel is locked against rotation when said side stand is moved into said stored location.

4,638,881

MOTORCYCLE, AND BODY STRUCTURE THEREFOR

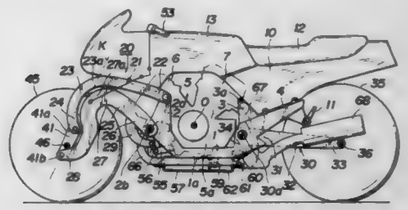
Minoru Morioka, Saitama; Toshiaki Kishi, Tokyo, and Toshiharu Yoshioka, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1984, Ser. No. 684,058

Claims priority, application Japan, Dec. 26, 1983, 58-249773

Int. Cl.⁴ B62K *21/02, 25/20, 25/24*

U.S. Cl. 180—219 **7 Claims**



1. A body structure for a motorcycle with a front wheel and a rear wheel, comprising:

an engine;

a body frame assembly having said engine mounted thereon;

a front leading arm for supporting said front wheel;

said front leading arm being vertically swingably joined at a rear portion thereof to said body frame assembly, and said front leading arm being operatively vertically swingably joined at a front portion thereof to said front wheel;

said front leading arm including an intermediate, arcuate portion extending above a straight line passing through both said swingable joints, and said arcuate portion being upwardly curved in the direction of a steering axis of said front wheel when viewed from a side of said motorcycle;

a first shock absorber operatively connected to said front leading arm;

a steering mechanism for steering said front wheel;

said steering mechanism including a handlebar;

a rear trailing arm for supporting said rear wheel;

said rear trailing arm being vertically swingably joined in a front portion thereof to said body frame assembly; and

a second shock absorber operatively connected to said rear trailing arm.

4,638,882

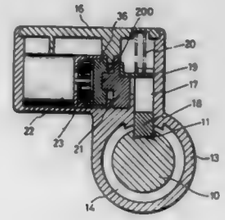
KEYLESS STEERING SHAFT LOCK ARRANGEMENT

Hidekazu Sato, Kasukabe, Japan, assignor to Kokusan Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1984, Ser. No. 684,134

Int. Cl.⁴ B60R *25/02*

U.S. Cl. 180—287 **5 Claims**



1. A keyless, motor-driven, steering shaft-locking and unlocking arrangement, said arrangement comprising:

a frame,

an electric motor,

a reduction gear connected with said motor,

an output shaft wheel connected to said reduction gear at an output side of said output shaft wheel,

a rotator coupled with said output shaft wheel and acting as a rotary cam,

said motor, said gear, said output shaft wheel and said rotator being arranged in line in said frame,

a spring-loaded hanger slidable within said frame and position-controlled by said rotator,

a shaft-locking and unlocking bar connected with said hanger and mounted slidably in the frame and engageable with a vehicle steering shaft, said bar being shiftable between a first position for unlocking of the vehicle steering shaft and a second position for locking the vehicle steering shaft, and

control circuit means for controlling the turning on and off of said motor, said control circuit means including

a sensor for sensing a vehicle-running condition and a vehicle-stationary condition and for delivering different signals for said two vehicle conditions,

a starter circuit connected with said sensor, said starter circuit being responsive to a signal from said sensor indicative of said vehicle-running condition to prevent said bar from moving to said second position, and

a locking circuit connected with said sensor, said electric motor being rotatable until driving said bar to said second position upon receipt of an output signal from said locking circuit based upon a signal received from said sensor indicative said vehicle-stationary condition.

4,638,883

STEERING SYSTEM FOR AUTOMOTIVE VEHICLE

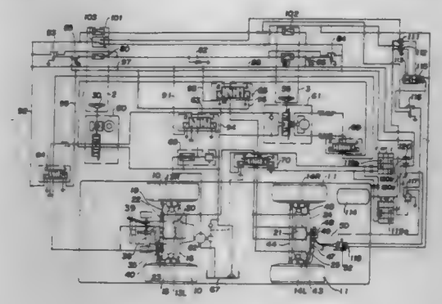
Ryoji Moriizumi; Yoichi Suzuki, and Kazuhiro Ameda, all of Ageo, Japan, assignors to Nissan Diesel Co., Ltd., Saitama, Japan

Filed Jun. 24, 1985, Ser. No. 748,019

Claims priority, application Japan, Jun. 29, 1984, 59-97998[U]; Sep. 25, 1984, 59-143500[U]

Int. Cl.⁴ B62D *5/08*

U.S. Cl. 180—324 **8 Claims**



1. A steering system for hydraulically steering the front wheels only or both of the front wheels and rear wheels of an automotive vehicle responsive to manipulation of any one of a plurality of steering wheels which respectively are accessible from a first seat positioned in a front portion of the vehicle and a second seat positioned in a rear portion of the vehicle, the first seat being adapted to drive the vehicle and the second seat to manipulate a crane or the like which is mounted on the vehicle, said steering system comprising:

power cylinders for changing orientation of the front wheels and power cylinders for changing orientation of the rear wheels;

directional control valves associated respectively with the first seat and the second seat for selectively communicating hydraulic fluid under pressure from a source of power to said power cylinders each responsive to the direction of

rotation of the steering wheel associated with the directional control valves;

a first solenoid-operated valve for selectively distributing the fluid under pressure from the source to said directional control valves;

second and third solenoid-operated valves included in a hydraulic circuit between the directional control valves and the power cylinders for selectively connecting the directional control valves and the power cylinders;

a power source circuit for applying a switching current to said first to third solenoid-operated valves via a key switch which is associated with the first seat;

a power source circuit for applying a switching current to the first to third solenoid-operated control valves via a key switch which is associated with the second seat;

a relay for cutting off said power source circuit associated with the second seat when the key switch associated with the first seat is turned on;

a relay for cutting off said power source circuit associated with the first seat when the key switch associated with the second seat is turned on; and

a solenoid-operated directional control valve;

hydraulic circuit means connecting said power cylinders, said directional control valves, said first, second, and third solenoid-operated valves and said solenoid-operated directional control valve;

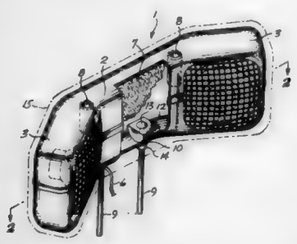
said solenoid-operated directional control valve selectively establishing and interrupting said hydraulic circuit means between the power cylinders associated with the front wheels and the power cylinders associated with the rear wheels.

4,638,884

CHAMBERED HEADREST MOUNTING FOR STEREOPHONIC LOUDSPEAKERS

James Lee, 2115 Mission, Spokane, Wash. 99201, assignor to Willis S. Cole, Seattle; James Lee, Vancouver; Rob Wortman and Claude Frabel, both of Lynnwood, all of, Wash.

Filed Jul. 11, 1985, Ser. No. 754,496
Int. Cl.[4] H05K 5/00
U.S. Cl. 181—141 10 Claims



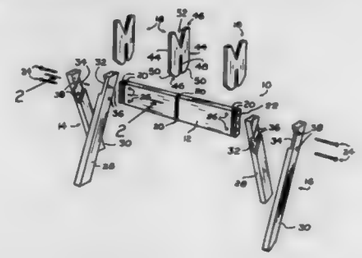
1. A headrest comprising a casing including a hollow central bridging portion and hollow end portions connected by said central bridging portion, stereophonic loudspeakers for different channels housed in said hollow end portions, respectively, said hollow end portions being in communication acoustically through said hollow central bridging portion, and vent means venting said casing hollow end portions to the exterior of said casing.

4,638,885

COMBINATION SAWHORSE AND SAWBUCK

Raymond L. Frederick, 7425 NW. Anderson Hill Rd., Silverdale, Wash. 98383

Filed Dec. 6, 1984, Ser. No. 678,774
Int. Cl.[4] B27B 21/00; B25B 1/20
U.S. Cl. 182—151 14 Claims



1. A combination sawhorse and sawbuck comprising:

a first leg assembly;

a second leg assembly which is substantially identical to said first leg assembly;

a horizontal member having first and second opposed ends and first and second opposed sides, said first end attached to said first leg assembly and said second end attached to said second leg assembly, said first side having a first vertical surface groove and said second side having a second vertical surface groove; and

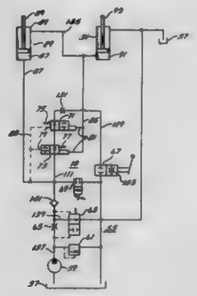
at least one removable member provided with a slot at a lower end thereof which is adapted to simultaneously engage said first and said second vertical surface grooves of said horizontal member, each removable member having a V shaped recess at an upper end thereof receptive to a work piece.

4,638,886

APPARATUS FOR DISABLING AN OBSTRUCTED LIFT MECHANISM

Walter E. Marietta, Racine, Wis., assignor to Sta-Rite Industries, Inc., Milwaukee, Wis.

Filed Oct. 21, 1985, Ser. No. 789,516
Int. Cl.[4] B66F 7/16; F15B 13/07
U.S. Cl. 187—8.49 9 Claims



1. An apparatus for disabling an obstructed lift mechanism having at least two hydraulic cylinders employed for controllably lifting and lowering a load, said apparatus including:

a first valve for sensing the differential pressure between a first sensing line and a second sensing line;

a second valve for sensing said differential pressure between said first sensing line and said second sensing line;

said first valve being movable to a position for preventing the flow of hydraulic fluid from a first cylinder when the pressure in said second sensing line exceeds the pressure in said first sensing line by a first predetermined value;

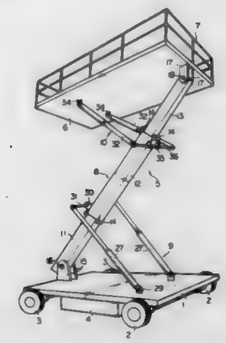
said second valve being movable to a position for preventing the flow of hydraulic fluid from said first cylinder when the pressure in said first sensing line exceeds the pressure in said second sensing line by a second predetermined value.

4,638,887

ELEVATING APPARATUS

Mitsuhiro Kishi, Ashikaga, Japan, assignor to Kabushiki Kaisha Hikoma Seisakusho, Tochigi, Japan

Filed Apr. 30, 1985, Ser. No. 728,838
Claims priority, application Japan, May 1, 1984, 59-88150; May 14, 1984, 59-95797; Jun. 4, 1984, 59-115239; Jun. 4, 1984, 59-115240; Apr. 8, 1985, 60-74044
Int. Cl.[4] B66B 9/20
U.S. Cl. 187—9 R 16 Claims



1. An elevating apparatus comprising:

(a) a base;

(b) a platform:

(c) a telescopic boom assembly connecting said base and said platform together, said telescopic boom assembly being composed of a lower outer boom pivotally coupled to said base, an upper outer boom pivotally coupled to said platform, and a middle boom slidably receiving said lower outer boom and slidably movable in and out of said upper outer boom, and an upper boom inserted in and fixed to said upper outer boom;

(d) at least one first hydraulic cylinder disposed in said telescopic boom assembly for extending and contracting said telescopic boom assembly;

(e) at least one second hydraulic cylinder operatively coupled between said telescopic boom assembly and said base for tilting said telescopic boom assembly with respect to said base; and

(f) at least one third hydraulic cylinder operatively coupled between said telescopic boom assembly and said platform for keeping said platform substantially parallel to said base.

4,638,888

HYDRAULIC ELEVATOR

Jeffrey A. Coy, Lincoln, Nebr., assignor to Brownie Manufacturing Co., Inc., Waverly, Nebr.

Filed Mar. 18, 1985, Ser. No. 712,766
Int. Cl.[4] B66B 1/04, 5/16
U.S. Cl. 187—19 11 Claims

1. A hydraulic elevator comprising, in combination:

a guide rail mast;

an elevator car mounted on said guide rail mast;

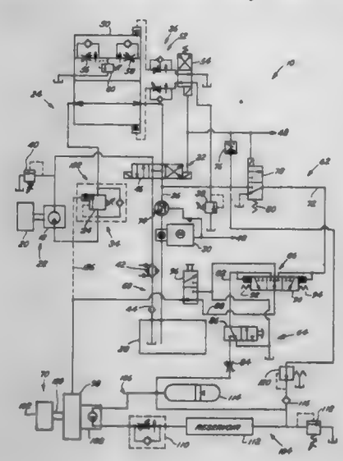
primary hydraulic control means for providing a regulated hydraulic flow having a direction and a rate, said primary hydraulic control means having a line pressure;

primary motor means, interconnected to said primary hydraulic control means and responsive to said regulated hydraulic flow, for bidirectionally driving said elevator car along said guide rail mast, said primary motor means including a hydraulic motor and motor gear means for interconnecting said hydraulic motor and said guide rail mast;

control means for monitoring said regulated hydraulic flow and for providing a primary brake release pressure supply under predetermined conditions within said primary hydraulic control means;

manually-activated emergency descent means for providing an emergency brake release pressure supply;

brake means, responsive to said primary brake release pressure supply and said emergency brake release pressure



supply, for selectively locking and releasing said elevator car in relation to said guide rail mast, said brake means including a hydraulic brake and brake gear means for interconnecting said hydraulic brake and said guide rail mast;

emergency stop means for overriding said control means and said manually-activated emergency descent means so as to activate said hydraulic brake and positionally lock said elevator car; and

hydraulic safety-governor means for monitoring and controlling said elevator car during descent thereof, said hydraulic safety-governor means including a hydrulic circuit mechanically coupled to said brake means;

said manually-activated emergency descent means being in fluid communication with said hydraulic circuit so as to draw said emergency brake release pressure supply therefrom.

4,638,889

ELEVATOR SYSTEM

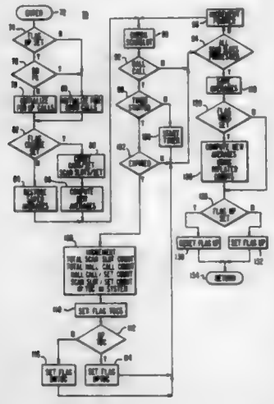
Richard H. Ludwig, West Caldwell, N.J., and Joanne E. Mikhail, Herndon, Va., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 10, 1985, Ser. No. 742,835
Int. Cl.[4] B66B 1/22
U.S. Cl. 187—29 R 8 Claims

1. A method of providing special service for a hall call registered for a predetermined period of time in an elevator system having a plurality of elevator cars mounted in a building to serve the floors therein, comprising the steps of:

providing an actual call per car average responsive to the

number of registered hall calls and the number of cars enabled to serve them,
providing a prospective call per car average responsive to the number of possible hall calls and the number of cars enabled to serve them,
assigning the floors and service directions therefrom to the elevator cars responsive to said actual and prospective hall call per averages,
timing the duration of at least certain of the hall calls,



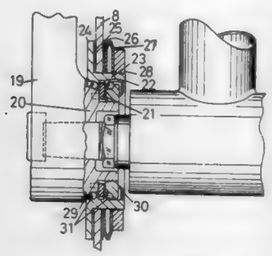
indicating that a hall call has timed-out when it has been registered for a predetermined period of time,
selecting an elevator car from all of the elevator cars suitably conditioned to serve a timed-out call responsive to their relative work loads.
and assigning the floor and service direction associated with a timed-out call to the car selected in the selecting step, while maintaining the prior assignment of the same floor and service direction previously made to another elevator car.

4,638,890

BRAKE DEVICE FOR A CYCLE

Oskar E. Lohman, Nacka, Sweden, assignor to AB Trama, Nacka, Sweden

PCT No. PCT/SE83/00401, § 371 Date Jul. 13, 1984, § 102(e) Date Jul. 13, 1984, PCT Pub. No. WO84/01924, PCT Pub. Date May 24, 1984
PCT Filed Nov. 15, 1983, Ser. No. 631,434
Claims priority, application Sweden, Nov. 15, 1982, 8206473
Int. Cl.⁴ B62L *5/00*; F16D *63/00*
U.S. Cl. 188—24.17 **9 Claims**



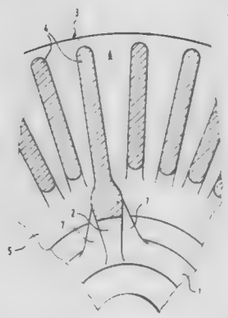
1. A system for braking at least one wheel of a cycle, comprising:
brakes which are operable to brake the rotational movement of the wheel,
actuating means for operating the brakes, said actuating means including a brake actuating member which is operatively connected to the brakes and is movable from an inactive position to an active position where it actuates the brakes of the cycle,
a pedal crank assembly which is rotatable in a forward direction to drive the cycle and is rotatable in a reverse direction to move the brake actuating member to its active position to actuate the brakes,
a freewheel means which connects the pedal crank assembly to the brake actuating member, said freewheel means being disengaged when the pedal crank assembly is driven in a forward direction and being engaged when the pedal crank assembly is driven in a reverse direction to move the brake actuating member to its active position,
a slip coupling means connected to the freewheel means and, together with said freewheel means, connecting the pedal crank assembly to the brake actuating member, said slip coupling means being operable when the pedal crank assembly is forced in a rearward direction to reduce the force transmitted from the pedal crank assembly to the brake actuating member during heavy braking.

4,638,891

SHAFT BRAKING DISC FOR RAIL VEHICLE DISC BRAKE

Xaver Wirth, Ismaning, Fed. Rep. of Germany, assignor to Knorr-Bremse AG, Munich, Fed. Rep. of Germany

Filed Sep. 3, 1985, Ser. No. 771,924
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1984, 3432374
Int. Cl.⁴ B61H *13/00*; F16D *65/12, 65/847*; B21H *5/00*
U.S. Cl. 188—58 **1 Claim**



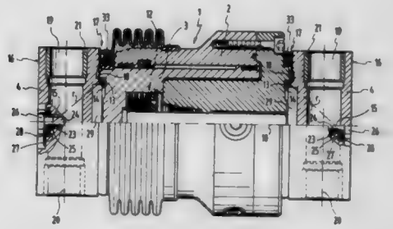
1. Shaft braking disc for a rail vehicle disc brake having a unitary friction ring (3) with an annular body (5) on each of its sides and radial cooling air channels (6) therebetween, said channels being limited by ventilation ribs (4) unitary with said annular bodies and extending radially in the direction of the circumference, at least some of said ventilation ribs, uniformly spaced along said circumference, being extended radially inwardly as support spokes (2) and being connected with a hub (1) seated on a shaft to be braked, said support spokes having a width, in the axial direction, which diminishes smoothly from said friction ring (3) radially inwardly to said hub, said support spokes being provided on both sides in the circumferential direction with reinforcement ribs (7) applied to a radially outer end of said support spokes and having a width which increases radially inwardly, said reinforcement ribs terminating radially inwardly in said hub (1), the sum of the cross sectional areas of said support spokes (2) and said reinforcement ribs (7) being at least substantially constant over the entire radial length of said support spokes.

4,638,892

LINK JOINT BETWEEN A BRAKE CYLINDER AND A BRAKE LINKAGE

Xaver Wirth, Ismaning, Fed. Rep. of Germany, assignor to Knorr-Bremse AG, Munich, Fed. Rep. of Germany

Filed Dec. 19, 1985, Ser. No. 810,485
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3447747
Int. Cl.⁴ F16D *55/224, 65/28*
U.S. Cl. 188—59 **9 Claims**



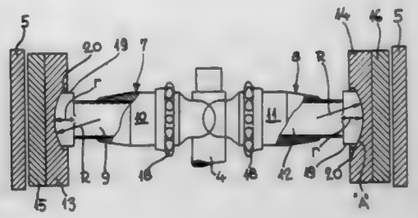
1. Link joint between a brake cylinder and a brake linkage with brake levers (6), especially for a brake cylinder (1) arranged between the brake levers (6) of a braking pincers for rail vehicle disc brakes, comprising a bearing lug (4), pivotally mounted on a brake cylinder part by means of a turning surface bearing (14, 18) symmetrical to a brake cylinder axis (10), a brake linkage part being coupled to said bearing lug (4) in a manner which permits rotation about a crossbolt (5), wherein said turning surface bearing (14, 18) has bearing surfaces (14, 18) which are narrow with relation to its diameter, which annularly surround said brake cylinder axis (10) and which are situated in a transition area (17) of the bearing lug (4) to said brake cylinder part, wherein said turning surface bearing (14, 18) is constructed as a pre-stressed thrust bearing, wherein the rotational center (15) of said turning surface bearing (14, 18) is located at least adjacent to a contact point (27) of at least one screw joint of said bearing lug (4), said contact point (27) is flexibly pre-stressed in a pressure direction located in the region of a surface (16) of said bearing lug (4) facing away from aid brake cylinder, and the screw joint is held, after passing through said bearing lug (4) with lateral play, on the other side, on said brake cylinder part (2, 3).

4,638,893

MEANS FOR TRANSMITTING BRAKE FORCE

Sven E. Camph, Flygarevägen 9F, S-236 00 Höllviksnäs, Sweden

Filed Nov. 20, 1984, Ser. No. 673,349
Int. Cl.⁴ F16D *65/56*
U.S. Cl. 188—79.5 GE **1 Claim**



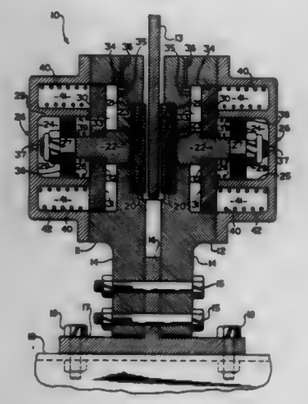
1. A braking system having a brake activating key and a brake shoe in a drum brake comprising a pair of variable length force transmitting elements one end of each of which engages the activating key and is actuated thereby, the other end of each force transmitting element having a convex cylindrical contact surface, said brake shoe (14) having a concave cylindrical contact surface of greater area of contact than the curved surface of said convex cylindrical surface, said convex and concave surfaces being complemental between said force transmitting elements and said brake shoe, means comprising the concave surface of greater area than the convex surface being shaped for mating in relative sliding contact with the convex surface in a limited direction which prevents relative sliding movement in the axial direction of the drum brake, the radius of said cylindrical curved surfaces of said force transmitting elements and the brake shoe being greater than the length of said force transmitting elements and lying in a plane containing the axis of the brake drum making the mating contact surface of the convex element engage the brake shoe cylindrical surface over an arc having a radius L.

4,638,894

CALIPER DISC BRAKE ASSEMBLY

Mansur N. Sitabkhan, North Royalton, and Raymond E. Mack, Rocky River, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed May 30, 1985, Ser. No. 739,343
Int. Cl.⁴ F16D *65/24*
U.S. Cl. 188—170 **13 Claims**



1. A caliper disc brake having a rotor disc and a pair of friction means disposed on opposite sides of the rotor disc comprising;
a pair of housing members supporting said friction means including means for mounting said friction means adjacent to and on opposing sides of said rotor disc, a bore in at least one of said housing members;
a force transmitting member slidably mounted in said bore, having means at one end which coacts with said friction members to move same into contact with the rotor disc;
a first piston slidable in said bore and fixed to the force transmitting member at the end thereof opposite to said one end;
a first spring means normally biasing said first piston and the force transmitting member in a direction away from said friction members element;
a second piston disposed in said bore and slidably mounted on and intermediate the ends of said force transmitting member, an abutment means formed on said force transmitting member adjacent said second piston;
a second spring means normally biasing said second piston in a direction toward the friction members element and having a biasing force substantially greater than said first spring means to force said second piston against said abutment means to apply the brake;
means to apply fluid pressure to said second piston on the side opposite said second resilient means to compress said second spring means and release the brake, and;
means to apply a modulated fluid pressure to said first piston

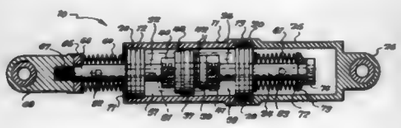
on the side thereof opposite to said first spring means to thereby cause said force transmitting member to apply a modulated braking force to said friction members elements.

4,638,895

FRICTIONLESS HYDRAULIC DAMPER AND DAMPER-SNUBBER

Douglas P. Taylor, N. Tonawanda, N.Y., and David A. Lee, Santa Monica, Calif., assignors to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed Jul. 5, 1985, Ser. No. 752,094
Int. Cl.[4] F16F 9/49; F16M 13/00
U.S. Cl. 188—280 **13 Claims**



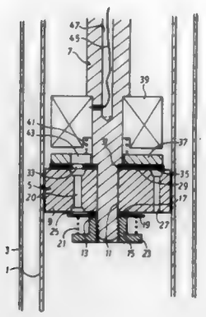
12. A damper-snubber comprising a cylinder, end walls in said cylinder, a shaft, labyrinth seals in said end walls, portions of said shaft in said labyrinth seals, end portions of said shaft extending outwardly beyond said labyrinth seals, a bellows seal mounted in fluid-tight relationship between each of said end walls and its adjacent end portion of said shaft, fluid in said cylinder and in both of said bellows, a piston head on said shaft in said cylinder, orifice means located relative to said piston head to permit flow of fluid past said piston head when said piston head moves below a predetermined velocity to thereby cause said damper-snubber to function as a damper, conduit means effecting communication between both of said bellows seals, first means on said shaft for attachment to a first external object, second means on said cylinder for attachment to a second external object which is movable relative to said first external object, and valve means for selectively closing said orifice means when said piston head moves above said predetermined velocity to cause said damper-snubber to function as a snubber.

4,638,896

SHOCK ABSORBERS

John Poyser, Haxby, England, assignor to Armstrong Patents Co. Ltd., North Humberside, United Kingdom

Filed May 3, 1985, Ser. No. 730,059
Claims priority, application United Kingdom, May 3, 1984, 8411319
Int. Cl.[4] B62K 25/06; F16F 9/46
U.S. Cl. 188—299 **3 Claims**



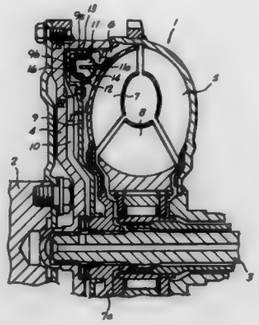
1. A twin tube telescopic shock absorber comprising a pair of coaxially aligned cylinders, one cylinder being located within the other, a foot valve assembly being located at one end region of the inner cylinder to control fluid flow between the inner cylinder and the annular cavity between the cylinders, and a piston being axially slidably arranged within the inner cylinder, an electromagnetically controlled valve being arranged to provide a fluid flow path bypassing the piston, the electromagnetically controlled valve being electrically connected to the outside of the shock absorber via an electrical connection which extends through a piston rod connected to the piston, and being closed when de-energised, the electromagnetically controlled valve comprising at least one bore extending axially through the piston, a flexible closure member of planar configuration, engaging against the rear face of the piston and having a restrictor aperture which is aligned with the bore, the flexible closure member being secured to said piston rear face at a point remote from said bore, a closure plate engaging over and being spring biased against said closure member to thus close the aperture and aligned bore, an electromagnet mounted on a piston rod connected to the rear face of the piston being capable, when energised, of lifting the closure plate off the closure member, to uncover the restrictor aperture in the closure member, allowing fluid to flow through the bore as the piston is moved axially within the cylinder.

4,638,897

DAMPER DEVICE FOR A TORQUE CONVERTER CLUTCH

Sadanori Nishimura, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1983, Ser. No. 505,753
Claims priority, application Japan, Jun. 24, 1982, 57-107675; Jul. 24, 1982, 57-111613[U]; Nov. 22, 1982, 57-175612[U]
Int. Cl.[4] F16D 33/00, 35/00
U.S. Cl. 192—3.3 **10 Claims**



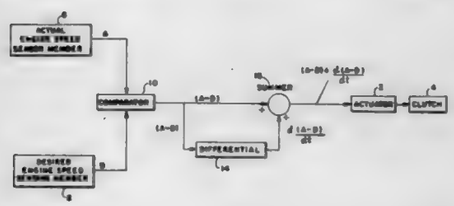
1. A damper device for a torque converter clutch with a clutch plate for coupling an input case on an input shaft to a turbine vane wheel on an output shaft in which higher fluid pressure differential across the clutch plate causes coupling and lower fluid pressure differential allows slipping wherein the clutch plate is connected to the turbine vane wheel by circumferentially extending springs to allow limited springbiased relative rotation therebetween, the improvement comprising; a fluid communication hole in the clutch plate, a flow control means positioned in association with said hole for opening or closing said hole and having means connected to the turbine vane wheel for tending to close said hole upon relative rotation between the clutch plate and turbine vane wheel caused by higher levels of torque transmission through the springs and tending to open said hole upon lower levels of torque, said flow control means being operated for tending to close the hole upon transmission of torque from said clutch plate to the turbine vane wheel directly through said circumferentially extending springs by the torque tending to compress said springs.

4,638,898

CLUTCH CONTROL SYSTEM AND CLUTCH ASSEMBLY USING SAME

Eugene R. Braun, Royal Oak, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 19, 1985, Ser. No. 810,618
Int. Cl.[4] B60K 41/28
U.S. Cl. 192—0.052 **39 Claims**



1. A clutch control system for controlling rate of engagement between a driven member of a clutch assembly and a driver member of an engine having an adjustable throttle, said system comprising,

a first sensor member operative to provide a first signal corresponding to actual engine speed,

a second sensor member operative to provide a second signal corresponding to a desired engine speed, and

control means operative to receive said first and second signals and provide an output function signal therefrom to an actuator operative to effect the engagement upon receipt of the function signal, said function signal represented by the equation:

$$F = (A-D) + \frac{d(A-D)}{dt}$$

where:

D=desired engine speed

A=actual engine speed

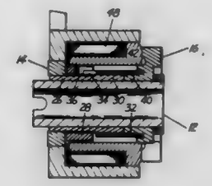
$\frac{d(A-D)}{dt}$ = rate of change of the difference between the actual and desired engine speeds with respect to time.

4,638,899

SIMPLIFIED METHOD OF SECURING THE CLUTCH SPRING TO THE TORQUE INPUT DRUM OF A SPRING CLUTCH, AND RESULTING MECHANISM

John A. Kossett, Columbia Heights, Minn., assignor to Reell Precision Manufacturing Corp., Saint Paul, Minn.

Filed Feb. 28, 1985, Ser. No. 706,633
Int. Cl.[4] F16D 13/08
U.S. Cl. 192—81 C **5 Claims**



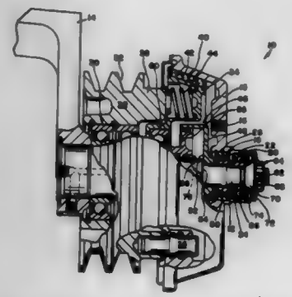
1. A spring clutch mechanism having an endpiece supporting a first drum or hub and grooved to provide a circular groove at least partially surrounding the base of said drum, a second drum coaxially adjacent said first drum, and a helical clutch spring closely surrounding said drums with a terminal coil of said spring permanently bound within said groove against rotation and removal.

4,638,900

FAN DRIVE MECHANISM

Brian C. Deem, Avon Lake, and Jack A. Kemp, Elyria, both of Ohio, assignors to Allied Corporation, Morristown, N.J.

Filed Jun. 17, 1985, Ser. No. 745,152
Int. Cl.[4] F16D 25/08
U.S. Cl. 192—85 CA **12 Claims**



1. Fan drive mechanism comprising a spindle having an axis, a fan plate, bearing means for rotatably mounting said fan plate on said spindle, said fan plate being displacable axially along said spindle upon failure of the bearing means, said bearing means including an inner race mounted on said spindle, an outer race mounted on said fan plate, and means for permitting rotation between said races, and stop means having a surface tapering radially outwardly with respect to said axis of the spindle to define a conical surface for engagement by said means permitting rotation upon separation of the latter from said inner race to thereby limit the axial displacement of the fan plate with respect to said spindle upon failure of the bearing means, a driving member rotatably mounted on said spindle, said driving member including a portion movable axially along said spindle for a predetermined maximum axial distance for driving engagement with said fan plate to form a driving connection between said driving member and said fan plate, said portion moving away from said fan plate to break said driving connection, and fluid pressure responsive means for moving said portion along said spindle, the axial length of said conical surface along the axis of said spindle being sufficiently long to permit movement of said fan plate after failure of said bearing means a distance at least incrementally longer than the maximum axial distance of movement of said portion on said spindle.

4,638,901

STEP OF AN ESCALATOR OR THE LIKE EQUIPPED WITH AT LEAST ONE SAFETY DEVICE

Gerhard Lunardi, Vienna, Austria, assignor to Inventio AG, Hergiswil, Switzerland

Filed Aug. 8, 1985, Ser. No. 763,836
Claims priority, application Switzerland, Aug. 22, 1984, 04014/84
Int. Cl.[4] B65G 43/00
U.S. Cl. 198—323 **15 Claims**

1. A step for an escalator, comprising:

a step body including a thread surface and a front surface;

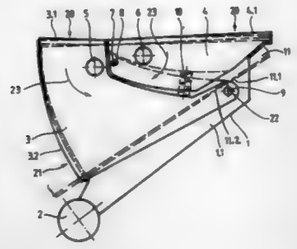
at least one side upright provided for said step body and equipped with a trailing roller;

a stationary skirt guard arranged laterally of said step body in the neighborhood of said at least one side upright;

two segments movably arranged on said step body at the region of said at least one side upright between said step body and said skirt guard;

a common spring provided for said two segments for pressing apart said two segments such that at least one of said two segments assumes a preparatory position at least partially protruding from said step body;

said at least one of said two segments being provided with warning transmission means for engaging a profiled guide



edge of a skirt of the escalator in an active warning position of said at least one of said two segments flush with said step body; and

said at least one of said two segments being shiftable by a load exerted by a passenger acting upon said at least one protruding segment into said active warning position for warning the passenger that the passenger has stepped onto a danger zone of the step body by vibrations of said warning transmission means engaging the profiled guide edge.

4,638,902

MECHANISM FOR AUTOMATICALLY POSITIONING CLAMPING FRAMES

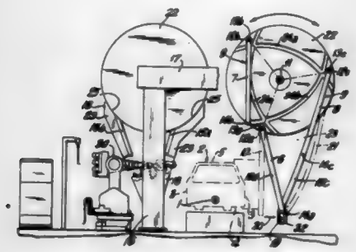
Roman Kellner, Bostetten; Georg Mayr, Friedberg; Karl-Heinz Prokesch, and Franz Pöckl, both of Augsburg, all of Fed. Rep. of Germany, assignors to KUKA Schweissanlagen Roboter GmbH, Fed. Rep. of Germany

Filed Apr. 12, 1985, Ser. No. 722,779

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1984, 3414387

Int. Cl.⁴ B65G *47/00*

U.S. Cl. 198—345 **12 Claims**



1. A mechanism for holding workpieces of different configurations, comprising:

a plurality of clamping frames each for engaging a workpiece of different configuration and each having first and second spaced apart portions;

rotary motion means rotatably connected to said first portion of each frame for rotating all of said first portions about a common axis, said first portions of said frames being mutually spaced from each other and spaced from said common axis, said rotary motion means comprising a fixed support and a disc rotatably mounted to said fixed support about said common axis, said common axis extending through a center of said disc, and said disc rotatably connected to said first portion of each frame at a location radially spaced from said common axis, said disc including a plurality of curved guideways each having a center of curvature at said first portion of one of said frames, each curved guideway having a radius corresponding to a distance between said first and second portion of each frame with said second portion of each frame being movable into a respective curved guideway when said frame is away from its working position; and

at least one fixed plate mounted below said disc and having at least one fixed guideway for sequentially engaging said second portion of each frame, one at a time, with rotation of said first portions about said common axis, each frame being movable from a standby position to a working position with engagement of its second portion in said fixed guideway and movement of said second portion to a selected location on said guideway.

4,638,903

METHOD OF SEPARATING AND COLLECTING COMMODITIES AND DEVICE FOR THE SAME

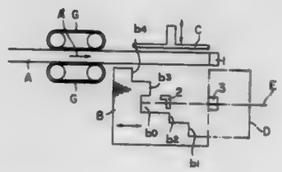
Yoshio Kimura, Tokyo, Japan, assignor to Tetra Pak International Aktiebolag, Lund, Sweden

Filed Jun. 27, 1985, Ser. No. 749,534

Claims priority, application Japan, Jun. 29, 1984, 59-136409

Int. Cl.⁴ B65G *47/26*

U.S. Cl. 198—419 **2 Claims**



1. A method for collecting articles comprising the steps of:

pushing transversely a predetermined number of articles into a tapered pusher, said articles being arranged longitudinally straight and said tapered pusher having a stepped configuration of a plurality of stages wherein each stage has a longitudinal side substantially equal to a length of said article and a transverse side substantially equal to a width of said article and at least one said stages in a middle portion of the tapered pusher is omitted, and said articles being prevented from entering into said omitted stage of said tapered pusher by a stop means; and

longitudinally advancing said pusher a distance equal to said length of said article so that the articles except for those in front of said omitted stage are pushed out of said pusher in a manner that said articles are grouped on either side of an imaginary line which is drawn from said omitted stage.

4,638,904

ADJUSTABLY POSITIONAL CRANK PIN SUPPORT MEANS FOR WIRE FEEDING APPARATUS

Magnus Randar, Menomonee Falls, and Terry R. Kroesing, Cedarburg, both of Wis., assignors to Artos Engineering Company, New Berlin, Wis.

Filed Jun. 27, 1985, Ser. No. 749,401

Int. Cl.⁴ B65G *25/00*

U.S. Cl. 198—468.2 **9 Claims**

1. Apparatus for feeding a strand of wire comprising:

a pair of wire feed clamps which are connected to a pair of parallel flights of a cable connected to be driven by a cable drum which is oscillatably rotatable between two extreme angular positions, said angular positions determining the axial positions of said parallel cable flights and thus the extreme operating positions and travel distance of each of said wire feed clamps; drive means to oscillatably rotate said cable drum to effect wire feeding movements of said wire feed clamps;

said drive means comprising a motor and a power output shaft rotatably driven about an axis of rotation by said motor;

a feed crank connected to be rotated by said power output shaft;

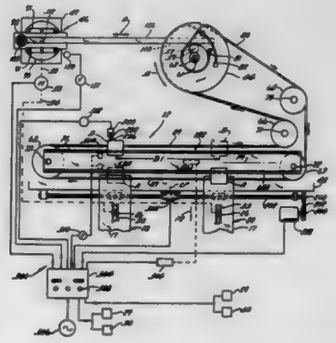
guide means mounted on said feed crank and movable between locking and unlocking positions;

biasing means biasing said guide means to one of said locked and unlocked positions;

a crank pin support member slidably mounted on and disposed between said feed crank and said guide means and being adjustably positionable in fixed positions wherein it can be releasably locked;

a crank pin mounted on said crank pin support member and having a pin axis which orbits around said axis of rotation as said feed crank rotates;

a reciprocably movable elongated drive rod connected to oscillatably rotate said cable drum,



said drive rod being pivotally connected at one end to said crank pin and being drivingly engaged at its other end to rotate said cable drum;

locking means operable to lock and unlock said crank pin support member on said feed crank, said locking means comprising an actuator connected to said guide means and biasing means;

to said guide means and which overcomes the force of said biasing means during movement of said guide means; to unlock said crank pin support member and enable adjustable repositioning of said wire feed clamps, said cable, said cable drum, said drive rod and said crank pin support member so that said wire feed clamps are able to provide a particular length of said wire strand, and said control means being further operable to lock said crank pin support member and entrap said crank pin support member between said guide means and said feed crank and to operate said motor of said drive means to effect wire feeding movements of said wire feed clamps while said crank pin support member is locked.

4,638,905

INCLINED GRATE FOR FURNACES

Manfred Weiss, Lauda-Königshofen, Fed. Rep. of Germany, assignor to Richard Kablitz GmbH & Co. KG, Fed. Rep. of Germany

Filed Aug. 30, 1984, Ser. No. 645,669

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1983, 3331156

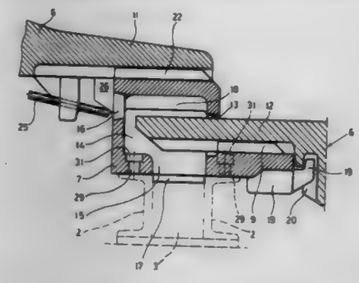
Int. Cl.⁴ B65G *25/00*

U.S. Cl. 198—774 **12 Claims**

1. A furnace grate structure over which solid fuel advances in a direction of conveyance as said fuel is combusted, said grate structure comprising:

a plurality of grate beams extending substantially parallel to one another and substantially transversely to said direction of conveyance and supported on a substructure, said beams forming upwardly facing support surfaces;

at least one bank of first and second types of elongated grate bars which extend substantially parallel to said direction of conveyance in spaced relation to each other, said grate bars having upwardly facing support surfaces inclined downwardly in said direction of conveyance for conveying said solid fuel, each of said grate bars being supported at each end thereof on a mounting surface of a respective said grate beam such that said first type of grate bars are



reciprocatingly movable in a substantially horizontal direction and said second type of grate bars are stationary, said bank of said grate bars being defined by alternating ones of said first and said second types of grate bars lying parallel and adjacent to one another;

at least one of said grate beams comprises a plurality of grate beam sections, each beam section having two ends, said grate beam sections being arranged end to end on said substructure to form one of said grate beams having gaps between adjacent grate beam sections; and

keyed engagement means on said grate beam sections for guiding and laterally positioning said reciprocatingly movable and said stationary grate bars such that each of said gaps between said adjacent ends of said grate beam sections are covered by a respective one of said grate bars.

4,638,906

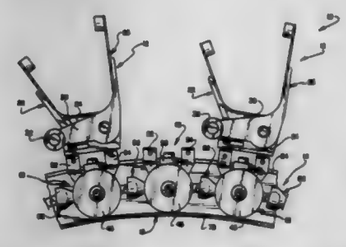
CONVEYOR ASSEMBLY

Michael E. Winiasz, Lorain, Ohio, assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Nov. 19, 1985, Ser. No. 799,402

Int. Cl.⁴ B65G *17/12, 39/20, 47/86*

U.S. Cl. 198—803.9 **4 Claims**



1. A gripper conveyor assembly comprising a plurality of gripper means for engaging articles to be conveyed from a first location to a second location, a track extending from the first location to the second location, a conveyor chain connected with said gripper means and movable along said track, said conveyor chain being enclosed by said track and including a

plurality of interconnected links anyone of which can be readily removed from said conveyor chain while the other links remain interconnected and are enclosed by said track, one of said links including a body section connected to one of said gripper means, roller means connected with said body section of said one link for engaging said track to guide movement of said body section along said track, socket means at a first end portion of said body section for receiving a plug of an adjacent link, and a plug at a second end portion of said body section for insertion into a socket means of an adjacent link, said socket means including surface means for defining an opening through which a plug of an adjacent link can be inserted into said socket means when said body section of said one link and the adjacent link are in a first orientation relative to each other and for blocking withdrawal of a plug of an adjacent link from said socket means when said body section of said one link and the adjacent link are in a second orientation relative to each other, said body section of said one link and said one gripper means being rotatable together relative to said track between the first and second orientations, said track including wall means for at least partially enclosing said conveyor chain and for defining a slot through which said one link and said one gripper means are interconnected, said slot including surface means for preventing rotation of said links from the second orientation to the first orientation during movement of said links along said track, said wall means including surface means at least partially defining an opening for enabling said body section of said one link and said one gripper means to be rotated together about the longitudinal axis of said track at the opening from the second orientation to the first orientation and longitudinally disconnected from the adjacent links and laterally moved through the opening while the adjacent links are enclosed by said track.

4,638,907

LAMINATED LAUNDRY PRODUCT

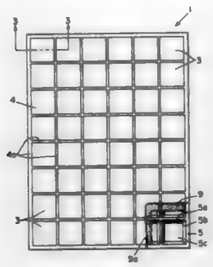
William T. Bedenk, and Kendall L. Harden, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 28, 1984, Ser. No. 675,804

The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.

Int. Cl.[4] C11D *17/04*

U.S. Cl. 206—0.5 **29 Claims**



1. A compact, through the wash laundry product comprising:

a laminate of two plies of which at least one ply comprises a strong, high stretch tissue which is deeply embossed to form a multiplicity of nonconnecting cups surrounded by rims;

the tissue in each cup having been stretched 15% to 100% by said deep embossing;

said cups containing a laundry active, said active being selected from powdered detergents, builders, brighteners, softeners, enzymes, bleach solids, fillers, and mixtures thereof;

the other of said two plies covering the deeply embossed ply forming patterned cells which contain the powder, said plies being sealed on said rims to provide said compact, through the wash laundry product;

said high stretch embossed tissue originally having a dry CD stretch of from about 9% to about 25% and a dry MD stretch of from about 30% to about 60%, a wet cross-directional tensile strength of from about 78.7 to about 315 g/cm (200–800 g/in), said one ply selected to withstand the stretching and said two plies selected to survive automatic washing and drying cycles without significant tearing; said tissue having sufficient porosity to permit the laundry actives to dissolve and flow through the tissue.

2. A compact, through the wash laundry product comprising:

a laminate consisting of at least two plies of tissue;

one of said plies being a high stretch tissue which is deeply embossed to form a multiplicity of nonconnecting cups surrounded by rims, said deeply embossed ply being stretched at least 15% to 100% from said deep embossing, said deeply embossed tissue having a wet cross-directional tensile strength of from about 78.7 to about 315 g/cm (200–800 g/in) and a dry CD stretch of at least 12% and a dry MD stretch of from 30% to 60%;

said cups containing laundry active powders selected from powdered detergents, builders, enzymes, softeners, brighteners, bleach solids, fillers, and mixtures thereof;

the other of said two plies of tissue covering the deeply embossed ply forming patterned cells which contain the powder, said plies being sealed on said rims;

said deeply embossed tissue is selected to withstand the stretching and both of said plies selected to survive automatic washing and drying cycles without significant tearing; said tissue having sufficient porosity to permit laundry actives to dissolve and flow through the tissue.

4,638,908

INSERT FOR A MONEY DRAWER

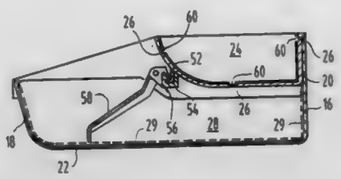
Guenter Baitz, and Wilfried Dobring, both of Berlin, Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,374

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 8409722[U]

Int. Cl.[4] A45C *11/28*

U.S. Cl. 206—0.8 **6 Claims**



1. A combination drawer and insert for receiving coins, currency, bills and the like, in the form of a trough-like receptacle open at the top, characterized by a relatively large area, relatively deep lower tray having partitions defining a plurality of relatively long compartments running from front to rear of said lower tray and sized to accommodate paper currency, a relatively small area, relatively shallow upper tray defining a plurality of relatively short compartments running from front to rear of said upper tray and sized to receive metal currency, and coacting means on said lower tray and on said upper tray for removably mounting said upper tray in the upper rear region of said lower tray so that said upper tray overlies the rear portions of said relatively long currency compartments defined by said lower tray and exposes the front portions of these compartments;

the front edge of the upper tray, when mounted in said lower tray, being rearwardly spaced from the front edge of the lower tray;

and at least one bill hold-down device mounted on the front edge of the upper tray and having a pivotal hold-down arm extending into a compartment of said lower tray.

4,638,909

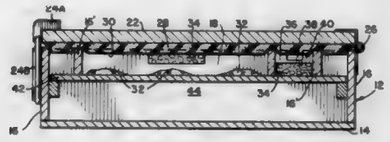
CONTAINER FOR RETAINING PAINT

Thomas E. Ford, 150-24 6th Ave., Whitestone, N.Y. 11357

Continuation of Ser. No. 521,640, Aug. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 385,019, Jun. 4, 1982, abandoned. This application Oct. 11, 1984, Ser. No. 660,010

Int. Cl.[4] B65D *21/00, 81/24*

U.S. Cl. 206—1.7 **5 Claims**



1. In an artist's paint box comprising a bottom wall and vertically extending side walls constructed to define a storage comprtment open only at the top thereof and further comprising a cover having one main surface and constructed to be releasably attachable and movable from an open position to a closed position wherein said one main surface is constructed to superpose said storage compartment and the upper edges of said side walls, the improvement comprising: a storage tray having a planar base and vertical walls extending upwardly from the base to form in said tray a plurality of compartments open only at their tops, means disposed on the side walls for removably supporting the tray in the box with the planar base disposed above the bottom wall and spaced apart therefrom such that the vertical walls of the tray are at substantially the same height as the side walls of the box, a gasket of resilient material completely covering the one main surface of the cover and a non-porous plastic film completely covering the gasket and facing said storage compartment, wherein the gasket is configured to be compressed by the side walls and vertical walls when the cover is in the closed position such that the plastic film coacts with the side walls and vertical walls to fluid-tightly seal the storage compartment from the atmosphere and each of the plurality of compartments from each other and to simultaneously fix the tray in place on the supporting means, whereby the box can be transported by a user without dislocation of the tray in the box or fluid communication between the compartments thereof.

4,638,910

CLEANING WAND CADDY

David J. Bokmiller, San Antonio, Tex., assignor to Sani-Fresh International, Inc., San Antonio, Tex.

Filed Sep. 20, 1984, Ser. No. 652,868

Int. Cl.[4] A45D *44/18*

U.S. Cl. 206—15.2 **3 Claims**

1. A housing for storing a cleaning wand in an upright position, comprising:

a base comprising a bottom, first and second base side walls, and a rear wall, said bottom for supporting a head of said wand thereon during storage of said wand and having a groove therein through which to receive a handle of said wand during storage of said wand;

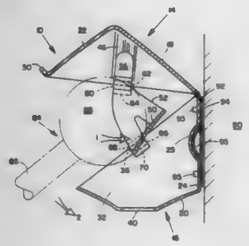
a lid comprising a top, first and second lid side walls, and a front wall, said lid hingedly connected to a top of said rear wall atop said base for placing said housing in an open position upon engagement of said wand head with said lid;

a press plate connected to said lid for placing said housing in a closed position upon engagement of said wand head with said press plate, said housing permitting said wand to be stored in said upright position with said wand handle extending vertically downward relative to said head; and

means for alternately locking said housing in said open position or said closed position, wherein said means for alternately locking said housing in said open or closed position comprises:

a first bracket connected to said first side wall of said lid;

a second bracket connected to said second side wall of said lid, said press plate connected to said first bracket and said second bracket;



a first inwardly protruding boss on said first side wall of said base, said first protruding boss adapted for alternate engagement with or disengagement from an uppermost groove on said first bracket and a lowermost groove on said first bracket; and

a second inwardly protruding boss on said second side wall of said base, said second protruding boss adapted for alternate engagement with or disengagement from an uppermost groove on said second bracket and a lowermost groove on said second bracket.

4,638,911

PACK AND PROCESS FOR THE MANUFACTURE THEREOF

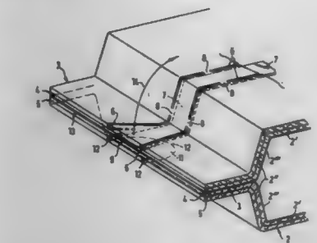
Helmut Prohaska, St. Polten, Austria, assignor to Folienwalzwerk Brueder Teich Akitengesellschaft, Obergrafendor Muhlhofen, Austria

Continuation of Ser. No. 261,157, Apr. 20, 1981, abandoned. This application May 21, 1985, Ser. No. 736,476

Claims priority, application Austria, Jun. 19, 1980, 00017/80

Int. Cl.[4] B65D *17/34*

U.S. Cl. 206—611 **2 Claims**



1. Pack for the packaging of articles to be packed with a wrapping having a tear-open member and consisting of a thin flexible and foldable packaging material, the packaging material having at least one double region with an exposed edge in which said packaging material forms two layers bonded to one another with a bonding agent and on which the start of the tear-open member is located, one of said layers being an extension of a part of the wrapping in which the tear-open member is located, characterized in that the thin packaging material, having lines of weakness formed in the material before formation of the pack, comprises a carrier layer which is provided along said lines of weakness with perforations at least over

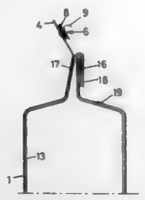
discrete sections and a non-perforated proofing layer which is bonded to the carrier layer and which is covered, in turn, with a sealing layer comprising the bonding agent, that the tear-open member is located between lines of weakness in the packaging material and that the layer (4) of the double region which is the extension of the wrapping part in which the tear-open member is located has a portion within which the start of the tear-open member is located and which lies opposite a region (11) located in the other layer (5) of the double region, this region (11) being encircled at least almost completely by lines of weakness (12) of the packaging material of this other layer (5) and an exposed straight edge of the double region (13), the two packaging layers being sealed together on their non-perforated proofing layers.

4,638,912

PACKAGE WITH TRANSFERABLE REUSABLE CLOSURE ELEMENT

Heinrich Graf, Beringen, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Apr. 10, 1985, Ser. No. 721,802
Claims priority, application Switzerland, Apr. 30, 1984, 2111/84
Int. Cl.⁴ B65D *33/16*
U.S. Cl. 206—621 **7 Claims**



1. In a reclosable package having a generally rectangular outer wrapper including a top closure formed of panels folded to one another and against a top face of the package; a flap constituting a continuation of one of the panels; the improvement comprising a hook-and-eye fastener having hook and eye components attachable to and separable from one another; one of said components being permanently affixed to a face of said flap and the other component being readily removably carried on said one component and having a reverse side; and means for permanently attaching said other component by said reverse side to an external location of said wrapper, whereby for reclosing said package after an initial opening thereof, said other component being transferable from said one component for permanent attachment to said wrapper, and said flap being positionable over said wrapper such that said components are in alignment for engagement with one another.

4,638,913

MULTIPLY PACKAGE HAVING DELAMINATING EASY OPEN SEAL

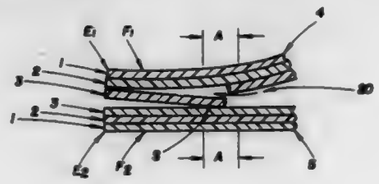
Milton A. Howe, Jr., Spartanburg, S.C., assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Aug. 21, 1981, Ser. No. 295,157
Int. Cl.⁴ B65D *77/12*
U.S. Cl. 206—632 **7 Claims**

1. An easy open seal for an opening in a receptacle of thermoplastic film, said film having at least two layers wherein the tensile or rupture strength of the outer surface layer is greater than the bond strength between the outer layer and its adjacent layer comprising:

(a) at least one fold in said film, said fold being adjacent a film edge which forms said opening, said fold providing direct contact between two surface areas of said outer layer;

(b) a seal between said two surface areas, said seal being located between said fold and said film edge and said seal closing said opening; and,



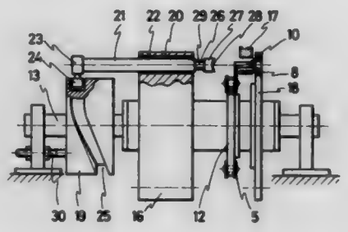
(c) said fold providing a tab which may be pulled to rupture one of said outer layers at said seal and causing said outer layer to delaminate from its adjacent layer to the edge of the film thereby opening said receptacle.

4,638,914

FRUIT SELECTING MACHINE

Juan C. Ollero-Pina, and Antonio Garrido-Diaz, both of Seville, Spain, assignors to Sociedad Anonima de Racionalizacion y Mechanizacion, Seville, Spain

Filed Jan. 16, 1985, Ser. No. 691,931
Claims priority, application Spain, Aug. 10, 1984, 281046[U]
Int. Cl.⁴ B07C *5/07*
U.S. Cl. 209—617 **8 Claims**



1. A machine for sizing an input stream of fruit such as olives into at least two separate output streams, comprising:

an endless conveyor entrained about longitudinally spaced, transversally extending wheel means, including an upstream wheel means and a downstream wheel means, so as to have a carrying run and a return run; said conveyor having a plurality of longitudinally spaced pushers mounted thereto, each such pusher being adapted to accept a single fruit to be sized and to push that fruit along said carrying run;

a hopper associated with said carrying run of said conveyor towards an upstream end of such run, this hopper being adapted to receive a plurality of fruit to be sized; and to supply such fruit individually to said conveyor so that each fruit is pushed by a respective said pusher;

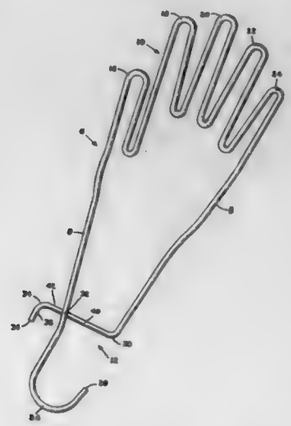
a sizing means associated with said downstream wheel means and adapted to rotate coaxially therewith, this sizing means including a plate means disposed laterally to one side of said endless conveyor, and a drum means disposed laterally to the opposite side of said endless conveyor; a plurality of shank means mounted to said drum means for reciprocal movement towards and away from said plate means; each said shank means being provided with a head which spacedly confronts said plate means; a relatively stationary cam channel-providing member having a cam channel provided therein; each said shank having a cam follower connected therewith and received in said cam channel; said cam channel being configured to have at least two shank head position-controlling segments, in one of which each shank head in succession is brought to a predetermined magnitude of proximity to said plate means as that shank head is rotated together with said downstream wheel means until said downstream wheel means has passed an undersized fruit unloading station located rotationally past top dead center of said drum means, and in a succeeding another one of which each shank head in succession is withdrawn to a position of greater spacing from said plate means as that shank head is rotated together with said downstream wheel means through an oversized fruit unloading station; each said shank head being adapted to be so aligned axially of said wheel with a respective said pusher as to engage, in use, the respective fruit being pushed by that pusher with sufficient compressive force to trap that fruit against said plate means only so long as said cam follower of the respective said shank is disposed in said one shank head position-controlling segment and only if that fruit is at least equal in linear dimension laterally of said conveyor to a predetermined linear dimension, whereby undersized fruit do not become trapped by said shank heads against said plate means and fall from said conveyor at said undersized fruit unloading station, whereas oversized fruit do become so trapped and are conveyed by said conveyor past said undersized fruit unloading station until said shanks are withdrawn and said oversized fruit fall from said conveyor at said oversized fruit unloading station.

4,638,915

GLOVE HOLDER FOR DISH DRAINER

Mitzi Kaplan, 280 Argyle Rd., Brooklyn, N.Y. 11218

Filed Oct. 28, 1985, Ser. No. 791,931
Int. Cl.⁴ A47F *7/00*
U.S. Cl. 211—13 **4 Claims**



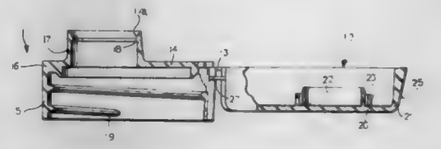
1. A glove holder comprising a unitary member having a first portion configured to receive a rubber glove thereover and a second portion configured for releasable engagement with a wire dish drainer to hold said glove holder selectively in either an upright, glove drying position or an inconspicuous folded down position, said member having five loops in said first portion corresponding with the thumb and fingers of said glove, the thumb loop and the loop for the little finger providing said holder with two extreme loops and said member extending to said second portion from said extreme loops, said second portion including a first open hook formed in the part of said member extending from one of said extreme loops and a second open hook formed in the part of said member extending from the other of said extreme loops, said hooks being located at the ends of said member with said first hook generally facing said first portion and said second hook generally facing away from said first portion, said hooks providing means for releasably engaging therebetween wires of said wire dish drainer to hold said glove holder in said upright, glove drying position and at least one of said hooks providing means to hold releasably a wire of said dish drainer to hold said glove holder in said folded down position.

4,638,916

CLOSURE WITH SNAP-TYPE HINGE CAP

James M. Beck, Carol Stream, and Robert D. Rohr, Elgin, both of Ill., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 12, 1985, Ser. No. 754,796
Int. Cl.⁴ B65D *43/14*
U.S. Cl. 215—235 **8 Claims**



1. A closure with a snap type hinge cap comprising

a first part adapted to interengage with the open neck of a container,

a second part forming a cap and

an integral hinge interconnecting the first and second parts,

each of the first and second parts comprising a base wall and a peripheral skirt,

a pair of hinge straps extending from the skirts on opposite sides of the integral hinge,

the ends of the straps being positioned in recesses in said skirts,

said straps being substantially straight when said first part and second part are in open position,

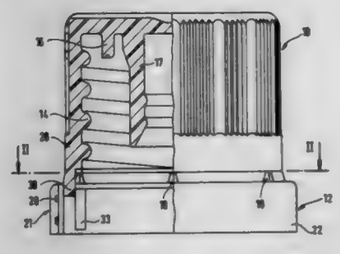
said integral hinge having a flat top surface and an inverted V-shaped bottom surface.

4,638,917

TAMPER PROOF CLOSURE

Alois Persch, Zell, Fed. Rep. of Germany, assignor to Zeller Plastik Koehn, Graebner & Co., Zell, Fed. Rep. of Germany

Filed Dec. 12, 1985, Ser. No. 808,265
Int. Cl.⁴ B65D *41/34*
U.S. Cl. 215—252 **6 Claims**



1. A tamper proof closure for a threaded container mouth having first lock elements thereon, said closure comprising:

(a) a plastic screw cap for sealing said mouth;

(b) a jacket divided into segments defining a ring around said cap for enclosing said mouth in a closed state;

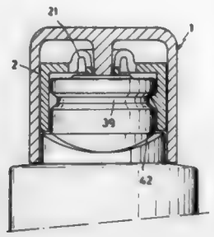
(c) tear-off elements connecting said jacket and cap;

(d) connection strips located between said segments defining predetermined rupture sites;

(e) each of said segments provided with an approximately radially extending inside flange, said flange circumferen-

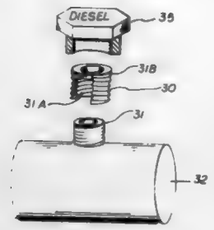
tially shorter than said jacket, said flanges defining apertures between them;
(f) at least one catch on said cap adapted to enter said apertures; and
(g) second lock elements provided inside said ring and cooperating with said first lock elements which facilitate relative rotation of said ring with respect to said mouth during a screwing shut motion but lock when screwing off.

4,638,918
BOTTLE STOPPER
Carlos Marzábal Martínez, Barcelona, Spain, assignor to Antonio Puig, S.A., Barcelona, Spain
Filed Dec. 10, 1985, Ser. No. 807,255
Claims priority, application Spain, Feb. 19, 1985, 540.507
Int. Cl.⁴ B65D *41/18, 41/34*
U.S. Cl. 215—295 **11 Claims**



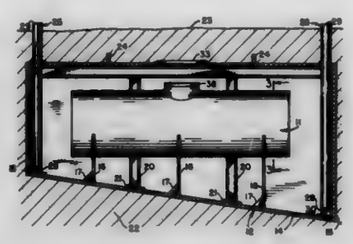
1. A stopper for bottles having a neck and comprising a cup shaped outer body member having a lateral skirt member, a base portion and an axial shank extending from the inner portion of the base portion in the centre thereof; and a resilient inner body member comprising a portion for attachment to the outer body member and a hollow sealing member within which there is inserted said axial shank and which is adapted to be inserted in the neck, characterized in that a plurality of bridges extend between said attachment portion and said hollow member connecting said attachment portion and said hollow member.

4,638,919
VEHICLE FUEL TANK CONSTRUCTION
Robert A. Feenick, 20 Buchanan St., Pearl River, N.Y. 10965
Filed Mar. 31, 1986, Ser. No. 846,275
Int. Cl.⁴ B65D *41/04*
U.S. Cl. 220—288 **5 Claims**



4. A fuel tank construction for use on a vehicle comprising
a body portion defining a reservoir for containing a supply of diesel fuel,
a fuel inlet having an inlet opening connected to said body portion,
said fuel inlet having a thread portion adjacent said inlet opening,
an adapter means forming an extension of said fuel inlet,
said adapter means comprising a tubular member having an internal threaded portion at one end and an external threaded portion at the other end thereof,
said internal threads complementing the threaded portion of said fuel inlet,
and said external threaded portion being left handed threads,
and a cap defining a closure for said adaptor means,
said cap having internal threads complementing said external threads to mate therewith.

4,638,920
UNDERGROUND FACILITY FOR STORAGE OF LIQUIDS
George S. Goodhues, Jr., 106 Homeland Ave., Baltimore, Md. 21212
Filed Jun. 26, 1984, Ser. No. 624,913
Int. Cl.⁴ B65D *25/00*
U.S. Cl. 220—445 **16 Claims**

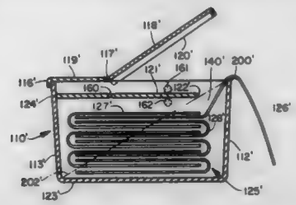


1. An underground facility for the storage of liquids, comprising a fabricated unitary structure adapted to be lowered into the ground as a unit and buried therein, the structure including a substantially rectangular, substantially totally enclosed vault having a top wall, a bottom wall, and four side walls therebetween, the side walls forming respective corners therebetween, a storage tank substantially disposed completely within the vault, the vault and tank having an access clearance therebetween sufficient to accommodate a repair person, spaced means supporting the storage tank within the vault, at least one substantially vertical pipe supported within the vault and disposed substantially adjacent to a respective corner thereof, the pipe having a lower end terminating above the bottom wall, the pipe further having an upper end extending through the top wall and above the ground, the pipe being sufficiently large to suitably accommodate a rod therein, thereby facilitating the detection of leaks from the storage tank into the vault, and the top wall having means therein providing access to the interior of the vault, whereby in situ repairs may be made to the tank, the bottom wall being inclined downwardly with respect to the top wall, wherein the vault has a lowermost portion at one end thereof for accumulation of leakage from the tank, wherein the pipe terminates just above the lowermost portion, and wherein the spaced means supporting the tank within the vault accommodates the relatively unimpeded flow of any leakage from the tank along the inclined bottom wall of the vault to the lowermost portion thereof.

4,638,921
DEVICE FOR DISPENSING INDIVIDUAL SHEETS FROM AN ARRAY OF STACKED SHEETS
Wayne C. Sigl, Neenah, and Elizabeth A. Wolfson, Menasha, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Continuation-in-part of Ser. No. 776,554, Sep. 16, 1985, abandoned. This application Oct. 11, 1985, Ser. No. 786,892
Int. Cl.⁴ A47K *10/20*; B65H *3/00*
U.S. Cl. 221—1 **17 Claims**

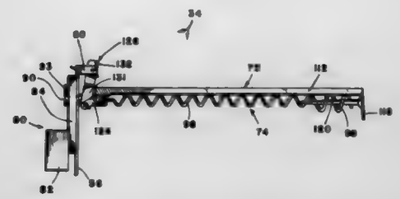
10. A method for sequentially dispensing individual liquid-impregnated sheets from an interfolded array of said sheets

while presenting a next available sheet from said array in a graspable position outside of a container, comprising the steps of:
a. holding said array of sheets in the container;
b. transversely hinging within the container a guide means, which is capable of being moved with reference to a hinge to allow a user to reach an uppermost sheet in the stacked array;
c. withdrawing said sheets from said array along a dispensing direction;
d. contacting a first surface of said sheets with said guide means to direct said sheets along a first curvilinear path which curves in a direction substantially perpendicular to



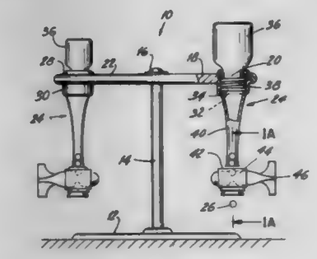
said first sheet surface while maintaining the cross-wise, transverse dimension of said sheets in a substantially linear, straight-line configuration; and
e. contacting an opposite surface of said sheets to direct said sheets along a second curvilinear path, which curves in a curvature direction that is generally opposite to the curvature direction of said first curvilinear path, while maintaining the cross-wise, transverse dimension of said sheets in a substantially linear, straight-line configuration, thereby drawing an overlapping portion between a preceding sheet and a next successive sheet along a generally zig-zag path to induce a separation of the individual sheets and present said successive sheet in said graspable position.

4,638,922
SHAKE COMPENSATED HOLE-PUNCHED PRODUCT VENDING SYSTEM
J. Stephen Stoltz, Conway, Ark., assignor to Stoco Industries, Inc., Conway, Ark.
Filed Jun. 6, 1985, Ser. No. 742,019
Int. Cl.⁴ G07S *11/36*
U.S. Cl. 221—75 **4 Claims**



1. A product vending module for deployment within a coin operated vending machine for selectively dispensing suitable hole punched products, said module comprising:
rigid frame means for operationally mounting said module within said vending machine;
elongated, helical spindle means extending perpendicularly outwardly from said frame means for supporting a plurality of punched products to be vended, said spindle means adapted to be rotated to vend a product, said spindle means comprising convolutions of a first predetermined diameter along a major portion of its length and terminating in integral convolutions of an increased diameter along a lesser portion of its length;
security bar means projecting toward said frame means and interiorly of said increased diameter convolutions of said spindle means for preventing product from moving relative to said convolutions without rotation of said spindle means whereby to prevent an unauthorized vend; and,
elongated cover plate means extending above and generally parallel to said spindle means, said cover plate means comprising:
an elongated generally rectangular main body portion disposed above said spindle means and having a remote end terminating adjacent said increased diameter convolutions of said spindle means;
a bracket portion hinged to said frame and pivotally coupled to said main body portion whereby to secure said cover plate means and to permit selective axial displacement of said main body portion relative to said spindle means;
downwardly turned tab means defined at the remote end of said main body portion upon which said security bar means is mounted and from which said security bar means projects toward said frame generally concentrically interiorly of said increased diameter spindle means convolutions; and,
spring means normally biasing said bracket portion toward said frame means whereby to yieldably urge said security bar means interiorly of said spindle means.

4,638,923
GRAVITY FEEDING PILL MEDICINE DISPENSER
Isaiah H. Mines, Jr., and George Spector, both of 233 Broadway RM 3615, New York, N.Y. 10007
Filed Apr. 8, 1985, Ser. No. 721,222
Int. Cl.⁴ G07F *11/00*
U.S. Cl. 221—132 **1 Claim**



1. A gravity feeding pill dispenser which comprises:
(a) a base plate being weighted for stability;
(b) a vertical shaft mounted to center of said base plate;
(c) a ball bearing rotator mounted to top of said vertical shaft;
(d) a caddy disc having a plurality of apertures around perimeter, said caddy disc rotatably mounted at center to said ball bearing rotator;
(e) means for dispensing pills from each said aperture of said caddy disc, wherein each said dispensing means comprises:
(f) a first resilient gasket for fitting within an aperture in said caddy disc;
(g) an inverted bottle top formed on underside of said caddy disc below said aperture, said bottle top having an opening therethrough;
(h) a push-in pill bottle having a beaded neck for engagement with said first resilient gasket;
(i) a clear feeder tube extending downwardly from said opening of said bottle top;
(j) a second gasket for fitting on bottom end of said feed tube;
(k) a sealed cylinder having a turn key stop cock, said sealed cylinder affixed to said bottom end of said feeder tube

whereby one turn key stop cock dispenses one pill therefrom, wherein said push-in pill bottle further comprises:

(l) a resilient skirt extending downwardly from said neck for engagement to top side of said caddy disc to stabilize said pill bottle and ensure freshness;

(m) a base of said pill bottle having an aperture therethrough; and

(n) a cap having an aperture, said cap rotatably affixed to said base of said pill bottle so that when said aperture of said cap lines up with said aperture of said base, pills can be refilled within said pill bottle without removing said pill bottle from said caddy disc.

4,638,924

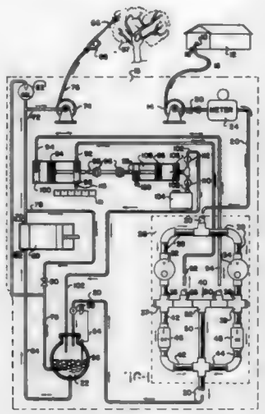
SELF MIXING SPRAYER

Horace R. Newsom, 5514 Cypress Ct., Midland, Tex. 79707

Filed Oct. 24, 1984, Ser. No. 664,234

Int. Cl.[4] G05D *11/03*; F16K *11/07*

U.S. Cl. 222—1 **17 Claims**



1. A process for combining

a. at least one concentrate and

b. water

wherein the improved method for combining the concentrate in a desired mixture proportion with water comprises the steps of:

c. flowing water from a source of water under pressure to a mix tank through one of two control valves;

d. switching one of the two control valves open and the other control valve closed, then

e. operating by the control valves a shuttle device that reverses power fluid connection of the source and the mix tank to each of two power chambers of a set of two proportioning pumps, each pump having two chambers separated by a movable pressure member, with the pressure members operatively connected so that reciprocation of one member reciprocates the other member,

f. fluidly connecting the source of water to one of the power chambers and

g. fluidly connecting the other power chamber to the mix tank, then

h. flowing water from the source of water under pressure to the one power chamber,

i. moving the pressure members of the proportioning pump set a proportioning stroke with water pressure, while

j. decreasing the volume of the other power chamber with the movement of the pressure members and

k. flowing water from the other power chamber to the mix tank,

l. increasing the volume of a concentrate chamber of the proportioning pump chambers with the movement of the pressure members and

m. withdrawing a preselected amount of concentrate from a reservoir fluidly connected to the concentrate chamber, and

n. measuring the amount of water flowed to the mix tank since the last switching step, then

o. switching the other control valve open and the one control valve closed responsive to measuring the flow of a unit amount of water since the last switching step,

p. operating the shuttle device to reverse the power fluid connections,

q. fluidly connecting the source to the other power chamber, and

r. fluidly connecting the one power chamber to the mix tank, then

s. flowing water under pressure from the source to the other power chamber,

t. moving the pressure members of the proportioning pump set a reverse proportioning stroke with the water pressure, while

u. decreasing the volume of the one power chamber with the reverse movement of the pressure members and

v. flowing water from the one power chamber to the mix tank,

w. decreasing the volume of the concentrate chamber with the reverse movement of the pressure members and

x. dispensing the withdrawn concentrate into the mix tank through a fluid connection of the concentrate chamber and the mix tank, and

y. measuring the amount of water flowed to the mix tank since the last switching step, then

z. switching the one control valve open responsive to measuring the flow of a unit amount of water since the last switching step,

aa. repeating the operating step "e." through the switching step "z.",

bb. the preselected amount of concentrate dispensed into the mix tank during each reciprocation of the pressure members being substantially in the same proportion to two of the measured unit amounts of flowed water as the desired mixture proportion,

bb'. measuring the level of mixture in the mix tank, and

bb''. closing both control valves when the level of the mixture in the mix tank reaches a preselected maximum.

4,638,925

APPARATUS FOR VOLUMETRIC METERING AND DISPENSING OR LIQUIDS

Norbert Buchner, Winnenden; Kuno Lemke, Bietigheim-Bissingen, and Günter Vögele, Schönaich, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 2, 1985, Ser. No. 718,969

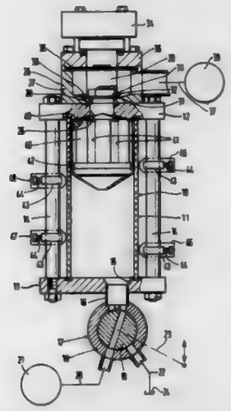
Claims priority, application Fed. Rep. of Germany, May 12, 1984, 3417696

Int. Cl.[4] B67D *5/30*

U.S. Cl. 222—21 **4 Claims**

1. An apparatus for the volumetric metering and dispensing of quantities of liquid, having a jacketed dispensing chamber, a bottom in said chamber provided with a valve-controlled inflow and outflow and a top on said chamber having a vent opening, and a reciprocable float means in said dispensing chamber, further wherein said float means comprises a detectable material thereon which is scannable by a scanning element, further that said apparatus comprises at least two scanning elements disposed at different height locations exteriorly of said jacketed dispensing chamber, one of said scanning elements arranged to cause a controlled retarded inflow and another of said scanning elements arranged to cause or controlled retarded outflow of said liquid, at least one responsive scanning element arranged to control said valve is disposed so

that its height is adjustable outside said jacket of said dispensing chamber, and a controllable throttle device associated with



said vent opening and controllably positioned by at least one of said scanning elements.

4,638,926

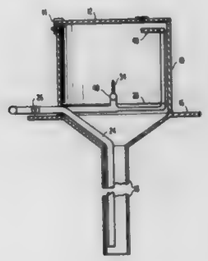
WETTABLE SPRAY BOX

James R. Brock, 1401 N. Rhodes St., No. 405, Arlington, Va. 22209

Filed Oct. 31, 1985, Ser. No. 793,551

Int. Cl.[4] B67B *7/24*

U.S. Cl. 222—82 **6 Claims**



1. A wettable spray box for dispensing wettable agricultural spray powders in a tank of spray equipment so as to protect the operator from exposure to the powders comprising:

a closable and sealable box for attachment to said tank for receiving a bag of wettable spray powder, said box having a base with an opening, said base being mateable with an opening of said tank to provide a direct access from the base opening to the tank;

a fill pipe for connection to a source of water under pressure and extending into said box to supply water to said tank through the base opening of said box;

a stationary knife within said box positioned to slit open a bag of wettable powder when it is inserted into said box, wettable powder from said bag being allowed to fall freely through the base opening of said box into said tank; and

an injector nozzle adjacent a cutting edge of said stationary knife for connection to a source of water under pressure to inject water into an opened bag of wettable powder and expel the powder into said tank.

4,638,927

CONTAINER FOR STORING AND DISPENSING A LIQUID PRODUCT AND AT LEAST ONE ADDITIONAL PRODUCT WHICH ARE TO REMAIN SEPARATED DURING STORAGE

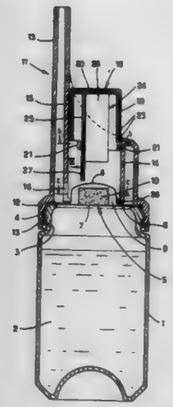
Bruno P. Morsne, Neuilly, France, assignor to L'Oreal, Paris, France

Filed May 8, 1985, Ser. No. 731,875

Claims priority, application France, May 15, 1984, 84 07497

Int. Cl.[4] B65D *25/08*; B67D *5/56*

U.S. Cl. 222—83 **9 Claims**



1. In a storage and dispensing container for a liquid product and at least one other additional product in liquid or powder form, comprising:

(a) a bottle containing said liquid product;

(b) a neck to said bottle, said neck having an end edge;

(c) a cap on said neck;

(d) a dispenser fitting to said cap;

(e) a leakproof envelope having two opposed wall portions and a peripheral flange held on said end edge of the bottle neck and containing said at least one additional product;

(f) perforator means in said cap slidably mounted in relation to the bottle neck and located, during storage of said liquid product and at least one additional product, in a position opposite the leak proof envelope, said perforator being adapted to slide from said position through a distance for it to effect perforation of said two opposed wall portions of the leakproof envelope; the improvement wherein

(g) said cap comprises central duct means enclosing the slidably mounted perforator means and

(h) said dispenser fitting comprises an eccentric duct means or said cap;

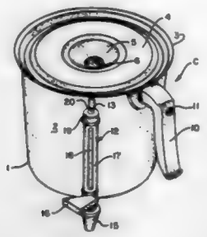
said perforator means having an upper portion with a push button integral therewith, said push button comprising a peripheral skirt surrounding said upper portion of said perforator means and said peripheral skirt being slidable along the internal surface of the central duct means of the cap, said lower portion of said skirt of said push button including gap means allowing the contents of the bottle to pass in a substantially radial direction towards the eccentric duct means for dispensing, after said perforator means has been depressed and said leakproof envelope has been perforated.

4,638,928

HOT BEVERAGE CONTAINER

Joseph P. Webster, St. Charles County, Mo., assignor to Newco Enterprises, Inc., St. Charles, Mo.

Filed May 29, 1984, Ser. No. 614,538
Int. Cl.[4] B67D *5/38*
U.S. Cl. 222—155 **7 Claims**



1. In a hot beverage container for use in conjunction with a heater and of the type incorporating a vessel normally having side walls and for holding a supply of brewed beverage for dispensing and consumption, incorporating a handle for ease of handling, and having a lid for retaining heat and moisture, the improvement which comprises, said container having an integral bottom useful for resting upon a warmer, said bottom being recessed in shape to stimulate the retention of uniformly maintained heat proximate said formed bottom while preventing the buildup of excessive heat that otherwise induces beverage scalding during its heat maintenance, said container bottom including an integral rim formed peripherally of the container and aligned with its side walls, and extending downwardly of its formed bottom, said container bottom and rim providing a pocket inwardly thereof for sustaining uniform heat retention, said container having an integral and continuous upstanding sidewall, a gauge means mounting to the container upon its sidewall, said gauge means including connector tubes securing to proximate the upper and lower edges of the container, and at least the lower connector tube opening through to the interior of the container thereof, a support tube interconnecting approximately vertically between the connector tubes, said support tube having a cut-out portion formed therethrough, and a transparent tube provided within the support tube and forming a fluid tight seal with either of the support or connector tubes, and providing a viewing of the beverage level sustained within the container, said gauge means including a vent opening therein, said vent opening being above the lowermost level of the container lid, and the lower connecting tube extending further outwardly thereof of the support tube and incorporating a tap thereon for dispensing beverage therefrom.

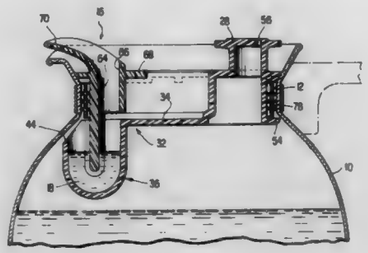
4,638,929

INJECTION MOLDED, SELF SEALING TOP ASSEMBLY FOR OPEN MOUTH COFFEE POTS

Wayne B. Stone, Jr., Bethesda, Md., assignor to Wood Manufacturing Co., Inc., Flippin, Ark.

Continuation-in-part of Ser. No. 532,980, Sep. 16, 1983. This application Apr. 10, 1984, Ser. No. 598,767
Int. Cl.[4] G01F *11/26*
U.S. Cl. 222—456 **2 Claims**

1. A top assembly for an open mouth coffee pot through which coffee is introduced from the exterior of a pot to the interior thereof and subsequently dispensed from the interior of a pot externally thereof; said top assembly having liquid flow passage means extending therethrough; said flow passage means including a liquid trap for retaining a volume of coffee therein following the introduction of coffee therethrough into a coffee pot and for retaining a volume of coffee therein following the dispensing of coffee therethrough from a coffee pot; said top assembly including two injection molded parts; the first of said parts having a bottom wall comprising a floor and a liquid holding well continuous therewith, in gravity flow relation, along a first peripheral portion of the well bounding wall; a second peripheral portion of said well bounding wall terminating below the level of said floor to define an overflow weir for liquid flowing from said floor into said well; the second of said parts being interfitted with said first part to define said liquid trap; said second part including a divider wall bridging said well and separating said first and second peripheral portions of said well bounding wall; said divider wall extending from a level above the floor of said first part down into said well and terminating below the level of said floor and above the bottom of said well whereby liquid will gravity flow from said floor across said first peripheral portion of the well bounding wall, down to the bottom of the well, beneath the lower end of the divider wall and across the overflow weir; seal means for sealing said top assembly with respect to the open mouth of a coffee pot; and restricted vent means opening on opposite sides of said seal means.

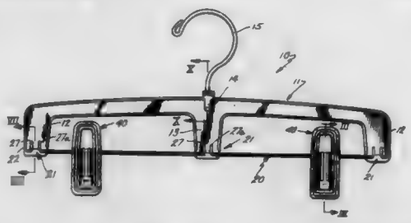


4,638,930

HANGER LEG MOUNTING STRUCTURE FOR A SUPPORT ROD

Russell O. Blanchard, Zeeland, Mich., assignor to Batts, Inc., Zeeland, Mich.

Filed Oct. 23, 1985, Ser. No. 790,492
Int. Cl.[4] A41D *27/22*
U.S. Cl. 223—85 **6 Claims**



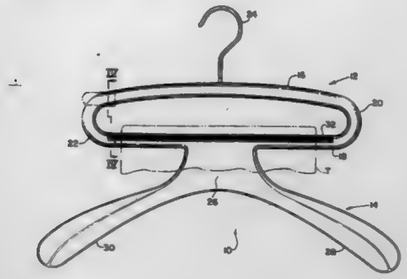
1. A hanger for articles, said hanger having a rigid elongated body, the ends of said body extending downwardly to form a pair of depending legs; a rod extending between the lower ends of said legs; each of said legs having a rod receiving pocket, said pocket having a laterally extending opening, an upstanding lip forming the bottom edge of said opening and defining one wall of a rod seat in said pocket, a resilient depending tongue forming the top of said pocket and spaced froms aid edge of said lip a distance less than the cross section of said rod whereby said tongue has to be deflected to pass said rod through said opening into said rod seat, and upon location of the rod in said seat return of said tongue to its normal position locks the rod against unintentional release from its sear; a finger projecting from the bottom end of said tongue away from said opening, the lower face of said finger being inclined upwardly away from said opening to provide a wedging effect biasing the rod away from said opening.

4,638,931

COMBINATION GARMENT HANGER

Robert L. Rieser, 4 E. High Rd., Port Washington, N.Y. 11050

Filed Feb. 18, 1986, Ser. No. 830,204
Int. Cl.[4] A47G *25/18*
U.S. Cl. 223—88 **4 Claims**



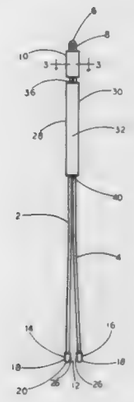
1. A combination suit hanger comprising an oblong planar frame having an upper bar provided with means for suspending said hanger from a support, a horizontally disposed lower bar over which a pair of trousers can be positioned and a pair of U-shaped end sections connecting the respective ends of said upper and lower bars, and an arched shoulder support depending fixedly from said lower bar substantially in the plane of said frame over which a jacket can be draped, one of said U-shaped end sections having its legs integrally formed with the upper and lower bars, the other of said U-shaped end sections having one leg pivotally journaled to one of said upper and lower bars permitting the other leg to swing between a first position in alignment with the other bar within the plane of said oblong frame to close said frame and a second position removed from alignment with said other bar to form a space in said oblong frame permitting the lateral insertion of said trousers into said oblong frame for positioning on said lower bar.

4,638,932

COMBINATION TOOL TO PULL UP AND REMOVE SOCKS, SHORTS AND TROUSERS

Henry C. Keller, 930 E. Lake St., Aurora, Ill. 60506

Filed Dec. 4, 1984, Ser. No. 677,963
Int. Cl.[4] A47G *25/80*
U.S. Cl. 223—111 **6 Claims**



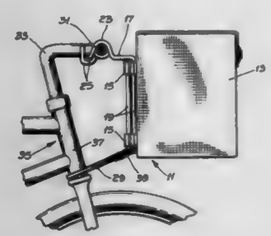
1. A tool to help in putting on and removing an article of clothing comprising elongated extension means to enable a user to reach beyond the end of his toes therewith without bending, said elongated extension means comprising a pair of elongated arms of circular cross section disposed in a side by side flexible, spring-like relationship and where one of said arms diverge slightly from the other, said elongated arms are at least 20 inches in length and are integrally joined at one end in a U-bend, jaw means at the other end of said elongated arms, said jaw means are adapted to receive and grasp a single edge portion of an article of clothing, said jaw means being movable between a jaws open position and a jaws closed position, handle means attached to said integral end of said elongated arms, said extension means further comprises operating means to manually operate said jaws means between said jaws open position and said jaws closed position, said operating means comprising and elongated rigid cylindrical member having an elongated cylindrical bore therein adapted to surround said elongated arms, said operating means being manually movable between a first position where the jaws are in the said open position and a second position where the jaws are in the said closed position, and wherein said operating means is adapted to move said jaw means into tighter gripping engagement the further said operating means is manually moved in the jaws closing direction, said jaw means having a first and second gripping means, each of said gripping means comprising a pad of resilient cushioning material, said resilient cushioning material comprising a body member having a top wall, bottom wall, broad side surfaces, a recess in said top wall to receive one of said elongated arms and a tapered portion converging toward said bottom wall.

4,638,933

PORTABLE FRONT BIKE PACK ASSEMBLY

Richard Boufford, 1983 Westminster, Costa Mesa, Calif. 92627, assignor to Richard Boufford, Newport Beach, Calif.

Filed May 28, 1985, Ser. No. 737,790
Int. Cl.[4] B67J *7/00*
U.S. Cl. 224—41 **14 Claims**



1. Front pack and support assembly for detachable connection to the gooseneck and handlebar intersection of a bicycle frame comprising:

(a) a pack having support engaging members mounted on an outer surface thereof; and

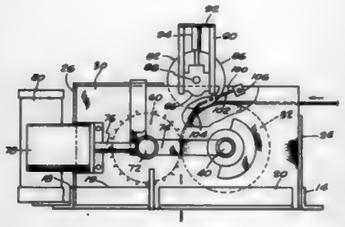
(b) a pair of independently rotatable rigid pack supports, each of said pack supports having first portions adapted to rotatably engage said pack support engaging members and second portions adapted for overlapping engagement about the gooseneck and handlebar intersection of a bicycle, each of said second portions being independently rotatable between a first position along the surface of the pack and a second position wherein said second portions extend from the surface of the pack for engagement about the gooseneck and handlebar intersection of the bicycle.

4,638,934

SLITTING AND DICING MACHINE FOR FIBERGLASS MAT AND MATS OF OTHER BRITTLE ABRASIVE FIBERS

Jerry Fram, 13231 Louvre St., Arleta, Calif. 91331

Filed Oct. 2, 1984, Ser. No. 656,863
Int. Cl.[4] B26F *3/00*
U.S. Cl. 225—97 7 Claims



1. Apparatus for slitting matting of brittle fiber material, comprising:

a frame;

a generally cylindrical anvil roller rotatably mounted on the frame, the outer cylindrical surface of the anvil roller having its outer cylindrical surface substantially covered with an elastomeric material;

a generally cylindrical cutter roller rotatably mounted on the frame;

a plurality of cutting blades disposed lengthwise on an outer surface of the cutter roller, the cutter roller being mounted with respect to the anvil roller such that the cutting blades deform the elastomeric surface of the anvil roller sufficiently to cut brittle fiber material by breaking the fibers;

a slicing roller including a plurality of spaced-apart cutting discs rotatably mounted on an axis parallel to the axis of the anvil roller and disposed with respect to the anvil roller such that the cutting discs on the slicing roller deform the elastomeric material on the anvil roller sufficiently to cut brittle fiber material by breaking the fibers;

a plurality of feed fingers resiliently mounted adjacent the anvil roller, each feed finger extending between adjacent cutting discs extending from the slicing roller, each feed finger having a distal end bent in the direction of the line of contact of the anvil roller and the cutter roller;

means for spring biasing the feed fingers toward the anvil roller; and

a feed path through which the mats of brittle fiber material are fed, first between the slicer roller and the anvil roller and, second, between the cutter roller and the anvil roller.

4,638,935

PAPER FEED TRACTOR WITH BELT TENSIONING

Wald, Robert D., Harwinton, Conn., assignor to Data Motion, Incorporated, Torrington, Conn.

Filed Sep. 10, 1982, Ser. No. 416,859
Int. Cl.[4] B65H *20/22*
U.S. Cl. 226—171 18 Claims

1. In a drive tractor for web material adapted to be mounted on a printer or the like, the combination comprising:

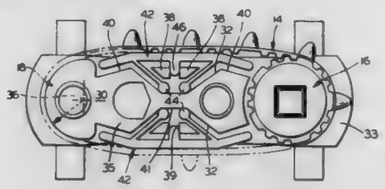
A. a chassis having a pair of spaced transversely extending apertures therein for receiving a pair of shafts of an associated printer or like device, at least one of said apertures being adjacent an end thereof;

B. a flexible endless one-piece belt extending about said chassis in a plane generally perpendicular to the axes of said apertures, said belt defining a closed path of travel thereabout and having an outer driving surface adapted to engage the associated web material and an inner driven surface;

C. a pulley rotatably mounted in said one chassis aperture and in engagement with said driven surface of said belt, said pulley having an aperture therethrough for receiving a drive shaft of an associated printer to effect rotation of said pulley and thereby said belt, the other of said apertures being adapted to receive a support shaft of the associated printer;

D. convexly arcuate belt support means adjacent the end of said chassis spaced from said drive pulley, said belt extending about said support means and pulley and extending in a web drive path therebetween;

E. guide means mounted for reciprocal movement on said chassis between a closed position overlying said web drive path and an open position; and



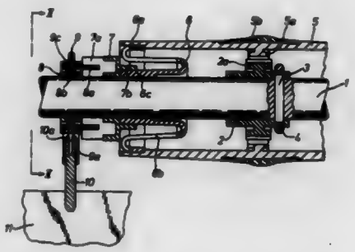
F. belt tensioning means movably supported on said chassis below said belt in the area of said web drive path for resilient deflection in a direction normal thereto, said belt tensioning means being integrally formed with a support plate portion elongated in the direction of said web drive path and having a portion of the length of its upper surface extending parallel to the plane of said web drive path, said surface portion bearing on the lower surface of said belt, said belt tensioning means also including at least one resiliently deflectable leg portion depending therefrom and slidably seated in a cooperating recess in said chassis, said deflectable leg portions normally urging said support plate portion against said belt and thereby said belt against said guide means.

4,638,936

APPARATUS FOR TREATMENT OF WEBS OF PHOTOGRAPHIC MATERIAL

Wolfgang Viehrig; Karl-Heinz Wagner, both of Munich, and Erwin Laar, Valley, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 11, 1984, Ser. No. 618,965
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1983, 3321048
Int. Cl.[4] B65H *20/02, 23/14*
U.S. Cl. 226—191 19 Claims



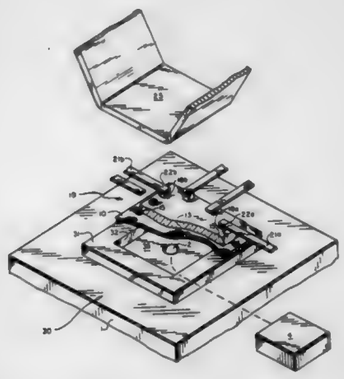
1. In an apparatus for wet treatment of running webs of photographic paper or the like, a driven shaft; a hollow roller normally coaxially surrounding said shaft and having a peripheral surface engageable by a running web; bearing means for radially movably mounting said roller and arranged to offer a predetermined resistance to radial movement relative to said shaft but to yield when the tension of the running web which contacts the peripheral surface of the roller reaches a preselected value; coupling means engageable to transmit torque from said shaft to said roller in response to radial movement of the roller; and means for braking said roller, including a first braking member arranged to share the rotary movements of said roller and having an annular external surface with a diameter smaller than the diameter of said peripheral surface, a second braking member having an internal surface in frictional engagement with said external surface, and means for preventing rotation of said second braking member so that the first braking member rotates with the roller and relative to said second braking member in response to engagement of said coupling means, said first braking member comprising a first ring which is rotatably mounted on said shaft, and said second braking member including an elastic split ring which surrounds said first ring in prestressed condition so that its internal surface bears against the external surface of said first ring, the internal surface of said split ring bearing against the external surface of said first ring due solely to the elasticity of said split ring, and said split ring having a portion which extends substantially radially outwardly from said first ring and constitutes part of said rotation preventing means, said rotation preventing means further including stop means in abutment with said portion of said split ring.

4,638,937

BEAM LEAD BONDING APPARATUS

Thomas D. Belanger, Jr., Clarendon Hills, Ill., assignor to GTE Communication Systems Corporation, Northlake, Ill.

Continuation-in-part of Ser. No. 725,606, Apr. 22, 1985, abandoned. This application Aug. 2, 1985, Ser. No. 761,721
Int. Cl.[4] B23K *37/00*
U.S. Cl. 228—5.5 8 Claims



1. A bonding apparatus for bonding a plurality of beam leads each including a bonding end randomly varying in thickness, said bonding ends positioned in relation to other ones of said beam lead bonding ends and positioned to engage a different one of a corresponding plurality of bonding bumps formed on a first side of a substrate, each of said bumps randomly varying in height, said substrate subject to cracking when subjected to a predetermined bonding force and further including a second side, said apparatus comprising:

a bonding element positioned to simultaneously engage said beam lead bonding ends and adapted to apply at least a bonding force to said ends;

a base including a support surface positioned proximate to said substrate second side and adapted to support said substrate;

a compliant pad positioned on said base support surface, said pad compressing in response to the application of bonding force by said bonding element to prevent said bonding ends and bonding bumps from exerting said predetermined bonding force on said substrate and

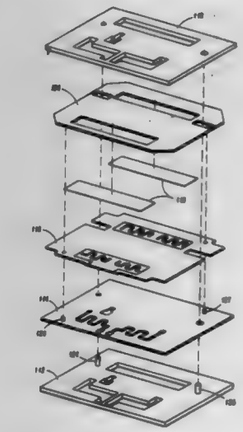
a protective layer positioned on said pad, wherein said protective layer has an upper surface for directly supporting said substrate and is resistant to laceration by a sharp edge of said substrate and thus protects said pad from laceration.

4,638,938

VAPOR PHASE BONDING FOR RF MICROSTRIP LINE CIRCUITS

Andrew J. Yarne, and Eldon F. Burr, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 648,837, Sep. 7, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 882,215
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—180.1 3 Claims



1. A method of forming a stripline circuit assembly comprising the steps of:

a. providing a clamping fixture with at least one vent therein;

b. clamping a workpiece chassis member to a stripline circuit with a solder material therebetween utilizing said clamping fixture; and

c. vapor phase soldering said clamped workpiece chassis member, stripline circuit, and solder, said at least one vent allowing vapor phase soldering gas access to said circuit whereby a high integrity groundplane conduction characteristic is formed.

3. A method of forming a stripline circuit assembly comprising:

a. providing a clamping fixture having a workpiece chassis member and a defined relief clearance area with at least one vent therein;

b. providing a printed circuit board having first and second sides;

c. providing at least one solder form,

d. positioning said first side of said printed circuit board in said defined relief clearance area of said clamping fixture;

e. clamping said printed circuit board to said workpiece chassis member of said clamping fixture with said soldering form therebetween;

f. vapor phase soldering said printed circuit board, said workpiece chassis member, and said solder form; and

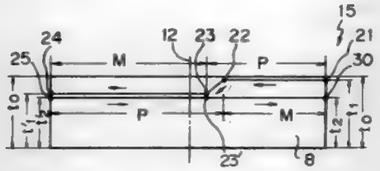
g. allowing access to said first side of said printed circuit board through said vent.

4,638,939

METHOD FOR PRODUCING A CLAD PLATE BY ROLLING

Seishiro Yoshiwara, and Takao Kawasami, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 1, 1984, Ser. No. 616,168
Claims priority, application Japan, Jun. 4, 1983, 58-99988; Jun. 25, 1983, 58-113624; Jun. 25, 1983, 58-113625
Int. Cl.⁴ B23K *31/02*
U.S. Cl. 228—186 **6 Claims**



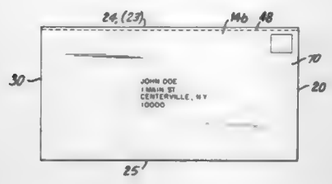
1. A method for producing a clad plate by means of hot rolling a cladding assembly having a first welded end and a second welded end and comprising a cladding material and a base material to bond the cladding material with the base material, characterized in that said bonding is effected by main rolling by at least two driven rolls spaced apart at a selected distance, which main rolling is initiated at an essentially central portion of a predetermined bonding surface of the cladding assembly and is advanced toward the first end of the cladding assembly.

4,638,940

COMBINED FORM FOR VISUAL MATTER, WRITTEN DESCRIPTIONS AND MAILING ENVELOPES

Peter G. Skokos, 902 Fletcher Lake, Bradley Beach, N.J. 07720, and Alvin A. Sobel, 577 Paramus Rd., Paramus, N.J. 07652

Filed Feb. 23, 1983, Ser. No. 469,001
Int. Cl.⁴ B65D *27/04, 27/06*
U.S. Cl. 229—92.3 **6 Claims**



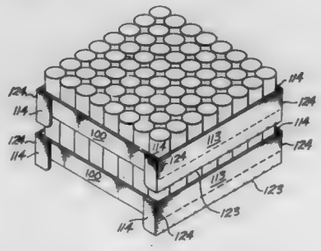
1. A business form comprising a single sheet utilizing both surfaces of said sheet and divided essentially into a first panel, a second panel and a third panel, whereby said form could be folded to form a first and a second envelope; said first panel on one surface providing a means for securing visual matter such as photographs or diagrams so that the visual matter would be visible after being secured and on the other surface an envelope face; said second panel on both surfaces providing a space for written descriptions and the third panel on one surface providing a space for written matter and on the other surface an envelope face, wherein said first panel is generally equal in width to the second and third panels and having a front and rear surface, bounded by a top, bottom, free edge and a fold line, said first panel having attached to one surface a see-through plastic sheet equal in dimension to said first panel, said first panel including adhesive strips placed along its four edges and apprxoimately in the middle of said first panel said plastic sheet being attached to the first panel along all adhesive strips except the strip which extends along the free edge to form two compartments which are open along the free edge the adhesive strip on the free-edge of said first panel being covered by a plastic overlay, said plastic overlay preventing adhesion of the see-through plastic sheet on the free edge thereby permitting insertion of visual matter through said free edge, and subsequent removal of said plastic overlay from said adhesive strip on said free edge would permit adhesion of said see-through plastic surface to said sheet forming an enclosed compartment to contain said visual matter, said rear surface being the face of an envelope.

4,638,941

SHIPPING AND DISPLAY CONTAINER

Robert L. Watson, Mt. Vernon, Ohio, assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Aug. 28, 1985, Ser. No. 770,825
Int. Cl.⁴ B65D *5/22*
U.S. Cl. 229—104 **3 Claims**



1. A shipping and display container comprising;
a base with four linear edges,
a first pair of opposing walls extending from opposing edges of said base to lie below and perpendicular to said base, each of said first pair of opposing walls having a lower edge parallel to said edge of said base,
a second pair of opposing walls extending from remaining opposing edges of said base to lie above and perpendicular to said base, each of said second pair of opposing walls having an upper edge parallel to said edge of said base,
each of said walls extending the entire length of said associated edge of said base,
a panel extending from the entire length of said lower edge of each of said first pair of opposing walls and extending above said base, said panel having an upper edge parallel to said lower edge of said first pair of opposing walls,
means for joining said panels to said second pair of opposing walls, said means comprising a substantially rectangular flap extending from each of the vertical edges of said panels, said flaps being contiguous with an adjacent wall wherein said flaps are joined to said adjacent walls, said flaps extending below said base, whereby said base may act as a base for contents contained therein, and as a cover for contents contained in a second similar container disposed thereunder and said panels and said second pair of opposing walls may surround said contents contained therein and said first pair of opposing walls and said flaps may surround said similar contents contained thereunder.

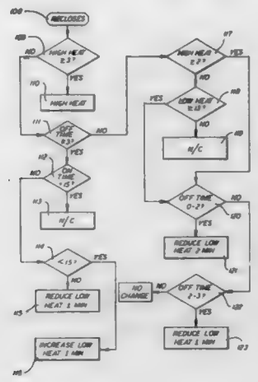
4,638,942

ADAPTIVE MICROPROCESSOR CONTROL SYSTEM AND METHOD FOR PROVIDING HIGH AND LOW HEATING MODES IN A FURNACE

Gary W. Ballard, Indianapolis, and Robert M. Mamot, Plainfield, both of Ind., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 2, 1985, Ser. No. 803,374
Int. Cl.⁴ F24D *5/00*
U.S. Cl. 236—10 **18 Claims**

1. A method for selectively providing a low heat mode and a high heat mode of a heating cycle in a furnace as a function of a previous heating cycle, comprising the steps of:
storing a previous time period of operation of a low heat mode and a previous time period of operation of a high heat mode of a previous heating cycle,
determining the existence of a heating load to be satisfied,



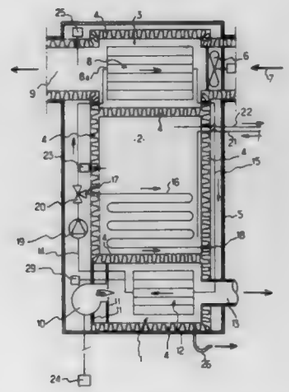
recalling the stored time period of the previous high heat mode,
providing a low heat mode for a selected first time period dependent upon the stored time period of the previous high heat mode, and
terminating the low heat mode if the heating load is satisfied during the selected first time period.

4,638,943

METHOD OF HEATING ANY BUILDING OR ROOM AND APPARATUS FOR CARRYING OUT THE SAID METHOD

Yves Casier, Ermont; Philippe Cassagne, Paris; Bernard Dore, and Sylvain Gicquel, both of Saint Denis, all of France, assignors to Gaz de France, France

Filed Jul. 18, 1985, Ser. No. 756,455
Claims priority, application France, Jul. 25, 1984, 84 11818
Int. Cl.⁴ F24H *3/06*
U.S. Cl. 237—7 **3 Claims**



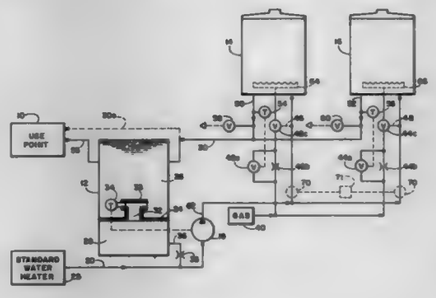
1. An apparatus for heating a space comprising in combination:
a hot air generator comprising at least one water-air exchanger with high thermal inertia and at least one fan associated with said exchanger for blowing air therethrough into the space to be heated;
a hot water generator comprising a burner and a second exchanger for heat exchange between the water and the combustion products of said burner;
a feed water line and a return water line respectively connecting said second exchanger to said water-air exchanger;
a tank for sanitary hot water;
a circuit extending through said tank for reheating the hot water stored therein, siad circuit communicating, on the one hand, with said feed water line, and, on the other hand, with said return water line; and
an electrovalve provided on said feed line to allow communication of the same with either said reheating circuit or with said water-air exchanger;
wherein said hot air generator, said storage tank, and said hot water generator are arranged in three heat-insulated tiers combined into a single unit.

4,638,944

COMPACT HIGH VOLUME POINT OF USE INSTANTANEOUS WATER HEATING SYSTEM

Stephen M. Kujawa, 90472 Sheffler Rd., Elmira, Oreg. 97437, and Melvin H. Simon, Box 529, Cottage Grove, Oreg. 97424

Filed Apr. 21, 1986, Ser. No. 853,858
Int. Cl.⁴ F24D *3/00*
U.S. Cl. 237—8 R **10 Claims**



1. A fluid heating system comprising:
(a) a fluid source;
(b) a use point for intermittently demanding fluid from said fluid source;
(c) respective first and second instantaneous heater means interposed operatively between said fluid source and said use point for heating fluid from said fluid source substantially instantaneously and delivering it substantially immediately after heating to said use point during periods of demand, each of said heater means having a respective control means for automatically varying the heating performed by the respective heater means in accordance with a respective duty cycle; and
(d) means for causing said control means to operate said first and second heater means at respective duty cycles substantially asynchronous with respect to each other.

4,638,945

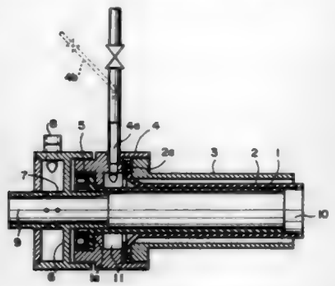
NOZZLE FOR THE GUNNING OF MONOLITHIC REFRACTORIES

Masumi Toda; Yukio Ozaki, and Shingo Nonaka, all of Okayama, Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1985, Ser. No. 753,227
Claims priority, application Japan, Sep. 1, 1984, 59-132059[U]
Int. Cl.⁴ B05B *9/00*
U.S. Cl. 239—143 **1 Claim**

1. In a nozzle for the gunnning of a monolithic refractory, said nozzle comprising means for admixing a gunning material with a liquid and tube means for conveying the admixed liquid

and gunning material through said nozzle to a nozzle outlet, the improvement wherein said tube means comprises a tubular protecting pipe, a flexible outer tube mounted within said protecting pipe, and a flexible inner tube mounted within and substantially coextensive with said flexible outer tube, the outside diameter of said flexible inner tube being as large or slightly larger than as the inside diameter of said outer tube, said flexible outer and inner tubes each being fixed at their ends



disposed towards said admixing means and being free at their opposite ends disposed towards said nozzle outlet, and wherein said nozzle further comprises means for introducing a fluid under pressure between said inner and outer flexible tubes at a location near the ends of the flexible tubes disposed towards said admixing means whereby, in use, the introduced fluid flows between said inner and outer flexible tubes towards the free end thereof to cause said inner and outer tubes to vibrate radially and axially.

4,638,946

VARIABLE CONFIGURATION EXHAUST DISCHARGE OPENING FOR A JET PROPULSION ENGINE

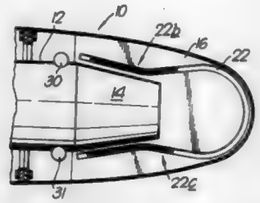
John M. Hall, Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed Sep. 24, 1979, Ser. No. 78,053

Claims priority, application United Kingdom, Oct. 2, 1978, 38936/78

Int. Cl.⁴ F02K *1/09*

U.S. Cl. 239—265.33 **5 Claims**



1. Apparatus for varying the configuration of the final exhaust discharge opening of a gas turbine jet propulsion engine comprising, a jet pipe at the downstream end of the engine and having a rectangular exhaust gas outlet therefrom, track means associated with the downstream end of the engine on both sides of the exhaust gas outlet and extending downstream beyond the exhaust gas outlet, the track means are generally U-shaped and have portions extending above and below the exhaust gas outlet from the jet pipe, said portions being interconnected by a curved portion downstream of the exhaust gas outlet, two flexible deflectors extending between the track means and defining with the exhaust gas outlet a final discharge opening for the engine exhaust gases, one of said deflectors is positioned on top and the other of said deflectors is positioned beneath the exhaust gas outlet from the jet pipe, means for engaging each deflector with the track means on both sides of the exhaust gas outlet and means for moving each deflector along the track means whereby it may be selectively positioned in or out of the exhaust gases leaving the outlet to vary the configuration of the final discharge opening.

4,638,947

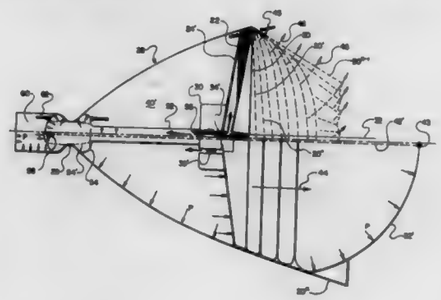
PNEUMATIC BAG DEPLOYMENT OF FOLDED NOZZLE EXTENSIONS

Vance W. Jaqua, Canoga Park, and Premysl Jencek, Chatsworth, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 30, 1985, Ser. No. 781,840

Int. Cl.⁴ F02K *1/08*

U.S. Cl. 239—265.43 **10 Claims**



1. An apparatus for deploying and forming a rocket engine nozzle extension prior to the rocket engine being fired, wherein said nozzle extension is attached to the end of a fixed nozzle and is turned inwardly toward the central axis of said fixed nozzle and folded along pleats so that prior to it being extended said nozzle extension is in a stowed configuration inside said fixed nozzle, comprising:

an inflatable bag within said fixed nozzle wherein prior to the rocket engine being fired said bag is inflated, concurrently unfolding said nozzle extension and pushing said nozzle extension rearwardly away from said fixed nozzle;

means for inflating said inflatable bag; and

means for jettisoning said inflatable bag.

4,638,948

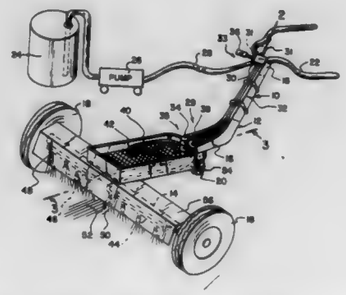
LIQUID CHEMICAL APPLICATOR FOR TREATMENT OF A HORIZONTAL SURFACE

Edward Marlek, 8 Northfield Dr., Ft. Salonga, N.Y. 11768

Filed Feb. 10, 1986, Ser. No. 827,941

Int. Cl.⁴ B05B *15/04, 15/06*

U.S. Cl. 239—722 **4 Claims**



1. A liquid chemical applicator for treatment of a horizontal surface which comprises:

(a) a pair of front wheels;

(b) a frame having an axle, an extension arm and a control handle, said axle extending between said front wheels, said extension arm rearwardly projecting transversely from center of said axle bending upwardly therefrom with, said control handle at distal end of said extension arm;

(c) a rear wheen rotatably connected to bottom of said extension arm rearwardly of said front wheels whereby said rear wheel is manually steered by an operator holding onto said control handle;

(d) means for applying a uniform coating of said liquid chemical onto said horizontal surface from said applicator which is controlled by said operator, said applying means including a drum for holding said liquid chemical therein and a pump fluidly connected to said drum for removing said liquid chemical from said drum and bringing said liquid chemical to said applicator at a desired pressure and means for directing flow of said liquid chemical through said applicator and a pair of manifolds mounted along said axle each of said manifolds having a plurality of spray nozzles and means for controlling pressure of said liquid chemical fluidly connected between said directing means and said spray nozzles of said manifolds so that said spray nozzles will apply a plurality of overlapping sprays of said liquid chemical at a constant height a constant pressure and a proper angle onto said horizonal surface;

(e) a storage basket mounted to top of said extension arm between said front wheels and said rear wheel; and

(f) a wind shield mounted onto said axle over said manifolds to help keep spray pattern constant and prevent said liquid chemical from blowing away.

4,638,949

DEVICE FOR SPRAYING PRODUCTS, MORE ESPECIALLY, PAINTS

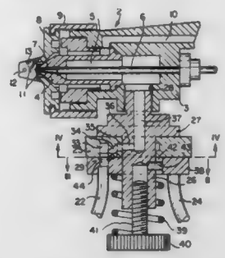
Patrick J. Mancel, 3 rue Lamartine, 78500 Sartrouville, France

Filed Apr. 26, 1984, Ser. No. 603,662

Claims priority, application France, Apr. 27, 1983, 83 06968

Int. Cl.⁴ B05B *7/26*

U.S. Cl. 239—307 **3 Claims**



1. A device for spraying a fluid mixture of one or more fluid components, said device comprising:

spray nozzle means comprising (a) a chamber for containing said mixture and (b) an aperture through which said mixture can be sprayed from said device;

a plurality of reservoirs, each for containing a corresponding one of said components;

a plurality of duct means for respectively connecting said plurality of reservoirs to said chamber;

regulating means connected to said duct means between each of said reservoirs and said chamber for selecting the relative amounts of said components provided from said reservoirs through said duct means to said chamber, said regulating means comprising a regulating element mounted for rotation about a rotation axis and including a surface disposed transversely to said axis, said surface having an arcuate-shaped recess extending at least partially around and radially spaced from said axis and adapted to communicate with at least one of said duct means, said recess being flush with said surface at the opposite ends of said recess and of a maximum depth at the middle part of said recess so that the depth of said recess varies such that rotation of said regulating element varies the amount of at least one of said components relative to at least one other of said components provided from the corresponding reservoirs through said recess and at least two of said duct means to said chamber wherein the arcuate length of said recess is such that positioning said regulating element so that one of said duct means communicates with said middle part of said recess, closes the other of said duct means;

needle valve means including a needle disposed in said nozzle means and movable between a first position wherein said needle blocks said aperture and thereby isolates said chamber from said aperture, and a second position wherein said needle is spaced from said aperture so that said chamber is open to said aperture; and

means for coupling said device to a source of pressurized gas so as to propel said mixture from said chamber to said aperture when said needle is disposed in said second position.

4,638,950

APPARATUS FOR APPLYING LIQUID FOR A ROLLING MILL

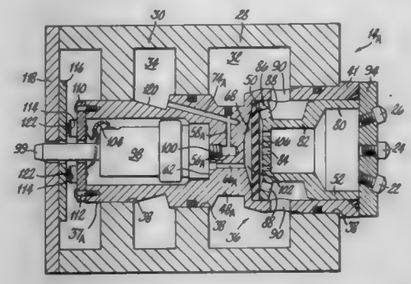
Christopher D. Collinson, and Hugh M. Ross, both of Poole, England, assignors to Davy McKee (Poole) Limited, Dorset, England

Filed Nov. 5, 1984, Ser. No. 668,485

Claims priority, application United Kingdom, Feb. 20, 1984, 8404387

Int. Cl.⁴ B05B *1/14*

U.S. Cl. 239—551 **6 Claims**



1. An apparatus for applying liquid for cooling and/or lubricating in a rolling mill comprising:

an elongate bar having a first manifold extending in the direction of its length and connected to a supply of liquid to be applied;

a multiplicity of spray units having associated spray nozzles, each spray unit being supported by the bar and each spray unit having a fluid connection with the first manifold;

each fluid connection having a valve associated therewith whereby the supply of liquid to the spray units can be controlled;

each valve having a diaphragm capable of closing with a first side the fluid connection between the first manifold and the spray unit;

said elongate bar having a second manifold extending in the direction of the length of the bar, and a source of control fluid under pressure connected to the second manifold;

for each valve, a second fluid connection between the second manifold and the other side of the diaphragm in the valve; and

each of said second connections having a respective solenoid operated fluid valve therein to control the flow of control

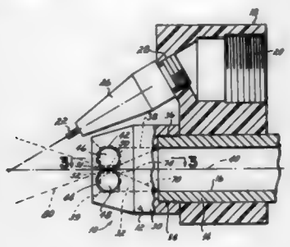
fluid from the second manifold, through said second connection to said other side of the diaphragm of the valve.

4,638,951

ADJUSTABLE POWDER SPRAY NOZZLE

Alexander Gabriel, Northfield, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed May 9, 1985, Ser. No. 732,381
Int. Cl.⁴ B05B *1/32, 5/00*
U.S. Cl. 239—707 **8 Claims**



1. An adjustable pattern powder spray nozzle assembly for spraying variable patterns of solid particulate powder material from said assembly of solid particulate powder material from said assembly comprising,

a nozzle body having an axial powder flow passage therein,

a pair of parallel, transverse bores in said body, said transverse bores intersecting said powder flow passage,

a pair of rotatable shafts, one of said rotatable shafts being mounted in each of said transverse bores, said shafts being positioned adjacently one another,

a longitudinally extending slot formed in the periphery of each of said shafts, said slots of said shafts being oppositely positioned so as to form a combined powder flow opening therethrough,

means for rotating said shafts in unison so as to vary the configuration of said powder flow opening and thereby the patterns of powder emitted from said nozzle assembly, and

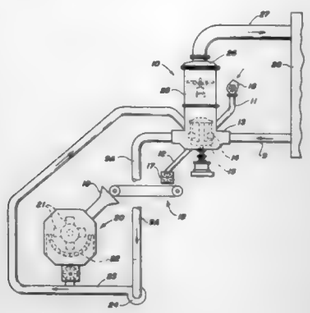
an electrode mount secured adjacent to said nozzle body, said electrode mount having a powder charging electrode extending from the forward end thereof.

4,638,952

METHOD OF FLUID COKE REDUCTION

Robert M. Williams, Ladue, and Robert M. Williams, Jr., Webster Groves, both of Mo., assignors to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

Filed Aug. 8, 1985, Ser. No. 763,516
Int. Cl.⁴ B02C *19/12*
U.S. Cl. 241—3 **4 Claims**



1. A method of reducing spherically shaped pelletized fluid coke waste by-product produced in the refining of petroleum, which method comprises:

(a) feeding the pelletized fluid coke waste into a first stage pulverizing and grinding mill for an initial reduction of such waste, including so much of the pellets as can be reduced;

(b) transporting the unreduced pellets of the fluid coke waste out of the first stage pulverizing and grinding mill into a separate second stage mill for reshaping of the spherical shaped pellets by hammer impact; and

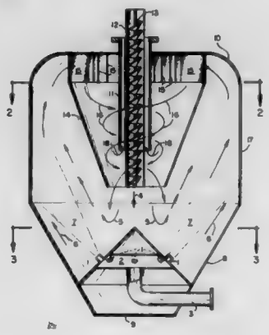
(c) collecting the pellets after being reshaped and returning the collected reshaped pellets to the first stage mill for final pulverization reduction.

4,638,953

CLASSIFIER FOR COMMINUTION OF PULVERULENT MATERIAL BY FLUID ENERGY

David W. Taylor, P.O. Box 67, Edgmont, Pa. 19028

Filed Jul. 19, 1985, Ser. No. 757,825
Int. Cl.⁴ B02C *19/06*
U.S. Cl. 241—39 **3 Claims**



1. A fluid energy mill for grinding pulverulent material comprising:

a vertical vessel whose walls are symmetrical about an axis of rotation, a closed bottom at one end and a closed top at the other end of said vessel;

a plurality of nozzles centrally disposed at said bottom so as to discharge fluid carrier medium in a generally axially upward and generally radially outward direction;

a centrifugal classifier axially coincident with said vessel at the top thereof;

inlet guide vanes at the top of said classifier coincident with the top of said vessel to impart rotational flow within said classifier; and

a central axial exhaust and feed in the center of said classifier for feeding pulverulent material into said mill and exhausting ground pulverulent material from said mill.

4,638,954

APPARATUS FOR THE SEPARATION OF MIXTURES OF MATERIALS OF DIFFERENT CONSISTENCIES SUCH AS MEAT AND BONE

Werner Poss, Oakville, Canada, assignor to Poss Design Limited, Hamilton, Canada

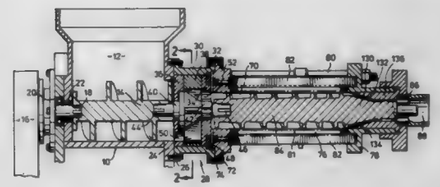
Continuation-in-part of Ser. No. 513,487, Jul. 13, 1983, abandoned. This application Jan. 10, 1985, Ser. No. 690,215
Int. Cl.⁴ B02C *19/22, 23/16*
U.S. Cl. 241—74 **27 Claims**

1. Apparatus for the separation of a composite mixture of different materials of different consistencies into separate fractions of the different consistencies comprising:

an apparatus body having an apparatus inlet for the composite mixture to be separated and respective outlets for the separated fractions,

a rotary vaned pump having a pump compartment mounted by the said body, the pump compartment having an inlet thereto receiving the mixture from the apparatus inlet into the pump compartment and the pump pressurising it in the pump compartment to an operative separation pressure,

said rotary vaned pump having a pump rotor carrying at least one vane rotatable about a rotor axis, said one vane being mounted in a respective radially-extending slot in the rotor and moving radially therein as the rotor rotates, and defining at least two pump chambers in the pump compartment, said pump chambers being formed about a chamber longitudinal axis radially displaced from said rotor axis so that each pump chamber decreases in volume



as the pump vane moves from the pump means inlet toward the pump means outlet and increases in volume as the pump vane moves from the outlet towards the inlet,

separator screen means mounted by the said body against a front face of which the pressurised mixture is delivered for the corresponding softer first fraction thereof to pass through the screen to a rear face thereof and for the remaining second harder fraction to be retained by the screen, and

means connecting at least the front face of the screen to a respective outlet for the respective separated second harder fraction,

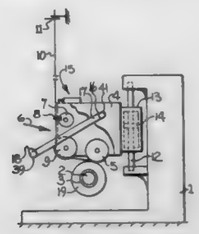
said separator screen means and the outlet for the second harder fraction maintaining the pressure of the pressurized mixture at an operative separation pressure.

4,638,955

YARN HANDLING APPARATUS FOR WINDING MACHINE

Heinz Schippers, and Erich Lenk, both of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Mar. 25, 1985, Ser. No. 715,902
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 3411158; Mar. 28, 1984, 3411464; Nov. 12, 1984, 3441250
Int. Cl.⁴ B65H *54/02*
U.S. Cl. 242—18 PW **25 Claims**



1. A textile yarn winding machine having a plurality of yarn winding positions aligned along at least one side thereof, and with each winding position comprising

at least one winding spindle adapted for coaxially receiving two or more bobbin tubes,

yarn traversing means for traversing each of a plurality of running yarns along a predetermined yarn traverse stroke to form a cross wound yarn package upon each associated bobbin tube, and

a plurality of yarn handling assemblies operatively associated with each winding position, with each of said yarn handling assemblies being associated with a respective one of said yarns being wound at said position and comprising

(a) yarn catching means,

(b) yarn severing means for severing the running yarn while the yarn is disposed in said yarn catching means, and

(c) yarn suction means for withdrawing the severed yarn end from said yarn catching means, and

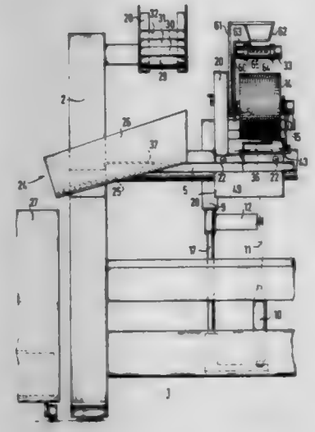
means mounting each assembly for movement along a predetermined path of travel between a first end position located on the upstream side of said winding spindle and wherein said yarn catching means is disposed in said predetermined yarn traverse stroke so that the running yarn moves into said yarn catching means where it is adapted to be severed and withdrawn by said severing means and said suction means, and a second end position located on the opposite side of said winding spindle and where the running yarn is adapted to be engaged by a yarn catching and severing notch or the like on the asociated empty bobbin tube mounted on said winding spindle and then again engaged by said yarn traversing means to commence winding of the running yarn upon the empty bobbin tube.

4,638,956

TEXTILE MACHINE FOR PRODUCING CROSS-WOUND BOBBINS

Edmund Wey, Nettetal, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Moenchengladbach, Fed. Rep. of Germany

Filed Sep. 30, 1985, Ser. No. 781,974
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1984, 3435951
Int. Cl.⁴ B65H *54/20, 67/04*
U.S. Cl. 242—35.5 A **4 Claims**



1. Textile machine assembly, comprising a textile machine for producing cross-wound bobbins, said textile machine having a head end, bobbin winding stations and a cross-wound bobbin collector disposed at said head end of said machine; a bobbin changer machine traveling from winding station to winding station for exchanging fully wound individual cross-wound bobbins for empty or partially wound tube sleeves at said winding stations and for transporting individual cross-wound bobbins from said winding stations to said collector; and means disposed at least at one of said machines for causing said bobbin changer machine to transport cross-wound bobbins

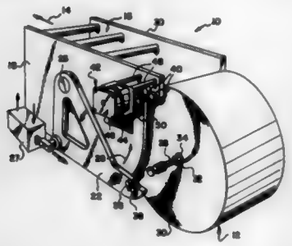
to said collector after each bobbin exchange has occurred and before beginning another bobbin exchange.

4,638,957

BRAKE ENGAGEMENT MECHANISM FOR A WEB PRESS

Gene E. Graves, Centerville, Ohio, assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Oct. 11, 1985, Ser. No. 786,571
Int. Cl.[4] B65H *19/30*; F16H *35/00*
U.S. Cl. 242—58.6 19 Claims



11. A mechanism for automatically engaging the roll shaft of an unwind station of a web press with a brake device, said unwind station having a frame, first and second arms pivotally connected thereto, means for raising and lowering said arms, and means disposed on said arms for rotatably supporting said roll shaft, said brake device being secured to said frame and having a brake shaft extending therefrom for driving said brake device, the mechanism comprising:

a first gear connected to said brake shaft;

a second gear connected to said roll shaft such that said second gear is movable, upon raising of said arms, along an arcuate path from a first disengaged position to a second position engaged with said first gear;

a rigid support means pivotally mounted to said brake shaft for pivotal movement about said brake shaft toward and away from said path;

a third gear rotatably mounted on said support means and engaged with said first gear;

a fourth gear rotatably mounted on said support means, engaged with said third gear and adjacent to but not engaged with said first gear; and

means for biasing said support means into a normal position wherein said fourth gear extends partially into said path.

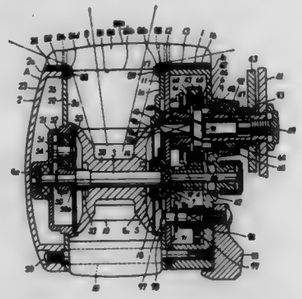
4,638,958

FISHING REEL

Yoshiyuki Furomoto, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 22, 1985, Ser. No. 757,474
Claims priority, application Japan, Jul. 27, 1984, 59-115114[U]
Int. Cl.[4] A01K *89/04*
U.S. Cl. 242—84.1 R 3 Claims

1. A fishing reel, comprising a reel body having a pair of side frames, a spool disposed between said side frames and supported rotatably to said side frames, a drive mechanism for driving said spool, a clutch means for selectively engaging and disengaging said spool with said drive mechanism, and a guide plate having guide means defining an elongate bore which extends in a same direction as an axis of rotation of said spool, lengthwise ends of said elongate bore being positioned between opposite inner surfaces of said side frames, said guide plate being disposed between said side frames and in front of said spool, said elongate bore comprising curved guide surfaces for guiding line wound onto said spool, said guide plate being rectangular in shape and comprising a pair of lips extending from opposite sides of said guide plate in a direction substantially perpendicular to a plane of said plate, said elongate bore comprising corners which include first ones of said curved guide surfaces for guiding line passing through said elongate bore, said lips having utmost ends in said direction



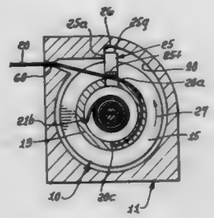
substantially perpendicular to said plane of said guide plate which comprise second ones of said curved guide surfaces for guiding line drawn outwardly from said lips and vertically with respect thereto.

4,638,959

PAWL CONTROLLED REEL EXTENSION

Ralph W. Jones, 1025 Avondale Rd., San Marino, Calif. 91108

Filed Aug. 19, 1985, Ser. No. 766,537
Int. Cl.[4] B65H *75/48*
U.S. Cl. 242—107.4 R 9 Claims



1. A line dispensing and retracting device, comprising

(a) a reel having a hub about which the line is wound as the reel rotates,

(b) structure mounting the reel for rotation relative thereto, and about an axis,

(c) a generally radially movable element carried by the reel to move between an inwardly retracted position in which the reel is free to rotate, and an outwardly extended position in which the movable element prevents further dispensing of the line,

(d) and the line wound on the reel in operative relation with the movable element to control said element's movement in response to reel rotation,

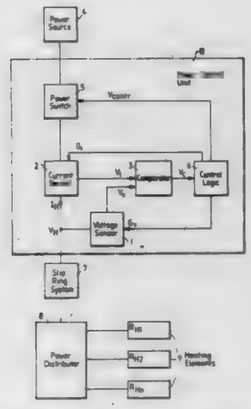
(e) said line including an inner winding extending sufficiently beneath said element as to urge the element outwardly relative to the reel in response to reel rotation in a line dispensing direction.

4,638,960

METHOD AND APPARATUS FOR DETERMINING ICE BOUNDARY TEMPERATURE FOR THE DE-ICING SYSTEM OF AN AIRCRAFT

Axel Straube, Uetersen, and Hans Loos, Holm, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

Filed Mar. 8, 1985, Ser. No. 709,505
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 3437304
Int. Cl.[4] B64D *15/12*
U.S. Cl. 244—134 D 14 Claims



9. An apparatus for determining the temperature of a resistive heating element having a temperature coefficient, comprising:

at least one resistive heating element;

a power supply connectable to said heating element for supplying a powering voltage and powering current to said heating element;

a controllable power switch connected between said power supply and said heating element for interrupting voltage and current supplied to said heating element;

a voltage sensor connected to said heating element for generating a voltage signal which is proportional to an instantaneous voltage supplied by said power supply to said heating element;

a current sensor connected to said heating element for generating a current signal which is proportional to instantaneous current supplied to said heating element by said power supply;

a comparator connected to said voltage and current sensors for comparing said voltage and current signals and for generating a difference signal corresponding to a difference between said voltage signal and said current signal; and

logic means including a predetermined switch threshold, said switching threshold corresponding to a desired temperature of said heating element, said difference signal corresponding to said switching threshold when said heating element reaches the desired temperature.

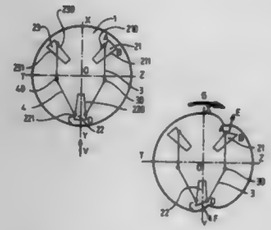
4,638,961

MANEUVERABLE PARACHUTE

Jacques R. Rousseau, Epinay-sur-Orge, France, assignor to Aerazur-Efa, Issy-les-Moulineaux, France

Filed Jul. 30, 1984, Ser. No. 636,026
Claims priority, application France, Mar. 30, 1984, 84 05099
Int. Cl.[4] B64D *17/00*
U.S. Cl. 244—142 4 Claims

4. A process for controlling a maneuverable parachute operable by a parachutist, said parachute comprising a canopy having a plurality of gores, said canopy comprising at least three maneuvering windows distributed over the canopy about a vertical main plane of symmetry perpendicular to a line through shoulders of the parachutist, two of said windows being situated in front of said line, each window having two opposite edges essentially parallel to the gores of the canopy, and at least two maneuver control means, each of said means comprising a control handle and line means having a first and second end, said first end being connected to an edge of a window and said second end being connected to a non-neighboring edge of a second window, the said two non-neighboring edges being situated on the same side of the main plane of



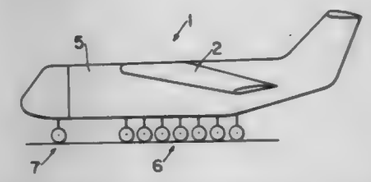
symmetry, said process comprising applying traction by the parachutist to a single control means for effecting a rotation of the parachute in the direction corresponding to the side on which the control means is situated in relation to the main plane of symmetry, applying traction by the parachutist to a pair of control means situated on the same side in relation to the main plane of symmetry for effecting a lateral displacement of the parachute, and applying traction by the parachutist to a pair of control means situated one on each side of the main plane of symmetry for effecting an axial displacement of the parachute.

4,638,962

JUMBO AIRCRAFT, IN PARTICULAR OF HIGH-WING MONOPLANE DESIGN

Heinz Günter, Friedrichshafen; Gerhard Kriechbaum, Markdorf; Hubert Krojer, Bermatingen; Rudolf Matecki, Markdorf, and Johannes Spintzyk, Friedrichshafen, all of Fed. Rep. of Germany, assignors to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Mar. 31, 1980, Ser. No. 135,548
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1979, 2924742
Int. Cl.[4] B64C *13/16*, *25/04*
U.S. Cl. 244—203 3 Claims



1. In a jumbo aircraft, in particular of high-wing monoplane design, with a fuselage and a retractable and steerable main landing gear and means for high lift generation, the improvement comprising:

(a) a plurality of rows of landing gear units mounted along the aircraft fuselage and spread across a range extending predominantly in the longitudinal aircraft direction, the number of said landing gear units extending in the longitudinal aircraft direction being a multiple of the number of landing gear units mounted in the direction of the aircraft transverse axis, said units forming said main landing gear.

(b) said landing gear units being of the same design and identical dimensions,

(c) means for switching-on the lift generating means at predetermined lift conditions, together with setting and maintaining a longitudinal attitude of the aircraft or of its landing gear parallel to the taxiway and runway, whereby the take-off phase or the landing phase is performed using the method of direct lift control; and

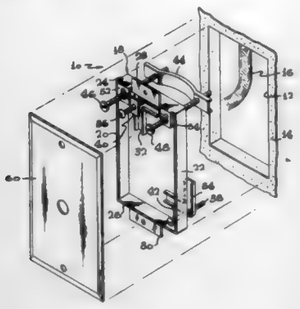
in which the actuation of the lift generating means is implemented as a function of the predetermined magnitudes of the landing gear loads.

4,638,963

ELECTRICAL WALL BRACKET

Jose L. Hernandez, 9940 La Tuna Canyon Rd., Sun Valley, Calif. 91352

Filed May 17, 1985, Ser. No. 735,449
Int. Cl.[4] F16L *5/00*
U.S. Cl. 248—56 **18 Claims**



1. An electrical wall bracket comprising:

a substantially rectangular frame having an open interior and having at least one boss directed toward the interior thereof, said boss having an opening therein;

means on said frame for securing said frame at least partially within an opening in wall board; and

a cable clamp mounted on said frame, said cable clamp comprising a clamp for engagement with the cable and at least one machine screw engaged through said opening in said boss and engaging said clamp so as to adjustably secure said clamp with respect to said frame for securing the cable with respect to the opening in the wall board so that the cable can be located and drawn through the opening in the wall board.

4,638,964

GROMMET ASSEMBLY

David K. Sovacool, Cortland; Allan S. Van Slyke, Southington, and Edward M. Bungo, Cortland, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

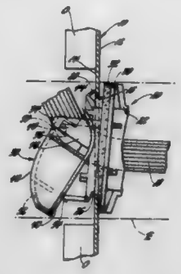
Filed Nov. 8, 1985, Ser. No. 796,198
Int. Cl.[4] F16L *5/00*
U.S. Cl. 248—56 **3 Claims**

1. A grommet assembly for passing a wire bundle through an aperture in a panel having opposed surfaces, said assembly being attachable to said panel within a limited access space around said aperture, comprising,

a grommet body having a passage through which a wire bundle may extend, said grommet body also having a stop portion that is engageable with one surface of said panel when said grommet body is placed in an attachment position overlying said aperture with said wire bundle passing through said aperture, said grommet body having a periphery defining, when in said attachment position, an attachment envelope within said limited access space,

a pivot support extending from said grommet body and offset to one side thereof while still being able to pass through said aperture as said grommet body is placed in said attachment position,

a retainer including at least one pivot member by which said retainer may be pivotally joined to said pivot support when said grommet body is in said attachment position so as to be rotatable toward said grommet body, said retainer further including a stop portion that is engageable with said panel other surface as said retainer rotates to an oper-



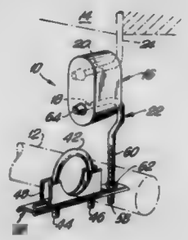
ative position, said retainer further being sized so as to remain substantially within said attachment envelope as said retainer rotates to said operative position, and locking means maintaining said retainer at said operative rotated position with said grommet body and said retainer stop portion engaged with their respective panel surfaces, whereby said grommet assembly is attached to said panel within said limited access space.

4,638,965

UNIVERSAL BRACKET ASSEMBLY

Mark De Bruine, Temperance, and Kenneth Spotts, Dundee, both of Mich., assignors to AP Industries, Inc., Toledo, Ohio

Filed Oct. 3, 1985, Ser. No. 783,828
Int. Cl.[4] E21F *17/02*
U.S. Cl. 248—59 **5 Claims**



1. A universal mounting bracket assembly for mounting an exhaust pipe to a vehicle, said assembly comprising:

an elongated support plate having opposed first and second ends and a pair of support rails extending along opposed sides thereof between the first and second ends, said elongated support plate further including a circular aperture generally adjacent to the first end and a pair of elongated cut outs disposed intermediate the circular aperture and the second end of said elongated support plate, said elongated cut outs and said circular aperture being generally collinearly with one another;

a support base mounted to said elongated support plate adjacent the elongated cut outs therein, said support base including an arcuate support surface for engaging the pipe;

a U-bolt dimensioned to engage the pipe, said U-bolt including a pair of generally parallel threaded ends, said threaded ends of said U-bolt extending through said support base and through the elongated cut outs of said support plate;

a pair of clamping nuts threadably mounted to the ends of said U-bolt;

a formed support rod having opposed first and second ends and being characterized by an array of external threads extending from the first end thereof to a point intermediate said first and second ends, said second end of said formed support rod being mountable to the vehicle, the first end of said formed support rod extending through said circular aperture in said elongated support plate;

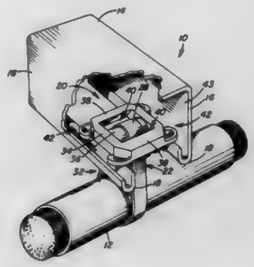
first and second support nuts threadably mounted to said formed support rod, said first and second support nuts being disposed on opposite sides of said elongated support plate, whereby the U-bolt and the formed support rod can be moved relative to the elongated support plate to effect the secure adjustable mounting of the pipe to the vehicle.

4,638,966

SUPPORT MEMBER FOR HANGING CABLE

James H. Ford, Pittsburgh, Pa., assignor to Robroy Industries, Verona, Pa.

Filed Jun. 21, 1985, Ser. No. 748,191
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—62 **17 Claims**



1. Cable supporting structure comprising:

a longitudinally extending channel-shaped support structure, said support structure including a pair of spaced side walls having free end portions turned inwardly to form opposed longitudinally extending flanges;

locking strip means capable of extending around cable means for securing said cable means to said support structure, said locking strip means including opposite portions and an intermediate portion therebetween;

a support member positioned within said support structure to extend between said flanges with opposite ends of said support member respectively supported by said flanges;

said support member including slotted means for receiving said locking strip means to extend around a central body portion of said support member in overlying relation with said body portion;

said support member including integral resiliently deflectable biasing means extending from at least one of said opposite ends for producing frictional contact betewen said support member and said side walls tending to resist movement of said support member within said support structure; and

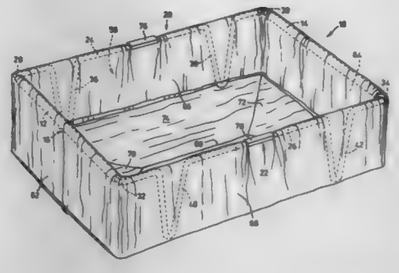
means associated with said locking strip menas for connecting said opposite end portions to form a loop of a preselected size extending around said body portion of said support member at said intermediate portion and around said cable means at the connected said opposite end portions to support said cable means against said support structure.

4,638,967

COLLAPSIBLE SUPPORT FRAME WITH RECEPTACLE

Richard J. MacDuffee, R.R. #1, Palgrave, Ontario, Canada

Filed Apr. 23, 1985, Ser. No. 726,401
Int. Cl.[4] A63B *55/04*
U.S. Cl. 248—97 **14 Claims**



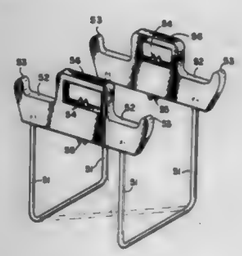
1. A collapsible support frame with receptacle wherein said frame is of generally rectilinear configuration including opposed spaced apart front and rear frame portions connected together with opposed spaced apart side frame portions, said side frame portions in the regions of the opposed spaced apart front and rear frame portions respectively presenting downwardly projecting surface engaging formations of like extent, said receptacle including opposed front and rear panels and opposed side panels terminating lowermost in a bottom panel and having a perimetral extent so as to be disposable within said collapsible support frame, said opposed front and rear panels and said opposed side panels of said receptacle having a vertical extent exceeding that of said downwardly projecting surface engaging formations of said collapsible support frame and a perimetral extent such that when said opposed front and rear panels and said opposed side panels are folded over the opposed spaced apart front and rear frame portions and opposed spaced apart side frame portions respectively of said collapsible support frame said front and rear frame portions and said side frame portions are constrained against separation.

4,638,968

RUBBISH CONTAINER

Howard L. Auten, Manapapan, Fla., assignor to Auten & Auten, Inc., Lantana, Fla.

Filed Aug. 22, 1984, Ser. No. 643,047
Int. Cl.[4] B65B *67/04*
U.S. Cl. 248—97 **2 Claims**



1. A bag holding structure, comprising:

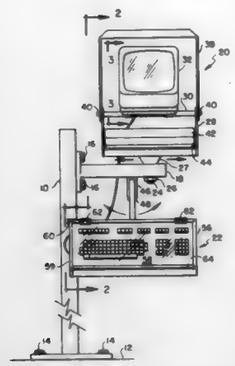
two parallel, relatively wide cross bars having an open inverted U-shaped handle extending upwardly between upturned end retaining shoulders.

two upright U-shaped support members having ends, each end being rotatably attached to a separate one of said two cross bars; and,

within said handle openings and also extending downwardly from said cross bar below said handles, projections ex-

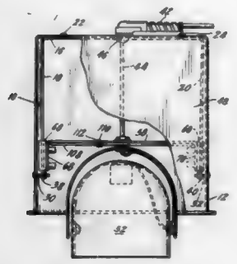
tending upwardly from said cross bar whereby bag material can be laid over said handles, and through said handle openings to be engageable on said projections and whereby said structure can be collapsible when not in use as permitted by the rotatable securement of said support members to said cross bars.

4,638,969
VIDEO DISPLAY ARRANGEMENT
Walter J. Brown, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Filed Dec. 24, 1984, Ser. No. 686,138
Int. Cl.[4] F16L *3/00*
U.S. Cl. 248—122 **11 Claims**



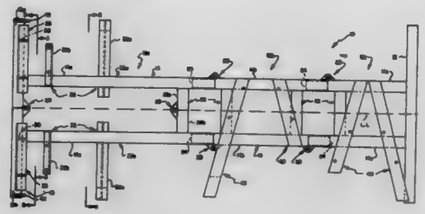
1. A support arrangement for mounting a video screen and a key board in a manufacturing environment comprising: a vertical support member, a second support member mounted to and substantially perpendicular to said vertical support member, a first casing horizontally, adjustably supported above and by said second support member, a rotatably adjusted bar member support in said first casing, a video screen attached to said bar member, means mounting a key board casing horizontally and adjustably below and to said second support member, said means including a second means to allow vertical rotation of said key board casing and a key board slidably mounted in said casing.

4,638,970
HIGH HAT LIGHT FIXTURE SUPPORT BRACKET
Gerard Phelan, Stony Point, N.Y., assignor to Swivelier, Nanuet, N.Y.
Filed Aug. 12, 1985, Ser. No. 764,569
Int. Cl.[4] B42F *13/00*
U.S. Cl. 248—342 **11 Claims**



1. A height adjustable light fixture support comprising:
a first generally U-shaped bracket having a first crosspiece and first and second legs depending from the first crosspiece;
a second generally U-shaped bracket, including first and second plates each shaped to define a respective sliding channel in which a respective one of the legs of the first U-shaped bracket is slidingly receivable; a second crosspiece extending between the plates for connecting the plates to one another;
a spring loaded biased member for each plate, the biased member being biased to penetrate into the sliding channel of the plate and to press against the respective leg of the first U-shaped bracket when the leg is inserted into the channel to thereby frictionally secure the plate and the leg to one another.

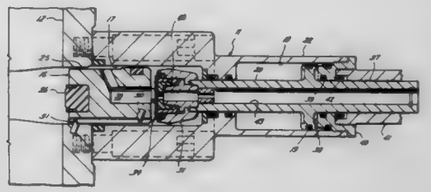
4,638,971
MACHINERY SKID
Michael J. Basinsky, Broken Arrow; Dale T. Bird, Bristow, and Daniel W. Smith, Tulsa, all of Okla., assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.
Filed Feb. 4, 1986, Ser. No. 825,824
Int. Cl.[4] F16M *3/00*
U.S. Cl. 248—678 **20 Claims**



1. A machinery skid comprising:
a modular frame assembly having first and second longitudinally interlockable sections;
engageable means for securing said sections together, said sections when assembled defining two relatively close longitudinal support members and a plurality of transverse support members, each longitudinal member having at least two segments joinable together in endwise alignment by said securing means, said first interlockable section having certain of said transverse members being fixedly secured to both longitudinal members and extending outwardly therefrom, said second interlockable section having other said transverse members only being fixedly secured to respective ones of said longitudinal members and extending outwardly therefrom, a pair of said other transverse members being positioned on respective free ends of said longitudinal members at one end of said second interlocking section, said pair of transverse members being joinable by said securing means such that one end of the skid is formed by said second interlocking section which can be disassembled from the skid in two laterally separate parts.

4,638,972
VALVE APPARATUS
Marvin R. Jones, and Paul E. Helfer, both of Houston, Tex., assignors to Koomey, Houston, Tex.
Filed Jul. 18, 1985, Ser. No. 756,187
Int. Cl.[4] E21B *33/06*
U.S. Cl. 251—1.3 **9 Claims**

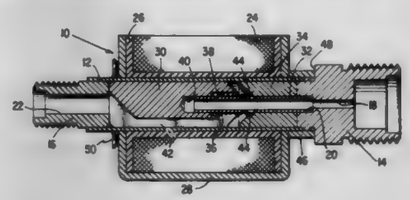
1. A blowout preventer, comprising
a housing having a bore therethrough and chambers which intersect the bore,
rams reciprocable within the chambers between positions for opening the bore and positions engaged with one another for closing the bore to divide it into zones above and below the rams,
means for so reciprocating each ram including a rod which extends sealably through the housing into the chamber and is connected to the ram for moving the ram inwardly with the rod to closed position and outwardly with the rod to open position,
first and second passageway means for connecting the upper and lower zones of the bore, respectively, with the chamber behind at least one ram when the rams are closed,
one of the passageway means extending through the one ram,
the connection of said one ram to its rod having lost motion, and
the rod for said one ram having a packing assembly thereon comprising
inner and outer metal rings which are carried by the inner end of the rod for axial movement with respect thereto and whose inner ends protrude from the surrounding end surface of the inner end of the rod, and
a ring of elastomeric material having its inner and outer diameters and outer end confined between said metal rings and by a recess in the inner end of the rod,



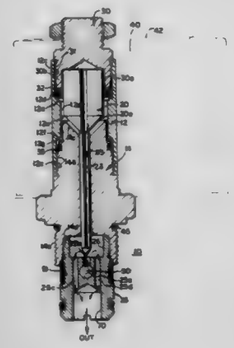
the inner diameter of the elastomeric ring subtending an area greater than that of the portion of the rod which extends sealably through the housing,
said elastomeric ring having an annular ridge on its inner end which protrudes from the adjacent end surfaces of the inner and outer metal rings, for sealable engagement with and disengagement from an end surface of the ram which surrounds the opening of the one passageway means into the chamber, in response to outward and inward movement of the rod, respectively,
the inner end of said packing assembly having an annular recess which surrounds the ridge and into which a volume of elastomeric material equivalent to that of the ridge may move as the ridge is deformed upon inward movement of the rod, and
the radially inner side of the end surface of the ridge being generally frusto-conically shaped, so that as the ridge first engages the end surface of the ram, well fluid in the chamber acts over an area subtended by the outer diameter of said surface, and then, as the pressure of the well fluid increases, over successively smaller areas.

4,638,973
INLINE SOLENOID OPERATED SLIDE VALVE
Robert J. Torrence, Addison, Ill., assignor to Eaton Corporation, Cleveland, Ohio
Filed Nov. 14, 1985, Ser. No. 798,100
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.02 **4 Claims**

1. An electrically operated fluid flow control valve, comprising:
a hollow cylindrical valve sleeve;
a pair of fittings fixedly mounted one on each end of said valve sleeve for coupling the valve into a fluid flow line, said fittings each having an internal fluid flow conduit, a first of said fittings having a counter bore extending part way into the conduit of said first fitting from the end of said first fitting which is mounted on said valve sleeve;
an electrical coil surrounding said valve sleeve between said fittings;
a magnetic pole piece fixedly secured within said valve sleeve and extending from the second of said fittings inside the region defined by said coil, said pole piece have a stepped counterbore extending part way into said pole piece from the end of said pole piece remote from said second fitting, said pole piece further having a longitudinal exterior channel extending the length of said pole piece, said channel intersecting the open end of said counterbore and communicating with the conduit of said second fitting;
a hollow tube member secured at one end in the counterbore of said first fitting and at the other end extending into the small step of the counter bore of said pole piece, said tube member having a valve port in its wall;
a magnetic plunger surrounding said tube member and slideable thereon to selectively cover and expose said valve port; and
spring means for yieldably biasing said plunger away from said pole piece.



4,638,974
ELECTROHYDRAULIC VALVE ASSEMBLIES AND METHOD
Kenneth W. Zeuner, 43 Red Fox Dr., New Hope, Pa. 18938; Steven K. Zeuner, 39 Larch Cir., and Thomas A. Zeuner, 230 Woodlake Dr., both of Holland, Pa. 18966
Filed Jan. 6, 1984, Ser. No. 568,599
Int. Cl.[4] F16K *31/02*
U.S. Cl. 251—129.15 **11 Claims**



1. A solenoid operated valve assembly having an armature comprising
a body section having high magnetically permeable material and having an upper threaded portion,
an end stop section having high magnetically permeable material and having a lower threaded portion,
an orifice assembly for controlling flow of fluid being secured to the body section,
plug means engaging the armature and movable between a valve closed state with the plug means seating in and closing the orifice assembly and a valve open state,

a unitary sleeve section of low magnetically permeable material having an inner chamber with upper and lower portions, upper and lower portions have internally threaded upper and lower threaded sections which are adapted to threadedly engage the threaded portion of the end stop section and the upper threaded portion of the body section, respectively, means for fluidly sealing the upper and lower portions with respect to the end stop section and the body section, respectively,

an internal pressure chamber for housing the armature formed by the end stop section, the inner chamber of the sleeve section and the body section and the body section in fluid communication with the orifice assembly whereby the sleeve section is of sufficient strength to withstand the pressure of the fluid within the inner chamber of the sleeve section, and

means for producing and concentrating magnetic flux flow through the end stop section, the armature and the body section for moving the armature and the plug means.

4,638,975

FLUID COUPLER

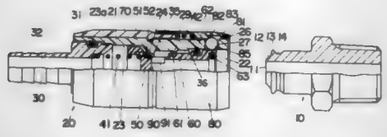
Akira Iuchi, Kobe, and Shinya Tsunokawa, Osaka, both of Japan, assignors to Osaka Gas Company Limited, Higashi, Japan

Filed Jul. 27, 1984, Ser. No. 635,023

Claims priority, application Japan, Jul. 30, 1983, 58-118978[U]

Int. Cl.⁴ F16L *37/28*

U.S. Cl. 251—149.6 **7 Claims**



1. In a fluid coupler having a female coupling member with an incorporated valve and a male coupling member for connection to the female coupling member for opening the valve to start a fluid flow therebetween, the combination comprising:

a generally cylindrical main body constituting said female coupling member and shaped to have an axial bore with front and rear openings at its axial ends, said cylindrical main body being provided intermediate the axial ends with an annular flange projecting inwardly thereof to define a valve seat;

a valve member slidably received within the main body to be movable in the axial direction thereof, said valve member including a head portion having an outside diameter greater than the inside diameter of said internal annular flange and located on the rear side thereof so as to be cooperaive with said valve seat to define said valve, said head portion of the valve member being shaped to define a fluid passage between its outer peripheral portion and the inner surface of the main body at the portion rearwardly of said internal annular flange when it is in an open position;

a connection plug fitted in the rear opening of the main body for connection of the female coupling member with a source of fluid;

a compression spring interposed between the valve member and the connection plug so as to bias the valve member into a closed position where the head portion of the valve member is in sealing contact with the valve seat;

a turbular member slidably received within the main body forwardly of the valve member so as to be movable therewith, said tubular member being provided at its front end with first sealing means adapted to be brought into sealing contact with the male coupling member to be inserted within the front opening of the main body and being provided around its periphery with second sealing means which projects outwardly therefrom so as to be brought into sealing contract with the inner surface of the main body when the valve member is in the open position;

a thrust member operatively interconnecting the valve member and the tubular member such that when the male coupling member is inserted in the female coupling the tubular member will be forced thereby to thrust the valve member so as to move it against the biasing force of the compression spring into an open position, said thrust member arranged substantially not to prevent fluid flow from the valve into the tubular member when the valve is opened; and

locking means to lock the male and female coulping members at a connecting position where the male member is slid into the female member by a certain distance enough to open the valve as well as ensure sealing contact between the front end of the tubular member and inlet end of the male coupling member;

said valve member having a sealing ring in sealing contact with the valve seat on the rear wall of said annular flange, said sealing ring being fitted around a reduced-in-diameter section of said valve member extending forwardly from the head portion at the juncture between the reduced-in-diameter section and the head portion of a larger diameter;

said sealing ring being fitted around said reduced-in-diameter section with its outer periphery projecting radially outwardly of the head portion of said valve member, said main body being provided on its cylindrical inner surface with an exially elongated and radially reduced platform which extends rearwardly from said annular flange by a limited distance, said platform having a diameter substantially uniformly along its length which is larger than the inside diameter of the annular flange but smaller than the remaining rear portion of the main body such that the sealing ring is kept in sealing contact with the platform to close the valve while it is moved together with the valve member within the axial length of the platform and is out of sealing contact with the platform to open the valve when it is moved together with the valve member rearwardly beyond the rear end of the platform, and said axial length of the platform being long enough to allow the valve member to compress the spring sufficiently for developing a secure sealing contact between the male coupling member and the tubular member before the valve member is forced by the male coupling member to move further rearwardly with the sealing ring into the open positon.

4,638,976

ROTARY GATE VALVE GASKET AND PROCESS FOR ITS MANUFACTURE

Robert Souplet, Nancy, and Jean Sutter, Villers les Nancy, both of France, assignors to Pont-a-Mousson S.A., France

Filed Jun. 24, 1985, Ser. No. 748,062

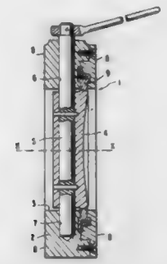
Claims priority, application France, Jun. 27, 1984, 84 10289

Int. Cl.⁴ F16K *25/00*

U.S. Cl. 251—173 **8 Claims**

1. A gasket for a valve (1) having a body (2) surrounding an axial fluid flow channel (3) with an axis X—X, a rotary gate (4) mounted within the body (2) on a shaft (5), and adapted to rotate between a channel open and channel closed position, the body having a first contoured surface formed in one face thereof, and an annular retaining ring (11) disposed coaxial with the body and having a shaped surface adapted to form a groove (10) when mated with the body, the groove having a wide portion (10*a*) opening into the axial channel (3) and a first narrow portion (10*b*), said gasket comprising:

a solid portion (15) in the shape of a circular ring having the axis X—X and a coaxial annular flange portion (16) contiguous with said solid portion and having a first and a second member (29, 30) extending outwardly from the solid portion and configured, when adjacent to each other, to fit tightly within said groove, an elastic ring (28) having a substantially rectangular cross section for bearing said solid portion against the valve gate when in a channel closed position, said ring being housed within a closed chamber defined by said solid portion and said first and second contiguous members, said chamber having two first surfaces (24, 25) parallel to axis X—X and two parallel second surfaces (26, 27) perpendicular to said first surface,



said gasket solid portion (15) and flange portion (16) being made of a fluorocarbon polymer material that can be used in a corrosive environment after sintering,

whereby said gasket may be used with corrosive fluids, provides substantially axially sized support and is adapted to withstand both upstream and downstream pressures.

4,638,977

VALVE ACTUATOR

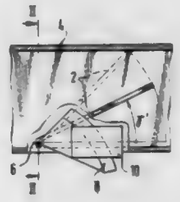
Georg Vonhausen, Nauheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1985, Ser. No. 792,192

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1984, 3429660

Int. Cl.⁴ F16K *31/53*

U.S. Cl. 251—248 **2 Claims**



1. Arrangement for actuating a control valve for mixed air heating systems in motor vehicles and the like comprising a non-shiftable spur wheel connected to a shaft that extends approximately at right angles to a rotatable shaft that is connected to the valve, a crown-wheel segment connected to said valve shaft having teeth continuously meshing with the spur wheel characterized by the teeth on the crown wheel segment having a pitch that decreases and/or increases in the direction of opening of the valve to thereby decrease and/or increase the rate of opening of the valve always within a full revolution of the spur wheel in either direction thereof and always retaining said continuous meshing.

4,638,978

HYDROPNEUMATIC CABLE TENSIONER

Larry B. Jordan, 10710 Archmont St., Houston, Tex. 77070

Continuation-in-part of Ser. No. 516,102, Jul. 22, 1983, Pat. No. 4,540,159. This application Aug. 1, 1985, Ser. No. 761,583

Int. Cl.⁴ B25B *25/00*; B66D *1/50*

U.S. Cl. 254—228 **8 Claims**



1. A hydropneumatic cable tensioner comprising:

a base;

a cylinder mounted on said base, said cylinder comprising an accumulator chamber and a piston bore chamber;

a first enclosure means for enclosing a first end of said cylinder;

a first cable sheave mounted to said first enclosure means;

a second enclosure means for enclosing a second end of said cylinder;

a piston rod comprising a first end extending within said piston bore chamber and a second end extending outside said cylinder through said second enclosure means, wherein said first end of said piston rod has a reduced diameter piston mounting section which forms a shoulder on said piston rod;

a second cable sheave mounted on said second end of said piston rod;

a piston comprising a conical frustum shaped support bushing removably fitted onto said reduced diameter piston mounting section and butted up to said shoulder on said piston rod, wherein said piston is reciprocable within said piston bore chamber;

a piston sealing means which in cooperation with said piston divides said piston bore chamber into a low pressure segment above said piston sealing means and a high pressure segment below said piston sealing means;

a first ported restriction means comprising a port communicating between said piston bore chamber and said accumulator chamber for controlling oil flow between said piston bore and accumulation chambers thereby limiting piston velocity in the event of a sudden change in cable tension, said piston bore chamber being ported to said accumulator chamber between said first closure means and said piston when said piston is fully retracted within said piston bore chamber proximate said first closure means;

a containment chamber within said piston rod for containing an initial charge of gas and oil;

a second ported restriction means comprising a port communicating between said piston bore chamber and said containment chamber for controlling oil flow between said piston bore and containment chambers thereby limiting piston velocity in the event of a sudden change of cable tension, said port being adjacent said piston;

an annular ring fitted within said piston bore chamber adjacent said second closure means having an inner face positioned around said piston rod adapted to receive said piston to prevent further movement of said piston toward said second closure means; and

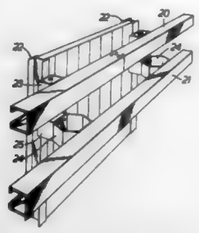
means for regulating the pressure within said accumulator chamber to regulate the pressure exerted on said piston to thereby control the movement of said piston and piston rod and the force applied thereby.

4,638,979

VEHICLE CRASH BARRIERS

Vincent M. Demarest, Ipsden, Wallingford, Oxfordshire, Great Britain OX9 6BS

Filed Mar. 29, 1985, Ser. No. 717,689
Int. Cl.[4] A01K *3/00*; E01F *15/00*
U.S. Cl. 256—13.1 8 Claims



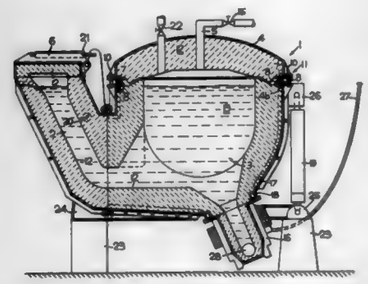
1. A vehicle crash barrier comprising a series of upright posts, a generally horizontal beam construction comprising two separate rails supported on said posts one above the other, and deformable connections between said rails and said posts, the connections to one of said rails being relatively stiff while the connections to the other rail are more easily deformable, thus providing a progressively increasing resistance to impact by a vehicle on the beam construction.

4,638,980

APPARATUS AND METHOD FOR MAINTAINING THE TEMPERATURE OF MOLTEN METAL

Günther Beele, Kerpen-Blatzheim, Fed. Rep. of Germany, assignor to Kloeckner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Filed Mar. 4, 1986, Ser. No. 836,095
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1985, 3507648
Int. Cl.[4] C21C *7/10*
U.S. Cl. 266—44 14 Claims



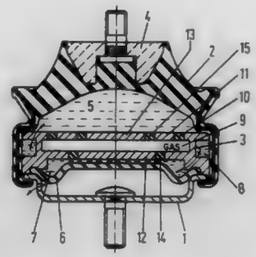
1. Apparatus for storing and maintaining a predetermined temperature level of a nodular cast iron melt which has been treated with magnesium, comprising: a heatable furnace chamber having a main part with an inner cavity for holding the major part of the melt and a combined inlet and outlet part secured to the main part, a chamber cover for the main part, a pressure sealing arrangement between said chamber cover and said main part, a closing cover in pressure sealed relation with said inlet and outlet part, and an inlet in said apparatus for delivering a medium under pressure to said cavity of said furnace chamber whereby the latter is maintained at a predetermined pressure greater than atmospheric pressure to prevent disintegration of the magnesium in said melt.

4,638,981

ENGINE MOUNT

Giacomo Sciortino, Heidelberg, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Oct. 17, 1985, Ser. No. 788,419
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1985, 3501112
Int. Cl.[4] B60G *13/00*; F16M *13/00*
U.S. Cl. 267—8 R 4 Claims



1. A hydraulically damped engine mount comprising:

a mounting bracket;

a supporting spring and a partition wall bounding a working space;

a resilient buffer wall, the resilient buffer wall and the partition wall bounding an equalizing space, the working space and the equalizing space being interconnected through a throttle opening;

a liquid filling the working space and the equalizing space;

a gas-filled chamber which is disposed within the partition wall; and

a disk suspended from the partition wall and closing the chamber, said disk being a chain vibrator comprising at least two successive, radially interposed neutralizing masses and annular diaphragms for elastically securing said neutralizing masses to each other and to the partition wall.

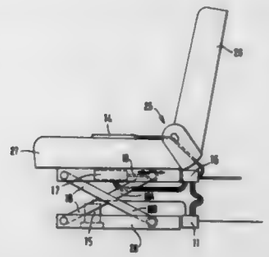
4,638,982

VEHICLE SEAT MONITORING MEANS

Hans-Peter Misher, Bad Meinberg, and Helge Pietsch, Detmold, both of Fed. Rep. of Germany, assignors to Gebr. Isringhausen, Lemgo, Fed. Rep. of Germany

Filed Apr. 3, 1984, Ser. No. 596,252
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1983, 3312732
Int. Cl.[4] A47C *7/14*; F16M *13/00*
U.S. Cl. 267—131 9 Claims

1. A vehicle seat monitoring means for an assembly that includes a vehicle seat, a base member, linkage means mounted on said base member and interconnected to said vehicle seat for effecting vertical movement thereof, a pneumatic spring engaging said linkage means for controlling the movement thereof and providing a resilient support for said vehicle seat, and an air valve for controlling admission and discharge of air to and from said pneumatic spring, the improvement comprising first and second sensing devices located at spaced positions above and below a predetermined rated central position of said vehicle seat, respectively, and being responsive to vertical oscillatory movement of said seat, for emitting electrical signals which differ from each other with respect to the direction of vertical movement of said seat as sensed by said sensing devices, a counter means for receiving and summing said electrical signals from said sensing devices, said counter means having a predetermined starting value, a first predetermined limiting value corresponding to a condition wherein the sum of the signals received from said first and second sensing devices is a predetermined amount greater than said starting value and



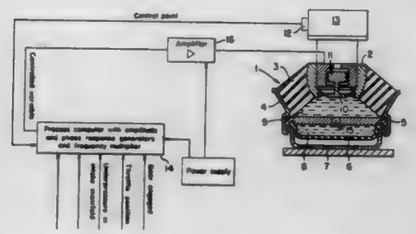
a second predetermined limiting value corresponding to a condition wherein the sum of the signals received from said first and second sensing devices is a predetermined amount less than said starting value, said counter summing said signals from said sensing devices until one of said limiting values is reached, whereupon the counter means is reset to said starting value and emits an electrical control signal to said air valve, said air valve being responsive to said electrical control signal emitted by said counter means for operating said pneumatic spring to position said seat at the rated central position thereof.

4,638,983

APPARATUS FOR RESILIENTLY MOUNTING A VIBRATING BODY

Werner Idigkeit, Weinheim; Klaus Kurr, Weinheim-Hohensachsen, and Gerd-Heinz Ticks, Wald-Michelbach, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Jul. 19, 1985, Ser. No. 756,999
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, 3433255
Int. Cl.[4] B60K *5/12*; F16F *13/00, 15/04*
U.S. Cl. 267—140.1 15 Claims



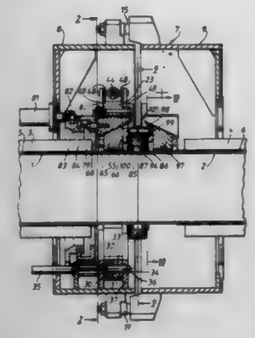
1. An apparatus for the resilient mounting of a vibrating body, said apparatus comprising a mounting bracket and a pedestal which are interconnected through a resilient element that contains a liquid-filled hollow space, a compensating baffle associated with a positioning element being provided whose adjustment permits compensation of the pressure variations in the liquid caused by disturbing vibrations, characterized in that the compensating baffle (10) bounds the working space (9) itself and covers at least 10 percent of the boundary surface of the working space; that the positioning element (11) is adapted to be actuated by a primary element (12) which detects disturbing vibrations of said body; and that the primary element and the positioning element are interconnected through a freely programmable control unit (14).

4,638,984

EXTERNAL APPARATUS FOR BUTT WELDING TWO PIPES

Xavier F. Puisais, Perret; Jean-Pierre Hamon, Cergy; Michel J. Jegousse, Saint-Herblain, and Michel Kaluszynski, Vitry-su-Seine, all of France, assignors to Total Compagnie Francaise des Petroles, Paris, France

Filed Oct. 9, 1985, Ser. No. 785,648
Claims priority, application France, Oct. 22, 1984, 84 16111
Int. Cl.[4] B23K *37/04*
U.S. Cl. 269—43 6 Claims



1. An externally applied apparatus for butting two tubular elements (1, 2) to be joined by welding, comprising: two frames (8, 9), each of which is provided with gripping means comprising a plurality of radially oriented jaws (55–64) for the external gripping of a respective one of the tubular elements and which are connected to one another by articulated jacks (10, 11) for bringing the elements together, wherein said two frames are also connected to one another by a plurality of circumferentially spaced pairs of alignment members (14–19), one member of each pair being carried by one frame, the other member of each pair being carried by the other frame, and the members (20, 21) of each pair being engageable one in the other with the interposition of an elastic means (22).

4,638,985

SHEET HOLDING APPARATUS

Yoshinobu Maeda, Katano; Kohji Fujiwara, Yamatokouriyama, and Takao Naito, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 23, 1985, Ser. No. 790,454
Int. Cl.[4] B25B *1/10, 5/10*
U.S. Cl. 269—244 6 Claims

1. A sheet holding apparatus comprising:

a pair of interconnected rails supported on a base for slidably holding edge parts of a sheet, disposed parallel to each other in a direction of transfer of said sheet, at least one of said rails being movable in a direction lateral thereto, to adjust distance between said pair of rails,

plural guide holders, at least one thereof being movable in a direction along said rails, to adjust distance therebetween to correspond to holes of said sheet,

plural positioning guide pins fixed on said guide holders, and being adapted to be inserted into holes of said sheet to hold said sheet at a predetermined position,

driving means for driving at least one rail and one guide holder.

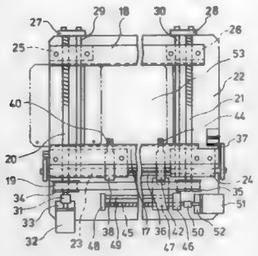
4. A sheet holding apparatus comprising:

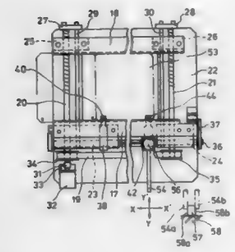
a pair of interconnected rails for holding edge parts of a sheet, disposed parallel to each other in a direction of

transfer of said sheet, at least one rail being adjustably movable in a direction lateral thereto,

plural guide holders, at least one guide holder being adjustably movable in a direction along said rails to correspond to holes of said sheet.

plural positioning guide pins being fixed on said guide holders, being adapted to be inserted into holes of said sheet to hold said sheet at a predetermined position,





a driving rod which is projecting from said at least one of said guide holders,

a base for holding said rails and plural guide holders, and being movable in Cartesian coodinates,

a fixed pin to be contacted with said driving rod, and being free from said base.

4,638,986

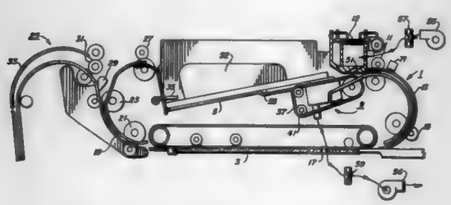
FEEDABILITY SENSOR FOR A VACUUM CORRUGATED FEEDER

Raymond W. Huggins, Pittsford, and Ralph A. Shoemaker, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 2, 1984, Ser. No. 667,693

Int. Cl.[4] B65H *3/12*

U.S. Cl. 271—98 **18 Claims**



1. In a vacuum corrugation sheet feeder system having an air knife to provide air pressure to separate a bottom sheet from the remainder of the sheets in the stack in a sheet feeder tray, the method of controlling the air pressure comprising the steps of:

driving the sheet feeder tray at resonant frequency,

increasing the air knife pressue from a point where the sheet stack moves with the tray to the point where the sheet stack remains stationary,

estimating the weight of the stack,

estimating the frictional force to maintain a given vibrational amplitude,

determining the coefficient of friction between the bottom two sheets of the stack, and

controlling the amount of air pressure from the air knife until a predetermined coefficient of friction is achieved.

4,638,987

AUTOMATIC DOCUMENT FEEDER

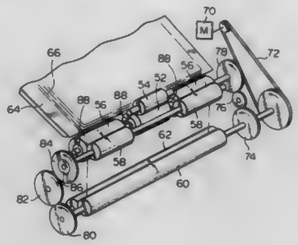
Yasuo Sakurai, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 16, 1985, Ser. No. 809,192

Claims priority, application Japan, Dec. 20, 1984, 59-267378

Int. Cl.[4] B65H *7/02*

U.S. Cl. 271—111 **8 Claims**



1. An automatic document feeder, comprising:

a separator roller and first feed rollers which are mounted coaxially with said separator roller;

a friction roller driven by said separator roller when the separator roller is rotated for separating documents stacked on a tray one at a time;

second feed rollers mounted coaxially with each other and held in contact one with each of the first feed rollers for feeding a document which has been separated by the separator roller;

reversible drive means drivably connected to the coaxial separator roller and first feed rollers and to said coaxial second feed rollers by a gearing; and

means responsive to a motion of the reversible drive means in one direction for rotating the separator roller and the first feed rollers in said one direction such that the separator roller drives the friction roller to separate a document and the first feed rollers drive the second feed rollers associated therewith to feed the separated document, and responsive to a motion of the drive means in the other direction for rotating the second feed rollers in said other direction such that the second feed rollers drive the first feed rollers associated therewith to further feed the document with the separator roller driven by the document which is fed by the first and second feed rollers.

4,638,988

SHEET STACK SUPPORT TRAYS

Ian G. Kershaw, Old Stevenage, United Kingdom, assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 7, 1985, Ser. No. 742,497

Claims priority, application United Kingdom, Jun. 22, 1984, 8416013

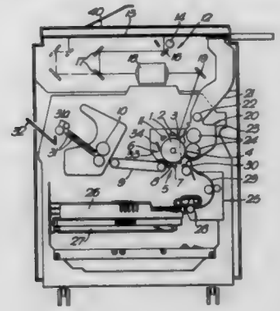
Int. Cl.[4] B65H *1/00*

U.S. Cl. 271—171 **2 Claims**

1. In a document sheet feeder for a copier with a document stacking tray with variabley spaced-apart edge guides, in which flimsy document sheets of various dimensions must be stacked in said tray and fed out from said tray between said

edge guides without mis-stacking or binding between said edge guides, yet in which said edge guides must maintain substantial alignment of said documents by maintaining said edge guides spaced apart by a distance only slightly greater than the dimensions of the documents being so stacked and fed, wherein one of said edge guides is fixed and the other is resettable to variable spacings relative thereto to accommodate different document sheet dimensions, and wherein said resettable side guide is resettable by a slideable movement of said side guide and an integral slide mounting therefor which is integral with said tray, the improvement wherein:

said resettable edge guide is slideably mounted to said slide mounting therefor with a preset limited degree fo allowable independent slideable movement between said resettable edge guide and said slide mounting,



and wherein preset spring force spring means are mounted to interconnect between said resettable edge guide and said slide mounting thereof,

said spring means being adapted to be compressed upon said resetting of said edge guide,

and said spring means being adapted to expand after said resettable edge guide has been reset to automatically slideably move said resettable edge guide away from said fixed edge guide by a small preset limited distance by said slideable movement between said resettable edge guide and its said slide mounting.

whereby said resettable edge guide retracts by said limited distance away from the documents when it is released after being pushed against a stack of documents in said tray.

4,638,989

DEVICE TO PREVENT TRANSPORT OF POORLY ALIGNED COPY PAPER

Yoji Senoo, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 30, 1985, Ser. No. 771,012

Claims priority, application Japan, Sep. 3, 1984, 59-134068[U]

Int. Cl.[4] B65H *7/08*

U.S. Cl. 271—227 **4 Claims**

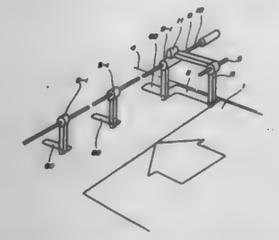
1. A device for ensuring correct transport of sheet material along a sheet material path comprising:

guide plate means, provided adjacent said sheet material transport path, for supporting said sheet material during transport, said guide plate means having an elongated reference edge parallel to said transport path and along one edge thereof, said elongated reference edge guiding an edge of said sheet material therealong during correct transport;

inlet feed means for feeding said sheet material to said transport path adjacent said guide plate means;

a plurality of actuator arms positioned transverse to said transport path, said actuator arms, when in a material restricting position inhibiting movement of said sheet material along said paper path, said actuator arms being collectively movable from said transport path in response to the pressure of said sheet material contacting at least a majority of said actuator arms and therefore being aligned with respect to said transport path; and

stopper means, positioned along said transport path upstream from said actuator arms and adjacent said elongated reference edge, for determining the presence of said sheet material adjacent said elongated reference edge, said stopper means inhibiting the movement of said actuator arms from said material restricting position until the presence of said sheet material is detected, thereby enabling movement of said actuator arms.



4,638,990

ROLL FEED APPARATUS WITH ADJUSTABLE NIP

Heizaburo Kato, Shizuoka, Japan, assignor to Sankyo Manufacturing Company, Ltd., Tokyo, Japan

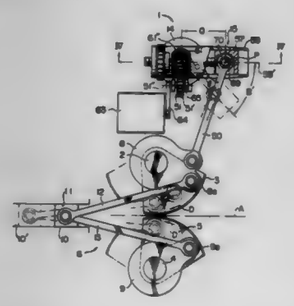
Filed Jul. 23, 1985, Ser. No. 757,980

Claims priority, application Japan, Jul. 27, 1984, 59-114306[U]

The portion of the term of this patent subsequent to Jan. 27, 2004, has been disclaimed.

Int. Cl.[4] B65H *17/36*

U.S. Cl. 271—272 **1 Claim**



1. A roll feed apparatus having a first roll integrally carried by a first roll shaft for oscillatory rotation therewith, a second roll integrally carried by a second roll shaft for oscillatory rotation therewith in the direction counter to that of rotation of said first rcll, said second roll being adapted for cooperation with said first roll in clamping therebetween a sheet and feeding said sheet, and a roll release means for moving, when said rolls are rotated in the directions counter to the feeding directions, said rolls relatively away from each other such as to release the clamping force which has been exerted by said rolls on said sheet, said roll feed apparatus comprising: a pivot member having a first end affixed to a pivot shaft extending from the housing of the apparatus substantially in parallel with the first roll shaft and a second free end, said pivoting member being mounted at a portion which is intermediate between said first and said second ends on a first roll shaft, said pivot member being adapted to cause, when it pivots, said first roll shaft and said first roll to move towards or away from said second

roll; a first adjusting device including a first casing fixed to said pivot member at a position between the second end of said pivot member and said first roll shaft, a first worm gear and a first wheel driven by said first worm gear, said first worm gear and said wheel being housed by said first casing, and a first screw rod held in screwing engagement with said wheel and having one end contacting said pivot member through a spring, such as to permit, when moved in one or the other direction by the rotation of said first wheel, an adjustment of a pressing force by which said pivot member is pressed such as to urge said first roll towards said second roll; and a second adjusting device including a second casing fixed to said housing, a second worm gear and a second wheel driven by said second worm gear, said second worm gear and said second wheel being housed by said second casing, and a second screw rod held in screwing engagement with said second wheel and having one end connected to said first casing, said second screw rod being adapted to cause, when moved in one or the other direction by the rotation of said second wheel, said pivot member to pivot through said first casing, such as to permit an adjustment of the size of the gap between said rolls.

4,638,991

ADJUSTABLE NIP ROLL FEED APPARATUS WITH BRAKING/RELEASING DEVICE

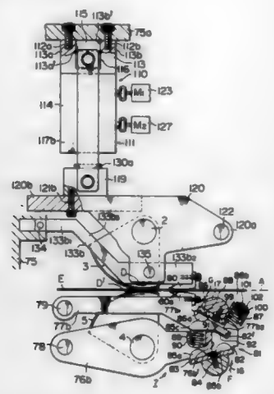
Heizuburo Kato, Shizuoka, Japan, assignor to Sankyo Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1985, Ser. No. 756,630

Claims priority, application Japan, Jul. 26, 1984, 59-112561[U]; Jul. 26, 1984, 59-112562[U]

Int. Cl.⁴ B65H *17/36*

U.S. Cl. 271—272 **2 Claims**



1. A roll feed apparatus having a first roll integrally carried by a first roll shaft for oscillatory rotation therewith, a second roll integrally carried by a second roll shaft for oscillatory rotation in the direction counter to that of rotation of said first roll, said second roll being adapted for cooperation with said first roll in clamping therebetween a sheet and feeding said sheet, a releasing/braking means for moving, when said rolls are rotated in the directions counter to the feeding directions, said second roll away from said first roll such as to release the clamping force which has been exerted by said rolls on said sheet, said releasing/braking means having first and second braking members, the first braking member being adapted to be moved towards said second braking member such as to temporarily fix said sheet when said sheet is unclamped from said rolls, and an adjusting device for adjusting the gap between said first and second rolls, wherein said adjusting device includes a pivot member having one end fitted on a first pivot shaft extending from the housing of the apparatus substantially in parallel with said first roll shaft and another end which is free, said pivot member being mounted at a portion between said fitted end and said free end on said first roll shaft, said pivot member being adapted to cause, when it pivots, said first roll shaft and said first roll to move towards and away from said second roll, and wherein said releasing/braking means includes a braking position adjusting arm disposed between said pivot member and the path of feed of the sheet and pivotally carried by said pivot member for pivotal movement about a second pivot shaft parallel to said first roll shaft, said braking position adjusting arm having one end pivotable on a third pivot shaft disposed adjacent said free end of said pivot member, said one end of said braking position adjusting arm being mounted on said housing for a slight sliding motion together with said third pivot shaft in the direction of feed of said sheet and in the direction counter to the feeding direction, another end of said braking position adjusting arm carrying said second braking member, and the positions of said first, second and third pivot shafts, the position of said first roll shaft, the position of said second braking member and the radius of said first roll being determined in relation to one another such that an imaginary plane connecting the portions of said first roll and said second braking member closest to the path of feed of said sheet is moved, when said pivot member pivots over a predetermined angle, substantially in parallel with the path of feed of said sheet.

4,638,992

SORTING APPARATUS

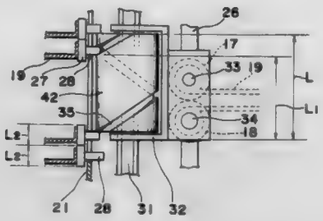
Akiyoshi Jobdai; Hirokazu Yamada; Yoshikazu Ikenoue, and Takuma Ishikawa, all of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 28, 1985, Ser. No. 792,733

Claims priority, application Japan, Nov. 7, 1984, 59-235606

Int. Cl.⁴ B65H *39/11*

U.S. Cl. 271—293 **9 Claims**



1. A sorting apparatus for sorting or collating copy paper sheets from a copying machine comprising:

a frame adapted to attach to a copying machine;

a plurality of bins supported on said frame for movement in a vertical direction, an adjacent pair of said bins being separated by a first predetermined distance in a non-expanded condition when copy paper sheets are not fed therebetween and being separated by a second predetermined distance in an expanded condition when copy paper sheets are fed therebetween, said second predetermined distance being greater than said first predetermined distance, each of said bins having a pair of pin members extending therefrom;

a pair of vertical shafts rotatably mounted on said frame;

a pair of cylindrical cams, each of which is mounted on a respective one of said vertical shafts, said cams being fixed for rotation with said vertical shafts and said cams being freely slidable in a vertical direction along said vertical shafts, each of said cams having a spiral groove formed on an outer cylindrical surface thereof for engagement with a respective one of said pair of pin members extending from a respective bin, each of said cams having a height in said vertical direction which is equal to at least the sum of said first and second predetermined distances, whereby a pair of adjacent bins are moved to an expanded condition without vertical movement of bins located above or below the bins being moved to an expanded condition.

4,638,993

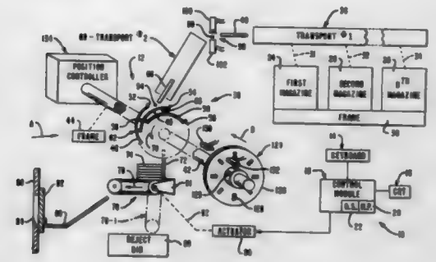
POSITION CONTROL FOR A STACKER WHEEL

Robert H. Granzow, Miamisburg, and Desh B. Gupta, Dayton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 29, 1981, Ser. No. 278,273

Int. Cl.⁴ B65H *29/20*

U.S. Cl. 271—315 **8 Claims**



1. In a media dispensing apparatus, the combination comprising:

a stacker wheel rotatably mounted in said apparatus;

said stacker wheel having compartments located around the periphery thereof with each said compartment having spaced ends providing an entrance area to the associated one of said compartments;

means for transporting media in spaced relationship along a path leading to a loading area with regard to said stacker wheel;

means for detecting the presence of a leading edge of one of said media in said path at a predetermined point from said loading area and also for generating a first signal in response thereto;

means for determining the rotational position of each said compartment of said stacker wheel with regard to said loading area to produce a second signal indicative of said position; and

means for rotating said stacker wheel and also for varying the velocity, when necessary, of said stacker wheel in response to said first and second signals so as to enable the leading edge of one of said media to be moved into a said compartment by said transporting means without contacting the associated said ends;

said means for rotating said stacker wheel and also for varying said velocity, hereinafter referred to as position controller, will vary said velocity, when necessary, in only a first direction; and

said stacker wheel having a shaft to rotate it and said position controller comprising:

a motor;

a resilient coupling means being operatively coupled between said motor and said shaft; and

a means for decelerating said shaft being operatively coupled to said shaft whereby as said motor rotates said shaft and stacker wheel via said resilient coupling means, said decelerating means will reduce said velocity of said shaft and stacker wheel in response to said first and second signals.

4,638,994

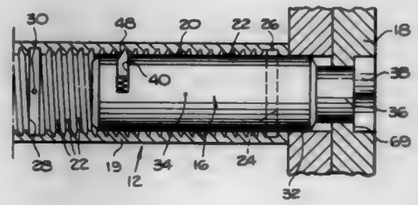
QUICK-BOLT LOCKING SYSTEM

Brian J. Gogarty, 5348 N. Magnolia, Chicago, Ill. 60640

Filed Jul. 30, 1984, Ser. No. 636,121

Int. Cl.⁴ A63B *11/00*

U.S. Cl. 272—122 **10 Claims**



1. An adjustable dumbbell, comprising,

a tubular main bar,

a plurality of weights having central holes therein,

an inner bar at each end of the main bar extending into the main bar, and having its outer end projecting outwardly beyond the main bar,

the holes in the weights being sufficiently large to pass over the outer end of the inner bar, and the longitudinally inner weight at each end bearing against the end of the main bar, and

a locking collar at each end, having a central hole capable of passing over the end of the inner bar, the inner bar and the locking collar being capable of being interlocking for preventing the locking collar from being removed over the inner bar, and

the inner bar and main bar having interlocking elements enabling interlocking the inner bar and main bar in response to pushing the inner bar axially inwardly, to a locking position locking the weights against the end of the main bar, and being capable of being threaded outwardly to release the weights.

8. Mounting means for mounting a member forming a central hole to a support, comprising,

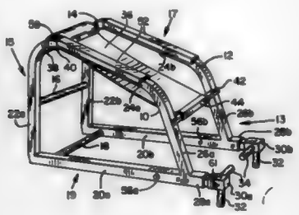
a support having a front face against which the member engages, and a recess opening through that front face, the member being positionable against said front face with the hole in register with the recess, and

locking means including a continuous and rigid main bar and an inner bar, the inner bar including a shank insertable into the recess and having a polygonal head on its outer surface, the polygonal head being dimensioned for passing through the hole in the member, and the main bar having a central hole sized to receive said polygonal head therethrough, and the marginal edge of the hole defining an outwardly facing socket capable of receiving said polygonal head in wrench-like position and whereby to the main bar to function as a wrench for turning the inner bar, and the inner bar and the surface of the recess having interlocking elements capable, in response to manipulation of the main bar, of releasably locking the member to the support,

one of the members having a continuous thread made up of buttress teeth having inclined surfaces facing axially outwardly and radially straight surfaces facing axially inwardly, and

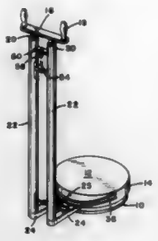
the inner bar having a insert tooth, yieldable radially, capable of snapping past the teeth in response to sliding the inner bar axially inwardly, but necessitating rotationally threading the inner bar to withdraw it axially outwardly.

4,638,995
EXERCISE CHAIR
Jerry L. Wilson, 485 NW. 170th Dr., Beaverton, Oreg. 97005
Filed Jan. 25, 1985, Ser. No. 694,950
Int. Cl.[4] A63B *23/02*
U.S. Cl. 272—144 13 Claims



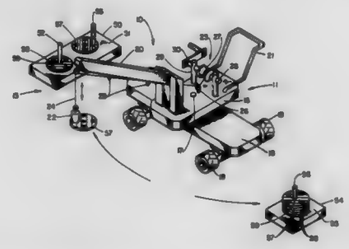
1. An exercise chair, comprising:
(a) a pair of frame means, disposed substantially parallel and spaced apart from one another, for supporting the chair on an underlying surface;
(b) connecting means disposed between said pair of frame means for rigidly attaching said frame means to one another;
(c) seat means for supporting a person seated on said exercise chair;
(d) anchor means for removably attaching said seat means to said frame means so as to be positioned therebetween;
(e) a pair of elongate shaft means for supporting a person performing physical exercises while said seat means is removed and a portion of said person's body resides between said frame means in the position of said seat means when attached, each of said shaft means being attached at one end thereof to one of said frame means and being unattached at the other end thereof; and
(f) attachment means movably connecting said elongate shaft means to said frame means for orienting said elongate shaft means in a first position where they are directed towards one another and a second position where they are not directed towards one another.

4,638,996
EXERCISE APPARATUS
Luther G. Simjian, Fort Lauderdale, Fla., assignor to Command Automation, Inc., Fort Lauderdale, Fla.
Filed Aug. 20, 1985, Ser. No. 767,524
Int. Cl.[4] A63B *23/02*
U.S. Cl. 272—146 24 Claims



1. An exercise apparatus comprising:
a stationary support;
a turntable platform mounted upon said support for oscillating rotating motion about a centrally disposed axis of said platform and adapted to support a person in standing position;
at least one substantially vertically disposed post mounted forward of the perimeter of said platform and supported for reciprocating substantially vertical, linear motion, and
drive means coupled between said platform and said post for causing, responsive to oscillating rotating motion of said platform, said post to be driven in reciprocating vertical motion.

4,638,997
COMBINATION TOY AND GAME
Gary E. Clark, Sikeston, Mo., assignor to G. W. Gilmore, Sikeston and R. G. Heywood, St. Louis, both of, Mo., part interest to each
Continuation-in-part of Ser. No. 596,040, Apr. 2, 1984, abandoned. This application Oct. 2, 1985, Ser. No. 782,937
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—1 GD 13 Claims

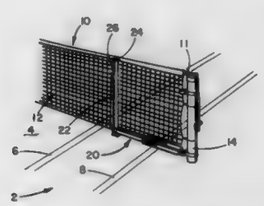


9. A combination toy and game apparatus for two players, comprising two sets of distinguishable, magnetic metal scoring pieces and each set thereof comprising a multiplicity of relatively flat and stackable discrete members having scoring indicia thereon, first and second spaced stations for holding said two sets of discrete scoring pieces, said first station being a starting station and including a pair of separate and spaced apart vertical pegs, each of which holds all of the scoring pieces in one of said sets in a vertically stacked starting condition, said second station being a scoring station and including at least one vertical peg adapted to receive all of the scoring pieces of at least one of said sets in a stacked condition thereon, all of said discrete scoring pieces in both sets having a central opening for the stacking of said scoring pieces on said vertical pegs, and magnetic toy means for individually transferring said discrete scoring pieces sequentially from said spaced pegs of said starting station to said second station, said magnetic toy means comprising crane means having a boom member adapted to be moved in a prescribed lateral horizontal arc between said starting and scoring stations, and magnet means adapted for selective vertical movement relative to said boom member and the vertical pegs of said starting and scoring stations whereby said scoring pieces are individually engagable by said magnet means and movable thereby in said vertical and horizontal paths of transfer from said starting station to said scoring station.

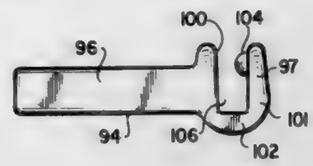
4,638,998
SINGLES STICK FOR NET HEIGHT ADJUSTMENT
John L. Shannon, Jr., 13297 Cardinal Creek Dr., Eden Prairie, Minn. 55344
Filed Apr. 19, 1985, Ser. No. 725,359
Int. Cl.[4] A63B *71/02*
U.S. Cl. 273—29 BB 14 Claims

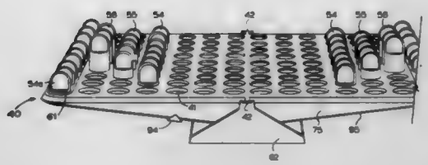
1. An attachment for a post which supports one end of an athletic net, which comprises:
(a) an elongated stick member having a height which is sufficiently long so that the stick member is capable of being wedged between a top edge of the net and the ground to raise the top edge of the net from its otherwise undisturbed orientation;

(b) means for releasably storing the stick member on the post so that the stick member is convenient for use,
(c) means for extensibly connecting the stick member to the post so that the stick member may be pulled toward or away from the post after release therefrom; and
(d) means responsive to movement of the stick member away from the post for limiting the extension of the connecting means to a predetermined distance in an operative position thereof which is selected in conjunction with the height of the stick member to raise the height of the net a precise amount at a particular point along its span, whereby the net may be accurately adjusted without having to manually measure the location of the stick member relative to the post.



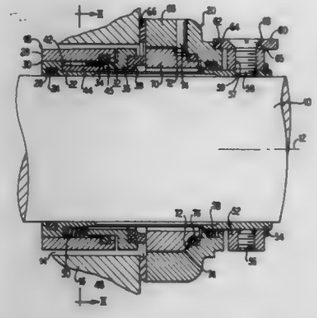
4,638,999
CLIPS FOR BALANCING TILTABLE BOARD GAME
Tadeusz W. Keska, Warwick, R.I., assignor to Jack B. Slimp, Jr., Manassas, Va.
Filed Feb. 15, 1984, Ser. No. 580,267
Int. Cl.[4] A63F *3/02, 9/00*
U.S. Cl. 273—258 20 Claims





20. In a game which includes a game board which tilts about projections extending from the board, means to adjust the balance of the board relative to said projections which comprises a pair of depending vertically disposed edges on the board extending generally horizontally and normally relative to said projections, said edges having a bead along their lower aspects, and means to adjust the balance of the board comprising U-shaped resilient clip means which is resiliently received by and bears on one of said edges above said bead and is slidable along said edge above said bead, said edges being generally lower than said projections and being inclined relative to the surface of the game board by not more than about 5°.

4,639,000
AUTOMATIC ALIGNING CARTRIDGE MOUNT SEAL
Dale J. Warner, 3916 Belmoor Dr., Palm Harbor, Fla. 33563
Filed Apr. 10, 1986, Ser. No. 850,107
Int. Cl.[4] F16J *15/34*
U.S. Cl. 277—41 13 Claims



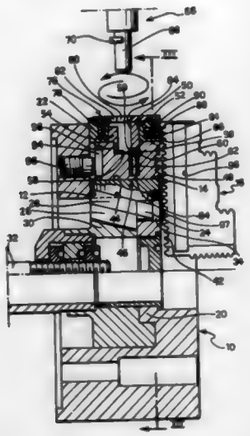
1. A cartridge mount seal for mounting on and sealing a rotatable shaft which extends through an opening in a machine wall, comprising:
a rotary seal unit including sleeve means for extending through the opening in the machine wall and for sealingly receiving the shaft therethrough, a seal ring, a seal ring adapter mounting said seal ring, drive means coupling said seal ring adapter to said sleeve means, and bias means urging said seal ring adapter and seal ring towards the opening in the machine wall;
a stationary unit for sealed attachment to the machine wall and including a cup-shaped stationary member sealingly mounted on said sleeve means, a chamber in said stationary member including an inner surface of changing diameter, a floating seal member in said chamber and about said sleeve means, said floating seal member sealingly engaging said seal ring and sealed to said cup-shaped stationary member, and anti-rotation means coupling said stationary and floating members, said floating seal member including an arcuate surface for engaging said inner surface in a line contact for automatic alignment of said floating seal member parallel to said seal ring and perpendicular to the axis of rotation of the shaft; and
means for securing said sleeve means to the shaft for rotation therewith.

4,639,001
SELF-CENTERING CHUCK WITH ADJUSTABLE AND REPLACEABLE JAWS
Giuseppe Berardo, Turin, Italy, assignor to Mario Pinto S.p.A., Turin, Italy
Filed Oct. 12, 1984, Ser. No. 660,181
Claims priority, application Italy, Oct. 13, 1983, 68056 A/83
Int. Cl.[4] B23B *31/16*
U.S. Cl. 279—121 8 Claims

1. A self-centering chuck of the type comprising:
an annular body having a frontal face and defining radial recesses;
respective false jaws slidable radially in said recesses and each defining a respective cavity parallel to the axis of the chuck;
a rod coaxial with the chuck and operable to effect sliding of the false jaws;
respective jaws also slidable in said recesses and radially removable therefrom each jaw projecting from the frontal face of the chuck body and having tangential teeth facing the respective false jaw;
respective pegs slidable parallel to the axis of the chuck in the cavities of the false jaws irrespective of the radial

position of said false jaws and each having teeth engageable with the teeth of a respective jaw, and

key operated means, operable from outside the chuck body, for moving the pegs selectively to disengage and reengage the pegs in relation to the respective jaws,



wherein the improvement consists in each peg having a transverse groove facing radially outwardly of the chuck, and the moving means comprising, for each peg, a respective eccentric rotatable within the respective false jaw about a radial axis parallel to the direction of sliding of the false jaw and engaged in the groove, said eccentric having a formation engageable positively by the key to rotate it.

4,639,002

WHEELED TROLLEY FRAME

Ladislav S. Karpisek, 86 Woodfield Blvde., Caringbah/Sydney, Australia (2229)

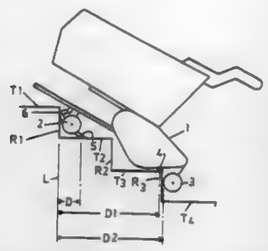
PCT No. PCT/AU84/00181, § 371 Date May 13, 1985, § 102(e) Date May 13, 1985, PCT Pub. No. WO85/01259, PCT Pub. Date Mar. 28, 1985

PCT Filed Sep. 14, 1984, Ser. No. 751,742

Claims priority, application Australia, Sep. 14, 1983, PG1400

Int. Cl.⁴ B62B *5/02*

U.S. Cl. 280—5.2 **4 Claims**



1. A wheeled trolley frame for use on an escalator, four ground engaging wheels comprising a pair of wheels adjacent each of two ends of the frame, said wheel pairs being spaced to thereby prevent the wheel pairs from not only sitting upon a single tread of a step of an escalator but also on the treads of two consecutive steps of an escalator, positioning means on the frame adjacent the first pair of wheels, an abutment face on said positioning means extending beyond the first pair of wheels adapted to engage the riser of a formed escalator step preceding the escalator step over which the first pair of wheels is positioned, a first escalator tread enagaging member on the frame located between the pairs of wheels and between the wheels of the first pair of wheels and vertically spaced above a ground plane on which all of the wheels would normally rest, a pair of second escalator tread engaging means mounted on the frame between the pairs of wheels and respectively adjacent the wheels of the second pair of wheels and vertically spaced above the ground plane, the first and second escalator tread engaging members providing a three point support for the frame when mounted on a formed escalator, said first and second escalator tread engaging members being respectively spaced from the abutment face of the positioning means by predetermined distances, whereby when the frame is on a formed escalator with the abutment face engaging a step riser preceding a first escalator tread the first tread engaging member bears on the first escalator tread and the first pair of wheels are positioned above and spaced from the first escalator tread and the second tread engaging members bear on the following second escalator tread and the second pair of wheels overlie the following third escalator tread and spaced therefrom.

4,639,003

POSITIVE LOCK MECHANISM FOR MOVING BOARD

Roger A. Potter, 6460 Windham Ave., Alexandria, Va. 22310

Filed Feb. 10, 1986, Ser. No. 827,966

Int. Cl.⁴ B62B *5/04*

U.S. Cl. 280—5.24 **2 Claims**



1. A piano board for carrying a piano and for use in sliding said piano, either in ascent or descent, over the crests of a flight of stairs with said piano board having a depending spade element to automatically allow said piano board to be rested freestanding, whether in such ascent or descent, at any one or all of the steps of said flight of stairs without the intervention or application of force on the part of any human operator to physically hold said piano board with its piano carried thereon in its rested position on the stairs; said piano board comprising a flat platform, foot, longitudinal runners, cross shaft, depending spade element, torsion spring and lanyard; said piano board being of the sled type and having said flat platform, said flat platform having a lower surface, said flat platform having terminal ends, said foot being upstanding from one of said terminal ends of said flat platform, said longitudinal runners depending from said platform, said runners freely carrying said cross shaft in transverse relationship therewith, said spade element having proximal and distal ends, said cross shaft freely mounting thereon said spade element in pivotal relationship between its said proximal and distal ends with said spade element thereby functioning as a first order lever, said cross shaft freely mounting thereon said torsion spring, said torsion spring having tails at its remote ends, said spring tails being in abutting relationship against and operative engagement with said lower surface of said flat platform and said spade element to constrain said spade element to rotate in one direction, said lower surface of said flat platform functioning as a limit stop to prevent further constrained rotation of said spade element upon said proximal end of said spade element abutting said lower surface of said flat platform, said lanyard being operatively connected to said spade element and, upon said lanyard being pulled sufficiently by a human operator and held as pulled, said spade element being caused to rotate to its retracted position between and within said longitudinal runners; upon ascent of said piano board over a flight of stairs: said runners sliding upwardly upon and over the crests of said flight of stairs, and the step riser before the next higher crest and said next higher crest, engageable by said spade element, engaging said spade element and causing said spade element to rotate in one direction towards its retracted position, and, upon said spade element passing beyond said next higher crest, the restoring force of said spring causing said spade element to rotate in the direction opposite to its retracted position to its position of automatic engagement and positive lock with said distal end of said spade element engaging the stair tread after said next higher crest and with said proximal end of said spade element abutting said lower surface of said flat platform; and upon descent of said piano board over a flight of stairs: said lanyard being pulled sufficiently by a human operator and being held as pulled to cause said spade element to be rotated to its said retracted position, and said runners sliding downwardly upon and over the crests of said flight of stairs to the next lower step engageable by said spade element, and, upon said lanyard being manually released by the human operator, the restoring force of said spring automatically causing said spade element to rotate to its position of automatic engagement and positive lock with said distal end of said spade element engaging the stair tread of said next lower step with said proximal end of said spade element abutting said lower surface of said flat platform.

4,639,004

HAND CART WITH FULCRUM LEVER AND VERTICALLY ADJUSTABLE AUXILIARY WHEELS

Kazuya Maeda, Osaka, and Yasusuke Ishihara, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Sano Sharyo Seisakusho Co., Ltd., both of, Japan

Filed Nov. 29, 1984, Ser. No. 676,381

Claims priority, application Japan, Nov. 29, 1983, 58-184764[U]; Nov. 29, 1983, 58-184765[U]; Jan. 13, 1984, 59-5095

Int. Cl.⁴ B62R *5/02*

U.S. Cl. 280—5.32 **4 Claims**



1. A hand-propelled cart comprising:

(a) a body having a pair of laterally spaced side frames each provided with an inner surface;

(b) a vertically movable mechanism movable along said body, said vertically movable mechanism comprising an upper support pipe having ends positioned respectively in said side frames, a lower support pipe having ends positioned respectively in said side frames, rollers rotatably mounted respectively on said ends of said upper and lower support pipes for rolling engagement with said inner surfaces of said side frames, and a pair of brackets fixed to said upper and lower support pipes;

(c) a pair of main wheels rotatably mounted on said vertically movable mechanism at a lower end portion of said body;

(d) a pair of auxiliary wheels rotatably mounted on said body above said main wheels; and

(e) a control lever pivotably mounted on said vertically movable mechanism and having contact means disposed radially outwardly of said main wheels for contacting a floor to function as a fulcrum when said control lever is turned downwardly, for lifting said body and said main wheels off the floor through the leverage of said control lever.

4. A hand-propelled cart comprising:

(a) a body having a substantially L-shaped side elevational configuration and including a handle and a cargo rest;

(b) a pair of main wheels rotatably mounted on a lower end portion of said body;

(c) a pair of auxiliary wheels rotatably mounted on said body above said main wheels;

(d) a foldable control lever pivotably mounted on said body adjacent to said main wheels and composed of lower and upper levers pivotably interconnected by pivots disposed radially outwardly of said main wheels for contracting a floor to function as a fulcrum when said control lever is turned downwardly, for lifting said body and said main wheels off the floor through the leverage of said control lever;

(e) a first lock mechanism disposed between each of said lower levers and said body for locking each said lower lever against downward angular movement; and

(f) a second lock mechanism disposed between said lower and upper levers in each pair for locking said upper levers against downward angular movement.

4,639,005

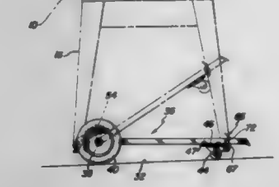
CARRIAGE APPARATUS FOR SAW TABLES

Adrian N. Birkley, 3413 N. 31st St., Phoenix, Ariz. 85016

Filed Jun. 3, 1985, Ser. No. 740,562

Int. Cl.⁴ B62D *61/12*

U.S. Cl. 280—43.14 **4 Claims**



1. A dolly for transporting a support table for a table saw, said table having four legs to which said dolly is attached, said dolly comprising:

a low-lying, flat, wheeled, frame structure having a front crossbar and a rearwardly extending, central, truss beam;

wheels mounted on the opposite ends of said front crossbar;

stearing means mounted rearwardly on said truss beam for controlling the directional movement of said dolly;

a front support brace forwardly disposed on and secured to said front crossbar;

wherein said front support brace includes a plurality of spacer struts mounted between said front support brace and said front crossbar, whereby said front support brace is positioned forwardly and below said front crossbar;

a rear support brace adapted to be releasably attached to said truss beam;

said rear support brace including an alignment means mounted thereon, whereby said truss beam engages said alignment means to prevent lateral movement between said truss beam and said rear support brace;

latching means mounted to said truss beam and positioned to releasably attach said rear support brace to said truss beam;

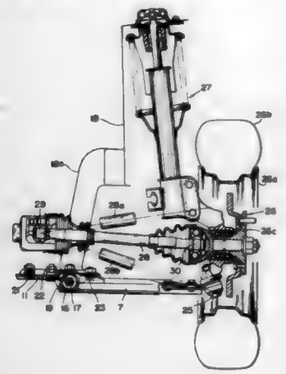
wherein said latching means comprises:
a latch pedal pivotally mounted in said truss beam;
a latch tongue formed on one end of said latch pedal;
a keeper member affixed to said rear support brace, and positioned to be releasably engaged by said latch tongue; and
a spring interposed between said latch pedal and said truss beam to bias said latch tongue in a latched position;
means for attaching said front support brace and said rear support brace to the respective legs of said support table.

4,639,006

SUSPENSION ARM ASSEMBLY FOR SUPPORTING AUTOMOBILE WHEEL

Hiroshi Aikawa, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Japan

Continuation of Ser. No. 331,071, Dec. 16, 1981, abandoned. This application Oct. 22, 1985, Ser. No. 789,929
Claims priority, application Japan, Jan. 19, 1981, 56-5519[U]
Int. Cl.⁴ B60G 7/00
U.S. Cl. 280—96.1 **12 Claims**



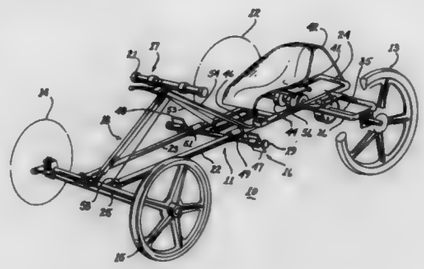
1. A front engine front wheel drive motor vehicle comprising:
a vehicle body;
right and left front road wheels; and
right and left suspension arm assemblies each of which includes a suspension arm supporting one of said front road wheels;
first and second bushing means placed apart from and coaxially with each other along the longitudinal direction of the vehicle,
a substantially flat and horizontal gusset plate swingably joined with said suspension arm by said first and second bushing means, and fixed substantially horizontally to a downwardly facing surface of said vehicle body by at least three nonpermanent fastening means in such a manner that said gusset plate can be removed from said vehicle body and fixed again, said fastening means being distributed along both the longitudinal direction and the lateral direction of the vehicle on a substantially horizontal planar surface of said gusset plate and at least two of said fastening means being spaced along the longitudinal direction of the vehicle at a distance approximately equal to a space between said first and second bushing means, said first bushing means projecting from said gusset plate towards the front of the vehicle, said second bushing means being located ahead of a rear end of said gusset plate under said gusset plate.

4,639,007

EXERCISE VEHICLE

Donald R. Lawrence, Tempe, Ariz., assignor to Fred W. Wagenhals, Tempe, Ariz.

Filed Sep. 19, 1985, Ser. No. 777,919
Int. Cl.⁴ B62M 1/12
U.S. Cl. 280—234 **8 Claims**



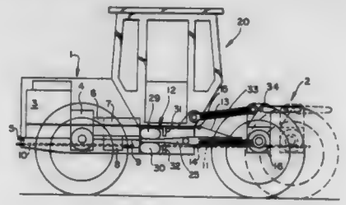
1. An exercise vehicle comprising a framework, a rear axle attached to said framework, a pair of rear wheels operatively attached to the ends of said rear axle, one of said rear wheels being driven by said rear axle, a front axle supported by said framework, a pair of front wheels operatively and steerably mounted on the ends of said front axle, an operator's seat mounted on said framework, an operator's foot actuated member slidably mounted on said framework, a first one-way clutch mounted on said rear axle, a first cable connecting said foot actuating member and said first one-way clutch, whereby moving said foot actuating member moves said vehicle in a forward direction, an extensible steering column pivotally attached at its lower end to said framework adjacent said front axle, a rigid rockable link connecting said extensible steering column at its upper end to said framework rearwardly of said front axle, a hand operated arm attached to the upper end of said steering column, a second one way clutch mounted on said rear axle, and a second cable connecting said rockable link from adjacent said upper end of the steering column to said second one-way clutch whereby moving said hand operated arm moves said vehicle in a forward direction indpendently of said foot actuated member.

4,639,008

SELF-PROPELLING VEHICLE WITH TWO AXLE UNITS CANTILEVERED TOGETHER

Gustav Krettenauer, Gaggenau, and Heinz Kiwitz, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,391
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1983, 3300335
Int. Cl.⁴ B62D 49/06
U.S. Cl. 280—405 R **22 Claims**



1. A self-propelling commercial vehicle, comprising two units each having and being supported by a single unsprung axle means, one of said units forming a drive unit and including a drive mechanism therefor and a driver place within an area of

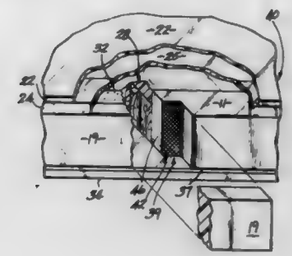
the one unit at an end adjacent to the other unit, and means including cantilever means for guiding the other unit, said cantilever means being pivotally connected with the one unit in the vertical direction about a horizontal axis and elastically supported with respect to said one unit, the cantilever means being additionally connected to and pivotal in the vertical direction with respect to a horizontal axis of the axle means of said other unit, and guide means for rectilinear guidance of said other unit, said guide means being connected to both units and disposed offset in the vertical direction to the cantilever means, being detachable to and vertically pivotal about horizontal axes with respect to both the axle means of the other unit and to the drive unit, wherein the connection between the drive and other unit by the cantilever and guide means does not permit unloading of the axle means of the one unit by increased changes in loading on the second unit when the guide means is detached.

4,639,009

SNOW SKI WITH ELASTOMERIC SIDEWALLS

Franklin D. Meatto, Cromwell, and Edward D. Pilpel, Avon, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Dec. 30, 1985, Ser. No. 814,832
Int. Cl.⁴ A63C 5/04
U.S. Cl. 280—602 **13 Claims**



1. An alpine snow ski for skiing across snow covered ground, the ski being of selected length with a contact length intermediate the shovel and the tail and having a binding area beneath where the center of gravity of a skier on the ski is located, comprising in combination:
(a) a bottom running surface;
(b) a pair of bottom edges flexibly mounted to the bottom running surface defining the lateral side limits of the ski along the bottom running surface;
(c) a core positioned above the bottom running surface and intermediate the lateral side limits of the ski;
(d) a plurality of generally horizontally positioned laminate layers below the core and above the bottom running surface and above at least a portion of the core;
(e) a top surface layer extending generally horizontally between the lateral side limits of the ski overlying the core and at least one of the plurality of generally horizontally positioned laminate layers above at least a portion of the core;
(f) a pair of top edges defining the lateral side limits of the top of the ski, the top edges being positioned above the core and beneath the top surface layer; and
(g) a pair of sidewalls extending along the selected length of the ski and between at least a portion of the lateral side limits of the pair of top edges and the bottom edges, the pair of sidewalls being formed at least partially of an elastomeric material and a second sidewall material, the elastomeric material being within the contact length, but extending a distance less than the selected length of the ski and including at least an area generally alongside the binding area where the center of gravity of a skier is located to Permit the bottom edges to flex upwardly to absorb shock as the bottom running surface passes over snow covered ground.

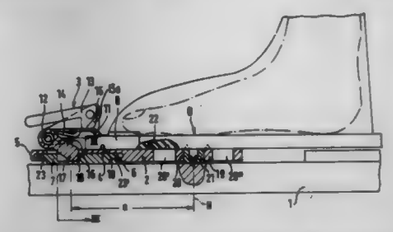
12. In an alpine snow ski having a shovel and a tail, a pair of bottom edges adjacent a bottom running surface and a pair of sidewalls forming a curvature of the sidecut of the ski along the lateral side limits, the ski further being of a selected length with a contact length intermediate the shovel and the tail, the improvement comprising in combination;
(a) the pair of sidewalls being formed at least partially along the contact length of an elastomeric material and a second sidewall material to form a composite sidewall, said second sidewall material and said elastomeric material having at least one stepped portion fitting beneath and interiorly to engage the second sidewall material;
(b) a pair of bottom edges flexibly connected to the bottom running surface, at least the bottom edges on the uphill side flexing upwardly with the elastomeric material in a turn to absorb shock as the bottom running surface passes over snow covered ground to increase the curvature of the sidecut of the ski so that the shovel and the tail dig into the snow permitting a sharper turn with a smaller radius to be effected.

4,639,010

RELEASABLE CROSS-COUNTRY SKI BINDING

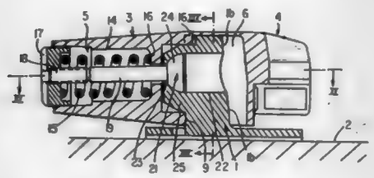
Georg Scheck, Leonberg; Martin Bogner, Ostfildern; Manfred Schmidt, Sindelfingen, and Ulrich Kowatsch, Leonberg, all of Fed. Rep. of Germany, assignors to GEZE GmbH, Leonberg, Fed. Rep. of Germany

Continuation of Ser. No. 557,220, Dec. 2, 1983, abandoned. This application Jan. 29, 1986, Ser. No. 823,962
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1982, 3245668
Int. Cl.⁴ A63C 9/02, 9/16
U.S. Cl. 280—615 **12 Claims**



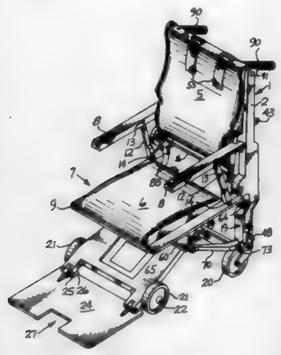
1. A releasable cross-country ski binding for securing to a cross country ski, a shoe having a sole with a toe region, a ball region immediately behind said toe region, and a heel region behind said ball region; said ski binding comprising: means for supporting a toe region of the shoe and a ball region of said shoe, said supporting means comprising a sole plate which includes a forwardly disposed relatively rigid base plate and a rearwardly disposed relatively flexible extension secured to said base plate; means for securing said shoe at said toe region supporting means to an upper surface of a said sole plate while permitting lifting of the heel region of the shoe from the ski during skiing; and means for defining an axis of rotation for the ski shoe relative to the ski, said means for defining said axis of rotation comprising a journal secured to said ski and a corresponding recess arranged in said extension for receiving said journal therein; said axis of rotation extending substantially at right angles to the upper surface of the ski through said ball region supporting means; means for releasing the ski shoe and sole plate from the ski on the occurrence at said toe region of the ski shoe, of lateral forces which correspond to an excessive turning moment about said axis of rotation, including a latch mechanism cooperating with a latch recess, one of said latch mechanism and said latch recess being carried by said sole plate, and the other of said latch mechanism and said latch recess being carried by a latch carrier fixedly mounted on the ski in front of said ball region supporting means.

4,639,011
SAFETY SKI BINDING
Pierre Rullier, Annecy, France, assignor to Salomon S.A., Annecy, France
Filed Feb. 13, 1984, Ser. No. 579,376
Claims priority, application France, Feb. 14, 1983, 83 02309
Int. Cl.[4] A63C *9/085*
U.S. Cl. 280—628 57 Claims



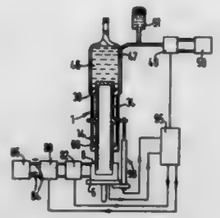
1. A safety ski binding adapted to releasably hold one end of a ski boot on a ski, wherein said binding comprises at least two elements comprising:
(a) a jaw comprising a portion adapted to hold one end of said boot and adapted to laterally pivot; and
(b) a support, adapted to be fixed to said ski, wherein said support comprises first and second surfaces, wherein said first surface faces said portion of said jaw and said second surface is opposite from said first surface, wherein said support further comprises two downwardly converging lines of support on said second surface, wherein said jaw is adapted to laterally pivot around either one of said two lines of support, wherein each of said lines of support comprises one of the members of the following group:
at least one groove and at least one projection, wherein said jaw comprises the other of the members from said group, wherein said at least one groove on one of said elements of said binding engages said at least one projection on the other of said elements of said binding during lateral pivoting of said jaw around said lines of support.

4,639,012
AIRBORNE FOLDING WHEELCHAIR
Tom M. Jensen, Everett, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Apr. 14, 1986, Ser. No. 851,611
Int. Cl.[4] B62B *7/06*
U.S. Cl. 280—642 10 Claims



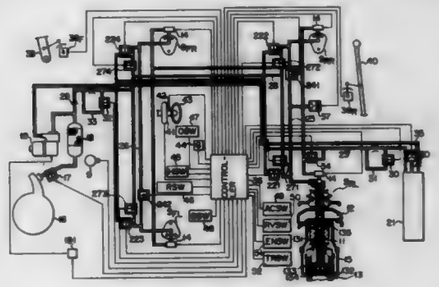
1. A wheelchair assembly, comprising: a back frame having a pair of parallel, vertically elongated side frame members and horizontal frame members secured between said side frame members for forming a rigid back frame structure which is adapted to be secured to a support member; seat pan frame extending horizontally forward from said back frame when in a position for occupancy and being pivotally supported at its aft end to said back frame for upward rotary movement to a vertical storage position; rear support legs formed by a lower section of said back frame, below the pivotal connection of said seat pan frame; front support legs comprising a folding linkage mechanism supportably mounted to the lower section of said back frame independently of said seat pan frame and forwardly extendable therefrom, for forming the front support legs when said linkage mechanism is locked in a forward extended position and being foldable substantially parallel to said back frame while in a retracted position; and wheels mounted to the lower ends of the front and rear support legs for rolling movement of the chair configuration, wherein said wheelchair assembly is usable either as a wheelchair, with said front support legs being forwardly extended, or as a seat with said front support legs in the retracted position and said back frame being secured to the support member.

4,639,013
VEHICLE SUSPENSION ARRANGEMENTS
David A. Williams, Cranfield, and Peter G. Wright, Norwich, both of England, assignors to Group Lotus Car Companies PLC, Norwich, England
Filed Feb. 21, 1985, Ser. No. 704,912
Claims priority, application United Kingdom, Feb. 8, 1985, 8503290
Int. Cl.[4] B60G *17/00*
U.S. Cl. 280—707 19 Claims



1. In a vehicle suspension system:
a wheel suspension device, said wheel suspension device comprising a double-acting hydraulic actuator, said hydraulic actuator having a piston movable therein, and gas spring means in parallel with said hydraulic actuator, said gas spring means being controllable to provide a selectively variable offset,
a hydraulic fluid pressure source,
a pressure fluid line communicating said hydraulic actuator with said hydraulic fluid pressure source,
valve means in said pressure fluid line,
sensor means providing an output in response to the sensing thereby at a load change experienced by said suspension device, and
control means responsive to said sensor means output to supply a control signal to said valve means to thereby effect adjustment of said hydraulic actuator before change of said offset of said gas spring means, to accommodate said load change.

4,639,014
VEHICLE SUSPENSION APPARATUS
Tadao Tanaka, Okazaki; Sunao Chikamori, Nagoya; Mitsuhiko Harara, Okazaki; Yasutaka Taniguchi; Masanaga Suzumura, both of Nagoya; Minoru Tatemoto, Okazaki; Naotake Kumagai, Aichi; Hiroki Abe, and Shozo Takizawa, both of Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 25, 1985, Ser. No. 727,285
Claims priority, application Japan, Apr. 25, 1984, 59-60925[U]; Apr. 8, 1985, 60-51959[U]
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—707 16 Claims



1. A vehicle suspension apparatus comprising:
a vehicle height sensor means for detecting the vehicle height;
timer means coupled to the sensor means for determining a cycle period of vertical vibration of the vehicle height;
switching means coupled to a control means for switching the characteristic of the suspension apparatus to a hard one or a soft one; and
said control means being coupled to said timer means for causing said switching means to hold said suspension apparatus characteristic to said hard one while the cycle period of vertical vibration of the vehicle height is within a predetermined interval of time.

4,639,015
Z-NECK, T-BAR TRAILER
John A. Pitts, 1600 Rosharon Rd., Lot #32, Alvin, Tex. 77511
Filed Aug. 19, 1985, Ser. No. 767,092
Int. Cl.[4] B62D *63/06*
U.S. Cl. 280—789 9 Claims



1. A heavy load handling trailer incorporating a main frame including a main center longitudinal frame member having front and rear ends, towing tongue means carried by the front end of said center frame member and projecting forwardly therefrom, the rear end portion of said center frame member including three central longitudinally spaced and transverse load support members anchored relative thereto and projecting outwardly of opposite sides of said center frame member, a pair of rear opposite side frame members extending between, bridging and anchored relative to corresponding end portion of said transverse members, front-to-rear extending sleeve means anchored relative to said center longitudinal frame member on one side thereof and also anchored to said transverse members, an elongated rear frame extension member adjustably telescoped into said sleeve means and projecting rearwardly of said center frame member and the rear ends of opposite side frame members, a rear transverse load support member carried by the rear end of said frame extension and projecting outwardly from the opposite sides thereto, said trailer frame including tandem axles dependently supported from said central longitudinally spaced transverse load support members, the rear ends of said opposite side members projecting rearwardly of the rear end of said center longitudinal frame member and the opposite ends of said rear transverse load support member including portions overlying and supported from the rear ends of said opposite side frame members when said rear frame extension member is forwardly retracted.

4,639,016
PIPELINE REPAIR KIT
Russell L. Rogers, Munith; Neill D. Perrine, and Richard M. Alexander, both of Jackson, all of Mich., assignors to Aeroquip Corporation, Jackson, Mich.
Filed Mar. 12, 1984, Ser. No. 588,354
Int. Cl.[4] F16L *27/00*
U.S. Cl. 285—15 5 Claims

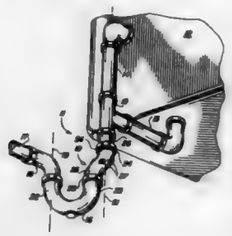


1. A pipeline repair system for interconnecting the spaced and misaligned ends of a ruptured pipeline having a cylindrical exterior surface comprising, in combination, a pair of tubular pipeline fittings each having compression sealing means for producing a sealing connection to the exterior cylindrical surface of a pipeline end and a tubular cylindrical extension for extending beyond the associated pipeline end, a primary rigid linear bridging conduit having cylindrical ends located between said fittings, a pair of angle conduits having cylindrical ends located adjacent each end of said bridging conduit and adjacent a pipeline fitting, each of said angle conduits having an outer cylindrical end and an inner cylindrical end, the axes of said cylindrical ends of an angle conduit intersecting and being angularly offset relative to each other, first rotatable sealing means sealing said inner cylindrical ends of an associated pair of angle conduits in rotatable aligned relationship whereby relative rotation of the associated angle conduits changes the angular relationship of said outer cylindrical ends of the associated angle conduits, second rotatable sealing means defined upon said ends of said bridging conduit rotatably sealing an outer end of each pair of associated angle conduits in communication therewith, and third rotatable sealing means rotatably sealing the other outer end of each pair of associated angle conduits to a pipeline fitting extension in communication therewith to establish sealed communication between the pipeline ends, said sealing means each including annular rotatable locking means interposed between the associated angle conduits, the associated bridging and angle conduits and the associated angle conduits and pipeline fitting extensions permitting relative rotation therebetween and preventing relative axial displacement thereof.

4,639,017
OFFSET NIPPLE
Dennis R. Domas, 7328 N. 22nd St., Phoenix, Ariz. 85020
Filed Dec. 24, 1985, Ser. No. 812,942
Int. Cl.[4] F16L *37/26*
U.S. Cl. 285—38 3 Claims

1. An offset nipple for interconnecting two substantially parallel but nonaligned pipes in waste and vent connections comprising:
a hollow pipe section distorted at each end to form inlet and

outlet ports, said ports being interconnected by an arcuate portion,
said arcuate portion having a roughened surface in the form



of a raised pad on its outer periphery at each of the four quadrants of said arcuate portion for gripping by the installer when using it to interconnect said inlet and outlet ports with nonaligned pipes.

4,639,018

JOINT FOR A WATER-CARRYING PIPE SYSTEM

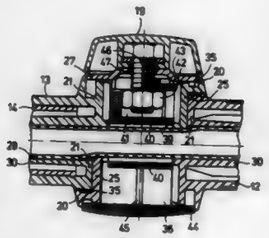
Hans Froelich, Bernstadt; Willi Hepperle, Westerstetten; Johann Katzer, Neu-Ulm, and Christian Stephany, Ulm, all of Fed. Rep. of Germany, assignors to Gardena Kress & Kastner GmbH, Fed. Rep. of Germany

Filed Jul. 10, 1985, Ser. No. 753,429

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1984, 3426575

Int. Cl.⁴ F16L *27/00*

U.S. Cl. 285—184 **23 Claims**



1. A joint for a liquid-carrying pipe system, in which connected ends of two rigid pipes in each case have a joint shoulder with a disk part provided with a tooth system, arranged in a plane parallel to a longitudinal axis of the pipes and having a bore for receiving a fastening element, the fastening element having a longitudinal axis at right angles to the longitudinal axis of the pipes and, said system having a flexible hose for guiding liquid in the system through the joint, wherein the disk parts are arranged on opposite lateral sides and on either longitudinal side of the joint, the hose being connected in liquid-tight manner to the pipe ends.

4,639,019

LUER CONNECTION

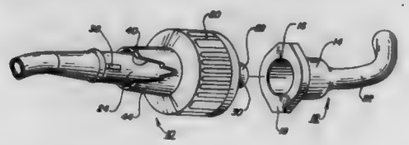
Herbert Mittleman, Deerfield, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 44,943, Jun. 4, 1979, abandoned. This application Jan. 6, 1981, Ser. No. 223,072

Int. Cl.⁴ F16L *19/02*

U.S. Cl. 285—332 **20 Claims**

1. A luer connection device which comprises:
a male luer connector comprising a tubular body defining a bore with the front end thereof adapted for insertion into a female luer connector and the rear end thereof adapted for coupling to tubing;
said tubular body having a front portion contiguous with said front end and a main portion that is separated from said front portion by a sleeve-retaining member;
a sleeve having a generally resilient rear portion that is slideable along said main portion and having a front portion that is internally threaded and adapted for receiving an outer flange carried by the female luer connector;



said main portion of said tubular body being tapered outwardly in the forward direction whereby increased compression between the rear portion of the sleeve and said main portion occurs as said sleeve is moved forwardly.

4,639,020

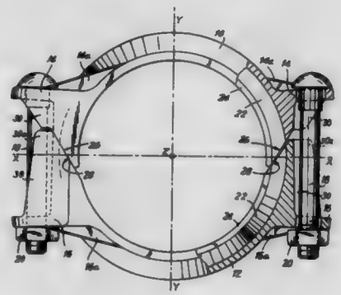
SELF-ADJUSTING PIPE CLAMP AND COUPLING

Robert Rung, Hopatcong, N.J., and Lani G. Ache, Allentown, Pa., assignors to Victaulic Company of America, Easton, Pa.

Division of Ser. No. 512,934, Jul. 12, 1983. This application Jun. 5, 1986, Ser. No. 871,453

Int. Cl.⁴ F16L *17/00*

U.S. Cl. 285—367 **5 Claims**



1. A segmented pipe coupling comprised of at least two arcuate coupling segments to be assembled in end-to-end relationship and encircling the juxtaposed ends of pipes to be coupled, the coupling segments having means providing for the reception of a sealing gasket and having radially inward extending engagement means for clamping engagement with the ends of the respective said pipes, further including:
end faces at each end of the respective coupling segments for direct sliding engagement with a juxtaposed end face of an adjacent coupling segment;
said end faces extending perpendicular to the X-Y plane of the coupling, and extending at an oblique angle to the diametral X-Z plane of the coupling; and,
traction means for urging said end faces towards each other to produce sliding of respective juxtaposed pairs of end faces relative to each other, in order to produce a reduction in the internal circumference of the coupling and cause said engagement means to clamp onto the exterior surface of said pipes to immobilize said pipes.

4,639,021

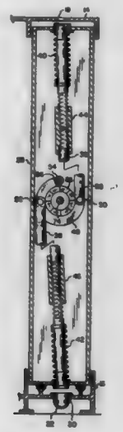
DOOR LOCK

Jimmie L. Hope, 3560 SW. Red Cedar Way, Lake Oswego, Oreg. 97034

Filed Nov. 25, 1985, Ser. No. 801,298

Int. Cl.⁴ E05C *5/00*

U.S. Cl. 292—7 **12 Claims**



1. A door lock comprising:
(a) a rotary actuator,
(b) means for mounting the actuator on the door,
(c) a shaft assembly connected for rotary movement to the actuator,
(d) at least one spring-biased bolt rod mounted on the door for reciprocation between door-locking and door-unlocking positions,
(e) a crank connected to the bolt rod and operable to shift the bolt rod to its spring-biased door-locking position,
(f) stop means positioned to stop the movement of the crank in the locking and unlocking positions of the bolt rod,
(g) rotary interengaging means releasably connecting the crank to the shaft assembly,
(h) a latch operable to maintain the spring-biased bolt rod releasably in its door-locking position, and
(i) trip means arranged for disengaging the rotary interengaging means when the bolt rod is in its spring-biased, door-locking position, thereby actuating automatic unlocking of the door.

4,639,022

SLIDING WINDOW OR DOOR LOCK

Gerald F. Dunphy, Glen Waverley, and Lance E. Best, Vermont South, both of Australia, assignors to Ogden Industries Pty Ltd, Victoria, Australia

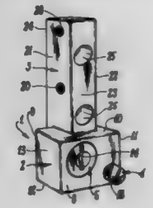
Filed Nov. 30, 1984, Ser. No. 677,608

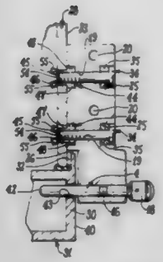
Claims priority, application Australia, Nov. 30, 1983, PG 2638/83

Int. Cl.⁴ E05C *1/04*; E05B *65/08*

U.S. Cl. 292—150 **15 Claims**

1. A lock including a body which is adapted to be secured to one of two relatively movable members, said body having a mounting part and an actuator part, a locking bar mounted on said actuator part for relative axial movement between an operative position in which an end portion of said bar projects beyond a back surface of said actuator part for location within a hole provided in the other of said two members and an inoperative position in which said end portion does not so project, locking means carried by said actuator part and being operable to hold said locking bar against movement from the operative to the inoperative position, said mounting part projecting laterally from one side of said actuator part in a direction transverse to the longitudinal axis of said bar, and having four sides which extend in that direction, two of said four sides constituting substantially parallel front and back sides of the mounting part and each of the other two said sides extends between said front and back sides in substantially parallel relationship, said front and back sides being spaced apart in the axial direction of said locking bar, at least one primary fastening bore extending through said front and back sides of the mounting part, and at least one secondary fastening bore extending through said other sides of the mounting part in a direction transverse to the axis of said primary fastening bore and also transverse to said direction of projection of said mounting part, the arrangement being such that said lock can





be secured either to an outwardly facing surface of said one member or to a surface which extends transverse to said outwardly facing surface, and in the former case said mounting part projects outwardly from said outwardly facing surface and is secured thereto by fastening means (for securing said body to said one member can be associated with either said primary or secondary bore whereby said body can be secured to a surface of said one member which is either parallel to or transverse to said locking bar axis) extending through said primary fastening bore, whereas in the latter case said mounting part is located to one side of said outwardly facing surface and is secured to said transverse surface by fastening means extending through said secondary bore.

4,639,023

PIVOTABLE LOCKING BAR FOR PATIO DOORS

Richard Boisvert, 7150 MB Jodoin Street, app. 703, Ville d'Anjou, Canada H1J 2J3

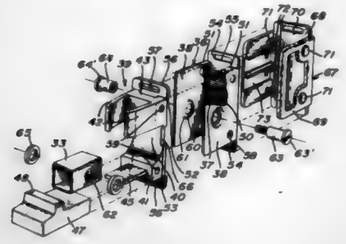
Filed May 30, 1985, Ser. No. 739,102

Int. Cl.⁴ E05C *17/04*

U.S. Cl. 292—262 **3 Claims**

1. A locking bar assembly for use between a vertical abutment member and a horizontally-slidable member of the type movable along a path between an opened position and a closed position, comprising: a locking bar having inner and outer end portions, a bracket assembly, means for mounting said bracket assembly to one of said members, pivotal means for mounting said locking bar adjacent its inner end portion on said bracket assembly for pivotal movement in a vertical plane about a pivotal axis carried by said bracket assembly between a generally horizontal locking position in which the outer end portion of said locking bar abuts the other of said members, and an upright position in which said locking bar permits opening

movement of said slidable member towards said bracket assembly, at least the inner end portion of said bar having a generally square cross-section and having opposite side faces, a top face and an underface as defined when said locking bar is in locking position, said bracket assembly including a cross-sectionally U-shape metallic casing defining a base plate and side walls, said base plate being elongated and vertically extending when fixed in position by said mounting means, a transverse shaft carried by said side walls and on which said inner end portion of said locking bar is pivotally mounted, spacer means about said transverse shaft to produce a space between each side face of said locking bar and the respective side walls, a stabilizing member made of resilient material and located within the confines of said casing, said stabilizing member including an intermediate plate applied flat against said base plate intermediate said transverse shaft and said base plate, the top face of said



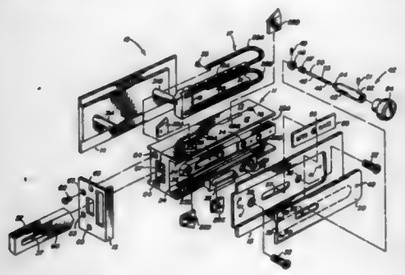
locking bar abutting said intermediate plate in the upright position of said locking bar, a pair of transversely-spaced clasping arms and a bottom tongue integral with and projecting from said intermediate plate between said side walls, said clasping arms extending in said spaces at either side of said locking bar and located above said transverse shaft, said tongue extending below said locking bar, each clasping arm having a terminal inner shoulder, the two shoulders moving away from each other by slidable engagement with the opposite side faces of said locking bar during pivotal movement of the latter between said two positions and overlapping the underface of said locking bar when the latter is in said upright position, and a bumper body, of elastomeric material, fixed to said tongue, extending below said locking bar in either position of the latter, and extending beyond said side walls and from the underface of said locking bar when the latter is in upright position.

4,639,024

SIMULTANEOUSLY OPERATED DEAD BOLT LOCK AND SECURITY CHAIN

Alois Crepinsek, 97 N. Arizona Pl., Chandler, Ariz. 85224

Filed Dec. 5, 1983, Ser. No. 557,907
Int. Cl.⁴ E05C *17/36*
U.S. Cl. 292—264 **14 Claims**



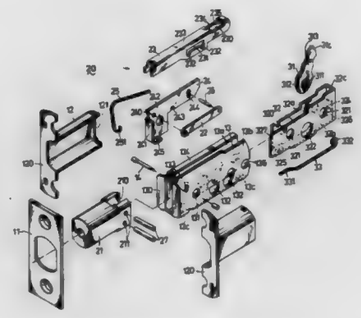
1. A dead bolt lock having an internally housed security chain simultaneously ejected with the dead bolt comprising:
a dead bolt lock having a dead bolt and a self-retracting security chain assembly housed therein, said self-retracting security chain assembly having means for retraction of said self-retracting security chain assembly into said dead bolt lock;
security chain drive linkage means coupled to said security chain assembly for partially ejecting a portion of said security chain assembly from said dead bolt lock; and
externally accessible drive means coupled to said security drive linkage means and to said dead bolt for simultaneously ejecting a portion of said dead bolt and a portion of said security chain assembly from said dead bolt lock.

4,639,025

ADJUSTABLE DEAD BOLT ASSEMBLY

Yaw S. Fann, and Rong-Fas Wu, both of Chia-Yi, Taiwan, assignors to Tong Lung Metal Industry Co., Ltd., Chia-Yi, Taiwan

Filed Mar. 17, 1986, Ser. No. 840,597
Int. Cl.⁴ E05C *1/06*
U.S. Cl. 292—337 **8 Claims**



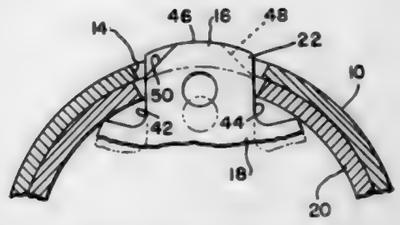
1. A dead bolt assembly for a lock including:
a bolt casing having a front mounting plate at its front side;
a bolt mounted movably in the bolt casing;
an extension housing fixed to the rear end of the bolt casing;
a crank plate mounted in the extension housing to be connected to the lock for transmitting the actuation of the lock to the bolt, the crank plate being turnable about an axis to move the bolt between a locking position and a releasing position; and an improvement which comprises:
an adjustable bolt extension member connected to the rear end of the bolt and housed in the extension housing, the bolt extension member including a fixed member fixed to the bolt and an extensible member pivoted movably to the fixed member and cooperating with the crank plate, one of the fixed member and the extensible member having a longitudinal guide aperture with a front and a rear engaging portion which is turned at an angle relative to the longitudinal aperture, and a pivot pin for pivoting the fixed member and the extensible member through the longitudinal guide aperture, the extensible member being movable between a first portion in which the pivot pin engages in the rear engaging portion and a second position in which the pivot pin engages in the front engaging portion;
means for disengaging the pivot pin from the front engaging portion or the rear engaging portion; and
a crank plate holding means which is disposed in the extension housing and which can be positioned adjustably in the extension housing in a first position and a second position corresponding to the first position and the second position of the extensible member so that the crank plate can always be kept in a cooperative relationship with the extensible member.

4,639,026

DOOR KNOB AND DOOR KNOB CATCH ARRANGEMENT

Jon M. Snallegan, San Mateo, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Oct. 11, 1985, Ser. No. 786,541
Int. Cl.⁴ E05B *3/00*
U.S. Cl. 292—352 **1 Claim**



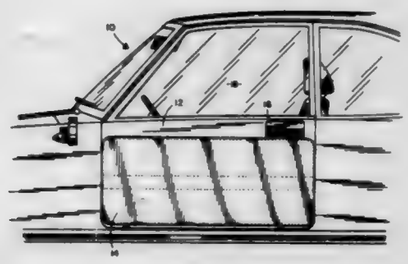
1. An improved door knob and door knob catch arrangement, for door knob-operated, latch mechanisms, including a spindle, a door knob having a cylindrical shank for a latched assembly thereof onto said spindle, and a door knob catch, resiliently projecting form said spindle, and wherein said shank has a relief formed therein for latchingly engaging said catch, the improvement comprising:
first and second ramp means formed on said shank, and on said catch, respectively, for accommodating a forced, slidable engagement of said first ramp means with said second ramp means, (a) to depress said catch, and (b) to allow said shank to slide over such depressed catch, whereby said catch and said relief can effect a mutual, latching engagement therebetween;
said catch having an uppermost projecting surface, relative to said spindle;
said second ramp means comprising a given ramp formed in said surface;
said catch having a pair of parallel faces joined through a pair of lateral edges and said edges join said surface through end corners
said second ramp means further comprising another ramp formed in said surface;
said given ramp comprises a bevel formed of one of said corners, and extending into one of said faces; and
said another ramp comprises a bevel formed of the other of said corners, and extending onto the other of said faces.

4,639,027

THEFT-RESISTANT AUTOMOBILE SIDE COVER

David T. Boyd, 94 Stanford, Irvine, Calif. 92715

Filed Sep. 27, 1985, Ser. No. 781,046
Int. Cl.⁴ B60J *11/00*
U.S. Cl. 293—128 **7 Claims**



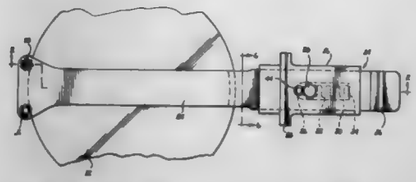
1. An apparatus primarily for attachment to the exterior side surface of a vehicle for protection of such surface against objects that would otherwise come in contact with the vehicle and damage the surface; the apparatus comprising:
a substantially planar cover of generally flexible material having an interior surface adapted to overlie and remain in substantially contiguous configuration with said vehicle surface; and
an elongated unitary strap of flexible material attached at its ends to the interior surface of said cover for horizontally encircling a door of said vehicle whereby closure and locking said vehicle door substantially resists unauthorized removal of said cover from said vehicle.

4,639,028

HIGH TEMPERATURE AND ACID RESISTANT WAFER PICK UP DEVICE

Donald M. Olson, Scottsdale, Ariz., assignor to Economic Development Corporation, Phoenix, Ariz.

Filed Nov. 13, 1984, Ser. No. 670,627
Int. Cl.⁴ B05G *13/02*; B65G *7/12*
U.S. Cl. 294—34 **18 Claims**



1. A device used for picking up wafers, comprising:
a closure channel having an aperture and a first extension protruding upward from the top surface of said closure channel;
a base plate including first groove means for operably engaging one of said wafers;
sliding plate means located between said closure channel and said base plate for operably engaging said one of said wafers, said sliding plate means having an aperture and a second extension protruding upward from the top surface of said sliding plate means, and said sliding plate means slidably engaging said closure channel and said base plate, said sliding plate means having a plurality of grasping extensions located on the top of the end thereof;
spring means located within said aperture of said sliding plate means for returning said sliding plate means to an original position after said sliding plate means has been moved to another position; and
coupling means for releasably coupling said closure channel, said base plate, said sliding plate means and said spring means together, said coupling means having a plurality of holding pins for securely holding said wafers.

4,639,029

TOOL HANDLE

Robert A. Kolonia, R.D. 3, Agnes Rd., Box 318, Milford, N.J. 08848

Filed Aug. 9, 1985, Ser. No. 764,125
Int. Cl.⁴ A01B *1/22*; B25G *3/34*
U.S. Cl. 294—57 **36 Claims**

1. A hand garden tool handle for a garden tool having a working tool end portion, a socket portion projecting outwardly from the working tool end portion and with a longitudinal central axis, and means for coupling the handle to the working tool end portion, said handle comprising:
(a) a composite structure including a core member having a molded plastic outer coating over the core member;
(b) the composite structure having a socket end, an intermediate section and a butt end,
(c) the socket end including a substantially circular cross section for insertion into the socket portion with the outer

coating to be disposed between the core member and the socket portion of the garden tool;

(d) the intermediate section being oval-shaped in cross-section along substantially the entire length thereof and having a transition portion connecting the circular socket end to the oval-shaped section;



(e) the oval-shaped intermediate cross section with the major axis thereof in a plane to extend symmetrically through the longitudinal central axis of the socket portion when the socket end is disposed in the portion of the tool thereby being effective to facilitate handling of the tool.

4,639,030

PROCESS AND APPARATUS FOR THE LIFTING AND CARRIAGE OF OBJECTS PLACED ON TRAY-LIKE SUPPORTS

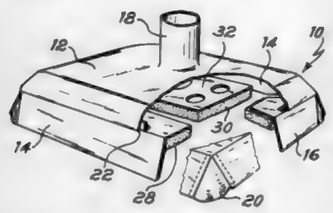
Anselmo Bini, 1, Via Sabatini, Chiesa Nuova di Monte San Pietro, Italy (20050)

Filed May 20, 1985, Ser. No. 735,873

Claims priority, application Italy, May 22, 1984, 21031 A/84

Int. Cl.⁴ B65G *57/04*; B66C *1/02*

U.S. Cl. 294—64.1 **15 Claims**



6. Apparatus for the lifting and carrying an assembly including objects arranged on a tray-like support, said apparatus comprising: a suction hood with an open bottom and movable side walls; means for placing the hood above the support and engaging said movable side walls with the edges of the support so that the support closes the bottom of the hood; means for applying a vacuum to the inside of the suction hood so that the support is urged toward the interior of the hood by atmospheric pressure; means for lifting and carrying the suction hood and the assembly from a start position to a final position while said vacuum is applied; and means for releasing the vacuum inside the suction hood when said support is in said final position.

4,639,031

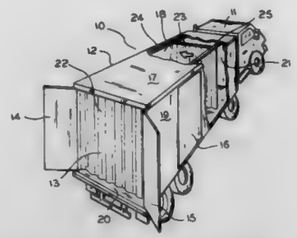
REPOSITIONABLE THERMAL INSULATING TRUCK BULKHEAD

Randall Truckenbrodt, Western Springs, Ill., assignor to Randall Industries, Hinsdale, Ill.

Filed Apr. 17, 1985, Ser. No. 724,317

Int. Cl.⁴ B62D *33/04*

U.S. Cl. 296—24 R **20 Claims**



1. Repositionable thermal barrier apparatus extendable between first and second sidewalls, said apparatus comprising:

a thermal barrier; and

means extendable between said first and second sidewalls for positioning said thermal barrier therebetween, said positioning means including a horizontal hanger bar from which said thermal barrier depends,

said hanger bar having first and second ends,

first and second means for supporting, respectively, said first and second ends of said hanger bar at said sidewalls,

said first support means including means for adjusting the position of said first hanger bar end along said first sidewall,

said adjusting means further including means to releaseably retain said adjusting means at selectable sites along said first support means,

said second support means further including means to releaseably attach said second hanger bar end at selected sites along said second sidewall,

said attaching means being selectively detachable from said second support means to enable said second bar end to be selectively secured to said first support means at said first sidewall.

4,639,032

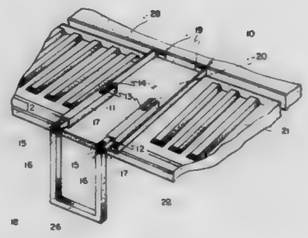
TAIL GATE STEP

Edward J. Barbour, Rte. 3, Box 299, Elizabethtown, N.C. 28337

Filed Nov. 1, 1984, Ser. No. 667,337

Int. Cl.⁴ B60R *3/02*

U.S. Cl. 296—62 **8 Claims**



1. An improved step comprising: a pair of generally parallel guide means mounted on a vehicle; keeper means slidingly mounted within each said guide means; stop means mounted on one end of each said keeper means; U-shaped step means pivotally connected to said keeper means on the end opposite said stop means and so sized to retractingly slide within said guide

means for storage and to slidingly extend outwardly therefrom during use whereby an extensible and retractable step is provided.

4,639,033

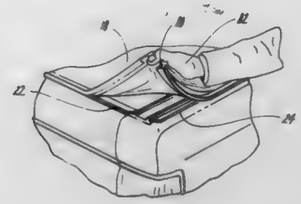
TONNEAU COVER

Donald G. Wheatley, and Patricia A. Wheatley, both of 4451 Ford Rd., Ann Arbor, Mich. 48105

Continuation-in-part of Ser. No. 650,275, Sep. 14, 1984, abandoned. This application Dec. 16, 1985, Ser. No. 809,167

Int. Cl.⁴ B60J *7/10*

U.S. Cl. 296—100 **6 Claims**



1. Tonneau means for covering the cargo area of a vehicle, such as a boat, a pickup truck or the like, said vehicle having a pair of spaced sidewalls, each sidewall having a lower edge, comprising:

a flexible cover having a side edge, the cover being adapted to fit over the cargo area of the vehicle;

a rail having a horizontal upper wall and a depending vertical wall, the rail being disposed on the top of the sidewall;

a clamping member having a slot receiving the lower edge of the sidewall and the depending vertical wall of the rail;

a fastener member mounted on the clamping member for engaging both the sidewall and the vertical wall of the rail in the clamping member slot; and

means for releasably fastening the cover to the rail whereby the cover is connected to the sidewall without the necessity for forming any holes in the sidewall for the fastener member.

4,639,034

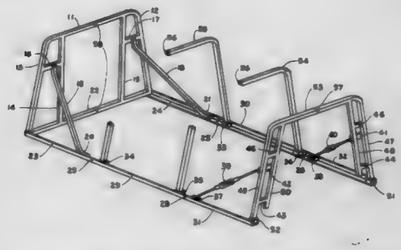
SOFT TOP FOR PICK-UP TRUCKS

James Amos, Muncie, Ind., assignor to American Insulation & Engineering Co., Inc., Muncie, Ind.

Filed May 6, 1985, Ser. No. 730,829

Int. Cl.⁴ B62D *25/06*

U.S. Cl. 296—100 **9 Claims**



1. A collapsible top for pick-up truck cargo compartments, comprising:

(a) first and second girders mutually spaced in parallel alignment, each having first and second ends:

(b) a first end rafter permanently connected to said first ends of said girders, said first end rafter having an outer face and an inner face, said first end rafter having a top and bottom horizontal beam in parallel alignment, said top and bottom beams having first and second ends, said top beam being shorter than said bottom beam, said first end rafter being further provided with first and second ends, said top beam being shorter than said bottom beam, said first end rafter being further provided with first and second side supports connected to said first and second ends of said top and bottom beams, respectively, said first end rafter being further provided with first and second vertical supports connected to said top and bottom beams, said vertical supports being mutually spaced inwardly from said first and second side supports and being perpendicular to said top and bottom means, said first end rafter being further provided with first and second horizontal rods, said first horizontal rod being connected to said first side support and said first vertical support, said second horizontal rod being connected to said second side support and said second vertical support, said first end rafter being further provided with first and second girder sections connected to said inward face, said first girder section connected to said first end of said bottom horizontal beam being in perpendicular alignment therewith, said second girder section connected to said second end of said bottom horizontal beam being in perpendicular alignment therewith, said first end rafter being further provided with first and second struts, said first strut being connected to said first side support and said first girder section, said second strut being connected to said second side support and said second girder section, whereby a frame for a window is defined;

(c) a second end rafter removably connected to said second ends of said girders, said second end rafter having an inward and outward face, said second end rafter being provided with a top horizontal beam having first and second ends and corresponding in length to said first end rafter's top horizontal beam, said second end rafter further comprising first and second side supports, said first side support connected to said first end of said top beam and removably connected to said second end of said first girder, said second side support being likewise connected to said second end of said top horizontal beam and removably connected to said second end of said second girder, said second end rafter being further provided with first and second inner parallel side supports, said inner parallel side supports having first and second ends, said first end of said first inner parallel side support connected to said top horizontal beam inward from the connection of said first side support, said first inner parallel side support being parallel to said first side support, said first end of said second inner parallel side support connected to said top horizontal beam inward from the connection of said second side support to said top horizontal beam, said second inner parallel side support being parallel to said second side support, said second end rafter being further provided with first and second series of rungs, each rung having first and second ends, said first series of rungs having said first ends connected to said first side support and said second ends connected to said first inner parallel side support, said second series of rungs having said first ends connected to said second side support and said second ends connected to said second inner parallel support, whereby a frame for a door is defined;

(d) first and second turnbuckles having first and second ends, said first end of said first turnbuckle being removably connected to said first girder and said second end of said first turnbuckle being pivotally connected to a first series rung, said first end of said second turnbuckle being removably connected to said second girder and said second end of said second turnbuckle being pivotally connected to a second series rung, whereby angular support for said second end rafter is defined;

(e) intermediate rafters removably connected to said girders, said intermediate rafter located between said first and second end rafters, said intermediate rafters being provided with top horizontal beams corresponding in length

to the top horizontal beams of the first and second end rafters and having first and second ends, said intermediate rafters being further provided with first and second side support members each having first and second ends, said first end of said first side support member being connected to said first end of said top horizontal beam and said second end of said first support member being removably connected to said first girder, said first end of said second support member being connected to said second end of said top horizontal beam and said second end of said second side support member being removably connected to said second girder, said intermediate rafters being parallel to each other as well as to the first and second end rafters;

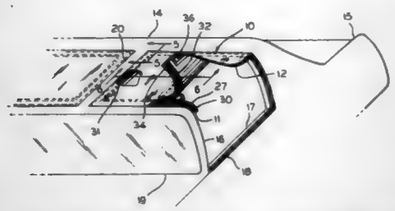
(f) architectural fabric removably covering said rafters, said fabric having window means located at said frame for a window and door means located at said frame for a door.

4,639,035

REMOVABLE LIGHTWEIGHT ROOF OPENING COVERS FOR VEHICLES

Jerry Isaacson, 8504 N. Central Park Ave., Skokie, Ill. 60076

Filed Nov. 14, 1983, Ser. No. 551,163
Int. Cl.⁴ B60J *7/10, 7/12, 7/185*
U.S. Cl. 296—218 **10 Claims**



1. A removable, lightweight cover assembly for covering a vehicle roof opening of the type defined by a vehicle roof, the vehicle roof enclosing the opening on three sides and providing roof panel supporting means about the opening for supporting a vehicle roof panel and fastening means for securing the vehicle roof panel thereto, comprising:

a generally U-shaped frame adapted to cooperate with and be supported by and to be removably secured to the roof panel supporting means of the vehicle roof, said frame also enclosing on three sides said roof opening, said roof opening thus enclosed being continuous on a fourth side with a door opening,

said frame having latching means for cooperating with the fastening means of the vehicle roof for removably securing said frame to the vehicle roof in substantially leakproof relation, said frame further having cover attachment means for removably attaching a pliable, lightweight cover thereto, and

a cover of pliable, lightweight, weather-resistant material adapted to span said frame and extend at least to marginal edges thereof,

said cover having attachment means for cooperating with said cover attachment means of said frame for separably attaching said cover to said frame in substantially water and air resistant relation.

4,639,036

SUN SHADE APPARATUS FOR A LOUNGE CHAIR

James O. Nichols, 1805 Olive La., Plymouth, Minn. 55447

Continuation-in-part of Ser. No. 543,751, Oct. 20, 1983, abandoned. This application May 17, 1985, Ser. No. 735,398
Int. Cl.⁴ A47C *7/62*
U.S. Cl. 297—184 **6 Claims**

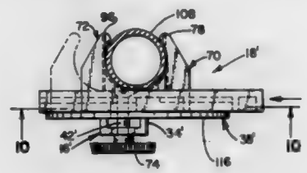
1. Sun shade apparatus for a chair comprising:

a frame;

a member for providing shade;

first means for attaching said shadeproviding member to said frame;

clamp means for pivotally holding said frame to said chair, said clamp means including first and second clamp elements, said clamp means further including a bearing member and second means for pivotally attaching together said first clamp element, said bearing member and said frame,



said first clamp element including means for retaining said second clamp element against said bearing member, said retaining means including means for moving said second clamp element linearly with respect to said first clamp element to releasably clamp said chair between said first and second clamp elements;

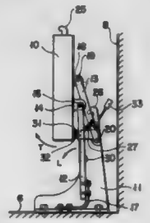
whereby said apparatus is adjustable at said first and second attaching means and said clamp means is clamped to and released from said chair by operating said moving means.

4,639,037

AUXILIARY SEAT ASSEMBLY FOR USE IN VEHICLES

Hidekazu Maruyama, 2-1-16 Shinmachi, Kokubunji-shi, Tokyo, and Kazuo Fujimaki, 403 Imajuku Nishi-cho, Asahi-ku, Yokohama-shi, Kanagawa-ken, both of Japan

Filed May 16, 1984, Ser. No. 610,713
Claims priority, application Japan, Jun. 16, 1983, 58-108058
Int. Cl.⁴ A47C *4/00*
U.S. Cl. 297—334 **6 Claims**



1. An auxiliary seat assembly for use in a vehicle, comprising:

a base adapted to be securely fixed on a floor of the vehicle and having upper and lower portions,

a seat to be pivotally connected to the base and having upper, lower, front and rear sides, said seat, in use, being moved into a horizontal position where the upper side of the seat faces upwardly and said seat, out of use, being located in an upright position where the upper side thereof faces forwardly,

a first link member having a lower end pivotally connected to the lower portion of the base, and an upper end pivotally connected to the front lower side of the seat,

a second link having a lower end pivotally connected to the upper portion of the base, and an upper end pivotally connected to the seat,

means for preventing the second link from rotating downwardly beyond the horizontal position when the seat is in the horizontal position, said means being formed at the upper portion of the base,

a spring member situated between the base and at least one of the first and second links to urge the seat to raise from the horizontal position to the upright position,

an engaging piece disposed at the rear side of the seat,

a hook situated at the upper portion of the base, said engaging piece engaging the hook when the seat is in the horizontal position to keep the seat in that position,

an engaging member connected to the lower side of the seat, and

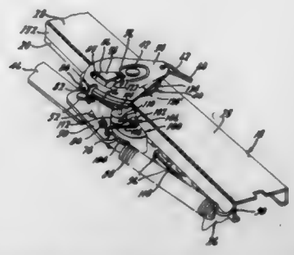
means for detachably engaging said engaging member, said engaging means being situated on one of the first and second links, said engaging member engaging the engaging means when the seat is in the upright position to securely place the seat in that position.

4,639,038

VEHICLE EASY ENTRY SEAT TRACK WITH ONE POSITION MEMORY

Dennis H. Heling, Canton, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jul. 2, 1985, Ser. No. 751,708
Int. Cl.⁴ B60N *1/04*
U.S. Cl. 297—341 **5 Claims**



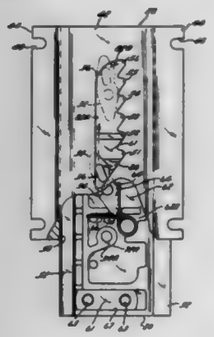
1. In a vehicle easy entry seat including a seat cushion and a seat back pivoted thereto by hinge means for pivotal movement between an upright position and a forward tilted position, an upper track member fixed to said seat cushion and a lower track member fixed on the vehicle for relative longitudinal movement of the seat cushion upper track on said lower track to a plurality of adjusted positions, said lower track member having a plurality of longitudinally spaced lock openings, a seat adjuster control mechanism comprising in combination; a latch plate formed with a locking detent pivotally mounted on said upper track member, first resilient means biasing said latch plate in a first rotational direction such that its locking detent is held in locked engagement with one of said lower track member openings, a pawl pivotally mounted on said latch plate, stop means on said latch plate positioning said pawl at either a first or second predetermined rotated position relative to said latch plate, second resilient means biasing said pawl in said first rotational direction into said first position, a cam member pivotally mounted on said latch plate, said cam member having means for engaging said pawl preventing rotation of said cam member in a second rotational direction when said pawl is positioned in its first rotated position, said cam member comprising a first planar wall portion and a second planar wall portion disposed in substantially normal relation to each other, third resilient means operative for biasing said cam member in either a first or second overcenter position, a lever member rotatably supported on said hinge means, link means connecting said lever member to said pawl, such that when said seat back is partially tilted forward said pawl is pivoted by said lever member to its second rotated position, wherein said cam member engaging means is moved out of contact with said pawl, and whereupon said seat back being tilted to its full forward position said latch plate and said pawl are pivoted in said second direction, whereby said locking detent is moved to its unlocked position out of engagement with its associated lower track member opening thereby allowing said upper track member to move forwardly on said lower track member to an easy entry or egress position, said third resilient means operative upon said engaging means on said cam member being moved out of contact with said pawl to rotate said cam member to its second overcenter position, whereby said cam member first planar wall portion is moved away from a position contacting a side wall of said upper track member and said second planar wall portion moved to a position slidably engaging said upper track member side wall so as to maintain said locking detent in its unlocked position during longitudinal movement of said upper track member, and camming means on said lower track member operative to engage said cam member upon said upper track member being moved rearwardly to a predetermined location, and wherein said cam member is rotated in said first direction for return to its first overcenter position allowing said first resilient means to rotate said locking plate in said first direction such that said locking detent engages a predetermined single-position memory opening in said lower track with said cam member first planar wall portion again in flush contact with said upper track member side wall, while said second resilient means rotates said pawl in said first direction to its first position whereby said cam member engaging means again engages said latch plate.

4,639,039

HEIGHT ADJUSTMENT MECHANISM FOR CHAIR BACKREST

Kyle P. Donovan, Brown Deer, Wis., assignor to Milsco Manufacturing Company, Milwaukee, Wis.

Filed Sep. 10, 1985, Ser. No. 774,447
Int. Cl.⁴ A47C *7/46*
U.S. Cl. 297—353 **8 Claims**



1. An adjustment mechanism (12) mountable on a chair (10) for releasably locking one chair component (22) in any one of a plurality of positions relative to another chair component (20) and relative to a support (18) which is part of the chair (10), comprising:

a guide member (24) which is adapted to be rigidly secured to said support (18);

a channel member (28) which is adapted to be rigidly secured to said one chair component (22) and which is mounted on said guide member (24) for sliding movement between two extreme positions; and

latching means for releasably latching said channel member (28) and said one chair component (22) secured thereto in either of said two extreme positions or in intermediate positions therebetween in response to manual movement of said one chair component (22);

said latching means comprising a slot (38) on said channel member (28), said slot (38) having a plurality of notches (51–56) along one side, an inclined cam surface (80) along one end, a curved cam surface (82B) along the other end, and an intermediate cam surface (82A) along the other side; a latch bar (32) mounted on said guide member (24) for pivotal movement in a plane parallel to a plane in which said slot (38) lies and having a latch pin (36) thereon extending transversely into and remaining in said slot (38);

and biasing means (40) connected between said guide member (24) and said latch bar (32) for biasing said latch bar (32) and latch pin (36) thereon alternately in a latched position wherein said latch pin (36) engages a notch (51–56) or an unlatched position wherein said latch pin (36) engages one of said cam surfaces (80, 82A, 82B);

said one chair component (22) being manually movable in one direction when said latch bar (32) is in latched position to move said latch pin (36) out of engagement with one notch and into engagement either with an adjacent notch or with said inclined cam surface (80) so that said latch bar (32) is moved from latched to unlatched position by said inclined cam surface (80);

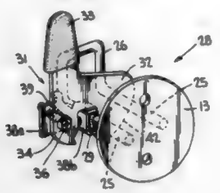
said one chair component (22) also being manually movable in an opposite direction when said latch bar (32) is in unlatched position to move said latch pin (36) from said inclined cam surface (80), along said intermediate cam surface (82A) and along said curved cam surface (82B) so that said latch bar (32) is moved from unlatched to latched position by said curved cam surface (82B).

4,639,040

FIXING DEVICE FOR A VEHICLE SEAT

Yasuyuki Fujita, and Takaichi Nishino, both of Tokyo, Japan, assignors to Tachikawa Spring Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 489,785, Apr. 29, 1983, abandoned. This application Nov. 19, 1985, Ser. No. 799,606
Claims priority, application Japan, Apr. 30, 1982, 57-64704
Int. Cl.⁴ B60N *1/02*
U.S. Cl. 297—379 **1 Claim**



1. A fixing device for a vehicle having a forwardly foldable seat back, comprising a support element adapted to be mounted to a side wall of the vehicle opposite an upper portion of the vehicle seat back, and a hook element engageable with said support element for locking said seat back relative to said side wall, said support element comprising a base plate for mounting said support element in place, a substantially horizontal set part affixed at one end to said base plate, and a slip-off preventing extension extending upwardly from the other end of said set part, said extension and said set part comprising a single, bent, rigid wire, a bolt rigidly secured to said upper portion of said seat back and extending outwardly thereof, said hook element being mounted on said bolt for pivotal movement about the axis thereof, said hook element comprising a plate having a hook part engageable with said set part, and an operative part for manually pivoting said hook element, a bracket fixedly secured to said upper portion of said seat back, said bracket having one leg with an opening through which said bolt extends for fixing said bracket in place, and said bracket having another leg lying parallel to said set part of said support element, cushioning material affixed to said another leg and abutting against said set apart for preventing a rearward folding of said seat back and for cushioning engagement between said hook element and said support element, said another leg having an edge confronting said slip-off preventing extension for engagement therewith upon the application of external rearward and forward forces against said seat back for thereby preventing said hook element from slipping off said set part.

4,639,041

HEADREST MOUNTING STRUCTURE FOR A VEHICLE SEAT

Toshio Furukawa, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1985, Ser. No. 747,442
Claims priority, application Japan, Jul. 31, 1984, 59-119945[U]
Int. Cl.⁴ A47C *7/36*
U.S. Cl. 297—391 **2 Claims**



1. A headrest mounting structure for a vehicle seat in which there are provided a pair of spaced-apart headrest stays for supporting a headrest on a seat back of the vehicle seat with the seat back extending generally in a selected plane transversly of said vehicle, comprising:

a pair of brackets each having an upper plate and a lower plate, said brackets being fixed to a seat back frame of said vehicle seat in a spaced-apart relationship with each other, each of said upper and lower plates being formed with an elongated insertion bore having a straight-line portion which extends in a transverse direction generally parallel of said selected plane of said seat back; and

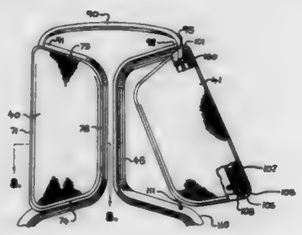
a pair of support tubes to be respectively inserted into said elongated insertion bores of said brackets, each of said support tubes having an insertion bore formed co-axially therewithin, said insertion bore being of an elliptical shape in section and including a straight-line portion which extends in a transverse direction generally parallel to the selected transverse plane of said seat back, and further each of said support tubes comprising a head portion to be abutted against the upper end of said seat back and a leg portion to be inserted through said elongated insertion bores of said brackets, said leg portion being so formed as to have a circular shape in section such that said tubes may be displaced to the right or to the left from the center of said insertion bores of said brackets, whereby said pair of headrest stays are respectively inserted into said insertion bores of said support tubes.

4,639,042

CHAIR BACK ARRANGEMENT

Gerd Lange, Kapweyer, Fed. Rep. of Germany, assignor to Fixtures Manufacturing Corporation, Kansas City, Mo.

Filed May 21, 1985, Ser. No. 736,457
Int. Cl.⁴ A47C *3/04*
U.S. Cl. 297—444 **9 Claims**



1. A chair comprising:

(a) a seat and support means;

(i) said support means orienting said seat for engagement by a person sitting on said chair;

(b) a chair back including a front side and having a frame and back panel means;

(i) said chair back having an upper edge, first and second outer side edges and a center portion;

(ii) said chair back frame including a first extension member and a second extension member;

(iii) said first extension member having an upper lateral extension, a lower lateral extension and a central, substantially vertical, portion; said first extension member being mounted in said chair, to form a portion thereof, by said first extension member lower lateral extension;

(iv) said second extension member having an upper lateral extension, a lower lateral extension and a central, substantially vertical, portion; and said second extension member being mounted in said chair, to form a portion thereof, by said second extension member lower lateral extension;

(c) said first extension member central, substantially vertical, portion being aligned with and laterally spaced from said second extension member central, substantially vertical, portion, forming a ventilation space between said first and second extension members and positioned in said center portion of said chair back;

(d) said back panel means including first and second laterally spaced back panels;

(i) said first panel being trapezoid-like in configuration and having: front and back sides; an inner edge; a longer, outer edge; and, first and second opposite and substantially equivalent side edges;

(ii) said first extension member having said first panel mounted thereon: with said first extension member central, substantially vertical, portion engaging said first panel inner edge; with said first extension member upper lateral extension engaging said first panel first side edge; and, with said first extension member lower lateral extension engaging said first panel second side edge;

(iii) said first panel outer edge forming a side edge of said chair back;

(iv) said second panel being trapezoid-like in configuration and having: front and back sides; an inner edge; a longer, outer edge; and, first and second opposite and substantially equivalent side edges;

(v) said second extension member having said second panel mounted thereon: with said second exteions member central, substantially vertical, portion engaging said second panel inner edge; with said second extension member upper lateral extension engaging said second panel first side edge; and, with said second extension member lower lateral extension engaging said second panel second side edge;

(vi) said second panel outer edge forming a side edge of said chair back;

(vii) said second panel inner edge extending generally along and spaced apart from said first panel inner edge, forming a ventilation space therebetween; and

(e) said first and second panels having a space therebetween and cooperating to form said chair back, against which a person sitting in said chair may lean, said space between said first and second panels corresponding to said ventilation space;

(f) whereby said chair back has a centrally positioned ventilation space therein for facilitating comfort of a person sitting in said chair; and

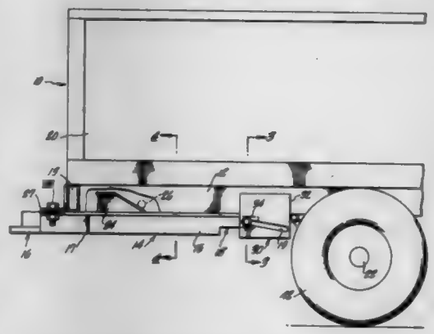
(g) whereby each of said panels is securely mounted within said chair by each one of said extension members engaging three sides of one of said panels.

4,639,043

SELF-DUMPING TRAILER

Richard W. Morissette, 3476 Gilham Rd., Eugene, Oreg. 97401

Filed Nov. 27, 1984, Ser. No. 675,358
Int. Cl.⁴ B60P *1/12*
U.S. Cl. 298—5 **4 Claims**



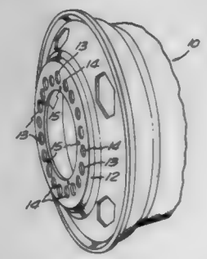
4. A trailer for towing behind a vehicle comprising, a rotatable frame having a negatively inclined slot therein, a yoke slidably attached to said frame slot, an inclined ramp connected to said yoke, a roller connected to said frame and positioned for engagement with said ramp, said ramp being configured to rotate said frame during yoke sliding, and said slot being angled to permit frame rotation free from interference from said yoke.

4,639,044

DEMOUNTABLE WHEEL

Max L. Eaders, deceased, late of South El Monte, and by Reinhard A. Thiel, administrator, Corona, both of Calif., assignors to William Douglas Sellers and George A. Brace, both of Pasadena, Calif.

Continuation of Ser. No. 090,550, Nov. 2, 1979, abandoned. This application May 18, 1981, Ser. No. 265,189
Int. Cl.⁴ B60B *1/00, 27/00*
U.S. Cl. 301—9 DN **4 Claims**



1. A pair of demountable vehicle wheels mountable interchangeable with either wheel innermost either on (1) an axle hub equipped with a ring of threaded cylindrical studs fixedly mounted therein each having a lug nut provided with a semispherical inner end and on (2) an axle hub equipped with a ring of threaded studs fixedly mounted therein having an exposed tapered length nearly as great as the combined thickness of the respective hubs of said pair of wheels which tapered studs each have a lug nut and a collet ring which ring has converging inner and outer surfaces tapered similarly to said tapered studs, each of said wheels having:

a hub;

a first ring of bores about the axis of said wheel hub sized and positioned to telescope loosely over an axle hub equipped

with said threaded cylindrical studs which bores are provided with semi-spherical recesses to seat the similarly contoured end of a lug nut mounted on the outer end of said threaded cylindrical studs;

a second ring of bores about the axis of said wheel hub tapered similarly to said tapered studs and sized and positioned to telescope over an axle hub equipped with said tapered studs;

the tapered bores of a first one of said wheels being adapted to have a snug metal-to-metal fit with the larger inner ends of said tapered studs with the smaller outer ends thereof projecting outwardly beyond the outer side of said wheel hub for a distance somewhat less than the thickness of said wheel hub;

a second one of said wheels being invertable with its tapered bores flaring outwardly and adapted to be telescoped loosely over the smaller outer ends of said tapered studs and clamped rigidly thereto by lug nuts wrenched onto said tapered studs and against said collet rings having inner and outer surfaces tapered similarly to said tapered bores and said tapered studs whereby said collet rings have metal-to-metal contact with said studs and with the tapered bores of said second wheel when said lug nuts are wrenched tight.

4,639,045

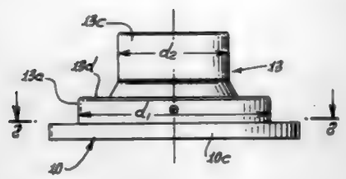
TRUCK WHEEL LUG NUT PROTECTOR APPARATUS

Timothy J. Kane, 1200 Greenfield, Arcadia, Calif. 91006

Filed Oct. 29, 1985, Ser. No. 793,328

Int. Cl.⁴ B60B *7/02, 7/06*

U.S. Cl. 301—37 S **5 Claims**



1. In protection apparatus for studs and lug nuts on a truck wheel, and in combination therewith, the nuts spaced about a central wheel axis and attached to bolts, the combination comprising

(a) two clips retained to the wheel, each clip including a base retained to the wheel by two lug nuts, and a flange extending outwardly away from the base and in spaced relation to said nuts, and

(b) a cover having a skirt removably attached to said flanges, said skirt protectively surrounding all of said lug nuts and bolts,

(c) there being at least eight of said lug nuts on at least eight of said studs, each base comprising a plate having two through openings passing two of said studs, the two clips respectively located at diametrically opposite sides of said axis,

(d) said cover including a first portion defining said skirt which is annular and has an outer diameter d_1 and said cover having a cap portion attached to said first portion and projecting axially at one side thereof, said cap portion having a diameter d_2 which is substantially less than d_1,

(e) said skirt extending further from said axis than each flange but extending in generally side-by-side relation with each said flange in substantially perpendicular relation to the wheel, and each said flange is located at a radius from said axis which exceeds the radii of said studs and nuts, from said axis,

(f) the skirt having a rim proximate an annular surface defined by the wheel, and extending radially outwardly of the base defined by each clip, and adjacent the clip flange.

4,639,046

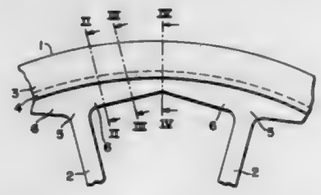
INJECTION MOLDED SYNTHETIC WHEEL

Werner Oleff, Ruscherstr. 13, D-4972 Löhne 3, and Fritz G. Pape, Porta Westfalica, both of Fed. Rep. of Germany, assignors to Werner Oleff, Löhne and ASV Stübbe GmbH & Co KG, Vlotho, both of, Fed. Rep. of Germany, a part interest

Filed Mar. 14, 1984, Ser. No. 589,458

Int. Cl.⁴ B60B *5/04*

U.S. Cl. 301—63 PW **1 Claim**



1. A wheel of synthetic material, comprising a hub and spokes and a rim,

said rim including main rim walls having a predetermined rim cross section and being unitary with said spokes at spoke connection locations on said rim, said hub being unitary with said spokes and being the injection-molding center part of the wheel, the improvement therewith which comprises:

said rim being provide with a plurality of circumferentially extending additional rim wall elements of synthetic material between all of said spokes,

each of said wall elements leading from said spoke connection location of a given spoke to the middle of a rim portion located between two adjacent spokes and each of said wall elements being designed, in comparison with said main rim walls with respect to the rheological cross-sectional area thereof, with an advance-flow cross-sectional area,

the synthetic material in each of said wall elements at the middle of said rim portion, where two of said wall elements join one another, and the synthetic material in said main rim walls of said rim portion between said two adjacent spoke connection locations being free from cold flow seams,

in which each of said wall elements is a rim element connected to said spokes and which projects radially inwardly from a surface of said rim and has two ends, one of which merges with said connection location of a given spoke, and the other of which merges in the middle of a rim portion with an end of another rim element extending from an adjacent spoke,

in which each of said rim elements has a radially outwardly disposed circumferential edge which merges with said remaining rim walls, and which has a varying cross-sectional width which steadily decreases in the direction from the middle of a rim portion toward a spoke.

4,639,047

RAILWAY VEHICLE BRAKE SYSTEM WITH IMPROVED BLENDING CONTROL OF PNEUMATIC AND ELECTRIC BRAKES

Asaji Imanaka, Kobe, Japan, assignor to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Apr. 8, 1985, Ser. No. 720,670

Claims priority, application Japan, Apr. 13, 1984, 59-55311[U]

Int. Cl.⁴ B60T *13/70, 75/54*

U.S. Cl. 303—15 **10 Claims**

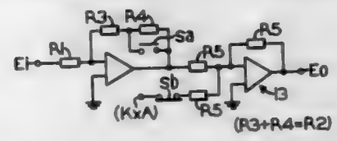
1. A brake control system for a railway vehicle having an electric brake system and a fluid pressure brake system, said brake control system comprising:

(a) means for providing a brake command signal according to the desired total brake power of said vehicle;

(b) said electric brake system being operative in response to said brake command signal to provide vehicle brake power;

(c) means for providing a feedback signal corresponding to the effective vehicle brake power provided by said electric brake system;

(d) an electrical amplifier circuit having one input subject to said feedback signal, another input subject to a bias signal, and an output providing an output signal, said output signal being derived from said feedback signal and said bias signal at a first amplification ratio in a first operating condition of said amplifier circuit and being derived from said feedback signal alone at a second amplification ratio in a second operating condition of said amplifier circuit;



(e) operator means for subtracting said output signal of said amplifier circuit from said brake command signal to provide a difference signal;

(f) said fluid pressure brake system being operative in response to said difference signal to provide supplemental brake power; and

(g) detector means operative in response to a drop in said electric brake feedback signal for causing said amplifier circuit to change from said first operating condition to said second operating condition, such that the total brake power of said vehicle corresponds substantially to said brake command signal during and following the transition from said electric brake system to said fluid pressure brake system.

4,639,048

PROCESS AND APPARATUS FOR BRAKE PRESSURE CONTROL

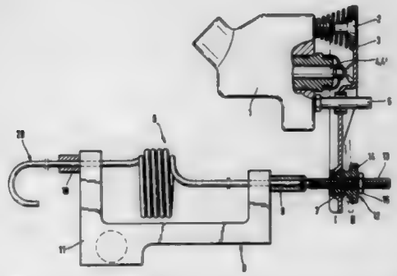
Bernd Schopper, Hattersheim, and Peter Tandler, Falkenstein, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 15, 1985, Ser. No. 734,582

Claims priority, application Fed. Rep. of Germany, May 15, 1984, 3418041

Int. Cl.⁴ B60T *8/18*

U.S. Cl. 303—22 R **17 Claims**



1. A brake pressure control unit for a pressure medium-actuable vehicle brake unit, which brake pressure control unit is load-sensitively controllable by an adjustable spring device and is equipped with at least one valve having a control piston pressure-sensitively slidable into a closing position against the force of the spring device, said spring device pivotally connected to a swivelling transmission lever, means for the preadjustment of the change-over point where pressure control is initiated by said brake pressure control unit, said preadjustment means comprising first stop means formed on said spring device and pivotally connected to said transmission lever, second stop means fastened to said spring device at a distance from said first stop means, and a removable spacing means in the shape of a distance gauge interposed between the said stop means and by which a distance of the said two stop means corresponding to a determined amount of preload of the spring is adjusted.

8. A process for the preadjustment of the change-over point of a brake pressure control unit of a pressure medium-actuatable vehicle brake unit, which said brake pressure control unit is load-sensitively controlled by an adjustable spring device and is equipped with at least one valve with a control piston being pressure-sensitively slidable into closing position against the force of the spring device, said spring device being pivotably connected to a swiveling transmission lever, in which the transmission lever is moved between two defined positions, a first position being defined by the closing position of the valve and a second position defined by the opening position of the valve, said process comprising the steps of: pivoting said spring device; applying a defined force to the free end of said spring device to prestress said spring device, stationarily fixing said free end of said spring device relative to said transmission lever while said transmission lever is in said first position to close said valve, bringing said transmission lever to said second position to open said valve, and fixing the length of said prestressed spring device.

4,639,049

MODULAR FURNITURE

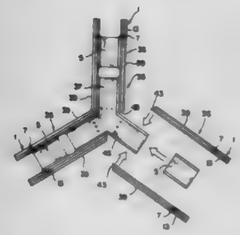
Francesco Frascaroli, and Carlo Biondi, both of Bologna, Italy, assignors to C.O.M. Cooperativa Operai Metallurgici S.C.R.L., Bologna, Italy

Filed Apr. 18, 1984, Ser. No. 601,854

Claims priority, application Italy, Apr. 22, 1983, 4850/83[U]

Int. Cl.⁴ A40B *45/00*

U.S. Cl. 312—195 **17 Claims**



1. Modular apparatus for combining into functional and esthetically pleasing office work stations and for managing electrical wires comprising:

(a) a plurality of generally horizontal beam members, each beam member including at least one plate interposed between and rigidly joined to a pair of laterally spaced substantially parallel beams;

(b) a plurality of connecting means for longitudinally rigidly connecting the respective beams of adjoining beam members into a selected overall length to suit an office space;

(c) at least two vertical support means for rigidly supporting the beam members at selected locations thereon;

(d) at least one work surface; and

(e) bracket means for rigidly mounting the work surface to the beam members at selected locations thereon,

so that the work surface and vertical support means may be rigidly connected to the beam members at selected locations thereon to create a great number of patterns to suit the office work and personnel requirements and wherein

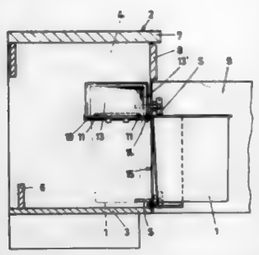
the beams are fabricated as generally rectangular tubes having top and bottom walls, each top and bottom wall being formed with a longitudinal depression in the exterior thereof, each top and bottom wall defining a plurality of aligned longitudinally spaced slots, the depressions and slots being adapted to receive and cooperate with the bracket means for rigidly mounting the work surface to the beam members.

4,639,050

TRASH PAIL FOR INSTALLATION IN A CABINET HAVING A SWINGABLE DOOR

Josef Neuhaus, Arnsberg, Fed. Rep. of Germany, assignor to Westermann Kommanditgesellschaft, Arnsberg, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,905
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1983, 3327614
Int. Cl.⁴ A47B *77/18*
U.S. Cl. 312—273 **9 Claims**



1. In a system comprising a trash pail for installation in a cabinet having a cabinet wall and swingable door, the improvement comprising

a support,

the trash pail being removably suspended in a vicinity of an upper edge thereof on said support, said support being pivotally fastened to said cabinet wall around a vertical axis and operatively coupled to said door, the pail, upon turning the support around said vertical axis upon opening the door, being swung out from inside of the cabinet,

said support comprises an angle member having two arms, said arms extend horizontally substantially 90° with respect to each other forming an angular space with respect to each other,

said trash pail is formed with a corner part of a wall surface of the trash pail, said corner part being of non-circular plan cross section and being supported within said angular space against said arms complementarily form-locking said trash pail thereon said upper edge of said trash pail forms a rim,

said angle member has as upper end edge of said arms of said angle member,

the rim of the trash pail is removably suspended over the upper end edge of said arms of said angle member forming said complementary form-locking.

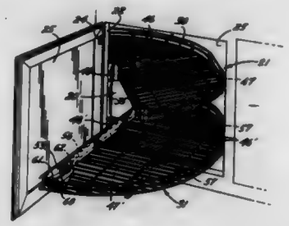
4,639,051

TURN-OUT SHELF ASSEMBLY FOR A CABINET

William DeBruyn, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Mar. 25, 1985, Ser. No. 715,881
Int. Cl.⁴ A47B *81/00*
U.S. Cl. 312—275 **3 Claims**

1. A rotary shelf assembly for a cabinet having a front opening and having a vertically extending door hinged adjacent one side of said opening to swing between closed and open positions about a vertical axis, said shelf assembly comprising a vertically extending post, means supporting said post within said cabinet to turn about a vertical axis located adjacent said one side of said opening and offset rearwardly from the axis of said door, an upper shelf supported on said post to turn in unison with said post about the axis of the post between stored and accessible positions, a lower shelf supported on the post to turn relative to the post about the axis of the post between stored and accessible positions, each shelf being located within the cabinet when the shelf is in its stored position and being at



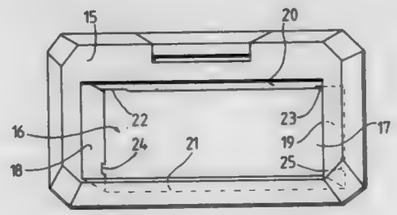
least partially located outside of the cabinet when the shelf is in its accessible position, means connecting said door to said lower shelf for causing said lower shelf to turn automatically between its stored and accessible positions as said door is swung between its closed and open positions, and releasable means holding said post against rotation when said lower shelf is turned while permitting rotation of said post when said upper shelf is turned.

4,639,052

DRAWER FOR A STORAGE CABINET

Patrick P. P. Posso, Lausanne, Switzerland, assignor to Gefitec S.A., Lausanne, Switzerland

Filed May 15, 1985, Ser. No. 734,470
Claims priority, application France, May 22, 1984, 84 07952
Int. Cl.⁴ A47B *88/04*
U.S. Cl. 312—333 **4 Claims**



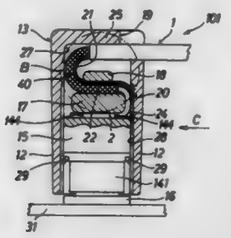
1. A drawer for a storage cabinet with a keeper and formed of moulded synthetic plastics material, comprises a front rectangular housing having a rectangular opening for receiving a locking device, an auxiliary locking device for securing said drawer to said storage cabinet including a support of general rectangular shape and dimensions substantially identical to that of the opening, and a lock supported on a front face of said support, said lock including a bolt extending in parallel to the front face and rotatable between a first and a second position, the support comprising, on at least two of its opposed sides, projecting parts, and the housing comprising on at least two of its opposed walls cut-outs, the projecting parts of the auxiliary locking device support engaging and locking into the cut-outs; said bolt engaging said keeper in the first position, and being disengaged from said keeper in the second position.

4,639,053

CONNECTOR FOR A SHIELDED FLAT CABLE

Manfred Reichardt, Weinsberg, and Gunter Schutzle, Heilbronn, both of Fed. Rep. of Germany, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 12, 1985, Ser. No. 797,342
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1984, 3441818
Int. Cl.⁴ H01R *4/66*
U.S. Cl. 339—14 R **18 Claims**



1. A connector for a flat cable having shield means, said connector comprising:

a connector housing;

an insulating body adapted to be placed in said connector housing;

said insulating body having a cable termination side and a connector receiving side;

a plurality of contacts arranged in said insulating body;

said contacts comprising at their end located at the cable termination side contact means for the displacement of the insulation of the flat cable;

cable holding means for holding the flat cable in engagement with said insulation displacement contact means and adapted to be mounted on the insulating body;

cable strain relief means adapted to urge the flat cable which is guided in a U-shaped manner about the cable holding means against the upper side of the cable holding means; and

grounding sheet metal means adapted for contacting said shield and for connecting it with a grounded component of the connector;

characterized in that the grounding sheet metal means if formed and arranged in the connector housing in such a manner that the shield at one wide side of the flat cable is directly contacted by said grounding sheet metal means and is connected by means of said grounding sheet metal means to a grounded component of the connector; and

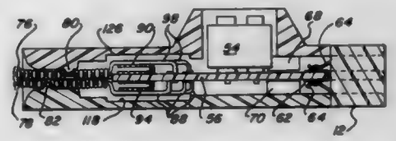
that the grounding sheet metal means urges the shield at the other wide side of the flat cable against a grounded component of the connector.

4,639,054

CABLE TERMINAL CONNECTOR

Mark D. Kersbergen, Longmont, Colo., assignor to Intelligent Storage Inc., Longmont, Colo.

Filed Apr. 8, 1985, Ser. No. 721,238
Int. Cl.⁴ H01R *9/09, 13/70*
U.S. Cl. 339—14 R **3 Claims**



1. A cable terminal capable of connecting a first woven ribbon cable and a second woven ribbon cable to a standardized terminal connector and selectively interconnecting said first and second woven ribbon cables comprising:

switch means for selectively interconnecting said first and second woven ribbon cables;

first mass ground terminator means for conductively connecting ground wires of said first woven ribbon cable by simultaneously physically securing and electrically connecting said ground wires to said first mass ground terminator means;

second mass ground terminator means for conductively connecting ground wires of said second woven ribbon cable by simultaneously physically securing and electrically connecting said ground wires to said first mass ground terminator means;

printed circuit board means comprising:

first signal connector means for connecting signal wires of said first woven ribbon cable means to a first side of said printed circuit board means, said first signal connector means having connector opening means for connecting each of said signal wires of said first woven ribbon cable to separate openings on said first side of said printed circuit board means and each of said signal wires of said second woven ribbon cable to separate openings on a second side of said printed circuit board means such that said signal wires are physically secured and electrically connected to said printed circuit board means to allow rapid connection and repair of said cable terminal;

second signal connector means for connecting signal wires of said second ribbon cable means to said second side of said printed circuit board means, said second connector means having connector opening means for connecting each of said signal wires of said first woven ribbon cable to separate openings on said first side of said printed circuit board means and each of said signal wires of said second woven ribbon cable to separate openings on said second side of said printed circuit board means such that said signal wires are physically secured and electrically connected to said printed circuit board means to allow rapid connection and repair of said cable terminal;

first ground connector means for connecting said first mass ground terminator means to said first side of said printed circuit board means;

second ground connector means for connecting said second mass ground terminator means to said second side of said printed circuit board means;

switch connector means for connecting said switch means to said printed circuit board means;

pad contact means for providing a conductive connection between said printed circuit board means and said standardized terminal connector;

printed circuit board conductor means conductively connected to said first and second signal connector means, said first and second ground connector means, said switch connector means and said pad contact means such that said signal wires and ground wires of said first and second woven ribbon cables are connected to predetermined pad elements of said pad contact means and said switch means is capable of selectively interconnecting said signal wires of said first and second woven ribbon cables;

housing means for providing a cover for said cable terminal comprising:

releasable connector means for joining portions of said housing means to allow said housing means to be disassembled for repair of said cable terminal;

catch means disposed on said housing means;

mounting means for mounting said switch means;

teeth means disposed to engage said first and second woven ribbon cables along transverse raised portions of said first and second woven ribbon cables resulting from weaving of said cables to provide strain relief

between said printed circuit board means and said first and second woven ribbon cables; and,

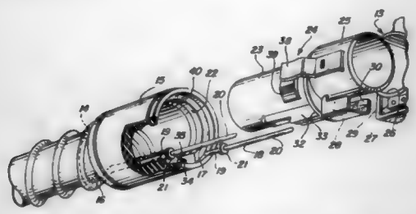
support means for securing said printed circuit board means to said housing means.

4,639,055

HOSE COUPLING FOR VACUUM CLEANER

James W. Keane, Ramsey County, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 3, 1985, Ser. No. 740,624
Int. Cl.[4] H01R *3/00*
U.S. Cl. 339—16 R 12 Claims



1. In a current-carrying vacuum cleaner air hose having electrical conductors extending lengthwise thereof, an end provided with a cuff, said conductors having ends at said cuff end, and a tubular adapter connected to said cuff and defining means for connecting the hose end and conductor ends to a coupling element to provide an air flow connection and an electrical connection therebetween, the improvement comprising:

a pair of separate contact pins removably mountable on said cuff end respectively in electrically conductive association with said conductor ends and projecting through said adapter to define electrical connection means for electrical connection to said coupling element;

guide means on said adapter for guiding said pins into electrical connection to said coupling element as an incident of the adapter being associated with the coupling element to have air flow connection therebetween; and

means on said adapter for retaining said pins separately in said electrically conductive association with said electrical conductors as a result of said adapter being connected to said cuff.

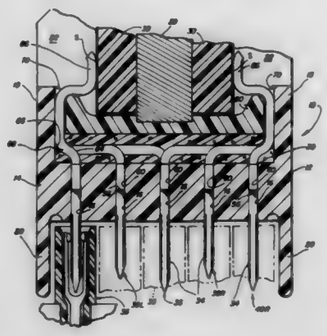
4,639,056

CONNECTOR CONSTRUCTION FOR A PC BOARD OR THE LIKE

Richard J. Lindeman, Wood Dale, and Thaddeus M. Rachwalski, Wheaton, both of Ill., assignors to TRW Inc., Redondo Beach, Calif.

Filed May 31, 1985, Ser. No. 740,093
Int. Cl.[4] H01R *9/09, 13/405*
U.S. Cl. 339—17 LC 13 Claims

1. In a connector for mounting a circuit board thereon, the combination comprising an apertured insulator having opposed sidewalls; a plurality of contacts mounted in apertures of said insulator in a plurality of spaced longitudinal rows arranged at intervals across the width of said insulator; said contacts having first terminal portions projecting from a first surface of said insulator for engaging contacts of a mating connector; second contact portions contiguous with said contact first terminal portions and disposed above a second surface of said insulator opposed to said first surface; said second contact portions being in spaced-apart relation; rigid, electrically non-conductive means in which said second contact portions are disposed secured to the second surface of said insulator; third contact portions contiguous with said second contact portions arranged in parallel, non-contacting relation along at least one of said insulator side-walls; continuations of said third contact portions terminating in contact portions for engaging conductive paths on a circuit board; all portions of each contact being integrally formed; and reinforcing means for supportably mounting a circuit board and for preventing bending of said insulator transverse to its longitudi-



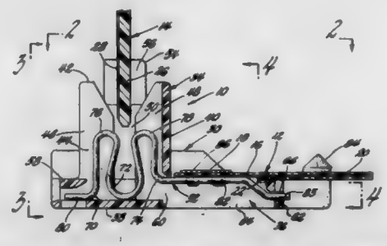
nal axis fixedly mounted in said electrically non-conductive means; said contact second portions, electrically non-conductive means, reinforcing means and insulator defining a rigid assembly resistant to bending.

4,639,057

ELECTRICAL CONNECTOR FOR PRINTED CIRCUITS

Ronald E. Daum, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 6, 1985, Ser. No. 708,788
Int. Cl.[4] H01R *9/07, 9/09*
U.S. Cl. 339—17 F 10 Claims



1. An electrical connector for connecting a flexible printed circuit to an end tab of a printed circuit board, comprising:

a dielectric connector body having a socket portion and a trailing attachment portion,

said socket portion having a base, an upright end wall at the trailing end of the base and a plurality of spaced partition walls which are integrally connected to the base and the end wall to define a row of terminal cavities which have interconnected openings at the leading end and the top of the socket portion,

a row of aligned slots in the respective partition walls which are open at the top of the socket portion for receiving an end tab of a printed circuit board in the row of terminal cavities,

a lock nib extending into each terminal cavity near the base and the opening at the leading end, and

an exit aperture for each terminal cavity extending through the end wall near the base,

said trailing attachment portion having an outrigger spaced from the trailing end of the base of the socket portion and connected thereto solely by a pair of integral side extensions to provide an open span between the socket portion and the outrigger, and

a row of apertures extending through the outrigger aligned

with the respective exit apertures of the terminal cavities, and

a plurality of contact strips associated with the respective terminal cavities, exit apertures, and outrigger apertures, each said contact strip having a locking portion at one end which cooperates with the lock nib of a terminal cavity to retain the contact strip in an operative position,

an intermediate resilient clip portion which is disposed in the terminal cavity for engaging the end tab of the circuit board when it is inserted into the socket portion, and

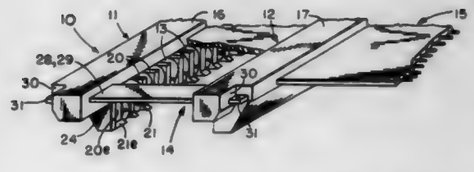
an elongated portion at the other end which extends through the exit aperture of the terminal cavity and the outrigger aperture associated with the terminal cavity so that the elongated portion extends across the open span between the socket portion and the outrigger for connection to a flexible printed circuit.

4,639,058

LOW PROFILE TEST CLIP AND HANDLE THEREFOR

Thomas E. Morgan, Concord, Ohio, assignor to Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Filed Aug. 22, 1984, Ser. No. 643,237
Int. Cl.[4] H01R *4/66, 13/62*
U.S. Cl. 339—17 CF 20 Claims



1. A low profile clip connector, comprising an electrical cable including plural electrical conductors; a pair of electrically non-conductive clip bodies molded to said cable, each body including therein plural electrical contacts having first portions electrically connected to said electrical conductors of said cable and second portions exposed for engaging the leads of an electrical device, and each body including electrically non-conductive separator walls laterally spaced apart and positioned to separate said second portions of said contacts from one another, said separator walls having a spacing and width that permits positioning thereof between the leads of the electrical device; and coupling means for coupling said pair of bodies with respect to each other for mounting of the clip connector on such electrical device to enable said contacts at their second portions to connect with the leads of the electrical device; and each clip body further including therein metal reinforcement means extending substantially the lateral extent of said separator walls for ridigfying said clip body along its lateral length.

4,639,059

CONNECTION DEVICE FOR ELECTRICAL COMPONENT

Claude Thepault, Milan, Italy, assignor to Crouzet S.p.A., Milan, Italy

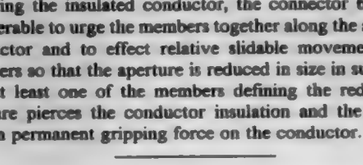
Filed Aug. 29, 1985, Ser. No. 770,706
Claims priority, application Italy, Sep. 5, 1984, 22525 A/84
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—17 F 4 Claims

1. A connection interface between an electrical component and other electrical circuit elements, comprising:

means forming a plurality of contact points on a side of said component;

at least one flexible printed circuit board affixed intermediate its length to said side of said component and electrically connected to said contact points in accordance with a selected connection arrangement, said printed circuit board having ends extending beyond said component on opposite sides thereof;

a respective flat preformed rigid body mounted on each of said ends and electrically connected to said printed circuit board along one side of each of said bodies in accordance with a selected connection arrangement, an opposite side of each preformed body being formed with terminals connectable to said elements, said bodies being foldable



over said side of said component provided with said contact points whereby said preformed bodies are generally in a coplanar relationship and said terminals project away from said component;

a slotted part hingedly connected to each of said bodies and receiving a ridge formed in said component adjacent the side provided with said contact points to enable said bodies to fold to overlie said side provided with said contact points; and

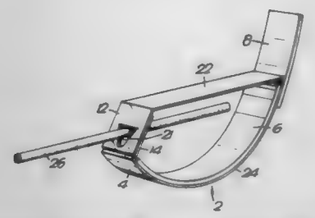
means for retaining said bodies in said coplanar relationship.

4,639,060

HEAT RECOVERABLE CONNECTOR

Richard Lionnet, Parmain, France, assignor to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 30, 1984, Ser. No. 605,513
Claims priority, application United Kingdom, May 20, 1983, 8314008
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—30 19 Claims



1. A connector for making an electrical connection to the conductor of an elongate insulated electrical conductor comprising contact members that are electrically conductive at least in part and which co-operate to form an aperture for receiving the insulated conductor, the connector being heat recoverable to urge the members together along the axis of the conductor and to effect relative slidable movement of the members so that the aperture is reduced in size in such a way that at least one of the members defining the reduced size aperture pierces the conductor insulation and the members exert a permanent gripping force on the conductor.

4,639,061

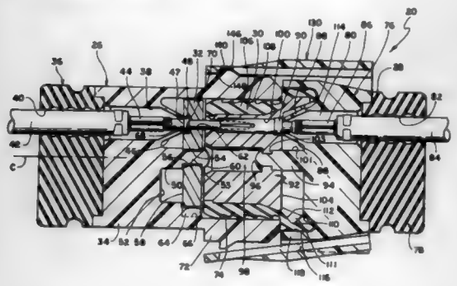
ENVIRONMENTALLY SEALED CONNECTOR

Steven Z. Muzslay, Huntington Beach, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Nov. 19, 1984, Ser. No. 672,536
Int. Cl.[4] H01R *11/00*
U.S. Cl. 339—59 M 18 Claims

1. A shell-less connector member comprising:

and insulative connector body comprising a front part and a rear part;
said rear part comprising a front section of relatively hard material and an integral rear section of elastomeric material;
at least one contact passage extending through said rear part;
a plurality of annular integral ribs on the wall of said passage in said rear section adapted to have a sealing fit with an insulated wire terminating in a contact in the forward portion of said passage in said front section;
integral contact retention fingers on said front section extending forwardly and inwardly from the wall of said passage for engaging a rearwardly facing shoulder on the contact to removably retain the contact in said passage;
means fixedly mounting said front part on said front section of said rear part, said front part being formed of a relatively hard material;



a bore extending through said front part concentric with said passage and adapted to receive the contact therein; and
said from part having a rearwardly facing shoulder surrounding said bore for restricting forward movement of the contact in said passage;
said front part embodying an integral elastomeric sealing section having a first set of annular, outwardly extending sealing ribs thereon adapted to sealingly engage the inner cylindrical wall of a recess in a mating connector member when said sealing section is pushed into the recess;
said sealing section of said front part embodying a second set of annular, outwardly extending sealing ribs thereon behind said first set;
said front section of said rear part embodying a cylindrical inner surface surrounding said second set of sealing ribs; and
said second set of sealing ribs are in sealing engagement with said inner surface.

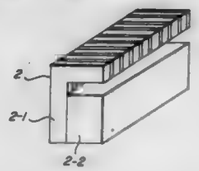
4,639,062

CIRCUIT BOARD CONNECTION

Koki Taniguchi, Osaka; Shigeri Yamaguchi, and Keiji Nakayama, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 572,053, Jan. 19, 1984, abandoned. This application Mar. 12, 1986, Ser. No. 839,807
Claims priority, application Japan, Jan. 25, 1983, 58-11039
Int. Cl.[4] H01R *11/00*
U.S. Cl. 339—59 M **3 Claims**

1. An integrated display board connection assembly for a printed wiring board consisting essentially of:
display segments having both common and segment sides to be independently connected to a wiring circuit of said printed wiring board;
a rubber connector consisting of a part that alternately contains conductive and insulated layers and a part that is only an insulator combined together so as to form an elongated slot for the insertion therein of said display segments such that selective contact is made by said respective common and segment sides of said display segments with said wiring circuit of said printed wiring board; and
an angle member interlocked with said printed wiring board, embracing and pressing said connector so as to bring a conductive film of said common side or said segment side



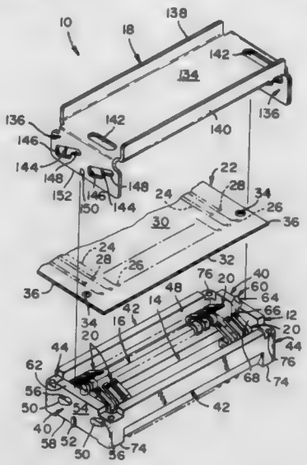
respectively, of said display segment into contact with a corresponding conductor of said printed wiring board via a conductor layer of said rubber connector.

4,639,063

ELECTRICAL CONNECTOR FOR FLEXIBLE FILM CIRCUITS

Arthur L. Mueller, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 20, 1985, Ser. No. 811,580
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—75 M **19 Claims**



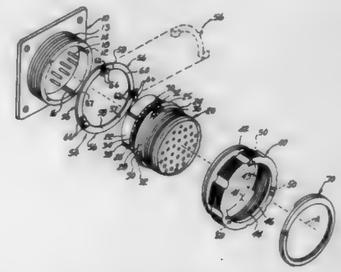
1. An electrical connector for electrically interconnecting conductors on a flexible film strip to circuit traces on a circuit board, comprising
dielectric housing means having side walls and end walls and a floor defining an upwardly opened cavity and having elongated passage means extending through said floor;
first cam means provided on said side walls of said housing means;
elongated means disposed in said passage means including a plurality of conductive contact element means spaced along and supported in an insulative member means, said contact element means having contact means extending upwardly in said cavity and lower portion means depending from said housing means for electrical connection to said circuit traces on said circuit board; and
cover means having base means and depending plate means at each side of said base means with second cam means thereon, said cover means being movably positioned on said housing means with said base means extending across the top of said housing means with a space therebetween to receive said flexible film strip, and said plate means extending along said side walls with said second cam means thereon cooperating with said first cam means on said side walls so that as said cover means is moved to a closed position, said first and second cam means cooperate to move said cover means towards said housing means so that said flexible film strip inserted between said cover means and said housing means is engaged by said base means and pressed against said contact means to establish electrical contact between the conductors on said film strip and said contact means.

4,639,064

ANTI-DECOUPLING RESISTING AND EMI SHIELDING MEANS FOR AN ELECTRICAL CONNECTOR ASSEMBLY

Anthony W. Knapp, Laurens, and Dee A. Werth, Afton, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 28, 1986, Ser. No. 834,690
Int. Cl.[4] H01R *13/623*
U.S. Cl. 339—89 M **6 Claims**



1. An electrical connector assembly comprising a pair of cylindrical shells the forward end portions of which interfit for mating, a rotatable coupling nut for coupling the shells together, and means operative only near full mate for resisting rotation of said coupling nut, one shell including a forwardly and a rearwardly facing annular face and the other shell terminating in a foward end face which during coupling rotation is advanced towards the forwardly facing annular face, said coupling nut having an annular endwall adjacent to the rearwardly facing annular face, said means being characterized in that
an annular spring member is slidably disposed about said one shell,
said endwall includes a plurality of angularly spaced detents, and
said rearwardly facing annular face includes a cavity,
said spring member comprising a flat annulus adapted to be sandwiched between the forward end face and the forwardly facing annular face and including an axially extending flange portion which is initially adapted to seat within the cavity so as not to impede rotation and at full mate as a result of the forward end face driving the flat annular against the forwardly facing annular face is driven axially rearward to be deformed within one of the detents whereby to resist rotation.

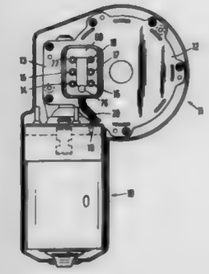
4,639,065

WINDSHIELD WIPER MOTOR

Alfred Kohler, Bietigheim; Theodor Schneider, Freudental, and Karl F. Schubert, Bietigheim, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

Filed Mar. 14, 1985, Ser. No. 711,603
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409680
Int. Cl.[4] H01R *13/514*
U.S. Cl. 339—119 R **19 Claims**

1. An electric wiper motor for motor vehicles, comprising:
a gear housing;
a cap covering said gear housing;
a plurality of plug contacts projecting from the outside of said cap for the connection of a mating plug;
a plurality of switch springs fixed to selected ones of said plug contacts, within said gear housing said selected ones of said plug contacts being fixed to said cap;
at least one of said plug contacts coupled to a motor supply lead;
and wherein



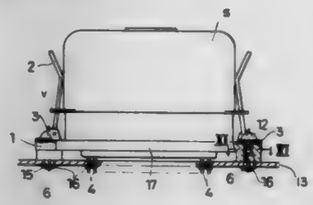
all of said plurality of plug contacts are formed as round pins and/or receptacles, said pins and/or receptacles project at least substantially perpendicularly from said cap, and the pin and/or the receptacle for said motor supply lead is guided at a structural member which is detachably secured to the outside of said cap.

4,639,066

CONNECTOR APPARATUS FOR A PRINTED CIRCUIT BASE BOARD

Yukio Shimamiya, Machida; Kinzo Narumo, Ichikawa, and Hiroshi Ebihara, Tokyo, all of Japan, assignors to Honda Tsushin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1985, Ser. No. 713,990
Claims priority, application Japan, Jan. 23, 1985, 60-6731[U]
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—132 B **7 Claims**



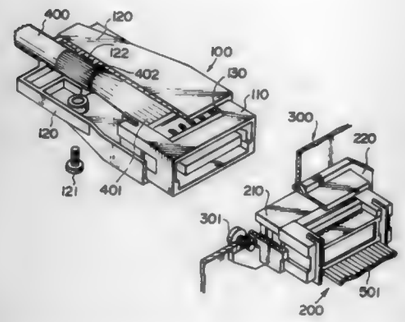
1. A connector apparatus comprising:
a connector member including an insulation material connector body;
a large number of contacts projecting downwardly from said connector member body for positioning on a printed circuit base board;
an attaching member for attaching said connector member to said printed circuit base board;
an end portion of each of the contacts is connected by soldering to a printed circuit of the base board;
said attaching member comprises a metallic plate member with first and second opposite end portions and provided at the metallic plate member first end portion with a pair of legs including projections positioned at forward ends respectively for engagement with and for soldering to the printed circuit base board;
said attaching member including a tap screw which is screwed into a second end portion of the metallic plate member to clamp the connector member to the printed circuit base board;
said second end portion of the metallic plate member is formed into a curved portion of an arc shape in section and the tap screw is screwed into the curved portion.

4,639,067

SHIELD STRUCTURE FOR ELECTRIC CONNECTORS

Sigeru Kikuta, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1985, Ser. No. 776,878
Claims priority, application Japan, Oct. 16, 1984, 59-216850
Int. Cl.[4] H01R 4/66
U.S. Cl. 339—143 R 3 Claims



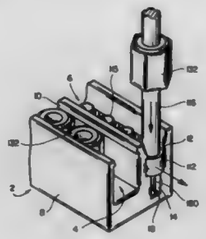
1. In a pair of electric connectors each of which comprises an insulating housing with a contact disposed therein and a conductive shield case surrounding the insulating housing, and which are coupled to each other, a shield structure characterized in that the insulating housing of one of said electric connectors has a portion protruding beyond the forward end of the conductive shield case of said one electric connector and adapted to be fitted into the conductive shield case of the other of said electric connectors, the conductive shield case of said one electric connector is provided on the inner wall of the rear end thereof with a cable clamp portion for coming into contact with the cable shield of a cable to be connected thereto, the forward end surface of the conductive shield case of said one electric connector is adapted to abut on the forward end surface of the conductive shield case of said other electric connector when said one electric connector is coupled to said other electric connector, earth plates are disposed on either outer side walls of the insulating housing of said one electric connector, a part of each of said earth plates being sandwiched between the inner wall of the conductive shield case of said one electric connector and the outer side wall of the insulating housing of said one electric connector so as to make contact with the inner wall of the forward end of the conductive shield case of said one electric connector and another part of each of said earth plates being laid on the outer side wall of the insulating housing of said one electric connector so as to be exposed outside the conductive shield case of said one electric connector, and said exposed part of each earth plate is adapted to come into the forward end of the conductive shield case of said other electric connector so as to make contact with the inner wall of the forward end of the conductive shield case of said other electric connector when said one electric connector is coupled to said other electric connector, whereby each of said earth plates extends across the abutting line of the forward end surface of the conductive shield case of said one electric connector past the forward end surface of the conductive shield case of said other electric connector so as to electrically connect the conductive shield case of said one electric connector to the conductive shield case of said other electric connector so that the cable shield of said cable can be positively and electrically connected to the conductive shield case of said other electric connector through said cable clamp portion, the body of the conductive shield case of said one electric connector and each of said earth plates.

4,639,068

HOLDER FOR COUPLING ASSEMBLY

Corey J. McMills, Los Altos, and James C. Milroy, Palo Alto, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 14, 1984, Ser. No. 650,930
Int. Cl.[4] H01R 17/18
U.S. Cl. 339—177 R 1 Claim



1. A kit of parts for connecting a coaxial cable, comprising:
a connector body having a mating area for engaging an outer layer of a cable and means for focussing the deformation of a deformable compressive member;
a driver member for interconnection with the connector body for compressing the compressive member between the driver member and the connector body;
a deformable compressive member adapted for positioning around the cable at the mating area and having sufficient compressive strength to deform the outer layer of a coaxial cable against the mating area of the connector body; and
a holder for holding the connector body and the driver member, said holder having first and second longitudinal channels formed therein capable of holding a plurality of the driver members and connector bodies, respectively, in such a manner so as to allow the driver members and connector bodies to be longitudinally slid into and out of said respective channels and retained therein, said second longitudinal channel having first and second sets of ridges for retaining edges of upper and lower surfaces of the connector bodies, said second longitudinal channel further having a longitudinal recess extending from a lower one of the set of ridges therein for accommodating a stripped end of a coaxial cable when inserted through the connector body retained within the second channel so as to allow visual inspection of an insertion depth of the stripped end of the coaxial cable through the connector body.

4,639,069

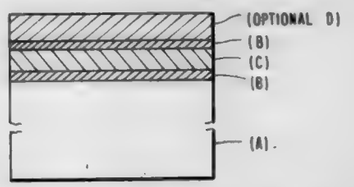
OPTICAL LAMINAR STRUCTURE

Toshiaki Yatabe, Tokyo; Toshio Nishihara, Yamaguchi, and Nobuo Suzuki, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jun. 28, 1983, Ser. No. 508,707
Claims priority, application Japan, Jun. 30, 1982, 57-115331; Dec. 15, 1982, 57-218438; Dec. 17, 1982, 57-220279; Dec. 17, 1982, 57-220280
Int. Cl.[4] G02B 5/24, 5/28; B05B 5/00; B05D 5/06
U.S. Cl. 350—1.7 5 Claims

1. An optical laminar structure being transparent for visible light and reflective for near infrared light comprising a dielectric layer arranged sandwichlike between thin metal layers, located on a transparent substrate, characterized in that the dielectric layer comprises a 30 nm to 200 nm (300 Å to 2,000 Å) thick transparent organic polymer layer with a refractive index

in the range of 1.35 to 1.65, the thin metal layer has a thickness of about 4 nm to about 15 nm (about 40 Å to about 150 Å) and



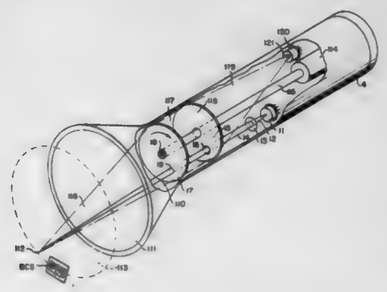
the transparent substrate is a 0.5 mm to 10 mm thick inorganic glass sheet or a 5 μm to 200 μm thick organic polymer film.

4,639,070

BEAM SCANNING TYPE INFORMATION READOUT DEVICE

Hiroyuki Ikeda, Yokohama; Seikichi Matsumoto, Sano; Shunji Kitagawa, Kawasaki; Takefumi Inagaki, Kawasaki, and Ichiro Sebata, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 9, 1981, Ser. No. 223,764
Int. Cl.[4] G02B 26/12
U.S. Cl. 350—3.71 3 Claims



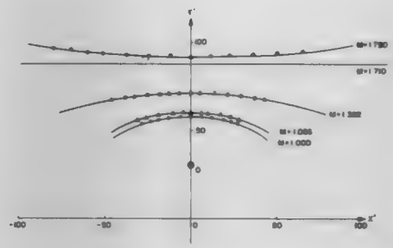
1. A hand held information readout device for reading a bar-code symbol on an object, comprising:
a laser beam generator;
an optical scanner comprising a disk hologram which deflects and substantially scans the beam generated from said laser beam generator in at least two different directions for the bar-code symbol to be read and which receives and guides a scattered beam reflected from the bar code symbol;
a convergent lens for converging the guided scattered beam;
an optical detector which detects the beam reflected from the bar-code symbol, guided by said disk hologram and converged by said convergent lens; and
a case accommodating said laser beam generator, said optical scanner and said optical detector having a grip portion for holding the device by the operator and including a rotation drive source located at one end of said case for rotating said disk hologram, located at the other end of said case, about a rotation axis; said laser beam generator being positioned adjacent the rotation axis to project the beam substantially parallel to the rotation axis and said detector being substantially aligned with and positioned adjacent to the rotation axis to detect the converged guided reflected beam.

4,639,071

LIGHT SCANNING APPARATUS

Seikichi Matsumoto, Sano, and Hiroyuki Ikeda, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 271,046, Jun. 5, 1981, abandoned. This application Feb. 26, 1986, Ser. No. 833,579
Claims priority, application Japan, Jun. 6, 1980, 55-76137
Int. Cl.[4] G02B 26/10
U.S. Cl. 350—3.71 11 Claims



1. A method for controlling the shape of a scanning locus of a light beam of a reconstruction wavelength on a surface of an object to be scanned, comprising the steps of
providing a reconstruction beam with said reconstruction wavelength, and
moving said reconstruction beam across a hologram mounted on a disc by means of rotating said disc about a rotation axis,
wherein said hologram has interferences fringes produced by interferring an object wave and a reference wave of a construction wavelength that is different from said reconstruction wavelength, said reference wave having a focus at a distance F from said hologram being produced, said interference fringes of said hologram define an optical axis of said hologram, said optical axis and said axis of rotation are arranged in parallel and spaced a distance R apart, and the value of said reconstruction wavelength, and said distances F and R, are determined to provide a selected shape of said scanning locus of said reconstruction beam on said surface to be scanned, as diffracted by said hologram on said rotating disc.

4,639,072

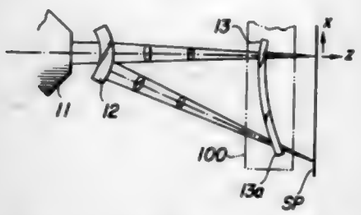
OPTICAL BEAM SCANNING APPARATUS INCLUDING A CYLINDRICAL LENS HAVING ITS OPPOSITE ENDS CLOSER TO THE SCANNED PLANE THAN ITS MEDIAL PORTION

Toyotsugu Itoh, Hachioji, and Toshio Muramatsu, Musashino, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 476,811, Mar. 18, 1983, Pat. No. 4,496,209. This application Nov. 29, 1984, Ser. No. 676,591
Claims priority, application Japan, Mar. 21, 1982, 57-45059
The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.
Int. Cl.[4] G02B 26/10
U.S. Cl. 350—6.8 13 Claims

1. In an optical beam scanning apparatus wherein a light beam from a light source is reflected by a rotary polygonal mirror and then radiated to a scanned plane through a condens-

ing lens for scanning of the beam, the improvement in that a cylindrical lens bent to have both ends in the longitudinal



direction thereof approaching to said scanned plane is disposed between said condensing lens and said scanned plane.

4,639,073

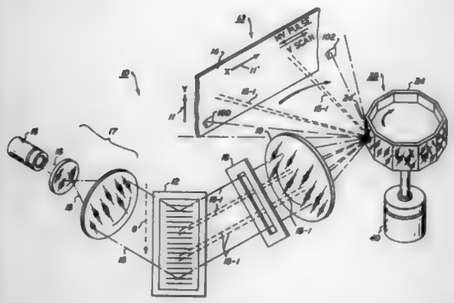
ELECTRO-OPTIC PULSE IMAGING RASTER OUTPUT SCANNER

Kwok-leung Yip; Mehdi N. Araghi, both of Webster; Joseph J. Daniele, Pittsford; Martin E. Banton, Fairport; Charles J. Kramer, Pittsford, and Joachim A. Ritter, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 19, 1984, Ser. No. 590,922

Int. Cl.[4] G02B *26/10*; H04N *1/04*

U.S. Cl. 350—6.8 **8 Claims**



1. A high performance pulse imaging system, comprising in combination:

(a) means providing a beam of high intensity radiation;

(b) a recording member on which images are formed,

(c) modulator means for modulating said beam in response to an image signal input to provide an imaging beam;

(d) a movable scanning element for line scanning said imaging beam across said recording member to expose said recording member and form images thereon;

said modulator means including:

(1) a substrate, and

(2) a row of discrete electrodes in operative relation with said substrate, said beam impinging on said row of electrodes, selective application of preset potentials to individual ones of said electrodes changing the index of refraction of said substrate in the vicinity of said electrodes and causing each segment of said beam passing through said substrate where the index of refraction is changed to be diffracted into at least one other path, each diffracted segment cooperating with any other diffracted segments to form a diffracted beam, remaining non-diffracted segments of said beam cooperating to form a non-diffracted beam;

(3) one of said diffracted or non-diffracted beams comprising said imaging beam; and

(e) control means for stepping said potentials across said row of electrodes from one end to the other so that said modulator outputs a succession of the segments of said beam progressing along said row of electrodes for each imaging spot, the segments of said beam progressing in a direction opposite to the direction of movement of said scanning element whereby to balance the rate at which successive ones of the segments of said beam are impinged on said recording member with the rate of movement of said scanning element to obviate image blur.

4,639,074

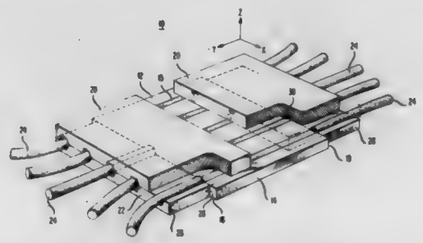
FIBER-WAVEGUIDE SELF ALIGNMENT COUPLER

Edmond J. Murphy, Bethlehem, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 18, 1984, Ser. No. 621,453

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.15 **7 Claims**



1. An optical fiber to waveguide coupler comprising

a first substrate containing at least one optical waveguide longitudinally disposed along a top surface thereof, at least one endface of said first substrate perpendicular to said top surface;

a second substrate including at least one longitudinal groove, each groove capable of containing an optimal fiber; and

a cover plate disposed to partially cover said second substrate and said at least one optical fiber located therein, an endface of said cover plate lying in the same plane as an endface of said at least one optical fiber, said cover plate endface connected to said first substrate endface such that said second substrate overlaps a portion of said top surface of said first substrate and said at least one optical fiber is aligned with said at least one optical waveguide.

4,639,075

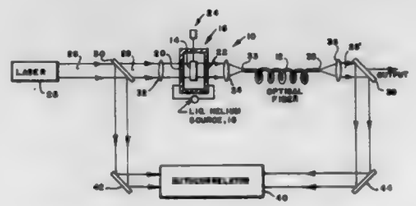
DISTORTION FREE FIBER OPTIC SYSTEM

Michael M. Salour, Cambridge, Mass., and Gustav W. Fehrenbach, Essen, Fed. Rep. of Germany, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 23, 1983, Ser. No. 497,443

Int. Cl.[4] G02B *6/28*; G02F *1/00*

U.S. Cl. 350—96.16 **18 Claims**



1. A distortion free optical fiber system comprising:

means for providing a beam of electromagnetic radiation, said beam of electromagnetic radiation being at a preselected wavelength;

an optical fiber optically aligned with said beam of electromagnetic radiation for passing said beam of electromagnetic radiation therethrough, said optical fiber having a first end and a second end;

compensator means positioned adjacent one of said ends of said optical fiber for receiving and passing therethrough said beam of electromagnetic radiation and for compensating for any distortion which may be incurred by said electromagnetic beam of radiation as said beam passes through said optical fiber, said compensator means including a semiconductor material having a predetermined excitonic-polariton resonance and a corresponding anomolous dispersion region; and

said preselected wavelength of said beam of electromagnetic radiation being tuned to said predetermined excitonic-polariton resonance and to said anomolous dispersion region of said semiconductor material such that dispersion through said semiconductor material counterbalances dispersion through said optical fiber, and wherein distortion free propagation within said fiber takes place when the following criteria is established:

$$\frac{d^i}{d\lambda^i} n = 0,$$

where $i \geq 2$ and i=an integer, λ=said preselected wavelength of said beam of electromagnetic radiation and n=index of refraction of said semiconductor material;

whereby said beam of electromagnetic radiation is output from said system substantially distortion free.

15. A method of providing substantially distortion free transmission of a beam of electromagnetic radiation through an optical fiber, comprising the following steps:

(a) providing compensator means in the form of a semiconductor material having a predetermined excitonic-polariton resonance and a corresponding anamolous dispersion region matched to a preselected wavelength of said beam of electromagnetic radiation such that dispersion through said semiconductor material counterbalances dispersion through said optical fiber and the following criteria is established:

$$\frac{d^i}{d\lambda^i} n = 0$$

where $i \geq 2$ and i equals an integer, λ=said wavelength of said beam of electromagnetic radiation, and n=the index of refraction of said semiconductor material;

(b) positioning said semiconductor material in optical alignment with and adjacent either end of said optical fiber; and

(c) passing said beam of electromagnetic radiation having said preselected wavelength through both said semiconductor material and said optical fiber.

4,639,076

LENS HOLDER ASSEMBLY FOR A FIBER OPTIC CONNECTOR

John H. Mikolajcyk, Oneonta, and Leonard A. Krantz, Jr., Sidney, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 14, 1983, Ser. No. 550,848

Int. Cl.[4] G02B *6/36*

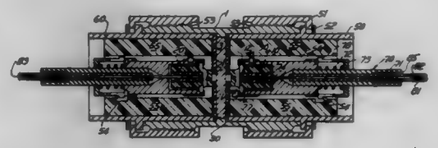
U.S. Cl. 350—96.20 **10 Claims**

5. In combination with a fiber optic connector of the type having: a housing having a central passage; an insert mounted in the central passage of said housing, said inset having at least one bore therein; at least one lens; and means for mounting a lens in each bore, the improvement wherein the lens and lens mounting means comprises:

a lens holder assembly for terminating an optical fiber, and a respective one of said lens holder assembly located in each of said bores, said lens holder assembly comprising:

a tubular member having a forward end, a rear end, and a central passage extending between the ends for receiving an optical fiber;

a lens removably mounted on the forward end of said housing; and said lens having a forwardly facing curved surface and a recess in the surface opposite said curved surface, said recess axially aligned with the curved surface for receiving an end of an optical fiber therein and located at the focal point of said lens for terminating said optical fiber;



means for mounting said lens to said tubular member so that said curved surface is facing forwardly and said recess is facing rearwardly and is axially aligned with the central passage in said tubular member and adapted to receive said one end of said optical fiber; and

means for releasably retaining a lens holder assembly in each bore of said insert, said means including a plurality of resiliently and radially deflectable spring fingers extending axially in each bore and located on one of said insert and lens holder assembly and a surface located on the other of said insert and lens holder assembly that engages the ends of each of said fingers to selectively prevent axial movement of said lens holder assembly in one axial direction.

4,639,077

COUPLING FOR A LIGHT-CONDUCTING FIBER

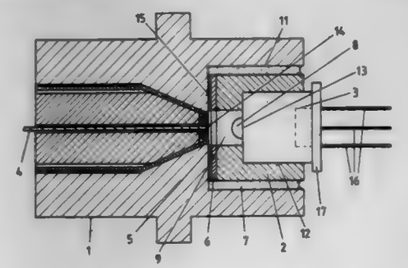
Thomas Dobler, Windisch, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jul. 19, 1984, Ser. No. 632,429

Claims priority, application Switzerland, Jul. 21, 1983, 3993/83

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 **12 Claims**



1. A coupling for a light-conducting fiber having an end piece, comprising:

a metal coupling body;

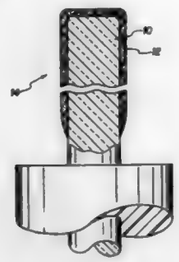
a first device mounted in the coupling body and adapted for holding the end piece of said light-conducting fiber;

an opto-electronic transmitting element mounted in a housing having an exit opening for light to be emitted by said element;

a metal cap for holding the opto-electronic transmitting element such that the exit opening is adapted to be opposite to an end face of the light-conducting fiber, said opto-electronic transmitting element fitted into said metal cap

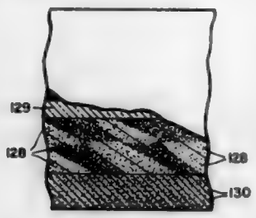
and having a through-hole for providing an optical connection between said exit opening and said fiber end face;
said opto-electronic transmitting element thermally coupled via said metal cap to the coupling body in order to improve heat dissipation; and
said housing and said coupling body defining therebetween a thermal resistance less than 100° C./W.

4,639,078
OPTICAL FIBER ATTENUATOR AND METHOD OF FABRICATION
Sang K. Sheem, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Oct. 5, 1984, Ser. No. 658,330
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 2 Claims



1. The method of making an optical fiber attenuator comprising the steps of:
coating a portion of a first optical fiber, including an end thereof, with a liquid which includes an adhesive and submicron light absorbing particles;
ultrasonically spreading said liquid about the surface of said fiber portion so as to achieve a substantially uniform coat of said liquid on said portion;
curing said coat;
testing the attenuation provided by said coat; and
splicing said first fiber at said end to an end of a second optical fiber.

4,639,079
OPTICAL FIBER PREFORM AND METHOD
Dale R. Powers, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Division of Ser. No. 427,523, Sep. 29, 1982. This application Oct. 28, 1985, Ser. No. 776,523
Int. Cl.[4] G02B *6/22*
U.S. Cl. 350—96.33 8 Claims

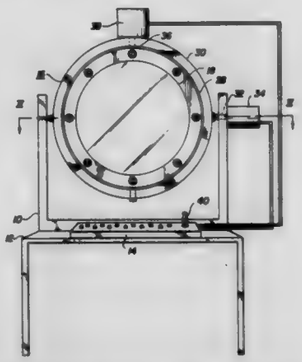


1. A rotationally symmetrical optical waveguide preform comprising a cylindrically-shaped region formed of a plurality of adjacent layers, each layer formed of first and second sublayers of glass particles, said first sublayer having a refractive index greater than that of said second sublayer, each sublayer comprising first and second sections, said first section of said first sublayer being adjacent to one of the adjacent layers and said second section of said first sublayer being adjacent to the adjacent layer that is opposite said one of the adjacent layers.

4,639,080
OPTICAL FIBERS COATED WITH MODIFIED 1,4-POLYBUTADIENES
Takao Kimura; Nobuo Inagaki, both of Ibaragi; Mitsuo Yoshihara, and Fumihiko Kato, both of Osaka, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Nitto Electric Industrial Co., Ltd., both of, Japan
Division of Ser. No. 394,245, Jul. 1, 1982, abandoned. This application Aug. 28, 1984, Ser. No. 645,138
Claims priority, application Japan, Jul. 4, 1981, 56-104770
Int. Cl.[4] G02B *6/00*
U.S. Cl. 350—96.34 2 Claims

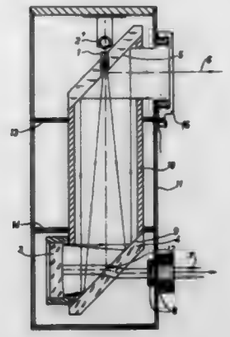
1. An optical glass fiber coated with a cured product formed from a coating material comprising 1,4-polybutadienes having functional groups or modified polybutadienes derived from the 1,4-polybutadienes and having introduced therein polymerizable double bonds different from the double bonds present in the 1,4-polybutadienes, further including a compound having polymerizable double bonds, and wherein the modified polybutadienes are polycondensation products of the 1,4-polybutadienes having functional groups and polyfunctional compounds having polymerizable double bonds.

4,639,081
GIMBALLED THREE-DIMENSIONAL DISPLAY SYSTEM
Thomas P. O'Brien, Deerfield, Ill., assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Aug. 15, 1985, Ser. No. 766,018
Int. Cl.[4] G02B *7/18, 27/22, 17/00, 5/10*
U.S. Cl. 350—144 7 Claims



1. A three-dimensional display system comprising:
(a) a volumetric display mechanism including a flexible membrane mirror;
(b) a console having user operator controls mounted thereon which govern image projection onto said mirror; and
(c) means for permitting a user of said console to maintain contact with said controls while changing the angular view of said image comprising a two axis remote control gimbal support for said mirror with said remote control for said gimbal support included with said user operator controls.

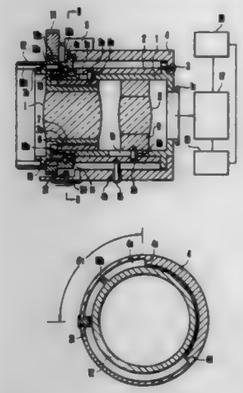
4,639,082
COLLIMATOR FOR COORDINATING TWO OPTICAL DEVICES
Fernand R. Loy, Sceaux, France, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 27, 1985, Ser. No. 716,890
Claims priority, application France, Apr. 17, 1984, 84 06057
Int. Cl.[4] G02B *27/14, 5/08*
U.S. Cl. 350—172 7 Claims



1. A collimater for coordinating two optical devices which operate in different wavelength regions, said collimator comprising:
a radiation source emitting radiation in two wavelength regions;
a plane mirror with an opening therein, said opening being arranged in front of the radiation source so as to define a primary beam having an optical axis, the plane mirror being arranged at an acute angle x with respect to the primary beam optical axis;
a plate arranged on the optical axis in front of the plane mirror, said plate having two substantially parallel surfaces, said plate being arranged at an acute angle y with respect to the primary beam optical axis;
a reflective layer on one parallel surface of the plate, said reflective layer having an opening therein;
a concave mirror arranged in front of the plate on a secondary beam optical axis, said secondary beam optical axis coinciding with the reflection of the primary beam axis by the plate, said concave mirror having a focus on the primary beam optical axis at the opening in the plane mirror; and
a compensator arranged behind the plate to receive radiation from the concave mirror which passes through the opening in the reflective layer.

4,639,083
LENS MOUNTING
Yutaka Fuziwara, and Hiroshi Yamamoto, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 8, 1984, Ser. No. 638,745
Claims priority, application Japan, Aug. 18, 1983, 58-150827
Int. Cl.[4] G02B *7/02*
U.S. Cl. 350—255 3 Claims

1. A lens mounting comprising:
(a) a focusing lens and a lens holder;
(b) a distance adjusting ring for moving said focusing lens, said distance adjusting ring including a radial projection for stopping rotation of said distance adjusting ring;
(c) a body tube including first and second stop portions for engagement with said radial projection of said distance adjusting ring; and
(d) stop means for shortening the range of movement of said distance adjusting ring,
said stop means including a stopper axially movable between a position for engagement with said radial projection of said distance adjusting ring and another position for disengagement therefrom.



4,639,084
LENS BARREL IN WHICH MOTOR CAPABLE OF SELECTING STEPPING DRIVE OR BRUSHLESS DRIVE IS PROVIDED
Michihiro Kugioka, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 26, 1984, Ser. No. 686,150
Claims priority, application Japan, Jan. 10, 1984, 59-2428; Jan. 19, 1984, 59-8340
Int. Cl.[4] G02B *7/04;* H02K *21/08*
U.S. Cl. 350—255 3 Claims



1. A lens barrel incorporating a motor, comprising:
a hollow cylindrical permanent magnet positioned in said lens barrel and provided with a step driving permanent magnet portion and a brushless driving permanent magnet portion;
step driving coils; and
brushless driving coils;
wherein a lens system is axially moved by the rotary motion of said hollow cylindrical permanent magnet; and
wherein, in case the amount of movement required for bringing said lens system to the in-focus position exceeds a predetermined value, said lens system is moved to a position corresponding to said predetermined value by the rotary motion of said brushless driving permanent magnet portion, and, in case said amount is equal to or less than said predetermined value, said lens system is moved to said in-focus position by the stepping rotary motion of said step driving permanent magnet portion.

4,639,085

VISOR WITH MIRROR WITH FLEXIBLE SLIDING COVER

Konrad H. Marcus, and Zooey C. Chu, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Filed Nov. 21, 1983, Ser. No. 553,645
Int. Cl.⁴ G02B *17/00*; B60J *3/00*
U.S. Cl. 350—283 **8 Claims**

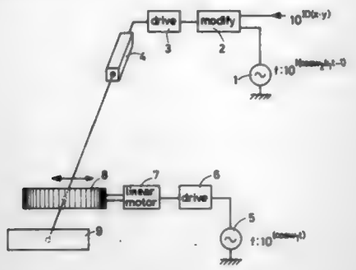
1. In a visor having a covered mirror comprising:
a visor body defining a housing having a frame;
a mirror stationarily mounted to said visor body in said frame, said frame including an opening in which said mirror is mounted, said opening exposing said mirror;
said housing including an aperture extending adjacent and along at least one edge of said opening and mirror;
a flexible cover for said mirror, said cover being of a size and shape to cover said opening;
roller means mounted within said housing, adjacent opposite edges of said opening and behind said frame; and
rigid means secured to opposite edges of said flexible cover substantially parallel to said opposite edges of said opening; said rigid means being coupled to each other by strings to form a continuous loop extending around said roller means for permitting movement of said cover around said roller means and through said aperture between a first position covering said opening and covering said mirror and between a second position extending into said housing behind said mirror so as to expose said mirror through said opening.

4,639,086

METHOD OF RECORDING A HALFTONE IMAGE

Ikuo Mitsuka, Shiga, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 510,871, Jul. 5, 1983, abandoned. This application Jan. 9, 1986, Ser. No. 816,994
Claims priority, application Japan, Oct. 4, 1982, 57-175120
Int. Cl.⁴ G03F *5/00*
U.S. Cl. 350—322 **2 Claims**



1. A system for exposing an image of continuously varying intensity composed of halftone dots to a photosensitive material, comprising:
means for obtaining original picture image signals;
oscillator means for generating a carrier wave described by the formula:

$$10^{\cos \omega 2(x \sin \alpha + y \cos \alpha) - 1};$$

where:
ω_2 represents a fundamental frequency of transmissivity distribution in a main scanning direction,
α represents a contact screen angle, and
x, y are contact screen coordinates;
means for multiplying said carrier wave by said image signals to obtain a modulation signal;
a light source for generating a thin exposure beam;
means responsive to said modulation signal for controlling said light source to intensity modulate said exposure beam;
a filter having a predetermined density distribution; and
means for oscillating said density filter;
said exposing beam being directed through said oscillating density filter to further intensity modulate said beam in accordance with the formula:

$$10^{\cos \omega 1(x \cos \alpha - y \sin \alpha) - 1}$$

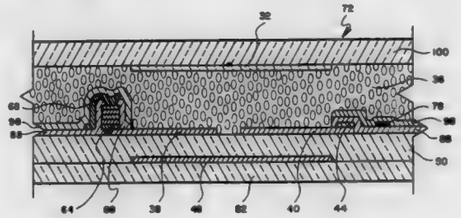
where ω_1 represents a fundamental frequency of transmissivity distribution in a subscanning direction, and α is the contact screen angle.

4,639,087

DISPLAYS HAVING PIXELS WITH TWO PORTIONS AND CAPACITORS

Vincent D. Cannella, Birmingham, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Aug. 8, 1984, Ser. No. 639,001
Int. Cl.⁴ G02F *1/133*
U.S. Cl. 350—332 **28 Claims**



1. In a display, including a matrix of pixels, at least one of said pixels having a pixel capacitance and an auxiliary capacitance and comprising:
a first electrode including at least two spaced apart electrode portions;
a second electrode spaced from and facing said first electrode portions in substantially parallel relation thereto said second electrode also being electrically insulated from all external circuit connections and from all other pixel electrodes;
light influencing display material between said first electrode and said second electrode;
a third electrode spaced from and facing said first electrode on the side of said first electrode opposite said light influencing material, said third electrode also being electrically insulated from all external circuit connections and from all other pixels, said second electrode forming with said first electrode said pixel capacitance and said third electrode forming with said first electrode said auxiliary capacitance electrically in parallel with said pixel capacitance.

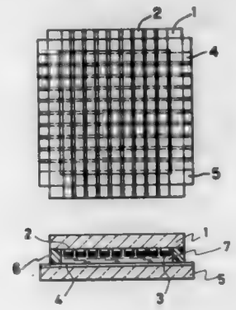
4,639,088

MULTI-COLOR DISPLAY DEVICE AND PROCESS OF FABRICATING SAME

Mitsuru Seginoya; Koji Iwasa; Hitoshi Kamamori; Yutaka Sano, and Yumiko Terada, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Jul. 19, 1984, Ser. No. 632,488
Claims priority, application Japan, Jul. 19, 1983, 58-131501
Int. Cl.⁴ G02F *1/13*
U.S. Cl. 350—339 F **16 Claims**

1. A process of fabricating a multi-color display device comprising the steps of: forming a plurality of display electrodes on a first substrate, selectively forming a color filter on each display electrode by electrodepositing a polymer together with coloring matter and electroconductive particles so that the display electrodes have different colors and electroconductivity, forming a counter electrode on a surface of a second substrate, and sandwiching a display material between said first substrate and said second substrate, said display material serving, in operation, as a light shutter controlled by the voltage applied between said color filter via said display electrodes and the counter electrode.

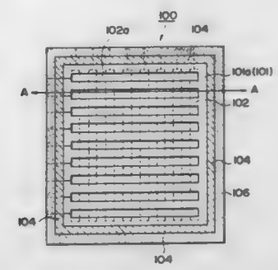


4,639,089

LIQUID CRYSTAL DEVICE

Shinjiro Okada, Kawasaki; Kazuharu Katagiri, and Junichiro Kanbe, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1985, Ser. No. 690,896
Claims priority, application Japan, Jan. 23, 1984, 59-10502
Int. Cl.⁴ G02F *1/13, 1/135*
U.S. Cl. 350—341 **33 Claims**



1. A liquid crystal device comprising a pair of base plates and a liquid crystal interposed between the pair of base plates; said liquid crystal showing a smectic phase and a cholesteric phase at a higher temperature than that giving the smectic phase and being capable of causing successive phase transition from the cholesteric phase through a smectic A phase to a chiral smectic phase having a non-spiral structure on temperature decrease; a face of at least one of said pair of base plates having been provided with a function of preferentially orienting the axes of the liquid crystal molecules contacting the face in one direction.

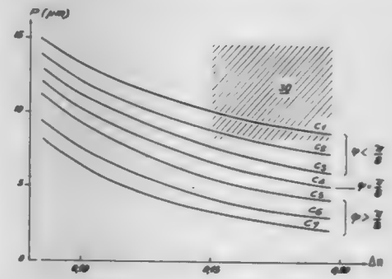
4,639,090

LIQUID CRYSTAL DICHROIC DISPLAY WITH A HIGH BRIGHTNESS CONTRAST

Jean-Frédéric Clerc, Meylan, and Francis Muller, Seyssinet, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 22, 1985, Ser. No. 736,816
Claims priority, application France, May 30, 1984, 84 08547
Int. Cl.⁴ G02F *1/13*
U.S. Cl. 350—346 **6 Claims**

1. A liquid crystal dichroic display with a high brightness contrast, comprising a liquid crystal film between two walls separated by a shim, one wall carrying transparent electrodes and the other wall a counterelectrode, said liquid crystal film having an optical anisotropy Δn and, in the absence of an electric field, a twisted or helical structure of pitch p, the wall carrying the counterelectrode being at least partly covered with a reflecting coating reversing the polarization of a circularly polarized electromagnetic wave and the optical anisotropy Δn and the pitch p being such that the light wave absorbed least by the display used in transmission has an ellipticity at least equal to $\pi/8$.



4,639,091

STATIC DEFLECTOR DEVICE FOR AN INFRARED BEAM

Jean-Pierre Huignard; Marcel Malard, and Guy de Corlieu, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 27, 1984, Ser. No. 583,645
Claims priority, application France, Feb. 25, 1983, 83 03132
Int. Cl.⁴ G02F *1/137*; G02B *5/18*
U.S. Cl. 350—347 V **15 Claims**



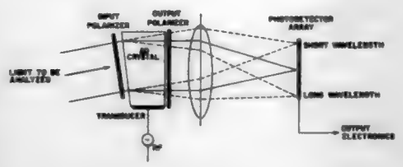
1. A static deflector device for deflecting a polarized infrared beam, said device being for use with a source of a polarized infrared beam, and comprising:
deflector means for deflecting said beam, said deflector means comprising a liquid crystal layer and modulator means for modulating said liquid crystal layer; and
control signal generator means for generating a control signal and applying said control signal to control said modulator means, thereby creating local variations of refractive index in said layer in such a manner as to form a beam diffraction grating of adjustable spacing in said liquid crystal layer;
said control signal being periodic in space having a staircase waveform varying from a minimum value to a maximum value in a continuous progression of N steps per period in such a manner that the maximum value causes an incident beam to be phase-shifted by 2π;
said modulator means for modulating said liquid crystal layer comprising electrodes disposed on both faces of said layer, the electrodes on the incident face of the layer being transparent, electrically isolated, and disposed in zones that are equidistant from one another and which are separated by inter-electrode spaces which, at least in one direction, range in size between 1 and 10 micrometers, a common electrode being disposed on the other face of said liquid crystal layer.

4,639,092

ACOUSTO-OPTIC DISPERSIVE LIGHT FILTER

Milton Gottlieb, Churchill Boro, Pa., and Fredrick L. Schaff, Ellicott City, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 30, 1984, Ser. No. 666,416
Int. Cl.[4] G02F *1/11, 1/33*
U.S. Cl. 350—372 6 Claims



1. A method for instantaneously monitoring two or more wavelengths of light comprising the steps of:

directing the light to be analyzed through an optically birefringent crystal having an optical input face, an optical output face and a pair of opposed parallel sides, wherein said light to be monitored is incident in one polarization and at a predetermined fixed angle over its entire spectral range to said optical input face, which optical input face is normal to the incident light and wherein one of said opposed parallel sides has means acoustically coupled therewith for launching acoustic waves into said crystal;

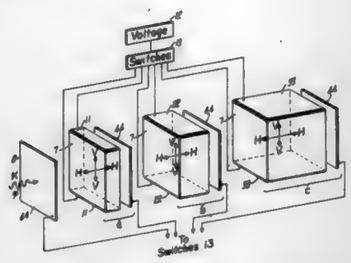
launching acoustic waves into said crystal at a predetermined fixed frequency wherein each wavelength resolution element which emerges from the crystal is at a different diffracted angle as a result of the interaction with the acoustic waves.

4,639,093

SWITCHABLE BANDWIDTH FILTER

Frederick Kubick, White Plains, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 2, 1984, Ser. No. 585,817
Int. Cl.[4] G02B *27/00*; G02F *1/05, 1/21*
U.S. Cl. 350—388 18 Claims



1. A filter device for switching between bandwidth states of a beam of millimeter wavelength radiation, comprising:

a plurality of stages of a material medium each having parallel input and output walls, and a pair of opposite sides, one of said pairs being horizontally and the other vertically disposed, each said medium being birefringent and having an optical axis and having at least two possible directions of orientation for said optic axis, and one of said directions being disposable parallel to the propagation of said beam of millimeter wavelength radiation;

at least two pairs of electrodes for each medium, each of said pairs straddlingly adjacent a corresponding one of said media, each of said pairs of electrodes being generally plane-parallel with respect to each other and each of said pairs of electrodes being orthogonal to a different one of said two directions of said optic axis; and

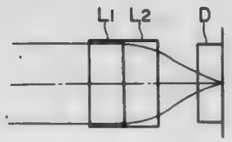
selective means for selectively providing electric power to selected ones of said pairs of electrodes and then to others of said pairs of electrodes, whereby an electric field is capable of establishment and disestablishment with respect to said material media and thereby effective for reorienting the optic axis of said material media from one direction to the other whereby the bandwidth of said millimeter wavelength radiation is discretely variable.

4,639,094

GRADIENT INDEX LENS SYSTEM

Yasuhiro Aono, Kawasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Sep. 27, 1983, Ser. No. 536,371
Claims priority, application Japan, Oct. 4, 1982, 57-173277; Oct. 4, 1982, 57-173278
Int. Cl.[4] G02B *3/00*
U.S. Cl. 350—413 23 Claims



1. A gradient index lens system for use as a pick-up lens for an optical disc, in which spherical aberration and coma are well corrected and which has an excellent imaging performance, said lens system comprising:

a first gradient index lens of a convergent refractive power having a gradient index rotationally symmetrical with respect to the optical axis thereof and having a refractive index which continuously decreases as the radius from the optical axis increases until the periphery is reached, and

a second gradient index lens of a convergent refractive power having a gradient index rotationally symmetrical with respect to the optical axis thereof and having a refractive index which continuously decreases as the radius from the optical axis increases until the periphery is reached,

the gradient index of said first gradient index lens being different from that of said second gradient index lens, and the gradient index of said first and second gradient index lenses being so determined that spherical aberration and coma of said lens system are compensated,

wherein when the gradient index n_1 of said first gradient index lens and the gradient index n_2 of said second gradient index lens are expressed by

$$n_1^2 = n_{01}^2 \{1 - (g_1 r)^2 + h_{41}(g_1 r)^4 + h_{61}(g_1 r)^6\}$$

$$n_2^2 = n_{01}^2 \{1 - (g_2 r)^2 + h_{42}(g_2 r)^4 + h_{62}(g_2 r)^6\},$$

the following conditions are satisfied:

$$1.0 < h_{41} < 5.0$$

$$-1.5 < h_{61} < 0$$

$$-5.0 < h_{42} < -0.5$$

$$1.0 < h_{62} < 8.0$$

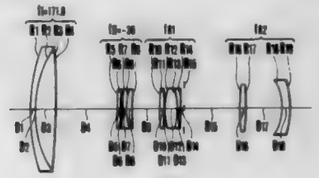
where n_0 is the center refractive index, r is the radial distance from the optical axis, g is a parameter indicative of the degree of refractive index gradient, h_4 and h_6 are the coefficients of the fourth order term and the sixth order term as the high order terms of gradient index, and subscript numbers 1 and 2 mean that the gradient indices are the amounts regarding said different first and second gradient index lenses.

4,639,095

TELEPHOTO ZOOM LENS

Masatake Kato, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1983, Ser. No. 491,053
Claims priority, application Japan, May 17, 1982, 57-82643
Int. Cl.[4] G02B *15/163*
U.S. Cl. 350—427 3 Claims



1. A telephoto zoom lens comprising:

three lens groups, said three lens groups being, from front to rear,

a 1st lens group of positive refractive power, a 2nd lens group of negative refractive power, and a 3rd lens group of positive refractive power,

said 3rd lens group being always stationary during zooming, said third lens group having a front sub-group of positive power, and a rear sub-group of positive power,

said 1st lens group and said 2nd lens group being made movable in order to change the focal length of the entire system, whereby the ratio of the amounts of movement ($d\eta/d\xi$) at the focal length of the telephoto side satisfies the following condition:

$$0.4 < (-d\eta/d\xi) < 5.0$$

wherein the focal length of the wide angle side is taken as a start point, the positive sign is given when measuring from front to rear, and ξ and η denotes the amounts of movement of said 1st lens group and said 2nd lens group respectively and wherein said telephoto zoom lens satisfying the following conditions:

$$0.6 < (Ra/fI) < 0.9$$

$$-12.0 < (Rb/fII) < 7.0$$

$$0.7 < (Rc/fII) < 1.2$$

$$Rd < 0$$

$$1.60 < N2 < 1.85$$

$$0.04 < Nb < 0.16$$

where

Ra is the radius of curvature of the front lens surface of the 1st lens, counting from front, in said 1st lens group,

Rb is the radius of curvature of the front lens surface of the 1st lens, counting from front, in said 2nd lens group,

Rc is the radius of curvature of the cemented surface of the cemented lens in said 2nd lens group,

Rd is the radius of curvature of the rear lens surface of the last lens in said rear sub-group,

N2 is the arithmetic means of the refractive indices of the glasses of the negative lenses in said 2nd lens group, and

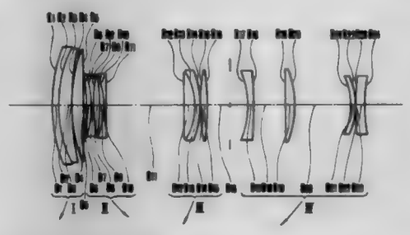
Nb is the difference between the refractive indices of the glasses of the two lenses of the cemented lens of said 2nd lens group.

4,639,096

HIGH RANGE ZOOM LENS

Nonoomu Kitagishi, Tokyo; Kikuo Momtyama; Keiji Ikemori, both of Kanagawa; Sadatoshi Takahashi, Tokyo, and Tsunefumi Tanaka, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1984, Ser. No. 657,762
Claims priority, application Japan, Oct. 6, 1983, 58-187398
Int. Cl.[4] G02B *15/14*
U.S. Cl. 350—427 6 Claims



1. A zoom lens comprising:

from front to rear, a first lens group having a positive refractive power;

a second lens group having a negative refractive power;

a third lens group having a positive refractive power; and

a fourth lens group, at least said first, said third and said fourth lens groups being movable for zooming, and said zoom lens satisfying the following conditions:

$$-3 < \beta_{3w} < -0.8$$

$$-0.35 < f3/f4 < 0.43$$

$$0.5 < Z2/Z < 1$$

$$! < f1/fw < 1.7$$

$$0.3 < |f2|/fw < 0.48$$

wherein

fi is the focal length of the i-th lens group counting from the front;

Z2 is the range of variation with zooming of the magnification power of said second lens group;

β_{3w} is the magnification power of said third lens group in a wide angle position;

fw is the shortest focal length of the entire system; and

Z is the zoom ratio of the entire system.

4,639,097

APPARATUS FOR THE INSPECTION OF COMBINED READ/WRITE HEADS OF DATA CARRIER DISKS IN EDP INSTALLATIONS

Artur Teske, Klaus-Groth-Str. 2, Neu-Wulmstorf, and Dietrich A. Klimmeck, Krambekweg 27, D-2359 Henstedt-Ulzburg, both of Fed. Rep. of Germany

Filed Feb. 9, 1984, Ser. No. 578,632
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1983, 8304588[U]; Nov. 4, 1983, 83111007
Int. Cl.[4] G02B *21/18, 21/24*
U.S. Cl. 350—507 7 Claims

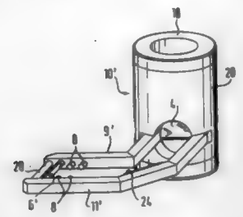
1. An apparatus for the inspection of combined read/write heads of data carrier disks in data processing installations, comprising:

a mirror holder, having a first side and a second side, said first side having a first area, a second area coupled to said first area and forming an angle of substantially 45 degrees therewith, and a third area, coupled to said second area and forming an angle of substantially 45 degrees therewith, and said second side having a first area, and a second area, coupled to said first area at a substantially right angle;

prism mirror means extending between said first area of said first and second sides of said mirror holder, respectively;

a second mirror, coupled to said second area of said first side; said prism mirror means having an upper mirror surface and a lower mirror surface extending at a selected angle to said upper surface, and a plane of symmetry which extends through a midpoint of said second mirror, for simultaneously reflecting light from both an upper surface and a lower surface of said object to be observed toward said second mirror;

a first optical path extending between said prism mirror means and said second mirror and an object to be observed being disposed in the vicinity of said prism mirror means, so that said prism mirror means reflects an optical sample of said object to be observed toward said second mirror;



a third mirror extending between said third area of said first side and said second area of said second side, light from said second mirror being coupled toward said third mirror;

first and second illuminating means, disposed on said first and second sides of said mirror holder, respectively near said prism mirror means, for illuminating said vicinity of said prism mirror means, to enable a better optical sample to be transmitted; and

lens means, disposed at an angle to said first optical path, light from said third mirror being coupled toward said lens means, and a focal length of said lens means being greater than a length of a second optical path which extends from said object to be observed in the vicinity of said prism mirror means to a principal plane of said lens means.

4,639,098

MICROSCOPE

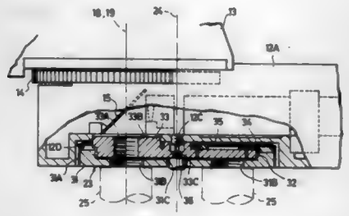
Tsutomu Aoyama; Taizo Nakamura; Naoyosi Terao, and Hirohiko Shinonaga, all of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,506

Claims priority, application Japan, Nov. 30, 1983, 58-185311[U]; Dec. 28, 1983, 58-203941[U]; Dec. 28, 1983, 58-203942[U]

Int. Cl.⁴ G02B *21/20, 7/16*

U.S. Cl. 350—514 **12 Claims**



1. A microscope, comprising:

a main body having vertically spaced upper and lower frames horizontally elongated in parallel to each other;

means defining a first optical axis on said upper frame;

a disk and rotational support means for rotatably supporting said disk on an undersurface of said upper frame about an axis of rotation extending parallel to said first optical axis;

plural objective lens barrels and mounting means for mounting said plural objective lens barrels to said disk, said lens barrels each having a second optical axis that extends parallel to said axis of rotation of said disk, said second optical axes each being arranged on a hypothetical circle on said disk that intersects said first optical axis;

a detent motion arresting means circumferentially provided between said disk and said undersurface of said upper frame for arresting the motion of said disk at each location whereat one of said second optical axes becomes aligned with said first optical axis;

an uprigtht barrel housing and large diameter thread detachable mounting means provided on an upper surface of said upper frame for facilitating a threaded attachment of said barrel housing to said upper frame, said barrel housing having first, second and third openings therein, said first and second openings being axially aligned and having a third optical axis coaxial with said first optical axis, said third opening having a fourth optical axis extending transversely to said third optical axis;

prism means mounted in said barrel housing and in a pathway defined by said coaxial first and third optical axes, said prism means including movable and stationary prism means for separating from said first and third optical axes an image path which is coaxial with said fourth optical axis, said prism means also including first means for effecting said coaxial alignment of said image path with said third optical axis adjacent a lower end of said upright barrel means, and second means for providing a non-inverted image to said fourth optical axis; and

mounting means on an upper end of said upright barrel means for facilitating a mounting of auxiliary optical recording apparatus having an input axis that is in coaxial alignment with said first optical axis.

4,639,099

OPTICAL INSTRUMENT

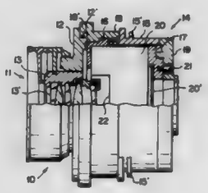
Kazuto Tanaka; Haruo Kakizawa, and Kouichi Nagata, all of Saitama, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

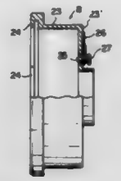
Filed Sep. 12, 1985, Ser. No. 775,248

Claims priority, application Japan, Oct. 6, 1984, 59-210096

Int. Cl.⁴ G02B *23/00*

U.S. Cl. 350—538 **4 Claims**





1. An optical instrument comprising:

(i) a casing;

(ii) at least one telescopic system mounted in said casing and composed of objective and eyepiece lenses;

(iii) an eyepiece mount supported on said casing;

(iv) an eyepiece lens unit detachably mounted on said eyepiece mount and comprising an eyepiece lens assembly including said eyepiece lens and an image intensifier tube assembly separably coupled to said eyepiece lens assembly, said image intensifier tube assembly including an image intensifier tube having a light-sensitive surface lying at the focal plane of said objective lens and a phosphor screen lying at the focal point of said eyepiece lens, said eyepiece lens assembly having first means for separably coupling the eyepiece lens assembly to said eyepiece mount without said image intensifier tube assembly disposed therebetween, said image intensifier tube assembly having second means for separably coupling the image intensifier tube assembly to said eyepiece mount with said eyepiece lens assembly attached to said image intensifier tube assembly, said first and second means being relatively positioned so that when said eyepiece lens assembly is coupled directly to said eyepiece mount without said image intensifier tube assembly disposed therebetween, said focal point of said eyepiece lens coincides with said focal plane of said objective lens.

4,639,100

ASTIGMATIC OPTICAL ELEMENT, ITS MANUFACTURING PROCESS, ILLUMINATING APPARATUS INCLUDING THE SAME AND ARTICLES TREATED BY THE SAME

Jean P. Arnaud, 23, rue de Pontoise, Moutmorency, F-95160, France

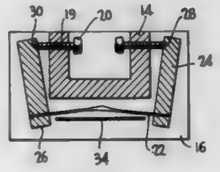
PCT No. PCT/EP83/00146, § 371 Date Feb. 10, 1984, § 102(e) Date Feb. 10, 1984, PCT Pub. No. WO83/04439, PCT Pub. Date Dec. 22, 1983

PCT Filed Jun. 7, 1983, Ser. No. 584,945

Claims priority, application France, Jun. 11, 1982, 82 10286

Int. Cl.⁴ G02B *5/08*

U.S. Cl. 350—611 **4 Claims**



1. Process for forming an optical element, said process comprising the steps of

forming a varied thickness flat member having first and second large faces, said first large face having a polished surface which is selectively planar or a section of a surface of revolution, and said second large face including at least a central portion which is a non-planar ruled surface having plural separate surfaces each defined from a generatrix, and

distorting said flat member by flexing said flat member around generatrices of said separate surfaces of said ruled surface to shape said polished surface as an optical surface which is neither planar nor a section of a surface of revolution.

4,639,101

THREE DIMENSIONAL MIRRORED AQUARIUM ORNAMENT

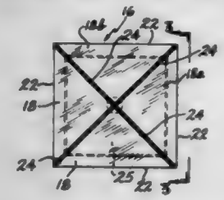
Ronald J. Stefancin, Jr., 4120 Columbia Sq., 101, North Olmsted, Ohio 44070

Filed Apr. 22, 1985, Ser. No. 725,899

Int. Cl.⁴ G02B *7/18, 5/08;* A01K *63/00*

U.S. Cl. 350—616 **12 Claims**

1. In combination a fish aquarium and a three dimensional mirrored aquarium ornament disposed in said aquarium, said ornament comprising plural mirror segments each including a base edge and side edges with said segments being disposed in generally abutting edge-to-edge relation to define an enclosure, means in said enclosure for weighting said ornament, and means oriented along abuttting edges of said segments to prevent the ingress of water into said enclosure and to prevent deterioration of the reflective coating of the mirror segments, and wherein said plural mirror segments include four side mirror segments defining a regular pyramidal shape and wherein said ornament includes a bottom wall, said bottom wall having an opening therethrough, and a plug for said opening to prevent the ingress of water into the interior of said ornament enclosure above said bottom wall.



4,639,102

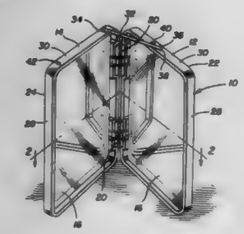
FOLDING DOUBLE MIRROR DEVICE

Paul Fetko, 6200 Rivercliffe Dr., NW., Atlanta, Ga. 30328, and Lawrence C. Zaglin, 3830 Paces Ferry West, NW., Atlanta, Ga. 30339

Filed Feb. 11, 1985, Ser. No. 700,177

Int. Cl.⁴ A45D *42/18, 42/00*

U.S. Cl. 350—626 **7 Claims**



1. A folding double mirror assembly including a pair of side-by-side mirror members each having a substantially reflective surface, mounting means pivotally connecting adjacent first marginal portions of said members together for relative swinging of said members between open positions with said reflective surfaces defining an included angle of at least 90° and closed positions with said surfaces disposed in substantially parallel juxtaposed relation, said mounting means including positioning means operative to releasably retentatively retain said mirror members in relatively angularly displaced positions with said reflective surfaces defining an included angle of substantially 75°.

4,639,103

REMOTE CONTROL MULTI-POSITION REAR VIEW MIRROR

Francis K. Hill, P.O. Box 2059, Wickenburg, Ariz. 85358

Continuation of Ser. No. 635,569, Jul. 30, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 885,317

Int. Cl.⁴ G02B *5/08;* A47G *1/24*

U.S. Cl. 350—636 **19 Claims**

1. A remote control multi-position rear view mirror for mounting on a vechicle comprising:

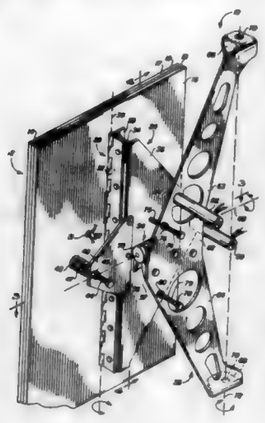
(a) a mirror having opposed reflective and non-reflective faces;

(b) a bracket coupled to the non-reflective face of said mirror and defining a first axis about which said mirror is pivotably movable relative to said bracket between first and second positions;

(c) biasing means for urging said mirror to its first position;

(d) first actuator means being remotely actuatable between extended and retracted postions, said first actuator means establishing the first position of said mirror when in the retracted state and moving said mirror to its second position when actuated to its extended state;

(e) first means on said bracket for establishing the second position of said mirror;
(f) a mounting arm for attachment to the vehicle and being adjustable for establishing the position of the mirror relative to the vehicle;
(g) interconnecting means coupling said mirror and said bracket to said mounting arm and defining a second axis about which said mirror and said bracket are movable as an entity between first and second positions, said interconnecting means being disposed so that the second axis defined thereby is at a right angle with respect to said first axis and includes means for biasing that entity to its first position;



(h) second and third means on said mounting arm for respectively establishing the first and second positions of movement of said mirror and said bracket as an entity about said second axis; and
(i) second actuator means being remotely actuatable between extended and retracted positions, said second actuator means moving said mirror and said bracket as an entity about said second axis to the second position thereof when said second actuator means is actuated to its extending state.

4,639,104

SIDEPIECE END OF A SPECTACLE FRAME SIDEPIECE

Hans Gaiser, Thuringer Str. 19, 7410 Reutlingen 24, Fed. Rep. of Germany

Filed May 22, 1985, Ser. No. 736,688
Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419509
Int. Cl.⁴ G02C *5/18, 5/14*
U.S. Cl. 351—117 **8 Claims**



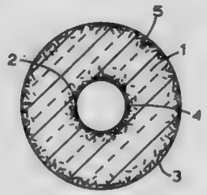
1. In a sidepiece end of a spectacle frame from sidepiece, having
a homogeneous metallic tang with a flat profile in the hard bending direction,
a thin sleeve of hard synthetic plastics material having a blind hole for receiving said flat profile,
a small plate extending integrally from said synthetic plastics sleeve having a flat profile and at least one transverse aperture, and
a sheath, of injected synthetic plastics silicone rubber material of a Shore-D hardness of 10–30 according to DIN 53505, surrounding said synthetic plastics sleeve, said small plate and said tang and having an end face at one end remote from said small plate, the improvement wherein:
(a) said synthetic plastics sleeve extends integrally as far as said end face of said sheath and has end walls and side walls that are mutually opposite each other and wider than said end walls,
(b) a plurality of through-passing holes are provided spaced from one another in said mutually opposite side walls of said synthetic plastics sleeve, and
(c) said material of the injection-moulded sheath engages in said holes.

4,639,105

SPIN CAST OCULAR COSMETIC DEVICE WITH COLOR SEPARATION

Charles W. Neefe, 811 Scurry St., Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 751,484, Jul. 3, 1985, which is a continuation-in-part of Ser. No. 740,569, Jun. 3, 1985, which is a continuation-in-part of Ser. No. 642,114, Jul. 17, 1984, Pat. No. 4,534,915, which is a continuation-in-part of Ser. No. 506,873, Jul. 5, 1983, abandoned, which is a continuation-in-part of Ser. No. 417,641, Sep. 9, 1982, Pat. No. 4,416,837. This application Aug. 30, 1985, Ser. No. 771,236
Int. Cl.⁴ B29D *11/00*
U.S. Cl. 351—162 **14 Claims**



8. A rotationally cast ocular cosmetic device that alters the apparent color of the eye having a plurality of concentric color components and is substantially the size and curvature of the cornea upon which it is placed and has an open central visual aperture substantially the size of the pupil and positioned on the cornea around the pupil of the eye, made from a composition comprising a liquid monomer, a soluble dye and suspended pigment particles, the composition is placed in a concave mold having a central conical protrusion which forms the central visual aperture and the concave mold is rotated around its central axis, some of the suspended pigment particles migrate to the device periphery, other suspended pigment particles remain adjacent to the open central visual aperture, the soluble dye does not migrate, the rotating liquid monomer is allowed to polymerize forming a solid cosmetic device having a plurality of concentric color components surrounding the central open visual aperture.

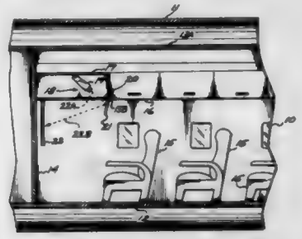
4,639,106

AIRCRAFT VIDEO PROJECTION SYSTEM

James H. Gradin, Irvine, Calif., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Apr. 26, 1985, Ser. No. 727,580
Int. Cl.⁴ G03B *21/30*
U.S. Cl. 353—13 **10 Claims**

1. A video projection system suitable for mounting above a ceiling of the passenger compartment of an aircraft for displaying video images for passengers embarked on the aircraft comprising:
(a) a video projector positioned above said ceiling in said aircraft passenger compartment, said ceiling having an opening through which said video projector transmits video images along a predetermined first path;
(b) light deflecting means supported in a position of light deflecting alignment relative to said first path, said position of light deflecting alignment being on the side of said ceiling opposite said video projector, said light deflecting means for deflecting said video images along a predetermined second path; and,
(c) projection screen means supported in a position of light receiving alignment relative to said second path for receiving and displaying to said aircraft passengers the video images deflected along said second path, said first path being no longer than said second path and defining an acute angle with said ceiling.

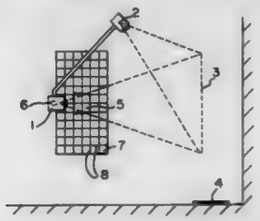


4,639,107

ACQUIRING MEASUREMENTS OF AN OBJECT BY MEANS OF PHOTOGRAPHY

Ulrich M. Landwehr, Bahnhofstr. 8, 1 OG, D-300 Hannover 1, Fed. Rep. of Germany

Filed Jul. 1, 1985, Ser. No. 750,862
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425913
Int. Cl.⁴ G03B *29/00*
U.S. Cl. 354—77 **8 Claims**



1. In an imaging method for ascertaining the dimensions of an object by means of photography, including the step of projecting during imaging in an oblique direction a particular pattern of horizontal lines upon the object to be imaged, the improvement comprising:
projecting during photographic imaging a measuring raster of horizontal and vertical lines directly upon and into the imaging plane in a photographic camera.

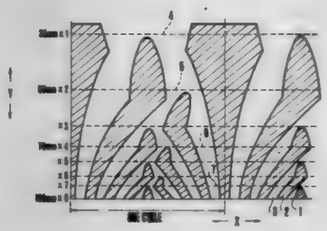
4,639,108

CODE PLATE

Shinji Sakai, Tokyo; Takashi Kawabata, Kanagawa, and Yoshihito Harada, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1983, Ser. No. 527,284
Claims priority, application Japan, Aug. 31, 1982, 57-150088
Int. Cl.⁴ G03B *3/10*; G01D *5/249*
U.S. Cl. 354—289.1 **4 Claims**

1. A code plate for a zoom lens, comprising:
a substrate for the code plate; and
a plurality of signal sources arranged and formed on said substrate of the code plate in a first direction in which a member moves as the object distance varies which moves according to a change in a distance to an object to be photographed, and, unlike that of the first detection, said signal sources being arranged to have their spacing intervals variable according to displacement of the member in a second direction in which said displacement takes place in association with a change in the focal length of a photo-taking lens and wherein the width of each of said signal sources in the first direction is equal to each of the spacing intervals of said signal sources in said first direction.

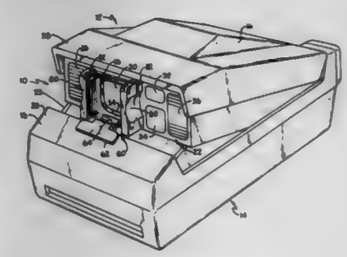


4,639,109

OPTICAL ACCESSORY FOR PHOTOGRAPHIC APPARATUS

William Hudspeth, Norwell, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 3, 1985, Ser. No. 740,852
Int. Cl.⁴ G03B *11/00*; G02B *7/00*
U.S. Cl. 354—295 **5 Claims**

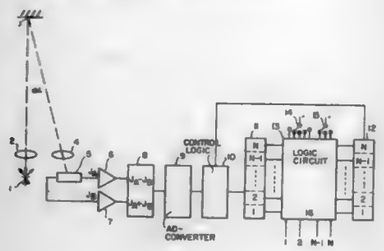


1. An accessory for a photographic apparatus, the apparatus including an objective lens assembly, a housing structure being provided with a recess adjacent the lens assembly, said accessory including:
a frame defining an opening, said frame including means for mounting an optical element in operative relationship with said opening; and,
means for releasably attaching said frame to the photographic apparatus so that said frame opening is disposed in general alignment with the lens assembly such that an optical element positioned in said mounting means is in operative optical relationship with respect to the lens assembly;
said attaching means including at least a resiliently flexible member extending from said frame, said member having a section configured to seat in the recess of the housing structure in coupled engagement therewith and a distal end section configured to project forwardly of the housing structure in a location outside the field of view of the lens assembly when said accessory is attached to the photographic apparatus so as to be accessible to an operator's finger to facilitate selective release of said accessory from the photographic apparatus.

4,639,110
AUTOMATIC FOCUSING SYSTEM FOR A PHOTOGRAPHIC CAMERA

Juergen Rinn, Wetzlar, and Fritz Belitz, Pohlheim-Hausen, both of Fed. Rep. of Germany, assignors to Minox GmbH, Giessen, Fed. Rep. of Germany

Filed Sep. 24, 1985, Ser. No. 779,710
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1984, 3437145
Int. Cl.⁴ G03B 3/00
U.S. Cl. 354—403 **4 Claims**



1. An automatic focusing system for photographic cameras, with an infrared light source, an infrared detector and a focusing optics mounted in front of the detector to focus the infrared radiation reflected from the object on the detector surface, where the detector is divided into two partial detectors each of which supplies a partial current of which the ratio depends directly on the object distance, characterized by the detector (5) being followed by an electronics (6–16) including a computing circuit (16) which by means of an objective-focusing system implements the objective-focus according to a preselection performed on one of the components (selection switch 15) of the electronics in one of the following several modes of operation

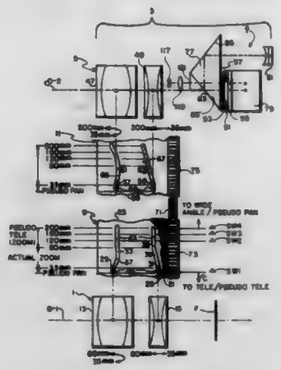
(a) focus is on the object to be photographed,
(b) extend the depth of field from the object toward the camera,
(c) extend the depth of field from the object toward the rear
(d) extend the depth of field from the object to infinity
(e) extend the depth of field between two consecutively targeted objects.

4,639,111
PSEUDO FORMAT CAMERA WITH EXPOSURE CONTROL

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 21, 1985, Ser. No. 747,515
Int. Cl.⁴ G03B 7/099
U.S. Cl. 354—481 **13 Claims**

1. A photographic camera for exposing a film frame for use in producing a pseudo telephoto print, said camera comprising:
an objective lens;
manually operated means for selecting a pseudo telephoto field of view reduced from the actual field of view of said objective lens;
exposure control means including a photosensitive element disposed to receive ambient light; and
light control means, responsive to the selection of a pseudo telephoto field of view, for controlling the amount of light reaching said photosensitive element in accordance with the amount of light available to the pseudo telephoto field

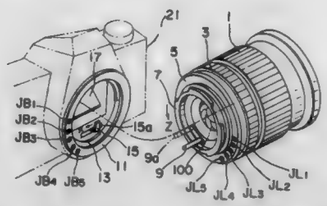


of view, whereby the portion of the film frame covered by the pseudo field of view can be more accurately exposed.

4,639,112
CAMERA SYSTEM CAPABLE OF INTERCHANGING ITS OBJECTIVE LENS

Masaaki Nakai, Nara; Masayoshi Sahara, Seman; Nobuyuki Taniguchi, Tondabayashi, and Toshihiko Ishimura, Habikino, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 478,910, Mar. 25, 1983, Pat. No. 4,560,267. This application Jul. 19, 1984, Ser. No. 632,405
Claims priority, application Japan, Mar. 26, 1982, 57-49768; Mar. 30, 1982, 57-52740; Apr. 1, 1982, 57-55187; Nov. 5, 1982, 57-194968; Apr. 26, 1984, 59-85599
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.⁴ G03B 7/20, 7/26
U.S. Cl. 354—455 **4 Claims**



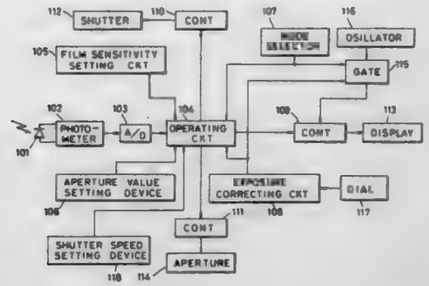
1. A camera system capable of interchanging an objective lens assembly with another lens assembly, which comprises:
an interchangeable lens assembly comprising
first and second terminals adapted to receive electrical power from a camera body and connectable respectively to a high voltage side and a ground side;
a lens circuit constituted by a C-MOS construction and adapted to receive the electric power from the first and second terminals;
a third terminal adapted to receive an enabling signal from the camera body for bringing the lens circuit into a condition ready to be enabled;
a fourth terminal adapted to receive the clock pulses from the camera body; and
a fifth terminal adapted to transmit there through to the camera body the various data peculiar to the interchangeable lens assembly which are serially outputted from the lens circuit, said first to fifth terminals being arranged in a row along the direction in which the lens assembly is turned, said fifth terminal being located at one end of said row on the leading side with respect to the direction of the

turn of the lens assembly when coupled to the camera body; and
said camera body comprising:
sixth to tenth terminals adapted to be connected respectively with the first to fifth terminals when the lens assembly has been completely coupled to the camera body;
means for outputting a power supply initiating signal in dependence on a manipulation;
a source of the electric power for supplying a voltage on the high voltage side to the sixth terminal through a protective resistor and also for providing the seventh terminal with a ground level;
means for outputting to the eighth terminal a first enabling signal for bringing the lens circuit into a condition ready to be enabled;
means for outputting the clock pulses to the ninth terminal;
a data output means for serially outputting data within the camera body on the basis of the clock pulses;
means for outputting a second enabling signal for bringing the data output means into a condition ready to be enabled at a timing different from the timing at which the lens circuit is enabled; and
a read-out circuit constituted by a C-MOS construction for sequentially reading through a common input terminal on the basis of the clock pulses not only of the various data peculiar to the lens assembly which have been inputted from the tenth terminal, but also the data with in the camera body fed from the data output means.

4,639,113
CAMERA DISPLAY DEVICE

Yuji Ohkubo, Ohmiya, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Sep. 30, 1985, Ser. No. 782,104
Claims priority, application Japan, Oct. 4, 1984, 59-208787
Int. Cl.⁴ G03B 17/18
U.S. Cl. 354—472 **5 Claims**

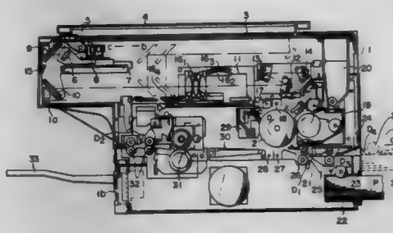


1. A camera operative in a first mode as an automatic control mode for automatically controlling at least one of an aperture and a shutter so as to obtain an optimal exposure, and in a second mode for manually controlling an aperture value and a shutter speed to be controlled, and having a member operated in the first mode to deviate an exposure to be controlled from the optimal exposure, including:
(a) detecting means for detecting a deviation of the exposure from the optimal exposure and an exposure deviation direction thereof upon operation of said member in the first mode and generating a first detection signal; and
(b) display means having a plurality of display parts for displaying the deviation and the exposure deviation direction in response to the first detection signal;
(c) said detecting means being adapted to generate a second detection signal representing a deviation of an exposure and an exposure deviation direction thereof obtained as a combination of a manually preset aperture value and shutter speed in the second mode; and
(d) said plurality of display parts being adapted to display the deviation and the exposure deviation direction in response to the second detection signal.

4,639,114
IMAGE-FORMING APPARATUS WITH AUTOMATIC AND MANUAL PAPER FEED MODES

Fumito Ide, Zama, and Hidenori Mochizuki, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 24, 1984, Ser. No. 664,291
Claims priority, application Japan, Oct. 25, 1983, 58-198332; Oct. 26, 1983, 58-199124; Oct. 31, 1983, 58-202587
Int. Cl.⁴ G03G 15/00
U.S. Cl. 355—35 H **2 Claims**



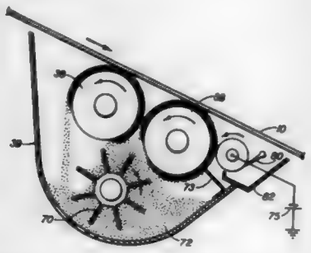
1. An image forming apparatus with automatic and manual sheet feed modes comprising:
first, detachable, sheet supply cassette means for containing sheets of a first predetermined size for automatic feeding;
second, detachable, sheet supply cassette means for containing sheets of a second predetermined size for automatic feeding, and for permitting manual feeding of a sheet from outside, said second sheet supply cassette means including a manual sheet supply guide which may be selectively moved between a first position, in which said guide permits manual feeding of said sheet from outside, and a second position, in which said guide permits automatic feeding of the sheets contained within said second sheet supply cassette means;
cassette selection means for supplying a command which designates from which of said first and second sheet supply cassette means sheets are to be fed;
first display means for displaying a manual feed mode;
second display means for displaying an automatic feed mode, and the size of the sheets which can be fed in such mode;
first control means for producing a first control signal which causes said second display means to operate in response to the second position assumed by said manual sheet supply guide, and in response to the command from said cassette selection means designating said first or second sheet supply cassette means;
second control means for producing a second control signal which causes said first display means to operate in response to the command from said cassette selection means designating said second sheet supply cassette means, and in response to the first position assumed by said manual sheet supply guide;
third control means for producing, when supplied with the command from said cassette selection means designating said first sheet supply cassette means while said first display means is operating, a third control signal which causes said second display means to operate, and a fourth control signal which causes said first display means to flash;
image data output means for outputting image data that is to be formed; and
image forming means for transferring image data output from said image data output means onto a sheet supplied

automatically or manually from one of said sheet supply cassette means and said manual sheet supply guide.

4,639,115
DEVELOPMENT APPARATUS WITH PAPER DEBRIS REMOVER

Ying-wei Lin, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 1, 1985, Ser. No. 718,615
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—3 DD 10 Claims

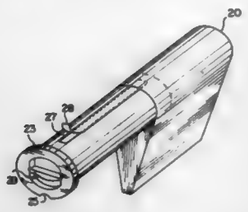


1. Apparatus for rendering latent electrostatic images on a charge-retentive surface visible, said apparatus comprising:
means containing a quantity of developer;
at least one magnetic developer roll rotatably supported for rotation in a predetermined direction intermediate said charge retentive surface and said developer containing means;
means for moving developer material from said containing means to said magnetic developer roll, said developer roll being positioned adjacent said charge retentive surface whereby developer carried thereby is presented to said charge retentive surface during rotation of said developer roll; and
paper debris removal means supported adjacent said magnetic developer roll in a location relative to the developer roll's path of travel whereby a section of said developer roll to which developer material has been attracted is moved by said developer roll into contact with said paper debris removal means prior to contactng said charge retentive surface.

4,639,116
PRINTER/COPIER WITH DISPOSABLE TONER CARTRIDGE

Kensuke Fukae, Allendale, N.J., and Keitaro Yamashita, Saitama, Japan, assignors to Keutek Information Systems, Inc., Allendale, N.J.

Filed Apr. 2, 1985, Ser. No. 718,946
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—3 DD 18 Claims

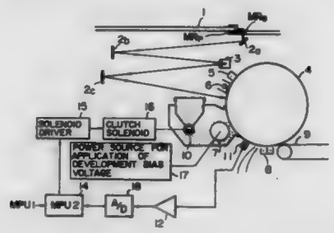


1. A self-contained developer unit for use in connection with an electrophotographic printing apparatus, said developer unit comprising
a substantially closed housing,
means for receiving a disposable cartridge containing toner,
a mixing chamber wherein said toner and a carrier are mixed,
means for delivering controlled amounts of toner from said cartridge to said mixing chamber,
circuit means for monitoring the toner/carrier mix in said mixing chamber,
means coupled to said delivering means for controlling the amount of toner delivered from said toner cartridge to said mixing chamber in response to signals generated by said circuit means,
means coupled to said mixing chamber for mixing said toner with carrier particles, and
means coupled to said mixing chamber for applying said toner/carrier mix to a photoconductive element to develop a latent electrostatic image,
said housing substantially enclosing said disposable cartridge receiving means, said mixing chamber, said delivery means, said mixing means, and said means for applying said toner/carrier mix to said photoconductive element, and at least partially enclosing said circuit means.

4,639,117
RECORDING IMAGE DENSITY CONTROL METHOD FOR ELECTROPHOTOGRAPHY

Kazuo Murai, Tokyo, and Yasushi Koichi, Yamato, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 4, 1982, Ser. No. 439,211
Claims priority, application Japan, Nov. 7, 1981, 56-178891
The portion of the term of this patent subsequent to Feb. 25, 2003, has been disclaimed.
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R 5 Claims

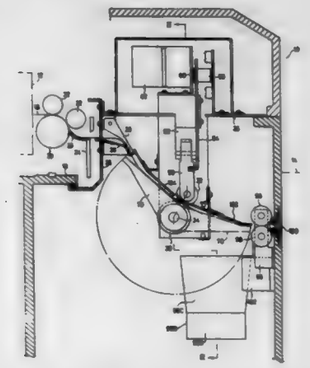


1. A recording image density control method for electrophotography in which latent electrostatic images are formed on a photoconductor by charging the surface of said photoconductor, followed by exposing the charged surface of said photoconductor to optical images, said latent electrostatic images are developed to toner images by a developer supplied from a development apparatus, and said toner images are transferred to a transfer sheet under application of image transfer charges thereto, comprising the steps of:
forming at least two latent electrostatic image patterns with different electric potentials on the surface of said photoconductor;
developing said latent electrostatic images patterns to toner image patterns by use of toner contained in said developer;
detecting a value relating to the image density of each said developed toner image pattern, with a different resolution for each said developed toner image pattern, by (1) converting the image density to an image density detection voltage, (2) dividing said image density detecting voltage into at least two image density detecting voltages with predetermined ratios, a direct image density detection voltage and a divided image density detection voltage, (3) inputting said direct image density voltage to a first channel of an A/D converter and said divided image density voltage to a second channel of said A/D converter, (4) comparing said direct image density voltage with a reference voltage, and when said direct image density voltage is not greater than said reference voltage, and direct image density voltage is employed as said value relating to the detected image density, while when said direct image density is greater than said reference voltage, said divided image density voltage input to said second channel of said A/D converter is employed as said value relating to the detected image density;
determining the ratio said value for one image pattern to said value for the other image pattern; and
controlling a recording image density controlling parameter in accordance with said ratio.

4,639,118
PHOTOGRAPHIC PAPER ACCOMMODATING APPARATUS

Mikio Kogane; Kenji Suzuki; Eiichi Kito; Kazufumi Kubota, and Kanji Tokuda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 1, 1985, Ser. No. 794,030
Claims priority, application Japan, Nov. 1, 1984, 59-230977
Int. Cl.[4] G03B *29/00*
U.S. Cl. 355—29 22 Claims

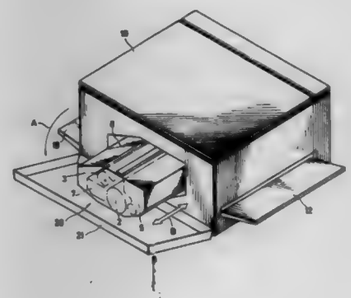


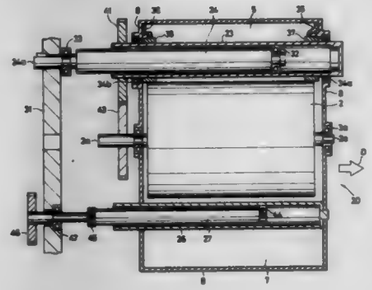
1. A photographic paper accommodating apparatus which is disposed on the downstream side of a photographic paper printing section for feeding an exposed continuous photographic paper to a subsequent step, said apparatus comprising:
(a) first clamping and transporting rollers disposed on the downstream side of said printing section so as to clamp and transport said photographic paper and define a first photographic paper looping area between said printing section and said rollers;
(b) second clamping and transporting rollers disposed on the downstream side of said first clamping and transporting rollers so as to clamp and transport said photographic paper and define a second photographic paper looping area between said first and second clamping and transporting rollers; and
(c) a guide member movable between at least two, that is, first and second, positions, at which first position said guide member is disposed between said printing section and said first clamping and transporting rollers so as to guide the leading end portion of said photographic paper to said first clamping and transporting rollers, and at which second position said guide member is disposed between said first and second clamping and transporting rollers so as to guide the leading end portion of said photographic paper to said second clamping and transporting rollers.

4,639,119
PROCESS KIT AND AN IMAGE FORMATION APPARATUS USING THE PROCESS KIT

Kazuo Isaka, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 374,055, May 3, 1982, abandoned. This application Mar. 22, 1985, Ser. No. 715,578
Claims priority, application Japan, May 12, 1981, 56-71227
Int. Cl.[4] G03G *15/09*
U.S. Cl. 355—3 DD 14 Claims



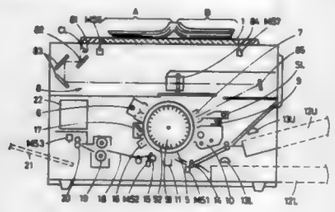


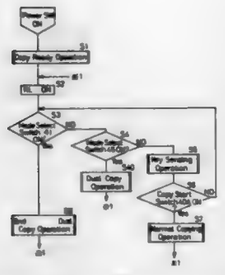
1. A process kit removably mountable with respect to the body of an image formation apparatus, said process kit having:
a housing,
a magnetic powder carrying member for carrying magnetic powder developer on the peripheral surface thereof by a magnetic field generated by magnetic field generating means disposed on the opposite side from the magnetic powder carrying surface of said magnetic powder carrying member when the process kit is inserted in the apparatus body,
a latent image carrying member on which an image can be developed using the magnetic powder developer,
a support member for said magnetic powder carrying member which rotatably supports said carrying member on the housing of said process kit, and
means defining an opening in said magnetic powder carrying member dimensioned to accept the insertion therein of the magnetic field generating means, which is mounted on the apparatus body, when said process kit is inserted in the apparatus body.

4,639,120
INDEPENDENT DUAL ELECTROPHOTOGRAPHIC COPYING MACHINE

Hirokazu Matsuura, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 12, 1985, Ser. No. 700,971
Claims priority, application Japan, Feb. 15, 1984, 59-27612
Int. Cl.[4] G03G *15/22*
U.S. Cl. 355—14 R 7 Claims





1. A control system in a dual electrophotographic copying machine, comprising:

document table means for receiving one or more copy documents positioned to correspond to first and second halves of a total area of said document table means;

copy start means for initiating a copying operation of a copy document disposed on said document table means;

mode selection means for selecting either a simple dual copying operation mode or a second dual copying operation mode, said simple dual copying operation mode being for copying said one or more copy documents positioned on first and second halves of said document table means onto one or both sides of identical size copy papers from a single paper cassette for a same number of copies for each document table half, and said second dual copying operation mode being for copying said one or more copy documents positioned on first and second halves of said document table means onto two different-size copy papers selected from two different paper cassettes for a same or different number of copies;

automatic mode selection means for automatically selecting a normal copying operation mode in the absence of an actuation of said copy start means in either of said simple or second dual-copying operation modes;

selection means, responsive to said mode selection means, for selecting and inputting copy information associated with said first and second halves of said document table means;

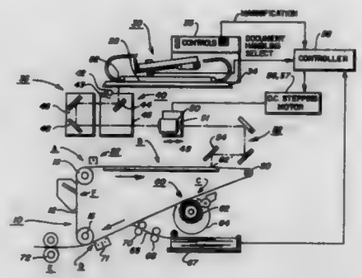
detection means, responsive to said selection means, for detecting which of said input copy information relates to either of said first or second halves of said document table means; and

control means, responsive to said detection means, for executing a selected copying operation mode upon actuation of said copy start means.

4,639,121
DOCUMENT REGISTRATION SYSTEM

John H. Looney, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 24, 1985, Ser. No. 748,071
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R 5 Claims



1. An imaging system for a document reproduction machine including:

a transparent platen for supporting a document to be reproduced, said platen having a first horizontal edge registration position associated with a first mode of operation and a second horizontal edge registration position associated with a second mode of operation,

means for generating an electrical signal indicative of said first or second registration position,

an illumination scan assembly for scanning said document,

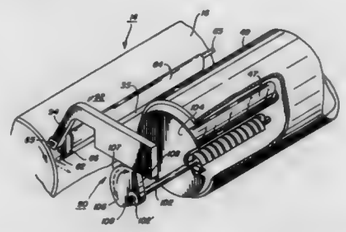
an optical system for forming latent images of said scanned document on a photoreceptor surface moving in a process direction, said optical system including a movable projection lens, and

control means adapted to receive said electrical signals corresponding to registration position and to move said lens in a direction perpendicular to said process direction so as to maintain a centered and edge-registered position of said latent image on said photoreceptor.

4,639,122
CONTROL FOR RETRACTING THE CLEANING BLADE OF A REPRODUCTION OR PRINTING MACHINE WHEN THE MACHINE IS NOT IN USE

Donald L. Pease, Honeoye, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 15, 1986, Ser. No. 818,929
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—15 8 Claims



1. In a reproduction machine having a recording member with an imaging surface on which latent electrostatic images are formed, developing means for developing images on the recording member surface, transfer means for transferring developed images to copy substrate material, fuser means for fixing developed images transferred to the copy substrate material, and cleaning means for cleaning the recording member surface after transfer, the cleaning means including a blade having a cleaning edge; the combination of:

(a) means for supporting said blade for movement between an operative position where said blade cleaning edge engages the recording member surface and an inoperative position where said blade cleaning edge is disengaged from the recording member surface;

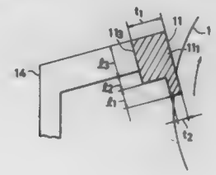
(b) bias means for biasing said blade so that said blade cleaning edge is in one of said operative and inoperative positions; and

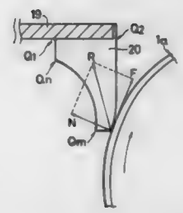
(c) temperature monitoring means for monitoring temperature conditions of said fuser means, said temperature monitoring means responding to a preset temperature condition of said fuser means to overcome said bias means and move said blade so that said blade cleaning edge is in the other of said operative and inoperative positions.

4,639,123
CLEANING DEVICE

Hiroyuki Adachi, Hachioji, and Takashi Saito, Ichikawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 9, 1984, Ser. No. 569,023
Claims priority, application Japan, Jan. 11, 1983, 58-2633
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—15 10 Claims





1. A cleaning device for cleaning a surface to be cleaned, comprising:

an elastic cleaning blade contacting the surface to be cleaned so as to clean said surface;

a support member supporting said elastic cleaning blade in such a manner that said cleaning blade contacts said surface to be cleaned while opposing a direction in which the surface to be cleaned moves; and

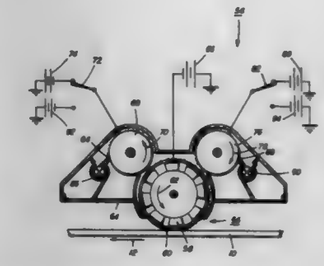
receiving means for receiving objects removed by said elastic cleaning blade from the surface to be cleaned;

wherein said elastic cleaning blade includes a substantially rectangular fore end portion which contacts the surface to be cleaned and which has a thickness less than at where said blade is supported by said support member.

4,639,124
CLEANING SYSTEM FOR A MULTICOLOR ELECTROPHOTOGRAPHIC PRINTING MACHINE

Leroy M. Nye, Jr., Ontario, and Thomas W. Pike, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 7, 1985, Ser. No. 795,947
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—15 21 Claims



1. An apparatus for removing particles of at least two different colors from a surface during two operating cycles, including:

a particle removing member;

first means for attracting the particles of one color from said removing member thereto;

second means for attracting the particles of the other color from said removing member thereto; and

means for electrically biasing said first attracting means and said second attracting means to a plurality of voltage levels with said first attracting means being electrically biased to a voltage level so as to attract the particles of one color from said removing member thereto during one cycle of the apparatus with said second attracting means being electrically biased to a voltage level so that substantially no particles are attracted thereto, and said second attracting means being electrically biased to a voltage level so as to attract particles of the other color from said removing member thereto during the other cycle of the apparatus with said first attracting means being electrically biased to a voltage level so that substantially no particles are attracted thereto.

4,639,125
AUTOMATIC DUPLEX COPYING TYPE COPYING APPARATUS

Masakiyo Okuda, Kashiwara; Kazuyuki Ohnishi, and Akira Mitsuyama, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 20, 1985, Ser. No. 811,478
Claims priority, application Japan, Dec. 26, 1984, 59-276620; Dec. 27, 1984, 59-276568
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—23 14 Claims

1. An automatic duplex copying type copying apparatus for automatically copying opposite copying faces of an original document onto opposite faces of a copy paper sheet, respectively, which has a function of returning the original document to an original feeding member through turnover of the original document after one copying face of the original document placed on an original platform has been copied onto one face of the copy paper sheet and a function of copying the other copying face of the original document onto the other face of the copy paper sheet by turning over the copy paper sheet having the one face copied from the one copying face of the original document, said copying apparatus comprising:

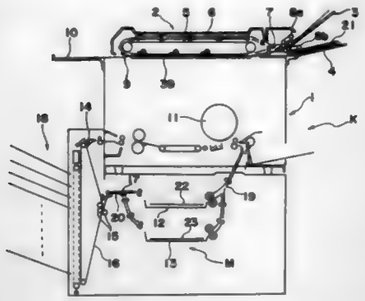
first and second trays for sequentially accommodating first and second copy paper sheets, respectively;

an original feeding means for continuously feeding first and

second original documents from said original feeding member to said original platform;

a transport means for transporting the first and second copy paper sheets to said first and second trays, respectively after one copying face of the first original document and one copying face of the second original document have been copied onto one face of the first copy paper sheet and one face of the second copy paper sheet, respectively;

an original returning means for returning the first and second copy paper sheets from said original platform to said original feeding member through turnover of the first and



second original documents after the one copying face of the first original document and the one copying face of the second original document have been copied onto the one face of the first copy paper sheet and the one face of the second copy paper sheet, respectively; and

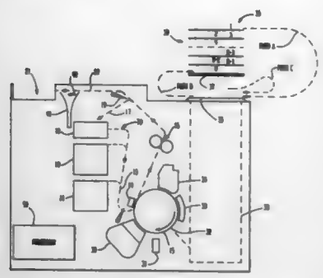
a paper feeding means for feeding the first and second copy paper sheets from said first and second trays, respectively such that the other copying face of the first original document and the other copying face of the second original document are copied onto the other face of the first copy paper sheet and the other face of the second copy paper sheet, respectively.

4,639,126

METHOD FOR PRODUCING DUPLEX COPY SETS FROM A DUPLEX ORIGINAL SET

Kenneth A. Bushaw; Louis A. Bustamante, both of Longmont, and James J. McCarry, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 7, 1985, Ser. No. 795,950
Int. Cl.⁴ G03G *21/00*
U.S. Cl. 355—3 SH **9 Claims**



1. A method of duplex-to-duplex copying which comprises copying both sides of a collated duplex original document set of N sheets, in order to produce M collated duplex copy sets of said original document set, comprising the steps of:

a. circulating each of said N sheets sequentially to an imaging station, and producing one copy of like-sides of each of said N sheets, each copy being produced on a sheet of blank copy substrate;

b. supplying the substrate sheets processed in step-a to a sheet accumulator, to thereby form a stack of N copy sheets, each sheet having an image thereof;

c. circulating each of said N sheets sequentially to said imaging station and producing two copies of the opposite side of each of said N sheets, one of said two copies being produced on the blank side of a sheet taken from said accumulator, and the other copy being produced on a sheet of blank copy substrate;

d. supplying the substrate sheets taken from the accumulator in step-c to an output means, to thereby complete the making of a copy set, and supplying the copies made on said blank copy substrate in step-c to said accumulator;

e. circulating each of said N sheets sequentially to said imaging station and producing two copies of said like-sides, one of said two copies being produced on the blank side of a sheet taken from said accumulator, and the other copy being produced on a sheet of blank copy substrate;

f. supplying the substrate sheets taken from the accumulator in step-e to said output means, to thereby complete the making of a copy set, and supplying the copies made on said blank copy substrate in step-e to said accumulator;

g. repeating step-c through step-f until M−1 copy sets have been made;

h. circulating each of said N sheets sequentially to said imaging station and producing one copy of the appropriate side of each of said N sheets on the blank side of a sheet taken from said accumulator; and

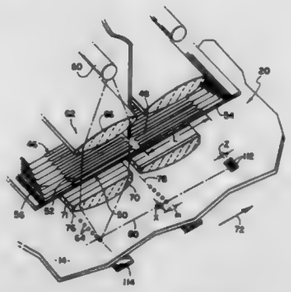
i. supplying the substrate sheets taken from said accumulator in step-h to said output means, to thereby complete the making of the Mth copy set.

4,639,127

EXPOSURE APPARATUS FOR PRINTING SYSTEM

Jack Beery, Fremont, and Barry G. Broome, Glendora, both of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Dec. 10, 1985, Ser. No. 807,417
Int. Cl.⁴ G03B *27/72, 27/76*
U.S. Cl. 355—35 **18 Claims**



1. Apparatus for selectively exposing each of a multiplicity of subminiature areas of a photosensitive layer of photosensitive material, to light, comprising:

means defining an exposure station for positioning a photosensitive layer to be exposed;

means for moving the photosensitive layer in a predetermined direction past said exposure station;

a row of independently operable light shutters, each shutter including a shutter area and being independently operable to an open state to pass light through a corresponding shutter area, and to a closed state to substantially block the passage of light through the shutter area;

means for directing light at the locations of said shutter areas, and for focusing light that passes through the shutter area of each open shutter onto a different pixel of a row of pixels that lie at the position of a photosensitive layer at the exposure station, said row of pixels extending largely perpendicular to the direction of movement of said layer past said exposure station;

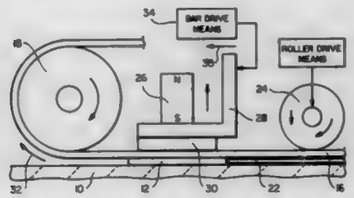
each shutter area having a length which is a plurality of time greater than its average width, and said focusing means focuses light passing through each shutter area onto a corresponding one of said pixels, said corresponding one having a length parallel to the direction of movement of the layer which is less than the length of said each shutter area.

4,639,128

AUTOMATIC PLATEN DOCUMENT STOP FOR ELECTROPHOTOGRAPHIC COPYING APPARATUS HAVING AN AUTOMATIC FEED ARRANGEMENT

Carl P. Anderson, Menlo Park, Calif., assignor to Ricoh Company, Ltd., Tokyo, Japan and Ricoh Systems, Inc., San Jose, Calif.

Filed Mar. 8, 1985, Ser. No. 710,001
Int. Cl.⁴ G03B *27/62*; G03G *15/00*
U.S. Cl. 355—75 **5 Claims**



1. In an electrophotographic copying apparatus designed to make a copy of a document automatically fed into an imaging station comprising a platen aligned with an electrophotographic drum, a belt movable along a path over the surface of the platen to carry said document into alignment with said image station, a document stop located between said belt and said platen comprising a metal strip extending substantially across the full width of the document path and means adjacent the platen for restraining the metal strip against movement along the path of the paper, and means for moving said document stop from a first position interrupting said path to a second position above and adjacent said path comprising a magnetic device aligned with the metal strip and separated from said stop by the belt, movement of said magnetic device carrying said metal strip therewith from said first position to said second position.

4,639,129

METHOD OF MEASURING DISTANCE BETWEEN TWO OBSERVATION POINTS

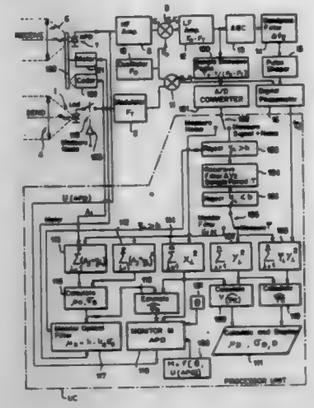
Francois Hullein, and Gérard Fribault, both of Nantes, France, assignors to Societe d'Etudes, Recherche et Constructions Electroniques-Sercel, Carquefou, France

Filed Nov. 30, 1984, Ser. No. 676,887
Claims priority, application France, Dec. 1, 1983, 83 19234
Int. Cl.⁴ G01C *3/08*
U.S. Cl. 356—5 **30 Claims**

1. A method of determining the distance between two points comprising the steps consisting in emitting oscillator modulated electromagnetic radiation from a first point towards a second point, in reflecting the said electromagnetic radiation from the second point back towards the first point, in receiving the reflected electromagnetic radiation at the first point by means of a receiver, in comparing the phase of a first signal derived from the receiver and of a second signal derived from the emission modulation, and in generating phase samples ϕ_i representative of the phase difference between the first and second signals, the improvement wherein the method further includes the following steps:

(i) in generating a signal representative of the instantaneous variance $V(\phi_i)$ of the phase samples ϕ_i;

(ii) in generating as an estimation of the phase an intermediate signal derived from the average ϕ_E of n phase samples ϕ_i weighted by their instantaneous variance;



(iii) in generating a useful signal representative of the value of the distance D on the basis of the phase estimation ϕ_E and

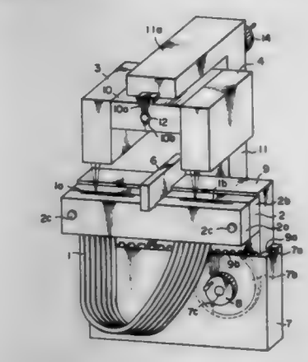
(iv) in displaying this distance value.

4,639,130

INSPECTION APPARATUS FOR OPTICAL FIBER ASSEMBLY

Kazuyoshi Koike, and Yasutaru Tahara, both of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1985, Ser. No. 749,422
Claims priority, application Japan, Jan. 29, 1984, 59-134182
Int. Cl.⁴ G01N *21/84*
U.S. Cl. 356—73.1 **12 Claims**



1. An apparatus for inspecting an optical fiber assembly composed of a plurality of optical fibers having light receiving and emitting ends, in such a manner as to measure irregularities in transmission loss of said optical fibers, comprising: a base; a first slider block slidably laid on said base; gripping means attached to said first slider block and adapted to grip both ends of said optical fiber assembly in a manner that they are substantially flush with each other; a feed mechanism for feeding said first slider block by sliding the same on said base; a frame member secured to said base; a second block carried by said frame member; a light projector carried by said second slider block, and adapted to irradiate a light beam onto said light receiving end of one of said optical fibers; a light receiver

carried by said second slider block and adapted to receive a light beam from said light emitting end of said one of said optical fibers; and a light stop mechanism disposed in said light projector and adapted to stop said light beam irradiated by said light projector, so that said light beam may be irradiated, exclusively, onto said light receiving end of only one of said optical fibers and within the same.

4,639,131

DEVICE FOR MEASURING THE STATIC LIVES OF OPTICAL FIBERS

Nicolaus Maan, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 10, 1985, Ser. No. 774,422

Claims priority, application Netherlands, Sep. 18, 1984, 8402857

Int. Cl.⁴ G01N *21/84*

U.S. Cl. 356—73.1 **6 Claims**



1. An apparatus for measuring the static lives of glass optical fibers, said apparatus comprising:

a number of cylindrical rods, each rod being wound with an optical fiber under stress;

a number of holders, each holder holding one rod;

a number of three-sided enclosures, each enclosure surrounding each holder on three sides such that on rupture of a fiber the broken fiber ends strike the enclosure to eject the rod on which the fiber was wound from its holder; and

means for recording the times rods are inserted in holders and the times rods are ejected from holders.

4,639,132

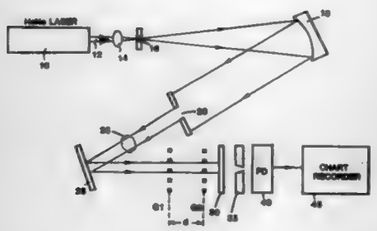
DIRECT DETERMINATION OF MODULATION TRANSFER FUNCTION BY MOIRE DEFLECTROMETRY

Ilana Glatt, Beer-Sheva; Aminadav Livnat, Arad, and Oded Kafri, Beer-Sheva, all of Israel, assignors to The State of Israel

Filed Jul. 3, 1984, Ser. No. 627,657

Int. Cl.⁴ G01M *11/00*

U.S. Cl. 356—124.5 **7 Claims**



4. Apparatus for determining the modulation transfer function of an optical system, said apparatus comprising

means for producing a parallel beam of light;

first directing means for directing said beam to said optical system;

a pair of spaced apart grating having a predetermined angular orientation;

said directing means for directing light from said optical system on to said gratings so as to form a moire pattern;

means for varying the spacing of said gratings; and

means for detecting and recording the contrast of said moire pattern as a function of the spacing so as thereby to determine the modulation transfer function.

4,639,133

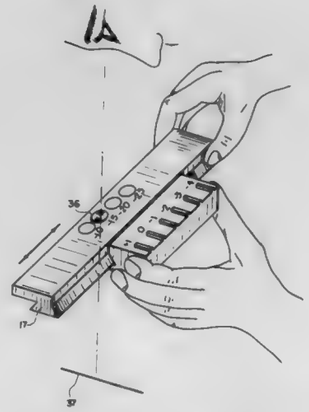
METHOD AND APPARATUS FOR TESTING THE POWER OF A LENS

Rex W. Cole, Warden at Thorpe La., San Marcos, Tex. 78666

Filed May 6, 1985, Ser. No. 731,043

Int. Cl.⁴ G01B *9/00*

U.S. Cl. 356—125 **5 Claims**



1. Apparatus for testing the power of an intraocular lens comprising:

(a) a first rigid substantially flat plate of elongated rectangular configuration having two long sides and two short sides, and having a first series of circular apertures positioned in a straight line adjacent one long side and holding minus lenses of equal diameter on optical axes perpendicular to said plate, said lenses having dioptric power between about −10 and −30 as measured in water sequentially arranged within said series,

(b) a second rigid plate having a second series of circular apertures positioned in a straight line and adapted to align with the apertures of said first series, said second series of apertures containing lenses of low dioptric power ranging from about +1 to −4 disposed on optical axes adapted to coincide with the axes of the lenses of said first series, and indexing ridges associated with said lenses and extending upwardly from said plate,

(c) means to permit sliding interengagement of said first and second plates in a manner permitting coaxial alignment of lenses of said first and second series, and

(d) indicia on each plate designating the power of each lens.

4,639,134

PROCESS AND CIRCUIT ARRANGEMENT FOR AMPLIFYING AN INPUT CURRENT

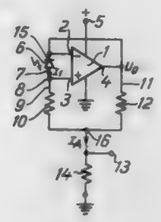
Walter Bletz, Braunfels, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jun. 5, 1984, Ser. No. 617,551

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1983, 3321503

Int. Cl.⁴ G01J *1/44, 1/46*

U.S. Cl. 356—223 **16 Claims**



1. A process for amplifying a photoelectric current generated by a photoelectric transducer and present at the input of a circuit arrangement including a feedback-coupled operational amplifier, comprising:

(a) forming two virtually equal voltages by passing the current from said photoelectric transducer through a first impedance to provide a first voltage at an input of the amplifier and producing a virtually identical voltage at an output of said amplifier;

(b) forming two current paths having a common connection point, the current in one current path being determined solely by the photoelectric transducer independently of said operational amplifier, while the current in the other current path is determined by impressing said virtually identical voltage at the output of said amplifier across a second impedance; and

(c) adding the currents of the two current paths at said common connector point to produce an output current greater than that produced by said photoelectric transducer, said output current being a function of the ratio of the first and second impedances as well as the magnitude of the current generated by the photoelectric transducer.

4,639,135

CUVETTE

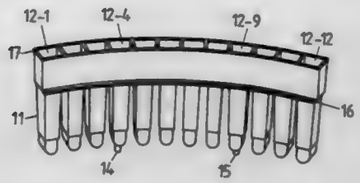
Claude Borer, Hünenberg, and Andreas Greter, Steinhausen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 19, 1985, Ser. No. 702,522

Claims priority, application Switzerland, Feb. 23, 1984, 896/84

Int. Cl.⁴ G01N *21/03*

U.S. Cl. 356—246 **2 Claims**



1. A cuvette arrangement for use in a chemical analysis system, which cuvette arrangement comprises an integrally formed, partially annular unit which defines a plurality of chambers for the receipt of sample-reagent mixtures, wherein each chamber includes the following elements:

(a) an open and a closed end,

(b) an outer side wall forming an outer edge which fits into a first arc,

(c) an inner side wall forming an inner edge which fits into a second arc concentric with the first arc,

(d) a bottom wall extending between the outer and inner side walls at the closed end of the chamber, and

(e) windows which enable radiation energy to be transmitted through the chamber with low loss and free from distortion, which windows comprise a pair of flat, mutually parallel parts which are separated from one another by a defined distance, one of the flat parts in each pair being integrated with the outer side wall and the other of the flat parts in each pair being integrated with the inner side wall,

said annular unit also including means for positioning it in the chemical analysis system, which positioning means comprises the following elements:

(f) a lip which is integrated with the inner side walls and extends radially from the latter on the outside of the chambers, and

(g) a projection which extends from the outside of the bottom wall of at least one of the chambers and along the longitudinal axis of the chamber.

4,639,136

ELECTROTHERMAL ATOMISER

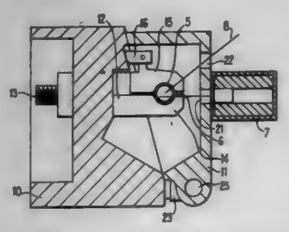
Stephen F. N. Morton, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 28, 1985, Ser. No. 738,003

Claims priority, application United Kingdom, Jun. 20, 1984, 8415682

Int. Cl.⁴ G01N *21/74*

U.S. Cl. 356—312 **6 Claims**



1. An electrothermal atomizer for a spectrophotometer, said atomizer comprising a hollow body of electrically conductive material, probe means for holding a sample in the interior of said hollow body, dosing means for depositing said sample onto said probe means within said interior, actuator means for inserting said probe means into said interior, and means for passing an electrical current through said hollow body to heat said interior to a temperature sufficient to atomize said sample, wherein at least a portion of said probe means on which said sample is deposited is of electrographite.

4,639,137

METHOD OF AND DEVICE FOR DETERMINING WHEN A LIQUID-RENEWAL PROCESS IS TO BE TERMINATED

Jean-Pierre Hazan, Sucy-en-Brie, and Michel Steers, Chennevieres-sur-Marne, both of France, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Jan. 15, 1985, Ser. No. 691,597

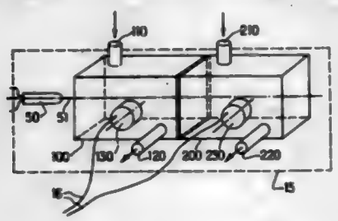
Claims priority, application France, Jan. 23, 1984, 84 00980

Int. Cl.⁴ G01N *21/53*

U.S. Cl. 356—339 **7 Claims**

1. A method of renewing a used liquid for reuse of the same, which includes establishing a body of a reference liquid for comparison with renewed used liquid; establishing a separate body of the used liquid adjacent the body of reference liquid; producing an incident light beam for consecutive traversal of the body of used liquid and the body of reference liquid, the

particles in the two liquid bodies thereby diffusing the light beam to provide respective luminous fluxes off the axis of said incident light beam; separately detecting said two luminous



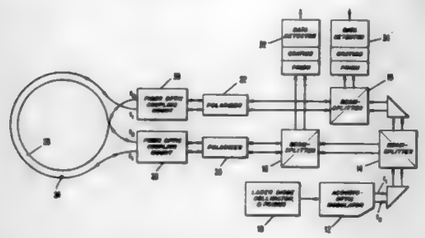
light fluxes and comparing the same; and automatically terminating such procedure when the detected luminous light fluxes are substantially equal to each other.

4,639,138

FIBER-OPTIC ROTATION RATE SENSOR HAVING DUAL INTERFEROMETER LOOPS

James M. Martin, Orlando; William S. Brockett, Mt. Dora; Ronald R. Selleck, Winter Park, and Michael G. Croteau, Orlando, all of Fla., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Oct. 29, 1984, Ser. No. 665,474
Int. Cl.[4] G01B *9/02*; G01C *19/64*
U.S. Cl. 356—350 13 Claims



1. A fiber optic rotation rate sensor, for measuring angular rotation rate about an axis, comprising:

a first fiber-optic loop that is disposed to rotate about said axis;

a second fiber-optic loop disposed to rotate about said axis with said first fiber-optic loop;

means for generating coherent light at a first frequency and introducing said light into each end of said first fiber-optic loop so that two beams of light at said first frequency travel around said first loop in opposite directions;

means for generating coherent light at a second frequency and introducing said light into each end of said second fiber-optic loop so that two beams of light at said second frequency travel around said second loop in opposite directions;

a first detector which receives the light beam emerging from one end of each of said two fiber-optic loops and produces a first output signal indicative of the difference in frequency between said first and second frequencies;

a second detector which receives the light beam emerging from the other end of each of said two fiber-optic loops and produces a second output signal indicative of the difference in frequency between said first and second frequencies; and

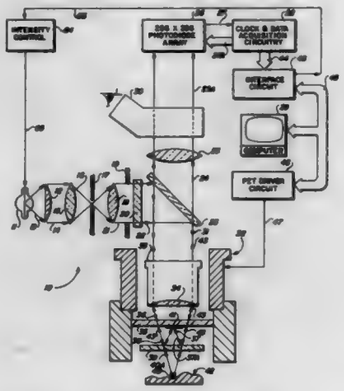
means for comparing said first and second output signals and generating a signal indicative of the phase difference between said output signals.

4,639,139

OPTICAL PROFILER USING IMPROVED PHASE SHIFTING INTERFEROMETRY

James C. Wyant, and Keith N. Prettyjohns, both of Tucson, Ariz., assignors to Wyko Corporation, Tucson, Ariz.

Filed Sep. 27, 1985, Ser. No. 781,261
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—359 24 Claims



1. A method of producing information representing the distribution of the phase difference between first and second interfering beams, the first and second interfering beams producing an interference pattern, the method comprising the steps of:

(a) changing the phase difference between the first and second beams at a constant rate;

(b) guiding the interference pattern into an array of photodetectors;

(c) integrating photocurrents produced by the individual photodetectors, respectively, to produce integrated buckets that correspond to intensities of various points across the interference pattern;

(d) measuring first, second, third and fourth integrated buckets produced by each photodetector at times that correspond to first, second, third, and fourth approximately 90 degree changes in the phase difference between the first and second beams while continuously maintaining the rate of change of the phase difference between the first and second beams at a constant value;

(e) computing a first phase value corresponding to each photodetector from the first, second, and third integrated buckets produced by that photodetector;

(f) computing a second phase value, corresponding to each photodetector, from the second, third, and fourth integrated buckets produced by that photodetector; and

(g) adding the first and second phase values corresponding to each of the photodetectors to cancel sinusoidal error produced by small errors in the approximately 90 degree changes in the phase difference between the first and second beams.

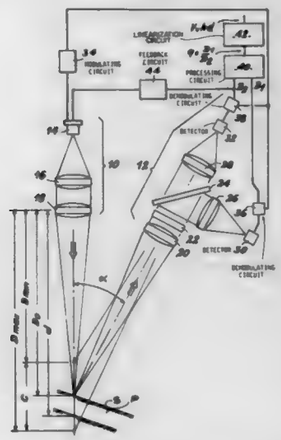
4,639,140

OPTICAL SURFACE PROXIMITY MEASURING DEVICE AND ITS APPLICATION TO THE PLOTTING OF THE PROFILE OF A SURFACE

Bernard Lerat, Igny, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 26, 1985, Ser. No. 705,734
Claims priority, application France, Feb. 29, 1984, 84 03168
Int. Cl.[4] G01B *11/24*
U.S. Cl. 356—376 11 Claims

11. An optical device for plotting the profile of a surface, comprising a surface proximity measuring device having a radiation emitter supplying an incident light beam forming a light spot on a surface, a receiver comprising first and second detectors respectively measuring light fluxes returned by said surface from said light spot through first and second focusing means respectively arranged between said surface and said first and second detectors, said first and second focusing means having different focal lengths, wherein said device further



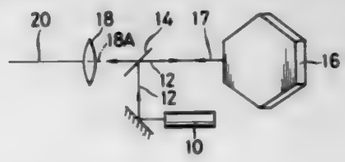
comprises processing means connected to said first and second detectors, said processing means supplying an output signal having a value equal to the ratio between the light fluxes measured by said first and second detectors, said value being a function of the distance separating the device from said surface and means for bringing about a scan of the profile of said surface by said surface proximity measuring device.

4,639,141

SCANNING RAY BEAM GENERATOR FOR OPTICAL MEASURING DEVICE

Yoshiharu Kuwabara, and Hiroyoshi Hamada, both of Kanagawa, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1983, Ser. No. 550,292
Claims priority, application Japan, Nov. 12, 1982, 57-198506; Nov. 16, 1982, 57-200977
Int. Cl.[4] G01B *11/08*
U.S. Cl. 356—387 12 Claims



1. An optical measuring device comprising:

a parallel scanning ray beam generator including a polygonal rotary mirror for reflecting incident ray beams from a beam generator and converting the same into rotary scanning ray beams and a collimator lens for converting the rotary scanning ray beam into parallel scanning ray beams; and

a light receiving element for detecting a presence or absence of the parallel scanning ray beams which have been directed at a workpiece to be measured;

whereby a dimension in the scanning direction of the workpiece to be measured is sought from a length of time of an absence of said parallel scanning ray beams is detected due to the obstruction of part of the parallel scanning ray beams by the workpiece to be measured which is interposed between the parallel scanning ray beam generator and the light receiving element.

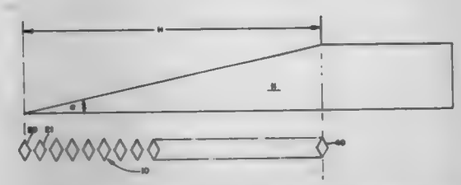
characterized in that at least a mirror out of the beam generator and a mirror for reflecting the ray beams from the beam generator and projecting the same to the rotary mirror and the collimator lens are mounted onto one bedplate, and a base of the rotary mirror is made rotatable with respect to the one bedplate about a pin stem and a pin hole disposed on an axial line passing through an intersection between the optical axis of the collimator lens and a reflecting surface of the rotary mirror and perpendicularly intersecting a plane incorporating the incident optical axis of the ray beams into the rotary mirror and the optical axis of the collimator lens.

4,639,142

DIMENSION MONITORING TECHNIQUE FOR SEMICONDUCTOR FABRICATION

Pei-Ming D. Chow, Yorba Linda, and Keh-Fei C. Chi, Torrance, both of Calif., assignors to Rockwell International Corporation, Anaheim, Calif.

Filed Apr. 13, 1983, Ser. No. 484,666
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—372 4 Claims



1. A method of visually monitoring the change in dimensions of elements on a surface of a semiconductor body during processing thereof comprising the steps of:

providing a fixed pattern of images on said surface having a predetermined distance between said images;

providing a wedge-shaped element on said surface having an apex adjacent one of said images and extending in a direction along other ones of said images;

processing said semiconductor body in a predetermined manner causing the dimensions of said wedge-shaped element to change;

subsequently visually inspecting the wedge shaped element with respect to the pattern of images to determine the extent of the change in dimension of said wedge shaped element during processing.

4,639,143

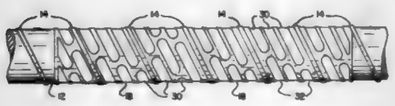
EXTRUSION SCREW

James D. Frankland, Jr., New Castle, Pa., assignor to New Castle Industries, Inc., New Castle, Pa.

Filed Feb. 28, 1985, Ser. No. 706,405
Int. Cl.[4] B01F *7/08*; B29B *1/06*
U.S. Cl. 366—89 11 Claims

1. In an extruder of the variety including a body having a bore, said body having an inlet and an outlet adjacent opposite ends of said bore, a shaft rotatably supported in said bore, at least one helical flight means on said shaft extending along its length and defining a helical channel for conveying a material from said inlet toward said outlet upon rotation of said shaft wherein said material is changed from a solid phase to a viscous phase, said shaft including along its length at least a feed section adjacent said inlet, an intermediate melt section, and a metering section adjacent said outlet, the improvement comprising:

a longitudinal portion in at least one of said sections having a plurality of discrete closed-ended grooves arranged in a discontinuous helix cut into said channel, said plurality of grooves being dimensioned to so receive said material



therein as said material is conveyed through said channel to said outlet that an average shear force is imparted to said material to reduce the temperature of said material while maintaining the output of said material at a predetermined rate.

4,639,144

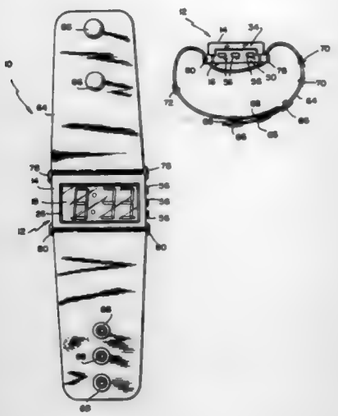
NOVELTY WRIST WATCH

Jacky Chau, Hong Kong, Hong Kong, assignor to Big Time, Inc., West Hemstead, N.Y.

Continuation-in-part of Ser. No. 750,918, Jul. 1, 1982, Pat. No. Des. 285,288. This application Dec. 16, 1985, Ser. No. 809,388

Int. Cl.⁴ G04B *37/00*; A44C *5/18*

U.S. Cl. 368—276 **20 Claims**



1. A novelty wrist watch comprising a molded plastic watch case, the watch case carrying a time display and a one piece watch strap, the watch case including strap retainer bars, the strap retainer bars being spaced from the ends of the watch case, the watch strap being positioned over one of the retainer bars and extending within a space between the one retainer bar and an end of the watch case and being positioned under the watch case and extending through a space between the other retainer bar and the other end of the watch case and extending over the other retainer bar, the retainer bars and the ends of the watch case being molded as an integral one piece unit, the watch strap including means for fastening the watch strap about a user's wrist, means mounting the fastening means to the watch strap, the fastening means being of a thickness greater than the space between the retainer bars and the ends of the watch case, each retainer bar including yieldable means for flexibly deflecting the retainer bar between the ends of the retainer bar to enlarge the space between the retainer bar and its watch case end to permit the watch strap with the fastening means to be inserted between the retainer bar and the end of the watch case.

4,639,145

DRAWER GUIDE

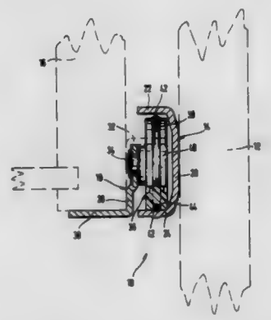
Horst Lautenschlager, Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschläger GmbH & Co. KG, Reinheim, Fed. Rep. of Germany

Filed Jun. 12, 1986, Ser. No. 873,715

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1985, 3521860

Int. Cl.⁴ F16C *19/00*; A47B *88/00*

U.S. Cl. 384—19 **2 Claims**



1. A guide for a drawable cabinet part, comprising: an elongated guide rail for fastening to a cabinet carcase, and having a front end and a rear end, and a flange; an elongated runner rail for fastening to a drawable cabinet part, and having a front end and a rear end, and also having a flange; said rails being displaceable relative to one another on first roller means rotatably mounted on the front end of the guide rail and rolling on the flange of the runner rail, and on second roller means rotatably mounted on the rear end of the runner rail and rolling on the flange of the guide rail; at least one circumferential groove in each roller surface of the roller means, a resilient tire inserted respectively into said roller means and protruding slightly above the rolling surface, end sections of the track flanges supported on the rolling surfaces of the respective roller means in fully retracted position of the tracks having a narrow indentation in alignment with the respective resilient tire and extending a short distance in the opening direction of the drawer, the depth of the indentation being at least equal to the radial elevation of the resilient tire above the rolling surface of the respective roller means.

4,639,146

THRUST BEARING

Masahiro Yoshioka, Ibaraki; Hideki Izumi, Tsuchiura; Hiroshi Inouye; Eiichi Hazaki, both of Ibaraki, and Shiro Nakadaira, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

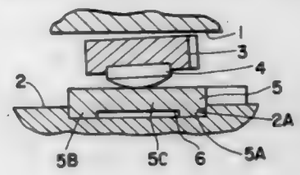
Filed Apr. 13, 1984, Ser. No. 600,324

Claims priority, application Japan, Apr. 15, 1983, 58-65389

Int. Cl.⁴ F16C *27/00, 27/08, 17/06*

U.S. Cl. 384—99 **5 Claims**

1. A thrust bearing of the type having a plurality of bearing pads, pivots being provided on a back side of said bearing pads, an annular carrier having supporting legs and a resilient portion between said supporting legs, a plurality of apertures being provided in said resilient portion, and support means for said annular carrier, wherein a rear side of said resilient portion, said supporting legs and said support means define a squeeze film damper gap.



4,639,147

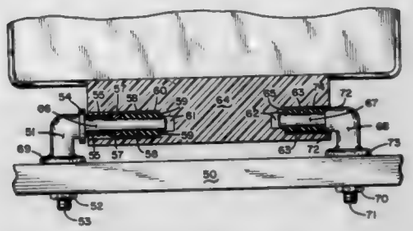
FRICTION PIVOT ASSEMBLY

Edward L. Schwarz, 2825 Brookwood Terr., Minneapolis, Minn. 55410

Filed Aug. 13, 1984, Ser. No. 639,802

Int. Cl.⁴ E05C *17/64*; A47K *13/12*; B63H *25/00*; F16C *11/04*

U.S. Cl. 384—125 **23 Claims**



1. A rotational friction pivot comprising:

(a) a journal member having a hole within it of preselected diameter and length;

(b) a bracket including a cylindrical shaft having a first portion projecting at least a predetermined distance into the hole, and a second portion integral with the remainder of the bracket, said shaft and journal member being relatively rotatable with respect to each other and said shaft having a diameter within the hole establishing an annular clearance space between itself and the wall of the journal member hole;

(c) a tubular friction bushing having first and second ends and formed of a pliable material, and having undeformed outside and inside diameters substantially that of the journal hole diameter and the shaft diameter respectively, and occupying a portion of the annular clearance space, said first and second ends of the friction bushing being adjacent the first and second portions of the shaft respectively;

(d) first and second stop means each at least partially disposed about the shaft adjacent the first and second ends of the friction bushing, at least one of said stop means occupying a part of the annular clearance space and slidably shiftable toward the other stop means within the annular clearance space; and

(e) compressing means operatively linked to the shiftable stop means for axially shifting said shiftable stop means relatively toward the other stop means and axially compressing the friction bushing within the annular clearance space, whereby the friction bushing radially expands against the journal member hole wall and the shaft surface adjacent to allow rotation with frictional slipping between the bushing and at least one of the journal member and the bracket.

4,639,148

THRUST BEARING FOR TURBOCHARGER

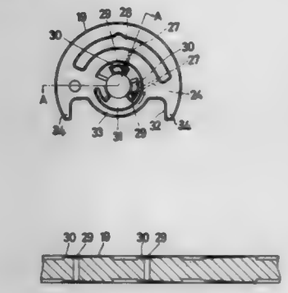
Toru Tamura, Obu; Noriyoshi Shibata, Nagoya, and Toshiro Kawakami, Obu, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 1, 1985, Ser. No. 697,526

Claims priority, application Japan, Feb. 24, 1984, 59-024557[U]

Int. Cl.⁴ F16C *17/04, 32/06, 33/10*

U.S. Cl. 384—420 **3 Claims**



1. A thrust bearing for sustaining the thrust load of the rotor shaft of a turbocharger, the thrust bearing having a first and second opposed side surface, comprising:

a first groove formed in said first side surface of the thrust bearing for holding lubricating oil supplied to the bearing;

at least one first oil passage extending from the groove toward the axis of the rotor shaft;

at least one second oil passage communicating with the first oil passage and having a plurality of oil holes connected thereto that extend respectively to a plurality of tapering land portions formed on said first and second side surfaces of said thrust bearing so that the axial thrust bearing clearance decreases in a direction of rotation of said shaft;

a first and second leg portion defining a cut out portion formed exclusively in the lower end portion of the thrust bearing;

a planar portion formed in the end surface of the thrust bearing along the first and second cut out portion and forming a portion of a closed loop; and

a second groove formed between the planar portion and said surfaces on which the shaft bears wherein the oil holes are formed in proximity to a point of maximum thrust clearance of said tapering land portions.

4,639,149

SEAL FOR A ROLLER BEARING

Johan Chr. M. Bras, Trichi, and Herman D. Laukamp, Odijk, both of Netherlands, assignors to SKF Industrial Trading & Development Company B. V., Netherlands

Filed Jul. 2, 1985, Ser. No. 751,288

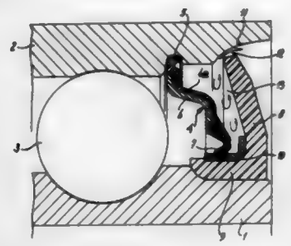
Claims priority, application Netherlands, Jul. 13, 1984, 8402222

Int. Cl.⁴ F16C *33/78*; F16J *15/40*

U.S. Cl. 384—477 **3 Claims**

1. A bearing assembly comprising inner and outer rings having spaced raceways for a plurality of rolling elements, seal means adjacent at least one axial end of the rings completely within the axial confines of the rings comprising a first sealing element including a sealing lip sealing the annular space between the rings and an annular shield of a rigid material secured to one of the race rings spaced axially outwardly of said first sealing element and having an outer edge spaced from an arcuate wall of the other race ring to define a slot-shaped opening adjacent the ring opposite the ring engaged by the sealing lip to form between the first sealing element and said shield a chamber connected via the slot-shaped opening to the

environment of the bearing whereby upon relative rotation of the rings a current is created in said chamber directed away



from the sealing lip to prevent penetration of the sealing lip by moisture and foreign matter in said chamber.

4,639,150

INTERMEDIATE BEARING FOR THE PROPELLER SHAFT OF A MOTOR VEHICLE

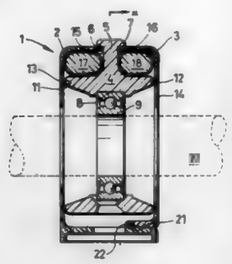
Heinz P. Habermann, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 25, 1986, Ser. No. 843,891

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511480

Int. Cl.[4] F16C *27/06*

U.S. Cl. 384—536 **9 Claims**



1. An intermediate bearing for the propeller shaft of a motor vehicle comprising:

a rigid casing constituted by two parts which form an annular casing having a generally U-shaped cross section;

a resilient deformation member contained in said casing and having on its inner periphery a receiving means for a bearing for said propeller shaft and further comprising radially outwardly extending webs which lie in the radial median plane of the bearing and are engaged with apertures formed in said rigid casing.

4,639,151

ELECTRONIC TYPEWRITER WHICH PRINTS SELECTED PORTIONS OF A TEXT

Hideo Ueno; Hiroshi Kuno, and Yoshifumi Hamabe, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 9, 1984, Ser. No. 670,021

Claims priority, application Japan, Nov. 18, 1983, 58-218409

Int. Cl.[4] B41J *5/30*

U.S. Cl. 400—63 **5 Claims**

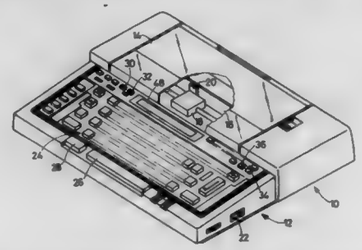
1. An electronic typewriter with data storing and editing capability, comprising:

keyboard means, having character keys and function keys, for entering printing data including character data representative of a text, said keyboard means having at least one cursor key;

text memory means for storing said printing data entered through said keyboard means;

printing assembly means operated according to the printing data stored in the text memory means, for printing said text;

display means for displaying at least a portion of a line of characters represented by one of plural groups of the character data which represents corresponding plural lines of characters constituting said text, said display means effecting a vertical scrolling operation by simultaneous activation of one of said function keys and one of said at least one cursor key, to select said one of plural groups of the character data, and thereby displaying the corresponding line of characters, said display means including means responsive to the simultaneous activation



of said one function key and said one cursor key for establishing an edit mode in which said corresponding line of characters displayed on said display means may be edited;

first printing control means, operative in an entire-text printing mode, for controlling the operation of the typewriter so as to cause said printing assembly means to print all lines of characters of said text stored in said text memory means;

second printing control means, operative in a single-line printing mode, for controlling the operation of the typewriter so as to cause said printing assembly means to print only said corresponding line of characters; and

third printing control means, operative in a partial-printing mode and in said edit mode, for controlling the operation of the typewriter so as to cause said printing assembly means to print said corresponding line of characters displayed on said display means, and all of the remaining lines of said text following the displayed lines.

4,639,152

PRINTING APPARATUS WITH A THERMAL PRINT HEAD

Takemi Yamamoto, and Yasutaka Tomida, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 14, 1984, Ser. No. 681,584

Claims priority, application Japan, Dec. 20, 1983, 58-240612; Dec. 20, 1983, 58-240613

Int. Cl.[4] B41J *3/20;* **H05B** *3/00;* **G01D** *15/10*

U.S. Cl. 400—120 **10 Claims**

1. A printing apparatus for printing on a sheet of paper via a thermal ribbon having a thermally transferable ink layer, comprising:

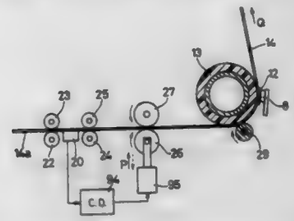
a paper feeding device for feeding the sheet of paper;

a thermal print head including heat generating elements which are held in pressed contact with the surface of said sheet of paper via said thermal ribbon, said heat generating elements being selectively energized to apply heat to said ink layer of the thermal ribbon to fuse the ink for adherence of the fused ink to the surface of the paper;

a first pair of rollers disposed on opposite sides of a path along which said sheet of paper is fed toward said thermal print head, and a second pair of rollers disposed on opposite sides of said path, said first and second pairs of rollers applying a tension to a portion of said sheet of paper between the first and second pairs of rollers;

a detecting device disposed between said first and second pairs of rollers in the direction of feed of said sheet of paper for sensing the surface smoothness of said sheet of paper fed by said paper feeding device;

a print-quality improving device for improving the quality of printing on said sheet of paper, said print-quality improving device being disposed downstream of said detecting device in said direction of feed of said sheet of paper; and



a control device connected to said detecting and print-quality improving devices and activating said print-quality improving device while said surface smoothness sensed by said detecting device is lower than a preset lower limit, said control device deactivating said print-quality improving device while the sensed surface smoothness is not lower than said preset lower limit.

4,639,153

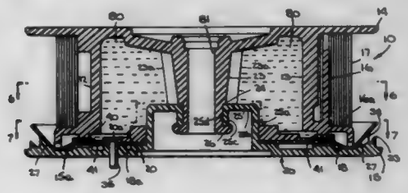
PRINTING RIBBON SPOOL HAVING AN INK RESERVOIR AND METHOD OF MAKING SAME

Wei-Tsang Cheng, Waterbury, Conn., assignor to Jing Tech, Inc., Bethany, Conn.

Filed Jul. 9, 1984, Ser. No. 628,762

Int. Cl.[4] B41J *31/14*

U.S. Cl. 400—202.1 **5 Claims**



1. A printing ribbon spool comprising:

a spool body, at least a portion of an ink reservoir in said spool body, said spool body having spaced flange portions extending outwardly, said spool body having a surface to receive a ribbon wound thereon between said spaced flange portions to define a zone of ribbon wrap, the ribbon advancing toward and from said zone of ribbon wrap when said spool is wound and unwound, respectively;

ink-delivery means for said spool comprising an ink-delivery pad near one of said flange portions, said ink-delivery pad having an exposed portion in the path of the advancing ribbon to contact a portion of the ribbon as the ribbon advances therepast, said ink-delivery pad communicating in ink-receiving relation with said ink reservoir to receive ink from said ink reservoir when said spool is in an operating position and to convey the ink to said exposed portion of said ink-delivery pad;

said spool including ink-impervious means forming a portion of said ink reservoir disposed between said ink-delivery pad and ink in said ink reservoir to isolate said ink-delivery pad from ink in said ink reservoir, said ink-impervious means having at least one breakable portion and said spool including means for breaking said portion to form an opening in said ink-impervious means to permit ink to pass therethrough from said ink reservoir to said ink-delivery pad.

4,639,154

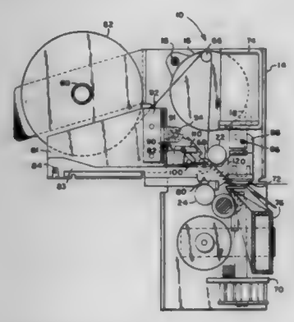
DUAL STATION PRINTER MECHANISM

Charles M. Myers, Riverton, Wyo., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 7, 1985, Ser. No. 742,331

Int. Cl.[4] B41J *15/22*

U.S. Cl. 400—584 **4 Claims**



1. A dual station printer mechanism comprising a driven first feed roller having a first pressure roller biased thereagainst for feeding a first data carrier therebetween to a position between a print bar and a printhead at which said data carrier can be printed, a driven second feed roller having a second pressure roller biased thereagainst for feeding a second data carrier therebetween to a position between a print bar and a printhead at which said second data carrier can be printed, and a singular elongate crank arm mounted for rotation by an operator and having spaced-apart first and second cam portions therealong, said first and second pressure rollers rotatably mounted on respective mountings adapted such that rotation of the crank arm causes said first cam portion to press against said first pressure roller mounting and move said first pressure roller away from said first feed roller a distance sufficient to remove or insert said first data carrier therebetween and causes said second cam portion to press against said second pressure roller mounting and move said second pressure roller away from said second feed roller a distance sufficient to remove or insert said second data carrier therebetween and said crank arm including means operative upon rotation thereof to move the print bar away from the print head a distance sufficient to enable insertion or removal of the first and second data carriers from therebetween.

4,639,155

MELT DISPENSERS

Heinz Schuster, Oberursel, and Gerd Press, Kelkheim/TS, both of Fed. Rep. of Germany, assignors to USM Corporation, Flemington, N.J.

PCT No. PCT/GB84/00438, § 371 Date Aug. 2, 1985, § 102(e) Date Aug. 2, 1985, PCT Pub. No. WO85/02793, PCT Pub. Date Jul. 4, 1985

PCT Filed Dec. 18, 1984, Ser. No. 767,275

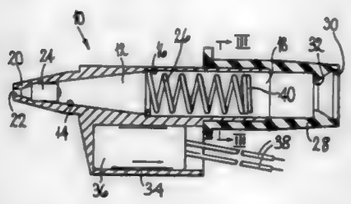
Claims priority, application United Kingdom, Dec. 22, 1983, 8334298; Oct. 26, 1984, 8427170

Int. Cl.[4] B67D *5/32*

U.S. Cl. 401—1 **16 Claims**

1. In a device for melting and dispensing thermoplastic material supplied in the form of a rod, said device comprising means for application of a feeding force on the rod to urge it in

a direction towards a melt body and a melt body having an inlet adapted to receive a rod of thermoplastic material, an outlet, a passage extending between the inlet and outlet, and means for heating the melt body so that material which enters the passage via the inlet in the form of a rod may be dispersed from the outlet in a molten condition;



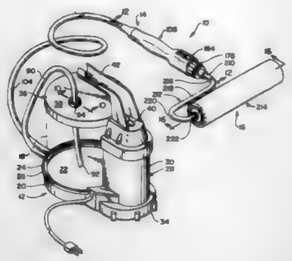
wherein the improvement comprises resilient means located within the passage and arranged to exert sufficient force in a reverse direction to move the rod outwardly of the melt body when the feeding force is not applied.

4,639,156

PAINTING APPARATUS AND METHOD

Donald J. Stern, 127 Underhill Rd., and Jon I. Allsop, 2317 N. Shore Rd., both of Bellingham, Wash. 98225

Filed May 25, 1984, Ser. No. 614,253
Int. Cl.⁴ B43K *5/02*
U.S. Cl. 401—146 **48 Claims**



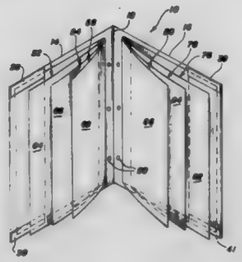
1. A painting system, comprising:
a. a supply section comprising a pump adapted to pump liquid paint from a paint source;
b. an applicator section comprising an applicator to dispense the paint from the applicator;
c. a delivery and control section comprising:
1. a delivery tube having a receiving end to receive the paint from the pump, a delivery passageway to carry the paint, and a discharge end to deliver paint to the applicator;
2. an actuating tube having an interior passageway distinct from said delivery passageway to contain air, said tube having a first end proximate to the supply section and a second end proximate to the applicator section;
3. a pressure responsive pump switch operatively connected to the actuating tube and to the pump to cause the pump to operate, said switch having an on position and an off position, said switch defining an air pressure chamber which, when pressurized to a first higher pressure level, holds said switch in said on-position, and when at a second lower pressure level, enables said switch to move to said off-position;
4. a pressurizing switch proximate to the applicator section and operatively connected to the second end of the actuating tube, said pressurizing switch having a release position where air pressure in the actuating tube is decreased to said lower pressure level to move the pump switch to its off position to inactivate the pump and interrupt delivery of paint, and a pressurizing position to raise pressure in said air pressure chamber so as to move the pump switch to its on position to activate the pump and to maintain said pressure at said higher pressure level so as to hold said pump switch in said on-position to cause delivery of the paint, said pressurizing switch comprising a switch housing, compressible tube means mounted in said switch housing and having a lengthwise axis, a first end, opening to ambient atmosphere, and a second end, opening to the second end of the actuating tube, and a manually operable pressure control member movable along said lengthwise axis on an actuating path from said release position where said control member is proximate said first end, to said pressurizing position where said control member is proximate said second end of the tube means, said control member being mounted to said switch housing in a manner that when said control member moves from said release position, said control member squeezes said tube means at a location proximate the first end of the tube means at an intermediate squeeze-off position to close said tube means to ambient atmosphere, and as said control member moves from said intermediate squeeze-off position to said pressurizing position, said control member squeezes said tube means along said lengthwise axis to pressurize the air pressure chamber of the pump switch to said higher level.

4,639,157

SECTIONALIZED FOLDER

Jason H. Herzfeld, 713 Double Tree La., Long Beach, Calif. 90815

Filed Aug. 22, 1985, Ser. No. 768,197
Int. Cl.⁴ B42F *11/00, 7/06*; B42D *3/06*
U.S. Cl. 402—19 **12 Claims**



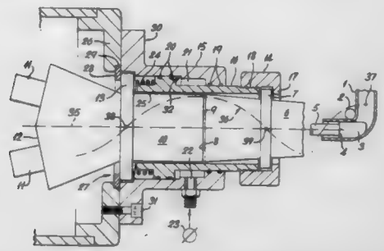
1. A folder comprising:
a front cover sheet;
a back cover sheet hingedly connected to said front cover sheet at inner lateral edge portions thereof;
a front flap covering an outer lateral portion of an inner face of said front cover, said front flap secured at its outer lateral edge to the outer lateral edge of said front cover and secured with a suitable adhesive at its upper and lower edges to upper and lower edges respectiely of said front cover to form a pocket at an outer lateral portion of said inner face;
a back flap covering an outer lateral portion of an inner face of said back cover, said back flap secured at its outer lateral edge to the outer lateral edge of said front cover and secured with a suitable adhesive at its upper and lower edges to upper and lower edges respectively of said back cover to form a pocket at an outer lateral portion of said inner face of said back cover;
a plurality of inner front sheets superimposed over said inner face of said front cover, said plurality of inner front sheets folded outwardly over themselves along a longitudinal line of each of said plurality of said inner front sheets, said longitudinal line of each of said plurality of sheets being superimposed over the longitudinal line of each successively lower sheet of said plurality of sheets;
a plurality of inner back sheets superimposed over said inner face of said back cover, said plurality of inner back sheets folded outwardly over themselves along a longitudinal line of each of said plurality of said inner back sheets, said longitudinal line of each of said plurality of sheets being superimposed over the longitudinal line of each successively lower sheet of said plurality of sheets.

4,639,158

FLUID PRESSURIZED JOINT ASSEMBLY

Gerald M. Jones, Trimpley, England, assignor to National Research Development Corp., London, England

Filed Jul. 2, 1984, Ser. No. 627,295
Claims priority, application United Kingdom, Jul. 8, 1983, 8318576
Int. Cl.⁴ F16D *1/10*; F16B *7/00*
U.S. Cl. 403—31 **2 Claims**



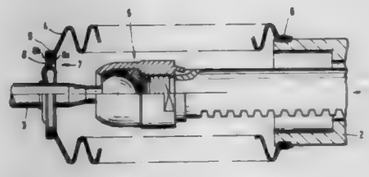
1. A joint assembly comprising a first and vibratable component and a second component to which vibration is to be transmitted, said first and second components having a common axis of alignment, each of said first and second components being of male form and having a peripheral flange and means for urging said first and second components towards and into firm and direct contact with each other in a direction parallel to said common axis and comprising:
a first joint member separate from but engageable in a direction parallel to said common axis with one of said components;
a second joint member separate from but engageable in a direction parallel to said common axis with the other of said components;
each of said first and second joint members being of female form and including a groove adapted to engage with said flange of a corresponding component, each flange received in a respective groove of said first and second joint members, and there being an annular space between at least one of said first and second male components and at least one of said first and second joint members;
intermediate means being sleeve-like in form and separate from said first and second components and which is fixed to one of said joint members and movable within said annular space for making a flexible sealed contact with the other of said joint members, to completely define a sealed chamber of variable capacity with said other of said joint members; and
means disposed on one of said first and second joint members for connnecting said chamber to a source of pressurized fluid, whereby a force is created when said chamber is pressurized, such force causing the joint members to engage with the respective components to cause relative sliding between said intermediate means and said other of said joint members, and thus to urge said first and second components toward one another into said firm and direct contact.

4,639,159

DEVICE FOR ATTACHING BELLOWS TO A CYLINDRICAL MEMBER

Hans Amrath, Viersen, Fed. Rep. of Germany, assignor to TRW Ehrenreich GmbH & Co. KG, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 29, 1984, Ser. No. 584,837
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307929
Int. Cl.⁴ F16J *15/52*; F16L *51/02*
U.S. Cl. 403—50 **14 Claims**



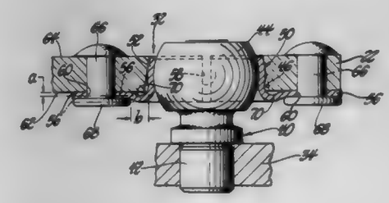
1. A device for attaching a bellows to a cylindrical member, comprising:
an annular disc arranged between an end of said bellows and said cylindrical member,
means for connecting said annular disc to said bellows,
the disc having a closed outer edge and an inner edge which is interrupted by substantially radially extending slots in the disc, and
said disc forming between said slots a plurality of resilient segments, and
said segments are bent alternately in opposite directions and spring biasingly engage against said cylindrical member.

4,639,160

WINDSHIELD WIPER BALL JOINT

Edward H. Huesman, West Carrollton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 21, 1986, Ser. No. 819,929
Int. Cl.⁴ F16B *9/00*; F16C *11/00*
U.S. Cl. 403—71 **2 Claims**

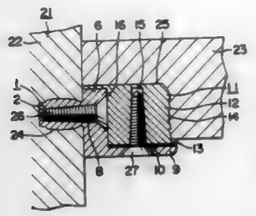


1. A universal joint for linkage apparatus including a pair of link members, comprising, means defining in one of said members a hole smoothly varying in diameter from a largest diameter adjacent one surface of such one member diameter to a least diameter adjacent the opposite surface thereof, a ball stud on the other of said members received in said hole, a socket member including a part-spherical socket portion engaged in said hole over said ball stud and slotted so as to be squeezable to decreasing diameters upon movement thereof in a direction axially of said hole toward said opposite surface, said socket member further including integral resilient attachment portions adapted for juxtaposition to said one surface, and attachment means resiliently stressing said attachment portions in secured and deformed relation to said one member about their juncture with said socket portion in a manner whereby said socket portion is urged axially of said hole toward said opposite surface.

4,639,161
SHELVING DEVICE

Yoshiyuki Mazaki, Kokubunji, Japan, assignor to Kabushiki Kaisha Murakoshi Seiko, Tokyo, Japan

Filed Nov. 1, 1985, Ser. No. 793,853
Int. Cl.[4] F16B 13/10
U.S. Cl. 403—245 3 Claims



1. A device for so securing a shelf to an upright member as to dispose an end of the shelf closely adjacent to a side of the upright member, of the type comprising an insert element for attachment to the upright member and an engagement element for attachment to the shelf and for connection with the insert element, said device being characterized by:

A. said insert element having

(1) a horizontally elongated buried portion which has inner and outer ends and which is receivable in a hole in the upright member that opens to said side thereof, and

(2) a receiving portion on the outer end of said buried portion, having

(a) a flat vertical surface which is transverse to the length of said buried portion and which faces towards said inner end thereof to flatwise engage said side of the upright member,

(b) a support plate portion that projects from said flat surface in the direction away from said inner end and which has a horizontal top surface, and

(c) a pair of opposite oblique side surfaces

(i) which extend at such opposite upward inclinations in relation to said horizontal surface as to be in upwardly convergent relation to one another and

(ii) which are at such opposite inclinations to said flat surface as to diverge from one another in said direction;

B. said engagement element being closely receivable in a cavity in the shelf that opens to its bottom and to its said end and having

(1) a flat side surface which is flush with said end of the shelf when the engagement element is received in said cavity,

(2) a bottom surface opposable to said horizontal top surface of the support plate portion of the insert element,

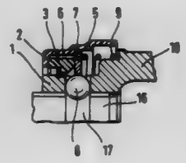
(3) a pocket which opens to said bottom surface and to said flat side surface and which has a pair of opposing oblique inner surfaces that matingly engage said oblique side surfaces on the receiving portion of the insert element and cooperate with them as the engagement element is slid down relative to the insert element to wedgingly drive said flat side surface of the engagement element firmly against said side of the upright member, and

(4) a hole opening to said bottom surface which aligns with a hole through said support plate portion of the insert element and in which a screw is receivable to draw the engagement element downward relative to the insert element and releasably secure those elements to one another.

4,639,162
DRAWING LOCK FOR TORQUE TRANSMITTING ENGAGEMENT BETWEEN TWO SHAFT MEMBERS ARRESTABLE IN THE OPEN POSITION

Hubert Geisthoff; Theo Buthe, both of Lohmar, and Felix Mikeska, Siegburg, all of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar/Rhld. 1, Fed. Rep. of Germany

Filed Mar. 4, 1986, Ser. No. 836,096
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511576; Oct. 31, 1985, 3538708
Int. Cl.[4] F16B 7/00
U.S. Cl. 403—316 10 Claims



1. A drawing lock capable of being arrested in an open position for connecting two shafts, particularly a power take-off shaft of a tractor and a drive shaft of an agricultural implement comprising

a coupling sleeve defining a bore adapted to receive a shaft, said shaft being inserted into said bore from a slipping-on direction and being in torque transmitting engagement with said coupling sleeve;

a plurality of radial apertures in said coupling sleeve and blocking members received in said apertures to be radially movable therein, said blocking members being adapted to engage within an annular groove within said shaft received in said bore;

a locking ring engaging said blocking members to hold them in engagement within said annular groove in said shaft;

spring means exerting a spring force on said locking ring;

gripping sleeve connected to said locking ring for enabling axial movement thereof, said gripping sleeve being shaped to define a free space on the side of said locking ring toward said slipping-on direction;

a slotted spring ring provided in said free space;

a supporting ring axially affixed to said coupling sleeve defining a supporting face located for engagement with said spring ring;

said slotted spring ring being configured with a stepped configuration on a side thereof facing toward said slipping-on direction defining a first axially acting stop face and a second axially acting stop face, said second stop face being axially spaced from said first stop face and being located radially inwardly thereof; and

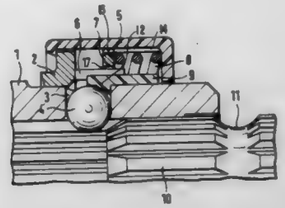
a continuous bead formed on said slotted spring ring adjacent said second stop face adapted for engaging with said blocking members;

said slotted spring ring being locked in a position with said continuous bead in engagement with said blocking members by engagement of said first stop face with said supporting face and being expanded radially by outward movement of said blocking members to enable a shaft to be inserted in torque transmitting engagement into said bore of said coupling sleeve, said radial expansion of said spring ring causing said first stop face to become disengaged from said supporting face and said second stop face to be brought into engagement therewith.

4,639,163
DRIVELINE COUPLING WITH SAFETY INTERLOCK MECHANISM

Theo Buthe; Hubert Geisthoff, both of Lohmar; Horst Kretschmer, Cologne; Felix Mikeska, Siegburg, and Alexander Post, Neunkirchen, all of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Dec. 6, 1984, Ser. No. 678,638
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345732
Int. Cl.[4] F16B 7/00
U.S. Cl. 403—322 12 Claims



1. A driveline coupling mechanism with a safety interlock device particularly suitable for connecting the drive shaft of an agricultural implement with the power takeoff shaft of a tractor, comprising:

a coupling sleeve having radial apertures therein;

a drive shaft configured to enable it to be held in torque transmitting engagement with said coupling sleeve having an annular groove formed therein;

engagement members located within said radial apertures and radially movable therein for engagement within said annular groove to axially hold said coupling and said shaft together;

a locking ring member axially movable on said coupling sleeve between a locking position, for locking said engagement members in engagement within said annular groove and an unlocking position, permitting said engagement members to move radially upwardly for disengagement from said annular groove;

spring means axially biasing said locking ring member toward said locking position;

latching means engaging within said radial apertures in a latched position and structured to abut said locking ring member for holding said locking ring member in said unlocking position, said latching means being engaged by said engagement members and being brought to an unlatched position to permit said locking ring member to move to said locking position when said drive shaft is inserted into said coupling sleeve;

a guide ring affixed to said coupling sleeve; and

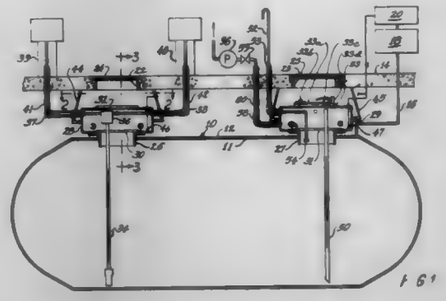
guide means interposed between said guide ring and said locking ring member for enabling relative axial movement between said locking ring member and said coupling sleeve while preventing relative rotative movement therebetween when said locking ring means is in said unlocking position.

4,639,164
UNDERGROUND TANK SUMP AND PIPING SYSTEM

Peter J. Pugnale, The Woodlands, Tex., and Michael J. Messner, Toledo, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 6, 1985, Ser. No. 730,961
Int. Cl.[4] B65D 25/24
U.S. Cl. 405—54 1 Claim

1. An underground storage tank and a sump and piping assembly therefor comprising an elongate, generally cylindrical tank installed underground with a longitudinal axis thereof extending generally horizontally, a manway fitting in an upper wall portion of the tank, the manway fitting including a tubular portion in communication with the inside of the tank and an upper external flange, a cylindrical sump mounted underground on the flange of the manway fitting in upwardly spaced relationship to the upper wall portion of the tank and including a bottom wall and a cylindrical sidewall, and piping in communication with the inside of the tank through the bottom wall of the sump, there being no communication between the sump



and the inside of the tank except through said piping, said piping also communicating with an above-ground dispenser through the sidewall of the sump, an underground portion of the piping leading to the dispenser from the sump being provided with a double wall including an inner wall and an outer wall, and said outer wall restraining any liquid leaked from said inner wall from contaminating the environment by conducting the leaked liquid through the sidewall to the inside of the sump.

4,639,165
DRAINAGE TUBE

Anthony E. Flecknoe-Brown, Melbourne, Australia, assignor to A.A.R.C. (Management) Pty. Limited, Victoria, Australia

Continuation-in-part of Ser. No. 419,752, Sep. 20, 1982, abandoned. This application Feb. 22, 1985, Ser. No. 704,575
Int. Cl.[4] E02B 11/00
U.S. Cl. 405—45 11 Claims

1. An essentially continuous subsoil sheet drainage element comprising:

a core sheet of generally planar configuration having on at least one side of a plane regularly spaced, hollow, equal depth supporting projections each having a base and a flat top, said plane located at the base of each projection; and

a covering of geotextile filter cloth surrounding said core;

the depth of projections on one side of said plane and the spacing between adjacent projections permits the core sheet to be tightly folded upon itself without damage or significant loss of water carrying capacity.

4,639,166
CONSTRUCTION OF JACKETS

Derek T. Fern, Watford, United Kingdom, assignor to PMB Systems Engineering Limited, London, England

Filed Apr. 17, 1985, Ser. No. 724,123
Claims priority, application United Kingdom, Mar. 22, 1985, 8507553
Int. Cl.[4] E02D 21/00, 25/00
U.S. Cl. 405—203 22 Claims

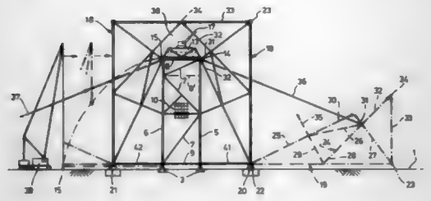
1. A method of constructing an elongate jacket for erection in water as a supporting structure wherein said jacket is constructed with its axis of elongation lying generally horizontally, comprising the steps of

forming elongate central trusses, said central trusses having elongate edges generally parallel to said axis of said jacket;

raising said central trusses into upright and mutually opposed positions resting on their respective elongate edges, and bracing said central trusses together to form a strong

and coherent internal structure extending lengthwise of the jacket and having a base, upright sides and an upper surface;

prefabricating substantially horizontally at least one side truss having outer and inner elongate edges, said inner elongate edge extending alongside and outwardly laterally spaced from a corresponding side of said internal structure;



supporting said inner elongate edge of said side truss;

applying tensile force between said internal structure at positions spaced from its base

and said side truss at positions spaced from said inner elongate edge, thereby to rotate said side truss into an upright position resting on said inner elongate edge; and

bracing said side truss thus rolled up at least to said internal structure.

4,639,167

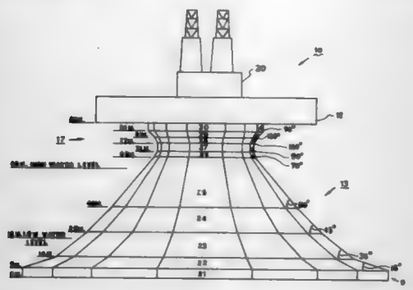
DEEP WATER MOBILE SUBMERSIBLE ARCTIC STRUCTURE

Terry D. Petty; Carmon R. Costello, both of Kenner; Kun K. Song, New Orleans; Luc G. Chabot, La Place, all of La.; Tadahiro Fujita, Kanagawa, Japan; Haruki Hirose, Kanagawa, Japan, and Nobutoshi Yoshimura, Mie, Japan, assignors to Odeco, Inc., New Orleans, La. and Nippon Kokan, K.K., Tokyo, Japan

Filed Apr. 24, 1985, Ser. No. 726,635

Int. Cl.⁴ E02B *17/00*

U.S. Cl. 405—217 **7 Claims**



1. A mobile marine drilling structure of the submersible bottom-founded type for operation in arctic waters, said structure including a base for placing the structure on the sea bed, a hull extending from the base, and a deck supported by the hull and located at a safe elevation above the water line for conducting drilling operations and having sufficient deck space to accommodate drilling equipment and supplies, said hull having an internal frame assembly including external wall sections at different inclinations to the horizontal to engage and break up the moving ice masses encroaching on the hull, the improvement wherein

said external wall sections include a plurality of matching polygonal, frusto-pyramidal, apex-up walls extending above the base at increasing angles to the horizontal from about 12° to 75°; a matching polygonal, substantially cylindrical, first transitional wall extending substantially vertically above the apex-up walls; at least one matching polygonal, frusto-pyramidal, apex-down wall extending above the cylindrical wall at an angle to the horizontal from 95° to 150°; and a matching polygonal,

second transitional wall extending above the apex down wall at an obtuse angle to the horizontal from 90° to 140°, and said obtuse angle being less than the angle of said apex-down wall.

4,639,168

HOLLOW FOUNDATION BODY AND METHOD OF MAKING A FOUNDATION

Bernhard Wietek, A-6073, Sistrans No. 290, Austria

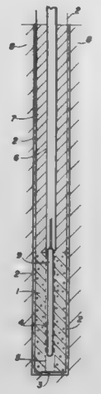
PCT No. PCT/AT83/00001, § 371 Date Jan. 13, 1984, § 102(e) Date Jan. 13, 1984, PCT Pub. No. WO83/04276, PCT Pub. Date Dec. 8, 1983

PCT Filed Jan. 7, 1983, Ser. No. 576,384

Claims priority, application Austria, May 24, 1982, 2031/82

Int. Cl.⁴ E02D *3/10, 5/38*

U.S. Cl. 405—239 **6 Claims**



1. A method of constructing a foundation body for reducing a ground water level comprising:

positioning a vertically elongated pile in an opening in the ground bearing the ground water level, the pile being vertically elongated and having a vertical opening extending therethrough;

providing said pile to include an upper load bearing part of water impervious material and a lower load bearing layer of water pervious material made of filtering concrete with a pipe which is water pervious at least in the area of said lower layer extending in a portion of said opening in said lower layer;

pumping out ground water through said pipe and said opening which has entered said opening through said lower layer; and

adding water impervious material to said lower layer through said opening to render said lower layer water impervious.

4,639,169

MINERAL MINING INSTALLATION

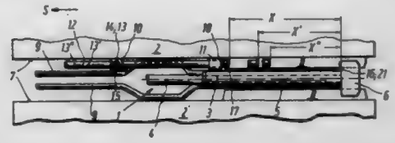
Kunibert Becker, Werl; Rüdiger Kirchbrücher, Dortmund-Brackel, and Michael Preuschoff, Lüdinghausen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Jan. 30, 1985, Ser. No. 696,559

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1984, 3403906

Int. Cl.⁴ E21D *15/44*

U.S. Cl. 405—291 **11 Claims**



1. A mineral mining installation comprising a roof support unit and an advance mechanism, said roof support unit having a floor sill constituted by at least one floor girder, said advance mechanism comprising a hydraulic advance ram, said advance ram having a relatively-displaceable cylinder and a piston rod, and a device for selectively limiting the working stroke of the ram, the improvement wherein said stroke-limiting device comprises a stop fixed to a movable part of the advance ram, and an adjustable stop member mounted on a roof support unit floor girder, said adjustable stop member comprising a rod, means for fixing said rod to said floor girder in any one of a plurality of positions, and wherein, said rod fixing means comprises at least one bracket fixed to said floor girder, and a passage in said at least one bracket slidably mounting said rod and means for locking said rod at a longitudinally adjustable position relative to said at least one bracket.

4,639,170

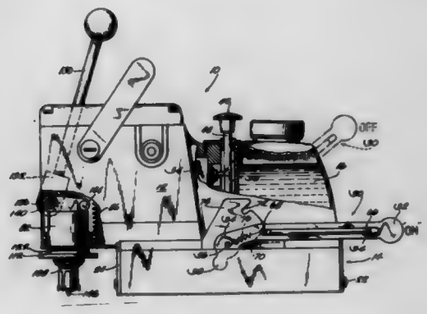
MAGNETIC BASE FOR PORTABLE TOOLS

Bernhard Palm, Brookfield, Wis., assignor to Milwaukee Electric Tool Corporation, Milwaukee, Wis.

Filed Apr. 8, 1985, Ser. No. 720,899

Int. Cl.⁴ B23B *45/14*

U.S. Cl. 408—76 **8 Claims**



1. An electric power tool having a base,

permanent magnet means in said base for holding said base to a ferromagnetic material,

means operative to substantially shunt the magnetic field of said permanent magnet means to permit removal of the tool from the material,

a handle including lever means movable between "on" and "off" positions and connected to said shunt means to cause said shunt means to become operative when the lever means is moved to said "off" position,

a probe mounted in said base for reciprocation between a retracted position and a second position in which it projects from said base,

a spring biasing said probe to its said second position,

and means interconnecting said probe and said shunt means to prevent movement of said shunt means when said probe is in said second position.

4,639,171

DOWEL HOLE DRILLING MACHINE

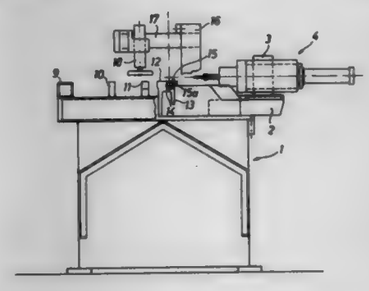
Johann Maier, Wolfratshausen, Fed. Rep. of Germany, assignor to Schleicher Maschinenbau und -Vertrieb GmbH, Geretsried, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,497

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 8407334

Int. Cl.⁴ B23B *41/00*

U.S. Cl. 408—89 **6 Claims**



1. A dowel hole drilling machine, comprising a work support having a first portion and a second portion; a crosspiece, the second portion of said support being provided on said crosspiece; means for pivotally connecting said crosspiece and the second portion of said support to the first portion of said support so that the crosspiece and the second portion of said support are pivotable about a predetermined axis between first and second postions at right angles to each other; at least one drilling unit mounted on and pivotable with said crosspiece between said first and second positions; and first and second stops provided on said crosspiece, a workpiece resting on the first portion of said support being arranged to simultaneously rest on the second portion of said support as well as to abut against one of said stops in one position of said crosspiece, and a workpiece resting on the first portion of said support being arranged to abut against the second portion of said support as well as to abut against the other of said stops in the other position of said crosspiece.

4,639,172

TRACE CONTROL METHOD

Hajimu Kishi; Mitsuo Matsui, and Hitoshi Matsuura, all of Tokyo, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP84/00056, § 371 Date Jan. 25, 1985, § 102(e) Date Jan. 25, 1985, PCT Pub. No. WO84/04718, PCT Pub. Date Dec. 6, 1984

PCT Filed Feb. 20, 1984, Ser. No. 700,703

Claims priority, application Japan, May 31, 1983, 58-096289

Int. Cl.⁴ B23Q *35/121*; G05B *19/24*

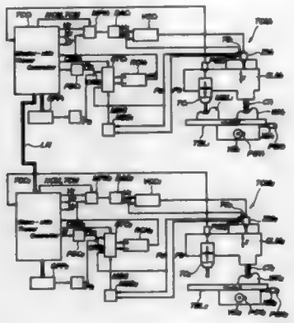
U.S. Cl. 409—80 **12 Claims**

1. A method for operating a master-slave type tracer system, comprising

machining a workpiece according to a model by tracing said model with a master unit of said system, said master unit including a tracer head for tracing a model and cutting means for cutting said workpiece, wherein said tracer means and cutting means are moved together on a movable element by respective motors of said master unit along respective axes for said tracing and machining, and

said master unit calculates velocity commands in digital form to drive said respective motors along said respective axes of said master unit, to provide said machining according to displacement signals corresponding to said respective axes from said tracing of said model by said tracer head, and

simultaneously machining a further workpiece, with a slave unit of said system which includes a respective cutter means driven along respective axes by respective motors of said slave unit, for machining said further workpiece in correspondence to said tracing by said master unit of said model according to a move command supplied from said master unit, for each of said respective axes of said slave unit in correspondance to said axes of said master unit during each of a succession of intervals,



wherein each said move command is provided from said master unit to said unit as digital numerical data, as a result of said master unit monitoring data corresponding to the current position along each respective axis of the movable element thereof on which said tracer head is mounted, and said slave unit calculates, on the basis of each said mode command from said master unit, a respective number of pulses corresponding to the movement to be provided along each respective axis of said slave unit during each said period, and produces each said number of calculated pulses during each respective period,

wherein said machining by said slave unit is provided by movement of the respective cutter means along each respective axis of said slave unit according to the pulses for each said axis for each said period.

4,639,173

APPARATUS FOR PRODUCING A CAM WITH SINUSOIDAL CAM LOBE SURFACES

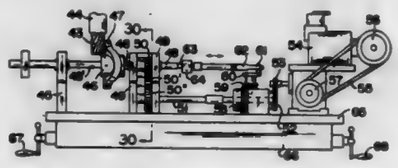
Francis E. Waller, Dover, Fla., assignor to Leonard J. E. Waller; Wm. J. Gdovin and Walter J. Monacelli, part interest to each

Continuation-in-part of Ser. No. 582,263, Feb. 22, 1984, abandoned, which is a continuation-in-part of Ser. No. 420,390, Sep. 20, 1982, abandoned, which is a division of Ser. No. 320,213, Nov. 12, 1981, Pat. No. 4,432,310, which is a continuation of Ser. No. 265,259, May 19, 1981, abandoned, which is a continuation of Ser. No. 35,553, May 3, 1979, abandoned. This application Aug. 1, 1985, Ser. No. 761,487

Int. Cl.⁴ B23C *3/08*

U.S. Cl. 409—122 **4 Claims**

1. Apparatus for producing a cam having sinusoidal cam lobe surfaces, which comprises (1) a first supporting means for rotatably supporting a cylinder workpiece; (2) a first rotating means for rotating said cylinder at a controlled rate about its cylindrical axis; (3) a second supporting means for supporting a cutting or grinding tool, (4) a rotating means for rotating said tool; (5) an advancing and retracting means for advancing and retracting said cylinder supporting means, said advancing and retracting means being adapted to position a flat end of said cylinder adjacent to and in cutting or grinding relationship with the side of said cutting or grinding tool; (6) a third supporting means for supporting said advancing and retracting



means; and (7) a moving means for moving said third supporting means incrementally toward said tool.

4,639,174

SELF-PLUGGING BLIND RIVET

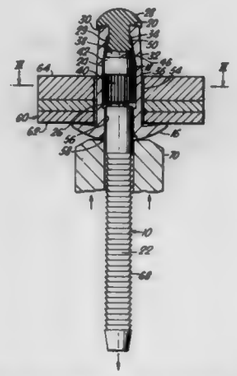
Keith Denham, and Stephen Archer, both of Welwyn, England, assignors to Avdel Limited, Welwyn Garden City, England

Filed Nov. 9, 1984, Ser. No. 669,867

Claims priority, application United Kingdom, Nov. 17, 1983, 8330688

Int. Cl.⁴ F16B *13/04*

U.S. Cl. 411—34 **12 Claims**



1. A self-plugging blind rivet comprising an elongate stem and a tubular rivet body, the body having an elongate shank, a radial enlargement providing a rivet head at one end of the shank, a tail-end at the other end of the shank, and a bore extending axially through the rivet head and shank to the tail end, the stem extending through the bore of the body and comprising a stem-tail which projects from the head end of the body, and a plug connected to the stem-tail, the plug having a generally cylindrical first part adjacent to the stem-tail, a second part which is spaced from the stem-tail by the first part, and a radially enlarged terminal head at the end of the stem remote from the stem-tail, wherein the second part has a maximum diameter not greater than the diameter of the cylindrical first part, and the diameter of the plug is reduced progressively in the second part in the direction towards the terminal head, the second part having an initial reduction in diameter adjacent to the cylindrical first part, and an abrupt further reduction in diameter at a position spaced from the first part and from the underhead surface, said abrupt further reduction providing an abutment which faces towards the terminal head and an annular groove between the said abutment and the underhead surface, the terminal head presenting an underhead surface which faces towards the stem-tail for abutting the tail-end of the shank, the shank of the body having a main portion adjacent to the rivet head and an end portion spaced from the rivet head by the main portion, wherein the external and internal diameters of the end portion of the shank reduce progressively in the direction towards the tail-end over an axial length greater than the width of the annular groove, and the end portion has a radially inwardly extending part adjacent the tail-end of the shank, which part extends into the annular groove.

4,639,175

SELF-SEALING EXPANSION RIVET ASSEMBLY

Burnell J. Wollar, Barrington, Ill., assignor to Phillips Plastics Corp., Chippewa Falls, Wis.

Filed May 15, 1984, Ser. No. 610,521

The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.

Int. Cl.⁴ F16B *13/04*

U.S. Cl. 411—38 **4 Claims**



1. A self-sealing expansion rivet assembly for use with aligned panel holes in a plurality of panels which are to be joined together, each panel having an outer surface and an inner surface, said panels being arranged so that an inner surface of one confronts the outer surface of another, said assembly comprising:

a plastic rivet having an expandable rivet shank, said rivet shank compriaing a head end and an insertion end and an expendable portion therebetween, a rivet head at said head end of said rivet shank for juxtaposition with the outer surface of one of said panels, and a rivet bore open at opposite ends extending through said rivet head and through said rivet shank, said rivet bore comprising a bore portion of reduced diameter near the head end of said rivet shank;

a drive pin compriaing a pin shank insertable in said rivet bore from said insertion end of said rivet shank and having a pin head at one end of said pin shank engageable with the exterior of said insertion end of said rivet shank for effecting expansion of said rivet shank when said drive pin is forced through said rivet bore to an installed position so that said expanded rivet shank is juxtaposed with the inner surface of another of said panels, said pin shank comprising a first portion having serrations thereon and a second break-away portion, said serrations having a greater diameter than said reduced diameter bore portion but a smaller diameter than said rivet bore;

said reduced diameter bore portion being interengageable with said serrations on said pin shank for maintaining said drive pin in said installed position and for maintaining said rivet shank expanded;

and integrally formed sealing means on said rivet between said rivet head and said expandable portion of said rivet shank for abutting the outer surface of at least one of said plurality of panels and to seal the hole therein when said drive pin is in installed position and said rivet shank is expanded, said sealing means comprising at least one annular shaped outwardly extending flexible sealing flange on said rivet shank, said flange having conically shaped inner and outer surfaces.

4,639,176

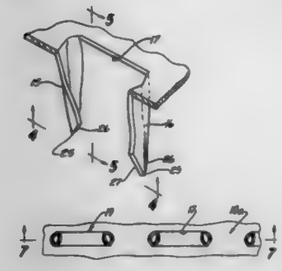
TRUSS PLATE

Glenn C. Smith; James R. Needham, both of 2914 E. Katella Ave., Orange, Calif. 92667, and William T. Turnbull, 1307 W. Sixth St., Suite 114, Corona, Calif. 91720

Filed Jan. 21, 1986, Ser. No. 820,227

Int. Cl.⁴ F16B *15/00*

U.S. Cl. 411—468 **9 Claims**



1. A truss connector plate formed of a stiff, thin sheet metal plate having numerous teeth struck-out of the plate for embedding in wood members for joining said members together to form trusses, beams, and the like construction elements, comprising:

the teeth being aligned in a number of longitudinal rows along the plate, and being formed in pairs that are struck-out of, and extend approximately perpendicularly to, the sheet metal plate with an elongated, longitudinally directed slot between each pair of teeth, and with the adjacent ends of the slots being spaced apart longitudinally;

each tooth being bent along its central axis into a generally V-shaped cross-section, and being radially twisted and predetermined amount from its base to its free end tip, and having an asymmetrical V-shaped tip formed in a V-shape having one leg longer than the other; and,

a second plate, including teeth identically configured to the first mentioned plate, said second plate being arranged in face-to-face contact with the first mentioned plate, with the teeth of the second plate being forcibly inserted through the adjacent slots of the first plate, and the teeth of the second plate being closely arranged to their adjacent teeth of the first plate and due to their twisted configuration and cross-sectional shapes, the adjacent teeth being partially gapped apart along their lengths to form double tooth sets for interlocking with a wood member.

4,639,177

BOOK SEWING MACHINE WITH AUTOMATIC SEPARATION OF BOOKS

Gianattilio Meratti, Carona, Switzerland, assignor to Meccatec S.p.A., Torre de' Roveri, Italy

Filed Sep. 26, 1984, Ser. No. 654,447

Claims priority, application Italy, Sep. 27, 1983, 67998 A/83

Int. Cl.⁴ B42C *19/04, 19/08*

U.S. Cl. 412—11 **17 Claims**

12. A book sewing machine of the chain-stitching type, including a sewing zone and a conveyor horizontally disposed having a receiving end disposed adjacent said sewing zone for receiving and for carrying a horizontal pile of vertically disposed books which have been sewn towards a discharge zone, wherein the improvement comprises an automatic mechanism for separating the books already sewn which includes:

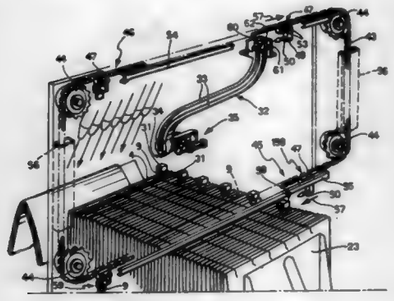
a separator member insertable between two contiguous books located close to the discharge zone and displaceable in a vertical transverse plane relative to the direction of advance of the conveyor from one side conveyor to the other;

a drive device for effecting the insertion and displacement of the separator member, and

a control system for said drive device including at least one indicator element:

a marker device including indicator element insertion means disposed adjacent said receiving end of said conveyor for periodically inserting an indicator element in varying relation to the final signature of each book in said conveyor adjacent the sewing zone, close to the top of a vertical side of each book and;

a sensor located close to the path traveled by the indicator element during the advance of the books towards the



discharge zone so as to detect the passage of the indicator element and to start the working cycle of the drive device of the separator member when the interval between the backs of the contiguous signatures of the books to be separated is in the transverse plane of displacement of the separator member;

wherein the indicator element also serves as the separator element and comprises a substantially cubic, parallelpipedal block and a plate which projects from the middle of the lower face of the block.

4,639,178

MACHINE PERMITTING THE REMOTE CLOSURE OF DRUMS

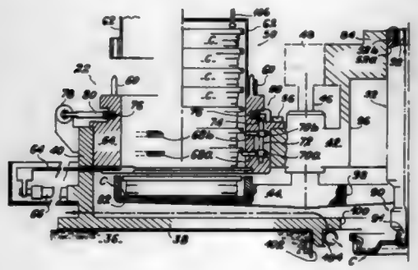
Robert Dabat, Octeville, and Claude Jamet, Equeurdreville, both of France, assignors to Commissariat a l'Energie Atomique, France

Filed Jan. 13, 1984, Ser. No. 570,355

Claims priority, application France, Jan. 14, 1983, 83 00525

Int. Cl.[4] B21D *51/30*

U.S. Cl. 413—26 **10 Claims**



1. A machine for closing drums within a pool, wherein said machine comprises a telescopic pole having at its lower end a gripping head, handling means for moving the latter between a bottom position in the pool and a top position above the pool, transfer means for transferring a cover beneath the gripping head when the latter is in the top position, and control means for putting into action means for attaching the cover to the drum, the handling means, transfer means and control means being positioned above the pool and the gripping head carrying connection means for the control means and attachment means.

4,639,179

DEVICE FOR LOADING A MACHINE FOR THE TREATMENT, NOTABLY THERMAL, OF CYLINDRICAL OBJECTS, NOTABLY IN GLASS, SUCH AS GLASS PIPES

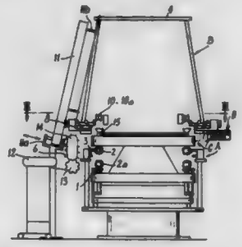
Dominique Soulard, Gauville, France, assignor to Societe Francaise d'Ampoules Mecaniques, Aumale, France

Filed Jun. 7, 1984, Ser. No. 618,363

Claims priority, application France, Jun. 14, 1984, 83 09801

Int. Cl.[4] B65H *1/00*

U.S. Cl. 414—223 **6 Claims**



1. In a system for treating elongated cylindrical objects, particularly glass objects such as glass pipes, said system being of the type including an object treating machine comprising a carrousel rotatable about a vertical axis and having therearound a plurality of treatment stations whereat the objects are received and treated, and means for supplying objects to be treated to said stations while said carrousel is rotating about said vertical axis, the improvement wherein said supplying means comprises:

a loading barrel mounted above said carrousel for rotation about a vertical axis coaxial with said vertical axis of said carrousel, said barrel having therearound a number of loading stations equal to the number of treatment stations of said carrousel;

coupling means for connecting said barrel to said carrousel to rotate therewith at the same speed during a loading operation, and for disconnecting said barrel from said carrousel during a supplying operation;

indexing means for rotating said barrel to supply said objects to respective loading stations;

means for, when said barrel is disconnected from said carrousel, supplying objects in substantially vertical alignment to said loading stations; and

means for, when said barrel is connected to said carrousel, discharging the loaded objects vertically downwardly from said loading stations to respective said treatment stations.

4,639,180

EQUIPMENT FOR LOADING BARS TO BE MACHINED ON A DEVICE FOR PRESENTING AND FEEDING SAID BARS TO A MACHINE TOOL

Giovanni Cucchi, and Pietro Cucchi, both of Bussero, Italy, assignors to F.LLI Cucchi S.R.L., Bussero, Italy

Filed May 15, 1985, Ser. No. 734,043

Claims priority, application Italy, May 24, 1984, 21909/84[U]

Int. Cl.[4] B65H *3/00*

U.S. Cl. 414—224 **4 Claims**

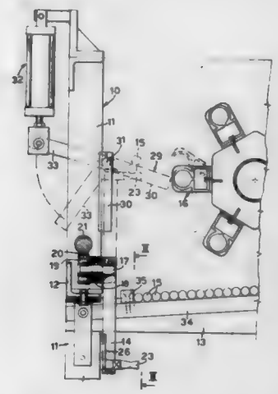
1. A mechanism for lifting bars from a supply of parallel bars in automatic bar loading devices for a machine tool, characterized in that said mechanism comprises

a plurality of arms mounted to rotate in a vertical plane parallel to said bars in said supply,

means on one end of each of said arms for grasping a bar in said supply,

means for driving said arms to displace said grasping means from a first lower position in which one bar is drawn out of said supply and moved by said grasping means to a second upper position,

a rotating comb device, and



means for rotating said comb device for drawing out said one bar from said grasping means and dropping it by gravity onto a channel-shaped jaw, said jaw being suitable for introducing said bar into the machine tool.

4,639,181

PALLET EXCHANGE DEVICE

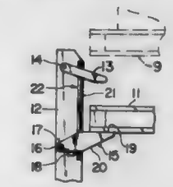
Yuzo Tsubouchi, Osaka, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

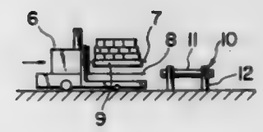
Filed Nov. 26, 1984, Ser. No. 674,590

Claims priority, application Japan, Nov. 28, 1983, 58-182078[U]; Nov. 28, 1983, 58-182079[U]

Int. Cl.[4] B66F *9/06*

U.S. Cl. 414—349 **10 Claims**





1. A pallet exchange device for use with a fork truck having a pair of vertically spaced apart forks which are raised and lowered in unison, said device comprising a plurality of upright stationary members defining therebetween a vertical path of movement for loaded and unloaded pallets, pallet supporting members mounted on said stationary members for movement between extended positions in said path of movement at a common level for supporting one of said pallets, and a retracted position out of said path, said supporting members being biased toward said extended positions, levers located at a position higher than the level of said pallet supporting members by a distance less than the vertical spacing between said pair of forks, said levers being mounted on said stationary members and each having a part to be displaced into or out of said path, connecting means having a plate for each supporting member, said plate being vertically guided by a stationary member, said connecting means adapted to engage both said levers and said supporting members so as to be displaced when said lever parts are engaged by a pallet being raised by the lower of said pair of forks and caused to move upwardly, and operable to displace said pallet supporting members to their retracted positions and latch said supporting members so that they remain in said retracted positions, said lever parts when moved downwardly by a pallet being lowered by the upper of said pair of forks, displacing said connecting means to unlatch said supporting members and allow them to return to their extended positions.

4,639,182

CRANE DEVICE INSTALLED IN CARGO TRANSPORTING VEHICLE

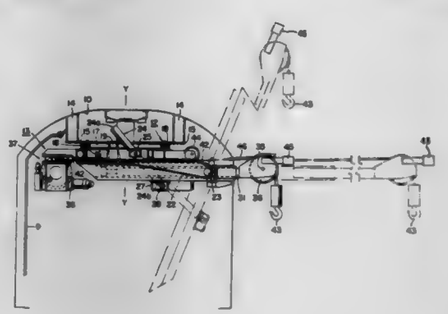
Mitsuharu Inaba, Utsunomiya; Takashi Sekiguchi, Tochigi; Yoshio Yoneyama, and Tadashi Suzuki, both of Utsunomiya, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1984, Ser. No. 637,650

Claims priority, application Japan, Aug. 26, 1983, 58-132113[U]; Aug. 26, 1983, 58-132114[U]; Aug. 26, 1983, 58-132115[U]

Int. Cl.[4] B60P *1/54*

U.S. Cl. 414—543 **3 Claims**



1. A crane device installed in a cargo transporting vehicle with a roof structure and comprising:

a revolvable frame supported by the roof structure in a suspended manner permitting revolution of the revolvable frame about a vertical axis;

a derrick boom assembly luffably supported by the revolvable frame and having a boom adapted to be extendible forward and contractible rearward in the longitudinal direction thereof;

a winch means mounted on the revolvable frame and having a winding drum, a length of wire rope, a portion of which is secured to and wound around the winding drum, the remaining outer portion of which is led to the extreme forward end of the boom, and a cargo hook adapted to be lowered and raised from said forward end by the wire rope unwound from and wound up on the winding drum;

first driving means for driving the revolving frame in revolution;

second driving means for driving the boom assembly in luffing movement;

third driving means for driving the boom in extending and contracting movement;

fourth driving means for driving the winch means in the operation thereof;

motive power means for each of the first through fourth driving means;

a safety system having a tactile sensor mounted on the extreme front end of the boom and operating to stop movements of the boom when the tactile sensor contacts an object;

the tactile sensor comprises:

a pair of bell cranks pivotally supported on the extreme front end of the boom by respective pivot pins disposed apart and symmetrically on opposite lateral sides of the boom centerline, each bell crank having an inner arm and an outer arm pin connected to a tactile feeler;

a detector rod slidably supported on the boom to move longitudinally rearward upon being pressed at a front end thereof by said inner arms of the bell cranks when the tactile feeler contacts an object;

a spring urging the detector rod in the forward direction; and

a detection switch operable in closing and opening action by the detector rod.

4,639,183

BUCKET EXCAVATOR

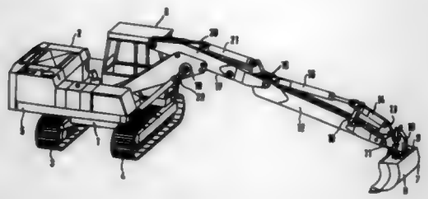
Wilfred Güthoff, Witten, Fed. Rep. of Germany, assignor to Friedrich Wilh. Schwing GmbH, Herne, Fed. Rep. of Germany

Filed Mar. 27, 1985, Ser. No. 716,582

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411866

Int. Cl.[4] E02F *5/02*

U.S. Cl. 414—705 6 Claims



1. A bucket excavator having a working implement which is connected to a bucket arm with an operating hinge for movement about an operating hinge axis, and having a drive which comprising first and second working cylinders attached on opposite sides of the operating hinge axis for moving the working implement about the operating hinge axis; the bucket excavator characterized by the operating hinge being attached to a clamp having first and second clamping feet, at least the first clamping foot being movable about a clamping hinge axis which coincides with the operating hinge axis, the first clamping foot being connected to the first working cylinder, and the first clamping foot opposing the second clamping foot to form a gripper for engaging connections provided on the working implement for attaching the operating hinge to the working implement, said connections cooperating with the clamping feet to provide a locking arrangement when the clamping feet are in a gripping position.

4,639,184

SAFETY COUPLING DEVICE FOR ROBOTIC TOOLING

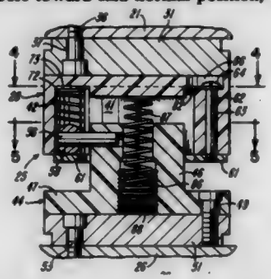
Harold E. Knasel, Springfield, and David A. Grigsby, Medway, both of Ohio, assignors to Process Equipment Company, Tipp City, Ohio

Filed Mar. 6, 1985, Ser. No. 708,561

Int. Cl.[4] B25J *9/00*

U.S. Cl. 414—730 15 Claims

1. A safety coupling device adapted for connecting tooling to the movable arm of a robot to protect against inadvertent damage to the robot and/or tooling and to minimize down time of the robot, said device comprising a first support member, means for rigidly securing said first support member to the arm of the robot, a second support member, means for rigidly securing said second support member to the tooling, means connecting said first and second support members and providing for relative universal tilting movement between said first and second support members from a normal position where said first support member is in predetermined relation to said second support member, means for biasing said first and second support members toward said normal position, control means



responsive to said tilting movement for stopping the movement of the arm of the robot, said connecting means including a set of relative movable electrically conductive elements, said control means including an electrical circuit with means for electrically connecting said elements in series, and said circuit opens by separation of at least two of said elements in response to said tilting movement of said support members.

4,639,185

BAG PACKAGE TRANSFER APPARATUS

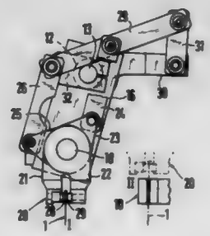
Walter Gressler, Bergisch-Gladbach, and Karl Kern, Schwalmtal-Amern, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 17, 1985, Ser. No. 788,363

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1985, 3501771

Int. Cl.[4] B25J *3/00*

U.S. Cl. 414—733 3 Claims



1. In a packaging machine the combination comprising a bag transfer apparatus for transferring bags in a vertical orientation, said apparatus having a pivot arm, a pair of tongs hinged to the pivot arm and including jaw means for grasping a flat bag at a first station, first lever means for pivoting said pivot arm to traverse said bag through a fixed path by a swinging movement of the pivot arm so as to position said flat bag onto a conveyor apparatus at a second station, a second lever means being linked to parallel spaced-apart connecting rod means by crank means, said connecting rod means being aligned substantially symmetrically adjacent to said pivot arm said crank means being linked to a first end of said connecting rod means by a coupling element and said tongs are articulated by a second end of said connecting rod means, said connecting rod means maintaining said bags in said vertical orientation during pivoting of said pivot arm and operable by said second lever means to open and close said tongs at said first and second stations, said first and second lever means are connected to individual and separate drive means.

4,639,186

FORWARDER

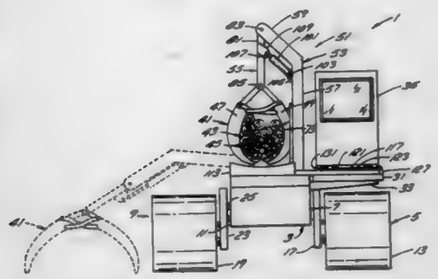
Per-Gustaf Mellgren, Beaconsfield, Canada, assignor to Forest Engineering Research Institute of Canada, Pointe Claire, Canada

Filed Nov. 27, 1984, Ser. No. 675,182

Claims priority, application Canada, Dec. 12, 1983, 443121

Int. Cl.[4] B60P *1/00*

U.S. Cl. 414—734 4 Claims



1. A vehicle for loading and transporting elongated articles, the vehicle having: a chassis; a first wheel support beam having a powered wheel unit at each end and fixedly mounted to the chassis on one side of the chassis; a second wheel support beam having a powered wheel unit at each end and pivotally mounted to the chassis on the other side of the chassis with a pivot pin; the axis of the pivot pin being horizontal and extending transverse to the longitudinal axis of the vehicle; a grapple for picking up a single full load of elongated articles and holding the load on the chassis with the articles generally parallel to the longitudinal axis of the vehicle; grapple arm means for mounting the grapple on the vehicle; pivot means pivotally mounting one end of the grapple arm means at about the longitudinal center of the chassis, the axis of the pivot means extending generally parallel to the longitudinal axis of the vehicle; means pivotally mounting the grapple to the other end of the grapple arm means; and means for moving the grapple arm means in a direction transverse to the longitudinal axis of the vehicle to move the grapple between a first article loading position adjacent the other side of the chassis and a second article carrying position over the chassis, said grapple moving in a vertical plane that extends transverse to the longitudinal axis of the vehicle, the axis of the pivot pin of the second wheel support beam, and the center of gravity of the vehicle located close to, or within, the vertical plane.

4,639,187

AUTOMATIC STORING EQUIPMENT

Aseo Maruyama, and Kokzo Miyagawa, both of Osaka, Japan, assignors to Tsubakimoto Chain Co., Japan

Filed Jul. 16, 1984, Ser. No. 630,951

Int. Cl.[4] B65G *1/06*

U.S. Cl. 414—787 16 Claims

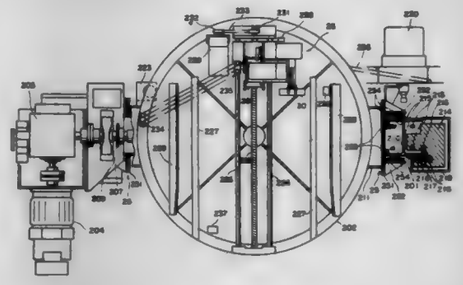
1. An automatic storing equipment which is capable of automatically storing articles onto each shelf at a carrousel and of automatically taking out the same from each shelf, characterized by providing

pallets for putting thereon said articles and having a power-feeding part to said put on article and two power-receiving parts connected with said power-feeding part,

a loading/unloading machine for storing said pallets onto each shelf and taking out the same therefrom, and

a carrousel means formed in multitiered and multirow construction and capable of stopping the predetermined row at the position where said loading/unloading machine is installed, each of said shelves having a power-feeding part engageable with one power-receiving part at said pallet,

said loading/unloading machine being provided with: a turntable means which is capable of lifting and lowering; a shifting means provided on said turntable means and movable horizontally for storing and/or taking out said articles and having a pallet chucking mechanism, and a power-feeding mechanism engageable with another power-receiving part on said pallet, for supplying power to said another power-receiving part of said pallet for energizing said article from the time it is placed on said loading/unloading machine before storing, to the time when said article is removed from said loading/unloading machine after storing.



4,639,188

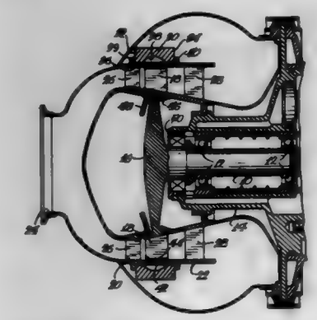
TURBINE WHEEL CONTAINMENT

Gerald L. Swadley, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 4, 1984, Ser. No. 677,874

Int. Cl.[4] F01D *21/00, 25/24*

U.S. Cl. 415—9 9 Claims



1. A turbine assembly, comprising:

a turbine wheel journalled for rotation about an axis, and having a plurality of turbine blades generally radially extending away from said axis in at least one stage;

a containment ring having a central opening surrounding said blades and spaced radially outwardly thereof, the radially inner surface of said ring including a radially inwardly opening groove; and

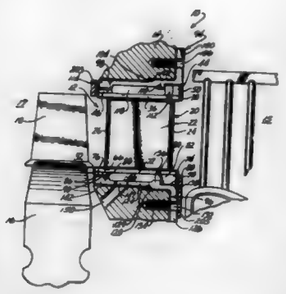
first and second, generally axially extending, deformable housings for said turbine wheel, said housings being radially outwardly of said blades and radially inwardly of said ring and sandwiching said ring to maintain said ring in axial alignment with said blades, said housings having portions overlapping and closing said groove without substantially entering the same and mounting turbine structure extending radially inwardly toward said axis to at least partially flank said blades in axially spaced relation thereto.

4,639,189

HOLLOW, THERMALLY-CONDITIONED, TURBINE STATOR NOZZLE

Irwin E. Roeman, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 27, 1984, Ser. No. 584,039
Int. Cl.[4] F01D *5/18, 25/08, 9/04*
U.S. Cl. 415—115 **17 Claims**



1. A stator nozzle for guiding the fluid flow from a forward inlet to the blades of a turbine comprising:
- a plurality of vanes arranged annularly to define the stator nozzle, each vane having a body adapted to guide fluid flow and with a substantially radially extending axis, said body disposed between outer and inner ends, each vane having a hollow core extending radially therethrough;
- a forward lug disposed on and projecting outward from each of the outer and inner ends;
- a rear lug disposed on and projecting outward from each of the outer and inner ends to the rear of the forward lugs;
- a floating support for each vane in the turbine to permit each vane to adjust in its respective radial and tangential directions to evenly distribute loads to each forward and rear lug, the floating support including a pair of concentrically arranged annularly spaced forward shoulders, the forward shoulders spaced from the outer and inner ends and adapted to abut the forward lugs of each vane to prevent the vanes from moving rearwardly, and a pair of concentrically arranged, annularly spaced rear shoulders in the turbine, the rear shoulders having notches adapted to loosely receive the rear lugs of each vane to confine tangential movement thereof, the spaces between the forward and rear shoulders defining outer and inner chambers communicating with the vane core at the outer and inner ends of each vane, a portion of the fluid passing directly through the cores to minimize thermal stresses on the vanes; and
- a first ring seal for each vane adapted to overlay and seal any openings between the vane and the rear shoulder at the outer end to prevent fluid from flowing rearwardly out of the outer chamber past said rear lug.

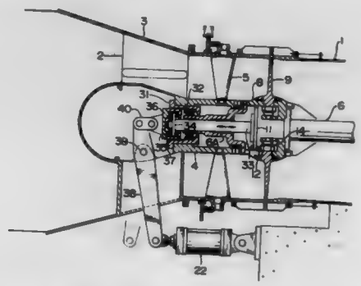
4,639,190

TUBULAR WATER WHEEL

Jiro Ohta, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 15, 1985, Ser. No. 734,121
Claims priority, application Japan, May 16, 1984, 59-98388
Int. Cl.[4] F01D *15/10;* **F03B** *3/06, 3/14*
U.S. Cl. 415—129 **7 Claims**

1. A tubular water wheel, comprising:
- a draft tube;
- a stationary stay ring fixably mounted to said draft tube;
- a stationary wheel inner case;
- a plurality of stay vanes rigidly mounting said wheel inner case within said stay ring;
- a main shaft having one end for mounting thereon a generator and having an opposite end;
- a runner fixedly mounted coaxially to said opposite end of said main shaft;
- a hollow main shaft portion fixedly mounted to said runner on the side opposite from and coaxial with said main shaft;
- a plurality of runner vanes mounted on said runner respectively for rotation about generally radial axes;
- linkage means connected to said runner vanes and having an input within said runner for converting a reciprocating input to rotary movement of said runner vanes for adjusting the angle of said runner vanes;
- an operating rod mounted coaxially within said hollow main shaft portion for reciprocating axial movement relative to said main shaft portion, said operating rod having a downstream axial end and an upstream axial end;
- a main shaft bearing coaxially mounted between said wheel inner case and said main shaft portion;
- a servo-motor mounted outside of said draft tube and said stay ring;
- at least one of said stay vanes being hollow;
- a lever extending through said one hollow stay vane, and



said lever having one end drivingly connected to said servo-motor, a midportion rotatably connected to said vane, and an opposite end;
- said main shaft bearing including a stationary bearing support portion;
- one of the downstream end of said hollow mainshaft portion and said bearing support portion having an inner cylindrical surface;
- a bearing retainer portion having a cylindrical exterior in axial sliding engagement with said cylindrical surface coaxially with said main shaft;
- a propelling force receiving plate fixably mounted on said operating rod;
- a thrust bearing mounted between said propelling force receiving plate and said bearing retainer portion;
- link means drivingly connecting said opposite end of said lever to one of said bearing retainer portion and said operating rod and the other of said operating rod and said bearing retaining portion being drivingly connected to said linkage means input so that said servo-motor will oscillate said lever, reciprocate said bearing retaining portion, reciprocate said operating rod, and rotatably adjust the angle of said runner vanes.

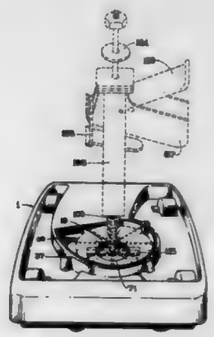
4,639,191

CENTRIFUGAL FAN LINER AND INSTALLING TOOL THEREFOR

Joseph D. Hart, San Marcos, Calif., and R. Leon Wells, 1649 Manor Dr., Vista, Calif. 92083, assignors to R. Leon Wells, Vista, Calif.

Continuation-in-part of Ser. No. 500,079, Jun. 1, 1983, abandoned. This application Feb. 25, 1985, Ser. No. 705,230
Int. Cl.[4] B23Q *3/00;* **F04D** *29/42*
U.S. Cl. 415—196 **2 Claims**

1. In a plastic base of an upright vacuum cleaner that includes a plastic fan chamber defined by first and second flat involute-outlined plastic chamber surfaces spaced apart by an outer plastic wall terminating at edges defining a chamber outlet, a chamber inlet in the first chamber surface, and a centrifugal fan including a fan plate rotably mounted adjacent the second chamber surface and vanes radially mounted thereon for spinning within the chamber, the improvement of a retrofittable thin metal liner, adapted for adhesive attachment to the first chamber surface, and a portable installation clamp therefor, for temporarily clamping said liner tightly to the surface, said clamp fully manipulative from only one side of the vacuum cleaner base, said metal liner comprising:
- (a) a flat metal plate having an outer-involute shaped perimeter substantially the same size and outline as the first chamber surface and having an inner edge of similar shape and location and slightly larger in size than the chamber inlet;
- (b) upstanding metal wall attached to said plate around the outer perimeter thereof terminating at edges defining the chamber outlet and of a height sufficient to span the distance between the first and second chamber surfaces snd terminating at the top edge of the outer plastic wall;
- (c) said liner aligned in tight registration with the terminating edges of the outer wall at the chamber outlet;
- (d) adhesive means for mounting said liner in the chamber; said portable clamp comprising:
- (e) a clamp handle;



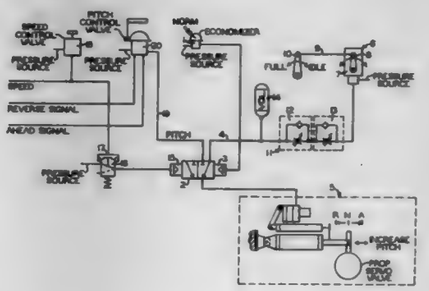
- (f) a shaft extending from said handle having first and second ends adapted for reciprocal motion;
- (g) first means on said shaft adapted to pass through the first chamber surface out through the chamber inlet for reversibly abutting the opposite side of the first chamber comprising a strap transversely and securely mounted on said shaft having a length greater than the width of the chamber inlet and adapted to pass through the chamber inlet by tilting said shaft first one way, to pass one part of said strap through, then tilting said shaft the other way to pass the other part through and thereafter straighten said shaft to cause said strap to span the chamber inlet on both sides thereof and abut the back side of the base parallel to the plane of said flat metal plate;
- (h) second means slidingly received on said shaft, including a surface substantially similar to the shape and size of said flat metal plate of said liner, for abutting said liner and providing full pressure over the entire surface thereof;
- (i) third means cooperative with said handle to cause said shaft to withdraw and draw said first means and said second means under intense hand pressure for squeezing and holding said liner into tight registration with said first chamber surface during the entire adhesive operation, comprising a squeezable trigger pivotally mounted to said handle, a drive plate having an aperture formed therein for receipt therethrough of said shaft and adapted to tilt and jam against said shaft under action of said trigger, forcing said plate and shaft rearward of said handle and to slide in a forward direction independent of said shaft under bias pressure when released by said trigger, a catch plate having an apertured formed therein for receipt therethrough of said shaft and adapted to slide independent of said shaft as said shaft moves in a rearward direction and to tilt and jam against said shaft and prevent forward motion thereof when said trigger is released and reset for another cycle of urging said shaft in a rearward direction, means biasing said trigger apart from said handle and biasing said drive plate in sliding contact with said shaft adapted to be overcome by hand squeezing to actuate said drive plate and drive said shaft rearward and urge said first means and said second means together, means biasing said catch plate to allow said shaft to pass rearward therethrough and tilting and jamming thereon to prevent forward motion thereof, and means in cooperation with said catch plate to overcome said bias means to allow release and forward motion of said shaft to release said clamp pressure.

4,639,192

PROPELLER PITCH CONTROLLING ARRANGEMENT HAVING A FUEL ECONOMIZING FEATURE

David P. Harrell, Metairie, La., assignor to American Standard Inc., Lexington, Ky.

Filed Apr. 11, 1984, Ser. No. 599,043
Int. Cl.[4] B63H *3/10*
U.S. Cl. 416—27 **6 Claims**



1. A propeller pitch controlling arrangement having a fuel economizer feature for use on marine vessels having an engine fuel rack and a variable pitch propeller, said propeller pitch controlling arrangement comprising:
- (a) a pitch controlling servomechanism operably engaged to the variable pitch propeller such that the pitch of the variable pitch propeller is controlled as a function of the amount of fluid pressure delivered thereto;
- (b) a fluid steering valve connected to said pitch controlling servomechanism and operable to one of a first and second valve position wherein fluid pressure from one of associated respective first and second flow paths is directed to said pitch controlling servomechanism;
- (c) said fluid steering valve having respective first and second pilot operated portions which, when actuated by respective first and second pilot signals, effect movement to such first and second valve positions, such first and second valve positions being mutually exclusive in operation;
- (d) a relay valve receptive of fluid pressure having a value determined by the marine vessel speed, said relay valve being connected to said first pilot portion of said fluid steering valve such that, upon reduction of such speed determined fluid pressure below a preselected value, such first pilot signal is transmitted to said fluid steering valve and said first flow path is established thereby;
- (e) a pitch control valve manually operable over a range of fluid pressure delivery settings such that, when said first flow path is established, a first operating fluid pressure is

transmitted thereover to said pitch controlling servo-mechanism;

(f) a mode selector valve manually operable to an economizer position and spring returnable to a normal position, such operation to the economizer position effecting a pulse-type transmission of such second pilot signal to said second pilot portion of said fluid steering valve such that said second flow path is established thereby;

(g) economizer valve means mechanically linked to such marine vessel engine fuel rack for transmitting a second operating fluid pressure to said pitch controlling servo-mechanism when said second flow path is established, such second operating fluid pressure being in inverse proportion to movement of such marine vessel engine fuel rack; and

(h) such first pilot signal being continuous in duration when such speed determined fluid pressure has been reduced below such preselected value, such first pilot signal thereby overriding such pulse-type second pilot signal in the event such first and second pilot signal occur simultaneously.

4,639,193

FAN WHEEL FOR RADIAL FAN

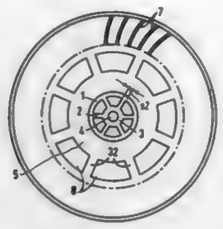
Gerhard Reichert, Coburg, and Friedrich Riedel, Redwitz, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 1, 1985, Ser. No. 782,399

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3441077

Int. Cl.⁴ F04D *29/28*

U.S. Cl. 416—184 **10 Claims**



1. A radial fan wheel comprising:

a hub having an axial length and including an inner hub ring and an outer hub ring, said outer hub ring being coaxial with said inner hub ring, said inner hub ring being fastenable to a rotary output shaft of a drive motor;

resilient means disposed between said inner hub ring and said outer hub ring for damping pulsations in torque transmitted from said drive motor, said resilient means including a plurality of planar resilient strips connecting said inner hub ring to said outer hub ring, said resilient strips extending in radial planes and having axial lengths smaller than the axial length of said hub, each of said resilient strips being axially staggered with respect to two of said resilient strips adjacent thereto;

a blade ring coaxial with said hub;

a multiplicity of fan blades fixed to said blade ring, said blades being circumferentially equispaced about said blade ring; and

an annular intermediate section connected at an inner periphery to said hub and at an outer periphery to said blade ring.

4,639,194

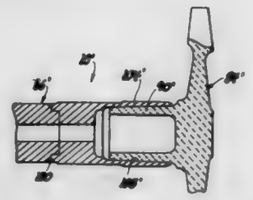
HYBRID GAS TURBINE ROTOR

Albert H. Bell, III, Birmingham, and Jesse F. Johnson, St. Clair Shores, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 2, 1984, Ser. No. 606,268

Int. Cl.⁴ F01D *5/34*

U.S. Cl. 416—241 B **2 Claims**



1. In a hybrid turbine rotor for a gas turbine engine, the combination comprising, a ceramic turbine wheel portion having a plurality of turbine blades therearound, a hollow ceramic stub shaft integral with said ceramic turbine wheel portion having a first coefficient of thermal expansion and a frustoconical outer surface with a predetermined taper angle and defining in cross section an annulus of predetermined area, said stub shaft being perpendicular to the plane of said turbine wheel portion with said frustoconical outer surface tapering axially away from said turbine wheel portion so that heat flow between said stub shaft and said turbine wheel portion is only through said annulus of predetermined area, an alloy metal shaft portion, and an alloy metal tubular end welded to said alloy metal shaft portion having a second coefficient of thermal expansion exceeding said first coefficient of thermal expansion and a frustoconical inner surface axially tapering toward said shaft at a taper angle corresponding to said outer surface taper angle, said tubular end being shrunk fit over said stub shaft on the opposite side of said annulus of predetermined area from said turbine wheel portion and with predetermined diametral interference between said outer and said inner surfaces at all operating temperatures of said hybrid rotor whereby torque transfer between said stub shaft and said tubular end occurs only at the shrunk fit interface between said outer and said inner surfaces and whereby all heat flow between said alloy metal shaft portion and said turbine wheel portion is through said annulus of predetermined area.

4,639,195

POWER CONTROL DEVICES FOR HYDROSTATIC PUMPS

Jurgen Norakas, Lohr, and Rudolf Richter, Hosbach, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

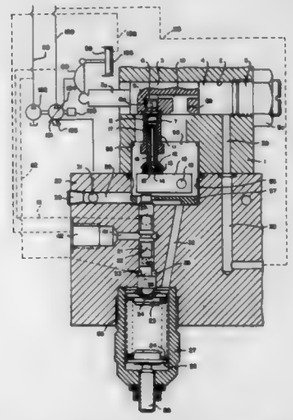
Filed Dec. 28, 1984, Ser. No. 687,524

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401818

Int. Cl.⁴ F04B *1/26*

U.S. Cl. 417—216 **15 Claims**

1. In a control device for an adjustable hydrostatic pump having a housing containing a servo piston acting on an adjusting member of the pump, a lever pivoted at one end and adjacent the other end bearing on a piston control valve that regulates the pressure loading on the servo piston, the improvement comprising pressure measuring piston loaded with feed pressure having one end slidably bearing against the lever between the pivot and said other end, said piston control valve acting on the lever opposite the pressure measuring piston, resilient means acting against the piston control valve opposite the lever biasing it toward the pressure measuring piston, a structural member fixed on the servo piston and movable therewith carrying said pressure measuring piston and a lever housing attached to said servo piston housing carrying a lever pivot support means for the lever and a borehole for the piston control valve and resilient means, a slide shoe located between the pressure measuring piston and lever and slides on said lever



as the pressure measuring piston moves with the servo piston and wherein pressure fluid feed means is provided in the pressure measuring piston providing a pressure fluid cushion between the lever and slide shoe.

4,639,196

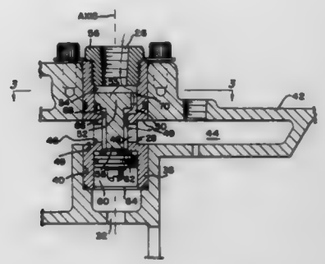
FLUID CONTROL VALVE

Thomas R. Kirkland, Jr., Mooresville, N.C., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 12, 1986, Ser. No. 828,673

Int. Cl.⁴ F16K *31/122*

U.S. Cl. 417—228 **12 Claims**



1. A fluid control valve, comprising:

a housing having a given axis and a bounding, circumferential, inner wall;

a piston, in said housing, having a head (a) movable along said axis, and (b) subdividing said housing into inner and outer chambers;

first means for admitting fluid into said outer chamber; and

second means for discharging fluid from said inner chamber; wherein

said head has outermost, circumferential surfaces engaged with said wall for guiding said piston in its axial movement;

said head has conduit means for effecting fluid communication between said chambers; and further including

a land, in said housing, intermediate opposite ends of said housing; wherein

said head has a shoulder for closure thereof onto, and for removal thereof from, said land to interdict, and to permit, fluid communication between said chambers;

said conduit means comprises a plurality of channels formed in said head;

said outermost circumferential surfaces are interrupted by said channels of said plurality thereof; and

said channels are radially outwardly disposed, relative to said shoulder.

4,639,197

PUMP FOR CRYOGENIC FLUIDS

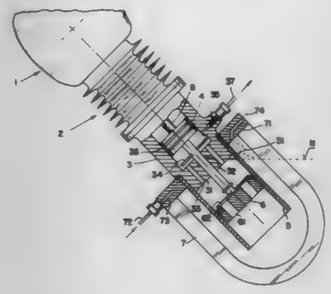
Jean Tornare, Hauptstrasse 49, CH 4422 Ariadorf/BL; Klaus Bofinger, Fuchsmattstrasse 13, CH 4107 Ettingen, and Claudio Tschopp, Lachmattstrasse 21, CH 4132 Muttenz, all of Switzerland

Filed Feb. 4, 1985, Ser. No. 697,756

Claims priority, application Switzerland, Jul. 20, 1984, 3535/84

Int. Cl.⁴ F04B *3/00, 15/08*

U.S. Cl. 417—259 **6 Claims**



1. Pump for cryogenic fluids, having a high pressure part and a supercharger part, the high pressure part and the supercharger part each comprising a piston pump (3,4) (5,6) disposed in tandem and separated from one another by a partition (31) the pistons having a common piston rod (8) which slidably and sealingly extends through said partition, said partition being provided with an intake valve (33,34) the supercharger part being disposed in a heat insulated intermediate fluid container in sealing relationship with said partition, providing a sump for said supercharger part, said supercharger part comprising a cylinder (5) open at the intake side and a piston (6) provided with an intake valve (61,62) the supercharger cylinder (5) having a larger inside diameter than the high pressure cylinder (3), volume equilibrium being attained by an opening (51) provided at the highest point of said supercharger - cylinder, said opening emptying into the intermediate fluid container (7).

4,639,198

SUCTION TUBE SEAL FOR A ROTARY COMPRESSOR

Edwin L. Gannaway, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Continuation of Ser. No. 670,306, Nov. 13, 1984, abandoned. This application Feb. 20, 1986, Ser. No. 830,500

Int. Cl.⁴ F04B *17/00, 35/04*

U.S. Cl. 417—410 **7 Claims**

1. A hermetic rotary compressor comprising:

a housing;

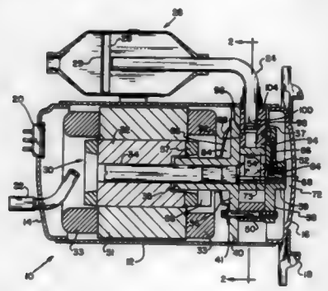
an electric motor operatively disposed within said housing and having a rotatable rotor;

a unitary suction tube sealingly secured to said housing and having an end portion thereof extending into said housing;

a cylinder disposed within said housing in axial alignment with said rotor and connected to the interior wall of said housing, said cylinder having a cylindrical bore therein;

a rotatable crankshaft received within said bore and driven by said rotor for driving a piston means inside said bore and compressing refrigerant therein;

a discharge port in said cylinder for discharging compressed refrigerant from said bore;
an aperture in the cylindrical wall of said cylinder in communication with said bore;
said suction tube end portion having a smaller outside diameter than the inside diameter of the aperture, said tube end being axially slidably disposed within said aperture;
resilient sealing means for sealing said suction tube end in said cylinder aperture and preventing refrigerant from leaking past said suction tube sealing means while permitting axial movement of said tube end in said aperture; and



a suction tube adapter means for securing the suction tube to the cylinder housing, said adapter means comprising a first cylindrical flange member adapted to fit over said tube and in contact with said tube, said adapter including a second cylindrical portion having a diameter greater than the outside diameter of said suction tube, a third transition portion for connecting said first and second portions, said second portion being in intimate contact with the housing of said compressor.

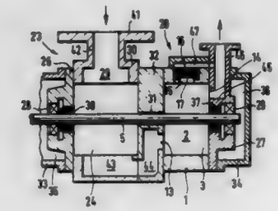
4,639,199

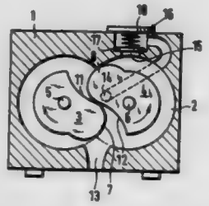
TWO-SHAFT VACUUM PUMP WITH INTERNAL COMPRESSION

Heinz Frings; Hans-Peter Kabelitz, both of Cologne, and Karl-Heinz Routhaler, Zulpich, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 596,099, Apr. 2, 1984, abandoned. This application Jan. 30, 1986, Ser. No. 824,308
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312117
Int. Cl.[4] F04C *18/18, 23/00, 25/02*
U.S. Cl. 418—3 **18 Claims**

1. In a two-shaft vacuum pump having an enclosed, hollow casing, an inlet port into the hollow casing, two rotors on respective parallel shafts for rotation in the hollow casing, and an outlet port in a side of the casing normal to the shafts, each rotor having at least one protruberance and at least one indentation cooperative with the other on the other rotor and the hollow casing for cylically drawing gas in the inlet and compressing it at the outlet when the shafts correspondingly rotate the rotors, whereby the location of the outlet determines a characteristic of the vacuum-pumping operation of the vacuum pump, the improvement comprising:
means for accommodating higher inlet pressures by relieving excessive compression pressures comprising a further outlet port (15) in a peripheral side of the casing parallel to the shafts and communicating with a place in the hollow casing at which the gas is compressed for the other outlet; and a pressure relief valve (16) responsive to the com-





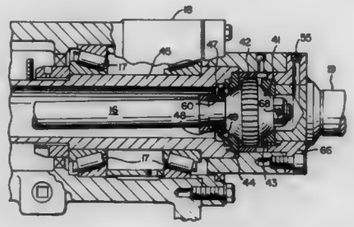
pressed pressure in the hollow casing and operative on the further outlet port.

4,639,200

SEALING APPARATUS FOR A GEAR BALL JOINT

Terry A. Baumgardner, Springfield; Jere L. Krouse, Urbana, and Alan G. Wild, Woodstock, all of Ohio, assignors to Robbins & Myers, Inc., Springfield, Ohio

Filed May 9, 1985, Ser. No. 732,119
Int. Cl.[4] F04C *18/22;* **F16J** *15/32;* **F16D** *3/16*
U.S. Cl. 418—48 **5 Claims**



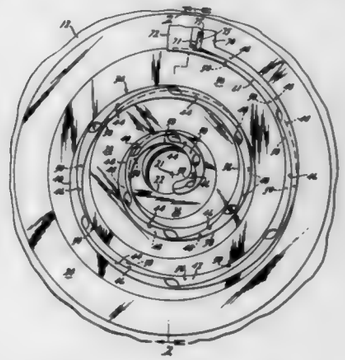
1. In a progressing cavity pump comprising a stator, a helical rotor mounted within said stator, a connecting rod connected to said rotor by means of a first gear ball joint, an annular drive shaft surrounding said connecting rod and connected thereto by a second gear ball joint comprising a gear ball mounted on said connecting rod, a ring gear for driving said gear ball, a primary thrust plate for supporting said gear ball on the surface thereof which is remote from said first ball joint, and a secondary thrust plate for supporting said gear ball on the surface thereof which faces said first ball joint; improved sealing means comprising:
a circumferentially extending recess in the interior surface of said drive shaft, said recess surrounding said connecting rod and facing said secondary thrust plate,
a circumferentially extending step on said secondary thrust plate spaced apart from and opposing said recess,
a flexible seal mounted sealingly around said connecting rod and sealingly between said step and said recess, and
a stiff support wire molded interiorly within said flexible seal member in that portion thereof which is positioned between said recess and said step.

4,639,201

SCROLL-TYPE MACHINE WITH VARIABLE WRAP THICKNESS

Jean-Luc Caillat, Dublin, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Filed Sep. 12, 1985, Ser. No. 775,154
Int. Cl.[4] F01C *1/04, 21/16;* **F04C** *18/04, 29/10*
U.S. Cl. 418—55 **29 Claims**



1. A scroll member for a scroll-type machine, comprising:
an end plate;
a spiral wrap affixed to said end plate, said wrap having a radially outer wrap section having an outer flank surface and a separate radially inner wrap section having an inner flank surface; and
actuating means for moving one wrap section with respect to the other wrap section to vary the space between said inner and outer flank surfaces and thereby change the effective thickness of said wrap.

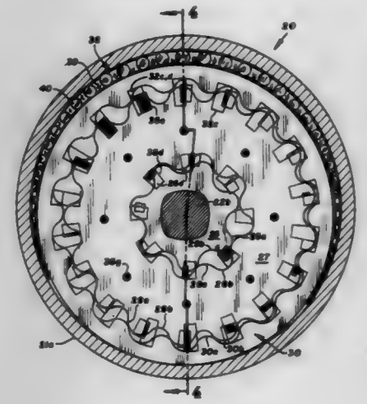
4,639,202

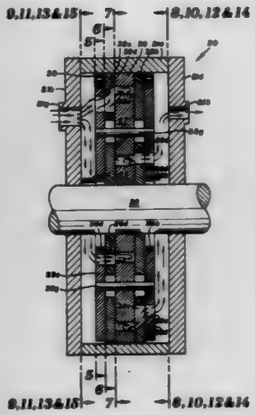
GEROTOR DEVICE WITH DUAL VALVING PLATES

Joseph W. Mahanay, 12018 Mississippi Dr., Champlin, Minn. 55316, and Lester D. Savage, 1010 W. Stroughton St., Urbana, Ill. 61801

Filed Feb. 6, 1985, Ser. No. 698,906
Int. Cl.[4] F01C *1/10, 11/00;* **F03C** *2/08;* **F04B** *17/00*
U.S. Cl. 418—59 **11 Claims**

1. A rotary motion fluid device including:
a. a fluid retaining housing having at least a fluid inlet and a fluid outlet;
b. a first gear member arranged for rotation within said housing and providing an outer peripheral surface defining a plurality of gear teeth thereon;
c. a first pair of valving plates arranged on opposite sides of said gear member and for rotation with said gear member and each having a plurality of flow passages therethrough for the inlet and exhaust of fluid from areas defined by said teeth of said gear;
d. a stationary ring gear member arranged interiorally of said housing and being radially spaced from said first gear member and providing an inner peripheral surface defining a plurality of gear teeth thereon;
e. a pair of stationary valving plates arranged on opposite sides of said stationary ring gear and having each having a plurality of flow passages therethrough for the inlet and exhaust of fluid from areas defined by said teeth of said gear;
f. a rotor ring gear arranged intermediate said first and said stationary gear members and providing an inner and outer peripheral surface, each such surface defining a plurality of gear teeth thereon, the diametric dimension of said ring gear permitting both orbital and rotational movement within the area defined between said first gear member and said stationary gear;
g. said inner and outer teethed surfaces of said rotor ring gear and the respective teeth of said first gear member and said stationary gear member providing a plurality of expanding and contracting chambers as relative motion exists therebetween upon flow of fluid through said housing;
h. a pair of valveplates arranged on opposite sides of said rotor ring and moveable therewith, each of said rotor





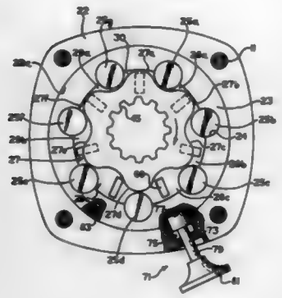
valveplates providing a first set of valving passages defined therethrough in a radial position to communicate with said flow passages of said pair of first valving plates and a second set of valve passages defined therethrough in a radial position to communicate with said flow passages of said stationary valve plates; and,
i. means for introducing fluid under pressure to said housing inlet for distribution to the chambers defined by said rotor ring, said stationary ring and said gear member to produce rotation of said first gear member.

4,639,203

ROTARY FLUID PRESSURE DEVICE HAVING FREE-WHEELING CAPABILITY

Steven J. Zambusch, Eden Prairie, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 26, 1985, Ser. No. 748,787
Int. Cl.[4] F01C *1/10, 21/16;* F03C *2/08*
U.S. Cl. 418—61 B 12 Claims



1. A rotary fluid pressure device of the type including housing means defining inlet means and fluid outlet means; a rotary fluid energy-translating displacement means associated with said housing means and including a rotary assembly and a normally stationary reaction-torque-receiving means, operably associated with said rotary assembly and with said housing means whereby, when said reaction-torque-receiving means is stationary, rotation of said rotary assembly defines expanding and contracting fluid volume chambers, said rotary fluid energy-translating displacement means comprising a means of the type wherein said normally stationary reaction-torque-receiving means defines a fluid chamber, and said rotary assembly is disposed within said reaction-torque-receiving means to separate said fluid chamber into said expanding and contracting fluid volume chambers in response to said rotation of said rotary assembly; means operable to communicate fluid from said fluid inlet means to said expanding fluid volume chambers and from said contracting fluid volume chambers to said fluid outlet means; input-output shaft means and means operable to transmit torque between said input-output shaft means and said rotary assembly; characterized by:

(a) an engagement member operably associated with said housing means and said normally stationary reaction-torque-receiving means; and

(b) actuation means operably associated with said engagement member and operable to move said engagement member between:

(i) a first position in which said engagement member is disposed to prevent rotational movement of said reaction-torque-receiving means relative to said housing means, whereby said rotary assembly has said normal rotation to define said expanding and contracting fluid volume chambers; and

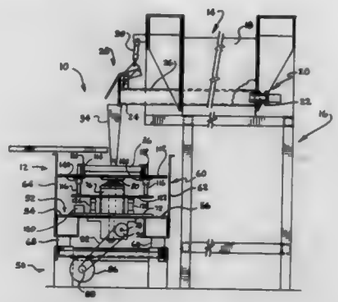
(ii) a second position in which said engagement member is disposed to permit rotational movement of said reaction-torque-receiving means relative to said housing means, whereby rotation of said rotary assembly does not result in the normal relative movement between said reaction-torque-receiving means and said rotary assembly, and said fluid volume chambers do not expand and contract.

4,639,204

APPARATUS FOR CENTRIFUGALLY CASTING CONCRETE PANELS

R. Jack Munsey, Caledonia; Leroy D. DeJong, Spring Lake, and Charles P. Keip, Grandville, all of Mich., assignors to C-Tec, Inc., Grand Rapids, Mich.

Filed Jun. 12, 1985, Ser. No. 743,987
Int. Cl.[4] B28B *1/20, 7/22*
U.S. Cl. 425—3 13 Claims



1. An apparatus for centrifugally casting a rectangular access floor panel and the like, said apparatus comprising:

a frame;

a turntable;

means supported on said frame and operatively connected to said turntable for rotating said turntable about a vertical axis;

vibration means operatively connected to said turntable for vibrating said turntable;

a mold defining a cavity, said mold further defining a central sprue aperture; and

turntable clamp means supported on said turntable for clamping said mold to said turntable, and wherein said mold comprises:

a mold member defining a thin mold cavity having a cavity bottom and cavity sidewalls dimensioned to receive a metal pan in a slip fit manner, said mold member further defining a generally centrally positioned sprue aperture;

a magnetic sheet disposed against said cavity bottom and defining a central aperture aligned with said sprue aperture, said sheet dimensioned and disposed to engage a planar bottom of the metal pan;

another mold member having a planar top surface facing said mold cavity; and

mold clamp means engaging said first and second members for clamping said members together.

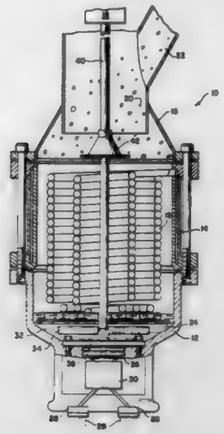
4,639,205

PUMP SHAFT STIRRER FOR GRID MELTER

Hyun S. Lim, Martinsville, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 31, 1984, Ser. No. 636,254
Int. Cl.[4] B29B *13/02*
U.S. Cl. 425—200 1 Claim

1. In an apparatus for melting particulate polymeric material including a melting grid, said grid having a center and a sidewall, a source of particulate material located above melting grid, a collecting chamber for the molten polymer placed beneath the grid and a rotatably driven central shaft coaxial with the collecting chamber and te melting grid, said shaft extending above said source, the improvement of an apparatus for distributing said particulate material away from the center to the sidewalls of the grid comprising: a cone fastened to said shaft at a location below said source and above said melting grid, said cone having an apex directed upward toward said source and a base, said base having an opposed pair of blades offset from each other extending from a periphery of the base.

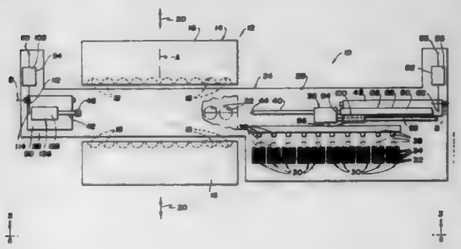


4,639,206

IN-MOLD LABEL DISPENSER FOR BLOW MOLDING

Richard C. Darr, Seville, Ohio, assignor to Plastipak Packaging, Inc., Plymouth, Mich.

Filed Oct. 16, 1985, Ser. No. 787,913
Int. Cl.[4] B29C *49/24*
U.S. Cl. 425—503 16 Claims



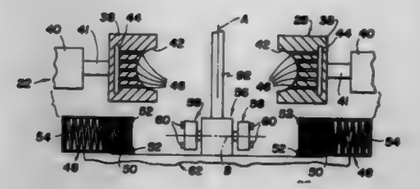
1. An in-mold label dispenser for a plastic blow molding machine, said blow molding machine including a mold having a pair of mold sections each of which includes a cavity section, and said mold sections being movable toward and away from each other between an open position spaced from each other and a closed position where the cavity sections thereof cooperate to define an enclosed cavity in which blow molding is performed, the in-mold label dispenser comprising: a base having first and second portions located on opposite sides of the mold; a label magazine mounted on the first base portion on one side of the mold; a dispensing head mounted on the first base portion for movement between a withdrawn position adjacent the label magazine and an inserted position between the open mold sections; a label carrier on the dispensing head for receiving a label from the label magazine with the dispensing head in the withdrawn position and for transferring the label to the cavity section of one mold section with the dispensing head in the inserted position between the open mold sections; a first locator on the dispensing head; and a second locator that is mounted on the second base portion, said second locator being engaged with the first locator upon movement of the dispensing head to the inserted position to cooperate in locating the dispensing head and label carrier thereof with respect to the open mold to provide accuracy in aligning the label with respect to the cavity section that receives the label.

4,639,207

IN-MOLD LABEL DISPENSER FOR BLOW MOLDING MACHINE

William A. Slat, Brooklyn, Mich.; Richard C. Darr, Seville, Ohio; Richard L. Dunlap, Cairo, Ohio, and Craig A. Larson, Westfield Court, Ohio, assignors to Plastipak Packaging, Inc., Plymouth, Mich.

Division of Ser. No. 447,872, Dec. 8, 1982, Pat. No. 4,479,770.
This application Jul. 27, 1984, Ser. No. 635,118
The portion of the term of this patent subsequent to Oct. 30, 2001, has been disclaimed.
Int. Cl.[4] B29C *49/24, 49/04*
U.S. Cl. 425—503 12 Claims



1. An in-mold label dispenser for a blow molding machine including at least one mold having mold sections movable between open and closed positions, and the mold sections including cavity sections which cooperatively define a cavity in which the blow molding is performed with the mold sections in the closed position and which permit ejection of a molded part in the open position, the label dispenser comprising: a label magazine for storing labels; a base; a dispensing head mounted on the base for movement along a first path from adjacent the label magazine to between the mold sections of the mold in the open position; a label carrier mounted on the dispensing head for movement along a second path transverse to the first path between retracted and extended positions; and a dispensing head and label carrier drive mechanism, said drive mechanism having an input that is mounted on the base and driven in association with the movement of the mold of the blow molding machine, said drive mechanism including a first solid mechanical drive that extends from the base to the dispensing head, said first solid mechanical drive having an input driven by the input of the drive mechanism to move the dispensing head in association with the movement of the mold, said drive mechanism also including a second solid mechanical drive that extends from the base to the label carrier, said second solid mechanical drive having an input driven by the input of the drive mechanism to move the label carrier in association with the movement of the mold, and said drive mechanism through the input thereof driving the inputs of the first and second solid mechanical drives actuating movement of the dispensing head and label carrier in association with the movement of the mold during a cyclical operation that: (a) initially moves the label carrier from the retracted position to the extended position with the dispensing head adjacent the label magazine such that the label carrier receives a label from the magazine, (b) thereafter moves the label carrier to the retracted position with the label thereon and also moves the dispensing head to between the mold sections of the mold in the open position, (c) subsequently moves the label carrier to the extended position to deposit the label on one of the mold sections within the cavity section thereof, and (d) finally moves the label carrier back to the retracted position and moves the dispensing head from between the mold sections back to adjacent the label magazine in preparation for the next cycle.

4,639,208

PULSE COMBUSTION APPARATUS WITH A PLURALITY OF PULSE BURNERS

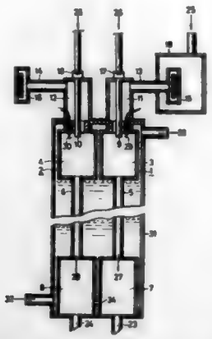
Isao Inui; Masato Hosaka, both of Osaka; Mitsuyoshi Nakamoto, and Kenji Okamoto, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 1, 1985, Ser. No. 718,452

Claims priority, application Japan, Apr. 3, 1984, 59-66073; Apr. 3, 1984, 59-66074; Apr. 3, 1984, 59-66075; Apr. 3, 1984, 59-66076; Apr. 9, 1984, 59-70284; Aug. 18, 1984, 59-171919

Int. Cl.[4] F23C *11/04*

U.S. Cl. 431—1 24 Claims



1. A pulse combustion apparatus, comprising:
(a) a fuel supply means;
(b) air supply means;
(c) a plurality of pulse burners coupled with said fuel supply means and said air supply means, each of said pulse burners having a combustion chamber, and an exhaust passage including a tail pipe communicating, at one end thereof, with said combustion chamber, and a cushion chamber communicating with said tail pipe at the other end of said tail pipe; and
(d) means for establishing communication between said exhaust passages of said plurality of pulse burners, the communication establishing means having a passage whose cross-sectional area is within a predetermined range having an upper limit which is smaller than the cross-sectional area of any tail pipe.

4,639,209

METHOD OF SPRAYING ADDITIVES IN AN INTENSIVELY MIXING MANNER INTO A COMBUSTION CHAMBER FOR BINDING SULFUR

Klaus Grethe, Gummersbach, Fed. Rep. of Germany, assignor to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

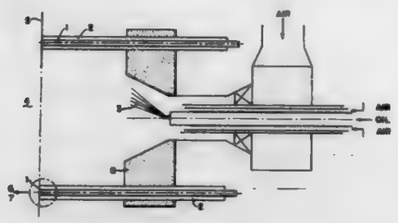
Filed Apr. 17, 1985, Ser. No. 724,195

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1984, 3441726

Int. Cl.[4] F23J *7/00*

U.S. Cl. 431—4 7 Claims

1. A method of spraying additives, in such a way that an intensive mixing occurs, into a combustion chamber for binding sulfur contained in combustion gases produced during the combustion of fuels which contain sulfur; said method comprising the steps of:
spraying the respectively utilized additive into said combustion chamber, with at least one spray nozzle, at a momentum which is sufficient to intensively mix said additive with said combustion gases;
utilizing, for said spraying, at least one spray nozzle having at least critical discharge;
spraying said additive into those regions of said combustion chamber which have temperatures in the optimum effective range of said additive for binding said sulfur, yet in which the mixing energy of said combustion gases does not alone ensure a sufficient mixing of said additive with said combustion gases; and
utilizing as a spray nozzle a two-component nozzle, with said additive, together with a small quantity of air as



carrier medium, being discharged from said nozzle at a low velocity, and with a spraying medium being discharged from a further nozzle opening of said nozzle at at least critical discharge to draw both said additive and said combustion gases, which surround the nozzle stream, into the mixture pattern of the nozzle stream cone.

4,639,210

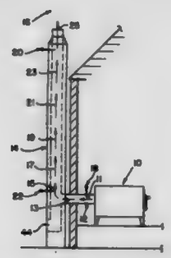
PROCESS FOR MONITORING THE HEAT GRADIENT IN A HEAT-PRODUCING SYSTEM

Licio Peanisi, R.D. 1, Box 99, Alfred Station, N.Y. 14803

Filed Mar. 31, 1986, Ser. No. 845,968

Int. Cl.[4] F23D *5/12*

U.S. Cl. 431—13 20 Claims



1. A process for monitoring the heat gradient in a system comprised of a heat source which produces exhaust gas, and means for venting said exhaust gas from the heat source to the atmosphere, wherein said process comprises the steps of:
(a) providing at least three heat sensors wherein, for any given temperature, each of said heat sensors has an output which is substantially identical to the outputs of each of the other heat sensors;
(b) disposing each of said heat sensors downstream of said heat source at different points along the path of said exhaust gas in sequential relationship with each other;
(c) providing means for determining, for each two sequential heat sensors, whether the temperature reported by the downstream heat sensor is lower than the temperature reported by the upstream heat sensor;
(d) providing switching means for activating an alarm whenever the temperature reported by a downstream heat sensor is lower than the temperature reported by an upstream heat sensor;
(e) providing an alarm which is operatively connected to said switching means;
(f) operatively connecting each two sequential heat sensors with said means for determining whether the temperature reported by said downstream heat sensor is lower than the temperature reported by said upstream heat sensor; and
(g) operatively connecting said means for determining whether the temperature reported by the downstream heat sensor is lower than the temperature reported by the upstream heat sensor with said switching means;
whereby, whenever any downstream heat sensor reports a temperature which is higher than that temperature reported by the heat sensor which is upstream of it, an alarm is activated.

4,639,211

DEODORIZING DEVICE FOR OIL STOVE

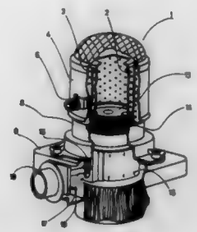
Kenji Akita, Sakai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 655,639, Sep. 28, 1984, abandoned. This application May 14, 1986, Ser. No. 863,021

Claims priority, application Japan, Oct. 4, 1983, 58-186172

Int. Cl.[4] F23N *3/00*

U.S. Cl. 431—20 4 Claims



1. A movable wick type oil stove containing an outer wick cylinder means and an inner wick cylinder means, said outer and inner cylinders defining a space therebetween;
wick means for absorbing oil and creating a fire at the top thereof, said wick means being disposed within said space formed between said cylinder means;
means for moving the wick means in the vertical direction along the cylinder means; and
deodorizing means operatively associated with the wick means for absorbing or removing gas and the associated smell produced when the fire at the top of the wick means is extinguished by lowering the wick to a predetermined position, said deodorizing means including suction means, and movement-sensing means for sensing the movement of the wick means, and temperature-sensing means for sensing the temperature in the vicinity of the wick means, said movement-sensing means and temperature sensing means being operatively connected with the suction means whereby in response to the lowering of the wick, the suction means is actuated if the temperature sensed by the temperature sensing means does not fall below a predetermined value.

4,639,212

SWIRLING DEVICE FOR STIRLING CYCLE ENGINES

Tetsumi Watanabe, Okazaki; Akira Yamaguro, Aujyo, and Susumu Yamaguchi, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

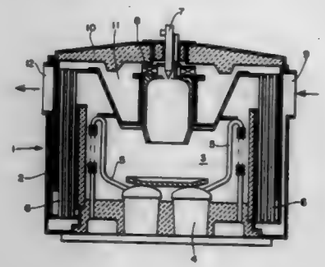
Filed Dec. 7, 1984, Ser. No. 679,453

Claims priority, application Japan, Dec. 9, 1983, 58-189271[U]

Int. Cl.[4] F23M *9/00*

U.S. Cl. 431—183 1 Claim

1. A burner for a stirling cycle engine which includes air inlet port means, exhaust port means and combustion chamber means between said inlet port means and said exhaust port means, said combustion chamber means having inlet means provided with swirl producing means including a pair of spaced apart, substantially parallel plates, each of said plates being formed with a central aperture, said apertures having centers and being substantially aligned with each other, a plurality of spiral guide vanes disposed between said plates, each of said guide vanes having a curvature in which a tangent line at any point on said guide vane makes an angle with a straight line passing through said point and said center of the central aperture, said angle being substantially constant and being between 60° and 70°, each two adjacent guide vanes



defining an inlet passage which is gradually decreased in area toward the central aperture, said inlet passage being communicated at an end adjacent to said central apertures with said combustion chamber means and at the other end with said inlet port means, said central apertures defining a swirl chamber, said burner including fuel injection means located in said swirl chamber, whereby mixing of fuel and air in said swirl chamber is enhanced.

4,639,213

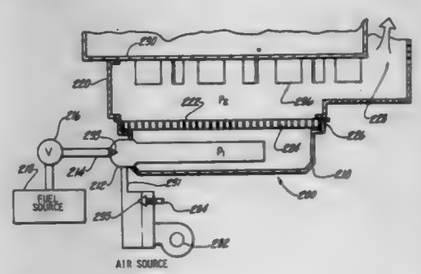
CONFINED SPACED INFRARED BURNER SYSTEM AND METHOD OF OPERATION

Thomas W. Simpson, Rochester, Mich., assignor to Solaronics, Inc., Rochester, Mich.

Filed Dec. 17, 1984, Ser. No. 682,538

Int. Cl.[4] F23D *13/12*

U.S. Cl. 431—326 9 Claims



1. A gas-fired infrared heating device comprising:
a burner plenum;
an air-gas mixer means for introducing a combustible air/gas mixture into the plenum at a pressure P1 which is greater than ambient pressure, said mixer means comprising first means for controlling gas flow, second means for providing air flow at above ambient pressure and third means for controlling air flow into the mixer means;
an enclosed but remote vented combustion chamber in which a back pressure P2 prevails, where P1 is greater than P2;
a thick, ceramic burner tile having a sufficient thickness to produce both a pressure and a temperature gradient,
forming a sealed boundary between the plenum and the combustion chamber and having opposite faces thereof addressing the chamber and plenum respectively, the tile having formed therein a plurality a small diameter parallel channels extending between said faces and possessing a

sufficient thickness to produce both pressure and temperature gradients between the faces thereof;

said first and third means being set such that the difference between P1 and P2 results in ignition and stoichiometric combustion of the air/gas mixture flowing from the plenum to the chamber via the channels substantially at the face of the tile which addresses the chamber;

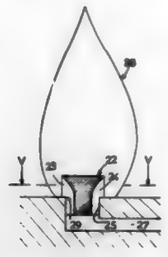
whereby heating the tile to infrared emitting temperature occurs.

4,639,214

LIQUEFIED GAS LIGHTER WITH FLAT FLAME WIDENED IN ITS MEDIAN PART

Jean-Philippe Ainoz, Faverges, France, assignor to S.T.Dupont, Paris, France

Filed Oct. 10, 1985, Ser. No. 786,271
Claims priority, application France, Oct. 31, 1984, 84 16703
Int. Cl.[4] F23D *14/28*
U.S. Cl. 431—344 5 Claims



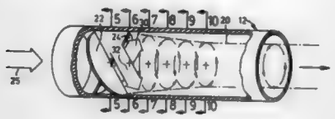
1. A gas lighter of the type having a body including a burner nozzle means, the burner nozzle means including only two, relatively closely spaced gas outlets having upper and lower surfaces, said outlets being formed in a common plane and directed in opposite directions, said lower surfaces terminating in downstream directions extending in a common plane and said upper surfaces extending away from the plane of said lower surfaces whereby flame from the gas outlets combines to form a flat flame widened at its median part.

4,639,215

GAS BURNER

Richard J. Armstrong, Toronto, Canada, assignor to Bernard Marks and Company Limited, Toronto, Canada

Continuation-in-part of Ser. No. 117,383, Feb. 1, 1980, abandoned. This application Jul. 19, 1982, Ser. No. 399,272
Int. Cl.[4] F23D *14/62*
U.S. Cl. 431—354 4 Claims



1. A burner for combustible gases comprises:

a duct for the flow of pressurized combustible mixture;

a vortex sheet generator mounted in said duct;

said vortex sheet generator having two baffles, each baffle defining a separate path through the generator adapted to conduct substantially equal portions of the total flow of combustion gas through the generator;

each of said baffles inclining in an opposite direction longitudinally of the duct and having a straight vortex sheet edge;

the vortex sheet edge of the two baffles meeting in the central area of the duct to make a V-configuration opening in the downstream direction of the duct;

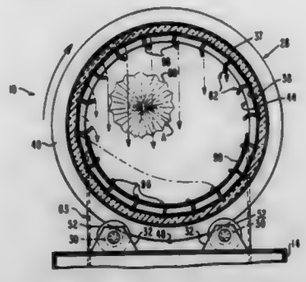
the vortex sheet edges of the two baffles being contained in a common plane that extends along the longitudinal axis of the duct, whereby gas from each path through said generator emerging past its respective vortex sheet edge interfaces with gas from the other path emerging from its respective vortex sheet edge in an opposed direction to form a vortex sheet by viscous shear that is attached to and downstream of said vortex sheet edges and that develops into a vortex tube still further downstream of the vortex sheet edges.

4,639,216

GRAIN ROASTING MACHINE AND METHOD

Dale L. Schnupp, Lebanon, Pa., assignor to Schnupp's Grain Roasting, Inc., Lebanon, Pa.

Continuation of Ser. No. 727,310, Apr. 25, 1985, abandoned. This application Mar. 13, 1986, Ser. No. 840,976
Int. Cl.[4] F27B *7/14*
U.S. Cl. 432—105 3 Claims



1. In a method of roasting grain, the combination comprising the steps of:

(a) rotating an elongated hollow roasting drum about its longitudinally-extending central axis;

(b) directing a roasting flame into said drum in a longitudinal direction extending from a front end toward an opposite rear end of said drum, generally parallel to, but offset to one side of, said central axis of said drum such that said roasting flame is located in a nine o'clock to twelve o'clock sector of the drum relative to its direction of rotation;

(c) delivering grain in said longitudinal direction into said drum at said front end thereof but offset to the opposite other side of said central axis of said rotating drum;

(d) conveying grain within said drum by carrying said grain along a first generally arcuate path being displaced from the periphery of said roasting flame and then dropping said grain along a second generally linear path in which most of said grain falls across said drum at said one side of said drum central axis and directly through said roasting flame, returning to said first path, and by concurrently moving said grain from said front end toward said rear end of said drum as it is carried and dropped through said respective first and second paths, as said drum is rotated about is central axis, said first arcuate path beginning at an approximately six o'clock position in the direction of rotation of said drum and extending through an approximately twelve o'clock position but with grain starting to drop from said path as it reaches an approximately nine o'clock position therealong and substantially completing dropping upon reaching an approximately twelve o'clock position such that substantially all of the grain is dropped from said path through said roasting flame being located substantially in the nine o'clock to twelve sector of the drum relative to its direction of rotation; and

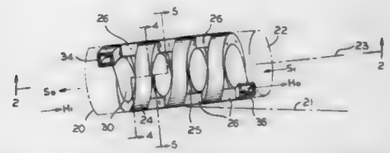
(e) discharging roasted grain from said drum through said rear end thereof as said drum is rotated.

4,639,217

COUNTERCURRENT HEAT TRANSFER DEVICE FOR SOLID PARTICLE STREAMS

D. Carlos Adams, 25 W. 280 High View Dr., Naperville, Ill. 60540

Filed Jan. 14, 1985, Ser. No. 691,494
Int. Cl.[4] F27B *7/08, 7/10*
U.S. Cl. 432—107 20 Claims



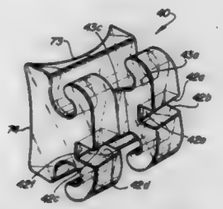
1. A rotating kiln comprising an elongated hollow vessel defining an outer container through which a first stream of solid particle material moves, a fluted interfacing shell with major and minor diameters providing a high surface-to-volume ratio, assembled inside of said hollow vessel wherein a second stream of solid particle material moves through said fluted interfacing shell counter-current to, and without mixing with, the first particle stream, a susbtantial amount of heat being transferred between the two streams and through the interfacing wall formed by said fluted interfacing shell, at least one of said strams of material being moved by means of an Archimedes screw action and means for mounting said kiln for rotation about a centre axis of rotation, each of said streams moving through the kiln responsive to the rotation of said kiln.

4,639,218

CRYSTALLINE ALUMINA ORTHODONTIC BRACKET

Robin M. F. Jones, Titusville; Robert D. DeLuca, Pennington, and Carlino Panzera, Belle Mead, all of N.J., assignors to Johnson & Johnson Dental Products Company, East Windsor, N.J.

Continuation-in-part of Ser. No. 602,876, Apr. 23, 1984, abandoned, and a continuation-in-part of Ser. No. 707,281, Mar. 6, 1985, abandoned. This application Jun. 12, 1985, Ser. No. 743,851
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—8 24 Claims



1. An orthodontic bracket comprising a base member for attaching to a tooth and a body member extending from the base member, said body member including walls defining an archwire groove, wherein said walls comprise crystalline alumina.

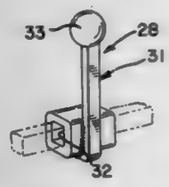
4,639,219

SURGICAL BALL HOOKS

William P. Gagin, Sheboygan, Wis., assignor to American Orthodontics Corporation, Sheboygan, Wis.

Filed Feb. 22, 1982, Ser. No. 351,278
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—22 3 Claims

1. An intermaxillary fixation appliance system for securing the jaws of a patient together with the teeth in proper occlusion comprising, edgewise brackets mounted on the upper and lower teeth, said brackets having horizontally rectangular archwire slots, rectangular archwire secured in said slots, a plurality of surgical ball hook appliances mounted on said archwires in opposed relation, each ball hook appliance including a tubular rectangular in cross section base having a rectangular opening therethrough for slidable movement on said archwire to any position between adjacent teeth and brackets, the mating relation between the opening and the archwire preventing rotation therebetween, said base having a length such that it can easily fit between brackets mounted on closely



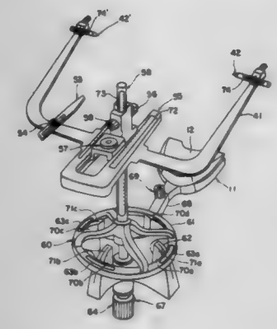
adjacent teeth, an elongated rectangular bar disposed perpendicular to said opening and along adjacent side and bottom walls of said base and extending gingivally of said base to coact therewith and define a hook, means securing the bar to said base, said base being mountable on said archwire so that the bar may be disposed on the labiobuccal or lingual side wall of said base, and a ball-shaped member at the end of said bar having a diameter greater than the maximum cross sectional dimension of the bar, and ligatures extending over said opposed ball hook appliances to fix the jaws together.

4,639,220

APPARATUS FOR DETERMINING THE THREE-DIMENSIONAL POSITION AND ATTITUDE

Toshio Nara, Odawara; Sumiya Hobo, Tokyo; Masao Kashiwada, Ebina; Motoyuki Totsuka, Atsugi; Takao Hoshina, Tokyo; Katsutoshi Umetani, Hiratsuka; Keisuke Akamatsu, Isehara; Tomohide Inada, Yamato, and Hisao Takayama, Tokyo, all of Japan, assignors to Nippon Avionics Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1983, Ser. No. 555,976
Claims priority, application Japan, Nov. 29, 1982, 57-209077
Int. Cl.[4] A61C *19/04*
U.S. Cl. 433—69 2 Claims



1. An apparatus for measuring the three-dimensional position and attitude of upper and lower clutches mounted on a patient's teeth, said apparatus comprising:

(a) a face-bow;

(b) a pair of pins movably mounted on said face-bow in position to contact a patient's condyles;

(c) an occlusal pointer movably mounted on said face-bow in position to indicate the position of the patient's margo infraorbitalis;

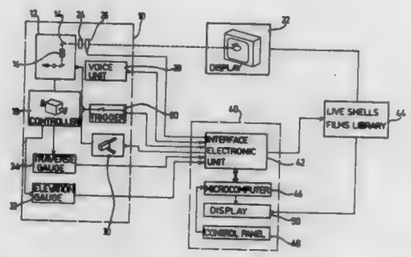
(d) a mounting shaft mounted on said face-bow and extending vertically thereto, said mounting shaft being movable relative to said face-bow both toward and away from the patient's face and vertically up and down;
(e) first means for locking said mounting shaft in a horizontal position relative to said face-bow;
(f) second means for locking said mounting shaft in a vertical position relative to said face-bow;
(g) an attitude measuring sphere mounted on the lower end of said mounting shaft, said attitude measuring sphere comprising:
(i) a ring that is perpendicular to and coaxial with said mounting shaft;
(ii) a plurality of calibrated scales marked on said ring;
(iii) an indicator mounted on said mounting shaft for vertical movement relative thereto;
(iv) a plurality of claws mounted on said indicator, each one of said plurality of claws having a part-spherical surface that makes surface contact with a corresponding part-spherical surface on said ring and having a line thereon that cooperates with a corresponding one of said plurality of calibrated scales marked on said ring; and
(v) third means for biasing said plurality of claws into surface contact with said ring; and
(h) fourth means for rigidly connecting upper and lower clutches mounted on the patient's teeth to said indicator.

4,639,221
TOOTH CLAMP
Michihiko Sairenji, 14-9, Hatanodai 3-chome, Shinagawa-ku, Tokyo, Japan
Filed Aug. 27, 1985, Ser. No. 769,736
Claims priority, application Japan, Dec. 18, 1984, 59-191818[U]
Int. Cl.[4] A61C *5/12*
U.S. Cl. 433—139 **5 Claims**



1. A tooth clamp for use on a tooth surrounded by a gum and having a given height and a top comprising:
(a) a resilient arcuate bridge;
(b) a plurality of gripping plates interconnected by said resilient arcuate bridge;
(c) a mount positioned on at least one of said gripping plates; and
(d) a stopper means, mounted on said mount, for engaging with the tooth along a predetermined extent of the given height of the tooth to prevent said gripping plates from moving into biting engagement with said gum and having means for adjusting a point of engagement along said given height of the tooth.

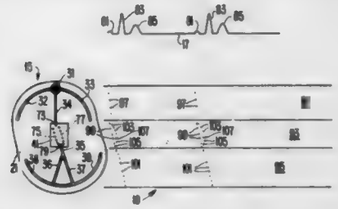
4,639,222
GUNNERY TRAINING APPARATUS
Yoram Vishlizky, Haifa, Israel, assignor to State of Israel, Ministry of Defense, Armament, Haifa, Israel
Filed Aug. 9, 1983, Ser. No. 521,718
Claims priority, application Israel, Aug. 9, 1982, 66497
Int. Cl.[4] F41F *27/00*
U.S. Cl. 434—20 **12 Claims**



1. A fully recorded image gunnery training system comprising:
a fire control unit located at a trainee location and including:
an aiming sight;
an aiming controller operative to control the orientation of an actual or simulated gun; and
a trigger;
a display viewable through said aiming sight and providing a field of view of a simulated target through said aiming sight corresponding to the actual view of an actual target through the aiming sight of an actual gun;
means for sensing the orientation of said gun produced by operation of said aiming controller by a trainee;
means for determining the trajectory of a simulated projectile relative to said simulated target in accordance with the orientation produced by operation of said aiming controller by said trainee;
means to store a plurality of video records of actual recorded projectile firings said storing means including a video disc library having video records each of about 3–8 seconds duration and including the continuous dynamic effects in the trajectory as would be seen from the location of said actual gun with projectile impact and accompanying sounds for various orientations of said actual gun relative to said actual target corresponding to said simulated target shown on said display means for accessing said video disc library to display said video to the user; and
means responsive to operation of said trigger and to an output from said determining means for selecting a video record from said library and displaying it on said display in a time relationship to trigger actuation by the trainee which corresponds generally to the time relationship between trigger actuation and the displayed events in actual firing.

4,639,223
SIMULATED HEART DISPLAY SYSTEM
J. Walter Keller, Jr., 8600 SW. 54th Ave., Miami, Fla. 33143
Filed Jan. 2, 1985, Ser. No. 688,194
Int. Cl.[4] G09B *23/28*
U.S. Cl. 434—272 **23 Claims**

1. A heart display system comprising computer means including means to define an electrophysiological network of conduction pathways in a selected pattern corresponding to a specific type of heart, means to store and monitor the electrophysiological state of the component parts of said pathways, and means to determine the travel of depolarization waves that occur in said pathways from the pattern of said pathways and by the electrophysiological state of said component parts and in response to predetermined parameters, to thereby simulate the electrophysiological operation of a beating heart, and



means to display a representation of the operation of said heart in accordance with the travel of said waves of depolarization in said pathways.

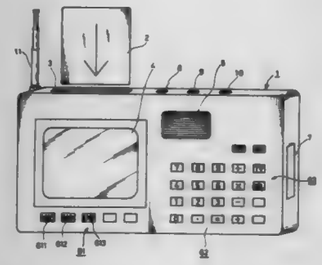
4,639,224
MULTIPLE PROJECTOR PLANETARIUM DRIVE SYSTEM
Takeshi Maejima, Toyokawa, and Kenji Shiba, Toyokashi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Apr. 26, 1985, Ser. No. 727,651
Claims priority, application Japan, Apr. 30, 1984, 59-86949
Int. Cl.[4] G09B *27/00*
U.S. Cl. 434—286 **13 Claims**



1. A planetarium having a star field first projector for the fixed stars and a plurality of second projectors for the planets or the like which are separated from the star field projector and are each driven by two motors for effecting the combined motions of two axes, comprising;
means for controlling the motion of each second projector in accordance with two modes which in the first mode the second projector is moved so as to trace the actual motion of the planet or the like and in the second mode the second projector is moved from the start position to the target position through the shortest route unrelated to the actual motion of the planet or the like whereby a position of the planet or the like to be projected is rapidly changed.

4,639,225
PORTABLE AUDIO-VISUAL ELECTRONIC APPARATUS
Isamu Washizuka, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jun. 22, 1983, Ser. No. 506,761
Claims priority, application Japan, Jun. 24, 1982, 57-110167
Int. Cl.[4] G09B *5/06*
U.S. Cl. 434—308 **6 Claims**

1. A portable audio-visual electronic apparatus having at least three operational modes, including a first mode displaying still display information, a second made displaying a moving picture from still display information and a third mode displaying television signals, comprising
(a) means for visually displaying information including screen display means composed of a matrix of display elements;
(b) a semiconductor memory card for storing a sequence of distinct screens of still display information;
(c) a housing in which said screen display means is disposed and inlet lot in which said semiconductor memory card may be inserted;
(d) display control means in said housing for sequentially displaying said screens of still display information stored on said memory card on said screen display means after the memory card is inserted into said housing via said inlet slot when the apparatus is in the first mode, said display control means being capable of automatically sequencing

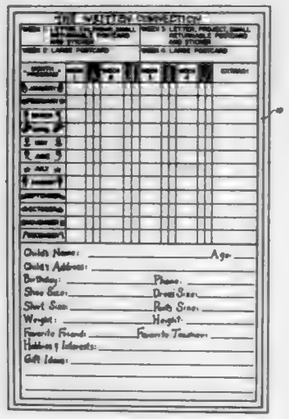


said still display information in rapid succession to create the appearance of moving pictures on said screen display means when the apparatus is in the second mode;
(e) receiver means in said housing for receiving T.V. broadcast signals and outputting video signals; and
(f) mode selection means including a T.V. selection key for selecting video signals from said received means when the apparatus is in the third mode;
said display control means, in response to the actuation of said T.V. selection key, displaying said video signals on said screen display means rather than said still display information.

4,639,226
ADULT/CHILD COMMUNICATION KIT
Melanie H. Rahn, and Jane E. Braun, both of Chandler, Ariz., assignors to Dorothy Laporte, Phoenix, Ariz., a part interest
Continuation of Ser. No. 624,472, Jun. 25, 1984, Pat. No. 4,556,390. This application Jul. 15, 1985, Ser. No. 754,950
The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.
Int. Cl.[4] G09B *29/00*; B42D *15/00*
U.S. Cl. 434—433 **7 Claims**

1. A communication kit for organizing and encouraging postal communication between a first person and a second person, said kit comprising:
a. a set of items of stationery to be sent at periodic intervals by said first person to said second person, including,
i. a first item of stationery to be sent at a first selected time, and
ii. a second item of stationery to be sent at a second selected time,

said second selected time being later then said first selected time; and



b. a returnable item of stationery to accompany at least one of said set of stationery items, said returnable item to be returned by said second person to said first person.

4,639,227

BUOY

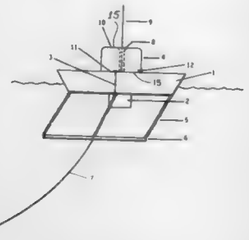
Petrus J. Rademakers, Aerdenhout, Netherlands, assignor to Datawell B.V.

Filed Jan. 11, 1982, Ser. No. 338,628

Claims priority, application Netherlands, Jan. 15, 1981, 8100166

Int. Cl.⁴ B63B *22/18*

U.S. Cl. 441—1 **7 Claims**



1. Buoy having a mainly circular horizontal cross-section with a diameter which is greater than the height of the buoy and a shape and weight distribution for following the angular movement of the water surface and for measuring wave slopes, said buoy having a disc shaped mainly circular main float body with a generally flat lower surface in contact with the water and with a horizontal upper surface, in which on the said upper surface an auxiliary mainly circular float body is mounted, said auxiliary float body being concentric with the said cross-section but having a smaller diameter, said auxiliary float body having further sufficient buoyancy for restoring the normal right-up position after upside down reverse by violent water and air movements, said auxiliary float body still further having a shape, horizontal dimension and height such that the tilting moment exerted by wind forces on sid auxiliary float body is compensated by the pressure distribution caused by said auxiliary float body on the said upper surface.

4,639,228

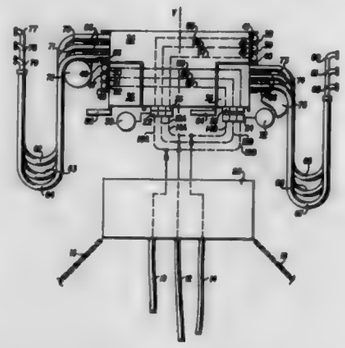
ROTATING MULTI-PATH FLUID MANIFOLD

Roland E. Bulow, Stamford, Conn., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,563

Int. Cl.⁴ B63B *21/52*

U.S. Cl. 441—5 **17 Claims**



16. A method of continuously withdrawing fluids from at least a fixed riser conduit into a vessel which is free to rotate in a plane, comprising the steps of:

dividing said at least a fixed riser conduit into a plurality of flowpaths, each flowpath ending in a separate connector;

positioning a plurality of drums, each drum including a connector and rotatable in said plane, over said flowpath connectors, each of said drums capable of being flexibly connected to said vessel and rotatable during connection with respect to said vessel through a connecting arc, where the sum of said plurality of connecting arcs is greater than 360°, with the connecting arc for one drum overlapping the connecting arc of an adjacent drum at both ends of said one drum connecting arc;

establishing a flowpath through connectors to respective drums and said vessel when said vessel is positioned within said respective connecting arc and disconnecting the connector associated with any drum prior to angular movement of said any drum outside its connection arc; and

repositioning of said any disconnected drum and its associated connector in order that it may be reconnected with its connecting arc.

4,639,229

SURVIVAL KIT AIR DEPLOYABLE APPARATUS AND METHOD

David A. Wright, and David B. Webb, both of Fort Erie, Canada, assignors to Her Majesty the Queen in right of Canada, Canada

Filed Feb. 20, 1985, Ser. No. 703,530

Claims priority, application Canada, Apr. 5, 1984, 451376

Int. Cl.⁴ B63C *9/04*

U.S. Cl. 441—42 **20 Claims**



1. An air deployable survival kit apparatus comprising:

(a) an outer, rigid container shell having an aerodynamic design to enable its being dropped from an airplane, the shell including a hollow body, a nose cone secured thereto and a tail cone releasably secured thereto;

(b) means attached to the shell to release the tail cone from secured position on the body of the container shell after deployment;

(c) individual survival kit elements packaged within the shell to be released through the tail cone end thereof when opened, the elements being packaged within the shell body in a predetermined manner as follows:

(i) a first survival kit package comprising a first deflated, inflatable life raft, inflation means therefor actuable a predetermined time after the first survival kit package has left the shell body, package means releasably enveloping the life raft and inflation means and an aerodynamic brake means secured to the package means to slow the vertical descent of the first survival kit package when it has left the shell body after air deployment of the survival kit apparatus, the first survival kit package being normally positioned within the shell body at its end adjacent the tail cone;

(ii) a second survival kit package comprising a second deflated, inflatable life raft, inflation means therefor actuable a predetermined time after the first survival kit package has left the shell body, and package means releasably enveloping the second life raft and inflation means, the second survival kit package being normally positioned within the shell body at its end near the nose cone;

(iii) a rope deployment package normally positioned within the shell body between the first and second survival kit packages, the rope deployment package comprising a coil of buoyant rope of predetermined length, uncoilable from one end, a package means releasably enveloping a major portion of the rope coil, the end of the rope from which the rope coil is uncoiled being secured to the second life raft and the other end of the rope being secured to the first life raft.

4,639,230

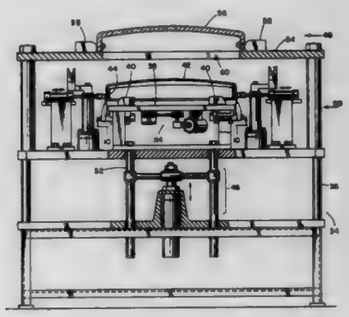
APPARATUS AND METHOD FOR SHADOW MASK INSERTION

William H. Meyle, Naperville, and Paul H. Wendt, Northlake, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 25, 1980, Ser. No. 172,330

Int. Cl.⁴ H01J *9/00*

U.S. Cl. 445—30 **2 Claims**



1. For use in the manufacture of a color cathode ray picture tube having a substantially rectangular face panel including a rearwardly extending flange with a plurality of inwardly extending studs, and with a shadow mask with frame suspended in precise adjacency to said panel by an equal plurality of leaf-type springs extending from said frame, the distal ends of each of said springs having an aperture for detachably engaging an associated one of said studs and an indent adjacent to said apertures for locking, in conjunction with an associated detent, said apertures at predetermined points, said mask and said panel being subject to dimensional deviations which preclude unequivocal engagement of said apertures with said studs, apparatus for inserting said mask in said panel, comprising:

platen means with mask frame-prelocating means for receiving and approximately locating said mask, convex-sideup, on said platen means;

elevator means for raising and lower said platen means and said mask between an upper assembly position and a lower, pre-assembly position;

table means in said upper assembly position for receiving and approximately locating said panel, convex-sideup, with respect to said mask, said table means having an opening for receiving said platen means in approximate coplanarity when said platen means is raised by said elevator means into said upper assembly position;

means for preparing said mask for engagement with said panel when said platen means and said mask is in said lower pre-assembly position, said means for preparing said mask for engagement including:

tapered pin means for seeking said spring apertures and locating the axes of said apertures in a first, substantially horizontal plane, including means for moving said tapered pin means into and away from engagement with said apertures;

spring depressor means for clamping each of said springs against said mask frame to preserve the location of said axes of said apertures in said first horizontal plane, said spring depressor means including said detents for mating with assigned ones of said indents to lock said apertures at said predetermined points in said first, substantially horizontal plane,

to simultaneously horizontally immobilize said frame,

and to maintain such horizontal immobility during any subsequent translation of said frame;

stud locating means for establishing the studs of said panel in a substantially horizontal second plane in said upper assembly position, said stud-locating means including V-groove tip means for locating, positioning and cradling said studs in said second plane with the axes of said studs in approximate vertical alignment with said predetermined points;

means for actuating said elevator means for raising said mask to said upper assembly position to translate said first and second planes into approximate coplanarity, and bring the axes of said apertures into approximate coincidence with the axes of said studs;

means for releasing said spring depressor means to cause said springs to rest against said V-groove tip means and to permit at least partial engagement of said apertures of said springs with said studs;

means for withdrawing said V-groove tip means to uncradle said studs and effect full engagement of said apertures of said springs with said studs;

such that dimensional deviations of said mask and said panel are nullified by locating and locking the axes of said apertures and positioning and cradling said studs in approximate coaxial coincidence before releasing said spring depressor means to provide positive, consistent and unequivocal mutual engagement of said apertures and said studs.

4,639,231

RETAINER FOR ELECTRICALLY FIRED GETTER

James G. Koper, and Bo H. G. Ljung, both of Wayne, N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Sep. 23, 1985, Ser. No. 778,940

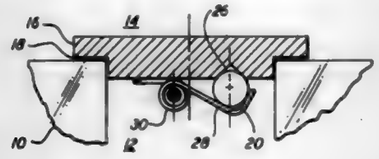
Int. Cl.⁴ H01S *3/083*

U.S. Cl. 445—31 **7 Claims**

1. In a ring laser gyroscope comprising a block having a cavity therein, an electrically fired getter in the cavity, the getter having a heater coil, feedthroughs for transmitting electrical current from the outside to the inside of the cavity, and wires for connectng the heater coil to the feedthroughts, the improvement comprising means for retaining the getter in a

position substantially stationary with respect to the block, wherein the means for retaining comprises;

a spring having an axis of symmetry and having a coil disposed symmetrically about said axis, said spring having an elongate U-shaped portion with a first arm portion and a second arm portion symmetrically disposed about said axis of symmetry for bearing on said getter, said coil



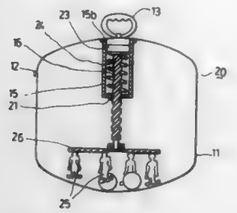
having a first coil portion fixedly connected to said first arm portion and having a second coil portion fixedly connected to said second arm portion, said first coil portion having a first end portion, and said second coil portion having a second end portion, said end portions being arranged to bear against a wall of said cavity for resisting a twisting moment on said coil; and means for holding the coil against the wall of the cavity.

4,639,232

TOY HAVING AN ENVELOPE ENCLOSING A MOVING MECHANISM

Cheng-Chung Wang, 12th Fl., No. 440, Sec. 4, Jen-Ai Rd., Taipei, Taiwan

Filed Mar. 1, 1985, Ser. No. 707,476
Int. Cl.[4] A63H *3/06*
U.S. Cl. 446—220 11 Claims



1. A toy comprising:

an envelope having a flexible material wall;

a sheet extending across an interior portion of the envelope and being connected to an inner side of the wall;

a rigid tubular member being centered through the sheet and having an outer periphery;

a transverse plate having a central opening and a cam edge around the opening, said transverse plate being fixed at a top end of the tubular member;

a moving rod mounted in the tubular member and passing through the central opening so as to be axially movable therethrough, said moving rod having an outer periphery, a longitudinal axis, a top end, and a bottom end; and

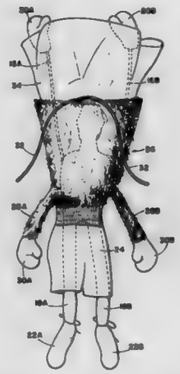
helical grooves of predetermined length provided on the outer periphery of the moving rod so as to engage with the cam edge around the central opening in the transverse plate.

4,639,233

DOLL HAVING MEANS TO CONVERT FROM ONE CHARACTER TO ANOTHER

Brian Brassfield, 2024 A. N. E., Miami, Okla. 74354

Filed Aug. 5, 1985, Ser. No. 761,546
Int. Cl.[4] A63H *3/16, 3/12, 3/20*
U.S. Cl. 446—321 3 Claims



1. A doll having means to convert from one character to another, comprising:

a doll body including a torso, legs, feet, a flexible pair of arms and a head portion, the head portion having a face thereon providing a first character;

a loose fitting outer garment received on said body, the garment having an open type lower portion such as a robe, skirt, dress, kilts or the like which does not receive said legs separately;

a first under garment lower portion received on said doll body and receiving both legs thereof;

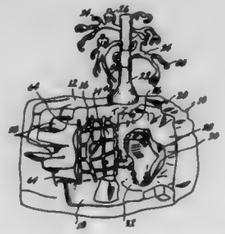
an invertable skirt-type, flexible member received on said doll lower portion over said first under garment and under said outer garment and having, on the underneath side thereof, elements forming upper body, face, and outer head features, the flexible member being invertable and maintained over said doll body head portion to encompass said head portion, the lower portion of said outer garment being receivable inside the inverted flexible member, the inverted flexible member thereby forming a second head and face of said doll body providing a second character.

4,639,234

TOY PLAY SET WITH PUPPET FOR TOY ACTION FIGURES

Robert W. Atwood, Whittier, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 4, 1985, Ser. No. 784,147
Int. Cl.[4] A63H *33/00*
U.S. Cl. 446—327 7 Claims



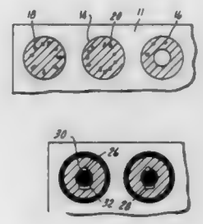
1. A toy playset for use with toy action figures comprising means for simulating a cage having a door, means for securing and releasing the door, means for simulating a trap capable of ensnaring a toy action figure, means for simulating a monster guarding the cage, and means for simulating a tree capable of grasping a toy action figure.

4,639,235

ATTACHABLE EYE FOR DOLLS

Rebecca C. Ibe, 39290 Prentiss, Mt. Clemens, Mich. 48045

Filed Mar. 8, 1985, Ser. No. 709,674
Int. Cl.[4] A63H *3/38;* A01N *1/00;* B32B *3/00*
U.S. Cl. 446—389 1 Claim



1. The method of making eye simulations for adhesive application to the head of a doll which comprises providing a flexible backing sheet of washable fibrous material, applying a first coating on said entire sheet of a white waterproof material, depositing upon said first coating a plurality of spaced apart circular areas of a waterproof coloring material of a color selected to represent irises of eyes, depositing centrally on each iris-simulating area a circular area of a black waterproof coloring material to simulate the pupil of the eye, applying another coating over said deposits of a transparent waterproof material to provide a gloss over the eye simulations, and finally trimming each eye simulation from the sheet to leave a border of the white backing sheet surrounding each iris-simulating area to represent the white of the eye.

4,639,236

TOY VEHICLE AND LAUNCHER

Robert S. McKay, 7420 Beckwith Rd., Morton Grove, Ill. 60053, and Dennis R. Dahm, Streamwood, Ill., assignors to Robert S. McKay, Wood Dale, Ill.

Filed Feb. 8, 1985, Ser. No. 699,591
Int. Cl.[4] A63H *29/00*
U.S. Cl. 446—430 9 Claims



1. A toy comprising:

(a) a toy vehicle having formed therein an opening at the rear of the vehicle;

(1) a spring positioned within the vehicle and compressible therein;

(b) a launcher comprising a weighted group of simulated dynamite sticks, sized to be received within said opening in said vehicle, the group containing release means for releasable engagement with said vehicle;

(c) actuator means for actuating the release means to engage and hold the group of dynamite sticks within the vehicle and to hold the spring in a compressed position, and to release the same and permit said spring to return to its uncompressed condition;

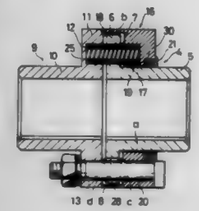
(d) wherein said launcher and actuator means are spaced apart and are connected only by an actuator cable adapted to cause said release means to release said vehicle from said launcher on actuation of said release means.

4,639,237

SHAFT COUPLING WITH PRESS FIT COIL SPRINGS FORMING RESILIENT TORQUE-TRANSMITTING ELEMENTS

Kazuichi Fukuda, Fujisawa, Japan, assignor to Shoyo Engineering Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 526,127, Aug. 24, 1983, abandoned. This application Aug. 19, 1985, Ser. No. 766,683
Claims priority, application Japan, Aug. 26, 1982, 57-146791; Feb. 7, 1983, 58-17420; May 19, 1983, 58-86648
Int. Cl.[4] F16D *3/56*
U.S. Cl. 464—65 15 Claims



1. A shaft coupling structure comprising:

first and second hubs for connection to respective shafts;

said first hub including a cylindrical portion having extending outwardly from one end thereof a flange having spaced around the circumference thereof a plurality of through holes extending entirely through said flange;

said second hub including a cylindrical portion having extending outwardly from one end thereof a flange structure having spaced around the circumference thereof a plurality of closed-end holes;

said hubs being positioned with said flange and said flange structure facing each other with axial clearance therebetween and with said through holes of said first hub aligned with respective said closed-end holes of said second hub;

a holding member including an annular body having therethrough a center opening and spaced therearound a plurality of closed-end holes, said holding member being positioned on the axial side of said flange of said first hub opposite that of said flange structure of said second hub, with said cylindrical portion of said first hub extending through said center opening of said annular body and with said closed-end holes of said annular body aligned with respective said through holes of said first hub;

a plurality of coil springs, each said coil spring being formed by a coiled wire having a rectangular cross section, and each said coil spring being positioned to extend through a respective said through hole of said first hub with opposite axial ends of said coil spring extending into and abutting bottom surfaces of respective said closed-end holes of said second hub and said annular body;

means connecting said annular body of said holding member to said flange structure of said second hub for axially compressing therebetween said coil springs such that the axial length of said compressed coil springs is from 65–80% of the uncompressed length of said coil springs, and thereby for radially enlarging said coil springs and bringing said coil springs into tight, press fitting abutment with inner surfaces of said through holes of said first hub and said closed-end holes of said second hub and said annular body;

said coil springs when uncompressed having outer surfaces spaced from said inner surfaces of said through holes of

said first hub and said closed-end holes of said second hub and said annular body by clearances equal to 0.0005–0.0015 times the outer diameter of said coil springs but not less than 0.02 mm, and said clearances being smaller than the radial increments of said coil spring that occur when the coil spring is axially compressed; and

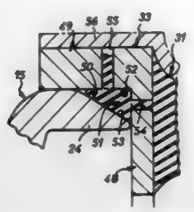
the diametral outer surface of said coil spring being ground so that said clearances are secured.

4,639,238

VARIABLE SPEED DRIVE PULLEY

Michel Jaccod, Champigny-sur-Marne, France, assignor to Valeo, Paris, France

Filed Nov. 27, 1985, Ser. No. 802,253
Claims priority, application France, Jul. 12, 1984, 8418696
Int. Cl.⁴ F16H *55/56*
U.S. Cl. 474—8 **10 Claims**



1. Variable speed drive pulley comprising a hub, two annular flange plates around said hub in face-to-face relationship, one of which is mobile axially relative to said hub, an annular diaphragm of variable cone angle having a peripheral part forming a Belleville spring washer and a central part divided into radial fingers, a connection piece, an elastic material annular spacer to which said connection piece is attached and through which said Belleville spring washer bears axially on said mobile flange plate, a support piece fixed axially with respect to said hub on which said radial fingers bear, a fluid-tight regulating chamber formed between said mobile flange plate, said diaphragm, said support piece and said hub and adapted to be connected to a source of fluid, and sealing means in one piece with said elastic material spacer disposed between said connection piece and said mobile flange plate.

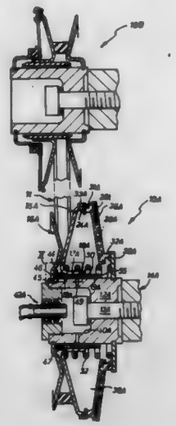
4,639,239

SPEED CHANGE DEVICE PULLEY WITH A SEAL AROUND THE HUB

Jacques Thirion de Briel, Levallois-Perret, and Michel Jaccod, Champigny-sur-Marne, both of France, assignors to Valeo, Paris, France

Filed Nov. 13, 1985, Ser. No. 797,526
Claims priority, application France, Nov. 15, 1984, 84 17437
Int. Cl.⁴ F16H *55/56*
U.S. Cl. 474—8 **15 Claims**

1. Variable speed drive pulley of the kind comprising a hub which has an internal opening and, in face-to-face relationship to each other around said hub, two annular flanges of which at least one, hereafter referred to for convenience as the mobile flange, is mounted so as to be mobile axially relative to said hub being for this purpose axially fastened to a bush slidably engaged on the latter with, disposed between said bush and said hub, two pads of anti-friction material axially spaced from each other, in association with a spacer, hereinafter referred to for convenience as the abutment space, which is also fastened axially to the mobile flange and adapted to limit its axial displacement in one direction, and in association with a regulating chamber which, adapted to be connected to a source of fluid, is defined at least in part by the mobile flange, the hub and a seal disposed around said hub in line with said abutment spacer and linked to move with said mobile flange, this variable speed drive pulley being characterized, in combination, on the one hand in that the abutment spacer is carried by the end of the bush of the mobile flange directed towards the fixed flange and it features, transversely, a collar which is directed radially towards the axis of the assembly and by virtue of which it delimits, for its part, a housing in which is disposed the associated seal, and, on the other hand, in that for the purpose of



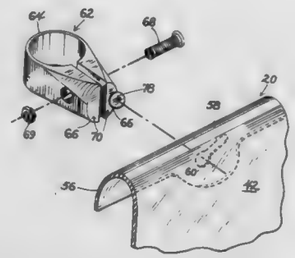
connecting the regulating chamber to a source of fluid there is provided in the bush between the anti-friction material pads at least one passage and, in the hub, also between said anti-friction material pads, for communication between the internal space of the hub and the volume delimited by the anti-friction material pad between it and the bush, at least one passage.

4,639,240

CHAINGUARD

King Liu, Taichung Hsen, Taiwan, assignor to Schwinn Bicycle Company, Chicago, Ill.

Filed Nov. 14, 1985, Ser. No. 797,868
Claims priority, application Taiwan, May 1, 1985, 74203323
Int. Cl.⁴ B62J *13/00*
U.S. Cl. 474—144 **6 Claims**



1. In a chainguard for a bicycle or the like of the type having a housing including a curved forward end portion adapted to extend at least partially about a front sprocket and a rear end portion adapted to extend along the top run of a bicycle chain and having means for attaching said rear end portion to a bicycle frame adjacent a rear sprocket, the improvement comprising:

said housing having a vertical wall adapted to lie alongside at least one frame tube of a bicycle, said wall having at least one through-alot with an enlarged portion therein;

a clamp adapted to encircle a bicycle frame tube and having opposed adjacent end portions with means for securing them together to grip said frame tube;

said clamp end portions having a pair of coplanar end surfaces adapted to abut said wall around said through-slot, a lug extending forwardly from one of said end surfaces;

said lug including a shank and an enlarged head at the end thereof;

said shank sized to fit within said through-slot and having an axial length at least equivalent to the thickness of the wall; and

said head being larger in diameter than the width of the through-slot and sized to pass through the enlarged portion thereof;

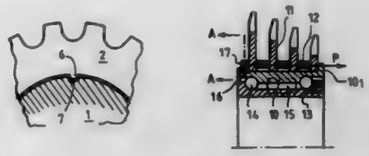
whereby said clamp is positionable in a range of connected positions of said lug along the length of said through-slot to accommodate a range of angular orientations of the bicycle frame tube relative to said chainguard.

4,639,241

FREEWHEEL FOR A CYCLE OR THE LIKE

Edouard Monka, Incheville, France, assignor to Etablissements Maurice Maillard, Incheville, France

Filed Oct. 28, 1985, Ser. No. 792,307
Claims priority, application France, Nov. 29, 1984, 84 18219
Int. Cl.⁴ F16H *55/12*
U.S. Cl. 474—902 **3 Claims**



1. A freewheel for a cycle, comprising a hollow body of generally circular shape which receives on its periphery a plurality of regularly spaced gearwheels retained laterally between two flanges, means also being provided for securing the gearwheels to the body in a manner precluding relative rotation, wherein at least one of the flanges comprises an annular part of which the original internal diameter is at least equal to the diameter of the periphery of the body which is accommodated, by permanent deformation, in an annular groove on the periphery of the body.

4,639,242

VESSEL AND PROCEDURE FOR AUTOMATED ASSAY

Arthur L. Babson, Old Mill Rd., Chester, N.J. 07930

Filed Feb. 4, 1985, Ser. No. 698,013
Int. Cl.⁴ B04B *1/00*; B65D *23/00*
U.S. Cl. 494—37 **20 Claims**



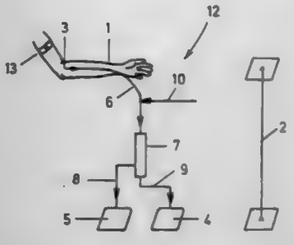
1. A vessel of single construction comprising in longitudinal order about a center axis (1) a closed bottom portion; (2) generally cylindrical mid-portion having a predetermined interior diameter somewhat narrower at the bottom-most portion than at the top-most portion of said mid-portion; (3) a chamber portion comprising an outwardly biased lower portion, a generally cylindrical middle portion of greater interior diameter than said mid-portion, and an inwardly biased upper portion; and (4) a neck portion having an interior diameter less than the interior diameter of said chamber middle portion.

4,639,243

PROCESS AND APPARATUS FOR OBTAINING BLOOD PLASMA

Baerbel Schmidt, Hirsch-Gereuth-Str. 27, D-8000 München 70; Walter Samtleben, Waldpromenade 102½, D-8035 Gauting, both of Fed. Rep. of Germany, and Michael J. Lysaght, 33A Shoreline Rd., Barrington, Ill. 60010

Filed Jan. 17, 1984, Ser. No. 571,399
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1983, 3302383
Int. Cl.⁴ A61M *1/34*
U.S. Cl. 604—6 **26 Claims**



1. A process of collecting plasma from a donor comprising the steps of

applying external pressure on the heart-side of a selected venous injection site on the donor,

puncturing the injection site with a cannula,

suspending a blood collection reservoir at a predetermined distance below the injection site so as to convey whole blood between the cannula and the blood collection reservoir through a plasma filtration unit to separate the plasma from the whole blood relying only upon the applied external pressure and the force of gravity, and

collecting the separated plasma.

17. An apparatus for collecting plasma from a donor comprising

a cannula inserted in a venous injection site on the donor for withdrawing whole blood while an external pressure is applied on the heart-side of the injection site,

a blood collection reservoir suspended a predetermined distance below said cannula, and,

means for conveying whole blood between said cannula and said blood collection reservoir, said conveying means including

filtration means positioned between said cannula and said reservoir for separating the plasma from the whole blood relying only upon the external pressure and the force of gravity, and

means for collecting the separated plasma.

4,639,244

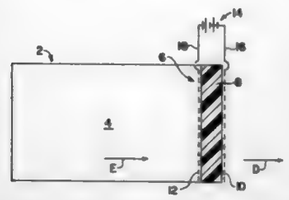
IMPLANTABLE ELECTROPHORETIC PUMP FOR IONIC DRUGS AND ASSOCIATED METHODS

Nabil I. Rizk, 229 Haymont Dr., Gibsonia, Pa. 15044, and Charles L. Stevens, Pittsburgh, Pa., assignors to Nabil I. Rizk, Gibsonia, Pa.

Continuation of Ser. No. 491,241, May 3, 1983, abandoned. This application Jul. 12, 1985, Ser. No. 754,629
Int. Cl.⁴ A61N *1/30*
U.S. Cl. 604—19 **48 Claims**

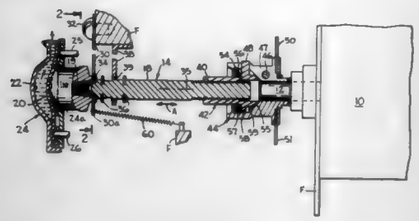
1. An implantable electrophoretic pump for ionic drugs comprising

a housing,
a substantially fixed volume reservoir for storing said ionic drugs having a filler opening and a discharge opening,
said housing having opening means disposed generally adjacent to said filler opening and said discharge opening,
a filler member disposed within said filler opening and being self-sealing and adapted to be pierced by a reservoir filling member and upon removal of said filling member will resist leakage therethrough,



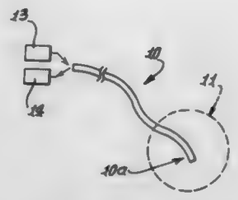
a reservoir discharge member disposed within said discharge opening and having a diffusion membrane and a pair of associated electrodes,
electrical energizing means for energizing said electrodes, and
the polarity of said electrodes being adapted to be connected such that when said electrodes are energized increased flow of said ionic drug through said discharge member will occur as compared with flow induced solely through diffusion when said electrodes are not energized, whereby said pump can deliver said ionic drugs electrophoretically.

4,639,245
FLUID INFUSION PUMP DRIVER
Giovanni Pastrone, Los Gatos, and Leland D. Chamness, Mountain View, both of Calif., assignors to Oximetrix, Inc., Mountain View, Calif.
Filed Dec. 20, 1985, Ser. No. 811,262
Int. Cl.[4] A61M *5/20*
U.S. Cl. 604—152 **14 Claims**



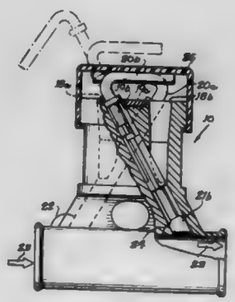
1. An infusion pump driver for pumping liquid from a cassette adapted to be selectively engaged with said driver and having a pumping chamber therein with an exposed wall thereof being formed by a flexible diaphragm, said driver comprising a frame structure, a motor mounted to said frame structure and including a drive shaft, a plunger adapted to engage said diaphragm for pumping liquid from the cassette pumping chamber, said plunger having an axially extending shaft, means for securing the plunger to said frame structure so as to permit movement thereof generally along the axis of the plunger shaft but preventing rotational movement thereof about said shaft axis, and means for coupling the plunger shaft to the drive shaft, said last named means providing a threaded connection between the drive shaft and the plunger shaft wherein rotation of the drive shaft results in movement of the plunger generally along the plunger shaft axis and including a universal joint for permitting relative pivotal movement between said plunger shaft axis and the axis of the drive shaft.

4,639,246
CATHETER
Ralph S. Dudley, Anaheim, Calif., assignor to Animal Healthcare Products, Vernon, Calif.
Filed Sep. 9, 1985, Ser. No. 773,569
Int. Cl.[4] A61M *5/00, 25/00*
U.S. Cl. 604—158 **11 Claims**



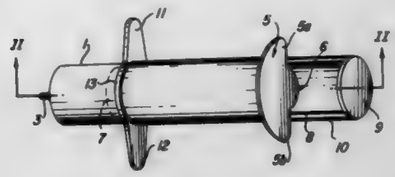
1. For use with a hollow needle insertible into the trachea of an animal, the improvement comprising
(a) an elongated, flexible plastic tube sized to pass lengthwise through the needle and to be threaded through the needle after its insertion into the animal trachea,
(b) said tube having an end portion adapted to extend into the trachea and at least four side openings in said end portion to deliver fluid to the trachea, and to withdraw fluid therefrom,
(c) said openings spaced at different distances from the terminal of said end portion, said openings being elongated in the direction of the tube, the lengths of said elongated openings being at least as great as the tube diameter, the openings' widths approximately equal to the inner diameter of the tube,
(d) each opening being symmetrical with respect to a tube axial radial plane bisecting that opening, the opening profile, viewed normal to said plane having elongated U-shape, with an elongated base the depth of which is greater than the tubing wall thickness,
(e) the widths of the openings being constant along major lengths of the openings.

4,639,247
PERCUTANEOUS ACCESS DEVICE
Jack C. Bokros, Austin, Tex., assignor to Carbomedics, Inc., Austin, Tex.
Filed Nov. 2, 1984, Ser. No. 667,581
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—175 **13 Claims**



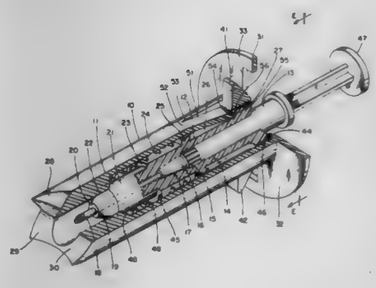
11. An implantable device comprising
a housing having one end which is implantable in a patient and a second end which extends external of the patient when implanted,
said housing having a substantially rectilinear first passageway of substantially constant cross-section extending between an opening in said first end of said housing and a first opening in said second end of said housing,
said housing also having a second passageway extending through the housing from a second opening in said second end to a junction with said first passageway located between said openings in said first and second ends so as to provide communication between said first passageway and a region exterior of the body through said second passageway,
a plunger disposed within said first passageway through said first opening comprising a shaft having an irregular cross-section that is smaller then the cross-section of said first passageway and that varies along the length of the plunger and also having sealing means on the distal end thereof which seals with the interior wall of said first passageway throughout substantially the entire length thereof, said housing having means permitting partial axial withdrawal of said plunger so said sealing means is located adjacent the junction of said passageways where there is communication between said first and second openings of said passageways through the junction and past said irregular cross-section shaft, access to said opening in said one end through said second passageway being achieved only upon selective rotation of said plunger in the partially axially withdrawn location and then withdrawal of said plunger and its associated sealing means past the junction between said second passageway and said first passageway, said shaft of said plunger being of such length that, when said plunger is fully inserted into said first passageway, said sealing means extends past said junction but not substantially beyond said opening in the first end.

4,639,248
SYRINGE
Jean-Denis Schweblin, 4, Place de l'Etrier, 1224 Chene Bougeries, Switzerland
Filed Nov. 22, 1985, Ser. No. 801,057
Claims priority, application Switzerland, Dec. 7, 1984, 5832/84; Jan. 11, 1985, 123/85
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—187 **8 Claims**



1. Syringe for extracting and emptying a liquid comprising:
a cylindrical body provided on its close front end with a needle supporting nozzle, and a piston movable coaxially in said body so that a relative axial movement between the body and the piston will correspond to a variation in the volume of the chamber formed between the front end of the body, its cylindrical wall and the adjacent surface of the piston for sucking or ejecting a liquid through said needle supporting nozzle, wherein the body comprises at its rear end a first bearing surface and that the piston is rigid through its rod, being coaxial and approximately semi-cylindrical cross-section, with a second bearing surface located between the first bearing surface and the front end of said body, so that when the second bearing surface is moved toward the first bearing surface the volume of the inner chamber increases, whereas when said second bearing surface is moved away from the first bearing surface the volume of said chamber decreases, the piston rod comprises a first inner part and a second outer part, being of approximate semi-cylindrical cross-section, connected at their rear end to a terminal part, whereby the inner part is fixed to the piston and the front end of the outer part is fixed to the second bearing surface.

4,639,249
LATCH INTEGRAL WITH LATCHED APPARATUS
Eldon E. Larson, 7500 Seabeck Holly Rd., NW., Bremerton, Wash. 98312
Filed Jan. 13, 1986, Ser. No. 818,477
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—198 **8 Claims**



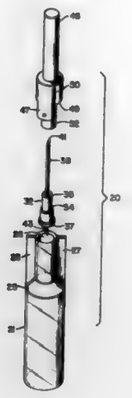
1. An apparatus comprising first and second elements made of resilient material and in sliding contact with each other, said second element being movable in a first direction with respect to said first element and in a second direction opposite to said first direction and having a face surface essentially perpendicular to said first and second directions, latch apparatus comprising:
a rectangular leaf spring integral with said first element and having:
a first side,
a second side,
a first end, and
a second end and
a width W, the distance from said first side to said second side,
said first and second sides being essentially parallel to said first and second directions, said first side being separated from said first element by a first slit having a width w1 and said second side being separated from said first element by a second slit having a width w2,
said second end being separated from said first element by a slit having a width w3,
said first end being integral with said first element and being located a distance L in said first direction from said second end, L being the effective length of said leaf spring and of said first and second slits,
said leaf spring being formed so that said second end is positioned to abut said face surface of said second element, whereby said second element is prevented from moving in said first direction relative to said first element,
means for deflecting said leaf spring to move said second end out of abutment with said face surface, whereby said second element is freed for sliding motion in said first direction relative to said first element.

4,639,250

SYRINGE BARREL AND HYPODERMIC NEEDLE ASSEMBLY

Alan K. Rycroft, Rutherford, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Feb. 20, 1986, Ser. No. 831,754
Int. Cl.[4] A61M *5/24*
U.S. Cl. 604—201 33 Claims



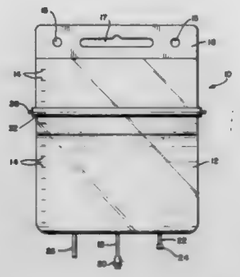
1. An operable syringe barrel and hypodermic needle assembly comprising:
an elongate barrel portion having an open proximal end and a chamber for retaining fluid;
a tip portion extending from a distal end of said barrel portion having a passageway therethrough;
a projection extending outwardly from said tip portion;
pierceable barrier means for preventing fluid communication between said chamber and said passageway;
a rigid hub having a forward end, a rearward end and a conduit therethrough, said hub movably positioned within said passageway;
a first cannula extending outwardly from said forward end of said hub and a second cannula extending outwardly from said rearward end of said hub, said first cannula and said second cannula being in fluid communication;
an elongate hollow needle shield slidably engaging said tip covering said first cannula, said needle shield having an outer skirt portion extending over a portion of said tip, said outer skirt portion being capable of contacting said projection for limiting the motion of said needle shield toward the proximal end of said barrel, said outer skirt portion including a longitudinal groove being wider than said projection and capable of receiving said projection; and
said needle shield having an inner skirt portion projecting proximally into said passageway and capable of contacting said hub, said inner skirt portion being long enough so that when said needle shield is rotated to align said groove and said protection, and moved in a proximal direction with respect to said tip portion so that said projection enters said groove, said inner skirt pushes against said hub and moves said hub in a proximal direction causing said second cannula to pierce said pierceable barrier means.

4,639,251

FLEXIBLE COLLAPSIBLE CONTAINER WITH LIQUID LEVEL INDICATING DEVICE

W. Dean Kirkland, Walnut Creek, Calif., assignor to KabiVitrum, Inc., Alameda, Calif.

Filed Jun. 28, 1985, Ser. No. 749,707
Int. Cl.[4] A61M *5/00*; G01F *23/00*
U.S. Cl. 604—260 5 Claims



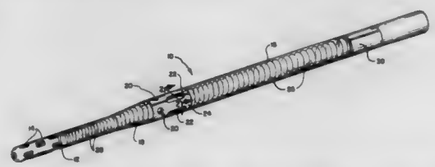
1. Apparatus for administering medical liquids comprising the combination of a calibrated flexible collapsible container and a liquid level indicating device which is supported on the outside surface of the calibrated container at about the upper level of the liquid contained therein wherein said collapsible container contains a liquid and is substantially devoid of air and said liquid level indicating device comprises a pair of spaced-apart, parallel elongated members which define a narrow rectangular slot, said slot being sized so that when a collapsed portion of the container is inserted therein opposing surfaces of said container are urged into abutting relationship with each other at about the level of the upper surface of liquid within the container.

4,639,252

VENOUS RETURN CATHETER

Michael N. Kelly, Salt Lake City, Utah; John B. Foster, Rolling Hills Estates, and Robert D. Foster, San Pedro, both of Calif., assignors to Research Medical, Inc., Salt Lake City, Utah

Filed Apr. 5, 1985, Ser. No. 720,172
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—282 16 Claims



1. A catheter for use in the venous drainage of blood during surgical procedures involving cardiopulmonary bypass, comprising:
a first diameter catheter portion forming the distal end of the catheter, said first diameter portion being suitable for placement within a vena cava, and said first diameter portion being provided with a plurality of drainage openings suitable for draining blood;
a second diameter catheter portion forming the proximal end of said catheter, said second diameter portion being in fluid communication with the first diameter portion, said second diameter catheter portion having a larger diameter than the first diameter portion, said second diameter portion being provided with drainage openings suitable for draining blood, and further being provided with reinforcement means for reinforcing a section of the second diameter catheter portion surrounding the drainage openings, the reinforcement means comprising a substantially continuous layer of a reinforcing material, the drainage openings being punched through said layer of reinforcing material; and
a transition catheter portion between the first and second diameter portions forming a smooth transition between said first and second diameter portions.

4,639,253

NONWOVEN SURGICAL SPONGE WITH X-RAY DETECTABLE ELEMENT

John Dyer, Randolph; John W. Kennette, Somerville; Alton H. Bassett, Princeton, and Stanley D. Hall, Plainsboro, all of N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Continuation of Ser. No. 605,369, Apr. 30, 1984, abandoned.
This application Nov. 25, 1985, Ser. No. 802,067
Int. Cl.[4] A61F *13/00*
U.S. Cl. 604—362 13 Claims



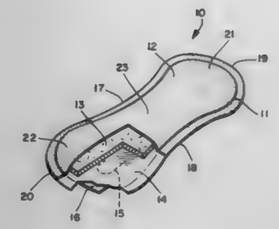
1. A surgical sponge including an integral X-ray detectable element, said sponge comprising a fibrous, nonwoven fabric consisting essentially of entangled fibers arranged in an interconnecting patterned relationship in the plane of the fabric, and at least one visually colored X-ray detectable element positioned interiorly of said fibrous nonwoven fabric in the plane thereof, the fibers of said nonwoven fabric being intertwined about said X-ray detectable element to provide a fibrous covering of said X-ray detectable element on a first surface of said fabric which is lighter than the fibrous covering on the other surface of said fabric, whereby said X-ray detectable element is more readily visible on said first surface than on said other surface.

4,639,254

THREE-DIMENSIONAL SANITARY NAPKIN HAVING ABSORBENT MATERIAL CONTOURED ON THE BAFFLE SIDE

Robert H. LeGault, Neenah, Wis.; Arrigo D. Jezzi, Roswell, Ga.; James D. Milner, Appleton, Wis.; Barbara Oakley, and Paul G. Franke, both of Menasha, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 24, 1985, Ser. No. 790,702
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 R 15 Claims



1. A three-dimensional hourglass-shaped sanitary napkin comprising a fluid permeable cover with a body contacting surface, an absorbent material adjacent the fluid permeable cover and a fluid impermeable baffle adjacent the alternate side of the absorbent material and having a garment facing surface, said sanitary napkin being substantially hourglass-shaped, comprising (a) two end lobe regions and (b) a middle region, said absorbent material in said middle region being outwardly bulging in said middle region by a greater amount than the absorbent in the end region on the alternate absorbent side adjacent the baffle and wherein said middle region comprises a greater amount of absorbent than said lobe regions.

4,639,255

SOLID FORM ADDITIVES AND METHOD OF FORMING SAME

Alexander D. Schuettenberg, and James T. Gragson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 112,363, Jan. 15, 1980, abandoned. This application Oct. 16, 1980, Ser. No. 197,457

Int. Cl.⁴ C10L *1/24*

U.S. Cl. 44—62 **40 Claims**

1. A solid form additive comprising:

a normally liquid fuel additive selected from carburetor detergent additives, antiknock additives, deposit-control additives, and mixtures thereof, suitable for use in fuel comprising gasoline for internal combustion engines; and

a structural agent for containing the fuel additive and for providing dimensional stability to the solid form additive, the structural agent being soluble and dispersible in the fuel;

wherein the fuel additive comprises between about 25% and about 75% by weight of the solid form additive; and wherein

the solid form additive is a pellet having structural agent and fuel additive essentially homogeneously dispersed throughout the solid form additive; and wherein

the pellet is coated with a sealing agent.

4,639,256

COLD FLOW IMPROVING ADDITIVE COMPOUND AND FUEL COMPOSITION CONTAINING SAME

Joan C. Axelrod, Media, Pa., and Sheldon Chibnik, Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 18, 1985, Ser. No. 810,114

Int. Cl.⁴ C10L *1/22*

U.S. Cl. 44—71 **43 Claims**

1. A product of reaction useful for improving the low temperature characteristics of distillate hydrocarbyl fuels comprising an ester derivative of a branched chain monocarboxylic acid having at least one tertiary amine group and at least one ester group prepared by reacting substantially stoichiometric or equimolar amounts of said branched chain acid and an amine having at least one tertiary amine group for a time sufficient to obtain said ester derivative and wherein said branched chain acid is a telomer acid.

4,639,257

RECOVERY OF CARBON DIOXIDE FROM GAS MIXTURE

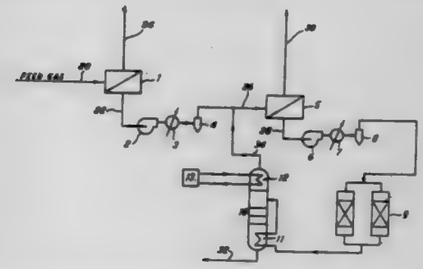
Melvyn Duckett, and David I. Limb, both of Stockport, United Kingdom, assignors to Costain Petrocarbon Limited, Wythenshawe, England

Continuation-in-part of Ser. No. 675,292, Nov. 17, 1984, abandoned. This application Jul. 15, 1985, Ser. No. 755,374

Claims priority, application United Kingdom, Dec. 16, 1983, 8508002; Mar. 27, 1985, 8333628

Int. Cl.⁴ B01D *53/22*

U.S. Cl. 55—16 **16 Claims**



1. A process for the recovery of carbon dioxide from a gas mixture containing carbon dioxide in a concentration not greater than the equilibrium concentration at the freezing temperature of the mixture, the process comprising subjecting the gas mixture to membrane separation;

recovering from said membrane separation a permeate wherein the concentration of carbon dioxide is between said equilibrium concentration and 98% (by volume) of the permeate and thereafter

subjecting said permeate to distillation at sub-ambient temperature above the freezing temperature of the permeate; and

recovering substantially pure carbon dioxide as a liquid bottoms products of said distillation.

4,639,258

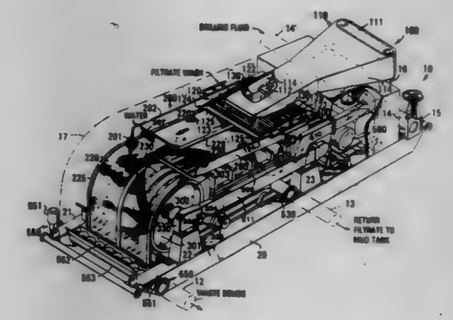
SINGLE PASS MUD REJUVENATION SYSTEM AND METHOD

Herman J. Schellstede, New Iberia, La., and James F. Youngblood, Houston, Tex., assignors to Leon E. Roy, New Iberia, La., a part interest

Filed Oct. 14, 1983, Ser. No. 541,923

Int. Cl.⁴ B01G *19/00*; B01D *33/04*

U.S. Cl. 55—52 **19 Claims**



1. A method for rejuvenating drilling mud received from a well comprising the steps of:

(a) providing an endless filter having an upper surface and a lower surface,

(b) causing said endless filter to move along a predetermined path of travel,

(c) delivering a mixture of drilling mud including cuttings solids to the upper surface of said endless filter, and

(d) applying suction to the lower surface of said filter and drawing substantially all of the drilling mud through the filter and leaving said cuttings solids on the upper surface of said endless filter to provide rejuvenated mud beneath said filter.

4,639,259

PROMOTED SCAVENGER FOR PURIFYING HCL-CONTAMINATED GASES

Michael J. Pearson, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Oct. 9, 1985, Ser. No. 785,706

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—71 **8 Claims**

1. A process for purifying industrial gases containing HCl as a contaminant which comprises contacting the gas containing up to about 1% by volume HCl in the presence of water vapor in an amount ranging from about 25 ppmv to about 2% by volume with a thermally activated alumina-containing scavenger promoted with an alkaline earth metal, the promoted scavenger containing from about 0.5 to about 45% by weight alkaline earth metal and exhibiting in the activated state a minimal

surface area of about 50 m^2/g and a minimum pore volume of at least about 0.3 cm^3/g, maintaining the contact between the HCl contaminated gas the the promoted scavenger until the HCl content of the gas, after contact with the promoted scavenger, reaches a predetermined threshold HCl level discontinuing the contact and recovering the promoted scavenger containing the HCl impurity removed from the gas.

4,639,260

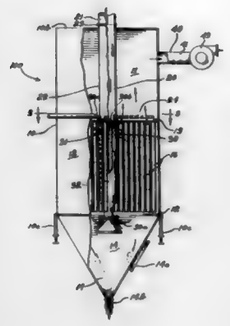
DUST SEPARATOR

Henry Borow, 185 Berlioz, Apt. 2N, Nuns Island, Verdun, Quebec, Canada (H3E 1C1)

Continuation-in-part of Ser. No. 627,196, Jul. 2, 1984, abandoned. This application Nov. 18, 1985, Ser. No. 798,956

Int. Cl.[4] B01D *46/04, 50/00*

U.S. Cl. 55—302 **16 Claims**



1. A gas filter apparatus for separating solids from a gas stream comprising a housing having a top, base, and side walls defining a chamber, a partition wall extending across the chamber and separating the chamber into an upper compartment and a lower compartment, a gas inlet conveyor tube in the chamber passing downwardly of the partition and into the lower compartment, the portion of the conveyor tube passing through said upper compartment being impervious and the portion of the conveyor tube extending downwardly into the lower compartment being provided with exit means including exit apertures at least in the area of the conveyor tube adjacent the partition wall, the partition wall being provided with a plurality of openings surrounding the conveyor tube and communicating the lower compartment with the upper compartment, filter means in the form of filter tubes covering each opening in the partition wall and extending downwardly in the lower compartment and parallel to the conveyor tube, at least one gas outlet communicating with the upper compartment, suction means associated with the gas outlet to provide a reduced pressure within the chamber, discharge means at the base of the housing associated with the lower compartment for discharging solid matter separated from the gas stream, whereby solid laden gas is conveyed into said lower compartment downwardly by the conveying tube and the gas of the stream is drawn from the conveyor tube immediately past the partition, through the surrounding filter tubes in order to prevent the formation of counter gas flows to the gravity discharge of the solids being separated from the gas stream.

4,639,261

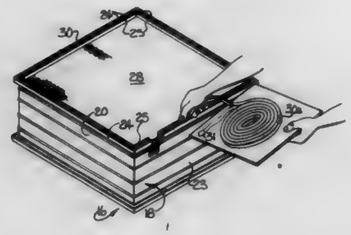
HIGH EFFICIENCY AIR FILTER

Clarence B. Pittman, Pinetown, and George H. Cadwell, Jr., Blounts Creek, both of N.C., assignors to Flanders Filters, Inc., Washington, N.C.

Filed Feb. 29, 1984, Ser. No. 584,819

Int. Cl.[4] B01D *46/52*

U.S. Cl. 55—502 **8 Claims**



7. An apparatus for filtering an airstream and comprising a supporting housing having an opening adapted to form a part of an air flow system having an airstream passing therethrough to define an air flow direction through said opening, a high efficiency air filter supported by said housing, and means for releasably sealing the periphery of said air filter to the periphery of said housing opening so as to permit the filter to be withdrawn from the housing and replaced with a fresh filter, the improvement wherein said sealing means comprises

a continuous peripheral channel surrounding said opening and sealably fixed to one of either said housing or said filter, said channel facing in a direction parallel to the air flow direction through said opening,

a sealant filling at least a substantial portion of said channel, said sealant comprising an essentially non-volatile and non-hardening gum-like uncured polysiloxane gum having a viscosity of at least about 500,000 centipoise and having a consistency substantially the same as modeling clay, and

a flange having a continuous cross sectional outline corresponding to that of said channel, said flange being sealably fixed to the other of either said housing or said filter and having a forward edge portion positioned within said channel and sealably embedded into said sealant.

4,639,262

METHOD AND APPARATUS FOR CARBON DIOXIDE LIQUEFACTION AND EVAPORATION

Albert N. Heichberger, 10960 Beach Blvd. 190 313, Jacksonville, Fla. 32216

Continuation of Ser. No. 622,217, Jan. 19, 1984, which is a continuation-in-part of Ser. No. 568,717, Jan. 6, 1984, Pat. No. 4,572,728, which is a continuation-in-part of Ser. No. 511,270, Jul. 6, 1983, Pat. No. 4,498,303. This application Jan. 13, 1986, Ser. No. 818,993

Int. Cl.[4] F25J *3/02*

U.S. Cl. 62—11 **18 Claims**

1. A method for selectively condensing carbon dioxide from a source gas flow, comprising merging source carbon dioxide after liquification and separation from noncondensed contaminating gases into evaporating liquid carbon dioxide coolant so as to preclude the need for intermediate conventional refrigeration apparatus, including:

providing a quantity of liquid carbon dioxide in a vertical configuration including, in ascending order, a lower removing region, a gas distributing region, a condensing region, and a gas collecting region;

introducing said flow of source gas into said gas distributing region;

removing heat from said liquid carbon dioxide within said condensing region at a rate sufficient to selectively condense substantially all carbon dioxide from said flow of source gas therein;

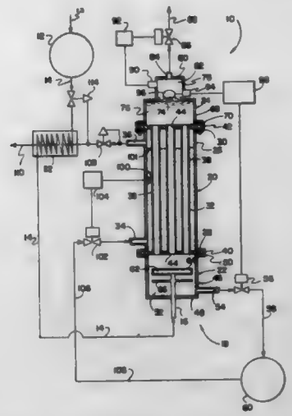
collecting noncondensed gas in said gas collecting region;

removing carbon dioxide liquid from said lower removing region; and

passing the removed carbon dioxide liquid as a coolant flow in indirect heat exchange relation with said condensing region while flashing at a rate sufficient to maintain said heat exchange relation.

12. Apparatus for selectively condensing carbon dioxide from a source gas flow, comprising means designed for merging source carbon dioxide after liquification and separation from noncondensed contaminating gases into evaporating liquid carbon dioxide coolant so as to preclude the need for intermediate conventional refrigeration apparatus, including:

a chamber configured to contain a quantity of liquid carbon dioxide in vertically arranged regions including, in ascending order, a lower removing region, a gas distributing region, a condensing region, and a gas collecting region;



inlet means for introducing said flow of source gas into said gas distributing region;

cooling means for removing heat from liquid carbon dioxide within said condensing region by indirect heat exchange;

said condensing region being configured such that substantially all carbon dioxide is selectively condensed from said flow of source gas while in direct heat exchange relation with liquid carbon dioxide therein;

collecting means for collecting noncondensed gas in said gas collecting region;

outlet means for removing carbon dioxide liquid from said lower removing region; and

cold path means for passing removed carbon dioxide liquid through said cooling means while flashing at a rate sufficient to maintain said heat exchange relation.

4,639,263

GLASSWARE FORMING PRODUCTION MONITOR

Joseph A. Kalikauskas, Elmira, N.Y., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jul. 16, 1985, Ser. No. 755,522

Int. Cl.[4] C03B *9/44*

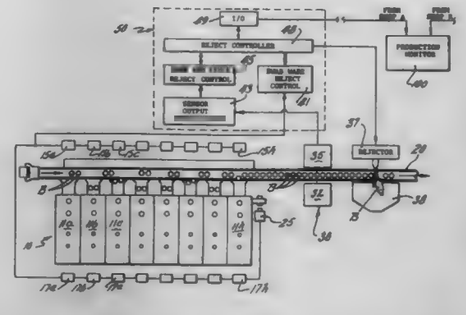
U.S. Cl. 65—158 **3 Claims**

1. In an apparatus for producing ware and including a plurality of forming sections; an outfeed conveyor for transporting ware from the forming sections for distribution and inspection; ware rejector means responsive to reject commands for removing unacceptable swab ware and down and stuck ware from the outfeed conveyor; a plurality of switches corresponding respectively to said forming sections for producing swab ware reject signals which designate swab ware to be rejected by said rejector means; and down and stuck detector located adjacent to said outfeed conveyor upstream of said ware rejector means and producing down and stuck reject signals in response to down and stuck ware; the improvement comprising:

reject controller means operatively connected between said switches and said rejector means and between said down and stuck detector and said rejector means for generating said reject commands in response to said swab ware signals and said down and stuck signals, said reject commands being timed with the arrival of the respective unacceptable ware adjacent to said rejector means,

communication controller means connected in operative relation with said reject controller means for transmitting a swab ware source signal when ware is rejected on account of swab ware contamination, and a down and stuck source signal when ware is rejected on account of a down and stuck condition,

first memory means connected in operative relation with said communication controller means, addressed by said swab ware source signals, and categorized by forming



section for tabulating the number of swab ware rejected per forming section during each of a plurality of first intervals,

second memory means connected in operative relation with said communication controller means, addressed by said down and stuck source signals and categorized by forming section for tabulating the number of down and stuck ware per forming section during each of said plurality of first intervals,

processor means connected in operative relation with said first memory means and said second memory means for tabulating the number of swab ware rejects per forming section over a selected interval encompassing a plurality of said first intervals and the number of down and stuck rejects per forming section over said selected interval, and

presentation means connected in operative relation with said processor means for visually presenting the number of swab ware rejects per forming section during said selected interval and the number of down and stuck ware rejects per forming section during said selected interval.

4,639,264

HERBICIDAL N-ARYLSULFONYL-N'-(4-MERCAPTOMETHYLPYRIMIDINYL)-UREAS

Werner Töpfl, Dornach, Switzerland, assignor to Ciga-Geigy Corporation, Ardsley, N.Y.

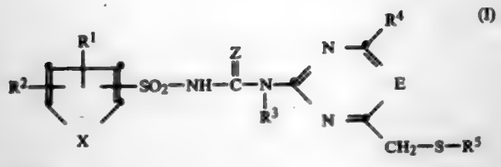
Filed Aug. 15, 1984, Ser. No. 641,091

Claims priority, application Switzerland, Aug. 26, 1983, 4669/83

Int. Cl.[4] A01N *57/16;* **C07F** *9/65*

U.S. Cl. 71—87 **19 Claims**

1. An N-arylsulfonyl-N'-(4-mercaptomethylpyrimidinyl)-urea of the formula I

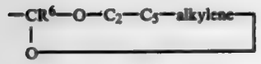


(I)

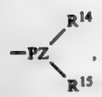
wherein
E is —CH=,
X is oxygen, sulfur, —NR^3—, —N=CR^3—, —CH=CH— or



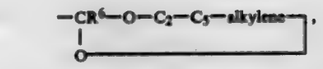
Z is oxygen or sulfur,
R^1 is hydrogen, halogen, nitro, ethinyl, —$NR^{16}R^{17}$, —CR^6(—O—C_2—C_3—alkylene)—O—di-C_1–C_4-alkoxy,



—CW—R^6, —SO_2—NR^7R^8, —CO—R^9, —Y_m—R^{10}, —SO_2—R^{11} or O—SO_2R^{12}, in which m is zero or 1,
R^2 is hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl or nitro,
R^3 is hydrogen, C_1–C_4-alkyl, C_3–C_4-alkenyl or C_1–C_4-alkoxy,
R^4 is hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio, C_2–C_4-alkoxyalkyl, C_2–C_4-alkoxyalkoxy, cyclopropyl, —NH_2, C_1–C_4-alkylamino, di-C_1–C_4-alkylamino, or a saturated 5- to 7-membered nitrogen heterocycle selected from pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine and hexamethyleneimine
R^5 is



R^6 is hydrogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_3–C_6-cycloalkyl, C_4–C_7-cycloalkylalkyl or C_2–C_4-alkoxyalkyl,
R^7 and R^{16} independently of one another are hydrogen, C_1–C_4-alkyl, C_1–C_4-cyanoalkyl or C_1–C_4-alkoxy,
R^8 and R^{17} independently of one another are hydrogen, C_1–C_4-alkyl, C_3–C_4-alkenyl or C_1–C_4-alkoxy, or
R^7 and R^8 as well as R^{16} and R^{17} independently of one another form, together with the nitrogen atom binding them, a 5- to 7-membered saturated nitrogen heterocycle selected from pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine and hexamethyleneimine,
R^9 is C_1–C_4-alkoxy, C_3–C_6-alkenyloxy, C_3–C_6-alkinyloxy, C_2–C_6-haloalkoxy, C_1–C_4-cyanoalkoxy, C_1–C_4-alkylthio, C_3–C_4-alkenylthio, C_3–C_4-alkinylthio, C_5–C_6-cycloalkoxy, C_4–C_7-cycloalkylalkoxy, —NR^7R^8 or C_2–C_6-alkoxyalkoxy,
R^{10} is C_3–C_4-alkinyl, C_2–C_4-alkenyl, C_1–C_4-alkyl, C_2–C_4-alkenyl mono- or polysubstituted by halogen, cyano, C_1–C_4-alkoxy or —SO_n—C_1–C_4-alkyl, or is C_1–C_4-alkyl mono- or polysubstituted by halogen, cyano, nitro, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-haloalkylthio, —SO_n—C_1–C_4-alkyl, —T—CX—R^{18},



—CO—R^6, —CO—R^9 or —SO_2—NR^7R^8, in which n is zero, 1 or 2,
R^{11} is C_2–C_4-haloalkoxy,
R^{12} is C_1–C_4-alkyl, C_1–C_4-haloalkyl or —$NR^{16}R^{17}$,
R^{14} and R^{15} independently of one another are C_1–C_4-alkyl, C_1–C_4-alkoxy, C_3–C_4-alkoxyalkoxy, C_3–C_4-alkenyloxy, C_1–C_6-alkylthio, C_1–C_4-alkylamino or di-C_1–C_4-alkylamino,
R^{18} is C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio or —$NR^{16}R^{17}$,
T is oxygen or sulfur,
W is oxygen or =N—O—R^3, and
Y is oxygen, sulfur, —SO— or —SO_2—;
and the salts of these compounds.

15. A herbicidal and plant-growth-inhibiting composition which contains, as active ingredient, at least one arylsulfonyl-N'-(4-mercaptomethylpyrimidinyl)-urea of claim 1, together with carriers and/or other additives.

16. A method of controlling undesirable plant growth, which method comprises applying thereto or to the locus thereof an effective amount of an active substance of claim 1.

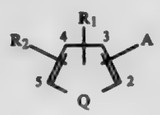
4,639,265

THIOPHENE OR FURAN HERBICIDES

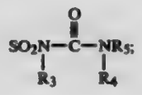
Rafael Shapiro, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 574,711, Jan. 27, 1984, Pat. No. 4,547,217, which is a continuation-in-part of Ser. No. 247,134, Mar. 24, 1981, abandoned. This application Aug. 12, 1985, Ser. No. 764,617
Int. Cl.[4] A01N *47/36*; C07D *491/048, 491/052, 239/70*
U.S. Cl. 71—90 15 Claims

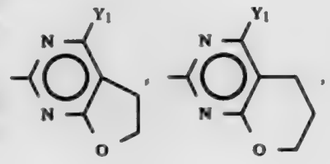
1. A compound of the formula:



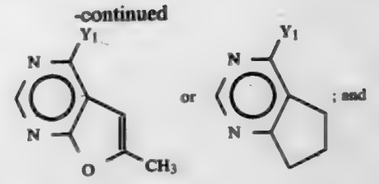
wherein
Q is O or S;
A is



R_1 is $R_6S[O]_n$;
R_6 is C_1–C_4 alkyl, C_3–C_4 alkenyl, cyclopentyl or cyclopropylmethyl;
R_2 is H, Cl, Br or CH_3;
R_3 and R_4 are independently H or CH_3;
n is 0, 1 or 2;
R_5 is



-continued



Y_1 is H, Cl, CH_3 or OCH_3;
and their agriculturally suitable salts; provided that both R_3 and R_4 may not simultaneously be CH_3, and further provided that R_1 and A are bonded to adjacent carbon atoms of the thiophene or furan ring.

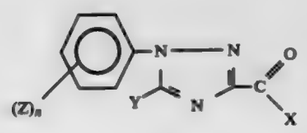
4,639,266

PLANT PROTECTION AGENTS BASED ON 1,2,4-TRIAZOLE DERIVATIVES AND ALSO NEW DERIVATIVES OF 1,2,4-TRIAZOLE

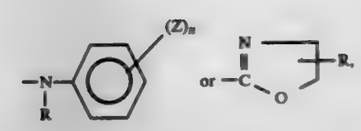
Günther Heubach, Kelkheim; Klaus Bauer, Rodgau, and Hermann Bieringer, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 9, 1985, Ser. No. 774,067
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, 3433249; Jul. 15, 1985, 3525205
Int. Cl.[4] A01N *43/653, 43/84*; C07D *294/08*
U.S. Cl. 71—92 7 Claims

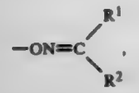
1. A plant protection agent which contains an effective amount of a compound of the formula I



in which
the Zs are identical or different and denote halogen, nitro, cyano, trifluoromethyl, (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy or (C_1–C_4)-alkylthio, it being possible for the alkyl, alkoxy and alkylthio groups to be substituted by one or more halogen atoms, in particular fluorine or chlorine, or (C_3–C_6)-cycloalkyl which can be substituted by (C_1–C_4)-alkyl, or denotes phenyl or phenoxy, it being possible for phenyl and phenoxy to be monosubstituted or polysubstituted by halogen and/or monosubstituted by trifluoromethyl,
Y denotes hydrogen, (C_1–C_4)-alkyl which can be wholly or partially substituted by halogen atoms and/or monosubstituted by (C_1–C_4)-alkoxy or (C_1–C_4)-alkylthio, or (C_2–C_6)-alkenyl or C_2–C_6)-alkinyl or denotes ((C_3–C_6)-cycloalkyl which can be substituted by (C_1–C_4)-alkyl and/or a dichlorovinyl radical, and
X denotes hydroxyl, (C_1–C_4)-alkyl, ((C_3–C_6)-cycloalkoxy, phenyl-(C_1–C_6)-alkoxy, phenoxy, (C_2–C_6)-alkenyloxy, (C_2–C_6)-alkinyloxy or (C_1–C_6)-alkoxy or (C_1–C_6)-alkylthio, it being possible for the alkoxy or alkylthio group to be substituted by (C_1–C_2)-alkoxy, mono-(C_1–C_4)-alkylaminocarbonyl, di-[(C_1–C_4 -alkyl]aminocarbonyl, phenylaminocarbonyl, N-[(C_1–C_4 -alkyl]-N--phenyl-aminocarbonyl, mono-(C_1–C_6)-alkylamino, di-(C_1–C_6)-alkylamino, (C_1–C_6 -alkylcarbonyloxy, (C_1–C_2)-alkylthio, cyano or halogen, or denotes a radical of the formulae



in which R in each case denotes hydrogen or (C_1–C_4)-alkyl, or denotes mono-(C_1–C_4)-alkylamino, di-(C_1–C_4)-alkylamino, (C_5–C_6)-cycloalkylamino, piperidino, morpholino or 2,6-dimethylmorpholino or a radical of the formula



in which R^1 and R^2 can be identical or different and denote (C_1–C_4)-alkyl radicals, and in which R^1 and R^2 together can also form a 5-membered, 6-membered or 7-membered cycloalkyl radical, and
n denotes the number 0, 1, 2 or 3, or, in the event that X=OH, salts thereof which can be employed for agriculture.

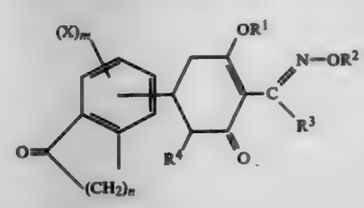
4,639,267

HERBICIDAL CYCLOHEXANE-1,3-DIONE DERIVATIVES

Graeme J. Farquharson, Carlton; Keith G. Watson, Blackburn North, and Graham J. Bird, Ascot Vale, all of Australia, assignors to ICI Australia Limited, Victoria, Australia

Filed Sep. 10, 1985, Ser. No. 774,526
Claims priority, application Australia, Sep. 24, 1984, PG7274
Int. Cl.[4] A01N *35/10*; C07C *131/00*
U.S. Cl. 71—98 12 Claims

1. A compound of the Formula I:



(I)

wherein:
m is zero or an integer selected from 1 to 3;
n is an integer selected from 2 to 4;
X, which may be the same or different, are indepdently selected from the group consisting of: halogen, C_1 to C_6 alkyl, C_1 to C_6 alkoxy and C_1 to C_6 alkylthio;
R^1 is selected from the group consisting of: hydrogen; C_2 to C_6 alkanoyl; benzoyl and substituted benzoyl wherein the benzene ring is substituted with from one to three substituents selected from the group consisting of halogens, nitro, C_1 to C_6 alkyl and C_1 to C_6 alkoxy; benzenesulfonyl and substituted benezenesulfonyl wherein the benzene ring is substituted with from one to three substituents selected from the group consisting of halogen, nitro, C_1 to C_6 alkyl and C_1 to C_6 alkoxy; and an inorganic or an organic cation selected from the alkali metals, the alkaline earth metals, the transition metals, the ammonium ion and the tri- and tetra(alkyl) ammonium ions wherein alkyl is selected from C_1 to C_6 alkyl and C_1 to C_6 hydroxyalkyl;
R_2 is selected from the group consisting of: C_1 to C_6 alkyl; C_2 to C_6 alkenyl; C_2 to C_6 haloalkenyl; C_2 to C_6 alkynyl, C_3 to C_6 haloalkynyl; and substituted C_1 to C_6 alkyl wherein the alkyl group is substituted with a substituent

selected from the group consisting of halogen, C_1 to C_6 alkoxy, C_1 to C_6 alkylthio, phenyl and substituted phenyl wherein the benzene ring is substituted with from one to three substituents selected from the group consisting of halogen, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_1 to C_6 alkoxy, and C_1 to C_6 alkylthio;

R^3 is selected from the group consisting of: C_1 to C_6 alkyl; C_1 to C_6 fluoroalkyl; C_2 to C_6 alkenyl; C_2 to C_6 alkynyl; and phenyl; and

R_4 is selected from the group consisting of: hydrogen; halogen; cyano; C_1 to C_6 alkyl; and (C_1 to C_6 alkoxy) carbonyl.

10. A process for severely damaging or killing unwanted plants which process comprises applying to said plants, or to the growth medium of said plants, an effective amount of a compound as defined according to claim 1.

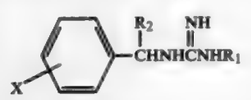
4,639,268

NITRO- AND CYANOGUANIDINES AS SELECTIVE PREEMERGENCE HERBICIDES AND PLANT DEFOLIANTS

Robert L. Arotin, Yardley, Pa.; Bryant L. Walworth, Pennington, N.J., and Michele E. Marini, Blacksburg, Va., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 29, 1985, Ser. No. 759,703
Int. Cl.[4] A01N *37/34, 33/04*
U.S. Cl. 71—105 10 Claims

1. A method for the preemergence control of undesirable broadleaf weeds and grass plants comprising, applying to soil containing seeds or other propagating organs of said undesirable broadleaf weeds and grass plants a herbicidally effective amount of a substituted nitroguanidine or cyanoguanidine compound selected from the group consisting of



(I)

wherein R_1 is NO_2 or CN; R_2 is n-C_3H_7, CH_2OCH_3 or $CH_2CH{=}CH_2$; X is hydrogen, o-F, m-F, p-F, m-OCH_3, m-OH or p-Cl; the salts, tautomers and optical isomers thereof and the (+) or (−)-isomers of compounds having the above structure, wherein R_1 and X are as described and R_2 is CH_3, C_2H_5 or CF_3.

4,639,269

METHOD AND APPARATUS FOR THE REDUCING TREATMENT OF MOLTEN METALS AND/OR SLAGS THEREOF

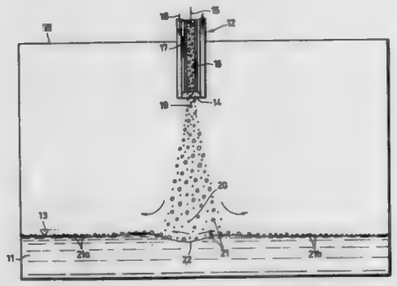
Hermann Hilbrans, Langenfeld; Michael Gamroth, Cologne; Gerhard Melcher, Cologne, and Friedrich Megerle, Cologne, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Del.X

Filed Dec. 6, 1985, Ser. No. 805,805
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1984, 3444962
Int. Cl.[4] C22B *15/00*
U.S. Cl. 75—76 12 Claims

1. A method for reducing molten material comprising metals or slags which comprises:

providing a confined molten bath of said material,

blowing a high velocity reduction gas stream onto the surface of said molten bath to provide a blow impression therein, said reduction gas stream including coal or coke particles in an oxygen containing gas, the amount of oxygen containing gas being less than that required to convert said coal or coke completely to CO, thereby providing a reduction gas stream consisting partly of non-gasified coal or coke particles and partly of a CO containing gas, and



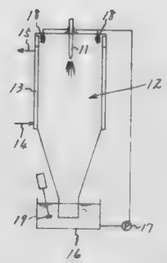
depositing said non-gasified coal or coke particles onto the surface of said melt outside the perimeter of said blow impression to inhibit reoxidation of said melt.

4,639,270

METHOD FOR PREPARING A COATING COMPOSITION FOR USE TO PRODUCE HEAT-SENSITIVE RECORD MATERIAL

Masatoshi Ando, Nishinomiya; Hiromine Mochizuki, and Kazuta Saito, both of Amagasaki, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1983, Ser. No. 517,774
Claims priority, application Japan, Jul. 30, 1982, 57-134038
Int. Cl.[4] C09D *11/00*
U.S. Cl. 106—21 13 Claims



1. In a method for preparing a coating composition for use to produce heat-sensitive record material comprising a base sheet having a color developing layer which includes finely divided particles comprising colorless chromogenic material and finely divided particles comprising acceptor which is reactive with said colorless chromogenic material to develop a color, at least one of said two kinds of finely divided particles further including a heat fusible material having a melting point within the range of 60° C. to 200° C., said heat fusible material being capable of dissolving at least one of said colorless chromogenic material and said acceptor therein when melted,

the improvement comprising the steps of:

admixing and heating at least one colorless chromogenic material or acceptor and at least one heat fusible material to form a co-melt,

atomizing said co-melt with a three-fluid type spray nozzle in which three different kinds of fluids comprising, respectively, said co-melt, an aqueous solution of a dispersing agent and high pressure steam or air, flow through three respective passages in said nozzle meeting at a common junction where said fluids are uniformly admixed and stirred before they are sprayed together from an opening in said nozzle to form finely divided particles comprising said colorless chromogenic material or acceptor and said heat fusible material, and

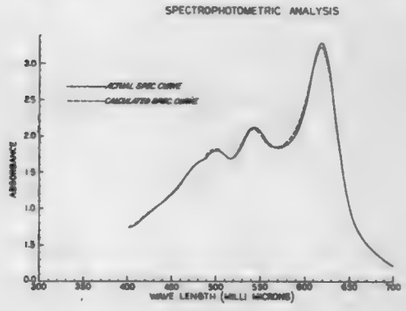
preparing a coating composition including said finely divided particles dispersed therein.

4,639,271

CHROMOGENIC MIXTURES

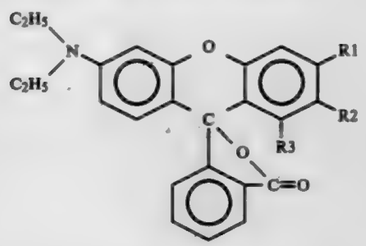
Robert W. Brunea, Grand Island, and James M. Raby, Lewiston, both of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Apr. 24, 1985, Ser. No. 726,484
Int. Cl.[4] C09D *11/00*
U.S. Cl. 106—21 10 Claims



1. A chromogenic mixture comprising:

(a) approximately 10% to 60% by weight of an orange chromogen having the following formula:



where R1, R2, and R3 are alkyl groups having 1–5 carbon atoms or hydrogen or combinations thereof;

(b) approximately 5% to 60% by weight of a blue, indigo or violet chromogen; and

(c) approximately 30% to 70% by weight of a green or single component black chromogen.

4,639,272

LIQUID COLORANT FOR ABS RESINS

Masashi Ito, Saitama; Toshio Ohashi, and Katsumi Ui, both of Aichi, all of Japan, assignors to Toyo Ink Mfg., Co., Ltd. and Toyoto Jidosha Kabushiki Kaisha, both of, Japan

Filed Jun. 26, 1985, Ser. No. 748,879
Claims priority, application Japan, Jun. 26, 1984, 59-130056
Int. Cl.[4] C08L *91/00, 67/02;* C08K *5/10;* C08J *3/20*
U.S. Cl. 106—243 13 Claims

1. A liquid colorant for ABS resins, consisting essentially of 100 parts by weight of a pigment or dye and 25 to 2,000 parts by weight of a saturated liquid polyester prepared mainly from an aliphatic dicarboxylic acid and an alcohol component comprising a dihydric alcohol, and having a viscosity of 1,500 poises or less at room temperature.

4,639,273

ASPHALT-ADHESION IMPROVING ADDITIVES PREPARED BY FORMALDEHYDE CONDENSATION WITH POLYAMINES

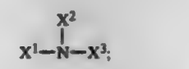
Dennis W. Gilmore, Fairfield, and Thomas G. Kugele, Cincinnati, both of Ohio, assignors to Morton Thiokol, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 492,136, May 6, 1983, abandoned. This application Aug. 12, 1983, Ser. No. 522,751
Int. Cl.[4] C09D *3/24*
U.S. Cl. 106—281 N 35 Claims

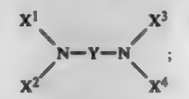
1. A composition of matter comprising

(a) an asphalt, and

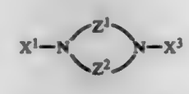
(b) a formaldehyde adduct of an amine or amide, said formaldehyde adduct comprising a compound or mixture of compounds produced by the reaction of a formaldehyde source with an amine or amide having a formula selected from:



General Formula I



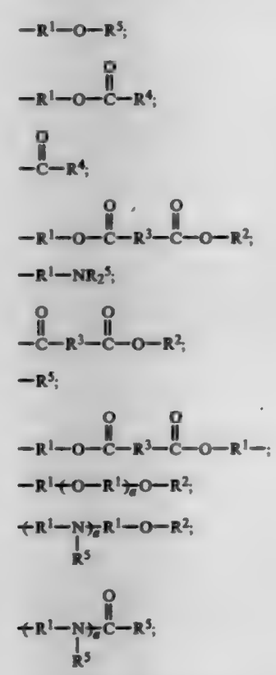
General Formula II



General Formula III

and adducts of said amines and amides with ethylene oxide; alkyl cycloalkyl, or aryl-substituted ethylene oxide; or cyclohexylene oxide; wherein:

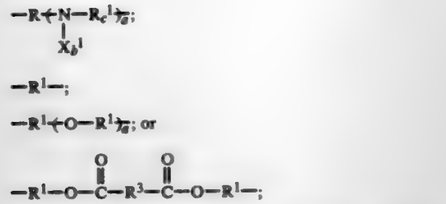
i. X^1, X^2, X^3, and X^4 are independently selected from:



and hydrogen; or X_1 and X_2 or X_3 and X_4 together form a 5 or 6-membered ring containing at least one nitrogen

atom, optionally substituted by oxygen or R^5, provided that at least one X or one R^5 must be hydrogen;

ii. Y is selected from the group consisting of



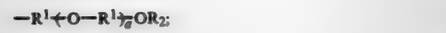
iii. Z^1 and Z^2 are independently selected from ethylene and substituted ethylene;

iv. R is selected from alkylene of from one to six carbon atoms and a 6-membered ring with two nitrogens;

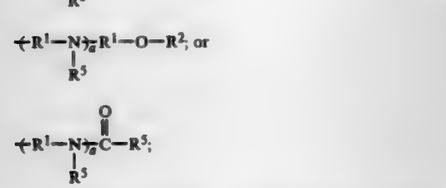
v. R^1 is alkylene of from 1 to 20 carbon atoms, cycloalkylene, arylene, or the previous substituted by hydroxy, ester or hydrocarbyl-substituted alkylene;

vi. R^2 is alkyl of from 1 to 20 carbon atoms, cycloalkyl, aryl, alkaryl, aralkyl, hydrogen, or the previous substituted by hydroxy or ester;

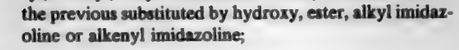
vii. R^3 is alkylene, cycloalkylene, arylene, or the previous substituted by hydrocarbyl, hydroxyl, ester or



viii. R^4 is alkenyl of from 1 to 20 carbon atoms, alkyl, aryl, alkaryl, aralkyl, or cycloalkyl, optionally substituted by hydroxy or ester;



ix. R^5 is hydrogen; alkenyl, alkyl, cycloalkyl, aryl, alkaryl, aralkyl, alkyl imidazoline, alkenyl imidazoline, or the previous substituted by hydroxy, ester, alkyl imidazoline or alkenyl imidazoline;



or



x. a is 0 or 1; b is 0, 1, or 2; c is 0, 1, or 2; and

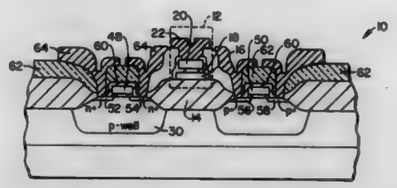
xi. compounds which contain at least two nitrogen atoms are not within the scope of General Formula I if they fall within the scope of General Formula II.

4,639,274

METHOD OF MAKING PRECISION HIGH-VALUE MOS CAPACITORS

Surinder Krishna, Fremont, Calif., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

Filed Nov. 28, 1984, Ser. No. 676,033
Int. Cl.[4] H01L *21/22, 21/265*
U.S. Cl. 148—1.5 9 Claims



1. An improved method for forming a capacitor on an integrated circuit structure comprising:

forming a first polycrystalline silicon layer;

implanting n-conductivity type ions into the first polycrystalline silicon layer at an implant energy between approximately 80 and 100 keV;

oxidizing the surface, of the polycrystalline silicon layer to form a uniform interpoly oxide layer, the oxidation being at a temperature which, for the implant dosage of the n-conductivity type ions, will make the interpoly oxide layer between approximately 770 and 2000 Angstroms thick;

annealing the interpoly oxide layer in a gaseous mixture including HCl at a temperature of approximately 1100° C.; and

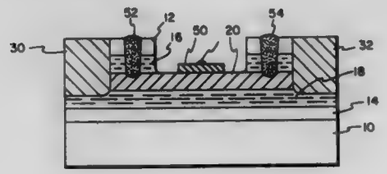
forming a second polycrystalline silicon layer over said interpoly oxide layer.

4,639,275

FORMING DISORDERED LAYER BY CONTROLLED DIFFUSION IN HETEROJUNCTION III-V SEMICONDUCTOR

Nick Holonyak, Jr., Urbana, Ill., assignor to The Board of Trustees of The University of Illinois, Urbana, Ill.

Continuation-in-part of Ser. No. 370,756, Apr. 22, 1982, Pat. No. 4,511,408. This application Aug. 31, 1984, Ser. No. 646,739
Int. Cl.[4] H01L *21/263, 21/265*
U.S. Cl. 148—1.5 23 Claims



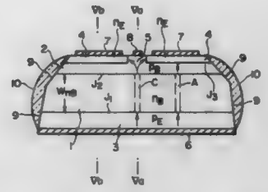
1. A method for converting a multilayer semiconductor structure, which comprises first active semiconductor regions interposed between second semiconductor barrier layers, into a disordered alloy of both said first and second semiconductors, said alloy exhibiting a higher energy gap than said first active semiconductor region, the method comprising diffusing a disordering element, selected from the group consisting of silicon, germanium, and tin, into said multilayer structure said diffusing being performed at a temperature in the range between about 700° C. and 850° C.

4,639,276

METHOD OF MAKING THYRISTOR WITH A HIGH TOLERABLE BIAS VOLTAGE

Tsutomu Nakagawa, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 536,797, Sep. 28, 1983, abandoned. This application Sep. 19, 1985, Ser. No. 777,577
Claims priority, application Japan, Sep. 28, 1982, 57-171415
Int. Cl.[4] H01L *21/265*
U.S. Cl. 148—1.5 7 Claims



1. A process for fabricating a thyristor, comprising:

preparing a semiconductor substrate of a first conductivity type by exposing said substrate to neutron irradiation in a pattern such that a central area of said substrate is exposed to a higher dose of neutron radiation than is the peripheral area, in order to form a higher impurity concentration at said central area;

diffusing an impurity of a second conductivity type into the upper and lower surfaces of said substrate to form a base layer (2) of said second conductivity type on the upper surface thereof, and a first emitter layer (3) of said second conductivity type on the lower surface thereof;

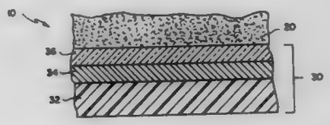
diffusing an impurity of said first conductivity type from the upper surface of said substrate to form a second emitter layer (4) on portions of said upper surface except for a central gate region (5) thereof, said gate region being formed over said central area.

4,639,277

SEMICONDUCTOR MATERIAL ON A SUBSTRATE, SAID SUBSTRATE COMPRISING, IN ORDER, A LAYER OF ORGANIC POLYMER, A LAYER OF METAL OR METAL ALLOY AND A LAYER OF DIELECTRIC MATERIAL

Gilbert A. Hawkins, Mendon, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 2, 1984, Ser. No. 626,848
Int. Cl.[4] H01L *27/12, 29/04*
U.S. Cl. 148—33.3 4 Claims



1. A substrate having thereon a layer of semiconductor material containing one or more majority carrier semiconductor devices, said substrate comprising, in order,

a layer of organic polymer;

a layer of metal or metal alloy;

and a layer of dielectric material completely isolating said metal or metal alloy later from said semiconductor material;

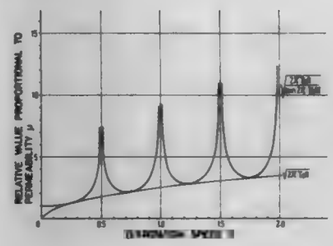
said dielectric layer and said metal or metal alloy layer together having thickness that are sufficient to disipate the heat that occurs when said semiconductor material is heated to 1000° C., without causing significant decomposition or thermal expansion of said polymer layer.

4,639,278

METHOD OF MANUFACTURING AN AMORPHOUS MAGNETIC ALLOY

Yoshimi Makino; Yoshitaka Ochiai; Satoru Uedaira; Kazuhide Hotai; Koichi Aso, all of Yokohama, and Masatoshi Hayakawa, Chigasaki, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 314,737, Oct. 23, 1981, abandoned. This application Dec. 23, 1983, Ser. No. 564,729
Claims priority, application Japan, Oct. 31, 1980, 55-153985
Int. Cl.[4] C21D *1/04*
U.S. Cl. 148—108 7 Claims



1. A method of manufacturing an amorphous magnetic alloy comprising the steps of:

(A) preparing an amorphous magnetic alloy ribbon, and

(B) annealing said ribbon at an elevated temperature less than the crystallization temperature of said alloy, said annealing being carried out in a magnetic field, said ribbon and said magnetic field being continuously rotated with respect to each other, the relative rotation being at a velocity substantially meeting the following relationship:

$$R_{\tau 0}=0.5n$$

where:

R is the number of revolutions per minute,

τ_0 is the average time required to cause the amorphous alloy material to reach a thermal equilibrium state of induced magnetic anisotropy, and

n is an integer of at least 1.

4,639,279

SINGLE FREQUENCY INDUCTION HARDENING PROCESS

Madhu S. Chatterjee, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1985, Ser. No. 797,707
Int. Cl.[4] C21D *9/24*
U.S. Cl. 148—147 2 Claims

1. In a single shot process for contour hardening a gear by induction, the process including a preheat step during which the gear is positioned within an encircling coil and heated by supplying the coil with alternating current for a desired preheat interval at a preheat power level, and a final heat step during which the gear is maintained within the coil and further heated by supplying the coil with alternating current for a desired final heat interval at a final heat power level, the improvement wherein:

the alternating current supplied to the coil in both the preheat and final heat steps is of a single frequency in the

general range of 50 kHz–100 kHz, and the time required for the supplied power level to achieve the final heat



power level in the final heat step is no more than approximately one-third of the desired final heat time.

4,639,280

MONOCRYSTALLINE ALLOY WITH A NICKEL MATRIX BASIS

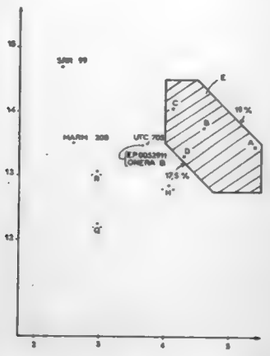
Allan Fredholm, Evry; James H. Davidson, Varennes-Vauzelles; Tasaddaq Khan, Jouy-en-Josas, and Jean-Marc C. F. Theret, Versailles, all of France, assignors to Association pour la Recherche et le Developpement des Methodes et Processus Industriels "A.R.M.I.N.E.S." , Paris; Societe Imphy S.A., Paris La Defense; Office National d'Etudes et de Recherche Aerospatiales (ONERA), Chatillon and Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.-M.A.", Paris, all of, France

Filed Dec. 10, 1984, Ser. No. 679,766

Claims priority, application France, Dec. 29, 1983, 83 20986

Int. Cl.[4] C22C *19/05*

U.S. Cl. 148—404 **14 Claims**



1. Monocrystalline alloy with a nickel base matrix having a high creep resistance, having a density of the order of 8.6% and consisting essentially of the following composition:

Co	5	to	8%
Cr	6.5	to	10%
Mo	0.5	to	2.5%
W	5	to	9%
Ta	6	to	9%
Al	4.5	to	5.8%
Ti	1	to	2%
Nb	0	to	1.5%
C,Zr,B	each less than 100 ppm		
Ni	remainder to 100%		

the percentages being given by weight, and the following criteria being observed:

the summation of the percentages by weight of Ta+Mo+½W lies between 11.5% and 13.5%;

the summation of Ti+Al+Ta+Nb in atomic percentages lies between 15.5 and 17%;

the summation of the atomic percentages of Ta+Nb+Mo+½W lies between 4 and 5.5%;

the summation of the atomic percentages Ti+Al+Ta+Nb+Mo+½W lies between 17.5 and 19%; and the summation of the atomic percentages Ti+Al lies between 12.8% and 14.5%.

4,639,281

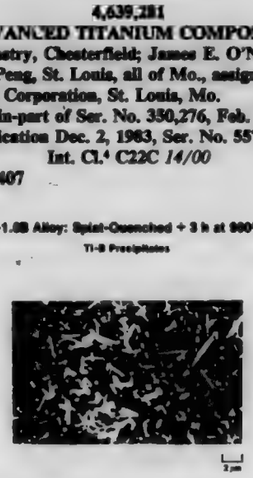
ADVANCED TITANIUM COMPOSITE

Shankar M. Sastry, Chesterfield; James E. O'Neal, Bridgeton, and Tzy C. Peng, St. Louis, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 350,276, Feb. 19, 1982. This application Dec. 2, 1983, Ser. No. 557,597

Int. Cl.[4] C22C *14/00*

U.S. Cl. 148—407 **11 Claims**



1. In an annealed titanium alloy, the improvement consisting essentially of the inclusion of anneal developed in situ formed fibrous dispersoids in a rapidly solidified titanium matrix, the dispersoids being effective to produce an increased strength in the resulting alloy.

4,639,282

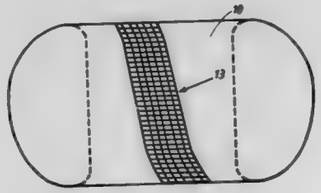
INSULATION OF METALLIC SURFACES IN POWER TRANSFORMERS

Bertil Moritz, Ludvika, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed Feb. 18, 1986, Ser. No. 829,953

Int. Cl.[4] H01B *13/26*

U.S. Cl. 156—53 **14 Claims**



1. A method for electrically insulating a metallic surface immersed in an electrically insulating liquid medium which is

subjected to a high d.c. voltage, which method comprises covering the metallic surface with an electrically insulating layer comprising at least three layers of a wrapping material having a fibrous and porous structure, the individual layers having through-going pores or openings with an opening area in the range 0.2–10 mm^2 and with an aggregate pore area which is from 20 to 80% of the total area of the wrapping material.

4,639,283

METHOD FOR MAKING A DIAPHRAGM FOR AN ELECTRO-ACOUSTIC TRANSDUCER

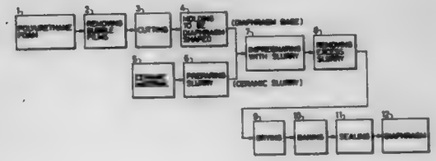
Akira Nakamura, Iwata, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 29, 1984, Ser. No. 676,280

Claims priority, application Japan, Dec. 2, 1983, 58-227890; Dec. 2, 1983, 58-186695

Int. Cl.[4] B32B *19/06*; C04B *38/06*; B28B *1/26, 7/34*

U.S. Cl. 156—89 **8 Claims**



1. A method for making a diaphragm for an electro-acoustic transducer, comprising:

(a) providing a plate-shaped mold of combustible foamed plastics material having as a mold cavity a network of open interstices extending three-dimensionally therethrough and being exposed externally thereof;

(b) filling said mold cavity with a slurry of ceramic material;

(c) baking said ceramic material and burning-away said foamed plastics material, thereby providing a diaphragm base made of baked ceramic material having a network of open interstices extending three-dimensionally therethrough and being exposed externally thereof; and

(d) applying a sealant to said diaphragm base so as to render said diaphragm base substantially air-impermeable thicknesswise thereof.

2. The method of claim 1, wherein:

said diaphragm base has a front surface and a back surface and the step of applying a sealant is carried out by adhering to at least one of said surfaces a sheet made of any one of Al, Be, Ti, B, carbon fiber-reinforced plastic material and aramid fiber-reinforced plastic material.

4,639,284

PROCESS FOR MANUFACTURING A VARIABLE PITCH MULTI-BLADE PROPELLER BY MOLDING RESIN-IMPREGNATED FAILS AROUND A PREFORM

Rene L. Mouille, Aix-en-Provence; Marc Declerco, Pelissane; Jean-Pierre Jalaguier, Vitrolles, and Bernard Jaugey, Marseilles, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Division of Ser. No. 587,649, Mar. 8, 1984. This application Jan. 4, 1985, Ser. No. 688,896

Claims priority, application France, Mar. 18, 1983, 83 04448

Int. Cl.[4] B32B *31/20*

U.S. Cl. 156—213 **4 Claims**

1. A process for manufacturing a rotor blade having

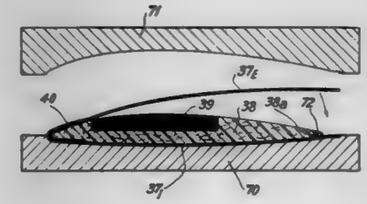
a shell with aerodynamic profile having an upper face and a lower face both extending from a blade leading edge part to a blade trailing edge part and each formed of a stacking of at least two foils of high mechanical resistance fiber fabrics rigidified by a polymerized synthetic impregnation resin,

a filling body in a foam-like synthetic material which has the same general profile as said shell and is disposed in the latter, extends chordwise from said leading edge part to said trailing edge part and presents a cut-out extending spanwise over all the length of said filling body and opening in a face of said filling body which is turned towards said upper face of said shell,

a spar constituted by a single elongated leaf of rovings of fibers with high mechanical resistance agglomerated by a polymerized synthetic resin, said spar having a longitudinal axis substantially parallel to that of the blade and presenting a spanwise extending major part provided with a section corresponding substantially to that of said cut-out, said spar major part being housed and fixed in said cut-out and presenting a spar face turned towards said shell upper face and along which said spar major part is directly fixed against an inner surface part of said shell upper face, said spar further presenting an end part emerging from said shell and arranged as a twistable and flexible spar root part for connecting said spar to a rotor hub, and

a metal leading edge cover integrated in said shell in said leading edge part;

the process being carried out by means of a lower half mould and a upper half mould provided with complementary impressions having the forms respectively of said lower face and of said upper face and the process comprising the following steps of



depositing and stacking in said lower half mould impression said at least two foils of fiber fabrics for forming said shell lower face and which are impregnated with a polymerizable synthetic resin,

positioning said filling body, made as a preformed body in a separate equipment, above said stacked foils,

disposing a major part of said leaf of rovings of fibers which are agglomerated by a polymerizable synthetic resin in said cut-out of said filling body and arranging an end part of said leaf of rovings beyond spanwise end of said cut-out for forming said spar root part,

depositing and stacking said at least two foils of fiber fabrics for forming said shell upper face and which are impregnated with a polymerizable synthetic resin on said stacked foils for forming said shell lower face, said filling body and said leaf of rovings thus assembled in said lower half mould,

installing said metal leading edge cover over parts of said stacked foils for forming said shell lower and upper faces which are adjacent to said leading edge part in said lower half mould,

placing said upper half mould on said lower half mould so that said stacked foils for forming said shell upper face are positioned in said upper half mould impression, and closing said half moulds against one another, and

polymerizing said resins impregnating said foils of fiber fabrics and agglomerating said rovings of fibers of said leaf.

4,639,285

HEAT-RESISTANT FLEXIBLE LAMINATE FOR SUBSTRATE OF PRINTED CIRCUIT BOARD AND A METHOD FOR THE PREPARATION THEREOF

Nilchiro Suzuki, Tokyo; Yoshimi Ogushi, Saitama; Kiyoshi Imai, Gunma; Nobuhiro Ohta, Kanagawa, and Susumu Ueno, Ibaraki, all of Japan, assignors to Shin-Etsu Chemical Co. Ltd., Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 826,004
Claims priority, application Japan, Feb. 13, 1985, 60-26057
Int. Cl.[4] B32B *31/00*; B29C *17/08*
U.S. Cl. 156—272.6 6 Claims

1. A method for the preparation of a metal-foiled flexible laminate formed of a flexible base film of an electrically insulating synthetic resin and a metal foil adhesively bonded to the base film and suitable for use as a substrate of printed circuit board which comprises the steps of:

(a) subjecting at least one surface of a base film of a synthetic resin to exposure to low temperature plasma generated in an atmosphere of an organosilicon compound in a gaseous form under a pressure in the range from 0.001 to 10 Torr; and

(b) adhesively bonding a metal foil to the surface of the base film exposed to the low temperature plasma by use of a silicone-based adhesive intervening therebetween.

4,639,286

CURABLE COMPOSITIONS CONTAINING AZLACTONE-FUNCTIONAL COMPOUNDS

Jerald K. Rasmussen, Stillwater; Steven M. Heilmann, North St. Paul, and Frederick J. Palensky, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

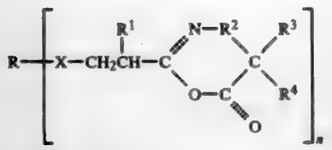
Division of Ser. No. 424,500, Sep. 27, 1984, Pat. No. 4,485,236. This application Aug. 17, 1984, Ser. No. 641,924
Int. Cl.[4] C09J *3/14, 5/04*; C08G *69/42*
U.S. Cl. 156—307.3 14 Claims

11. A process for adhering two substrates together comprising the steps:

(1) providing two substrates,

(2) coating, without solvent, upon one surface of one substrate a layer of the azlactone-functional compound having the formula

Formula I



wherein

R^1 is hydrogen, chlorine or a methyl group;

R^2 is a single bond of a methylene or ethylene group, the last two of which can be substituted by alkyl groups having 1 to 6 carbon atoms or phenyl groups;

R^3 and R^4 are independently an alkyl or cycloalkyl group having up to 12 carbon atoms, an aryl or aralkyl group having 6 to 12 carbon atoms, or R^3 and R^4 taken together with the carbon atom to which they are attached form a 5- to 12-membered carbocyclic ring;

X is a nucleophilic group selected from



and —S—, in which R^5 is a hydrocarbyl group selected from (1) an alkyl or cycloalkyl group having up to 18 carbon atoms and (2) an aryl or aralkyl group having 6 to 12 carbon atoms;

R is a mono or polyvalent organic group that has a valence of n and is the residue of a nucleophilic group-substituted compound, $(HX)_nR$, in which X is defined above, the residue having a molecular weight up to 20,000, R being selected from (1) an aliphatic group having 2 to 20 carbon atoms, these groups optionally having one to four catenary heteroatoms of oxygen, nitrogen or sulfur, (2) polyoxyalkylene, (3) polyester, (4) polyolefin, (5) polyacrylate, and (6) polysiloxane, all optionally including at least one non-nucleophilic or nucleophilic group, and

n is an integer having a value of one to six, and

(3) coating, without solvent, upon one surface of said second substrate a layer of at least one nucleophilic group-substituted compound, $R^6(YH)_m$, wherein

R^6 is an organic group that has a valence of m and is the residue of a nucleophilic group-substituted compound, $R^6(YH)_m$, R^6 being selected from

(a) mono- and polyvalent aliphatic and aromatic groups having 2 to 20 carbon atoms and optionally one to four caternary heteroatoms selected from oxygen, nitrogen, and sulfur,

(b) mono- and polyvalent groups selected from polyoxyalkylene, polyester, polyolefin, polyacrylate, and polysiloxane having a molecular weight up to 500,000,

both (a) and (b) groups being optionally substituted by at least one non-nucleophilic group or atom selected from cyano, halo, ester, ether, keto, nitro, silyl, and sulfide, wherein

Y is —O—, —X—, or

in which R^7 is hydrogen or a lower alkyl group of one to four carbon atoms, and

m is an integer having a value of 1 to 20,000,

(4) pressing the coated surfaces of the substrates together, and

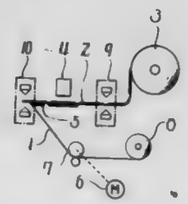
(5) allowing said at least one nucleophilic compound to cure said azlatone-functional compound.

4,639,287

LABEL FEED CONTROL SYSTEM

Yasuhiro Sakura, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 21, 1981, Ser. No. 265,833
Claims priority, application Japan, May 26, 1980, 55-69825; May 26, 1980, 55-69826; Jun. 20, 1980, 55-83572; Jun. 20, 1980, 55-83573
Int. Cl.[4] B65H *5/28*
U.S. Cl. 156—361 11 Claims



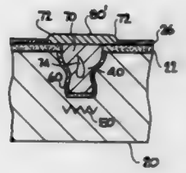
1. A label feed control system comprising a driver means for driving a feed means which transports a paper base ribbon with labels lightly adhered thereon, a separator means for peeling said label off said base ribbon, a label detector disposed adjacent said separator means for detecting a peeled-off front edge of said label while said label adheres to said base ribbon and after the front edge is peeled off said base ribbon by said separator means, and an incremental feed means for controlling the operation of said driver means such that said base ribbon is fed for a certain amount after said label detector has detected the peeled-off front edge of said label.

4,639,288

PROCESS FOR FORMATION OF TRENCH IN INTEGRATED CIRCUIT STRUCTURE USING ISOTROPIC AND ANISOTROPIC ETCHING

William L. Price, Saratoga; Ronald L. Schlupp, Los Gatos, and Mammen Thomas, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 5, 1984, Ser. No. 668,225
Int. Cl.[4] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 19 Claims



1. An improved method for making a trench in an integrated circuit structure wherein voids formed during deposition of material to refill the trench are not opened during planarization whereby oxidation of the walls of the void is prevented, the method comprising:

(a) patterning a silicon oxide layer previously deposited on a silicon integrated circuit structure containing device regions to be separated by said trench to form a mask;

(b) isotropically etching through said mask a shallow opening in said silicon layer sufficiently to undercut the edges of the openings in said overlying silicon oxide mask;

(c) anisotropically etching said silicon through said same mask to the desired depth of the trench;

(d) oxidizing the walls of said trench to provide electrical insulation between devices in said integrated circuit structure separated by said trench;

(e) refilling the trench by depositing material therein;

(f) planarizing said structure to remove any of said material deposited on the surface of said structure adjacent said trench; and

(g) growing an oxide layer layer said material in said trench.

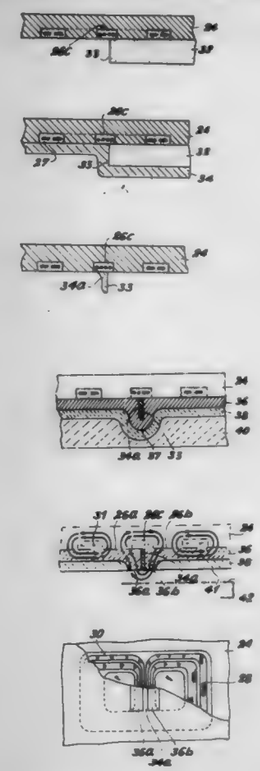
4,639,289

PROCESS FOR PRODUCING A MAGNETIC READ - WRITE HEAD AND HEAD OBTAINED BY THIS PROCESS

Jean-Pierre Lazzari, Corenc, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 30, 1985, Ser. No. 696,517
Claims priority, application France, Feb. 3, 1984, 84 01879
Int. Cl.[4] G11B *5/127, 5/17, 5/187*; B44C *1/22*
U.S. Cl. 156—643 4 Claims

1. A process for producing a magnetic read-write head, comprising the steps of: depositing a first magnetic material film on a support, etching a groove in said first magnetic film, said groove being shaped like a figure eight with two loops having in common a rectilinear central portion, the magnetic film being preserved within said two loops and forms there two central pole pieces separated by a central channel corresponding to the central portion of the figure eight, filling the groove with an electrically insulating material, etching in the insulating material a notch forming a double groove wound respectively around the two central pole pieces, depositing a conductive coating at the bottom of the double groove and then filling the double groove with a first electrically insulating material, depositing a second insulating material layer on the two central pole pieces and on the first electrically insulating material, etching in said layer a step having a side substantially perpendicular to the surface of the central portion of the figure eight but which is slightly off-center with respect thereto, depositing an amagnetic material film on the thus etched step, anisotropic etching said amagnetic film so as to only leave a wall of said amagnetic film perpendicular to the plane of the films and constituted by that part of the amagnetic film deposit-



ing on the side of the step, depositing a second magnetic material film forming a boss covering the wall, depositing a protective coating on said second magnetic material film and covering the boss and cutting the protective coating of the second magnetic material film and the amagnetic wall, along a common horizontal plane substantially parallel to said first magnetic film, pole pieces are separated by an air gap.

4,639,290

METHODS FOR SELECTIVELY REMOVING ADHESIVES FROM POLYIMIDE SUBSTRATES

Richard N. Leyden, Topanga, and Robert Lawrence, Malibu, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 9, 1985, Ser. No. 806,874
Int. Cl.[4] B44C *1/22*; B29C *17/08*; C03C *15/00*; C23F *1/02*
U.S. Cl. 156—644 14 Claims

1. A method for forming holes of predetermined size in a polyimide substrate having thereon a metallic layer and an adhesive layer linking said polyimide substrate to said metallic layer, said adhesive including a cross-linked acrylic polymer, comprising:

(a) forming at least one opening in said metallic layer, exposing a portion of said adhesive layer;

(b) contacting the portion of said adhesive layer exposed in said at least one opening with an alkaline glycol solution at a temperature in the range of about 120° C. to about 145° C., and for a time sufficient to loosen said exposed portion

of said adhesive layer, and then removing said exposed portion of said adhesive layer by contacting said exposed portion with an adhesive-removing medium; and

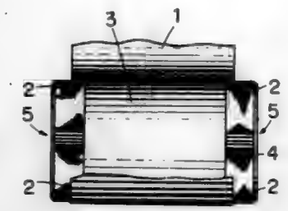
(c) contacting the portion of said polyimide substrate exposed by the removal of said portion of said adhesive layer, with an etchant for selectively removing exposed polyimide substrate from said at least one opening, said etchant being substantially non-reactive with said adhesive layer under the conditions of said contacting.

4,639,291

METHOD OF CONTROLLING MOISTURE PROFILE IN PAPER WEB IN PAPER DRYING PROCESS AND APPARATUS PRACTICING SAME

Toyokazu Ota, Omihachiman; Yutaka Nakamura, Tomakomai; Yutaka Ikeda, Tomakomai; Shunzi Katsuka, Tomakomai, and Yoshinobu Ito, Tomakomai, all of Japan, assignors to Shikishima Canvas Kabushiki Kaisha, Osaka and Oji Seishi Kabushiki Kaisha, Tokyo, both of, Japan

Filed Oct. 19, 1984, Ser. No. 662,483
Int. Cl.⁴ D21F *5/02*
U.S. Cl. 162—207 **9 Claims**



1. A method for adjusting the moisture profile across the width of a wet paper web being fed longitudinally and wrapped partially around the dryer cylinder in the drying section of a papermaking machine characterized by contacting the wet paper web with the surface of a dryer cylinder, said surface having in a circumferential area around said cylinder where the moisture profile of said wet paper web is adjusted, a synthetic fabric having filaments extending longitudinally and filaments extending transversely of said cylinder in the direction of cylinder rotation, said longitudinally extending filaments and said transversely extending filaments, with said dryer cylinder surface, forming air filled heat insulting voids between the intersticies between said filaments and said wet paper web width contacting said synthetic fabric and feeding said wet paper web around said cylinder to dry said paper web and adjust the moisture profile thereacross.

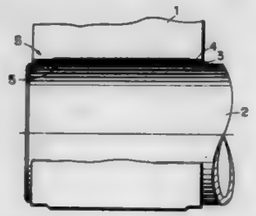
4,639,292

DRYING CYLINDER FOR USE IN PAPER MAKING

Toyokazu Ota, Omihachiman, and Yutaka Nakamura, Tomakomai, both of Japan, assignors to Oji Seisha Kabushiki Kaisha, Tokyo and Shikishima Canvas Kabushiki Kaisha, Osaka, both of, Japan

Filed Oct. 19, 1984, Ser. No. 662,481
Claims priority, application Japan, Dec. 6, 1983, 58-189012
Int. Cl.⁴ D21F *5/02*
U.S. Cl. 162—375 **5 Claims**

1. A drying cylinder for use in controlling the moisture profile of paper web in the cross machine direction in the drier section of a paper making machine comprising, a built-up insulating sheet fixedly wound around the circumferential surface of said drying cylinder in the surface portion where the width of said paper web where the mositure profile is controlled contacts said drying cylinder said insulation sheet being built up of a fluoride resin coated sheet having an adhesive agent coated layer on the one side thereof and a synthetic fabric sheet having air holding voids defined between intersticies of the filaments forming the fabric sheet and adhered to said fluorine resin coated sheet, said fabric sheet having a width slightly smaller than that of said fluorine resin coated sheet, said built-up insulating sheet being adhered to the circumferential surface of said drying cylinder with said fabric



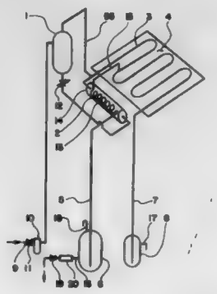
sheet having said air holding voids against said cylinder surface through said adhesive agent coated layer exposed at the end portion of said fluorine resin coated sheet and extending beyond the opposite longitudinal edges of said smaller width fabric sheet.

4,639,293

PARTIALLY EVACUATED SOLAR STILL

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed May 6, 1983, Ser. No. 492,445
Int. Cl.⁴ B01D *3/10*
U.S. Cl. 202—205 **5 Claims**



1. A partially evacuated solar still comprising in combination:

(a) a solar collector including a plurality of heater tubings wherein solar heat collected by the solar collector heats said heater tubings;

(b) a feed water supply means including a feed tubing for feeding water into said heater tubings wherein said water is evaporated to steam by heat transferred to said heater tubings from said solar collector;

(c) means for withdrawing said steam from said heater tubings through at least one steam tubing branching off from said heater tubings;

(d) a condenser for condensing said steam into water wherein the heat of condensation released by the steam is used to preheat the water fed to said heater tubings;

(e) a flow controlling means on said feed tubing for controlling the feed rate of the water fed to said heater tubings;

(f) means connected to said heater tubings for creating and maintaining a partial vacuum in said heater tubings; and

(g) means for purging reject water from said heater tubings without breaking said partial vacuum in said heater tubings.

4,639,294

PROCESS FOR PRODUCTION SORBIC ACID

Noboru Kamei; Kinjiro Ikeda; Keishi Aoyama, and Seitaro Hamano, all of Niigata, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 16, 1985, Ser. No. 755,518
Claims priority, application Japan, Jul. 16, 1984, 59-146027
Int. Cl.⁴ B01D *3/12*
U.S. Cl. 203—88 **6 Claims**

1. A process for producing sorbic acid by first reacting crotonaldehyde with ketene to prepare a polyester, then decomposing the polyester with hydrochloric acid, separating the crude sorbic acid from the reaction solution, and purifying the separated sorbic acid, said purifying step comprising the following steps:

(a) continuously dissolving the crude sorbic acid in petroleum at a temperature in the range of from 100° to 140° C. while evaporating the residual water and hydrochloric acid from the solution of the sorbic acid in petroleum;

(b) separating the tar content from the petroleum solution at a temperature in the range of from 100° to 140° C.;

(c) thereafter substantially precluding the formation of solid state (rigid) tar by subjecting the mixture of sorbic acid and petroleum to flash evaporation in a film-type evaporator at a reduced pressure in the range of from 20 to 60 mmHg,; and

(d) recycling residue from the bottom of the evaporator to step (b).

4,639,295

ZINC PHOSPHATING METHOD

Satoshi Miyamoto, Kanagawa, and Masamichi Nagatani, Tokyo, both of Japan, assignors to Amchem Products, Inc., Ambler, Pa.

Filed Aug. 14, 1985, Ser. No. 765,624
Claims priority, application Japan, Aug. 14, 1984, 59-170298
Int. Cl.⁴ C25D *11/36*
U.S. Cl. 204—38.1 **14 Claims**

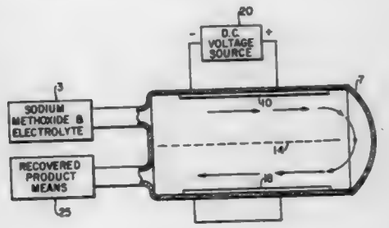
1. In a method for applying a zinc phosphate coating to a metal substrate, wherein said substrate is first given a conventional zinc phosphate coating, the improvement comprising providing a further zinc phosphate coating by using said zinc phosphate-coated substrate as a negative electrode and applying a direct current thereto, in the presence of an electrolyte solution comprising zinc ions in a concentration of 2 to 3 g/l, phosphate ions in a concentration of 8 to 14 g/l and chloride ions in a concentration of 3 to 6 g/l.

4,639,296

METHOD FOR FORMING ETHYLENE GLYCOL FROM SODIUM METHOXIDE

Ronald L. Cook, Aurora, Ill., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 31, 1986, Ser. No. 824,811
Int. Cl.⁴ C25C *1/00*
U.S. Cl. 204—59 R **8 Claims**



1. A method for forming ethylene glycol from sodium methoxide comprising the steps of:

combining sodium methoxide with anhydrous methanol to form a mixture,

flowing the mixture past an anode and then past a cathode, and

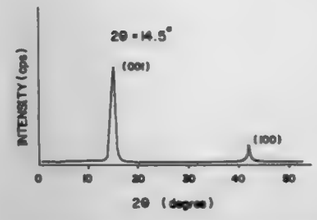
providing a DC voltage across the anode and the cathode so that the mixture yields ethylene glycol.

4,639,297

FLUORINATED GRAPHITES AND A PROCESS FOR PRODUCTION THEREOF

Kazumi Suematsu, Shizuoka, Japan; Kaoru Soutome, Pocatello, Id., and Tatsumi Arakawa, Shizuoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 584,992, Mar. 1, 1984, abandoned. This application Aug. 5, 1985, Ser. No. 763,067
Claims priority, application Japan, Mar. 16, 1983, 58-42230; Jun. 22, 1983, 58-110999; Jul. 19, 1983, 58-130355
Int. Cl.⁴ C25C *1/00*
U.S. Cl. 204—59 F **26 Claims**



1. A process for producing a fluorinated graphite intercalation compound having the formula $(C_xF)_n$ wherein x is a numerical value of about 2.0 to about 5.5 and n refers to an indefinite number of recurring (C_xF) units and having a crystalline structure exhibiting a peak at about 13.7° to about 15.0° in terms of an angle of 2θ corresponding to the diffraction of the (001) plane in the X-ray diffraction pattern, a peak in the vicinity of 685.3 eV due to the F_{1S} and two peaks in the vicinity of 287.5 eV and 284.3 eV due to the C_{1S} in the spectrum of electron spectroscopy of chemical analysis, two peaks in the vicinity of 1100 cm^{-1} and 1240 cm^{-1} in the IR spectrum, an electric conductivity of at least about $10^{-8}\Omega^{-1}cm^{-1}$; and being thermally stable in air up to 200° C. from the viewpoint concerning a pattern of X-ray diffraction, which process comprises subjecting a carbon material to electrolysis in hydrogen fluoride at a voltage of about 6.5 V to about 15 V at a temperature of about −40° C. to about 100° C. in the presence of water or a metal fluoride for a sufficient time to fluorinate the carbon material throughout.

4,639,298

OXIDATION OF ORGANIC COMPOUNDS USING CERIC IONS IN AQUEOUS METHANESULFONIC ACID

Robert P. Kreh, Jessup, and Robert M. Spotnitz, Catonsville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed May 5, 1986, Ser. No. 859,548
Int. Cl.⁴ C25B *3/02*
U.S. Cl. 204—59 R **23 Claims**

1. A process for forming carbonyl group containing compounds from their respective organic substrate selected from aromatic and alkylaromatic compounds comprising contacting the organic substrate with an aqueous solution containing ceric methanesulfonate in the presence of at least 1.5 molar concentration of free methanesulfonic acid, said solution being substantially free of extraneous anions of other acids and having at least 0.2 molar cerium concentration.

4,639,299

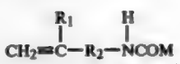
ACRYLIC AND ACRYLIC/EPOXY COPOLYMER COMPOSITION AS SELF-CURING CATHODIC ELECTROCOATING VEHICLES

Edward T. Turpin, Elyria, and David T. Thrase, Fairview Park, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Dec. 3, 1984, Ser. No. 677,341
Int. Cl.[4] C25D *13/06*
U.S. Cl. 204—181.7 6 Claims

1. A method of electrocoating an electrically conductive substrate serving as a cathode which comprises passing an electric current between said cathode and an anode in contact with an aqueous electrodepositable composition, wherein said composition comprises an acid solubilized, or dispersed self-curing amino cation-active aqueous polymer composition containing amino, hydroxyl and blocked isocyanate functionality derived from the polymerization of:

(a) at least 5 weight percent of a polymerizable blocked monoisocyanate having the formula:



wherein R_1 is hydrogen or C_{1-3} lower alkyl group; R_2 is diradical



n is 1 to 3; and M is an isocyanate blocking agent residue; said blocked monoisocyanate being copolymerized with

(b) 30 to 90 weight percent polymerizable vinyl comonomer comprising at least one member of the group consisting of acrylate and methacrylate esters, styrene, vinyl chloride, vinylidene chloride and vinyl acetate and wherein said acrylate or methacrylate esters are selected from alkyl, hydroxyalkyl, alkylaminoalkyl and dialkylaminoalkyl esters, wherein the weight percentages are based on the combined weights of (a) and (b) monomers and total 100 percent; and wherein said polymerization is carried out in the presence of

(c) 60 to 300 weight percent of an amine-epoxy adduct comprising the reaction product of an epoxide and an organic amine having at least one primary or secondary group reactive with said epoxide; and percent (c) being based on total weights of (a) and (b) monomers; and wherein the amine cation-activity is derived from monomer (b), amine-epoxy adduct (c) or combinations thereof sufficient to provide an amino-cation activity of from 35 to 175 milliequivalents per 100 gram resin solids and to effect polymer solubilization or dispersion on partial or full acidification.

4,639,300

METHOD AND APPARATUS FOR ELECTROFILTRATION

Joseph B. Culkin, Wilton, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

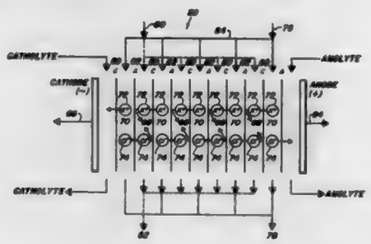
Filed May 21, 1985, Ser. No. 736,604
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—182.3 12 Claims

1. A process for dewatering a liquid suspension of solids subject to the influence of an electric field, which comprises the steps of:

(a) demineralizing the suspension of solids to lower the conductivity of the suspension;

(b) subjecting said suspension of solids which has been demineralized in step (a) to an electric field within an electrically augmented vacuum filter;

(c) concentrating said suspension of solids by forming a slurry or solids cake on an electrode surface of said electrically augmented vacuum filter; and



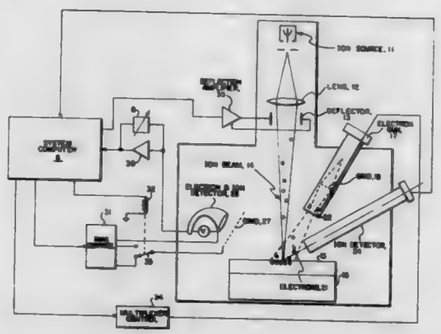
(d) removing the slurry or solids cake formed in step (c) from the electrode surface.

4,639,301

FOCUSED ION BEAM PROCESSING

John A. Doherty, Sudbury; Billy W. Ward, Rockport, and David C. Shaver, Carlisle, all of Mass., assignors to Micrion Limited Partnership, Beverly, Mass.

Filed Apr. 24, 1985, Ser. No. 726,713
Int. Cl.[4] C23C *14/00*
U.S. Cl. 204—192.31 15 Claims



1. Focused ion beam processing apparatus comprising,

a source of a finely focused ion beam of submicron shape for impingement upon a substrate surface in a predetermined surface plane,

a source of an electron beam,

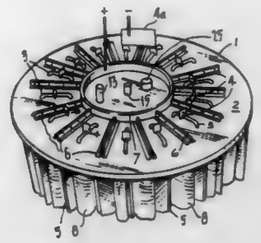
and means for directing said electron beam toward said surface plane in a region embracing the target point in said surface plane intersected by said ion beam for neutralizing the surface charge in said surface plane otherwise produced thereat by said ion beam to reduce defocusing and undesired deflection of said ion beam in said surface plane to allow precise positioning of said ion beam on said target point and maintenance of said submicron shape of said ion beam on said target point.

4,639,302

ELECTROLYTIC CELL FOR RECOVERY OF METALS FROM METAL BEARING MATERIALS

Peter K. Everett, Chatswood, Australia, assignor to Dextec Metallurgical Pty. Ltd., New South Wales, Australia

PCT No. PCT/AU83/00182, § 371 Date Jul. 26, 1984, § 102(e) Date Jul. 26, 1984, PCT Pub. No. WO84/02356, PCT Pub. Date Jun. 21, 1984
PCT Filed Dec. 9, 1983, Ser. No. 638,485
Claims priority, application Australia, Dec. 10, 1982, PF7223
Int. Cl.[4] C25C *7/00, 7/08, 7/02*
U.S. Cl. 204—258 30 Claims



1. An electrolytic cell for recovery of metal from mineral ores or concentrates comprising:

(a) a tank adapted to hold a slurry of electrolyte and said mineral ores or concentrates,

(b) means within the tank for agitating said slurry,

(c) a plurality of vertical anodes radially disposed in said tank,

(d) a plurality of vertical cathodes radially disposed in said tank and interposed between said anodes,

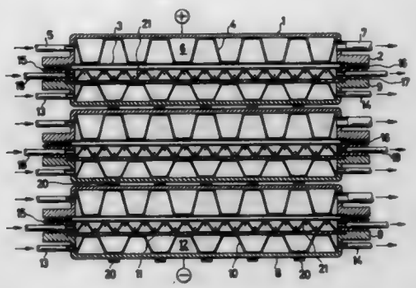
(e) porous diaphragm bag means which surround said radially disposed plurality of cathodes and separates said cathodes from the electrolyte slurry.

4,639,303

ELECTROLYSIS APPARATUS WITH HORIZONTALLY DISPOSED ELECTRODES

Rudolf Staab; Dieter Bergner, and Kurt Hanneken, all of Kelkheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 24, 1985, Ser. No. 790,825
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1984, 3439265
Int. Cl.[4] C25B *9/00, 11/10, 13/00*
U.S. Cl. 204—258 3 Claims



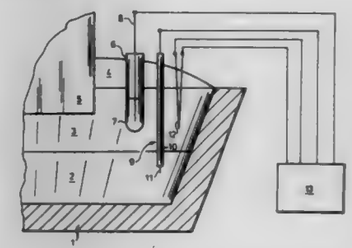
1. Electrolysis apparatus for preparing chlorine from aqueous alkali halide solutions comprising at least one electrolytic cell having an anode and a gas diffusion cathode both of which are horizontally disposed, a partition separating the anode and cathode from each other, a housing consisting of two half shells surrounding the anode and cathode, a mechanical and electrical connection between the anode and one of the half shells and a similar connection between the cathode and the other half shell, devices for feeding electrolytic starting materials into the housing and for removing products of electrolysis therefrom, a liquid-tight connection between the cathode and its half shell, a current supply and distribution device supporting the cathode in its half shell, a spacer extending between the cathode and the partition for supporting the partition, means holding the partition between the half shells, seal means sealing the partition from the anode shell, a circumferential frame between the shells connected to hold the spacer in its position, and inlet and outlet means in the frame for feeding and removing catholyte.

4,639,304

APPARATUS FOR DETERMINATION OF ALUMINUM OXIDE CONTENT OF THE CRYOLITE MELT IN ALUMINUM ELECTROLYSIS CELLS

Imre Báder; Endre Berecz, both of Miskolc; Gábor Szina, and János Horváth, both of Budapest, all of Hungary, assignors to Nehezipari Muszaki Egyetem, Hungary

Filed Nov. 1, 1985, Ser. No. 794,103
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—413 2 Claims



1. An apparatus for determination of aluminium oxide content of a cryolite melt in aluminium electrolysis cells comprising an oxygen ion conducting solid electrolyte containing oxygen galvanic cell equipped with a reference electrode of given oxygen potential arranged in a zirconium oxide tube closed on one end and with a measuring electrode covered with aluminium, said measuring electrode comprising a conductor, said reference electrode being a cryolite melt supersaturated with Al_2O_3 and the aluminium coating of the measuring electrode being the aluminium melt in the cell into which the conductor of the electrode protrudes.

4,639,305

ELECTROCHEMICAL ELEMENT

Kazuyoshi Shibata, and Hitoshi Nishizawa, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 3, 1985, Ser. No. 740,430
Claims priority, application Japan, Jun. 6, 1984, 59-116227
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—426 7 Claims

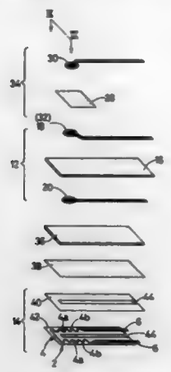
1. An electrochemical element comprising:

at least one electrochemical cell having a planar solid electrolyte body and a pair of electrodes held in contact with said planar solid electrolyte body;

at least one electrical heater layer which is located on one of opposite sides of the electrochemical cell, said heater layer comprising a heater member having a heat-generating portion shaped in a serpentine strip to heat at least a portion of said electrochemical cell at which said pair of electrodes are disposed, said serpentine strip being formed in a zig-zag fashion to provide a heating region in which said heat-generating portion is accommodated;

said heat-generating portion having a cross sectional area at central portions thereof located in a central portion of said heating region, which is greater than a cross sectional area

at a peripheral portions thereof located adjacent to a peripheral portion of said heating region, such that said



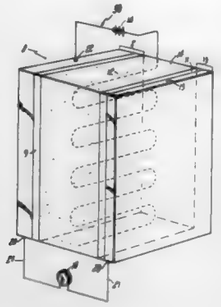
heat-generating portion provides a substantially uniform distribution of temperature throughout the heating region.

4,639,306

ELECTROCHEMICAL GAS SENSOR

Beth A. Tomasovic, New Kensington, and Robert L. Novack, Evans City, both of Pa., assignors to Bacharach, Inc., Pittsburgh, Pa.

Filed Sep. 20, 1985, Ser. No. 777,989
Int. Cl.⁴ G01N *27/30, 27/46*
U.S. Cl. 204—432 **3 Claims**



1. An apparatus for the detection and measurement of a gaseous component in an object gas comprising:

a sensing electrode having a porous, electrically conductive substrate with a catalyst dispersed on one or more surfaces,

a counter electrode having a porous, electrically conductive substrate with a catalyst dispersed on one or more surfaces,

an electrolyte in contact with the catalytic surface of the sensing electrode and the catalytic surface of the counter electrode,

a reference electrode in contact with the electrolyte,

a means for supplying and maintaining an electrical potential between the sensing electrode substrate and the reference electrode, and

a means for measuring the current flow from the sensing electrode substrate to the counter electrode substrate resulting from the catalytic reaction of the gaseous component at the interface of the sensing electrode and the electrolyte, wherein said electrically conductive substrates have an electrical conductivity greater than 10 $ohm^{-1}cm^{-1}$ and a porosity greater than 10 percent.

4,639,307

METHOD FOR PRODUCING INDUSTRIAL ASPHALTS

Judson E. Goodrich, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 31, 1984, Ser. No. 646,397
Int. Cl.⁴ C08L *95/00*; C10C *1/20, 3/02*
U.S. Cl. 208—44 **1 Claim**

1. A one-step method of producing an industrial asphalt from a petroleum residuum consisting essentially of mixing together without air-blowing and in a nitrogen atmosphere:

(a) a feed consisting essentially of a bituminous material having a viscosity of 65 to 180 centistokes at 350 degrees Fahrenheit and wherein said feed forms a single phase when mixed with 5 percent ferric chloride; and

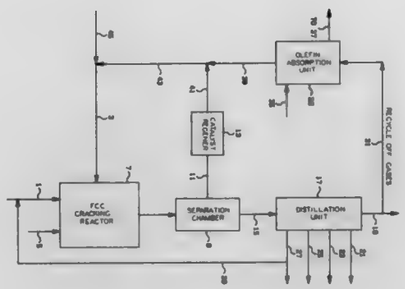
(b) from more than 0.5 to less than 10 percent by weight of ferric chloride, said mixing being done at a temperature in the range of 400 to 500 degrees Fahrenheit for from 5 to 25 minutes; whereby the softening point of the asphalt is substantially increased by 70 to 100 degrees Fahrenheit and the penetration is significantly decreased by at least 30 to 60 dmm at 77 degrees Fahrenheit thereby producing an industrial asphalt having a softening point in the range 200 to 235 degrees Fahrenheit and a penetration of 12 to 30.

4,639,308

CATALYTIC CRACKING PROCESS

Fu-Ming Lee, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 16, 1986, Ser. No. 819,316
Int. Cl.⁴ C10G *11/18*
U.S. Cl. 208—100 **20 Claims**



1. A catalytic cracking process comprising the steps of:

(A) contacting (a) an oil feed stream comprising hydrocarbons having more than ten carbon atoms per molecule with (b) a solid cracking catalyst, under such conditions as to obtain (c) gaseous products comprising hydrogen, paraffins having from 1–4 carbon atoms per molecule and olefins having from 2–4 carbon atoms per molecule and (d) at least one stream of substantially liquid products comprising hydrocarbons having an average molecular weight lower than that of the hydrocarbons in said feed stream;

(B) substantially separating said gaseous products from said at least one stream of substantially liquid products and said solid cracking catalyst;

(C) treating at least a portion of the separated gaseous product from step B under such conditions as to reduce therein the content of olefins having 2–4 carbon atoms per molecule;

(D) recycling and introducing at least a portion of said gaseous product stream having reduced olefin content into the contacting zone of step A where said feed stream is contacted with said solid cracking catalyst, the recycle gaseous product stream comprising hydrogen and said paraffins;

(E) repeating steps A through D.

4,639,309

PROCESS FOR THE DEHALOGENATION OF POLYHALOGENATED HYDROCARBON CONTAINING FLUIDS

Jean-Marc Lalancette, Sherbrooke, and Germain Belanger, St-Germain de Grantham, both of Canada, assignors to Hydro-Quebec, Montreal, Canada

Filed Sep. 18, 1985, Ser. No. 777,300
Int. Cl.⁴ C10G *17/00*
U.S. Cl. 208—262 **14 Claims**

1. In a process for the dehalogenation of polyhalogenated hydrocarbons from an oil containing same wherein the dehalogenation is carried out through the reaction of sodium or potassium, the improvement which comprises contacting a dispersion of sodium or potassium over the surface of a particulate inert material having a density of at least 2.0 with a polyhalogenated hydrocarbon contaminated hydrocarbon fluid, said mixture being in an inert atmosphere, heated to a temperature of at least 100° C. and under constant agitation whereby the sodium or potassium coated on the surface of the particulate inert material reacts with the halogen of the polyhalogenated hydrocarbon to form the corresponding sodium or potassium halide which is constantly removed from the active surface of the sodium or potassium by abrasion and recovering the hydrocarbon fluid substantially devoid of polyhalogenated hydrocarbon.

4,639,310

PROCESS FOR THE PRODUCTION OF REFORMER FEED AND HEATING OIL OR DIESEL OIL FROM COAL BY LIQUID-PHASE HYDROGENATION AND SUBSEQUENT GAS-PHASE HYDROGENATION

Werner Döhler, Mari; Ludwig Merz, Recklinghausen; Heinz Frohnert, Bottrop; Bernd Uckermann, Dortmund; Ulrich Graeser, Halten; Alfons Jankowski, Essen; Eckard Wolowski, Mülheim-Ruhr; Hans-Friedrich Tamm, Recklinghausen, and Norbert Wilczok, Mülheim, all of Fed. Rep. of Germany, assignors to Veba Oel Entwicklungs-Gesellschaft, Fed. Rep. of Germany

Filed Aug. 2, 1985, Ser. No. 761,681
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1984, 3428783; May 4, 1985, 3516084
Int. Cl.⁴ C10G *1/00, 1/06*
U.S. Cl. 208—412 **17 Claims**

1. A process for the production of reformer feed and heating oil or diesel oil from coal, which comprises:

(i) introducing a pulverized coal-oil slurry together with a hydrogenation gas into a liquid-phase hydrogenation stage;

(ii) removing a solids-containing residue from the discharge of the said liquid-phase hydrogenation stage;

(iii) cooling the resulting residue-free volatile coal-oil fraction from the said discharge;

(iv) feeding the said volatile coal-oil fraction to a gas-phase hydrogenation stage;

(v) introducing fresh hydrogen which is substantially free of contaminants into the said gas-phase hydrogenation stage together with the said volatile coal-oil fraction, said fresh hydrogen introduced in the said gas-phase hydrogenation stage constituting the entire amount of hydrogen required for the said process; and

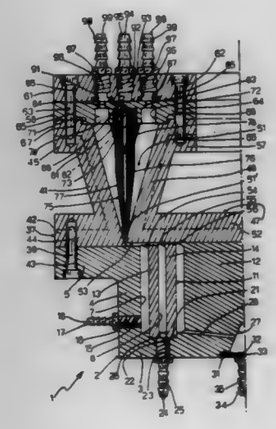
(vi) utilizing the waste-gas from the said gas-phase hydrogenation as the hydrogenation gas for the said liquid-phase hydrogenation.

4,639,311

DEVICE FOR SEPARATING AIRBORNE PARTICLES INTO GRAIN SIZE CLASSES

Vittorio Prodi, Via Martinelli, 7, 40137 Bologna, Italy

Filed Apr. 16, 1985, Ser. No. 723,670
Claims priority, application Italy, Apr. 19, 1984, 3433 A/84
Int. Cl.⁴ B07B *7/086*
U.S. Cl. 209—143 **13 Claims**



1. A device employing a source of filtered air and means to create a negative pressure for separating from a source of suspensoids airborne particles, such as an aerosol, into a plurality of suspensoids of airborne particles each containing particles of predetermined grain size classes, comprising:

a first body including a base wall having extending transversely therefrom a side wall, a first and second dividing wall and a third wall, said side wall and said first dividing wall defining between them a first chamber, a second chamber being defined between said first and second dividing wall, said second dividing wall and said third wall defining a third chamber, said base wall having an outlet opening communicating with each of said first, second, and third chambers and outlet means adapted to separately connect said means to create a negative pressure to at least one of said first, second and third chamber outlets;

a second upper body defining a first cavity having an inlet opening communicating with said source of filtered air, the connection of said second body to said first body defining a second cavity and an elbow passage way at one end of said second cavity providing a communication between said first and second cavities, said first, second, and third chambers being open to and communicating with said second cavity at the other end thereof; and

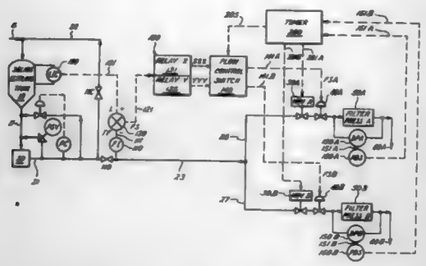
a nozzle positioned in said first cavity in said first cavity and adapted to be connected to said source of suspensoids and operable to eject said suspensoides through said elbow passageway, said nozzle being positioned and said elbow joint being curved in such a way that the suspensoids after having traversed said elbow passageway separate into a plurality of grain size classes each flowing into a predetermined one of said first, second and third chambers in dependence on the magnitude of negative pressure formed therein.

4,639,312

FILTER PRESS FLOW CONTROL SYSTEM FOR DEWATERING SLUDGE

Deborah E. R. Quock, Houston; Timothy L. Triplett, Missouri City, and Don E. Childress, Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 3, 1985, Ser. No. 783,720
Int. Cl.⁴ B01D *25/12*
U.S. Cl. 210—101 **1 Claim**



1. A system for controlling the flow of settled solids from a solids settling tank to a pair of filter presses; filter press A and filter press B, the solids settling tank supplied with sludge consisting of solids and aqueous fluid; the system comprising:

A. a plurality of sensors comprising:

1. a first sensor providing a signal corresponding to the sensed settled solids/aqueous fluid interface level, L, in the solids settling tank and providing a signal corresponding thereto,
2. a second sensor sensing the total flow of settled solids from the solids settling tank, FT, to the filter presses and providing a signal corresponding thereto,
3. a third pair of sensors sensing the pressure differential across each filter press, DPA being the pressure differential across filter press A and DPB being the pressure differential across filter press B, and providing signals corresponding thereto,

B. a plurality of valves comprising:

1. a pair of flow control valves for controlling the flow rate of settled solids to the filter presses, flow control valve A controlling the flow rate to filter press A receiving as an input flow control valve A activating signal, FSA, and flow control valve B controlling the flow rate to filter press B receiving as an input flow control valve B activating signal, FSB,
2. a pair of motor operated valves for blocking flow to the filter presses, motor operated valve A up-stream of flow control valve A and motor operated valve B up-stream of flow control valve B,

C. a flow controller receiving both signal, L, from the first sensor corresponding to a reference input and signal, FT, from the second sensor corresponding to a feedback variable and providing a flow control valve actuating signal, FS, proportional to the difference between the reference input and the feedback variable,

D. a relay means comprising two amplifying relays, relay x providing signal xxx and relay y providing signal yyy, the amplifying relays adjusting the respective signals such that as control valve actuating signal FS varies from 0% to 50%, signal xxx varies linearly from 0% to 100% and signal yyy remains constant at 0%; and as control valve actuating signal FS varies from 50% to 100%, signal xxx remains constant at 100% and signal yyy varies linearly from 0% to 100%;

E. a flow control switch receiving as inputs a flow control switch actuating signal, signal xxx from relay x and signal yyy from relay y; and in mode one providing signal xxx, as output signal FSA, and signal yyy, as output signal FSB, and in mode two providing signal xxx, as output signal FSB, and signal yyy, as output signal FSA, alternating between mode one and mode two on receipt of a flow control switch activating signal,

F. pressure switch means receiving as inputs, the signals corresponding to the pressure differential across each filter press, DPA and DPB, and at a predetermined pressure differential, providing as an output a timer actuating signal,

G. a timer receiving as an input the timer actuating signal and providing as outputs:

i. an actuating signal to open the motor operated valve up-stream of the flow control valve receiving the varying control valve actuating signal,

ii. an actuating signal; after a predetermined time period, to close the motor operated valve up-stream of the flow control valve receiving the constant control valve actuating signal, and simultaneously

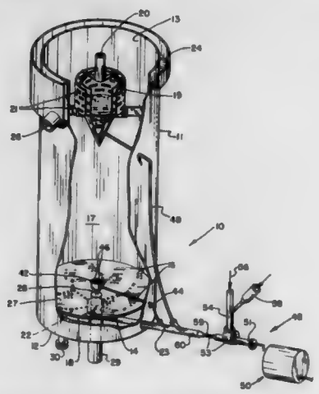
iii. the flow control switch actuating signal to the flow control switch.

4,639,313

FLOATATION APPARATUS FOR CONCENTRATION OF MINERALS FROM HIGH WATER CONTENT AQUEOUS SLURRIES

Donald E. Zipperian, Tucson, Ariz., assignor to The Deister Concentrator Company, Fort Wayne, Ind.

Filed Jul. 5, 1985, Ser. No. 752,465
Int. Cl.⁴ B03D *1/24*
U.S. Cl. 209—170 **17 Claims**



17. In an apparatus for separation of minerals by froth flotation from an aqueous pulp containing a mixture of mineral and gangue particles, said apparatus including means for removing a froth of a float fraction of the aqueous pulp at a substantially continuous rate, and a hydraulic compartment wherein aerated water is distributed substantially uniformly to provide levitating air bubbles for upward passage through said aqueous pulp producing said froth, the improvement comprising:

means for providing a controllably flowing stream of pressurized air;

water supply means;

means for aspirating a controllable quantity of water into said flowing steam of said pressurized air, said aspiration resulting from the flow of said stream of pressurized air;

means for controllably introducing a flow of surfactant into said quantity of water aspirated; and

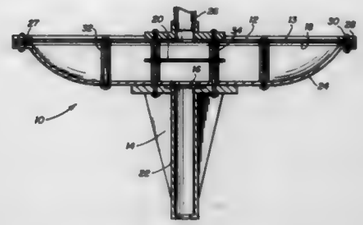
means for turbulently mixing said flowing stream of pressurized air, said aspirated water, and said surfactant to produce a stream of aerated water for delivery to said hydraulic compartment.

4,639,314

FINE BUBBLE DIFFUSER AND DIFFUSER SYSTEM HAVING FILTERED BLOW-DOWN TUBE

Robert R. Tyer, 15722 Brookvilla, Houston, Tex. 77059

Filed Jan. 18, 1985, Ser. No. 692,919
Int. Cl.⁴ B01F *3/04*
U.S. Cl. 210—220 **12 Claims**



1. In a gas diffuser system for a vessel having at least one gas diffuser element connected to a gas supply pipe, the improvement comprising:

(a) At least one tube connected to the system, the tube extending in a downward direction from the system and having an opening to the vessel located in predetermined distance below the level of the diffuser element, and the tube communicating with the system through an upper end; and

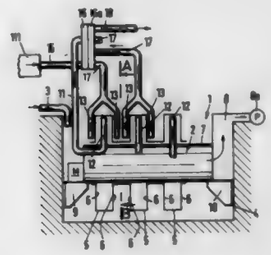
(b) a filter extending across the tube and having pores sized to exclude from the interior portions of the system solid material suspended in liquid material entering the tube through its opening to the vessel.

4,639,315

APPARATUS FOR MECHANICAL PURIFICATION OF WASTE WATER

Ernst Fuchs, Schmerikon, and Karl Fitzi, Hombrechtikon, both of Switzerland, assignors to Mecapec S.A., Schmerikon/SG, Switzerland

Filed Oct. 15, 1985, Ser. No. 787,620
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 3438170
Int. Cl.⁴ B01D *23/24, 29/38*
U.S. Cl. 210—333.1 **17 Claims**



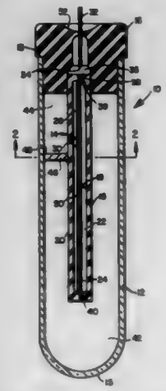
1. Apparatus for mechanical purification of waste water, particularly of water which has undergone a biological purification, comprising a vessel for a supply of waste water; a hollow support; at least one hollow drum-shaped frame rotatably mounted on and surrounding said support, said frame having at least one opening at least a portion of which is immersed into waste water in said vessel during each revolution of said frame about said support; filter means including a foraminous filter mounted in said frame and having an inner side overlying said opening and an outer side which intercepts impurities contained in waste water entering said frame by way of said filter and said opening; means for withdrawing the thus purified water from the interior of said frame; a source of clean water; a feeding device operable to supply clean water from said source into the interior of said frame and having a stationary portion arranged to direct clean water against successive portions of the inner side of said filter as the filter rotates with said frame around said support; and suction generating means including a portion adjacent to the outer side of said filter opposite said portion of said feeding device and actuatable to collect impurities which are expelled from the filter by clean water in response to operation of said feeding device, said portion of said feeding device cooperating with said portion of said suction generating means to maintain the permeability of said filter above a preselected minimum acceptable value for extended intervals of time.

4,639,316

AUTOMATIC LIQUID COMPONENT SEPARATOR

Mourad M. Eldegheidy, Raleigh, N.C., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Dec. 14, 1984, Ser. No. 681,771
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—416.1 **9 Claims**



1. A device for the immediate separation of a blood sample into a cell containing and a cell free fraction of said blood sample characterized by

(a) an elongated cylindrical tube having a closed end and an open end;

(b) said tube defining an evacuated chamber;

(c) an elastomeric stopper sealingly closing said open end, said stopper having a bottom surface;

(d) a recess in the bottom surface of said stopper facing said evacuated chamber, said recess defining a sample receiving area;

(e) a flat elongated separation assembly in said evacuated chamber;

(f) said separation assembly positioned in said evacuated chamber to extend from said closed end of said tube to a point spaced from the open end thereof and having a length extending along the central axis of said tube;

(g) said separation assembly separating said evacuated chamber into a cell free fraction receiving chamber and a cell containing fraction receiving chamber;

(h) said elongated separation assembly comprising

(1) a pair of spaced apart elongated walls;

(2) said spaced apart walls defining a blood sample collection passage therebetween;

(3) the first of said spaced walls containing a cell free fraction receiving distributor panel;

(4) the second of said spaced walls containing a sample distribution chamber having first and second ends;

(5) said sample distribution chamber connected to said sample receiving area at said first end and to said cell

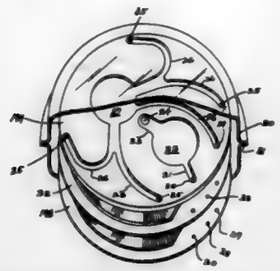
containing fraction receiving chamber at said second end;
(6) a membrane separator positioned in said blood sample collection passage and extending along the length thereof;
(7) said membrane separator having one side adjacent said cell free fraction receiving distributor panel and one side adjacent said sample distribution chamber;
(8) said cell free fraction distributor panel having a plurality of spaced apart channels therein for receiving a cell free fraction passing through said membrane separator; and
(9) means providing flow communication between said channels and said cell free fraction receiving chamber.

4,639,317

PLASMAPHERESIS FILTRATION MODULE HAVING IMPROVED SEALING MEANS

Robert P. Luoma, II, Newark, Del., and Frank M. Willis, Wenonah, N.J., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Feb. 16, 1982, Ser. No. 349,370
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—433.2 **15 Claims**



1. Plasmapheresis filtration module comprising a plasma side support having a blood inlet sealing surface, a blood side support having a multiplicity of blood flow channels around the periphery of a blood inlet, and a planar membrane pressed between the plasma side support and the blood side support, the blood flow channels being opposite the inlet sealing surface so that blood flows on the blood side, but not on the plasma side, of the membrane, said module being circular and having a central inlet with a generally radial blood flow path extending therefrom between the blood side support and the membrane, wherein said module the plasma side support has generally radial plasma flow channels extending from the inlet sealing surface to a plasma collection channel and the blood flow channels extend radially from the inlet to a plasma-depleted blood collection channel, and wherein said module the entrances to the blood flow channels uniformly decrease in depth from greater than about 15 mils (0.4 mm) to about 4 to 15 mils (0.1 to 0.4 mm) and the initial width of the entrances is about 4 to 20 mils (0.1 to 0.5 mm).

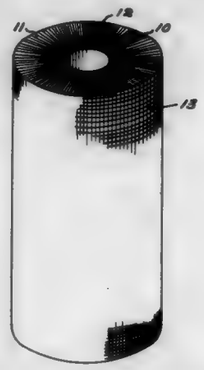
4,639,318

TUBULAR FILTER PRIMARILY INTENDED FOR FILTRATION OF LIQUIDS

Ralf G. Andersson, Ödakra, Sweden, assignor to Gulfiber AB, Billesholm, Sweden

PCT No. PCT/SE84/00085, § 371 Date Nov. 7, 1984, § 102(e) Date Nov. 7, 1984, PCT Pub. No. WO84/03450, PCT Pub. Date Sep. 13, 1984
PCT Filed Mar. 8, 1984, Ser. No. 679,043
Claims priority, application Sweden, Mar. 9, 1983, 8301282
Int. Cl.⁴ B01D *27/00, 39/14*
U.S. Cl. 210—491 **10 Claims**

1. A tubular filter primarily intended for filtration of liquid flowing substantially radially towards the interior of the filter comprising in combination an inner filter layer of mineral wool, the fibres of which are oriented substantially concentrically to the tube axis, and an outer layer, of mineral wool, the



fibres of which are oriented substantially radially to the tube axis, the density of the filter increasing from the outer surface of the outer layer to the inner surface of the inner layer, the increase being continuous in the outer layer.

4,639,319

ELECTROLYTE STABILIZATION OF LATICES

Lutz Schelleaberg, Cologne; Matthias Hamacher, Huerth-Gleul, both of Fed. Rep. of Germany, and Bashir M. Ahmed, Ambler, Pa., assignors to Gerhard Collardin GmbH, Cologne, Fed. Rep. of Germany

Filed Jul. 22, 1985, Ser. No. 757,597
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 3431276
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—651 **19 Claims**

1. A method for stablizing the electrolyte content of acidic aqueous resin latex composition baths for autodeposition comprising:
introducing said latex composition into flowing contact with the outer surface of a filtration membrane whose pore size is at least small enough to prevent substantially all latex resin particles from passing through;
flowing at least partially deionized water along the inner surface of said filtration membrane in a closed circuit at a sufficient flow rate to generate a pressure differential of about 40 to 500 mbar between said membrane's outer and inner surfaces, thereby removing water and a portion of the soluble electrolytes from said latex composition and adding the same to said flowing at least partially deionized water; and
replenishing a volume of deionized water to said bath equal to the volme removed by filtration.

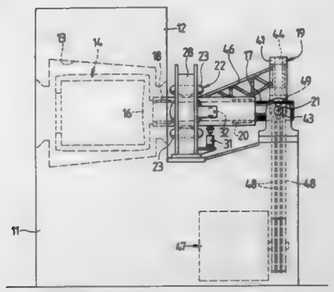
4,639,320

METHOD FOR EXTRACTING WATER FROM SOLID FINES OR THE LIKE

Lloyd B. Smith, Bristol, Tenn., assignor to United Coal Company, Bristol, Va.

Continuation-in-part of Ser. No. 720,554, Apr. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 436,735, Oct. 26, 1982, abandoned. This application Feb. 19, 1986, Ser. No. 831,056
Int. Cl.⁴ B04B *1/06*
U.S. Cl. 210—739 **4 Claims**

1. A method for centrifugally removing fluid from wet particulate matter comprising the steps of:
(a) introducing said wet particulate matter into a batch-type centrifuge having a bowl with an opening at one end for receiving said wet particulate matter, a base support at the other end thereof attached to a driven shaft rotatable at variable speeds and a filter media liner proximal the inner surface of said bowl for fluid to be centrifugally extracted from said wet particulate matter;
(b) supporting said shaft on a gimbal-like system at the end thereof distal said bowl to maintain a vertex of precession of said shaft and bowl within a well defined locus and to constrain said shaft to pivotal motion about said vertex, such that the freedom of movement of said bowl and shaft is limited to directions transverse to the axis of rotation thereof;
(c) supporting said shaft proximal said bowl on supports of variable resiliency;



(d) accelerating the rotational speed of said centrifuge to a controlled drying speed to reduce the moisture content of said particulate matter to below a predetermined percentage by centrifugal extraction of the fluids;
(e) decelerating the rotational speed of said centrifuge;
(f) removing the particulate matter from the centrifuge at controlled rotational speeds of said centrifuge; and
(g) controlling the natural radial frequency fn of said centrifuge by varying the resiliency of said supports of variable resiliency in accordance with the rotational speed f of said centrifuge such that the ratio f/fn becomes 1.0 only during said accelerating and decelerating steps and the interval of time during which the condition f/fn equals 1.0 is insufficient to induce excessive radial vibration in said centrifuge.

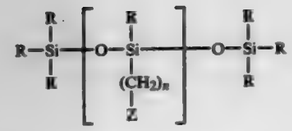
4,639,321

LIQUID DETERGENT COMPOSITIONS CONTAINING ORGANO-FUNCTIONAL POLYSILOXANES

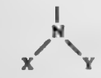
Christian R. Barrat, Brussels; Alfred Busch, Strombeek-Bever, both of Belgium, and Kosmas Sardelis, Athens, Greece, assignors to The Procter and Gamble Company, Cincinnati, Ohio

Filed Jan. 22, 1985, Ser. No. 693,322
Int. Cl.⁴ D06M *11/00*
U.S. Cl. 252—8.8 **15 Claims**

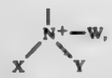
1. A liquid detergent composition capable of providing desirable textile benefits inclusive of softness, containing:
(a) from 5% to 70% by weight of a surface-active agent selected from the group of anionic, nonionic, amphoteric and zwitterionic surface-active agents and mixtures thereof;
(b) a liquid carrier; and
(c) from 0.05% to 5% by weight of an organo-functional poly-di-C_{1-4}-alkyl siloxane textile treatment agent having the general formula:



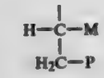
wherein
R=C_{1-4}-alkyl; n is an integer from 1 to 6;
Z is



whereby X and Y are, selected independently, —H; —C_{1-30}-alkyl; —C_6-aryl; —C_{5-6}-cycloalkyl; —C_{1-6}—NH_2; —CO—R; with the proviso that the nitrogen can be quaternized such as to represent



whereby W can be selected from X or Y; or
Z is



whereby P and M are —COOH; —CO—NR'_2; or C_{1-2}-alkyl;
with the further proviso that the degree of substitution, i.e., the molar proportion of silicones carrying a substituent other than a C_{1-4}-alkyl group to total silicones is in the range from 0.01 to 0.7.

4,639,322

BIOPOLYMER COMPOSITIONS HAVING ENHANCED FILTERABILITY

Donald Beck, Ledyard; James W. Miller, Mystic; William C. Wernau, Groton, and Thomas B. Young, III, North Stonington, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 548,473, Nov. 3, 1983, abandoned. This application Aug. 27, 1984, Ser. No. 644,593
Int. Cl.⁴ E21B *43/22*
U.S. Cl. 252—8.554 **22 Claims**

1. A composition for use in enhanced oil recovery comprising from about 1.5–20 weight percent Xanthomonas biopolymer in the form of whole Xanthomonas fermentation broth or concentrated Xanthomonas fermentation broth and from about 0.0008–3 weight percent methylene bis(thiocyanate), said amount of methylene bis(thiocyanate) sufficient to lyse Xanthomonas cells, said composition having a pH above about 3.5.

4,639,323

WATER SOLUBLE METALWORKING FLUIDS

Tseng K. Liao, Jackson County, Mo., assignor to Nihon Kohsakuyu Company, Ltd., Japan

Continuation-in-part of Ser. No. 474,305, Mar. 11, 1983, abandoned. This application Jul. 2, 1984, Ser. No. 627,086
Claims priority, application Japan, Feb. 2, 1983, 58-014588
Int. Cl.⁴ C10M *103/00*
U.S. Cl. 252—32.5 **11 Claims**

1. A composition for use as an active ingredient in a metal-working fluid, said composition comprising:

80–95% by weight disodium phosphate heptahydrate; and

5–20% by weight of a fluorinated hydrocarbon surfactant.

4,639,324

LUBRICATING COMPOSITIONS

William Y. Lam, Ballwin, Mo., assignor to Ethyl Petroleum Additives, Inc., St. Louis, Mo.

Filed Jul. 8, 1985, Ser. No. 752,509
Int. Cl.⁴ C16M *129/68*
U.S. Cl. 252—48.6 **72 Claims**

1. A lubricating oil additive prepared by the process comprising:

(A) in a first stage reacting at about 140°–180° C. a mixture comprising 100 parts by weight of at least one aliphatic olefinically unsaturated hydrocarbon containing from about 8 to 36 carbon atoms and about 1 to 160 parts by weight of at least one fatty acid ester with elemental sulfur to obtain an intermediate, and

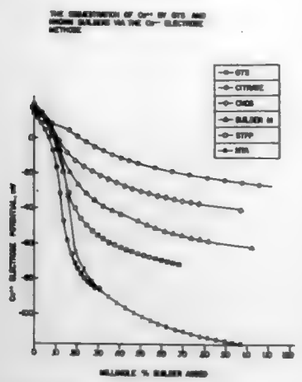
(B) in a second stage reacting at about 110°–140° C., said intermediate with additional sulfur and from about 25 to 100 parts by weight based on the total weight of combined said aliphatic olefinically unsaturated hydrocarbon and said fatty acid ester, a dimer of cyclopentadiene or lower C_{1-4} alkyl substituted cyclopentadiene dimer.

4,639,325

DETERGENT BUILDER

Vivian B. Valenty, Schenectady, N.Y.; William H. Hill, Cedar City, Utah, and Prasad S. Ravi, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Del.

Continuation-in-part of Ser. No. 664,451, Oct. 24, 1984, abandoned, which is a continuation-in-part of Ser. No. 575,421, Jan. 31, 1984, Pat. No. 4,524,009. This application Feb. 14, 1986, Ser. No. 829,678
Int. Cl.⁴ C11D *1/08*
U.S. Cl. 252—89.1 **37 Claims**



1. A compound of the formula:

$$[MOOCCH_2(MOOC)CHOCH_2]_2CHOCH(COOM)CH_2COOM \quad (I)$$

wherein M is a salt-forming cation or hydrogen or mixtures thereof.

2. A compound of the formula:

$$HOCH_2CH[OCH(COOM)CH_2COOM]CH_2OH \quad (V)$$

wherein M is a salt-forming cation or hydrogen or mixtures thereof.

4,639,326

PROCESS FOR THE PREPARATION OF A POWDER DETERGENT COMPOSITION OF HIGH BULK DENSITY

Klaus Czempik, Verden, and Gerd Stremmel, Brühl, both of Fed. Rep. of Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed Jul. 3, 1985, Ser. No. 752,344
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3424987
Int. Cl.⁴ C11D *1/83, 3/075, 11/00, 11/02*
U.S. Cl. 252—91 **5 Claims**

1. A process for the preparation of a nonionic surfactant-containing powder detergent composition having a total surfactant content from 5 to 15% and of greater than 0.60 kg/l bulk density, comprising the steps of:

(a) spray-drying a base powder comprising from about 4% to about 6% by weight of said detergent composition of a nonionic surfactant;

(b) spraying onto said base powder a further amount of nonionic surfactant in an amount from about 4% up to not more than half of the total nonionic content by weight of said detergent composition;

(c) subsequent to step (b) adding a final amount of nonionic surfactant obtained by granulation with a carrier, the amounts of said surfactant and carrier being from about 2.85 to 4.0% and being about 22%, respectively, by weight of said detergent composition; and

(d) subsequently adding adjunct detergent components to the base powder, said base powder being essentially free of sodium sulfate and the carrier for the nonionic surfactant comprising a mixture of zeolite and alkali metal perborate monohydrate in the amount of about 3 to 4% and about 8.5%, respectively, by weight of said detergent composition; said base powder and nonionic containing granulated carrier being present from about 59% and about 26%, respectively, by weight of said detergent composition.

4,639,327

COMPOSITION AND METHOD FOR CLEANING PAINTED SURFACES

Larry E. McGaha, P.O. Box 21, Clinton, Mont. 59825

Filed Jan. 20, 1985, Ser. No. 746,783
Int. Cl.⁴ C11D *7/08, 7/50*
U.S. Cl. 252—143 **2 Claims**

1. A liquid cleaning composition for cleaning painted surfaces comprising:

i. 10 to 90 parts of a fixed oil taken from the group consisting of linseed oil, tung oil and sunflower oil,

ii. 10 to 90 parts of an alcohol taken from the group consisting of methanol, ethanol and isopropyl alcohol,

iii. 1 to 5 parts of a carboxylic acid, the total of (i), (ii) and (iii) being 100 parts.

4,639,328

THIENOTHIOPHENE DERIVATIVES

Joachim Krause, Dieburg; Michael Römer, Rodgau, and Georg Weber, Erzhausen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschraakter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 674,891
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342631
Int. Cl.⁴ C09K *3/34*; G02F *1/13*; C07D *409/00*
U.S. Cl. 252—299.61 **18 Claims**

1. A liquid crystalline phase comprising at least two liquid-crystal components, wherein at least one component is of the formula

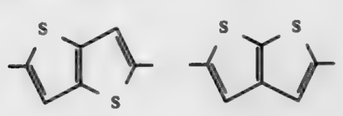
$$R^1-(A^1)_m-Z^1-A-(Z^2-A^2)_n-R^2$$

wherein

R^1 and R^2 are independently each H, alkyl of 1–12 C-atoms, or alkyl of 1–12 C-atoms, in which one or two non-adjacent CH_2 groups are replaced by an oxa atom, —CO— or —CH=CH—, in each case the resultant groups having 1–12 C— and oxa atoms in total, or independently are each F, Cl, Br, CN, —COOR or —O—COR;

A^1 and A^2 are independently each 1,4-phenylene, 1,4-cyclohexylene, 1,3-dioxane-2,5-diyl, 1,3-dithiane-2,5-diyl, tetrahydropyran-2,5-diyl, pyridazine-3,6-diyl or the corresponding N-oxide, piperidine-1,4-diyl, 1,4-bicyclo[2.2.-2]octylene or pyrimidine-2,5-diyl each of which is unsubstituted or substituted by one or two of F, Cl, Br, CN or CH_3;

A is a group of the formula 1 or 2



1 2

each of which is unsubstituted or substituted by one or two Cl or Br atoms;

Z^1 and Z^2 are independently each —CO—O—, —O—CO—, $—CH_2CH_2—$, $—OCH_2—$, $—CH_2O—$ or a single bond;

R is alkyl of 1–10 C-atoms;

m is 1 or 2;

n is 0 or 1; and

when m is 2, the two groups A^1 are identical or different.

4,639,329

FUNCTIONAL ORGANIC-INORGANIC COMPOSITE AMORPHOUS MATERIAL AND PROCESS FOR ITS PRODUCTION

Akio Makishima, Sakuramura, and Toshiro Tani, Ibaraki, both of Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki and Agency of Industrial Science and Technology, Tokyo, both of, Japan

Filed Sep. 19, 1985, Ser. No. 777,492
Claims priority, application Japan, Sep. 19, 1984, 59-196360
Int. Cl.⁴ H01C *13/00*
U.S. Cl. 252—501.1 **5 Claims**

1. A process for producing a functional organic-inorganic composite amorphous material, which comprises adding to an organic metal compound of silicon or germanium capable of being made amorphous by hydrolysis and dehydrating condensation, functional organic molecules soluble in a solvent capable of dissolving said organic metal compound, said functional organic molecules being selected from the group consisting of xanthene, coumarin, conjugated polyene, acridine, condensed polycyclic aromatic hydrocarbon, porphyrin, naphthoquinone and anthraquinone molecules, together with said solvent, adjusting the pH to a level of from 7 to 3, and then subjecting the mixture to hydrolysis followed by dehydrating condensation to form an integrated composite.

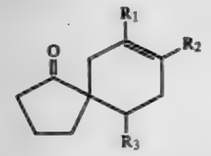
4,639,330

ALKYL-SUBSTITUTED SPIRODECENONE DERIVATIVES, ORGANOLEPTIC UTILITY THEREOF AND PROCESSES FOR PREPARING SAME

Mark A. Sprecker, Sea Bright, and Marie R. Hanna, Hazlet, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 21, 1986, Ser. No. 842,207
Int. Cl.⁴ A61K *7/46*
U.S. Cl. 252—522 R **15 Claims**

1. An alkyl-substituted spirodecenone derivative defined according to the structure:



wherein one of R_1 or R_2 is methyl and the other of R_1 or R_2 is hydrogen; and wherein R_3 represents C_3–C_4 alkyl.

4,639,331

PROCESS FOR MAKING PULVERULENT AMMONIUM POLYPHOSPHATES STABLE TO HYDROLYSIS

Georg Elsner, Hürth; Horst Staendeke, Lohmar, and Gero Heymer, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 23, 1984, Ser. No. 603,120
Claims priority, application Fed. Rep. of Germany, May 7, 1983, 3316880
Int. Cl.⁴ C09K *21/04, 21/10*; C08K *3/28, 3/32*
U.S. Cl. 252—609 **8 Claims**

1. Process for making a particulate, free-flowing, pulverulent ammonium polyphosphate of the general formula

$$H_{(n-m)+2}(NH_4)_mP_nO_{3n+1}$$

in which n stands for a whole number having an average value of about 20 to 800 and the m/n ratio is about 1, wherein 75 to 99 parts by weight ammonium polyphosphate are encapsulated with 1 to 25 parts by weight melamine/formaldehyde-resin or phenol/formaldehyde-resin, which comprises:

placing particulate ammonium polyphosphate, an aliphatic C_1–C_4 alcohol as a diluent, and melamine/formaldehyde-resin or phenol/formaldehyde-resin in an autoclave and initmately mixing them as a suspension at room tempera-

ture therein, heating the suspension to a temperature of 80° to 180° C., allowing the mixture to remain over a period of 15 to 240 minutes at that temperature, cooling the mixture to room temperature, separating the alcohol and dring the product so obtained.

4,639,332

PROCESS FOR THE PREPARATION OF INSULIN DERIVATIVES

Ulrich Grau, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

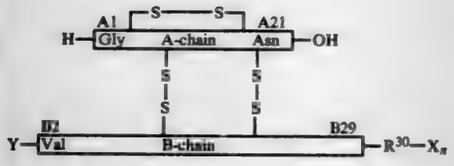
Filed Aug. 1, 1984, Ser. No. 636,672

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1983, 3327928

Int. Cl.⁴ C07K *7/40*

U.S. Cl. 530—303 **10 Claims**

1. A process for the preparation of an insulin derivative of the formula I



(I)

in which

R^{30} represents the radical of a neutral L-amino acid selected from the group consisting of Ala, Thr, and Ser,

n=1, 2 or 3,

X represents identical or different radicals of naturally occurring L-amino acids which can be genetically coded, at least one of which is a basic amino acid, and, where n is 2 or 3, the C-terminal member may also be homoserine-lactone,

Y=Phe or H

by splitting of proinsulin intermediates, proinsulin, preproinsulin or analogs thereof, which comprises carrying out the splitting reaction at a pH in the range from 1 pH unit below the isoelectric point of each individual insulin derivative of the formula I to 1 pH unit above said isoelectric point in the presence of at least one phenol.

4,639,333

PROCESS FOR CONVERTING PREPROINSULIN ANALOGS INTO INSULINS

Rainer Obermeier, Hattersheim am Main; Rolf Geiger, Frankfurt am Main, and Ulrich Grau, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

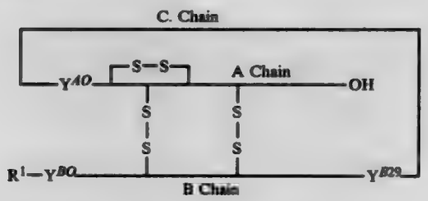
Continuation of Ser. No. 474,458, Mar. 11, 1983. This application Oct. 12, 1984, Ser. No. 659,865

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209184

Int. Cl.⁴ C07K *7/40*

U.S. Cl. 530—303 **16 Claims**

1. A process for the preparation of insulin from a synthetic analog of human, bovine or procine preproinsulin of the formula I



(I)

in which Y denotes Lys or Arg and R^1 denotes hydrogen, an L-amino acid or a peptide residue capable of serving as a signal sequence, which comprises reacting such preproinsulin analog, in a solvent system consisting of water and acetic acid at a pH below the isoelectric point of the insulin in the presence of trypsin or a trypsin-like endopeptidase, with an amino acid derivative selected from the group consisting of Ala-OtBu, Thr-OMe, Thr-OtBu and Thr(tBu)OtBu and then cleaving off the ester group and other protective groups which may be optionally present.

4,639,334

PREPARATION OF 1-BENZYLAZETIDINE-3-OL DERIVATIVES

Derek A. Wood, Sittingbourne, and Paul H. Briner, Faversham, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed May 9, 1985, Ser. No. 732,214

Claims priority, application United Kingdom, May 18, 1984, 8412814

Int. Cl.⁴ C07D *205/04*

U.S. Cl. 548—952 **5 Claims**

1. A process for the preparation of 1-benzylazetidin-3-ol that comprises the step of cyclizing N-benzyl-3-amino-1-chloropropan-2-ol, in solution in triethylamine and optionally in the presence of a phase transfer catalyst.

4,639,335

STEREOCONTROLLED ACETOXYAZETIDINONE PROCESS

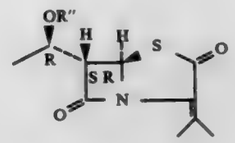
Alain Martel, Delson, and Jean-Paul Daris, St-Hubert, both of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 597,765, Apr. 6, 1984. This application Jan. 13, 1986, Ser. No. 818,145

Int. Cl.⁴ C07D *499/00*; A61K *31/425*

U.S. Cl. 540—304 **11 Claims**

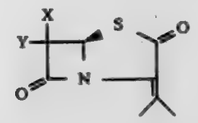
1. A process for the preparation of an intermediate of the formula



IIIb

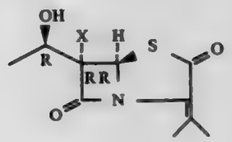
wherein R" is a conventional hydroxy-protecting group selected from triisopropylsilyl, t-butyldimethylsilyl or t-butyldiphenylsilyl, which comprises the steps of

(a) reacting a 6,6-disubstituted anhydropenicillin of the formula



V

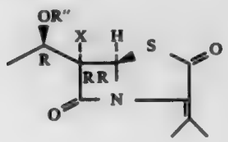
wherein X and Y are each independently chloro, bromo, iodo or phenylseleno with a reagent selected from a Grignard reagent of the formula R_1MgX or an organolithium compound of the formula R_1Li in which R_1 is (lower alkyl or C_6–C_{10} aryl and X is as defined above in an anhydrous inert organic solvent and at a temperature in the range of about 0° to −78° C. and subsequently adding acetaldehyde to exclusively produce the cis isomer of the formula



IIa

wherein X is as defined above:

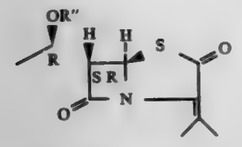
(b) converting intermediate IIa to the corresponding intermediate of the formula



IIb

wherein R" and X are as defined above; and

(c) subjecting intermediate IIb to reduction in an inert solvent and isolating the so-produced 5,6-trans isomer of the formula



IIIb

wherein R" is as defined above.

4,639,336

NOVEL RADIOACTIVE ESTRADIENES LABELLED WITH IODINE

Alain Jouquey; Jean Salmon; Michel Mouren, and Gaëtan Touyer, all of Paris, France, assignors to Roussel Uclaf, Paris, France

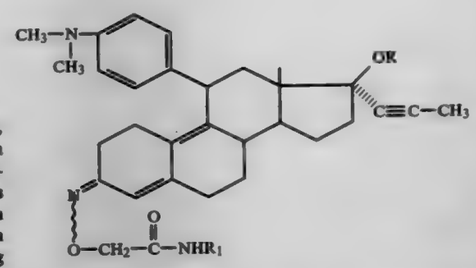
Filed Jun. 14, 1984, Ser. No. 620,455

Claims priority, application France, Jun. 14, 1983, 83 09812; Jun. 20, 1983, 83 10142

Int. Cl.⁴ C07J *1/00*

U.S. Cl. 260—397.5 **15 Claims**

1. A radioactive estradiene labelled with iodine of the formula



I

in the form of their sync or anti isomers or mixtures thereof wherein the wavy line indicates anti or syn position, R is selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms and acyl of an organic carboxylic acid of 1 to 12 carbon atoms and R_1 is the residue of an an amino acid R_1NH_2 possessing an iodine acceptor group or a derivative thereof labelled with iodine^{125} or ^{131}.

4,639,337

PROCESS FOR SEPARATING SURFACTANTS FROM LIQUID USED IN THE MANUFACTURE OF CONCENTRATED FLUOROPOLYMER DISPERSIONS

Charles S. Cope, Parkersburg, W. Va.; Katsunosuke Kitagawa, and Kazuo Konabe, both of Shimizu, Japan, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 14, 1985, Ser. No. 711,833

Int. Cl.⁴ C11C *3/00*; C07B *53/21*

U.S. Cl. 260—408 **1 Claim**

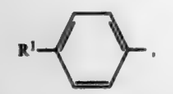
1. A process for separating a fluoroalkanoic acid having the general formula

$$X—R_f—COOH$$

wherein R_f is a saturated, perfluorinated linear or methyl-branched alkylene group containing from 5 to 10 carbon atoms and X is a member of the class consisting of hydrogen, fluorine or chlorine from a hydrocarbyl oxyethoxylated polyether having the general formula:

$$R(O—CH_2—CH_2)_yOH$$

where R is a primary of secondary alkyl group of from 11 to 18 carbon atoms or is



where R^1 is a primary, secondary, or tertiary alkyl group containing from 8 to 12 carbon atoms, and y is a number of from 8 to 14, when both are present in an organic liquid selected from dichloromethane or trichloromethane, which comprises:

(1) contacting said organic liquid with activated alumina and separating the organic liquid from the alumina,

(2) washing and drying the alumina and contacting it with ammonium hydroxide whereby the ammonium salt of the fluoroalkanoic acid is removed from the alumina,

(3) boiling the organic liquid obtained in step (1) until the ethoxylated compound remains.

4,639,338

PREPARATION OF CRYSTALLINE DISODIUM 3-AMINO-1-HYDROXYPROPANE-1,1-DIPHOSPHONATE PENTAHYDRATE

Peter H. Stahl, Freiburg i/Br., Fed. Rep. of Germany, and Beat Schmitz, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y. and Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed Jul. 29, 1985, Ser. No. 759,985

Claims priority, application Switzerland, Aug. 6, 1984, 3768/84

Int. Cl.⁴ C07F *9/38;* **A61K** *31/045, 31/66*

U.S. Cl. 260—502.5 C **11 Claims**

1. Process for the manufacture of disodium 3-amino-1-hydroxypropane-1,1-diphosphonate in a crystalline form that contains water of crystallisation, characterised in that disodium 3-amino-1-hydroxypropane-1,1-diphosphonate is caused to crystallise from a water-containing solution or that a solid form of disodium 3-amino-1-hydroxypropane-1,1-diphosphonate containing relatively little water is treated with water, and in each case the product is isolated and dried at normal or slightly elevated temperature.

4,639,339

SULFONATED POLYETHYLENEIMINE USEFUL AS BLOOD ANTICOAGULANT

Yoshio Murashige, Iwakuni; Akira Yanagase; Yasunori Kawachi, both of Ohtake, and Junko Soga, Saiki, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,145

Claims priority, application Japan, Aug. 13, 1985, 60-178069

Int. Cl.⁴ C07C *143/86*

U.S. Cl. 260—513.6 **2 Claims**

1. A sulfonated polyethyleneimine formed by sulfonating 1 mole % or more of the —NH— and —NH_2 groups present in a polyethyleneimine having a molecular weight of 300 or greater.

4,639,340

DISSOLVING GAS IN A LIQUID

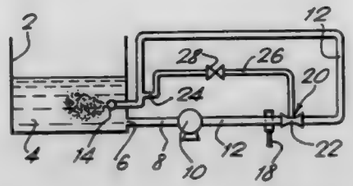
Michael E. Garrett, Woking, England, assignor to The BOC Group plc, Windlesham, England

Filed Jan. 23, 1985, Ser. No. 693,937

Claims priority, application United Kingdom, Jan. 24, 1984, 8401779

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—36.1 **21 Claims**



1. A method of dissolving gas in a liquid comprising the steps of pressurising a stream of liquid, introducing the gas into the stream to dissolve some of the gas therein and to form a gas-liquid mixture travelling at a velocity less than that of sound in said mixture, accelerating the stream to a supersonic velocity to create a first shockwave effective to reduce the size of the gas bubbles in the stream and thereby to form a dispersion of small gas bubbles in the liquid, reducing the velocity of the stream to below sonic velocity, transporting the stream as said dispersion of small gas bubbles in the liquid to at least one outlet in a volume of the liquid at a substantially lower pressure than that to which said stream is pressurized accelerating the stream at near to said outlet so as to create a second shockwave effective to reduce further the size of the gas bubbles, and introducing the stream through said outlet into the volume of liquid.

4,639,341

METHOD FOR INJECTION MOLDING ARTICLES WHILE SIMULTANEOUSLY FORMING PATTERNS THEREON

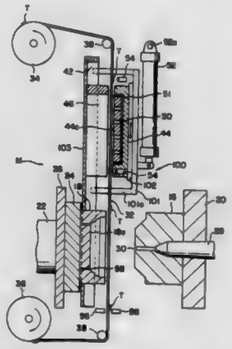
Keiji Hanamoto, Miyoshi, and Fumio Takagi, Tokyo, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 523,757, Aug. 16, 1983, Pat. No. 4,545,752. This application Jul. 3, 1985, Ser. No. 752,253

Claims priority, application Japan, Aug. 17, 1982, 57-142398; May 4, 1983, 58-78592

Int. Cl.⁴ B29C *31/08, 45/14, 51/16*

U.S. Cl. 264—40.1 **3 Claims**



1. A method for molding an article by injection molding while simultaneously imprinting on or transferring onto the molded article a pattern on a continuous pattern sheet,

wherein, prior to the injection of molten plastic material, a softened pattern sheet is pre-molded by pressing said pattern sheet under an air pressure against the cavity surface of a female mold, and wherein the molten plastic material is injected from a male mold into the cavity defined between said male and female molds mated together with each other to integrate the molded article with the pattern on said pattern sheet, said method comprising the steps of:

(a) disposing said pattern sheet which has a plurality of patterns and register marks spaced apart from each other by a predetermined distance in its longitudinal direction in such a way that said pattern sheet is transported so as to cover the opening of said female mold;

(b) detecting the register marks on said pattern sheet at the upstream of said female mold to cause pattern-sheet-holding-and-transferring means to actuate in a manner to hold said pattern sheet at a predetermined position with respect to each pattern thereon;

(c) sucking the pattern sheet against heating means of the pattern-sheet-holding-and-transferring means through air passages formed therein at an initial position wherein the pattern-sheet-holding-and-transferring means is located at the upstream of the female mold;

(d) moving the pattern-sheet-holding-and-transferring means to the female mold from its inital position while its heating means holds and heats the pattern sheet to be softened in order to transport by one pitch said pattern sheet so as to cover said opening of said female mold while heating said pattern sheet;

(e) pressing the softened pattern sheet transfered over a cavity of the female mold against a cavity surface thereof by blowing compressing air through air passages, thereby premolding the pattern sheet;

(f) returning said pattern-sheet-holding-and-transferring means to its initial position; and

(g) injecting the molten plastic material through the male mold into the cavity defined by said male and female molds which are mated together, whereby the molded article is integrated with said pattern sheet.

4,639,342

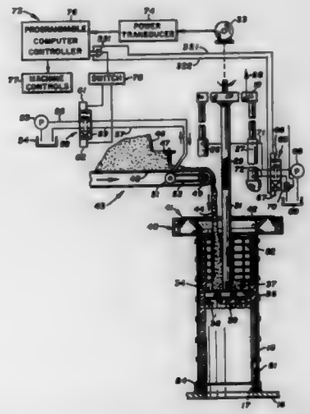
COMBINED CONCRETE FEED AND PACKERHEAD LIFT CONTROL

Tarek A. Adly, Nashua, Iowa, assignor to Hydrotile Machinery Company, Nashua, Iowa

Continuation-in-part of Ser. No. 619,748, Jun. 11, 1984, abandoned. This application Jan. 27, 1986, Ser. No. 823,160

Int. Cl.⁴ B28B *7/18, 13/02, 21/10*

U.S. Cl. 264—40.1 **15 Claims**



5. In a packerhead pipe making machine having a packerhead which is simultaneously rotated by a packerhead motor and lifted by variable speed lift means to form a concrete pipe within a vertically oriented mold from concrete that is deposited into the mold on top of the packerhead by a conveyor driven by a variable speed conveyor motor, a control for coordinating the regulation of the speed of the conveyor and the lift speed of the packerhead to maintain the density of the pipe substantially uniformly between predetermined limits of overpacking and underpacking, comprising:

(a) first means for sensing the power used to rotate the packerhead and for generating a packerhead motor load signal representative of the sensed power;

(b) second means responsive to said packerhead motor load signal to control the speed of the conveyor motor and thereby to control the rate at which concrete is discharged by the conveyor into the mold; and

(c) third means for maintaining the lift speed of the packerhead substantially constant during variations of said packerhead motor load signal between a selected upper limit packerhead motor load signal and a selected lower limit packerhead motor load signal; and

(d) said third means further providing for increasing the lift speed of the packerhead up to a selected maximum lift speed in response to an increase of said packerhead motor load signal above said upper limit signal and for decreasing the lift speed of the packerhead down to a selected minimum lift speed in response to a decrease of said packerhead motor load signal below said lower limit signal.

12. A method for making concrete pipe with a machine having a packerhead for forming concrete pipe in a vertically oriented mold, packerhead motor means for rotating the packerhead, lift means for moving the packerhead in an upward direction through the mold, and conveyor means driven by a conveyor motor for supplying concrete to the mold, said method comprising the steps of:

locating the packerhead in the lower end of the mold;

discharging concrete from the conveyor means into the mold while simultaneously rotating and lifting the packerhead relative to the mold to form a concrete pipe therein;

sensing the power used by the packerhead motor means to rotate the packerhead and providing a packerhead motor load signal representative of the power used;

controlling the amount of concrete discharged into the mold by varying the operating speed of the conveyor motor as a function of the packerhead motor load signal;

providing a packerhead motor load upper limit reference signal and a packerhead motor load lower limit reference signal; and

varying the lift speed of the packerhead within a range between a selected maximum lift speed and a selected minimum lift speed when the packerhead motor load exceeds the upper limit reference signal or falls below the lower limit reference signal whereby the density of the concrete pipe formed within the mold is substantially uniform throughout its length.

4,639,343

FORMING TECHNIQUES FOR SHAPING POLYIMIDE FOAMS

John V. Long, 1756 E. Lexington Pl., El Cajon, Calif. 92021, and John Gagliani, 6280 Lance Pl., San Diego, Calif. 92120

Filed May 20, 1985, Ser. No. 736,241

Int. Cl.⁴ C08J *9/34, 9/02;* **B29C** *43/00, 67/22*

U.S. Cl. 264—45.5 **15 Claims**



1. The method of reshaping polyimide foam sheets which comprises the steps of:

providing a sheet of polyimide foam;

placing one major surface of said sheet into contact with a first mold surface;
bringing a second mold surface at least into substantially complete contact with the second major surface of said sheet and compressing and reshaping the sheet;
heating at least one major surface of said sheet to a temperature of from about 220° to 320° C. for about 0.5 to 5 minutes while allowing the balance of said sheet to remain at a lower temperature; and
removing the reshaped foam sheet from the mold;
whereby a self-sustaining foam structure having a higher density, moisture impervious, fire blocking and abrasion resistant skin on the heated foam surface results.

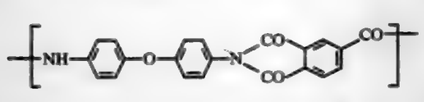
4,639,344

PROCESS FOR PRODUCING FORMED ARTICLES OF AROMATIC POLYAMIDE-IMIDE RESIN

Katsuji Ueno; Kenji Nagaoka, both of Hirakata; Akira Miyashita, and Satoshi Ebisu, both of Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 6, 1984, Ser. No. 617,632
Claims priority, application Japan, Jun. 16, 1983, 58-109028
Int. Cl.⁴ B29B *13/02*; B29C *43/00*; C08J *3/00*
U.S. Cl. 264—83 **3 Claims**

1. In a process for producing a formed articles of aromatic polyamide-imide resin by compression-molding at a temperature lower than the melting temperature of the resin, said aromatic polyamide-imide resin comprising a substantially single recurring unit represented by the formula



the improvement which comprises subjecting the resin, prior to molding, to heat treatment in an oxygen-containing gas under conditions satisfying the following equation

$$\log t \geqq a_1+a_2T+a_3T^2+a_4T^3,$$

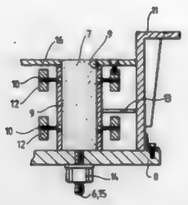
wherein $a_1=2.5841$, $a_2=-8.4926\times10^{-3}$, $a_3=6.9984\times10^{-6}$, and $a_4=-2.0449\times10^{-8}$; t represents the lower limit for the heat-treatment time in hours and T represents the heat-treatment temperature in °C.; and 200° C.≦T≦400° C.

4,639,345

INTERLOCKING BUILDING BLOCK SYSTEM

Randolffa R. Olsen, P.O. Box 4615, Harare, Zimbabwe, South Africa

Filed Mar. 24, 1983, Ser. No. 478,554
Claims priority, application United Kingdom, Mar. 24, 1982, 82/08626
Int. Cl.⁴ B29C *33/40*; B28B *7/36*
U.S. Cl. 264—226 **14 Claims**



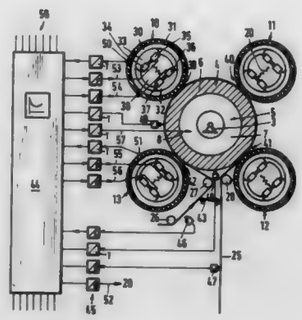
1. A method of manufacturing a machine mould for the continuous casting in cycles of a plurality of dry wall building blocks of substantially constant cross-section, the method comprising:
(i) providing at least one master form of a shape and dimensions corresponding to the shape and dimensions of the required finished block;
(ii) positioning a plurality of metal liners against side faces of the or each master form, each liner defining a wear surface and being positioned with the wear surface laid face-to-face on a respective side face of the master form so as to form a mould cavity or cavities reproducing at least in part the shape of the master form or forms;
(iii) filling the spaces around the or each master form and liners to a required height with a liquid casting compound which is then allowed to set; and
(iv) removing the or each master form to leave a female mould having a mould cavity or cavities corresponding in shape to the shape of the master form or forms.

4,639,346

METHOD AND APPARATUS FOR CALENDERING MAGNETIC TAPES

Josef Pav; Richard Rauf, both of Krefeld; Peter Svenka, Grefrath, and Reinhard Wenzel, Krefeld, all of Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Apr. 23, 1985, Ser. No. 726,068
Claims priority, application Fed. Rep. of Germany, May 2, 1984, 3416211
Int. Cl.⁴ B29B *13/02*; B29C *43/24, 43/46*
U.S. Cl. 264—280 **27 Claims**



1. A method of calendering a web of the type having a magnetic film at one side thereof, particularly of calendering an audio or video recording tape, comprising the steps of advancing the web longitudinally in a predetermined direction and along an elongated path; training the web over at least one primary calendering roll in a predetermined portion of the path so that the magnetic film of successive elongated increments of the running web contacts the primary roll; establishing at least two-spaced-apart nips between the primary roll and discrete secondary rolls so that spaced-apart portions of said increments are compelled to advance through and are compressed in such nips, the upstream nip of said nips constituting the foremost compressing nip along said path; heating the primary roll so that the latter exchanges heat with successive increments of the running web including those portions of the increments which extend between the nips; and heating the web ahead of said upstream nip, the training step including maintaining the web in substantially uninterrupted contact with the primary roll in the portion of said path between said nips.

9. A calender for a web of the type having a magnetic film at one side thereof, particularly for calendering an audio or video recording tape, comprising a frame; a primary calendering roll mounted in said frame for rotation about a fixed axis; at least two secondary calender rolls rotatably supported by said frame and defining with said primary roll spaced-apart compressing nips; means for advancing the web in a predetermined direction and along an elongated path which extends along the

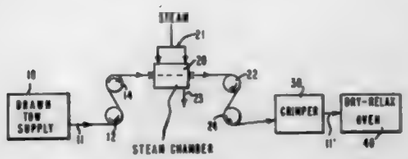
periphery of said primary roll and through said nips, the upstream nip of said nips constituting the foremost compressing nip along said path, and said advancing means being arranged to advance the web in such a way that the running web contacts the primary roll ahead of said upstream nip and is maintained in substantially uninterrupted contact with said primary roll in the portion of said path between said nips; means for moving at least one of said secondary rolls with reference to said primary roll so as to alter the pressure upon the running web in the respective nip; and means for heating said primary roll so that the latter exchanges heat with the running web in the entire portion of said path between said nips.

4,639,347

PROCESS OF MAKING CRIMPED, ANNEALED POLYESTER FILAMENTS

Jack A. Hancock, Franklin, Tenn.; Walter D. Johnson, Midlothian, Va., and Alan D. Kennedy, Kinston, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 491,267, May 4, 1983, abandoned. This application Mar. 16, 1984, Ser. No. 590,291
Int. Cl.⁴ B29C *55/00*
U.S. Cl. 264—291 **5 Claims**



1. A process for manufacturing crimped, annealed filaments consisting essentially of poly(ethylene terephthalate) comprising advancing a bundle of substantially fully drawn filaments through a pressurized zone of saturated steam maintained at a pressure of at least about 150 psig for at least about 0.2 seconds while controlling the bundle length within the zone within the range of from about 5% extension to no more than about 10% retraction, withdrawing the bundle from the zone into ambient atmospheric pressure whereupon the filaments are rapidly cooled by vaporization of water while they are still under said controlled length, crimping the cooled filaments and drying and relaxing the crimped filaments at a temperature of less than about 125° C.

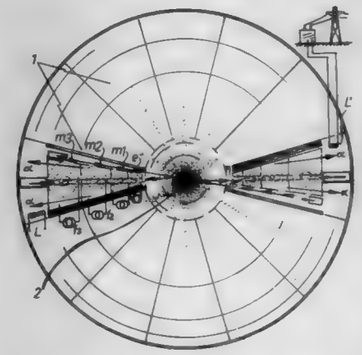
4,639,348

RECYCLOTRON III, A RECIRCULATING PLASMA FUSION SYSTEM

William S. Jarnagin, P.O. Box 127, Concord, Mass. 01742

Filed Nov. 13, 1984, Ser. No. 670,806
Int. Cl.⁴ G21B *1/02*; G21D *7/00*; H05H *1/14, 1/24*
U.S. Cl. 376—107 **5 Claims**

1. A recyclotron nuclear fusion system comprising a plurality of recyclotrons, each said recyclotron comprising cyclotron means for receiving and accelerating charged particles in spiral and work conservative pathways, and output means for forming a beam from particles received from said cyclotron means;
(i) said cyclotron means comprising
(a) a channel shaped electromagnet having a pair of indented polefaces, oriented along an input axis and defining an input magnetic well,
(b) a pair of elongated linear electrodes centered along said input magnetic well arranged generally parallel to said input axis and having a gap therebetween,
(c) tuned oscillator means connected to said electrodes for applying an oscillating electric potential thereto,
(ii) said output means comprising
(e) inverter means comprising an electromagnet having a polarity opposite that of the channel shaped electromagnet oriented contigously therealong for extracting fully accelerated particles from said cyclotron means,
(f) reinverter means comprising an electromagnet having a polarity the same as that of the channel shaped electromagnet for correcting the flightpath of the extracted particles, said inverter means and said reinverter means defining an output axis, said output means directing said beam along said output axis;



each of said plurality of recyclotrons being arranged so that particles of its output beam are received by the input magnetic well of an opposing similar recyclotron.

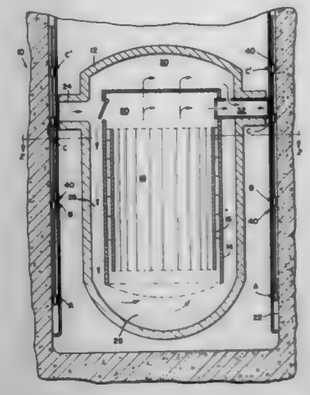
5. A recyclotron nuclear fusion system as in claim 1, wherein said plurality of recyclotrons are arranged in a generally spherical array, each recyclotron being radially tapered and having its output beam directed toward the center of the generally spherical array.

4,639,349

NON-INVASIVE LIQUID LEVEL AND DENSITY GAUGE FOR NUCLEAR POWER REACTOR PRESSURE VESSELS

Anthony J. Baratta, Tyrone; William A. Jester, State College; Edward S. Kenney, State College; Ira B. McMaster, State College, all of Pa., and Mortimer A. Schultz, N. Palm Beach, Fla., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 360,194, Mar. 22, 1982, abandoned. This application Jul. 26, 1984, Ser. No. 634,659
Int. Cl.⁴ G21C *17/00*
U.S. Cl. 376—254 **10 Claims**



4. A method of non-invasively determining the liquid coolant level and density in a nuclear power reactor pressure vessel comprising the steps:
positioning at least three neutron detector fission chambers

externally of the reactor pressure vessel at multiple spaced positions along the side of the fuel core, with one of the neutron detectors being positioned at the side near the bottom of the fuel core, with the multiple spaced positions along the side removing any ambiguity as to whether the liquid level is decreasing or increasing:

shielding the neutron detector fission chamber from thermal neutrons to avoid the noise associated therewith, and

eliminating the effects of gamma radiation from the detected signals;

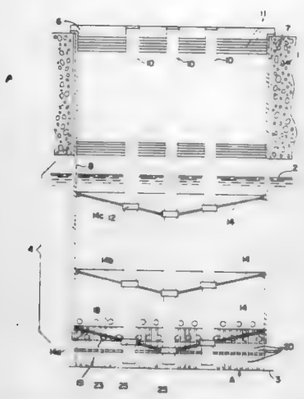
monitoring the detected neutron level signals to determine the coolant liquid level and density in the nuclear power reactor pressure vessel.

4,639,350

COVER-PLUG FOR THE CORE OF A FAST NEUTRON NUCLEAR REACTOR

Claude Malaval, Antony, France, assignor to Novatome, Plessis-Robinson, France

Filed Oct. 13, 1983, Ser. No. 541,745
Claims priority, application France, Nov. 5, 1982, 82-18570
Int. Cl.⁴ G21C *13/06*
U.S. Cl. 376—290 **6 Claims**



1. A fast neutron nuclear reactor comprising a reactor vessel, a core, control rods, a cooling fluid contained in said reactor vessel, core instrumentation and a cover plug comprising a support plate resting on a turning plug (1) closing said reactor vessel, around an opening for passage (7) of said core cover-plug (4) into said turning plug (1), a cylindrical shell (8) having a vertical axis and fixed integrally to said support plate (6) at its upper part, a plug for radiation protection (11) occupying the internal volume of said cylindrical shell over a height which corresponds substantially to the thickness of said turning plug, and a set of vertical tubes (10) for receiving said control rods, said vertical tubes being fixed to said support plate (6) at their upper ends, arranged within said cylindrical shell (8) and connected to braces (14) having outer edges and arranged transversely relative to said shell (8), wherein

(a) a set of said braces (14) which are fixed to said tubes (10), inside said shell (8) consists of at least two vertically spaced conical webs (14) having an axis coinciding with the axis of said shell (8), a top angle greater than 120° and an external diameter which is slightly smaller than the internal diameter of said shell (8), a clearance existing between the inner surface of said shell (8) and said outer edge of said braces (14);

(b) said braces (14) are held in an axial position relative to said cylindrical shell (8) by abutments (15) which are integral with said shell (8) each of said braces having openings only large enough to allow passage of said vertical tubes therethrough, the upper of said at least two braces having additional passages allowing passage of sodium therethrough; and

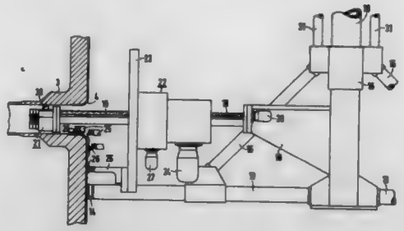
(c) the lowermost brace (14*a*) is free of any additional sodium passage holes and is arranged with its outer surface directed downwardly, said lowermost brace being held by said abutments just above the lower part of said shell (8) said shell being pierced with openings (18, 19) only in the lower portion thereof, said openings (18, 19) being on either side of said lowermost brace (14*a*) enabling deflection of said cooling fluid.

4,639,351

REPAIR DEVICE FOR A REACTOR PRESSURE VESSEL

Siegfried Förner, Erlangen; Erich Kitacher, Marloffstein, and Stefan Ring, Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Mar. 19, 1984, Ser. No. 590,691
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310947
Int. Cl.⁴ G21C *19/42*
U.S. Cl. 376—310 **4 Claims**



1. Repair device for removing an inner surface layer on a feed-water connector of a reactor pressure vessel received in a reactor housing having an assembly platform with a carriage displaceable thereon transversely to the reactor pressure vessel, the repair device comprising centering means located at a lower end of a telescopically extensible upright tube suspended from the carriage for centering said lower end of said upright tube in the pressure vessel, said centering means having at least two outwardly swingable supports and a hydraulic system for swinging said two supports outwardly umbrella-like; a supporting frame for a feed-rod also disposed at said lower end of said upright tube, said feed-rod being horizontally self-supporting at an end thereof; a drive motor connected to said feed rod for rotating said feed-rod; means located at said self-supporting end of said feed rod for centrally fixing said self-supporting end in the feed-water connector of the reactor pressure vessel, and a horizontally displaceable turning machine tool mounted on said feed rod, said turning machine tool having a face plate and a radially movable holder for a turning tool bit carried by said mounting support.

4,639,352

HARD ALLOY CONTAINING MOLYBDENUM

Mitsuo Kodama; Masaya Miyake; Minoi Nakano; Tsuyoshi Asai, and Akio Hara, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

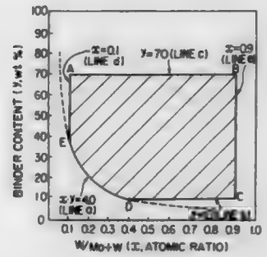
Continuation of Ser. No. 738,908, May 29, 1985, abandoned, which is a continuation of Ser. No. 548,034, Nov. 2, 1983, abandoned, which is a continuation of Ser. No. 269,664, Jun. 2, 1981, abandoned. This application Dec. 13, 1985, Ser. No. 808,228
Int. Cl.⁴ C22C *29/02*
U.S. Cl. 419—15 **12 Claims**

1. A process for preparing a hard alloy having a gross composition within the range of the shaded portion ABCDEA in FIG. 1, comprising the following two phases:

(1) a hard phase comprising at least one compound having a simple hexagonal MC type crystal structure selected from the group consisting of mixed carbides, carbonitrides and carboxynitrides of molybdenum and tungsten, and

(2) a binder phase comprising at least one element selected from the group consisting of iron, cobalt, and nickel,

which process comprises reducing a mixture of oxides of molydenum and tungsten having a particle size of at most 1 micron to produce an (Mo,W) alloy; heat treating said (Mo,W) alloy at a temperature of 1100° to 1400° C. in a



stream of nitrogen or hydrogen; carburizing the heat-treated alloy at a controlled temperature which is as high as possible but lower than the decomposition temperature of (Mo,W)C into $(Mo,W)_2C$, to produce said hard phase composed of coarse particles having a mean particle size of at least 3 microns and having a uniform molybdenum to tungsten ratio in said coarse particles; mixing said hard phase with said binder phase; and sintering the resultant mixture to produce said hard alloy, said process being conducted in a manner to hold the quantity of M_2C precipitated to a minimum.

4,639,353

BLOOD OXYGENATOR USING A HOLLOW-FIBER MEMBRANE

Tohru Takemura; Atushi Nakashima, both of Ohtake; Haruhiko Yoshida, Kuga; Jun Kamo, and Eiichi Hamada, both of Ohtake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1985, Ser. No. 726,391
Claims priority, application Japan, Apr. 24, 1984, 59-81088; Aug. 7, 1984, 59-164280; Nov. 9, 1984, 59-236027; Nov. 9, 1984, 59-236028
Int. Cl.⁴ A61M *1/14*; B01D *13/01*
U.S. Cl. 422—46 **10 Claims**



1. A blood oxygenator comprising:

a housing having a plurality of contact chambers therein, a blood inlet, a blood outlet, a gas inlet, and a gas outlet, said plurality of chambers communicating respectively with said blood inlet and said blood outlet and forming separate blood flow paths between said blood inlet and said blood outlet, said oxygenator comprising means downstream from said blood inlet for separating blood into separate but substantially equal volumes of blood and for introducing said separate but substantially equal volumes, respectively, into said plurality of chambers; and

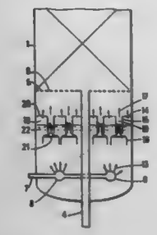
a bundle or bundles of hollow fibers of a composition suitable for blood-gas oxygen exchange and being disposed in each said chamber substantially perpendicular to the direction of blood flow therethrough, opposite ends of said hollow; fibers respectively communicating with said gas inlet and said gas outlet.

4,639,354

APPARATUS FOR THE LIQUID PHASE HYDROTREATMENT OF HYDROCARBONS IN THE PRESENCE OF AN EXPANDED OR EBULLATED CATALYST BED

Didier Bischoff; Gérard Courtehoux, both of Rueil Malmaison, and Pierre Renard, Saint Nom La Breteche, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Division of Ser. No. 512,050, Jul. 8, 1983, Pat. No. 4,478,707. This application Aug. 16, 1984, Ser. No. 641,527
Claims priority, application France, Jul. 9, 1982, 82 12239
The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.
Int. Cl.⁴ B01J *8/22*
U.S. Cl. 422—140 **11 Claims**



1. An apparatus for the catalytic treatment of a fluid charge, wherein solid particles are withdrawn and a fluid charge is introduced at the lower portion of a contact zone, comprising a reactor (1), a first introducing means for introducing fresh catalyst at an upper part of the reactor, a first discharge means for discharging used catalyst at a lower part of the reactor, wherein said first discharge means comprises at least one withdrawing tube (4) of sufficient size for discharging used catalyst from the reactor, said reactor further comprising:

(a) at least one wall (5), said wall being substantially horizontal and located at the lower part of the reactor, said wall being provided with perforations (6) substantially distributed over the major part of the surface of said wall, the size of said perforations being sufficiently small to prevent passage of catalyst particles introduced into the reactor through said perforations in said wall, but sufficiently large to permit passage through said wall of an ascending stream of a fluid charge;

(b) a second introducing means (7) and (8) for introducing a fluid at the lower part of the reactor and a second discharge means for discharging a treated fluid charge at the upper part of the reactor; and

(c) plural elements arranged between the discharge tube (4) and the second introducing means (7) and (8), said plural elements comprising:

(i) a grid means (14) having perforations (20) which are sufficiently small to prevent the passage of the major part of a liquid phase of fluid introduced through said second introducing means, and permitting only passage of the major part of a gaseous phase of the fluid introduced;

(ii) at least one continuous barrier means (15) supported on said grid means (14) and having a lower end arranged in the reactor at a level higher than that of said second

introducing means (7) and (8), said barrier means thus defining compartments (18) and chimneys (19); and

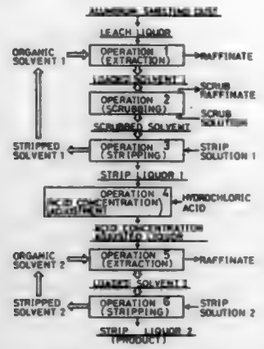
(iii) baffle means (21) arranged below the lower ends of said chimneys for ensuring accumulation of the introduced fluid in said compartments.

4,639,355

PROCESS FOR RECOVERING GALLIUM FROM ALUMINUM SMELTING DUST

Shingo Matsui; Hidetsugu Ikeda; Akio Era, all of Fukuoka, and Senji Nishimura, Kyoto, all of Japan, assignors to Mitsui Aluminium Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1985, Ser. No. 757,591
Int. Cl.[4] C01G *15/00*
U.S. Cl. 423—112 **9 Claims**



1. A process for recovering gallium from aluminum smelting dust comprising

(a) leaching aluminum smelting dust with sulfuric acid to obtain a leach liquor;

(b) extracting the leach liquor with a first organic solution containing an extracting agent comprising a liquid cation exchange agent selected from the group consisting of organic phosphoric acid, organic phosphoric acid and organic phosphoric acid having 8 to 20 carbon atoms per molecule to extract gallium and impurities from the leach liquor and to produce a first loaded organic solution;

(c) scrubbing the first loaded organic solution with an aqueous solution of 4–9 mol/l hydrochloric acid to scrub off the impurities;

(d) stripping the scrubbed loaded organic solution with a mineral acid selected from the group consisting of hydrochloric acid, sulfuric acid and nitric acid having a concentration higher than 0.1 mol/l to quantitatively strip gallium and to produce a stripped liquor;

(e) adjusting the acid concentration of the stripped liquor with hydrochloric acid to more than about 3 mol/l in concentration;

(f) extracting the concentration-adjusted stripped liquor with a second organic solution containing a neutral extracting agent selected from the group consisting of isopropyl ether, tributyl phosphate, methyl isobutyl ketone and trioctyl phosphine oxide to extract gallium and iron from the stripped liquor and to produce a second loaded organic solution; and

(g) stripping the second loaded organic solution with water or a dilute solution of mineral acid selected from the group consisting of hydrochloric acid, sulfuric acid and hydrochloric acid to strip gallium from the solution.

4,639,356

HIGH TECHNOLOGY CERAMICS WITH PARTIALLY STABILIZED ZIRCONIA

Michael P. O'Toole, and Roger J. Card, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 5, 1985, Ser. No. 795,288
Int. Cl.[4] C01G *25/02*
U.S. Cl. 423—266 **25 Claims**

1. A process for making a fully or a partially stabilized zirconia comprising:

(a) making an aqueous solution of zirconium sulfate in admixture with an inorganic or organic water soluble salt of one or more metals selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ac, Ce, Th, and Al, said organic salt having from about 1 to about 20 carbon atoms;

(b) atomizing said solution into a solvent at least partially miscible with water, said solvent present in an amount of at least 3 times the volume of said solution wherein the ratio of said solvent to said solution is about 3:1 to about 50:1, based on volume, said solvent being agitated during the addition of said solution, forming a coprecipitated metal salt;

(c) separating the coprecipitated metal salt from said solvent by filtration;

(d) washing the coprecipitated metal salt filtrate with an inert solvent or solvents;

(e) drying the washed filtrate; and

(f) calcining the dried filtrate in a flowing gas or mixture of gases.

4,639,357

CRYSTALLINE SILICOPHOSPHOALUMINATE MCM-5

Eric G. Derouane, Namur, Belgium, and Roland von Ballmoos, Pennington, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 562,908, Dec. 19, 1983, abandoned. This application Dec. 21, 1984, Ser. No. 685,172
Int. Cl.[4] C01B *25/36, 33/28*
U.S. Cl. 423—306 **18 Claims**

1. A synthetic crystalline material having a composition as follows:

$$vA:M_{x/m}^{m+}:(AlO_2)_{1-y}^{-}:(PO_2)_{1-x}^{+}:(SiO_2)_{x+y}\cdot N_{y/n}^{n-}\cdot wH_2O$$

wherein M is a cation of valence m, N is an anion of valence n, A is occluded organic directing agent and solvent, v is the number of moles of A, w is the number of moles of H_2O and x and y are numbers of from greater than -1 to less than $+1$ which satisfy the relationships:

(1) if x is 0, then y is not 0,

(2) if y is 0, then x is not 0,

(3) if the atomic ratio of Al/P is greater than 1, then $x+y$ is greater than 0.001 and $y+0.6x$ is less than 0.4, and

(4) if the atomic ratio of Al/P is less than 1, then $x+y$ is greater than 0.001 and $x+0.5y$ is less than 0.5,

which, as synthesized, exhibits a characteristic X-ray diffraction pattern as shown in Table 1-A of the specification.

4,639,358

CRYSTALLINE SILICOPHOSPHOALUMINATE MCM-1

Eric G. Derouane, Namur, Belgium, and Roland von Ballmoos, Pennington, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 562,677, Dec. 19, 1983, abandoned. This application Dec. 21, 1984, Ser. No. 685,173
Int. Cl.[4] C01B *25/36, 33/28*
U.S. Cl. 423—306 **18 Claims**

1. A synthetic crystalline material having a composition as follows:

$$vA:M_{x/m}^{m+}:(AlO_2)_{1-y}^{-}:(PO_2)_{1-x}^{+}:(SiO_2)_{x+y}\cdot N_{y/n}^{n-}\cdot wH_2O$$

wherein M is a cation of valence m, N is an anion of valence n, A is occluded organic directing agent and solvent, v is the number of moles of A, w is the number of moles of H_2O and x and y are numbers of from greater than -1 to less than $+1$ which satisfy the relationships:

(1) if x is 0, then y is not 0,

(2) if y is 0, then x is not 0,

(3) if the atomic ratio of Al/P is greater than 1, then $x+y$ is greater than 0.001 and $y+0.6x$ is less than 0.4, and

(4) if the atomic ratio of Al/P is less than 1, then $x+y$ is greater than 0.001 and $x+0.5y$ is less than 0.5,

which, as synthesized, exhibits a characteristic X-ray diffraction pattern as shown in Table 1-A of the specification.

4,639,359

PROCESS OF REMOVING CATIONIC IMPURITIES FROM WET PROCESS PHOSPHORIC ACID

Dennis H. Michalski, Lakeland, Fla., and Viswanathan Srinivasan, Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Dec. 16, 1985, Ser. No. 809,440
Int. Cl.[4] C01B *25/16*
U.S. Cl. 423—321 R **20 Claims**

1. A method for removing aluminum, magnesium and iron impurities from wet process phosphoric acid having a P_2O_5 content of about 17–54%, comprising the steps of:

partially ammoniating the phosphoric acid;

adding a fluoride ion donating compound to the acid to form a precipitate;

separating the precipitate from the acid; and

recovering a partially ammoniated wet process phosphoric acid of reduced impurity content.

4,639,360

SYNTHESIS OF CRYSTALLINE SILICATE ZSM-5 USING AN ORGANIC SULFONIC ACID

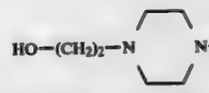
Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 28, 1985, Ser. No. 791,658
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—329 **24 Claims**

1. A method for synthesizing a crystalline silicate having the structure of ZSM-5 exhibiting a characteristic X-ray diffraction pattern as shown in Table 1 of the specification, which comprises (i) preparing a mixture capable of forming said silicate, said mixture comprising sources of alkali metal cations (M), an oxide of silicon, an oxide of aluminum, water and an anionic directing agent (R), and having a composition, in terms of mole ratios, within the following ranges:

SiO_2/Al_2O_3	20 to less than 400
H_2O/SiO_2	2 to 1000
OH^-/SiO_2	0 to 10
M/SiO_2	0.01 to 4
R/SiO_2	0.01 to 4

wherein R is an anion of the formula



(ii) maintaining said mixture under sufficient conditions until crystals of said silicate are formed and (iii) recovering said crystalline silicate having the structure of ZSM-5 from step (ii), said recovered crystalline silicate containing said anion R and alkali metal cations.

4,639,361

PROCESS OF PREPARING DISILANE BY REDUCTION OF HEXACHLORODISILANE

Koji Aono, Saitama; Toshinori Saito, Kawagoe, and Chiharu Okada, Kamifukuoka, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Feb. 19, 1985, Ser. No. 702,643
Claims priority, application Japan, Feb. 21, 1984, 59-29507
Int. Cl.[4] C01B *33/04*
U.S. Cl. 423—347 **12 Claims**

1. A process of preparing disilane, comprising the step of subjecting hexachlorodisilane to a reduction reaction with a mixture of lithium hydride and lithium aluminum hydride in an organic liquid medium; wherein the molar ratio of lithium hydride to lithium aluminum hydride in said mixture is between about 2 and about 20 and wherein the total quantity of lithium hydride and lithium aluminum hydride is between about 110 percent and about 150 percent of the theoretical quantity.

4,639,362

PROCESS FOR THE PRODUCTION OF MAGALDRATE

Klaus Schanz, Darmstadt-Schneeruheim, Fed. Rep. of Germany, assignor to Giulini Chemie GmbH, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Mar. 5, 1985, Ser. No. 708,553
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1984, 3408463
Int. Cl.[4] C01F *1/00*; A61K *33/08, 33/04*
U.S. Cl. 423—554 **5 Claims**

1. A process for producing magaldrate of the formula,

$$Al_5Mg_{10}(OH)_{31}(SO_4)_2\cdot\times H_2O,$$

comprising mixing an aqueous suspension of carbonate containing active aluminum hydroxide with an aluminum sulfate solution in stoichiometric quantities under intensive stirring; after the generation of carbon dioxide ceases, mixing in stoichiometric quantities of magnesium oxide having an iodine number between 20 and 100; and allowing the resulting mixture to stand for 10 to 24 hours without mixing to form magaldrate paste.

4. A process for producing magaldrate of the formula,

$$Al_5Mg_{10}(OH)_{31}(SO_4)_2\cdot\times H_2O,$$

comprising combining magnesium hydroxide with at least one water soluble sulfate containing compound in the presence of water and in stoichiometric quantities while stirring, thereafter adding stoichiometric quantities of active aluminum hydroxide while continuing to stir, and allowing the resulting mixture to stand without mixing to form magaldrate paste.

4,639,363

PROCESS FOR PREPARING AMORPHOUS PHASES OF INTERMETALLIC COMPOUNDS BY A CHEMICAL REACTION

Masao Komatsu, Higashi-Osaka, and Hiroshi Fujita, Ibaraki, both of Japan, assignors to Osaka University, Suita, Japan

Filed Mar. 12, 1985, Ser. No. 711,442
Claims priority, application Japan, Sep. 14, 1984, 59-191643
Int. Cl.[4] C01B *6/24*
U.S. Cl. 423—644 **8 Claims**

1. A process for preparing amorphous hydrides of intermetallic compounds by a chemical reaction, said process comprising:

a. alloying a mixture consisting essentially of zirconium and aluminum to form intermetallic compounds thereof; and

b. reacting said intermetallic compounds at an elevated temperature in a reaction chamber with a gas including hydrogen gas to produce amorphous hydrides of said intermetallic compounds, said elevated temperature ranging from a temperature effective to cause said chemical

reaction to a temperature which does not equal or exceed the temperature at which said amorphous hydrides crystallize.

8. Amorphous hydrides of intermetallic compounds prepared by a process comprising:

a. alloying a mixture consisting essentially of zirconium and aluminum to form intermetallic compounds thereof; and

b. reacting said intermetallic compounds at an elevated temperature in a reaction chamber with a gas including hydrogen gas to produce amorphous hydrides of said intermetallic compounds, said elevated temperature ranging from a temperature effective to cause a chemical reaction to a temperature which does not equal or exceed the temperature at which said amorphous phases crystallize.

4,639,364

METHODS AND COMPOSITIONS FOR ENHANCING MAGNETIC RESONANCE IMAGING

George B. Hoey, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Nov. 14, 1984, Ser. No. 671,456
Int. Cl.[4] A61K *49/00*; A61B *5/05, 6/00*
U.S. Cl. 424—9 9 Claims

1. A method for obtaining fluorine magnetic resonance images of body organs and tissues which comprises administering to a mammal a composition comprising a water soluble, substantially nontoxic salt of a compound of the formula:

CF_3R

wherein R is $—SO_3H$, $—SO_2NH_2$ or $—PO_3H_2$, in a sufficient amount to provide fluorine magnetic resonance images of said body organs and tissues, and imaging said organs and tissues.

4,639,365

GADOLINIUM CHELATES AS NMR CONTRAST AGENTS

A. Dean Sherry, Richardson, Tex., assignor to The Board of Regents, The University of Texas System, Austin, Tex.

Filed Oct. 18, 1984, Ser. No. 662,075
Int. Cl.[4] A61K *49/00*; G01N *31/00*; A61B *6/00*
U.S. Cl. 424—9 4 Claims

1. A method of enhancing NMR contrast in a living subject, comprising administering internally to the subject an effective amount of a contrast agent which comprises a chelate of gadolinium with a compound selected from the group consisting of DOTRA, DOTA, NOTA, and salts thereof.

4,639,366

POLYMERS CONTAINING PENDANT ACID FUNCTIONALITIES AND LABILE BACKBONE BONDS

Jorge Heller, Woodside, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 6, 1984, Ser. No. 618,002
Int. Cl.[4] A61K *31/74, 31/765*
U.S. Cl. 424—19 4 Claims

1. A polymer with at least one labile backbone bond per repeat unit and at least one pendant acid functionality per thousand repeat units.

4,639,367

AEROSOL FOAM

Leonard Mackles, New York, N.Y., assignor to Product Resources International, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 713,294, Mar. 18, 1985, abandoned. This application Sep. 20, 1985, Ser. No. 778,026
Int. Cl.[4] A61K *9/00*
U.S. Cl. 424—45 23 Claims

1. An edible, anhydrous aerosol foam composition comprising a foamable liquid oil, a foaming agent and a propellant, said propellant being present in an amount sufficient to produce a stable, measurable foam but insufficient to produce a spray when said composition is ejected through an aerosol valve, and dispersed solid particles, said particles comprising an active therapeutic agent.

4,639,368

CHEWING GUM CONTAINING A MEDICAMENT AND TASTE MASKERS

Sarfaraz Niazi, Oakbrook, Ill., and Alvin Shemesh, Hopkins, Minn., assignors to Farnacon Research Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 643,584, Aug. 23, 1984. This application Jun. 6, 1985, Ser. No. 741,871
Int. Cl.[4] A61K *9/68*
U.S. Cl. 424—48 11 Claims

1. A chewing gum composition adapted to supply a medicament to the oral cavity comprising, a chewing gum base, an orally administrable medicament capable of being absorbed through the buccal cavity, said medicament consisting essentially of phenylpropanol amine, and a carbon dioxide generator.

4,639,369

HIGHER ACYL LOWER ALKYL HYDROXYSTEARATES USEFUL IN COSMETICS

Joseph P. Claudelli, Ramsey, N.J., assignor to Revlon, Inc., New York, N.Y.

Filed Mar. 3, 1986, Ser. No. 835,687
The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.
Int. Cl.[4] C11C *3/00*; A61K *7/027, 7/42, 7/15*
U.S. Cl. 424—59 10 Claims

1. A fatty acid ester of the formula

$CH_3(CH_2)_5CH(OCOR_1)(CH_2)_{10}COOR_2$

wherein,

R_1 is a hydrocarbon radical having 17 carbon atoms with 1 to 3 double bonds therein; and

R_2 is a hydrocarbon radical having 1 to 4 carbon atoms.

10. A cosmetic composition comprising by weight 1–20% of a fatty acid ester of the formula

$CH_3(CH_2)_5CH(OCOR_1)(CH_2)_{10}COOR_2$

wherein,

R_1 is a hydrocarbon radical having 17 carbon atoms with 1 to 3 double bonds therein; and

R_2 is a hydrocarbon radical having 1 to 4 carbon atoms;

5–10% of an humectant;

0.2–1.0% of a thickener

0.5–10% of an emulsifier; and

50–80% water.

4,639,370

PHARMACEUTICAL COMPOSITION

Fabio Carli, Turin, Italy, assignor to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Feb. 6, 1985, Ser. No. 698,815
Claims priority, application United Kingdom, Feb. 8, 1984, 8403359
Int. Cl.[4] A61K *31/79*
U.S. Cl. 424—80 7 Claims

1. A process for loading a water-swellable, water-insoluble polymer with a biologically active substance or a substance convertible into a biologically active substance in vivo, which process comprises:

preparing and grinding a mixture of a said substance with a water-swellable, water-insoluble polymer in a weight ratio of the said substance:polymer of from 1:0.1 to 1:100.

4,639,371

HEPATITIS B ANTIGENIC COMPOSITIONS AND VACCINES AGAINST HEPATITIS B DERIVED THEREFROM

Alfred M. Prince, Pound Ridge, and John Vnek, Bronx, both of N.Y., assignors to New York Blood Center, Inc., New York, N.Y.

Filed Oct. 2, 1984, Ser. No. 656,833
Int. Cl.[4] A61K *39/12, 39/42*; C07K *15/04*
U.S. Cl. 424—86 44 Claims

1. A proteinaceous mass comprising particles of HBsAg, said particles being branched ring-shaped as depicted in FIG. 1*b*, open ring-shaped as depicted in FIG. 1*d*, or ring-shaped branched as depicted in FIG. 1*e*.

4,639,372

COCCIDIOSIS VACCINE

Peter K. Murray, Redbank, and Stefan Galuska, North Plainfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 29, 1984, Ser. No. 625,882
Int. Cl.[4] A61K *39/012, 37/00*
U.S. Cl. 424—88 13 Claims

1. An extract obtained by grinding and centrifuging a suspension of sporulated oocysts of *Eimeria tenella*, and purifying sporozoites from the pelleted material resulting from the centrifugation step, the pelleted material containing antigens capable of immunizing chickens against coccidiosis.

6. A method of immunizing chickens against coccidiosis comprising administering an anti-coccidial effective dose of the extract of claim 1.

4,639,373

STABILIZATION OF GRANULOCYTES

Bernard M. Babior, Lexington, Mass., assignor to New England Medical Center Hospitals, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 676,071, Nov. 29, 1984. This application Jul. 24, 1985, Ser. No. 758,514
Int. Cl.[4] A61K *35/14*
U.S. Cl. 424—101 5 Claims

1. The method of stabilizing for storage without freezing human granulocytes obtained from blood which comprises suspending them in a non-toxic buffer containing gelatin and plasma in which the amount of said gelatin is at least 1% by weight of the total composition and less than the amount required to cause said composition to set to a gel at 40° C. or higher and the amount of said plasma is from 25 to 90% by weight of the total composition.

5. A composition comprising granulocytes suspended in a non-toxic buffer at pH 6.1 to 8.0 containing gelatin and plasma, the amount of said gelatin is at least 1% by weight of the total composition and less than the amount required to cause said composition to set to a gel at 40° C. or higher and the amount of said plasma is from 25 to 90% by weight of the total composition.

4,639,374

ALMOND NUT PASTE FOR BEVERAGES AND DESSERTS

Akira Matsunobu; Sumio Horishita, and Tetsuo Yamada, all of Hyogo, Japan, assignors to Ton Company Ltd., Japan

Continuation-in-part of Ser. No. 375,633, May 6, 1982, abandoned. This application May 8, 1984, Ser. No. 608,289
Claims priority, application Japan, Nov. 9, 1981, 56-180180
Int. Cl.[4] A23C *9/127*; A23L *2/38, 1/36, 1/221*
U.S. Cl. 426—43 9 Claims

1. A homogeneous mixture for beverages and desserts, comprising a finely ground almond paste derived from unskinned dry- or oil-roasted almonds wherein substantially all of the almonds have a maximum particle size of not more than 105 microns, with more than 80% by weight of a particle size not more than 25 microns and with more than 95% by weight of a particle size not more than 46 microns, and also containing two types of nonionic surfactants, one being selected from hydrophilic surfactants of HLB not less than 7 and the other from lipophilic surfactants of HLB not more than 6 with the mean HLB of the surfactants used being more than 10 and less than 15, and a thickener and a sugar.

7. A method of manufacturing a nut sour, which comprises suspending a nut paste comprising a finely ground almond paste derived from unskinned dry- or oil-roasted almonds substantially all of which have a maximum particle size of not more than 105 microns, with more than 80% by weight of a particle size not more than 25 microns and with more than 95% by weight of a particle size not more than 46 microns, two types of nonionic surfactants, one being selected from hydrophilic surfactants of HLB not less than 7 and the other from lipophilic surfactants of HLB not more than 6 with the mean HLB of the surfactants used being more than 10 and less than 15, a thickener and sugar in skim milk or a skim milk substitute, and subjecting the resultant suspension to a lactic fermentation.

4,639,375

ENZYMATIC TREATMENT OF BLACK TEA LEAF

Chee-Hway Tsai, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 12, 1983, Ser. No. 522,878
Int. Cl.[4] A23F *3/00*; A23B *7/10*; A23K *1/00*
U.S. Cl. 426—49 10 Claims

1. A process for increasing the yield and tea solid solubility of black tea by enzymatic treatment, comprising the steps of:

(1) wetting fermented black tea leaf prior to extraction with an enzyme solution comprising water, tannase and at least one cell-wall-digesting enzyme which breaks down one or more tea cell wall constituents to simpler materials wherein the tea leaf is combined with the enzyme solution at a tea:enzyme solution weight ratio of from about 4:1 to about 1:2.5;

(2) incubating the enzyme-wetted tea to cause partial digestion and fermentation of the tea leaf in a closed system such that volatiles are not lost or damaged;

(3) neutralizing the tea to a pH of from about 4.75 to about 5.75 with an edible base; and

(4) inactivating the enzymes by heating.

4,639,376

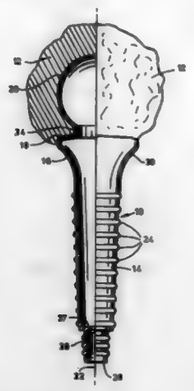
ICE CREAM HANDLE

Salvatore Salsalino, 49 Poynter Dr., Etobicoke, Ontario, M9R 1L3, Canada, and Victoria M. Samson, R.R. #4, Brampton, Ontario, L6T 3S1, Canada

Filed Oct. 10, 1985, Ser. No. 786,061
Int. Cl.[4] A23G *9/26*
U.S. Cl. 426—134 5 Claims

1. A unitary handle for supporting an individual serving of pre-formed, deep-frozen ice cream for storage and consumption comprising a hand held elongated hollow gripping portion capable of fitting the contour of the hand flaring outwardly toward a top end thereof, thence extending inwardly to define a substantially flat annular surface sufficient to support an individual serving of ice cream thereon; a closed hollow head portion projecting upwardly from the annular surface sufficient to hold the individual serving of ice cream; said flat annular surface and said head portion being connected by a neck portion which is narrower than both said flat annular surface and said head portion and sufficient to retain cold air inside the head portion sufficient to retain ice cream on the surface of the head portion cold and hard; the interior of the head portion being in fluid communication with the interior of the gripping portion; the gripping portion having a bottom end remote from said top end with the bottom end having an opening to the exterior and with said opening having a cross-sec-

tional area less than about 60% of the least cross-sectional area within the gripping portion sufficient to minimize convective



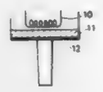
heat interchange between air within the hollow gripping handle and the exterior air.

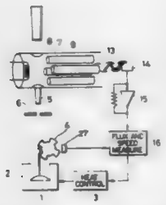
4,639,377

THIN FILM FORMATION TECHNIQUE AND EQUIPMENT

Shigehiko Yamamoto, Tokorozawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 22, 1985, Ser. No. 725,793
Claims priority, application Japan, Apr. 24, 1984, 59-81121
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—10 11 Claims





1. In a thin film formation technique which sticks molecules onto a substrate and forms a thin film, the thin film formation technique comprising the steps of:

converting a molecular beam effusing from molecular beam source equipment to a pulsed molecular beam;

introducing said pulsed molecular beam into an ionization chamber so that most of said pulsed molecular beam is caused to be incident on said substrate while a part of said pulsed molecular beam is ionized by said ionization chamber;

amplifying the ion or the electron converted from the ion and converting it to an electrical signal;

calculating the flux and speed of said molecular beam in accordance with the electrical signal;

controlling said molecular beam effusing from said molecular beam source equipment on the basis of the calculation information of the flux and speed; and

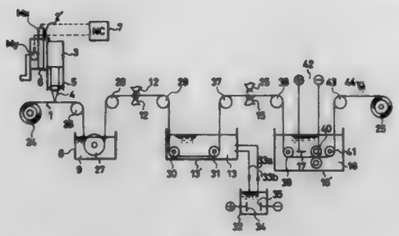
forming said thin film on said substrate.

4,639,378

AUTO-SELECTIVE METAL DEPOSITION ON DIELECTRIC SURFACES

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue Japax Research Incorporated, Kanagawaken, Japan

Filed Jan. 16, 1985, Ser. No. 691,877
Claims priority, application Japan, Jan. 17, 1984, 59-6116; Jan. 17, 1984, 59-6117
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—35 6 Claims



1. A method of plating a pattern of metal on a dielectric surface, comprising the steps of:

(a) maskleasly treating the dielectric surface to selectively activate preselected areas thereof while said preselected areas are in contact with a priming solution so that the dielectric surface in contact with the priming solution becomes catalytic, and thereby receptive to electroless metal deposition, selectively at said preselected areas; and

(b) contacting the treated dielectric surface with an electroless plating solution to allow metal therefrom to autoreductively deposit selectively at said preselected catalyzed areas, thereby forming the pattern of metal desired on the dielectric surface.

4,639,379

METHOD FOR THE IMPROVEMENT OF ANTISTATIC PERFORMANCE OF SYNTHETIC RESIN SHAPED ARTICLES

Michihiko Asai, Ibaraki; Yukio Shimura, Kanagawa; Keishiro Tsuda, Ibaraki; Susumu Ueno, Ibaraki; Hirokazu Nomura, Ibaraki, and Kiyoshi Imada, Saitama, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 441,935, Nov. 15, 1982, abandoned. This application Jun. 11, 1985, Ser. No. 743,874
Claims priority, application Japan, Nov. 16, 1981, 56-183346
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—40 6 Claims

1. A method for improving the antistatic performance of a shaped article of a synthetic resin which comprises the steps of

(a) forming a crosslinked layer in at least the surface portion of the shaped article, and

(b) exposing the surface of the shaped article thus provided with the crosslinked layer to low temperature plasma generated in an atmosphere containing a gaseous silicon compound represented by the general formula

$$R_aH_bSiX_{4-a-b}$$

in which R is a substituted or unsubstituted monovalent hydrocarbon group, X is a halogen atom or an alkoxy group, a is an integer of 0, 1, 2 or 3 and b is an integer of 0 or 1 with the proviso that a+b is not exceeding 3, or a hydrolysis-condensation product thereof, to form a plasma-polymerized surface film of the silicon compound having a thickness of at least 5 nm on the surface of the shaped article.

4,639,380

PROCESS FOR PREPARING A SUBSTRATE FOR SUBSEQUENT ELECTROLESS DEPOSITION OF A METAL

William J. Amelio; David W. Hume; Donald G. McBride, all of Binghamton, and Robert G. Rickert, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 6, 1985, Ser. No. 730,918
Int. Cl.[4] H05K *3/42*
U.S. Cl. 427—97 20 Claims

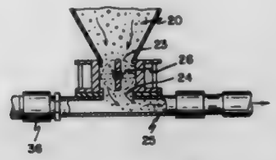
1. A process for preparing a substrate for the electroless deposition of a metal thereon which comprises contacting the substrate with a surfactant and with an organic carboxylic acid, and then contacting said substrate with an aqueous sulfuric acid solution containing about 2% to about 20% by volume of sulfuric acid.

4,639,381

METHOD FOR REDUCING FIRESIDE TUBE DEPOSITION AND BOILER SOOTBLOWING REQUIREMENTS

Robert B. Wierzba, Bridgeview; Robert G. Snyder, Palos Heights, and Blaise H. Kloeflach, Riverdale, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 533,568, Sep. 19, 1983, Pat. No. 4,545,411. This application Jun. 19, 1985, Ser. No. 746,378
Int. Cl.[4] B05D *1/12*
U.S. Cl. 427—156 3 Claims



1. The method of operating a dry product feeding apparatus to periodically feed measured amounts of a dry product into a kraft recovery boiler in timed relation to a sootblowing cycle to coat the fireside surfaces of the sootblown heat exchanger tubes and establish a cleavage plane to inhibit deposit formation, wherein said apparatus includes a vessel having an inlet into which a measured amount of said product is fed by a metering device and an outlet connected to an air supply line, said air supply line being connected to an air supply upstream from the vessel and the boiler downstream from the vessel, a control valve in said line upstream from the vessel to selectively turn the air supply on and off, valves at said inlet and said outlet for controlling the passage of product into and out of said vessel, and a programmable relay for sequentially operating said air supply valve, said inlet and outlet valves and said metering device, said method comprising the steps of, opening the air supply valve to blow the air supply line clear, opening the outlet valve to allow the product to enter the air supply line and be blown into the boiler, closing the outlet valve and allowing the air supply to continue to blow the line clear, closing the air supply valve and opening the inlet valve, turning on the metering device and charging the vessel with a subsequent measured amount of product, and turning off the metering device and closing said inlet valve.

4,639,382

METHOD OF PROVIDING A METAL MIRROR ON A SURFACE MANUFACTURED FROM AN ACRYLATE SYNTHETIC RESIN OR A METHACRYLATE SYNTHETIC RESIN

Johannes J. Poujee, and Christiaan J. A. Verwijlen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 25, 1982, Ser. No. 436,535
Claims priority, application Netherlands, Jul. 14, 1982, 8202842
Int. Cl.[4] B05D *5/06*
U.S. Cl. 427—162 2 Claims

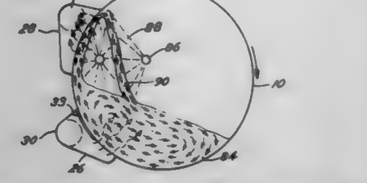
1. A method of providing a metal mirror on an article of which at least the surface on which the metal mirror is to be provided is formed of an acrylate synthetic resin or a methacrylate synthetic resin, characterized in that said surface is treated with a solution of tannin in a mixture of water and from 2% by volume up to the saturation concentration of a water-miscible organic solvent selected from the group consisting of water-miscible organic acids, alcohols, ethers, ketones and esters, and a metal mirror is then provided on said treated surface by use of an electroless metallization process.

4,639,383

METHOD AND APPARATUS FOR COATING PARTICULATE GRANULES

Thomas J. Casey, Barrington Hills, Ill., assignor to Thomas Engineering, Inc., Hoffman Estates, Ill.

Continuation of Ser. No. 534,185, Sep. 20, 1983, abandoned. This application Apr. 21, 1986, Ser. No. 854,735
Int. Cl.[4] B05D *1/02*
U.S. Cl. 427—213 32 Claims



18. A method of coating particulate granules, comprising:

agitating a charge of particulate granules by tumbling the granules in a rotating pan and simultaneously fluidizing the granules with a stream of flowing gas, with at least a portion of the rotating pan's surface being porous, and with fluidizing of the granules being accomplished by injecting the stream of flowing gas through the pan's porous surface into the charges of granules;

drawing a portion of the agitated granules from the charge by the application of a means for drawing gas through the pan's porous surface in the vicinity of the agitated charge, which means simultaneously exhausts the flowing gaseous medium from the granules;

cascading the drawn granules back into the agitated charge; and

dispensing a coating material upon the granules.

4,639,384

METHOD OF CASTING URETHANE ELASTOMER ON METAL

Sumio Umemoto; Eiichi Hattori, and Ryutaro Kamakari, all of Osaka, Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Filed Jan. 27, 1986, Ser. No. 822,808
Claims priority, application Japan, Jan. 28, 1985, 60-14968
Int. Cl.[4] B05D *5/00, 3/12;* B32B *31/00*
U.S. Cl. 427—290 13 Claims

1. A method for adhering an urethane elastomer to a metal

which comprises applying a thermosetting resin containing a flaky inorganic filler to a surface of a metal matrix, curing the thermosetting resin layer, applying an isocyanate-terminated prepolymer thereon, curing the prepolymer layer, and casting an urethane elastomer stock solution over the cured laminate.

4,639,385

HIGH VOLTAGE HIGH VACUUM COATING

William L. Jolitz, San Jose, and Richard A. Williams, Palo Alto, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Sep. 30, 1985, Ser. No. 781,544
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—386 **16 Claims**

1. A conformal coating for electrical components, comprising:

particles of elemental boron having a maximum particle size of 20 microns and uniformly dispersed throughout an organic binder having a secondary electron emission coefficient approximately equal to 1; wherein

the surface resistivity of the coating is between a preselected minimum and 10^{12} ohms per square, said preselected minimum being equal to a hundred times the highest resistance of the electrical components being coated; and

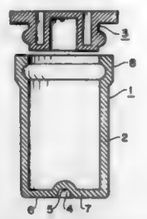
the thickness of the coating is less than 0.01 inch.

4,639,386

CONTAINER FOR PHOTOGRAPHIC FILM CARTRIDGE

Mutsuo Akao, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 31, 1985, Ser. No. 696,763
Claims priority, application Japan, Feb. 3, 1984, 59-18084; Feb. 22, 1984, 59-24331[U]
Int. Cl.[4] B27N *5/02*
U.S. Cl. 428—35 **10 Claims**



1. A container for a photographic film cartridge having a mean peripheral wall thickness of from 0.5 to 1.0 mm, and which is molded from a resin, comprising a polymer of which the content of propylene unit is more than 70 weight %, and wherein said resin has a melt index of 16 to 80 g/10 minutes, a yielding point of tensile stress of higher than 250 kg/cm^2, a bending elastic modulus of higher than 10,000 kg/cm^2, and a notched impact strength at 20° C. measured by an Izod testing machine of higher than 2.0 kg.cm/cm.

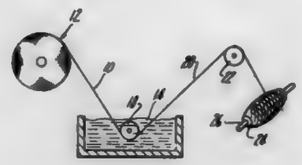
4,639,387

FIBROUS ARMOR MATERIAL

Joseph N. Epel, Southfield, Mich., assignor to Budd Company, Troy, Mich.

Continuation of Ser. No. 488,557, Apr. 25, 1983, abandoned. This application Jan. 18, 1985, Ser. No. 693,218
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—113 **8 Claims**

1. An armor material suitable for resisting substantial impacts comrpising: a plurality of monofilament fibers disposed within said material, said fibers being disposed in successive alternating and separate layer, the fiber axis in any given layer being substantially parallel to each other to form a thin layer having a thickness equal to the diameter of the fibers, the fiber axes in layers adjoining said given layer being disposed substantially parallel to each other and at angles to the fiber axis in said given layer to form a multiplicity of cross over points; a resinous material surrounding and consolidating said fibers into a three-dimensional structure to form a resin matrix, said resinous material having adhesion to said fibers less than the



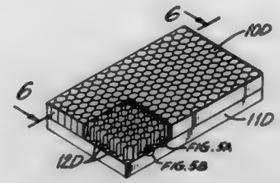
cohesive strength of said fibers to afford movement of the fibers relative to said matrix upon application of impact force to said armor material whereby a substantial amount of the impact force will be absorbed longitudinally along the axes of the fibers.

4,639,388

CERAMIC-METAL COMPOSITES

John H. Ainsworth, and Robert E. Shepler, both of Richardson, Tex., assignors to Chromalloy American Corporation, Dallas, Tex.

Filed Feb. 12, 1985, Ser. No. 701,022
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—117 **54 Claims**



1. A reinforced composite structure comprising a heat resistant chemically-bonded layer of a ceramic composition mechanically attached to a metallic substrate,

said structure including a metallic anchoring matrix characterized by a plurality of spatially and cooperably arranged reinforcing elements,

said matrix being substantially uniformly attached over the surface of said substrate and projecting from the surface thereof with the spatially arranged reinforcing elements of said matrix collectively defining a ceramic-occupiable zone of finite thickness adjacent to and following the surface configuration of said substrate,

said zone having at least confined therein said heat resistant chemically-bonded ceramic composition in intimate and mechanically-bonded contact with said reinforcing elements,

said chemically-bonded ceramic composition having been produced by mixing a low-temperature chemical bonding agent with said ceramic composition and heating said composition to a low temperature below the normal sintering temperature of said ceramic when the low-temperature chemical bonding agent is not present, said chemical bonding temperature being below about 1095° C.,

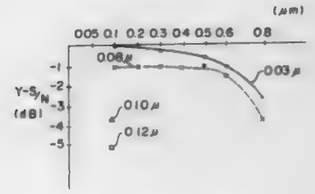
whereby said composition of reinforced heat resistant ceramic is strongly mechanically bonded as a layer to said substrate by virtue of said metallic matrix attached to said substrate.

4,639,389

MAGNETIC RECORDING MEDIUM

Masaharu Nishimatsu, Komoro; Toshiaki Ide, and Hiroyuki Arioka, both of Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 12, 1984, Ser. No. 680,889
Claims priority, application Japan, Dec. 12, 1983, 58-232777; Dec. 12, 1983, 58-232778
Int. Cl.[4] G11B *5/72*
U.S. Cl. 428—141 **10 Claims**



1. A magnetic recording medium comprising a plastic base film, a magnetic layer formed on one side of the base film and a backing layer formed on the other side of the base film, characterized in that said magnetic layer has a surface roughness of at most 0.08 μm, and said backing layer having a surface roughness of from 0.05 to 0.6 μm and is composed essentially of first particles of an inorganic pigment having an average particle size of from 0.02 to 0.5 μm and a Mohs hardness of from 2 to 4 and second particles of an inorganic pigment having an average particle size of from 0.04 to 0.5 μm and a Mohs hardness of from 5 to 7 present in a weight ratio of 1:9 to 5:5, dispersed in a thermoset or radiation-cured binder the ratio of the total of said particles to said binder being 4:1 to 1:1.

4,639,390

PREPARATION OF NON-WOVEN FABRIC CONTAINING POLYVINYL ALCOHOL FIBER

Rikuo Shoji, Moriyama, Japan, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Nov. 1, 1985, Ser. No. 794,115
Claims priority, application Japan, Nov. 27, 1984, 59-250968
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—195 **18 Claims**

1. A method for preparation of non-woven fabric which contains polyvinyl alcohol fibers comprising:

forming a web containing slightly soluble polyvinyl alcohol fiber which is soluble or swellable in the presence of water at a temperature of 90° C. or higher in the amount of at least 10% by weight;

providing water in said web to obtain a water content of at least 20% by weight; and

partially thermally bonding the web so that the bonded area occupies 5 to 40% of the web area.

4,639,391

THICK FILM RESISTIVE PAINT AND RESISTORS MADE THEREFROM

Charles C. Y. Kuo, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed Mar. 14, 1985, Ser. No. 711,983
Int. Cl.[4] H01B *1/06*
U.S. Cl. 428—210 **20 Claims**

1. A base metal resistor paint having a controlled sheet resistance and TCR, which comprises:

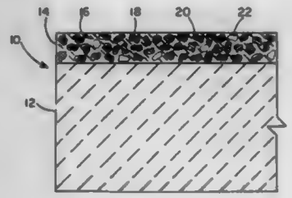
(a) mixing a glass frit selected from a quantity of at least one of a first and second glass material, the first glass material comprising 5 to 10% SiO_2, 30 to 50% BaO, 40 to 60% B_2O_3 and 1 to 5% CuO; and the second glass material comprising 50 to 70% B_2O_3, 25 to 40% SrO, and 2 to 10% SiO_2;

(b) mixing 45 to 60% of the glass frit with from 10 to 30% of a mixture comprising $TiSi_2$ and at least one of Ti_5Si_3 and Al_2O_3; and

(c) blending the glass frit and the mixture of $TiSi_2$ and at least one of Ti_5Si_3 and Al_2O_3 with from 18 to 35% of a screening agent to form a resistor paint therefrom, for subsequent screening upon a substrate and firing in an inert atmosphere to form a resistor exhibiting controlled sheet resistance and TCR.

17. A thick film base metal resistor having a substrate with a resistive paint screened and fired thereon, wherein the improvement comprises:

(a) controllably blending a glass frit selected from at least one of a first and second glass material, the first glass material comprising 5 to 10% SiO_2, 30 to 50% BaO, 40 to



60% B_2O_3 and 1 to 5% CuO; and the second glass material comprising 50 to 70% B_2O_3, 25 to 45% SrO, and 2 to 10% SiO_2;

(b) mixing 45 to 65% of the blended glass frit with 10 to 30% of a selected mixture comprising $TiSi_2$ and at least one of Ti_5Si_3 and Al_2O_3;

(c) screening the resistive paint onto a substrate;

(d) drying the screened substrate in air prior to firing; and

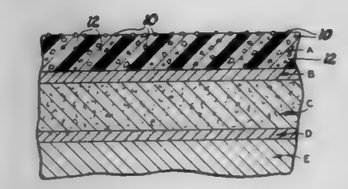
(e) firing the screened substrate in an inert atmosphere at a peak firing temperature of approximately 900° C., wherein the selected quantity of the first and second glass material and the selected mixture of $TiSi_2$ and at least one of Ti_5Si_3 and Al_2O_3, provide a means to control the sheet resistivity and the TCR of the base metal resistor made therefrom.

4,639,392

CLUTCH PLATE MEMBER HAVING LAYER OF HIGH DURABILITY, SELF-CONFORMING FRICTION FACING

Terry E. Nels, Xenia; Larry Eldridge, Dayton, and Gerald L. Doty, Miamisburg, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1985, Ser. No. 792,110
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—283 **6 Claims**



1. A clutch plate member for operating in a fluid medium to transmit torque to a metal mating surface situated on an opposing clutch plate member in a wide range of slip speeds, said clutch plate member comprising a friction facing layer consisting of thermoset resin bonded carbon particles bonded to a compliant carrier sheet which is in turn bonded to a metal support plate, said compliant carrier sheet improving the conformability of said friction facing layer to said metal mating surface resulting in a reduction in the maximum operating

temperature of said friction facing layer by at least five percent.

4,639,393

DISPENSERS FOR THE CONTROLLED RELEASE OF PEST-CONTROLLING AGENTS AND METHODS FOR COMBATTING PESTS THEREWITH

Henry Von Kohorn, Greenwich, Conn., and Agis F. Kydonieus, Kendall Park, N.J., assignors to Herculite Protective Fabrics Corporation, New York, N.Y.

Division of Ser. No. 764,312, Jan. 31, 1977, Pat. No. 4,160,335, which is a continuation of Ser. No. 535,658, Dec. 23, 1974, abandoned, which is a continuation of Ser. No. 305,032, Nov. 9, 1972, abandoned. This application Nov. 17, 1978, Ser. No. 961,893

Int. Cl.⁴ A01M *1/14*

U.S. Cl. 428—304.4 28 Claims



1. A dispenser for the maintenance in an active state and the controlled release of at least one active pheromone agent consisting of a laminated article which comprises:

at least a first solid, non-porous, polymeric wall element having at least a first outer surface exposed to the environment of said dispenser,

a second wall element providing a second outer surface exposed to the environment of said dispenser,

at least one inner layer of said laminate between said first and second wall element comprising a layer of a solid, polymeric composition, said inner layer comprising:

at least one active pheromone agent which is capable of migrating through said first wall element and is present in said inner layer in sufficient amount so that upon migration of at least a portion of said pheromone agent through said first wall element an effective level of said active pheromone agent is present on said first outer surface of said wall element, said active pheromone agent having a rate of migration through said wall element such that said active pheromone agent becomes available on said first outer surface of said first wall element and in the surrounding environment of said dispenser in accordance with a detailed dosage regimen for effective attraction of a target pest species,

said dispenser having physical dimensions adapted to allow spraying of said dispenser by entrainment in a carrier fluid, and wherein the outer surfaces of the dispenser are coated with a slip promoting agent to facilitate entrainment and dispersion in said carrier fluid.

4,639,394

NON-AQUEOUS DISPERSIONS PREPARED WITH STYRENE POLYMER DISPERSION STABILIZERS

Suryya K. Das, Pittsburgh, and Roetyslaw Dowbenko, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 1, 1985, Ser. No. 718,756

Int. Cl.⁴ C08K *5/01;* C08L *53/00;* B22B *5/16, 27/06*

U.S. Cl. 428—327 37 Claims

1. A non-aqueous dispersion of polymeric particles having an average particle size ranging from 0.1 to 10 microns in an organic dispersing liquid which is formed by the free radical initiated addition polymerization of 20 to 70 percent by weight of a polymerizable ethylenically unsaturated monomer component in 25 to 80 percent by weight of the dispersing liquid; the polymerization being conducted in the presence of 1 to 25 percent by weight of a dispersion stabilizer, the percentage by weight being based on total weight of polymerizable ethylenically unsaturated monomer component, dispersing liquid and stabilizer, characterized in that the dispersion stabilizer is a styrene polymer and containing ethylenic unsaturation in only the terminal position.

14. A polymeric microparticle having an average particle size ranging from 0.1 to 10 microns which is prepared by free radical addition polymerization of 20 to 70 percent by weight of a polymerizable ethylenically unsaturated monomer component in 20 to 85 percent by weight of an organic dispersing liquid, said polymerization being conducted in the presence of 1 to 25 percent by weight of a dispersion stabilizer, the percentage by weight being based on total weight of polymerizable ethylenically unsaturated monomer component, dispersing liquid and stabilizer, characterized in that the dispersion stabilizer is a styrene polymer containing ethylenic unsaturation is the terminal position only.

24. A coating composition comprising a solution of a film-forming polymer in combination with polymeric microparticles which are insoluble in the film-forming polymer solution; said polymeric microparticles having an average particle size ranging from 0.1 to 10 microns being prepared by free radical addition polymerization in an organic dispersing liquid of 20 to 70 percent by weight of a polymerizable ethylenically unsaturated monomer component in 25 to 80 percent by weight of the dispersing liquid, said polymerization being conducted in the presence of 1 to 25 percent by weight of a dispersion stabilizer, the percentage by weight being based on total weight of polymerizable ethylenically unsaturated monomer component, dispersing liquid and stabilizer, characterized in that the dispersion stabilizer is a styrene polymer containing ethylenic unsaturation in only the terminal position.

35. A coated article comprising a substrate and a coating containing the polymeric microparticle of claim 14 adhered thereto.

4,639,395

PREPASTED WALLCOVERINGS

John B. Clarke, and John F. Firth, both of West Yorkshire, England, assignors to Allied Colloids Limited, Great Britain

Filed Mar. 14, 1985, Ser. No. 711,615

Claims priority, application United Kingdom, Mar. 15, 1984, 8406783

Int. Cl.⁴ C09J *7/02;* B05D *5/10*

U.S. Cl. 428—341 16 Claims

1. A prepasted wallcovering comprising a substrate carrying a water-moistenable prepaste coating formed of at least two layers and consisting essentially of an anionic polymer that is substantially non-swellable in water and that is swellable in the presence of aqueous alkali, the anionic polymer being present in an amount in the range of 3 to 20 grams per square meter of substrate, an alkaline material that on contact with water will form said aqueous alkali, said alkaline material being present in an amount in the range of 0.2 to 5.0 grams per square meter of substrate and a water-soluble cationic polymer present in an amount in the range of from 0.1 to 3.0 grams per square meter of substrate, said anionic polymer and said alkaline material being in separate layers.

9. A process for producing a wallcovering comprising a substrate carrying a water-moistenable prepaste coating formed of at least two layers and consisting essentially of an anionic polymer which is substantially non-swellable in water and is swellable in aqueous alkali, the anionic polymer being present in an amount in the range of 3 to 20 grams per square meter of substrate, an alkaline material that on contact with water will form said aqueous alkali, said alkaline material being present in an amount in the range of 0.2 to 5.0 grams per square meter of substrate and a water-soluble cationic polymer present in an amount in the range of 0.1 to 3.0 grams per square meter of substrate, said process comprising applying an aqueous dispersion of substantially unswollen particles of the anionic polymer to the substrate in one of said layers, applying the cationic polymer to the substrate from aqueous solution, applying the alkaline material to the substrate from aqueous solution and drying the coated substrate.

4,639,396

THERMOPLASTICS-METAL FIBER THREADS

Mohammad A. Semsarzadeh, Bethesda, Md., assignor to Princeton Polymer Laboratories, Plainsboro, N.J.

Filed Jul. 19, 1984, Ser. No. 632,466

Int. Cl.⁴ B32B *27/18, 31/30;* C08K *7/04;* H01B *1/06*

U.S. Cl. 428—373 7 Claims

1. An extrusion drawn oriented elongated filament comprising a minor proportion of elongated metal fiber embedded in a major proportion of thermoplastic polymer by weight wherein the melting temperature of said metal is within the softening to molten range of said polymer and wherein said metal fiber is unidirectional and extends into the elongated length of said polymer, said drawing having been accomplished while the metal is in the molten condition and the extrusion is carried out by simultaneously extruding the metal and polymer.

4,639,397

THICK AND THIN FIBER HAVING GROOVES ON ITS SURFACE AND PROCESS FOR PRODUCING THE SAME

Yoshiaki Sato, and Hisao Suzuki, both of Mishima, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,445

Claims priority, application Japan, Apr. 15, 1983, 58-65273

Int. Cl.⁴ D02G *3/00*

U.S. Cl. 428—397 7 Claims



1. A thick and thin fiber comprised of a thermoplastic polymer, said fiber being alternatingly thick and thin along its longitudinal axis and having at least two axially continuous grooves on its surface, each groove having an entrance width of 0.2 to 4μ and a depth of 0.1 to 1.8μ.

4,639,398

COMPOUND FILM CONTAINING OLEFIN

Christer Bergström, Helsinki, Finland, assignor to Neste Oy, Finland

PCT No. PCT/FI83/00013, § 371 Date Sep. 13, 1984, § 102(e) Date Sep. 13, 1984, PCT Pub. No. WO84/03240, PCT Pub. Date Aug. 30, 1984

PCT Filed Feb. 17, 1983, Ser. No. 653,230

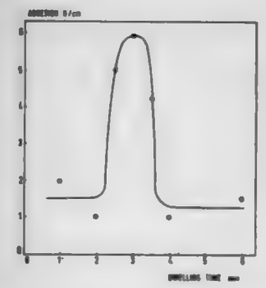
Int. Cl.⁴ B32B *27/32, 13/12, 27/08;* C08L *51/06*

U.S. Cl. 428—451 20 Claims

1. A multilayer compound film including at least one layer of polyolefin in contact with a polymer containing polar radicals, said polyolefin layer having between 0.01–10% of an unsaturated alkoxysilane grafted thereon and wherein the alkoxy groups thereof are unhydrolyzed and therefore reactable to adhere the polyolefin to the polymer containing the polar radicals.

15. A method of forming a multilayer compound film including at least one layer of polyolefin in contact with a polymer containing polar radicals, said method comprising the steps of

(a) admixing between 0.01–10% of an unsaturated alkoxysilane and 0.01–0.5% of a radical former, under conditions where no grafting of the silane takes place,



(b) then grafting the thus-admixed alkoxysilane onto the polyolefin layer to be modified, and

(c) forming a multilayer compound film.

4,639,399

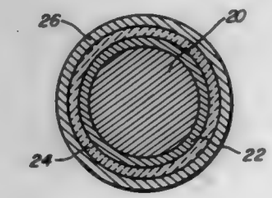
NICKEL OXIDE, CERAMIC INSULATED, HIGH TEMPERATURE COATING

Louis F. Aprigliano, Riva, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 26, 1985, Ser. No. 801,895

Int. Cl.⁴ F01D *5/28;* B32B *15/04*

U.S. Cl. 428—623 18 Claims



1. A corrosion, oxidation, and heat resistant layered coating for a substrate material in a high temperature, corrosive environment, consisting of:

a base layer selected from the group consisting of Aluminide and MCrAlY, wherein M is a metal selected from the group consisting of nickel, cobalt, and a combination thereof;

a ceramic layer, impermeable to the metallic elements of said substrate material and said MCrAlY layer, and bonded to said substrate material by said MCrAlY layer; and,

a nickel oxide layer, applied to said ceramic layer.

4,639,400

CERAMIC SUBSTRATE OF NA_2O AND NB_2O_5 FOR MAGNETIC METAL THIN FILM

Takashi Yamaguchi, Tokyo; Naomi Nagasawa, and Hidemasa Tamura, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 10, 1985, Ser. No. 786,464

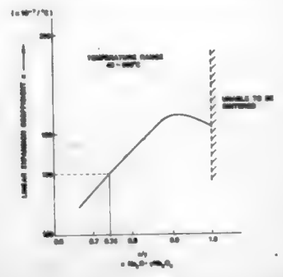
Claims priority, application Japan, Oct. 12, 1984, 59-213594

Int. Cl.⁴ B32B *9/00, 18/00*

U.S. Cl. 428—694 3 Claims

1. A thin film magnetic head having a base and a magnetic

alloy film deposited thereon, said base being composed of a ceramic composition having the general formula:



$xNa_2O \cdot yNb_2O_5$ wherein the ratio x/y is at least 0.74 but less than 1.00, said ceramic composition having a coefficient of thermal expansion of at least 130×10^{-7}/° C.

4,639,401

SURFACTANT ADDITION TO PHOSPHORIC ACID ELECTROLYTE

John F. Jackovitz, Monroeville, and Richard P. Kunkle, Irwin, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 26, 1986, Ser. No. 832,785

Int. Cl.⁴ H01M *8/10*

U.S. Cl. 429—30 **4 Claims**

1. A fuel cell comprising a container having disposed therein: a cathode, an anode, a divider positioned between said cathode and anode to separate said cathode and anode one from the other and an electrolyte comprising H_3PO_4 and at least about 0.5 wt. percent of an amine capable of reacting with said H_3PO_4 in situ to produce an ammonium phosphate thereby reducing interfacial tension and increasing the wetting properties of said H_3PO_4.

4,639,402

PHOTORECEPTOR CONTAINING SELENIUM PARTICLES COATED WITH A REACTION PRODUCT OF A HYDROLYZED SILANE

Satchidanand Mishra, and Leon A. Teuscher, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1985, Ser. No. 761,931

Int. Cl.⁴ G03G *5/087*

U.S. Cl. 430—58 **15 Claims**

1. An electrostatographic imaging member comprising a photoconductive layer comprising an organic resin binder and photoconductive particles consisting essentially of selenium coated with a thin layer of a reaction product of a hydrolyzed aminosilane.

4,639,403

ELECTROSTATOGRAPHIC SUSPENSION DEVELOPER AND A PROCESS FOR ITS PREPARATION COMPRISING QUATERNARY IONIC COPOLYMER FOR POSITIVE TONER CHARGE

Wolfgang Podszün; John Goossens, both of Cologne; Carlhans Süling, Odenthal; Günther Hoffarth, Leverkusen; Wolfgang Richter, Krefeld, all of Fed. Rep. of Germany; Herman Uytterhoeven, Bonheiden, and Walter de Winter, Grafenwezen, both of Belgium, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

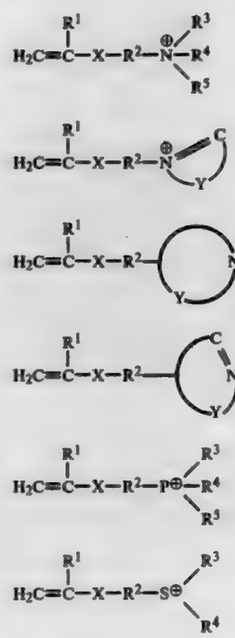
Filed Jul. 5, 1985, Ser. No. 752,095

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1984, 3426256

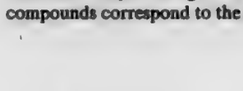
Int. Cl.⁴ G03G *9/12*

U.S. Cl. 430—115 **7 Claims**

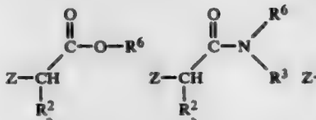
1. An electrostatographic suspension developer containing a dispersed pigment and at least one ionic copolymer to produce a positive toner charge in an electrically insulating carrier liquid having a volume resistivity of at least 10^9 ohm.cm and a dielectric constant below 3, characterized in that the copolymer is formed from cationic monomers in which the cations of the monomers correspond to the following general formulae



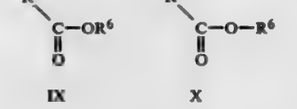
I



II



III



IV

V

VI

in which

R^1 is a hydrogen atom or a CH_3-group,

R^2 is a C_1–C_{18} hydrocarbon radical,

R^3 and R^4 may be the same or different and represent a C_1–C_{18} hydrocarbon radical or together form a 5- or 6-membered ring,

R^5 is a hydrogen atom or a C_1–C_{18} hydrocarbon radical,

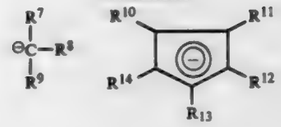
X is one of the groups

and

Y represents the atoms required to complete a 5- or 6-membered heterocyclic ring, and the anions of the cationic compounds correspond to the following general formulae

IX X XI

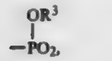
-continued



XII XIII

in which

Z is one of the groups $—SO_3^{\ominus}$ or



R^2 and R^3 each represent a C_1–C_{18} hydrocarbon radical

R^6 is a C_6–C_{24} hydrocarbon radical,

R^7 is one of the groups $—COOR^6$ or $—SO_2R^6$,

R^8 and R^9 may be the same or different and represent one of the groups —CN, $—CO_2$, —halogen, —COOR or $—SO_2R$,

R^{10} has the same meaning as R^6 or is a $—COOR^6$ group,

R^{11} is one of the groups —CN or —COOR and

R^{12}, R^{13} and R^{14} may be the same or different and represent a hydrogen atom or the groups —CN, —R or —COOR,

R is a C_1–C_{24} hydrocarbon radical.

4,639,404

LIQUID DEVELOPER FOR DEVELOPMENT OF ELECTROSTATIC IMAGES

Herman J. Uytterhoeven, Bonheiden; Walter F. De Winter, 's-Gravenwezel, and August M. Mariën, Oevel, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Sep. 26, 1985, Ser. No. 780,584

Claims priority, application European Pat. Off., Oct. 2, 1984, 84201390

Int. Cl.⁴ G03G *9/12*

U.S. Cl. 430—115 **10 Claims**

1. A liquid developer composition that is suitable for rendering visible electrostatically charged areas, which composition contains in an electrically insulating non-polar carrier liquid having a volume resistivity of at least 10^9 ohm.cm and a dielectric constant less than 3, dispersed colouring matter acting as toner particles and at least one anionic addition polymer comprising anionic groups neutralized with non-polymeric counter cations, characterized in that said cations are positively charged metal ion containing coordination compounds.

4,639,405

METHOD AND APPARATUS FOR FIXING TONER IMAGES

Hans G. Franke, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 30, 1985, Ser. No. 781,363

Int. Cl.⁴ G03G *13/20, 15/20*

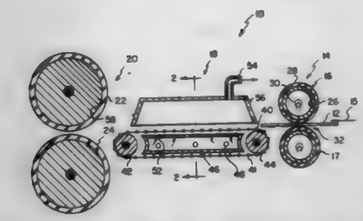
U.S. Cl. 430—124 **13 Claims**

1. A method of fixing a toner image on a copy sheet, said method comprising the steps of:

(a) fixing a toner image to copy sheets moveable along a copy sheet path; and

(b) removing from about 50% to about 80% of the moisture content of a copy sheet bearing a toner image; and

(c) passing said copy sheet through surfacing means to provide a gloss to the toner image, said surfacing means



following said fuser means and said conditioner means along said copy sheet path.

4,639,406

LIGHT-SENSITIVE COMPOUND, LIGHT-SENSITIVE MIXTURE, AND LIGHT-SENSITIVE COPYING MATERIAL PREPARED THEREFROM WITH 0-NAPHTHOQUINONE DIAZIDE COMPOUND

Paul Stahlhofen, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

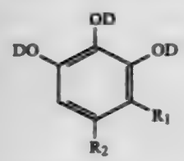
Filed Oct. 20, 1981, Ser. No. 313,232

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040156

Int. Cl.⁴ G03C *1/54, 1/94*; G07C *113/00*

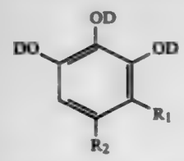
U.S. Cl. 430—165 **7 Claims**

1. A light-sensitive mixture which contains a 1,2-naphthoquinone-2-diazide-4- or -5-sulfonic acid ester of a gallic acid alkyl ester or of a pyrogallyl alkyl ketone and a water-insoluble resinous binder, which is soluble or at least swellable in aqueous-alkaline solutions, wherein the naphthoquinone diazide sulfonic acid ester corresponds to the general formula I



in which D is a 1,2-naphthoquinone-2-diazide-4-sulfonyl radical or a 1,2-naphthoquinone-2-diazide-5-sulfonyl radical, R_1 is a hydrogen atom or a $—COC_nH_{2n+1}$ radical, and R_2 is a hydrogen atom or a $—CO—OC_nH_{2n+1}$ radical, n being an integer from 10 to 25 and the sum of the carbon atoms of R_1+R_2 being n+1.

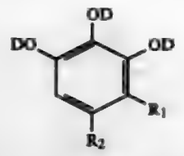
4. A light-sensitive copying material, composed of a support and a light-sensitive layer which contains a 1,2-naphthoquinone-2-diazide-4- or -5-sulfonic acid ester of a gallic acid alkyl ester or of a pyrogallyl alkyl ketone and a water-insoluble resinous binder, which is soluble or at least swellable in aqueous-alkaline solutions, wherein the naphthoquinone diazide sulfonic acid ester corresponds to the general formula I



in which D is a 1,2-naphthoquinone-2-diazide-4-sulfonyl radical or a 1,2-naphthoquinone-2-diazide-5-sulfonyl radical, R_1 is a hydrogen atom or a $—COC_nH_{2n+1}$ radical, and R_2 is a hydrogen atom or a $—CO—OC_nH_{2n+1}$ radical, n being an inte-

ger from 10 to 25, and the sum of the carbon atoms of R_1+R_2 being n+1.

6. A 1,2-naphthoquinone-2-diazide-4- or -5-sulfonic acid ester of a gallic acid alkyl ester or of a pyrogally alkyl ketone, wherein the sulfonic acid ester corresponds to the general formula I



in which D is a 1,2-naphthoquinone-2-diazide-4-sulfonyl radical or a 1,2-naphthoquinone-2-diazide-5-sulfonyl radical, R_1 is a hydrogen atom or a $-COC_nH_{2n+1}$ radical, and R_2 is a hydrogen atom or a $-CO-CO_nH_{2n+1}$ radical, n being an integer from 10 to 25, and the sum of the carbon atoms of R_1+R_2 being n+1.

4,639,407

HEAT-DEVELOPABLE LIGHT-SENSITIVE MATERIAL USED IN SILVER SALT TRANSFERS

Toshiaki Aono, and Hiroshi Hara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 18, 1985, Ser. No. 712,499
Claims priority, application Japan, Mar. 16, 1984, 59-50658
Int. Cl.⁴ G03C *5/54*
U.S. Cl. 430—203 **12 Claims**

1. A method for forming a silver image which comprises imagewise exposing and heating a heat-developable light-sensitive material containing a light-sensitive silver halide and an organic silver salt oxidizing agent to result in exposed and unexposed silver halide, the imagewise exposing and heating resulting in the imagewise production of a moveable silver salt in the presence of a reducing agent and a silver halide solvent, the reducing agent being present in an amount of from about 0.1 to about 20 mols per mol of the total amount of the silver halide and organic silver salt oxidizing agent, said unexposed silver halide reacting with said silver halide solvent to form said movable silver salt and said movable silver salt then diffusing due to said heating to a silver salt fixing layer comprising a silver precipitate to form a silver image corresponding to said movable silver salt.

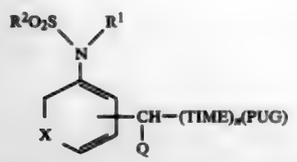
4,639,408

PROCESS FOR IMAGE FORMATION COMPRISING A HEATING STEP

Hiroshi Kitaguchi, and Masatoshi Kato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

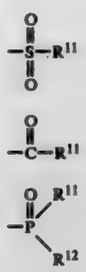
Filed Nov. 20, 1985, Ser. No. 799,996
Claims priority, application Japan, Nov. 21, 1984, 59-246468
Int. Cl.⁴ G03C *1/40, 5/54, 1/06, 1/42*
U.S. Cl. 430—351 **12 Claims**

1. A process for forming an image comprising a heating step wherein a silver halide light-sensitive photographic material is heated in the presence of a compound represented by formula (I)



(I)

wherein X represents an atomic group completing a carbocyclic aromatic ring or a heterocyclic aromatic ring; R^1 is selected from groups represented by formulae (A), (B), and (C)



(A)

(B)

(C)

in which R^{11} and R^{12} each represents a substituted or unsubstituted alkyl group, a cycloalkyl group, a substituted or unsubstituted alkenyl group, an aralkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic group, an alkyloxy or aryloxy group, an alkylthio or arylthio group, or a substituted or unsubstituted amino group, or R^{11} and R^{12} together form a 5-membered or 6-membered ring; R^2 represents a group selected from the groups represented by R^{11}; R^1 and R^2 together form a 5-membered or 6-membered ring; Q represents a hydrogen atom, an alkyl group, or an aryl group; TIME represents a timing group; PUG represents a photographically useful group; and n represents 0 or an integer, wherein the photographic material contains a base or a base precursor.

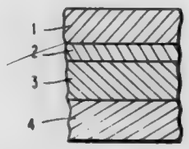
10. A process as in claim 1, wherein PUG represents a photographically useful reagent selected from an antifoggant, a development restrainer, a developing agent, a development accelerator, an electron donor, a fogging agent, a nucleus-forming agent, a solvent for silver halide, a dye, a colored material for color diffusion transfer, and a coupler.

4,639,409

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Soichiro Yamamoto, Kanagawa, and Takeo Shimada, Tokyo, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 19, 1985, Ser. No. 725,199
Claims priority, application Japan, Apr. 19, 1984, 59-79162
Int. Cl.⁴ G03C *1/40, 1/46, 7/20*
U.S. Cl. 430—505 **4 Claims**



1. A silver halide color photographic light-sensitive material comprising a support having thereon, in succession, a 1st silver halide photographic light-sensitive emulsion layer, a photographic auxiliary layer, and a 2nd silver halide photographic light sensitive emulsion layer, or a support having on one side thereof a 1st silver halide photographic light-sensitive emulsion layer and on the other side thereof, in succession, a photographic auxiliary layer and a 2nd silver halide photographic light-sensitive emulsion layer, said photographic auxiliary layer comprising a hydrophilic colloid having dispersed therein at least one kind of white pigment having a mean particle size of 0.1 to 1.0μ in an amount of at least 10% by weight, having a thickness of 0.5 to 5μ, having a spectral

reflectance of not less than 20% in a wavelength range of 410 nm to 700 nm and having a spectral transmittance of not less than 5% in said wavelength range.

2. The silver halide color photographic light-sensitive material as claimed in claim 1, wherein the 1st silver halide photographic light-sensitive emulsion layer and the 2nd silver halide photographic light-sensitive emulsion layer each comprises a blue-sensitive emulsion layer, a green-sensitive emulsion layer, and a red-sensitive emulsion layer.

4,639,410

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT SENSITIVE-MATERIAL

Yoshihara Mochizuki, Hachioji; Sohei Goto, Hino; Toshihiko Yagi, Kanagawa; Katsumasa Yamazaki, Hachioji, and Kenji Michiue, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Feb. 1, 1985, Ser. No. 697,458
Claims priority, application Japan, Feb. 2, 1984, 59-17955
Int. Cl.⁴ G03C *1/76*
U.S. Cl. 430—506 **17 Claims**

1. In a silver halide color photographic light-sensitive material comprising a support having thereon at least one light-sensitive layer comprised of a plurality of silver halide emulsion layers substantially identical in the color sensitivity but differing in the speed,

wherein said at least one light-sensitive layer is comprised substantially of monodisperse Emulsion A and Emulsion B in combination,

said Emulsion A being a core/shell-type silver halide emulsion whose silver halide particles each has a shell consisting substantially of silver bromide on the core thereof whose silver iodide content is not less than 6 mole %, said silver halide particles having a mean particle size of xμ,

said Emulsion B being a core/shell-type silver halide emulsion whose silver halide particles each has a shell consisting substantially of silver bromide on the core thereof whose silver iodide content is not less than 5 mole % smaller than that of said core of said Emulsion A, said silver halide particles of Emulsion A having a mean particle size of yμ,

wherein said x and said y have a relation of $(y/x)\times 100<70$.

4,639,411

RADIOGRAPHIC ELEMENTS EXHIBING REDUCED CROSSOVER

Richard L. Daubendiek; Robert E. Dickerson, both of Rochester, and James E. Kelly, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 11, 1986, Ser. No. 839,014
Int. Cl.⁴ G03C *1/84*
U.S. Cl. 430—510 **8 Claims**



1. A radiographic element comprised of

a support capable of transmitting blue light,

coated on each of two opposite major faces of said support,

a silver halide emulsion layer capable of forming a latent image in response to exposure to blue light transmitted through the support, and

interposed between at least one of said latent image forming emulsion layers and said support a blue absorbing layer, characterized in that

said blue absorbing interposed layer is a silver iodide emulsion layer exhibiting at temperatures below 25° C. an absorption transition wavelength that is bathochromically displaced by at least 20 nm as compared to the absorption transition wavelength of β phase silver iodide.

4,639,412

RESISTIVELY HEATED PHOTOTHERMOGRAPHIC MEDIA ON VESICULAR SUBSTRATE

Gary E. LaBelle, Hugo, Minn., and David T. Ask, Somerset, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 13, 1986, Ser. No. 873,817
Int. Cl.⁴ G03C *1/84*
U.S. Cl. 430—523 **20 Claims**

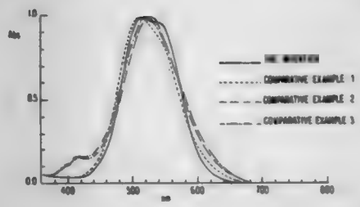
1. A photothermographic element comprising an opaque substrate having at least one photothermographic emulsion coated on one side of said substrate and a resistively heatable layer adhered to the other side of said substrate, said emulsion comprising silver halide in reactive association with a light-insensitive organic silver salt, a reducing agent for silver ion, and an organic film having at least 1% by volume of vesicles, at least 1% by weight of white pigment and an optical transmission density at least 1.5 to white light.

4,639,413

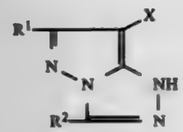
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS CONTAINING MAGENTA COUPLER AND HIGH BOILING POINT ORGANIC SOLVENT

Toshio Kawagishi, and Kiyoshi Nakazyo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

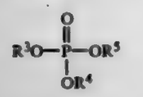
Filed Aug. 14, 1985, Ser. No. 765,626
Claims priority, application Japan, Aug. 14, 1984, 59-169856
Int. Cl.⁴ G03C *1/08, 7/26, 7/32*
U.S. Cl. 430—546 **8 Claims**



1. A silver halide color photographic material comprising a support having formed thereon at least one silver halide emulsion layer having dispersed therein, in a coexisting state, at least one magenta coupler represented by formula (I) and at least one high-boiling point organic solvent represented by formula (II)



(I)



(II)

wherein R^1 and R^2 each represents a hydrogen atom or a substituent and X represents a hydrogen atom or a group capable of being released by a coupling reaction with the

oxidation product of an aromatic primary amine developing agent; and

wherein, R^3, R^4, and R^5 each represents an alkyl group, a cycloalkyl group, or an alkenyl group, and the total number of carbon atoms of the groups R^3, R^4, and R^5 is from 12 to 60, wherein the weight ratio of the high-boiling point organic solvent represented by formula (II) to the magenta coupler represented by formula (I) is from 0.05/1 to 20/1.

4,639,414

HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Yukihiko Sakaguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 13, 1985, Ser. No. 744,369
Claims priority, application Japan, Jun. 13, 1984, 59-120039
Int. Cl.⁴ G03C *1/02*
U.S. Cl. 430—550 **22 Claims**

1. A heat developable light-sensitive material comprising a support having thereon (1) a light-sensitive hydrophilic colloid silver halide emulsion, (2) at least one of a base and a base precursor, and (3) a hydrophilic binder, wherein the light-sensitive hyrophilic colloid silver halide emulsion is one which is chemically sensitized in the presence of a spectral sensitizing dye added after the formation of the silver halide grains but before completion of chemical sensitization.

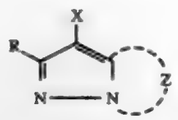
4,639,415

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING A MAGENTA COLOR IMAGE-FORMING COUPLER

Yutaka Kaneko, Sagamihara; Toshihiko Kimura, Hino, and Kenji Kadokura, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Sep. 16, 1985, Ser. No. 776,442
Claims priority, application Japan, Sep. 17, 1984, 59-194494; Feb. 18, 1985, 60-31297
Int. Cl.⁴ G03C *1/06, 1/08, 7/26, 7/32*
U.S. Cl. 430—558 **10 Claims**

1. A silver halide color photographic material containing a magenta color image-forming coupler represented by the following formula (I) and a compound represented by the following formula (II):



(I)

wherein

Z represents the group of nonmetallic atoms necessary for forming a nitrogen-containing heterocyclic ring, provided that the ring to be formed by said Z may have a substituent;

X represents a hydrogen atom or a substituent capable of leaving upon reaction with the oxidized product of a color developing agent; and

R represents a hydrogen atom or a substituent,



(II)

wherein R_1 is an aliphatic group, a cycloalkyl group or an aryl group; and

Y represents the group of nonmetallic atoms necessary for forming a 5- to 7-membered heterocyclic ring taken together with the nitrogen atom, provided that at least two hetero atoms among the heterocyclic ring-forming nonmetallic atoms including the nitrogen atom are not adjacent to each other.

4,639,416

INTERNAL LATENT IMAGE-TYPE SILVER HALIDE EMULSION

Tetsuo Yoshida, and Tadayoshi Kokubo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 11, 1984, Ser. No. 609,176
Claims priority, application Japan, May 12, 1983, 58-83222
Int. Cl.⁴ G03C *1/28*
U.S. Cl. 430—567 **11 Claims**

1. An internal latent image silver halide emulsion containing core/shell silver halide grains with a mean grain size of about 0.4 μm or less, said grains comprising a core of chemically sensitized silver halide and a shell of silver halide covering at least the light-aensitive sites of the core, and the surface of said grains being chemically sensitized, wherein the core is chemically sensitized to such an extent that the difference between fog density F_1 and fog density F_2 as defined below is at least 0.10,

where fog density F_1 is the fog density when the internal latent image emulsion is coated in an amount (as silver) of 1.5 g/m² and developed with Developer D as described below at 20° C. for 13 minutes without application of imagewise exposure, not including base density;

Composition of Developer D	
N—Methyl-p-aminophenol Sulfate	2.5 g
L—Ascorbic Acid	10 g
Sodium Metaborate	35 g
Potassium Bromide	1 g
Sodium Thiosulfate	3 g
Water to make	1,000 ml

and

fog density F_2 is the fog density when the internal latent image emulsion is coated in an amount (as silver) of 1.5 g/m² and developed with Developer E as described below at 20° C. for 13 minutes without application of imagewise exposure, not including base density

Composition of Developer E	
N—Methyl-p-aminophenol Sulfate	2.5 g
L—Ascoribc Acid	10 g
Sodium Metaborate	35 g
Potassium Bromide	1 g
Water to make	1,000 ml

4,639,417

SILVER HALIDE X-RAY PHOTOSENSITIVE MATERIAL

Chika Honda; Akio Suzuki; Katsutoshi Machida, all of Hachioji, and Masatoshi Iwata, Akishima, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Jan. 25, 1985, Ser. No. 694,833
Claims priority, application Japan, Jan. 27, 1984, 59-13955; Jan. 30, 1984, 59-15535
Int. Cl.⁴ G03C *1/02*
U.S. Cl. 430—567 **7 Claims**

1. A negative silver halide X-ray photosensitive material comprising a support bearing thereon a silver halide emulsion layer comprising at least three kinds of silver halide emulsions whose sensitivity and gradiation are substantially different from each other, wherein out of at least three kinds of said silver halide emulsions, at least one of them is a monodisperse emulsion E_1 being substantially responsible for an effective density range of from 20% up to 80% of the maximum value of effective density of a characteristic curve for the photosensitive material, at least another one of the silver halide emulsions is a polydisperse emulsion E_2 being substantially responsible for an effective density range of from 0 to 25% of the maximum value of effective density of the characteristic curve, and at least another one of the silver halide emulsions is a low-speed emulsion.

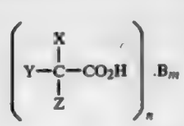
4,639,418

HEAT DEVELOPABLE PHOTOSENSITIVE MATERIAL

Yoshiharu Yabuki; Kozo Sato; Ken Kawata, and Hiroyuki Hirai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 22, 1985, Ser. No. 768,282
Claims priority, application Japan, Aug. 22, 1984, 59-173161
Int. Cl.⁴ G03C *1/02*
U.S. Cl. 430—617 **10 Claims**

1. A heat developable photosensitive material comprising a support having thereon at least one light-sensitive layer comprising light-sensitive silver halide and a binder, wherein at least one layer contains a base precursor represented by the following general formula (I):



(I)

wherein at least one of X, Y and Z, which may be the same or different, represents an electron-attractive substituent selected from the group (a) consisting of a substituted sulfamoyl group, an unsubstituted sulfamoyl group, an



group and an



group, wherein R and R_2 each represents a hydrogen atoms, an alkyl group or an aryl group, and the alkyl or aryl moiety of these groups may be further substituted;

the remainder of X, Y and Z being selected from the group (b) consisting of a hydrogen atom, an alkyl group, a cycloalkyl group, an alkenyl group, an alkynyl group, an aryl group, an aralkyl group, a silyl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group and a hydroxy group, wherein the alkyl and aryl moieties may be further substituted with a substituent other than a perhaloalkyl group containing up to 3 carbon atoms;

B represents a mono-acidic or di-acidic base having a pKa value of at least 7 and containing not more than 12 carbon atoms; and

n and m each represents 1 or 2, provided that the net charge of the compound is zero.

4,639,419

IMMUNOLOGICAL COLOR CHANGE TEST INVOLVING TWO DIFFERENTLY COLORED REAGENT SPOTS

Douglas R. Olson, Chalfont, Pa.; James R. Harness, Woodbridge, and John W. Waterston, Chantilly, both of Va., assignors to Meloy Laboratories, Inc., Springfield, Va.

Continuation of Ser. No. 313,558, Oct. 22, 1981, abandoned.
This application Sep. 21, 1984, Ser. No. 653,384
Int. Cl.⁴ G01N *33/546, 33/564, 33/569*
U.S. Cl. 435—5 **46 Claims**

1. A diagnostic device for detecting an antigenic material by visual color change resulting from antigenic-antibody reaction comprising:

a first reagent spot carried by a substrate and dyed to form a first color;

a second reagent spot carried by a substrate and dyed to form a second color which is visually distinct from said first reagent;

means for mixing said dyed reagent spots and a fluid specimen for for forming a a suspension having a color which is visually different than the colors of said first and second dyed reagents.



2. The diagnostic device of claim 1 wherein one of said reagents comprises an antibody carried by a substrate, said substrate selected from the group consisting of organic and inorganic agglutimalle particles.

5. The diagnostic device of claim 2, wherein said first dye absorbs light in a first part of the spectrum, said second dye absorbs light in a second part of the spectrum and a physical combination of said first dye and said second dye appears to absorb light in a third portion of the spectrum and each dye is distinguishable by the human eye.

4,639,420

METHOD FOR THE IMMUNOANALYSIS OF CHOLESTEROL EPOXIDES

Carl P. Schaffner, 10 Youngs Rd., Trenton, N.J. 08619

Filed Nov. 21, 1984, Ser. No. 673,768
Int. Cl.⁴ G01N *33/53, 33/566, 33/531*; C12Q *1/60*
U.S. Cl. 435—7 **9 Claims**

1. A method for determining the presence or concentration of 5α,6α- and 5β,6β-cholesterol epoxide in a fluid containing said epoxides comprising:

contacting said fluid with a hapten in the presence of a hapten-linking reagent to convert said epoxides to ring-opened 3,5(6)-trans-diaxial-dihydroxycholestane-6(5)yl-hapten adduct;

combining said adduct with a measured amount of said adduct, said measured amount of adduct being labelled with a colorimetrically, spectrophotometrically or radioactively measurable label;

combining said adduct and measured adduct with an excess of an antibody to said adduct;

and measuring the amount of labelled adduct bound to said antibody.

4,639,421

FLUORESCENT GRAM STAIN

Burton H. Sage, Jr., Raleigh, N.C., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Oct. 1, 1984, Ser. No. 656,617
Int. Cl.⁴ C12Q *1/04, 1/14, 1/10*
U.S. Cl. 435—34 **10 Claims**

1. A method for the rapid determination of the Gram sign of microorganisms in a fluid sample comprising adding a staining buffer and a fluorescent dye to a fluid sample to provide a first mixture, incubating said first mixture, additing propidium iodide to said mixture to provide a second mixture, incubating said second mixture wherein absortion of said fluorescent dye in conjunction with absorption of said propidium iodide provides fluorescently stained microorganisms, applyihg excitation energy to said second mixture, observing the color of the fluorescence emission of the stained microorganisms, and as-

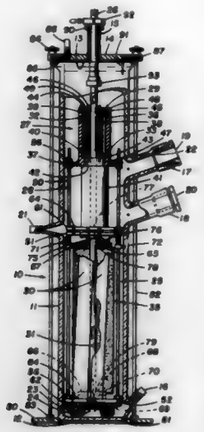
signing the positive Gram sign to microorganisms which fluoresce substantially green and the negative Gram sign to microorganisms which fluoresce substantially orange.

4,639,422

CELL CULTURE FILTER APPARATUS AND METHOD

Raymond C. Geimer, Mehlville, and William R. Tolbert, Manchester, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 3, 1986, Ser. No. 825,717
Int. Cl.[4] C14M *3/02*
U.S. Cl. 435—286 6 Claims



1. Continuous cell culture filter apparatus adapted for convenient manual assembly - disassembly comprising:

(A) a hollow vessel having an opening at the top,

(B) a stationary, hollow shaft means positioned within said vessel in fluid communication with said top opening of said vessel and supported downwardly therefrom without any lower bearing,

(C) a stationary filter unit supported downwardly from said shaft means without any lower bearing and without any moving seals between the filter unit or any moving filter support means which could contact the cell suspension, said filter having

(1) a fluid collection cavity in direct communication with the interior of said shaft means and the top of said vessel, and

(2) a porous outer surface having a pore size smaller than the cells to be cultured or the carrier particles upon which said cells are attached but sufficiently large to permit permeation of fluid into said fluid collection cavity,

(D) a rotatable agitator means supported downwardly from said shaft means and concentrically disposed about said filter unit for rotation by suspension from bearing means having low-friction engagement with said hollow shaft means,

(E) said shaft means having a boss section positioned between said filter unit and said bearing means and a spring seat adaptable for holding spring means positioned between said boss section and said filter unit,

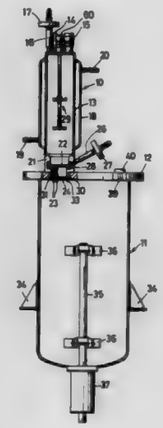
(F) said agitator means having suspended thereon a plurality of flexible vanes which are substantially equidistantly spaced apart circumferentially and which extend substantially throughout the length of said filter unit, said vanes being held between a pair of disc-like holding means at each of the upper and lower ends of the vanes and transverse to the axis of said agitator means, with the lower member of the upper pair and the upper member of the lower pair of said holding means having side slits circumferentially spaced apart to receive the widths of said vanes, and said vanes having elastomeric means at each end compressed between the corresponding pair of said holding means.

4,639,423

APPARATUS FOR THE PRODUCTION OF BIOCATALYST BEADS

Wolfgang Kahlert, Melsungen; Joachim Klein, Braunschweig; Hans-Jürgen Steinert, Illsede, and Claus Vorlop, Braunschweig, all of Fed. Rep. of Germany, assignors to Intermedicat GmbH, Emmenbruck, Switzerland

Filed Nov. 1, 1984, Ser. No. 667,361
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1983, 3339764
Int. Cl.[4] C12M *1/00*
U.S. Cl. 435—287 14 Claims



1. In an apparatus for the production of biocatalyst beads which includes:

an immobilization vessel which has an upper region and a lower region, said immobilization vessel being sealed in a germproof manner;

at least one nozzle means for filling said immobilization vessel, said nozzle means being associated with said immobilizaton vessel upper region;

discharge means associated with said immobilization vessel lower region, said discharge means comprising a pressure chamber defined by a top member and a bottom member, with said bottom member being provided with a plurality of discharge openings, a plurality of discharge pipes, each discharge pipe penetrating the top member for communication with the interior of the immobilization chamber and coaxially passing through one of said discharge openings in said bottom member;

a collecting vessel for containing a solution of a cross-linking agent or a reprecipitation bath, said collecting vessel having an upper region arranged beneath the lower region of said immobilization vessel;

the improvement comprising:

a connecting nozzle surrounding all of said discharge pipes and forming part of the lower region of said immobilization vessel;

said collecting vessel being sealed in a germproof manner;

means located in the upper region of said collecting vessel receiving said connecting nozzle whereby the interior of said immobilization vessel and the interior of said collecting vessel are in communication via said discharge pipes; and

means providing a germproof seal between said connecting nozzle and said means receiving said connecting nozzle.

4,639,424

DETERMINATION OF ALKALI METALS

Sie-Ting Wong, Mundelein, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 544,172, Oct. 21, 1983, abandoned. This application Jul. 27, 1984, Ser. No. 634,946
Int. Cl.[4] G01N *1/18, 21/75, 33/20, 33/50*
U.S. Cl. 436—74 2 Claims

1. A method for determining the alkali metal content of a protein-containing liquid which has not been treated to remove proteins, which method comprises the steps of:

(a) contacting the protein-containing liquid containing an alkali metal cation with (1) a monocyclic crown ether capable of forming a complex with the alkali metal cation, (2) a solvent selected from the group consisting of diphenyl ether, p-chlorobenzotrifluoride, 3,4-dichlorobenzotrifluoride, 1,2,4-trichlorobenzene, trichlorotrifluoroethane and mixtures thereof, and (3) an anionic dye to form a reaction mixture having an aqueous phase and a phase containing said solvent;

(b) separating from the mixture of step (a) the solvent phase, said phase containing said solvent containing a complex of the alkali metal cation, the crown ether and the anionic dye; and

(c) determining the concentration of the dye in the solvent phase as a measure of the alkali metal content of the protein-containing liquid.

4,639,425

HETEROGENEOUS IMMUNOASSAY AND REAGENT THEREFORE

Manfred Baier, Pocking-Possenhofen, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jul. 17, 1984, Ser. No. 631,816
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1983, 3327642
Int. Cl.[4] G01N *33/543, 33/544, 33/545, 33/546*
U.S. Cl. 436—518 7 Claims

1. In a heterogeneous immunoassay for the determination of a partner of an immune reaction in a blood serum or plasma sample in which one of the reaction partners is adsorbed on a solid carrier, the improvement comprising adding a detergent in such an amount to the incubation medium of the immune reaction between the soluble partner or partners and the partner adsorbed on the solid carrier that its concentration is from 0.0001 to 0.01% (w/v).

4,639,426

DECORATIVE HARD GOLDEN CERAMIC ARTICLE

Yoshio Nagato, Kokubu, and Kazunori Sorei, Sendai, both of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Continuation of Ser. No. 535,739, Sep. 26, 1983, Pat. No. 4,511,665. This application Mar. 18, 1985, Ser. No. 712,424
Claims priority, application Japan, Sep. 30, 1982, 57-173769
The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.
Int. Cl.[4] C04B *35/48, 35/58*
U.S. Cl. 501—96 7 Claims

1. A method for making a decorative hard golden ceramic article comprising the steps of:

(a) forming a powdered mixture consisting essentially of at least one member selected from titanium nitride and zirconium nitride as the main component, and 5% to 30% by weight of zirconia (ZrO_2);

(b) compression molding said mixture into a desired shape in a mold prior to sintering; and

(c) sintering the molded mixture in a non-oxidizing atmosphere after said molded mixture is removed from said mold.

4. A method for making a decorative hard golden ceramic article comprising the steps of:

(a) forming a powdered mixture consisting essentially of at least one member selected from titanium nitride and zirconium nitride as the main component, and 0.1% to 30% by weight of a second member selected from the group consisting of zirconis (ZrO_2), alumina (Al_2O_3) and mixtures thereof;

(b) compression molding said mixture into a desired shape in a mold prior to sintering; and

(c) sintering the molded mixture in a non-oxidizing atmosphere after said molded mixture is removed from said mold.

4,639,427

STRESS-CORROSION RESISTANT PROPPANT FOR OIL AND GAS WELLS

Arup K. Khaund, Niagara Falls, Canada, assignor to Norton Company, Worcester, Mass.

Filed Jun. 28, 1985, Ser. No. 750,714
Int. Cl.[4] C04B *35/10*
U.S. Cl. 501—128 3 Claims

1. In a proppant medium composed of spherical particles of a sintered composition of alumina, silica, and the impurities associated with bauxite, such impurities selected from the group consisting of alkali and alkaline earth, oxides, iron oxide, and titanium oxide, the improvement wherein there is at least 15% silica in the composition and zirconium oxide is present in the ratio of between one part of zirconia per twenty parts of silica to one part of zirconia per six parts of silica by weight, the proppant spheres as fired, consisting essentially of mullite, alumina, and glass, the silica content in the weight ratio being calculated as SiO_2 combined in the mullite phase and SiO_2 in the glass phase, and zironia content calculated as ZrO_2 and present in the glass phase.

4,639,428

POLYMERIZATION CATALYST, PRODUCTION AND USE

Steven A. Best, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 6, 1984, Ser. No. 638,319
Int. Cl.[4] C08F *4/62, 4/64, 4/68*
U.S. Cl. 502—115 36 Claims

1. A transition metal containing catalyst component comprising the solid reaction product obtained by treating an inert solid support material in an inert solvent sequentially with (A) an organometallic compound of a Group IIa, IIb or IIIa metal wherein all the metal valencies are satisfied with a hydrocarbon group, (B) an oxygen containing compound selected from ketones, aldehydes, alcohols or mixtures thereof, (C) an acyl halide, (D) at least one transition metal compound of a Group IVb, Vb, VIb or VIII metal, (E) a Group IIIa metal hydrocarbyl dihalide and (F) Cl_2, Br_2, an interhalogen or mixtures thereof with the proviso that the inert solid support material can alternatively be treated with (i) the (A) organometallic compound and the (B) oxygen containing compound simultaneously, (ii) the reaction product of the (A) organometallic compound and (B) oxygen containing compound or (iii) the (B) oxygen containing compound followed by treating with the (A) organometallic compound.

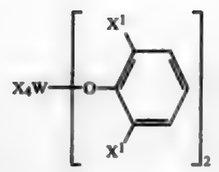
4,639,429

CATALYST FOR THE METATHESIS OF OLEFINS

Jean M. M. Basset; Michel Lecoute, both of Villeurbanne; Jean Ollivier, Arady, and Francoise Quignard, Lyons, all of France, assignors to Societe Nationale Elf Aquitaine, France

Division of Ser. No. 621,041, Jun. 15, 1984, Pat. No. 4,550,216. This application Jul. 18, 1985, Ser. No. 756,457
Claims priority, application France, Jun. 15, 1983, 83 09876; Jun. 8, 1984, 84 09001
Int. Cl.[4] B01J *31/12, 31/14*
U.S. Cl. 502—117 12 Claims

1. A di(2,6-dihalophenoxy)tungsten tetrahalide of the formula



wherein X and X' are halogen.

5. A catalyst for the metathesis of olefins comprising the combination of an organoaluminum, organotin or organolead compound and the tungsten tetrahalide of claim 1.

4,639,430

CATALYST SUPPORT, PROCESS FOR ITS MANUFACTURE, AND CATALYSTS PREPARED WITH THIS SUPPORT

Veronique Pasquet, Lyons, and Roger Spitz, Serezin, both of France, assignors to Atochem, France

Filed May 22, 1986, Ser. No. 866,139

Claims priority, application France, Jun. 14, 1985, 85 09090

Int. Cl.⁴ C08F *4/62, 4/64, 4/68*

U.S. Cl. 502—120 **9 Claims**

1. A catalyst support consisting essentially of a mixture of silica and a magnesium chloride, said support having a porous texture and containing less than 100 micromoles of hydroxyl groups per gram of support.

7. A catalyst for the polymerization of an alphaolefin consisting essentially of a catalyst support of claim 1 or 2 and at least one active component selected from a halide of a transition metal of Group IV, V or VI of the Periodic Table.

4,639,431

CATALYSTS IN FISCHER-TROPSCH PROCESS FOR PRODUCING OLEFINS

William E. Gates, Somerset, and Rocco A. Fiato, Scotch Plains, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jul. 11, 1985, Ser. No. 754,003

Int. Cl.⁴ B01J *23/10, 23/78, 23/80*

U.S. Cl. 502—304 **12 Claims**

1. A hydrocarbon synthesis catalyst comprising a sintered combination of metal oxides having the following components:

(a) an oxide of a Group VIII metal;

(b) an oxide of a Group IIB metal;

(c) an oxide of a Group IA alkali metal; and,

(d) an oxide of a lanthanide metal,

such that said sintered combination comprises a series of the Group VIII metal and the Group IIB metal spinels and the alkali metal oxide dispersed in a lanthanide metal oxide matrix.

4,639,432

OXIDATION CATALYSTS

Andrew Holt, Enfield; Martin G. Cheek, Cheshunt, and Ernest N. Clegg, Ware, all of England, assignors to UOP Limited, Middlesex, England

Filed Oct. 18, 1983, Ser. No. 543,001

Claims priority, application United Kingdom, Oct. 18, 1982, 8229655

Int. Cl.⁴ B01J *23/10, 23/64, 23/66, 23/89*

U.S. Cl. 502—324 **7 Claims**

1. A catalyst for catalyzing the oxidation, in the presence of oxygen, of carbon monoxide to carbon dioxide, said catalyst being substantially chloride-free and consisting essentially of stannic oxide supporting a mixture of (i) palladium, (ii) at least one member of the group consisting of platinum, ruthenium, rhodium and iridium and (iii) at least one metal selected from the group consisting of copper, nickel, cobalt, iron, manganese, silver, lanthanum, cerium, praseodymium and neodymium, said catalyst being suitable for use at ambient or sub-ambient temperature and being characterized by enhanced activity for said oxidation and reduced proneness to deactivation in service by the incorporation therein of (ii) and (iii).

4,639,433

GLYCOPEPTIDE DERIVATIVES

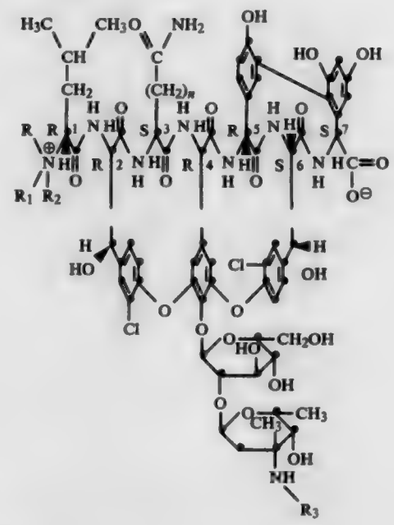
Ann H. Hunt, Greenwood; R. Michael Molloy, Danville; Ramakrishnan Nagarajan, and Amelia A. Schabel, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 14, 1985, Ser. No. 765,430

Int. Cl.⁴ A61K *37/00*; C07K *9/00*

U.S. Cl. 514—8 **29 Claims**

1. compound of the formula:



wherein

R and R_1 are hydrogen or methyl;

R_2 is methyl or R_3;

R_3 is hydrogen, C_4–C_{24}-alkanoyl, C_4–C_{24}-alkenoyl or a C_4–C_{24}-alkanoyl or C_4–C_{24}-alkenoyl group which has one or more halo, C_1–C_8-alkoxy, C_1–C_8-alkylthio, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkanoyl, carboxy, hydroxy, or



substituents;

R_4 and R_5 are independently hydrogen or C_1–C_4-alkyl, or R_4 is hydrogen and R_5 is an amino-protecting group; and

n is 1 or 2;

provided that: (1) at least one of R_2 and R_3 must be other than hydrogen; and (2) when n is 2, R and R_1 must be hydrogen; and the salts of these compounds.

4,639,434

NOVEL CYCLOSPORINS

Roland Wenger, Rieben; René P. Traber; Hans Kobel, both of Basel, and Hans Hofmann, Ettingen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Mar. 19, 1985, Ser. No. 713,429

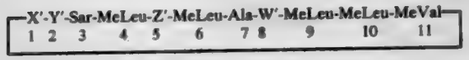
Claims priority, application United Kingdom, Mar. 23, 1984, 8407618; May 10, 1984, 8411922

Int. Cl.⁴ A61K *37/64*; C07K *5/12*

U.S. Cl. 514—11 **6 Claims**

1. A cyclosporin of formula IIIa,

(IIIa)



wherein

Y' is -αAbu-, -Thr-, -Val- or -Nva-,

Z' is -Val-, when Y' is -Thr-, or -Val- or

Z' is -Val- or -Nva-, when Y' is -αAbu- or -Nva-,

W' is -(D)Ser-,

when Y' is -Thr-, -Val- or -Nva- and Z' is -Val-, or

when Y' is -αAbu- or -Nva- and Z' is -Nva- or

W' is -(D)Thr-, when Y' is -αAbu- and Z is -Val-, and

X' is -MeBmt- or

X' is -dihydro -MeBmt-, when Y' is -Thr-, -Val-, or -Nva-,

Z' is -Val- and

W' is -(D)Ser-.

4,639,435

PHARMACEUTICAL COMPOSITION SUITABLE FOR INTESTINAL ADMINISTRATION

Setsuro Fujii, Toyonaka; Touru Yokoyama, Tokyo; Kouji Ikegaya, Higashi-Murayama; Nobuo Yokoo, and Masahiko Nagakura, both of Sayama, all of Japan, assignors to Kowa Co., Ltd., Nagoya, Japan

Filed Jun. 27, 1984, Ser. No. 625,231

Claims priority, application Japan, Jun. 29, 1983, 58-116089

Int. Cl.⁴ A61K *37/30, 37/558*

U.S. Cl. 514—11 **3 Claims**

1. A pharmaceutical composition suitable for intestinal absorption, comprising (i) a physiologically active substance which is at least one member selected from the group consisting of kallikrein and calcitonin, and (ii) 1-isopropyl-4-[4-(1,2,3,4-tetrahydronaphthoyloxy)-benzoyl] piperazine methanesulfonate.

4,639,436

ANTIDIABETIC 3,4,5-TRIHYDROXYPIPERIDINES

Bodo Junge; Hans P. Krause; Lutz Müller, and Walter Puls, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

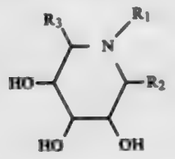
Filed Aug. 23, 1978, Ser. No. 936,280

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1977, 27387173; Dec. 24, 1977, 27580252

Int. Cl.⁴ A61K *31/70*; C07D *211/46*

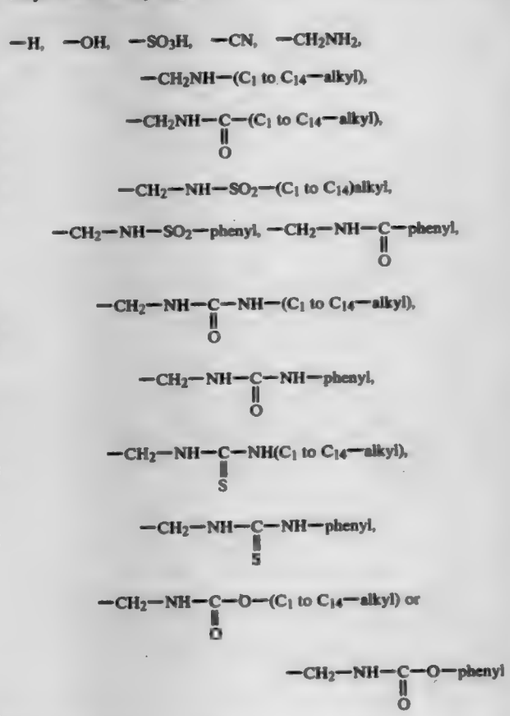
U.S. Cl. 514—24 **32 Claims**

1. A compound of the formula



I

in which R_1 is C_5–C_{30} alkyl, C_2–C_{18} alkenyl, C_2–C_{18} alkinyl, C_3–C_8 cycloalkyl, C_3–C_8 cycloalkenyl, C_3–C_8-cycloalkinyl, phenyl (a), C_1–C_2 and C_7–C_{30} alkyl substituted by phenyl (b) or substituted C_1–C_4-alkyl said C_5–C_{30} alkyl, cycloalkyl, cycloalkenyl and cycloalkinyl being unsubstituted or substituted by hydroxy, C_1–C_4-alkoxy, acyloxy, amino, mono- C_1–C_4 alkylamino, di-C_1–C_4 alkylamino, acylamino, mercapto, C_1–C_4 alkylthio, halogen, C_1–C_4 alkylcarbonyl, carboxyl nitro, cyano, formyl, sulfo, a heterocyclic radical derived from a hexose or pentose, attached to the alkyl moiety directly via a ring atom or via an —O—, —S— or —NH-bridge or naphthyl said phenyl (a) being unsubstituted or substituted by C_1 to C_{10} alkyl, C_1 to C_{10} chloroalkyl, C_1 to C_{10} nitroalkyl, C_1 to C_{10} cyanoalkyl, C_1 to C_{10} alkenyl, hydroxyl, C_1 to C_4 alkoxy, amino, mono-C_1 to C_4 alkylamino, di-C_1–C_4 alkylamino, mercapto, C_1–C_4 alkylthio, carboxyl, C_1–C_4 carbalkoxy, sulfo, C_1–C_4 alkylsulfonyl, phenylsulfonyl, aminosulfonyl, C_1–C_4 alkylaminosulfonyl, di-C_1–C_4 alkylaminosulfonyl, nitro, cyano, formyl, C_1–C_4 alkylcarbonylamino, C_1–C_4 alkylcarbonyl, benzoyl, benzylcarbonyl or phenylethylcarbonyl; said substituted C_1–C_4 alkyl being substituted by hydroxy, C_1–C_4-alkoxy, acyloxy, amino, mono- C_1–C_4 alkylamino, di-C_1–C_4 alkylamino, acylamino, mercapto, C_1–C_4 alkylthio, halogen, C_1–C_4 alkylcarbonyl, carboxyl nitro, cyano, formyl, sulfo, a heterocyclic radical derived from a hexose or pentose, attached to the alkyl moiety directly via a ring atom or via an —O—, —S— or —NH—bridge or naphthyl, said acyl being derived from an aliphatic carboxylic acid having from 1 to 7 C-atoms, a phenyl carboxylic acid, unsubstituted or substituted by carboxy, hydroxy, halogen, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, nitro or amino, or a 5- or 6-membered aromatic heterocyclic carboxylic acid containing from 1 to 3 hetero-atoms each of which is N, O or S, unsubstituted or substituted by C_1 to C_4 alkyl, chlorine, bromine or amino; said naphthyl and phenyl (b) being unsubstituted or substituted by hydroxyl, amino, C_1–C_4 alkylamino, di-C_1–C_4 alkylamino, C_1–C_4alkoxy, nitro, cyano, carboxy, C_1–C_4 alkoxycarbonyl, C_1–C_6 alkyl, halogen, C_1–C_4 alkylthio, mercapto, C_1–C_4 alkylsulfonyl, sulfo, aminosulfonyl or C_1–C_4 alkylaminosulfonyl R_2 is



wherein phenyl is unsubstituted or substituted by methyl, ethyl, methoxy, chlorine, bromine or nitro, R_3 is —H, —CH_3,

—CH_2OH, —CH_2—NH_2, NHR'—CH_2—, NR'R"—CH_2—, R'CONH—CH_2, R'CO—NR"CH_2—, R'O—CH_2, R'COOCH_2—, R'SO_2NHCH_2—, R'SO_2—NR"CH_2—, R'NH—CO—NH—CH_2—, R'NHCS—NH—CH_2, R'O—CO—NH—CH_2—, wherein R' and R" are the same or different and each has the meaning hydrogen or C_1–C_{30} alkyl, C_2–C_{18} alkenyl, C_2–C_{18} alkinyl, C_3–C_8 cycloalkyl, C_3–C_8 cycloalkenyl, C_3–C_8-cycloalkinyl or phenyl (a), said alkyl, cycloalkyl, cycloalkenyl and cycloalkinyl being unsubstituted or substituted by hydroxy, C_1–C_4-alkoxy, acyloxy, amino, mono- C_1–C_4alkylamino, di-C_1–C_4 alkylamino, acylamino, mercapto, C_1–C_4 alkylthio, halogen, C_1–C_4 alkylcarbonyl, carboxyl, nitro, cyano, formyl, sulfo, a heterocyclic radical derived from a hexose or pentose, attached to the alkyl moiety directly via a ring atom or via an —O—, —S— or —NH— bridge, naphthyl or phenyl (b) said acyl being derived from an aliphatic carboxylic acid having from 1 to 7 C-atoms, a phenyl carboxylic acid, unsubstituted or substituted by carboxy, hydroxy, halogen, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, nitro or amino, or a 5- or 6-membered aromatic heterocyclic carboxylic acid containing from 1 to 3 hetero-atoms each of which is N, O or S, unsubstituted or substituted by C_1 to C_4 alkyl, chlorine, bromine or amino; said phenyl (a) being unsubstituted or substituted by C_1 to C_{10} alkyl, C_1 to C_{10} chloroalkyl, C_1 to C_{10} nitroalkyl, C_1 to C_{10} cyanoalkyl, C_1 to C_{10} alkenyl, hydroxyl, C_1 to C_4 alkoxy, amino, mono-C_1 to C_4 alkylamino, di-C_1–C_4alkylamino, mercapto, C_1–C_4alkylthio, carboxyl, C_1–C_4-carbaloxy, sulfo, C_1–C_4alkylsulfonyl, phenylsulfonyl, aminosulfonyl, C_1–C_4 alkylaminosulfonyl, di-C_1–C_4alkylaminosulfonyl, nitro, cyano, formyl, C_1–C_4 alkylcarbonylamino, C_1–C_4 alkylcarbonyl, benzoyl, benzylcarbonyl or phenylethylcarbonyl; said napthyl and phenyl (b) being unsubstituted or substituted by hydroxyl, amino, C_1–C_4 alkylamino, di-C_1–C_4 alkylamino, C_1–C_4alkoxy, nitro, cyano, carboxy, C_1–C_4 alkoxycarbonyl, C_1–C_6 alkyl, halogen, C_1–C_4 alkylthio, mercapto, C_1–C_4 alkylsulfonyl, sulfo, aminosulfonyl or C_1–C_4 alkylaminosulfonyl.

27. A method of combating adiposity, diabetes and/or hyperlipaemia in warm-blooded animals which comprises administering to the said animal an effective amount for the treatment of diabetes, hyperlipaemia or adiposity of an active compound according to claim 1 either alone or in admixture with a diluent or in the form of a medicament.

4,639,437

KIT OR DEVICE AND METHOD FOR ADMINISTERING GANGLIOSIDES AND DERIVATIVES THEREOF BY INHALATION AND PHARMACEUTICAL COMPOSITIONS SUITABLE THEREFOR

Francesco della Valle, Padova, and Aurelio Romeo, Rome, both of Italy, assignors to Fidia, S.p.A., Abano Terme, Italy

Filed Apr. 12, 1984, Ser. No. 599,340
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—54 10 Claims

1. A method for stimulating nerve sprouting which comprises administering by inhalation an effective amount of at least one ganglioside compound or a pharmaceutically acceptable salt thereof, or at least one inner ester ganglioside derivative or a pharmaceutically acceptable salt thereof, or mixtures thereof, wherein said inner ester ganglioside derivative comprises:

(a) a carbohydrate portion, at least one ceramide and at least one acid moiety;

(b) said carbohydrate portion including at least one N-acetylgalactosamine or N-acetylglucosamine moiety and at least one glucose or galactose moiety;

(c) said acid moiety including at least one N-acetylneuraminic acid or N-glycolylneuraminic acid; and

(d) the carboxyl group of at least one of said acid moieties being ester bonded to a hydroxyl group of one of said carbohydrates or one of said acid moieties to form a lactonic ring.

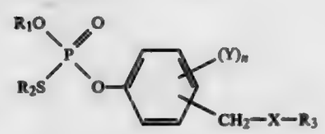
4,639,438

O,S-DIALKYL-O-(SUBSTITUTED PHENYL)-THIOLPHOSPHATES AS PESTICIDES

Richard Sehring; Wolfgang Buck, both of Ingelheim; Ricarda Prokic-Immel, Mainz, and Sigmund Lust, Darmstadt, all of Fed. Rep. of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 678,224, Dec. 5, 1984, abandoned, which is a continuation of Ser. No. 503,675, Jun. 13, 1983, abandoned. This application Mar. 12, 1986, Ser. No. 839,036
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1982, 3223949
Int. Cl.[4] A01N *57/14*; C07F *9/18*
U.S. Cl. 514—129 6 Claims

1. A compound of the formula



wherein

R_1 and R_2 are each independently straight or branched alkyl of 1 to 3 carbon atoms;

R_3 is alkyl of 1 to 8 carbon atoms;

X is oxygen;

Y is chlorine, bromine or fluorine; and

n is 1 or 2.

2. The method of killing pests, which comprises contacting said pests with an effective pesticidal amount of a compound of claim 1.

4,639,439

CONTRACEPTIVE COMPOSITION

Peter W. Howie, Monifieth, and Alan McNeilly, Galashiels, both of England, assignors to Societe d'Etudes Scientifiques et Industrielles de l'Ile de France, Paris, France

Filed Oct. 10, 1985, Ser. No. 786,328
Claims priority, application European Pat. Off., Oct. 10, 1984, 84402033.9
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—171 10 Claims

1. A pharmaceutical composition for suppressing fertility comprising a prolactin elevating benzamide, a progestogen and a pharmaceutically acceptable carrier.

4,639,440

THERAPEUTIC USE OF CYPROTERONE ACETATE

Manlio Blandamura, Rome, Italy, assignor to Finchimica S.R.L., Milan, Italy

Filed Sep. 24, 1985, Ser. No. 779,421
Claims priority, application Italy, Jan. 8, 1985, 19041 A/85
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—178 4 Claims

1. A method of treating functional and tumoral estrogen-dependent pathology caused by intrafollicular iperestrogenism, which comprises:

administering to a subject a therapeutically effective amount of cyproterone acetate which blocks the estrogen signal in said subject.

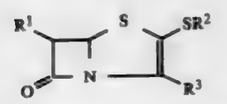
4,639,441

2-PENEM-3-CARBOXYLIC ACID DERIVATIVES AND USE

Tetsuo Miyadera; Yukio Sugimura; Teruo Tanaka; Toshihiko Hashimoto; Kimio Iiso, and Shinichi Sugawara, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Continuation of Ser. No. 241,737, Mar. 9, 1981. This application Feb. 24, 1984, Ser. No. 582,152
Claims priority, application Japan, Mar. 10, 1980, 55-30013; Mar. 17, 1980, 55-33529; Jun. 3, 1980, 55-74761
Int. Cl.[4] C07D *499/00*; A61K *31/425*
U.S. Cl. 514—195 28 Claims

1. Compounds of formula (I)



(I)

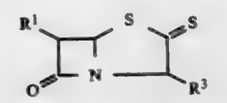
wherein

R^1 represents hydrogen, lower alkyl, lower alkoxy, a group of the formula R^4A— in which R^4 represents a hydroxy group, an alkoxy-group having from 1 to 3 carbon atoms in the alkyl moiety, an aliphatic acyloxy group having from 2 to 4 carbon atoms in the aliphatic moiety, a benzyloxycarbonyloxy group, a p-nitrobenzyloxycarbonyloxy group, an alkylsulfonyloxy group having from 1 to 3 carbon atoms, a benzenesulfonyloxy group, a p-toluenesulfonyloxy group, a trimethylsilyloxy group or a t-butyldimethylsilyloxy group; and A represents an ethylidene group;

R^2 represents a hydrogen atom; and

R^3 represents a carboxy group or a protected carboxy group; and

the tautomers of said compounds of the formula Ia



(Ia)

and pharmaceutically acceptable salts thereof.

4,639,442

BENZOCYCLOBUTENE AMINOALKYLENE ETHERS AND THIOETHERS, PHARMACEUTICAL COMPOSITIONS AND USE

Donald E. Kuhla, Doylestown; Henry F. Campbell, Lansdale, and William L. Studt, Harleysville, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

PCT No. PCT/US85/00789, § 371 Date Nov. 1, 1985, § 102(e) Date Nov. 1, 1985, PCT Pub. No. WO85/05032, PCT Pub. Date Nov. 21, 1985
Continuation-in-part of Ser. No. 664,222, Oct. 23, 1984, which is a continuation-in-part of Ser. No. 604,813, Apr. 27, 1984, which is a continuation-in-part of Ser. No. 489,702, Apr. 29, 1983, Pat. No. 4,529,723. This PCT application Apr. 29, 1985, Ser. No. 798,697
Int. Cl.[4] A61K *31/41, 31/445*; C07D *249/14, 401/12*
U.S. Cl. 514—212 22 Claims

1. A compound of the formula



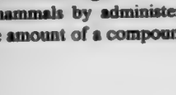
wherein:

a is 1 or 2;

b is 0 or 1;

c is 2, 3 or 4;

X is oxygen, sulfur,



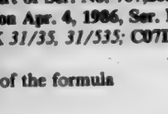
Z is —NHR_7;

R_1 is —NR_5R_6;

R_2, R_3 and R_4 are each independently hydrogen, lower alkyl, allyl, arylloweralkyl, loweralkoxycarbonyl or lower alkyl substituted by hydroxy, loweralkoxycarbonyl or NR_5R_6;

R_5 and R_6 are each independently H or alkyl, or both together with the nitrogen to which they are attached form a 5, 6 or 7-membered ring which may include one to three additional hetero atoms of N, O or S;

R_7 is selected from the group consisting of



R_8 is H or lower alkyl;

R_{10} is hydrogen, lower alkyl, lower alkenyl, aryl, arloweralkyl, hydroxyloweralkyl, acyloxyloweralkyl, loweralkoxyloweralkyl, aryloxyalkyl, aroyloxyalkyl, aralkyloxyalkyl, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, hydroxy, alkoxy, alkylthio, halogen or $NR_{11}R_{12}$, where:

R_{11} is hydrogen, lower alkyl, lower alkenyl or arloweralkyl; and

R_{12} is hydrogen, COR_{13}, SO_2R_{14} or



R_{13} is hydrogen, lower alkyl, aryl, arloweralkyl, loweralkoxy, heteroaryl, or monocyclic heteroarylalkyl;

R_{14} is loweralkyl or aryl;

R_{15} is hydrogen, lower alkyl, cycloloweralkyl, aryl or lower aralkyl;

wherein the term aryl is phenyl or substituted phenyl

or a pharmaceutically acceptable salt thereof.

19. A method for decreasing acid secretion in the gastrointestinal tract of mammals by administering thereto an antisecretory effective amount of a compound according to claim 1.

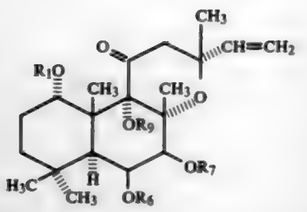
4,639,443

LABDANE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND USE

Raymond W. Kosley, Jr., Bridgewater, and Robert J. Cherill, Somerset, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 707,283, Mar. 1, 1985. This application Apr. 4, 1986, Ser. No. 848,053
Int. Cl.[4] A61K *31/35, 31/535*; C07D *319/04, 413/06*
U.S. Cl. 514—222 9 Claims

1. A compound of the formula



wherein:

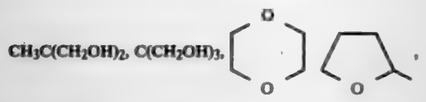
(a) R_6 and R_7 are each independently hydrogen, a group of the formula R_8CO wherein R_8 is hydrogen, loweralkyl,



HC, CH_3C, CH_3CHOH, $HOCH_2CHOH$,

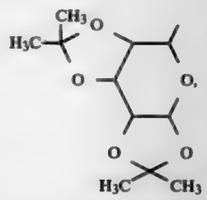
$(CH_3)_2COCH_2OCH_2CH_2OCH_3$, $CH_3C(CH_3)OH$,

$HOCH_2C(CH_3)OH$, $HOCH_2C(CH_3)_2$, $HOC(CH_2OH)CH_2CH_3$,



$CH_3C(CH_2OH)_2$, $C(CH_2OH)_3$,



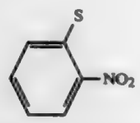


a group of the formula $R_{10}OCR_{31}R_{32}(CH_2)_n$ wherein R_{10} is hydrogen or loweralkyl, R_{31} is hydrogen or loweralkyl, R_{32} is hydrogen or loweralkyl, and n is 0, 1, 2, or 3, a group of the formula $R_{11}R_{12}NCHR_{13}$ wherein R_{11} is hydrogen, loweralkyl, a group of the formula

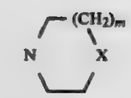


$(CH_3)_3COC$,

a group of the formula

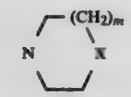


or a group of the formula $R_{14}CO$ wherein R_{14} is hydrogen or loweralkyl; R_{12} is hydrogen or loweralkyl; R_{13} is hydrogen, loweralkyl, benzyl or a group of the formula CH_2OH; R_{11} and R_{12} taken together with the nitrogen atom to which they are attached form a group of the formula



wherein X is O, S or a group of the formula CHR_{15} wherein R_{15} is hydrogen, loweralkyl or a group of the formula OR_{16} wherein R_{16} is hydrogen, loweralkyl or a group of the formula COR_{17} wherein R_{17} is loweralkyl, and m is 0 or 1; a group of the formula NR_{18} wherein R_{18} is loweralkyl;

(b) R_1 and R_9 taken together form a group of the formula $CHNR_{19}R_{20}$ wherein R_{19} and R_{20} are each independently loweralkyl; and R_{19} and R_{20} taken together with the nitrogen atom to which they are attached form a group of the formula



wherein X and m are as hereinbeforedescribed;

the optical and geometric isomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

9. An intraocular pressure reducing composition comprising an inert intraocular pressure reducing adjuvant and as the active ingredient, an intraocular pressure reducing effective amount of a compound or a pharmaceutically acceptable acid addition salt thereof according to claim 1.

4,639,444

3,5-DIALKYL-4,6-DIARYL-TETRAHYDRO-2H-13,5-THIADIAZINE-2-THIONE DERIVATIVE, PROCESS FOR ITS PRODUCTION AND ANTIHYPERLIPIDEMIC AGENT CONTAINING IT

Yoshihiro Fujikawa, Funabashi; Mitsuaki Sakashita, Urawa, and Nobutomo Tsuruzoe, Kuki, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Nov. 20, 1985, Ser. No. 800,025

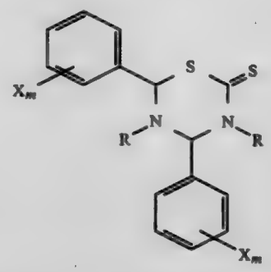
Claims priority, application Japan, Nov. 30, 1984, 59-254921

Int. Cl.⁴ C07D *285/34, 407/10;* A61K *31/54*

U.S. Cl. 514—222 **31 Claims**

1. A compound of the formula:

(I)



wherein R is methyl or ethyl, m is 1, 2 or 3, X is independently selected from hydrogen, a lower alkyl, lower alkoxy, lower alkylthio, fluorine, bromine, phenoxy or substituted phenoxy, with the proviso that when X is hydrogen, R is ethyl and 2X taken together is methylenedioxy or —CH=CH—CH=CH—, and with the further proviso that the substituents on the substituted phenoxy are selected from the group consisting of a lower alkyl, lower alkoxy, lower alkylthio, fluorine and bromine.

10. A pharmaceutical composition for raising the ratio of high density lipoprotein chlesterol to total cholesterol in serum, comprising a ratio raising effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier.

4,639,445

METABOLITES OF TRIAZOLO[1,5-C]PYRIMIDINES

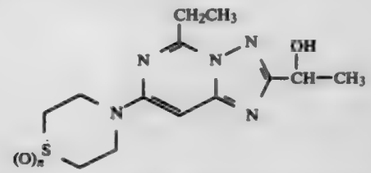
Roy L. McQuinn, White Bear, and James J. Wade, Oakdale, both of Minn., assignors to Riker Laboratories, St. Paul, Minn.

Filed Oct. 25, 1985, Ser. No. 791,594

Int. Cl.⁴ C07D *417/04;* A61K *31/54*

U.S. Cl. 514—222 **7 Claims**

1. A compound of the formula:



wherein n is 1 or 2; said compound being levorotatory; or a pharmaceutically acceptable acid-addition salt thereof.

6. A method for obtaining bronchodilation in a mammal, comprising administering a compound according to claim 1 to said mammal in an amount effective to obtain bronchodilation.

4,639,446

AMINOACYLLABDANES, PHARMACEUTICAL COMPOSITIONS AND USE

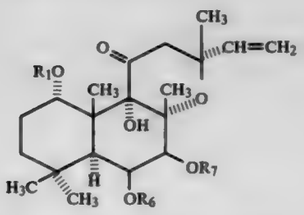
Raymond W. Kosley, Jr., Bridgewater, and Robert J. Cherill, Somerset, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 681,779, Dec. 14, 1984. This application Dec. 4, 1985, Ser. No. 804,405

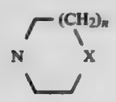
Int. Cl.⁴ A61K *31/35, 31/535;* C07D *311/92, 413/12*

U.S. Cl. 514—222 **28 Claims**

1. A compound of the formula

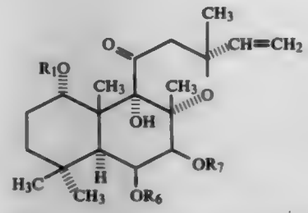


wherein R_1 is $R_2R_3NCHR_4CO$ wherein R_2 is hydrogen, loweralkyl or benzyl, R_3 is hydrogen or loweralkyl and R_4 is hydrogen, loweralkyl or benzyl; R_2 and R_3 taken together with the nitrogen atom to which they are attached form a group of the formula

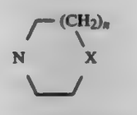


wherein X is CO, O, S, SO, SO_2; a group of the formula CHR_9 wherein R_9 is hydrogen, loweralkyl or a group of the formula OR_{10} wherein R_{10} is hydrogen or COR_{11} wherein R_{11} is loweralkyl; or a group of the formula NR_{12} wherein R_{12} is loweralkyl; n is 1 or 0; R_6 is hydrogen or a group of the formula R_5CO wherein R_5 is hydrogen or loweralkyl; R_7 is hydrogen or a group of the formula R_8CO wherein R_8 is hydrogen or loweralkyl; the optical and geometric isomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

23. An intraocular pressure reducing composition comprising an inert adjuvant and as the active ingredient, an amount effective in reducing intraocular pressure of a compound of the formula



wherein R_1 is $R_2R_3NCHR_4CO$ wherein R_2 is hydrogen, loweralkyl or benzyl, R_3 is hydrogen or loweralkyl and R_4 is hydrogen, loweralkyl or benzyl; R_2 and R_3 taken together with the nitrogen atom to which they are attached form a group of the formula



wherein X is CO, O, S, SO, SO_2, a group of the formula CHR_9 wherein R_9 is hydrogen, loweralkyl or a group of the formula OR_{10} wherein R_{10} is hydrogen or COR_{11} wherein R_{11} is loweralkyl, or a group of the formula NR_{12} wherein R_{12} is loweralkyl; n is 0 or 1; R_6 is hydrogen or a group of the formula R_5CO wherein R_5 hydrogen or loweralkyl; R_7 as hydrogen or a group of the formula R_8CO wherein R_8 is hydrogen or loweralkyl; the optical and geometric isomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

4,639,447

AZOLYLNITRILES, AND FUNGICIDES CONTAINING THESE COMPOUNDS

Karl Roeser, Hirschberg; Manfred Lauer, Ludwigshafen; Hubert Sauter, Mannheim; Eberhard Ammermann, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 4, 1985, Ser. No. 741,112

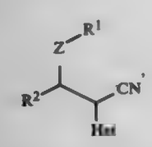
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421179

Int. Cl.⁴ A01N *43/50, 43/653;* C07D *233/61, 249/08*

U.S. Cl. 514—222 **4 Claims**

1. A compound of the formula

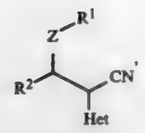
(I)



where R^2 is a 5-membered or 6-membered unsaturated heterocyclic structure possessing one or two hetero atoms or is phenyl which is unsubstituted or substituted by R_n, R is hydrogen, alkyl, alkoxy, alkylthio, alkylsulfonyl, halogen, haloalkyl, nitro, cyano, unsubstituted or halogen, cyano, nitro or halo-C_1–C_2-alkyl substituted phenyl, unsubstituted or halogen, cyano, nitro or halo-C_1–C_2-alkyl substituted phenoxy or unsubstituted or C_1–C_4-alkyl substituted amino, R^1 is C_1–C_{10}-alkyl, C_3–C_8-cycloalkyl, C_4–C_{11}-cycloalkyl-alkyl, unsubstituted or halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy,

C_1–C_4-alkythio or halo-C_1–C_4-alkyl substituted aryl, unsubstituted or halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkythio or halo-C_1–C_4-alkyl substituted aralkyl, unsubstituted or halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkythio or halo-C_1–C_4-alkyl substituted aryloxyalkyl, unsubstituted or halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkythio or halo-C_1–C_4-alkyl substituted benzyloxyalkyl, C_2–C_4-alkenyl, propargyl, butynyl or $(CH_2—CH_2O)_m—R^4$, where R^4 is C_1–C_4-alkyl, unsubstituted or chloro-substituted aryl or unsubstituted or chloro-substituted benzyl and m is 1, 2, 3 or 4, Het is 1,2,4-triazol-1-yl or imidazol-1-yl, n is 1, 2, 3, 4 or 5, Z is oxygen, SO_t or, (R^3N) where t is 0, 1 or 2 and R^3 has the same meanings as R^1 and is identical to or different from R^1 or together with R^1 forms a diradical of the formula $—(CH_2)_k—X—(CH_2)_l—$, where k and l independently of one another are each 1, 2, 3, 4 or 5, and X is O, S or NH, or Z—R^1 is unsubstituted or alkyl, alkoxy, alkylthio, alkylsulfonyl, halogen, haloalkyl nitro or cyano substituted phenyl, or a plant-tolerated acid addition salt thereof, with the proviso that Het may also be pyrid-3-yl when Z is oxygen, SO_t or (R^3N) where t is 1 or 2.

4. A process for combatting fungi, wherein the fungi or the materials, plants, soil or seed to be protected against fungus attack are treated with an effective amount of a compound of the formula



(I)

where R^2 is a 5-membered or 6-membered unsaturated heterocyclic structure possessing one or two hetero atoms or is phenyl which is unsubstituted or substituted by R_n, R is hydrogen, alkyl, alkoxy, alkylthio, alkylsulfonyl, halogen, haloalkyl, nitro, cyano, unsubstituted or halogen, cyano, nitro or halo-C_1–C_2-alkyl substituted phenyl, unsubstituted or halogen, cyano, nitro or halo-C_1–C_2-alkyl substituted phenoxy or unsubstituted or C_1–C_4-alkyl substituted amino, R^1 is C_1–C_{10}-alkyl, C_3–C_8-cycloalkyl, C_4–C_{11}-cycloalkyl-alkyl, unsubstituted or halogen, cyano, nitro, C_1–C_4-aikyl, C_1–C_4-alkoxy, C_1–C_4-alkythio or halo-C_1–C_4-alkyl substituted aryl, unsubstituted or halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkythio or halo-C_1–C_4-alkyl substituted aralkyl, unsubstituted or halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkythio or halo-C_1–C_4-alkyl substituted aryloxyalkyl, unsubstituted or halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkythio or halo-C_1–C_4-alkyl substituted benzyloxyalkyl, C_2–C_4-alkenyl, propargyl, butynyl or $(CH_2—CH_2O)_m—R^4$, where R^4 is C_1–C_4-alkyl, unsubstituted or chloro-substituted aryl or unsubstituted or chloro-substituted benzyl and m is 1, 2, 3 or 4, Het is 1,2,4-triazol-1-yl or imidazol-1-yl, n is 1, 2, 3, 4 or 5, Z is oxygen, SO_t or, (R^3N) where t is 0, 1 or 2 and R^3 has the same meanings as R^1 and is identical to or different from R^1 or together with R^1 forms a diradical of the formula $—(CH_2)_k—X—(CH_2)_l—$, where k and l independently of one another are each 1, 2, 3, 4 or 5, and X is O, S or NH, or Z—R^1 is unsubstituted or alkyl, alkoxy, alkylthio, alkylsulfonyl, halogen, haloalkyl nitro or cyano substituted phenyl, or a plant-tolerated acid addition salt thereof, with the proviso that Het may also be pyrid-3-yl when Z is oxygen, SO_t or (R^3N) where t is 1 or 2.

4,639,448

7-AMINO-3-[SUBSTITUTED VINYL]-3-CEPHEM-4-CARBOXYLATES HAVING ANTIMICROBIAL ACTIVITY

Takao Takaya, Kawanishi; Hisashi Takasugi, Hamagutinishi; Hideaki Yamanaka, Hirakata; Kenji Miyai, Kawanishi, and Yoshikazu Inoue, Amagasaki, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

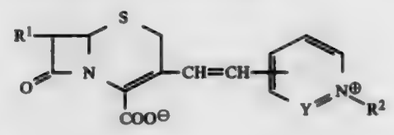
Division of Ser. No. 528,796, Sep. 2, 1983, Pat. No. 4,546,101. This application Jun. 4, 1985, Ser. No. 741,267

Claims priority, application United Kingdom, Sep. 10, 1982, 8225836; Apr. 29, 1983, 8311815

Int. Cl.[4] C07D *501/24;* A61K *31/54*

U.S. Cl. 514—226 6 Claims

1. A cephem compound of the formula:



wherein

R^1 is amino,

R^2 is lower alkyl, and

Y is CH or N,

and pharmaceutically acceptable salts thereof.

5. A method of treatment of infectious diseases which comprises administering a compound of claim 1 or pharmaceutically acceptable salt thereof to a human being or animal.

4,639,449

MORPHOLINE CONTAINING PROPIONYLANILIDES AND PHARMACEUTICAL COMPOSITIONS

Egidio Molinari, Longone al Segrino, Italy, assignor to Erregierre Industria Chimica Spa, San Paolo d'Argon (BG), Italy

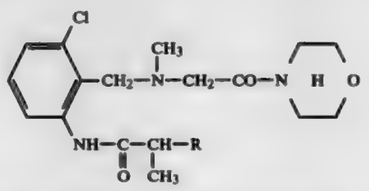
Filed Apr. 23, 1986, Ser. No. 854,789

Claims priority, application Italy, May 15, 1985, 20726 A/85

Int. Cl.[4] A61K *31/535;* C07D *295/18*

U.S. Cl. 514—234 2 Claims

1. Propionylanilides, and relative salts of addition, of formula:



(I)

in which R is chosen from the group consisting of 4-isobutylphenyl, 3-benzoylphenyl, 6-methoxy-2-naphthyl and 2-fluoro-4-diphenyl.

2. Pharmaceutical compositions containing as active principle at least one propionylanilide claimed in claim 1, together with pharmacologically acceptable dispersants and/or diluents.

4,639,450

POLYPRENYLCARBOXYLIC ACID MORPHOLIDES AND PHARMACEUTICAL COMPOSITIONS

Isao Yamatsu, Kawaguchi; Yuichi Inai; Shinya Abe, both of Tokyo; Hideaki Watanabe, Aichi; Toshiji Igarashi, Tokorozawa; Hiroyuki Shiojiri, Sayama; Yoshio Tanabe, Saitama, and Kumiko Hara, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

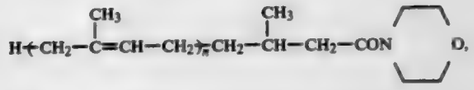
Continuation of Ser. No. 503,205, Jun. 10, 1983, abandoned, which is a division of Ser. No. 175,213, Aug. 4, 1980, Pat. No. 4,456,603. This application Dec. 4, 1984, Ser. No. 677,893

Claims priority, application Japan, Aug. 14, 1979, 54-102747; Aug. 28, 1979, 54-108668

Int. Cl.[4] A61K *31/535;* C07D *295/18*

U.S. Cl. 514—238 4 Claims

1. A compound having the formula:



wherein n is an integer of 1 to 4.

4. A pharmaceutical composition for treating liver dysfunction which comprises an effective amount of a compound as claimed in claim 1 as an active ingredient, and at least one pharmaceutically acceptable inert carrier or diluent.

4,639,451

PYRIDAZINONE DERIVATIVES

Tsutomu Katakami; Nobuyuki Fukazawa, both of Yokohama; Hajime Iizuka, Hiratsuka; Takashi Nishina, Mobara; Joji Kamiya, Mobara; Yasuhito Tanaka, Mobara, and Takuo Nakano, Yokohama, all of Japan, assignors to Mitsui Toatsu Kagaku-Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00415, § 371 Date Jun. 3, 1983, § 102(e) Date Jun. 3, 1983, PCT Pub. No. WO83/01447, PCT Pub. Date Apr. 28, 1983

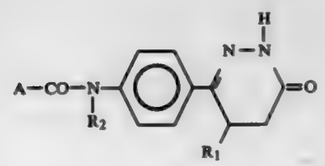
PCT Filed Oct. 20, 1982, Ser. No. 504,039

Claims priority, application Japan, Oct. 20, 1981, 56-166437; Oct. 20, 1981, 56-166438; Dec. 28, 1981, 56-209937

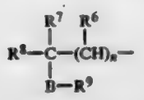
Int. Cl.[4] C07D *237/04;* A61K *31/50*

U.S. Cl. 514—247 22 Claims

1. A pyridazinone derivative of the formula:



wherein R^1 stands for a hydrogen atom or a methyl group; R^2 for a hydrogen atom or a lower alkyl group; and A for a grouping of the formula:



wherein R^6, R^7 and R^8 each stand for a hydrogen atom or a lower alkyl group, B is an oxygen atom or a sulfur atom, R^9 stands for a hydrogen atom or a lower alkanoyl group, and n is 0 or 1.

4,639,452

ARYLIC DERIVATIVES OF PIPERAZINE, THE METHOD OF PREPARING SAME AND THEIR APPLICATION IN THERAPEUTICS

Alain Y. Platel, Rueil Malmaison; Guy R. Bourgery, Colombes, both of France, and Alain Lacour, deceased, late of Saint Maur des Fossés, France (by Hélène Christiane José Guiblain, Cécile Hélène Laurence Lacour, Laurent Pierre Rolland Lacour, heirs), assignors to Delalande S.A., Courbevoie, France

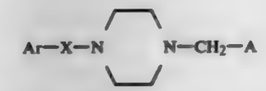
Filed Feb. 25, 1983, Ser. No. 469,968

Claims priority, application France, Feb. 26, 1982, 82 03256

Int. Cl.[4] C07D *295/18;* A61K *31/495*

U.S. Cl. 514—252 21 Claims

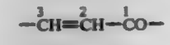
1. New compounds having the general formula:



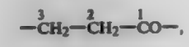
(I)

in which X represents:

either the chain of trans configuration



or the chain



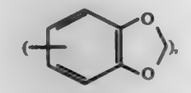
connected to Ar by their carbon atom 3, in which case A represents:

a carbohydroxamic (—CONHOH), Ar then representing the (3,4,5-trimethoxy)phenyl nucleus,

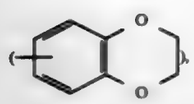
a carboxyl group (COOH), Ar then representing the para-chlorophenyl, para-hyroxyphenyl, (3,4-methylenedioxy)-phenyl or (3,5-dimethoxy 4-hydroxy)phenyl nucleus, or

an amido group of structure $CO—NR_2R_3$ in which the pair (R_2, R_3) takes on one of the following meanings: (H,H), (C_1–C_4 alkyl, C_1–C_4 alkyl), (H, C_3–C_6 cycloalkyl), (H, C_3–C_6 cycloalkylmethyl), (H, phenyl), (H, phenyl substituted by one or more halogen atoms), (H, phenyl substituted by one or more methyl or methoxy groups), (H, benzyl), (H, benzyl substituted by one or more halogen atoms), (H, benzyl substituted by one or more methyl or methoxy groups), (CH_3, benzyl), (CH_3, benzyl substituted by one or more halogen atoms), (CH_3, benzyl substituted by one or more methyl or methoxy groups), (H, allyl), (H, propargyl), R_2, R_3 being also able to form jointly with the nitrogen atom to which they are linked, a pyrrolidino, piperidino, or morpholino radical; Ar then representing a phenyl nucleus, a phenyl nucleus substituted by one or more halogen atoms, by one or more methoxy groups, by a methyl group, by a trifluoromethyl group or by one or two hydroxy radicals,

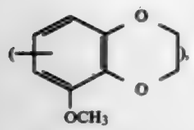
a 1,3-benzodioxolyl group:



a 1,4-benzodioxannyl group:

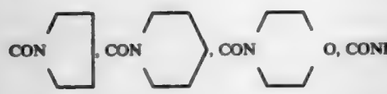


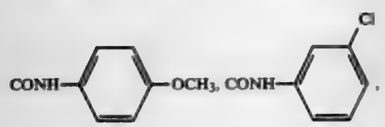
a (5-methoxy) 1,4-benzodioxannyl group:



a naphthyl group, the (3-methoxy 4-hydroxy)phenyl group, the (3-hydroxy 4-methoxy)phenyl group, the (3,5-dimethoxy 4-hydroxy)phenyl group or a (4-C_2–C_4 alkoxy 3,5-dimethoxy)phenyl group;

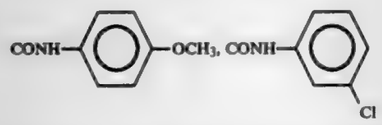
A not however being able to assume the following values: $CONH_2$, $CON(C_1$–C_4 alkyl$)_2$,





when Ar represents the (3,4,5-trimethoxy)phenyl group; A not however being able to assume the following values: $CONH_2$, $CON(C_1$–C_4 alkyl$)_2$,

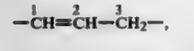




when Ar represents the (3,5-dimethoxy 4-hydroxy)phenyl group and A not however being able to assume the value $CON(C_2H_5)_2$ when Ar=2-hydroxyphenyl and X=CH_2—CH_2CO;

or an N-isopropylcarboxamido, Ar then representing a (3-methoxy 4-hydroxy)phenyl nucleus;

or the chain of trans configuration



linked to Ar by its carbon atom 1 or the chain —CH$_2$—CH_2—CH_2—, in which case A represents a carboxamido, N-isopropylcarboxamido, pyrrolidinocarbonyl or piperidinocarbonyl group, Ar then representing a (3,4,5-trimethoxy)phenyl or (3,4-methylenedioxy)phenyl group, with the proviso that A cannot represent a pyrrolidinocarbonyl group when Ar=(3,4,5-trimethoxy)phenyl,

as well as the acid addition salts thereof and the hydrates of these derivatives and salts.

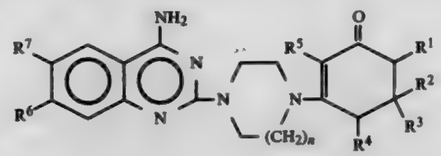
4,639,453

SUBSTITUTED 1-(4-AMINO-6,7-DIALKOXYQUINAZOLINYL)-4 CYCLOHEXENYL DERIVATIVES OF PIPERAZINE AND HOMOPIPERAZINE, PROCESSES FOR THEIR PREPARATION AND THEIR USE, FORMULATIONS CONTAINING THESE COMPOUNDS AND INTERMEDIATES

Werner Haasen, Hamburg, Fed. Rep. of Germany, assignor to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Dec. 7, 1984, Ser. No. 679,178
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346675
Int. Cl.[4] A61K *31/505*; C07D *403/04, 405/14*
U.S. Cl. 514—254 10 Claims

1. Substituted 1-(4-amino-6,7-dialkoxyquniazolinyl)-4-cyclohexenyl derivatives of piperazine and homopiperazine, of the formula I



(I)

in which

R^1, R^2, R^3, R^4 and R^5, which can be indentical or different, denote hydrogen, straight-chain or branched alkyl with in each case 1 to 6 carbon atoms, carbocyclic aliphatic groups with in each case 5 to 7 carbon atoms, mono- or bi-cyclic carbocyclic aromatic radicals or substituted mono- or bi-cyclic carbocyclic aromatic radicals, which can be monosubstituted or polysubstituted by identical or different substituents selected from the group consisting of halogen, lower alkyl and alkoxy with in each case 1 to 4 carbon atoms in the alkyl part or denote aralkyl radicals in which the alkyl portions is C_1–C_4-alkyl and the aryl portion is monocyclic carbocylic aryl, furanyl radicals or thienyl radicals, or

R^2 and R^3 together denote the group —$(CH_2)_a$—, wherein a is the number 4 to 5, or

R^3 and R^4 together denote the group —$(CH_2)_b$— wherein b is the number 3, 4 or 5,

R^6 and R^7, which can be identical or different denote alkoxy groups with 1 to 4 carbon atoms in the alkyl part, which can be straight-chain or branched, and

n denotes the number 1 and 2, the tautomeric forms thereof, as well as pharmaceutically acceptable acid addition salts and hydrates thereof.

5. A pharmaceutical composition containing, as an active ingredient an effective amount of a cardiovascular system regulator of a compound according to claim 1 or a pharmaceutically acceptable acid addition salt thereof in admixture with an inert pharmaceutical carrier.

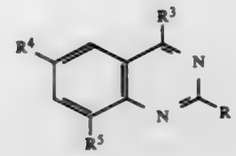
4,639,454

PHENYLQUINAZOLINECARBOXYLIC ACIDS AND DERIVATIVES AS CANCER CHEMOTHERAPEUTIC AGENTS

David P. Hesson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 17, 1985, Ser. No. 692,412
Int. Cl.[4] A61K *31/505*; C07D *239/74*
U.S. Cl. 514—259 21 Claims

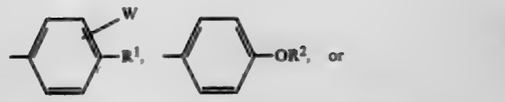
1. A quinazoline-4-carboxylic acid having the formula:

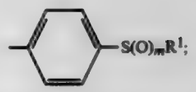


(I)

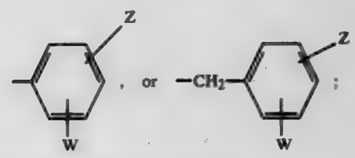
wherein

R is

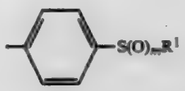




R^1 is alkyl of 5–12 carbon atoms, cycloalkyl of 3–7 carbon atoms, cycloalkyl alkyl of 4–12 carbon atoms, cycloalkenyl of 5–7 carbon atoms,



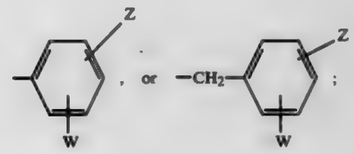
with the proviso that when R is



then R^1 can be in addition alkyl of 3–4 carbon atoms;

m is 0 or 1;

R^2 is

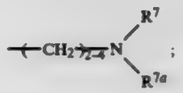


W and Z are independently H, F, Cl, Br, alkyl of 1–5 carbon atoms, NO_2, alkoxy of 1–5 carbon atoms, OH, CF_3, or NH_2;

R^3 is COOH, or $COOR^6$;

R^4 and R^5 are independently H, halogen, CF_3, or alkyl of 1 or 2 carbon atoms;

R^6 is



R^7 and R^{7a} are independently H or alkyl of 1–3 carbon atoms;

or a pharmaceutically suitable salt thereof.

15. A method of treating lymphoid leukemia in a mammal which comprises administering to a mammal an effective amount of at least one compound of claim 1.

4,639,455

MEANS OF AIDING IN THE PREVENTION OF SUDDEN INFANT DEATH SYNDROME

Luana Moore, Miami Beach, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Filed Oct. 2, 1984, Ser. No. 657,096
Int. Cl.[4] A61K *31/41*
U.S. Cl. 514—282 7 Claims

1. A method aiding in the prevention of SIDS, comprising: administering a pharmaceutically effective amount of 6-methylene-6-desoxy-N-cyclopropylmethyl-14-hydroxydihydronormorphone to an infant determined to be susceptible to SIDS so as to block the attachment of endogenous endorphins to nerve receptor sites responsible for the actuation of respiration.

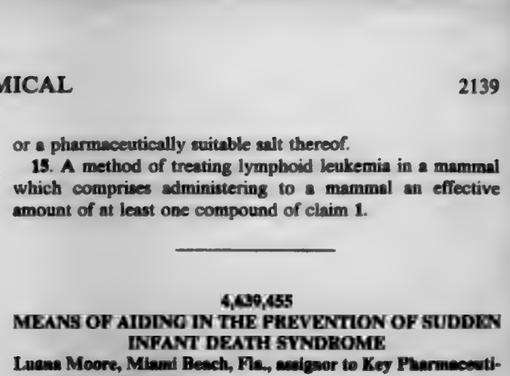
4,639,456

VINBLASTIN-23-OYL AMINO ACID DERIVATIVES

Andre B. L. Trouet, Winksele; Jean A. A. J. Hannart, Dion Valmont, and Kandukuri S. B. Rao, Rosieres, all of Belgium, assignors to Omnichem S.A., Belgium

Continuation-in-part of Ser. No. 269,876, Jun. 3, 1981, Pat. No. 4,388,305. This application Dec. 3, 1982, Ser. No. 446,708
Claims priority, application Luxembourg, Jun. 10, 1980, 82514; Dec. 23, 1980, 83034; Dec. 8, 1981, 83822
The portion of the term of this patent subsequent to Jun. 14, 2000, has been disclaimed.
Int. Cl.[4] C07D *519/04, 47/16*; A61K *31/40*
U.S. Cl. 514—283 20 Claims

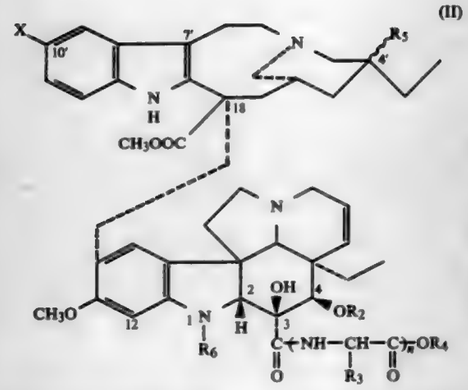
1. A vinblastine group of the formula



(I)

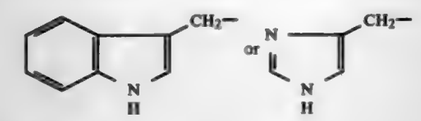
wherein R_1 is an ester, attached through the nitrogen of a α-aminoacid selected from the group consisting of glycine, alanine, valine, leucine, isoleucine, serine, threoinine, aspartic acid, glutamic acid, aspargine, glutamine, arginine, lysine, cysteine, cystine, methionine, phenylalanine, tyrosine, tryptophan, proline, histidine, hydroxy-lysine, hydroxyproline, or of a peptide consisting of 2–6 identical or different such aminoacids, and the ester group, which may be straight or branched, being a carboalkoxy group having 2–9 carbon atoms, and R_2 is hydrogen or a C_2–C_9 alkanoyl group, R_5 is H or OH, R_6 is CH_3, CHO or H and X is Br and their pharmaceutically acceptable mineral or organic acid addition salts.

2. A vinblastine group of the formula



(II)

wherein R_2 is a hydrogen atom or a C_2–C_3 alkanoyl group, R_3 is a hydrogen atom, straight or branched C_1–C_8 alkyl, hydroxy - C_1–C_8 -alkyl, carboxy -C_1–C_8 -alkyl, amido -C_1–C_8- alkyl, amino -C_1–C_8-alkyl or hydroxyalkyl, guanadino -C_1–C_8- alkyl, sulfydryl -C_1–C_8alkyl, methylthio-ethyl, benzyl, hydroxy-benzyl, or a group:



or R_3 together with the carbon to which it is attached and the amido nitrogen, forms an azole or an hydroxy-azole ring; n is an integer of from 1 to 6; and R_4 is a straight or branched C_1–C_8-alkyl, or a benzyl group R_5 is H or OH; R_6 is CH_3, CHO or H and X=Br, and their pharmaceutically acceptable mineral and organic acid addition salts.

19. The method of treating leukemia, solid tumors treatable with vinblastine, vincristine or vindesine or Hodgkins disease which comprises administering to a cancer patient in therapeutically effective amount, a compound as defined in claim 2.

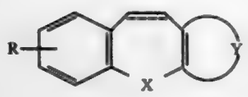
4,639,457

BENZOCYCLOHEPTAPYRIDONE COMPOUNDS FOR TREATING CONGESTIVE HEART FAILURE

David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 19, 1985, Ser. No. 766,472
Int. Cl.[4] A61K *31/44*; C07D *221/16*
U.S. Cl. 514—290 **9 Claims**

9. A method for treating congestive heart failure which comprises administering to a patient suffering from congestive heart failure, a therapeutic amount of a compound having the formula:



wherein:

the ⎓ bond designation indicates that the bond may be a saturated single bond or an unsaturated double bond;

X is —C=O or —CHOH;

Y is —NHCOCH=CH—;

wherein the ends of the chain may be attached to the carbon of the ring in either direction so that either —NH— or =CH— is attached to the carbon adjacent to X; and

R is hydrogen, lower alkoxy, cyano, halo, trifluoromethylthio, or lower alkylthio.

4,639,458

TABLET AND FORMULATION

Ashok V. Katdare, Ambler, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 22, 1985, Ser. No. 693,071
Int. Cl.[4] A61K *31/47, 9/20*
U.S. Cl. 514—311 **3 Claims**

1. A composition containing by weight, about 80–85% norfloxacin, about 13.5–18.5% microcrystallin cellulose, about 0.5–2% magnesium stearate, and about 1–4.5% croscarmellose sodium.

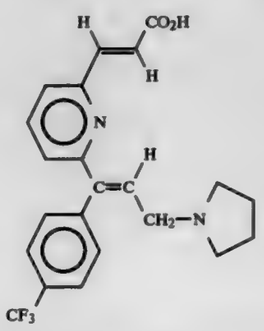
4,639,459

USE OF TRIFLUOROMETHYL COMPOUNDS

John W. A. Findlay, Chapel Hill, N.C., and Geoffrey G. Coker, Bromley, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 462,788, Feb. 1, 1983, abandoned. This application Aug. 29, 1985, Ser. No. 771,142
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—343 **4 Claims**

1. A method of obtaining an antihistaminic effect in a human in need thereof comprising administering an effective antihistaminic amount of the compound of formula I



I

or a pharmaceutically acceptable salt thereof to said human.

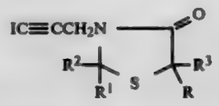
4,639,460

FUNGICIDAL SUBSTITUTED N-(1-IODOPROPARGYL)THIAZOLIDINONES

Bernard F. Rose, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 762,660, Aug. 5, 1985, which is a continuation of Ser. No. 629,657, Jul. 11, 1984, abandoned. This application Mar. 27, 1986, Ser. No. 845,160
Int. Cl.[4] C07D *277/14*; A01N *43/78*
U.S. Cl. 514—369 **25 Claims**

1. A compound of the formula:



wherein R is hydrogen, lower alkyl; or aryl or aralkyl having from 6 to 12 carbon atoms, optionally substituted with one to three substituents, each independently with one to three substituents, each independently selected from halogen, cyano, lower alkyl, lower alkoxy, nitro or trihalomethyl; R^1 is alkyl having from 1 to 12 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms; aryl or aralkyl having from 6 to 12 carbon atoms optionally substituted with one to three substituents, each independently selected from halogen, cyano, lower alkyl, lower alkoxy, nitro, trihalo-substituted methyl, phenyl, phenoxy, substituted phenoxy substituted with 1 to 3 substituents independently selected from halogen, lower alkyl, lower alkoxy or trihalomethyl, benzyloxy, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl, arylthio (C_6 to C_{12}), or two lower alkoxy groups joined to give an alkylene bridge; or thiophene or furanyl either opionally substituted with 1 to 3 substituents independently selected from halogen, trihalomethyl, lower alkyl, lower alkoxy; R^2 is hydrogen, lower alkyl, cycloalkyl having from 3 to 8 carbon atoms, or aryl or aralkyl having from 6 to 12 carbon atoms optionally substituted with one to three substituents, each independently selected from halogen, cyano, lower alkyl, lower alkoxy, nitro or trihalomethyl; and R^3 is hydrogen or lower alkyl.

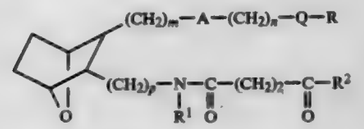
4,639,461

7-OXABICYCLOHEPTANE SUBSTITUTED KETO-AMIDE PROSTAGLANDIN ANALOGS USEFUL IN THE TREATMENT OF THROMBOTIC DISEASE

Masami Nakane, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 28, 1985, Ser. No. 791,819
Int. Cl.[4] A61K *31/557*; C07D *307/00, 405/08*
U.S. Cl. 514—382 **15 Claims**

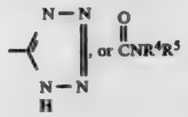
1. A compound having the structure



including all stereoisomers thereof, wherein m is 0 to 4; A is —CH=CH— or —CH_2—CH_2—; n is 1 to 5; Q is —CH=CH—, —CH_2—,



or a single bond; R is CO_2H, CO_2alkyl, CO_2 alkali metal, CO_2 polyhydroxyamine salt,



wherein R^4 and R^5 are the same or different and are H, lower alkyl, hydroxy, lower alkoxy or aryl at least one of R^4 and R^5 being other than hydroxy and lower alkoxy; p is 1 to 4; R^1 is H or lower alkyl; and R^2 is H, lower alkyl, lower alkenyl containing 2 to 12 carbons, aryl, arylalkyl, cycloalkyl or cycloalkylalkyl; wherein lower alkyl or alkyl alone or as part of another group contains 1 to 12 carbons and is unsubatituted or substituted with a halo-substituent, such as F, Br, Cl or I or CF_3, an alkoxy substituent, an aryl substituent, an alkyl-aryl substituent, a haloaryl substituent, a cycloalkyl substituent, an alkylcycloalkyl substituent, hydroxy, an amino substituent, an amido substituent, an alkylamino substituent, an arylamino substituent, an alkanoylamino substituent, an arylcarbonylamino substituent, a thioamido substituent, a nitro substituent, a cyano substituent, a thiol substituent, an arylthio substituent or an alkylthio substituent; cycloalkyl alone or as part of another group includes saturated cyclic hydrocarbon groups containing 3 to 12 carbons, which is unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups 1 or 2 lower alkoxy groups, 1 or 2 hydroxy groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups, and/or 1 or 2 alkylthio groups; aryl or Ar alone or as part of another group is phenyl or naphthyl, which is unsubstituted or substituted with 1 or 2 lower alkyl groups, halogens selected from the group consisting of Cl, Br, or F, 1 or 2 lower alkoxy groups, 1 or 2 hydroxy groups, 1 or 2 amino groups, 1 or 2 alkylamino groups, 1 or 2 arylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amido groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thioamido groups, 1 or 2 thiol groups, 1 or 2 arylthio groups, and/or 1 or 2 alkylthio groups;

$(CH_2)_m$, $(CH_2)_n$ or $(CH_2)_p$ may independently contain 1 or 2 lower alkyl and/or 1 or 2 halo substituents.

11. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

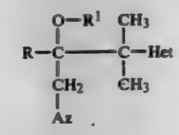
4,639,462

HETEROCYCLO-HYDROXYALKYL-AZOLYL DERIVATIVES AND USE AS FUNGICIDES

Wolfgang Krämer, Wuppertal; Karl H. Büchel, Burscheid; Graham Holmwood; Erik Regel, both of Wuppertal; Paul Reinecke, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 1, 1983, Ser. No. 547,807
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1982, 3242252
The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.
Int. Cl.[4] A01N *43/50, 43/61*; C07D *233/60, 249/08*
U.S. Cl. 514—383 **12 Claims**

1. A heterocyclyl-hydroxyalkyl-azolyl derivative of the formula



(I)

in which

Az represents 1,2,4-triazol-1-yl, 1,2,4-triazol-4-yl or imidazol-1-yl,

Het represents dioxolan-2-yl or 1,3-dioxanyl, each of which is optionally substituted by identical or different substituents selected from the group consisting of alkyl with 1 to 4 carbon atoms, and phenyl and phenoxyalkyl with 1 to 4 carbon atoms in the alkyl part, each of which is optionally substituted on the phenyl by identical or different substituents selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms and halogenoalkyl, halogenoalkoxy and halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms;

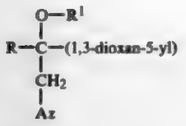
R represents straight-chain or branched alkyl with 1 to 7 carbon atoms, or phenyl, phenylalkyl with 1 to 4 carbon atoms in the alkyl part, phenoxy- or phenylthio-alkyl with in each case 1 to 4 carbon atoms in the alkyl part or phenylethenyl, each of which is optionally substituted on the phenyl by identical or different substituents selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms, nitro, halogenoalkyl, halogenoalkoxy and

halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, hydroximinoalkyl with 1 to 4 carbon atoms, alkoximinoalkyl with 1 to 4 carbon atoms in each alkyl part, and phenyl, phenoxy, benzyl and benzyloxy, each of which is optionally substituted by halogen or alkyl with 1 or 2 carbon atoms; or R represents cycloalkyl with 5 to 7 carbon atoms, which is in each case optionally monosubstituted or polysubstituted by identical or different alkyl radicals with 1 to 4 carbon atoms, or cycloalkyl-methyl or -ethyl with 5 to 7 carbon atoms in the cycloalkyl part, or cyclohexylethenyl, or, alkenyl with 2 to 6 carbon atoms, 2-furyl, naphthyloxymethyl, 1,2,4-triazol-1-yl-methyl, 1,2,4-triazol-4-yl-methyl, imidazol-1-yl-methyl or pyrazol-1-yl-methyl,

R′ represents hydrogen, alkyl which has 1 to 4 carbon atoms and is optionally substituted by phenyl, it being possible for the phenyl radical to be substituted by the substituents on phenyl mentioned under R, or alkenyl with 2 to 4 carbon atoms,

or an addition product thereof with an acid or metal salt.

2. A heterocyclyl-hydroxyalkyl-azolyl derivative of the formula



in which

Az represents 1,2,4-triazol-1-yl, 1,2,4-triazol-4-yl or imidazol-1-yl; the 1, 3- dioxan-5-yl is optionally substituted by identical or different substituent selected from the group consisting of alkyl with 1 to 4 carbon atoms, and phenyl and phenoxyalkyl with 1 to 4 carbon atoms, and phenyl and phenoxyalkyl with 1 to 4 carbon atoms in the alkyl part, each of which is optionally substituted on the phenyl by identical or different substituents selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms and halogenoalkyl, halogenoalkoxy and halogenoalkythio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms;

R represents straight-chain or branched alkyl with 1 to 7 carbon atoms, or phenyl, phenylalkyl with 1 to 4 carbon atoms in the alkyl part, phenoxy- or phenylthio-alkyl with in each case 1 to 4 carbon atoms in the alkyl part or phenylethenyl each of which is optionally substituted on the phenyl by identical or different substituents selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms, nitro, halogen alkyl, halogenoalkoxy and halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, hydroximinoalkyl with 1 to 4 carbon atoms, alkoximinoalkyl with 1 to 4 carbon atoms in each alkyl part, and phenyl, phenoxy, benzyl and benzyloxy, each of which is optionally substituted by halogen or alkyl with 1 or 2 carbon atoms; or R represents cycloalkyl with 5 to 7 carbon atoms, which is in each case optionally monosubstituted or polysubstituted by identical or different alkyl radicals with 1 to 4 carbon atoms, or cycloalkyl-methy or -ethyl with 5 or 7 carbon atoms in the cycloalkyl part, or cyclothexylethenyl, or, alkenyl with 2 to 6 carbon atoms, 2-furyl, naphthyloxymethyl, 1,2,4-triazol-1-yl-methyl, 1,2,4-triazol-4-yl-methyl, imidazol-1-yl-methyl or pyrazol-1-yl-methyl,

R′ represents hydrogen, alkyl which has 1 to 4 carbon atoms and is optionally substituted by phenyl, it being possible for the phenyl radical to be substituted by the substituents on phenyl mentioned under R, or alkenyl with 2 to 4 carbon atoms.

or an addition product thereof with an acid or metal salt.

4,639,463

SUBSTITUTED PHENYLSULFONYLOXYBENZIMIDAZOLECARBAMATES AND ANTHELMINTIC COMPOSITIONS

Manfred Rösner, Eppstein; Heinz Loewe, Kelkheim; Dieter Düwel, Hofheim am Taunus, and Reinhard Kirsch, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

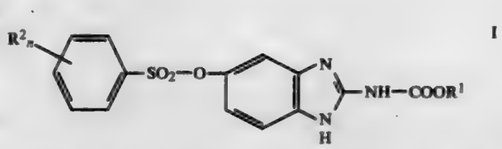
Filed Dec. 21, 1983, Ser. No. 563,780

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247615

Int. Cl.⁴ A61K *31/415;* **C07D** *403/30, 235/04, 471/00*

U.S. Cl. 514—395 **15 Claims**

1. A phenylsulfonyloxybenzimidazolecarbamate of the formula I



I

in which R^1 denotes straight-chain or branched alkyl having 1–4 carbon atoms, n denotes 1 or 2, and the individual substituents R^2, independently of one another, denote 1,1,2,2-tetrafluoroethoxy, cycloalkyl having 3–8 carbon atoms or 4-fluoro.

4. Method of treating a patient or animal suffering from infection by helminths by administering an effective amount of a substituted phenylsulfonyloxybenzimidazolecarbamate of the formula I in claim 1.

4,639,464

ANTIHYPERTENSIVE SUBSTITUTED IMIDAZOLE DERIVATIVES

Arto J. Karjalainen, and Kauko O. A. Kurkela, both of Oulu, Finland, assignors to Farmos Group, Ltd., Turku, Finland

Division of Ser. No. 396,000, Jul. 7, 1982, Pat. No. 4,544,664. This application Mar. 19, 1985, Ser. No. 713,654

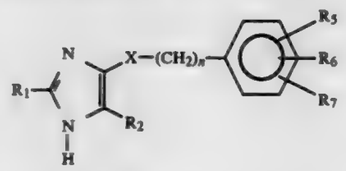
Claims priority, application United Kingdom, Jul. 10, 1981, 8121333

The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.

Int. Cl.⁴ A61K *31/415;* **C07D** *405/06, 233/64*

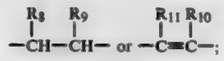
U.S. Cl. 514—396 **18 Claims**

17. A pharmaceutical composition useful for producing an antihypertensive effect comprising an effective amount of a substituted imidazole of the formula:



(II)

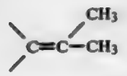
wherein R_1 is H, an alkyl of 1 to 4 carbon atoms or $—CH_2OH$; R_2 is H or CH_3; X is



R_5, R_6 and R_7, which can be the same or different, are H, $—CH_3$, $—CH_2CH_3$, halogen, OH or $—OCH_3$, but are not all hydrogen or R_5 is hydrogen and R_6 and R_7 together form an $—O—CH_2—O—$bridge between two adjacent carbon atoms in the phenyl group; $—CHR_8—$ is $—CH_2—$, $—CH(CH_3)—$, $—CH(—CH_2CH_3)—$, $—CH(—CH_2CH_2CH_3)—$,



$—CH(—CH_2CH_2CH_2CH_3)—$ or $>C=CH_2$, $>C=CH—CH_3$, $>C=CH—CH_2CH_3$,



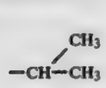
or $>C=CH—CH_2CH_2CH_3$; R_9 is H, $—CH_3$, $—CH_2CH_3$, $—CH_2CH_2CH_3$,



$—CH_2CH_2CH_2CH_3$ or OH; R_{10} is H, $—CH_3$, $—CH_2CH_3$, $—CH_2CH_2CH_3$,



or $—CH_2CH_2CH_2CH_3$; R_{11} is H, $—CH_3$, $—CH_2CH_3$, $—CH_2CH_2CH_3$,



or $—CH_2CH_2CH_2CH_3$; n is 0 to 4; provided that R_8 and R_9 or R_{11} and R_{10} are not simultaneously hydrogen, or a non-toxic pharmaceutically acceptable acid addition salt thereof and a compatible, pharmaceutically acceptable carrier therefor.

4,639,465

METHOD AND COMPOSITION FOR RELIEVING PAIN

Robert L. Pollack, Philadelphia, and Lawrence Durst, Bridgeport, both of Pa., assignors to Commonwealth Medical Corporation of America, Allentown, Pa.

Filed Aug. 30, 1985, Ser. No. 771,325

Int. Cl.⁴ A61K *31/40, 31/70, 31/435*

U.S. Cl. 514—419 **10 Claims**

1. A dietary supplement for increasing a patient's threshold of pain via steady and prolonged production of serotonin withinthe patient's brain, comprising:

approximately 5 to 15 parts by weight of L-tryptophan for increasing said production of serotonin and approximately 5 to 15 parts by weight of fructose for producing a steady release of insulin into the patient's blood increasing transport of L-tryptophan from the patient's blood plasma into the patient's brain.

4,639,466

3′,6-DIISOPENTENYL-2′,4′-DIHYDROXY-5,7-DIMETHOXY-ISOFLAVAN AND RELATED COMPOUNDS USEFUL AS ANXIOLYTIC AGENTS AND AVERMECTIN ANTIDOTES

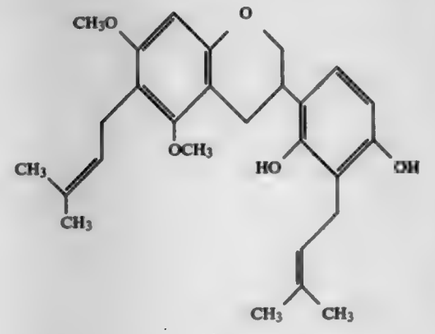
Leeyuan Huang, Westfield, and Y. K. Tony Lam, Plainsboro, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 1, 1984, Ser. No. 656,554

Int. Cl.⁴ A61K *31/35*

U.S. Cl. 514—456 **1 Claim**

1. A method of treatment or management of CNS disorders mediated by benzodiazepine receptors and intoxication caused by avermectin comprising the administration to a mammalian species in need of such treatment an effective amount of a compound of structural formula:



4,639,467

ANTIBIOTIC CRISMAICIN A AND COMPOSITIONS THEREOF

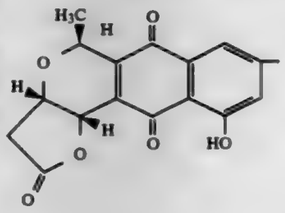
Martin S. Celino, deceased, late of Lucena City; by Cecilio Celino, administrator, and Antonio Larrauri, administrator, both of San Pablo City, Laguna, all of Philippines

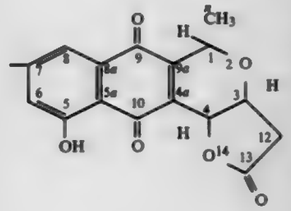
Continuation-in-part of Ser. No. 603,621, Apr. 25, 1984, abandoned. This application Apr. 11, 1985, Ser. No. 722,207

Int. Cl.⁴ C07D *493/04;* **A61K** *31/365*

U.S. Cl. 514—468 **8 Claims**

1. A substantially pure compound having the formula:





4,639,468

DERIVATIVES OF GLYCINAMIDE, THEIR PREPARATION AND THEIR USE

Roméo Rosaccci, Paris, France; Claude L. Gillet, Biaumont, Belgium; Alexis H. Cordi, Villers-la-Ville, Belgium; Mark A. Martens, Zottegem, Belgium; Joseph L. Roba, Houyet, Belgium; Paul J. Niebes, Grez-Doiceau, Belgium; Georges E. Lambelin, and William R. Van Dorsser, both of Brussels, Belgium, assignors to Continental Pharma Inc., Brussels, Belgium

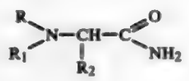
Continuation of Ser. No. 458,756, Apr. 21, 1983, abandoned, which is a continuation of Ser. No. 133,102, Mar. 24, 1980, abandoned. This application Aug. 23, 1985, Ser. No. 768,185

Claims priority, application Luxembourg, Mar. 22, 1979, 81068; Mar. 22, 1979, 81069

Int. Cl.⁴ A61K *31/16, 31/165*

U.S. Cl. 514—620 **5 Claims**

1. A pharmaceutical composition containing as the active ingredient an effective amount, for the treatment of epilepsy, dyskinesiae, memory troubles and psychic troubles, of a glycinamide derivative of the formula:



wherein:

R is a linear pentyl group, or a linear or branched C_2–C_5 alkyl group substituted by at least one phenyl group or at least one halo-substituted phenyl group,

R_1 is hydrogen, and

R_2 is hydrogen,

or the non-toxic, pharmaceutically acceptable acid addition salt thereof together with a pharmaceutically acceptable carrier or diluent.

4,639,469

METHOD OF PREPARING SOBREROL AND THE PHARMACEUTICAL APPLICATION OF THE SOBREROL THUS OBTAINED

Camillo Corvi-Mora, Via Spiga, 42, Milan, Italy

Continuation of Ser. No. 198,269, Oct. 17, 1980, abandoned, which is a continuation of Ser. No. 13,414, Feb. 21, 1979, abandoned, which is a continuation of Ser. No. 622,415, Oct. 14, 1975, abandoned, which is a continuation of Ser. No. 94,188, Dec. 1, 1970, abandoned. This application Sep. 30, 1982, Ser. No. 429,445

Claims priority, application Italy, Apr. 17, 1970, 23490 A/70

Int. Cl.⁴ A61K *31/045*

U.S. Cl. 514—729 **5 Claims**

1. A process for treating a patient with a respiratory disease which comprises treating the patient with high purity sobrerol-d,l substantially free of human irritants, including ketones and aldehydes, in a balsamic fluidizer and expectorant and respiratory analeptic amount, said sobrerol-d,l being produced by

in a first stage, epoxidizing α-pinene with a 15–30% solution of perbenzoic acid in chloroform at a temperature between −1° C. and −10° C. to obtain α-pinene epoxide

in a second stage, forming sobrerol-d,l by hydrating said pinene epoxide at 36°–100° C. and then at an ultimate temperature between about 72°–100° C. in an aqueous solution of carbon dioxide having a ratio of about 55–100 parts by weight of α-pinene epoxide for 100 parts by weight of aqueous CO_2 solution, said solution having a pH of 3.5–3.9;

washing the formed sobrerol-d,l with a solvent for adhering aldehyde and ketone impurities until free of ketone and aldehyde impurities, and

then drying the formed at least 98% pure sobrerol-d,l under conditions which prevent sublimation of the product to thereby produce a sobrerol-d,l free of aldehyde and ketone impurities suitable for therapeutic applications and having a melting point of 130°–131.5° C.

4,639,470

METHOD FOR MAKING METHANOL

R. Lawrence Mednick, Roslyn Heights, N.Y., and David B. Blum, Wayne, N.J., assignors to Chem Systems, Inc., New York, N.Y.

Continuation of Ser. No. 633,231, Jul. 23, 1984, Pat. No. 4,567,204, which is a continuation of Ser. No. 325,507, Nov. 27, 1981, abandoned, which is a continuation of Ser. No. 120,903, Feb. 12, 1980, abandoned. This application Dec. 20, 1985, Ser. No. 811,653

The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.

Int. Cl.⁴ C07C *27/06*

U.S. Cl. 518—700 **3 Claims**

1. A process for preparing methanol from synthesis gas containing hydrogen and carbon monoxide comprising the steps:

(a) entraining methanol-forming catalyst particles in an inert liquid, said catalyst particles having an average particle size of less than about 125 microns;

(b) contacting said synthesis gas with said entrained catalyst in a reaction zone at a temperature of from 100° C. to 500° C. and at a pressure of from 200 to 10,000 psia;

(c) withdrawing from said reaction zone the inert liquid with said entrained catalyst and cooling the same in a cooling zone;

(d) recycling said inert liquid with said entrained catalyst particles back to said reaction zone; and

(e) withdrawing from said reaction zone methanol and unreacted synthesis gas.

4,639,471

PROCESS FOR PRODUCING POLYESTER POLYURETHANE

Koji Hirai; Shunro Tanigaki; Michihiro Ishiguro; Yoshifumi Murata; Shinichi Yokota; Masao Ishii; Noriaki Yoshimura, all of Kurashiki, and Takayuki Okamura, Okayama, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

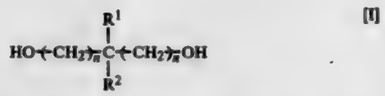
Filed Feb. 6, 1986, Ser. No. 826,595

Claims priority, application Japan, Feb. 12, 1985, 60-25428

Int. Cl.⁴ C08G *18/14*

U.S. Cl. 521—172 **10 Claims**

1. In a process for producing a polyester polyurethane from a high-molecular weight polyol and a polyisocyanate, the improvement which comprises using as said polyol a polyester polyol which is obtained by reacting a dicarboxylic acid with a mixture of 1,9-nonanediol and a polyol represented by the formula



[I]

wherein R^1 denotes methyl group or ethyl group, R^2 denotes hydrogen atom, methyl group, ethyl group, hydroxymethyl group or hydroxyethyl group, and n is an integer of 1 to 5, said polyester polyol having an average molecular weight of 500 to 30,000.

4,639,472

N-VINYL-2-OXAZOLIDINONES AS REACTIVE DILUENTS IN ACTINIC RADIATION CURABLE COATINGS

John G. Green, and David G. Hunt, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 682,450, Dec. 17, 1984, abandoned. This application Jul. 9, 1985, Ser. No. 753,009

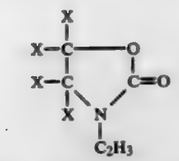
Int. Cl.⁴ C08G *63/76*

U.S. Cl. 522—107 **14 Claims**

1. An actinic radiation curable composition which comprises:

(a) an oligomer having a molecular weight within the range of from about 200 to about 3000 which is substantially comprised of polyester units and which is end capped with acrylate groups, methacrylate groups, or mixtures thereof to provide sites for free radical polymerization by actinic radiation; and

(b) as a reactive diluent, an N-vinyl-2-oxazolidinone having the formula,



wherein each X is independently selected from the group consisting of hydrogen and alkyl radicals, said alkyl radicals containing from 1 to about 4 carbon atoms.

4,639,473

THERMOPLASTIC MOULDING COMPOSITIONS

Frank Wingler, Leverkusen; Otto Koch; Joachim Doering, both of Cologne; Karl-Heinz Ott, Leverkusen, and Lothar Liebig, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 568,050, Jan. 4, 1984, abandoned. This application Nov. 22, 1985, Ser. No. 801,075

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1983, 3301161

Int. Cl.⁴ C08L *51/04*

U.S. Cl. 525—83 **6 Claims**

1. A thermoplastic moulding composition of

(A) from 50 to 80 parts by weight of a graft polymer comprising from 70 to 30% by weight of a mixture of:

(a) an aromatic vinyl compound and

(b) acrylonitrile, methacrylonitrile or a mixture thereof; grafted onto 30 to 70% by weight of a rubber having a glass transition temperature of below −10° C. as the graft base; and

(B) from 20 to 95 parts by weight of a terpolymer of

(c) from 20 to 50 parts by weight of α-methyl styrene or α-methyl styrene mixed in a molar ratio of 1:0 to 1:1 with one or more monomers selected from the group consisting of styrene, acrylic acid alkyl esters, methacrylic acid alkyl esters, acrylic acid cyclohexyl esters, methacrylic acid cyclohexyl esters, acrylic acid phenyl esters, methacrylic acid phenyl esters, acrylic acid benzyl esters, methacrylic acid, acrylic acid amide, methacrylic acid amide, N-alkylacrylamide having 1–8 carbon atoms in the alkyl group, N-alkyl-methacrylamide having 1 to 8 carbon atoms in the alkyl group, o-chlorostyrene, m-chlorostyrene, p-chlorostyrene, o-chlorostyrene, p-cyanostyrene, o-methoxy styrene, m-methoxy styrene, p-methoxy styrene, p-isopropyl styrene and 2,5-dimethoxy styrene;

(d) from 20 to 50 parts by weight p-methyl styrene and

(e) from 10 to 40 parts by weight acrylonitrile, methacrylonitrile or a mixture thereof, the sum total of the parts by weight in the (c) to the (e) amounting to 100.

4,639,474

MONOLITHIC REFRACTORY COMPOSITION

Thomas F. Vezza, West Mifflin, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 8, 1983, Ser. No. 560,043

Int. Cl.⁴ C21C *7/00*

U.S. Cl. 523—141 **5 Claims**

1. A monolithic refractory composition having relatively high thermal conductivity and a relatively high degree of water insolubility consisting essentially of, by weight, 50–70% relatively large grain flake graphite, 5–30% micronized flake graphite and the remainder crude clay, and the addition based upon the total weight of said mix of 10–25% liquid thermosetting phenolic resin in combination with an alcoholic solvent, and a thermosetting resin curing agent.

4,639,475

ADHESIVE STICK AND A PROCESS FOR ITS PRODUCTION

Wolfgang Diericks, Duesseldorf; Gerhard Gierenz, Solingen, and Gabriella Kraus, Neuss, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 17, 1984, Ser. No. 601,183

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1983, 3328095

Int. Cl.⁴ C08F *3/56, 29/12*

U.S. Cl. 523—164 **10 Claims**

1. An adhesive applicator crayon or stick comprised of an amount of more than 50% by weight of the finished crayon or stick of an adhesive resin dissolved and/or dispersed in an amount of at most 35% by weight of the finished crayon or stick of an aqueous solvent system, from 1% to 10% by weight of a gel-forming component and, optionally, other conventional additives for adhesive applicator crayons or sticks, whereby, when applied by rubbing onto a receiving surface, the adhesive layer produced has permanently tacky pressure-sensitive adhesive properties, said adhesive applicator crayon or stick consisting essentially of the reaction product of sorbitol and/or xylitol and benzaldehyde, as said gel-forming component, and the reaction mixture from the reaction of 1 part by weight of methyl vinyl ether/maleic acid anhydride copolymers with from 5 to 12 parts by weight of partially neutralized acid phosphate esters of nonionic wetting agents of the lower alkylene oxide adduct type (pH-value of a 10% solution of the phosphate esters being from 5 to 6), as said adhesive resin.

4,639,476

EPOXY RESIN POWDER COATING COMPOSITION

Kazuhiro Tajiri; Michio Kohmoto; Kiyoshi Saito, and Hitoshi Takahira, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 27, 1985, Ser. No. 749,251

Claims priority, application Japan, Jun. 27, 1984, 59-133494; Sep. 22, 1984, 59-198886; Feb. 19, 1985, 60-30722

Int. Cl.⁴ C08K *3/40*

U.S. Cl. 523—213 **12 Claims**

1. An epoxy resin powder coating composition comprising an epoxy resin with at least a hardener and a filler added thereto, wherein the filler is a mixture of from 30 to 180 parts by weight per 100 parts by weight of the epoxy resin of a needle-like glass powder having an average length of at least 40 μm and an aspect ratio of at least 4:1, and at least 30 parts by weight per 100 parts by weight of the epoxy resin of a granular inorganic filler having an average particle diameter of 1.0 μm or less and wherein the needle-like glass powder is surface treated with aminosilane, epoxysilane, or mercaptolsilane, and the granular inorganic filler is subjected to surface treatment to increase its affinity to the epoxy resin.

4,639,477

PROCESS FOR COLORING HIGH-MOLECULAR ORGANIC MATERIAL, AND NOVEL METAL COMPLEXES OF OXIME(S) OF O-HYDROXY BENZALDEHYDE(S) AND KETONE(S)

Georg Cseh, Pratt, and Paul Lienhard, Frenkendorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

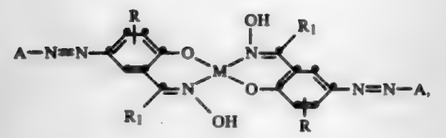
Filed Jun. 13, 1985, Ser. No. 745,033

Claims priority, application Switzerland, Jun. 15, 1984, 2914/84

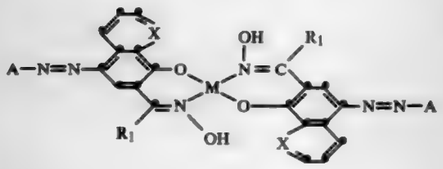
Int. Cl.[4] C08K 5/23; C09B 45/00, 56/02

U.S. Cl. 524—83 3 Claims

1. Mass-colored high-molecular weight synthetic or natural organic material having incorporated therein a compound of formula I, a compound of formula Ia or a mixture thereof



(I)



(Ia)

in which

A is a phenyl radical which is unsubstituted or substituted by halogen, phenyl, phenylazo, carboxyl, —CF_3, —NO_2, —CN, C_1–C_4-alkyl, C_1–C_4-alkoxy, —$CONH_2$, —SO_2NH_2, —$CONHR_2$, —$COOR_3$, —$NHCOR_4$ or —SO_2NHR_2, where R_2 is C_1–C_4-alkyl or phenyl which is unsubstituted or substituted by halogen, —CF_3, C_1–C_4-alkyl, C_1–C_4-alkoxy, —NO_2, —CN, —$CONH_2$, —SO_2NH_2, —$CONHC_1$–C_4-alkyl, —$CONHC_6H_5$, C_2–C_5-alkoxycarbonyl, C_2–C_5-N-alkylcarbamoyl, —$NHCOC_6H_5$, —SO_2NH—C_1–C_4-alkyl or —$SO_2NHC_6H_5$, R_3 is C_1–C_4-alkyl, benzyl which is unsubstituted or substituted by halogen or C_1–C_4-alkyl, or phenyl which is unsubstituted or substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_2–C_5-alkoxycarbonyl or C_2–C_5-N-alkylcarbamoyl, and R_4 is C_1–C_4-alkyl or phenyl which is unsubstituted or substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, —NO_2 or C_2–C_5-N-alkylcarbamoyl, and A is also a naphthyl radical which is unsubstituted or substituted by halogen or —CH_3, an anthraquinonyl radical which is unsubstituted or substituted by halogen, —NO_2, —CH_3, OCH_3, —$NHCOCH_3$ or —$NHCOC_6H_5$, or a heterocyclic aromatic radical which is unsubstituted or substituted by —CL, —CH_3 or —OCH_3, R is —H, —Cl, —CH_3or —OCH_3, R_1 is —H, C_1–C_4-alkyl or phenyl which is unsubstituted or substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, —NO_2, —$CONH_2$, —$CONHR_2$, or C_2–C_5-N-alkylcarbamoyl, X is —CH= or —N=, and M is a divalent transition metal, which is copper, nickel, cobalt or zinc.

4,639,478

BISMORPHOLINES, A PROCESS FOR THEIR PREPARATION AND THEIR USE FOR PROTECTION AGAINST HYDROLYSIS

Peter Haas, Haan; James M. Barnes, Wermelskirchen, and Wilhelm Goyert, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Division of Ser. No. 640,907, Aug. 15, 1984. This application Apr. 29, 1986, Ser. No. 857,014

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1983, 3331436

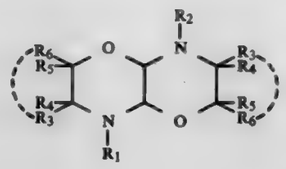
Int. Cl.[4] C08K 5/15

U.S. Cl. 524—97 12 Claims

1. A composition containing hydrolysis protective agents which comprises

(a) a synthetic polymer containing ester groups and/or carbonate groups and

(b) a quantity of about 0.1 to 10% by weight, based on the weight of component (a), of a 2,3,2',3'-bismorpholine derivative corresponding to the formula



wherein

R_1 and R_2 may be identical or different and represent alkyl, alkenyl, cycloalkyl or aryl substituents,

R_3, R_4, R_5 and R_6 represent hydrogen, alkyl, alkenyl, cycloalkyl and/or aryl substituents, or a cycloalkylene or arylene substituent formed by linkage of R_3 and R_6 with the proviso that R_4 and R_5 are omitted in the case of arylene, and wherein the cycloalkyl or aryl groups of R_1, R_2, R_3, R_4, R_5 or R_6 may optionally contain inert substituents comprising a member selected from the group consisting of C_1–C_7-alkyl, chlorine or bromine.

4,639,479

POLYALKYLENEPOLYAMINE HAVING PENDANT SUBSTITUTED OXO-PIPERAZINYLTRIAZINES AND UV LIGHT STABILIZED COMPOSITIONS

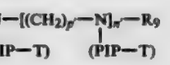
John T. Lai, Broadview Heights, and Pyong N. Son, Akron, both of Ohio, assignors to The BFGoodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 664,901, Oct. 26, 1984, Pat. No. 4,547,538, which is a continuation-in-part of Ser. No. 350,536, Feb. 2, 1982, Pat. No. 4,480,092. This application Sep. 20, 1985, Ser. No. 777,999

Int. Cl.[4] C08K 5/34; C07D 251/70, 251/52, 401/14

U.S. Cl. 524—100 6 Claims

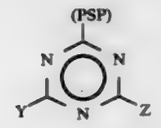
1. A class of compounds comprising acyclic polyalkylenepolyamines ("PAPA") having a pendant substituent at each N atom to form a PAPA with a pendant triazine nucleus at each nitrogen atom to form a pendant piperazinone-triazine ("P[PIP-T]") having the structure



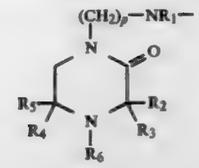
wherein

p' is an integer in the range from 2 to 8; R_9 represents H, C_1–C_{24} alkyl, C_4–C_7 cycloalkyl; C_1–C_{12} cyanoalkyl or hydroxyalkyl, and phenyl;

n' is an integer in the range from 2 to 12; (PIP-T) is represented by the residue of



wherein, PSP is a substituent having the formula



wherein,

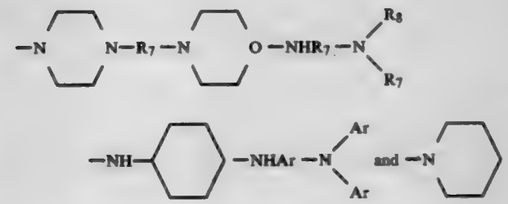
R_1 represents alkyl having 1 to about 24 carbon atoms (C_1–C_{24}), C_5–C_7 cycloalkyl, C_7–C_{20} aralkyl, C_1–C_{24} azaalkyl, and C_6–C_{20} azacycloalkyl;

R_2, R_3, R_4 and R_5 independently represent C_1–C_{24} alkyl, and C_4–C_7 polymethylene which are cyclizable forming a spiro cycloalkylene substituent with the C atom of the piperazinone ring;

R_6 represents hydrogen or oxygen, C_1–C_{24} alkyl, C_1–C_{12} hydroxyalkyl, benzyl, allyl, and C_1–C_{12} haloalkyl;

Y may be the same as (PSP) or Z;

Z represents a radical selected from the group consisting of Cl, OH,



R_7 and R_8 represent C_2–C_{24} alkyl;

Ar represents aryl;

p represents an integer in the range from 2 to 20;

and, Y and Z may be the same, or the same as X provided one of the substituents furnishes a leaving group.

4,639,480

POLYESTER COMPOSITIONS CONTAINING A PHTHALIMIDE

Gail H. Birum, Kirkwood; Thomas C. Mathis, St. Louis, and Richard D. Stolk, Manchester, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 17, 1985, Ser. No. 736,004

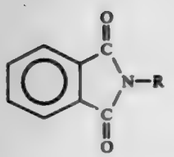
Int. Cl.[4] C08K 5/34

U.S. Cl. 524—104 13 Claims

1. A polyester molding composition, comprising:

(a) from about 40 to about 95 parts by weight of a polyethylene terephthalate having an intrinsic viscosity of at least 0.4 deciliter/gram measured as a 0.5% by weight solution in a 60:40 mixture of phenol and tetrachloroethane at 25° C.; and

(b) from about 0.5 to about 15 parts by weight of a plasticizer comprising a phthalimide, of the formula:



where R is alkyl, alkenyl, or alkoxy alkyl with from 12 to 30 carbon atoms.

4,639,481

MODIFIED THERMOPLASTIC POLYESTER MOLDING COMPOSITIONS AND ARTICLES MOLDED THEREFROM

Harold F. Giles, Jr., Cheshire, Mass., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 424,266, Sep. 27, 1982, abandoned. This application Apr. 9, 1985, Ser. No. 721,340

Int. Cl.[4] C08L 69/00

U.S. Cl. 524—128 8 Claims

1. A thermoplastic molding composition comprising:

(a) from about 15 to about 49 parts by weight of poly(C_{2-6} alkylene terephthalate) resin;

(b) from about 51 to about 80 parts by weight of an aromatic polycarbonate resin; and

(c) from about 5 to about 20 parts by weight of a polyolefin copolymer consisting of ethylene and propylene reaction products or ethylene, propylene and diene reaction products.

7. A composition according to claim 1, which includes from about 0.01 to about 0.5 percent by weight of an organic phosphite.

4,639,482

PHOSPHORIC ACID COMPOUNDS AS CO-STABILIZERS FOR ME(II)-CARBOXYLATES AND/OR ME(II)-PHENOLATES IN PVC

Horst Müller, Fürth/Odenwald; Horst Zinke, Ernsthofen, and Wolfgang Wehner, Zwingenberg, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

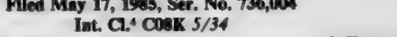
Filed Mar. 21, 1983, Ser. No. 477,183

Claims priority, application Switzerland, Mar. 25, 1982, 1842/82; Nov. 30, 1982, 6949/82

Int. Cl.[4] C08K 5/52

U.S. Cl. 524—137 7 Claims

1. A stabilized composition comprising polyvinyl chloride and a stabilizer mixture comprising at least one compound of the formula I



(I)

wherein X is O or S, n is an integer from 1 to 5, and R is straight-chain or branched-chain C_1–C_{18}-alkyl or substituted or unsubstituted cyclohexyl, and at least one polyvinyl chloride stabilizer of the type Me(II)-carboxylate and/or Me(II)-phenolate, where Me(II) denotes one or more metals from the series: Ba, Sr, Ca, Mg, Zn and Cd, and wherein there are used, relative to the polyvinyl chloride, 0.01–2 percent by weight of the compound of the formula I and 0.1–4 percent by weight of the Me(II)-carboxylate and/or Me(II)-phenolate.

4,639,483

SOAP-THICKENED REENTERABLE GELLED ENCAPSULANTS

James E. Billigmeier, St. Paul, Minn.; James D. Groves, Hudson, Wis.; Harwick A. Haugen, Roseville, and Richard J. Pokorny, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 9, 1985, Ser. No. 732,423
Int. Cl.[4] C08K 5/09
U.S. Cl. 524—296 24 Claims

1. A composition of matter consisting essentially of a mixture of:
(a) 35 to 90 parts by weight of a plasticizer that does not stress-crack polycarbonate, said plasticizer being a naphthenic or paraffinic oil having an aromatic content of less than 15 weight percent, a paraffinic content of 85 to 100 percent, and a specific gravity in the range of 0.80 to 1.00,
(b) 9 to 20 parts by weight of an aliphatic or aromatic carboxylic acid having 18 to 100 carbon atoms,
(c) 2 to 20 parts by weight of a basic oxide or hydroxide, and
(d) an effective amount up to 10 parts by weight of an elastomer which is soluble in said composition and having a solubility parameter of 7 to 9, and
(e) optionally, an effective amount up to 30 parts by weight of at least one of thickening agents, flow point elevators, antioxidants, fungicides, and flame retardants.

4,639,484

MOLD RELEASE ENHANCEMENT FOR ACRYLONITRILE-BUTADIENE-STYRENE MOLDING RESINS

Kim S. Percell, Memphis, Tenn., assignor to Witco Chemical Corporation, New York, N.Y.

Filed Mar. 25, 1986, Ser. No. 843,719
Int. Cl.[4] C08J 3/10
U.S. Cl. 524—318 18 Claims

1. A thermoplastic molding composition, comprising a thermoplastic acrylonitrile-butadiene-styrene resin and a mold release force reduction effective amount of a mold release agent ester selected from the group consisting of cetyl palmitate, cetyl stearate and blends of cetyl palmitate and cetyl stearate.

4,639,485

CO-SOLVENT ACCELERATOR FOR CONVERSION OF POLYAMIDE-ACID SOLUTION TO POLYIMIDE

Paul D. Frayer, Brooklyn, Conn., assignor to Rogers Corporation, Rogers, Conn.

Filed Jul. 31, 1985, Ser. No. 760,899
Int. Cl.[4] C08J 3/02; C08K 5/04
U.S. Cl. 524—378 6 Claims

1. A co-solvent for a polyimide-acid ether solution for accelerating the conversion of said solution to polyimide and permitting rapid removal of the ether solvent, said co-solvent comprising:
polyamide-acid solution;
ether solvent; and
a pyrrolidone based polar aprotic solvent, wherein said ether solvent and said pyrrolidone based polar aprotic solvent form a co-solvent mixture with said polyamide-acid solution whereby the conversion of said polyamide-acid to polyimide is accelerated along with rapid removal of ether solvent from said polyamide-acid solution.

4,639,486

FLAME RETARDANT ELASTOMERIC COMPOSITIONS

Nan-I Liu, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 8, 1985, Ser. No. 785,642
Int. Cl.[4] C08G 73/10
U.S. Cl. 524—409 29 Claims

1. A flame retardant thermoplastic composition comprising (A)(i) one or more thermoplastic elastomeric polymers characterized as having ether, ester and imide linkages and wherein the ether linkages are present as a high molecular weight, i.e. MW of from about 400 to about 12000, polyoxyalkylene or copolyoxyalkylene units derived from long chain ether glycols or long chain ether diamines, alone or in combination with (ii) one or more modifying resins,
(B) a flame retarding amount of a halogenated flame retarding material,
(C) optionally, an effective amount of an organic or inorganic flame retardant synergist compound, and
(D) optionally, an effective amount of an organic or inorganic drip suppressant material.

4,639,487

HEAT SHRINKABLE THERMOPLASTIC OLEFIN COMPOSITION

Donald R. Hazelton, Chatham, and Robert C. Paydak, Cranbury, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 11, 1984, Ser. No. 629,634
Int. Cl.[4] C08J 3/24; C08L 23/26, 15/02, 33/04
U.S. Cl. 524—425 33 Claims

1. A heat shrinkable, thermoplastic elastomeric composition comprising a polyolefin resin wherein the polyolefin resin comprises an ethylene copolymer resin and a butyl or halogenated butyl rubber wherein at least a part of the rubber is dynamically vulcanized to a fully cured state in the presence of the polyolefin resin except that the use of peroxide cure systems are specifically excluded and wherein said ethylene copolymer resin is selected from the group consisting of copolymers of ethylene and vinyl acetate, copolymers of ethylene with an alkyl ester of an alpha, beta monoethylenically unsaturated monocarboxylic acid and copolymers of ethylene with said acid.

4,639,488

IMPACT-RESISTANT POLYOXYMETHYLENE MOLDING MATERIALS AND THEIR PREPARATION

Wilhelm Schutte, Speyer; Graham Edmund McKee, Weinheim; Albrecht Hilt, Limburgerhof; Gerhard Heinz, Weisenheim, and Heiner Goerrissen, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 5, 1985, Ser. No. 795,128
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1984, 3441547
Int. Cl.[4] C08L 51/00
U.S. Cl. 524—456 7 Claims

1. An impact-resistant polyoxymethylene molding material containing
(A) from 30 to 95% by weight of one or more polyoxymethylenes and
(B) from 5 to 70% by weight of one or more elastomeric graft polymers which are prepared by emulsion polymerization, are dispersed in component A, have a mean particle diameter of from 0.08 to 2 μm and are composed of
1. from 60 to 90% by weight of a grafting base of crosslinked polybutadiene in which not more than 30% by weight of the butadiene may be replaced by one or more of isoprene, 2,3-dimethylbutadiene, styrene, p-methylstyrene, α-methylstyrene and (meth)acrylonitrile, and
2. from 10 to 40% by weight of one or more grafted shells consisting of polymers of styrene, methyl methacrylate or mixtures thereof which not more than 30% by weight of the said monomers 2 may be replaced with acrylonitrile or a C_1–C_8-alkyl acrylate,
the percentages A and B and the percentages 1 and 2 summing to 100,

4,639,489

METHOD OF PRODUCING A SILICONE DEFOAMER COMPOSITION

Koichi Aizawa; Shingo Sewa, and Hideki Nakahara, all of Kanagawa, Japan, assignors to Dow Corning Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1985, Ser. No. 738,922
Claims priority, application Japan, May 30, 1984, 59-108450
Int. Cl.[4] C08K 3/36
U.S. Cl. 524—588 18 Claims

1. A method of producing a silicone defoamer composition comprising reacting at a temperature of 50° C. to 300° C.:
(1) 0 to 100 parts by weight of a polyorganosiloxane having a viscosity of 20 to 100,000 cs at 25° C. and being expressed by the general formula $R_a^1SiO_{(4-a)/2}$ in which R^1 is a monovalent hydrocarbon or halogenated hydrocarbon group having 1 to 10 carbon atoms and a has an average value of from 1.9 to 2.2;
(2) 5 to 100 parts by weight of a polyorganosilxoane having a viscosity of 200 to several million cs at 25° C. expressed by the general formula $R_b^2(R^3O)_cSiO_{(4-b-c)/2}$ in which R^2 is a monovalent hydrocarbon or halogenated hydrocarbon group having 1 to 10 carbon atoms, R^3 is hydrogen or a monovalent hydrocarbon group having 1 to 10 carbon atoms, b has an average value of from 1.9 to 2.2 and c has a sufficiently large value to give at least one —OR^3 group in each molecule, said —OR^3 group being present at least at the end of a molecular chain;
(3) 0.5 to 20 parts by weight for every 100 parts by weight of said components (1) and (2) of one or more compounds selected from the following (a) to (d):
(a) an organosilicon compound of the general formula $R_d^4SiX_{4-d}$ in which R^4 is a monovalent hydrocarbon group having 1 to 5 carbon atoms, X is a hydrolyzable group and d has an average value of one or less;
(b) a partially hydrolyzed condensate of said compound (a);
(c) a siloxane resin consisting essentially of $(CH_3)_3SiO_{1/2}$ and SiO_2 units and having a $(CH_3)_3SiO_{1/2}/SiO_2$ ratio of 0.4/1 to 1.2/1; and
(d) a condensate of said compound (c) with said compound (a) or (b);
(4) 0.5 to 30 parts by weight of a finely divided filler for every 100 parts by weight of said components (1) and (2);
(5) a catalytic amount of a compound for promoting the reaction of the other components; and
(6) 0 to 20 parts by weight, for every 100 parts by weight of said components (1) and (2), of a polyorganosiloxane having a viscosity of 5 to 200 cs at 25° C. and being expressed by the general formula $R_e^5(R^9O)_fSiO_{(4-e-f)/2}$ in which R^5 is a monovalent hydrocarbon or halogenated hydrocarbon group having 1 to 10 carbon atoms, R^9 is hydrogen or a monovalent hydrocarbon group having 1 to 10 carbon atoms, e is from 1.9 to 2.2 on an average and f has a sufficiently large value to give at least two —OR^9 groups in each molecule at the end of a molecular chain.

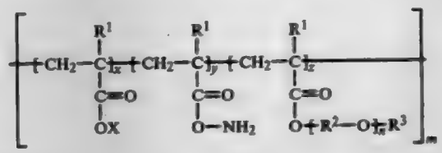
4,639,490

PROCESS FOR PREPARING NOVEL COPOLYMER

William F. Masler, III, Hinckley, and Zahid Amjad, Avon Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 685,279, Dec. 24, 1984, Pat. No. 4,566,974, which is a division of Ser. No. 508,636, Jun. 28, 1983, Pat. No. 4,499,002. This application Jan. 27, 1986, Ser. No. 822,705
Int. Cl.[4] C08K 5/05
U.S. Cl. 524—765 3 Claims

1. A method for forming a copolymer of (i) acrylic acid or methacrylic acid, (ii) acrylamide or methacrylamide, and (iii) and alkoxyalkyl (meth)acrylate ester comprising,
reacting preselected amounts of each of the foregoing in the presence of an effective amount of an initiator and a solvent selected from a primary alcohol and a mixture of a primary alcohol with water, at a temperature in the range from about 30° C. to the reflux temperature of the solution, so as to form an alcoholic solution of a random copolymer having the structural formula



wherein,
X represents H, or NH_4, or an alkali metal selected from the group consisting of sodium and potassium;
R^1 represents H, or methyl;
R^2 represents lower alkyl having from 2 to about 4 carbon atoms;
R^3 represents lower alkyl having from 1 to about 10 carbon atoms;
n is an integer in the range from 2 to about 6;
m is an integer in the range from about 3 to about 70; and,
for each y (that is, y=1) x is an integer in the range from about 1 to about 8, and z is a number in the range from 1 to about 0.075; and x, y and z are present in relative heterogeneous order, said copolymer being present in the solution in an amount in excess of 90% by weight of polymer formed.

4,639,491

DISPERSION STABILIZER FOR WATER-IN-OIL SUSPENSION POLYMERIZATION

Akihiro Kondo; Rikio Tsuhima, and Yuzo Sumida, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Dec. 12, 1985, Ser. No. 808,415
Claims priority, application Japan, Dec. 28, 1984, 59-276416
Int. Cl.[4] C08F 2/32
U.S. Cl. 524—801 7 Claims

1. A process for preparing a polymer by water-in-oil suspension polymerization, which comprises:
preparing an oil composition comprised of a water-insoluble, non-polar, organic solvent and a dispersant polymer, said dispersant polymer consisting esentially of from 70 to 99 mole percent of lipophilic, ethylenically unsaturated monomer units and from 1 to 30 mole percent of ethylenically unsaturated monomer units having a cationic group,
separately preparing an aqueous solution of a polymerization initiator and at least one water-soluble, ethylenically unsaturated monomer,
and then mixing said aqueous solution with said oil composition and maintaining the mixture thereof under water-in-oil suspension polymerization conditions effective to polymerize said water-soluble, ethylenically unsaturated monomer.

4,639,492

PHENOLIC-MODIFIED ROSIN ESTERS

Joseph M. Makhlouf, Mars; Frederick A. Falk, Pittsburgh, and Robert M. Piccirilli, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 9, 1985, Ser. No. 764,028
Int. Cl.[4] C09F 1/04, 7/08
U.S. Cl. 525—54.42 24 Claims

1. A phenolic-modified rosin ester comprising:
(a) a rosin esterification product of:
(i) an acid functional reactant comprising a rosin polyacid containing a dimerized rosin, and
(ii) an alcohol; reacted with
(b) a phenolic resin.

4,639,493

CONJUGATED DIENE FUNCTIONAL MODIFIED AMINOEPOXY RESINS

Ray A. Dickie, Birmingham, and Saiyed B. A. Qaderi, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 10, 1984, Ser. No. 679,977
Int. Cl.⁴ C08L 63/10
U.S. Cl. 525—113 **19 Claims**

1. A substantially gel-free diene functional modified aminoepoxy resin of number average molecular weight (Mn) about 1000–18,000, comprising the reaction product of (i) diepoxide reactant, (ii) amine functional conjugated diene chain extending reactant selected from the group consisting of di-secondary amine functional bis-diene, mono-primary amine functional diene, and a mixture of any of them, (iii) modifying agent comprising hydroxy functional secondary amine, and (iv) second modifying agent selected from the group consisting of secondary amine terminated. butadiene acrylonitrile copolymer resin, carboxy terminated butadiene acrylonitrile copolymer resin, and any mixture thereof, said second modifying agent having number average molecular weight about 1400–4400 and amine or carboxy, respectively, equivalent weight of about 700–2200.

4,639,494

PROCESS FOR PRODUCING POLYSTYRENE

Akio Imai, Ichihara; Yasushi Okamoto, Ibaraki, and Masatoshi Saito, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 25, 1985, Ser. No. 704,856
Claims priority, application Japan, Feb. 28, 1984, 59-37490
Int. Cl.⁴ C08F 4/08, 279/00
U.S. Cl. 525—271 **13 Claims**

1. In a process for producing a high impact polystyrene comprising radical polymerization of styrene in the presence of a butadiene rubber, the improvement which comprises the butadiene rubber being a highly branched polymer prepared by homopolymerizing 1,3-butadiene or copolymerizing 1,3-butadiene with styrene in the presence of an organomonolithium compound and a Lewis base compound, followed by further reacting the resulting polymer with at least one multifunctional halogen compound selected from the group consisting of silicon tetrachloride, tin tetrachloride and germanium tetrachloride; in the butadiene rubber, the average content of 1,2-bonds being 18 to 32 mole % based on the total bonded butadiene, the content of bonded styrene being up to 10% by weight, and the content of branched polymer chains being at least 60% by weight; the butadiene rubber exhibiting a Mooney viscosity of 40 to 90 at 100° C. and a solution viscosity in styrene of 60 to 90 cps at 25° C. and at a concentration of 5% by weight, and the ratio of the solution viscosity (SV) to the Mooney viscosity (ML) being $0.7 \leqq SV/ML \leqq 1.28$; and the styrene polymerization being carried out so that the content of the butadiene rubber in the product polystyrene lies between 3 and 20% by weight.

4,639,495

EXTRUDING PROCESS FOR PREPARING FUNCTIONALIZED POLYOLEFIN POLYMERS

Marion G. Waggoner, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 333,177, Dec. 21, 1981, abandoned. This application Apr. 14, 1983, Ser. No. 485,005
Int. Cl.⁴ C08F 255/02
U.S. Cl. 525—285 **4 Claims**

1. A process for the preparation of functionalized polyolefin polymers comprising:

(i) concurrently heating to 200°–350° C. and homogeneously mixing a blend of a polyolefin having 2 to 8 carbon atoms, said polyolefin being at a temperature below its melting point prior to said heating, 0.1 to 10 weight percent of an α,β ethylenically unsaturated monomer and 0.05 to 2.0 weight percent of an organic peroxide initiator in an intensive mixing zone of an extruder for a time sufficient to graft the monomer onto the polyolefin such that 0.1 to 3.0 weight percent of the grafted polyolefin consists of the monomers;

(ii) passing the mixture into a reduced pressure zone as compared to the intensive mixing zone and removing any excess monomer therefrom; and

(iii) passing the mixture through the remainder of the extruder.

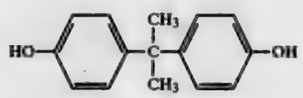
4,639,496

METHOD FOR THE MANUFACTURE OF A POLYMER REACTED WITH $FECL_3$

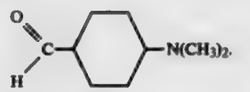
Gerd Weddigen; Robert Huber, both of Heidelberg; Birgit Schmidt, Ludwigshafen, and Hartmut Schneider, Plankstadt, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Division of Ser. No. 563,871, Dec. 21, 1983, Pat. No. 4,564,466. This application Aug. 29, 1985, Ser. No. 770,701
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3248088
Int. Cl.⁴ C08G 8/28
U.S. Cl. 525—506 **1 Claim**

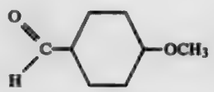
1. Method for the production of a synthetic polymer with triaromatic methane units as basic building blocks having an electric conductivity through formation of charge transfer complexes, said polymer selected from the group consisting of a polymer formed by polycondensation of bisphenol-A,



and 4-dimethylaminobenzaldehyde



by polycondensation of bisphenol-A and para-anisaldehyde



and by polycondensation of benzaldehyde and resorcinol, which comprises adding 10 to 50% by weight ferric chloride relative to the total weight of the polymer as an electron acceptor and reacting the ferric chloride with the polymer to form charge transfer complexes and produce a fusible and soluble polymer with an electric bulk conductivity within a range from 2×10^{-15} to 3×10^{-4} $(ohm\times cm)^{-1}$.

4,639,497

PREPARATION OF TETRAFLUOROETHYLENE FINE POWDER

Alan C. Knight, and Satish C. Malhotra, both of Parkersburg, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 28, 1985, Ser. No. 770,259
Int. Cl.⁴ C08F 114/26
U.S. Cl. 526—93 **5 Claims**

1. A process for polymerizing tetrafluoroethylene in an aqueous medium in the presence of a substantially non-telogenic anionic surfactant present in an amount which maintains colloidal particles of polymerization product in dispersed form, said process being carried out by contacting tetrafluoroethylene in said aqueous medium in the presence of a redox polymerization initiator system defined as a mixture of

(i) manganese triacetate oxidizing agent, and

(ii) a substantially non-telogenic reducing agent and wherein the redox initiator components are added such that the last portion of the polymerization is slowed down by stopping addition of such components so that the end point of the reaction is at least 10% longer than if addition of such component is continued to the end of the polymerization.

4,639,498

AEROBICALLY HARDENABLE PLASTIC COMPOSITIONS

Wolfgang Ritter, Düsseldorf, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 407,887, Aug. 13, 1982, abandoned. This application May 29, 1985, Ser. No. 739,484
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1982, 3201731
Int. Cl.⁴ C08F 4/52
U.S. Cl. 526—196 **27 Claims**

1. An aerobically hardenable plastic composition comprising

(a) a component containing polymerizable ethylenic double bonds, and

(b) an organo-boron compound having a boron-free polymer matrix with at least one organic polymer chain to which are attached, as side chains by hydroboration of ethylenic double bonds, boron-containing groups of the structure R_1R_2B— in which R_1 is a hydrocarbon radical having up to 25 carbon atoms and R_2 is either hydrogen, a hydrocarbon radical having up to 25 carbon atoms, or together with R_1 forms a cyclic hydrocarbon radical having up to 25 carbon atoms, each end of which is bound to the boron atom with a boron-carbon bond, said boron-free polymer matrix being largely inert to atmospheric oxygen and having an iodine number of from about 1 to about 500 before hydroboration.

4,639,499

CROSS-LINKABLE POLYMER RESINS AND USE THEREOF AS BINDERS FOR COATING AGENTS

Peter Höhlein, Kempen; Manfred Schmidt, Dormagen; Josef Pedain; Bernd Riberi, both of Cologne, and Michael Sonntag, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 18, 1985, Ser. No. 756,483
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1984, 3427385
Int. Cl.⁴ C08F 238/00, 220/04
U.S. Cl. 526—285 **3 Claims**

1. A cross-linkable, hydroxyl group-containing polymer resin which is suitable as a lacquer binder and produced by copolymerizing olefinically-unsaturated monomers, said polymer resin having an hydroxyl number of about 20 to 400, an average osmometrically-determined molecular weight of about 500 to 30,000 and a molecular inhomogeneity U of about 0.5 to 40, wherein said polymer resin contains about 0.2 to 80% by weight, based on the weight of said polymer resin, of incorporated monomers selected form the group consisting of olefinically-unsaturated aliphatic diols having 4 carbon atoms; acetylenically-unsaturated aliphatic diols having 4 carbon atoms; the ether group-containing alkoxylation products of said olefinically-unsaturated aliphatic diols having 4 carbon atoms, said ether groups-containing alkoxylation products having a hydroxyl number of about 50 to 900; the ether group-containing alkoxylation products of said acetylenically-unsaturated aliphatic diols having 4 carbon atoms, said ether group-containing alkoxylation products having a hydroxyl number of about 50 to 900; the reaction products of said olefinically-unsaturated aliphatic diols having 4 carbon atoms with ϵ-caprolactone in a mole ratio of said olefinically-unsaturated aliphatic diols having 4 carbon atoms to ϵ-caprolactone of about 1:0.2 to 1:10; the reaction products of said acetylenically-unsaturated aliphatic diols having 4 carbon atoms with ϵ-caprolactone in a mole ratio of said acetylenically-unsaturated aliphatic diols having 4 carbon atoms to ϵ-caprolactone of about 1:0.2 to 1:10; and mixtures thereof.

4,639,500

RESIN COMPOSITIONS CURABLE BY ACTIVE ENERGY RAYS

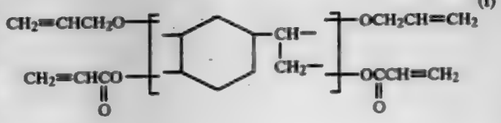
Motonobu Kubo, Iwakuni, Japan, assignor to Sanyo-Kokusaku Pulp Company, Limited, Tokyo, Japan

Filed Jul. 27, 1984, Ser. No. 635,269
Claims priority, application Japan, Feb. 3, 1984, 59-19107
The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.
Int. Cl.⁴ C08F 2/50, 20/28, 20/40
U.S. Cl. 526—301 **4 Claims**

1. A resin composition curable by active energy rays which comprises:

(A) A base resin having a polymerizable ethylenic unsaturated group; and

(B) A reactive diluent having the formula (I):



(I)

4,639,501

METHOD FOR FORMING NEW PRECERAMIC POLYMERS CONTAINING SILICON

Dietmar Seyferth, Lexington, Mass., and Yuan-Fu Yu, Dayton, Ohio, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 4, 1985, Ser. No. 772,375
Int. Cl.⁴ C08G 77/06
U.S. Cl. 528—15 **42 Claims**

1. A method for preparing preceramic organosilicon polymers, wherein the method comprises:

(a) mixing an organopolysilane of the formula $[(RSiH)_x(RSi)_y]_n$ with a sufficient quantity to undergo a hydrosilylation reaction of an organosilicon compound containing at least two alkenyl groups or a cyclic organic compound containing at least three alkenyl groups where $x+6=1$, $0<x<1$, $0<y<1$, R is a lower alkyl group having from 1 to about 6 carbon atoms, a substituted or unsubstituted cycloalkyl group having 3 to about 6 carbon atoms, or a substituted or unsubstituted lower aryl group having from 6 to 10 carbon atoms, and n is an integer greater than 1, and

(b) allowing the mixture of step (a) to react, neat or in an organic solvent, thereby forming said preceramic organosilicon polymer.

4,639,502

SUBSTANTIALLY COLORLESS ORGANIC POLYISOCYANATES, PROCESSES FOR THEIR PRODUCTION AND THEIR USE IN THE PRODUCTION OF POLYURETHANE PLASTICS

Hanns P. Müller, Odenthal; Werner Clarenz, Leverkusen; Ulrich von Gizycki, Leverkusen, and Kuno Wagner, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed May 3, 1985, Ser. No. 730,134

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416896

Int. Cl.⁴ C08G *18/80, 18/79*

U.S. Cl. 528—45 **11 Claims**

1. A substantially colorless organic polyisocyanate, optionally in solution in an inert solvent, having a Hazen color index according to DIN 53 409 of at most 60 and a yellow value according to DIN 6167 of at most 3.0, which contains about 0.01 to 1 ppm (by weight), based on polyisocyanate, of an organic dye soluble in the polyisocyanate and having an absorption maximum of about 560 to 590 nm or of a mixture of said dyes.

3. A process for producing a substantially colorless organic polyisocyanate which comprises mixing a polyisocyanate, optionally dissolved in an inert solvent, with about 0.01 to 1 ppm, based on polyisocyanate, of an organic dye soluble in the polyisocyanate and having an absorption maximum of about 560 to 590 nm or of a mixture of said dyes.

6. A process for the production of polyisocyanate polyaddition products which comprises reacting

(a) the polyisocyanate of claim 1 with

(b) an isocyanate-reactive compound.

8. The process of claim 6 wherein said polyisocyanate is blocked with a blocking agent for isocyanate groups.

4,639,503

THERMOSETTING RESIN COMPOSITION

Hajime Hara, Fujisawa; Shingo Orii; Kazuho Aoyama, both of Kawasaki, and Masami Enomoto, Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1985, Ser. No. 798,426

Int. Cl.⁴ C08G *59/62*

U.S. Cl. 528—92 **1 Claim**

1. A thermosetting resin composition comprising as the essential components;

(1) 100 weight parts of a curable epoxy resin; and

(2) 30 to 300 weight parts of a phenol adduct of a conjugated diolefin polymer prepared by the addition reaction of a phenol compound with a member selected from the group consisting of a conjugated diolefin homopolymer having a number-average molecular weight of 300 to 10,000 and a conjugated diolefin copolymer containing at least 50 mol % of conjugated diolefin monomer units and having the same molecular weight as above in the presence of aluminum phenoxide as the catalyst.

4,639,504

PRODUCTION OF THERMALLY STABILIZED AROMATIC POLYESTERS

Steve G. Cottis, Fort Wright, Ky., assignor to Dart Industries Inc., Northbrook, Ill.

Continuation of Ser. No. 386,452, Jun. 8, 1982, abandoned. This application May 16, 1985, Ser. No. 734,953

Int. Cl.⁴ C08G *63/60*

U.S. Cl. 528—176 **25 Claims**

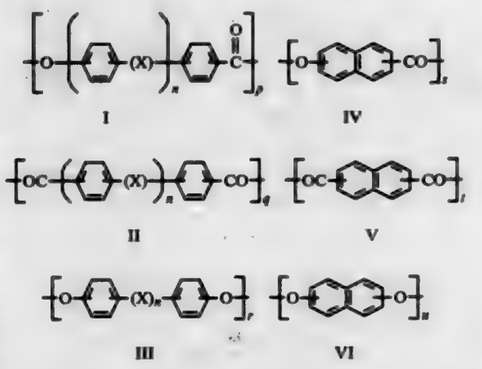
1. A bulk polymerization process for preparing a thermally stable wholly aromatic polyester comprising:

heat condensing wholly aromatic precursors to form a prepolymer;

incorporating into the reaction mixture a phosphite compound, after substantial formation of the prepolymer and before advancing the prepolymer, in an amount of between about 0.05 to 0.5 parts per hundred by weight; and

advancing the prepolymer to form a thermally stable wholly aromatic polyester having the required degree of polymerization.

9. The process of claim 1 wherein the polyester comprises recurrent moieties selected from the following formulas:



I IV

II V

III VI

where X is O, S, CO, NH, or SO_2; n is zero or one; and p+q+r+s+t+u is about 3 to 800.

4,639,505

POLY (ETHER AMIDE) COMPOSITION FROM REACTION OF BIS BICYCLIC AMIDE ACETAL WITH BIS- OR POLY-PHENOLIC MATERIAL

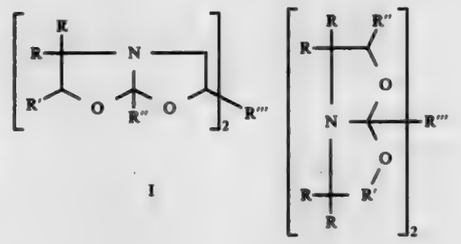
Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 7, 1985, Ser. No. 763,106

Int. Cl.⁴ C08G *67/00*

U.S. Cl. 528—211 **5 Claims**

1. The process for preparing a polymer composition containing ether-amide groups comprising reacting a bis bicyclic amide acetal of Formula I or II



I

II

wherein R, R′ and R″ independently represent hydrogen, an alkyl group having from 1 to 20 carbon atoms, an aryl group having from 6 to 12 carbon atoms, an arkaryl group having from 7 to 20 carbon atoms or a hydrocarbon ether group having from 1 to 20 carbon atoms and R‴ represents an alkylene group having from 1 to 20 carbon atoms, an arylene group having from 6 to 12 carbon atoms or an alkarylene group having from 7 to 20 carbon atoms, with a bis-phenolic or poly-phenolic compound at a temperature in the range of from about 80° C. to 200° C.

4,639,506

PROCESS FOR PREPARING POLYPHENYLENETHERS

Luigi Saccomi, Florence; Marco Foà ; Elena Bencini, both of Novara, and Giampiero Sabarino, Vercelli, all of Italy, assignors to Montedison S.p.A., Milan, Italy

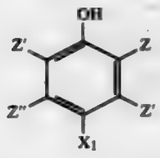
Filed Apr. 9, 1985, Ser. No. 721,541

Claims priority, application Italy, Apr. 10, 1984, 20456 A/84

Int. Cl.⁴ C08G *33/00*

U.S. Cl. 528—212 **6 Claims**

1. A process for preparing polyphenylenethers by oxidative polymerization of phenols having the formula:



(II)

in which X_1 is an atom selected from the group consisting of hydrogen, chlorine, bromine and iodine; Z is a radical selected from the group consisting of hydrocarbyl and halohydrocarbyl radicals having at least two carbon atoms between the halogen atom and the aromatic nucleus, or Z is a radical selected from the group consisting of hydroxyalkyl and halohydroxyalkyl radicals having at least two carbon atoms between the halogen atom and the aromatic ring;

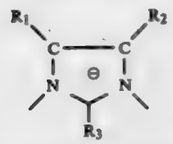
Z′ and Z″ are the same as Z, or are halogen atoms, provided Z, Z′ and Z″ do not have a tertiary carbon atom in position alpha with respect to the aromatic nucleus, which process is carried out with oxygen, in the presence of an aliphatic organic base, in at least prevailingly hydrocarbon medium, and of a catalyst consisting of a copper compound having the formula:

$$(B)_n(Cu)_aX_bY_z \qquad (I)$$

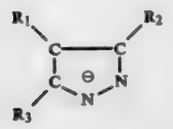
in which B is a naphthiridine group, with the two nitrogen atoms placed one in respect to the other in any possible relationship, or B is a naphthiridine group substituted by at least one substituent selected from the group consisting of alkyl, cycloalkyl, arylalkyl, aromatic groups, said substituents which are further substituted and contain from 1 to 10 carbon atoms, of alkoxy, phenoxy, haloid, dialkylaminic, carboxyl, ketonic, alkoxycarbonyl groups, nitro-groups, and amidic groups;

X is selected from the group consisting of chlorine or bromine, a nitro-group and a perchlorate group;

Y is an anionic compound bridging two copper atoms, having a heteroaromatic structure selected from pyrazole groups having the formula:



or imidazole groups having the formula



in which formulae: R_1, R_2, R_3 are selected from the group consisting of hydrogen, C_1–C_5 alkyl, cycloalkyl, arylalkyl, aryl and heterocyclic groups, or R_1 and R_2 together form an aromatic ring containing from 6 to 10 carbon atoms or a heteroaromatic ring containing 5 or 6 terms, condensed with the pyrazole or imidazole structure;

z is zero or 1, wherefore: when z is zero, a and n, like or unlike each other, are alternatively 1 or 2;

b is an integer from 1 to 3, while: when z is 1, n=a=2, and b=3.

4,639,507

PROCESS FOR THE ISOLATION OF POLYARYLENE SULPHIDE

Wolfgang Alewelt, Krefeld; Wolfgang Eisermann, Duesseldorf; Karl-Heinrich Meyer; Erhard Tresper, both of Krefeld, and Martin Ulbrich, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 3, 1985, Ser. No. 771,645

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3433978

Int. Cl.⁴ C08G *75/14*

U.S. Cl. 528—388 **2 Claims**

1. A process for the isolation of polyarylene sulphide from a crude reaction mixture which comprises removing water and other volatile materials by evaporation in a heated screw machine in less than one hour.

4,639,508

PROCESS FOR PRODUCING GRANULAR COMPOSITION OF ETHYLENETHIOUREA-CHLOROPRENE RUBBER

Yasuhiro Sakasaka, and Shuichi Okuzono, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Continuation of Ser. No. 199,056, Oct. 20, 1980, abandoned. This application Apr. 30, 1984, Ser. No. 605,209

Claims priority, application Japan, Jan. 16, 1980, 55-2603

Int. Cl.⁴ C08C *1/00*; C08K *5/36*

U.S. Cl. 528—486 **5 Claims**

1. A process for producing a granular composition of ethylenethiourea-chloroprene rubber which comprises adding drop-wise a mixture of chloroprene rubber latex and a 3–40 wt. % solution of ethylenethiourea in water at a rate of 5–100 wt. % per rubber component of said rubber latex and the macromolecular polyanion sodium alginate at a ratio of 2–8 wt. % per rubber of said rubber latex, at lower than 10° C. into an aqueous solution containing at least one alkaline earth metal salt at lower than 10° C. to form granules, separating the granules from the aqueous solution in which they are formed and then, dehydrating and drying the granules.

4,639,509

[16,19-DI-ALANINE] CALCITONIN

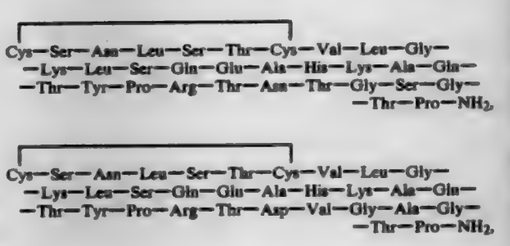
Ronald C. Orlowski, Frankfort, Ill.; Glenn L. Stahl, Manchester, Mo., and Robert L. Colescott, Bourbonnais, Ill., assignors to Armour Pharmaceutical Company, Tuckahoe, N.Y.

Filed Mar. 28, 1985, Ser. No. 717,216

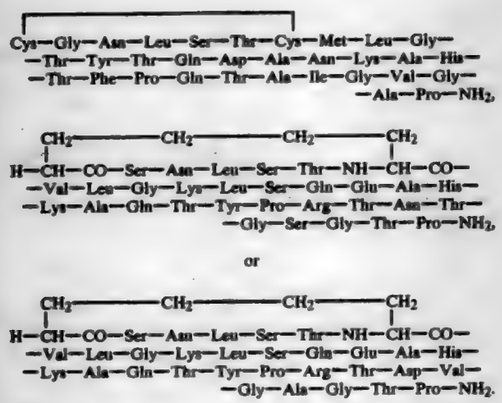
Int. Cl.⁴ C07K *7/36*

U.S. Cl. 530—307 **2 Claims**

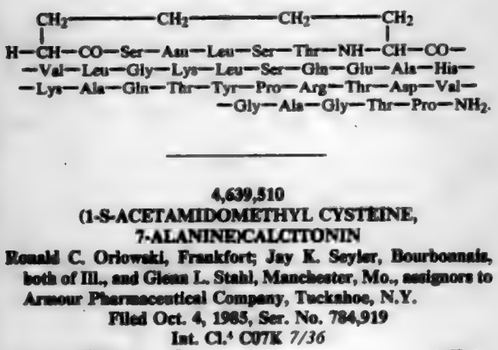
1. A peptide having the structure:



-continued



or

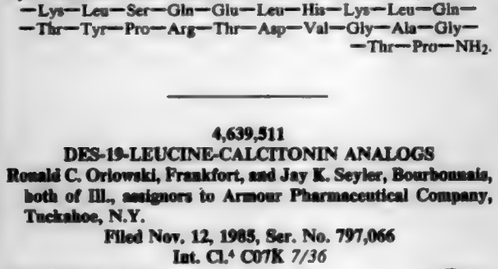


4,639,510
(1-S-ACETAMIDOMETHYL CYSTEINE, 7-ALANINE)CALCITONIN

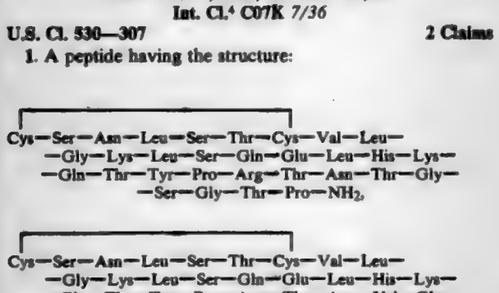
Ronald C. Orlowski, Frankfort; Jay K. Seyler, Bourbonnais, both of Ill., and Glenn L. Stahl, Manchester, Mo., assignors to Armour Pharmaceutical Company, Tuckahoe, N.Y.

Filed Oct. 4, 1985, Ser. No. 784,919
Int. Cl.[4] C07K *7/36*
U.S. Cl. 530—307 **1 Claim**

1. A peptide having the structure:



or

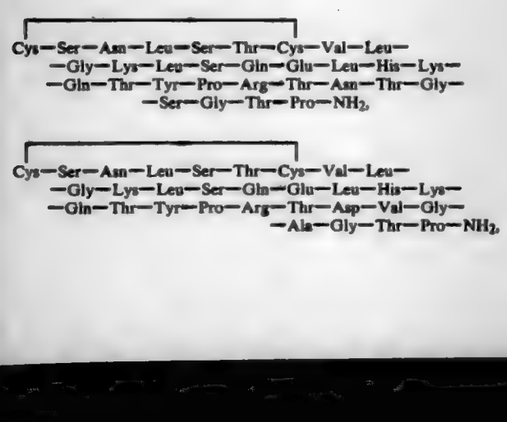


4,639,511
DES-19-LEUCINE-CALCITONIN ANALOGS

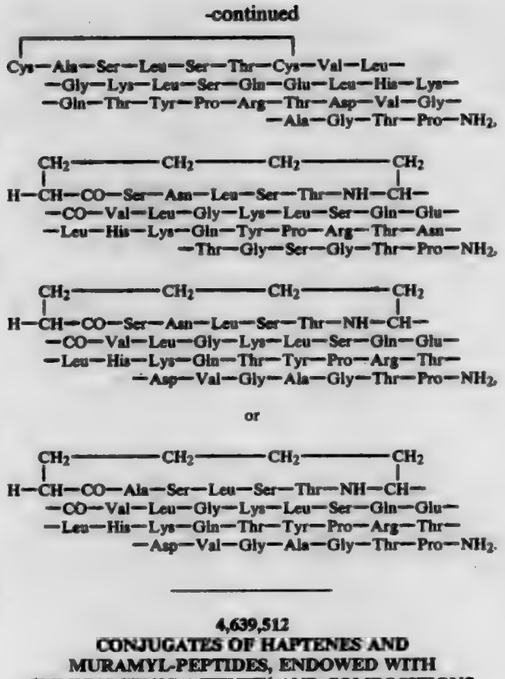
Ronald C. Orlowski, Frankfort, and Jay K. Seyler, Bourbonnais, both of Ill., assignors to Armour Pharmaceutical Company, Tuckahoe, N.Y.

Filed Nov. 12, 1985, Ser. No. 797,066
Int. Cl.[4] C07K *7/36*
U.S. Cl. 530—307 **2 Claims**

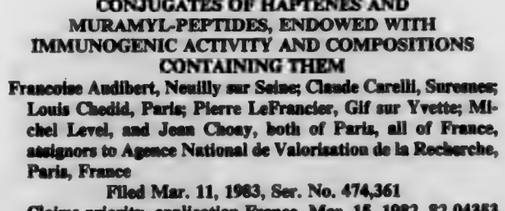
1. A peptide having the structure:



-continued



or



4,639,512
CONJUGATES OF HAPTENES AND MURAMYL-PEPTIDES, ENDOWED WITH IMMUNOGENIC ACTIVITY AND COMPOSITIONS CONTAINING THEM

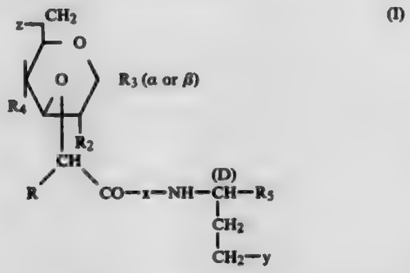
Francoise Audibert, Neuilly sur Seine; Claude Carelli, Suresnes; Louis Chedid, Paris; Pierre LeFrancier, Gif sur Yvette; Michel Level, and Jean Choay, both of Paris, all of France, assignors to Agence National de Valorisation de la Recherche, Paris, France

Filed Mar. 11, 1983, Ser. No. 474,361
Claims priority, application France, Mar. 15, 1982, 82 04353
Int. Cl.[4] A61K *39/00, 37/00*
U.S. Cl. 530—313 **25 Claims**

1. An immunogenic and apyrogenic conjugate consisting essentially of a hapten covalently linked to a muramyl peptide, which conjugate comprises a molecular weight which does not exceed 5000,

wherein the hapten is selected from the group consisting of peptides, glycopeptides, oligosaccharides, lipopeptides, glycolipids, lipids and steroids which are incapable of inducing an immunological response in vivo except when bound to an immunological carrier;

and wherein the muramyl peptide part conjugated to the hapten is derived from the muramyl peptide which has the general formula (I):



(I)

in which the following groups, when not covalently linked to the hapten, have the following meaning:

R_5 is a free carboxyl group or amido group, or a carboxyl group esterified by an aliphatic alcohol possessing from 1 to 10 carbon atoms, or a carboxyl

group substituted by an amino acid possessing itself a free carboxyl group or an amidated group or a carboxyl group esterified by an aliphatic alcohol possessing from 1 to 10 carbon atoms,

R is a hydrogen or a methyl group,

R_2 is an acetamido or a glycoyl-amido group,

R_1 is either $—NH_2$, or OH, or a radical comprising at the most 10 carbon atoms, corresponding to an alkyl, aryl, arylalkyl or alkylaryl group, optionally bearing hydroxyl-, amido, carboxamido-, sulfonamido-, ether, thioether, ester- or thioester substituents

R_4 is a hydroxyl or an oxyacyl group comprising from 1 to 4 carbon atoms,

X is an aminoacyl residue of the group comprising: alanyl, arginyl, asparagyl, aspartyl, cysteinyl, glutaminyl, glutamyl, glycyl, histidyl, hydroxy-prolyl isoleucyl, leucyl, lysyl, methionyl, phenylalanyl, prolyl, seryl, threonyl, tryptophanyl, tyrosyl, valyl and aminobutyryl,

Z is a group substituting the position at C-6 of muramic acid, and which has the following general formula (II):



in which x=0 or 1 and in which,

if x=0,

R_6 is hydroxyl or amino and,

if x=1,

R_6 is hydroxyl group or amino, carboxamido, sulfonamide ether or thioether, ester or thioester,

R_7 then being a chain of $—CH_2$, —CH=CH—, —S—, —CO— or NH groups, $—CH_2—$; —CH=CH—, or NH-groups, said groups being optionally replaced or substituted by aryl groups or by carboxlyic, amino, sulfhydryl or hydroxyl groups, or by alkyl groups including up to 5 carbon atoms or by alkylaryl groups, arylalkyl including in all up to 8 carbon atoms or by heterocyclic groups including up to six carbon atoms and one or two oxygen, nitrogen or sulfur atoms, said alkylaryl or arylalkyl groups optionally containing carbonyl groups or being optionally substituted by carboxyl, amino, sulfhydryl or hydroxyl groups, said heterocyclic groups being themselves optionally substituted by alkyl groups which can contain up to 5 carbon atoms, carboxyl, amino, sulfhydryl or hydroxyl, the above said R_7 group having none the less a length not exceeding that of an n-decyl hydrocarbon chain,

Y is a free or amidated carboxyl group, or an ester group comprising up to 10 carbon atoms, or substituted by an amino acid or is a group of formula (III):



(III)

in which x equals 0 or 1 and

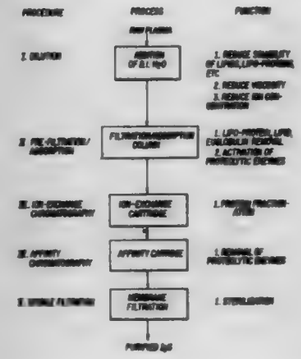
in which R_8 is an amide or ester linkage when x is equal to zero, or when x is different from zero, R_8 is a carboxamido-, ester- or thioester-group, R_9 then having the same meaning as R_7;

and which conjugate when administered in vivo elicits only antibodies or a cell mediated immunological response involving the hapten.

4,639,513
INTRAVENOUSLY INJECTABLE IMMUNOGLOBULIN G (IGG) AND METHOD FOR PRODUCING SAME

Kenneth C. Hou, Glastonbury, and Garrett Cogswell, Vernon, both of Conn., assignors to Cuno Inc., Meriden, Conn.

Continuation-in-part of Ser. No. 576,448, Feb. 2, 1984, which is a continuation-in-part of Ser. No. 466,114, Feb. 14, 1983, abandoned, and a continuation-in-part of Ser. No. 643,212, Aug. 22, 1984, abandoned, and a continuation-in-part of Ser. No. 643,613, Aug. 22, 1984. This application Oct. 2, 1984, Ser. No. 656,922
Int. Cl.[4] A61K *37/04;* **C07K** *3/20*
U.S. Cl. 530—387 **35 Claims**



1. A method for production of high purity IgG from animal plasma, or a fraction thereof, comprising:

(1) separating IgG from said animal plasma or fraction thereof to produce partially purified IgG by ion exchange chromatography using a chromatographic media comprising a matrix material comprising a first surface reactive group—containing substrate selected from the group consisting of silica, polysaccharide, or polypeptide, said surface reactive group being selected from the group consisting of the hydroxy group of silica, the hydroxy group of polysaccharide, or the amino group of polypeptide, said first substrate covalently bonded to a first synthetic polymer, said first synthetic polymer comprising:

(a) a polymerizable compound containing an epoxy group capable of direct covalent coupling to said reactive group of said substrate; and

(b) one or more polymerizable compounds containing:

(i) an ionizable chemical group;

(ii) a chemical group capable of transformation to an ionizable group;

(2) separating high purity IgG from said partially purified IgG by affinity chromatography using a chromatographic media comprising a second matrix material comprising a second surface reactive group-containing substrate selected from the group consisting of silica, polysaccharide or polypeptide, said surface reactive group being selected from the group consisting of the hydroxy group of silica, the hydroxy group of polysaccharide, or the amino group of polypeptide, said second substrate covalently bonded to a second synthetic polymer, said second synthetic polymer comprising:

(a) a polymerizable compound containing an epoxy group capable of direct covalent coupling to said reactive group of said second substrate; and

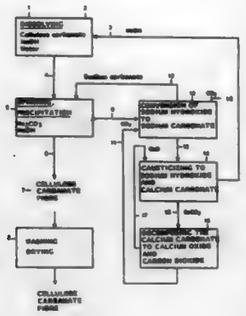
(b) one or more polymerizable compounds containing a chemical group capable of causing the covalent coupling of said second synthetic polymer to an affinity ligand or a biologically active molecule.

4,639,514

CYCLIC PROCESS FOR PRODUCING AN ALKALI SOLUTION OF CELLULOSE CARBAMATE AND PRECIPITATING THE CARBAMATE

Olli T. Turunen; Jouko Huttunen, both of Porvoo; Johan-Fredrik Selin, Helsinki; Jan Fors, and Vidar Eklund, both of Porvoo, all of Finland, assignors to Neste Oy, Finland

Filed Sep. 24, 1985, Ser. No. 779,702
Claims priority, application Finland, Sep. 27, 1984, 843813
Int. Cl.[4] C08B *3/00*; D01F *2/00*
U.S. Cl. 536—30 13 Claims



1. A cyclic method of producing an alkali solution of cellulose carbamate, precipitating the cellulose carbamate in the form of fiber or film from the alkali solution, and recovering and converting the chemicals remaining after precipitation of the cellulose carbonate for reuse in the method comprising the steps of:

(a) dissolving cellulose carbamate in an aqueous solution of sodium hydroxide, thereby producing an alkali solution of cellulose carbamate;

(b) extruding said alkali solution into contact with an aqueous precipitating solution containing sodium carbonate, whereby the cellulose carbamate precipitates and can be separated from the resultant solution;

(c) conducting carbon dioxide into the solution obtained in step (b), thereby converting the sodium hydroxide into sodium carbonate and regenerating the precipitating solution;

(d) treating the solution obtained in step (c) with calcium oxide, thereby converting the sodium carbonate into sodium hydroxide and causing calcium carbonate to precipitate from the solution;

(e) recylcing the solution containing sodium hydroxide obtained in step (d) to dissolve cellulose carbamate according to step (a);

(f) decomposing the calcium carbonate obtained in step (d) into carbon dioxide and calcium oxide;

(g) recylcing the carbon dioxide obtained in step (f) to convert sodium hydroxide according to step (c); and

(h) recycling the calcium oxide obtained in step (f) to convert sodium carbonate according to step (d).

4,639,515

CYCLIC PROCESS FOR PRODUCING AN ALKALI SOLUTION OF CELLULOSE CARBAMATE AND PRECIPITATING THE CARBAMATE

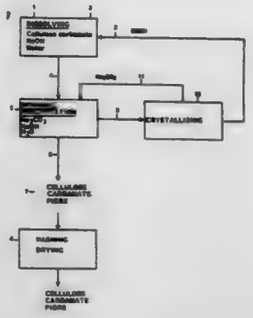
Olli T. Turunen; Jouko Huttunen, both of Porvoo; Johan-Fredrik Selin, Helsinki; Jan Fors, and Vidar Eklund, both of Porvoo, all of Finland, assignors to Neste Oy, Finland

Filed Sep. 24, 1985, Ser. No. 779,798
Claims priority, application Finland, Sep. 27, 1984, 843814
Int. Cl.[4] C08B *3/00*; D01F *2/00*
U.S. Cl. 536—30 16 Claims

1. A cyclic method of producing an alkali solution of cellulose carbamate, precipitating the cellulose carbamate in the form of fiber or film from the alkali solution, and recovering and converting the chemicals remaining after precipitation of the cellulose carbonate for re-use in the method, comprising the steps of:

(a) dissolving cellulose carbamate in an aqueous solution of sodium hydroxide, thereby producing an alkali solution of cellulose carbamate;

(b) extruding said alkali solution into contact with an aqueous precipitating solution containing sodium carbonate,



whereby the cellulose carbamate precipitates and can be separated from the resultant solution;

(c) withdrawing the resultant solution of step (b) and separating said solution into aqueous sodium hydroxide and sodium carbonate components;

(d) recycling the aqueous sodium hydroxide obtained in step (c) to dissolve cellulose carbamate according to step (a);

(e) recycling the sodium carbonate obtained in step (c) to regenerate the precipitating solution utilized in step (b).

4,639,516

POLYSACCHARIDE POLYOL

Akira Misaki, Osaka; Yoshiaki Sone, Senaan, and Takao Kato, Shinsanyo, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinsanyo, Japan

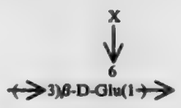
Filed Mar. 8, 1984, Ser. No. 587,475
Claims priority, application Japan, Mar. 9, 1983, 58-37486
Int. Cl.[4] C08B *37/00*
U.S. Cl. 536—123 1 Claim

1. A polysaccharide polyol derived from *Volvariella volvacea*, which consists essentially of first recurring units represented by the following formula:

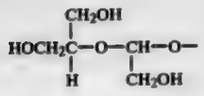
→3)βD-Glu(1→

wherein D-Glu represents a D-glucopyranosyl group, β represents the linkage mode and each number represents the linkage position,

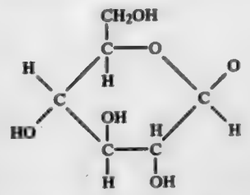
second recurring units represented by the following formula:



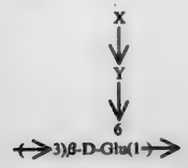
wherein D-Glu, β and each number are defined above, and X represents a group represented by the following formula:



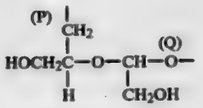
or a D-glucopyranosyl group represented by the following formula:



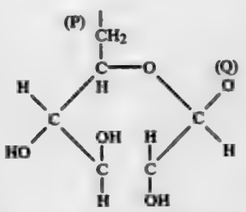
and third recurring units represented by the following formula:



wherein D-Glu, β and each number are defined above, and Y represents a group represented by the following formula:

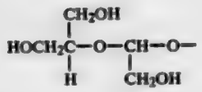


or a D-glucopyranosyl residue represented by the following formula:



in each formula, X being linked to the carbon atom to which (P) is attached and the group being linked to the glucopyranosyl residue through the oxygen atom to which (Q) is attached,

wherein a part of X, in at least one of the second recurring units and the third recurring units is a group represented by the following formula:



the average number of the third recurring units is about 4 to about 12 per 100 of the sum of the first, second and third recurring units, and the average number of the sum of the second and third recurring units is about 16 and about 33 per 100 of the sum of the first, second and third recurring units, said polysaccharide polyol having a molecular weight of about 70,000 to about 2,800,000 in gel permeation high speed liquid chromatography using as the mobile phase a tris-hydrochloride buffer solution having a concentration of 0.1 mole/l and a pH value of 8.6.

4,639,517

PROCESS FOR STABILIZING THIOCARBAMYLSULFENAMIDES

Enrique G. Reynes, Middleburg Heights, and John O. Leising, Avon Lake, both of Ohio, assignors to The B F Goodrich Company, Akron, Ohio

Filed Jul. 29, 1985, Ser. No. 760,183
Int. Cl.[4] C07C *155/04*
U.S. Cl. 544—85 6 Claims

1. A method for improving the heat stability of thiocarbamylsulfenamides comprising treating a thiocarbamylsulfenamide dissolved in an organic solvent with a dilute aqueous acid solution, to a pH of about 1 to less than about 5, separating the organic solution from the aqueous phase, removing the solvent from the thiocarbamylsulfenamide and drying.

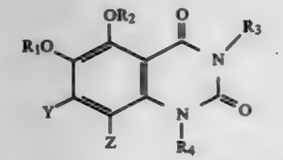
4,639,518

SUBSTITUTED QUINAZOLINEDIONES

Victor T. Bandurco, Bridgewater, N.J.; Stanley C. Bell, Narberth, Pa.; Donald W. Combs, Piscataway; Robert Falotico, Belle Mead, both of N.J., and Alfonso J. Tobia, Doylestown, Pa., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Sep. 24, 1984, Ser. No. 653,620
Int. Cl.[4] C07D *239/96*
U.S. Cl. 544—285 8 Claims

1. A compound of the formula



wherein R_1 and R_2 are the same or different substituents and are hydrogen, lower alkyl having 1–5 carbon atoms or —CH_2— when taken together; Y and Z are the same or different and are hydrogen, nitro, amino, acetamido, alkylamino wherein the alkyl group 1–5 carbon atoms, alkyl wherein the alkyl group has 1–5 carbon atoms, cycloalkylamino wherein the cycloalkyl group has 4–8 carbon atoms, and cycloalkyldiamino wherein the cycloalkyl group has 4–8 carbon atoms, carboxy, carboalkoxy wherein the alkoxy group has 1–5 carbon atoms, cyano, methanesulfonyl, carboxamide, and halo; R_3 is hydrogen, alkyl wherein the alkyl group has 1–5 carbon atoms, hydroxyalkyl wherein the alkyl group has 1–5 carbon atoms, haloalkyl wherein he alkyl group has 1–5 carbon atoms, amino, dialkylamino wherein the alkyl group has 1–5 carbon atoms, dialkylamino alkyl wherein the alkyl group has 1–5 carbon atoms, cycloalkylamino and cycloalkylaminoalkyl wherein the alkyl group has 1–5 carbon atoms and the cycloalkyl group has 5–6 carbon atoms, phenyl, substituted phenyl wherein the substituent is halo, lower alkoxy, alkyl having 1–5 carbon atoms; alkylphenyl wherein the alkyl group has 1–5 carbon atoms; substituted alkylphenyl wherein the substituent is nitro, amino, alkylamino having 1–5 carbon atoms, cycloalkylamino and cyclodialkylamino wherein the cycloalkyl group has 4–8 carbon atoms, carboxy, carboalkoxy wherein the alkoxy group has 1–5 carbon atoms, mono-and dihydroxy, cyano, methanesulfonyl, carboxamide or halo; R_4 is hydrogen, lower

alkyl wherein the alkyl group has 1–5 carbon atoms, carboalkoxy and $R_5CH_2CH_2X$ wherein R_5 is hydrogen or lower alkyl; X is carboxy, carboalkoxy wherein the alkoxy group has 1–3 carbon atoms, cyano, carboxamido, methanesulfonyl, formyl, benzoyl and substituted benzoyl and the pharmaceutically acceptable salts thereof; provided that when R_3 is amino or alkylamino wherein the alkyl group has 1–5 carbon atoms, Y and Z are not simultaneously hydrogen.

4,639,519

2-SUBSTITUTED ALKYLAMINOPYRIMIDONES USEFUL AS H_2-ANTAGONISTS AND ANTIINFLAMATORY AGENTS

Charon R. Ganellin, Welwyn; Robert J. Ife, Stevenage, and David A. A. Owen, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden, England

Division of Ser. No. 549,953, Nov. 9, 1983, Pat. No. 4,558,128, which is a division of Ser. No. 290,628, Aug. 6, 1981, Pat. No. 4,439,435, which is a division of Ser. No. 56,171, Jul. 10, 1979, Pat. No. 4,305,945. This application May 1, 1985, Ser. No. 729,448

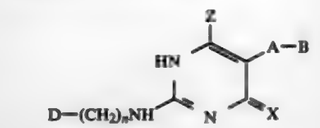
Claims priority, application United Kingdom, Jul. 15, 1978, 29999/78

The portion of the term of this patent subsequent to Nov. 18, 1997, has been disclaimed.

Int. Cl.[4] C07D *239/02;* A61K *31/505*

U.S. Cl. 544—320 **1 Claim**

1. A compound of the formula



where D is HO—; n is from 3 to 8; X is oxygen or sulphur; Z is hydrogen or lower alkyl; A is straight or branched C_1–C_5 alkylene or $—(CH_2)_pW(CH_2)_q—$ where W is oxygen or sulphur and the sum of p and q is 1 to 4; and B is methyl, C_3–C_6 cycloalkyl, a heteroaryl group selected from pyridyl, N-oxopyridyl, furyl, thienyl, thiazolyl, oxazolyl, isothiazolyl, imidazolyl, pyrimidyl, pyrazyl, pyridazyl, thiadiazolyl, quinolyl, isoquinolyl, 5,6,7,8-tetrahydroquinolyl, 1,3-dioxolopyridyl, benzimidazolyl and benzthiazolyl, said heteroaryl group being optionally substituted by one or more lower alkyl, lower alkoxy, halo, hydroxy or amino groups or B is a naphthyl, 5- or 6-(2,3-dihydro-1,4-benzodioxinyl) or 4- or 5-(1,3-benzodioxolyl) group, or a phenyl group optionally substituted with one or more lower alkyl, lower alkoxy, halogen, phenyl(lower alkoxy), hydroxy, lower alkoxy-lower alkoxy, trifluoromethyl, di(lower alkyl)amino, phenoxy, halophenoxy, lower alkoxyphenoxy, phenyl, halophenyl or lower alkoxyphenyl group, provided that —A—B is not alkyl, in the form of the free base or a pharmaceutically acceptable acid addition salt thereof.

4,639,520

PREPARATION OF 14-HYDROXY-N-ETHOXY-CARBONYL-NORCODEINONE

Frank Kavka, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Mar. 27, 1984, Ser. No. 593,752

Int. Cl.[4] C07D *489/08*

U.S. Cl. 546—45 **21 Claims**

1. A method for preparing N-ethoxycarbonyl-14-β-hydroxynorcodeinone, which comprises contacting N-ethoxycarbonyl-norcodeinone enol acetate

(i) with an aromatic or aliphatic non-basic or poly-basic peroxy-acid

(ii) under reaction conditions effective for substituting an —OH group in the 14-position of the norcodeinone enol acetate,

said reaction conditions including:

(I) substantial absence of systems for chemical generation of singlet oxygen;

(II) the presence of

(A) a moderately strong acid having a pk_a of from about 0.3 to about 3.5 and

(B) an inert organic solvent which is a solvent for and substantially non-reactive with the N-ethoxycarbonyl-norcodeinone enol acetate, said peroxy-acid and said moderately strong acid; said solvent being present in a solubilizing amount for each of the N-ethoxycarbonyl-norcodeinone enol acetate, said peroxy-acid and said moderately strong acid;

(III) the substantial absence of water;

(IV) at least about 1 gram-equivalent of said peroxy-acid being present per gram-mole of the N-ethoxycarbonyl-norcodeinone enol acetate; and

(V) the substantial absence of an acid having a pK_a of less than 0.3.

4,639,521

ISOQUINOLINE DERIVATIVES

Kunio Sansohe; Kengo Otsuka; Toshohiko Ito, all of Kanagawa; Masahiko Maruyama, Chiba; Takafumi Kitano, Chiba, and Makoto Hirayama, Chiba, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

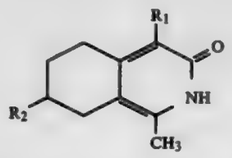
Filed Jun. 20, 1986, Ser. No. 878,527

Claims priority, application Japan, Jul. 2, 1985, 60-144008

Int. Cl.[4] C07D *401/04, 217/24*

U.S. Cl. 546—141 **5 Claims**

1. Isoquinoline derivatives represented by the general formula:



(I)

wherein R_1 denotes a hydrogen or halogen atom, or a nitro or acetyl group, and R_2 denotes a hydrogen atom, or a methyl, methoxy, phenyl, 4-pyridyl or 2-pyridyl group, and therapeutically acceptable salts thereof.

4,639,522

1-BENZYL-3,5-DIMETHYL-4-PIPERDYL ESTER OF A HANTZSCH DIHYDROPYRIDINE

Kenji Muto; Toru Sugaya, both of Shizuoka; Tokuyuki Kuroda, Susono; Tamotsu Hashimoto, Numazu; Koji Yamada; Nobuhiro Nakamizo, both of Machida, and Minoru Watanabe, Tokyo, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 542,185, Oct. 14, 1983, abandoned. This application Feb. 14, 1986, Ser. No. 829,179

Claims priority, application Japan, Oct. 15, 1982, 57-180615

Int. Cl.[4] C07D *401/12;* A61K *31/455*

U.S. Cl. 546—194 **1 Claim**

1. A compound; namely, 2,6-dimethyl-4-(3-nitrophenyl)-1,4-dihydropyridine-3,5-dicarboxylic acid 3-(1-benzyl-3,5-dimethyl-4-piperidyl)-5-methyl ester hydrochloride.

4,639,523

AMINOALKYLPHENOXY DERIVATIVES

Fujio Nohara, Takaoka, and Tomoaki Fujinawa, Toyama, both of Japan, assignors to Ikeda Mohando Co., Ltd., Toyama, Japan

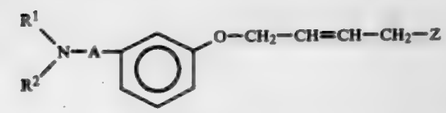
Filed May 24, 1985, Ser. No. 737,489

Claims priority, application Japan, Jun. 1, 1984, 59-112746

Int. Cl.[4] C07D *401/12, 417/12, 285/12*

U.S. Cl. 546—209 **3 Claims**

1. An amino alkyl phenoxy derivative having the formula:



wherein R^1 and R^2 are individually hydrogen atoms or lower alkyl groups having 1 to 4 carbon atoms, or R^1 and R^2 form, together with a bonded nitrogen atom, a 4 to 8 member heterocyclic ring selected from the group consisting of azetidino-, pyrrolidino-, piperidino- and perhydroazepino- groups, which is unsubstituted or substituted by one or more hydroxyl, methoxy, ethoxy, or lower alkyl groups of 1 to 6 carbon atoms; A is a straight-chain or a branched-chain alkylene group having 1 to 4 carbon atoms; and Z is a moiety of the formula:



wherein R^{11} and R^{12} are each hydrogen, or lower alkyl, lower alkenyl, lower alkynyl or lower alkyl groups or a heterocyclic aryl alkyl group selected from the group consisting of 2-pyridinomethyl, 3-pyridinomethyl, 2-thiophenomethyl, 3-thiophenomethyl, 2-furanomethyl and 3-furanomethyl; or a heterocyclic group formed respectively by R^{11} and R^{12} together with the nitrogen atom bonded therewith selected from the group consisting of azetidino-, pyrrolidino- and piperidino- rings; or a hydrate, salt or solvate thereof.

4,639,524

MONOBASIC DISOBUTAMIDE DERIVATIVES

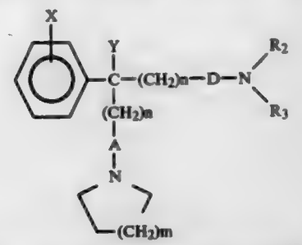
Bipinchandra N. Desai, Vernon Hills; Robert J. Chorvat, Arlington Heights, and Kurt J. Rorig, Glenview, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Jul. 9, 1984, Ser. No. 628,933

Int. Cl.[4] C07D *207/04, 211/06*

U.S. Cl. 546—229 **3 Claims**

1. A compound comprising the following formula:



and the pharmaceutically acceptable acid addition salts thereof wherein X represents a halo, lower alkyl, hydrogen, trifluormethyl, phenyl, or lower alkoxy substituent; Y represents —CN, $—CONH_2$, $CON(R_1)_2$ or CO_2R_1 where R_1 is a lower alkyl; m is an integer 1 or 2 and n is an integer from 1 to 3 inclusive; R_2 represents lower alkyl; R_3 represents acetyl, benzoyl, phenacetyl or trifluoroacetyl; and A and D are methylene.

4,639,525

PROCESS FOR THE PREPARATION OF PYRIDONE-2 BY DEMETHYLATION

Roland E. van der Stoel, Born, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Nov. 14, 1984, Ser. No. 671,308

Claims priority, application Netherlands, Nov. 28, 1983, 8304065

Int. Cl.[4] C07D *213/64*

U.S. Cl. 546—290 **5 Claims**

1. A gas phase process for preparing 2-pyridone, that 6-methyl-2-pyridone is contacted with a metal catalyst selected from the group consisting of nickel, cobalt, platinum, palladium and ruthenium, in the presence of water at a temperature of 200° C. to 500° C. to obtain a reaction mixture containing 2-pyridone; and

subsequently recovering 2-pyridone from the reaction mixture so produced.

4,639,526

N-SUBSTITUTED 5-AMINO-1,3,4-THIADIAZOLES

Carl Metzger; Ludwig Ene, and Helmuth Hack, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

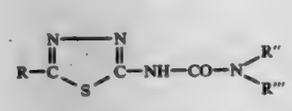
Filed Aug. 29, 1968, Ser. No. 756,284

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1967, F53531

Int. Cl.[4] A01N *47/36;* C07D *285/12*

U.S. Cl. 548—140 **5 Claims**

1. N-substituted 5-amino-1,3,4-thiadiazole having the formula



in which R is alkyl-mercapto having 1–4 carbon atoms, R″ is selected from the group consisting of hydrogen and alkyl having 1–4 carbon atoms, and R‴ is selected from the group consisting of alkyl having 1–4 carbon atoms and alkenyl having 2–4 carbon atoms.

4,639,527

PROCESS FOR THE PREPARATION OF β-HYDROXYETHYL-(1,2,4-TRIAZOLE) DERIVATIVES

Reinhard Lantzsch, Leverkusen, and Karl-Julius Reubke, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

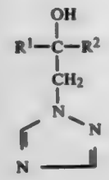
Filed Nov. 19, 1984, Ser. No. 672,553

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342693

Int. Cl.[4] C07D *249/08*

U.S. Cl. 548—262 **9 Claims**

1. A process for the preparation of a β-hydroxyethyl-(1,2,4-triazole) derivative of the formula

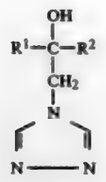


(I)

in which

R^1 is methyl, ethyl, propyl, isopropyl, n-butyl, iso-butyl, sec.-butyl or tert.-butyl, or methyl, ethyl, propyl, isopropyl, n-butyl, iso butyl, sec.-butyl or tert.-butyl which is substituted by 1 to 3 fluorine and/or chlorine atoms, or represents cyclopropyl, cyclopentyl or cyclohexyl which is optionally substituted by methyl, or represents phenyl, which can be mono-, di- or tri-substituted by fluorine, chlorine, bromine, methyl, tert.-butyl, cyclohexyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, phenyl which is optionally substituted by fluorine, chlorine and/or methyl, phenoxy which is optionally substituted by fluorine, chlorine and/or methyl, benzyl which is optionally substituted by fluorine, chlorine and/or methyl and/or benzyloxy which is optionally substituted by fluorine, chlorine and/or methyl, or represents phenethyl, which can be 1-, 2- or 3-substituted in the phenyl part by fluorine, chlorine, bromine, methyl, tert.-butyl, cyclohexyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, phenyl which is optionally substituted by fluorine, chlorine and/or methyl, phenoxy which is optionally substituted by fluorine, chlorine and/or methyl, benzyl which is optionally substituted by fluorine, chlorine and/or methyl and/or benzyloxy which is optionally substituted by fluorine, chlorine and/or methyl, and

R^2 is hydrogen, methyl, ethyl, propyl isopropyl, n-butyl, iso-butyl, sec.-butyl or tert.-butyl, or methyl, ethyl, propyl, isopropyl, n-butyl, iso-butyl, sec.-butyl or tert.-butyl which is substituted by 1 to 3 fluorine and/or chlorine atoms, or represents alkenyl with 2 to 6 carbon atoms, alkinyl with 2 to 6 carbon atoms, or cyclopropyl, cyclopentyl or cyclohexyl which is optionally substituted by methyl, or cyclopentenyl, cyclohexenyl, cycloheptenyl or cyclooctenyl which is optionally substituted by methyl, or represents phenyl, which can be mono-, di- or tri-substituted by fluorine, chlorine, bromine, methyl, tert.-butyl, cyclohexyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, phenyl which is optionally substituted by fluorine, chlorine and/or methyl, phenoxy which is optionally substituted by fluorine, chlorine and/or methyl, benzyl which is optionally substituted by fluorine, chlorine and/or methyl and/or benzyloxy which is optionally substituted by fluorine, chlorine and/or methyl, or represents phenethyl, which can be 1-, 2- or 3-substituted in the phenyl part by fluorine, chlorine, bromine, methyl, tert.-butyl, cyclohexyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, phenyl which is optionally substituted by fluorine, chlorine and/or methyl, phenoxy which is optionally substituted by fluorine, chlorine and/or methyl, benzyl which is optionally substituted by fluorine, chlorine and/or methyl and/or benzyloxy which is optionally substituted by fluorine, chlorine and/or methyl which process comprises stirring a β-hydroxyethyl-(1,3,4-triazole) derivative of the formula



(II)

in which

R^1 and R^2 have the abovementioned meanings, in the presence of a base and in the presence of N-methylpyrrolidone.

4,639,528

CRYSTALLINE FORM OF 7-(DIMETHYLAMINOMETHYLENE-AMINO-9A-METHOXYMITOSANE

Murray A. Kaplan, Syracuse, and Dolatrai M. Vyas, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 21, 1985, Ser. No. 703,778
Int. Cl.[4] C07D *487/14*
U.S. Cl. 548—422 3 Claims

1. A new crystalline form of 7-(dimethylaminomethylene)amino-9a-methoxymitosane having an infrared absorption spectrum (potassium bromide disc) exhibiting principal absorption peaks at 3430, 3310, 2920, 1720, 1620, 1540, 1455, 1440, 1420, 1400, 1375, 1310, 1270, 1230, 1205, 1100, 1065, 950, 850, 780, 700, 625, 575, and 525 reciprocal centimeters.

3. A process for preparing crystalline 7-(dimethylaminomethylene)amino-9a-methoxymitosane which comprises slurrying amorphous 7-(dimethylaminomethylene)amino-9a-methoxymitosane in ethyl ether and thereafter adding a small amount of crystalline 7-(dimethylaminomethylene)amino-9a-methoxymitosane to cause crystallization of the amorphous 7-(dimethylaminomethylene)amino-9a-methoxymitosane.

4,639,529

ANALGESIC AND ANTI-INFLAMMATORY COMPOUNDS

Bola V. Shetty, Stamford, Conn.; Arthur McFadden, East Brunswick, N.J., and Peter Hofer, Liestel, Switzerland, assignors to The Purdue Frederick Company, Norwalk, Conn.

Division of Ser. No. 349,992, Feb. 19, 1982, Pat. No. 4,476,311, which is a continuation of Ser. No. 129,578, Dec. 3, 1980, abandoned. This application Jun. 18, 1984, Ser. No. 621,680
Int. Cl.[4] C07D *207/12*
U.S. Cl. 548—550 3 Claims

1. The compound 1-benzyl-4-N,N-dimethylaminomethyl-5-(3-methoxyphenyl)-pyrrolidin-2-one.

2. The compound 4-dimethylaminomethyl-5-(3-methoxyphenyl)-1-phenyl pyrrolidin-2-one.

3. The compound 1-benzyl-4-N,N-dimethylaminomethyl-5-(3-hydroxyphenyl)-pyrrolidin-2-one.

4,639,530

PROCESS FOR MAKING MALEIC ANHYDRIDE

Eric L. Moorehead, Diamond Bar, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 666,997, Oct. 31, 1984, Pat. No. 4,604,371, which is a continuation-in-part of Ser. No. 461,942, Jan. 28, 1983, Pat. No. 4,481,363, Ser. No. 646,291, Aug. 29, 1984, abandoned, Ser. No. 492,163, May 6, 1983, Pat. No. 4,562,291, and Ser. No. 492,226, May 6, 1983, said Ser. No. 461,942, is a division of Ser. No. 289,806, Aug. 3, 1981, Pat. No. 4,388,221, said Ser. No. 646,291, is a continuation-in-part of Ser. No. 461,942, , which is a division of Ser. No. 289,806, , said Ser. No. 492,163, and Ser. No. 492,226, each is a continuation-in-part of Ser. No. 275,370, Jun. 19, 1981, abandoned. This application Jun. 27, 1985, Ser. No. 749,556
The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.
Int. Cl.[4] C07D *307/60*
U.S. Cl. 549—260 34 Claims

1. A method for producing maleic anhydride which comprises contacting molecular oxygen and a C_4 to C_{10} hydrocarbon under reaction conditions with an oxidation catalyst comprising vanadium and phosphorus components in combination with a microporous crystalline silica or a crystalline zeolite having a silica-to-alumina ratio of at least 6.0.

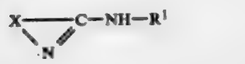
4,639,531

PROCESS FOR THE PREPARATION OF DIMETHYLMALEIC ANHYDRIDE

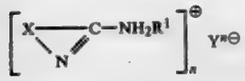
Marcus Baumann, and Werner Breitenstein, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 6, 1985, Ser. No. 762,752
Claims priority, application Switzerland, Aug. 15, 1984, 3910/84
Int. Cl.[4] C07D *307/60*
U.S. Cl. 549—261 11 Claims

1. A process for the preparation of dimethylmaleic anhydride by reacting 2 equivalents of maleic acid, fumaric acid and/or maleic anhydride at a temperature of at least 90° C. and in the presence of an amidine of formula I and/or an amidine salt of formula II



(I)



(II)

in which formulae R^1 is a hydrogen atom, alkyl, cycloalkyl, carboxyalkyl, aryl, aralkyl, alkaryl, or alkaralkyl, Y is an anion of an inorganic or organic protonic acid, n is an integer from 1 to 3, and X, together with the group

$$-N=C<,$$

forms the radical of a substituted or unsubstituted 5- or 6-membered heterocyclic ring which may contain further hetero atoms, which process comprises employing the compounds of formulae I and II in catalytic amounts of 0.1 to 15 mol%, based on maleic acid, fumaric acid and/or maleic anhydride.

4,639,532

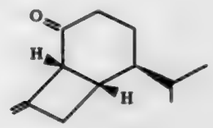
PROCESS FOR PREPARING SYNTHETIC PERIPLANONE-B

Stuart L. Schreiber, Bethany, Conn., assignor to Yale University, New Haven, Conn.

Filed Jun. 18, 1984, Ser. No. 621,574
Int. Cl.[4] C07D *493/10*
U.S. Cl. 549—332 8 Claims

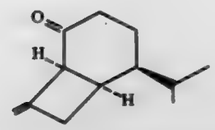
1. A process for synthesizing periplanone-B comprising:

a. reacting allene and 4-isopropyl-2-cyclohexen-1-one by photocycloaddition to form a mixture of:



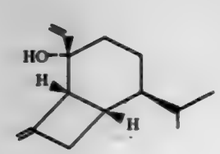
IIIa

and



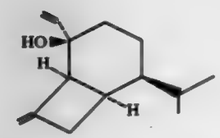
IIIb

b. reacting the mixture of IIIa and IIIb with a vinyl metallic halide to form the corresponding allylic carbinols having the structure:



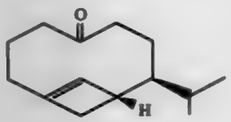
IVa

and



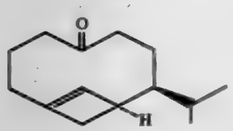
IVb

c. reacting the product of step b with strong base which will deprotonate an alcohol to form compounds having the structure:



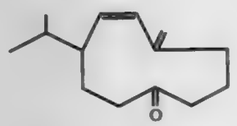
Va

and

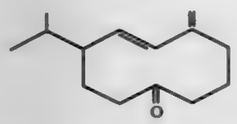


Vb

d. heating the product of step c to thereby obtain electrocyclic ring opening to form a mixture of:



VI

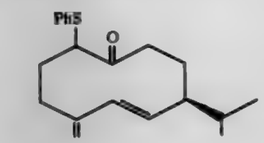


VII

in a molar ratio of cis-diene (VI) to trans-diene (VII) of about 2/1;

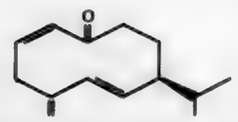
e. irradiating with light the mixture produced in step d to form a mixture of VI and VII in a molar ratio of 1/15, respectively and isolating VII from such mixture;

f. reacting VII with a base strong enough to deproponate a ketone followed by reaction with a sulfenylating agent to form a 16/1 regioisomeric mixture of monosulfenylated ketones having the general formula:



VIII

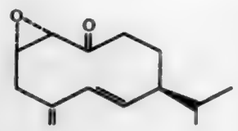
g. reacting the product of step f with $NaIO_4$ to form the corresponding sulfoxides followed by pyrolysis to form:



IX

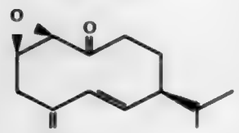
and isolating IX from the reaction mixture;

h. reacting IX with t-butyl hydroperoxide to form a mixture of cis epoxides Xa and Xb in a molar ratio of beta/alpha of about 4/1



Xa

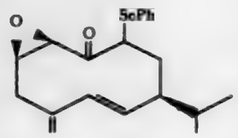
alpha-epoxide



Xb

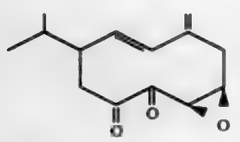
beta-epoxide

i. reacting Xa and Xb with a base strong enough to deprotonate a ketone followed by reaction with a selenylizing agent to form the selenide:



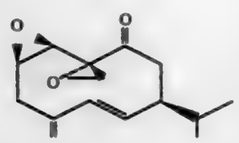
XI

reacting XI with H_2O_2 to the corresponding selenoxide and rearranging the selenoxide in the presence of anhydrous sodium acetate and acetic anhydride to form the alpha-diketone:



XII

j. reacting XII with the ylide formed from trimethylsulfonium iodide and dimsyl sodium to form periplanone-B having the structure



I

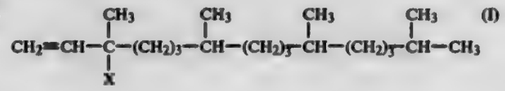
4,639,533

ALPHA TOCOPHEROL PROCESS

Jeffrey L. Fiaman, Southgate, Mich., assignor to BASF Corporation, Wyandotte, Mich.

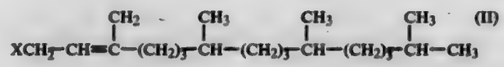
Filed Jul. 29, 1982, Ser. No. 403,085
Int. Cl.[4] C07D *311/72*
U.S. Cl. 549—411 19 Claims

1. A process for producing alpha tocopherol comprising reacting, in the presence of an inert organic solvent, trimethylhydroquinone with a phytyl derivative selected from the group consisting of at least one of



(I)

and



(II)

wherein X is a leaving group, in the presence of at least one aprotic Lewis acid, at least one protonic strong acid, and at least one amine having about 7 to about 24 carbon atoms.

4,639,534

ISOLATION OF PSEUDOMONIC ACID

Alan D. Curzons, Brighton, England, assignor to Beecham Group p.l.c., England

Continuation of Ser. No. 332,669, Dec. 21, 1981, abandoned, which is a continuation of Ser. No. 207,773, Nov. 17, 1980, abandoned, which is a division of Ser. No. 36,061, May 4, 1979, abandoned. This application Dec. 21, 1984, Ser. No. 684,479
Claims priority, application United Kingdom, May 20, 1978, 20958/78
Int. Cl.[4] C07D *309/10*
U.S. Cl. 549—414 4 Claims

1. A process for the isolation of pseudomonic acid from a crude preparation thereof which process comprises extracting the crude preparation into a polar, organic, water-immiscible solvent in which the pseudomonic acid is soluble, treating the extract with a lithium salt of an alkanoic acid of formula $R—CO_2^-Li^+$, wherein R is an alkyl group containing from 1 to 20 carbon atoms, separating the resulting lithium pseudomonate and thereafter hydrolysing the lithium pseudomonate to produce pseudomonic acid.

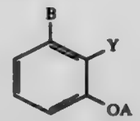
4,639,535

TRISUBSTITUTED BENZENE DERIVATIVES AND A METHOD FOR THE PREPARATION THEREOF

Trevor S. Abram, Marlow; Peter Norman, Slough, and Brian T. Warren, Ickenham, all of England, assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 615,042, May 29, 1984, Pat. No. 4,571,405.
This application Oct. 30, 1985, Ser. No. 792,851
Int. Cl.[4] C07D *263/04, 309/10*
U.S. Cl. 549—419 4 Claims

1. A compound of the formula:

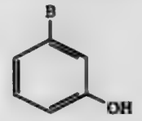


wherein B is selected from the group consisting of —NHCOC$(CH_3)_3$, 1,3-oxazolinyl and —CONHR, wherein R is methyl, phenyl, or t-butyl; Y is selected from the group consisting of CO_2H, CHO, CO_2R' and COR', wherein R' is a

lower alkyl having from 1 to 4 carbon atoms; and A is H or tetrahydropyran.

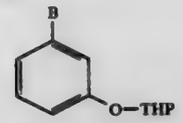
4. A method for preparing the compound of claim 1 comprising the steps of:

(a) reacting 3-aminophenol with an amino-protecting moiety to produce a compound of the formula:



wherein B has the meaning defined above;

(b) reacting the product of (a) with a hydroxy-protecting moiety to produce a compound of the formula:



wherein THP refers to tetrahydropyran; and

(c) reacting the compound of (b) with a lithiating agent and a compound containing said Y moiety.

4,639,536

INTERMEDIATE, ITS SYNTHESIS, AND ITS USE IN A PROCESS FOR THE PREPARATION OF 2,3-DIHYDRO-2,2-DIMETHYL-7-HYDROXYBENZOFURAN

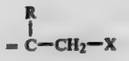
Constance A. Fellows, Durham, and Wallace Y. Fu, Chapel Hill, both of N.C., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 30, 1984, Ser. No. 645,714
Int. Cl.[4] C07D *307/86;* C07C *43/23*
U.S. Cl. 549—462 17 Claims

1. A process for the preparation of 2-(2-hydroxy-2-methylpropoxy)phenol which comprises reacting catechol with an alkylating agent of the formula:



wherein Q is



wherein R is halogen and X is halogen;
in the presence of a base and a solvent in an environment with a pH greater than about 9 to form 2-(2-hydroxy-2-methylpropoxy)phenol.

10. A process for the preparation of 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofuran which comprises:

(a) reacting catechol with an alkylating agent of the formula:



wherein Q is



wherein R is halogen and X is halogen;
in the presence of a base and a solvent in an environment with a pH greater than about 9 to form 2-(2-hydroxy-2-methylpropoxy)phenol; and

(b) heating the resultant 2-(2-hydroxy-2-methylpropoxy)-phenol in the presence of an acid catalyst at a temperature greater than about 90° C. to form the 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofuran.

4,639,537

CERTAIN LAEVOROTATORY P-TOLYSULFONYL OR METHANESULFONYL PROPIONIC ACID ESTER INTERMEDIATES

Koichi Moriya, Hachioji, Japan; Uwe Priewitz, Solingen, Fed. Rep. of Germany; Hans-Jochem Riebel, Wuppertal, Fed. Rep. of Germany; Ludwig Ese, Leverkusen, Fed. Rep. of Germany, and Robert R. Schmidt, Bergish-Gladbach, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 560,725, Dec. 12, 1983, Pat. No. 4,596,599.
This application May 24, 1985, Ser. No. 738,105
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247930
Int. Cl.[4] C07C *143/38, 149/32, 149/40*
U.S. Cl. 558—48 3 Claims

1. A laevorotatory enantiomer of the formula

wherein R is halogen and X is halogen;
in the presence of a base and a solvent in an environment with a pH greater than about 9 to form 2-(2-hydroxy-2-methylpropoxy)phenol; and

(b) heating the resultant 2-(2-hydroxy-2-methylpropoxy)-phenol in the presence of an acid catalyst at a temperature greater than about 90° C. to form the 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofuran.

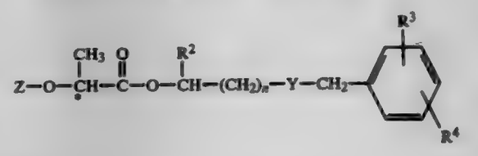
4,639,537

CERTAIN LAEVOROTATORY P-TOLYSULFONYL OR METHANESULFONYL PROPIONIC ACID ESTER INTERMEDIATES

Koichi Moriya, Hachioji, Japan; Uwe Priewitz, Solingen, Fed. Rep. of Germany; Hans-Jochem Riebel, Wuppertal, Fed. Rep. of Germany; Ludwig Ese, Leverkusen, Fed. Rep. of Germany, and Robert R. Schmidt, Bergish-Gladbach, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 560,725, Dec. 12, 1983, Pat. No. 4,596,599.
This application May 24, 1985, Ser. No. 738,105
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247930
Int. Cl.[4] C07C *143/38, 149/32, 149/40*
U.S. Cl. 558—48 3 Claims

1. A laevorotatory enantiomer of the formula



in which
Z represents tosyl or mesyl,
Y represents oxygen or the radical SO_m,
wherein
m represents 0, 1 or 2,
R^2 represents hydrogen or methyl,
n represents 1 or 2 and
R^3 and R^4 independently of one another represent hydrogen, halogen, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, nitro, cyano or alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy group.

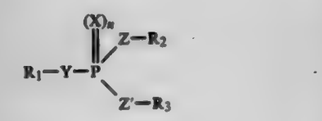
4,639,538

DEODORIZED COMPOSITIONS BASED ON ORGANOTHIOPHOSPHORUS COMPOUNDS

Hubert Linares, Caluire, France, assignor to Rhone-Poulenc Agrochimie, Lyons, France

Filed May 8, 1984, Ser. No. 608,097
Claims priority, application France, May 10, 1983, 83 08020
Int. Cl.[4] C07F *9/16*
U.S. Cl. 558—71 9 Claims

1. Deodorised compositions based on organothiophosphorus compounds which contain organothiophosphorus compounds of the formula:



in which:

R_1 denotes a hydrogen atom, an alkyl radical containing from 1 to 8 carbon atoms, preferably from 1 to 4 carbon atoms,

R_2 denotes an alkyl radical containing from 1 to 8 carbon atoms, preferably from 2 to 4 carbon atoms,

R_3 denotes an alkyl radical containing from 1 to 8 carbon atoms, preferably from 1 to 4 carbon atoms, optionally substituted by a halogen atom, a carbonamide group itself optionally substituted by at least one alkyl or alkylthio or alkoxycarbonyl or a phenyl radical, phenyl substituted by 1 to 3 substituents chosen from the group comprising a halogen atom, an alkyl containing from 1 to 4 carbon atoms, and the nitro and cyano group.

X, Y, Z and Z', which may be identical or different, denote an oxygen atom or a sulphur atom, with n being an integer equal to 0 or 1, Y being moreover capable of being a direct bond between R_1 and the phosphorus atom, and at least one of X, Y, Z and Z' necessarily being a sulphur atom, and an effective quantity of styrene as a deodoriser.

4,639,539

DIMERIZATION PROCESS IMPROVEMENTS

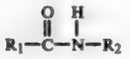
Leonard L. Hovey; Marion J. Mathews, III, and P. Robert Peoples, all of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 686,109, Dec. 24, 1984, abandoned, and a continuation-in-part of Ser. No. 664,625, Oct. 25, 1984, abandoned. This application Dec. 3, 1985, Ser. No. 804,013

Int. Cl.⁴ C07C *121/30*

U.S. Cl. 558—363 **4 Claims**

1. In a process for the production of 1,4-dicyano-1-butene from acrylonitrile where the acrylonitrile is catalytically dimerized in the presence of an organic phosphorus (III) catalyst, selected from the group consisting of phosphinites and phosphonites, an inert hydrocarbon reaction slovent and a non-interfering proton-donating solvent; and the dimerized product is thereafter separated from the catlyst by extraction, the improvement characterized in that in the extraction the dimerized product is dissolved in an extraction solvent consisting essentially of an amide of the empirical formula



where R_1 and R_2 individually have 0-6 carbon atoms and are individually selected from the group consisting of hydrogen, alkyl, cycloalkyl and aryl, and is removed from the catalyst by phase separation.

4,639,540

DICYANOETHENYL FATTY COMPOUNDS AND DERIVATIVES THEREOF

Michael J. Virnig, Fridley, and James P. Clark, St. Anthony, both of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Filed Feb. 28, 1985, Ser. No. 706,540

Int. Cl.⁴ C07C *121/30*

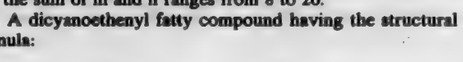
U.S. Cl. 558—444 **4 Claims**

1. A dicyanoethenyl fatty compound having the structural formula:



where m and n are integers, provided that n is greater than 4 and the sum of m and n ranges from 8 to 20.

2. A dicyanoethenyl fatty compound having the structural formula:



wherein R is H or methyl, m and n are integers and provided that n is greater than 4 and the sum of m and n ranges from 8 to 20.

4,639,541

SUBSTITUTED PHENYLACETIC ACID IODOPROPARGYL ESTERS, BIOCIDAL AGENTS CONTAINING SAME AND PROCESS FOR MANUFACTURING SAME

Gerhard Staiger, Munich; Tassilo Selmayr, Freising; Peter Kinzel, Feldkirchen-Westerham, and Anneliese Reütter, Engelharting, all of Fed. Rep. of Germany, assignors to Consortium fur elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

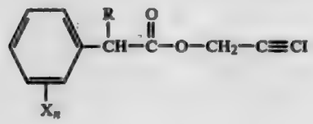
Filed Apr. 25, 1985, Ser. No. 727,027

Claims priority, application Fed. Rep. of Germany, May 7, 1984, 3416722

Int. Cl.⁴ C07C *79/46, 69/76*

U.S. Cl. 560—20 **12 Claims**

1. A compound of the formula:



wherein,

R represents a member selected from the group consisting of hydrogen, fluorine, chlorine, bromine, iodine, methoxy, 1-imidazolyl and 1,2,4-triazolyl;

X represents one or more of the same or different substituents independently selected from the group consisting of fluorine, chlorine, bromine, iodine, cyano, nitro, carboxyl, an alkyl of 1 to 12 carbon atoms, an alkoxy of 1 to 12 carbon atoms, a cycloalkyl of 3 to 6 carbon atoms, formyl, acetyl, propionyl, benzoyl, phenylsulfonyl, phenyl, phenoxy, and substituted phenyl and phenoxy each having from 1 to 3 substituents selected from the group consisting of fluorine, chlorine, bromine, nitro, methyl and methoxy; and

n is an integer of from 1 to 5 and, with the proviso that R does not represent hydrogen, n is 0 or an integer from 1 to 5.

4,639,542

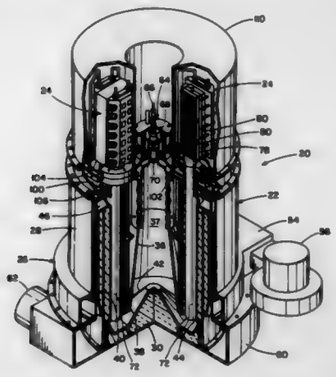
MODULAR THERMOELECTRIC CONVERSION SYSTEM

John C. Bass, and Norbert B. Elsner, both of La Jolla, Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed Jun. 11, 1984, Ser. No. 618,991

Int. Cl.⁴ H01L *35/28*

U.S. Cl. 136—210 **14 Claims**



1. A thermoelectric conversion system including a burner assembly and a plurality of modules for converting thermal energy resulting from the operation of said burner assembly into electrical energy, said burner assembly comprising:

a central combustion chamber for providing hot gase;

a plurality of heat pipes extending vertically throughout their length with each having an evaporator section for boiling a liquid to form vapor and a condenser section for condensing said vapor to form said liquid with the evaporator sections hanging pendant and disposed at spaced locations about said combustion chamber; and

flow means for causing the hot gases provided by said combustion chamber to flow past said evaporator sections thereby heating said sections to boil said liquid,

said heat pipes and said conversion modules corresponding in number, with each of said modules connected in heat transfer relationship with a corresponding heat pipe condenser section.

4,639,543

SEMICONDUCTOR DEVICES HAVING A METALLIC GLASS SUBSTRATE

Pao-Hsien Fang, Belmont, Mass., assignor to Richard J. Birch, Wellesley, Mass., a part interest

Continuation-in-part of Ser. No. 698,073, Feb. 4, 1985, abandoned. This application Mar. 8, 1985, Ser. No. 709,572

Int. Cl.⁴ H01L *31/04*

U.S. Cl. 136—256 **14 Claims**

13. A solar cell comprising:

an amorphous and electrically conductive substrate of metallic glass, said substrate forming one electrode of the solar cell;

at least one semiconductor layer deposited on said metallic glass substrate; and,

another electrode in electrically conductive contact with said at least one semiconductor layer said metallic glass substrate having one or more constituents of zinc, silicon, and copper, said one or more constituents providing an autodoping source and stabilizer for the deposited, immediately superimposed semiconductor layer.

4,639,544

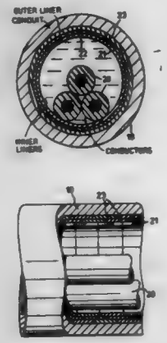
PIPE-TYPE CABLE SYSTEM WITH ELECTROMAGNETIC FIELD SHAPER

Joseph H. Dubich, 806 Queensbridge Drive, Mississauga, Ontario, Canada (L5C 3K4), and Raymond D. Findlay, 574 Tuscarora Road, Ancaster, Ontario, Canada (L9G 3N3)

Filed Aug. 1, 1985, Ser. No. 761,537

Int. Cl.⁴ H05K *9/00*

U.S. Cl. 174—32 **19 Claims**



1. In an electrical cable system for transmitting alternating current at power frequency, the system comprising a group of individually insulated conductors extending side by side within a metallic conduit, the conduit having a continuous interior wall and the conductors being disposed eccentrically within the conduit adjacent a first longitudinally extending region of said inner wall, a metallic first liner interposed between the conductors and said wall, the first liner having a longitudinal slot extending throughout its length, the slot being disposed adjacent a second longitudinally extending region of said wall opposite the first region.

4,639,545

RECOVERABLE ARTICLE FOR SCREENING

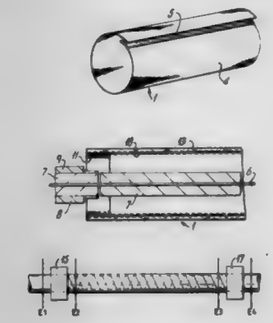
Kenneth B. Pithouse, nr. Swindon Wiltshire; Thomas P. H. Jones, Cirencester; Frank J. Lowe, Freshbrook, and Richard S. Skipper, Highworth Wiltshire, all of United Kingdom, assignors to Raychem Limited, London, England

Filed Feb. 5, 1985, Ser. No. 698,303

Claims priority, application United Kingdom, Feb. 7, 1984, 8403203

Int. Cl.⁴ H01B *7/34*

U.S. Cl. 174—36 **14 Claims**



1. An article capable of screening an electrical component, which comprises:

(a) a recoverable fabric having as a component thereof fibres comprising an electrically conductive material; and

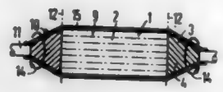
(b) means for electrically terminating said fibres, said article after recovery having a surface transfer impedance of 5 ohm/m or less, measured over a frequency of from 1 to 50 MHz.

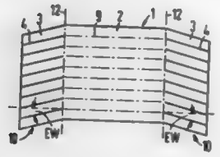
4,639,546

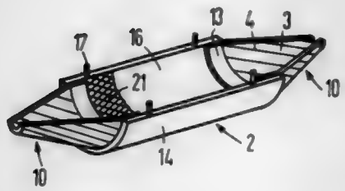
INSERT FOR A CABLE SLEEVE AND METHOD FOR THE PRODUCTION THEREOF

Hans-Jürgen Meltsch, Schwerte-Ergste, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 23, 1985, Ser. No. 790,559
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1984, 3439711
Int. Cl.⁴ H02G *15/08*; H01R *43/00*
U.S. Cl. 174—92 **37 Claims**







1. An insert for an electrical cable sleeve, consisting of an approximately rectangular central part and at least one contiguous lateral part which has incisions starting from the outwardly directed end, whereby strips are formed which serve to bridge the difference in diameter between the central part and an introduced cable, wherein incision angles are formed by the incisions in the lateral part extending obliquely in the same direction relative to the longitudinal axis of the insert, in such a way that in the mounted state of the insert the strips can be turned into the reduced diameter.

35. A method for the production of an electrical cable sleeve insert for mounting, over a cable splice, consisting of the steps of:

winding a rectangular central part of an insert in which lateral parts are attached to each end of the central part around cable splice material to be wrapped;

turning obliquely projecting strips of each respective lateral part of the insert inwardly or outwardly by light application of pressure and with a simultaneous rotational movement in a direction given by incision angles of incisions in the lateral part forming the strips to the longitudinal direction of the rectangular central part to reduce a diameter of the insert; and

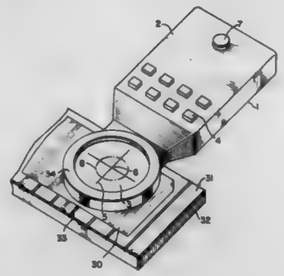
applying a protective covering over the mounted insert.

4,639,547

MARKING DEVICE FOR USE WITH INDUCTIVE MEASURING SENSOR

Wolfgang Jacob-Grinschgl, 40 Rumfordstrasse, D-8000 Munich, and Udo Müller, 20 b Furtweg, D-8044 Unterschleissheim, both of Fed. Rep. of Germany

Filed Oct. 2, 1985, Ser. No. 783,292
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1984, 3436641
Int. Cl.⁴ G08C *21/00*
U.S. Cl. 178—18 **11 Claims**



1. A marking device for marking a sheet mounted on a digitizer board of the type having a plurality of spaced, parallel conductors to which the application of current pulses in timed sequence produces a time variable magnetic flux, said marking device comprising:

a. a measuring coil having torroidal winding for receiving flux produced by said board when said coil is operatively positioned relative to said board;

b. switch means operable to cause said current pulses to be applied to said conductors on said board; and

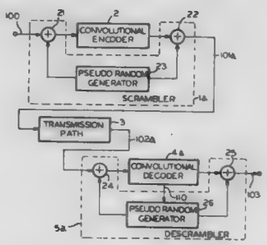
c. marking means responsive to operation of said switch means for marking said sheet when said coil is operatively positioned relative to said board.

4,639,548

DIGITAL COMMUNICATION SYSTEM INCLUDING AN ERROR CORRECTING ENCODER/DECODER AND A SCRAMBLER/DESCRAMBLER

Goro Oshima, and Kotaro Kato, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Apr. 1, 1985, Ser. No. 718,725
Claims priority, application Japan, Apr. 3, 1984, 59-67237
Int. Cl.⁴ H04L *9/00*
U.S. Cl. 380/43 **10 Claims**



10. A method of correcting errors in scrambled digital communication, said method comprising the steps of:

(a) providing digital signals for encoding and scrambling;

(b) encoding said signals in a convolution encoder means having a transmit input and output with said transmit input coupled to receive said digital signals and said transmit output coupled to a transmission path;

(c) scrambling said digital signals by including a first random generator means coupled between a source of said digital signals and said transmit input and between said transmit output and said transmission path whereby said scrambler means is coupled in parallel with said convolutional encoder means;

(d) transmitting said digital signals from said transmit output to said transmission path;

(e) applying signals transmitted over said transmission path to the convolution decoder means having a receive input and a receive output with said receive input being coupled to said transmission path and said receive output being coupled to a system output terminal;

(f) descrambling of said transmitted signals by including a second random generator means coupled between said transmission path and said receive input whereby a means for accomplishing said descrambling is coupled in parallel with said decoder;

(g) operating said first and second random generator means operating in the same pattern; and

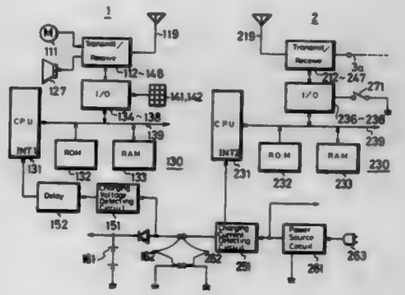
(h) monitoring a code error in said decoder, thereby synchronizing said second random generator.

4,639,549

CORDLESS TELEPHONE

Shoji Hirayama, Kanagawa, and Mitsuharu Inada, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 29, 1985, Ser. No. 696,183
Claims priority, application Japan, Jan. 31, 1984, 59-15451; Feb. 8, 1984, 59-21259
Int. Cl.⁴ H04Q *7/04*
U.S. Cl. 379—62 **18 Claims**



1. A cordless telephone, comprising:

a base unit connectable to a telephone network line for receiving and transmitting message signals therethrough;

a handset unit selectively mountable upon and separable from said base unit;

said base unit and said handset unit being adapted to preliminarily open and establish a communication channel therebetween by the transmission and reception of electromagnetic waves;

said base unit including identifying code generating means for automatically generating one of a plurality of identifying codes upon the mounting of said handset unit upon said base unit, first memory means for storing said generated identifying code, and means for initially transmitting said generated identifying code over said communication channel to said handset unit mounted thereupon;

said handset unit including second memory means for storing said identifying code initially transmitted thereto;

at least one of said base and handset units including means for transmitting over said communication channel to the other of said units the identifying code stored within the memory means of said one unit when said communication channel is preliminarily opened; and

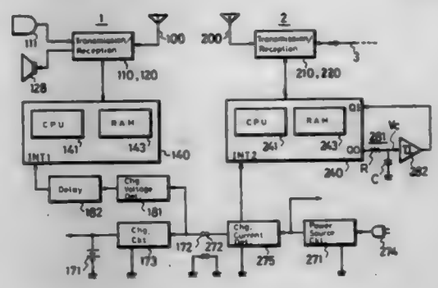
said other unit including means for detecting when said transmitted identifying code is identical to the identifying code stored in the memory means of said other unit and for establishing said communication channel only when identity is detected.

4,639,550

CORDLESS TELEPHONE

Masato Yamagawa, Kanagawa, and Keizo Tsukada, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 12, 1985, Ser. No. 722,359
Claims priority, application Japan, Apr. 20, 1984, 59-79784
Int. Cl.⁴ H04Q *7/04*
U.S. Cl. 379—62 **23 Claims**



1. A cordless telephone, comprising:

a base unit connectable to a telephone network line for receiving and transmitting message signals therethrough;

a handset unit selectively mountable upon and separable from said base unit;

said base unit and said handset unit each including means for transmitting an identifying code signal over electromagnetic waves and means for receiving said transmitted identifying code signal;

said base unit including first memory means, first detecting means for generating a first detected output upon the mounting of said handset unit upon said base unit, means for automatically generating a counted value in response to said first detected output and a predetermined time associated therewith, and first means for storing said counted value as a new identifying code signal in said first memory means, said means for transmitting thereupon transmitting said new identifying code signal to said handset unit;

said handset unit including second memory means, second detecting means for generating a second detected output upon the mounting of said handset unit upon said base unit, and second means for storing said new identifying code signal in said second memory means in response to said second detected output;

said base and said handset unit each further including identity detecting means for detecting when a received identifying code signal is identical to an identifying code signal stored in said first and second memory means, respectively, and means for establishing a communication channel between said base and handset units only when identity is detected.

4,639,551

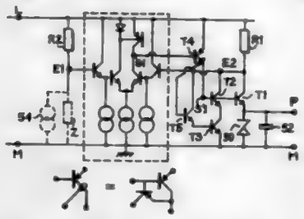
REGULATED POWER SUPPLY CIRCUIT PARTICULARLY FOR TELEPHONE SET

Jean C. Kaire, Ste Egreve, France, assignor to Thomson-CSF, Paris, France

Filed Jul. 12, 1984, Ser. No. 629,992
Claims priority, application France, Jul. 22, 1983, 83 12173
Int. Cl.⁴ H04M *19/00*
U.S. Cl. 323—231 **3 Claims**

1. DC voltage power supply circuit drawing its energy from

a line carrying an AC signal, including a voltage regulator configuration (50, 52) in series with a transistor (T1) controlled by a current regulator configuration (AD, R1, R2, 54), characterised in that there is also provided an assembly of second and third transistors in series (T2, T3), in parallel with the series assembly of the first transistor (T1) and of the voltage regulator configuration (50, 52), the second transistor having its base controlled like the first by the current regulator configuration



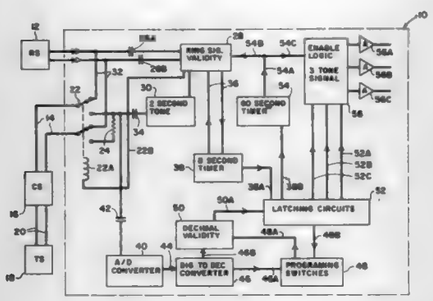
and the third having its base controlled by a means (56) of detecting the saturation of the current regulator configuration, so that a current is shunted out of the voltage regulator configuration when the input voltage of the circuit drops to a value that is too low, with respect to the output voltage of the voltage regulator configuration, for the current regulator configuration to continue to supply the voltage regulator configuration without discontinuity of current.

4,639,552

APPARATUS FOR CONVERTING A STANDARD TELEPHONE TO AN UNLISTED NUMBER TELEPHONE

Leon Hall, 1520 E. 43rd St. Tulsa, Okla. 74105

Filed Mar. 8, 1985, Ser. No. 710,003
Int. Cl.⁴ H04M *1/57*
U.S. Cl. 379—199 **2 Claims**



1. Apparatus for converting a standard telephone system including a conventional telephone instrument at a transmitting station (TS) which is conventionally connected by wire conduit to a central station (CS); and a receiving station (RS) having a conventional telephone instrument connected by conventional wire line to said central station;

the improved apparatus adapted to be attached to said RS which would convert it to an unlisted number telephone, comprising:

(a) switch means adapted to switch resistive load means across said line at the RS;

(b) first validity test means capacitance coupled to the line at said RS to recognize the wave shape of a conventional ringing signal, and to determine its validity;

(c) means responsive to said first validity test means, to produce for a selected time interval a selected first tone signal and apply it to said line;

whereby responsive to receiving this first tone signal at said TS, the TS, via a DTMF system, transmits to said RS a private code which may be one or more decimal digits in a selected successive order; whereby said dialed numbers will produce a pattern of tones received at said RS;

(d) capacitive coupled to said line at said RS in an analog to digital converter means (A/DC) and digital to decimal converter means (D/DC) for producing a series of decimal digit signals which pass to a second validity check means, to check that the dialed digits are valid;

(e) a plurality of settable switches are connected serially to the output of said A/DC and D/DC;

(f) third validity test means to determine that each successive decimal digit corresponds completely to the numbers set into said successive swtiches; and means responsive to each successive validation of a switch to set a corresponding latch; and

(g) responsive to said set latches, logic means to enable one of a selected number of tone generators to apply their signals to a sound source;

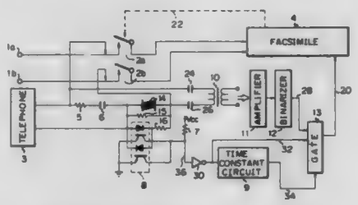
whereby the operator of said RS can determine from the particular tone or tones, which one of a selective group of possible callers, the present call is from, and whether or not he wants to speak with said caller.

4,639,553

CALL SIGNAL DETECTING DEVICE

Masao Kiguchi, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 9, 1985, Ser. No. 721,406
Claims priority, application Japan, Apr. 9, 1984, 59-69245
Int. Cl.⁴ H04N *1/32*
U.S. Cl. 379—377 **3 Claims**



1. A call signal detecting device connected to a telephone line together with a telephone set for identifying an unsounding call signal and a sounding call signal which are received over the telephone line, said call signal detecting device comprising:

first binarizer means for converting a frequency signal received over the telephone line to two binary levels and providing a first output;

second binarizer means for converting a sounding call signal received over the telephone line to two binary levels and providing a second output;

selector means for selectively delivering said outputs of said first and second binarizer means wherein the selector means selects said second output and the second binarizer means has received said sounding call signal; and

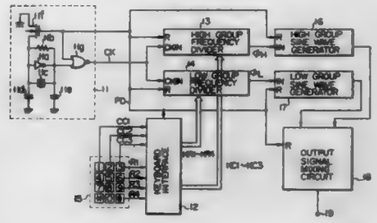
signal identifying means for identifying an unsounding call signal and a sounding call signal by measuring a period of a signal delivered from said selector means.

4,639,554

DUAL-TONE MULTIPLE-FREQUENCY-SIGNAL GENERATING APPARATUS

Eiji Masuda, Kawasaki, and Yasuhiko Fujita, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 24, 1984, Ser. No. 685,834
Claims priority, application Japan, Dec. 26, 1983, 58-244116; Dec. 26, 1983, 58-244117; Dec. 26, 1983, 58-244118
Int. Cl.⁴ H03K *1/16*; G06F *15/20*
U.S. Cl. 340—365 S **34 Claims**



1. A dual-tone multiple-frequency-signal generating apparatus, comprising:

key input means in which keys are arranged in a matrix;

reference-frequency-signal generating means for generating a reference frequency signal;

frequency dividing means for dividing the reference frequency signal from said reference-frequency-signal generating means corresponding to a key actuated by said key input means and for producing first and second frequency-divided signals;

sine-wave-signal generating means for generating respective first and second sine wave signals having approximately the same cycles as those of first and second standard frequencies using the first and second frequency-divided signals from said frequency dividing means;

first level converting means with high input impedance for receiving and level converting the first sine wave signal;

second level converting means with high input impedance for receiving and level converting the second sine wave signal; and

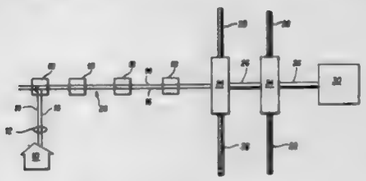
output-signal-mixing means connected to said first and second level converting means for combining the first and second level converted sine wave signals produced from said first and second level converting means to produce a dual-tone multiple frequency signal.

4,639,555

PAIR CUT APPARATUS AND METHOD OF USE

Ronald N. Bone, Dallas, Tex., assignor to Southwestern Bell Telephone Company, St. Louis, Mo.

Filed Mar. 8, 1985, Ser. No. 709,792
Int. Cl.⁴ H04Q *1/18*
U.S. Cl. 379—327 **13 Claims**



1. A method of restoring service in telephone networks in which a fault has occurred between a field box and a central office wherein said networks contain pairs of wires which originate at a customer's premises; field connection boxes which connect pairs of wires; and cable protector blocks on a central office distributing frame which contain protectors having means for connecting with corresponding receptacles on said protector block wherein each protector connects a pair of wires from the field with its corresponding pair of office wires comprising:

(a) in a field box, which is located between the customer's premises and the fault, connecting the non-functioning pair of wires which runs towards the customer's premises and which has been assigned to the customer to a second unassigned functioning pair of wires which runs to the central switching office;

(b) removing the protector on the cable protector block from the non-functioning pair of wires which has been assigned to said customer and from said second unassigned functioning pair of wires;

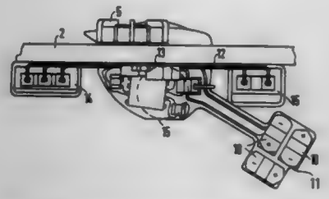
(c) with a connecting cable which has connectors on each of its ends, connecting one end of said cable with the receptacles on the cable protector block that corresponds to the office wires of the non-functioning pair of wires which has been assigned to said customer and connecting the other end of said cable with the receptacles on the cable protector block that correspond to the field wires of said second unassigned pair of wires.

4,639,556

HEARING AID WITH A FLEXIBLE PRINTED CIRCUIT BOARD

Christof Hirtl, Neuakirchen, and Hans Wagner, Buckenhof, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 14, 1984, Ser. No. 650,387
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1983, 3336266
Int. Cl.⁴ H04R *25/02, 25/00*
U.S. Cl. 381—68.6 **6 Claims**



1. A hearing aid for insertion into a user's outer auditory canal, comprising:

a housing including an end plate;

a flexible printed circuit comprising component zones to which electrical components are mounted and bending zones which are devoid of electrical components; and

a user-operated control element located on the end plate of the housing and fastening the circuit to the end plate inside the housing.

4,639,557

REMOTE TESTING SYSTEM FOR ELECTRICAL CIRCUITS

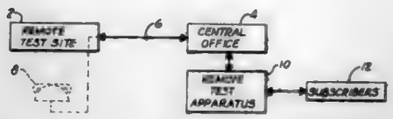
Myron C. Butler, Edmond, Okla.; William R. Hilligoss, and Lawrence O. Hilligoss, both of Ashland, Oreg., assignors to Communications Technology Corporation, Los Angeles, Calif.

Filed Sep. 27, 1985, Ser. No. 781,412
Int. Cl.⁴ H04B *3/46*
U.S. Cl. 379—29 **20 Claims**

1. A test system for testing from a test site a selectable one of a plurality of electrical circuits, comprising:

testing means, connectible to the plurality of electrical circuits, for receiving a control signal from the test site and for generating and applying a test signal to the one of the

plurality of electrical circuits selected in response to the control signal from the test site; and



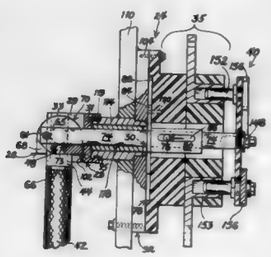
synthesized voice means, connected to said testing means, for generating audible speech signals to verbally communicate a result from said testing means to the test site.

4,639,558

REVERSING SWITCH

Jennings Lycan, Huntington, W. Va., assignor to Service Machine Co., Huntington, W. Va.

Filed Jan. 2, 1986, Ser. No. 815,520
Int. Cl.[4] H01H *9/00*
U.S. Cl. 200—1 V 11 Claims



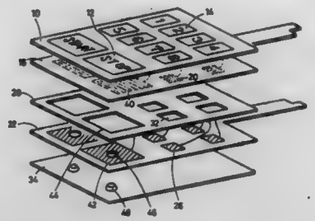
1. In a reversing switch having an enclosure with a hub extending through a wall thereof, a shaft extending through said hub and being journaled therein for rotational and axial movement, stationary contact means circumferentially spaced within said enclosure, moveable contact means supported by said shaft and rotatable therewith in the axially displaced position to engage said stationary contact means in forward and reverse modes at opposite ends of a range of rotation of said shaft, an operator member at the forward end of the hub through which said shaft is axially and rotatably journaled, handle means connected to said shaft and having means engageable with said operator member to move said shaft back and forth longitudinally to open and close said contact means in response to backward and forward swinging movement of said handle means, said shaft and moveable contact means being rotatable by said handle means between selected positions prior to axial displacement to close said contact means, the improvement comprising: means interconnecting the operator member and hub preventing fore and aft movement of the operator member relative to the hub while enabling rotation of the operator member about the hub.

4,639,559

MEMBRANE KEYBOARD

Toshimichi Taguchi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 461,148, Jan. 26, 1983, Pat. No. 4,585,601. This application May 7, 1985, Ser. No. 731,273
Claims priority, application Japan, Jan. 29, 1982, 57-13679; Jan. 29, 1982, 57-13680
The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.
Int. Cl.[4] H01H *13/70*
U.S. Cl. 200—5 A 1 Claim



1. A membrane keyboard comprising:
a first flexible sheet having key pad lables formed thereon, said key pad labels including at least one larger size key pad label and at least one smaller size key pad label;
a second flexible sheet disposed below said first flexible sheet, said second flexible sheet carrying conductor electrodes formed on the rear surface thereof, each of said conductor electrodes having a size substantially identical to the corresponding key pad label formed on said first flexible sheet;
a third flexible sheet disposed below said second flexible sheet, said third flexible sheet carrying counter conductor electrodes formed on the front surface thereof, each of said counter conductor electrodes having a size substantially identical to the corresponding conductor electrode formed on the rear surface of said second flexible sheet;
a spacer sheet disposed between said second and third flexible sheets, said spacer sheet including:
large and small openings formed at positions corresponding to the conductor electrodes formed on the rear surface of said second flexible sheet, each of said openings having a size substantially identical to the corresponding conductor electrode; and
a partition bridge member integral with the spacer sheet and formed across the larger opening which corresponds to said larger size key pad label, said partition bridge member dividing the larger opening into two sections, whereby additional support provided for said second flexible sheet by said partition bridge member prevents an erroneous connection between the conductor electrodes and counter conductive electrodes;
and a reinforcing plate disposed below said third flexible sheet.

4,639,560

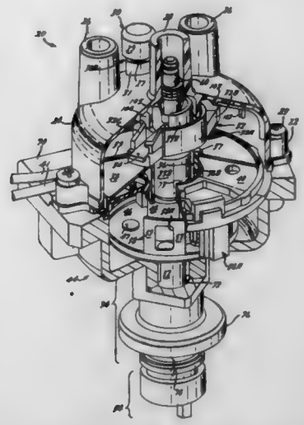
SPARK SHIELD AND INLET AIR VENT FOR AN IGNITION DISTRIBUTOR

Leonard J. Kronberger, Oak Park, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 1, 1985, Ser. No. 782,760
Int. Cl.[4] F02P *1/00*; H01H *19/00*
U.S. Cl. 200—19 R 2 Claims

1. For an internal combustion engine with cylinders, an ignition distributor including a distributor cap, a rotor, spark plug electrodes, a coil electrode, a shaft, a bowl shaped housing, a switch plate assembly with mating pockets, an interrupter and a rotor electrode, a spark shield comprising:

a circular shaped membrane of a generally domed shape;
radial stiffening ribs projecting from the outer circumferential edge of the circular membrane;
the membrane having an opening at its center into which the radial stiffening ribs terminate; and



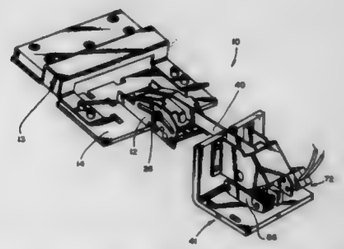
mating means located on the outer circumferential edge of the circular membrane for communication with the switch plate assembly.

4,639,561

MECHANICAL TIME DELAY MECHANISM

Aymon A. Maulandi, Cedar Rapids, Iowa, assignor to Square D Company, Palatine, Ill.

Filed Dec. 18, 1984, Ser. No. 683,092
Int. Cl.[4] H01H *7/00*
U.S. Cl. 200—33 R 13 Claims



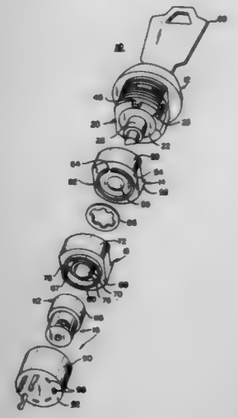
1. A time delay mechanism displacing a second member after a predeterined time delay and in response to the displacement of a first member being located adjacent said mechanism, the second member also being located adjacent said mechanism, said mechanism comprising:
a link having a first end and a second end, said first end connected with the first member;
delay means for delaying movement of the link in response to displacement of the first member;
a wheel rotatably mounted about an axle, said wheel having a point spaced apart from said axle, said wheel connected at said point to the second end of said link, said wheel rotating in response to movement of said link;
slow means for slowing the rotation of said wheel; and
a pin mounted on said wheel, said pin being adapted to displace the second member upon the rotation of the wheel through a predetermined angle.

4,639,562

KEY LOCK SWITCH WITH ANTISTATIC MEANS

Eric Fredrickson, W. Bridgewater, Mass., assignor to C&K Components, Inc., Newton, Mass.

Filed Nov. 14, 1984, Ser. No. 671,409
Int. Cl.[4] H01H *27/06*
U.S. Cl. 200—43.08 9 Claims



1. A lock actuated switch comprising a lock, a key, a midplate, and a switch, the lock including a lock cylinder and a shell, the lock cylinder having a body portion, the body portion having a flange extending therefrom and a stop portion extending therefrom and including a key hole and an activating means, the activating means extending from the lock cylinder, having a free terminal end and having a logitudinal axis, the key engageable in the key hole and adapted on movement to rotate the activating means, the midplate comprises a top surface, a mid-surface, a lower surface and a centrally located through aperture, the lower surface having a tubular element extending therefrom forming a continuation of the aperture and is coaxial therewith, an antistatic wall extends away from the lower surface, circumscribes the tubular element in spaced relation, in spaced from the periphery of the lower surface, has a bottom surface and extends beyond the horizontal plane of the lower surface, the shell having a wall defining a through, longitudinal bore having a recess formed therewith, the body portion fitted within the bore and the stop portion positioned within the recess, the switch includes a tubular engagement portion extending therefrom and an engagement wall defining a circular configuration, the tubular element circumscribing the engagement portion, the engagement wall circumscribing the tubular element and the antistantic wall circumscribing the engagement wall, the tubular element and the antistatic wall of the midplate associated with the lock and the switch and positioned between the lock and the switch, the midplate operationally engaged with the switch and the lock, the switch having an actuating means and the activating means engaging the actuating means whereby rotation of the key will actuate the switch and will move the stop portion within the recess.

4,639,563

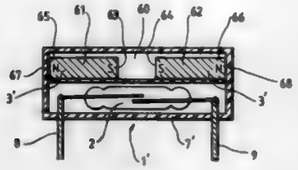
ACCELERATION AND DECELERATION SENSOR

Walter Günther, Nürnberg, Fed. Rep. of Germany, assignor to W. Günther GmbH, Nürnberg, Fed. Rep. of Germany

Filed Oct. 22, 1984, Ser. No. 663,185
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1983, 3338287
Int. Cl.[4] H01H *35/14*
U.S. Cl. 200—61.45 M 4 Claims

1. An acceleration and deceleration sensor, comprising:
a first abutment;

a second abutment spaced apart from said first abutment by a fixed distance;
a first permanent magnet slidably mounted between said first and second abutments;
a second permanent magnet slidably mounted between said first permanent magnet and said second abutment, said second permanent magnet being oriented to magnetically repel said first permanent magnet, so that mutual magnetic



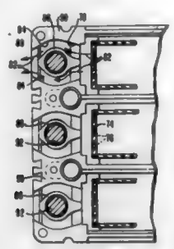
repulsion forces said first permanent magnet against said first abutment and forces said second permanent against said second abutment except when the sensor undergoes acceleration or deceleration; and
a reed switch mounted adjacent said magnets, said reed switch being responsive to magnet position in order to sense an acceleration or deceleration which forces one magnet toward the other despite the repelling force.

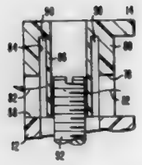
4,639,564

CIRCUIT BREAKER WITH ARC CHAMBER VENT

Kurt A. Grunert, Beaver Boro; Roger E. Walker, Franklin Township, Beaver County; Charles R. Paton, New Brighton, and David A. Leone, Center Township, Beaver County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 1, 1985, Ser. No. 729,437
Int. Cl.[4] H01H *33/04*
U.S. Cl. 200—144 R 7 Claims





1. A circuit breaker with arc chamber vent, comprising:
an electrically insulated housing including line and load terminals;
an arc quenching chamber within the housing;
a circuit breaker structure within the housing and having stationary and movable contacts operable between open and closed positions in an arcing zone within the chamber;
the contacts forming a circuit breaker path between the terminals;
operating means for actuating the contacts;
the housing having wall means forming a compartment for containing each terminal and having a first opening between each pair of corresponding chambers and compartments;
the wall means also forming second openings on the side of the chamber opposite the first openings, and
the wall means also forming a tubular wall around the terminal and between the first and second openings for isolating the terminal from any arc gases venting from the chamber and through the compartment to ambient air, thereby avoiding an electrical breakdown between the terminal and any proximate electrical conductor.

4,639,565

HIGH TENSION ARC-BLAST CIRCUIT BREAKER

Van Doan Pham, Meyzieu, France, assignor to Alsthom-Atlantique, Paris, France

Filed May 21, 1985, Ser. No. 736,505
Int. Cl.[4] H01H *33/88*
U.S. Cl. 200—148 A 4 Claims

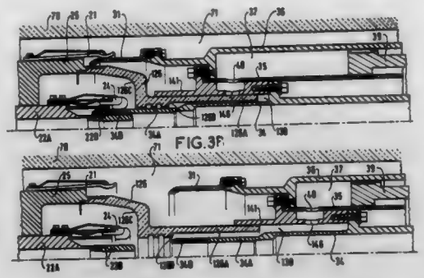


FIG.3F

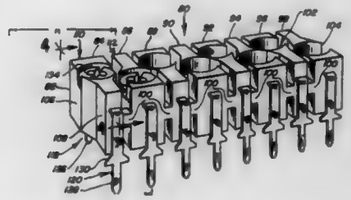
1. In a high tension arc-blast circuit breaker comprising at least one circuit breaker for breaking one phase of a polyphase current and disposed inside an insulating or metal envelope (70), said circuit-breaking device comprising a fixed first assembly having fixed main contacts (21) and fixed anti-sparking contacts (24, 22B), and a moving second assembly having moving main contacts (31) and moving anti-sparking contacts (34B), the fixed assembly including a first volume (27) in which pressure is increased under the effect of the breaking arc, the gas in said volume expanding via a first nozzle (26A) to blast the arc at a zero crossing in the current to be broken, the second moving assembly including a second volume (37) in which the gas is compressed by a piston at the beginning of the circuit breaker opening phase and is directed onto the arc via a second nozzle (42A) during the later phases, the improvement comprising interengaging means carried by said nozzles (26A, 42A) which remain in contact over the full extent of relative movement between said nozzles to prevent any direct passage of blast gases into the volume (71) lying between said assemblies and said envelope.

4,639,566

DIP SWITCH ASSEMBLY HAVING SIDE EXTENDING LEADS

Lon DeHaitre, Arlington Heights, Ill., assignor to Abbott-Interfast Corporation, Wheeling, Ill.

Continuation-in-part of Ser. No. 686,290, Dec. 26, 1984, abandoned, which is a continuation of Ser. No. 484,896, Apr. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 331,235, Dec. 16, 1981, Pat. No. 4,403,126. This application Apr. 4, 1985, Ser. No. 719,919
The portion of the term of this patent subsequent to Sep. 6, 2000, has been disclaimed.
Int. Cl.[4] H01B *3/40*; H01H *1/02*; H01R *9/00*
U.S. Cl. 200—158 12 Claims



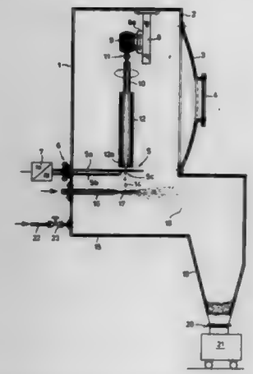
1. A switch assembly comprising:
a body of electrically insulative material molded to provide a strip of integrally formed, joined segments arranged in side-by-side alignment, each segment having a top surface, a bottom surface, lateral side surfaces, and two opposed ends;
each segment presenting a pair of horizontally extending passageways opening to said side surfaces, and each segment presenting a vertical socket open to the top surface, the sockets of respective segments being arranged adjacent alternating ends of said adjacent segments, the passageways in adjacent segments being spaced apart at a standard distance;
a pair of conductive stakes in each segment, one stake being inserted in each passageway of each said segment and each stake presenting a top contact portion formed to be adjacent to and spaced from the socket of that segment to form a pole of a switch so that the top portions of the two stakes inserted in the two passageways of each segment form two spaced poles of a switch;
each segment having a headed screw inserted in said socket and forming a bridging member extending between said two poles, said screw capable of being rotated between an engaged position in which the screw head makes electrical contact between the poles of said segment to close the switch of that segment and a disengaged position in which the screw head is free of said poles to open the switch of that segment;
there being connecting webs between every pair of adjacent segments formed about the median horizontal plane of the segments, the connecting webs having a height less than the distance between the segment top and bottom surfaces and a width much less than the distance between the segment ends;
each said pair of stakes forming a pair of opposed leads having said contact portions thereof integrally molded in said body, and central portions that extend substantially perpendicularly out of said body respectively at said two sides of the body and that are bent downwardly at approximately right angles to said contact portions, and each of said leads having end portions terminating said leads opposite said contact portions, the distance between lead end portions of adjacent pairs of leads being a standard distance, and the distance between lead end portions of each pair of leads also being a standard distance.

4,639,567

METHOD AND APPARATUS FOR MELTING ROD-SHAPED MATERIAL WITH AN INDUCTION COIL

Otto Steazel, Gründau, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Sep. 11, 1985, Ser. No. 774,918
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1984, 3433458
Int. Cl.[4] H05B *6/40*
U.S. Cl. 219—10.43 12 Claims



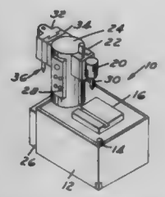
1. A method for drip-melting rod-shaped material comprising:
continuously displacing rod-shaped material in the direction of the rod axis towards an induction coil arranged at the lower end of the rod coaxially therewith, supplied with an alternating current and having an opening, the axial dimension of the induction coil being several times smaller than the diameter of the rod-shaped material, and causing melt of the rod-shaped material freely to fall in liquid form through the opening of the induction coil by holding the lower end of the rod-shaped material with its end face at a substantially constant axial spacing above the induction coil.

4,639,568

APPARATUS AND METHOD FOR FINISHING FUEL INJECTOR SPRAY TIPS USING EDM

John M. Check, Chelsea, and Myron C. Johnson, Freeland, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Jul. 13, 1984, Ser. No. 630,809
Int. Cl.[4] B23H *7/00, 9/10*; B21K *1/24*; F02M *55/00*
U.S. Cl. 219—69 M 8 Claims



5. A method for producing a dripless fuel sack volume in a fuel injector spray tip having a bore terminating at a frusto-conical surface with a blunt end surface comprising the steps of: cold deforming the blunt end surface and frusto-conical surface to produce a V-shaped electrode tip relief space and a near net shape valve seat, and thereafter non-contact machining the valve seat by use of a V-shaped electrode having its tip configured to be spaced from the tip at the relief space thereby to form a finished valve tip interior that accommodates a

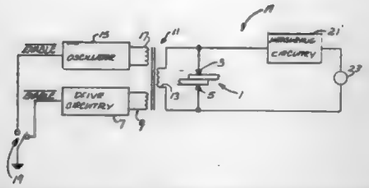
needle valve component while defining a reduced volume fuel cavity to reduce fuel dribble when the valve is closed.

4,639,569

WELD RESISTANCE MEASURING APPARATUS FOR A SPOT WELDER

Gerald Dufresne, LaVerne, Calif., assignor to Unitek Corporation, Monrovia, Calif.

Filed Apr. 1, 1985, Ser. No. 718,295
Int. Cl.[4] B23K *11/24*
U.S. Cl. 219—109 **22 Claims**



8. In a spot welder having drive circuit means and welding electrodes for connection to each of a group of weld sites that are subject to variation with respect to weld resistance, the drive circuit means having an output for supplying welding current through the welding electrodes to the connected weld site, apparatus to selectively supply welding current or alternating current for measuring weld resistance of the connected weld site, the improvement which comprises:

(a) measuring circuit means having an input for connection in parallel with the weld site and said output;

(b) test-signal-generating means for inducing a flow of alternating current through the weld site such that the percentage variation in the magnitude of the alternating current is substantially less than the percentage variation to which resistance weld sites are subject; and

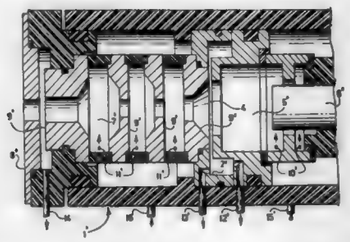
(c) the measuring circuit means including means responsive to voltage developed at said input as a result of the flow of the alternating current through the weld site for producing a signal representative of the magnitude of the resistance of the weld site.

4,639,570

APPARATUS FOR STABILIZATION OF LOW-TEMPERATURE PLASMA OF AN ARC BURNER

Karel Zverina, No. 4 U kola, Praha 4; Denek Tluchor, No. 4 Drevna, Praha 2; Josef Szabo, No. 4 Ripska, Praha 10; Jaromir Polidor, No. 43 Ovenecka, Praha 7, and Petr Kroupa, No. 540 Fertekova, Praha 8, all of Czechoslovakia

Division of Ser. No. 466,648, Feb. 15, 1983, Pat. No. 4,531,043. This application Feb. 8, 1985, Ser. No. 699,654
Claims priority, application Czechoslovakia, Feb. 15, 1982, 1023-82; Feb. 15, 1982, 1024-82
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 PP **1 Claim**



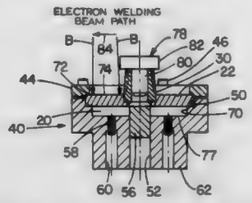
1. In a liquid stabilized plasma burner containing a discharge chamber which surrounds a rod-like cathode, a front nozzle, and a stabilization channel disposed between said discharge chamber and nozzle, the improvement wherein between the discharge chamber and the stabilization channel there is disposed a transition space, said transition space separating said discharge chamber and said stabilization channel, said discharge chamber having disposed therein at least one tangential inlet for a first stabilization liquid which is adapted to be introduced into said discharge chamber, and said stabilization channel having disposed therein at least one tangential inlet for a second stabilization liquid which is adapted to be introduced into said stabilization channel, and said transition space having arranged therein at least one outlet for the stabilization liquids, first conduit means externally connected to said burner for supplying a first stabilization liquid to the tangential inlet of said discharge chamber, second conduit means externally connected to said burner for supplying a second stabilization liquid to the tangential inlet of said stabilization channel, said first and second conduits being independent of each other, and an orifice plate arranged between the discharge chamber and stabilization channel, said orifice plate forming two circumferential slot outlets on respective opposite sides of said orifice plate, the first and second stabilization liquids flowing in opposite axial directions.

4,639,571

METHOD OF BEAM WELDING METALLIC PARTS TOGETHER AND APPARATUS FOR DOING SAME

Edward F. Lewandowski, Westmont, Ill.; Dale A. Cassidy, Valparaiso, Ind., and Robert G. Sommer, Lemont, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 29, 1985, Ser. No. 802,874
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 EC **15 Claims**



1. A method of welding an elongated metallic piece to one side of a metallic plate from the opposite other side of such plate, such method comprising the steps of

temporarily clamping the elongated piece to such one side of the plate while leaving the opposite side of the plate exposed,

the clamped piece and plate initially having an interface tracing an elongated path therebetween with interstices along the plate,

providing a heat conductive heat sink material, and configuring such material to engage such piece, and such plate on the one side, each at locations proximate to but spaced from the interface,

subjecting the other side of such plate to an electron welding beam, focused narrowly at and in registry opposite to the elongated clamped piece,

moving the electron welding beam along the elongated path in opposite registry to the elongated clamped piece,

the electron welding beam being supplied with adequate energy for penetrating through the plate, across the interface, and into the piece,

whereby the electron welding beam produces molten material from the plate and piece at the interface,

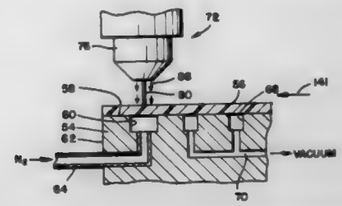
the heat sink material sufficiently cooling the plate and piece proximate to but not at the interface, and preventing thereby the molten material from extruding from the interface, but instead of filling the interstices and providing a welded joint substantially void of interstices.

4,639,572

LASER CUTTING OF COMPOSITE MATERIALS

Boris Grazman, Binghamton, and Carl-Otto Nilsen, Vestal, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Nov. 25, 1985, Ser. No. 801,606
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LG **19 Claims**



1. A method of laser cutting of sheet material while minimizing oxidation thereof comprising the steps of:

directing a laser beam at a first surface of the sheet material;

selectively moving the beam and the sheet material relative to one another to thereby cut the sheet material;

isolating in an atmosphere of inert gas a second surface of the sheet material opposite the first surface and proximate to the anticipated cut line to be made by the laser beam; and

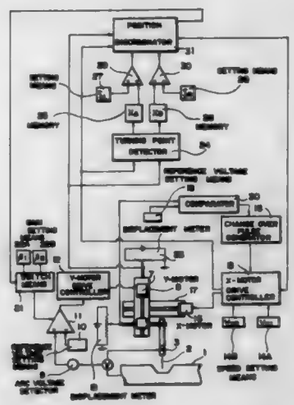
simultaneously directing a cylindrical jet of inert gas against the first surface of the sheet material at which the laser beam is directed, the jet of inert gas being coaxial with the laser beam to thereby isolate a region of the first surface surrounding the location at which the laser beam strikes the first surface.

4,639,573

AUTOMATIC GROOVE TRACING CONTROL METHOD FOR ARC WELDING

Yuji Sagitani, and Naohiro Tamaoki, both of Tsu, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1985, Ser. No. 750,169
Claims priority, application Japan, Jul. 4, 1984, 59-137245
Int. Cl.[4] B23K *9/12*
U.S. Cl. 219—124.22 **4 Claims**



1. In an automatic groove tracing control method for arc welding in which during arc welding of a groove of a pair of metals to be welded a welding torch is moved in its axial direction so as to maintain an arc voltage or welding current at a predetermined value and thereby maintain an arc length constant and said torch is caused to weave in a width direction of said groove with respect to a direction of welding while changing the direction of said weaving each time a displacement or position of said torch in said torch axial direction attains a predetermined value thereby effecting an automatic tracing control of said torch during said arc welding, the improvement comprising the steps of:

detecting positions of terminal ends of each cycle of said weaving from a weaving stroke of said torch in said groove width direction;

establishing a predetermined small area on each side of a central portion of said groove in accordance with said terminal ends;

increasing a first travel speed of said torch in said torch axial direction and decreasing a second travel speed of said torch in said groove width direction each time the weaving position of said torch in said groove width direction enters each of said small areas from said groove central portion;

restoring said second travel speed to its initial value when the direction of said weaving is reversed; and

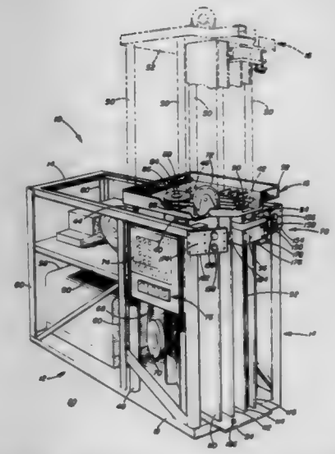
restoring said first travel speed of said torch to its initial value when said torch emerges from each said small area and enters said groove central portion.

4,639,574

AUTOMATIC DUCT WELDING MACHINE

Peter J. Arnoldt, Clairton, and Fredrick J. Arnoldt, Bethel Park, both of Pa., assignors to Ductmate Industries, Inc., Pittsburgh, Pa.

Filed Oct. 19, 1984, Ser. No. 662,956
Int. Cl.[4] B23K *9/12, 37/02*
U.S. Cl. 219—125.1 **20 Claims**



1. Apparatus for welding sheet member edges together to form a duct section comprising,

a machine frame, said machine frame having a stationary portion and a movable portion, said movable portion being vertically movable relative to said stationary portion between an upper unloading position offset from said stationary portion and a lower welding position telescoping with said stationary portion,

said stationary portion including an abutment member with a surface defining a V-groove or U-channel for supporting a pair of adjacent longitudinal sheet member edges at a preselected angle to maintain the adjacent longitudinal sheet member edges positioned in abutting relation,

clamp means positioned on said frame movable portion to move toward and away from said abutment member for

engaging and disengaging the sheet member edges with said abutment member surface,

a welding machine including a welding gun positioned on said frame movable portion,

guide means positioned on said frame movable portion in facing relation to said V-groove or U-channel for supporting said welding gun for longitudinal movement on said frame movable portion along a path facing said V-groove or U-channel for welding together in abutting relation said longitudinal sheet member edges,

actuating means mounted on said machine frame for moving said welding gun along said guide means the length of the abutting sheet member edges positioned in engagement with said abutment member surface, and

control means for actuating said welding machine upon movement of said welding gun to form a continuous welded seam sealingly connecting the abutting sheet member edges.

13. A method for connecting sheet member edges with internal welding in the formation of duct work of polygonal or circular cross-section comprising the steps of,

positioning a body of sheet material arranged to have an outline of a duct portion having a pair of adjacent longitudinally extending sheet member edges on a fixed frame,

supporting the pair of longitudinal sheet member edges on the fixed frame so that the adjacent sheet member edges are positioned in abutting relation,

clamping the pair of sheet member edges in said abutting relation to said fixed frame by moving clamp means outward toward said longitudinal sheet member edges,

mounting a welding gun within said body in position opposite to the abutting sheet member edges for linear movement along the length of the sheet member edges,

moving the welding gun in a linear path within said body and parallel to the abutting sheet member edges,

actuating the welding gun when the welding gun reaches a first position in said linear path opposite to the upper end of the abutting sheet member edges,

welding together the pair of sheet member edges upon movement of the welding gun along said linear path, and

stopping the movement of the welding gun and interrupting the welding operation when the welding gun moves to a second position in said linear path opposite to the lower end of the abutting sheet member edges to form a continuous weld extending along the pair of sheet member edges to weld said abutting edges together to complete said duct portion.

4,639,575

THREE O'CLOCK NARROW GROOVE WELDING APPARATUS

Isao Asano, Kure, Japan, assignor to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 317,544, Nov. 2, 1981, Pat. No. 4,504,729. This application Jan. 23, 1984, Ser. No. 573,130

Claims priority, application Japan, Nov. 5, 1980, 55-154702; Nov. 11, 1980, 55-157742

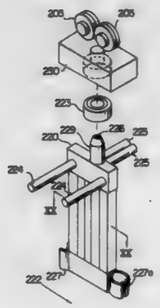
Int. Cl.⁴ B23K *9/00*

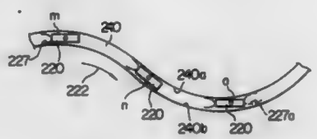
U.S. Cl. 219—136 **4 Claims**

1. An apparatus for three o'clock welding in a narrow groove wherein welding is carried out by moving a welding torch in a space in a groove having a center line in the form of a curve displaced in the horizontal direction and/or in the vertical direction, comprising:

a welding head for feeding a welding wire;

a welding torch provided with a contact means and mounted on the welding head so that the torch is freely rotatably movable with respect to the welding head by a force applied thereto from the wall of the groove, with a center of the rotatable movement being that of the contact means; and





means for moving said welding torch along the space in the narrow groove at all times.

4,639,576

WELDING ELECTRODE

Lewis E. Shoemaker, and Thomas O. Bates, both of Huntington, W. Va., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Continuation of Ser. No. 714,988, Mar. 22, 1985, abandoned. This application May 30, 1986, Ser. No. 871,128

Int. Cl.⁴ B23K *35/22*

U.S. Cl. 219—146.23 **6 Claims**

1. A consumable electrode for welding a 625 alloy clad steel workpiece, the electrode including a core wire and a coating, the core wire consisting essentially of about 20% to about 23% chromium, about 8% to about 10% molybdenum, up to about 5% iron, up to about 1% cobalt, up to about 0.5% silicon, up to about 0.4% aluminum, up to about 0.4% titanium, about 3% to about 4% columbium plus tantalum, the balance nickel and trace impurities, and the coating consisting essentially of about 10% to about 40% calcium carbonate, about 10% to about 35% cryolite, about 10% to about 30% titanium dioxide, up to about 10% magnetite, about 6% to about 12% molybdenum, up to about 7% nickel-columbium, up to about 10% chromium, up to about 15% nepheline syenite, up to about 5% zirconium oxide, up to about 5% periclase, up to about 5% extrusion aids, and a binder.

4,639,577

ELECTRODES FOR ENHANCED HEAT AND MASS TRANSFER APPARATUS

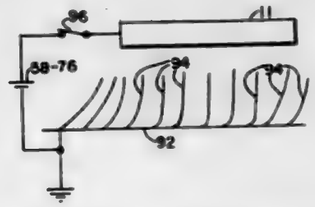
Eugene J. Sturdevant, Berwyn, Pa., assignor to Harry Hill Associates, Philadelphia, Pa.

Filed Jul. 3, 1985, Ser. No. 752,367

Int. Cl.⁴ H05B *3/62;* **H01T** *19/04*

U.S. Cl. 219—399 **16 Claims**

1. An improved corona generation electrode configuration for use in a device for enhancing heat and mass transfer, employing corona discharge, wherein the corona generation electrode and another body providing a second electrode are able to produce corona discharges between them, comprising providing said corona generation electrode with a plurality of corona discharge generators with pointed or small diameter free ends fixed at their opposite ends to a common conductive base wherein the corona generation electrode employs a plurality of flexible self-adjusting corona discharge generators having at least a current conducting capability and each of



which is connected to the conductive base so as to yield under mechanical pressure but return to operative position upon imposition of a corona producing potential and to individually yield to varying electrostatic forces during operation.

4,639,578

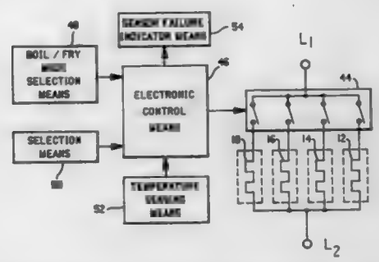
TEMPERATURE SENSOR FAILURE DETECTION SYSTEM FOR COOKING APPLIANCE

Thomas R. Payne, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 6, 1986, Ser. No. 816,615

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—450 **20 Claims**



1. In a cooking appliance of the type having heater means for heating a cooking utensil, user input selection means for enabling the user to select a desired heating level for said heater means, and temperature sensing means operative to sense the temperature of the utensil being heated by said heater means, an improved control arrangement comprising:

control means responsive to the temperature sensing means and the user input selection means, operative under normal operating conditions to control energization of the heater means in accordance with a closed loop control strategy as a function of a sensed utensil temperature and the user selected setting;

said control means including means for detecting an abnormal operating condition for said temperature sensing means;

said control means being operative in response to detection of said abnormal condition to operate said heater means in accordance with an open loop control strategy as a function of the user selected setting independently of the sensed temperature, whereby the closed loop temperature control arrangement converts to an open loop power control arrangement upon detection of a temperature sensing means failure.

4,639,579

HEATING APPARATUS

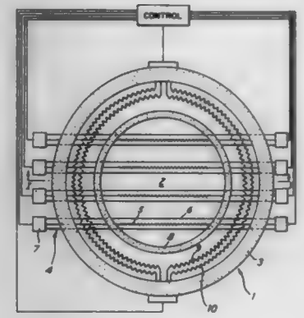
Steve M. Brooks, Essex, and David R. May, Cheshunt, both of England, assignors to Thorn EMI Domestic Appliances Limited, London, England

Filed May 14, 1985, Ser. No. 733,802

Claims priority, application United Kingdom, May 15, 1984, 8412339

Int. Cl.⁴ H05B *3/68*

U.S. Cl. 219—464 **5 Claims**



1. A heating unit suitable for mounting in a cooking hob, said unit comprising:

a base layer of thermally-insulative material;

a peripheral thermally-insulative wall defining a first hotplate region;

an inner thermally-insulative wall defining a second hotplate region located within said first region;

an electrical heating element; means for supporting said heating element between said inner and peripheral walls adjacent said base layer,

a lamp emissive of infra-red radiation and having first and second ends, said lamp comprising a tubular envelope and a linear filament supported in said envelope;

means for supporting said lamp such that said envelope extends across said first hotplate region and said first and second ends are located outside of said first region, said filament being of length commensurate with said second hotplate region; and

means, connectable to said lamp and said heating element, for energising the filament and the heating element independently and concurrently, selectively.

4,639,580

COUPLING DEVICES FOR USE WITH ELECTROFUSION FITTINGS OF THERMOPLASTIC MATERIAL

Alan Johnson, Sunderland, England, assignor to British Gas Corporation, London, England

Filed Dec. 17, 1984, Ser. No. 682,184

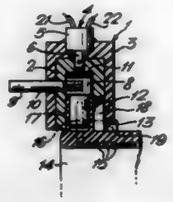
Claims priority, application United Kingdom, Dec. 16, 1983, 8333350

Int. Cl.⁴ H05B *3/08*

U.S. Cl. 219—541 **12 Claims**

1. A coupling device for use with an electrofusion fitting of thermoplastic material comprising; identifying means in the form of shaped portions carried by the fitting and arranged in a predetermined formation representative of that fitting; and separate connector means having indicator means selectively operable by said connector means when the connector means is brought into register with said identifying means so as to

provide an indication of the identity of the fitting and the optimum period and value of electrical energisation of its



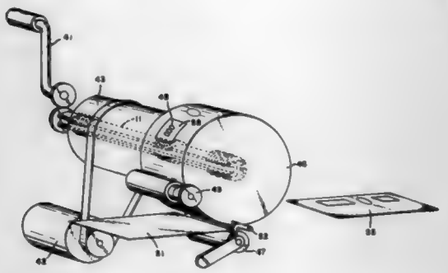
resistance heating wire winding required for satisfactory electrofusion.

4,639,581

INSTRUMENT AXLE FOR POSTAGE METER

Erwin Berger, Thörishaus, and Rudolf Grünig, Schliern, both of Switzerland, assignors to Hasler AG Bern, Bern, Switzerland

Filed Dec. 20, 1984, Ser. No. 684,277
Int. Cl.[4] G06F *1/106*
U.S. Cl. 235—101 **19 Claims**



1. A postage meter machine comprising
a rotary drive;
an axle constructed of a metallic core force transmittingly connected to the rotary drive; arms forming part of the core of the axle with the core defining an H-shaped cross-section with two grooves between said arms of the H; a jacket of a plastic material surrounding the core; centered circular bearing flanges attached to the axle formed of a material corresponding to the jacket material; transporting means driven by the axle for moving mail pieces through the postage meter machine; a system for setting and printing numerals onto the mail pieces coordinated to the mail pieces moving through the postage meter machine.

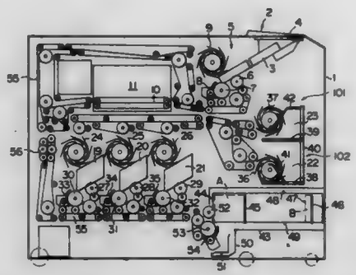
4,639,582

CIRCULATING-TYPE BILL DEPOSITING AND DISBURSING MACHINE

Junichi Arikawa; Hiroshi Chiba, both of Urawa; Osamu Miyazaki, Kawaguchi, and Masatoshi Osanai, Urawa, all of Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed May 14, 1985, Ser. No. 733,786
Claims priority, application Japan, May 16, 1984, 59-98292; May 16, 1984, 59-98293
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 **6 Claims**

1. A circulating-type bill depositing and disbursing machine allowing received bills to be reused as dispensable ones, comprising: a first and second storing parts for storing the received bills after sorting the same into undamaged and damaged bills; a depositing and disbursing box for storing the undamaged and damaged bills in said first and second storing parts and for using only the undamaged bills stored as dispensable ones; and a disbursing bill storing section divided into denominations for accumulating the undamaged bills dispensed from said depositing and disbursing box and for dispensing bills according to the amount of money specified to be disbursed, said first and second storing parts being provided in the front and vertical positions of a machine body and being provided with a storing



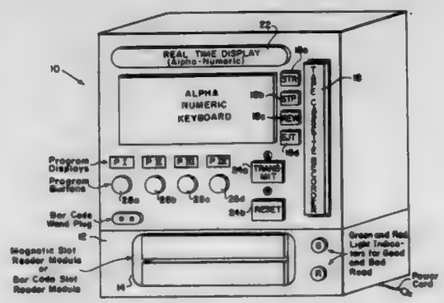
front plate and a holding plate capable of reciprocating vertically between the same and said depositing and disbursing box and of clamping the undamaged and damaged bills in an upright position, as well as a storage bottom plate for supporting the undamaged and damaged bills which is coupled with said storing front plate.

4,639,583

DATA TERMINAL SYSTEM

Jeffrey H. Zerowin, 3 Franciscan Way, Fairlawn, N.J. 07410

Filed Mar. 14, 1985, Ser. No. 711,952
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 **18 Claims**



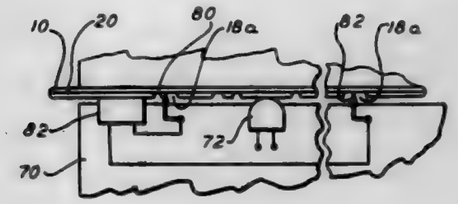
1. An identification system comprising:
a plurality of identification cards available for use by a plurality of individuals;
multiple terminals, each of said terminals operating as a stand-alone entity independent of each of the other of said terminals;
a plurality of readable record means, each of said record means adapted to be coupled to any one of said terminals, each of said record means being readily removable from the terminal to which it is coupled and portable between terminals;
each of said terminals including means to read identification data from any one of said identification cards presented at the terminal involved, and means to record said identification data on the record means that is coupled to said terminal.

4,639,584

NON-ALTERABLE MAGNETIC CODING

Robert T. Adams, 64 Great Hills Rd., Short Hills, N.J. 07078, and Ronald Erickson, 1416 Morris Ave., Suite 3, Union, N.J. 07083

Filed Jul. 25, 1985, Ser. No. 758,695
Int. Cl.[4] G06K *7/08*
U.S. Cl. 235—449 **44 Claims**



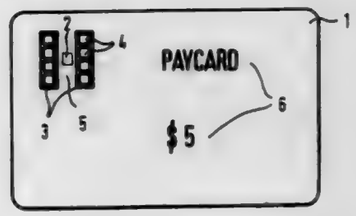
1. A card for carrying a machine readable magnetic code, comprising:
a non-magnetic substrate; and
an interrupted strip of nonpermanently magnetizable material affixed to said substrate, said strip being several times thinner than said substrate, said strip having a column of parallel rifts, none of said substrate being in said rifts, said rifts and said magnetizable material between each of said rifts being arranged in a pattern bearing a predetermined relationship to said code, said magnetizable material between each of said rifts being magnetized in the same direction.

4,639,585

DATA CARRIER WITH AN IC MODULE AND A METHOD FOR PRODUCING SUCH A DATA CARRIER

Yahya Haghiri-Tehrani, and Joachim Hoppe, both of Munich, Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Filed Sep. 11, 1984, Ser. No. 649,378
Claims priority, application Fed. Rep. of Germany, May 29, 1984, 3420051
Int. Cl.[4] G06K *15/00*
U.S. Cl. 235—492 **13 Claims**



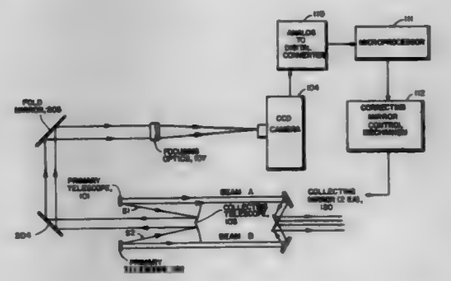
1. A data carrier with an IC module for processing electrical signals, in which the IC module is disposed in the interior of the data carrier and connected via leads to contact surfaces arranged in the vicinity of the IC module, communication taking place with peripheral units via these contact surfaces, characterized in that a first area of the data carrier in which the IC module, the leads and the contact surfaces are provided is connected with a second, remaining area of the data carrier by one or more predetermined breaking points arranged along a line separating the two areas and which reduce transmission of bending stresses from one area of the card to the other.

4,639,586

OPTICALLY PHASED LASER TRANSMITTER

Janet S. Fender, Albuquerque, N. Mex.; Salvatore J. Cusumano, Champaign, Ill.; Robert R. Butts, Colorado Springs, Colo., and Christopher R. DeHainaut, Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 6, 1985, Ser. No. 698,962
Int. Cl.[4] G01J *1/20*; G01B *9/02*
U.S. Cl. 250—201 **17 Claims**



1. A laser transmitter which produces an output by phase matching all outputs of an array of independent laser telescopes including a first primary telescope which has a first singular laser source which emits a first laser beam, and a plurality of second primary telescopes each placed in a position adjacent to said first primary telescope, each of said second primary telescopes having their own independent and singular laser source emitting their own independent second laser beams thereby creating a plurality of second laser beams, said laser transmitter comprising:
a plurality of collecting telescopes facing and bridging said first and second primary telescopes, each of said plurality of collecting telescopes intercepting and diverting a sample of said first laser beam from said first primary telescope and a sample of said second laser beams from one of said plurality of second primary telescopes by partially blocking the first and second laser beams, said plurality of collecting telescopes reflecting all intercepted beams back in sets of focus points, each of said focus points being a focused pair of said sample from said first primary telescope and a sample of said second laser beam which is obtained from the first and second primary telescopes which are bridged by that particular collecting telescope;
a detector array means receiving said sets of focus points from said plurality of said collecting telescopes and generating therefrom a set of interference patterns between each second laser beam from said plurality of second primary telescopes and the first laser beam from said first primary telescope;
an analog-to-digital converter receiving and converting into a set of digital signals said set of interference patterns from said detector array means;
a data processor means receiving said set of digital signals from said analog-to-digital converter and estimating an optical path length adjustment amount between each of said second laser beams and said first laser beam, said optical path adjustment amount being a measure of distance between the optical path lengths of said first laser beam and an associated second laser beam such that the application of said optical path length adjustment amount to the optical path of the second laser beam results in a matching of the phase of said second laser beam to said first laser beam; and
a correcting means receiving said optical path length adjustment amount from said data processor and receiving said first and second laser beams from said first and second primary telescopes, said correcting means performing an

adjustment of the optical path length of each of said second laser beams to match their phases with said first laser beam.

4,639,587

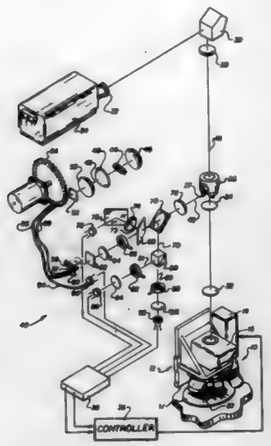
AUTOMATIC FOCUSING SYSTEM FOR A MICROSCOPE

Curt H. Chadwick, Los Altos; Art M. Shulenberger, Capitola; John S. Taylor, San Jose, and Richard R. Simmons, Los Altos, all of Calif., assignors to KLA Instruments Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 582,584, Feb. 22, 1984. This application Jan. 22, 1985, Ser. No. 693,651

Int. Cl.⁴ G01J *1/20*

U.S. Cl. 250—201 **20 Claims**



1. An automatic focusing system for a microscopic optical inspection system of the type used to inspect objects such as semiconductor wafers and the like, and having an optical inspection axis extending between an inspection means and an electrically controllable microscope device, comprising:

means forming a first optical axis having a light source at one end and a first beamsplitter means at the other end, said first beamsplitter means being disposed along said optical inspection axis and operative to pass light from said first optical axis into said microscope device and to return reflected light from said microscope device back along said first optical axis;

means disposed along said first optical axis for cooperating with said light source to develop and for alternately communicating bursts of spacially separated light rays from opposite sides of said first optical axis to a pupil means disposed along said first optical axis at the conjugate image location of the back aperture of the microscope objective;

reticle means disposed along said first optical axis between said pupil means and said first beamsplitter means and having aperture means formed therein such that each said burst of light from said pupil passes through said reticle means and casts an image of the aperture means onto the object being inspected by said microscope device;

second beamsplitter means disposed between said reticle means and said first beamsplitter means and operative to deflect returning light from said object, including said aperture means images, onto a second optical axis defined at one end by said second beamsplitter means and at the other end by an S-CURVE photodetector means, and including a first return mask disposed along said second optical axis;

third beamsplitter means disposed along said second optical axis between said second beamsplitter means and said first return mask, said third beamsplitter means reflecting a portion of said returning light along a third optical axis having said third beamsplitter means at one end and a SUM photodetector means at the other end, and including a second return mask disposed therebetween; and

electronic control means responsive to the output signals developed by said SUM photodetector means and said S-CURVE photodetector means and operative to generate drive signals for controlling the positioning of said microscope device relative to the object being inspected such that said microscope device focuses to a level commensurate with the average local relief of the surface area being inspected.

4,639,588

AUTOMATIC FOCUSING DEVICE WITH RANGE BOUNDARY SETTING

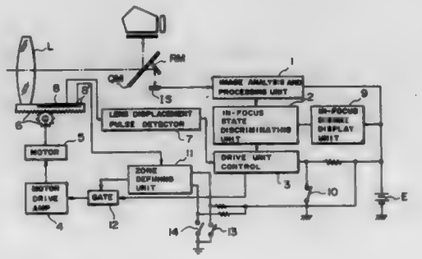
Nobuhiko Shinoda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1984, Ser. No. 642,270

Claims priority, application Japan, Sep. 5, 1983, 58-162902

Int. Cl.⁴ G01J *1/20*

U.S. Cl. 250—201 **7 Claims**



1. An automatic focusing device for an imaging lens, comprising:

(a) focus state detection means for producing a signal representing a focus adjusting state of the imaging lens;

(b) driving means for moving the imaging lens to an in-focus position on the basis of the adjusting state signal;

(c) memory means;

(d) signal forming means for producing a memory signal, said memory signal being used for causing said memory means to store first in-focus position information and second in-focus position information, the first in-focus information being obtained from an output of said focus state detection means which corresponds to the object-position of a predetermined object, and the second in-focus state position information being obtained from an output of said focus state detection means which corresponds to another object-postion different from the object-position of the predetermined object; and

(e) control means for permitting a lens moving operation of said driving means on the basis of the output of said focus state detection means, when the output is of a value between the outputs respectively corresponding to the first and second in-focus state position information.

4,639,589

OPTICAL SCANNING DEVICE, PARTICULARLY FOR SEEKER HEADS IN TARGET SEEKING MISSILES

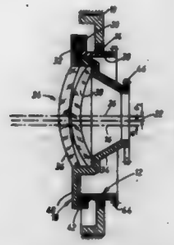
Berthold Weber, Bodman; Peter Giesenberg, Salem, and Johannes Steimel, Constance, all of Fed. Rep. of Germany, assignors to Bodenseewerk Geräitetechnik GmbH, Uberlingen, Fed. Rep. of Germany

Filed Oct. 17, 1985, Ser. No. 788,465

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1984, 3438898

Int. Cl.⁴ G01J *1/20*

U.S. Cl. 250—203 R **7 Claims**



1. Optical scanning device, particularly for seeker heads in target seeking missiles, comprising

(a) a base portion (10),

(b) a detector (74) located on the base portion (10),

(c) a holder (18) rotatably mounted and driven about an axis or rotation (22), and

(d) an optical imaging system (72)

(d_1) adapted to image a field of view in the plane of the detector (74), and

(d_2) comprising imaging optical means (24) presenting rotation symmetry, which are arranged on the holder (18) and define an optical axis (26), which extends eccentrically with regard to the axis of rotation (22) of the holder (18),

characterized in that

(e) the hodler (18) is mounted in a bearing portion (12) rotatably mounted and driven about an axis of rotation (16) with regard to the base portion (10), and

(f) the axis of rotation (22) of the holder (18) extends eccentrically with regard to the axis of rotation (16) of said bearing portion (12).

4,639,590

INTENSIFIED CHARGE-COUPLED IMAGE SENSOR HAVING A CHARGE-COUPLED DEVICE WITH CONTACT PADS ON AN ANNULAR RIM THEREOF

Gilbert N. Butterwick, Upper Leacock Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 26, 1985, Ser. No. 705,707

Int. Cl.⁴ H01J *31/50*

U.S. Cl. 250—213 VT **2 Claims**



1. In an intensified charge-coupled image sensor of the type comprising

an image intensifier section including an envelope having therein a photoemissive cathode for emitting photoelectrons in a pattern corresponding to the intensity of radiation incident thereon, and

a header assembly spaced from said cathode, said header assembly including a charge-coupled device with a front surface having a plurality of electrodes adjacent thereto and a back surface directed toward said cathode for receiving photoelectrons therefrom,

wherein the improvement comprising

said charge-coupled device being formed on a disc-shaped semiconductor wafer having a center portion and an annular rim portion, said center portion having a thickness less than that of said annular rim portion, said rim portion having a plurality of contact pads around at least a portion thereof which are electrically connected to different ones of said plurality of electrodes.

4,639,591

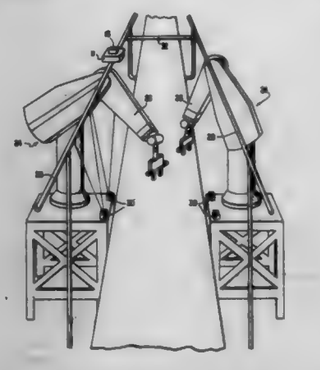
SYSTEM FOR OPTICAL MONITORING OF MACHINE POSITIONS

Robert F. Barry, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 31, 1984, Ser. No. 688,117

Int. Cl.⁴ G01V *9/04*

U.S. Cl. 250—221 **7 Claims**



1. In an installation includir.g a plurality of machines disposed adjacent a common work space delimited by a boundary surface, each machine being associated with a respective portion of the boundary surface and having a work-performing member selectively movable into and out of the work space through the associated boundary surface portion to perform an operation in the work space, the improvement comprising an optical monitoring system composed of a plurality of optical monitoring assemblies each associated with a respective machine, each said assembly comprising:

light barrier means including means producing a plurality of light beams and an associated plurality of light sensors each disposed in the path of a respective light beam, said light barrier means forming a light barrier coextensive with the boundary surface portion associated with the associated machine, and each said light sensor producing an electrical signal indicative of reception of its associated light beam;

electrical signal processing means connected to all of said light sensors to receive the electrical signals therefrom for producing a light barrier intrusion signal when any one of said light sensors is not receiving its associated light beam;

optical warning means connected to said electrical signal processing means for emitting a predetermined light signal in response to production of a light barrier intrusion signal;

light receiving means optically linked with said optical warning means of every other assembly for producing a warning signal in response to emission of the predetermined signal by said optical warning means of any other assembly; and

control means connected between said light receiving means and the associated machine for causing the work-performing member of the associated machine to remain outside

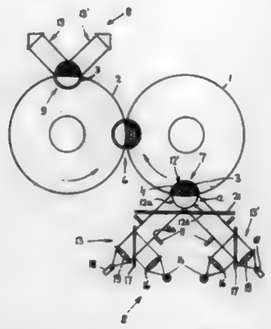
the work space when a warning signal is being produced by said light receiving means.

4,639,592

CIGARETTE TESTING APPARATUS

Uwe Heitmann, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. Kg., Hamburg, Fed. Rep. of Germany

Filed Jun. 14, 1984, Ser. No. 620,578
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1983, 3321408
Int. Cl.⁴ G01N *21/88*
U.S. Cl. 250—223 B **24 Claims**



1. Apparatus for ascertaining the presence of defects at the exterior of rod-shaped articles of the tobacco processing industry, comprising means for transporting a series of articles in a predetermined direction, at right angles to the axes of the articles, and along successive portions of a predetermined path in each of which a different section of the exterior of the articles is exposed, said transporting means comprising several neighboring conveyors with a transfer zone between neighboring conveyors, said conveyors including first and second conveyors and said portions of said path including first and second portions which are defined by the respective conveyors, the number of transfer zones in said transporting means between said first and second conveyors being an odd number and said conveyors including means for holding the articles against movement with reference to the respective conveyors during transport along the respective portions of said path; and discrete scanning means for each portion of said path, each of said scanning means comprising means for monitoring the respective section of the exterior of the article in the corresponding portion of said path and for generating signals in response to detection of defects.

4,639,593

AIRFLOW DETECTION SYSTEM USING FIBER OPTICS

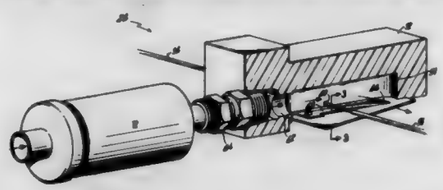
Karl A. Stetson, Coventry, Conn., and John Palecki, Northampton, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 29, 1984, Ser. No. 665,845
Int. Cl.⁴ H01J *5/14*; G01D *5/30*; G01L *11/00*; G01F *1/66*
U.S. Cl. 250—227 **8 Claims**

1. A sensor, for providing an optical signal indicative of the presence of fluid flow in a plenum, in a system having an optical signal detector and optical signal source, comprising:

displacement means, having a chamber for receiving fluid flow from the plenum and including a cantilevered member disposed therein, said cantilevered member oscillating at a sensor characteristic frequency in response to fluid flow through said chamber; and

first and second optical sections having an optical surface on each end thereof, said sections arranged end to end on a major surface of said cantilevered member such that a first end of each form, in combination, an optical coupling, said coupling adapted to flex with oscillation of said cantilevered member, the opposite end of said first and second sections being optically aligned with the optical signal source and the optical signal detector, respectively, to



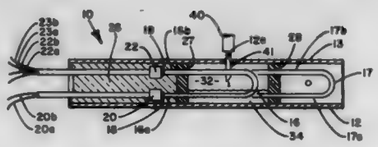
couple optical signals from the signal source through said optical coupling to the dectector, whereby oscillation of said member in the presence of fluid flow produces an oscillatory misalignment of said optical coupling to further provide intensity modulation of such optical signals at the sensor characteristic frequency.

4,639,594

FIBEROPTIC PROBE AND METHOD OF MAKING AND USING

Stephen A. Schoch, Clay, and Howard W. Sibley, Baldwinsville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 17, 1984, Ser. No. 682,504
Int. Cl.⁴ H01J *5/16*
U.S. Cl. 250—227 **10 Claims**



1. A fiberoptic probe for in situ sensing of a fluid condition by immersion therein comprising:

a tubular sheath;

a reference fluid sealed within a first chamber in said sheath;

a first U-shaped fiber within said first chamber so as to be isolated from the fluid to be sensed;

a second U-shaped fiber extending through said first chamber so as to contact the fluid to be sensed;

an LED positioned in said sheath so as to direct light into said first and second U-shaped fibers;

a first detector means in said sheath for detecting light passing through said first U-shaped fiber; and

a second detector means in said sheath for detecting light passing through said second U-shaped fiber.

4,639,595

OPTICAL ROTARY ENCODER

Masao Okita, and Hiroyasu Miyata, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Feb. 21, 1984, Ser. No. 581,661
Claims priority, application Japan, Feb. 21, 1983, 58-26375
Int. Cl.⁴ G01D *5/34*
U.S. Cl. 250—231 SE **7 Claims**

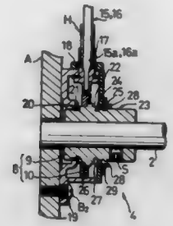
1. In an optical rotary encoder for providing rotation signals indicative of rotation of an associated device, said encoder comprising an encoder shaft (2), a shaft fitting member (9) mounted on said encoder shaft, a rotor disk (10) fixed to said shaft fitting member and having at least one light reflecting element on its circumference, a housing (4) for said rotor disk, and an optical detection head (H), having a light emitting part (15*a*) and a light receiving part (16*a*), which is mounted in said

housing at an axial position corresponding to an operative position of said rotor disk wherein light from said light emitting part can be reflected by said light reflecting element on the circumference of said rotor disk and received by said light receiving part for detection of rotation of said rotor disk,

the improvement of said encoder further comprising:

said shaft fitting member (9) and said rotor disk (10) being axially movable on said encoder shaft (10) from an assembly position to the operative position, said shaft fitting member having formed on one end thereof a first positioning engaging part (20) axially spaced apart from a first relief part (21);

means for locking said shaft fitting member (9) on said encoder shaft (2) at said operative position;



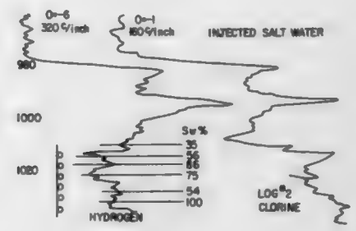
said housing (4) including a holding member (19) having a positioning engaged part (26) which engages said first positioning engaging part (20) of said shaft fitting member (9) to hold said rotor disk (10) fixed relative to said housing in said assembly position during assembly, said shaft fitting member and rotor disk being movable axially in said housing to said operative position and locked by said locking means to said shaft at said operative position upon completion of assembly, wherein said first positioning engaged part (26) of said holding member (9) is disposed opposite and without contacting said first relief part (21) of said shaft fitting member such that said rotor disk is rendered rotatable relative to said housing.

4,639,596

PETROLEUM RESERVOIR FLOODING METHOD

Harley L. Tanner, III, Houston, and Joseph C. Allen, Bellaire, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 6, 1983, Ser. No. 456,065
Int. Cl.⁴ G01T *1/18*
U.S. Cl. 250—259 **7 Claims**



1. A method of flooding a petroleum reservoir in an earth formation by way of an injection well to aid in the recovery of hydrocarbons from a recovery well comprising:

running a radioactive well logging tool in the injection well to derive a first well log of the reservoir in the vicinity of the injection well,

flooding the reservoir with a solvent fluid injected in the reservoir at a predetermined rate from the injection well to displace the hydrocarbons present in the reservoir,

running the well logging tool in the injection well so as to derive a second well log,

injecting substantially high salinity salt water into the reservoir,

running the well logging tool in the injection well so as to derive a third well log, and

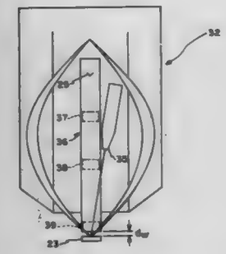
utilizing the well logs to provide a record of the effectiveness of the solvent flood.

4,639,597

AUGER ELECTRON SPECTROMETER CAPABLE OF ATTAINING A HIGH RESOLUTION

Yoshiro Shiokawa, Tokyo, Japan, assignor to Anelva Corporation, Japan

Filed Oct. 23, 1984, Ser. No. 663,855
Claims priority, application Japan, Oct. 24, 1983, 58-197546
Int. Cl.⁴ H01J *37/252*
U.S. Cl. 250—305 **11 Claims**



1. In an Auger electron spectrometer comprising an electron gun for radiating an electron beam onto a surface of an object to make the surface emit Auger electrons and an electron spectroscope for detecting and analyzing said Auger electrons, said electron gun having an electron gun axis extended to said surface, an electron beam source for generating said electron beam along said electron gun axis, and an electron lens system between said electron beam source and said surface for guiding said electron beam towards said surface along said electron gun axis, the improvement wherein said electron lens system comprises:

controllable electrostatic lens means adjacent to said electron beam source for controllably focusing said electron beam into a controllably processed beam; and

a permanent magnet member nearer to said surface than said electrostatic lens means for generating a magnetic field to focus said processed beam onto said surface.

4,639,598

FIRE SENSOR CROSS-CORRELATOR CIRCUIT AND METHOD

Mark T. Kern, Goleta, and Kenneth A. Shamordola, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed May 17, 1985, Ser. No. 735,039
Int. Cl.⁴ G08B *17/12*
U.S. Cl. 250—339 **36 Claims**

1. A cross-correlation circuit for fire sensing comprising:

first and second parallel signal channels for responding to long wavelength and short wavelength radiation, respectively;

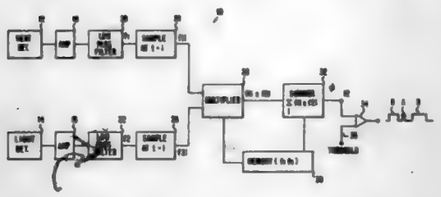
said first channel including a short wavelength detector, an amplifier, a low pass filter, and signal sampling means coupled together in series;

said second signal channel including a long wavelength detector, an amplifier, a low pass filter and signal sampling means coupled together in series;

a signal multiplier stage coupled to receive the sampled

signal outputs of the two signal channels and multiply sampled signals together by pairs; and

means coupled to the output of said multiplier stage for summing the sampled pair products in order to develop a



cross-correlation function signal corresponding to said signals from said signal channels which is indicative of the detection by both of said detectors of radiation from a fire source.

4,639,599

RING TYPE SINGLE-PHOTON EMISSION CT IMAGING APPARATUS

Takashi Ichihara, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

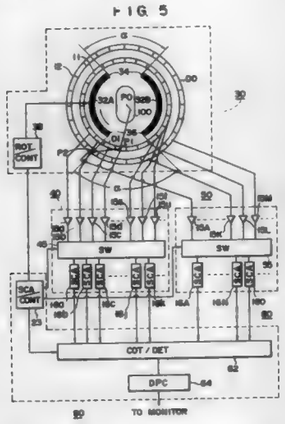
Filed May 9, 1985, Ser. No. 732,078

Claims priority, application Japan, May 10, 1984, 59-94797; May 10, 1984, 59-94798

Int. Cl.[4] G01T *1/164*

U.S. Cl. 250—363 S 20 Claims

FIG. 5



1. A single-photon emission computerized tomography imaging apparatus comprising:

first ring-shaped means including thereon a plurality of first detector elements and surrounding an object under examination to which radioisotope has been administered;

second ring-shaped means including thereon a plurality of second detector elements and concentrically surrounding the first ring-shaped means, wherein a gamma ray irradiated from the administered radioisotope through the object firstly scatters in one of the first detector elements, producing a first detector signal and thereafter the scattered gamma ray disappears in one of the second detector elements, producing a second detector signal;

first analyzing means including a plurality of first single channel analyzers coupled to the corresponding first detector elements for analyzing whether an energy level of the first detector signal is involved in a first predetermined level width of the first single channel analyzers and producing a first analyzing signal;

second analyzing means including a plurality of second single channel analyzers coupled to the corresponding second detector elements for analyzing whether an energy level of the second detector signal is involved in a second predetermined level width of the second single channel analyzers and producing a second analyzing signal;

image reconstruction means for reconstructing a computerized tomographic image signal by processing the first and second analyzing signals, said first and second analyzing signals containing both first data on the positional information of the first and second detector elements upon which said gamma ray and scattered gamma ray are incident, and second data on the energy information derived from the first and second analyzing means; and

means for displaying a computerized tomographic image by receiving the reconstructed tomographic image signal.

4,639,600

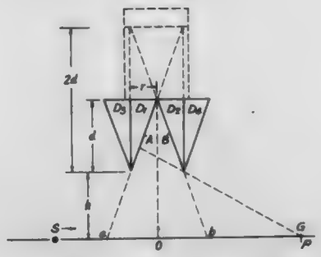
RADIATION DETECTOR

Gerard R. Laurer, Monroe, N.Y., assignor to New York University, New York, N.Y.

Filed Oct. 21, 1983, Ser. No. 544,373

Int. Cl.[4] G01T *1/20*

U.S. Cl. 250—363 S 15 Claims



7. In a radiation detector assembly wherein a radiation source is adapted to be scanning by at least one radiation detector element, the detector element having a surface for receiving radiation from said source, the improvement wherein at least a portion of said surface is at an acute angle to the direction of relative scanning between said element and source, whereby said portion is blocked from receiving radiation from said source in predetermined regions, said surface being positioned to receive uncollimated radiation from said source, said radiation detector having at least four of said radiation detector elements adjoining one another with the radiation receiving surfaces thereof defining a pyramidal recess in said detector.

4,639,601

APPARATUS FOR DETECTING AND DETERMINING THE DISTRIBUTION OF RADIOACTIVITY ON A MEDIUM

Brian R. Pullan, 167 Bramhall Lane South, Bramhall, Stockport, SK7 2NG, England

Filed Nov. 23, 1983, Ser. No. 574,328

Claims priority, application United Kingdom, Nov. 25, 1982, 8233701

Int. Cl.[4] G01T *1/185*

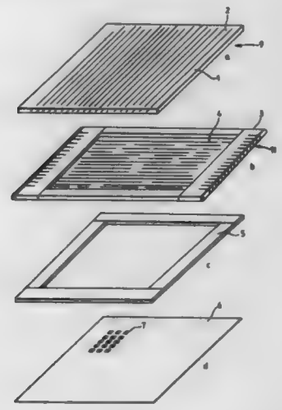
U.S. Cl. 250—385 10 Claims

1. Apparatus for providing output signals relating to individual ionizing events due to radioactive decay of material in a sample medium on a planar support, said apparatus comprising:

A an ionization chamber;

B a scanning head disposed in said ionization chamber and including two detecting electrode assemblies which are located in spaced apart relationship, each detecting electrode assembly having an array of spaced conductors, the conductors on one array extending transversely of the conductors of the other array thereby providing a plurality of conductor crossing points; and a mask having a plurality of radiation transmissive zones therein, said mask being supported relative to said detecting electrode assemblies such that said radiation transmissive zones respectively correspond with said conductor crossing points;

C means supporting said scanning head in juxtaposition with a sample receiving zone for receiving said sample medium so that when the sample medium is in place, the mask is then in close proximity to its planar support; and



D scanning means to cause relative movement between said scanning head and said sample receiving zone so that said radiation transmissive zones in said mask scan a predetermined path relative to said sample receiving zone, whereby said radiation transmissive zones expose said corresponding crossing points to respective scanning regions of said sample receiving zone and said electrode assemblies yield said output signals.

4,639,602

SYSTEM FOR DEFLECTING A BEAM OF CHARGED PARTICLES

Martin Henzler, Garbsen, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 699,046

Claims priority, application European Pat. Off., Feb. 18, 1984, 84101691

Int. Cl.[4] G21K *1/08*; H01J *3/14*

U.S. Cl. 250—396 R 4 Claims



1. A deflection system for a beam of charged particles, having a plurality of concentrically arranged deflection plates surrounding the beam, comprising:

a rotationally symmetrical arrangement of eight plates with respect to the axis of the system, the deflection plates being divided in their longitudinal direction into a plurality of longitudinally divided sections, and a voltage supply for the plates, and the ratio of deflection plate section lengths, and the voltage supply for the plates, being selected such that the beam leaves the system parallel to its axis.

4,639,603

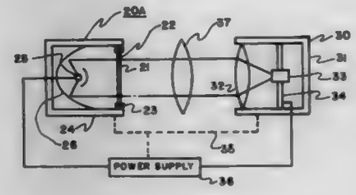
IR IMAGE SOURCE USING SPECULARY REFLECTIVE TRANSPARENCY

Helmut H. Pistor, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 21, 1985, Ser. No. 747,207

Int. Cl.[4] G01M *11/00*; G03B *21/00*

U.S. Cl. 250—504 R 8 Claims



1. A FIR image projector comprising:

a source of FIR radiation;

a transparency in the path of said radiation, said transparency having;

a base layer,

an image receiving layer on said base layer containing an image of specularly reflective silver,

and a layer of transparent abrasion resistant material over said emulsion layer.

4,639,604

METHOD AND APPARATUS FOR DETECTING AN EDGE POSITION OF A PATTERN AND ELIMINATING OVERLAPPING PATTERN SIGNALS

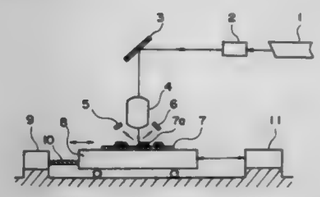
Seiro Murakami, Tokyo, and Muneki Hamajima, Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 593,870, Mar. 27, 1984, abandoned. This application Apr. 4, 1986, Ser. No. 851,293

Claims priority, application Japan, Mar. 29, 1983, 58-51504; Apr. 7, 1983, 58-60081

Int. Cl.[4] G01N *21/86*; G01V *9/04*

U.S. Cl. 250—548 17 Claims



8. An apparatus for detecting a position of a pattern of a predetermined shape on an object emitting a radiation indicative of the pattern through reception of the radiation, said apparatus comprising:

(a) means adapted to scan said object in a predetermined direction with respect to said object to detect the radiation from said object, said means successively generating a pattern signal corresponding to said pattern in response to said scanning in accordance with said detected radiation;

(b) position detecting means for detecting a position of the scanning of said radiation detecting means along said predetermined direction and generating a position signal each time the position of said scanning advances a predetermined unit amount; and

(c) means for sampling a value of said pattern signal in response to each of said position signals, said sampling means eliminating each overlapping value of said pattern

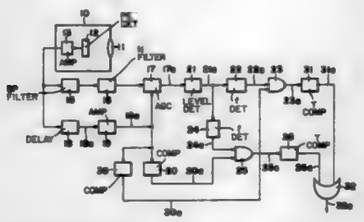
signal sampled at the same scanning position as any one of the values of said pattern signal.

4,639,605

FIRE SENSOR DEVICE

Hiroshi Seki, 2265 Kamihongo, Matsudo-shi, Chiba-ken, and Ryuichiro Katsushi, Kyoto, both of Japan, assignors to Hiroshi Seki, Chiba, Japan

Filed Apr. 17, 1984, Ser. No. 601,176
Claims priority, application Japan, Apr. 20, 1983, 58-69752
Int. Cl.⁴ G08B *17/12*
U.S. Cl. 250—554 **9 Claims**



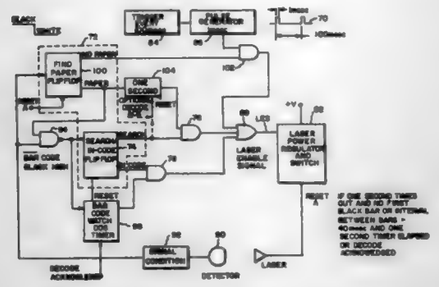
1. A fire sensor device for detecting the movement of flames and the presence of smoke comprising:
(1) a detector unit having a condenser lens adapted to determine variations of brightness based upon variations in the illumination of said detector unit which occur due to said movement of flames of a fire and said presence of smoke proximate said detector unit and for producing a detector signal,
(2) correction circuit means, connected to said detector unit, for compensating errors in said detector signal due to slowly changing variations in the illumination of said detector unit,
(3) a first frequency detection circuit, connected to said correction circuit means and receiving the compensated detector signal, for detecting flame,
(4) a second frequency detection circuit, connected to said correction circuit means and receiving the compensated detector signal, for detecting smoke,
wherein the frequency and amplitude of said detector signal output from said detector unit and the number of pulses generated, based upon said detector signal, during a predetermined period of time are computed, thereby detecting the presence of fire on the basis of the duration of the computed signal.

4,639,606

BAR CODE SCANNER LASER RADIATION EXPOSURE LIMIT CONTROL SYSTEM

John A. Boles, Fishers, and Jay M. Eastman, Pittsford, both of N.Y., assignors to Optel System Limited, Rochester, N.Y.

Filed Oct. 26, 1984, Ser. No. 665,276
Int. Cl.⁴ G06K *7/10*
U.S. Cl. 250—555 **9 Claims**



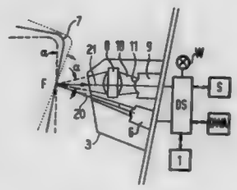
1. In a code symbol scanner apparatus having a laser normally operable at a power output above radiation safety limits and photodetector means for deriving signals from said code symbols, the improvement which comprises mode control means for providing a first mode of operation of said apparatus during which a search is carried out for said code symbols and a second mode of operation after said symbols are detected and while scanning of said symbols is carried out, means for operating said mode control means for initiating said second mode upon detection of a first of said symbols, means for discontinuing said second mode unless signals corresponding to successive ones of said symbols are derived by said photodetector means within a given period of time, means operated by said mode control means for turning on said laser during said first and second modes at said power output above said limits, and means for further controlling said mode control means for controlling the time said laser is turned on so that the radiation safety limits are not exceeded.

4,639,607

DEVICE FOR SENSING A RECORDING MEDIUM IN A LINE PRINTER

Alois Brandner, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 5, 1984, Ser. No. 678,498
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3345030
Int. Cl.⁴ G01N *9/04*
U.S. Cl. 250—561 **11 Claims**



1. In a sensing device of a printing apparatus having a printing head movable line-wise along a recording medium which is conducted over a reflective surface, said sensing device having sensing means coupled to move with the printing head for determining the presence of a recording medium in front of the reflective surface, said sensing means including a radiation source for projecting radiation at a spot on the reflective surface and photoelectric receiving means having a receiving surface for receiving a sensing beam reflected from a spot of the reflective surface, the improvements comprising said sensing means including a convergent lens system being disposed in front of the receiving means with one of the focal points of the lens system being positioned in the immediate proximity of said spot on the reflective surface so that the lens system planarly projects the sensing beam onto the receiving surface even when the beam is deflected from a desired path of reflection.

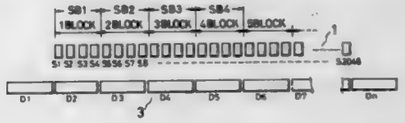
4,639,608

IMAGE READ-OUT APPARATUS WITH LIGHT SOURCE DRIVING MEANS

Yasuo Kuroda, Sagamihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,197
Claims priority, application Japan, May 18, 1983, 58-85891; Jun. 1, 1983, 58-95680
Int. Cl.⁴ H01J *40/14*; H04N *1/10*
U.S. Cl. 250—578 **14 Claims**

1. An image read-out apparatus comprising:
light source means for exposing an original document, said light source means comprising a plurality of light source blocks which are arranged for exposign a line of image, each said light source block being able to be turned on individually;
image sensor means for reading an image of the original document based on light from the original document exposed by means of said light source means; and



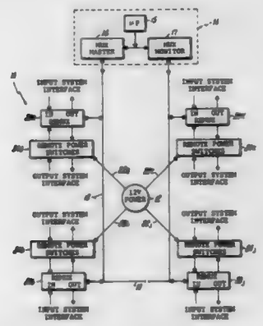
driving means for driving said light source means so as to turn on said light source blocks sequentially, said driving means being operable to cause adjacent light source blocks to be turned on during a predetermined time period on an overlap basis.

4,639,609

LOAD CURRENT MANAGEMENT SYSTEM FOR AUTOMOTIVE VEHICLES

William M. Floyd, Livonia, and David L. Juzswik, Dearborn Heights, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Feb. 26, 1985, Ser. No. 705,480
Int. Cl.⁴ B62G *45/00*
U.S. Cl. 307—10 R **19 Claims**



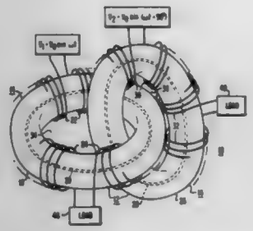
1. An electrical power delivery system for a vehicle comprising:
power conducting means for delivering power to a plurality of loads in a region of said vehicle, said power conducting means having a fixed capacity to carry current which capacity is less than the current required to simultaneously operate all of said loads;
power switch means connecting the power conducting means to each of said loads, said power switch means including control means for selectively energizing the appropriate loads in response to selected input signals; and
logic means operatively connected to the control means to circumvent the input signals to selectively energize the power switch means to prevent the current flow through the power conducting means from exceeding the capacity of the power conducting means.

4,639,610

ROTATING FLUX TRANSFORMER

Robert M. Del Vecchio, Sunnyvale, Calif., and Theodore R. Specht, Sharon, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 10, 1985, Ser. No. 807,147
Int. Cl.⁴ H02J *1/00*; H01H *85/02*
U.S. Cl. 307—83 **17 Claims**



1. An electrical transformer, compriaing:
first and second magnetic cores,
each of said first and second magnetic cores being a closed loop which defines a core window, with each magnetic core having an outer surface surrounding a longitudinal axis and a continuous axially extending opening,
first and second shorted poloidal windings disposed in the axially extending openings of said first and second magnetic cores, respectively,
first and second toroidal primary windings disposed about the outer surfaces of said first and second magnetic cores, respectively,
first and second sources of alternating potential connected to said first and second toroidal primary windings, respectively, with said first and second sources of alterating potential having like frequencies which are phase displaced by about 90 electrical degrees,
and a first toroidal secondary winding disposed in inductive relation with a selected one of said first and second toroidal primary windings,
said first and second magnetic cores being linked, with each magnetic core passing through the window of the other magnetic core, to induce a voltage in each of said first and second shorted poloidal windings which is 90° out of phase with the voltages applied to the first and second toroidal primary windings, respectively,
wherein the magnetic fluxes in each magnetic core due to the toroidal primary winding and shorted poloidal winding produce a rotating induction vector.

4,639,611

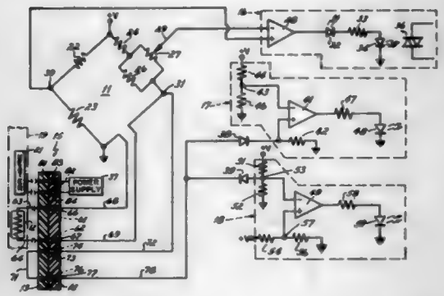
BRIDGE CIRCUIT SYSTEM

Charles K. Sticher, Snellville, Ga., assignor to Nordson Corporation, Amherst, Ohio

Filed Jan. 9, 1985, Ser. No. 689,829
Int. Cl.⁴ G05D *23/24*; H05B *1/02*
U.S. Cl. 307—117 **6 Claims**

1. A bridge circuit system comprising:
a bridge circuit including a variable impedance element which can be selectively connected and disconnected to the bridge circuit;
means for sensing impedance variations in the variable impedance element when it is connected to the bridge circuit;
fault detection means, which can be selectively connected and disconnected to the bridge circuit, for detecting impedance fault conditions of the variable impedance element when both said fault detection means and said variable impedance element are connected to said bridge; and
electrical connector means, including a first connector component connected to the variable impedance element and a second connector component connected to the bridge

circuit, for connecting the variable impedance element to the bridge circuit when the first and second connector components are connected together, and for connecting



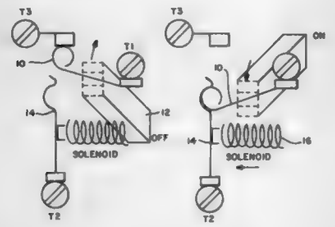
the fault detection means to the bridge circuit only when the first and second connector components are connected together.

4,639,612

ELECTRO MECHANICAL SWITCH HAVING REMOTELY CONTROLLED OFF POSITION

Gordon Bowman-Jones, Foster City, Calif., assignor to Endless Energy, Inc., Paramus, N.J.

Filed May 3, 1985, Ser. No. 729,924
Int. Cl.[4] H01H *1/52*
U.S. Cl. 307—132 E 6 Claims



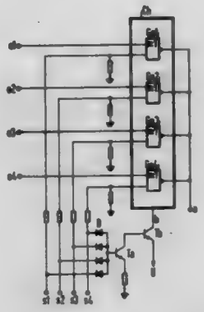
1. An electromechanical switch comprising
a power terminal for receiving electrical power,
a first switch terminal,
a second switch terminal,
a first spring contact coupled to said power terminal and spring biased towards said first switch terminal,
a second spring contact coupled to said second switch terminal and configured to receive said first spring contact in yieldable engagement,
a lever coupled to said first spring contact for manually moving said first spring contact to engagement with said second spring contact, and
solenoid means actuable in response to removal of power from said switch for releasing the yieldable engagement of said first and second spring contacts.

4,639,613

BROAD BAND COUPLING SWITCH ARRANGEMENT WITH GATED POWER SUPPLY

Helmut Bauch, Starnberg, and Hans Rehm, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 173,658, Jul. 29, 1985, abandoned. This application Nov. 29, 1985, Ser. No. 802,625
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1979, 2932588
Int. Cl.[4] H03K *17/56, 19/086, 3/01*
U.S. Cl. 307—241 8 Claims



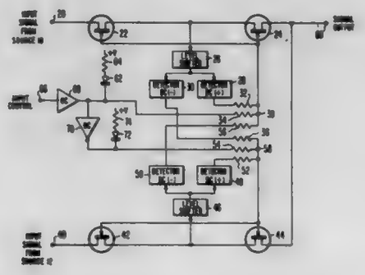
1. A broad band coupling arrangement comprising a broad band switching network with coupling point switches, said network having a chip module providing logic elements in ECL technology for forming a plurality of said coupling point switches, and operating voltage supply means for said logic elements of said chip module, a switching transistor is inserted in said operating voltage supply means of each said chip module, said operating voltage supply means comprising a common operating voltage supply for said chip module shared by all of said logic elements of said chip module, and said swithing transistor being conductive for enabling said switching network only in response to a logic signal condition for at least one of said logic elements of the said chip module, said switching network using less energy when it is disabled than when it is enabled.

4,639,614

SOLID STATE RF SWITCH WITH SELF-LATCHING CAPABILITY

Philip C. Basile, Turnersville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 13, 1985, Ser. No. 775,606
Int. Cl.[4] H03K *17/56, 17/687*
U.S. Cl. 307—243 19 Claims



1. An apparatus for selectively enabling an input ac signal to a utilization means, said apparatus including means for providing a bias voltage and an input control signal, said apparatus comprising:

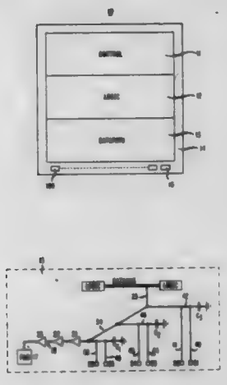
a switching device having input, output and control terminals, said device being responsive to an enabling voltage level at said control terminal for enabling signal flow between said input and said output terminals, and responsive to an inhibiting voltage level at said control terminal for inhibiting signal flow between said input and said output terminals;
first coupling means for coupling said input ac signal to said switching device input terminal;
second coupling means for coupling said utilization means to said switching device output terminal;
means responsive to said bias voltage and said input control signal for providing a switch control signal, said switch control signal having an enabling voltage level in response to a first voltage level of said input control signal, and having an inhibiting voltage level in response to a second voltage level of said input control signal;
means for detecting the ac signal enabled through said switching device and for providing therefrom a dc signal having said enabling voltage level; and
means for summing said switch control signal and said dc signal, and for applying the summed control signal to said control terminal of said switching device, whereby said switching device is actuated in accordance with said input control signal during the presence of said bias voltage, and is actuated in accordance with the detected level of the ac signal enabled through said switching device in the absence of said bias voltage.

4,639,615

TRIMMABLE LOADING ELEMENTS TO CONTROL CLOCK SKEW

Charles M. Lee, New Providence, and Bernard T. Murphy, Summit, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 28, 1983, Ser. No. 566,154
Int. Cl.[4] H03K *19/096, 19/003, 5/13, 5/26*
U.S. Cl. 307—269 12 Claims



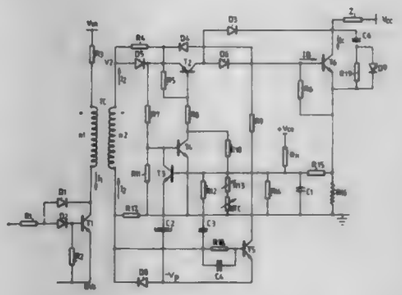
1. A semiconductor integrated circuit comprising:
clock means for generating clock pulses;
first and second logic circuits each having an output node and controlled by said clock means;
means for coupling clock pulses from said clock means to a first node connected to said first logic circuit;
and means for coupling clock pulses from said clock means to a second node connected to said second logic circuit,
characterized in that
said integrated circuit further comprises at least one trimmable element connected to said first node and adapted to adjusting the skew of the clock pulses developed at said first logic circuit output node with respect to the clock pulses at said second logic circuit output node.

4,639,616

CIRCUIT FOR CONTROLLING THE BASE OF A POWER TRANSISTOR USED IN HIGH TENSION SWITCHING

Maurice Gaude, La Tronche, France, assignor to La Telemecanique Electrique, France

Filed Dec. 14, 1983, Ser. No. 561,256
Claims priority, application France, Dec. 14, 1982, 82 20906
Int. Cl.[4] H03K *3/45, 17/60*
U.S. Cl. 307—270 10 Claims



1. A base drive and control circuit for a bipolar power transistor having a base, a collector and an emitter through the collector emitter path of which a current flows when a turn on biasing voltage is applied to the base, whereas the power transistor is cut off when a turn off voltage is applied to the base, said control circuit comprising:
i—a pulse transformer having primary and secondary windings;
ii—source means for applying control pulses of one polarity across the primary winding;
iii—first switch means connecting the secondary winding to the base of said power transistor, said first switch means having a control input;
iv—first control means, connected to the control input of said first switch means and to the secondary winding, for closing said first switch means during the interval of each control pulse;
v—a capacitor;
vi—first circuit means connected to the secondary winding and to said capacitor for charging said capacitor to said turn off voltage;
vii—second switch means connecting said capacitor to the base of said power transistor, said second switch means having a control input, and
viii—second control means, connected to the secondary winding and to the control input of said second switch means, for closing the second switch means and discharging the capacitor during the interval between each control pulse and the next control pulse.

4,639,617

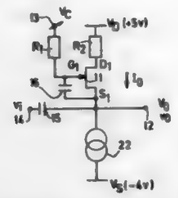
VARIABLE-BIAS CIRCUIT WITH HF TRANSMISSION PATH

Alex Giakoumis, Drancy, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,406
Claims priority, application France, Jun. 29, 1984, 84 10368
Int. Cl.[4] H03K *3/01, 3/353*
U.S. Cl. 307—296 R 4 Claims

1. A variable-bias circuit with an HF transmission path, having an output terminal (12) on which a variable bias voltage (Vo) is produced in response to variations of a d.c. control voltage (Vc) applied to a control terminal (13), which variable-bias circuit transmits an HF signal from an input terminal (14) to the output terminal (12) with a low attenuation, said input terminal and output terminal being interconnected by a decou-

pling capacitor (15), characterized in that said variable-bias circuit comprises a first field-effect transistor (11) whose source (S1) is driven by a constant-current generator (22) and



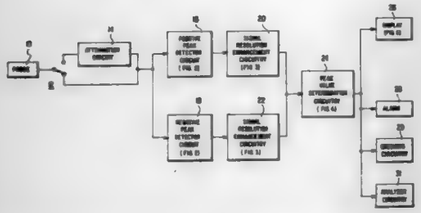
is connected to the output terminal (12), the gate (G1) of the transistor (11) being connected to the control terminal (13) via a resistor (R1) and to the source (S1) of the transistor (11) via a capacitive element (16).

4,639,618

SPIKE DETECTOR CIRCUITRY

Ole V. Olesen, Annapolis, Md., assignor to Pace, Incorporated, Laurel, Md.

Filed Sep. 26, 1983, Ser. No. 535,925
Int. Cl.[4] H03K *5/19*; G01R *19/04*
U.S. Cl. 307—351 11 Claims



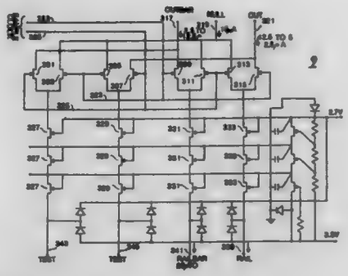
1. Circuitry for detecting a pulse of short duration including storage means for storing the peak amplitude of said pulse;
signal resolution enhancement means responsive to said storage means for establishing a plurality of channels respectively corresponding to a plurality of signal amplitude ranges where the range of signal amplitudes for each successive range is larger than that of the range preceding it, said signal resolution means including signal amplification means for each range;
peak signal detecting means responsive to said signal resolution enhancement means for (a) scanning said channels, (b) selecting one of said channels, said selected channel being such that said peak amplitude falls within the range for said channel, and (c) detecting said peak amplitude of the pulse;
said storage means including first storage means for storing the peak amplitude of positive going pulses and second storage means for storing the peak amplitude of negative going pulses; said signal resolution enhancement means including a first plurality of said channels for said positive going pulses and a second plurality of said channels for said negative going pulses; and
said peak signal detecting means including means for toggling between one channel corresponding to the smallest signal amplitude range for said positive going pulses and another channel corresponding to the smallest signal amplitude range for said negative going pulses.

4,639,619

ELECTRONIC SAMPLER SWITCH

Gary Baldwin, Palo Alto, Calif.; Robert B. Hallgren, Ithica, N.Y.; Thomas Hornak, Portola Valley, Calif., and Fred H. Ives, Veradale, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 20, 1985, Ser. No. 799,887
Int. Cl.[4] H03K *17/14, 17/16, 17/687*
U.S. Cl. 307—352 8 Claims



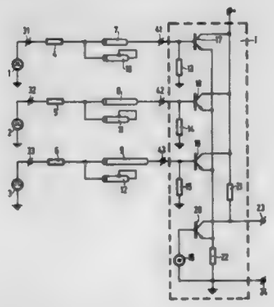
1. An electronic sampler switch comprising:
a first switch having a switch input, a control input and a switch output, said first switch responsive to a control signal applied to the control input for coupling an input current applied at the switch input to the switch output when said control signal is of a first value and for coupling said input current away from the switch output when said control signal is of a second value; and
a second switch coupled to the switch output, said second switch responsive to said control signal for subtracting from the switch output a current sufficient to canel any current coupled to the switch output by said control signal from effects of interelectrode capacitance between the first switch control input and the switch output such that the total current at the switch output is equal to said input current when said control signal is of said first value and is zero when said control signal is of said second value.

4,639,620

PARALLEL-SERIES CONVERTER

Johannes Wagenaekers, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 11, 1985, Ser. No. 690,924
Claims priority, application Netherlands, Jan. 11, 1984, 8400090
Int. Cl.[4] H03K *19/08*
U.S. Cl. 307—446 8 Claims



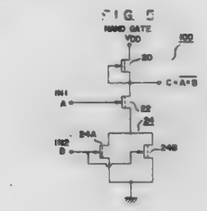
1. In a parallel-series converter having a plurality of parallel data signal inputs, a series data signal output, and a combining arrangement having a plurality of inputs equal in number to said plurality of data signal inputs, the improvement characterized in that:
each of the parallel data signal inputs is respectively connected by a series arrangement of a terminating impedance and a transmission line to respective ones of the inputs of said combining arrangement, the time delays of the respective transmission lines having different magnitudes according to an arithmetical progression; and
the junction between each terminating impedance and the associated transmission line is connected to a short-circuited transmission line having a length $\lambda/2$, where λ is the wavelength of the data signal output of said converter;
whereby each pulse in an input data signal reaching any such junction is reflected back to such junction by the short-circuited transmission line connected thereto in inverted form and after a time delay such that it substantially wholly cancels the portion of the original pulse which is overlapped by the inverted pulse.

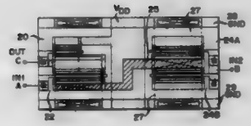
4,639,621

GALLIUM ARSENIDE GATE ARRAY INTEGRATED CIRCUIT INCLUDING DCFL NAND GATE

Yasuo Ikawa, Tokyo; Katsue Kawakyu, Kawasaki, and Atushi Kameyama, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 5, 1985, Ser. No. 804,744
Claims priority, application Japan, Mar. 28, 1985, 60-64424
Int. Cl.[4] H03K *19/094, 19/20, 19/017*
U.S. Cl. 307—450 4 Claims





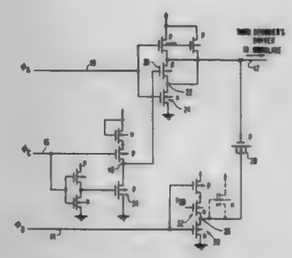
1. A gallium arsenide gate array integrated circuit comprising:
a plurality of direct-coupled field effect transistor logic NAND gates connected between a power source and a ground potential, each of said logic gates including:
a normally-on type field effect transistor functioning as a load transistor having an output terminal and a drain connected to the power source; and
a plurality of normally-off type field effect transistors functioning as at least two independent driver transistors having respective input terminals and series-connected between the power source and the ground potential through the load transistor, one of which driver transistors includes a plurality of normally-off type field effect transistors having a common gate connection and parallel-connected to each other so as to jointly constitute a single driver transistor made up by two normally-off type field effect transistors and with said single driver transistor connected to the ground potential by one of its source and drain terminals and to the other of said driver transistors by the other of said source and drain terminals.

4,639,622

BOOSTING WORD-LINE CLOCK CIRCUIT FOR SEMICONDUCTOR MEMORY

John J. Goodwin, Pleasantville, and Nicky C. Lu, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1984, Ser. No. 672,521
Int. Cl.[4] H03K *19/096*
U.S. Cl. 307—482 13 Claims



1. A voltage boosting circuit combination comprising a charge/discharge circuit being connectible to sources of first and second voltage levels and including a first plurality of MOSFET's,
an output lead for connection from said charge/discharge circuit to a word-line of a semiconductor memory,
a first input lead having an initially low voltage level clock signal Φ_A thereon connected to said charge/discharge circuit for actuating said MOSFET's to produce a voltage change on said output lead from a first voltage level to a second voltage level when said clock signal Φ_A turns on at time t_1,
a threshold voltage circuit including a second plurality of MOSFET's and a lead connecting said threshold voltage circuit to said charge/discharge circuit for deactivating one of said MOSFET's in said charge/discharge circuit,
a second input lead having an initially high voltage level clock signal Φ_C thereon connected to said threshold voltage circuit and turning off at a time t_3 after time t_1 for controlling the voltage level in said threshold voltage circuit.
an output signal boosting circuit including a third plurality of MOSFET's,
a third input lead having an initially low voltage level clock signal Φ_D thereon connected to said boosting circuit and turning on at a time t_2 between t_1 time and t_3 for actuating said MOSFET's to produce a voltage boosting signal, wherein said clock signals Φ_A and Φ_D are initially off at said low voltage levels and said clock signal Φ_C is initially on at said high voltage level to maintain an output signal on said lead from said threshold circuit to said charge/discharge circuit, and,
means connecting said boosting circuit to said output lead for applying said voltage boosting signal from said voltage boosting circuit to said output lead for boosting the voltage level change on said output lead to a third voltage level from said second voltage level.

4,639,623

HIGH SENSITIVITY SIGNAL DETECTOR

Keats A. Pullen, Jr., 2807 Jerusalem Rd., Kingsville, Md. 21087

Filed Jul. 13, 1984, Ser. No. 630,458
Int. Cl.[4] G06F *7/556*; H03K *5/153*
U.S. Cl. 307—492 6 Claims

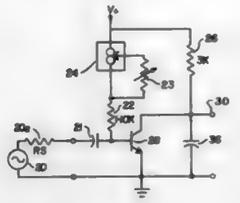
1. A detector circuit having improved sensitivity comprising:
a direct voltage source;
a load element;
a transistor circuit having a common emitter, a base, and a

collector connected to one end of said load element, said base and emitter forming a base-emitter junction which requires a minimum bias voltage for conduction, said common emitter and an opposite end of said load element connected to said direct voltage source;

a stable bias current source connected to said base connection to supply a stable bias current;

AC coupling means;

a signal source of alternating signals having an internal



impedance less than half the impedance of said base-emitter junction, said signal source being AC coupled to said base and emitter by said AC coupling means;

said bias current selected to provide an operating current for said transistor base-emitter junction which produces a substantially square law response to said alternating signals whereby alternating signals having peak to peak voltage levels less than half said base-emitter junction minimum bias voltage produce a base current magnitude change.

4,639,624

TORQUE MOTOR HAVING A COIL WITH FINITE TURNING RANGE

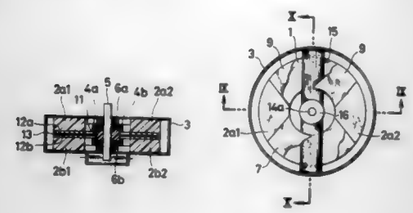
Yuuki Ejiri; Tomoo Ito, both of Katsuta; Hisato Tsuruta, Hitachi, and Hiroshi Kamifuji, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 759,964

Claims priority, application Japan, Jul. 27, 1984, 59-158258

Int. Cl.⁴ H02K *17/32*

U.S. Cl. 310—154 **14 Claims**



1. A torque motor comprising a housing, shaft means extending through said housing and supported by bearing means, a stationary core disposed in said housing, at least one coil fixed to said shaft means and arranged for rotation with respect to said stationary core within a finite range, magnet means fixed to said housing for imparting rotational force to said at least one coil, support means in said housing for fixedly supporting said stationary core, said at least one coil being provided with oppositely disposed free ends and extending across said stationary core between the free ends such that each of the free ends projects beyond an outer peripheral surface of said stationary core without contacting said stationary core, said support means including at least two plate members disposed on opposite sides of said shaft means, and said magnet means being disposed within said housing at portions other than portions where said support means is disposed.

4,639,625

DIRECT-CURRENT MACHINE HAVING PERMANENT MAGNET FIELD SYSTEM

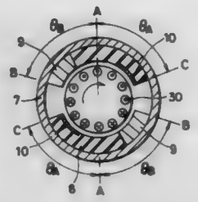
Toshimi Abukawa, Hitachiohta; Kazuo Tahara; Noriyoshi Takahashi, both of Hitachi; Fumio Tajima, Jyuoh, and Toslo Tomita, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 22, 1985, Ser. No. 768,323

Claims priority, application Japan, Aug. 29, 1984, 59-178348

Int. Cl.⁴ H02K *21/26*

U.S. Cl. 310—154 **11 Claims**



1. A direct-current machine comprising: a rotor including an armature core, an armature winding and a commutator; and a stator including a yoke, and permanent magnets and auxiliary poles both placed side by side on the inner peripheral surface of said yoke, and

a member of a high saturation magnetic flux density material which is placed on a part of a pole face of each of the permanent magnets, said part facing an air-gap and being under the influence of a demagnetizing field.

4,639,626

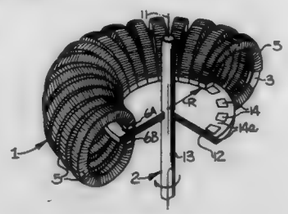
PERMANENT MAGNET VARIABLE RELUCTANCE GENERATOR

Daniel W. McGee, Fairfield, Iowa, assignor to Magnetics Research International Corporation, Fairfield, Iowa

Filed Apr. 26, 1985, Ser. No. 727,441

Int. Cl.⁴ H02K *21/38*

U.S. Cl. 310—155 **27 Claims**



1. A variable magnetic reluctance generator comprising:

stator means having a pair of fixed spaced poles of opposite magnetic polarity, each pole forming a continuous and smooth surface ring without surface discontinuities, the two rings together defining an annular gap having a magnetic field between the poles with the field intensity being uniform along the length of the annular gap, and magnetically permeable means for providing a magnetically permeable path connecting the poles;

at least one fixed stator winding surrounding the magnetically permeable path means; and

rotor means having alternating segments of high and low magnetic permeability, said rotor mean disposed for rotation with said segments of alternating high and low magnetic permeability remaining within and moving through the length of said gap between the opposite polarity poles, whereby the changes in the magnetic permeability of the gap between the opposite polarity poles resulting from the rotation of the rotor means causes variations in the magnitude but not direction of the magnetic flux in the associated magnetically permeable path means, which induces an electrical current in the surrounding stator winding.

4,639,627

INTERLOCKING YOKE AND ENDPLATES FOR PERMANENT MAGNET ROTOR

Yoshitaka Takekoshi, Hachioji, and Shigeyuki Uchiyama, Hino, both of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

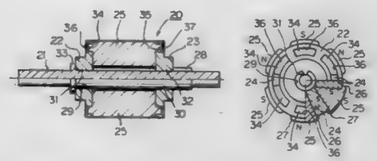
PCT No. PCT/JP84/00199, § 371 Date Dec. 20, 1984, § 102(e) Date Dec. 20, 1984, PCT Pub. No. WO84/04430, PCT Pub. Date Nov. 8, 1984

PCT Filed Apr. 19, 1984, Ser. No. 691,299

Claims priority, application Japan, Apr. 20, 1983, 58-68338

Int. Cl.⁴ H02K *21/12*

U.S. Cl. 310—156 **5 Claims**



1. A permanent-magnet field rotor, comprising:

a shaft having a cylindrical outer surface;

a pair of end plates secured to said cylindrical outer surface of said shaft and axially spaced from each other, each of said end plates having therein engagement holes spaced circumferentially from each other around the axis of said shaft;

a plurality of permanent magnets arranged circumferentially around the axis of said shaft and axially extending between said end plates to abut at either axial end thereof against said corresponding end plate, each of said permanent magnets having an outer surface and an inner surface in contact with said cylindrical outer surface of said shaft; and

a yoke disposed between each successive pair of permanent magnets to hold said permanent magnets therebetween, said yokes extending axially between said end plates to abut at either axial end of said yokes against said corresponding end plate, each of said yokes being provided at either axial end thereof with an axial protrusion which, when inserted into said corresponding engagement hole of said corresponding end plate, prevents said yoke from moving circumferentially and radially of said shaft and at either outer circumferential corner thereof with a protruding end which is in contact with said outer surface of said corresponding permanent magnet for preventing said permanent magnet from moving radially.

4,639,628

SMALL SIZE MOTOR

Toshiji Kobayashi, and Katsumi Matsumoto, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

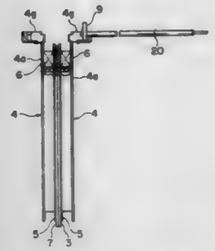
Filed Jul. 19, 1984, Ser. No. 632,170

Claims priority, application Japan, Nov. 8, 1983, 58-171936[U]

Int. Cl.⁴ H02K *11/00*

U.S. Cl. 310—194 **1 Claim**

1. A small motor, comprising, a core having a plurality of bent pole-teeth at a radial periphery thereof, a coil bobbin having at least one flange portion and a drum portion, said drum portion being fitted onto said core at the other periphery of said pole-teeth, lead wire holding means projecting from said flange portion and connected thereto by hinge portions at the outer periphery of said flange portion, said lead wire holding means connecting a wire wound on said coil bobbin to a lead wire, said hinge portions being formed at sides of said lead wire holding means so as to permit said lead wire holding



means to pivot to a position generally axially displaced from a plane of said coil bobbin.

4,639,629

BRUSH-HOLDER FOR FLAT-COMMUTATOR ELECTROMECHANICAL TRANSDUCER

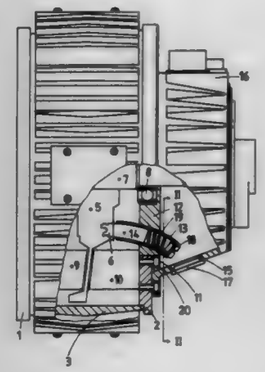
Damien Casanova, Barcelona, Spain, assignor to Mavilor Systemes S.A., Switzerland

Filed Jan. 9, 1985, Ser. No. 689,821

Claims priority, application France, Jan. 13, 1984, 84 00512

Int. Cl.⁴ H02K *13/00*

U.S. Cl. 310—248 **8 Claims**



1. Brush holder for an electromechanical transducer provided with a flat commutator, comprising guide sockets, characterized by the fact that the guide sockets are curved for receiving curved brushes and so disposed that their first ends register with the commutator and on a virtual circle concentric to the transducer shaft, whereas the second ends remote from said shaft lie on a second virtual circle concentric to said shaft and of radius greater than that of the virtual circle.

4,639,630

PIEZOCERAMIC SERVO-DRIVE FOR PRODUCING TRANSLATIONAL MOTION, ESPECIALLY FOR APPLICATION TO RING LASER MIRRORS

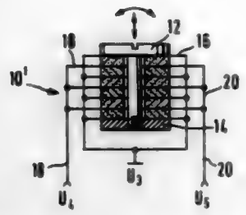
Rüdiger K. Rodloff, Meinersen, and Werner W. Jungbluth, Königslutter, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Mar. 26, 1985, Ser. No. 716,324

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412014

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—328 **3 Claims**



1. A piezoelectric drive for producing translation and angular movement comprising a plurality of first and second piezo discs arranged in a column, said discs being polarized in such a way that the direction of extension of the column and the direction of the electrical field are substantially parallel, said first and second piezo discs each having contact surfaces on the opposite sides thereof, the contact surfaces on said first piezo discs being substantially continuous, the contact surface on one side of each of said second piezo discs being symmetrically divided into a plurality of separate contact segments, each of said contact surfaces and each of said contact segments having a separate electrical contact thereon, means for effecting initial compression of said discs and a support engaging one end of said column and positioning the other end thereof in engagement with a component to be adjusted.

4,639,631

ELECTROSTATICALLY SEALED PIEZOELECTRIC DEVICE

Marc K. Chason, Schaumburg; Carl A. Kotecki, Palatine; Joseph P. Tomase, Libertyville; Michael J. Onystok, Bloomingdale; Donald J. Ryback, Northbrook; Robert G. Kinsman, Naperville; Lawrence N. Dworsky, Northbrook; Kenneth J. Nield, Western Springs, all of Ill., and Steven C. Moore, Mountain View, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1985, Ser. No. 750,455

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—344 **43 Claims**

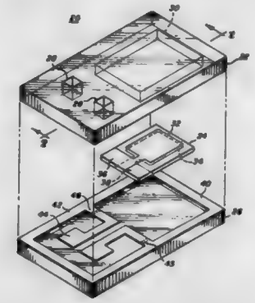
1. A hermetically sealed piezoelectric device package comprising:

a base and cover which are insulators within the operating temperature range of the device;

piezoelectric device mounted between said base and cover and having first and second electrodes;

means for providing electrical connections outside of said package with said first and second electrodes, said connection means including at least a first hole disposed in one of said base and cover and a first metal pad electrically connected to said first electrode, said pad contiguously abutting the periphery of said first hole;

means for electrostatically sealing said cover to said base to hermetically seal said device in the package, said sealing means including a strip of metal disposed contiguous to the periphery of said base and cover, said sealing means utilizing said first pad to form an electrostatic seal about said first hole and utilizing said strip of metal to form a seal about the periphery of said cover and base, thereby hermetically sealing the piezoelectric device inside the package.



4,639,632

PIEZOELECTRIC RESONATOR MOUNTINGS

Hozumi Nakata, Iruma, and Tsutomu Yamakawa, Kawagoe, both of Japan, assignors to Nihon Dempa Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 632,408, Jul. 19, 1984, abandoned. This application Oct. 22, 1985, Ser. No. 789,928

Claims priority, application Japan, Jul. 27, 1983, 58-115596; Nov. 7, 1983, 58-171252; Dec. 23, 1983, 58-198264; Dec. 23, 1983, 58-198265; Dec. 27, 1983, 58-198940; Dec. 27, 1983, 58-198941; May 29, 1984, 59-78951

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—351 **10 Claims**



1. A piezoelectric resonator, comprising:

a case including a pair of plate-like halves each of which has a frame portion along its edge, wherein said frame portions oppose each other and can adhere to each other;

a generally planar piezoelectric element including driving elements at central parts of its upper and lower surfaces, connecting electrodes extending, in opposite directions, from said driving electrodes toward edges of said upper and lower surfaces of the piezoelectric element, and conducting electrodes provided at parts of the edges of said upper and lower surfaces of the piezoelectric element to connect with said connecting electrodes;

a pair of lead-in conductors penetrating side portions of said case generally parallel to each other, said conductors including narrow-width portions which project from central portions of said conductors toward one another, arcuate projections each integrally connected at a central part to free ends of associated ones of said narrow-width portions wherein said projections are curved to extend inwardly of a region bounded by said conductors, and U shaped portions for reducing the effect of thermal conditions and mechanical vibration on said piezoelectric element when supported by said electrodes within said case, wherein the central parts of said arcuate projections of said lead-in conductors are attached and electrically connected to said conducting electrodes at the edge parts of the piezoelectric element by a conductive adhesive agent, and end portions of said arcuate projections are attached to regions of said piezoelectric element outside of the conducting electrode edge parts by an adhesive agent.

4,639,633

ELECTRON TUBE WITH CATHODE COOLING DEVICE

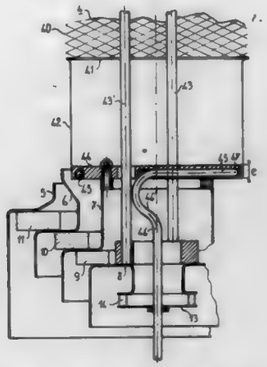
Roger Hoet, and Pierre Geriach, both of Thonon les Bains, France, assignors to Thomson-CSF, Paris, France

Filed May 7, 1985, Ser. No. 731,546

Claims priority, application France, May 9, 1984, 84 07104

Int. Cl.⁴ H01J *7/26*

U.S. Cl. 313—35 **2 Claims**



1. An electron tube comprising coaxial electrodes including a cathode, an anode and at least a control grid,

means forming with said electrodes a tube envelope,

skirt means within said envelope having a first end and a second end, said first end connected to the cathode,

plate means within said envelope and connected to said second end of said skirt means,

output connection means connected to the plate means and extending through the envelope for providing external connection to the cathode, and

tubular means having a spiral portion with an inlet and an outlet and included within said plate means for flowing cooling fluid for cooling said plate means and said skirt means with little cooling of the cathode.

4,639,634

CYCLOTRON WITH FOCUSSING-DEFOCUSSING SYSTEM

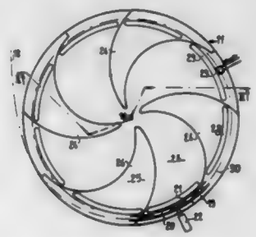
Gabriel Meyrand, Elancourt Marepas, France, assignor to C.G.R. MeV, Duc, France

Filed Apr. 6, 1984, Ser. No. 597,595

Claims priority, application France, Apr. 12, 1983, 83 05939

Int. Cl.⁴ H05H *13/00*

U.S. Cl. 313—62 **7 Claims**



1. A cyclotron having two pole pieces occupying the two axial faces of a relatively flat, cylindrical accelerating cavity, in the center of which is placed a charged particle source and which has means for positioning a target within said cavity, of the type in which the pole pieces have a succession of thick, spaced sectors regularly circumferentially distributed in order to define within the cavity an alternating succession of narrow air gap zones and wide air gap zones in order to ensure the vertical focussing, wherein there is also an arrangement of elongated narrow curved arcuate coils arranged in a circular manner in the vicinity of the periphery of the cavity and means for supplying electric power thereto, in order to vary to defocus the vertical focussing conditions in the vicinity of a circular path corresponding to the radial positioning of the target the coils locally strengthening the fields in the wide air gap regions and locally weakening the field in the narrow air gap regions.

4,639,635

SPARK PLUG

Anthony J. J. Lee, Chelmsford, England, assignor to National Research Development Corporation, London, England

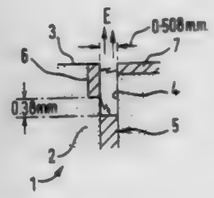
PCT No. PCT/GB83/00253, § 371 Date Jun. 7, 1984, § 102(e) Date Jun. 7, 1984, PCT Pub. No. WO84/01674, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 11, 1983, Ser. No. 619,163

Claims priority, application United Kingdom, Oct. 11, 1982, 8229009; Apr. 29, 1983, 8311904

Int. Cl.⁴ H01T *13/46*

U.S. Cl. 313—123 **12 Claims**



1. A spark plug including means defining a spark cavity having a base, sidewalls, and an exit opening providing a path of escape from the cavity for gases expanding therein,

first electrode means defining a first spark gap across an interior portion of said cavity, and

second electrode means defining a second spark gap extending across said exit opening,

said second electrode means being positioned relative to said first electrode means such that gases escaping from the cavity interior along said path of escape as a result of a spark across said first spark gap must traverse said second spark gap,

said second electrode means further being in series with said first electrode means,

whereby any tendency of said escaping gases to reduce spark current at said second spark gap causes a similar spark current reduction at said first spark gap, thereby reducing the flow of escaping gases and stabilizing the spark currents at said first and second spark gaps.

4,639,636

COLOR DISPLAY TUBE WINDOW, SKIRT AND MOUNT FOR COLOR SELECTION MEANS

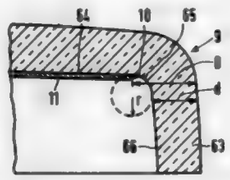
Gijsbertus Bakker, and Gerhardus J. Rorije, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, Tarrytown, N.Y.

Filed May 4, 1984, Ser. No. 607,359

Claims priority, application Netherlands, Dec. 6, 1983, 8304179

Int. Cl.⁴ H01J 29/07, 29/24

U.S. Cl. 313—408 2 Claims



1. In a color display tube including an envelope having a neck, a cone and a substantially flat display window which changes into a skirt, said skirt being substantially parallel to the axis of the envelope, by means of a strongly curved portion, an inner surface of the display window changing into the inner surface of said skirt by means of a first strongly curved surface having a radius of curvature r and the outer surface of said display window changing into the outer surface of said skirt by means of a second strongly curved surface, said skirt in proximity of said transition having a thickness d, said display window having on its inside surface a substantially rectangular display screen including a material luminescing in at least one color, color selection means positioned in front of said display screen, and means in said neck to generate at least one electron beam, said display window having a distance D in a plane perpendicular to said tube axis, between the boundary of said luminescent material of said display screen and said outer surface of said skirt of said display window,

the improvement wherein D is substantially equal throughout the circumference of said display window, and wherein the radius r is equal to or less than 10 mm and (D−d)/r is equal to or less than one.

4,639,637

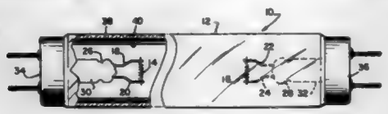
ARC DISCHARGE LAMP HAVING IMPROVED LUMEN MAINTENANCE

Fred R. Taubner, and Joseph A. Roy, both of Danvers, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 27, 1981, Ser. No. 228,865

Int. Cl.⁴ H01J 31/00, 31/26

U.S. Cl. 313—489 5 Claims



1. An arc discharge lamp having a light emitting envelope containing an ionizable medium which includes mercury vapor and having electrodes sealed into the ends thereof; and a layer of phosphor on the interior surface of said envelope, the improvement comprising: a layer of submicron size alumina overlying said layer of phosphor, the weight of said alumina being in the range of about 300 to 500 micrograms per square centimeter.

4,639,638

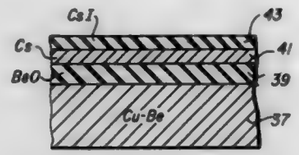
PHOTOMULTIPLIER DYNODE COATING MATERIALS AND PROCESS

John A. Purcell, Hightstown; John T. Puglis, Bridgewater, and Steven W. Duckett, Princeton, all of N.J., assignors to Sangamo Weston, Inc., Norcross, Ga.

Filed Jan. 28, 1985, Ser. No. 695,155

Int. Cl.⁴ H01J 1/32, 43/22

U.S. Cl. 313—534 18 Claims



1. In a photomultiplier of the type including a photocathode formed from at least an alkali metal or compound thereof and at least one electron accelerating structure, such as a dynode or the like,

an improved coating for said electron accelerating structure comprising:

at least one layer of a secondary electron emissive material disposed over the electron accelerating structure, the secondary electron emissive material being an alkali halide selected from the group consisting of cesium iodide, cesium bromide, cesium chloride, rubidium bromide, rubidium chloride, potassium bromide, potassium chloride, potassium iodide, lithium fluoride, sodium bromide, sodium chloride, sodium fluoride, and sodium iodide, the coating material coating any free alkali metal present on the surface of the electron accelerating structure whereby the photosensitivity of the electron accelerating structure to radiation of wavelengths of 400 nanometers or greater is reduced.

4,639,639

HIGH-PRESSURE SODIUM VAPOR LAMP AND TERNARY AMALGAM THEREFOR

Chikara Hirayama, Murrysville, and Kenneth F. Andrew, Pittsburgh, both of Pa., assignors to North American Philips Corporation, New York, N.Y.

Filed Apr. 23, 1985, Ser. No. 726,214

Int. Cl.⁴ H01J 61/20

U.S. Cl. 313—639 13 Claims



1. A high pressure sodium vapor lamp for operation at a sodium vapor pressure of at least 60 Torr, such lamp comprising an arc discharge tube containing a ternary amalgam of mercury, sodium and a third metal selected from the group consisting of indium, gallium and tin, the atomic proportion of the third metal exceeding that of the mercury but not exceeding that of the sodium in the amalgam, and the atomic proportion of the sodium being at least twice but not over four times that of the mercury.

4,639,640

RESISTORS FOR USE IN CATHODE RAY TUBES

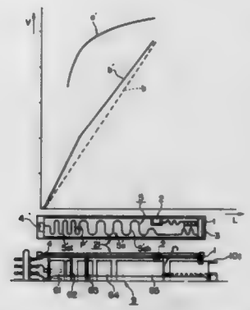
Katsuhiko Hata, and Takahiko Yamakami, both of Aichi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 17, 1984, Ser. No. 682,247

Claims priority, application Japan, Dec. 16, 1983, 58-238244

Int. Cl.⁴ H01J 23/16

U.S. Cl. 315—3 9 Claims



1. A resistor for use in a cathode ray tube comprising

an insulating plate provided thereon with at least first and second electrode terminals for use respectively with relatively high and low voltages in the cathode ray tube,

a coating insulator provided on said insulating plate for covering the same, and

a resistive layer provided in a predetermined pattern on said insulating plate for coupling therethrough said first and second electrode terminals with each other and being covered by said coating insulator, said resistive layer being so arranged that the resistance of said resistive layer obtained per unit length on said insulating plate between said second electrode terminal and a high potential difference position between said first and second electrode terminals, where the potential difference between the outer surface of said coating insulator and said resistive layer is to be relatively large in the use of said resistor in the cathode ray tube, is greater than that between said high potential difference position and said first electrode terminal.

4,639,641

SELF-FOCUSING LINEAR CHARGED PARTICLE ACCELERATOR STRUCTURE

Dominique Tronc, Chatou, France, assignor to C. G. R. MeV, Buc, France

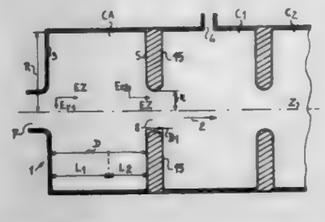
Filed Aug. 27, 1984, Ser. No. 644,540

Claims priority, application France, Sep. 2, 1983, 83 14090

Int. Cl.⁴ H01J 25/10

U.S. Cl. 315—5.41 4 Claims

1. In a self focusing linear charged particle accelerator structure, comprising a first accelerating cavity of a succession of accelerating cavities for accelerating a beam of charged particles under the effect of an electromagnetic wave of a given frequency F injected into said structure, said first cavity having an axis merging with a longitudinal axis of said structure and the axis of said beam and comprising an inlet face and an outlet face provided respectively for the passage of said beam with an inlet hole and an outlet hole of a given radius, the distance between said inlet and outlet faces of said first cavity comprising a conventional accelerating length L1, the radius r of the outlet hole being sufficiently small with respect to said accelerating length for the radio 2r/L1 to be less than 1, wherein said distance betewen said inlet and outlet faces is formed by said accelerating length plus an additional length to delay the time of arrival of the particles at said outlet face, and in which said additional length is chosen so that the outlet face



corresponds to a region where the particles in the beam which have been bunched in transit through the first cavity no longer experience a radial divergent electric field component of the electromagnetic field at said outlet hole.

4,639,642

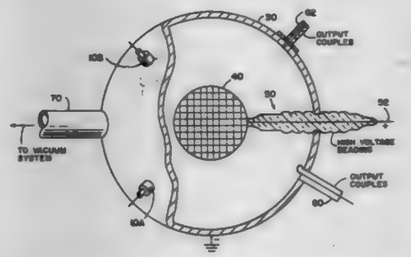
SPHERICON

Thomas G. Roberts, Huntsville, and Thomas E. Honeycutt, Somerville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 20, 1984, Ser. No. 684,391

Int. Cl.⁴ H01J 7/46, 19/80

U.S. Cl. 315—39 10 Claims



1. A RF energy producing device comprising a spherical outer electrode; first means for producing electrons; second means for injecting the electrons inside said spherical electrode; a second spherical inner electrode positioned symmetrically inside said outer electrode; third means connected to said inner electrode so as to make said inner electrode a positive voltage potential relative to said outer electrode; and said inner electrode being substantially open in construction so that most electrons will be accelerated by the voltage potential and will not be collected by the inner electrode but will oscillate about the electrodes creating RF energy.

4,639,643

THYRATRON INTERRUPTERS

Timothy P. Donaldson, Great Totham, and Hugh Meanown, Writtle, both of England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Nov. 12, 1981, Ser. No. 320,682

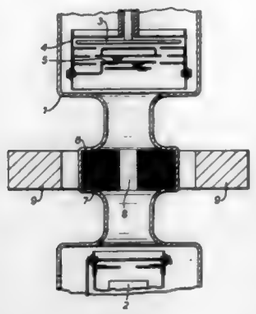
Claims priority, application United Kingdom, Nov. 15, 1980, 8036736

Int. Cl.⁴ H05B 37/00, 39/00, 41/00; H01J 11/04, 13/48, 15/04, 17/36

U.S. Cl. 315—344 19 Claims

1. A thyratron interruptor comprising: discharge means for generating a discharge current comprising an anode electrode, a control grid and a cathode electrode, said discharge means

having a space between said anode and cathode electrodes for the discharge current to flow with said control grid being disposed in said space; and quenching means for selectively causing the recombination of ions and electrons in the discharge to quench the discharge, said quenching means comprising a quenching structure which is disposed in said space between said anode and cathode electrodes in addition to said



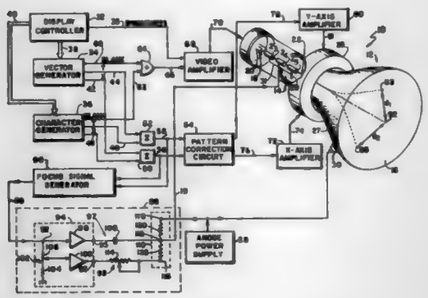
control grid, with said structure including plural surfaces, whose potential may float during normal operation, disposed along the direction of the discharge current flow and presenting a passage therethrough for the discharge current flow, and control means for selectively moving the discharge current flow into contact with said plural surfaces to cause the recombination of ions and electrons in the discharge.

4,639,644

HIGH VOLTAGE DYNAMIC FOCUSING SYSTEM

Lawrence H. Skow, Marlboro, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 575,081, Jan. 30, 1984. This application Apr. 3, 1986, Ser. No. 847,103
Int. Cl.[4] H01J *29/58*
U.S. Cl. 315—382 16 Claims



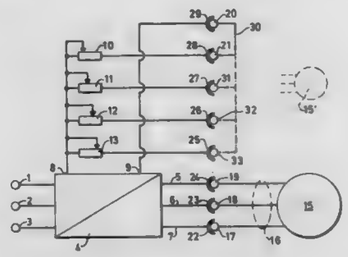
8. A display system comprising:
a display screen having a plurality of display positions;
means for projecting an electron beam onto a nominal display position on the display screen;
means for positioning the projected electron beam to display positions on the display screen other than the nominal display position in accordance with positioning signals;
means, responsive to the positioning signals, for generating a variable focusing signal;
means for focusing the projected electron beam at each display position on the display screen to which the projected electron beam is positioned; and
a circuit, responsive to the variable focusing signal, for producing a composite focusing signal and coupling said composite focusing signal to the focusing means, said circuit comprising:
(a) means, fed by the variable focusing signal, for producing a first amplified, variable focusing signal at a first output port, and a second amplified, variable focusing signal at a second output port;
(b) means, including a capacitor coupled to the first output port, for coupling the first amplified, variable focusing signal through the capacitor to produce a capacitively coupled, first amplified, variable focusing signal;
(c) means for producing a first predetermined reference voltage; and
(d) combining means for coupling the first predetermined reference voltage producing means to an output terminal to provide a nominal focusing voltage at the output terminal, for combining therewith at the output terminal the capacitively coupled, first amplified, variable focusing signal and the second amplified, variable focusing signal to produce the composite focusing signal at the output terminal, and for attenuating the nominal focusing voltage produced at the output terminal to a predetermined factor thereof at the second output port of the amplifying means.

4,639,645

DRIVE SYSTEM FOR A.C. MOTORS

Carl S. M. Hartwig, Taby, Sweden, assignor to Institut Cerac S. A., Ecublens VD, Switzerland

Filed Jul. 10, 1985, Ser. No. 753,497
Claims priority, application Switzerland, Aug. 1, 1984, 3710/84
Int. Cl.[4] H02P *7/74*
U.S. Cl. 318—51 10 Claims



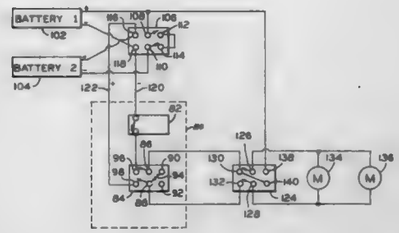
1. A machine drive system comprising:
at least two brushless AC motors (15) having mutually distinct working characteristics, each of said motors being adapted to be responsive to specific electrical input power having particular parameters;
a static converter means (4) having a common output (5, 6, 7) and a control input (8, 9), said converter means being adapted to be connected to said motors and to selectively provide from said common output said specific electrical input power having particular parameters;
circuit means connecting said motors, one at a time to said static converter means, said circuit means having an exclusive connection identification means (10–13; 35; 44; 47) for each motor,
said connection identification means being adapted to set said control input on said converter means whereby said converter means is adjusted to generate the specific electrical input power for the respective motor.

4,639,646

TWO PEDAL, THREE-WAY CONTROL FOR CHILD'S RIDING TOY

Timothy S. Harris, and Lawrence R. Harrod, both of Fort Wayne, Ind., assignors to Kransco Manufacturing, Inc., San Francisco, Calif.

Filed Feb. 4, 1985, Ser. No. 697,838
Int. Cl.[4] H02P *1/22, 3/12*
U.S. Cl. 318—139 8 Claims



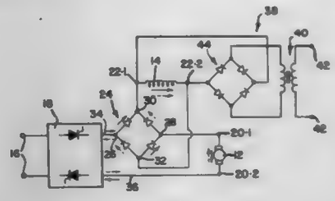
1. A child's riding toy comprising:
motor drive means;
reversing switch means connected to the motor drive means and having a forward position and a reverse position;
battery power supply means connected to the reversing switch means to supply a plurality of levels of driving current up to a predetermined maximum level through the reversing switch means in one polarity to the motor drive means when the reversing switch means is in its forward position;
a separate connection means connected from the battery power supply means to the reversing switch means for only supplying less than said predetermined maximum level of driving current through the reversing switch means in an opposite polarity when the reversing switch means is in its reverse position, whereby a maximum driving current supplied to the motor drive means when the reversing switch means is in its reverse position is less than and of opposite polarity to the predetermined maximum level of driving current supplied to the motor drive means when the reversing switch means is in its forward position;
the battery power supply means comprising means to supply, selectively, high and low battery voltages to the reversing switch means, thereby to supply said driving current in one polarity to the motor drive means when the reversing switch means is in its forward positon;
spring-biased switching means connected between the battery power supply means and the reversing switch means normally to disconnect the battery power supply means from the reversing switch means, whereby no driving current will normally be supplied to the motor drive means, the spring-biased switching means being actuable by a driver of the toy to supply the driving current to the motor drive means in a polarity determined by a position to which the reversing switch is set; and
a dynamic braking load connected to the spring-biased switching means to be connected thereby to the reversing switch means when the spring-biased switching means is in a normal position, whereby current generated by the motor drive means when the spring-biased switching means is not actuated can flow through the dynamic braking load.

4,639,647

FOUR QUADRANT CONTROL OF SERIES MOTORS

Bonne W. Posma, 1 Main St., Youngstown, N.Y. 14174

Filed Mar. 19, 1985, Ser. No. 713,546
Claims priority, application South Africa, Apr. 4, 1984, 84/2499; Nov. 27, 1984, 84/9258
Int. Cl.[4] H02P *7/12*
U.S. Cl. 318—247 16 Claims



1. A method of controlling at least one series motor which includes connecting rectifier means in series with the motor so that current through a field winding of the motor is always in the same direction irrespective of the polarity of the input voltage while the current direction through an armature of the motor reverses in accordance with the polarity of the input voltage, applying an energizing current to the field winding to ensure that the field winding always produces some flux during operation of the motor, and detecting a regenerative condition of the motor, and when detected, causing a switching action to take place to isolate the field winding from the armature thereby to change the series motor to an equivalent shunt motor.

14. A controller for controlling at least one series motor, the controller comprising:
control means operable to vary the polarity and voltage supplied to the motor;
rectifier means intermediate the control means and the motor for supplying current in one direction only through a field winding of the motor irrespective of the polarity of the voltage supplied by the control means and for supplying current with reversible polarity to an armature of the motor in accordance with polarity of the voltage as supplied by the control means;
bias power supply means connectable to the field winding for producing field flux during all stages of operation of the motor to produce counter EMF when the motor rotates, whether or not armature current flows; and
means for detecting a regenerative condition of the motor and for operating a switch means when said regenerative condition is detected to isolate the field winding from the armature.

4,639,648

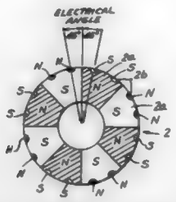
THREE-PHASE BRUSHLESS MOTOR

Satoshi Sakamoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 654,004, Sep. 12, 1984, Pat. No. 4,585,979. This application Jan. 24, 1986, Ser. No. 822,159
Claims priority, application Japan, Feb. 18, 1985, 60-29503
Int. Cl.[4] H02K *29/08*
U.S. Cl. 318—254 19 Claims

1. A three-phase brushless motor in which two electromagnetic transducer elements to detect a rotational position of a rotor having a plurality of magnetic poles disposed so as to produce a composite signal having a phase difference of 120° relative to respective output signals from said two electromagnetic transducer elements, said output signals from said two electromagnetic transducer elements and said composite signal are used to determine a drive current which will be fed to a stator coil, characterized in that auxiliary magnetic poles having opposite polarities to those of main magnetic poles on said rotor are disposed on said rotor in opposing relationship to said

electromagnetic transducer elements and at a positions on said rotor with an electrical angle of substantially ±45° from a boundary between respective North poles and South poles of



said main magnetic poles, whereby waveforms of said composite signal and said output signals from said electromagnetic transducer elements have a steep slope at zero-crossing points.

4,639,649

MOTOR CONTROL DEVICE

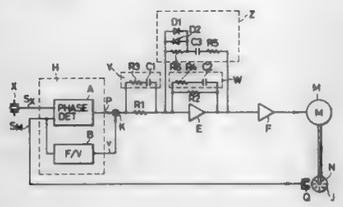
Kaoru Seto, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 563,793, Dec. 21, 1983, abandoned. This application Mar. 6, 1986, Ser. No. 838,394

Claims priority, application Japan, Dec. 29, 1982, 57-231516

Int. Cl.⁴ H02P *5/16*

U.S. Cl. 318—314 **7 Claims**



1. A motor control device comprising speed detection means for detecting a motor speed and for generating a detection signal having a frequency depending on the motor speed; reference signal generating means for generating a reference signal having a reference frequency; and control means for controlling the motor speed; wherein said control means includes:

means for detecting a phase difference between the reference signal and the detection signal and for generating a phase difference signal depending on the phase difference;

means for generating a speed signal depending on the frequency of the detection signal;

combining means for combining the phase difference signal and the speed signal and for generating a control signal for controlling the motor speed; and

error-eliminating means for substantially eliminating from the control signal, generated by said combining means, a phase error component resulting from the phase difference between the reference signal and the detection signal when the phase error component exceeds a predetermined level during the phase synchronization pull-in period, and for providing the control signal from which the error component has been eliminated to said motor.

4,639,650

CONTROL SYSTEM FOR A COOLING FAN IN AN IMPACT PRINTER

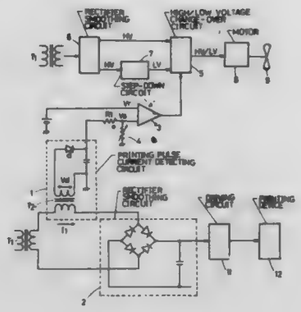
Toshihiko Nakai, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1985, Ser. No. 701,615

Claims priority, application Japan, Feb. 17, 1984, 59-021623[U]

Int. Cl.⁴ G05B *5/00*; B41J *19/00*

U.S. Cl. 318—333 **3 Claims**



1. In a control system for an impact printer having a printing device, a driving circuit for diving the printing device, a cooling fan, and a motor for driving the cooling fan, the improvement comprising:

first means for detecting a current for driving the printing device, said current for driving being indicative of the printing rate of the printing device, and for producing an output voltage which is dependent on the current;

comparator means for comparing the output voltage of the first means with a reference value and producing a difference level which is dependent on the comparison;

second means for selectively supplying a first current, proportional to a high voltage, to the motor or a second current, proportional to a low voltage, to the motor; and

change-over means, responsive to the difference signal of the comparator means, for controlling the current selected to be supplied by said second means so as to supply said first current to the motor for driving the fan when a high level difference signal is outputted from said comparator means, said high level difference signal being indicative of a high printing rate in the printing device, so as to increase the motor speed for driving the fan or to supply said second current to the motor when a low level difference signal is outputted from said comparator means said low level signal being indicative of a low printing rate in the printing device so as to decrease the motor speed for driving the fan.

4,639,651

ELECTROMAGNETIC SERVO DEVICE

Yasuo Shimizu, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1985, Ser. No. 791,641

Claims priority, application Japan, Oct. 26, 1984, 59-225456

Int. Cl.⁴ G05B *11/10*

U.S. Cl. 318—432 **5 Claims**

1. In an electromagnetic servo device (200) including:

an input shaft (1);

an output shaft (4);

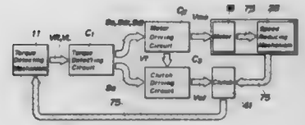
electric motor means (18) for producing auxiliary torque to be applied to said output shaft (4);

electromagnetic clutch means (41) for transmitting motor torque of said motor means (18) as the auxiliary torque to said output shaft (4);

torque detection means (11) for detecting steering torque (Ti) acting on said input shaft (1); and

driving control circuit means (100) adapted for, in accordance with an output signal (VR, VL) from said torque detection means (11), providing:

a first control signal (Vmo), to thereby feed an armature current (Io) of a controlled quantity in a controlled direction, to said motor means (18); and



a second control signal (Vc1), to thereby control, said clutch means (41),

an improvement comprising:

said second control signal (Vcl) having fed back thereto a signal (Vf) according to the actual quantity of said armature current (Io).

4,639,652

CONTROL SYSTEM FOR ROBOT MANIPULATOR

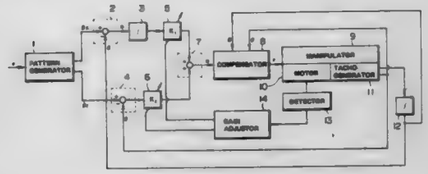
Tohru Takahashi, Yokosuka, and Kunihiko Kurami, Kawasaki, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Jun. 18, 1985, Ser. No. 746,021

Claims priority, application Japan, Jun. 19, 1984, 59-124472

Int. Cl.⁴ G05B *19/42*

U.S. Cl. 318—568 **2 Claims**



1. A control system for a controlled body whose motion is controlled by the output of an electric motor comprising:

a source providing electric current for the motor;

a feedback loop providing feedback signals from the output of the motor to the source including means for adjusting gain in the feedback signals;

means for detecting a value representing electric current supplied from said source for driving the motor;

means for comparing the detected value with a predetermined band having maximum and minimum levels based on the saturated electric current level of the motor; and

means responsive to the comparison for adjusting the feedback gain so that the detected value is maintained within said predetermined band to control the characteristic motion of the controlled body.

4,639,653

METHOD AND APPARATUS FOR PERFORMING WORK IN A THREE DIMENSIONAL SPACE

Robert L. Anderson, Boulder; James A. Pilarski, Northglenn, and Jerry A. Klintz, Boulder, all of Colo., assignors to Applied Microbotics Corporation, Boulder, Colo.

Filed Apr. 15, 1985, Ser. No. 723,552

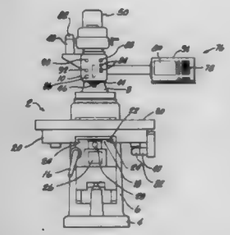
Int. Cl.⁴ G05B *11/28*

U.S. Cl. 318—599 **43 Claims**

1. A method for controlling the relative movement of a workpiece and a tool in a three dimensional space so as to perform desired operations on the workpiece comprising:

providing a motor control means for moving at least one of said workpiece and tool in a direction along an x, y or z axis; and

generating a signal by concurrently performing a first set of tasks including foreground tasks, midground tasks and background tasks;



transmitting said signal to a motor control board;

generating another signal by said motor control board by concurrently performing a second set of tasks including foreground tasks, midground tasks and background tasks; and

using said another signal to operate said motor control means.

4,639,654

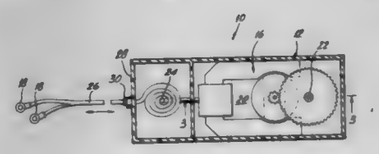
EMERGENCY GENERATOR BATTERY SYSTEM

Benjamin D. Braxton, and George Spector, both of 233 Broadway, Rm 3615, both of New York, N.Y. 10007

Filed Jul. 2, 1985, Ser. No. 751,504

Int. Cl.⁴ H02J *7/00*

U.S. Cl. 320—2 **2 Claims**



1. An emergency generator for a battery which comprises:

(a) a housing with a handle;

(b) a magneto power source mounted within said housing;

(c) electric leads on a reel within said housing; and

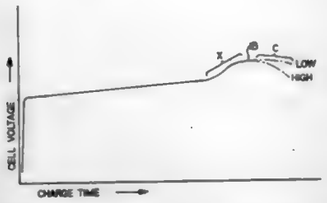
(d) a pair of terminal rings mounted on end portions of said leads which extend externally from said housing and a crank for actuating said magneto mounted on said housing, said crank being rotatable about an axis parallel to the axis of rotation of said reel, wherein said reel is spring biased to the reeled-in position and said leads are in the form of a cable that extends outwardly through a side of said housing in a direction transverse to said crank axis; including a spring lock latch mounted on said side of said housing to engage with said cable so that said cable can be pulled out and locked by said latch to any desireable length as needed.

4,639,655

METHOD AND APPARATUS FOR BATTERY CHARGING

Lawrence A. Westhaver, 8609 Portsmouth Dr., Laurel, Md. 20708, and Ronald E. Rukzenis, 5488 Halflight Garth, Columbia, Md. 21045

Filed Apr. 19, 1984, Ser. No. 601,958
Int. Cl.[4] H02J 7/04
U.S. Cl. 320—14 7 Claims



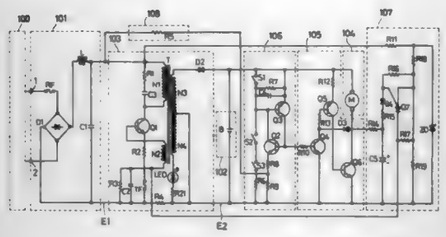
1. A method of charging a battery and terminating the charging thereof upon determination of the existence of a prescribed condition comprising the steps of:
applying charging current to the battery;
measuring the battery voltage soon after the charging current is applied;
determining, on the basis of said battery voltage measurement, the knee voltage of the charging characteristic of the particular battery being charged;
calculating a battery voltage limit beyond which no further charging current is to be applied, said voltage limit being the point at which the instantaneous battery voltage is a pre-determined value greater than the knee voltage of the battery's charging characteristic;
continued measuring of the battery voltage as said charging current is applied; and
terminating the application of charging current when said battery voltage limit is reached.

4,639,656

ELECTRICAL APPARATUS CONNECTED WITH A BATTERY CHARGER SYSTEM

Kiyotaka Mukai, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 2, 1985, Ser. No. 729,689
Claims priority, application Japan, May 4, 1984, 59-65748[U]; May 4, 1984, 59-65749[U]; Aug. 3, 1984, 59-120501[U]
Int. Cl.[4] H02J 7/00
U.S. Cl. 320—22 10 Claims



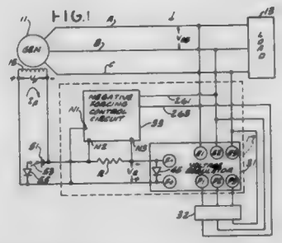
1. An electrical apparatus connected with a battery charger system comprising;
a rechargeable battery,
a charge current source for supplying charge current to said battery and electrically connected to said battery, means for controlling said charge current supplied to said battery, said charge current controlling means changing large current for fast charging into small current for normal charging of said battery by said charge current supplied thereto, said charge current controlling means being interconnected between said battery and said charge current source and disposed therebetween,
electrical load means supplied with load current from said battery and electrically connected to said battery,
switching means interconnected between said battery and said load means for switching between a conduction and a non-conduction state for controlling the supply of said load current to said load means from said battery,
switch-operating means interconnected between said battery and said switching means for operating said switching means to switch between said conduction state and said non-conduction state, and
fast-charging-period controlling means electrically connected to said charge current source, said switching means and said charge current controlling means for controlling the supply of said large current for fast charging by said charge current controlling means,
said fast-charging-period controlling means comprising a capacitor capable of being charged to a potential indicative of the time required to charge said battery to a value sufficient to operate said load means for a fixed period of time and discharged across a resistor and said switching means, said charge current controlling means enabling rapid flow of said large current used for fast charging to said battery during the interval when the charge voltage of said capacitor is raised to said indicative potential and thereafter enabling said small current for said normal charging to flow through said charge current controlling means; whereby said battery for operating said load means can be rapidly charged to a value sufficient to permit the operation thereof for said period while enabling normal charging of said battery thereafter.

4,639,657

ELECTRICAL CONTROL APPARATUS AND METHODS

Waldo J. Frierdich, Highland, Ill., assignor to Basler Electric Company, Highland, Ill.

Filed Aug. 30, 1984, Ser. No. 645,559
Int. Cl.[4] H02P 7/12
U.S. Cl. 322—59 39 Claims



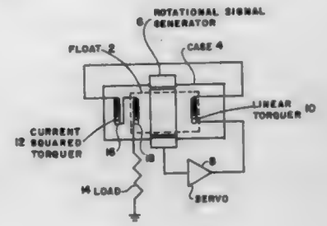
1. For use in an electrical power generating system including a generator for supplying an A.C. output voltage to a load on a set of lines, means responsive to the A.C. output voltage for producing a regulating voltage, the generator having a winding the D.C. energization of which controls the A.C. output voltage, and an electrical resistance for connection between the winding and the voltage regulating means, apparatus for controlling the energization of the winding comprising:
switching means adapted to be connected across the resistance and which when rendered conductive bypasses the resistance to couple the regulating voltage from the voltage regulating means to the winding with negligible loss of energy;
means for producing a signal when an increase in the A.C. output voltage exceeding a preselected parameter occurs;
means for rendering the switching means nonconductive in response to the signal thereby causing the resistance to consume energy from the winding; and
means directly responsive to the regulating voltage for rendering the switching means conductive when the regulating voltage rises above a predetermined value.

4,639,658

FLOAT STABILIZED CONSTANT CURRENT SOURCE

Jeffrey W. Hegg, Clearwater, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 23, 1986, Ser. No. 854,960
Int. Cl.[4] G05F 1/00
U.S. Cl. 323—204 6 Claims



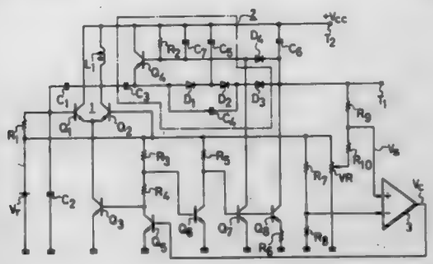
1. A current source comprising
a current output circuit,
a floated cylinder means including a floated cylinder,
a first torquer means arranged to produce a torque on said cylinder directly proportional to an electrical current,
a second torquer means arranged to produce a torque on said cylinder directly proportional to the square of an electrical current and opposite to the torque produced by said first torquer means,
signal generator means for producing an output current representative of a rotation of said cylinder and
servo means for supplying a feedback connection for the output current from said generator means to a series connection of said first and second torquer means and said output current circuit.

4,639,659

DC-DC CONVERTER

Taiwa Okanobu, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 21, 1986, Ser. No. 842,252
Claims priority, application Japan, Apr. 5, 1985, 60-72193
Int. Cl.[4] G05F 1/46
U.S. Cl. 323—224 9 Claims



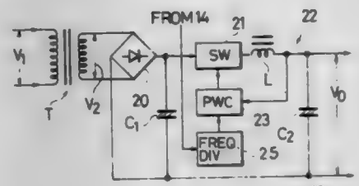
1. A DC-DC converter comprising:
oscillation circuit means having an oscillating state in which an oscillation output is provided and a stop state;
an output terminal;
a voltage source line for receiving a power source voltage;
voltage-multiplying rectifier means receiving said power source voltage from said voltage source line and connected to said oscillation circuit means to receive said oscillation output in said oscillating state and to then generate a rectified output having a voltage which is at least two times the peak voltage of said oscillation output and which is superposed on said power source voltage to provide an output voltage at said output terminal which is higher than said power source voltage;
a series circuit formed of a resistor and a diode and being connected between said voltage source line and said output terminal; and
voltage dividing means connected between a connection point of said resistor to said diode in said series circuit and a ground so that, in said stop state of said oscillation circuit means, said power source voltage is divided by said voltage dividing means for obtaining an output voltage at said said output terminal which is lower than said power source voltage.

4,639,660

SWITCHING CIRCUIT FOR A POWER SUPPLY IN A SIGNAL PROCESSING APPARATUS

Masayuki Yoshida, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 19, 1985, Ser. No. 713,676
Claims priority, application Japan, Mar. 19, 1984, 59-39385[U]
Int. Cl.[4] G05F 1/44
U.S. Cl. 323—266 3 Claims



1. In a signal processing apparatus for processing signals in synchronism with a first clock signal having predetermined frequency, a source of said first clock signal, a source of non-stabilized DC voltage, and a switching means connected to receive said DC voltage and to provide an output voltage to a power supply line, the improvement comprising:
a frequency divider means adapted to receive said first clock signal and to generate a second clock signal having a frequency which is in an integer ratio relationship with said predetermined frequency, said switching means being driven by said second clock signal whereby said switching means is adapted to interrupt said non-stabilized DC voltage intermittently to provide a DC output voltage, and
electric power supplying means responsive to said second clock signal for regulating said switching means such that the DC output voltage to be supplied to said electric power supply line is set equal to a predetermined voltage value.

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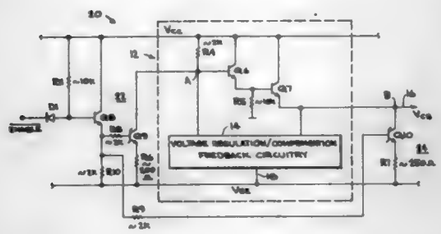
POWER-DOWN ARRANGEMENT FOR AN ECL CIRCUIT

Bertrand J. Williams, San Jose, and Stanley Wilson, Sunnyvale, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 3, 1985, Ser. No. 772,211
Int. Cl.[4] G05F 3/20
U.S. Cl. 323—317 20 Claims

1. A circuit arrangement for reducing a reference supply voltage level of a reference generator for an ECL circuit during a power-down mode comprising in combination:
the ECL circuit including;
a first transistor having its collector connected to a supply

potential via a first resistor and its base connected to an input logic signal;
a second transistor having its collector connected to the supply potential via a second resistor and its base connected to a reference bias voltage;
a constant current source is formed of a third transistor and a third resistor, the collector of said third transistor being connected to the emitters of said first and second transistors, the emitter of said third transistor being connected one end of said third resistor, the other end of said third resistor being connected to a supply voltage source;
a fourth transistor having its collector connected to the



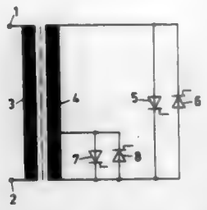
supply potential, its base connected to the collector of said first transistor and its emitter connected to an inverted output terminal; and
a fifth transistor having its collector connected to the supply potential, its base connected to the collector of said second transistor and its emitter connected to a non-inverted output terminal;
reference generator means having a reference supply voltage connected to the base of said third transistor; and
switching means connected to the input of said reference generator means for disabling of the input of said reference generator means in response to a control signal so as to reduce the reference supply voltage level.

4,639,662

THYRISTOR CIRCUIT FOR CURRENT REGULATION

Georg Mastner, Niederrohrdorf, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Aug. 9, 1984, Ser. No. 639,000
Claims priority, application Switzerland, Aug. 18, 1983, 4509/83
Int. Cl.⁴ G05F *1/32*
U.S. Cl. 323—343 **6 Claims**



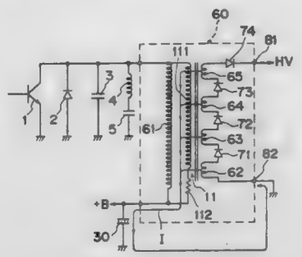
3. A circuit for producing a regulated d.c. current, comprising:
a transformer comprising plural inductively coupled windings including a first winding having two primary connections for connecting of the thyristor circuit to an electric circuit, and a second winding;
at least a first bipolar thyristor switch connected between a first two connections of said second winding;
at least a second bipolar thyristor switch connected between a second two connections of said second winding;
said second winding having N_1 turns between the first two connections and N_2 turns between the second two connections, wherein $N_2<N_1$;
a full-wave rectifier connected to said first connections of said secondary windings, said full-wave rectifier having an output;
a smoothing capacitor connected to said output of said full-wave rectifier;
a regulator connected to the capacitor and the output of said full-wave rectifier for producing an output signal if the voltage at the output of said rectifier exceeds a predetermined value;
at least a first firing pulse generator having a trigger input connected to the output of said regulator for producing a firing output connected to a triggering input of said first bipolar thyristor switch;
a delay circuit connected to the output of said regulator;
a second firing pulse generator connected to an output of said delay circuit and having an output connected to a triggering input of said second bipolar thyristor switch, said delay circuit exhibiting a delay time greater than a firing delay of said first bipolar thyristor switch.

4,639,663

FLY-BACK TRANSFORMER WITH REDUCED RINGING

Michio Ueno, Kyoto; Toshimi Miyagi, Kusatsu, and Soji Yamaguchi, Yokohama, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jan. 21, 1986, Ser. No. 821,054
Claims priority, application Japan, Jan. 23, 1985, 60-11560
Int. Cl.⁴ H01F *27/42*
U.S. Cl. 323—356 **3 Claims**



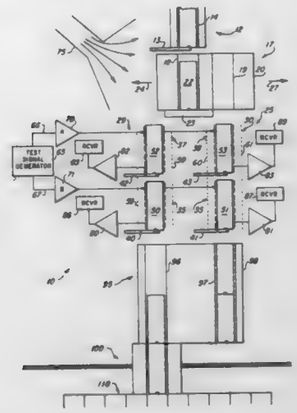
1. A fly-back transformer wherein a primary winding and a secondary winding are provided, a ringing removing winding which is connected with the secondary winding through the distributed capacity with respect to the secondary winding to form a closed circuit of the ringing current together with said secondary winding is connected in parallel to said primary winding through a DC resistance component, said primary winding and said ringing removing winding satisfy a relation formula of $0.85 \leqq M/L1 \leqq 1$, wherein L1 is the inductance of the primary winding, M is the mutual inductance between the primary winding and the ringing removing winding, the impedance between said primary winding and the secondary winding has a value larger with respect to the frequency of the ringing current than a value of the DC resistance component added to the impedance between the ringing removing winding and the secondary winding.

4,639,664

APPARATUS FOR TESTING A PLURALITY OF INTEGRATED CIRCUITS IN PARALLEL

Anthony M. Chiu, Richardson, Tex.; Mark D. Allison, Boise, Id.; James W. Jones, Singapore, Singapore; Lyndale A. Trammell, Baguio City, Philippines, and Fock San Ho, Singapore, Singapore, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 31, 1984, Ser. No. 615,979
Int. Cl.⁴ G01R *31/28*; B07C *5/00*
U.S. Cl. 324—73 AT **12 Claims**



1. Apparatus for parametrically and functionally testing integrated circuit devices in parallel, comprising:
at least one integrated circuit receiving channel defining a plurality of integrated circuit device test stations therealong;
load means for automatically delivering via the integrated circuit receiving channel to each of the plurality of integrated circuit device test stations a separate integrated circuit device for testing;
means for delivering parametric and functional test signals at least functionally in parallel to each of said integrated circuit device test stations;
means at each of said test stations for selectively engaging the delivered integrated circuit device to apply the parameter test signals to the integrated circuit device at said test station;
means for receiving an output from each test location in response to the test signals; and
means for determining from said output the parameters of each tested integrated circuit device.

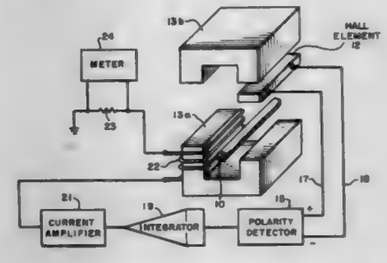
4,639,665

SENSING SYSTEM FOR MEASURING A PARAMETER

James R. Gary, Elk Grove Village, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 22, 1983, Ser. No. 525,520
Int. Cl.⁴ G01R *33/00, 19/00*
U.S. Cl. 324—117 H **13 Claims**

1. A sensing system for measuring a parameter, comprising:
a hall element;
means for establishing, in said hall element, a first magnetic flux having a magnitude which is a function of the parameter to be measured,
said hall element thereby producing a hall voltage having a polarity and an amplitude determined by the first magnetic flux;
a polarity detector, coupled to said hall element, for developing an output voltage of a polarity determined by that of the hall voltage;
an integrator for integrating the output voltage of said polarity detector;
cancelling means for establishing, in said hall element and in response to the integrator output voltage, a second magnetic flux of equal magnitude but of opposite direction



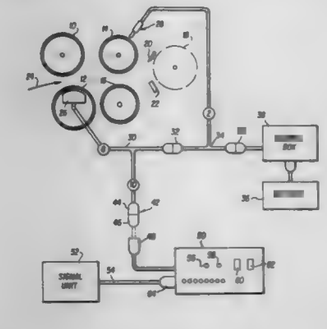
relative to the first magnetic flux, the net flux in said hall element, and the resulting hall voltage, thereby tending to become zero;
and means, included in said cancelling means, for producing a control voltage which is proportional to and represents the measured parameter.

4,639,666

METAL DETECTOR SENSITIVITY ADJUSTMENT AND TEST ASSEMBLY

Richard P. Strosser, Akron; Carl E. Bohman, New Holland, and Mark K. Chow, Leola, all of Pa., assignors to New Holland, Inc.

Filed Aug. 27, 1984, Ser. No. 644,422
Int. Cl.⁴ G01R *35/00*; G01N *27/72*; A01D *75/18*
U.S. Cl. 324—202 **18 Claims**



5. Apparatus for testing the sensitivity of a metal detector of the type having magnet means for generating a magnetic field, a sensing means for sensing the variations in said magnetic field caused by the movement of a ferrous metal object through said field, and circuit means responsive to said sensing means for producing an output signal, said apparatus comprising:
a magnetic field generator disposed in the vicinity of said sensing means;
means for energizing said magnetic field generator with a sub-audio signal of predetermined magnitude whereby a magnetic field of predetermined intensity is generated in the region of said sensing means to cause said circuit means to produce an output signal which should be within a predetermined range of magnitudes said magnetic field generator being manually movable to and fro in the vicinity of said sensing means;
a visual indicator means of a type capable of indicating the magnitude of an input signal applied thereto; and,
circuit means responsive to said output signal for applying

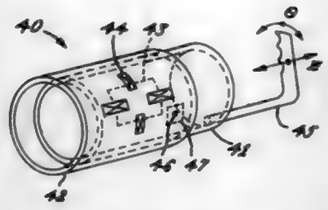
an input signal to said visual indicator means whereby a visual observation of said visual indicator means may be made to determine if the magnitude of said output signal is within said predetermined range of magnitudes, the magnitude of said output signal being proportional to the sensitivity of said metal detector.

4,639,667

CONTACTLESS CONTROLLERS SENSING DISPLACEMENT ALONG TWO ORTHOGONAL DIRECTIONS BY THE OVERLAP OF A MAGNET AND SATURABLE CORES

Herman J. Andresen, 726 Carriage Hill, Glenview, Ill. 60025

Filed May 23, 1983, Ser. No. 496,843
Int. Cl.⁴ G01B *7/14*; G08C *19/06*
U.S. Cl. 324—208 **6 Claims**



1. A contactless, multi-directional controller of the kind having a reference frame and a carrier, means for guiding the carrier with respect to the reference frame in first and second generally orthogonal directions while restraining motion of the carrier with respect to the reference frame in a third generally orthogonal direction, manipulator means attached to the carrier for manually positioning the carrier with respect to the reference frame in the first and second directions, and contactless sensing means comprising carrier-based means fixed to the carrier and reference-based means fixed to the reference frame, the carrier-based means being adjacent the reference-based means along the third direction, wherein the sensing means comprise first sensing means for sensing the displacement of the carrier with respect to the reference frame in the first direction, and second sensing means for sensing the displacement of the carrier with resect to the reference frame in the second direction,

wherein the improvement comprises,

said carrier and frame are generally cylindrical, said carrier is telescopingly received in said frame, the first and second directions are the axial and circumferential directions of the cylinder of the carrier, and the third direction is the radial direction of the cylinder of the carrier; and

said sensing means comprise at least one magnet and at least two pairs of magnetically saturable cores overlapped by said magnet, each pair of said cores being associated with a respective one of the two directions, the proportional part of each core that is saturated sensing the displacement of the carrier along the associated direction.

4,639,668

ANALOG MANIPULATOR WITH PROXIMITY DETECTION OF A MOVEABLE MAGNETIZABLE MASS

Pierre Petit, Champniers, and Jean-Marie Periot, La Couronne, both of France, assignors to La Telemecanique Electrique, France

Filed Feb. 7, 1985, Ser. No. 699,099
Claims priority, application France, Feb. 8, 1984, 84 01917
Int. Cl.⁴ G01B *7/14*; G05G *9/00*
U.S. Cl. 324—208 **8 Claims**

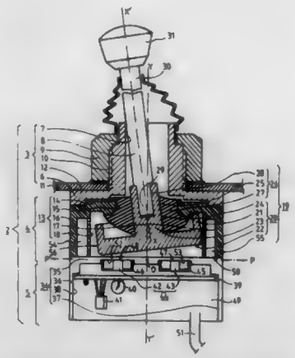
1. An analog manipulator comprising :

a first case of prismatic shape which has an upper wall provided with a central opening, side walls extending perpendicularly to said upper wall, and a lower open face, said upper wall and said side walls delimiting a cavity;

a magnetizable mass located in said cavity and having an axis XX' and an active face ;

a lever coaxial to said mass and extending opposite said face through said central opening and having a first end secured to said mass, and a second end connected to an operating member;

resilient pivoting and return means formed by an annular



piece made from elastomer material and having a peripheral region secured to said upper wall and a central region through which passes and is secured said lever, and

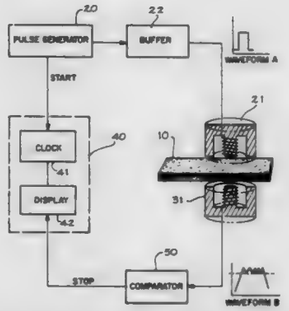
an electronic assembly fixed to said open face of the case and comprising two pairs of proximity detectors facing said active face of said mass, the relative position of said active face and of the detectors being chosen so that a small movement of said mass along said axis generates an identical distance variation between the magnetizable mass and each of said detectors.

4,639,669

PULSED ELECTROMAGNETIC NONDESTRUCTIVE TEST METHOD FOR DETERMINING VOLUME DENSITY OF GRAPHITE FIBERS IN A GRAPHITE-EPOXY COMPOSITE MATERIAL

Darryl A. Howard, Sunnyvale, and Lawrence Y. L. Shen, Saratoga, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Sep. 26, 1983, Ser. No. 535,576
Int. Cl.⁴ G01N *9/24*; G01R *33/12*
U.S. Cl. 324—239 **3 Claims**



1. A method for nondestructively determining volume density of graphite fibers in a sample of graphite-epoxy composite material, said sample conforming in volume to a reference piece of graphite-epoxy composite material for which the volume density of graphite fibers is known, said method comprising the steps of:

(a) inductively coupling a first pulse of radio-frequency electromagnetic energy into said reference piece;

(b) receiving energy propagated through said reference piece due to said first pulse;

(c) measuring elapsed time before a time-dependent function of said energy propagated through said reference piece due to said first pulse reaches a value larger than a pre-set threshold value;

(d) inductively coupling a second pulse of radio-frequency electromagnetic energy into said sample, said second pulse being substantially identical in waveform to said first pulse;

(e) receiving energy propagated through said sample due to said second pulse;

(f) measuring elapsed time before a time-dependent function of said energy propagated through said sample due to said second pulse reaches a value larger than said pre-set threshold value; and

(g) calculating a ratio of said elapsed time before said time-dependent function of energy propagated through said sample reaches said threshold value to said elapsed time before said time-dependent function of energy propagated through said reference piece reaches said threshold value, said ratio being substantially equal to the ratio of volume density of graphite fibers in said sample to volume density of graphite fibers in said reference piece.

4,639,670

MAGNETIC FIELD SENSOR COMPRISING WIEGAND WIRES OR SIMILAR BISTABLE MAGNETIC ELEMENTS

Norbert Normann, Pforzheim, Fed. Rep. of Germany, assignor to Dodnco KG Dr. Eugen Durrwachter, Pforzheim, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 703,769
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3406871
Int. Cl.⁴ G01R *33/02*
U.S. Cl. 324—260 **4 Claims**



1. In a sensor for sensing an external magnetic field, comprising

wire form bistable magnetic elements and

electrical detector winding means surrounding said bistable magnetic elements,

the improvement residing in that

said bistable magnetic elements comprise a bundle of identical bistable magnetic elements which extend parallel to each other, and

said electrical detector winding means comprise a plurality of electrical detector windings which surround respective ones of said bistable magnetic elements and are wound in the same sense and are electrically connected in parallel.

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SIMULTANEOUS NMR IMAGING SYSTEM

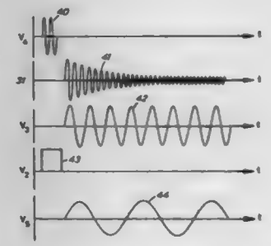
Albert Macovski, Menlo Park, Calif., assignor to General Electric Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 499,218, May 31, 1983, abandoned. This application Apr. 24, 1984, Ser. No. 603,333
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—309 **56 Claims**

1. In a method for measuring the NMR activity of points in a volume the steps of:

exciting the volume with an rf excitation signal;

receiving signals emitted from the volume in the presence of a time-varying magnetic field gradients in the three axes; and



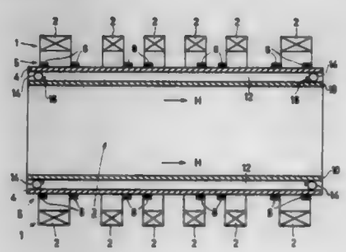
processing the received signal to derive information about the NMR activity of points in the volume using a plurality of components of the frequency spectrum of the received signal to derive information about each point.

4,639,672

NUCLEAR MAGNETIC RESONANCE APPARATUS

Chrities J. M. Beaumont, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 10, 1984, Ser. No. 659,214
Claims priority, application Netherlands, Oct. 14, 1983, 8303534
Int. Cl.⁴ G01V *3/00*
U.S. Cl. 324—318 **9 Claims**



1. A nuclear magnetic resonance apparatus comprising an electromagnetic main coil system extending about a generally cylindrical interior area and generating a homogeneous magnetic field in a measuring space within said interior area, a gradient coil system for generating gradient fields in said measurement space, and noise absorbing means disposed between said measurement space and said gradient coil system for reducing, within said measurement space, noise produced by said gradient coil system upon activation thereof.

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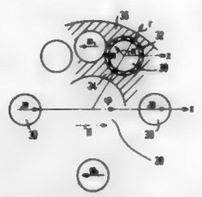
NUCLEAR MAGNETIC RESONANCE APPARATUS WITH A MAGNET OF PERMANENT MAGNETIC MATERIAL

Hinne Zijlstra, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 19, 1984, Ser. No. 662,651
Claims priority, application Netherlands, Jul. 17, 1984, 8402249
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—319 **13 Claims**

1. A nuclear magnetic resonance apparatus comprising a system of magnets for generating a homogeneous main magnetic field in a measuring space, said system comprising a plurality of permanent magnets in the form of elongated bars made of permanent magnetic material; a housing for supporting said bars so that said bars are arranged about said measur-

ing space, and means for mounting at least one of said bars in said housing for movement with respect to said housing and with respect to another of said bars so as to enable the direction



of magnetization of said at least one bar to be changed with respect to the direction of magnetization of said another bar to thereby adjust said magnetic field in said measuring space after installation of said bars in said housing.

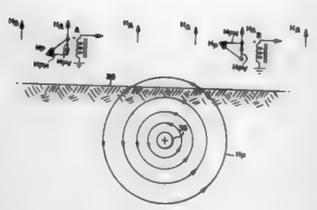
4,639,674

APPARATUS AND METHOD EMPLOYING EXTRANEOUS FIELD COMPENSATION FOR LOCATING CURRENT-CARRYING OBJECTS

John B. Rippingale, Leesburg, Va., assignor to Schonstedt Instrument Company, Reston, Va.

Filed Apr. 11, 1983, Ser. No. 483,613
Int. Cl.[4] G01R *19/00*; G01V *3/08, 3/10*
U.S. Cl. 324—326 16 Claims





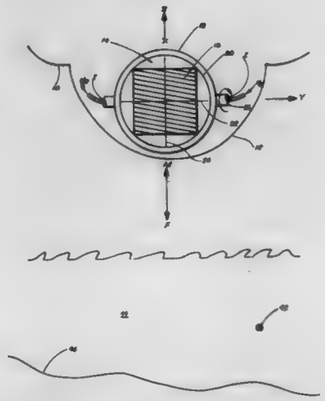
1. Apparatus for locating an obscured elongated object carrying current induced therein by electromagnetic energy propagated from a remote source, the current producing a circumferential magnetic field, comprising first and second sensor means arranged to measure at first and second locations, respectively, a component of said magnetic field and for producing corresponding first and second signals, respectively, portions of said signals being due to measuring by said first and second sensor means of a magnetic field component of said propagated electromagnetic energy, third sensor means for measuring at a third location between the first and second locations said magnetic field component of said propagated electromagnetic energy and for producing a corresponding third signal, said first, second, and third sensor means being positioned at the vertices of an isosceles triangle, with the first and second sensor means located at the base of the triangle, the sensor means having a fixed positional relationship with respect to one another and being movable as a group relative to said object and relative to said remote source, means for combining the signals from the sensor means so as to produce a first resultant signal representative of subtraction of the magnetic field component measured at the third location from the magnetic field components measured at the first location and so as to produce a second resultant signal representative of subtraction of the magnetic field component measured at the third location from the magnetic field components measured at the second location, means for processing the resultant signals, and means responsive to the processing means for indicating the location of the object.

4,639,675

SUPERCONDUCTING CONDUCTIVITY ANOMALY DETECTION SYSTEM

George F. Hinton, Bay St. Louis, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 11, 1984, Ser. No. 629,936
Int. Cl.[4] G01V *3/165*; G01R *33/035*
U.S. Cl. 324—334 7 Claims



1. A conductivity anomaly detection system comprising:
a direct current superconducting electromagnet mounted in a moving vehicle within a cryogenic housing for producing a dipole field;
means coupled to said housing for continuously rotating said housing and said electromagnet and its resultant dipole field around a predetermined axis at a predetermined frequency in the direction of motion of said vehicle to produce a rotating magnetic field in the medium over which said vehicle is moving and
sensing means within said housing rigidly mounted in relation to and rotating with said electromagnet for measuring the magnetic field resulting from currents induced in a conducting body of interest located within said medium by said rotating electromagnet.

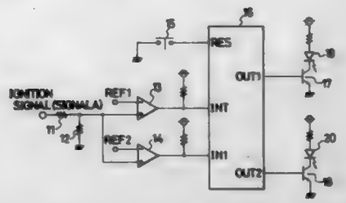
4,639,676

DEVICE FOR DIAGNOSIS OF TROUBLE IN VEHICLE IGNITION DEVICES

Akio Kawai, Yokohama; Ken Ito, and Hideo Iwamoto, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 18, 1984, Ser. No. 662,028
Claims priority, application Japan, Oct. 19, 1983, 58-194204
Int. Cl.[4] F02P *17/00*
U.S. Cl. 324—380 8 Claims

1. In a vehicle ignition device which is constructed to lengthen an electrical discharge time of an ignition coil, a diagnostic device for diagnosing whether or not the longer electrical discharge is occurring normally, comprising:
measuring means connected to a primary side of the ignition coil for measuring a level condition of a voltage on the primary side of the ignition coil;
means connected to said measuring means for determining whether or not the voltage level measured by said measuring means exceeds a predetermined value, said determining means operable only after a predetermined time is elapsed from the time the ignition signal is generated, said determining means including timer means for measuring said predetermined time; and



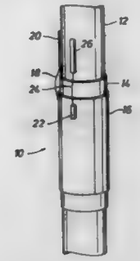
indicating means for indicating the result of the determination which is performed by said determination means.

4,639,677

CATHODIC PROTECTION MONITORING SYSTEM

Alvin D. Goolsby, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 336,666, Jan. 4, 1982, Pat. No. 4,489,277. This application Sep. 10, 1984, Ser. No. 649,013
Int. Cl.[4] G01N *27/00*
U.S. Cl. 324—425 3 Claims



1. A method for monitoring the cathodic protection of a partially submerged structure provided by a cathodic protection system, comprising:
establishing a submerged metallic body of material having substantially the same composition as said structure adjacent said structure;
determining that the cathodic protection of said body by said cathodic protection system is substantially the same as the cathodic protection of said structure;
detecting and measuring the cathodic current at said metallic body; and
while said body is protected by said cathodic protection system, evaluating the measured metallic body cathodic current to afford monitoring of the cathodic protection being provided to the structure.

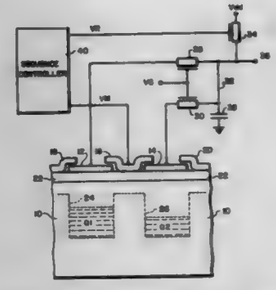
4,639,678

ABSOLUTE CHARGE DIFFERENCE DETECTION METHOD AND STRUCTURE FOR A CHARGE COUPLED DEVICE

Eugene S. Schlig, Somers, N.Y., and Savvas G. Chamberlain, Waterloo, Canada, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,220
Int. Cl.[4] G01R *29/24, 29/12*; H01L *29/78*; G11C *19/28*
U.S. Cl. 324—457 5 Claims

1. A method for determining the absolute value of the difference between two charge packets in a charge coupled device including a semiconductor substrate having overlying electrodes comprising placing the charge packets in separate potential wells in the semiconductor substrate of the charge coupled device separated by a potential barrier, merging the charge packets by removing the barrier, and integrating the electrical signals induced into the overlying electrodes of the charge coupled device by the merger of the charge packets as a measure of the original absolute difference between the two charge packets, the same first level potential being applied to the two electrodes overlying the separate potential wells to maintain wells of equal depth, while maintaining an intermediate electrode at a second potential level to maintain the potential barrier between the potential wells, the barrier being removed by changing the potential on the intermediate electrode to cause the charge packets to merge and the potentials under all three electrodes to equalize, changing the potential of the intermediate electrode to restore the potential barrier, and integrating a current induced by the merging of the charge packets through the one of the two overlying electrodes originally having the lesser charge packet as a measure of the original absolute difference between the two charge packets.

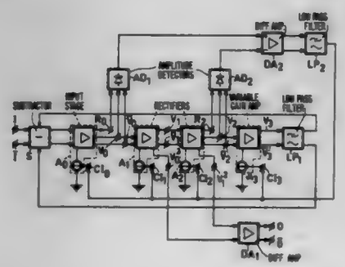


4,639,679

FREQUENCY-DOUBLING CIRCUIT

Wolfdietrich G. Kasperkovitz, and Herman W. Van Rumpt, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 13, 1984, Ser. No. 671,151
Claims priority, application Netherlands, Nov. 10, 1983, 8303855
Int. Cl.[4] H03K *1/16*
U.S. Cl. 328—20 7 Claims



1. In a frequency-doubling circuit for doubling the fundamental frequency of a signal wave, such circuit comprising first and second full-wave rectifier circuits to which the signal wave is applied in mutual phase-quadrature and having outputs at which they produce rectified signals which are subtracted from each other to obtain the second harmonic of the fundamental frequency of the signal wave, the improvement characterized in that:
said first full-wave rectifier circuit comprises a first variable-gain amplifier having an input to which the signal wave is applied and an output which is capacitively loaded to produce a 90°-phase shift at the fundamental frequency, said first variable-gain amplifier further having a control

input for controlling the gain factor thereof, the output of said first variable-gain amplifier being coupled to the input of said second full-wave rectifier circuit;

said frequency-doubling circuit further comprises:

first and second amplitude detectors each having inputs and an output, an input of the first amplitude detector being coupled to the input of the first variable-gain amplifier and an input of the second amplitude detector being coupled to the output of the second full-wave rectifier circuit; and

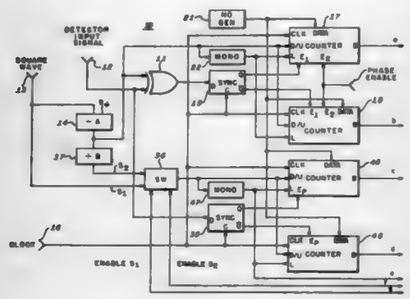
a first differential amplifier having inputs respectively coupled to the outputs of the first and second amplitude detectors and having an output coupled to the control input of the first variable-gain amplifier for supplying a negative feedback control signal thereto which adaptively maintains the gain factor of the first variable-gain amplifier at unity at said fundamental frequency.

4,639,680

DIGITAL PHASE AND FREQUENCY DETECTOR

Alec L. Nelson, Scottsdale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,624
Int. Cl.⁴ H03D *13/00*
U.S. Cl. 328—134 **6 Claims**



1. A digital signal detector comprising:

means for providing a reference signal at a frequency f_1 and phase p_1;

means for providing an input signal representative of a signal at a frequency f_2 and phase p_2;

means for providing clock pulses;

count means responsive to said reference signals, said input signals, and said clock pulses for counting said clock pulses when p_1 differs from p_2 and when f_1 differs from f_2, and for providing output signals indicating phase and frequency differences when clock pulse counts exceed preselected count values.

4,639,681

WAVEFORM RESHAPING CIRCUIT

Tsunao Hasegawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

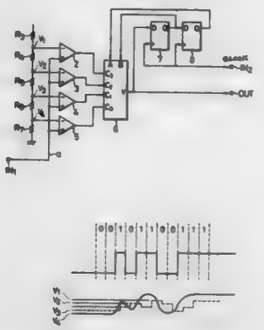
Filed Feb. 21, 1985, Ser. No. 703,966
Claims priority, application Japan, Feb. 22, 1984, 59-32239
Int. Cl.⁴ H03K *5/08*
U.S. Cl. 328—164 **3 Claims**

1. A waveform reshaping circuit for a distorted digital input signal whose instantaneous level varies according to binary data, comprising:

a plurality of comparison means for comparing an instantaneous level of said digital signal with a plurality of reference levels to provide outputs, respectively; and

selecting means for selecting one of said outputs as a digital signal which is waveform shaped selectively according to binary data in said digital signal which has been outputted; and

wherein said selecting means comprises: a multiplexer having data inputs receiving respective ones of said outputs of said comparison means; and shift register means having a clock input, a data input coupled to an output of said multiplexer, and logic coded clocked outputs coupled to control inputs of said multiplexer, so that said multiplexer



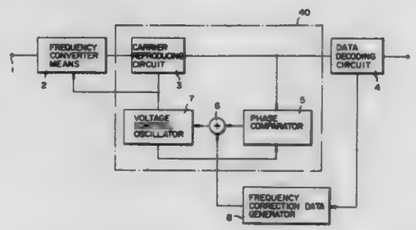
selects an instantaneous reference level from said outputs of said plurality of comparison means according to said binary data in said distorted digital input signal, whereby a reshaped undistorted digital output is provided in synchronism with said clock.

4,639,682

CARRIER REPRODUCING CIRCUIT FOR PHASE SHIFT KEYING SIGNALS

Seiji Takeuchi, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 2, 1985, Ser. No. 751,236
Claims priority, application Japan, Jul. 10, 1984, 59-141472
Int. Cl.⁴ H03D *3/02*
U.S. Cl. 329—50 **5 Claims**



1. A carrier reproducing circuit for signals transmitted in carrier suppressed modulation comprising:

frequency converting means for converting said transmission signal to a frequency of a carrier to be reproduced;

demodulator means, coupled to said frequency converting means, for demodulating transmission data, said demodulator means including carrier reproducing means for producing said carrier, voltage controlled oscillator means, coupled to said carrier reproducing means, for generating an oscillation output and for supplying said oscillation output to said carrier reproducing means, and phase comparing means, coupled to said carrier reproducing means and said voltage controlled oscillator means, for comparing the phase of said reproduced carrier and said oscillation output and for generating a control voltage, said voltage controlled oscillator means being controlled by said control voltage;

error detecting means coupled to said demodulator means for detecting the bit error rate of said demodulated data; and

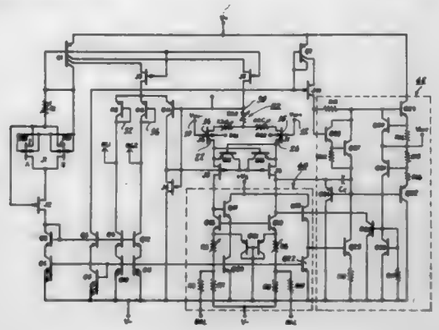
frequency correction data generator means coupled to said error detecting means for generating a correction voltage in accordance with said detected bit error rate, said frequency correction data generator being coupled to said voltage controlled oscillator means so as to superimpose said correction voltage onto said control voltage.

4,639,683

VERY LOW INPUT CURRENT JFET AMPLIFIER

Lewis W. Counts, Lexington, and JoAnn P. Close, Arlington, both of Mass., assignors to Analog Devices, Incorporated, Norwood, Mass.

Filed Feb. 7, 1986, Ser. No. 827,236
Int. Cl.⁴ H03F *3/45*
U.S. Cl. 330—253 **21 Claims**



1. An IC chip including a low-input-current differential amplifier comprising:

a pair of low-leakage-current JFETs having their top and back gates electrically isolated in the transistor structures;

a pair of input terminals connected respectively to the top gates of said JFETs to supply thereto a differential input signal to be amplified;

a supply voltage circuit having first and second terminals;

first circuit means connecting said first supply voltage terminal to the source electrodes of said JFETs to furnish operating current thereto;

second circuit means connecting said second supply voltage terminal to the drain electrodes of said JFETs;

bias means connected to said source electrodes and including a bias terminal establishing a predetermined bias potential with respect to said source electrodes; and

third circuit means coupling said bias terminal to the back gates of said JFETs.

4,639,684

DIFFERENTIAL INPUT STAGE FOR THE REALIZATION OF LOW NOISE AND HIGH PRECISION BIPOLAR TRANSISTOR AMPLIFIERS

David P. Laude, Colorado Springs, Colo., assignor to Harris Corporation, Melbourne, Fla.

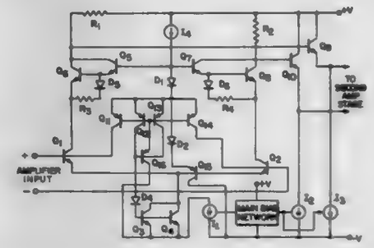
Filed Nov. 6, 1984, Ser. No. 668,864
Int. Cl.⁴ H03F *3/45*
U.S. Cl. 330—259 **37 Claims**

1. A differential amplifier stage, comprising:

a differential transistor pair, each transitor having a first and second terminal and a control terminal, each of said first terminals being connected to a first reference potential, each of said control terminals being connected to respective stage inputs, and each of said second terminals being connected together at a common node;

biasing means for causing a biasing current to flow from said common node to a second reference potential;

sensing means serially connected to said biasing means between said common node and said second reference potential for sensing said biasing current; and



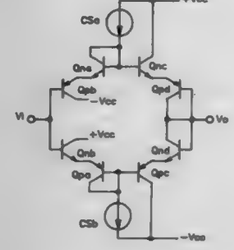
feedback means, interconnecting said sensing means and said stage inputs, for supplying current to the control terminals of the differential transistor pair as a function of said sensed biasing current.

4,639,685

OFFSET REDUCTION IN UNITY GAIN BUFFER AMPLIFIERS

Kenneth R. Saller, Ft. Collins, and Kurt R. Rentel, Loveland, both of Colo., assignors to Comlinear Corporation, Fort Collins, Colo.

Filed Jul. 18, 1985, Ser. No. 756,750
Int. Cl.⁴ H03F *3/26, 3/45*
U.S. Cl. 330—263 **4 Claims**



1. A unity gain buffer amplifier, the amplifier comprising:

first PNP transistor means having base, emitter, and collector electrodes, the collector electrode of which is connected to a source of negative supply voltage;

first NPN transistor means having base, emitter, and collector electrodes, the collector electrode of which is connected to a source of positive supply voltage, and the base electrode of which is connected to the base electrode of said first PNP transistor means and for receiving an input signal;

second PNP transistor means having base, emitter, and collector electrodes, the emitter electrode of which is connected to the emitter electrode of said first NPN transistor means and the base and collector electrodes of which are connected together and, through a first current source, to said source of negative supply voltage;

second NPN transistor means having base, emitter, and collector electrodes, the emitter electrode of which is connected to the emitter electrode of said first PNP transistor means and the base and collector electrodes of which are connected together and, through a second current source, to said source of positive supply voltage;

third PNP transistor means having base, emitter, and collector electrodes, the base electrode of which is connected to the base electrode of said second PNP transistor means

and the collector electrode of which is connected to said source of negative supply voltage;

third NPN transistor means having base, emitter, and collector electrodes, the base electrode of which is connected to the base electrode of said second NPN transistor means and the collector electrode of which is connected to said source of positive supply voltage;

fourth PNP transistor means having base, emitter, and collector electrodes, the emitter electrode of which is connected to the emitter electrode of said third NPN transistor means and the base and collector electrodes of which are connected together; and

fourth NPN transistor means having base, emitter, and collector electrodes, the emitter electrode of which is connected to the emitter electrode of said third PNP transistor means and the base and collector electrodes of which are connected together and to the base and collector electrodes of said fourth PNP transistor means to provide an output of said unity gain buffer amplifier.

4,639,686

HIGH FREQUENCY AMPLIFIER CIRCUIT

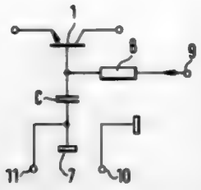
Walter Beckenbach, and Heinz Rinderle, both of Heilbronn, Fed. Rep. of Germany, assignors to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Jul. 11, 1984, Ser. No. 629,619

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 3326957

Int. Cl.⁴ H03F *3/195*

U.S. Cl. 330—307 **9 Claims**



1. A high frequency amplifier circuit comprising: a passive tuned input circuit; a passive tuned output circuit; and a single amplifier transistor, for amplifying an input signal at a given operating frequency, integrated into a semiconductor substrate and connected in a common base configuration with its emitter zone directly connected to said input circuit to receive the input signal to be amplified, its collector zone connected to said output circuit, and its base zone connected to said semiconductor substrate via an integrated capacitance of a value which short circuits said base of said amplifying transistor to said substrate at the operating frequency of said amplifier circuit.

4,639,687

PHASE CONTROL CIRCUIT

Werner Scholz, Gehrden, Fed. Rep. of Germany, assignor to Telefunken Fernseh und Rundfunk GmbH, Hanover, Fed. Rep. of Germany

PCT No. PCT/EP84/00381, § 371 Date Aug. 12, 1985, § 102(e) Date Aug. 12, 1985, PCT Pub. No. WO85/02731, PCT Pub. Date Jun. 20, 1985

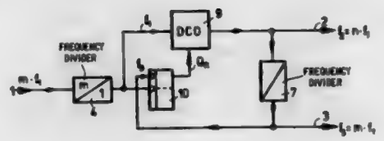
PCT Filed Dec. 1, 1984, Ser. No. 767,198

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345142

Int. Cl.⁴ H03L *7/08*

U.S. Cl. 331—1 A **8 Claims**

1. A phase control circuit comprising: a frequency controllable oscillator means which is controllable by a correction signal to produce, from an input signal having an input frequency, an output signal which has selected nominal frequency and phase relations to the input frequency; and a phase comparator stage operative for generating the correction signal and connected to said oscillator means for controlling said oscillator means as a function of the correction signal, wherein the correction signal is a digital signal and said oscillator means comprise circuit means operative for causing the frequency of



the output signal to selectively vary between a first frequency value which is on average slightly below the frequency value corresponding to the nominal frequency relation and a second frequency value which is on average slightly above the frequency value corresponding to the selected nominal frequency relation.

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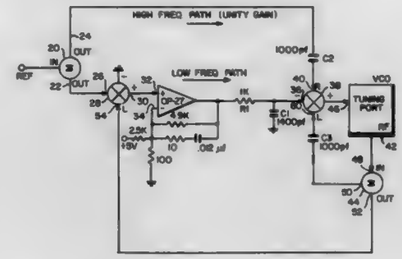
WIDE-BAND PHASE LOCKED LOOP AMPLIFIER APPARATUS

Francis W. Hopwood, Severna Park; Stephen P. Caldwell, Linthicum, and Martin J. Decker, Baltimore, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 18, 1985, Ser. No. 724,714

Int. Cl.⁴ H03L *7/00*

U.S. Cl. 331—10 **7 Claims**



1. A wide-band phase locked loop amplifier apparatus comprising in combination:

a first summing means to receive an RF reference signal, said first summing means having a first and second output port,

a first mixer means having a first input port to receive said RF reference signal from said second output port of said first summing means, said first mixer means having a second input port and a first and second output port, said first output port connected to ground,

an amplifier means connected to said second output port of said first mixer means to receive the first composite signal therefrom at its noninverting input terminal, said amplifier means having an inverting terminal and an output terminal,

a filter means connected to said output terminal of said amplifier means to receive the output signal therefrom, said filter means filtering said output signal,

a second mixer means receiving said output signal from said filter means at its first input port, said second mixer means having a second input port, a third input port and an output port, said second input port of said second mixer means receiving said RF reference signal from said first output port of said first summing means, said second mixer means providing a second composite signal at said output port,

a voltage controlled oscillator means receiving said second composite signal at its tuning port, said voltage controlled oscillator means providing an RF signal at its output port, and,

a second summing means receiving said RF signal from said voltage controlled oscillator at a first input port, said second summing means having a first and second output port, said second summing means applying said RF signal through said second output port to said third input port of said second mixer means such that said second mixer means combines all received input signals to form said second composite signal, said second summing means applying said RF signal through said third output port to said second input port of said first mixer means such that the received signals are combined to form said first composite signal.

4,639,689

INDUCTIVE LOOP DETECTOR

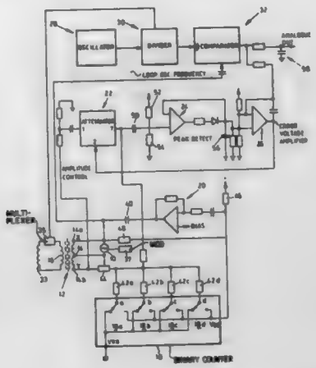
David W. Bartlett, Natal, South Africa, assignor to E M X International Limited, United Kingdom

Filed Aug. 27, 1985, Ser. No. 769,868

Claims priority, application United Kingdom, Sep. 4, 1984, 8422277

Int. Cl.⁴ G01N *27/00*; G08G *1/01*

U.S. Cl. 331—65 **16 Claims**



1. A method of controlling the frequency of oscillation of an inductive loop which is excited in response to at least a first signal which includes the steps of deriving a second signal with an amplitude which is dependent on the amplitude of the first signal, deriving an intermediate signal which is in antiphase to the first signal, deriving a third signal with an amplitude which is dependent at least on the amplitude of the intermediate signal, combining the third signal with the second signal to produce a fourth signal, and further exciting the loop in response to the fourth signal thereby to vary the frequency of oscillation of the loop.

4,639,690

TUNABLE, DIELECTRIC-RESONATOR-STABILIZED OSCILLATOR AND METHOD OF TUNING SAME

Gary K. Lewis, Upper Marlboro, Md., assignor to Litton Systems, Inc.

Filed Jul. 5, 1985, Ser. No. 752,297

Int. Cl.⁴ H03B *5/18*; H01P *7/10*

U.S. Cl. 331—96 **17 Claims**

1. A tunable, frequency-stabilized oscillator, comprising:

a negative resistance oscillator circuit having at least one active element; and

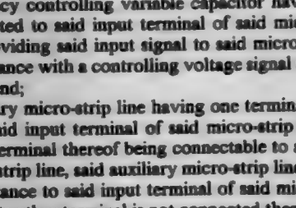
at least one dielectric resonator connected in said oscillator circuit having at least one electrically-conductive area on its surface, the selective variation in size of which alters the resonant frequency of said at least one resonator;

said at least one dielectric resonator further comprising:

a. an electrically conductive resonator housing having a resonating cavity therethrough;

b. a resonator body made of dielectric medium;

c. a resonator body mounting plate of thin, rigid dielectric



material mounted at one end of said cavity in said housing to mount said resonator body within said cavity; and

d. a tuning plate of thin, rigid dielectric material mounted at the other end of said cavity from said first-mentioned plate, coated with an electrically conductive material whose areal extent over said plate may be selectively varied, whereby the resonant frequency of said dielectric resonator may be finely tuned.

4,639,691

OSCILLATOR

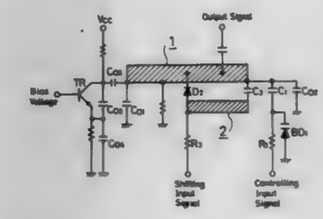
Kouta Iigima, Souma, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Oct. 4, 1985, Ser. No. 784,339

Claims priority, application Japan, Oct. 4, 1984, 59-150397[U]

Int. Cl.⁴ H03B *5/18, 7/12*

U.S. Cl. 331—99 **2 Claims**



1. An oscillator comprising:

a microstrip line acting as a resonance line having an input terminal for receiving an input signal and an output terminal for providing an output signal of a selected oscillation frequency in response to said input signal;

a frequency controlling variable capacitor having one end connected to said input terminal of said micro-strip line for providing said input signal to said micro-strip line in accordance with a controlling voltage signal applied to its other end;

an auxiliary micro-strip line having one terminal connected with said input terminal of said micro-strip line and another terminal thereof being connectable to a part of said micro-strip line, said auxiliary micro-strip line providing a capacitance to said input terminal of said micro-strip line when its other terminal is not connected thereto such that the oscillation frequency of the output signal is at one level, and said auxiliary micro-strip line acting to decrease the line impedance of said micro-strip line when its other terminal is connected with said part of said micro-strip line such that the oscillation frequency of the output signal is increased to another level; and

a switch for connecting and disconnecting said other termi-

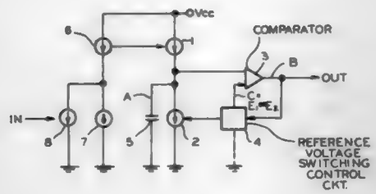
nal of said auxiliary micro-strip line with and from said part of said micro-strip line so that the oscillation frequency of the oscillator may be switched between said one or the other levels.

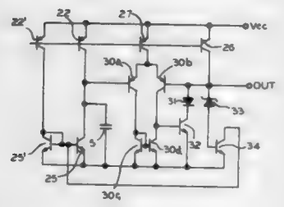
4,639,692

INTEGRATABLE SQUAREWAVE PULSE OSCILLATOR

Takahiro Kitaguchi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 6, 1985, Ser. No. 742,052
Claims priority, application Japan, Jun. 11, 1984, 59-119395
Int. Cl.[4] H03K 3/26
U.S. Cl. 331—111 6 Claims





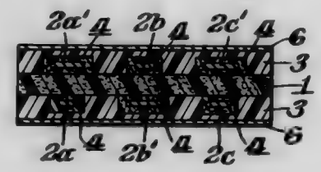
1. An oscillator circuit comprising:
a capacitor;
a charge current source for charging the capacitor;
a discharge constant current circuit for discharging said capacitor;
a comparator for comparing the voltage of said capacitor when charged with a first or second reference voltage, said first and second reference voltages being upper and lower level voltages;
said comparator comprising a first transistor having a base electrode connected to one terminal of the capacitor, a second transistor having a base electrode connected to the output terminal of the oscillator circuit and having an emitter electrode connected to an emitter electrode of the first transistor, two additional transistors having base electrodes connected to each other in a current mirror coupling, a collector of one of the additional transistors being connected to a base electrode of the other of the additional transistors and to a collector electrode of the first transistor, a collector electrode of the other of the additional transistors being connected to a collector electrode of the second transistor;
a reference voltage switching control circuit for supplying to said comparator the first or second reference voltage in response to the output of said comparator, said reference voltages switching control means alternately and cyclically supplying the two reference voltages to cause said comparator to have an oscillating output, the supplied reference voltage controlling the turning on and off of said discharge constant current circuit whereby the oscillating frequency at the output of said comparator is determined by the charging and discharging current supplied to said capacitor;
said switching control means comprising a third transistor having a base electrode connected to the collector of the other of the additional transistors, a diode connected between the output of the oscillator circuit and a collector of the third transistor, a fourth transistor having a collector electrode connected to the discharge constant current circuit, a Zener diode connected between the output of the oscillator circuit and a base electrode of the fourth transistor, emitters electrodes of the third and fourth transistors being grounded; and
a control constant current source for controlling the current from said charge current source;
wherein the output signal frequency of said comparator is controlled by regulating said control constant current source to switch the current capacity of said charge current source.

4,639,693

STRIP LINE CABLE COMPRISED OF CONDUCTOR PAIRS WHICH ARE SURROUNDED BY POROUS DIELECTRIC

Hirosuke Suzuki, Tokorozawa; Hiromi Yasumoto, and Hiroshi Umemoto, both of Umaikizawa Hitaka, all of Japan, assignors to Junkosha Company, Ltd., Tokyo, Japan

Filed Apr. 15, 1985, Ser. No. 723,540
Claims priority, application Japan, Apr. 20, 1984, 59-58184[U]
Int. Cl.[4] H01P 3/08
U.S. Cl. 333—1 4 Claims



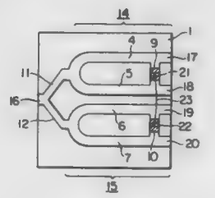
1. A strip line cable comprising a plurality of pairs of electrical conductors having a porous strip of dielectric insulation material interposed between the conductors of said pairs, and a covering jacket covering said conductors and having, in addition, an insulation layer of a porous plastic dielectric material provided between said conductors and said covering jacket such that porous dielectric surrounds each individual said conductor.

4,639,694

POWER DISTRIBUTION CIRCUIT HAVING CENTER PORTIONS OF ISOLATION RESISTORS CONNECTED TOGETHER

Kiyoharu Seino; Tadashi Takagi, and Fumio Takeda, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 23, 1985, Ser. No. 726,322
Claims priority, application Japan, Apr. 27, 1984, 59-85833
Int. Cl.[4] H01P 5/12
U.S. Cl. 333—128 3 Claims



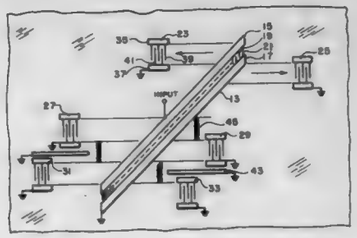
1. A power distribution circuit for splitting a signal at an input terminal into four output signals at four output terminals comprising:
a substrate,
a first and second Wilkinson-type parallel bi-distribution circuit formed of a microstrip on said substrate,
said first bi-distribution circuit including a first pair of planar conducting elements on said substrate extending between an input end and a first pair of said output teminals, means connecting the input end of said elements of said first bi-distribution circuit together and to said input terminal of said power distribution circuit, a first isolation resistor formed on said substrate shunting longitudinally between said first pair of output terminals,
said second bi-distribution circuit including a second pair of planar conducting elements on said substrate extending between an input end and a second pair of said output terminals, means connecting the input end of said elements of said second bi-distribution circuit together and to said input terminal of said power distribution circuit, a second isolation resistor formed on said substrate shunting longitudinally between said second pair of output terminals, and
said power distribution circuit including a metallic thin wire spaced from said substrate and connecting the longitudinal center portions of said first and second isolation resistors together.

4,639,695

WIDEBAND SAW CHANNELLIZER USING SLANTED ARRAY INPUT TRANSDUCER

Elio A. Mariani, Hamilton Square, and William J. Skudera, Jr., Eatontown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 25, 1985, Ser. No. 749,038
Int. Cl.[4] H03H 9/72
U.S. Cl. 333—133 8 Claims



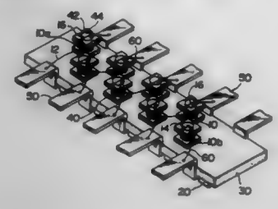
1. Apparatus for frequency-partitioning and channelizing a wideband RF spectrum surface acoustic wave signal into a multiplicity of narrow band contiguous acoustic output signals, comprising, in combination:
a surface wave conductive base;
an input transducer on said base aslant the direction of reception signal propagation:
a first multiplicity of output transducers on said base arranged in spaced-apart relationship along a first longitudinally extending side of said input transducer and spaced therefrom;
a second multiplicity of output transducers on said base arranged in spaced relationship along a second longitudinally extending side of said input transducer, one each of said second multiplicity of output transducers disposed oppolite a space between the output transducers in said first multiplicity of output transducers, and spaced therefrom.

4,639,696

DELAY LINE

Kiyobumi Murata, Saitama, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Nov. 5, 1985, Ser. No. 795,174
Claims priority, application Japan, Nov. 6, 1984, 59-168411[U]
Int. Cl.[4] H03H 7/32
U.S. Cl. 333—138 6 Claims



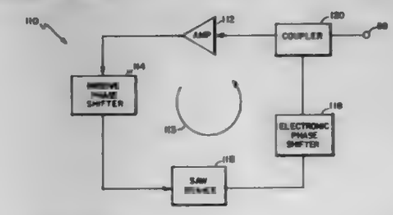
1. A lumped constant type delay line device, comprising:
a base plate formed of a insulating material;
a plurality of terminals securely attached to said base plate;
a plurality of cores each having a coil wound thereon and each having a top surface, each of said coils being provided with a tap; and
a plurality of planar electrodes respectively intimately adhering to the top surfaces of said cores, said taps being connected to said electrodes respectively.

4,639,697

TEMPERATURE COMPENSATION CIRCUITRY

Arthur Yarranton, Maynard; Charles E. Chase, Jr., Needham, and Jean E. Picquenadar, Wareham, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Sep. 13, 1984, Ser. No. 650,019
Int. Cl.[4] H03H 9/42, 9/68; H03B 5/32
U.S. Cl. 333—155 47 Claims



11. In combination:
a surface acoustic wave device to provide in response to an input signal, an output signal having a first predetermined phase shift and a first predetermined phase shift variation as a function of temperature with respect to the input signal; and
means, disposed to have at least one of said input and output signals coupled therethrough, said means including a passive component having an electrical characteristic which varies as a function of the temperature of the component, for providing a second temperature dependent predetermined phase shift variation to reduce the temperature dependent phase shift variation of said output signal.

4,639,698

CERAMIC ELECTRONIC FILTER

Masahiro Nishiki, Aichi, Japan, assignor to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jan. 21, 1986, Ser. No. 820,094
Claims priority, application Japan, Jan. 21, 1985, 60-6966[U]
Int. Cl.[4] H03H 9/10, 9/60, 9/52
U.S. Cl. 333—187 15 Claims

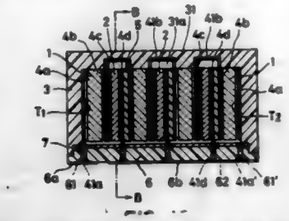
1. A filter assembly comprising:

at least two planar piezoelectric resonator elements, each element having opposed nodal points in the planar surfaces thereof;

inputting, outputting, and grounding planar terminal boards operatively, electrically and mechanically connected to said resonator elements at said nodal points, said planar resonator elements and said planar terminal boards being positioned in parallel relationship to one another;

a plurality of terminal legs, one of said legs extending from an edge of each of said planar terminal boards in a direction essentially parallel to the plane of the respective board;

an insulating case open on one side, said resonator elements and said terminal boards being housed in said case, said



terminal boards being positioned in said case with each of said terminal legs protruding from the open case side;

an insulating lid for closing said case, said lid having holes positioned and configured for receiving said protruding terminal legs; and

conductive means disposed in a predetermined pattern on the outer surface of said insulating lid for electrically connecting said received terminal legs,

wherein said at least two resonator elements are electrically connected in series, the filter assembly further including at least two series terminal boards housed in said insulating case and a bridge element for electrically interconnecting said two resonator elements, and wherein a wall of said insulating case has a recess to receive said bridge element.

4,639,699

DIELECTRIC RESONATOR COMPRISING A RESONANT DIELECTRIC PILLAR MOUNTED IN A CONDUCTIVELY COATED DIELECTRIC CASE

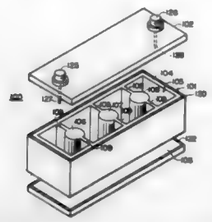
Toshio Nishikawa, Nagaokakyo; Youhei Ishikawa, Kyoto, and Hidekazu Wada, Kobe, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Sep. 30, 1983, Ser. No. 537,711

Claims priority, application Japan, Oct. 1, 1982, 57-173713; Oct. 4, 1982, 57-175458; Oct. 4, 1982, 57-151615[U]; Oct. 5, 1982, 57-151578[U]; Oct. 7, 1982, 57-176707; Oct. 7, 1982, 57-152415[U]; Oct. 18, 1982, 57-183170; Nov. 12, 1982, 57-171900[U]; Dec. 6, 1982, 57-185090[U]; Feb. 1, 1983, 58-14075[U]; Feb. 1, 1983, 58-14076[U]

Int. Cl.⁴ H01P 7/10

U.S. Cl. 333—202 39 Claims



38. A dielectric resonator for electromagnetic waves at a resonant frequency, comprising:

a case comprised of dielectric material having surfaces which define an interior region bounded by said case, a conductive film located on and extending over said dielectric material, said conductive film substantially enclosing said region, said dielectric material of said case having a given coefficient of linear expansion; and

a first element having a body comprised of dielectric material and located in said region, said dielectric material of said first element having said above-mentioned given coefficient of linear expansion, said case comprising a piece formed of said dielectric material, said piece being integral with said first element, said dielectric resonator further comprising second and third elements located in said region, each comprising dielectric material and being integrally formed with said piece of said case, the respective dielectric materials of said second and third elements each having said above-mentioned given coefficient of linear expansion, both said case and said elements having the same said given coefficient of linear expansion for stabilizing said resonant frequency of electromagnetic waves in said region.

4,639,700

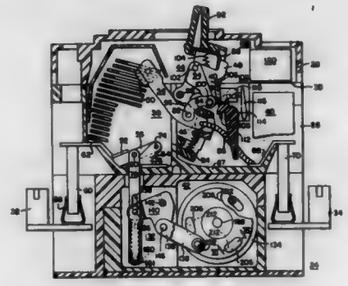
CIRCUIT INTERRUPTER WITH SHOCK RESISTANT MECHANISM

Edward J. Shestak, Penn Hills Township, Allegheny County, and David Marschik, Wilkens Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1986, Ser. No. 831,034

Int. Cl.⁴ H01H 77/00

U.S. Cl. 335—6 8 Claims



1. A circuit interrupter with shock-resistant mechanism, comprising:

an electrically insulating housing;

a circuit breaker having first and second separable contacts operable between open and closed positions;

the circuit breaker including a trip mechanism having a releasable lever movable when released to a tripped position to cause automatic opening of the contacts;

the first contact being mounted on a first arm coupled to the releasable lever;

the second contact being mounted on a second arm of which at least a portion is substantially parallel to the first arm to cause current limiting repulsion of the contacts in response to a predetermined overcurrent condition;

electromagnetic actuating means connected to the second arm for moving the second contact between open and closed positions relative to the first contact;

the electromagnetic actuating means comprising a pair of solenoids, each solenoid having a coil and an armature contained within a case including an apertured end wall and the armature extending through the end wall and the armatures being in substantial alignment,

each armature having an armature plate integral with the end of the armature and external of the end wall,

rotary means between each armature plate and end wall for rotating the armature plate when the armature moves

longitudinally in response to operation of the armature coil;

the armature plates being oppositely disposed and having a common connection forming an assembly of the plates which is rotatable in tandem between first and second positions corresponding to the closed and open positions of the separable contacts;

linkage means between the armature plates and the second contact arm and including a coupler link pivotally connected at one end to a common connection between the armature plates for movement with the plates; and

the longitudinal axis of the coupler link being in alignment with a line extending through the common connection and the rotational axis of the plates when the plates are in the first position so as to resist opening of the contacts when the circuit interrupter is subjected to vibrational shock waves.

4,639,701

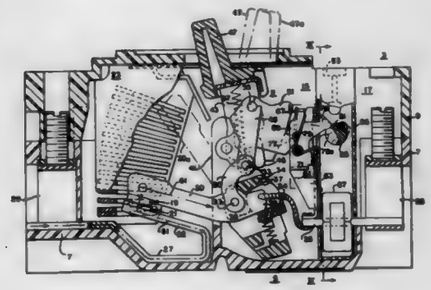
CIRCUIT BREAKER WITH INTERFACE FLUX SHUNT TRIP

Alan B. Shimp, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 30, 1985, Ser. No. 771,377

Int. Cl.⁴ H01H 73/02, 75/00, 77/00

U.S. Cl. 335—21 4 Claims



1. A circuit breaker comprising:

a housing;

a circuit breaker structure supported in the housing;

the circuit breaker structure having a pair of contacts operable to open and close an electric circuit;

a releasable mechanism;

manually operable means manually operable when the releasable mechanism is in a latched position to open and close the contacts;

trip means including an electro-mechanical means operable automatically in response to overload current conditions above a predetermined value to release the releasable mechanism whereupon the releasable mechanism automatically moves from the latched position to a tripped position to open the contacts;

the manually operable means being operable to move the releasable mechanism from the tripped position to the latched position after release of the releasable mechanism;

latch means including a latch lever operable between latching and unlatching positions to latch the releasable mechanism;

the trip means also including a trip bar rotatably mounted on its longitudinal axis between latching and unlatching positions in response to operation of the electro-mechanical means for unlatching the latch lever and being biased in the untripped position; and

the electro-mechanical means being operable against a surface of the trip bar to rotate the bar to the tripped position and including a second lever movable by the electromechanical means against a surface of the trip bar to unlatch the latch lever.

4,639,702

REED RELAY

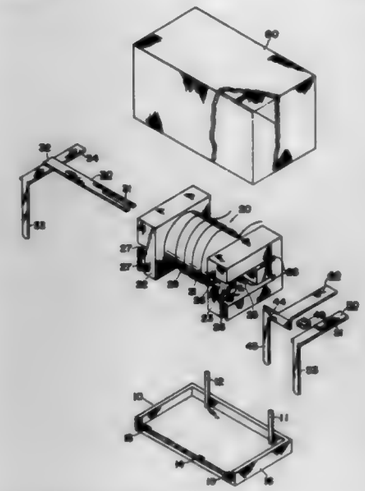
Ryuichi Sato, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 9, 1985, Ser. No. 785,825

Claims priority, application Japan, Oct. 9, 1984, 59-152920[U]

Int. Cl.⁴ H01H 1/66, 51/00

U.S. Cl. 335—153 6 Claims



1. A reed relay comprising:

(a) a pair of fixed contact supports mounted at a first end of said relay each having a fixed contact thereon and arranged at a regular spacing therebetween;

(b) a reed strip having a fixed end mounted at a second end of said relay being opposed to said first end and a movable contact at a free end thereof and arranged so that said movable contact is positioned between said pair of fixed contacts, said movable contact also having a pair of sides;

(c) a coil wound around said reed strip; and

(d) a permanent magnet disposed in contact with one of said fixed contact supports and on one of said sides of the movable contact of said reed strip and being spaced apart therefrom to allow an unobstructed viewing space to remain at the first end of the relay, allowing viewing of the free end of said reed strip.

4,639,703

SADDLE COILS FOR ELECTROMAGNETIC DEFLECTION UNITS

John G. Metcalfe, York, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 22, 1985, Ser. No. 736,909

Int. Cl.⁴ H01F 5/02

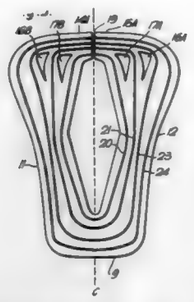
U.S. Cl. 335—213 35 Claims

1. A method of forming a saddle coil for a deflection coil assembly which in use deflects the electron beam or beams of a cathode ray display tube in one of two orthogonal directions, the saddle coil comprising conductive patterns on assembled layers of insulating film parts, said method comprising the steps of:

(i) producing for each of said layers a first substantially 'U' shaped lamelliform part and a second lamelliform part from insulating film with patterns of conductive members on each part, the width of each part at any point being

marginally greater than the width of the conductive pattern thereon at that point,

(ii) assembling the first part with the second part to form a layer by distorting the shape of the first part such that it is flared and bridging the distal ends of the first part with the second part so that the flared side limbs of the first part form the side members of the layer for the saddle coil with the transverse limb of the first part forming the gun end whilst the second parts forms at least part of the screen



end of the layer for the saddle coil, the conductive pattern on the second part providing the required interconnections between ends of the conductive pattern at the distal ends of the first part to form an electrical coil,

(iii) assembling a plurality of layers so formed such that successive layers adhere to each other to form a substantially rigid and self-supporting saddle coil, and

(iv) providing electrical connections between the conductive members of the various layers of said saddle coil.

4,639,704

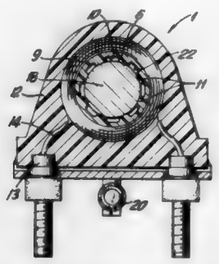
DEBRIS TOLERANT SOLENOID

J. Richard Shaud, Middlebury, and Raymond H. LaChance, Canaan, both of Conn., assignors to Bicron Electronics Company, Canaan, Conn.

Filed Mar. 3, 1986, Ser. No. 835,684

Int. Cl.⁴ H01F *7/08*

U.S. Cl. 335—255 **6 Claims**



1. In a solenoid adapted to be immersed in a fluid containing magnetic contaminants, said solenoid including a frame having two longitudinally spaced ends, a bobbin of non-magnetic material disposed between said frame ends, said bobbin having a central longitudinal passage, an electromagnetic coil wound on said bobbin, a magnetic more piece attached to one of said frame ends and extending partially through the bobbin central longitudinal passage, and an armature extending through the other frame end and movable within said bobbin central longitudinal passage to and from the core piece and defining a variable volume fluid chamber between the armature and core piece, the improvement comprising:

a plurality of longitudinal, circumferentially spaced flutes in the bobbin central passage defining a plurality of longitudinal passages open at either end of the bobbin, said passages communicating with said variable volume fluid chanber defined between the armature and the core piece, whereby energization of said coil moves said armature toward said core to reduce the volume of said chamber and expel fluid from said chamber and through said longitudinal passages to prevent entry of magnetic contaminants.

4,639,705

TRANSPORMER WITH GAPLESS CORE ON SUPPORT

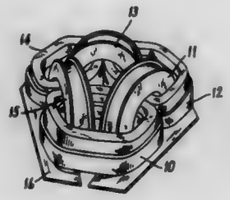
Jean-Claude Beisser, Pierre Grise, La Chaux-de-Fonds, Switzerland (CH-2300)

Filed Feb. 27, 1985, Ser. No. 706,296

Claims priority, application France, Mar. 6, 1984, 84 03465

Int. Cl.⁴ H01F *33/02, 27/26, 27/30*

U.S. Cl. 336—5 **10 Claims**



1. An electric transformer comprising:

at least one electrical winding made of a conductive material wound about a wheel rim-shaped annular former;

at least one magnetic circuit made of at least one elementary circuit provided by coiling a magnetic metal strip of constant width into a gapless core with a window, said at least one magnetic circuit having the shape of an irregular polygon with an axis of symmetry;

a support plate having a recess;

said at least one magnetic circuit being positioned and maintained on said support plate with said window aligned with said recess; and

said at least one winding extending through said recess and said window and surrounding said plate and said at least one magnetic circuit.

4,639,706

FLYBACK TRANSFORMER

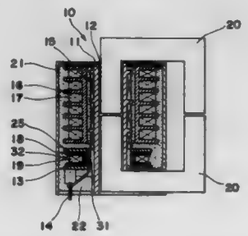
Yohei Shimizu, Nishinomiya, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Oct. 4, 1985, Ser. No. 784,440

Claims priority, application Japan, Oct. 30, 1984, 59-164020[U]

Int. Cl.⁴ H01F *27/30*

U.S. Cl. 336—170 **3 Claims**



1. A flyback transformer which comprises:

a low tension coil bobbin including a hollow cylindrical

portion surrounded by a primary coil winding having terminal ends, a terminal board provided with a plurality of legs supporting connecting terminals, and a flange portion axially spaced a predetermined distance from said terminal board and forming a substantially cylindrical compartment portion below said hollow cylindrical portion, said low tension coil bobbin further including a plurality of first passage means formed axially in said cylindrical compartment portion leading said primary coil winding terminal ends from said hollow cylindrical portion through said cylindrical compartment portion to said connecting terminals;

a high tension coil bobbin concentrically disposed at an outer peripheral portion of said hollow cylindrical portion of said low tension coil, bobbin extending a predetermined distance along said hollow cylindrical portion and being wound with a secondary coil around an outer portion thereof; and

an auxiliary coil bobbin composed of insulating material, including a pair of semi-annular frame members of U-shaped cross section fitted into said cylindrical compartment portion of said low tension coil bobbin and joined together so as to define an annular groove in which a tertiary coil is wound, said tertiary coil being electrically separated from said terminal ends of said primary coil winding passing through said first passage means by said auxiliary coil bobbin, said auxiliary coil bobbin being formed with a plurality of second passage means guiding terminal ends of said tertiary coil winding to said connecting terminals.

4,639,707

TRANSFORMER WITH TOROIDAL MAGNETIC CORE

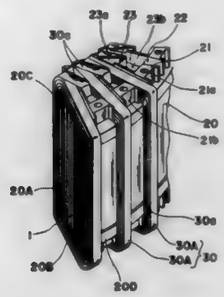
Kazuhiro Tanaka, Suita; Yasuo Yamamoto, Settsu; Katsumi Hanaoka, Kawanishi, and Masatake Hirai, Kyoto, all of Japan, assignors to Allied Corporation, New York, N.Y.

Filed Mar. 19, 1986, Ser. No. 841,164

Claims priority, application Japan, Mar. 20, 1985, 60-29026[U]

Int. Cl.⁴ H01F *27/30*

U.S. Cl. 336—185 **4 Claims**



1. A transformer with a toroidal magnetic core which comprises:

a toroidal magnetic core;

an annular winding frame for covering the top and bottom surfaces of the toroidal magnetic core in its axial direction thereof on which a plurality of grooves for inserting a winding conductor are formed radially;

a winding of the transformer being consisted of a plurality of unit coils being connected between the adjacent two of them electrically, where the unit coils are wound around the core, fixed in the groove of the annular winding frame;

conductor guiding grooves each being laid between two grooves for inserting a winding conductor adjacent to each other, said conductor guiding groove having a shallow groove portion near the end on the entrance side of the conductor guiding groove and a deep groove portion near the end on the exit side of the conductor guiding groove,

the bottom of said deep groove portion is formed to have a plane same to that of the bottom of the winding conductor groove to which the exit end of the conductor guiding groove is connected.

4,639,708

PARALLELOGRAM ELECTRIC COIL HELICALLY WOUND

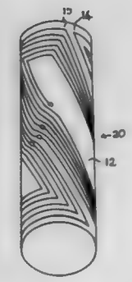
John D. Weatherly, Manurewa, New Zealand, assignor to Development Finance Corporation of New Zealand, Auckland, New Zealand

Filed Feb. 19, 1985, Ser. No. 703,131

Claims priority, application New Zealand, Feb. 23, 1984, 207264

Int. Cl.⁴ H01F *27/28*

U.S. Cl. 336—200 **5 Claims**



1. A cylindrical coil, with electrically conductive elements arranged to create a magnetic field therein, said magnetic field having an axial component and a transverse component, wherein the said transverse component rotates through 90° over at least part of the length of the coil; said coil being formed from a substrate having said electrically conductive elements thereon, said electrically conductive elements comprising at least one spiral of electrically conductive material in the shape of a parallelogram on a planar surface of the substrate, said at least one spiral being in turn wound around the cylinder as at least one helix.

4,639,709

THERMOSTAT WITH ADJUSTABLE TEMPERATURE RANGE SETPOINT STOPS

Howard Koets, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

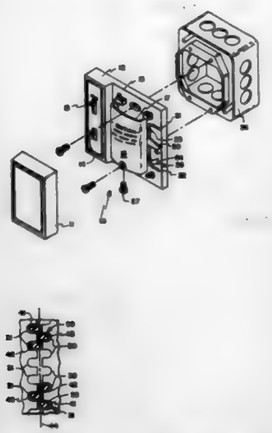
Filed Jun. 6, 1986, Ser. No. 871,339

Int. Cl.⁴ H01H *37/12*

U.S. Cl. 337—360 **5 Claims**

1. A thermostat for control of an environmental temperature, including: base means for support of temperature control means; lever means mounted on said base means with said lever means connected to said temperature control means to set said control means to operate at a selected temperature; said lever means movable between range setpoint stop means; slot means formed into said base means to mount said stop means; said slot means having a geometric design including a plurality of offset recessed openings on opposite sides of said slot means; said stop means having a plurality of projections which frictionally engage with and are held by said offset recessed openings; and

said projections being shaped to allow said stop means to be removed, rotated, and reinserted to provide a plurality of



temperature range setpoint stop positions when said stop means are mounted in said slot means.

4,639,710
FOOT PEDAL FOR VARYING RESISTANCE IN AN ELECTRICAL CIRCUIT

Thomas A. McMillan, 101 Dory Rd., N. Palm Beach, Fla. 33408; Henry W. Mitchell, 9744 Dogwood Ave., Palm Beach Gardens, Fla. 33410, and Alvin S. Cecil, 6042 Rogers St., Lake Park, Fla. 33310

Filed Jan. 24, 1986, Ser. No. 822,219
Int. Cl.[4] H01H *3/14*; H01C *10/10*
U.S. Cl. 338—108 5 Claims

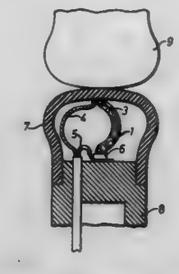


1. A foot pedal device for varying resistance in an electrical circuit comprising a base plate; an actuator foot plate; means pivotally mounting one end of said foot plate to one end of said base plate; means limiting the distance the other ends of said foot plate and base plate can open; spring means biasing said other ends to their open position; a circular recess in said base plate faces said actuator foot plate; an array of circular members positioned in said circular recess; said array comprising a first insulating disc, a first electrode disc, a compressible resistance disc, a second electrode disc, a second insulating disc, and a circular actuating plate; said circular actuating plate having an upwardly facing spherical seat at the center thereof; said actuator foot plate having a downwardly extending spherical surface for engaging said spherical seat to compress said compressible resistance disc to vary the resistance thereof between said first and second electrode discs; electrical conducting means connected to each electrode disc for forming part of an electrical circuit.

4,639,711
SIGNAL TRANSMITTER

Stig Edholm, Klillingevägen 8, S-181 43 Lidingö, Sweden, and Bengt Stenberg, Kottvägen 3, S-191 40 Sollentuna, Sweden

PCT No. PCT/SE83/00445, § 371 Date Aug. 8, 1984, § 102(e) Date Aug. 8, 1984, PCT Pub. No. WO84/02611, PCT Pub. Date Jul. 5, 1984
PCT Filed Dec. 12, 1983, Ser. No. 638,838
Claims priority, application Sweden, Dec. 21, 1982, 8207305
Int. Cl.[4] H01C *10/10, 10/12*
U.S. Cl. 338—114 6 Claims

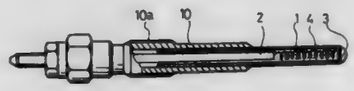


1. A signal transmitter, comprising an elastically deformable body in the form of a matrix consisting of an elastomer containing carbon black as a filling agent, the signal being generated by a change of the electrical resistance of the body when subjected to deformation and outputted via a pair of electrodes, characterized in that said body is an elongate body, the carbon black is of a structure-forming type so that the body has a relatively low electrical resistance in the undeformed state, and in that said electrodes are respectively connected to the opposite longitudinal ends of said elongate body, so that, when the body is deformed between said ends by bending, said resistance becomes only higher.

4,639,712
SHEATHED HEATER

Akihiro Kobayashi, Hazu; Shozo Yamaguchi, Okazaki; Kiyomi Kobayashi, Kariya, and Hiroaki Takaba, Obu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 21, 1985, Ser. No. 789,768
Claims priority, application Japan, Oct. 25, 1984, 59-224381
Int. Cl.[4] H01C *1/03, 1/028*; H01M *6/36, 2/18*
U.S. Cl. 338—238 3 Claims

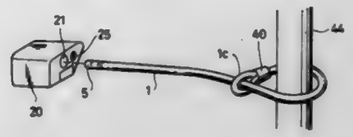


1. A sheathed heater, comprising:
a sheath;
an electric heating element disposed within said sheath; and
an electrically insulating filling material packed into said sheath for electrically insulating said electric heating element from said sheath, and for preventing electrical short-circuiting between spacedly-adjacent portions of said electric heating element within said sheath;
said filling material being constituted by 80 mol percent or more of aluminum nitride powder, and 20 mol percent or less of a metallic oxide powder.

4,639,713
THEFTPROOF DEVICE

Tadao Kitagawa, Kasuifukuoka; Yutaka Kosuge, Sayama, and Yoichiro Noda, Miyazaki, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo and Kabushiki Kaisha Honda Rokku, Miyazaki, both of, Japan

Filed Sep. 16, 1982, Ser. No. 418,645
Claims priority, application Japan, Sep. 18, 1981, 56-148265; Sep. 18, 1981, 56-148266; Sep. 19, 1981, 56-139435; Oct. 9, 1981, 56-161842; Oct. 9, 1981, 56-161843; Oct. 9, 1981, 56-161845; Oct. 23, 1981, 56-169585; Jul. 23, 1982, 56-128579
Int. Cl.[4] B60R *25/00*; G08B *13/14*; G01V *9/04*; H01J *5/16*
U.S. Cl. 340—63 7 Claims

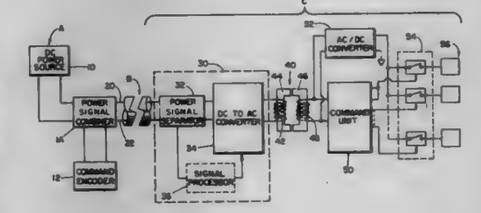


1. A theftproof device comprising:
an elongate flexible tying member having two ends;
an optical fiber longitudinally extending through said flexible tying member and having two ends, one end of said optical fiber being located at one end of said flexible tying member and another end of said optical fiber being located at the other end of said flexible tying member;
said flexible tying member having a looped portion including said other end thereof;
a light emission element arranged opposite one end of said optical fiber, for converting an electric signal supplied thereto into a corresponding photo signal;
a light receiving element arranged opposite another end of said optical fiber, for converting a photo signal supplied thereto into a corresponding electric signal;
at least one electric wire longitudinally extending through said flexible tying member adjacent said optical fiber, said electric wire being connected to a selected one of said light emission and light receiving elements for transmitting an electric signal transduced by the selected one of said elements, so that (i) when the electric wire is connected to the light emission element, the wire transmits an electric signal to be transduced to a photo signal by said light emission element, and (ii) when the electric wire is connected to the light receiving element, the wire transmits an electric signal which has been transduced from a photo signal by said light receiving element;
a fixture adapted to be fixed to an object which is to be protected from theft,
said flexible tying member being adapted to have said one end thereof passed through said looped portion after said flexible tying member is wound around a solid structure adjacent said object to be protected from theft;
plug means provided at one end of said flexible tying member for mechanically connecting one end of said flexible tying member to said fixture, said plug means being adapted to disconnectably connect said one end of said flexible tying member to said fixture;
a caulking member caulked to join said other end of said flexible tying member to an end part of said looped portion opposite said other end of said flexible tying member,
said caulking member accomodating one of said light emission and light receiving elements;
an electrical circuit arranged in said fixture for supplying an electric signal to said light emission element and also disposed to be supplied with an electric signal generated by said light receiving element; and
connector means arranged within said plug means for electrically connecting said light emission element and said light receiving element to said electrical circuit, one of said light emission and light receiving elements being electrically connected to said connector means by way of said at least one electric wire;
said electrical circuit operating in a manner such that upon occurrence of a change in a photo signal generated by said light emission element and transmitted through said optical fiber, caused by disconnection or cutting of either said optical fiber or said at least one electric wire, said electical circuit is operable in response to a change in an electric signal supplied thereto from said light receiving element, which corresponds to said change in said photo signal, to perform a predetermined warning function.

4,639,714
COMBINED POWER AND CONTROL SIGNAL TRANSMISSION SYSTEM

Wayne D. Crowe, Houston, Tex., assignor to Ferranti Subsea Systems, Ltd., London, England

Filed Dec. 21, 1984, Ser. No. 685,262
Int. Cl.[4] H04M *11/04*
U.S. Cl. 340—310 R 20 Claims



1. A method of concurrently transmitting electrical power and communication signals from a source station to a remote station containing controllable power consuming components, the method comprising:
transmitting electrical power along an electrical conductor;
superimposing an electrical communication signal on the electrical power along the electrical conductor for relating command information from the source station to the remote station;
at a remote station, separating the communication signal from the electrical power;
converting the electrical power to a high frequency signal which is encoded as a function of the separated communication signal;
transmitting the encoded high frequency signal across an inductive coupler;
deriving a control signal from the high frequency signal which is transmitted across the inductive coupler which varies in accordance with the communication signal to control operations of the power consuming components; and
powering the components at the remote station with the high frequency signal transmitted across the inductive coupler.

4,639,715
FLASH ANALOG TO DIGITAL CONVERTER

Tunc Doluca, Santa Clara, Calif., assignor to Intersil, Inc., Cupertino, Calif.

Filed Feb. 13, 1984, Ser. No. 579,276
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 AD 3 Claims

1. An analog to digital converter for converting an analog input signal to a digital representation by comparison with a desired reference voltage, said converter comprising:
a scale input for receiving a scale reference signal;
a program input for receiving a program input signal having a first logic value if said scale reference signal has the same voltage polarity as said desired reference voltage and

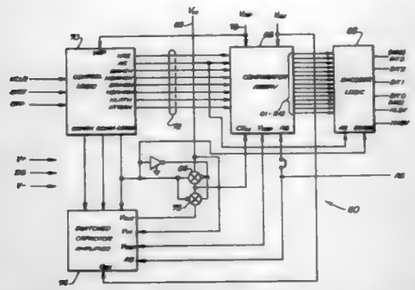
having the opposite logic value if said scale reference signal has the opposite voltage polarity of said desired reference voltage;

incremental reference means coupled to said scale input for providing a plurality of incremental reference voltages;

a plurality of comparator means each for comparing said analog input signal to a respective incremental reference voltage, each comparator means including an amplifier, a pair of input capacitors coupled to said amplifier and switch means for selectively coupling one of said input capacitors either to said analog input signal or to circuit common and for selectively coupling the other input capacitor either to its respective incremental reference voltage or to circuit common; and

control means coupled to said scale input, said program input and said plurality of comparator means, said control means for operating said plurality of comparator means in an auto-zero period and a comparison period, said control means controlling said switch means in a manner adapted to:

(1) apply said analog input signal to said one input capacitor in said auto-zero period and the respective incremental



reference voltage to said other input capacitor in said comparison period if said scale reference signal and said desired reference voltage have the same polarity and said desired reference voltage has a first polarity;

(2) apply the respective incremental reference voltage to said other input capacitor in said auto-zero period and said analog input signal to said one input capacitor in said comparison period if said scale reference signal and said desired reference voltage have the same polarity and the desired reference voltage has a second polarity opposite to said first polarity;

(3) apply said analog input signal and the respective incremental reference voltage to said one and said other input capacitors, respectively, during said comparison period if said scale reference signal and said desired reference voltage are of opposite polarity and said desired reference voltage has said second polarity; and

(4) apply said analog input signal and the respective incremental reference voltage to said one and said other input capacitors, respectively, during said auto-zero period if said scale reference signal and said desired reference voltage are of opposite polarity and said desired reference voltage has said first polarity.

4,639,716

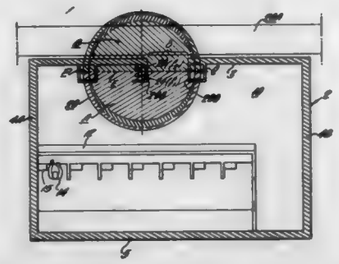
ALARM PACKET SYSTEM

Earl R. Payne, Urbana, Ill., assignor to ICI Americas Inc., Wilmington, Del.

Filed Nov. 19, 1984, Ser. No. 673,006
Int. Cl.[4] G08B *13/14*
U.S. Cl. 340—571 12 Claims

1. A system for producing alarm-actuating signals in a packet when it is moved in a predetermined direction along a path extending from a first position on one side of a check point to a second position on the other side of said check point, comprising:

field-generating means for producing, adjacent said check-point and along said path, first and second mutually-exclusive field regions containing fields of detectable magnitudes and respectively different field characteristics, with the beginning of said second field region positioned further along said path in said predetermined direction than said first field region, and for also producing an additional detectable field condition, different from the field characteristics of said first and second regions, at a predetermined position further along said path than said beginning



of said second field region but not as far along said path as said second position;

circuit means in said packet for producing field-indicating signals indicative of whether said packet is in said first field region, in said second field region, or at said predetermined position where said additional detectable field condition exists; and

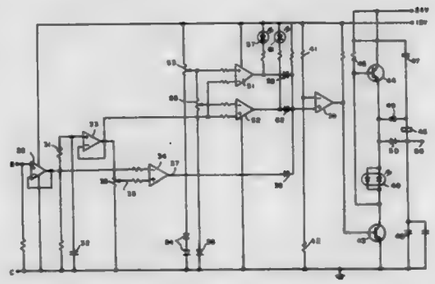
logic means in said packet responsive to said field-indicating signals for producing alarm-actuating signals in said packet only when said packet has been moved along said path from said first field region through said second field region to said predetermined position.

4,639,717

METHOD AND APPARATUS FOR MONITORING FLAME CONDITION

Laurent De Meirsman, Groot-Bijgaarden, Belgium, assignor to Electronics Corporation of America, Waltham, Mass.

Filed Jul. 15, 1985, Ser. No. 755,179
Int. Cl.[4] G08B *17/06*
U.S. Cl. 340—578 12 Claims



1. In a multiburner system, a flame monitor for determining the condition of a particular burner flame which has continuous luminous intensity fluctuations during normal operation which vary substantially relative to the average intensity of said flame comprising:

a sensor responsive to said luminous intensity fluctuations for producing a flame signal which varies with said fluctuations over a wide range of intensities;

means for mounting said sensor to receive light from said particular flame with the field of view for said sensor including the portion of the combustion chamber of said system beyond the flame being monitored; and

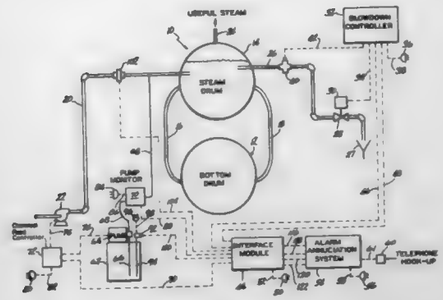
means responsive to excursions of said flame signal relative to the average value thereof exceeding a threshold level for producing a flame presence signal.

4,639,718

BOILER BLOWDOWN MONITORING SYSTEM AND PROCESS FOR PRACTICING SAME

Kenneth E. Gasper, Leawood, Kans., assignor to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 595,776, Apr. 2, 1984. This application Feb. 25, 1985, Ser. No. 705,179
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—603 4 Claims



3. A boiler blowdown monitoring system comprising:

(a) a boiler blowdown valve located in a boiler blowdown line for releasing boiler water during blowdown operation;

(b) a boiler blowdown sensor located in said blowdown line for sensing the conductivity of the water in said blowdown line;

(c) a boiler blowdown controller for generating first, second and third output signals;

(i) said first output signal being generated to said blowdown valve, said blowdown sensor and an interrogation means simultaneously when a predetermined condition exists and being capable of (aa) causing said blowdown valve to open to release water, (bb) causing said blowdown sensor to start sensing said water conductivity and to start tranferring water conductivity measurements to said controller, and (cc) causing said interrogation means to start an interrogation sequence;

(ii) said second output signal being generated to said blowdown valve, said blowdown sensor and said interrogation means simultaneously when said sensor senses a preselected first (optimum) conductivity level and being capable of (aa) causing said blowdown valve to close, (bb) causing said blowdown sensor to stop sensing and to stop transferring conductivity measurements to said controller, and (cc) causing said interrogation means to stop said interrogation sequence;

(iii) said third output signal being generated to said interrogation means when said sensor senses a conductivity level above a preselected second (maximum) conductivity level or below a preselected third (minimum) conductivity level;

(d) said interrogation being capable of sensing said first output signal, said second output signal, and said third output signal, and capable of performing an interrogation sequence, said interrogation sequence comprising:

(i) waiting a predetermined time period after the sensing of said first output signal, then generating an alarm signal to an alarm annunciating means if said third output signal is sensed; and

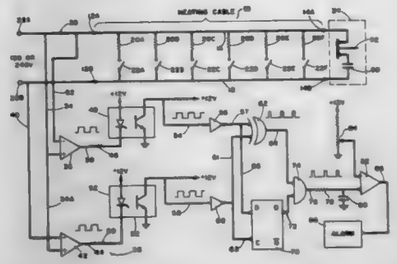
(ii) ending said interrogation sequence when said second output signal is sensed.

4,639,719

APPARATUS FOR MONITORING CIRCUIT INTEGRITY

Thomas W. Pappano, Tulsa, and David O. Brown, Claremore, both of Okla., assignors to General Signal Corporation, Stamford, Conn.

Filed Mar. 11, 1985, Ser. No. 710,315
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—652 6 Claims



1. Apparatus for monitoring circuit integrity in which an AC voltage source is connected to a plurality of paralleled current consuming loads spaced at points from a voltage source, comprising:

a reactive load in parallel with said current consuming loads at a point in the circuit more distant from the voltage source than any of the current consuming loads being monitored;

a phase shift detector connected to the current consuming loads at a point in the circuit between the voltage source and the nearest current consuming load being monitored, the phase shift detector being sensitive to the shift in current phase induced by said reactive load; and

a signal means connected to and actuated by said phase shift detector, the signal means providing a warning when the phase shift induced by said reactive load is lost.

4,639,720

ELECTRONIC SKETCH PAD

William P. Rympalski, Melbourne; James S. Herstein, Satellite Beach, and Roger L. Ritenour, Palm Bay, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jan. 12, 1981, Ser. No. 224,067
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—712 30 Claims

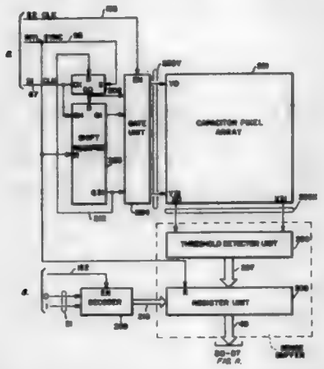
1. A display device comprising:

a transparent array of variable capacitance pixels supported by way of a first member, each variable capacitance pixel undergoing a change in capacitance in response to the coupling of a conductive medium at the surface of said first member;

an array of display element pixels supported by way of a second member positioned adjacent said first member, so that said array of variable capacitance pixels overlies said array of display element pixels, each of said display element pixels being selectively energized in response to control signals applied thereto; and

control means, coupled to said transparent array of variable capacitance pixels and said array of display element pixels, for scanning said transparent array of pixels and selec-

tively causing a prescribed control signal to be coupled to a respective display element pixel corresponding to a



respective variable capacitance pixel at which a change in capacitance has been detected.

4,639,721

DATA SELECTION CIRCUIT FOR THE SCREEN DISPLAY OF DATA FROM A PERSONAL COMPUTER

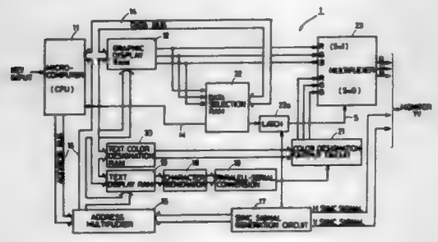
Masayuki Eto, Yaita; Kazuyoshi Izumi; Fuyuki Kobayashi, both of Utsunomiya; Mamoru Kawagishi, and Masahiro Oosewa, both of Yaita, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 29, 1983, Ser. No. 536,965

Claims priority, application Japan, Oct. 9, 1982, 57-177990; Oct. 12, 1982, 57-179248

Int. Cl.⁴ G09G *3/16*

U.S. Cl. 340—747 **2 Claims**



1. A display system for a microcomputer comprising:
a graphics display RAM for storing graphic data as a 3-bit red, green, blue (RGB) color signal for each pixel of graphic data;
a text display RAM for storing text data;
a keyboard for inputting said graphic and text data as well as display instructions;
a color monitor for displaying color pixels of both said graphic and text data thereon;
multiplexer means for reading out said graphic and text data from said graphic display and text display RAMs to said color monitor;
priority read out means including a data select RAM for storing priority bit signals for selectively reading out either said graphic data or text data for given pixels of displayed information, said priority bit signals being addressed in said data select RAM by said RGB color signals stored in said graphic display RAM and output to said multiplexer means.

4,639,722

LIQUID CRYSTAL DISPLAY APPARATUS

Tetsuo Urabe, Matsudo, and Shigeru Kojima, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

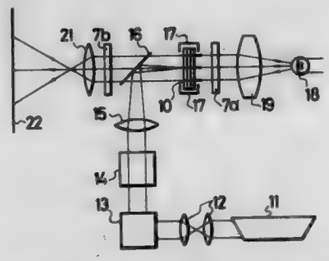
PCT No. PCT/JP82/00442, § 371 Date Jul. 18, 1983, § 102(e) Date Jul. 18, 1983, PCT Pub. No. WO83/01841, PCT Pub. Date May 26, 1983

PCT Filed Nov. 19, 1982, Ser. No. 530,596

Claims priority, application Japan, Nov. 20, 1981, 56-186334

Int. Cl.⁴ G09G *3/36*

U.S. Cl. 340—784 **4 Claims**



1. A liquid crystal display apparatus comprising:
a pair of plates including internal opposing electrodes,
a smectic liquid crystal body confined between said plates and being bistably switchable in polarity between a first orientation state and a second orientation state in which molecules in said first and second orientation states have polarities equivalent in energy and have dipole moments in opposite directions,
means for initially orienting said molecules in said first state,
irradiating means for irradiating an energy beam onto said molecules so as to heat the same and change said molecules from said first orientation state into a third orientation state in which said molecules are substantially perpendicular to said plates, and
means for applying a weak DC electric field to said molecules to change said orientation state from said third state to said second state while the remainder of said molecules remain in said first state thereby providing information recording.

4,639,723

DATA DISPLAY SYSTEM

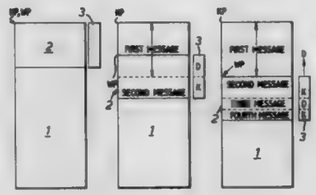
Geoffrey J. Boughton, Sandy, England, assignor to International Computers Limited, London, England

Filed May 24, 1984, Ser. No. 613,523

Claims priority, application United Kingdom, Jun. 8, 1983, 8315752

Int. Cl.⁴ G09G *1/02*

U.S. Cl. 340—799 **4 Claims**



1. A method of handling data in a data terminal having a display area in which only a limited number of data lines can be displayed including the steps of:
entering data lines consecutively into the terminal until said limited number of data lines are displayed in the display area;
shifting the displayed data lines relative to the display area to remove data lines sequentially from the display area to thereby make available space for further data lines to be displayed;
selectively storing indicator flags in response to operator input signals which select particular data lines, wherein said indicator flags indicate whether the data lines, on removal from the display area, are to be retained; and,
as the data lines are removed sequentially from the display area, retaining in a buffer store, having a capacity to store a greater number of lines of data than said limited number, each data line being indicated for retention.

4,639,724

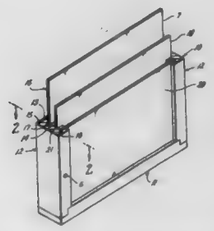
GRAPHIC DISPLAY

Mauro G. Tognori, P.O. Box 12818, Houston, Tex. 77017

Continuation of Ser. No. 688,398, May 20, 1976, abandoned. This application Sep. 27, 1978, Ser. No. 946,398

Int. Cl.⁴ G08B *5/00*

U.S. Cl. 340—815.01 **20 Claims**



1. A grapic display system for displaying electrical signals by light sources in the presence of an external lighting system, comprising:
a frame;
a set of plates; one of said plates having
means for supporting such light sources;
means for connecting said plates to said frame;
means for connecting such light sources to such electrical signals; and
said plates including glare means for preventing substantial reflection of incident light on one plate from said external lighting.

4,639,725

PICTURE DISPLAY CASE

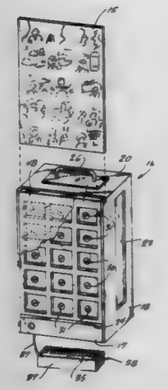
Martin G. Franke, Terao-Kamata 1-10-12, Ayase-Shi, Kanagawa-Ken, Japan (252), assignor to Martin G. Franke, Tokyo, Japan

Filed Apr. 4, 1984, Ser. No. 596,496

Int. Cl.⁴ G09G *3/00*

U.S. Cl. 340—815.02 **6 Claims**

1. In a picture display case: a frame; a light panel supported in said frame; a plurality of lamps fixedly mounted on said light panel in spaced relationship; support means in said frame for removably receiving and supporting different selected picture panels individually with the different picture panels containing varying numbers and sizes of pictures as well as different arrangements of pictures, such panels being supported in front of said light panel so that all of the pictures on the particular picture panel in said frame can be illuminated individually by the selective energization of said lamps; control means connected to regulate the transmission of electrical energy to regulate the transmission of electrical energy to said lamps and actuatable for producing the energization of said lamps in different sequences and different combinations for illuminating all of the pictures on the panel selectively; and adjusting means connected to be actuated according to the panel in said frame for adjusting said control means to energize said lamps in the particular sequence and particular combinations that accommodate the number of pictures on the selected picture panel in the machine and the arrangement or size of such pictures on the panel.



4,639,726

RADIO COMMUNICATION APPARATUS DISABLED ON RECEPTION OF A PREDETERMINED SIGNAL

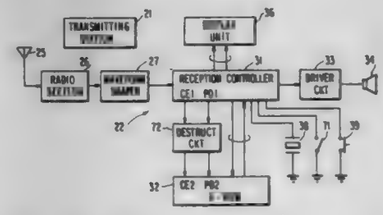
Yoshio Ichikawa; Masaaki Akahori; Daisuke Ishii; Kazuyuki Tsunoda; Yohichiro Minami, and Koichi Nagata, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 20, 1984, Ser. No. 642,292

Claims priority, application Japan, Aug. 18, 1983, 58-150801; Jul. 17, 1984, 59-147008

Int. Cl.⁴ H04Q *7/00*; H04B *7/00*

U.S. Cl. 340—825.44 **6 Claims**



1. A pager receiver comprising:
call signal receiving means for carrying out a call signal reception operation of selectively receiving a call signal specific to said pager receiver;
tone producing means for producing a call tone after reception of said call signal;
resetting means for resetting said call tone after production of said call tone;
additional signal receiving means for carrying out an additional signal reception operation of receiving an additional signal succeeding said call signal;
checking means for checking whether or not said additional signal is identical with a predetermined signal and producing an signal indicating said identity;
means responsive to said identity signal for driving said tone producing means to make said tone producing means continuously produce another tone signal, and to disable said call signal receiving means and said resetting means.

4,639,727

DATA TRANSMISSION SYSTEM OF OPTTO-COUPLERS

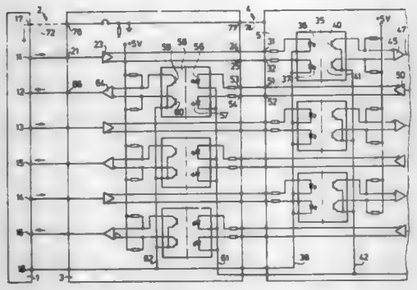
Udo Blaulus, and Anton Rodi, both of Leimen, Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 483,661, Apr. 11, 1983, abandoned. This application Jul. 3, 1985, Ser. No. 752,481

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213527

Int. Cl.⁴ H04Q 1/00

U.S. Cl. 340—825.57 6 Claims



1. Data transmission system having at least two spatially separated devices mutually connected by electric lines affording data transmission therebetween in both directions, the devices each having at least one data output and a data input separated from the data output, comprising an optocoupler and an electrical receiving unit included in at least one of the devices, said optocoupler having an input connected to the data input of said one device, and having an output connected to said electrical receiving unit of said one device, the data inputs and the data outputs of each of said spatially separated devices being insulated from one another and the data outputs of one of the spatially separated devices being connected with the respective data inputs of another one of the devices, and being similarly connected in the opposite direction.

4,639,728

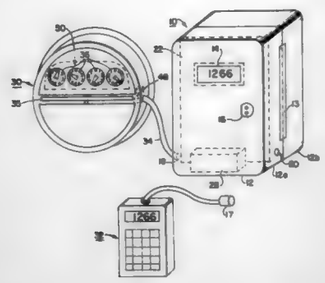
METHOD OF AND SYSTEM FOR ACCUMULATING VERIFIABLE ENERGY DEMAND DATA FROM REMOTE ELECTRICITY METERS

Scott C. Swanson, Roswell, Ga., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Sep. 16, 1985, Ser. No. 776,719

Int. Cl.⁴ G08C 5/12

U.S. Cl. 340—870.03 12 Claims



1. A system for accumulating verifiable energy demand data from a remote electricity meter of a type having at least one register indicating accumulated demand and generating pulses corresponding to demand rate, comprising:

means for detecting pulses generated by said meter;

means for counting the pulses detected by said detecting means during a predetermined measurement interval to develop an interval pulse count;

means for digitally encoding an output of said register;

means for reading an output of said encoding means at the last of a predetermined number of measurement intervals;

solid state memory means for storing data; and

means for storing interval pulse counts and encoded register readings in different addressable locations of said memory means.

4,639,729

TELEMETRIC SYSTEM

Carl H. Savit, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Sep. 23, 1985, Ser. No. 779,073

Int. Cl.⁴ G08C 19/16

U.S. Cl. 340—870.13 9 Claims



1. A telemetric system for transmitting time-division multiplexed data pulses to a central recording station, said system comprising:

(a) a cable having a plurality of transmission channels extending the length thereof and operably coupled to said central recording station;

(b) a plurality of sensors disposed at substantially equal intervals along each of said channels, said sensors on each channel being offset from sensors on adjacent channels by a predetermined distance;

(c) means for time-division multiplexing a plurality of data pulses traveling on each of said channels; and

(d) means for time-division multiplexing said multiplexed data pulses from each of said channels to said central recording station.

4,639,730

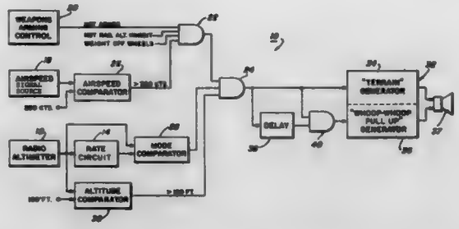
EXCESSIVE TERRAIN CLOSURE WARNING SYSTEM

Noel S. Paterson, Bothell, and Everette E. Vermilion, Seattle, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed May 13, 1983, Ser. No. 494,591

Int. Cl.⁴ G08B 23/00; G01C 21/00; G06F 15/48

U.S. Cl. 340—970 16 Claims



1. A warning system for providing a warning to a pilot of an aircraft of an excessive closure rate with terrain, comprising:

means for providing signals representative of the altitude of the aircraft above the ground, the closure rate of the aircraft and the airspeed of the aircraft; and

means responsive to signals representative of the altitude of the aircraft above ground, the closure rate of the aircraft and the air speed of the aircraft for generating a warning if the aircraft is below approximately 1800 feet above ground and has a closure rate in excess of 15,000 feet per minute and the airspeed of the aircraft is greater than a predetermined value;

wherein said aircraft is fitted with weapons, and wherein said warning system includes means responsive to the arming of the weapons of the aircraft for enabling the generation of said warning only when the weapons are not armed.

4,639,731

MONOPULSE FEEDER FOR TRANSMITTING AND RECEIVING RADAR SIGNALS WITHIN TWO MUTUALLY SEPARATED FREQUENCY BANDS

Göran R. Karlsson, Älvängen, and John H. S. Karnevi, Gothenburg, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Aug. 29, 1984, Ser. No. 645,447

Claims priority, application Sweden, Sep. 14, 1983, 8304937

Int. Cl.⁴ G01S 13/44

U.S. Cl. 342—147 3 Claims



1. A two frequency band monopulse radar antenna system comprising: a two-band Cassegrain reflector array having a parabolic reflector with a focal point and a hyperbolic reflector having a first focal point coinciding with the focal point of said parabolic reflector and a second focal point; and monopulse feeder means positioned at the second focal point of said hyperbolic reflector and being adapted to be connected to a first transmission means for a first radar band and to a second transmission means for a second radar band; said monopulse feeder means having

a mouth section including a first pair of openings (81*a*, 81*b*) with the same cross-sectional dimensions, and a second pair of openings (82*a*, 82*b*) with the same cross-sectional dimensions, all of said openings being in the same plane,

a wave guide section having one end for connection to said transmission means and another end, first and second pairs of waveguides and third and forth pairs of wave guides for connecting said ends, said one end including a first (91*a*, 91*b*) and a second (92*a*, 92*b*) pair of openings for providing communication of said first and second pairs of wave guides with the first transmission means, and said one end further including a third (93*a*, 93*b*) and a fourth (94*a*, 94*b*) pair of openings for providing for communication of said third and fourth pairs of waveguides with the second transmission means, and

a matching section connecting said mouth section to the other end of said wave guide section, said matching section including a first wave guide means for merging the first pair of wave guides of said wave guide section into a single wave guide connected to one of the openings of said first pair of openings of said mouth section, a second wave guide means for merging the second pair of wave guides of said wave guide section into a single wave guide connected to the other opening of said first pair of openings of said mouth section, a third wave guide means for merging the third pair of wave guides of said waveguide sections with a single wave guide connected to one of the openings of said second pair of openings of said mouth section and a forth wave guide means for merging the forth pair of wave guides of said wave guide section into a single wave guide connected to the other opening of said second pair of openings of said mouth section

4,639,732

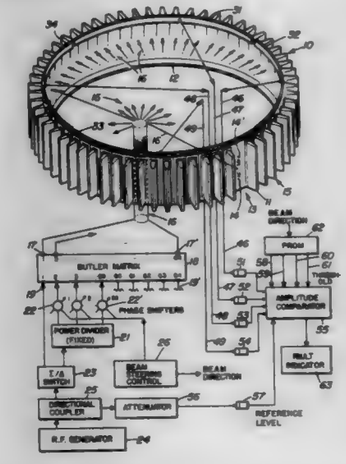
INTEGRAL MONITOR SYSTEM FOR CIRCULAR PHASED ARRAY ANTENNA

Joseph H. Acoraci, Phoenix, and Alvin W. Moeller, Kingsville, both of Md., assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 22, 1985, Ser. No. 704,687

Int. Cl.⁴ H01Q 3/26; G01S 7/40; H04B 17/00

U.S. Cl. 342—371 7 Claims



1. In a circular phased array antenna having a mounting ring, a plurality of radiating elements spaced about the circumference of the mounting ring, means of feeding r.f. currents to said radiating elements with relative amplitudes and phases whereby energy is radiated from said antenna in a focused beam, and means for steering said beam to a selected direction, a monitor system for warning of failures in the array antenna comprising,

a monitor signal circuit secured to said array mounting ring, said signal circuit being divided into a plurality of like segments, each said segment being formed as a microstrip printed circuit and including:

a plurality of probes, each said probe being located in near proximity to separate ones of said radiating elements of said array and receiving energy principally from its associated one of said radiating elements;

individual phase shifter means connected to each said probe;

a transmission line and

individual coupling means connected to each said phase shifter means for coupling energy from said phase shifter means into said transmission line, said phase shifter means and said coupling means for each said probe being adjusted to provide a phase shift negative to and an amplitude corresponding to the relative phase and amplitude of the r.f. current in the radiating element associated with that said probe;

said segments being secured to said array mounting ring end to end so as to encircle said array mounting ring;

data storage means having stored therein threshold data indicative of the amplitude of the signal appearing on said transmission line of each said signal circuit segment for each selected direction of the array beam for a normally operating array;

amplitude comparator means for comparing the amplitude of signal appearing on said transmission line for each said signal circuit segment at a particular beam direction of said array with data retrieved from said storage means for

each said transmission line for that particular beam direction; and

fault indicator means for signaling a fault condition in said array whenever the difference between the signal amplitude and the threshold data retrieved from said storage means and compared in said comparator means for any one of said transmission lines exceeds a predetermined amount.

4,639,733

DIRECTION FINDING

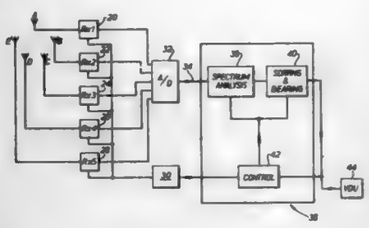
Nigel J. R. King; Ian W. N. Pawson, both of Bracknell; Michael P. Baker, Reading; Robert N. Shaddock, Binfield, and Edward V. Stansfield, Earley, all of England, assignors to Racal Communications Equipment Limited, Berkshire, England

Filed May 11, 1984, Ser. No. 609,232

Claims priority, application United Kingdom, May 11, 1983, 8312943

Int. Cl.⁴ G01S 5/02

U.S. Cl. 342—424 9 Claims



1. An interferometer-type direction finding system including at least five antennas defining a non-linear array providing 360° coverage, and such that the spacing between any pair of apertures is greater than a wavelength of the radio signal to be received, means for receiving radio energy detected by the antennas over a predetermined band, analysing means for effectively outputting the amplitude and relative phase of any radio signal received by each antenna in each of a plurality of frequency intervals within said band, means for effectively identifying from said output any received radio signal within said band, and means for processing only the relative phase at each antenna of any identified radio signal to produce only one possible value of the bearing of the source from which any said identified signal originates.

4,639,734

SUPPORT STRUCTURE FOR PARABOLOID REFLECTOR

Edward J. Schock, 1000 Conestoga Rd. C-347, Rosemont, Pa. 19010

Filed Apr. 20, 1984, Ser. No. 602,348

Int. Cl.⁴ H01Q 1/14, 15/16

U.S. Cl. 343—912 4 Claims

1. A support structure for a paraboloid reflector comprising:

a plurality of elongated ribs,

each rib having a pair of parallel flat faces displaced one from the other by the uniform thickness of the rib,

each flat face of each rib having an inwardly curved forward edge,

the thickness of each rib being substantially less than the width of the two flat faces of the rib,

each flat face of each rib being a segment of a plane parallel to the focal axis of the paraboloid,

the forward edges of the flat faces of the ribs defining an inwardly contoured support surface for a reflecting surface,

wherein the improvement comprises:

in a plurality of sets of ribs,

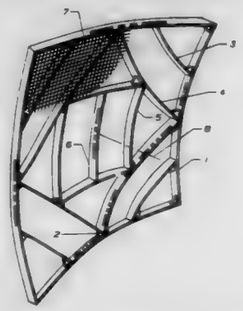
each set arranged such that the planes of the flat faces of four equal-length ribs intersect in two squares on a plane perpendicular to the focal axis of the paraboloid,

the two squares separated by the uniform thickness of the ribs, each square having the focal axis of the paraboloid at its center,

the sets of ribs being joined together in the following pattern: a first set of four equal-length ribs having each end of each rib joined to an end of another rib in the set,

the first set being an outermost square,

within the outermost square there being a plurality of additional nested sets of four equal-length ribs,



the plurality including at least a second and third set of ribs, each rib of the second additional set extending between pairs of adjacent ribs in the outermost square,

and of the third set extending between pairs of adjacent ribs in the second set,

each end of each rib in the additional sets joining a rib in the next outer square along the length of that rib in the next outer square,

the planes of the flat faces of each rib in the additional sets intersecting the planes of the flat faces of each rib in the next outer square at forty-five-degree angles on a plane perpendicular to the focal axis of the paraboloid.

4,639,735

APPARATUS FOR DRIVING LIQUID JET HEAD

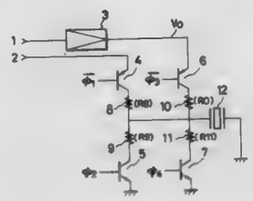
Mitsuru Yamamoto, Yokohama; Kunio Watanabe, Kawasaki, and Junji Shimoda, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1984, Ser. No. 616,703

Claims priority, application Japan, Jun. 14, 1983, 58-106436

Int. Cl.⁴ G01D 15/16

U.S. Cl. 346—1.1 2 Claims



1. A method of ejecting a droplet of a liquid from a discharge port in communication with a liquid chamber, comprising the steps of:

reducing the volume of said liquid chamber without ejecting a droplet of liquid from said discharge port;

suddenly increasing the volume of said liquid chamber to retract a meniscus of the liquid from said discharge port;

suddenly reducing the volume of said liquid chamber, substantially immediately after said sudden increase in volume and in substantial synchronism with the maximum velocity of the natural recovery of the meniscus toward said discharge port, to eject liquid from said discharge port; and

increasing the volume of said liquid chamber to an original condition.

4,639,736

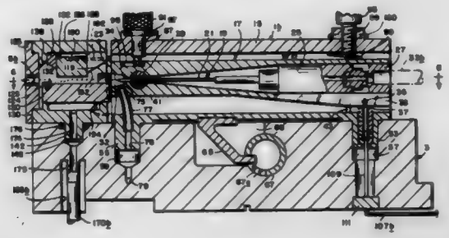
INK JET RECORDER

Dieter Jochimsen, Winchester, Mass., assignor to Iris Graphics, Inc., Stoneham, Mass.

Filed Jul. 9, 1985, Ser. No. 753,454

Int. Cl.⁴ G01D 15/18

U.S. Cl. 346—75 54 Claims



1. An ink jet recorder adapted for pressure ejecting a fine ink stream along a predetermined path to a recording surface, said recorder being of the type having, a nozzle unit from which said ink stream is ejected toward the recording surface, an ink reservoir supplying electrically conductive ink to said nozzle unit, means for selectively charging the ink projected from said nozzle unit and means for deflecting charged ink from said path, said recorder comprising:

(a) a mounting block having a reference surface on said mounting block;

(b) a first port in said mounting block for connecting said mounting block to a suction pump;

(c) corresponding first and second mating means in said mounting block and said nozzle unit, respectively, for positioning said nozzle unit in an operative position on said reference surface;

(d) a first conduit in said mounting block connecting said first port with said first mating means;

(e) a vacuum guide in said nozzle unit having an inlet end in the region in which the ink is ejected from said nozzle unit; and

(f) a second conduit in said nozzle unit connecting an outlet end of said vacuum guide with said second mating means whereby said second conduit communicates with said first conduit and the suction pump is connected to said vacuum guide.

4,639,737

TENSIONABLE ELECTRODES FOR CHARGING AND/OR DEFLECTING FLUID DROPLETS IN FLUID-JET MARKING APPARATUS

Richard Sutera, Hauppauge, N.Y., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Oct. 10, 1985, Ser. No. 786,124

Int. Cl.⁴ G01D 15/18

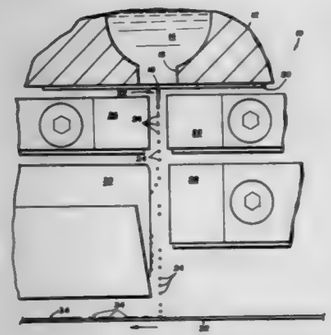
U.S. Cl. 346—75 24 Claims

1. An electrode for use in a fluid jet marking apparatus having means to generate at least one linear array of fluid droplet streams, means for charging selected ones of said droplets in said streams and means for electrostatically deflecting said selected charged droplets towards a catching structure, wherein said electrode comprises said means for charging and/or said means for deflecting and includes:

a flexible and tensionable electrode member; and

mounting means for mounting said electrode member in confronting, substantially parallel alignment to the linear array of fluid droplet streams, said mounting means including

(a) a pair of mounting arm means in spaced-apart relationship, said pair of mounting arm means for mounting respective end portions of said electrode member therebetween, one of said pair being rigid and the other one of said pair being pivotal, and



(b) tensioning means connected to said other pivotal one of said pair of arm means for pivotally displacing said other pivotal one relative to said rigid one to responsively tension said electrode member between said pair of mounting leg means.

4,639,738

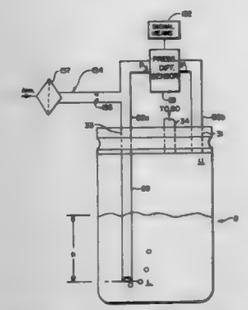
INK LEVEL DETECTION SYSTEM FOR INK JET PRINTING APPARATUS

Lawrence R. Young, West Lebanon, N.H.; Gregory J. Sexton, Dayton, Ohio; Randal L. Mullins, Xenia, Ohio, and Brian D. Bradley, Beavercreek, Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,549

Int. Cl.⁴ G01D 15/18; G01F 23/18

U.S. Cl. 346—75 5 Claims



1. Ink jet printing apparatus, adapted for using an ink supply/return cartridge and having (i) a print head assembly, (ii) ink supply means for providing ink from such cartridge to said assembly and (iii) ink return means, including means to induce a negative pressure within such cartridge and an ink return conducit, an improved level detection construction for cooperating with such a cartridge, including

(a) means for sensing and signalling a predetermined pressure difference between first and second pressure regions;

(b) first conduit means connectible to a first port of such cartridge for transmitting a representative of the pressure within an upper, evacuated cartridge region to said sensing means; and

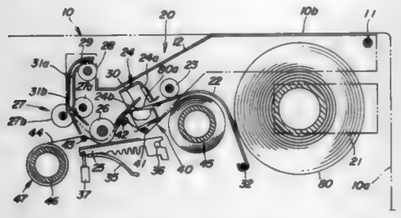
(c) second conduit means connectible to the upper port of a cartridge tube for transmitting a representation of the pressure at a lower port of such cartridge tube, said second conduit means including a branch passage to a source of atmospheric pressure and flow restrictor means in such branch passage.

4,639,739

THERMAL TRANSFER RECORDING METHOD AND APPARATUS

Teruo Tsutsumi, Tama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Sep. 12, 1985, Ser. No. 775,264
Claims priority, application Japan, Nov. 30, 1984, 59-254331
Int. Cl.⁴ G01D *15/10*
U.S. Cl. 346—76 PH **17 Claims**



1. A thermal transfer recording method for use in a thermal transfer recording apparatus having a thermal head, a roll of recording paper of ordinary paper material, a roll of an ink ribbon, cutting means for cutting of a part of said roll of recording paper, a platen roller, and pressure releasing means for releasing said thermal head and said platen roller from the pressure contacted state, said method comprising the steps of:

unwinding said roll of recording paper and said ink ribbon to bring them into pressure contact with said thermal head while superposing them one over the other;

selectively transferring ink from said ribbon onto said recording paper by means of said thermal head;

separating said recording paper away from said ink ribbon by said pressure releasing means;

transporting said recording paper until the last ink transferred part of said recording paper reaches said cutting means while holding said ink ribbon in a stationary position;

cutting said recording paper by said cutting means so that the ink transferred part of said recording paper is cut off; and

transporting said recording paper until the leading end thereof is located in the proximity of said thermal head.

4,639,740

LASER MARKING ENHANCEMENT SYSTEM USING REFLECTION FROM THE MASK

David C. Hamilton, Cottingham, England, assignor to Laser Applications Limited, Hull, England

Filed Apr. 5, 1985, Ser. No. 720,299
Int. Cl.⁴ G01D *9/00, 9/42;* **G02B** *5/30;* **G03B** *27/02*
U.S. Cl. 346—76 L **11 Claims**



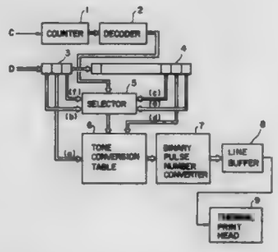
1. A method of laser marking of an article of the type in which a stencil-type mask having opaque parts and open parts is imaged onto an article to be marked by passing a pulsed laser beam through the open parts of the stencil-type mask and onto the article to be marked, wherein the pulsed laser beam is caused to be linearly polarized and wherein at least part of the laser beam energy is reflected from the opaque parts of the mask and is collected and redirected to the mask to thereby increase the overall transmission and hence the efficiency of the process.

4,639,741

BLOCK-DIVIDED DRIVING OF A THERMAL PRINTHEAD

Takashi Inoue, Asaka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 16, 1985, Ser. No. 755,579
Claims priority, application Japan, Jul. 16, 1984, 59-147148
Int. Cl.⁴ G01D *15/10*
U.S. Cl. 346—76 PH **4 Claims**



1. A system for driving a line-type thermal printhead block to block in sequence from one end to the other, comprising:

detecting means for detecting as to whether a pixel data for a dot of interest is for an end dot of a block, said detecting means supplying a first output indicating as to whether said dot of interest is an end dot of a block or not;

address forming means for forming an address using pixel data at least for two adjacent pixel data on both sides of said pixel data for said dot of interest;

storing means for storing a predetermined table of energy levels, said storing means receiving said first output from said detecting means and said address from said address forming means for accessing a particular energy level in said table and supplying as its output a driving energy level for said dot of interest; and

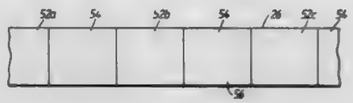
means for driving said dot of interest in said thermal printhead in accordance with said driving energy level supplied from said storing means.

4,639,742

METHOD AND APPARATUS FOR PRINTING AN IMAGE

Tomohiko Takahashi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 23, 1985, Ser. No. 779,064
Claims priority, application Japan, Oct. 8, 1984, 59-210915
Int. Cl.⁴ G01D *15/10*
U.S. Cl. 346—76 PH **19 Claims**



1. An apparatus for printing an image on a recording medium comprising:

means for holding the recording medium opposite to an ink donor sheet, said ink donor sheet having a first portion provided with a colorant capable of being transferred onto the recording medium to print the image and a second portion provided with a transfer ratio regulating material capable of being transferred onto the recording medium to achieve a predetermined gradation pattern of the printed image by changing the amount of transfer of said colorant onto the recording medium;

means for transferring said colorant and said transfer ratio regulating material onto the recording medium held by said holding means in accordance with a predetermined gradation pattern; and

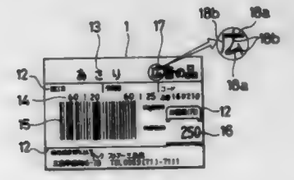
means for disposing said ink donor sheet so that the recording medium overlaps said second portion to transfer said transfer ratio regulating material in accordance with the gradation pattern of the image to be printed on the recording medium and then overlaps said first portion to form the image on the surface of the recording medium having said transfer ratio regulating material transferred thereon.

4,639,743

THERMAL PRINTER

Yasuhiro Sakura; Hitoshi Nimura, and Mamoru Ishikawa, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1986, Ser. No. 829,611
Claims priority, application Japan, Feb. 25, 1985, 60-35808
Int. Cl.⁴ G01D *15/10*
U.S. Cl. 346—76 PH **2 Claims**



1. A thermal printer comprising: recording papers each having multi-color-forming temperature characteristic; a thermal head containing a multiplicity of heating elements and capable of printing the recording paper over the entire width thereof while being kept in contact therewith during its unidirectional motion; at least two print buffers for feeding print data to control energization of the heating elements of said thermal head; and a current on-time control circuit for differentially setting the on-time periods of a constant current to the heating elements of said thermal head in response to selection of said print buffers under the predetermined condition that a basic color for general print data is formed at a low temperature while a different particular color for specific print data is formed at a high temperature in a printing operation on the recording paper by the heating elements of said thermal head, wherein horizontal line segments of the characters transverse to the recording paper feed direction are set to be thick in the character pattern of the specific information to be printed in said different particular color.

4,639,744

RECORDING APPARATUS

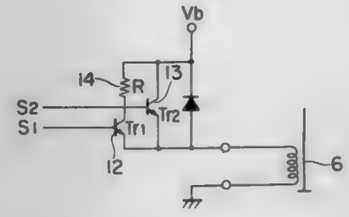
Yoshio Uchikata, Yokohama; Mineo Nozaki, Kawasaki; Osamu Asakura, Tokyo, and Masasumi Nagashima, Yokosuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1983, Ser. No. 553,817
Claims priority, application Japan, Dec. 1, 1982, 57-209441; Dec. 3, 1982, 57-211294
Int. Cl.⁴ G01D *15/10*
U.S. Cl. 346—76 PH **28 Claims**

1. A recording apparatus comprising:

means supplied with electric power for moving a recording head for effecting recording toward a recording medium and for holding the recording head in a recording position;

means for generating timing signals; and



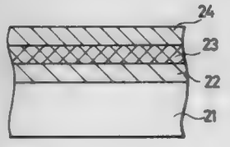
means for controlling the value of the electric power so as to gradually vary the electric power applied to said holding means by the timing signals from said generating means.

4,639,745

OPTICAL RECORDING MEDIUM

Fumio Matsui; Shuichi Yanagisawa; Yoshiyuki Kakuta, and Atsushi Yoshizawa, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 10, 1985, Ser. No. 690,200
Claims priority, application Japan, Jan. 11, 1984, 59-3118; Jan. 14, 1984, 59-5351
Int. Cl.⁴ G01D *15/34*
U.S. Cl. 346—135.1 **4 Claims**



1. An optical information recording medium comprising:

a substrate;

a first recording layer of a first light-sensitive material on said substrate; and

a second recording layer of a second light-sensitive material on said first recording layer, said second light-sensitive material being different from said first light-sensitive material, wherein said first light-sensitive material is nitrocellulose and said second light-sensitive material is Indocyanine Green.

4,639,746

IMAGE RECORDING APPARATUS

Mitsuru Yamamoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1984, Ser. No. 624,708
Claims priority, application Japan, Jul. 6, 1983, 58-122971
Int. Cl.⁴ G01D *15/18, 15/10*
U.S. Cl. 346—140 R **19 Claims**

1. An image recording apparatus for recording an image on a recording medium, comprising:

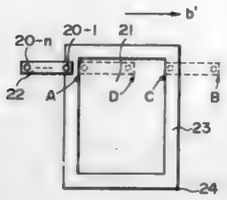
image signal generating means for obtaining an image signal which represents an image to be recorded in a predetermined area on the recording medium;

additional signal generating means for obtaining an additional signal which represents additional data to be recorded outside the predetermined area on the recording medium;

recording means including a plurality of recording elements for recording on the recording medium in response to the signals from said image signal generating means and said

additional signal generating means, wherein at least one other recording element, which does not record additional data, scans the predetermined area during the recording of the additional data;

scanning means for providing relative movement between said recording means and the recording medium, the predetermined area being defined by the relative move-



ment of said recording means and the recording medium; and

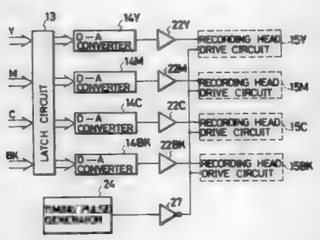
control means for applying the additional signal to at least one of said plurality of recording elements when said at least one recording element scans the recording medium outside the predetermined area, such that said at least one recording element records the additional data outside the predetermined area on the recording medium.

4,639,747

RECORDING HEAD DRIVE CONTROL APPARATUS

Nobuaki Sakurada, Yokohama; Hideaki Kawamura, and Takashi Sasaki, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1984, Ser. No. 619,340
Claims priority, application Japan, Jun. 22, 1983, 58-112563
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R 16 Claims



1. A recording apparatus comprising:

a plurality of recording heads for recording with recording densities that vary in response to the level of drive signals;

a plurality of drive circuits for driving said plurality of recording heads;

a control circuit for outputting variable-level drive signals through said drive circuits to said recording heads; and

timing pulse supplying means for supplying drive timing pulses for said recording heads to said drive circuits,

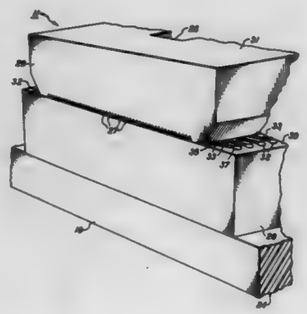
wherein said supplying means supplies the drive timing pulses during operation of the recording apparatus even when all or some of said plurality of recording heads are not to record and said control circuit controls the levels of the drive signals for the recording heads which are not to record to be less than a threshold value below which said recording heads do not perform recording.

4,639,748

INK JET PRINTHEAD WITH INTEGRAL INK FILTER

Donald J. Drake, Rochester; William G. Hawkins, and Michael R. Campanelli, both of Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 30, 1985, Ser. No. 781,554
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R 13 Claims



1. An ink jet printhead comprising:

first and second substrates;

one surface of the first substrate containing a linear array of heating elements and each heating element having individual addressing electrodes, the heating elements and addressing electrodes being coated with a passivation layer;

one surface of the second substrate containing a pattern of recesses, including a linear array of parallel channel recesses opening on one end through an edge of the second substrate and the other ends communicating with a common manifold recess, an internal chamber recess being provided by an enclosing wall inside of and surrounded by the manifold recess, a plurality of passageway recesses being formed perpendicularly through the chamber walls to provide communication between the internal chamber and the manifold;

a fill hole being provided through the second substrate, one end of the fill hole entering the internal chamber recess;

the surface of the first substrate having the heating elements and addressing electrodes being aligned with and bonded against the surface of the second substrate having the recesses, so that each channel has one of the heating elements therein spaced a predetermined distance from the channel open ends that serve as droplet emitting nozzles;

means for providing ink at a predetermined pressure to the fill hole, so that ink travels through the fill hole to the internal chamber, through the passageways to the manifold, and from the manifold to fill the channels and form a meniscus at each nozzle;

the ink being filtered as it flows through the passageways because the cross-sectional flow areas of each of the passageways are smaller than each of the cross-sectional flow areas of the channels while the total flow area of the passageways is greater than the total flow area of the channels; and

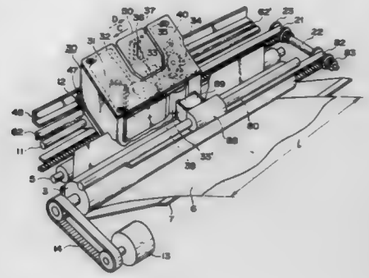
means for selectively placing a current pulse representing digitized data signals on the addressing electrodes to temporarily vaporize the ink contacting the passivated heating elements and produce bubbles which expel droplets of ink from the nozzles of the selectively pulsed heating elements.

4,639,749

PRINTING APPARATUS

Yoshio Ito, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1985, Ser. No. 711,179
Claims priority, application Japan, Mar. 17, 1984, 59-51751
Int. Cl.[4] G01D *15/14*
U.S. Cl. 346—153.1 10 Claims



1. A printing apparatus, comprising:

means for intermittently feeding a recording material;

supporting means for detachably supporting a cartridge having a rotatable image bearing member, developing means for developing with developer powder an electrostatic latent image formed on said image bearing member and cleaning means for removing from said image bearing member the developer powder not transferred to the recording material;

means for applying to said image bearing member image information to form the electrostatic latent image thereon, said image information applying means being fixed on said supporting means;

means for reciprocally moving said supporting means in a direction crossing with a direction of the recording material feed;

means for contacting said image bearing member to the recording material to transfer to the recording material a powder image formed on said image bearing member during forward movement of said supporting means, and for disengaging said image bearing member from the recording material;

means for rotating said image bearing member so that it passes through a station where said developing means operates, a station where it is contacted to the recording material and a station where said cleaning means operates, during backward movement of said supporting means; and

means for preventing rotation of said image bearing member in a direction opposite to the direction during the backward movement of said supporting means.

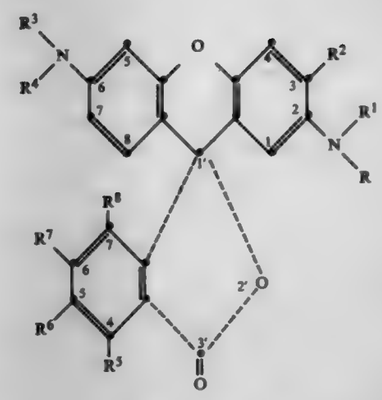
4,639,750

FLUORAN COMPOUNDS AND MARKING SYSTEMS

William M. Hung, and Edward E. Ehlinger, both of Cincinnati, Ohio, assignors to The Hilton-Davis Chemical Company, Cincinnati, Ohio

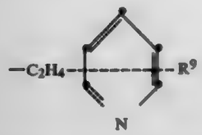
Division of Ser. No. 549,057, Nov. 7, 1983, abandoned, which is a continuation-in-part of Ser. No. 445,537, Nov. 30, 1982, Pat. No. 4,447,616. This application Feb. 24, 1986, Ser. No. 831,965
Int. Cl.[4] C07D *521/00*; C09D *11/02*
U.S. Cl. 346—221 23 Claims

1. A 2-(N-R-N-R[1])amino-3-R[2]-6-(N-R[3]-N-R[4])amino-4'-R[5]-5'-R[6]-6'-R[7]-7'-R[8]-fluoran having the formula

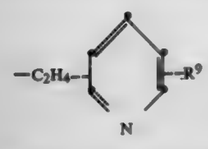


wherein:

R and R[3] independently represent hydrogen, non-tertiary C_1 to C_8 alkyl, C_4 to C_8 cycloalkyl, phenyl, phenyl substituted by one or two of C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy or halo, benzyl, benzyl substituted by one or two of C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy or halo, or



in which R^9 represents hydrogen, or non-tertiary C_1 to C_4 alkyl with the proviso that at least one of R and R^3 is



R^1 represents hydrogen, non-tertiary C_1 to C_8 alkyl, formyl, non-tertiary C_2 to C_4 acyl, benzoyl, benzoyl substituted in the benzene ring by one or two of halo, non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy or nitro, phenylcarbamyl, naphthylcarbamyl, phenylsulfonyl, phenylsulfonyl substituted in the benzene ring by one or two of halo, non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy or nitro, benzyl or benzyl substituted in the benzene ring by one or two of C_1 to C_3 alkyl, non-tertiary Cl to C4 alkoxy or halo;

R^2 represents hydrogen, halo or non-tertiary C_1 to C_4 alkyl;

R^4 represents hydrogen, non-tertiary C_1 to C_4 alkyl, benzyl or benzyl substituted in the benzene ring by one or two of C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy or halo;

R^3 and R^4 taken together with the nitrogen atom to which they are attached represent pyrrolidino, piperidino or morpholino;

R^5, R^6, R^7 and R^8 each independently represent hydrogen, halo, nitro or when R^5, R^8 and one of R^6 and R^7 are each hydrogen, the other of R^6 and R^7 represents COOY in which Y represents hydrogen or non-tertiary C_1 to C_{18} alkyl.

17. A pressure-sensitive carbonless duplicating system or thermal-responsive marking system comprising a support sheet coated with a layer containing as a color-forming substance a

2-(N-R-N-R[1])amino-3-R[2]-6-(N-R[3]-N-R[4])amino-4'-R[5]-5'-R[6]-6'-R[7]-7'-R[8]-fluoran according to claim 1 wherein R, R[1], R[2], R[3], R[4], R[5], R[6], R[7] and R[8] each have the same respective meanings given in claim 1.

4,639,751

IMAGE-RECEIVING SHEET FOR HEAT TRANSFER RECORDING SYSTEM

Tohru Mori; Takayasu Hougo, and Rinzo Kamikura, all of Amagasaki, Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1985, Ser. No. 785,443
Claims priority, application Japan, Oct. 9, 1984, 59-211866
Int. Cl.[4] B41M 5/26
U.S. Cl. 346—227 5 Claims

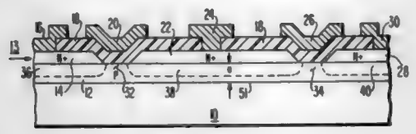
1. An image-receiving sheet for a heat transfer recording system, adapted to receive an image transferred from a heat transfer recording sheet, comprising a substrate and an image-receiving layer of coating composition thereon, said coating composition comprising non-plate-shaped inorganic pigment as the principal pigment component and a binder, said binder being at least one of the substances selected from the group consisting of oxidized starch, etherified starch, esterified starch, cationic starch, carboxymethyl cellulose, methyl cellulose, hydroxyethyl cellulose, polyvinyl alcohols, sodium salt and ammonium salt of styrene-maleic anhydride copolymer, styrene-butadiene copolymer, vinyl acetate copolymer and vinyl chloride copolymer, the smoothness under TAPPI Standard T 479 om-81 of the image-receiving surface thereof being 200 to 1,000 sec/10 ml, and the air permeability under ASTM D726 Method B of said image-receiving sheet being below 500 sec/100 ml.

4,639,752

FAST TERNARY (GAINAS) LOGIC GATE DEVICE

Walter R. Curtice, Princeton Junction, N.J., assignor to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 595,529, Mar. 30, 1984. This application Jul. 17, 1985, Ser. No. 755,828
Int. Cl.[4] H01L 29/78, 29/20
U.S. Cl. 357—16 10 Claims



1. A semiconductor device comprising a substrate formed of indium phosphide (InP) having a surface, a first epitaxial layer of a semiconductor material comprising GaInAs of a first conductivity type on said substrate surface and having a surface, a first, second and third discrete region of a second conductivity type material comprising GaInAs along said first layer surface, a depletion region within said epitaxial layer between each of said three discrete regions and said substrate surface, a first and second channel region between, respectively, said first and second and said second and third discrete regions, a first, second and third electrical contact at each of said discrete regions, respectively, the thickness (a) of said first layer having values lying within the range of 0.15 micrometer and 0.33 micrometer and the dopant concentration (N) of said first layer has values lying within the range of $1.0\times10^{16}\,cm^{-3}$ and $4.7\times10^{16}\,cm^{-3}$, whereby said depletion region extends completely within said first layer beneath each of said discrete regions to said substrate surface, whereby said first layer is essentially completely depleted at thermal equilibrium and whereby the capacitance between each of said adjacent discrete regions is reduced towards a minimum.

4,639,753

SEMICONDUCTOR DEVICE

Takahiro Yamada, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 19, 1985, Ser. No. 725,353
Claims priority, application Japan, Apr. 19, 1984, 59-78865; May 31, 1984, 59-111158; Jul. 18, 1984, 59-148828; Aug. 28, 1984, 59-179749
Int. Cl.[4] H01L 29/80
U.S. Cl. 357—22 11 Claims

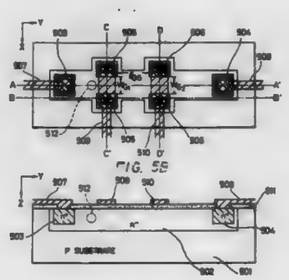


FIG. 5B

1. A semiconductor device comprising:
(a) a source region of a first conductivity;
(b) a drain region of said first conductivity;
(c) a semiconductor region of said first conductivity for forming a channel functioning as a path of carriers between said source region and said drain region;
(d) a substrate region of a second conductivity surrounding said semiconductor region;
(e) a pair of first gate regions of said second conductivity formed in said semiconductor region at a location close to said source region;
a potential barrier being formed at a location in said channel close to said first gate region, various portions of the device having an impurity concentration and dimensions selected so that a series resistance r_s from said source region to said potential barrier is less than the reciprocal of the transconductance gm of the device,
said potential barrier being formed by the depletion layer extending into said semiconductor region from said first gate region even when no voltage is applied to said first gate regions; and
(f) a pair of second gate regions of said second conductivity formed in said semiconductor region at a location close to said first gate regions, the dimension of various portions of the device so

$$l_{GG} > W_{G2} > \Delta l_n + \Delta l_p$$

wherein l_{GG} is the shortest distance between said first and second gate regions;
W_{G2} is the shortest channel width determined by said second gate regions;
Δl_n is the shortest distance between said gate regions and said substrate region; and
Δl_p is the depletion layer width of said substrate region extending from said semiconductor region;
said second gate regions functioning as an electric shielding electrode to make said first gate regions free from the voltage of said drain region.

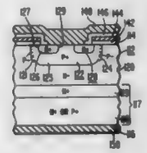
4,639,754

VERTICAL MOSFET WITH DIMINISHED BIPOLAR EFFECTS

Carl F. Wheatley, Jr., Butler Township, Luzerne County; John M. S. Neilson, Lower Providence Twsp, Montgomery County, both of Pa., and John P. Russell, Hopewell Township, Mercer County, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 25, 1985, Ser. No. 705,371
Int. Cl.[4] H01L 29/78
U.S. Cl. 357—23.4 7 Claims





1. In an insulated gate field effect transistor device comprising a semiconductor wafer including a drain region of first conductivity type contiguous with a wafer surface, a body region of second conductivity type extending into the wafer from said surface so as to form a body/drain PN junction having an intercept at said surface, said body region including a body-contact portion of relatively high conductivity at said surface, a source region of first conductivity type extending into the wafer from said surface so as to form a source/body PN junction having first and second intercepts at said surface, said first intercept being spaced from said body/drain intercept so as to define a channel region in the body region at said surface, said second intercept being contiguous with said body-contact portion, and a source electrode on said wafer surface in contact with said body-contact portion and said source region, the improvement comprising:
said second intercept being relatively narowly and substantially uniformly spaced from said first intercept along most of the length of said first intercept and being significantly more widely spaced from said first intercept at one or more predetermined portions; and
said body-contact portion including lateral extensions beneath said source region in areas corresponding to said widely spaced portions.

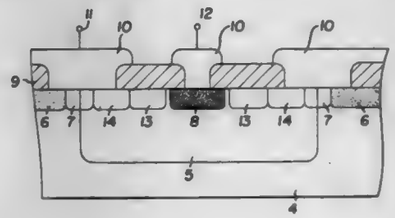
4,639,755

THERMOSENSITIVE SEMICONDUCTOR DEVICE USING DARLINGTON CIRCUIT

Masayuki Namiki; Masaaki Kamiya; Yoshikazu Kojima, and Kojiro Tanaka, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Aug. 31, 1982, Ser. No. 413,492
Claims priority, application Japan, Sep. 1, 1981, 56-137408
Int. Cl.[4] H01L 23/56
U.S. Cl. 357—28 6 Claims

1. A thermosensitive semiconductor device comprising: transistors connected in a Darlington connection and formed on a semiconductor substrate of one conductivity type which constitutes a common collector acting as a first collector region of each of the transistors, the semiconductor substrate having formed thereon a base region and an emitter region of each of the transistors, the base region of the first stage transistor in the Darlington connection being connected to said common collector to constitute a first terminal of the device, the emitter region of the final stage transistor of the Darlington connection constituting a second terminal of the device, and a



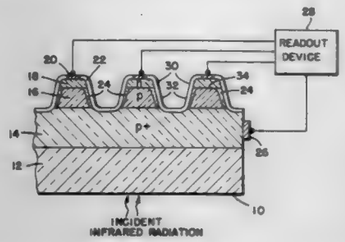
constant current source connected between the first and second terminals.

4,639,756

GRADED GAP INVERSION LAYER PHOTODIODE ARRAY

Joseph P. Rosbeck, Goleta, and Ichiro Kasai, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed May 5, 1986, Ser. No. 859,674
Int. Cl.[4] H01L 27/14, 31/12, 31/00, 29/06
U.S. Cl. 357—30 17 Claims



1. A photodiode assembly for detecting radiation incident at a bottom side of said assembly comprising:
an array of photodiodes;
a common substrate disposed at said bottom side and supporting said array of photodiodes;
a semiconducting buffer layer disposed on said substrate and extending beneath said array of photodiodes, said substrate and said buffer layer being transparent to said radiation, said substrate being an electrical insulator, said buffer layer being doped for electrical conductivity and serving as a common terminal to said photodiodes;
and wherein each of said photodiodes comprises:
a semiconductor base layer doped for electrical coonductivity, said base layer being disposed on said buffer layer for interaction with said radiation to produce electric charge carriers;
a capping layer doped with opposite electrical-conductivity dopant from said base layer to provide a p-n junction at an interface between said base layer and said capping layer, said p-n junction allowing for a flow of current of said charge carriers;
an electric terminal disposed on said capping layer;
and wherein said assembly further comprises an electrically-charged electrically-insulating passivation layer covering each of said photodiodes and extending downward through said capping layer and said base layer into said buffer layer around each photodiode to electrically isolate currents of respective ones of said photodiodes, said charged passivation layer inducing an inversion layer in said base layer in each of said photodiodes along an interface with said passivation layer for extension of said p-n

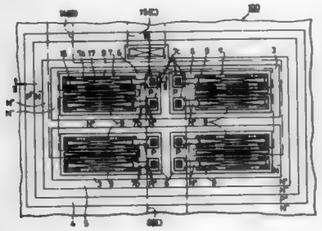
junction and increased photon collection efficiency of a photodiode, the doping of said buffer layer being sufficiently larger than the doping of said base layer to inhibit formation of the inversion layer along an interface between said passivation layer and said buffer layer.

4,639,757

POWER TRANSISTOR STRUCTURE HAVING AN EMITTER BALLAST RESISTANCE

Isao Shimizu, Takasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 11, 1981, Ser. No. 329,948
Claims priority, application Japan, Dec. 12, 1980, 55-174499
Int. Cl.⁴ H01L *29/72, 27/02, 23/48*
U.S. Cl. 357—36 **16 Claims**



1. A semiconductor device including a bipolar transistor and a parasitic transistor, said semiconductor device comprising:

a first semiconductor region of a first conductivity type to serve as a collector region of said bipolar and parasitic transistors;

a second semiconductor region of a second conductivity type to serve as a base region for said bipolar and parasitic transistors, said second semiconductor region being formed adjacent to said first semiconductor region; and

a third semiconductor region of said first conductivity type to serve as an emitter region for said bipolar and parasitic transistors, said third semiconductor region being formed adjacent to said second semiconductor region,

wherein said third semiconductor region comprises an operating portion for forming the emitter of the bipolar transistor, and a ballast resistance portion and a terminal portion which form the emitter of the parasitic transistor, and further wherein said ballast resistance portion is surrounded by said second semiconductor region and the effective base width of said parasitic transistor is greater than the base width of the bipolar transistor base region in the base region portion of said parasitic transistor adjacent to said terminal portion of said third semiconductor layer to reduce a current gain of the parasitic transistor, and

wherein said semiconductor device further comprises a base contact portion formed in said second semiconductor region to extend adjacent to said operating portion of said emitter region of said bipolar transistor but not extending adjacent to said ballast resistance portion and said terminal portion, an emitter input terminal electrode formed to contact said emitter terminal portion, a metal contact stripe formed to contact said emitter operating portion and spaced from said emitter input terminal electrode, a base input terminal electrode formed to contact said base contact region along said metal contact stripe so that said emitter input terminal electrode and said base input terminal electrode are spaced apart from one another, and

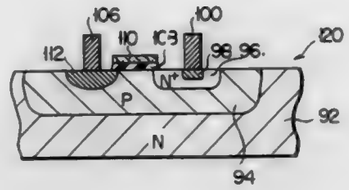
wherein an emitter-base junction located between said emitter terminal portion and said base region is located more closely adjacent to said emitter terminal portion than to said base contact region.

4,639,758

METAL OXIDE SEMICONDUCTOR FIELD-EFFECT TRANSISTOR WITH METAL SOURCE MAKING OHMIC CONTACT TO CHANNEL-BASE REGION

Tetsuya Iizuka, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 211,929, Dec. 1, 1980, abandoned. This application Aug. 23, 1983, Ser. No. 525,707
Claims priority, application Japan, Dec. 7, 1979, 54-157967
Int. Cl.⁴ H01L *27/02*
U.S. Cl. 357—42 **3 Claims**



1. A memory cell with metal oxide semiconductor field-effect transistors comprising:

a first semiconductor layer of a first conductivity type;

first and second MOS transistors formed in said first semiconductor layer, each having one conductivity type channel and having a source region, drain region and gate electrode, source regions of said first and second MOS transistors receiving a first power source voltage;

a second semiconductor layer of a second conductivity type;

third and fourth MOS transistors formed in said second semiconductor layer, each having the opposite conductivity type channel and having a drain region, gate electrode and means for providing an inversion layer carrier source consisting essentially of a metal diffusion region, formed in said second semiconductor layer in ohmic contact with said second semiconductor layer, wherein (i) current flows in a first direction between said metal diffusion region and said drain of each of said third and fourth MOS transistors through an inversion layer which is induced in the surface of said second semiconductor layer under said gate electrode of each of said third and fourth MOS transistors and which is coupled to the associated metal diffusion region when a first polarity voltage is applied to the associated gage electrode, and (ii) a current flows in a second, opposite direction between said metal diffusion region of each of said third and fourth MOS transistors and said second semiconductor layer, and a p-n junction between said second semiconductor layer and said drain region of each of said third and fourth MOS transistors is reverse biased when a second polarity voltage is applied to the associated gate electrode;

the drain region of said third MOS transistor being connected to the drain region of said first MOS transistor, the drain region of said fourth MOS transistor being connected to the drain region of said second MOS transistor, the gates of said first and third MOS transistors being connected to each other and also connected to a node between the drains of said second and fourth MOS transistors, the gate of said second and fourth MOS transistors being connected to each other and also connected to a node between the drains of said first and third MOS transistors; and

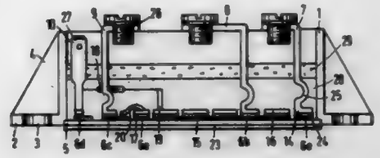
means for supplying said second semiconductor layer with a second power source voltage to permit said second power source voltage to be supplied to said metal diffusion region of said third and fourth MOS transistors.

4,639,759

POWER TRANSISTOR MODULE

Arno Neidig, Plankstadt; Bernd Leukel, Weinheim, and Lutz Bergmann, Lampertheim, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie., AG, Mannheim, Fed. Rep. of Germany

Filed Nov. 10, 1983, Ser. No. 550,910
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1982, 3241509
Int. Cl.⁴ H01L *23/02;* **H02G** *13/08*
U.S. Cl. 357—74 **4 Claims**



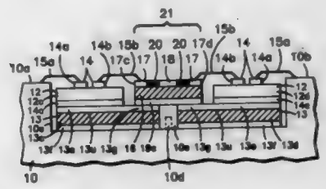
1. Power transistor module, comprising a housing having a frame forming a housing wall and a ceramic plate fastened to said frame forming a housing bottom; structured metallizations disposed on said ceramic plate forming conductor runs and terminal pads; components including at least one power transistor having a collector electrode and a bypass diode connected to said terminal pads; wiring elements being connected to said components and being freely accessible from the top of said housing, said wiring elements including an auxiliary collector terminal; and an auxiliary diode connected between said auxiliary collector terminal and the collector electrode of said power transistor.

4,639,760

HIGH POWER RF TRANSISTOR ASSEMBLY

Helge O. Granberg, Phoenix, and Samuel L. Coffman, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 21, 1986, Ser. No. 820,773
Int. Cl.⁴ H01L *25/04, 23/14, 23/02, 23/06*
U.S. Cl. 357—75 **4 Claims**



1. A high power, high frequency transistor unit, comprising:

an electrically and thermally conductive base plate having a centerline;

at least two separate electrically insulating but thermally conducting isolators disposed in either side of said centerline, each having a first principal face bonded to said base plate and a second principal face opposite said first principal face, wherein said second principal face has thereon a first metal layer;

at least two transistor die, each having a signal input contact, a reference contact, and a power output contact, wherein said signal input contact and said reference contact are on a first face of said transistor die and said power output contact is on an opposed second face of said transistor die, and wherein said at least two transistor die are disposed on said isolators, one per isolator, with said power output contact bonded to said first metal layer of said isolator;

a ballasted electrical input-output assembly comprising a substantially flat electrically insulating plate having first and second opposed principal faces, wherein said insulating plate extends over and parallel to said centerline and portions of said at least two isolators and bridges between at least two of said at least two isolators located on either side of said centerline;

wherein said insulating plate has on said first face a first metal region region forming an input lead for said assembly and at least two ballast resistor regions, one per transistor, each ballast resistor region being located between said input lead and a second metal region coupled to said input contact of one of said transistors;

wherein said insulating plate has on said second face an output conductor electrically coupled to said output contacts of said transistors die by said first metal layers on said isolators, and wherein said output conductor extends around an edge of said insulating plate onto said first surface; and

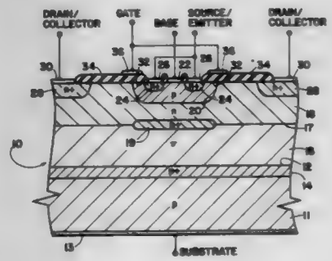
first wire bonds extending from said input lead to an external input lead of said assembly, second wire bonds extending from said output lead to an external output lead of said assembly, third wire bonds extending from said reference contacts of said transistor die to said substrate, and fourth wire bonds extending from said second metal regions on said insulating plate to said input contacts of said transistor die.

4,639,761

COMBINED BIPOLAR-FIELD EFFECT TRANSISTOR RESURF DEVICES

Barry M. Singer, New York, N.Y., and Rajsekhar Jayaraman, Cambridge, Mass., assignors to North American Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 562,145, Dec. 16, 1983, abandoned. This application Oct. 25, 1985, Ser. No. 792,221
Int. Cl.⁴ H01L *27/02, 29/78, 29/90, 29/00*
U.S. Cl. 357—234 **8 Claims**



1. A combined bipolar-field effect transistor RESURF device, which comprises;

a semiconductor substrate of a first conductivity type and having a major surface and a substrate electrode connected to the side of said substrate opposite said major surface;

a lightly-doped epitaxial buried layer of said first conductivity type on said major surface of the substrate and having a doping level at least an order of magnitude less than that of said substrate;

an epitaxial surface layer of a second conductivity type opposite to that of said first on said buried epitaxial layer, the doping concentration and thickness of said epitaxial surface layer being selected in accordance with the REduced SURface Field (RESURF) technique such that the product of doping concentration and epitaxial layer thickness ($N_{epi} \times d_{epi}$) is about 10^{12} atoms/cm^2;

a surface-adjoining base region of said first conductivity type in said epitaxial surface layer;

a base electrode connected to said base region;

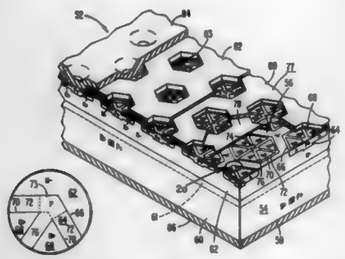
a highly-doped buried region of said second conductivity type located beneath said base region and sandwiched between said epitaxial buried layer and said epitaxial surface layer;
a surface-adjoining source/emitter region of said second conductivity type in said base region, the source/emitter region serving both as the source and the emitter of said combined device;
a source/emitter electrode connected to said source/emitter region;
a surface-adjoining drain/collector region of said second conductivity type in said epitaxial surface layer and spaced apart from said base region, the drain/collector region serving as both the drain and the collector of said combined device;
a drain/collector electrode connected to said drain/collector region;
a surface-adjoining channel region at least partly in a peripheral portion of said base region which is nearest said drain/collector region;
an insulating layer on said surface layer and covering at least that part of said channel region which is in said base region; and
a gate electrode on said insulating layer and over at least that part of said channel region which is in said base region.

4,639,762

MOSFET WITH REDUCED BIPOLAR EFFECTS

John M. S. Neilson, Norristown, Pa., and Norbert W. Brackelmanns, Ironia, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 30, 1984, Ser. No. 605,427
Int. Cl.[4] H01L 29/78, 29/06
U.S. Cl. 357—23.8 12 Claims



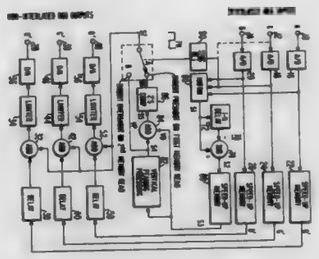
1. An IGFET device comprising:
a semiconductor wafer including a drain region of first conductivity type contiguous with a wafer surface;
a diffused body region of second conductivity type extending into the wafer from said wafer surface so as to form a body/drain PN junction having an intercept at said surface, said intercept having a substantially polygonal shape;
a plurality of source regions of first conductivity type extending into the wafer from said surface within the boundary of the body region, each source region forming a source/body PN junction which is spaced from said body/drain PN junction so as to define a channel region in the body region at said surface, and each of the source/body PN junctions being spaced from each other so as to define, in the body region, at the wafer surface, a contact area and at least one shunt region, each shunt region extending from said contact area to a corner of said polygonally-shaped body/drain PN junction intercept; and
a source electrode which contacts said body region contact area and each of the shunt regions and source regions adjacent thereto.

4,639,763

INTERLACE TO NON-INTERLACE SCAN CONVERTER FOR RGB FORMAT VIDEO INPUT SIGNALS

Donald H. Willis, Marion County, and Russell T. Fling, Fishers, both of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 30, 1985, Ser. No. 729,014
Int. Cl.[4] H04N 9/77
U.S. Cl. 358—11 9 Claims



1. Interlaced to non-interlaced scan conversion apparatus, comprising:
input means for receiving first, second and third color component signals representative of an image raster scanned in interlaced fashion at a given horizontal line rate;
video speed-up circuit means, coupled to said input means, for providing first, second and third double line rate color component video ouput signals;
vertical detail signal forming means, coupled to a selected one of said input means and said speed-up circuit means, for providing a double line-rate vertical detail representative signal;
processing means, coupled to said vertical detail signal forming means, for providing a double line rate vertical peaking signal; and
output means, having a first operative condition for combining said vertical peaking and detail signals with every other line of said double line-rate video output signals for causing said other lines to exhibit preshoot and having a second operative condition for combining said vertical peaking signal with intermediate lines of said double line-rate video output signals for causing the intermediate lines to exhibit overshoot.

4,639,764

MAC VERTICAL SYNCHRONIZING SIGNALS

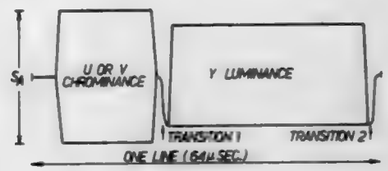
Richard Morcom, Winchester, United Kingdom, assignor to Independent Broadcasting Authority, London, United Kingdom

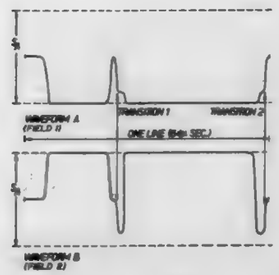
PCT No. PCT/GB83/00186, § 371 Date Mar. 23, 1984, § 102(e) Date Mar. 23, 1984, PCT Pub. No. WO84/00657, PCT Pub. Date Feb. 16, 1984
PCT Filed Jul. 29, 1983, Ser. No. 398,326
Claims priority, application United Kingdom, Jul. 30, 1982, 8222055
Int. Cl.[4] H04N 5/04
U.S. Cl. 358—14 10 Claims

2. A transmission system for transmitting television signals of the type including separate chrominance and luminance components within individual line periods, the system comprising means for separating the chrominance and luminance components from a picture signal to provide line scan periods having said separated components, means for inserting a vertical synchronisation signal within each field of television signals, said vertical synchronisation signal having a duration of one line period and an amplitude component greater than that

of a corresponding component of the separated picture signal, the luminance component of the television signal has an amplitude limit less than that of the chrominance component, the vertical synchronisation signal inserting means generates a signal having a component corresponding to the luminance component but with a greater amplitude, and the amplitude of said vertical synchronisation signal component corresponding to the luminance component has an amplitude equal to that of the amplitude limit of the chrominance component.

5. A transmission system for transmitting television signals of the type including separate chrominance and luminance components within individual line periods, the system comprising means for separating the chrominance and luminance components from a picture signal to provide line scan periods having said separated components, means for inserting a vertical synchronisation signal within each field of television signals, said vertical synchronisation signal having a duration of one line period and an amplitude component greater than that of a corresponding component of the separated picture signal, the picture signal includes transitions between the chrominance and luminance components for horizontal synchronisation information, and said vertical synchronisation signal inserting means provides similar transitions in the vertical synchronisation signal, so as to accelerate horizontal synchronisation.





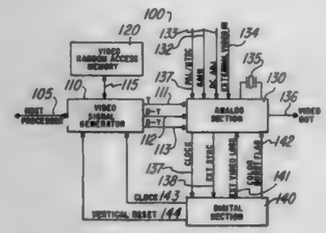
4,639,765

SYNCHRONIZATION SYSTEM FOR OVERLAY OF AN INTERNAL VIDEO SIGNAL UPON AN EXTERNAL VIDEO SIGNAL

Lodewijk J. D'Hont, Zwolle, Netherlands, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 28, 1985, Ser. No. 706,690
Int. Cl.[4] H04N 9/455
U.S. Cl. 358—19 20 Claims

1. A video signal mixing system comprising:
an input means for receiving an external composite video signal:
a horizontal synchronization pulse detecting means connected to said input means for detecting the horizontal synchronization pulses of said first composite video signal;
an external signal loss detector connected to said input means for detecting and indicting the loss for longer than a first predetermined period of time greater than the period of said horizontal synchronization pulses the loss of said external composite video signal;
a video clock frequency standard for determining a frequency;
a video clock signal generating means connected to said horizontal synchronization pulse detecting means and said external signal loss detector for generating a video clock signal, said video clock signal generating means having
a horizontal phase lock loop means connected to said horizontal synchronization pulse detecting means including a horizontal controlled oscillator for generating internal horizontal synchronization pulses in phase synchronization with said detected horizontal synchronization pulses, and
a video clock phase lock loop means connected to said horizontal phase lock loop means and said video clock frequency standard including a video clock controlled oscillator for generating said video clock signal having a frequency corresponding to and corrected by the frequency of said internal horizontal synchronization pulses when said external signal loss detector does not indicate the loss of said external composite video signal and having a frequency corresponding to said frequency determined by said video frequency standard when said external signal loss detector indicates loss of said external composite video signal, whereby momentary loss of said external composite video signal for a time less than said predetermined period of time causes said frequency of said video clock signal to be controlled by said horizontal controlled oscillator;
a video signal generating means connected to said video clock signal generating means for generating an internal composite video signal in synchronization with said video clock signal thereby generating said internal composite video signal having horizontal lines in synchronism with said detected horizontal synchronization pulses; and
a video switching means connected to said input means, said external signal loss detector and said video signal generating means having an output means for selectively connecting either said external composite video signal or said internal composite video signal to said output means, said video switching means selecting said internal composite video signal when said external signal loss detector indicates loss of said external composite video signal, whereby said output means receives a combined video signal having synchronized horizontal lines.



4,639,766

PHASE AND AMPLITUDE CONTROL OF VERTICAL MODULATION IN HORIZONTAL SCAN OF CRT HIGH RESOLUTION TELEVISION

Jonathan M. Schine, Los Angeles, Calif., assignor to High Resolution Television, Inc., Los Angeles, Calif.

Filed Oct. 2, 1984, Ser. No. 656,864
Int. Cl.[4] H04N 9/00
U.S. Cl. 358—21 R 6 Claims

1. In a system having means for producing video signals for display with vertical deflection of the horizontal scan modulated at twice the color subcarrier frequency for greater verti-

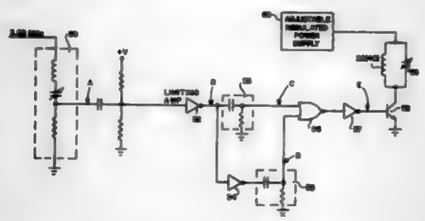
cal resolution of information to be displayed on a display unit having vertical deflection coil of the horizontal scan to be modulated in synchronism with vertical modulation at the video signal source,

a capacitor connected in parallel with an inductor to form an LC resonant circuit tuned to twice said color subcarrier frequency,

a local oscillator at the display site for producing a sinusoidal signal synchronized in frequency and phase with said color subcarrier frequency,

means for adjusting the phase of said sinusoidal signal and producing a square waveform signal from said sinusoidal signal,

means for differentiating said square waveform with an RC circuit having a time constant selected to cause the decaying waveform cross a predetermined threshold level of a particular polarity in a period substantially equal to one quarter period of said color subcarrier frequency,



means for inverting said square waveform,

means for differentiating said inverted square waveform with an RC circuit having a time constant selected to cause the decaying waveform cross a predetermined threshold level of said particular polarity in a period substantially equal to one quarter period of said color subcarrier frequency,

means responsive to the decaying waveforms of both differentiated square waveforms to produce a signal train of pulses, each pulse being produced from said decaying waveforms while they exceed said threshold, thereby generating a square waveform at a frequency that is twice said color subcarrier frequency, and

an active switching element connected to conduct current through said deflection coil in response to each pulse in said train, said LC resonant circuit as a load.

4,639,767

APPARATUS FOR DETECTING MOVEMENT IN A TELEVISION SIGNAL BASED ON TAKING RATIO OF SIGNAL REPRESENTING FRAME DIFFERENCE TO SIGNAL REPRESENTING SUM OF PICTURE ELEMENT DIFFERENCES

Norio Suzuki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 7, 1984, Ser. No. 648,984

Claims priority, application Japan, Sep. 8, 1983, 58-165447; Nov. 15, 1983, 58-214541

Int. Cl.[4] H04N 9/64

U.S. Cl. 358—21 R 12 Claims

7. A movement detecting apparatus for detecting the degree of movement of an image which is represented by a composite television signal having a brightness signal component and a chrominance signal component, said apparatus comprising:

means for producing a frame difference signal having a magnitude which is related to the difference between a present and previous television signal;

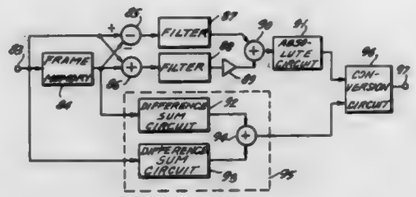
means for obtaining a high frequency component signal from said composite television signal; and

means for producing an output which is indicative of the degree of movement of said image, said output being proportional to said frame difference signal and being scaled by said high frequency component signal;

said means for producing said frame difference signal including first means for producing a first frame difference signal based on said brightness signal component, a second means for producing a second frame difference signal based on said chrominance signal component, and an addition circuit for combining said first and second frame difference signals.

9. A movement detecting apparatus for detecting the degree of movement of an image which is represented by a composite television signal having a brightness signal component and a chrominance signal component, said apparatus comprising:

means for producing a frame difference signal having a magnitude which is related to the difference between a present and previous television signal;



means for obtaining a high frequency component signal from said composite television signal; and

means for producing an output which is indicative of the degree of movement of said image, said output being proportional to said frame difference signal and being scaled by said high frequency component signal;

said means for obtaining a high frequency component signal comprising a first one sample delay element; a subtraction circuit connected to said first one sample delay circuit and to said television signal; a two sample delay circuit connected to said subtraction circuit; a first addition circuit connected to said two sample delay circuit and to said subtraction circuit; an absolute value circuit connected to said first addition circuit; a second one sample delay circuit connected to said absolute value circuit; and a second addition circuit connected to said second one sample delay circuit and to said absolute value circuit.

4,639,768

VIDEO SIGNAL SUPERIMPOSING DEVICE

Atsushi Ueno, and Takao Abumi, both of Yaita, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 1, 1984, Ser. No. 656,757

Claims priority, application Japan, Oct. 3, 1983, 58-185755

Int. Cl.[4] H04N 9/74

U.S. Cl. 358—22 9 Claims

1. A video signal superimposing device for superimposing and displaying video signals produced from at least two systems comprising:

first input means for inputting a color complex video signal;

means for producing a burst signal from said color complex video signal;

separation means for separating a first brightness signal and a first chroma signal from the color complex video signal;

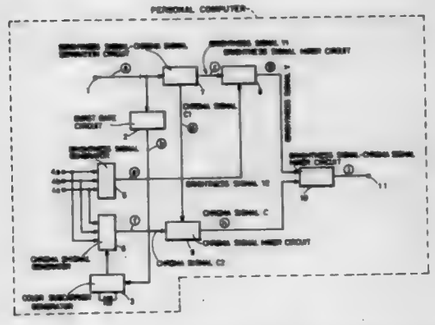
second input means for inputting R.G.B. signals;

first generation means for generating a second brightness signal from said R.G.B. signals;

first mixer means for mixing the second brightness signal and the first brightness signal separated by the separation means to form a mixed brightness signal;

second generation means responsive to said burst signal for generating a second chroma signal from said R.G.B. signals;

second mixer means for mixing the second chroma signal and the first chroma signal separated by the separation means to form a mixed chroma signal; and



third mixer means for mixing the mixed brightness signal applied from the first mixer means and the mixed chroma signal applied to the second mixer means to form a combined signal.

4,639,769

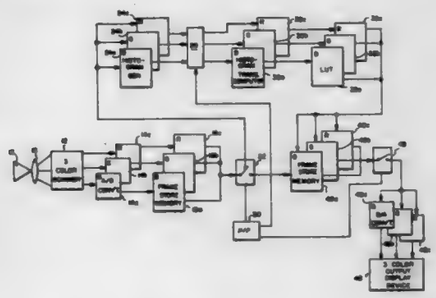
MODIFYING COLOR DIGITAL IMAGES

Richard B. Fleisher, Pittsford, and Bruce A. Rubin, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,317

Int. Cl.[4] H04N 9/73

U.S. Cl. 358—27 3 Claims



1. Apparatus for modifying the brightness levels of three digital color images which have a predetermined number of discrete brightness levels respectively to make them compatible with an output display device which has a number of available discrete brightness levels, comprising:

(a) means responsive to the color digital images for forming three separate histograms; and

(b) means responsive to each histogram for producing a transform function that operates upon its color digital image pixels to modify their brightness levels so that predetermined numbers of the brightest and darkest pixels are respectively assigned to the brightest and darkest level of the output display device and the remaining digital image pixels are assigned to their corresponding remaining output display device brightness levels, whereby an improved output image is produced by the display device.

4,639,770

METHOD AND CIRCUIT ARRANGEMENT FOR SIMULATING A MULTI-COLORED REPRODUCTION ON A COLOR MONITOR

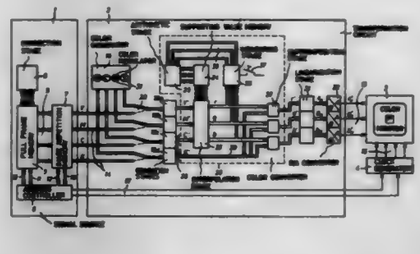
Eggert Jung, Schoenberg, and Siegfried Klopsch, Probsteierhagen, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Dec. 19, 1984, Ser. No. 683,803

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3347049

Int. Cl.[4] H04N 1/46

U.S. Cl. 358—76 17 Claims



1. An arrangement for isochromatic simulation of a multi-colored reproduction on a color monitor, comprising:

(a) signal source means for outputting color separation values Y,M,C,K of a multi-colored reproduction;

(b) transformer stage means connected to said signal source means for transformation of said color separation values Y,M,C,K into color monitor video drive values required for the isochromatic simulation;

(c) a color monitor means connected to receive said video drive values;

(d) said transformer stage means comprising

(i) gradation stage means connected to said signal source means for changing the color separation values Y,M,C,K output by said signal source means according to a reproduction gradation curve dependent on the later to occur reproduction process;

(ii) an arithmetic stage means for calculation of color value triads r,g,b for a supporting point network of a reproduction color space;

(iii) a supporting value memory means connected to said arithmetic stage means for deposit of the calculated color value triads of the supporting point network;

(iv) an interpolation stage means communicating with said gradation stage means, arithmetic stage means, and supporting value memory means for interpolation of color value triads r,g,b from color value triads r_n,b_n, g_n of said supporting point network dependent on altered color separation values Y', M', C' of the three chromatic color separations of the multi-colored reproduction;

(v) logic stage means communicating with said interpolation stage means and gradation stage means for formation of corrected color value triads r', g', b' from the color value triads r,g,b and from color separation values K' of a black separation;

(vi) linearization stage means connected to said logic stage means for generating linearized color value triads r_v, g_v, b_v from the color value triads r,g,b according to the radiation density characteristics of the color monitor means; and

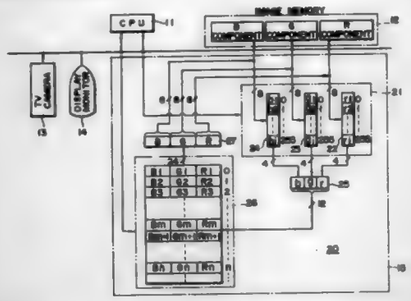
(vii) analog-to-digital converter means communicating with the linearization stage means for generating video drive values r'_v, g'_v, b'_v from the linearized color value triads r_v, g_v, b_v.

4,639,771

IMAGE PROCESSING SYSTEM

Yoshihisa Hattori, and Nobuo Inoue, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 30, 1985, Ser. No. 792,867
Claims priority, application Japan, Oct. 31, 1984, 59-227913
Int. Cl.[4] H04N 1/46, 9/74
U.S. Cl. 358—80 3 Claims



1. An image processing system having an image memory for storing an input image as first density pixel data of red (R), green (G) and blue (B) components to perform image display in accordance with storage contents of said image memory, comprising:

a density conversion table memory addressed by the first density pixel data read out from said image memory, to generate second density pixel data predetermined as representative density pixel data of the first density pixel data;

a color conversion table memory addressed by the second density pixel data read out from said density conversion table memory, to generate color density pixel data prepared for color display in advance; and

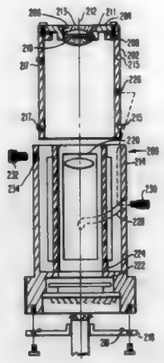
means for writing in said image memory the color density pixel data read out from said color conversion table memory.

4,639,772

FOCUSABLE VIDEO CAMERA FOR USE WITH ENDOSCOPES

Erik Sluyter, Santa Barbara, and Edward A. Wooff, Jr., Ventura, both of Calif., assignors to Circon Corporation, Santa Barbara, Calif.

Filed Feb. 7, 1984, Ser. No. 578,274
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—98 3 Claims



1. A highly compact focusable video camera for use in medical and surgical procedures in conjunction with an endoscope comprising:

a cylindrical body defining a containment space having an open input end;

a cover having an apertured top portion and a cylindrical sleeve, the sleeve portion extending into the containment space in close fit to the cylindrical body portion;

an optical system, a portion thereof being mounted in the cover for receiving optical imagery through the optical aperture in the cover, and a portion thereof being mounted in the cylindrical body, the optical system being focusable by relative movement along its optical axis, of the body and the cover, the optical axis of the optical system being coextensive with the axis of the cylindrical body and the cover;

a groove in the internal surface of the cylindrical body extending at least partially thereinto defining spaced parallel cam surfaces extending from a predetermined point closer to the aperture of the cover to a point more distant from the aperture of the cover, the total axial pitch of the cam surfaces relative to the optical axis being the desired focusing adjustment between the portions of the optical system;

a follower fixed to the cylindrical sleeve and extending into the groove;

sealing means between the interior surface of the body and the external surface of the sleeve for blocking the passage of fluid into the containment space;

means inside the containment space for sensing and converting the optical imagery transmitted to it by the lens system, into unprocessed electronic video signals; and

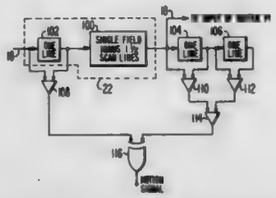
means for receiving the unprocessed electronic video signals and for preprocessing said signals and for transmitting said signals outside the body.

4,639,773

APPARATUS FOR DETECTING MOTION IN A VIDEO IMAGE BY COMPARISON OF A VIDEO LINE VALUE WITH AN INTERPOLATED VALUE

Robert N. Hurst, Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Division of Ser. No. 601,365, Apr. 17, 1984, abandoned, which is a continuation of Ser. No. 226,712, Jan. 21, 1981, abandoned.
This application Nov. 20, 1985, Ser. No. 799,858
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—105 7 Claims



1. In a video signal processing apparatus; circuitry for detecting image motion comprising:

a signal input for applying a video signal;

delay means coupled to said signal input and having a first plurality including one, of signal paths for providing video signals from a first field of the video signal, and having a second plurality, including at least two, of signals paths for providing at least two video signals from a second field of the video signal different from said first field wherein the video signals from said first and second fields are separated by substantially an odd integral number, including one, of field intervals and said at least two video signals are separated from each other by an integral number, including one, of horizontal line intervals;

first conbining means coupled to said second plurality of signal paths for summing said at least two video signals, to produce a video signal representing approximately like spatial image points as said video signal from said first field;

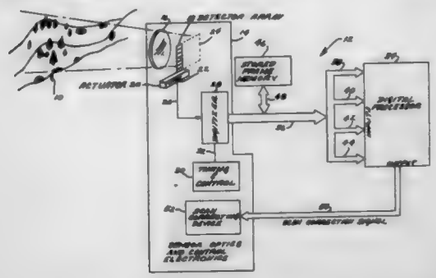
means, including means coupled to said first plurality of signal paths and said first combining means for comparing video signals from said first plurality of signal paths with video signals from said first combining means and generating a motion indicating signal having a first state when video signals from said first and second fields differ, and having a second state otherwise.

4,639,774

MOVING TARGET INDICATION SYSTEM

David L. Fried, Placentia, Calif., assignor to D. L. Fried Associates, Inc., Placentia, Calif.

Filed Jun. 21, 1985, Ser. No. 747,972
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—105 16 Claims



1. In a moving target indication system wherein a field of view is repeatedly scanned with detection means, the combination of,

means for developing and storing information of said field of view from a first scan,

means for developing later information of said field of view from a succeeding scan,

means for comparing said later information with said stored information from said first scan, and to indicate any difference therebetween,

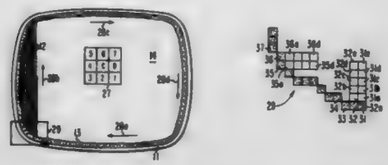
and means for effecting adjustment of said later information to compensate for any misalignment of said succeeding scan as compared to said first scan.

4,639,775

METHOD FOR DETECTING BLEMISHES NEAR THE PERIMETER OF A CCD IMAGE

Edward Cohen, Lancaster; Clarence M. Weaver, Jr., Reamstown, and Robert A. Daschi, Lancaster, all of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed May 17, 1985, Ser. No. 735,054
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—106 19 Claims



1. A method for detecting blemishes near the perimeter of a CCD (charge coupled device) image, wherein said perimeter is identified by perimeter identifying CCD pixels, and wherein said perimeter identifying pixels are sequentially considered in a selected direction around said perimeter, said method comprising the steps of:

detecting the charge levels of perimeter identifying pixels in a sequence of pixel motions, wherein a pixel motion is the detection of adjacent pixel charge levels and wherein adjacent pixels are pixels having contiguous sides or contiguous corners, said pixel motions being taken in directions defined by a pixel direction matrix wherein the pixel being detected is surrounded by adjacent pixels whereby the detection of side adjacent pixels results in straight pixel motions and the detection or corner adjacent pixels results in diagonal pixel motions, and whereby blemish detection motions are motions normal to said straight pixel motions toward the center of said CCD image;

sequentially detecting the charge levels on adjacent perimeter identifying pixels to detect straight and diagonal pixel motions;

taking blemish detection motions from each of said adjacent perimeter identifying pixels while considering a plurality of pixels along said blemish detection motions; and

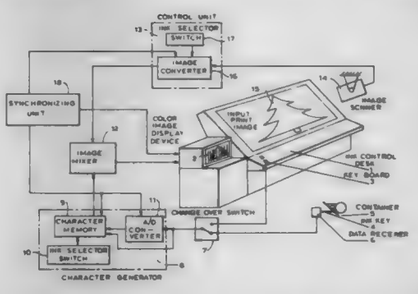
comparing a first portion of said plurality of pixels with a second portion of said pixels and providing a blemish signal when the comparison is outside a selected variance.

4,639,776

INDICATING DEVICE FOR A PRINTING MACHINE FOR SUPERIMPOSING INK KEY SETTING VALUES ON AN IMAGE TO BE PRINTED

Karl-Heinz Foerster, Dresden, and Siegfried Koerner, Coswig, both of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Oct. 26, 1983, Ser. No. 545,740
Claims priority, application German Democratic Rep., Oct. 26, 1982, 244262
Int. Cl.[4] H04N 7/18; B41F 31/02
U.S. Cl. 358—107 7 Claims



1. An indicating device for a printing machine having ink keys, comprising: displaying means; means for scanning an input print image to be printed and producing signals corresponding to the scanned image; means for producing digital signals corresponding to desired or actual setting values for ink keys; means for mixing the signals corresponding to the scanned image and the digital signals; and means for simultaneously transmitting the mixed signals to the displaying means to display thereon the desired or actual setting values superimposed over the input print image to be printed.

4,639,777

APPARATUS FOR SCRAMBLING AND DESCRAMBLING COMMUNICATION SIGNALS

Hitoshi Mori, Kobe, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

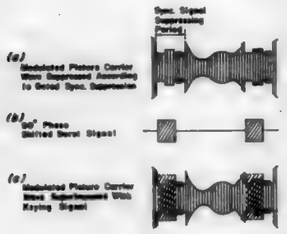
Filed Dec. 13, 1984, Ser. No. 681,368
Claims priority, application Japan, Dec. 16, 1983, 58-238103
Int. Cl.[4] H04N 7/167; H04K 1/02
U.S. Cl. 358—120 7 Claims

1. A method of scrambling a communication signal comprising the steps of:

(a) compressing a synchronizing signal component of a picture carrier wave which has been amplitude-modulated by a video signal; and

(b) superimposing a keying signal, indicative of the period

during which said synchronizing signal is compressed, on said picture carrier wave within or preceding said period,



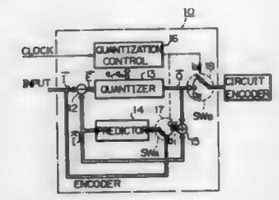
said keying signal being a carrier wave shifted 90° in phase from said picture carrier wave.

4,639,778

EMBEDDING QUANTIZATION SYSTEM FOR VECTOR SIGNALS

Hirohisa Yamaguchi, and Kazuo Yamada, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1984, Ser. No. 635,679
Claims priority, application Japan, Jul. 28, 1983, 58-136697
Int. Cl.[4] H04N *7/13*
U.S. Cl. 358—135 7 Claims



1. In an embedding quantization system of a vector signal comprising:

an input terminal for receiving a sampled input signal;

a quantizer;

a predictor having an input coupled to the output of said quantizer;

a subtractor for providing the difference between the input signal and the output of said predictor, to said quantizer;

wherein the input signal applied to said input terminal is a vector signal which is subject to quantization;

an adder means for providing a sum of the output of said quantizer and the output of said predictor, to the input of said predictor, wherein a prediction by said predictor and a quantization by said quantizer are input of said predictor, wherein a prediction by said predictor and a quantization by said quantizer are accomplished a plurality of times by feeding back the output of said predictor to the input of said predictor through said adder means to provide a plurality of quantized output signals;

a quantization control means;

a first switch for switching the input of said predictor wherein the input signal is applied to said predictor at a first clock period for the embedding quantization operation, and the output of said adder is applied to the predictor at other clock periods controlled by said quantization control means; and

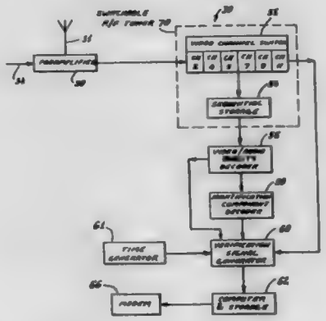
a second switch, coupled to the output of said quantizer, for providing quantized output signals to an external circuit under the control of said quantization control means.

4,639,779

METHOD AND APPARATUS FOR THE AUTOMATIC IDENTIFICATION AND VERIFICATION OF TELEVISION BROADCAST PROGRAMS

Burton L. Greenberg, 28 E. 10th St., New York, N.Y. 10003

Continuation of Ser. No. 476,915, Mar. 21, 1983, Pat. No. 4,547,804. This application Oct. 15, 1985, Ser. No. 786,983
The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.
Int. Cl.[4] H04N *7/087, 7/08, 7/00*
U.S. Cl. 358—142 11 Claims



1. A method for automatically identifying and verifying the proper airing of a television program which has an identification code recorded on a selected line of each frame of the program and which is transmitted as a composite signal from one or more sending stations at one or more times over one or more channels for reception in a receiving area, comprising the steps of:

(a) storing reference signals in a first memory means, each of said reference signals containing information referenced to said identification code specifying a bought airing of the program identified thereby;

(b) receiving each of the composite signals of said channels;

(c) automatically scanning said channels to detect the presence of said identification code and of a proper audio and video portion of each received composite signal which includes said identification code;

(d) separating the detected identification code from each of said received composite signals;

(e) generating an electrical time signal;

(f) generating a channel identifying signal;

(g) forming with said time signal and said channel identifying signal a separate verification signal for each separated identification code, said verification signal including information specifying said separated identification code and the time and channel of receiving said program;

(h) storing each said verification signal in a second memory means to identify a verified airing of said program; and

(i) comparing verified airings information from said second memory means with bought airings information from said first memory means and making therefrom a list of the number of verified airings that were bought airings and the number of bought airings for which there is no verified airing.

4,639,780

TELEVISION SYNCHRONIZING APPARATUS

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

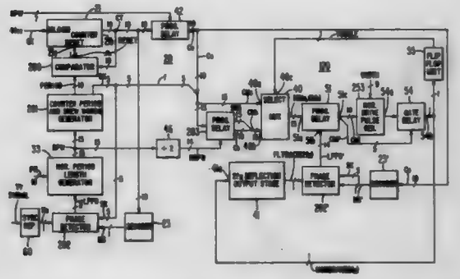
Filed Apr. 1, 1985, Ser. No. 718,365
Int. Cl.[4] H04N *5/06*
U.S. Cl. 358—150 25 Claims

1. A television apparatus for generating from a periodic, scanning frequency, synchronizing input signal, an output signal that is periodic at a frequency greater than said scanning frequency, comprising:

a source of said synchronizing input signal;

means responsive to said input signal for developing a part length signal that is indicative of the length of a part period of said synchronizing input signal;

means responsive to said synchronizing input signal for generating a first periodic signal;



means responsive to said part length signal for time shifting said first periodic signal by an amount that is determined in accordance with said length to generate a second periodic signal; and

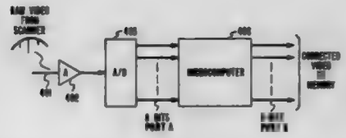
means responsive to said first and second periodic signals for generating said output signal therefrom.

4,639,781

DYNAMIC GAIN ADJUSTER FOR AN IMAGE SCANNER

Norman M. Rucci, Howell, and Helmuth O. Sautter, Middletown, both of N.J., assignors to AT&T Information Systems, Murray Hill, N.J.

Filed Feb. 19, 1985, Ser. No. 703,235
Int. Cl.[4] H04N *5/14, 3/14, 1/40*
U.S. Cl. 358—163 12 Claims



1. A method of compensating for sensitivity variations in an image sensing device, the method comprising the steps of:

receiving an input signal in a plurality of scanned lines from the image sensing device, the input signal being reflective of an image for display;

determining instantaneous signal amplitude levels in the input signal, each instantaneous signal amplitude level being indicative of a particular section of the image on a scan line;

storing in memory a plurality of the instantaneous signal amplitude levels;

comparing first and second instantaneous signal amplitude levels on adjacent scan lines for generating a corrective factor signal, the comparing step including comparing the second instantaneous signal amplitude level with the previously received and juxtaposed first instantaneous signal amplitude level and further including the step of storing as the corrective factor signal that one of the two signal levels having the greatest amplitude; and

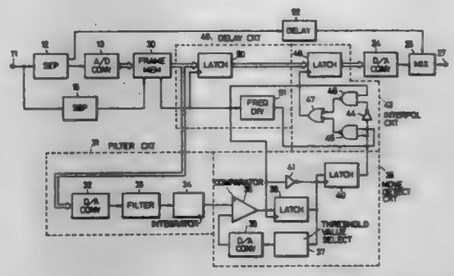
averaging the corrective factor signals for each scan line, the averaging step including generating for each corrective factor signal an adjusted signal level derived from averaging a first corrective factor signal located immediately before and a second corrective factor signal located immediately after the corrective factor signal being adjusted, the average of the first and second corrective factor signal being combined with the corrective factor signal being adjusted for generating and substituting therefor the adjusted signal level, and the averaging step being applied to a plurality of corrective factor signals being adjusted for producing from the adjusted signal levels a smoothed gain corrective function for each scan line, the gain corrective function being combined with the plurality of instantaneous signal amplitude levels for producing an output signal compensated for sensitivity variations in the image sensing device.

4,639,782

VIDEO SIGNAL PROCESSING APPARATUS FOR PROCESSING A VIDEO SIGNAL WHICH IS TRANSMITTED IN ACCORDANCE WITH A DOT INTERLACED SCHANNING SYSTEM AND INPUTTED THERETO

Akira Fujita, and Kyoichi Shimizu, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 13, 1985, Ser. No. 701,137
Claims priority, application Japan, Feb. 15, 1984, 59-26604
Int. Cl.[4] H04N *5/21, 5/208*
U.S. Cl. 358—166 7 Claims



1. A video signal processing apparatus for processing a video signal which is transmitted in accordance with a dot interlaced scanning system and inputted thereto, said video signal being obtained by carrying out a dot interlaced scanning in terms of four fields so that picture element data related to odd numbered picture elements in odd lines and picture element data related to even numbered picture elements in even lines are sampled and transmitted during the first and second fields and picture element data related to even numbered picture elements in odd lines and picture element data related to odd numbered picture elements in even lines are sampled and transmitted during the third and fourth fields, said video signal processing apparatus comprising:

first separating means for separating a luminance signal and a carrier chrominance signal from said video signal;

analog-to-digital converting means supplied with the luminance signal from said first separating means for subjecting the luminance signal to an analog-to-digital conversion to produce a digital luminance signal;

second separating means for separating synchronizing signals from said video signal;

memory means for writing therein and reading out therefrom the digital luminance signal, said memory means comprising clock pulse generating means for generating clock pulses, said memory means writing therein and reading therefrom the digital luminance signal responsive to the synchronizing signals which are separated by said second separating means and the clock pulse which is generated by said clock pulse generating means so that a digital luminance signal which corresponds to one field and in which luminance data of first and third dot inter-

laced fields alternately exist in each line is obtained during a certain time period of one field and a digital luminance signal which corresponds to one field and in which luminance data of second and fourth dot interlaced fields alternately exist in each line is obtained during a subsequent time period of one field;

luminance difference detecting means supplied with the digital luminance signal which is read out from said memory means for performing a detecting operation to detect a luminance difference between two digital luminance data which belong respectively to said first and third dot interlaced fields or belong respectively to said second and fourth dot interlaced fields and are in the same line and are within the digital luminance signal corresponding to one field, said luminance difference detecting means producing an output detection signal when the luminance difference is detected during two or more consecutive detecting operations;

interpolation means supplied with the digital luminance signal from said memory means for producing an interpolated digital luminance signal, said interpolation means normally passing the digital luminance signal in the absence of the output detection signal of said luminance difference detecting means, said interpolation means replacing one digital luminance data out of said two digital luminance data by the other digital luminance data in response to the output detection signal of said luminance difference detecting means;

digital-to-analog converting means for producing an analog luminance signal by subjecting the interpolated digital luminance signal to a digital-to-analog conversion;

delay means supplied with the carrier chrominance signal from said first separating means for delaying the carrier chrominance signal by a predetermined delay time to produce a delayed carrier chrominance signal; and

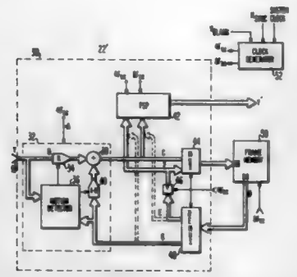
mixing means for mixing said analog luminance signal and said delayed carrier chrominance signal and for producing a video signal.

4,639,783

VIDEO SIGNAL FIELD/FRAME STORAGE SYSTEM

Russell T. Fling, Fishers, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 30, 1984, Ser. No. 676,814
Int. Cl.[4] H04N 5/14
U.S. Cl. 358—166 **8 Claims**



1. A video signal processing system utilizing a memory for temporary storage of video signal samples occurring at a predetermined rate, comprising:

a source of video signal samples;

means for operating said memory in a serial mode wherein data is output from said memory in the same sequence data is loaded into said memory;

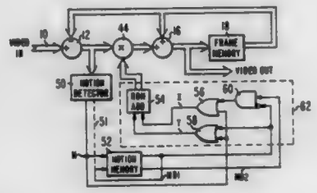
means coupled to said source and an output port of said memory for forming a sequence of samples alternating between said video signal samples from said source and samples from said memory output port, and applying said sequence as input samples to said memory.

4,639,784

VIDEO SIGNAL RECURSIVE FILTER ADAPTIVELY CONTROLLED RESPONSIVE TO THE HISTORY OF IMAGE MOTION

Russell T. Fling, Fishers, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 19, 1985, Ser. No. 702,612
Int. Cl.[4] H04N 5/21
U.S. Cl. 358—167 **11 Claims**



1. In a recursive filter system for filtering video signal, including means for delaying said video signal by one image period and means for scaling and combining said video signal and said delayed video signal from said delaying means, to produce recursively filtered output signals, apparatus for generating scale factors to be applied to said scaling means, comprising:

a motion detector including means for determining the difference between said video signal and said delayed video signals and comparing means responsive to said differences for generating a motion signal indicative of the occurrence of image motion between pixels of a current image period and a previous image period when the magnitude of said differnce exceeds a predetermined value;

means coupled to said motion detector for delaying said motion signal by substantially one image period to produce delayed replicas of said motion signal;

a decoder responsive only to said motion signal and said delayed replicas of said motion signal for selecting signals corresponding to said scale factors, for application to said scaling means from a predetermined set of predetermined arbitrary values, each of said arbitrary values being determined in relation to a particular number of frame segments since the lastmost detection of motion.

4,639,785

NON-SATURATING VIDEO OUTPUT AMPLIFIER

James C. Tallant, II, Noblesville City, and Robert P. Parker, Indianapolis, both of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 26, 1984, Ser. No. 593,094
Int. Cl.[4] H04N 5/68
U.S. Cl. 358—184 **8 Claims**

1. A video signal processing system comprising:

a source of video signal;

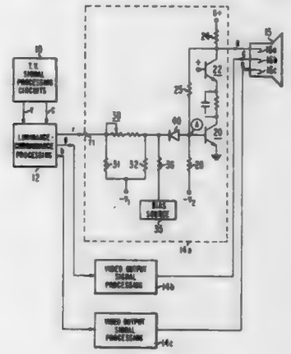
an image display device responsive to video signals applied to an intensity control electrode thereof;

a feedback driver amplifier with a signal input and a signal output for providing video drive signals to said intensity control electrode of said image display device, said amplifier including a feedback network with an impedance coupled from said signal output to said signal input;

an input circuit coupled to said source, for providing video signals to said amplifier input; and

a signal limiter included in said input circuit for limiting the magnitude of input signals greater than a given level to prevent saturation of said amplifier; said signal limiter being coupled between said source of video signal and said

feedback impedance and having an input for receiving a bias current via a signal current path from said source, and



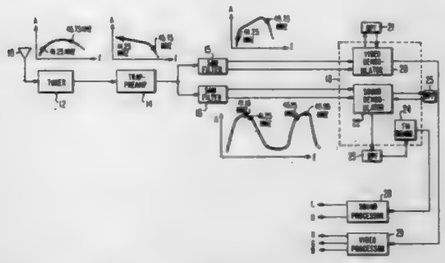
an output for receiving a bias current via a signal path including said feedback impedance.

4,639,786

TELEVISION SOUND SIGNAL PROCESSOR

Gregory G. Tamer, Marion County, and David E. Hollinden, Monroe County, both of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 23, 1985, Ser. No. 790,458
Int. Cl.[4] H04N 5/62
U.S. Cl. 358—197 **10 Claims**



1. In a video signal processing system including a section for processing an IF signal containing a modulated sound carrier and a modulated video carrier, apparatus comprising

a surface acoustic wave (SAW) filter for receiving said IF signal from said section, wherein to improve the quality of a sound signal ultimately derived from said modulated sound carrier said SAW filter has a first peak amplitude response at a first prdetermined frequency different from the frequency of said sound carrier and a second peak amplitude response at a second predetermined frequency different from the frequency of said video carrier. carrer.

4,639,787

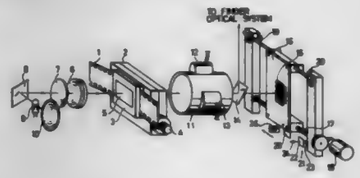
IMAGE-SCANNING APPARATUS

Masaki Isogai, Tokyo, and Atsushi Kawahara, Kawasaki, both of Japan, assignors to Kyodo News Service and Nippon Kogaku K. K., both of Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,422
Claims priority, application Japan, Sep. 16, 1983, 58-170809
Int. Cl.[4] H04N 5/253, 5/238
U.S. Cl. 358—214 **9 Claims**

1. Apparatus for generating picture signals having an optical system for forming an image of an object on a predetermined plane and means for scanning said object image by a light-receiving surface disposed on said predetermined plane and generating an output indicative of the light intensity distribution of said object image on said plane, the apparatus comprising:

(a) driving means for driving said scanning means relative to said object image to perform a first scan and a second scan, said driving means performing said second scan after the completion of said first scan;



(b) control means for controlling the exposure of the light-receiving surface of said scanning means during said second scan in accordance with the output of said scanning means generated during said first scan; and

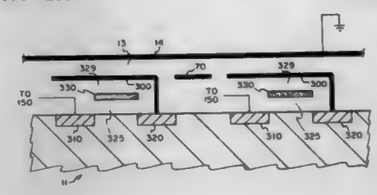
(c) processing means for processing the output of said scanning means generated during said second scan into a picture signal corresponding to said object image in accordance with the output of said scanning means generated during said first scan.

4,639,788

VIDEO DISPLAY METHOD AND APPARATUS

William E. Glenn, Ft. Lauderdale, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Dec. 7, 1984, Ser. No. 679,228
Int. Cl.[4] H04N 5/74
U.S. Cl. 358—233 **21 Claims**



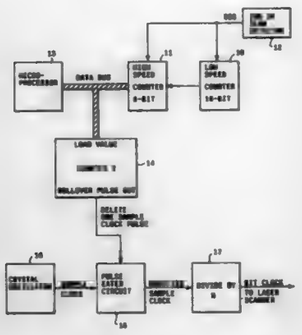
1. In a video display apparatus for generating images represented by input video signals, said apparatus including: an array of semiconductor devices having respective electrodes arranged in a pattern of columns and rows; a layer of deformable material disposed over said electrodes, a conductive/reflective layer disposed over said deformable layer whereby electrical potentials between said conductive/reflective layer and the electrodes of said devices are operative to deform said conductive/reflective layer; and optical means for converting deformations of the conductive/reflective layer into an image; the improved method, comprising the steps of:

applying a bias potential to said conductive/reflective layer;

applying, during one field of a video frame, the input video signal to the electrodes of even rows of devices and a reference potential to the electrodes of odd rows of devices, said reference potential being different than said bias potential; and

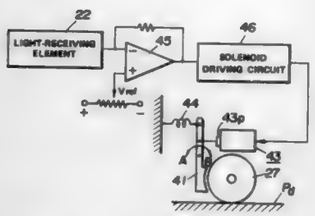
applying, during the other field of a video frame, the input video signal to the electrodes of odd rows of devices and said reference potential to the electrodes of even rows of devices.

4,639,789
RASTER SCANNER VARIABLE-FREQUENCY CLOCK CIRCUIT
Douglas N. Curry, Mealo Park, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed May 29, 1984, Ser. No. 615,002
Int. Cl.[4] H04N *1/04, 1/36*
U.S. Cl. 358—285 **5 Claims**



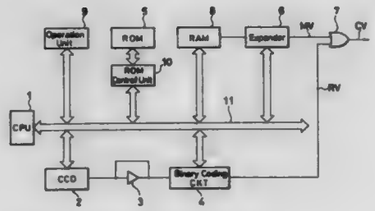
1. A digital circuit for varying the frequency of the bit clock in a raster input or output scanner comprising:
a sample clock generator,
means for measuring each scan duration,
means responsive to said measurement for deleting an evenly spaced number of sample clock pulses per scan, said number of deleted pulses per scan being a function of said measured scan duration, and
means for counting down the output of the means for deleting to produce the bit clock for the next scan.

4,639,790
IMAGE INPUT APPARATUS
Satoshi Kusaka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 19, 1984, Ser. No. 683,684
Claims priority, application Japan, Dec. 19, 1983, 58-239409
Int. Cl.[4] H04N *1/10, 1/22*
U.S. Cl. 358—293 **4 Claims**



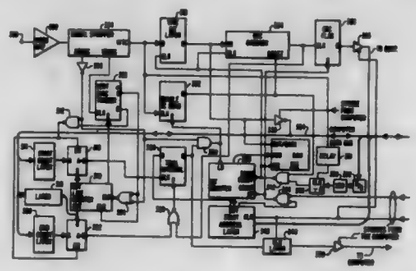
1. An image input apparatus comprising:
a housing;
a light source provided within said housing for illuminating an object surface;
a roller rotatably supported by said housing member so as to contact with said object surface;
postion detecting means said roller for detecting a rotation thereof;
a line sensor provided within said housing member for reading image information of said object surface through a lens array according to light provided from said light source and reflected by said image information surface;
a line sensor driving circuit for driving said line sensor;
memory means for storing a first output signal from said line sensor in accordance with a second output signal from said position detecting means representing the position of image information signal stored in said memory means;
a braking means for locking said roller; and
a light receiving means fro detecting the brightness of light from said light source, and means for releasing said braking means at the time the output of said light receiving means equal to a predetermined value.

4,639,791
IMAGE OVERLAY APPARATUS WITH ELECTRONIC IMAGE STORAGE
Hisaji Masaki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 8, 1984, Ser. No. 669,528
Claims priority, application Japan, Nov. 15, 1983, 58-215721
Int. Cl.[4] H04N *1/23, 1/29*; G03B *27/52, 27/10*
U.S. Cl. 358—300 **12 Claims**



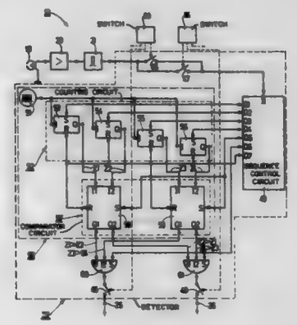
1. A recording apparatus comprising:
memory means for holding previously stored constant information and control information relating to a recording mode of the constant information;
recording means for synthesizing variable information and the constant information from said memory means and recording the synthesized information; and
control means for controlling said recording means to achieve synthesized recording in response to said control information.

4,639,792
APPARATUS FOR DECODING VIDEO ADDRESS CODE SIGNALS
Edwin C. Moxon, Boxboro, Mass., assignor to The Stypher Corporation, Hudson, Mass.
Continuation of Ser. No. 435,689, Oct. 21, 1982, Pat. No. 4,516,164. This application May 2, 1985, Ser. No. 729,652
The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.
Int. Cl.[4] H04N *5/782*
U.S. Cl. 358—335 **7 Claims**



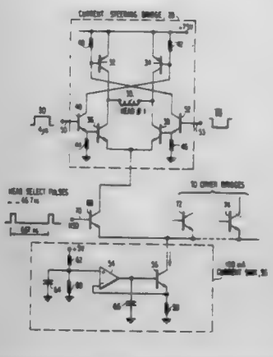
1. In apparatus for reading coded information recorded on video magnetic tape, said apparatus having means for reading signals from said tape as said tape is run through said apparatus at different speeds, a local oscillator for generating sampling signals at various frequencies, means responsive to said sampling signals for sampling said signals read from said tape to produce received information, the improvement comprising,
means responsive to the data content of selected portions of said received information read from said tape for adjusting the frequency of said sampling signals to produce error-free reception of said information.

4,639,793
SYSTEM FOR RECORDING OR DETECTING TWO MARKING SIGNALS ON A RECORD CARRIER
Peter Goldmann, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 539,491, Oct. 6, 1983, abandoned. This application Apr. 9, 1986, Ser. No. 850,442
Claims priority, application Austria, Dec. 7, 1982, 4450/82
Int. Cl.[4] G11B *27/28, 5/09*
U.S. Cl. 360—44 **9 Claims**



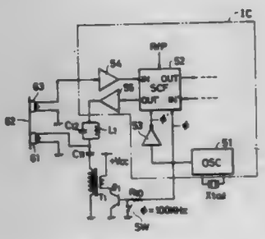
1. A system for recording and/or detecting marking signals of two different types, recorded on or scanned from a record carrier, which signal differ from each other in respect of at least one parameter, comprising:
a recording device for selectively recording marking signals, comprising generator means for generating the marking signals to be recorded on a record carrier, and
a detection device for detecting said marking signals, comprising detector means for detecting the marking signals read from the record carrier,
characterized in that the generator means comprises a single pulse generator only for supplying marking signals in the form of two marking-pulse trains having a same frequency to which a given period corresponds, but having different duty factors which differ from the value 0.5, the duty factor of one marking-pulse train being k and the duty factor of the other marking-pulse train being 1−k; means for enabling said generator for a period of time equal to a given plurality of said given periods only; and means for selecting one of said marking-pulse trains and for recording said selected train on the record carrier for said period of time, and
the detector means comprises a single duty-factor detector only, which detects the duty factor of a marking-pulse train with respect to a value of 0.5, during at least two consecutive periods, and in response to detection that said at least two consecutive periods have the same duty factor supplies a specific detection signal depending on the detected duty factor.

4,639,794
MULTIPLY PULSED MAGNETIC RECORDING
Herman Ferrier, Los Gatos, Calif., assignor to Fuji Photo Film Co., Ltd., Japan
Filed Jun. 19, 1984, Ser. No. 622,333
Int. Cl.[4] G11B *5/09, 5/02*
U.S. Cl. 360—46 **14 Claims**



1. A current driver for a magnetic recording head, comprising:
means for directing to said head a current of a polarity corresponding to a digital data signal pulse during the pulse width of said signal pulse; and
means for enabling said current directing means only during a plurality of separate write pulse widths occurring during a signal pulse width, the sum of said plurality of write pulse widths being substantially less than the signal pulse width, a repetition period of said write pulse widths being longer than a value that is a ratio of a value of a head gap of said recording head to a velocity of a magnetic tape moving relative to said magnetic recording head, said value being increased to account for movement of said tape during one said write pulse width.

4,639,795
SIGNAL TRANSMISSION CIRCUIT
Kazuo Watanabe, and Tetsuo Sato, both of Takasaki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Division of Ser. No. 578,786, Feb. 10, 1984, abandoned. This application Mar. 20, 1986, Ser. No. 841,830
Claims priority, application Japan, Mar. 25, 1983, 58-48825
Int. Cl.[4] G11B *15/12, 5/02*
U.S. Cl. 360—62 **2 Claims**



1. A magnetic recording and playback apparatus, comprising
means including a playback amplifier for detecting a signal recorded on a magnetic tape;
a first switched capacitor circuit having an input connected to the output of said playback amplifier;
means including a recording amplifier for recording signals on a magnetic tape;

a second switched capacitor circuit having an output connected to the input of said recording amplifier;

control means including an oscillator circuit for generating control signals for controlling the operation of said first and second switched capacitor circuits; and

means connected to the output of said recording amplifier for generating an A.C. bias signal for said magnetic tape, wherein the difference frequency between the frequency of the control signals generated by said control means and the frequency of said A.C. bias signal is either zero or falls outside of the audio frequency band.

4,639,796

ARRANGEMENT FOR POSITIONING A TRANSDUCER TO AT LEAST ONE TRACK OF A TAPE-SHAPED RECORDING MEDIUM

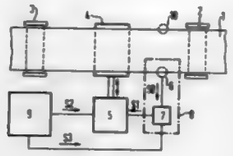
Erik Solhjell, Oslo, Norway, assignor to Tandberg Data A/S, Oslo, Norway

Filed Dec. 28, 1984, Ser. No. 687,527

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1983, 3347632

Int. Cl.⁴ G11B *5/55, 5/56*

U.S. Cl. 360—77 **9 Claims**





1. An arrangement for positioning a transducer perpendicular to the running direction of a plurality of tracks of a tape-shaped recording medium and to compensate transverse deviation of the recording medium as it runs through a magnetic recording machine housing, said arrangment comprising:

a fixed barrier device connected to the machine housing for emitting a light beam at an edge of the recording medium and producing an edge position signal in response to the light passing the edge;

control means operable to produce a positioning signal indicating the desired position of the transducer;

a converter connected to said light barrier for converting the edge position signal into a control signal representing the amount of transverse edge deviation; and

positioning means carrying the transducer, said positioning means connected to said converter and connected to said control means and operable in response to the position and control signal to move the transducer to a track represented by said positioning signal and to move the transverse transducer perpendicularly of the recording medium a distance equal to the transverse edge deviation.

4,639,797

RECORDING OR REPRODUCING APPARATUS

Junji Kobayashi, Tokyo, and Takashi Kimura, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1985, Ser. No. 814,623

Claims priority, application Japan, Dec. 28, 1984, 59-279327

Int. Cl.⁴ G11B *15/66*

U.S. Cl. 360—71 **7 Claims**

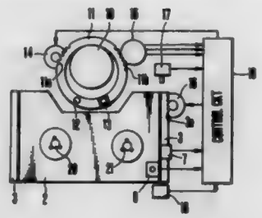
1. A recording or reproducing apparatus for use with a cassette housing therein a tape shaped record bearing medium, comprising:

(A) a rotary head drum assembly having at least one rotary head for recording signals on or reproducing signals from the medium;

(B) first means for selectively causing said cassette and said drum assembly to relatively come near to each other and to relatively go away from each other;

(C) detection means for detecting whether said cassette is loaded or not;

(D) loading means for pulling out the medium from said cassette and for engaging the pulled out medium with said



drum assembly, said loading means including at least one movable member which is selectively movable to a first position for pulling out the medium from the cassette, a second position for engaging the pulled out medium with the drum assembly and a third position between said first and said second position; and

(E) second means responsive to said detection means for operating said loading means, said second means moving said movable member between said first and said second positions when the cassette is loaded and moving the movable member between said first and said third positions when the cassette is not loaded.

4,639,798

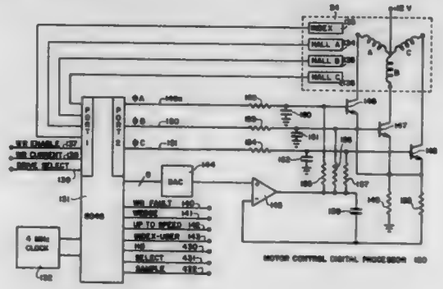
DISK DRIVE HAVING TWO INTERACTIVE ELECTROMECHANICAL CONTROL SUBSYSTEMS

Joel N. Harrison, Campbell; Vincent A. Condito, San Jose; Randolph H. Graham, Santa Clara; Brian J. Nixon, and Richard C. Simonsen, both of Pleasanton, all of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Division of Ser. No. 444,523, Nov. 26, 1982, abandoned. This application Dec. 6, 1985, Ser. No. 806,082

Int. Cl.⁴ G11B *19/28*

U.S. Cl. 360—73 **10 Claims**



1. In a rotating disk data storage device including a brushless direct current motor having plural non-rotating field coils and including internal non-contacting commutation sensors, at least one data storage disk rotated by said motor, a data transducer for reading and writing data from and to data tracks on a storage surface of said disk, a transducer carriage for supporting said transducer, a power actuator for moving said carriage to position said transducer among selected data tracks, the improvement comprising:

driver circuit means connected for switching drive current among said coils and for varying said drive current,

programmed digital processor means connected to said commutation sensors and to said driver circuit means for calculating switching commands in accordance with data provided by said commutation sensors and for putting out said switching commands to said driver circuit means for switching said drive current, said processor means further connected for monitoring motor speed and for calculating speed correction values and putting them out to said circuit means for adjusting said drive current to maintain motor speed at a constant nominal value.

4,639,799

MAGNETIC TAPE RECORDING AND REPRODUCING APPARATUS WITH ROTATABLE DRUM HAVING INCLINED HEADS

Osamu Inoue, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Nov. 19, 1984, Ser. No. 672,899

Claims priority, application Japan, Nov. 18, 1983, 58-178609[U]

Int. Cl.⁴ G11B *15/66, 5/56*

U.S. Cl. 360—85 **4 Claims**

1. A magnetic tape recording and reproducing apparatus comprising:

(a) a rotatable head drum having heads and inclined with respect to a reference plane;

(b) a pair of movable tape guide members movably located in first positions respectively upstream and downstream of said head drum in a direction of travel of a magnetic tape, for guiding the magnetic tape to be wrapped helically around said head drum in a wrapping range along a tape path inclined with respect to said reference plane to allow each of said heads to scan said magnetic tape along a scanning locus to form thereon a track inclined with respect to a logitudinal direction of said magnetic tape in a recording mode;

(c) means for transporting said magnetic tape at a first speed in said recording mode and at a second speed different from said first speed in a playback mode;

(d) means for positioning said tape guide members in said first positions in said recording and playback modes; and

(e) said positioning means including means for displacing along said reference plane one of the tape guide members and locking said one of the tape guide members in a second position other than said first positions to change said wrapping range of the magnetic tape, whereby said tape path is shifted so that said formed track on the magnetic tape will be brought into conformity with the scanning locus of each of said heads when said magnetic tape is transported at said second speed in the playback mode,

wherein said positioning means comprises a pair of concentric annular loading gears supporting said tape guide members respectively thereon, a pair of motors, a pair of worms rotatable by said motors, and a pair of worm gears meshing with said worms and said loading gears.

4,639,800

TAPE RECORDER

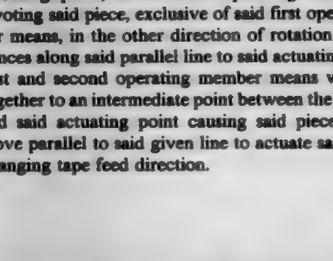
Shinsaku Tanaka, Tokyo, and Toshio Yoshimura, Kawasaki, both of Japan, assignors to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1984, Ser. No. 669,265

Claims priority, application Japan, Nov. 23, 1983, 58-220289; Dec. 27, 1983, 58-246411

Int. Cl.⁴ G11B *15/00*

U.S. Cl. 360—90 **3 Claims**



1. A tape recorder apparatus having a housing to which are mounted a magnetic head, two spaced reel shafts, means to engage said magnetic head with magnetic tape, means to drive said magnetic tape as it is engaged with said magnetic head to recore/reproduce signals, means to drive said magnetic tape at high speed, and means for changing tape feed direction, said apparatus comprising:

first operating member means mounted to said housing and selectively manually movable for reciprocating relative to said housing between its rest position and an actuating point along a given line to actuate said high speed tape driving means for one reel shaft when it reaches said actuating point;

second operating member means mounted to said housing and selectively manually movable for reciprocating relative to said housing between its rest position and an actuating point along a line parallel to said given line to actuate said high speed tape driving means for another reel shaft when it reaches said actuating point;

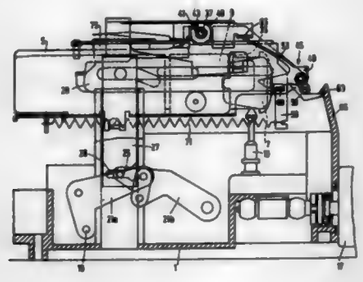
resilient means to bias said first and second operating member means away from said actuating point and toward said rest position;

a tape-direction changing piece mounted to said housing for pivotal and linear movement relative thereto, said first operating member means pivoting said piece, exclusive of said second operating member means, in one direction of rotation when it advances along said given line to the actuating point, said second operating member means pivoting said piece, exclusive of said first operating member means, in the other direction of rotation when it advances along said parallel line to said actuating point, said first and second operating member means when moved together to an intermediate point between the rest position and said actuating point causing said piece to linearly move parallel to said given line to actuate said means for changing tape feed direction.

4,639,801
LOADING MECHANISM FOR A MAGNETIC TAPE CASSETTE APPARATUS

Rolf D. Hoppenanne; Walter Steup; Willibald Wiecnorek, all of Krefeld, Fed. Rep. of Germany, and Franz Beitler, Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 9, 1984, Ser. No. 628,701
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1983, 3325053
Int. Cl.⁴ G11B 5/008
U.S. Cl. 360—96.5 10 Claims



1. A loading mechanism for a magnetic tape cassette apparatus comprising a cassette holder having an ejection slide movable with respect to the holder between an outward position and a pushed-in position, means for locking the ejection slide in the pushed-in position, and a lifting device arranged for moving said cassette holder up and down when the cassette is in said pushed-in position,

characterized by comprising a latch on said ejection slide,

a pivoting catch pivotally mounted on said holder, said catch being pivotable to a locked position for engaging said latch when the slide is in the pushed-in position,

a tilting lever, and means mounting said tilting lever to said holder to permit pivotable movement of said lever with respect to said holder and said catch, and

a control element arranged to engage said tilting lever when the cassette holder is moved upwards and downwards, arranged such that said tilting lever moves along said control element without performing any function during one of the directions of cassette holder movement, and that during movement of holder in the other direction the tilting lever engages said control element and the catch so as to pivot the catch out of the locked position, thereby unlocking the ejection slide for movement toward said outward position.

4,639,802
SHRINK RING FOR DISK CLAMPING

Jerry L. Neubauer, Stewartville; Laurence J. Schmidt, and Steven H. Voss, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

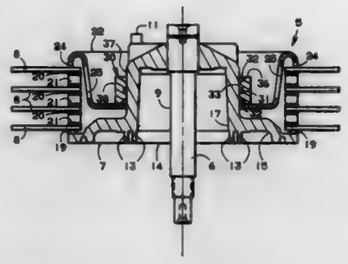
Filed Jun. 25, 1984, Ser. No. 624,330
Int. Cl.⁴ G11B 5/012
U.S. Cl. 360—98 4 Claims

1. In a disk drive with a plurality of storage disks, a storage disk assembly including a hub on which said disks are mounted about a common axis in axially spaced relationship for unitary rotary motion comprising

means on said hub for supporting said disks in one axial direction, and

a shrink ring surrounding a portion of said hub and secured to said hub by interference fit to maintain a predetermined axial force in the direction opposite said one axial direction,

said shrink ring having a substantially cylindrical outer surface and a substantially cylindrical inner surface with the axial length of said outer surface exceeding the axial length of said inner surface, whereby the outer surface presents an enlarged heat transfer surface and the inner surface presents a reduced heat transfer surface confronting said hub,

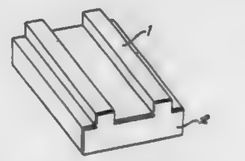


said shrink ring being heated and assembled about said hub and an axial force maintained as said ring cools to establish said interference fit and said predetermined axial force on said plurality of disks.

4,639,803
THIN FILM MAGNETIC HEAD SLIDER

Yukio Takeda, Hitachi; Shiro Iijima, Mito; Shinsake Higuchi, Hitachi; Masaki Ohura, and Sadanori Nagaike, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 22, 1985, Ser. No. 757,493
Claims priority, application Japan, Jul. 31, 1984, 59-161281
Int. Cl.⁴ G11B 5/60
U.S. Cl. 360—103 3 Claims



1. A thin film magnetic head slider, comprising:

a slider body formed of a sintered material comprising a mixture of AlN and TiN;

a thin film transducer disposed on the end surface of said slider body;

said mixture having a ratio of the volume % of AlN to TiN in the range of 50:50 through 99:1.

4,639,804
HEAD LOADING SYSTEM

Yoshihiro Moribe, Chigasaki; Yukitaka Hayashi, Odawara; Hideo Mackawa, Yokohama, and Kunitsugu Tsukai, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1983, Ser. No. 475,592
Claims priority, application Japan, Mar. 19, 1982, 57-42748
Int. Cl.⁴ G11B 5/54
U.S. Cl. 360—105 11 Claims

1. A head loading system comprising:

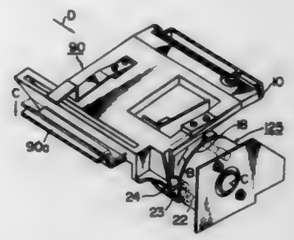
at least one head support mechanism supporting at least one head for at least reproducing information in juxtaposed relation to one surface of a recording medium; and

a loading actuator for driving said head support to move said head toward and away from said one surface of said recording medium;

said load actuator comprising:

a solenoid including a plunger for moving the plunger in a linear motion in a direction substantially parallel to said one surface of said recording medium;

motion converting means for converting the linear motion of said plunger of said solenoid into a rotary motion, said motion converting means having an axis of rotation parallel to the direction of movement of the linear motion; and



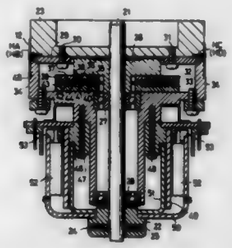
a bail having opposite ends, said bail being driven at one of said opposite ends by the rotary motion of said motion converting means and pivotally supported only at the other end thereof about an axis substantially parallel to said one surface of said recording medium; and

said support mechanism comprising a hook to be engaged by said one end of said bail.

4,639,805
COMBINATION OF REPRODUCING HEADS AND A ROTARY TRANSFORMER DEVICE

Akira Hirota, Chigasaki, and Masahiko Tsuruta, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Nov. 22, 1983, Ser. No. 554,457
Claims priority, application Japan, Nov. 25, 1982, 57-178265[U]
Int. Cl.⁴ G11B 5/52
U.S. Cl. 360—108 6 Claims



1. A combination of reproducing heads and a rotary transformer device,

said reproducing heads being constituted by a first pair of mutually opposing heads each having a gap of a first azimuth angle and a second pair of mutually opposing heads each having a gap of a second azimuth angle, said first azimuth angle being different from said second azimuth angle, said first and second pairs of heads being mounted on a rotary body with an equi-angular separation of 90° between two adjacent heads, said rotary body being wrapped with a magnetic tape around a peripheral surface thereof over an angular range which is greater than 270° but less than 360° and rotating at a rotational speed of 270° per unit, said unit being 1/n times one field period of a video signal which is pre-recorded on said magnetic tape, where n is a natural number, three heads out of said first and second pairs of heads constantly making contact with said magnetic tape at one time while one of said three heads scans over a desired track which is pre-recorded with video signal by a head having a gap of the same azimuth angle as that of said one head, each of two remaining heads out of said three heads generating an undesired signal by scanning over a part of a track which is pre-recorded with the video signal by a head having a gap of the same azimuth angle as that of each of said two remaining heads and is adjacent to said desired track,

said rotary transformer device comprising:

a rotary core rotating unitarily with said rotary body, said rotary core having five circular grooves arranged and formed in one surface thereof;

first through fourth ring-shaped coils embedded in four of said five grooves of said rotary core excluding a center groove which is located at an innermost position of said five grooves;

a first short-circuiting ring embedded in said center groove among said five grooves of said rotary core;

a stationary core located at a position opposing said one surface of said rotary core with a slight gap formed between said stationary core and said one surface of said rotary core, said stationary core being stationary and having five circular grooves arranged and formed in one surface thereof which opposes said one surface of said rotary core, said give grooves of said stationary core respectively opposing said five grooves of said rotary core;

fifth through eighth ring-shaped coils embedded in four of said five grooves of said stationary core excluding a center groove which is located at an innermost position of said five grooves, said fifth through eighth ring-shaped coils performing transmission and reception of signals between said first through fourth ring-shaped coils which are embedded in said rotary core; and

a second short-circuiting ring embedded in said center groove among said five grooves of said stationary core, said second short-circuiting ring opposing said first short-circuiting ring,

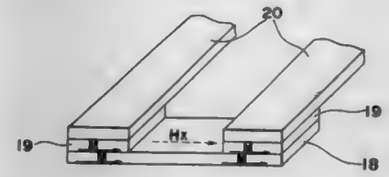
said first and second ring-shaped coils located on one side with respect to said first short-circuiting ring being coupled to said first pair of heads,

said third and fourth ring-shaped coils located on a side opposite to said one side with respect to said first short-circuiting ring being coupled to said second pair of heads.

4,639,806
THIN FILM MAGNETIC HEAD HAVING A MAGNETIZED FERROMAGNETIC FILM ON THE MR ELEMENT

Toru Kira, Tenri; Teiichi Miyauchi, Nara, and Mitsuhiko Yoshikawa, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 6, 1984, Ser. No. 577,389
Claims priority, application Japan, Sep. 9, 1983, 58-167312; Nov. 30, 1983, 58-228125
Int. Cl.⁴ G11B 5/127; G01R 33/02
U.S. Cl. 360—113 2 Claims



1. A thin film magnetic head for detecting, as a change in electric resistance, a change in signal magnetic field to be applied along the magnetization-hard-axis direction of an elongated metal ferromagnetic thin film (MR element) having

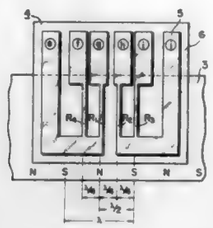
uni-axis anisotropy, which comprises a ferromagnetic film, which is sufficiently larger in coercive force than said metal ferromagnetic thin film (MR element), said ferromagnetic film being exclusively magnetized along a longitudinal direction of said elongated MR element and arranged on a superposed portion between a lead conductor portion and said metal ferromagnetic thin film (MR element), said metal ferromagnetic thin film (MR element) being coupled in a ferromagnetic exchange interaction relationship with said ferromagnetic film to thereby increase the sensitivity of the head, while suppressing Barkhausen noise.

4,639,807

MAGNETIC DETECTOR HAVING MAGNETORESISTIVE ELEMENTS

Sadao Sekizawa; Toshio Seki, and Tadashi Takahashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1983, Ser. No. 475,519
Claims priority, application Japan, Mar. 15, 1982, 57-39574
Int. Cl.[4] G11B *5/127;* G01B *7/14*
U.S. Cl. 360—113 10 Claims



1. A magnetic detector used in an arrangement close to and opposite to a magnetic recording medium with a relative movement provided between the magnetic detector and the magnetic recording medium, the magnetic detector comprising:

a plurality of elongated stripe-shaped magnetoresistive elements formed in juxtapositional relation with one another on a non-magnetic substrate, each magnetoresistive element extending in a longitudinal direction transverse to the direction of relative movement between the magnetic detector and the magnetic recording medium and having a first and a second end;

bridge output terminals connected to respective first ends of said magnetoresistive elements in the longitudinal directions thereof; and

common terminal means having one end connected to the second ends of at least two of said magnetoresistive elements in the longitudinal directions thereof, said common terminal means having an intermediate portion with a width larger than the width of each of the magnetoresistive elements and extending along and parallel to an outer-side face of the outermost one of said elongated longitudinally extending magnetoresistive elements to another end portion at a position adjacent to said bridge output terminals provided at said first ends of said magnetoresistive elements, whereby the magnetic detector has a small width and high sensitivity.

4,639,808

ASYMMETRICAL SHIELDS FOR CONTROLLING FEEDTHROUGH IN READ/WRITE HEADS

Richard Thornley, Boulder County, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Sep. 26, 1984, Ser. No. 655,011
Int. Cl.[4] G11B *5/115, 5/14, 5/27*
U.S. Cl. 360—121 6 Claims



1. A transducer for writing data to and reading data from a magnetic medium comprising:

a magnetically shielding center section;

a write head disposed on one side of said center section; and

a read head on the other side of said center section, said read head including

a shielded magnetoresistive element and

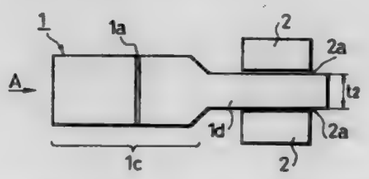
first and second read shields, and on each side of said magnetoresistive element, the read shield closest to said write, head being thinner than the other read shield to reduce magnetic feedthrough between said write head and said read head.

4,639,809

MAGNETIC HEAD

Tetsuya Iwata, Keide, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Nov. 15, 1984, Ser. No. 671,634
Claims priority, application Japan, Nov. 16, 1983, 58-176027[U]
Int. Cl.[4] G11B *5/27, 5/22*
U.S. Cl. 360—121 3 Claims



1. In a magnetic head comprising a recording/reproducing core having a tip end portion of a generally elongated rectangular shape extending in a longitudinal direction which a magnetic media is moved relative to said tip end portion, said tip end portion having a recording/reproducing gap formed at a position intermediate its ends along said longitudinal direction, and a pair of erasing cores arranged opposing each other in a direction transverse to said longitudinal direction with each erasing core disposed adjacent a respective side of said tip end portion in said transverse direction,

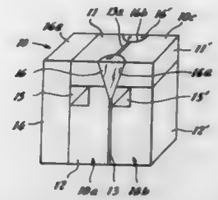
the improvement wherein said tip end portion has an upstream (relative to said longitudinal direction of movement of said magnetic media) portion including said gap which is provided with a given thickness in the transverse direction suitable for a desired mechanical strength property, and a downstream portion parallel to said upstream portion which is thinner compared to said given thickness so as to be suitable for a higher density recording property, and said erasing cores are arranged on opposite sides of said downstream portion of reduced thickness.

4,639,810

MAGNETIC HEAD FOR PERPENDICULAR MAGNETIZATION

Kunihide Sakai, Ebina, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Feb. 17, 1984, Ser. No. 581,070
Claims priority, application Japan, Feb. 18, 1983, 58-24756
Int. Cl.[4] G11B *5/127, 5/187*
U.S. Cl. 360—125 7 Claims



1. A magnetic head for perpendicular magnetization, comprising:

(a) a body of a nonmagnetic material having a surface for sliding contact with a magnetic recording medium;

(b) a yoke of a ferromagnetic material, said body being mounted on said yoke;

(c) a film of a ferromagnetic material having a relatively high saturation magnetic density held in direct contact with a side of said yoke and having an end exposed in said surface;

(d) a coil wound around said yoke and said film in direct contact with said film; and

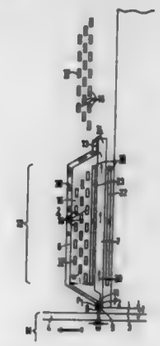
(e) a block of a ferromagnetic oxide material attached to a side of said body and said yoke for cooperating with the magnetic recording medium, said film, and said yoke in defining a closed magnetic path.

4,639,811

COMBINED MAGNETIC WRITE AND READ HEAD FOR THE VERTICAL MAGNETIZATION OF A CORRESPONDING RECORDING MEDIUM

Heinrich Diepers, Viet-Stoss-Str, and Herbert Schewe, Haydnstr, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 684,055
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346876
Int. Cl.[4] G11B *5/127, 5/17*
U.S. Cl. 360—125 11 Claims



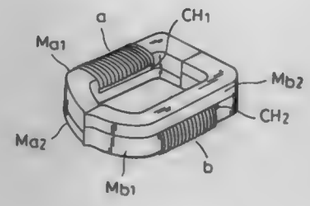
1. A combined magnetic write and read head for a recording medium, the recording medium being provided with at least one magnetizable storage layer into which information can be written along and read from a track by perpendicular magnetization of the storage layer, said magnetic head comprising a ring-shaped magnetic conduction body for carrying magnetic flux having two magnet legs, the magnet legs each having a pole at ends of the magnet legs facing the medium and which are arranged adjacently one behind the other in a direction of relative motion of the head and medium and at a predetermined distance from each other, at least one read coil winding being associated with said magnetic conduction body, the turns of the read coil winding extending through a space formed between the magnet legs, said read coil winding serving for executing a read function, an additional coil winding being provided for executing a write function, said additional coil winding at least partially surrounding one of said magnet legs, the other of said magnet legs having, at least in a subsection thereof, a predetermined small cross section relative to a cross section of said one of said magnet legs, whereby said subsection is driven at least largely into magnetic saturation, as a result of the difference in said cross sections of said magnet legs, during the write function by said additional write coil winding while the read coil winding is deenergized.

4,639,812

MAGNETIC HEAD AND APPARATUS FOR AUTOMATICALLY ADJUSTING THE AZIMUTH POSITION THEREOF

Niro Nakamichi, Tokyo, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Filed Oct. 24, 1983, Ser. No. 544,745
Claims priority, application Japan, Nov. 8, 1982, 57-194613
Int. Cl.[4] G11B *5/147, 5/127, 5/00, 20/20*
U.S. Cl. 360—126 5 Claims



1. An apparatus for reproducing a signal recorded on a magnetic tape, comprising:

a magnetic head which includes a core having a single gap corresponding to a predetermined recording track of said magnetic tape, said core including left-hand right-hand core parts which are spaced in a direction of travel of said tape, each of said core parts including an uper core piece and a lower core piece, the ratio of the thickness of the upper core piece to the thickness of the lower core piece being less than 1 for one of said left-hand and right-hand core parts and being greater than 1 for the other thereof, said magnetic head further including first and second pick-up coils which each encircle a portion of the thicker core piece of a respective one of said left-hand and right-hand core parts;

means supporting said magnetic head for movement in directions effecting variation of the azimuth position of said magnetic head relative to the magnetic tape; and

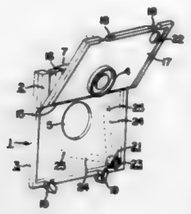
means responsive to output signals from said first and second pick-up coils and cooperable with said magnetic head for causing movement of said magnetic head which adjusts the azimuth position of said magnetic head relative to a recorded signal on said recording track.

4,639,813

CLEANING DISKET WITH INTERNAL PATHS FOR CLEANING LIQUID

Masatoshi Uno, Tokyo, Japan, assignor to Kabushiki Kaisha Nagaoka, Tokyo, Japan

Filed Jan. 7, 1985, Ser. No. 742,406
Claims priority, application Japan, Nov. 27, 1984, 59-249966
Int. Cl.[4] G11B *5/10, 5/127, 5/41, 3/58*
U.S. Cl. 360—128 7 Claims



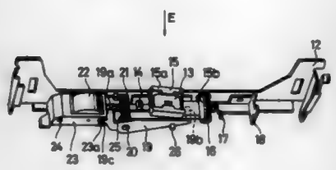
1. A head cleaning apparatus comprising:
a case formed to the same shape and dimension of a hard case for a floppy disk;
a cleaning sheet adapted to be rotated in the case and formed to the same shape and dimension of the magnetic disk of a floppy disk; and
a cleaning liquid inlet tube provided to the case having means for supplying a cleaning liquid to the cleaning sheet with the cleaning liquid injected under pressure from outside the case, the cleaning liquid inlet tube being in communication with liquid supply paths extending within the case, said liquid supply paths having ejection holes opposing the cleaning sheet for causing the liquid to permeate the disk.

4,639,814

TAPE RECORDER WITH IMPROVED TAPE CASSETTE PAD SHIFTER

Shigeto Ueno; Masanori Ohnishi; Yuji Nakamura, and Shinichi Tanaka, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 18, 1983, Ser. No. 467,919
Claims priority, application Japan, Feb. 19, 1982, 57-26279
Int. Cl.[4] G11B *15/60*
U.S. Cl. 360—130.1 2 Claims



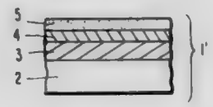
1. A tape recorder for use with a tape cassette including a case having an access opening and a magnetic tape and a resiliently biased pad disposed in the case, the tape recorder having a plurality of different modes of operation, comprising:
(a) a base comprising a cassette holder for receiving the tape cassette;
(b) a magnetic head fixedly mounted on said base for contact with the magnetic tape through the access opening when the tape cassette is inserted in the tape recorder;
(c) a pad position control member movably mounted on said base for displacing the pad through the access opening when the tape cassette is inserted in the tape recorder, said pad position control member including a pad presser having a pair of opposite edges spaced from each other by a distance smaller than the width of said resiliently biased pad;
(d) means responsive to selection of at least one of the tape recorder modes for actuating said pad position control member in a first direction to allow the pad to press the magnetic tape against said magnetic head through the acess opening and between said edges of said pad presser and also responsive to selection of at least one of the other tape recorder modes for actuating said pad position control member in a second direction opposite to said first direction to enable said pad presser to displace the pad out of pressing contact with the magnetic tape, said means comprising a first spring acting between said cassette holder and said pad position control member for normally urging the latter in said first direction, a control arm movably mounted on said base and engaging said pad position control member, a second spring acting between said cassette holder and said control arm for normally urging said control arm in said second direction, said second spring having a resiliency larger than that of said first spring for enabling said control arm to be displaced in said second direction to a stop mode of operation, and an operator-controlled rod movable in response to selection of recording playback modes of operation for pressing said control arm in said first direction against the resiliency of said second spring to permit said pad position control member to move in said first direction under the resiliency of said first spring, whereby the pad is allowed under its own resiliency to press the magnetic tape against said magnetic head;
(e) said eassctte holder including a pair of first and second pins, said pad position control member comprising a pad presser positioned adjacent to said magnetic head and engageable with the pad and a support supporting said pad presser and pivotably mounted on said first pin, said first spring engaging said support, said control arm being pivotably mounted on said second pin and having a presser held in engagement with said pad position control member, said second spring being mounted on said second pin; and
(f) said magnetic head having a pair of recesses spaced from each other for receiving therein said edges, respectively, of said pad presser when said pad position control member is moved in said first direction.

4,639,815

MAGNETIC RECORDING MEDIUM WITH CHROMIUMIRON PROTECTIVE LAYER

Yoshihiro Arai, and Akira Nakara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 27, 1984, Ser. No. 604,549
Claims priority, application Japan, Apr. 28, 1983, 58-75402
Int. Cl.[4] G11B *5/74*
U.S. Cl. 360—131 5 Claims



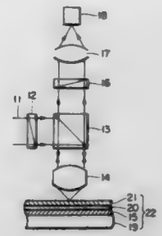
1. A magnetic recording medium comprising a non-magnetic support, a thin magnetic metal film on the support, and a protective layer on the thin magnetic film, to improve corrosion and scraping resistance, said protective layer containing chromium and iron and nickel, the chromium being present in an amount of 6 to 40 wt % nickel in an amount of not more than 20 wt % and iron, being the remainder, wherein the protective layer has a thickness in a range of from 10 Å to 200 Å.

4,639,816

MAGNETO-OPTICAL RECORDING MEDIUM

Yasuo Tomita, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,698
Claims priority, application Japan, Sep. 27, 1982, 57-168123; Sep. 27, 1982, 57-168121; Sep. 27, 1982, 57-168122
Int. Cl.[4] G11B *5/74, 23/00*
U.S. Cl. 360—131 6 Claims



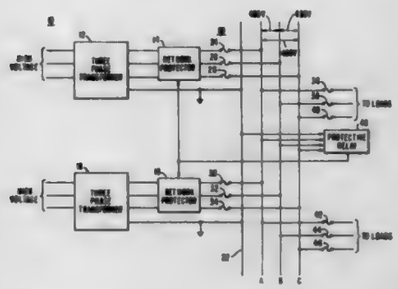
1. A magneto-optical recording medium which is adapted for use in a reading system in which a linearly polarized light beam is projected on said medium whereby a light beam reflected by said medium is detected by a photoconductor, said photoconductor having a multiplying function, said magneto-optical recording medium comprising:
a substrate;
a magnetic film formed on said substrate, said magnetic film having an axis of easy magnetization perpendicular to the magnetic film surface; and
a dielectric material layer formed on and in contact with said magnetic film to establish a reflection factor at the magnetic film surface, said reflection factor being about 10% or less.

4,639,817

PROTECTIVE RELAY CIRCUIT FOR DETECTING ARCING FAULTS ON LOW-VOLTAGE SPOT NETWORKS

John H. Cooper, Murrysville, and William H. South, McKeesport, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 15, 1984, Ser. No. 610,539
Int. Cl.[4] H02H *3/22*
U.S. Cl. 361—62 4 Claims



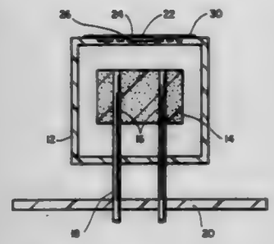
1. A protective relay for detecting a power arc fault in an AC three-phase electrical power spot network including a bus having phase A, B, and C conductors and a neutral conductor for distributing power to at least one load, a plurality of power sources for supplying power to said bus, and means for interrupting power to said bus from said plurality of power sources, said protective relay comprising:
means coupled to each of the phase A, B, and C conductors and the neutral conductor to provide a first voltage signal representative of the voltage difference between the phase A conductor and the neutral conductor, to provide a second voltage signal representative of the voltage difference between the phase B conductor and the neutral conductor, and to provide a third voltage signal representative of the voltage difference between the phase C conductor and the neutral conductor, each voltage signal representing its corresponding phase voltage fundamental frequency and all phase voltage harmonics thereof which are present on the corresponding phase conductor;
first, second, and third bandpass filter means corresponding to said first, second, and third voltage signals respectively, each bandpass filter means for passing only a predetermined band of harmonic frequency components of its corresponding voltage signal to produce first, second, and third filtered signals, said predetermined band of harmonic frequencies including frequencies substantially between 1 kHz and 100 kHz, thereby being limited substantially to include only harmonic frequencies which are indicative of power arc faults;
first, second, and third amplifier means responsive to said first, second, and third filtered signals, respectively, to produce first, second, and third amplified signals;
first, second, and third rectifier means for rectifying and averaging the harmonic frequency components of said first, second, and third amplified signals to produce first, second, and third rectified signals in response thereto;
first, second, and third peak detector means which produce first, second, and third peak signals representative of the peaks of said first, second, and third rectified signals, respectively; and
timer means which indicates a fault when one of said first, second, and third peak signals is substantially at at least a predetermined magnitude for a specified time interval, thereby indicating the presence of a permanent power arc fault.

4,639,818

VENT HOLE ASSEMBLY

Gabe Cherian, Fremont, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 17, 1985, Ser. No. 776,943
Int. Cl.[4] H02H *5/04*
U.S. Cl. 361—106 19 Claims



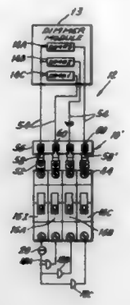
1. An assembly which comprises
(1) at least one circuit protection device which comprises a PTC conductive polymer element;
(2) a hollow enclosure which surrounds and is spaced apart from the protection device, which is hermetically sealed except for at least one vent, and whose exterior surface adjacent the vent is provided with a plurality of channels; and
(3) a deformable cover member which is releasably secured to the exterior surface of the enclosure which defines the vent and the channels.

4,639,819

PROTECTIVE BYPASS FOR ELECTRONIC CIRCUITS

David Kirby, Emmaus, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Aug. 6, 1984, Ser. No. 637,862
Int. Cl.[4] H01R *31/08*
U.S. Cl. 361—115 20 Claims



1. A protective bypass circuit optionally shortcircuiting the lugs of a plurality of circuit breakers, said bypass circuit comprising:

a plurality of lug plates each having first and second sections, said first section of each lug plate being received in and clamped by a lug of a respective circuit breaker;

a plurality of lead wire clamping elements, each said clamping element being electrically coupled to said first section of a respective said lug plate and adapted to releasably clamp a lead wire thereto;

a shorting bus bar; and

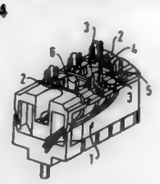
means for releasably coupling said shorting bus bar to said second section of each of said lug plates.

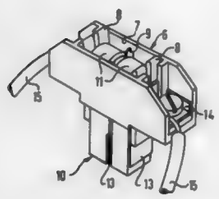
4,639,820

PROTECTIVE ELEMENT FOR DISTRIBUTOR STRIPS

Franz Dolansky, Munich, and Ewald Steiner, Berg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 3, 1985, Ser. No. 719,342
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412421
Int. Cl.[4] H02H *3/22*
U.S. Cl. 361—124 4 Claims





1. A protective element for distributor strips having a plurality of double terminal post means for non-stripped connection of electrical conductors arranged in two rows, a plurality of upwardly open receptacle chamber means being provided between the two rows for receiving respective surge arresters in an upper portion of the distributor strip, contact springs being connected to the respective double terminal post means at outer sides of the receptacle chamber means, and portions of a grounding rail projecting into the receptacle chamber means between the contact springs opposite one another in the chamber means, comprising:

a lower part of the protective element being designed as a plug means for insertion into at least one of the receptacle chamber means for the distributor strip;

an upwardly open receptacle chamber means being provided in the protective element for accommodating surge arresters at an upper part of the protective element;

contact springs opposite one another at sides of the receptacle chamber means and a grounding rail having a portion projecting into the receptacle chamber means between the contact springs;

the contact springs and the grounding rail portion being connected via the plug means to the contact springs and the grounding rail of a receptacle chamber means of the distributor strip in which the protective element is plugged; and

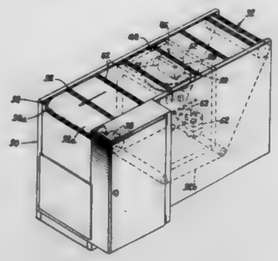
each contact spring in the protective element being connected to a screw terminal positioned outside of the receptacle chamber means in the protective element.

4,639,821

DEGAUSSER/DEMAGNETIZER

Kenneth M. Littwin, Chicago; Joseph A. Armond, River Grove; Gabriel R. Buky, and Fred Patrick, both of Chicago, all of Ill., assignors to Electro-Matic Products Co., Chicago, Ill.

Filed Jul. 10, 1985, Ser. No. 753,597
Int. Cl.[4] H01F *13/00*
U.S. Cl. 361—151 13 Claims



1. Degausser apparatus comprising,

a conveyor adapted to be moved along a linear path, and having a supporting surface for supporting articles to be degaussed and operable for carrying them along the path,

means for so moving the conveyor,

a magnet having a fixed magnetic field positioned closedly adjacent said supporting surface with pole surfaces lying in a common plane and its magnetic field extending through said supporting surface and into articles on the supporting surface,

the magnet being rotatable bodily about an axis extending through said supporting surface with its magnetic field remaining fixed relative to the magnet, whereby the magnetic field extends through the articles in direction constantly changing corresponding to the rotation of the magnet, and

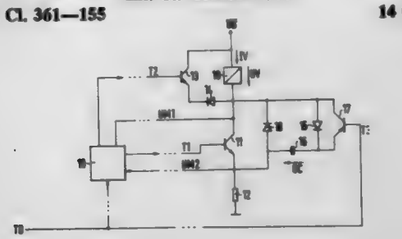
means for rotating the magnet.

4,639,822

ARRANGEMENT FOR RAPID SWITCHING OF AN ELECTROMAGNETIC LOAD

Hans Kubach, Korntal-Münchingen, and Hartmann Rupp, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Boech GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 28, 1985, Ser. No. 770,646
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442764
Int. Cl.[4] H01H *47/32*
U.S. Cl. 361—155 14 Claims



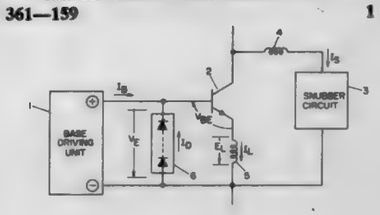
1. A switching arrangement for an electromagnetic load which is interposed between two points one of which is at a predetermined electrical potential difference from the other, comprising switching means arranged in series with the electromagnetic load and operative for selectively enabling and disabling electric current flow in a predetermined direction through the electromagnetic load to energize and deenergize the latter; controllable capacitor means arranged in parallel with said switching means; and means for controlling the operation of at least said capacitor means in such a manner as to be charged to a potential difference exceeding said predetermined potential difference with respect to the other point while the electromagnetic load is energized, and as to discharge during the de-energization of the electromagnetic load with attendant electric current flow from said capacitor means through the electromagnetic load to the one point in a direction opposite to said predetermined direction.

4,639,823

CONTROL CIRCUIT FOR SWITCHING TRANSISTORS

Kazuo Kuroki, Tokyo, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 18, 1984, Ser. No. 682,916
Claims priority, application Japan, Dec. 27, 1983, 58-247276
Int. Cl.[4] H01H *47/00;* H03K *17/60*
U.S. Cl. 361—159 1 Claim



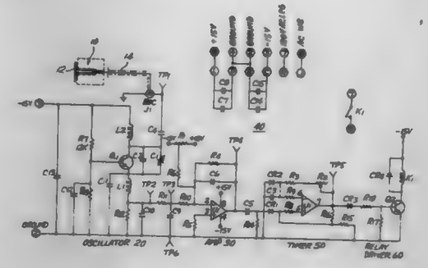
1. A circuit arrangement including a switching transistor having emitter, base and collector electrodes, snubber circuit means including associated distributed reactance, inductance means, diode means and base driving means for switching the transistor characterized in that the emitter-collector circuit branch includes in series the inductance means and the snubber circuit means and the emitter-base circuit branch includes in series the inductance means and the parallel arrangement of the diode means and the base driving means, the diode means being poled such that the electromotive force generated in the inductance means as the current decreases when the transistor is switched off is applied to the base of the switching transistor.

4,639,824

TOUCH SENSOR FOR WIRE STRIPPER

James J. Furlong, Seattle, and Dwayne E. Howe, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 353,750, Mar. 1, 1982, abandoned. This application Sep. 28, 1984, Ser. No. 655,495
Int. Cl.[4] H01H *47/12*
U.S. Cl. 361—179 3 Claims



1. An adjustable picofarad detector circuit comprising in combination:

a capacitance sensing probe having an electrically conductive plate member;

an oscillator circuit coupled to said capacitance sensing probe;

a timer circuit;

an inverse amplifier circuit coupled between said oscillator circuit and said timer circuit for providing a discrete level output signal when said electrically conductive plate member contacts a wire thereby triggering said timer circuit; and,

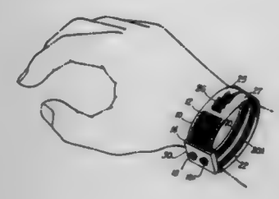
a relay driver circuit responsive to said timer circuit for an adjustable time period.

4,639,825

STRETCHABLE GROUNDING STRAP HAVING REDUNDANT CONDUCTIVE SECTIONS

Albert C. Breidegam, Sharpsburg, Ga., assignor to Semtronics Corporation, Peachtree City, Ga.

Continuation-in-part of Ser. No. 654,636, Sep. 25, 1984, Pat. No. 4,577,256. This application Dec. 2, 1985, Ser. No. 804,052
Int. Cl.[4] H05F *3/00*
U.S. Cl. 361—212 38 Claims



1. A strap for establishing electrical contact with a persons' body comprising:

(a) a plurality of sections of electrically conductive material;

(b) a plurality of non-conductive means, each for electrically separating two adjacent electrically conductive sections; and

(c) a plurality of fittings, each of which:

(i) is in electrical contact with one of the sections of electrically conductive material; and

(ii) receives an electrically conductive cord for connect-

ing the sections of electrically conductive material to ground.

4,639,826
RADIATION-HARDENED CASING FOR AN ELECTRONIC COMPONENT

Christian Val, St. Remy-les Chevreuses; Joseph Pinel, Villefranche-de-Lauragais, and Yves B. Gibod, St. Cyr-L'Ecole, all of France, assignors to Compagnie d'Informatique Militaire, Spatiale et Aeronautique, Paris, France

Filed May 24, 1984, Ser. No. 613,905
Claims priority, application France, Jun. 3, 1983, 83 09288
Int. Cl.[4] H05K *5/06*; B65D *73/02*; H01G *1/06*
U.S. Cl. 361—272 20 Claims

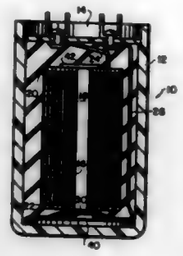


1. A radiation-hardened casing for an electronic component, comprising three elements, namely a base for receiving the component, a side part, and a cover fixed to the base by means of said side part, at least one of said elements comprising at least two layers of distinct materials, one of them being closer to the component than the other, the atomic charge number of said closer material being low with respect to that of the other, whereby said other layer highly attenuates ionizing radiation to provide said radiation-hardened casing and said closer layer has low electron ignition and shields said electronic component from electrons from said other layer caused by ionizing radiation.

4,639,827
PRESSURE SENSITIVE FAULT INTERRUPTER FOR A MULTI SECTION AC CAPACITOR

Thomas F. Strange, and John W. Carino, both of Columbia, S.C., assignors to North American Philips Corporation, New York, N.Y.

Filed Nov. 27, 1985, Ser. No. 802,782
Int. Cl.[4] H01G *1/06*
U.S. Cl. 361—272 6 Claims



1. A multisection AC capacitor having pressure sensitive fault interrupters on each of its capacitor sections, for use as dry metallized film AC motor start or motor run capacitors, wherein said multisection capacitor includes a plurality of metallized foil capacitor sections, each section having a void core, a contact bridge for each electrode of each capacitor section, one contact bridge being on each end of each capacitor section, connecting tabs to said contact bridges, said capacitor sections within said multisection capacitor being connected in parallel through said connecting tabs, a case, potting material securing said capacitor sections and their parallel connections within said case, and connecting terminals for said electrode tabs in a cover for said case, wherein the fault interrupter for each of said capacitor sections comprises:

a diaphragm mechanically and electrically attached to the contact bridge at the base end of said capacitor section;

a tab connection for one electrode from said diaphragm to one of said connecting terminals;

a plug in a form of a tape positioned over the upper end of said core;

said capacitor section with said diaphragm connected thereto being positioned within said case, such that the perimeter of said diaphragm is in firm contact with the base of said case and a void space is left beneath said diaphragm to permit a movement thereof;

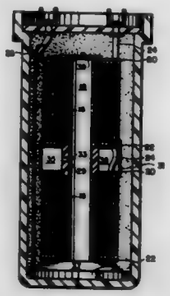
a potting material disposed around said capacitor roll within said case such that said capacitor roll and the parallel electrical connections between said capacitor section and at least a second capacitor section is firmly sealed within said case; and

said diaphragm being secured to the bottom of said capacitor roll within said case such that, when a fault occurs, said diaphragm is depressed by gaseous pressure from within its core to break the electrical contact between said diaphragm and its contact bridge, thereby electrically isolating the faulty capacitor section, while leaving the other capacitor sections within said case to function normally.

4,639,828
PRESSURE SENSITIVE FAULT CURRENT INTERRUPTER FOR MULTIPLE CAPACITOR DEVICE

Thomas F. Strange, and John W. Carino, both of Columbia, S.C., assignors to North American Philips Corporation, New York, N.Y.

Filed Nov. 27, 1985, Ser. No. 802,783
Int. Cl.[4] H01G *1/06*
U.S. Cl. 361—272 11 Claims



1. A multisection capacitor having a pressure sensitive fault interrupter, wherein said capacitor includes a plurality of metallized foil capacitor sections, each of said sections having an interior core void, a contact bridge formed at each end of each capacitor section to serve as the electrodes of said sections, a connecting tab to each of said contact bridges, a case, and potting material to secure said capacitor sections within said case, and connecting terminals for said tabs in a cover for said case, wherein said fault interrupter comprises:

means to attach and separate spatially each of said capacitor sections into a stack, providing an air gap between the bottom of one stacked capacitor section and the top of the adjacent lower capacitor section in said stack and having means to permit the passage of gases to the core of said stack;

means to connect electrically in series said capacitor sections within said stacked capacitor;

at least one sleeve circumferentially surrounding said stack of capacitor sections, at least in the area of said air gap;

means to cover the top of the core of the upper most roll in said stack;

a diaphragm electrically and mechanically attached to the base of the lowest capacitor section in said stack;

a conductive electrode tab connection running from said diaphragm to a terminal on the cover of said case;

a tab connected to the second of said terminals on said cover to the first of said capacitor sections in said stack;

a tab connecting each of the intermediate capacitor sections from the bottom of one section to the top of the adjacent lower section in said stack;

said capacitor sections within said sleeve and with said diaphragm connected thereto being positioned within said case;

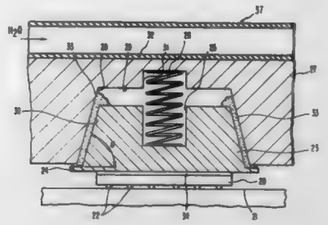
potting material disposed around and above said capacitor sections within said case such that the top of said case is sealed and the sides of said case are filled with potting material between the case and said sleeve;

said diaphragm secured to the bottom of said stack of capacitor sections within said case such that said diaphragm may be depressed by gaseous pressure to break the electrical contact between the diaphragm and the contact bridge to which it is secured.

4,639,829
THERMAL CONDUCTION DISC-CHIP COOLING ENHANCEMENT MEANS

Carl D. Ostergren, Montgomery, N.Y., and John A. Paivanas, deceased, late of Williamsville, N.Y. (by Sophia Paivanas, executor), assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 626,554, Jun. 29, 1984, abandoned.
This application Jun. 20, 1986, Ser. No. 878,399
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 15 Claims



1. An apparatus which cools a heat generating semiconductor integrated circuit chip comprising:

a heat conductive truncated conical disc having flat base at one end and a conical portion at the opposite end, said opposite end constituting a truncated end, said base contacting the back surface of said chip;

a heat conductive, thick-walled hat having a tapered inner surface essentially conforming to said disc;

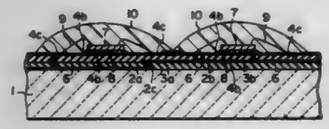
a spring member having upper and lower portions located between said hat and said disc forcing the disc against the chip and forming a narrow peripheral gap between the conical portion of said disc and said tapered surface of said hat; and

conductive thermal grease filled in said peripheral gap providing a low interfacial thermal resistance between the disc and the hat.

4,639,830
PACKAGED ELECTRONIC DEVICE

Yoshitaka Fukuoka, Hamuramachi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 28, 1985, Ser. No. 716,980
Claims priority, application Japan, Mar. 31, 1984, 59-64747
Int. Cl.[4] H05K *1/03*
U.S. Cl. 361—411 5 Claims

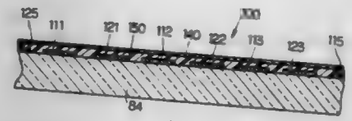


1. An electronic device comprising a thick film, multilayer interconnection substrate on which wiring conductor patterns, conductor patterns for connecting input/output leads, conductor patterns for mounting integrated circuit chips and the like and wiring are formed, a noncrystallizing glass formed on said substrate, except for said conductor patterns for connecting input/output leads, said conductor patterns for mounting integrated chips and the like and said wiring, a crystallizing glass layer formed on said noncrystallizing glass layer and a hardening composition potted on said crystallizing glass layer to cover said conductor patterns for connecting input/output leads, said conductor patterns for mounting integrated circuit chips and the like and said wiring.

4,639,831
SENSOR FOR DETECTING AN AMOUNT OF RAIN

Motomi Iyoda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Feb. 4, 1986, Ser. No. 825,991
Claims priority, application Japan, Feb. 15, 1985, 60-20645[U]; Nov. 29, 1985, 60-269830
Int. Cl.[4] H01G *5/20*; G01R *27/26*
U.S. Cl. 361—286 20 Claims



1. A sensor for detecting an amount of rain comprising:

a first conductor member being made of transparent material, the first conductor member including a plurality of first projections, each of the plurality of first projections being spaced from the other of the plurality of first projections;

a second conductor member being made of transparent material, the second conductor member including a plurality of second projections, each of the plurality second projections being spaced from the other of the plurality of second projections, at least one of the plurality of second projections being inserted between two of the plurality of first projections of said first conductor member with a clearance, said first conductor member being insulted electrically from said second conductor member by the clearance; and

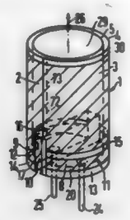
a first insulating member being mounted on said first and second conductor members, said first insulating member being made from a first transparent material.

4,639,832

CONSOLIDATED WINDING ELECTRICAL CAPACITOR AND METHOD FOR THE MANUFACTURE THEREOF

Reinhard Behn, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 13, 1986, Ser. No. 862,822
Claims priority, application Fed. Rep. of Germany, May 14, 1985, 3517435
Int. Cl.[4] H02B *1/04;* H01G *13/06, 4/08*
U.S. Cl. 361—306 21 Claims



1. An electrical capacitor, comprising:

a plurality of dielectric bands of stretched plastic film wound together with one another to form a consolidated winding having first and second opposite end faces;

the bands having a regenerably thin metal layer thereon as a coating;

at the first end face of the capacitor an incision being provided in the wound bands, said incision proceeding in a direction of and approximately along a central longitudinal axis of the winding, said incision forming a plurality of individual projections along a first side edge of each band;

metal-free insulating strips being extending longitudinally in a winding direction of and at alternate projections in each band and such that the metal-free insulating strips alternate in aligned projections of adjacent bands;

a depth of the incision being at least sufficient to intersect the metal-free insulating strip and thus electrically isolate an end of those projections having the metal-free insulating strip;

the individual projections of the bands combining to form two major projections at said first end face as a result of the incision; and

ends of the two major projections of the consolidated winding being provided with respective metal contacting layers, a contact surface thus being formed at ends of each major projection.

4,639,833

NEW ELECTRICAL INSULATING OIL AND OIL-FILLED ELECTRICAL APPLIANCES

Atsushi Sato, Tokyo; Keiji Endo, Yokosuka; Shigenobu Kawakami, Ichikawa, and Hideyuki Dohi, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Ltd., Japan

Filed Aug. 12, 1985, Ser. No. 764,873
Claims priority, application Japan, Aug. 18, 1984, 59-172240
Int. Cl.[5] H01G *4/22;* H01B *3/22*
U.S. Cl. 361—315 7 Claims

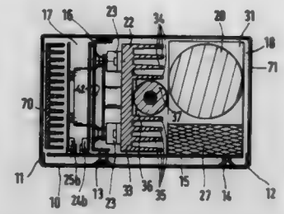
1. An electrical insulating oil which comprises an isomer mixture of dibenzylbenzenes in which the quantity of p-dibenzylbenzene is not more than 10% by weight and the weight ratio of m-dibenzylbenzene/o-dibenzylbenzene is not lower than 3.

4,639,834

POWER SUPPLY

Hartwig Mayer, Neckargerach, Fed. Rep. of Germany, assignor to CEAG Licht- und Stromversorgungstechnik GmbH, Bochum, Fed. Rep. of Germany

Filed Nov. 8, 1985, Ser. No. 797,001
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1984, 3440756
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—388 12 Claims



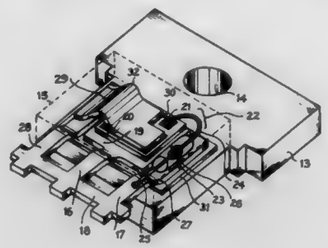
1. Power supply, comprising a housing having a bottom, a partition at said bottom of said housing extended perpendicular to said bottom of said housing as seen in longitudinal direction of said partition subdividing said housing into first and second spaces, electronic modules including switching and control stages exclusively disposed in said first space and at least one other module disposed in said second space, a power transformer fastened to said partition, extended through an opening formed in said partition and having a primary side disposed in said first space in vicinity of said switching stage, and a circuit board spaced from said bottom of said housing having conductor runs forming connecting lines interconnecting said modules.

4,639,835

DEVICE OBTAINED BY MOUNTING TWO SEMICONDUCTOR COMPONENTS WITHIN A SINGLE HOUSING

Francis Daubresse, La Mombralle Choisille, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 15, 1985, Ser. No. 787,063
Claims priority, application France, Oct. 16, 1984, 84 15817
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—392 5 Claims



1. Electronic component incorporating two semiconductor components within a common housing, this common housing having at least two outlet connector pins, one of which is electrically connected to a rear face of a first semiconductor chip in order to form a first component, this first chip furthermore comprising at least one first metallized zone on its front face wherein the second component is constituted by a semiconductor chip encapsulated within a sealed housing provided with two outlet electrodes and wherein one of these electrodes is welded to the said metallized zone whereas the other is welded to the second connector pin.

4,639,836

UNENCAPSULATED CHIP CAPACITOR

Harris L. Crowley, Jr., Simpsonville, S.C., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 19, 1984, Ser. No. 683,796
Int. Cl.[4] H01G *9/00*
U.S. Cl. 361—433 3 Claims



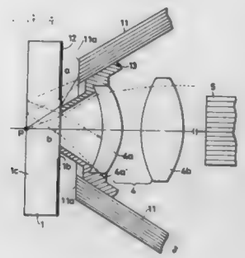
1. A solid unencapsulated electrolytic capacitor of substantially rectangular cross section comprising a tantalum anode body having a relatively short axial lead wire extending from one end and having a peripheral uneven manganese dioxide layer which is mostly covered by metallization but which is exposed at said end of the capacitor body from which the axial lead wire extends; a metal anode strip transverse to said axial lead wire joined thereto and spaced from said end of the capacitor body and being coextensive with an edge region of said end of said capacitor body; a thin, electrically insulative, adherent oxide coating bonded to and interlocking only with the peripheral manganese dioxide layer at said edge region and being formed of microscopic leaflike interlocking particles of oxide.

4,639,837

ILLUMINATING OPTICAL SYSTEM FOR HIGH MAGNIFICATION ENDOSCOPES

Akira Yokota, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1985, Ser. No. 717,093
Claims priority, application Japan, Mar. 29, 1984, 59-061768
Int. Cl.[4] F21V *7/04*
U.S. Cl. 362—32 9 Claims



1. An illuminating optical system for high magnification endoscopes, comprising:

an observation optical system;

a cover glass disposed on the light incident side of said observation optical system;

a light guide disposed around said observation optical system in an annular form tapering toward said cover glass; and

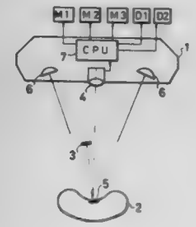
a flare stop defining a predetermined opening and disposed between a light-emitting end of said light guide and an object side surface of said cover glass and having a diameter arranged so that light emitted from an innermost end of said light guide and passing through the a peripheral edge of said opening is led out of said observation optical system after being reflected by the object side surface of said cover glass.

4,639,838

SHADOWLESS LIGHTING EQUIPMENT FOR MEDICAL USE

Yasuhiro Kato, and Mitsuhiro Koyama, both of Tokyo, Japan, assignors to Yamada Iryo Shomei Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1985, Ser. No. 793,979
Claims priority, application Japan, Mar. 30, 1985, 60-65058
Int. Cl.[4] F21M *1/00;* A61B *6/08*
U.S. Cl. 362—33 10 Claims



1. A shadowless lighting equipment for medical use comprising:

a means for lighting a patient positioned on an operating table;

a means for emitting a wave beam on a predetermined portion of said patient so as to form an irradiation area thereon;

a means for receiving a wave beam reflected from said predetermined portion of said patient and for forming an image of said irradiation area;

a means for comparing received information regarding an image forming position by said image forming means with received information regarding a light concentration position of said lighting means and for generating an output containing information regarding a positional difference between said image forming position and said light concentration position when said former position is shifted from said later position; and

a means for driving said lighting means in response to said output from said comparing means until said light concentration position is the same as said image forming position.

4,639,839

VEHICULAR LIGHTING DEVICE HAVING A POWER DRIVEN LAMP COVER

Kenji Miyazawa, Shizuoka, Japan, assignor to Koito Seisakusho Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1986, Ser. No. 833,865
Claims priority, application Japan, Aug. 9, 1985, 60-175492
Int. Cl.[4] F21V *17/00*
U.S. Cl. 362—64 8 Claims

1. A lighting device for vehicular use, comprising:

(a) a lamp assembly comprising:

(1) a lamp housing having a front side; and

(2) a light source within the lamp housing for providing illumination through the front side thereof;

(b) a lamp cover mounted to the lamp housing of the lamp assembly for pivotal motion between an open position, where the lamp cover uncovers the front side of the lamp

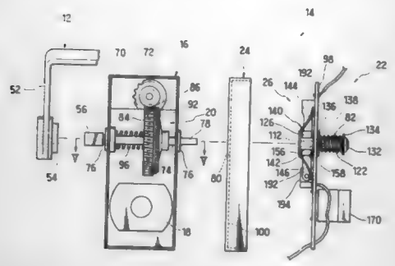
housing, and a closed position where the lamp cover covers the front side of the lamp housing;

(c) a lamp cover drive mechanism mounted to the lamp housing of the lamp assembly for pivoting the lamp cover between the open and closed positions, the lamp cover drive mechanism comprising:

(1) a reversible electric drive motor;

(2) a drive shaft coupled to the lamp cover for pivoting the same between the open and closed positions by being driven by the drive motor; and

(3) a torque limiter interposed between the drive motor and the drive shaft for protecting the drive motor from overloading, the torque limiter normally causing the drive motor to drive the drive shaft and permitting the drive motor to rotate independently of the drive shaft upon jamming of the lamp cover; and



(d) an electric control circuit comprising:

(1) a lamp/cover control switch;

(2) first circuit means responsive to the actuation of the lamp/cover control switch for causing the drive motor of the lamp cover drive mechanism to rotate in a predetermined direction to an extent necessary for pivoting the lamp cover from the closed to the open position, the first circuit means being further responsive to the deactuation of the lamp/cover control switch for causing the drive motor to rotate in an opposite direction to an extent necessary for pivoting the lamp cover from the open to to the closed position; and

(3) second circuit means associated with the first circuit means for lighting up the light source of the lamp assembly when the lamp cover is in the open position.

4,639,840

VEHICLE HEADLAMP ASSEMBLY

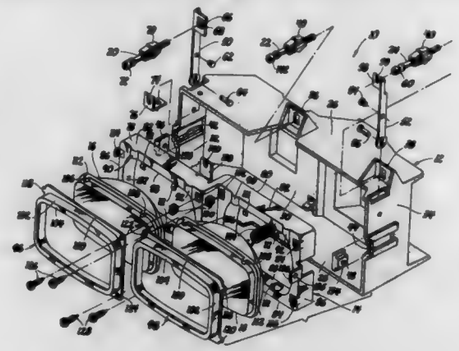
David R. McMahan, and Richard W. Nicholas, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 677,697, Dec. 3, 1984, abandoned. This application Jun. 10, 1985, Ser. No. 743,088

Int. Cl.[4] B60Q *1/04*

U.S. Cl. 362—80 **3 Claims**

1. A headlamp assembly for a vehicle body having a front end, said headlamp assembly adapted to be mounted to said vehicle body at the front end thereof and including a support bracket providing adjustable aiming movement of a headlamp unit, said headlamp unit being rectangular in configuration and having a peripheral flange provided with an outer vertical surface, said outer vertical surface having three aiming pads that define an aiming plane, said support bracket having a front face, three projections connected to said front face of said support bracket for defining a substantially vertically orientated seating plane, a retainer for maintaining said headlamp unit in said support bracket, said retainer having an outer end and an inner end, said outer end being formed with a radially inwardly extending rim portion and having the inner end of said retainer formed with an edge located in a plane parallel to the plane of said rim portion, fastener means for connecting said retainer to said support bracket so that said edge of said retainer contacts said three projections of said support bracket so as to cause said plane of said rim portion to be located parallel to said seating plane of said three projections, and spring means between said support bracket and said headlamp



unit for biasing the latter towards said retainer so that said aiming pads of said headlamp unit are seated on said rim portion of said retainer to automatically aim the headlamp unit without requiring readjustment of said support bracket.

4,639,841

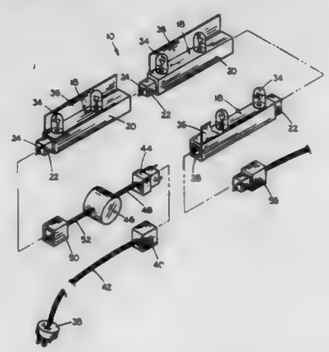
MODULAR LIGHTING SYSTEM

Charles B. Salestrom, No. 2 Seminole La., and Kenneth E. Anderson, No. 9 N. Lake Dr., both of Kearney, Nebr. 68847

Filed Jan. 13, 1986, Ser. No. 817,988

Int. Cl.[4] F21M *33/00*

U.S. Cl. 362—227 **7 Claims**



1. A modular lighting system, comprising,

a plurality of elongated light modules selectively connected in an end-to-end relationship,

each of said elongated light modules having a male plug portion at one end thereof and a female plug portion at its other end,

first electric circuit means electrically connecting said male and female plug portions,

a plurality of light sockets provided on each of said modules and being electrically connected to said first electric circuit means,

a light bulb means in each of said light sockets,

the male plug portion of each of said modules adapted to be:

(1) received by the female plug portion of the adjacent module, or:

(2) electrically connected to a source of electrical energy, or:

(3) electrically connected to a female plug portion of a module separated therefrom whereby the length of the modular lighting system may be varied by the use of more or less modules.

4,639,842

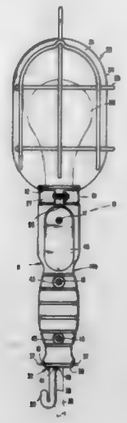
TROUBLE LIGHT WITH ROTATABLE ATTACHING MEANS

James E. Upchurch, Indianapolis, Ind., assignor to Woods Wire Products, Inc., Carmel, Ind.

Filed Oct. 28, 1985, Ser. No. 792,029

Int. Cl.[4] F21V *15/00*

U.S. Cl. 362—376 **16 Claims**



1. A light comprising:

a generally cylindrical, hollow, elongated handle shaped to be comfortably held in the hand and having a distal end and a proximate end, said handle having a first longitudinal axis;

an incandescent light bulb socket located in the distal end;

said distal end being open and internally sized to receive the incandescent light bulb socket, said proximate end having an end wall enclosing said proximate end;

switch means electrically connected to said incandescent light bulb socket for controlling the flow of electricity to said incandescent light bulb socket;

wiring means connectable to an external electric source, designed and arranged to supply electricity to said switch means;

a two-piece cage sized to permit an incandescent light bulb to be inserted therein, said cage having a first piece being manufactured of opaque material and being designed and arranged to protect an incandescent light bulb inserted in said socket and reflect the light emitted therefrom, said cage having a second piece and being of a grid design to allow light from said bulb to emit therethrough;

an attachment means for attaching said cage to the distal end of said handle;

a hanging means for hanging said light; and,

rotatable mounting means for rotatably mounting the hanging means to the end wall and configured to allow the light assembly to be hung with said electrical socket therebeneath opening downward wherein the rotatable mounting means for rotatably mounting the hanging means comprises:

receiving means including a hole in the end wall enclosing the proximate end of said handle, sized to allow an electrical cord to pass therethrough, said hole being concentric about the longitudinal axis of the handle; and further comprising

a first disc and a second disc;

a cylindrical intermediate portion integrally joining said first disc and said second disc to form a rotation assembly,

said rotation assembly having a second longitudinal axis and being concentric about said second axis;

said first disc and second disc having outside diameters greater than the outside diameter of said cylindrical intermediate portion;

said first disc being sized to fit within the inside diameter of said handle, said cylindrical intermediate portion having an outside diameter sized to fit within the hole in the proximate end of said handle, said second disc having an outside diameter which approximates the outside diameter of said handle, said cylindrical intermediate portion having a length slightly greater than the thickness of the end wall enclosing the proximate end of said handle to allow for the sides of the first disc and second disc to be in frictional contact with the end wall of said handle; and,

said rotation assembly seated in the hole in the proximate end of said handle so that the sides of the first disc and second disc are in frictional contact with the wall enclosing the proximate end of said handle.

4,639,843

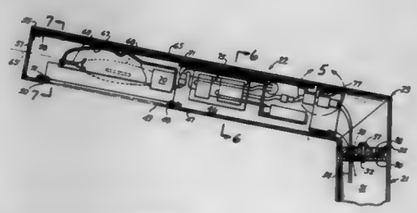
LUMINAIRE

Wayne W. Compton, Chino Hills, Calif., assignor to Kidde Consumer Durables, Corporation, City of Industry, Calif.

Filed Apr. 10, 1985, Ser. No. 722,125

Int. Cl.[4] F21V *19/02*

U.S. Cl. 362—431 **12 Claims**



1. A luminaire comprising:

a post;

an arm supported by said post, said arm comprising: a body having an internal chamber; a peripheral wall; an aperture formed through said wall; and light transmissive means closing said aperture;

an opening through said body giving access to said chamber;

a removable closure adapted to close said opening;

track means in said chamber said track means having an axis;

mount means in said chamber adapted to be releasably retained by said track means and slidable along said axis;

reflector means mounted to said mount means facing toward said aperture and adapted to mount a lamp;

circuit means mounted to said mount means and connected to said lamp; and

electrical disconnect means between said circuit means and a source of electrical current, said disconnect means including a first connector mounted to said arm and a second connector mounted to said mount means, said connectors being axially aligned, whereby to make a circuit connection when said mount means is moved so as to join them, and to break said connection when said mount means is moved sufficiently to separate them, after which the mount means may be released from said track means, said mount means, with the reflector and lamps mounted to it, being insertable into said chamber through said opening when said closure does not close said opening.

4,639,844

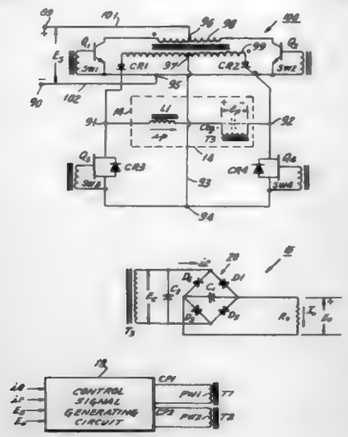
RESONANT CURRENT DRIVEN POWER SOURCE FOR LOW INPUT VOLTAGES

George C. Gallios, Setauket, and Charles Lien, Huntington, both of N.Y., assignors to Venus Scientific Inc., Farmingdale, N.Y.

Continuation-in-part of Ser. No. 417,465, Sep. 13, 1982, Pat. No. 4,475,149. This application Aug. 6, 1984, Ser. No. 637,779

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—17 21 Claims



1. A power source comprising:

an LC circuit including an inductor and a capacitor electrically coupled to one another;

an input inverter circuit for converting an input DC voltage into an AC voltage having substantially no DC components, said input inverter circuit applying said AC voltage across said LC circuit in a manner which causes said inductor and capacitor to resonate with one another, a resonant AC voltaage thereby appearing across said capacitor; and

an output circuit for applying power from said inverter circuit to a load;

said input inverter including a step-up transformer having a center-tapped primary to which said DC voltage is applied and having a center-tapped secondary through which said AC voltage is applied across said LC circuit for stepping up the input DC voltage to improve the operating efficiency of the power source for low input voltages.

4,639,845

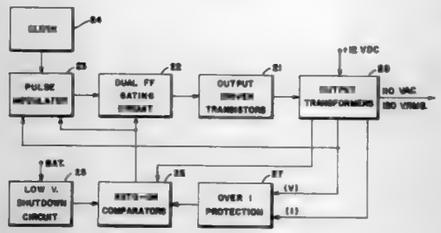
VOLTAGE INVERTER

Eric G. Persson, Minneapolis, and Ronald D. Veith, St. Peter, both of Minn., assignors to GTO Electronics, St. Peter, Minn.

Filed May 11, 1984, Ser. No. 609,470

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—26 5 Claims



1. A voltage inverter comprising:

clocking means for producing a clock signal;

output drive transistors for switching DC voltage in response to first and second drive signals;

primary output transformer means connected to said output drive transistors for commutation of said switched DC voltage through said transformer;

power output transformer means controlled by said primary transformer means for commutating of DC power through to an inverter output to produce an AC voltage;

voltage sensing means connected to said power output transformer means for producing a first feedback signal indicative of the magnitude of the AC voltage output;

pulse modulation means receiving said clock signal and said first feedback signal and operative in response thereto for producing first and second square wave control signals, the phase relationship between said control signals being varied according to the magnitude of the AC voltage output; and

gating circuit means receiving said first and second square wave control signals for producing said first and second drive signals such that the first drive signal always has a greater active duty cycle than the second drive signal, causing said output drive transistors to be simultaneously active for the period of overlap between the active duty cycles of said first and second drive signals whereby the magnetic field in said primary output transformer is dynamically switched suppressing voltage spikes on said inverter output.

4,639,846

METHOD AND COMPENSATING DEVICE FOR COMPENSATING CURRENT OSCILLATIONS

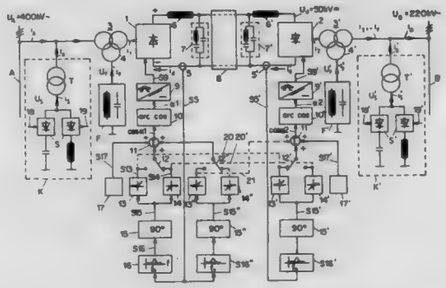
Peter Dähler, Remigen; Peter Neidhart, Untersiggenthal, both of Switzerland; Kadry Sadek, Lauchringen, Fed. Rep. of Germany, and Herbert Stemmler, Kirchdorf, Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 19, 1986, Ser. No. 830,721

Claims priority, application Switzerland, Aug. 16, 1985, 3547/85

Int. Cl.[4] H02J *1/02*

U.S. Cl. 363—39 9 Claims



1. Method for compensating current oscillations in a direct-current link circuit between at least one first static converter or link-circuit rectifier (1) and at least one second static converter or link-circuit inverter (2), particularly for compensating current oscillations in a high-voltage direct-current transmission system,

(a) in which arrangement at least one direct-current link-circuit current signal (S5, S5'), which characterises the current oscillations, is detected and

(b) an inverter is controlled in dependence on this direct-current link-circuit current signal, with the aim of compensating the current oscillations,

characterised in that,

(c) additionally also at least one phase control angle (α 1) of the link-circuit rectifier (1) is controlled in dependence on at least one direct-current link-circuit current signal.

4,639,847

CIRCUIT ARRANGEMENT FOR CONTROLLED POWER SUPPLY DEVICES PARTICULARLY FOR AUTOCONVERTERS

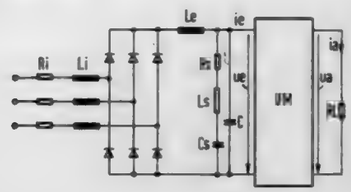
Bogdan Brakus, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 8, 1985, Ser. No. 731,740

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1984, 3420908

Int. Cl.[4] H02M *1/14*

U.S. Cl. 363—46 4 Claims



1. A circuit for a controlled power supply device connectable to a feed network, said device having a controlled circuit portion exhibiting a negative input impedance in at least a portion of its operating range, and an input circuit portion, said input circuit portion being a filter having at least a series inductance and a shunt capacitance for suppressing disruptions to the feed network, said circuit comprising:

a series resonant circuit having a further inductance, a further capacitance and an ohmic resistance connected in a shunt branch of said filter, said series resonant circuit having a resonant frequency substantially equal to the resonant frequency of said filter formed by said series inductance and said shunt capacitance;

the capacitance of the filter being larger than the capacitance of the series resonant circuit and the inductance of the filter being smaller than the inductance of the series resonant circuit such that the impedance of the combination of said filter and said series resonant circuit has minimum at said resonant frequency, and further has respective maxima at a lower resonant frequency defined by the inductance of the filter and the capacitance of the series resonant circuit, and at a higher resonant frequency defined by the capacitance of the filter and the inductance of the series resonant circuit; and

the ohmic damping resistance of the series resonant circuit has value such that at both said upper and lower resonant frequencies undamping of said controlled circuit portion is overcompensated by said negative input impedance.

4,639,848

METHOD AND SYSTEM FOR CONTROLLING AN AC-DC CONVERTER SYSTEM

Takami Sakai, Akishima, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 22, 1985, Ser. No. 736,781

Claims priority, application Japan, May 24, 1984, 59-103614

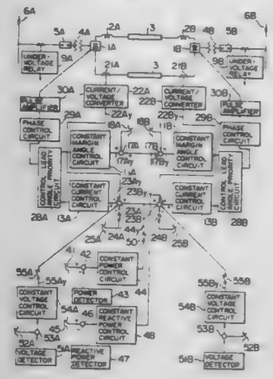
Int. Cl.[4] H02H *7/00*

U.S. Cl. 363—51 7 Claims

1. A method for controlling an AC-DC converter system including a plurality of AC-DC converters having respective AC terminals connected to separate ones of a plurality of AC power systems and having respective DC terminals connected to each other, comprising the steps of:

detecting a fault in any one of said plurality of AC power systems; and

adjusting, when a fault occurs in a faulty one of the plurality of AC power systems, the DC current of the AC-DC converter which is connected to a sound AC power system of said plurality of power systems in such a manner as to maintain the AC voltage of the AC-DC converter



which is connected to said sound AC power system at a desired value.

4,639,849

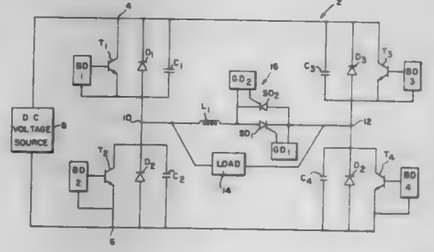
SNUBBER CIRCUIT FOR H.F. BRIDGE CONVERTER

Zbigniew Noworolski, Willowvale, and Jerzy Ferens, Toronto, both of Canada, assignors to International Exide Electronics/-Corporation, Raleigh, N.C.

Filed May 8, 1985, Ser. No. 731,895

Int. Cl.[4] H02H *7/122*

U.S. Cl. 363—56 3 Claims



1. A high-frequency bridge converter circuit for converting a direct-current input voltage to a high-frequency alternating-current output voltage, comprising

(a) a plurality of current-conducting first switching devices (T_1–T_4) each including a control electrode and a pair of power circuit electrodes;

(b) means connecting said first switching devices to define a four-armed bridge circuit having a pair of input terminals adapted for connection across a direct-current voltage source, and a pair of output terminals adapted for connection across a load, the power circuit electrodes of first and second pairs of said first switching devices T_1, T_2, T_3, T_4) being connected in series to define first and second current paths extending in the same direction between said input terminals, respectively, said output terminals being located at the junctions between the switching devices of each pair, respectively, said bridge circuit also including

(1) a plurality of capacitors (C_1–C_4) connected across the power circuit electrodes of said switching devices, respectively;

(2) a plurality of blocking diodes (D_1–D_4) connected across said switching devices, respectively; and

(3) first control means (BD_1–BD_4) for alternately switching the pairs of first switching devices contained in diagonally opposite arms (T_1, T_4; T_2, T_3) of said bridge

circuit between oppositely conducting and non-conducting conditions, respectively, said first control means being operable to cause one arm to be conductive at a time (t_5,t_8) delayed from the time (t_4,t_7) at which the other arm is caused to be non-conductive, respectively, and;

(c) snubber circuit means connected between said bridge output terminals for controlling the discharging of said capacitors during the operation of said first switching devices, respectively, said snubber circuit means including

(1) an inductor (L_1) connected at one end with one of said output terminals,

(2) means including a pair of parallel-connected oppositely-poled second switching means with reverse blocking characteristics (SD_1, SD_2) connecting the other end of said inductor with the other output terminal, and

(3) second control means (GD_1, GD_2) for operating said second switching means to connect in series with said inductor those capacitors (C_1, C_4; C_2, C_3) that are charged when the state of conduction of the arms of said bridge circuit is reversed, respectively, said second control means being operable at the times (t_4, t_7) at which the arms are switched to their non-conductive conditions, respectively.

4,639,850

POWER CONVERTER DEVICE

Takeaki Aseeda, Kobe; Toru Nakamura, Akashi, and Takashi Yutani, Kobe, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

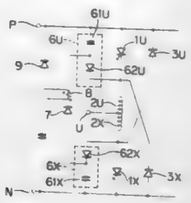
PCT No. PCT/JP84/00144, § 371 Date Sep. 20, 1984, § 102(e) Date Sep. 20, 1984, PCT Pub. No. WO84/04004, PCT Pub. Date Oct. 11, 1984

PCT Filed Mar. 28, 1984, Ser. No. 650,370

Claims priority, application Japan, Mar. 29, 1983, 58-55596

Int. Cl.⁴ H02H *7/122*

U.S. Cl. 363—58 **4 Claims**



1. A power conversion device for converting D-C input power across a pair of electrodes of a D-C bus into an A-C load power across a pair of reactors, said device comprising:

self-extinguishing switching elements connected in series across said electrodes;

corresponding snubbers connected in parallel with said switching elements, each of said snubbers having a capacitor connected to one of said electrodes and a diode in series with said capacitor;

a capacitor-discharging circuit having a diode and connected across the diodes of said snubbers providing a current path for discharging said snubbers;

a power source feedback circuit for returning discharging current from said snubbers to said source, said feedback circuit including:

a diode and a current transformer in said discharge circuit and connected across said electrodes of said bus.

4,639,851

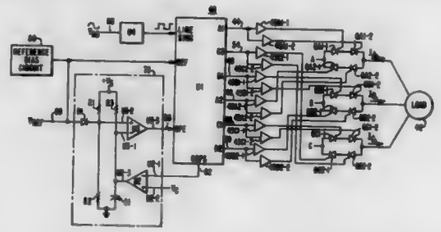
METHOD AND APPARATUS FOR FIRING ANGLE CONTROL OF SERIES CONNECTED THYRISTOR SWITCHES

Frederick O. Johnson, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1985, Ser. No. 727,174

Int. Cl.⁴ H02M *5/257*

U.S. Cl. 363—164 **6 Claims**



1. In an AC firing angle control circuit having as inputs thereto a reference control signal and a gate firing enable signal for producing a fixed frequency, variable voltage output to an electrical load having a unity or lagging power factor via a thyristor string in each phase having at least two series-connected thyristors with the firing angle control circuit using coincident sequential gate firing signals for the phase angle firing of the thyristor string, the firing angle control being responsive to the reference control signal for controlling the delay for the phase angle firing of the thyristor: with the thyristors being responsive to the gate firing signals only when the gate firing enable signal is present, a method for preventing voltage imbalance across the series connected thyristors during reversed voltage operation thereof, comprising:

controlling the phase angle firing of the thyristors as a function of the reference control signal such that the delay for the phase angle firing advances toward 0° as the reference signal increases toward a maximum value with the maximum delay in phase angle corresponding to the minimum value for the reference signal that is necessary for coincident sequential gate firing to occur thereby providing current to the electrical load; and

controlling the gate firing enable signal as a function of the reference signal such that, as the reference signal decreases, the length of presence of the gate enable signal decreases so that, whenever the delay in the phase angle firing determined by the reference signal would cause the string of thyristors to be fired at a time when the thyristors are reversed biased by the applied phase voltage, the gate firing enable signal is removed until the next occurrence of coincident sequential firing for the string of thyristors.

4,639,852

PROCESS CONTROL SYSTEM

Takehiko Motomiya, Tokyo, Japan, assignor to Ohkura Electric Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1984, Ser. No. 657,407

Claims priority, application Japan, Nov. 24, 1983, 58-221139

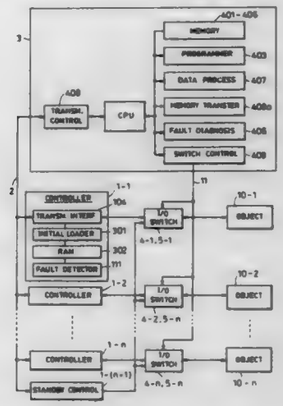
Int. Cl.⁴ G06F *15/46*

U.S. Cl. 364—138 **4 Claims**

1. A process control system for controlling process variables of a process at different portions thereof, the process control system comprising:

a plurality of controllers coupled to a process at different portions thereof to control process variables thereat, each controller having, coupled together, an initial load means for loading, an input interface means for receiving input signals representing measured value of a process variable being controlled, an output interface means for sending out output signals to a corresponding portion of the process, a random access memory (RAM) means, a central processing unit (CPU), a fault detector circuit producing a detection signal upon detection of controller runaway, and a transmission interface, said RAM means for storing a control program and control information including a set point of the process variable being controlled and the measured value of said process variable, said CPU running said control program so as to produce the output signals based on said input signals and said control information, said output signals acting on said portion of the process so as to minimize difference between said set point and said measured value of the variable being controlled;

a supervisory computer having, coupled together, a memory means for storing the control informations of said controllers, said control informations covering said set points of the variables being controlled, operating modules for effecting mathematical operations, operating loops, operating modes, parameters of the controllers and said detection signals, said operating modes being formulated by said supervisory computer by selectively combining said operating modules and said parameters so as to selectively produce different combinations of on-off, proportional, derivative, and integral control actions; a programmer means for automatically editing control programs for said



controllers based on said control information; and a transmission control means controlling signal transmission both between said transmission interface of the controllers and said memory means and between said transmission interface of the controllers and said programmer means; and

transmission lines extending between said transmission interfaces of the controllers and said transmission control means of the supervisory computer, whereby, said supervisory computer selectively transmits initial control programs and initial parameters to individual controllers for loading therein through said initial loader means so as to start said controllers with the initially loaded control programs and parameters, while during operation each controller samples relevant control parameters through said means for receiving input signals and transmits the sampled parameters to said supervisory computer so as to update the control parameters stored in the memory means thereof, and in response to the detection signal said programmer means of the supervisory computer automatically edits the control program of the runaway-detected controller immediately before the runaway based on the updated control information and said transmission control means of the supervisory computer transmits the thus edited control program to the runaway-detected controller.

4,639,853

TIME-DISCRETE ADAPTIVE SWITCHING ON-OFF CONTROLLER

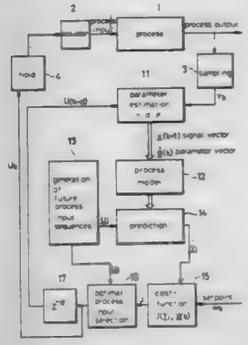
Heinrich Rake; Ulrich Hoffmann; Ulrich Müller; Rudolf Breddermann, all of Aachen, and Rainer Blumbach, Würselen, all of Fed. Rep. of Germany, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jun. 1, 1984, Ser. No. 616,196

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320224

Int. Cl.⁴ G05B *13/04, 13/02, 13/00, 21/02*

U.S. Cl. 364—149 **15 Claims**



14. An apparatus used in the transient phase of a process to be controlled comprising:

means for generating a process input sequence within which only one switching of an actuating signal occurs, the switching occurring after a first sampling interval of the process input sequence,

means for predicting a process output sequence over a number of future sampling intervals as a response to the process input sequence generated that is applied to a discrete-time linear process model, and further predicting the extremal point of the process output sequence, and

means for selecting an actuating signal for the next sampling interval from the process input sequence generated, if a system deviation in the extremal point of the future process output sequence is of such a nature that no overshooting of the process output occurs, and for selecting, where overshooting of a process occurs, an actuating signal for the next sampling interval that results from a switching of such actuating signal to its counteracting level that is for the first sampling interval of the process input sequence generated.

4,639,854

HIGH GAIN FEEDBACK CONTROL SYSTEM

Kazuo Kurokawa, Ichigayadaimachi, and Tadashi Tanaka, Ueda, both of Japan, assignors to Sanyo Denki Co. Ltd., Kitaotsuka, Japan

Filed Jan. 25, 1984, Ser. No. 573,837

Claims priority, application Japan, Feb. 1, 1983, 58-15155

Int. Cl.⁴ G05B *13/02*

U.S. Cl. 364—157 **5 Claims**

1. A feedback control system comprising:

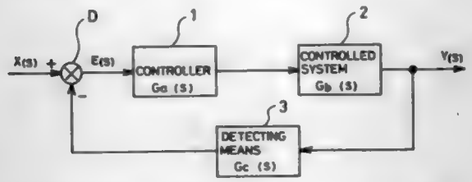
at least one closed loop control system having n poles for a loop transfer function with n being a positive integer of 2 or more;

said closed loop control system comprising a controller having a high gain, said controller receiving a deviation signal E(s) and amplifying said deviation signal;

a controlled system controlled depending upon an output from said controller;

a detecting means for detecting a controlled variable Y(s) from said controlled system; and

a summing point for providing said deviation signal E(s) by summing a reference input X(s) with a detecting output from said detecting means;



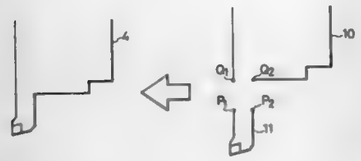
wherein said detecting means has a transfer function determined so as to allow said loop transfer function to have (n−1) zero points.

4,639,855

TOOL DISPLAY METHOD FOR LATHE EQUIPPED WITH NUMERICAL CONTROL UNIT

Katsuhide Sekikawa, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1984, Ser. No. 669,185
Claims priority, application Japan, Nov. 7, 1983, 58-208618
Int. Cl.⁴ G06F *15/00*
U.S. Cl. 364—188 **7 Claims**



1. A tool display method for a lathe equipped with a numerical control unit which comprises a numerical control unit body for controlling said lathe and a configuration display device connected to said control unit body for displaying the configuration of a tool, which method comprises the steps of:

storing a plurality of tool configuration types in a memory in said numerical control unit body;

storing in said memory dimensions of configurations of cutters as functions with respect to a reference dimension according to the tool configuration types thus stored;

inputting a plurality of items of tool data by operating an input section in said numerical control unit body;

selecting an optimum tool configuration type according to the tool data thus inputted;

calculating in an arithmetic section in said numerical control unit dimensions of a cutter configuration according to said tool data with reference to said optimum tool configuration type thus selected;

determining according to said tool data a tool mounting direction and whether or not a tool edge should be displayed; and

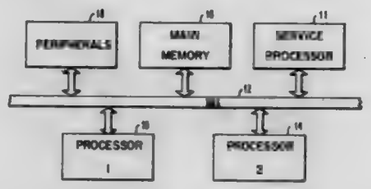
determining a tool configuration according to said selected optimum tool configuration type, the calculated dimensions of said cutter configuration and said tool mounting direction and according to whether or not the edge of said tool should be displayed, synthesizing said tool configuration and a tool post configuration into a turret configuration, and displaying said turret configuration on said configuration display device.

4,639,856

DUAL STREAM PROCESSOR APPARATUS

John Hrustich, Endicott, and Wayne R. Sitler, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 4, 1983, Ser. No. 548,748
Int. Cl.⁴ G06F *11/00*
U.S. Cl. 364—200 **3 Claims**



1. In a multiprocessor computer system including a plurality of processors, service processor means connected to the plurality of processors for developing an output signal in the event a failure occurs within one of the processors, a main memory connected to the plurality of processors for supplyihg instructions and data, I-module means disposed within each of the processors for preventing a current instruction from being re-executed and a next instruction from being executed in response to a trap signal, and control means disposed within each of the processors for controlling the operation of the processor, remaining ones of said plurality of processors attempting to search for data in the one processor prior to searching for the data in the main memory, said control means of the one processor comprising:

first means connected to said service processor means for transmitting a special signal from the one processor to the remaining ones of said plurality of processors in the event said failure occurs within the one processor in response to said output signal from said service processor means, said remaining ones of said plurality of processors neglecting to search for the data in the one processor and searching for the data in the main memory in response to said special signal from said first means of said one processor, said first means including,

latch circuit means for generating a set signal in response to said output signal from said service processor means, and

gate means for generating an output signal in response to said set signal,

said first means transmitting said special signal in response to said output signal from said gate means.

4,639,857

DIGITAL DATA PROCESSOR INCORPORATING AN ORTHOGONALLY CONNECTED LOGIC CELL ARRAY

John V. McCanny, and John G. McWhirter, both of Malvern, England, assignors to The Secretary of State for Defence in her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 406,916, Aug. 10, 1982, Pat. No. 4,533,993. This application May 6, 1985, Ser. No. 730,941
Claims priority, application United Kingdom, Aug. 18, 1981, 8125222
The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.
Int. Cl.⁴ G06F *7/52*
U.S. Cl. 364—200 **10 Claims**

1. A digital data processor for performing a multiplication operation involving generation and accumulation of bit-level product terms, and including:

(1) a two dimensional array of bit level arithmetic logic cells arranged in rows and columns, each cell being arranged to receive input multiplicand, carry and cumulative sum bits and output new carry and cumulative sum bits;

(2) a plurality of storing means each arranged for input and subsequent output of successive bits from a respective cell output in response to clock signal activation;

(3) cell interconnection lines arranged to connect each cell via respective storing means to its immediate row and column neighbors, said lines providing routes through the array for propagation of all input multiplicand bits;

(4) digital data input means for multiplicand input to the array in response to clock signal activation, said input means being arranged to provide input data with relative delays;



(5) clocking means for sole control of calculation execution, the clocking means being arranged to activate the storing means and digital data input means appropriately to synchronize input of successive combinations of bits to each cell, and the storing means, cell interconnection lines, digital data input means and clocking means being arranged in combination so that cumulative sum contributions to output results are accumulated in cascade along routes through the array via successive logic cells;

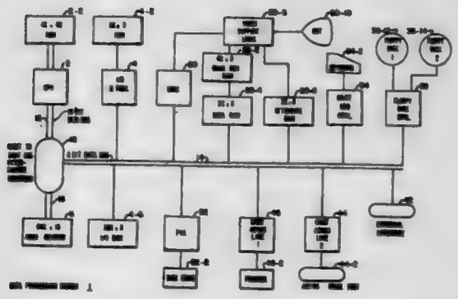
(6) array output lines connected to respective cell outputs appropriate to provide cumulative sums resulting from cell logic operations cascaded through the array.

4,639,858

APPARATUS AND METHOD FOR TESTING AND VERIFYING THE REFRESH LOGIC OF DYNAMIC MOS MEMORIES

Thomas L. Murray, Jr., Merrimack, N.H., and Thomas O. Holtey, Newton, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jul. 5, 1983, Ser. No. 510,711
Int. Cl.⁴ G06F *13/00*; G11C *7/00*
U.S. Cl. 364—200 **8 Claims**



1. A data processing system includes a plurality of metal oxide semiconductor (MOS) dynamic random access memories, each of said plurality of MOS dynamic random access memories having a plurality of MOS chips, each of said plurality of MOS chips storing a plurality of binary bits, each of said binary bits being identified by a row address and a column address, said system further including apparatus for testing and verifying logic which refreshes bit positions of said plurality of MOS chips, said apparatus comprising:

timing means for generating an interrupt signal which cycles between a first and a second state at a predetermined rate;

central processor unit (CPU) means having first means responsive to said interrupt signal at each said first state for generating a plurality of row address signals applied to the plurality of MOS chips for refreshing said bit positions of said plurality of MOS chips, and said CPU means having second means responsive to said interrupt signal at each said first state for generating a refresh signal;

microprocessor means including third means for counting the number of times said refresh signal is generated and generating a refresh count signal in a first state after counting a first predetermined number of said refresh signals;

said microprocessor means further including fourth means coupled to said third means for testing said refresh count signal to determine if it is in said first or a second state and fifth means coupled to said fourth means for storing a test count of the number of times said refresh count signal was in the second state when tested by said fourth means;

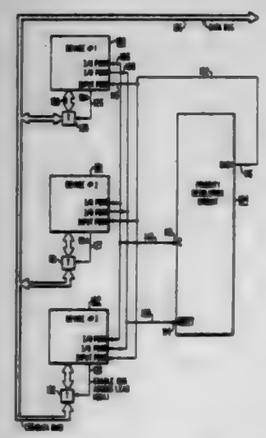
said microprocessor means further including sixth means coupled to said third means for comparing said test count with a second predetermined number, and including seventh means coupled to said sixth means for comparing said test count with a third predetermined number, and eighth means coupled to said sixth and said seventh means for indicating a failure when said test count is less than said second predetermined number or greater than said third predetermined number.

4,639,859

PRIORITY ARBITRATION LOGIC FOR A MULTI-MASTER BUS SYSTEM

Russell G. Ott, Cranford Township, Union County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 24, 1984, Ser. No. 613,410
Int. Cl.⁴ G06F *15/16*; H04Q *9/00*
U.S. Cl. 364—200 **8 Claims**



1. In a system comprising a plurality of devices none, one, some or all of which may be contending for use of a common data bus, a priority resolution circuit for determining which particular device of said plurality of devices shall obtain control of the common data bus, comprising:

first logic means common to all of said devices, comprising:

a first common control bus having one level signal thereon when none of said devices is attempting to obtain control

of the common data bus and another level signal thereon when any one or ones of said devices is/are attempting to obtain control of said common data bus; and

a second common control bus having one level signal thereon when none of said devices has control of said common data bus and another level signal thereon when one of said devices has control of said common data bus;

each of said devices including said particular device comprising second logic means for testing the signal level on said first common control bus and responsive to said one level signal on said first common control bus to then test the signal level on said second common control bus;

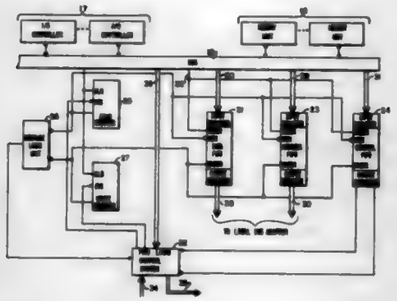
the said second logic means of said particular device being further responsive to said another level signal on said second common control bus to obtain control of said common data bus.

4,639,860

WRAP-AROUND LOGIC FOR INTERPROCESSOR COMMUNICATIONS

Arthur Peters, Sudbury, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 377,300, May 12, 1982, abandoned.
This application Dec. 6, 1985, Ser. No. 806,123
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 4 Claims



1. A data processing system comprising a plurality of units including a central processor unit (CPU), a subordinate processor unit (SUB), a local bus coupled to said (CPU) and (SUB), a local bus adapter coupled to said local bus for the transfer of information in a primary mode of operation directly between the CPU and SUB, an input output unit (I/O) for issuing input output commands to transfer information from the I/O to said CPU and SUB, a common bus coupled to said (I/O) CPU and SUB for providing a path for the transfer of information between the I/O and the CPU and SUB, a common bus adapter including wrap-around logic means coupled to said local bus adapter and to said common bus for capturing information being transferred on the common bus and directing that information to the CPU and SUB, and also for transferring information from the CPU and SUB to the common bus, and said wrap-around logic means in said local bus and common bus adapters for inhibiting transfer of information directly between the CPU and SUB and for returning information from the CPU or SUB utilizing input output commands issued by said I/O, which information has been previously transferred to the common bus under commands issued by said CPU, back through the common bus adapter to the CPU or SUB in a secondary mode of operation;

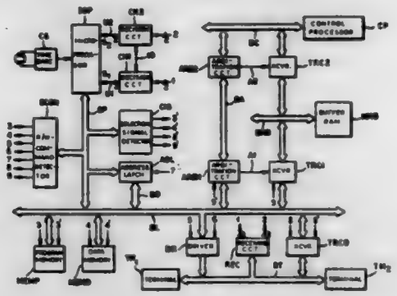
whereby there is provided an alternate route for issuing instructions from the CPU to the SUB, by having the CPU and its SUBs coupled by dedicated private interfaces, with instructions issued directly from the CPU to these interfaces, and whereby the wrap-around logic means detects information that is not to be transferred to the I/O units and accordingly reroutes it back to the CPU or its SUBs.

4,639,861

INTERFACE CONTROLLING BIDIRECTIONAL DATA TRANSFER BETWEEN A SYNCHRONOUS AND AN ASYNCHRONOUS BUS

Silvano Appiano, Montafia d'Asti; Paolo Destefanis, and Cesare Poggio, both of Turin, all of Italy, assignors to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Jan. 20, 1984, Ser. No. 572,579
Claims priority, application Italy, Jan. 21, 1983, 67070 A/83
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—200 3 Claims



1. In a data-handling system wherein a processing unit dialoguing with a plurality of terminals carries out a main program in a temporally uncorrelated manner, with emission and acquisition of data by said processing unit at irregular intervals via an asynchronic two-way bus to each of said terminals, each of said terminals emitting periodically recurring access requests over a common synchronous two-way bus to said processing unit with a minimum recurrence period accommodating a data transfer involving each of said terminals.

the combination therewith of an interface with input/output connections to both said asynchronous bus and said synchronous bus, whereby said interface controls bidirectional transfer of data between said asynchronous bus and said synchronous bus to avoid congestion, said interface comprising:

receiving means connected to said synchronous bus for detecting access requests from any of said terminals;

decision means connected to said receiving means for establishing an order of succession among simultaneously arriving requests from said plurality of terminals;

microprocessing means connected to said decision means for controlling said data transfer between said synchronous bus and said asynchronous bus;

a two-way synchronous internal bus connected to said microprocessing means;

memory means connected to said asynchronous bus and said two-way synchronous internal bus;

first arbitration means for establishing communication of said memory means with said two-way synchronous internal bus in response to instructions from said microprocessing means with simultaneous cutoff of said memory means from said asynchronous bus; and

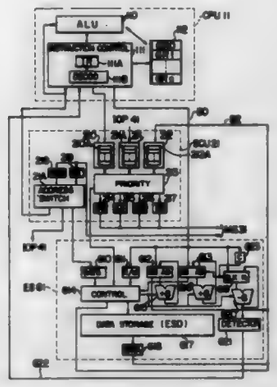
second arbitration means for establishing communication of said memory means with said asynchronous bus in response to instructions from said processing unit, with simultaneous cutoff of said memory means from said two-way synchronous bus.

4,639,862

COMPUTER SYSTEM

Hideo Wada, and Hamio Goto, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 21, 1983, Ser. No. 544,136
Claims priority, application Japan, Mar. 14, 1983, 58-40676
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 5 Claims



1. A computer system comprising

(a) a central processing unit,

(b) a main storage,

(c) a storage control unit for controlling read-out from and writing into said main storage in response to an instruction issued from said central processing unit, and

(d) an extended storage connected to said central processing unit and said storage control unit, wherein

(e) said extended storage includes an address space which is independent of the address space of said main storage,

(f) said central processing unit includes an instruction control for providing said extended storage with an instruction of transferring data between said main storage and said extended storage, said instruction having an instruction code and an operand address consisting of a main storage address and an extended storage address,

(g) said extended storage includes

(i) means for holding the instruction code given by the instruction, the main storage address and the extended storage address, and

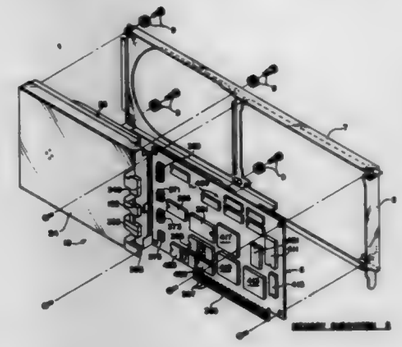
(ii) control means for controlling said extended storage in response to the instruction code received from said means for holding and transferring the main storage address held in said means for holding together with data read out from said extended storage to said storage control unit as a write request into said main storage when said instruction code indicates a read instruction; and for transferring the main storage address held in said means for holding to said storage control unit as a read request from said main storage, receiving data read out from said main storage through said storage control unit and writing said data to said extended storage at said extended storage address held in said means for holding when the instruction code indicates a write instruction.

4,639,863

MODULAR UNITARY DISK FILE SUBSYSTEM

Joel N. Harrison, Monte Sereno; William G. Moon, Sunnyvale, and Randolph H. Graham, Fremont, all of Calif., assignors to Plus Development Corporation, Milpitas, Calif.

Filed Jan. 4, 1985, Ser. No. 741,175
Int. Cl.[4] G06F *1/00*; G11B *5/012*
U.S. Cl. 364—200 20 Claims



13. A rotating disk memory accessory subsystem module for attachment and use entirely within a housing of a host computer at one of a plurality of accessory plug-in location originally provided for a single, substantially flat electronics printed circuit accessory card, the slot location having predetermined actual length and height dimension constraints and a nominal width dimension constraint for a printed circuit accessory card, said width dimension constraint being defined by the distance between adjacent accessory plug-in slot locations, and said length and height dimension constraints being limited by the internal dimensions of said housing, and each of the slot locations further having at least one multiple signal path receptacle aligned and extending longitudinally along a lower attachment surface providing electrical connection to data, address and control buses of the host computer, said subsystem module including:

support frame means for supporting, aligning and providing electrical interconnection of:

a rotating disk assembly including a radially positionable head transducer for flying in close proximity to a data storage surface of at least one rotating data storage disk upon an air bearing created by rotation of said disk, and wherein the data storage surface lies in a plane which is substantially parallel when the subsystem module is installed at the said one slot location to a plane defined by the length and height dimension constraints of the said one location and which plane passes through a longitudinal axis of the said at least one multiple signal path receptacle, and

printed circuit board means for carrying electronics circuitry including:

at least one multiple signal path edge connector aligned and extending along an edge of said printed circuit board means for mating with said at least one multiple signal path receptacle thereby providing direct plug-in attachment, connection and use of said subsystem module with the host computer without cabling at said one slot location, and

said electronics circuitry including:

data transducer position control means for controlling the radial position of the head transducer in relation to user data block locations on the data storage surface,

disk user data controller means for controlling the formatting, storage and retrieval of user data blocks to and from the storage surface via the head transducer, and

interface means connected to said at least one multiple signal path edge connector, said data transducer position control means and said disk user data controller means for obtaining control signals and data blocks from the host computer for storage of said data blocks on the data surface, and for supplying control signals and retrieving data blocks from the data surface and sending said supplied control signals and retrieved data blocks to the host computer via electrical signal paths through the said connector and the said receptacle,

wherein said support frame means, said rotating disk assembly, and said printed circuit board means including said edge connector and said electronics circuitry of the subsystem module are positioned entirely within the actual length and height dimension constraints of the said one slot location entirely within said housing, location, and lie sufficiently within the width dimension constraint thereof without vertical extension and overhang above adjacent slot locations so that slot locations of the host computer situated directly adjacent to the said one slot location are capable of receiving and being occupied by additional structure providing said host computer with at least one additional accessory function when the said subsystem module is installed at the said one slot location of the host computer.

4,639,864

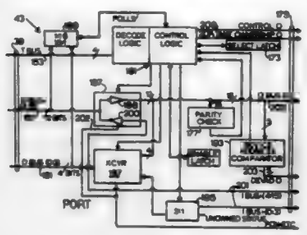
POWER INTERLOCK SYSTEM AND METHOD FOR USE WITH MULTIPROCESSOR SYSTEMS

James A. Katzman, San Jose; Joel F. Bartlett, Palo Alto; Richard M. Bixler, Sunnyvale; William H. Davidow, Atherton; John A. Despotakis, Pleasanton; Peter J. Graziano; Michael D. Green, both of Los Altos; David A. Greig; Steven J. Hayashi, both of Cupertino; David R. Mackie, Ben Lomond; Dennis L. McEvoy, Scotts Valley; James G. Treybig, and Steven W. Wierenga, both of Sunnyvale, all of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Division of Ser. No. 721,043, Sep. 7, 1976. This application May 6, 1980, Ser. No. 147,135

Int. Cl.[4] G06F *15/16, 13/00, 11/00*

U.S. Cl. 364—200 5 Claims



1. A power interlock system for preventing corruption of data on a bus by isolating from the bus logic modules which are usually connected thereto comprising

a plurality of logic modules including interface logic,

a bus connected to the logic modules for communicating data therebetween,

power supply means for supplying power to the logic modules,

voltage monitor means for detecting whether the voltage supplied by the power supply is within a safe power-on range, a safe power-off range, and an unsafe intermediate range,

the interface logic being responsive to the voltage monitor means for operatively isolating a logic module from the bus to prevent corruption of data on the bus when the voltage supplied to that logic module is in the power-off range or the intermediate range by causing the logic module is present a high impedance to the bus.

4,639,865

COMPUTER SYSTEM HAVING CONVERSION OF OPERATION CODES

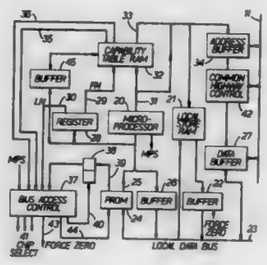
Michael W. Martin, Letchworth, England, assignor to International Computers Limited, London, England

Filed Mar. 19, 1984, Ser. No. 590,962

Claims priority, application United Kingdom, Mar. 24, 1983, 8308149

Int. Cl.[4] G06F *5/00, 9/30*

U.S. Cl. 364—200 2 Claims



1. A computer system comprising:

(a) a store for holding instructions, each of said instructions includes an op-code,

(b) an op-code conversion memory having a plurality of locations, each of said locations contains an op-code value and a control signal.

(c) means for fetching instructions from the store and for utilizing the op-code of each instruction to address the op-code conversion memory to thereby read out an op-code value from one of the locations of the op-code conversion memory, and

(d) a processing unit connected to said op-code conversion memory, for receiving and executing each op-code value read out of the op-code conversion memory,

(e) the op-code values held in a majority of the locations of the op-code conversion memory being equal to the respective op-codes by which they are addressed, those op-codes therefore being passed to the processing unit for execution without modification,

(f) the op-code values held in a minority of the locations of the op-code conversion memory being different from the respective op-codes by which they are addressed, those op-codes therefore being converted into different op-code values before being passed to the processing unit for execution,

(g) the system also including priviledge level indication means having a first state indicating a privileged level of operation and a second state indicating a non-privileged level of operation, the privilege level indication means being connected to receive said control signal from the op-code conversion memory and to provide an output signal thereto; and

(h) means for setting the privilege level indication means to said first state whenever said control signal has a first value, and to said second state whenever said control signal has a second value.

4,639,866

PIPELINED DATA PROCESSING APPARATUS

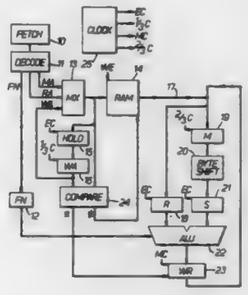
Johnson Loo, Newcastle-Under-Lyme, Great Britain, assignor to International Computers Limited, London, England

Filed Jan. 11, 1985, Ser. No. 690,727

Claims priority, application United Kingdom, Jan. 24, 1984, 8401807

Int. Cl.[4] G06F *9/38*

U.S. Cl. 364—200 7 Claims



1. Pipelined data processing apparatus for obeying a sequence of instructions, comprising:

(a) a memory,

(b) clock means for producing first clock signal defining a clock beat and at least one further clock signal which divides each clock beat into a write sub-beat and at least one read sub-beat,

(c) means responsive to the first clock signal for advancing each instruction through a read phase, an execute phase, and a write phase during successive clock beats,

(d) execution means connected to the memory and operative during each clock beat to perform a function specified by the instruction currently in its execute phase, thereby producing a result for the instruction,

(e) write means operative during the write sub-beat of each clock beat to write to the memory the result of the instruction currently in its write phase,

(f) read means operative during the read sub-beat of each clock beat to read an operand from the memory for the instruction currently in its read phase,

(g) detection means connected to said write means and to said read means for detecting a read/write clash in which the instruction currently in its read phase requires to read from the memory an operand which is about to be written by the instruction currently in its execute phase, and

(h) means connected to said execution means and to said detection means and operative upon detection of said read/write clash, for making the result of the instruction currently in its execute phase directly available as an operand for the instruction currently in its read phase.

4,639,867

DIGITAL FLUOROSCOPY APPARATUS

Motomu Suzuki, Ootawara, and Hiroshi Asahina, Tochigi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 20, 1984, Ser. No. 652,656

Claims priority, application Japan, Sep. 21, 1983, 58-173117

Int. Cl.[4] G06F *15/42;* G06G *7/60*

U.S. Cl. 364—414 8 Claims

1. A digital fluoroscopy apparatus wherein a plurality of X-ray images of an object under examination are sequentially produced and are then converted into a plurality of first analogue image signals comprising:

means for A/D-converting one of the first analogue image signals into first digital image data;

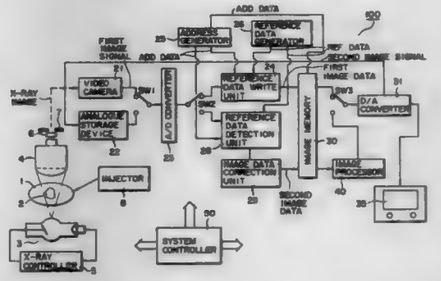
means for generating reference data in a digital form having contrast level information with respect to the X-ray images;

means for generating address data in a digital form;

means for writing, based upon the address data, the reference data into a given data position of the first image data where no medical information is contained;

means for digitally storing the first image data into which the reference data has been written;

means for D/A-converting the first image data derived from the digital storage means into a second analogue image signal having D/A-converted reference data;



analogue storage means for storing the second analogue image signal having the D/A-converted reference data;

means for detecting reference data of second image data derived from the analogue storage means, which has been A/D-converted by the A/D converter means so as to obtain level variations of the A/D-converted reference data written into the second image data from the reference data generated by the reference data generation means; and

means for correcting contrast levels of the second image data detected by the reference data detection means based upon the detected level variations.

4,639,868

CONTROL METHOD FOR DRILLING APPARATUS WHICH MAKES USE OF A FINAL DRILLING PATTERN TRANSFORMED FROM PRIMARY AND SECONDARY PATTERNS

Kazumoto Tanaka, Hiroshima; Toru Mashimo; Osamu Sato, both of Higashihiroshima, and Toyohiko Kobayashi, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 19, 1985, Ser. No. 713,493

Claims priority, application Japan, Mar. 24, 1984, 59-56797

Int. Cl.[4] G06F *15/20;* E21B *7/00*

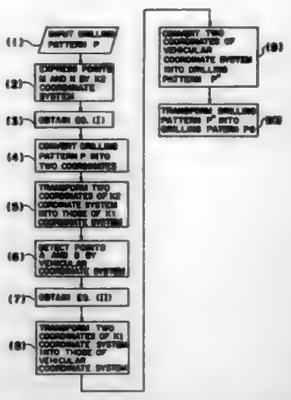
U.S. Cl. 364—420 9 Claims

1. A drilling method of automatically drilling a facing of a tunnel to be excavated, in which a drilling pattern expressed in a rectangular coordinate system defined with respect to said facing is transformed into a final drilling pattern expressed in a final coordinate system defined with respect to a drilling vehicle such that a boom mounted on said drilling vehicle and mounted with a drilling apparatus is positioned, through feedback control thereof, at a predetermined position of said facing on the basis of said final drilling pattern, said drilling method, when an imaginary facing for excavating a curved tunnel is so employed as to be nonparallel to an existing facing and a primary drilling pattern expressed in a primary coordinate system defined with respect to said imaginary facing has been given so as to be transformed into a secondary drilling pattern expressed rn a secondary coordinate system defined with respect to said existing facing such that said secondary drilling pattern is further transformed into said final drilling pattern, comprising the pretreatment steps of:

(a) expressing first and second coordinates of first and second points of said secondary coordinate system by using

another first and second coordinates of said primary coordinate system, respectively such that a first equation for transformation between said primary and secondary coordinate systems is obtained on the basis of relations between said first coordinates and said another first coordinates and between said second coordinates and said another second coordinates;

(b) converting said primary drilling pattern into third and fourth coordinates of third and fourth points of said primary coordinate system such that said third and fourth coordinates are, respectively, transformed, by using said first equation, into another third and fourth coordinates of said secondary coordinate system, with said another third and fourth coordinates representing said secondary drilling pattern;



(c) detecting fifth and sixth coordinates of a reference point and a fixed point of said secondary coordinate system, in terms of another fifth and sixth coordinates of said final coordinate system, respectively such that a second equation for transformation between said secondary and final coordinate systems is obtained on the basis of relations between said fifth coordinates and said another fifth coordinates and between said sixth coordinates and said another sixth coordinates, with said fixed point being determined on the basis of said reference point; and

(d) transforming said another third and fourth coordinates of said secondary coordinate system into further third and fourth coordinates of said final coordinate system, respectively by using said second equation such that said further third and fourth coordinates of said final coordinate system are converted into said final drilling pattern of said final coordinate system.

4,639,869

METHOD OF PROVIDING VARIABLE REDUCTION AXLE

Eric L. Storm, Troy, Mich., assignor to Eaton Corporation, Cleveland, Ohio

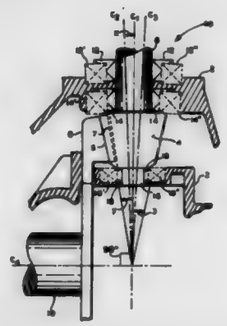
Filed Sep. 20, 1984, Ser. No. 652,247
Int. Cl.[4] B60K *17/16*
U.S. Cl. 364—424.1 2 Claims

1. In a method of providing a motor vehicle axle differential having a pinion gear and a ring gear having a predetermined number of teeth mounted upon respective shafts with variable gear reduction ratios therebetween by adjusting the angular relationship between the ring gear shaft and the pinion gear shaft according to a range of pinion gears having a varying number of teeth, said method including the steps of;

(a) determining the number of teeth desired for the ring gear;

(b) determining the lowest and highest number of teeth desired for the pinion gear range selected;

(c) determining the median number of pinion gear teeth between the highest and lowest number of teeth determined in step (b);



(d) determining the pitch angle of the pinion gear having the median number of teeth determined in step (c) for a shaft angle of 90° between the ring gear shaft and the pinion gear shaft from the equation:

$$A = \tan^{-1}\frac{n}{N}$$

where:
A=pitch angle of pinion gear in degrees
n=median number of teeth of pinion gear
N=number of ring gear teeth determined in step (a);

(e) determining the pitch angle of the ring gear from the equation:

$$y = 90° - A$$

where:
y=pitch angle of ring gear in degrees
90°=angle between the pinion and ring gear shafts for median pinion gear having median number of teeth;

(f) determining the angle between the pinion gear and ring gear shafts for each pinion gear selected from the highest to the lowest number of teeth determined in step (b) from the equation:

$$x = y - z$$

where:
x=angle between the pinion and ring gear shafts
y=ring gear pitch angle in degrees determined in step (e)

z = pinion gear pitch angle whose tangent is

$$\frac{\sin x}{\frac{N}{n} + \cos y}$$

(for shaft angles less than 90°)

or

z = pinion gear pitch angle whose tangent is

$$\frac{\sin (180° - x)}{\frac{N}{n} - \cos (180° - x)}$$

(for shaft angles greater than 90°)

where:
N=number of ring gear teeth determined in step (a) above
n=particular pinion gear teeth determined in step (b) above and;

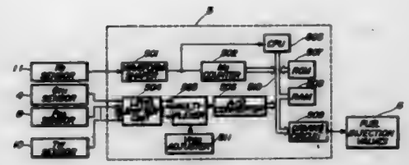
(g) mounting the pinion gear shaft at the angular relationship to the mounted ring gear shaft determined in step (f).

4,639,870

FUEL SUPPLY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES, WITH ADAPTABILITY TO VARIOUS ENGINES AND CONTROLS THEREFOR HAVING DIFFERENT OPERATING CHARACTERISTICS

Yutaka Otobe, Shiki; Takeo Kiuchi, Asaka, and Kikuo Tomozawa, Minato, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha and Oki Denki Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 12, 1984, Ser. No. 619,788
Claims priority, application Japan, Jun. 15, 1983, 58-107580
Int. Cl.[4] F02D *5/02*
U.S. Cl. 364—431.05 3 Claims



1. A fuel supply control method for an internal combustion engine, said method being adapted to determine a quantity of fuel for supply to said engine by multiplying a basic value of said quantity of fuel determined as a function of at least one operating parameter of said engine, by correction coefficients dependent upon operating conditions of said engine, and adding to said basic value correction variables dependent upon operating conditions of said engine, and to supply the determined quantity of fuel to said engine, wherein a single voltage creating means is adjusted to set an output voltage therefrom to a desired value, and a value of a predetermined one of said correction coefficients and a value of a predetermined one of said correction variables are determined which correspond to said set desired value of output voltage of said single voltage creating means, the method being characterized by comprising the steps of:

(1) adjusting a single voltage creating means to set an output voltage therefrom to a desired value, a predetermined one of said correction coefficients having a value thereof set as a function of said output voltage from said voltage creating means, and a predetermined one of said correction variables having a value thereof set as a function of said output voltage from said voltage creating means, wherein said predetermined one correction coefficient and said predetermined one correction variable are in a predetermined relationship with respect to output voltage from said voltage creating means;

(2) determining a value of said predetermined one correction coefficient and a value of said predetermined one correction variable at the same time, which corresponds to said set desired value of output of said voltage creating means; and

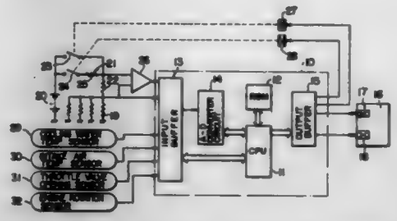
(3) multiplying said basic value of said quantity of fuel by the determined value of said predetermined one correction coefficient together with the correction coefficients other than said predetermined one of said correction coefficients, and adding to said basic value of said quantity of fuel the determined value of said predetermined one correction variable together with the correction variables other than said predetermined one of said correction variables, to determine said quantity of fuel.

4,639,871

GLOW PLUG HEATING CONTROL APPARATUS FOR A DIESEL ENGINE

Tsuyoshi Sakai, Toyohashi; Hideaki Nambe, Ooba, and Masahiro Ohba, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 2, 1984, Ser. No. 576,479
Claims priority, application Japan, Feb. 3, 1983, 58-16526
Int. Cl.[4] F02P *19/02*
U.S. Cl. 364—431.10 9 Claims



4. A glow plug heating control apparatus for a diesel engine which has at least one glow plug energized by an electric current before and after a starting operation of said diesel engine for heating the same, said control apparatus comprising:

means for detecting a resumption of fuel supply to said diesel engine after a cut-off of fuel supply to said diesel engine during a deceleration operation; and

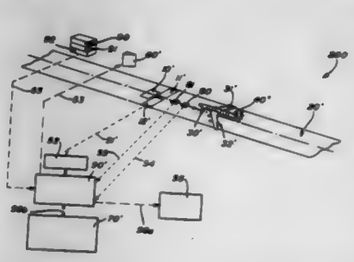
means for energizing said glow plug in response to an output of said fuel supply resumption detecting means.

4,639,872

METHOD AND APPARATUS FOR DETERMINING WEIGHT AND CENTER OF GRAVITY OF A VEHICLE

Charles J. McHale, Pointe Claire; Joseph Marrone, St. Leonard, and David Watson, Hudson, all of Canada, assignors to Allis Consultants Inc., Montreal, Canada

Filed Feb. 10, 1984, Ser. No. 578,874
Int. Cl.[4] G01M *1/12*
U.S. Cl. 364—463 36 Claims



1. An apparatus for use in determining the respective weight and center of gravity of different types of aircraft rapidly prior to their successively taking off, each aircraft including at least a pair of laterally spaced main undercarriage wheels and a tail or nose wheel longitudinally spaced from said main under-carriage wheels with the lateral spacing between the main undercarriage wheels as well as the longitudinal spacing between the nose or tail wheels and the main undercarriage wheels varying substantially from one type of aircraft to another, said apparatus comprising in combination:

(a) a plurality of load measuring devices secured to a roadway in spaced relation one to another and integrally forming part of said roadway, ones of said devices each comprising an elongated aircraft wheel supporting platform extending transversely of said roadway for respectively receiving and supporting the respective varyingly spaced

main undercarriage wheels of said different types of aircraft as said aircraft are moved along a common path of travel upon said roadway, said path extending in a direction generally normal to the length of each platform, a further one of said devices comprising an aircraft wheel supporting platform positioned in said path of travel for receiving and supporting the respective nose or tail wheel of said different types of aircraft as said aircraft are moved along said common path of travel;

(b) aircraft weight readout means linked to said load measuring devices for displaying load data measured thereby upon said platforms receiving and supporting thereon said respective aircraft nose or tail and main undercarriage wheels; and

(c) computer means operatively connected in the link between said load measuring devices and said aircraft weight readout means, for use in computing the respective center of gravity of said different types of aircraft following successive arrival of the wheels thereof on said platforms, said computing of said centerof gravity of each respective aircraft utilizing data entered into said computer means, said data comprising nose or tail wheel to main undercarriage wheel spacing and the loads measured by said load measuring devices, whereby following said computing, center of gravity data for the aircraft may be is displayed on said readout means.

4,639,873

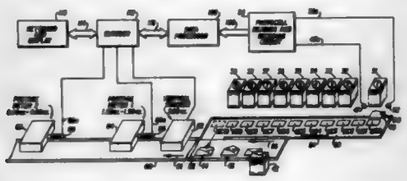
INSERTION MACHINE WITH POSTAGE CATEGORIZATION AND SELECTIVE MERCHANDISING

Brad A. Baggarly, Upland, Calif., and Christopher K. Scullion, Bethlehem, Pa., assignors to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 576,839, Feb. 3, 1984, abandoned. This application Jan. 13, 1986, Ser. No. 818,389

Int. Cl.[4] B65H *39/075;* **B65B** *35/50;* **G06F** *15/20*

U.S. Cl. 364—466 **20 Claims**



1. An insertion machine of the type in which a plurality of feed stations feed items onto an insertion track, said plurality of feed stations including a control feed station from which a master control item is fed onto said track and further feed stations from which items are selectively fed in accordance with indicia on said master control item onto said track for inclusion with a group including said master control item, wherein the improvement comprises:

means for reading said indicia;

means for designating whether at least one of said feed stations is a required feed station from which items must be fed if said indicia so indicates or an optional feed station from which items may conditionally be fed;

means for determining from said indicia on said master control item the particular further feed stations from which items must be fed onto said insertion track for inclusion with said group including said master control item;

data processing means including memory means and arithmetic logic means;

means including said data processing arithmetic logic means for using values indicative of the per item weight of items held in said control feed station and said required feed stations from which it is required that items be fed to obtain a calculated total weight with respect to said group of items;

means for using said calculated total weight to determine a postage category for said group of items; and,

means for determining whether optional items from one or more respective optional feed stations can be fed from said optional feed stations and associated with said group of items without changing the postage category determined on the basis of the calculated total weight of said group of items.

4,639,874

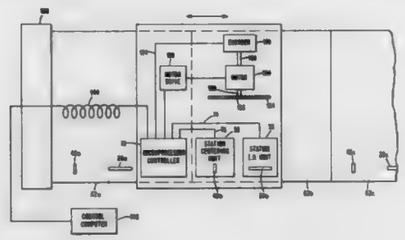
SYSTEM FOR MONITORING AND CONTROLLING POSITION OF HOISTS

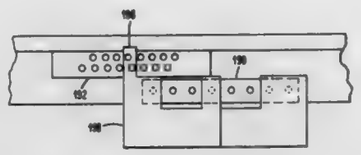
Stylianos Pezaris, Winchester, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Apr. 18, 1984, Ser. No. 601,766

Int. Cl.[4] G05B *5/01*

U.S. Cl. 364—478 **6 Claims**





1. Apparatus for monitoring and controlling the position of a hoist operable to move articles to and from selected work stations located along a line of tanks comprising:

a frame for supporting the hoist above said tanks;

a sensing unit mounted on the hoist, said sensing unit including an array of radiation emitters spaced along the direction of movement of said hoist and an array of radiation detectors facing said radiation emitters and defining an elongated gap therebetween;

a mounting strip attached to said frame and extending along said line of tanks;

a stationary plate attached to said mounting strip at each of said work stations, each of said places having elements for blocking radiation from selected emitters of said sensing unit when said hoist is moved to, or positoned at, a work station, to indicate that the hoist is positioned at a work station and to indicate the identify of said station;

said mounting strip having regularly spaced perforations for facilitating relocation of one or more of said stationary plates;

drive means for moving said hoist among, and stopping said hoist at, said work stations without physically contacting any of said plates;

an encoder attached to said drive means, said encoder operable to provide signals indicating the distance and direction of movement of said hoist from a reference point; and

a computer connected to said sensing unit, to said drive means, and to said encoder, said computer operable: (a) from signals produced by said sensing unit, to determine the position of the hoist at a work station and the identity of said station, (b) from signals from said encoder, to determine the position of the hoist between work stations and to verify on-station positioning of said hoist, and (c) by use of the position information of (a) and (b) above, to direct said drive means to rapidly move the hoist to, and stop the hoist at, a selected work station.

4,639,875

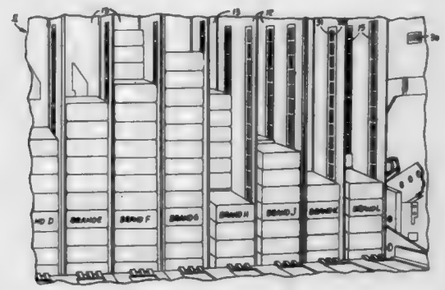
QUANTITY CHECKING SYSTEM AND METHOD

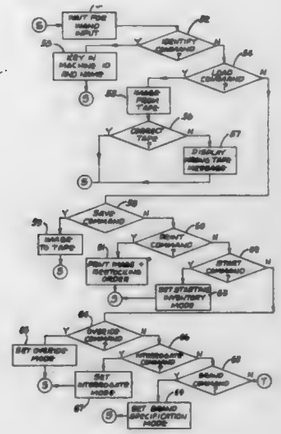
Joseph N. Abraham, 4290 Silsby Rd., University Heights, Ohio 44118, and Donald S. Scipione, 2427 Woodmere Dr., Cleveland Heights, Ohio 44106

Filed May 17, 1984, Ser. No. 611,509

Int. Cl.[4] G06F *15/20, 15/226;* **G06G** *7/48*

U.S. Cl. 364—479 **18 Claims**





1. A quantity checking system for a plurality of storage racks for storage of articles in a vending machine with the articles adapted to be dispensed from the racks, said articles adapted to be stored along the length of each rack in numerical sequence, said system comprising in combination:

means for dispensing articles from the racks;

passive indicia mounted adjacent each of said plurality of racks and adapted to identify a plurality of different brands of articles;

each of said indicia being subdivided along the length of the rack into passive individual indicia, each one corresponding to the numerical sequence of the respective adjacent article stored in the rack;

interrogation means unconnected to, yet cooperable with, said indicia for interrogating and determining data from said indicia as to a particular rack and the sequential number of the last article near one end of the particular rack at that instant;

memory means having an input from said interrogation means to store data from each said indicia from each interrogation of the plurality of storage racks and to store data from at least one prior interrogation of the plurality of storage racks; and

a computer connectable to said memory means to determine which brands of articles are being dispensed more frequently.

4,639,876

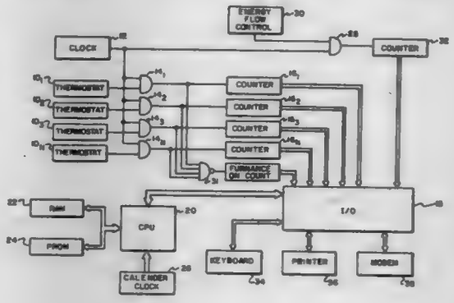
MULTI-UNIT ENERGY USE MONITOR

Robert G. Deeds, 214 N. Harvard, Villa Park, Ill. 60181

Filed Oct. 22, 1984, Ser. No. 663,447

Int. Cl.[4] G01R *19/00;* **G01K** *17/06*

U.S. Cl. 364—483 **6 Claims**



1. A system for monitoring energy use by each of a plurality of users of a common heating/cooling system wherein each said user is provided with an individual on/off state thermostat coupled to said system such that when any thermostat is in the on state heating/cooling is provided to the respective user, said energy monitoring system comprising

means for generating clock pulses at a preselected frequency;

a plurality of first gating means, one associated with each of said individual thermostats, having a first input coupled to its respective thermostat, having a second input coupled to said clock pulse generating means, and an output whereby clock pulses are passed to the output of said plurality of first gating means at any time the associated thermostat is on;

a plurality of first counting means, one associated with each of said first gating means, having an input coupled to the output of and operative to count the clock pulses passed by its respective first gating means;

means for periodically scanning each of said plurality of first counting means to determine the number of pulses counted thereby since the next previous scan thereof; and

means coupled to said scanning means for accumulating the number of pulses counted by each individual counting means during a preselected interval of time and generating an output signal indicating the total amount of time that each said thermostat was on during said interval of time.

4,639,877

PHRASE-PROGRAMMABLE DIGITAL SPEECH SYSTEM

William J. Raymond, Barrington; Robert L. Morgan, Rolling Meadows, and Ricky L. Miller, Elgin, all of Ill., assignors to Jostens Learning Systems, Inc., Minneapolis, Minn.

Filed Feb. 24, 1983, Ser. No. 469,482

Int. Cl.[4] G10L *5/00*

U.S. Cl. 364—513.5 **19 Claims**

1. A phrase speaking computer system having a programma-

ble digital computer and a speech processor, the speech processor comprising:

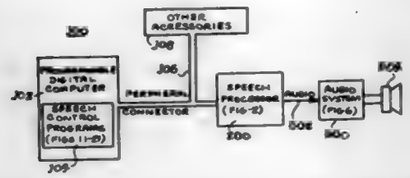
a voice synthesizer;

a read/write speech data segment memory;

a read/write command memory;

control processor means including processor control programs and logic connecting to said memories and to said voice synthesizer, and arranged to scan said command memory and to respond to command data entries stored therein by transferring corresponding speech data segments from said speech data segment memory to said voice synthesizer;

data conveyance means, connecting said computer to said command memory and said speech data segment memory,



for transferring said command data entries supplied by said computer into said command memory and for transferring said speech data segments supplied by said computer into said speech data segment memory; and

an enable signal line connecting said computer to said speech processor and arranged to initiate the operation of said processor control programs and logic when said enable signal line is enabled by said computer;

said programmable computer including speech control programs controlling the operation of said computer including data conveyance command sequences that cause said computer to supply command data entries to said data conveyance means and speech processor enabling command sequences that cause said computer to energize said enable signal line.

4,639,878

METHOD AND SYSTEM FOR AUTOMATICALLY DETERMINING THE POSITION AND ATTITUDE OF AN OBJECT

Chia P. Day, Troy; Kenneth W. Krause, Rochester; Louis L. Whitcomb, Troy, all of Mich., and Berthold K. P. Horn, Concord, Mass., assignors to GMF Robotics Corporation, Troy, Mich.

Filed Jun. 4, 1985, Ser. No. 741,123

Int. Cl.⁴ G06E *15/46*; B25J *9/00*

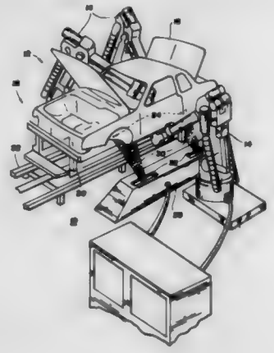
U.S. Cl. 364—513 **18 Claims**

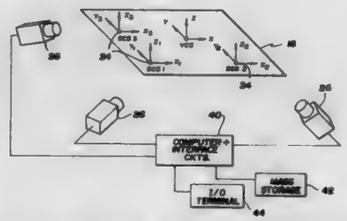
1. Method for automatically determining the position and attitude of a three-dimensional body in space having at least three spaced apart target points at a vision station having a fixed coordinate system, said method comprising the steps of:

generating calibration data defining a nominal position of the body at the vision station;

generating substantially simultaneously a single plane of image data for each of said target points, each plane of image data containing its respective target point and each plane of image data being non-overlapping with respect to each of the other planes of image data;

determining the locations of the target points within their respective image planes to obtain positional data; and





processing the calibration data and the positional data together to provide data defining the position and attitude of the body with respect to the fixed coordinate system.

4,639,879

METHOD AND DEVICE FOR LIGHT EMITTING INTENSITY CONTROL IN A GRAPHIC DISPLAY DEVICE

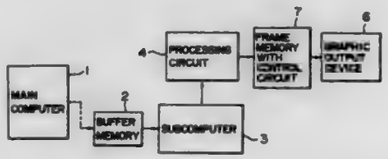
Hiromi Chaya, Shiga, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Feb. 15, 1983, Ser. No. 466,503

Claims priority, application Japan, Feb. 19, 1982, 57-25618

Int. Cl.⁴ G06F *3/14*

U.S. Cl. 364—518 **27 Claims**



11. A device for light emitting intensity control in a graphic display device which performs brightness operations on every picture element of the graphic display device by utilizing picture element memory means in the graphic display device to which command signals are input from an external source, which allows the graphic display device to generate brightness signals by itself according to time duration without being fed any brightness signals from the external source, comprising:

(a) a computer which inputs a light emitting intensity control start signal, a signal designating the light emitting intensity signal and the kind of computation, and a computational constant signal;

(b) a memory device which stores these signals;

(c) an instruction decoder for decoding these signals;

(d) a computation unit for computing a computational result, according to an arithmetic function, from the light emitting intensity signal and the computational constant; and

(e) a display unit which displays at a light emitting intensity corresponding to the computational result of the computational unit.

4,639,880

RIBBON FEED SYSTEM OF COMBINED PRINTER

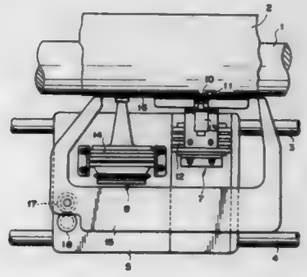
Miki Yasuhiro, Nagoya, Japan, assignor to Brother Industries, Ltd., Nagoya, Japan

Filed Aug. 7, 1985, Ser. No. 763,467

Claims priority, application Japan, Aug. 21, 1984, 59-174721

Int. Cl.⁴ B41J *3/58*

U.S. Cl. 364—519 **2 Claims**



1. In a combined printer comprising a first printing section for printing characters by using types, a second printing section for printing character patterns formed by a matrix of dots and a print ribbon for performing printing as the first printing section and second printing section are moved in the direction in which printing is to be performed in one line, a ribbon feed system comprising:

ribbon drive means for moving the print ribbon;

a first control unit for controlling the ribbon drive means in such a manner that the print ribbon is fed intermittently a predetermined distance each time one character is printed when the first printing section is rendered operative;

a second control unit for controlling the ribbon drive means in such a manner that the print ribbon is continuously fed when the second printing section is rendered operative; and

a control means including a means for deciding whether print data inputted from outside are data to be printed by using the first printing section or data to be printed by using the second printing section, a first selecting means for selecting said first printing section when said deciding means decides that the print data inputted from outside are data to be printed by using the first printing section, and selecting said second printing section when said deciding menas decides that the print data inputted from outside are data to be printed by using the second printing section, and a second selecting means for selecting said first control unit in order to carry out intermittent feeding of said print ribbon when said first selecting step selects the first printing section and selecting said second control unit in order to carry out continuous feeding of said print ribbon when said first selecting step selects the second printing section.

4,639,881

DATA INPUT UNIT AND METHOD FOR PRINTING MACHINES

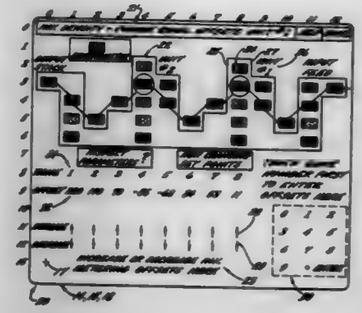
Oded Ziegler, Mahlweg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen AG., Fed. Rep. of Germany

Filed Jun. 1, 1983, Ser. No. 499,860

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1982, 3220622

Int. Cl.⁴ G06F *15/626*; G09G *3/02*

U.S. Cl. 364—521 **50 Claims**



1. A control terminal for the remote computer control of a printing machine, the control terminal having a video display for computer-generated output and a transparent pressure-sensitive sensor having a plurality of pressure-sensitive points overlaid on the video display for input from a machine operator to a remote control computer, wherein the improvement comprises

a graphics template having at least part of a machine diagram providing a pictorial representation of the printing machine, said template also being overlaid on the video display, the video display having means for selectively generating visually perceptible symbols aligned with certain respective machine status areas on the part of the machine diagram on the graphics template, said machine status areas pictorially representing specific respective components of the printing machine, and the pressure-sensitive sensor having pressure-sensitive points aligned with the machine status areas; and

means for initiating and conducting a respective interactive input-output procedure between the control terminal and the machine operator corresponding to a selected machine status area but using a common portion of the video display and pressure-sensitive sensor separate from the machine diagram after the operator presses a pressure-sensitive point aligned with the selected machine status area.

4,639,882

MONITORING SYSTEM

Albert B. Keats, Dorchester, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Jun. 18, 1984, Ser. No. 621,720

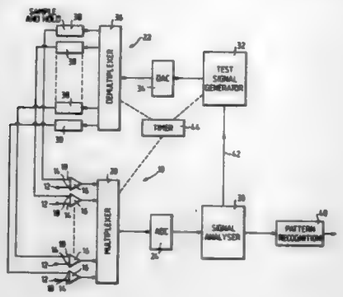
Claims priority, application United Kingdom, Jun. 24, 1983, 8317224

Int. Cl.⁴ H04J *3/14*; G01K *7/02*

U.S. Cl. 364—550 **13 Claims**

1. A system for monitoring a plurality of data signals from a plant or apparatus, each data signal representing a parameter of the plant or apparatus, the system comprising, means for periodically examining the data signals and for providing output signals representing whether each data signal represents an acceptable or an unacceptable state of the respective parameter, and means for supplying test signals to be superimposed on selected said data signals before each periodic examination thereof such as to produce corresponding combined signals

equivalent to data signals representing the unacceptable state, the selection of the data signals on which the test signals are superimposed being changed for each periodic examination of



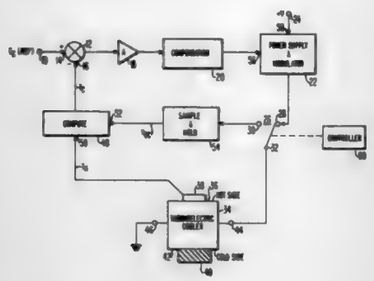
the data signals within a predetermined sequence so that the examining means produces a recognisable pattern of said output signals.

4,639,883

THERMOELECTRIC COOLING SYSTEM AND METHOD

Theodore D. Michaelis, Medford, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 28, 1984, Ser. No. 675,779
Int. Cl.[4] F25B *21/02*; G06F *15/32*
U.S. Cl. 364—557 **22 Claims**



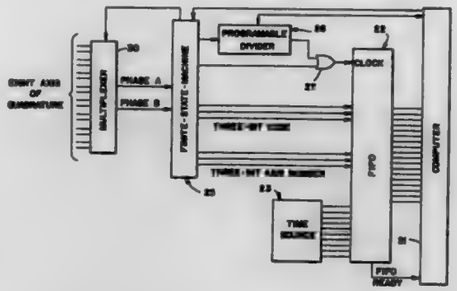
8. A thermoelectric cooling system including:
means for providing electric current;
a thermoelectric cooler having a cold side and a hot side and having terminals for receiving said electric current therethrough, said electric current being applied to said terminals such that said current flows through said thermoelectric cooler in a direction so as to maintain said cold side at a temperature lower than said hot side, said thermoelectric cooler being adapted to be affixed at its cold side to a workpiece;
means for sensing the temperature at said hot side of said thermoelectric cooler;
means for periodically interrupting said electric current supplied to said thermoelectric cooler;
means for detecting the voltage across said terminals during said interruptions, said voltage being induced by the difference in temperature between hot side and said cold side;
means responsive to said sensing means and to said detecting means for computing the temperature of said cold side of said thermoelectric cooler; and
means coupled to said source of electric current and responsive to said computing means for controlling said flow of electric current.

4,639,884

METHOD AND APPARATUS FOR MEASURING VELOCITY AND POSITION IN SERVO SYSTEMS

Paul Sagues, Berkeley, Calif., assignor to Berkeley Process Control, Inc., Berkeley, Calif.

Filed Mar. 5, 1984, Ser. No. 586,250
Int. Cl.[4] G01P *3/42*; G06F *15/20*
U.S. Cl. 364—565 **16 Claims**



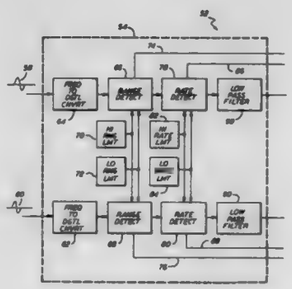
1. A method for measuring the velocity of a servo shaft driven cyclically by a motor, without employing a tachmeter, comprising the steps of:
producing from movement of said shaft a pair of overlapping square-wave signals in quadrature with transitions expressible in Gray code for each cycle,
producing from a clock a large number of evenly spaced clock pulses per a selected number of quadrature transitions,
reading the number of clock pulses between two selected quadrature transitions, and
dividing the total number of quadrature transitions between said selected transitions by the total number of clock pulses during the same time.

4,639,885

EMI SUPPRESSION FOR ELECTRONIC ENGINE CONTROL FREQUENCY SIGNAL INPUTS

Wayne R. Spock, Canton, and Richard P. Meisner, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 24, 1984, Ser. No. 686,064
Int. Cl.[4] H04B *15/00*
U.S. Cl. 364—574 **4 Claims**



1. Apparatus for use in digital electronic engine controls for selecting the best signal representation of a gas turbine engine parameter from among the sample values of two sensed signals representative of the parameter actual value, and a synthesized signal representative of the parameter nominal value, comprising:

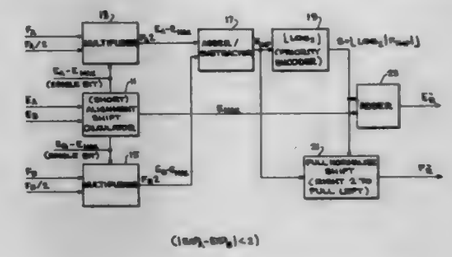
signal comparison means, responsive to the sampled values of each of the two sensed signals, for comparing each sample value to maximum and minimum performance value limits established for the parameter, and for rejecting those sensed signal samples which exceed these limits; and
signal selection means, responsive to the nonrejected sensed signal samples from said signal comparison means
for determining the difference signal magnitude between the sampled actual parameter value and the nominal value of the synthesized signal,
for rejecting each previously nonrejected sensed signal sample having said difference value greater than a selected maximum,
for selecting a nonrejected sensed signal sample as the parameter value in the presence of nonrejected samples, and
for selecting the synthesized signal as the parameter value in the absence of nonrejected sensed signal samples.

4,639,887

BIFURCATED METHOD AND APPARATUS FOR FLOATING POINT ADDITION WITH DECREASED LATENCY TIME

Paul M. Farnwald, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 24, 1984, Ser. No. 583,531
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—748 **14 Claims**



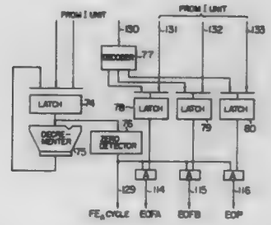
1. In a method for performing floating point addition of a pair of floating point binary numbers each expressed as a mantissa and an exponent, comprising the steps of alignment of the mantissas, addition of the aligned mantissas and postnormalization of the mantissa of the sum, the improvement comprising;
comparing the exponents of the two floating point numbers prior to the alignment step;
simultaneously performing two separate calculations along first and second separate parallel paths as follows:
calculating a first sum in the first path as if the difference of the exponents is either 0 or 1, including performing the alignment step by at most a one place right shift of one mantissa;
simultaneously calculating a second sum in the second path as if the difference of the exponents is greater than 1, including performing the postnormalization step by at most a one place shift of the mantissa of the second sum;
selecting between the first sum and the second sum after simultaneously performing the two calculations.

4,639,886

ARITHMETIC SYSTEM HAVING PIPELINE STRUCTURE ARITHMETIC MEANS

Masahiro Hashimoto, Sagamihara; Tsuyoshi Watanabe, Hadano, and Kenichi Wada, Zama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 29, 1983, Ser. No. 509,047
Claims priority, application Japan, Jun. 29, 1982, 57-112111
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—736 **20 Claims**



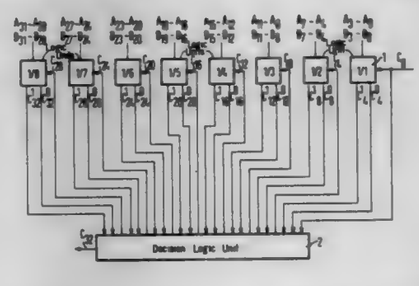
1. An arithmetic system having pipeline arithmetic means for executing arithmetic operations in accordance with instructions provided by instruction means, comprising:
first arithmetic means for executing simultaneously N arithmetic operations by pipelined processing for N instructions, where N is an integer equal to or larger than two; and
first indicating means, connected to receive from said instruction means information as to the number of execution cycles required by said first arithmetic means for execution of the instruction, for indicating with a signal when each of the instructions being executed in said first arithmetic means requires N cycles before completion of the execution of the instruction;
wherein said first arithmetic means includes means connected to said first indicating means for initiating an arithmetic operation for a new instruction in response to the indication signal of said first indicating means.

4,639,888

CIRCUIT ARRANGEMENT FOR ACCELERATED CARRY FORMATION IN AN ADDER DEVICE

Hans K. Nussbaecher, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 30, 1984, Ser. No. 595,241
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311970; Dec. 21, 1983, 3346241
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—788 **12 Claims**



1. A circuit arrangement for accelerated carry information in an adder device in response to an input carry for the adder

device, in which a plurality of binary-coded operands are available as input signals in first and second groups which are sub-divided into mutually corresponding bit groups, comprising:

a plurality of parallel operating logic units each including inputs for receiving respective operands of mutually corresponding bit groups;

each of said logic units comprising means for forming a respective carry pair in response to its input operands, and a pair of outputs for said carry pair independently of the two possible values of the input carry of the bit group;

a decision logic unit including a plurality of inputs connected to said carry pair outputs of said plurality of logic units, a control input for receiving the input carry of the adder device and a plurality of outputs each connected to a respective logic unit;

said decision logic unit comprising a plurality of individual selection switches arranged in time stages and operable to select the output carries, beginning with the carry pairs of a predetermined plurality of the lowest big groups, belonging to such bit groups dependent on the input carry of the adder device and, dependent on the most significant actual output carry respectively identified in the preceding time stage, and increasing number of actual high-order output carries being selected in each following time stage until all carry pairs of said logic units have been served; and

said selection switches for the selection of the individual actual output carries being ordered such that for the selection of the individual, actual output carries the selection switches are partly preceded in pairs by selection switches of lower time stages by way of which, respectively dependent on a lower-order carry pair, the respectively appertaining carry is selectable from at least one following higher-order carry pairs so that, in chronological succession, more intermediate carry pairs combining carry pairs are always successively formed simultaneously with the already occurring offering of lower-order output carries.

4,639,889

SYSTEM FOR CONTROLLING COMMUNICATION BETWEEN A MAIN CONTROL ASSEMBLY AND PROGRAMMABLE TERMINAL UNITS

Hironichi Matsumoto, and Ritsuo Hashimoto, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Company, Kyoto, Japan

Continuation of Ser. No. 550,061, Nov. 9, 1983, abandoned, which is a continuation of Ser. No. 235,951, Feb. 19, 1981, abandoned. This application Sep. 17, 1984, Ser. No. 651,639

Claims priority, application Japan, Feb. 19, 1980, 55-19919; Mar. 12, 1980, 55-32031; Mar. 12, 1980, 55-32032; Mar. 14, 1980, 55-33149

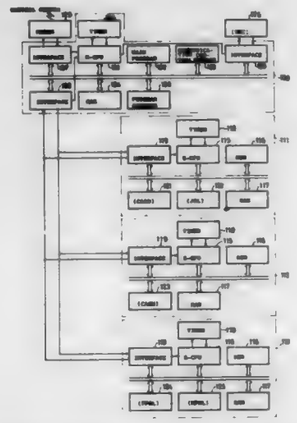
Int. Cl.⁴ G06F *15/16, 11/06*

U.S. Cl. 364—900 **12 Claims**

1. A system for controlling communication between a main control assembly having a central processing unit and a plurality of individually programmable input/output terminal units each having a slave central processing unit and a program to control the operation of the respective input/output terminal unit, each of said input/output terminal units having a different address, and communication means including a set of communication lines connecting said main control assembly to all of said terminal units, and interface means in said main control assembly and in each of said terminal units and connected to said set of communication lines for serially transmitting messages between said main control assembly and said terminal units, said system comprising:

means in said main control assembly for controlling said input/output terminal units including memory means having stored therein instructions including instructions for controlling said input/output terminal units in a predetermined sequence, processing means for reading said instructions and editing a message corresponding to an instruction for transmission to a selected one of said input-/output terminal units including the address of said selected unit, and means for transmitting said message to said selected input/output terminal unit via said communications means; and

means in said main control assembly for controlling the communication between said main control assembly and



said input/output terminal units to cause said main control assembly, to address a message to a selected input/output terminal unit and, after a response is received from said selected input/output terminal unit indicating completion of the instruction, to cause said main control assembly to read the next instruction.

4,639,890

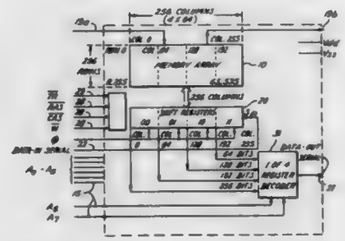
VIDEO DISPLAY SYSTEM USING MEMORY WITH PARALLEL AND SERIAL ACCESS EMPLOYING SELECTABLE CASCADED SERIAL SHIFT REGISTERS

Andrew Heilveil; Jerry R. VanAken; Karl M. Guttag; Donald J. Redwine, all of Houston; Raymond Plakham, Stafford, and Mark F. Novak, Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1983, Ser. No. 567,040

Int. Cl.⁴ G09G *1/02*

U.S. Cl. 364—900 **26 Claims**



1. In a memory device having an array of memory cells, address terminals, a data input terminal, a data output terminal, means responsive to address signals received by said address terminals for addressing a memory cell in said array, means for writing data presented at said data input terminal to an addressed memory cell, and means for reading data contained in an addressed memory cell so that said data is presented at said data output terminal, the improvement comprising:

a register comprised of a plurality of memory cells;

means, coupled to said array and to said register, for transferring the contents of a predetermined number of memory cells in said array to memory cells in said register;

a serial output terminal;

serial output means, connected to said serial output terminal and connectable to a memory cell in said register, for communicating the contents of said selected memory cell to said serial output terminal;

means for selecting a memory cell in said register to be connected to said serial output means, responsive to an address signal received by said address terminals;

a serial clock terminal for receiving a clock signal;

shifting means, connected to said serial clock terminal, for shifting the contents of another memory cell in said register to said serial output means so that, responsive to a series of said clock signals received by said serial clock terminal, the contents of a series of memory cells in said register are presented at said serial output terminal, beginning with the contents of the memory cell in said register selected by said selecting means;

a transfer control terminal for receiving a transfer control signal; and

transfer control means, connected to said transfer control terminal and to said transferring means, for enabling and disabling said transferring means responsive to said transfer control signal, so that during such time as said transferring means is disabled, data may be written to and read from any of said memory cells in said array independently from the presentation of data at said serial output terminal.

4,639,891

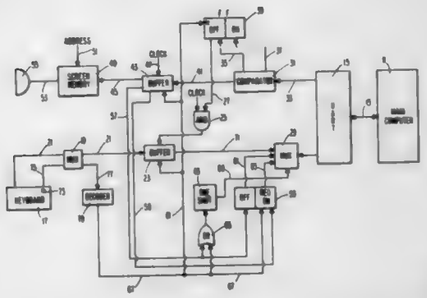
SIGNALS PATH CONTROL CIRCUITRY FOR A DATA TERMINAL

Thomas C. Porcher, Stow, Mass., and Morgan E. Robinson, Hanover, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 14, 1983, Ser. No. 551,010

Int. Cl.⁴ G06F *3/04*

U.S. Cl. 364—900 **9 Claims**



1. In a data terminal system which has a data output means including a data display means an output means memory and a keyboard means and which data terminal system is formed to receive from and send data signals to a main data processor, which main data processor transmits coded "on" and "off" signals to said data terminal system to control whether or not said data terminal system transmits signals to said main data processor, an arrangement to alternatively clear and block transmission of signals between said data terminal system and said main data processor comprising in combination: bidirectional signal conversion means formed to convert parallel signals to serial signals and alternatively to convert serial signals to parallel signals, said bidirectional signal conversion means coupled to receive from and send signals to said main data processor; first signal buffer means formed to have first clearing means which can cause said first signal buffer means to be cleared in response to a clear signal and connected to said output means memory to transmit signals thereto for display on said data display means; first logic circuitry including monitoring signal means connected to said bidirectional signal conversion means and to said first buffer means to receive signals to be passed to said first buffer means and monitor said last mentioned signals to detect said coded "on" and "off" signals should either be present; keyboard circuitry means including a clear communication signal means connected to said keyboard; second signal buffer means formed to have second clearing means which can cause said second signal buffer means to be cleared in response to a clear signal and connected to said keyboard circuitry means to receive signals from said keyboard and store the same for further transmission; second logic circuitry connected to said first logic circuitry, to said second buffer means and to said bidirectional signal conversion means to selectively pass data signals to said main data processor through said bidirectional signal conversion means; third circuitry means connected from said clear communication signal means to said first and second buffer means and to said first logic circuitry whereby, in response to a clear communication signal from said keyboard circuitry means, said third circuitry means transmits a clear signal to said first and second clearing means to clear said first and second buffer means and transmits a reset signal to said first logic circuitry to reset said monitor signal means to an "on" condition in the event said monitor signal means is in an "off" condition.

4,639,892

SEMICONDUCTOR READ-ONLY MEMORY DEVICE

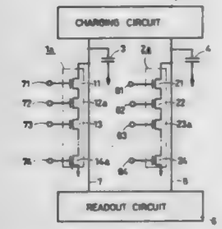
Shigeo Mizugaki, and Tsunenori Umeki, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1983, Ser. No. 556,387

Claims priority, application Japan, Nov. 30, 1982, 57-211601

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—182 **11 Claims**



1. A semiconductor read-only memory device having at least first and second different types of MOS field effect transistor means for storage of different values of data bits, said first and second types of MOS transistor means formed on a substrate and in electrical connection with each other, each transistor means having a gate electrode means on a major surface of said substrate defining a gate area therein,

said first type of MOS transistor means including two-level turn on means for causing said type of MOS field effect transistor to be turned on in response to application of either of a first or second different voltage level to the gate electrode means thereof, said two-level turn on means comprising a structural arrangement including double diffusion deep and shallow drain and sink regions with substantial lateral diffusion expansion regions, said lateral diffusion exapnsion regions providing a reduced effective gate length, said reduced effective gate length being substantially shorter than the width of said gate electrode means thereof for simulating a depletion type MOS transistor independently of channel doping thereof,

said second type of MOS transistor means including on-off means for causing said second type of MOS field effect transistor to be turned on in response to application of said

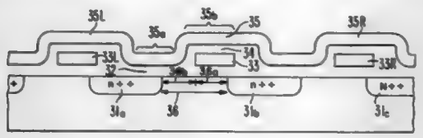
first voltage level to the gate electrode means thereof and to be turned off in response to application of said second voltage level to the gate electrode means thereof, said on-off means comprising a structural arrangement including a graded drain structure with deep diffusion drain and sink regions and shallow diffusion regions at least adjacent said gate electrode means thereof thereby minimizing reduction of effective gate length and providing a substantially longer effective gate length than the effective gate length of said first type of transistor means.

4,639,893

SELF-ALIGNED SPLIT GATE EPROM

Boaz Eitan, Sunnyvale, Calif., assignor to Wafer Scale Integration, Inc., Fremont, Calif.

Filed May 15, 1984, Ser. No. 610,369
Int. Cl.⁴ G11C *11/40*
U.S. Cl. 365—185 **7 Claims**



1. A self-aligned split gate single transistor memory cell for a programmable read only memory comprising

a semiconductor substrate containing a source region and a drain region separated by a channel region;

a floating gate formed over but insulated from a first portion of the channel region, a first edge of the floating gate being aligned with and used to define one edge of said drain region and a second edge of said floating gate being over said channel region and separated from the closest edge of said source region by a second portion of said channel region; and

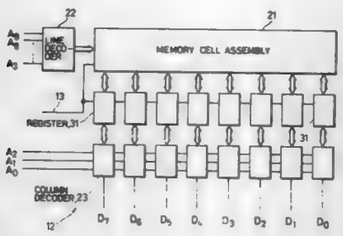
a control gate formed over but insulated from said floating gate and formed over but insulated from said second portion of said channel region.

4,639,894

DATA TRANSFERRING METHOD

Chiharu Ishii, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 705,001
Claims priority, application Japan, Feb. 25, 1984, 59-33374
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—189 **12 Claims**



10. A memory addressed by an address word comprising:

a word-organized memory cell assembly arranged as M rows by N words with P bits per word;

a row decoder coupled to said memory cell assembly and enabled by certain bits of said address word;

P registers of N words, coupled to said memory cell assembly to receive the data from an entire row of said memory selected by said row decoder and to present for input the data in an entire row of said memory selected by said row decoder; and

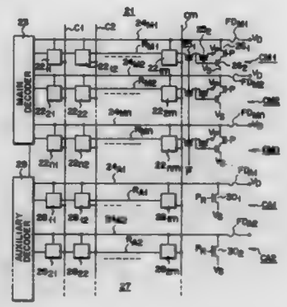
P column decoders enabled by certain bits of said address word for transferring P-bit data between said P registers and a P-bit data bus.

4,639,895

SEMICONDUCTOR MEMORY DEVICE

Hiroshi Iwahashi, and Kiyofumi Ochii, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 23, 1983, Ser. No. 497,135
Claims priority, application Japan, May 28, 1982, 57-89891
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—200 **5 Claims**



1. An error correction semiconductor memory device coupled to a power source comprising:

a main memory including a plurality of memory cells arranged in a matrix of rows and columns, one of said memory cells which does not operate correctly being an error bit cell;

an auxiliary memory used as a redundance memory including a plurality of auxiliary memory cells arranged in a matrix of rows and columns;

a plurality of main row lines each connected to said main memory cells in a different row of said main memory;

a plurality of auxiliary row lines each connected to said auxiliary memory cells in a different row of said auxiliary memory, each of said auxiliary row lines corresponding to a different row line in said main memory;

a plurality of column lines each commonly connected to said main memory cells and auxiliary memory cells in different corresponding columns of said main and auxiliary memories;

a plurality of power source lines connected to said power source, each of said power source lines being connected to a different one of said main row lines and auxiliary row lines;

an enhancement type MOS transistor connected between said power source and the power source line corresponding to the row line connected to said error bit cell of said main memory; and

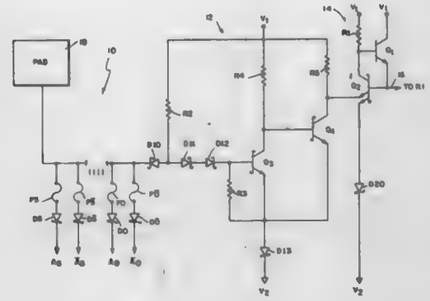
means for turning off said enhancement type MOS transistor for disconnecting said corresponding power source line from said power source, said turning off means including a depletion type MOS transistor and a resistance element connected in series between a predetermined potential and a reference potential, one terminal of the source-drain path of said depletion type MOS transistor being connected to said predetermined potential and the other terminal of the source-drain path and the gate of said depletion type MOS transistor being connected to one terminal of said resistance element, the other terminal of said resistance element being connected to said reference potential, and the junction of said other terminal of said source-drain path of said depletion type MOS transistor and said one terminal of said resistance element being connected to the gate of said enhancement type MOS transistor, wherein said corresponding power source line is disconnected from said power source at times when said error bit cell is detected.

4,639,896

REDUNDANT ROW DECODING FOR PROGRAMMABLE DEVICES

Michael J. Brannigan, Palm Bay, Fla., and David L. Rutledge, Beaverton, Oreg., assignors to Harris Corporation, Melbourne, Fla.

Filed Nov. 30, 1984, Ser. No. 676,846
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—200 **7 Claims**



1. In a memory array having at least one redundant row, programmable decoder for said redundant row, and a row driver connected between said programmable decoder and said redundant row, the improvement comprising:

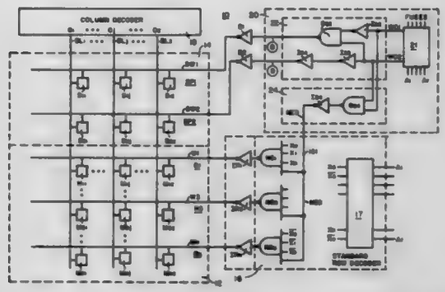
protection means connected between said programmable decoder and said row driver for isolating said decoder from said row driver and for limiting the voltage across said programmable decoder.

4,639,897

PRIORITY ENCODED SPARE ELEMENT DECODER

Ihor T. Wacyk, Bridgewater Township, Somerville County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 31, 1983, Ser. No. 528,035
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—200 **6 Claims**



1. In a memory array formed on a semiconductor chip comprising memory cells arranged in rows and columns, some of the rows being standard rows and N of the rows being initially spares to be substituted for standard rows which include defective cells, where N is an integer equal to or greater than 2; the improvement comprising:

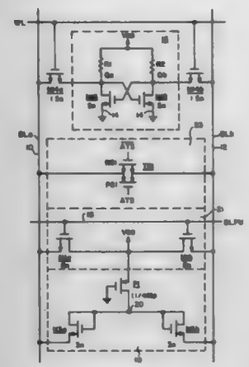
means for selectively substituting any one of said N spare rows for any one of said standard rows including means for encoding the spare rows in a predetermined order of priority and selectively substituting a spare row of higher priority for a spare row of lower priority.

4,639,898

BIT-LINE PULL-UP CIRCUIT

Donald J. Sauer, Allentown, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 21, 1984, Ser. No. 685,251
Int. Cl.⁴ G11C *11/40*
U.S. Cl. 365—202 **6 Claims**



1. In a memory array, a circuit for establishing a given potential on the bit lines of the memory array comprising:

first and second bit-lines for the application of complementary signals thereto;

a relatively high impedance, low power dissipation, static circuit coupled to said bit-lines tending to maintain the potential on said bit-lines at a first given potential, said relatively high impedance circuit comprising:

(a) a high impedance current limiting element having its conduction path connected between a point of operating potential and a first node;

(b) first and second diode-connected transistors having their conduction paths connected between said first node and said first and second bit lines, respectively; and

(c) said high impedance current limitigg element functioning to limit the voltage drop across said first and second diodes and maintaining the current therethrough a linear function of the applied voltage when either one of said first and second bit lines is short-circuited to a second potential; and

a pulsed precharge circuit coupled to said bit lines for momentarily precharging said bit-lines to said first given potential prior to a read or a write cycle, said precharge circuit having a much lower impedance than said static circuit for driving said bit lines to said first given potential quickly.

4,639,899

MEMORY CIRCUIT HAVING A MEMORY RESET AND RECOVERY CONTROLLER

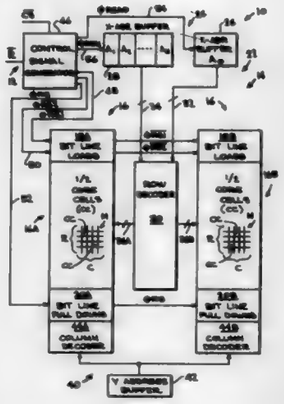
Colin N. Murphy, San Mateo, and Guey T. Lu, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 27, 1983, Ser. No. 536,920
Int. Cl.⁴ G11C *7/00, 11/40*
U.S. Cl. 365—230 **24 Claims**

1. A memory apparatus comprising;

a plurality of rows of bistable memory cells, each of said cells having a first and a second node coupled to a first and a second bit line, respectively,

means for discharging to a first predetermined potential, simultaneously, said first node of all of said cells via said first bit line; and



means for charging to a second predetermined potential, simultaneously, said second node of all of said cells via said second bit line after said first node of all of said cells has been discharged.

4,639,900

METHOD AND A SYSTEM FOR MONITORING A SEA AREA

Bengt G. Gustafson, Sigtuna, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1984, Ser. No. 582,424
Int. Cl.⁴ G01S *3/80, 3/02*
U.S. Cl. 367—5 **4 Claims**



1. A method for locating a sound source in a water area, such method being for use in a system comprising:

at least three listening devices each provided with a hydrophone and a radio transmitter;

a radio master station to which signals indicating detection of sounds by the listening devices are transmitted and which determines the geographical position of the sound source by correlating the times of reception of such sound detection signals;

and at least two relay stations at fixed geographical positions relative to said master station; such method comprising the steps of:

transmission by each of the listening devices, alternatively, of radio signals identifying such devices, such identifying signals being received by the master station and the relay stations;

transmission by each of the listening devices, in respective radio channels, of said sound detection signals;

the relay stations relaying the identifying signals received thereby to the master station;

the master station processing the identifying signals received thereby directly from the listening devices and relayed from the relay stations to determine, from the relative times of reception of such signals, the geographical position of each of said listening devices;

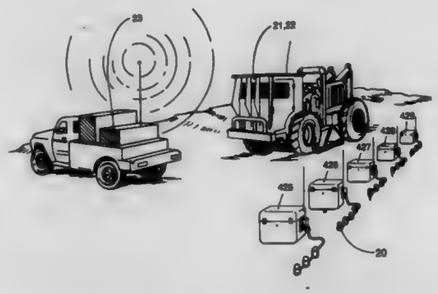
and the master station processing the sound detection signals received from each of the listening devices to determine the geographical position of the sound source with respect to said determined geographical positions of the listening devices, such processing being effected by correlating the relative times of reception of said sound detection signals.

4,639,901

METHOD FOR TESTING CABLELESS SEISMIC DIGITAL FIELD RECORDERS

Ralph E. Warmack, Kingwood, Tex., and William D. Woodruff, Tulsa, Okla., assignors to Standard Oil Company, Chicago, Ill.

Filed Dec. 29, 1982, Ser. No. 454,404
Int. Cl.⁴ G01V *1/16*; H04B *17/00*
U.S. Cl. 367—13 **4 Claims**



1. A method for testing a cableless seismic digital recording system recorder capable of weighting and vertically stacking seismic-trace data for determining the operational status and for facilitating the maintenance of the recorder, comprising the steps of:

a. connecting the recorder to a source of test signals;

b. transmitting a coded signal to the recorder for selecting at least one weighting mode;

c. transmitting a coded signal to the recorder for initially activating the recorder to receive a first test signal;

d. acquiring the first test signal during the initial activation of the recorder;

e. weighting the acquired first test signal during the initial activation of the recorder according to the selected weighting mode;

f. transmitting a coded signal to the recorder for subsequently activating the recorder to receive a second test signal;

g. acquiring the second test signal during the subsequent activation of the recorder;

h. weighting the acquired second test signal during the subsequent activation of the recorder according to the selected weighting mode;

i. vertically stacking the weighted first and second test signals; and

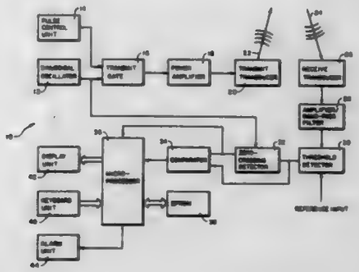
j. reproducing the weighted and vertically stacked first and second test signals for indicating the operability of the weighting mode.

4,639,902

NEAR ULTRASONIC PATTERN COMPARISON INTRUSION DETECTOR

Robert A. Leverance, College Park, and Socrates A. Longas, Glenndale, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 24, 1985, Ser. No. 748,366
Int. Cl.⁴ G08B *13/16*
U.S. Cl. 367—93 **11 Claims**



1. An intrusion detector apparatus for detecting an unauthorized entry in a room to be secured, comprising:

means for transmitting for a predetermined period transmitted signal(s), said means for transmitting being configured to repeat transmitting of the transmitted signal(s) at a predetermined interval(s) following the predetermined period; and

means for receiving received or return signal(s) during the predetermined interval in response to the transmitted signal(s) being reflecting from the walls, floor, ceiling or objects in the room to be secured, if present, said means for receiving including a microprocessor and being cofigured to detect, process and store a facsimile of the received signal(s) for the room to be secured when unoccupied, and then to continually compare facsimiles of subsequent received signal(s) therewith, according to a predetermined algorithm, so as to give a visual and/or audible indication of an unauthorized entry into the room to be secured, the predetermined algorithm operating to cause said microprocessor to indicate an alarm when there are two or more errors and/or unauthorized entry occurrences as determined by comparison between the stored facsimile and the current facsimile during at least three consecutive ones of the predetermined interval(s).

4,639,903

UNDERWATER SOUND DELIVERY SYSTEM

Michel Redolfi, c/o CIRM, 33 Avenue Jean Medecin, 0600 Nice, France

Filed Nov. 21, 1983, Ser. No. 553,527
Int. Cl.⁴ H04R *1/44*
U.S. Cl. 367—131 **9 Claims**

1. An underwater sound deliver apparatus which comprises:

a hollow sphere partially submerged in water;

said sphere being truncated to form an opening;

at least one sound transducer attached to the submerged portion of the sphere; and



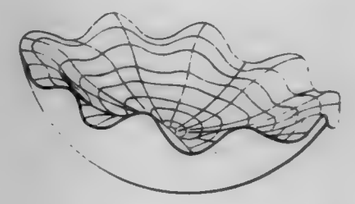
buoyant means for maintaining a portion of the sphere above water when water is admitted therein.

4,639,904

SONIC TRANSMITTERS

Rainer Riedlinger, Karlsruhe, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Jan. 29, 1986, Ser. No. 823,642
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510341
Int. Cl.⁴ H04R *1/34*
U.S. Cl. 367—140 **21 Claims**



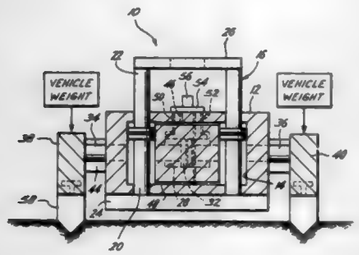
1. In a sound transmitter for generation of transient acoustic pulses, comprising a spatially curved focussing emitter surface which is represented by the area of at least one emitter, provided that where a plurality of emitters are used they are matched in respect of their period of operation and amplitude, the pulses generated in the focussed volume being engendered by a substantially unipolar and chronologically limited pulse on the emitter surface, an improvement characterised in that the emitter surface deviates from an ideal focussing emitter surface in such a way that as a consequence of the differences in the periods of operation caused by the areal deviation, the chronological rise and fall in the region of the focus of the velocity potential $\phi(t)$ calculable by means of the Rayleigh integral differ in speed in the region of the focus and that the bipolar pressure pulse p(t) determined by derivation based on time from the substantially unipolar evolution of the velocity potential comprises a brief pulse of high amplitude and an adjacent longer pulse of lower amplitude.

4,639,905

DUAL-MODE VIBRATOR

Kent J. Goodloe, Sugarland, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Filed Dec. 3, 1984, Ser. No. 677,292
Int. Cl.[4] H04R *11/00*; G01V *1/00, 1/04*
U.S. Cl. 367—189 **1 Claim**



1. A dual-mode vibrator assembly for selectively injecting P-waves and S-waves into the earth, comprising:
(a) an inertia mass having a plurality of cylinder bores therein parallel to a first direction and at least one cylinder bore therein essentially transverse to said first direction;
(b) a plurality of first piston members reciprocally disposed within each of said parallel cylinder bores;
(c) first means connected to said first piston members for contacting the earth;
(d) a second piston member reciprocally disposed within said at least one cylinder bore;
(e) second means connected to said second piston member for contacting the earth;
(f) means for selectively placing said first earth-contacting means or said second earth-contacting means in contact with the earth;
(g) means for directing said inertia mass to reciprocate parallel to said first direction when said first means is in contact with the earth, said means for directing said inertia mass to reciprocate parallel to said first direction having means for simultaneously supplying a fluid under pressure to said plurality of first piston members within each of said parallel cylinder bores when said first means is in contact with the earth;
(h) means for directing said inertia mass to reciprocate parallel to said second direction when said second means is in contact with the earth, said means for directing said inertia mass to reciprocate parallel to said second direction having means for supplying said fluid under pressure to said second piston member within said at least one cylinder bore when said second means is in contact with the earth; and
(i) means interconnecting said means for contacting the earth, and in sliding relationship with said inertia mass for preventing said inertia mass from rotating about said second piston member.

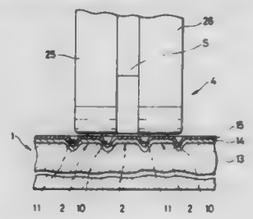
4,639,906

MAGNETIC RECORDING ON TRACKING CONTROLLED GROOVELESS MEDIUM HAVING MAGNETIC AND CAPACITANCE PROPERTIES

Kunio Goto, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Apr. 7, 1982, Ser. No. 367,033
Claims priority, application Japan, Apr. 7, 1981, 56-51957
Int. Cl.[4] G11B *13/00, 21/10*
U.S. Cl. 369—14 **7 Claims**

7. A system for reproducing signals from a recording medum having an underlying layer of a ferromagnetic material formed with a series of minute pits along each of a plurality of laterally spaced apart, first and second, guide tracks to define therebetween a magnetic recording track, the minute pits on said first guide track being arranged to occur at a rate different from the rate of occurrence of those on the second guide track; and an overlying layer of a dielectric material, comprising:
means for moving said medium;
a pickup head comprising an electrode for acting upon said first and second guide tracks by contact with the surface of said medium, an electromagnetic transducer for reproducing signals from said magnetic recording track, said electrode and transducer being arranged on a common plane aligned with the magnetic recording track and a pair of wear resistant identical supports between which said electrode and said transducer are secured, said supports defining with said electrode and transducer a contact face with which the pickup head contacts the surface of said recording medium, said contact face having a width greater than the width of said magnetic recording track;



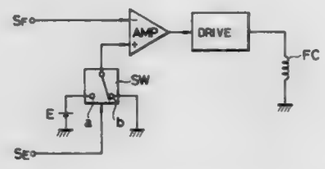
means for supplying ultrahigh frequency energy to said electrode and modulating the energy with capacitance variations which occur between said electrode and said recording medium at a rate corresponding to the rates of occurrence of said minute pits on said first and second guide tracks;
means for coupling said transducer to an external utilization circuit;
means for generating an error signal in response to said modulated ultrahigh frequency energy; and
means for controlling the position of said pickup head laterally with respect to said magnetic recording track in response to said error signal,
whereby signals are magnetically reproduced from said magnetic recording track of said recording medium.

4,639,907

MAGNETO-OPTICAL APPARATUS

Yoshio Aoki, Tokyo, and Yoshihiro Tsukamura, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,535
Claims priority, application Japan, Sep. 5, 1983, 58-162955
Int. Cl.[4] G11B *7/125*
U.S. Cl. 369—45 **2 Claims**



1. A magneto-optical recording apparatus for use with a magneto-optical medium having a first amorphous layer recording layer comprising, a laser source producing a laser beam, means for projecting said laser beam onto said magneto-optical layer and a reflected laser beam produced thereby, an objective lens through which said laser beam and said reflected laser beam pass, means for generating a focus error signal, a focusing coil mounted so as to move said objective lens normal to said magneto-optical medium in response to said focus error signal so that said laser beam is focused on said first layer of said magneto-optical medium during the recording mode of operation; a D.C. signal source, and adding means for adding said D.C. signal to said focus error signal during the erasing mode of operation so that the beam of said laser source is focused on a plane in front of said first layer of said magneto-optical medium and intelligence recorded on said first layer of said magneto-optical medium will be erased.

4,639,908

HIGH DENSITY INFORMATION RECORDS MADE OF CONDUCTIVE RESIN COMPOSITIONS COMPRISING INORGANIC POWER STABILIZERS

Kazuhira Namikawa; Toshiaki Hamaguchi; Mutsuaki Nakamura, and Akio Kuroda, all of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Dec. 7, 1984, Ser. No. 679,490
Claims priority, application Japan, Dec. 10, 1983, 58-232238
Int. Cl.[4] G11B *23/00*
U.S. Cl. 369—288 **6 Claims**

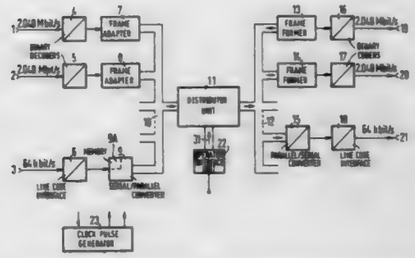
1. A high density information record of an electrostatic capacitance type which comprises a record substrate on which signal information is recorded as geometric variations, the substrate being made of a conductive resin composition comprising a vinyl chloride resin, 5 to 30 parts by weight of a conductive powder and not greater than 10 parts by weight of an inorganic stabilizer capable of suppressing a dehydrochlorination reaction occurring in the vinyl chloride resin during a processing operation and capable of fixing hydrochloric acid produced during the operation, said inorganic stabilizer being selected from the group consisting of calcium hydroxide, basic aluminum magnesium carbonate hydrate and hydrotalcite and being in the form of a powder having an average size below 10 μm and an antacidic action, both based on 100 parts by weight of the vinyl chloride resin, whereby dropout defects of the record are greatly reduced.

4,639,909

DIGITAL SIGNAL DISTRIBUTOR

Heinrich Nirschl, Munich; Klaus Kamp, Neuried, and Baldur Stummer, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 18, 1984, Ser. No. 651,862
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1983, 3333775
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58 **31 Claims**



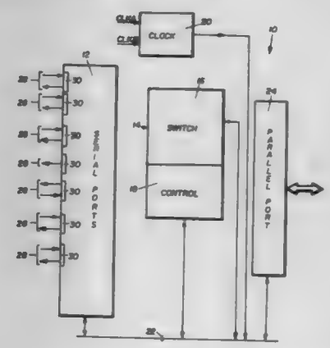
1. A digital signal distribution circuit for time division multiplex signals each having a same frame format and for discrete channel signals comprising:
a plurality of frame adaptor means respectively connected to a plurality of inputs of said circuit, said frame adaptor means synchronizing and storing said time division multiplex signals for forming code words therefrom;
a memory and converter means connected to another input of said circuit for converting and storing said discrete channel signals and forming code words therefrom;
a distributor means having inputs respectively connected to outputs of said frame adaptor means and said memory and converter means respectively through a first bus and first discrete lines;
a clock pulse generator for cyclically controlling feed of code words into said first bus and said first discrete lines;
an operator interface means for entering setting information into said distributor means for controlling distribution of said code words by said distributor means; and
a second bus and second discrete lines connected to outputs of said distributor means and to respective outputs of said circuit to which code words distributed by said distributor means are supplied.

4,639,910

APPARATUS FOR ESTABLISHING COMMUNICATION PATHS

Herbert J. Toegel, Middlebury; Joseph R. Yudichak, and John F. Gliedorf, both of Madison, all of Conn., assignors to ITT Corporation, New York, N.Y.

Filed Dec. 14, 1984, Ser. No. 682,228
Int. Cl.[4] H04G *11/04*
U.S. Cl. 370—58 **24 Claims**



1. An apparatus for establishing communication paths comprising:
a plurality of duplex ports;
a switch, said switch having a switch controller associated therewith and
means for conveying information and instructions between said ports and said switch, said conveying means is a single internal TDM bus, said internal TDM bus interconnecting said switch with all of said duplex ports, said instructions being provided via any said duplex ports and conveyed via said internal TDM bus, whereby communication paths across said switch can be established according to said instructions.

4,639,911

HEAD-END AND RECEIVER FOR A SIGNAL DISTRIBUTION SYSTEM

Engel Roza, and Hendrik G. Van Veenendaal, both of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

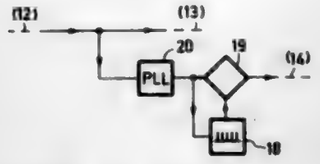
Filed Sep. 12, 1983, Ser. No. 531,544
Claims priority, application Netherlands, Sep. 17, 1982, 8203599
Int. Cl.[4] H04J *1/00*; H04N *7/04*; H04K *1/10*
U.S. Cl. 370—69.1 **8 Claims**

1. In a receiver for processing received digital signals signifying a signal having a wide frequency band and a sub-carrier added to said signal having said wide frequency band, said

sub-carrier being modulated with a signal having a narrow frequency band, comprising

first digital-to-analog converter means for generating said signal having said wide frequency band in response to said received signal;

bandpass filter means for extracting said modulated sub-carrier from said received signal;



amplitude demodulator means connected to said bandpass filter means for generating a demodulated digital signal corresponding to said signal having said narrow frequency band; and

second digital/analog converter means connected to said amplitude demodulator means for converting said demodulated digital signal to said signal having said narrow frequency band.

4,639,912

SIGNAL TRANSMISSION APPARATUS

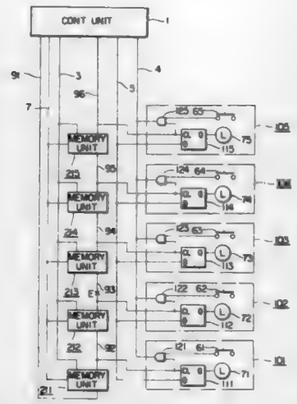
Junichi Tanino, Ichinomiya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1984, Ser. No. 652,626

Claims priority, application Japan, Sep. 30, 1983, 58-182203

Int. Cl.⁴ H04J *3/00*; H04Q *3/00*

U.S. Cl. 370—86 **10 Claims**



1. A signal transmission apparatus comprising:

a control unit for generating clock pulses and receiving signals representing external data through signal lines;

a plurality of signal terminal means respectively connected in parallel with said signal lines for transmitting said data signals;

pulse generator means provided in said control unit for generating said clock pulses;

a counter provided in said control unit for counting said clock pulses and generating a gate signal upon reaching a predetermined number of said clock pulses, said predetermined number being greater than the number of said signal terminal means;

a plurality of memory means corresponding to said plurality of signal terminal means and connected in series one after another from a starting terminal to a terminating terminal, including a starting memory means at the starting terminal and a terminating memory means at the terminating terminal connected to said control unit to constitute a closed loop, one of said starting and terminating memory means receiving and storing a first gate signal from said counter for subsequent transfer along a sending path to the remaining memory means responsive successively to said clock pulses;

detector means for detecting complete transfer of said first gate signal from said starting terminal to said terminating of said memory means before a next gate signal is generated; and

switching means for switching said sending path upon a detected result of said detector means so that the first gate signal is sent to one of said starting and terminating memory means.

4,639,913

METHOD AND EQUIPMENT FOR ELECTRONICALLY TRANSMITTING INFORMATIONS

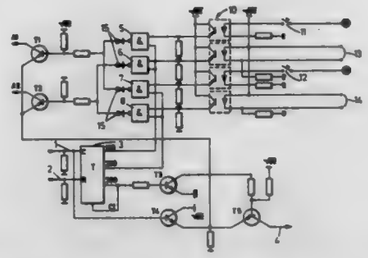
Willy Rombaut, Leopoldstraat 55, 9400 Ninove-Okegem, Belgium

Filed Dec. 19, 1984, Ser. No. 683,672

Claims priority, application Belgium, Dec. 19, 1983, 896499

Int. Cl.⁴ H04J *3/02*

U.S. Cl. 370—90 **10 Claims**



1. Method for electronically transmitting informations, comprising the steps of:

generating a clock pulse series with a pulse generator which clock pulse series includes a plurality of clock pulses, each of which include at least one pulse;

transmitting said clock pulses on a common line said pulses being transmitted on a first end of said common line, and a second end thereof being coupled to a point near said first end, so that said common line is formed in a ring,

picking up the frontmost clock pulse at a first point on said common line and letting the ones of the clock pulses that follow said front-most clock pulse move along said common line;

performing an operation on the picked-up clock pulse which conveys thereto the information to be transmitted to form a treated pulse, and feeding such treated pulse to a common answer line;

performing picking-up and treating steps for frontmost clock pulses for all information to be transmitted;

feeding the treated clock pulses on the answer line to a receiving means and separating the various treated pulses according to the clock sequence to make use of the information content thereof; and

using the first clock pulse to return the pick-up means to an original condition thereof and to cause the clock pulse generator to perform a new cycle after using the same for transmitting informations.

4,639,914

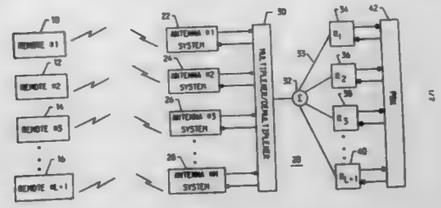
WIRELESS PBX/LAN SYSTEM WITH OPTIMUM COMBINING

Jack H. Winters, Middletown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 6, 1984, Ser. No. 679,067

Int. Cl.⁴ H04J *3/12*; H04Q *7/00*; H04B *1/00*

U.S. Cl. 370—110.1 **9 Claims**



1. A wireless system for communication between a base station and a plurality of terminals at locations remote from said base station, said system comprising in combination

means, including plural antennas for adaptive signal processing at said base station for interference suppression and separation of desired signals,

means for adaptive power control at transmitters located at said terminals for reducing interference to acceptable levels, and

means for adaptive retransmission with time division in the direction from said base station to said terminals for communications therebetween and for sending power control information to said terminals.

4,639,915

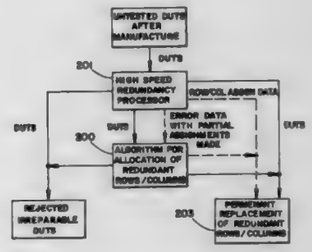
HIGH SPEED REDUNDANCY PROCESSOR

Gene P. Bosse, Newberry Park, Calif., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 539,511, Oct. 6, 1983, Pat. No. 4,586,178. This application Sep. 10, 1984, Ser. No. 648,674

Int. Cl.⁴ G06F *10/20*

U.S. Cl. 371—10 **8 Claims**



1. A system for testing a redundantly reparable array comprising:

means for detecting data representing the locations of faulty cells of the array during a testing sequence:

means for generating a redundancy signal representative of at least one redundant element available for repair of the faulty cells;

logic circuit means coupled to said detector means and to said signal generating means to provide an output array pattern during the testing sequence which selectively specifies replacement of said faulty cells with a redundant element;

means for generating a signal indicative of a comparison between said redundancy signal and said output array pattern; and

abort circuit means coupled to said logic circuit means to provide an abort signal terminating the testing in accordance with said comparison signal.

4,639,916

AUTOMATIC METHOD AND MACHINE FOR THE SIMULTANEOUS TESTING OF DATA PROCESSING SYSTEMS

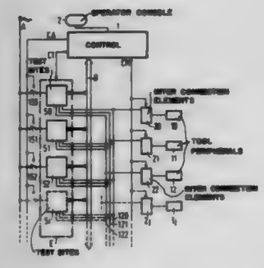
Daniel Boutterin, Bretigny; Jean-Paul Bertaux, Kremlin Bicêtre, and Alain Bader, Boulogne Billancourt, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 19, 1984, Ser. No. 622,348

Claims priority, application France, Jun. 22, 1983, 83 10315

Int. Cl.⁴ G06F *11/26*

U.S. Cl. 371—16 **14 Claims**



1. A method for testing a plurality of data processing systems, each by means of at least one test program from a first set of test programs, each data processing system comprising a central processing unit, a main memory, a stabilized power supply unit, and at least one control means for an associated peripheral device, and loading means for loading a test program in its main memory for execution by its central processing unit, each data processing system having an individual identification, said method being characterized by the following steps:

(a) providing a test machine for interconnection to said plurality of data processing systems, said test machine including a control unit, a power supply interconnection, a second set of tool peripherals controlled by an associated and selectable one of said control means, memory means for storing said first set of test programs and operator interface means;

(b) entering into said test machine the configuration data of each data processing system of said plurality of data processing systems as represented by the number and nature of the control means for peripheral devices thereof;

(c) automatic selecting by said test machine of specific test programs as a subset from said first set for execution in each data processing system as determined by said number and nature of said control means;

(d) executing said testing by recurrently executing the following substeps;

(d1) scanning the connection points of data processing systems interconnected to said test machine to determine the presence or absence of a system;

(d2) for a data processing system present and connected, scanning the set of specific test programs which can be selected to test said system;

(d3) for a specific test program selected, accessing any tool peripheral necessary for execution of the test program in question for determining the availability of said tool peripheral and in case of availability, allocating the tool peripheral in question to the data processing system in question;

(d4) in case of unavailability of any tool peripheral necessary, first, searching for any tool peripheral adapted as a substitute for the unavailable tool peripheral, second, in case of unavailability of any necessary substitute tool peripheral, disallocating any tool peripheral allocated

to the data processing system in question and thereupon scanning any remaining test program of said specific test programs for the data processing system in question for detecting an executability condition thereof as based on an availability of all necessary tool peripherals then allocated thereto, third, in case of absence of any executability condition for the data processing system in question, disallocating any tool peripheral allocated to the data processing system in question and returning to the substep of scanning the data processing system;

(d5) in case of detecting an executability condition, loading the test program in question into the main memory of the data processing system in question for subsequent execution thereby and returning to the substep of scanning the data processing systems;

(d6) in said data processing system executing said test program as isolated from any other scanning, availability detecting, executability detecting, or allocating substep, and after terminating said executing, signalling said terminating to said test machine;

(d7) upon receiving a terminating signal from a data processing system, disallocating in said test machine any tool peripheral then allocated to the data processing system in question and returning to the substep of scanning the data processing system;

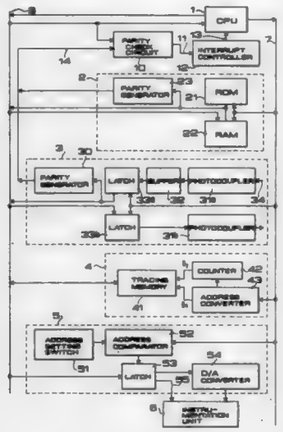
(e) upon reaching an output condition, outputting test results from each test program executed, as represented by an OK/OK condition, a test identity, and an identification as to the tested data processing system.

4,639,917

FAULT DETERMINING APPARATUS FOR DATA TRANSMISSION SYSTEM

Michihiro Furuta, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1984, Ser. No. 623,705
Claims priority, application Japan, Jun. 24, 1983, 58-114608
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—16 **5 Claims**



1. A fault determining apparatus for a data transmission system having a central processing unit (CPU) which transfers data to and from a main storage and an input/output unit through a data bus in accordance with information on an address command bus, said apparatus comprising:

parity generating means in each of said main storage and said input/output unit for generating and appending a parity bit to the data bus upon transfer of data bits from the respective main storage and input/output unit to the data bus,

parity checking means associated with the CPU and connected to the data bus for receiving the data bits and the parity bit and for generating a parity error signal when the parity of the received data bits does not correspond to the received parity bit,

a trace memory means connected to the data bus and the address command bus and including addressing means responsive to detection of predetermined signals on the address command bus for storing trace information of data received by said CPU from said main storage and said input/output units over a predetermined duration and for storing a transitional record of the logical state of a fault detection signal and the parity error signal from the parity checking means along with the stored data;

trace memory retrieval means for retrieving information stored in said trace memory means corresponding to stored data from a selected source address of said main storage and said input/output means along with the corresponding stored transitional record of the fault detection signal and the parity error signal; and

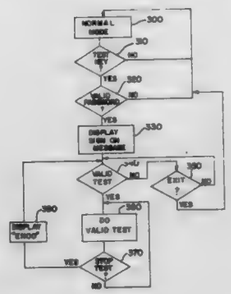
means for generating a record of said data transmission system based on said retrieved data and transitional record of said fault detection signal and said parity error signal retrieved by said trace memory retrieval means.

4,639,918

DIAGNOSTIC CONTROL KEYBOARD FOR A MAILING MACHINE

William J. Linkowski, Poughquag, N.Y., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 18, 1985, Ser. No. 692,803
Int. Cl.[4] G06F *15/20, 11/00*
U.S. Cl. 371—20 **33 Claims**



1. A method of performing diagnostic testing in an automatic mailing machine having a plurality of subsystems and a control panel which includes a visual display and plurality of keys for control of the mailing machines functions during a normal mode of operation, the method comprising the steps of:

initiating a test mode in response to activating a predetermined key on the control panel;

transforming the control panel to function as a test selection panel in response to initiating the test mode;

generating a password signal in response to activating a predetermined sequence of control panel keys;

performing a selected one of a plurality of diagnostic tests in response to initiation of the test mode and generation of the password signal; and

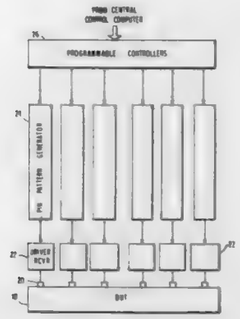
said mailing machine further including a photo-sensor and wherein one of the plurality of diagnostic tests comprises the steps of displaying a preselected set of characters on the visual display in response to blocking the photo-sensor, displaying a second preselected set of characters on the visual display in response to clearing the photo-sensor, and stopping the test in response to activation of a stop key.

4,639,919

DISTRIBUTED PATTERN GENERATOR

Yi-Hua E. Chang, Poughkeepsie; Algirdas J. Gruodis, Wappingers Falls; Hans P. Muhlfeld, Jr., Highland, all of N.Y.; Charles W. Rodriguez, Bethel, Conn., and Mark L. Shulman, Hyde Park, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1983, Ser. No. 564,853
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—27 **19 Claims**



1. An apparatus for testing an array having a plurality of terminals, said apparatus testing said array by applying a sequence of test vectors to said array terminals with each said test vector including a plurality of bits each of which is applied to a respective one of said array terminals, each terminal receiving a serial pattern of bits as its respective portion of said sequence of vectors, said apparatus including a plurality of pattern generating means each for separately generating said pattern of bits for a respective one of said terminals, each said pattern generating means comprising pattern generator storage means for storing a plurality of basic pattern, and repetition control means for reading out said basic patterns, combinations of said basic patterns and sequences of said combinations of said basic patterns in order to obtain said serial pattern of bits, said repetition control means including address means for generating an address to said pattern generator storage means for reading out a pattern memory word stored at said address, said pattern memory word including at least one of said basic patterns and said pattern memory word further including control data for controlling the combinations and repetitions of basic patterns to be read out of said pattern generator storage means, and said repetition control means further comprising logic means responsive to said control data for controlling said address means to provide a desired sequence of addresses to said pattern generator storage means.

4,639,920

DATA INTERPOLATING CIRCUIT USING A TWO DATA WORD MEMORY

Takashi Kaneko, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

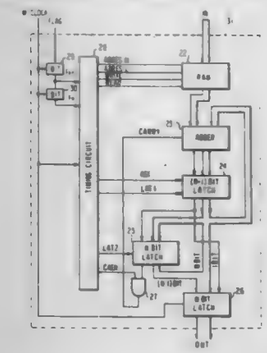
Filed Feb. 27, 1984, Ser. No. 584,262
Claims priority, application Japan, Feb. 25, 1983, 58-31481
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—31 **17 Claims**

1. A data interpolating circuit under control of a source of clock signals for interpolating an erroneous data word which is contained in a plurality of digital data words in a received digital bit stream, each data word being constituted by a plurality of bits and being accompanied by an error-flag bit, said circuit comprising:

an error-flag latch means connected to remove said error flag bits and said clock signals for temporarily storing both an error-flag bit added to an n-th data word and an error-flag bit added to an (n+1)th data word, where n stands for an integer of two or more;

a memory circuit connected to receive said digital bit stream and consisting of first and second memory regions for storing two data words;

a timing circuit means connected to receive said clock signals and signals stored in said error flag latch means and to provide control signals to said memory circuit for controlling the operation of writing an input data word into said first memory region and of transferring a data word stored in said first memory region to said second memory region in accordance with the data stored in said error-flag latch means whereby, at a given point in time, a correct data



word is stored in said first memory region and the last occurring correct data is stored in said second memory region;

an arithmetic circuit connected to said memory circuit and said timing circuit means for performing an arithmetic operation on the data words read out from said memory circuit in accordance with the data stored in said error-flag latch means and an output of said timing circuit means; and

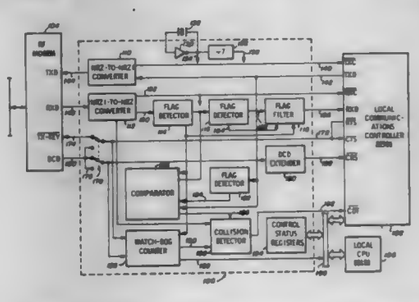
an output latch means connected to said arithmetic circuit for temporarily storing the result of the arithmetic operation and providing the result as an output under control of said clock signals.

4,639,921

METHOD AND AN APPARATUS FOR EARLY BIT COLLISION DETECTION

Joseph M. Gang, San Jose, and Mitchell B. Bain, Mountain View, both of Calif., assignors to Sytek, Inc., Mountain View, Calif.

Filed Jan. 9, 1985, Ser. No. 690,114
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—53 **5 Claims**



1. A method of serially transmitting bits in a network and receiving echo bits from the network to provide early detec-

tion of bit collision, the method comprising in combination the steps of:

serially transmitting the bits;

developing a running count of said bits as they are being transmitted beginning at least from a first predetermined one of said bits;

developing a running check sum of said bits as they are being transmitted beginning at least from a second predetermined one of said bits;

serially receiving said bits;

developing a running count of said bits as they are being received at least from said first predetermined bit;

developing a running check sum of said bits as they are being received at least from said second predetermined bit;

at a time at least when a third predetermined one of said bits is being received, storing the current transmitted-bit count;

at said third predetermined bit time, storing the current transmitted-bit-check sum;

comparing the current received-bit count to the stored-bit count; and

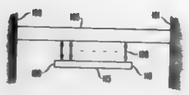
when the current received-bit count equals said stored-bit count, comparing the current received-bit-check sum to the stored-bit-check sum to detect a bit collision.

4,639,922

SINGLE MODE INJECTION LASER STRUCTURE

Stewart E. Miller, Middletown Township, Monmouth County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Sep. 28, 1984, Ser. No. 655,257
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—19 **22 Claims**



1. An injection laser which comprises:

a laser cavity having a main mode,

an active laser region disposed within the laser cavity,

means for injection pumping the active laser region to produce laser radiation, and

auxiliary light guiding means disposed in a physical relationship with said active laser region so that laser radiation is coupled therebetween in order to provide a wavelength selective energy loss in said active laser region, wherein a value of loss at the wavelength of the main mode is less than its value at the wavelengh of modes other than the main mode.

4,639,923

OPTICAL PARAMETRIC OSCILLATOR USING UREA CRYSTAL

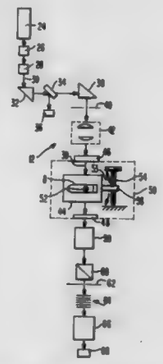
Chung L. Tang, Ithaca, N.Y., and William F. Donaldson, Pittsford, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed May 21, 1984, Ser. No. 612,756
Int. Cl.⁴ H01S *3/10*
U.S. Cl. 372—21 **16 Claims**

1. A tunable optical parametric oscillator, comprising:

a pump source producing a pump beam at a first frequency and a first wavelength;

a resonant cavity incorporating a nonlinear organic crystal aligned with and responsive to said pump beam to produce at least an output signal beam at a second frequency



and a second wavelength which is longer than said first wavelength; and

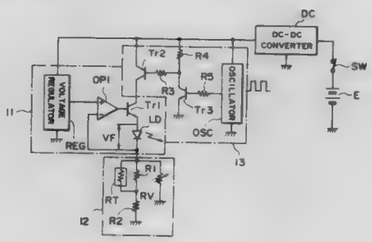
means for adjusting the angle of said crystal with respect to said pump beam to tune said oscillator in order to vary the frequency and wavelength of said output signal beam.

4,639,924

DRIVE SYSTEM FOR A SEMICONDUCTOR LASER

Tokuichi Tsunekawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1983, Ser. No. 525,174
Claims priority, application Japan, Sep. 3, 1982, 57-154131; Sep. 3, 1982, 57-154132; Apr. 7, 1983, 58-61452; Apr. 7, 1983, 58-61453
Int. Cl.⁴ H01S *3/13*
U.S. Cl. 372—33 **5 Claims**



1. A semiconductor laser driving circuit comprising:

(a) a semiconductor laser having two terminals;

(b) a transistor having a first terminal connected to one terminal of said laser, a second terminal arranged for connection to an electric power source and a control terminal;

(c) an operational amplifier having one input terminal for accepting a reference voltage and another input terminal connected to the other terminal of said laser, an output of said operational amplifier being connected to said control terminal of said transistor;

(d) a temperature compensation resistance circuit connected to a junction of said other terminal of said laser and said other input terminal of said operational amplifier; and

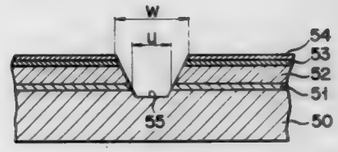
(e) an adjusting resistance connected in parallel with said temperature compensation resistance circuit.

4,639,925

SEMICONDUCTOR LASER

Haruki Kurihara, Tokyo; Minoru Segara; Kenji Matumoto, both of Yokohama, and Hideo Tamura, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 24, 1984, Ser. No. 603,453
Claims priority, application Japan, Apr. 27, 1983, 58-72933; Apr. 27, 1983, 58-72934
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—46 **17 Claims**



1. A semiconductor laser comprising:

(i) a semiconductor base structure including a GaAs substrate provided with an etched channel, a channel deformation-preventing layer formed of $Ga_{1-x}Al_xAs$ ($0.1 \leqq x \leqq 1$) and formed on the surface of said substrate except over said channel, said channel deformation-preventing layer having a thickness of 0.2 μm or less, and an oxidation-preventing layer formed of GaAs and formed on the surface of said channel deformation-preventing layer;

(ii) a laminated semiconductor structure formed on said base structure and including a lower cladding layer formed on the surface of said semiconductor base structure including said channel, an active layer formed on the surface of said lower cladding layer, and an upper cladding layer formed on the surface of said active layer; and

(iii) an electrode means for applying current to said active layer.

4,639,926

EFFICIENT CATHODE ASSEMBLY FOR METAL VAPOR LASER

Shing C. Wang, Arcadia, and Randolph W. Hamerdinger, Glendora, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 9, 1980, Ser. No. 158,000
Int. Cl.⁴ H01S *3/097*
U.S. Cl. 372—87 **22 Claims**



1. A metal vapor laser tube for generating simultaneous multi-line emissions comprising:

a gas-filled envelope having a longitudinal axis, said gas including as a portion thereof a given metal vapor, an anode electrode forming a portion of said envelope;

a cathode assembly comprising a perforated hollow cathode located within said envelope and coaxially disposed with respect to said anode electrode portion of said envelope and concentric therewith, a metal member positioned with respect to said hollow cathode, said metal member when vaporized providing said given metal vapor, and an insulator member in contact with said metal member;

an anode screen interposed between said anode electrode and said cathode assembly and electrically coupled to said anode electrode;

coaxially aligned end members, said end members and said envelope being adapted to provide a structure for confining a gaseous medium therein;

means for generating a dc voltage; and

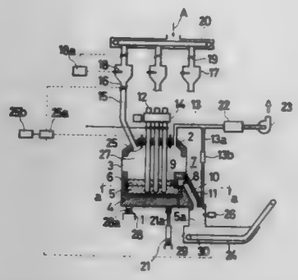
means for applying said dc voltage between said anode screen and said cathode assembly whereby a discharge between said cathode and said anode screen is created, said gas being excited by said discharge for stimulating continuous wave, simultaneous multi-line emissions along the longitudinal axis of said cathode.

4,639,927

CONTINUOUS MELT ELECTRIC FURNACE WITH CONTINUOUS DISCHARGE

Kunihiko Uno, Hirakata; Kunihiro Nakazato, Takatsuki; Masahide Nishigaki, Miki; Hajime Hirotomi, Kakogawa; Shigeo Kimura, Kobe; Sadao Kurihara, Kosugimachi; Hideo Tanaka, Takaoka; Jiro Mihara, Tokyo, and Kiyoaki Takai, Takaoka, all of Japan, assignors to Kabushiki Kaisha Takuma, Osaka and Nihon Jukagaku Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jul. 23, 1985, Ser. No. 757,985
Int. Cl.⁴ F27D *3/14*
U.S. Cl. 373—84 **8 Claims**



1. An electric melting furnace for receiving unmolten combustion residue, continuously melting said combustion residue to produce molten substances, and continuously discharging said molten substances, said furnace comprising:

a furnace body having an exit on a sidewall thereof through which said molten substances are discharged and a plurality of electrodes extending downwardly into said furnace body,

said exit comprising an upwardly extending overflow dam and a downwardly extending blocking plate located inwardly of said overflow dam, said blocking plate blocking the outflow of unmolten combustion residue from said furnace;

said exit being positioned substantially colinearly with the center of said furnace body and one of said electrodes,

said dam being spaced from said one electrode by a distance L where

$$L = 1.6 \times \frac{1}{K} \sqrt{\frac{4}{3} \times \frac{P}{\pi}}$$

where L is expressed in centimeters, P is the electric furnace load in Watts and K is a constant in the range of 16 to 25 $Watt^{\frac{1}{2}} \cdot cm^{-1}$.

4,639,928

DISC MEANS FOR AN ELECTRODE FOR USE IN ELECTRIC ARC FURNACES

Claudio Conradty, Röthenbach/Pegnitz; Dieter Zöllner, Schwaig/Nürnberg; Inge Lauterbach-Dammler, Nuremberg, and Thomas Taube, Erlangen-Steudach, all of Fed. Rep. of Germany, assignors to Arc Technologies Systems Ltd., Grand Cayman, Cayman Islands

Filed Mar. 12, 1984, Ser. No. 588,788

Claims priority, application Switzerland, Mar. 22, 1983, 1545/83

Int. Cl.⁴ H05B 7/08

U.S. Cl. 373—93 **11 Claims**



1. In an arc furnace electrode, having an upper-metallic, water-cooled electrode holder, surrounded by a protective jacket resistant to elevated temperature and mechanical stress, and a consumable section, threadably connected to the electrode holder by means of a threaded nipple, the improvement comprising a disc arranged between the metallic part of the electrode holder and the consumable section, said disc being attached to or carried by said metallic part while being in covering contact with a lower front plate of said metallic part of the electrode holder, with the disc being formed from a material having good electrical conductivity and resistance to thermal and mechanical stress, said disc having a central aperture having a diameter essentially corresponding to the diameter of the threaded nipple.

4,639,929

CONTINUOUS METHOD OF GRAPHITIZING LONG CARBON-CONTAINING PRODUCTS AND A FURNACE FOR CARRYING OUT THE METHOD

Jean-Claude Bernard, Sainte-Foy-les-Lyon, France; Patrick Chabrier, La Corogne, Spain; Bernard Tahon; Jean-Marc Tesoriere, both of Le Fayet, France, and Domingo Ortega, Paris, France, assignors to Societe des Electrodes et Refractaires "Savoie" (SERS), Paris, France

PCT No. PCT/FR83/00200, § 371 Date Jun. 6, 1984, § 102(e) Date Jun. 6, 1984, PCT Pub. No. WO84/01368, PCT Pub. Date Apr. 12, 1984

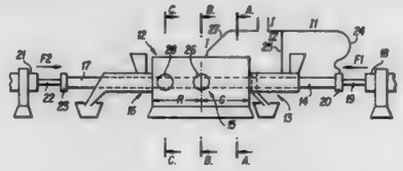
PCT Filed Oct. 4, 1983, Ser. No. 619,591

Claims priority, application France, Oct. 6, 1982, 82 17020

Int. Cl.⁴ H05B 3/60

U.S. Cl. 373—120 **20 Claims**

1. A method for continously graphitizing a long pre-cooked carbon-containing product, comprising passing the said carbon-containing product through the inside of a furnace in a column, and heating the said column of carbon-containing product by the Joule effect to a temperature of at least 2500° C., wherein the said column of carbon-containing product is arranged substantially horizontally, and wherein the said furnace is packed with a fragmented carbon-containing material which is maintained within the furnace.



4,639,930

PORT FOR GRAPHITIZATION FURNACE

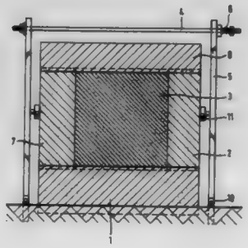
Ulrich Kandzia, Bad Soden, Fed. Rep. of Germany, assignor to Sigri GmbH, Meitingen, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 698,930

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404322

Int. Cl.⁴ H05B 3/00

U.S. Cl. 373—120 **14 Claims**



1. Port for a graphitizing furnace, particularly for a longitudinal graphitizing oven, comprising refractory masonry and an electrode set into the masonry, said masonry formed of a bottom section, lateral blocks and a yoke, said electrode resting on the bottom section and the yoke resting on the electrode, and a clamping device comprising a tierod, a lever and a spring clamping the lateral blocks to the electrode.

4,639,931

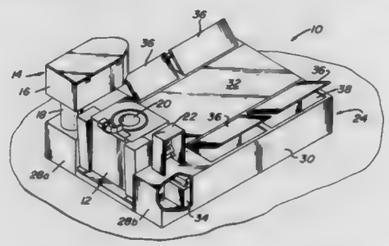
INDUCTION FURNACE PACKAGING SYSTEM

John H. Mortimer, Medford, N.J., assignor to Inductotherm Industries, Inc., Rancocas, N.J.

Filed Aug. 1, 1985, Ser. No. 761,272

Int. Cl.⁴ H05B 5/00

U.S. Cl. 373—138 **3 Claims**



1. A packaging system for an induction furnance comprising:

(a) housing means having a base, side walls and a top wall, the base, top and side walls defining an enclosed space,

(b) an induction furnace contained substantially within the enclosed space,

(c) furnace operating equipment centrally located within the enclosed space and defining spaces between the furnace operating equipment and side walls of the housing means,

(d) access means in the top wall adjacent the spaces between the furnace operating equipment and the side walls for providing access to the spaced and access to the furnace operating equipment from the sides thereof while preventing access to the furnace operating equipment from the top thereof,

(e) induction furnace charging means mounted on the housing means adjacent the induction furnace and pivotable with respect thereto for charging the induction furnace with metal to be melted, and

(f) furnace control housing means mounted on the top wall and adjacent the induction furnace.

4,639,932

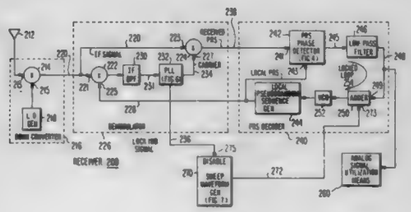
CLOCK RATE SPREAD SPECTRUM

Leonard N. Schiff, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 29, 1985, Ser. No. 770,561

Int. Cl.⁴ H04K 1/02

U.S. Cl. 375—1 **10 Claims**



1. A decoder for a direct-sequence spread spectrum signal encoded with a first pseudorandom sequence the clock rate of which is modulated by analog information, comprising:

a rate-controllable oscillator for generating variable-rate clock signals;

a local pseudorandom sequence generator coupled to said rate controlled oscillator for being clocked thereby to produce a local rate-variable pseudorandom sequence, said local pseudorandom sequence corresponding to said first pseudorandom sequence;

phase detecting means including (a) first and second mixing means, each of which includes a first and second input terminals and an output terminal, said first input terminals of said first and second mixing means being coupled together and to receive said spread-spectrum signal, said second input terminal of said first mixing means being coupled to said local pseudorandom sequence generator for receiving said local pseudorandom sequence, (b) delay means coupled between said second input terminal of said first mixing means and second input terminal of said second mixing means for delaying said local pseudorandom signal applied to said second mixing means, (c) first and second lowpass filters coupled to said output terminals of said first and second mixing means, respectively and (d) differencing means coupled to said output terminals of said first and second low pass filters for receiving filtered mixed signals therefrom for generating a control signal equal to the difference between said filtered mixed signals;

loop filter means coupled to said differencing means portion of said phase detecting means for averaging said control signal to generate a filtered control signal;

coupling means coupled to said loop filter means and to said rate-controlled oscillator for closing a degenerative feedback loop for maintaining said first and local pseudorandom sequences in phase coherence, whereby said filtered control signal manifests said analog information; and

information utilizing means coupled to said filter means for receiving as said analog information said filtered control signal.

4,639,933

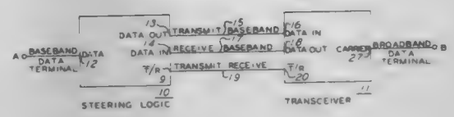
STEERING LOGIC CIRCUIT FOR A DIGITAL DATA TRANSCEIVER

Edward K. Howell, Simsbury, and Thomas E. Anderson, Avon, both of Conn., assignors to General Electric Company, Portsmouth, Va.

Continuation of Ser. No. 561,483, Dec. 14, 1983, abandoned. This application Oct. 29, 1985, Ser. No. 792,239

Int. Cl.⁴ H04L 5/16

U.S. Cl. 375—8 **6 Claims**



1. Steering logic for interconnecting a transceiver with a baseband bus, said transceiver being connected to a broadband bus for transmitting or receiving modulated carrier wave signals on said broadband bus, said transceiver having data in and data out terminals for inputting or outputting digital signals at baseband and at least one control terminal for receiving a control signal, said transceiver being responsive to said control signal for enabling or disabling transmitting or receiving functions of said transceiver, said steering logic comprising:

a baseband bus terminal to which baseband digital transmit signals may be applied and to which baseband digital receive signals from said transceiver are applied;

a buffer connected between the data out terminal of said transceiver and said baseband bus terminal; and

logic means having inputs connected to said baseband bus terminal and the data out terminal of said transceiver and an output connected to said at least one control terminal, said logic means being responsive to baseband digital transmit signals applied to said baseband bus terminal for generating said control signal to enable the transmitting function and to disable the receiving function of said transceiver.

4,639,934

LINE IMPAIRMENT DISPLAY FOR DIGITAL MODEMS

Edward S. Zuranski, Largo; Robert E. Scott, Clearwater, and William L. Betts, St. Petersburgh, all of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Apr. 11, 1985, Ser. No. 722,295

Int. Cl.⁴ H04B 3/46

U.S. Cl. 375—10 **6 Claims**

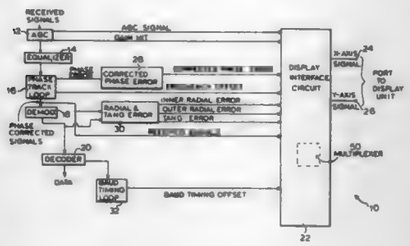
1. A modem receiver for generating binary data signals from quadrative amplitude modulated received signals comprising:

means for converting said received signals into in-phase and quadrature components;

means for generating error signals corresponding to said received signals; and

display interface means for combining said in-phase and quadrature components and said error signals to generate

display two orthogonal signals defining a composite image; said composite image comprising a signal constellation having points corresponding to said in-phase and



quadrature components mapped into a complex plane and a plurality of monitoring points disposed at predetermined positions and corresponding to said error signals.

4,639,935

APPARATUS FOR CORRECTING FREQUENCY-DEPENDENT ATTENUATION OF THE TRANSMITTING MEDIUM IN SIGNAL TRANSMISSION

Göran Jarnestedt, Johanneshov, and Rolf von Campenhausen, Lidingö, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

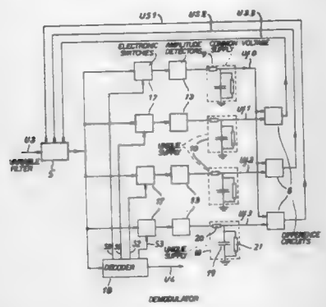
PCT No. PCT/SE84/00368, § 371 Date Jun. 19, 1985, § 102(e) Date Jun. 19, 1985, PCT Pub. No. WO85/02509, PCT Pub. Date Jun. 6, 1985

PCT Filed Oct. 31, 1984, Ser. No. 749,533

Claims priority, application Sweden, Dec. 2, 1983, 8306671

Int. Cl.⁴ H04L *27/28*

U.S. Cl. 375—11 **3 Claims**



1. In a transmission system wherein digital information represented by signals with n-different frequencies is transmitted through a medium which attenuates the signals based on their frequencies, apparatus for correcting the frequency-dependent attenuation of such signals comprising:

a variable filter means, having a signal input for receiving such signals, an output for transmitting controllably attenuated signals and n−1 control inputs for controlling the attenuation of signals received at said signal input by an amount determined by the presence of a control signal at one of said control inputs,

common voltage generating means connected to the output means of said variable filter means for generating a common voltage signal which is a function of the amplitude of signals having a first of the n-different frequencies,

n−1 other voltage generating means connected to the output means of said variable filter means, each of said n−1 voltage generating means generating a voltage signal which is a function of the amplitude of such signals having one of the n−1 frequencies different from said first frequency,

n−1 difference circuit means, each of said difference circuit means having a first input connected to the common voltage generating means to receive the common voltage signal, each of said n−1 difference circuit means having a second input connected to a different one of said n−1 voltage other voltage generating means to receive the voltage signal generating thereby, and each of said n−1 difference circuit means having an output for generating said control signal which is a function of the difference in amplitude between the voltage signals received at the inputs thereof,

and means for connecting the respective outputs of said n−1 difference circuit means to respective control inputs of said variable filter means.

4,639,936

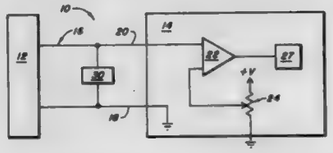
DATA TRANSMISSION SIGNAL APPARATUS

Thomas C. Hogan, Natick, and Arnold Adelman, Berlin, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Feb. 10, 1984, Ser. No. 579,093

Int. Cl.⁴ H04L *25/06*

U.S. Cl. 375—36 **10 Claims**



1. In a data communication transmission system having an signal transmitter; an analog signal receiver having a threshold element, with a selected threshold value, for receiving a transmitted signal said transmitted signal including a succession of interspersed relatively high and relatively low peak voltages and having transitional voltages between said high and low peak voltages; and a transmission link directly interconnecting said transmitter and said receiver;

a data transmission signalling apparatus comprising

voltage clamping means connected directly across said transmission link at a receiver connection for clamping voltages appearing at a receiver input between a minimum clamped voltage less than a minimum expected voltage equal to the lowest expected relatively high peak voltage appearing on the transmission link at the receiver and a maximum clamped voltage greater than a maximum expected voltage equal to the hightest expected relatively low peak voltage appearing on the transmission link at the receiver, said minimum and maximum clamped voltages being set symmetrically about said threshold value.

4,639,937

HF AVALANCHE RELAY COMMUNICATION TECHNIQUE

Daniel D. McRae, West Melbourne, and Joseph B. Cain, III, Indialantic, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Dec. 7, 1983, Ser. No. 559,091

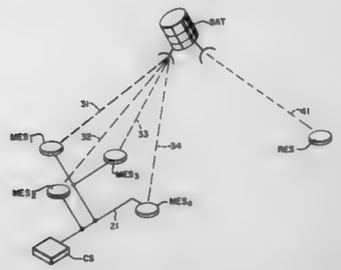
Int. Cl.⁴ H04B *7/15*

U.S. Cl. 375—40 **15 Claims**

1. For use in a communication network having a plurality of stations between which communications are to take place, a method of conveying a message from a message originating station to one or more of a plurality of recipient stations of said network for whom the message is intended comprising the steps of:

(a) transmitting a message from said originating station; and

(b) at said originating station and at all stations in said network that have received said message, each of said stations being capable of simultaneously receiving at the same receiver thereat signals that have been transmitted from multiple sites and utilizing each received signal to obtain information contained therein representative of



said originally transmitted message so as to derive the originally transmitted message regardless of the amplitude, phase and time of arrival of each of the received signals, simultaneously retransmitting said message on the same carrier frequency.

4,639,938

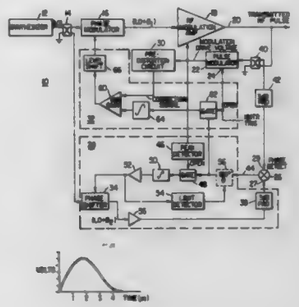
RF PULSE TRANSMITTER HAVING INCIDENTAL PHASE MODULATION (IPM) CORRECTION

Scott W. Kennett, West Jordan, Utah, assignor to E-Systems, Inc., Dallas, Tex.

Filed Nov. 6, 1985, Ser. No. 795,407

Int. Cl.⁴ H04L *25/49*

U.S. Cl. 375—60 **11 Claims**



1. An RF pulse transmitter having incidental phase modulation (IPM) correction, comprising:

means for generating a carrier signal having a predetermined frequency;

means for generating a modulation drive signal;

means responsive to the modulation drive signal for generating an RF pulse at the predetermined frequency;

means for generating a reference signal at the predetermined frequency;

means for receiving the RF pulse and the reference signal and in response thereto generating a phase error signal;

said means for generating a reference signal including means for adjusting the phase of the reference signal to thereby drive the phase error signal to a predetermined value at a pulse peak of the RF pulse;

means responsive to the modulation drive signal for generating a pre-modeled correction signal for use in correcting for the incidental phase modulation (IPM); and

means responsive to the phase error signal for applying a portion of the correction signal to the means for generating an RF pulse to correct for the incidental phase modulation.

4,639,939

APPARATUS FOR CANCELLING PERIODIC CARRIER PHASE JITTERS

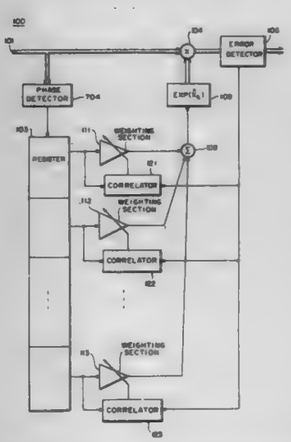
Botaro Hirosaki, and Osamu Tanaka, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 19, 1985, Ser. No. 702,656

Claims priority, application Japan, Feb. 20, 1984, 59-29735; Dec. 28, 1984, 59-277477

Int. Cl.⁴ H04L *7/02;* H03L *7/00*

U.S. Cl. 375—118 **12 Claims**



1. An apparatus for removing a periodic carrier phase jitter from a complex baseband signal, comprising:

means for detecting sequential carrier phases of the complex baseband signal;

storing means for storing said detected carrier phases;

phase predicting means responsive to outputs of said storing means for producing a predicted carrier phase;

means for compensating for a carrier phase deviation of said complex baseband signal in response to said predicted carrier phase and for producing a phase deviation compensated complex baseband signal;

error detecting means responsive to said phase deviation compensated complex baseband signal for detecting an error;

means for controlling said phase predicting means in response to said error to minimize said error.

4,639,940

CHARGE COUPLED DEVICE WITH MEANDER CHANNEL AND ELONGATED, STRAIGHT, PARALLEL GATE ELECTRODES

Osamu Ohtsuki, Kobe, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 332,241, Dec. 18, 1981, Pat. No. 4,531,225, which is a continuation of Ser. No. 887,655, Mar. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 735,639, Oct. 26, 1976, abandoned. This application May 8, 1985, Ser. No. 731,797

Claims priority, application Japan, Oct. 31, 1975, 50-131941; Dec. 24, 1975, 50-153232; Dec. 29, 1975, 50-156876

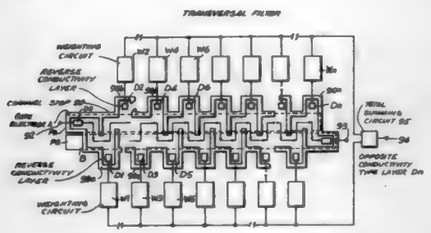
The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.

Int. Cl.⁴ G11C *19/28;* H01L *29/78;* H03H *15/02*

U.S. Cl. 377—60 **2 Claims**

1. A charge coupled device having a semiconductor substrate of predetermined conductivity type, said substrate hav-

ing a surface, a pair of substantially band-shaped channel stops formed on the substrate surface and extending in spaced substantially parallel relation, said channel stops comprising a high impurity concentration layer of the predetermined conductivity type formed on said substrate surface, a charge transfer area of a uniform conductivity type bounded by the band-shaped channel stops, a plurality of short channel stops alternately extending from each of the band-shaped channel stops toward the center of the charge transfer area, each of the short channel stops terminating at a predetermined space from the opposing band-shaped channel stop, the short channel stops comprising the high impurity concentration layer of the predetermined conductivity type formed on said substrate surface in an interdigitated pattern with the channel stops, a plurality of cells each comprising a small area between next-adjacent short channel stops of a corresponding one of the band-shaped channel stops, said cells being staggered along said charge coupled



device, means for forming an asymmetrical depletion layer in each of said cells in a regular arrangement to determine a transfer direction of the charge, a film of electrically insulative material covering the charge transfer area, and a pair of elongated substantially straight parallel gate electrodes over said insulative film, one of said gate electrodes commonly covering the cells of one of the band-shaped channel stops and the other of said gate electrodes commonly covering the cells of the other of the band-shaped channel stops thereby forming a single directional meander-shaped charge transfer channel of said uniform conductivity type in the charge transfer area under said pair of gate electrodes free from any other electrode, said gate electrodes having a side; and

a signal device at the side of said gate electrodes and providing a connection path for a signal charge through said one of said band-shaped channel stops, thereby eliminating electrode crossover.

4,639,941

RADIOGRAPHY

Godfrey N. Hounsfield, Newark, England, assignor to EMI Limited, Hayes, England

Continuation of Ser. No. 13,476, Feb. 21, 1979, Ser. No. 858,612, Dec. 8, 1977, Pat. No. 4,188,541, and Ser. No. 869,711, Jan. 16, 1978, which is a continuation of Ser. No. 758,147, Jan. 10, 1977, abandoned, which is a continuation of Ser. No. 481,443, Jun. 20, 1974, Pat. No. 4,035,647, which is a division of Ser. No. 358,980, May 10, 1973, Pat. No. 3,881,110, said Ser. No. 858,612, is a division of Ser. No. 780,791, Mar. 24, 1977, abandoned, which is a continuation of Ser. No. 657,543, Feb. 12, 1976, Pat. No. 4,052,618, which is a division of Ser. No. 468,005, May 7, 1974, Pat. No. 3,944,833, which is a division of Ser. No. 349,198, Apr. 9, 1973, Pat. No. 3,866,047, which is a continuation-in-part of Ser. No. 212,778, Dec. 27, 1971, Pat. No. 3,778,614, which is a continuation of Ser. No. 861,358, Aug. 21, 1969, abandoned. This application May 14, 1984, Ser. No. 609,521

The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.

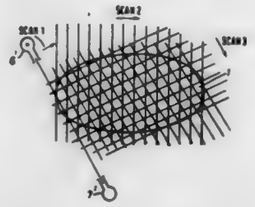
Int. Cl.⁴ G01N *23/06*

U.S. Cl. 378—11 **73 Claims**

3. In an apparatus for obtaining a 3-D tomograph of a body to be examined:

means for directing a divergent beam of penetrating radiation through the body to be examined from a source on one side of the body to a detector on the other side of the body;

means for detecting the divergent penetrating radiation that is passed through the body at a number of angularly spaced positions within the angle subtended by the divergent beam as a function of the relative angular position of



the divergent beam relative to the body to derive sets of detected radiation data representative of sets of angularly spaced divergent ray shadowgrams of absorption or transmission of the divergent penetrating radiation by the body with different ones of said angularly spaced sets of divergent ray shadowgram data corresponding to different sets of intersecting rays of divergent penetrating radiation.

4,639,942

PROCEDURE FOR MEASURING THE QUANTITY OF SILICON COATING ON PAPER OR CARDBOARD

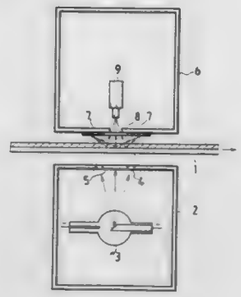
Pertti Puumalainen, Kuopio, Finland, assignor to Enso-Gutzeit Oy, Helsinki, Finland

Continuation of Ser. No. 624,934, Jun. 27, 1984. This application Mar. 17, 1986, Ser. No. 840,390

Claims priority, application Finland, Jun. 28, 1983, 832344

Int. Cl.⁴ G01N *23/223*

U.S. Cl. 378—045 **7 Claims**



1. A procedure for on-line measuring of the quantity of silicon coating on paper or cardboard moving as a continuous web and having a first face surface and an oppositely directed second face surface with the silicon coating formed on the first face surface thereof, comprising the steps of producing a primary x-ray radiation with a primary radiation source located on and spaced outwardly from the second face surface of the web, directing the primary radiation through the web from the second face surface to the first face surface and then to a secondary radiation source on the first face surface side of the web and spaced closely outwardly from the web, the secondary radiation source comprising an element having ordinal number higher than that of silicon, and exciting with said primary radiation the characteristic x-ray radiation of said element, directing the characteristic x-ray radiation excited in the secondary radiation source obliquely into the first face surface of the web and thereby exciting the characteristic x-ray radiation of the silicon contained in the silicon coating, collecting the excited characteristic x-ray radiation of silicon in a detector spaced outwardly from the first face surface side of the web, and registering by said detector said excited characteristic x-ray radiation as an indication of the amount of silicon coating, and providing screen means on the first face surface side of the web between the primary radiation source and the web for selectively passing the primary x-ray radiation from the primary radiation source at an oblique angle to the second face surface of the web and then through the web to the secondary radiation source while preventing the primary the x-ray radiation from passing directly through the web to the detector.

4,639,943

X-RAY DIAGNOSTIC SYSTEM WITH AUTOMATIC CONTROL OF RADIATION EXPOSURE

Udo Heinze, Nuernberg, and Paul Marhoff, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 25, 1985, Ser. No. 694,957

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 3402888

Int. Cl.⁴ H05G *1/44*

U.S. Cl. 378—96 **7 Claims**

1. An x-ray diagnostic system having an x-ray tube, a voltage source for operating said x-ray tube, and a control loop for controlling at least one radiographic exposure parameter of said x-ray tube, said control loop comprising:

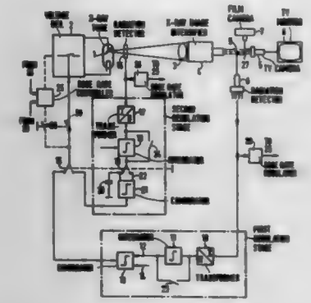
a first radiation detector disposed for detecting an x-ray image of an examination subject;

a first regulating stage connected to an output of said first radiation detector for controlling said parameter based on said first radiation detector output, said first regulating stage having an output;

a second radiation detector disposed before said examination subject in the direction of radiation propagation;

a second regulating stage for controlling said parameter based on said second radiation detector output having a memory supplied through a first switch in a first switching position with a signal derived from said output of said second radiation detector and storing said signal, and a switching unit having a signal input, a reference input connected to said memory, and an output which is the output of said second regulating stage; and

a second switch operated simultaneously with said first switch, said second switch in a first switching position connecting said output of said first regulating stage to said



voltage source for operating said x-ray tube, and when switched to a second switching position disconnecting said output of said first regulating stage and connecting said output of said second regulating stage to said voltage source for operating said x-ray tube, said first switch when simultaneously switched to a second switching position supplying said signal derived from said output of said second radiation detector to said signal input of said switching unit for thereafter maintaining said parameter at a value stored in said memory.

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DESIGN PATENTS

GRANTED JAN. 27, 1987

ERRATA

For CLASS	See PATENT NO.
D29-022	287,904
D14-053	287,964
D99-028	288,011

287,900
PROTECTIVE CAP
Sam S. Sherman, Erie, Pa., assignor to Sherman & Gray, Gastonia, N.C.
Filed Dec. 24, 1984, Ser. No. 686,038
Term of patent 14 years
U.S. Cl. D2—247

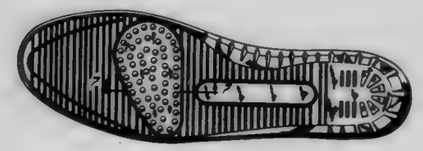


287,901
NOVELTY SUN VISOR
Jennifer Laughlin, Clearwater, Fla., assignor to B. O. Wyss, St. Louis; E. L. Wyss, Alton and R. G. Heywood, St. Louis, all of, Mo., part interest to each
Filed Apr. 27, 1984, Ser. No. 604,381
Term of patent 14 years
U.S. Cl. D2—252

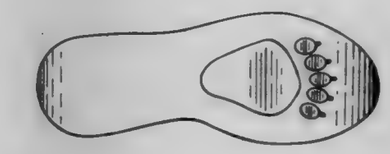




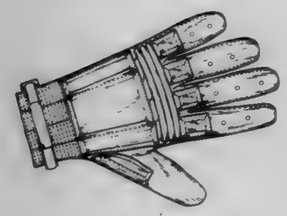
287,902
INSOLE
James A. Forsyth, Stow, Ohio, assignor to Sorbothane, Inc., Kent, Ohio
Filed Jan. 22, 1985, Ser. No. 693,622
Term of patent 14 years
U.S. Cl. D2—318



287,903
SHOE SOLE
Michael R. Jones, and Samuel N. Jones, both of 8534 N. Tyler, Portland, Oreg. 97203
Filed Jan. 25, 1985, Ser. No. 695,164
Term of patent 14 years
U.S. Cl. D2—321



287,904
ATHLETIC GLOVE
Alfred R. Pierce, Jr., 25 Argyle Ave., Blackwood, N.J. 08012
Filed Dec. 31, 1984, Ser. No. 687,745
Term of patent 14 years
U.S. Cl. D29—22





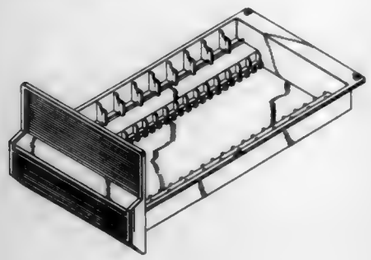
287,905
HOLDER FOR A PAGER
Takashi Oyamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed May 17, 1984, Ser. No. 611,555
Claims priority, application Japan, Nov. 17, 1983, 58-50052
Term of patent 14 years
U.S. Cl. D3—106



287,906
TRAVEL CASE FOR AN ELECTRIC SHOE POLISHING KIT OR THE LIKE
Masao Tsuji, Old Lyme, and William J. Rakocy, Madison, both of Conn., assignors to North American Philips Corporation, New York, N.Y.
Filed Nov. 9, 1984, Ser. No. 669,982
Term of patent 14 years
U.S. Cl. D3—30.5



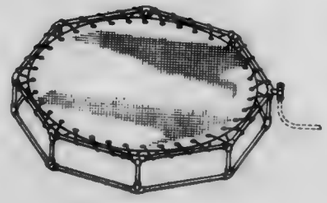
287,907
MAGNETIC TAPE STORAGE DRAWER
Jackson Yu, Taipei, Taiwan, assignor to Worthy Industrial Inc., Taipei, Taiwan
Filed Jul. 10, 1984, Ser. No. 629,463
Term of patent 14 years
U.S. Cl. D3—35



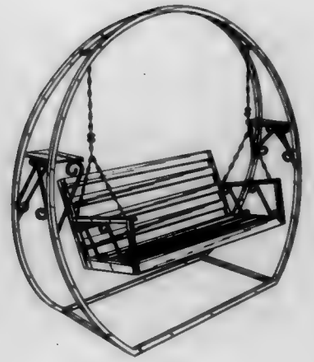
287,908
HANGER
Saul Fox, 19 Sulgrave Crescent, Willowdale, Ontario, Canada M2L 1W5
Filed May 10, 1984, Ser. No. 609,057
Claims priority, application Canada, May 1, 1984, 01-05-84-9
Term of patent 14 years
U.S. Cl. D6—328



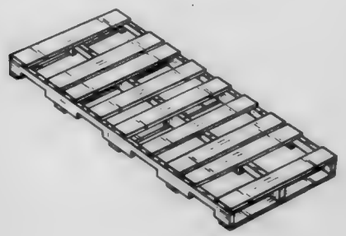
287,909
RECREATIONAL LOUNGE
Samuel M. Weiss, 9037 Burton Way, Los Angeles, Calif. 90048
Filed Mar. 26, 1984, Ser. No. 593,372
Term of patent 14 years
U.S. Cl. D6—329



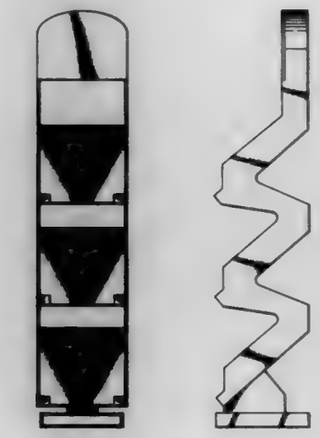
287,910
COMBINED SWING AND PLURAL SHELF UNIT
Glenn Schlarb, 1322 Mill St., Alva, Okla. 73717
Filed Jan. 16, 1984, Ser. No. 570,842
Term of patent 14 years
U.S. Cl. D6—347



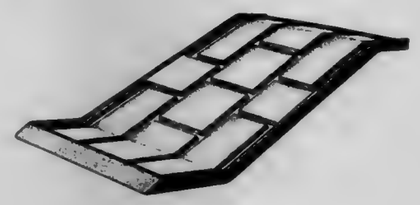
287,911
PALLET
Norman J. Teixeira, Santa Maria, Calif., assignor to Teixeira Farms, Inc., Santa Maria, Calif.
Filed Apr. 30, 1984, Ser. No. 605,196
Term of patent 14 years
U.S. Cl. D6—382



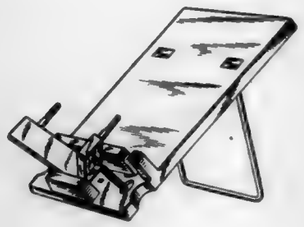
287,912
DISPLAY STAND
Pietro Ferrero, Genoese, Belgium, assignor to Ferrero S.p.A., Alba, Italy
Filed Jan. 29, 1984, Ser. No. 626,028
Term of patent 14 years
U.S. Cl. D6—408



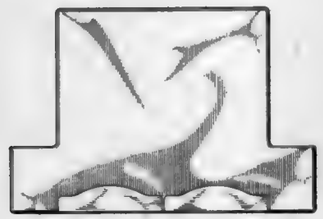
287,913
CARPET DISPLAY STAND
James L. Knight, Rte. 7, Cumming, Ga. 30130, and Christopher C. Bidwell, 342 Summer Pl., Norcross, Ga. 30071
Filed Jan. 26, 1984, Ser. No. 574,027
Term of patent 14 years
U.S. Cl. D6—409

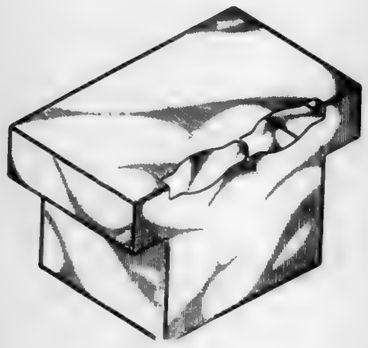


287,914
FOLDABLE BOOK SUPPORT
Peter Woolf, Sparta, N.J., assignor to Spartan International Corporation, Sparta, N.J.
Filed Oct. 25, 1984, Ser. No. 664,616
Term of patent 14 years
U.S. Cl. D6—419

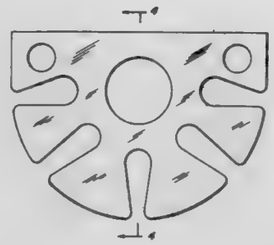


287,915
COMBINED SHELVES AND DISPENSER FOR DISPOSABLE DIAPERS
John F. Bonczek, and Linda D. Bonczek, both of 6993 NW. 5th Ct., Margate, Fla. 33063
Filed Apr. 9, 1984, Ser. No. 598,226
Term of patent 14 years
U.S. Cl. D6—515



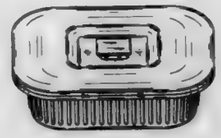


287,916
WALL MOUNTED BRACKET FOR USE IN BEAUTY SALONS AND THE LIKE
Andrea F. DelGarbino, and David L. DelGarbino, both of 2120 Arma Dr., Girard, Ohio 44420
Filed Feb. 13, 1984, Ser. No. 579,513
Term of patent 14 years
U.S. Cl. D6—567

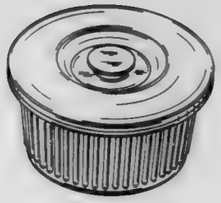




287,917
MICROWAVE OVEN COVERED DISH
James F. Pomroy, St. Paul; Allen M. Danley, Eagan, and Harry A. Rubbright, Mendota Heights, all of Minn., assignors to Plastics, Inc., St. Paul, Minn.
Filed Nov. 19, 1984, Ser. No. 672,715
Term of patent 14 years
U.S. Cl. D7—18









287,918
CREAM PITCHER
Robin Levien, London, England, assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Dec. 28, 1983, Ser. No. 566,220
Term of patent 14 years
U.S. Cl. D7—19



287,919
DRINKING CUP LID
Jack D. Clements, Ada, Okla., assignor to Solo Cup Company, Highland Park, Ill.
Filed Aug. 22, 1984, Ser. No. 643,072
Term of patent 14 years
U.S. Cl. D7—40



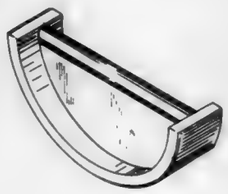


287,920
CONTAINER HOLDER
James R. Lanier, 1013 Forest Ridge, Garland, Tex. 75042
Filed Sep. 14, 1984, Ser. No. 650,524
Term of patent 14 years
U.S. Cl. D7—70



287,921
THERMALLY INSULATED FOOD BAG
Ingrid Skanser, Hoffman Estates, Ill., assignor to Thermal Bags by Ingrid, Inc., Chicago, Ill.
Filed Feb. 7, 1984, Ser. No. 577,693
Term of patent 14 years
U.S. Cl. D7—77

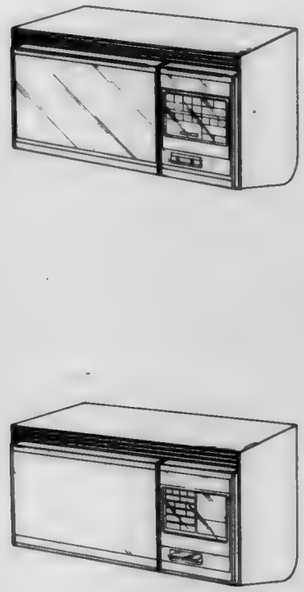
287,922
COFFEE FILTER SEPARATING UTENSIL
David R. Bremer, 446 E. Birch, Canton, Ill. 61520
Filed Apr. 16, 1984, Ser. No. 600,544
Term of patent 14 years
U.S. Cl. D7—99



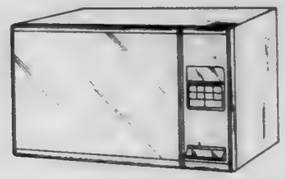
287,923
COFFEE POT
Tapio Wirkkala, Helsinki, Finland, assignor to Rosenthal Aktiengesellschaft Rechtsabteilung, Fed. Rep. of Germany
Filed Jul. 30, 1984, Ser. No. 635,430
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1984, 7363
Term of patent 14 years
U.S. Cl. D7—321



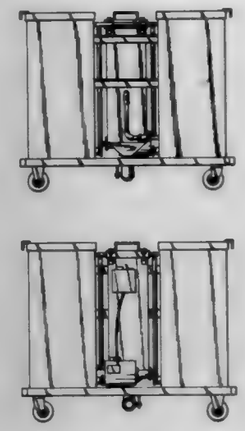
287,924
MICROWAVE OVEN
Masayoshi Kubo; Kensuke Mizuma; Masuo Ichihara, and Toshio Harada, all of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 19, 1984, Ser. No. 632,366
Claims priority, application Japan, Jan. 19, 1984, 59-1614; Jan. 19, 1984, 59-1615
Term of patent 14 years
U.S. Cl. D7—351



287,925
MICROWAVE OVEN
Masayoshi Kubo; Kensuke Mizuma; Masuo Ichihara, and Toshio Harada, all of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 19, 1984, Ser. No. 632,176
Claims priority, application Japan, Jan. 19, 1984, 59-1616
Term of patent 14 years
U.S. Cl. D7—351



287,926
MACHINE FOR FILTERING LUBRICATING OIL FOR A DOUGH DIVIDER MACHINE
D. L. Adcock, 6412 S. Douglas Ave., Oklahoma City, Okla. 73139
Filed Feb. 27, 1984, Ser. No. 584,018
Term of patent 14 years
U.S. Cl. D7—368



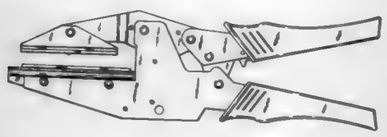
287,927
COMBINATION GAS MAIN VALVE AND WATER MAIN VALVE WRENCH
Andrew J. Zankich, 356 Virginia St., #304, El Segundo, Calif. 90245
Filed Oct. 12, 1984, Ser. No. 661,235
Term of patent 14 years
U.S. Cl. D8—17



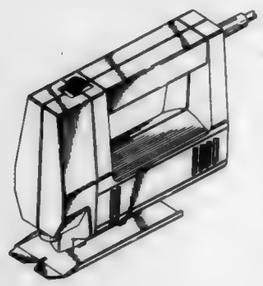
287,928
PIVOTED JAW WRENCH
Kiyoshi Watanabe, Sanjo, Japan, assignor to Top Kogyo Co., Ltd., Niigata, Japan
Filed Apr. 12, 1984, Ser. No. 599,538
Claims priority, application Japan, Jan. 25, 1984, 59-2159
Term of patent 14 years
U.S. Cl. D8—22



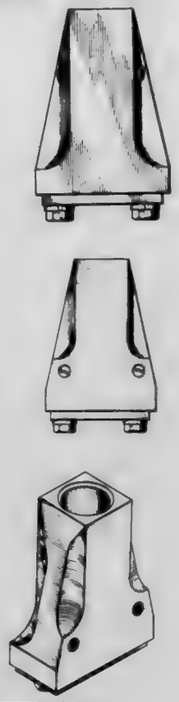
287,929
CRIMPING TOOL
Jan O. Higg, Stenhamra, and Lars-Olov Persson, Älvdalen, both of Sweden, assignors to Pressmaster Tool AB, Älvsden, Sweden
Filed Feb. 14, 1984, Ser. No. 579,961
Term of patent 14 years
U.S. Cl. D8—51



287,930
ELECTRIC JIG SAW
Robert I. Somers, Raleigh, N.C., assignor to Black & Decker, Inc., Newark, Del.
Filed Apr. 2, 1984, Ser. No. 595,611
Term of patent 14 years
U.S. Cl. D8—64



287,931
MOUNTING BLOCK
Jerry L. Crose, Batesville, Ind., assignor to Hill-Rom Company, Inc., Batesville, Ind.
Filed Jan. 30, 1985, Ser. No. 696,611
Term of patent 14 years
U.S. Cl. D8—373



287,932
PACKAGING CONTAINER FOR BEVERAGES
Barry Seward, 33 Carleton Close, Hook, Hampshire; Paul Woolman, "Glenwood", Firtree Avenue, Stoke Poges, Buckinghamshire; Kevin C. Pope, 25 Winchfield Gardens, Tadley, Hampshire; Digby R. Redshaw, 12 Edward Street, Warwick, Warwickshire; Malcolm B. Hastings, 2 Overstreet, Court House Green, Coventry, Warwickshire, and Malcolm D. N. Withnall, "The Barn", Lighthorne Rough, Moreton Morrell, Warwickshire, all of United Kingdom
Filed Nov. 22, 1983, Ser. No. 554,186
Claims priority, application United Kingdom, May 27, 1983, 1013312
Term of patent 14 years
U.S. Cl. D9—305



287,933
BOTTLE
Frederick G. W. Mills, North Walsham, and Michael Piercy, Wandsworth, both of England, assignors to United Glass Limited, Middlesex and Universal Wines & Spirits Limited, London, both of, England
Filed Oct. 10, 1986, Ser. No. 623,229
Term of patent 14 years
U.S. Cl. D9—349



287,934
PLASTIC BOTTLE FOR LIQUIDS
Robert M. Harris, Jr., Reseda, Calif., assignor to McKesson Corporation, San Francisco, Calif.
Filed Sep. 25, 1984, Ser. No. 654,754
Term of patent 14 years
U.S. Cl. D9—370



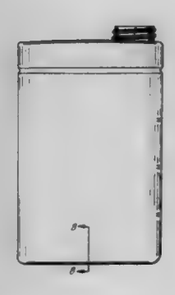
257,935
BOTTLE
Frank W. Bech, 11, Kokkedal Industripark, DK-2980 Kokkedal, Denmark
Filed Apr. 2, 1984, Ser. No. 595,677
Claims priority, application Denmark, Oct. 25, 1983, 1007/83
Term of patent 14 years
U.S. Cl. D9—372



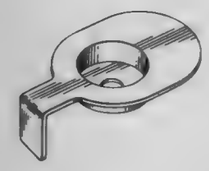
287,936
BOTTLE
Frederick G. W. Mills, Norfolk, and Michael Piercy, London, both of England, assignors to United Glass Limited, Middlesex and Universal Wines & Spirits Limited, London, both of, England
Filed Jun. 21, 1984, Ser. No. 623,228
Term of patent 14 years
U.S. Cl. D9—372



287,937
BOTTLE
Charles L. Sargent, Ann Arbor; Michael W. Larime, Dexter, and John R. Selina, Ypsilanti, all of Mich., assignors to Thetford Corporation, Ann Arbor, Mich.
Filed Aug. 29, 1984, Ser. No. 645,464
Term of patent 14 years
U.S. Cl. D9—375



287,938
RETENTION WASHER
Isaac Sacks, 1240 Ridgewood Drive, Chomedey, Laval, Quebec, Canada H7W 1L3
Filed Jun. 15, 1984, Ser. No. 621,098
Term of patent 14 years
U.S. Cl. D9—439



287,939
SPRINKLER SPOUT CLOSURE
Walter D. Harmon, 6990 Bucktrout Pl., Worthington, Ohio 43085
Division of Ser. No. 568,042, Jan. 4, 1984. This application May 21, 1986, Ser. No. 865,618
Term of patent 14 years
U.S. Cl. D9—447



287,940
BOWLING PIN CLOCK
Wilbur E. DeGroff, 908 Anton Rd., Plymouth, Wis. 53073
Continuation-in-part of Ser. No. 545,447, Oct. 26, 1983, abandoned. This application May 8, 1985, Ser. No. 731,977
Term of patent 14 years
U.S. Cl. D10—6



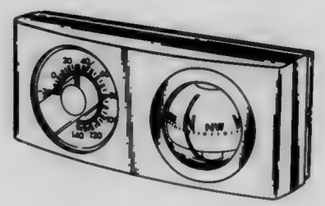
287,941
CLOCK
Fernando C. Richards, 56 Peabody St., Salem, Mass. 01970
Filed Feb. 23, 1984, Ser. No. 583,057
Term of patent 14 years
U.S. Cl. D10—7



287,942
COMBINED THERMOMETER AND COMPASS UNIT FOR VEHICLES
Yoshihisa Tanaka, Ichikawa, Japan, assignor to Tanaka Manufacturing Co., Ltd., Tokyo, Japan
Filed Dec. 11, 1984, Ser. No. 680,373
Claims priority, application Japan, Nov. 8, 1984, 59-46.052
Term of patent 14 years
U.S. Cl. D10—53



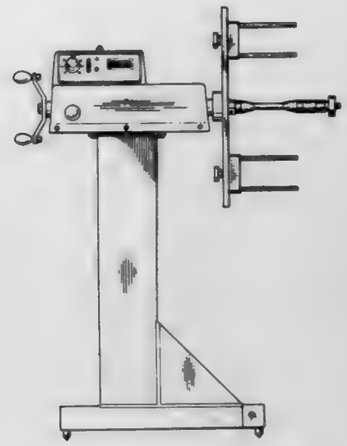
287,943
COMBINED THERMOMETER AND COMPASS UNIT FOR VEHICLES
Yoshihisa Tanaka, Ichikawa, Japan, assignor to Tanaka Manufacturing Co., Ltd., Tokyo, Japan
Filed Dec. 11, 1984, Ser. No. 680,374
Claims priority, application Japan, Nov. 8, 1984, 59-46.053
Term of patent 14 years
U.S. Cl. D10—53

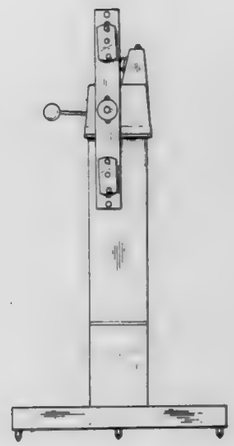


287,944
CONSTRUCTION TOOL
Leslie R. Hewston, 12106 Rocker Rd., Nevada City, Calif. 95959
Filed Jul. 9, 1984, Ser. No. 629,158
Term of patent 14 years
U.S. Cl. D10—64



287,945
WHEEL BALANCING MACHINE
Hyo-Sup Park, 387 Laurelwood Rd., Santa Clara, Calif. 95050
Filed Oct. 7, 1983, Ser. No. 540,146
Term of patent 14 years
U.S. Cl. D10—82

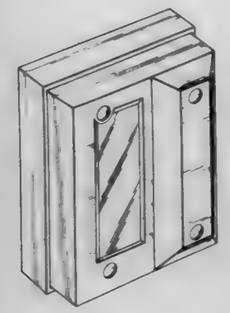




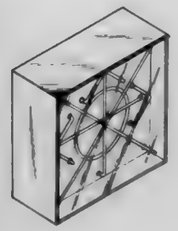
287,946
COMPUTERIZED MULTIPLE FUNCTION BICYCLE METER
Sadaharu Tsuyama, Osaka, Japan, assignor to Tsuyama Mfg. Co., Ltd., Japan
Filed Apr. 20, 1984, Ser. No. 602,619
Claims priority, application Japan, Nov. 9, 1983, 58-48764
Term of patent 14 years
U.S. Cl. D10—98



287,947
HOUSING FOR A REMOTE METER DISPLAY
Irwin A. Hicks, Radnor, and Joseph P. Schroeck, Cheltenham, both of Pa., assignors to The Singer Company, Stamford, Conn.
Filed May 4, 1984, Ser. No. 607,083
Term of patent 14 years
U.S. Cl. D10—102



287,948
TRAFFIC LIGHT
Edwin C. Evans, 47 Colonial Pkwy., Manhasset, N.Y. 11030
Filed Dec. 24, 1984, Ser. No. 685,758
Term of patent 14 years
U.S. Cl. D10—115



287,949
NECKLACE
Gianni Bulgari, Roma, Italy, assignor to Partecipazioni Bulgari S.p.A., Roma, Italy
Filed May 11, 1984, Ser. No. 609,289
Claims priority, application Italy, Nov. 17, 1983, 36.232B/83
Term of patent 14 years
U.S. Cl. D11—6

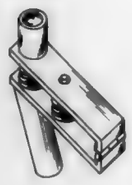


287,950
VASE
Donald E. Weder; Erwin Weder, both of Highland, and Robert C. Abrams, Edwardsville, all of Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 613,053, May 22, 1984. This application Sep. 21, 1984, Ser. No. 653,033
Term of patent 14 years
U.S. Cl. D11—143





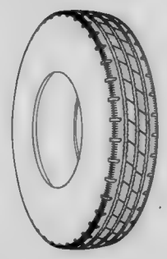
287,951
BICYCLE SEAT POST WITH SPRING SUPPORT
Richard H. Yerkes, 2647 Skyview Ave., Langhorne, Pa. 19047
Filed Jun. 26, 1986, Ser. No. 879,169
Term of patent 14 years
U.S. Cl. D12—119



287,952
MOTORCYCLE TIRE
Junichi Kawajiri, and Toshio Hayakawa, both of Tokyo, Japan, assignors to Bridgestone Corporation, Japan
Filed May 29, 1984, Ser. No. 615,023
Claims priority, application Japan, Nov. 30, 1983, 58-51630
Term of patent 14 years
U.S. Cl. D12—136



287,953
AUTOMOBILE TIRE
Akihiro Takeuchi, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Oct. 4, 1984, Ser. No. 657,518
Claims priority, application Japan, Aug. 29, 1984, 59-36127
Term of patent 14 years
U.S. Cl. D12—146



287,954
MOTORCYCLE TIRE
Atsushi Tomura, Tokyo, and Hideaki Nishio, Saitama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Sep. 17, 1984, Ser. No. 651,130
Claims priority, application Japan, Mar. 29, 1984, 59-11925
Term of patent 14 years
U.S. Cl. D12—147



287,955
MOTORCYCLE TIRE
Toshio Hayakawa, and Atsushi Tomura, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Dec. 3, 1984, Ser. No. 677,277
Claims priority, application Japan, Jun. 1, 1984, 59-22295
Term of patent 14 years
U.S. Cl. D12—147



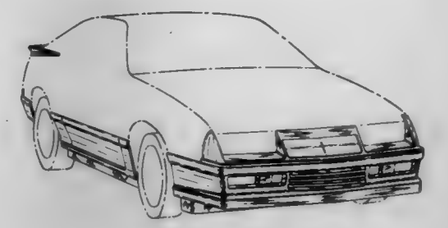
287,956
MOTORCYCLE TIRE
Hideaki Nishio, Saitama, and Kazuo Matsuda, Tokyo, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Dec. 3, 1984, Ser. No. 677,278
Claims priority, application Japan, Jun. 1, 1984, 59-22294
Term of patent 14 years
U.S. Cl. D12—147



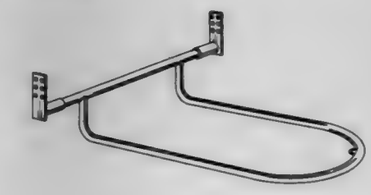
287,957
MOTORCYCLE TIRE
Toshio Hayakawa; Atsushi Tomura, both of Tokyo, and Hideaki Nishio, Saitama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Dec. 3, 1984, Ser. No. 677,279
Claims priority, application Japan, Jun. 1, 1984, 59-22302
Term of patent 14 years
U.S. Cl. D12—147



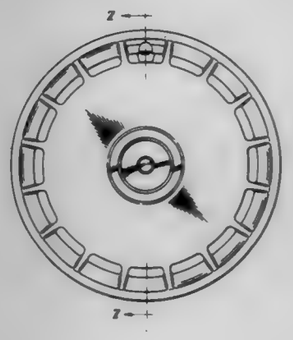
287,958
AUTOMOBILE BUMPER
William A. Dayton, Northville; John E. Crain, Birmingham, and Steven N. Bollinger, West Bloomfield, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.
Filed Dec. 19, 1983, Ser. No. 562,810
Term of patent 14 years
U.S. Cl. D12—169



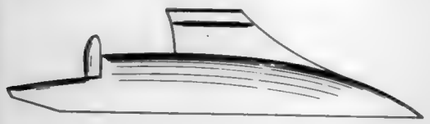
287,959
SPARE TIRE CARRIER
William A. Hooper, Jr., 6910 Sycamore, Kansas City, Mo. 64133
Filed Dec. 14, 1984, Ser. No. 681,607
Term of patent 14 years
U.S. Cl. D12—202



287,960
WHEEL COVER
Boyke Boyer, Wesuling, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Munich, Fed. Rep. of Germany
Filed May 10, 1984, Ser. No. 609,015
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, MR 13665
Term of patent 14 years
U.S. Cl. D12—211



287,961
BOAT HULL
Leonard M. Greene, White Plains, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.
Filed Aug. 31, 1984, Ser. No. 646,203
Term of patent 14 years
U.S. Cl. D12—300

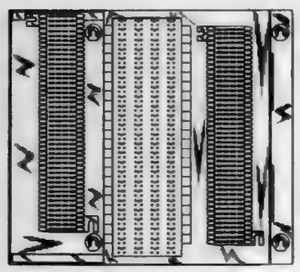


287,962
BRACE FOR STABILIZER OF V-TAIL AIRCRAFT
George V. Brechtbill, Wilton, Calif., and Charlie O. Nicolos, 3501 East View Dr., Shingle Springs, Calif. 95682, assignors to Charlie O. Nicolos, Shingle Springs, Calif.
Filed May 17, 1984, Ser. No. 611,238
Term of patent 14 years
U.S. Cl. D12—345

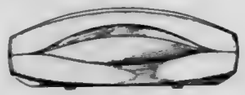


287,963
BUILDING TELEPHONE ENTRANCE TERMINAL
Michael Fasano, Syosset, and Paul De Luca, Plandome Manor, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.
Filed Apr. 16, 1984, Ser. No. 601,031
Term of patent 14 years
U.S. Cl. D13—24





287,964
HOUSING FOR A TELEPHONE HANDSET AND STAND UNIT
George Perkins, Burbank, Calif., assignor to TeleQuest, Inc., Burbank, Calif.
Filed Nov. 23, 1984, Ser. No. 674,173
Term of patent 14 years
U.S. Cl. D14—53





287,965
COMBINED HOUSING FOR BIAS COMPONENTS AND CONNECTOR THEREFOR
John E. Kastanowicz, Newton, and Michael L. Landes, Brockton, both of Mass., assignors to GTE Government Systems Corporation, Waltham, Mass.
Filed Jun. 13, 1984, Ser. No. 620,300
Term of patent 14 years
U.S. Cl. D13—99



287,966
COIN-OPERATED TELEPHONE BOX
Robert V. Albertson, Wayzata, Minn., assignor to Burd, Bartz & Gutenkauf, Minneapolis, Minn.
Filed Jul. 18, 1985, Ser. No. 756,772
Term of patent 14 years
U.S. Cl. D14—55



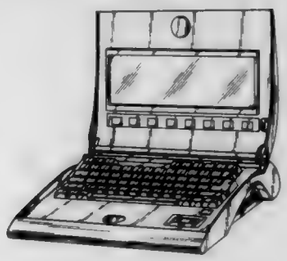
287,967
PERSONAL COMPUTER HOUSING
Rob J. Gemmell, Santa Clara; Hartmut H. Esslinger, and Stephen Peart, both of Los Gatos, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Filed Apr. 17, 1984, Ser. No. 601,179
Term of patent 14 years
U.S. Cl. D14—100



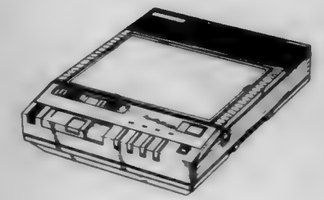
287,968
COMPUTER WORKSTATION
Edward C. Ng, San Jose, Calif., and William M. Cassovsky, Austin, Tex., assignors to Motorola Computer Systems, Inc., Cupertino, Calif.
Filed Aug. 1, 1984, Ser. No. 636,534
Term of patent 14 years
U.S. Cl. D14—106



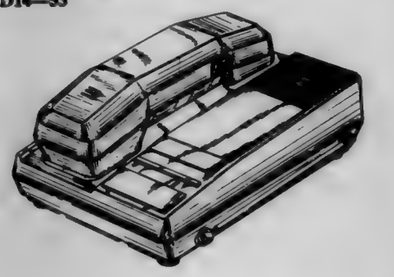
287,969
PORTABLE ELECTRONIC COMPUTER
Takashi Kusanagi, Ota, Japan, assignor to Ampere Incorporated, Tokyo, Japan
Filed Sep. 7, 1984, Ser. No. 648,068
Claims priority, application Japan, May 2, 1984, 59-17841
Term of patent 14 years
U.S. Cl. D14—106

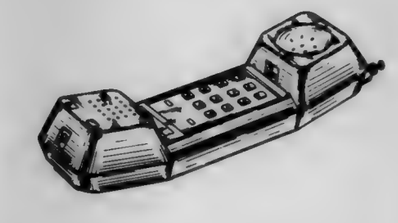


287,970
TELEPHONE ANSWERING MACHINE
Noriaki Kaka, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 19, 1984, Ser. No. 591,087
Claims priority, application Japan, Sep. 29, 1983, 58-42480
Term of patent 14 years
U.S. Cl. D14—4



287,971
CORDLESS HANDSET AND STAND TELEPHONE UNIT
Raymond G. Bond, Long Beach, Calif., assignor to Fortel, Inc., Compton, Calif.
Filed Jul. 30, 1984, Ser. No. 635,919
Term of patent 14 years
U.S. Cl. D14—53

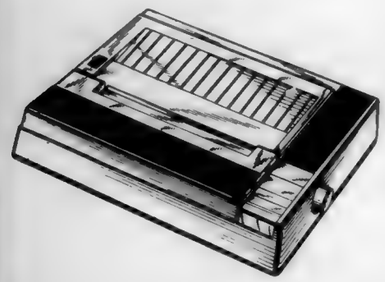




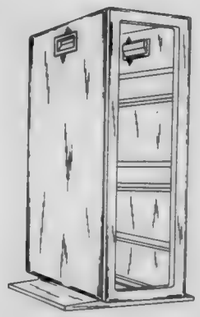
287,972
KEYBOARD FOR A PERSONAL COMPUTER
Thomas A. Anzalone, Fort Lauderdale; Myron F. Davis, and Willis Y. Jordan, III, both of Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 15, 1983, Ser. No. 532,644
Term of patent 14 years
U.S. Cl. D14—100



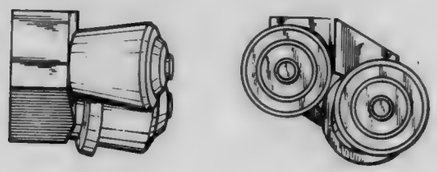
287,973
SERIAL PRINTER
Shigemasa Kato, Zama, and Sanae Takada, Chofu, both of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan
Filed Sep. 20, 1984, Ser. No. 652,805
Claims priority, application Japan, Mar. 26, 1984, 59-11689
Term of patent 14 years
U.S. Cl. D14—111



287,974
FLOOR STANDING ENCLOSURE FOR PERSONAL COMPUTER
Myron F. Davis; Fred E. Goetz; James C. Harris, all of Boca Raton; Steven E. Howell, Lantana, and David F. O'Connor, Delray Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 15, 1984, Ser. No. 619,411
Term of patent 14 years
U.S. Cl. D14—114



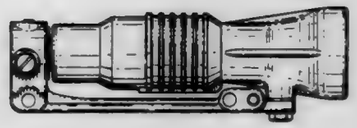
287,975
BAND SAW GUIDE
William E. Thompson, Rte. 1, Box 89, Middletown, Ind. 47356
Filed May 24, 1984, Ser. No. 613,430
Term of patent 14 years
U.S. Cl. D15—134



287,976
COMBINED CAMERA AND FILM CASSETTE THEREFOR
Hiroshi Nakazawa, Tokyo, Japan, and Kazushi Koida, Hong Kong, Hong Kong, assignors to Seibido Co. Ltd., Tokyo, Japan and Sanyei Corp. Hong Kong Ltd., Hong Kong, Hong Kong
Filed Jun. 17, 1986, Ser. No. 875,743
Term of patent 14 years
U.S. Cl. D16—1



287,977
SIGHT
Albert W. Cannon, Poole, England, assignor to Focal Point Limited, England
Filed Aug. 3, 1984, Ser. No. 637,416
Claims priority, application United Kingdom, Feb. 7, 1984, 1017751
Term of patent 14 years
U.S. Cl. D16—132



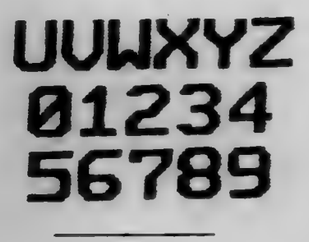
287,978
CALCULATOR
John M. Zatezalo, Pittsburgh, Pa., assignor to Industrial Maintenance Systems, Inc., Pittsburgh, Pa.
Filed Dec. 26, 1984, Ser. No. 686,422
Term of patent 14 years
U.S. Cl. D18—7



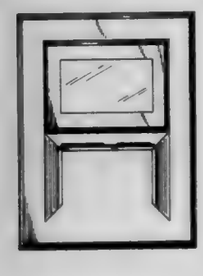


287,979
FONT OF TYPE
Thomas L. Tragesser, P.O. Box 388, Belleville, Ill. 62222
Filed Sep. 24, 1984, Ser. No. 653,576
Term of patent 14 years
U.S. Cl. D18—24





287,980
COMBINED SUPPORT FOR HOLDING AND DISPLAYING CARDS
Larry C. Adams, 103 Sweetbriar, Hernando, Miss. 38632
Filed Feb. 6, 1984, Ser. No. 577,521
Term of patent 14 years
U.S. Cl. D19—86





287,981
COLLATOR
Lawrence J. McNally, 326 Hurricane Rd., Lawrenceville, Ga. 30245
Filed May 7, 1984, Ser. No. 607,464
Term of patent 14 years
U.S. Cl. D19—92

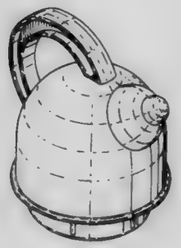
287,982
GAME BOARD OR SIMILAR ARTICLE
Donatus O. Enyi, 2100 19th St., N.W., Washington, D.C. 20009
Filed Jun. 20, 1984, Ser. No. 622,627
Term of patent 14 years
U.S. Cl. D21—34



287,983
FLEXIBLE BAND FOR HOLDING GAME PIECES OR THE LIKE
Augusto A. Picozza, Johnston, R.I., assignor to Dart Industries Inc.
Filed Aug. 31, 1984, Ser. No. 646,388
Term of patent 14 years
U.S. Cl. D21—48



287,984
TOY KETTLE
Harry S. Thomson, Richmond; David M. Raffo, and John A. Pape, both of Hitchin, all of England, assignors to Hestair Kiddicraft Limited, Great Britain
Filed Dec. 26, 1984, Ser. No. 686,296
Claims priority, application United Kingdom, Sep. 21, 1984, 1022172
Term of patent 14 years
U.S. Cl. D21—122



287,985
MOUSE FIGURES TOY
Johnny K. Lin, Norwalk, Calif., assignor to 3L Plastics USA, Inc., Los Angeles, Calif.
Filed Nov. 26, 1984, Ser. No. 674,943
Term of patent 14 years
U.S. Cl. D21—149



287,986
TOY ROBOT
Tomotoshi Matsui, Tokyo, Japan, assignor to Tomy Kogyo, Inc., Tokyo, Japan
Filed Aug. 2, 1984, Ser. No. 637,170
Claims priority, application Japan, Feb. 7, 1984, 59-3833
Term of patent 14 years
U.S. Cl. D21—150



287,987
NOVELTY GOLF BALL FIGURE
George M. Colclasure, 4233 Charter Ave., Oklahoma City, Okla. 73108
Filed Sep. 20, 1983, Ser. No. 778,311
Term of patent 14 years
U.S. Cl. D21—155



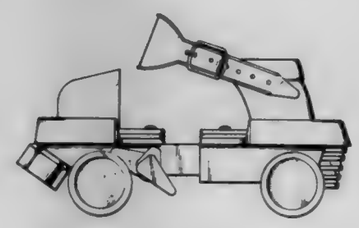
287,988
TOY BALL
Andrew J. Billinghurst, Biggin Hill, England, assignor to Hestair Kiddicraft Limited, Great Britain
Filed Mar. 12, 1984, Ser. No. 588,303
Claims priority, application United Kingdom, Jan. 18, 1984, 1017392
Term of patent 14 years
U.S. Cl. D21—204



287,989
SHUTTLECOCK
Eugene Kornhaber, 318 Douglas Rd., Chippaqua, N.Y. 10514, and Ronald Gold, 3400 South Ocean Blvd., Palm Beach, Fla. 33480
Filed Feb. 14, 1984, Ser. No. 580,167
Term of patent 14 years
U.S. Cl. D21—207



287,990
ROLLER SKATE
Reuben B. Klamer, Los Angeles, Calif., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Nov. 1, 1983, Ser. No. 547,648
Term of patent 14 years
U.S. Cl. D21—226



287,991
LURE
Michael G. Lammis, Portage, Mich., assignor to P.T.C., Inc., Kalamazoo, Mich.
Filed Apr. 16, 1984, Ser. No. 600,967
Term of patent 14 years
U.S. Cl. D22—129



287,992
YOKE FOR A SPRINKLER
William R. McLennan, Easton, Pa., and Robert Rung, Hopatcong, N.J., assignors to Victaulic Company of America, Easton, Pa.
Filed Jun. 12, 1984, Ser. No. 619,859
Term of patent 14 years
U.S. Cl. D23—7

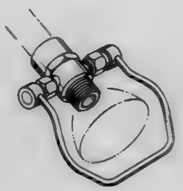


287,994
PAINT CUP YOKE
James E. Jones, deceased, late of Toledo, Ohio (by Amy T. Jones, executor), and Thomas E. Grime, Temperance, Mich., assignors to Champion Spark Plug Company, Toledo, Ohio
Filed Feb. 27, 1984, Ser. No. 584,218
Term of patent 14 years
U.S. Cl. D23—18





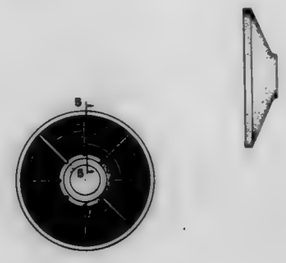
287,995
SHOWER FLOW CONTROLLER
Kenneth F. Ferguson, 16467 Seneca, Victorville, Calif. 92392
Filed Apr. 23, 1984, Ser. No. 602,903
Term of patent 14 years
U.S. Cl. D23—19



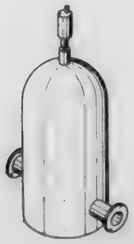
287,993
LIQUID DISPENSER
Herman L. Crow, 8218 Cordelia Cir., Citrus Heights, Calif. 95621
Filed Mar. 24, 1986, Ser. No. 845,752
Term of patent 14 years
U.S. Cl. D23—17



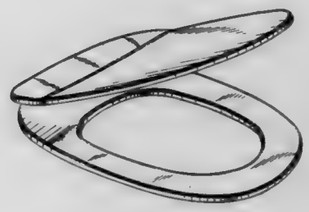
287,996
SPLASH GUARD FOR A FUEL DISPENSING NOZZLE
Mervin L. Carder, Sr., Fenton, Mo., assignor to M. Carder Industries, Inc., St. Louis, Mo.
Filed Sep. 24, 1984, Ser. No. 654,207
Term of patent 14 years
U.S. Cl. D23—36



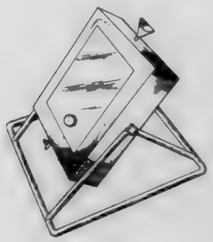
287,997
AIR ELIMINATOR FOR PLUMBING SYSTEMS
Keizo Houma, 6, Nishi 15-chome, Minami 15 Jo, Chuo-ku, Sapporo, Japan
Filed Aug. 1, 1984, Ser. No. 637,502
Claims priority, application Japan, Mar. 3, 1984, 59-8955
Term of patent 14 years
U.S. Cl. D23—46



287,998
COMBINED TOILET SEAT AND COVER, OR SIMILAR ARTICLE
Knud H. Holscher, Virum, Denmark, assignor to Dansk Pressalit A/S, Arhus C, Denmark
Filed May 30, 1984, Ser. No. 615,460
Claims priority, application Denmark, Dec. 21, 1983, 1225/83
Term of patent 14 years
U.S. Cl. D23—71



287,999
PIVOTED VESSEL FOR THE SOLAR HEATING OF WATER
Dennis E. Stowell, Box 796, Parowan, Utah 84761
Filed May 7, 1984, Ser. No. 608,018
Term of patent 14 years
U.S. Cl. D23—72



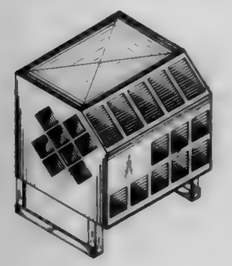
288,000
OIL STOVE
Kunio Takahashi, Kamo, Japan, assignor to Uchida Manufacturing Co., Ltd., Sanjyo, Japan
Filed Feb. 25, 1983, Ser. No. 469,912
Term of patent 14 years
U.S. Cl. D23—121



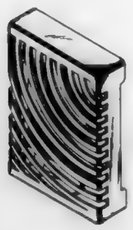
288,001
DEVICE FOR COLLECTING AND REMOVING FIREPLACE ASHES
Chae Y. Chong, 9602 Della Dr., Richmond, Va. 23233
Filed Mar. 27, 1985, Ser. No. 716,464
Term of patent 14 years
U.S. Cl. D23—131



288,002
AIR COOLED REFRIGERATION CONDENSER
Roland A. Area, St. Charles, and Dennis R. Maechler, St. Louis, both of Mo., assignors to Huxemann Corporation, Bridgeton, Mich.
Filed Oct. 9, 1984, Ser. No. 659,008
The portion of the term of this patent subsequent to Jan. 13, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—139

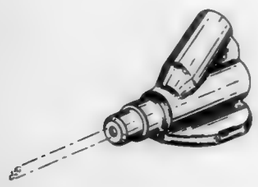


288,003
HOUSING FOR AIR FRESHENER
Earl Hoyt, Franklin Lakes, N.J., assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Oct. 25, 1984, Ser. No. 664,676
Term of patent 14 years
U.S. Cl. D23—150



288,004
BREAST PUMP
Donald L. Blachly, Reedsburg, Wis., assignor to Gerber Products Company, Fremont, Mich.
Filed Aug. 29, 1983, Ser. No. 527,587
Term of patent 14 years
U.S. Cl. D24—51

288,005
NEEDLE HUB
Dean M. Glash, McHenry; Robert J. Kruger, Arlington Heights; Steven L. Olson, McHenry, all of Ill., and Richard L. West, Salem, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Apr. 15, 1983, Ser. No. 485,370
The portion of the term of this patent subsequent to Jan. 20, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—61

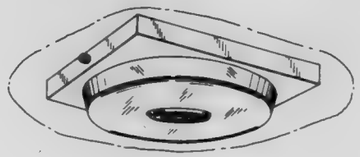


288,006
DISPOSABLE SYRINGE FOR STORING AND ADMINISTERING PHARMACEUTICAL PREPARATIONS
Nils-Gustaf Bergström, Vagnhärad, and Stig B. Lanfelt, Södertälje, both of Sweden, assignors to Astra Läkemedel Aktiebolag, Sweden
Filed Mar. 26, 1984, Ser. No. 593,616
Claims priority, application Sweden, Sep. 26, 1983, 2468/83; Sep. 26, 1983, 2469/83
Term of patent 14 years
U.S. Cl. D24—63





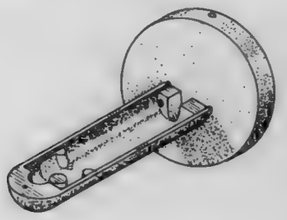
288,007
COMBINATION DEODORIZER AND LIGHT
Kenneth J. Jonas, Hartford, Wis.; Ralph M. Lazar, Skokie, Ill., and David W. Wolbrink, Hartford, Wis., assignors to Broan Mfg. Co., Inc., Hartford, Wis.
Filed Oct. 5, 1983, Ser. No. 539,255
Term of patent 14 years
U.S. Cl. D26—51



288,008
GRILL FOR MOTORCYCLE LIGHT
Gordon E. McMahon, 7400 NW. 31st., Bethany, Okla. 73008
Continuation-in-part of Ser. No. 501,177, Jun. 6, 1983. This application Jul. 30, 1984, Ser. No. 635,849
Term of patent 14 years
U.S. Cl. D26—139



288,009
BRACKET FOR A WALL LAMP OR SIMILAR ARTICLE
Murray C. Pfister, San Francisco, Calif., assignor to Boyd Lighting Company, San Francisco, Calif.
Filed May 16, 1984, Ser. No. 611,025
Term of patent 14 years
U.S. Cl. D26—145



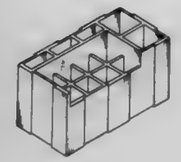
288,010
FIRELESS ASHTRAY
Eulice E. Faulkenberry, 4922 E. Admiral Pl., Tulsa, Okla. 74112
Filed Jan. 28, 1985, Ser. No. 695,275
Term of patent 14 years
U.S. Cl. D27—8



288,011
AUTOMATED TELLER SERVICE CENTER ENCLOSURE
Ernest F. J. Prinzhorn, 1120 Towne Ave., Los Angeles, Calif. 90021
Division of Ser. No. 556,856, Dec. 1, 1983. This application Oct. 11, 1985, Ser. No. 786,618
Term of patent 14 years
U.S. Cl. D99—28



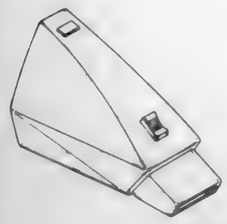
288,012
ORGANIZER FOR LIPSTICKS AND SIMILAR ARTICLES
Howard Sussman, 3101 NW. 25th Ave., Pompano Beach, Fla. 33060
Filed Aug. 20, 1984, Ser. No. 642,348
Term of patent 14 years
U.S. Cl. D28—86



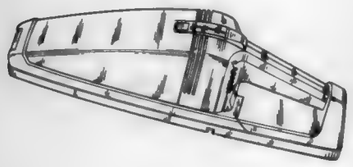
288,013
BIRD FEEDER
Georgiana Schueler, 9 Bengeyfield Dr., East Williston, N.Y. 11596
Filed Feb. 27, 1984, Ser. No. 583,587
Term of patent 14 years
U.S. Cl. D30—13



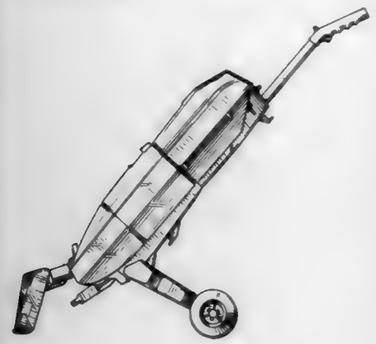
288,014
HAND VACUUM NOZZLE AND HOUSING
Nancy J. Perkins, Schaumberg, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed May 22, 1984, Ser. No. 612,894
Term of patent 14 years
U.S. Cl. D32—18



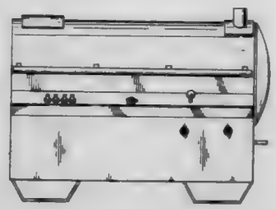
288,015
COMBINED HAND-HELD VACUUM CLEANER, ACCESSORIES AND SUPPORT THEREFOR
Alain Verdier, Sainte Foy Les Lyon, and Marc Polly, Villeurbanne, both of France, assignors to Black & Decker Inc., Newark, Del.
Filed Jun. 19, 1984, Ser. No. 622,114
Claims priority, application France, Dec. 21, 1983, 834799
Term of patent 14 years
U.S. Cl. D32—18



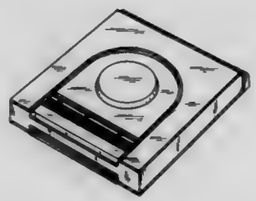
288,016
CARPET CLEANER
Donald E. Watkins, Parma, Ohio, and Frank P. Asdahl, Bound Brook, N.J., assignors to The Regina Co., Inc., Rahway, N.J.
Filed Mar. 2, 1984, Ser. No. 585,719
The portion of the term of this patent subsequent to Jan. 20, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—22



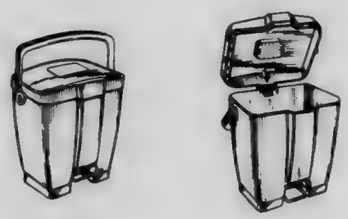
288,017
GAS FIRED HOT WATER PRESSURE CLEANING APPARATUS
Paul W. Linton, 2722 SE. Evans, Troutdale, Oreg. 97060
Filed Aug. 8, 1984, Ser. No. 638,951
Term of patent 14 years
U.S. Cl. D32—25



288,018
CASE FOR A COMPACT DISC SURFACE CLEANING DEVICE AND COMPACT DISC CLEANING SUPPORT
Hirokazu Kawabe, Tokyo, Japan, assignor to Kabushiki Kaisha Nagaoka, Japan
Filed Apr. 27, 1984, Ser. No. 604,535
Claims priority, application Japan, Feb. 1, 1984, 59-3478
Term of patent 14 years
U.S. Cl. D32—35



288,019
DIAPER PAIL
Albert W. Gebhard, Denver; William G. Au, Broomfield, and Robert M. Parker, Aurora, all of Colo., assignors to Gerico, Inc., Denver, Colo.
Filed Dec. 3, 1984, Ser. No. 677,360
Term of patent 14 years
U.S. Cl. D32—37



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF JANUARY, 1987

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.A.R.C. (Management) Pty. Limited: *See*—
Flecknoe-Brown, Anthony E., 4,639,165, Cl. 405-45.000.
A. E. Staley Manufacturing Company: *See*—
Valenty, Vivian B.; Hill, William H.; and Ravi, Prasad S., 4,639,325, Cl. 252-89.100.
A. T. Newell Co. Inc.: *See*—
Newell, Alfred T., III; and Nichols, E. Lane, 4,638,850, Cl. 165-26.000.
AB Electrolux: *See*—
Lindstrom, Fred B., 4,638,775, Cl. 123-185.00G.
AB Trama: *See*—
Lohman, Oskar E., 4,638,890, Cl. 188-24.170.
AB Volvo: *See*—
Kronogard, Sven O., deceased; Linden, Allen, administrator; Kronogard, Clas O.; and Kronogard, Hakan, 4,638,637, Cl. 60-718.000.
Abadie, Carole R. Fish attracting device. 4,638,588, Cl. 43-44.990.
Abbott-Interfast Corporation: *See*—
DeHaitre, Lon, 4,639,566, Cl. 200-158.000.
Abbott Laboratories: *See*—
Wong, Sie-Ting, 4,639,424, Cl. 436-74.000.
Abe, Hiroki: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,639,014, Cl. 280-707.000.
Abe, Hiroyuki: *See*—
Fushiya, Fusao; Hakamata, Nobuo; Abe, Hiroyuki; and Inoue, Nobuhiro, 4,638,700, Cl. 83-467.00R.
Abe, Shinya: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,639,450, Cl. 514-238.000.
Abraham, Joseph N.; and Scipione, Donald S. Quantity checking system and method. 4,639,875, Cl. 364-479.000.
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Ueno, Atsushi; and Abumi, Takao, 4,639,768, Cl. 358-22.000.
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Merrill, Richard E.; and Allard, Craig L., 4,638,797, Cl. 128-156.000.
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Adachi, Hiroyuki; and Saito, Takashi, to Canon Kabushiki Kaisha. Cleaning device. 4,639,123, Cl. 355-15.000.
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Adams, Robert T.; and Erickson, Ronald. Non-alterable magnetic coding. 4,639,584, Cl. 235-449.000.
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Hogan, Thomas C.; and Adelman, Arnold, 4,639,936, Cl. 375-36.000.
Adenauer, Ernst: *See*—
Balduin, Franz; and Adenauer, Ernst, 4,638,876, Cl. 177-139.000.
Adly, Tarek A., to Hydrotile Machinery Company. Combined concrete feed and packerhead lift control. 4,639,342, Cl. 264-40.100.
Advanced Cardiovascular Systems, Inc.: *See*—
Powell, Philip E., 4,638,805, Cl. 128-344.000.
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Murphy, Colin N.; and Lu, Guey T., 4,639,899, Cl. 365-230.000.
Price, William L.; Schlupp, Ronald L.; and Thomas, Mammen, 4,639,288, Cl. 156-643.000.
Williams, Bertrand J.; and Wilson, Stanley, 4,639,661, Cl. 323-317.000.
AE Plc: *See*—
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Rousseau, Jacques R., 4,638,961, Cl. 244-142.000.
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Hawley, Frank D.; and Rogers, Russell L., 4,638,842, Cl. 141-302.000.
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Audibert, Francoise; Carelli, Claude; Chedid, Louis; LeFrancier, Pierre; Level, Michel; and Choay, Jean, 4,639,512, Cl. 530-313.000.
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Agfa Gevaert Aktiengesellschaft: *See*—
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Hoffarth, Gunther; Richter, Wolfgang; Uytterhoeven, Herman; and de Winter, Walter, 4,639,403, Cl. 430-115.000.
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Uytterhoeven, Herman J.; De Winter, Walter F.; and Marien, August M., 4,639,404, Cl. 430-115.000.
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Schellenberg, Lutz; Hamacher, Matthias; and Ahmed, Bashir M., 4,639,319, Cl. 210-651.000.
Aikawa, Hiroshi, to Nissan Motor Co., Ltd. Suspension arm assembly for supporting automobile wheel. 4,639,006, Cl. 280-96.100.
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Hess, Jack H., 4,638,519, Cl. 5-455.000.
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Tamura, Toru; Shibata, Noriyoshi; and Kawakami, Toshiro, 4,639,148, Cl. 384-420.000.
Watanabe, Tetsumi; Yamaguro, Akira; and Yamaguchi, Susumu, 4,639,212, Cl. 431-183.000.
Aizawa, Koichi; Sewa, Shingo; and Nakahara, Hideki, to Dow Corning Kabushiki Kaisha. Method of producing a silicone defoamer composition. 4,639,489, Cl. 524-588.000.
Akahori, Masaaki: *See*—
Ichikawa, Yoshio; Akahori, Masaaki; Ishii Daisuke; Tsunoda, Kazuyuki; Minami, Yohichiro; and Nagata, Koichi, 4,639,726, Cl. 340-825.440.
Akamatsu, Keisuke: *See*—
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, 4,639,220, Cl. 433-69.000.
Akao, Mutsuo, to Fuji Photo Film Co., Ltd. Container for photographic film cartridge. 4,639,386, Cl. 428-35.000.
Akita, Kenji, to Sharp Kabushiki Kaisha. Deodorizing device for oil stove. 4,639,211, Cl. 431-20.000.
Akiyama, Hideki; and Imai, Shigeru, to Yoshida Kogyo K. K. Method and apparatus for forming element-free spaces in slide fastener chains. 4,638,542, Cl. 29-408.000.
Albrecht, Allan, to J. I. Case Company. Bucket linkage. 4,638,680, Cl. 74-516.000.
Aldis Consultants Inc.: *See*—
McHale, Charles J.; Marrone, Joseph; and Watson, David, 4,639,872, Cl. 364-463.000.
Alewelt, Wolfgang; Eisermann, Wolfgang; Meyer, Karl-Heinrich; Tresper, Erhard; and Ullrich, Martin, to Bayer Aktiengesellschaft. Process for the isolation of polyarylene sulphide. 4,639,507, Cl. 528-388.000.
Alexander, Richard M.: *See*—
Rogers, Russell L.; Perrine, Neill D.; and Alexander, Richard M., 4,639,016, Cl. 285-15.000.
Alfred Teves GmbH: *See*—
Schopper, Bernd; and Tandler, Peter, 4,639,048, Cl. 303-22.00R.
Allard, Craig L.: *See*—
Merrill, Richard E.; and Allard, Craig L., 4,638,797, Cl. 128-156.000.
Allen, Joseph C.: *See*—
Tanner, Harley L., III; and Allen, Joseph C., 4,639,596, Cl. 250-299.000.
Allied Colloids Limited: *See*—
Clarke, John B.; and Firth, John F., 4,639,395, Cl. 428-341.000.
Allied Corporation: *See*—
Acoraci, Joseph H.; and Moeller, Alvin W., 4,639,732, Cl. 342-371.000.
Buike, James W.; and Eddy, William C., 4,638,837, Cl. 137-627.500.
Deem, Brian C.; and Kemp, Jack A., 4,638,900, Cl. 192-85.0CA.

Knapp, Anthony W.; and Werth, Dee A., 4,639,064, Cl. 339-89.00M.
Mikolaicyk, John H.; and Krantz, Leonard A., Jr., 4,639,076, Cl. 350-96.200.
Reichardt, Manfred; and Schutzle, Gunter, 4,639,053, Cl. 339-14.00R.
Tanaka, Kazuhiro; Yamamoto, Yasuo; Hasaoka, Katsumi; and Hirai, Masatake, 4,639,707, Cl. 336-185.000.
Trinh, Lahn T.; and Lewis, Thomas E., 4,638,780, Cl. 123-416.000.

Allison, Mark D.: *See*—
Chiu, Anthony M.; Allison, Mark D.; Jones, James W.; Trammell, Lyndale A.; and San Ho, Fock, 4,639,664, Cl. 324-73.0AT.

Allmanna Brandreskapsaffaren AB: *See*—
Ribrant, Sven, 4,638,531, Cl. 24-274.00R.

Allsop, Jon L: *See*—
Stern, Donald J.; and Allsop, Jon L, 4,639,156, Cl. 401-146.000.

Alps Electric Co., Ltd.: *See*—
Fuke, Takamichi, 4,638,677, Cl. 74-84.00R.
Iigima, Kouta, 4,639,691, Cl. 331-99.000.
Iwata, Tetsuya, 4,639,809, Cl. 360-121.000.
Okita, Masao; and Miyata, Hiroyasu, 4,639,595, Cl. 250-231.0SE.

Alsthom-Atlantique: *See*—
Pham, Van Doan, 4,639,565, Cl. 200-148.00A.

Amaniera, John A.: *See*—
Hanson, Harvey E.; and Amaniera, John A., 4,638,603, Cl. 51-219.00R.

Amasek, Inc.: *See*—
Stewart, E. Allen, III; and Keesling, Evan L., 4,638,621, Cl. 56-9.000.

Amchem Products, Inc.: *See*—
Miyamoto, Satoshi; and Nagatani, Masamichi, 4,639,295, Cl. 204-38.100.

Ameda, Kazuhiro: *See*—
Moriizumi, Ryoji; Suzuki, Yoichi; and Ameda, Kazuhiro, 4,638,883, Cl. 180-324.000.

Amelio, William J.; Hume, David W.; McBride, Donald G.; and Rickert, Robert G., to International Business Machines Corporation. Process for preparing a substrate for subsequent electroless deposition of a metal. 4,639,380, Cl. 427-97.000.

American Cyanamid Company: *See*—
Arotin, Robert L.; Walworth, Bryant L.; and Marini, Michele E., 4,639,268, Cl. 71-105.000.
O'Toole, Michael P.; and Card, Roger J., 4,639,356, Cl. 423-266.000.

American Insulation & Engineering Co., Inc.: *See*—
Amos, James, 4,639,034, Cl. 296-100.000.

American Orthodontics Corporation: *See*—
Gagin, William P., 4,639,219, Cl. 433-22.000.

American Standard Inc.: *See*—
Harrell, David P., 4,639,192, Cl. 416-27.000.

Amerock Corporation: *See*—
DeBruyn, William, 4,639,051, Cl. 312-275.000.

Ametek, Inc.: *See*—
McCall, Floyd, 4,638,672, Cl. 73-861.520.

Amjad, Zahid: *See*—
Masler, William F., III; and Amjad, Zahid, 4,639,490, Cl. 524-765.000.

Ammermann, Eberhard: *See*—
Roeser, Karl; Lauer, Manfred; Sauter, Hubert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,639,447, Cl. 514-222.000.

Amos, James, to American Insulation & Engineering Co., Inc. Soft top for pick-up trucks. 4,639,034, Cl. 296-100.000.

AMP Incorporated: *See*—
Mueller, Arthur L., 4,639,063, Cl. 339-75.00M.

Amrath, Hans, to TRW Ehrenreich GmbH & Co. KG. Device for attaching bellows to a cylindrical member. 4,639,159, Cl. 403-50.000.

Analog Devices, Incorporated: *See*—
Counts, Lewis W.; and Close, JoAnn P., 4,639,683, Cl. 330-253.000.

Anderson, Carl P., to Ricoh Company, Ltd.; and Ricoh Systems, Inc. Automatic platen document stop for electrophotographic copying apparatus having an automatic feed arrangement. 4,639,128, Cl. 355-75.000.

Anderson, Kenneth E.: *See*—
Salestrom, Charles B.; and Anderson, Kenneth E., 4,639,841, Cl. 362-227.000.

Anderson, Robert L.; Pilarski, James A.; and Klintz, Jerry A., to Applied Microbotics Corporation. Method and apparatus for performing work in a three dimensional space. 4,639,653, Cl. 318-599.000.

Anderson, Sharon K. Security system. 4,638,764, Cl. 119-96.000.

Anderson, Thomas E.: *See*—
Howell, Edward K.; and Anderson, Thomas E., 4,639,933, Cl. 375-8.000.

Andersson, Ralf G., to Gullfiber AB. Tubular filter primarily intended for filtration of liquids. 4,639,318, Cl. 210-491.000.

Ando, Masatoshi; Mochizuki, Hiromine; and Saito, Kazuta, to Kanzaki Paper Manufacturing Co., Ltd. Method for preparing a coating composition for use to produce heat-sensitive record material. 4,639,270, Cl. 106-21.000.

Andresen, Herman J. Contactless controllers sensing displacement along two orthogonal directions by the overlap of a magnet and saturable cores. 4,639,667, Cl. 324-208.000.

Andrew, Kenneth F.: *See*—
Hirayama, Chikara; and Andrew, Kenneth F., 4,639,639, Cl. 313-639.000.

Anelva Corporation: *See*—
Shiokawa, Yoshiro, 4,639,597, Cl. 250-305.000.

Angel, Anthony L.: *See*—
Roberts, Donald L.; Angel, Anthony L.; Clark, Douglas C.; Clearman, Jack F.; and Sink, T. Stephen, 4,638,820, Cl. 131-336.000.

Animal Healthcare Products: *See*—
Dudley, Ralph S., 4,639,246, Cl. 604-158.000.

Antonio Puig, S.A.: *See*—
Marzabal Martinez, Carlos, 4,638,918, Cl. 215-295.000.

Aoi, Kazuo, to Yamaha Hatsudoki Kabushiki Kaisha. Valve actuating mechanism for internal combustion engine. 4,638,774, Cl. 123-90.220.

Aoki, Yoshio; and Tsukamura, Yoshihiro, to Sony Corporation. Magneto-optical apparatus. 4,639,907, Cl. 369-45.000.

Aono, Koji; Saito, Toshinori; and Okada, Chiharu, to Central Glass Company, Limited. Process of preparing disilane by reduction of hexachlorodisilane. 4,639,361, Cl. 423-347.000.

Aono, Toshiaki; and Hara, Hiroshi, to Fuji Photo Film Co., Ltd. Heat-developable light-sensitive material used in silver salt transfers. 4,639,407, Cl. 430-203.000.

Aono, Yasuhiro, to Nippon Kogaku K. K. Gradient index lens system. 4,639,094, Cl. 350-413.000.

Aoyama, Kazuho: *See*—
Hara, Hajime; Orii, Shingo; Aoyama, Kazuho; and Enomoto, Masami, 4,639,503, Cl. 528-92.000.

Aoyama, Keishi: *See*—
Kamei, Noboru; Ikeda, Kinjiro; Aoyama, Keishi; and Hamano, Seitaro, 4,639,294, Cl. 203-88.000.

Aoyama, Tsutomu; Nakamura, Taizo; Terao, Naoyosi; and Shinonaga, Hirohiko, to Mitutoyo Mfg. Co., Ltd. Microscope. 4,639,098, Cl. 350-514.000.

AP Industries, Inc.: *See*—
De Bruine, Mark; and Spotts, Kenneth, 4,638,965, Cl. 248-59.000.

Appiano, Silvano; Destefanis, Paolo; and Poggio, Cesare, to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A. Interface controlling bidirectional data transfer between a synchronous and an asynchronous bus. 4,639,861, Cl. 364-200.000.

Applied Microbotics Corporation: *See*—
Anderson, Robert L.; Pilarski, James A.; and Klintz, Jerry A., 4,639,653, Cl. 318-599.000.

Aprigliano, Louis F., to United States of America, Navy. Nickel oxide, ceramic insulated, high temperature coating. 4,639,399, Cl. 428-623.000.

Araghi, Mehdi N.: *See*—
Yip, Kwok-leung; Araghi, Mehdi N.; Daniele, Joseph J.; Banton, Martin E.; Kramer, Charles J.; and Ritter, Joachim A., 4,639,073, Cl. 350-6.800.

Arai, Yoshihiro; and Nahara, Akira, to Fuji Photo Film Co., Ltd. Magnetic recording medium with chromiumiron protective layer. 4,639,815, Cl. 360-131.000.

Arakawa, Tatsumi: *See*—
Suematsu, Kazumi; Soutome, Kaoru; and Arakawa, Tatsumi, 4,639,297, Cl. 204-59.00F.

Arc Technologies Systems Ltd.: *See*—
Conradty, Claudio; Zollner, Dieter; Lauterbach-Dammler, Inge; and Taube, Thomas, 4,639,928, Cl. 373-93.000.

Archer, David H.; Bauer, Frank I.; and Vidt, Edward J., to Westinghouse Electric Corp. Process for electric power production using a biogas. 4,638,629, Cl. 60-39.050.

Archer, Stephen: *See*—
Denham, Keith; and Archer, Stephen, 4,639,174, Cl. 411-34.000.

Arikawa, Junichi; Chiba, Hiroshi; Miyazaki, Osamu; and Osanai, Masatoshi, to Laurel Bank Machines Co., Ltd. Circulating-type bill depositing and disbursing machine. 4,639,582, Cl. 235-379.000.

Arioka, Hiroyuki: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; and Arioka, Hiroyuki, 4,639,389, Cl. 428-141.000.

Aritake, Masanori: *See*—
Sugita, Hiroshi; Iwasa, Tadanobu; Yasukawa, Takemasa; and Aritake, Masanori, 4,638,525, Cl. 15-250.360.

Arlington Automatics Inc.: *See*—
Magee, Robert L., Jr.; and Traweek, Marvin B., IV, 4,638,860, Cl. 166-114.000.

Armond, Joseph A.: *See*—
Littwin, Kenneth M.; Armond, Joseph A.; Buky, Gabriel R.; and Patrick, Fred, 4,639,821, Cl. 361-151.000.

Armour Pharmaceutical Company: *See*—
Orlowski, Ronald C.; Stahl, Glenn L.; and Colescott, Robert L., 4,639,509, Cl. 530-307.000.
Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., 4,639,510, Cl. 530-307.000.
Orlowski, Ronald C.; and Seyler, Jay K., 4,639,511, Cl. 530-307.000.

Armstrong Patents Co. Ltd.: *See*—
Poyser, John, 4,638,896, Cl. 188-299.000.

Armstrong, Richard J., to Bernard Marks and Company Limited. Gas burner. 4,639,215, Cl. 431-354.000.

Arnaud, Jean P. Astigmatic optical element, its manufacturing process, illuminating apparatus including the same and articles treated by the same. 4,639,100, Cl. 350-611.000.

Arnoldt, Fredrick J.: *See*—
Arnoldt, Peter J.; and Arnoldt, Fredrick J., 4,639,574, Cl. 219-125.100.

Arnoldt, Peter J.; and Arnoldt, Fredrick J., to Ductmate Industries, Inc. Automatic duct welding machine. 4,639,574, Cl. 219-125.100.

Arotin, Robert L.; Walworth, Bryant L.; and Marini, Michele E., to American Cyanamid Company. Nitro- and cyanoguanidines as selective preemergence herbicides and plant defoliants. 4,639,268, Cl. 71-105.000.

Artos Engineering Company: *See*—
Randar, Magnus; and Kroening, Terry R., 4,638,904, Cl. 198-468.200.

Asaeda, Takeaki; Nakamura, Toru; and Yutani, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Power converter device. 4,639,850, Cl. 363-58.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Suematsu, Kazumi; Soutome, Kaoru; and Arakawa, Tatsumi, 4,639,297, Cl. 204-59.00F.

Asahina, Hiroshi: *See*—
Suzuki, Motomu; and Asahina, Hiroshi, 4,639,867, Cl. 364-414.000.

Asai, Michihiko; Shimura, Yukio; Tsuda, Keishiro; Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, to Shin-Etsu Chemical Co., Ltd. Method for the improvement of antistatic performance of synthetic resin shaped articles. 4,639,379, Cl. 427-40.000.

Asai, Tsuyoshi: *See*—
Kodama, Mitsuo; Miyake, Masaya; Nakano, Minoi; Asai, Tsuyoshi; and Hara, Akio, 4,639,352, Cl. 419-15.000.

Asakura, Osamu: *See*—
Uchikata, Yoshio; Nozaki, Mineo; Asakura, Osamu; and Nagashima, Masasumi, 4,639,744, Cl. 346-76.0PH.

Asano, Isao, to Babcock-Hitachi Kabushiki Kaisha. Three o'clock narrow groove welding apparatus. 4,639,575, Cl. 219-136.000.

ASEA Aktiebolag: *See*—
Hassellof, Ake; Lenasson, Carl-Gustaf; and Nordhall, Lennart, 4,638,540, Cl. 29-168.000.
Moritz, Bertil, 4,639,282, Cl. 156-53.000.

Ashland Oil, Inc.: *See*—
Goel, Anil B., 4,639,505, Cl. 528-211.000.

Ask, David T.: *See*—
LaBelle, Gary E.; and Ask, David T., 4,639,412, Cl. 430-523.000.

Askins, William E., to Woodstream Corporation. Animal trap with improved security. 4,638,589, Cl. 43-88.000.

Aso, Koichi: *See*—
Makino, Yoshimi; Ochiai, Yoshitaka; Uedaira, Satoru; Hotai, Kazuhide; Aso, Koichi; and Hayakawa, Masatoshi, 4,639,278, Cl. 148-108.000.

Association pour la Recherche et le Developpement des Methodes et Processus Industriels "A.R.M.I.N.E.S." : *See*—
Fredholm, Allan; Davidson, James H.; Khan, Tasadduq; and Theret, Jean-Marc C. F., 4,639,280, Cl. 148-404.000.

Astec Industries, Inc.: *See*—
Brock, J. Donald; and May, James G., 4,638,747, Cl. 110-264.000.

ASV Stubbe GmbH & Co KG: *See*—
Oleff, Werner; and Pape, Fritz G., 4,639,046, Cl. 301-63.0PW.

AT&T Bell Laboratories: *See*—
Lee, Charles M.; and Murphy, Bernard T., 4,639,615, Cl. 307-269.000.
Murphy, Edmond J., 4,639,074, Cl. 350-96.150.
Winters, Jack H., 4,639,914, Cl. 370-110.100.

AT&T Information Systems: *See*—
Rucci, Norman M.; and Sautter, Helmuth O., 4,639,781, Cl. 358-163.000.

AT&T Technologies, Inc.: *See*—
Kim, Myung K.; and Viriyayuthakorn, Montri, 4,638,762, Cl. 118-725.000.
McGonigal, Charles, 4,638,559, Cl. 29-874.000.

Atlantic Richfield Company: *See*—
Wilson, Robert, 4,638,863, Cl. 166-248.000.
Wolcott, Herbert A., II, 4,638,833, Cl. 137-312.000.

Atochem: *See*—
Pasquet, Veronique; and Spitz, Roger, 4,639,430, Cl. 502-120.000.

Atwood, Robert W., to Mattel, Inc. Toy play set with puppet for toy action figures. 4,639,234, Cl. 446-327.000.

Audibert, Francoise; Carelli, Claude; Chedid, Louis; LeFrancier, Pierre; Level, Michel; and Choay, Jean, to Agence National de Valorisation de la Recherche. Conjugates of haptenes and muramyl-peptides, endowed with immunogenic activity and compositions containing them. 4,639,512, Cl. 530-313.000.

Auten & Auten, Inc.: *See*—
Auten, Howard L., 4,638,968, Cl. 248-97.000.

Auten, Howard L., to Auten & Auten, Inc. Rubbish container. 4,638,968, Cl. 248-97.000.

Avdel Limited: *See*—
Denham, Keith; and Archer, Stephen, 4,639,174, Cl. 411-34.000.

Axelrod, Joan C.; and Chibnik, Sheldon, to Mobil Oil Corporation. Cold flow improving additive compound and fuel composition containing same. 4,639,256, Cl. 44-71.000.

B. F. Goodrich Company, The: *See*—
Masler, William F., III; and Amjad, Zahid, 4,639,490, Cl. 524-765.000.
Reynes, Enrique G.; and Leising, John O., 4,639,517, Cl. 544-85.000.

Babcock-Hitachi Kabushiki Kaisha: *See*—
Asano, Isao, 4,639,575, Cl. 219-136.000.

Babior, Bernard M., to New England Medical Center Hospitals, Inc. Stabilization of granulocytes. 4,639,373, Cl. 424-101.000.

Babson, Arthur L. Vessel and procedure for automated assay. 4,639,242, Cl. 494-37.000.

Bacharach, Inc.: *See*—
Tomasovic, Beth A.; and Novack, Robert L., 4,639,306, Cl. 204-432.000.

Bader, Alain: *See*—
Boutterin, Daniel; Bertaux, Jean-Paul; and Bader, Alain, 4,639,916, Cl. 371-16.000.

Bader, Imre; Berecz, Endre; Szina, Gabor; and Horvath, Janos, to Nehezipari Muszaki Egyetem. Apparatus for determination of aluminum oxide content of the cryolite melt in aluminum electrolysis cells. 4,639,304, Cl. 204-413.000.

Baggarly, Brad A.; and Scullion, Christopher K., to Bell & Howell Company. Insertion machine with postage categorization and selective merchandising. 4,639,873, Cl. 364-466.000.

Baier, Manfred, to Boehringer Mannheim GmbH. Heterogeneous immunoassay and reagent therefore. 4,639,425, Cl. 436-518.000.

Bailey, Wallace O., to Ford Motor Company. Motor vehicle fuel tank with unitary fuel reservoir. 4,638,836, Cl. 137-574.000.

Bain, Mitchell B.: *See*—
Gang, Joseph M.; and Bain, Mitchell B., 4,639,921, Cl. 371-53.000.

Baitz, Guenter; and Dobring, Wilfried, to Nixdorf Computer AG. Insert for a money drawer. 4,638,908, Cl. 206-0.800.

Baker, Gary L., to Crankshaft Machine Company. Concise quick release tool holder. 4,638,537, Cl. 29-40.000.

Baker, Michael P.: *See*—
King, Nigel J. R.; Pawson, Ian W. N.; Baker, Michael P.; Shaddock, Robert N.; and Stansfield, Edward V., 4,639,733, Cl. 342-424.000.

Bakker, Gijsbertus; and Rorije, Gerhardus J., to U.S. Philips Corporation. Color display tube window, skirt and mount for color selection means. 4,639,636, Cl. 313-408.000.

Balduin, Franz; and Adenauer, Ernst, to Balduin, Franz. Weighing apparatus. 4,638,876, Cl. 177-139.000.

Baldwin, Gary; Hallgren, Robert B.; Hornak, Thomas; and Ives, Fred H., to Hewlett-Packard Company. Electronic sampler switch. 4,639,619, Cl. 307-352.000.

Ball, Lawrence E.; Griffin, William M.; Wallace, Kathleen M.; and Nemecek, Amy L., to Standard Oil Company, The. Bioresistant water-soluble alkyl substituted acrylamide polymers and enhanced oil recovery method employing same. 4,638,865, Cl. 166-274.000.

Ballard, Gary W.; and Mamot, Robert M., to Carrier Corporation. Adaptive microprocessor control system and method for providing high and low heating modes in a furnace. 4,638,942, Cl. 236-10.000.

Ballard Medical Products: *See*—
Palmer, Darrel, 4,638,539, Cl. 29-157.00R.

Ballheimer, Benny, to Caterpillar Inc. Engine having a multipiece cylinder block. 4,638,769, Cl. 123-41.840.

Bandurco, Victor T.; Bell, Stanley C.; Comba, Donald W.; Falotico, Robert; and Tobia, Alfonso J., to Ortho Pharmaceutical Corporation. Substituted quinazolinediones. 4,639,518, Cl. 544-285.000.

Banton, Martin E.: *See*—
Yip, Kwok-leung; Araghi, Mehdi N.; Daniele, Joseph J.; Banton, Martin E.; Kramer, Charles J.; and Ritter, Joachim A., 4,639,073, Cl. 350-6.800.

Baratta, Anthony J.; Jester, William A.; Kenney, Edward S.; McMaster, Ira B.; and Schultz, Mortimer A., to Research Corporation. Non-invasive liquid level and density gauge for nuclear power reactor pressure vessels. 4,639,349, Cl. 376-254.000.

Barbour, Edward J. Tail gate step. 4,639,032, Cl. 296-62.000.

Barbulla, Winfried P. Water bed mattress. 4,638,518, Cl. 5-452.000.

Bardwick, John, III: *See*—
Rogers, O. David; Bardwick, John, III; and Staten, Kenneth, 4,638,604, Cl. 52-6.000.

Barmag Barmer Maschinenfabrik AG: *See*—
Schippers, Heinz; and Lenk, Erich, 4,638,955, Cl. 242-18.0PW.

Barnes, James M.: *See*—
Haas, Peter; Barnes, James M.; and Goyert, Wilhelm, 4,639,478, Cl. 524-97.000.

Barrat, Christian R.; Busch, Alfred; and Sardelis, Kosmas, to Procter and Gamble Company, The. Liquid detergent compositions containing organo-functional polysiloxanes. 4,639,321, Cl. 252-8.800.

Barrett, Mark D.: *See*—
Elmore, Carl L.; Poulin, Ted M.; and Barrett, Mark D., 4,638,855, Cl. 165-101.000.

Barrineau, Julius P.: *See*—
Barrineau, Wyman L., Sr.; and Barrineau, Julius P., 4,638,828, Cl. 137-62.000.

Barrineau, Wyman L., Sr.; and Barrineau, Julius P. Water temperature actuated drip valve. 4,638,828, Cl. 137-62.000.

Barry, Robert F., to Westinghouse Electric Corp. System for optical monitoring of machine positions. 4,639,591, Cl. 250-221.000.

Bartlett, David W., to E M X International Limited. Inductive loop detector. 4,639,689, Cl. 331-65.000.

Bartlett, Joel F.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.

Bartlett, Lawrence D., to Johnson, Robert T., a part interest. Rectal hemorrhoid therapeutic apparatus. 4,638,806, Cl. 128-400.000.

BASF Aktiengesellschaft: *See*—
Roeser, Karl; Lauer, Manfred; Sauter, Hubert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,639,447, Cl. 514-222.000.
Schuette, Wilhelm; McKee, Graham E.; Hilt, Albrecht; Heinz, Gerhard; and Goerrissen, Heiner, 4,639,488, Cl. 524-456.000.

BASF Corporation: *See*—
Finnan, Jeffrey L., 4,639,533, Cl. 549-411.000.

Basile, Philip C., to RCA Corporation. Solid state RF switch with self-latching capability. 4,639,614, Cl. 307-243.000.

Basinsky, Michael J.; Bird, Dale T.; and Smith, Daniel W., to Dowell Schlumberger Incorporated. Machinery skid. 4,638,971, Cl. 248-678.000.

Basler Electric Company: *See*—
Frierdich, Waldo J., 4,639,657, Cl. 322-59.000.

Bass, John C.; and Elsner, Norbert B., to GA Technologies Inc. Modular thermoelectric conversion system. 4,639,542, Cl. 136-210.000.

Basseen, Sanjiv K.; and Harlan, Richard A. Air dryer for pneumatic systems. 4,638,852, Cl. 165-47.000.

Basset, Jean M. M.; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, to Societe Nationale Elf Aquitaine. Catalyst for the metathesis of olefins. 4,639,429, Cl. 502-117.000.

Bassett, Alton H.: *See*—
Dyer, John; Kennette, John W.; Bassett, Alton H.; and Hall, Stanley D., 4,639,253, Cl. 604-362.000.

Bates, Thomas O.: *See*—
Shoemaker, Lewis E.; and Bates, Thomas O., 4,639,576, Cl. 219-146.230.

Batts, Inc.: *See*—
Blanchard, Russell O., 4,638,930, Cl. 223-85.000.

Bauch, Helmut; and Rehm, Hans, to Siemens Aktiengesellschaft. Broad band coupling switch arrangement with gated power supply. 4,639,613, Cl. 307-241.000.

Bauer, Frank L: *See*—
Archer, David H.; Bauer, Frank L; and Vidt, Edward J., 4,638,629, Cl. 60-39.050.

Bauer, Klaus: *See*—
Heubach, Gunther; Bauer, Klaus; and Bieringer, Hermann, 4,639,266, Cl. 71-92.000.

Baumann, Marcus; and Breitenstein, Werner, to Ciba-Geigy Corporation. Process for the preparation of dimethylmaleic anhydride. 4,639,531, Cl. 549-261.000.

Baumers, Hans; Lietzke, Heinz; and Schulte, Winfred, to Losenhausen Maschinenbau AG & Co. Kommanditgesellschaft. Steering axle arrangement for a wheel body of a vehicle. 4,638,877, Cl. 180-21.000.

Baumgardner, Terry A.; Krouse, Jere L.; and Wild, Alan G., to Robbins & Myers, Inc. Sealing apparatus for a gear ball joint. 4,639,200, Cl. 418-48.000.

Baxter Travenol Laboratories, Inc.: *See*—
Mittleman, Herbert, 4,639,019, Cl. 285-332.000.

Bayer Aktiengesellschaft: *See*—
Alewelt, Wolfgang; Eisermann, Wolfgang; Meyer, Karl-Heinrich; Tresper, Erhard; and Ullrich, Martin, 4,639,507, Cl. 528-388.000.
Haas, Peter; Barnes, James M.; and Goyert, Wilhelm, 4,639,478, Cl. 524-97.000.
Hohlein, Peter; Schmidt, Manfred; Pedain, Josef; Riberi, Bernd; and Sonntag, Michael, 4,639,499, Cl. 526-285.000.
Junge, Bodo; Krause, Hans P.; Muller, Lutz; and Puls, Walter, 4,639,436, Cl. 514-24.000.
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; Reinecke, Paul; and Brandes, Wilhelm, 4,639,462, Cl. 514-383.000.
Lantzsch, Reinhard; and Reubke, Karl-Julius, 4,639,527, Cl. 548-262.000.
Metzger, Carl; Eue, Ludwig; and Hack, Helmuth, 4,639,526, Cl. 548-140.000.
Moriya, Koichi; Priesnitz, Uwe; Riebel, Hans-Jochem; Eue, Ludwig; and Schmidt, Robert R., 4,639,537, Cl. 558-48.000.
Muller, Hanns P.; Clarenz, Werner; von Gizycki, Ulrich; and Wagner, Kuno, 4,639,502, Cl. 528-45.000.
Richter, Roland; Muller, Hanns P.; and Wegner, Christian, 4,638,795, Cl. 128-90.000.
Wingler, Frank; Koch, Otto; Doering, Joachim; Ott, Karl-Heinz; and Liebig, Lothar, 4,639,473, Cl. 525-83.000.

BBC Brown, Boveri & Company, Limited: *See*—
Dahler, Peter; Neidhart, Peter; Sadek, Kadry; and Stemmler, Herbert, 4,639,846, Cl. 363-39.000.
Dobler, Thomas, 4,639,077, Cl. 350-96.200.
Mastner, Georg, 4,639,662, Cl. 323-343.000.

Beaumont, Chritien J. M., to U.S. Philips Corporation. Nuclear magnetic resonance apparatus. 4,639,672, Cl. 324-318.000.

Beck, Donald; Miller, James W.; Wernau, William C.; and Young, Thomas B., III, to Pfizer Inc. Biopolymer compositions having enhanced filterability. 4,639,322, Cl. 252-8.554.

Beck, James M.; and Rohr, Robert D., to Owens-Illinois, Inc. Closure with snap-type hinge cap. 4,638,916, Cl. 215-235.000.

Beckenbach, Walter; and Rinderle, Heinz, to Telefunken Electronic GmbH. High frequency amplifier circuit. 4,639,686, Cl. 330-307.000.

Becker, Kunibert; Kirchbrucher, Rudiger; and Preuschoff, Michael, to Gewerkschaft Eisenhutte Westfalia. Mineral mining installation. 4,639,169, Cl. 405-291.000.

Becton, Dickinson and Company: *See*—
Eldegheidy, Mourad M., 4,639,316, Cl. 210-416.100.
Rycroft, Alan K., 4,639,250, Cl. 604-201.000.
Sage, Burton H., Jr., 4,639,421, Cl. 435-34.000.

Bedenk, William T.; and Harden, Kendall L., to Procter & Gamble Company, The. Laminated laundry product. 4,638,907, Cl. 206-0.500.

Bedinghaus Business Forms, Inc.: *See*—
Dove, Thomas D., 4,638,569, Cl. 33-562.000.

Beecham Group p.l.c.: *See*—
Curzons, Alan D., 4,639,534, Cl. 549-414.000.

Beele, Gunther, to Kloeckner-Humboldt-Deutz AG. Apparatus and method for maintaining the temperature of molten metal. 4,638,980, Cl. 266-44.000.

Beery, Jack; and Broome, Barry G., to ITT Corporation. Exposure apparatus for printing system. 4,639,127, Cl. 355-35.000.

Behn, Reinhard, to Siemens Aktiengesellschaft. Consolidated winding electrical capacitor and method for the manufacture thereof. 4,639,832, Cl. 361-306.000.

Beiersdorf Aktiengesellschaft: *See*—
Hansen, Werner, 4,639,453, Cl. 514-254.000.

Beisser, Jean-Claude, to Societe Nouvelle Transfix. Method of constructing transformers using a transformer-coil winding wheel. 4,638,554, Cl. 29-605.000.

Beisser, Jean-Claude. Transformer with gapless core on support. 4,639,705, Cl. 336-5.000.

Beitler, Franz: *See*—
Hoppmanns, Rolf D.; Steup, Walter; Wieczorek, Willibald; and Beitler, Franz, 4,639,801, Cl. 360-96.500.

Belanger, Germain: *See*—
Lalancette, Jean-Marc; and Belanger, Germain, 4,639,309, Cl. 106-267.000.

Belanger, Thomas D., Jr., to GTE Communication Systems Corporation. Beam lead bonding apparatus. 4,638,937, Cl. 228-5.500.

Belitz, Fritz: *See*—
Rinn, Juergen; and Belitz, Fritz, 4,639,110, Cl. 354-403.000.

Bell, Albert H., III; and Johnson, Jesse F., to General Motors Corporation. Hybrid gas turbine rotor. 4,639,194, Cl. 416-241.00B.

Bell Communications Research, Inc.: *See*—
Miller, Stewart E., 4,639,922, Cl. 372-19.000.

Bell & Howell Company: *See*—
Baggarly, Brad A.; and Scullion, Christopher K., 4,639,873, Cl. 364-466.000.

Bell, Stanley C.: *See*—
Bandurco, Victor T.; Bell, Stanley C.; Combs, Donald W.; Falotico, Robert; and Tobia, Alfonso J., 4,639,518, Cl. 344-285.000.

Bencini, Elena: *See*—
Sacconi, Luigi; Foa , Marco; Bencini, Elena; and Sabarino, Giampiero, 4,639,506, Cl. 528-212.000.

Bennett, Mark A., to Kelley Company, Inc. Dock shelter. 4,638,612, Cl. 52-173.0DS.

Benshoof, Steven C. Method and means for mounting a vehicle seat. 4,638,546, Cl. 29-526.00R.

Benson, David A.; and Dilts, Ray A., to Full Vision, Inc. Tube bender. 4,638,665, Cl. 72-389.000.

Bensussen, Isaac M.; and Tittel, Hans, to Boeing Company, The. Wire stripper with double wedge spring loaded gripper. 4,638,692, Cl. 81-9.410.

Berardo, Giuseppe, to Mario Pinto S.p.A. Self-centering chuck with adjustable and replaceable jaws. 4,639,001, Cl. 279-121.000.

Berecz, Endre: *See*—
Bader, Imre; Berecz, Endre; Szina, Gabor; and Horvath, Janos, 4,639,304, Cl. 204-413.000.

Berger, Erwin; and Grunig, Rudolf, to Hasler AG Bern. Instrument axle for postage meter. 4,639,581, Cl. 235-101.000.

Bergmann, Lutz: *See*—
Neidig, Arno; Leukel, Bernd; and Bergmann, Lutz, 4,639,759, Cl. 357-74.000.

Bergmans, Anthony B., to Gould Electronics B.V. Apparatus for measuring the volume of a measuring gas. 4,638,661, Cl. 73-237.000.

Bergner, Dieter: *See*—
Staab, Rudolf; Bergner, Dieter; and Hannesen, Kurt, 4,639,303, Cl. 204-258.000.

Bergstrom, Christer, to Neste Oy. Compound film containing olefin. 4,639,398, Cl. 428-451.000.

Berkeley Process Control, Inc.: *See*—
Sagues, Paul, 4,639,884, Cl. 364-565.000.

Bernard, Jean-Claude; Chabrier, Patrick; Tahon, Bernard; Tesoriere, Jean-Marc; and Ortega, Domingo, to Societe des Electrodes et Refractaires "Savoie" (SERS). Continuous method of graphitizing long carbon-containing products and a furnace for carrying out the method. 4,639,929, Cl. 373-120.000.

Bernard Marks and Company Limited: *See*—
Armstrong, Richard J., 4,639,215, Cl. 431-354.000.

Bertaux, Jean-Paul: *See*—
Boutterin, Daniel; Bertaux, Jean-Paul; and Bader, Alain, 4,639,916, Cl. 371-16.000.

Best, Lance E.: *See*—
Dunphy, Gerald F.; and Best, Lance E., 4,639,022, Cl. 292-150.000.

Best, Steven A., to Exxon Research & Engineering Co. Polymerization catalyst, production and use. 4,639,428, Cl. 502-115.000.

Betts, William L.: *See*—
Zuranski, Edward S.; Scott, Robert E.; and Betts, William L., 4,639,934, Cl. 375-10.000.

BFGoodrich Company, The: *See*—
Lai, John T.; and Son, Pyong N., 4,639,479, Cl. 524-100.000.

Bicron Electronics Company: *See*—
Shand, J. Richard; and LaChance, Raymond H., 4,639,704, Cl. 335-255.000.

Bieringer, Hermann: *See*—
Heubach, Gunther; Bauer, Klaus; and Bieringer, Hermann, 4,639,266, Cl. 71-92.000.

Big Time, Inc.: *See*—
Chau, Jacky, 4,639,144, Cl. 368-276.000.

Biljanic, Matt: *See*—
Crittenden, William, 4,638,776, Cl. 123-235.000.

Billigmeier, James E.; Groves, James D.; Haugen, Harwick A.; and Pokorny, Richard J., to Minnesota Mining and Manufacturing Company. Soap-thickened reenterable gelled encapsulants. 4,639,483, Cl. 524-296.000.

Bingener, Hans, to Durol Flying Lindauer Ikh Montage GmbH. Procedure for coating and heat insulating of walls and ceilings, etc., and device for carrying out the procedure. 4,638,545, Cl. 29-460.000.

Bini, Anselmo. Process and apparatus for the lifting and carriage of objects placed on tray-like supports. 4,639,030, Cl. 294-64.100.

Biondi, Carlo: *See*—
Frascaroli, Francesco; and Biondi, Carlo, 4,639,049, Cl. 312-195.000.

Birch, Richard J.: *See*—
Fang, Pao-Hsien, 4,639,543, Cl. 136-256.000.

Bird, Dale T.: *See*—
Basinsky, Michael J.; Bird, Dale T.; and Smith, Daniel W., 4,638,971, Cl. 248-678.000.

Bird, Graham J.: *See*—
Farquharson, Graeme J.; Watson, Keith G.; and Bird, Graham J., 4,639,267, Cl. 71-98.000.

Birkley, Adrian N. Carriage apparatus for saw tables. 4,639,005, Cl. 280-43.140.

Birum, Gail H.; Mathis, Thomas C.; and Stolk, Richard D., to Monsanto Company. Polyester compositions containing a phthalimide. 4,639,480, Cl. 524-104.000.

Bischoff, Didier; Courteheuse, Gerard; and Renard, Pierre, to Institut Francais du Petrole. Apparatus for the liquid phase hydrotreatment of hydrocarbons in the presence of an expanded or ebullated catalyst bed. 4,639,354, Cl. 422-140.000.

Bisera, Jose; Carrington, James H.; and Weil, Max H., to Institute of Critical Care Medicine. Vascular interface. 4,638,811, Cl. 128-673.000.

Bisping, Bernhard; and Bornefeld, Klaus, to Rheinmetall GmbH. Fin stabilized subcaliber shell of large length to diameter ratio. 4,638,738, Cl. 102-516.000.

Bixler, Richard M.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.

Bjorshol, Kolbjorn. Conveyer apparatus for fishing line having snoods along its length. 4,638,583, Cl. 43-4.000.

Blanchard, Russell O., to Batts, Inc. Hanger leg mounting structure for a support rod. 4,638,930, Cl. 223-85.000.

Blandamura, Manlio, to Finchimica S.R.L. Therapeutic use of cyproterone acetate. 4,639,440, Cl. 514-178.000.

Blaschke, Felix, to Siemens Aktiengesellschaft. Method and apparatus for determining the torque of a torque generator. 4,638,673, Cl. 73-862.170.

Blasius, Udo; and Rodi, Anton, to Heidelberger Druckmaschinen AG. Data transmission system of optto-couplers. 4,639,727, Cl. 340-825.570.

Bletz, Walter, to Ernst Leitz Wetzlar GmbH. Process and circuit arrangement for amplifying an input current. 4,639,134, Cl. 356-223.000.

Bloothoofd, William, to Hercules Incorporated. Capped printing plate making machine. 4,638,758, Cl. 118-412.000.

Blum, David B.: *See*—
Mednick, R. Lawrence; and Blum, David B., 4,639,470, Cl. 518-700.000.

Blumbach, Rainer: *See*—
Rake, Heinrich; Hoffmann, Ulrich; Muller, Ulrich; Breddermann, Rudolf; and Blumbach, Rainer, 4,639,853, Cl. 364-149.000.

Board of Regents, The University of Texas System, The: *See*—
Sherry, A. Dean, 4,639,365, Cl. 424-9.000.

BOC Group plc, The: *See*—
Garrett, Michael E., 4,639,340, Cl. 261-36.100.
Marshall, John; and Oakey, John D., 4,638,638, Cl. 62-9.000.
Marshall, John; and Oakey, John D., 4,638,639, Cl. 62-9.000.

Bodenseewerk Geratetechnik GmbH: *See*—
Weber, Berthold; Giesenberg, Peter; and Steimel, Johannes, 4,639,589, Cl. 250-203.00R.

Boehringer Mannheim GmbH: *See*—
Baier, Manfred, 4,639,425, Cl. 436-518.000.

Boeing Company, The: *See*—
Bensussen, Isaac M.; and Tittel, Hans, 4,638,692, Cl. 81-9.410.
Furlong, James J.; and Howe, Dwayne E., 4,639,824, Cl. 361-179.000.
Jensen, Tom M., 4,639,012, Cl. 280-642.000.
Krogh, Steven B.; and Lloyd, Adam J. P., 4,638,791, Cl. 128-1.00A.
Thompson, Douglas, 4,638,566, Cl. 33-534.000.

Bofinger, Klaus: *See*—
Tornare, Jean; Bofinger, Klaus; and Tschopp, Claudio, 4,639,197, Cl. 417-259.000.

Boge GmbH: *See*—
Moser, Bernd, 4,638,670, Cl. 73-658.000.

Bogner, Martin: *See*—
Scheck, Georg; Bogner, Martin; Schmidt, Manfred; and Kowatsch, Ulrich, 4,639,010, Cl. 280-615.000.

Bohman, Carl E.: *See*—
Strosser, Richard P.; Bohman, Carl E.; and Chow, Mark K., 4,639,666, Cl. 324-202.000.

Boisvert, Richard. Pivotable locking bar for patio doors. 4,639,023, Cl. 292-262.000.

Bokmiller, David J., to Sani-Fresh International, Inc. Cleaning wand caddy. 4,638,910, Cl. 206-15.200.

Bokros, Jack C., to Carbomedics, Inc. Percutaneous access device. 4,639,247, Cl. 604-175.000.

Boles, John A.; and Eastman, Jay M., to Optel System Limited. Bar code scanner laser radiation exposure limit control system. 4,639,606, Cl. 250-555.000.

Bolin, Michael L.: *See*—
Zunkel, Gary D.; and Bolin, Michael L., 4,638,859, Cl. 166-51.000.

Bomar Corporation, Inc.: *See*—
Lybecker, Robert W., 4,638,597, Cl. 49-340.000.

Bonacorsi, Robert W., to Phillips Home Products. Trash compactor. 4,638,730, Cl. 100-229.00A.

Bone, Ronald N., to Southwestern Bell Telephone Company. Pair cut apparatus and method of use. 4,639,555, Cl. 379-327.000.

Bonvallet, Duane J., to General Motors Corporation. Variable valve lift/timing mechanism. 4,638,773, Cl. 123-90.160.

Borer, Claude; and Greter, Andreas, to Hoffmann-La Roche Inc. Cuvette. 4,639,135, Cl. 356-246.000.

Borg-Warner Corporation: *See*—
Gary, James R., 4,639,665, Cl. 324-117.00H.

Bornefeld, Klaus: *See*—
Bisping, Bernhard; and Bornefeld, Klaus, 4,638,738, Cl. 102-516.000.

Borow, Henry. Dust separator. 4,639,260, Cl. 55-302.000.

Bosse, Gene P., to Eaton Corporation. High speed redundancy processor. 4,639,915, Cl. 371-10.000.

Boufford, Richard, to Boufford, Richard. Portable front bike pack assembly. 4,638,933, Cl. 224-41.000.

Boughton, Geoffrey J., to International Computers Limited. Data display system. 4,639,723, Cl. 340-799.000.

Boulanger, Henry J., to Texas Instruments Incorporated. Pressure responsive device. 4,638,721, Cl. 92-6.00D.

Bourgery, Guy R.: *See*—
Platel, Alain Y.; Bourgery, Guy R.; and Lacour, Alain, deceased, 4,639,452, Cl. 514-252.000.

Bousaid, Issam S., to Texaco Inc. Recovery of heavy crude oil from shallow formations by in situ combustion. 4,638,864, Cl. 166-251.000.

Boutterin, Daniel; Bertaux, Jean-Paul; and Bader, Alain, to U.S. Philips Corporation. Automatic method and machine for the simultaneous testing of data processing systems. 4,639,916, Cl. 371-16.000.

Bouvot, Jean-Francois; and Leborgne, Jose , to Valeo. Reduced pressure control device for moving a movable member between three positions. 4,638,723, Cl. 92-48.000.

Bowman-Jones, Gordon, to Endless Energy, Inc. Electro mechanical switch having remotely controlled off position. 4,639,612, Cl. 307-132.00E.

Boyd, David T. Theft-resistant automobile side cover. 4,639,027, Cl. 293-128.000.

Brace, George A.: *See*—
Enders, Max L., deceased; and Thiel, Reinhard A., administrator, 4,639,044, Cl. 301-9.0DN.

Brackelmanns, Norbert W.: *See*—
Neilson, John M. S.; and Brackelmanns, Norbert W., 4,639,762, Cl. 357-23.800.

Bradley, Brian D.: *See*—
Young, Lawrence R.; Sexton, Gregory J.; Mullins, Randal L.; and Bradley, Brian D., 4,639,738, Cl. 346-75.000.

Brakus, Bogdan, to Siemens Aktiengesellschaft. Circuit arrangement for controlled power supply devices particularly for autoconverters. 4,639,847, Cl. 363-46.000.

Brandes, Wilhelm: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; Reinecke, Paul; and Brandes, Wilhelm, 4,639,462, Cl. 514-383.000.

Brandner, Alois, to Siemens Aktiengesellschaft. Device for sensing a recording medium in a line printer. 4,639,607, Cl. 250-561.000.

Brannigan, Michael J.; and Rutledge, David L., to Harris Corporation. Redundant row decoding for programmable devices. 4,639,896, Cl. 365-200.000.

Bras, Johan Chr. M.; and Lankamp, Herman D., to SKF Industrial Trading & Development Company B. V. Seal for a roller bearing. 4,639,149, Cl. 384-477.000.

Brassfield, Brian. Doll having means to convert from one character to another. 4,639,233, Cl. 446-321.000.

Braun, Eugene R., to Eaton Corporation. Clutch control system and clutch assembly using same. 4,638,898, Cl. 192-0.052.

Braun, Jane E.: *See*—
Rahn, Melanie H.; and Braun, Jane E., 4,639,226, Cl. 434-433.000.

Braxton, Benjamin D.; and Spector, George. Emergency generator battery system. 4,639,654, Cl. 320-2.000.

Breddermann, Rudolf: *See*—
Rake, Heinrich; Hoffmann, Ulrich; Muller, Ulrich; Breddermann, Rudolf; and Blumbach, Rainer, 4,639,853, Cl. 364-149.000.

Breidegam, Albert C., to Semtronics Corporation. Stretchable grounding strap having redundant conductive sections. 4,639,825, Cl. 361-212.000.

Breitenstein, Werner: *See*—
Baumann, Marcus; and Breitenstein, Werner, 4,639,531, Cl. 549-261.000.

Brews, James A.: *See*—
Dawe, Stephen G.; and Brews, James A., 4,638,874, Cl. 175-321.000.

Briner, Paul H.: *See*—
Wood, Derek A.; and Briner, Paul H., 4,639,334, Cl. 548-952.000.

Bristol-Myers Company: *See*—
Kaplan, Murray A.; and Vyas, Dolatrai M., 4,639,528, Cl. 548-422.000.
Martel, Alain; and Daris, Jean-Paul, 4,639,335, Cl. 540-304.000.

British Gas Corporation: *See*—
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Sperinck, William A.; and Hall-Wilton, Michael J., 4,638,675, Cl. 73-864.340.

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Bunch, Graham; and Dawes, Richard G., 4,638,766, Cl. 122-398.000.
Brock, J. Donald; and May, James G., to Astec Industries, Inc. Coal-fired asphalt plant. 4,638,747, Cl. 110-264.000.
Brock, James R. Wettable spray box. 4,638,926, Cl. 222-82.000.
Brock, Robert K.: *See—*
Johnson, Phil E.; and Brock, Robert K., 4,638,726, Cl. 92-241.000.
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Brooks, Steve M.; and May, David R., to Thorn EMI Domestic Appliances Limited. Heating apparatus. 4,639,579, Cl. 219-464.000.
Broome, Barry G.: *See—*
Beery, Jack; and Broome, Barry G., 4,639,127, Cl. 355-35.000.
Brother Industries, Ltd.: *See—*
Yasuhiro, Miki, 4,639,880, Cl. 364-519.000.
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Ueno, Hideo; Kuno, Hiroshi; and Hamabe, Yoshifumi, 4,639,151, Cl. 400-63.000.
Yamamoto, Takemi; and Tomida, Yasutaka, 4,639,152, Cl. 400-120.000.
Brown, Boveri & Cie., AG: *See—*
Neidig, Arno; Leukel, Bernd; and Bergmann, Lutz, 4,639,759, Cl. 357-74.000.
Weddigen, Gerd; Huber, Robert; Schmidt, Birgit; and Schneider, Hartmut, 4,639,496, Cl. 525-506.000.
Brown, David O.: *See—*
Pappano, Thomas W.; and Brown, David O., 4,639,719, Cl. 340-652.000.
Brown, Gregory C.; and Gravel, James L., to Rosemount Inc. High sensitivity magnetic actuator. 4,638,830, Cl. 137-83.000.
Brown, Walter J., to Milliken Research Corporation. Video display arrangement. 4,638,969, Cl. 248-122.000.
Brownie Manufacturing Co., Inc.: *See—*
Coy, Jeffrey A., 4,638,888, Cl. 187-19.000.
Brunea, Robert W.; and Raby, James M., to Moore Business Forms, Inc. Chromogenic mixtures. 4,639,271, Cl. 106-21.000.
Brunner, Othmar: *See—*
Wullschleger, Andreas; and Brunner, Othmar, 4,638,627, Cl. 59-80.000.
BSD Medical Corporation: *See—*
Turner, Paul F., 4,638,813, Cl. 128-804.000.
Buchel, Karl H.: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; Reinecke, Paul; and Brandes, Wilhelm, 4,639,462, Cl. 514-383.000.
Buchholz, Karl-Heinz: *See—*
Potel, Gerd; and Buchholz, Karl-Heinz, 4,638,742, Cl. 105-199.300.
Buchner, Norbert; Lemke, Kuno; and Vogele, Gunter, to Robert Bosch GmbH. Apparatus for volumetric metering and dispensing or liquids. 4,638,925, Cl. 222-21.000.
Buck, Wolfgang: *See—*
Sehring, Richard; Buck, Wolfgang; Prokic-Immel, Ricards; and Lust, Sigmund, 4,639,438, Cl. 514-129.000.
Budapest Muszaki Egyetem: *See—*
Csak, Bela, 4,638,609, Cl. 52-167.000.
Budd Company: *See—*
Epel, Joseph N., 4,639,387, Cl. 428-113.000.
Buike, James W.; and Eddy, William C., to Allied Corporation. Electro/pneumatic proportional valve. 4,638,837, Cl. 137-627.500.
Buky, Gabriel R.: *See—*
Littwin, Kenneth M.; Armond, Joseph A.; Buky, Gabriel R.; and Patrick, Fred, 4,639,821, Cl. 361-151.000.
Bulow, Roland E., to Mobil Oil Corporation. Rotating multi-path fluid manifold. 4,639,228, Cl. 441-5.000.
Bunch, Graham; and Dawes, Richard G., to British Petroleum Company p.l.c., The. Process for the treatment of boiler condensate. 4,638,766, Cl. 122-398.000.
Bunch, Richard P.: *See—*
Parracho, Rui M.; Smith, Lloyd S.; Bunch, Richard P.; and Gross, Alexander L., 4,638,576, Cl. 36-68.000.
Bungo, Edward M.: *See—*
Sovacool, David K.; Van Slyke, Allan S.; and Bungo, Edward M., 4,638,964, Cl. 248-56.000.
Buniff, Egbert D. N. Telescoping measuring stick with signal means. 4,638,563, Cl. 33-169.00R.
Burandt, Corliss O., to Investment Rarites, Incorporated. Valve actuating apparatus for minimizing the need for lash adjustment. 4,638,772, Cl. 123-90.600.
Burgin, Kermit H. Adjustable speculum with incorporated lighting system. 4,638,792, Cl. 128-6.000.
Burlington Industries, Inc.: *See—*
Sutera, Richard, 4,639,737, Cl. 346-75.000.
Burr, Eldon F.: *See—*
Yarne, Andrew J.; and Burr, Eldon F., 4,638,938, Cl. 228-180.100.
Burroughs Wellcome Co.: *See—*
Findlay, John W. A.; and Coker, Geoffrey G., 4,639,459, Cl. 514-343.000.
Burrows, Philip J. Measuring guide for saw and measuring guide system. 4,638,564, Cl. 33-185.00R.
Busch, Alfred: *See—*
Barrat, Christian R.; Busch, Alfred; and Sardelis, Kosmas, 4,639,321, Cl. 252-8.800.
Buschmann, Gerhard; and Muller, Georg, to Jagenberg Ag. Device for measuring the winding hardness of a strip, especially a strip of paper, wound into a reel. 4,638,657, Cl. 73-78.000.
Bushaw, Kenneth A.; Bustamante, Louis A.; and McCurry, James J., to International Business Machines Corporation. Method for producing duplex copy sets from a duplex original set. 4,639,126, Cl. 355-3.0SH.
Bustamante, Louis A.: *See—*
Bushaw, Kenneth A.; Bustamante, Louis A.; and McCurry, James J., 4,639,126, Cl. 355-3.0SH.
Buthe, Theo; Geisthoff, Hubert; Kretschmer, Horst; Mikeska, Felix; and Post, Alexander, to Jean Walterscheid GmbH. Driveline coupling with safety interlock mechanism. 4,639,163, Cl. 403-322.000.
Buthe, Theo: *See—*
Geisthoff, Hubert; Buthe, Theo; and Mikeska, Felix, 4,639,162, Cl. 403-316.000.
Butka, Kemal. Boat with a swinging mast. 4,638,755, Cl. 114-91.000.
Butler, Myron C.; Hilligoss, William R.; and Hilligoss, Lawrence O., to Communications Technology Corporation. Remote testing system for electrical circuits. 4,639,557, Cl. 379-29.000.
Butterwick, Gilbert N., to RCA Corporation. Intensified charge-coupled image sensor having a charge-coupled device with contact pads on an annular rim thereof. 4,639,590, Cl. 250-213.0VT.
Butts, Robert R.: *See—*
Fender, Janet S.; Cusumano, Salvatore J.; Butts, Robert R.; and DeHainaut, Christopher R., 4,639,586, Cl. 250-201.000.
C.G.R. MeV: *See—*
Meyrand, Gabriel, 4,639,634, Cl. 313-62.000.
Tronc, Dominique, 4,639,641, Cl. 315-5.410.
C&K Components, Inc.: *See—*
Fredrickson, Eric, 4,639,562, Cl. 200-43.080.
C.O.M. Cooperativa Operai Metallurgici S.C.R.L.: *See—*
Frascaroli, Francesco; and Biondi, Carlo, 4,639,049, Cl. 312-195.000.
C-Tec, Inc.: *See—*
Munsey, R. Jack; DeJong, Leroy D.; and Keip, Charles P., 4,639,204, Cl. 425-3.000.
Cadwell, George H., Jr.: *See—*
Pittman, Clarence B.; and Cadwell, George H., Jr., 4,639,261, Cl. 55-502.000.
Caillat, Jean-Luc, to Copeland Corporation. Scroll-type machine with variable wrap thickness. 4,639,201, Cl. 418-55.000.
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McRae, Daniel D.; and Cain, Joseph B., III, 4,639,937, Cl. 375-40.000.
Caldwell, Stephen P.: *See—*
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Campanelli, Michael R.: *See—*
Drake, Donald J.; Hawkins, William G.; and Campanelli, Michael R., 4,639,748, Cl. 346-140.00R.
Campbell, Henry F.: *See—*
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,639,442, Cl. 514-212.000.
Camph, Sven E. Means for transmitting brake force. 4,638,893, Cl. 188-79.5GE.
Cannella, Vincent D., to Energy Conversion Devices, Inc. Displays having pixels with two portions and capacitors. 4,639,087, Cl. 350-332.000.
Canon Kabushiki Kaisha: *See—*
Adachi, Hiroyuki; and Saito, Takashi, 4,639,123, Cl. 355-15.000.
Fuziwara, Yutaka; and Yamamoto, Hiroshi, 4,639,083, Cl. 350-255.000.
Isaka, Kazuo, 4,639,119, Cl. 355-3.0DD.
Ito, Yoshio, 4,639,749, Cl. 346-153.100.
Kato, Masatake, 4,639,095, Cl. 350-427.000.
Kitagishi, Nozomu; Momiyama, Kikuo; Ikemori, Keiji; Takahashi, Sadatoshi; and Tanaka, Tsunefumi, 4,639,096, Cl. 350-427.000.
Kobayashi, Junji; and Kimura, Takashi, 4,639,797, Cl. 360-71.000.
Kugioka, Michihiro, 4,639,084, Cl. 350-255.000.
Kuroda, Yasuo, 4,639,608, Cl. 250-578.000.
Masaki, Hisaji, 4,639,791, Cl. 358-300.000.
Nakamura, Shunji; Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; and Nakahata, Kimio, 4,638,760, Cl. 118-658.000.
Okada, Shinjiro; Katagiri, Kazuharu; and Kanbe, Junichiro, 4,639,089, Cl. 350-341.000.
Sakai, Shinji; Kawabata, Takashi; and Harada, Yoshihito, 4,639,108, Cl. 354-289.100.
Sakurada, Nobuaki; Kawamura, Hideaki; and Sasaki, Takashi, 4,639,747, Cl. 346-140.00R.
Seto, Kaoru, 4,639,649, Cl. 318-314.000.
Shinoda, Nobuhiko, 4,639,588, Cl. 250-201.000.
Tomita, Yasuo, 4,639,816, Cl. 360-131.000.
Tsunekawa, Tokuichi, 4,639,924, Cl. 372-33.000.
Uchikata, Yoshio; Nozaki, Mineo; Asakura, Osamu; and Nagashima, Masasumi, 4,639,744, Cl. 346-76.0PH.
Yamamoto, Mitsuru; Watanabe, Kunio; and Shimoda, Junji, 4,639,735, Cl. 346-1.100.
Yamamoto, Mitsuru, 4,639,746, Cl. 346-140.00R.
Canosa, Joseph F. Dishwashing apparatus. 4,638,826, Cl. 134-100.000.
Capasso, Vincent; and Kalck, Charles W., Sr., to Kalck, Charles W., Sr.; and Kalck, Kathy. Fire-sprinkler cut-off device. 4,638,866, Cl. 169-90.000.
Caputo, Anthony; and Culter, Gary P. Toilet hook. 4,638,515, Cl. 4-661.000.

Carbomedics, Inc.: *See—*
Bokros, Jack C., 4,639,247, Cl. 604-175.000.
Card, Roger J.: *See—*
O'Toole, Michael P.; and Card, Roger J., 4,639,356, Cl. 423-266.000.
Carelli, Claude: *See—*
Audibert, Francoise; Carelli, Claude; Chedid, Louis; LeFrancier, Pierre; Level, Michel; and Choay, Jean, 4,639,512, Cl. 530-313.000.
Carino, John W.: *See—*
Strange, Thomas F.; and Carino, John W., 4,639,827, Cl. 361-272.000.
Strange, Thomas F.; and Carino, John W., 4,639,828, Cl. 361-272.000.
Carl Freudenberg, Firma: *See—*
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Sciortino, Giacomo, 4,638,981, Cl. 267-8.00R.
Shoji, Rikuo, 4,639,390, Cl. 428-195.000.
Carli, Fabio, to Farmitalia Carlo Erba S.p.A. Pharmaceutical composition. 4,639,370, Cl. 424-80.000.
Carr, Paul, to Flo-Tork, Inc. Combination of cushion, adjuster and side ports in a single unit rotary actuator. 4,638,717, Cl. 91-26.000.
Carranza, Fermin A., Jr.: *See—*
Newman, Michael G.; and Carranza, Fermin A., Jr., 4,638,823, Cl. 132-91.000.
Carrick, Lee. Applicator for coating suspended cable. 4,638,761, Cl. 118-694.000.
Carrier Corporation: *See—*
Ballard, Gary W.; and Mamot, Robert M., 4,638,942, Cl. 236-10.000.
Schoch, Stephen A.; and Sibley, Howard W., 4,639,594, Cl. 250-227.000.
Carrington, James H.: *See—*
Bisera, Jose; Carrington, James H.; and Weil, Max H., 4,638,811, Cl. 128-673.000.
Casanova, Damien, to Mavilor Systemes S.A. Brush-holder for flat-commutator electromechanical transducer. 4,639,629, Cl. 310-248.000.
Casey, Thomas J., to Thomas Engineering, Inc. Method and apparatus for coating particulate granules. 4,639,383, Cl. 427-213.000.
Casier, Yves; Cassagne, Philippe; Dore, Bernard; and Gicquel, Sylvain, to Gaz de France. Method of heating any building or room and apparatus for carrying out the said method. 4,638,943, Cl. 237-7.000.
Cassagne, Philippe: *See—*
Casier, Yves; Cassagne, Philippe; Dore, Bernard; and Gicquel, Sylvain, 4,638,943, Cl. 237-7.000.
Cassidy, Dale A.: *See—*
Lewandowski, Edward F.; Cassidy, Dale A.; and Sommer, Robert G., 4,639,571, Cl. 219-121.0EC.
Caterpillar Inc.: *See—*
Ballheimer, Benny, 4,638,769, Cl. 123-41.840.
Murphy, Michael J.; and Smith, Kent D., 4,638,869, Cl. 172-821.000.
Cauwet, Daniele: *See—*
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,638,822, Cl. 132-7.000.
Cavalieri, Dominic A. Turbine blade holding device. 4,638,602, Cl. 51-217.00R.
CEAG Licht- und Stromversorgungstechnik GmbH: *See—*
Mayer, Hartwig, 4,639,834, Cl. 361-388.000.
Cecil, Alvin S.: *See—*
McMillan, Thomas A.; Mitchell, Henry W.; and Cecil, Alvin S., 4,639,710, Cl. 338-108.000.
Celamerck GmbH & Co. KG: *See—*
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Celino, Cecilio, administrator: *See—*
Celino, Martin S., deceased; Celino, Cecilio, administrator; and Larrauri, Antonio, administrator, 4,639,467, Cl. 514-468.000.
Celino, Martin S., deceased; by Celino, Cecilio, administrator; and Larrauri, Antonio, administrator. Antibiotic Crismaicin A and compositions thereof. 4,639,467, Cl. 514-468.000.
Central Glass Company, Limited: *See—*
Aono, Koji; Saito, Toshinori; and Okada, Chiharu, 4,639,361, Cl. 423-347.000.
Central Mine Equipment Company: *See—*
Rassieur, Charles L., 4,638,871, Cl. 173-26.000.
Centro Sperimentale Metallurgico S.p.A.: *See—*
Lubrano, Maurizio, 4,638,654, Cl. 72-201.000.
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Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hiroae, Haruki; and Yoshimura, Nobutoshi, 4,639,167, Cl. 405-217.000.
Chabrier, Patrick: *See—*
Bernard, Jean-Claude; Chabrier, Patrick; Tahon, Bernard; Tesoriere, Jean-Marc; and Ortega, Domingo, 4,639,929, Cl. 373-120.000.
Chadwick, Curt H.; Shulenberger, Art M.; Taylor, John S.; and Simmons, Richard R., to KLA Instruments Corporation. Automatic focusing system for a microscope. 4,639,587, Cl. 250-201.000.
Chamberlain, Savvas G.: *See—*
Schlig, Eugene S.; and Chamberlain, Savvas G., 4,639,678, Cl. 324-457.000.
Chamness, Leland D.: *See—*
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Chang, Yi-Hua E.; Gruodis, Algirdas J.; Muhlfeld, Hans P., Jr.; Rodriguez, Charles W.; and Shulman, Mark L., to International Business Machines Corporation. Distributed pattern generator. 4,639,919, Cl. 371-27.000.
Chao, Ting-Tsung, to Echolac Co., Ltd. Dual action luggage latch. 4,638,649, Cl. 70-71.000.
Charles Stark Draper Laboratory, Inc., The: *See—*
Wood, George A., 4,638,749, Cl. 112-121.120.
Charron, Rene. Protective outer garment for divers. 4,638,509, Cl. 2-2.10R.
Chase, Charles E., Jr.: *See—*
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Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., to Motorola, Inc. Electrostatically sealed piezoelectric device. 4,639,631, Cl. 310-344.000.
Chatterjee, Madhu S., to General Motors Corporation. Single frequency induction hardening process. 4,639,279, Cl. 148-147.000.
Chau, Jacky, to Big Time, Inc. Novelty wrist watch. 4,639,144, Cl. 368-276.000.
Chawla, Manmohan S.; and Speights, Junius L., III Dresser Industries, Inc. Bullet perforating apparatus, gun assembly and barrel. 4,638,712, Cl. 89-1.150.
Chaya, Hiromi, to Dainippon Screen Seizo Kabushiki Kaisha. Method and device for light emitting intensity control in a graphic display device. 4,639,879, Cl. 364-518.000.
Check, John M.; and Johnson, Myron C., to Ex-Cell-O Corporation. Apparatus and method for finishing fuel injector spray tips using EDM. 4,639,568, Cl. 219-69.00M.
Chedid, Louis: *See—*
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Chem Systems, Inc.: *See—*
Mednick, R. Lawrence; and Blum, David B., 4,639,470, Cl. 518-700.000.
Cheng, Wei-Tsang, to Jing Tech, Inc. Printing ribbon spool having an ink reservoir and method of making same. 4,639,153, Cl. 400-202.100.
Cherian, Gabe, to Raychem Corporation. Vent hole assembly. 4,639,818, Cl. 361-106.000.
Cherill, Robert J.: *See—*
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,639,443, Cl. 514-222.000.
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,639,446, Cl. 514-222.000.
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Goodrich, Judson E., 4,639,307, Cl. 208-44.000.
Rose, Bernard F., 4,639,460, Cl. 514-369.000.
Chi, Keh-Fei C.: *See—*
Chow, Pei-Ming D.; and Chi, Keh-Fei C., 4,639,142, Cl. 356-372.000.
Chiba, Hiroshi: *See—*
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Chibnik, Sheldon: *See—*
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Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,639,014, Cl. 310-707.000.
Childress, Don E.: *See—*
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Chiu, Anthony M.; Allison, Mark D.; Jones, James W.; Trammell, Lyndale A.; and San Ho, Fock, to Texas Instruments Incorporated. Apparatus for testing a plurality of integrated circuits in parallel. 4,639,664, Cl. 324-73.0AT.
Chloride Silent Power Ltd.: *See—*
MacLachlan, Stuart; and O'Neill Bell, Christopher, 4,638,555, Cl. 29-623.100.
Choay, Jean: *See—*
Audibert, Francoise; Carelli, Claude; Chedid, Louis; LeFrancier, Pierre; Level, Michel; and Choay, Jean, 4,639,512, Cl. 530-313.000.
Chorvat, Robert J.: *See—*
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Chou, Stephen Y., to Massachusetts Institute of Technology. Quantum tunneling cantilever accelerometer. 4,638,669, Cl. 73-517.00R.
Chow, Mark K.: *See—*
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Chow, Pei-Ming D.; and Chi, Keh-Fei C., to Rockwell International Corporation. Dimension monitoring technique for semiconductor fabrication. 4,639,142, Cl. 356-372.000.
Chromalloy American Corporation: *See—*
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Chrysler Motors Corporation: *See—*
Heling, Dennis H., 4,639,038, Cl. 297-341.000.
Kronberger, Leonard J., 4,639,560, Cl. 200-19.00R.
Chu, Richard C., to International Business Machines Corp. Composite heat transfer device with pins having wings alternately oriented for up-down flow. 4,638,858, Cl. 165-185.000.
Chu, Zooey C.: *See—*
Marcus, Konrad H.; and Chu, Zooey C., 4,639,085, Cl. 350-283.000.
Chuang, Rong-Chao. Automatic overflow control apparatus for the pipeline passage. 4,638,835, Cl. 137-519.500.
Ciaudelli, Joseph P., to Revlon, Inc. Higher acyl lower alkyl hydroxystearates useful in cosmetics. 4,639,369, Cl. 424-59.000.
Ciba-Geigy Corporation: *See—*
Baumann, Marcus; and Breitenstein, Werner, 4,639,531, Cl. 349-261.000.
Cseh, Georg; and Lienhard, Paul, 4,639,477, Cl. 524-83.000.
Muller, Horst; Zinke, Horst; and Wehner, Wolfgang, 4,639,482, Cl. 524-137.000.
Stahl, Peter H.; and Schmitz, Beat, 4,639,338, Cl. 260-502.50C.
Ciga-Geigy Corporation: *See—*
Topfl, Werner, 4,639,264, Cl. 71-87.000.
Cigolini, Flavio. Orthopaedic safety strap suitable for bicycle pedals. 4,638,685, Cl. 74-594.600.
Circon Corporation: *See—*
Sluyter, Erik; and Wooff, Edward A., Jr., 4,639,772, Cl. 358-98.000.
Citizen Watch Co., Ltd.: *See—*
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Clarenz, Werner: *See—*
Muller, Hanns P.; Clarenz, Werner; von Gizycki, Ulrich; and Wagner, Kuno, 4,639,502, Cl. 528-45.000.
Clark, Douglas C.: *See—*
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Clark, Gary E., to Gilmore, G. W.; and Heywood, R. G., part interest to each. Combination toy and game. 4,638,997, Cl. 273-1.0GD.
Clark, James P.: *See—*
Virnig, Michael J.; and Clark, James P., 4,639,540, Cl. 558-444.000.
Clarke, John B.; and Firth, John F., to Allied Colloids Limited. Prepasted wallcoverings. 4,639,395, Cl. 428-341.000.
Clauss, Julius A.: *See—*
Lemieux, George E.; Lewicki, Reginald T.; and Clauss, Julius A., 4,638,686, Cl. 74-688.000.
Clearman, Jack F.: *See—*
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Clegg, Ernest N.: *See—*
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Clerc, Jean-Frederic; and Muller, Francis, to Commissariat a l'Energie Atomique. Liquid crystal dichroic display with a high brightness contrast. 4,639,090, Cl. 350-346.000.
Clive-Smith, Martin. Corner mechanism for collapsable container. 4,638,744, Cl. 108-56.100.
Close, JoAnn P.: *See—*
Counts, Lewis W.; and Close, JoAnn P., 4,639,683, Cl. 330-253.000.
Coalequip (Proprietary) Limited: *See—*
Dawe, Stephen G.; and Brews, James A., 4,638,874, Cl. 175-321.000.
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Gifford, Michael F.; and Coffman, James H., 4,638,825, Cl. 133-8.00R.
Coffman, Samuel L.: *See—*
Granberg, Helge O.; and Coffman, Samuel L., 4,639,760, Cl. 357-75.000.
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Cohen, Joseph D., to General Electric Company. Fuel nozzle. 4,638,636, Cl. 60-741.000.
Coker, Geoffrey G.: *See—*
Findlay, John W. A.; and Coker, Geoffrey G., 4,639,459, Cl. 514-343.000.
Cole, Rex W. Method and apparatus for testing the power of a lens. 4,639,133, Cl. 356-125.000.
Cole, Willis S.: *See—*
Lee, James, 4,638,884, Cl. 181-141.000.
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Orlowski, Ronald C.; Stahl, Glenn L.; and Colescott, Robert L., 4,639,509, Cl. 530-307.000.
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Collmann, Wilhelm. Device for the positioning of tires. 4,638,756, Cl. 118-215.000.
Collonia, Harald, to VDO Adolf Schindling AG. Device for regulating the speed of a vehicle, particularly an automotive vehicle, having an electronic regulator. 4,638,879, Cl. 180-179.000.
Combs, Donald W.: *See—*
Bandurco, Victor T.; Bell, Stanley C.; Combs, Donald W.; Falotico, Robert; and Tobia, Alfonso J., 4,639,518, Cl. 544-281.000.
Comlinear Corporation: *See—*
Saller, Kenneth R.; and Rentel, Kurt R., 4,639,685, Cl. 330-263.000.
Command Automation, Inc.: *See—*
Simjian, Luther G., 4,638,996, Cl. 272-146.000.
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Clerc, Jean-Frederic; and Muller, Francis, 4,639,090, Cl. 350-346.000.
Dabat, Robert; and Jamet, Claude, 4,639,178, Cl. 413-26.000.
Lazzari, Jean-Pierre, 4,639,289, Cl. 156-643.000.
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Pollack, Robert L.; and Durst, Lawrence, 4,639,465, Cl. 514-419.000.
Communications Technology Corporation: *See—*
Butler, Myron C.; Hilligoss, William R.; and Hilligoss, Lawrence O., 4,639,557, Cl. 379-29.000.
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Val, Christian; Pinel, Joseph; and Gibod, Yves B., 4,639,826, Cl. 361-272.000.
Compton, Wayne W., to Kidde Consumer Durables, Corporation. Luminaire. 4,639,843, Cl. 362-431.000.
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Harrison, Joel N.; Condito, Vincent A.; Graham, Randolph H.; Nixon, Brian J.; and Simonsen, Richard C., 4,639,798, Cl. 360-73.000.
Conradty, Claudio; Zollner, Dieter; Lauterbach-Dammler, Inge; and Taube, Thomas, to Arc Technologies Systems Ltd. Disc means for an electrode for use in electric arc furnaces. 4,639,928, Cl. 373-93.000.
Consortium fur elektrochemische Industrie GmbH: *See—*
Staiger, Gerhard; Selmayr, Tassilo; Kinzel, Peter; and Reutter, Anneliese, 4,639,541, Cl. 560-20.000.
Continental Pharma Inc.: *See—*
Roncucci, Romeo; Gillet, Claude L.; Cordi, Alexis H.; Martens, Mark A.; Roba, Joseph L.; Niebes, Paul J.; Lambelin, Georges E.; and Van Dorsser, William R., 4,639,468, Cl. 514-620.000.
Converse Inc.: *See—*
Parracho, Rui M.; Smith, Lloyd S.; Bunch, Richard P.; and Gross, Alexander L., 4,638,576, Cl. 36-68.000.
Conway, Anthony J.; Conway, Peter R.; and Conway, Philip J., to Mentor Corporation. Contraceptive hood. 4,638,790, Cl. 128-138.00R.
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Conway, Anthony J.; Conway, Peter R.; and Conway, Philip J., 4,638,790, Cl. 128-138.00R.
Conway, Philip J.: *See—*
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Cook, Ronald L., to Texaco Inc. Method for forming ethylene glycol from sodium methoxide. 4,639,296, Cl. 204-59.00R.
Cook, William A. Radio frequency nozzle bar dryer. 4,638,571, Cl. 34-1.000.
Cooper, John H.; and South, William H., to Westinghouse Electric Corp. Protective relay circuit for detecting arcing faults on low-voltage spot networks. 4,639,817, Cl. 361-62.000.
Cope, Charles S.; Kitagawa, Katsunosuke; and Konabe, Kazuo, to Du Pont de Nemours, E. I., and Company. Process for separating surfactants from liquid used in the manufacture of concentrated fluoropolymer dispersions. 4,639,337, Cl. 260-408.000.
Copeland Corporation: *See—*
Caillat, Jean-Luc, 4,639,201, Cl. 418-55.000.
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Richard, Philippe; Papillon, Jean-Charles; Guyot, Alain; and Corbellini, Carlo, 4,638,838, Cl. 138-30.000.
Cordi, Alexis H.: *See—*
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Cornell Research Foundation, Inc.: *See—*
Tang, Chung L.; and Donaldson, William F., 4,639,923, Cl. 372-21.000.
Corning Glass Works: *See—*
Powers, Dale R., 4,639,079, Cl. 350-96.330.
Cornwall, Kenneth R. Firestop fitting for carrier mounted water closets. 4,638,829, Cl. 137-75.000.
Corvi-Mora, Camillo. Method of preparing sobrerol and the pharmaceutical application of the sobrerol thus obtained. 4,639,469, Cl. 514-729.000.
Costain Petrocarbon Limited: *See—*
Duckett, Melvyn; and Limb, David I., 4,639,257, Cl. 55-16.000.
Costello, Carmon R.: *See—*
Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, 4,639,167, Cl. 405-217.000.
Cottis, Steve G., to Dart Industries Inc. Production of thermally stabilized aromatic polyesters. 4,639,504, Cl. 528-176.000.

Counts, Lewis W.; and Close, JoAnn P., to Analog Devices, Incorporated. Very low input current JFET amplifier. 4,639,683, Cl. 330-253.000.
Courteheuse, Gerard: *See—*
Bischoff, Didier; Courteheuse, Gerard; and Renard, Pierre, 4,639,354, Cl. 422-140.000.
Cox, Richard H.; Grubbs, Harvey J.; and Haut, Stephen A., to Philip Morris Incorporated. Smoking compositions containing a glycosylamine flavorant additive. 4,638,816, Cl. 131-276.000.
Coy, Jeffrey A., to Brownie Manufacturing Co., Inc. Hydraulic elevator. 4,638,888, Cl. 187-19.000.
Coy, William H., to Precisionform, Inc. Breakaway standard support assembly. 4,638,608, Cl. 52-98.000.
Crankshaft Machine Company: *See—*
Baker, Gary L., 4,638,537, Cl. 29-40.000.
Crepinsek, Alois. Simultaneously operated dead bolt lock and security chain. 4,639,024, Cl. 292-264.000.
Critikon, Inc.: *See—*
Ramsey, Maynard, III; Medero, Richard; and Hood, Ruth W., Jr., 4,638,810, Cl. 128-681.000.
Crittenden, William, to Biljanic, Matt. Rotary internal combustion engine. 4,638,776, Cl. 123-235.000.
Croteau, Michael G.: *See—*
Martin, James M.; Brockett, William S.; Selleck, Ronald R.; and Croteau, Michael G., 4,639,138, Cl. 356-350.000.
Crouzet S.p.A.: *See—*
Thepault, Claude, 4,639,059, Cl. 339-17.00F.
Crowe, Wayne D., to Ferranti Subsea Systems, Ltd. Combined power and control signal transmission system. 4,639,714, Cl. 340-310.00R.
Crowley, Harris L., Jr., to Union Carbide Corporation. Unencapsulated chip capacitor. 4,639,836, Cl. 361-433.000.
Csak, Bela, to Budapest Muszaki Egyetem. System for reducing the seismic load of tall buildings. 4,638,609, Cl. 52-167.000.
Cseh, Georg; and Lienhard, Paul, to Ciba-Geigy Corporation. Process for coloring high-molecular organic material, and novel metal complexes of oxime(s) of o-hydroxy benzaldehyde(s) and ketone(s). 4,639,477, Cl. 524-83.000.
CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Appiano, Silvano; Destefanis, Paolo; and Poggio, Cesare, 4,639,861, Cl. 364-200.000.
CTS Corporation: *See—*
Kuo, Charles C. Y., 4,639,391, Cl. 428-210.000.
Cucchi, Giovanni; and Cucchi, Pietro, to F.LLI Cucchi S.R.L. Equipment for loading bars to be machined on a device for presenting and feeding said bars to a machine tool. 4,639,180, Cl. 414-224.000.
Cucchi, Pietro: *See—*
Cucchi, Giovanni; and Cucchi, Pietro, 4,639,180, Cl. 414-224.000.
Culkin, Joseph B., to Dorr-Oliver Incorporated. Method and apparatus for electrofiltration. 4,639,300, Cl. 204-182.300.
Culter, Gary P.: *See—*
Caputo, Anthony; and Culter, Gary P., 4,638,515, Cl. 4-661.000.
Cuno Inc.: *See—*
Hou, Kenneth C.; and Cogswell, Garrett, 4,639,513, Cl. 530-387.000.
Curry, Douglas N., to Xerox Corporation. Raster scanner variable-frequency clock circuit. 4,639,789, Cl. 358-285.000.
Curtice, Walter R., to RCA Corporation. Fast ternary (GaInAs) logic gate device. 4,639,752, Cl. 357-16.000.
Curzons, Alan D., to Beecham Group p.l.c. Isolation of pseudomonic acid. 4,639,534, Cl. 549-414.000.
Cusumano, Salvatore J.: *See—*
Fender, Janet S.; Cusumano, Salvatore J.; Butts, Robert R.; and DeHainaut, Christopher R., 4,639,586, Cl. 250-201.000.
Czempik, Klaus; and Stremmel, Gerd, to Lever Brothers Company. Process for the preparation of a powder detergent composition of high bulk density. 4,639,326, Cl. 252-91.000.
D. L. Fried Associates, Inc.: *See—*
Fried, David L., 4,639,774, Cl. 358-105.000.
Dabat, Robert; and Jamet, Claude, to Commissariat a l'Energie Atomique. Machine permitting the remote closure of drums. 4,639,178, Cl. 413-26.000.
Dableh, Joseph H.; and Findlay, Raymond D. Pipe-type cable system with electromagnetic field shaper. 4,639,544, Cl. 174-32.000.
Dahler, Peter; Neidhart, Peter; Sadek, Kadry; and Stemmler, Herbert, to BBC Brown, Boveri & Company, Limited. Method and compensating device for compensating current oscillations. 4,639,846, Cl. 363-39.000.
Dahm, Dennis R.: *See—*
McKay, Robert S.; and Dahm, Dennis R., 4,639,236, Cl. 446-430.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
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Daicel Chemical Industries, Ltd.: *See—*
Kamei, Noboru; Ikeda, Kinjiro; Aoyama, Keishi; and Hamano, Seitaro, 4,639,294, Cl. 203-88.000.
Daikyo Service Station Development Co. Ltd.: *See—*
Yamamoto, Yoshinori, 4,638,671, Cl. 73-708.000.
Daimler-Benz Aktiengesellschaft: *See—*
Krettenauer, Gustav; and Kiwitz, Heinz, 4,639,008, Cl. 280-405.00R.
Schiessle, Edmund; and Forkel, Werner, 4,638,659, Cl. 73-119.00A.
Dainippon Screen Mfg. Co., Ltd.: *See—*
Mitsuka, Ikuo, 4,639,086, Cl. 350-322.000.
Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Chaya, Hiromi, 4,639,879, Cl. 364-518.000.
Daishoku Kako Kabushiki Kaisha: *See—*
Koike, Akira, 4,638,561, Cl. 30-284.000.
Daly, Richard T.; and Trokel, Stephen L., to Lasers for Medicine. Laser ophthalmic surgical system. 4,638,801, Cl. 128-303.100.
Daniele, Joseph J.: *See—*
Yip, Kwok-leung; Araghi, Mehdi N.; Daniele, Joseph J.; Banton, Martin E.; Kramer, Charles J.; and Ritter, Joachim A., 4,639,073, Cl. 350-6.800.
Dantzig, Jonathan A.: *See—*
Pryor, Michael J.; Winter, Joseph; and Dantzig, Jonathan A., 4,638,535, Cl. 29-1.300.
Daris, Jean-Paul: *See—*
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Darr, Richard C., to Plastipak Packaging, Inc. In-mold label dispenser for blow molding. 4,639,206, Cl. 425-503.000.
Darr, Richard C.: *See—*
Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., 4,639,207, Cl. 425-503.000.
Dart Industries Inc.: *See—*
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Das, Suryya K.; and Dowbenko, Rostyslaw, to PPG Industries, Inc. Non-aqueous dispersions prepared with styrene polymer dispersion stabilizers. 4,639,394, Cl. 428-327.000.
Data Motion, Incorporated: *See—*
Wald, Robert D., 4,638,935, Cl. 226-171.000.
Datawell B.V.: *See—*
Rademakers, Petrus J., 4,639,227, Cl. 441-1.000.
Daubendiek, Richard L.; Dickerson, Robert E.; and Kelly, James E., to Eastman Kodak Company. Radiographic elements exhibing reduced crossover. 4,639,411, Cl. 430-510.000.
Daubresse, Francis, to Thomson-CSF. Device obtained by mounting two semiconductor components within a single housing. 4,639,835, Cl. 361-392.000.
Daum, Ronald E., to General Motors Corporation. Electrical connector for printed circuits. 4,639,057, Cl. 339-17.00F.
Davidow, William H.: *See—*
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.
Davidson, James H.: *See—*
Fredholm, Allan; Davidson, James H.; Khan, Tasadduq; and Theret, Jean-Marc C. F., 4,639,280, Cl. 148-404.000.
Davison, Grenville: *See—*
Milne, Alistair R.; and Davison, Grenville, 4,638,713, Cl. 89-14.100.
Davy McKee (Poole) Limited: *See—*
Collinson, Christopher D.; and Ross, Hugh M., 4,638,950, Cl. 239-551.000.
Dawe, Stephen G.; and Brews, James A., to Coalequip (Proprietary) Limited. Drill adaptor. 4,638,874, Cl. 175-321.000.
Dawes, Richard G.: *See—*
Bunch, Graham; and Dawes, Richard G., 4,638,766, Cl. 122-398.000.
Day, Chia P.; Krause, Kenneth W.; Whitcomb, Louis L.; and Horn, Berthold K. P., to GMF Robotics Corporation. Method and system for automatically determining the position and attitude of an object. 4,639,878, Cl. 364-513.000.
Day, Wallace, to GIW Industries, Inc. Method of forming abrasive resistant white cast iron. 4,638,847, Cl. 164-55.100.
De La Hoz, Jorge W. Dental floss device. 4,638,824, Cl. 132-91.000.
Debeneix, Pierre; and Tournere, Marcel J., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A." . Multiflow turbo jet engine secondary flow adjusting device. 4,638,631, Cl. 60-226.300.
DeBin, Rene F.; and Lambrecht, Emiel Y., to FMC Corporation. Web cutting method and apparatus. 4,638,702, Cl. 83-509.000.
De Brie Perry, Forbes G., to National Research Development Corporation. Continuously-variable-ratio transmission having a single input member. 4,638,687, Cl. 74-691.000.
De Bruine, Mark; and Spotts, Kenneth, to AP Industries, Inc. Universal bracket assembly. 4,638,965, Cl. 248-59.000.
DeBruyn, William, to Amerock Corporation. Turn-out shelf assembly for a cabinet. 4,639,051, Cl. 312-275.000.
Decker, Martin J.: *See—*
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Declerco, Marc: *See—*
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de Corlieu, Guy: *See—*
Huignard, Jean-Pierre; Malard, Marcel; and de Corlieu, Guy, 4,639,091, Cl. 350-347.00V.
Deeds, Robert G. Multi-unit energy use monitor. 4,639,876, Cl. 364-483.000.
Deem, Brian C.; and Kemp, Jack A., to Allied Corporation. Fan drive mechanism. 4,638,900, Cl. 192-85.0CA.
Deere & Company: *See—*
McKee, Kevin D.; and Formwalt, Charles W., Jr., 4,638,720, Cl. 91-522.000.
DeHainaut, Christopher R.: *See—*
Fender, Janet S.; Cusumano, Salvatore J.; Butts, Robert R.; and DeHainaut, Christopher R., 4,639,586, Cl. 250-201.000.
DeHaitre, Lon, to Abbott-Interfast Corporation. DIP switch assembly having side extending leads. 4,639,566, Cl. 200-158.000.

Deisinger, Franz: *See*—
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Deister Concentrator Company, The: *See*—
Zipperian, Donald E., 4,639,313, Cl. 209-170.000.
DeJong, Leroy D.: *See*—
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Delalande S.A.: *See*—
Platel, Alain Y.; Bourgery, Guy R.; and Lacour, Alain, deceased, 4,639,452, Cl. 514-252.000.
della Valle, Francesco; and Romeo, Aurelio, to Fidia, S.p.A. Kit or device and method for administering gangliosides and derivatives thereof by inhalation and pharmaceutical compositions suitable therefor. 4,639,437, Cl. 514-54.000.
DeLuca, Robert D.: *See*—
Jones, Robin M. F.; DeLuca, Robert D.; and Panzera, Carlino, 4,639,218, Cl. 433-8.000.
Del Vecchio, Robert M.; and Specht, Theodore R., to Westinghouse Electric Corp. Rotating flux transformer. 4,639,610, Cl. 307-83.000.
DeMarco, Joseph. Folding umbrella. 4,638,827, Cl. 135-26.000.
Demarest, Vincent M. Vehicle crash barriers. 4,638,979, Cl. 256-13.100.
De Meirsman, Laurent, to Electronics Corporation of America. Method and apparatus for monitoring flame condition. 4,639,717, Cl. 340-571.000.
Denham, Keith; and Archer, Stephen, to Avdel Limited. Self-plugging blind rivet. 4,639,174, Cl. 411-34.000.
Derouane, Eric G.; and von Ballmoos, Roland, to Mobil Oil Corporation. Crystalline silicophosphoaluminate MCM-5. 4,639,357, Cl. 423-306.000.
Derouane, Eric G.; and von Ballmoos, Roland, to Mobil Oil Corporation. Crystalline silicophosphoaluminate MCM-1. 4,639,358, Cl. 423-306.000.
Desai, Bipinchandra N.; Chorvat, Robert J.; and Rorig, Kurt J., to G. D. Searle & Co. Monobasic disobutamide derivatives. 4,639,524, Cl. 546-279.000.
Despotakis, John A.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Grazziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.
Desrosiers, Wilfrid; and Labelle, Gaston. Humane animal trap. 4,638,590, Cl. 43-88.000.
Destefanis, Paolo: *See*—
Appiano, Silvano; Destefanis, Paolo; and Poggio, Cesare, 4,639,861, Cl. 364-200.000.
Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Data mask tone variation in an electronic musical instrument. 4,638,707, Cl. 84-1.190.
Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Rodloff, Rudiger K.; and Jungbluth, Werner W., 4,639,630, Cl. 310-328.000.
Wulf, Rudolf; and Stager, Wolfgang, 4,638,632, Cl. 60-319.000.
Development Finance Corporation of New Zealand: *See*—
Weatherly, John D., 4,639,708, Cl. 336-200.000.
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Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Hoffarth, Gunther; Richter, Wolfgang; Uytterhoeven, Herman; and de Winter, Walter, 4,639,403, Cl. 430-115.000.
De Winter, Walter F.: *See*—
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Dextec Metallurgical Pty. Ltd.: *See*—
Everett, Peter K., 4,639,302, Cl. 204-258.000.
D'Hont, Lodewijk J., to Texas Instruments Incorporated. Synchronization system for overlay of an internal video signal upon an external video signal. 4,639,765, Cl. 358-19.000.
Diamond Oil Well Drilling Company: *See*—
Park, Arthur; and Wilson, Bob T., 4,638,872, Cl. 175-46.000.
Dickerson, Robert E.: *See*—
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Dickie, Ray A.; and Qaderi, Saiyed B. A., to Ford Motor Company. Conjugated diene functional modified aminoepoxy resins. 4,639,493, Cl. 525-113.000.
Diepers, Heinrich; and Schewe, Herbert, to Siemens Aktiengesellschaft. Combined magnetic write and read head for the vertical magnetization of a corresponding recording medium. 4,639,811, Cl. 360-125.000.
Dierichs, Wolfgang; Giereaz, Gerhard; and Kraus, Gabriella, to Henkel Kommanditgesellschaft auf Aktien. Adhesive stick and a process for its production. 4,639,475, Cl. 523-164.000.
Diesel Kiki Co., Ltd.: *See*—
Yasuhara, Seishi; Hagiwara, Mitsuo; Inoue, Kazuo; Fujimori, Kyoichi; Sekiguchi, Akira; and Okada, Hiroshi, 4,638,782, Cl. 123-502.000.
Digital Equipment Corporation: *See*—
Porcher, Thomas C.; and Robinson, Morgan E., 4,639,891, Cl. 364-900.000.
Dilts, Ray A.: *See*—
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Dobler, Thomas, to BBC Brown, Boveri & Company Limited. Coupling for a light-conducting fiber. 4,639,077, Cl. 350-96.200.
Dobring, Wilfried: *See*—
Baitz, Guenter; and Dobring, Wilfried, 4,638,908, Cl. 206-0.800.
Dr. Ing. Rudolf Hell GmbH: *See*—
Jung, Eggert; and Klopsch, Siegfried, 4,639,770, Cl. 358-76.000.
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Normann, Norbert, 4,639,670, Cl. 324-260.000.
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Wingler, Frank; Koch, Otto; Doering, Joachim; Ott, Karl-Heinz; and Liebig, Lothar, 4,639,473, Cl. 525-83.000.
Doherty, John A.; Ward, Billy W.; and Shaver, David C., to Micrion Limited Partnership. Focused ion beam processing. 4,639,301, Cl. 204-192.310.
Dohi, Hideyuki: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; and Dohi, Hideyuki, 4,639,833, Cl. 361-315.000.
Dohler, Werner; Merz, Ludwig; Frohnert, Heinz; Uckermann, Bernd; Graeser, Ulrich; Jankowski, Alfons; Wolowski, Eckard; Tamm, Hans-Friedrich; and Wilczok, Norbert, to Veba Oel Entwicklungs-Gesellschaft. Process for the production of reformer feed and heating oil or diesel oil from coal by liquid-phase hydrogenation and subsequent gas-phase hydrogenation. 4,639,310, Cl. 208-412.000.
Dolansky, Franz; and Steiner, Ewald, to Siemens Aktiengesellschaft. Protective element for distributor strips. 4,639,820, Cl. 361-124.000.
Doluca, Tunc, to Intersil, Inc. Flash analog to digital converter. 4,639,715, Cl. 340-347.0AD.
Domas, Dennis R. Offset nipple. 4,639,017, Cl. 285-38.000.
Donaldson, Timothy P.; and Menown, Hugh, to English Electric Valve Company Limited. Thyratron interrupters. 4,639,643, Cl. 315-344.000.
Donaldson, William F.: *See*—
Tang, Chung L.; and Donaldson, William F., 4,639,923, Cl. 372-21.000.
Donovan, Kyle P., to Milsco Manufacturing Company. Height adjustment mechanism for chair backrest. 4,639,039, Cl. 297-353.000.
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Casier, Yves; Cassagne, Philippe; Dore, Bernard; and Gicquel, Sylvain, 4,638,943, Cl. 237-7.000.
Dornier GmbH: *See*—
Gunter, Heinz; Kriechbaum, Gerhard; Krojer, Hubert; Matecki, Rudolf; and Spintzyk, Johannes, 4,638,962, Cl. 244-203.000.
Dorr-Oliver Incorporated: *See*—
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Drake, Donald J.; Hawkins, William G.; and Campanelli, Michael R., to Xerox Corporation. Ink jet printhead with integral ink filter. 4,639,748, Cl. 346-140.00R.
Drake, Tom. Extension handles for hedge trimmers. 4,638,562, Cl. 30-296.00R.
Dresser Industries, Inc.: *See*—
Chawla, Manmohan S.; and Speights, Junius L., 4,638,712, Cl. 89-1.150.
Fanner, John C.; and Snyder, Warren E., 4,638,777, Cl. 123-277.000.
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Dufrenne, Gerald, to Unitek Corporation. Weld resistance measuring apparatus for a spot welder. 4,639,569, Cl. 219-109.000.
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Hancock, Jack A.; Johnson, Walter D.; and Keanedy, Alan D., 4,639,347, Cl. 264-291.000.
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Knight, Alan C.; and Malhotra, Satish C., 4,639,497, Cl. 526-93.000.
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Luoma, Robert P., II; and Willis, Frank M., 4,639,317, Cl. 210-433.200.
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Braun, Eugene R., 4,638,898, Cl. 192-0.052.
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Sitabkhan, Mansur N.; and Mack, Raymond E., 4,638,894, Cl. 188-170.000.
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Storm, Eric L., 4,639,869, Cl. 364-424.100.
Torrence, Robert J., 4,638,973, Cl. 251-129.020.
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Ejiri, Yuuki; Ito, Tomoo; Tsuruta, Hisato; and Kamifuji, Hiroshi, to Hitachi, Ltd. Torque motor having a coil with finite turning range. 4,639,624, Cl. 310-154.000.
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Turunen, Olli T.; Huttunen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,515, Cl. 536-30.000.
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Elmore, Carl L.; Poulin, Ted M.; and Barrett, Mark D., to Kamyr, Inc. Heat exchange treatment of fluids. 4,638,855, Cl. 165-101.000.
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Best, Steven A., 4,639,428, Cl. 502-115.000.
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Falotico, Robert: *See*—
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Fang, Pao-Hsien, to Birch, Richard J., a part interest. Semiconductor devices having a metallic glass substrate. 4,639,543, Cl. 136-256.000.
Fann, Yaw S.; and Wu, Rong-Faa, to Tong Lung Metal Industry Co., Ltd. Adjustable dead bolt assembly. 4,639,025, Cl. 292-337.000.
Fanner, John C.; and Snyder, Warren E., to Dresser Industries, Inc. Prechamber fuel control system. 4,638,777, Cl. 123-277.000.
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Farmer, James R., to ISC Technologies, Inc. Bomblet dispersion system for a cluster bomb. 4,638,736, Cl. 102-393.000.
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Farmos Group, Ltd.: *See*—
Karjalainen, Arto J.; and Kurkela, Kauko O. A., 4,639,464, Cl. 514-396.000.
Farmwald, Paul M., to United States of America, Energy. Bifurcated method and apparatus for floating point addition with decreased latency time. 4,639,887, Cl. 364-748.000.
Farquharson, Graeme J.; Watson, Keith G.; and Bird, Graham J., to ICI Australia Limited. Herbicidal cyclohexane-1,3-dione derivatives. 4,639,267, Cl. 71-98.000.
Farrar, Frank W. Grip for hand gun. 4,638,582, Cl. 42-71.010.
Feenick, Robert A. Vehicle fuel tank construction. 4,638,919, Cl. 220-286.000.
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Fellows, Constance A.; and Fu, Wallace Y., to Union Carbide Corporation. Intermediate, its synthesis, and its use in a process for the preparation of 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofuran. 4,639,536, Cl. 549-462.000.
Fender, Janet S.; Cusumano, Salvatore J.; Butts, Robert R.; and DeHainaut, Christopher R., to United States of America, Air Force. Optically phased laser transmitter. 4,639,586, Cl. 250-201.000.
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Shallenberger, John M.; and Ferlan, Stephen J., 4,638,556, Cl. 29-723.000.
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Flecknoe-Brown, Anthony E., to A.A.R.C. (Management) Pty. Limited. Drainage tube. 4,639,165, Cl. 405-45.000.
Fleischhauer, Eugene T. Vacuum cleaner attachments. 4,638,527, Cl. 15-371.000.
Fleisher, Richard B.; and Rubin, Bruce A., to Eastman Kodak Company. Modifying color digital images. 4,639,769, Cl. 358-27.000.
Fleissner, Heinz, to Vepa Aktiengesellschaft. Heat treatment tunnel. 4,638,572, Cl. 34-41.000.
Fling, Russell T., to RCA Corporation. Video signal field/frame storage system. 4,639,783, Cl. 358-166.000.
Fling, Russell T., to RCA Corporation. Video signal recursive filter adaptively controlled responsive to the history of image motion. 4,639,784, Cl. 358-167.000.
Fling, Russell T.: *See*—
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Foerster, Karl-Heinz; and Koerner, Siegfried, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Indicating device for a printing machine for superimposing ink key setting values on an image to be printed. 4,639,776, Cl. 358-107.000.
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Lemieux, George E.; Lewicki, Reginald T.; and Clauss, Julius A., 4,638,686, Cl. 74-688.000.
Tannenlaufer, Gerd, 4,638,679, Cl. 74-501.00R.
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Formwalt, Charles W., Jr.: *See*—
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Fournier, Jean, to Stein Industrie. Vertical tube heat exchanger panel for waste-recovery boilers such as black liquid boilers or household waste incinerator furnaces, and methods of manufacture. 4,638,857, Cl. 165-162.000.
Fox, Duke. Porting system for two cycle internal combustion engines. 4,638,770, Cl. 123-65.00P.
Foxboro Company, The: *See*—
Sgourakes, George E., 4,638,656, Cl. 73-4.00R.
Frabel, Claude: *See*—
Lee, James, 4,638,884, Cl. 181-141.000.
Fram, Jerry. Slitting and dicing machine for fiberglass mat and mats of other brittle abrasive fibers. 4,638,934, Cl. 225-97.000.
Franke, Hans G., to Eastman Kodak Company. Method and apparatus for fixing toner images. 4,639,405, Cl. 430-124.000.
Franke, Martin G., to Franke, Martin G. Picture display case. 4,639,725, Cl. 340-815.020.
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LeGault, Robert H.; Jezzi, Arrigo D.; Milner, James D.; Oakley, Barbara; and Franke, Paul G., 4,639,254, Cl. 604-385.00R.
Frankel, Alfred R. Sweat collecting headband. 4,638,512, Cl. 2-171.000.
Frankland, James D., Jr., to New Castle Industries, Inc. Extrusion screw. 4,639,143, Cl. 366-89.000.
Frascaroli, Francesco; and Biondi, Carlo, to C.O.M. Cooperativa Operai Metallurgici S.C.R.L. Modular furniture. 4,639,049, Cl. 312-195.000.
Frayer, Paul D., to Rogers Corporation. Co-solvent accelerator for conversion of polyamide-acid solution to polyimide. 4,639,485, Cl. 524-378.000.
Frederick, Raymond L. Combination sawhorse and sawbuck. 4,638,885, Cl. 182-151.000.
Fredericks, Chester P. Thermally insulative self-supporting panel. 4,638,616, Cl. 52-397.000.
Fredholm, Allan; Davidson, James H.; Khan, Tasadduq; and Theret, Jean-Mare C. F., to Association pour la Recherche et le Developpement des Methodes et Processus Industriels "A.R.M.I.N.E.S." ; Societe Imphy S.A.; Office National d'Etudes et de Recherche Aerospatiales (ONERA); and Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Monocrystalline alloy with a nickel matrix basis. 4,639,280, Cl. 148-404.000.
Fredrickson, Eric, to C&K Components, Inc. Key lock switch with antistatic means. 4,639,562, Cl. 200-43.080.
Fribault, Gerard: *See*—
Hullein, Francois; and Fribault, Gerard, 4,639,129, Cl. 356-5.000.
Fried, David L., to D. L. Fried Associates, Inc. Moving target indication system. 4,639,774, Cl. 358-105.000.
Friedrich Wilh. Schwing GmbH: *See*—
Guthoff, Wilfred, 4,639,183, Cl. 414-705.000.
Frierdich, Waldo J., to Basler Electric Company. Electrical control apparatus and methods. 4,639,657, Cl. 322-59.000.
Frings, Heinz; Kabelitz, Hans-Peter; and Ronthaler, Karl-Heinz, to Leybold-Heraeus GmbH. Two-shaft vacuum pump with internal compression. 4,639,199, Cl. 418-3.000.
Froelich, Hans; Hepperle, Willi; Katzer, Johann; and Stephany, Christian, to Gardena Kress & Kastner GmbH. Joint for a water-carrying pipe system. 4,639,018, Cl. 285-184.000.
Frohnert, Heinz: *See*—
Dohler, Werner; Merz, Ludwig; Frohnert, Heinz; Uckermann, Bernd; Graeser, Ulrich; Jankowski, Alfons; Wolowski, Eckard; Tamm, Hans-Friedrich; and Wilczok, Norbert, 4,639,310, Cl. 208-412.000.
Fu, Wallace Y.: *See*—
Fellows, Constance A.; and Fu, Wallace Y., 4,639,536, Cl. 549-462.000.
Fuchs, Ernst; and Fitzi, Karl, to Mecapec S.A. Apparatus for mechanical purification of waste water. 4,639,315, Cl. 210-333.100.
Fuji Electric Co., Ltd.: *See*—
Kuroki, Kazuo, 4,638,823, Cl. 361-159.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Inaba, Mitsuharu; Sekiguchi, Takashi; Yoneyama, Yoshio; and Suzuki, Tadashi, 4,639,182, Cl. 414-543.000.
Sakai, Yasuhito, 4,638,689, Cl. 74-866.000.
Fuji Photo Film Co., Ltd.: *See*—
Akao, Mutsuo, 4,639,386, Cl. 428-35.000.
Aono, Toshiaki; and Hara, Hiroshi, 4,639,407, Cl. 430-203.000.
Arai, Yoshihiro; and Nahara, Akira, 4,639,815, Cl. 360-131.000.
Ferrier, Herman, 4,639,794, Cl. 360-46.000.
Kawagishi, Toshio; and Nakazyo, Kiyoshi, 4,639,413, Cl. 430-546.000.
Kitaguchi, Hiroshi; and Kato, Masatoshi, 4,639,408, Cl. 430-351.000.
Kogane, Mikio; Suzuki, Kenji; Kito, Eiichi; Kubota, Kazufumi; and Tokuda, Kanji, 4,639,118, Cl. 355-29.000.
Sakaguchi, Yukihiko, 4,639,414, Cl. 430-550.000.
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, 4,639,418, Cl. 430-617.000.
Yamamoto, Soichiro; and Shimada, Takeo, 4,639,409, Cl. 430-505.000.
Yoshida, Tetsuo; and Kokubo, Tadayoshi, 4,639,416, Cl. 430-567.000.
Fuji Photo Optical Co., Ltd.: *See*—
Tanaka, Kazuto; Kakizawa, Haruo; and Nagata, Kouichi, 4,639,099, Cl. 350-538.000.
Fuji Xerox Co., Ltd.: *See*—
Ishii, Chiharu, 4,639,894, Cl. 365-189.000.
Fujii, Setsuro; Yokoyama, Touru; Ikegaya, Kouji; Yokoo, Nobuo; and Nagakura, Masahiko, to Kowa Co., Ltd. Pharmaceutical composition suitable for intestinal administration. 4,639,435, Cl. 514-11.000.
Fujikawa, Yoshihiro; Sakashita, Mitsuaki; and Tsuruzoe, Nobutomo, to Nissan Chemical Industries Ltd. 3,5-dialkyl-4,6-diaryl-tetrahydro-2H-13,5-thiadiazine-2-thione derivative, process for its production and antihyperlipidemic agent containing it. 4,639,444, Cl. 514-222.000.
Fujimaki, Kazuo: *See*—
Maruyama, Hidekazu; and Fujimaki, Kazuo, 4,639,037, Cl. 297-334.000.
Fujimori, Kyoichi: *See*—
Yasuhara, Seishi; Hagiwara, Mitsuo; Inoue, Kazuo; Fujimori, Kyoichi; Sekiguchi, Akira; and Okada, Hiroshi, 4,638,782, Cl. 123-502.000.
Fujinawa, Tomoaki: *See*—
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Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Takasugi, Hisashi; Yamanaka, Hideaki; Miyai, Kenji; and Inoue, Yoshikazu, 4,639,448, Cl. 514-226.000.
Fujita, Akira; and Shimizu, Kyoichi, to Victor Company of Japan, Ltd. Video signal processing apparatus for processing a video signal which is transmitted in accordance with a dot interlaced schanning system and inputted thereto. 4,639,782, Cl. 358-166.000.
Fujita, Hiroshi: *See*—
Komatsu, Masao; and Fujita, Hiroshi, 4,639,363, Cl. 423-644.000.
Fujita, Tadahiro: *See*—
Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, 4,639,167, Cl. 405-217.000.
Fujita, Yasuhiko: *See*—
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Fujita, Yasuyuki; and Nishino, Takaichi, to Tachikawa Spring Co., Ltd. Fixing device for a vehicle seat. 4,639,040, Cl. 297-379.000.
Fujitsu Limited: *See*—
Ikeda, Hiroyuki; Matsumoto, Seikichi; Kitagawa, Shunji; Inagaki, Takefumi; and Sebata, Ichiro, 4,639,070, Cl. 350-3.710.
Matsumoto, Seikichi; and Ikeda, Hiroyuki, 4,639,071, Cl. 350-3.710.
Ohtsuki, Osamu, 4,639,940, Cl. 377-60.000.
Fujiwara, Kohji: *See*—
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Fukae, Kensuke; and Yamashita, Keitaro, to Kentek Information Systems, Inc. Printer/copier with disposable toner cartridge. 4,639,116, Cl. 355-3.0DD.
Fukazawa, Nobuyuki: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,639,451, Cl. 514-247.000.
Fuke, Takamichi, to Alps Electric Co., Ltd. Intermittent drive member. 4,638,677, Cl. 74-84.00R.
Fukuda, Kazuichi, to Shoyo Engineering Company Limited. Shaft coupling with press fit coil springs forming resilient torque-transmitting elements. 4,639,237, Cl. 464-65.000.
Fukuda, Kiyoshi: *See*—
Shimbo, Masaru; Fukuda, Kiyoshi; and Ohwada, Yoshiaki, 4,638,552, Cl. 29-576.00J.
Fukuoka, Yoshitaka, to Kabushiki Kaisha Toshiba. Packaged electronic device. 4,639,830, Cl. 361-411.000.
Fukushima, Takeo: *See*—
Makihara, Katsumi; Yanagi, Kenichi; Fukushima, Takeo; Suganuma, Namio; Samejima, Ichiro; and Takahashi, Seiichi, 4,638,851, Cl. 165-32.000.
Full Vision, Inc.: *See*—
Benson, David A.; and Dilts, Ray A., 4,638,665, Cl. 72-389.000.
Furlong, James J.; and Howe, Dwayne E., to Boeing Company, The. Touch sensor for wire stripper. 4,639,824, Cl. 361-179.000.
Furomoto, Yoshiyuki, to Shimano Industrial Company Limited. Fishing reel. 4,638,958, Cl. 242-84.10R.
Furukawa, Toshio, to Tachikawa Spring Co., Ltd. Headrest mounting structure for a vehicle seat. 4,639,041, Cl. 297-391.000.
Furuta, Michihiro, to Mitsubishi Denki Kabushiki Kaisha. Fault determining apparatus for data transmission system. 4,639,917, Cl. 371-16.000.
Fushiya, Fusao; Hakamata, Nobuo; Abe, Hiroyuki; and Inoue, Nobuhiro, to Makita Electric Works, Ltd. Portable miter saws. 4,638,700, Cl. 83-467.00R.
Fuziwara, Yutaka; and Yamamoto, Hiroshi, to Canon Kabushiki Kaisha. Lens mounting. 4,639,083, Cl. 350-255.000.
G. D. Searle & Co.: *See*—
Desai, Bipinchandra N.; Chorvat, Robert J.; and Rorig, Kurt J., 4,639,524, Cl. 546-229.000.
GA Technologies Inc.: *See*—
Bass, John C.; and Elsner, Norbert B., 4,639,542, Cl. 136-210.000.
Gabriel, Alexander, to Nordson Corporation. Adjustable powder spray nozzle. 4,638,951, Cl. 239-707.000.
Gagin, William P., to American Orthodontics Corporation. Surgical ball hooks. 4,639,219, Cl. 433-22.000.
Gagliani, John: *See*—
Long, John V.; and Gagliani, John, 4,639,343, Cl. 264-45.500.
Gaiser, Hans. Sidepiece end of a spectacle frame sidepiece. 4,639,104, Cl. 351-117.000.
Gajjar, Bharat J., to Du Pont de Nemours, E. I., and Company. Layered warp knits. 4,638,648, Cl. 66-193.000.
Gallardo, Mike. Safety lock for security window gratings. 4,638,596, Cl. 49-56.000.

Gallios, George C.; and Lien, Charles, to Venus Scientific Inc. Resonant current driven power source for low input voltages. 4,639,844, Cl. 363-17.000.
Galuska, Stefan: *See—*
Murray, Peter K.; and Galuska, Stefan, 4,639,372, Cl. 424-88.000.
Gamm, Robert J., to Kangaroos U.S.A., Inc. Pocketed athletic shoe. 4,638,579, Cl. 36-136.000.
Gamroth, Michael: *See—*
Hilbrans, Hermann; Gamroth, Michael; Meicher, Gerhard; and Megerle, Friedrich, 4,639,269, Cl. 75-76.000.
Ganellin, Charon R.; Ife, Robert J.; and Owen, David A. A., to Smith Kline & French Laboratories Limited. 2-substituted alkylaminopyrimidones useful as H_2-antagonists and antiinflamatory agents. 4,639,519, Cl. 544-320.000.
Gang, Joseph M.; and Bain, Mitchell B., to Sytek, Inc. Method and an apparatus for early bit collision detection. 4,639,921, Cl. 371-53.000.
Gannaway, Edwin L., to Tecumseh Products Company. Suction tube seal for a rotary compressor. 4,639,198, Cl. 417-410.000.
GAO Gesellschaft fur Automation und Organisation mbH: *See—*
Haghiri-Tehrani, Yahya; and Hoppe, Joachim, 4,639,585, Cl. 235-492.000.
Garcia, Robert L. Floating fishing accessory. 4,638,593, Cl. 43-54.100.
Gardena Kress & Kastner GmbH: *See—*
Froelich, Hans; Hepperle, Willi; Katzer, Johann; and Stephany, Christian, 4,639,018, Cl. 285-184.000.
Garrett Corporation, The: *See—*
McLean, John R., 4,638,634, Cl. 60-612.000.
Garrett, Michael E., to BOC Group plc, The. Dissolving gas in a liquid. 4,639,340, Cl. 261-36.100.
Garrido-Diaz, Antonio: *See—*
Ollero-Pina, Juan C.; and Garrido-Diaz, Antonio, 4,638,914, Cl. 209-617.000.
Gary, James R., to Borg-Warner Corporation. Sensing system for measuring a parameter. 4,639,665, Cl. 324-117.00H.
Gasper, Kenneth E., to Olin Corporation. Boiler blowdown monitoring system and process for practicing same. 4,639,718, Cl. 340-603.000.
Gates, William E.; and Fiato, Rocco A., to Exxon Research and Engineering Company. Catalysts in Fischer-Tropsch process for producing olefins. 4,639,431, Cl. 502-304.000.
Gaude, Maurice, to La Telemecanique Electrique. Circuit for controlling the base of a power transistor used in high tension switching. 4,639,616, Cl. 307-270.000.
Gaz de France: *See—*
Casier, Yves; Cassagne, Philippe; Dore, Bernard; and Gicquel, Sylvain, 4,638,943, Cl. 237-7.000.
Gdovin, Wm. J.: *See—*
Waller, Francis E., 4,638,547, Cl. 29-558.000.
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Gebr. Hennig GmbH: *See—*
Schneider, Barbara; Hennig, Kurt; and Klein, Manfred, 4,638,722, Cl. 92-42.000.
Gebr. Isringhausen: *See—*
Misher, Hans-Peter; and Pietsch, Helge, 4,638,982, Cl. 267-131.000.
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Posso, Patrick P. P., 4,639,052, Cl. 312-333.000.
Geiger, Rolf: *See—*
Obermeier, Rainer; Geiger, Rolf; and Grau, Ulrich, 4,639,333, Cl. 530-303.000.
Geimer, Raymond C.; and Tolbert, William R., to Monsanto Company. Cell culture filter apparatus and method. 4,639,422, Cl. 435-286.000.
Geisthoff, Hubert; Buthe, Theo; and Mikeska, Felix, to Jean Walterscheid GmbH. Drawing lock for torque transmitting engagement between two shaft members arrestable in the open position. 4,639,162, Cl. 403-316.000.
Geisthoff, Hubert: *See—*
Buthe, Theo; Geisthoff, Hubert; Kretschmer, Horst; Mikeska, Felix; and Post, Alexander, 4,639,163, Cl. 403-322.000.
General Electric Company: *See—*
Cohen, Joseph D., 4,638,636, Cl. 60-741.000.
Giles, Harold F., Jr., 4,639,481, Cl. 524-128.000.
Howell, Edward K.; and Anderson, Thomas E., 4,639,933, Cl. 375-8.000.
Liu, Nan-I, 4,639,486, Cl. 524-409.000.
Macovski, Albert, 4,639,671, Cl. 324-309.000.
Payne, Thomas R., 4,639,578, Cl. 219-450.000.
General Instrument Corporation: *See—*
Einthoven, Willem G., 4,638,551, Cl. 29-571.000.
General Motors Corporation: *See—*
Bell, Albert H., III; and Johnson, Jesse F., 4,639,194, Cl. 416-241.00B.
Bonvallet, Duane J., 4,638,773, Cl. 123-90.160.
Chatterjee, Madhu S., 4,639,279, Cl. 148-147.000.
Daum, Ronald E., 4,639,057, Cl. 339-17.00F.
Gloomis, Lawrence A.; and Ches, Gregory S., 4,638,533, Cl. 24-633.000.
Gorman, Michael J.; and McClellan, William R., 4,638,678, Cl. 74-476.000.
Huesman, Edward H., 4,639,160, Cl. 403-71.000.
LeBlanc, Richard S., 4,638,715, Cl. 89-41.120.
McMahan, David R.; and Nicholas, Richard W., 4,639,840, Cl. 362-80.000.
McNeil, James E., 4,638,544, Cl. 29-434.000.
Nels, Terry E.; Eldridge, Larry; and Doty, Gerald L., 4,639,392, Cl. 428-283.000.
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General Signal Corporation: *See—*
Pappano, Thomas W.; and Brown, David O., 4,639,719, Cl. 340-652.000.
George, Martin C. J., to Stone Allen Limited. Heating system. 4,638,767, Cl. 122-448.00B.
Gerhard Collardin GmbH: *See—*
Schellenberg, Lutz; Hamacher, Matthias; and Ahmed, Bashir M., 4,639,319, Cl. 210-651.000.
Gerlach, Pierre: *See—*
Hoet, Roger; and Gerlach, Pierre, 4,639,633, Cl. 313-35.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Becker, Kunibert; Kirchbrucher, Rudiger; and Preuschoff, Michael, 4,639,169, Cl. 405-291.000.
GEZE GmbH: *See—*
Scheck, Georg; Bogner, Martin; Schmidt, Manfred; and Kowatsch, Ulrich, 4,639,010, Cl. 280-615.000.
Ghiardo, Fiorenzo; and Maina, Bruno, to ROJ Electrotex S.p.A. Weft feeder for weaving looms. 4,638,840, Cl. 139-452.000.
Giakoumis, Alex, to U.S. Philips Corporation. Variable-bias circuit with HF transmission path. 4,639,617, Cl. 307-296.00R.
Giannetti, Anna; Massa, Sergio; and Re, Cesare, to S.r.l. LO.GI.CAM - Lombarda General Engeenering Costruzioni Automatiche. Publicity board with rotating prismatic members. 4,638,580, Cl. 40-503.000.
Gibod, Yves B.: *See—*
Val, Christian; Pinel, Joseph; and Gibod, Yves B., 4,639,826, Cl. 361-272.000.
Gicquel, Sylvain: *See—*
Casier, Yves; Cassagne, Philippe; Dore, Bernard; and Gicquel, Sylvain, 4,638,943, Cl. 237-7.000.
Gidseg, Edward. Circulating air refrigerator with removable divider shelf. 4,638,644, Cl. 62-329.000.
Gierenz, Gerhard: *See—*
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Giesenberg, Peter: *See—*
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Gifford, Michael F.; and Coffman, James H., to Coffman Systems, Inc. Coin counter. 4,638,825, Cl. 133-8.00R.
Giles, Harold F., Jr., to General Electric Company. Modified thermoplastic polyester molding compositions and articles molded therefrom. 4,639,481, Cl. 524-128.000.
Gillet, Claude L.: *See—*
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Gillette Company, The: *See—*
Walsh, William H., 4,638,653, Cl. 72-129.000.
Gilmore, Dennis W.; and Kugele, Thomas G., to Morton Thiokol, Inc. Asphalt-adhesion improving additives prepared by formaldehyde condensation with polyamines. 4,639,273, Cl. 106-281.00N.
Gilmore, G. W.: *See—*
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Gilsdorf, John F.: *See—*
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Giulini Chemie GmbH: *See—*
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GIW Industries, Inc.: *See—*
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Glaseman, Richard W.: *See—*
Podany, Clayton J.; and Glaseman, Richard W., 4,638,565, Cl. 33-265.000.
Glatt, Ilana; Livnat, Aminadav; and Kafri, Oded, to State of Isreal, The. Direct determination of modulation transfer function by moire deflectrometry. 4,639,132, Cl. 356-124.500.
Glenn, William E., to New York Institute of Technology. Video display method and apparatus. 4,639,788, Cl. 358-233.000.
Gloomis, Lawrence A.; and Ches, Gregory S., to General Motors Corporation. Variable release seat belt buckle. 4,638,533, Cl. 24-633.000.
GMF Robotics Corporation: *See—*
Day, Chia P.; Krause, Kenneth W.; Whitcomb, Louis L.; and Horn, Berthold K. P., 4,639,878, Cl. 364-513.000.
Goel, Anil B., to Ashland Oil, Inc. Poly (ether amide) composition from reaction of bis bicyclic amide acetal with bis- or poly-phenolic material. 4,639,505, Cl. 528-211.000.
Goerrissen, Heiner: *See—*
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Goff, Charles W.; and Goff, Charles W., Jr. Machine gun receiver top strap. 4,638,716, Cl. 89-199.000.
Goff, Charles W., Jr.: *See—*
Goff, Charles W.; and Goff, Charles W., Jr., 4,638,716, Cl. 89-199.000.
Gogarty, Brian J. Quick-bolt locking system. 4,638,994, Cl. 272-122.000.
Gold, Peter N. Force hinge connection for the latching mechanism of a panel truck or van window. 4,638,598, Cl. 49-394.000.
Goldmann, Peter, to U.S. Philips Corporation. System for recording or detecting two marking signals on a record carrier. 4,639,793, Cl. 360-44.000.
Gonthier, Bruno F.: *See—*
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Goodhues, George S., Jr. Underground facility for storage of liquids. 4,638,920, Cl. 220-445.000.
Goodloe, Kent J., to Western Geophysical Co. of America. Dual-mode vibrator. 4,639,905, Cl. 367-189.000.
Goodrich, Judson E., to Chevron Research Company. Method for producing industrial asphalts. 4,639,307, Cl. 208-44.000.
Goodwin, John J.; and Lu, Nicky C., to International Business Machines Corporation. Boosting word-line clock circuit for semiconductor memory. 4,639,622, Cl. 307-482.000.
Goolsby, Alvin D., to Shell Oil Company. Cathodic protection monitoring system. 4,639,677, Cl. 324-425.000.
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Gorman, Michael J.; and McClellan, William R., to General Motors Corporation. Manual transmission shift control mechanism having a reverse inhibitor. 4,638,678, Cl. 74-476.000.
Goto, Humio: *See—*
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Goto, Kunio, to Victor Company of Japan, Limited. Magnetic recording on tracking controlled grooveless medium having magnetic and capacitance properties. 4,639,906, Cl. 369-14.000.
Goto, Sohei: *See—*
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Gottlieb, Milton; and Schaff, Fredrick L., to Westinghouse Electric Corp. Acousto-optic dispersive light filter. 4,639,092, Cl. 350-372.000.
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Goyert, Wilhelm: *See—*
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Graeser, Ulrich: *See—*
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Graf, Heinrich, to SIG Schweizerische Industrie-Gesellschaft. Package with transferable reusable closure element. 4,638,912, Cl. 206-621.000.
Gragson, James T.: *See—*
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Harrison, Joel N.; Condito, Vincent A.; Graham, Randolph H.; Nixon, Brian J.; and Simonsen, Richard C., 4,639,798, Cl. 360-73.000.
Harrison, Joel N.; Moon, William G.; and Graham, Randolph H., 4,639,863, Cl. 364-200.000.
Granberg, Helge O.; and Coffman, Samuel L., to Motorola, Inc. High power RF transistor assembly. 4,639,760, Cl. 357-75.000.
Granzow, Robert H.; and Gupta, Desh B., to NCR Corporation. Position control for a stacker wheel. 4,638,993, Cl. 271-315.000.
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Ball, Lawrence E.; Griffin, William M.; Wallace, Kathleen M.; and Nemecek, Amy L., 4,638,865, Cl. 166-274.000.
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Hass, Peter; Barnes, James M.; and Goyert, Wilhelm, to Bayer Aktiengesellschaft. Bismorpholines, a process for their preparation and their use for protection against hydrolysis. 4,639,478, Cl. 524-97.000.
Habermann, Heinz P., to Ford Motor Company. Intermediate bearing for the propeller shaft of a motor vehicle. 4,639,150, Cl. 384-536.000.
Hack, Helmuth: *See—*
Metzger, Carl; Esse, Ludwig; and Hack, Helmuth, 4,639,526, Cl. 548-[illegible].
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Hancock, Jack A.; Johnson, Walter D.; and Kennedy, Alan D., to Du Pont de Nemours, E. I., and Company. Process of making crimped, annealed polyester filaments. 4,639,347, Cl. 264-291.000.

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Hansen, Loren F.; and Lamb, Mark E., to Outboard Marine Corporation. Tine holder for turf aerating apparatus. 4,638,867, Cl. 172-22.000.

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Hanson, Harvey E.; and Amaniera, John A. Device for sharpening single-flute countersinks. 4,638,603, Cl. 51-219.00R.

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Hara, Akio: *See*—
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Hara, Hajime; Orii, Shingo; Aoyama, Kazuho; and Enomoto, Masami, to Nippon Oil Co., Ltd. Thermosetting resin composition. 4,639,503, Cl. 528-92.000.

Hara, Hiroshi: *See*—
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Harrell, David P., to American Standard Inc. Propeller pitch controlling arrangement having a fuel economizing feature. 4,639,192, Cl. 416-27.000.

Harris Corporation: *See*—
Brannigan, Michael J.; and Rutledge, David L., 4,639,896, Cl. 365-200.000.
Laude, David P., 4,639,684, Cl. 330-259.000.
McRae, Daniel D.; and Cain, Joseph B., III, 4,639,937, Cl. 375-40.000.
Rympalski, William P.; Herstein, James S.; and Ritenour, Roger L., 4,639,720, Cl. 340-712.000.

Harris Graphics Corporation: *See*—
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Winiasz, Michael E., 4,638,906, Cl. 198-803.900.

Harris, Timothy S.; and Harrod, Lawrence R., to Kransco Manufacturing, Inc. Two pedal, three-way control for child's riding toy. 4,639,646, Cl. 318-139.000.

Harrison, Joel N.; Condito, Vincent A.; Graham, Randolph H.; Nixon, Brian J.; and Simonsen, Richard C., to Quantum Corporation. Disk drive having two interactive electromechanical control subsystems. 4,639,798, Cl. 360-73.000.

Harrison, Joel N.; Moon, William G.; and Graham, Randolph H., to Plus Development Corporation. Modular unitary disk file subsystem. 4,639,863, Cl. 364-200.000.

Harrod, Lawrence R.: *See*—
Harris, Timothy S.; and Harrod, Lawrence R., 4,639,646, Cl. 318-139.000.

Harry Hill Associates: *See*—
Sturdevant, Eugene J., 4,639,577, Cl. 219-399.000.

Hart, Joseph D.; and Wells, R. Leon, to Wells, R. Leon. Centrifugal fan liner and installing tool therefor. 4,639,191, Cl. 415-196.000.

Hartl, Christof; and Wagner, Hans, to Siemens Aktiengesellschaft. Hearing aid with a flexible printed circuit board. 4,639,556, Cl. 381-68.600.

Hartwig, Carl S. M., to Institut Cerac S. A. Drive system for A.C. motors. 4,639,645, Cl. 318-51.000.

Hartwig, Jurgen, to Pfaff Haushaltmaschinen GmbH. Sewing machine for producing a stitch pattern. 4,638,752, Cl. 112-458.000.

Harvey, Donald M., to Eastman Kodak Company. Pseudo format camera with exposure control. 4,639,111, Cl. 354-481.000.

Hasegawa, Tsunao, to Pioneer Electronic Corporation. Waveform reshaping circuit. 4,639,681, Cl. 328-164.000.

Hashimoto, Masahiro; Watanabe, Tsuyoshi; and Wada, Kenichi, to Hitachi, Ltd. Arithmetic system having pipeline structure arithmetic means. 4,639,886, Cl. 364-736.000.

Hashimoto, Ritsuo: *See*—
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Hashimoto, Tamotsu: *See*—
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Hasler AG Bern: *See*—
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Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, to Isuzu Motors Limited. Method and apparatus for controlling electronically controlled transmissions. 4,638,690, Cl. 74-866.000.

Hattori, Yoshihisa; and Inoue, Nobuo, to Kabushiki Kaisha Toshiba. Image processing system. 4,639,771, Cl. 358-80.000.

Haugen, Harwick A.: *See*—
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Hawkins, Gilbert A., to Eastman Kodak Company. Semiconductor material on a substrate, said substrate comprising, in order, a layer of organic polymer, a layer of metal or metal alloy and a layer of dielectric material. 4,639,277, Cl. 148-33.300.

Hawkins, William G.: *See*—
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Hayakawa, Masatoshi: *See*—
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Hayashiguchi, Seizo. Window screen. 4,638,844, Cl. 160-23.00R.

Haybuster Manufacturing, Inc.: *See*—
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Hazaki, Eiichi: *See*—
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Hazelton, Donald R.; and Puydak, Robert C., to Exxon Research & Engineering Co. Heat shrinkable thermoplastic olefin composition. 4,639,487, Cl. 524-425.000.

Heath, Thomas E. Device for handling fluids drained from a vehicle. 4,638,841, Cl. 141-98.000.

Hegg, Jeffrey W., to Honeywell Inc. Float stabilized constant current source. 4,639,658, Cl. 323-204.000.

Heichberger, Albert N. Method and apparatus for carbon dioxide liquefaction and evaporation. 4,639,262, Cl. 62-11.000.

Heidelberger Druckmaschinen AG: *See*—
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Heikkinen, Urho, to Elevator GmbH. Theatrical stage. 4,638,610, Cl. 52-109.000.

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Heilveil, Andrew; VanAken, Jerry R.; Guttag, Karl M.; Redwine, Donald J.; Pinkham, Raymond; and Novak, Mark F., to Texas Instruments Incorporated. Video display system using memory with parallel and serial access employing selectable cascaded serial shift registers. 4,639,890, Cl. 364-900.000.

Heintz, Wolfgang; Pehker, Manfred; and Metz, Josef, to Rheinmetall GmbH. Cannon with longitudinally shiftable barrel. 4,638,714, Cl. 89-37.010.

Heinz, Gerhard: *See*—
Schuette, Wilhelm; McKee, Graham E.; Hilt, Albrecht; Heinz, Gerhard; and Goerrissen, Heiner, 4,639,488, Cl. 524-456.000.

Heinze, Udo; and Marhoff, Paul, to Siemens Aktiengesellschaft. X-ray diagnostic system with automatic control of radiation exposure. 4,639,943, Cl. 378-96.000.

Heitmann, Uwe, to Hauni-Werke Korber & Co. Kg. Cigarette testing apparatus. 4,639,592, Cl. 250-223.00B.

Helfer, Paul E.: *See*—
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Heling, Dennis H., to Chrysler Motors Corporation. Vehicle easy entry seat track with one position memory. 4,639,038, Cl. 297-341.000.

Heller, Jorge, to Merck & Co., Inc. Polymers containing pendant acid functionalities and labile backbone bonds. 4,639,366, Cl. 424-19.000.

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Dierichs, Wolfgang; Gierenz, Gerhard; and Kraus, Gabriella, 4,639,475, Cl. 523-164.000.
Ritter, Wolfgang, 4,639,498, Cl. 526-196.000.
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Henry, Richard D. Basic flight instrument. 4,638,660, Cl. 73-178.00R.

Henzler, Martin, to Leybold-Heraeus GmbH. System for deflecting a beam of charged particles. 4,639,602, Cl. 250-396.00R.

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Herculite Protective Fabrics Corporation: *See*—
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Hernandez, Jose L. Electrical wall bracket. 4,638,963, Cl. 248-56.000.

Herstein, James S.: *See*—
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Herzfeld, Jason H. Sectionalized folder. 4,639,157, Cl. 402-19.000.

Hess, Jack H., to Air Plus, Inc. Fluidized hospital bed. 4,638,519, Cl. 5-455.000.

Hesson, David P., to Du Pont de Nemours, E. I., and Company. Phenylquinazolinecarboxylic acids and derivatives as cancer chemotherapeutic agents. 4,639,454, Cl. 514-259.000.

Heubach, Gunther; Bauer, Klaus; and Bieringer, Hermann, to Hoechst Aktiengesellschaft. Plant protection agents based on 1,2,4-triazole derivatives and also new derivatives of 1,2,4-triazole. 4,639,266, Cl. 71-92.000.

Hewlett-Packard Company: *See*—
Baldwin, Gary; Hallgren, Robert B.; Hornak, Thomas; and Ives, Fred H., 4,639,619, Cl. 307-352.000.

Heymer, Gero: *See*—
Elsner, Georg; Staendeke, Horst; and Heymer, Gero, 4,639,331, Cl. 252-609.000.

Heywood, R. G.: *See*—
Clark, Gary E., 4,638,997, Cl. 273-1.0GD.

Higashi, Kanji, to Kabushiki Kaisha Bandai. Safety razor. 4,638,560, Cl. 30-47.000.

High Resolution Television, Inc.: *See*—
Schine, Jonathan M., 4,639,766, Cl. 358-21.00R.

Higuchi, Shinsuke: *See*—
Takeda, Yukio; Iijima, Shiro; Higuchi, Shinsuke; Ohura, Masaki; and Nagaike, Sadanori, 4,639,803, Cl. 360-103.000.

Hikino, Keiji: *See*—
Nakamura, Shin; Hikino, Keiji; Kaji, Shinichi; and Komatsu, Tsunetoshi, 4,638,573, Cl. 34-82.000.

Hilbrans, Hermann; Gamroth, Michael; Melcher, Gerhard; and Megerle, Friedrich, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method and apparatus for the reducing treatment of molten metals and/or slags thereof. 4,639,269, Cl. 75-76.000.

Hill, Francis K. Remote control multi-position rear view mirror. 4,639,103, Cl. 350-636.000.

Hill, William H.: *See*—
Valenty, Vivian B.; Hill, William H.; and Ravi, Prasad S., 4,639,325, Cl. 252-89.100.

Hilligoss, Lawrence O.: *See*—
Butler, Myron C.; Hilligoss, William R.; and Hilligoss, Lawrence O., 4,639,557, Cl. 379-29.000.

Hilligoss, William R.: *See*—
Butler, Myron C.; Hilligoss, William R.; and Hilligoss, Lawrence O., 4,639,557, Cl. 379-29.000.

Hilt, Albrecht: *See*—
Schuette, Wilhelm; McKee, Graham E.; Hilt, Albrecht; Heinz, Gerhard; and Goerrissen, Heiner, 4,639,488, Cl. 524-456.000.

Hilti Aktiengesellschaft: *See*—
Kousek, Heinz, 4,638,870, Cl. 173-12.000.

Hilton-Davis Chemical Company, The: *See*—
Hung, William M.; and Ehlinger, Edward E., 4,639,750, Cl. 346-221.000.

Hinton, George F., to United States of America, Navy. Superconducting conductivity anomaly detection system. 4,639,675, Cl. 324-334.000.

Hirai, Hiroyuki: *See*—
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, 4,639,418, Cl. 430-617.000.

Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, to Kuraray Co., Ltd. Process for producing polyester polyurethane. 4,639,471, Cl. 521-172.000.

Hirai, Masatake: *See*—
Tanaka, Kazuhiro; Yamamoto, Yasuo; Hanaoka, Katsumi; and Hirai, Masatake, 4,639,707, Cl. 336-185.000.

Hiraiwa, Kazuyoshi, to Nissan Motor Co., Ltd. Planetary gear train for automotive transmission or the like. 4,638,688, Cl. 74-763.000.

Hirayama, Chikara; and Andrew, Kenneth F., to North American Philips Corporation. High-pressure sodium vapor lamp and ternary amalgam therefor. 4,639,639, Cl. 313-639.000.

Hirayama, Makoto: *See*—
Sannohe, Kunio; Otsuka, Kengo; Ito, Toshohiko; Maruyama, Masahiko; Kitano, Takafumi; and Hirayama, Makoto, 4,639,521, Cl. 546-141.000.

Hirayama, Shoji; and Inada, Mitsuharu, to Sony Corporation. Cordless telephone. 4,639,549, Cl. 379-62.000.

Hirosaki, Botaro; and Tanaka, Osamu, to NEC Corporation. Apparatus for cancelling periodic carrier phase jitters. 4,639,939, Cl. 375-118.000.

Hirose Electric Co., Ltd.: *See*—
Kikuta, Sigeru, 4,639,067, Cl. 339-143.00R.

Hirose, Haruki: *See*—
Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, 4,639,167, Cl. 405-217.000.

Hirota, Akira; and Tsuruta, Masahiko, to Victor Company of Japan, Ltd. Combination of reproducing heads and a rotary transformer device. 4,639,805, Cl. 360-108.000.

Hirotomi, Hajime: *See*—
Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.

Hitachi, Ltd.: *See*—
Abukawa, Toshimi; Tahara, Kazuo; Takahashi, Noriyoshi; Tajima, Fumio; and Tomite, Tosio, 4,639,625, Cl. 310-154.000.
Ejiri, Yuuki; Ito, Tomoo; Tsuruta, Hisato; and Kamifuji, Hiroshi, 4,639,624, Cl. 310-154.000.
Hashimoto, Masahiro; Watanabe, Tsuyoshi; and Wada, Kenichi, 4,639,886, Cl. 364-736.000.
Koseki, Yasuo; Yamada, Akira; Kurokawa, Hideki; Matsuzaki, Harumi; Ebara, Katsuya; and Takahashi, Sankichi, 4,638,646, Cl. 62-478.000.
Moribe, Yoshihiro; Hayashi, Yukitaka; Maekawa, Hideo; and Tsukui, Kunitsugu, 4,639,804, Cl. 360-105.000.
Nakamura, Ichiro, 4,638,718, Cl. 91-178.000.
Nakamura, Shin; Hikino, Keiji; Kaji, Shinichi; and Komatsu, Tsunetoshi, 4,638,573, Cl. 34-82.000.
Ohta, Jiro, 4,639,190, Cl. 415-129.000.
Sakazume, Akio; Yoshikawa, Hiroki; and Matsushima, Hiroaki, 4,638,643, Cl. 62-209.000.
Sekizawa, Sadao; Seki, Toshio; and Takahashi, Tadashi, 4,639,807, Cl. 360-113.000.
Shimizu, Isao, 4,639,757, Cl. 357-36.000.
Takeda, Yukio; Iijima, Shiro; Higuchi, Shinsuke; Ohura, Masaki; and Nagaike, Sadanori, 4,639,803, Cl. 360-103.000.
Wada, Hideo; and Goto, Humio, 4,639,862, Cl. 364-200.000.
Watanabe, Kazuo; and Sato, Tetsuo, 4,639,795, Cl. 360-62.000.
Yamamoto, Shigehiko, 4,639,377, Cl. 427-10.000.
Yoshioka, Masahiro; Izumi, Hideki; Inouye, Hiroshi; Hazaki, Eiichi; and Nakadaira, Shiro, 4,639,146, Cl. 384-99.000.

Hobo, Sumiya: *See*—
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, 4,639,220, Cl. 433-69.000.

Hoechst Aktiengesellschaft: *See*—
Elsner, Georg; Staendeke, Horst; and Heymer, Gero, 4,639,331, Cl. 252-609.000.
Grau, Ulrich, 4,639,332, Cl. 530-303.000.
Heubach, Gunther; Bauer, Klaus; and Bieringer, Hermann, 4,639,266, Cl. 71-92.000.
Obermeier, Rainer; Geiger, Rolf; and Grau, Ulrich, 4,639,333, Cl. 530-303.000.
Rosner, Manfred; Loewe, Heinz; Duwel, Dieter; and Kirsch, Reinhard, 4,639,463, Cl. 514-395.000.
Staab, Rudolf; Bergner, Dieter; and Hannesen, Kurt, 4,639,303, Cl. 204-258.000.
Stahlhofen, Paul, 4,639,406, Cl. 430-165.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,639,443, Cl. 514-222.000.
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,639,446, Cl. 514-222.000.

Hoet, Roger; and Gerlach, Pierre, to Thomson-CSF. Electron tube with cathode cooling device. 4,639,633, Cl. 313-35.000.

Hoey, George B., to Mallinckrodt, Inc. Methods and compositions for enhancing magnetic resonance imaging. 4,639,364, Cl. 424-9.000.

Hofer, Peter: *See*—
Shetty, Bola V.; McFadden, Arthur; and Hofer, Peter, 4,639,529, Cl. 548-550.000.

Hoffarth, Gunther: *See*—
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Hoffarth, Gunther; Richter, Wolfgang; Uytterhoeven, Herman; and de Winter, Walter, 4,639,403, Cl. 430-115.000.

Hoffmann-La Roche Inc.: *See*—
Borer, Claude; and Greter, Andreas, 4,639,135, Cl. 356-246.000.

Hoffmann, Ulrich: *See*—
Rake, Heinrich; Hoffmann, Ulrich; Muller, Ulrich; Breddermann, Rudolf; and Blumbach, Rainer, 4,639,853, Cl. 364-149.000.

Hofmann, Hans: *See*—
Wenger, Roland; Traber, Rene P.; Kobel, Hans; and Hofmann, Hans, 4,639,434, Cl. 514-11.000.

Hofmann, Manfred: *See*—
Leverberg, Siegfried; and Hofmann, Manfred, 4,638,668, Cl. 73-866.500.

Hogan, Thomas C.; and Adelman, Arnold, to Prime Computer, Inc. Data transmission signal apparatus. 4,639,936, Cl. 375-36.000.

Hohlein, Peter; Schmidt, Manfred; Pedain, Josef; Riberi, Bernd; and Sonntag, Michael, to Bayer Aktiengesellschaft. Cross-linkable polymer resins and use thereof as binders for coating agents. 4,639,499, Cl. 526-285.000.

Hollinden, David E.: *See*—
Tamer, Gregory G.; and Hollinden, David E., 4,639,786, Cl. 358-197.000.

Holmwood, Graham: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; Reinecke, Paul; and Brandes, Wilhelm, 4,639,462, Cl. 514-383.000.

Holonyak, Nick, Jr., to University of Illinois, The Board of Trustees of The. Forming disordered layer by controlled diffusion in heterojunction III-V semiconductor. 4,639,275, Cl. 148-1.500.

Holt, Andrew; Cheek, Martin G.; and Clegg, Ernest N., to UOP Limited. Oxidation catalysts. 4,639,432, Cl. 502-324.000.

Holtey, Thomas O.: *See*—
Murray, Thomas L., Jr.; and Holtey, Thomas O., 4,639,858, Cl. 364-200.000.

Honda, Chika; Suzuki, Akio; Machida, Katsutoshi; and Iwata, Masatoshi, to Konishiroku Photo Industry Co., Ltd. Silver halide X-ray photosensitive material. 4,639,417, Cl. 430-567.000.

Honda Giken Kogyo K.K.: *See*—
Kitagawa, Tadao; Kosuge, Yutaka; and Noda, Yoichiro, 4,639,713, Cl. 340-63.000.
Otobe, Yutaka, 4,638,658, Cl. 73-117.300.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Morioka, Minoru; Kishi, Toshiaki; and Yoshioka, Toshiharu, 4,638,881, Cl. 180-219.000.
Nishimura, Sadanori, 4,638,897, Cl. 192-3.300.
Otobe, Yutaka; Kiuchi, Takeo; and Tomozawa, Kikuo, 4,639,870, Cl. 364-431.050.
Sasaki, Kiichi; and Takashi, Iimuro, 4,638,534, Cl. 24-683.000.
Shimizu, Yasuo, 4,639,651, Cl. 318-432.000.

Honda Tsushin Kogyo Kabushiki Kaisha: *See*—
Shimamiya, Yukio; Narumo, Kinzo; and Ebihara, Hiroshi, 4,639,066, Cl. 339-132.00B.

Honeycutt, Thomas E.: *See*—
Roberts, Thomas G.; and Honeycutt, Thomas E., 4,639,642, Cl. 315-39.000.

Honeywell Inc.: *See*—
Hegg, Jeffrey W., 4,639,658, Cl. 323-204.000.
Koets, Howard, 4,639,709, Cl. 337-360.000.

Honeywell Information Systems Inc.: *See*—
Murray, Thomas L., Jr.; and Holtey, Thomas O., 4,639,858, Cl. 364-200.000.
Peters, Arthur, 4,639,860, Cl. 364-200.000.

Hongo, Takayasu: *See*—
Mori, Tohru; Hongo, Takayasu; and Kamikura, Rinzo, 4,639,751, Cl. 346-227.000.

Hood, Rush W., Jr.: *See*—
Ramsey, Maynard, III; Medero, Richard; and Hood, Rush W., Jr., 4,638,810, Cl. 128-681.000.

Hope, Jimmie L. Door lock. 4,639,021, Cl. 292-7.000.

Hoppe, Joachim: *See*—
Haghiri-Tehrani, Yahya; and Hoppe, Joachim, 4,639,585, Cl. 235-492.000.

Hoppmanns, Rolf D.; Steup, Walter; Wieczorek, Willibald; and Beitler, Franz, to U.S. Philips Corporation. Loading mechanism for a magnetic tape cassette apparatus. 4,639,801, Cl. 360-96.500.

Hopwood, Francis W.; Caldwell, Stephen P.; and Decker, Martin J., to United States of America, Air Force. Wide-band phase locked loop amplifier apparatus. 4,639,688, Cl. 331-10.000.

Hori, Yoshiaki: *See*—
Ogawa, Yutaka; Ogasawara, Takayuki; and Hori, Yoshiaki, 4,638,683, Cl. 74-567.000.

Horishita, Sumio: *See*—
Matsunobu, Akira; Horishita, Sumio; and Yamada, Tetsuo, 4,639,374, Cl. 426-43.000.

Horn, Berthold K. P.: *See*—
Day, Chia P.; Krause, Kenneth W.; Whitcomb, Louis L.; and Horn, Berthold K. P., 4,639,878, Cl. 364-513.000.

Hornak, Thomas: *See*—
Baldwin, Gary; Hallgren, Robert B.; Hornak, Thomas; and Ives, Fred H., 4,639,619, Cl. 307-352.000.

Horvath, Janos: *See*—
Bader, Imre; Berecz, Endre; Szina, Gabor; and Horvath, Janos, 4,639,304, Cl. 204-413.000.

Hosaka, Masato: *See*—
Inui, Isao; Hosaka, Masato; Nakamoto, Mitsuyoshi; and Okamoto, Kenji, 4,639,208, Cl. 431-1.000.

Hoshiai, Takao: *See*—
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, 4,639,220, Cl. 433-69.000.

Hosoi, Atsushi: *See*—
Nakamura, Shunji; Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; and Nakahata, Kimio, 4,638,760, Cl. 118-658.000.

Hotai, Kazuhide: *See*—
Makino, Yoshimi; Ochiai, Yoshitaka; Uedaira, Satoru; Hotai, Kazuhide; Aso, Koichi; and Hayakawa, Masatoshi, 4,639,278, Cl. 148-108.000.

Hou, Kenneth C.; and Cogswell, Garrett, to Cuno Inc. Intravenously injectable immunoglobulin G (IGG) and method for producing same. 4,639,513, Cl. 530-387.000.

Hounsfield, Godfrey N., to EMI Limited. Radiography. 4,639,941, Cl. 378-11.000.

Hovey, Leonard L.; Mathews, Marion J., III; and Peoples, P. Robert, to Monsanto Company. Dimerization process improvements. 4,639,539, Cl. 558-363.000.

Howard, Darryl A.; and Shen, Lawrence Y. L., to Lockheed Missiles & Space Company, Inc. Pulsed electromagnetic nondestructive test method for determining volume density of graphite fibers in a graphite-epoxy composite material. 4,639,669, Cl. 324-239.000.

Howe, Dwayne E.: *See*—
Furlong, James J.; and Howe, Dwayne E., 4,639,824, Cl. 361-179.000.

Howe, Milton A., Jr., to W. R. Grace & Co., Cryovac Div. Multiply package having delaminating easy open seal. 4,638,913, Cl. 206-632.000.

Howell, Edward K.; and Anderson, Thomas E., to General Electric Company. Steering logic circuit for a digital data transceiver. 4,639,933, Cl. 375-8.000.

Howie, Peter W.; and McNeilly, Alan, to Societe d'Etudes Scientifiques et Industrielles de l'Ile de France. Contraceptive composition. 4,639,439, Cl. 514-171.000.

Hrustich, John; and Sitler, Wayne R., to International Business Machines Corporation. Dual stream processor apparatus. 4,639,856, Cl. 364-200.000.

Huang, Leeyuan; and Lam, Y. K. Tony, to Merck & Co., Inc. 3',6-diisopentenyl-2',4'-dihydroxy-5,7-dimethoxy-isoflavan and related compounds useful as anxiolytic agents and avermectin antidotes. 4,639,466, Cl. 514-456.000.

Hubbard, Robert P. Neck protection device with occupant of a high performance vehicle. 4,638,510, Cl. 2-6.000.

Huber, Robert: *See*—
Weddigen, Gerd; Huber, Robert; Schmidt, Birgit; and Schneider, Hartmut, 4,639,496, Cl. 525-506.000.

Hudspeth, William, to Polaroid Corporation. Optical accessory for photographic apparatus. 4,639,109, Cl. 354-295.000.

Huesman, Edward H., to General Motors Corporation. Windshield wiper ball joint. 4,639,160, Cl. 403-71.000.

Huggins, Raymond W.; and Shoemaker, Ralph A., to Xerox Corporation. Feedability sensor for a vacuum corrugated feeder. 4,638,986, Cl. 271-98.000.

Hughes Aircraft Company: *See*—
Leyden, Richard N.; and Lawrence, Robert, 4,639,290, Cl. 156-644.000.

Huguet, Jean-Gerard; and Jaussely, Bernard, to Institut National de la Recherche Agronomique. Process and apparatus for automatically controlling the irrigation of plants. 4,638,594, Cl. 47-1.00R.

Huignard, Jean-Pierre; Malard, Marcel; and de Corlieu, Guy, to Thomson-CSF. Static deflector device for an infrared beam. 4,639,091, Cl. 350-347.00V.

Hullein, Francois; and Fribault, Gerard, to Societe d'Etudes, Recherche et Constructions Electroniques-Sercel. Method of measuring distance between two observation points. 4,639,129, Cl. 356-5.000.

Hume, David W.: *See*—
Amelio, William J.; Hume, David W.; McBride, Donald G.; and Rickert, Robert G., 4,639,380, Cl. 427-97.000.

Hung, William M.; and Ehlinger, Edward E., to Hilton-Davis Chemical Company, The. Fluoran compounds and marking systems. 4,639,750, Cl. 346-221.000.

Hunt, Ann H.; Molloy, R. Michael; Nagarajan, Ramakrishnan; and Schabel, Amelia A., to Eli Lilly and Company. Glycopeptide derivatives. 4,639,433, Cl. 514-8.000.

Hunt, David G.: *See*—
Green, John G.; and Hunt, David G., 4,639,472, Cl. 522-107.000.

Hunt, Robert D.: *See*—
Neumann, David B.; and Hunt, Robert D., 4,638,591, Cl. 43-89.000.

Hurst, Robert N., to RCA Corporation. Apparatus for detecting motion in a video image by comparison of a video line value with an interpolated value. 4,639,773, Cl. 358-105.000.

Huttenen, Jouko: *See*—
Turunen, Olli T.; Huttenen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,514, Cl. 536-30.000.

Huttunen, Jouko: *See*—
Turunen, Olli T.; Huttunen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,515, Cl. 536-30.000.

Hydro-Quebec: *See*—
Lalancette, Jean-Marc; and Belanger, Germain, 4,639,309, Cl. 208-262.000.

Hydrotechnik GmbH: *See*—
Leverberg, Siegfried; and Hofmann, Manfred, 4,638,668, Cl. 73-866.500.

Hydrotile Machinery Company: *See*—
Adly, Tarek A., 4,639,342, Cl. 264-40.100.

Ibe, Rebecca C. Attachable eye for dolls. 4,639,235, Cl. 446-389.000.

Ichihara, Takashi, to Kabushiki Kaisha Toshiba. Ring type single-photon emission CT imaging apparatus. 4,639,599, Cl. 250-363.00S.

Ichikawa, Yoshio; Akahori, Masaaki; Ishii, Daisuke; Tsunoda, Kazuyuki; Minami, Yohichiro; and Nagata, Koichi, to NEC Corporation. Radio communication apparatus disabled on reception of a predetermined signal. 4,639,726, Cl. 340-825.440.

ICI Americas Inc.: *See*—
Payne, Earl R., 4,639,716, Cl. 340-571.000.

ICI Australia Limited: *See*—
Farquharson, Graeme J.; Watson, Keith G.; and Bird, Graham J., 4,639,267, Cl. 71-98.000.

Ide, Fumito; and Mochizuki, Hidenori, to Kabushiki Kaisha Toshiba. Image-forming apparatus with automatic and manual paper feed modes. 4,639,114, Cl. 355-35.00H.

Ide, Toshiaki: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; and Arioka, Hiroyuki, 4,639,389, Cl. 428-141.000.

Idigkeit, Werner; Kurr, Klaus; and Ticks, Gerd-Heinz, to Carl Freudenberg, Firma. Apparatus for resiliently mounting a vibrating body. 4,638,983, Cl. 267-140.100.

Iesaka, Takashi; Wada, Takaaki; Ohta, Ikumi; and Izumi, Masayuki, to Inax Corporation; and Japan Alpha Corporation. Decorative panels comprising replaceable decorative sheets. 4,638,618, Cl. 52-509.000.

Ife, Robert J.: *See*—
Ganellin, Charon R.; Ife, Robert J.; and Owen, David A. A., 4,639,519, Cl. 544-320.000.

Igarashi, Toshiji: *See*—
Yamatsu, Isao; Insi, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,639,450, Cl. 514-238.000.

Iigima, Kouta, to Alps Electric Co., Ltd. Oscillator. 4,639,691, Cl. 331-99.000.

Iijima, Shiro: *See*—
Takeda, Yukio; Iijima, Shiro; Higuchi, Shinsuke; Ohura, Masaki; and Nagaike, Sadanori, 4,639,803, Cl. 360-103.000.

Iino, Kimio: *See*—
Miyadera, Tetsuo; Sugimura, Yukio; Tanaka, Teruo; Hashimoto, Toshihiko; Iino, Kimio; and Sugawara, Shinichi, 4,639,441, Cl. 514-195.000.

Iizuka, Hajime: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,639,451, Cl. 514-247.000.

Iizuka, Tetsuya, to Tokyo Shibaura Denki Kabushiki Kaisha. Metal oxide semiconductor field-effect transistor with metal source making ohmic contact to channel-base region. 4,639,758, Cl. 357-42.000.

Ikawa, Yasuo; Kawakyu, Katsue; and Kameyama, Atushi, to Kabushiki Kaisha Toshiba. Gallium arsenide gate array integrated circuit including DCFL NAND gate. 4,639,621, Cl. 307-450.000.

Ikeda, Hidetsugu: *See*—
Matsui, Shingo; Ikeda, Hidetsugu; Era, Akio; and Nishimura, Sanji, 4,639,355, Cl. 423-112.000.

Ikeda, Hiroyuki; Matsumoto, Seikichi; Kitagawa, Shunji; Inagaki, Takefumi; and Sebata, Ichiro, to Fujitsu Limited. Beam scanning type information readout device. 4,639,070, Cl. 350-3.710.

Ikeda, Hiroyuki: *See*—
Matsumoto, Seikichi; and Ikeda, Hiroyuki, 4,639,071, Cl. 350-3.710.

Ikeda, Kinjiro: *See*—
Kamei, Noboru; Ikeda, Kinjiro; Aoyama, Keishi; and Hamano, Seitaro, 4,639,294, Cl. 203-88.000.

Ikeda Mohando Co., Ltd.: *See*—
Nohara, Fujio; and Fujinawa, Tomoaki, 4,639,523, Cl. 546-209.000.

Ikeda, Sakio, to Dynic Corporation; and Mine Kinzoku Kogyo Kabushiki Kaisha. Device for decreasing side stream smoke of tobacco products. 4,638,819, Cl. 131-331.000.

Ikeda, Shinji, to Toyota Jidosha Kabushiki Kaisha. Method of and apparatus for controlling vacuum modulating valve for exhaust gas recirculation control. 4,638,784, Cl. 123-571.000.

Ikeda, Yutaka: *See*—
Ota, Toyokazu; Nakamura, Yutaka; Ikeda, Yutaka; Kataoka, Shunzi; and Ito, Yoshinobu, 4,639,291, Cl. 162-207.000.

Ikegaya, Kouji: *See*—
Fujii, Setsuro; Yokoyama, Touru; Ikegaya, Kouji; Yokoo, Nobuo; and Nagakura, Masahiko, 4,639,435, Cl. 514-11.000.

Ikemori, Keiji: *See*—
Kitagishi, Nozomu; Momiyama, Kikuo; Ikemori, Keiji; Takahashi, Sadatoshi; and Tanaka, Tsunefumi, 4,639,096, Cl. 350-427.000.

Ikenoue, Yoshikazu: *See*—
Johdai, Akiyoshi; Yamada, Hirokazu; Ikenoue, Yoshikazu; and Ishikawa, Takuma, 4,638,992, Cl. 271-293.000.

Illustrato, Vito J. Spring heel for shoe and the like. 4,638,575, Cl. 36-38.000.

Imada, Kiyoshi: *See*—
Asai, Michihiko; Shimura, Yukio; Tsuda, Keishiro; Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,639,379, Cl. 427-40.000.

Imai, Akio; Okamoto, Yasushi; and Saito, Masatoshi, to Sumitomo Chemical Company, Limited. Process for producing polystyrene. 4,639,494, Cl. 525-271.000.

Imai, Kiyoshi: *See*—
Suzuki, Niichiro; Ogushi, Yoshimi; Imai, Kiyoshi; Ohta, Nobuhiro; and Ueno, Susumu, 4,639,285, Cl. 156-272.600.

Imai, Shigeru: *See*—
Akiyama, Hideki; and Imai, Shigeru, 4,638,542, Cl. 29-408.000.

Imanaka, Asaji, to Nippon Air Brake Co., Ltd. Railway vehicle brake system with improved blending control of pneumatic and electric brakes. 4,639,047, Cl. 303-15.000.

Imaoka, Kanya: *See*—
Hakoyama, Soichi; Mori, Shigetatu; Takebe, Yoshiyuki; and Imaoka, Kanya, 4,638,624, Cl. 57-208.000.

Inaba, Mitsuharu; Sekiguchi, Takashi; Yoneyama, Yoshio; and Suzuki, Tadashi, to Fuji Jukogyo Kabushiki Kaisha. Crane device installed in cargo transporting vehicle. 4,639,182, Cl. 414-543.000.

Inada, Mitsuharu: *See*—
Hirayama, Shoji; and Inada, Mitsuharu, 4,639,549, Cl. 379-62.000.

Inada, Tomohide: *See*—
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, 4,639,220, Cl. 433-69.000.

Inagaki, Nobuo: *See*—
Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, 4,639,080, Cl. 350-96.340.
Inagaki, Takefumi: *See*—
Ikeda, Hiroyuki; Matsumoto, Seikichi; Kitagawa, Shunji; Inagaki, Takefumi; and Sebata, Ichiro, 4,639,070, Cl. 350-3.710.
Inai, Yuichi: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,639,450, Cl. 514-238.000.
Inax Corporation: *See*—
Iesaka, Takashi; Wada, Takaaki; Ohta, Ikumi; and Izumi, Masayuki, 4,638,618, Cl. 52-509.000.
Inco Alloys International, Inc.: *See*—
Shoemaker, Lewis E.; and Bates, Thomas O., 4,639,576, Cl. 219-146.230.
Independent Broadcasting Authority: *See*—
Morcom, Richard, 4,639,764, Cl. 358-14.000.
Inductotherm Industries, Inc.: *See*—
Mortimer, John H., 4,639,931, Cl. 373-138.000.
Ingersoll-Rand Company: *See*—
Kirkland, Thomas R., Jr., 4,639,196, Cl. 417-228.000.
Inoue Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,639,378, Cl. 427-35.000.
Inoue, Kazuo: *See*—
Yasuhara, Seishi; Hagiwara, Mitsuo; Inoue, Kazuo; Fujimori, Kyoichi; Sekiguchi, Akira; and Okada, Hiroshi, 4,638,782, Cl. 123-502.000.
Inoue, Kiyoshi, to Inoue Japax Research Incorporated. Auto-selective metal deposition on dielectric surfaces. 4,639,378, Cl. 427-35.000.
Inoue, Nobuhiro: *See*—
Fushiya, Fusao; Hakamata, Nobuo; Abe, Hiroyuki; and Inoue, Nobuhiro, 4,638,700, Cl. 83-467.00R.
Inoue, Nobuo: *See*—
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Inoue, Osamu, to Victor Company of Japan, Ltd. Magnetic tape recording and reproducing apparatus with rotatable drum having inclined heads. 4,639,799, Cl. 360-85.000.
Inoue, Takashi, to Ricoh Company, Ltd. Block-divided driving of a thermal printhead. 4,639,741, Cl. 346-76.0PH.
Inoue, Yoshikazu: *See*—
Takaya, Takao; Takasugi, Hisashi; Yamanaka, Hideaki; Miyai, Kenji; and Inoue, Yoshikazu, 4,639,448, Cl. 514-226.000.
Inouye, Hiroshi: *See*—
Yoshioka, Masahiro; Izumi, Hideki; Inouye, Hiroshi; Hazaki, Eiichi; and Nakadaira, Shiro, 4,639,146, Cl. 384-99.000.
Institut Cerac S. A.: *See*—
Hartwig, Carl S. M., 4,639,645, Cl. 318-51.000.
Institut Francais du Petrole: *See*—
Bischoff, Didier; Courteheuse, Gerard; and Renard, Pierre, 4,639,354, Cl. 422-140.000.
Institut National de la Recherche Agronomique: *See*—
Huguet, Jean-Gerard; and Jaussely, Bernard, 4,638,594, Cl. 47-1.00R.
Institute of Critical Care Medicine: *See*—
Bisera, Jose; Carrington, James H.; and Weil, Max H., 4,638,811, Cl. 128-673.000.
Intelligent Storage Inc.: *See*—
Kersbergen, Mark D., 4,639,054, Cl. 339-14.00R.
Intermedicat GmbH: *See*—
Kahlert, Wolfgang; Klein, Joachim; Steinert, Hans-Jurgen; and Vorlop, Claus, 4,639,423, Cl. 435-287.000.
International Business Machines Corporation: *See*—
Amelio, William J.; Hume, David W.; McBride, Donald G.; and Rickert, Robert G., 4,639,380, Cl. 427-97.000.
Bushaw, Kenneth A.; Bustamante, Louis A.; and McCurry, James J., 4,639,126, Cl. 355-3.0SH.
Chang, Yi-Hua E.; Gruodis, Algirdas J.; Muhlfeld, Hans P., Jr.; Rodriguez, Charles W.; and Shulman, Mark L., 4,639,919, Cl. 371-27.000.
Chu, Richard C., 4,638,858, Cl. 165-185.000.
Goodwin, John J.; and Lu, Nicky C., 4,639,622, Cl. 307-482.000.
Gruzman, Boris; and Nilsen, Carl-Otto, 4,639,572, Cl. 219-121.0LG.
Hrustich, John; and Sitler, Wayne R., 4,639,856, Cl. 364-200.000.
Neubauer, Jerry L.; Schmidt, Laurence J.; and Voss, Steven H., 4,639,802, Cl. 360-98.000.
Ostergren, Carl D.; and Paivanas, John A., deceased, 4,639,829, Cl. 361-386.000.
Schlig, Eugene S.; and Chamberlain, Savvas G., 4,639,678, Cl. 324-457.000.
International Computers Limited: *See*—
Boughton, Geoffrey J., 4,639,723, Cl. 340-799.000.
Loo, Johnson, 4,639,866, Cl. 364-200.000.
Martin, Michael W., 4,639,865, Cl. 364-200.000.
International Exide Electronics/Corporation: *See*—
Noworolski, Zbigniew; and Ferens, Jerzy, 4,639,849, Cl. 363-56.000.
International Flavors & Fragrances Inc.: *See*—
Sprecker, Mark A.; and Hanna, Marie R., 4,639,330, Cl. 252-522.00R.
International Minerals & Chemical Corp.: *See*—
Michalski, Dennis H.; and Srinivasan, Viswanathan, 4,639,359, Cl. 423-321.00R.
International Rectifier Corporation: *See*—
Nilarp, Anders, 4,638,553, Cl. 29-580.000.
Intersil, Inc.: *See*—
Doluca, Tunc, 4,639,715, Cl. 340-347.0AD.
Inui, Isao; Hosaka, Masato; Nakamoto, Mitsuyoshi; and Okamoto, Kenji, to Matsushita Electric Industrial Co., Ltd. Pulse combustion apparatus with a plurality of pulse burners. 4,639,208, Cl. 431-1.000.
Inventio AG: *See*—
Lunardi, Gerhard, 4,638,901, Cl. 198-323.000.
Investment Rarites, Incorporated: *See*—
Burandt, Corliss O., 4,638,772, Cl. 123-90.600.
Iris Graphics, Inc.: *See*—
Jochimsen, Dieter, 4,639,736, Cl. 346-75.000.
Isaacson, Jerry. Removable lightweight roof opening covers for vehicles. 4,639,035, Cl. 296-218.000.
Isaka, Kazuo, to Canon Kabushiki Kaisha. Process kit and an image formation apparatus using the process kit. 4,639,119, Cl. 355-3.0DD.
ISC Technologies, Inc.: *See*—
Farmer, James R., 4,638,736, Cl. 102-393.000.
Ishigure, Kazuaki, to Omron Tateisi Electronics Co. Device for automatically opening and closing cash container. 4,638,746, Cl. 109-52.000.
Ishiguro, Michihiro: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 4,639,471, Cl. 521-172.000.
Ishihara, Masaki: *See*—
Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, 4,638,690, Cl. 74-866.000.
Ishihara, Yasusuke: *See*—
Maeda, Kazuya; and Ishihara, Yasusuke, 4,639,004, Cl. 280-5.320.
Ishii, Chiharu, to Fuji Xerox Co., Ltd. Data transferring method. 4,639,894, Cl. 365-189.000.
Ishii, Daisuke: *See*—
Ichikawa, Yoshio; Akahori, Masaaki; Ishii, Daisuke; Tsunoda, Kazuyuki; Minami, Yohichiro; and Nagata, Koichi, 4,639,726, Cl. 340-825.440.
Ishii, Masao: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 4,639,471, Cl. 521-172.000.
Ishikawa, Mamoru: *See*—
Sakura, Yasuhiro; Nimura, Hitoshi; and Ishikawa, Mamoru, 4,639,743, Cl. 346-76.0PH.
Ishikawa, Takuma: *See*—
Johdai, Akiyoshi; Yamada, Hirokazu; Ikenoue, Yoshikazu; and Ishikawa, Takuma, 4,638,992, Cl. 271-293.000.
Ishikawa, Yoshihiro: *See*—
Ueki, Takashi; and Ishikawa, Yoshihiro, 4,638,789, Cl. 126-351.000.
Ishikawa, Youhei: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; and Wada, Hidekazu, 4,639,699, Cl. 333-202.000.
Isogai, Masaki; and Kawahara, Atsushi, to Kyodo News Service; and Nippon Kogaku K. K. Image-scanning apparatus. 4,639,787, Cl. 358-214.000.
Issledovatelski Centar "Tekom" : *See*—
Hadjiiski, Anatoli M.; Varbanov, Hristo P.; Mishonov, Michail T.; Stamov, Vladimir P.; Savov, Rosen P.; Radenkov, Strahil K.; Panev, Vladimir B.; and Velev, Alexander S., 4,638,607, Cl. 52-79.900.
Isuzu Motors Limited: *See*—
Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, 4,638,690, Cl. 74-866.000.
Ito, Ken: *See*—
Kawai, Akio; Ito, Ken; and Iwamoto, Hideo, 4,639,676, Cl. 324-380.000.
Ito, Masashi; Ohashi, Toshio; and Ui, Katsumi, to Toyo Ink Mfg., Co., Ltd.; and Toyoto Jidosha Kabushiki Kaisha. Liquid colorant for ABS resins. 4,639,272, Cl. 106-243.000.
Ito, Tomoo: *See*—
Ejiri, Yuuki; Ito, Tomoo; Tsuruta, Hisato; and Kamifuji, Hiroshi, 4,639,624, Cl. 310-154.000.
Ito, Toshohiko: *See*—
Sannobe, Kunio; Otsuka, Kengo; Ito, Toshohiko; Maruyama, Masahiko; Kitano, Takafumi; and Hirayama, Makoto, 4,639,521, Cl. 546-141.000.
Ito, Yoshinobu: *See*—
Ota, Toyokazu; Nakamura, Yutaka; Ikeda, Yutaka; Kataoka, Shunzi; and Ito, Yoshinobu, 4,639,291, Cl. 162-207.000.
Ito, Yoshio, to Canon Kabushiki Kaisha. Printing apparatus. 4,639,749, Cl. 346-153.100.
Itoh, Toyotsugu; and Muramatsu, Toshio, to Konishiroku Photo Industry Co., Ltd. Optical beam scanning apparatus including a cylindrical lens having its opposite ends closer to the scanned plane than its medial portion. 4,639,072, Cl. 350-6.800.
ITT Corporation: *See*—
Beery, Jack; and Broome, Barry G., 4,639,127, Cl. 355-35.000.
Muzslay, Steven Z., 4,639,061, Cl. 339-59.00M.
Toegel, Herbert J.; Yudichak, Joseph R.; and Gilsdorf, John F., 4,639,910, Cl. 370-58.000.
Iuchi, Akira; and Tsunokawa, Shinya, to Osaka Gas Company Limited. Fluid coupler. 4,638,975, Cl. 251-149.600.
Iura, Takao: *See*—
Shiki, Kazuhiro; and Iura, Takao, 4,638,781, Cl. 123-493.000.
Ives, Fred H.: *See*—
Baldwin, Gary; Hallgren, Robert B.; Hornak, Thomas; and Ives, Fred H., 4,639,619, Cl. 307-352.000.

Iwahashi, Hiroshi; and Ochii, Kiyofumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device. 4,639,895, Cl. 365-200.000.
Iwamoto, Hideo: *See*—
Kawai, Akio; Ito, Ken; and Iwamoto, Hideo, 4,639,676, Cl. 324-380.000.
Iwasa, Koji: *See*—
Suginoya, Mitsuru; Iwasa, Koji; Kamamori, Hitoshi; Sano, Yutaka; and Terada, Yumiko, 4,639,088, Cl. 350-339.00F.
Iwasa, Tadanobu: *See*—
Sugita, Hiroshi; Iwasa, Tadanobu; Yasukawa, Takemasa; and Aritake, Masanori, 4,638,525, Cl. 15-250.360.
Iwata, Masatoshi: *See*—
Honda, Chika; Suzuki, Akio; Machida, Katsutoshi; and Iwata, Masatoshi, 4,639,417, Cl. 430-567.000.
Iwata, Tetsuya, to Alps Electric Co., Ltd. Magnetic head. 4,639,809, Cl. 360-121.000.
Iyoda, Motomi, to Toyota Jidosha Kabushiki Kaisha. Sensor for detecting an amount of rain. 4,639,831, Cl. 361-286.000.
Izuhara, Katsuhiro: *See*—
Kobayashi, Hisamine; and Izuhara, Katsuhiro, 4,638,600, Cl. 51-164.200.
Izumi, Hideki: *See*—
Yoshioka, Masahiro; Izumi, Hideki; Inouye, Hiroshi; Hazaki, Eiichi; and Nakadaira, Shiro, 4,639,146, Cl. 384-99.000.
Izumi, Kazuyoshi: *See*—
Eto, Masayuki; Izumi, Kazuyoshi; Kobayashi, Fuyuki; Kawagishi, Mamoru; and Oosawa, Masahiro, 4,639,721, Cl. 340-747.000.
Izumi, Masayuki: *See*—
Iesaka, Takashi; Wada, Takaaki; Ohta, Ikumi; and Izumi, Masayuki, 4,638,618, Cl. 52-509.000.
Izumida, Teruo: *See*—
Yamanaka, Yasutoshi; Ageishi, Kazunobu; and Izumida, Teruo, 4,638,856, Cl. 165-119.000.
J. I. Case Company: *See*—
Albrecht, Allan, 4,638,680, Cl. 74-516.000.
Jaccod, Michel, to Valeo. Variable speed drive pulley. 4,639,238, Cl. 474-8.000.
Jaccod, Michel: *See*—
Thirion de Briel, Jacques; and Jaccod, Michel, 4,639,239, Cl. 474-8.000.
Jackovitz, John F.; and Kunkle, Richard P., to United States of America, Energy. Surfactant addition to phosphoric acid electrolyte. 4,639,401, Cl. 429-30.000.
Jacob-Grinschgl, Wolfgang; and Muller, Udo. Marking device for use with inductive measuring sensor. 4,639,547, Cl. 178-18.000.
Jagenberg Ag: *See*—
Buschmann, Gerhard; and Muller, Georg, 4,638,657, Cl. 73-78.000.
Jalaguier, Jean-Pierre: *See*—
Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, 4,639,284, Cl. 156-213.000.
James, Barry R., to Merkle Engineers, Inc. Refractory curtain wall. 4,638,617, Cl. 52-474.000.
Jamet, Claude: *See*—
Dabat, Robert; and Jamet, Claude, 4,639,178, Cl. 413-26.000.
Jankowski, Alfons: *See*—
Dohler, Werner; Merz, Ludwig; Frohnert, Heinz; Uckermann, Bernd; Graeser, Ulrich; Jankowski, Alfons; Wolowski, Eckard; Tamm, Hans-Friedrich; and Wilczok, Norbert, 4,639,310, Cl. 208-412.000.
Janome Sewing Machine Co., Ltd.: *See*—
Hanyu, Susumu; Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, 4,638,751, Cl. 112-254.000.
Japan Alpha Corporation: *See*—
Iesaka, Takashi; Wada, Takaaki; Ohta, Ikumi; and Izumi, Masayuki, 4,638,618, Cl. 52-509.000.
Japan Tobacco, Inc.: *See*—
Okumoto, Yutaka, 4,638,817, Cl. 131-280.000.
Jaqua, Vance W.; and Jencek, Premysl, to Rockwell International Corporation. Pneumatic bag deployment of folded nozzle extensions. 4,638,947, Cl. 239-265.430.
Jarnagin, William S. Recyclotron III, a recirculating plasma fusion system. 4,639,348, Cl. 376-107.000.
Jarnestedt, Goran; and von Campenhausen, Rolf, to Telefonaktiebolaget LM Ericsson. Apparatus for correcting frequency-dependent attenuation of the transmitting medium in signal transmission. 4,639,935, Cl. 375-11.000.
Jaugey, Bernard: *See*—
Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, 4,639,284, Cl. 156-213.000.
Jaussely, Bernard: *See*—
Huguet, Jean-Gerard; and Jaussely, Bernard, 4,638,594, Cl. 47-1.00R.
Jayaraman, Rajsekhar: *See*—
Singer, Barry M.; and Jayaraman, Rajsekhar, 4,639,761, Cl. 357-234.000.
Jean Walterscheid GmbH: *See*—
Buthe, Theo; Geisthoff, Hubert; Kretschmer, Horst; Mikeska, Felix; and Post, Alexander, 4,639,163, Cl. 403-322.000.
Geisthoff, Hubert; Buthe, Theo; and Mikeska, Felix, 4,639,162, Cl. 403-316.000.
Jegousse, Michel J.: *See*—
Puisais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel J.; and Kaluszynski, Michel, 4,638,984, Cl. 269-43.000.
Jencek, Premysl: *See*—
Jaqua, Vance W.; and Jencek, Premysl, 4,638,947, Cl. 239-265.430.
Jensen, Tom M., to Boeing Company, The. Airborne folding wheelchair. 4,639,012, Cl. 280-642.000.
Jester, William A.: *See*—
Baratta, Anthony J.; Jester, William A.; Kenney, Edward S.; McMaster, Ira B.; and Schultz, Mortimer A., 4,639,349, Cl. 376-254.000.
Jewusiak, Stephen J., to Ethicon, Inc. Double-latched non-metallic, bio-compatible hemostatic clip. 4,638,804, Cl. 128-325.000.
Jezzi, Arrigo D.: *See*—
LeGault, Robert H.; Jezzi, Arrigo D.; Milner, James D.; Oakley, Barbara; and Franke, Paul G., 4,639,254, Cl. 604-385.00R.
Jing Tech, Inc.: *See*—
Cheng, Wei-Tsang, 4,639,153, Cl. 400-202.100.
Jochimsen, Dieter, to Iris Graphics, Inc. Ink jet recorder. 4,639,736, Cl. 346-75.000.
Jodel Associates, Inc.: *See*—
Eldridge, John D., Jr., 4,638,681, Cl. 74-544.000.
Johdai, Akiyoshi; Yamada, Hirokazu; Ikenoue, Yoshikazu; and Ishikawa, Takuma, to Minolta Camera Kabushiki Kaisha. Sorting apparatus. 4,638,992, Cl. 271-293.000.
Johnson, Alan, to British Gas Corporation. Coupling devices for use with electrofusion fittings of thermoplastic material. 4,639,580, Cl. 219-541.000.
Johnson, Frederick O., to Westinghouse Electric Corp. Method and apparatus for firing angle control of series connected thyristor switches. 4,639,851, Cl. 363-164.000.
Johnson, Jesse F.: *See*—
Bell, Albert H., III; and Johnson, Jesse F., 4,639,194, Cl. 416-241.00B.
Johnson & Johnson Dental Products Company: *See*—
Jones, Robin M. F.; DeLuca, Robert D.; and Panzera, Carlino, 4,639,218, Cl. 433-8.000.
Johnson & Johnson Products, Inc.: *See*—
Dyer, John; Kennette, John W.; Bassett, Alton H.; and Hall, Stanley D., 4,639,253, Cl. 604-362.000.
Johnson, Lloyd D., to Standard-Knapp, Inc. Carton flap opener. 4,638,620, Cl. 53-382.000.
Johnson, Myron C.: *See*—
Check, John M.; and Johnson, Myron C., 4,639,568, Cl. 219-69.00M.
Johnson, Phil E.; and Brock, Robert K., to LTV Energy Products Company. Load bearing swab cup. 4,638,726, Cl. 92-241.000.
Johnson, Robert T.: *See*—
Bartlett, Lawrence D., 4,638,806, Cl. 128-400.000.
Johnson, Walter D.: *See*—
Hancock, Jack A.; Johnson, Walter D.; and Kennedy, Alan D., 4,639,347, Cl. 264-291.000.
Johnson, William M.; and Mere, Ilmar, to Ralph McKay Limited. Earth engaging implements. 4,638,868, Cl. 172-762.000.
Jolitz, William L.; and Williams, Richard A., to Ford Aerospace & Communications Corporation. High voltage high vacuum coating. 4,639,385, Cl. 427-386.000.
Jones, Gerald M., to National Research Development Corp. Fluid pressurized joint assembly. 4,639,158, Cl. 403-31.000.
Jones, James W.: *See*—
Chiu, Anthony M.; Allison, Mark D.; Jones, James W.; Trammell, Lyndale A.; and San Ho, Fock, 4,639,664, Cl. 324-73.0AT.
Jones, Marvin R.; and Helfer, Paul E., to Koomey. Valve apparatus. 4,638,972, Cl. 251-1.300.
Jones, Ralph W. Pawl controlled reel extension. 4,638,959, Cl. 242-107.40R.
Jones, Robin M. F.; DeLuca, Robert D.; and Panzera, Carlino, to Johnson & Johnson Dental Products Company. Crystalline alumina orthodontic bracket. 4,639,218, Cl. 433-8.000.
Jones, Thomas P. H.: *See*—
Pithouse, Kenneth B.; Jones, Thomas P. H.; Lowe, Frank J.; and Skipper, Richard S., 4,639,545, Cl. 174-36.000.
Jordan, Larry B. Hydropneumatic cable tensioner. 4,638,978, Cl. 254-228.000.
Jose Guiblain, Helene Christiane, Cecile Helene Laurence Lacour, Laurent Pierre Rolland Lacour, heirs: *See*—
Platel, Alain Y.; Bourgery, Guy R.; and Lacour, Alain, deceased, 4,639,452, Cl. 514-252.000.
Josef Gartner & Co.: *See*—
Papak, Viktor, 4,638,853, Cl. 165-50.000.
Jostens Learning Systems, Inc.: *See*—
Raymond, William J.; Morgan, Robert L.; and Miller, Ricky L., 4,639,877, Cl. 364-513.500.
Jouquey, Alain; Salmon, Jean; Mouren, Michel; and Touyer, Gaetan, to Roussel Uclaf. Novel radioactive estradienes labelled with iodine. 4,639,336, Cl. 260-397.500.
Jung, Eggert; and Klopsch, Siegfried, to Dr. Ing. Rudolf Hell GmbH. Method and circuit arrangement for simulating a multi-colored reproduction on a color monitor. 4,639,770, Cl. 358-76.000.
Jungbluth, Werner W.: *See*—
Rodloff, Rudiger K.; and Jungbluth, Werner W., 4,639,630, Cl. 310-328.000.
Junge, Bodo; Krause, Hans P.; Muller, Lutz; and Puls, Walter, to Bayer Aktiengesellschaft. Antidiabetic 3,4,5-trihydroxypiperidines. 4,639,436, Cl. 514-24.000.
Junkosha Company, Ltd.: *See*—
Suzuki, Hirosuke; Yasumoto, Hiromi; and Umemoto, Hiroshi, 4,639,693, Cl. 333-1.000.
Justusson, William M.: *See*—
Ackerman, Allen D.; Perkey, Conrad G.; Martin, Robert A.; and Justusson, William M., 4,638,846, Cl. 164-55.100.

Juzswik, David L.: *See*—
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Kabelitz, Hans-Peter: *See*—
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KabiVitrum, Inc.: *See*—
Kirkland, W. Dean, 4,639,251, Cl. 604-260.000.

Kabushiki Kaisha Bandai: *See*—
Higashi, Kanji, 4,638,560, Cl. 30-47.000.

Kabushiki Kaisha Daini Seikosha: *See*—
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Wanibuchi, Hiroshi; and Kubota, Akira, 4,638,704, Cl. 83-628.000.

Kabushiki Kaisha Hikoma Seisakusho: *See*—
Kishi, Mitsuhiro, 4,638,887, Cl. 187-9.00R.

Kabushiki Kaisha Honda Rokku: *See*—
Kitagawa, Tadao; Kosuge, Yutaka; and Noda, Yoichiro, 4,639,713, Cl. 340-63.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,706, Cl. 84-1.010.
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,709, Cl. 84-1.190.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kitada, Tomowo, 4,638,779, Cl. 123-385.000.
Sato, Kanichi; Setoyama, Mikio; Kiguchi, Shoji; and Tanaka, Toshio, 4,638,845, Cl. 164-12.000.

Kabushiki Kaisha Kuboto Tekkojo: *See*—
Wanibuchi, Hiroshi; and Kubota, Akira, 4,638,704, Cl. 83-628.000.

Kabushiki Kaisha Murakoshi Seiko: *See*—
Mazaki, Yoshiyuki, 4,639,161, Cl. 403-245.000.

Kabushiki Kaisha Nagaoka: *See*—
Uno, Masatoshi, 4,639,813, Cl. 360-128.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Kobayashi, Toshiji; and Matsumoto, Katsumi, 4,639,628, Cl. 310-194.000.

Kabushiki Kaisha Takuma: *See*—
Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.

Kabushiki Kaisha Toshiba: *See*—
Fukuoka, Yoshitaka, 4,639,830, Cl. 361-411.000.
Hattori, Yoshihisa; and Inoue, Nobuo, 4,639,771, Cl. 358-80.000.
Ichihara, Takashi, 4,639,599, Cl. 250-363.00S.
Ide, Fumito; and Mochizuki, Hidenori, 4,639,114, Cl. 355-35.00H.
Ikawa, Yasuo; Kawakyu, Katsue; and Kameyama, Atushi, 4,639,621, Cl. 307-450.000.
Kurihara, Haruki; Sagara, Minoru; Matumoto, Kenji; and Tamura, Hideo, 4,639,925, Cl. 372-46.000.
Masuda, Eiji; and Fujita, Yasuhiko, 4,639,554, Cl. 340-365.00S.
O'Brien, Thomas P., 4,639,081, Cl. 350-144.000.
Sakai, Takami, 4,639,848, Cl. 363-51.000.
Shimbo, Masaru; Fukuda, Kiyoshi; and Ohwada, Yoshiaki, 4,638,552, Cl. 29-576.00J.
Suzuki, Motomu; and Asahina, Hiroshi, 4,639,867, Cl. 364-414.000.
Takahashi, Tomohiko, 4,639,742, Cl. 346-76.0PH.
Takeuchi, Seiji, 4,639,682, Cl. 329-50.000.
Tsutsumi, Teruo, 4,639,739, Cl. 346-76.0PH.

Kadokura, Kenji: *See*—
Kaneko, Yutaka; Kimura, Toshihiko; and Kadokura, Kenji, 4,639,415, Cl. 430-558.000.

Kafri, Oded: *See*—
Glatt, Ilana; Livnat, Aminadav; and Kafri, Oded, 4,639,132, Cl. 356-124.500.

Kahlert, Wolfgang; Klein, Joachim; Steinert, Hans-Jurgen; and Vorlop, Claus, to Intermedicat GmbH. Apparatus for the production of biocatalyst beads. 4,639,423, Cl. 435-287.000.

Kaire, Jean C., to Thomson-CSF. Regulated power supply circuit particularly for telephone set. 4,639,551, Cl. 323-231.000.

Kaiser Aluminum & Chemical Corporation: *See*—
Pearson, Michael J., 4,639,259, Cl. 55-71.000.

Kaji, Shinichi: *See*—
Nakamura, Shin; Hikino, Keiji; Kaji, Shinichi; and Komatsu, Tsunetoshi, 4,638,573, Cl. 34-82.000.

Kakizawa, Haruo: *See*—
Tanaka, Kazuto; Kakizawa, Haruo; and Nagata, Kouichi, 4,639,099, Cl. 350-538.000.

Kakuta, Yoshiyuki: *See*—
Matsui, Fumio; Yanagisawa, Shuichi; Kakuta, Yoshiyuki; and Yoshizawa, Atsushi, 4,639,745, Cl. 346-135.100.

Kalck, Charles W., Sr.: *See*—
Capasso, Vincent; and Kalck, Charles W., Sr., 4,638,866, Cl. 169-90.000.

Kalck, Kathy: *See*—
Capasso, Vincent; and Kalck, Charles W., Sr., 4,638,866, Cl. 169-90.000.

Kaluszynski, Michel: *See*—
Puisais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel J.; and Kaluszynski, Michel, 4,638,984, Cl. 269-43.000.

Kamakari, Ryutaro: *See*—
Umemoto, Sumio; Hattori, Eiichi; and Kamakari, Ryutaro, 4,639,384, Cl. 427-290.000.

Kamal, Benjelloun. Stringed instrument. 4,638,708, Cl. 84-293.000.

Kamamori, Hitoshi: *See*—
Suginoya, Mitsuru; Iwasa, Koji; Kamamori, Hitoshi; Sano, Yutaka; and Terada, Yumiko, 4,639,088, Cl. 350-339.00F.

Kamei, Eiichi; and Namba, Hideaki, to Nippondenso Co., Ltd. Idle speed control apparatus for internal combustion engine. 4,638,778, Cl. 123-339.000.

Kamei, Noboru; Ikeda, Kinjiro; Aoyama, Keishi; and Hamano, Seitaro, to Daicel Chemical Industries, Ltd. Process for production sorbic acid. 4,639,294, Cl. 203-88.000.

Kameyama, Atushi: *See*—
Ikawa, Yasuo; Kawakyu, Katsue; and Kameyama, Atushi, 4,639,621, Cl. 307-450.000.

Kamifuji, Hiroshi: *See*—
Ejiri, Yuuki; Ito, Tomoo; Tsuruta, Hisato; and Kamifuji, Hiroshi, 4,639,624, Cl. 310-154.000.

Kamikura, Rinzo: *See*—
Mori, Tohru; Hongo, Takayasu; and Kamikura, Rinzo, 4,639,751, Cl. 346-227.000.

Kamiya, Joji: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,639,451, Cl. 514-247.000.

Kamiya, Masaaki: *See*—
Namiki, Masayuki; Kamiya, Masaaki; Kojima, Yoshikazu; and Tanaka, Kojiro, 4,639,755, Cl. 357-28.000.

Kamo, Jun: *See*—
Takemura, Tohru; Nakashima, Atushi; Yoshida, Haruhiko; Kamo, Jun; and Hamada, Eiichi, 4,639,353, Cl. 422-46.000.

Kamp, Klaus: *See*—
Nirschl, Heinrich; Kamp, Klaus; and Stummer, Baldur, 4,639,909, Cl. 370-58.000.

Kamyr, Inc.: *See*—
Elmore, Carl L.; Poulin, Ted M.; and Barrett, Mark D., 4,638,855, Cl. 165-101.000.

Kan, Fumitaka: *See*—
Nakamura, Shunji; Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; and Nakahata, Kimio, 4,638,760, Cl. 118-658.000.

Kanbe, Junichiro: *See*—
Okada, Shinjiro; Katagiri, Kazuharu; and Kanbe, Junichiro, 4,639,089, Cl. 350-341.000.

Kandzia, Ulrich, to Sigri GmbH. Port for graphitization furnace. 4,639,930, Cl. 373-120.000.

Kane, Timothy J. Truck wheel lug nut protector apparatus. 4,639,045, Cl. 301-37.00S.

Kaneko, Takashi, to NEC Corporation. Data interpolating circuit using a two data word memory. 4,639,920, Cl. 371-31.000.

Kaneko, Yutaka; Kimura, Toshihiko; and Kadokura, Kenji, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic material containing a magenta color image-forming coupler. 4,639,415, Cl. 430-558.000.

Kangaroos U.S.A., Inc.: *See*—
Gamm, Robert J., 4,638,579, Cl. 36-136.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Ando, Masatoshi; Mochizuki, Hiromine; and Saito, Kazuta, 4,639,270, Cl. 106-21.000.
Mori, Tohru; Hongo, Takayasu; and Kamikura, Rinzo, 4,639,751, Cl. 346-227.000.

Kao Corporation: *See*—
Kondo, Akihiro; Tsushima, Rikio; and Sumida, Yuzo, 4,639,491, Cl. 524-801.000.

Kaplan, Mitzi. Glove holder for dish drainer. 4,638,915, Cl. 211-13.000.

Kaplan, Murray A.; and Vyas, Dolatrai M., to Bristol-Myers Company. Crystalline form of 7-(dimethylaminomethylene-amino-9a-methoxymitosane. 4,639,528, Cl. 548-422.000.

Karjalainen, Arto J.; and Kurkela, Kauko O. A., to Farmos Group, Ltd. Antihypertensive substituted imidazole derivatives. 4,639,464, Cl. 514-396.000.

Karl Lautenschlager GmbH & Co. KG: *See*—
Lautenschlager, Horst, 4,639,145, Cl. 384-19.000.

Karlsson, Goran R.; and Karnevi, John H. S., to Telefonaktiebolaget LM Ericsson. Monopulse feeder for transmitting and receiving radar signals within two mutually separated frequency bands. 4,639,731, Cl. 342-147.000.

Karnevi, John H. S.: *See*—
Karlsson, Goran R.; and Karnevi, John H. S., 4,639,731, Cl. 342-147.000.

Karpisek, Ladislav S. Wheeled trolley frame. 4,639,002, Cl. 280-5.200.

Kartridg Pak Co., The: *See*—
Woodworth, Gary C.; and Roberts, Gary F., 4,638,729, Cl. 99-450.600.

Kasai, Ichiro: *See*—
Rosbeck, Joseph P.; and Kasai, Ichiro, 4,639,756, Cl. 357-30.000.

Kashiwada, Masao: *See*—
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, 4,639,220, Cl. 433-69.000.

Kasperkovitz, Wolfdietrich G.; and Van Rumpt, Herman W., to U.S. Philips Corporation. Frequency-doubling circuit. 4,639,679, Cl. 328-20.000.

Katagiri, Kazuharu: *See*—
Okada, Shinjiro; Katagiri, Kazuharu; and Kanbe, Junichiro, 4,639,089, Cl. 350-341.000.

Kataishi, Ryuichiro: *See*—
Seki, Hiroshi; and Kataishi, Ryuichiro, 4,639,605, Cl. 250-554.000.

Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, to Mitsui Toatsu Kagaku-Kabushiki Kaisha. Pyridazinone derivatives. 4,639,451, Cl. 514-247.000.

Kataoka, Shunzi: *See*—
Ota, Toyokazu; Nakamura, Yutaka; Ikeda, Yutaka; Kataoka, Shunzi; and Ito, Yoshinobu, 4,639,291, Cl. 162-207.000.

Katdare, Ashok V., to Merck & Co., Inc. Tablet and formulation. 4,639,458, Cl. 514-311.000.

Kato, Fumihiko: *See*—
Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, 4,639,080, Cl. 350-96.340.

Kato, Heizaburo, to Sankyo Manufacturing Co., Ltd. Press machine. 4,638,731, Cl. 100-282.000.

Kato, Heizaburo, to Sankyo Manufacturing Company, Ltd. Roll feed apparatus with adjustable nip. 4,638,990, Cl. 271-272.000.

Kato, Heizaburo, to Sankyo Manufacturing Co., Ltd. Adjustable nip roll feed apparatus with braking/releasing device. 4,638,991, Cl. 271-272.000.

Kato, Kotaro: *See*—
Oshima, Goro; and Kato, Kotaro, 4,639,548, Cl. 178-22.170.

Kato, Masatake, to Canon Kabushiki Kaisha. Telephoto zoom lens. 4,639,095, Cl. 350-427.000.

Kato, Masatoshi: *See*—
Kitaguchi, Hiroshi; and Kato, Masatoshi, 4,639,408, Cl. 430-351.000.

Kato, Takao: *See*—
Misaki, Akira; Sone, Yoshiaki; and Kato, Takao, 4,639,516, Cl. 536-123.000.

Kato, Yasuhiro; and Koyama, Mitsuhiro, to Yamada Iryo Shomei Kabushiki Kaisha. Shadowless lighting equipment for medical use. 4,639,838, Cl. 362-33.000.

Katona, Joseph W., to Mills Products, Inc. Handle construction. 4,638,529, Cl. 16-111.00R.

Katscher, Erich: *See*—
Forner, Siegfried; Katscher, Erich; and Ring, Stefan, 4,639,351, Cl. 376-310.000.

Katzer, Johann: *See*—
Froelich, Hans; Hepperle, Willi; Katzer, Johann; and Stephany, Christian, 4,639,018, Cl. 285-184.000.

Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., to Tandem Computers Incorporated. Power interlock system and method for use with multiprocessor systems. 4,639,864, Cl. 364-200.000.

Kaushansky, David A., to Moskovsky Institut Neftekhimicheskoi i Gazovoi Promyshlennosti. Method for treating the bottom-hole formation zone. 4,638,861, Cl. 166-247.000.

Kavka, Frank, to Mallinckrodt, Inc. Preparation of 14-hydroxy-N-ethoxy-carbonyl-norcodeinone. 4,639,520, Cl. 546-45.000.

Kawabata, Takashi: *See*—
Sakai, Shinji; Kawabata, Takashi; and Harada, Yoshihito, 4,639,108, Cl. 354-289.100.

Kawachi, Yasunori: *See*—
Murashige, Yoshio; Yanagase, Akira; Kawachi, Yasunori; and Soga, Junko, 4,639,339, Cl. 260-513.600.

Kawagishi, Mamoru: *See*—
Eto, Masayuki; Izumi, Kazuyoshi; Kobayashi, Fuyuki; Kawagishi, Mamoru; and Oosawa, Masahiro, 4,639,721, Cl. 340-747.000.

Kawagishi, Toshio; and Nakazyo, Kiyoshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic materials containing magenta coupler and high boiling point organic solvent. 4,639,413, Cl. 430-546.000.

Kawahara, Atsushi: *See*—
Isogai, Masaki; and Kawahara, Atsushi, 4,639,787, Cl. 358-214.000.

Kawai, Akio; Ito, Ken; and Iwamoto, Hideo, to Nissan Motor Co., Ltd. Device for diagnosis of trouble in vehicle ignition devices. 4,639,676, Cl. 324-380.000.

Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,638,707, Cl. 84-1.190.

Kawakami, Shigenobu: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; and Dohi, Hideyuki, 4,639,833, Cl. 361-315.000.

Kawakami, Toshiro: *See*—
Tamura, Toru; Shibata, Noriyoshi; and Kawakami, Toshiro, 4,639,148, Cl. 384-420.000.

Kawakyu, Katsue: *See*—
Ikawa, Yasuo; Kawakyu, Katsue; and Kameyama, Atushi, 4,639,621, Cl. 307-450.000.

Kawamura, Hideaki: *See*—
Sakurada, Nobuaki; Kawamura, Hideaki; and Sasaki, Takashi, 4,639,747, Cl. 346-140.00R.

Kawanami, Takao: *See*—
Yoshiwara, Seishiro; and Kawanami, Takao, 4,638,939, Cl. 228-186.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Togashi, Toshio, 4,638,880, Cl. 180-219.000.

Kawasaki Steel Coporation: *See*—
Makihara, Katsumi; Yanagi, Kenichi; Fukushima, Takeo; Suganuma, Namio; Samejima, Ichiro; and Takahashi, Seiichi, 4,638,851, Cl. 165-32.000.

Kawata, Ken: *See*—
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, 4,639,418, Cl. 430-617.000.

Keane, James W., to Whirlpool Corporation. Hose coupling for vacuum cleaner. 4,639,055, Cl. 339-16.00R.

Keats, Albert B., to United Kingdom Atomic Energy Authority. Monitoring system. 4,639,882, Cl. 364-550.000.

Keesling, Evan L.: *See*—
Stewart, E. Allen, III; and Keesling, Evan L., 4,638,621, Cl. 56-9.000.

Keip, Charles P.: *See*—
Munsey, R. Jack; DeJong, Leroy D.; and Keip, Charles P., 4,639,204, Cl. 425-3.000.

Keller, Henry C. Combination tool to pull up and remove socks, shorts and trousers. 4,638,932, Cl. 223-111.000.

Keller, J. Walter, Jr. Simulated heart display system. 4,639,223, Cl. 434-272.000.

Kelley Company, Inc.: *See*—
Bennett, Mark A., 4,638,612, Cl. 52-173.0DS.

Kellner, Roman; Mayr, Georg; Proksch, Karl-Heinz; and Pockl, Franz, to KUKA Schweissanlagen Roboter GmbH. Mechanism for automatically positioning clamping frames. 4,638,902, Cl. 198-345.000.

Kelly, James E.: *See*—
Daubendiek, Richard L.; Dickerson, Robert E.; and Kelly, James E., 4,639,411, Cl. 430-510.000.

Kelly, Michael N.; Foster, John B.; and Foster, Robert D., to Research Medical, Inc. Venous return catheter. 4,639,252, Cl. 604-282.000.

Kemp, Jack A.: *See*—
Deem, Brian C.; and Kemp, Jack A., 4,638,900, Cl. 192-85.0CA.

Kennedy, Alan D.: *See*—
Hancock, Jack A.; Johnson, Walter D.; and Kennedy, Alan D., 4,639,347, Cl. 264-291.000.

Kennett, Scott W., to E-Systems, Inc. RF pulse transmitter having incidental phase modulation (IPM) correction. 4,639,938, Cl. 375-60.000.

Kennette, John W.: *See*—
Dyer, John; Kennette, John W.; Bassett, Alton H.; and Hall, Stanley D., 4,639,253, Cl. 604-362.000.

Kenney, Edward S.: *See*—
Baratta, Anthony J.; Jester, William A.; Kenney, Edward S.; McMaster, Ira B.; and Schultz, Mortimer A., 4,639,349, Cl. 376-254.000.

Kentek Information Systems, Inc.: *See*—
Fukae, Kensuke; and Yamashita, Keitaro, 4,639,116, Cl. 355-3.0DD.

Kern, Karl: *See*—
Gressler, Walter; and Kern, Karl, 4,639,185, Cl. 414-733.000.

Kern, Mark T.; and Shamordola, Kenneth A., to Santa Barbara Research Center. Fire sensor cross-correlator circuit and method. 4,639,598, Cl. 250-339.000.

Kersbergen, Mark D., to Intelligent Storage Inc. Cable terminal connector. 4,639,054, Cl. 339-14.00R.

Kershaw, Ian G., to Xerox Corporation. Sheet stack support trays. 4,638,988, Cl. 271-171.000.

Keska, Tadeusz W., to Slimp, Jack B., Jr. Clips for balancing tiltable board game. 4,638,999, Cl. 273-258.000.

Key Pharmaceuticals, Inc.: *See*—
Moore, Luana, 4,639,455, Cl. 514-282.000.

Khan, Tasadduq: *See*—
Fredholm, Allan; Davidson, James H.; Khan, Tasadduq; and Theret, Jean-Mare C. F., 4,639,280, Cl. 148-404.000.

Khaund, Arup K., to Norton Company. Stress-corrosion resistant proppant for oil and gas wells. 4,639,427, Cl. 501-128.000.

Kidde Consumer Durables, Corporation: *See*—
Compton, Wayne W., 4,639,843, Cl. 362-431.000.

Kiguchi, Masao, to Ricoh Company, Ltd. Call signal detecting device. 4,639,553, Cl. 379-377.000.

Kiguchi, Shoji: *See*—
Sato, Kanichi; Setoyama, Mikio; Kiguchi, Shoji; and Tanaka, Toshio, 4,638,845, Cl. 164-12.000.

Kikuta, Sigeru, to Hirose Electric Co., Ltd. Shield structure for electric connectors. 4,639,067, Cl. 339-143.00R.

Kim, Myung K.; and Viriyayuthakorn, Montri, to AT&T Technologies, Inc. Chemical vapor deposition method and apparatus. 4,638,762, Cl. 118-725.000.

Kimberly-Clark Corporation: *See*—
LeGault, Robert H.; Jezzi, Arrigo D.; Milner, James D.; Oakley, Barbara; and Franke, Paul G., 4,639,254, Cl. 604-385.00R.
Sigl, Wayne C.; and Wolfson, Elizabeth A., 4,638,921, Cl. 221-1.000.

Kimura, Shigeo: *See*—
Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.

Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, to Nippon Telegraph & Telephone Public Corporation; and Nitto Electric Industrial Co., Ltd. Optical fibers coated with modified 1,4-polybutadienes. 4,639,080, Cl. 350-96.340.

Kimura, Takashi: *See*—
Kobayashi, Junji; and Kimura, Takashi, 4,639,797, Cl. 360-71.000.

Kimura, Toshihiko: *See*—
Kaneko, Yutaka; Kimura, Toshihiko; and Kadokura, Kenji, 4,639,415, Cl. 430-558.000.

Kimura, Yoshio, to Tetra Pak International Aktiebolag. Method of separating and collecting commodities and device for the same. 4,638,903, Cl. 198-419.000.

Kinetic Concepts, Inc.: *See*—
Vrzalik, John H., 4,638,516, Cl. 5-64.000.

King, Michael H.: *See*—
Smith, Donald R., 4,638,821, Cl. 132-7.000.

King, Nigel J. R.; Pawson, Ian W. N.; Baker, Michael P.; Shaddock, Robert N.; and Stansfield, Edward V., to Racal Communications Equipment Limited. Direction finding. 4,639,733, Cl. 342-424.000.

Kinsman, Robert G.: *See*—
Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., 4,639,631, Cl. 310-344.000.

Kinzel, Peter: *See*—
Staiger, Gerhard; Selmayr, Tassilo; Kinzel, Peter; and Reutter, Anneliese, 4,639,541, Cl. 560-20.000.

Kira, Toru; Miyauchi, Teiichi; and Yoshikawa, Mitsuhiko, to Sharp Kabushiki Kaisha. Thin film magnetic head having a magnetized ferromagnetic film on the MR element. 4,639,806, Cl. 360-113.000.

Kirby, David, to Lutron Electronics Co., Inc. Protective bypass for electronic circuits. 4,639,819, Cl. 361-115.000.

Kirchbrucher, Rudiger: *See*—
Becker, Kunibert; Kirchbrucher, Rudiger; and Preuschoff, Michael, 4,639,169, Cl. 405-291.000.

Kirkland, Thomas R., Jr., to Ingersoll-Rand Company. Fluid control valve. 4,639,196, Cl. 417-228.000.

Kirkland, W. Dean, to KabiVitrum, Inc. Flexible collapsible container with liquid level indicating device. 4,639,251, Cl. 604-260.000.

Kirsch, Reinhard: *See*—
Rosner, Manfred; Loewe, Heinz; Duwel, Dieter; and Kirsch, Reinhard, 4,639,463, Cl. 514-395.000.

Kirschner, Wallace: *See*—
Salazar, Edilberto I.; and Kirschner, Wallace, 4,638,732, Cl. 101-91.000.

Kishi, Hajimu; Matsui, Mitsuo; and Matsuura, Hitoshi, to Fanuc Ltd. Trace control method. 4,639,172, Cl. 409-80.000.

Kishi, Mitsuhiro, to Kabushiki Kaisha Hikoma Seisakusho. Elevating apparatus. 4,638,887, Cl. 187-9.00R.

Kishi, Toshiaki: *See*—
Morioka, Minoru; Kishi, Toshiaki; and Yoshioka, Toshiharu, 4,638,881, Cl. 180-219.000.

Kitada, Tomowo, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for controlling an engine in a hydraulically driven vehicle. 4,638,779, Cl. 123-385.000.

Kitagawa, Katsunosuke: *See*—
Cope, Charles S.; Kitagawa, Katsunosuke; and Konabe, Kazuo, 4,639,337, Cl. 260-408.000.

Kitagawa, Katsunosuke: *See*—
Cope, Charles S.; Kitagawa, Katsunosuke; and Konabe, Kazuo, 4,639,337, Cl. 260-408.000.

Kitagawa, Shunji: *See*—
Ikeda, Hiroyuki; Matsumoto, Seikichi; Kitagawa, Shunji; Inagaki, Takefumi; and Sebata, Ichiro, 4,639,070, Cl. 350-3.710.

Kitagawa, Tadao; Kosuge, Yutaka; and Noda, Yoichiro, to Honda Giken Kogyo K.K.; and Kabushiki Kaisha Honda Rokku. Theftproof device. 4,639,713, Cl. 340-63.000.

Kitagishi, Nozomu; Momiyama, Kikuo; Ikemori, Keiji; Takahashi, Sadatoshi; and Tanaka, Tsunefumi, to Canon Kabushiki Kaisha. High range zoom lens. 4,639,096, Cl. 350-427.000.

Kitaguchi, Hiroshi; and Kato, Masatoshi, to Fuji Photo Film Co., Ltd. Process for image formation comprising a heating step. 4,639,408, Cl. 430-351.000.

Kitaguchi, Takahisa, to NEC Corporation. Integratable squarewave pulse oscillator. 4,639,692, Cl. 331-111.000.

Kitamura, Masatsugu; Wagatsuma, Kikuji; Watanabe, Tokumi; Yamashita, Naoki; and Yoshida, Hiroshi, to Victor Company of Japan, Ltd. Periodic waveform generation by nonrecyclically reading lower frequency audio samples and recyclically reading higher frequency audio samples. 4,638,710, Cl. 84-1.260.

Kitamura, Mineo: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,706, Cl. 84-1.010.
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,709, Cl. 84-1.190.

Kitanihon Spinning Co., Ltd.: *See*—
Hakoyama, Soichi; Mori, Shigetatu; Takebe, Yoshiyuki; and Imaoka, Kanya, 4,638,624, Cl. 57-208.000.

Kitano, Takafumi: *See*—
Sannohe, Kunio; Otsuka, Kengo; Ito, Toshohiko; Maruyama, Masahiko; Kitano, Takafumi; and Hirayama, Makoto, 4,639,521, Cl. 546-141.000.

Kito, Eiichi: *See*—
Kogane, Mikio; Suzuki, Kenji; Kito, Eiichi; Kubota, Kazufumi; and Tokuda, Kanji, 4,639,118, Cl. 355-29.000.

Kiuchi, Takeo: *See*—
Otobe, Yutaka; Kiuchi, Takeo: and Tomozawa, Kikuo, 4,639,870, Cl. 364-431.050.

Kiwitz, Heinz: *See*—
Krettenauer, Gustav; and Kiwitz, Heinz, 4,639,008, Cl. 280-405.00R.

KLA Instruments Corporation: *See*—
Chadwick, Curt H.; Shulenberger, Art M.; Taylor, John S.; and Simmons, Richard R., 4,639,587, Cl. 250-201.000.

Kleefisch, Blaise H.: *See*—
Wierzba, Robert B.; Snyder, Robert G.; and Kleefisch, Blaise H., 4,639,381, Cl. 427-156.000.

Klein, Joachim: *See*—
Kahlert, Wolfgang; Klein, Joachim; Steinert, Hans-Jurgen; and Vorlop, Claus, 4,639,423, Cl. 435-287.000.

Klein, Manfred: *See*—
Schneider, Barbara; Hennig, Kurt; and Klein, Manfred, 4,638,722, Cl. 92-42.000.

Kleinewefers GmbH: *See*—
Pav, Josef; Rauf, Richard; Svenka, Peter; and Wenzel, Reinhard, 4,639,346, Cl. 264-280.000.

Klimmeck, Dietrich A.: *See*—
Teske, Artur; and Klimmeck, Dietrich A., 4,639,097, Cl. 350-507.000.

Klintz, Jerry A.: *See*—
Anderson, Robert L.; Pilarski, James A.; and Klintz, Jerry A., 4,639,653, Cl. 318-599.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Hilbrans, Hermann; Gamroth, Michael; Melcher, Gerhard; and Megerle, Friedrich, 4,639,269, Cl. 75-76.000.

Kloeckner-Humboldt-Deutz AG: *See*—
Beele, Gunther, 4,638,980, Cl. 266-44.000.
Komp, Hermann-Josef, 4,638,878, Cl. 180-89.130.

Kloeckner-Humboldt-Deutz AG Zweigniederlassung Fahr: *See*—
Schaible, Siegfried; and Schneble, Edwin, 4,638,623, Cl. 56-341.000.

Klopsch, Siegfried: *See*—
Jung, Eggert; and Klopsch, Siegfried, 4,639,770, Cl. 358-76.000.

Knapp, Anthony W.; and Werth, Dee A., to Allied Corporation. Anti-decoupling resisting and EMI shielding means for an electrical connector assembly. 4,639,064, Cl. 339-89.00M.

Knasel, Harold E.; and Grigsby, David A., to Process Equipment Company. Safety coupling device for robotic tooling. 4,639,184, Cl. 414-730.000.

Knight, Alan C.; and Malhotra, Satish C., to Du Pont de Nemours, E. I., and Company. Preparation of tetrafluoroethylene fine powder. 4,639,497, Cl. 526-93.000.

Knorr-Bremse AG: *See*—
Wirth, Xaver, 4,638,891, Cl. 188-58.000.
Wirth, Xaver, 4,638,892, Cl. 188-59.000.

Kobayashi, Akihiro; Yamaguchi, Shunzo; Kobayashi, Kiyomi; and Takaba, Hiroaki, to Nippondenso Co., Ltd. Sheathed heater. 4,639,712, Cl. 338-238.000.

Kobayashi, Fuyuki: *See*—
Eto, Masayuki; Izumi, Kazuyoshi; Kobayashi, Fuyuki; Kawagishi, Mamoru; and Oosawa, Masahiro, 4,639,721, Cl. 340-747.000.

Kobayashi, Hisamine; and Izuhara, Katsuhiro, to Lipton Manufacturing Corporation. Multi-function work finshing machine using barrel containers. 4,638,600, Cl. 51-164.200.

Kobayashi, Junji; and Kimura, Takashi, to Canon Kabushiki Kaisha. Recording or reproducing apparatus. 4,639,797, Cl. 360-71.000.

Kobayashi, Kiyomi: *See*—
Kobayashi, Akihiro; Yamaguchi, Shunzo; Kobayashi, Kiyomi; and Takaba, Hiroaki, 4,639,712, Cl. 338-238.000.

Kobayashi, Toshiji; and Matsumoto, Katsumi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Small size motor. 4,639,628, Cl. 310-194.000.

Kobayashi, Toyohiko: *See*—
Tanaka, Kazumoto; Mashimo, Tohru; Sato, Osamu; and Kobayashi, Toyohiko, 4,639,868, Cl. 364-420.000.

Kobel, Hans: *See*—
Wenger, Roland; Traber, Rene P.; Kobel, Hans; and Hofmann, Hans, 4,639,434, Cl. 514-11.000.

Koch, Alexander W. Disposable casting aid. 4,638,587, Cl. 43-43.120.

Koch, Otto: *See*—
Wingler, Frank; Koch, Otto; Doering, Joachim; Ott, Karl-Heinz; and Liebig, Lothar, 4,639,473, Cl. 525-83.000.

Kodama, Mitsuo; Miyake, Masaya; Nakano, Minoi; Asai, Tsuyoshi; and Hara, Akio, to Sumitomo Electric Industries, Ltd. Hard alloy containing molybdenum. 4,639,352, Cl. 419-15.000.

Koerner, Siegfried: *See*—
Foerster, Karl-Heinz; and Koerner, Siegfried, 4,639,776, Cl. 358-107.000.

Koets, Howard, to Honeywell Inc. Thermostat with adjustable temperature range setpoint stops. 4,639,709, Cl. 237-360.000.

Kogane, Mikio; Suzuki, Kenji; Kito, Eiichi; Kubota, Kazufumi; and Tokuda, Kanji, to Fuji Photo Film Co., Ltd. Photographic paper accommodating apparatus. 4,639,118, Cl. 355-29.000.

Kohama, Masayuki; Wakabayashi, Tatsuro; and Tsunoda, Kouichi, to Oiles Industry Co., Ltd. Method of manufacturing wound bush bearing with notch-free flange and mold assembly for manufacturing the same. 4,638,538, Cl. 29-149.50C.

Kohler, Alfred; Schneider, Theodor; and Schubert, Karl F., to SWF Auto-Electric GmbH. Windshield wiper motor. 4,639,065, Cl. 339-119.00R.

Kohmoto, Michio: *See*—
Tajiri, Kazuhiro; Kohmoto, Michio; Saito, Kiyoshi; and Takahira, Hitoshi, 4,639,476, Cl. 523-213.000.

Koichi, Yasushi: *See*—
Murai, Kazuo; and Koichi, Yasushi, 4,639,117, Cl. 355-14.00R.

Koike, Akira, to Daishoku Kako Kabushiki Kaisha. Combined knife and slicer. 4,638,561, Cl. 30-284.000.

Koike, Kazuyoshi; and Tahara, Yasuteru, to Mitsubishi Rayon Co., Ltd. Inspection apparatus for optical fiber assembly. 4,639,130, Cl. 356-73.100.

Koike, Mikio: *See*—
Hanyu, Susumu; Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, 4,638,751, Cl. 112-254.000.

Koito Seisakusho Co., Ltd.: *See*—
Miyazawa, Kenji, 4,639,839, Cl. 362-64.000.

Kojima, Shigeru: *See*—
Urabe, Tetsuo; and Kojima, Shigeru, 4,639,722, Cl. 340-784.000.

Kojima, Yoshikazu: *See*—
Namiki, Masayuki; Kamiya, Masaaki; Kojima, Yoshikazu; and Tanaka, Kojiro, 4,639,755, Cl. 357-28.000.

Kokubo, Tadayoshi: *See*—
Yoshida, Tetsuo; and Kokubo, Tadayoshi, 4,639,416, Cl. 430-567.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Yamaguchi, Hirohisa; and Yamada, Kazuo, 4,639,778, Cl. 358-135.000.

Kokusan Kinzoku Kogyo Kabushiki Kaisha: *See*—
Sato, Hidekazu, 4,638,882, Cl. 180-287.000.

Kolonia, Robert A. Tool handle. 4,639,029, Cl. 294-57.000.

Komatsu, Masao; and Fujita, Hiroshi, to Osaka University. Process for preparing amorphous phases of intermetallic compounds by a chemical reaction. 4,639,363, Cl. 423-644.000.

Komatsu, Tsunetoshi: *See*—
Nakamura, Shin; Hikino, Keiji; Kaji, Shinichi; and Komatsu, Tsunetoshi, 4,638,573, Cl. 34-82.000.

Komp, Hermann-Josef, to Kloeckner-Humboldt-Deutz AG. Device for the cushioned mounting of a tractor cab. 4,638,878, Cl. 180-89.130.

Konabe, Kazuo: *See*—
Cope, Charles S.; Kitagawa, Katsunosuke; and Konabe, Kazuo, 4,639,337, Cl. 260-408.000.

Kondo, Akihiro; Tsushima, Rikio; and Sumida, Yuzo, to Kao Corporation. Dispersion stabilizer for water-in-oil suspension polymerization. 4,639,491, Cl. 524-801.000.

Kondo, Tatsunori: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,706, Cl. 84-1.010.
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,709, Cl. 84-1.190.

Konishiroku Photo Industry Co., Ltd.: *See*—
Honda, Chika; Suzuki, Akio; Machida, Katsutoshi; and Iwata, Masatoshi, 4,639,417, Cl. 430-567.000.
Itoh, Toyotsugu; and Muramatsu, Toshio, 4,639,072, Cl. 350-6.800.
Kaneko, Yutaka; Kimura, Toshihiko; and Kadokura, Kenji, 4,639,415, Cl. 430-558.000.
Mochizuki, Yoshihara; Goto, Sohei; Yagi, Toshihiko; Yamazaki, Katsumasa; and Michiue, Kenji, 4,639,410, Cl. 430-506.000.

Koomey: *See*—
Jones, Marvin R.; and Helfer, Paul E., 4,638,972, Cl. 251-1.300.

Kopecky, Ivyl D., to Haybuster Manufacturing, Inc. Applicator and grain drill shank. 4,638,748, Cl. 111-7.000.

Koper, James G.; and Ljung, Bo H. G., to Singer Company, The. Retainer for electrically fired getter. 4,639,231, Cl. 445-31.000.

Korte, Gerald A. Motorized fishing device and method. 4,638,585, Cl. 43-26.100.

Koseki, Yasuo; Yamada, Akira; Kurokawa, Hideki; Matsuzaki, Harumi; Ebara, Katsuya; and Takahashi, Sankichi, to Hitachi, Ltd. Heat storing apparatus. 4,638,646, Cl. 62-478.000.

Kosley, Raymond W., Jr.; and Cherill, Robert J., to Hoechst-Roussel Pharmaceuticals Inc. Labdane compounds, pharmaceutical compositions and use. 4,639,443, Cl. 514-222.000.

Kosley, Raymond W., Jr.; and Cherill, Robert J., to Hoechst-Roussel Pharmaceuticals Inc. Aminoacyllabdanes, pharmaceutical compositions and use. 4,639,446, Cl. 514-222.000.

Kossett, John A., to Reell Precision Manufacturing Corp. Simplified method of securing the clutch spring to the torque input drum of a spring clutch, and resulting mechanism. 4,638,899, Cl. 192-81.00C.

Kosuge, Yutaka: *See*—
Kitagawa, Tadao; Kosuge, Yutaka; and Noda, Yoichiro, 4,639,713, Cl. 340-63.000.

Kotecki, Carl A.: *See*—
Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., 4,639,631, Cl. 310-344.000.

Kousek, Heinz, to Hilti Aktiengesellschaft. Motor driven hand-held device containing a displacement mass. 4,638,870, Cl. 173-12.000.

Kowa Co., Ltd.: *See*—
Fujii, Setsuro; Yokoyama, Touru; Ikegaya, Kouji; Yokoo, Nobuo; and Nagakura, Masahiko, 4,639,435, Cl. 514-11.000.

Kowatsch, Ulrich: *See*—
Scheck, Georg; Bogner, Martin; Schmidt, Manfred; and Kowatsch, Ulrich, 4,639,010, Cl. 280-615.000.

Koyama, Mitsuhiro: *See*—
Kato, Yasuhiro; and Koyama, Mitsuhiro, 4,639,838, Cl. 362-33.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Forner, Siegfried; Katscher, Erich; and Ring, Stefan, 4,639,351, Cl. 376-310.000.
Redmann, Eckhard, 4,638,674, Cl. 73-863.120.

Kramer, Charles J.: *See*—
Yip, Kwok-leung; Araghi, Mehdi N.; Daniele, Joseph J.; Banton, Martin E.; Kramer, Charles J.; and Ritter, Joachim A., 4,639,073, Cl. 350-6.800.

Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; Reinecke, Paul; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Heterocyclo-hydroxyalkyl-azolyl derivatives and use as fungicides. 4,639,462, Cl. 514-383.000.

Kransco Manufacturing, Inc.: *See*—
Harris, Timothy S.; and Harrod, Lawrence R., 4,639,646, Cl. 318-139.000.

Krantz, Leonard A., Jr.: *See*—
Mikolaicyk, John H.; and Krantz, Leonard A., Jr., 4,639,076, Cl. 350-96.200.

Kraus, Gabriella: *See*—
Dierichs, Wolfgang; Gierenz, Gerhard; and Kraus, Gabriella, 4,639,475, Cl. 523-164.000.

Krause, Hans P.: *See*—
Junge, Bodo; Krause, Hans P.; Muller, Lutz; and Puls, Walter, 4,639,436, Cl. 514-24.000.

Krause, Joachim; Romer, Michael; and Weber, Georg, to Merck Patent Gesellschaft mit beschrankter Haftung. Thienothiophene derivatives. 4,639,328, Cl. 252-299.610.

Krause, Kenneth W.: *See*—
Day, Chia P.; Krause, Kenneth W.; Whitcomb, Louis L.; and Horn, Berthold K. P., 4,639,878, Cl. 364-513.000.

Kreh, Robert P.; and Spotnitz, Robert M., to W. R. Grace & Co. Oxidation of organic compounds using ceric ions in aqueous methanesulfonic acid. 4,639,298, Cl. 204-59.00R.

Kretschmer, Horst: *See*—
Buthe, Theo; Geisthoff, Hubert; Kretschmer, Horst; Mikeska, Felix; and Post, Alexander, 4,639,163, Cl. 403-322.000.

Krettenauer, Gustav; and Kiwitz, Heinz, to Daimler-Benz Aktiengesellschaft. Self-propelling vehicle with two axle units cantilevered together. 4,639,008, Cl. 280-405.00R.

Kriechbaum, Gerhard: *See*—
Gunter, Heinz; Kriechbaum, Gerhard; Krojer, Hubert; Matecki, Rudolf; and Spintzyk, Johannes, 4,638,962, Cl. 244-203.000.

Krishna, Surinder, to Fairchild Semiconductor Corporation. Method of making precision high-value MOS capacitors. 4,639,274, Cl. 148-1.500.

Kroening, Terry R.: *See*—
Randar, Magnus; and Kroening, Terry R., 4,638,904, Cl. 198-468.200.

Krogh, Steven B.; and Lloyd, Adam J. P., to Boeing Company, The. Apparatus and methods for providing rapid protection from accelerative forces experienced by aircraft crew members. 4,638,791, Cl. 128-1.00A.

Krojer, Hubert: *See*—
Gunter, Heinz; Kriechbaum, Gerhard; Krojer, Hubert; Matecki, Rudolf; and Spintzyk, Johannes, 4,638,962, Cl. 244-203.000.

Kronberger, Leonard J., to Chrysler Motors Corporation. Spark shield and inlet air vent for an ignition distributor. 4,639,560, Cl. 200-19.00R.

Kronogard, Clas O.: *See*—
Kronogard, Sven O., deceased; Linden, Allen, administrator; Kronogard, Clas O.; and Kronogard, Hakan, 4,638,637, Cl. 60-718.000.

Kronogard, Hakan: *See*—
Kronogard, Sven O., deceased; Linden, Allen, administrator; Kronogard, Clas O.; and Kronogard, Hakan, 4,638,637, Cl. 60-718.000.

Kronogard, Sven O., deceased; Linden, Allen, administrator; Kronogard, Clas O.; and Kronogard, Hakan, to AB Volvo. Vehicle propulsion plant. 4,638,637, Cl. 60-718.000.

Kroupa, Petr: *See*—
Zverina, Karel; Tluchor, Denek; Szabo, Josef; Polidor, Jaromir; and Kroupa, Petr, 4,639,570, Cl. 219-121.0PP.

Krouse, Jere L.: *See*—
Baumgardner, Terry A.; Krouse, Jere L.; and Wild, Alan G., 4,639,200, Cl. 418-48.000.

Kubach, Hans; and Rupp, Hartmann, to Robert Bosch GmbH. Arrangement for rapid switching of an electromagnetic load. 4,639,822, Cl. 361-155.000.

Kubick, Frederick, to United Technologies Corporation. Switchable bandwidth filter. 4,639,093, Cl. 350-388.000.

Kubo, Motonobu, to Sanyo-Kokusaku Pulp Company, Limited. Resin compositions curable by active energy rays. 4,639,500, Cl. 526-301.000.

Kubota, Akira: *See*—
Wanibuchi, Hiroshi; and Kubota, Akira, 4,638,704, Cl. 83-628.000.

Kubota, Kazufumi: *See*—
Kogane, Mikio; Suzuki, Kenji; Kito, Eiichi; Kubota, Kazufumi; and Tokuda, Kanji, 4,639,118, Cl. 355-29.000.

Kuenzel, Rolf: *See*—
Grenzendoerfer, Dietmar; Wierzgon, Achim; Mueller, Gerhard; Erth, Dieter; Guenther, Ludwig; and Kuenzel, Rolf, 4,638,647, Cl. 66-84.00A.

Kugele, Thomas G.: *See*—
Gilmore, Dennis W.; and Kugele, Thomas G., 4,639,273, Cl. 106-281.00N.

Kugioka, Michihiro, to Canon Kabushiki Kaisha. Lens barrel in which motor capable of selecting stepping drive or brushless drive is provided. 4,639,084, Cl. 350-255.000.

Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., to William H. Rorer, Inc. Benzocyclobutene aminoalkylene ethers and thioethers, pharmaceutical compositions and use. 4,639,442, Cl. 514-212.000.

Kujawa, Stephen M.; and Simon, Melvin H. Compact high volume point of use instantaneous water heating system. 4,638,944, Cl. 237-8.00R.

KUKA Schweissanlagen Roboter GmbH: *See—*
Kellner, Roman; Mayr, Georg; Proksch, Karl-Heinz; and Pockl, Franz, 4,638,902, Cl. 198-345.000.
Kulikauskas, Joseph A., to Emhart Industries, Inc. Glassware forming production monitor. 4,639,263, Cl. 65-158.000.
Kumagai, Naotake: *See—*
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,639,014, Cl. 280-707.000.
Kunkle, Richard P.: *See—*
Jackovitz, John F.; and Kunkle, Richard P., 4,639,401, Cl. 429-30.000.
Kuno, Hiroshi: *See—*
Ueno, Hideo; Kuno, Hiroshi; and Hamabe, Yoshifumi, 4,639,151, Cl. 400-63.000.
Kuo, Charles C. Y., to CTS Corporation. Thick film resistive paint and resistors made therefrom. 4,639,391, Cl. 428-210.000.
Kuperus, John H. Method of preparing radionuclide doses. 4,638,809, Cl. 128-653.000.
Kurami, Kunihiko: *See—*
Takahashi, Tohru; and Kurami, Kunihiko, 4,639,652, Cl. 318-568.000.
Kuraray Co., Ltd.: *See—*
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 4,639,471, Cl. 521-172.000.
Kurihara, Haruki; Sagara, Minoru; Matumoto, Kenji; and Tamura, Hideo, to Kabushiki Kaisha Toshiba. Semiconductor laser. 4,639,925, Cl. 372-46.000.
Kurihara, Sadao: *See—*
Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.
Kurkela, Kauko O. A.: *See—*
Karjalainen, Arto J.; and Kurkela, Kauko O. A., 4,639,464, Cl. 514-396.000.
Kuroda, Akio: *See—*
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Kuroda, Tokuyuki: *See—*
Muto, Kenji; Sugaya, Toru; Kuroda, Tokuyuki; Hashimoto, Tamotsu; Yamada, Koji; Nakamizo, Nobuhiro; and Watanabe, Minoru, 4,639,522, Cl. 546-194.000.
Kuroda, Yasuo, to Canon Kabushiki Kaisha. Image read-out apparatus with light source driving means. 4,639,608, Cl. 250-578.000.
Kurokawa, Hideki: *See—*
Koseki, Yasuo; Yamada, Akira; Kurokawa, Hideki; Matsuzaki, Harumi; Ebara, Katsuya; and Takahashi, Sankichi, 4,638,646, Cl. 62-478.000.
Kurokawa, Kazuo; and Tanaka, Tadashi, to Sanyo Denki Co. Ltd. High gain feedback control system. 4,639,854, Cl. 364-157.000.
Kuroki, Kazuo, to Fuji Electric Co., Ltd. Control circuit for switching transistors. 4,639,823, Cl. 361-159.000.
Kurr, Klaus: *See—*
Idigkeit, Werner; Kurr, Klaus; and Ticks, Gerd-Heinz, 4,638,983, Cl. 267-140.100.
Kusaka, Satoshi, to Sony Corporation. Image input apparatus. 4,639,790, Cl. 358-293.000.
Kuwabara, Yoshiharu; and Hamada, Hiroyoshi, to Mitutoyo Mfg. Co., Ltd. Scanning ray beam generator for optical measuring device. 4,639,141, Cl. 356-387.000.
Kydonieus, Agis F.: *See—*
Von Kohorn, Henry; and Kydonieus, Agis F., 4,639,393, Cl. 428-304.400.
Kyocera Corporation: *See—*
Nagato, Yoshio; and Soroi, Kazunori, 4,639,426, Cl. 501-96.000.
Kyodo News Service: *See—*
Isogai, Masaki; and Kawahara, Atsushi, 4,639,787, Cl. 358-214.000.
Kyowa Hakko Kogyo Co., Ltd.: *See—*
Muto, Kenji; Sugaya, Toru; Kuroda, Tokuyuki; Hashimoto, Tamotsu; Yamada, Koji; Nakamizo, Nobuhiro; and Watanabe, Minoru, 4,639,522, Cl. 546-194.000.
Tokuno, Sanji, 4,638,642, Cl. 62-498.000.
L. & C. Steinmuller GmbH: *See—*
Grethe, Klaus, 4,639,209, Cl. 431-4.000.
La Telemecanique Electrique: *See—*
Gaude, Maurice, 4,639,616, Cl. 307-270.000.
Petit, Pierre; and Periot, Jean-Marie, 4,639,668, Cl. 324-208.000.
Laar, Erwin: *See—*
Viehrig, Wolfgang; Wagner, Karl-Heinz; and Laar, Erwin, 4,638,936, Cl. 226-191.000.
LaBelle, Gary E.; and Ask, David T., to Minnesota Mining and Manufacturing Company. Resistively heated photothermographic media on vesicular substrate. 4,639,412, Cl. 430-523.000.
Labelle, Gaston: *See—*
Desrosiers, Wilfrid; and Labelle, Gaston, 4,638,590, Cl. 43-88.000.
LaChance, Raymond H.: *See—*
Shand, J. Richard; and LaChance, Raymond H., 4,639,704, Cl. 335-255.000.
Lacour, Alain, deceased: *See—*
Platel, Alain Y.; Bourgery, Guy R.; and Lacour, Alain, deceased, 4,639,452, Cl. 514-252.000.
Lai, John T.; and Son, Pyong N., to BFGoodrich Company, The. Polyalkylenepolyamine having pendant substituted oxo-piperazinyl-triazines and UV light stabilized compositions. 4,639,479, Cl. 524-100.000.
Lake Center Industries: *See—*
Whetstone, Wayne L.; and Tryan, Fredrick W., 4,638,640, Cl. 62-139.000.
Lalancette, Jean-Marc; and Belanger, Germain, to Hydro-Quebec. Process for the dehalogenation of polyhalogenated hydrocarbon containing fluids. 4,639,309, Cl. 208-262.000.
Lam, William Y., to Ethyl Petroleum Additives, Inc. Lubricating compositions. 4,639,324, Cl. 252-48.600.
Lam, Y. K. Tony: *See—*
Huang, Leeyuan; and Lam, Y. K. Tony, 4,639,466, Cl. 514-456.000.
Lamb, Mark E.: *See—*
Hansen, Loren F.; and Lamb, Mark E., 4,638,867, Cl. 172-22.000.
Lambelin, Georges E.: *See—*
Roncucci, Romeo; Gillet, Claude L.; Cordi, Alexis H.; Martens, Mark A.; Roba, Joseph L.; Niebes, Paul J.; Lambelin, Georges E.; and Van Dorsser, William R., 4,639,468, Cl. 514-620.000.
Lambrecht, Emiel Y.: *See—*
DeBin, Rene F.; and Lambrecht, Emiel Y., 4,638,702, Cl. 83-509.000
Lancelot, Pierre, to Eurofours. Device for mounting a glass pane on an oven door. 4,638,788, Cl. 126-198.000.
Landsberger, Kurt. Raised superimposed toilet seat and bidet-like device in combination. 4,638,514, Cl. 4-239.000.
Landwehr, Ulrich M. Acquiring measurements of an object by means of photography. 4,639,107, Cl. 354-77.000.
Lang, Jerry M.: *See—*
Lively, Gordon R.; and Lang, Jerry M., 4,638,676, Cl. 74-31.000.
Lange, Gerd, to Fixtures Manufacturing Corporation. Chair back arrangement. 4,639,042, Cl. 297-444.000.
Lankamp, Herman D.: *See—*
Bras, Johan Chr. M.; and Lankamp, Herman D., 4,639,149, Cl. 384-477.000.
Lantzsch, Reinhard; and Reubke, Karl-Julius, to Bayer Aktiengesellschaft. Process for the preparation of β-hydroxyethyl-(1,2,4-triazole) derivatives. 4,639,527, Cl. 548-262.000.
Laporte, Dorothy: *See—*
Rahn, Melanie H.; and Braun, Jane E., 4,639,226, Cl. 434-433.000.
Larrauri, Antonio, administrator: *See—*
Celino, Martin S., deceased; Celino, Cecilio, administrator; and Larrauri, Antonio, administrator, 4,639,467, Cl. 514-468.000.
Larson, Craig A.: *See—*
Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., 4,639,207, Cl. 425-503.000.
Larson, Eldon E. Latch integral with latched apparatus. 4,639,249, Cl. 604-198.000.
Laser Applications Limited: *See—*
Hamilton, David C., 4,639,740, Cl. 346-76.00L.
Lasers for Medicine: *See—*
Daly, Richard T.; and Trokel, Stephen L., 4,638,801, Cl. 128-303.100.
Laude, David P., to Harris Corporation. Differential input stage for the realization of low noise and high precision bipolar transistor amplifiers. 4,639,684, Cl. 330-259.000.
Lauer, Manfred: *See—*
Roeser, Karl; Lauer, Manfred; Sauter, Hubert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,639,447, Cl. 514-222.000.
Laurel Bank Machines Co., Ltd.: *See—*
Arikawa, Junichi; Chiba, Hiroshi; Miyazaki, Osamu; and Osanai, Masatoshi, 4,639,582, Cl. 235-379.000.
Laurer, Gerard R., to New York University. Radiation detector. 4,639,600, Cl. 250-363.00S.
Lautenschlager, Horst, to Karl Lautenschlager GmbH & Co. KG. Drawer guide. 4,639,145, Cl. 384-19.000.
Lauterbach-Dammler, Inge: *See—*
Conradty, Claudio; Zollner, Dieter; Lauterbach-Dammler, Inge; and Taube, Thomas, 4,639,928, Cl. 373-93.000.
Lawrence, Donald R., to Wagenhals, Fred W. Exercise vehicle. 4,639,007, Cl. 280-234.000.
Lawrence, Robert: *See—*
Leyden, Richard N.; and Lawrence, Robert, 4,639,290, Cl. 156-644.000.
Lazzari, Jean-Pierre, to Commissariat a l'Energie Atomique. Process for producing a magnetic read - write head and head obtained by this process. 4,639,289, Cl. 156-643.000.
LeBlanc, Richard S., to General Motors Corporation. Handwheel assembly for weapon system. 4,638,715, Cl. 89-41.120.
Leborgne, Jose : *See—*
Bouvot, Jean-Francois; and Leborgne, Jose , 4,638,723, Cl. 92-48.000.
Leconte, Michel: *See—*
Basset, Jean M. M.; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, 4,639,429, Cl. 502-117.000.
Lee, Anthony J. J., to National Research Development Corporation. Spark plug. 4,639,635, Cl. 313-123.000.
Lee, Charles M.; and Murphy, Bernard T., to AT&T Bell Laboratories. Trimmable loading elements to control clock skew. 4,639,615, Cl. 307-269.000.
Lee, David A.: *See—*
Taylor, Douglas P.; and Lee, David A., 4,638,895, Cl. 188-280.000.
Lee, Fu-Ming, to Phillips Petroleum Company. Catalytic cracking process. 4,639,308, Cl. 208-100.000.
Lee, James, to Cole, Willis S.; Lee, James; Wortman, Rob; and Frabel, Claude. Chambered headrest mounting for stereophonic loudspeakers. 4,638,884, Cl. 181-141.000.

LeFrancier, Pierre: *See—*
Audibert, Francoise; Carelli, Claude; Chedid, Louis; LeFrancier, Pierre; Level, Michel; and Choay, Jean, 4,639,512, Cl. 530-313.000.
LeGault, Robert H.; Jezzi, Arrigo D.; Milner, James D.; Oakley, Barbara; and Franke, Paul G., to Kimberly-Clark Corporation. Three-dimensional sanitary napkin having absorbent material contoured on the baffle side. 4,639,254, Cl. 604-385.00R.
Leineweber, Gunter; Warnecke, Rolf; and Ruhmer, Heinz, to Volkswagenwerk Aktiengesellschaft. Unbalanced hydraulic amplifier valve assembly. 4,638,719, Cl. 91-373.000.
Leising, John O.: *See—*
Reynes, Enrique G.; and Leising, John O., 4,639,517, Cl. 544-85.000.
Lelu, Andre E.; Grignon, Jean R.; Gonthier, Bruno F.; and Tauzia, Jean-Michel, to Societe Nationale des Poudres et Explosifs. Combustion inhibitor based on an aliphatic polyurethane elastomer for a propellant, and block coated with this inhibitor. 4,638,735, Cl. 102-290.000.
Lemieux, George E.; Lewicki, Reginald T.; and Clauss, Julius A., to Ford Motor Company. Transaxle for a vehicle driveline. 4,638,686, Cl. 74-688.000.
Lemke, Kuno: *See—*
Buchner, Norbert; Lemke, Kuno; and Vogele, Gunter, 4,638,925, Cl. 222-21.000.
Lenasson, Carl-Gustaf: *See—*
Hasselfof, Ake; Lenasson, Carl-Gustaf; and Nordhall, Lennart, 4,638,540, Cl. 29-168.000.
Lenk, Erich: *See—*
Schippers, Heinz; and Lenk, Erich, 4,638,955, Cl. 242-18.0PW.
Leone, David A.: *See—*
Grunert, Kurt A.; Walker, Roger E.; Paton, Charles R.; and Leone, David A., 4,639,564, Cl. 200-144.00R.
Lerat, Bernard, to Commissariat a l'Energie Atomique. Optical surface proximity measuring device and its application to the plotting of the profile of a surface. 4,639,140, Cl. 356-376.000.
Leukel, Bernd: *See—*
Neidig, Arno; Leukel, Bernd; and Bergmann, Lutz, 4,639,759, Cl. 357-74.000.
Level, Michel: *See—*
Audibert, Francoise; Carelli, Claude; Chedid, Louis; LeFrancier, Pierre; Level, Michel; and Choay, Jean, 4,639,512, Cl. 530-313.000.
Lever Brothers Company: *See—*
Czempik, Klaus; and Stremmel, Gerd, 4,639,326, Cl. 252-91.000.
Leverance, Robert A.; and Longas, Socrates A., to United States of America, Navy. Near ultrasonic pattern comparison intrusion detector. 4,639,902, Cl. 367-93.000.
Leverberg, Siegfried; and Hofmann, Manfred, to Hydrotechnik GmbH. Measurement coupling for fluidic systems. 4,638,668, Cl. 73-866.500.
Leversee, Garrett J. Key decoding device for automobiles. 4,638,567, Cl. 33-540.000.
Lew, Hyok S. Partially evacuated solar still. 4,639,293, Cl. 202-205.000.
Lewandowski, Edward F.; Cassidy, Dale A.; and Sommer, Robert G., to United States of America, Energy. Method of beam welding metallic parts together and apparatus for doing same. 4,639,571, Cl. 219-121.0EC.
Lewandowski, Thomas: *See—*
Steere, Robert; and Lewandowski, Thomas, 4,638,601, Cl. 51-165.710.
Lewicki, Reginald T.: *See—*
Lemieux, George E.; Lewicki, Reginald T.; and Clauss, Julius A., 4,638,686, Cl. 74-688.000.
Lewis, Gary K., to Litton Systems, Inc. Tunable, dielectric-resonator-stabilized oscillator and method of tuning same. 4,639,690,. Cl. 331-96.000.
Lewis, Thomas E.: *See—*
Trinh, Lahn T.; and Lewis, Thomas E., 4,638,780, Cl. 123-416.000.
Leybold-Heraeus GmbH: *See—*
Frings, Heinz; Kabelitz, Hans-Peter; and Ronthaler, Karl-Heinz, 4,639,199, Cl. 418-3.000.
Henzler, Martin, 4,639,602, Cl. 250-396.00R.
Stenzel, Otto, 4,639,567, Cl. 219-10.430.
Leyden, Richard N.; and Lawrence, Robert, to Hughes Aircraft Company. Methods for selectively removing adhesives from polyimide substrates. 4,639,290, Cl. 156-644.000.
Liao, T. K., to Nihon Kohsakuyu Company, Ltd. Water soluble metal-working fluids. 4,639,323, Cl. 252-32.500.
Licentia Patent-Verwaltungs-GmbH: *See—*
Straube, Axel; and Loos, Hans, 4,638,960, Cl. 244-134.00D.
Liebig, Lothar: *See—*
Wingler, Frank; Koch, Otto; Doering, Joachim; Ott, Karl-Heinz; and Liebig, Lothar, 4,639,473, Cl. 525-83.000.
Lien, Charles: *See—*
Gallios, George C.; and Lien, Charles, 4,639,844, Cl. 363-17.000.
Lienhard, Paul: *See—*
Cseh, Georg; and Lienhard, Paul, 4,639,477, Cl. 524-83.000.
Lietzke, Heinz: *See—*
Baumers, Hans; Lietzke, Heinz; and Schulte, Winfred, 4,638,877, Cl. 180-21.000.
Lim, Hyun S., to Du Pont de Nemours, E. I., and Company. Pump shaft stirrer for grid melter. 4,639,205, Cl. 425-200.000.
Limb, David I.: *See—*
Duckett, Melvyn; and Limb, David I., 4,639,257, Cl. 55-16.000.
Lin, Ying-wei, to Xerox Corporation. Development apparatus with paper debris remover. 4,639,115, Cl. 355-3.0DD.
Linares, Hubert, to Rhone-Poulenc Agrochimie. Deodorized compositions based on organothiophosphorus compounds. 4,639,538, Cl. 558-71.000.
Linde Aktiengesellschaft: *See—*
Norskau, Jurgen; and Richter, Rudolf, 4,639,195, Cl. 417-216.000.
Lindeman, Richard J.; and Rachwalski, Thaddeus M., to TRW Inc. Connector construction for a PC board or the like. 4,639,056, Cl. 339-17.0LC.
Linden, Allen, administrator: *See—*
Kronogard, Sven O., deceased; Linden, Allen, administrator; Kronogard, Clas O.; and Kronogard, Hakan, 4,638,637, Cl. 60-718.000.
Lindgren, Nils E., to SSAB Svenskt Stal AB. Valve arrangement for unloading liquid flow at a non-return valve. 4,638,831, Cl. 137-117.000.
Lindsay, William R. Luminescent fishing lures. 4,638,584, Cl. 43-17.600.
Lindstrom, Fred B., to AB Electrolux. Hand-actuated engine starter. 4,638,775, Cl. 123-185.00G.
Linkowski, William J., to Pitney Bowes Inc. Diagnostic control keyboard for a mailing machine. 4,639,918, Cl. 371-20.000.
Lionnet, Richard, to Raychem Corporation. Heat recoverable connector. 4,639,060, Cl. 339-30.000.
Lipton Manufacturing Corporation: *See—*
Kobayashi, Hisamine; and Izuhara, Katsuhiro, 4,638,600, Cl. 51-164.200.
Litton Systems, Inc.: *See—*
Lewis, Gary K., 4,639,690, Cl. 331-96.000.
Littwin, Kenneth M.; Armond, Joseph A.; Buky, Gabriel R.; and Patrick, Fred, to Electro-Matic Products Co. Degausser/demagnetizer. 4,639,821, Cl. 361-151.000.
Liu, King, to Schwinn Bicycle Company. Chainguard. 4,639,240, Cl. 474-144.000.
Liu, Nan-I, to General Electric Company. Flame retardant elastomeric compositions. 4,639,486, Cl. 524-409.000.
Lively, Gordon R.; and Lang, Jerry M., to Rota-Flex Corporation. Reciprocating drive mechanism with positive pinion-to-rack gear engagement. 4,638,676, Cl. 74-31.000.
Livnat, Aminadav: *See—*
Glatt, Ilana; Livnat, Aminadav; and Kafri, Oded, 4,639,132, Cl. 356-124.500.
Ljung, Bo H. G.: *See—*
Koper, James G.; and Ljung, Bo H. G., 4,639,231, Cl. 445-31.000.
Lloyd, Adam J. P.: *See—*
Krogh, Steven B.; and Lloyd, Adam J. P., 4,638,791, Cl. 128-1.00A.
Lockheed Missiles & Space Company, Inc.: *See—*
Howard, Darryl A.; and Shen, Lawrence Y. L., 4,639,669, Cl. 324-239.000.
Loewe, Heinz: *See—*
Rosner, Manfred; Loewe, Heinz; Duwel, Dieter; and Kirsch, Reinhard, 4,639,463, Cl. 514-395.000.
Lohman, Oskar E., to AB Trama. Brake device for a cycle. 4,638,890, Cl. 188-24.170.
Long, John V.; and Gagliani, John. Forming techniques for shaping polyimide foams. 4,639,343, Cl. 264-45.500.
Longas, Socrates A.: *See—*
Leverance, Robert A.; and Longas, Socrates A., 4,639,902, Cl. 367-93.000.
Loo, Johnson, to International Computers Limited. Pipelined data processing apparatus. 4,639,866, Cl. 364-200.000.
Loomis, Russell M., to Railcar Specialties, Inc. Method of reinforcing a covered hopper car hatch. 4,638,743, Cl. 105-377.000.
Looney, John H., to Xerox Corporation. Document registration system. 4,639,121, Cl. 355-14.00R.
Loos, Hans: *See—*
Straube, Axel; and Loos, Hans, 4,638,960, Cl. 244-134.00D.
L'Oreal: *See—*
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,638,822, Cl. 132-7.000.
Morane, Bruno P., 4,638,927, Cl. 222-83.000.
Losenhausen Maschinenbau AG & Co. Kommanditgesellschaft: *See—*
Baumers, Hans; Lietzke, Heinz; and Schulte, Winfred, 4,638,877, Cl. 180-21.000.
Lovas, Kurt; and Deisinger, Franz, to Schubert & Salzer Maschinenfabrik. Process and apparatus for stopping and restarting an open-end spinning machine with a plurality of spinning devices. 4,638,625, Cl. 57-263.000.
Lowe, Frank J.: *See—*
Pithouse, Kenneth B.; Jones, Thomas P. H.; Lowe, Frank J.; and Skipper, Richard S., 4,639,545, Cl. 174-36.000.
Loy, Fernand R., to U.S. Philips Corporation. Collimator for coordinating two optical devices. 4,639,082, Cl. 350-172.000.
LTV Energy Products Company: *See—*
Johnson, Phil E.; and Brock, Robert K., 4,638,726, Cl. 92-241.000.
Lu, Guey T.: *See—*
Murphy, Colin N.; and Lu, Guey T., 4,639,899, Cl. 365-230.000.
Lu, Nicky C.: *See—*
Goodwin, John J.; and Lu, Nicky C., 4,639,622, Cl. 307-482.000.
Lubrano, Maurizio, to Centro Sperimentale Metallurgico S.p.A. Device for control of roll camber in a rolling mill. 4,638,654, Cl. 72-201.000.
Lucky, Lloyd P. Magnetic utensil-holder. 4,638,786, Cl. 126-24.000.
Ludwig, Richard H.; and Mikhail, Joanne E., to Westinghouse Electric Corp. Elevator system. 4,638,889, Cl. 187-29.00R.
Luk Lamellen und Kupplungsbau GmbH: *See—*
Maucher, Paul, 4,638,684, Cl. 74-574.000.

Lumen Electronics Corporation: *See*—
Wong, John K. Y.; and Wong, Simon K. Y., 4,638,666, Cl. 73-431.000.

Lunardi, Gerhard, to Inventio AG. Step of an escalator or the like equipped with at least one safety device. 4,638,901, Cl. 198-323.000.

Luoma, Robert P., II; and Willis, Frank M., to Du Pont de Nemours, E. I., and Company. Plasmapheresis filtration module having improved sealing means. 4,639,317, Cl. 210-433.200.

Lust, Sigmund: *See*—
Sehring, Richard; Buck, Wolfgang; Prokic-Immel, Ricarda; and Lust, Sigmund, 4,639,438, Cl. 514-129.000.

Lutron Electronics Co., Inc.: *See*—
Kirby, David, 4,639,819, Cl. 361-115.000.

Lybecker, Robert W., to Bomar Corporation, Inc. Modular automatic gate opener. 4,638,597, Cl. 49-340.000.

Lycan, Jennings, to Service Machine Co. Reversing switch. 4,639,558, Cl. 200-1.00V.

Lysaght, Michael J.: *See*—
Schmidt, Baerbel; Samtleben, Walter; and Lysaght, Michael J., 4,639,243, Cl. 604-6.000.

M.A.N.-Roland Druckmaschinen AG.: *See*—
Zingher, Oded, 4,639,881, Cl. 364-521.000.

Maan, Nicolaus, to U.S. Philips Corporation. Device for measuring the static lives of optical fibers. 4,639,131, Cl. 356-73.100.

MacDuffee, Richard J. Collapsible support frame with receptacle. 4,638,967, Cl. 248-97.000.

Machida, Katsutoshi: *See*—
Honda, Chika; Suzuki, Akio; Machida, Katsutoshi; and Iwata, Masatoshi, 4,639,417, Cl. 430-567.000.

Mack, Raymond E.: *See*—
Sitabkhan, Mansur N.; and Mack, Raymond E., 4,638,894, Cl. 188-170.000.

Mackie, David R.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.

Mackles, Leonard, to Product Resources International, Inc. Aerosol foam. 4,639,367, Cl. 424-45.000.

MacLachlan, Stuart; and O'Neill Bell, Christopher, to Chloride Silent Power Ltd. Sodium sulphur cells and their manufacture. 4,638,555, Cl. 29-623.100.

Macovski, Albert, to General Electric Company. Simultaneous NMR imaging system. 4,639,671, Cl. 324-309.000.

Maeda, Kazuya; and Ishihara, Yasusuke, to Matsushita Electric Industrial Co., Ltd.; and Sano Sharyo Seisakusho Co., Ltd. Hand cart with fulcrum lever and vertically adjustable auxiliary wheels. 4,639,004, Cl. 280-5.320.

Maeda, Yoshinobu; Fujiwara, Kohji; and Naito, Takao, to Matsushita Electric Industrial Co., Ltd. Sheet holding apparatus. 4,638,985, Cl. 269-244.000.

Maejima, Takeshi; and Shiba, Kenji, to Minolta Camera Kabushiki Kaisha. Multiple projector planetarium drive system. 4,639,224, Cl. 434-286.000.

Maekawa, Hideo: *See*—
Moribe, Yoshihiro; Hayashi, Yukitaka; Maekawa, Hideo; and Tsukui, Kunitsugu, 4,639,804, Cl. 360-105.000.

Magee, Robert L., Jr.; and Traweek, Marvin B., IV, to Arlington Automatics Inc. Apparatus for blocking communication between well bore intervals. 4,638,860, Cl. 166-114.000.

Magnetics Research International Corporation: *See*—
McGee, Daniel W., 4,639,626, Cl. 310-155.000.

Magurit-Gefrierschneider GmbH: *See*—
Hager, Juergen; Vieth, Walter; and Manderla, Werner, 4,638,697, Cl. 83-356.300.

Mahanay, Joseph W.; and Savage, Lester D. Gerotor device with dual valving plates. 4,639,202, Cl. 418-59.000.

Mahle GmbH: *See*—
Ripberger, Emil; and Stuska, Gotthard, 4,638,725, Cl. 92-237.000.

Maier, Johann, to Schleicher Maschinenbau und -Vertrieb GmbH. Dowel hole drilling machine. 4,639,171, Cl. 408-89.000.

Maier, Kurt. Gear grinding machine for radial or helical spur gears. 4,638,599, Cl. 51-52.00R.

Maina, Bruno: *See*—
Ghiardo, Fiorenzo; and Maina, Bruno, 4,638,840, Cl. 139-452.000.

Makhlouf, Joseph M.; Falk, Frederick A.; and Piccirilli, Robert M., to PPG Industries, Inc. Phenolic-modified rosin esters. 4,639,492, Cl. 525-54.420.

Makihara, Katsumi; Yanagi, Kenichi; Fukushima, Takeo; Suganuma, Namio; Samejima, Ichiro; and Takahashi, Seiichi, to Mitsubishi Jukogyo Kabushiki Kaisha; and Kawasaki Steel Coporation. Cooling apparatus for metal strip. 4,638,851, Cl. 165-32.000.

Makino, Tomoatsu: *See*—
Matsui, Takeshi; Takeda, Shunichi; and Makino, Tomoatsu, 4,638,785, Cl. 123-644.000.

Makino, Yoshimi; Ochiai, Yoshitaka; Uedaira, Satoru; Hotai, Kazuhide; Aso, Koichi; and Hayakawa, Masatoshi, to Sony Corporation. Method of manufacturing an amorphous magnetic alloy. 4,639,278, Cl. 148-108.000.

Makishima, Akio; and Tani, Toshiro, to National Institute for Researches in Inorganic Materials; and Agency of Industrial Science and Technology. Functional organic-inorganic composite amorphous material and process for its production. 4,639,329, Cl. 252-501.100.

Makita Electric Works, Ltd.: *See*—
Fushiya, Fusao; Hakamata, Nobuo; Abe, Hiroyuki; and Inoue, Nobuhiro, 4,638,700, Cl. 83-467.00R.

Malard, Marcel: *See*—
Huignard, Jean-Pierre; Malard, Marcel; and de Corlieu, Guy, 4,639,091, Cl. 350-347.00V.

Malaval, Claude, to Novatome. Cover-plug for the core of a fast neutron nuclear reactor. 4,639,350, Cl. 376-290.000.

Malhotra, Satish C.: *See*—
Knight, Alan C.; and Malhotra, Satish C., 4,639,497, Cl. 526-93.000.

Mallinckrodt, Inc.: *See*—
Hoey, George B., 4,639,364, Cl. 424-9.000.
Kavka, Frank, 4,639,520, Cl. 546-45.000.

Malzkorn, Matthias, to Scharmann GmbH & Co. Horizontal drilling and milling machine. 4,638,550, Cl. 29-568.000.

Mamot, Robert M.: *See*—
Ballard, Gary W.; and Mamot, Robert M., 4,638,942, Cl. 236-10.000.

MAN Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Potel, Gerd; and Buchholz, Karl-Heinz, 4,638,742, Cl. 105-199.300.

Mancel, Patrick J. Device for spraying products, more especially, paints. 4,638,949, Cl. 239-307.000.

Manderla, Werner: *See*—
Hager, Juergen; Vieth, Walter; and Manderla, Werner, 4,638,697, Cl. 83-356.300.

Mannesmann AG: *See*—
Sebastian, Wilhelm; Nickel, Wilhelm; and Schirmag, Klaus-Peter, 4,638,655, Cl. 72-208.000.

Marcellus, Leland D. Creosote cutter mounting bracket assembly. 4,638,524, Cl. 15-249.000.

Marcus, Konrad H.; and Chu, Zooey C., to Prince Corporation. Visor with mirror with flexible sliding cover. 4,639,085, Cl. 350-283.000.

Marhoff, Paul: *See*—
Heinze, Udo; and Marhoff, Paul, 4,639,943, Cl. 378-96.000.

Mariani, Elio A.; and Skudera, William J., Jr., to United States of America, Army. Wideband saw channellizer using slanted array input transducer. 4,639,695, Cl. 333-133.000.

Marien, August M.: *See*—
Uytterhoeven, Herman J.; De Winter, Walter F.; and Marien, August M., 4,639,404, Cl. 430-115.000.

Marietta, Walter E., to Sta-Rite Industries, Inc. Apparatus for disabling an obstructed lift mechanism. 4,638,886, Cl. 187-8.490.

Marini, Michele E.: *See*—
Arotin, Robert L.; Walworth, Bryant L.; and Marini, Michele E., 4,639,268, Cl. 71-105.000.

Mario Pinto S.p.A.: *See*—
Berardo, Giuseppe, 4,639,001, Cl. 279-121.000.

Marlek, Edward. Liquid chemical applicator for treatment of a horizontal surface. 4,638,948, Cl. 239-722.000.

Marrone, Joseph: *See*—
McHale, Charles J.; Marrone, Joseph; and Watson, David, 4,639,872, Cl. 364-463.000.

Marschewski, Henry. Ring segment ship hull. 4,638,753, Cl. 114-56.000.

Marschik, David: *See*—
Shestak, Edward J.; and Marschik, David, 4,639,700, Cl. 335-6.000.

Marshall, John; and Oakey, John D., to BOC Group, PLC, The. Refrigeration method and apparatus. 4,638,638, Cl. 62-9.000.

Marshall, John; and Oakey, John D., to BOC Group, plc, The. Gas refrigeration method and apparatus. 4,638,639, Cl. 62-9.000.

Martel, Alain; and Daris, Jean-Paul, to Bristol-Myers Company. Stereocontrolled acetoxyazetidinone process. 4,639,335, Cl. 540-304.000.

Martens, Alan; and Snow, Bennie E., to Westinghouse Electric Corp. Cooldown control system for a combined cycle electrical power generation plant. 4,638,630, Cl. 60-39.182.

Martens, Mark A.: *See*—
Roncucci, Romeo; Gillet, Claude L.; Cordi, Alexis H.; Martens, Mark A.; Roba, Joseph L.; Niebes, Paul J.; Lambelin, Georges E.; and Van Dorsser, William R., 4,639,468, Cl. 514-620.000.

Martin, James M.; Brockett, William S.; Selleck, Ronald R.; and Croteau, Michael G., to Martin Marietta Corporation. Fiber-optic rotation rate sensor having dual interferometer loops. 4,639,138, Cl. 356-350.000.

Martin Marietta Corporation: *See*—
Martin, James M.; Brockett, William S.; Selleck, Ronald R.; and Croteau, Michael G., 4,639,138, Cl. 356-350.000.

Martin, Michael W., to International Computers Limited. Computer system having conversion of operation codes. 4,639,865, Cl. 364-200.000.

Martin, Robert A.: *See*—
Ackerman, Allen D.; Perkey, Conrad G.; Martin, Robert A.; and Justusson, William M., 4,638,846, Cl. 164-55.100.

Maruyama, Asao; and Miyagawa, Kohzo, to Tsubakimoto Chain Co. Automatic storing equipment. 4,639,187, Cl. 414-787.000.

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Maruzen Sewing Machine Co., Ltd.: *See*—
Mikuni, Yoshio, 4,638,750, Cl. 112-230.000.

Marzabal Martinez, Carlos, to Antonio Puig, S.A. Bottle stopper. 4,638,918, Cl. 215-295.009.

Masaki, Hisaji, to Canon Kabushiki Kaisha. Image overlay apparatus with electronic image storage. 4,639,791, Cl. 358-300.000.

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Tanaka, Kazumoto; Mashimo, Tohru; Sato, Osamu; and Kobayashi, Toyohiko, 4,639,868, Cl. 364-420.000.

Masler, William F., III; and Amjad, Zahid, to B. F. Goodrich Company, The. Process for preparing novel copolymer. 4,639,490, Cl. 524-765.000.

Massa, Sergio: *See*—
Giannetti, Anna; Massa, Sergio; and Re, Cesare, 4,638,580, Cl. 40-503.000.

Massachusetts Institute of Technology: *See*—
Chou, Stephen Y., 4,638,669, Cl. 73-517.00R.
Seyferth, Dietmar; and Yu, Yuan-Fu, 4,639,501, Cl. 528-15.000.

Mastner, Georg, to BBC Brown, Boveri & Company, Limited. Thyristor circuit for current regulation. 4,639,662, Cl. 323-343.000.

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Gunter, Heinz; Kriechbaum, Gerhard; Krojer, Hubert; Matecki, Rudolf; and Spintzyk, Johannes, 4,638,962, Cl. 244-203.000.

Mathews, Marion J., III: *See*—
Hovey, Leonard L.; Mathews, Marion J., III; and Peoples, P. Robert, 4,639,539, Cl. 558-363.000.

Mathis, Thomas C.: *See*—
Birum, Gail H.; Mathis, Thomas C.; and Stolk, Richard D., 4,639,480, Cl. 524-104.000.

Matsui, Fumio; Yanagisawa, Shuichi; Kakuta, Yoshiyuki; and Yoshizawa, Atsushi, to Pioneer Electronic Corporation. Optical recording medium. 4,639,745, Cl. 346-135.100.

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Kishi, Hajimu; Matsui, Mitsuo; and Matsuura, Hitoshi, 4,639,172, Cl. 409-80.000.

Matsui, Shingo; Ikeda, Hidetsugu; Era, Akio; and Nishimura, Sanji, to Mitsui Aluminium Co., Ltd. Process for recovering gallium from aluminum smelting dust. 4,639,355, Cl. 423-112.000.

Matsui, Takeshi; Takeda, Shunichi; and Makino, Tomoatsu, to Nippondenso Co., Ltd. Ignition system for internal combustion engines. 4,638,785, Cl. 123-644.000.

Matsumoto, Hiromichi; and Hashimoto, Ritsuo, to Omron Tateisi Electronics Company. System for controlling communication between a main control assembly and programmable terminal units. 4,639,889, Cl. 364-900.000.

Matsumoto, Katsumi: *See*—
Kobayashi, Toshiji; and Matsumoto, Katsumi, 4,639,628, Cl. 310-194.000.

Matsumoto, Seikichi; and Ikeda, Hiroyuki, to Fujitsu Limited. Light scanning apparatus. 4,639,071, Cl. 350-3.710.

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Ikeda, Hiroyuki; Matsumoto, Seikichi; Kitagawa, Shunji; Inagaki, Takefumi; and Sebata, Ichiro, 4,639,070, Cl. 350-3.710.

Matsunobu, Akira; Horishita, Sumio; and Yamada, Tetsuo, to Ton Company Ltd. Almond nut paste for beverages and desserts. 4,639,374, Cl. 426-43.000.

Matsushima, Hiroaki: *See*—
Sakazume, Akio; Yoshikawa, Hiroki; and Matsushima, Hiroaki, 4,638,643, Cl. 62-209.000.

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Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,706, Cl. 84-1.010.
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Matsushita Electric Industrial Co., Ltd.: *See*—
Inui, Isao; Hosaka, Masato; Nakamoto, Mitsuyoshi; and Okamoto, Kenji, 4,639,208, Cl. 431-1.000.
Maeda, Kazuya; and Ishihara, Yasusuke, 4,639,004, Cl. 280-5.320.
Maeda, Yoshinobu; Fujiwara, Kohji; and Naito, Takao, 4,638,985, Cl. 269-244.000.
Mori, Hitoshi, 4,639,777, Cl. 358-120.000.
Murata, Yoshitaka; Hatano, Tsuyoshi; and Ohkubo, Hideo, 4,638,526, Cl. 15-367.000.
Ueno, Shigeto; Ohnishi, Masanori; Nakamura, Yuji; and Tanaka, Shinichi, 4,639,814, Cl. 360-130.100.
Yamada, Takahiro, 4,639,753, Cl. 357-22.000.

Matsuura, Hirokazu, to Sharp Kabushiki Kaisha. Independent dual electrophotographic copying machine. 4,639,120, Cl. 355-14.00R.

Matsuura, Hitoshi: *See*—
Kishi, Hajimu; Matsui, Mitsuo; and Matsuura, Hitoshi, 4,639,172, Cl. 409-80.000.

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Okazaki, Takashi; Matsu'ura, Yukio; and Saijo, Yoshihiko, 4,638,549, Cl. 29-564.400.

Matsuzaki, Harumi: *See*—
Koseki, Yasuo; Yamada, Akira; Kurokawa, Hideki; Matsuzaki, Harumi; Ebara, Katsuya; and Takahashi, Sankichi, 4,638,646, Cl. 62-478.000.

Mattel, Inc.: *See*—
Atwood, Robert W., 4,639,234, Cl. 446-327.000.

Matumoto, Kenji: *See*—
Kurihara, Haruki; Sagara, Minoru; Matumoto, Kenji; and Tamura, Hideo, 4,639,925, Cl. 372-46.000.

Maucher, Paul, to Luk Lamellen und Kupplungsbau GmbH. Assembly for taking up and compensating for torque-induced shocks. 4,638,684, Cl. 74-574.000.

Maulandi, Aymon A., to Square D Company. Mechanical time delay mechanism. 4,639,561, Cl. 200-33.00R.

Mavilor Systemes S.A.: *See*—
Casanova, Damien, 4,639,629, Cl. 310-248.000.

Mawhinney, Daniel D., to RCA Corporation. Circuit for separating one type signal component from another. 4,638,808, Cl. 128-653.000.

May, David R.: *See*—
Brooks, Steve M.; and May, David R., 4,639,579, Cl. 219-464.000.

May, James G.: *See*—
Brock, J. Donald; and May, James G., 4,638,747, Cl. 110-264.000.

Mayer, Hartwig, to CEAG Licht- und Stromversorgungstechnik GmbH. Power supply. 4,639,834, Cl. 361-388.000.

Mayr, Georg: *See*—
Kellner, Roman; Mayr, Georg; Proksch, Karl-Heinz; and Pockl, Franz, 4,638,902, Cl. 198-345.000.

Mazaki, Yoshiyuki, to Kabushiki Kaisha Murakoshi Seiko. Shelving device. 4,639,161, Cl. 403-245.000.

Mazda Motor Corporation: *See*—
Tanaka, Kazumoto; Mashimo, Tohru; Sato, Osamu; and Kobayashi, Toyohiko, 4,639,868, Cl. 364-420.000.

McBride, Donald G.: *See*—
Amelio, William J.; Hume, David W.; McBride, Donald G.; and Rickert, Robert G., 4,639,380, Cl. 427-97.000.

McCall, Floyd, to Ametek, Inc. Fluid flowmeter. 4,638,672, Cl. 73-861.520.

McCann, Gilbert D.: *See*—
Shelden, C. Hunter; and McCann, Gilbert D., 4,638,798, Cl. 128-[illegible].00H.

McCanny, John V.; and McWhirter, John G., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in her Britannic Majesty's Government of the. Digital data processor incorporating an orthogonally connected logic cell array. 4,639,857, Cl. 364-200.000.

McClellan, William R.: *See*—
Gorman, Michael J.; and McClellan, William R., 4,638,678, Cl. 74-476.000.

McCurry, James J.: *See*—
Bushaw, Kenneth A.; Bustamante, Louis A.; and McCurry, James J., 4,639,126, Cl. 355-3.0SH.

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Sastry, Shankar M.; O'Neal, James E.; and Peng, Tzy C., 4,639,281, Cl. 148-407.000.

McEvoy, Dennis L.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.

McFadden, Arthur: *See*—
Shetty, Bola V.; McFadden, Arthur; and Hofer, Peter, 4,639,529, Cl. 548-550.000.

McGaha, Larry E. Composition and method for cleaning painted surfaces. 4,639,327, Cl. 252-143.000.

McGee, Daniel W., to Magnetics Research International Corporation. Permanent magnet variable reluctance generator. 4,639,626, Cl. 310-155.000.

McGonigal, Charles, to AT&T Technologies, Inc. Methods of and apparatus for making slotted beam contact elements. 4,638,559, Cl. 29-874.000.

McHale, Charles J.; Marrone, Joseph; and Watson, David, to Aldis Consultants Inc. Method and apparatus for determining weight and center of gravity of a vehicle. 4,639,872, Cl. 364-463.000.

McIngvale, Pat H., to United States of America, Army. Multi-warhead, anti-armor missile. 4,638,737, Cl. 102-489.000.

McKay, Robert S.; and Dahm, Dennis R., to McKay, Robert S. Toy vehicle and launcher. 4,639,236, Cl. 446-430.000.

McKee, Graham E.: *See*—
Schuette, Wilhelm; McKee, Graham E.; Hilt, Albrecht; Heinz, Gerhard; and Goerrissen, Heiner, 4,639,488, Cl. 524-456.000.

McKee, Kevin D.; and Formwalt, Charles W., Jr., to Deere & Company. Electro-hydraulic control system. 4,638,720, Cl. 91-522.000.

McLean, John R., to Garrett Corporation, The. Engine powered auxiliary air supply system. 4,638,634, Cl. 60-612.000.

McMahan, David R.; and Nicholas, Richard W., to General Motors Corporation. Vehicle headlamp assembly. 4,639,840, Cl. 362-80.000.

McMaster, Ira B.: *See*—
Baratta, Anthony J.; Jester, William A.; Kenney, Edward S.; McMaster, Ira B.; and Schultz, Mortimer A., 4,639,349, Cl. 376-254.000.

McMillan, Thomas A.; Mitchell, Henry W.; and Cecil, Alvin S. Foot pedal for varying resistance in an electrical circuit. 4,639,710, Cl. 338-108.000.

McMills, Corey J.; and Milroy, James C., to Raychem Corporation. Holder for coupling assembly. 4,639,068, Cl. 339-177.00R.

McNeil, James E., to General Motors Corporation. Plastic covered fastening device and method of assembly. 4,638,544, Cl. 29-434.000.

McNeilly, Alan: *See*—
Howie, Peter W.; and McNeilly, Alan, 4,639,439, Cl. 514-171.000.

McQuinn, Roy L.; and Wade, James J., to Riker Laboratories. Metabolites of triazolo[1,5-c]pyrimidines. 4,639,445, Cl. 514-222.000.

McRae, Daniel D.; and Cain, Joseph B., III, to Harris Corporation. HF avalanche relay communication technique. 4,639,937, Cl. 375-40.000.

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McCanny, John V.; and McWhirter, John G., 4,639,857, Cl. 364-200.000.

Meatto, Franklin D.; and Pilpel, Edward D., to Olin Corporation. Snow ski with elastomeric sidewalls. 4,639,009, Cl. 280-602.000.

Mecapec S.A.: *See*—
Fuchs, Ernst; and Fitzi, Karl, 4,639,315, Cl. 210-333.100.

Meccatec S.p.A.: *See*—
Meratti, Gianattilio, 4,639,177, Cl. 412-11.000.

Medero, Richard: *See*—
Ramsey, Maynard, III; Medero, Richard; and Hood, Rush W., Jr., 4,638,810, Cl. 128-681.000.

Mednick, R. Lawrence; and Blum, David B., to Chem Systems, Inc. Method for making methanol. 4,639,470, Cl. 518-700.000.

Megerle, Friedrich: *See*—
Hilbrans, Hermann; Gamroth, Michael; Melcher, Gerhard; and Megerle, Friedrich, 4,639,269, Cl. 75-76.000.

Meisner, Richard P.: *See*—
Spock, Wayne R.; and Meisner, Richard P., 4,639,885, Cl. 364-574.000.

Melcher, Gerhard: *See*—
Hilbrans, Hermann; Gamroth, Michael; Melcher, Gerhard; and Megerle, Friedrich, 4,639,269, Cl. 75-76.000.

Mellgren, Per-Gustaf, to Forest Engineering Research Institute of Canada. Forwarder. 4,639,186, Cl. 414-734.000.

Meloy Laboratories, Inc.: *See*—
Olson, Douglas R.; Harness, James R.; and Waterston, John W., 4,639,419, Cl. 435-5.000.

Meltsch, Hans-Jurgen, to Siemens Aktiengesellschaft. Insert for a cable sleeve and method for the production thereof. 4,639,546, Cl. 174-92.000.

Menown, Hugh: *See*—
Donaldson, Timothy P.; and Menown, Hugh, 4,639,643, Cl. 315-344.000.

Mentor Corporation: *See*—
Conway, Anthony J.; Conway, Peter R.; and Conway, Philip J., 4,638,790, Cl. 128-138.00R.

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Sheffer, Phil B., 4,638,745, Cl. 108-111.000.

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Heller, Jorge, 4,639,366, Cl. 424-19.000.
Huang, Leeyuan; and Lam, Y. K. Tony, 4,639,466, Cl. 514-456.000.
Katdare, Ashok V., 4,639,458, Cl. 514-311.000.
Murray, Peter K.; and Galuska, Stefan, 4,639,372, Cl. 424-88.000.
Remy, David C., 4,639,457, Cl. 514-290.000.

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Krause, Joachim; Romer, Michael; and Weber, Georg, 4,639,328, Cl. 252-299.610.

Mere, Ilmar: *See*—
Johnson, William M.; and Mere, Ilmar, 4,638,868, Cl. 172-762.000.

Merkle Engineers, Inc.: *See*—
James, Barry R., 4,638,617, Cl. 52-474.000.

Merrill, Richard E.; and Allard, Craig L., to Acme United Corporation. Reinforced moisture vapor permeable, pressure-sensitive adhesive wound dressings. 4,638,797, Cl. 128-156.000.

Merz, Ludwig: *See*—
Dohler, Werner; Merz, Ludwig; Frohnert, Heinz; Uckermann, Bernd; Graeser, Ulrich; Jankowski, Alfons; Wolowski, Eckard; Tamm, Hans-Friedrich; and Wilczok, Norbert, 4,639,310, Cl. 208-412.000.

Messmer, Michael J.: *See*—
Pugnale, Peter J.; and Messmer, Michael J., 4,639,164, Cl. 405-54.000.

Metcalfe, John G., to U.S. Philips Corporation. Saddle coils for electromagnetic deflection units. 4,639,703, Cl. 335-213.000.

Metz, Josef: *See*—
Heintz, Wolfgang; Pehker, Manfred; and Metz, Josef, 4,638,714, Cl. 89-37.010.

Metzger, Carl; Eue, Ludwig; and Hack, Helmuth, to Bayer Aktiengesellschaft. N-substituted 5-amino-1,3,4-thiadiazoles. 4,639,526, Cl. 548-140.000.

Meyer, Karl-Heinrich: *See*—
Alewelt, Wolfgang; Eisermann, Wolfgang; Meyer, Karl-Heinrich; Tresper, Erhard; and Ullrich, Martin, 4,639,507, Cl. 528-388.000.

Meyle, William H.; and Wendt, Paul H., to Zenith Electronics Corporation. Apparatus and method for shadow mask insertion. 4,639,230, Cl. 445-30.000.

Meyrand, Gabriel, to C.G.R. MeV. Cyclotron with focussing-defocussing system. 4,639,634, Cl. 313-62.000.

Michaelis, Theodore D., to RCA Corporation. Thermoelectric cooling system and method. 4,639,883, Cl. 364-557.000.

Michalski, Dennis H.; and Srinivasan, Viswanathan, to International Minerals & Chemical Corp. Process of removing cationic impurities from wet process phosphoric acid. 4,639,359, Cl. 423-321.00R.

Michel, Chazalon. Machine for trimming and disbudding vine shoots. 4,638,705, Cl. 83-701.000.

Michel, Thomas J., to Research Physics, Inc. Laser beam surgical system. 4,638,800, Cl. 128-303.100.

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Mochizuki, Yoshihara; Goto, Sohei; Yagi, Toshihiko; Yamazaki, Katsumasa; and Michiue, Kenji, 4,639,410, Cl. 430-506.000.

Michiyama, Hisao. Auxiliary pedal device for trick-cycling attached to the front fork blade of a bicycle. 4,638,682, Cl. 74-560.000.

Micrion Limited Partnership: *See*—
Doherty, John A.; Ward, Billy W.; and Shaver, David C., 4,639,301, Cl. 204-192.310.

Mihara, Jiro: *See*—
Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.

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Buthe, Theo; Geisthoff, Hubert; Kretschmer, Horst; Mikeska, Felix; and Post, Alexander, 4,639,163, Cl. 403-322.000.
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Ludwig, Richard H.; and Mikhail, Joanne E., 4,638,889, Cl. 187-29.00R.

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Abram, Trevor S.; Norman, Peter; and Warren, Brian T., 4,639,535, Cl. 549-419.000.

Miller, James W.: *See*—
Beck, Donald; Miller, James W.; Wernau, William C.; and Young, Thomas B., III, 4,639,322, Cl. 252-8.554.

Miller, Michael A., to 20th Century Machine. Method of forming a helical ball screw member. 4,638,548, Cl. 29-558.000.

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Raymond, William J.; Morgan, Robert L.; and Miller, Ricky L., 4,639,877, Cl. 364-513.500.

Miller, Stewart E., to Bell Communications Research, Inc. Single mode injection laser structure. 4,639,922, Cl. 372-19.000.

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Brown, Walter J., 4,638,969, Cl. 248-122.000.

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Katona, Joseph W., 4,638,529, Cl. 16-111.00R.

Milne, Alistair R.; and Davison, Grenville, to Vickers Public Limited Company. Thermal sleeve for gun barrels. 4,638,713, Cl. 89-14.100.

Milner, James D.: *See*—
LeGault, Robert H.; Jezzi, Arrigo D.; Milner, James D.; Oakley, Barbara; and Franke, Paul G., 4,639,254, Cl. 604-385.00R.

Milroy, James C.: *See*—
McMills, Corey J.; and Milroy, James C., 4,639,068, Cl. 339-177.00R.

Milsco Manufacturing Company: *See*—
Donovan, Kyle P., 4,639,039, Cl. 297-353.000.

Milwaukee Electric Tool Corporation: *See*—
Palm, Bernhard, 4,639,170, Cl. 408-76.000.

Minami, Yohichiro: *See*—
Ichikawa, Yoshio; Akahori, Masaaki; Ishii, Daisuke; Tsunoda, Kazuyuki; Minami, Yohichiro; and Nagata, Koichi, 4,639,726, Cl. 340-825.440.

Mine Kinzoku Kogyo Kabushiki Kaisha: *See*—
Ikeda, Sakio, 4,638,819, Cl. 131-331.000.

Mines, Isaiah H., Jr.; and Spector, George. Gravity feeding pill medicine dispenser. 4,638,923, Cl. 221-132.000.

Minnesota Mining and Manufacturing Company: *See*—
Billigmeier, James E.; Groves, James D.; Haugen, Harwick A.; and Pokorny, Richard J., 4,639,483, Cl. 524-296.000.
LaBelle, Gary E.; and Ask, David T., 4,639,412, Cl. 430-523.000.
Morgan, Thomas E., 4,639,058, Cl. 339-17.0CF.
Rasmussen, Jerald K.; Heilmann, Steven M.; and Palensky, Frederick J., 4,639,286, Cl. 156-307.300.

Minolta Camera Kabushiki Kaisha: *See*—
Johdai, Akiyoshi; Yamada, Hirokazu; Ikenoue, Yoshikazu; and Ishikawa, Takuma, 4,638,992, Cl. 271-293.000.
Maejima, Takeshi; and Shiba, Kenji, 4,639,224, Cl. 434-286.000.
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,639,112, Cl. 354-455.000.

Minox GmbH: *See*—
Rinn, Juergen; and Belitz, Fritz, 4,639,110, Cl. 354-403.000.

Misaki, Akira; Sone, Yoshiaki; and Kato, Takao, to Toyo Soda Manufacturing Co., Ltd. Polysaccharide polyol. 4,639,516, Cl. 536-123.000.

Misher, Hans-Peter; and Pietsch, Helge, to Gebr. Isringhausen. Vehicle seat monitoring means. 4,638,982, Cl. 267-131.000.

Mishonov, Michail T.: *See*—
Hadjiiski, Anatoli M.; Varbanov, Hristo P.; Mishonov, Michail T.; Stamov, Vladimir P.; Savov, Rosen P.; Radenkov, Strahil K.; Panev, Vladimir B.; and Velev, Alexander S., 4,638,607, Cl. 52-79.900.

Mishra, Satchidanand; and Teuscher, Leon A., to Xerox Corporation. Photoreceptor containing selenium particles coated with a reaction product of a hydrolyzed silane. 4,639,402, Cl. 430-58.000.

Mitchell, Arthur W. Chimney cowls. 4,638,727, Cl. 98-79.000.

Mitchell, Henry W.: *See*—
McMillan, Thomas A.; Mitchell, Henry W.; and Cecil, Alvin S., 4,639,710, Cl. 338-108.000.

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Asaeda, Takeaki; Nakamura, Toru; and Yutani, Takashi, 4,639,850, Cl. 363-58.000.
Furuta, Michihiro, 4,639,917, Cl. 371-16.000.
Mizugaki, Shigeo; and Umeki, Tsunenori, 4,639,892, Cl. 365-182.000.
Nakagawa, Tsutomu, 4,639,276, Cl. 148-1.500.
Seino, Kiyoharu; Takagi, Tadashi; and Takeda, Fumio, 4,639,694, Cl. 333-128.000.
Sekikawa, Katsuhide, 4,639,855, Cl. 364-188.000.

Tanino, Junichi, 4,639,912, Cl. 370-86.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,639,014, Cl. 280-707.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Makihara, Katsumi; Yanagi, Kenichi; Fukushima, Takeo; Suganuma, Namio; Samejima, Ichiro; and Takahashi, Seiichi, 4,638,851, Cl. 165-32.000.

Mitsubishi Rayon Co., Ltd.: *See*—
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Murashige, Yoshio; Yanagase, Akira; Kawachi, Yasunori; and Soga, Junko, 4,639,339, Cl. 260-513.600.
Takemura, Tohru; Nakashima, Atushi; Yoshida, Haruhiko; Kamo, Jun; and Hamada, Eiichi, 4,639,353, Cl. 422-46.000.

Mitsui Aluminium Co., Ltd.: *See*—
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Mitsui Toatsu Kagaku-Kabushiki Kaisha: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,639,451, Cl. 514-247.000.

Mitsuka, Ikuo, to Dainippon Screen Mfg. Co., Ltd. Method of recording a halftone image. 4,639,086, Cl. 350-322.000.

Mitsuyama, Akira: *See*—
Okuda, Masakiyo; Ohnishi, Kazuyuki; and Mitsuyama, Akira, 4,639,125, Cl. 355-23.000.

Mittleman, Herbert, to Baxter Travenol Laboratories, Inc. Luer connection. 4,639,019, Cl. 285-332.000.

Mitutoyo Mfg. Co., Ltd.: *See*—
Aoyama, Tsutomu; Nakamura, Taizo; Terao, Naoyosi; and Shinonaga, Hirohiko, 4,639,098, Cl. 350-514.000.
Kuwabara, Yoshiharu; and Hamada, Hiroyoshi, 4,639,141, Cl. 356-387.000.

Miyadera, Tetsuo; Sugimura, Yukio; Tanaka, Teruo; Hashimoto, Toshihiko; Iino, Kimio; and Sugawara, Shinichi, to Sankyo Company Limited. 2-penem-3-carboxylic acid derivatives and use. 4,639,441, Cl. 514-195.000.

Miyagawa, Kohzo: *See*—
Maruyama, Asao; and Miyagawa, Kohzo, 4,639,187, Cl. 414-787.000.

Miyagi, Toshimi: *See*—
Ueno, Michio; Miyagi, Toshimi; and Yamaguchi, Soji, 4,639,663, Cl. 323-356.000.

Miyai, Kenji: *See*—
Takaya, Takao; Takasugi, Hisashi; Yamanaka, Hideaki; Miyai, Kenji; and Inoue, Yoshikazu, 4,639,448, Cl. 514-226.000.

Miyake, Masaya: *See*—
Kodama, Mitsuo; Miyake, Masaya; Nakano, Minol; Asai, Tsuyoshi; and Hara, Akio, 4,639,352, Cl. 419-15.000.

Miyamoto, Satoshi; and Nagatani, Masamichi, to Amchem Products, Inc. Zinc phosphating method. 4,639,295, Cl. 204-38.100.

Miyashita, Akira: *See*—
Ueno, Katsuji; Nagaoka, Kenji; Miyashita, Akira; and Ebisu, Satoshi, 4,639,344, Cl. 264-83.000.

Miyata, Hiroyasu: *See*—
Okita, Masao; and Miyata, Hiroyasu, 4,639,595, Cl. 250-231.0SE.

Miyauchi, Teiichi: *See*—
Kira, Toru; Miyauchi, Teiichi; and Yoshikawa, Mitsuhiko, 4,639,806, Cl. 360-113.000.

Miyazaki, Osamu: *See*—
Arikawa, Junichi; Chiba, Hiroshi; Miyazaki, Osamu; and Osanai, Masatoshi, 4,639,582, Cl. 235-379.000.

Miyazawa, Kenji, to Koito Seisakusho Co., Ltd. Vehicular lighting device having a power driven lamp cover. 4,639,839, Cl. 362-64.000.

Mizoguchi, Masafumi: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,706, Cl. 84-1.010.
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,709, Cl. 84-1.190.

Mizugaki, Shigeo; and Umeki, Tsunenori, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor read-only memory device. 4,639,892, Cl. 365-182.000.

Mobil Oil Corporation: *See*—
Axelrod, Joan C.; and Chibnik, Sheldon, 4,639,256, Cl. 44-71.000.
Bulow, Roland E., 4,639,228, Cl. 441-5.000.
Derouane, Eric G.; and von Ballmoos, Roland, 4,639,357, Cl. 423-306.000.
Derouane, Eric G.; and von Ballmoos, Roland, 4,639,358, Cl. 423-306.000.
Valyocsik, Ernest W., 4,639,360, Cl. 423-329.000.

Mochizuki, Hidenori: *See*—
Ide, Fumito; and Mochizuki, Hidenori, 4,639,114, Cl. 355-35.00H.

Mochizuki, Hiromine: *See*—
Ando, Masatoshi; Mochizuki, Hiromine; and Saito, Kazuta, 4,639,270, Cl. 106-21.000.

Mochizuki, Yoshihara; Goto, Sohei; Yagi, Toshihiko; Yamazaki, Katsumasa; and Michiue, Kenji, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic light sensitive-material. 4,539,410, Cl. 430-506.000.

Moeller, Alvin W.: *See*—
Acoraci, Joseph H.; and Moeller, Alvin W., 4,639,722, Cl. 342-371.000.

Mokveld, Nicolaas J., to Mokveld Valves bv. Nonreturn piston slide valve. 4,638,832, Cl. 137-220.000.

Mokveld Valves bv.: *See*—
Mokveld, Nicolaas J., 4,638,832, Cl. 137-220.000.

Molinari, Egidio, to Erregierre Industria Chimica Spa. Morpholine containing propionylanilides and pharmaceutical compositions. 4,639,449, Cl. 514-234.000.

Molloy, R. Michael: *See*—
Hunt, Ann H.; Molloy, R. Michael; Nagarajan, Ramakrishnan; and Schabel, Amelia A., 4,639,433, Cl. 514-8.000.

Momiyama, Kikuo: *See*—
Kitagishi, Nozomu; Momiyama, Kikuo; Ikemori, Keiji; Takahashi, Sadatoshi; and Tanaka, Tsunefumi, 4,639,096, Cl. 350-427.000.

Monacelli, Walter J.: *See*—
Waller, Francis E., 4,638,547, Cl. 29-558.000.
Waller, Francis E., 4,639,173, Cl. 409-122.000.

Monka, Edouard, to Etablissements Maurice Maillard. Freewheel for a cycle or the like. 4,639,241, Cl. 474-902.000.

Monsanto Company: *See*—
Birum, Gail H.; Mathis, Thomas C.; and Stolk, Richard D., 4,639,480, Cl. 524-104.000.
Geimer, Raymond C.; and Tolbert, William R., 4,639,422, Cl. 435-286.000.
Hovey, Leonard L.; Mathews, Marion J., III; and Peoples, P. Robert, 4,639,539, Cl. 558-363.000.

Montedison S.p.A.: *See*—
Sacconi, Luigi; Foa , Marco; Bencini, Elena; and Sabarino, Giampiero, 4,639,506, Cl. 528-212.000.

Montgomery, Ronald S. Tapping saddle. 4,638,834, Cl. 137-315.000.

Moon, William G.: *See*—
Harrison, Joel N.; Moon, William G.; and Graham, Randolph H., 4,639,863, Cl. 364-200.000.

Moore Business Forms, Inc.: *See*—
Brunea, Robert W.; and Raby, James M., 4,639,271, Cl. 106-21.000.

Moore, Luana, to Key Pharmaceuticals, Inc. Means of aiding in the prevention of sudden infant death syndrome. 4,639,455, Cl. 514-282.000.

Moore, Robert R. Needle guide apparatus for discolysis procedures. 4,638,799, Cl. 128-303.00B.

Moore, Steven C.: *See*—
Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., 4,639,631, Cl. 310-344.000.

Moore, Wildey J. Ambidexterous magazine catch. 4,638,581, Cl. 42-7.000.

Moorehead, Eric L., to Union Oil Company of California. Process for making maleic anhydride. 4,639,530, Cl. 549-260.000.

Morane, Bruno P., to L'Oreal. Container for storing and dispensing a liquid product and at least one additional product which are to remain separated during storage. 4,638,927, Cl. 222-83.000.

Morcom, Richard, to Independent Broadcasting Authority. MAC vertical synchronizing signals. 4,639,764, Cl. 358-14.000.

Morgan, Robert L.: *See*—
Raymond, William J.; Morgan, Robert L.; and Miller, Ricky L., 4,639,877, Cl. 364-513.500.

Morgan, Thomas E., to Minnesota Mining & Manufacturing Co. Low profile test clip and handle therefor. 4,639,058, Cl. 339-17.0CF.

Mori, Atsushi, to Sanshin Kogyo Kabushiki Kaisha. Lubricating system for two-cycle internal combustion engine. 4,638,771, Cl. 123-73.0AD.

Mori, Hitoshi, to Matsushita Electric Industrial Co., Ltd. Apparatus for scrambling and descrambling communication signals. 4,639,777, Cl. 358-120.000.

Mori, Shigetatu: *See*—
Hakoyama, Soichi; Mori, Shigetatu; Takebe, Yoshiyuki; and Imaoka, Kanya, 4,638,624, Cl. 57-208.000.

Mori, Tohru; Hongo, Takayasu; and Kamikura, Rinzo, to Kanzaki Paper Mfg. Co., Ltd. Image-receiving sheet for heat transfer recording system. 4,639,751, Cl. 346-227.000.

Moribe, Yoshihiro; Hayashi, Yukitaka; Maekawa, Hideo; and Tsukui, Kunitsugu, to Hitachi, Ltd. Head loading system. 4,639,804, Cl. 360-105.000.

Morizumi, Ryoji; Suzuki, Yoichi; and Ameda, Kazuhiro, to Nissan Diesel Co., Ltd. Steering system for automotive vehicle. 4,638,883, Cl. 180-324.000.

Morioka, Minoru; Kishi, Toshiaki; and Yoshioka, Toshiharu, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle, and body structure therefor. 4,638,881, Cl. 180-219.000.

Morissette, Richard W. Self-dumping trailer. 4,639,043, Cl. 298-5.000.

Moritz, Bertil, to ASEA Aktiebolag. Insulation of metallic surfaces in power transformers. 4,639,282, Cl. 156-53.000.

Moriya, Koichi; Priesnitz, Uwe; Riebel, Hans-Jochem; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Certain laevorotatory p-tolysulfonyl or methanesulfonyl propionic acid ester intermediates. 4,639,537, Cl. 558-48.000.

Morris, John: *See*—
Morse, Milton; and Morris, John, 4,638,652, Cl. 70-454.000.

Morse, Milton; and Morris, John, to Morse, Nena. Sealing cap. 4,638,652, Cl. 70-454.000.

Morse, Nena: *See*—
Morse, Milton; and Morris, John, 4,638,652, Cl. 70-454.000.

Mortimer, John H., to Inductotherm Industries, Inc. Induction furnace packaging system. 4,639,931, Cl. 373-138.000.

Morton, Stephen F. N., to U.S. Philips Corporation. Electrothermal atomiser. 4,639,136, Cl. 356-312.000.

Morton Thiokol, Inc.: *See*—
Gilmore, Dennis W.; and Kugele, Thomas G., 4,639,273, Cl. 106-281.00M.

Moser, Bernd, to Boge GmbH. Apparatus for the determination of the distance traveled by a piston in a cylinder. 4,638,670, Cl. 73-658.000.

Moskovsky Institut Neftekhimicheskoi i Gazovoi Promyshlennosti: *See*—
Kaushansky, David A., 4,638,861, Cl. 166-247.000.

Motomiya, Takehiko, to Ohkura Electric Co., Ltd. Process control system. 4,639,852, Cl. 364-138.000.

Motorola, Inc.: *See*—
Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., 4,639,631, Cl. 310-344.000.
Granberg, Helge O.; and Coffman, Samuel L., 4,639,760, Cl. 357-75.000.

Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, to Societe Nationale Industrielle Aerospatiale. Process for manufacturing a variable pitch multi-blade propeller by molding resin-impregnated fails around a preform. 4,639,284, Cl. 156-213.000.

Mouren, Michel: *See*—
Jouquey, Alain; Salmon, Jean; Mouren, Michel; and Touyer, Gaetan, 4,639,336, Cl. 260-397.500.

Moxon, Edwin C., to Stypher Corporation, The. Apparatus for decoding video address code signals. 4,639,792, Cl. 358-335.000.

MTS Vektronics Corporation: *See*—
Eaton, Homer L., 4,638,558, Cl. 29-861.000.

Mueller, Arthur L., to AMP Incorporated. Electrical connector for flexible film circuits. 4,639,063, Cl. 339-75.00M.

Mueller, Gerhard: *See*—
Grenzendoerfer, Dietmar; Wierzgon, Achim; Mueller, Gerhard; Erth, Dieter; Guenther, Ludwig; and Kuenzel, Rolf, 4,638,647, Cl. 66-84.00A.

Muhlfeld, Hans P., Jr.: *See*—
Chang, Yi-Hua E.; Gruodis, Algirdas J.; Muhlfeld, Hans P., Jr.; Rodriguez, Charles W.; and Shulman, Mark L., 4,639,919, Cl. 371-27.000.

Muhr, Karl-Heinz. Shear for different structural shapes. 4,638,703, Cl. 83-518.000.

Mukai, Kiyotaka, to Sanyo Electric Co., Ltd. Electrical apparatus connected with a battery charger system. 4,639,656, Cl. 320-22.000.

Muller, Francis: *See*—
Clerc, Jean-Frederic; and Muller, Francis, 4,639,090, Cl. 350-346.000.

Muller, Georg: *See*—
Buschmann, Gerhard; and Muller, Georg, 4,638,657, Cl. 73-78.000.

Muller, Hanns P.; Clarenz, Werner; von Gizycki, Ulrich; and Wagner, Kuno, to Bayer Aktiengesellschaft. Substantially colorless organic polyisocyanates, processes for their production and their use in the production of polyurethane plastics. 4,639,502, Cl. 528-45.000.

Muller, Hanns P.: *See*—
Richter, Roland; Muller, Hanns P.; and Wegner, Christian, 4,638,795, Cl. 128-90.000.

Muller, Horst; Zinke, Horst; and Wehner, Wolfgang, to Ciba-Geigy Corporation. Phosphoric acid compounds as co-stabilizers for Me(II)-carboxylates and/or Me(II)-phenolates in PVC. 4,639,482, Cl. 524-137.000.

Muller, Lutz: *See*—
Junge, Bodo; Krause, Hans P.; Muller, Lutz; and Puls, Walter, 4,639,436, Cl. 514-24.000.

Muller, Udo: *See*—
Jacob-Grinschgl, Wolfgang; and Muller, Udo, 4,639,547, Cl. 178-18.000.

Muller, Ulrich: *See*—
Rake, Heinrich; Hoffmann, Ulrich; Muller, Ulrich; Breddermann, Rudolf; and Blumbach, Rainer, 4,639,853, Cl. 364-149.000.

Mullins, Randal L.: *See*—
Young, Lawrence R.; Sexton, Gregory J.; Mullins, Randal L.; and Bradley, Brian D., 4,639,738, Cl. 346-75.000.

Multi-Clean, Inc.: *See*—
Todd, Mike J., 4,638,523, Cl. 15-98.000.

Munsey, R. Jack; DeJong, Leroy D.; and Keip, Charles P., to C-Tec, Inc. Apparatus for centrifugally casting concrete panels. 4,639,204, Cl. 425-3.000.

Murai, Kazuo; and Koichi, Yasushi, to Ricoh Company, Ltd. Recording image density control method for electrophotography. 4,639,117, Cl. 355-14.00R.

Murakami, Seiro; and Hamajima, Muneki, to Nippon Kagaku K.K. Method and apparatus for detecting an edge position of a pattern and eliminating overlapping pattern signals. 4,639,604, Cl. 250-548.000.

Muramatsu, Toshio: *See*—
Itoh, Toyotsugu; and Muramatsu, Toshio, 4,639,072, Cl. 350-6.800.

Murashige, Yoshio; Yanagase, Akira; Kawachi, Yasunori; and Soga, Junko, to Mitsubishi Rayon Co., Ltd. Sulfonated polyethyleneimine useful as blood anticoagulant. 4,639,339, Cl. 260-513.600.

Murata, Kiyobumi, to Toko, Inc. Delay line. 4,639,696, Cl. 333-138.000.

Murata Manufacturing Co., Ltd.: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; and Wada, Hidekazu, 4,639,699, Cl. 333-202.000.
Ueno, Michio; Miyagi, Toshimi; and Yamaguchi, Soji, 4,639,663, Cl. 323-356.000.

Murata, Yoshifumi: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 4,639,471, Cl. 521-172.000.

Murata, Yoshitaka; Hatano, Tsuyoshi; and Ohkubo, Hideo, to Matsushita Electric Industrial Co., Ltd. Nozzle assembly for vacuum cleaner. 4,638,526, Cl. 15-367.000.

Murphy, Bernard T.: *See*—
Lee, Charles M.; and Murphy, Bernard T., 4,639,615, Cl. 307-269.000.

Murphy, Colin N.; and Lu, Guey T., to Advanced Micro Devices, Inc. Memory circuit having a memory reset and recovery controller. 4,639,899, Cl. 365-230.000.

Murphy, Edmond J., to AT&T Bell Laboratories. Fiber-waveguide self alignment coupler. 4,639,074, Cl. 350-96.150.

Murphy, Michael J.; and Smith, Kent D., to Caterpillar Inc. Bulldozer blade mounting and stabilizing arrangement. 4,638,869, Cl. 172-821.000.

Murray, Peter K.; and Galuska, Stefan, to Merck & Co., Inc. Coccidiosis vaccine. 4,639,372, Cl. 424-88.000.

Murray, Thomas L., Jr.; and Holtey, Thomas O., to Honeywell Information Systems Inc. Apparatus and method for testing and verifying the refresh logic of dynamic MOS memories. 4,639,858, Cl. 364-200.000.

Murray, William R., to Fiber Controls Corp. Blending system weighing unit. 4,638,875, Cl. 177-1.000.

Muto, Kenji; Sugaya, Toru; Kuroda, Tokuyuki; Hashimoto, Tamotsu; Yamada, Koji; Nakamizo, Nobuhiro; and Watanabe, Minoru, to Kyowa Hakko Kogyo Co., Ltd. 1-benzyl-3,5-dimethyl-4-piperdyl ester of a Hantzsch dihydropyridine. 4,639,522, Cl. 546-194.000.

Muzslay, Steven Z., to ITT Corporation. Environmentally sealed connector. 4,639,061, Cl. 339-59.00M.

Myers, Charles M., to Eaton Corporation. Dual station printer mechanism. 4,639,154, Cl. 400-584.000.

Nagaike, Sadanori: *See*—
Takeda, Yukio; Iijima, Shiro; Higuchi, Shinsuke; Ohura, Masaki; and Nagaike, Sadanori, 4,639,803, Cl. 360-103.000.

Nagakura, Masahiko: *See*—
Fujii, Setsuro; Yokoyama, Touru; Ikegaya, Kouji; Yokoo, Nobuo; and Nagakura, Masahiko, 4,639,435, Cl. 514-11.000.

Nagaoka, Kenji: *See*—
Ueno, Katsuji; Nagaoka, Kenji; Miyashita, Akira; and Ebisu, Satoshi, 4,639,344, Cl. 264-83.000.

Nagarajan, Ramakrishnan: *See*—
Hunt, Ann H.; Molloy, R. Michael; Nagarajan, Ramakrishnan; and Schabel, Amelia A., 4,639,433, Cl. 514-8.000.

Nagasawa, Naomi: *See*—
Yamaguchi, Takashi; Nagasawa, Naomi; and Tamura, Hidemasa, 4,639,400, Cl. 428-694.000.

Nagashima, Eiji: *See*—
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,706, Cl. 84-1.010.
Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, 4,638,709, Cl. 84-1.190.

Nagashima, Masasumi: *See*—
Uchikata, Yoshio; Nozaki, Mineo; Asakura, Osamu; and Nagashima, Masasumi, 4,639,744, Cl. 346-76.0PH.

Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronical musical instrument with note frequency data setting circuit and interpolation circuit. 4,638,706, Cl. 84-1.010.

Nagashima, Yoichi; Kondo, Tatsunori; Takauji, Kiyomi; Kitamura, Mineo; Matsushima, Tadashi; Nagashima, Eiji; and Mizoguchi, Masafumi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument with temporal variation data generating circuit and interpolation circuit. 4,638,709, Cl. 84-1.190.

Nagata, Koichi: *See*—
Ichikawa, Yoshio; Akahori, Masaaki; Ishii, Daisuke; Tsunoda, Kazuyuki; Minami, Yohichiro; and Nagata, Koichi, 4,639,726, Cl. 340-825.440.

Nagata, Kouichi: *See*—
Tanaka, Kazuto; Kakizawa, Haruo; and Nagata, Kouichi, 4,639,099, Cl. 350-538.000.

Nagatani, Masamichi: *See*—
Miyamoto, Satoshi; and Nagatani, Masamichi, 4,639,295, Cl. 204-38.100.

Nagato, Yoshio; and Soroi, Kazunori, to Kyocera Corporation. Decorative hard golden ceramic article. 4,639,426, Cl. 501-96.000.

Nahara, Akira: *See*—
Arai, Yoshihiro; and Nahara, Akira, 4,639,815, Cl. 360-131.000.

Naito, Takao: *See*—
Maeda, Yoshinobu; Fujiwara, Kohji; and Naito, Takao, 4,638,985, Cl. 269-244.000.

Nakadaira, Shiro: *See*—
Yoshioka, Masahiro; Izumi, Hideki; Inouye, Hiroshi; Hazaki, Eiichi; and Nakadaira, Shiro, 4,639,146, Cl. 384-99.000.

Nakagawa, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha. Method of making thyristor with a high tolerable bias voltage. 4,639,276, Cl. 148-1.500.

Nakahara, Hideki: *See*—
Aizawa, Koichi; Sewa, Shingo; and Nakahara, Hideki, 4,639,489, Cl. 524-588.000.

Nakahata, Kimio: *See*—
Nakamura, Shunji; Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; and Nakahata, Kimio, 4,638,760, Cl. 118-658.000.

Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Camera system capable of interchanging its objective lens. 4,639,112, Cl. 354-455.000.

Nakai, Toshihiko, to Citizen Watch Co., Ltd. Control system for a cooling fan in an impact printer. 4,639,650, Cl. 318-333.000.

Nakamichi Corporation: *See*—
Nakamichi, Niro, 4,639,812, Cl. 360-126.000.

Nakamichi, Niro, to Nakamichi Corporation. Magnetic head and apparatus for automatically adjusting the azimuth position thereof. 4,639,812, Cl. 360-126.000.

Nakamizo, Nobuhiro: *See*—
Muto, Kenji; Sugaya, Toru; Kuroda, Tokuyuki; Hashimoto, Tamotsu; Yamada, Koji; Nakamizo, Nobuhiro; and Watanabe, Minoru, 4,639,522, Cl. 546-194.000.

Nakamoto, Mitsuyoshi: *See*—
Inui, Isao; Hosaka, Masato; Nakamoto, Mitsuyoshi; and Okamoto, Kenji, 4,639,208, Cl. 431-1.000.

Nakamura, Akira, to Nippon Gakki Seizo Kabushiki Kaisha. Method for making a diaphragm for an electro-acoustic transducer. 4,639,283, Cl. 156-89.000.

Nakamura, Ichiro, to Hitachi, Ltd. Fluid-pressure driving device. 4,638,718, Cl. 91-178.000.

Nakamura, Mutsuaki: *See*—
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; and Kuroda, Akio, 4,639,908, Cl. 369-288.000.

Nakamura, Shin; Hikino, Keiji; Kaji, Shinichi; and Komatsu, Tsunetoshi, to Hitachi, Ltd. Lint and raveling collector for clothes dryer. 4,638,573, Cl. 34-82.000.

Nakamura, Shunji; Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; and Nakahata, Kimio, to Canon Kabushiki Kaisha. Developing apparatus. 4,638,760, Cl. 118-658.000.

Nakamura, Taizo: *See*—
Aoyama, Tsutomu; Nakamura, Taizo; Terao, Naoyosi; and Shinonaga, Hirohiko, 4,639,098, Cl. 350-514.000.

Nakamura, Toru: *See*—
Asaeda, Takeaki; Nakamura, Toru; and Yutani, Takashi, 4,639,850, Cl. 363-58.000.

Nakamura, Yuji: *See*—
Ueno, Shigeto; Ohnishi, Masanori; Nakamura, Yuji; and Tanaka, Shinichi, 4,639,814, Cl. 360-130.100.

Nakamura, Yutaka: *See*—
Ota, Toyokazu; Nakamura, Yutaka; Ikeda, Yutaka; Katsoka, Shunzi; and Ito, Yoshinobu, 4,639,291, Cl. 162-207.000.
Ota, Toyokazu; and Nakamura, Yutaka, 4,639,292, Cl. 162-375.000.

Nakane, Masami, to E. R. Squibb & Sons, Inc. 7-oxabicycloheptane substituted keto-amide prostaglandin analogs useful in the treatment of thrombotic disease. 4,639,461, Cl. 514-382.000.

Nakano, Minol: *See*—
Kodama, Mitsuo; Miyake, Masaya; Nakano, Minol; Asai, Tsuyoshi; and Hara, Akio, 4,639,352, Cl. 419-15.000.

Nakano, Takuo: *See*—
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,639,451, Cl. 514-247.000.

Nakashima, Atushi: *See*—
Takemura, Tohru; Nakashima, Atushi; Yoshida, Haruhiko; Kamo, Jun; and Hamada, Eiichi, 4,639,353, Cl. 422-46.000.

Nakata, Hozumi; and Yamakawa, Tsutomu, to Nihon Dempa Kogyo Co., Ltd. Piezoelectric resonator mountings. 4,639,632, Cl. 310-351.000.

Nakayama, Keiji: *See*—
Taniguchi, Koki; Yamaguchi, Shigeri; and Nakayama, Keiji, 4,639,062, Cl. 339-59.00M.

Nakazato, Kunihiro: *See*—
Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.

Nakazyo, Kiyoshi: *See*—
Kawagishi, Toshio; and Nakazyo, Kiyoshi, 4,639,413, Cl. 430-546.000.

Nalco Chemical Company: *See*—
Wierzba, Robert B.; Snyder, Robert G.; and Kleefisch, Blaise H., 4,639,381, Cl. 427-156.000.

Nam, Chul W. Internal combustion engine system. 4,638,635, Cl. 60-716.000.

Namba, Hideaki: *See*—
Kamei, Eiichi; and Namba, Hideaki, 4,638,778, Cl. 123-339.000.
Sakai, Tuguyasu; Namba, Hideaki; and Ohba, Masahiro, 4,639,871, Cl. 364-431.100.

Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; and Kuroda, Akio, to Victor Company of Japan, Ltd. High density information records made of conductive resin compositions comprising inorganic power stabilizers. 4,639,908, Cl. 369-288.000.

Namiki, Masayuki; Kamiya, Masaaki; Kojima, Yoshikazu; and Tanaka, Kojiro, to Kabushiki Kaisha Daini Seikosha. Thermosensitive semiconductor device using Darlington circuit. 4,639,755, Cl. 357-28.000.

Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, to Nippon Avionics Co., Ltd. Apparatus for determining the three-dimensional position and attitude. 4,639,220, Cl. 433-69.000.

Narumo, Kinzo: *See*—
Shimamiya, Yukio; Narumo, Kinzo; and Ebihara, Hiroshi, 4,639,066, Cl. 339-132.00B.

National Institute for Researches in Inorganic Materials: *See*—
Makishima, Akio; and Tani, Toshiro, 4,639,329, Cl. 252-501.100.

National Research Development Corporation: *See*—
De Brie Perry, Forbes G., 4,638,687, Cl. 74-691.000.
Jones, Gerald M., 4,639,158, Cl. 403-31.000.
Lee, Anthony J. J., 4,639,635, Cl. 313-123.000.

NCR Corporation: *See*—
Granzow, Robert H.; and Gupta, Desh B., 4,638,993, Cl. 271-315.000.

NEC Corporation: *See*—
Hirosaki, Botaro; and Tanaka, Osamu, 4,639,939, Cl. 375-118.000.
Ichikawa, Yoshio; Akahori, Masaaki; Ishii, Daisuke; Tsunoda, Kazuyuki; Minami, Yohichiro; and Nagata, Koichi, 4,639,726, Cl. 340-825.440.
Kaneko, Takashi, 4,639,920, Cl. 371-31.000.
Kitaguchi, Takahisa, 4,639,692, Cl. 331-111.000.
Oshima, Goro; and Kato, Kotaro, 4,639,548, Cl. 178-22.170.
Suzuki, Norio, 4,639,767, Cl. 358-21.00R.

Needham, James R.: *See*—
Smith, Glenn C.; Needham, James R.; and Turnbull, William T., 4,639,176, Cl. 411-468.000.

Neefe, Charles W. Spin cast ocular cosmetic device with color separation. 4,639,105, Cl. 351-162.000.

Nehezipari Muszaki Egyetem: *See*—
Bader, Imre; Berecz, Endre; Szina, Gabor; and Horvath, Janos, 4,639,304, Cl. 204-413.000.

Neidhart, Peter: *See*—
Dahler, Peter; Neidhart, Peter; Sadek, Kadry; and Stemmler, Herbert, 4,639,846, Cl. 363-39.000.

Neidig, Arno; Leukel, Bernd; and Bergmann, Lutz, to Brown, Boveri & Cie., AG. Power transistor module. 4,639,759, Cl. 357-74.000.

Neilson, John M. S.; and Brackelmanns, Norbert W., to RCA Corporation. MOSFET with reduced bipolar effects. 4,639,762, Cl. 357-23.800.

Neilson, John M. S.: *See*—
Wheatley, Carl F., Jr.; Neilson, John M. S.; and Russell, John P., 4,639,754, Cl. 357-23.400.

Nels, Terry E.; Eldridge, Larry; and Doty, Gerald L., to General Motors Corporation. Clutch plate member having layer of high durability, self-conforming friction facing. 4,639,392, Cl. 428-283.000.

Nelson, Alec L., to Sperry Corporation. Digital phase and frequency detector. 4,639,680, Cl. 328-134.000.

Nemecek, Amy L.: *See*—
Ball, Lawrence E.; Griffin, William M.; Wallace, Kathleen M.; and Nemecek, Amy L., 4,638,865, Cl. 166-274.000.

Neste Oy: *See*—
Bergstrom, Christer, 4,639,398, Cl. 428-451.000.
Turunen, Olli T.; Huttenen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,514, Cl. 536-30.000.
Turunen, Olli T.; Huttunen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,515, Cl. 536-30.000.

Neubauer, Jerry L.; Schmidt, Laurence J.; and Voss, Steven H., to International Business Machines Corporation. Shrink ring for disk clamping. 4,639,802, Cl. 360-98.000.

Neuhaus, Josef, to Westermann Kommanditgesellschaft. Trash pail for installation in a cabinet having a swingable door. 4,639,050, Cl. 312-273.000.

Neumann, David B.; and Hunt, Robert D. Fish securing device. 4,638,591, Cl. 43-89.000.

New Castle Industries, Inc.: *See*—
Frankland, James D., Jr., 4,639,143, Cl. 366-89.000.

New England Medical Center Hospitals, Inc.: *See*—
Babior, Bernard M., 4,639,373, Cl. 424-101.000.

New Holland, Inc.: *See*—
Strosser, Richard P.; Bohman, Carl E.; and Chow, Mark K., 4,639,666, Cl. 324-202.000.

New York Blood Center, Inc.: *See*—
Prince, Alfred M.; and Vnek, John, 4,639,371, Cl. 424-86.000.

New York Institute of Technology: *See*—
Glenn, William E., 4,639,788, Cl. 358-233.000.

New York University: *See*—
Laurer, Gerard R., 4,639,600, Cl. 250-363.00S.

Newco Enterprises, Inc.: *See*—
Webster, Joseph P., 4,638,928, Cl. 222-155.000.

Newell, Alfred T., III; and Nichols, E. Lane, to A. T. Newell Co. Inc. Electronic thermostat. 4,638,850, Cl. 165-26.000.

Newman, Michael G.; and Carranza, Fermin A., Jr. Fluoride-coated dental floss. 4,638,823, Cl. 132-91.000.

Newsom, Horace R. Self mixing sprayer. 4,638,924, Cl. 222-1.000.

NGK Insulators, Ltd.: *See*—
Ogawa, Yutaka; Ogasawara, Takayuki; and Hori, Yoshiaki, 4,638,683, Cl. 74-567.000.
Shibata, Kazuyoshi; and Nishizawa, Hitoshi, 4,639,305, Cl. 204-426.000.

NGK Spark Plug Co., Ltd.: *See*—
Nishiki, Masahiro, 4,639,698, Cl. 333-187.000.

Niazi, Sarfaraz; and Shemesh, Alvin, to Farmacon Research Corporation. Chewing gum containing a medicament and taste maskers. 4,639,368, Cl. 424-48.000.

Nicholas, Richard W.: *See*—
McMahan, David R.; and Nicholas, Richard W., 4,639,840, Cl. 362-80.000.

Nichols, E. Lane: *See—*
Newell, Alfred T., III; and Nichols, E. Lane, 4,638,850, Cl. 165-26.000.

Nichols, James O. Sun shade apparatus for a lounge chair. 4,639,036, Cl. 297-184.000.

Nichols, Walter A.; and Wayne, Reginald, to Philip Morris Incorporated. Method of making a filter cigarette. 4,638,818, Cl. 131-281.000.

Nickel, Wilhelm: *See—*
Sebastian, Wilhelm; Nickel, Wilhelm; and Schirmag, Klaus-Peter, 4,638,655, Cl. 72-208.000.

Niebes, Paul J.: *See—*
Roncucci, Romeo; Gillet, Claude L.; Cordi, Alexis H.; Martens, Mark A.; Roba, Joseph L.; Niebes, Paul J.; Lambelin, Georges E.; and Van Dorsser, William R., 4,639,468, Cl. 514-620.000.

Nield, Kenneth J.: *See—*
Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., 4,639,631, Cl. 310-344.000.

Nifco Inc.: *See—*
Omata, Nobuaki, 4,638,528, Cl. 16-82.000.

Nihon Dempa Kogyo Co., Ltd.: *See—*
Nakata, Hozumi; and Yamakawa, Tsutomu, 4,639,632, Cl. 310-351.000.

Nihon Jukagaku Kogyo Kabushiki Kaisha: *See—*
Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.

Nihon Kohsakuyu Company, Ltd.: *See—*
Liao, T. K., 4,639,323, Cl. 252-32.500.

Nilarp, Anders, to International Rectifier Corporation. Method of manufacture of semiconductor device. 4,638,553, Cl. 29-580.000.

Nilsen, Carl-Otto: *See—*
Gruzman, Boris; and Nilsen, Carl-Otto, 4,639,572, Cl. 219-121.0LG.

Nimura, Hitoshi: *See—*
Sakura, Yasuhiro; Nimura, Hitoshi; and Ishikawa, Mamoru, 4,639,743, Cl. 346-76.0PH.

Nippon Acchakutanshi Seizo Kabushiki Kaisha: *See—*
Okazaki, Takashi; Matsu'ura, Yukio; and Saijo, Yoshihiko, 4,638,549, Cl. 29-564.400.

Nippon Air Brake Co., Ltd.: *See—*
Imanaka, Asaji, 4,639,047, Cl. 303-15.000.

Nippon Avionics Co., Ltd.: *See—*
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, 4,639,220, Cl. 433-69.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Nakamura, Akira, 4,639,283, Cl. 156-89.000.

Nippon Kagaku K.K.: *See—*
Murakami, Seiro; and Hamajima, Muneki, 4,639,604, Cl. 250-548.000.

Nippon Kogaku K. K.: *See—*
Aono, Yasuhiro, 4,639,094, Cl. 350-413.000.
Isogai, Masaki; and Kawahara, Atsushi, 4,639,787, Cl. 358-214.000.
Ohkubo, Yuji, 4,639,113, Cl. 354-472.000.

Nippon Kokan, K.K.: *See—*
Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, 4,639,167, Cl. 405-217.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Sugitani, Yuji; and Tamaoki, Naohiro, 4,639,573, Cl. 219-124.220.

Nippon Oil Co., Ltd.: *See—*
Hara, Hajime; Orii, Shingo; Aoyama, Kazuho; and Enomoto, Masami, 4,639,503, Cl. 528-92.000.

Nippon Petrochemicals Company, Ltd.: *See—*
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; and Dohi, Hideyuki, 4,639,833, Cl. 361-315.000.

Nippon Seiko Kabushiki Kaisha: *See—*
Tanaka, Hirohisa, 4,638,691, Cl. 74-866.000.

Nippon Steel Corporation: *See—*
Yoshiwara, Seishiro; and Kawanami, Takao, 4,638,939, Cl. 228-186.000.

Nippon Telegraph & Telephone Public Corporation: *See—*
Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, 4,639,080, Cl. 350-96.340.

Nippondenso Co., Ltd.: *See—*
Kamei, Eiichi; and Namba, Hideaki, 4,638,778, Cl. 123-339.000.
Kobayashi, Akihiro; Yamaguchi, Shunzo; Kobayashi, Kiyomi; and Takaba, Hiroaki, 4,639,712, Cl. 338-238.000.
Matsui, Takeshi; Takeda, Shunichi; and Makino, Tomoatsu, 4,638,785, Cl. 123-644.000.
Sakai, Tuguyasu; Namba, Hideaki; and Ohba, Masahiro, 4,639,871, Cl. 364-431.100.
Yamanaka, Yasutoshi; Ageishi, Kazunobu; and Izumida, Teruo, 4,638,856, Cl. 165-119.000.

Nirschl, Heinrich; Kamp, Klaus; and Stummer, Baldur, to Siemens Aktiengesellschaft. Digital signal distributor. 4,639,909, Cl. 370-58.000.

Nishigaki, Masahide: *See—*
Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, 4,639,927, Cl. 373-84.000.

Nishihara, Toshio: *See—*
Yatabe, Toshiaki; Nishihara, Toshio; and Suzuki, Nobuo, 4,639,069, Cl. 350-1.700.

Nishikawa, Toshio; Ishikawa, Youhei; and Wada, Hidekazu, to Murata Manufacturing Co., Ltd. Dielectric resonator comprising a resonant dielectric pillar mounted in a conductively coated dielectric case. 4,639,699, Cl. 333-202.000.

Nishiki, Masahiro, to NGK Spark Plug Co., Ltd. Ceramic electronic filter. 4,639,698, Cl. 333-187.000.

Nishimatsu, Masaharu; Ide, Toshiaki; and Arioka, Hiroyuki, to TDK Corporation. Magnetic recording medium. 4,639,389, Cl. 428-141.000.

Nishimura, Sadanori, to Honda Giken Kogyo Kabushiki Kaisha. Damper device for a torque converter clutch. 4,638,897, Cl. 192-3.300.

Nishimura, Sanji: *See—*
Matsui, Shingo; Ikeda, Hidetsugu; Era, Akio; and Nishimura, Sanji, 4,639,355, Cl. 423-112.000.

Nishina, Takashi: *See—*
Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,639,451, Cl. 514-247.000.

Nishino, Takaichi: *See—*
Fujita, Yasuyuki; and Nishino, Takaichi, 4,639,040, Cl. 297-379.000.

Nishizawa, Hitoshi: *See—*
Shibata, Kazuyoshi; and Nishizawa, Hitoshi, 4,639,305, Cl. 204-426.000.

Nissan Chemical Industries Ltd.: *See—*
Fujikawa, Yoshihiro; Sakashita, Mitsuaki; and Tsuruzoe, Nobutomo, 4,639,444, Cl. 514-222.000.

Nissan Diesel Co., Ltd.: *See—*
Moriizumi, Ryoji; Suzuki, Yoichi; and Ameda, Kazuhiro, 4,638,883, Cl. 180-324.000.

Nissan Motor Co., Ltd.: *See—*
Aikawa, Hiroshi, 4,639,006, Cl. 280-96.100.
Hiraiwa, Kazuyoshi, 4,638,688, Cl. 74-763.000.
Kawai, Akio; Ito, Ken; and Iwamoto, Hideo, 4,639,676, Cl. 324-380.000.
Takahashi, Tohru; and Kurami, Kunihiko, 4,639,652, Cl. 318-568.000.

Nitto Electric Industrial Co., Ltd.: *See—*
Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, 4,639,080, Cl. 350-96.340.
Tajiri, Kazuhiro; Kohmoto, Michio; Saito, Kiyoshi; and Takahira, Hitoshi, 4,639,476, Cl. 523-213.000.

Nitzsche, Erhard: *See—*
Grossmann, Stefan; and Nitzsche, Erhard, 4,638,734, Cl. 101-248.000.

Nixdorf Computer AG: *See—*
Baitz, Guenter; and Dobring, Wilfried, 4,638,908, Cl. 206-0.800.

Nixon, Brian J.: *See—*
Harrison, Joel N.; Condito, Vincent A.; Graham, Randolph H.; Nixon, Brian J.; and Simonsen, Richard C., 4,639,798, Cl. 360-73.000.

Noda, Yoichiro: *See—*
Kitagawa, Tadao; Kosuge, Yutaka; and Noda, Yoichiro, 4,639,713, Cl. 340-63.000.

Nohara, Fujio; and Fujinawa, Tomoaki, to Ikeda Mohando Co., Ltd. Aminoalkylphenoxy derivatives. 4,639,523, Cl. 546-209.000.

Nomura, Hirokazu: *See—*
Asai, Michihiko; Shimura, Yukio; Tsuda, Keishiro; Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,639,379, Cl. 427-40.000.

Nonaka, Shingo: *See—*
Toda, Masumi; Ozaki, Yukio; and Nonaka, Shingo, 4,638,945, Cl. 239-143.000.

Nordhall, Lennart: *See—*
Hassellof, Ake; Lenasson, Carl-Gustaf; and Nordhall, Lennart, 4,638,540, Cl. 29-168.000.

Nordson Corporation: *See—*
Gabriel, Alexander, 4,638,951, Cl. 239-707.000.
Sticher, Charles K., 4,639,611, Cl. 307-117.000.

Noren, Don W. Heat pipe assembly. 4,638,854, Cl. 165-76.000.

Norman, Peter: *See—*
Abram, Trevor S.; Norman, Peter; and Warren, Brian T., 4,639,535, Cl. 549-419.000.

Normann, Norbert, to Doduco KG Dr. Eugen Durrwachter. Magnetic field sensor comprising Wiegand wires or similar bistable magnetic elements. 4,639,670, Cl. 324-260.000.

Norskau, Jurgen; and Richter, Rudolf, to Linde Aktiengesellschaft. Power control devices for hydrostatic pumps. 4,639,195, Cl. 417-216.000.

North American Philips Corporation: *See—*
Hirayama, Chikara; and Andrew, Kenneth F., 4,639,639, Cl. 313-639.000.
Singer, Barry M.; and Jayaraman, Rajsekhar, 4,639,761, Cl. 357-234.000.
Strange, Thomas F.; and Carino, John W., 4,639,827, Cl. 361-272.000.
Strange, Thomas F.; and Carino, John W., 4,639,828, Cl. 361-272.000.

Norton Company: *See—*
Khaund, Arup K., 4,639,427, Cl. 501-128.000.

Novack, Robert L.: *See—*
Tomasovic, Beth A.; and Novack, Robert L., 4,639,306, Cl. 204-432.000.

Novak, Mark F.: *See—*
Heilveil, Andrew; VanAken, Jerry R.; Guttag, Karl M.; Redwine, Donald J.; Pinkham, Raymond; and Novak, Mark F., 4,639,890, Cl. 364-900.000.

Novatome: *See—*
Malaval, Claude, 4,639,350, Cl. 376-290.000.

Noworolski, Zbigniew; and Ferens, Jerzy, to International Exide Electronics/Corporation. Snubber circuit for H.F. bridge converter. 4,639,849, Cl. 363-56.000.

Nozaki, Mineo: *See—*
Uchikata, Yoshio; Nozaki, Mineo; Asakura, Osamu; and Nagashima, Masasumi, 4,639,744, Cl. 346-76.0PH.

Nussbaecher, Hans K., to Siemens Aktiengesellschaft. Circuit arrangement for accelerated carry formation in an adder device. 4,639,888, Cl. 364-788.000.

Nye, Leroy M., Jr.; and Pike, Thomas W., to Xerox Corporation. Cleaning system for a multicolor electrophotographic printing machine. 4,639,124, Cl. 355-15.000.

Oakey, John D.: *See—*
Marshall, John; and Oakey, John D., 4,638,638, Cl. 62-9.000.
Marshall, John; and Oakey, John D., 4,638,639, Cl. 62-9.000.

Oakley, Barbara: *See—*
LeGault, Robert H.; Jezzi, Arrigo D.; Milner, James D.; Oakley, Barbara; and Franke, Paul G., 4,639,254, Cl. 604-385.00R.

Oberlander, Karol H.; and Umlauf, Norbert, to Umlauf, Norbert. Shears, especially circular knife shears. 4,638,701, Cl. 83-490.000.

Obermeier, Rainer; Geiger, Rolf; and Grau, Ulrich, to Hoechst Aktiengesellschaft. Process for converting preproinsulin analogs into insulins. 4,639,333, Cl. 530-303.000.

O'Brien, Thomas P., to Kabushiki Kaisha Toshiba. Gimballed three-dimensional display system. 4,639,081, Cl. 350-144.000.

Ochiai, Yoshitaka: *See—*
Makino, Yoshimi; Ochiai, Yoshitaka; Uedaira, Satoru; Hotai, Kazuhide; Aso, Koichi; and Hayakawa, Masatoshi, 4,639,278, Cl. 148-108.000.

Ochii, Kiyofumi: *See—*
Iwahashi, Hiroshi; and Ochii, Kiyofumi, 4,639,895, Cl. 365-200.000.

Odeco, Inc.: *See—*
Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, 4,639,167, Cl. 405-217.000.

Office National d'Etudes et de Recherche Aerospatiales (ONERA): *See—*
Fredholm, Allan; Davidson, James H.; Khan, Tasadduq; and Theret, Jean-Mare C. F., 4,639,280, Cl. 148-404.000.

Ogasawara, Takayuki: *See—*
Ogawa, Yutaka; Ogasawara, Takayuki; and Hori, Yoshiaki, 4,638,683, Cl. 74-567.000.

Ogawa, Yutaka; Ogasawara, Takayuki; and Hori, Yoshiaki, to NGK Insulators, Ltd. Camshaft for engine. 4,638,683, Cl. 74-567.000.

Ogden Industries Pty Ltd: *See—*
Dunphy, Gerald F.; and Best, Lance E., 4,639,022, Cl. 292-150.000.

Ogushi, Yoshimi: *See—*
Suzuki, Niichiro; Ogushi, Yoshimi; Imai, Kiyoshi; Ohta, Nobuhiro; and Ueno, Susumu, 4,639,285, Cl. 156-272.600.

Ohashi, Toshio: *See—*
Ito, Masashi; Ohashi, Toshio; and Ui, Katsumi, 4,639,272, Cl. 106-243.000.

Ohba, Masahiro: *See—*
Sakai, Tuguyasu; Namba, Hideaki; and Ohba, Masahiro, 4,639,871, Cl. 364-431.100.

Ohkubo, Hideo: *See—*
Murata, Yoshitaka; Hatano, Tsuyoshi; and Ohkubo, Hideo, 4,638,526, Cl. 15-367.000.

Ohkubo, Yuji, to Nippon Kogaku K. K. Camera display device. 4,639,113, Cl. 354-472.000.

Ohkura Electric Co., Ltd.: *See—*
Motomiya, Takehiko, 4,639,852, Cl. 364-138.000.

Ohnishi, Kazuyuki: *See—*
Okuda, Masakiyo; Ohnishi, Kazuyuki; and Mitsuyama, Akira, 4,639,125, Cl. 355-23.000.

Ohnishi, Masanori: *See—*
Ueno, Shigeto; Ohnishi, Masanori; Nakamura, Yuji; and Tanaka, Shinichi, 4,639,814, Cl. 360-130.100.

Ohta, Ikumi: *See—*
Iesaka, Takashi; Wada, Takaaki; Ohta, Ikumi; and Izumi, Masayuki, 4,638,618, Cl. 52-509.000.

Ohta, Jiro, to Hitachi, Ltd. Tubular water wheel. 4,639,190, Cl. 415-129.000.

Ohta, Nobuhiro: *See—*
Suzuki, Niichiro; Ogushi, Yoshimi; Imai, Kiyoshi; Ohta, Nobuhiro; and Ueno, Susumu, 4,639,285, Cl. 156-272.600.

Ohtsuki, Osamu, to Fujitsu Limited. Charge coupled device with meander channel and elongated, straight, parallel gate electrodes. 4,639,940, Cl. 377-60.000.

Ohura, Masaki: *See—*
Takeda, Yukio; Iijima, Shiro; Higuchi, Shinsuke; Ohura, Masaki; and Nagaike, Sadanori, 4,639,803, Cl. 360-103.000.

Ohwada, Yoshiaki: *See—*
Shimbo, Masaru; Fukuda, Kiyoshi; and Ohwada, Yoshiaki, 4,638,552, Cl. 29-576.00J.

Oiles Industry Co., Ltd.: *See—*
Kohama, Masayuki; Wakabayashi, Tatsuro; and Tsunoda, Kouichi, 4,638,538, Cl. 29-149.50C.

Oji Seisha Kabushiki Kaisha: *See—*
Ota, Toyokazu; and Nakamura, Yutaka, 4,639,292, Cl. 162-375.000.

Oji Seishi Kabushiki Kaisha: *See—*
Ota, Toyokazu; Nakamura, Yutaka; Ikeda, Yutaka; Kataoka, Shunzi; and Ito, Yoshinobu, 4,639,291, Cl. 162-207.000.

Okada, Chiharu: *See—*
Aono, Koji; Saito, Toshinori; and Okada, Chiharu, 4,639,361, Cl. 423-347.000.

Okada, Hiroshi: *See—*
Yasuhara, Seishi; Hagiwara, Mitsuo; Inoue, Kazuo; Fujimori, Kyoichi; Sekiguchi, Akira; and Okada, Hiroshi, 4,638,782, Cl. 123-502.000.

Okada, Shinjiro; Katagiri, Kazuharu; and Kanbe, Junichiro, to Canon Kabushiki Kaisha. Liquid crystal device. 4,639,089, Cl. 350-341.000.

Okada, Tsutomu, to Olympus Optical Co., Ltd. High frequency instrument for incision and excision. 4,638,802, Cl. 128-303.140.

Okamoto, Kenji: *See—*
Inui, Isao; Hosaka, Masato; Nakamoto, Mitsuyoshi; and Okamoto, Kenji, 4,639,208, Cl. 431-1.000.

Okamoto, Yasushi: *See—*
Imai, Akio; Okamoto, Yasushi; and Saito, Masatqahi, 4,639,494, Cl. 525-271.000.

Okamura, Takayuki: *See—*
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 4,639,471, Cl. 521-172.000.

Okanobu, Taiwa, to Sony Corporation. DC-DC converter. 4,639,659, Cl. 323-224.000.

Okazaki, Takashi; Matsu'ura, Yukio; and Saijo, Yoshihiko, to Nippon Acchakutanshi Seizo Kabushiki Kaisha. Apparatus for manufacturing electrical harnesses. 4,638,549, Cl. 29-564.400.

Oki Denki Giken Kogyo Kabushiki Kaisha: *See—*
Otobe, Yutaka; Kiuchi, Takeo; and Tomozawa, Kikuo, 4,639,870, Cl. 364-431.050.

Okita, Masao; and Miyata, Hiroyasu, to Alps Electric Co., Ltd. Optical rotary encoder. 4,639,595, Cl. 250-231.0SE.

Okuda, Masakiyo; Ohnishi, Kazuyuki; and Mitsuyama, Akira, to Sharp Kabushiki Kaisha. Automatic duplex copying type copying apparatus. 4,639,125, Cl. 355-23.000.

Okumoto, Yutaka, to Japan Tobacco, Inc. Device for controlling contents of tobacco on cigarette machine. 4,638,817, Cl. 131-280.000.

Okuzono, Shuichi: *See—*
Sakanaka, Yasuhiro; and Okuzono, Shuichi, 4,639,508, Cl. 528-486.000.

Oleff, Werner; and Pape, Fritz G., to Oleff, Werner; and ASV Stubbe GmbH & Co KG, a part interest. Injection molded synthetic wheel. 4,639,046, Cl. 301-63.0PW.

Olesen, Ole V., to Pace, Incorporated. Spike detector circuitry. 4,639,618, Cl. 307-351.000.

Olin Corporation: *See—*
Gasper, Kenneth E., 4,639,718, Cl. 340-603.000.
Meatto, Franklin D.; and Pilpel, Edward D., 4,639,009, Cl. 285-402.000.
Pryor, Michael J.; Winter, Joseph; and Dantzig, Jonathan A., 4,638,535, Cl. 29-1.300.

Ollero-Pina, Juan C.; and Garrido-Diaz, Antonio, to Sociedad Anonima de Racionalizacion y Mechanizacion. Fruit selecting machine. 4,638,914, Cl. 209-617.000.

Ollivier, Jean: *See—*
Basset, Jean M. M.; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, 4,639,429, Cl. 502-117.000.

Olsen, Randolffa R. Interlocking building block system. 4,639,345, Cl. 264-226.000.

Olson, Donald M., to Economic Development Corporation. High temperature and acid resistant wafer pick up device. 4,639,028, Cl. 294-34.000.

Olson, Douglas R.; Harness, James R.; and Waterston, John W., to Meloy Laboratories, Inc. Immunological color change test involving two differently colored reagent spots. 4,639,419, Cl. 435-5.000.

Olympus Optical Co., Ltd.: *See—*
Okada, Tsutomu, 4,638,802, Cl. 128-303.140.
Yokota, Akira, 4,639,837, Cl. 362-32.000.

Omata, Nobuaki, to Nifco Inc. Oil type damper. 4,638,528, Cl. 16-82.000.

Omholt, Bruce D., to Prints Plus, Inc. Drop feed mitering machine. 4,638,698, Cl. 83-444.000.

Omnichem S.A.: *See—*
Trouet, Andre B. L.; Hannart, Jean A. A. J.; and Rao, Kandukuri S. B., 4,639,456, Cl. 514-283.000.

Omron Tateisi Electronics Co.: *See—*
Ishigure, Kazuaki, 4,638,746, Cl. 109-52.000.
Matsumoto, Hiromichi; and Hashimoto, Ritsuo, 4,639,889, Cl. 364-900.000.
Rake, Heinrich; Hoffmann, Ulrich; Muller, Ulrich; Breddermann, Rudolf; and Blumbach, Rainer, 4,639,853, Cl. 364-149.000.
Sato, Ryuichi, 4,639,702, Cl. 335-153.000.

O'Neal, James E.: *See—*
Sastry, Shankar M.; O'Neal, James E.; and Peng, Tzy C., 4,639,281, Cl. 148-407.000.

O'Neill Bell, Christopher: *See—*
MacLachlan, Stuart; and O'Neill Bell, Christopher, 4,638,555, Cl. 29-623.100.

Onystok, Michael J.: *See—*
Chason, Marc K.; Kotecki, Carl A.; Tomase, Joseph P.; Onystok, Michael J.; Ryback, Donald J.; Kinsman, Robert G.; Dworsky, Lawrence N.; Nield, Kenneth J.; and Moore, Steven C., 4,639,631, Cl. 310-344.000.

Oosawa, Masahiro: *See*—
Eto, Masayuki; Izumi, Kazuyoshi; Kobayashi, Fuyuki; Kawagishi, Mamoru; and Oosawa, Masahiro, 4,639,721, Cl. 340-747.000.

Oplatek Oy: *See*—
Sandgren, Lasse, 4,638,757, Cl. 118-411.000.

Optel System Limited: *See*—
Boles, John A.; and Eastman, Jay M., 4,639,606, Cl. 250-555.000.

Orii, Shingo: *See*—
Hara, Hajime; Orii, Shingo; Aoyama, Kazuho; and Enomoto, Masami, 4,639,503, Cl. 528-92.000.

Orlowski, Ronald C.; Stahl, Glenn L.; and Colescott, Robert L., to Armour Pharmaceutical Company. [16,19-Di-alanine] calcitonin. 4,639,509, Cl. 530-307.000.

Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., to Armour Pharmaceutical Company. (1-S-acetamidomethyl cysteine, 7-alanine)calcitonin. 4,639,510, Cl. 530-307.000.

Orlowski, Ronald C.; and Seyler, Jay K., to Armour Pharmaceutical Company. Des-19-leucine-calcitonin analogs. 4,639,511, Cl. 530-307.000.

Ortega, Domingo: *See*—
Bernard, Jean-Claude; Chabrier, Patrick; Tahon, Bernard; Tesoriere, Jean-Marc; and Ortega, Domingo, 4,639,929, Cl. 373-120.000.

Ortho Pharmaceutical Corporation: *See*—
Bandurco, Victor T.; Bell, Stanley C.; Combs, Donald W.; Falotico, Robert; and Tobia, Alfonso J., 4,639,518, Cl. 544-285.000.

Osaka Gas Company Limited: *See*—
Iuchi, Akira; and Tsunokawa, Shinya, 4,638,975, Cl. 251-149.600.

Osaka University: *See*—
Komatsu, Masao; and Fujita, Hiroshi, 4,639,363, Cl. 423-644.000.

Osanai, Masatoshi: *See*—
Arikawa, Junichi; Chiba, Hiroshi; Miyazaki, Osamu; and Osanai, Masatoshi, 4,639,582, Cl. 235-379.000.

Oshima, Goro; and Kato, Kotaro, to NEC Corporation. Digital communication system including an error correcting encoder/decoder and a scrambler/descrambler. 4,639,548, Cl. 178-22.170.

Ostergren, Carl D.; and Paivanas, John A., deceased (by Paivanas, Sophia, executor), to International Business Machines Corporation. Thermal conduction disc-chip cooling enhancement means. 4,639,829, Cl. 361-386.000.

Ota, Toyokazu; Nakamura, Yutaka; Ikeda, Yutaka; Kataoka, Shunzi; and Ito, Yoshinobu, to Shikishima Canvas Kabushiki Kaisha; and Oji Seishi Kabushiki Kaisha. Method of controlling moisture profile in paper web in paper drying process and apparatus practicing same. 4,639,291, Cl. 162-207.000.

Ota, Toyokazu; and Nakamura, Yutaka, to Oji Seisha Kabushiki Kaisha; and Shikishima Casvas Kabushiki Kaisha. Drying cylinder for use in paper making. 4,639,292, Cl. 162-375.000.

Otobe, Yutaka, to Honda Giken Kogyo K.K. Method of detecting abnormality in a system for detecting exhaust gas ingredient concentration of an internal combustion engine. 4,638,658, Cl. 73-117.300.

Otobe, Yutaka; Kiuchi, Takeo; and Tomozawa, Kikuo, to Honda Giken Kogyo Kabushiki Kaisha; and Oki Denki Giken Kogyo Kabushiki Kaisha. Fuel supply control method for internal combustion engines, with adaptability to various engines and controls therefor having different operating characteristics. 4,639,870, Cl. 364-431.050.

O'Toole, Michael P.; and Card, Roger J., to American Cyanamid Company. High technology ceramics with partially stabilized zirconia. 4,639,356, Cl. 423-266.000.

Otsuka, Kengo: *See*—
Sannohe, Kunio; Otsuka, Kengo; Ito, Toshohiko; Maruyama, Masahiko; Kitano, Takafumi; and Hirayama, Makoto, 4,639,521, Cl. 546-141.000.

Ott, Karl-Heinz: *See*—
Wingler, Frank; Koch, Otto; Doering, Joachim; Ott, Karl-Heinz; and Liebig, Lothar, 4,639,473, Cl. 525-83.000.

Ott, Russell G., to RCA Corporation. Priority arbitration logic for a multi-master bus system. 4,639,859, Cl. 364-200.000.

Otters, John L. External combustion engines. 4,638,633, Cl. 60-518.000.

Outboard Marine Corporation: *See*—
Hansen, Loren F.; and Lamb, Mark E., 4,638,867, Cl. 172-22.000.

Owen, David A. A.: *See*—
Ganellin, Charon R.; Ife, Robert J.; and Owen, David A. A., 4,639,519, Cl. 544-320.000.

Owens-Corning Fiberglas Corporation: *See*—
Pugnale, Peter J.; and Messmer, Michael J., 4,639,164, Cl. 405-54.000.

Owens-Illinois, Inc.: *See*—
Beck, James M.; and Rohr, Robert D., 4,638,916, Cl. 215-235.000.

Oximetrix, Inc.: *See*—
Pastrone, Giovanni; and Chamness, Leland D., 4,639,245, Cl. 604-152.000.

Ozaki, Yukio: *See*—
Toda, Masumi; Ozaki, Yukio; and Nonaka, Shingo, 4,638,945, Cl. 239-143.000.

Pace, Incorporated: *See*—
Olesen, Ole V., 4,639,618, Cl. 307-351.000.

Paivanas, John A., deceased: *See*—
Ostergren, Carl D.; and Paivanas, John A., deceased, 4,639,829, Cl. 361-386.000.

Paivanas, Sophia, executor: *See*—
Ostergren, Carl D.; and Paivanas, John A., deceased, 4,639,829, Cl. 361-386.000.

Palecki, John: *See*—
Stetson, Karl A.; and Palecki, John, 4,639,593, Cl. 250-227.000.

Palensky, Frederick J.: *See*—
Rasmussen, Jerald K.; Heilmann, Steven M.; and Palensky, Frederick J., 4,639,286, Cl. 156-307.300.

Palm, Bernhard, to Milwaukee Electric Tool Corporation. Magnetic base for portable tools. 4,639,170, Cl. 408-76.000.

Palmer, Darrel, to Ballard Medical Products. Aspirating/ventilating apparatus and method. 4,638,539, Cl. 29-157.00R.

Panev, Vladimir B.: *See*—
Hadjiiski, Anatoli M.; Varbanov, Hristo P.; Mishonov, Michail T.; Stamov, Vladimir P.; Savov, Rosen P.; Radenkov, Strahil K.; Panev, Vladimir B.; and Velev, Alexander S., 4,638,607, Cl. 52-79.900.

Panzera, Carlino: *See*—
Jones, Robin M. F.; DeLuca, Robert D.; and Panzera, Carlino, 4,639,218, Cl. 433-8.000.

Papak, Viktor, to Josef Gartner & Co. Apparatus for conditioning and controlling the temperature of rooms in a building. 4,638,853, Cl. 165-50.000.

Pape, Fritz G.: *See*—
Oleff, Werner; and Pape, Fritz G., 4,639,046, Cl. 301-63.0PW.

Papillon, Jean-Charles: *See*—
Richard, Philippe; Papillon, Jean-Charles; Guyot, Alain; and Corbellini, Carlo, 4,638,838, Cl. 138-30.000.

Pappano, Thomas W.; and Brown, David O., to General Signal Corporation. Apparatus for monitoring circuit integrity. 4,639,719, Cl. 340-652.000.

Paradyne Corporation: *See*—
Zuranski, Edward S.; Scott, Robert E.; and Betts, William L., 4,639,934, Cl. 375-10.000.

Park, Arthur; and Wilson, Bob T., to Diamond Oil Well Drilling Company. Core monitoring device. 4,638,872, Cl. 175-46.000.

Parker, Robert P.: *See*—
Tallant, James C., II; and Parker, Robert P., 4,639,785, Cl. 358-184.000.

Parracho, Rui M.; Smith, Lloyd S.; Bunch, Richard P.; and Gross, Alexander L., to Converse Inc. Athletic shoe with external counter and cushion assembly. 4,638,576, Cl. 36-68.000.

Pasquet, Veronique; and Spitz, Roger, to Atochem. Catalyst support, process for its manufacture, and catalysts prepared with this support. 4,639,430, Cl. 502-120.000.

Pastrone, Giovanni; and Chamness, Leland D., to Oximetrix, Inc. Fluid infusion pump driver. 4,639,245, Cl. 604-152.000.

Paterson, Noel S.; and Vermilion, Everette E., to Sundstrand Data Control, Inc. Excessive terrain closure warning system. 4,639,730, Cl. 340-970.000.

Paton, Charles R.: *See*—
Grunert, Kurt A.; Walker, Roger E.; Paton, Charles R.; and Leone, David A., 4,639,564, Cl. 200-144.00R.

Patrick, Fred: *See*—
Littwin, Kenneth M.; Armond, Joseph A.; Buky, Gabriel R.; and Patrick, Fred, 4,639,821, Cl. 361-151.000.

Pav, Josef; Rauf, Richard; Svenka, Peter; and Wenzel, Reinhard, to Kleinewefers GmbH. Method and apparatus for calendering magnetic tapes. 4,639,346, Cl. 264-280.000.

Pawson, Ian W. N.: *See*—
King, Nigel J. R.; Pawson, Ian W. N.; Baker, Michael P.; Shaddock, Robert N.; and Stansfield, Edward V., 4,639,733, Cl. 342-424.000.

Payne, Earl R., to ICI Americas Inc. Alarm packet system. 4,639,716, Cl. 340-571.000.

Payne, Thomas R., to General Electric Company. Temperature sensor failure detection system for cooking appliance. 4,639,578, Cl. 219-450.000.

Pearson, Michael J., to Kaiser Aluminum & Chemical Corporation. Promoted scavenger for purifying HCl-contaminated gases. 4,639,259, Cl. 55-71.000.

Pease, Donald L., to Xerox Corporation. Control for retracting the cleaning blade of a reproduction or printing machine when the machine is not in use. 4,639,122, Cl. 355-15.000.

Pedain, Josef: *See*—
Hohlein, Peter; Schmidt, Manfred; Pedain, Josef; Riberi, Bernd; and Sonntag, Michael, 4,639,499, Cl. 526-285.000.

Pehker, Manfred: *See*—
Heintz, Wolfgang; Pehker, Manfred; and Metz, Josef, 4,638,714, Cl. 89-37.010.

Peng, Tzy C.: *See*—
Sastry, Shankar M.; O'Neal, James E.; and Peng, Tzy C., 4,639,281, Cl. 148-407.000.

Pennisi, Licio. Process for monitoring the heat gradient in a heat-producing system. 4,639,210, Cl. 431-13.000.

Peoples, P. Robert: *See*—
Hovey, Leonard L.; Mathews, Marion J., III; and Peoples, P. Robert, 4,639,539, Cl. 558-363.000.

Percell, Kim S., to Witco Chemical Corporation. Mold release enhancement for acrylonitrile-butadiene-styrene molding resins. 4,639,484, Cl. 524-318.000.

Periot, Jean-Marie: *See*—
Petit, Pierre; and Periot, Jean-Marie, 4,639,668, Cl. 324-208.000.

Perkey, Conrad G.: *See*—
Ackerman, Allen D.; Perkey, Conrad G.; Martin, Robert A.; and Justusson, William M., 4,638,846, Cl. 164-55.100.

Perrine, Neill D.: *See*—
Rogers, Russell L.; Perrine, Neill D.; and Alexander, Richard M., 4,639,016, Cl. 285-15.000.

Perry, Roger A. Tool carrier. 4,638,530, Cl. 24-3.00L.

Persch, Alois, to Zeller Plastik Koehn, Graebner & Co. Tamper proof closure. 4,638,917, Cl. 215-252.000.

Persson, Eric G.; and Veith, Ronald D., to GTO Electronics. Voltage inverter. 4,639,845, Cl. 363-26.000.

Peters, Arthur, to Honeywell Information Systems Inc. Wrap-around logic for interprocessor communications. 4,639,860, Cl. 364-200.000.

Petit, Pierre; and Periot, Jean-Marie, to La Telemecanique Electrique. Analog manipulator with proximity detection of a moveable magnetizable mass. 4,639,668, Cl. 324-208.000.

Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, to Odeco, Inc.; and Nippon Kokan, K.K. Deep water mobile submersible arctic structure. 4,639,167, Cl. 405-217.000.

Pezaris, Stylianos, to Thermo Electron Corporation. System for monitoring and controlling position of hoists. 4,639,874, Cl. 364-478.000.

Pezzoli, Nello, to Vamatex S.p.A. Guide for the gripper carrying straps inside the shed of weaving loom. 4,638,839, Cl. 139-449.000.

Pfaff Haushaltmaschinen GmbH: *See*—
Hartwig, Jurgen, 4,638,752, Cl. 112-458.000.

Pfizer Inc.: *See*—
Beck, Donald; Miller, James W.; Wernau, William C.; and Young, Thomas B., III, 4,639,322, Cl. 252-8.554.

Pham, Van Doan, to Alsthom-Atlantique. High tension arc-blast circuit breaker. 4,639,565, Cl. 200-148.00A.

Phelan, Gerard, to Swivelier. High hat light fixture support bracket. 4,638,970, Cl. 248-342.000.

Philip Morris Incorporated: *See*—
Cox, Richard H.; Grubbs, Harvey J.; and Haut, Stephen A., 4,638,816, Cl. 131-276.000.
Nichols, Walter A.; and Wayne, Reginald, 4,638,818, Cl. 131-281.000.

Phillips Home Products: *See*—
Bonacorsi, Robert W., 4,638,730, Cl. 100-229.00A.

Phillips Petroleum Company: *See*—
Lee, Fu-Ming, 4,639,308, Cl. 208-100.000.
Schuettenberg, Alexander D.; and Gragson, James T., 4,639,255, Cl. 44-62.000.

Phillips Plastics Corp.: *See*—
Wollar, Burnell J., 4,639,175, Cl. 411-38.000.

Piccirilli, Robert M.: *See*—
Makhlouf, Joseph M.; Falk, Frederick A.; and Piccirilli, Robert M., 4,639,492, Cl. 525-54.420.

Picquendar, Jean E.: *See*—
Yarranton, Arthur; Chase, Charles E., Jr.; and Picquendar, Jean E., 4,639,697, Cl. 333-155.000.

Pietsch, Helge: *See*—
Misher, Hans-Peter; and Pietsch, Helge, 4,638,982, Cl. 267-131.000.

Pike, Thomas W.: *See*—
Nye, Leroy M., Jr.; and Pike, Thomas W., 4,639,124, Cl. 355-15.000.

Pilarski, James A.: *See*—
Anderson, Robert L.; Pilarski, James A.; and Klintz, Jerry A., 4,639,653, Cl. 318-599.000.

Pilpel, Edward D.: *See*—
Meatto, Franklin D.; and Pilpel, Edward D., 4,639,009, Cl. 280-602.000.

Pinel, Joseph: *See*—
Val, Christian; Pinel, Joseph; and Gibod, Yves B., 4,639,826, Cl. 361-272.000.

Pinkham, Raymond: *See*—
Heilveil, Andrew; VanAken, Jerry R.; Guttag, Karl M.; Redwine, Donald J.; Pinkham, Raymond; and Novak, Mark F., 4,639,890, Cl. 364-900.000.

Pioneer Electronic Corporation: *See*—
Hasegawa, Tsunao, 4,639,681, Cl. 328-164.000.
Matsui, Fumio; Yanagisawa, Shuichi; Kakuta, Yoshiyuki; and Yoshizawa, Atsushi, 4,639,745, Cl. 346-135.100.
Yoshida, Masayuki, 4,639,660, Cl. 323-266.000.

Pistor, Helmut H., to United States of America, Army. IR image source using speculary reflective transparency. 4,639,603, Cl. 250-504.00R.

Pithouse, Kenneth B.; Jones, Thomas P. H.; Lowe, Frank J.; and Skipper, Richard S., to Raychem Limited. Recoverable article for screening. 4,639,545, Cl. 174-36.000.

Pitney Bowes Inc.: *See*—
Linkowski, William J., 4,639,918, Cl. 371-20.000.
Salazar, Edilberto I.; and Kirschner, Wallace, 4,638,732, Cl. 101-91.000.

Pittman, Clarence B.; and Cadwell, George H., Jr., to Flanders Filters, Inc. High efficiency air filter. 4,639,261, Cl. 55-502.000.

Pitts, John A. Z-neck, T-bar trailer. 4,639,015, Cl. 280-789.000.

Plastipak Packaging, Inc.: *See*—
Darr, Richard C., 4,639,206, Cl. 425-503.000.
Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., 4,639,207, Cl. 425-503.000.

Platel, Alain Y.; Bourgery, Guy R.; and Lacour, Alain, deceased (by Jose Guiblain, Helene Christiane, Cecile Helene Laurence Lacour, Laurent Pierre Rolland Lacour, heirs), to Delalande S.A. Arylic derivatives of piperazine, the method of preparing same and their application in therapeutics. 4,639,452, Cl. 514-252.000.

Plus Development Corporation: *See*—
Harrison, Joel N.; Moon, William G.; and Graham, Randolph H., 4,639,863, Cl. 364-200.000.

PMB Systems Engineering Limited: *See*—
Fern, Derek T., 4,639,166, Cl. 405-203.000.

Pockl, Franz: *See*—
Kellner, Roman; Mayr, Georg; Prokach, Karl-Heinz; and Pockl, Franz, 4,638,902, Cl. 198-345.000.

Podany, Clayton J.; and Glaseman, Richard W. Bow sight. 4,638,565, Cl. 33-265.000.

Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Hoffarth, Gunther; Richter, Wolfgang; Uytterhoeven, Herman; and de Winter, Walter, to Agfa Gevaert Aktiengesellschaft. Electrostatographic suspension developer and a process for its preparation comprising quaternary ionic copolymer for positive toner charge. 4,639,403, Cl. 430-115.000.

Poggio, Cesare: *See*—
Appiano, Silvano; Destefanis, Paolo; and Poggio, Cesare, 4,639,861, Cl. 364-200.000.

Pokorny, Richard J.: *See*—
Billigmeier, James E.; Groves, James D.; Haugen, Harwick A.; and Pokorny, Richard J., 4,639,483, Cl. 524-296.000.

Polaroid Corporation: *See*—
Hudspeth, William, 4,639,109, Cl. 354-295.000.

Polidor, Jaromir: *See*—
Zverina, Karel; Tluchor, Denek; Szabo, Josef; Polidor, Jaromir; and Kroupa, Petr, 4,639,570, Cl. 219-121.0PP.

Pollack, Robert L.; and Durst, Lawrence, to Commonwealth Medical Corporation of America. Method and composition for relieving pain. 4,639,465, Cl. 514-419.000.

Pommer, Ernst-Heinrich: *See*—
Roeser, Karl; Lauer, Manfred; Sauter, Hubert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,639,447, Cl. 514-222.000.

Ponjee, Johannes J.; and Verwijlen, Christiaan J. A., to U.S. Philips Corporation. Method of providing a metal mirror on a surface manufactured from an acrylate synthetic resin or a methacrylate synthetic resin. 4,639,382, Cl. 427-162.000.

Pont-a-Mousson S.A.: *See*—
Souplet, Robert; and Sutter, Jean, 4,638,976, Cl. 251-173.000.

Porcher, Thomas C.; and Robinson, Morgan E., to Digital Equipment Corporation. Signals path control circuitry for a data terminal. 4,639,891, Cl. 364-900.000.

Posma, Bonne W. Four quadrant control of series motors. 4,639,647, Cl. 318-247.000.

Poss Design Limited: *See*—
Poss, Werner, 4,638,954, Cl. 241-74.000.

Poss, Werner, to Poss Design Limited. Apparatus for the separation of mixtures of materials of different consistencies such as meat and bone. 4,638,954, Cl. 241-74.000.

Posso, Patrick P. P., to Gefitec S.A. Drawer for a storage cabinet. 4,639,052, Cl. 312-333.000.

Post, Alexander: *See*—
Buthe, Theo; Geisthoff, Hubert; Kretschmer, Horst; Mikeska, Felix; and Post, Alexander, 4,639,163, Cl. 403-322.000.

Potel, Gerd; and Buchholz, Karl-Heinz, to MAN Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Vertically adjustable emergency support of a car body. 4,638,742, Cl. 105-199.300.

Potente, Daniel F.: *See*—
Potente, John E.; and Potente, Daniel F., 4,638,521, Cl. 15-111.000.

Potente, John E.; and Potente, Daniel F. Oral cleaning device. 4,638,521, Cl. 15-111.000.

Potter, Roger A. Positive lock mechanism for moving board. 4,639,003, Cl. 280-5.240.

Poulin, Ted M.: *See*—
Elmore, Carl L.; Poulin, Ted M.; and Barrett, Mark D., 4,638,855, Cl. 165-101.000.

Powell, Philip E., to Advanced Cardiovascular Systems, Inc. Self-venting balloon dilatation catheter and method. 4,638,805, Cl. 128-344.000.

Powers, Dale R., to Corning Glass Works. Optical fiber preform and method. 4,639,079, Cl. 350-96.330.

Poyser, John, to Armstrong Patents Co. Ltd. Shock absorbers. 4,638,896, Cl. 188-299.000.

PPG Industries, Inc.: *See*—
Das, Suryya K.; and Dowbenko, Rostyslaw, 4,639,394, Cl. 428-327.000.
Makhlouf, Joseph M.; Falk, Frederick A.; and Piccirilli, Robert M., 4,639,492, Cl. 525-54.420.

Precisionform, Inc.: *See*—
Coy, William H., 4,638,608, Cl. 52-98.000.

Press, Gerd: *See*—
Schuster, Heinz; and Press, Gerd, 4,639,155, Cl. 401-1.000.

Prettyjohns, Keith N.: *See*—
Wyant, James C.; and Prettyjohns, Keith N., 4,639,139, Cl. 356-359.000.

Preuschoff, Michael: *See*—
Becker, Kunibert; Kirchbrucher, Rudiger; and Preuschoff, Michael, 4,639,169, Cl. 405-291.000.

Price, William L.; Schlupp, Ronald L.; and Thomas, Mammen, to Advanced Micro Devices, Inc. Process for formation of trench in integrated circuit structure using isotropic and anisotropic etching. 4,639,288, Cl. 156-643.000.

Priebisch, Artwin: *See*—
Schneider, Gunther; and Priebisch, Artwin, 4,638,733, Cl. 101-114.000.

Priesnitz, Uwe: *See*—
Moriya, Koichi; Priesnitz, Uwe; Riebel, Hans-Jochem; Eue, Ludwig; and Schmidt, Robert R., 4,639,537, Cl. 558-48.000.

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Hogan, Thomas C.; and Adelman, Arnold, 4,639,936, Cl. 375-36.000.

Prince, Alfred M.; and Vnek, John, to New York Blood Center, Inc. Hepatitis B antigenic compositions and vaccines against hepatitis B derived therefrom. 4,639,371, Cl. 424-86.000.
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Marcus, Konrad H.; and Chu, Zooey C., 4,639,085, Cl. 350-283.000.
Princeton Polymer Laboratories: *See*—
Semsarzadeh, Mohammad A., 4,639,396, Cl. 428-373.000.
Prints Plus, Inc.: *See*—
Ornbolt, Bruce D., 4,638,698, Cl. 83-444.000.
Process Equipment Company: *See*—
Knasel, Harold E.; and Grigsby, David A., 4,639,184, Cl. 414-730.000.
Procter and Gamble Company, The: *See*—
Barrat, Christian R.; Busch, Alfred; and Sardelis, Koumas, 4,639,321, Cl. 252-8.800.
Bedenk, William T.; and Harden, Kendall L., 4,638,907, Cl. 206-0.500.
Tsai, Chee-Hway, 4,639,375, Cl. 426-49.000.
Prodi, Vittorio. Device for separating airborne particles into grain size classes. 4,639,311, Cl. 209-143.000.
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Mackles, Leonard, 4,639,367, Cl. 424-45.000.
Prohaska, Helmut, to Folienwalzwerk Brueder Teich Akitenesellschaft. Pack and process for the manufacture thereof. 4,638,911, Cl. 206-611.000.
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Sehring, Richard; Buck, Wolfgang; Prokic-Immel, Ricarda; and Lust, Sigmund, 4,639,438, Cl. 514-129.000.
Prokuch, Karl-Heinz: *See*—
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Pryor, Michael J.; Winter, Joseph; and Dantzig, Jonathan A., to Olin Corporation. Apparatus for forming a thixoforged copper base alloy cartridge casing. 4,638,535, Cl. 29-1.300.
Puglis, John T.: *See*—
Purcell, John A.; Puglis, John T.; and Duckett, Steven W., 4,639,638, Cl. 313-534.000.
Pugnale, Peter J.; and Messmer, Michael J., to Owens-Corning Fiberglas Corporation. Underground tank sump and piping system. 4,639,164, Cl. 405-54.000.
Puisais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel J.; and Kaluszynski, Michel, to Total Compagnie Francaise des Petroles. External apparatus for butt welding two pipes. 4,638,984, Cl. 269-43.000.
Pullan, Brian R. Apparatus for detecting and determining the distribution of radioactivity on a medium. 4,639,601, Cl. 250-385.000.
Pullen, Keats A., Jr. High sensitivity signal detector. 4,639,623, Cl. 307-492.000.
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Purcell, John A.; Puglis, John T.; and Duckett, Steven W., to Sangamo Weston, Inc. Photomultiplier dynode coating materials and process. 4,639,638, Cl. 313-534.000.
Purdue Frederick Company, The: *See*—
Shetty, Bola V.; McFadden, Arthur; and Hofer, Peter, 4,639,529, Cl. 548-550.000.
Puumalainen, Pertti, to Enso-Gutzeit Oy. Procedure for measuring the quantity of silicon coating on paper or cardboard. 4,639,942, Cl. 178-045.000.
Puydak, Robert C.: *See*—
Hazelton, Donald R.; and Puydak, Robert C., 4,639,487, Cl. 524-425.000.
Qaderi, Saiyed B. A.: *See*—
Dickie, Ray A.; and Qaderi, Saiyed B. A., 4,639,493, Cl. 525-113.000.
Quantum Corporation: *See*—
Harrison, Joel N.; Condito, Vincent A.; Graham, Randolph H.; Nixon, Brian J.; and Simonsen, Richard C., 4,639,798, Cl. 360-71.000.
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Basset, Jean M. M.; Lecoate, Michel; Ollivier, Jean; and Quignard, Francoise, 4,639,429, Cl. 502-117.000.
Quock, Deborah E. R.; Triplett, Timothy L.; and Childress, Don E., to Texaco Inc. Filter press flow control system for dewatering sludge. 4,639,312, Cl. 210-101.000.
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Raby, James M.: *See*—
Brunea, Robert W.; and Raby, James M., 4,639,271, Cl. 106-21.000.
Racal Communications Equipment Limited: *See*—
King, Nigel J. R.; Pawson, Ian W. N.; Baker, Michael P.; Shaddock, Robert N.; and Stansfield, Edward V., 4,639,733, Cl. 342-424.000.
Rachwalski, Thaddeus M.: *See*—
Lindeman, Richard J.; and Rachwalski, Thaddeus M., 4,639,056, Cl. 339-17.0LC.
Rademakers, Petrus J., to Datawell B.V. Buoy. 4,639,227, Cl. 441-1.000.
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Rahn, Melanie H.; and Braun, Jane E., to Laporte, Dorothy, a part interest. Adult/child communication kit. 4,639,226, Cl. 434-433.000.
Railcar Specialties, Inc.: *See*—
Loomis, Russell M., 4,638,743, Cl. 105-377.000.
Rake, Heinrich; Hoffmann, Ulrich; Muller, Ulrich; Breddermann, Rudolf; and Blumbach, Rainer, to Omron Tateisi Electronics Co. Time-discrete adaptive switching on-off controller. 4,639,853, Cl. 364-149.000.
Ralph McKay Limited: *See*—
Johnson, William M.; and Mere, Ilmar, 4,638,868, Cl. 172-762.000.
Ramsey, Maynard, III; Medero, Richard; and Hood, Rush W., Jr., to Critikon, Inc. Automated diastolic blood pressure monitor with data enhancement. 4,638,810, Cl. 128-681.000.
Rand, Robert W. Medical apparatus for inducing scar tissue formation in a body. 4,638,803, Cl. 128-325.000.
Randall Industries: *See*—
Truckenbrodt, Randall, 4,639,031, Cl. 296-24.00R.
Randar, Magnus; and Kroening, Terry R., to Artos Engineering Company. Adjustably positional crank pin support means for wire feeding apparatus. 4,638,904, Cl. 198-468.200.
Rao, Kandukuri S. B.: *See*—
Trouet, Andre B. L.; Hannart, Jean A. A. J.; and Rao, Kandukuri S. B., 4,639,456, Cl. 514-283.000.
Rasmussen, Jerald K.; Heilmann, Steven M.; and Palensky, Frederick J., to Minnesota Mining and Manufacturing Company. Curable compositions containing azlactone-functional compounds. 4,639,286, Cl. 156-307.300.
Rassieur, Charles L., to Central Mine Equipment Company. Earth drill rig. 4,638,871, Cl. 173-26.000.
Rauf, Richard: *See*—
Pav, Josef; Rauf, Richard; Svenka, Peter; and Wenzel, Reinhard, 4,639,346, Cl. 264-280.000.
Raute Oy: *See*—
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Ravi, Prasad S.: *See*—
Valenty, Vivian B.; Hill, William H.; and Ravi, Prasad S., 4,639,325, Cl. 252-89.100.
Raychem Corporation: *See*—
Cherian, Gabe, 4,639,818, Cl. 361-106.000.
Lionnet, Richard, 4,639,060, Cl. 339-30.000.
McMills, Corey J.; and Milroy, James C., 4,639,068, Cl. 339-177.00R.
Raychem Limited: *See*—
Pithouse, Kenneth B.; Jones, Thomas P. H.; Lowe, Frank J.; and Skipper, Richard S., 4,639,545, Cl. 174-36.000.
Raymond, William J.; Morgan, Robert L.; and Miller, Ricky L., to Jostens Learning Systems, Inc. Phrase-programmable digital speech system. 4,639,877, Cl. 364-513.500.
Raytheon Company: *See*—
Skow, Lawrence H., 4,639,644, Cl. 315-382.000.
Yarranton, Arthur; Chase, Charles E., Jr.; and Picquendar, Jean E., 4,639,697, Cl. 333-155.000.
RCA Corporation: *See*—
Basile, Philip C., 4,639,614, Cl. 307-243.000.
Butterwick, Gilbert N., 4,639,590, Cl. 250-213.0VT.
Cohen, Edward; Weaver, Clarence M., Jr.; and Duschl, Robert A., 4,639,775, Cl. 358-106.000.
Curtice, Walter R., 4,639,752, Cl. 357-16.000.
Fling, Russell T., 4,639,783, Cl. 358-166.000.
Fling, Russell T., 4,639,784, Cl. 358-167.000.
Hurst, Robert N., 4,639,773, Cl. 358-105.000.
Mawhinney, Daniel D., 4,638,808, Cl. 128-653.000.
Michaelis, Theodore D., 4,639,883, Cl. 364-557.000.
Neilson, John M. S.; and Brackelmanns, Norbert W., 4,639,762, Cl. 357-23.800.
Ott, Russell G., 4,639,859, Cl. 364-200.000.
Sauer, Donald J., 4,639,898, Cl. 365-202.000.
Schiff, Leonard N., 4,639,932, Cl. 375-1.000.
Tallant, James C., II; and Parker, Robert P., 4,639,785, Cl. 358-184.000.
Tamer, Gregory G.; and Hollinden, David E., 4,639,786, Cl. 358-197.000.
Wacyk, Ihor T., 4,639,897, Cl. 365-200.000.
Wheatley, Carl F., Jr.; Neilson, John M. S.; and Russell, John P., 4,639,754, Cl. 357-23.400.
Willis, Donald H.; and Fling, Russell T., 4,639,763, Cl. 358-11.000.
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Redmann, Eckhard, to Kraftwerk Union Aktiengesellschaft. Sample-collecting device for gaseous or vaporous condensable radioactive substances, especially for collecting traces of tritium. 4,638,674, Cl. 73-863.120.
Redolfi, Michel. Underwater sound delivery system. 4,639,903, Cl. 367-131.000.
Redwine, Donald J.: *See*—
Heilveil, Andrew; VanAken, Jerry R.; Guttag, Karl M.; Redwine, Donald J.; Pinkham, Raymond; and Novak, Mark F., 4,639,890, Cl. 364-900.000.
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Kramer, Wolfgang; Buchel, Karl H.; Holmwood, Graham; Regel, Erik; Reinecke, Paul; and Brandes, Wilhelm, 4,639,462, Cl. 514-383.000.
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Reichardt, Manfred; and Schutzle, Gunter, to Allied Corporation. Connector for a shielded flat cable. 4,639,053, Cl. 339-14.00R.
Reichert, Gerhard; and Riedel, Friedrich, to Siemens Aktiengesellschaft. Fan wheel for radial fan. 4,639,193, Cl. 416-184.000.
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Rentel, Kurt R.: *See*—
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Research Corporation: *See*—
Baratta, Anthony J.; Jester, William A.; Kenney, Edward S.; McMaster, Ira B.; and Schultz, Mortimer A., 4,639,349, Cl. 376-254.000.
Research Medical, Inc.: *See*—
Kelly, Michael N.; Foster, John B.; and Foster, Robert D., 4,639,252, Cl. 604-282.000.
Research Physics, Inc: *See*—
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Revlon, Inc.: *See*—
Ciaudelli, Joseph P., 4,639,369, Cl. 424-59.000.
Reynes, Enrique G.; and Leising, John O., to B F Goodrich Company, The. Process for stabilizing thiocarbamylsulfenamides. 4,639,517, Cl. 544-85.000.
Rheinmetall GmbH.: *See*—
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Rhodes, Arthur B. Device for selectively coupling a movable load bearing unit to a link chain conveyor flight. 4,638,740, Cl. 104-172.200.
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Hohlein, Peter; Schmidt, Manfred; Pedain, Josef; Riberi, Bernd; and Sonntag, Michael, 4,639,499, Cl. 526-285.000.
Ribrant, Sven, to Allmanna Brandreskapsaffaren AB. Hose clamp. 4,638,531, Cl. 24-274.00R.
Rice, Ivan G. Process for directing a combustion gas stream onto rotatable blades of a gas turbine. 4,638,628, Cl. 60-39.020.
Richard Kablitz GmbH & Co. KG: *See*—
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Richard, Philippe; Papillon, Jean-Charles; Guyot, Alain; and Corbellini, Carlo, to Commissariat a l'Energie Atomique. Hydropneumatic accumulator. 4,638,838, Cl. 138-30.000.
Richard Wolf GmbH: *See*—
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Richter, Roland; Muller, Hanns P.; and Wegner, Christian, to Bayer Aktiengesellschaft. Material for support dressings. 4,638,795, Cl. 128-90.000.
Richter, Rudolf: *See*—
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Richter, Wolfgang: *See*—
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Ricoh Company, Ltd.: *See*—
Anderson, Carl P., 4,639,128, Cl. 355-75.000.
Inoue, Takashi, 4,639,741, Cl. 346-76.0PH.
Kiguchi, Masao, 4,639,553, Cl. 379-377.000.
Murai, Kazuo; and Koichi, Yasushi, 4,639,117, Cl. 355-14.00R.
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Riebel, Hans-Jochem: *See*—
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Riedel, Friedrich: *See*—
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Riedlinger, Rainer, to Richard Wolf GmbH. Sonic transmitters. 4,639,904, Cl. 367-140.000.
Rieser, Robert L. Combination garment hanger. 4,638,931, Cl. 223-88.000.
Riesselmann & Sohn, Firma: *See*—
Seelhorst, Gottfried, 4,638,663, Cl. 73-313.000.
Riggs, Donnie E. Shoe with angular slotted midsole. 4,638,577, Cl. 36-114.000.
Riker Laboratories: *See*—
McQuinn, Roy L.; and Wade, James J., 4,639,445, Cl. 514-222.000.
Rinderle, Heinz: *See*—
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Ring, Stefan: *See*—
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Rinn, Juergen; and Belitz, Fritz, to Minox GmbH. Automatic focusing system for a photographic camera. 4,639,110, Cl. 354-403.000.
Rinnai Kabushiki Kaisha: *See*—
Ueki, Takashi; and Ishikawa, Yoshihiro, 4,638,789, Cl. 126-351.000.
Ripberger, Emil; and Stuska, Gotthard, to Mahle GmbH. Light alloy piston. 4,638,725, Cl. 92-237.000.
Rippingale, John B., to Schonstedt Instrument Company. Apparatus and method employing extraneous field compensation for locating current-carrying objects. 4,639,674, Cl. 324-326.000.
Ritenour, Roger L.: *See*—
Rympalski, William P.; Herstein, James S.; and Ritenour, Roger L., 4,639,720, Cl. 340-712.000.
Ritter, Joachim A.: *See*—
Yip, Kwok-leung; Araghi, Mehdi N.; Daniele, Joseph J.; Banton, Martin E.; Kramer, Charles J.; and Ritter, Joachim A., 4,639,073, Cl. 350-6.800.
Ritter, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Aerobically hardenable plastic compositions. 4,639,498, Cl. 526-196.000.
Rivero, Mauricio. Plant transporting device. 4,638,595, Cl. 47-39.000.
Rizk, Nabil I.; and Stevens, Charles L., to Rizk, Nabil I. Implantable electrophoretic pump for ionic drugs and associated methods. 4,639,244, Cl. 604-19.000.
Roba, Joseph L.: *See*—
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Robbins & Myers, Inc.: *See*—
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Robert Bosch GmbH: *See*—
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Gressler, Walter; and Kern, Karl, 4,639,185, Cl. 414-733.000.
Kubach, Hans; and Rupp, Hartmann, 4,639,822, Cl. 361-155.000.
Roberts, Donald L.; Angel, Anthony L.; Clark, Douglas C.; Clearman, Jack F.; and Sink, T. Stephen, to R. J. Reynolds Tobacco Company. Puff control cigarette. 4,638,820, Cl. 131-336.000.
Roberts, Gary F.: *See*—
Woodworth, Gary C.; and Roberts, Gary F., 4,638,729, Cl. 99-450.600.
Roberts, Thomas G.; and Honeycutt, Thomas E., to United States of America, Army. Spherical. 4,639,642, Cl. 315-39.000.
Robertson, Charles M. Curling brooms. 4,638,522, Cl. 15-160.000.
Robinson, Morgan E.: *See*—
Porcher, Thomas C.; and Robinson, Morgan E., 4,639,891, Cl. 364-900.000.
Robroy Industries: *See*—
Ford, James H., 4,638,966, Cl. 248-62.000.
Rockwell International Corporation: *See*—
Chow, Pei-Ming D.; and Chi, Keh-Fei C., 4,639,142, Cl. 356-372.000.
Jaqua, Vance W.; and Jencek, Premysl, 4,638,947, Cl. 239-265.430.
Rosman, Irwin E., 4,639,189, Cl. 415-115.000.
Sheem, Sang K., 4,639,078, Cl. 350-96.210.
Yarne, Andrew J.; and Burr, Eldon F., 4,638,938, Cl. 228-180.100.
Roda, Dominick A., to Roda Industries, Inc. Removable shoe protector. 4,638,574, Cl. 36-7.200.
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Roda, Dominick A., 4,638,574, Cl. 36-7.200.
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Rodloff, Rudiger K.; and Jungbluth, Werner W., to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Piezoceramic servo-drive for producing translational motion, especially for application to ring laser mirrors. 4,639,630, Cl. 310-328.000.
Rodriguez, Charles W.: *See*—
Chang, Yi-Hua E.; Gruodis, Algirdas J.; Muhlfeld, Hans P., Jr.; Rodriguez, Charles W.; and Shulman, Mark L., 4,639,919, Cl. 371-27.000.
Roeser, Karl; Lauer, Manfred; Sauter, Hubert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. Azolylnitriles, and fungicides containing these compounds. 4,639,447, Cl. 514-222.000.
Rogers Corporation: *See*—
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Rogers, O. David; Bardwick, John, III; and Staten, Kenneth, to Stage Rite Corporation. Staging structure. 4,638,604, Cl. 52-6.000.
Rogers, Russell L.; Perrine, Neill D.; and Alexander, Richard M., to Aeroquip Corporation. Pipeline repair kit. 4,639,016, Cl. 285-15.000.
Rogers, Russell L.: *See*—
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Rohr, Robert D.: *See*—
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ROJ Electrotex S.p.A.: *See—*
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Rolls-Royce Limited: *See—*
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Rombout, Willy. Method and equipment for electronically transmitting informations. 4,639,913, Cl. 370-90.000.
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Romer, Michael: *See—*
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Roncucci, Romeo; Gillet, Claude L.; Cordi, Alexis H.; Martens, Mark A.; Roba, Joseph L.; Niebes, Paul J.; Lambelin, Georges E.; and Van Dorsser, William R., to Continental Pharma Inc. Derivatives of glycinamide, their preparation and their use. 4,639,468, Cl. 514-620.000.
Ronthaler, Karl-Heinz: *See—*
Frings, Heinz; Kabelitz, Hans-Peter; and Ronthaler, Karl-Heinz, 4,639,199, Cl. 418-3.000.
Rorig, Kurt J.: *See—*
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Rorije, Gerhardus J.: *See—*
Bakker, Gijsbertus; and Rorije, Gerhardus J., 4,639,636, Cl. 313-408.000.
Rosa, Frank, to Redyref-Pressed & Welded, Inc. Mounting mechanism for connecting light box to telephone enclosure. 4,638,605, Cl. 52-28.000.
Rosbeck, Joseph P.; and Kasai, Ichiro, to Santa Barbara Research Center. Graded gap inversion layer photodiode array. 4,639,756, Cl. 357-30.000.
Rose, Bernard F., to Chevron Research Company. Fungicidal substituted N-(1-iodopropargyl)thiazolidinones. 4,639,460, Cl. 514-369.000.
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Rosman, Irwin E., to Rockwell International Corporation. Hollow, thermally-conditioned, turbine stator nozzle. 4,639,189, Cl. 415-115.000.
Rosner, Manfred; Loewe, Heinz; Duwel, Dieter; and Kirsch, Reinhard, to Hoechst Aktiengesellschaft. Substituted phenylsulfonyloxybenzimidazolecarbamates and anthelmintic compositions. 4,639,463, Cl. 514-395.000.
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Collinson, Christopher D.; and Ross, Hugh M., 4,638,950, Cl. 239-551.000.
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Rousseau, Jacques R., to Aerazur-Efa. Maneuverable parachute. 4,638,961, Cl. 244-142.000.
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Fleisher, Richard B.; and Rubin, Bruce A., 4,639,769, Cl. 358-27.000.
Rucci, Norman M.; and Sautter, Helmuth O., to AT&T Information Systems. Dynamic gain adjuster for an image scanner. 4,639,781, Cl. 358-163.000.
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Rutledge, David L.: *See—*
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Ryback, Donald J.: *See—*
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Rycroft, Alan K., to Becton, Dickinson and Company. Syringe barrel and hypodermic needle assembly. 4,639,250, Cl. 604-201.000.
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Rympalski, William P.; Herstein, James S.; and Ritenour, Roger L., to Harris Corporation. Electronic sketch pad. 4,639,720, Cl. 340-712.000.
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Giannetti, Anna; Massa, Sergio; and Re, Cesare, 4,638,580, Cl. 40-503.000.
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Ainoz, Jean-Philippe, 4,639,214, Cl. 431-344.000.
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Sagues, Paul, to Berkeley Process Control, Inc. Method and apparatus for measuring velocity and position in servo systems. 4,639,884, Cl. 364-565.000.
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Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,639,112, Cl. 354-455.000.
Saijo, Yoshihiko: *See—*
Okazaki, Takashi; Matsu'ura, Yukio; and Saijo, Yoshihiko, 4,638,549, Cl. 29-564.400.
Sairenji, Michihiko. Tooth clamp. 4,639,221, Cl. 433-139.000.
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Sakaguchi, Yukihiko, to Fuji Photo Film Co., Ltd. Heat developable light-sensitive material. 4,639,414, Cl. 430-550.000.
Sakai, Kunihide, to Victor Company of Japan, Limited. Magnetic head for perpendicular magnetization. 4,639,810, Cl. 360-125.000.
Sakai, Shinji; Kawabata, Takashi; and Harada, Yoshihito, to Canon Kabushiki Kaisha. Code plate. 4,639,108, Cl. 354-289.100.
Sakai, Takami, to Kabushiki Kaisha Toshiba. Method and system for controlling an AC-DC converter system. 4,639,848, Cl. 363-51.000.
Sakai, Tuguyasu; Namba, Hideaki; and Ohba, Masahiro, to Nippondenso Co., Ltd. Glow plug heating control apparatus for a diesel engine. 4,639,871, Cl. 364-431.100.
Sakai, Yasuhito, to Fuji Jukogyo Kabushiki Kaisha. Hydraulic line pressure control system for an infinitely variable transmission. 4,638,689, Cl. 74-866.000.
Sakamoto, Satoshi, to Sony Corporation. Three-phase brushless motor. 4,639,648, Cl. 318-254.000.
Sakanaka, Yasuhiro; and Okuzono, Shuichi, to Toyo Soda Manufacturing Co., Ltd. Process for producing granular composition of ethylenethiourea-chloroprene rubber. 4,639,508, Cl. 528-486.000.
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Sakazume, Akio; Yoshikawa, Hiroki; and Matsushima, Hiroaki, to Hitachi, Ltd. Control system for compressor motor used with air-conditioning unit. 4,638,643, Cl. 62-209.000.
Sakura, Yasuhiro, to Tokyo Electric Co., Ltd. Label feed control system. 4,639,287, Cl. 156-361.000.
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Sakurada, Nobuaki; Kawamura, Hideaki; and Sasaki, Takashi, to Canon Kabushiki Kaisha. Recording head drive control apparatus. 4,639,747, Cl. 346-140.00R.
Sakurai, Yasuo, to Ricoh Company, Ltd. Automatic document feeder. 4,638,987, Cl. 271-111.000.
Saladino, Salvatore; and Samson, Victoria M. Ice cream handle. 4,639,376, Cl. 426-134.000.
Salazar, Edilberto I.; and Kirschner, Wallace, to Pitney Bowes Inc. Sheet handling apparatus. 4,638,732, Cl. 101-91.000.
Salestrom, Charles B.; and Anderson, Kenneth E. Modular lighting system. 4,639,841, Cl. 362-227.000.
Saller, Kenneth R.; and Rentel, Kurt R., to Comlinear Corporation. Offset reduction in unity gain buffer amplifiers. 4,639,685, Cl. 330-263.000.
Salmon, Jean: *See—*
Jouquey, Alain; Salmon, Jean; Mouren, Michel; and Touyer, Gaetan, 4,639,336, Cl. 260-397.500.

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Salour, Michael M.; and Fehrenbach, Gustav W., to United States of America, Air Force. Distortion free fiber optic system. 4,639,075, Cl. 350-96.160.
Samejima, Ichiro: *See—*
Makihara, Katsumi; Yanagi, Kenichi; Fukushima, Takeo; Suganuma, Namio; Samejima, Ichiro; and Takahashi, Seiichi, 4,638,851, Cl. 165-32.000.
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Samtleben, Walter: *See—*
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Sandgren, Lasse, to Oplatek Oy. Apparatus for spreading jointing adhesive on a paper web which make one side of a form envelope. 4,638,757, Cl. 118-411.000.
Sandoz Ltd.: *See—*
Wenger, Roland; Traber, Rene P.; Kobel, Hans; and Hofmann, Hans, 4,639,434, Cl. 514-11.000.
Sangamo Weston, Inc.: *See—*
Purcell, John A.; Puglis, John T.; and Duckett, Steven W., 4,639,638, Cl. 313-534.000.
Swanson, Scott C., 4,639,728, Cl. 340-870.030.
San Ho, Fock: *See—*
Chiu, Anthony M.; Allison, Mark D.; Jones, James W.; Trammell, Lyndale A.; and San Ho, Fock, 4,639,664, Cl. 324-73.0AT.
Sani-Fresh International, Inc.: *See—*
Bokmiller, David J., 4,638,910, Cl. 206-15.200.
Sankyo Company Limited: *See—*
Miyadera, Tetsuo; Sugimura, Yukio; Tanaka, Teruo; Hashimoto, Toshihiko; Iino, Kimio; and Sugawara, Shinichi, 4,639,441, Cl. 514-195.000.
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Sannohe, Kunio; Otsuka, Kengo; Ito, Toshohiko; Maruyama, Masahiko; Kitano, Takafumi; and Hirayama, Makoto, to Mitsui Toatsu Chemicals, Inc. Isoquinoline derivatives. 4,639,521, Cl. 546-141.000.
Sano Sharyo Seisakusho Co., Ltd.: *See—*
Maeda, Kazuya; and Ishihara, Yasusuke, 4,639,004, Cl. 280-5.320.
Sano, Yutaka: *See—*
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Santa Barbara Research Center: *See—*
Kern, Mark T.; and Shamordola, Kenneth A., 4,639,598, Cl. 250-339.000.
Rosbeck, Joseph P.; and Kasai, Ichiro, 4,639,756, Cl. 357-30.000.
Sanyo Denki Co. Ltd.: *See—*
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Sanyo Electric Co., Ltd.: *See—*
Mukai, Kiyotaka, 4,639,656, Cl. 320-22.000.
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Sanyo-Kokusaku Pulp Company, Limited: *See—*
Kubo, Motonobu, 4,639,500, Cl. 526-301.000.
Sardelis, Kosmas: *See—*
Barrat, Christian R.; Busch, Alfred; and Sardelis, Kosmas, 4,639,321, Cl. 252-8.800.
Sasaki, Kiichi; and Takashi, Iimuro, to Honda Giken Kogyo Kabushiki Kaisha. Pivot structure for seat belt buckle. 4,638,534, Cl. 24-683.000.
Sasaki, Takashi: *See—*
Sakurada, Nobuaki; Kawamura, Hideaki; and Sasaki, Takashi, 4,639,747, Cl. 346-140.00R.
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Hanyu, Susumu; Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, 4,638,751, Cl. 112-254.000.
Sastry, Shankar M.; O'Neal, James E.; and Peng, Tzy C., to McDonnell Douglas Corporation. Advanced titanium composite. 4,639,281, Cl. 148-407.000.
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; and Dohi, Hideyuki, to Nippon Petrochemicals Company, Ltd. New electrical insulating oil and oil-filled electrical appliances. 4,639,833, Cl. 361-315.000.
Sato, Hidekazu, to Kokusan Kinzoku Kogyo Kabushiki Kaisha. Keyless steering shaft lock arrangement. 4,638,882, Cl. 180-287.000.
Sato, Kanichi; Setoyama, Mikio; Kiguchi, Shoji; and Tanaka, Toshio, to Kabushiki Kaisha Komatsu Seisakusho. Process for making foundry molds. 4,638,845, Cl. 164-12.000.
Sato, Kozo: *See—*
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, 4,639,418, Cl. 430-617.000.
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Sato, Ryuichi, to Omron Tateisi Electronics Co. Reed relay. 4,639,702, Cl. 335-153.000.
Sato, Tetsuo: *See—*
Watanabe, Kazuo; and Sato, Tetsuo, 4,639,795, Cl. 360-62.000.
Sato, Yoshiaki; and Suzuki, Hisao, to Toray Industries, Inc. Thick and thin fiber having grooves on its surface and process for producing the same. 4,639,397, Cl. 428-397.000.
Sauer, Donald J., to RCA Corporation. Bit-line pull-up circuit. 4,639,898, Cl. 365-202.000.
Sautter, Hubert: *See—*
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Sautter, Helmuth O.: *See—*
Rucci, Norman M.; and Sautter, Helmuth O., 4,639,781, Cl. 358-163.000.
Savage, Kerry D., to Texaco Inc. Means and method for producing hydrocarbons from an earth formation during the RF retorting of a hydrocarbon stratum. 4,638,862, Cl. 166-248.000.
Savage, Lester D.: *See—*
Mahanay, Joseph W.; and Savage, Lester D., 4,639,202, Cl. 418-59.000.
Savit, Carl H., to Western Geophysical Company of America. Telemetric system. 4,639,729, Cl. 340-870.130.
Savov, Rosen P.: *See—*
Hadjiiski, Anatoli M.; Varbanov, Hristo P.; Mishonov, Michail T.; Stamov, Vladimir P.; Savov, Rosen P.; Radenkov, Strahil K.; Panev, Vladimir B.; and Velev, Alexander S., 4,638,607, Cl. 52-79.900.
Sayles, David C., to United States of America, Army. Sabot for an electromagnetically-accelerated, unguided hypervelocity penetrator. 4,638,739, Cl. 102-520.000.
Schabel, Amelia A.: *See—*
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Schaff, Fredrick L.: *See—*
Gottlieb, Milton; and Schaff, Fredrick L., 4,639,092, Cl. 350-372.000.
Schaffner, Carl P. Method for the immunoanalysis of cholesterol epoxides. 4,639,420, Cl. 435-7.000.
Schaible, Siegfried; and Schneble, Edwin, to Kloeckner-Humboldt-Deutz AG Zweigniederlassung Fahr. Round baling press. 4,638,623, Cl. 56-341.000.
Schanz, Klaus, to Giulini Chemie GmbH. Process for the production of magaldrate. 4,639,362, Cl. 423-554.000.
Scharmann GmbH & Co.: *See—*
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Scheck, Georg; Bogner, Martin; Schmidt, Manfred; and Kowatsch, Ulrich, to GEZE GmbH. Releasable cross-country ski binding. 4,639,010, Cl. 280-615.000.
Schellenberg, Lutz; Hamacher, Matthias; and Ahmed, Bashir M., to Gerhard Collardin GmbH. Electrolyte stabilization of latices. 4,639,319, Cl. 210-651.000.
Schellstede, Herman J.; and Youngblood, James F., to Roy, Leon E., a part interest. Single pass mud rejuvenation system and method. 4,639,258, Cl. 55-52.000.
Schewe, Herbert: *See—*
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Schiessle, Edmund; and Forkel, Werner, to Daimler-Benz Aktiengesellschaft. Device for the indirect contactless electrical measuring of short paths. 4,638,659, Cl. 73-119.00A.
Schiff, Leonard N., to RCA Corporation. Clock rate spread spectrum. 4,639,932, Cl. 375-1.000.
Schindler, Edward F., Jr. Tools for repairing a diesel engine cylinder head. 4,638,541, Cl. 29-402.060.
Schine, Jonathan M., to High Resolution Television, Inc. Phase and amplitude control of vertical modulation in horizontal scan of CRT high resolution television. 4,639,766, Cl. 358-21.00R.
Schippers, Heinz; and Lenk, Erich, to Barmag Barmer Maschinenfabrik AG. Yarn handling apparatus for winding machine. 4,638,955, Cl. 242-18.0PW.
Schirmag, Klaus-Peter: *See—*
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Schlage Lock Company: *See—*
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Schleicher Maschinenbau und -Vertrieb GmbH: *See—*
Maier, Johann, 4,639,171, Cl. 408-89.000.
Schlig, Eugene S.; and Chamberlain, Savvas G., to International Business Machines Corporation. Absolute charge difference detection method and structure for a charge coupled device. 4,639,678, Cl. 324-457.000.
Schlupp, Ronald L.: *See—*
Price, William L.; Schlupp, Ronald L.; and Thomas, Mammen, 4,639,288, Cl. 156-643.000.
Schmidt, Baerbel; Samtleben, Walter; and Lysaght, Michael J. Process and apparatus for obtaining blood plasma. 4,639,243, Cl. 604-6.000.
Schmidt, Birgit: *See—*
Weddigen, Gerd; Huber, Robert; Schmidt, Birgit; and Schneider, Hartmut, 4,639,496, Cl. 525-506.000.
Schmidt, Laurence J.: *See—*
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Schmidt, Manfred: *See—*
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Schmidt, Robert R.: *See—*
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Schmitz, Beat: *See—*
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Schneble, Edwin: *See—*
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Schneider, Barbara; Hennig, Kurt; and Klein, Manfred, to Gebr. Hennig GmbH. Bellows. 4,638,722, Cl. 92-42.000.
Schneider, Gunther; and Priebisch, Artwin, to Rebhan, Horst. Squeegee head for printing of bodies by the screen printing method. 4,638,733, Cl. 101-114.000.
Schneider, Hartmut: *See—*
Weddigen, Gerd; Huber, Robert; Schmidt, Birgit; and Schneider, Hartmut, 4,639,496, Cl. 525-506.000.
Schneider, Theodor: *See—*
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Schneidmiller, Rodney G. Fly trap and attractant therefore. 4,638,592, Cl. 43-122.000.
Schnupp, Dale L., to Schnupp's Grain Roasting, Inc. Grain roasting machine and method. 4,639,216, Cl. 432-105.000.
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Schnupp, Dale L., 4,639,216, Cl. 432-105.000.
Schoch, Stephen A.; and Sibley, Howard W., to Carrier Corporation. Fiberoptic probe and method of making and using. 4,639,594, Cl. 250-227.000.
Schock, Edward J. Support structure for paraboloid reflector. 4,639,734, Cl. 343-912.000.
Scholz, Werner, to Telefunken Fernseh und Rundfunk GmbH. Phase control circuit. 4,639,687, Cl. 331-1.00A.
Schonstedt Instrument Company: *See—*
Rippingale, John B., 4,639,674, Cl. 324-326.000.
Schopper, Bernd; and Tandler, Peter, to Alfred Teves GmbH. Process and apparatus for brake pressure control. 4,639,048, Cl. 303-22.00R.
Schreiber, Stuart L., to Yale University. Process for preparing synthetic periplanone-B. 4,639,532, Cl. 549-332.000.
Schroder, Werner. Shear for profile and/or flat and/or solid-section steel stock. 4,638,699, Cl. 83-452.000.
Schubert, Karl F.: *See—*
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Schubert & Salzer Maschinenfabrik: *See—*
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Schuco Heinz Schurmann GmbH & Co.: *See—*
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Schuette, Wilhelm; McKee, Graham E.; Hilt, Albrecht; Heinz, Gerhard; and Goerrissen, Heiner, to BASF Aktiengesellschaft. Impact-resistant polyoxymethylene molding materials and their preparation. 4,639,488, Cl. 524-456.000.
Schuettenberg, Alexander D.; and Gragson, James T., to Phillips Petroleum Company. Solid form additives and method of forming same. 4,639,255, Cl. 44-62.000.
Schulte, Winfred: *See—*
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Schultz, Mortimer A.: *See—*
Baratta, Anthony J.; Jester, William A.; Kenney, Edward S.; McMaster, Ira B.; and Schultz, Mortimer A., 4,639,349, Cl. 376-254.000.
Schuster, Heinz; and Preas, Gerd, to USM Corporation. Melt dispensers. 4,639,155, Cl. 401-1.000.
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Schwarz, Edward L. Friction pivot assembly. 4,639,147, Cl. 384-125.000.
Schweblin, Jean-Denis. Syringe. 4,639,248, Cl. 604-187.000.
Schwinn Bicycle Company: *See—*
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Sciortino, Giacomo, to Carl Freudenberg, Firma. Engine mount. 4,638,981, Cl. 267-8.00R.
Scipione, Donald S.: *See—*
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Turpin, Edward T.; and Thrane, David T., 4,639,299, Cl. 204-181.700.
Scott, Robert E.: *See—*
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Scullion, Christopher K.: *See—*
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Sebastian, Wilhelm; Nickel, Wilhelm; and Schirmag, Klaus-Peter, to Mannesmann AG. Holding and guiding a mandrel rod in rolled stock in and adjacent to a tube rolling mill. 4,638,655, Cl. 72-208.000.
Sebata, Ichiro: *See—*
Ikeda, Hiroyuki; Matsumoto, Seikichi; Kitagawa, Shunji; Inagaki, Takefumi; and Sebata, Ichiro, 4,639,070, Cl. 350-3.710.
Seelhorst, Gottfried, to Riesselmann & Sohn, Firma. Level indicating device for liquid containers. 4,638,663, Cl. 73-313.000.
Sehring, Richard; Buck, Wolfgang; Prokic-Immel, Ricarda; and Lust, Sigmund, to Celamerck GmbH & Co. KG. O,S-dialkyl-O-(substituted phenyl)-thiolphosphates as pesticides. 4,639,438, Cl. 514-129.000.
Seiko Instruments & Electronics Ltd.: *See—*
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Tamura, Fujio, 4,638,664, Cl. 73-384.000.
Seino, Kiyoharu; Takagi, Tadashi; and Takeda, Fumio, to Mitsubishi Denki Kabushiki Kaisha. Power distribution circuit having center portions of isolation resistors connected together. 4,639,694, Cl. 333-128.000.
Seki, Hiroshi; and Kataishi, Ryuichiro, to Seki, Hiroshi. Fire sensor device. 4,639,605, Cl. 250-554.000.
Seki, Toshio: *See—*
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Sekiguchi, Akira: *See—*
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Sekikawa, Katsuhide, to Mitsubishi Denki Kabushiki Kaisha. Tool display method for lathe equipped with numerical control unit. 4,639,855, Cl. 364-188.000.
Sekizawa, Sadao; Seki, Toshio; and Takahashi, Tadashi, to Hitachi, Ltd. Magnetic detector having magnetoresistive elements. 4,639,807, Cl. 360-113.000.
Selin, Johan-Fredrik: *See—*
Turunen, Olli T.; Huttenen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,514, Cl. 536-30.000.
Turunen, Olli T.; Huttunen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, 4,639,515, Cl. 536-30.000.
Selleck, Ronald R.: *See—*
Martin, James M.; Brockett, William S.; Selleck, Ronald R.; and Croteau, Michael G., 4,639,138, Cl. 356-350.000.
Sellers, William Douglas: *See—*
Enders, Max L., deceased; and Thiel, Reinhard A., administrator, 4,639,044, Cl. 301-9.0DN.
Selmayr, Tassilo: *See—*
Staiger, Gerhard; Selmayr, Tassilo; Kinzel, Peter; and Reutter, Anneliese, 4,639,541, Cl. 560-20.000.
Semsarzadeh, Mohammad A., to Princeton Polymer Laboratories. Thermoplastics-metal fiber threads. 4,639,396, Cl. 428-373.000.
Semtronics Corporation: *See—*
Breidegam, Albert C., 4,639,825, Cl. 361-212.000.
Sen Gupta, Sisir K., to Talon, Inc. Semi-automatic apparatus for attaching flypieces to a slide fastener chain. 4,638,557, Cl. 29-766.000.
Senoo, Yoji, to Sharp Kabushiki Kaisha. Device to prevent transport of poorly aligned copy paper. 4,638,989, Cl. 271-227.000.
Service Machine Co.: *See—*
Lycan, Jennings, 4,639,558, Cl. 200-1.00V.
Seto, Kaoru, to Canon Kabushiki Kaisha. Motor control device. 4,639,649, Cl. 318-314.000.
Setoyama, Mikio: *See—*
Sato, Kanichi; Setoyama, Mikio; Kiguchi, Shoji; and Tanaka, Toshio, 4,638,845, Cl. 164-12.000.
Sewa, Shingo: *See—*
Aizawa, Koichi; Sewa, Shingo; and Nakahara, Hideki, 4,639,489, Cl. 524-588.000.
Sexton, Gregory J.: *See—*
Young, Lawrence R.; Sexton, Gregory J.; Mullins, Randal L.; and Bradley, Brian D., 4,639,738, Cl. 346-75.000.
Seyferth, Dietmar; and Yu, Yuan-Fu, to Massachusetts Institute of Technology. Method for forming new preceramic polymers containing silicon. 4,639,501, Cl. 528-15.000.
Seyler, Jay K.: *See—*
Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., 4,639,510, Cl. 530-307.000.
Orlowski, Ronald C.; and Seyler, Jay K., 4,639,511, Cl. 530-307.000.
Sgourakes, George E., to Foxboro Company, The. Apparatus and method for calibrating span of pressure measuring instruments. 4,638,656, Cl. 73-4.00R.
Shaddock, Robert N.: *See—*
King, Nigel J. R.; Pawson, Ian W. N.; Baker, Michael P.; Shaddock, Robert N.; and Stansfield, Edward V., 4,639,733, Cl. 342-424.000.
Shallenberger, John M.; and Ferlan, Stephen J., to Westinghouse Electric Corp. Locking tube removal fixture and method in a reconstitutable fuel assembly. 4,638,543, Cl. 29-426.500.
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Shamordola, Kenneth A.: *See—*
Kern, Mark T.; and Shamordola, Kenneth A., 4,639,598, Cl. 250-339.000.
Shand, J. Richard; and LaChance, Raymond H., to Bicron Electronics Company. Debris tolerant solenoid. 4,639,704, Cl. 335-255.000.
Shannon, John L., Jr. Singles stick for net height adjustment. 4,638,998, Cl. 273-29.0BB.
Shapiro, Rafael, to Du Pont de Nemours, E. I., and Company. Thiophene or furan herbicides. 4,639,265, Cl. 71-90.000.
Sharp Kabushiki Kaisha: *See—*
Akita, Kenji, 4,639,211, Cl. 431-20.000.
Eto, Masayuki; Izumi, Kazuyoshi; Kobayashi, Fuyuki; Kawagishi, Mamoru; and Oosawa, Masahiro, 4,639,721, Cl. 340-747.000.
Kira, Toru; Miyauchi, Teiichi; and Yoshikawa, Mitsuhiko, 4,639,806, Cl. 360-113.000.
Matsuura, Hirokazu, 4,639,120, Cl. 355-14.00R.
Okuda, Masakiyo; Ohnishi, Kazuyuki; and Mitsuyama, Akira, 4,639,125, Cl. 355-23.000.
Senoo, Yoji, 4,638,989, Cl. 271-227.000.
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Taniguchi, Koki; Yamaguchi, Shigeri; and Nakayama, Keiji, 4,639,062, Cl. 339-59.00M.
Ueno, Atsushi; and Abumi, Takao, 4,639,768, Cl. 358-22.000.
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Shaver, David C.: *See—*
Doherty, John A.; Ward, Billy W.; and Shaver, David C., 4,639,301, Cl. 204-192.310.
Sheem, Sang K., to Rockwell International Corporation. Optical fiber attenuator and method of fabrication. 4,639,078, Cl. 350-96.210.
Sheffer, Phil B., to Merchandising Innovations, Inc. Telescoping display stand. 4,638,745, Cl. 108-111.000.
Shelden, C. Hunter; and McCann, Gilbert D. Stereotactic method and apparatus for locating and treating or removing lesions. 4,638,798, Cl. 128-303.00B.
Shell Oil Company: *See—*
Goolsby, Alvin D., 4,639,677, Cl. 324-425.000.
Wood, Derek A.; and Briner, Paul H., 4,639,334, Cl. 548-952.000.
Shemesh, Alvin: *See—*
Niazi, Sarfaraz; and Shemesh, Alvin, 4,639,368, Cl. 424-48.000.
Shen, Lawrence Y. L.: *See—*
Howard, Darryl A.; and Shen, Lawrence Y. L., 4,639,669, Cl. 324-239.000.
Shepler, Robert E.: *See—*
Ainsworth, John H.; and Shepler, Robert E., 4,639,388, Cl. 428-117.000.
Sherry, A. Dean, to Board of Regents, The University of Texas System, The. Gadolinium chelates as NMR contrast agents. 4,639,365, Cl. 424-9.000.
Shestak, Edward J.; and Marschik, David, to Westinghouse Electric Corp. Circuit interrupter with shock resistant mechanism. 4,639,700, Cl. 335-6.000.
Shetty, Bola V.; McFadden, Arthur; and Hofer, Peter, to Purdue Frederick Company, The. Analgesic and anti-inflammatory compounds. 4,639,529, Cl. 548-550.000.
Shiba, Kenji: *See—*
Maejima, Takeshi; and Shiba, Kenji, 4,639,224, Cl. 434-286.000.
Shibata, Kazuyoshi; and Nishizawa, Hitoshi, to NGK Insulators, Ltd. Electrochemical element. 4,639,305, Cl. 204-426.000.
Shibata, Noriyoshi: *See—*
Tamura, Toru; Shibata, Noriyoshi; and Kawakami, Toshiro, 4,639,148, Cl. 384-420.000.
Shiki, Kazuhiro; and Iura, Takao, to Toyota Jidosha Kabushiki Kaisha. Fuel cut-off device for internal combustion engine. 4,638,781, Cl. 123-493.000.
Shikishima Canvas Kabushiki Kaisha: *See—*
Ota, Toyokazu; Nakamura, Yutaka; Ikeda, Yutaka; Kataoka, Shunzi; and Ito, Yoshinobu, 4,639,291, Cl. 162-207.000.
Shikishima Canvas Kabushiki Kaisha: *See—*
Ota, Toyokazu; and Nakamura, Yutaka, 4,639,292, Cl. 162-375.000.
Shimada, Takeo: *See—*
Yamamoto, Soichiro; and Shimada, Takeo, 4,639,409, Cl. 430-505.000.
Shimamiya, Yukio; Narumo, Kinzo; and Ebihara, Hiroshi, to Honda Tsushin Kogyo Kabushiki Kaisha. Connector apparatus for a printed circuit base board. 4,639,066, Cl. 339-132.00B.
Shimano Industrial Company Limited: *See—*
Furomoto, Yoshiyuki, 4,638,958, Cl. 242-84.10R.
Shimbo, Masaru; Fukuda, Kiyoshi; and Ohwada, Yoshiaki, to Kabushiki Kaisha Toshiba. Method of manufacturing semiconductor substrate. 4,638,552, Cl. 29-576.00J.
Shimizu, Isao, to Hitachi, Ltd. Power transistor structure having an emitter ballast resistance. 4,639,757, Cl. 357-36.000.
Shimizu, Kyoichi: *See—*
Fujita, Akira; and Shimizu, Kyoichi, 4,639,782, Cl. 358-166.000.
Shimizu, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Electromagnetic servo device. 4,639,651, Cl. 318-432.000.
Shimizu, Yohei, to Sanyo Electric Co., Ltd. Flyback transformer. 4,639,706, Cl. 336-170.000.
Shimoda, Junji: *See—*
Yamamoto, Mitsuru; Watanabe, Kunio; and Shimoda, Junji, 4,639,735, Cl. 346-1.100.
Shimp, Alan B., to Westinghouse Electric Corp. Circuit breaker with interface flux shunt trip. 4,639,701, Cl. 335-21.000.
Shimura, Yukio: *See—*
Asai, Michihiko; Shimura, Yukio; Tsuda, Keishiro; Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,639,379, Cl. 427-40.000.
Shin-Etsu Chemical Co., Ltd.: *See—*
Asai, Michihiko; Shimura, Yukio; Tsuda, Keishiro; Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,639,379, Cl. 427-40.000.
Suzuki, Niichiro; Ogushi, Yoshimi; Imai, Kiyoshi; Ohta, Nobuhiro; and Ueno, Susumu, 4,639,285, Cl. 156-272.600.
Shinagawa Refractories Co., Ltd.: *See—*
Toda, Masumi; Ozaki, Yukio; and Nonaka, Shingo, 4,638,945, Cl. 239-143.000.
Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. Automatic focusing device with range boundary setting. 4,639,588, Cl. 250-201.000.
Shinonaga, Hirohiko: *See—*
Aoyama, Tsutomu; Nakamura, Taizo; Terao, Naoyosi; and Shinonaga, Hirohiko, 4,639,098, Cl. 350-514.000.
Shiojiri, Hiroyuki: *See—*
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Shiokawa, Yoshiro, to Anelva Corporation. Auger electron spectrometer capable of attaining a high resolution. 4,639,597, Cl. 250-305.000.
Shoemaker, Lewis E.; and Bates, Thomas O., to Inco Alloys International, Inc. Welding electrode. 4,639,576, Cl. 219-146.230.
Shoemaker, Ralph A.: *See—*
Huggins, Raymond W.; and Shoemaker, Ralph A., 4,638,986, Cl. 271-98.000.
Shoji, Rikuo, to Carl Freudenberg, Firma. Preparation of non-woven fabric containing polyvinyl alcohol fiber. 4,639,390, Cl. 428-195.000.
Shoyo Engineering Company Limited: *See—*
Fukuda, Kazuichi, 4,639,237, Cl. 464-65.000.
Shulenberger, Art M.: *See—*
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Shulman, Mark L.: *See—*
Chang, Yi-Hua E.; Gruodis, Algirdas J.; Muhlfeld, Hans P., Jr.; Rodriguez, Charles W.; and Shulman, Mark L., 4,639,919, Cl. 371-27.000.
Sibley, Howard W.: *See—*
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Siemens Aktiengesellschaft: *See—*
Bauch, Helmut; and Rehm, Hans, 4,639,613, Cl. 307-241.000.
Behn, Reinhard, 4,639,832, Cl. 361-306.000.
Blaschke, Felix, 4,638,673, Cl. 73-862.170.
Brakus, Bogdan, 4,639,847, Cl. 363-46.000.
Brandner, Alois, 4,639,607, Cl. 250-561.000.
Diepers, Heinrich; and Schewe, Herbert, 4,639,811, Cl. 360-125.000.
Dolansky, Franz; and Steiner, Ewald, 4,639,820, Cl. 361-124.000.
Hartl, Christof; and Wagner, Hans, 4,639,556, Cl. 381-68.600.
Heinze, Udo; and Marhoff, Paul, 4,639,943, Cl. 378-96.000.
Meltsch, Hans-Jurgen, 4,639,546, Cl. 174-92.000.
Nirschl, Heinrich; Kamp, Klaus; and Stummer, Baldur, 4,639,909, Cl. 370-58.000.
Nussbaecher, Hans K., 4,639,888, Cl. 364-788.000.
Reichert, Gerhard; and Riedel, Friedrich, 4,639,193, Cl. 416-184.000.
Siemens Medical Laboratories: *See—*
Spanswick, Keith A., 4,638,814, Cl. 128-804.000.
SIG Schweizerische Industrie-Gesellschaft: *See—*
Graf, Heinrich, 4,638,912, Cl. 206-621.000.
Sigl, Wayne C.; and Wolfson, Elizabeth A., to Kimberly-Clark Corporation. Device for dispensing individual sheets from an array of stacked sheets. 4,638,921, Cl. 221-1.000.
Sigri GmbH: *See—*
Kandzia, Ulrich, 4,639,930, Cl. 373-120.000.
Silicon Technology Corporation: *See—*
Steere, Robert; and Lewandowski, Thomas, 4,638,601, Cl. 51-165.710.
Simila, Eric J. Beverage container cooler. 4,638,645, Cl. 62-457.000.
Simjian, Luther G., to Command Automation, Inc. Exercise apparatus. 4,638,996, Cl. 272-146.000.
Simmons, Richard R.: *See—*
Chadwick, Curt H.; Shulenberger, Art M.; Taylor, John S.; and Simmons, Richard R., 4,639,587, Cl. 250-201.000.
Simon, Melvin H.: *See—*
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Simonsen, Richard C.: *See—*
Harrison, Joel N.; Condito, Vincent A.; Graham, Randolph H.; Nixon, Brian J.; and Simonsen, Richard C., 4,639,798, Cl. 360-73.000.
Simpson, Thomas W., to Solaronics, Inc. Confined spaced infrared burner system and method of operation. 4,639,213, Cl. 431-326.000.
Sims, Calvin L., to Winfield Laboratories, Inc. Method of dressing wounds. 4,638,796, Cl. 128-155.000.
Simtek Inc.: *See—*
Urwyler, Peter R., 4,638,696, Cl. 83-261.000.
Singer, Barry M.; and Jayaraman, Rajsekhar, to North American Philips Corporation. Combined bipolar-field effect transistor resurf devices. 4,639,761, Cl. 357-234.000.
Singer Company, The: *See—*
Koper, James G.; and Ljung, Bo H. G., 4,639,231, Cl. 445-31.000.
Sink, T. Stephen: *See—*
Roberts, Donald L.; Angel, Anthony L.; Clark, Douglas C.; Clearman, Jack F.; and Sink, T. Stephen, 4,638,820, Cl. 131-336.000.
Sinko, Hannu, to Raute Oy. Method for the manufacture of a veneer beam. 4,638,843, Cl. 144-350.000.
Sitabkhan, Mansur N.; and Mack, Raymond E., to Eaton Corporation. Caliper disc brake assembly. 4,638,894, Cl. 188-170.000.
Sitler, Wayne R.: *See—*
Hrustich, John; and Sitler, Wayne R., 4,639,856, Cl. 364-200.000.
SKF Industrial Trading & Development Company B. V.: *See—*
Bras, Johan Chr. M.; and Lankamp, Herman D., 4,639,149, Cl. 384-477.000.
Skinner, Geoffrey F., to Foster Wheeler Energy Corporation. Heat recovery system. 4,638,765, Cl. 122-7.00R.
Skipper, Richard S.: *See—*
Pithouse, Kenneth B.; Jones, Thomas P. H.; Lowe, Frank J.; and Skipper, Richard S., 4,639,545, Cl. 174-36.000.
Skokos, Peter G.; and Sobel, Alvin A. Combined form for visual matter, written descriptions and mailing envelopes. 4,638,940, Cl. 229-92.300.
Skow, Lawrence H., to Raytheon Company. High voltage dynamic focusing system. 4,639,644, Cl. 315-382.000.

Skudera, William J., Jr.: *See—*
Mariani, Elio A.; and Skudera, William J., Jr., 4,639,695, Cl. 333-133.000.
Slat, William A.; Darr, Richard C.; Dunlap, Richard L.; and Larson, Craig A., to Plastipak Packaging, Inc. In-mold label dispenser for blow molding machine. 4,639,207, Cl. 425-503.000.
Slee, Roger H., to AE Plc. Manufacture of pistons. 4,638,694, Cl. 82-13.000.
Slimp, Jack B., Jr.: *See—*
Keska, Tadeusz W., 4,638,999, Cl. 273-258.000.
Sluyter, Erik; and Wooff, Edward A., Jr., to Circon Corporation. Focusable video camera for use with endoscopes. 4,639,772, Cl. 358-98.000.
Smallegan, Jon M., to Schlage Lock Company. Door knob and door knob catch arrangement. 4,639,026, Cl. 292-352.000.
Smith, Daniel W.: *See—*
Basinsky, Michael J.; Bird, Dale T.; and Smith, Daniel W., 4,638,971, Cl. 248-678.000.
Smith, David C. Safety roller assembly for bracket mounting to the top or rear face of rotary lawn mower deck. 4,638,622, Cl. 56-17.400.
Smith, Donald R., to King, Michael H., a part interest. Method and apparatus for isolation of hair from treatment materials. 4,638,821, Cl. 132-7.000.
Smith, Glenn C.; Needham, James R.; and Turnbull, William T. Truss plate. 4,639,176, Cl. 411-468.000.
Smith, Kent D.: *See—*
Murphy, Michael J.; and Smith, Kent D., 4,638,869, Cl. 172-821.000.
Smith Kline & French Laboratories Limited: *See—*
Ganellin, Charon R.; Ife, Robert J.; and Owen, David A. A., 4,639,519, Cl. 544-320.000.
Smith, Lloyd B., to United Coal Company. Method for extracting water from solid fines or the like. 4,639,320, Cl. 210-739.000.
Smith, Lloyd S.: *See—*
Parracho, Rui M.; Smith, Lloyd S.; Bunch, Richard P.; and Gross, Alexander L., 4,638,576, Cl. 36-68.000.
Snow, Bennie E.: *See—*
Martens, Alan; and Snow, Bennie E., 4,638,630, Cl. 60-39.182.
Snyder, Robert G.: *See—*
Wierzba, Robert B.; Snyder, Robert G.; and Kleefisch, Blaise H., 4,639,381, Cl. 427-156.000.
Snyder, Warren E., to Dresser Industries, Inc. Carburetion system for engines. 4,638,783, Cl. 123-527.000.
Snyder, Warren E.: *See—*
Fanner, John C.; and Snyder, Warren E., 4,638,777, Cl. 123-277.000.
Sobel, Alvin A.: *See—*
Skokos, Peter G.; and Sobel, Alvin A., 4,638,940, Cl. 229-92.300.
Sociedad Anonima de Racionalizacion y Mechanizacion: *See—*
Ollero-Pina, Juan C.; and Garrido-Diaz, Antonio, 4,638,914, Cl. 209-617.000.
Societe des Electrodes et Refractaires "Savoie" (SERS): *See—*
Bernard, Jean-Claude; Chabrier, Patrick; Tahon, Bernard; Tesoriere, Jean-Marc; and Ortega, Domingo, 4,639,929, Cl. 373-120.000.
Societe d'Etudes, Recherche et Constructions Electroniques-Sercel: *See—*
Hullein, Francois; and Fribault, Gerard, 4,639,129, Cl. 356-5.000.
Societe d'Etudes Scientifiques et Industrielles de l'Ile de France: *See—*
Howie, Peter W.; and McNeilly, Alan, 4,639,439, Cl. 514-171.000.
Societe Francaise d'Ampoules Mecaniques: *See—*
Soulard, Dominique, 4,639,179, Cl. 414-223.000.
Societe Imphy S.A.: *See—*
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Societe Nationale des Poudres et Explosifs: *See—*
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Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A." : *See—*
Debeneix, Pierre; and Tournere, Marcel J., 4,638,631, Cl. 60-226.300.
Fredholm, Allan; Davidson, James H.; Khan, Tasadduq; and Theret, Jean-Mare C. F., 4,639,280, Cl. 148-404.000.
Societe Nationale Elf Aquitaine: *See—*
Basset, Jean M. M.; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, 4,639,429, Cl. 502-117.000.
Societe Nationale Industrielle Aerospatiale: *See—*
Mouille, Rene L.; Declerco, Marc; Jalaguier, Jean-Pierre; and Jaugey, Bernard, 4,639,284, Cl. 156-213.000.
Societe Nouvelle Transfix: *See—*
Beisser, Jean-Claude, 4,638,554, Cl. 29-605.000.
Soeters, Raymond A., Jr., to Eaton Corporation. Supercharger assembly and rotor phasing fixture and method of partially assembling. 4,638,570, Cl. 33-562.000.
Soga, Junko: *See—*
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Solaronics, Inc.: *See—*
Simpson, Thomas W., 4,639,213, Cl. 431-326.000.
Solhjell, Erik, to Tandberg Data A/S. Arrangement for positioning a transducer to at least one track of a tape-shaped recording medium. 4,639,796, Cl. 360-77.000.
Soltesz, Richard G.: *See—*
Zimmer, John J.; and Soltesz, Richard G., 4,638,667, Cl. 73-432.100.
Sommer, Robert G.: *See—*
Lewandowski, Edward F.; Cassidy, Dale A.; and Sommer, Robert G., 4,639,571, Cl. 219-121.0EC.
Son, Pyong N.: *See—*
Lai, John T.; and Son, Pyong N., 4,639,479, Cl. 524-100.000.
Sone, Yoshiaki: *See—*
Misaki, Akira; Sone, Yoshiaki; and Kato, Takao, 4,639,516, Cl. 536-123.000.
Song, Kun K.: *See—*
Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, 4,639,167, Cl. 405-217.000.
Sonntag, Michael: *See—*
Hohlein, Peter; Schmidt, Manfred; Pedain, Josef; Riberi, Bernd; and Sonntag, Michael, 4,639,499, Cl. 526-285.000.
Sony Corporation: *See—*
Aoki, Yoshio; and Tsukamura, Yoshihiro, 4,639,907, Cl. 369-45.000.
Hata, Katsuhiko; and Yamakami, Takahiko, 4,639,640, Cl. 315-3.000.
Hirayama, Shoji; and Inada, Mitsuharu, 4,639,549, Cl. 379-62.000.
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Makino, Yoshimi; Ochiai, Yoshitaka; Uedaira, Satoru; Hotai, Kazuhide; Aso, Koichi; and Hayakawa, Masatoshi, 4,639,278, Cl. 148-108.000.
Okanobu, Taiwa, 4,639,659, Cl. 323-224.000.
Sakamoto, Satoshi, 4,639,648, Cl. 318-254.000.
Urabe, Tetsuo; and Kojima, Shigeru, 4,639,722, Cl. 340-784.000.
Yamagawa, Masato; and Tsukada, Keizo, 4,639,550, Cl. 379-62.000.
Yamaguchi, Takashi; Nagasawa, Naomi; and Tamura, Hidemasa, 4,639,400, Cl. 428-694.000.
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Nagato, Yoshio; and Soroi, Kazunori, 4,639,426, Cl. 501-96.000.
Soulard, Dominique, to Societe Francaise d'Ampoules Mecaniques. Device for loading a machine for the treatment, notably thermal, of cylindrical objects, notably in glass, such as glass pipes. 4,639,179, Cl. 414-223.000.
Souplet, Robert; and Sutter, Jean, to Pont-a-Mousson S.A. Rotary gate valve gasket and process for its manufacture. 4,638,976, Cl. 251-173.000.
South, William H.: *See—*
Cooper, John H.; and South, William H., 4,639,817, Cl. 361-62.000.
Southwestern Bell Telephone Company: *See—*
Bone, Ronald N., 4,639,555, Cl. 379-327.000.
Soutome, Kaoru: *See—*
Suematsu, Kazumi; Soutome, Kaoru; and Arakawa, Tatsumi, 4,639,297, Cl. 204-59.00F.
Sovacool, David K.; Van Slyke, Allan S.; and Bungo, Edward M., to General Motors Corporation. Grommet assembly. 4,638,964, Cl. 248-56.000.
Spanswick, Keith A., to Siemens Medical Laboratories. Electron accelerator unit for electron beam therapy. 4,638,814, Cl. 128-804.000.
Specht, Theodore R.: *See—*
Del Vecchio, Robert M.; and Specht, Theodore R., 4,639,610, Cl. 307-83.000.
Spector, George: *See—*
Braxton, Benjamin D.; and Spector, George, 4,639,654, Cl. 320-2.000.
Mines, Isaiah H., Jr.; and Spector, George, 4,638,923, Cl. 221-132.000.
Speights, Junius L.: *See—*
Chawla, Manmohan S.; and Speights, Junius L., 4,638,712, Cl. 89-1.150.
Sperinck, William A.; and Hall-Wilton, Michael J., to British Nuclear Fuels plc. Liquid sampling system. 4,638,675, Cl. 73-864.340.
Sperry Corporation: *See—*
Nelson, Alec L., 4,639,680, Cl. 328-134.000.
Spintzyk, Johannes: *See—*
Gunter, Heinz; Kriechbaum, Gerhard; Krojer, Hubert; Matecki, Rudolf; and Spintzyk, Johannes, 4,638,962, Cl. 244-203.000.
Spitz, Roger: *See—*
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Spock, Wayne R.; and Meisner, Richard P., to United Technologies Corporation. EMI suppression for electronic engine control frequency signal inputs. 4,639,885, Cl. 364-574.000.
Spotnitz, Robert M.: *See—*
Kreh, Robert P.; and Spotnitz, Robert M., 4,639,298, Cl. 204-59.00R.
Spotts, Kenneth: *See—*
De Bruine, Mark; and Spotts, Kenneth, 4,638,965, Cl. 248-59.000.
Sprecker, Mark A.; and Hanna, Marie R., to International Flavors & Fragrances Inc. Alkyl-substituted spirodecenone derivatives, organoleptic utility thereof and processes for preparing same. 4,639,330, Cl. 252-522.00R.
Square D Company: *See—*
Maulandi, Aymon A., 4,639,561, Cl. 200-33.00R.
Srinivasan, Viswanathan: *See—*
Michalski, Dennis H.; and Srinivasan, Viswanathan, 4,639,359, Cl. 423-321.00R.
SSAB Svenskt Stal AB: *See—*
Lindgren, Nils E., 4,638,831, Cl. 137-117.000.
Sta-Rite Industries, Inc.: *See—*
Marietta, Walter E., 4,638,886, Cl. 187-8.490.
Staab, Rudolf; Bergner, Dieter; and Hannesen, Kurt, to Hoechst Aktiengesellschaft. Electrolysis apparatus with horizontally disposed electrodes. 4,639,303, Cl. 204-258.000.

Staendeke, Horst: *See—*
Elsner, Georg; Staendeke, Horst; and Heymer, Gero, 4,639,331, Cl. 252-609.000.
Stage Rite Corporation: *See—*
Rogers, O. David; Bardwick, John, III; and Staten, Kenneth, 4,638,604, Cl. 52-6.000.
Stager, Wolfgang: *See—*
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Stahl, Glenn L.: *See—*
Orlowski, Ronald C.; Stahl, Glenn L.; and Colescott, Robert L., 4,639,509, Cl. 530-307.000.
Orlowski, Ronald C.; Seyler, Jay K.; and Stahl, Glenn L., 4,639,510, Cl. 530-307.000.
Stahl, Peter H.; and Schmitz, Beat, to Ciba-Geigy Corporation; and Henkel Kommanditgesellschaft auf Aktien. Preparation of crystalline disodium 3-amino-1-hydroxypropane-1,1-diphosphonate pentahydrate. 4,639,338, Cl. 260-502.50C.
Stahlecker, Fritz; and Stahlecker, Hans, to Stahlecker, Fritz; and Stahlecker, Hans. Fiber feed channel arrangement for open end friction spinning machine. 4,638,626, Cl. 57-401.000.
Stahlecker, Hans: *See—*
Stahlecker, Fritz; and Stahlecker, Hans, 4,638,626, Cl. 57-401.000.
Stahlhofen, Paul, to Hoechst Aktiengesellschaft. Light-sensitive compound, light-sensitive mixture, and light-sensitive copying material prepared therefrom with 0-naphthoquinone diazide compound. 4,639,406, Cl. 430-165.000.
Staiger, Gerhard; Selmayr, Tassilo; Kinzel, Peter; and Reutter, Anneliese, to Consortium fur elektrochemische Industrie GmbH. Substituted phenylacetic acid iodopropargyl esters, biocidal agents containing same and process for manufacturing same. 4,639,541, Cl. 560-20.000.
Stamicarbon B.V.: *See—*
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Stamov, Vladimir P.: *See—*
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Standard-Knapp, Inc.: *See—*
Johnson, Lloyd D., 4,638,620, Cl. 53-382.000.
Standard Oil Company, The: *See—*
Ball, Lawrence E.; Griffin, William M.; Wallace, Kathleen M.; and Nemecek, Amy L., 4,638,865, Cl. 166-274.000.
Warmack, Ralph E.; and Woodruff, William D., 4,639,901, Cl. 367-13.000.
Stansfield, Edward V.: *See—*
King, Nigel J. R.; Pawson, Ian W. N.; Baker, Michael P.; Shaddock, Robert N.; and Stansfield, Edward V., 4,639,733, Cl. 342-424.000.
State of Israel, Ministry of Defense, Armament: *See—*
Vishlizky, Yoram, 4,639,222, Cl. 434-20.000.
State of Isreal, The: *See—*
Glatt, Ilana; Livnat, Aminadav; and Kafri, Oded, 4,639,132, Cl. 356-124.500.
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Steere, Robert; and Lewandowski, Thomas, to Silicon Technology Corporation. Automatic edge grinder. 4,638,601, Cl. 51-165.710.
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Hazan, Jean-Pierre; and Steers, Michel, 4,639,137, Cl. 356-339.000.
Stefancin, Ronald J., Jr. Three dimensional mirrored aquarium ornament. 4,639,101, Cl. 350-616.000.
Steimel, Johannes: *See—*
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Stein Industrie: *See—*
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Steinert, Hans-Jurgen: *See—*
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Stemmler, Herbert: *See—*
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Stenberg, Bengt: *See—*
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Stenzel, Otto, to Leybold-Heraeus GmbH. Method and apparatus for melting rod-shaped material with an induction coil. 4,639,567, Cl. 219-10.430.
Stephany, Christian: *See—*
Froelich, Hans; Hepperle, Willi; Katzer, Johann; and Stephany, Christian, 4,639,018, Cl. 285-184.000.
Stern, Donald J.; and Allsop, Jon I. Painting apparatus and method. 4,639,156, Cl. 401-146.000.
Stetson, Karl A.; and Palecki, John, to United Technologies Corporation. Airflow detection system using fiber optics. 4,639,593, Cl. 250-227.000.
Steup, Walter: *See—*
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Stevens, Charles L.: *See—*
Rizk, Nabil I.; and Stevens, Charles L., 4,639,244, Cl. 604-19.000.
Stewart, E. Allen, III; and Keesling, Evan L., to Amasek, Inc. Method and system for processing aquatic plants. 4,638,621, Cl. 56-9.000.
Sticher, Charles K., to Nordson Corporation. Bridge circuit system. 4,639,611, Cl. 307-117.000.
Stoco Industries, Inc.: *See—*
Stoltz, J. Stephen, 4,638,922, Cl. 221-75.000.
Stolk, Richard D.: *See—*
Birum, Gail H.; Mathis, Thomas C.; and Stolk, Richard D., 4,639,480, Cl. 524-104.000.
Stoltz, J. Stephen, to Stoco Industries, Inc. Shake compensated hole-punched product vending system. 4,638,922, Cl. 221-75.000.
Stone Allen Limited: *See—*
George, Martin C. J., 4,638,767, Cl. 122-448.00B.
Stone, Wayne B., Jr., to Wood Manufacturing Co., Inc. Injection molded, self sealing top assembly for open mouth coffee pots. 4,638,929, Cl. 222-456.000.
Storage Technology Corporation: *See—*
Thornley, Richard, 4,639,808, Cl. 360-121.000.
Storm, Eric L., to Eaton Corporation. Method of providing variable reduction axle. 4,639,869, Cl. 364-424.100.
Strange, Thomas F.; and Carino, John W., to North American Philips Corporation. Pressure sensitive fault interrupter for a multi section AC capacitor. 4,639,827, Cl. 361-272.000.
Strange, Thomas F.; and Carino, John W., to North American Philips Corporation. Pressure sensitive fault current interrupter for multiple capacitor device. 4,639,828, Cl. 361-272.000.
Straube, Axel; and Loos, Hans, to Licentia Patent-Verwaltungs-GmbH. Method and apparatus for determining ice boundary temperature for the de-icing system of an aircraft. 4,638,960, Cl. 244-134.00D.
Stremmel, Gerd: *See—*
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Striebig, Ludwig, 4,638,695, Cl. 83-100.000.
Striebig, Ludwig, to Striebig AG. Board saw with sawdust exhaust. 4,638,695, Cl. 83-100.000.
Stroh, Paul F. Tremolo accessory. 4,638,711, Cl. 84-313.000.
Strosser, Richard P.; Bohman, Carl E.; and Chow, Mark K., to New Holland, Inc. Metal detector sensitivity adjustment and test assembly. 4,639,666, Cl. 324-202.000.
Studt, William L.: *See—*
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,639,442, Cl. 514-212.000.
Stummer, Baldur: *See—*
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Sturdevant, Eugene J., to Harry Hill Associates. Electrodes for enhanced heat and mass transfer apparatus. 4,639,577, Cl. 219-399.000.
Stuska, Gotthard: *See—*
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Stypher Corporation, The: *See—*
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Suematsu, Kazumi; Soutome, Kaoru; and Arakawa, Tatsumi, to Asahi Kasei Kogyo Kabushiki Kaisha. Fluorinated graphites and a process for production thereof. 4,639,297, Cl. 204-59.00F.
Suganuma, Namio: *See—*
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Sugimoto, Kenji, to Citizen Watch Co., Ltd. Bar stock feeder. 4,638,693, Cl. 82-2.500.
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Suginoya, Mitsuru; Iwasa, Koji; Kamamori, Hitoshi; Sano, Yutaka; and Terada, Yumiko, to Seiko Instruments & Electronics Ltd. Multi-color display device and process of fabricating same. 4,639,088, Cl. 350-339.00F.
Sugita, Hiroshi; Iwasa, Tadanobu; Yasukawa, Takemasa; and Aritake, Masanori, to Toyoda Goseki Co., Ltd. Wiper blade rubber. 4,638,525, Cl. 15-250.360.
Sugitani, Yuji; and Tamaoki, Naohiro, to Nippon Kokan Kabushiki Kaisha. Automatic groove tracing control method for arc welding. 4,639,573, Cl. 219-124.220.
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Sumida, Yuzo: *See—*
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Sumitomo Electric Industries, Ltd.: *See—*
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Sundstrand Corporation: *See*—
Swadley, Gerald L., 4,639,188, Cl. 415-9.000.
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Gradin, James H., 4,639,106, Cl. 353-13.000.
Paterson, Noel S.; and Vermilion, Everette E., 4,639,730, Cl. 340-970.000.
Surko, Walter E., Jr., to Yale Security Inc. Lock cylinder having two sets of tumblers and key therefor. 4,638,651, Cl. 70-364.00A.
Sutera, Richard, to Burlington Industries, Inc. Tensionable electrodes for charging and/or deflecting fluid droplets in fluid-jet marking apparatus. 4,639,737, Cl. 346-75.000.
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Suzuki, Hirosuke; Yasumoto, Hiromi; and Umemoto, Hiroshi, to Junkosha Company, Ltd. Strip line cable comprised of conductor pairs which are surrounded by porous dielectric. 4,639,693, Cl. 333-1.000.
Suzuki, Hisao: *See*—
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Suzuki, Motomu; and Asahina, Hiroshi, to Kabushiki Kaisha Toshiba. Digital fluoroscopy apparatus. 4,639,867, Cl. 364-414.000.
Suzuki, Niichiro; Ogushi, Yoshimi; Imai, Kiyoshi; Ohta, Nobuhiro; and Ueno, Susumu, to Shin-Etsu Chemical Co. Ltd. Heat-resistant flexible laminate for substrate of printed circuit board and a method for the preparation thereof. 4,639,285, Cl. 156-272.600.
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Suzuki, Norio, to NEC Corporation. Apparatus for detecting movement in a television signal based on taking ratio of signal representing frame difference to signal representing sum of picture element differences. 4,639,767, Cl. 358-21.00R.
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Swadley, Gerald L., to Sundstrand Corporation. Turbine wheel containment. 4,639,188, Cl. 415-9.000.
Swanson, Scott C., to Sangamo Weston, Inc. Method of and system for accumulating verifiable energy demand data from remote electricity meters. 4,639,728, Cl. 340-870.030.
SWF Auto-Electric GmbH: *See*—
Kohler, Alfred; Schneider, Theodor; and Schubert, Karl F., 4,639,065, Cl. 339-119.00R.
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Tachikawa Spring Co., Ltd.: *See*—
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Taguchi, Toshimichi, to Sharp Kabushiki Kaisha. Membrane keyboard. 4,639,559, Cl. 200-5.00A.
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Takahashi, Noriyoshi: *See*—
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Takahashi, Tohru; and Kurami, Kunihiko, to Nissan Motor Co., Ltd. Control system for robot manipulator. 4,639,652, Cl. 318-568.000.
Takahashi, Tomohiko, to Kabushiki Kaisha Toshiba. Method and apparatus for printing an image. 4,639,742, Cl. 346-76.0PH.
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Takaya, Takao; Takasugi, Hisashi; Yamanaka, Hideaki; Miyai, Kenji; and Inoue, Yoshikazu, to Fujisawa Pharmaceutical Co., Ltd. 7-amino-3-[substituted vinyl]-3-cephem-4-carboxylates having antimicrobial activity. 4,639,448, Cl. 514-226.000.
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Takekoshi, Yoshitaka; and Ushiyama, Shigeyuki, to Fanuc Ltd. Interlocking yoke and endplates for permanent magnet rotor. 4,639,627, Cl. 310-156.000.
Takemura, Tohru; Nakashima, Atushi; Yoshida, Haruhiko; Kamo, Jun; and Hamada, Eiichi, to Mitsubishi Rayon Co., Ltd. Blood oxygenator using a hollow-fiber membrane. 4,639,353, Cl. 422-46.000.
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Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,639,014, Cl. 280-707.000.
Tallant, James C., II; and Parker, Robert P., to RCA Corporation. Non-saturating video output amplifier. 4,639,785, Cl. 358-184.000.
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Tamura, Fujio, to Seiko Instruments & Electronics Ltd. Quartz barometer. 4,638,664, Cl. 73-384.000.
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Tamura, Hideo: *See*—
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Tamura, Toru; Shibata, Noriyoshi; and Kawakami, Toshiro, to Aisin Seiki Kabushiki Kaisha. Thrust bearing for turbocharger. 4,639,148, Cl. 384-420.000.
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Tanaka, Hirohisa, to Nippon Seiko Kabushiki Kaisha. Control device of an infinitely variable transmission. 4,638,691, Cl. 74-866.000.
Tanaka, Kazuhiro; Yamamoto, Yasuo; Hanaoka, Katsumi; and Hirai, Masatake, to Allied Corporation. Transformer with toroidal magnetic core. 4,639,707, Cl. 336-185.000.
Tanaka, Kazumoto; Mashimo, Tohru; Sato, Osamu; and Kobayashi, Toyohiko, to Mazda Motor Corporation. Control method for drilling apparatus which makes use of a final drilling pattern transformed from primary and secondary patterns. 4,639,868, Cl. 364-420.000.
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Tanaka, Kojiro: *See*—
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Tanaka, Osamu: *See*—
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Ueno, Shigeto; Ohnishi, Masanori; Nakamura, Yuji; and Tanaka, Shinichi, 4,639,814, Cl. 360-130.100.
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Miyadera, Tetsuo; Sugimura, Yukio; Tanaka, Teruo; Hashimoto, Toshihiko; Iino, Kimio; and Sugawara, Shinichi, 4,639,441, Cl. 514-195.000.
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Sato, Kanichi; Setoyama, Mikio; Kiguchi, Shoji; and Tanaka, Toshio, 4,638,845, Cl. 164-12.000.
Tanaka, Tsunefumi: *See*—
Kitagishi, Nozomu; Momiyama, Kikuo; Ikemori, Keiji; Takahashi, Sadatoshi; and Tanaka, Tsunefumi, 4,639,096, Cl. 350-427.000.
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Katakami, Tsutomu; Fukazawa, Nobuyuki; Iizuka, Hajime; Nishina, Takashi; Kamiya, Joji; Tanaka, Yasuhito; and Nakano, Takuo, 4,639,451, Cl. 514-247.000.
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Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,639,864, Cl. 364-200.000.
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Conradty, Claudio; Zollner, Dieter; Lauterbach-Dammler, Inge; and Taube, Thomas, 4,639,928, Cl. 373-93.000.
Taubner, Fred R.; and Roy, Joseph A., to GTE Products Corporation. Arc discharge lamp having improved lumen maintenance. 4,639,637, Cl. 313-489.000.
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Lelu, Andre E.; Grignon, Jean R.; Gonthier, Bruno F.; and Tauzia, Jean-Michel, 4,638,735, Cl. 102-290.000.
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Taylor, Douglas P.; and Lee, David A., 4,638,895, Cl. 188-280.000.
Taylor, David H., to Thermo King Corporation. Transport refrigeration unit with evaporator fan drive using ram air pressure. 4,638,641, Cl. 62-180.000.
Taylor, David W. Classifier for comminution of pulverulent material by fluid energy. 4,638,953, Cl. 241-39.000.
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Taylor, Lawrence H. Metallic structural member particularly for support of walls and floors of buildings. 4,638,615, Cl. 52-364.000.
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Gannaway, Edwin L., 4,639,198, Cl. 417-410.000.
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Hakoyama, Soichi; Mori, Shigetatu; Takebe, Yoshiyuki; and Imaoka, Kanya, 4,638,624, Cl. 57-208.000.
Yatabe, Toshiaki; Nishihara, Toshio; and Suzuki, Nobuo, 4,639,069, Cl. 350-1.700.
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Jarnestedt, Goran; and von Campenhausen, Rolf, 4,639,935, Cl. 375-11.000.
Karlsson, Goran R.; and Karnevi, John H. S., 4,639,731, Cl. 342-147.000.
Telefunken Electronic GmbH: *See*—
Beckenbach, Walter; and Rinderle, Heinz, 4,639,686, Cl. 330-307.000.
Telefunken Fernseh und Rundfunk GmbH: *See*—
Scholz, Werner, 4,639,687, Cl. 331-1.00A.
Terada, Yumiko: *See*—
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Bernard, Jean-Claude; Chabrier, Patrick; Tahon, Bernard; Tesoriere, Jean-Marc; and Ortega, Domingo, 4,639,929, Cl. 373-120.000.
Tetra Pak International Aktiebolag: *See*—
Kimura, Yoshio, 4,638,903, Cl. 198-419.000.
Teuscher, Leon A.: *See*—
Mishra, Satchidanand; and Teuscher, Leon A., 4,639,402, Cl. 430-58.000.
Texaco Inc.: *See*—
Bousaid, Issam S., 4,638,864, Cl. 166-251.000.
Cook, Ronald L., 4,639,296, Cl. 204-59.00R.
Quock, Deborah E. R.; Triplett, Timothy L.; and Childress, Don E., 4,639,312, Cl. 210-101.000.
Savage, Kerry D., 4,638,862, Cl. 166-248.000.
Tanner, Harley L., III; and Allen, Joseph C., 4,639,596, Cl. 250-259.000.
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Boulanger, Henry J., 4,638,721, Cl. 92-6.00D.
Chiu, Anthony M.; Allison, Mark D.; Jones, James W.; Trammell, Lyndale A.; and San Ho, Fock, 4,639,664, Cl. 324-73.0AT.
D'Hont, Lodewijk J., 4,639,765, Cl. 358-19.000.
Heilveil, Andrew; VanAken, Jerry R.; Guttag, Karl M.; Redwine, Donald J.; Pinkham, Raymond; and Novak, Mark F., 4,639,890, Cl. 364-900.000.
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Therkorn, Jens. Couch of adjustable inclination for body extension. 4,638,793, Cl. 128-71.000.

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Pezaris, Stylianos, 4,639,874, Cl. 364-478.000.
Thermo King Corporation: *See*—
Taylor, David H., 4,638,641, Cl. 62-180.000.
Thiel, Reinhard A., administrator: *See*—
Enders, Max L., deceased; and Thiel, Reinhard A., administrator, 4,639,044, Cl. 301-9.0DN.
Thirion de Briel, Jacques; and Jaccod, Michel, to Valeo. Speed change device pulley with a seal around the hub. 4,639,239, Cl. 474-8.000.
Thomas Engineering, Inc.: *See*—
Casey, Thomas J., 4,639,383, Cl. 427-213.000.
Thomas, Mammen: *See*—
Price, William L.; Schlupp, Ronald L.; and Thomas, Mammen, 4,639,288, Cl. 156-643.000.
Thompson, Douglas, to Boeing Company, The. Hole angularity gauge. 4,638,566, Cl. 33-534.000.
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Daubresse, Francis, 4,639,835, Cl. 361-392.000.
Hoet, Roger; and Gerlach, Pierre, 4,639,633, Cl. 313-35.000.
Huignard, Jean-Pierre; Malard, Marcel; and de Corlieu, Guy, 4,639,091, Cl. 350-347.00V.
Kaire, Jean C., 4,639,551, Cl. 323-231.000.
Thorn EMI Domestic Appliances Limited: *See*—
Brooks, Steve M.; and May, David R., 4,639,579, Cl. 219-464.000.
Thornley, Richard, to Storage Technology Corporation. Asymmetrical shields for controlling feedthrough in read/write heads. 4,639,808, Cl. 360-121.000.
Thrane, David T.: *See*—
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Idigkeit, Werner; Kurr, Klaus; and Ticks, Gerd-Heinz, 4,638,983, Cl. 267-140.100.
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Tobia, Alfonso J.: *See*—
Bandurco, Victor T.; Bell, Stanley C.; Combs, Donald W.; Falotico, Robert; and Tobia, Alfonso J., 4,639,518, Cl. 344-285.000.
Toda, Masumi; Ozaki, Yukio; and Nonaka, Shingo, to Shinagawa Refractories Co., Ltd. Nozzle for the gunning of monolithic refractories. 4,638,945, Cl. 239-143.000.
Todd, Mike J., to Multi-Clean, Inc. Air guard diffuser. 4,638,523, Cl. 15-98.000.
Toegel, Herbert J.; Yudichak, Joseph R.; and Gilsdorf, John F., to ITT Corporation. Apparatus for establishing communication paths. 4,639,910, Cl. 370-58.000.
Togashi, Toshio, to Kawasaki Jukogyo Kabushiki Kaisha. Side stand of a motorcycle. 4,638,880, Cl. 180-219.000.
Togneri, Mauro G. Graphic display. 4,639,724, Cl. 340-815.010.
Toko, Inc.: *See*—
Murata, Kiyobumi, 4,639,696, Cl. 333-138.000.
Tokuda, Kanji: *See*—
Kogane, Mikio; Suzuki, Kenji; Kito, Eiichi; Kubota, Kazufumi, and Tokuda, Kanji, 4,639,118, Cl. 355-29.000.
Tokuno, Sanji, to Kyowa Hakko Kogyo Co., Ltd. Heat pump. 4,638,642, Cl. 62-498.000.
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Sakura, Yasuhiro, 4,639,287, Cl. 156-361.000.
Sakura, Yasuhiro; Nimura, Hitoshi; and Ishikawa, Mamoru, 4,639,743, Cl. 346-76.0PH.
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Ueki, Takashi; and Ishikawa, Yoshihiro, 4,638,789, Cl. 126-351.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Iizuka, Tetsuya, 4,639,758, Cl. 357-42.000.
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Tolbert, William R.: *See*—
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Tomase, Joseph P.: *See*—
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Tomasovic, Beth A.; and Novack, Robert L., to Bacharach, Inc. Electrochemical gas sensor. 4,639,306, Cl. 204-432.000.
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Tomita, Yasuo, to Canon Kabushiki Kaisha. Magneto-optical recording medium. 4,639,816, Cl. 360-131.000.
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Ton Company Ltd.: *See*—
Matsunobu, Akira; Horishita, Sumio; and Yamada, Tetsuo, 4,639,374, Cl. 426-43.000.
Tong Lung Metal Industry Co., Ltd.: *See*—
Fann, Yaw S.; and Wu, Rong-Faa, 4,639,025, Cl. 292-337.000.
Tonsmann, Armin, to Schuco Heinz Schurmann GmbH & Co. Metal-glass structure for a front wall or a roof. 4,638,613, Cl. 52-235.000.
Topfl, Werner, to Ciga-Geigy Corporation. Herbicidal N-arylsulfonyl-N'-(4-mercaptomethylpyrimdinyl)-ureas. 4,639,264, Cl. 71-87.000.
Toray Industries, Inc.: *See*—
Sato, Yoshiaki; and Suzuki, Hisao, 4,639,397, Cl. 428-397.000.
Tornare, Jean; Bofinger, Klaus; and Tachopp, Claudio. Pump for cryogenic fluids. 4,639,197, Cl. 417-259.000.
Tornay, Edmund G. Vessel hull and bulkheads construction employing curved plating. 4,638,754, Cl. 114-79.00R.
Torrence, Robert J., to Eaton Corporation. Inline solenoid operated slide valve. 4,638,973, Cl. 251-129.020.
Total Compagnie Francaise des Petroles: *See*—
Puissais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel J.; and Kaluszynski, Michel, 4,638,984, Cl. 269-43.000.
Totsuka, Motoyuki: *See*—
Nara, Toshio; Hobo, Sumiya; Kashiwada, Masao; Totsuka, Motoyuki; Hoshiai, Takao; Umetani, Katsutoshi; Akamatsu, Keisuke; Inada, Tomohide; and Takayama, Hisao, 4,639,220, Cl. 433-69.000.
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Toyo Ink Mfg., Co., Ltd.: *See*—
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Toyo Rubber Industry Co., Ltd., The: *See*—
Umemoto, Sumio; Hattori, Eiichi; and Kamakari, Ryutaro, 4,639,384, Cl. 427-290.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
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Toyoda Goseki Co., Ltd.: *See*—
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Toyota Jidosha Kabushiki Kaisha: *See*—
Ikeda, Shinji, 4,638,784, Cl. 123-571.000.
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Ito, Masashi; Ohashi, Toshio; and Ui, Katsumi, 4,639,272, Cl. 106-243.000.
Traber, Rene P.: *See*—
Wenger, Roland; Traber, Rene P.; Kobel, Hans; and Hofmann, Hans, 4,639,434, Cl. 514-11.000.
Trammell, Lyndale A.: *See*—
Chiu, Anthony M.; Allison, Mark D.; Jones, James W.; Trammell, Lyndale A.; and San Ho, Fock, 4,639,664, Cl. 324-73.0AT.
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Trinh, Lahn T.; and Lewis, Thomas E., to Allied Corporation. Individual cylinder ignition control. 4,638,780, Cl. 123-416.000.
Triplett, Timothy L.: *See*—
Quock, Deborah E. R.; Triplett, Timothy L.; and Childress, Don E., 4,639,312, Cl. 210-101.000.
Trokel, Stephen L.: *See*—
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Tronc, Dominique, to C. G. R. MeV. Self-focusing linear charged particle accelerator structure. 4,639,641, Cl. 315-5.410.
Trouet, Andre B. L.; Hannart, Jean A. A. J.; and Rao, Kandukuri S. B., to Omnichem S.A. Vinblastin-23-oyl amino acid derivatives. 4,639,456, Cl. 514-283.000.
Truckenbrodt, Randall, to Randall Industries. Repositionable thermal insulating truck bulkhead. 4,639,031, Cl. 296-24.00R.
TRW Ehrenreich GmbH & Co. KG: *See*—
Amrath, Hans, 4,639,159, Cl. 403-50.000.
TRW Inc.: *See*—
Lindeman, Richard J.; and Rachwalski, Thaddeus M., 4,639,056, Cl. 339-17.0LC.
Tryan, Fredrick W.: *See*—
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Tsai, Chee-Hway, to Procter & Gamble Company, The. Enzymatic treatment of black tea leaf. 4,639,375, Cl. 426-49.000.
Tsai, Ming Cherng: *See*—
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Tsair, Chu H.: *See*—
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Tschopp, Claudio: *See*—
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Tsubouchi, Yuzo, 4,639,181, Cl. 414-349.000.
Tsuboi, Nobuyuki. Precision roller attachment for automation procession. 4,638,741, Cl. 105-141.000.
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Tsuda, Keishiro: *See*—
Asai, Michihiko; Shimura, Yukio; Tsuda, Keishiro; Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,639,379, Cl. 427-40.000.
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Tsunekawa, Tokuichi, to Canon Kabushiki Kaisha. Drive system for a semiconductor laser. 4,639,924, Cl. 372-33.000.
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Tsutsumi, Teruo, to Kabushiki Kaisha Toshiba. Thermal transfer recording method and apparatus. 4,639,739, Cl. 346-76.0PH.
Turnbull, William T.: *See*—
Smith, Glenn C.; Needham, James R.; and Turnbull, William T., 4,639,176, Cl. 411-468.000.
Turner, Paul F., to BSD Medical Corporation. Electric field probe. 4,638,813, Cl. 128-804.000.
Turpin, Edward T.; and Thrane, David T., to SCM Corporation. Acrylic and acrylic/epoxy copolymer composition as self-curing cathodic electrocoating vehicles. 4,639,299, Cl. 204-181.700.
Turunen, Olli T.; Huttenen, Jouko; Selin, Johan-Fredrik; Fors, Jan; and Eklund, Vidar, to Neste Oy. Cyclic process for producing an alkali solution of cellulose carbamate and precipitating the carbamate. 4,639,514, Cl. 536-30.000.
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Tyer, Robert R. Fine bubble diffuser and diffuser system having filtered blow-down tube. 4,639,314, Cl. 210-220.000.
Tyson, William H. Grill means. 4,638,787, Cl. 126-25.00R.
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Dohler, Werner; Merz, Ludwig; Frohnert, Heinz; Uckermann, Bernd; Graeser, Ulrich; Jankowski, Alfons; Wolowski, Eckard; Tamm, Hans-Friedrich; and Wilczok, Norbert, 4,639,310, Cl. 208-412.000.
Uedaira, Satoru: *See*—
Makino, Yoshimi; Ochiai, Yoshitaka; Uedaira, Satoru; Hotai, Kazuhide; Aso, Koichi; and Hayakawa, Masatoshi, 4,639,278, Cl. 148-108.000.
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Ueno, Hideo; Kuno, Hiroshi; and Hamabe, Yoshifumi, to Brother Kogyo Kabushiki Kaisha. Electronic typewriter which prints selected portions of a text. 4,639,151, Cl. 400-63.000.
Ueno, Katsuji; Nagaoka, Kenji; Miyashita, Akira; and Ebisu, Satoshi, to Sumitomo Chemical Company, Limited. Process for producing formed articles of aromatic polyamide-imide resin. 4,639,344, Cl. 264-83.000.
Ueno, Michio; Miyagi, Toshimi; and Yamaguchi, Soji, to Murata Manufacturing Co., Ltd. Fly-back transformer with reduced ringing. 4,639,663, Cl. 323-356.000.
Ueno, Shigeto; Ohnishi, Masanori; Nakamura, Yuji; and Tanaka, Shinichi, to Matsushita Electric Industrial Co., Ltd. Tape recorder with improved tape cassette pad shifter. 4,639,814, Cl. 360-130.100.
Ueno, Susumu: *See*—
Asai, Michihiko; Shimura, Yukio; Tsuda, Keishiro; Ueno, Susumu; Nomura, Hirokazu; and Imada, Kiyoshi, 4,639,379, Cl. 427-40.000.
Suzuki, Niichiro; Ogushi, Yoshimi; Imai, Kiyoshi; Ohta, Nobuhiro; and Ueno, Susumu, 4,639,285, Cl. 156-272.600.
Ui, Katsumi: *See*—
Ito, Masashi; Ohashi, Toshio; and Ui, Katsumi, 4,639,272, Cl. 106-243.000.
Ullrich, Martin: *See*—
Alewelt, Wolfgang; Eisermann, Wolfgang; Meyer, Karl-Heinrich; Tresper, Erhard; and Ullrich, Martin, 4,639,507, Cl. 528-388.000.
Umeki, Tsunenori: *See*—
Mizugaki, Shigeo; and Umeki, Tsunenori, 4,639,892, Cl. 365-182.000.
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Suzuki, Hirosuke; Yasumoto, Hiromi; and Umemoto, Hiroshi, 4,639,693, Cl. 333-1.000.
Umemoto, Sumio; Hattori, Eiichi; and Kamakari, Ryutaro, to Toyo Rubber Industry Co., Ltd., The. Method of casting urethane elastomer on metal. 4,639,384, Cl. 427-290.000.
Umemura, Hiroo, to Taiho Kogyo Corporation, Ltd. Method and apparatus for measuring wall thickness of a workpiece. 4,638,568, Cl. 33-549.000.
Umetani, Katsutoshi: *See*—
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Umlauf, Norbert: *See*—
Oberlander, Karol H.; and Umlauf, Norbert, 4,638,701, Cl. 83-490.000.
Union Carbide Corporation: *See*—
Crowley, Harris L., Jr., 4,639,836, Cl. 361-433.000.
Fellows, Constance A.; and Fu, Wallace Y., 4,639,536, Cl. 549-462.000.
Union Oil Company of California: *See*—
Moorehead, Eric L., 4,639,530, Cl. 549-260.000.
United Coal Company: *See*—
Smith, Lloyd B., 4,639,320, Cl. 210-739.000.
United Kingdom Atomic Energy Authority: *See*—
Keats, Albert B., 4,639,882, Cl. 364-550.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in her Britannic Majesty's Government of the: *See*—
McCanny, John V.; and McWhirter, John G., 4,639,857, Cl. 364-200.000.
United States Gypsum Company: *See*—
Wendt, Alan C., 4,638,606, Cl. 52-36.000.
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Air Force: *See*—
Fender, Janet S.; Cusumano, Salvatore J.; Butts, Robert R.; and DeHainaut, Christopher R., 4,639,586, Cl. 250-201.000.
Hopwood, Francis W.; Caldwell, Stephen P.; and Decker, Martin J., 4,639,688, Cl. 331-10.000.
Salour, Michael M.; and Fehrenbach, Gustav W., 4,639,075, Cl. 350-96.160.
Army: *See*—
Mariani, Elio A.; and Skudera, William J., Jr., 4,639,695, Cl. 333-133.000.
McIngvale, Pat H., 4,638,737, Cl. 102-489.000.
Pistor, Helmut H., 4,639,603, Cl. 250-504.00R.
Roberts, Thomas G.; and Honeycutt, Thomas E., 4,639,642, Cl. 315-39.000.
Sayles, David C., 4,638,739, Cl. 102-520.000.
Vig, John R., 4,638,536, Cl. 29-25.350.
Energy: *See*—
Farmwald, Paul M., 4,639,887, Cl. 364-748.000.
Jackovitz, John F.; and Kunkle, Richard P., 4,639,401, Cl. 429-30.000.
Lewandowski, Edward F.; Cassidy, Dale A.; and Sommer, Robert G., 4,639,571, Cl. 219-121.0EC.
Navy: *See*—
Aprigliano, Louis F., 4,639,399, Cl. 428-623.000.
Hinton, George F., 4,639,675, Cl. 324-334.000.
Leverance, Robert A.; and Longas, Socrates A., 4,639,902, Cl. 367-93.000.
U.S. Philips Corporation: *See*—
Bakker, Gijsbertus; and Rorije, Gerhardus J., 4,639,636, Cl. 313-408.000.
Beaumont, Chritien J. M., 4,639,672, Cl. 324-318.000.
Boutterin, Daniel; Bertaux, Jean-Paul; and Bader, Alain, 4,639,916, Cl. 371-16.000.
Giakoumis, Alex, 4,639,617, Cl. 307-296.00R.
Goldmann, Peter, 4,639,793, Cl. 360-44.000.
Gustafson, Bengt G., 4,639,900, Cl. 367-5.000.
Hazan, Jean-Pierre; and Steers, Michel, 4,639,137, Cl. 356-339.000.
Hoppmanns, Rolf D.; Steup, Walter; Wieczorek, Willibald; and Beitler, Franz, 4,639,801, Cl. 360-96.500.
Kasperkovitz, Wolfdietrich G.; and Van Rumpt, Herman W., 4,639,679, Cl. 328-20.000.
Loy, Fernand R., 4,639,082, Cl. 350-172.000.
Maan, Nicolaus, 4,639,131, Cl. 356-73.100.
Metcalfe, John G., 4,639,703, Cl. 335-213.000.
Morton, Stephen F. N., 4,639,136, Cl. 356-312.000.

Ponjee, Johannes J.; and Verwijlen, Christiaan J. A., 4,639,382, Cl. 427-162.000.
Roza, Engel; and Van Veenendaal, Hendrik G., 4,639,911, Cl. 370-69.100.
Wagenmakers, Johannes, 4,639,620, Cl. 307-446.000.
Zijlstra, Hinne, 4,639,673, Cl. 324-319.000.

United Technologies Automotive, Inc.: *See*—
Floyd, William M.; and Juzswik, David L., 4,639,609, Cl. 307-10.00R.

United Technologies Corporation: *See*—
Kubick, Frederick, 4,639,093, Cl. 350-388.000.
Spock, Wayne R.; and Meisner, Richard P., 4,639,885, Cl. 364-574.000.
Stetson, Karl A.; and Palecki, John, 4,639,593, Cl. 250-227.000.

Unitek Corporation: *See*—
Dufrenne, Gerald, 4,639,569, Cl. 219-109.000.

University of Illinois, The Board of Trustees of The: *See*—
Holonyak, Nick, Jr., 4,639,275, Cl. 148-1.500.

Uno, Kunihiko; Nakazato, Kunihiro; Nishigaki, Masahide; Hirotomi, Hajime; Kimura, Shigeo; Kurihara, Sadao; Tanaka, Hideo; Mihara, Jiro; and Takai, Kiyoaki, to Kabushiki Kaisha Takuma; and Nihon Jukagaku Kogyo Kabushiki Kaisha. Continuous melt electric furnace with continuous discharge. 4,639,927, Cl. 373-84.000.

Uno, Masatoshi, to Kabushiki Kaisha Nagaoka. Cleaning disket with internal paths for cleaning liquid. 4,639,813, Cl. 360-128.000.

UOP Limited: *See*—
Holt, Andrew; Cheek, Martin G.; and Clegg, Ernest N., 4,639,432, Cl. 502-324.000.

Upchurch, James E., to Woods Wire Products, Inc. Trouble light with rotatable attaching means. 4,639,842, Cl. 362-376.000.

Urabe, Tetsuo; and Kojima, Shigeru, to Sony Corporation. Liquid crystal display apparatus. 4,639,722, Cl. 340-784.000.

Uriuhara, Makoto: *See*—
Hattori, Toshihiro; Ishihara, Masaki; and Uriuhara, Makoto, 4,638,690, Cl. 74-866.000.

Urwyler, Peter R., to Simtek Inc. Apparatus for dispensing strip material or the like. 4,638,696, Cl. 83-261.000.

Ushiyama, Shigeyuki: *See*—
Takekoshi, Yoshitaka; and Ushiyama, Shigeyuki, 4,639,627, Cl. 310-156.000.

USM Corporation: *See*—
Schuster, Heinz; and Press, Gerd, 4,639,155, Cl. 401-1.000.

Uytterhoeven, Herman: *See*—
Podszun, Wolfgang; Goossens, John; Suling, Carlhans; Hoffarth, Gunther; Richter, Wolfgang; Uytterhoeven, Herman; and de Winter, Walter, 4,639,403, Cl. 430-115.000.
Uytterhoeven, Herman J.; De Winter, Walter F.; and Marien, August M., to Agfa-Gevaert, N.V. Liquid developer for development of electrostatic images. 4,639,404, Cl. 430-115.000.

Val, Christian; Pinel, Joseph; and Gibod, Yves B., to Compagnie d'Informatique Militaire, Spatiale et Aeronautique. Radiation-hardened casing for an electronic component. 4,639,826, Cl. 361-272.000.

Valenty, Vivian B.; Hill, William H.; and Ravi, Prasad S., to A. E. Staley Manufacturing Company. Detergent builder. 4,639,325, Cl. 252-89.100.

Valeo: *See*—
Bouvot, Jean-Francois; and Leborgne, Jose , 4,638,723, Cl. 92-48.000.
Jaccod, Michel, 4,639,238, Cl. 474-8.000.
Thirion de Briel, Jacques; and Jaccod, Michel, 4,639,239, Cl. 474-8.000.

Valyocsik, Ernest W., to Mobil Oil Corporation. Synthesis of crystalline silicate ZSM-5 using an organic sulfonic acid. 4,639,360, Cl. 423-329.000.

Vamatex S.p.A.: *See*—
Pezzoli, Nello, 4,638,839, Cl. 139-449.000.

VanAken, Jerry R.: *See*—
Heilveil, Andrew; VanAken, Jerry R.; Guttag, Karl M.; Redwine, Donald J.; Pinkham, Raymond; and Novak, Mark F., 4,639,890, Cl. 364-900.000.

van der Stoel, Roland E., to Stamicarbon B.V. Process for the preparation of pyridone-2 by demethylation. 4,639,525, Cl. 546-290.000.

Van Dorsser, William R.: *See*—
Roncucci, Romeo; Gillet, Claude L.; Cordi, Alexis H.; Martens, Mark A.; Roba, Joseph L.; Niebes, Paul J.; Lambelin, Georges E.; and Van Dorsser, William R., 4,639,468, Cl. 514-620.000.

Van Rumpt, Herman W.: *See*—
Kasperkovitz, Wolfdietrich G.; and Van Rumpt, Herman W., 4,639,679, Cl. 328-20.000.

Van Slyke, Allan S.: *See*—
Sovacool, David K.; Van Slyke, Allan S.; and Bungo, Edward M., 4,638,964, Cl. 248-56.000.

Van Veenendaal, Hendrik G.: *See*—
Roza, Engel; and Van Veenendaal, Hendrik G., 4,639,911, Cl. 370-69.100.

Varbanov, Hristo P.: *See*—
Hadjiiski, Anatoli M.; Varbanov, Hristo P.; Mishonov, Michail T.; Stamov, Vladimir P.; Savov, Rosen P.; Radenkov, Strahil K.; Panev, Vladimir B.; and Velev, Alexander S., 4,638,607, Cl. 52-79.900.

Vaughn, Charles R. Guy-wire guard assembly and fastening systems therefor. 4,638,611, Cl. 52-147.000.

VDO Adolf Schindling AG: *See*—
Collonia, Harald, 4,638,879, Cl. 180-179.000.

Veb Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Foerster, Karl-Heinz; and Koerner, Siegfried, 4,639,776, Cl. 358-107.000.

VEB Kombinat Textima: *See*—
Grenzendoerfer, Dietmar; Wierzgon, Achim; Mueller, Gerhard; Erth, Dieter; Guenther, Ludwig; and Kuenzel, Rolf, 4,638,647, Cl. 66-84.00A.

Veba Oel Entwicklungs-Gesellschaft: *See*—
Dohler, Werner; Merz, Ludwig; Frohnert, Heinz; Uckermann, Bernd; Graeser, Ulrich; Jankowski, Alfons; Wolowski, Eckard; Tamm, Hans-Friedrich; and Wilczok, Norbert, 4,639,310, Cl. 208-412.000.

Veith, Ronald D.: *See*—
Persson, Eric G.; and Veith, Ronald D., 4,639,845, Cl. 363-26.000.

Velev, Alexander S.: *See*—
Hadjiiski, Anatoli M.; Varbanov, Hristo P.; Mishonov, Michail T.; Stamov, Vladimir P.; Savov, Rosen P.; Radenkov, Strahil K.; Panev, Vladimir B.; and Velev, Alexander S., 4,638,607, Cl. 52-79.900.

Venus Scientific Inc.: *See*—
Gallios, George C.; and Lien, Charles, 4,639,844, Cl. 363-17.000.

Vepa Aktiengesellschaft: *See*—
Fleissner, Heinz, 4,638,572, Cl. 34-41.000.

Vermilion, Everette E.: *See*—
Paterson, Noel S.; and Vermilion, Everette E., 4,639,730, Cl. 340-970.000.

Verwijlen, Christiaan J. A.: *See*—
Ponjee, Johannes J.; and Verwijlen, Christiaan J. A., 4,639,382, Cl. 427-162.000.

Vezza, Thomas F., to Dresser Industries, Inc. Monolithic refractory composition. 4,639,474, Cl. 523-141.000.

Vickers Public Limited Company: *See*—
Milne, Alistair R.; and Davison, Grenville, 4,638,713, Cl. 89-14.100.

Victaulic Company of America: *See*—
Rung, Robert; and Ache, Lani G., 4,639,020, Cl. 285-367.000.

Victor Company of Japan, Ltd.: *See*—
Fujita, Akira; and Shimizu, Kyoichi, 4,639,782, Cl. 358-166.000.
Goto, Kunio, 4,639,906, Cl. 369-14.000.
Hirota, Akira; and Tsuruta, Masahiko, 4,639,805, Cl. 360-108.000.
Inoue, Osamu, 4,639,799, Cl. 360-85.000.
Kitamura, Masatsugu; Wagatsuma, Kikuji; Watanabe, Tokumi; Yamashita, Naoki; and Yoshida, Hiroshi, 4,638,710, Cl. 84-1.260.
Namikawa, Kazuhira; Hamaguchi, Toshiaki; Nakamura, Mutsuaki; and Kuroda, Akio, 4,639,908, Cl. 369-288.000.
Sakai, Kunihide, 4,639,810, Cl. 360-125.000.

Vidt, Edward J.: *See*—
Archer, David H.; Bauer, Frank I.; and Vidt, Edward J., 4,638,629, Cl. 60-39.050.

Viehrig, Wolfgang; Wagner, Karl-Heinz; and Laar, Erwin, to AGFA-Gevaert Aktiengesellschaft. Apparatus for treatment of webs of photographic material. 4,638,936, Cl. 226-191.000.

Vieth, Walter: *See*—
Hager, Juergen; Vieth, Walter; and Manderla, Werner, 4,638,697, Cl. 83-356.300.

Vig, John R., to United States of America, Army. Method of making a resonator having a desired frequency from a quartz crystal resonator plate. 4,638,536, Cl. 29-25.350.

Ville, Ivan B.; Walling, James D.; and Yousey, Kevin E., to Eastman Kodak Company. Magnetic brush apparatus for developing electrostatic images. 4,638,759, Cl. 118-657.000.

Viriyayuthakorn, Montri: *See*—
Kim, Myung K.; and Viriyayuthakorn, Montri, 4,638,762, Cl. 118-725.000.

Virnig, Michael J.; and Clark, James P., to Henkel Corporation. Dicyanoethenyl fatty compounds and derivatives thereof. 4,639,540, Cl. 558-444.000.

Vishlizky, Yoram, to State of Israel, Ministry of Defense, Armament. Gunnery training apparatus. 4,639,222, Cl. 434-20.000.

Vnek, John: *See*—
Prince, Alfred M.; and Vnek, John, 4,639,371, Cl. 424-86.000.

Vogele, Gunter: *See*—
Buchner, Norbert; Lemke, Kuno; and Vogele, Gunter, 4,638,925, Cl. 222-21.000.

Volkswagenwerk Aktiengesellschaft: *See*—
Leineweber, Gunter; Warnecke, Rolf; and Ruhmer, Heinz, 4,638,719, Cl. 91-373.000.

von Ballmoos, Roland: *See*—
Derouane, Eric G.; and von Ballmoos, Roland, 4,639,357, Cl. 423-306.000.
Derouane, Eric G.; and von Ballmoos, Roland, 4,639,358, Cl. 423-306.000.

von Campenhausen, Rolf: *See*—
Jarnestedt, Goran; and von Campenhausen, Rolf, 4,639,935, Cl. 375-11.000.

von Gizycki, Ulrich: *See*—
Muller, Hanns P.; Clarenz, Werner; von Gizycki, Ulrich; and Wagner, Kuno, 4,639,502, Cl. 528-45.000.

Vonhausen, Georg, to General Motors Corporation. Valve actuator. 4,638,977, Cl. 251-248.000.

Von Kohorn, Henry; and Kydonieus, Agis F., to Herculite Protective Fabrics Corporation. Dispensers for the controlled release of pest-controlling agents and methods for combatting pests therewith. 4,639,393, Cl. 428-304.400.

Vorlop, Claus: *See*—
Kahlert, Wolfgang; Klein, Joachim; Steinert, Hans-Jurgen; and Vorlop, Claus, 4,639,423, Cl. 435-287.000.

Voss, Steven H.: *See*—
Neubauer, Jerry L.; Schmidt, Laurence J.; and Voss, Steven H., 4,639,802, Cl. 360-98.000.

Vrzalik, John H., to Kinetic Concepts, Inc. Therapeutic bed support. 4,638,516, Cl. 5-64.000.

VSI Corporation: *See*—
Whitehorn, Sydney H., 4,638,849, Cl. 164-311.000.

Vyas, Dolatrai M.: *See*—
Kaplan, Murray A.; and Vyas, Dolatrai M., 4,639,528, Cl. 548-422.000.

W. Gunther GmbH: *See*—
Gunther, Walter, 4,639,563, Cl. 200-61.45M.

W. R. Grace & Co.: *See*—
Kreh, Robert P.; and Spotnitz, Robert M., 4,639,298, Cl. 204-59.00R.

W. R. Grace & Co., Cryovac Div.: *See*—
Howe, Milton A., Jr., 4,638,913, Cl. 206-632.000.

W. Schlafhorst & Co.: *See*—
Wey, Edmund, 4,638,956, Cl. 242-35.50A.

Wacyk, Ihor T., to RCA Corporation. Priority encoded spare element decoder. 4,639,897, Cl. 365-200.000.

Wada, Hidekazu: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; and Wada, Hidekazu, 4,639,699, Cl. 333-202.000.

Wada, Hideo; and Goto, Humio, to Hitachi, Ltd. Computer system. 4,639,862, Cl. 364-200.000.

Wada, Kenichi: *See*—
Hashimoto, Masahiro; Watanabe, Tsuyoshi; and Wada, Kenichi, 4,639,886, Cl. 364-736.000.

Wada, Takaaki: *See*—
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Wade, James J.: *See*—
McQuinn, Roy L.; and Wade, James J., 4,639,445, Cl. 514-222.000.

Wafer Scale Integration, Inc.: *See*—
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Wagatsuma, Kikuji: *See*—
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Wagenhals, Fred W.: *See*—
Lawrence, Donald R., 4,639,007, Cl. 280-234.000.

Wagenmakers, Johannes, to U.S. Philips Corporation. Parallel-series converter. 4,639,620, Cl. 307-446.000.

Waggoner, Marion G., to Du Pont de Nemours, E. I., and Company. Extruding process for preparing functionalized polyolefin polymers. 4,639,495, Cl. 525-285.000.

Wagner, Hans: *See*—
Hartl, Christof; and Wagner, Hans, 4,639,556, Cl. 381-68.600.

Wagner, Karl-Heinz: *See*—
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Wagner, Kuno: *See*—
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Wakabayashi, Tatsuro: *See*—
Kohama, Masayuki; Wakabayashi, Tatsuro; and Tsunoda, Kouichi, 4,638,538, Cl. 29-149.50C.

Wald, Robert D., to Data Motion, Incorporated. Paper feed tractor with belt tensioning. 4,638,935, Cl. 226-171.000.

Walker, Roger E.: *See*—
Grunert, Kurt A.; Walker, Roger E.; Paton, Charles R.; and Leone, David A., 4,639,564, Cl. 200-144.00R.

Wallace, Kathleen M.: *See*—
Ball, Lawrence E.; Griffin, William M.; Wallace, Kathleen M.; and Nemecek, Amy L., 4,638,865, Cl. 166-274.000.

Waller, Francis E., to Waller, Leonard J. E.; Gdovin, Wm. J.; and Monacelli, Walter J., a part interest to each. Process for producing a cam with sinusoidal cam lobe surfaces. 4,638,547, Cl. 29-558.000.

Waller, Francis E., to Waller, Leonard J. E.; Gdovin, Wm. J.; and Monacelli, Walter J., part interest to each. Apparatus for producing a cam with sinusoidal cam lobe surfaces. 4,639,173, Cl. 409-122.000.

Waller, Leonard J. E.: *See*—
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Walling, James D.: *See*—
Ville, Ivan B.; Walling, James D.; and Yousey, Kevin E., 4,638,759, Cl. 118-657.000.

Walsh, William H., to Gillette Company, The. Method of manufacturing and delivering coil springs. 4,638,653, Cl. 72-129.000.

Walworth, Bryant L.: *See*—
Arotin, Robert L.; Walworth, Bryant L.; and Marini, Michele E., 4,639,268, Cl. 71-105.000.

Wang, Cheng-Chung. Toy having an envelope enclosing a moving mechanism. 4,639,232, Cl. 446-220.000.

Wang, Shing C.; and Hamerdinger, Randolph W., to Xerox Corporation. Efficient cathode assembly for metal vapor laser. 4,639,926, Cl. 372-87.000.

Wanibuchi, Hiroshi; and Kubota, Akira, to Kabushiki Kaisha Daini Seikosha; and Kabushiki Kaisha Kuboto Tekkojo. Press device having means to enable ram and bolster to be removed as a unit. 4,638,704, Cl. 83-628.000.

Ward, Billy W.: *See*—
Doherty, John A.; Ward, Billy W.; and Shaver, David C., 4,639,301, Cl. 204-192.310.

Warmack, Ralph E.; and Woodruff, William D., to Standard Oil Company. Method for testing cableless seismic digital field recorders. 4,639,901, Cl. 367-13.000.

Warnecke, Rolf: *See*—
Leineweber, Gunter; Warnecke, Rolf; and Ruhmer, Heinz, 4,638,719, Cl. 91-373.000.

Warner, Dale J. Automatic aligning cartridge mount seal. 4,639,000, Cl. 277-41.000.

Warren, Brian T.: *See*—
Abram, Trevor S.; Norman, Peter; and Warren, Brian T., 4,639,535, Cl. 549-419.000.

Washizuka, Isamu, to Sharp Kabushiki Kaisha. Portable audio-visual electronic apparatus. 4,639,225, Cl. 434-308.000.

Watanabe, Hideaki: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,639,450, Cl. 514-238.000.

Watanabe, Kazuo; and Sato, Tetsuo, to Hitachi, Ltd. Signal transmission circuit. 4,639,795, Cl. 360-62.000.

Watanabe, Kunio: *See*—
Yamamoto, Mitsuru; Watanabe, Kunio; and Shimoda, Junji, 4,639,735, Cl. 346-1.100.

Watanabe, Minoru: *See*—
Muto, Kenji; Sugaya, Toru; Kuroda, Tokuyuki; Hashimoto, Tamotsu; Yamada, Koji; Nakamizo, Nobuhiro; and Watanabe, Minoru, 4,639,522, Cl. 546-194.000.

Watanabe, Tetsumi; Yamaguro, Akira; and Yamaguchi, Susumu, to Aisin Seiki Kabushiki Kaisha. Swirling device for stirling cycle engines. 4,639,212, Cl. 431-183.000.

Watanabe, Tokumi: *See*—
Kitamura, Masatsugu; Wagatsuma, Kikuji; Watanabe, Tokumi; Yamashita, Naoki; and Yoshida, Hiroshi, 4,638,710, Cl. 84-1.260.

Watanabe, Tsuyoshi: *See*—
Hashimoto, Masahiro; Watanabe, Tsuyoshi; and Wada, Kenichi, 4,639,886, Cl. 364-736.000.

Waterston, John W.: *See*—
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Yoshida, Hiroshi: *See*—
Kitamura, Masatsugu; Wagatsuma, Kikuji; Watanabe, Tokumi; Yamashita, Naoki; and Yoshida, Hiroshi, 4,638,710, Cl. 84-1.260.
Yoshida Kogyo K. K.: *See*—
Akiyama, Hideki; and Imai, Shigeru, 4,638,542, Cl. 29-408.000.
Yoshida, Masayuki, to Pioneer Electronic Corporation. Switching circuit for a power supply in a signal processing apparatus. 4,639,660, Cl. 323-266.000.
Yoshida, Tetsuo; and Kokubo, Tadayoshi, to Fuji Photo Film Co., Ltd. Internal latent image-type silver halide emulsion. 4,639,416, Cl. 430-567.000.
Yoshihara, Mitsuo: *See*—
Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, 4,639,080, Cl. 350-96.340.
Yoshikawa, Hiroki: *See*—
Sakazume, Akio; Yoshikawa, Hiroki; and Matsushima, Hiroaki, 4,638,643, Cl. 62-209.000.
Yoshikawa, Mitsuhiko: *See*—
Kira, Toru; Miyauchi, Teiichi; and Yoshikawa, Mitsuhiko, 4,639,806, Cl. 360-113.000.
Yoshimura, Nobutoshi: *See*—
Petty, Terry D.; Costello, Carmon R.; Song, Kun K.; Chabot, Luc G.; Fujita, Tadahiro; Hirose, Haruki; and Yoshimura, Nobutoshi, 4,639,167, Cl. 405-217.000.
Yoshimura, Noriaki: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 4,639,471, Cl. 521-172.000.
Yoshimura, Toshio: *See*—
Tanaka, Shinsaku; and Yoshimura, Toshio, 4,639,800, Cl. 360-90.000.
Yoshioka, Masahiro; Izumi, Hideki; Inouye, Hiroshi; Hazaki, Eiichi; and Nakadaira, Shiro, to Hitachi, Ltd. Thrust bearing. 4,639,146, Cl. 384-99.000.
Yoshioka, Takeo. Water pipe. 4,638,815, Cl. 131-173.000.
Yoshioka, Toshiharu: *See*—
Morioka, Minoru; Kishi, Toshiaki; and Yoshioka, Toshiharu, 4,638,881, Cl. 180-219.000.
Yoshiwara, Seishiro; and Kawanami, Takao, to Nippon Steel Corporation. Method for producing a clad plate by rolling. 4,638,939, Cl. 228-186.000.
Yoshizawa, Atsushi: *See*—
Matsui, Fumio; Yanagisawa, Shuichi; Kakuta, Yoshiyuki; and Yoshizawa, Atsushi, 4,639,745, Cl. 346-135.100.
Young, Lawrence R.; Sexton, Gregory J.; Mullins, Randal L.; and Bradley, Brian D., to Eastman Kodak Company. Ink level detection system for ink jet printing apparatus. 4,639,738, Cl. 346-75.000.
Young, Thomas B., III: *See*—
Beck, Donald; Miller, James W.; Wernau, William C.; and Young, Thomas B., III, 4,639,322, Cl. 252-8.554.
Youngblood, James F.: *See*—
Schellstede, Herman J.; and Youngblood, James F., 4,639,258, Cl. 55-52.000.
Yousey, Kevin E.: *See*—
Ville, Ivan B.; Walling, James D.; and Yousey, Kevin E., 4,638,759, Cl. 118-657.000.
Yu, Yuan-Fu: *See*—
Seyferth, Dietmar; and Yu, Yuan-Fu, 4,639,501, Cl. 528-15.000.
Yudichak, Joseph R.: *See*—
Toegel, Herbert J.; Yudichak, Joseph R.; and Gilsdorf, John F., 4,639,910, Cl. 370-58.000.
Yutani, Takashi: *See*—
Asaeda, Takeaki; Nakamura, Toru; and Yutani, Takashi, 4,639,850, Cl. 363-58.000.
Zaglin, Lawrence C.: *See*—
Fetko, Paul; and Zaglin, Lawrence C., 4,639,102, Cl. 350-626.000.
Zeller Plastik Koehn, Graebner & Co.: *See*—
Persch, Alois, 4,638,917, Cl. 215-252.000.
Zenith Electronics Corporation: *See*—
Meyle, William H.; and Wendt, Paul H., 4,639,230, Cl. 445-30.000.
Zerowin, Jeffrey H. Data terminal system. 4,639,583, Cl. 235-380.000.
Zeuner, Kenneth W.; Zeuner, Steven K.; and Zeuner, Thomas A. Electrohydraulic valve assemblies and method. 4,638,974, Cl. 251-129.150.
Zeuner, Steven K.: *See*—
Zeuner, Kenneth W.; Zeuner, Steven K.; and Zeuner, Thomas A., 4,638,974, Cl. 251-129.150.
Zeuner, Thomas A.: *See*—
Zeuner, Kenneth W.; Zeuner, Steven K.; and Zeuner, Thomas A., 4,638,974, Cl. 251-129.150.
Zijlstra, Hinne, to U.S. Philips Corporation. Nuclear magnetic resonance apparatus with a magnet of permanent magnetic material. 4,639,673, Cl. 324-319.000.
Zimmer, John J.; and Solteaz, Richard G., to Westinghouse Electric Corp. Remote probe positioning apparatus. 4,638,667, Cl. 73-432.100.
Zingher, Oded, to M.A.N.-Roland Druckmaschinen AG. Data input unit and method for printing machines. 4,639,881, Cl. 364-521.000.
Zinke, Horst: *See*—
Muller, Horst; Zinke, Horst; and Wehner, Wolfgang, 4,639,482, Cl. 524-137.000.
Zipperian, Donald E., to Deister Concentrator Company, The. Floatation apparatus for concentration of minerals from high water content aqueous slurries. 4,639,313, Cl. 209-170.000.
Zollner, Dieter: *See*—
Conradty, Claudio; Zollner, Dieter; Lauterbach-Dammler, Inge; and Taube, Thomas, 4,639,928, Cl. 373-93.000.
Zumbusch, Steven J., to Eaton Corporation. Rotary fluid pressure device having free-wheeling capability. 4,639,203, Cl. 418-61.00B.
Zunkel, Gary D.; and Bolin, Michael L., to Halliburton Company. Gravel packer. 4,638,859, Cl. 166-51.000.
Zuranski, Edward S.; Scott, Robert E.; and Betts, William L., to Paradyne Corporation. Line impairment display for digital modems. 4,639,934, Cl. 375-10.000.
Zverina, Karel; Tluchor, Denek; Szabo, Josef; Polidor, Jaromir; and Kroupa, Petr. Apparatus for stabilization of low-temperature plasma of an arc burner. 4,639,570, Cl. 219-121.0PP.
20th Century Machine: *See*—
Miller, Michael A., 4,638,548, Cl. 29-558.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF JANUARY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alexander, John B.; Dennehey, Michael T.; Greff, Richard J.; and Munsch, John M., to Baxter Travenol Laboratories, Inc. Gripper member for retention of a plastic tube. Re. 32,338, Cl. 294-16.000.
Baxter Travenol Laboratories, Inc.: *See*—
Alexander, John B.; Dennehey, Michael T.; Greff, Richard J.; and Munsch, John M., Re. 32,338, Cl. 294-16.000.
Dart Industries Inc.: *See*—
Dobson, William C.; and Spoeth, Carl R., Re. 32,340, Cl. 200-50.00B.
Dennehey, Michael T.: *See*—
Alexander, John B.; Dennehey, Michael T.; Greff, Richard J.; and Munsch, John M., Re. 32,338, Cl. 294-16.000.
Dictaphone Corporation: *See*—
Wilder, Leslie N.; Whitney, James C.; and Matison, Gary G., Re. 32,342, Cl. 360-72.200.
Dobson, William C.; and Spoeth, Carl R., to Dart Industries Inc. Electrical switch-plug assembly with baffle. Re. 32,340, Cl. 200-50.00B.
Escaron, Pierre C.; and Hoppe, Joachim A., to Schlumberger Technology Corporation. Method and apparatus for conducting logging or perforating operations in a borehole. Re. 32,336, Cl. 166-250.000.
Greff, Richard J.: *See*—
Alexander, John B.; Dennehey, Michael T.; Greff, Richard J.; and Munsch, John M., Re. 32,338, Cl. 294-16.000.
Heck, Betty M. Fluid administration splint. Re. 32,335, Cl. 128-88.000.
Hoppe, Joachim A.: *See*—
Escaron, Pierre C.; and Hoppe, Joachim A., Re. 32,336, Cl. 166-250.000.
Jones, John C.; Sifford, Perry P.; and Sutton, Joel F., to United Technologies Corporation. Blade to blade vibration damper. Re. 32,339, Cl. 416-190.000.
Matison, Gary G.: *See*—
Wilder, Leslie N.; Whitney, James C.; and Matison, Gary G., Re. 32,342, Cl. 360-72.200.
Munsch, John M.: *See*—
Alexander, John B.; Dennehey, Michael T.; Greff, Richard J.; and Munsch, John M., Re. 32,338, Cl. 294-16.000.
Oizumi, Yoshio, to Yamakyu Automatics Co., Ltd. System for conveying conical articles. Re. 32,337, Cl. 198-463.600.
Schlumberger Technology Corporation: *See*—
Escaron, Pierre C.; and Hoppe, Joachim A., Re. 32,336, Cl. 166-250.000.
Sifford, Perry P.: *See*—
Jones, John C.; Sifford, Perry P.; and Sutton, Joel F., Re. 32,339, Cl. 416-190.000.
Smith, Robert M. Disco light assembly. Re. 32,341, Cl. 315-291.000.
Spoeth, Carl R.: *See*—
Dobson, William C.; and Spoeth, Carl R., Re. 32,340, Cl. 200-50.00B.
Sutton, Joel F.: *See*—
Jones, John C.; Sifford, Perry P.; and Sutton, Joel F., Re. 32,339, Cl. 416-190.000.
United Technologies Corporation: *See*—
Jones, John C.; Sifford, Perry P.; and Sutton, Joel F., Re. 32,339, Cl. 416-190.000.
Whitney, James C.: *See*—
Wilder, Leslie N.; Whitney, James C.; and Matison, Gary G., Re. 32,342, Cl. 360-72.200.
Wilder, Leslie N.; Whitney, James C.; and Matison, Gary G., to Dictaphone Corporation. Instruction indicating apparatus for a record and/or playback device. Re. 32,342, Cl. 360-72.200.
Yamakyu Automatics Co., Ltd.: *See*—
Oizumi, Yoshio, Re. 32,337, Cl. 198-463.600.

LIST OF DESIGN PATENTEES

Aadahl, Frank P.: *See*—
Watkins, Donald E.; and Aadahl, Frank P., 288,016, Cl. D32-22.000.
Abrams, Robert C.: *See*—
Weder, Donald E.; Weder, Erwin; and Abrams, Robert C., 287,950, Cl. D11-143.000.
Adams, Larry C. Combined support for holding and displaying cards. 287,980, 1-27-87, Cl. D19-86.000.
Adcock, D. L. Machine for filtering lubricating oil for a dough divider machine. 287,926, 1-27-87, Cl. D7-368.000.
Airwick Industries, Inc.: *See*—
Hoyt, Earl, 288,003, Cl. D23-150.000.
Albertson, Robert V., to Burd, Bartz & Gutenkauf. Coin-operated telephone box. 287,966, 1-27-87, Cl. D14-55.000.
American Commercial, Incorporated: *See*—
Levien, Robin, 287,918, Cl. D7-19.000.
Ampere Incorporated: *See*—
Kusanagi, Takashi, 287,969, Cl. D14-106.000.
Anzelone, Thomas A.; Davis, Myron F.; and Jordan, Willis Y., III, to International Business Machines Corporation. Keyboard for a personal computer. 287,972, 1-27-87, Cl. D14-100.000.
Apple Computer, Inc.: *See*—
Gemmell, Rob J.; Esslinger, Hartmut H.; and Peart, Stephen, 287,967, Cl. D14-100.000.
Ares, Roland A.; and Maechler, Dennis R., to Hussmann Corporation. Air cooled refrigeration condenser. 288,002, 1-27-87, Cl. D23-139.000.
Astra Lakemedel Aktiebolag: *See*—
Bergstrom, Nils-Gustaf; and Lanfelt, Stig B., 288,006, Cl. D24-63.000.
Au, William G.: *See*—
Gebhard, Albert W.; Au, William G.; and Parker, Robert M., 288,019, Cl. D32-37.000.
Baxter Travenol Laboratories, Inc.: *See*—
Glash, Dean M.; Kruger, Robert J.; Olson, Steven L.; and West, Richard L., 288,005, Cl. D24-61.000.
Bayerische Motoren Werke AG: *See*—
Boyer, Boyke, 287,960, Cl. D12-211.000.
Bech, Frank W. Bottle. 287,935, 1-27-87, Cl. D9-372.000.
Bergstrom, Nils-Gustaf; and Lanfelt, Stig B., to Astra Lakemedel Aktiebolag. Disposable syringe for storing and administering pharmaceutical preparations. 288,006, 1-27-87, Cl. D24-63.000.
Bidwell, Christopher C.: *See*—
Knight, James L.; and Bidwell, Christopher C., 287,913, Cl. D6-409.000.
Billinghurst, Andrew J., to Hestair Kiddicraft Limited. Toy ball. 287,988, 1-27-87, Cl. D21-204.000.
Blachly, Donald L., to Gerber Products Company. Breast pump. 288,004, 1-27-87, Cl. D24-51.000.
Black & Decker, Inc.: *See*—
Somers, Robert I., 287,930, Cl. D8-64.000.
Verdier, Alain; and Polly, Marc, 288,015, Cl. D32-18.000.
Bollinger, Steven N.: *See*—
Dayton, William A.; Crain, John E.; and Bollinger, Steven N., 287,958, Cl. D12-169.000.
Bonczek, John F.; and Bonczek, Linda D. Combined shelves and dispenser for disposable diapers. 287,915, 1-27-87, Cl. D6-515.000.
Bonczek, Linda D.: *See*—
Bonczek, John F.; and Bonczek, Linda D., 287,915, Cl. D6-515.000.
Bond, Raymond G., to Fortel, Inc. Cordless handset and stand telephone unit. 287,971, 1-27-87, Cl. D14-53.000.
Boyd Lighting Company: *See*—
Pfister, Murray C., 288,009, Cl. D26-145.000.
Boyer, Boyke, to Bayerische Motoren Werke AG. Wheel cover. 287,960, 1-27-87, Cl. D12-211.000.
Brechtbill, George V.; and Nicolos, Charlie O., to Nicolos, Charlie O. Brace for stabilizer of V-tail aircraft. 287,962, 1-27-87, Cl. D12-345.000.
Bremer, David R. Coffee filter separating utensil. 287,922, 1-27-87, Cl. D7-99.000.
Bridgestone Corporation: *See*—
Hayakawa, Toshio; and Tomura, Atsushi, 287,955, Cl. D12-147.000.
Hayakawa, Toshio; Tomura, Atsushi; and Nishio, Hideaki, 287,957, Cl. D12-147.000.
Kawajiri, Junichi; and Hayakawa, Toshio, 287,952, Cl. D12-136.000.
Nishio, Hideaki; and Matsuda, Kazuo, 287,956, Cl. D12-147.000.
Tomura, Atsushi; and Nishio, Hideaki, 287,954, Cl. D12-147.000.

Broan Mfg. Co., Inc.: *See—*
Jonas, Kenneth J.; Lazar, Ralph M.; and Wolbrink, David W., 288,007, Cl. D26-51.000.
Bulgari, Gianni, to Partecipazioni Bulgari S.p.A. Necklace. 287,949, 1-27-87, Cl. D11-6.000.
Burd, Bartz & Gutenkauf: *See—*
Albertson, Robert V., 287,966, Cl. D14-55.000.
Cannon, Albert W., to Focal Point Limited. Sight. 287,977, 1-27-87, Cl. D16-132.000.
Carder, Mervin L., Sr., to M. Carder Industries, Inc. Splash guard for a fuel dispensing nozzle. 287,996, 1-27-87, Cl. D23-36.000.
Casnovsky, William M.: *See—*
Ng, Edward C.; and Casnovsky, William M., 287,968, Cl. D14-106.000.
Champion Spark Plug Company: *See—*
Jones, James E., deceased; and Grime, Thomas E., 287,994, Cl. D23-18.000.
Chong, Chae Y. Device for collecting and removing fireplace ashes. 288,001, 1-27-87, Cl. D23-131.000.
Chrysler Motors Corporation: *See—*
Dayton, William A.; Crain, John E.; and Bollinger, Steven N., 287,958, Cl. D12-169.000.
Clements, Jack D., to Solo Cup Company. Drinking cup lid. 287,919, 1-27-87, Cl. D7-40.000.
Colclasure, George M. Novelty golf ball figure. 287,987, 1-27-87, Cl. D21-155.000.
Crain, John E.: *See—*
Dayton, William A.; Crain, John E.; and Bollinger, Steven N., 287,958, Cl. D12-169.000.
Crone, Jerry L., to Hill-Rom Company, Inc. Mounting block. 287,931, 1-27-87, Cl. D8-373.000.
Crow, Herman L. Liquid dispenser. 287,993, 1-27-87, Cl. D23-17.000.
Danley, Allen M.: *See—*
Pomroy, James F.; Danley, Allen M.; and Rubbright, Harry A., 287,917, Cl. D7-18.000.
Dansk Pressalit A/S: *See—*
Holscher, Knud H., 287,998, Cl. D23-71.000.
Dart Industries Inc.: *See—*
Picozza, Augusto A., 287,983, Cl. D21-48.000.
Davis, Myron F.; Goetz, Fred E.; Harris, James C.; Howell, Steven E.; and O'Connor, David F., to International Business Machines Corporation. Floor standing enclosure for personal computer. 287,974, 1-27-87, Cl. D14-114.000.
Davis, Myron F.: *See—*
Anzelone, Thomas A.; Davis, Myron F.; and Jordan, Willis Y., III, 287,972, Cl. D14-100.000.
Dayton, William A.; Crain, John E.; and Bollinger, Steven N., to Chrysler Motors Corporation. Automobile bumper. 287,958, 1-27-87, Cl. D12-169.000.
DeGroff, Wilbur E. Bowling pin clock. 287,940, 1-27-87, Cl. D10-6.000.
DelGarbino, Andrea F.; and DelGarbino, David L. Wall mounted bracket for use in beauty salons and the like. 287,916, 1-27-87, Cl. D6-567.000.
DelGarbino, David L.: *See—*
DelGarbino, Andrea F.; and DelGarbino, David L., 287,916, Cl. D6-567.000.
De Luca, Paul: *See—*
Fasano, Michael; and De Luca, Paul, 287,963, Cl. D13-24.000.
Enyi, Donatus O. Game board or similar article. 287,982, 1-27-87, Cl. D21-34.000.
Esslinger, Hartmut H.: *See—*
Gemmell, Rob J.; Esslinger, Hartmut H.; and Peart, Stephen, 287,967, Cl. D14-100.000.
Evans, Edwin C. Traffic light. 287,948, 1-27-87, Cl. D10-115.000.
Fasano, Michael; and De Luca, Paul, to Porta Systems Corp. Telephone building entrance terminal. 287,963, 1-27-87, Cl. D13-24.000.
Faulkenberry, Eulice E. Fireless ashtray. 288,010, 1-27-87, Cl. D27-8.000.
Ferguson, Kenneth F. Shower flow controller. 287,995, 1-27-87, Cl. D23-19.000.
Ferrero, Pietro, to Ferrero S.p.A. Display stand. 287,912, 1-27-87, Cl. D6-408.000.
Ferrero S.p.A.: *See—*
Ferrero, Pietro, 287,912, Cl. D6-408.000.
Focal Point Limited: *See—*
Cannon, Albert W., 287,977, Cl. D16-132.000.
Forsyth, James A., to Sorbothane, Inc. Insole. 287,902, 1-27-87, Cl. D2-318.000.
Fortel, Inc.: *See—*
Bond, Raymond G., 287,971, Cl. D14-53.000.
Fox, Saul. Hanger. 287,908, 1-27-87, Cl. D6-328.000.
Gebhard, Albert W.; Au, William G.; and Parker, Robert M., to Gerico, Inc. Diaper pail. 288,019, 1-27-87, Cl. D32-37.000.
Gemmell, Rob J.; Esslinger, Hartmut H.; and Peart, Stephen, to Apple Computer, Inc. Personal computer housing. 287,967, 1-27-87, Cl. D14-100.000.
Gerber Products Company: *See—*
Blachly, Donald L., 288,004, Cl. D24-51.000.
Gerico, Inc.: *See—*
Gebhard, Albert W.; Au, William G.; and Parker, Robert M., 288,019, Cl. D32-37.000.
Glash, Dean M.; Kruger, Robert J.; Olson, Steven L.; and West, Richard L., to Baxter Travenol Laboratories, Inc. Needle hub. 288,005, 1-27-87, Cl. D24-61.000.
Goetz, Fred E.: *See—*
Davis, Myron F.; Goetz, Fred E.; Harris, James C.; Howell, Steven E.; and O'Connor, David F., 287,974, Cl. D14-114.000.
Gold, Ronald: *See—*
Kornhaber, Eugene; and Gold, Ronald, 287,989, Cl. D21-207.000.
Greene, Leonard M., to Safe Flight Instrument Corporation. Boat hull. 287,961, 1-27-87, Cl. D12-300.000.
Grime, Thomas E.: *See—*
Jones, James E., deceased; and Grime, Thomas E., 287,994, Cl. D23-18.000.
GTE Government Systems Corporation: *See—*
Kasianowicz, John E.; and Landes, Michael L., 287,965, Cl. D13-99.000.
Hagg, Jan O.; and Persson, Lars-Olov, to Pressmaster Tool AB. Crimping tool. 287,929, 1-27-87, Cl. D8-51.000.
Harada, Toshio: *See—*
Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 287,924, Cl. D7-351.000.
Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 287,925, Cl. D7-351.000.
Harman, Walter D. Sprinkler spout closure. 287,939, 1-27-87, Cl. D9-447.000.
Harris, James C.: *See—*
Davis, Myron F.; Goetz, Fred E.; Harris, James C.; Howell, Steven E.; and O'Connor, David F., 287,974, Cl. D14-114.000.
Harris, Robert M., Jr., to McKesson Corporation. Plastic bottle for liquids. 287,934, 1-27-87, Cl. D9-370.000.
Hastings, Malcolm B.: *See—*
Seward, Barry; Woolman, Paul; Pope, Kevin C.; Redshaw, Digby R.; Hastings, Malcolm B.; and Withall, Malcolm D. N., 287,932, Cl. D9-305.000.
Hayakawa, Toshio; and Tomura, Atsushi, to Bridgestone Corporation. Motorcycle tire. 287,955, 1-27-87, Cl. D12-147.000.
Hayakawa, Toshio; Tomura, Atsushi; and Nishio, Hideaki, to Bridgestone Corporation. Motorcycle tire. 287,957, 1-27-87, Cl. D12-147.000.
Hayakawa, Toshio: *See—*
Kawajiri, Junichi; and Hayakawa, Toshio, 287,952, Cl. D12-136.000.
Hestair Kiddicraft Limited: *See—*
Billinghurst, Andrew J., 287,988, Cl. D21-204.000.
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 287,984, Cl. D21-122.000.
Hewston, Leslie R. Construction tool. 287,944, 1-27-87, Cl. D10-64.000.
Heywood, R. G.: *See—*
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Hicks, Irwin A.; and Schroeck, Joseph P., to Singer Company, The. Housing for a remote meter display. 287,947, 1-27-87, Cl. D10-102.000.
Highland Supply Corporation: *See—*
Weder, Donald E.; Weder, Erwin; and Abrams, Robert C., 287,950, Cl. D11-143.000.
Hill-Rom Company, Inc.: *See—*
Crone, Jerry L., 287,931, Cl. D8-373.000.
Holscher, Knud H., to Dansk Pressalit A/S. Combined toilet seat and cover, or similar article. 287,998, 1-27-87, Cl. D23-71.000.
Honma, Keizo. Air eliminator for plumbing systems. 287,997, 1-27-87, Cl. D23-46.000.
Hooper, William A., Jr. Spare tire carrier. 287,959, 1-27-87, Cl. D12-202.000.
Howell, Steven E.: *See—*
Davis, Myron F.; Goetz, Fred E.; Harris, James C.; Howell, Steven E.; and O'Connor, David F., 287,974, Cl. D14-114.000.
Hoyt, Earl, to Airwick Industries, Inc. Housing for air freshener. 288,003, 1-27-87, Cl. D23-150.000.
Hussmann Corporation: *See—*
Ares, Roland A.; and Maechler, Dennis R., 288,002, Cl. D23-139.000.
Ichihara, Masuo: *See—*
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Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 287,925, Cl. D7-351.000.
Industrial Maintenance Systems, Inc.: *See—*
Zatezalo, John M., 287,978, Cl. D18-7.000.
International Business Machines Corporation: *See—*
Anzelone, Thomas A.; Davis, Myron F.; and Jordan, Willis Y., III, 287,972, Cl. D14-100.000.
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Jonas, Kenneth J.; Lazar, Ralph M.; and Wolbrink, David W., to Broan Mfg. Co., Inc. Combination deodorizer and light. 288,007, 1-27-87, Cl. D26-51.000.
Jones, Amy T., executor: *See—*
Jones, James E., deceased; and Grime, Thomas E., 287,994, Cl. D23-18.000.
Jones, James E., deceased (by Jones, Amy T., executor); and Grime, Thomas E., to Champion Spark Plug Company. Paint cup yoke. 287,994, 1-27-87, Cl. D23-18.000.
Jones, Michael R.; and Jones, Samuel N. Shoe sole. 287,903, 1-27-87, Cl. D2-321.000.
Jones, Samuel N.: *See—*
Jones, Michael R.; and Jones, Samuel N., 287,903, Cl. D2-321.000.
Jordan, Willis Y., III: *See—*
Anzelone, Thomas A.; Davis, Myron F.; and Jordan, Willis Y., III, 287,972, Cl. D14-100.000.

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341 4,638,623

CLASS 57

208 4,638,624
263 4,638,625
401 4,638,626

CLASS 59

80 4,638,627

CLASS 60

99.03 4,638,628
39.05 4,638,629
39.182 4,638,630
226.3 4,638,631
319 4,638,632
518 4,638,633
612 4,638,634
716 4,638,635
718 4,638,637
741 4,638,636

CLASS 62

9 4,638,638
4,638,639
11 4,639,262
139 4,638,640
180 4,638,641
209 4,638,643
329 4,638,644
457 4,638,645
478 4,638,646
498 4,638,642

CLASS 65

158 4,639,263

CLASS 66

64 A 4,638,647
193 4,638,648

CLASS 70

71 4,638,649
179 4,638,650
364 A 4,638,651
454 4,638,652

CLASS 71

87 4,639,264
90 4,639,265
92 4,639,266
98 4,639,267
105 4,639,268

CLASS 72

129 4,638,653
201 4,638,654
208 4,638,655
389 4,638,665

CLASS 73

4 R 4,638,656
78 4,638,657
117.3 4,638,658
119 A 4,638,659
178 R 4,638,660
237 4,638,661
302 4,638,662
313 4,638,663
384 4,638,664
431 4,638,666
432.1 4,638,667
517 R 4,638,669
658 4,638,670
708 4,638,671
861.52 4,638,672
862.17 4,638,673
863.12 4,638,674
864.34 4,638,675
868.5 4,638,668

CLASS 74

31 4,638,676
84 R 4,638,677
476 4,638,678
501 R 4,638,679
516 4,638,680
544 4,638,681
560 4,638,682
567 4,638,683
574 4,638,684
594.6 4,638,685
681 4,638,686
691 4,638,687
763 4,638,688
866 4,638,689
4,638,690
4,638,691

CLASS 75

76 4,639,269

CLASS 81

9.41 4,638,692

CLASS 82

2.5 4,638,693
18 4,638,694

CLASS 83

100 4,638,695
161 4,638,696
356.3 4,638,697
444 4,638,698
452 4,638,699
467 R 4,638,700
490 4,638,701
509 4,638,702
318 4,638,703
518 4,638,704
701 4,638,705

CLASS 84

1.01 4,638,706
1.19 4,638,707
4,638,709
1.26 4,638,710
293 4,638,708
313 4,638,711

CLASS 89

1.15 4,638,712
14.1 4,638,713
37.01 4,638,714
41.12 4,638,715
199 4,638,716

CLASS 91

26 4,638,717
178 4,638,718
373 4,638,719
522 4,638,720

CLASS 92

6 D 4,638,721
42 4,638,722
48 4,638,723
84 4,638,724
237 4,638,725
241 4,638,726

CLASS 98

2.08 4,638,728
79 4,638,727

CLASS 99

450.6 4,638,729

CLASS 100

229 A 4,638,730
282 4,638,731

CLASS 101

91 4,638,732
114 4,638,733
248 4,638,734

CLASS 102

190 4,638,735
393 4,638,736
489 4,638,737
516 4,638,738
520 4,638,739

CLASS 104

172.2 4,638,740

CLASS 105

141 4,638,741
199.3 4,638,742
377 4,638,743

CLASS 106

21 4,639,270
4,639,271
243 4,639,272
281 N 4,639,273

CLASS 108

56.1 4,638,744
111 4,638,745

CLASS 109

82 4,638,746

CLASS 110

264 4,638,747

CLASS 111

7 4,638,748

CLASS 112

121.12 4,638,749
230 4,638,750
254 4,638,751
438 4,638,752

CLASS 114

56 4,638,753
79 R 4,638,754
91 4,638,755

CLASS 118

215 4,638,756
411 4,638,757
412 4,638,758
657 4,638,759
658 4,638,760
694 4,638,761
725 4,638,762

CLASS 119

1 4,638,763
96 4,638,764

CLASS 122

7 R 4,638,765
398 4,638,766
448 B 4,638,767
512 4,638,768

CLASS 123

41.84 4,638,769
65 P 4,638,770
73 AD 4,638,771
90.16 4,638,773
90.22 4,638,774
90.6 4,638,772
185 G 4,638,775
235 4,638,776
277 4,638,777
339 4,638,778
385 4,638,779
416 4,638,780
493 4,638,781
502 4,638,782
527 4,638,783
571 4,638,784
644 4,638,785

CLASS 126

24 4,638,786
25 R 4,638,787
198 4,638,788
351 4,638,789

CLASS 128

1 A 4,638,791
6 4,638,792
71 4,638,793
80 H 4,638,794
86 Re.32,335
90 4,638,795
138 R 4,638,790
155 4,638,796
176 4,638,797
311 B 4,638,798
4,638,799
303.1 4,638,800
4,638,801
303.14 4,638,802
325 4,638,803
4,638,804
344 4,638,805
400 4,638,806
444 4,638,807
633 4,638,808
4,638,809
673 4,638,811
681 4,638,810
726 4,638,812
804 4,638,813
4,638,814

CLASS 131

173 4,638,815
276 4,638,816
280 4,638,817
281 4,638,818
331 4,638,819
336 4,638,820

CLASS 132

7 4,638,821
4,638,822
91 4,638,823
4,638,824

CLASS 133

8 R 4,638,825

CLASS 134

100 4,638,826

CLASS 135

26 4,638,827

CLASS 136

210 4,639,542
256 4,639,543

CLASS 137

82 4,638,828
75 4,638,829
83 4,638,830
117 4,638,831
220 4,638,832
312 4,638,833
315 4,638,834
519.5 4,638,835
574 4,638,836
627.5 4,638,837

CLASS 138

30 4,638,838

CLASS 139

449 4,638,839
452 4,638,840

CLASS 141

98 4,638,841
300 4,638,842

CLASS 144

330 4,638,843

CLASS 148

1.5 4,639,274
4,639,275
4,639,276
33.3 4,639,277
108 4,639,278
147 4,639,279
404 4,639,280
407 4,639,281

CLASS 156

53 4,639,282
89 4,639,283
213 4,639,284
272.6 4,639,285
307.3 4,639,286
361 4,639,287
643 4,639,288
4,639,289
644 4,639,290

CLASS 160

23 R 4,638,844

CLASS 162

107 4,639,291
375 4,639,292

CLASS 164

12 4,638,845
55.1 4,638,846
4,638,847
305 4,638,848
311 4,638,849

CLASS 165

26 4,638,850
32 4,638,851
47 4,638,852
50 4,638,853
76 4,638,854
101 4,638,855
119 4,638,856
162 4,638,857
185 4,638,858

CLASS 166

51 4,638,859
114 4,638,860
247 4,638,861
248 4,638,862
4,638,863
250 Re.32,336
251 4,638,864
274 4,638,865

CLASS 169

90 4,638,866

CLASS 172

22 4,638,867
762 4,638,868
821 4,638,869

CLASS 173

12 4,638,870

26 4,638,871

CLASS 174

32 4,639,544
36 4,639,545
92 4,639,546

CLASS 175

46 4,638,872
73 4,638,873
321 4,638,874

CLASS 177

1 4,638,875
139 4,638,876

CLASS 178

18 4,639,547
22.17 4,639,548

CLASS 180

21 4,638,877
89.13 4,638,878
179 4,638,879
219 4,638,880
4,638,881
287 4,638,882
324 4,638,883

CLASS 181

141 4,638,884

CLASS 182

151 4,638,885

CLASS 187

8.49 4,638,886
9 R 4,638,887
19 4,638,888
29 R 4,638,889

CLASS 188

24.17 4,638,890
58 4,638,891
59 4,638,892
79.5 GE 4,638,893
170 4,638,894
180 4,638,895
299 4,638,896

CLASS 192

0.052 4,638,898
3.3 4,638,897
81 C 4,638,899
85 CA 4,638,900

CLASS 198

323 4,638,901
345 4,638,902
419 4,638,903
463.6 Re.32,337
468.2 4,638,904
774 4,638,905
803.9 4,638,906

CLASS 200

1 V 4,639,558
5 A 4,639,559
19 R 4,639,560
31 R 4,639,561
41.08 4,639,562
50 B Re.32,340
61.45 M 4,639,563
144 R 4,639,564
148 A 4,639,565
158 4,639,566

CLASS 202

202 4,639,293

CLASS 203

88 4,639,294

CLASS 204

38.1 4,639,295
59 F 4,639,297
59 R 4,639,296
4,639,298
181.7 4,639,299
182.3 4,639,300
192.31 4,639,301
258 4,639,302
4,639,303
413 4,639,304
426 4,639,305
432 4,639,306

CLASS 206

0.5 4,638,907
0.8 4,638,908
1.7 4,638,909
15.2 4,638,910
611 4,638,911
631 4,638,912
632 4,638,913

CLASS 208

44 4,639,307
100 4,639,308

262 4,639,309
412 4,639,310

CLASS 209

143 4,639,311
170 4,639,313
617 4,638,914

CLASS 210

101 4,639,312
220 4,639,314
333.1 4,639,315
416.1 4,639,316
433.2 4,639,317
491 4,639,318
651 4,639,319
739 4,639,320

CLASS 211

13 4,638,915

CLASS 215

235 4,638,916
252 4,638,917
295 4,638,918

CLASS 219

10.43 4,639,567
69 M 4,639,568
109 4,639,569
121 EC 4,639,571
121 LG 4,639,572
121 PP 4,639,570
124.22 4,639,573
125.1 4,639,574
136 4,639,575
146.23 4,639,576
399 4,639,577
450 4,639,578
464 4,639,579
541 4,639,580

CLASS 220

288 4,638,919
445 4,638,920

CLASS 221

1 4,638,921
75 4,638,922
132 4,638,923

CLASS 222

1 4,638,924
21 4,638,925
82 4,638,926
83 4,638,927
155 4,638,928
456 4,638,929

CLASS 223

85 4,638,930
88 4,638,931
111 4,638,932

CLASS 224

41 4,638,933

CLASS 225

97 4,638,934

CLASS 226

171 4,638,935
191 4,638,936

CLASS 228

5.5 4,638,937
180.1 4,638,938
186 4,638,939

CLASS 229

92.3 4,638,940
104 4,638,941

CLASS 235

101 4,639,581
379 4,639,582
380 4,639,583
449 4,639,584
492 4,639,585

CLASS 236

10 4,638,942

CLASS 237

7 4,638,943
8 R 4,638,944

CLASS 239

143 4,638,945
265.33 4,638,946
265.43 4,638,947
307 4,638,949
551 4,638,950
707 4,638,951
722 4,638,948

CLASS 241

3 4,638,952
39 4,638,953

74 4,638,954

CLASS 242

18 PW 4,638,955
35.5 A 4,638,956
58.6 4,638,957
84.1 R 4,638,958
107.4 R 4,638,959

CLASS 244

134 D 4,638,960
142 4,638,961
203 4,638,962

CLASS 248

56 4,638,963
4,638,964
59 4,638,965
62 4,638,966
97 4,638,967
4,638,968
122 4,638,969
342 4,638,970
678 4,638,971

CLASS 250

201 4,639,586
4,639,587
4,639,588
203 R 4,639,589
213 VT 4,639,590
221 4,639,591
223 B 4,639,592
227 4,639,593
4,639,594
231 SE 4,639,595
259 4,639,596
305 4,639,597
339 4,639,598
363 S 4,639,599
4,639,600
385 4,639,601
396 R 4,639,602
504 R 4,639,603
548 4,639,604
554 4,639,605
555 4,639,606
561 4,639,607
578 4,639,608

CLASS 251

1.3 4,638,972
129.02 4,638,973
129.15 4,638,974
149.6 4,638,975
173 4,638,976
248 4,638,977

CLASS 252

8.554 4,639,322
8.8 4,639,321
32.5 4,639,323
48.6 4,639,324
89.1 4,639,325
91 4,639,326
143 4,639,327
299.61 4,639,328
501.1 4,639,329
522 R 4,639,330
609 4,639,331

CLASS 254

228 4,638,978

CLASS 256

13.1 4,638,979

CLASS 260

397.5 4,639,336
408 4,639,337
502.5 C 4,639,338
513.6 4,639,339

CLASS 261

36.1 4,639,340

CLASS 264

40.1 4,639,341
4,639,342
45.5 4,639,343
83 4,639,344
226 4,639,345
280 4,639,346
291 4,639,347

CLASS 266

44 4,638,980

CLASS 267

8 R 4,638,981
131 4,638,982
140.1 4,638,983

CLASS 269

43 4,638,984
244 4,638,985

CLASS 271

98 4,638,986

111 4,638,987
171 4,638,988
227 4,638,989
272 4,638,990
4,638,991
293 4,638,992
315 4,638,993

CLASS 272

122 4,638,994
144 4,638,995
146 4,638,996

CLASS 273

1 QD 4,638,997
29 BB 4,638,998
258 4,638,999

CLASS 277

41 4,639,000

CLASS 279

121 4,639,001

CLASS 280

5.2 4,639,002
5.24 4,639,003
5.32 4,639,004
43.14 4,639,005
96.1 4,639,006
234 4,639,007
405 R 4,639,008
602 4,639,009
615 4,639,010
628 4,639,011
642 4,639,012
707 4,639,013
4,639,014
789 4,639,015

CLASS 285

15 4,639,016
38 4,639,017
184 4,639,018
332 4,639,019
367 4,639,020

CLASS 292

7 4,639,021
150 4,639,022
262 4,639,023
264 4,639,024
337 4,639,025
352 4,639,026

CLASS 293

128 4,639,027

CLASS 294

16 Re.32,338
34 4,639,028
57 4,639,029
64.1 4,639,030

CLASS 296

24 R 4,639,031
62 4,639,032
100 4,639,033
4,639,034
218 4,639,035

CLASS 297

184 4,639,036
334 4,639,037
341 4,639,038
353 4,639,039
379 4,639,040
391 4,639,041
444 4,639,042

CLASS 298

5 4,639,043

CLASS 301

9 DN 4,639,044
37 S 4,639,045
63 PW 4,639,046

CLASS 303

15 4,639,047
22 R 4,639,048

CLASS 307

10 R 4,639,609
83 4,639,610
117 4,639,611
132 E 4,639,612
241 4,639,613
243 4,639,614
289 4,639,615
270 4,639,616
296 R 4,639,617
351 4,639,618
352 4,639,619
446 4,639,620
450 4,639,621
482 4,639,622
492 4,639,623

CLASS 310

154 4,639,624
4,639,625
155 4,639,626
156 4,639,627
184 4,639,628
248 4,639,629
328 4,639,630
344 4,639,631
351 4,639,632

CLASS 312

195 4,639,049
273 4,639,050
275 4,639,051
333 4,639,052

CLASS 313

35 4,639,634
62 4,639,634
123 4,639,635
408 4,639,636
489 4,639,637
534 4,639,638
639 4,639,639

CLASS 315

3 4,639,640
5.41 4,639,641
39 4,639,642
291 Re.32,341
344 4,639,643
382 4,639,644

CLASS 318

51 4,639,645
139 4,639,646
247 4,639,647
254 4,639,648
314 4,639,649
333 4,639,650
432 4,639,651
568 4,639,652
599 4,639,653

CLASS 320

2 4,639,654
14 4,639,655
22 4,639,656

CLASS 322

59 4,639,657

CLASS 323

204 4,639,658
224 4,639,659
231 4,639,551
266 4,639,660
317 4,639,661
343 4,639,662
356 4,639,663

CLASS 324

73 AT 4,639,664
117 H 4,639,665
202 4,639,666
208 4,639,667
4,639,668
239 4,639,669
260 4,639,670
309 4,639,671
318 4,639,672
319 4,639,673
326 4,639,674
334 4,639,675
4,639,676
380 4,639,677
425 4,639,678
457

CLASS 328

20 4,639,679
134 4,639,680
164 4,639,681

CLASS 329

50 4,639,682

CLASS 330

253 4,639,683
259 4,639,684
263 4,639,685
307 4,639,686

CLASS 331

1 A 4,639,687
10 4,639,688
65 4,639,689
96 4,639,690
99 4,639,691
111 4,639,692

CLASS 333

1 4,639,693
138 4,639,694
133 4,639,695
4,639,696
155 4,639,697
187 4,639,698

202 4,639,699

CLASS 335

6 4,639,700
21 4,639,701
153 4,639,702
213 4,639,703
255 4,639,704

CLASS 336

5 4,639,705
170 4,639,706
185 4,639,707
200 4,639,708

CLASS 337

360 4,639,709

CLASS 338

108 4,639,710
114 4,639,711
238 4,639,712

CLASS 339

14 R 4,639,053
4,639,054
16 R 4,639,055
17 CF 4,639,058
17 F 4,639,057
4,639,059
17 LC 4,639,056
30 4,639,060
39 M 4,639,061
4,639,062
75 M 4,639,063
89 M 4,639,064
119 R 4,639,065
132 B 4,639,066
143 R 4,639,067
177 R 4,639,068

CLASS 340

53 4,639,713
310 R 4,639,714
347 AD 4,639,715
365 S 4,639,554
571 4,639,716
578 4,639,717
603 4,639,718
652 4,639,719
712 4,639,720
747 4,639,721
784 4,639,722
799 4,639,723
815.01 4,639,724
815.02 4,639,725
825.44 4,639,726
825.57 4,639,727
870.03 4,639,728
870.13 4,639,729
970 4,639,730

CLASS 341

147 4,639,731
371 4,639,732
424 4,639,733

CLASS 343

912 4,639,734

CLASS 346

1.1 4,639,735
75 4,639,736
4,639,737
4,639,738
76 L 4,639,740
76 PH 4,639,739
4,639,741
4,639,742
4,639,743
4,639,744
135.1 4,639,745
140 R 4,639,746
4,639,747
4,639,748
153.1 4,639,749
221 4,639,750
227 4,639,751

CLASS 358

1.7 4,639,069
3.71 4,639,070
4,639,071
6.8 4,639,072
4,639,073
96.15 4,639,074
96.16 4,639,075
96.20 4,639,076
4,639,077
96.21 4,639,078
96.33 4,639,079
96.34 4,639,080
144 4,639,081
172 4,639,082
255 4,639,083
4,639,084
283 4,639,085

322 4,639,086
332 4,639,087
339 F 4,639,088
4,639,089
341 4,639,090
346 4,639,091
347 V 4,639,092
372 4,639,093
388 4,639,094
413 4,639,095
427 4,639,096
4,639,097
507 4,639,098
514 4,639,099
538 4,639,100
611 4,639,101
616 4,639,102
626 4,639,103
936

CLASS 351

117 4,639,104
162 4,639,105

CLASS 353

13 4,639,106

CLASS 354

77 4,639,107
289.1 4,639,108
295 4,639,109
403 4,639,110
455 4,639,112
472 4,639,113
481 4,639,111

CLASS 355

3 DD 4,639,115
4,639,116
4,639,119
3 SH 4,639,126
14 R 4,639,117
4,639,120
4,639,121
15 4,639,122
4,639,123
4,639,124
23 4,639,125
29 4,639,118
35 4,639,127
35 H 4,639,114
75 4,639,128

CLASS 356

5 4,639,129
73.1 4,639,130
4,639,131
124.5 4,639,132
125 4,639,133
223 4,639,134
246 4,639,135
312 4,639,136
339 4,639,137
350 4,639,138
359 4,639,139
372 4,639,142
376 4,639,140
387 4,639,141

CLASS 357

16 4,639,752
22 4,639,753
23.4 4,639,754
23.8 4,639,762
28 4,639,755
30 4,639,756
36 4,639,757
42 4,639,758
74 4,639,759
75 4,639,760
234 4,639,761

CLASS 358

11 4,639,763
14 4,639,764
19 4,639,765
21 R 4,639,766
4,639,767
22 4,639,768
27 4,639,769
76 4,639,770
80 4,639,771
98 4,639,772
105 4,639,773
4,639,774
106 4,639,775
107 4,639,776
120 4,639,777
135 4,639,778
142 4,639,779
150 4,639,780
163 4,639,781
166 4,639,782
4,639,783
167 4,639,784
184 4,639,785
197 4,639,786
214 4,639,787
233 4,639,788
285 4,639,789
293 4,639,790
300 4,639,791
335 4,639,792

CLASS 360

44 4,639,793
46 4,639,794
82 4,639,795
71 4,639,797
72.2 Re.32,342
73 4,639,798
77 4,639,796
85 4,639,799
90 4,639,800
96.5 4,639,801
98 4,639,802
103 4,639,803
105 4,639,804
108 4,639,805
113 4,639,806
4,639,807
121 4,639,808
4,639,809
125 4,639,810
4,639,811
126 4,639,812
138 4,639,813
130.1 4,639,814
131 4,639,815
4,639,816

CLASS 361

82 4,639,817
106 4,639,818
115 4,639,819
124 4,639,820
151 4,639,821
155 4,639,822
159 4,639,823
179 4,639,824
212 4,639,825
272 4,639,826
4,639,827
4,639,828
286 4,639,831
306 4,639,832
315 4,639,833
386 4,639,829
388 4,639,834
392 4,639,835
411 4,639,830
433 4,639,836

CLASS 362

32 4,639,837
33 4,639,838
64 4,639,839
80 4,639,840
227 4,639,841
376 4,639,842
431 4,639,843

CLASS 363

17 4,639,844
26 4,639,845
39 4,639,846
46 4,639,847
51 4,639,848
56 4,639,849
58 4,639,850
164 4,639,851

CLASS 364

138 4,639,852
149 4,639,853
157 4,639,854
188 4,639,855
200 4,639,856
4,639,857
4,639,858
4,639,859
4,639,860
4,639,861
4,639,862
4,639,863
4,639,864
4,639,865
4,639,866
414 4,639,867
420 4,639,868
424.1 4,639,869
431.05 4,639,870
431.10 4,639,871
463 4,639,872
466 4,639,873
478 4,639,874
479 4,639,875
483 4,639,876
513 4,639,878
513.5 4,639,877
518 4,639,879
519 4,639,880
521 4,639,881
550 4,639,882
557 4,639,883

565 4,639,884
574 4,639,885
736 4,639,886
748 4,639,887
788 4,639,888
900 4,639,889
4,639,890
4,639,891

CLASS 365

182 4,639,892
185 4,639,893
189 4,639,894
200 4,639,895
4,639,896
4,639,897
202 4,639,898
230 4,639,899

CLASS 366

89 4,639,143

CLASS 367

5 4,639,900
13 4,639,901
93 4,639,902
131 4,639,903
180 4,639,904
189 4,639,905

CLASS 368

276 4,639,144

CLASS 369

14 4,639,906
45 4,639,907
288 4,639,908

CLASS 370

58 4,639,909
4,639,910
69.1 4,639,911
86 4,639,912
90 4,639,913
110.1 4,639,914

CLASS 371

10 4,639,915
16 4,639,916
4,639,917
20 4,639,918
27 4,639,919
31 4,639,920
53 4,639,921

CLASS 372

19 4,639,922
21 4,639,923
33 4,639,924
46 4,639,925
87 4,639,926

CLASS 373

84 4,639,927
93 4,639,928
120 4,639,929
4,639,930
138 4,639,931

CLASS 375

1 4,639,932
8 4,639,933
10 4,639,934
11 4,639,935
36 4,639,936
40 4,639,937
80 4,639,938
118 4,639,939

CLASS 376

107 4,639,348
254 4,639,349
290 4,639,350
310 4,639,351

CLASS 377

60 4,639,940

CLASS 378

11 4,639,941
36 4,639,943
045 4,639,942

CLASS 379

29 4,639,557
62 4,639,549
4,639,550
4,639,552
327 4,639,555
377 4,639,553

CLASS 381

68.6 4,639,556

CLASS 384

19 4,639,145
99 4,639,146
125 4,639,147
420 4,639,148

477 4,639,149
516 4,639,150

CLASS 400

63 4,639,151
120 4,639,152
202.1 4,639,153
584 4,639,154

CLASS 401

1 4,639,155
146 4,639,156

CLASS 403

19 4,639,157

CLASS 483

31 4,639,158
50 4,639,159
71 4,639,160
243 4,639,161
316 4,639,162
322 4,639,163

CLASS 405

45 4,639,165
54 4,639,164
203 4,639,166
217 4,639,167
239 4,639,168
191 4,639,169

CLASS 406

76 4,639,170
89 4,639,171

CLASS 409

80 4,639,172
122 4,639,173

CLASS 411

34 4,639,174
38 4,639,175
468 4,639,176

CLASS 412

11 4,639,177

CLASS 413

26 4,639,178

CLASS 414

223 4,639,179
224 4,639,180
349 4,639,181
543 4,639,182
705 4,639,183
730 4,639,184
733 4,639,185
734 4,639,186
787 4,639,187

CLASS 415

9 4,639,188
115 4,639,189
129 4,639,190
196 4,639,191

CLASS 416

27 4,639,192
184 4,639,193
190 Re.32,339
241 B 4,639,194

CLASS 417

216 4,639,195
228 4,639,196
259 4,639,197
410 4,639,198

CLASS 418

3 4,639,199
48 4,639,200
55 4,639,201
59 4,639,202
61 B 4,639,203

CLASS 419

15 4,639,352

CLASS 422

46 4,639,353
140 4,639,354

CLASS 423

112 4,639,355
266 4,639,356
306 4,639,357
4,639,358
321 R 4,639,359
329 4,639,360
347 4,639,361
354 4,639,362
644 4,639,363

CLASS 424

9 4,639,364
4,639,365
19 4,639,366

45 4,639,367
48 4,639,368
59 4,639,369
80 4,639,370
86 4,639,371
88 4,639,372
101 4,639,373

CLASS 425

3 4,639,204
200 4,639,205
503 4,639,206
4,639,207

CLASS 426

43 4,639,374
49 4,639,375
134 4,639,376

CLASS 427

10 4,639,377
35 4,639,378
40 4,639,379
97 4,639,380
156 4,639,381
182 4,639,382
213 4,639,383
290 4,639,384
386 4,639,385

CLASS 428

35 4,639,386
113 4,639,387
117 4,639,388
141 4,639,389
195 4,639,390
210 4,639,391
283 4,639,392
304.4 4,639,393
327 4,639,394
341 4,639,395
373 4,639,396
397 4,639,397
451 4,639,398
623 4,639,399
694 4,639,400

CLASS 429

30 4,639,401

CLASS 488

18 4,639,402
115 4,639,403
4,639,404
124 4,639,405
165 4,639,406
203 4,639,407
351 4,639,408
505 4,639,409
506 4,639,410
510 4,639,411
523 4,639,412
546 4,639,413
550 4,639,414
558 4,639,415
567 4,639,416
4,639,417
617 4,639,418

CLASS 431

1 4,639,208
4 4,639,209
13 4,639,210
20 4,639,211
183 4,639,212
326 4,639,213
344 4,639,214
354 4,639,215

CLASS 432

105 4,639,216
107 4,639,217

CLASS 433

8 4,639,218
22 4,639,219
69 4,639,220
139 4,639,221

CLASS 434

20 4,639,222
272 4,639,223
286 4,639,224
306 4,639,225
433 4,639,226

CLASS 435

5 4,639,419
7 4,639,420
34 4,639,421
286 4,639,422
287 4,639,423

CLASS 436

74 4,639,424
518 4,639,425

CLASS 441

1 4,639,227

5 4,639,228
82 4,639,229

CLASS 445

30 4,639,230
31 4,639,231

CLASS 446

220 4,639,232
321 4,639,233
327 4,639,234
389 4,639,235
430 4,639,236

CLASS 464

65 4,639,237

CLASS 474

8 4,639,238
4,639,239
144 4,639,240
902 4,639,241

CLASS 494

37 4,639,242

CLASS 901

96 4,639,426
128 4,639,427

CLASS 902

115 4,639,428
117 4,639,429
120 4,639,430
304 4,639,431
324 4,639,432

CLASS 514

8 4,639,433
11 4,639,434
4,639,435
24 4,639,436
54 4,639,437
129 4,639,438
171 4,639,439
178 4,639,440
195 4,639,441
212 4,639,442
222 4,639,443
4,639,444
4,639,445
4,639,446
226 4,639,448
234 4,639,449
238 4,639,450
247 4,639,451
252 4,639,452
254 4,639,453
259 4,639,454
282 4,639,455
283 4,639,456
290 4,639,457
311 4,639,458
343 4,639,459
369 4,639,460
382 4,639,461
383 4,639,462
395 4,639,463
396 4,639,464
419 4,639,465
456 4,639,466
468 4,639,467
620 4,639,468
729 4,639,469

CLASS 518

700 4,639,470

CLASS 521

172 4,639,471

CLASS 522

107 4,639,472

CLASS 523

141 4,639,474
164 4,639,475
213 4,639,476

CLASS 534

83 4,639,477
97 4,639,478
100 4,639,479
104 4,639,480
128 4,639,481
137 4,639,482
196 4,639,483
318 4,639,484
378 4,639,485
479 4,639,486
625 4,639,487
856 4,639,488
588 4,639,489
765 4,639,490
801 4,639,491

26 4,638,871
CLASS 174
32 4,639,544
36 4,639,545
92 4,639,546
CLASS 175
46 4,638,872
73 4,638,873
321 4,638,874
CLASS 177
1 4,638,875
139 4,638,876
CLASS 178
18 4,639,547
22.17 4,639,548
CLASS 180
21 4,638,877
89.13 4,638,878
179 4,638,879
219 4,638,880
4,638,881
287 4,638,882
324 4,638,883
CLASS 181
141 4,638,884
CLASS 182
151 4,638,885
CLASS 187
8.49 4,638,886
9 R 4,638,887
19 4,638,888
29 R 4,638,889
CLASS 188
24.17 4,638,890
58 4,638,891
59 4,638,892
79.5 GE 4,638,893
170 4,638,894
280 4,638,895
299 4,638,896
CLASS 192
0.052 4,638,898
3.3 4,638,897
81 C 4,638,899
85 CA 4,638,900
CLASS 198
323 4,638,901
345 4,638,902
419 4,638,903
463.6 Re.32,337
468.2 4,638,904
774 4,638,905
803.9 4,638,906
CLASS 200
1 V 4,639,558
5 A 4,639,559
19 R 4,639,560
33 R 4,639,561
43.08 4,639,562
50 B Re.32,340
61.45 M 4,639,563
144 R 4,639,564
148 A 4,639,565
158 4,639,566
CLASS 202
205 4,639,293
CLASS 203
88 4,639,294
CLASS 204
38.1 4,639,295
59 F 4,639,297
59 R 4,639,296
4,639,298
181.7 4,639,299
182.3 4,639,300
192.31 4,639,301
258 4,639,302
4,639,303
413 4,639,304
426 4,639,305
432 4,639,306
CLASS 206
0.5 4,638,907
0.8 4,638,908
1.7 4,638,909
15.2 4,638,910
611 4,638,911
621 4,638,912
632 4,638,913
CLASS 208
44 4,639,307
100 4,639,308

262 4,639,309
412 4,639,310
CLASS 209
143 4,639,311
170 4,639,313
617 4,638,914
CLASS 210
101 4,639,312
220 4,639,314
333.1 4,639,315
416.1 4,639,316
433.2 4,639,317
491 4,639,318
651 4,639,319
739 4,639,320
CLASS 211
13 4,638,915
CLASS 215
235 4,638,916
252 4,638,917
295 4,638,918
CLASS 219
10.43 4,639,567
69 M 4,639,568
109 4,639,569
121 EC 4,639,571
121 LG 4,639,572
121 PP 4,639,570
124.22 4,639,573
125.1 4,639,574
136 4,639,575
146.23 4,639,576
399 4,639,577
450 4,639,578
464 4,639,579
541 4,639,580
CLASS 220
288 4,638,919
445 4,638,920
CLASS 221
1 4,638,921
75 4,638,922
132 4,638,923
CLASS 222
1 4,638,924
21 4,638,925
82 4,638,926
83 4,638,927
155 4,638,928
456 4,638,929
CLASS 223
85 4,638,930
88 4,638,931
111 4,638,932
CLASS 224
41 4,638,933
CLASS 225
97 4,638,934
CLASS 226
171 4,638,935
191 4,638,936
CLASS 228
5.5 4,638,937
180.1 4,638,938
186 4,638,939
CLASS 229
92.3 4,638,940
104 4,638,941
CLASS 235
101 4,639,581
379 4,639,582
380 4,639,583
449 4,639,584
492 4,639,585
CLASS 236
10 4,638,942
CLASS 237
7 4,638,943
8 R 4,638,944
CLASS 239
143 4,638,945
265.33 4,638,946
265.43 4,638,947
307 4,638,949
551 4,638,950
707 4,638,951
722 4,638,948
CLASS 241
3 4,638,952
39 4,638,953

74 4,638,954
CLASS 242
18 PW 4,638,955
35.5 A 4,638,956
58.6 4,638,957
84.1 R 4,638,958
107.4 R 4,638,959
CLASS 244
134 D 4,638,960
142 4,638,961
203 4,638,962
CLASS 248
56 4,638,963
4,638,964
59 4,638,965
62 4,638,966
97 4,638,967
4,638,968
122 4,638,969
342 4,638,970
678 4,638,971
CLASS 250
201 4,639,586
4,639,587
4,639,588
4,639,589
203 R 4,639,590
213 VT 4,639,591
221 4,639,592
223 B 4,639,593
227 4,639,594
231 SE 4,639,595
259 4,639,596
305 4,639,597
339 4,639,598
363 S 4,639,599
4,639,600
385 4,639,601
396 R 4,639,602
504 R 4,639,603
548 4,639,604
554 4,639,605
555 4,639,606
561 4,639,607
578 4,639,608
CLASS 251
1.3 4,638,972
129.02 4,638,973
129.15 4,638,974
149.6 4,638,975
173 4,638,976
248 4,638,977
CLASS 252
8.554 4,639,322
8.8 4,639,321
32.5 4,639,323
48.6 4,639,324
89.1 4,639,325
91 4,639,326
143 4,639,327
299.61 4,639,328
501.1 4,639,329
522 R 4,639,330
609 4,639,331
CLASS 254
228 4,638,978
CLASS 256
13.1 4,638,979
CLASS 260
397.5 4,639,336
408 4,639,337
502.5 C 4,639,338
513.6 4,639,339
CLASS 261
36.1 4,639,340
CLASS 264
40.1 4,639,341
4,639,342
45.5 4,639,343
83 4,639,344
226 4,639,345
280 4,639,346
291 4,639,347
CLASS 266
44 4,638,980
CLASS 267
8 R 4,638,981
131 4,638,982
140.1 4,638,983
CLASS 269
43 4,638,984
244 4,638,985
CLASS 271
98 4,638,986

111 4,638,987
171 4,638,988
227 4,638,989
272 4,638,990
4,638,991
293 4,638,992
315 4,638,993
CLASS 272
122 4,638,994
144 4,638,995
146 4,638,996
CLASS 273
1 GD 4,638,997
29 BB 4,638,998
258 4,638,999
CLASS 277
41 4,639,000
CLASS 279
121 4,639,001
CLASS 280
5.2 4,639,002
5.24 4,639,003
5.32 4,639,004
43.14 4,639,005
96.1 4,639,006
234 4,639,007
405 R 4,639,008
602 4,639,009
615 4,639,010
628 4,639,011
642 4,639,012
707 4,639,013
4,639,014
789 4,639,015
CLASS 285
15 4,639,016
38 4,639,017
184 4,639,018
332 4,639,019
367 4,639,020
CLASS 292
7 4,639,021
150 4,639,022
262 4,639,023
264 4,639,024
337 4,639,025
352 4,639,026
CLASS 293
128 4,639,027
CLASS 294
16 Re.32,338
34 4,639,028
57 4,639,029
64.1 4,639,030
CLASS 296
24 R 4,639,031
62 4,639,032
100 4,639,033
4,639,034
218 4,639,035
CLASS 297
184 4,639,036
334 4,639,037
341 4,639,038
353 4,639,039
379 4,639,040
391 4,639,041
444 4,639,042
CLASS 298
5 4,639,043
CLASS 301
9 DN 4,639,044
37 S 4,639,045
63 PW 4,639,046
CLASS 303
15 4,639,047
22 R 4,639,048
CLASS 307
10 R 4,639,609
83 4,639,610
117 4,639,611
132 E 4,639,612
241 4,639,613
243 4,639,614
269 4,639,615
270 4,639,616
296 R 4,639,617
351 4,639,618
352 4,639,619
446 4,639,620
450 4,639,621
482 4,639,622
492 4,639,623

CLASS 310
154 4,639,624
4,639,625
155 4,639,626
156 4,639,627
194 4,639,628
248 4,639,629
328 4,639,630
344 4,639,631
351 4,639,632
CLASS 312
195 4,639,049
273 4,639,050
275 4,639,051
333 4,639,052
CLASS 313
35 4,639,633
62 4,639,634
123 4,639,635
408 4,639,636
489 4,639,637
534 4,639,638
639 4,639,639
CLASS 315
3 4,639,640
5.41 4,639,641
4,639,642
39 Re.32,341
291 4,639,643
344 4,639,644
382
CLASS 318
51 4,639,645
139 4,639,646
247 4,639,647
254 4,639,648
314 4,639,649
333 4,639,650
432 4,639,651
568 4,639,652
599 4,639,653
CLASS 320
2 4,639,654
14 4,639,655
22 4,639,656
CLASS 322
59 4,639,657
CLASS 323
204 4,639,658
224 4,639,659
231 4,639,551
266 4,639,660
317 4,639,661
343 4,639,662
356 4,639,663
CLASS 324
73 AT 4,639,664
117 H 4,639,665
202 4,639,666
208 4,639,667
4,639,668
239 4,639,669
260 4,639,670
309 4,639,671
318 4,639,672
319 4,639,673
326 4,639,674
334 4,639,675
380 4,639,676
425 4,639,677
457 4,639,678
CLASS 328
20 4,639,679
134 4,639,680
164 4,639,681
CLASS 329
50 4,639,682
CLASS 330
253 4,639,683
259 4,639,684
263 4,639,685
307 4,639,686
CLASS 331
1 A 4,639,687
10 4,639,688
65 4,639,689
96 4,639,690
99 4,639,691
111 4,639,692
CLASS 333
1 4,639,693
128 4,639,694
133 4,639,695
138 4,639,696
155 4,639,697
187 4,639,698

202 4,639,699
CLASS 335
6 4,639,700
21 4,639,701
153 4,639,702
213 4,639,703
255 4,639,704
CLASS 336
5 4,639,705
170 4,639,706
185 4,639,707
200 4,639,708
CLASS 337
360 4,639,709
CLASS 338
108 4,639,710
114 4,639,711
238 4,639,712
CLASS 339
14 R 4,639,053
4,639,054
16 R 4,639,055
17 CF 4,639,058
17 F 4,639,057
4,639,059
17 LC 4,639,056
30 4,639,060
59 M 4,639,061
4,639,062
75 M 4,639,063
89 M 4,639,064
119 R 4,639,065
132 B 4,639,066
143 R 4,639,067
177 R 4,639,068
CLASS 340
63 4,639,713
310 R 4,639,714
347 AD 4,639,715
365 S 4,639,554
571 4,639,716
578 4,639,717
603 4,639,718
652 4,639,719
712 4,639,720
747 4,639,721
784 4,639,722
799 4,639,723
815.01 4,639,724
815.02 4,639,725
825.44 4,639,726
825.57 4,639,727
870.03 4,639,728
870.13 4,639,729
970 4,639,730
CLASS 342
147 4,639,731
371 4,639,732
424 4,639,733
CLASS 343
912 4,639,734
CLASS 346
1.1 4,639,735
75 4,639,736
4,639,737
4,639,738
76 L 4,639,740
76 PH 4,639,739
4,639,741
4,639,742
4,639,743
4,639,744
135.1 4,639,745
140 R 4,639,746
4,639,747
4,639,748
153.1 4,639,749
221 4,639,750
227 4,639,751
CLASS 350
1.7 4,639,069
3.71 4,639,070
4,639,071
6.8 4,639,072
4,639,073
96.15 4,639,074
96.16 4,639,075
96.20 4,639,076
4,639,077
96.21 4,639,078
96.33 4,639,079
96.34 4,639,080
144 4,639,081
172 4,639,082
255 4,639,083
4,639,084
283 4,639,085

322 4,639,086
332 4,639,087
339 F 4,639,088
341 4,639,089
346 4,639,090
347 V 4,639,091
372 4,639,092
388 4,639,093
413 4,639,094
427 4,639,095
4,639,096
507 4,639,097
514 4,639,098
538 4,639,099
611 4,639,100
616 4,639,101
626 4,639,102
636 4,639,103
CLASS 351
117 4,639,104
162 4,639,105
CLASS 353
13 4,639,106
CLASS 354
77 4,639,107
289.1 4,639,108
295 4,639,109
403 4,639,110
455 4,639,112
472 4,639,113
481 4,639,111
CLASS 355
3 DD 4,639,115
4,639,116
4,639,119
3 SH 4,639,126
14 R 4,639,117
4,639,120
4,639,121
15 4,639,122
4,639,123
4,639,124
23 4,639,125
29 4,639,118
35 4,639,127
35 H 4,639,114
75 4,639,128
CLASS 356
5 4,639,129
73.1 4,639,130
4,639,131
124.5 4,639,132
125 4,639,133
223 4,639,134
246 4,639,135
312 4,639,136
339 4,639,137
350 4,639,138
359 4,639,139
372 4,639,142
376 4,639,140
387 4,639,141
CLASS 357
16 4,639,752
22 4,639,753
23.4 4,639,754
23.8 4,639,762
28 4,639,755
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36 4,639,757
42 4,639,758
74 4,639,759
75 4,639,760
234 4,639,761
CLASS 358
11 4,639,763
14 4,639,764
19 4,639,765
21 R 4,639,766
4,639,767
22 4,639,768
27 4,639,769
76 4,639,770
80 4,639,771
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105 4,639,773
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106 4,639,775
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135 4,639,778
142 4,639,779
150 4,639,780
163 4,639,781
166 4,639,782
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184 4,639,785
197 4,639,786
214 4,639,787
233 4,639,788

285 4,639,789
293 4,639,790
300 4,639,791
335 4,639,792
CLASS 360
44 4,639,793
46 4,639,794
62 4,639,795
71 4,639,797
72.2 Re.32,342
73 4,639,798
77 4,639,796
85 4,639,799
90 4,639,800
96.5 4,639,801
98 4,639,802
103 4,639,803
105 4,639,804
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113 4,639,806
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121 4,639,808
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125 4,639,810
4,639,811
126 4,639,812
128 4,639,813
130.1 4,639,814
131 4,639,815
4,639,816
CLASS 361
62 4,639,817
106 4,639,818
115 4,639,819
124 4,639,820
151 4,639,821
155 4,639,822
159 4,639,823
179 4,639,824
212 4,639,825
272 4,639,826
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286 4,639,831
306 4,639,832
315 4,639,833
386 4,639,829
388 4,639,834
392 4,639,835
411 4,639,830
433 4,639,836
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33 4,639,838
64 4,639,839
80 4,639,840
227 4,639,841
376 4,639,842
431 4,639,843
CLASS 363
17 4,639,844
26 4,639,845
39 4,639,846
46 4,639,847
51 4,639,848
56 4,639,849
58 4,639,850
164 4,639,851
CLASS 364
138 4,639,852
149 4,639,853
157 4,639,854
188 4,639,855
200 4,639,856
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414 4,639,867
420 4,639,868
424.1 4,639,869
431.05 4,639,870
431.10 4,639,871
463 4,639,872
466 4,639,873
478 4,639,874
479 4,639,875
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513 4,639,878
513.5 4,639,877
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565 4,639,884
574 4,639,885
736 4,639,886
748 4,639,887
788 4,639,888
900 4,639,889
4,639,890
4,639,891
CLASS 365
182 4,639,892
185 4,639,893
189 4,639,894
200 4,639,895
4,639,896
4,639,897
202 4,639,898
230 4,639,899
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89 4,639,143
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5 4,639,900
13 4,639,901
93 4,639,902
131 4,639,903
140 4,639,904
189 4,639,905
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276 4,639,144
CLASS 369
14 4,639,906
45 4,639,907
288 4,639,908
CLASS 370
58 4,639,909
4,639,910
69.1 4,639,911
86 4,639,912
90 4,639,913
110.1 4,639,914
CLASS 371
10 4,639,915
16 4,639,916
4,639,917
20 4,639,918
27 4,639,919
31 4,639,920
53 4,639,921
CLASS 372
19 4,639,922
21 4,639,923
33 4,639,924
46 4,639,925
87 4,639,926
CLASS 373
84 4,639,927
93 4,639,928
120 4,639,929
4,639,930
138 4,639,931
CLASS 375
1 4,639,932
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10 4,639,934
11 4,639,935
36 4,639,936
40 4,639,937
60 4,639,938
118 4,639,939
CLASS 376
107 4,639,348
254 4,639,349
290 4,639,350
310 4,639,351
CLASS 377
60 4,639,940
CLASS 378
11 4,639,941
96 4,639,943
045 4,639,942
CLASS 379
29 4,639,557
62 4,639,549
4,639,550
199 4,639,552
327 4,639,555
377 4,639,553
CLASS 381
68.6 4,639,556
CLASS 384
19 4,639,145
99 4,639,146
125 4,639,147
420 4,639,148

477 4,639,149
536 4,639,150
CLASS 400
63 4,639,151
120 4,639,152
202.1 4,639,153
584 4,639,154
CLASS 401
1 4,639,155
146 4,639,156
CLASS 402
19 4,639,157
CLASS 403
31 4,639,158
50 4,639,159
71 4,639,160
245 4,639,161
316 4,639,162
322 4,639,163
CLASS 405
45 4,639,165
54 4,639,164
203 4,639,166
217 4,639,167
239 4,639,168
291 4,639,169
CLASS 408
76 4,639,170
89 4,639,171
CLASS 409
80 4,639,172
122 4,639,173
CLASS 411
34 4,639,174
38 4,639,175
468 4,639,176
CLASS 412
11 4,639,177
26 4,639,178
CLASS 414
223 4,639,179
224 4,639,180
349 4,639,181
543 4,639,182
705 4,639,183
730 4,639,184
733 4,639,185
734 4,639,186
787 4,639,187
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9 4,639,188
115 4,639,189
129 4,639,190
196 4,639,191
CLASS 416
27 4,639,192
184 4,639,193
190 Re.32,339
241 B 4,639,194
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216 4,639,195
228 4,639,196
259 4,639,197
410 4,639,198
CLASS 418
3 4,639,199
48 4,639,200
55 4,639,201
59 4,639,202
61 B 4,639,203
CLASS 419
15 4,639,352
CLASS 422
46 4,639,353
140 4,639,354
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112 4,639,355
266 4,639,356
306 4,639,357
4,639,358
321 R 4,639,359
329 4,639,360
347 4,639,361
554 4,639,362
644 4,639,363
CLASS 424
9 4,639,364
4,639,365
19 4,639,366

45 4,639,367
48 4,639,368
59 4,639,369
80 4,639,370
86 4,639,371
88 4,639,372
101 4,639,373
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CLASS 426
43 4,639,374
49 4,639,375
134 4,639,376
CLASS 427
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290 4,639,384
386 4,639,385
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113 4,639,387
117 4,639,388
141 4,639,389
195 4,639,390
210 4,639,391
283 4,639,392
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327 4,639,394
341 4,639,395
373 4,639,396
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451 4,639,398
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30 4,639,401
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115 4,639,403
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124 4,639,405
165 4,639,406
203 4,639,407
351 4,639,408
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523 4,639,412
546 4,639,413
550 4,639,414
558 4,639,415
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617 4,639,418
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1 4,639,208
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344 4,639,214
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433 4,639,226
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518 4,639,425
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327 4,639,234
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117 4,639,429
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324 4,639,432
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395 4,639,463
396 4,639,464
419 4,639,465
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468 4,639,467
620 4,639,468
729 4,639,469
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700 4,639,470
CLASS 521
172 4,639,471
CLASS 522
107 4,639,472
CLASS 523
141 4,639,474
164 4,639,475
213 4,639,476
CLASS 524
83 4,639,477
97 4,639,478
100 4,639,479
104 4,639,480
128 4,639,481
137 4,639,482
296 4,639,483
318 4,639,484
378 4,639,485
409 4,639,486
425 4,639,487
456 4,639,488
588 4,639,489
765 4,639,490
801 4,639,491

CLASSIFICATION OF PATENTS

CLASS 525		**CLASS 528**			4,639,511	320	4,639,519	952	4,639,334	44	4,639,540
54.42	4,639,492	15	4,639,501	313	4,639,512	**CLASS 546**		**CLASS 549**		**CLASS 560**	
83	4,639,473	45	4,639,502	387	4,639,513	45	4,639,520	260	4,639,530	20	4,639,541
113	4,639,493	92	4,639,503	**CLASS 536**		141	4,639,521	261	4,639,531	**CLASS 604**	
271	4,639,494	176	4,639,504	30	4,639,514	194	4,639,522	332	4,639,532	6	4,639,243
285	4,639,495	211	4,639,505		4,639,515	209	4,639,523	411	4,639,533	19	4,639,244
506	4,639,496	212	4,639,506	123	4,639,516	229	4,639,524	414	4,639,534	152	4,639,245
CLASS 526		388	4,639,507	**CLASS 540**		290	4,639,525	419	4,639,535	158	4,639,246
93	4,639,497	486	4,639,508	304	4,639,335	**CLASS 548**		462	4,639,536	175	4,639,247
196	4,639,498	**CLASS 530**		**CLASS 544**		140	4,639,526	**CLASS 558**		187	4,639,248
285	4,639,499	303	4,639,332			262	4,639,527	48	4,639,537	198	4,639,249
301	4,639,500		4,639,333	85	4,639,517	422	4,639,528	71	4,639,538	201	4,639,250
		307	4,639,509	285	4,639,518	550	4,639,529	363	4,639,539	260	4,639,251
			4,639,510							282	4,639,252
										362	4,639,253
										385 R	4,639,254

CLASSIFICATION OF DESIGNS

D2—	247	287,900		77	287,921		7	287,941		300	287,961
	252	287,901		99	287,922		53	287,942		345	287,962
	318	287,902		321	287,923			287,943	D13—	24	287,963
	321	287,903		351	287,924		64	287,944		99	287,965
D3—	30.5	287,906			287,925		82	287,945	D14—	4	287,970
	35	287,907		368	287,926		98	287,946		53	287,964
	106	287,905	D8—	17	287,927		102	287,947			287,971
D6—	328	287,908		22	287,928		115	287,948		55	287,966
	329	287,909		51	287,929	D11—	6	287,949		100	287,967
	347	287,910		64	287,930		143	287,950			287,972
	382	287,911		373	287,931	D12—	119	287,951		106	287,968
	408	287,912	D9—	305	287,932		136	287,952			287,969
	409	287,913		349	287,933		146	287,953		111	287,973
	419	287,914		370	287,934		147	287,954		114	287,974
	515	287,915		372	287,935			287,955	D15—	134	287,975
	567	287,916			287,936			287,956	D16—	1	287,976
D7—	18	287,917		375	287,937			287,957		132	287,977
	19	287,918		439	287,938		169	287,958	D18—	7	287,978
	40	287,919		447	287,939		202	287,959		24	287,979
	70	287,920	D10—	6	287,940		211	287,960	D19—	86	287,980

D21—	92	287,981		131	288,001						
	34	287,982		139	288,002						
	48	287,983		150	288,003						
	122	287,984	D24—	51	288,004						
	149	287,985		61	288,005						
	150	287,986		63	288,006						
	155	287,987	D26—	51	288,007						
	204	287,988		139	288,008						
	207	287,989		145	288,009						
	226	287,990	D27—	8	288,010						
D22—	129	287,991	D28—	86	288,012						
D23—	7	287,992	D29—	22	287,904						
	17	287,993	D30—	13	288,013						
	18	287,994	D32—	18	288,014						
	19	287,995			288,015						
	36	287,996		22	288,016						
	46	287,997		25	288,017						
	71	287,998		35	288,018						
	72	287,999		37	288,019						
	121	288,000	D99—	28	288,011						

CLASSIFICATION OF PLANTS

P.—	15	5,864		43	5,865		54	5,866		68	5,867

	5,868			5,869	

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

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Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
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Delaware	10	Montana	30	Vermont	50
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,638,737		4,638,959		4,639,884		4,638,810		4,639,381		4,639,472
	4,638,739		4,638,963		4,639,887		4,638,824		4,639,383	24 :	4,638,920
	4,638,807		4,639,026		4,639,893		4,638,841		4,639,424		4,638,929
	4,638,850		4,639,027		4,639,899		4,638,968		4,639,509		4,639,298
	4,639,642		4,639,044		4,639,903		4,638,996		4,639,510		4,639,396
02 :	4,638,786		4,639,045		4,639,915		4,639,000		4,639,511		4,639,399
04 :	4,639,005		4,639,061		4,639,921		4,639,138		4,639,524		4,639,618
	4,639,007		4,639,068		4,639,926		4,639,173		4,639,566		4,639,623
	4,639,017		4,639,106	08 :	4,638,513		4,639,223		4,639,571		4,639,655
	4,639,024		4,639,127		4,638,764		4,639,262		4,639,631		4,639,688
	4,639,028		4,639,128		4,639,054		4,639,359		4,639,657		4,639,690
	4,639,103		4,639,142		4,639,126		4,639,455		4,639,665		4,639,732
	4,639,139		4,639,157		4,639,293		4,639,539		4,639,667		4,639,902
	4,639,226		4,639,176		4,639,653		4,639,658		4,639,716	25 :	4,638,576
	4,639,313		4,639,189		4,639,684		4,639,710		4,639,821		4,638,636
	4,639,680		4,639,191		4,639,685		4,639,720		4,639,876		4,638,656
	4,639,760		4,639,234		4,639,808		4,639,788		4,639,877		4,638,749
05 :	4,638,770		4,639,245	09 :	Re.32,342		4,639,896	18 :	4,638,614		4,639,075
	4,638,922		4,639,246		4,638,530		4,639,934		4,638,792		4,639,109
06 :	Re.32,341		4,639,251		4,638,535		4,639,937		4,638,942		4,639,301
	4,638,544		4,639,259		4,638,620	13 :	4,638,559		4,639,034		4,639,348
	4,638,553		4,639,274		4,638,651		4,638,829		4,639,279		4,639,373
	4,638,558		4,639,288		4,638,732		4,638,847		4,639,391		4,639,481
	4,638,563		4,639,290		4,638,935		4,639,102		4,639,433		4,639,501
	4,638,567		4,639,307		4,639,009		4,639,611		4,639,486		4,639,543
	4,638,582		4,639,343		4,639,153		4,639,728		4,639,646		4,639,562
	4,638,591		4,639,366		4,639,228		4,639,825		4,639,763		4,639,637
	4,638,596		4,639,385		4,639,300	17 :	Re.32,338		4,639,780		4,639,644
	4,638,603		4,639,460		4,639,322		4,638,606		4,639,783		4,639,683
	4,638,611		4,639,530		4,639,356		4,638,616		4,639,784		4,639,697
	4,638,633		4,639,542		4,639,393		4,638,617		4,639,785		4,639,736
	4,638,634		4,639,569		4,639,485		4,638,743		4,639,786		4,639,792
	4,638,645		4,639,587		4,639,513		4,638,769		4,639,840		4,639,860
	4,638,653		4,639,598		4,639,529		4,638,869		4,639,842		4,639,874
	4,638,669		4,639,610		4,639,532		4,638,916	19 :	4,638,546		4,639,891
	4,638,672		4,639,612		4,639,593		4,638,932		4,638,720		4,639,936
	4,638,681		4,639,619		4,639,704		4,638,937		4,638,729	26 :	4,638,510
	4,638,696		4,639,661		4,639,885		4,638,973		4,638,938		4,638,511
	4,638,698		4,639,669		4,639,910		4,638,994		4,639,342		4,638,529
	4,638,707		4,639,671		4,639,933		4,639,019		4,639,561		4,638,533
	4,638,780		4,639,715	10 :	4,638,571		4,639,031		4,639,626		4,638,537
	4,638,798		4,639,756		4,638,648		4,639,035	20 :	4,638,665		4,638,548
	4,638,799		4,639,766		4,638,758		4,639,051		4,639,718		4,638,570
	4,638,803		4,639,772		4,639,265		4,639,056	21 :	Re.32,335		4,638,604
	4,638,805		4,639,774		4,639,317		4,639,081		4,638,740		4,638,678
	4,638,809		4,639,789		4,639,454		4,639,175		4,638,806		4,638,686
	4,638,811		4,639,794		4,639,495		4,639,188		4,639,504		4,638,715
	4,638,823		4,639,798	12 :	Re.32,339		4,639,217		4,639,578		4,638,761
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